

APPENDIX A FEDERAL COORDINATION AND PLANNING

BASIS FOR FEDERAL COORDINATION PROCESS

In 1963, Congress and the Executive Office of the President expressed concern about the adequacy of coordination of Federal meteorological activities. In response, Congress directed in Section 304 of Public Law 87-843—the Appropriations Act for State, Justice, Commerce, and Related Agencies—that the Bureau of the Budget prepare an annual horizontal budget for all meteorological programs in the Federal agencies.

The Bureau of the Budget (now the Office of Management and Budget) issued a report entitled “Survey of Federal Meteorological Activities” (1963). The report described each agency’s program in some detail, particularly its operational services, and detailed the relationship between the programs of the various agencies. The report revealed close cooperation but little evidence of systematic coordination. Based on this study, the Bureau of the Budget issued a set of ground rules to be followed in the coordination process. It established a permanent general philosophy for assignment and assessment of agency roles in the field of meteorology and set certain goals to be achieved by the coordination process. The Bureau of the Budget tasked the Department of Commerce (DOC) to establish the coordinating mechanism in concert with the other Federal agencies. It also reaffirmed the concept of having a central agency—the DOC—responsible for providing common meteorological facilities and services and clarified the responsibilities of other agencies for providing meteorological services specific to their own needs.

The implementation of these directives by DOC led to the creation of the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM) which operates with policy guidance from the Federal Committee for Meteorological Services and Supporting Research. The principal work in the coordination of meteorological activities and in the preparation and maintenance of Federal plans is accomplished by the OFCM staff with the advice and assistance of the Interdepartmental Committee for Meteorological Services and Supporting Research, and over 30 program councils, committees, working groups, and joint action groups.

MISSION OF THE OFFICE OF THE FEDERAL COORDINATOR FOR METEOROLOGY (OFCM)

The mission of the OFCM is to ensure the effective use of Federal meteorological resources by leading the systematic coordination of operational weather requirements, services, and supporting research, among the Federal agencies. The high level focus and output as a result of carrying out this mission includes needs and requirements; issues and problems; studies, reports, plans, and handbooks; and crosscut reviews, assessments, and analyses.

OFCM’s objectives in carrying out its mission include:

- Documenting agency programs and activities in a series of national plans and reports that enable agencies to revise/adjust their individual ongoing programs and provide a means for communicating new ideas and approaches to fulfill require-

ments.

- Providing structure and programs to promote continuity in the development and coordination of interagency plans and procedures for meteorological services and supporting research activities.
- Preparing analyses, summaries, or evaluations of agency meteorological programs and plans that provide a factual basis for the Executive and Legislative branches to make appropriate decisions related to the allocation of funds.
- Reviewing Federal weather programs and Federal requirements for meteorological services and supporting research. This review may suggest additions or revisions to current or proposed programs, or identify opportunities for improved efficiency, reliability, or cost avoidance through coordinated actions or integrated programs.

As detailed in the report which follows, this

has been an excellent year for OFCM in carrying out its interagency activities. The accomplishments of FY 2008 were substantial and meaningful for the nation, and the foundation has been laid for a similarly productive FY 2009.

FEDERAL COMMITTEE FOR METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH

The Federal Committee for Meteorological Services and Supporting Research (FCMSSR), established in 1964, provides policy-level agency representation and guidance to the Federal Coordinator to address agency priorities, requirements, and issues related to services, operations, and supporting research, and also resolves agency differences that arise during the coordination of meteorological activities and the preparation of Federal plans. The Under Secretary of Commerce for Oceans and Atmosphere, who is also the Administrator of the National Oceanic and Atmospheric Administration (NOAA), serves as the FCMSSR Chairperson.

The 15 Federal agencies that engage in meteorological activities or have a need for meteorological services are represented on FCMSSR. The FCMSSR membership includes: the Departments of Agriculture, Commerce, Defense, Energy, Homeland Security, the Interior, State and Transportation, and the Environmental Protection Agency, National Aeronautics and Space Administration, National Science Foundation, National Transportation Safety Board, Nuclear Regulatory Commission, the Office of Science and Technology Policy and the Office of Management and Budget (OMB).

