

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 AND STAFFING OF THE OFFICE OF THE FEDERAL COORDINATOR FOR METEOROLOGY

The mission of the OFCM is to ensure the effective use of federal meteorological resources by leading the systematic coordination of operational weather requirements and services, and supporting research, among the federal agencies. To discharge its mission, OFCM has meshed its objectives with the objectives of the agencies that provide the services and perform the research.

These objectives 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 requirements.

- 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.

DOC currently has ten positions assigned to OFCM. DOC also provides administrative support to OFCM and approximately one-half of OFCM's annual operating budget. The Department of Defense (DOD) currently provides two senior staff officers--one Air Force and one Navy--and contributes approximately one-fourth of the annual operating budget. The Department of Transportation (DOT) Federal Aviation Administration (FAA) provides one professional staff member and also provides approximately one-fourth of the annual operating budget. These three agency representatives are designated Assistant Federal Coordinators for liaison to their respective agencies. In all, 13 meteorologists, oceanographers, physical scientists, and administrative and computer-support personnel are assigned to the OFCM staff.

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 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 Chair.

The 15 federal agencies that engage in meteorological activities or have a need for meteorological services are represented on FCMSSR. The FCMSSR membership includes: DOC, DOD, DOT, the Departments of Agriculture (USDA), Energy (DOE), Interior (DOI), and State (DOS), and the Environmental Protection Agency

(EPA), Federal Emergency Management Agency (FEMA), National Aeronautics and Space Administration (NASA), National Science Foundation (NSF), National Transportation Safety Board (NTSB), Nuclear Regulatory Commission (NRC), the Office of Science and Technology Policy (OSTP), and the Office of Management and Budget (OMB).

HIGHLIGHTS FOR FISCAL YEAR 2001 AND PLANS FOR FISCAL YEAR 2002

NATURAL DISASTER REDUCTION

55th Interdepartmental Hurricane Conference (IHC) (March 5-9, 2001).

OFCM annually hosts the Interdepartmental Hurricane Conference 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 program in the future. The 55th IHC was held in Orlando, Florida. The theme for the conference was *Landfalling Hurricanes-A Major Challenge for Operations and Research in the 21st Century*. The conference was attended by over 210 people -- a new record, representing twelve federal agencies, the academic community, local emergency management, and the weather media. Special sessions were conducted on transitioning research to operations and the Hurricane Landfall component of the United States Weather Research Program (USWRP). The major outcome of the IHC was identification of the need for a sustainable, formalized approach to transition successful research results into the operational environment, which the OFCM will

pursue through its Committee for Cooperative Research. In May, OFCM published the 39th edition of the *National Hurricane Operations Plan*, which details responsibilities of federal agencies; operations and procedures; products; aircraft, satellite, radar, and buoy data collection; and marine weather broadcasts.

National Hurricane Conference (April 9-13, 2001). OFCM sponsored a three-hour session attended by more than 200 individuals at the 2001 National Hurricane Conference with the theme *Toward a Safer America: Making the Nation More Resilient to Hurricanes*. The session included two distinguished panels which addressed managing the public's vulnerabilities and consequences through risk assessment and management, and improving hurricane preparedness and response through new communications technology and enhancing public outreach and education.

Post-Storm Data Acquisition. The OFCM-sponsored Working Group for Natural Disaster Reduction/Post-Storm Data Acquisition coordinated efforts to examine the devastation that resulted from the tornado outbreak in the Tallahassee Florida area (northern Florida and southern Georgia) in mid-March 2001, and to examine flooding,

ice jams, and levies in the area of the Red River near Grand Forks, North Dakota, in early April 2001. Aerial photographic support was provided by the Air Force's Civil Air Patrol (CAP). The CAP support, negotiated by the working group and documented in a memorandum of understanding, has proven to be both timely and very cost effective.

