

Workshop on Improving Regional Ocean Governance in the United States



Workshop Proceedings

December 9, 2002
Hotel Washington, Washington D.C.



Sponsored by

U.S. National Oceanic and Atmospheric Administration
Office of Ocean and Coastal Resource Management

Center for the Study of Marine Policy
University of Delaware

U.S. Environmental Protection Agency,
Ocean and Coastal Protection Division

Coastal States Organization

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**Improving Regional Ocean
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WORKSHOP PROCEEDINGS

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FOREWORD

This volume contains the papers prepared for the *Workshop on Improving Regional Ocean Governance in the United States*, held on December 9, 2002 at the Hotel Washington in Washington, DC.

The purpose of the Workshop was to identify ocean and coastal problems that are most appropriately and effectively addressed through a regional approach to governance and to identify options for improving regional ocean governance in the U.S.

While national-level action to improve U.S. ocean governance is clearly needed, the great diversity that exists in different regions of the U.S. coastal ocean (in terms of such factors as biogeographic conditions, ocean resources, conflicts, culture, institutional relationships) means that uniformity in approaches to ocean governance at the regional level may not be the best alternative. Instead, more tailored approaches that take into account important differences in regional circumstances, interests, and policy needs, may be more appropriate.

Other countries, which have recently undertaken major efforts at national ocean policy and Exclusive Economic Zone (EEZ) planning, such as Canada and Australia, and are engaged in major regional marine planning.

Through brief presentations and intensive discussion among participants, the Workshop addressed the following major themes:

- The diversity of regional ocean contexts in the U.S., and the major ocean and coastal problems and/or conflicts in each region;
- Key issues in regional ocean governance, including an examination of potential goals and key features of regional ocean governance frameworks;
- Drawing lessons from existing efforts at regional ocean governance in the U.S. and in other countries;
- Major options for improving ocean governance in the United States;
- Desirable features of a regional ocean governance system.

This is a key time in ocean and coastal policy decision-making in the United States, with both the U.S. Commission on Ocean Policy and the Pew Ocean Commission poised to present findings and recommendations for more effective governance of our coastal and marine areas. We sincerely hope that the results of the Workshop will be useful for the important work of the U.S. Commission on Ocean Policy, as well as the work of federal and state governments, non-governmental organizations, and the private sector.

This Proceedings Volume brings together the papers prepared for the Workshop, as well as the Workshop Summary drafted by members of the Steering Committee following the meeting.

The workshop was organized by a multi-stakeholder steering committee drawn from federal and state agencies, the private sector, environmental groups, and academia (see inside cover of the volume). Sincere thanks are due to members of the Workshop Steering Committee for all of their contributions in elucidating questions related to regional ocean governance before, during, and following the workshop.

Many thanks are due to the Ocean and Coastal Resource Management Office, National Oceanic and Atmospheric Administration (NOAA/OCRM) for its organizational and financial support of the conference, to the Center for the Study of Marine Policy (CSMP) at the University of Delaware for its organizational work on the workshop and the preparation of this volume, and for the financial and technical support of the U.S. Environmental Protection Agency's Ocean and Coastal Protection Division and of the Coastal States Organization.

Special thanks are due to Kevin Goldstein at the Center for the Study of Marine Policy for his work in organizing and editing this volume, to Cathy Johnston, Meredith Blaydes, and Bernice McLean (CSMP) in organizing the workshop, and to Barbara Macneill, Debra Persons, and Angela Veney (NOAA/OCRM) for their assistance in the administrative aspects of the workshop.

We would also like to thank all of the workshop participants for their contributions in this important step toward more effective governance of our nation's oceans and coasts.

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WORKSHOP SUMMARY

Why Regional Ocean Governance?

Our current approach to ocean governance is fragmented and inefficient. It is made up of overlapping and conflicting laws, regulations, and management bodies at the state and federal levels, with most efforts focused primarily on the resolution of issues on a single sector-by-sector basis. This “system” requires unreasonable amounts of time and litigation to resolve issues, and even then often creates single-issue outcomes that are shown over time to conflict significantly with the interests of neighboring states or other local, state, national, industry or environmental concerns in the same region.

This approach continues to result in costly, time-consuming, and less than adequate management of our fisheries resources, protection of the environment, and support of economic development of U.S. offshore waters. It is increasingly clear that the nation needs some form of regional approach to ocean governance that crosses state boundaries; addresses the interaction between inland watersheds and offshore areas; addresses the interaction of resources, activities and impacts between state and federal waters; and is specifically designed to address the full range of multiple-use issues.

The problems will only get worse with growing pressures in our coastal and ocean areas:

We have constantly growing coastal populations – now over 50% of our people live within 50 miles of the shoreline.

Traditional uses of our waters are increasing, including marine transportation, fishing, development of offshore oil and gas resources and other mineral resources, marine recreation and tourism, and military operations.

In addition, a number of newer uses are being proposed, many involving long-term occupation of ocean

space, including offshore aquaculture, offshore wind energy generation (“windfarming”), floating liquified natural gas terminals, exploitation of methane hydrates; wave-generated electricity; and bioprospecting for pharmaceuticals and medicines. The economic development potential of such newer marine and coastal activities is hampered by the absence of management frameworks to properly guide development.

The Workshop

Participants in the *Workshop on Improving Regional Ocean Governance in the United States* are shown in Appendix 1 of this volume. Papers prepared for and discussed at the Workshop are found in this volume. The papers and workshop discussions address the following major themes:

- The diversity of ocean and coastal concerns in various U.S. regions;
- Lessons from existing regional ocean governance efforts in the U.S. and other countries;
- Key goals and required features of regional ocean governance mechanisms;
- Major options for improving ocean governance in the United States;
- Potential next steps for action.

Major Issues Addressed at the Workshop

Advantages of Regional Ocean Governance

Given the jurisdictional split among federal, state and local governments — with the federal government controlling the 3-200 nautical mile zone; coastal states controlling the 0-3 nautical mile ocean zone; and coastal and inland states and local governments controlling land uses of watersheds and river basins that directly affect the health of marine ecosystems:

- Regional governance could provide a mechanism to approximate ecosystems and to institute ecosystem-based management practices
- Regional governance could improve coordination among federal agencies within a region
- Regional governance could improve coordination between federal and state agencies in a region
- Regional governance could improve coordination among states in a region for coastal and marine resource management
- Since States have no governance rights in the federal Exclusive Economic Zone (EEZ) (except to the extent that the consistency provision of the Coastal Zone Management Act provides some say over activities that impact state coastal zones), regional approaches could provide a role for states in developing regional EEZ plans, creating a strong incentive for states to support a regional approach.

Delimitation of regions

Regions can be defined in a variety of ways, based on physical/ecological; cultural; activity/use based (functional); political; or administrative considerations.

In recent years, delimitation of marine regions on an ecosystem basis has been advocated by a variety of institutions and groups, and the goal of managing marine areas on an ecosystem basis was adopted by all nations of the world in the 2002 World Summit on Sustainable Development.

Among ecosystem approaches, the Large Marine Ecosystem approach (LME), is already in use by many nations. It involves "...regions of ocean space encompassing coastal areas from river basins and estuaries on out to the seaward boundary of continental shelves and the seaward boundary of coastal current systems. They are relatively large regions of the order

of 200,000 km² or larger, characterized by distinct bathymetry, hydrography, productivity, and trophically-dependent populations" (See Sherman paper). Seven LMEs have been identified in U.S. waters. While the LME approach is very desirable, it is also difficult to apply, because of the lack of congruence between "ecologically defined space" and "politically defined space," and because human exploitation and other pressures may emanate from outside the LME.

Workshop discussions indicated that regional marine management would likely be most successful if it can be built on a regional delimitation that:

- is ecologically sound (an LME or subregion of an LME)
- addresses a wide range of multiple-use ocean activities within the same boundary
- if current administrative management boundaries can be made to correspond with it
- builds on instances of existing regional cooperation

Diversity of regional contexts

Workshop participants discussed in some detail the diversity of marine regional contexts in the U.S.: in the Northeast, Southeast, Gulf of Mexico, Pacific coast, Pacific islands, and Great Lakes regions. For each of these areas, the following factors are summarized in the "overview" paper (the first paper in this volume):

- biogeography of the region
- major ocean and coastal problems
- major conflicts and reasons for the conflicts
- state action in state waters (generally the 0-3 mile zone)
- interstate and intergovernmental discussions and joint action on regional issues
- existing fora potentially available for regional cooperation

- the extent of planning (or lack thereof) for newer uses of the EEZ

The absence of useful information on the factors noted above was noted by a number of participants, and the desirability of fostering analyses of ecosystem health and analysis of patterns of multiple-use interactions at the regional level was emphasized.

Lessons from Existing Experience with Regional Cooperation

In all U.S. ocean and coastal regions, there are a variety of cooperative efforts related to regional ocean governance and ecosystem health. Some are more formal than others, some are led by the federal government, others by the states. Most have focused on single issues or issues of limited scope, rather than multiple-use and region-wide issues.

There are also important lessons to be learned from the experiences with federally-driven regional cooperation in other nations and with international regional arrangements (See Frenette, Sakell, West, Belfiore, and Van Dyke papers in this volume).

Workshop attendees discussed the major goals (planning, research, multiple-use decisions, environmental protection), approaches (study, assessment, consensus or majority decision-making), results, and factors for success or failure in current efforts.

Also considered were which (if any) of current nearshore regional approaches discussed could (or should) be extended to offshore regions in the U.S. EEZ.

This discussion revealed a variety of successful experiences at regional cooperation in U.S. waters, ranging from the state-based Great Lakes Commission in the Great Lakes region, to the federally-led Gulf of Mexico program (especially the hypoxia task force), to cooperation among the Pacific Island states through the Pacific Basin Development Council, to the assessment, education, and outreach efforts of the state-based Gulf of Maine Council. These experiences suggest that there is a variety of already existing rich experiences with regional cooperation on ocean and

Great Lakes issues on which any new regional ocean governance scheme should build.

Results

There was general agreement among the Workshop participants on a number of points.

Principles

Workshop participants supported the principles enunciated for national ocean policy by the U.S. Commission on Ocean Policy—stewardship of resources, sustainability, participatory governance, transparency, accountability, timeliness, precautionary approach, ecosystem-based approach, biodiversity conservation—as appropriate also for application to the regional governance problem. A number of these principles have also been articulated by the Pew Oceans Commission, especially the need to manage oceans on an ecosystem basis.

Goals of Regional Ocean Governance

Provide stewardship of resources. Protect the ecological base of the coastal and marine region; preserve biological diversity; ensure ecosystem health.

Promote economic development. Promote appropriate and sustainable economic and social uses of coastal and marine regions.

Achieve balanced use. Harmonize and balance existing and potential uses; address conflicts among coastal and marine uses; employ mitigation measures.

Protect public safety. Protect public safety in coastal and marine regions, typically prone to natural, as well as human-made, hazards.

Exercise wise proprietorship of public submerged lands and waters. Manage long-term occupation of public submerged lands and waters (e.g., offshore oil, aquaculture, windfarms) wisely and with economic returns to the public.

Required Features of a Regional Ocean Governance Framework

Major issues that need to be taken into account in designing processes and institutions to improve re-

gional ocean governance include consideration of the following factors:

- Scope and extent of governance
- Delimitation of governance boundaries
- Policy priorities, goals, and objectives
- Opportunities for public and other stakeholder participation
- Power/authority to resolve conflict and enforce decisions
- Decision rules (consensus, majority rule, etc.)
- Federal/state interactions
- Relationship of regional efforts to national and international ocean governance
- Relationship to current regional fishery management councils
- Potential tools/approaches (e.g., use zoning and expansion of coastal management consistency provisions)
- Incentives for collaboration across jurisdictions
- Financing for governance activities (e.g., planning, implementation, monitoring, program evaluation, and research)
- A *nested governance approach* that links processes concerned with:
 - ecosystem health (from headwaters to the edge of the 200 nautical mile zone)
 - state-based planning and management of state waters (generally 0-3 nautical miles offshore)
 - regional multiple-use activities in the Federal 3-200 nautical mile zone
- Mechanisms to include current, effective ad-hoc arrangements in the region

- A flexible approach allowing the governance framework to be tailored for various regions taking into account important differences in regional circumstances, interests, and policy needs.

Major options for regional ocean governance

Workshop participants discussed in some detail the suitable form, function and phasing-in of possible options for improving regional ocean governance in the U.S. Five approaches were deemed potentially viable, and worthy of further development:

1) *Combining and expanding ad hoc arrangements already established in response to the mix of multiple-use problems in a particular region.* Expansion of arrangements focused on coastal areas to areas further offshore for multiple-use management, and further inland for ecosystem health, is needed.

Good examples exist of expansion of existing cooperative arrangements within the National Estuary Program (MacDonald, 2002). Supporting such ad hoc arrangements can encourage creativity and innovation at the local level (Whittle, 2002), and encourage buy-in and “ownership” of the process among regional stakeholders.

2) *State-based regional ocean governance arrangements fostering regional agreements among the states and federal agencies.* The approach taken in the Great Lakes area, with establishment of the Great Lakes Commission, provides a useful example of multi-state frameworks (MacDonald, 2002). The Atlantic States Marine Fisheries model provides a good basis for integration of the principles of sovereignty, balance, flexibility, and a compelling mechanism (O’Shea, 2002). Certain features of the Coastal Zone Management Act model were suggested as relevant, including: effective partnership between the federal and state agencies; provision of appropriate incentives; and an enforcement and compliance mechanism (Cooksey, 2002).

3) *Federally-led regional planning and management (by a federal agency or combination of federal agencies, as is the case in Australia and Canada).* The Large Marine Ecosystem (LME) programs provide useful

lessons for federal leadership and state involvement in terms of certain activities such as science assessment and technological support (Sherman, 2002). It was generally agreed it is the responsibility of the federal government to provide the large-scale research, monitoring and assessment functions necessary to support regional ocean governance.

4) *Expansion of regional fishery councils into multiple-use ocean councils.* The participants had mixed feelings about this option. It would clearly require increased resources to support an expansion of the regional fisheries council mandates (Furlong, 2002).

5) *Ecosystem-based multiple-use regional ocean councils.* Discussions included the possibility of two related efforts—one entailing a wider geographical area aimed at achieving ecosystem health, and one aimed at multiple-use ocean management in the EEZ within a more limited geographical area. Most agreed that the current regional fisheries councils should feed into or be included in some way, not be replaced by, such wider, multi-use councils.

Participants also agreed this approach would best be implemented as a state-federal partnership. It would be necessary to strengthen the linkage between land-based management issues and ocean management issues, particularly in adopting a watershed management approach (Ehler, 2002). It is also necessary to fit state and regional priorities in with higher level priorities (such as climate change, homeland security and monitoring and assessment) on a consistent basis (MacDonald, 2002).

Recommendations

Although the participants did not formally endorse these recommendations, the conference steering committee derive the following possible course of action from the workshop papers and discussions:

**Because of increasing multi-use pressures in our coastal and offshore waters — and because of the increasingly complex, conflicting and costly approaches in place to resolve multi-use conflicts — a regional ocean governance approach combining local, state, multi-state and*

federal jurisdictions and issues should be embarked upon expeditiously by the United States.

**Given the complexity of scientific, regulatory, legal, sovereignty, and political issues involved, a phased approach should be adopted — one that allows for flexibility among regions based upon their unique mix of issues, problems, environmental conditions, users, and capacity for governance.*

**To be effective both in multi-use conflict resolution, and in ecosystem conservation, one set of regions should be delimited encompassing watersheds and coastal and offshore waters, where a coordinated, balanced approach to addressing all overlapping concerns in a region can be resolved in a comprehensive manner. Because some impacts will be trans-boundary issues (such as aerosols with adverse effects on coastal waters), a mechanism for coordinating cross-region issues must also be established.*

**To initiate the phased approach, begin with a proposed regional planning demonstration for one or more regions of U.S. waters. The planning effort(s) should include at least:*

-proposed delimitation of boundaries

-priority regional issues and conflict problems, including proposed new uses

-clearly stated goals, objectives, and measures of performance

-in-place management and conflict-resolution mechanisms at all levels

-proposed mechanism to coordinate in-place mechanisms, cross-region issues

-proposed balance among local/state/federal authorities

-proposed decision-making process, and enforcement of decisions

-a capacity to monitor and evaluate performance

-any significant changes in state or federal laws or regulations to implement

-expected savings to industry and government from streamlined process

**If the planning demonstration(s) is/are successful, the relevant federal agencies and/or Congress should consider providing greater flexibility in the application of federal regulations to facilitate a controlled experiment in implementation of the proposed regional plan.*

**Congress should consider authorization and appropriation of funds to support the regional planning demonstration(s) and if appropriate, the implementation experiment(s), with sufficient resources available to accomplish an adequate analysis of effectiveness before further action in the targeted region, or expansion to other regions.*

**Congress should consider establishing a process, involving the Congressional Ocean Caucus, the Senate National Ocean Policy Study, and all relevant authorizing and appropriating Committees, to choose the region(s) for the initial demonstration(s), and to ensure that all appropriate federal agencies work together to identify, and recommend potential ways to resolve their overlapping and conflicting regulations focused on different uses and jurisdictional areas.*

Conclusion

In conclusion, it is at the regional level that ocean processes and resources are found and where ocean uses and activities take place and often conflict. Taking the steps outline above would begin the process of improving regional ocean governance, a key aspect of the overall challenge of developing a more comprehensive and integrated national ocean policy for the United States.

AN OVERVIEW OF POLICY ISSUES AND OPTIONS FOR IMPROVED REGIONAL OCEAN GOVERNANCE

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Background

In 2002, two national commissions—the congressionally-mandated U.S. Commission on Ocean Policy, and the Pew Oceans Commission—a privately-established ocean commission—are examining policy options for improving the national governance of oceans in the United States. While national-level action to improve U.S. ocean governance is clearly needed, the great diversity that exists in different regions of the U.S. coastal ocean (in terms of such factors as biogeographic conditions, ocean resources, conflicts, culture, institutional relationships) means that complete uniformity in approaches to ocean governance at the national level is not the best alternative. Instead, more tailored approaches that take into account important differences in regional circumstances, interests, and policy needs, may be more appropriate.

It is at the regional level, too, that various users of the ocean (from transportation to fishing to military uses to offshore oil and gas development to marine recreation to other economic and social activities) interact and often conflict. Two major types of conflicts related to coastal and ocean resources have typically occurred in the U.S. coastal ocean: 1) conflicts among users over the use or nonuse of particular ocean and coastal areas, and 2) conflicts among government agencies that administer programs related to the coast and ocean. User conflicts have typically been related to 1) competition for ocean or coastal space, 2) adverse

effects of one use on another use, 3) adverse effects on ecosystems, and 4) effects on onshore systems such as competition for harbor space.

Conflicts among agencies have included interagency conflicts (among agencies at the same level of government—whether national, state, or local), and intergovernmental conflicts. Agency conflicts have occurred for a variety of reasons, including divergent legal mandates and missions (this is especially so in the U.S. where most ocean uses are regulated (and protected) separately by single-purpose laws); divergent perspectives and interests such as those of state and federal authorities, differences in agency outlooks and type of personnel; and differences in external constituency groups with which agencies interact.

Countries which have recently begun major efforts at national ocean policy and Exclusive Economic Zone (EEZ) planning, such as Australia and Canada, have recognized the importance of developing ocean policies at both national and regional levels. In addition to developing a set of principles and policies for ocean policy at the national level, they have also begun to develop regional ocean plans for important ocean regions in collaboration with states and stakeholders.

The governance situation regarding the U.S. coastal ocean (out to the edge of the 200-mile Exclusive Economic Zone) is complicated by both federalism factors and by the type of ocean regimes that have been created to date:

1. The jurisdictional split among levels of government.

Coastal and ocean areas are governed by three separate bands of jurisdiction: local governments generally control shoreland and shoreline use, state governments have jurisdiction in the belt of ocean from the tidemark out to the 3-mile limit*, and the federal government has jurisdiction from 3 to 200 nautical miles offshore. Three major problems are posed by these jurisdictional splits:

- Many of the important ocean activities traverse or impact all three jurisdictions adding complexity to the planning and management of these activities, given the absence of effective mechanisms to coordinate the actions of all levels of government.
- The benefits and costs of ocean resource exploitation frequently fall disproportionately on different jurisdictions, exacerbating interjurisdictional frictions.
- It has been difficult, in this context, to determine and plan for improvement of the health of ocean ecosystems, since it is typically difficult to take into account the upland factors which are intimately related to the health of the ocean and of its resources.

2. The sector-by-sector approach to management.

Especially in the federal zone (3 to 200 miles offshore), each resource or use typically falls under the jurisdiction of a different agency operating under a different legislative framework, causing the following major problems:

- Few opportunities exist for examination of the ramifications that decisions in one ocean sectors (such as oil development) have on other sectors (such as fisheries). While most of the laws do call for examination of the proposed action on other ocean uses, these reviews take place within a specialized

context that tends to be biased toward a particular outcome, either protection or development, depending on the particular law in question.

- Few opportunities exist for rational and long-range planning for the protection, enhancement, and use of ocean resources in specific regions.
- Because resources are managed on a use-by-use basis, few opportunities exist for the interested public to debate overall priorities and goals for a particular region or to contribute to making trade-off decisions among different sets of values expressed by user groups.
- Conflicts among users and agencies are often difficult to solve through public means because no agency or other authoritative source has jurisdiction over such conflicts. Marine conflicts can be costly in many ways; they can result in extensive delays and incur significant costs to ocean industries; threaten public health and order; threaten the long-term well-being of marine resources, and involve excessive duplication and waste on the part of government.
- Problems in the ocean governance regime have contributed to the loss of opportunities for appropriate economic development of the U.S. ocean zone. Many U.S. marine industries are not faring well, in contrast to those of other countries; examples include loss of shipping to other nations, declines in the fishing industry and the offshore oil and gas industry, and trade deficits in fishery products.
- Similarly, the economic development potential of newer marine and coastal activities such as marine aquaculture and biotechnology, is hampered by the absence of appropriate management frameworks to properly encourage and guide development.

*With the exception of Texas and Florida, of which jurisdiction extends to about 10 miles (3 marine leagues) into the Gulf of Mexico as a result of Supreme Court Decisions involving their historic boundaries.

In summary, the existing ocean regime in the U.S. makes it difficult to:

- insure the health of ocean ecosystems
- attain multiple economic and social benefits which can be derived from multiple ocean uses
- properly accommodate new uses of offshore waters, such as offshore aquaculture, bioprospecting, wind farming, etc. As noted by Charter (2002), proposals for new uses of the EEZ abound while there is no appropriate governance framework for managing these uses. Appendix 1 provides a summary of the requirements of some of these new uses as well as a chart noting how they may affect other uses and ocean ecosystems.

Objective of this paper

The object of this paper is to provide an overview of the major issues involved in regional ocean governance and to identify options for improving regional ocean governance in the U.S. for discussion at the Workshop on “Improving Regional Governance in the United States” held on December 9, 2002, in Washington, DC. The paper provides:

- a brief review of the concept of region and of complexities in delimiting marine regions
- discusses the diversity of regional contexts and issues in the U.S. coastal zone
- discusses major examples of existing regional cooperation
- identifies major options for improving ocean governance in the U.S. and puts forth an evaluative framework for judging such options
- suggests some directions for initial discussion

Three appendices are included in the paper (found at the end of this volume):

- Appendix 1, on new uses of the EEZ;
- Appendix 2, a review of the major issues identified in different coastal regions in the regional meetings held by the U.S. Commission on Ocean Policy in 2002;
- Appendix 3, a review of coastal state efforts at creating state ocean policies.

Defining the Concept of Region

Defining marine regions is a complex enterprise as regions may be delimited on various bases. In this section, I first define the term “region,” discuss various types of regions, and then set out various modes of defining marine regions.

What is a region? A region, as defined by Alexander (1982), is “an area of the earth’s surface differentiated from other areas by the existence within it of a certain association of features that are not present outside the region. The distinguishing criteria for the region may be physical in nature, or may represent demographic, economic, political, or other elements.” Regions may also be defined on other bases. A management region, for example, might be created to govern a particular function, resource, or activity, whereas a geostrategic region could be formed where national interests meet and interact within a geographically contained area. The concept of region, then, can apply both to natural regions based on some physical phenomena, as well as to areas delineated by human constructs. As Morgan (1989) describes it, “...they are defined and delineated by people for various purposes and with a variety of motives in mind. The regional boundaries are frequently difficult to recognize, and in many cases they are more in the category of frontiers rather than boundaries.”

Types of Regions. Morgan (1989) identifies six fundamental classification bases for defining regions (See Table 1 at the end of this paper). Regions can be defined on a *physical* basis, such as the Large Marine Ecosystem approach pioneered by Sherman. *Cultural* factors, such as homogeneity among beliefs and norms, represent another basis for region boundary

definition. *Functional* regions (or activity/use-based regions) are defined by a specific pattern of use or activity that may dominate a spatial area. *Political* regions exist as a result of shared political or jurisdictional boundaries and/or a commonality in political outlooks. *Administrative* regions may be defined on the basis of agency jurisdiction. Finally, regions may exist that are based on a *combination of factors*, for example, the Mediterranean Sea represents a confluence of physical ecosystem and use factors.

The Large Marine Ecosystem Approach. A major approach to delimiting marine regions is the Large Marine Ecosystem approach (LME) developed by Ken Sherman and others at the National Marine Fisheries Service's laboratory in Narragansett, Rhode Island. LMEs are defined as:

"...regions of ocean space encompassing coastal areas from river basins and estuaries on out to the seaward boundary of continental shelves and the seaward boundary of coastal current systems. They are relatively large regions of the order of 200,000 km² or larger, characterized by distinct bathymetry, hydrography, productivity, and trophically dependent populations" (Sherman 1994).

Sherman and his collaborators have identified 49 LMEs around the world (seven LMEs in U.S. waters) and have undertaken work, in cooperation with a variety of international organizations, to intensively study several LMEs (10 to date, e.g., Bay of Bengal, South China Sea, Yellow Sea, Gulf of Guinea, Benguela Current, Somali Current, Agulhas Current, Canary Current, Caribbean Sea, Baltic Sea). For each LME, these authors address: ocean productivity (photosynthetic activity, zooplankton biodiversity, oceanographic variability); fisheries issues (biodiversity, finfish, shellfish, demersal species, pelagic species); pollution and ecosystem health issues (eutrophication, biotoxins, pathology, emerging disease, health indices); socio-economics (patterns of ocean use); and governance (existing governance arrangements).

Sherman and his colleagues have identified and described (at various levels of specificity) 7 LMEs in U.S. waters. As shown in Figure 1, going from East

to South to West, they are: 1) the Northeastern Continental Shelf Ecosystem; 2) the Southeast Continental Shelf Ecosystem; 3) Gulf of Mexico Ecosystem; 4) California Current Ecosystem; 5) Gulf of Alaska Ecosystem; 6) Eastern Bering Sea Ecosystem; 7) Insular Pacific Ecosystem (Sherman 1995, also <http://www.edc.uri.edu/lme>).

As noted earlier, the LME approach has been utilized in 10 major marine regions of the world. Similarly, this concept has been adopted by some national governments, notably Australia, in its national ocean planning efforts. In its national Oceans Policy adopted in December 1998, the Australian Government has committed itself to integrated ecosystem-based planning and management for multiple use of their oceans and improved coordination between the States and the Commonwealth to ensure that jurisdictional boundaries do not hinder effective planning and management. In addition to setting up a National Oceans Office (including a National Oceans Ministerial Board and a National Oceans Advisory Group), the strategy calls for a major Regional Marine Planning process—based on large marine ecosystems—which integrates sectoral commercial interests and conservation requirements. Regional marine plans will adhere to a set of broad Principles for Ecologically Sustainable Ocean Use and additional policy guidance. The first Regional Marine Plan has been developed for the south-eastern region of Australia's Exclusive Economic Zone (e.g., the Commonwealth's waters off the southeast of South Australia, Tasmania (including McQuarie Island), Victoria and southeastern New Wales (Australia 1998) (Sakell 2002).

Usefulness of the LME approach. The strength of the LME approach is that it is science-based and provides an explanation of how ocean processes and resources are interrelated in a particular geographical area, as noted below:

1. Orienting a management framework to an LME should permit more accurate determination of the appropriate boundaries for the management area.
2. An LME approach provides a framework for

understanding the physical and biological properties of a marine area. Gaps in understanding should be more easily discernable within the LME framework and, hence, research should be more readily guided to those questions.

3. The LME brings greater scientific understanding to the ocean management process and with it the potential for improved science-based approaches to conflict resolution.

Difficulties of applying an LME approach. Although solidly science-based on an ecosystem approach, the LME marine region delimitation sometimes does not correspond well with the cultural, political, administrative and pattern-of-use bases of defining marine regions. As Juda (1999) notes, “one of the basic problems faced by those who favor ecosystem-based management is the lack of congruence between what might be termed ‘politically defined space,’ that is, the geographic area encompassed by particular human governance systems and ‘ecologically defined space,’ composed of the area over which natural ecosystems extend (p. 93).” I would add, also, that the pattern of human use affecting a marine ecosystem is also often not congruent in geographical area as the marine ecosystem—for example, fishing effort in the Alaska region which is coming from fishers from the Lower 48, or the damaging effects of acid rain on Chesapeake Bay which finds its source in the polluting industries of the Ohio Valley.

It would seem that a marine region management effort would likely be the most successful when it can be built on the basis of a regional delimitation that makes sense:

- from an ecological point of view (as an LME or a subregion of an LME),
- that exhibits an interrelated pattern of multiple use ocean activities,
- that corresponds (or can be made to correspond) to administrative considerations,
- and where there has been a history of cultural

affinity and political cooperation.

Table 2 (at the end of this paper) illustrates five types of marine regions using the different bases for defining regions discussed above.

Figure 2 (at the end of this paper) illustrates a number of steps that would be helpful in linking the LME concept to regional ocean governance. As the illustration shows, we can visualize three additional kinds of mapping in addition to mapping the LME itself. These involve: (1) human use mapping; (2) jurisdictional mapping; (3) institutional and political mapping. These steps, in effect, provide the linkage between the physical and biological ocean system, on the one hand, and the legal, institutional, and political systems associated with various uses within that ocean system.

With regard to human use mapping, the following variables need to be examined:

- What uses are occurring where (within the LME)?
- From where are these uses emanating?
- How are they being regulated/managed and by whom?
- With what other uses are they interacting and how?
- How are the other uses being regulated and by whom?
- What use conflicts are occurring? How can they be harmonized?
- If harmonization is not possible, how can they be mitigated?

With regard to jurisdictional mapping, the following variables need to be examined:

- What (legal) jurisdictions are involved in the LME?
- What regulatory activity exists within each

jurisdiction?

- What cross-jurisdictional efforts exist, if any?
- What areas are involved in each jurisdiction?

Concerning the political and institutional mapping, the following questions need to be examined:

- What agencies/institutions have responsibility for jurisdictions within the LME?
- What are their goals and values for the ocean area involved?
- What incentives can be devised to entice different political jurisdictions to cooperate one with each other?
- How can political will for cooperation be fostered within an LME?

The Diversity of Regional Ocean Contexts in the U.S.

The character of state coastlines and adjacent ocean space and resources differs greatly in different coastal locations around the United States. Differences in state coastal areas and ocean space and resources, in turn, affect how citizens and state governments view these resources. In island settings such as Hawaii, for example, where the state is totally encompassed by ocean space, ocean governance represents an important public policy issue, both in terms of assuring the environmental integrity of offshore waters and of deriving appropriate benefits for the state from the exploitation of resources such as offshore minerals and fisheries. In other states that are generously endowed with mineral and fishery resources offshore, ocean governance also looms as an important policy issue. States such as California, Alaska, and Louisiana fall in this category—all three have rich fisheries and significant offshore oil resources and have been in conflict with the federal government over the governance and disposition of these assets.

In East Coast states, such as Delaware and Maryland, the major policy emphasis in recent years has been on the management of valuable inland waters and bays

(such as Delaware Bay and the Inland Bays in Delaware and Chesapeake Bay and Maryland's Coastal Bays in Maryland). More recently, the need to address issues further offshore has also become apparent (see e.g., Belfiore et al 2000). In Delaware, for example, state authorities are concerned with the conflicts that have developed between mining of offshore sand resources to replenish Delaware's valuable beaches and the protection of essential fish habitats under the federal Sustainable Fisheries Act. In Maryland, in the development of its new work program, the Chesapeake Bay Program has emphasized the need to address offshore fisheries issues to protect and enhance the bay's fisheries resources and to address marine transportation issues which may pose a threat to the water quality of Chesapeake Bay.

These various examples suggest that problems and issues that the coastal states face regarding the ocean areas offshore their coasts vary greatly according to location and thus should be addressed on a region-by-region basis.

In thinking about regional governance, it is important to understand in some detail the great diversity—both in terms of ecology and in terms of patterns of human use of the oceans and of accompanying conflicts—that exists in different regions. For each region, the following questions should be asked:

- What are the major ocean and coastal problems in each region?
- What is the status of ocean ecosystem health in the region?
- What are the major conflicts among ocean and coastal uses in this region?
- To what are these conflicts due? (e.g., economic and social competition, legal problems between different laws; lack of a decisionmaking forum for addressing the problems; lack of history of working together)
- To what extent (if any) have the states in this region developed ocean plans for the 0 to 3

mile zone or taken other actions to manage state waters?

- To what extent have there been any discussions among the states and federal agencies in this region on regional ocean issues?
- To what extent have the federal ocean/coastal programs worked together to address common issues (for example, exploitation of sand resources while taking into account Essential Fish Habitat for particular species)?
- In what fora have these discussions taken place?
- To what extent, if any, has there been planning at a regional level to anticipate newer uses of the EEZ such as offshore aquaculture and bioprospecting?

A major challenge is to define the particular configuration of ocean and coastal issues present in each region. A preliminary attempt to do so follows, based, in part, on testimony presented at the different regional meetings convened by the U.S. Commission on Ocean Policy in 2002 (see the Appendix 2 to this paper for a more detailed discussion).

In several of the regions, there have been significant efforts at regional cooperation on ocean issues, particularly in the Northeast, the Gulf of Mexico region and the Pacific islands region. These regional cooperation efforts are briefly described in terms of the following variables: 1) *basis of the region* (e.g., physical, cultural, administrative, etc.), 2) whether the focus is mainly on *shared or common regional problems* (“*shared*” problems may be defined as problems in which two or more coastal states are physically, economically, or otherwise linked to the problem, such as an estuary bordered by a number of states; “*common*” problems are the similar problems faced by states in a region, e.g. how to address issues related to run-away coastal development), 3) whether the approach has been “*bottom-up*” or *federally-led*, and 4) whether a *regional institution* has been created (Cicin-Sain 1995).

Northeast

This is an area traditionally rich in fishery resources and with significant potential for offshore oil and gas development as well. In the past, significant conflicts have existed between fishing and offshore oil, with a moratorium now in place for offshore oil development. A major policy issue in the region has been fisheries decline which has significantly impacted coastal communities dependent on fishing. Coastal tourism and recreation are a big factor in the region.

The major current issues noted by testimony to the U.S. Commission on Ocean Policy include: recovery of fishing habitats and stocks, conflicts between protected marine mammals (e.g. right whales) and marine transportation; wasteful land development patterns (including siting in hazardous areas); contamination of sediments from harbor dredging; difficulty of designating dredge disposal sites, likely closure of current disposal sites; nonpoint source pollution and fragmentation of valuable coastal habitats below critical mass levels. In this region, too, public officials are considering the implications of development of new uses of the EEZ, such as offshore aquaculture (a number of experimental sites are operational), and wind farming (a major proposal is being considered).

Regional cooperation. In 1989, the states of Maine, New Hampshire, and Massachusetts, together with the Canadian provinces of Nova Scotia and New Brunswick, joined together to create the Gulf of Maine Council on the Marine Environment. The purposes of the council are to discuss and act upon environmental issues of common concern including, but not limited to, protection and conservation of the ecological balance within the Gulf of Maine ecosystem, the problem of marine debris and medical waste, the relationship between land use and the marine environment, the sustainable use of resources within the Gulf of Maine, and cooperative programs to better protect and conserve the Gulf’s natural resources (Gulf of Maine Council on the Marine Environment 1991).

Basis for the region. The region clearly represents a *physical* region, a subregion of the Large Marine Eco-

system. Similar cultural factors are also present in parts of the region, particularly evidenced in a common maritime orientation.

Type of regional problems addressed: These have mainly been *shared* regional problems—pollution, regionally significant habitats, public education efforts throughout the region.

Bottom up or top down? This effort has definitely been of a *bottom up* nature, with the U.S. states and Canadian provinces taking the lead in regional organization. An interesting aspect of this case is that cross-national regional cooperation has been achieved on a state-to-province level, with little involvement by federal authorities.

Regional institution: A new regional institution (the Gulf of Maine Council) has been created and is in operation. While particularly effective at activities such as public education, the Council has been criticized for avoiding the most difficult regional issues, such as addressing the decline of fisheries in the Gulf of Maine.

Southeast

Coastal tourism and recreation have traditionally been very important in this region which is prone to coastal hazards such as storms and flooding.

Commission testimony highlighted, in particular, the detrimental effects of urban sprawl which have occurred on a large scale in this region since the 1970s impacting significantly on waterfront lands, wetlands, irreplaceable landscape, and endangered species. A larger proportion of coastal watersheds in this region are developed compared to coastal watersheds in other regions.

Non-point source pollution (from both agricultural and animal waste runoff and from industrial runoff from population growth and land development have significantly degraded this region's water quality. Particular multiple use conflicts include competition between commercial fishers and recreational users for waterfront land and marinas, and loss of public access to the coast through the rising establishment of

private business and residential areas.

Significant conflicts offshore have included controversies over offshore oil and gas development in North Carolina, and region-wide conflicts between marine mammals and the marine transportation and fishing industries.

Among the states in the region, North Carolina and Florida have been most active in analyzing the ocean issues prevalent offshore these states and in developing state ocean policies (see Appendix 3).

With regard to regional cooperation, although efforts were made by the states in the region with the assistance of NOAA/OCRM to identify region-wide issues (in 1995), interstate regional cooperation has not advanced considerably.

Gulf of Mexico

This region has significant offshore oil and gas resources (with development offshore Texas and Louisiana representing about 90% of offshore oil and gas development in the U.S.), significant fishery resources, especially shrimp, and a significant coastal tourism and recreation industry. This area, as the Southeast, is particularly prone to coastal hazards such as storms and flooding. New technological advances have allowed the offshore oil industry to operate in deeper Gulf waters in previously unheard of depths. New offshore floating storage and processing oil facilities represent an important new way of using the EEZ. States in the region are also experimenting with offshore aquaculture, in some cases in association with offshore oil and gas facilities.

Major coastal and ocean issues in this region cited in the Commission testimony included non-point source pollution, entering the Gulf of Mexico (largely from the Mississippi River) which has resulted in a hypoxic zone on the continental shelf of Louisiana and Texas. This "dead zone," almost the size of New Jersey when it peaks in the summer months, poses a serious threat to marine life, ecosystem health, and the sustainability of Gulf fisheries.

The increased subsidence of the Louisiana delta looms

as a major risk to New Orleans as well as its neighboring populations and economic centers. Since the 1930s, the state has lost one million acres of its coastal land and in the next 40 years, is projected to lose another million unless action is taken. The resulting loss of wetlands could easily translate into significant habitat losses for shrimp, fish, and other biologically and economically important species.

Oil and gas exploration, as well as the construction of canals have disrupted the natural balance and flow of salt and fresh water, resulting in saltwater intrusion into the region's coastal wetlands.

Enhanced port security measures have conflicted with commercial needs for expeditious and efficient movement of ships and containers in and out of ports (especially for the Port of Houston, the largest port in the nation for foreign trade).

Among the states in the region, the state of Mississippi has conducted extensive research on, and analyzed, the ocean issues affecting the state.

Regional cooperation. In the Gulf of Mexico region (Florida, Alabama, Mississippi, Louisiana, Texas), regional efforts in recent years have centered around the EPA Gulf of Mexico Program which is federally-led but involves considerable participation by state and local governments and stakeholders in the various committees involved in the Gulf of Mexico Program.

Basis for the region. Physical—The Gulf of Mexico can be considered as a large marine ecosystem, although there are clear connections to the Wider Caribbean.

Type of regional problems addressed. Mainly *shared* issues, such as pollution, freshwater inflow, effects of offshore oil development. Most of the attention of the Gulf of Mexico Program, however, seems to have been focused not on Gulf-wide problems, but on sub-regional problems and nearshore problems. A recent regional effort related to hypoxia, however, reflects a larger regional perspective.

Bottom up or top down? This has been mainly a *top down*, federally-led effort, although it involves con-

siderable participation by state and local entities and interest groups. The state coastal and ocean management programs in the region have not come together on Gulf-wide issues, in contrast to the Gulf of Maine region.

Regional institution. A region-wide institution exists in the form of the EPA Gulf of Mexico Program. There have been a number of proposals in Congress to create a Gulf of Mexico Commission with a higher political profile but no new institutions have been created so far.

Pacific coast

The Pacific coast states have very rich fishery resources, abundant oil and gas deposits offshore and other mineral resources such as polymetallic sulfides. A variety of marine mammal species populate the offshore waters, a number of them in an endangered status. Some fishery populations, such as salmon, are endangered as well, and have been the object of concerted recovery efforts. Coastal/marine tourism is an important factor in all of the Pacific coast states. Especially in the southern part of the Pacific coast, coastal population growth and attendant development has placed significant pressure on fragile coastal resources (in California, for example, 85% of the population lives within an hour's drive to the coast). This ocean region has been the site of serious multiple use conflicts, especially regarding offshore oil development, decline of fisheries, marine mammal/fisheries conflicts, port expansion and dredging, and marine aquaculture/commercial fisheries conflicts. Several marine protected areas are already in place in the region, and a network of marine protected areas ranging from Alaska to Baja California is being discussed. Also of importance in the region is the resource management role of tribal authorities, especially in the Pacific Northwest.

Testimony presented to the U.S. Commission on Ocean Policy highlighted the problems noted above, and other problems as well, e.g., the problem of invasive species related to extensive shipping traffic along the Pacific coast, contaminated sediments in estuaries and bays, loss of wetlands, and oil pollution threats

(especially from tanker traffic) for marine coastal water quality. In Alaska, problems of overfishing and bycatch, and preservation of biological diversity were among the issues receiving emphasis in the testimony. In Alaska, too, there is a problem of accumulation of pollutants coming from other regions of the world through currents.

States in the Pacific coast have been very active in ocean management, both individually and on a regional basis. Oregon has carried out extensive work in ocean management, both through its territorial sea plan and through its ocean plan which defined an ocean stewardship zone of interest to the state (basically the continental shelf area ranging out up to 85 miles offshore). California has developed a detailed ocean resources management plan to provide guidance on the use and conservation of the ocean area offshore the state. Regionally, two regional entities have been especially active on marine resource management, working with the states in developing joint work to address regional issues: the Western Governors Association and the Western Legislative Conference.

Pacific Islands

Given the intimate relationship between islands and the ocean surrounding them, ocean management is of crucial importance to the American Flag Pacific Islands (AFPI) (Hawaii, Guam, American Samoa, and the Commonwealth of the Northern Marianas). These states and territories depend on the oceans and coasts for much of their economic and social well-being, especially through tourism, marine transportation, and fishing. The area is the home of bountiful, and in some cases, endangered marine life, such as marine mammals and coral species. Traditional island cultures have placed great value on proper management of oceans and coasts in an integrated manner—from the hilltops to the oceans, way before the idea of integrated coastal and ocean management became the accepted international norm.

Asserting full state and territorial control over the adjoining ocean has been an important theme in the American Flag Pacific islands. Among the states and territories in the region, Hawaii has been especially

active in ocean management, especially through the development of a state ocean resources management plan. American Samoa is currently in the process of developing an ocean plan.

Among the ocean issues in the Pacific Islands highlighted in testimony to the U.S. Commission on Ocean Policy, the following were noted: competition between tourists and locals in the use of coastal and marine resources, invasive species, marine pollution threats to coral reefs and marine habitat, marine debris, and point source pollution from ships.

Regional cooperation. Interstate regional cooperation on ocean matters has been an important feature of activity by the American Flag Pacific Islands. In 1987-1989, these states/territories conducted a study of management of Exclusive Economic Zone resources in the region, involving the collection of all relevant laws and regulations pertaining to ocean and coastal resources in the region, a July 1987 symposium on the EEZ held in Hawaii, field visits to all the AFPI by a team of policy consultants, and a workshop held in Hawaii in December 1988. These efforts led, in November 1990, to the formal establishment of a Regional Ocean, CZM, and EEZ Management Program (ROCEMP) by the Governors of American Samoa, Commonwealth of the Northern Mariana Islands, Guam and Hawaii. Major areas of emphasis of ROCEMP include building regional oil spill management capacity, development of a regional tuna policy, defining marine mineral potential, refining methods for developing integrated ocean policy, defining marine mineral potential, refining methods for developing integrated ocean and coastal resource management plans for the AFPA, and establishing mechanisms for settling disputes between the American Flag Pacific Islands and the U.S. federal government.

Basis for the region. The area does not represent a discrete physical region; instead, *cultural and political factors* form the underlying basis for regional action.

Type of regional problems addressed. These have been both *shared* regional problems (e.g., regional oil spill planning) and *common* regional problems (e.g., developing a common stance vis-à-vis the federal gov-

ernment on ocean governance issues). The common concerns of these states have been particularly important as a catalyst in fostering regional cooperation.

Bottom up or top down? The effort has largely been a *bottom up* effort, although federal funding (from NOAA/OCRM) has been functional in documenting the case for regional organization through the funding of a series of regional ocean governance studies.

Regional institution. An existing regional institution—the Pacific Basin Development Council—has played a key role in initiating and maintaining work on regional ocean governance. However, the efforts have been hampered in recent years by funding difficulties.

Great Lakes

According to testimony presented to the U.S. Commission on Ocean Policy, the Great Lakes region has been particularly affected by pollution issues and by decline, endangerment and extinction of fish, related in part to previous dumping of toxic persistent chemicals in the lakes. There have been a number of beach closings in the region due to bacteriological contamination. There is a strong concern over sustainable water quality. There are a number of contaminated areas and brownfields from current and former industrial sites which affect coastal habitats and resources. Invasive species, such as zebra mussels and round robi, have been a serious problem in the region, associated with the extensive shipping traffic throughout the Great Lakes area.

Regional cooperation in the Great Lakes region is longstanding and extensive. As noted in the Commission testimony, several institutions play an important role in organizing and implementing joint action on regional issues: The Great Lakes Commission, the International Joint Commission, the Great Lakes Fishery Commission, and the Council of Great Lakes Governors. Several “state of the lakes” reports have been prepared.

Conclusion to Regional Analysis

In conclusion, the coastal ocean regions of the United States vary considerably on the primary ocean and

coastal problems and conflicts affecting the region, the extent of planning for the 0 to 3 mile ocean zone, extent of federal-state interaction/discussion and/or cooperation to address issues of common concern; and extent of planning at the regional level for future EEZ uses.

As Blaydes notes in her review of the testimony to the U.S. Commission on Ocean Policy (in Appendix 2 of this paper), those who testified in the various regional workshops before the Commission consistently discussed the need for improved regional ocean governance in their particular region, or in relation to the nation as a whole. Not once was the opposite argument made.

While the testimonies identified many similar ocean and coastal problems and multiple-use conflicts among the regions, they also illustrated the individuality of each region by uncovering how these problems and conflicts vary considerably among them. For example, non-point source pollution is a primary problem in each U.S. region (apart from Alaska). Other commonly shared problems/conflicts among the regions include: coastal and estuarine erosion; urban sprawl/wasteful development patterns; and the threat of invasive species. Difficulties with endangered species management, conflicts between maritime shipping and marine mammals, and declining fish stocks exemplify other, less commonly shared, problems and conflicts among the regions. Many mutual problems and conflicts, indeed, abound in all U.S. coastal regions. Yet, despite these similarities, each region retains its own unique configuration of problems and conflicts, which cannot be addressed in a blanket manner. Poor water quality in the Great Lakes, resource management conflicts with indigenous peoples in the Northwest, and the impacts of the tourism industry on the environment of the Pacific Islands region comprise a few of these region-specific issues.

Likewise, with regard to specific regional institutions, mechanisms, and practices, in some regions there is extensive experience while in other regions there is comparatively less experience. For example, only three coastal states (Hawaii, California, and Oregon) have developed comprehensive plans for their jurisdictional

waters (0 to 3 mile zone) to more effectively manage ocean uses and activities, settle conflicts, and anticipate future uses. A number of regions, furthermore, demonstrate extensive cooperation between research institutions (state and federal) and universities, often in efforts to set up national and/or regional ocean observing systems. Every region in the U.S. has demonstrated some degree of federal, state, local, private, and NGO cooperation, whether it be through collaborative discussion and interaction or through more formalized programs and projects. The regions bordering Canada and with extensive indigenous populations (Northeast, Great Lakes, Northwest, and Alaska) have had to address special issues (related to tribal governments and to international issues) in addition to those pertaining to federal, state, and local partnerships. Such issues involve, for example, the organization of international summits and the subsequent implementation of international agreements and the inclusion of tribal governments in agreements and resource management programs.

Existing Efforts at Regional Ocean Governance in the U.S. and in Other Countries

In all U.S. ocean and coastal regions, there have been a variety of cooperative efforts related to regional ocean governance and to ecosystem health. Some efforts are more formal than others, some are led by the federal government, others by the states, as illustrated in the previous section.

A preliminary (incomplete) list of existing regional cooperation efforts may be found in Table 3. Most of the efforts, as can be seen, have tended to involve single issues or issues of limited scope, rather than multiple-use and region-wide issues.

In addition to experiences in different regions of the U.S. coastal ocean, there are important lessons to be learned from the experiences with regional cooperation in other nations (Sakell, 2002, Frennette, 2002), and with international regional arrangements (see West 2002, Belfiore 2002, and Van Dyke 2002 papers in this Volume).

Workshop attendees were asked to draw lessons from these experiences –both positive and negative—for regional ocean governance.

The main questions that should be addressed include:

- What have been the major goals pursued by the various regional mechanisms? (e.g., is the major goal planning, or research, or decisionmaking about multiple uses, decisionmaking about ecosystem health, etc.)
- What approaches and strategies have been pursued by the various regional mechanisms, and using what decision rules? (e.g., do they involve study and assessment or implementation of some binding decision about uses? Do they employ consensus rules or majority voting, etc.)
- What results/outcomes have been achieved through various regional governance experiences?
- What factors are responsible for successful outcomes?
- The extent to which (if any) the regional approaches discussed could (and should) be extended to marine regions in the U.S. EEZ (e.g., many of the examples of regional cooperation are related to coastal areas and to ocean areas nearshore—can these approaches be successfully adapted to the situation in ocean areas further offshore?

To cite some examples of seemingly successful regional cooperation, a recent analysis suggests factors that have worked to achieve good transboundary cooperation across the U.S. Canada border in three regions: Gulf of Maine, Great Lakes, and George Basin/Puget Sound (Hildebrand et al 2002).

These three areas share common issues and a willingness among jurisdictions to work toward common, ecosystem based objectives. Cooperative agreements have been formalized in response to the multi-juris-

dictional, multi-resource management demands of their respective ecosystems. Elements of successful transboundary cooperation have been identified:

- Recognition of one ecosystem
- Subnational leadership—can initiate and manage a shared international aquatic resource without formal federal endorsement or leadership
- Common objectives/action plans—explore commonalities with others
- Morally binding agreements—mutual expectations for activities
- Soft accountability—voluntary agreements have no formal mechanism to ensure implementation, so it is necessary to look to higher-order goals and objectives that provide a backbone for ecosystem level management; peer pressure leverage
- Partnerships—minimize duplication of effort; helps address complex problems
- Diversified resource base—federal/local/private funding are necessary
- Complementary structures—establish a framework based on consensus
- Incorporation of ecosystem objectives into workplans
- Joint research—agencies and universities
- Information sharing and communication—regional information networks
- Ecosystem charter—good faith agreement that explicitly define goals (Hildebrand et al.)

Similar and additional lessons can be drawn from the West 2002, Belfiore 2002, Schwartz 2002, and Tippie and Colby 2002 papers in this Volume.

Major Options for Improving Regional Ocean Governance in the U.S.

There are, theoretically, a wide range of options for improving regional ocean governance in the U.S. A set of hypothetical options are noted below, arrayed on a continuum of “least change required” to “most change required.”

- *Ad hoc arrangements*, depending on the particular mix of multiple-use problems in a particular region
- *Expansion of existing cooperative arrangements* related to coastal areas and areas nearshore to areas further offshore for multiple-use ocean planning and management and further inland for ecosystem health
- *State-based regional ocean governance arrangements* fostering regional agreements among the states and federal agencies
- *Federally-led regional planning and management* (by a federal agency or combination of federal agencies) (as is the case in Australia and Canada)
- *Expansion of regional fishery councils* into multiple-use ocean councils
- *Ecosystem-based multiple-use regional ocean councils* (or two related efforts—one aimed at achieving ecosystem health and entailing a wider geographical area; one aimed at multiple-use ocean management in the EEZ within a more limited geographical area)
- *Establishment of independent offshore authorities* for various regions (such as in the case of the Great Barrier Reef Marine Park)
- *Nationalizing the U.S. ocean* whereby management of ocean resources would be carried out solely by the national government

Of course, these options may not be all the options available. Similarly, some options may be used in

combination with other options, as discussed in the last section of this paper.

As discussion proceeds on options such as those above, it would be useful to: 1) evaluate options according to the same evaluative criteria, and 2) to flesh out, for particularly attractive options, the details of what that option might look like. In this regard, some of the key variables that should be taken into account are noted in the section that follows.

Possible Evaluative Criteria for Considering Options

- Providing a vision for the protection and management of multiple uses in the ocean region through planning and multi-sector, multi-agency, and multi-stakeholder involvement
- Coordination of ocean policy development and implementation
- Achieving ecosystem integration—having the proper scale to capture the factors that influence ocean ecosystem health
- Achieving sectoral integration—capability to manage multiple ocean uses, to harmonize uses and to mitigate when accommodation is not possible
- Potential for realizing economic and social opportunities from the oceans
- Achieving an appropriate balance of development and conservation
- Achieving administrative efficiency/effectiveness
- Achieving intergovernmental integration (a true partnership of state and federal interests)
- Fiscal costs of the regional effort
- Political tractability

Some Basic Questions that Need to be Addressed about Regional Ocean Governance Options

What are the features of a desirable regional arrangement (s)?

- Scope and extent
- Boundaries
- Principles
- Power/authority
- Goals and functions (e.g., determine and protect ecosystem health, Manage interactions/conflicts among uses to achieve economic and social benefits, anticipate, plan for, and manage new uses)
- Participants
- Decision rules (consensus, majority rule, etc.)
- Opportunities for public participation
- Federal/State interactions
- Use of consistency
- What tools/approaches can be used in regional mechanism? (e.g. zoning?)
- Relationship to national and international ocean governance initiatives
- Relationship to regional fish councils
- Policy priorities
- Funding
- Mechanism for science support

Ways of linking various regionally-based and state-based ocean mechanisms

How can various regional mechanisms and state-based efforts be linked in a “seamless web”?

- Creative new ways of using the consistency doctrine?

- What incentives can be given to agencies/groups to collaborate together across jurisdictions?

Timing

Given the complexity involved in some of these issues, might a staged approach be suitable, e.g.:

- to formulate the details of different approaches for consideration by all the relevant actors
- Perhaps trying a demonstration project in one or more regions by regional team(s) (Tippie and Basta suggestion)

Some Possible Directions for Regional Ocean Governance for Discussion

To help focus discussion, it may be useful to focus on the major functions that need to be performed at the regional level which are not currently being performed, i.e., functions relating to determining and protecting ocean ecosystem health, and functions related to management of multiple economic and social activities in the ocean.

One big assumption that one has to make is whether the existing federalist authority (division of authority between state and federal levels) would be retained or whether it is subject to change. In my view, the existing federal structure is a given that is not subject to change in the foreseeable future. The history of marine policy in the U.S. is replete with examples of intergovernmental conflicts over marine resources with each level of government trying to gain new ground at different points in our history.

Instead of replaying these issues, it is important, I think, to be creative about setting up a more seamless regime that coordinates ocean-related activities throughout the entire range from inland waters to the coastal zone, to state waters, to the EEZ.

One approach might be based on the following:

- 1) Address the two main regional needs

identified related to ecosystem health and to economic and social well-being:

- understanding and maintaining/restoring ecosystem health
 - multiple-use management to achieve multiple economic and social benefits in ocean regions from current and emerging uses
- 2) Build on existing experiences and strengths
 - 3) Build on the current federalist structure in which the States have sovereign power over the 0-3 mile ocean zone
 - 4) Use a nested approach—linking institutions concerned with:

- a. ecosystem health (and embracing the largest areas—from headwaters to the edge of the 200-mile zone and beyond),
- b. state-based coastal management institutions dealing with the land-sea interface and the 3 mile ocean zone), and
- c. regional multiple use councils in the 3-200 mile zone to harmonize current and emerging uses of the EEZ.
- d. Also consider what mechanisms will be needed to link these three, including possibly a new form of consistency arrangement.

- 5) Have a clear connection and line of authority to the national oceans institutions that may be created following the recommendations of the two commissions, such as, for example, an enhanced oceans agency and an interagency national oceans council.

Several task groups could be charged with discussing how the following might be accomplished and by whom:

- 1) The ecosystem health challenge,

2) The multiple use management challenge, in both state waters and in the 3-200 mile zone

3) Insuring the connectivity among these

Some preliminary ideas are offered below.

1. Addressing ecosystem health from head waters to the edge of the 200-mile zone and beyond

This includes:

- determining and maintaining/restoring ecosystem health
- focusing on nonpoint sources of marine pollution, which account for 80% of marine pollution
- focusing on living marine resources (fisheries, marine mammals) and their upland requirements for habitat, adequate stream flow, protection from pollution, etc.
- protection of marine biodiversity
- creation and management of networks of coastal and marine protected areas, as needed, to insure ecosystem health

It is clear that fully addressing ecosystem health requires:

- *the broadest boundaries*—entire watersheds from headwaters of rivers to the edge of the 200-mile zone and beyond as needed, taking into account interfaces with the world oceans and consideration of climate change and other global factors
- *a complex array of institutional actors*—federal agencies, coastal and inland states, local governments, tribes, stakeholders
- *a thorough scientific underpinning, especially from the natural sciences*
- *collaborative problem-solving across jurisdictions*

- *the setting, implementation, and enforcement of measurable goals and standards*

A thorny challenge in addressing this goal is to get the cooperation of inland states and jurisdictions which do not have an immediate and tangible connection to the coastal zone.

There are a variety of institutions with very relevant experiences in addressing this challenge:

- 1) EPA, through the National Estuary Program and the development of coordinated and comprehensive management plans for 27 estuaries, has developed considerable experience in the management of watersheds and ecosystems through collaborative problem-solving with multiple jurisdictions and stakeholders, moving from an initial focus only on pollution to more comprehensive ecosystem-based management including fish resources and habitats.
- 2) EPA's efforts to control nonpoint sources of marine pollution through section 319 of the Clean Water Act
- 3) The experience of the coastal states in controlling nonpoint sources through the 6217 program, and at understanding and managing coastal habitats and restoration through the CZMA program and through the NERRS program.
- 4) The Large Marine Ecosystem work, led by Ken Sherman (NMFS), which has experimented with and perfected approaches to large marine ecosystem management in 29 LMEs around the world
- 5) The efforts at ecosystem management and coastal restoration by Coastal America, often with a more localized focus and in response to development proposals.
- 6) Local watershed councils which are operative in various parts of the U.S. coastal zone and in inland areas

- 7) Regional-based efforts, such as the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, the Gulf of Maine Council, the Cal Fed program, etc.
- 8) The efforts of regional fishery councils to manage fisheries throughout their range and to determine essential fish habitat (and critical fish habitat) under the requirements of the Magnuson-Stevens Sustainable Fisheries Act.
 - managing the siting of coastal development
 - ensuring public access to the coast
 - protecting coastal habitats such as wetlands
 - encouraging water dependent uses of the coastal zone
 - encouraging appropriate harbor and port development
- 9) The efforts of the Marine Mammal Commission and NMFS and Fish and Wildlife Service to insure the ecological well-being of marine mammal populations.
- 10) The efforts of the National Marine Sanctuaries Program and of other federal and state marine protected programs to manage areas of the ocean with particular ecological, cultural, or other vulnerabilities.
- 11) Scientific study of these issues by many scientific institutions around the country and by government programs such as NOAA/NOS special projects office.
- 12) Multiple efforts at restoration of coastal habitats by both public and private actors.

A number of states have created ocean management plans for their state waters (see Appendix 3), but other states have done little to date to plan and manage their state waters in a comprehensive way.

Possible directions to consider:

- States should prepare plans for state waters (0 to 3 miles) where most of the ocean uses take place. New federal funding could be made available for this purpose.
- States should participate in the efforts to determine ocean ecosystem health to define requirements for supporting ocean ecosystem health at both national and regional levels.
- States should participate in regional multiple-use ocean councils to insure a close link between actions in the 3-200 mile zone and in their own state waters and to determine regional-level issues of interest and relevance to their state.

2. State-based coastal management institutions dealing with the land-sea interface and the 3 mile ocean zone

As discussed earlier, the coastal states have been managing their coastal lands (using inland boundaries that vary from state to state) and their coastal waters (following their powers under the Submerged Lands Act) since the Coastal Zone Management (CZMA) was first enacted in 1972. As is well known, the CZMA provided two major incentives for states to carry out coastal management: funding for coastal plan development and implementation and the consistency authority whereby federal activities affecting the coastal zone have to be consistent with the state's federally-approved coastal zone management program.

3. Regional multiple use councils in the 3-200 mile zone to harmonize current and emerging uses of the EEZ.

There are currently no mechanisms for addressing conflicts and opportunities regarding multiple social

and economic ocean activities in the 3 to 200 mile zone. As discussed earlier, there are no opportunities for region-wide ocean planning to consider how various ocean use activities can be encouraged and accommodated in particular areas, and how new ocean activities such as offshore aquaculture and windfarming can be accommodated.

Addressing multiple-use conflicts and opportunities in ocean regions will require the establishment of new regional processes for discussion, planning, and eventually decisionmaking. Such processes will have to involve all the federal agencies with authority over different uses of the ocean, representatives of the adjoining coastal states, stakeholders, and natural and social scientists. Analysis of existing patterns of use and of interactions among uses (whether they are conflictive, neutral, or mutually beneficial) will need to be made, especially by social scientists.

4. Possible mechanisms for linking these three area-based efforts, including possibly a new form of consistency arrangement.

A major challenge here is how to harmonize and link the activities of these three area-based efforts—on ocean ecosystem health spanning the largest geographical area; the specific state-based plans for the 0-to-3 mile ocean zone; and ocean planning in the federal area 3-200 miles offshore. Discussion here could center on how a principle of consistency (akin to the CZMA consistency provision) could be applied to insure harmonization of policies and of outcomes.

A special challenge here will be to determine the balance of state and federal authorities. For example, when states participate in a regional council related to the 3-200 mile zone and when their territorial sea plans are taken into account by such a regional council, would they be bound by the decisions made by the council or do they have an option to alter such decisions by making a separate consistency determination regarding their own state waters?

5. Linking cooperative arrangements to the national ocean entities.

Any regional processes regarding ocean ecosystem health and multiple-use ocean management will need to be appropriately linked to national entities which may be created ultimately. Under discussion in both ocean commissions are the creation of an interagency ocean council and some form of ocean agency reorganization to provide more effective national guidance for ocean policy.

For example, one would need to consider whether ocean plans created at the regional level would undergo review by a national ocean council or a consolidated national ocean agency, and detail possible processes for review and approval.

6. Linking regional ocean planning and management efforts to a coastal and ocean observing system.

There are plans underway by a variety of educational and government entities to develop new capacities and expand already existing work in coastal and ocean observing systems to lend scientific data and support to the making of management-relevant decisions regarding ocean ecosystem health and multiple-use ocean management.

The challenge here is to determine precisely how such coastal and ocean observing systems can be closely linked to regional processes for determining and managing ocean ecosystem health and regional processes for multiple-use ocean management.

Conclusion

In summary, it is at the regional level that ocean processes and resources occur, and where ocean uses and activities take place and often conflict. How to improve regional ocean governance thus looms as an important challenge in the effort to create a more comprehensive and integrated national ocean policy for the United States.