HIGHLIGHTS FOR FISCAL YEAR 2008 AND PLANS FOR FISCAL YEAR 2009

NATURAL DISASTER REDUCTION INTERDEPARTMENTAL HURRICANE CONFERENCE

The OFCM annually hosts the Interdepartmental Hurricane Conference (IHC) to provide a forum for the responsible Federal agencies, together with representatives of the user communities such as emergency management, to review the nation's hurricane forecast and warning program and to make recommendations on how to improve the pro-

gram. The OFCM hosted the 62nd IHC in Charleston, South Carolina, March 3-7, 2008. The theme of the conference was Tropical Cyclone Operations and Research: Priorities for the Future. With strong partnerships and alliances built over many years, the conference was attended by approximately 200 people for the ninth consecutive year, including representatives from nine Federal agencies: DOC/NOAA, DOD (Navy, Air Force, and Army Corps of Engineers), NASA, NSF, DHS/FEMA, DOT/FHWA, DOI/USGS, USDA and DOE. Ms. Mary Glackin, Deputy Under Secretary of Commerce for Oceans and Atmosphere, set the tone for the meeting during her Monday afternoon keynote address. She emphasized the importance of collaborative partnerships for the nation's hurricane forecast and warning program, especially in the areas of data collection, modeling, research activities, and transition of research results to operations. She highlighted the ultimate purpose in the partnerships is to further improve capabilities in forecasting track and intensity, storm surge, rainfall/flooding, storm structure, and sea state (waves)—all supported by improved observations from new and traditional sensors and sensor systems.

Objectives of the 2008 IHC included the following: (1) review the Nation's tropical cyclone forecast and warning program from end-to-end; (2) update the National Hurricane Operations Plan for 2008; (3) review the 2007 Joint Hurricane Testbed (JHT) projects, and identify candidates that may be successfully transitioned into operations; (4) examine how hazard risk reduction improvements can be made through stronger local partnerships and alliances; and (5) as recommended in the Interagency Strategic Research Plan for Tropical Cyclones: The Way Ahead, begin developing an interagency implementation strategy for the tropical cyclone research priorities.

It was clear from the first workshop, Interagency Priorities for Tropical Cyclone Research, that all agencies are doing important, relevant research against the research priorities outlined in Chapter 5 of the Strategic Research Plan. The partnerships required to tackle all the priorities are well accepted, with normal agency concerns remaining regarding control and funding. Some potential gaps and deficiencies were highlighted during the workshop: (1)

the United States is not producing enough new personnel with the education and training required for improving tropical cyclone forecasts via advanced data assimilation and numerical modeling systems; (2) there is slow progress on wind lidar (global 3D wind solution); (3) we need increased emphasis in the area of operationalizing data; (4) we need improved calibration, validation and quality control; (5) we need Observing System Simulation Experiments for impact definition; and (6) civil agencies lack targeted funding for transition of research to operations (such as DoD's 6.4 funding). The workshop, in conjunction with all of the other sessions conducted at the 62nd IHC, provided a baseline of research activities to track against the research priorities outlined in Table 5.1 of the Strategic Research Plan.

The workshop, *Strong Local Partnerships: The Keys to Success*, which related to Section 5.3 (Research Needs in the Social Sciences) in the Strategic Research Plan, provided some key take away points. All emergencies are local, with local emergency managers (EMs) charged to lead hazard preparation, response and recovery. In this regard, it's important that EMs: (1) convene pre-hurricane public talks designed to define actions; (2) prepare citizens to act in advance of hazards (e.g., develop Community Emergency Response Teams); and (3) sequester local elected leaders and ensure that they understand the plan of action. To be successfully prepared, local partnerships are vital (e.g., with local NWS WFO; local, state, regional and Federal officials; neighborhood associations; and media). Additionally, the workshop highlighted that current decision support systems (e.g., television overrides, Connect-CTY, WebEOC) and those in development—like the Integrated Public Alert and Warning System (IPAWS)—have the potential to further improve hazard preparation, response and recovery by enabling the dissemination of critical information to all citizens of communities, including citizens with language barriers, disabilities, economic constraints, and those with literacy challenges.

