



# Groundfish Research

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## Funding will soon be received for new Fleet Observer Program

The Northwest Fisheries Science Center (NWFS) will soon receive federal funding to implement a comprehensive, at-sea observer program for the non-whiting, west coast groundfish fleets. Observers will ride fishing vessels and monitor and record information about the number of fish caught and discarded.

Observers are currently used in many fisheries worldwide to gather critical data for a wide range of conservation and management needs. NMFS has been using observers to collect fisheries data since 1972, to monitor fishing activities in nearly 20 different domestic fisheries, on all US coasts.

It has been a long-term goal of NMFS, and the conservation and fishing communities, to begin an observer program for the non-whiting fishery, in order to improve information about fishing activities. Observer-gathered data will provide accurate, fleet-wide information on total catch, bycatch and discard associated with different fisheries, and fish stocks.

"I am pleased that we have been given the opportunity to begin this program. It will be a true collaboration with the fishing community," says Dr. Elizabeth Clarke, Director of the NWFS Division that will lead the development of this program.

The goal is to have observers on board vessels this summer. The NWFS will administer and oversee the program, design the sampling plan, train and debrief observers, and maintain the observer database. The Pacific States Marine Fisheries Commission, as part of its cooperative agreement with NMFS, will provide the observers and state coordinators.

NMFS and Pacific States Marine Fisheries Commission will be hosting a series of information sessions, in several coastal communities, to explain the details of any observer regulations and the sampling plan. The sampling plan, which outlines where and when observers will be deployed, is scheduled to be presented at the Pacific Fisheries



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### *A Message from the Science Director*

Building sustainable groundfish and salmon fisheries, recovering protected species, and improving habitats, requires the cooperation of many people – in and outside of government. Citizens and professionals alike have valuable knowledge and experience to commit to this effort. In the last few years, we have made great strides in strengthening relationships with our colleagues from industry, environmental groups, academia, and other government agencies that share our stewardship mission. These relationships are vital, if we are to meet our goals to improve the status of our groundfish stocks. This newsletter describes the people and the exciting cooperative projects we are involved with.

I also want to take this opportunity to recognize a new member of the FRAM staff. We look forward to the leadership and wise counsel that Elizabeth Clarke will bring to the Division as its new director. Welcome, Elizabeth!



Dr. Usha Varanasi  
Science and Research Director  
Northwest Fisheries Science Center



## **New Fleet Observer Program**

(Continued from front page)

Management Council meeting in April.

Vessels will be randomly selected to carry observers. Before observers can be deployed, each vessel must have a Coast Guard inspection or examination. Now is the time for fishers to make sure their inspections are up-to-date. For more information about Coast Guard vessel inspections or to schedule an inspection contact:

in Washington & Oregon:

Lt. Chris Woodley  
13<sup>th</sup> Coast Guard District  
915 2<sup>nd</sup> Avenue, Suite 3506  
Seattle, WA 98174  
(206) 220-7226

in California:

Dennis Robison  
11<sup>th</sup> Coast Guard District  
Marine Safety Division  
Bldg 50-6, Coast Guard Island  
Alameda, CA 94501  
(510) 437-2947

Current regulations require that any unallowable catch must be discarded at sea. But the observer program will conduct a pilot project to examine the utility of allowing retention of bycatch. Since many fish that are caught and discarded die anyway, retention of this catch could reduce wastage and improve information on the total number of fish that are caught. Experimental fishing permits will be required on those vessels selected to participate in this pilot program.

“There is still a long way to go before the program is complete,” says Dr. Clarke, “but even this first phase should provide improved information for management decisions.”

*E-mail requests for more information can be sent to [Elizabeth.Clarke@noaa.gov](mailto:Elizabeth.Clarke@noaa.gov) at the Northwest Fisheries Science Center and [al\\_didier@psmfc.org](mailto:al_didier@psmfc.org) at the Pacific States Marine Fisheries Commission.*

## Stock assessments for 2001

In 2001, stock assessments will be completed for yelloweye rockfish, black rockfish (southern area), Dover sole, sablefish and shortspine thornyhead. In addition, the first phase of a two-year effort to develop a new method to assess rockfishes, with relatively little data, will be presented for review. Scientists from the Northwest and Southwest Fisheries Science Centers and the Washington Department of Fish and Wildlife are collaborating on the assessments of yelloweye and black rockfish and on developing the new assessment methods. A team of scientists from the NWFSC is conducting assessments of sablefish and shortspine thornyhead. In addition, the Pacific Conservation Groundfish Trust is assessing the status of sablefish. For the Dover sole assessment, NWFSC scientists are partnering with a researcher from Oregon State University.