Crafting appropriate regional ocean governance approaches will require understanding of the extensive differences that exist in different ocean regions of the U.S.—both in terms of ecology and in terms of patterns of human use of the oceans and accompanying

conflicts, and building on efforts at regional cooperation which may already be in place in different regions. Much additional work needs to be done to better understand and respond to varying ecological, human use, and regional cooperation patterns.

There are a variety of options for improving regional ocean governance requiring different levels of intervention and change. There is, at present, no clear answer as to which option is preferable— some options might be most suitable for some regional contexts; other options for other regional contexts. Further analysis and some policy experimentation are clearly needed to develop realistic options that respond to regional variations while ensuring adequate national standards in all regions.

In this paper, a nested approach involving linking efforts to manage ecosystem health (involving the broadest geographical area from hilltops to oceans), state-based ocean management of state waters, and multiple use mechanisms for conflict resolution of multiple use activities in federal waters (3 to 200 miles offshore) has been suggested as a possible approach for further analysis and experimentation.

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Table 1: Types of Regions

<i>Bases for defining the region</i>	<i>Main features</i>
Physical	Natural features define the system (e.g., Large marine ecosystems, semi-enclosed seas)
Cultural	Patterns of culture define the system
Activity-use based (Functional)	System defined by pattern of use/activity (often economic)
Political	System defined by common political/jurisdictional boundaries and/or commonality in political outlooks
Administrative	System defined through administrative action
Combination (combines several features)	--e.g. Geostrategic region (physical features, political [the Mediterranean is an example]) --Example of a region based on physical and pattern of use factors is the North Sea

Source: Adapted from Morgan (1989)

Table 2: Different Types of Marine Regions

<i>Type of region</i>	<i>Underlying basis for the region</i>
1. Marine area corresponds to a scientifically-defined Large Marine Ecosystem (e.g. the Northeast Shelf system)	Corresponds to physical region
2. Marine area is a sub-region within a scientifically- defined Large Marine Ecosystem (e.g., the Mid-Atlantic, the Gulf of Maine region, both part of the Northeast Shelf system)	Corresponds to physical region but may also incorporate a cultural region, e.g. a "New England culture," a "Mid-Atlantic culture"
3. Marine area corresponds to ocean region containing a set of interrelated and often conflicting uses in need of integrated governance	Corresponds to activity-based region
4. Marine area is defined by the legislative jurisdiction of various ocean laws (e.g., the Sustainable Fisheries Act, the Outer Continental Shelf Lands Act, etc.)	Corresponds to administrative region
5. Marine area is defined by the pattern of cooperative interaction among the coastal states (e.g., cooperation among the states in the Gulf of Maine, cooperation among Pacific Flag Island states in the Pacific)	Corresponds to political region

Table 3: Regional and Sub-regional Forums to Address Ocean Issues

Region	Forum	Scope	Initiated	Primary functions	Participation	Coverage	EEZ extension
Northeast	New England Fishery Management Council	Regional	Federal	Management of fishery resources in federal waters	- State and federal representatives - Designees	Federal waters (3 to 200 n.m.)	LME
	Mid-Atlantic Fishery Management Council	Regional	Federal	Management of fishery resources in federal waters	- State and federal representatives - Designees	Federal waters (3 to 200 n.m.)	LME
	Chesapeake Bay Commission	Sub-regional	State	Restoration of Chesapeake Bay (living resources, vital habitats, water quality, land use, stewardship and community involvement)	- State legislators - EPA	Chesapeake Bay	No, watershed-based ecosystem
Southeast	South Atlantic Fishery Management Council	Regional	Federal	Management of fishery resources in federal waters	- State and federal representatives - Designees	Federal waters (3 to 200 n.m.)	LME
Gulf of Mexico	Gulf Fishery Management Council	Regional	Federal	Management of fishery resources in federal waters	- State and federal representatives - Designees	Federal waters (3 to 200 n.m.)	LME
	Gulf of Mexico Program	Regional	Federal	Ocean stewardship (invasive species, public health, eutrophication, habitats)	- EPA - State representatives	State and federal waters (?)	Yes
Florida and the Caribbean	Caribbean Fishery Management Council	Regional	Federal	Management of fishery resources in federal waters	- State and federal representatives - Designees	Federal waters (3 to 200 n.m.)	LME
	Tortugas 2000 Working Group	Sub-regional	Federal?	Study of the area's coral reef environment	- Sanctuary representatives - Local, state, federal agencies	National Marine Sanctuary	No, ecosystem approach applied to the study area
Southwest	Pacific Fishery Management Council	Regional	Federal	Management of fishery resources in federal waters	- State and federal representatives - Designees	Federal waters (3 to 200 n.m.)	LME
	California ???	Sub-regional			-		
Northwest	North Pacific Fishery Management Council	Regional	Federal	Management of fishery resources in federal waters	- State and federal representatives - Designees	Federal waters (3 to 200 n.m.)	LME
	Puget Sound Council	Sub-regional	Federal?	Water quality management in the Puget Sound	- Federal, state, tribal and local interests	Puget Sound	No
Hawaii and the Pacific islands	Western Pacific Fishery Management Council	Regional	Federal	Management of fishery resources in federal waters	- State and federal representatives - Designees	Federal waters (3 to 200 n.m.)	LME
Great Lakes	Great Lakes Commission	Regional	Binational	Environmental and Economic Management	- States/provinces	Great Lakes	—

Figure 1: LMEs in US Waters Source: Adapted from Large Marine Ecosystem project at <http://www.edc.uri.edu/lme>

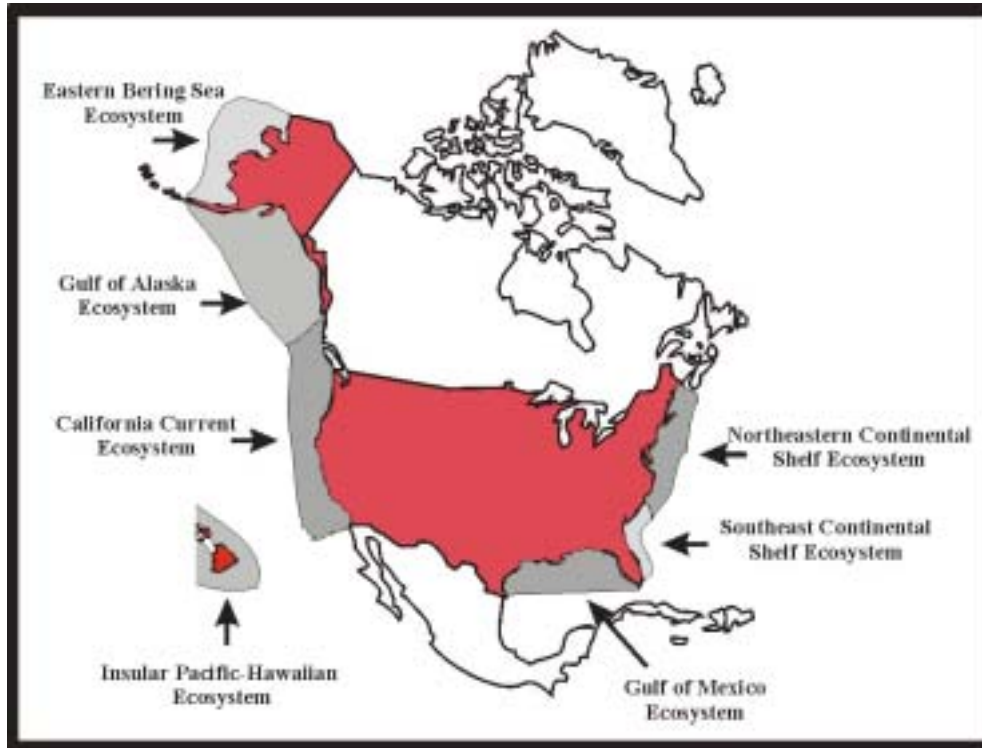
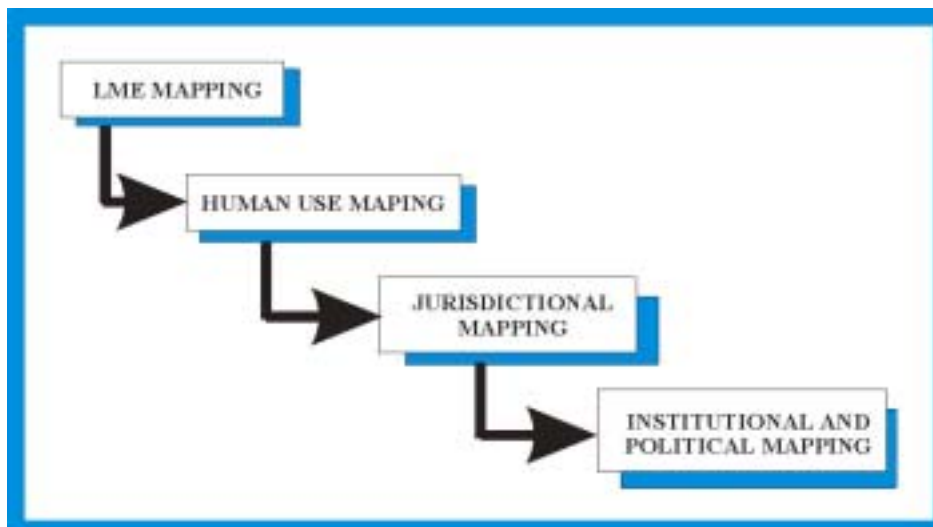


Figure 2 Steps in the application of the LME approach to ocean management



CONSIDERATIONS IN EFFORTS TO EFFECTUATE REGIONAL OCEAN GOVERNANCE

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The purpose of this very brief paper is to encourage discussion of some key problem areas in advancing efforts to promote regional ocean governance; it does not attempt to provide a road map for how to achieve regional ocean governance. Several fundamental difficulties are noted, as is the fact that regional approaches are essential for effective governance.

At the international level, interest in regional ocean management efforts came of age during the 1970s as it became clear that attempts at management on a unilateral basis by individual states had severe limitations. The establishment of the Regional Seas Program by the United Nations Environment Program served as an indicator of this development.

Conceptually, the idea of a "region" has been subject to different interpretations and may be understood, variously, as involving geographical, cultural, political, or economically linked extents of space. (Alexander 1977) Indeed, it has been suggested that a region "is in the eye of the beholder," (Clingan 1979) or is an "intellectual concept," (Alexander 1986) that it is functional in nature, and that the perception of a region is determined by the purpose that the region could serve.

In the contemporary context, as anthropogenic pressures on ocean resources and the environment have continued to grow and the understanding of the workings of nature has become more sophisticated, it has been asserted that management regions should take into account or be defined on the basis of the operation of natural ecosystems. (Alexander 1993;

General Accounting Office 1994; Interagency Ecosystem Management Task Force 1995-1996; Christensen et al. 1996). The rapidly expanding body of literature on large marine ecosystems (LMEs) centers on the significance of the health and productivity of natural systems that sustain the oceans' living resources. (Sherman et al. 1992, 1993, 1996, 1998, 1999) Concern with, among other things, habitat considerations, bycatch problems, and the consequences of human land-based activities on ocean resources and ecology exemplifies a broader, systemic perception of the world's ocean areas. (World Commission on Environment and Development 1987; Juda 1996)

The primary impetus that impels movement toward regional ocean governance in ecosystemic terms is encapsulated in the term "reality." The reality that must be considered is an elemental fact: failure to understand and to take into account the significance and the interactions of the various parts of natural systems which compose a whole and the effects of human uses can result in the inability of those systems to continue to provide valuable goods and services. However, a basic and underlying impediment to ecosystem-based governance is that, whether at the local, national, or international level, there is typically a lack of congruence between:

- a) the physical extent of natural ecosystems which are being utilized for human ends; and
- b) the territorial/jurisdictional scale of systems for the governance of human activities.

In short, there is a disconnect between what may be termed “ecologically defined space,” representing the extent of land and sea over which an ecosystem extends and “politically defined space,” that area over which particular governance institutions have jurisdiction. (Juda 1999) That this divergence is now recognized as an important problem is affirmed by increasing interest in system-based governance of naturally determined areas such as watersheds, estuaries, semi-enclosed seas, and large marine ecosystems. There is growing recognition in national legislation and international agreements of the need for system-wide coordination and governance. And conferences such as this are assessing the changes needed to encourage and to effectuate regional governance efforts. To consider how to improve regional, ecosystem-based ocean governance it is necessary to take note of the problems that such approaches encounter.

Obstacles to Regional Ocean Governance

At least three very significant and interrelated impediments stand in the way of effective regional governance efforts:

- the predominance of national and sectoral rather than systems-based and integrated approaches to the environment
- the existence of “turf” problems among levels of government and among governmental units at the same level of government
- the concern over the allocative consequences of organizational change in terms of power and authority over and access to ocean resources and the environment that may accompany efforts to move toward ecosystem-based governance.

Collectively, these factors, taken together with the conceptual difficulties associated with appropriately defining “regions,” and the need to overcome the problems consequent to the divergence of politically and ecologically defined space, make it difficult to operationalize new governance frameworks.

National and Sectoral vs. Systems-based and Integrated Approaches

For the most part, contemporary ocean use management has occurred in the context of a spatial approach to the oceans that is politically determined and associated with the perceived needs of coastal states. The international legal system that provides the framework for management efforts is characterized by the extended nationalization of ocean space that is believed to serve national goals in terms of allocation and conservation of resources and is evidenced by the recognition of the exclusive economic zone (EEZ). Yet in a number of respects and despite coastal state sovereign rights and jurisdiction in the EEZ, it is apparent that the EEZ is often not an appropriate management unit. (Juda 1987) Fishery management problems involving transnational, straddling, and highly migratory stocks continue in the age of EEZs and, therefore, it is not surprising that there are a growing number of regional international agreements addressing that issue. (FAO 1998; Juda 2002)

Further undermining attempts at effective management of the human uses of ocean space is the traditional sectoral approach to the use and governance of the environment and its resources which focuses on particular human activities and needs and, consequently, tends to neglect generated externalities. For example, it is becoming increasingly clear that problems such as that of the “Dead Zone” in the Gulf of Mexico are related to agricultural practices even hundreds of miles away. (Malakoff 1998) Accordingly, systems, rather than particular uses, are becoming the point of public policy attention.

Within areas under state jurisdiction, the sectoral approaches to governance efforts and their shortcomings have been the subject of frequent comment over time from the issuance of the report of the Stratton Commission (Commission on Marine Science Engineering and Resources 1969) to the present (National Research Council 1997; H. John Heinz III Center 1998; Independent World Commission on the Oceans 1998). This sectoral disconnect is observed in governmental efforts around the world (Levy 1988) and is also seen at the international level in the work

of the functionally organized Specialized Agencies of the United Nations system. (United Nations Conference on Environment and Development 1992; Independent World Commission on the Oceans 1998).

Turf Problems Between Levels of Government and Among Agencies at the Same Level of Government

In many governments ocean responsibilities are shared between the national and subnational governments and within a particular level authority may be shared among a number of functionally oriented bodies. (Commission on Marine Science, Engineering and Resources 1969; Department of Fisheries and Oceans 1997; National Oceans Office 1997) This phenomenon has led to tensions and competition for both authority and funding and highlights recognition of the need for horizontal (as between governmental bodies at the same level) and vertical (as between different governmental levels) policy integration. (Underdal 1980).

Concern over the Allocative Consequences of Organizational Change

For the natural scientist, reality may suggest that there is a need to consider natural systems as a logical basis for governance. Yet for politicians and diplomats, reference to regional or ecosystem-based governance raises questions regarding possible implications for existing authority arrangements and socio-economic effects; indeed, it is well understood that organizational change has policy implications. For example, Burke (1993) has noted the failure of the 1992 United Nations Conference on the Human Environment (UNCED) to make reference to large marine ecosystems because of the possible allocative and governance implications of that concept. Coastal states feared that reference to LMEs would allow other states to interfere with their management practices in the EEZ while distant water fishing states were concerned that reference to LMEs could provide a basis for coastal states to claim authority beyond the 200 mile limit associated with EEZs. Thus, perceived political reality may suggest courses of action different from those

seen as appropriate by natural scientists and environmental and resource managers.

Toward Regional Ocean Governance?

Can needed efforts at appropriate regional governance be advanced in the face of the types of impediments alluded to above? A qualified “yes” is in order if the political will to move in the direction of ecosystem-based, regional governance emerges and strengthens. Is there the will and, more directly, the political constituency to encourage such change? Recognition of the limitations of traditional approaches to ocean management may serve as a major impetus to finding alternative management frameworks. At the international level, a number of new initiatives such as those in the Baltic, the Arctic, and efforts associated with large marine ecosystem approaches are in evidence.

Domestically, the work of the Pew Commission and that of the official Oceans Commission could provide new agendas for change through their studies and recommendations. But one can wonder if their potential contributions will not be limited, being shaped and overshadowed by the events of September 11 and the increasing focus on national security at the expense of other concerns. Nonetheless, the needs that impel change toward regional, ecosystem-based management remain valid and will become more apparent over time.

The basic change that is occurring now is perceptual and conceptual, with movement in the direction of a more systemic view of ocean and related coastal areas and the multiplicity of human activities with their cumulative effects on the natural environment. Such a paradigm change has organizational and policy implications that often will be difficult to operationalize and institute in governance systems. What is needed is the continued development of mechanisms, policies, and initiatives that will encourage needed regional approaches to governance without simply creating new levels of bureaucracy and, thus, further complicating the ability of society to adapt to changing circumstances. A variety of approaches to achieving regional, ecosystem-based and multi-use governance, involv-

ing institutional change and restructuring, the inclusion of a wider range of considerations in policymaking, and the coordination and harmonizing of policies are possible and must be evaluated pragmatically.

In the last analysis, it is necessary to develop functionally appropriate governance systems that are also politically acceptable and thus “do-able.” But it must be noted that what is viewed as politically acceptable and socially required is subject to change over time in the face of increasing knowledge and ongoing experience; non-governmental as well as governmental bodies play important roles in this evolutionary process. (Juda and Hennessey 2001) While change that occurs may appear to be piecemeal rather than systemic in nature, the cumulative result of a number of smaller changes may have significant effects and contribute to the emergence of new, more effective regional governance frameworks.

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THE STATUS OF MARINE ECOSYSTEMS AND THE IMPERATIVE OF IMPROVED MANAGEMENT

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Introduction

The United States has some of the most diverse marine ecosystems in the world, from the frigid waters of the North Atlantic and Arctic Oceans to the tropical reefs of the Florida Keys and the Pacific Islands. These systems are home to some of the world's most varied marine plants and animals, and provide critically important ecological services (such as protecting water quality and providing essential nutrients and habitat for a variety of marine species), outstanding recreational and economic opportunities, and potential future benefits to society. Custody of these biologically diverse marine waters entails a special responsibility to protect them. Yet, our oceans are experiencing an unprecedented series of stresses. They have been dramatically affected by fishing, pollution, and degradation of habitat.

This paper addresses the ecological state of the U.S. marine environment with a focus on the health of our fish populations, marine wildlife, coastal waters, and ecosystems. The following examples of management failures are by no means isolated incidents. The recommendations that follow attempt to address some of the most egregious threats to our oceans.

Fish Populations

Humankind has traditionally viewed the oceans as an inexhaustible resource to be fished without limit. Yet, as we have increased our capacity to fish, we have begun systematically decimating fish populations. In recent years, fishery disasters have been declared in

New England, the Pacific, and the North Pacific. The National Marine Fisheries Service (NMFS) has assessed only about one-third of U.S. fish stocks, and of those, approximately half are overfished. This vast lack of knowledge regarding fish stocks may mask even more serious declines in fish populations.

In the North Atlantic, catches of preferred food fish have declined by half over the past 50 years, even though we have increased our fishing effort threefold.¹ Since 1991, cod catches in the Gulf of Maine have declined by 75 percent—from 20 million pounds to less than five million pounds per year. In 1982, fishermen caught over nine million pounds of haddock; by 1996, the haddock catch had declined to just one million pounds, a 90 percent decrease.² As a result of overfishing, Atlantic halibut has been largely absent from the U.S. Northwest Atlantic Ocean since the 1940s.³

Just this year (2002), fishery managers were forced to close large areas of the Pacific Ocean off California, Oregon, and Washington to most types of bottom fishing. These closures may be in place for many decades if current rebuilding projections are accurate. Scientific warnings of unsustainable fishing were issued as early as 1984, but lacking ironclad proof, managers were unwilling to restrict fishing over the objections of the fishing industry.

Some fishing methods and gear types damage ocean habitat. Such operations are ultimately self-defeating, because habitat destruction reduces the productivity of marine fish populations. Less harmful

alternatives already exist for many types of destructive fishing methods, and their use would make fishing operations more sustainable.

Worldwide, it is estimated that bycatch amounts to one-quarter of the annual global fish catch of 84 million tons.⁴ Bycatch contributes to the decline of fish populations of all kinds. Gear is frequently indiscriminate—some gear types catch virtually everything in their path: all types and sizes of fish, as well as mammals, sea turtles, and even sea birds. Even if unwanted animals are released, they often do not survive the harsh process of capture, onboard sorting, and eventual return to the ocean.

Recommendations

1. Congress should overhaul the Fishery Management Council system to reduce the predominance of resource users over conservation interests, scientists, and other stakeholders. In addition, the councils should not set fishing mortality levels but should retain their role in making allocation decisions.
2. Congress should fully fund and NMFS should conduct stock assessments for all fisheries. Stocks particularly vulnerable to depletion or with outdated or non-existent assessments should be given top priority. Information collection efforts should be expanded, such as at-sea fish surveys and cooperative research with the fishing community.
3. The health of ocean ecosystems should become the dominant goal of fisheries management. NMFS should rebuild and protect individual species under a broader ecosystem framework. Where information is lacking, precautionary policies should ensure that over-exploitation does not occur while information is being collected.

Marine Wildlife

Marine mammals and sea turtles are among America's most charismatic and vulnerable marine resources. Human activity represents the greatest threat to marine wildlife. Coastal development and pollution destroy habitat, and global warming has the potential to fundamentally alter the marine environment

in the years to come. But the most immediate threat to already threatened and endangered mammals and sea turtles result from the far-reaching impacts of fishing. Our nation must enforce existing laws and treaties that protect wildlife, bolster such measures where they need improvement, and establish new commitments to conservation as needs arise.

In U.S. waters, 38 marine mammals—including manatees, whales, seals, sea lions, and otters—are either listed as depleted under the Marine Mammal Protection Act (MMPA), as threatened or endangered under the Endangered Species Act (ESA), or have unsustainable mortality rates. For 10 of these species, accidental death rates from human activities are so high that the stock may not grow or recover. Yet the most significant threat to their continued existence—death by entanglement in fishing gear—is largely preventable with proper implementation and enforcement of laws such as the MMPA and ESA.

Man-made noise in the ocean is a growing threat to marine wildlife, particularly to marine mammals that use low-frequency sound to communicate and to sense their environments, such as whales and dolphins. Sound travels greater distances under water and five times faster than in air. Because of their nature, location, intensity, or duration, some sounds are likely to have biologically significant effects on marine mammals. Therefore, there is a great need for increased research focused on the impacts of sound on marine wildlife. There is also a pressing need to develop and implement appropriate controls on activities that produce potentially harmful sounds.

NMFS estimates that more than 4,000 large loggerhead, green, and leatherback sea turtles are unable to escape shrimp trawls in U.S. waters each year. Many of these animals drown or die after release due to the effects of forced submergence. In April 2000, NMFS notified the public that it would propose changes to the 1990 regulations for Turtle Excluder Devices (TEDs) in the Gulf of Mexico and southeast Atlantic. The TED regulations require shrimp trawlers to use inserts (excluders) that enable turtles to escape trawl nets. Yet NMFS still has not published a final rule requiring larger TED openings.

Recommendations

1. NMFS should seek, and Congress should provide, more funding for marine mammal take reduction teams to increase observer coverage, better estimate bycatch, and improve population abundance estimates.
2. In consultation with conservation groups, industry, academic experts, the Department of Defense, the Department of Commerce, the Marine Mammal Commission, and the National Academy of Sciences, the Administration should develop a national policy and action plan to address the impacts of noise on marine mammals.
3. NMFS should expeditiously complete work on the new turtle excluder device (TED) rule and implement final regulations to better protect sea turtles. Moreover, NMFS should make a concerted effort to export this technology overseas. NMFS should also develop and implement a comprehensive strategy to reduce sea turtle mortality in fisheries that does not come at the expense of other species, like sea birds.

Coastal Water Quality

Each year, our coastal waters face increased pressures and demands. EPA's recent *National Coastal Conditions Report* found the overall condition of our coastal waters to be only fair to poor. Many of the nation's coastal environments exhibit symptoms of pollution, including harmful algal blooms, loss of seagrass beds and coral reefs, shellfish bed contamination, and serious oxygen depletion. During 2001, there were 13,410 days of beach⁵ closings and advisories across the nation due to high levels of bacteria or other pollution. Unfortunately, our current laws and policies have failed to control pollution carried by nonpoint sources, the leading cause of water quality impairment in the United States.

As rain washes over roads, parking lots, construction sites, and industrial or commercial sites, it becomes contaminated with oil and grease, heavy metals, pesticides, litter, fecal matter, and other pollutants. In

rural and suburban areas, rainwater flows over farmland, roads, golf courses, and lawns into waterways. The rainwater can then become a toxic mix, carrying animal waste, fertilizers, oil, metals, and pesticides. This polluted runoff, or nonpoint source pollution, is diverted to or runs directly into local waterways, ultimately flowing into coastal waters and the ocean.

While the Clean Water Act has direct regulatory authority over the discharge of pollutants from point sources, no such authority regulates nonpoint sources. A key provision of the Clean Water Act developed to clean up polluted waters is the Total Maximum Daily Load (TMDL) program. This program requires states and the EPA to identify polluted waterways, rank them for priority attention, and then develop pollution limits for each. Currently, the TMDL program implementation is weak, and the Administration is considering changes to the TMDL program which would delay clean ups indefinitely.

Only one in five concentrated animal feedlot operations (CAFOs) in the U.S. has applied for a National Pollution Discharge Elimination System (NPDES) permit, despite their tremendous impact on water quality. The Administration has blocked a pending CAFO rule, and has done little to support further controls to slow the flow of agricultural wastes to inland and coastal waterways.

Ballast water discharges from ships are a primary vector for invasive species. Invasive species threaten biodiversity by preying upon or out-competing native species, thereby reducing an ecosystem's diversity, threatening public health, and costing billions of dollars to coastal communities. Yet in the federal 2000 budget, agricultural invasive species management and research received 90 percent of the funds, whereas aquatic invasive species received only one percent.⁶

Recommendations

1. Congress should act to reduce polluted runoff by strengthening the Clean Water Act's TMDL program and should reauthorize the Coastal Zone Management Act to include substantially increased, dedicated funding for state implementation and en-

forcement of Coastal Nonpoint Pollution Control Programs.

2. EPA and Department of Agriculture should issue rules to control pollution from CAFOs through National Pollutant Discharge Elimination System (NPDES) permits, nutrient management plans, enforcement, strong effluent limits, banning of open-air lagoons, and eliminating current regulatory loopholes.

3. EPA should implement the Clean Water Act's permit provisions with respect to ballast water in order to protect our ocean ecosystems from invasive species.

4. The National Invasive Species Act should be amended to establish and strengthen treatment standards for ballast water and to better coordinate a partnership between Coast Guard's enforcement and monitoring authority under the National Invasive Species Act and EPA's existing Clean Water Act authority.

Coastal and Marine Ecosystems

Our marine resource policy reflects a tendency to focus primarily on certain "valuable" species and treat them as independent commodities. This has led not only to depletions of those species, but to wholesale changes in marine ecosystems. Although it is common knowledge that all species inhabiting an ecosystem are connected, our current resource management strategies do not adequately consider these interconnections and consequently fail.

America's 13 National Marine Sanctuaries are all currently undergoing, or are scheduled soon to begin, management plan review. Currently, most of these sites are sanctuaries in name only, providing insufficient protection to either species or habitats. Most sanctuaries fall far short of their mandate to "maintain the natural biological communities . . . and to protect, and where appropriate, restore and enhance natural habitats, populations, and ecological processes."⁷

Coral reefs are threatened by a variety of human im-

pacts, including pollution, unsustainable fishing activities, global climate change, and even boat groundings. In the Florida Keys, an alarming 37 percent of the stony coral cover was lost between 1996 and 2000.⁸ Recent reports suggest that 27 percent of the world's coral reefs have already been lost, a figure that is expected to rise to 50 percent within the next 20 years.

While coastal marine habitats, including wetlands and marshes, seagrass beds, mangrove stands, mudflats, and kelp forests provide a host of essential and valuable ecological services, such as nutrients and habitat for a variety of marine species, these areas continue to vanish due to increased, ill-managed coastal development.

Recommendations

1. The United States urgently needs to establish a national system of marine protected areas that is comprehensive, that represents the nation's diverse marine and coastal habitats and biological communities, and that is large enough to contribute significantly to restoring depleted species and damaged habitats, protecting ecological processes, and restoring the health of marine ecosystems. The national marine protected areas system must include adequate no-take marine reserves that are free from the pressures of fishing, oil and gas development, and other resource extraction activities.

2. The United States should adopt an ocean wilderness ethic similar to that which we have adopted on land. On land, our most treasured and wild spaces are designated as wilderness to protect them in an "untrammled" state. Our underwater treasures are equally deserving of protection, and equally vulnerable. These places must be identified and protected to the highest standard, so that they, too, remain wild and untrammled for present and future generations to experience, explore, but leave unaltered. Consistent with our approach on land, at least five percent of U.S. waters should be protected as true ocean wilderness.

3. NOAA should fully implement its mandate under the National Marine Sanctuaries Amendments

Act of 2000 to protect, restore and enhance natural habitats, populations, and ecological processes in the national marine sanctuary system. The management review process for the sanctuary system should be fully supported by NOAA and the Administration and completed in a timely manner to ensure that all threats to the sanctuaries, including those arising from fishing, are identified and addressed.

Conclusion

Ocean ecosystems are tremendously resilient, but not endlessly so. Thirty years ago, in response to the alarming and obvious degradation of our marine environment, Congress passed the Clean Water Act, the National Marine Sanctuaries Act, the Marine Mammal Protection Act and the Coastal Zone Management Act to restore the integrity and health of our nation's marine environment. For the most part, the history of these laws has been one of success. However, the same history has provided us with clear insight as to where and how they have failed. We can ill afford to allow our waters to become any more polluted, our fish populations further depleted, or our precious marine ecosystems more degraded.

The United States' ocean governance structure is in desperate need of reform. Our marine resources, both living and non-living, are held in the public's trust and need and deserve the federal government's commitment to better management. With vision and political will, the U.S. can choose to restore them and allow them to heal themselves. With so much at stake, ecologically and economically, it is imperative we improve the management of our oceans.

Notes:

¹ Daniel Pauly et al., presentation at the American Association for the Advancement of Science conference, Boston, MA, February 21, 2002.

² State of Maine Planning Office, "Fisheries," www.state.me.us/spo/mcp/fisheries.htm.

³ "Atlantic Halibut: Life History and Characteristics," NOAA Technical Memorandum NMFS-NE-125.

⁴ Marine Fish Conservation Network. www.conservefish.org/capitol_hill/bycatch.html.

⁵ This figure combines data regarding ocean, bay, Great Lakes and some freshwater beaches.

⁶ "Aquaculture is 'Gateway for Exotic Species' Study Says," *Ocean Update*, December 2001, Sea Web.

⁷ 16 U.S.C. §1431(b)(3)

⁸ U.S. Environmental Protection Agency and Florida Keys National Marine Sanctuary Coral Reef Monitoring Project, "Executive Summary 2001," from FKNMS Symposium: An Ecosystem Report Card, Washington, DC, December 2001.

OCEANS AT THE BRINK: EMERGING ISSUES IN GOVERNANCE OF OUR SEAS

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Emerging marine resource extraction technologies, innovative science, and new legislative initiatives aimed at undermining longstanding environmental protections are all converging on our coastal waters. Our oceans are increasingly being targeted as both a “source” and a “sink” - a source of energy, minerals, pharmaceuticals and food - and a sink for the disposal of wastes ranging from non point runoff associated with inappropriate agricultural practices to partially-treated sewage discharges from urban population centers.

Global climate change has already begun to induce unprecedented alterations in our ocean ecosystem. In addition, increasing efforts to partially mitigate the climate impacts of continuing to burn fossil fuels have made our ocean waters a handy target for new schemes to sequester excess carbon.

The disturbing consequences likely to result from the convergence of the myriad threats to our oceans now compels us to design and apply new ocean governance strategies which take this new world into full account.

Planning for a “Future” that is Already Here Now:

Governance methodologies for our oceans have, for the most part, not yet begun to anticipate and adapt to these new threats. The effective application of traditional “Integrated Coastal Zone Management” faces dramatic challenges as we move into the new century. To the degree that we can learn from the past in order to better address the challenges of the future, the time for designing better planning strategies is well upon us. With marine extinctions looming and clear evidence confronting us of the degrading health of

our oceans, we ignore the current danger signals at our own economic and evolutionary peril.

Society’s relationship with the marine environment has historically been characterized by the belief that the immense size of the oceans made them somehow invincible, too huge for our petty human impacts to hurt them. Science has only recently enabled us to better understand the complex and often fragile ecological relationships within our oceans, even as our human impacts have begun to reach a scale which generates a cumulative level of concern. As we assess thirty years of experience in the U.S. with the federal Coastal Zone Management Act (CZMA), we must ask where we are now, and we must determine what adjustments we will need to make to meet the new challenges now confronting us.

Troubled Waters:

While along our shorelines there are many recent regional and local success stories of which coastal managers can be justly proud, there are also compelling signs that America’s coastal waters are in trouble:

- A massive “dead zone” haunts the Gulf of Mexico, and harmful algal blooms are now recurring in once-pristine estuarine waters along the Eastern Seaboard.
- Coral bleaching has recently been found, for the first time, even among the remote reefs of the Northwest Hawaiian Islands. Dozens of fisheries in U.S. waters are severely depleted or in collapse, and many of our best efforts to restore them through conventional fishery management measures are not succeeding.

- Chronic oil leaks from aging petroleum pipelines plague the waters and watersheds of Alaska's Cook Inlet, even as three new federal offshore oil lease sales are proposed for the entire Arctic coastline – a region where no spill cleanup technology has yet been invented that can respond to oil spills in broken sea ice conditions or under the ice.
- Lingering crude oil left over from the 1989 Exxon Valdez tankship spill can still be readily found among the rocky cobblestone beaches and estuaries of Prince William Sound, as toxic as the day it was spilled. And the eggs of pink salmon in the Sound have demonstrated lifetime mutagenic impacts to this species as a result of oil spill contamination from polynuclear aromatic hydrocarbon (PAH) compounds at levels of parts per billion.

The long-term environmental implications for our oceans resulting from non point runoff, chronic hydrocarbon pollution, and widespread overfishing are just now becoming apparent to decisionmakers, and these issues cannot be ignored.

Current Efforts to Undermine Ocean Protection:

Even as these concurrent alarm bells are ringing, in the waters of the Exclusive Economic Zone (EEZ), federal regulatory initiatives are already underway with the intent of weakening the role of coastal states as they comment on proposed federal offshore drilling and other industrial projects off their shores.

Recently-adopted amendments by Congress to the U.S. Deepwater Ports Act have undermined state jurisdiction over offshore Liquefied Natural Gas (LNG) facilities. An end-of-legislative-session compromise by lame duck House-Senate conferees only narrowly prevented the proposed exemption of offshore LNG projects from future legal challenges on behalf of the public and conservation groups under the amended Deepwater Ports Act.

The National Environmental Policy Act (NEPA) is being rolled back by the Administration for military and transportation projects, both on the land and in the EEZ. Further erosion of NEPA is already high

on the legislative agenda in the Congress. The White House Energy Task Force is engaged in a concerted push to transfer unilateral permitting jurisdiction to the Secretary of Interior for virtually all offshore industrial projects, including wind energy installations, wave energy facilities, and a range of hydrocarbon extraction and transportation infrastructure activities.

In the U.S. Gulf of Mexico, political pressure exerted by the geophysical industry recently forced federal decisionmakers to weaken their science-based Biological Opinion and to withdraw and weaken regulations intended to protect endangered sperm whales from intense seismic survey sound impulses.

Even within our flagship national marine sanctuaries, which enjoy a firm legislative mandate to maintain the health of marine ecosystems in perpetuity, we find that marine life is often in decline. In our sanctuaries, proposals for various industrial projects - from fiber optic cable landfalls to wave energy projects - are already setting precedents for the approval of industrial projects within these acknowledged "crown jewels" of America's marine environment.

Will the Commissions Launch a Commitment to Change?

Against this backdrop of current technical, regulatory, and legislative challenges, two prestigious national oceans commissions are preparing to release their respective final reports during 2003. The Pew Oceans Commission, and the Administration's National Commission on Ocean Policy, are each expected to unveil their own blueprints for a new management agenda aimed at better stewardship of America's oceans.

Even as the recommendations of hundreds of witnesses have been documented at dozens of hearings held before these two panels, new legislative initiatives and rapidly emerging technologies have already begun to undermine and outpace the deliberations of these commissions. Useful findings of these commissions may be proactively rendered partially obsolete by Congress and the Administration, even before each commissions' final conclusions are released.

Each of the dramatic new challenges to the biological integrity of our oceans represents an opportunity, however, if we can accelerate our societal responses in time to get ahead of the planning curve before the real-world impacts these new technologies and relaxed regulatory frameworks are fully upon us.

Energy: Hydrocarbons and the Oceans

On the federal Outer Continental Shelf (OCS), the Minerals Management Service (MMS) has recently approved a new Five-Year OCS Leasing Program for the years 2002-2007. Offshore the “Lower-48” states, this leasing program has scheduled twelve proposed OCS lease sales which are distributed throughout the Eastern, Central, and Western Gulf of Mexico OCS “Planning Areas”. In addition, eight additional new OCS lease sales target Alaskan federal waters, including three massive offshore leasing plans along a 400-mile stretch of the Arctic coastline extending from the Canadian border nearly to Barrow, Alaska. A large portion of this lease area lies immediately seaward of the Arctic National Wildlife Reserve (ANWR). If significant petroleum discoveries occur offshore, pressure to allow OCS-related onshore support facilities within the Arctic Refuge will be inevitable.

With respect to federal waters nationwide, the House and the Senate have both recently renewed the legislative OCS moratorium for fiscal year 2003, continuing the 21st consecutive year of this protection. This legislative OCS moratorium currently protects the U.S. West Coast, the East Coast, the West Coast of Florida south of 26 degrees north latitude, and Alaska’s fishery-rich Bristol Bay from new federal offshore lease sales.

In addition, a presidential directive, first issued by former president George Herbert Walker Bush in 1992, then extended by Bill Clinton in 1998, precludes new OCS leasing in the same areas, with the exception of Bristol Bay, until at least 2012.

Off of Central California’s pristine Pt. Conception coastline, lessees of 40 active-but-undeveloped OCS tracts are seeking a federal buyout to terminate their leases. The lessees in this region are seeking a resolu-

tion to their “stranded assets” dilemma that would be similar to a previous agreement, made during the spring of 2002 between President George W. Bush and Florida’s governor Jeb Bush, that resulted in the cancellation and reacquisition of active OCS leases off of the beaches of the Florida Panhandle.

Along the U.S. West Coast, where there are currently no Liquefied Natural Gas terminals, a proliferation of new plans for coastal LNG facilities is now being proposed. Near Oxnard, California, local interests recently managed to protect important coastal habitat on property targeted for an Occidental Petroleum LNG terminal. Near Rosarita Beach, in Baja California, several large coastal properties have already been optioned by the oil industry for the construction of three major LNG terminals and gasification facilities, with the natural gas destined for transshipment to U.S. Sun Belt cities and Southern California. Planners of LNG facilities are also targeting the Port of Long Beach, and other Southern California locations. Within San Francisco Bay, a new proposal has emerged for a LNG terminal and gasification plant at Mare Island in Vallejo. The Vallejo site has been generating substantial local controversy, and alternative LNG sites are now being studied at Eureka and near Moss Landing, within the Monterey Bay National Marine Sanctuary.

Nationwide, a number of petroleum companies are also looking into floating single-point LNG moorings and platform-mounted offshore LNG terminals at various locations, including off of Boston and South Carolina. And in the Bahamas, El Paso Gas has acquired a plan from now-bankrupt Enron Corporation to build a LNG terminal and gasification plant, with a subsea gas pipeline to the East Coast of Florida. LNG tankers, terminals, and gasification facilities represent very substantial concentrations of highly-flammable fuel, and present serious combustion threats to nearby infrastructure and human populations as a result of radiative heat transfer and explosion risks.

The transition to LNG as the industrial world’s fuel-of-choice is expected to bring with it serious environmental consequences around the Pacific Rim,

threatening the virgin salmon streams of the Russian Far East, fragile marine environments throughout Asia, and terrestrial wilderness in Bolivia and elsewhere. LNG as a “bridging fuel” is also driving commercialization of Gas-to-Liquids technology (GTL) in an effort to convert LNG into a transportable liquid fuel for transportation uses.

Ultimately, conversion of LNG into hydrogen for use as a transportation fuel, and the anticipated eventual conversion of methane hydrates (see subsequent section of this report) into hydrogen fuel, is viewed by some as a desirable goal with respect to moderating climate change. Should hydrogen - for transportation and other energy applications - be derived from conventional hydrocarbons or from methane hydrates, efforts to sequester excess carbon in the oceans will undoubtedly increase. Portions of the LNG infrastructure now being contemplated throughout the global ocean will also likely eventually be applicable to the future methane hydrates energy economy.

A new high-pressure undersea natural gas pipeline, El Paso’s “Blue Atlantic” pipeline, is being planned to transport natural gas from present OCS production facilities off of the East Coast of Canada to gas markets in New Jersey, with four compressor platforms along the way. The subsea right-of-way for this gas line would be adjacent to the boundary of the Stellwagen Bank National Marine Sanctuary, and would cross New England’s Georges Bank, potentially undermining the longstanding legislative OCS moratorium which has thus far precluded new offshore drilling there.

Along Canada’s West Coast, on the shoreline of British Columbia, near Vancouver Island, and among the Queen Charlotte Islands, the Canadian provincial and federal governments appear poised to lift a longstanding moratorium on offshore drilling.

Virtually all American and Canadian nearshore coastal waters are under increased pressure for hydrocarbon development. Only within the existing U.S. national marine sanctuaries, and in small zones off of California’s Pt. Reyes and the City of Santa Barbara, is offshore oil and gas leasing permanently precluded.

In the Central and Western Gulf of Mexico, the proposed implementation of massive new “Floating Production and Storage” facilities will, for the first time, result in very large accumulations of produced oil being stored at sea in floating vessels. New types of contingency planning, including onsite environmental protections, oil spill response planning, and security measures must be put in place to ensure the safety of these Floating Production and Storage installations. The potential for a very large catastrophic oil spill in Gulf Coast waters is exacerbated by the increased risk posed by the volume of oil concentrated in these installations.

Public concern is rising in Gulf Coast communities about recent studies showing high levels of toxic mercury contamination around existing offshore drilling rigs, resulting from the dumping of spent drill muds, which is apparently finding its way into humans via consumption of recreationally-caught fish. In addition, some drilling locations in the Gulf of Mexico have exhibited elevated levels of radium in the “produced water” being brought up from subsea geologic formations, prompting calls for new controls on this largely-unregulated source of radioactivity now routinely entering the marine food chain.

Energy: Methane Hydrates

Embedded in geologic formations under the deep seafloor, and in shallower pockets under Arctic permafrost, are vast deposits of frozen natural gas, locked in water ice, called methane hydrates. The solid ice characteristic of the marine methane hydrates “zone of stability” is maintained by a combination of the immense pressure of the overlying water column, and the intense cold found at great depths in the ocean.

Methane hydrate resources have been estimated to represent several orders of magnitude greater energy reserves than all of the remaining conventional oil and gas deposits on earth. The uncertain timing of commercialization of methane hydrates presents a significant unknown. Unanticipated cavitation of the hydrate zone around certain oil wells on Alaska’s North Slope, and in an oil field in the former Soviet Union, has already produced natural gas from meth-

ane hydrates. A “Joint Industry Project” and multi-government research well in Canada’s Mackenzie River Delta produced experimental quantities of natural gas from hydrates during the summer of 2002, confirming the probable availability of this resource via present-day drilling methods.

The future technology of commercial production of methane hydrates is expected to involve conventional vertical boreholes accompanied by “steamflood” injection of heat to destabilize the hydrates, or “deroofing” of the hydrate deposits through seafloor stripmining techniques. Other extraction proposals under study include the injection of antifreeze solution, methanol, or steam through horizontal boreholes under the seafloor to attempt “*in situ*” extraction of natural gas.

Industry predicts eventual development of a methane-fueled seafloor electrical power generating plant utilizing a future “well-to-wire” technology. Hypothetically, undersea hydrates could be gasified *in situ*, burned to fuel a subsea electrical generating plant, excess carbon would then be sequestered in the ocean, and the resulting electricity conveyed to terrestrial consumers via a seafloor transmission cable. Well-to-wire techniques are still conceptual, but when they are developed they can be expected to involve substantial environmental impacts to marine biota associated with extraction technologies as well as the ocean sequestration of carbon dioxide.

Commercial production of natural gas (methane) from methane hydrate deposits is expected to initially be successfully accomplished in the permafrost environment of the Arctic, with industry expectations that such commercialization will first occur in these high latitudes within 10 years.

Substantial reserves of marine methane hydrates are thought to exist in U.S. EEZ waters offshore Oregon, the Carolinas, throughout the Gulf of Mexico, and also off of Canada’s West Coast and in the Russian Far East. U.S. federal agencies are just beginning to design bidding and royalty scenarios to ensure that the American taxpayer will obtain full market value from the anticipated exploitation of the hydrate re-

source. As energy companies and the federal government move forward to develop the commercial potential of methane hydrate deposits on the seafloor and in the permafrost, the serious hazards posed to the marine environment and to the atmosphere must be taken into full account. Environmental protections to prevent harm to marine life, and to mitigate the potential for methane hydrate development to exacerbate and to potentially dramatically accelerate global climate change, must be addressed prior to commercial-scale methane hydrate leasing and extraction. Chemosynthetic “cold seep” seafloor vent ecosystems are associated with methane hydrate deposits, and research into the scientific lessons to be learned from these unique biological assemblages is still in its infancy.

The geologic record contains evidence of methane hydrate deposits becoming unstable under certain conditions, with such instability apparently contributing to the eruption of very large-scale seafloor “mud volcanoes” with resulting mega-tsunamis. Some of these past geologic events have precipitated the rapid gasification and sudden atmospheric release of truly massive amounts of methane, a scenario which, in today’s world, could hypothetically trigger a runaway acceleration of global warming.

Energy: Ocean Carbon Sequestration Experiments

Burning fossil fuels emits carbon into the atmosphere in increasing quantities, and is the major driving force behind global warming. Proposals involving various technologies have emerged which attempt to isolate, or “hide”, excess carbon emissions derived from fossil fuel combustion, and many of these sequestration schemes involve the oceans. Carbon sequestration proposals range from iron fertilization, in which a dust of iron is spread over large areas of the sea surface to promote blooms of new biological activity, to the direct injection of bubbles of carbon dioxide into the deep ocean. Each of these sequestration proposals has its own inherent ecological implications.

Continued reliance by human societies on the combustion of conventional hydrocarbon fuels is clearly

contributing to global climate change. The scale of fossil fuel consumption continues to rise, and future projections of excess carbon emissions are of grave concern. Levels of carbon dioxide in the atmosphere have now increased to levels at which some direct absorption of excess carbon by the world's oceans is already occurring. Oil companies are very interested in locating places to sequester excess carbon, as a way to justify society's continued reliance on fossil fuels. Injection of carbon dioxide (CO₂) into geologic formations, as has been occurring for many years in association with the Statoil Project off the coast of Northern Europe, has been touted by the petroleum industry as one promising answer to the problem of disposing of excess carbon. Recent geophysical studies have shown, however, that the massive accumulated Statoil "lens" of injected carbon dioxide now appears to be migrating upward within the geologic formations that were presumed to be able to entomb it for a long period of time.

Ocean carbon sequestration "experiments" have been proposed by multi-national research consortia involving the U.S., Canada, Japan, and Norway, in cooperation with large petroleum companies. Intermediate-scale "experiments" involving the deepwater direct injection of carbon dioxide into the sea have recently been proposed within the U.S. EEZ off the Kona Coast of Hawaii, and off the island of Kauai. Both of these planned carbon injection projects were withdrawn after generating major public controversy. A similar ocean injection experiment proposed off the coast of Norway this year was also cancelled when public opposition emerged in that nation. Additional carbon sequestration "experiments" in the deep ocean are still being planned, unaddressed by any relevant ocean governance strategy for responding to them.

Carbon sequestration in the deep ocean poses a range of risks which have not been seriously studied and which may well result in serious adverse environmental consequences for sensitive deepwater marine life. Prior to any large-scale experiments with iron fertilization or with CO₂ deepwater injection, society must better understand the anticipated residence time of injected CO₂, the currents and transport mechanisms at work in the deep ocean, and the cumulative im-

pacts of carbon sequestration and CO₂-induced pH changes on the marine food web.

Federal Jurisdiction: Undermining the State Role in Our Oceans

The Coastal Zone Management Act (CZMA) grants coastal states which are affected by offshore drilling and other industrial activities in federal OCS waters the right to make a formal determination as to whether or not a proposed offshore lease sale or drilling scenario is "consistent" with that state's federally approved coastal zone management plan. In the event that the state finds a federal OCS decision to be inconsistent with its coastal zone management plan, the Secretary of Commerce serves as the arbiter of any consistency appeal by the state. In recent years, congressional overtures have been initiated by the petroleum industry aimed at undermining states rights under the CZMA. Such initiatives have included the introduction of draft legislative proposals that would have transferred the ultimate appellate authority over OCS consistency decisions to the Secretary of Interior, although these efforts have thus far failed to gain credibility in the Congress.

A CZMA-related "Advance Notice of Proposed Rulemaking" (ANPR) was promulgated and circulated for comment by the National Oceanic and Atmospheric Administration (NOAA) during the summer of 2002. This ANPR proposes changes to the CZMA consultative process which would seriously weaken the role of affected coastal states as they make their all-important "consistency determination" on major federal actions, including OCS oil and gas lease sales and exploratory and development drilling. This proposed rulemaking, if enacted, would increase the threshold of information required from affected states, would permit streamlined approval of sequential projects under a single categorical permit, and would substantially diminish the role of coastal states in what NOAA has termed "far offshore" projects. The ANPR has not identified with any specificity how far offshore such projects may be located. In late September of 2002, 100 Members of the House of Representatives sent a letter to the White House asking that this proposed rulemaking be withdrawn by the Administration.

New Issues Highlight Gaps in Ocean Governance:

Energy: Offshore Wind Electrical Generation

Planning for an initial series of U.S. offshore wind projects is now proceeding rapidly, starting with the “Cape Wind” proposal to locate 170 wind turbines, each 260 feet tall, over 28-square-miles of Nantucket Sound. This project has been proceeding under a Section 10 U.S. Army Corps of Engineers permit process, in cooperation with an interagency working group involving NOAA, EPA, and other federal and state agencies. A legal challenge has been mounted by local NGO groups, claiming that the Corps currently lacks any clear authority to grant rights to occupy the seabed for a planned pre-project data gathering tower.

Emerging local concerns related to the Cape Wind project include the location of the site in a region critical to bird migrations, submarine cable laying impacts, and marine wildlife use of the area. In response to the Cape Wind proposal, the Massachusetts Attorney General has called for a moratorium on new offshore wind energy projects. While most national conservation groups have generally not opposed Cape Wind, the local NGO concerns are now being cited by the Interior Department as indicative of a need for Congress to grant unilateral permitting authority to the Secretary of Interior over all future wind, wave, and hydrocarbon-related industrial facilities in the U.S. Exclusive Economic Zone (EEZ). A consensus has emerged among the majority of the national conservation community that the Interior Department is not the proper leasing and permitting authority for such projects, although there is also a growing agreement that full NEPA compliance will need to be undertaken for each new windfarm project, on a site-by-site basis, to resolve potential wildlife issues and to ensure the adoption of effective mitigation measures.

Representative Barbara Cubin (R-WY), during July of 2002, held a hearing of the House Subcommittee on Energy and Mineral Resources to consider HR 5156, a bill under her sponsorship which would have

made the Secretary of Interior the “energy czar” over all renewable energy resource development and other industrial projects in the EEZ. This hastily-organized hearing attracted only two witnesses, and the Cubin bill never was marked up in the full House Resources Committee, nor was a Senate counterpart ever introduced. House-Senate Conferees, however, subsequently discussed including HR 5156 in the final conference version of the Energy Bill, but that conference was subsequently abandoned. In the event that the Interior Department eventually were to become the lead agency with full jurisdiction over offshore wind energy facilities, MMS has already indicated its intent to collect royalties on the wind resource. Such a royalty regime would likely further impede the economic viability of offshore wind, a technology which is already expected to be at an economic disadvantage relative to terrestrial wind electrical generation due to construction and maintenance issues associated with operating in the marine environment. There is emerging agreement within the NGO community that NOAA, with its history of stewardship over living marine resources, would likely be a more appropriate lead agency for the permitting of renewable energy projects in the EEZ.

Very significant contributions to the Northeast power grid are possible from offshore wind, without the oil spill, air quality, or radiation pollution concerns posed by conventional electrical power generating stations, and without contributing to atmospheric carbon loading. In addition to the now-pending Cape Wind proposal, at least 21 additional large-scale offshore wind farm proposals are now on the drawing boards for the Eastern Seaboard, at locations extending from the shores of Cape Cod to Maryland.

Energy: Wave-Generated Electricity

The first offshore wave energy prototype is now being planned within the waters of Washington State’s Olympic Coast National Marine Sanctuary. This project involves a single floating buoy, or “duck” technology, and is being constructed by Aqua Energy Group Limited in partnership with the Makah Tribe. Public concerns which have been articulated include potential installation impacts of the buoy’s anchor-

ing system on hardrock substrate and benthic organisms, hazards posed should the float break loose in a major storm, and the need for full NEPA compliance by such projects to ensure the adequacy of mitigation measures. This wave energy installation is expected to set a precedent for the manner in which NOAA might be expected to permit and process applications for similar projects elsewhere within the National Marine Sanctuary system.

Energy: Tidal Marine Hydroelectric Turbines

A new generation of underwater turbines are on the drawing boards, going by the working title of “Blue Hydro”, or marine hydroelectric generators. These turbines, unlike previous ocean-driven turbines which required the damaging damming of estuaries in order to gather the necessary elevated “head” of pressure to power the blades, rely instead on passive “tidal fences” constructed under the water. Within these tidal fences screened turbines are installed to harvest the normal tidal movement of the waters within coastal embayments. Relatively large potential energy resources could result from the judicious harvest of tidal energy, often in proximity to major metropolitan electricity markets. Necessary mitigation measures include proper safeguards for screening fish from the turbines and proper design of the tidal fence installations so as not to interfere unduly with the normal circulation of water within the estuary. This type of installation is presently under study by the City of San Francisco for use - on a limited basis - within San Francisco Bay to supplement the City’s power supply.

Water: Desalinization of Seawater for Fresh Water Supplies

Desalinization of seawater through reverse osmosis for use as a municipal water supply is now being seriously investigated by San Diego and other Southern California cities. Environmental impacts of this technology on marine resources relate primarily to the disposal via marine discharge of the spent brine waste byproducts of this process. Energy consumption issues and land use conflicts represented by such “desal” facilities are also a concern.

Water Export: Interbasin Transport of Fresh Water via Sea

On the rural coast of Northern California, a large multinational conglomerate called Alaska Water Exports is targeting the fragile estuaries of two coastal streams, the Albion and the Gualala Rivers, for the proposed extraction of fresh water to transport to San Diego to supplement inadequate municipal water supplies there. These projects propose the installation of riverbed collection devices to capture the winter flow of the rivers and to then pump the water into floating polyfiber “bladders” offshore for transport by oceangoing tug to water markets in major urban population centers. The proposed Gualala River extraction project would result in the export of 8,700-acre-feet of water annually. Concerns have arisen over the impacts of this activity on salmonid migration, estuarine biota, and the growth-inducing implications for local communities adjacent to the source rivers. The California State Legislature this year passed, and the state’s Governor signed, a law requiring a five-year scientific study prior to the granting of any permits for these projects. Further water export proposals of this kind are anticipated along the West Coast, highlighting the lack of appropriate laws and regulations currently in place to adequately respond to this activity.

Bioprospecting: Pharmaceuticals and Medicines

The pharmaceutical industry is engaged in a global search for the chemical templates for innovative new drugs and medicines. Many species in the ocean have shown unique promise for medical applications ranging from cancer treatments to new kinds of painkillers and anesthetics. The primary danger to marine ecosystems posed by this bioprospecting would occur primarily if ocean organisms were identified as the *only* available source of a promising new material. Thus far, however, samples of potential pharmaceutical materials appear to be viewed by most researchers primarily as models from which to subsequently replicate analogous chemical compounds in the laboratory.

Minerals: Seafloor Hard Rock Mining

During the Reagan Administration, former Interior Secretary James Watt initiated a “Hard Rock Mineral Leasing Program” to be conducted under the auspices of the Minerals Management Service (MMS) at the Department of Interior. Early subsea mineral leasing proposals were pursued during the early 1980’s by Secretary Watt off of the Oregon Coast for polymetallic sulfides (targeting primarily copper, zinc, and trace amounts of gold and silver) associated with hydrothermal vents on the deep-sea feature called the Gorda Ridge, and for cobalt-rich manganese crusts on the Loihi seamount off of Hilo on Hawaii’s Big Island. Because Watt’s version of this program involved the premature transfer of seabed lease rights to lessees without adequate environmental studies, strong public and state opposition resulted in the withdrawal of these initial hard minerals lease sale proposals. Past experiments involving the gathering of manganese “nodules” from the ocean floor did not provide evidence that commercial nodule extraction could be economically-competitive. The economics of seafloor mining relative to land-based sources of similar mineral deposits may be changing, however, and seabed minerals are likely to become more attractive to extractive industries in the future. Nearshore seamounts and hydrothermal vent communities are of particular concern from a biological standpoint and often involve endemic chemosynthetic species which are unique to each vent site. Thorough scientific evaluation and comprehensive environmental studies should *precede*, not follow, leasing of seafloor sites for hard minerals mining.

Minerals: Offshore Mining of Sand and Construction Aggregate

The Minerals Management Service is promoting an active offshore leasing program of undersea sand and construction-grade gravel aggregates from various sites on the Outer Continental Shelf, under the jurisdictional authority of the OCS Lands Act. Environmental concerns include induced turbidity plumes, destruction of important fish habitat, and excessive siltation. These seabed aggregate products are being touted by MMS as a cost-competitive alternative to

similar construction products obtained from terrestrial gravel quarries.

Development: Beach Dredging and Sand Pumping

Restoration of eroding beaches through replenishment with sand from other sites is an established but controversial procedure along the shorelines of various coastal states. This practice can induce significant adverse environmental impacts if sensitive offshore and onshore habitats are not avoided, particularly during important seasonal biological events. Beach dredging can also promote inappropriate urban development on eroding shorelines, with a resulting future commitment of taxpayer subsidies becoming necessary to maintain long-term shoreline protection required by such development. Sea level rise is expected to create a demand for more coastal hardening and additional sand pumping, with astronomical cost projections accruing to federal agencies involved in this effort. Better biological oversight and fiscal justification for this activity are clearly needed at this time.

Water Quality: Land-Based Sources of Pollution

Non point runoff from agricultural and urban watersheds is recognized as a major contributing factor to declining nearshore marine water quality. Harmful algal blooms in estuarine waters are becoming a recurring phenomenon in many regions. New EPA rollbacks of air quality regulations for electrical power plants are expected to exacerbate the contribution of airborne Nitrogen compounds to estuarine water pollution. Inappropriate logging and construction practices often contribute excessive sediment loading to coastal waters. Non point pollution is particularly difficult to regulate and curtail, since the multiple sources of the problem are, by nature, diffuse and hard to identify and monitor. Nonetheless, this pollution source is clearly damaging to coastal waters and marine life and will require increasing governance measures and expenditures in coming years. Satellite-based remote sensing technologies hold the promise of helping to create better large-scale management strategies for the control of non point pollution in coastal watersheds.

Living Marine Resources: Declining Fisheries

Declines in many economically important marine fish species are now affecting virtually every region in U.S. waters. Conventional fishery management measures, such as time and area closures and gear restrictions, have in many cases proven to be inadequate to the task of restoring these vital living resources. Damaged fisheries have implications for the character of coastal communities, for regional unemployment, and for overall degradation of ocean ecosystems. New approaches to resolving the complex problems associated with declining fisheries are needed, and include reduction of fishing capacity through the wise application of individual fishing quotas (IFQs) and limited entry measures, and the use of stakeholder-designed networks of fully-protected marine reserves to rebuild the integrity of ocean ecosystems and reproductive capacity.

Living Marine Resources: Aquaculture

Commercial operations involving the marketing of pen-raised marine life are fast becoming a pressing problem for nearshore coastal waters in some regions. The inevitable escape of aquaculture fish from net pens can cause genetic contamination of remaining natural fish stocks, unleash disease vectors upon native fisheries, and introduce antibiotic resistance into important food species. Wastes from pen-rearing operations can also contaminate sensitive coastal waters. Better regulation of commercial aquaculture operations, and oversight of damage done by this industry to important estuarine and coastal habitats, are clearly needed.

Living Marine Resources: Genetically-Engineered Fish

Known as “Frankenfish”, the escape of genetically engineered fish into the wild is viewed by many biologists as one of the most serious threats to marine ecosystems. Genetically manipulated to enable them to grow faster to a larger size, Frankenfish represent a regulatory challenge of serious proportions.

Living Marine Resources: Invasive Species

Ballast and bilge water discharge from cargo vessels has introduced new marine species into virtually every coastal bay and estuary in U.S. waters. Improved ballast water treatment facilities at major and intermediate-sized ports, as well as dramatic improvements in performance standards, monitoring, and enforcement are needed to ensure improvements in the control of this problem. Invasive marine species often outcompete native species, creating a virtual biological “weed field” where formerly-robust native marine life populations once held the dominant ecological niche.

Living Marine Resources: Kelp Harvesting

Commercial harvesting of kelp for use in chemical and pharmaceutical products occurs on a large scale in some regions. While kelp harvesting companies claim that natural kelp beds regrow rapidly after being cut by their ships, scientific studies about the actual impacts of this activity, and on the fate and survivability of important marine life that resides within the natural floating kelp substrate, is lacking. Current regulation of this industry often consists of little more than the granting of inexpensive leases of kelp beds to harvesters, and relies on the industry itself for many aspects of monitoring and mitigation.

Energy: “Deep Spill” Scenarios:

The offshore oil and gas industry has experienced a series of dramatic technological advances which now permit exploration and development of subsea hydrocarbon resources in much deeper waters than ever thought economically possible. Offshore leasing of U.S. deepwater tracts has been promoted through congressionally adopted “deepwater royalty relief” incentives which are now provided to the oil industry. Unfortunately, the ability of the drilling industry to respond to and curtail oil spills associated with deepwater operations has not kept pace with the drilling technology. Unocal recently experienced their first “deep spill” from a leaking plugged well casing at their Ranggag 6 well in 5,500 feet of water in the Makassar Straits near the island of Borneo. Unocal took at

least a month to notify the relevant authorities of the ongoing spill. Unocal is still studying the appropriate remedial response at this site, to determine what action should be taken.

Global Climate Change: Coral bleaching

Coral bleaching has now been observed in virtually all of the world's tropical oceans, including, most recently, in the Northwest Hawaiian Islands. The implications of coral damage to the entire spectrum of life within the planetary reef ecosystem are of major concern.

Global Climate Change: Sea Level Rise

Even the most conservative projections of the anticipated impacts of climate-induced sea level rise presume the need to protect developed coastal areas on most U.S. shorelines. While the problems posed by sea level rise are most severe for island nations around the globe and for U.S. Pacific Trust Territories, mainland coastal cities are already predicting the need for very costly and environmentally-damaging "hardening" of their shorelines to protect infrastructure and developed areas. No governance regime has been proposed for adapting our coastal areas to sea level rise, nor for funding the extensive structural protections which are now anticipated.

