CHAPTER 2

AUTHORITY AND CAPABILITIES OF PARTICIPATING FEDERAL AGENCIES

2.1 General. The Department of Commerce through the OFCM assumes overall responsibility for the preparation and maintenance of the NPSDAP. The OFCM also assumes overall responsibility for post-event federal agency coordination. The role each agency assumes during the post-event period is determined by the individual agency's authority and mission requirements; see sections 2.2 and 2.3 for additional information on agency authorities and mission requirements. Specific agency authority and mission statements are contained in Appendix A.

2.2 Participating Agencies and Mission Requirements. The following federal departments are participants in the coordination plan, to include the individual agenices within the departments:

- Department of Defense (DOD) - U.S. Army Corps of Engineers (USACE), U.S. Air Force (USAF), Civil Air Patrol (CAP)-USAF Auxiliary.
- Department of Commerce (DOC) - National Oceanic and Atmospheric Administration (NOAA), National Institute of Standards and Technology (NIST).
- Department of Interior (DOI) - U.S. Geological Survey (USGS).
- Department of Agriculture (USDA) - Natural Resources Conservation Service (NRCS).
- Federal Emergency Management Agency (FEMA).

Mission statements of the participating agencies are founded in explicit directives contained in specific Public Law (e.g., PL 166 - 79th Congress, PL 71 - 84th Congress as applied to the USACE) or interpretation of more broadly worded agency mandates.

The Federal Highway Administration (FHWA) of the Department of Transportation (DOT), though not a current participant in the WG/NDR/PSDA, is expected to become more involved in the future. While they have no requirements to acquire environmental data following significant storm events, they work with state and local DOTs who are building the capabilities to do so. These sites, which monitor the highway system, could eventually be used in the port-storm data acquisition process.

2.3 Agency Capabilities and Data Requirements.

2.3.1 Department of Defense (DOD). The DOD is represented on the working group by elements of the U.S. Army and U.S. Air Force, primarily by the USACE and the Civil Air Patrol -- a civilian auxiliary of the U.S. Air Force. The CAP and the Air Force Reserve Command's 53rd Weather Reconnaissance Squadron (53 WRS) serve principally in a supporting role to the other participating agencies. The USACE has primary responsibility for construction and maintenance

of marine navigation in public waterways and coastal storm protection projects on public lands. The USACE post-event activities are coordinated through the Office, Chief of Engineers, and the Engineer Research and Development Center (ERDC).

a. **Capabilities**. The ERDC, in cooperation with participating USACE district offices, can provide data on nearshore wave conditions, beach profiles, damage assessment to marinas, coastal projects and navigation structures, morphological changes to beaches, and identification of high-water marks. The CAP provides, through a Memorandum of Understanding (between the CAP and the NWS), light aircraft, aircrews, and communications in support of post-storm overflights. The 53 WRS conducts aerial reconnaissance of tropical and extratropical cyclones to provide meteorological data on the geographic position of the storms; central sea-level pressure; vertical profiles of pressure, temperature, dew-point temperature, and wind speed and direction from the surface to flight level; geopotential heights of designated pressure surfaces; and other relevant data.

b. **Requirements**. Because they serve only in a supporting role, the CAP and 53 WRS have no individual requirements for data. The USACE requires environmental data to support the following missions:

- Coastal - shore protection, beach preservation and restoration
- Estuarine - navigation, environmental and water quality monitoring
- Riverine - inland navigation, flooding and streambank erosion control
- Reservoir control - reservoir level monitoring, catchment rate determination

In the broadest sense, any data which contribute to the performance of these missions are of value. Types of data include: tropical and extratropical storm-surge water levels, storm-generated coastal current and morphological changes, estuarine tidal inundation, precipitation-generated estuarine inflow, riverine flooding events, and reservoir overtopping.