In an on-going effort to improve stock assessments, the NWFSC is supporting a research position at the University of Washington. Dr. Andre Punt, from Australia, assumed this position in January and has also been appointed to the PFMC's Scientific and Statistical Committee.

More details about the stock assessment and review (STAR) panels, and availability of documents from the Pacific Fishery Management Council, will be announced shortly in the Federal Register and in PFMC mailings.

The dates and locations of the STAR panels are given below.

May 21-25 in Santa Cruz, CA:  
 Black Rockfish (southern area)  
 Yelloweye Rockfish  
 Method Development

July 9-16 in Newport, OR:  
 Sablefish  
 Shortspine Thornyhead  
 Dover Sole

*E-mail requests for more information can be sent to [Cyreis.Schmitt@noaa.gov](mailto:Cyreis.Schmitt@noaa.gov) at the Northwest Fisheries Science Center.*

## Introducing FRAM Division's new Director

Dr. M. Elizabeth Clarke has been appointed Director of the Fishery Resource Analysis and Monitoring Division (FRAM) at the Northwest Fisheries Science Center (NWFSC). Dr. Clarke comes to the Center via Washington, DC., Alaska, California, Oregon and Florida.

A native of California, Dr. Clarke began her studies in marine science at the University of Alaska, where she received her Master of Science in Fisheries. She received her doctorate from the Scripps Institution of Oceanography in La Jolla, CA and then spent one year as a post-doctoral researcher at the Hatfield Marine Science Center, Newport Oregon. She then joined the faculty of the University of Miami where she became a leader in the field of fisheries oceanography, authoring numerous publications and serving on many national and international scientific steering groups.

Dr. Clarke served as the Associate Director of the Ocean Studies Board of the National Academy of Science's National Research Council, during a sabbatical from the University from 1996 to 1997. While at the National Academy, she participated in congressionally mandated studies including the review of the Northeast groundfish stock assessments. She returned to DC in 1998, when she joined NMFS's Office of Science and Technology to develop science quality assurance programs for the agency.

During the NRC study that reviewed the Community Development Quota program, she was able to visit many fishing communities in Alaska. "I think that experience lured me back into government from academia. I really wanted to become more directly involved in marine resource issues. I look forward to my new duties and to the exciting challenges they present."

Elizabeth has a passion for hands-on science, including field studies and surveys and she plans on participating in some of the surveys this year. From working in the Indian Ocean during the monsoon season, to the Bering Sea, aboard an 82-foot research vessel in the month of March, she is no stranger to tough conditions at sea. Her strong scientific background and her dedication to marine resource issues will serve her well as she takes on her new duties.

## Ocean scientists to study unexplored marine habitat

Astoria Canyon Research will provide baseline data about an undisturbed submarine ecosystem.

Two centuries after Meriwether Lewis and William Clark explored the once-remote regions of the Pacific Northwest, an interdisciplinary team of ocean scientists, commercial fishers, museum curators, educators, and students will use 21<sup>st</sup> century technology to extend the famed pair's legacy to the ocean.

In late June, a team led by National Oceanographic and Atmospheric Administration (NOAA) scientist Waldo Wakefield and Ric Brodeur, of the Northwest Fisheries Science Center's Newport Research Facility, and Bob Embley, of the Pacific Marine Environmental Laboratory will begin to map Astoria Canyon, located ten miles west of the mouth of the Columbia River, and document its physical and biological systems. Scientists believe that this remote, virtually unexplored, submarine ecosystem, provides a rich biological haven for vast numbers of fish and unusual invertebrates, like gorgonian corals. Its landmasses of precipitous volcanic forms, tectonic activity, and millions of years of undisturbed, accumulated organic material may also make the area a source of methane seeps.