Energy: Floating Nuclear Power Stations

Russian technologists are currently developing a new generation of floating nuclear power generating stations, with plans to deploy them in their own waters. Marketing of this technology to other nations is also possible. An accident involving a meltdown of a reactor on one of these barges could plunge the reactor core into the sea or seabed, with resulting widespread radioactive contamination of the marine environment. International oversight and a strategy for regulation of this technology is lacking.

Military: Ocean-based Defense and Weapons Systems

Various emerging weapons and defense systems are increasingly relying on the global oceans as a theater

for the conduct of new forms of marine warfare. Recent controversies over the planned deployment of intense sound-generating sonars such as LFA and LWAD have led to successful legal challenges from conservation groups concerned about the well-known auditory sensitivity of marine mammals, including whales and dolphins. Recent newsworthy cases involving the mass stranding of marine mammals associated with military sonar experiments and sound research in nearby waters have increased the public profile of this problem. In addition to sonars and sound impacts, military planners are moving toward a weapons delivery system known as the supercavitating long-range torpedo. This long-range delivery system provides the military with the option of avoiding airborne or space-based missile defense systems by using the world's oceans as the conduit for delivery of nuclear or conventional explosives at high speed over vast distances. The probable impacts of this technology on the marine environment are unknown.

A New Era of Coastal and Ocean Management:

The acceleration of our technological capacities to impact the world's coasts and oceans brings with it the absolute responsibility for society to design appropriate management regimes to address the broad range of new issues associated with these technologies. In some instances, relatively minor adjustments to proven marine and coastal management strategies may be adequate to address the new concerns. But in the case of some of the large-scale emerging marine technologies, a global reassessment of how humanity views its world oceans will be needed. Even a renewable energy future must be reconciled with maintaining a sustainable marine environment. Ocean governance, like all human institutions, is in need of constant upgrading to ensure that it remains relevant to the changing threats posed by new technologies at our command. As increasing human demands are placed on the sea, a system of marine zoning - to ensure that appropriate activities are properly sited and mitigated - appears to be a likely need. The future of our oceans has already arrived, and society must address this future with long-term vision, foresight, and care.

INTERNATIONAL CONSIDERATIONS IN REGIONAL OCEANS GOVERNANCE

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I. Introduction

Regional approaches to oceans governance are a promising way to address various oceans issues. While the U.S. Commission on Ocean Policy will examine regional governance primarily with regard to different regions of the United States, international regional oceans governance should also be taken into account, for two reasons. First, as the Commissioners are well aware, U.S. oceans policy is necessarily affected by international considerations, including the role of regional international organizations. Indeed, it is critical to the success of U.S. oceans policy that we maintain our leadership role internationally. Second, examination of international regional governance approaches offers valuable lessons that can be used to develop better domestic regional approaches. This paper describes six international regional organizations and identifies key factors that either contribute to the success, or cause roadblocks, within the selected organizations.

II. International Considerations

Oceans governance in regions around the United States will need to be informed by international considerations. For example, the regional fishery management councils include, as non-voting members, representatives of the State Department. While DOS participation has diminished as foreign fishing in our exclusive economic zone has been reduced, the Department still reviews fishery management plans and regulations and consults with the Commerce Department on aspects of domestic fisheries as well as high seas activities.

As other regional governance bodies are contemplated, the same sort of international perspective will be needed, to address jurisdictional issues, to act as a liaison with other countries and international bodies, and to ensure compliance of the bodies' activities with international law.

III. What Makes An Effective International Organization?

International regional organizations meet a varied range of oceans governance and policy goals, from regional planning, to research, to decision-making and quota setting. The aim of the organizations is equally diverse, from fisheries management, to the protection of non-living marine resources, to water quality protection to more diffuse objectives. Despite this diversity in roles and expectations, some generalized observations about what works in regional organizations can be made.

1. Clarity of expected outcomes. Regional organizations must be carefully chartered so as not to create expectations for outcomes that overwhelm the ability of the organization to make progress. Instead of having one regional body attempt to manage every oceans-related issue, separate bodies with specific mandates (i.e., fisheries, water quality) tend to produce more consistent results.

2. Willingness of members to reach a common goal. In some cases, regional organizations may create goals and expectations that, while lofty and correct, are unattainable because members have acquiesced without truly committing to the outcome. Such situ-

ations inevitably lead to stalling and obfuscation tactics during the negotiating phase of an issue, and ineffective or lax implementation after approval. By contrast, even ambitious goals can be achieved where there is a demonstrated level of commitment by all stakeholders prior to the goal-setting process.

3. Consensus-based approach. Agreements get implemented more effectively if they have been adopted by consensus rather than through a voting procedure. Moreover, organizations with bloc voting patterns tend to inhibit consensus building, stymieing progress.

4. An appropriately sized, technically expert administrative staff for the organization. A small, dedicated staff, with appropriate background in the issues addressed by the organization, is able to greatly facilitate the work of the organization.

Of the regional organizations with oceans responsibilities the United States belongs to, the examples below demonstrate the importance of these criteria.

IV. Stakeholder Buy-In, Common Goals and Consensus – The International Coral Reef Initiative

The International Coral Reef Initiative (ICRI) brings together stakeholders to promote sustainable use and conservation of coral reefs for future generations. ICRI is an informal mechanism that allows representatives of more than 80 developing countries with coral reefs to sit in equal partnership with major donor countries and development banks, international environmental and development agencies, scientific associations, the private sector and NGOs, to decide on the best strategies to conserve the world's coral reef resources. Stakeholders are linked by a Secretariat, run and funded by the government of one country, but often with assistance of others. The first Secretwo largest and most consistent donors, providing annual contributions to the operating fund and project funding. The United States currently provides \$300,000 in contributions and upwards of \$300,000 in project support through the Department's Oceans, International Environment and Scientific Initiatives (OESi) program.

The current management of the CEP is also a reason for its success. The staff is talented and motivated, and has managed to develop strong personal relationships with representatives of all countries of the region, crossing linguistic (English, Spanish, Dutch and French) and regional political divides. The program's managers actively seek out collaborative opportunities with other international organizations and secretariats of other Multilateral Environmental Agencies, and with academic institutes and NGOs active in the Caribbean. In recent years the CEP staff has applied to the GEF for funding of programs related to pesticide run-off and other land-based source projects. If accepted, this GEF financing will allow the CEP to move to a higher level of funding and program effectiveness and confirm its position as a regional focal point for marine conservation.

Another fundamental reason for CEP success is U.S. engagement. Without U.S. funding, active participation in meetings and collaboration with U.S. Government agencies on projects, the CEP would be much less dynamic and effective in promoting the goals of the program and the convention and its protocols. Such support provides the political will and financial support to steer the CEP's development.

The effectiveness of the CEP is one of the reasons we have chosen the Wider Caribbean for the regional focus of the World Summit on Sustainable Development White Water to Blue Water initiative. The CEP will co-host with the US Government the November 2003 Miami regional stakeholders' conference, and is playing a focal role in the initiative's goals of improving regional governance and capacity building. Among other things, the program's secretariat will develop and maintain a website to be used to support the conference and as a post-conference clearinghouse of regional partnerships.

VI. Focused, Common Goals, Wide Impact – The South Pacific Regional Environment Program

The Pacific region encompasses a third of the Earth's surface and contains more than half of its water. The Pacific's nearly 30,000 islands comprise only about

2% of its area, and the relative isolation of its 500 inhabited islands in such a vast area imposes unique environmental vulnerabilities and challenges, including susceptibility to natural disasters, limited arable land and fresh water resources, waste disposal and pollution control and vulnerability of native (often endemic) biodiversity to invasive species. Enhanced understanding and protection of the Pacific region ecosystem is critical to the region's sustainable development.

The South Pacific Regional Environmental Program (SPREP) promotes regional cooperation and provides assistance in environmental protection and sustainable development in the Pacific islands. SPREP grew out of a recommendation from the 1969 Regional Symposium on the Conservation of Nature that a regional ecological advisor should be appointed to the South Pacific Commission (renamed the "Secretariat of the Pacific Community" (SPC)). In 1982 SPREP was created as a separate entity within the SPC. An agreement establishing SPREP as an independent intergovernmental organization was signed on June 16, 1993. No direct relationship now exists between SPREP and SPC.

SPREP is beneficial to the positive maintenance of United States relations with both developed and still-developing Pacific nations, since Pacific donor countries such as Australia, New Zealand, and France are active in the program, while Pacific small island developing states are its focus. SPREP has 26 members, including 14 small island nations and the five "metropolitan" countries, United States, United Kingdom, France, Australia and New Zealand. The U.S. territories of American Samoa, Guam and the Commonwealth of the Northern Mariana Islands send their own representatives to SPREP meetings, as do the French overseas territories of French Polynesia, New Caledonia and Wallis and Futuna, as well as the New Zealand territory of Tokelau.

In contrast to the SPC's mission of development-related technical advice and assistance, SPREP's focus is exclusively environmental. With its mandate of promoting regional cooperation and providing assistance in protecting the Pacific islands' environment,

SPREP has concentrated on capacity-building of its members in areas such as the implementation of environmental education programs, the development of information resource centers and databases and the hosting of workshops and training in areas such as natural resource conservation, waste management and pollution control and invasive species control. The 2001-2004 Action Plan for Managing the Environment of the Pacific Island Region now in place focuses on several Key Results Areas including Nature and Biodiversity Preservation, Pollution Prevention, and Economic Development.

VII. A Model for Regional Governance – The Arctic Council

The Arctic Ocean and the lands bordering this polar sea define a distinct marine environment. Regional cooperation plays an important role in protecting this environment and enhancing sustainable development in line with principles agreed upon at the Summits on Sustainable Development in Rio and Johannesburg. The Arctic Council is an intergovernmental forum established by countries with territory above the Arctic Circle: Canada, Denmark (including Greenland and the Faeroe Islands), Finland, Iceland, Norway, the Russian Federation, Sweden and the United States. Decisions in the Council are reached by consensus. Financial contributions are entirely voluntary. From the beginning, Arctic governments and indigenous communities joined together to make environmental monitoring and assessment a key element of the Arctic Council's agenda. The approach of the Council encourages continuous dialogue among scientists, policy planners, Arctic residents and political level decision-makers. Scientifically based decision-making that is informed by the traditional knowledge of indigenous peoples is a deeply rooted principle that has been put into practice by this regional body.

The significance of regional governance in the Arctic is closely related to the unique character of the Arctic Ocean. While it is made up of several large seas, it is essentially a semi-enclosed ocean that is shared by a small number of surrounding countries. The Arctic Ocean drives global climate processes and is the re-

ipient of global pollution. The 1997 report of the Arctic Monitoring and Assessment Program (AMAP) highlighted the risks posed to human health and wildlife by persistent organic pollutants (POPs), heavy metals and long-lived radionuclides. AMAP's findings and the advocacy of Arctic indigenous organizations gave an important, positive impetus to the international negotiations on POPs that resulted in the Stockholm Convention, signed in May 2001. The Council's Action Plan (ACAP) includes specific initiatives to eliminate or reduce sources in the Arctic region of the dozen pollutants identified by the Stockholm agreement.

The value of regional collaborative scientific research as a foundation for governance is further illustrated by the Council's work on climate variability and change. Climate change is taking place with strong and largely unpredictable effects on nature and communities in the Arctic. The Arctic Council Ministers meeting in Barrow, Alaska, at the close of the U.S. chairmanship in 2000, adopted a new, ambitious project, the Arctic Climate Impact Assessment (ACIA). The United States has provided crucial leadership and funding of ACIA. NSF and NOAA, for example, have contributed \$2.5 million toward the costs of the two-person Secretariat and other organizational requirements. The project group is to address environmental, human health, social, cultural and economic impacts and consequences of climate variability and change, and make policy recommendations to the Arctic Council Ministerial in the Fall of 2004.

The start-up of the ACIA is the latest example of the role of U.S. leadership and the commitment of all Arctic states, indigenous communities and several observers, to combine knowledge and work for a common, urgent purpose. The ACIA will pay special attention to the impacts of climate change on indigenous peoples.

VIII. Coordinated Fisheries Management - The North American Anadromous Fish Commission (NPAFC)

The North American Anadromous Fish Commission (NPAFC) was created by treaty in 1992 to expand

the previous International North Pacific Fish Commission (INPFC.) Current parties to the convention include the United States, Canada, Japan and the Russian Federation, with Korea soon to accede. The goals of the treaty are straightforward: prohibit directed fishing for anadromous species (mainly salmon) in the Convention area of the high seas north of 33 degrees latitude in the North Pacific, minimize incidental taking, take collective action to prevent trafficking and cooperate on enforcement and scientific research. The recent annual meeting of the NPAFC in Vladivostok celebrated ten years of increasingly successful international cooperation that have resulted in decreases in incidences of violations; continued healthy salmon stocks; expanding international cooperation in exchange of catch statistics; remarkable advances in scientific research, made possible only by international collaboration; and joint enforcement exercises of U.S. Coast Guard personnel on Russian aircraft out of a Russian base (and vice versa), which could not even have been imagined ten years ago.

NPAFC success should in large part be attributed to the shared goals of the Parties: this is a conservation convention rather than a fishing treaty. It does not include contentious allocation issues, but focuses on the goal of maintaining healthy salmon stocks and preventing illegal high seas fishing and bycatch. Since anadromous species return to freshwater to spawn, they can be caught within territorial waters and therefore high seas fishing may be banned. Although differences of opinion and position certainly occur, these have thus far been resolved within the confines of the Commission. Particularly notable is the degree to which the interest groups (including commercial interests and indigenous groups) within the U.S. delegation work together and respect one another in their common pursuit.

Not to be overlooked is the excellent communication that takes place year-round among the participants, including the high quality of interpretative services and a strong Secretariat with broad representation. Veteran participants also emphasize how cooperation has improved over time as delegates and participants have worked together in the past ten years

and developed a high level of trust, both on a personal and institutional level. This trust has translated into higher degrees of cooperation on scientific exchange (unusual in scientific fora), statistical information and enforcement activities. This success was not achieved overnight, but gradually in small steps. All four Parties are firmly committed to this Convention, and its successful implementation has not only been good for anadromous species, but also for international relations as well.

IX. Bloc Voting, Uneven Implementation - The North Atlantic Fisheries Organization

The North Atlantic Fisheries Organization (NAFO) was established in 1979 to manage fish stocks in the region after many countries, pursuant to the United Nations Convention on the Law of the Sea, established exclusive economic zones out to 200 nautical miles. The membership of NAFO consists of 16 countries, either coastal States in the region or countries whose fishing fleets conduct fishing operations in the North Atlantic. NGO's and the European Union also attend. The United States became a member of NAFO in 1995, a relative latecomer to the organization.

NAFO consists of two main councils, the Scientific Council and the General Council. The Scientific Council evaluates the health of fish stocks in the region. The General Council approves catch allocations for different species in different parts of the North Atlantic. Determination of these allocations proves to be one of the most contentious issues in regional governance.

NAFO does not normally work by consensus. A voting procedure is used. Over time, bloc voting has developed, leading to those not in the bloc often on the outside looking in. Thus, countries that believe the allocation is not distributed fairly may ignore the allocation, leading to a weakening of certain fish stocks. While the United States is an active participant and contributor to NAFO, as a non-member of the voting bloc, it frequently does not attain its desired goals. More important, while all member countries publicly support NAFO determinations for total

allowable catch for specific species and efforts to eradicate illegal, unregulated and underreported fishing, examination of actual implementation of these standards shows widespread non-compliance. The reason: not all countries have fully embraced the objectives of NAFO. Until common conservation goals can be accepted, such as in NPAFC, and a more consensus-based approach adopted, this lack of progress is likely to continue.

X. Conclusion

The examples given in this paper are merely illustrative, and do not necessarily represent the best or the worst of international regional governance. However, what becomes apparent is that the formula for success is relatively simple, as are the pathways to ineffectiveness. Building domestic regional governance models based on the success stories in the international arena bodes well for creating a strong domestic oceans policy that will also likely bring advances on the international front.

A ZONING APPROACH TO MANAGING MARINE ECOSYSTEMS

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The Problem of Open Access

Leo Tolstoy begins his 1878 novel *Anna Karenina* with a fascinating observation: “Happy families are all alike; every unhappy family is unhappy in its own way.” The list of fundamental weaknesses in US ocean governance in Cicin-Sain and Knecht (2000) suggests that our country manages our Exclusive Economic Zone (EEZ) under a variety of dysfunctional regimes, each dysfunctional in its own way. Years of watching interminable conflict and almost universal dissatisfaction among ocean interests have convinced me that there is only one kind of management framework with a high probability of working well from a broad range of perspectives: comprehensive ocean zoning.

Open access is a major contributor to dysfunction in US ocean governance. The ocean’s physical processes, biological patterns and human uses are heterogeneous, but, unlike the Earth’s land surface, where boundaries between different uses are often readily apparent, many uses of oceans overlap spatially. The tradition that people can go wherever and do whatever they want is why the sea is often called “the last frontier” (e.g., Lemonick 1995; NOAA 1999). The “frontier mentality” serves some purposes of governance so long as the ratio of users to resources is very low. But as American frontier historian Frederick Jackson Turner (1893) observed, “the democracy born of free land, strong in selfishness and individualism, intolerant of administrative experience and education, and pressing individual liberty beyond its proper bounds, has its dangers as well as its benefits.” As the ratio of users to resources grows, competition among interest groups has increasingly undesirable effects.

Some of the least reversible and most pernicious effects of competition in frontiers are the harm it causes

to biodiversity and its users (in the sea these include fishermen, divers, whale watchers). Frontier users inevitably cause profound ecological changes that lead to the end of frontier systems of use. Since the 1990s marine scientists have documented a ubiquitous pattern of changes that strongly suggest we are nearing the end of the sea’s frontier era. These include:

- 1) accelerating loss of marine biodiversity (Norse 1993; Butman and Carlton 1995; MCBI 1998)
- 2) sharply reduced abundance of species at higher trophic levels (large predators) (Pauly et al. 1998; Steneck and Carlton 2001);
- 3) serial depletion of fisheries (moving from one abundant species or biomass-rich place to the next as each is depleted, as described by Fogarty and Murawski 1998 and Orensanz et al. 1998);
- 4) extensive elimination of benthic structure-forming species such as corals, sponges and tubeworms (Watling and Norse 1998);
- 5) proliferation and spread of weedy unusable or nonnative species such as jellyfishes (Brodeur et al. 1999) and starfishes (Buttermore et al. 1994); and
- 6) dramatic changes in biogeochemical functioning (Peterson and Estes 2001);

There are many legitimate sectors with interests in the sea, including shipping, defense, energy production, telecommunications, commercial fishing, sportfishing, recreational diving, whale watching, pleasure boating, tourism and coastal real estate development. In theory—and, very occasionally, in practice—the public’s interests transcend the interests

of these sectors. Much of humankind depends on marine ecosystems to provide food and other crucial economic products, and all of us depend on marine ecosystem services that include generating oxygen and absorbing carbon dioxide (thereby slowing global warming). But competing uses are degrading the oceans' capacity to meet vital human needs. Scientists now recognize that the most important threat to the sea's biodiversity is fishing (Jackson et al. 2001). Open access competition is particularly fierce among people who fish for commerce, sport and subsistence.

As fishing pressure increases, competition among sectors of the commercial fishing industry and between commercial and recreational fishermen leads to what ecologist Garrett Hardin (1968) calls "The tragedy of the commons" and what social scientists (e.g. Taylor 1990) call a "collective action dilemma." This is a situation where all individuals or groups behave in an economically rational way (for example, by catching fish before someone else gets them), thereby ensuring the collapse of the resources that everyone depends on. Thus, it results from an inherent divergence between the interests of individuals, companies or user groups and those of society. Open access competition for the ocean's goods and services harms many—perhaps all—sectors of users and the public.

Zoning Dramatically Reduces Problems Resulting From Open Access

Zoning is a place-based ecosystem management system that reduces conflict, uncertainty and costs by separating incompatible uses and specifying how particular areas may be used. Thus, it provides an alternative to worsening problems caused by open access within nations' EEZs. Some elements of zoning, including leasing of offshore lands for oil and gas exploration and production, have already become commonplace on the world's continental shelves and slopes. Others, including networks of marine reserves, have gained strong support from marine scientists and conservationists interested in maintaining the sea's biological diversity. The prospect of methane-hydrate mining, offshore wind farms and offshore aquaculture furthers the potential for conflict unless the USA can determine which ocean uses are compatible and

incompatible, and establish a mosaic of zones that separate incompatible uses.

Zoning can occur by happenstance or by design, but the second is preferable in at least two ways. Zoning by design allows zoning decisions to be made with all of society's goals in mind, not just single goals. And zoning by design increases the chance that adjacent zones are compatible.

A Simple Zoning System

Experience in the largest zoned area of ocean, the Great Barrier Reef Marine Park off Queensland, Australia shows that a simple zoning classification is crucial for public acceptance (Day 2002). A simple, workable system might have four major types of zones:

- 1) *No-go zones* (e.g., seabird nesting colonies) so sensitive that human visits (except by permitted researchers) are prohibited seasonally or permanently (these zones are very limited in extent);
- 2) *Marine reserve zones* that fully protect marine biodiversity by prohibiting extractive or any other harmful uses;
- 3) *Buffer zones* adjoining no-go zones and marine reserves that allow extractive uses that do not degrade marine habitats; and
- 4) *General use zones* that allow a wide range of human activities, and are likely to comprise a plurality of the zoning scheme.

Under this classification scheme, nonconsumptive activities such as boating and recreational diving can occur in Zones 2, 3 and 4; fishing methods that don't degrade marine habitats can occur in Zones 3 and 4; all kinds of fishing, oil and gas development, sand and gravel mining, port facilities and municipal waste discharges can occur in Zone 4. So, spearfishing, purse-seining, most pot fishing and most hook and line fishing could occur in Zones 3 and 4, while trawling and dredging would occur only in Zone 4.

Subzones can be used to differentiate incompatible uses within the four zones listed above. For example,

within Zone 3 or 4, sportfishing subzones can be established around artificial reefs to provide quality recreational fishing without competition from commercial fishing.

Political Benefits of Zoning

Unlike the land, zoning in the ocean will not be hampered by questions of private ownership, although mosaics of traditional uses need to be considered seriously. Zoning is likely to engender political opposition simply because it is new and different, therefore frightening. But I have a growing sense that the question is not whether the USA should have comprehensive ocean zoning throughout the EEZ, but rather how can we effect the best possible transition from the current open access system to a zoning system. A broad variety of interests will benefit from zoning and are likely to support zoning because they:

- 1) Don't have to compete incessantly for resources;
- 2) Are legally and socially acknowledged to be legitimate; and
- 3) Have enough certainty and stability to make long-term capital investments.

Many interests will prefer to have unfettered, nearly uncontested access to some of the sea over fighting forever to get whatever they can from all the sea because it is better to be certain of having all of something than to risk having none of everything. Zoning also encourages public participation in governance; zoning mosaics designated through transparent democratic processes have the highest probability of getting "buy-in" from the diversity of interests in the sea. Moreover, zone boundaries can be changed as new information about resources and uses is incorporated into regular rezoning processes.

Questions to be Addressed

There is enough precedent for zoning on land throughout the USA and in Australia's Great Barrier Reef Marine Park to inform a US ocean zoning process without having to rethink things from first prin-

ciples. But getting from here to there will involve a lot of planning, unanticipated problems, unanticipated benefits, and adaptation to new understanding. To do so, we need to begin addressing—at minimum—the following questions.

- 1) What proportion of the sea should be allocated to the various zones?
- 2) How can government best incorporate information about existing values, threats and uses to maximize zoning benefits and minimize disruption to users?
- 3) What interests (e.g., fiber optic cables, pipelines, shipping, marine reserves) require connectivity and how can zoning fulfill their connectivity needs?
- 4) What activities are compatible and incompatible within zones and between adjacent zones?
- 5) How large should various zones be and how should they be shaped?
- 6) What are the special needs of national defense and how can they best be incorporated into the zoning scheme?
- 7) Are there adequate state and federal legal authorities for establishing a zoning system, or are new authorities needed?
- 8) Are there implications of domestic zoning for international law that need to be taken into account?
- 9) What is the ideal governance structure to oversee zoning and rezoning and the congressional committee structure to authorize and appropriate funds to it?
- 10) At what scale is zoning best accomplished: national regional or statewide? Should zoning begin in federal waters, state waters or both? And how should federal and state zoning systems be coordinated?
- 11) What are the most effective means of

maximizing meaningful public participation in government zoning decisions?

- 12) Given the short-term dislocation that will inevitably occur as a result of zoning, what is an appropriate transition strategy to minimize harm while achieving the long-term goal?
- 13) Both before and after zones are initially established, what kinds of monitoring and assessment are needed to inform the rezoning process?
- 14) How can zones be designed as experiments to yield the maximum amount of unambiguous information for decision making?
- 15) What are the best ways (technologically and socially) to draw “lines on the water” to make the zoning mosaic real in the minds of the public?
- 16) What are the conditions necessary for effective and affordable enforcement of the zoning mosaic?
- 17) How many years should the initial zoning pattern be in place before rezoning is initiated?
- 18) What needs to happen before the USA can get started?

Final Caveats

Zoning will reduce competition within zones, but will not eliminate it. Combining zoning with mechanisms such as individual fishing quotas or co-management schemes could further reduce competition in an orderly way, clearly a desirable outcome.

Zoning decisions need to favor long-term sustainability and achieve a genuine balance between various user groups and public interest conservation groups. The failure of US marine fisheries management clearly shows that user groups are not capable of making sustainable decisions when faced with the collective action dilemma. Conservation groups that do not profit from sale of marine resources do not

suffer from the collective action dilemma.

Determining zoning of uses involving tens of millions of people, hundreds of billions of dollars and change-resistant institutions will undoubtedly set off powerful political currents for many years. The seeming difficulties in doing so will sometimes seem insurmountable. Careers will end and institutions will change. We will need to take the unprecedented step of training a new generation of multidisciplinary ocean managers to oversee the zoning process. But the alternative—accelerating loss of the ocean resources on which our economy and well-being depend—is worse than any problems that will arise from zoning the EEZ. Taking this first essential step through the worrisome, maddening, fascinating and exciting zoning process will ultimately lead to dramatically improved ocean management in the USA and could well serve as a model for nations around the world and, perhaps, for governance on the High Seas

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APPLICATION OF THE LARGE MARINE ECOSYSTEM APPROACH TO U.S. REGIONAL OCEAN GOVERNANCE

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Sustainability of Large Marine Ecosystems

There is ample evidence of the degradation of coastal waters around the globe from habitat alteration, fish and fisheries depletion, eutrophication, pollution and emerging diseases (Harvell et al. 1999, Jackson et al. 2001). A global campaign is underway to reverse this trend and improve global prospects for the long term sustainability of resources and environments of international coastal waters. Scientific and technical assistance is being provided to developing countries by NOAA-NMFS, IUCN (the World Conservation Union), and the Global Environment Facility (GEF) in partnership with several United Nations agencies (e.g. UNIDO, UNDP, UNEP, IOC, FAO) for advancing new policies and taking direct actions for eliminating root causes of practices leading to habitat degradation, pollution and losses in food security and economic gains from overexploitation of fish populations in Large Marine Ecosystems located around the margins of the world's oceans (Sherman and Duda 1999).

Large Marine Ecosystems

Large Marine Ecosystems (LMEs) are regions of ocean space encompassing coastal areas from river basins and estuaries to the seaward boundaries of continental shelves and the outer margins of the major coastal currents (Figure 1). They are relatively large regions, on the order of 200,000 km² or greater, characterized by distinct (1) bathymetry, (2) hydrography, (3) productivity and (4) trophically dependent populations. On a global scale, 64 LMEs produce 95 percent of the world's annual marine fishery biomass

yields. Within their waters, most of the global ocean pollution, overexploitation of fish and fisheries, and coastal habitat alteration occurs. For 39 of the 64 LMEs, retrospective studies have been conducted of the principal driving forces effecting changes in biomass yields. They have been peer reviewed and published in eleven volumes; volume twelve has been peer reviewed and is currently in press (Table 1).

Modular Assessments Supporting Governance Actions

Based on information obtained from the LME case studies, a modular strategy has been developed to provide information for the monitoring, assessment, and management of LMEs. The modules are focused on ecosystem (1) productivity, (2) fish and fisheries, (3) pollution and ecosystem health, (4) socioeconomic conditions, and (5) governance. A description of the science-based modular activities is given in Sherman and Duda (1999). Principal components of the modules are shown in Figure 2. Descriptions for this report are limited to the socioeconomic and governance modules.

The Socioeconomic module is characterized by its emphasis on practical applications of its scientific findings in managing an LME and on the explicit integration of economic analysis with science-based assessments to assure that prospective management measures are cost-effective. Economists and policy analysts will need to work closely with ecologists and other scientists to identify and evaluate management options that are both scientifically credible and economically practical with regard to the use of ecosys-

tem goods and services (Hanna 1998). Designed to respond adaptively to enhanced scientific information, socioeconomic considerations and management approaches must be closely integrated with the science. A summary of steps needed to properly monitor and assess socioeconomic and governance activities considered as “human dimensions” of LMEs is given as Table 2. A more complete description of the approach is given in Sutinen (2000). *The Governance module* is evolving, based on case studies now underway among ecosystems to be managed from a more holistic perspective than generally practiced in the past. In projects supported by the Global Environmental Facility (GEF) for the Yellow Sea ecosystem, the Guinea Current LME, and the Benguela LME agreements were reached among the environmental ministers of the countries bordering these LMEs to enter into joint resource assessment and management activities. Among other LMEs, the Great Barrier Reef ecosystem is being managed from an ecosystems perspective (Kelleher 1993) along with the Northwest Australian Continental Shelf ecosystem (Sainsbury 1988) being managed by the state and federal governments of Australia. The Antarctic marine ecosystem is being managed from an ecosystem perspective under the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and its 21-nation membership (Scully 1993). Movement toward ecosystems management is emerging for the North Sea (NSQSR 1993), Barents Sea (Eikeland 1992), Black Sea (Hey and Mee 1993) and Baltic Sea (Thulin 2000 and ICES website, Baltic Sea OPS Plan). Recent reports have examined options for improving linkages between the science-based productivity, fish and fisheries, and ecosystem pollution and health modules to the socioeconomic (Sutinen 2000) and governance modules (Juda 1999; Juda and Hennessy 2000).

Applications of the LME Approach

LME – GEF Operational Strategy

In 1995, the Global Environment Facility (GEF) Council included the concept of LMEs in its GEF Operational Strategy as a vehicle for promoting ecosystem-based management of coastal and marine re-

sources in the international waters focal area within a framework of sustainable development. The Report of the Second Meeting of the UN Informal, Open-ended Consultative Process on Ocean Affairs (UN 2001) related to UNCLOS recognized the contribution of the GEF in addressing LMEs through its science-based ecosystem approach. The geographic extent of the LME, its coastal area, and contributing basins constitute the place-based area for assisting countries to understand linkages among root causes of degradation and integrating needed changes in sectoral economic activities. The LME areas serve to initiate capacity building and for bringing science to pragmatic use in improving the management of coastal and marine ecosystems. The GEF Operational Strategy recommends that nations sharing an LME begin to address coastal and marine issues by jointly undertaking strategic processes for analyzing factual, scientific information on transboundary concerns, their root causes, and by setting priorities for action on transboundary concerns. This process has been referred to as a Transboundary Diagnostic Analysis (TDA) and it provides a useful mechanism to foster participation at all levels. Countries then determine the national and regional policy, legal and institutional reforms and investments needed to address the priorities in a country-driven Strategic Action Program (SAP). This allows sound science to become the basis for policy-making and fosters a geographic location upon which an ecosystem-based approach to management can be developed. Stakeholders within the geographic area are encouraged to contribute to the TDA/SAP dialogue and support an ecosystem-based approach that can be pragmatically implemented through the application of the LME science-based assessment and management strategy by the communities and governments involved. Without such participative processes to engage specific stakeholders in a place-based setting, marine science has often remained confined to the marine science community or has not been embraced in policy-making. Furthermore, the science-based approach encourages transparency through joint monitoring and assessment processes (joint cruises for countries sharing an LME) that builds trust among nations over time and can overcome the barrier of false information being

reported. The LME projects that have been approved by the GEF or are under preparation with GEF funding are listed in Table 3. The approved GEF-LME projects include developing nations or those in economic transition as well as other OECD (Organization for Economic Co-operation and Development) countries since the living resources, the pollution loading, or the critical habitats have transboundary implications across rich and poor nations alike. Over one-half billion dollars in total project costs from the North and South are currently being invested as of December 2001 in 10 LME projects in 72 countries with \$225 million in GEF grant finance. An additional 7 LME projects are under preparation involving 54 nations. A total of 126 different countries are participating in these GEF LME projects. With OECD countries involved that share the LMEs with the GEF recipient nations, expectations are that reforms will take place in both the North and the South in order to operationalize this ecosystem-based approach to managing human activities in the different economic sectors that contribute to place-specific degradation of the LME and adjacent waters. Systematic application of the 5 modules through the TDA-SAP processes is fostering an adaptive management approach to joint governance based on the application of assessment indicators to guide governance decisions. This process facilitates the integration of science-based information into the management regime.

Regional LME Governance

Angola, Namibia and South Africa are jointly moving forward within the framework of the GEF supported Benguela Current LME program (BCLME) toward the recovery of depleted fish stocks, restoration of damaged habitats, control of coastal pollution, and improved forecasting of ocean variability effecting coastal upwelling and fish stock productivity. Governance considerations led to the formulation of the BCLME program as an international body under the terms of the UN Convention on the Law of the Sea (UNCLOS) and, the establishment of an Interim Benguela Current Commission (IBCC) to strengthen regional cooperation. The IBCC is supported by a Program Coordinating Unit and subsid-

iary bodies including Advisory Groups on 1) Fisheries and other Large Marine Resources, 2) Environmental Variability and Ecosystem Health, 3) Marine Pollution, 4) Legal Affairs and Maritime Law, and 5) Information and Data Exchange. The IBCC is to become a fully operational Commission with a supporting Secretariat within the initial 5 years of the BCLME Program's operation. Similar governance mechanisms in the form of Joint Program Commissions, Joint Compacts, and Joint Steering Committees serve as important governance mechanisms in GEF supported LME projects, for the Guinea Current LME, the Humboldt Current LME, and the Yellow Sea LME. Other GEF supported projects, including those for the Baltic Sea, Red Sea, and Black Sea LMEs, are using existing regional institutions to address management and governance issues. The LME assessment and governance activities are conducted in harmony with the existing UNEP Regional Seas Agreements under UNCLOS and, with other thematic conventions (e.g. Abidjan Convention, Commission on Biological Biodiversity [CBD]; the Global Program of Action [GPA] for the protection of the Marine Environment from land-based Activities, the UN Framework Convention on Climate Change [UNFCCC], and the UN Fish Stocks Agreement [FSA]). The LME programs are broader in scope and content than any one of the more narrowly focused thematic international and regional instruments. Operationalization of the 5 module assessment strategy serves as a means for introducing ecosystem-based assessment and management to a growing number of LMEs and their bordering countries and regions around the globe. Joint LME monitoring surveys are being employed to provide transparency in collection of data and confidence and trust among participating nations. In the Gulf of Guinea and Benguela Current LME projects in Africa, joint fish stock assessment surveys also serve to build capacity among nations to utilize sound science so that management decision-making can be improved.

U.S. Regional LME Model

The U.S. Northeast Shelf ecosystem is presently undergoing a significant transition from depleted fish stocks to the recovery of pelagic and demersal fish

species important to the economy of the adjacent northeast states from Maine to North Carolina. Although the recovery has not as yet been fully achieved, the corner has been turned from declining over-harvested fish stocks toward a condition wherein the stocks can be managed to sustain their long-term potential yield levels. The management decisions taken to reduce fishing effort to recover lost biomass was supported by science-based monitoring and assessment information forthcoming from the LME (1) productivity, (2) fish and fisheries, (3) pollution and ecosystem health, (4) socioeconomics, and (5) governance modules that have been operationalized by NOAA's Northeast Fisheries Science Center (NEFSC) in collaboration with state, federal, and private stakeholders from the region. This case study can serve to underscore the utility of the modular approach to ecosystem-based management to the six other U.S. LMEs: Southeast Shelf, Gulf of Mexico, California Current, East Bering Sea, Gulf of Alaska, Insular Pacific-Hawaiian Islands (Figure 1). Recent evidence following mandated substantial reductions in fishing effort indicate that both haddock and yellowtail flounder stocks are responding to the catch reductions rather favorably with substantial growth reported in spawning stock biomass size, since 1994 for haddock and flounder. In addition, in 1997 a very strong year-class of yellowtail flounder was produced, and in 1998, a strong year-class of haddock was produced (Figure 3). Given the observed robust levels of primary productivity and zooplankton biomass of the NE Shelf ecosystem (Sherman et al. 1998), it appears that the «carrying capacity» of zooplankton supporting herring and mackerel stocks and larval zooplanktivorous haddock and yellowtail flounder is sufficient to sustain the recovery process and the strong year-classes reported for 1997 (yellowtail flounder) and 1998 (haddock).

EPA and NOAA Partnership

The NEFSC combines fishery-independent survey data, with systematically collected catch and effort data to prepare annual reports on the status of the region's marine fish and fisheries. These analyses are provided as input to a national report, "Our Living Oceans" (NOAA 1999). During the past several de-

caes, EPA has been compiling information on the condition of the nation's coastal waters. Last year, EPA issued a national report of its findings entitled, the National Coastal Condition Report (EPA 2001). Discussions are underway with NOAA-NMFS and EPA to combine the results for the U.S. Northeast shelf ecosystem as an initial annual report on the condition of the nation's Large Marine Ecosystems to be followed by joint assessments of the other six US-LMEs, in a NOAA – EPA partnership arrangement. This joint NOAA-EPA partnership is to be conducted in cooperation with the states and other pertinent Federal agencies. The legislative mandate for proceeding with the ecosystem-based partnership activity is given in the 1992 National Coastal Monitoring Act (Title V, sec 501 to 504), wherein the Congress requested that the Administrator of EPA and the Under Secretary of Commerce for Oceans and Atmosphere, "jointly develop and implement a program for the long-term collection, assimilation, and analysis of scientific data designed to measure the environmental quality of the *Nation's coastal ecosystems*." The Act is included in the NOAA Authorization Act of 1992.

Lessons Learned

While many of the multi-country-driven LME initiatives supported with GEF grant funding have just started, and in others the national and regional reforms in progress will take a number of years to achieve, several lessons are becoming evident for the world community to consider in reversing the declining conditions of coastal ecosystems.

--A geographic approach, based on the LMEs of the world, their adjacent coastal areas and linked fresh-water contributing basins, can overcome the limits of more thematically directed activities to address global environmental problems (e.g. fisheries, sewage, sediment, contaminants, climate change, biodiversity, degraded habitats). In this manner, the different stresses that are important to each specific area can be addressed jointly through processes that result in collective national actions in different economic sectors where needed. Processes such as the TDA and SAP foster multi-stakeholder dialogue, inter-ministerial

dialogue, and a discourse with the science community in unraveling complex situations so they can be divided into priority components for more effective management than is now in general practice.

--Fragmented, thematic, single purpose agency programs are just not able to harness stakeholder involvement sufficiently to drive needed reforms compared to geographic-based initiatives.

--The assessment and management cycle based on the five modules in the TDA and SAP processes, fosters an adaptive management approach through establishment of monitoring and evaluation indicators that are periodically measured by the nations and tracked over time for reporting to stakeholders and the GEF. GEF partner agencies have fostered participation of multiple levels of institutions (multi-country, national-interministerial, and local government/communities) for buy-in and adoption of reforms. The geographic nature of LME areas is conducive for harnessing stakeholder participation and gaining political commitments to change. Thematic programs which are not place-based cannot garner real commitments for change in economic sectors without mobilizing local stakeholders as driving forces for reforms. The national interministerial committee established in each country to operationalize reforms and programs is particularly important to achieve practical integration of needed actions in different economic sectors. However, GEF was designed to play a minor, catalytic role and new North-South Partnerships are needed to sustain the momentum that has been created.

--Perhaps most importantly, The Summit on Sustainable Development (WSSD) of 2002 in Johannesburg, recognizing the need for greater cross-sectoral integration, endorsed the ecosystem-based approach for global resources assessment and management. In addition, the WSSD endorsed several targets relating to the ecosystem-based approach, including the restoration of depleted fish stocks by 2015. Consistent with the WSSD, the GEF LME projects are demonstrating that ecosystem-based approaches to managing human activities in LMEs, their coasts, and their linked watersheds are critical, and

provide a needed place-based area within which to focus on multiple benefits to be gained from multiple global instruments. Instead of establishing competing programs with inefficiencies and duplication, which is the norm now, the LME projects foster action on priority transboundary issues across instruments in an integrated manner—across UNCLOS, Chapter 17 of Agenda 21, the Jakarta Mandate of the CBD, the GPA and its pollution loading reductions, and in dealing with inevitable adaptation issues under UNFCCC.

The ecosystem-based approach, centered around LMEs and participative processes for countries to undertake for building political and stakeholder commitment and inter-ministerial buy-in, can serve as the way ahead on reversing the degradation of marine ecosystems consistent with Chapter 17 of Agenda 21. The adaptive governance framework resulting from application of the LME approach allows developing countries the opportunity to secure investments from stakeholders leading to self-financing of ecosystem-based assessment and management practices that promote resource sustainability and support global conventions and other instruments for restoring damaged habitats, controlling pollution, and recovering depleted fish stocks, as recommended by the global community of nations at the Johannesburg Summit.

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Table 1. List of LMEs and subsystems for which syntheses relating to primary, secondary, or tertiary driving forces controlling variability in biomass yields have been completed for inclusion in LME volumes (also listed below).

Large Marine Ecosystem	Volume No.	Authors
U.S. Northeast Continental Shelf	1	Sissenwine
	4	Falkowski
	6	Murawski
	10	Sherman et al.
U.S. Southeast Continental Shelf	4	Yoder
Gulf of Mexico	2	Richards and McGowan
	4	Brown et al.
	9	Shipp
	9	Pauly et al.
	9	Lohrenz et al.
California Current	1	MacCall
	4	Mullin
	5	Bottom
Eastern Bering Sea	1	Incze and Schumacher
	8	Livingston et al.
Iceland Shelf	10	Astthorsson and Vilhjalmsson
West Greenland Shelf	3	Hovgård and Buch
Norwegian Sea	3	Ellersten et al.
Barents Sea	2	Skjoldal and Rey
	4	Borisov
	10	Dalpadado et al.
North Sea	1	Daan
	10	McGlade
Baltic Sea	1	Kullenberg
Faroe Shelf	10	Gaard et al.
Iberian Coastal	2	Wyatt and Perez-Gandaras
Bay of Biscay	10	Valdés and Lavin
	10	Wyatt and Porteiro
Mediterranean-Adriatic Sea	5	Bombace
Newfoundland-Labrador Shelf	9	Rice
Canary Current	5	Bas
Gulf of Guinea	5	Binet and Marchal
	11	Mensah and Quaatay
	11	Lovell and McGlade
	11	Cury and Roy
	11	Koranteng
Benguela Current	2	Crawford et al.
Patagonian Shelf	5	Bakun
Caribbean Sea	3	Richards and Bohnsack
South China Sea-Gulf of Thailand	2	Piyakarnchana
East China Sea	8	Chen and Shen
Sea of Japan	8	Terazaki
Yellow Sea	2	Tang
Sea of Okhotsk	5	Kusnetsov et al.
Humboldt Current	5	Alheit and Bernal
Pacific Central American	8	Bakun et al.
Indonesia Seas-Banda Sea	3	Zijlstra and Baars
Bay of Bengal	5	Dwivedi
	7	Hazizi et al.
Antarctic Marine	1&5	Scully et al.
Weddell Sea	3	Hempel
Kuroshio Current	2	Terazaki
Oyashio Current	2	Minoda
Great Barrier Reef	2	Bradbury and Mundy
	5	Kelleher
	8	Brodie
Scotian Shelf	10	Zwanenburg et al.
Somali Current	7	Okemwa
South China Sea	5	Pauly and Christensen
West Greenland	10	Pedersen and Rice

Table 1 (con'td). LME Volumes

Vol.1	Variability and Management of Large Marine Ecosystems. Edited by K. Sherman and L. M. Alexander. AAAS Selected Symposium 99. Westview Press, Inc., Boulder, CO, 1986. 319 p.
Vol.2	Biomass Yields and Geography of Large Marine Ecosystems. Edited by K. Sherman and L.M. Alexander. AAAS Selected Symposium 111. Westview Press, Inc., Boulder, CO, 1989. 493 p.
Vol.3	Large Marine Ecosystems: Patterns, Processes, and Yields. Edited by K. Sherman, L.M. Alexander, and B.D. Gold. AAAS Symposium. AAAS, Washington, DC, 1990. 242 p.
Vol.4	Food Chains, Yields, Models, and Management of Large Marine Ecosystems. Edited by K. Sherman, L.M. Alexander, and B.D. Gold. AAAS Symposium. Westview Press, Inc., Boulder, CO, 1991. 320 p.
Vol.5	Large Marine Ecosystems: Stress, Mitigation, and Sustainability. Edited by K. Sherman, L.M. Alexander, and B.D. Gold. AAAS Press, Washington, DC, 1992. 376 p.
Vol.6	The Northeast Shelf Ecosystem: Assessment, Sustainability, and Management. Edited by K. Sherman, N.A. Jaworski, and T. J. Smayda. Blackwell Science, Inc., Cambridge, MA, 1996. 564 p.
Vol.7	Large Marine Ecosystems of the Indian Ocean: Assessment, Sustainability, and Management. Edited by K. Sherman, E.N. Okemwa, and M.J. Ntiba. Blackwell Science, Inc., Malden, MA, 1998. 394 p.
Vol.8	Large Marine Ecosystems of the Pacific Rim: Assessment, Sustainability, and Management. Edited by K. Sherman and Q. Tang. Blackwell Science, Inc., Malden, MA. 1999, 455 p.
Vol.9	The Gulf of Mexico Large Marine Ecosystem: Assessment, Sustainability, and Management. Edited by H. Kumpf, K. Stiedinger, and K. Sherman. Blackwell Science, Inc., Malden, MA, 1999. 736 p.
Vol.10	Large Marine Ecosystems of the North Atlantic: Changing States and Sustainability. Edited by H.R. Skjoldal and K. Sherman. Elsevier, Amsterdam and New York. 2002. 449 p.
Vol.11	Gulf of Guinea Large Marine Ecosystem: Environmental Forcing and Sustainable Development of Marine Resources. Edited by J. McGlade, P. Cury, K. Koranteng, N.J. Hardman-Mountford. Elsevier Science, Amsterdam and New York. 2002.
Vol.12	Large Marine Ecosystems of the World: Trends in Exploitation, Protection, and Research. Edited by G. Hempel and K. Sherman. Elsevier Science. In press.

Table 2. Steps for monitoring and assessment of the human dimensions of an LME, and of the use of its resources (from Sutinen 2000).

1.	Identify principal uses of LME resources
2.	Identify LME resource users and their activities
3.	Identify governance mechanisms influencing LME resource use
4.	Assess the level of LME-related activities
5.	Assess interactions between LME-related activities and LME resources
6.	Assess impacts of LME-related activities on other users
7.	Assess the interactions between governance mechanisms and resource use
8.	Assess the socioeconomic importance of LME-related activities and economic and sociocultural value of key uses and LME resources
9.	Identify the public's priorities and willingness to make tradeoffs to protect and restore key natural resources
10.	Assess the cost of options to protect or restore key resources
11.	Compare the benefits with the costs of protection and restoration options
12.	Identify financing alternatives for the preferred options for protecting/restoring key LME resources

Table 3. Countries where Marine Resource Ministries (fisheries, environment, finance) are supportive of resource assessment and management from an ecosystems perspective, and LME project planning and/or implementation is underway.

Approved GEF Projects	
LME	Countries
Gulf of Guinea (6)	Benin, Cameroon, Côte d'Ivoire, Ghana, Nigeria, Togo ^a
Yellow Sea (2)	China, Korea
Patagonia Shelf/Maritime Front (2)	Argentina, Uruguay
Baltic (9)	Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, Sweden
Benguela Current (3)	Angola, ^b Namibia, South Africa ^b
South China Sea (7)	Cambodia, China, Indonesia, Malaysia, Philippines, Thailand, Vietnam
Black Sea (6)	Bulgaria, Georgia, Romania, Russian Federation, Turkey, ^b Ukraine
Mediterranean (19)	Albania, Algeria, Bosnia-Herzegovina, Croatia, Egypt, ^b France, Greece, Israel, Italy, Lebanon, Libya, Morocco, ^b Slovenia, Spain, Syria, Tunisia, Turkey, Yugoslavia, Portugal
Red Sea (7)	Djibouti, Egypt, Jordan, Saudi Arabia, Somalia, Sudan, Yemen
Western Pacific Warm Water Pool-SIDS (13)	Cook Islands, Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
	Total number of countries: 72 ^c
GEF Projects in the Preparation Stage	
Canary Current (7)	Cape Verde, Gambia, Guinea, ^b Guinea-Bissau, ^b Mauritania, Morocco, Senegal
Bay of Bengal (8)	Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka, Thailand
Humboldt Current (2)	Chile, Peru
Guinea Current (16)	Angola, Benin, Cameroon, Congo, Democratic Republic of the Congo, Côte d'Ivoire, Gabon, Ghana, Equatorial Guinea, Guinea, Guinea-Bissau, Liberia, Nigeria, Sao Tome and Principe, Sierra Leone, Togo
Gulf of Mexico (3)	Cuba, ^b Mexico, ^b United States
Agulhus/Somali Currents (8)	Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, Tanzania
Caribbean LME (23)	Antigua and Barbuda, The Bahamas, Barbados, Belize, Columbia, Costa Rica, Cuba, Grenada, Dominica, Dominican Republic, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Venezuela
	Total number of countries: 54 ^c

^aThe six countries participating in the Gulf of Guinea project also appear in a GEF/LME project in the preparatory phase

^bCountries that are participating in more than one GEF/LME project

^cAdjusted for multiple listings

Figure 1 Map of the 64 LMEs and their watersheds

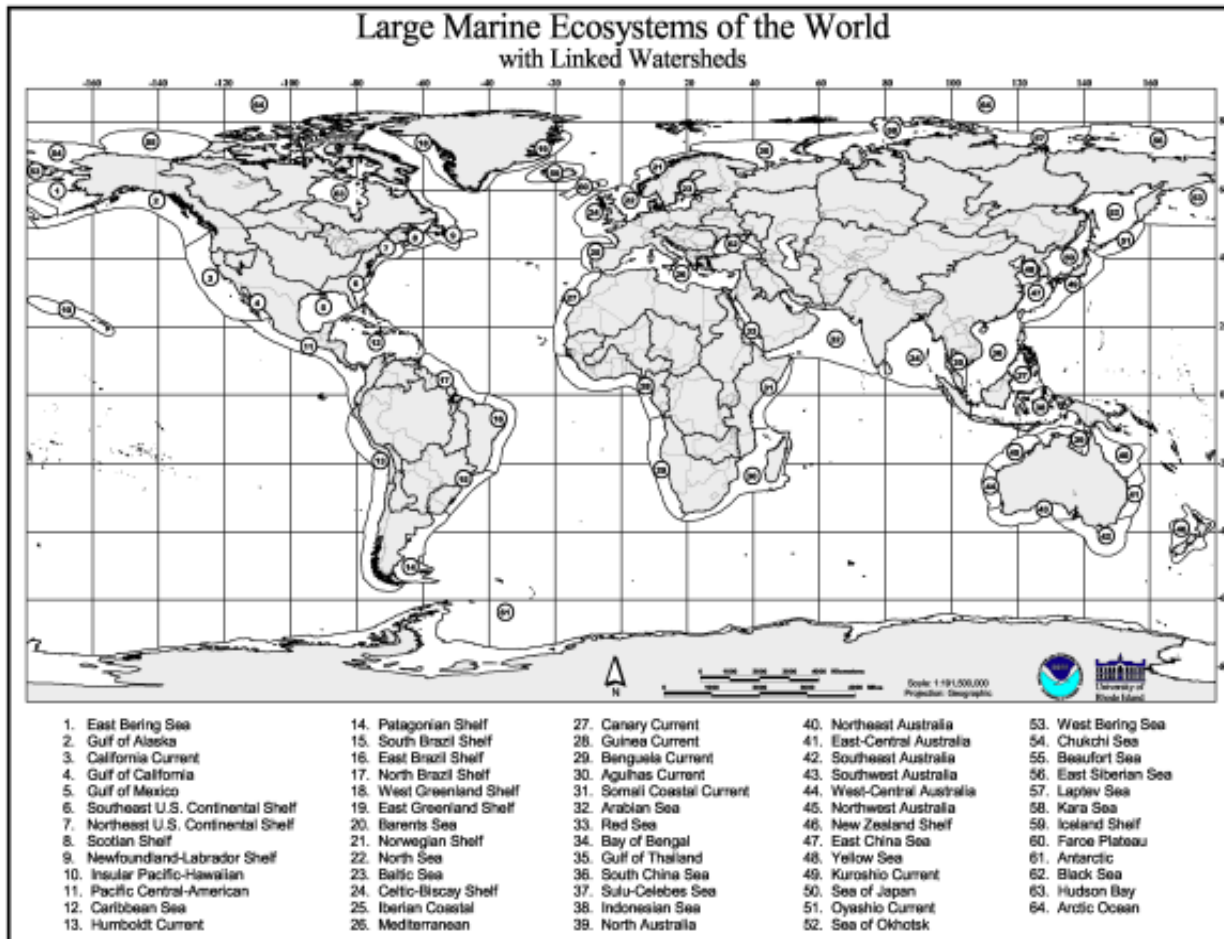


Figure 2. The 5 module LME assessment and management strategy

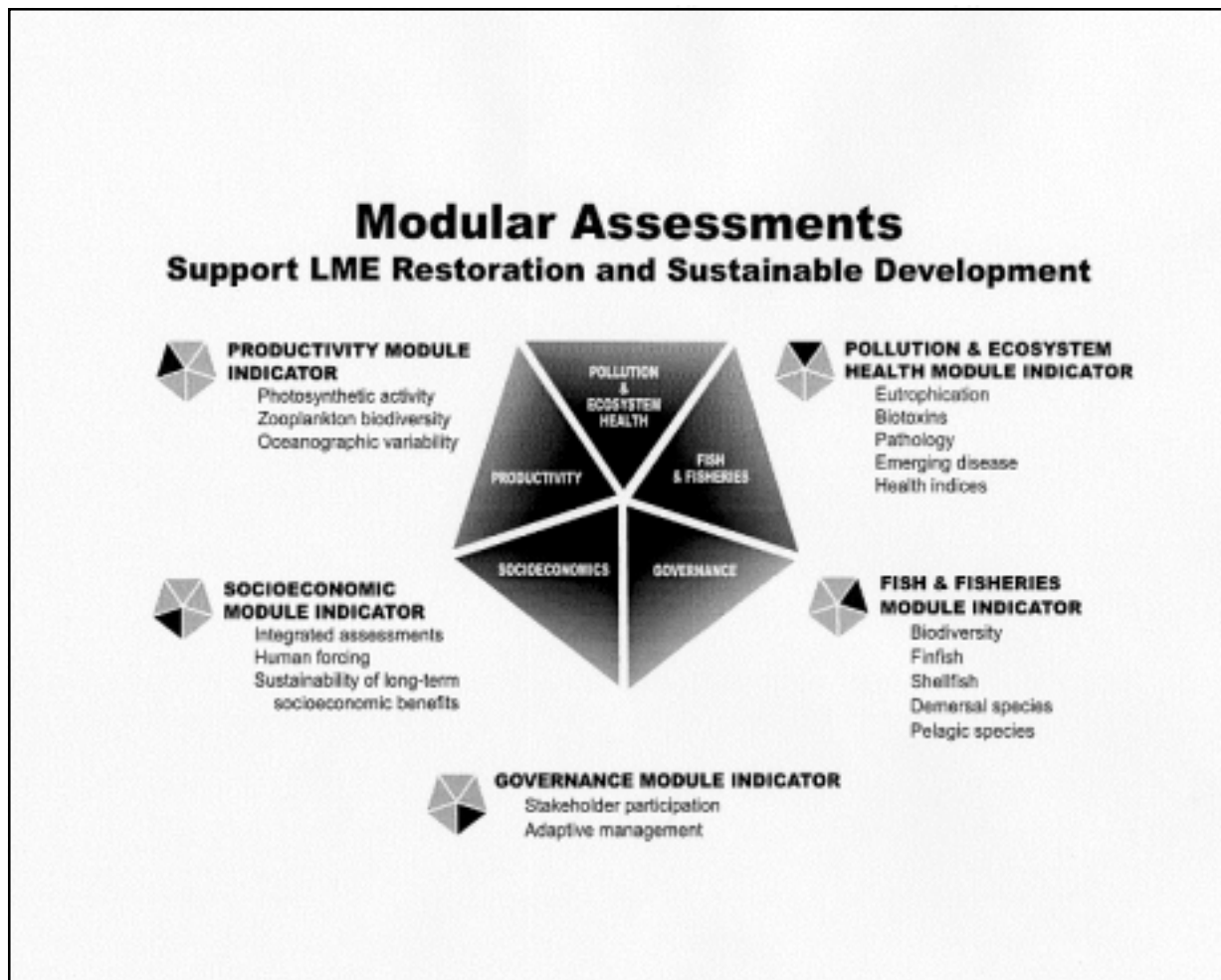
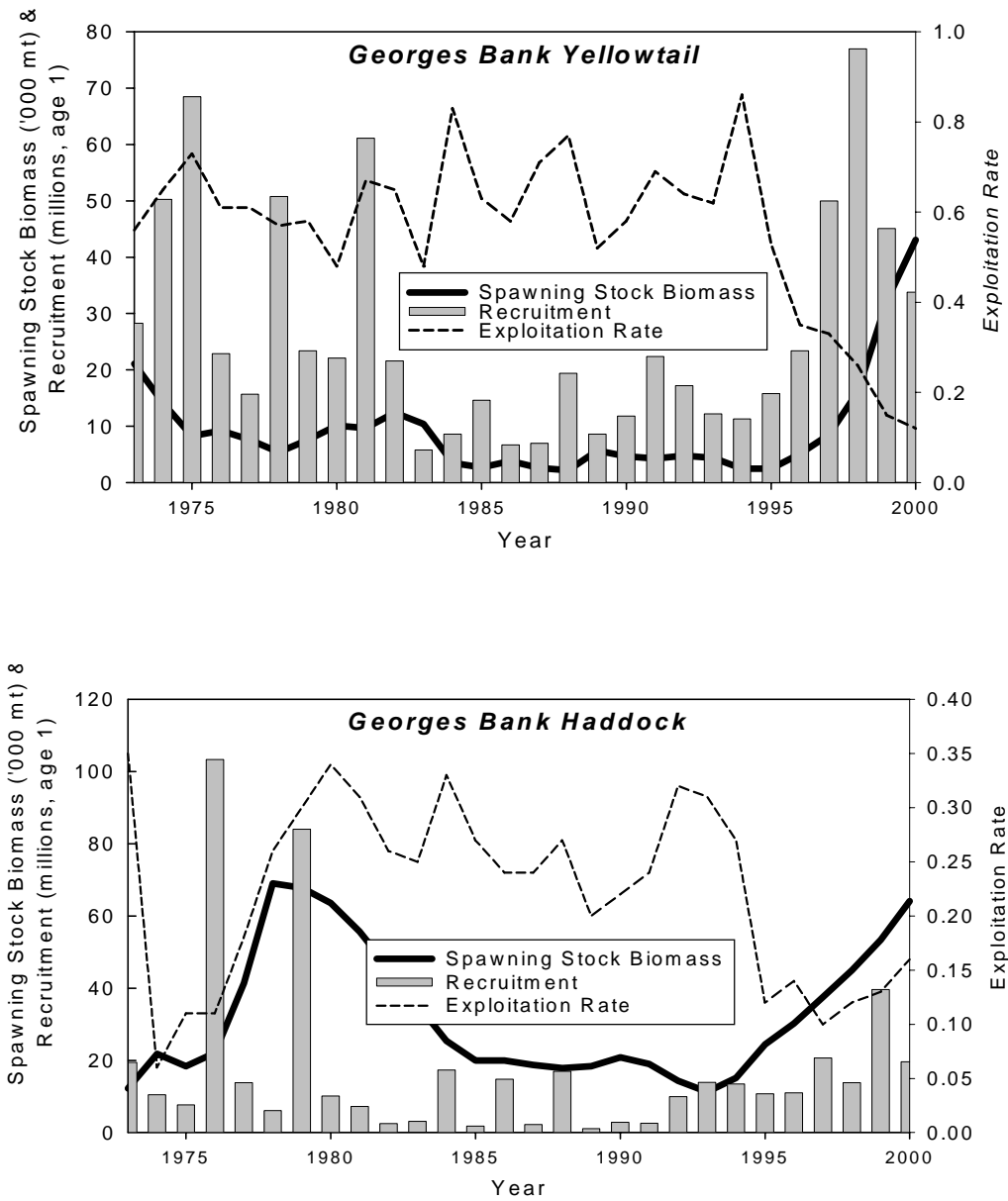


Figure 3 Trends in spawning stock biomass (ssb) and recruitment in relation to reduction in exploitation rate (fishing effort) for two commercially important species inhabiting the Georges Bank subarea of the Northeast Shelf ecosystem: yellowtail flounder (a) and haddock (b).



**GOVERNANCE FOR SUSTAINABLE SEAS:
THE PEW OCEANS COMMISSION'S APPROACH TO
ECOSYSTEM-BASED MANAGEMENT OF OUR COASTS AND OCEANS**

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Background

When the Stratton Commission examined U.S. ocean governance more than 30 years ago, the oceans held the promise of vast, largely untapped resources to benefit the nation. Today, our sheer numbers and our technology have reduced many of the living resources of the seas to a fraction of their historical abundance. We use the oceans as the ultimate receptacle for our wastes, and these contaminants are altering ecosystems and harming marine life. Poorly planned development along our shores has destroyed habitat needed by marine and coastal species.

The Pew Oceans Commission was created to chart a new course for the nation's ocean policy. Its mission is to identify policies and practices necessary to restore and protect living marine resources in U.S. waters and the ocean and coastal habitats on which they depend. To develop a broad-based, nonpartisan consensus on the future direction of U.S. ocean policy, the Commission brought together 18 leaders from the fields of science, business, government, fishing, and conservation.

Over the course of two years, the Commission held 15 regional meetings, public hearings, and workshops to listen to those who live and work along the coasts. From Maine to Hawaii, Alaska to the Gulf of Mexico the Commission spoke to hundreds of citizens, fishermen, scientists, government officials, tourism operators and business leaders. Commissioners went lobster fishing in Maine, toured a pineapple plantation in Hawaii to learn about ways to control polluted runoff, held a series of 12 focus groups with fishermen, and visited coastal habitat protection and restoration projects in New York and South Carolina.

Everywhere the Commission traveled, people spoke passionately about the value of the oceans—socially, spiritually and economically—to their communities. They also spoke of how the changes taking place in the oceans threaten those values.

America's Oceans in Crisis

In its investigation, the Commission found America's oceans in crisis. Of the fish stocks that have been assessed, one-third are either overfished or are being fished unsustainably. We do not even know the status of many stocks that are fished commercially. Large areas of ocean have been closed to fishing in New England and off California because of depletion of groundfish stocks. Wild salmon are virtually extinct in New England and they are hanging on precariously in the Pacific Northwest, devastated by dam building and other habitat alterations.

Sixty percent of our coastal rivers and bays are moderately to severely degraded by nutrient pollution. Runoff from our roads and streets dump 11 million gallons of oil and gas—the equivalent of the *Exxon Valdez* oil spill—into our rivers and bays every eight months. New sources of pollution, such as invasive species and low frequency sound, are emerging as threats to marine life.

Sprawl is consuming land at many times the rate of population growth in many coastal areas, destroying and fragmenting habitat and contributing to water quality degradation. We have already lost half of our original wetlands in the lower 48 states, and are continuing to lose more than 20,000 acres of coastal wetlands annually.

A Failure of Governance

We have reached a point where the combined effects of what we put into and take out of the oceans has severely reduced the capacity of our oceans to deliver the ecological and economic goods and services on which coastal communities depend, and which are of great value—both spiritually and economically—to the nation as a whole.

The United States has a formidable body of environmental law designed to protect our air, water, coastal zone, marine mammals, endangered species and fisheries. However, these laws—and the institutions charged with implementing them—have failed to prevent a broad decline in the health of marine ecosystems. This decline, in the face of so many environmental laws designed to prevent it, is a clear failure of governance. Why has this happened?