Actions resulting from the conference included: (1) Update and execute the National Hurricane Operations Plan for the 2008 hurricane season; (2) Analyze tropical cyclone research activities presented at the 62nd IHC and other subsequent forums with respect to the priorities established in Table

5.1 of the interagency strategic research plan; (3) Identify overlaps, gaps, areas for collaboration and leveraging opportunities; and (4) Establish the next steps needed to fill the gaps. The IHC was extremely successful in bringing the operational and research communities together to further improve the tropical cyclone forecast and warning program. It was also successful in addressing the needs of the Federal agencies and user communities that have a stake in the nation's tropical cyclone program. Finally, the conference provided a baseline of research activities that will enable the development of an interagency implementation strategy for the tropical cyclone research priorities, which can be reviewed at subsequent IHCs. The 2009 IHC is being planned for St. Petersburg, Florida.

TROPICAL CYCLONE RESEARCH AND DEVELOPMENT PLAN

The tropical cyclone forecast and warning program is an interdepartmental collaboration to provide the United States and designated international recipients with forecasts, warnings, and assessments concerning tropical and subtropical weather systems. Previously mentioned in Section 3, the three centers that cooperate to provide the operational forecast and warning services are NWS's Tropical Prediction Center/National Hurricane Center (TPC/NHC), NWS's Central Pacific Hurricane Center (CPHC), and DoD's the Joint Typhoon Warning Center (JTWC). The Interagency Strategic Research Plan for Tropical Cyclones: *The Way Ahead* (Feb 07) provides a strategy for continuing to improve the effectiveness of operational forecasts and warnings through strategic coordination and increased collaboration among the major players in the operational and research and development (R&D) communities. The plan notes that vast improvements in tropical cyclone prediction are attainable with focused research efforts, enhanced transition of research to operations capabilities, strong interagency partnerships, coordination, and planning, and most importantly, sufficient resources—both human and infrastructure. This strategic plan has become the underpinning of NOAA's Hurricane Forecast Improvement Program and provides a foundation for Navy and NASA research as well as supporting NSF's related activities. In response to direction from the Interdepartmental

Committee for Meteorological Services and Supporting Research (ICMSSR), the OFCM formed the Working Group for Tropical Cyclone Research with cochairs from NOAA and the Navy. In FY 2009, the Working Group will be developing an implementation strategy for the research objectives outlined in the strategic research plan. The ultimate goal is to prevent loss of life and injuries and to reduce the nation's vulnerability to these potentially devastating storms.

POST-STORM DATA ACQUISITION

The OFCM continued to coordinate, as required, timely post-storm data acquisition surveys in response to Presidentially declared natural disasters and other agency requirements to evaluate, for example, the impact on coastal ecosystems. These natural disaster reduction efforts contribute to the determination of the intensity and magnitude of storms, and, in many cases, help to determine the extent of damage for use in Presidential disaster declarations. The additional data collected after hurricane landfall is also used in validating modeling efforts with both emergency management models (e.g., FEMA's HAZUS) and hurricane storm-surge models (e.g., NOAA's SLOSH). These models are used in real time to assist decisionmakers in evacuation decisions and procedures. Post-storm data are also used to update FEMA Flood Insurance Rate Maps. Under the 5-year Umbrella Agreement and an FY 2008 funding agreement between OFCM and the U.S. Air Force for up to \$22,000 in reimbursable support, the Civil Air Patrol flew 17 missions in support of tornado and hurricane damage assessments, flood assessment, survey of potential dam breaks, glacial lake damming in Alaska, and a pre-storm hydrology survey in Hawaii. This support will continue in FY 2009 at a planned level of \$25,000 set aside for these missions.

URBAN METEOROLOGY

NATIONAL WILDLAND FIRE WEATHER NEEDS ASSESSMENT

An important contribution to urban meteorology is the National Wildland Fire Weather Needs Assessment which is being conducted by OFCM in concert with the agencies and stakeholders. Wild-