"Large decreases in the fish population and invertebrate communities worldwide have raised concerns about the long-term health of sea floor ecosystems," says Wakefield. "The Astoria Canyon study will yield extensive data about the characteristics of an essentially untouched ocean ecosystem and allow us to test our assumptions about how human impacts contribute to sea floor deterioration."

Scientists from NOAA's Southwest Fisheries Science Center and the Olympic Coast National Marine Sanctuary, Oregon State University, Washington State University, the University of British Columbia, the California Department of Fish and Game, and curators from the Los Angeles County Museum, and the public aquarium and outreach center of OSU's Hatfield Marine Science Center are also participating in the project. The 34-member

study team will rely on the NOAA ship *Ronald H. Brown* and a variety of remote data collection vehicles to detail the topography and biological composition of the Canyon and to collect specimens. The cruise will be staged from Victoria, BC, Canada, and end in Astoria, Oregon. Allowing for rough terrain and sample collection, the team intends to make about 15 transects of the canyon walls and floor. The explorations will cover approximately 40 km along the upper part of the Canyon, ranging at depths of 200 to 2,000 meters (650 – 6,560 feet).



NOAA RV *Ronald H. Brown* with ROPOS remote operating vehicle in foreground

Submarine canyons are a common feature of many of the world's continental shelf breaks. Due to their abrupt topography, these canyons are known to modify circulation patterns and increase shelf-slope exchange of water masses, nutrients, and suspended particles. The canyons also transport large quantities of organic matter offshore through sediment flushing, thus enriching the deep oceans. These regions may yield enhanced concentrations of macrobenthos, micronekton, demersal fishes, and cetaceans relative to the slope as a whole.

According to Wakefield, "these canyons are a good target for exploration because their steep walls and rugged terrain inhibit bottom trawling. When compared with data from more extensively disturbed ocean ecosystems, these unaltered environments provide scientists with a way to measure



ROPOS remote operating vehicle on stern of NOAA RV *Ronald H. Brown*

the degree to which human technology is responsible for declining ocean fish populations.”

To monitor oceanographic conditions, this year’s research team will conduct reconnaissance CTD casts, including optical and chemical sensors. Data from these casts will define the distribution of dissolved and particulate materials (nutrients, organic matter) that can affect the health of benthic regions of the canyon. These measurements will be used to quantify the conditions under which biologically important material is transported and concentrated.

Acoustic transects will also be conducted by Ric Brodeur’s group, using a towed *Simrad Ek500* (38 and 120 kHz) echosounder (or equivalent system) to search for aggregations of fish and zooplankton. The micronekton size fraction of the acoustics survey will be groundtruthed with an Isaacs-Kidd midwater trawl towed from the *Ronald H. Brown*. In addition, the exploration project will take advantage of an ongoing study of the pelagic fishes in the ocean waters overlying the Canyon. The chartered commercial fishing vessel for this project will conduct sampling with a Nordic 264 rope trawl to provide additional groundtruthing of the nekton size fraction.

Acoustic data collected by the SOund SURveillance System, or SOSUS, prior to and during the summer of 2001, will be analyzed and all detected biological and geological sources within the area of investigation will be located and identified, including fault movement, mass wasting, and whale and fish vocalizations.

Looking to the future, the exploration team would like to explore additional submarine canyons along the northwest coast (e.g., the Juan de Fuca Canyon off Washington), and other important submarine provinces such as seamounts. The floor of the Pacific Ocean is punctuated with hundreds of volcanoes, or seamounts, that have developed over the past 200 million years. Many of these seamounts rise into the upper portion of the ocean where they alter the hydrography and create local upwelling zones that stimulate biologic productivity. Seamounts that rise into the light penetrating zone create specialized habitats for diverse invertebrates and fish populations. In the northern hemisphere, a seamount intruding into surface ocean currents creates a clockwise flow around the summit that can magnify currents by as much as a factor of fifty. Careful exploration of a summit could yield important new explanations about how certain environmental factors effect the distribution and success of benthic habitats.