Lack of a clear mandate—Those entrusted with managing our ocean resources need to be given a clear mandate to protect, maintain and restore the ecosystems that provide these resources to us.

Jurisdictional fragmentation—The federal/state division of ocean space and resources divides jurisdiction arbitrarily—from an ecosystem standpoint—into a nearshore and an offshore component. Even within a geographic jurisdiction, a number of government agencies have authority over various aspects of any one piece of ocean real estate.

Poor coordination—Although efforts are certainly made to coordinate federal and state policy—the Coastal Zone Management Act being a prime example, these efforts are insufficient to address today's threats to the health of marine ecosystems.

Insufficient information—Resource managers need a better understanding of the workings of marine ecosystems in order to protect them. But they also need to be able to make full use of the data that is available.

Toward Ecosystem-Based Management

The problems outlined above are not trivial. They are deeply entrenched for reasons of history and our

peculiar approach to the management of marine resources, which differs in important respects from our management of other public resources. However, the Pew Oceans Commission believes that the health of marine ecosystems is so important to the economic and environmental security of the nation that we must make the difficult changes required to protect it.

Ecosystem management is a lot like the weather: Everyone talks about it but nobody *does* anything about it. Some would even say that it can't be done—that we lack the information and knowledge to do it properly. The Pew Oceans Commission rejects this contention: While we can't manage *ecosystems*, per se, we certainly can manage human uses of ecosystems in a way that protects, maintains, and restores their health, productivity and resiliency. This is the essence of ecosystem-based management.

Five Objectives to Protect, Maintain and Restore Ecosystem Health

What are the essential elements of ecosystem-based management for the oceans? There is no magic formula, but certainly steps must be taken to address the major threats to ocean ecosystems outlined above. In its final report, the Commission will make detailed recommendations to address harmful fishing practices, pollution, unwise coastal development, and failures of ocean governance. The Commission's core recommendations can be summarized as follows:

1. Declare a principled, unified national oceans policy based on protecting ecosystem health and requiring sustainable use of ocean resources.
2. Encourage comprehensive and coordinated governance of ocean resources and uses at scales appropriate to the problems to be solved—
 - a) For ocean governance generally and fisheries management, this will be at the regional scale of large marine ecosystems;
 - b) For coastal development and pollution control, this will be primarily at the watershed scale.

3. Restructure fishery management institutions and reorient fishery policy to protect and sustain the ecosystems on which our fisheries depend.
4. Protect important habitat and manage coastal development to minimize habitat damage and water quality impairment.
5. Control sources of pollution—particularly nutrients—that are harming marine ecosystems.

Implementing Ecosystem-Based Management in the Oceans

The above actions describe *what* needs to be done to protect and restore ocean ecosystems. But they shed little light on *how* these changes would be carried out. In other words, how does the Commission propose that these changes would come about? In addition to suggesting ways to address specific threats to ocean ecosystem health, the Commission will make a number of recommendations regarding the mechanisms and infrastructure by which this goal could be achieved.

Establish a strong national mandate for ocean protection—The Commission proposes the enactment of a National Oceans Policy Act requiring federal and state agencies to protect, maintain and restore marine and coastal ecosystems, and reorienting national and regional decision-making bodies to these ends. This legislation should provide clear and measurable goals and standards to govern activities affecting the oceans and establish mechanisms to ensure compliance with the national policy.

Create appropriate forums to carry out the national policy—The Commission recommends the establishment of regional ocean governance councils with geographic jurisdiction corresponding as closely as possible to the boundaries of large marine ecosystems. These councils should consist of federal, state, and tribal authorities with jurisdiction over marine resources. The Commission also recommends that states create watershed councils to assist them in the development and implementation of watershed protection plans.

Require comprehensive planning for ocean governance—Regional ocean councils should be charged with assessing the status of and threats to marine ecosystems, and developing enforceable ocean ecosystem restoration plans that comply with national standards and are binding on the federal and state governments. Plans should include clear and measurable performance measures and should assign responsibility for implementation among the parties to the agreement.

Provide effective oversight—The Commission recommends the establishment of a strong, independent national oceans agency to oversee implementation of the national oceans policy, to review and approve ocean ecosystem plans, and to provide technical and financial assistance to the regional ocean governance councils in carrying out their duties. The Commission also recommends establishing of a permanent interagency National Oceans Council to provide a venue for resolving interagency conflicts regarding implementation of the national oceans policy.

Conclusion

While far-reaching, these recommendations are simply common sense. They apply principles of precaution and adaptive management to ocean governance. They demand that renewable resources be used sustainably, and they promote the use of non-renewable resources in ways that do not harm living systems. They recognize the interdependency of species and habitats in the ocean, and the linkage between marine ecosystems and the watersheds that nourish them. They are designed to improve our understanding of marine ecosystems and the effects our actions have on them. They are intended to ensure a more transparent and equitable approach to ocean governance. Last, but not least, they are designed to ensure that our governments uphold their public trust responsibility to restore and secure the full benefits of our oceans for the public while passing along these precious resources undiminished to future generations.

REGIONAL OCEAN RESOURCES MANAGEMENT

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Abstract

The fluid nature of the ocean environment and the mobility of living ocean resources place obvious limits on the ability of state and federal resource managers to effectively manage based on traditional jurisdictional boundaries offshore. There are sufficient regional variations in the ocean areas subject to United States and Canadian jurisdiction to suggest the merits of regional approaches. As U.S. coastal states and Canadian provinces formulate approaches to development and management of adjacent ocean areas, regional considerations should play a prominent role. Drawing on evolving concepts of sea use planning, integrated marine policy, large marine ecosystem management, and exclusive economic zone governance, and on international examples of regional ocean management, this paper explores the potential for regional ocean management on the United States west coast. The emphasis is on legal and institutional arrangements, which would support regional management on the west coast.

Introduction

The four west coast states and British Columbia are very concerned about how adjacent portions of the Pacific Ocean are used. From an economic perspective, development of ocean resources off one state can affect important economic sectors of the other coastal states in the region, both positively and negatively. From an environmental point of view, planning for the conservation and management of living marine resources and their habitats is often best approached from a regional basis. Too, the risks associated with some types of ocean development in one state (such

as oil spills) can threaten sensitive areas in the coastal zones of other states. From a logistical perspective, some ocean development projects (e.g., ocean mining, waste disposal) in the ocean adjacent to one state can involve ports and harbors in a neighboring coastal state.

Several recent research reports (Alaska Oil Spill Commission, 1990; Cicin—Sain et al., 1990; States/British Columbia, 1990) support regional approaches to ocean management on the west coast. This paper explores the conceptual, legal, and institutional bases for such approaches. For this purpose “ocean management” is defined as planning for and administering multiple uses to reduce conflicts and increase benefits (Juda & Burroughs, 1990) in the 12—mile territorial seas and adjacent 200—mile resource zones which the U.S. and Canada claim (Hildreth, Forthcoming, 1991). Ocean management specifically is distinguished from marine resources management which focuses on the allocation or control of single resources or activities (Cicin-Sain et al., 1990). Furthermore, a “regional” approach is defined as one involving two or more states or provinces, one or more states or provinces and a national government, or national governments acting in a geographically limited way.

On the west coast, planning for multiple use ocean management so far has occurred only on the individual state level (in Oregon and California). However, the Western Legislative Conference and the Pacific Fisheries Legislative Task Force with the support of the Alaska Oil Spill Commission and the States/British Columbia Oil Spill Task Force have proposed that the four west coast states and British Columbia create a regional multiple use ocean man-

agement process through interstate compacts and similar arrangements. State legislation to establish such an interstate compact has been drafted. The legal and institutional framework for implementing these proposals is analyzed in this paper. Specific components of a west coast regional scheme are suggested.

The North American and International Experience with Regional Ocean Management

Elsewhere in the world, regional ocean management programs are being developed by coastal nations both unilaterally and multi—laterally (Chircop, 1989; Council on Ocean Law, 1986). Useful lessons for regional ocean management in the U.S. can be derived from these international experiences. Multi—national efforts of interest include several of the ten regional components of the pollution control oriented united Nations Environment Programme's (TJNEP) Regional Seas Programme (Thacher, 1983; United Nations Environment Programme) and efforts focused on the North Sea (Andresen, 1989; Freestone & Ijlstra, 1990; Grant, 1978). The most fully developed regional multiple use ocean management program appears to be Australia's scheme for the Great Barrier Reef (Baker, 1989; Cocks, 1984; Woodley, 1985).

The regional variations in ocean conditions and resource use in different North American coastal areas have been documented (Alexander & Hanson, 1984; Delaware Sea Grant, 1977; Ehler et al., 1986; Ehler & Basta, 1984; Miles et al, 1982a, 1982b). A broad spectrum of ocean policy experts has suggested that regional approaches be seriously considered for administering U.S. (Cicin-sain & Knecht, 1985; Curlin, 1986; Gaither, 1975; Hildreth, 1984, 1987b; Jacobson, 1989; Jacobson & Hildreth, 1989) and Canadian (Johnston, 1985; Rothwell, 1988) ocean waters. In addition to the west coast, initiatives to establish regional multiple use ocean management are underway for Lancaster Sound in the Canadian Arctic (Dobbin, Lemay & Dobbin, 1983); the Gulf of Maine (Coastal Zone Management, 1990; Council on Ocean Law, 1990; Gulf of Maine Council, 1990; Havran & Wiese, 1983, 1982; Van Dusen & Hayden, 1989); the Gulf of Mexico (Buff & Turner, 1987;

Lipka et al., 1989; Environmental Protection Agency, 1989); the Gulf of Mexico and the South Atlantic combined (Florida Statutes Sec. 380.28 (Florida Senate Bills 314 & 481) (1989)); and Pacific Ocean waters surrounding U.S. flag Pacific island states and territories (Pacific Basin Development Council, 1989)

Multiple Ocean Uses on the West Coast

The variety and scale of ocean resource use off the west coast is not surprising when the immense area encompassed is considered. The four U.S. states combined have jurisdiction over 27,000 square miles offshore, nearly 48 percent of all state ocean waters within the United States. Their 8,500 miles of coastline represents close to 67 percent of the U.S. total. In Pacific Ocean waters adjacent to the west coast including Alaska, three distinct large marine ecosystems have been identified; the California current off California, Oregon, and Washington; the Gulf of Alaska; and the Eastern Bering Sea (Alexander, 1986; Incze & Schumacher, 1986; MacCall, 1986; Oregon Ocean Resources Management Task Force, 1990; Sherman, 1989). The resources and environmental conditions found in these waters have been mapped and analyzed in varying levels of detail in other sources (Cicin—Sain et al., 1990; National Ocean Service, 1986, 1988a, 1988b; National Research Council, 1989). Their multiple uses can only be briefly highlighted here, with emphases on use conflicts and other problems whose resolution would be aided by regional ocean management.

Two overlapping types of problems have been identified, common problems and shared problems (Cicin-Sain et at, 1990). As an illustration of a common problem, all four west coast states and British Columbia must deal with the risks from oil transported in tankers and barges Up and down the coast. Shared problems are those to which two or more states or provinces are physically, ecologically, economically, or otherwise directly linked, for example, pollution in the ocean waters at their boundaries. Regional economic linkages include the facts that most of the labor and capital involved in Alaska salmon harvests (valued at \$473 million in 1987) comes from Washington and Oregon (Northwest Power Planning

Council, 1988), and Oregon fishermen fishing in Alaska waters and engaged in joint ventures with foreign processors off Alaska and Oregon brought home an estimated \$34.9 million in revenues in 1986 (west Coast Fisheries Development Foundation, 1988).

Planning for and managing offshore oil and gas development in federal and state waters is a common problem faced by all four states and British Columbia. President Bush's June 1990 announcement regarding federal OCS oil and gas development suggests that until the year 2000 OCS development on the U.S. west coast will be confined to OCS waters off Alaska and in the Santa Barbara Channel and Santa Maria Basin of California. For other west coast OCS areas, the President's decision has created a decade of lead time for regional planning and data gathering. The President's announcement avoids for the time being a federal buy back of OCS oil and gas leases recently issued in fishery rich Bristol Bay, Alaska, although leases issued in sensitive areas off Florida will be bought back.

All four of the U.S. west coast states have imposed some form of moratorium on oil and gas development in state waters. The circumstances and conditions under which exploration for oil and gas in Queen Charlotte Sound remains under discussion between British Columbia, the Canadian government, and industry.

A recent study identified the development of uniform regional minimum standards for offshore oil and gas development as a high priority (Hildreth et al., 1989). A principal goal of these standards would be to minimize conflicts between offshore oil and gas development and fishing, a conflict which has occurred in several places in the region (Cicin—Sain et al., 1990), including Alaska where offshore oil and gas development conflicts with subsistence hunting and fishing on the North Slope. The regional standards also could provide uniform treatment as "areas of critical environmental concern" or similar status for offshore rocks, reefs, and islands in state waters which currently are included in the federal California Islands Wildlife Sanctuary, Oregon Islands National Wildlife Refuge, and similar management units in Washington and Alaska.

President Bush's June 1990 decision to limit west coast OCS oil and gas development through the year 2000 increases the regional prominence of oil spills from other sources such as barges and tankers. This common west coast concern about the risks of marine transportation of oil became a shared problem when the December 1988 *Nestucca* barge spill oiled the waters and beaches of Washington, British Columbia, and Oregon. While the *Exxon Valdez* tanker spill was confined to Alaska waters, all four states and British Columbia were involved in assessing the risks from transportation of the crippled tanker for repairs, first proposed for Portland, Oregon, and then changed to San Diego, California. Tons of oily debris from that spill were shipped to an Oregon landfill near the Columbia River.

Concern about oil spills has been the driving force behind the States/British Columbia Oil Spill Task Force, Western Legislative Conference, and Pacific Fisheries Legislative Task Force proposals for formal regional arrangements. Given that all four states and British Columbia have enacted or introduced new oil spill prevention and clean up bills, the potential exists for regional coordination of design, manning, contingency plan, and equipment standards, financial responsibility requirements, and liability limits as part of a regionally coordinated approach to multiple—use ocean management. Such an approach would also facilitate cooperative monitoring of international, federal, and industry initiatives regarding oil spill prevention and liability, vessel design, clean up technology, and personnel training standards.

Another pollution problem lending itself to a regional approach is managing plastic and other wastes generated by vessels engaged in commercial and recreational fishing and navigation in compliance with Annex V of the MARPOL Convention and U.S. and Canadian legislation and regulations implementing the convention. Currently, plastic and garbage pollution in Pacific Ocean waters adversely affects seabirds, marine mammals, and fish significantly. Since the vessels involved crossed state and provincial boundaries and enter many different ports in the region, standardized approaches to signs, facilities, and port handling of shipboard waste would lower

compliance costs for ports and vessel operators and promote compliance with the convention's requirements.

As another common problem in ocean management, all four states and British Columbia have some potential for offshore hard mineral mining. The economic and environmental issues likely to arise are similar and thus appropriate subjects for coordinated regional management. Dredging for gold currently occurs in Alaskan state waters in Norton Sound and is proposed for adjacent federal waters (Minerals Management Service, 1990). Specific risks include resuspension of heavy metals like arsenic and mercury with consequent contamination of fish and marine mammals harvested by Alaskan natives. Seabed areas of interest for minerals off of Oregon overlap important commercial and recreational fisheries and are transected by towboat and barge lanes.

Other issues meriting attention from any west coast multiple—use ocean management process that is established include: conflicts between commercial fishing activities and marine mammal preservation (Manning, 1989); aesthetic and habitat objections to kelp harvesting; conflicts between military uses offshore and other ocean uses; conflicts between commercial and recreational fishing and other recreational uses and marine mammal and seabird conservation; coordination of National Marine Sanctuary and state marine park designations and regulations in west coast ocean waters; coordination of proposals for improved Vessel Traffic Separation Schemes at several locations in the region where navigation traffic is particularly heavy and risky (Townsend, 1990); and the transboundary impacts of high seas driftnetting in the North Pacific (Johnston, 1990; University of Oregon, 1990).

Conceptual Framework for Regional Ocean Management

Concepts relevant to regional ocean management on the west coast include sea use planning (Andresen & Fløistad, 1988; Eisma, van Hoorn & de Jong, 1979; Forte, 1984; Townsend Gault, 1984; Miles, 1989; Smith, 1990; Smith, Lalwani & Brookfield, 1981;

Young & Fricke, 1975); integrated marine policy (Levy, 1988; Underdal, 1980; Watt, 1990); large marine ecosystem management (Belsky, 1989, 1988; Morgan, 1989, 1987; Sherman, 1989); and exclusive economic zone governance (Cicin—Sain et al., 1990; Fischer, 1990; Hildreth, Forthcoming, 1991; Juda & Burroughs, 1990; Vallejo, 1989). From these theories and their applications, several guidelines for regional ocean management on the west coast can be derived.

To the maximum extent practicable, a regional approach should embrace relevant ecosystems. A west coast approach embracing Canadian Pacific Ocean waters through British Columbia's participation does in fact do so (Morgan, 1987). With its emphasis on living resources, principally fish, large marine ecosystem theory needs to be adjusted to encompass non-living resource uses such as minerals mining and commercial navigation. Furthermore, a west coast regional approach should be integrated, i.e., includes area-based planning and management of multiple ocean uses coordinated between government departments and different levels of government within each nation. However, Underdal's call for a weighing of the benefits and costs of such integrated management makes theoretical sense but may not be possible given the present state of the art (Underdal, 1980). Thus any such assessment will have to be qualitative rather than quantitative, and based heavily on intuition. Also, events like the 1989 *Exxon Valdez* tanker spill and the 1969 Santa Barbara Channel platform blowout spill can generate political demands for integrated management regardless of cost, in which case the question becomes how best to implement such an approach. This paper's next section suggests a legal and institutional framework within which an integrated, ecosystem based approach can be carried out on the west coast.

The functions to be performed through regional ocean management have been described by several commentators at various levels of detail (Hildreth, Forthcoming, 1991; Juda & Burroughs, 1990; Levy, 1988; Smith, 1990). Three stand out as especially useful roles for a regional ocean management scheme on the west coast: (1) guiding and directing federal, state,

and provincial research activities to respond to regional planning and management needs (Bottom et al., 1989; Hildreth et al., 1989); (2) assessing the cumulative effects of multiple ocean uses in the region on: (a) each use sector including preservation uses, and (b) marine environmental quality, with the goal of promoting sustainable development of ocean resources in the region; and (3) establishing principles and priorities with the force of law for resolving ocean use conflicts and procedures for applying them to disputes. Some initial guidance on the formulation of such principles and priorities is available (Hildreth, 1989). The legal and institutional framework for regional ocean management suggested in the next section is designed to promote the development of such principles and priorities in greater detail and their application as a key component of a regional multiple—use ocean management scheme.

Institutionalizing Regional Ocean Management Interstate Compacts

For effective action on the common and shared regional problems summarized above, multiple sector planning and decision making mechanisms are needed in addition to the single sector international, national, federal—state, and state and provincial efforts reviewed above. However, to date there has been little detailed investigation of legal mechanisms for implementing multiple use ocean management on a regional basis. Effectively managing major interstate rivers, lakes, and bays presents problems similar to those involved in regional ocean management (National Environmental Symposium, 1988). For interstate rivers and lakes, interstate compacts approved by Congress under the Compact Clause of the United States Constitution (Art. I, § 10, cl. 3) have been used with a mixed record of success (Bowman & Kearney, 1986; Council of State Governments, 1977; Curlin, 1972; Derthick, 1974; Frankfurter & Landis, 1925; Girardot, 1929; Grad, 1963; Hill, 1989; Wiggins, 1987; Zimmermann & Wendell, 1976).

Compacts also have been used to manage ocean and in— river fisheries in the Pacific Northwest under the Columbia River Fish Compact created by legislation adopted by Oregon and Washington in 1915

(ORS § 507.010 et seq.; RCW § 75.40— .010 et seq.) and ratified by Congress in 1912 (40 Stat. 515), and the Pacific Marine Fisheries Compact (PMFC) ratified by Congress in 1947 (P.L. 80—232, 61 Stat. 419). Federal financial support for interstate fisheries management under the PMFC and by individual states is now provided under the federal Interjurisdictional Fisheries Act of 1986 (16 U.S.C. 4101 et seq.) and implementing regulations (50 CFR Part 253). Through various devices that act encourages states to enter compacts to— manage fisheries throughout their range. None of these interstate fisheries arrangements currently has the capacity for regional multiple—use ocean management. However, as one option for initiating such management on the west coast, the Pacific States Marine Fisheries Commission which administers the PMFC on behalf of the five compacting states as described above, could be expanded from fisheries into multiple—use management by appropriate compact amendments accompanied by the necessary fiscal and personnel adjustments.

Congressional consent to a compact usually is given in the form of duly enacted federal legislation or a joint resolution of Congress. Obtaining congressional consent to interstate compacts for regional ocean management does not appear insurmountable given that: (a) regional fisheries management was created by Congress over executive branch objections; and (b) Congress is the branch generally most sympathetic to state and regional concerns in ocean resources management (Hildreth, 1986). Congressional consent helps remove constitutional doubts sometimes raised by the federal courts about interstate arrangements which proceed without congressional consent as illustrated by *New Hampshire v. Maine*, 426 U.S. 363, 369 (1976). Modest financial support for such interstate arrangements also may be available under federal Coastal Zone Management Act section 308 as amended in 1990.

The December 12, 1989 “Agreement on Conservation of the Marine Environment of the Gulf of Maine” between Maine, New Hampshire, Massachusetts, New Brunswick, and Nova Scotia and proposed regional ocean management arrangements between

Alaska, California, Oregon, Washington, and British Columbia fit within a long tradition of formal and informal arrangements between U.S. states and Canadian provinces concerning natural resources management and environmental quality (Curtis & Carroll, 1933; Hero & Daneau, 1984; Hill, 1989; Swanson, 1973, 1974). On the west coast, British Columbia's inclusion in regional ocean management arrangements recognizes ecological reality but introduces some political and legal complexity (Cicin-Sain et al., 1990). Constitutional questions in both Canada and the U.S. concerning the ability of provinces and states to enter binding international obligations without federal approval suggest the wisdom of obtaining federal consent to such arrangements in both countries (Saunders, 1986).

Compact Provisions

There are a range of potential provisions to be included in regional ocean management interstate compacts and any federal legislation authorizing and consenting to them. Agendas for such legislation already exist in the literature (Curlin, 1986; Hildreth, 1987a, 1987b; Knecht, Cicin—Sain & Archer, 1988; Jacobson, 1939). The states in the region already have begun building the legal framework for a compact by enacting statutes mandating coordination by state single—sector marine resource management agencies with state and federal agencies elsewhere in the region; the development of regional computerized information retrieval systems (1989 Ore. Laws Chapter 895 (S.B. 1152)) and consistent interstate oil spill financial responsibility requirements, liability rules, and spill response procedures (ORS 468.823—833 (1939 S.B. 1038, 1039)); and comparative study of state oil spill damage assessment methods (1987 Wash. S.B. 5986). In addition, state legislators have actively participated in the regional ocean resources management coordination activities of the Pacific Fisheries Legislative Task Force and Ocean Resources Committee of the Western Legislative Conference, while the four states' governors and British Columbia's premier have executed and state and provincial personnel have implemented the June 1989 "Oil Spill Memorandum of Cooperation" creating the States/British Columbia Oil Spill Task Force. The agree-

ment creating the joint oil spill task force provides some useful departure points for structuring further regional cooperation in ocean management. The task force explicitly operates within the federal framework of the Canada-U.S.A. Joint Marine Pollution Contingency Plan and is intended to be perpetual in duration, with each party able to terminate its participation by written notice to the other parties; each party bears its own expenses of cooperating pursuant to the agreement.

A foundation for broader regional arrangements is the Western Legislative Conference's Resolution 89—8 adopted in November 1989 which supports the establishment of a compact between British Columbia and Pacific coast states "to provide better planning for ocean resources which are of regional concern, develop a coast wide oil spill response plan, and oversee the management and utilization of ocean resources to insure their continued contribution to state and provincial economies." Following up on this resolution, the WLC's Ocean Resources Committee drafted model state legislation ratifying an eleven article compact creating a Pacific Marine Resources Commission on behalf of Alaska, California, Oregon, Washington, and British Columbia. The first bill based on the model legislation was prepared in California (California Assembly Bill No. 11, 1989—90 Regular Session, November 9, 1989 Preprint).

Each state or province party to that proposed compact would have one vote on the commission, although the size and makeup of the party's delegation would be decided according to state or provincial law so long as at least one member of the delegation was the administrator of a state or provincial agency charged with ocean resources management. Decisions of the commission are by majority vote of the compacting parties present at any meeting. The principal duties of the commission are to: (1) establish a "regional ocean resources management plan" which gives priority to the use of renewable resources; (2) develop a comprehensive coast wide oil and hazardous material spill response system; (3) identify regional data needs and establish compatible data formats accessible to all compacting parties; (4) give advice to and recommend rules and regulations to relevant state and

federal ocean resource management agencies, state governors and provincial premiers, and state and provincial legislatures.

The WLC's proposed compact expressly is not intended to prevent the individual compacting parties from adopting "conditions and restrictions conserving ocean resources" in addition to those developed pursuant to the compact. In addition, a party to the compact may terminate its participation upon six months written notice to the other parties. The proposed commission's annual budget is to be shared by the compacting parties in proportion to their coastline miles, with each party responsible for the expenses of its commission representatives.

One revenue source that both Alaska and California could utilize for their shares of compact expenses are the federal DOS oil and gas revenues currently paid to them under section 8(g) of the Outer Continental Shelf Lands Act (Hildreth, 1990). This method would be somewhat analogous to the funding of the compact—created Northwest Power Planning Council for the Columbia River basin. It is funded out of electricity revenues collected by the Bonneville Power Administration, the federal agency that markets power produced by federal dams and some other sources in the Pacific Northwest. Under current law, section 2(g) revenues would only be available to Oregon and Washington when 005 leases were issued in the zone 3 to 6 nautical miles off their coasts which is now not likely to occur before the year 2000. Thus, at least in the compact's early years, those states and British Columbia would have to fund their participation from other sources such as any revenues from oil and gas and seabed minerals development in state or provincial waters.

The proposed compact's only provision regarding public participation in the Pacific Marine Resources Commission's deliberations authorizes the commission to establish advisory committees. Limits on public participation in fisheries management decisions reached under the Columbia River Fish Compact between Oregon and Washington have been challenged in court (McGinley, 1988). To promote broader public participation in regional ocean man-

agement, the proposed commission could include public notice, hearings, and opportunity—to—comment provisions in the rules and regulations the compact authorizes the commission to adopt for the conduct of its business.

The proposed compact contains no provisions regarding compact amendments. The usual method is uniform adoption by state's legislature followed by congressional approval of the amendment as illustrated by the Southeast Interstate Low—Level Radioactive Waste Compact Amendments Consent Act of 1989 (H.R. 2642, 135 Cong. Rec. H. 7747—02, October 30, 1989). Unless an amendment process is added, amendments to the proposed Pacific Marine Resources Commission compact would follow a process similar to its initial formation, adoption of uniform amendments by state and provincial legislation, congressional consent as to the four U.S. coastal states, with full effectiveness as to British Columbia requiring specific approval by the Canadian government.

In its consent legislation, Congress could require the Pacific Marine Resources Commission to report annually like the Northwest Power Planning Council is required to do pursuant to section 4(h) (12) (A) of the Northwest Power Act (P.L. 96—501) (Northwest Power Planning Council, 1989) and expand the compact's public participation provisions. A bolder but not unprecedented step would be for Congress to mandate federal agency consistency with the Pacific Marine Resource Commission's decisions through provisions in its consent legislation analogous to the Coastal Zone Management Act's federal consistency provisions and the Northwest Power Planning Act's mandates for federal agency consistency with the Northwest Power Planning Council's regional energy planning and fisheries restoration decisions.

Two basic techniques the Pacific Marine Resources Commission could use in carrying out its proposed mandate to develop a regional ocean resources management plan giving priority to renewable uses would be a textual codification of use priority rules and procedures for conflict resolution along the lines of Oregon's Ocean Resources Goal 19 and administrative rules implementing it, and zoning maps allocat-

ing (where necessary) Pacific Ocean areas within the region to various uses allowable according to the codified principles (Hildreth, 1989; Trefts, 1986).

To confirm the legally binding nature of such commission decisions and provide additional enforcement mechanisms, the compacting parties could individually adopt through legislation and agency administrative rules the rules and procedures developed by the commission and appropriate geographic areas of the commission's zoning scheme, with the caveat noted above that the proposed compact allows the parties to adopt additional conditions and restrictions to conserve ocean resources. To aid in this process, each compacting party could establish its own ocean resources commission to monitor the regional commission's activities, provide representatives to the regional commission, and serve as an intermediary between single—sector state and provincial marine resources management agencies and the regional commission, perhaps along the lines of Oregon's proposed state Ocean Policy Advisory Council (Oregon Ocean Resources Management Task Force, 1990). The wisdom of such individual state and provincial follow up to the regional commission's decisions is illustrated by the experience with the Lake Tahoe compact between Nevada and California where California has established a state agency to monitor the compact agency's compliance with the compact and enforce and expand the compact agency's decisions with respect to California portions of the Lake Tahoe basin, as illustrated in *People v. Tahoe Regional Planning Agency*, 766 F.2d 1308 (9th Cir. 1985).

Alternative structures for the proposed Pacific Marine Resources Commission would include the one adopted for the Gulf of Maine Council described above based on two representatives from each participating state and province with voting federal representatives on the Council's Working Group, or the more elaborate structure that was recommended earlier for the Gulf of Maine which also included federal agency representatives on a regional council in addition to state representatives (Havran & Wiese, 1983, 1982). Voting federal participation might dilute the emphasis on regional concerns more than the compact parties would prefer. Thus any federal par-

ticipation could be through nonvoting ex-officio representatives from regional offices of federal agencies like the Environmental Protection Agency, Department of Transportation (Coast Guard), Department of Commerce (National Marine Fishery Service, National Ocean Service), Department of Interior (Minerals Management Service, Fish and Wildlife Service, Geological Survey), the two regional fishery management councils, the Corps of Engineers and other Department of Defense units with ocean operations in the region (principally the Navy), and from Canadian counterparts of these U.S. federal agencies.

Alternative Approaches to Compacts

The compact approach should be compared with alternatives such as creating a regional management council by treaty and implementing federal legislation, adding British Columbia to and including multiple use management within the mandates of the two regional fishery management councils or existing single—sector federal—state task forces, or seeking special area designations under the MARPOL convention as proposed for the Gulf of Mexico (Environmental Protection Agency, 1989).

A common problem shared by these alternatives is that the necessary congressional action to implement them would appear to be more difficult to obtain than congressional consent to a regional ocean management compact including British Columbia. The MARPOL special area designation process with its broader international dimension and its narrower focus on pollution concerns clearly is less suitable as the basis for regional multiple—use ocean management. However, once such a scheme was created by other means, MARPOL designations for particularly sensitive areas within the scheme could be sought.

The two regional fishery management councils represent a unique exercise in regional federal—state single—sector marine resources management (Branson, 1987; Fullerton, 1987). Expansion of the councils' mandate is an attractive concept because it does not involve creation of a new institution or layer of government; instead, an existing entity's mission is revised and expanded. Expansion of their mandates to multiple—use management, while theoretically

attractive (Hildreth, 1984), seems less feasible than the compact approach given congressional inertia and the already very tight personnel budget constraints under which the councils operate. Furthermore, the constitutionality of the regional fishery management councils was questioned in Northwest Environmental Defense Center v. Gordon, 849 F.2d 1241, 1245 (9th Cir. 1988).

The current congressional disinclination to create new layers of government makes even less likely the negotiation of a treaty and passage in Canada and the U.S. of legislation creating a regional management council or legislation formalizing and expanding the mandates of current informal single—sector federal—state task forces in the region to include multiple—use management. While federal—state task forces operating with respect to OCS oil and gas and minerals development in the region have played a very useful role in identifying research needs and promoting federal—state communication (Hildreth, 1989; Holtz, 1988), legislation which would formalize their status such as H.R. 2440 (101st Cong., 1st Sess., May 22, 1989) would appear less likely to be enacted than regional compact consent legislation of the form discussed above.

Conclusion

Knowledgeable observers see little likelihood in the near term of a U.S. federal government reorganization to integrate U.S. marine policy and carry out multiple—use ocean management either on a regional or national basis (Miller & Broches, 1989) - The outlook appears similar at the federal level in Canada (Hildreth, Forthcoming, 1991). Opportunities to initiate regional approaches at the state and provincial level appear greater. The next step could be a regional conference to exchange information and discuss coordination mechanisms and institutional arrangements between the four states, British Columbia, and regional offices of relevant federal agencies. At this and succeeding conferences, protocols for regional responses to ocean management problem areas could be developed and a compact prepared for enactment in the four states and British Columbia and submission to Congress and the Canadian government.

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FISHERY MANAGEMENT COUNCILS

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As the largest of the eight federal fishery management Councils, the Mid-Atlantic Fishery Management Council has its work complicated by adjacent Councils, member states and their associated Marine Fisheries Commission (ASMFC). For the benefit of those who are unfamiliar with Marine Fishery Commissions, a brief overview is in order. There are three such Commissions, i.e., Atlantic States, Gulf of Mexico States, and Pacific States Marine Fisheries Commissions. When originally formed, the Commissions were created to assist in managing and conserving their shared coastal fishery resources. It was recognized that the collective interest of member states was best served by working together to achieve the goal of a sustainable and healthy coastal fishery resources. However, in December 1993 the Atlantic States Marine Fisheries Commission (ASMFC), unlike the other two Commissions, became a management authority in its own right. The passage of the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) empowered the ASMFC to ensure member state compliance with mandated conservation measures adopted in Commission approved fishery management plans (FMPs). This authority is unique to the ASMFC as member states in the other two Commissions are not mandated to comply with their Commission approved FMPs, i.e., for those states it is a voluntary action. Hence, since December 1993, east coast fishermen have the potential to be governed by three layers of fishery management, i.e., state measures, Commission rules, and Council recommended federal regulations.

Pity the poor recreational fisherman who is fishing for summer flounder without his lawyer. Imagine him at the intersection of Delaware's and New Jersey's territorial seas and the federal exclusive economic zone

(EEZ) . . . which rules apply? What's a legal size fish? How many can he keep? Is the season even open? Is fishing really all that complicated? You betcha! But, this complication is in reality an opportunity to coordinate and cooperate with various management jurisdictions to ensure that mutual constituents and common fishery resources enjoy the best possible management and conservation regimes of anywhere in the country.

Like other Councils, the Mid-Atlantic Council is charged by the Magnuson-Stevens Fishery Conservation and Management Act (Act) to do seven things:

1. Prepare and submit fishery management plans (FMP), and amendments thereto to the Secretary of Commerce,
2. Prepare comments on any application for foreign fishing,
3. Conduct public hearings to allow all interested persons an opportunity to be heard in the development of fishery management plans and amendments,
4. Submit to the Secretary such periodic reports as the Council deems appropriate,
5. Review the assessments and specifications made with respect to the optimum yield from each fishery,
6. Review and comment on any federal or state action that may affect fishery habitats under the Council's jurisdiction, and
7. Conduct any other activities which are necessary and appropriate to the foregoing functions.

In meeting these responsibilities, the Mid-Atlantic Council must communicate and coordinate its efforts with adjacent management authorities and their jurisdictional constituents. One example of these efforts is the manner in which this Council's Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (FMP) governs the operations of the summer flounder fishery. The FMP directly governs two user groups, the commercial and the recreational sectors of the summer flounder fishery. The summer flounder fishery extends beyond the Council's seven state jurisdiction to include a number of New England states. The commercial fishery is governed through a quota management mechanism, and the commercial quota is subdivided into state-by-state suballocations. Two years ago the Mid-Atlantic Council, in conjunction with the ASMFC, established a conservation equivalency measure for the recreational sector. What this action achieved was to allow the member states of the Commission who are involved in managing the summer flounder recreational sector to establish state-by-state recreational management measures to achieve the conservation goals of the Council's and Commission's FMP. In other words, the lowest level of management authority, i.e., the state, rather than the highest, i.e., the federal government, now has the ability to set its own size, season, and bag measures so as to achieve the required conservation goals of the FMP in lieu of adopting a "one-size-fits-all" coast wide quota measure. By communicating and coordinating with the ASMFC, as well as member states within the Council's and Commission's family, flexibility has been established to let those closest to the constituents and fishery resource determine "how" to manage it.

The foregoing example documents what we consider a genuine success story between Council and Commission in managing a shared common property fishery resource. Another example of such coordination relates to our Council's efforts as lead Council in the development of the Spiny Dogfish Fishery Management Plan. This Plan was developed jointly with the New England Fishery Management Council and governs the operation of this fishery from the US/Canadian border through North Carolina. This is a

fishery that has significant problems related to recruitment and spawning stock biomass of adult female dogfish. Although each Council has a very different view as to how the Plan should operate, the process as mandated by the Magnuson-Stevens Act allows each Council to express its interpretation of the status of these stocks and express its view regarding how the fishery should operate. This open process provides a healthy forum for participants and stakeholders to voice their concerns and views regarding the operation of the FMP. This FMP is also one with which the environmental community has been actively involved in trying to protect the resource from over exploitation by the fishing community, and through the Magnuson-Stevens Act process its voice has been heard and incorporated into the Plan's implementing regulations. Moreover, the ASMFC recently approved its own Spiny Dogfish Fishery Management Plan for state waters that is modeled on the federal plan. Hence, we now have one common property fishery resource that is governed by three different management authorities through two different plans affecting 11 coastal states. Coordination and cooperation on these matters are achieved through joint meetings, public hearings, and dissemination of information through each of the management authorities' web pages as well as newsletters and press releases.

These two examples of regional coordination on two different species with two different entities demonstrate that existing legislation and authority can achieve desired conservation and management outcomes. Can such success be improved? Definitely . . . these results did not come easily, nor did they come in a timely fashion. These results are the product of an exceedingly slow, convoluted, bureaucratic process. In fact, the process is so time-consuming and burdensome that serious consideration should be given to our third President's dictum that "The government that governs least governs best." My interpretation of President Jefferson's guidance as it relates to fishery management is that we should have fewer requirements to implement fishery conservation and management measures. For instance, what value is added to the fishery management process by conforming it with the National Environmental Policy Act (NEPA)?

NEPA is a process requirement that adds nothing by way of substance to the MSA. If the following language were included in the next MSA reauthorization, i.e.,

Sec. 315. COMPLIANCE WITH NATIONAL ENVIRONMENTAL POLICY ACT OF 1969.

“Any fishery management plan, amendment to such plan, or regulation implementing such a plan that is prepared in accordance with applicable provisions of sections 303 and 304 of this Act is deemed to have been prepared in compliance with the requirement of section 102(20)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(C)).”, then this language, like the MSA exemption from Federal Advisory Committee Act requirements, would remove the NEPA litigation lightning rod and with it, nearly one third of the lawsuits brought against NMFS and Councils. Now that’s regulatory streamlining!

What’s worse than lawsuits? Try the fear of lawsuits. Councils and NMFS still suffer somewhat from paralysis by analysis, but immobility from potential legal hostility permeates all our actions. This is not peculiar or unique to fisheries - our society as a whole is suffering from potential litigation timidity. For example, when was the last time you saw a diving board at a hotel or motel pool? How about seesaws or jungle gym sets at your local school or play ground? Gone! These are cultural touchstones in America, yet fear of injury liability arising from lawsuits has driven them from our society. Insurance underwriters will not assume the exposure, and property owners, whether private or public, cannot, or will not, assume such risk. Hence, bit by bit our culture is being eroded. To reverse this trend in fisheries, we will need both a cultural and legislative fix. To do so, Aradical@ ideas such as exempting the Councils and NMFS from NEPA should be, and must be, raised and discussed if progress is to be made in changing the current system we know as fishery management today.

In closing, since my topic is Fishery Management Councils, I will briefly highlight some facts about

the Mid-Atlantic Fishery Management Council. The Council consists of seven states B New York, New Jersey Pennsylvania, Delaware, Maryland, Virginia and North Carolina. There are 21 voting Council members, 13 of whom are Secretarial appointed members and eight statutory members, i.e., the NMFS Northeast Regional Administrator and the senior state officials who are responsible for marine fishery management within each of the seven constituent states.

Of the 13 politically appointed Council members, there are six who represent the commercial fishing sector, five who represent the recreational fishing sector, and two others.

There are also four non-voting Council members, i.e., a single representative from each of the following organizations: The Atlantic States Marine Fisheries Commission, the US Department of State, the US Fish & Wildlife Service, and US Coast Guard.

The Council has 12 committees as well as liaisons with the New England Council and South Atlantic Council.

Each state hosts one meeting per year. To accommodate this rotation of meeting sites, the Council meets about every seven or eight weeks in a formal session in one of the constituent states. Council meetings usually serve as a forum for committee meetings, but committee meetings can also occur outside the Council meeting schedule.

The Council currently operates seven Fishery Management Plans (FMPs). Five plans B Surfclam and Ocean Quahog; Summer Flounder, Scup, and Black Sea Bass; Bluefish; Squid, Mackerel, Butterfish; and Tilefish are exclusively the jurisdiction of this Council. Two plans are joint plans with the New England Council. Spiny dogfish for which we are the lead Council, and Monkfish for which the New England Council is lead. We regulate 13 species and 14 stocks through these plans. Through the NMFS we govern these fisheries by federal regulations that define who gets the fish, where they fish, when they fish, how much they can take, what types of gear they can use,

what size fish they can take and other measures so as to achieve optimum yield for each fishery.

For additional information about the MAFMC I encourage you to contact us on our web page at www.mafmc.org. Stay informed--it's your best safeguard to insure that your government is doing what you believe needs to be done.

REGIONAL EFFORTS OF THE ATLANTIC COASTAL STATES TOWARDS SUSTAINABLE MANAGEMENT OF MARINE FISHERIES

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“To promote the better utilization of the fisheries, marine, shell and anadromous, of the Atlantic seaboard by the development of a joint program for the promotion and protection of such fisheries, and by the prevention of physical waste of the fisheries from any cause.” --Mission Statement of the Atlantic States Marine Fisheries Commission

“Healthy, self-sustaining fish populations for all Atlantic coast fish species, or successful restoration well in progress, by the year 2015.” --Vision Statement

The Atlantic States Marine Fisheries Commission (The Commission) was formed by the 15 Atlantic coast states in 1942 to assist in managing and conserving their shared coastal fisheries resources. With the recognition that fish do not adhere to political boundaries, the states formed an Interstate Compact, approved by Congress. The states have found that their mutual interest in sustaining healthy, coastal fishery resources is best achieved by working cooperatively in collaboration with the federal government. Through this approach, the states uphold their collective fisheries management responsibilities in a cost effective, timely, and responsive fashion.

The Commission's current budget is \$4.1 million dollars. The base funding of \$353,000 comes from member state appropriations as determined by the value of their respective commercial fishing landings and saltwater recreational trips. The bulk of the Commission's budget is provided through a combination of state and federal grants. The largest is a line item in the National Marine Fisheries Service (NMFS) budget funding the Atlantic Coastal Fisheries Cooperative Management Act of 1993. The Commission also receives funds from NMFS to carry out the mandates of the Interjurisdictional Fisheries

Act of 1986 (P.L. 99-659). The U.S. Fish and Wildlife Service also provides grant funding through its Federal Aid in Sport Fish Restoration Program (Wallop/Breaux). In addition to providing administrative support, the Commission is a partner in the Atlantic Coastal Cooperative Statistics Program, a state and federal partnership for Atlantic coastal fisheries data collection and management. Funding for this program is provided by the Atlantic Coastal Fisheries Cooperative Management Act.

The Commission serves as the deliberative body of the Atlantic coastal states, coordinating the conservation and management of near shore fishery resources. Each state has one vote. The 15 member states of the Commission are Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida. Each state is represented by three Commissioners: The director for the state's marine fisheries management agency, a state legislator, and an individual representing fishery interests appointed by the governor. These Commissioners participate in the deliberations in the Commission's five main policy arenas of:

- Interstate fisheries management
- Research and statistics
- Habitat conservation
- Recreational fisheries
- Law enforcement.

The Atlantic States Marine Fisheries Commission differs from the Gulf States and Pacific States Commissions by virtue of its fisheries management role, actively managing 22 species of fin and shellfish. Generally, Commission managed species are those with a strong link to state waters. Estuarine habitat may provide critical spawning and nursery areas, or these species may spend a significant portion of their lives in state waters. Some species migrate “vertically” through state jurisdictions, while others range “laterally” between state and federal waters. In all cases landings occur within the jurisdictions of the states, providing an important opportunity for control.

The management function is handled through a system of individual species boards consisting of the Commissioners from the states with an interest in the fishery. Technical committees and advisory panels provide scientific and stakeholder advice. The full Commission reviews and approves the actions of the management boards. Generally the Commission’s strategy is to set broad goals for a fishery, and then define a range of acceptable management measures to accommodate the needs and concerns of the individual states. The Commission process allows the states to design a management plan that they know they are capable of implementing.

Obviously most marine species do not remain exclusively within state waters. In the case of Atlantic striped bass, a species severely depleted in the early 80’s, federal action closed the Exclusive Economic Zone to fishing. This pushed management into the exclusive control of the states, which implemented a five-year moratorium and subsequent rebuilding plan through the Commission. The states were well-positioned to enforce the moratorium by monitoring fishing activity within their waters and inspecting land-

ings of both commercial and recreational fishermen. From a low of 20 million pounds, striped bass stocks have been restored to 160 million pounds, a historic high, and notable fisheries success story.

For other species, where federal plans do not exist, Commission plans are supported through regulations requiring compliance with the state laws in which the fish are landed. This is the mechanism being used for American lobster, the most economically important species managed by the Commission. In other cases, the federal-state jurisdiction issue is addressed through joint plans between the Commission and the cognizant regional fishery management council. Summer flounder, scup, and black sea bass are managed under such an arrangement. In this joint plan, the states have effectively used their ability to control landing activity to essentially control total allowable landings as well as allocations among the states for fish harvested in both state and federal waters.

There are important differences between the Commission management process and other arrangements used to manage natural resources. State directors have a strong presence in the Commission process, and their actions reflect their professional training as natural resource managers. At the same time, legislative and governor-appointed Commissioners provide stakeholders with a greater voice than they might have in a process conducted exclusively by professional managers. The one state one-vote concept drives the delegations to address the stakeholder-resource balance at the state level. Each of the three Commissioners on a state delegation are empowered through the null vote, which cancels a state’s vote if the delegation can not reach agreement.

The Commission process is generally quicker than federal processes. State directors know what is practicable within their state agencies, programs, and constituents. Sitting as Commissioners they decide on action, design a plan, then return home to implement it. This differs from the regional councils whose actions are reviewed by NMFS and must be approved by the Secretary. The Atlantic Coastal Fisheries Cooperative Management Act of 1993 (P.L. 103-206) essentially makes Commission plans binding on the

affected states. The Act provides a mechanism for the Secretary of Commerce to take over (and close) a state fishery when it is found to be out of compliance with a Commission plan. To date, the threat of this action has been a useful tool to encourage states to address and resolve their internal constituent differences with Commission decisions.

In addition to having flexibility to address the regional differences in the biological characteristics of a fishery, the Commission process recognizes and respects the significant political reality of states' sovereignty. The process provides a greater degree of resolution in addressing stakeholder needs and concerns. One of the important tools developed by the Commission is the concept of conservation equivalency. As striped bass stocks recovered for example, states were able to select from a combination of size and creel limits as well as season lengths to control their recreational harvest. This strategy has obvious benefits towards promoting greater stakeholder acceptance and compliance compared to a one-size fits all approach.

The Commission process is essentially a state process. Although there is close collaboration with federal fisheries scientists for example, state scientists form the majority of the species technical and scientific committees. A considerable portion of Commission resources and staff time are directed to the important work of sponsoring and staffing management and technical committee meetings. This provides for a high degree of participation by the states, encourages understanding and buy in of the results.

Beyond fisheries management, the Commission also recognizes the importance of fisheries habitat. The estuarine areas present a significant challenge as they provide critical spawning, nursery, and foraging areas for many marine species. By one estimate more than 90 percent of all Atlantic coast federally managed species are at one point in their life cycle dependent on activity that takes place in state waters. Yet these same marsh and tidal areas are under intense pressure from coastal development and the impacts of agricultural and urban activities. The Commission has provided an important forum for the states to develop strategies to address these issues.

Looking forward, the Commission recognizes the key role data collection plays in effective fisheries management. Management of both federal and Commission species could be greatly improved with a better understanding of fishery effort, landings, and discards. The Commission is an active partner along with the states and other federal agencies in the Atlantic Coastal Cooperative Statistics Program an important effort to improve the quality and accessibility of fishery data.

As reflected in its mission statement, the Commission's focus is on responsible stewardship of marine fisheries resources. While the Commission consists of states, its purpose is not to promote a particular state or a particular stakeholder sector. Instead, the Commission serves as a forum for the states to address fisheries resource issues in a collective and cooperative manner, achieving more as a group than they could as individuals. The Commission's positive record in marine resource stewardship has earned it a reputation for effectiveness and efficiency.

For more information regarding the Atlantic States Marine Fisheries Commission and its activities, please visit our web site at www.asmfmc.org.

IMPROVING EFFECTIVENESS OF THE REGIONAL FISHERY MANAGEMENT COUNCILS

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Introduction

A cliché of fishery management is that we are managing people, not fish. If achieving the objectives of the Magnuson-Stevens Fishery Conservation and Management Act requires managing people, a critical intervention point for improving management effectiveness is where the involvement of people is the greatest – the regional fishery management councils.

The regional fishery management council system is under strain. Since the inception of federal fishery management in 1977, fisheries have undergone development and growth, stress and decline. Management problems have been caused by the race for fish, a short-term perspective, an over-investment in fishing capital and an under-investment in the information base of management. Pressures for improving management performance are growing, evidenced in part by the 1996 Sustainable Fisheries Act and by the large number of lawsuits contesting federal management decisions (Botsford et al 1997; Restrepo et al. 1998; Ecosystems Principles Advisory Panel 1999; Heinz Center 2000; National Academy of Public Administration 2002.)

In failing to address the race for fish, the problem of overcapacity, and the need to manage for long-term productivity, management through the regional council system has become increasingly complex and costly. Losses in biological and economic productivity have required more complicated regulations, expanded requirements for information, and created more conflicts among user groups. In turn, these factors have increased management costs while undermining

management legitimacy and effectiveness (Hanna 1997; 1998).

The Sustainable Fisheries Act (SFA) introduced much stricter standards for the protection of fish populations and their habitat. But the SFA did little to address the fundamental economic problems that continue to plague fisheries. Fishery management under the council system has been conducted, for the most part, in avoidance of the fundamental economic problems facing fisheries. Many fisheries are managed under regulations that still promote a race for fish, with incentives that are incompatible with long-term sustainability. Fisheries are almost universally over-capitalized. Economic data and analysis are inadequate to the information required. Management costs are high. Each of these problems diminishes the effectiveness of management (Judicello et al 1999; Heinz Center 2000.)

Improving Management Effectiveness

This paper recommends solutions to the economic problems plaguing fisheries to improve the effectiveness of the regional fishery management council system. The recommendations are: institute property rights, allow the use of market-based allocation mechanisms, invest in social science, integrate economic and biological goals, educate fishery managers, and monitor and evaluate fishery management outcomes.

Institute Property Rights

The absence of property rights in fisheries creates uncertainty that provides an incentive to emphasize

short-term over long-term goals. Without property rights, ownership of fish is possible only at capture. Fishermen compete for ownership through the race for fish and invest in levels of capacity that will maintain their competitive position. Seafood processors expand their plants to accommodate the increased volumes of fish being landed. The result is over-investment in fishing and processing capacity.

Once a fishery has more capacity than the resource can support at profitable levels, economic productivity is lost. Overcapacity forces managers to focus on short-term allocation problems at the expense of long-term strategies. Assurance about the future declines, and conflict among competing interests increases. Management costs rise. Many U.S. fisheries reached this condition by the early 1980s.

Lacking property rights that assign levels of use, a lot of management time is devoted to designing regulations that are fair to diverse groups and that sanction those who fail to comply. A different approach would be to encourage the development of property rights and responsibilities that promote long-term perspectives, define responsibilities associated with rights, and reward desired behavior. The existence of property rights would allow the focus to shift toward performance-based regulation, where the right to fish depends on certification of meeting specified conditions (Hanna 1999; 2001.)

Recommendation: Require some form of property rights to be instituted in all federally managed fisheries to provide consistent expectations about rights and responsibilities of fishery participants.

Allow the use of market-based allocation mechanisms.

Market based allocation mechanisms, such as individual transferable quotas, community development quotas, and transferable gear quotas use the power of the market to allocate quota shares among fishery participants. They substantially reduce the time managers spend in allocation decisions and have been shown to be effective mechanisms for reducing fishing capacity (National research Council 1999.)

A range of costs are associated with the moratorium placed on market-based regulatory instruments like individual tradable quotas (ITQs) in 1996. Fleet profitability has suffered as overcapacity lingers. Conflicts over limited resources continue. Regional fishery management councils have continued expensive allocation processes at the cost of finding time to experiment with new technologies that have the potential to enhance ecosystem monitoring, data entry and ecosystem-based management.

Recommendation: Congress should remove the moratorium on individual transferable quotas and allow regional fishery management councils to use these and other market-based tools in fisheries for which they are appropriate. Specific design constraints, such as prohibitions against transferability, should not be written into law.

Invest in Social Science

The idea behind the council system is that people with working knowledge of regional fisheries can make the most informed decisions about those fisheries. The effectiveness of council decision-making rests in large part on the quality of the information describing and predicting the people they manage (Heinz Center 2000.) A look at the meeting agenda of any regional fishery management council will confirm that a large proportion of council meeting time is devoted to human issues – to allocating allowable catches among competing interests. But the investment in social science – in the data and research to understand the human components of fisheries – is insufficient to enable councils to be as effective as possible. The social science that exists does not provide in-depth description and prediction on an ongoing basis (National Academy of Public Administration 2002.)

Part of the problem is too few trained social scientists in positions to conduct research.

For every one economist or social scientist in the National Marine Fisheries Service (NMFS) there are 26 biologists or ecologists. NMFS has long recognized the deficiency in its economics staffing and has

developed an ambitious plan to increase the number of economists and social scientists and to enhance economics and social science data, but this effort is progressing slowly. Systematic inadequacies in economic data collection, many of which are the result of legal prohibition as well as low levels of funding, hinder analysts. The scientific validity of analysis suffers, and councils are often in a position of learning about the human end of fisheries through anecdotes or public testimony. These forms of information do not provide a systematic representative picture of the people being managed.

There is a need to increase the amount of biological as well as social basic science in fisheries. But given limited resources, the question is where fishery management will get the greatest return on enhanced investment: in expanding biological understanding of each of the species in the 43 fishery management plans or in using social science research to develop tools to reduce exploitation pressure on them? Investments in economics data and research that lead to lower levels of demand for harvest will reduce the fineness of resolution we require of biological assessments.

Recommendation: Encourage substantial public investment in data and analysis on the human and regulatory elements of fisheries.

Integrate Economic and Biological Productivity Goals

The 1996 Sustainable Fisheries Act introduced much stronger protections for the biological productivity of fish populations through requirements to end overfishing, rebuild overfished stocks, reduce bycatch and account for essential fish habitat. These requirements, while reasonable conservation standards, address only part of the picture for long-term sustainability.

Sustainability requires that the biological and economic systems remain in balance. There is an important connection between long-term profitability and stewardship: economic health in the fishing industry provides the surplus that enables investment in conservation. The desire to maintain economic health provides the incentive to conserve. The regional fishery management councils, in setting goals and objec-

tives for fishery management plans have not made explicit the link between biological and economic productivity, nor have they defined specific objectives of maintaining economic and biological productivity. Overall, councils have not managed with full appreciation of the long-term wealth-producing potential of fisheries as public assets. Despite the regulatory requirement to assess economic impacts of proposed regulations, the regional council system does not devote much attention to the production of long-term economic benefits from the fisheries they manage.

Recommendation: Require that all fishery management plans contain specific, measurable economic and biological objectives and that progress toward meeting those objectives be assessed annually.

Educate Fishery Managers

A basic premise of the regional council system is that people who have working knowledge of regional fisheries can make the most informed decisions about those fisheries. Informed decisions require educated decision-makers. The legal requirements and conditions under which management takes place are highly complex. The concepts underlying statistical sampling, stock assessment, impact assessment and cost-benefit analysis – all part of the scientific basis of management – are detailed and difficult.

Yet people are routinely placed on regional fishery management councils without any required training in the legal, biological, and economic tools that form the basis of management. Council members are not necessarily informed about critical components of the management system such as the distribution of decision authority, legal procedural requirements, or the interpretation of biological and economic analyses. As a result, confusion remains among many about which decisions are made at what levels, the legal constraints of regulations, or the likely economic or biological consequences of management. Management costs are increased by efforts to “muddle through” that may require substantial subsequent correction.

Recommendation: Establish training on the federal

management structure, procedures and scientific tools, and require all council appointees to become certified in this training.

Monitor and Evaluate Fishery Management Outcomes

The short-term focus of management prevents the development of experiments that would increase management adaptability. New regulatory requirements such as those added by the SFA are increasingly proscriptive and limit the flexibility with which management can meet its objectives.

Fishery managers spend a lot of time trying to figure out how a regulation will affect different sectors in the fishery and whether it will be effective in achieving the desired results. Compared to the amount of time spent developing regulations, very little time is spent assessing the performance of regulations once implemented. The objectives of fishery management plans are usually vague and immeasurable, discouraging assessment of effectiveness. The existence of explicit performance indicators – either biological or economic – is rare.

Recommendation: Require that all fishery management plans contain specific plans to monitor and evaluate management performance according to specified, measurable biological and economic indicators.

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REGIONAL FISHERY MANAGEMENT COUNCILS

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Introduction

First, I want to thank the organizers for inviting me to participate in this workshop on improving regional ocean governance in the United States. I have been assigned one of the richer topics the Regional Fishery Management Councils.

Most of us consider 2002 as the 26th anniversary of the Magnuson-Stevens Fishery Conservation and Management Act, (hereto referred to as the Magnuson-Stevens Act) but probably few of us recall that 2002 is the 29th year anniversary of the Regional Council System. Almost three decades ago, the blueprint for the Fishery Council system was drafted, and three years later the Magnuson-Stevens Act was the mechanism used to fill in the details.

Yes, I am correct, the Regional Councils preceded the Magnuson-Stevens Act¹. Indeed, by April 1975 comprehensive Fishery Management Plans were being developed with timetables for implementing conservation measures. Although these plans were never actually put into effect, they were developed long before President Ford signed the Act on April 13, 1976, which became effective in March 1977.

A Little History

In 1964, Congress passed the Bartlett Act², which excluded foreign fishing vessels from U.S. territorial waters and prohibited foreign fishing vessels from harvesting the resources of the continental shelf. This Act gave the federal government a role in marine fisheries but mostly one of enforcement. Two years later, Congress enacted the Contiguous Fisheries Zone Act³ creating a nine-mile contiguous zone from the three-

mile limit of the territorial sea to 12 miles from the shore in which foreign fishing was excluded. For the next decade, there was a lot of federal-state planning, federal-state committees established and then replaced by regional marine fisheries councils, and fisheries management plans developed by the councils but never fully implemented. Perhaps, it was because the federal role with the Bartlett Act as supplemented was still primarily limited to data gathering and law enforcement against foreign fishermen. However, during these years, the blueprint of the Council system was being developed.

The Commission on Marine Science, Engineering, and Resources (also known as the Stratton Commission) reported in 1969 that “to rehabilitate domestic fisheries, the Nation must eliminate the overlapping conflicting, restricting, Federal, State, and local laws” which hampered fisheries management. Also, the 1969 report noted that many fish stocks were being depleted or threatened with depletion through over fishing by foreign and domestic fishermen.

Comptroller General of the United States in his report of February 18, 1976, entitled *Action is needed now to Protect Our Fishery Resources* noted the problems associated with common property resources, fragmented jurisdictions, and imprecise biological data to make decisions. The report further stated that because the States had trouble agreeing on management measures and timelines, “the Congress should consider giving the Secretary of Commerce statutory authority to impose management measures on U.S. fisheries when states fail to do so”

It is of interest to note that between the passages of

the Bartlett Act the Magnuson-Stevens Act, a decade later, the federal government had promulgated not a single regulation affecting fishing outside state waters.

I have two favorite quotes one from Robert F. White and the other from Elliot L. Richardson at a National Conference for Regional Management Councils in Arlington Virginia, September 1976.

Robert F. White, NOAA Administrator, and convener of conference stated, “ *We begin one of the most unique natural resource management and conservation tasks in the history of our country. The fisheries management principles outlined by the Act are far reaching. They provide the framework for innovative approaches to our management problems. Under these principles, management will be based on science enrooted in conservation. And it is up to us, all of us in the room, to make a new fisheries management system work. By succeeding in this venture we will have done more than pioneer a new direction in fisheries conservation and management, we will have set out new directions in federal and state relations and new concepts of user involvement in governmental decisions,* ”

At the same Conference, then Secretary of Commerce, Elliot L. Richardson stated eloquently his support for the council system. He said, “ *Let me assure you of my wholehearted support for the principle of Regional Management which is a basic element in the Act. We all talk about the desirability of having decisions made where the people and the problems are and that means out of Washington. Washington has enough problems of its own to be sure and some of the problems where you are are problems inflicted on you by Washington. But, certainly the concept of dealing with regional problems through people with intimate knowledge of those problems is a sound concept. These Regional Councils also have the great and almost unique advantage of involving knowledgeable and experience private citizens and state and federal fisheries officials. This involvement provides comprehensive consideration of the total regional equation of marine resources. Conditions, which sustain them. And the demands being made upon them. I'm enthusiastic about the concept of these Councils and am confident that it will work effectively.* ”

The Magnuson-Stevens Act and the Regional Fishery Management Councils Section 302(a)

NMFS guides while the councils lead in the management of ocean fisheries under the Magnuson-Stevens Act. The Councils are unique governmental entities, mixed bodies of private and public officials with substantial real, not advisory powers to devise measures affecting hundreds of thousands of commercial fishers and millions of recreational fishers. They reflect regional differences, especially differences in the user groups involved in the fisheries. Because they are chosen from lists prepared by state governors, and because the chief state fishery officials are statutory members, they reflect interest of the constituent state.

The eight Regional Fishery Management Councils are established for the New England, Mid-Atlantic, South Atlantic, Caribbean, Gulf of Mexico, Western Pacific, and North Pacific regions (See Figure 1).

The eight Councils prepare fishery management plans (FMPs) for those fisheries both commercial and recreational, which they determine requires Federal management. Every FMP must have an environmental impact statement or an environmental assessment. After public hearings on these plans, the Councils submit revised FMPs to the Secretary of Commerce for approval. Implementing Federal regulations are published in the *Federal Register* for approved plans. The Councils may amend or revise plans through a similar procedure.

Today, there are 42 Fisheries Management Plans in effect and an additional one is being developed. Many of these plans have been amended several times since first implemented. The Regional Councils also manage a very valuable resource. According to NMFS, commercial landings by U.S. fishermen at ports in the 50 states were 9.5 billion pounds or 4.3 million metric tons valued at \$321.2 million (down 9 percent) compared to 2000. Finfish accounted for 87 percent of the total landings, but only 46 percent of the value. The 2001 average exvessel price paid to fishermen was 34 cents compared to 39 cents in 2001.

The 2001 marine recreational fisheries finfish catch including fish kept and released (discarded) on the

Atlantic, Gulf, and Pacific coasts was an estimated 40.3 million fish taken on an estimated 84.3 million fishing trips. The fish taken (fish kept or released (dead)) was estimated at 186.7 million fish weighing 262.4 millions of pounds.

U.S. consumers spent an estimated \$55.3 billion for fishery produces in 2001. The 2001 total include \$38.2 billion in expenditures at food establishments, 16.8 in retail sales for home consumption, caterers and \$276.3 for industrial fish products. Fisheries products are valued by consumers provide a livelihood for the commercial fishermen, and relaxation and pleasure for the recreational fishermen. Decisions made by the councils impact not only economics but diverse user groups,

No wonder, council decisions rarely leave everyone with a warm fuzzy feeling. Good conservation decisions can, in the long run, be a win-win situation but an immediate allocation decision more than likely leaves both winners and losers in its wake. Those perceiving themselves to be short-changed in the Council process may argue vehemently for less authority for the Councils and sometimes even for more control by the Secretary of Commerce.