land fires from 2004 to 2007 set records for acreage burned and the number of fires have trended upwards more than 100 percent since the mid-1980s. Fire at the Wildland Urban Interface is a serious problem, with increasing intrusion into the urban landscape and loss of homes and other structures. In June 2005, the Western Governors' Association (WGA) urged NOAA to have the OFCM complete a national assessment of Federal, state, and local fire managers' needs for weather information in their wildfire and prescribed fire decisionmaking processes and develop a framework to meet those needs. The needs assessment has been completed, capabilities information has been gathered, and an initial gap analysis has been completed. The needs assessment identified 47 specific needs in nine functional areas and the initial gap analysis indicates just two of these needs may have no activity against them but, conversely, none of the needs may be considered fully met at this time. The OFCM briefed the results of the needs assessment and provided a copy of the summary report to the NOAA Science Advisory Board's Working Group on Fire Weather Research as part of their kickoff activities in October 2007. The results of the NOAA SAB's working group study have been incorporated into the draft final report. The OFCM also briefed the needs assessment results to the Committee for Climate Analysis, Monitoring and Services in the fall of 2007. For FY 2009, the OFCM will form the Working Group for Wildland Fire Weather to complete the final report which will outline the needs, capabilities, gaps, and a framework to address the needs, to be completed in the spring of 2009.

ATMOSPHERIC TRANSPORT AND DIFFUSION RESEARCH AND DEVELOPMENT

The OFCM developed an atmospheric transport and diffusion (ATD) implementation strategy for the recommendations for which OFCM has primary responsibility in the Federal Research Needs and Priorities for Atmospheric Transport and Diffusion Modeling (September 2004) report. The implementation strategy has three parts: (1) working with the agencies to identify and improve a baseline set of national ATD modeling capabilities; (2) helping the agencies implement a common framework for model development and evaluation; and (3) recommending

criteria for multifunctional joint urban test beds ["urban" describes a metropolitan area and its interfaces with surrounding areas]. In accordance with this, OFCM formed a Joint Action Group for Joint Urban Test Beds (JAG/JUTB) under the Working Group for Urban Meteorology (WG/UM); and this joint action group has met frequently, and is continuing work to develop an operational concept document for multifunctional joint urban test beds to provide services and data to model developers, test and evaluation personnel, and users. The operational concept document will include capabilities and benefits, management structure, infrastructure requirements, selection process, implementation framework, definitions, and characteristics of urban scales. The joint urban test beds will support the following functional areas: severe weather (e.g., hurricanes, tornadoes, heat waves and cold spells, drought, and wildland fires), homeland security (dispersion of hazardous materials), climate, air quality (e.g., particulate matter aerosols), and water quality (e.g., deposition of airborne contaminants on water sources and waterborne transport of contaminants). JAG/JUTB is currently planning to pursue implementation of a JUTB over the National Capital Region first; this JUTB would be the proof of concept and our experience with it would allow for the improved development of an operational concept document.

GEORGE MASON UNIVERSITY ATMOSPHERIC TRANSPORT AND DISPERSION MODELING CONFERENCE

George Mason University (GMU), Fairfax, Virginia, conducted its 12th Annual Conference on Atmospheric Transport and Dispersion Modeling in July, 2008. The OFCM cosponsored the event, together with the Joint Science and Technology Office for Chemical and Biological Defense, Defense Threat Reduction Agency (DTRA); the Naval Surface Warfare Center, Dahlgren Division (NSW-CDD); and GMU. Themes for the conference were: improve understanding of atmospheric transport and diffusion processes; support homeland security requirements; and share experience across different sectors. Participants included representatives from DOD, EPA, DOE, NOAA, universities, private companies and other agencies doing related research, as well as scientists from other countries. Technical

topics of interest for the conference were: new developments in basic theories of boundary layer models and transport and diffusion models; urban-scale meteorological and dispersion experiments and models; computational fluid dynamics (CFD) model theory and applications; field experiments and laboratory experiments concerned with boundary layer studies and turbulence and dispersion studies; mesoscale meteorological modeling for input to transport and dispersion models; the use of remote sensing technology in boundary layer and transport and dispersion studies; model evaluation methods, uncertainty/sensitivity analyses, and risk assessments; improvements in model inputs (e.g., land-use data, 3-D building data) and output visualizations; and methods and criteria for emergency response and decision making. The OFCM conducted a special session related to the OFCM's ongoing work with other members of the Federal meteorological community to implement the recommendations in the report, Federal Research Needs and Priorities for Atmospheric Transport and Diffusion Modeling. The special session provided much information on benefits of joint urban test beds; it was chaired by Dr. Walter Bach, Jr., Program Manager of the Environmental Sciences Division of the U.S. Army Research Office.