2.3.2 Department of Commerce (DOC). Within the DOC, NOAA is the principal meteorological agency of the federal government. By law, NOAA is responsible for reporting the weather of the U.S., providing weather and flood warnings and forecasts to the general public, developing and furnishing applied weather services, and recording the climate of the U.S. This mission is carried out within NOAA by the NWS; the National Environmental Satellite, Data, and Information Service (NESDIS); the Office of Oceanic and Atmospheric Research; the National Ocean Service (NOS); and the NOAA Marine and Aviation Operations (NMAO).

2.3.2.1 National Weather Service (NWS). The NWS consists of a national headquarters in Silver Spring, MD; 6 regional headquarters across the continental U.S., Alaska and the Pacific; 122 weather forecast offices; and 13 river forecast centers which provide basin-specific forecast guidance on riverine and flash flooding. In addition, the agency's National Centers for Environmental Prediction (NCEP) include the following service centers: the Environmental Modeling Center, the Storm Prediction Center (SPC), NCEP Central Operations, the Hydrometeorological Prediction Center, the Ocean Prediction Center, the Tropical Prediction

Center, the Climate Prediction Center, the Aviation Weather Center, and the Space Environment Center. These service centers provide focused expertise and guidance, modeling, and numerical weather prediction for severe local storms, marine weather, tropical weather, climatic trends, aviation weather, and the space environment. This support provides basic information for NWS Weather Forecast Offices and the external community, including other federal agencies and emergency management officials.

Respondents in the event of tornadoes and other severe convective storms, flooding, and other weather-related natural disasters, represent all strata of the NWS, depending on the type of event. Warning Coordination Meteorologists (WCM) at each of the 122 weather forecast offices are the initial respondents to all major weather events, documenting apparent damage and causal effects as well as commentary from witnesses.

For all tornadoes suspected of producing greater than F3 damage, a special Quick Response Team (QRT) will be dispatched by the NWS. Internal NWS QRT operational procedures are included in Appendix B. The NWS QRT will enlist recognized wind damage expert(s) to determine the final F-Scale rating for these events. These experts include, but are not limited to: member(s) of the American Association for Wind Engineering (AAWE); other NWS personnel; members of the academic community; and, other private sector wind damage experts. These experts possess expertise in the areas of wind and associated wind-driven water loads on buildings and structures, societal impact of winds, hurricane and tornado risk assessment, cost-benefit analysis, codes and standards, dispersion of urban and industrial pollution, wind energy, urban aerodynamics, etc.

NWS will notify OFCM via phone if they plan to deploy a QRT following a significant wind event. OFCM will then notify via phone all appropriate agencies of the NPSDAP about the NWS QRT deployment, including AAWE. This notification should be followed up with coordination among all agencies of the NPSDAP, and with AAWE.

a. **Capabilities**. The NWS provides a continuous weather watch throughout the Americas and the Pacific, with lesser amounts of data collected globally. Data are gathered via remote sensing (satellite, radar, vertical sounders, and automatic surface observing systems) as well as manually (surface observations). Observational and computational information are processed through numerical weather prediction and river forecast computer models which are available to a wide variety of users globally.

b. **Requirements**. The NWS data requirements include obtaining all available records that define the impact, extent, timing, and intensity of significant natural hazard episodes such as floods, tropical cyclones, extratropical cyclones, tornadoes and other severe convective events, katabatic winds, and tsunamis.

2.3.2.2 National Institute of Standards and Technology (NIST). The mission of the Building and Fire Research Laboratory of NIST is to enhance the competitiveness of US industry

and safety of the public, through performance prediction and measurement technologies and technical advances that improve the life-cycle quality of constructed facilities.

a. **Background**. NIST, through the Structures Division, conducts laboratory, field, and analytical research in structural engineering, including the investigation of important structural failures, the characterization of building loads during construction and during their service life, and structural response analyses. Extreme events, such as hurricanes and tornadoes, are viewed as opportunities to evaluate the performance of structures subjected to wind loads that may approach or exceed the ultimate limit states of the structure. Beginning with Hurricane Camille in 1969, the Structures Division has conducted post-storm assessments on its own, or in collaboration with other federal agencies, universities, and building research centers.