Severe Local Storms Operations. In May 2001, the OFCM-sponsored Joint Action Group for Severe Local Storms Operations published the *National Severe Local Storms Operations Plan*. The plan outlines the responsibilities of the various United States federal agencies that provide meteorological services in observing, forecasting, and warning of severe local storms. It also defines meteorological terms used by the agencies preparing severe local storms forecasts and warnings; identifies differing operational warning criteria and procedures; and discusses communications, observations, and some public release aspects of severe storms warnings.

TRANSITION ISSUES

The Federal Committee for Meteorological Services and Supporting Research (FCMSSR) met on November 14, 2000, in the Herbert C. Hoover Building, Washington,

District of Columbia, to focus on issues that were relevant to the transition team for the next administration. The meeting was very successful and was attended by thirteen of the FCMSSR agencies. A white paper identifying and describing transition issues was prepared subsequent to the meeting and provided to the agencies for use in interactions with the transition team. Areas and issues identified were: (1) The Next Step Beyond Modernization (fully implement observational program; continue evolution of National Weather Service (NWS) systems); (2) Climate Services (implement global climate ocean observing systems; upgrade national computational capabilities); (3) Comprehensive Strategy for Emergency Management (support FEMA's *Project Impact*; support the Global Disaster Information Network; communicate rainfall and flooding information better); (4) Landfalling Hurricanes (improve hurricane track and intensity forecasts; follow and report on hurricanes after landfall); (5) Transportation (enhance weather information dissemination for aviation; improve accuracy of convective forecasts for aviation; improve road weather information); and (6) Strategy for Atmospheric Information (develop a strategy for atmospheric information; improve communication of weather and climate information).

ANNUAL FEDERAL PLAN

OFCM prepared *The Federal Plan for Meteorological Services and Supporting Research -- Fiscal Year 2002*. 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 duplication among the agencies. It is a comprehensive publication that documents proposed programs for Fiscal Year 2002 and reviews agency

programs in Fiscal Year 2001. The Plan demonstrates to the Congress and to the Executive Branch how the agencies work together to accomplish their missions in an effective and efficient manner.

WEATHER INFORMATION FOR SURFACE TRANSPORTATION

OFCM has continued its extensive involvement in the area of Weather Information for Surface Transportation (WIST). The OFCM and United States Department of Transportation - Federal Highway Administration (USDOT-FHWA) co-sponsored Symposium on Weather Information for Surface Transportation, *Preparing for the Future: Improved Weather Information for Decision-Makers* was held December 4-6, 2000, in Rockville, Maryland. The symposium was attended by more than 100 individuals who were a cross-section of the transportation and weather communities (federal, state, and city governments, urban and rural transportation agencies, professional and trade organizations, and government and commercial weather service providers). Eight overarching areas of concern were identified and five specific action items were highlighted as needing priority for continued progress. The bottom line is that improvements in surface transportation weather support will result in safer and more efficient operations by all users.

OFCM also made substantial progress in preparation of a document addressing meteorological requirements for the six core modes of surface transportation: roadway, railway, transit, waterway, pipeline, and airport ground operations. This activity has included formation of a joint action group to address meteorological requirements for surface transportation; questionnaires; surveys; WIST symposia conducted jointly with the Federal Highway Administration; meetings with railroad, pipeline, and

emergency managers; and participation on panels concerning public-private partnerships in transportation and Intelligent Transportation Systems. The requirements document will be a culmination of intensive OFCM efforts in this area and is expected to be published in November 2001.

AVIATION WEATHER

OFCM completed its analysis of agency and industry programs/projects identified as meeting the needs and concerns contained in the January 1999 *National Aviation Weather Initiatives* document. A significant enabler in the process was the OFCM-sponsored July 2000 Aviation Weather User Forum. The forum provided an opportunity for open dialog between program managers as well as the users and providers of aviation weather information. The forum also played a significant role in completing the *National Aviation Weather Initiatives Tier 3 (Service Design)/Tier 4 (Budgets and Schedules) Baseline Report* which was issued in April 2001, a first-ever achievement for all government. The report was a major contribution toward establishing a baseline for ongoing and planned research and development for each initiative (requirements and products). The report will serve as a vehicle for transitioning research results into operations. Of the 86 initiatives, only ten have no agency identified as satisfying a particular need or concern. The next step will focus on key issues and actions identified during the Aviation Weather User Forum. One such issue is the need for improved aviation weather training and, in that regard, OFCM will take a leadership role in coordinating the establishment of a National Training Program. Another issue deals with establishing, validating, and prioritizing requirements. Now that we have established a baseline, the Joint Action Group for Aviation Weather will revisit the initiatives to determine if they continue to