CLIMATE

The OFCM supports the U.S. Climate Change Science Program (CCSP) and participated in extensive reviews of the Synthesis and Assessment Products produced in FY 2008, offering substantive comments accepted into the transportation product, in particular. The Federal Coordinator, through his participation on the Committee on Environment and Natural Resources (CENR), will continue to review and provide concurrence on CCSP Synthesis and Assessment Products.

OPERATIONAL PROCESSING

OFCM's activities regarding Operational Processing Centers (OPC) continue to improve processing and backup capabilities of NOAA's National Centers for Environmental Prediction and Office of Satellite Data Processing and Distribution, the Air Force Weather Agency, and the U.S. Navy's Fleet Numerical Meteorology and Oceanography Center and Naval Oceanographic Office. During FY 2008

in response to a request from the National Polar-orbiting Operational Environmental Satellite System (NPOESS) Senior Users Advisory Group (SUAG), COPC fostered the synergistic coordination, program development, and implementation of NPOESS data exploitation strategies. Also in FY 2008, the agencies signed the Data Acquisition, Processing, and Exchange (DAPE) Memorandum of Agreement to update and formalize these activities among the operational processing centers. The Environmental Satellite Data Acquisition (ESDA) annex to the DAPE MOA is in final coordination and will be completed in FY 2009. This annex will replace the expiring Shared Processing Program (SPP) agreement which provides for funding to support the exchange of extensive volumes of data.

ANNUAL FEDERAL PLAN

In October 2007, the OFCM issued The Federal Plan for Meteorological Services and Supporting Research—Fiscal Year 2008. The Federal Plan is congressionally mandated and is a one-of-a-kind document which articulates the meteorological services provided and supporting research conducted by agencies of the Federal government. The Federal Plan helps to reduce overlap and duplication among the agencies. It is a comprehensive publication that documents proposed programs for FY 2008, and reviews agency programs for FY 2007. The feature article for the FY 2008 Annual Federal Plan describes a crosscutting assessment of Federal agency hydro-meteorological products, services, and supporting research. The feature article for the FY 2009 Annual Federal Plan focuses on natural disasters in the urban environment.

WEATHER INFORMATION FOR SURFACE TRANSPORTATION

Since 1998, OFCM has made weather services and research and development (R&D) activities supporting the surface transportation community a priority for the Federal meteorological community. In June 2008, the Federal Coordinator for Meteorology provided a keynote address at the Fourth National Symposium on Surface Transportation Weather in Indianapolis, Indiana. As this area of weather products, services, and supporting research continues to grow, the expansion across international borders

continues as well. At the invitation of the U.S. Embassy in Austria, the Federal Coordinator for Meteorology provided a keynote address at the Safety in Mobility conference held in Velden, Austria, in July 2008. The conference brought together experts and stakeholders from across the European continent to discuss issues and move forward in this important area. In addition, the Federal Coordinator made a presentation at the Intelligent Transportation Systems World Congress held in New York City from 16-20 November 2008. The OFCM will continue to work with the agencies to advance weather information for surface transportation throughout FY 2009, focusing on areas such as: current and emerging capabilities; transition of research to operations to improve products and services; getting the right message out and the need for social science involvement; education and outreach; the need for metrics to measure success and guide resource allocation; identifying gaps and setting research priorities; and exploiting the opportunity for a near-term intermodal initiative to develop and demonstrate emerging capabilities.

AVIATION WEATHER

The OFCM continued to participate in the Next Generation Air Transportation System (Next-Gen) Weather Working Group Executive Committee and the Friends/Partners in Aviation Weather (FPAW). We attended the FPAW meeting at the National Business Aviation Association annual gathering in Orlando, Florida, in October, 2008, and presented results of the 10-year effort to reduce weather-related aviation accidents. The OFCM completed the analysis of National Transportation Safety Board accident information now finalized through 2006 to assess performance toward the goal of reducing weather-related fatal aviation accidents by 80 percent over the 10-year period from 1997 through 2006. Although the National Aviation Weather Program achieved significant progress over this period, particularly in the area of general aviation, the second five years of the 10-year period showed a marked slow down in the decline of accident rates and the ambitious 80 percent reduction goal was not achieved. The analysis of the accident data raised a number of questions and the cause of the slow down is not readily apparent. It is likely a combination of