Those that perceive themselves as winners may argue to maintain the status quo, that is, to let the Councils to make decisions and manage the resource.

Because there are winners and losers, it is hard to know whether the “problems” identified are real or are simply reflections of the disappointment of disgruntled user groups which have been losers in the political give and take of a particular allocation battle. There can be little doubt that user groups have sought changes in the system. As a reflection of this, the Magnuson Stevens Act is one of the most often revised statutes in the United States Code. Enacted in April 13, 1976,, it has been amended no less than twenty times in twenty-five years. Major amendments were adopted in 1978, 1980, 1983, 1986, 1990, and most recently 1996. Yet, even with all this past tinkering and continued nagging dissatisfactions and at times highly charged debate on issues facing the Council and industry, the Council system, in my opinion, is a strong, effective, piece of participatory public policy.

The Councils in Magnuson-Stevens Act – Areas of Tension

From their inception until now, many concerns have been voiced about the fairness and efficiency of the Councils and their operations. These issues include “who is in charge?” federal or non-federal status of the Councils, adequate funding, scientific information needs, the applicability of the National Environmental Policy Act and the Federal Advisory Committee Acts, lengths of the review process for plans, whether the Council could hire their own lawyers, extension of emergency rules to 180 days from 90 days? whether the Secretary of Commerce could take emergency action for other than biological reasons, Council membership and conflict of interest.

As mentioned earlier, the Magnuson-Stevens Act is already one of the most revised statutes in the United States Code, but questions remain. What are those areas that need to be changed, how can the present regime be improved, and if it cannot be improved, what would you replace it with? These questions will face the new 108th Congress as the Magnuson-Stevens Act is up once again for reauthorization.

I would like to focus on the Council membership, which has been discussed at most reauthorization to show how it has evolved but maintained regional knowledge and experience.

The Composition of the Councils

A perennial concern among the various user groups around the country is the asserted imbalance of the membership of the Councils. As mentioned earlier, members are chosen from lists prepared by state governors, and because the chief state fishery officials are statutory members they reflect the interest of the constituent states. While councils are made up of individuals who have other jobs, council chairs, elected by the members, meet frequently to forge common policies reflecting the institutional interest of the councils.

The council membership issue has been reviewed at most oversight hearings and amendments proposed during reauthorization hearings. The Council

Membership provisions have been amended several times. A summary of those changes by year enacted follows:

1983 Requires the Secretary of Commerce to appoint to the Regional Fishery Management Council only persons with fishery resource background.

1986 Requires members of the Regional Fishery Management Councils to be knowledgeable and experienced with regard to the conservation and management of the fishery resources of the geographic area concerned. Prohibits the governors of a state from submitting names of individuals to the secretary of commerce for appointment to such councils unless the governor has first consulted with commercial and recreational fishing representatives of the state regarding such individuals. Prohibits an individual's appointment to a council position until such individuals comply with certain financial disclosure requirements. Provides a three-year term for each voting member appointed.

1996 Modifies Fishery Management Council requirements regarding composition operations, jurisdiction, disclosure of financial interest and other matters.

These amendments sought to remedy the perceived Council imbalances. However, despite Congress's efforts, widespread concerns regarding the Council's composition continue. Although there will always be some group somewhere that will feel that they are not adequately represented, what additional improvements can be made in the nomination and appointment system?

In my opinion, the Councils are an innovative, participatory management system involving the federal government, the states, the fishing industry and other entities interested in the fisheries. Can the system be improved? Of course, if I was in charge of the world, I would: (1) separate allocation decisions from conservation decision; (2) consider all limited access mechanisms including expanded use of Individual Fishery Quotas (IFQs) as management tools at Councils discretion⁴; (3) make science more transparent;

and (4) develop performance measures review decisions made by Council.

The Council system has been operating for almost three decades. We should carefully and analytically examine its strength and weaknesses as we consider regional governance for the future.

Notes:

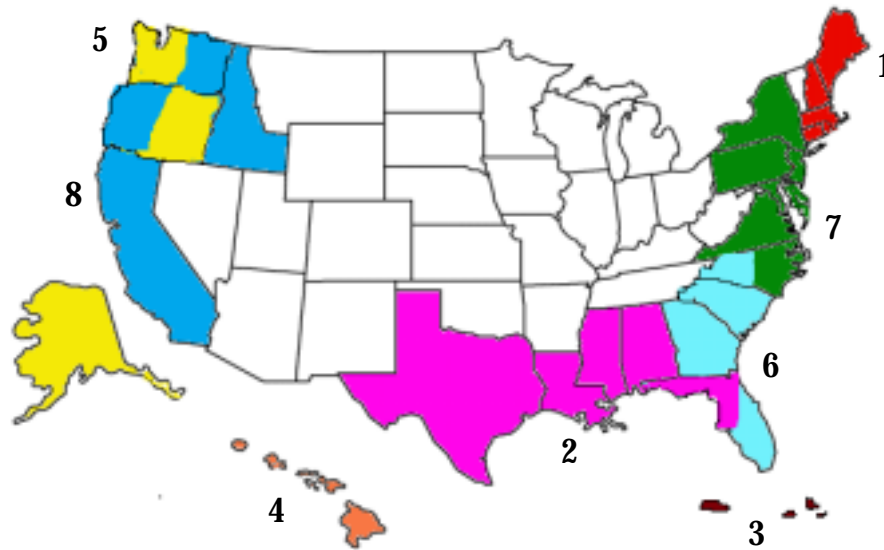
¹ In October 1971, NMFS established the State-Federal Fisheries Management Program for cooperative management. Federal-state management committees were formed composed of state fishery administrators concerned with particular species and NMFS regional directors, and members of the private sector also assisted. During 1972, NMFS formally discussed cooperative management with 21 state officials. By June 1973, six state-federal management committees had been established for species such as American lobster, surf clams, northern Atlantic shrimp, Dungeness crab, Gulf menhaden, and South Atlantic shrimp. In late 1973, these six committees were replaced by five regional marine fisheries councils with high-level representation to review and decide on policy issues. The five councils were: New England, South Atlantic, Gulf of Mexico, Western (California, Oregon, and Washington), and Alaska.

² Public Law Number 88-308, 78 Stat. 194 (1964)

³ Public Law Number 89-658, 80 Stat. 908 (1966) repealed 1977

⁴ I thank William Hines of the National Marine Fisheries Service for reviewing this brief paper and trying to keep me out of trouble. I appreciate his efforts.

Figure 1: Regional Fishery Management Councils



1 **New England**
(CT, MA, ME, NH, RI)

2 **Gulf of New Mexico**
(AL, FL, LA, MS, TX)

3 **Caribbean**
(PR, U.S.V.I.)

4 **Western Pacific**
(AS, GU, HI, CNMI)

5 **North Pacific Fishery**
(AK, OR, WA)

6 **South Atlantic**
(FL, GA, NC, SC)

7 **Mid-Atlantic**
(DE, MD, NC, NJ, NY, PA, VA)

8 **Pacific**
(CA, ID, OR, WA)

RECOMMENDATIONS FROM THE OFFSHORE ENERGY INDUSTRY ON OCEAN GOVERNANCE

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Editor's Note: The following paper, kindly contributed by Tom Fry, represents the perspectives of the offshore energy industry on national and regional ocean governance presented to the U.S. Commission on Ocean Policy.

In support of the Commission's development of recommendations for a coordinated and comprehensive national ocean policy and final report in 2003, the American Petroleum Institute, the Domestic Petroleum Council, the Independent Petroleum Association of America, the International Association of Drilling Contractors, the National Ocean Industries Association, the Petroleum Equipment Suppliers Association, and the United States Oil and Gas Association, are pleased to submit the following recommendations on ocean governance.

Basic Principles of Ocean Governance

The Commission has identified governance as one of four major issue areas under consideration, specifically the roles of federal, state, and local governments as they relate to the oceans and the management of living and nonliving marine resources. The Commission's September 2002 mid-year report, concluded that "[w]hat is lacking is a comprehensive strategy that would allow for the management of ocean resources within an integrated framework: one that would balance the protection of marine resources with responsible use. . . ." The Commission noted that the current system includes 60-plus congressional committees and subcommittees overseeing almost 20 federal agencies and permanent commissions, governed by more than 140 federal ocean-related statutes.

The energy industry has participated fully in the Commission's year-long comment and education process. We have focused on the need to reform the Coastal Zone Management Act (CZMA) consistency review process in testimony and comments dealing with governance issues. Industry continues to recommend that the Commission should exercise caution

in considering broad new ocean governance laws. Although problems such as delays in the CZMA process are well documented, the existing framework of federal law and agency responsibilities is generally adequate and appropriate to protect the marine environment and balance the use of ocean and coastal resources.

We also support the need for improvement, well-expressed in your September 17 letter to the President:

"...As the Commission completes its regional hearing schedule and enters its deliberative phase, we will use the wealth of information and advice we have received to develop recommendations to you and the Congress. These recommendations will set the foundation for the coherent, comprehensive, and long-range national policy to explore, protect, and use ocean and coastal resources as called for in the Commission's enabling legislation. Implementation of such a policy may well call for new and creative governance mechanisms, which we fully intend to address in our final report to you in June 2003.

Coordination of ocean governance is the key. This can be accomplished under existing government structures, laws and regulations. An Ocean Policy Coordinator could be established in the Executive Office of the President, such as in the Office of Management and Budget. The purpose of this coordinator would be to establish and maintain a collaborative mechanism through which the various Federal agencies would agree upon and implement policy goals and objectives. The output of this process would be coordinated agreements with clear lines of authority and accountability, and a distinct improvement in overall ocean governance.

Recommendations for new and creative governance mechanisms should be guided by the following basic principles:

- Recognition of the role of clear national ocean resource priorities such as OCS energy production, and the need for mixed and balanced use of all resources;
- Maintenance of the DOI/ MMS role as manager of offshore energy development;
- Maintenance of existing federal administrative agency authorities and substantive ocean governance laws as the foundation for enhanced policy coordination and conflict resolution mechanisms;
- Utilization of existing federal administrative mechanisms to the greatest degree practicable, such as the Executive Office, Office of Management and Budget;
- Establishment of new or enhanced federal government roles as needed by Executive Order, without statutory or regulatory change;
- Evaluation of potential recommendations against well-documented resource and interagency problems to ensure that real potential for improvement;
- Equal consideration of environmental, economic, technical feasibility and scientific factors in conflict resolution and policy coordination;
- Enhancement of regulatory process certainty in ocean resource management;
- Enhancement of a public/ industry customer-based approach by government to ocean resource management (MMS/energy, NOAA/fisheries);
- Enhancement of interagency coordination based on accountability for advancement of national ocean resource priorities.

The Link between Ocean Governance and U.S. Energy Policy

One of the most important outcomes of the Commission's ocean governance recommendations should be clear support for the President's National Energy Policy. Industry and government must work together to demonstrate that energy production does not compromise environmental quality. The Commission's recommendations should focus on placing fair and accurate information regarding energy and the environment before the American people so that we can fashion a truly forward thinking energy policy. As President George W. Bush has stated, "America must have an energy policy that plans for the future, but meets the needs of today. I believe we can develop our natural resources and protect our environment."

The Administration's May 2001 National Energy Policy establishes several basic principles, which should be the foundation for the Commission's recommendations relative to OCS energy resources. The Commission has a unique opportunity to focus America's citizens and political leaders on these clear directions and critical choices in ocean and coastal resource policy. The following principles are as applicable to a successful national ocean policy as they are to a successful national energy policy:

"The Policy is a long-term, comprehensive strategy. Our energy crisis has been years in the making, and will take years to put fully behind us." Citizens of our coastal communities and states, and their elected representatives, recognize the need for domestic energy supplies and the problems caused by the leasing and drilling moratoria. As things currently stand, less than 20% of the federal OCS is open to offshore energy exploration and development — either currently under lease or scheduled for lease sales through the next five-year plan. We must move away from these self-defeating moratoria on natural resources and toward the sound management of our nation's energy needs and supply.

"The Policy will advance new, environmentally-friendly technologies to increase energy supplies and encourage

cleaner, more efficient energy use.” Citizens of our coastal communities and states, and their elected representatives, need to understand the true environmental, economic and societal effects, impacts and consequences of OCS energy development. Industry too, must do its part to demonstrate that the new technological advances in drilling allow it to develop needed domestic supplies in an environmentally sensitive manner. In the same decade that we have seen phenomenal advances in offshore technology, the barriers to offshore oil and natural gas exploration have actually increased. We hope that the growing technological potential will motivate our policymakers to identify and recommend policies that will remove barriers to access and the development of offshore energy supplies.

“The Policy seeks to raise the living standards of the American people, recognizing that to do so our country must fully integrate its energy, environmental, and economic policies.” This requires the citizens of our coastal communities and states, and their elected representatives, to recognize that America’s OCS resources, and the promise of American living standards, belong to all Americans. It requires the federal government leadership to implement a U.S. energy policy that takes a balanced approach to natural resource use, conservation, and preservation. Our ocean and coastal policy must recognize that citizens are also resources; an educated public may be our most valuable ocean and coastal resource.

The Governance Problem from an Energy Perspective

As we have previously put forth to the Commission, the most serious governance impediment to the nation’s offshore energy program currently is the lack of predictability caused by implementing regulations and statutes that govern state/federal consistency determinations under the Coastal Zone Management Act (CZMA). This lack of predictability, in terms of delays in agency permitting and planning, is among the most significant, preventable problems facing industry today.

Unfortunately the unpreventable problem of a declining resource base in the United States has

converged with politically-driven decisions that increasingly restrict access to prospective natural resources off our shores. Even in areas where development is permitted, oil and gas exploration and production activities are frequently stalled or halted by a progressively less predictable approval process. This lack of predictability stemming from the CZMA consistency process represents the most significant obstacle to industry’s ability to explore for, and produce, U.S. oil and natural gas in an environmentally compatible, timely and cost-effective manner.

You have previously been provided industry’s detailed recommendations to assist you in examining and improving the implementing regulations and statutes that govern state/federal consistency determinations under the Coastal Zone Management Act. Enacted in 1972 with the goal of balancing and managing the often competing and conflicting demands of coastal resource use, economic development and conservation, through cooperative partnerships among federal, state, and local governments, the CZMA has achieved many successes in its time, including acting as a vehicle for the distribution of nearly 100 million dollars per year for state coastal programs.

The CZMA is also intended to facilitate the coordination and cooperation of state and federal agencies to ensure expedited governmental decisionmaking for the management of coastal resources. This presents an opportunity to support new and creative governance approaches as well. Industry urges the Commission to recommend the following improvements in the CZMA process with respect to energy-related actions and projects through appropriate statutory, rule and/or policy amendments:

Limit a state’s CZMA consistency review of private permits over activities outside of its own coastal zone. The CZMA was intended to grant a state the right to conduct a consistency review of federal licenses and permits within the territorial boundaries of that state and oil and gas activities occurring on the OCS that would have direct impacts in the coastal zone of that state. However, the statute has been implemented to allow states to review activities and block permits for activities taking place in and seaward of other states,

sometimes more than 100 miles from the reviewing state's coast. Each affected state would still be allowed to conduct a consistency review for all licenses and permits within its boundaries, but unnecessary "extraterritorial" state and resource use or permit conflicts with other states would be prevented.

Allow a single consistency certification for an Outer Continental Shelf (OCS) plan to cover all activities, including air and water permits. The energy industry has experienced inordinate delays due to the lack of coordination between federal agencies in processing permits for OCS, especially involving separate state consistency reviews for the permits. The efficiency of state consistency reviews for OCS exploration or development plans would be improved by using a single consistency certification for all related permitted activities, including air and water discharges.

Grant the Secretary of the Interior the authority to determine information requirements for consistency certifications. Some states have used findings of a lack of information to delay decisions, deny consistency certifications and obstruct OCS activity. However, the Secretary of the Interior has adopted detailed information requirements for OCS exploration and development plans under the provisions of the Outer Continental Shelf Lands Act (OCSLA). The OCSLA specifies requirements for the Department of the Interior's consultation with state coastal zone authorities regarding areas of particular state concern. The Secretary of Interior is in the best position to conduct an analysis of the information requirements.

Provide the Secretary of the Interior with the authority to determine state appeals concerning OCS energy activities. Again, the Secretary of the Interior's expertise regarding OCS exploration and development plans and their environmental effects makes the Interior Secretary best suited to implement the law in this area.

Ensure timely decisions on override appeals. Appeals to consistency determinations are often drawn out by the Commerce Department's implementation requirement that the deadline for decisionmaking does not begin to run until the administrative record is closed. The law

needs a definite decision deadline governed by the date when the appeal was filed. The need for predictability in these override decisions mandates a predetermined time for review; otherwise, the decisionmaking process will always be potentially subject to policy-driven delays.

Examine efficient state consistency permitting practices that are already in place. Many states engage in practices that streamline the consistency review process. Some states allow for consistency reviews of projects that may impact the environment during the projects "scoping" phase. Another state practice that could have a streamlining effect is the provision of a conditional consistency finding, pending final mitigation and monitoring plans.

The OCS leasing program should ensure that lessees that comply with their lease terms and operational requirements should have a fair chance at a return on their lease investment. Instead, the CZMA consistency process has allowed states to unilaterally use the process as a tool in their philosophical opposition to offshore drilling. In a recent case-in-point involving a CZMA consistency dispute over a project offshore North Carolina, the Court of Federal Claims wrote in its opinion: "Common sense suggests that no sophisticated oil and gas company with many years of experience in drilling for oil in offshore leased tracts would knowingly agree to pay the huge, up-front considerations . . . for such tenuous and unilaterally interruptible drilling rights." [Conoco Inc. v. United States, 35 Fed. Cl. 309, 324 (Fed. Cl. 1996)] The court's opinion is correct; unless changes are made, the CZMA consistency process could seriously impede the development of oil and natural gas from the OCS — an activity that currently accounts for approximately 25 percent of domestic energy production.

Industry remains committed to working to support the Coastal Zone Management Act's stated purpose of balancing the competing demands of coastal resource use, economic development, and conservation through cooperative partnerships among federal, state and local governments. The Commission has an opportunity here to make a genuine difference in the

sustainability of the U.S. offshore energy program that could have beneficial impacts for years to come.

The Governance Opportunity: Creative, Common-Sense Improvements

In *“Developing a National Ocean Policy--A Mid-Term Report of the U.S. Commission on Ocean Policy”*, the Commission documented the following highest-priority ocean and coastal resource issues and problems, and observed that the comment process has “also exposed the Commission to a wide range of new and exciting opportunities to address those troubles”:

- “Dramatic increases in population and pollution along our shorelines continue
- The depletion of our fish stocks continues
- Ocean pollution is a growing problem, much of it caused by nonpoint sources
- Water-borne commerce is essential to the Nation’s economic wellbeing
- Oceans and climate are inextricably linked and climate change affects everyone
- Particularly important features of our ocean and coastal environment may require special protection
- Jurisdictional and legal confusion and ambiguity are not uncommon in our coastal laws.
- Multiple use problems are exacerbated by growing litigation, regulatory confusion and delay, and uncoordinated policy.
- The Commission is optimistic that it can provide answers to many serious challenges, yet it is concerned whether there is a sufficient sense of national urgency to implement a coordinated and comprehensive national ocean policy to address these challenges as contemplated by the Oceans Act of 2000.”

Industry endorses the development of a more comprehensive, integrated approach to these issues within the existing federal resource management structure; it supports a wide variety of new and creative solutions. These include a number of innovations before the Commission such as the following from the DOI and others:

- Expanded use of appropriate economic incentives to achieve goals beyond traditional regulatory schemes;
- Utilization of existing agency experience and identification of successful models/ best practices of coordination and management, such as resource management and energy development in the Central and Western Gulf of Mexico;
- Development of performance measures to evaluate improvements in federal ocean policy management and agency coordination;
- Enhanced coordination of cooperative programs to improve the scientific and technical base for reduction of hazards impacting coastal and marine environments;
- Enhanced, federally-led collaborative efforts to characterize the EEZ marine environment, and to provide the science and information base required to protect and develop coastal and marine resources;
- Establishment of protocols and mechanisms to consistently monitor resource protection programs and support realistic management adaptations as needed;
- Development of resource protection, use, and pollution reduction strategies based on improved understanding of the linkage across terrestrial, coastal, and marine systems, and human impacts;
- Development of a comprehensive assessment of the future EEZ energy resource potential, including identification of areas in which

expanded deployment of existing technology is protective of the environment;

- Development of broadly acceptable and adaptable models of marine resource systems, supported across government, academic and resource user communities; and
- Improve coordination among federal and state agencies on watershed and oceanic research, sampling, and mapping.

The Foundation of Governance: Ocean Observation, Information, and Knowledge

Many of the innovations before the Commission to enhance ocean governance are based on expanding the pool of knowledge through scientific research and exploration. Industry is interested in doing its part to advance scientific understanding of ocean resources. While research is not industry's primary goal or function, the production of energy frequently involves companies in intensive research and technological development. U.S. industry continues to lead the world in innovation. The extensive infrastructure deployed throughout the Gulf of Mexico is an example of this innovation and presents significant opportunity for cooperative progress in the scientific arena.

However, industry willingness to contribute to data sharing and scientific research should not be confused with willingness to shoulder the financial or liability burden of non-industry related research. Industry collects large amounts of data in the course of its daily operations, some of which are non-proprietary, and there may be opportunities for cooperation in data accumulation and sharing.

Additionally, industry deploys vessels and platforms throughout the Gulf of Mexico, some of which may be suitable for the mounting of instrumentation. However, serious concerns with regard to safety, liability, maintenance, and data usage must be resolved before industry can move forward with a cooperative program. Industry is interested in the potential for partnerships that would use already-existing infrastructure toward the ocean observation effort. Assuming that all safety, environmental and economic

concerns are met, industry could consider placement of instrumentation at its facilities and coordinate in cooperation with government, academic, and other industry researchers.

In fact many such cooperative efforts are already underway. Industry and government researchers have successfully collaborated on a number of research initiatives. Recently, the Minerals Management Service presented the prestigious Corporate Leadership Award to a team of three industry scientists who helped lead a coalition of industry, government and academic researchers in conducting a study of migratory neotropical birds and their interaction with offshore platforms. The study, which involved the placement of birdwatchers at ten offshore platforms, was one of the first large scale documentations of birds actually engaged in trans-Gulf migration.

Other collaborative public-private research efforts currently underway are looking into the short-term, high velocity "loop currents" as well as weather forecasting. Additionally, numerous fields of research have benefited from the use of Remotely Operated Vehicles (ROVs), a technology advanced primarily by the offshore energy industry as it moved into progressively deeper waters. Now industry, government, and academic researchers alike use these unmanned vessels for oceanography, salvage and rescue, and biomedical marine research. This kind of investment in research and development by the petroleum industry will continue to provide scientific advancements with applications far beyond finding, producing and transporting natural gas and oil. These innovations begin with the natural gas and oil industry but they enrich the lives of all Americans.

Industry is interested in continuing to reach out to the scientific community in a meaningful way. Companies that are involved with OCS exploration and development rely on the oceans 24 hours a day, 365 days a year and are very interested in developing a greater understanding of the marine environment. Industry is studying ways in which it can better overcome concerns regarding the security of proprietary data in order that allow transfer of non-proprietary data to research and academic institutions.

Developing conduits for the free and rapid flow of such information would go far toward helping us better understand the ocean environment. But, the widely varying activities and equipment, safety and liability issues involved with OCS exploration and production mandates that such cooperation be approached on case-by-case basis.

We recommend that the Commission support establishing a coordinating body composed of government agencies, academic representatives and industry trade groups could begin to tackle the complex logistics involved. An adequate framework may already exist in the National Office for Integrated and Sustained Ocean Observation (“Ocean. US”) and the National Oceanographic Partnership Program. A sub-group of this partnership, with Minerals Management Service as the lead agency might begin by tackling individual issues on a discrete basis and resolving concerns in a prudent manner.

The Key to Governance Improvement: Ocean Literacy and Future Leadership

Another critical element in developing and sustaining innovative approaches to ocean governance is the much-needed improvement in U.S. ocean literacy, and in the nation’s ability to attract people to ocean science and leadership positions.

Industry is also concerned about future talent and leadership in both the ocean and energy sciences. The offshore oil and natural gas industry has undergone a sea change in the type of talent that we need to attract. Thanks to revolutionary technological advancements, the industry’s workforce must now be more technically proficient than ever before. Contrary to the prevailing conception of the offshore oil workers as brawny roughnecks, companies now rely on teams of engineers, geoscientists, marine biologists and other highly skilled and highly trained technicians to run the mechanical marvels that drill and produce oil and natural gas in thousands of feet of water.

While technological advances have increased efficiency, safety and environmental performance, they have also uncovered a serious need for a new generation of young

leaders in science and technology. Enrollment in petroleum engineering schools in the United States has fallen from a peak in 1983, when the two largest petroleum engineering schools in the country — Texas A&M University and the University of Texas — had a combined enrollment of 2,738 undergraduates in their petroleum engineering departments. Currently that number stands at 411.

Part of this decline is rooted in the dated perceptions of the oil industry. What many in this country still understand as a smokestack industry is now a knowledge-based commercial process that increasingly relies on the rapid development and application of technology to maintain competitiveness. At a recent World Energy Conference, the noted economist Lester Thurow stated, “The oil industry still produces oil, but it has been infused by so many new technologies that it should be thought of as one of the new manmade brainpower industries like biotechnology.” This change has shifted the industry’s focus to high-tech expertise.

Industry’s recruiting efforts at campuses are shifting into high gear and partnerships with academic institutions are beginning to turn this trend around. Companies are sponsoring scholarships at prestigious universities and working with masters and doctoral programs to ensure that promising students are aware of the challenges and opportunities that await them in offshore energy production. Some of the National Sea Grant programs are actively engaged in this effort. Each year the Texas A&M Sea Grant program sponsors an Industry Outlook Conference in which industry leaders and executives discuss economic and technological forecasts for the offshore industry before an audience of students and professionals.

Conclusion

The offshore energy industry will continue to support and assist the commission as it develops final recommendations for a coordinated and comprehensive national ocean policy. All Americans agree that we must including strengthen the nation’s energy security, protect ocean and coastal resources, and enhance maritime commerce.

TOWARD REGIONAL GOVERNANCE IN THE GULF OF MEXICO

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Examples of regional governance in the Gulf of Mexico region are limited but with the growing attention to the Gulf as a national economic and environmental asset, policy makers at the state and federal levels are encouraging the use of regional mechanisms to better manage and protect Gulf resources and activities. Many of these efforts seem to be realized as a result of federal funding and, often, congressional mandates. This paper introduces three regional efforts in the Gulf: the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, efforts to create a regional aquatic nuisance species management plan, and the Gulf Ecological Management Sites Program. As these efforts illustrate, the key to implementing a regional governance effort in the Gulf of Mexico is through a federally funded and mandated program. Current efforts are being implemented through regional programs such as the EPA Gulf of Mexico Program.

The total area of the Gulf of Mexico is about 600,000 square miles, with a watershed that covers almost two million square miles. Of this area, about 1.6 million square miles are in the United States and Canada. Approximately two-thirds of the area of the continental United States drains into the Gulf, including 33 major rivers and the Mississippi River Basin System which drains over 40% of the continental United States (i.e., over 1.2 million square miles). The inflow from the Mississippi and Atchafalaya Rivers dwarfs the input from any other Gulf Coast system, providing ninety percent of Gulf of Mexico freshwater inflow. (Belefski and Norton 1999) The Gulf region has nearly fifty percent of the nation's coastal wetlands, forty percent of U.S. fish landings, and significant contributions of shrimp and oysters. (Palmer 2002) The Gulf of Mexico is the most active area in

the world for offshore oil with nearly 1,600 outer continental shelf leases in production in the Gulf of Mexico, yielding about 97 percent of U.S. offshore production. Lastly, of the ten busiest ports in the nation, seven are located in the Gulf; of the top seven ports in the world, two are in the Gulf of Mexico - New Orleans and Houston.

In 1988, recognizing the ecological and economic value of and risk to the Gulf's resources, EPA implemented the intergovernmental, community-based Gulf of Mexico Program. The Program was not envisioned nor has it operated as a regulatory program. Rather, it focuses on coordination among federal and Gulf State agencies and involvement of nongovernmental organizations to protect and restore the coastal and marine waters of the Gulf of Mexico. The four main categories of issues addressed by the Program are: public health, excessive nutrient enrichment, habitat loss, and the introduction of nonindigenous or exotic species.

Most relevant to the Program's work in "excessive nutrient enrichment," the EPA formed the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force in 1997 to develop responses to hypoxia in the Gulf of Mexico. Scientific research in the Gulf of Mexico has shown a large area of the Louisiana continental shelf with seasonally-depleted oxygen levels resulting in a large "dead zone" in which most aquatic species cannot survive. Some oxygen depletion, called hypoxia, is a natural event but nutrient over-enrichment from anthropogenic sources is thought to cause significant increases. For example, "after the Mississippi River flood of 1993, the spatial extent of this zone more than doubled in size, to over 18,000 km², and has remained about that size each

year through midsummer 1997.” (Belefski and Norton 1999) Obviously, an hypoxia zone of this size can adversely affect important commercial and recreational Gulf fisheries and the ecosystem as a whole.

There are multiple sources of excessive nutrients in watersheds, both point and non-point, and policy approaches to regulating or reducing pollution sources can differ greatly. As a result, the EPA formed the Task Force and in 1998, under the Harmful Algal Bloom and Hypoxia Research and Control Act (Public Law 105-383), Congress called for the development of a plan of action to reduce, mitigate, and control hypoxia in the northern Gulf of Mexico. The plan proposes a new federal restoration fund to subsidize measures in upstream states to reduce nutrient loadings to the Gulf and the application of existing federal regulatory requirements. (Cannon 2000)

The Task Force was made up of federal agencies, state water quality agencies from Louisiana to Minnesota, and tribes. The members determined that restoration of natural habitats capable of removing nutrients from waters must be fostered using existing federal laws and programs including the Clean Water Act, the Farm Bill, Coastal Zone Amendments and Reauthorization Act, and State cost-sharing programs; the Environmental Quality Incentives Program to assist grain and livestock producers in reducing excessive nutrients’ movement to water resources; Conservation Reserve Program under the Corps of Engineers and Agricultural Extension Education Programs to promote restoration; watershed-based approaches to water quality management, including total maximum daily loads and flood control alternatives under the Coastal Wetlands Planning, Protection, and Restoration Act.

As noted in the Plan, “while the primary focus of this strategy is on reducing nitrogen loads to the northern Gulf, many of the actions proposed through this plan will also achieve basinwide improvements in surface-water quality by reducing phosphorus as well. Likewise, actions taken to address local water quality problems in the basin will frequently also contribute to reductions in nitrogen loadings to the Gulf.” (Ac-

tion Plan 2001). The existence of federal laws that can address non-Gulf activities and a federal mandate to reduce the Gulf of Mexico hypoxia has catalyzed the Task Force’s efforts.

Unlike the hypoxia problem, the Gulf states have not had the cornerstone nuisance invasion such as the zebra mussel in the Great Lakes (though arguably, the destruction of Louisiana wetlands by the nutria rivals economically adverse invasions in other regions). As a result of the perceived lesser threat, the development of a regional aquatic nuisance species plan lags behind that of the hypoxia action plan. The Aquatic Nuisance Species Task Force, the national entity directed to assist in developing and implementing state plans to control exotic or nuisance species, has issued a Guidance for State and Interstate Management Plans noting that one of the goals of a state management plan for aquatic nuisance species (ANS) is to “paint a picture of [nonindigenous] problems and concerns.” (Guidance 2000)

In many cases, the current “picture” is composed of a patchwork of state statutes and regulations prescribing a permitting scheme for possession, sale, transport or release of a species that is found on the state’s “dirty list,” that list of species known to be harmful to the state’s waters or ecosystems. When Congress passed the Nonindigenous Aquatic Nuisance Species Prevention and Control Act in 1990 and called for states to assess the risk of ANS, as well as the methods to curtail and prevent the introduction and spread, most states were aware of the high risk species in their waters—those that threaten economies and ecosystems such as the sea lamprey or zebra mussel in the Great Lakes states. These high risk species are easier to target, however, after they have made true nuisances of themselves. The statute itself was the result of zebra mussel infestation across the lower Great Lakes and the emerging day-to-day crisis propelled the bill forward: “Mussel encrustation of intake pipes shut down the Monroe, Michigan water supply for two days, bringing the impact of the zebra mussel directly to the homes of basin residents.” (O’Shea and Cangelosi 1996)

As states and regions throughout the United States took notice of the economic and ecosystem devasta-

tion resulting from the introduction of one species, they began to reevaluate their own methods of aquatic nuisance management. While aquatic nuisance species are present in the Gulf waters, the Gulf states have been slow to implement protections for a variety of reasons: lack of funding, lack of research on preventative measures, and lack of an “exotics crisis” with a widespread economic magnitude similar to the zebra mussel crisis in the Great Lakes. Without an immediate call for help, state resource departments find it difficult to convince their legislatures of the need for resources to develop management plans. (Fletcher 2000) In addition, how does a resource department create a preventative plan for threats which may or may not exist?

A Gulf Regional Panel of the Aquatic Nuisance Species Task Force has been created to develop regional efforts in the Gulf of Mexico. Most recently, administration of the Panel has been moved from the Gulf of Mexico Program to the Gulf States Marine Fisheries Commission, effective December 31, 2002. At that time, the Gulf Regional Panel will be reformed to begin the development of a regional management strategy for use by states in the implementation of state plans including the operation and staffing of the Regional Panel, coordination of state and federal activities, establishment of research needs and strategies, establishment of a Gulf-wide database, and establishment and revision of Regional Panel and work group goals and objectives. The ultimate goal is the creation and implementation of a regional plan for the Gulf of Mexico, leaving the Marine Fisheries Commission a tall order of regional governance.

Lastly, the Gulf of Mexico Program has initiated the creation of GEMS, Gulf Ecological Management Sites, which are geographic areas that have special ecological significance to the continued production of fish, wildlife and other natural resources or that represent unique habitats. The GEMS Program uses existing federal, state, local and private programs to identify GEMS in each state and build an informational database. Over one hundred special ecological areas have been identified as GEMS and states are collecting information such as size, boundaries, ecological characteristics and current management status

to include in a Gulf-wide information system. The goal of the GEMS information network, supported by Gulf of Mexico Program funding, is to coordinate and to share information between states and agencies about ecologically important sites and appropriate management techniques on a regional basis.

Critics theorize that even though the Gulf of Mexico is a highly valued and at-risk resource, investments in regional efforts, especially regional governance, are lower because parties may believe there is less at stake. For example, the EPA’s budgeted contribution to the Gulf of Mexico Program is “less than a third of its contribution to the Chesapeake Bay Program, and the five states that ring the Gulf have invested considerably less in their joint effort than their Chesapeake counterparts in the Bay Program.” (Cannon 2000) In addition, while governors of state represented in the Chesapeake Bay Program participate in program deliberations, governors of the Gulf States do not. (Belefski & Norton 1999). Another theory is that there is less sense of environmental risk in the Gulf region or that there is a recognition that “some of the Gulf’s water quality problems have their primary source in states along the Mississippi River and other tributaries to the Gulf.” (Cannon 2000)

The similarities between the three efforts above show the direction of regional governance efforts in the Gulf of Mexico beginning with their voluntary nature and ending with a central (and, often federal) body and federal funding. In addressing the dead zone, spread of aquatic nuisance species and protection of unique marine and coastal habitat, the Gulf states have responded to a centralized governance body as a method to collectively examine an issue while reducing transaction costs and allowing for region-wide responses. The existence of a centralized body is necessary, in particular, to respond to the hypoxia problem because a dialogue regarding hypoxia without states and entities from across the Mississippi River Basin is meaningless. While the centralized body exists in the GEMS effort (the Gulf of Mexico Program), states actually identify and manage the sites. This allows for localized approaches within a regional effort.

Unfortunately, perhaps because of reduced funding and perceived insignificant environmental problems, the centralized body can often be called upon to play too many roles at one time. The effort by the Gulf of Mexico Program to evolve the aquatic nuisance species Gulf Regional Panel has been transferred to the Gulf States Marine Fisheries Commission which will likely require a more tailored approach to coerce the five states to address a problem that is most effectively address by prevention rather than reaction. In meeting the challenge before it, the Commission must define responsibilities for the states and employ implementation vehicles such as those illustrated in the hypoxia task force and GEMS program.

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OREGON EFFORTS TOWARD REGIONAL OCEAN GOVERNANCE

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Introduction

The State of Oregon has a long association with regional ocean policy and ocean issues. The state's ocean resources management program, established by the 1991 Oregon legislature, resulted from political momentum generated by two region-scale ocean resource issues. The primary driver was offshore oil and gas leasing proposed for the Oregon-Washington OCS Planning Area throughout the mid-1980s. The other was a proposal by the federal government, shortly after proclaiming the US Exclusive Economic Zone, to lease for exploration and development of polymetallic minerals on the Gorda Ridge, an area the size of South Dakota off southern Oregon and northern California. In each case, the State of Oregon worked with neighboring states to address these issues in a larger physical, biological, and political context. In addition, Oregon is one of three member states on the Pacific Fishery Management Council, the single fishery management council for the 1,500 mile-long US Pacific coast. The actions of this Council affect fisheries in California, Oregon, and Washington.

At the same time, the Oregon coast is about 360 miles long, spanning seven coastal counties and at least two relatively distinct physical, biological, and economic subregions related to ocean resources. Thus, there is the need to balance a broader statewide, i.e. regional, approach to ocean resource policy and management with the need to accommodate more local conditions. As noted below, Oregon's statewide program constitutes a kind of regional framework for addressing management needs at the local scale. The challenge is to create a similar mechanism at the national level to enable states and federal agencies to more effectively

plan for and respond to local management needs within a larger regional, trans-boundary context driven by the realities of physical, biologic, and economic forces.

Oregon's ocean policies provide a regional approach to ocean governance.

Oregon recognizes, as a matter of state ocean policy, that issues regarding management of ocean resources and uses may need to be addressed on a regional basis. This policy, first developed in the Oregon Ocean Resources Management Plan adopted in 1990, is based on an assessment of the dynamics of a variety of ocean resources, ocean conditions, and ocean uses. Statewide Planning Goal 19, Ocean Resources, one of nineteen statewide planning goals with which all state agencies and local governments must comply, incorporates this policy and asserts:

“The State of Oregon has interests in the conservation of ocean resources in an Ocean Stewardship Area, an ocean area where natural phenomena and human uses can affect uses and resources of Oregon's territorial sea. The Ocean Stewardship Area includes the state's territorial sea, the continental margin seaward to the toe of the continental slope, and adjacent ocean areas. Within the Ocean Stewardship Area, the State of Oregon will:

- *Use all applicable state and federal laws to promote its interests in management and conservation of ocean resources;*
- *Encourage scientific research on marine ecosystems, ocean resources and uses, and oceanographic conditions to acquire information needed to make ocean and coastal-management decisions;*

- *Seek co-management arrangements with federal agencies when appropriate to ensure that ocean resources are managed and protected consistent with the policies of Statewide Planning Goal 19, Ocean Resources, and the Territorial Sea Plan; and*
- *Cooperate with other states and governmental entities directly and through regional mechanisms to manage and protect ocean resources and uses.*

The Ocean Stewardship Area is not intended to change the seaward boundary of the State of Oregon, extend the seaward boundaries of the state's federally approved coastal zone under the federal Coastal Zone Management Act, affect the jurisdiction of adjacent coastal states, alter the authority of federal agencies to manage the resources of the United States Exclusive Economic Zone, or limit or otherwise change federal agency responsibilities to comply with the consistency requirements of the federal Coastal Zone Management Act."

Oregon's ocean resources management utilizes a regional perspective.

The Oregon Territorial Sea Plan, adopted in 1994, includes a strategy for managing Oregon's rocky shores. The plan states:

"The strategy encompasses a broad view of the entire coast to provide a larger ecosystem context for meeting local management needs and setting priorities for action through site management plans. A coastwide ecosystem context is important because the management and use of one site can affect management and use of nearby sites (a spillover effect) and because of the diversity of sites and conditions along the coast.

The scientific basis for the strategy is an extensive inventory and analysis of all rocky shore sites on the coast. The inventory was conducted by aerial surveys and field study during the summers of 1993 and 1994 by the Oregon Department of Fish and Wildlife (this inventory is summarized in subsection F.1.)."

The Appendix to the Territorial Sea Plan further elaborates on the regional scale required for managing rocky shore resource management on a site-by-site basis.

"The scale of the marine environment is vast; yet the scale of definable habitats and human use can be much smaller, often at a very precise location. The marine environment thus requires that management account for the tremendous differences in scales of reference. The concept of Large Marine Ecosystems, based on broad regional distinctions and characteristics, is the basis for Oregon's shoreline classification system, which also allows for increasingly fine scales of geographic and ecological resolution and for choosing appropriate scales of research and management."

The specific region-scale frame of reference for Oregon is cited:

"Oregon's entire coastline lies within [the Northern California Current Ecoregion], which extends from Cape Mendocino, California to Vancouver Island, British Columbia, and which extends seaward from the shoreline approximately 500 to 1000 kilometers across the broad, slowly southward-flowing California Current. This is a recognized Large Marine Ecosystem, one of 28 that have been identified around the world as of 1991."

Oregon has actively pursued region-scale marine research:

PNCERS: Pacific Northwest Coastal Ecosystems Regional Study

In 1995, the Oregon Ocean Program initiated PNCERS, the Pacific Northwest Coastal Ecosystems Regional Study, in partnership with the Washington Sea Grant Program and the National Marine Fisheries Service Northwest Fisheries Science Center, funded by the NOAA Coastal Ocean Program in the National Centers for Sponsored Coastal Ocean Research. This interdisciplinary six-year program extended from the Strait of Juan de Fuca, WA to Cape Mendocino, CA and was aimed at providing coastal managers and policy makers with information on how natural variability and human activities have affected the nearshore-ocean and estuaries of the Pacific Northwest. Fourteen principal investigators have led a range of biologic, oceanographic, water quality, social, and economic studies over the past five years. PNCERS has worked to understand large-scale regional patterns

of change and ecosystem principles that would help the region's coastal "practitioners" to understand how these region-scale forces affect local issues and decisions.

Plan for West Coast Nearshore Rockfish Research

In 1999 and 2000 managers, policy-makers, and scientists from Oregon, California, and Washington worked to prepare a region-wide research plan to provide basic information on a wide range of commercially harvested rockfish species that occur along the entire West Coast. This plan outlines a multi-year, interdisciplinary program of scientific research for nearshore rockfish, associated species, habitats, and ecological relationships along 1500 miles of the West Coast of the United States, from Mexico to Canada. Notably, the plan envisions seven sub-regions within which a suite of comparable studies would be conducted, as well as broad scale studies such as genetics, stock assessments, population models, and management alternatives. While this plan has not yet been funded, preparation of the plan reinforced the need to address some ocean resource management issues on a regional scale.

PISCO, Partnership for Interdisciplinary Studies of the Coastal Ocean

While Oregon's state-level ocean management program is not directly involved, a significant region-scale research program is underway along the Pacific Coast. Funded by the Packard Foundation, PISCO involves principal investigators from Oregon State University, University of California at Santa Cruz, Stanford University's Hopkins Marine Lab, and University of California at Santa Barbara. PISCO has a goal of better understanding how large region-scale ocean forces affect the nearshore and coastal shore environments and ecosystems along the entire Pacific Coast. This program has already led to new understanding of the characteristics of region-scale conditions as well as differences in conditions at the local or sub-regional level. PISCO research will be an important component of Oregon's efforts to establish a network of marine reserves along the coast.

West Coast GLOBEC, California Current Studies

West Coast GLOBEC, part of the U.S. Global Ocean Ecosystems Dynamics Program North East Pacific study, is an important research program that provides an essential region-scale framework for the PNCERS and PISCO research discussed above. West Coast GLOBEC focuses on the California Current because it is a region-scale up-welling system that dominates much of the physical and biological dynamics of the West Coast of the US. The overarching goal is to understand the effects of climate variability and climate change on the distribution, abundance and production of marine animals (including commercially important living marine resources) in the eastern North Pacific. Information being produced by GLOBEC lays a foundation for addressing ocean management issues at appropriate regional or sub-regional scales.

Pacific Coast Regional Ocean Management Conference.

Oregon has long been interested in a regional approach for planning and management of ocean resources and uses. In 1995, Oregon, along with the NOAA Office of Ocean and Coastal Resource Management, sponsored a conference on regional ocean management on the Pacific Coast. The conference brought together representatives of Pacific Coast states, key federal agencies, Indian tribes, and other interested parties to determine the need and opportunity for a practical regional ocean management framework. While no specific action resulted, the conference highlighted the growing recognition that sustainable use of marine resources will require management that is based on the characteristics of marine ecosystems rather than political jurisdictions.

**THE GREAT LAKES COMMISSION BACKGROUND PAPER
WORKSHOP ON IMPROVING REGIONAL OCEAN GOVERNANCE
IN THE UNITED STATES**

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Introduction

The Great Lakes Commission appreciates the opportunity to contribute a background paper for the Workshop on Improving Regional Ocean Governance in the United States. The following narrative presents background on the Great Lakes Commission, an overview of its coastal management interests and activities, and a series of recommendations (and accompanying rationale) directed at principles for ocean governance and prospective institutional arrangements. The narrative is drawn largely from testimony presented at a regional public meeting of the U.S. Commission on Ocean Policy (Chicago, Illinois, September 24, 2002).

Our primary message, however, can be summarized succinctly as follows: The formulation and implementation of a national ocean policy must fully recognize and address the critically important issues and opportunities associated with our nation's freshwater resources and, specifically, the Great Lakes. The policy must build upon and fully utilize existing water resource management institutions. It must be state and region-based, enlist partnerships at all levels within and outside of government, and place an emphasis on strong federal/state relationships. It must be science-based, guided by principles of sustainable development, and accommodate issues and opportunities ranging from environmental protection and resource management to transportation and sustainable economic development. Further, any such policy must be accompanied by adequate, long-term and reliable funding to ensure that goals can be met and sustained.

The Great Lakes Commission

The Great Lakes Commission is a binational membership agency of the eight Great Lakes states (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin) and the two Canadian provinces of Ontario and Québec. The Commission has legal standing as an interstate compact and was established under state statutes in 1955 and granted Congressional consent in 1968 via P.L. 90-419, the Great Lakes Basin Compact. Associate (non-voting) membership for Ontario and Québec was secured in 1999 via a *Declaration of Partnership* signed by representatives of the eight states and two provinces. The Compact directs the Commission to “promote the orderly, integrated, and comprehensive development, use and conservation of the water resources of the Great Lakes Basin.”

The Commission is comprised of state and provincial delegations whose members include senior agency officials, legislators and governors'/premiers' appointees. The Commission also maintains a strong and active “Observer” program that ensures the involvement of other key entities (i.e., U.S. and Canadian federal agencies, tribal authorities, regional and international commissions, academic associations) in its work. We are pleased to note that the National Oceanic and Atmospheric Administration, through the National Sea Grant College Program and the Great Lakes Environmental Research Laboratory, has long been an outstanding partner to the Great Lakes Commission and its member states and provinces.

The Great Lakes Commission is mandated to promote sound public policy on issues that include environmental protection, resource management, transportation and sustainable development in the binational Great Lakes region. Three primary functions are provided for in the Compact: information sharing among the membership and the larger Great Lakes community; policy research and development on issues of regional interest; and advocacy of those positions on which the membership agrees. The latter is a unique and vitally important function of the Great Lakes Commission. It has long had an influential voice in representing the interests of its state members on matters of federal legislation, policies, programs and appropriations.

We at the Great Lakes Commission share a philosophy that influences every aspect of our work. In brief, we recognize that:

< Regional environmental protection and sustainable economic development goals are not mutually exclusive. They are inseparable and must be pursued in concert to achieve the region's full potential.

< The eight Great Lakes states, acting collectively through the Great Lakes Commission, have a principal stewardship responsibility for the precious and irreplaceable water and related natural resources of the Great Lakes system.

< Management of this system is of regional, national and international interest. In the United States it is neither the exclusive responsibility of the states nor the federal government. Rather, a federal/state partnership must be sustained and nurtured.

< The Great Lakes system, despite its vast and resilient nature, is a finite and fragile resource. Maintaining its integrity is a sound and necessary investment in the region's environmental and economic prosperity and, specifically, in the health, welfare and quality of life of its residents.

< No single management institution has the authority or capability to develop and administer the programs needed to ensure the informed use, man-

agement, restoration and protection of the resource. The partnerships within and among all elements of the Great Lakes "institutional ecosystem" are essential to achieving shared goals.

Each of these points has relevance to the formulation and implementation of a national ocean policy.

The Ecological and Economic Attributes of the Great Lakes System

The binational Great Lakes system is one of virtually unfathomable expanse and corresponding complexity. Its myriad characteristics are inextricably linked to – and in large part the determinants of – the region's environmental health, economic well-being and overall quality of life. Yet, the expansiveness and complexity of the resource belies its fragility. Even minor stresses – whether they be physical, chemical, biological or political — can have lasting impacts upon the sustainable use, development and protection of the resource.

The Great Lakes system enjoys global prominence, containing some 6.5 quadrillion gallons of fresh surface water, a full 20 percent of the world's supply and 95 percent of the United States' supply. Its component parts – the five Great Lakes – are all among the fifteen largest freshwater lakes in the world. Collectively, the lakes and their connecting channels comprise the world's largest body of fresh surface water. They lend not only geographic definition to the region, but help define the region's distinctive socio-economic, cultural and quality of life attributes, as well.

An international resource shared by the United States and Canada, the system encompasses some 95,000 square miles of surface water and a drainage area of almost 200,000 square miles. Extending some 2,400 miles from its western-most shores to the Atlantic, the system is comparable in length to a trans-Atlantic crossing from the east coast of the United States to Europe. Recognized in U.S. federal law as the nation's "fourth seacoast," the Great Lakes system includes well over 10,000 miles of coastline. The coastal reaches of all basin jurisdictions are population centers and the locus of intensive and diverse water-dependent

economic activity. Almost 20 percent of the U.S. population and 40 percent of the Canadian population resides within the basin.

The role of the Great Lakes system in advancing and sustaining regional, national and binational economic development has long been recognized. The physical presence, geographic configuration, biological diversity and hydrological characteristics of the lakes have been, and continue to be, determinants of locational decisions for business and industry. Much of the early economic activity during settlement of the region was directly attributable to resource exploitation potential (e.g., fisheries, trapping, mining, forestry) and the availability of water-based transport. While the industrial base has diversified over the years, the basin's water resources continue to exercise a substantive role in the attraction, retention and day-to-day operation of industry. Every day, for example, nearly 1 trillion gallons of water (3.75 trillion liters) are withdrawn or used instream for industrial, municipal, agricultural, power generation and other purposes. Every year, basin industry accounts for 70 percent of all U.S. steel production, one-fifth of U.S. heavy manufacturing and one-half of Canada's heavy manufacturing. The Great Lakes-St. Lawrence Seaway contributes \$3.0 billion annually to the region's economy. The sport fishery is valued at \$2-4 billion annually in direct and indirect benefits. Economic activities as diverse as agriculture, recreational boating and water-based tourism are all multi-billion dollar industries, as well.

Governance Issues in the Context of a National Ocean Policy--Great Lakes Commission Perspectives

Political jurisdictions in the binational Great Lakes region have long recognized the benefits of multi-jurisdictional cooperation for the development and implementation of water resources management policies, plans and programs. As a shared, multi-purpose resource, the Lakes are intensively used and managed at every level from the local to international arena. Eight states and two Canadian provinces share the basin. Literally hundreds of government entities are charged with management of some aspect of the re-

source, including municipalities, county health boards, state and provincial departments of natural resources and environment, planning and conservation districts, multiple U.S. and Canadian federal agencies, various regional agencies and international bodies as well. Most are limited in management authority to a defined political jurisdiction and/ or a specific management function. Yet, singly and collectively, they contribute to efforts to manage, protect and use the resource in a sustainable manner. Complementing these governmental entities is a constellation of research institutes, academic institutions, business and industry associations, citizen groups and others that influence the direction of water resource policy and planning.

Our regional, multi-jurisdictional institutions are the key elements in this highly complex "institutional ecosystem." By transcending the parochialism of traditional political jurisdictions and addressing resource planning and management needs on a hydrologic – or watershed – basis, they add a new dimension of governance that enhances efficiency and effectiveness by coordinating and advancing the activities of those jurisdictions. Our grand "institutional experiment" began well over 100 years ago, and the Great Lakes region is widely recognized for its highly developed and effective approach to basin water resources planning and management. Its premier regional institutions for such services include the Great Lakes Commission, the International Joint Commission, the Great Lakes Fishery Commission and the Council of Great Lakes Governors. Each of these institutions has considerable experience with large scale, multi-jurisdictional planning initiatives and, as such, has much to offer in terms of "lessons learned."

What A Comprehensive National Ocean Policy Might Look Like

The Great Lakes Commission recognizes an unmet need for a national policy on marine and freshwater resources that presents a clearly articulated vision and a series of science-based goals, objectives and strategic actions needed to both achieve and sustain that vision. A multiplicity of federal agencies presently share planning and policymaking responsibilities for the

nation's marine and freshwater resources. While our experience tells us that good faith efforts are typically made to minimize duplication of effort and partner on matters of shared jurisdiction, the process is nonetheless overly complex and inherently inefficient.

The Great Lakes region is, in many respects, a microcosm of the jurisdictional complexity experienced at the federal level with regard to water resource policy. In the last two years, in fact, our regional leadership within and outside government has recognized the need for an overarching, large scale, consensus-based Great Lakes Restoration Plan that can serve as a coordination device; a blueprint to guide individual and collective restoration efforts. We believe that a similar need exists at the federal level.

In addition to the piecemeal approach to ocean policy that occurs at present at the federal level, we in the Great Lakes region share an ongoing- and significant- concern over the bifurcated treatment of marine and freshwater resources. Too often, we find freshwater and marine interests competing with one another for legislation, policies, programs and appropriations. This occurs, unfortunately, even within the National Oceanic and Atmospheric Administration. The Great Lakes Commission, for example, has on numerous occasions found it necessary to remind the Congress- and our federal agencies- that the Great Lakes are formally recognized in U.S. federal law as the nation's "fourth seacoast" and, as such, have equal standing with the nation's other three coasts. We believe that a formal ocean policy, properly devised and implemented, can eliminate or reduce such problems and appropriately recognize the need for the integrated management of all the nation's water resources.

Guiding Principles for Ocean Governance

As previously noted, the Great Lakes region has a long and rich history of experimentation with regional, multi-jurisdictional approaches to water resource management. A multitude of plans and policies- both issue specific and broad based- have been successfully crafted and implemented to ensure a consistent and coordinated approach to basin management needs. Those experiences elicit a series of guiding principles

that will be of interest as a national ocean policy is developed. Toward that end, we offer the following:

A national ocean policy must:

- < Be the outcome of an open, inclusive process that seeks and secures meaningful input from the range of governmental and constituent groups that will influence, or be affected by that policy
- < Fully recognize and address the nation's freshwater resources on an equitable and integrated basis with the nation's marine resources
- < Embrace sustainability principles and accommodate environmental protection, resource management and economic development considerations
- < Build upon and fully utilize the considerable institutional resources already available at the state and, in particular, regional levels
- < Be a "bottom up" process that elevates, showcases and synthesizes state and regional policies rather than replacing or competing with them
- < Be pursued on a hydrologic rather than political jurisdictional basis, recognizing that the watershed is inherently the most appropriate planning and management unit
- < Be of sufficient detail to provide a meaningful "blueprint" that Congress and governmental agencies at all levels can use for practical guidance in the formulation of laws and programs, the appropriation of necessary funds, and benchmarking to allow for evaluation of progress and necessary mid-course corrections
- < Be willing to reject the status quo and make bold, fundamental changes, if warranted, to enhance the efficiency and effectiveness of our current approach to managing our freshwater and marine resources
- < Provide for an institutional arrangement- either new or existing- that will be responsible for coordinating implementation efforts and sustaining progress over the long term

We also know from experience that the success of any plan is determined, in large part, by constituent support. NOAA's National Sea Grant Program is a well acknowledged success story in the Great Lakes region for many reasons, and its extension services are principal among those reasons. Consideration should be given to an extension service program throughout NOAA and modeled after the National Sea Grant approach. We must connect with our constituents!

This is but a sampling of the types of guiding principles that can be drawn from decades of "lessons learned" in the Great Lakes region.

The Appropriate Role and Scale for Ocean Governance

Our experience in the Great Lakes region tells us that no single level of government is capable of delivering the types of services necessary to ensure the informed and sustainable use, management and protection of our shared water and related natural resources. Further, we have found that planning and policymaking initiatives are merely exercises in futility if they are not pursued in an open, inclusive and consensus-based manner. What is required is a careful balance; a need exists for a lead agency that can initiate, coordinate, maintain and advocate policy by nurturing, rather than attempting to force or bypass consensus.

In our view, a national approach to ocean policy development is needed, but the building blocks for that approach must be assembled at the regional level. Toward that end, we suggest that consideration be given to the structure provided in the Water Resources Planning Act of 1965 as it related to the formation of a national system of (multi-state) river basin commissions and a federal U.S. Water Resources Council. Under that model, the river basin commissions were charged with the development of comprehensive, coordinated joint plans for their geographic areas of responsibility. As designed, those plans were to be forwarded to the U.S. Water Resources Council for assembly into a national water resources management plan that would provide an "umbrella" of consistency across the nation while respecting the unique aspects and requirements of individual river

basins. While the objectives of this legislation were not fully realized before the termination of this process in 1981, we do see merit in such an approach. In advising this, however, it is important to reiterate that formulation and implementation of a national ocean policy must build upon existing plans, policies and institutions at the regional level.

Improving Governance by Modifying Current Legal, Regulatory and Management Mechanisms

The Great Lakes Commission supports the development of an organic statute that would provide guidance to federal agencies with respect to their roles and responsibilities for freshwater and marine policy. Recent decades have seen increased recognition of the environmental protection, resource management, social and economic dimensions of our water resource management decisions. That recognition has been accompanied by an increase in the number of agencies with an interest in those areas. Further, we have seen a trend toward multi-agency and multi-jurisdictional approaches to policy, planning and management. While this is a positive trend, it is increasingly clear that the traditional agency-by-agency approach to policy development is no longer sufficient for current and emerging needs. Thus, a comprehensive analysis of roles, responsibilities and unmet needs in ocean policy is well advised, and should include active consideration of an organic act.

A related issue concerns the Congressional appropriations process for current ocean programs. A multitude of committees are involved in the process and, as a result, it is piecemeal, time-consuming and inherently inefficient. Thus, in addition to organic legislation, we need a more focused appropriations process with fewer and better coordinated committees.

Should reorganization of federal agencies be considered, the Great Lakes Commission urges the Administration to embrace the same principles that we outline above with respect to formulation and implementation of a national ocean policy. In particular, we emphasize that a strong and clearly defined federal/ state partnership must be established. The fed-

eral government, in consultation with the states (and relevant interstate agencies) must establish overarching policy, maintain an associated plan, promote consistency among states and regions, and support strong monitoring and research programs. At the same time, such plans and policies must be developed from the “bottom up;” they must be responsive to the unique needs and requirements of different regions, and they must provide those regions (via state and interstate governments) with the latitude and authority to develop and administer programs consistent with overarching federal policy. And, as noted earlier, it is critically important that the needs of freshwater systems are fully accommodated and addressed.

Enhancing Coordination in Management of Our Ocean Resources

In the experience of the Great Lakes Commission, the federal government has generally done a commendable job in embracing a partnership-based approach to the management of water and related natural resources. These partnerships, however, are typically specific to individual programs and projects and are often pursued largely on an ad hoc basis. We do see a need for organic legislation to codify roles and responsibilities between and among federal agencies, to characterize the nature of the federal/ state relationship, and to specify the prospective role of multi-state and related regional institutions in the formulation and implementation of such policy. We further believe that the development of a large scale, consensus-based national ocean plan is needed to guide coordination efforts.

The “new federalism” philosophy that emerged in the 1980’s is now firmly in place in the Great Lakes region and throughout the United States. State governments have accepted greater stewardship responsibility and associated resource management authority, and substate entities (i.e., counties, municipalities, regional planning commissions) have done the same. Tribal authorities have also increasingly asserted stewardship responsibility and are playing a larger role in policy and planning initiatives. Further, nongovernmental interests, ranging from academic research institutes to citizen organizations, are actively

involved in policy discussions and planning activities that affect the current and future state of our marine and freshwater resources. We have found that meaningful involvement of all such interests in the policy and planning process is key to consensus building and, in many cases, is a determinant of ultimate implementation success.

Moving from Single Issue to Comprehensive Management

In its document titled *Toward a National Ocean Policy* (Working Draft, July 16, 2002), the U.S. Commission on Ocean Policy recognizes the complexity of the current management challenge. Dimensions of a prospective policy, as presented in that document, include living marine resources; pollution/water quality; coastal zone management; nonliving marine resources; research, exploration and monitoring; education; technology and marine operations. We in the Great Lakes region have seen a similar, steady progression toward such multi-objective policy development with regard to the water and related natural resources of the Great Lakes region. Consider, for example, just a few of the leading management challenges facing the Great Lakes region today:

- < Intensive development activity in coastal areas that is threatening habitat and other nearshore resources
- < The introduction and spread of invasive species that compromise ecosystem integrity, disrupt the food chain and have significant attendant economic impacts
- < Increasing conflicts associated with the withdrawal and use of water resources, including concerns over the growing threat of both large scale in-basin consumptive uses and diversion/ export to non-basin areas
- < The legacy of past abuses, as evidenced by designated Areas of Concern, (i.e., “toxic hotspots”), as well as the plethora of contaminated sites, or brownfields, that characterize the shorelines of many current/former industrial areas

< The rising incidence of beach closures and associated human health concerns brought on by improper sewage treatment practices and other factors yet to be fully understood

< Continued challenges associated with the management of the commercial and sport fishery, including food web disruption, aquatic nuisance species impacts, and fish consumption advisories

< The impacts of urban sprawl on the quality of land, air and water resources, and associated infrastructure needs

< Maintenance and enhancement of a viable maritime transportation infrastructure given both economic needs and environmental considerations

The unifying factor in reconciling these and many other challenges, at least through the work of the Great Lakes Commission, has been the adoption of sustainability principles to guide all policy development and planning activity. This has included a recognition that environmental and economic prosperity goals are not mutually inconsistent, and can and must be pursued in concert to achieve our shared vision.

Models for Improving the Approach to Resource Use, Protection and Management

The types of ocean governance challenges confronting us nationwide have been experienced to varying degrees in the Great Lakes region as well. Our binational region is home not only to the largest system of fresh surface water on the face of the earth, but to some of the most water-dependent economic activity in the world as well. The magnitude, complexity and diversity of the resource and its people has led to ecosystem stresses that have demanded creative, multi-agency and multi-jurisdictional responses. Three specific initiatives come to mind that may provide useful models for improving our existing approach to resource use, protection and management of marine and freshwater resources on a national scale:

Program evaluations and benchmarking: The federal presence and performance in Great Lakes management has been the focus of concerted attention in recent

years. Both the U.S. General Accounting Office and the Auditor General of Canada have recently completed investigations to assess efficiency and effectiveness and examine opportunities for improvement. In addition, numerous agencies at the state and federal level have initiated “state of the lakes” reporting to provide the policy and management community – and the public – with periodic qualitative or quantitative assessments of ecosystem health. Principal among these efforts is the State of the Lakes Ecosystem Conference (SOLEC) process sponsored by the U.S. Environmental Protection Agency and Environment Canada. Incorporating an ongoing evaluation process into policy implementation activity is well advised, as is the development of benchmarks (i.e., measurable indicators) that allow for assessment of progress and mid-course corrections, as needed.

Regional, multi-jurisdictional management institutions: The binational Great Lakes region is widely recognized and lauded for a well-developed set of institutional arrangements at the regional level that contribute to greater efficiencies in the formulation and implementation of policies that advance environmental protection, resource management and sustainable economic development goals. Among others, principal public entities with a binational, basinwide focus include the Great Lakes Commission, International Joint Commission, Great Lakes Fishery Commission and the Council of Great Lakes Governors. In developing and implementing a national ocean policy, it is imperative that the full potential of such entities be explored and, where they do not exist, due consideration for their establishment is advised.