The Structures Division has conducted post-storm investigation following notable events such as Hurricanes Alicia, Andrew, Bob, Camille, Elena, Frederic, and Hugo, as well as the Lubbock tornado outbreak of 1970. In recent years, the Structures Division has maintained an informal working relationship with the Research Division of the Atlantic Oceanographic and Meteorological Laboratory of NOAA to document near-surface wind speeds in hurricanes. The availability of reliable wind-speed estimates is crucial to the correct assessment of structural performance in extreme wind events.

b. **Capabilities**. A well-equipped structural testing laboratory and computer facilities for modeling loads and structural response are maintained by the Structures Division. The division's capabilities for predicting and assessing wind effects on buildings and other structures include computer codes for the simulation of extreme wind speeds in atmospheric boundary layers. The division also maintains special equipment and supplies needed for the rapid deployment of investigative teams following major wind and earthquake disasters, structural collapses, and building fires. NIST will notify OFCM via phone if they plan to deploy an investigative team following significant events. OFCM will then notify via phone all appropriate agencies of the NPSDAP about the NIST deployment. This notification should be followed up with coordination among all the agencies involved with PSDA activities.

The Process Measurement Division of the Chemical Science and Technology Laboratory within NIST maintains wind and water tunnels for fluid mechanics research. Of particular interest is the closed-return, low-speed, low-turbulence wind tunnel facility which serves as the U.S. primary standard for anemometer calibration. Interchangeable test sections allow calibrations at wind speeds of up to 67 m s^{-1} (149.87 mph). State-of-the-art flow visualization techniques, hot-wire anemometry, and laser-Doppler velocimetry are available in this laboratory.

c. **Requirements**. In wind-related disasters, all available records of wind speeds (from both ground stations and aircraft), barometric pressure measurements, and radar images from which to reconstruct the surface wind field are essential. In addition, aerial photographs of sufficient resolution to show damage and debris distribution and extent of storm-surge effects are of considerable value. In the case of damage to major structures, detailed site studies, followed by structural analyses, are performed.

2.3.3 Department of the Interior (DOI). Within DOI, the USGS is the principal Earth science agency responsible for collection, assessment, and dissemination of information, regarding the geology, topography, mineral resources, hydrology, and biology of the U.S. The USGS is a nationally recognized provider of accurate, unbiased water data and information for use by others to design, operate, manage, and regulate water resources, establish floodplain boundaries, issue flood warnings and river forecasts, and manage emergency operations. The Office of Management and Budget Memorandum M-92-01 designates DOI, through the USGS, as the lead agency for the Water Information Coordination Program (WICP) and provides that "all other federal organizations funding, collecting, or using water resources information should assist the USGS in ensuring the implementation of an effective WICP."

a. **Capabilities**. The principal data-collection activity of the USGS Water Resources Division (WRD) is the operation of 7,000 stream-gaging stations in cooperation with other federal, state, and local agencies. These stations are operated by USGS personnel in 48 districts (usually corresponding to state boundaries) in 160 offices dispersed throughout the Nation and strategically located near important rivers and streams. WRD personnel monitor the streams and make on-site measurements of depths, velocities, and flows. WRD personnel frequently make emergency measurements of discharge at the request of NWS forecasters, flood fighters, and emergency management personnel to aid in the management and assessment of the floods.

In addition to stream-gage operations, WRD investigates and documents floods, droughts, and mudflows. Historically, post-storm activities usually are not supported through annual Congressional appropriations but through a 50-50 cost share program between state and local agencies and the USGS, reimbursements from local, state, or federal agencies, and, occasionally, supplemental Congressional appropriations. Since federal fiscal year 2000, some Congressional appropriations have been provided for these activities although not enough to cover costs in a typical year.

Regarding post-storm data acquisition, WRD district (state) offices, in cooperation with other federal, state, and local agencies, can identify, document, and survey high-water marks, make discharge measurements, collect water-quality samples, and make post-storm estimates of peak-flow discharges by use of indirect measurements. The district offices also can furnish records of flood stage, flow, and occasionally rainfall at affected gaging stations and historic records of stage and discharge for comparison to floods of interest.