a number of factors and the OFCM will be working with the NTSB and others in FY 2009 to develop an understanding of the change in the trend lines, how the program can sustain the progress which has already been made, and how to jump start additional progress toward the overall 80 percent reduction. The final report assessing this goal will be published in FY 2009. The OFCM continues to implement the National Aviation Weather Program, and is working with the agencies to advance meteorological standards, improve products, enhance services, and participate in research that contributes to the overall goal of providing the best state-of-the-art information to aviation end users where and when they need it. The OFCM has monitored the development of the Next Generation Air Transportation System concept of operations and functional requirements for the network-enabled weather capability envisioned for NextGen, with special emphasis on complementary development of a broader environmental data cloud. OFCM's coordinating infrastructure will continue to contribute the collaboration in the aviation community.

SPACE WEATHER

The Committee for Space Weather continued to move forward to address the recommendations of the 2006 independent assessment of the National Space Weather Program (NSWP), including development of a new strategic plan for the NSWP. The new NSWP Strategic Plan is in final clearance within the Executive Office of the President, and OFCM expects to publish it in FY 2010, with a follow-on effort to craft an updated NSWP Implementation Plan. In a complementary effort, the Committee prepared and submitted a Space Weather Implementation Plan (SWxIP) as requested by the Committee on Environment and Natural Resources (CENR) Subcommittee for Disaster Reduction (SDR). Space weather was identified as one of the SDR's Grand Challenges for Disaster Reduction and SDR requested that the OFCM spearhead an effort, through the NSWP, to develop the SWxIP. Another significant NSWP effort in FY 2008 was the completion of the report Impacts of NPOESS Nunn-McCurdy Certification and Potential Loss of ACE Spacecraft Solar Wind Data on National Space Environmental Monitoring Capabilities, documenting the results of a study request-

ed by the Office of Science and Technology Policy (OSTP). The report was submitted to OSTP in January 2008 following high-level coordination in each of the stakeholding agencies, and the interagency study team briefed the results to staff from both OSTP and OMB in February. The report identifies a number of significant impacts resulting from the expected loss of space environmental sensing capability and the report is marked For Official Use Only. The OFCM received a follow-on request from OSTP to conduct a mitigation study in FY 2009.

PHASED ARRAY RADAR

The Working Group for Multifunction Phased Array Radar (WG/MPAR), cochaired by NOAA/OAR, FAA, DHS, and DOD/Air Force, continued to move forward with a coordinated approach to risk reduction for applying phased array radar to concurrent air and weather surveillance. The OFCM, in conjunction with OSTP's Committee on Environment and Natural Resources, Subcommittee on Disaster Reduction (SDR), hosted a symposium on MPAR in Norman, OK, in October 2007 with the theme Leveraging Technology to Build a Next Generation National Radar System. More than 180 people attended the symposium, representing Federal agencies, academia, military laboratories, and the radar industry. The fundamental message/outcome from the symposium was that now is the time to begin the evaluation of MPAR, and a risk-reduction implementation strategy was needed.

Items driving the urgency to begin the evaluation of MPAR are: (1) legacy weather and aircraft surveillance radars are nearing the end of their lifecycles; (2) society demands greater protection of life and property, more timely warnings of hazardous weather events, and increased accuracy, spatial resolution and lead times for severe weather warnings; (3) the need for enhanced capability to track non-cooperative aircraft and other airborne threats to safety and security is paramount; (4) the multifunction capability of MPAR leads to reduced lifecycle costs; and (5) a risk-reduction implementation strategy will reduce uncertainties and produce cost-effective alternatives, which will lead to a sound business case. The WG/MPAR developed a coordinated implementation strategy in early 2008, which formed the anchor point for ongoing planning and coordinated

action across NOAA, DOD, DHS, and the FAA. In late FY 2008, the OFCM and WG/MPAR completed a service improvement assessment for weather surveillance which mapped the linkages from basic capabilities expected of a PAR system, to derived capabilities, and subsequently to anticipated service improvements. A similar analysis is underway for air surveillance and should be completed in FY 2009. Several WG/MPAR members also participated in the Interagency Surveillance Summit in June 2008 and the Federal Coordinator for Meteorology is expected to participate in the summit to be held in December 2008.