Regionwide agreements and plans: In addition to the several regional organizations mentioned above, the Great Lakes region has benefited from a series of regional agreements that have helped shape the substance and direction of policy associated with issues of shared interest. The U.S.- Canada Great Lakes Water Quality Agreement, for example, established a series of goals, objectives and programs to coordinate joint action by the two federal governments under the auspices of the International Joint Commission.

The Council of Great Lakes Governors addresses continuing issues of water quantity management under the terms of a Great Lakes Charter of 1985 and its Annex 2001. The Great Lakes Fishery Commission maintains a binational fisheries management plan with signatories that include federal agencies, states, provinces and tribal authorities/First Nations. The Great Lakes Commission also has coordinated the adoption of a series of regional agreements that range from aquatic nuisance species prevention and control to the maintenance of an economically viable and environmentally responsible maritime transportation system. The Commission-coordinated *Ecosystem Charter for the Great Lakes St. Lawrence Region*, which has garnered over 175 signatures from public agencies and nongovernmental interests since 1995, is the most comprehensive summary of management principles, goals and objectives assembled to date. The Commission has also authored an eight point plan, titled *The Great Lakes Program to Ensure Environmental and Economic Prosperity*, that offers another model for consideration. More recently, the U.S. Policy Committee, comprised of federal and state agencies with Great Lakes management responsibilities, released its *Great Lakes Strategy* highlighting restoration priorities.

In recent years, the notion of a large scale, consensus-based Great Lakes Restoration Plan has gained support within the Great Lakes region including its Congressional Delegation, governors and state agencies, regional agencies and nongovernmental interests. This process will yield a vision for the region and the restoration goals, objectives, strategic actions and partnerships necessary to achieve it. We're pleased to note that the National Oceanic and Atmospheric Administration and, in particular, the National Sea Grant Program, will be valued partners in that process. The Great Lakes Restoration Plan could provide one of the regional building blocks for a larger national ocean policy.

Improving U.S. Leadership and Cooperation to Further International Ocean Policy

Without question, the United States has a responsibility to play a strong leadership role in working with

other nations on international ocean policy issues. In the binational Great Lakes region, we have long recognized that the success of any water management initiative is fundamentally dependent upon a strong partnership with other nations that share the resource. More recently, we have realized that actions and policy decisions in nations far removed from our basin can still have significant environmental and economic implications for us (e.g., demand for water export, introduction of aquatic nuisance species, climate change impacts, contaminants from air deposition). Toward this end, enhancing international relationships is now a stated priority of the Great Lakes Commission, and we are actively involved in international fellowship/exchange programs, technology transfer initiatives, joint technology development projects, and organizational efforts to strengthen linkages between and among multi-jurisdictional commissions around the world. The U.S. Administration would be well advised to thoroughly investigate and actively participate, as appropriate, in current and prospective international organizations and summits for ocean management. Any such involvement, we emphasize, should reflect the partnership approach embraced in the United States and provide opportunities for regional, multi-jurisdictional agencies to participate at the international level.

Conclusion

The Great Lakes Commission, on behalf of its eight member states, appreciates the opportunity to offer its perspectives on governance with regard to the prospective formulation and implementation of a national ocean policy. We endorse such an initiative and urge that it fully and equitably address the freshwater resources of the nation's "fourth seacoast" – the Great Lakes; make full use of existing regional water resource management agencies; represent a "bottom up" approach that provides for state and regional partnership; embrace principles of sustainable development that accommodate environmental and economic prosperity goals; be based upon sound science; and be accompanied by a funding strategy that ensures long term support. In making such an endorsement, we are pleased to offer our full support and assistance as this critically important work moves forward.

LESSONS FROM REGIONAL MARINE PLANNING BY FEDERAL AGENCIES – THE NATIONAL ESTUARY PROGRAM

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Background on the National Estuary Program.¹

Estuaries are tidal, sheltered waters that support unique communities of plants and animals that live at the margin of the sea, and are often the cultural centers of coastal communities, serving as the focal points for local commerce, recreation, celebrations, and traditions. Across the United States, development is increasingly concentrated along the coast, with about 820,000 new homes and more than half of all new industrial, office, and retail building constructed in coastal areas annually.² Evidence is mounting that many coastal environmental quality problems are the result of development pressures. As these pressures result in changes in the way coastal ecosystems function, the ecological and economic values of coastal areas are being threatened, and many of the qualities that initially attracted people to coastal watersheds are diminishing.

The National Estuary Program (NEP) was established in 1987 by amendments to the Clean Water Act (Section 320) to identify, restore, and protect nationally significant estuaries of the United States. The Governor of a State must nominate an estuary before it can be accepted into the NEP. After EPA review and acceptance into the national program, a Management Conference is formed to provide the local decision-making framework for the estuary. The Management Conference is a collection of committees that directs the day-to-day development of the management plan for the estuary. The Management Conference typically includes local governments, affected businesses and industries, public and private institutions, non-governmental organizations, the general public and representatives from EPA, other Federal agencies, State

governments, and interstate or regional agencies. Representatives on the Management Conference speak for and bring information back to their constituencies, agencies, and organizations. In addition to being a Management Conference participant, EPA provides financial and technical assistance, and reviews program performance.

The Management Conference defines program goals and objectives, identifies the extent and causes of the estuary's environmental problems, and designs action plans to prevent or control pollution and restore habitats and living resources. These action plans come together in a *Comprehensive Conservation and Management Plan* (Management Plan or CCMP), which serves as a blueprint for protecting and restoring the estuary. The Management Conference ensures that estuary-specific information, issues, and priorities are factored into the NEP process. Twenty-eight estuaries have been designated to the NEP since 1987.

Unlike traditional, regulatory approaches to environmental protection, the NEP targets a broad range of issues and encourages communities to develop common solutions. Staff scientists, policy analysts, and outreach coordinators work with local communities to identify problems and create consensus-based actions to address problems facing their watersheds. The fundamental concepts fostered by the NEP in coastal areas have evolved from its environmental management predecessors, including the Chesapeake Bay Program. The cornerstones of the NEP, drawn from these predecessors, include a focus on watersheds as the basic environmental management unit, the integration of good science with sound decision-making, a collaborative approach to problem solving, and the

critical role of public participation.

EPA provides technical, financial, and administrative support to individual estuary programs and their EPA Regional offices; serves as a liaison with States, other EPA programs, other Federal agencies, and various organizations that support coastal watershed management programs; and helps facilitate the transfer of tools and lessons learned to other coastal watersheds. An example of the success of the program is that, as of 2001, the 28 National Estuary Programs have protected or restored over 1,000,000 acres of coastal habitat.

Some Lessons Learned

Lesson # 1: Community-Based Resource Management Can Achieve Results. Building an effective management and decision-making framework requires commitment, close collaboration on the part of participants, and time. It is especially important that there is close coordination among Federal, State, and local governments. NEPs have been the catalyst to bring together various levels and branches of government that had previously never worked cooperatively – thereby providing more comprehensive management and expediting the regulatory review process.

It is critical that the appropriate stakeholders be involved in the programs during the early stages of development of the CCMP. The consensus-building process used by the stakeholders must reflect the character of the local community and balance the divergent needs and interests of the coastal stakeholders. The success of any watershed management program ultimately depends on citizen support and involvement – to ensure that funds are made available to support planning and implementation, for the successful implementation of actions aimed at changing day-to-day behaviors in the watershed, and for ensuring public involvement in the decision-making process.

Public involvement is used to guide program development, identify priority issues, build local support, and evaluate progress. The strong public participation efforts of the NEP suggest that they are well

equipped to work within the context of, and improve the capacity for, decentralized governance. The NEPs successfully integrate different levels of government (Federal, State, local) and sectors (e.g., fisheries, coastal tourism, port development) through the development and implementation of actions and projects in their Management Plans.

Lesson #2: Governance Structures Will Vary. NEPs receive Federal funding from EPA, which they leverage and match with State, local, and private funds. The NEP staff are employed in a variety of administrative structures, including State agencies, EPA Regional offices, and nonprofit organizations. The programs also demonstrate a range of ways in which citizens are involved and have decision-making power in their management structure. Therefore, the NEPs rely on existing organizational structures rather than the creation of new oversight entities.

To carry out the operations of the estuary program, each NEP establishes a committee structure to meet its particular needs. Again, the NEPs examine the community of the estuary: how decisions are reached, what perceptions are prevalent, and who or what institutions are influential. The size of the community also makes a difference. For instance, a comparatively small area, located within a single State, requires a simpler committee structure than a much larger, interstate estuary. Generally, the structure consists of a policy-making committee, a management committee, work groups or subcommittees, and other standing committees including a scientific and technical advisory committee, a citizens advisory committee, and often a local government committee and a financial planning committee.

Lesson #3: Setting Measurable Environmental Goals and Indicators is Important. Each NEP sets specific goals and indicators against which progress can be readily measured. These measures allow the NEPs to monitor environmental conditions and environmental responses to restoration efforts, inform and involve the public in achieving restoration goals, provide information to establish restoration goals, and calibrate and refine ecosystem models that furnish long-term databases for estuary research. These mea-

asures evolve through extensive meetings with partners and stakeholders using a variety of techniques, such as public meetings, planning *charrettes*, focus groups, and comparative risk ranking. One NEP, for example, adopted a single set of measurable goals aimed primarily at restoring and protecting that estuary's seagrasses and managing water quality as needed to support the habitat restoration goals. In that case, instead of assigning responsibilities to participating agencies or local governments for implementing certain actions, all participating partners commit as a whole through a formal Interlocal Agreement to take the actions necessary to achieve the specific, measurable goals adopted in the Management Plan. As a result, participating agencies are not restricted to the actions itemized in the Management Plan to achieve the agreed-upon goals. Participants are given the flexibility to choose the options that make the most sense given the opportunities and resources available to their communities.

Lesson # 4: Environmental and Programmatic Monitoring are Critical. Programs must invest in environmental and programmatic monitoring to assess progress in implementing comprehensive conservation and management plans as well as changes in environmental conditions and the emergence of new coastal challenges. As implementation of NEP management plans proceed, each activity is reviewed, evaluated and redirected as necessary. Demonstrating results is a challenge. The causal link between management actions and environmental results are not always clear. Just as many environmental impacts develop over years, reversing those impacts is likely to take time — which may make it difficult to maintain public support during implementation. Even in cases where improvement in environmental indicators can be measured and linked to actions that have been implemented, these indicators may not always be meaningful to the public (e.g., increases in dissolved oxygen levels or decreases in bacteria may show results, but those results might have more public support if they could be equated to abundance of fish, or the opening of closed shellfish beds and bathing beaches). One method used by the NEPs to bridge the gap between the long-term nature of environmental improvements and the need to demonstrate short-

term results to stakeholders, is to integrate programmatic indicators with available environmental indicators to measure outcomes of management programs. For example, a “Report Card” can communicate the status of the top issues, changes in public awareness of the issues over the years, funding, and effectiveness of efforts to address the issues. The report card can also serve to educate the public about emerging issues and new priorities for the future.

The NEPs are moving beyond single measures of environmental conditions, such as dissolved oxygen, to comprehensive ecosystem-based indicators, such as fish community composition, submerged aquatic vegetation extent and density, and physical habitat. The latter are better measures of the overall integrity of the estuary and can provide advance warning of emerging problems in the watershed.

Lesson #5: There are Common Coastal Environmental Problems and Challenges. Between 1960 and 1990, the population of the nation's 673 coastal counties grew by more than 38 million people (an increase of 41 percent) and by 1990, more than 133 million people — representing 54 percent of the total U.S. population at the time, resided in less than 17 percent of the land area in the contiguous United States — along the Atlantic and Pacific Oceans, Gulf of Mexico, and Great Lakes.³ Stresses caused by pollution, excessive demands on limited resources, and expansive development have resulted in a host of human health and natural resource problems.

Experts at the National Oceanic and Atmospheric Administration's (NOAA) 1999 National Assessment Workshop determined that the severity and extent of eutrophic conditions are expected to worsen in more than half of the nation's estuaries, and along the coasts, by 2020. Their predictions are based on projected population growth, coupled with susceptibility to nutrient inputs (e.g., fresh water inflow, tidal flushing, and degree of stratification — which influence the transport and fate of nutrients in coastal water bodies, and help determine the susceptibility of an estuary to retain nutrients).⁴

While each estuary is unique, the estuaries of national significance confront common problems: over-

enrichment of nutrients, loss of habitat, alteration of freshwater inflow, contamination from pathogens and toxic chemicals, decline in fish and wildlife, and introduction of invasive species. In implementing efforts to meet these challenges, the NEPs share information and transfer technologies, and some common solutions have emerged.

Lesson #6: The NEPs are demonstrating the ability to address emerging issues. The NEPs are well poised to address emerging issues, even when those issues had not been originally identified through the comprehensive planning process. Two examples of this kind of adaptive management can be seen in the programs' reaction to threats from invasive species and poorly planned development.

Because land use decisions occur at the State and local level where NEPs operate, some of the programs have demonstrated that inter-jurisdictional coordination at the watershed or regional level on "smart growth" initiatives can create more effective protection of water resources through thoughtful community land use planning.

Several NEPs have taken a leadership role in meeting the challenge of Aquatic Nuisance Species (ANS), providing the first comprehensive assessment of marine invasive species in their watersheds, conducting ANS field surveys, collecting and identifying sample specimens, and determining whether the specimens are indigenous, invasive, or cryptogenic; and using data from their assessments to develop State Aquatic Nuisance Species Management Plans as well as NEP-specific and/or regional assessment, monitoring, and rapid response plans.

Some NEP pilot projects on ANS aim to enhance the public's understanding of aquatic nuisance species and their local/ecosystem impacts, and the roles that the public and decision-makers can play to prevent and mitigate those impacts. The awareness effort can include development of public education materials such as signs, a website, radio messages, and tips for prevention, as well as creation of a clearinghouse for citizens to report sightings of unusual plants or animals.

Another area where the NEPs are providing approaches to emerging challenges is in the development and implementation of "Total Maximum Daily Loads" or TMDLs. A TMDL defines the pollutant load that a waterbody can assimilate without causing violations of water quality standards, and allocates the loading between contributing point sources and non-point source categories. Long Island Sound NEP is an example of how the NEP's close partnership with multiple levels of government — dozens of municipalities, the states of New York and Connecticut, and the Environmental Protection Agency (EPA) — fostered an innovative TMDL. The LIS NEP's management plan called for reductions in point and nonpoint source nitrogen loading to the Sound to improve water quality and reduce hypoxia. The LIS NEP worked with the EPA, States, and local governments to adopt aggressive nitrogen reduction targets in 1998 and then to adopt a nitrogen TMDL for the Sound in 2001. This TMDL establishes an enforceable schedule for point and nonpoint nitrogen reduction to the Sound over a 15 year period ending in 2014. The LIS NEP helped Connecticut develop a general permit to incorporate nitrogen load limits for participating publically owned treatment works in the watershed. The LIS NEP also fostered New York's bubble permit proposal for dischargers to the Sound. The Connecticut general permit scheme incorporates a nitrogen credit trading program that, in concert with the TMDL limits, sets a precedent in finding new ways of meeting water quality standards while keeping costs down for taxpayers. The TMDL is posted on LIS NEP's website.

Lesson # 7: Identifying Sustainable Levels of Funding are Key. Successful NEPs have a broad spectrum of funding sources. The NEPs have learned that a wide variety of funding sources — public and private, local, state and federal, direct and indirect — must be secured to achieve their goals and control the pace of their progress. For example, the NEPs have tapped, either directly or through their partners, the State Clean Water Revolving Fund, municipal bonds, fines and settlements, tax abatements and incentives, and sales fees. For one NEP a key revenue source is a two percent real estate transfer tax, an assessment made

by the county on land and deed transfers based on the sales price of property. Five towns surrounding the estuary have raised nearly \$70 million in less than three years (April 1999 to September 2001) with the tax.

Success leads to more funds. NEPs which are successful at financing tend to attract additional funding from various sources and through partnerships with other successful organizations. In some cases the NEPs have strengthened the capacity of their partners to obtain funding. For example, one NEP received \$1.13 million in EPA Section 320 funds during the three years from September 1998 through August 2001. Through a combination of appropriations, grants, and in-kind contributions, this NEP raised an additional \$8.88 million during this time period; \$7.87 raised for every \$1 of EPA support. The rate of leveraging increased dramatically from 1999 to 2001, starting at about \$1:\$1 in 1999 and reaching a level of approximately \$20:\$1 in 2001. The same NEP also created a land trust that has proved successful in acquiring funds to protect habitat in the watershed.

Financial Planning is critical. NEPs that are successful at raising funds usually develop strategic financial plans that they integrate into their on-going management and planning efforts. These NEPs are more aware of the funding landscape and thus are able to take advantage of new approaches to funding, such as storm water utilities. As a result of focusing their fund-raising efforts on sources most likely to yield returns, these NEPs have more time available for implementation activities.

End Notes

¹ The National Estuary Program or “NEP” refers to both the national program made up of 28 programs and the 28 individual programs themselves.

² NOAA’s Coastal Population and Development Home Page

³ 50 Years of Population Change Along the Nation’s Coasts: 1960-2010, NOAA April 1990

⁴ Bricker, S.B., C.G. Clement, D.E. Pirhalla, S.P. Orlando, and D.R.G. Farrow. 1999. *National Estuarine Eutrophication Assessment: Effects of Nutrient Enrichment in the Nation’s Estuaries*. NOAA, National Ocean Service, Silver Spring, MD: 71pp

Appendix: Cornerstones and Success stories from the NEPs

Cornerstone 1: Focus on the watershed and ecosystems. The NEPs use geographic and ecosystem-based approaches to address complex environmental problems found in estuaries. This approach targets and manages hydrologically defined basins or watersheds and the ecological communities that exist within them. The NEPs are moving beyond single measures of environmental conditions, such as dissolved oxygen, to comprehensive ecosystem-based indicators, such as fish communities and habitat. The latter are better measures of the overall integrity of the estuary and its watershed. Defining management areas according to hydrologic boundaries and ecosystems allows the NEPs to better understand and address environmental problems because contaminants do not conform to political jurisdictions. It also allows the NEPs to draw upon the full range of available management resources and tools, regardless of political jurisdiction. The NEPs thus take a multi-jurisdictional approach to problem identification and solving.

Cornerstone 2: Integration of good science with sound decision-making. Decision-making should be based on the best information and science available. Sound science provides objective information that informs debate, provides data on the status and trends of the estuary and causes and consequences of actions, and provides a basis for policies and programmatic decisions. Science, however, is in part the product of the public participation process. Stakeholders and partners play a key role in identifying problems to be assessed and collecting the data needed to form conclusions. The iterative nature of this approach encourages partners to set goals and targets and to make maximum progress based on available information, while continuing analysis and verification in areas where information is incomplete.

Cornerstone 3: Collaborative problem-solving. As an environmental management approach, collaboration involves creating a shared vision and joint strategies to address concerns that go beyond any particular interest or stakeholder's purview. Through listening

and learning, successful collaboration achieves results. Conflicting needs and uses are balanced without compromising the environmental goal of restoration and maintenance of the estuary. Consensus-based decision-making is used to ensure that collaborative decisions are made with the input of the stakeholders and that all options, suggestions, and opinions are treated as worthy of consideration.

Cornerstone 4: Public participation. The success of any watershed management program ultimately depends on citizen support and involvement – to ensure that: (1) funds are made available to support planning and implementation; (2) actions aimed at changing day-to-day behaviors in the watershed are implemented; and (3) opportunities are available for the public to voice their interests in a way that can lead to a mutual understanding of the issues. In the long run, the support of the public and private interests will be required to implement measures needed to maintain and restore the watershed. These measures may include additional taxes to pay for sewage treatment and sediment controls, changes in lawn care and agricultural practices, and stricter regulations on wastewater dischargers. An informed and involved citizenry is often the management program's most valuable asset for mustering the critical support needed to implement these kinds of actions.

Examples of NEP Actions and Projects

The following examples of NEP actions and projects provide a few of the approaches successfully taken by different NEPs to tackle these issues. In many cases, actions and projects address multiple problems simultaneously, such as construction of wetland habitat to reduce pathogen contamination and increase nursery acreage for wetland-dependent species. Specific information on the goals, objectives, and actions leading to the implementation efforts described below can be found in the Management Plans of the referenced NEPs. In addition to the examples provided below, the Management Plans developed by the existing 28 NEPs contain a vast variety of actions addressing a multitude of issues.

Example 1: New legislation requiring advanced wastewater treatment to address loss of seagrasses due to excess nutrients.

The Sarasota Bay National Estuary Program evaluated the effectiveness of Florida's Grizzle Figg legislation promulgated in 1990 aimed at controlling the amount of nutrients entering the Bay. (). The legislation requires that wastewater discharged directly to surface waters meet advanced wastewater treatment standards (3 mg/l for nitrogen). To meet the legislative requirements, most municipal and private wastewater treatment plants modified operations. During the same period, problems with regard to saltwater intrusion and the impact on the Floridan Aquifer were made public. The SBNEP sponsored research and engineering analysis to promote the optimum reuse of wastewater through a regional reuse system that minimized discharge to the Bay and provided an alternative source of water. Aquifer storage and recovery is being tested regionally as a method to store highly treated wastewater for alternative uses. If successful, discharge from wastewater plants could be eliminated. Regional reuse systems are concurrently being constructed to transport wastewater as an alternative source to agricultural operations, golf courses and urban irrigation. Nitrogen loads to Sarasota Bay have decreased by 47 percent (80 percent from wastewater treatment plants), and seagrass coverage has increased by eighteen percent (about 1751 acres) between 1988 and 1996.

Example 2: Shellfish beds reopened through construction of wetlands that filter pathogen contamination out of stormwater runoff.

The Buzzards Bay Project () assisted the Town of Marion, Massachusetts in developing a constructed wetlands system to abate pathogen contamination at Spragues Cove, a shellfish-harvesting site regularly closed due to high concentrations of fecal coliforms. The discharge also adjoined a bathing area. A three-acre constructed wetland was designed to collect and treat stormwater runoff and associated nonpoint-source pollutants from a 64-acre drainage area. Within the first year following construction, sampling

indicated an overall percent reduction of fecal coliform bacteria in the cove. As additional plants become established in the wetlands, it is expected that fecal coliform counts will continue to decrease.

Example 3: Development of technical assistance program to address toxic contamination from small businesses and industry.

The Narragansett Bay Estuary Program (<http://home.earthlink.net/~narrabay/>) set up the Hazardous Waste Reduction Program as a partnership with the Rhode Island Department of Environmental Management and the University of Rhode Island. The Program focuses on both education and prevention. The Program provides technical assistance to businesses for pollution prevention through a waste information "hotline" and distributes information on source reduction, recycling, and chemical substitution/disposal alternatives. The Program also has developed a system for conducting onsite hazardous waste assessments for local businesses and industries. The Hazardous Waste Reduction Program has been so successful that it is now a State-funded, broad-based industrial pollution prevention program. The Program has been expanded to include information on and a collection and treatment facility (the Eco-Depot) for household toxic and hazardous wastes.

Example 4: Removal of dam to allow commercial and recreational fish to return to historical spawning areas.

The Management Plan for the Albemarle-Pamlico Sounds National Estuary Program (<http://www.epa.gov/owow/estuaries/aps.htm>) calls for the restoration of vital fisheries habitats by means such as replanting vegetation, repairing hydrological systems, and improving water quality. The removal of the Quaker Neck Dam (completed during the summer of 1998) successfully restored 1,054 miles of anadromous fish-spawning habitat along the Neuse River and its tributaries. This project was significant because it was the first dam ever removed specifically to benefit the environment. In April 1999, biologists reported that striped bass had returned to spawn in the lower half of the newly opened portion of the

river. Other species expected to benefit include several major commercial and recreational fish species, such as American shad, hickory shad, and shortnose sturgeon. The success of the Quaker Neck Dam removal project resulted in the removal of two additional North Carolina dams for environmental purposes.

Example 5: Dissemination of brochure providing identification and eradication information for shoreline homeowners to address the uncontrolled spreading of Brazilian pepper plants.

The Tampa Bay Estuary Program () provided seed money to a local homeowners association to develop a brochure on the Brazilian pepper plant. This educational leaflet provides homeowners with information on how to identify and eradicate the Brazilian pepper and where to obtain help. The brochure was distributed to citizens with shoreline homes and has been one of the Program's most popular public outreach tools.

Example 6: Development of best management practices to regulate freshwater flow and prevent irregular and inconsistent flows of freshwater to the estuary.

The Charlotte Harbor National Estuary Program's Management Plan calls for a watershed approach to surface water management (). Under this approach, a watershed management plan can be created for each drainage basin in the study area that will establish minimum flows and water levels for each water body, and determine the maximum cumulative withdrawals. One such plan is the Peace River Comprehensive Watershed Management Plan, developed by the Southwest Florida Water Management District and a team of stakeholders, which helps serve as a framework for future water use decisions. This plan seeks to provide a holistic method of not only protecting water quality in the basin but also ensuring adequate water supply for urban areas, agriculture, and the environment. Activities in the Comprehensive Watershed Management Plan and related efforts by the Charlotte Harbor National Estuary Program and the State include additional research of surface and ground-

water flow conditions within the study area; the regulation of surface and groundwater withdrawals for water supply, agriculture, and industrial purposes; regulation and monitoring of flow rates of point source discharges from sewage treatment plants and industrial facilities; the use of best management practices to decrease and retain stormwater runoff; the issuance of water use permits; and public education programs. Two community education programs related to water use for landscaping include xeriscaping and the Florida Yards and Neighborhoods Program.

Example 7: Development of priority list and GIS map of habitat sites for restoration and acquisition.

Through an ongoing process, the New York-New Jersey Harbor Estuary Program Habitat Work Group (<http://www.epa.gov/region02/water/nep/nep.htm>) developed a list and GIS map of priority habitat sites for restoration and acquisition. This information is being used by the States, Federal partners, and others to identify appropriate restoration and acquisition projects. The map and the tireless activity of the work group have resulted in the funding of millions of dollars worth of restoration projects. One of the major sources of funding has been the multi-million dollar New York State Clean Air-Water Bond Act. The map has also been used by the Corps of Engineers to refine their list of sites to be included in the Hudson-Raritan Reconnaissance Study, an effort that may ultimately result in the restoration of hundreds of acres of habitat.

Example 8: Clam beds reopened through water quality improvements due to increased municipal sewerage coverage.

In November 2000, the Seabrook Middle Ground was reopened to clamming for the first time in nearly 10 years. This reclassification points to marked water quality improvements largely due to increased municipal sewerage coverage in the Town of Seabrook and other smaller scale pollution control measures. The water testing, pollution source identification and reduction work that has made this reclassification possible has been a cooperative effort by the New

Hampshire Estuaries Project (<http://www.epa.gov/owow/estuaries/nhe.htm>); NH Department of Health and Human Services; NH Fish and Game Department; NH Office of State Planning; NH Department of Environmental Services; the Towns of Seabrook, Hampton, and Hampton Falls; and a number of dedicated volunteers from Great Bay Watch and area towns. The reclassification of the Seabrook Middle Ground represents a significant increase in the area and number of shellfish available for recreational harvest by New Hampshire residents.

IMPROVING REGIONAL GOVERNANCE IN THE UNITED STATES: LEARNING FROM THE COASTAL AMERICA EXPERIENCE

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Introduction

Cooperative mechanisms that enable responsible parties the means to simultaneously fulfill their responsibilities while acting in a coordinated manner with others are essential to coastal policy. Essentially this amounts to coordinated, shared governance. Ten years ago, several federal departments initiated a novel, voluntary approach to facilitate coastal protection, preservation, and restoration. This partnership effort is known as Coastal America. The purpose of this paper is to review the key features of the Coastal America Partnership.

Collaborative Needs

Coastal Responsibilities and Authorities. Many authorities and tools can be enlisted to protect, preserve, and restore coastal resources. These authorities and tools are vested in several agencies and levels of government, as well as among non-governmental organizations. The result is the challenge of attempting to use these various authorities and tools in a concerted, focused way to address coastal resource issues that cross multiple jurisdictions. At just the federal level, numerous statutory authorities affect our ability to protect and conserve coastal resources. In addition, each coastal state has authorities and resources that can be used to address coastal needs. Local governments possess additional land use planning and regulatory tools. And many voluntary organizations and institutions have significant abilities to shape the future condition of coastal areas.

The Coordination Challenge. The challenge is how to effectively mobilize and synthesize the various coastal authorities and tools into a coordinated set of actions that can deliver the desired results. To be most effective, governance strategies must integrate the technical and managerial capabilities and resources of federal partners with those of state, local, and voluntary organizations in efforts to collaboratively identify and solve specific local coastal problems. These collaborative strategies are united by the principles of sustainable development while recognizing that to be effective, they must be developed within ecosystem and watershed contexts.

The Coastal America partnership was established to address this challenge by providing a framework that brings the responsibilities, talents and resources of many entities together in a strategic way.

Coastal America: A Working Model Since 1992

Uniting Coastal Conservation Efforts:

Several federal departments and agencies established Coastal America in 1992 as a mechanism to foster collaborative strategies and actions. Currently, the participating Coastal America partners are: Departments of Agriculture, Air Force, Army, Commerce, Defense, Energy, Housing and Urban Development, the Interior, the Navy, State, Transportation; the Environmental Protection Agency; and the Executive Office of the President (Council on Environmental Quality). The enabling memorandum of understanding has been renewed several times – most recently in November 2002.

The Coastal America Partnership was established to:

- Protect, preserve, and restore the Nation’s coastal ecosystems through existing Federal capabilities and authorities;
- Facilitate collaboration and cooperation in the stewardship of coastal living resources by working in partnership with other Federal programs and integrating Federal actions with state, local, and nongovernmental efforts; and
- Provide a framework for action that effectively focuses agency expertise and resources on jointly identified problems to produce demonstrable environmental and programmatic results that may serve as models for effective management of coastal living resources.

How the Coastal America Partnership Works – A Collaborative Process

Coastal America isn’t an agency or a single program. It is a collaborative process, bringing agencies together to systematically cooperate on problems that benefit from multi-faceted interagency efforts. Coastal America helps identify areas of overlapping mandates, authorities, policies, and objectives. It encourages collaboration in those overlapping areas.

Operating Premise. The operating premise is that if one agency identifies a project that needs group assistance, all agencies review their own mandates for applicable programs such that a collaborative effort results, often yielding a solution beyond the scope of any single agency.

Distinguishing Features.

- National Memorandum of Understanding with shared goals and objectives
- Regional Teams supported by national structure
- Flexible regional approach to meet local needs
- Effective leveraging of resources

- Combines existing program authorities
- Inclusive process (Federal/State/Local/Tribal/NGO/Private)
- Voluntary involvement
- Action focus with on-the-ground projects
- Well-established awards program

Structure

Principals Group – A working group of Assistant and Under Secretaries of the partnering departments that meet several times a year to provide overall program direction and set policy for the partnership.

National Implementation Team – A group of senior managers from each of the partner agencies. They meet monthly to implement policy direction and provide support to the Regional Teams.

Regional Principals Groups and Regional Implementation Teams – This is the core of Coastal America. Under the guidance of Regional Principals, nine implementation teams have been established covering all coastal areas (See Figure 1). Comprised of senior regional officials of the federal partner agencies and state agency representatives, they represent the primary operating units for interagency consultation and action. They identify regional issues, develop strategies, and select and prioritize projects. They are advocates for the projects with their headquarters counterparts. They communicate, build relationships, synthesize information and look for ways to break down barriers that prevent collaboration. They deliver federal programs on the ground to communities.

Project Teams – Locally based groups comprised of federal, state, and local organizations. They are established as needed to implement projects. The Regional Implementation Teams support the project teams. Place-based coalitions such as the American Heritage Rivers and National Estuary Programs have local action plans and processes that often facilitate project development and implementation.

Accomplishments

Regional Strategies – Early in the development of Coastal America the uniqueness of coastal ecosystems in each region was recognized. While many issues are the same (e.g. habitat loss and degradation), the ecological features are often distinct, and local resources, methods, and priorities for addressing these issues may differ. Further, different social, economic, and political institutions mandate differing approaches when dealing with these problems. The regional teams set ecological priorities and focus their collaborative efforts on providing the desired government services to communities within a regional context.

Projects. Over 600 projects have been accomplished to protect, preserve, and restore coastal resources. Many of these efforts act on a larger scale (e.g. watershed). Through these projects, over 250 state and local governments, and more than 450 private businesses and organizations have employed their resources in collaborative coastal restoration and protection efforts. The web site <http://www.CoastalAmerica.gov> displays these projects.

Coastal Ecosystem Learning Centers (CELC). Established in 1996, the CELC initiative is a partnership network of federal agencies and 15 marine education centers. Most Learning Centers are aquariums, but science centers and even a fishing museum are included. The goal of each Learning Center is to educate and involve the public in protecting our nation's coastal ecosystems. Through these centers, the federal government is able to directly assist in education.

Corporate Wetlands Restoration Partnership (CWRP). The CWRP is a public/private partnership developed in 1999. The National Association of Manufacturers is the national sponsor and there are currently more than 100 participating companies. In addition, more than 55 non-governmental organizations are participating in CWRP. The CWRP is deployed through state-specific charters and will eventually include all states. Further detail about CWRP activities may be found at <http://www.CWRP.org>.

Added Value--Participants in Coastal America enjoy the following benefits:

- Ready mechanism and processes for addressing complex ecological issues.
- Quicker implementation of multi-party projects.
- Mechanism to focus national attention on program directives or regulatory burdens that warrant relief.
- Mechanism for public-private partnerships with investments for restoration and protection of wetlands and related natural resources.
- Priority for funding of endorsed projects.
- Effective means for increasing public understanding of coastal processes, issues, and needs.
- Ready means for facilitating national understanding of regional and local needs.

A Nationally Recognized Partnership

Over the years, Coastal America has been recognized for its effective innovation. The Partnership received the “Hammer Award” for reinventing government and has been recognized by the Innovations in American Government program of the Ford Foundation and The John F. Kennedy School of Government at Harvard University. A 1997 National Fish and Wildlife Foundation report concluded, “The success of the Coastal America partnership can be attributed to: (1) A collaborative approach that encourages innovative and cost-effective solutions to specific real world problems, (2) A partnership network that enables the development of a broad consensus for action and insures implementation, and (3) A management structure that facilitates communication across government and from the field to the policy level.”

Lessons Learned

The Coastal America experience has shown that a collaborative partnership needs to have adequate scope, an effective organizational structure and appropriate operational mechanisms.

Scope: Collaborative coastal management requires adequate scoping to meet statutory responsibilities, accommodate shared work processes, and address multiple goals. The multiplicity of federal, state, and local authorities reflects the complexity and diversity of coastal resource management issues. A collaborative partnership approach is often better matched to real world needs because it addresses this diversity. The Coastal America experience has shown that governmental agencies with statutory responsibilities for coastal resources or whose operational activities affect the coastal environment are most effective when they work together. These include agencies with responsibilities for:

- Stewardship/protection of natural resources;
- Commerce, Transportation, and Infrastructure;
- Military operations and services.

Organizational Structure: In order to effectively manage coastal resources and restore degraded areas, means must be found for the various actors to come together in a concerted, coordinated effort. A horizontally and vertically integrated organizational structure best facilitates this process. The Coastal America experience suggests that an effective partnership structure should:

- Encourage a collaborative approach among federal, state, and local entities.
- Allow for individual missions of the different programs to be maintained in their entirety.
- Increase coordination and efficiency among the programs.
- Provide for accountability to be maintained, and expectations to be met.
- Be transparent and easily understood by all stakeholders.

Operational Mechanisms: The achievement of partnership goals and objectives is the measure of program success. Operational mechanisms that facilitate implementation of partnership efforts are essential to the process. The Coastal America experience suggests that a collaborative partnership can be most effective when:

- There is a set of comprehensive strategies, supported by the partners, that addresses restoration of deteriorated areas and conservation of areas with resources at risk.
- Agency leadership sets high expectations for the partnership and emphasizes collaborative efforts.
- The work of the partnership is transparent and it is held accountable for results.
- Agency budgets assign priority to actions supported by the partnership.
- Agencies have clear direction to share strategies, budgets, personnel and program resources.
- Accomplishments are rewarded and result in career enhancements.
- Incentives are provided to ensure appropriate involvement of state and local governments, Native American tribes, and affected non-governmental organizations.
- The partnership supports and encourages place-based solutions to local and regional needs. Such solutions must be comprehensive to the extent that all affected authorities are involved in implementing cooperative actions.
- Agency work processes are sufficiently flexible to permit synthesizing or blending to accommodate regional and local needs. Such work processes include, among others: land use and water planning, budgeting, use authorization, restoration, and evaluation.

Challenges and Opportunities

Collaborative partnerships by their nature focus complex and diverse interests toward collaborative, comprehensive solutions to which each party may provide a unique contribution. It is the nature of collaborative efforts that each of the partners makes a contribution to the whole, thus providing for a more comprehensive solution. There are opportunities for any collaborative governance to go even further than Coastal America has gone to date. Some of those opportunities are:

Citizen-Centered Governance. Shared communities of interests develop solutions to real world local and regional problems. By using a transparent process that is tailored to local factors and interests, citizens have expanded opportunities to drive the outcomes. Local and regional interests could use established collaborative processes to develop workable solutions. The process could essentially provide “one stop shopping” for an improved delivery of federal services. Effective citizen-centered governance builds broad credibility and confidence.

Related Collaborative Efforts. Currently, officials from several federal agencies and the Council on Environmental Quality are examining ways and means for the federal government to better support watershed coordinating bodies. Those interests have viewed the collaborative partnership model as an effective means of addressing watershed concerns.

Strengthened Goals and Strategies. A shared governing mechanism could be tasked to represent their agencies in developing a set of shared quantifiable goals that include end outcomes, intermediate outcomes, and outputs. The goals and commensurate strategies would be most sound if the processes afforded sufficient opportunity for community input. Participating agencies could ensure that the shared goals are compatible with their GPRA strategic and performance plans.

Measuring the Value-Added Through Collaborative Governance. In order to be able to effectively communicate their accomplishments to the public, participating agencies will need to agree on a set of common performance measures and definitions for the work they do collaboratively. Common performance measures for the coast and oceans should be

used to monitor resources and evaluate program effectiveness.

Budget Crosscut. The FY 2004 budget guidance issued by the Office of Management and Budget encouraged agencies doing similar work to develop budget crosscuts. It is likely that this approach will be pursued further by the current Administration. It would be valuable to develop a budget crosscut for ocean and coastal protection, preservation and restoration. This could aid in the development of performance-based budgets for the participating agencies with respect to contributing programs. It would also lead to strengthening agency commitments to collaborative strategies and solutions. Individuals experienced with collaborative governance could be very helpful in constructing such a crosscut.

Single Source for Information. A collaborative governance mechanism could provide a basis for assembling a single source of readily available and reliable shared data about coastal areas and affected federal policies and programs. This could be done through an electronic portal – in effect, a “One-Stop” with organized links to all information of shared relevance.

Accountability. It is helpful if the collaborative governance mechanism provides a framework that could be used to account for collaborative actions. The partnering agencies could account for those efforts collectively rather than piecemeal as is often necessary using established internal agency-specific accounting procedures. A collective accounting would provide citizens with a comprehensive and, therefore, more accurate picture.

Next Steps

Should there be interest in pursuing these opportunities, a responsible approach would be to utilize an interagency regional team to conduct a demonstration or testing of the actions mentioned in the previous section. Or perhaps different teams could test different features. The demonstration effort would be complex, and would require time and commitment of significant resources to the team. However, this may be more cost effective than establishing new regional governing arrangements that could find themselves at odds with existing authorities.

Figure 1: Coastal America Regions



REGIONAL MARINE PLANNING: THE AUSTRALIAN EXPERIENCE

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Australia's Oceans Policy was launched in December 1998, the International Year of the Ocean, to manage the resources and use of the vast oceans that surround the world's only island continent. The Policy represents a significant commitment by the Australian Government to become a world leader in implementing integrated oceans planning and management.

The Policy was developed, in part, as a means of ensuring Australia's international rights and obligations under the United Nations Convention on the Law of the Sea (UNCLOS) were met. The impetus also came from a widely recognised need to plan for the maintenance of marine ecosystems into the future.

While the environment is at the centre of *Australia's Oceans Policy*, it must be understood that it is not an environment protection policy. Nor is it an economic development policy. To quote the then Minister who launched the policy, Senator Robert Hill,

"It is a Policy for the ecologically sustainable development of our oceans."

Responsibility for coordinating the implementation of *Oceans Policy* rests with the National Oceans Office, an independent agency of the Australian Government, created in 1999.

By way of background, it is important to understand the basic legal and constitutional arrangements that apply in Australia for oceans jurisdiction. Around continental Australia, sole Federal Government jurisdiction stretches from the outer boundaries of the Exclusive Economic Zone to three nautical miles from the coastal baseline, or low water mark. The coastal

within the three nautical mile zone falls within the primary jurisdiction of the State and Territory Governments. Local Government authorities, a third level of government, add another layer of complexity through their role in the planning and management of the coast and catchment areas.

The marine jurisdiction in Australia encompasses around 11 million kilometres of ocean, which could increase up to 15 million square kilometres when the claimable continental shelf is determined. That's about twice the area of the Australian continent. The marine jurisdiction is divided into 13 Large Marine Domains, based on ecosystem characteristics. These are the cornerstones of regional marine planning and the vehicle to achieve the policy's vision. *Australia's Oceans Policy* sets "the framework for integrated and ecosystem-based planning and management for all Australia's marine jurisdictions" (Vol 1, p2).

Ecosystem-based oceans planning and management aims to ensure the maintenance of:

- ecological processes in all ocean areas, including, for example, water and nutrient flows, community structures and food webs, and ecosystem link;
- marine biological diversity, including the capacity for evolutionary change; and
- viable populations of all native marine species in functioning biological communities.

Ecosystem-based management is one of two key drivers at the core of Australia's Oceans Policy. The other is the multiple-use approach. This approach to

resource management tells us that we cannot regard our ocean resources, or our ocean uses, in isolation. Instead we should manage activities for the whole ocean ecosystem and the range of values and uses that drive our interactions with it. That is, by using a whole-of-system approach.

There is growing acceptance within and outside government in Australia that without a national *Oceans Policy* and the strategic approach that it brings, the problems associated with a traditional sectoral approach to oceans management would continue. The existing arrangements do not enable adequate responses to the increasing pressures on our oceans. Furthermore, without reform, we know there would be a continuation of cross-sectoral and cross-jurisdictional disputes over resource allocation and usage.

In Australia, we are at an exciting stage in the development of Oceans Policy. This month, the first of Australia's regional marine plans for the South-east region was presented to the Ministerial Board which oversees the implementation of the policy. It represented the culmination of four years of work.

The South-east Regional Marine Plan covers more than two million square kilometres of ocean surrounding the states of Victoria and Tasmania, and encompasses the ocean off the far south coast of New South Wales and easternmost South Australia. It also includes the waters around the sub-Antarctic Macquarie Island, a world heritage listed outpost in the middle of the Southern Ocean, closer to Antarctica than Australia (See figure 1). Nowhere in the world has there been an attempt to develop an integrated, ecosystem-based management strategy on this scale.

The South-east Regional Marine Plan began in September 2000. Firstly, the Scoping Phase defined what the requirements on the final plan would be and described the South-east Marine region in broad terms. Secondly the Assessment Phase gathered information and research from all over the Region to develop a solid and credible information base on which to build the Plan. Thirdly, the Options Phase engaged stakeholders to help the National Oceans Office define objectives, targeted issues and a number of manage-

ment responses. The release of the draft plan is the next challenge.

The National Oceans Office has already commenced its second regional planning process in the North of Australia (See figure 2) and there are some differences. The Northern Planning Area covers the eastern Arafura Sea, the Gulf of Carpentaria and the waters of Torres Strait, between Australia and New Guinea. The Office is working cooperatively with the state of Queensland the Northern Territory in the scoping phase where key regional characteristics and issues are being identified and stakeholder consultation mechanisms are being established.

In progressing the Northern Plan, the Federal Government has sought to engage the governments of state and territory governments in a more formal way than was possible at the commencement of the South-east planning process. A Memorandum of Understanding is being developed that describes the relationship between the jurisdictions and the roles each government will play during the scoping phase of the regional marine planning process.

This represents a lesson learned during Australia's regional marine planning process that may well be relevant in the context of the policy-making process underway in the United States. Without a genuine "buy-in" of all jurisdictions at the earliest possible stage, the integrity of the process can be threatened. It only takes one weak link to break the chain.

The Northern marine planning process has taken a slightly different approach also in terms of the information gathering process. Under the Northern planning process, information collection has been more focussed and based on identified issues from the region. The process of defining issues in the South-east Regional Marine Plan has revealed that it is difficult to identify and address issues at a regional scale when the national dimension of the issue has not been addressed. Consequently, many of the issues coming out of the South-east are directed towards national solutions. The North Plan also involves cross jurisdictional issues with other sovereign nations, namely Papua New Guinea and Indonesia.

In a wider context of Oceans *Policy*, the National Oceans Office is working cooperatively with all states to develop a national approach to Integrated Ocean Management (IOM). This involves improvements to coordination across sectoral management activities within and between spheres of government. It is based on consideration of the ecological, social, cultural and economic values of marine regions. Its overarching goal is the ecologically sustainable development of the ocean and its resources.

The need for strategic planning and integration across jurisdictions has underpinned *Australia's Oceans Policy* since its inception.

“Implementing a national oceans policy will need better coordination between the national, State and Territory Governments in integrating planning and management to ensure that jurisdictional boundaries do not hinder effective management. The Government will seek the early and full endorsement of Australia's Oceans Policy by the States and Territories. (Senator Hill, Australia's Oceans Policy, 1999)

The fundamental objective behind the ecosystem-based approach is that planning and management boundaries recognise ecological entities, integrating across other administrative, sectoral and jurisdictional boundaries. The Government's commitment to integrated ecosystem-based planning and management necessitates the pursuit of improved coordination between the states and the Federal Government to ensure that jurisdictional boundaries are not barriers to this objective.

Ocean management arrangements in Australia are unquestionably complex, sometimes duplicative and in some cases uncoordinated. There are about 90 pieces of Federal legislation and 250 pieces of state legislation that apply to the first region to undergo the regional planning process, the South-east plan. Attached to much of this legislation are associated regulations and government administrative arrangements.

While there is broad recognition of the need for greater co-ordination between governments on ocean management, this co-ordination requires consistency at

the policy level, agreed outcomes for the management of Australia's oceans, and agreed ways to work towards those outcomes.

To achieve integration across governments there needs to be a capability for joint State and Federal decision-making on matters that cross jurisdictional boundaries. At present, direct, flexible and efficient mechanisms for joint decision-making do not exist, but governments have agreed to develop a national approach to integrated oceans management working through the Natural Resource Management Ministerial Council. This is an annual forum attended by State and Federal Ministers with responsibility for Natural Resource Management. Some other Ministerial Councils are also addressing integrated oceans management issues.

These Ministerial Councils are working towards agreements on desired outcomes for integration across jurisdictions and the governance arrangements needed to support those outcomes. The products of this work will be considered by Ministerial Councils late next year.

Although the South-east Plan does not directly impact upon state responsibilities, it does provide the states with a number of opportunities to link with the Federal Government on cross-jurisdictional issues. Last month, the Federal Minister for the Environment, Dr David Kemp, wrote to each of the state Premiers seeking to discuss their more formal involvement in the process. We are awaiting the states' responses, but we hope to engage them to the fullest possible extent on cross jurisdictional issues. The states will all be exposed to a draft this month, two months before its public release. If, however, the states do agree at a political level to formally engage in the South-east plan, then this could cause delays in the current timetable for the public release of the Plan, scheduled for early next year.

Also at this regional level, a South-east States Consultative Working Group is a forum for addressing cross-jurisdictional issues within that marine region. This Working Group came about from an invitation by the Federal Government for the South-east states

to work collaboratively on decision-making on cross-jurisdictional issues, and coordinating the implementation of management responses when these are of relevance to more than one government.

In Australia, it has also been necessary to integrate management within the Federal Government itself. Currently, as activities that affect the ocean are regulated sector by sector, each industry has its own set of legislative and administrative rules. While in most cases this approach is effective, there are cases in which decisions must take into account the fundamental ecological links across resources that are currently managed in a sectoral fashion by different Federal agencies.

Australia's Oceans Policy says that Regional Marine Plans would integrate the current sectoral management of our oceans. To this end, all the relevant sectors were represented on the Ministerial Board to direct the process. The Ministerial Board provided an opportunity for this integration to occur but there was no framework for how this would happen. This too is a lesson for any government considering regional marine planning for ocean waters under its jurisdiction. There must be a framework, whether that be legislative or administrative, to support it.

An Oceans Policy Senior Officials Group provides a capability to address cross-sectoral issues within the Federal Government. With representation from all the relevant Federal agencies, this group exists to integrate management, where possible, across the Commonwealth.

In terms of lessons learned, it is also essential to engage at the highest possible levels across government. This high level of engagement involves a considerable investment of time and resources and a commitment on the part of the coordinating agency, in Australia's case, the National Oceans Office, to demonstrate the net gains from the process to all stakeholders. A high level of engagement from agencies is also necessary to ensure that there is capacity as a group to make formal changes in strategic direction.

In order to engage all stakeholders, it has been found in the Australian regional marine planning experience that credible scientific and socio-economic data is a vital prerequisite.

Much of the scientific rigour underpinning the regional marine planning process in Australia is provided by the National Work Program. This work program is designed to build on the existing knowledge base; to make our delimitation of marine regions more meaningful, to map Australia's marine jurisdiction; measure performance of regional marine plans; establish an accessible marine knowledge base; and facilitate international cooperation.

In Australia's case, an area that is critically important to the knowledge base is a program of bioregionalisation for all of Australia's EEZ. Bioregionalisation projects have been developed and will be implemented in collaboration with Federal and State research agencies, universities and museums. These projects include validation of fish datasets, the creation of bathymetric models, collation of oceanographic data, datasets of invertebrates, other biological and sediment distribution. Due to the often long lead times in information gathering voyages, it is important that these are planned well ahead of other aspects of Regional Marine Planning.

Summary

Integrated, sustainable and ecosystem-based management is not easy to achieve, even in countries with far less jurisdictional complexity than Australia's. The process requires good information, stakeholder confidence and commitment both to the process and its outcomes, a clear framework to implement the management plan and high levels of cooperation between governments.

Figure 1: Area of the South-East Regional Marine Plan

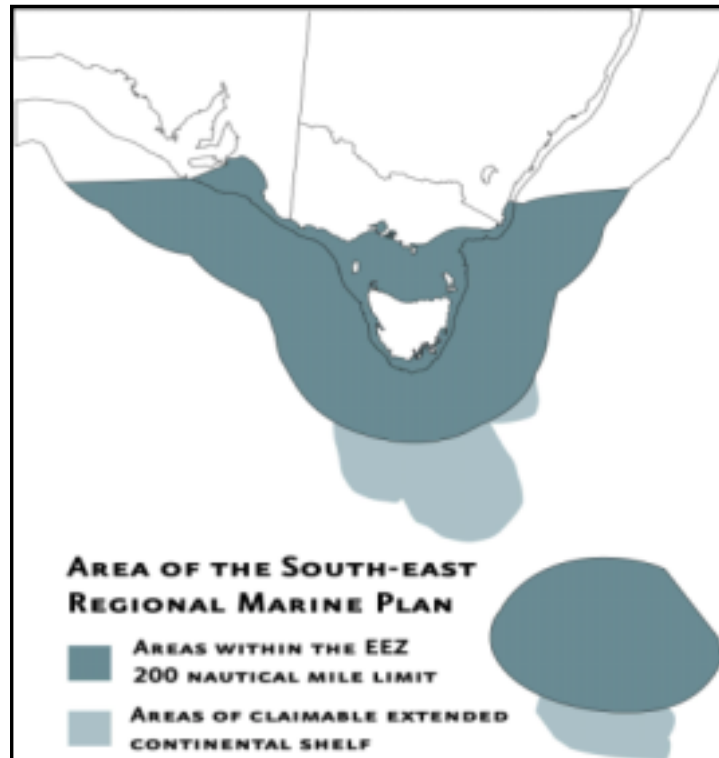
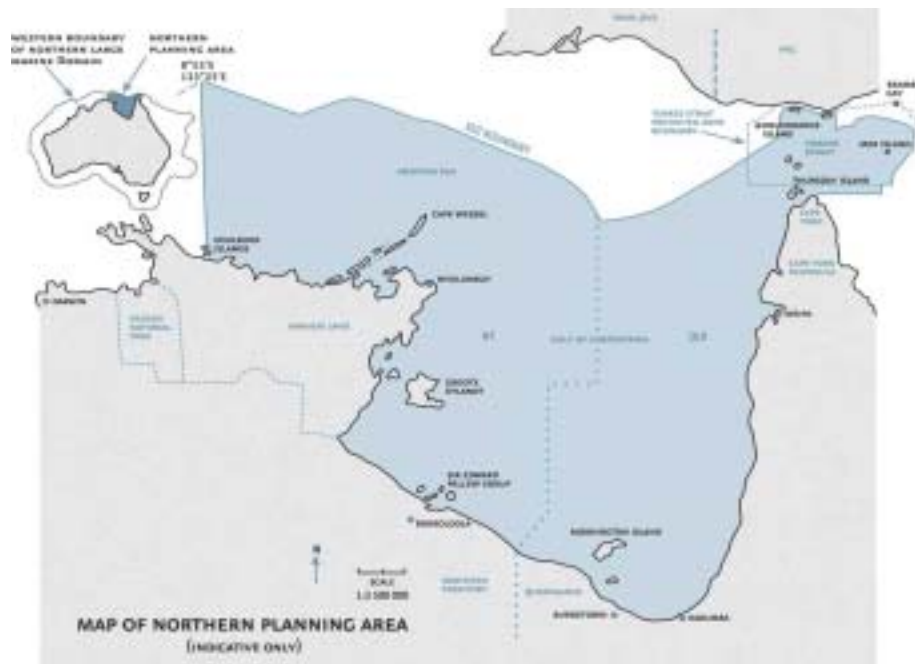


Figure 2: Map of the Northern Planning Area



MARITIME REGIME BUILDING IN THE PACIFIC

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Introduction

The Pacific is the world's largest ocean, and it contains many of the world's smallest countries. Most of these isolated islands of the Pacific were under colonial domination from the mid-nineteenth century (or earlier) until (usually) the 1970s, when most became independent. Some are still connected with, or integrated into, a larger metropolitan power (i.e., French Polynesia, New Caledonia, and Wallis & Futuna, are still connected to France, and Hawai'i, American Samoa, Guam, and the Northern Marianas are connected to the United States²). New Zealand (Aotearoa) and Australia participate in many Pacific regional organizations and activities; they are viewed as partners, but play separate and different, although still important, role, because of their larger size and differences in culture and history. The regional organizations used to be titled "South Pacific...." but increasingly the term "Pacific" is now used, because the Republic of the Marshall Islands, the Federated States of Micronesia, and the Republic of Palau (all situated north of the equator) have become active members of these organizations since they emerged from their colonial status in the late 1980s and early 1990s, and Guam and the Commonwealth of the Northern Mariana Islands also participate in some of them. This paper will explore the origins and accomplishments of the South Pacific Commission (SPC)(now the Secretariat of the Pacific Community), the South Pacific Forum (SPF), the Forum Fisheries Agency (FFA), and the South Pacific Regional Environmental Programme (SPREP).³ The Pacific Island Development Program at the East-West Center in Honolulu should also be mentioned, because it has been an effective organization to identify research priorities and to coordinate academic work relevant to

the region. The major treaties negotiated by these groups and their member nations include the Tuna Treaty, the South Pacific Nuclear Free Zone (SPNFZ) Treaty, the SPREP Treaty, and the Waigani Treaty. Particular focus is given to the work of SPREP, one of the most inclusive South Pacific regional organizations, with 26 members.

South Pacific Commission/Secretariat of the Pacific Community

The South Pacific Commission (SPC) was formed in 1947 by four nations with colonies in the Pacific (France, Great Britain, the Netherlands, and the United States) in order to maintain the stability of the region and assist with education, health, and economic development in their colonies.⁴ Most of the island colonies also became members of the organization, which was based in Noumea, New Caledonia, and its meetings featured a unique mix of representatives from both the metropolitan powers and the islands themselves. In the 1960s, as the movement toward decolonialization picked up momentum, a growing feeling that the colonial nations were interlopers in the area led to a revolution of sorts, and the island members worked to change the SPC's form and mission, moving to "replace trusteeship with collegial co-operation...and technical expertise with direct financial assistance."⁵ This revolution, as well as the rapid growth of independence in the South Pacific, led to the formation in 1965 of the first purely indigenous regional organization, the Pacific Island Producers Association (PIPA), followed soon by the Forum. Today the SPC is now longer viewed as the colonial body it once was. It now has 26 members (the same as SPREP), and has recently been renamed the Secretariat of the Pacific Community, to acknowl-

edge its northern pacific members and to move away from the colonialism implied in the word “commission.”⁶ This body has concentrated on technical assistance, and has focused, for instance, on the development of the tuna industry, providing important data through its tuna tagging projects.

The Forum

Largely to counter the big-power domination found in the SPC, the independent and self-governing island countries in the Pacific created the South Pacific Forum in 1971. This new organization has had a broad political agenda. It has always acted through an annual meeting attended by the heads of government of its members, and has a Secretariat based in Suva, Fiji.⁷ The environment has been only one of the many issues it has addressed, but by unifying the South Pacific Island nations, it paved the way for organizations which could address the environmental concerns of the entire region. Each newly independent nation has been invited to join the Forum, and it now contains 16 members: Australia, the Cook Islands, the Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Papua New Guinea, Samoa (formerly “Western Samoa”) Solomon Islands, Tonga, Tuvalu, and Vanuatu. The Forum created the important Forum Fisheries Agency, provided the venue to negotiate the South Pacific Nuclear Free Zone Treaty (SPNFZ), assisted with the development of the SPREP Treaty, has promoted the Ocean Resources Management Training Program,⁸ has assisted in the development of the 1995 Treaty of Waigani on the movements of hazardous and radioactive wastes, and has issued important statements drawing attention to the inadequacies of the international regime governing the shipment of ultrahazardous radioactive cargoes by sea.

Pacific Island nations have vigorously protested these shipments since they began in the early 1990s.⁹ At the meeting of the South Pacific Forum in October 1999, the Pacific Island leaders expressed their concern once again and called specifically for a compensation regime to be established that would indemnify the island communities for any economic losses that their tourism and fishing industries might suffer as a

result of an accident “even if there is no actual environmental damage caused.”¹⁰ This communique also urged members to work within the International Maritime Organization (IMO) and the International Atomic Energy Agency (IAEA) to develop “a strong regime of prior notification to, and consultation with, coastal states on planned shipments of radioactive materials and MOX fuel (consistent with security requirements), the development of a regime for the preparation of Environmental Impact Statements and Emergency Response Plans.”¹¹ New Zealand has taken a lead in protesting these shipments, arguing that they should not be permitted through New Zealand’s EEZ because of the “precautionary principle’ enshrined in the Rio Declaration,” and that “there should be recognition in international law of the right of potentially affected coastal states to prior notification, and, ideally, prior informed consent for shipments of nuclear material.”¹²

The Forum Fisheries Agency

In 1979, the 12 countries that were then members of the Forum established the Forum Fisheries Agency (FFA) to coordinate regional fishing concerns in light of the international recognition (in the drafts that eventually became the 1982 United Nations Law of the Sea Convention¹³) of the 200-nautical-mile exclusive economic zone (EEZ).¹⁴ The FFA’s members are now the same 16 countries that are members of the Forum, and its main functions are to set policy for fishing in the South Pacific Region and to negotiate agreements (through its staff, based in Honiara, Solomon Islands) with fishing companies that wish to fish in the EEZs of its members. Others functions include “accumulating detailed and up-to-date information on aspects of living marine resources in the region; evaluating and analyzing data to provide clear, timely, concise, complete and accurate advice to member countries; [and] developing and maintaining a communications network for the dissemination of information to member countries’.”¹⁵ The FFA members outlawed fishing for tuna without a license within their EEZs zones, but until 1987 the U.S. refused to recognize these prohibitions with regard to tuna, a migratory fish that moves from zone to zone. Eventually, however, political developments led the

U.S. to agree to meet with leaders of the Pacific Islands and to negotiate a Multilateral Fisheries Treaty.¹⁶

This treaty authorized up to 50 U.S. vessels to fish in the EEZs of the 16 countries in the FFA. The treaty was originally to end in 1993, but the parties agreed to extend it for another ten years, granting an additional 5 licenses to the United States and increasing the price paid to the island countries for the licenses.¹⁷ The FFA distributes the licensing funds to the individual states, monitors fishing in the EEZs, and provides observers for the boats.¹⁸

More recently, the FFA has coordinated the Pacific Islanders' role in the important multilateral negotiations designed to create a new fisheries organization for the Pacific combining distant-water fishing countries with the island and coastal countries of the region.¹⁹ These high-level multilateral negotiations were designed to create the regional organization anticipated by Article 64 of the 1982 Law of the Sea Convention²⁰ and by the 1995 Straddling and Migratory Stocks Agreement.²¹ The final negotiating session was held in Honolulu from August 30 to September 5, 2000, and a treaty was signed by most of the negotiating parties, but China, France, and Tonga abstained²² and Japan and South Korea refused to sign the agreement.²³ The FFA members worked hard during the three-year negotiating period to ensure that the convention area was as large as possible, that decisions could be made without unanimous agreement, that developing countries would receive financial assistance to carry out their obligations under the treaty, that the treaty could come into force even if the distant-water fishing nations did not ratify it, and that a vessel monitoring system would become mandatory for all vessels. Although not all the FFA positions were achieved to extent desired,^{24 25} the final version of the treaty was signed in September 2000 by all the FFA members except Tonga.

The South Pacific Nuclear Free Zone Treaty (SPNFZ)

In 1985, under the auspices of the Forum, the nations of the South Pacific adopted the South Pacific Nuclear Free Zone Treaty,²⁶ creating a unique nuclear

free zone in the Pacific. The parties to the Treaty agreed to prevent testing, stationing, manufacturing, and dumping of nuclear weapons and devices within their territories and to discourage the use of the region for nuclear testing and waste disposal.²⁷ The treaty permits, however, nuclear-powered vessels and ships carrying nuclear weapons to go through the waters covered by the treaty without restrictions, leading some to question the teeth of the treaty.²⁸ France continued to test nuclear weapons at Mururoa in French Polynesia for a number of years,²⁹ but finally ended that program in 1996. The SPNFZ treaty has been important as a symbolic statement issued by the Pacific Island community, and with the end of the Cold War and the easing of international tension, it may be possible to revisit the text and tighten the regime created by it.³⁰

The South Pacific Regional Environmental Programme

The Early Days. The idea of a South Pacific Regional Environmental Programme was originally conceived at a nature conservation workshop in 1969, which led to a workshop in 1973, which in turn led to a program for the conservation of nature included within the SPC's agenda in 1973.³¹ SPREP was finally formally established in 1982, as a joint initiative of the SPC and the Forum. In 1982, at the "Conference on the Human Environment in the South Pacific," the delegates decided to set up SPREP as a separate entity within the SPC. At this conference, SPREP's first "Action Plan for Managing the Natural Resources of the South Pacific Region" was produced. This document was revised in 1991 and 1997, and remains the focus of SPREP's activities.

During the early 1980s, the United Nations Environment Programme (UNEP) provided funds to permit the Pacific Island countries to negotiate a regional-seas treaty, which was completed in 1986.³² This treaty is formally titled the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region,³³ but it is usually informally called the "SPREP Treaty." The Treaty is designed to protect both the land and marine resources of the region, and contains two protocols – on waste

dumping and combating pollution emergencies. The Treaty was particularly important in that it completely prohibited the dumping of both high- and low-level nuclear waste in the area it covered.³⁴ Although the Mediterranean³⁵ and Baltic³⁶ Treaties also contained such prohibition, the Pacific region is much larger and contains sites that were considered by many as appropriate for nuclear waste dumping. Nonetheless, in an important concession that led to the later ban on all nuclear waste dumping in the 1996 Protocol³⁷ to the London Convention, 1972,³⁸ the United States agreed to the prohibition. The SPREP Treaty also contains valuable provisions requiring environmental assessments with regard to any major activity affecting the SPREP Treaty area.³⁹

After the SPREP Treaty was completed in 1986, bi-annual intergovernmental meetings began to be held, and after 1990, these meetings became annual events. Also in 1986, a five-member steering committee was established, consisting of representatives from Polynesia, Melanesia, Micronesia, the metropolitan powers (France/United Kingdom/USA), and Australia/New Zealand.