Through the Coastal and Marine Geology Program, the USGS Geologic Division (GD) investigates the geologic impacts of extreme storms and hurricanes on the physical coastal environment. A major objective of these investigations is to improve the capability to predict coastal erosion and other coastal changes caused by extreme storms. To conduct these investigations, GD personnel employ aerial photography and oceanographic techniques, emerging technologies like airborne scanning laser (e.g., LIDAR), recently available declassified instruments and data, and a USGS network of tide and environmental sensors. State-of-the art research vessels, Global Positioning System (GPS) satellites, and side-scan survey and velocity measurement equipment are used to collect post-storm data.

b. **Requirements.** The operational needs of the USGS during pre- and post-storm activities include access to forecasts, flood reports, and warning statements issued by NWS, and road and access reports issued by emergency management operation centers and law enforcement agencies. Potential data needs from other agencies include aerial photography, field support with small aircraft (fixed wing and helicopter), and analytical model results of storm surge and waves. Photographs of stream-gaging stations and bridge sites would be useful during and immediately after floods at which a survey and computation of discharge could be made after the flood.

2.3.4 Department of Agriculture (USDA). The National Resources Conservation Service (NRCS) provides technical and financial assistance through local conservation districts to land users, communities, watershed groups, federal and state agencies, American Indian tribes, and others at their request. The NRCS staff at the local level works alongside state and local conservation staff and volunteers in a partnership to care for natural resources on private lands. The NRCS develops comprehensive technical guidance for conservation planning and assistance.

The benefits of these activities include sustained and improved agricultural productivity; cleaner, safer, and more dependable water supplies; reduced damages caused by floods and other natural disasters; and an enhanced resource base to support continued economic and recreational project development.

The Rural Development Act of 1972, Public Law 92-419, Sec. 302, Title III (7 USC 1010a), August 30, 1972, authorized a land inventory and monitoring program, including studies and surveys of erosion, sediment damage, flood plain identification, and land-use changes and trends. The NRCS informs the USDA of the extent of short-duration natural phenomena that affect health, safety, and agricultural production. The reports will document impacts on resources of NRCS activities and describe the event in quantitative terms, including amount of precipitation and surface-wind speeds.

The Watershed Protection and Flood Prevention Act (PL 83-566, Statute 606) authorizes the Secretary of Agriculture to cooperate with state and local governments in planning and conducting improvements for soil conservation and other purposes. The NRCS can prepare reports on the impact of serious storms on the installed project measures.

2.3.5 Federal Emergency Management Agency (FEMA). FEMA is the federal coordinating agency that responds to major disasters or threats in the United States and its territories. FEMA provides response and recovery and hazard mitigation assistance, emergency management preparedness training, flood insurance, and funding for related studies and services. Headquartered in Washington, DC, FEMA has 10 regional offices, with field offices and special facilities located nationwide.

a. **Capabilities**. When a Presidentially declared disaster occurs, one or more Disaster Recovery Centers are established to coordinate federal disaster assistance for response and assistance. FEMA also employs a large contingent of temporary disaster assistance workers when necessary in addition to its authorized permanent staff. FEMA is organized along emergency

management functions and administers the Federal Insurance Administration and U.S. Fire Administration. Within FEMA's Mitigation Directorate, Flood Insurance Studies for the National Flood Insurance Program and Hurricane Evacuation Studies for the National Hurricane Program are prepared. FEMA's web-site address is www.fema.gov where the latest organization chart and articles on FEMA and Presidentially declared disasters may be viewed.