With its obvious tie to the earlier exploration by Meriwether Lewis and William Clark and the Corps of Discovery, at the western most extent of their historic crossing of the United States, this proposed exploration offers an exciting public and educational outreach opportunity.



Lowering the ROPOS remote operating vehicle from stern of NOAA RV *Ronald H. Brown*  
(Photos courtesy of Jennifer Bloeser, Pacific Marine Conservation Council)

## Beta test beginning for Electronic Logbook

The prototype Electronic Fish Catch Logbook (EFCL), developed by the Northwest Fisheries Science Center (NWFSC), is designed to simplify commercial fishing logbook data entry, increase the amount and uses of fishery dependent data, aid in data verification, and improve access to data.

The EFCL project began in late 1997 with funding from the National Performance Review, a source of seed money for innovative communication technology projects that serve the public and involve multiple agencies.

The undertaking was, in part, a response to a request from the West Coast trawl fleet, which asked the NWFSC to develop and field test an electronic system to collect and analyze fish catch and logbook data. "The industry was looking for opportunities to improve reliance on logbook data for fishery management. The use of logbook data in fishery management has been limited, primarily because of concerns about data verification," says Carol Murray, project director.

Alpha testing of the prototype EFCL is complete. Prototype beta trials on vessels will begin within 45 days. Murray says, "the goal of the project is to develop an effective electronic reporting and data retrieval system and to test it in actual fishing conditions with real data." Demonstrations of the alpha version of the EFCL system have been made to the Washington, Oregon, and California fishery management agencies, and to Pacific States Marine Fishery Commission staff. Demonstrations have also been provided to representatives of the fishery and seafood processing industries.

The alpha demonstrations were well received and constructive input was made for improvements and possible use. Based on the demonstrations, some improvements have already been built into the beta version.

### Testing the Software

Alpha testing has validated the software components developed by two outside firms, Scientific Fishery Systems, Inc., the NWFSC Cooperative Research and Development Agreement partner, and ARIS Corp., the software contractor. The onboard application, the software that will operate on computers on fishing vessels, has been constructed by Scientific Fishery Systems, Inc. The data storage system and worldwide web application has been developed by ARIS Corp. In addition to matched pairs of logbook data and fish tickets provided to the NWFSC by the states, port sampling data and observer data have also been tested.

To complete the beta testing, the NWFSC is developing sets of equipment that will allow the testing to be independent of all vessel systems except for provision of a stable 110-volt power supply.

### Vessels using the EFCL will need to have equipment on board that includes a:

- Pentium II PC or a lap-top computer with at least a 166 Mhz processor; 32 MB of RAM; 250 MB of free hard disk storage space; a CD-ROM player; a zip drive or 3.5" disc drive; and a Windows 95 or 98 operating system;

- GPS with the ability to transmit through an RS232 connection using the NMEA 183 protocol;
- stable 110-volt power supply;
- 28.8 Kbps or faster modem capable of connecting to a required cellular phone (note: a cell phone connection is unlikely to be faster than 4800 bps); and
- connection to the Internet through an Internet Service Provider account.

Users will need some experience in the PC and Windows computing environment to be able to use the EFCL. Fishermen participating in the beta testing will be encouraged to land their catches to processors who are testing the electronic fish ticket. This will allow an end-to-end test of information collection and retrieval.

Processors, biologists, staff, and others who wish to use the web site, will need a computer with a connection to the internet through a modem and an ISP.

The planned beta tests will involve actual use of the system by fishers, processors and biologists during their routine work. To provide a potential pathway for use alongside existing paper-based reporting systems, the EFCL has been designed to provide paper replicas of existing groundfish fishery logbooks and fish tickets for Washington, Oregon, and California.

### Possible Outcomes

The NWFSC expects the EFCL to allow quicker and more accurate reporting of logbook, fish ticket and observer information. It also expects the web-enabled database to provide confidential access to information for fishers to improve fishing business decisions and to enable processors to improve data entry, processing efficiency and marketing. Fishery managers will benefit with information to better monitor in-season harvest quotas and determine future quotas.

For more information, contact the project, 206-860-5604, or visit our web site at [www.nwfsc.noaa.gov](http://www.nwfsc.noaa.gov).