In 1991, the leaders of SPREP decided that the organization should become autonomous from SPC and the Forum. Samoa offered to host the organization's headquarters, and SPREP moved to Apia, Samoa in 1992. In 1993, SPREP's members signed the Agreement Establishing SPREP in order to formalize its new status as an independent intergovernmental organization. In 1995, Niue became the tenth nation to ratify this Agreement, and SPREP officially became autonomous.⁴⁰

SPREP Today. SPREP follows the model utilized earlier by SPC which allows all political entities to participate in its activities, whether they are independent or not, and today, 26 such political entities nations participate in SPREP's policy-making decisions.⁴¹ In its latest Action Plan (for 1997-2000), SPREP described its primary four-year goal as "To build national capacity to protect and improve the environment of the region for the benefit of Pacific island people now and in the future."⁴² Its five current objectives are:

- To protect natural heritage through the conservation and sustainable use of biodiversity.
- To understand and respond to climate change, particularly through integrated coastal management.
- To minimise pollution and wastes, and improve preparedness for pollution emergencies.
- To plan, manage and regulate development in a manner that is environmentally sustainable.
- To strengthen environmental education, training, and information systems.

The staff of SPREP grew from fewer than ten in the 1980s to about 35 employees by the time the organization moved its headquarters to Apia in 1992. Today, SPREP has more than 60 full time employees, working throughout the Pacific Islands. SPREP's budget, almost entirely based on contributions, has also been steadily growing. In 1995, the total general budget was about 7.3 million dollars. The largest share came from the United Nations Development Programme (UNDP), which gave 29% of the total budget. The second largest donor was the Australian Agency for International Development (AusAID), which contributed 27% of SPREP's 1995 budget. New Zealand gave 8%, and a number of other donors gave similar amounts.⁴³

In 1997, SPREP helped coordinate the adoption of a Strategic Action Programme for International Waters of the Pacific Region, to combat the degradation of water quality and associated critical habitats and the unsustainable use of resources.⁴⁴ Most of SPREP's activities are carried out with the assistance of international or national agencies. Their main current activities include the South Pacific Biodiversity Conservation Programme, the Pacific Islands Climate Change Assistance Programme, and the Programme of Capacity Building for Sustainable Development in the South Pacific, which are funded through the United Nations Development Programme; the Waste

Management Education and Awareness Programme, funded by the European Union; the Climate Change and Environmental Education and Training Programmes, funded through the Australian Agency for International Development (AusAID); the Atmospheric and Radiation Measurements in the Tropical Western Pacific, funded by the U.S. Department of Energy; and meteorological services, in conjunction with the World Meteorological Organization.

For the future, SPREP will be focusing on protecting the biodiversity of the region, preparing for the impacts of climate change, promoting integrated coastal management, preventing pollution, managing wastes (and encouraging the ratification of the Treaty of Waigani,⁴⁵ discussed below), preparing for emergencies, and building capacity within each island community so that the environment can be understood and protected.⁴⁶

The Wellington Driftnet Convention

One example of swift collective action taken by Pacific Islanders is their adoption in 1989 of the Convention for the Prohibition of Fishing with Long Driftnets in the South Pacific⁴⁷ (often called the Wellington Convention or the South Pacific Driftnet Convention). This treaty was negotiated swiftly because of the concern that large amounts of juvenile albacore tuna were being harvested through the high-seas driftnetting utilized by Japanese, Koreans, and Taiwanese. The treaty prohibited the landing or transshipment of driftnet catches in the ports of the contracting parties, the importation of any fish or fish product caught with a driftnet, and the possession of any driftnet on board any vessel within the fisheries jurisdiction of the contracting parties.⁴⁸ After adopting their own treaty, the Pacific Islanders worked effectively together to promote the adoption by the United Nations General Assembly later in 1989⁴⁹ and again in 1991⁵⁰ of resolutions supporting global restrictions and calling upon countries to ban the use of high seas driftnets entirely.

The Treaty of Waigani

Another important initiative taken in the Pacific was the adoption in September 1995 of the Waigani Con-

vention on the movement of hazardous and radioactive wastes.⁵¹ The Waigani Convention, when it takes effect, will require contracting parties to prohibit the import of hazardous and radioactive wastes and establishes mandatory notification procedures for transboundary movements of nonradioactive hazardous waste. As of September 1999, Australia, the Federated States of Micronesia, Fiji, Papua New Guinea, and the Solomon Islands had ratified the Convention, and another five ratifications were needed before the treaty would take effect.⁵²

Lessons Learned

It may be hard to translate lessons from the Pacific to other areas, because the Pacific is unique in its huge size and its small, scattered population. Most of the Pacific is not industrialized, and its pollution problems are modest compared to those of other areas.

But certain lessons are certainly evident. When the benefits have been seen to be high, as with regard to the exploitation of the important fishery resources of the Pacific, a strong and coordinated cooperative body (the Forum Fisheries Agency (FFA)) has been established, with a skilled secretariat, and it has taken important initiatives and provided significant benefits for the region. This initiative has been taken, perhaps, because the small islands feel vulnerable when dealing with the industrialized distant-water fishing countries, similarly to the vulnerability found among the Caribbean islanders and the small island communities in the Indian Ocean. Although those countries (mostly in the Western Pacific) with greater fishing resources have coordinated their actions to some extent, they have been relatively generous toward those island countries with fewer fish in their waters, and the regime has maintained its cohesion through this sense of cooperation and sharing.

With regard to environmental protection, the countries of the region have adopted sound treaties, and established a small secretariat to coordinate environmental activities, but almost all the funding has come from outside the region, because most threats to the environment are distant and the priority for environmental protection is low. But when they perceive a

regional threat, they do act effectively together. Pacific Islanders acted in a coordinated manner to demonstrate their abhorrence of nuclear testing by adopting the 1985 South Pacific Nuclear Free Zone Treaty, and they acted to ban driftnets through the adoption of the 1989 South Pacific Driftnet Convention and by working together to adopt strong U.N. General Assembly resolutions. More recently, they have expressed their strong concern about the movement of ultrahazardous cargoes through their waters and about global warming and sea-level rise, but they have not yet been effective in stopping these shipments or in forcing an effective global response to global warming.

Pacific Islanders have created functioning regional organizations that have played important roles in allowing the small islands to speak with a more uniform and louder voice when talking to the larger powers. The island communities have a natural cultural affinity, and generally enjoy working and coordinating policy with each other.⁵³ But political conflicts within some of the countries (particularly Fiji and the Solomon Islands) have caused the regional organizations to be less effective than they might otherwise have been, and the fact that many countries in the region are dependent on outside aid makes them less able to criticize the activities of those countries (like Japan) that give them aid.

The SPREP Secretariat has established a sound agenda, but it has avoided the most controversial subjects, focusing on consensus- and capacity-building rather than confrontation. The global-warming/climate-change issue is another one where we see Pacific Islanders working together effectively in international forums to ensure that their voices are heard. Although such coordinated action may not involve a “regime” in the legal sense, it does appear to be like a regime in the political-science sense. To summarize, a good beginning has been made in the Pacific, but how effective these initiatives will be in the long run remains to be determined.

Notes:

¹ The author gratefully acknowledges the assistance in the research and drafting of this paper provided by Sat Khalsa, member

of the class of 2002, William S. Richardson School of Law, University of Hawai'i at Manoa.

² Pitcairn is still governed by the United Kingdom and the Tokelau Islands are a political dependency of New Zealand. The Cook Islands and Niue are “freely associated states” with New Zealand, and the Republic of the Marshall Islands, the Federated States of Micronesia, and the Republic of Palau are “freely associated states” with the United States, but they are now all viewed as essentially independent countries, with the right to conduct their own foreign affairs, and are all members of the Pacific's regional organizations in their own right.

³ Several other Pacific Island cooperative activities should also be mentioned. The Pacific Island nations have worked together since 1972 to coordinate research on deep seabed minerals through an organization first called the Committee for Coordination of Joint Prospecting for Mineral Resources in the South Pacific Offshore Areas (CCOP/SOPAC), and later called the South Pacific GeoSciences Commission (SOPAC).

They also negotiated a treaty called the Convention on the Conservation of Nature in the South Pacific, which was adopted in Apia, Samoa, on June 12, 1976, and came into force in the 1990s (sometimes called the Apia Convention). The purpose of the Apia Convention was to take action for the conservation, utilization, creation, and development of natural resources of the region through careful planning and management. In particular, the parties are encouraged to create protected areas to safeguard natural ecosystems, superlative scenery, striking geographical formations, and areas of historic, cultural, aesthetic, or scientific value. See Florian Gubon, *Steps Taken by South Pacific Island States to Preserve and Protect Ocean Resources for Future Generations, in Freedom for the Seas in the 21st Century* 121, 124-25 (Jon M. Van Dyke, Durwood Zaelke, and Grant Hewison, eds., 1993).

⁴ See Biliiana Cicin-Sain & Robert W. Knecht, *The Emergence of a Regional Ocean Regime in the South Pacific*, 16 Ecology L. Q. 171, 179 (1989); Jon M. Van Dyke and Susan Heftel, *Tuna Management in the Pacific: An Analysis of the South Pacific Forum Fisheries Agency*, 3 U. Haw. L. Rev. 1, 4 n.9 (1981).

⁵ Cicin-Sain and Knecht, *id.* (citing Richard Herr, *Regionalism in the South Seas: The Impact of the South Pacific Commission, 1947-1974* (unpublished dissertation, Duke University, 1976)).

⁶ See Secretariat of the Pacific Community, SPC's History, <<http://www.spc.org.nc/En/history.htm>>, (last visited August 19, 2000); Flags of the World, *Pacific Community*, <<http://fotw.digibel.be/flags/spc.html#desc>>, (last modified August 19, 2000).

⁷ The Secretariat was originally called the South Pacific Bureau for Economic Cooperation (SPEC), but now is called the South Pacific Forum Secretariat.

⁸ Cicin-Sain and Knecht, *supra* note 3, at 180-81, 184-85.

⁹ See listing of protests in Jon M. Van Dyke, *Applying the Precautionary Principle to Ocean Shipments of Radioactive Materials*, 27 *Ocean Development & Int'l L.* 379, 386 (1996).

¹⁰ Thirteenth South Pacific Forum, Forum Communiqué, para. 31 (Koror, Palau, Oct. 3-5, 1999).

¹¹ *Id.* para. 33.

¹² Letter from Don McKinnon, New Zealand Minister of Foreign Affairs and Trade, to Michael Szabo, July 7, 1999. Legislation is now being examined by New Zealand's parliament that would further restrict vessels powered by or carrying nuclear materials from entering New Zealand's waters.

¹³ United Nations Convention on the Law of the Sea, Dec. 10, 1982, U.N. A/CONF.62/122.

¹⁴ See generally Jon M. Van Dyke and Susan Heftel, *Tuna Management in the Pacific: An Analysis of the South Pacific Forum Fisheries Agency*, 3 *U. Haw. L. Rev.* 1 (1981).

¹⁵ Francis Bugotu, Peter Sitan, & Teekabu Tikai, *A Review of the Achievements of the Forum Fisheries Agency in its First Decade of Operations*, in *The Forum Fisheries Agency: Achievements, Challenges and Prospects* 3 (1990, Richard Herr, ed.).

¹⁶ Forum Fisheries Agency, Multilateral Treaty on Fisheries with the United States between the Governments of certain Pacific Island States and the Government of the United States of America, 26 *I.L.M.* 1048 (1987), and <http://www.ffa.int/frame_index1.html>, (last visited August 21, 2000). Two incidents which led to the U.S. willingness to negotiate were the seizing of a U.S. fishing vessel by the Solomon Islands, and the beginning of preliminary negotiations regarding access to fishing between Kiribati and Russia. *Id.* See generally Jon M. Van Dyke and Carolyn Nicol, *U.S. Tuna Policy: A Reluctant Acceptance of the International Norm in Tuna Issues and Perspectives in the Pacific Islands Region* 105 (David J. Douman ed., East-West Center, 1987).

¹⁷ During the first five years of the original Treaty, the FFA countries were paid about \$12 million per year by the U.S. governments and the tuna fishing industry. After the extension the total payment went up to \$18 million annually. The Treaty also requires the U.S. vessels to fund and carry FFA observers on board to monitor compliance and to do scientific data collection. See Forum Fisheries Agency, Multilateral Treaty on Fisheries with the United States between the Governments of certain Pacific Island States and the Government of the United States of America, <http://www.ffa.int/frame_index1.html>, (last visited August 21, 2000).

¹⁸ For additional information about the FFA, see Gracie Fong, *Governance and Stewardship of the Living Resources: The Work of the South Pacific Forum Fisheries Agency*, in *Freedom for the Seas in the*

21st Century 131-41 (Jon M. Van Dyke, Durwood Zaelke, and Grant Hewison eds. 1993).

¹⁹ See Final Act of the Multilateral High Level Conference on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific, Sept. 5, 2000.

²⁰ See generally Van Dyke and Heftel, *supra* note 13, at 11-17.

²¹ Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, UN Doc. A/CONF.164/37, 8 September 1995, 34 *I.L.M.* 1542 (1995); see generally Jon M. Van Dyke, *The Straddling and Migratory Stocks Agreement and the Pacific*, 11 *Int'l J. Marine & Coastal L.* 406 (1996).

²² China abstained because of its concern about Taiwan's classification as a "fishing entity," with some rights to participate separately in decisionmaking, and France abstained because it wanted the French islands in the Pacific to have separate status in the Commission that is to be established.

²³ Japan and South Korea stated that they view the treaty as too restrictive of their historic fishing practices in the high seas.

²⁴ ...

²⁵ Among the many compromises, for instance, was the decisionmaking provision, which established "chambers" consisting of the FFA and the non-FFA members of the Commission, and provided that each chamber would need to support a decision by a three-fourths majority, with the proviso that no proposal could be defeated by fewer than three votes in either chamber.

²⁶ South Pacific Nuclear Free Zone Treaty, Aug. 6, 1985, 24 *I.L.M.* 1440 (1985). The treaty came into force in 1986 when Australia became the 8th nation to ratify it. *Id.* See generally *International Navigation: Rocks and Shoals Ahead?* 352-72 (Jon M. Van Dyke, Lewis Alexander, and Joseph Morgan eds. 1988).

²⁷ See Florian Gubon, *supra* note 3, at 125-26.

²⁸ See, e.g., Michael Hamel-Green, *The South Pacific Nuclear Free Zone Treaty: A Critical Assessment* (1990); Ramesh Thakur, *The Treaty of Rarotonga: The South Pacific Nuclear-Free Zone*, in *Nuclear Free Zones* 23-45 (1987, David Pitt & Gordon Thompson, eds.); Greg Fry, *Regional Arms Control in the South Pacific*, in *Nuclear Free Zones* 46-66 (1987, David Pitt & Gordon Thompson, eds.); Peter Glebbeek, *The South Pacific Nuclear Free Zone Treaty: A Lost Battle Against the Superpowers?* 10-11 (Institute of Social Studies, The Hague, Netherlands, Working Paper Series No. 73, Jan. 1990).

²⁹ See generally Jon M. Van Dyke, Kirk R. Smith, and Suliana Siwatibau, *Nuclear Activities and Pacific Islanders*, 9 *Energy* 733 (1984).

³⁰ Article 5(2) of the treaty allows each nation in the region to decide for itself if it wants to give port access and/or navigation rights to nuclear armed and/or propelled vessels. Glebbeek, *supra* note 27, at 14-15.

³¹ For more on SPREP's history, *see generally*, South Pacific Regional Environmental Programme, *What's SPREP*, <http://www.sprep.org.ws/whatsprep_.htm>, (last visited on August 17, 2000); *see also* South Pacific Regional Environmental Programme, *SPREP Annual Report 1995/96* at 9 (1996) (hereinafter cited as "Annual Report 1995/96"). Arthur Dahl, who had been with the Smithsonian Institute in Washington, D.C., and more recently has worked at the United Nations Environment Programme, is recognized as "SPREP's founding father," and was the sole Regional Ecological Advisor in the SPC in 1974. *V-Files — The Early Days of SPREP: A Roundtable with Arthur*, SPREP's Environment Newsletter, Dec. 1997, at 9.

³² *See* Jon M. Van Dyke, *The United States and Japan in Relation to the Resources, the Environment, and the People of the Pacific Island Region*, 16 Ecology L.Q. 217, 22-23 (1989).

³³ Convention for the Protection of the Natural Resources and Environment of the South Pacific Region, Nov. 25, 1986, 26 I.L.M. 38 (1987).

³⁴ *Id.* art. 10(1). Subseabed emplacement was also prohibited. *Id.*

³⁵ Convention for the Protection of the Mediterranean Sea Against Pollution, Feb. 16, 1967, art. 4, 15 I.L.M. 290, 291; *id.* annex I(7).

³⁶ Convention on the Protection of the Marine Environment of the Baltic Sea Area, March 22, 1974, art. 9, 13 I.L.M. 544, 549.

³⁷ *See* David Hunter, James Salzman, and Durwood Zaelke, *International Environmental Law and Policy* 767-70 (1998).

³⁸ Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, December 1972, 11 I.L.M. 129.

³⁹ SPREP Treaty, art. 16.

⁴⁰ For more on the SPREP Treaty, *see* Mere Pulea, *The Unfinished Agenda for the Pacific to Protect the Ocean Environment*, in *Freedom for the Seas in the 21st Century* 103, 107-10 (Jon M. Van Dyke, Durwood Zaelke, and Grant Hewison, eds., 1993), and A.V.S. Va'ai, *The Convention for the Protection of the Natural Resources and Environment of the South Pacific Region: Its Strengths and Weaknesses*, in *Freedom for the Seas*, *id.*, at 113-20.

⁴¹ *Annual Report 1995/96* at 7. These 26 political units are: American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji, France, French Polynesia, Guam, Kiribati,

Marshall Islands, Nauru, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn, Samoa (formerly Western Samoa), Solomon Islands, Tokelau, Tonga, Tuvalu, United States, Vanuatu, and Wallis & Futuna.

⁴² South Pacific Regional Environmental Programme, *Action Plan for Managing the Environment of the South Pacific Region 1997-2000* at 6 (1997) (hereinafter cited as "Action Plan").

⁴³ *Annual Report 1995/96* at 35. Some donors contribute to particular projects, as well as to the general budget.

⁴⁴ *Strategic Action Programme for Waters of the Pacific*, SPREP's Environment Newsletter, Dec. 1997, at 10.

⁴⁵ Tamari'i Tutangata, *Signing on to Watching Waste*, Islands Business, Sept. 1999, at 48.

⁴⁶ *1997-2000 Action Plan*.

⁴⁷ Convention for the Prohibition of Fishing with Long Driftnets in the South Pacific, *done* at Wellington, Nov. 24, 1989, and Noumea, Oct. 20, 1990, 29 I.L.M. 1449 (1990).

⁴⁸ *See generally* Gubon, *supra* note 3, at 126-27.

⁴⁹ Large-Scale Pelagic Driftnet Fishing and Its Impact on the Living Marine Resources of the World's Oceans and Seas, G.A. Res. 44/225, U.N. GAOR Supp. (No. 49), U.N.Doc. A/44/746/Add.7 (1989), *adopted by consensus* Dec. 22, 1989, *reprinted in* 20 Env't'l Pol'y & L. 36 (1990).

⁵⁰ U.N.Doc. A/RES/46/215 (1991). *See generally* David Hunter, James Salzman, and Durwood Zaelke, *International Environmental Law and Policy* 721-31 (1998).

⁵¹ Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Management of Hazardous Wastes Within the South Pacific Region, Sept. 16, 1995 (commonly referred to as the Waigani Treaty or Convention, because it was opened for signature at the 1995 meeting of the Forum in Waigani, Papua New Guinea). This treaty is not yet in force.

⁵² Tutangata, *supra* note 44. Only two Pacific Island countries (Federated States of Micronesia, and Papua New Guinea) have ratified the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, March 22, 1989, UNEP Doc. T/BSL/000, 28 I.L.M. 657, which regulates the movement of hazardous wastes at the global level.

⁵³ The Pacific Islands have not, however, made any governmental moves to create a regional human rights organization. *See* Jon M. Van Dyke, *Prospects for the Development of Intergovernmental Human Rights Bodies in Asia and the Pacific*, in *New Directions in Human Rights* (Ellen L. Lutz, Hurst Hannum, and Kathryn J. Burke, eds. 1989).

REGIONAL OCEAN GOVERNANCE: LESSONS FROM THE REGIONAL SEAS PROGRAMME

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Introduction

While global in nature and local in their manifestations, problems of ocean and coastal areas can often be better addressed through actions at the national level framed in wider regional environment and development strategies. In this perspective, regional cooperation seems an adequate way of addressing problems common to groups of countries sharing the same environment and biogeographic region, such as enclosed and semi-enclosed seas. Such an approach has been adopted by the Regional Seas Programme of the United Nations Environment Programme (UNEP) since the mid-1970s and its experience can be analyzed to assess the contribution of regional environmental agreements to regional ocean governance frameworks.

The Regional Seas Programme was launched in 1974 as a series of regional action plans complemented by legal instruments and technical assistance to address common and shared marine environmental problems such as:

- Degradation and reduction of ecosystems and biodiversity;
- Overexploitation of marine living resources;
- Land-based sources of pollution;
- Shipping and sea-based pollution;
- Coastal development;
- Vulnerability of small islands; and
- Protection of marine mammals.

Today, fourteen action plans, participated by over 140 countries, are in existence.¹ To these, other four marine regional programs not led by UNEP can be assimilated.² The regional action plans all consist of three main components:

1. *Environmental assessment* (evaluation and review, research, monitoring, and information exchange);
2. *Environmental management* (goal setting and planning, international consultation and agreements); and
3. *Supporting measures* (education and training, public information, technical cooperation, organization, and financing).

The original focus of the entire Regional Seas Programme was mainly on marine pollution control and the harmonization of regional and national marine environmental policies. With time, however, the scope of the action plans was broadened to more cross-sectoral aspects, such as integrated coastal management (ICM), to tackle environment and development issues in a more coordinated way.

There is great variety in the actual levels of progress and implementation of the different action plans, which makes difficult an attempt to assess the contribution of the overall Regional Seas Programme to the development of regional ocean policies. In order to highlight some of the achievements of the program, two case studies will be examined. The Mediterranean Action Plan (MAP), the first established in 1975, has experienced a substantial evolution and

adaptation over more than 25 years, and can today be considered one of the most successful example of regional cooperation. The South Pacific Regional Environmental Programme (SPREP) represents a very positive case of integration of regional environmental agreements with development policies for the exclusive economic zone (EEZ) led by indigenous economic organizations.

The Regional Scale of Ocean Governance

Defining regions

The regional scale of ocean governance has been defined in different terms by the United Nations Convention on the Law of the Sea (LOS) and the Regional Seas Programme. The regional seas have originally been defined by UNEP:

As appropriate, enclosed or semi-enclosed seas, as well as marine and coastal areas with well-defined common problems (Report of the meeting of Government experts on Regional Marine Programs, January 29, 1982, UNEP/WG.63/4, Annex II, Recommendation 2).

In practice, regional seas include not only enclosed and semi-enclosed basins but also open water bodies as well as coastal areas. These areas, however, must be characterized by problems that are common to the bordering countries and are well-defined. The definition is complemented by the one provided by guidelines for the preparation and implementation of the action plans [1]:

Geographic boundaries of the regions, as well as the contents of the programmes to be implemented within them, will need to be defined by the Governments concerned, taking into account a variety of criteria based, for example, on *biophysical factors, jurisdictional structures, political priorities* and/or *statistical factors*. Coastal and other activities that affect the quality of the regional environment may be viewed differently by various parties. Therefore, Governments should determine the criteria by which their regions are to be defined in order to ensure that the action plan is responsive to the particular characteristics of each region. This will require co-operation

among those concerned with diverse sectors and interests, including coastal settlements, industrialization, agriculture, fisheries, human health, transportation, science, and indeed the full range of human activities in the region. At the international level, with which this paper is concerned, it is evident that an extensive, dynamic process of mutual consultations and interactions is called for in order to enlist the resources available throughout the entire United Nations system — and beyond, if appropriate — in the service of the Governments of each region (emphasis added).

From the above specifications, it is apparent that UNEP kept a flexible definition of “region,” allowing the countries participating in the individual action plans the task to define their area of application. Within the action plans and related conventions, the area of application has evolved overtime. In the Mediterranean, the area of application of the Barcelona convention, originally defined as the Mediterranean proper, has been broadened to encompass the coastal zone, as defined by the parties, and up to the entire hydrographic basin for the protection of the marine environment from land-based activities.

On the other hand, the LOS [2] does not define the concept of “region,” to which any form of multinational cooperation applies, and provides a combined definition of the concept of “enclosed and semi-enclosed seas” that

means a gulf, basin or sea surrounded by two or more States and connected to another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States (article 123).

In this case, either a geographical or jurisdictional criterion allows determining where multinational cooperation should occur. Cooperation between states bordering enclosed and semi-enclosed seas is called for the use of marine living resources, the protection of the marine environment, and marine scientific research. Regional cooperation on these aspects is also called for in Part XII on Marine Environmental Protection (articles 197, 200, 207), in Part VII on the High Seas in relation to the conservation and man-

agement of living resources (articles 118 and 199); and in Part XIV on the Development and Transfer of Marine Technology in relation to the establishment of marine scientific and technological centers (article 276).

Goals, approaches and strategies

The general goals of the action plans developed under the Regional Seas Programme are referred to the following focus areas: marine resources, marine biodiversity, ecosystems and habitats, coral reefs, coastal wetlands, marine mammals and sea turtles, and small islands. In relation to these focus areas, the action plans and related legal instruments have the following general goals:

- a) Reduction of marine pollution, both land- and sea-based, with particular attention to dumping of oil and other wastes and spills from maritime accidents and offshore oil drilling and the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA);
- b) Reduction of overexploitation of marine living resources, particularly eliminating destructive fishing practices;
- c) Protection of the coastal and marine environment from degradation by alteration of physical habitats;
- d) Protection from invasive species, particularly from ships ballast waters; and
- e) Research on the diversity and significance of potential impacts from climate changes and sea level rise to all sectors of human activity, and in particular for freshwater management, agriculture, fisheries and forestry.

Some of the above goals and activities have been pursued through the use of legal instruments, such as framework conventions and protocols on specific issues. Other aspects have been addressed through action plans or ad hoc activities. For each regional sea it is possible to detail the focus areas and main activi-

ties. Some of the action plans have relied on informal and voluntary coordination mechanisms, while other have elaborated more structured institutional arrangements. From the overview of the regional seas action plans and legal instruments presented in Table 1 it is possible to identify the focus area in which most productive regional cooperation has been.

Most regional seas, whose plans and framework conventions were formulated and adopted between the 1970s and 1980s, during the preparatory works of the Law of the Sea Convention, have addressed issues of marine pollution in shared international waters due to accidental oil spills and dumping. More recently, the majority of regional seas has dealt with pollution from land-based activities, in conjunction with the development of the GPA, and later, due to the growing interest for the protection of biodiversity, has developed instruments for coastal and marine protected areas. Pollution from exploration and exploitation of offshore oil and gas resources has also been addressed, while issues with radioactivity and transboundary movements of hazardous wastes have only been dealt with in individual regional seas, reflecting specific regional priorities. It is noteworthy that neither the East Asian Seas nor the South Asian Seas have adopted legal instruments. It can be concluded that the legal component of the Regional Seas Programme has been clearly oriented towards creating regional instruments in implementation of provisions of the LOS Convention, the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), and the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters 1972 relating to marine pollution.

The action plans developed under the Regional Seas Programme, however, have also given birth to a number of non-legal instruments, such as action programs, that are worthy being examined. In the last years, the regional seas seem having reoriented towards new priorities: the conservation of biodiversity, the protection of the marine environment from land-based activities, and integrated coastal management.

Main outcomes and emerging trends

Legal developments

The Regional Seas Programme has enabled the implementation of regional approaches to provisions contained in the Law of the Sea and in other international marine agreements, most notably the MARPOL Convention and London Dumping Convention. These agreements are reflected in the framework conventions and the related emergency and dumping protocols that characterize the early phase of the Regional Seas Programme. The regional protocols on biodiversity and specially protected areas can also be seen as regional counterparts of global conventions such as the Ramsar Convention on Wetlands or other regional agreements such as the Convention on the Conservation of European Wildlife and Natural Habitats 1979 (the Bern Convention). The provisions of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal 1989 are reflected in the Mediterranean and the ROPME region, while only the Southeast Pacific has addressed issues related to the control of radioactivity. Among the most promising areas of cooperation the following can be identified:

- a) The provisions of the protocols relating to land-based sources and activities, developed or amended in the 1990s in support to the GPA, are innovative: the integration of marine and land use management appears to be one of the distinguishing features of the current approach of the Regional Seas Programme, with the development of regional action plans for addressing marine pollution from land-based activities and the extension of the application areas of the plans to the hydrographic basins.
- b) The new generation of protocols related to biodiversity and protected areas, started in the Mediterranean in 1995, reflects the provisions of the Convention on Biodiversity and the Jakarta Mandate on Marine and Coastal Biodiversity and even allows the creation of marine protected areas on the high seas.
- c) ICM is another area of development: the possibility of creating a regional protocol on ICM is

currently being examined in the Mediterranean [3, 4], while the Draft Antigua Convention for the Northeast Pacific specifically promotes integrated management and sustainable development of the marine and coastal environment, thus broadening the scope of a framework convention, previously limited to protection from marine pollution.

Scientific research and technical assistance

Through the Regional Seas Programme, cooperative scientific research has been developed on virtually all aspects concerning marine management. The products of this research are published in a number of series including the Regional Seas Reports and Studies, encompassing over 200 titles, and other regionally-specific technical reports, for example assessments of land-based pollution. Technical assistance has been particularly productive in the field of ICM, with 13 pilot projects developed in the Mediterranean and a similar number in the Wider Caribbean. This activity has also yielded regional guidelines for ICM [5-7] and the integrated management of coastal and river basin areas [8]. Associated to this activity line is the organization of training courses, for example on the use of environmental impact assessment (EIA) and geographical information systems (GIS).

Emerging directions

In the last years, UNEP has increased its support to the Regional Seas Programme [9], contributing financial support for several meetings and projects in Eastern Africa, the Wider Caribbean, the South-East Pacific and East Asia. More notably, the following initiatives have been undertaken:

- Sharing of experience among regional seas action plans is being pursued as a form of inter-regional cooperation, for example through twinning arrangements such as that between the Eastern Africa Action Plan and the HELCOM Commission in the Baltic.
- UNEP leads the Global International Waters Assessment (GIWA) carried out by the Kalmar University in Sweden in 66 water regions with the support of the Global Environment Facility (GEF).

The implementation of the GPA through regional assessments and action plans, to be translated at the national level, is synergistic with the revitalization of the entire Regional Seas Programme, with collaborative actions related to (a) problem identification (monitoring and assessment), (b) planning (regional and national action plans for addressing land-based activities), and regulatory frameworks (voluntary codes of conduct, guidelines, incentives; regional conventions; regional protocols), the Mediterranean and the ROPME Sea Area being the most advanced in the process.

The Regional Seas Programme is exploring possibilities for a more coordinated approach to the implementation of global and regional conventions, through joint meetings and memorandums of understanding with key partners such as the secretariats of the LOS Convention, the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, the Ramsar Convention, the International Coral Reef Initiative (ICRI), and the Global Plan of Action for Marine Mammals.

To date, the collaboration between the Regional Seas Programme and regional fishery organization has not yet produced substantial results, which would be required to implement an ecosystem-based approach to ocean governance.

Lessons Learned From the Mediterranean and the South Pacific

When reviewing the activities developed under each regional sea, it is possible to identify common and different approaches and strategies. Not all regional seas have resulted in the establishment of regional institutional arrangements for the management of the marine environment and marine resources. Some regional action plans, however, have been able to combine the legal developments associated with the framework convention and related protocols with a number of programmatic actions. The examples of the Mediterranean and the South Pacific will be used to illustrate these results.

Mediterranean

In the Mediterranean, the Mediterranean Action Plan (MAP), participated by 20 countries and the European Union (EU), focuses on four main fields of activity:

1. *Curbing pollution* through the Programme for Assessment and Control of Pollution in the Mediterranean Region (MED POL), evolved from an assessment programme to an instrument of control in support to the implementation of the Strategic Action Programme to address pollution from land-based activities;
2. *Safeguarding natural and cultural resources* through the Protocol on Specially Protected Areas and Biodiversity and related action plans;
3. *Managing coastal areas* through a number of 3 to 4-year Coastal Area Management Programmes (CAMPs), generally initiated in pollution hot spots; and
4. *Integrating environment and development*, promoting the integration of environmental considerations into all aspects of Mediterranean development, also through the development of the Mediterranean Observatory on Environment and Development (MEDO).

Institutional arrangements

For the implementation of the above activities, a number of regional centers were established:

- The Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC), established in Malta in 1976, assists Mediterranean countries in building their capability to address marine pollution incidents;
- The Regional Activity Centre for Priority Actions Programme (PAP/RAC), established in 1977 in Split, Croatia, deals with integrated coastal area management programs;

- The Regional Activity Centre for the Blue Plan (BP/RAC), established in 1978 in Sophia Antipolis, France, is charged with the preparation of systemic and prospective tools for environment and development scenarios for the Mediterranean coastal zone;

- The Regional Activity Centre for Specially Protected Areas (SPA/RAC), established in 1985 in Tunis, Tunisia, focuses on biodiversity and the protection of Mediterranean species, habitats and ecosystems;

- The Regional Activity Centre for Environment Remote Sensing (ERS/RAC), established in 1993 in Scanzano, Italy, provides satellite technology-based services and products to assist in decision making for coastal and marine resources; and

- The Regional Activity Centre for Cleaner Production (CP/RAC), established in 1996 in Barcelona, Spain, promotes the reduction of industrial wastes by disseminating tested cleaner production technologies.

The RACs are responsible for the implementation of specific programs of action. For example, PAP/RAC is in charge of the CAMPs, BP/RAC of MEDO, and SPA/RAC follows the implementation of the plans of action on monk seals, marine turtles, cetaceans, and marine vegetation.

A particular feature of MAP is the Mediterranean Commission on Sustainable Development (MCSD), established in 1995 with the mandate of (a) assessing the regional major economic, ecological and social problems; (b) enhancing regional cooperation and rationalizes the inter-governmental decision-making capacity in the Mediterranean basin for the integration of environment and development issues; and (c) tracking implementation of proposals made to the Contracting Parties. The Commission is composed of 36 members, including representatives from each of the Contracting Parties (21 members) and representatives of local authorities, socio-economic actors and nongovernmental organizations (15 members) active in the fields of environment and sustainable development.

Legal arrangements

The Barcelona Convention, amended in 1995 as Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, is complemented by a number of protocols:

- Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft (Dumping Protocol) 1976;

- Protocol concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in cases of Emergency 1976/1995;

- Protocol for the protection of the Mediterranean Sea against Pollution from Land-based Sources and Activities (LBS Protocol) 1980/1996;

- Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean 1995;

- Protocol for the Protection of the Mediterranean Sea against Pollution resulting from Exploration and Exploitation (Offshore Protocol) of the Continental Shelf 1994; and

- Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal (Hazardous Wastes Protocol) 1996.

Lessons learned

Among the outcomes resulting from regional cooperation in the Mediterranean, the following can be named [see also 10].

On the institutional side:

- Political collaboration and confidence building, demonstrated by the region-wide participation in the action plan and its legal instruments and the improved harmonization of policies;

- Scientific and technical collaboration and networking, as well as sharing of experience, through

regional assessment programs such as MED POL, action plans and programs of action aimed at specific issues or resources, and training and pilot initiatives such as in ICM; and

- Democratization of decision making processes and forums, through the participation of the representatives from the government, the civil society and the scientific and technical community in the MCSD.

In environmental and socioeconomic terms [11], for example:

- The building and sharing of information and knowledge for decision making, in particular environmental and socioeconomic assessments and scenarios;

- A steadily increase of beaches monitored under MED POL complying with quality standards as a surrogate measure of the improvement of the treatment and disposal of sewage;

- The dissemination, even outside the Mediterranean, of approaches and techniques for coastal and ocean management, such as pilot projects, guidelines, and training on ICM, watershed management, EIA procedures, legal aspects, or the use of GIS; and

- The sustainability of MAP on a self-financing basis.

On the other hand, a series of obstacles and pitfalls have to be highlighted:

- Disconnection of MAP activities from fishery issues and organizations, due to the character of high seas of the Mediterranean;

- Slow process of ratification of the amended Barcelona Convention and amended or new protocols, including the protocols on land-based activities, specially protected areas and biodiversity, and transboundary movements of hazardous wastes; and

- With the exception of the GPA, approaches to the joint implementation of regional and global agreements and programs are still in their infancy and will require to be better experimented.

- Limited visibility of activities due to insufficient reporting and outreach to a broader audience.

South Pacific

The South Pacific area comprises twenty-three self governing nations scattered over thirty million square kilometers of ocean. Geographical and economic factors have prompted regional cooperation on coastal and marine resource management since the establishment of the South Pacific Commission in 1947 [12]. Today, five regional organizations address regional marine environmental and economic issues: the Pacific Community, the Forum Secretariat, the South Pacific Forum Fisheries Agency, the South Pacific Applied Geosciences Commission, and the University of the South Pacific [13].

Institutional arrangements

The Pacific Community (formerly, the South Pacific Commission), originally created in 1947 to coordinate the activities of the former colonial powers, provides a forum for the discussion of regional problems. A Marine Resources Division focuses on assistance to the island states for coastal fisheries (Coastal Fisheries Programme), stock assessments and research on tuna resources (Oceanic Fisheries Programme), and implementation of international maritime conventions (Regional Maritime Programme).

The South Pacific Forum was established in 1971 as an annual conference of Head of States and provides the political forum for the discussion of regional issues. Through the Forum, regional cooperation has been pursued on such issues as nuclear testing, sustainable fisheries management, and transport of nuclear and hazardous wastes.

The Forum Fisheries Agency (FFA) was established in 1979 under the South Pacific Forum Fisheries Agency Convention (FFA Convention). Through its bodies — the Forum Fisheries Committee and the Secretariat — the FFA promotes intra-regional cooperation on and harmonization of fisheries policies, relations with distant water fishing countries and access to the EEZ of other parties, cooperation in

surveillance and enforcement, and cooperation on fish processing and marketing.

The South Pacific Regional Environmental Programme (SPREP), established in 1993, addresses the protection of coastal and marine ecosystems and species through the ecologically sustainable utilization of resources and reduction of marine pollution. SPREP operates through action plans involving (a) biodiversity and natural resource conservation, (b) climate change and integrated coastal management, (c) waste management, pollution prevention and emergencies, and (d) environmental management, planning and institutional strengthening. Through SPREP, regional conventions have been adopted on nature conservation, environmental protection, and hazardous and radioactive wastes.

The South Pacific Applied Geosciences Commission (SOPAC) was established in 1990 with a broad mandate encompassing all marine and coastal environmental issues. The activities of SOPAC focus on research on the physical environment and the development of offshore nonliving resources.

The University of the South Pacific (USP), established in 1970 in Suva, Fiji, is not a formal regional organization, but has provided an important platform for research, education and training in marine resources and environmental management in the region.

Legal arrangements

A number of conventions form the regional legal framework for the management of the marine environment and its resources in the South Pacific:

- The Convention on the Conservation of Nature in the South Pacific 1976;
- The South Pacific Nuclear Free Zone Treaty 1985;
- The Convention for the Protection of the Natural Resources and Environment of the South Pacific Region 1993; and
- The Convention for the Prohibition of

Fishing with Long Drift Nets in the South Pacific 1989.

Lessons learned

The South Pacific represents a good case study on the effectiveness of a regional approach to global issues and an example of a composite ocean regime addressing both environmental and economic aspects through the collaboration of different regional bodies [14]. The lessons learned from this experience can be summarized as follows [12, 13]:

- In the South Pacific, regional cooperation has been achieved focusing on common goals based on economic needs and driven by the peaceful use of the ocean and management of marine resources. This has been achieved by a decision making process based on consensus and avoidance of conflicts among members.

- The influence of the interests of the former colonial powers has been progressively reduced achieving agreement on controversial issues such as nuclear testing (establishment of a nuclear free zone) and management of transboundary, highly migratory fish stocks.

- Common regional initiatives have allowed for the shaping of a unitary regional “voice” in international forums such as the United Nations and fostering the mobilization of financial resources to improve the economy of the region.

- Economies of scale and information management and joint enforcement in fisheries, also through the sharing of remote-sensing derived information and patrol boats.

- While regional cooperation has increased, the number of regional organizations and their differentiated memberships has given rise to problems of duplication of role and responsibilities. The 1995 Review of Regional Institutional Arrangements in the Marine Sector, in particular, has highlighted issues of ineligibility of certain countries to membership in the South Pacific Forum as well as the participation of non-island countries in regional bodies.

Conclusions

The review of UNEP's Regional Seas Programme and the examination of two of the action plans — the Mediterranean and the South Pacific — allows drawing some conclusions on the program and its outcomes in terms of regional ocean governance. The Regional Seas Programme has provided and is being providing the only global framework for addressing coastal and marine issues on the regional scale.

The program has allowed for a very flexible definition of the marine regions to which it would apply, encompassing both enclosed and semi-enclosed seas and open bodies of waters. The geographical scope of the individual regional seas was originally limited to marine areas, depending on the jurisdictional framework, for example the high seas in the Mediterranean or the EEZ in the South Pacific. The review of the program in the mid-1990s after UNCED opened new prospects in the both geographical and issue coverage. In the Mediterranean, the amended Barcelona Convention 1995, not yet into force, makes the extension of the application area to the coastal area possible. This approach is consistent with a better consideration of integrated coastal management and the regional implementation of the GPA. The curbing of land-based pollution, in fact, is a high priority particularly in enclosed and semi-enclosed seas bordered by coastal regions with high population pressure, such as in the Mediterranean and the Caribbean as well as sister regional seas such as the Baltic. In the South Pacific, a high number of small island states scattered across a vast sea area has required a focus on issues such as fisheries management, joint surveillance and control of the valuable fish stocks of the EEZ (tuna in particular), and the establishment of a nuclear free zone. The protection of biodiversity and the establishment of marine protected areas are also a promising area of regional cooperation that is expected to gain further attention in the light of the establishment of a representative network of marine protected areas by 2012 as suggested by the Plan of Implementation for the World Summit on Sustainable Development (WSSD) (paragraph 31[c]). Issues related with the transboundary transportation of hazardous

and radioactive wastes are also emerging but represent an area yet very controversial.

In terms of institutional and legal arrangements, each regional sea has chosen a slightly different approach depending on the degree of regional cohesion among the countries. Therefore, there are regional seas where no legal arrangements were negotiated and for which the secretariat functions required by the action plans are performed by UNEP at its headquarters in Nairobi. Programmatic arrangements and resource or sectoral specific action plans, however, have been implemented in most regional seas. In some cases, this has required the establishment of regional activity centers devoted to specific activities and hosted by individual countries. The availability of financial resources for the implementation of the action plans and their sustainability is another factor of differentiation among the regional seas. Both the Mediterranean and the South Pacific action plans were able to achieve a certain degree of financial sustainability, either for the presence of developed contracting parties, including the EU, or due to the cooperation of economic organizations.

Several assessments of the effectiveness of the Regional Seas Programme have been produced, with emphasis on the role played by the scientific community [15], the processes involved in the establishment, implementation and sustainability of the action plans [16], the ability to address specific issue-areas [17], the lack of compliance and financial constraints [18], the support of international organizations [19], the processes of regional integration [20] or the external factors supporting environmental regimes [21]. The main outcomes of the experience of the Regional Seas Programme can certainly be identified in an increased regional awareness of environmental issues and cohesion in addressing them, improved scientific capacity and exchange of information, sharing of experience in the management of natural resources and coastal areas, and, ultimately, signs of improvement or non-deterioration of environmental conditions, particularly in relation to marine pollution. The development of regional ocean governance, however, is still in its infancy [22] and will require the adoption and imple-

mentation of ecosystem-based regional ocean management and a better integration between actions to curb marine pollution and management of land-based activities in coastal and inland areas as well as an enhanced role for intergovernmental institutions, such as a better integration of regional fishery organizations into regional environmental cooperation frameworks [23].

Strengthened regional cooperation and coordination, as called for by the Plan of Implementation for the WSSD (paragraph 29[f]) and a new phase of the Regional Seas Programme will be possible by developing and operationalizing the following approaches:

a) Adoption of the ecosystem approach. The application of the ecosystem approach to large-scale coastal and marine areas requires the convergence of global and regional legal arrangements to address shared problems on the regional and subregional scale. This can be possible only devising adequate institutional mechanisms able to balance conservation and development goals in managing multiple sea uses over large marine ecosystems and related watersheds [23].

b) Management linkages. Linkages among global conventions and between these and regional instruments have been recently explored [24-28]. Linkages among instruments on a regional basis can be built by functions, such as (a) collection of information for integrated assessment and decision making, (b) development of coherent norms, rules and guidelines, (c) coherence in financial support and technical assistance, and (d) improved monitoring and reporting for better accountability.

c) Governance and enforcement. Ocean governance at the regional level can be improved by enlarging the mandate of international organizations in relation to the joint implementation of ocean-related agreements, thus optimizing scarce financial and human resources. On the other hands, incentives and guidance must be provided to contracting parties to comply with and enforce regional agreements at the national level [29]. This would allow reducing the two main obstacles to ocean governance: multiple institutions at the global and regional level and institutional fragmentation at the national level [30].

Notes

¹ Mediterranean (1975), Red Sea and Gulf of Aden (1976, revised in 1982), Kuwait (1978), West and Central Africa (1981), Caribbean (1981), East Asian Seas (1981), South-East Pacific (1981), South Pacific (1982), Eastern Africa (1985), Black Sea (1993), North-West Pacific (1994), South Asian Seas (1995), North-East Pacific (2001), and Upper South-West Atlantic (2002).

²The Arctic, OSPAR for the North-East Atlantic, HELCOM for the Baltic, and the Caspian Sea.

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Table 1: Regional seas action plans and legal instruments

Regional sea action plan	Year	Members	Secretariat	Activity centers	Framework convention	Oil spills emergency	Hazardous wastes	Land-based activities	Biodiversity and MPAs	Radio-activity	Offshore	Dumping
Mediterranean	1975	21	MEDUNIT	REMPEC PAP/RAC BP/RAC SPA/RAC ERS/RAC CP/RAC	1976/1995	●	●	●	●		●	●
Red Sea and Gulf of Aden	1976	8	PERGSA		1982	●						
ROPME Sea Area	1978	8	ROPME	MEMAC	1978	●	●	●			●	
Wider Caribbean	1981	28	CEP		1983	●		●	●			
East Asian Seas	1981	10	COBSEA		—							
South-East Pacific	1981	5	CPPS		1981	●		●	●	●		
West and Central Africa	1981	21	UNEP		1981	●						
South Pacific	1982	19	SPREP		1986	●						●
Eastern Africa	1993	10	EAF/RCU		1985	●			●			
Black Sea	1996	6	BSEP		1992	●		●				●
North-West Pacific	1994	5	NOWPAP	MER/RAC	—							
South Asian Seas	1995	5	SACEP		—							
North-East Pacific	2002	8	UNEP		2002							
Upper South-West Atlantic	u.p.	3	UNEP		—							
Baltic	1974	10	HELCOM		1974/1992	●		●			●	●
North-East Atlantic	1972	16	OSPAR		1992			●	●		●	●
Arctic	1996	8	Arctic Council		—							
Caspian	1991	5	PCU	11 CRTCs	u.p.							

u.p. = under preparation

Acronyms

BP/RAC	Regional Activity Centre for the Blue Plan	ERS/RAC	Regional Activity Centre for Environment Remote Sensing	PAP/RAC	Regional Activity Centre for Priority Actions Programme
BSEP	Black Sea Environmental Programme	HELCOM	Helsinki Commission	PERGSA	Protection of the Environment of the Red Sea and the Gulf of Aden (Organization for)
CEP	Caribbean Environmental Programme	MEDUNIT	Mediterranean Co-ordinating Unit	REMPEC	Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea
COBSEA	Coordinating Body on the Seas of East Asia	MEMAC	Main Emergency Mutual Aid Centre	ROPME	Regional Organisation for the Protection of the Marine Environment
CP/RAC	Regional Activity Centre for Cleaner Production	MER/RAC	Marine Environmental Emergency Preparedness and Response Regional Activity Center	SACEP	South Asia Co-operative Environment Programme
CPPS	Comisión Permanente del Pacífico Sur	NOWPAP	Northwest Pacific Action Plan	SPA/RAC	Regional Activity Centre for Specially Protected Areas
CRTC	Caspian Regional Thematic Centre	OSPAR	Oslo and Paris Convention	SPREP	South Pacific Regional Environment Programme
EAF/RCU	Regional Coordinating Unit for the Eastern African Region	PCU	Programme Coordinating Unit		

APPENDICES TO
“An Overview of Policy Issues and Options for
Improved Regional Ocean Governance”
Prepared at the Center for the Study of Marine Policy
December 2002

- Appendix 1. Considering the Needs of New Uses of the Exclusive Economic Zone**
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- Appendix 2. Regional ocean issues, as identified in testimony to the U.S. Commission
on Ocean Policy**
(Prepared by Meredith Blaydes, November 2002, Center for the Study of Marine Policy,
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- Appendix 3. Review of coastal states efforts in ocean planning**
(From Stefano Belfiore et al, *Turning to the Sea: Toward an Ocean Plan for Delaware*,
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Considering the Needs of New Uses of the Exclusive Economic Zone: Implications for Structural Arrangements

The following table presents an overview of the deployment of new uses of the sea in relation to the following components: (a) Geographical space: horizontal; (b) Geographical space: vertical; (c) Jurisdictional space.

Use	Geographical space: horizontal			Geographical space: vertical				Jurisdictional space			Comments
	Land	Land-sea interface	Ocean	Water surface	Water column	Seabed	Subsoil	3-n.m. state waters	12 n.m. extended territorial sea	200 n.m. EEZ	
Offshore aquaculture			•	<ul style="list-style-type: none"> Floating longlines Lantern nets Net pens Sea cages Transportation Exclusion zones 	<ul style="list-style-type: none"> Floating longlines Lantern nets Net pens Sea cages Mooring Exclusion zones 	<ul style="list-style-type: none"> Mooring Exclusion zones may extend to the seabed 	<ul style="list-style-type: none"> Exclusion zones may extend to the subsoil 	•	•	•	No existing federal regime, no commercial projects ongoing, only few experiments: need to develop a regime before the development takes place
Offshore renewable energy (wind, tidal power, OTEC)	• cables	• cables	•	<ul style="list-style-type: none"> Turbines Tidal structures OTEC Exclusion zones 	<ul style="list-style-type: none"> Turbines Tidal structures OTEC 	<ul style="list-style-type: none"> Undersea cables 	<ul style="list-style-type: none"> Undersea cables 	•	•	•	Patents for ocean energy devices issued, but no incentives to develop further. Proposal for wind mills offshore Massachusetts
Bioprospecting for genetic resources			•	<ul style="list-style-type: none"> Vessels ROV Manned submersibles 	<ul style="list-style-type: none"> ROV Manned submersibles 	<ul style="list-style-type: none"> Prospecting 	<ul style="list-style-type: none"> Prospecting 	•	•	•	Use unregulated outside sanctuaries; CBD and Jakarta Mandate could provide useful guidance
Artificial reefs			•			<ul style="list-style-type: none"> Artificial reefs Exclusion zones 	<ul style="list-style-type: none"> Artificial reefs 	•	•	•	Controversy over the possible use of decommissioned oil rigs as artificial reefs
Undersea telecommunication cables	•	•	•		<ul style="list-style-type: none"> Maintenance activities 	<ul style="list-style-type: none"> Maintenance activities 	<ul style="list-style-type: none"> Undersea cables 	•	•	•	Currently excluded from environmental reviews; potential for a use fee
Protection of underwater cultural heritage			•	<ul style="list-style-type: none"> Exclusion zones 	<ul style="list-style-type: none"> Cultural resources 	<ul style="list-style-type: none"> Cultural resources 	<ul style="list-style-type: none"> Cultural resources 	•	•	•	No existing regime in the 3 to 200 zone; UNESCO convention could provide useful guidance

While some of the uses involve also the land and the land-sea interface, all involve the ocean. Most of them entail spatial occupation of the water surface, the water column, the seabed and its subsoil. Artificial reefs and undersea cables mainly occur on the seabed and the subsoil. All of these uses deploy on the entire maritime jurisdictional space.

Appendix 1

Compatibility of Emerging Sea Uses with Other Uses

Living resources	Offshore aquaculture																			
	Artificial reefs	*																		
	Fisheries	X	O																	
Energy	Offshore renewable energy	X	X	X																
	Offshore oil and gas	X	X	X	X															
Minerals	Sand and gravel extraction	X	*	X			X													
Research	Bioprospecting						X	X												
Telecommunications	Undersea cables			X			X	X	X			X								
Cultural heritage	Underwater cultural heritage			*			X	X			X									
Recreation	Recreation (incl. SCUBA)	X	O	X	X	X	X	X						O						
Conservation	Conservation of biodiversity	*	O				X			O										
	Protection of mammals	*		*	X	X														O
CATEGORY/USE		Offshore aquaculture	Artificial reefs	Fisheries	Offshore renewable energy	Offshore oil and gas	Sand and gravel extraction	Bioprospecting	Undersea cables	Underwater cultural heritage	Recreation (include. SCUBA)	Conservation of biodiversity	Protection of mammals							
		Living resources	Energy	Research	Telecommunications	Cultural heritage	Recreation	Conservation												

Legend:

- O = Positive impact
- * = Moderately negative impact
- X = Negative impact

Empty cells indicate neutral or irrelevant interaction

A similar matrix could be built focusing on the impacts the uses have on the environment, e.g.:

- Physical and chemical conditions
- Biological conditions
- Cultural factors
- Ecological relationships

Appendix 2

Analysis of Domestic Regional Issues based on testimony presented to the U.S. Ocean Commission

This Appendix examines the major problems and multiple-use conflicts, as well as the current governance structure addressing these problems and conflicts, in nine major coastal regions of the United States: 1) Northeast; 2) Southeast; 3) Florida and the Caribbean; 4) Gulf of Mexico; 5) Hawaii and Pacific Islands; 6) Southwest; 7) Northwest; 8) Alaska; and 9) Great Lakes. The paper is based on a review of testimony presented to the U.S. Commission on Ocean Policy. From January to September 2002, the U.S. Commission on Ocean Policy held a meeting in each of these regions to obtain the local/regional perspective on pressing ocean and coastal issues. The reader should note that this analysis is limited in that it is based only on the testimony received by the Commission; it does not include any historical analysis of past issues which have been important in each region.

At the present juncture in U.S. history, with the development of a new national oceans policy by the Commission, it is important to diagnose the ocean and coastal conflicts in this nation on a regional basis, before taking the necessary steps to address them. Before choosing the most appropriate ocean governance framework, therefore, the following diagnostic questions must be answered for each region:

What are the region's primary ocean and coastal problems?

What are the region's primary conflicts among coastal and ocean users?

To what can these conflicts be attributed (for example: social and/or economic competition; contradictory laws; lack of decision-making fora to address the problems; and/or inexperience with cooperation and coordination)?

To what degree, if any, have the states in the region taken action to manage their waters out to 3 miles, by developing, for example, ocean plans for that zone?

To what degree have state and federal agencies discussed the region's ocean and coastal issues?

To what degree have federal coastal/ocean programs cooperated to address issues of common concern (for example, taking into account the issue of sand exploitation and its impact on Essential Fish Habitat for certain species, or the pressures of oil transportation along the West Coast)?

In what settings have these dialogues taken place?

In the region, to what degree, if any, has planning taken place at the regional level to anticipate future uses of the EEZ (for example, offshore aquaculture and/or bioprospecting)?

Northeast

Primary Ocean and Coastal Problems

In Massachusetts and New England, fishing habitats and stocks serve as one of the most urgent maritime problems. Regional fishery management goals must concentrate on obtaining economical fishing levels while ensuring the ability of the fishery to consistently achieve its maximum sustainable yield (Durand 2002). The groundfish fishery of New England, for example, suffers from substantial bycatch problems, and "has been going through crisis management for over a decade" (Tuyn 2002).

Wasteful development patterns, such as the spread of residents in coastal towns to the outskirts of coastal watersheds, have resulted in negative fiscal, environmental, and social consequences. Chief examples include nonpoint source pollution and fragmentation of valuable coastal habitats below critical mass levels (Richert 2002).

One of the greatest environmental challenges faced in Connecticut lies in managing the land side of the coastal zone. In addition to poor growth management, obstacles to this land-side management include: government subsidies and incentives for development and redevelopment in high flood, erosion, and hazard-prone areas, placing lives and property at serious risk; loss of tidal wetlands; difficulty of designating dredge disposal sites, and the likely closure of current disposal sites (Stahl 2002).

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The Northeast needs both improved water quality and quantity (Geiger 2002).

Primary Multiple-Use Conflicts and Underlying Causes

The proposal for a wind farm project, which would occupy a sizeable part of Nantucket Sound (25 square miles), has given rise to a number of difficult questions. This area houses archaeological resources and is part of the flyway for eastern migratory birds. Further, it is both intensively used and highly valued by the recreational fishing and boating industry, the commercial fishing industry, and the marine transportation industry (Durand 2002).

Insufficiently planned development of coastal watersheds competes with more water-dependent economic activities, including recreation, tourism, and commercial fishing (Stahl 2002). Development and the concomitant alteration and loss of aquatic habitats serves as a primary reason for biodiversity loss and the decline of interjurisdictional and native fish and other aquatic resources in the Northeast (Geiger 2002).

Right whale populations in the North Atlantic have come into conflict with the marine transportation industry (Keeley 2002).

The marine transportation industry has vastly resulted in the contamination of riverine and estuarine sediments. In some harbors of the Northeast, such as New Bedford, Massachusetts, some bottom sediments exceed human health risk action levels. These sediments, further, are contaminated beyond that which the Marine Protection, Research and Sanctuaries Act and the Clean Water Act would permit for unconfined aquatic disposal (Koning 2002).

Degree of 0 to 3 Mile Ocean Planning

In the Gulf of Maine, two appreciable research programs (Global Ocean Dynamics and Global Ecology and Oceanography Harmful Algal Blooms) have brought new information on pelagic zone biology and oceanography to light. The resulting developments aid fisheries managers in achieving more of an ecosystem approach (Richert 2002).

Rutgers University in New Jersey has deployed long-range CODAR systems, high-frequency radar for coastal research, in the New York Bight. These systems can grid hourly surface current changes for the entire continental shelf including, and out to, the boundary of the Gulf Stream (Grassle 2002).

Led by Evan Richert from the University of Southern Maine, the Census of Marine Life in the Gulf of Maine (GoMAP) convenes groups of Canadian and U.S. scientists to generate a more integrated view of the area's marine life, using the advanced monitoring systems and technologies already in place there (Grassle 2002).

Degree of State-Federal Discussion/Interaction on Ocean and Coastal Issues

Approved in 2001, the New Hampshire Estuaries Project focuses its attention and efforts on shellfish and water quality issues. This effort received much financial and political support from local, state, and federal government levels (Hartman 2002).

In the Northeast Region, all of the U.S. Fish & Wildlife Service's resource management programs are directly involved in efforts to stem the invasion of aquatic nuisance species through education, outreach, on-the-ground programs, and collaborative work with state and federal partners.

Degree of State-Federal Cooperation to Address Common Issues and Forums Used for Such Cooperation

In response to the groundfish industry crisis, Congress has appropriated emergency funding through the National Marine Fisheries Service and the Northeast Consortium to conduct cooperative research with the fishing industry (Richert 2002).

Maine's Office of State Planning and its Department of Marine Resources have brought together almost 30 public and private organizations and agencies, from Nova Scotia to Massachusetts, to comprise the Gulf of Maine Ocean Observing System (GoMOOS). Having received two years of funding from Congress and the Office of Naval Research thus far to get it

Appendix 2

through the initial planning and design stages, GoMOOS hopes to unite one day with similar, U.S. coastal observing systems to both observe and forecast coastal ocean conditions in a manner similar to the National Weather Service's observations and forecasts of atmospheric conditions (Richert 2002). The design criteria for this system are targeted to aid recreational boaters, commercial fishermen, mariners, aquaculturists and other ocean/coastal users, as well as environmental managers. Further, both NMFS and the Department of Fisheries and Oceans Canada are working with GoMOOS toward more informed fishery resource management (Bogden 2002).

Coastal America, a voluntary organization, has fostered the collaboration of federal and state agencies on the restoration of aquatic ecosystems. Through this federal-state cooperation, New England has restored important eelgrass, salt marsh, and fisheries habitat (Koning 2002).

Degree of Regional-Level Planning for Potential Future Uses of the EEZ

The Massachusetts Executive Office of Environmental Affairs has reviewed, or is reviewing at present, proposals for the following marine activities:

- Offshore aquaculture
- A marine-based wind farm project, known as "Cape Wind" in Nantucket Sound. If completed, this project would be based completely in federal waters (aside from the electrical lines that would connect it to Cape Cod shores) and classed with the largest wind farms in the world (Durand 2002).
- The Massachusetts Executive Office of Environmental Affairs recognizes the need for a more all-encompassing leasing and management authority to fill the regulatory void that currently exists for these types of projects proposed for the EEZ. Under current law, for example, the wind farm project could be built on submerged, public trust lands without compensating the government. While payment structures to

ensure mitigation for the public exist in tidelands, they do not in federal, EEZ waters, aside from oil, gas, and hard mineral extraction/operations. The Executive Office of Environmental Affairs proposes that the potential, new uses of the EEZ, including marine aquaculture and wind farming, be subsumed with the more traditional uses closer to shore under a framework that provides for coordination, planning, leasing, monitoring, and environmental protection (Durand 2002).

Southeast

Primary Ocean and Coastal Problems

Steady shoreline erosion underscores the need for more regular beach renourishment.

Coastal managers must deal with contradictory federal mandates (difficulty when reviewing separate projects for federal consistency when they carry the NMFS mandate to protect Essential Fishery Habitat and the Corps of Engineers' mandate to dredge waterways for unimpeded navigation) (Cooksey 2002).

Management of interdependent species (in Delaware, horseshoe crabs and migrating shorebirds) (Cooksey 2002), threatened and/or endangered species (nesting sea turtles), and endangered species (for example, the North Atlantic right whale, "the most challenging recovery problem of all for the southeast and the Atlantic Coast in general") proves difficult (Hogarth 2002).

Urban sprawl has occurred on a large scale in this region since the 1970's. Creating an urban strategy that will protect waterfront lands, wetlands, irreplaceable landscape, and endangered species from the sprawling development projected into the future proves daunting (Allen 2002).

In 1997, the mid-Atlantic's coastal watersheds were 30% developed (compared to 17% coastal watershed development in New England, 15% in California, and 12.5% in the Gulf/South Atlantic region. The mid-Atlantic region is projected to see development

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of more than 60% of its watersheds, compared to 25% and 30% watershed development projected for New England, California, and the Gulf/South Atlantic region (Beach 2002).

Non-point source pollution from the following sources degrades this region's water quality:

- Agricultural and animal waste runoff, resulting in excessive nutrient (e.g. phosphorus and nitrogen) loading and eutrophication
- Industrial runoff from population growth and land development, resulting in toxicant pollution (oil/gasoline, chemicals, etc.) (Boesch 2002)

Primary Multiple-Use Conflicts and Underlying Causes

Shifting demographics in some areas (NC, for example) are resulting in the displacement of working-class populations with older and wealthier residents. Thus, uses dependent on recreation and tourism are displacing the traditional heavy industries of coastal area economies. Conflicts include:

- Competition between commercial fishers and recreational users for waterfront land and marinas
- Choking out of the public's already low access to the coast through the rising establishment of private business and residential areas (Orbach 2002)

Both the marine transportation industry, with increasing shipping traffic, and the fishing industry, with problematic gear, threaten marine mammals (in particular, the endangered Northern Atlantic right whales) (Hogarth 2002).

The decision to build upon the current facility infrastructure in Charleston and Savannah ports will result in increased container vessel traffic. Recreational boaters and commercial shippers, therefore, will be competing even more for the use of the same waterways (Carmichael 2002).

Degree of 0 to 3 Mile Ocean Planning

The state of North Carolina has conducted extensive research on, and analyzed, its ocean issues (Cicin-Sain 2002).