Also in late FY 2008, the National Academies' Board on Atmospheric Science and Climate (BASC) Committee on the Evaluation of the MPAR Planning Process delivered their report. Their overarching recommendation was to continue the MPAR research and development, and they noted the need to develop a detailed set of requirements and that the cost estimates were "promising, but embryonic." The WG/MPAR is working on defining requirements and drafting an operations concept for MPAR. The committee's principal findings were: (1) phased array technology can offer some significant technical advantages; (2) significant technical questions for weather surveillance need to be answered (i.e., dual polarization); (3) implementation of a network of about 350 MPAR systems could replace existing NWS and FAA radars; (4) replacement of existing systems alone cannot meet all agency mission requirements with the main issue of low-level coverage of weather and non-cooperative aircraft; and (5) cost-benefit considerations are embryonic at this time and a series of trade studies are needed.

Over the last year, DHS supported targeted research using the National Weather Radar Testbed at the National Severe Storms Laboratory in Norman, OK, and additional future funds were programmed for phased array radar work in NOAA. At its meeting on September 29, 2008, the ICMSSR supported the creation of a senior policy council for MPAR within the Federal meteorological coordinating infrastructure. This council would begin addressing policy issues among the key stakeholding agencies as anticipated funding increases materialize in the years ahead. Finally, the WG/MPAR will be planning for a second MPAR Symposium expected to be held in early

FY 2010.

CROSSCUTTING HYDROMETEOROLOGICAL ASSESSMENT

The OFCM hosted a one-day hydrometeorology mini-workshop in September 2008 to bring together the relevant Federal agencies to initiate discussion in the following areas: (1) programs and initiatives in the agencies; (2) product suites and services, both current and experimental; (3) needs and requirements; (4) potential benefits from improved products and services; (5) challenges and gaps in products and services; (6) research underway, opportunities, and plans to meet identified gaps; (7) processes for transitioning research into operational applications; and (8) related education and outreach activities. The workshop spurred interest among the participants to see what others are working on and to continue gathering needs and requirements and identifying priorities and gaps. Although lacking some details at this stage, the participants were appreciative of this first step to bring the community together to begin addressing these issues. Attendees identified additional future participants and the OFCM will conduct a follow-on mini-workshop on hydrometeorological products, services, and supporting research in December 2008.

CRITICAL SKILL SHORTAGES

In 2007, the Interagency Strategic Research Plan for Tropical Cyclones: The Way Ahead, identified an important example of a deficiency in workforce development when it noted the insufficient production of new personnel with the education and training required for improving tropical cyclone forecasts via advanced data assimilation and numerical modeling systems. The Data Assimilation Education Forum at the 88th Annual Meeting of the American Meteorological Society in January 2008, co-sponsored by the OFCM, corroborated this shortage and revealed the lack of personnel with programming and computational skills for high-end computers. Anecdotal evidence indicates additional potential shortages in the areas of probability, radar meteorology, and tropical meteorology. At its meeting on September 29, 2008, the Interdepartmental Committee for Meteorological Services and Supporting Research (ICMSSR) agreed to establish the Joint Action Group

for Critical Skill Shortages to identify other critical areas, collect information, and conduct an analysis of the Federal sector's current and projected critical skill shortages. The group will then make recommendations to address the skill shortages identified. An interim report is expected in late FY 2009 and a final report in FY 2010.

ENVIRONMENTAL LITERACY

The OFCM has laid out a vision, framework, and methodology which the office will embrace to systematically promote environmental literacy through interdepartmental collaboration within the OFCM coordinating infrastructure. The methodology defines how to determine if an opportunity to promote environmental literacy exists. It also describes the method to be used to determine the target public, private, and/or academic sector audiences and how to reach them. Determining the target audiences' needs and a means for assessing how those needs are being met is incorporated into the methodology as well. Executing this methodology will result in a nation better able to understand the linkages between weather and climate and personal and professional choices and build a national capacity to solve problems and respond to change. It will provide for a more environmentally literate citizenry. In this regard, the OFCM developed an implementing strategy/action plan to make environmental literacy a crosscutting priority within the OFCM coordinating infrastructure. The OFCM is also continuing its support of an American Meteorological Society undergraduate scholarship in the atmospheric and related oceanic and hydrologic sciences.