In addition, FEMA's Program Assessment and Outreach Division Federal Insurance and Mitigation Administration may elect to deploy a Building Performance Assessment Team (BPAT) following a disaster. The objectives of the BPAT are to inspect buildings and infrastructure, conduct forensic enginnering analyses to determine causes of structural failure and success, and recommend actions that state and local governments, the construction industry, and building code organizations can take to reduce future damages and protect lives and property in hazard areas. FEMA BPAT will notify OFCM via phone if they plan to deploy a field team following a disaster. OFCM will then notify via phone all appropriate agencies of the NPSDAP about the FEMA BPAT deployment. This notification should be followed up with coordination among all the agencies involved with PSDA activities.

b. **Requirements**. Perishable storm data are needed to support FEMA's mission. Data include principally high-water marks in riverine and coastal-flooded areas in addition to perishable wind-waterline data. The data are typically obtained by field survey teams within a few days or a week after the flooding event has occurred because high-water marks are quickly destroyed by response and recovery efforts. Along with FEMA, personnel from the NWS, USACE, USGS, NIST, NRCS, as well as private contractors comprise the perishable data collection teams in the field and assist in their analysis. The collected data are used to determine the extent and magnitude of the disaster, assess disaster damages, determine the range of mitigation alternatives, prepare benefit-cost analyses for federal recovery assistance and mitigation measures, and verify prediction models for natural hazards. For disaster response and recovery efforts, reconnaissance data are required during or within 12-24 hours after the event and are obtained by radar, reconnaissance flights, satellites, and water-level gauges that transmit their data.

Analyzed fields of maximum surface wind speeds caused by tornadoes, tropical storms, hurricanes, and winter storms also are required. The information in these fields is typically derived from surface observations and available Doppler radar data. Water-level, wind-speed and wind-waterline data have been used to prepare the Hazard Analysis section in Post-Storm Assessment reports following major hurricanes. Wind-waterline data, that is, the line that distinguishes damages caused by water damage versus wind damage, has immediate application for insurance claims. Water-level and wind-speed information from recent tropical storms and hurricanes have been used by the Storm-Surge Group at the Tropical Prediction Center/National Hurricane Center to verify their hurricane and winter-storm computer simulation and prediction models. These studies are sponsored by FEMA and are primarily used to verify the predicted maximum storm-surge heights derived from the NWS's Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model. The SLOSH model is used to make predictions of maximum storm-surge heights for classes of hurricanes striking a given coastal area. Information derived from SLOSH is used to identify the vulnerable population that must be evacuated and the critical facilities that need to be protected from

storm-surge flooding in coastal communities. These data will continue to be needed in future disasters to verify SLOSH model output and to support other FEMA mission requirements.

Perishable, storm-caused riverine and coastal-flooding data are used by the National Flood Insurance Program to calibrate and verify hydrologic and hydraulic models used in Flood Insurance Studies to establish the one-percent chance base-flood elevations shown on Flood Insurance Rate Maps (FIRM). Flooding information caused by tsunami events affecting the U.S. West Coast and Pacific islands is also needed to prepare tsunami hazard maps. Existing water-level data documenting such events are insufficient and are critically needed to verify computer models used for tsunami run-up predictions.

2.3.6 American Association for Wind Engineering (AAWE). AAWE is a national, nonprofit, technical society of engineers, meteorologists, architects, planners, public officials, social scientists, manufacturers and constructors. Included among AAWE members are researchers, practicing professionals, educators, government officials, and building code regulators.

a. **Capabilities.** AAWE was originally established as the Wind Engineering Research Council in 1966 to promote and disseminate technical information in the research community. In 1983 the name was changed to American Association for Wind Engineering and incorporated as a nonprofit professional organization. The multi-disciplinary field of wind engineering considers problems related to wind and associated water loads on buildings and structures, societal impact of winds, hurricane, and tornado risk assessment, cost-benefit analysis, codes and standards, dispersion of urban and industrial pollution, wind energy, and urban aerodynamics.

b. **Requirements.** AAWE affiliation with the NPSDAP is currently limited to coordination with the National Weather Service. For all tornadoes suspected of producing greater than F3 damage, a QRT will be dispatched by the NWS. NWS Headquarters, Office of Climate, Water, and Weather Services (OCWWS), will notify OFCM via phone of the QRT deployment. OFCM will then notify via phone, all appropriate members of the NPSDAP about the deployment, including AAWE. This notification should be followed up with coordination between AAWE and the NWS regarding any PSDA activities.