E-mail requests can be sent to [stewart.toshach@noaa.gov](mailto:stewart.toshach@noaa.gov).



## Update on expanding Whiting surveys

This year, the NWFSC has partnered with the Canadian Department of Fisheries and Oceans to continue to study the winter spawning distribution of Pacific whiting. Whiting had a strong northward displacement in the late 1990s, causing much uncertainty about the current north-south distribution of spawning. A secondary goal of this study was to evaluate the feasibility of conducting quantitative hydroacoustic surveys for whiting in the winter, to ease the summer ship time crunch.

The Canadian vessel *Ricker* departed Nanaimo on Jan 10 and conducted a hydroacoustic, midwater trawling, and oceanographic observations from Queen Charlotte Sound to San Diego. It returned to Nanaimo on Feb 5. NWFSC scientists Larry Hufnagle and Jackie Popp were on-board for the first leg, and Tom Helser participated on the second leg. The survey found a large aggregation of pre-spawning whiting off San Diego and a high abundance of age 2 whiting distributed along the Oregon and northern California coasts.

Another area of new whiting research is the development of a prerecruitment survey. The effort began in 1998 in cooperation with the Alaska Fisheries Science Center and the Pacific Whiting Conservation Cooperative (PWCC). In 1999, the PWCC, in conjunction with the Midwater Trawlers Cooperative (MTC) of Newport, OR, conducted a study to examine the feasibility of developing a midwater prerecruitment survey of age 1 and 2 Pacific whiting.

The results of the 1999 study indicated that it was difficult to assess age 1 whiting with a midwater trawl, but more feasible to assess young-of-the-year whiting (fish under one year of age). In 2000, the PWCC combined its rockfish prerecruitment research efforts with the NMFS Southwest Center's young-of-the-year index survey. The rockfish survey, conducted during May and June, between Monterey Bay and Pt. Arenas, CA, has been carried out since 1983 and targets juvenile fish. This survey also takes young-of-the-year Pacific whiting in sufficient quantities to establish an index of prerecruitment abundance. This index appears to be indicative of relative year class strength, but it covers only a small portion of the distributional range of whiting.

The PWCC-NWFSC survey followed the sampling protocol of the Southwest's Center's survey, but occurred over a broader area. The purpose of the survey was to determine if broader spatial coverage will yield better indices of prerecruitment whiting abundance. The PWCC surveyed to the south and north of the NWFSC survey area to

determine the extent of the young-of-the-year whiting distribution, and conducted side-by-side comparative trawls with the NOAA *RV David Starr Jordan* in Monterey Bay. The most significant finding was a large aggregation of age 1 whiting off northern California.

## Collaborative research update

The Northwest Fisheries Science Center recognizes the benefits that collaborative research can bring to west coast groundfish and is moving ahead to expand these research activities. The Center sees a significant role for its partners in implementing the NMFS's Research Plan for West Coast Groundfish. For example, the Center benefits from the wealth of knowledge about fish biology and stocks from state and federal fisheries resource agencies, environmental organizations, universities, and particularly the fishing industry. Based on an industry proposal and other NMFS collaborative research programs, the NWFSC is establishing an on-going program to enhance collaborative research opportunities on west coast groundfish between the NWFSC and fisheries partners.

The NWFSC scientists are currently involved in several collaborative research activities on west coast groundfish. For example, we are partnering with other agencies, academia, and the fishing industry by sponsoring two fellowships for graduate students, whose research involves working with both the fishing industry and with research scientists on groundfish topics. Since beginning in 1998, the NWFSC continues to rely upon commercial fishing vessels for conducting research surveys to measure the abundance of groundfish stocks on the continental slope. For research on whiting, we are also partnering with the fishing industry to conduct multiple experiments to determine the abundance of juveniles and of spawning adults. Also, in collaboration with the fishing industry and other agencies, we recently completed a project to evaluate the feasibility of using plant workers to collect biological samples of groundfish landings.

Congress has provided limited funding in 2001, for NMFS to expand its cooperative research activities, primarily with the fishing industry, marine scientists, and regulators. Upon consultation with various industry constituents, the NWFSC has requested funds for several high priority research projects on the west coast, and expects to learn shortly about the funding level.