GUIDANCE AND PRACTICES FOR XML

In 2007, the charter for the Committee for Environmental Information Systems and Communications (CEISC) Joint Action Group for Extensible Markup Language and Web Services (JAG/XMLWS) was enhanced so that this group would serve as the primary national collaboration forum to work on three primary objectives. The objectives are: (1) Establish agreed national standards (develop by JAG/XMLWS or obtained from national or international standards bodies) and common services and components for common weather information exchange in a net-centric operations environment; (2)

Serve as the national working body to develop the U.S. position and candidate standards for adoption consideration for the newly formed World Meteorological Organization (WMO) Expert Team on the Assessment of Data Representation Systems; and (3) Support the development of a specialty subset of national standards specifically related to aviation weather. This is needed both in support of the Next Generation Air Transportation System (NextGen) and to support the Federal Aviation Administration (FAA) engagement with EUROCONTROL on a similar need for equivalent aviation system modernization. The desired intent is to develop common standards to be used both by EUROCONTROL and by NextGen. The group developed the U.S. position and supported both WMO and ICAO meeting in FY 2008 and the ultimate outcome remains in development.

COLLABORATION WITH NAS/NRC BOARD ON ATMOSPHERIC SCIENCES AND CLIMATE

The OFCM continued its mutually beneficial interactions with the National Academies National Research Council (NRC). The Federal Coordinator for Meteorology continued to participate in NRC Board on Atmospheric Sciences and Climate (BASC) strategic planning workshops and regularly scheduled meetings and is expected to continue participation throughout FY 2009. In FY 2008, BASC's Committee on the Evaluation of the Multifunction Phased Array Radar Planning Process completed its study, originally performed at the request of the OFCM.

COLLABORATION WITH THE COMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES

CENR PRINCIPALS

The Federal Coordinator continued to be a participant on the CENR, and continued to assist CENR through review and concurrence of CENR reports and materials. This activity will continue in FY 2009.

SUBCOMMITTEE ON DISASTER REDUCTION

The OFCM has been an active participant in the work of the CENR Subcommittee on Disaster Reduction (SDR). SDR has developed Grand Challenges implementation plans to improve the na-

tion's capacity to prevent and recover from disasters. The implementation plans include such topics as assessing disaster resilience, understanding the natural processes that produce hazards, and promoting risk-wise behavior. As mentioned earlier, space weather was identified as one of the SDR's Grand Challenges for Disaster Reduction. OFCM is committed to working with SDR to provide a forum for information sharing, development of collaborative opportunities, and interactive dialogue with the U.S. policy community to advance informed strategies for managing risks associated with natural and technological disasters.

AMERICAN METEOROLOGICAL SOCIETY

The OFCM supports AMS endeavors by participating in AMS conferences and workshops and other environmental science education and outreach programs, including for example the January 2008, 88th AMS Annual Meeting in New Orleans, Louisiana. As part of the annual meeting, OFCM cosponsored the Forum on Education in Data Assimilation. The Federal Coordinator continues to serve as a member of the AMS Commission on the Weather and Climate Enterprise (CWCE).

INTERNATIONAL COLLABORATION

At the invitation of the U.S. Embassy in Austria, the Federal Coordinator for Meteorology provided a keynote address on Weather Information for Surface Transportation (WIST) at the European conference on Safety in Mobility, held in Velden, Austria,

in July 2008. In addition, the Federal Coordinator made a presentation at the Intelligent Transportation Systems World Congress held in New York City from 16-20 November 2008.

PUBLICATIONS

The following publications were prepared in hard copy and/or have been placed on OFCM's Web site (www.ofcm.gov) during FY 2008:

- The Federal Plan for Meteorological Services and Supporting Research-Fiscal Year 2008
- National Hurricane Operations Plan
- Impacts of NPOESS Nunn-McCurdy Certification and Potential Loss of ACE Spacecraft Solar Wind Data on National Space Environmental Monitoring Capabilities (For Official Use Only)
- Federal Meteorological Handbook No. 11 - Doppler Radar Meteorological Observations (WSR-88D) Part A - System Concepts, Responsibilities, and Procedures
- MPAR Service Improvement Assessment
- DRAFT -- National Post-Storm Data Acquisition Plan
- DRAFT -- National Severe Local Storms Operations Plan
- DRAFT -- Federal Lightning Capability Requirements

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