Management authority for protected species in the state waters along the East Coast resides in the Atlantic States Marine Fisheries Commission (ASMFC) under the Atlantic Coastal Act (Hogarth 2002).

Degree of State-Federal Discussion/Interaction on Ocean and Coastal Issues

The Southeastern University Research Association (SURA), comprised of research institutions and universities from the Southeast, is working toward a national ocean observing system in tandem with the efforts of the Consortium for Ocean Research and Education (CORE) and the national ocean/marine science community, the private sector, and federal agencies (including Ocean.US) (Boesch 2002).

Degree of State-Federal Cooperation to Address Common Issues and Forums Used for Such Cooperation

The Land Use – Coastal Ecosystem Study (LU-CES) is an investigation into the impacts of shifting land use patterns and coastal land development on the economic and natural resources of the Southeast's salt marsh estuaries. The fundamental goals of this effort are to pinpoint the underlying causes for the region's changing land usage and to provide decision makers/resource managers (especially those at the local level) with the tools to reduce and mitigate the resulting negative effects. LU-CES receives federal funding from NOAA's Coastal Ocean Program (COP) and is managed by the South Carolina Sea Grant Consortium, with feedback from Georgia Sea Grant (Kleppel 2002).

The LU-CES has already convened (or will do so soon) a resource manager/user panel, made up of decision-makers, planners, and managers to work together in developing the program, to provide feedback on and guide the progress of the program (Kleppel 2002).

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Due to cooperative federal (NOAA), state, and regional (Gulf and Southeast Regional Fishery Management Councils) efforts, three out of the four overfished Atlantic and Gulf stocks (comprised of both Spanish and King mackerel) were rebuilt. The fourth stock is “well on its way” (Hogarth 2002) to recovering. State/federal cooperation in managing summer flounder stocks has resulted in their recovery as well.

NOAA has held workshops for protected species. Also, due to the fact that MMPA and ESA implementation are impossible without state cooperation, NOAA has also convened an annual meeting for state directors to discuss and harmonize conflicting activities (Hogarth 2002).

For almost 20 years, the Chesapeake Bay Program has led Bay restoration efforts. The states of Virginia, Maryland, and Pennsylvania, as well as the District of Columbia and the Chesapeake Bay Commission (comprised of state legislators), serve as the core partners on the state side while the Environmental Protection Agency (EPA) serves as the federal partner. This program has developed extensive sets of indicators and in its newest 2000 agreement, has laid out five priority areas for action: 1) living resource restoration and protection; 2) restoration and protection of vital habitat; 3) restoration and protection of water quality; 4) responsible land use; and 5) stewardship and community involvement (Marx 2002).

Chesapeake Bay Program’s Executive Council meets yearly and consists of six members (three state governors, the District of Columbia mayor, the Chesapeake Bay Commission chair, and the EPA administrator). A number of other participants, both public and private, contribute to the program’s restoration efforts. Further, when the Chesapeake Bay Program crafted its new, *Chesapeake 2000* agreement, the traditional process of bringing all public and stakeholder comments to the table was used (Marx 2002).

Through the Heinz Center, Dr. Hogarth of NOAA established the “summer flounder roundtable”. In this forum, all stakeholders (with representatives from non-governmental organizations, from recreational

and commercial fishing groups, and from the states) discuss how to best resolve allocation and quota issues.

Florida and the Caribbean

Primary Ocean and Coastal Problems

Non-point source pollution, largely from stormwater runoff, degrades the region’s coastal and marine water quality with the following types of contaminants: pesticides, fertilizers, oil from impervious surfaces and cars, and animal waste products. The introduction of sediments to the region’s waters from the dredging of coastal waterways also threatens water quality.

This reduction in marine water quality from land-based non-point sources of pollution threatens the region’s coral reefs, fishery resources, coastal/marine resources based tourism industry, and public health (Ragster 2002).

The introduction of invasive species from ships poses a high risk due to the extensive presence of the shipping and transportation industry in this region.

Rapid coastal population growth has contributed to the degradation of critical marine and coastal habitats. With that land loss comes the increased vulnerability of those populations to coastal hazards and sea level rise (Groat 2002).

Coastal erosion further contributes to the degradation/loss of coastal and estuarine habitats, resulting in a decreased natural buffering capacity of the land against pollutants, and increased vulnerability of coastal populations during coastal storms/natural hazards.

Primary Multiple-Use Conflicts and Underlying Causes

Enhanced security measures in the wake of September 11th have conflicted with commercial needs for expeditious and efficient movement of ships and containers in and out of ports. The need exists, therefore, to streamline national, state, and local security goals with those for economic efficiency. Furthermore, in seeking to improve port security, Captains

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of the Port have begun to restrict the use of specific waterways through the establishment of security zones (for example, manatee zones and Naval Protective Zones). Competition between recreational boaters and commercial shippers in the more congested, open waterways is, therefore, intensified (Carmichael 2002).

Coral reef ecosystem protection initiatives, including the establishment of no-take zones and marine park management strategies have met with opposition from various stakeholders in economic and development sectors (Ragster 2002).

The State of Florida contends that oil and gas exploration and/or development in its territorial waters poses significant risks to its coastal interests. Using the CZMA's federal consistency provision, Florida has charged exploration and development plans, and lease sales as inconsistent with its coastal management program (Haddad 2002).

Efforts to protect the critically endangered North Atlantic Right whale (numbering close to 300 individuals) conflict with maritime operations, as multiple ship strikes have resulted in lethal injuries (Haddad 2002).

Degree of 0 to 3 Mile Ocean Planning

The State of Florida has conducted extensive research on, and analyzed, its ocean issues (Cicin-Sain 2002). In moving toward a more comprehensive approach toward ocean/coastal policy development and resource management, Florida has engaged in various statewide efforts, including:

- Efforts to better assess the state of Florida's resources
- The Florida Ocean Policy Roundtable – for assessment of policy
- Looking Seaward: Development of a State Ocean Policy – for legal analysis
- The Statewide Ocean Resources Inventory (SORI) – for a GIS-based, resource inventory

Efforts to raise awareness of the value of the ocean to Florida through the formulation of the Florida Governor's Ocean Committee. With representatives from the private sector, government, conservation, science, and recreation, and other fields, this committee has made important recommendations on how to better manage the state's ocean/coastal resources.

Efforts to raise awareness of the environmental, economic, and social importance of Florida's coastal/ocean resources to not only the state, but also to the nation and the world through Florida Ocean Alliance. This statewide initiative, bringing together academia, government, and private interests, focuses on public outreach and activities.

The State of Florida has partnered with Latin American and Caribbean businesses and governments to address regional issues including port policies, scientific organization collaboration, and Best Management Practices for cruise lines (Murley 2002).

Degree of State-Federal Discussion/Interaction on Ocean and Coastal Issues

Long-term partnerships between Florida, NOAA, EPA, and National Park Service in the monitoring and assessment of the Florida Keys Reef Tract and Florida Bay seagrasses have resulted in the gathering of extremely valuable data. The experience and information gained through these longstanding, cooperative projects have yielded insight into future status and trends, which proves crucial for adaptive management of the studied habitats.

The recent passage of the Comprehensive Everglades Restoration Plan marks the beginning of an extensive, 30-year project requiring the cooperation of agencies at all governmental levels, as well as that of NGOs.

Degree of State-Federal Cooperation to Address Common Issues and Forums Used for Such Cooperation

Another large-scale effort, similar to the Everglades project, to restore the Florida Keys National Marine Sanctuary serves as another example of federal, state, local, and private cooperation in the region (Murley 2002).

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The Tortugas Ecological Reserve was established within the Florida Keys National Marine Sanctuary as an area of full protection. Due to its regulatory isolation, this Reserve was recognized as a prime, control area for studying the changes to the area's coral reef environment. The Tortugas 2000 Working Group, set up to conduct the study for the placement of this small reserve in the NMS, was comprised of Sanctuary members, government representatives, and other stakeholders. Furthermore, all local, state and federal agencies with authority over resources in the Tortugas study area were asked to dedicate a representative for the Working Group proceedings. The Working Group used the ecosystem approach in making its final recommendations to NOAA on the placement of the Tortugas Ecological Reserve (Causey 2002).

Gulf of Mexico

Primary Ocean and Coastal Problems

Non-point source pollution, entering the Gulf of Mexico (largely from the Mississippi River) has resulted in a hypoxic zone on the continental shelf of Louisiana and Texas (Boesch 2002). This "dead zone", almost the size of New Jersey when it peaks in the summer months, poses a serious threat to marine life, ecosystem health, and the sustainability of Gulf fisheries.

The increased subsidence of the Louisiana delta looms as a major risk to New Orleans as well as its neighboring populations and economic centers. Since the 1930's, the state has lost one million acres of its coastal land and in the next 40 years, is projected to lose another million unless action is taken (Caldwell 2002).

The resulting wetland loss could easily translate into significant habitat losses for shrimp, fish, and other biologically and economically important species (Groat 2002).

Declining fish stocks in the Gulf, coupled with a lack of economic and social data on them poses significant problems for resolving fisheries management issues (Swingle 2002).

Primary Multiple-Use Conflicts and Underlying Causes

Enhanced port security measures have conflicted with commercial needs for expeditious and efficient movement of ships and containers in and out of ports. The Port of Houston is the largest port in the nation for foreign trade (Edmonds 2002), and while economic setbacks from slow traffic in the intercoastal waterway would be severe, so would the aftermath of a terrorist attack. The need exists, therefore, to streamline national, state, and local security goals with those for economic efficiency.

Oil and gas exploration, as well as the construction of canals have disrupted the natural balance and flow of salt and fresh water, resulting in saltwater intrusion into the region's coastal wetlands.

Degree of 0 to 3 Mile Ocean Planning

The state of Mississippi has conducted extensive research on, and analyzed, its ocean issues (Cicin-Sain 2002).

Through the Gulf of Mexico Program (initiated at the federal level), the states in this region have met on a regional basis to share experiences and begin formulating regional views on ocean stewardship issues (Cicin-Sain 2002).

Degree of State-Federal Discussion/Interaction on Ocean and Coastal Issues

In 2001, eight federal agencies and nine states agreed on the goal of reducing nitrogen nutrient loading in the Gulf of Mexico dead zone by 30% (Boesch 2002).

Ideas for expanding the uses of offshore petroleum platforms in the northern Gulf of Mexico from extraction operations to include storm hazard forecasting, improved fishery management, and monitoring of Dead Zone dynamics have been put forth. The integration, and consequent synergy, of these uses may be achieved through a "nexus of continuous environmental sensors" (Boesch 2002). The Southeastern University Research Association (SURA), comprised of research institutions and universities from the

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Southeast, is working toward a national ocean observing system that can accomplish these tasks, in tandem with the efforts of the Consortium for Ocean Research and Education (CORE) and the national ocean/marine science community, the private sector, and federal agencies.

Degree of State-Federal Cooperation to Address Common Issues and Forums Used for Such Cooperation

The Gulf Regional Fishery Management Council, created under the Magnuson-Stevens Act, has a modest staff of economists and biologists. It relies on: NMFS for scientific research; NOAA for legal backing and adoption of both rules and fishery management plan amendments; and the Coast Guard and NOAA for law enforcement (Morris 2002).

The State of Louisiana and the Corps of Engineers are currently engaged in a federal-state cost share agreement, which, upon the signing of the agreement, began an 18-month attempt to acquire congressional authorization of a far-reaching restoration program under the Water Resources Development Act (Bahr 2002).

Hawaii and the Pacific Islands

Primary Ocean and Coastal Problems

Marine pollution from the following sources severely threatens the region's coral reefs, marine habitats, and coastlines:

- marine debris from the dumping of fishing gear, with Hawaii serving as a sink for significant amounts due to patterns of ocean currents (Coloma-Agaran 2002)
- point-source pollution from indiscriminate vessel dumping
- non-point source pollution from agricultural runoff, landfill leaching, and faulty sanitation structures

Coastal erosion threatens the shorelines and beaches of this region. Noted causes range from stranded or

sunken vessels to development (including seawall and jetty construction).

Problems with local fisheries exist in this region, including the following examples:

- Exploitation of the fish stocks from poachers persists, particularly in the Commonwealth of the Northern Mariana Islands, due to lack of regulatory enforcement.
- Overfishing, pollution, and development have contributed to the decline of nearshore fisheries in Hawaii (Coloma-Agaran 2002).

Limited technical capacity and experience at the local level has resulted in this region's reliance on outside expertise. The need has been recognized for the improved education of visitors, residents, and coastal management staff, which will foster enhanced stewardship of the region's ocean and coastal resources (Tenorio 2002).

Primary Multiple-Use Conflicts and Underlying Causes

Long-line fishing fleets have been banned in Hawaii from many of their former fishing grounds due to the incidental take of leatherback turtles. Many boats in the longline fleet have sought fishing markets elsewhere. International fleet fishing efforts continue, however, resulting in only marginal protection of the endangered leatherback turtle (Coloma-Agaran 2002). Additionally, the five sea turtle species occurring in the U.S. Pacific region are listed under the Endangered Species Act as either threatened or endangered (Eckert 2002).

Those who work in this region's tourism industry must compete with the native residents for coastal space and use. The infrastructure of Hawaii's harbors, for example, is inadequate to accommodate the demands of the cruise line industry. Further, some of the island's most popular marine protected areas face overuse and related impacts. New recreational activities such as jet skiing must also compete with traditional activities, including diving, fishing, and surfing.

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Marine protected areas are marketed to the millions of tourists as “‘must-see’ destinations” (Coloma-Agaran 2002). While these areas boost the economy by attracting many visitors, they also sustain serious environmental degradation from the tourism industry.

The introduction of alien species threatens the region’s ecological integrity. For example, invasive algae have overtaken large areas of Hawaii’s coral reefs (Coloma-Agaran 2002).

Coral reefs in this region also suffer from marine debris, contaminated run-off, and groundings of vessels (Blane 2002).

Degree of 0 to 3 Mile Ocean Planning

The state of Hawaii has developed a comprehensive plan for its jurisdictional waters (0 to 3 mile zone) to direct ocean uses and activities, to settle conflicts, and to anticipate future uses.

Through the work of the Pacific Basin Development Council, the state of Hawaii and the U.S. islands in this region have held meetings to share experiences and to begin formulating regional views on ocean stewardship issues (Cicin-Sain 2002). Integrating traditional and Western implementation approaches when instituting resource management programs is critical (Peau 2002).

Degree of State-Federal Discussion/Interaction on Ocean and Coastal Issues

In Hawaii, the state and the National Marine Sanctuary (NMS) Program jointly manage NMS waters.

Degree of State-Federal Cooperation to Address Common Issues and Forums Used for Such Cooperation

NOAA’s National Ocean Service, the University of Hawaii, and the Department of Land and Natural Resources work together to fund and manage the Hawaii Coral Reef Initiative Research Program (Colomo-Agaran 2002).

Southwest

Primary Ocean and Coastal Problems

Invasive species from the extensive shipping traffic along the West Coast are an ever-present threat.

Marine pollution from sewage treatment facilities, industrial plants, agricultural sites, construction plots, roadways, and other sources seriously threatens marine water quality in this region. The most significant marine pollution threat is from non-point sources.

Contaminated sediments are yet another major source of coastal water contamination in California, with hotspots predominately forming at the mouths of creeks, rivers, and storm drains. These hotspot sediments have high concentrations of petroleum hydrocarbons and heavy metals, among other pollutants.

Population density in the California coastal zone places significant pressure on the region’s ocean and coastal resources. At least 85% of California residents live within a one-hour drive from the coast (Notthoff 2002).

Oil pollution from accidental tanker spills threatens water quality, wildlife, habitat, and other elements of the coastal zone.

The geologic recession and erosion of California’s coastline have been exacerbated by constricted sediment flow to the shorelines (from diking practices) and by anthropogenic activities associated with coastal zone development.

Loss of wetlands in this region is a pressing problem, with some studies suggesting that the region has lost 70 to 95% of its historic wetlands.

Widespread pollution has resulted from aquaculture operations, both from uneaten feed and from significant amounts of fecal matter in and around netpens (Parravano 2002).

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Primary Multiple-Use Conflicts and Underlying Causes

California's concerns with outer continental shelf (OCS) oil and gas operations include not only their potential detrimental impacts offshore, but also onshore, with adverse impacts on habitat, aesthetics, water quality, public transportation and safety, public recreation and access, and lands used for cultivation.

Certain fishing practices conflict with the laying of fiber optic cables in this region.

Along with the water quality problems resulting from aquaculture practices, aquaculture also negatively impacts wild fish stocks.

California's OCS is put to the following uses, with irrefutable multiple-use conflicts: oil and gas exploration and development; direction of oil tankers; dumping of municipal waste; dumping of dredge materials; expansion of marine sanctuaries and marine protected areas; laying of fiber optic cables; testing for noise impacts and acoustics (including military operations) (Wan 2002).

Due to the lack of proper offshore disposal sites, contaminated and fine-grained sediment has accumulated in the state's bays and harbors, with resulting negative consequences for the transportation/shipping industry (Thompson 2002).

Degree of 0 to 3 Mile Ocean Planning

The State of California has developed a comprehensive plan for its jurisdictional waters (0 to 3 mile zone) to direct ocean uses and activities, to settle conflicts, and to anticipate future uses (Cicin-Sain 2002).

Through the work of the Western Legislative Conference and the Western Governor's Association, the State of California has held meetings to share experiences and to begin formulating regional views on ocean stewardship issues (Cicin-Sain 2002).

With regard to the management of marine resources, the State of California has broadened its mandates to include the ecosystem approach. In addition, the

emphasis has shifted from attaining a maximum sustainable yield for fisheries toward sustainable fisheries, habitat and resources (Bunn 2002). Some key examples of California's progressive approaches toward marine resource management are evidenced in the Marine Life Management Act, Marine Life Protection Act, and Marine Managed Area Improvement Act (Nichols 2002).

The California Department of Resources has taken unprecedented strides regarding marine protected areas. For example, it has:

- Delineated a clear process and authority for state establishment of MPAs
- Delimited MPAs on a regional basis, to encapsulate oceanographic and environmental characteristics (Baird 2002)

Degree of State-Federal Discussion/Interaction on Ocean and Coastal Issues

The California Coastal Commission has sued the Minerals Management Service (MMS) over 36 old, offshore oil and gas leases, which were approved by the federal government before the CZMA's federal consistency provisions existed.

Through a cooperative arrangement with California's Scripps Institution of Oceanography, the MMS has funded physical oceanographic research along the Pacific coast (Kearney 2002).

The California Department of Resources, in cooperation with the Channel Island National Marine Sanctuary, has completed an innovative mechanism for the identification and possible designation of Marine Reserves in both federal and state waters (Baird 2002).

Degree of State-Federal Cooperation to Address Common Issues and Forums Used for Such Cooperation

The Fish and Wildlife Service (FWS) is taking steps to improve estuarine water quality along the West Coast through cooperative programs in the region.

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Efforts are focusing on the removal of 100-year old dams, which will restore the waterway flow to estuaries and open the passageways for fish, particularly salmon and other anadromous species.

The FWS is also cooperating with numerous partners throughout California to combat the invasive alien species problem.

The National Park Service (NPS) manages eight parks along California's coasts: Cabrillo National Monument; Channel Islands National Park; Fort Point National Historic Site; Golden Gate National Recreation Area; Point Reyes National Seashore; Redwood National Park; San Francisco Maritime National Historic Park; and the Santa Monica Mountains National Recreation Area. Channel Islands National Park, in cooperation with state, federal, and private interests is working to restore the kelp ecosystems of Southern California. These kelp forests enhance biodiversity and, thus, fishing and recreational opportunities (Kearney 2002).

Currently, California is working with local governments and the Corps of Engineers on a 'Master Plan' for coastal erosion and sediment buildup issues (Nichols 2002).

Degree of Regional-Level Planning for Potential Future Uses of the EEZ

With regard to OCS oil and gas extraction, the State of California is currently considering two proposals, one of which has been the topic of public hearings – the production of oil from State leases by drilling from existing Federal lease platforms.

Northwest

Primary Ocean and Coastal Problems

Invasive species from the extensive shipping traffic along the West Coast pose a constant threat.

Contaminated sediments in estuaries and bays result largely from "mixing zones", in which it is legal to discharge toxic pollutants. Some of the most daunting and longest-delayed Superfund sites in the North-

west are in marine environs (Fletcher 2002).

Oil pollution, whether from accidental tanker spills or from the intentional dumping of oil by vessels, threatens marine/coastal water quality, wildlife and habitat.

Non-point source pollution further degrades water quality. Sources of this difficult-to-manage type of pollution include untreated waste, run-off, and residential activities, including pesticide and fertilizer use.

Coastal erosion and loss of estuarine habitat (Shultz 2002) result in habitat degradation/loss, a decreased natural buffering capacity of the land against pollutants, and increased vulnerability of coastal populations during coastal storms/natural hazards.

Declining fish stocks have resulted in the upsurge of fish farming in the region. As with many new industries, management difficulties have beset aquaculture, including the issue of what to do with the concomitant waste.

Primary Multiple-Use Conflicts and Underlying Causes

Marine pollution undermines the region's shellfish industry.

Declining and depleted fish stocks have disrupted the aquatic food chain in this region. For example, the endangerment of the Pacific salmon has contributed to the endangerment of the Orca whale, which feeds on the salmon (Fletcher 2002).

Native Americans depend nutritionally, culturally, and economically on marine resources that are currently contaminated and depleted. (Fletcher 2002).

Competition for coastal land occurs on many fronts. The preservation of coastal land (for example, from development for shoreline protection, for wildlife habitat preservation, and for public recreation/access) conflicts with the economic opportunities of developing the land (for example, for water-dependent commercial activities). States in this region must balance these conflicting values (Shultz 2002).

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Limited space in freshwater and marine habitats creates competition between aquaculture, coastal property owners, and fishermen (Chew 2002).

Degree of 0 to 3 Mile Ocean Planning

Through the work of the Western Legislative Conference and the Western Governor's Association, Pacific Coast states in this region have met on a regional basis to share experiences and to begin formulating regional views on ocean stewardship issues.

The state of Oregon has developed a comprehensive plan for its jurisdictional waters (0 to 3 mile zone) to direct ocean uses and activities, to settle conflicts, and to anticipate future uses (Cicin-Sain 2002).

Degree of State-Federal Discussion/Interaction on Ocean and Coastal Issues

In 1991, the Oregon legislature established the Ocean Resources Management Program, which brings existing state agencies and all other involved interests together into a common process. Multiple federal agencies have participated in this state program, including the U.S. Fish and Wildlife Service, the Corps of Engineers, National Marine Fisheries Service (NMFS), and the Minerals Management Service (Solliday 2002).

Degree of State-Federal Cooperation to Address Common Issues and Forums Used for Such Cooperation

In the Pacific Northwest, the largest federal expenditure on an ocean-related resource management effort is for the recovery of declined salmon stocks (Dornbusch and Gore no date).

With the EPA's establishment of the National Estuary Program (NEP) came the challenge to environmental managers to build partnerships concerning the social and economic conditions of the Puget Sound eco-region. The NEP prioritized an integrated approach in its 1997-1999 work plan for the Puget Sound. NEP funding aided in the eventual formation of the Puget Sound Water Quality Action Team (Action Team) and Puget Sound Council (Council), both of which are responsible for developing and

tracking the implementation of a comprehensive Puget Sound Water Quality Management Plan. This plan provides the mechanism for protecting and managing the Puget Sound. It also coordinates the roles and duties of the federal, state, tribal, and local governments (Hildebrand, Pebbles, et al. 2002).

NMFS is currently engaged in two primary approaches to restore depleted salmon stocks: 1) the establishment of Technical Recovery Teams, comprised of technical staff from NMFS, and academic, state, tribal, and local biologists; and 2) participation in policy forums aimed at fostering cooperation among diverse interests in developing a regional recovery plan (Lohn and Ruckelshaus 2002).

Degree of Regional-Level Planning for Potential Future Uses of the EEZ

Oregon contends that both its environmental and economic interests extend out to 85 miles, well beyond the three-mile zone and well into the Exclusive Economic Zone (Cicin-Sain 2002). This area, extending from the shoreline out to the edge of the continental shelf, is based on the distribution of living marine resources, fishery patterns, and ocean current dynamics, and other data. Under its coastal management program, Oregon calls this zone the "Ocean Stewardship Area" (Solliday 2002).

Alaska

Primary Ocean and Coastal Problems

A number of issues impact fisheries management in the State of Alaska, including, but not limited to:

- Overfishing poses a problem in Alaskan waters, with some fish stock levels reduced to the point of threatened survival and others substantially reduced to point of becoming similarly threatened. Alaska's Representative Young addressed this problem by stating: 'It is crucial that the management agencies within the Federal Government be pro-active in protecting fisheries rather than attempting to address overfished stocks after they are in a crisis situation' (Tuyn 2002).

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- “Localized depletion” and “serial overfishing” have characterized fishing operations in the Shelikof Strait, the Bogoslof/Aleutian Basin, and the Aleutian Islands. These methods entail fishing one stock to exhaustion and moving on to another stock of fish in another area.
- Bycatch in the North Pacific is not a minor matter, measuring in the millions (pounds). In 1998 and 1999, shocking amounts of waste were discovered, with 330 million pounds of groundfish, over 14 million pounds of halibut, almost two million pounds of herring, and well beyond six million pounds of crab taken as bycatch (Tuyn 2002).

Stellar sea lions, as well as the sea otter and the Beluga whale (in Cook Inlet) are in decline (Stevens 2002).

Offshore oil and gas platforms discharge large amounts of “pollutant-laden” (Tuyn 2002) waters annually. For example, the open-ocean platforms in Cook Inlet collectively release 89,000 barrels of this contaminated water each year (Tuyn 2002).

The problems that commonly plague the other regions of the United States (for example, non-point source pollution and urban sprawl) do impact the State of Alaska, but not on as critical a level. The imperative set currently before this region is that of maintaining its present levels of biodiversity and relative environmental health. To accomplish this task, Alaska must greatly increase its scientific knowledge of coastal and oceanic processes, on all levels (biological, physical, and chemical) and integrate that knowledge into projections about human/environmental interactions (Dorman 2002).

Primary Multiple-Use Conflicts and Underlying Causes

When commercial fishermen deplete a fish stock in a particular area, in a style pioneered by the Japanese, the species of the area that feed upon those fish are subsequently become malnourished and experience population declines. In the Gulf of Alaska and Bering

Sea/Aleutian Islands, for example, the precipitous drop in the Stellar sea lion population coincided in both place and time with the development and operation of “high-volume trawl groundfish fisheries” (Tuyn 2002).

Declines in Beluga whale populations in Cook Inlet are largely attributed to overharvesting by Alaskan Natives for the commercial and subsistence purposes. Further explanations for their 65 to 75% declines in the past two decades include: drowning in commercial fishing gear; health impairment from pollution; seismic testing noise; and collisions with ships, personal watercraft, and motorboats (Tuyn 2002).

Persistent organic pollutants, migrating from other parts of the world, migrate to the waters surrounding Alaska through currents. These pollutants accumulate in the fat tissues of Arctic animals, posing unparalleled environmental threats and health concerns for native peoples (Childers 2002).

Alaska’s shoreline is home to petroleum development, commercial fisheries on a large scale, major marine ports, extensive cruise ship activities, and beautiful natural resources. No doubt, these different activities and elements potentially give rise to a number of serious conflicts. Alaska’s environment, with limited visibility, rough seas, ice-laden traffic lanes, and extensive tidal ranges (among other extremes), exacerbates these risks. The *Exxon Valdez* tanker spill serves as a prime case in point (Keeney 2002).

Degree of 0 to 3 Mile Ocean Planning

The North Pacific Fishery Management Council (NPFMC) celebrates widespread support. One of the key strengths of the NPFMC is the availability of the staff and members to the public. The Science and Statistics Committee (SSC), the Advisory Panel (AP), and the Council discuss the same issues and meet in the same location in a standardized manner, which enables the public to track an issue and testify, if desired, before all three entities. In addition to the open process engendered by the NPFMC, another one of its strengths lies in the strong role it accords the SSC. Thus, by creating an inclusive process for the public and listening carefully to the SSC, the

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NPFMC enhances its ties to sound science and steps away from the “us versus them” situation commonly found between scientists and fishermen (Winther 2002).

Degree of State-Federal Discussion/Interaction on Ocean and Coastal Issues

The NPFMC and the NMFS Alaska Region have cooperated together well, showing that a double-headed partnership is doable (Leitzell 2002).

NMFS and the Alaska Department of Fish and Game work together closely in collecting fishery conservation and management data. Their common objectives include: catch monitoring to ensure that quotas are not surpassed; data collection (for example, on the time and place of the catch) for use in continuing scientific research; and enforcement of closed or restricted fishing areas, areas with gear restrictions, and areas designated for endangered species protection. To meet these common objectives, these two entities effectively use fish tickets, permits, logbooks, observers, and a vessel monitoring system (Leitzell 2002).

To address the bycatch problem, the State of Alaska and NGOs have taken steps to disclose the raw data obtained by NMFS to the public and to fisheries managers (Tuyn 2002).

Degree of State-Federal Cooperation to Address Common Issues and Forums Used for Such Cooperation

The Sitka Salmon Summit of 1996 and the 1999 Pacific Salmon Treaty agreements established a renewed commitment to conservation between the State of Alaska, the Canadian government, and the Northwest tribes and states. The principles shared in these forums and agreements are simple: “conservation, research, and stewardship for wild Pacific salmon”. Two funds have emerged from these cooperative efforts as well, one an endowment and one called the Sustainable Salmon Fund, in support of research, enhancement, and conservation of salmon fisheries (Knowles 2002).

Degree of Regional-Level Planning for Potential Future Uses of the EEZ

The State of Alaska has significant offshore oil and gas reserves, especially in the Arctic Ocean. Stevens (2002) contends that because Alaska has proven its capabilities in systematically managing the oil and gas resources within state waters, it should be granted the “same degree of control” in offshore areas. Future research should further enable Alaska to safely and efficiently tap into its offshore methane hydrate sources in addition to its oil and gas reserves (Stevens 2002).

Great Lakes

Primary Ocean and Coastal Problems

Despite accomplishments made in the area of water quality over the past 30 years, serious pollution problems persist along Great Lakes beaches. Bacteriological and chemical pollution comprise the two largest sources of this contamination (Hartwig 2002).

The State of Illinois has experienced an increase in its number of beach closing days due to bacteriological contamination of the water (Vonnahme 2002). While it proves difficult to pinpoint the sources of such contamination, one culprit is poor wastewater infrastructure, which leads to sewage releases (source of *E. coli* bacteria) during heavy rains (Jimenez 2002).

Concerns have arisen around the issue of sustainable water quantity in the Great Lakes. Lake Michigan, for example, provides drinking water for over 6.7 million Illinois residents alone and the potential exists for states beyond the region to extract water from the Great Lakes in the future. At present, knowledge of Great Lakes Basin hydrology and of the impacts on ecosystems with regard to withdrawals is extremely inadequate (Vonnahme 2002).

A surfeit of brownfields, contaminated areas, characterizes the shorelines in the Great Lakes region of numerous current, and former, industrial sites (Kudrna 2002).

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Primary Multiple-Use Conflicts and Underlying Causes

The historical use of the Great Lakes as a dumpsite for toxic, persistent chemicals has resulted in the serious decline, endangerment, and extinction of fish (for example, Lake Erie's blue pike). These chemicals continue to be released into the Basin and also enter the food web through contaminated sediments (Hartwig 2002).

The threat of invasive species is ever-present and growing in the Great Lakes (Jimenez 2002). These alien species, should they become invasive (for example, zebra mussels and round goby in Lake Michigan) place the survival of native fish and aquatic species at risk. The vector for the introduction of these alien species, ships carrying ballast water from distant ports, must therefore be controlled. According to Vonnahme (2002) of the Illinois Department of Natural Resources, this problem is the most serious one currently facing the Great Lakes. This region further finds it difficult at times to receive funding from the federal government to combat its invasive species problem. For example, the National Undersea Research Program does not group the Great Lakes as a distinct region, but instead lumps it with the Northeast – thus making it less likely for dollars to reach the Basin (Reutter 2002).

Rapid development activities and urban sprawl in coastal areas threatens nearshore resources and habitat as well as the quality of air, land and water resources in the region (Kudrna 2002).

The maritime industry must balance its economic needs with environmental concerns as it moves to maintain and promote a more efficient transportation infrastructure (Kudrna 2002).

Degree of 0 to 3 Mile Ocean Planning

In May of 2002, the Mayor of Chicago convened mayors of cities along the southern end of Lake Michigan, from Milwaukee, Wisconsin, to Gary, Indiana, to address and discuss issues of common concern. This next year, in addition to the mayors he

invited previously, he plans to invite mayors from some of the larger cities throughout the Great Lakes region, to carry on the discussion. The purpose is to design a Great Lakes Protection and Restoration Strategy, to enlist the support of the Great Lakes Governors, and to inform the new Congress about this agenda. This Strategy will seek to identify the programs, projects, and policies deemed necessary for the protection, conservation and management of Great Lakes resources. After identifying the capabilities and resources of state and local governments, the aim of the Strategy is to delineate the best methods for coordinating with the federal government to meet the set goals (Jimenez 2002).

Degree of State-Federal Discussion/Interaction on Ocean and Coastal Issues

The U.S. Fish & Wildlife Service has worked, and will continue to work with other federal agencies, states, tribes, and local governments to formulate water quality standards to safeguard against contamination from toxic substances including dioxins, furans, mercury, and PCB's that heavily impact both human health and the environment (Hartwig 2002).

Numerous agencies at the federal and sub-federal level, in both the United States and Canada, have begun "state of the lakes" reporting to provide regular, qualitative and quantitative assessments of ecosystem health to policy analysts, managers, and the public. A premier example of these efforts is the State of the Lakes Ecosystem Conference (SOLEC) process, sponsored by Environment Canada and the U.S. EPA (Kudrna 2002).

In the past few years, the idea of a broad, consensus-based Great Lakes Restoration Plan has garnered support within the Great Lakes Basin from interests including: its delegation from Congress; state agencies and governors; regional agencies; and nongovernmental entities. NOAA and the National Sea Grant Program will be valuable partners in this process as well (Kudrna 2002).

Degree of State-Federal Cooperation to Address Common Issues and Forums Used for Such

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Cooperation

The Great Lakes region is widely known for its effective and sophisticated approach to the planning and management of basin water resources. The leading regional institutions for governing resources of the Great Lakes region include the Great Lakes Commission, the International Joint Commission, the Great Lakes Fishery Commission, and the Council of Great Lakes Governors (Kudrna 2002).

The Great Lakes Commission (GLC) is a binational agency, with eight Great Lakes states (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin) and two Canadian provinces (Ontario and Quebec) serving as members. Chief agency officials, legislators, and premiers'/governors' appointees comprise the delegations. Further, the Commission upholds a strong "Observer" program, which secures the involvement of other core entities (international and regional commissions, Canadian and U.S. national agencies, tribal authorities, and academic institutions). The GLC carries the mandate to promote sound public policy on issues including resource management, environmental protection, sustainable development, and transportation in the region (Kudrna 2002).

The International Joint Commission (IJC) is a binational agency comprised of officials from federal, sub-federal (state and provincial), and, increasingly, non-governmental individuals. It was created by the 1909 Boundary Waters Treaty (Chandler 2002). Signed by the United States and Canada, this treaty provided a framework for the binational management of the transboundary, Great Lakes waters. As time passed and new issues emerged, the need for new management frameworks became apparent and in 1972, the two countries signed the Great Lakes Water Quality Agreement (Davis 2002). This Agreement evolved through amendments and protocols, in 1979 and 1987, respectively. Through this progression, it set a global precedent by stepping beyond the chemical-by-chemical approach and adopting more of an ecosystem approach. Under the Agreement, also, are the "Great Lakes Strategy 2002" of the U.S. EPA and "Lakewide Management Plans" (Davis 2002). Over

the past 90 years, many binational issues have impacted both Canada and the U.S. The flexibility of the Boundary Waters Treaty has aided these two nations in finding mutually agreeable solutions. The IJC has participated in finding many of these solutions (Chandler 2002).

The Great Lakes fisheries are managed through the following three mechanisms:

- Sub-national governments (the states, the province of Ontario, and the two U.S. intertribal agencies). These entities operate together through a Joint Strategic Plan for Management of Great Lakes Fisheries and separately through their own agencies.
- The U.S.-Canadian Great Lakes Fishery Commission, which functions under a binational treaty; and
- The national governments, operating under a number of initiatives and laws

No binding, top-down authority exists in this region to govern cooperative fishery management. Rather, each sub-national unit can manage its fishery section in the manner it deems appropriate. Further, both the United States and Canada prohibit the sub-national governments from creating more formal modes of cooperation. The need for ecosystem management complicates the governance of fisheries further still by requiring fishery managers to coordinate their efforts with environmental agencies such as Environment Canada, the U.S. EPA, and the International Joint Commission.

Despite the intergovernmental complications inherent in governing the fisheries of the Great Lakes, the Joint Strategic Plan is lauded as one of the best examples in the world of cooperative fishery management. Implemented by the Great Lakes Fishery Commission, it neither binds agencies and/or governments nor infringes on agency jurisdiction. Instead, Great Lakes fishery management rests on consensus, accountability, information sharing, and ecosystem management (Gaden et al 2002).

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The Council of Great Lakes Governors addresses the ongoing problems of water quantity management according to the terms laid out in the 1985 Great Lakes Charter and its 2001 Annex (Kudrna 2002).

Conclusion

In conclusion, the nine regions of the United States (Northeast; Southeast; Florida and the Caribbean; Gulf of Mexico; Hawaii and Pacific Islands; Southwest; Northwest; Alaska; and Great Lakes) vary extensively according to the criteria discussed herein:

- primary ocean and coastal problems and conflicts;
- extent of 0 to 3 mile ocean planning;
- extent of federal state interaction/discussion and/or cooperation to address issues of common concern; and
- extent of planning at the regional level for future EEZ uses.

Those who testified in the various regional workshops before the U.S. Commission on Ocean Policy consistently expounded on the need for improved regional ocean governance in their particular region, or on behalf of the entire nation as a whole. Not once was the opposite argument made.

While the testimonies uncovered many similar ocean and coastal problems and multiple-use conflicts among the regions, they also illustrated the individuality of each region by uncovering how these problems and conflicts vary considerably among them. For example, non-point source pollution is a primary problem in each U.S. region (apart from Alaska). Other commonly shared problems/conflicts among the regions include: coastal and estuarine erosion; urban sprawl/wasteful development patterns; and the threat of invasive species. Difficulties with endangered species management, conflicts between maritime shipping and marine mammals, and declining fish stocks exemplify other, less commonly shared, problems and

conflicts among the regions. Many mutual problems and conflicts, indeed, abound between the nine U.S. regions. Yet, despite these similarities, each region retains its own unique problems and conflicts, which cannot be addressed in a blanket manner. Poor water quality in the Great Lakes, resource management conflicts with indigenous peoples in the Northwest, and the destructive nature of the tourism industry in the Hawaii and Pacific Islands Region comprise a few of these region-specific issues.

Likewise, with regard to specific regional institutions, mechanisms, and practices, some regions displayed extensive levels of experience, while others demonstrated comparatively less. For example, only three coastal states (Hawaii, California, and Oregon) have developed comprehensive plans for their jurisdictional waters (0 to 3 mile zone) to more effectively manage ocean uses and activities, settle conflicts, and anticipate future uses. A number of regions, furthermore, demonstrate extensive cooperation between research institutions (state and federal) and universities, often in efforts to set up national and/or regional ocean observing systems. Every region in the U.S. has demonstrated some degree of federal, state, local, and private (NGOs) cooperation, whether it be through collaborative discussion and interaction or through more formalized programs and projects. Those regions bordering Canada and/or housing indigenous peoples (Northeast, Great Lakes, Northwest, and Alaska) have had considerations to make in addition to those pertaining to federal, state, and local partnerships. These additional steps may often involve: the arrangement and organization of international summits and the subsequent implementation of treaties formulated therein; and/or the inclusion of tribal parties in agreements and resource management programs.

So what conclusions does this analysis afford? Firstly, the regions that currently have regional ocean governance mechanisms in place demonstrate that it works. Secondly, the stories told in the testimonies illustrate the need to fill the void between state and federal coastal/ocean regulation with regional ocean governance. How may regional ocean governance help to

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accomplish this goal? It may easily do so by: 1) more specifically addressing the problems and conflicts in the regions than the federal government can; and 2) focusing on the problems and conflicts plaguing regions where their problems actually lie (often not at the state or local level, but at the *regional* level).

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Coastal State Experiences with Ocean Planning

Editor's Note: This report is excerpted from Stefano Belfiore et al, Turning to the Sea: Toward an Ocean Plan for Delaware, June 2000, Center for the Study of Marine Policy, University of Delaware

Introduction

The experience of several states with ocean plan initiatives demonstrates the opportunities offered by ocean management to coastal states. Particular attention is paid to the initiatives developed by Oregon, Hawaii, California, North Carolina and Florida. Management efforts were focused on the land in these states until some outside threat mobilized them to develop ocean management plans or programs. The plans and programs developed by these five states are influenced by a series of common factors, including (a) a strong ocean heritage, (b) government capacity in coastal and ocean management, (c) relevance of ocean and coastal management problems and opportunities and (d) political momentum. In all cases, the state "ocean projection" provided an essential instrument for protecting state interests in the 3-mile zone and enhancing the marine-related economy.

The purpose of examining the experiences of other states is to gain some guidance and insight for other states that might be beginning new ocean management efforts. Presentation of the five states will start with Oregon, a model ocean management program, and continue with Hawaii, California, North Carolina and Florida. The first step in this section was a review of each state plan and existing literature about the plans. This study also conducted a survey of ocean and coastal managers from these states in order to understand the dynamics and situations particular to each state. The survey consists of ten (10) questions that probed the history of the planning effort, the issues that are most important to the state, the conflict (or issue) resolution mechanisms enacted by the program or plan and any vertical segregation present between state and federal agencies.

State Experiences

Oregon

Oregon's state program was triggered by participation in planning for federal outer-continental shelf (OCS) oil and gas leasing in the 1980s and interest from industry and the United States Department of Interior in marine mineral development in the late 1980s. While trying to respond to these issues, Oregon became aware that it was "weak in needed policies, information, and institutional capacity to respond effectively" (Bailey 2000). Agencies were not coordinated about ocean issues and turf battles occurred over which agency should be the lead agency of a coordinating council.

Then State Senator Bill Bradbury and Oregon coastal management staff (e.g. Robert Bailey) began working with other key individuals to produce a "progressive, comprehensive approach to state ocean policy" (Bailey 2000). They agreed that an act of legislation was the only way to achieve a clear and politically unambiguous direction for such an approach. The Oregon Ocean Resources Management Act, passed in 1987 with one dissenting vote in the House, established an Ocean Task Force. There was no opposition as long as policy makers stayed away from requiring local governments to do ocean planning and as long as they addressed some of the concerns of various state agencies. The legislation was amended in 1991 to institute the Ocean Policy Advisory Council in the Office of the Governor and to require a Territorial Sea Plan (Bailey 2000).

Oregon's 1990 Ocean Resources Management Plan, supported by the 1987 Oregon Ocean Resources Management Act, provides an impressive tool to enhance coastal and marine resource management by adopting a planning area up to the 200-mile zone, with a special emphasis on a 35-80-mile Oregon "ocean stewardship area." This initiative well addresses state interests beyond the 3-mile zone, particularly with reference to fishing, transportation, and recreation, and provides an important tool for coordinating coastal management with seaward federal activities, also through the establishment of a resource information base.

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Full implementation of the Act resulted in two planning documents, (a) the Oregon Ocean Resources Management Plan (1990) and (b) the Territorial Sea Management Plan. The Ocean Resources Management Plan is meant to fulfill the objectives of the Statewide Planning Goal 19, Ocean Resources. The approach of the plan includes (a) an analysis of state and federal laws, programs, and regulations affecting ocean resources, (b) a study of the present and future ocean uses offshore of Oregon, (c) maps and other information about ocean conditions, resources and uses, and (d) recommendations for developing or improving state programs to manage ocean resources. The plan includes legislative ocean-related policies, an Ocean Policy Advisory Council, and mandates the coordination of state and federal policies, programs and agencies. The Ocean Program staff supports the work of the Ocean Policy Advisory Council, provides leadership and coordination with state and federal agencies, and applies for, obtains and administers federal funds for special ocean-related projects. The Territorial Sea Plan has three parts: (a) background information, (b) standards for reviewing and approving ocean development actions by state agencies; and (c) a rocky shores strategy that has site-specific management designations and prescriptions (Bailey 2000). The Territorial Sea Plan is a plan to coordinate and assure compatibility among agency responses to situations as they arise; many of the recommendations of the Plan will take effect only when a situation arises and an agency responds to it.

The Ocean Resources Management Plan, now called the Ocean Program, introduces major innovations to organize a broad policy framework for ocean management. These include:

- (a) definition of a 35-80-mile ocean stewardship area off of Oregon, from the crest of the coastal mountains to the toe of the continental margin. In this area Oregon asserts its interest in ocean-resource management and applies policies and principles for conservation and marine habitat protection;
- (b) definition of priorities among ocean uses offshore Oregon (Statewide Planning Goal 19, Ocean Resources), i.e., priority to the management and pro-

tection of renewable resources, and the requirement that agency decisions be based on scientific information;

- (c) identification of 33 sensitive marine habitats on offshore rocks and islands and shoreline cliffs. The plan explicitly prohibits oil and gas development in state waters and provides restrictions for federal oil and gas activities offshore; and

- (d) promotion of state-federal cooperation, in order to act as an agent of change in ocean government.

The plan provides opportunities for integration with the existing state coastal plans also through the creation of an Ocean Resource Management Task Force.

The 1991 Ocean Resources Management Plan was adopted as part of the state's Coastal Zone Management program but never submitted to the National Oceanic and Atmospheric Administration (Office of Coastal Resource Management) because it would not have been approved with its policies on offshore oil, gas and minerals (Bailey 2000). The 1994 Territorial Sea Plan, however, was adopted in the CZMP and approved by NOAA/OCRM and is an official part of the state CZM process.

The success of the Oregon Ocean Program stems from it being a program and not just a plan. "Plans become outdated even if they are the best at the time of development" (Bailey 2000). The Ocean Plan, which does not have mandatory policies, and the Territorial Sea Plan, which does have mandatory policies, continue to provide core policy direction. The Ocean Policy Advisory Council has provided Oregon with a forum and method for fairly and regularly addressing emerging issues that either were not covered in the plan ("because all plans are incomplete and cannot predict everything") or were covered by the plan but had to be re-evaluated to respond to new situations. The Council has been the forum for discussing and resolving issues like site-specific management problems, proposals for the commercial harvesting of kelp, and strengthening protection of rocky intertidal areas. It has provided a forum for discussing, and often

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resolving, fishery management issues with industry and federal agencies, and for interacting with the university marine research community to bring results of research to the management arena (Bailey 2000).

Hawaii

In Hawaii, ocean management is supported by the Ocean Management Plan and the 1988 Ocean Resources Management Act, with two major objectives: minimization of environmental problems and enhancement of the marine-related economy (Lowry et al. 1990). As the primary source of income, tourism grosses close to \$ 11 billion/year, of which ocean and beach recreation are major components. Similarly important for the economy are the growing aquaculture industry, generating close to \$21-million/year, the ocean transportation industry, with revenues of \$400-million/year, and harbors, whereby 98% of important goods reach Hawaii (State of Hawaii 2000).

The particular, archipelagic characteristics of Hawaii have allowed the state to assert and reserve its rights and interests in the EEZ with reference to the exploration, exploitation, conservation and management of natural resources, both living and nonliving, of the seabed, subsoil and superadjacent waters. Judicial overlaps among state agencies and among county, state and federal activities, and conflicts between public and private use of the ocean resources prompted the development of the 1991 Hawaii Ocean Resources Management Plan (Cicin-Sain 1990). The process started in 1990 Coastal Zone Management Program (in the Governor's Office of State Planning) evaluated its programs and promoted extensive public meetings that formed the basis of the January 1991 report. The Ocean and Marine Resources Council, a multi-agency, cabinet-level council, which included private sector and non-governmental representatives, was established to draft the plan and submit it to the 1991 State Legislature.

The Hawaii Ocean Resources Management Plan (1991) established guiding principles and overall recommendations for the State, and set forth policies and implementing actions for 10 resources areas: research and education, ocean recreation, fisheries, har-

bors, marine ecosystem protection, beaches and coastal erosion, waste management, aquaculture, energy and marine minerals. The plan also established the following priority recommendations to provide a foundation for all future marine and coastal management activities in Hawaii:

1. Implement a regional planning approach
2. Improve the information base
3. Establish carrying capacities
4. Develop conflict resolution procedures
5. Enforce ocean use laws and regulations
6. Improve public participation (Hawaii Ocean and Marine Resources Council 1991).

In 1994 the State Legislature adopted the ORMP and in 1995 the plan was incorporated into the CZM program. At the same time a Marine and Coastal Zone Management Advisory Group (MACZMAG) was established to provide guidance and make recommendations for implementation of the ORMP. In 1998 a report on the status of implementation of the ORMP was gathered from surveys distributed by MACZMAG to all agencies designated in the plan. Results showed great the extent of implementation accomplished in different resource areas: all actions (100%) pertaining to aquaculture were ongoing or planned, 94% of actions in marine minerals and 93% of actions pertaining to waste management were being implemented. Following were beaches and coastal erosion (78%), harbors (73%), ocean recreation (66%), marine ecosystem protection (59%), research and education (48%), energy (43%) and fisheries (42%). Future steps include an ORMP assessment by an independent contractor, a "summit" for all agencies involved on ORMP to report and discuss actions, and a final legislative report discussing the effectiveness of the ORMP implementation (MACZMAG 1998).

California

The 1100-mile coast of California is an important resource that provides food, recreation, energy re-

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sources, and serves as transportation link between California and other states and countries (Resources Agency 1997). The ocean-dependent resources in California, such as commercial fishing, mariculture, kelp harvesting, offshore oil and gas, coastal mineral production, port activities and coastal tourism and recreation are of major importance to the state (Resources Agency 1997). These seven ocean-dependent industries contributed approximately \$17.3 billion to the California economy and supported 370,000 jobs in 1992 (Resources Agency 1997). Of the \$17.3 billion, tourism and recreation is the largest portion with a contribution of \$9.9 billion (Resources Agency 1997). California's seaports and shipbuilding contributed another \$6 billion, while oil and gas added \$860 million and commercial fishing, mariculture and kelp harvesting added another \$554 million to the state's economy (Resources Agency 1997). This conservative representation represents in total approximately \$10 billion in direct impacts alone, which represents about 1.4 % of the total state gross product and is comparable to the direct farm production of California (Resources Agency 1997).

In 1991, the governor of California signed the amendments to the California Ocean Resources Management Act (CORMA) into law (Baird 2000). With these amendments the Secretary for Resources, a California Cabinet Secretary, acquired responsibility for all non-statutory marine and coastal resource management programs. California began developing its Ocean Resources Management Program in 1993, pursuant to the requirements of the California Ocean Resources Management Act (CORMA) (Resources Agency 1997). The mission of the program is:

To ensure comprehensive and coordinate management, conservation and enhancement of California's ocean resources for their intrinsic value and for the benefit of current and future generations (Resources Agency 1997).

The Ocean Program's goal was to prepare a strategy regarding existing ocean resources, management activities and impacts to increase coordination and reduce duplication of management efforts (Baird 2000). The Ocean Program produced a landmark ocean strat-

egy, California's Ocean Resources: An Agenda for the Future, which identified major ecological components of the state's ocean ecosystem, established the economic contribution of seven key ocean-dependent industries, and provided an inventory and analysis of state and federal laws, authorities and programs which pertain to ocean resource protection and management (Baird 2000).

After extensive public and legislative review, the Ocean Agenda, which is more of a strategy than a plan, was ultimately supported by representatives of government agencies, industries, academia, legislative and environmental groups. One industry group, oil and gas, was not supportive since the Agenda stressed the impacts of offshore oil and gas production and recommended no more leasing occur off the California coast (Baird 2000).

The program sets a context and a series of objectives for California's action in ocean management:

- Stewardship towards the assessment, conservation, restoration and management of California's ocean resources and ecosystems
- Economic sustainability of ocean resource development activities
- Research, education and technology for future needs and uses of the ocean
- Jurisdiction and ownership to maximize California's interests in the ocean (Resources Agency 1997)

This program is comprehensive in two ways: by the nature of the stakeholders who have an interest in ocean issues and by the recognition of multiple jurisdictional nature of management. California provides a good example of addressing activities heavily dependent on the ocean: the use of living ocean resources (commercial fisheries, marine aquaculture, kelp harvesting); non-living resources (minerals production and hydrocarbon exploitation); and, the development of other ocean activities (port activities and tourism and recreation) (Resources Agency 1997). As the Strategy was intended to direct the activities for ocean and

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coastal management at the Executive Branch of the California State government, it was not thought necessary or appropriate to incorporate it into the state Coastal Management Program (Baird 2000). The Ocean Program was established at the executive level so the activities of subordinate departments could be coordinated from the highest levels of state government (Baird 2000). Even though it is not incorporated into the CMP, many of the recommendations are intended to assist California's coastal management agency to carry out its duties under both state and federal law (Baird 2000).

The Strategy also recognizes the institutional complexities involved in the management of ocean resources at the local, state, federal and international level; therefore, calling for a comprehensive approach to planning and decision-making (Resources Agency 1997). The program recognizes state jurisdiction out to 3 nautical miles offshore, on state tidelands and submerged lands, and on the outer continental shelf (Resources Agency 1997). Coordination of management efforts on the federal and state level involve a variety of advisory panels and groups, such as the National Marine Sanctuary Advisory Panels. On the state level, coordination happens with state agency workshops on marine managed areas, shoreline erosion and for research needs. The Secretary for Resources also meets with the directors of all the departments within the Resources Agency on a weekly basis. Both of these options provide excellent opportunities to address coordination and management concerns (Baird 2000).

The management tools of the program are a set of issue analyses and recommendations for both natural processes and ocean activities, and the call for a coordinating council (Resources Agency 1997). The three natural processes addressed are: habitats and living resources, water quality and shoreline erosion (Resources Agency 1997). The program focuses on the following ocean activities: ports and harbors; non-living resource exploitation, navigation; tourism and recreation; education research and technology; and, desalination (Resources Agency 1997). The coordinating council is intended to provide a cabinet-level

forum to coordinate inter-agency, multi-state, and international approaches to ocean resources management issues (Resources Agency 1997).

North Carolina

North Carolina, as is the case in many other coastal states, has been traditionally more interested in shore-based activities than in offshore activities. The state's interests in ocean policy have primarily been linked with fisheries and, to a lesser degree, with the protection of underwater cultural heritage (the U.S.S. Monitor). Their interest is well expressed by the creation of the North Carolina Marine Science Council in 1973 to provide advice and research support to public and private marine-related sectors. In the 1980 report entitled *North Carolina and the Sea: A Planning Report for the Development of North Carolina's Coastal Area Resources*, the Council's recommendation on ocean issues concerned only fisheries and the protection of shipwrecks.

However, in 1985 the Council produced a report entitled *North Carolina and the Sea: An Ocean Policy Analysis* that served as the basis for the 1985 national conference on Coastal States Ocean Policy. The report identified 16 issue areas related principally to oceanic activities with which the state had concern, and made 9 recommendations for state action to better coordinate state and federal policy and management of offshore resources. At the same time, the Office of Marine Affairs (Department of Administration) was given formal responsibility for the North Carolina Outer Continental Shelf Task Force. In the following years, attention to ocean issues was stimulated also by new developments, such as the appointment of the North Carolina State-Federal Ocean Phosphates Task Force and the creation of the Outer Continental Shelf Office in the Department of Administration.

The North Carolina State-Federal Ocean Phosphates Task Force—similar to its counterpart organizations in Oregon and Hawaii—was appointed because of the documented existence of phosphate reserves offshore of North Carolina. The state competence on offshore hard minerals is given only under the federal

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consistency review of the Coastal Zone Management Act and as a consulting role under the Outer Continental Shelf Lands Act. Given the difficulties in assessing the phosphate potential and the economic feasibility for exploitation, the Minerals Management Service (MMS) in the U.S. Department of Interior slowly decreased its enthusiasm for the initiative and virtually let it die.

The Outer Continental Shelf Task Force, lead by the Office of Marine Affairs, was created as an interagency group to advise the governor on state responses to offshore oil and gas activities. Most of the activities of the task force deal with compliance by the state, federal, government, and private oil companies with reference to lease sales, particularly the exploration plan submitted by Mobil Oil in 1988.

Interest in ocean management per se was revived in 1994, which Governor Hunt designated as the Year of the Coast. The problems and opportunities confronting the area included the rapidly increasing permanent and seasonal populations of the coastal counties, conflicts among users, particularly commercial fishers and recreational fishers and tourists- and increased pressure to extract sand and gravel for beach renourishment. In addition, as of 1995, tourism and commercial/recreational fishing in the coastal counties each add 1 billion dollars annually to the state economy. The governor convened a multi-disciplinary Coastal Futures Committee, which, after a year of study, recommended that the DCM develop a comprehensive ocean management plan.

This led to the creation of the Ocean Resources Task Force, who, with a five-year NOAA Enhancement Grant, began a series of public meetings and studies designed to identify the relevant issues. Those identified included hard mineral mining; pollution (ocean outfalls and oil spills); marine fisheries; OCS oil and gas; recreational uses; and natural and cultural resources in need of special protection. Their recommended plan, delivered in 1995, contained three main parts: 1) Ocean resource data in GIS format, 2) An ocean management study, and 3) Enforceable state policies. Also included was the recommendation that the North Carolina stewardship zone should extend

throughout the entire 200-mile EEZ.

Florida

Florida's ocean is one of its most distinctive and unique features. The ocean plays a very important role in Florida's economy, serving as the basis for some of the most important industries in Florida, including fishing, shipping, and tourism. The state has approximately 8,400 miles of tidal coastline. The territorial waters extend three miles into the Atlantic Ocean and three marine leagues into the Gulf of Mexico. Underneath those territorial waters lay approximately six million acres of submerged lands.

Ocean planning efforts are relatively recent in Florida. In 1998, Governor Lawton Chiles created the Florida Governor's Ocean Committee (FGOC). The FGOC consisted of twenty-four members from the government, conservation, education, scientific, recreation, and business sectors. The FGOC carried out two major activities during its tenure: a comprehensive analysis of the status of marine law and policy in Florida and a public outreach effort to develop more awareness of the unique coastal ecosystems. In its final report to the governor in November 1999, FGOC made an overarching recommendation:

The Florida Legislature should create a Florida Ocean Council to provide leadership and policy direction on ocean issues, and to coordinate ocean resource management and identify priorities for research, education, and information needs on Florida's ocean resources. The Council should follow a long-term adaptive approach that builds on existing efforts to collect information and integrate it across political, ecological, and physical boundaries, and across multiple uses.

As an interim step, the existing FGOC should be re-appointed for a one-year term as the Florida Ocean Study Commission. (FGOC 1999)

The FGOC identified five challenges of critical importance in the implementation of a state ocean plan: 1) how to improve information on and understanding of ocean resources; 2) how to create an improved ocean management framework that is more coordi-

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nated and comprehensive; 3) how to achieve and sustain diverse marine ecosystems that are capable of supporting multiple uses; 4) how to raise awareness, promote education, and foster stewardship of the ocean; 5) and how to facilitate greater financial support for ocean research, education, and management. In addition the FGOC suggested strategies and particular actions to solve each of the five challenges.

During last year's legislative session (March-April 1999), legislation to continue the FGOC for one additional year was introduced. During that year, the Committee would have been responsible for developing strategies and recommendations on the establishment of a more permanent administrative body that could coordinate policy issues associated with ocean resources. Due to adverse circumstances the legislation, however, was not enacted and the FGOC has expired (Divers 2000). Notwithstanding, the Florida Coastal Management Program and other Florida environmental agencies have been implementing specific FGOC recommendations where appropriate (Divers 2000).

Therefore, while still in the early implementation phase of their ocean planning, Florida faces some of the similar issues as Delaware, such as fishing, beaches, and population growth. In 1997, the commercial fishing industry in Florida landed 121 million pounds of fisheries products, valued at \$211 million dockside (FGOC 1998). Economically, of those 121 million pounds of seafood, revenues totaled approximately \$900 million annually (FGOC 1998). In addition, tourists flock to the beaches of Florida all year round. In 1998, the Florida Shore and Beach Preservation Association reported that Florida's beaches host approximately 22.9 million tourists annually. These beach-goers spend \$9.7 billion, and their ripple effect on the overall economy is estimated at \$18.9 billion (FGOC 1998). Today approximately 14 million people populate Florida, with 78 percent of them living in coastal counties. Future growth is expected to escalate, with projections showing a population of 17 million people by 2010 (FGOC 1998). As population figures rise and more people visit the "Sunshine State," the state will be forced to address the pressures of tourism, land development, and the accompanying threat of pollution.

Comparisons and Conclusions

After reviewing the state plans and surveying the people most involved in ocean management for each state, we can draw some conclusions about the overall experiences the states had in developing their plans (see following Tables for a comparison of issues and the main components of state initiatives). Deficiencies in policies and laws have often come after an in-depth study of segregated marine resource management regimes. A noticeable lack of ocean management policies has served to increase interest and support in developing a comprehensive and integrated ocean management program.

Windows of opportunity have driven a lot of the states ocean management experiences. Three out of the five states had governors who pushed for ocean management strategies and plans; this support from the executive levels of state government is extremely important to the success of making plans realities. Another window of opportunity states have utilized has been the declaration of state, national and international declarations that garner public and legislative support for the environment. North Carolina and Florida both used this to further their management plans with the declarations of the Year of the Coast (1994) and the Year of the Ocean (1998), respectively.

States have become increasingly interested in extending their jurisdiction beyond their state territorial waters, often the zone of zero to three nautical miles, so they can manage their ocean resources. Oregon was the first to declare an ocean stewardship zone with a planning area of 200 miles, but that emphasizes the 35-80 mile zone. Its management plan has been adopted into their state CMP but has not been submitted to NOAA for federal approval. On the other hand, North Carolina has recommended a stewardship zone of 200 miles (the limits of the United States Exclusive Economic Zone). States are interested in managing their ocean resources to the 200 mile limit, but the federal government traditionally has jurisdiction over this area and are very hesitant to increase state jurisdiction and powers.

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The success of many of these plans has been after significant legislation has been passed. Most of the ocean management plans are direct results of sections in the “ocean resources management acts” that require the state to develop a management plan or program. Success has also stemmed from the position of lead agencies in the state government hierarchy. Many of the lead agencies are cabinet or executive level agencies, created expressly for the purpose of minimizing conflicts between departments and offices that are charged with the implementation of the program or plan. Further success has been met when the development of the program was transparent and open to public review.

States Ocean Plans Operational Areas

Operational areas	California	Florida	Hawaii	North Carolina	Oregon
Jurisdiction and administration	✓	✓	✓	✓	✓
Marine transportation	✓	✓	✓		✓
Vessel traffic safety	✓				
Disposal of dredged materials					✓
Commercial fisheries	✓			✓	✓
Artificial reefs					✓
Offshore aquaculture	✓		✓		✓
Marine plants harvesting	✓				✓
Offshore oil and gas	✓	✓	✓	✓	✓
Oil spills response	✓				✓
Coastal mineral production	✓		✓	✓	✓
Protection of habitats and living resources, including marine protected areas	✓	✓	✓	✓	✓
Port and harbor activities	✓		✓		
Tourism, recreation and culture	✓	✓	✓		✓
Water quality	✓				✓
Marine debris				✓	
Waste management and sea outfalls			✓	✓	
Shoreline erosion, beaches and dunes	✓	✓	✓		✓
Coastal hazards		✓			✓
Desalination	✓				
Education, research, training	✓		✓		✓
Military activities		✓			

Main Components Of The States Ocean Initiatives

Main components	California	Florida	Hawaii	North Carolina	Oregon
Ocean plan	Ocean Resources Management Plan 1995		Ocean Management Plan 1985		Ocean Resources Management Plan 1990
Legislation	Ocean Resources Management Act 1993		Ocean Resources Management Act 1988		Ocean Resources Management Act 1997
Institution	State Interagency Marine Managed Areas Workgroup	Governor's Ocean Committee 1998	Ocean and Marine Resources Council 1991	North Carolina Ocean Resources Task Force	Ocean Policy Advisory Council
Supporting reports	Final Report 2000	Final Report 1999		Strategic Plan 1999	

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