## NWFSC prepares for 4<sup>th</sup> Annual Slope Survey cruise

The Fishery Resource Analysis and Monitoring Division (FRAM) of the Northwest Fisheries Science Center (NWFSC) is planning its fourth annual bottom trawl survey cruise this summer. Analyses of the results from earlier surveys for years 1998-2000, are nearly completed and the data are being used in 2001, to determine stock assessments for Dover sole, sablefish, shortspine and longspine thornyhead — groundfish that inhabit the slope zone off the Washington, Oregon, and California coasts. This year's survey begins during the last week of June and continues through September. The survey zone extends from Cape Flattery, WA, to Point Conception, CA.

The annual surveys are designed to provide information that will be used to determine the relative abundance of various groundfish species in the region and to characterize their distribution. These data improve the understanding of the biological condition and population dynamics of the fish and are used by the Pacific Fisheries Management Council to manage and ensure sustainability of fish populations. The surveys are an essential part of the NWFSC's comprehensive groundfish research plan and represent one of the agency's most successful collaborations with individual fishers, industry, regional universities, and government agencies.

### Survey Methods

The NWFSC relies on chartered commercial fishing vessels to conduct the surveys each year. Standard trawl gear is used to match the vessel's size and engine horsepower characteristics. A stratified random sampling scheme is employed, using five stations set at randomly selected depths ranging from 100 to 700 fathoms placed along east-west transects. The transects are spaced ten minutes of latitude apart, with each vessel occupying a unique set of 20 transects. Eighty transects are sampled during the survey for a total of 400 hauls. Sampling tows are conducted according to predetermined fishing and operational protocols. The catches are then sorted by species and weighed. Biological data about fish length, sex, and age are collected and sea surface and bottom temperatures are recorded for each station.

Specialized technology tracks the trawl net as it moves along the bottom allowing scientists to evaluate the success of a tow. Other equipment, such as electronic fish measuring boards and scales designed to compensate for a vessel's pitch and roll are used to record fish data. All information is digitally linked to a single portable computer, minimizing the time needed for collecting and entering data and reducing the potential for errors.

The boats operate in pairs, with the second pair beginning their leg of the survey two weeks after the end of the first cruise. Mid-cruise port calls are made at Newport, Eureka, and San Francisco, where scientific personnel are exchanged, retained fish are off-loaded, and fuel and provisions are replenished.

Bids for this year's cruises are now being solicited. Four vessels will be involved in the five week cruises. Vessel owners who contract for the survey are paid half in cash. A small amount is also paid by the sale of fish caught during the survey. Any balance, that is still owed, is compensated through a special Exempted Fishing Permit that allows the vessel to land a weight of fish in excess of its trip limits with a value equal to the balance due. Contracts for this year's vessels are expected to be completed by mid-May.

### Barry Fisher Fisheries Pioneer

We learned of the death of R. Barry Fisher as this newsletter went to press. Captain Fisher was a tireless advocate and a great leader whose contributions will be remembered by many generations of fishery managers, scientists, and the fishing community.

The Northwest Fisheries Science Center (NWFSC) provides scientific and technical support to NOAA Fisheries (the National Marine Fisheries Service or NMFS) for management and conservation of the Northwest region's marine and anadromous resources. The Center conducts research in cooperation with other federal and state agencies and academic institutions. Five divisions—Conservation Biology, Environmental Conservation, Fish Ecology, Resource Enhancement and Utilization Technologies, and Fishery Resource Analysis and Monitoring—conduct applied research to resolve problems that threaten marine resources or that deter their use.

The *Fishery Resource Analysis and Monitoring Division* (FRAM) of the NWFSC develops and provides scientific information necessary for managing west coast marine fisheries. It endeavors to provide useful stock assessment data with which fishery managers can set ecologically safe and economically valuable harvest levels. To do this, it works in partnership with state and federal resource agencies, universities, and others interested in west coast groundfish. The FRAM conducts major components of groundfish research at the NWFSC Newport Research Station, located at the Hatfield Marine Science Center, Newport, Oregon.

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