represent the priorities for aviation safety and efficiency. Consideration will also be given as to how best to meet the requirements for the ten initiatives identified that are not now being addressed by agencies or industry. OFCM is also continuing efforts concerning volcanic ash and expects to publish *A National Framework for Volcanic Ash Hazards to Aviation during FY 2002*.

WIND CHILL TEMPERATURE INDEX

Under the leadership of OFCM's federal coordinating infrastructure, United States federal agencies, Canadian participants, and the academic research community have taken an important step towards improving the Wind Chill Temperature (WCT) Index. The new WCT Index will provide the citizens of the United States and Canada better protection of life and property. The current wind chill index attempts to measure the rate of heat loss by the human body as wind blows across it at different temperatures and speeds. The index was developed in the 1940s during an Antarctic expedition, and is now known to overestimate the effect of wind by at least ten degrees. This overestimate gives a false sense of security and people are sometimes not aware or prepared for the danger of severe winter weather. OFCM led the improvement effort by creating a Joint Action Group for Temperature Indices within its federal coordinating infrastructure, and this Joint Action Group pulled together the various United States, Canadian, and academic entities to develop the new WCT Index based on 21st Century science. Funding for the development of the new WCT Index was provided by OFCM, the United States Army's Cold Region Research and Engineering Laboratory, and the Defence Research and Development Canada. NOAA's NWS, the United States Air Force, and the Meteorological Service of Canada

will implement the new WCT Index during the winter season of 2001-2002. This new WCT Index will be a substantial improvement over the current practice and will be based on a human face model, use wind speed calculated at the average height of an adult's face, incorporate modern heat transfer theory, lower the walking speed threshold used in calm wind situations, and use a consistent standard for skin tissue resistance. Later refinements will include adjustments for solar radiation for a variety of conditions.

SPACE WEATHER

Space weather refers to conditions on the Sun and in the solar wind, magnetosphere, ionosphere, and thermosphere that can influence the performance and reliability of space-borne and ground-based technological systems, and can endanger human life or health. Space weather storms can cause disruption of satellites, communications, navigation, and electric power distribution grids. The overarching goal of the National Space Weather Program (NSWP), which is managed by an OFCM program council, is to achieve an active, synergistic, interagency system to provide timely, accurate, and reliable space weather warnings, observations, specifications, and forecasts within the next ten years. The *NSWP Strategic Plan* and *Implementation Plans* provide, respectively, broad guidance and a detailed roadmap for the Program. The Committee for Space Weather (CSW) recently established the Community Coordinated Modeling Center (CCMC), with a mission to prepare the next generation of space weather models for transition to operations through the operational centers' rapid prototyping centers. During FY 2001, the fledgling CCMC transferred its first model to the Department of Commerce's Space Environment Center (SEC). The magnetohydrodynamic version of the Magnetospheric

Specification Model will significantly improve the SEC's ability to predict the future state of the magnetosphere based on solar wind inputs. Nearing completion is work on coupling this model with a radiation belt model. During 2002, the CCMC will focus on ionospheric and heliospheric models and coupling ionospheric and magnetospheric models. In addition, the highly successful competition for space weather research grants, sponsored and administered by the National Science Foundation (NSF), will continue in 2002 with a modest increase in funding.

STRATEGY FOR PROVIDING ATMOSPHERIC INFORMATION

OFCM is planning a forum to respond to the agency priorities and to address Leadership and Management Recommendation 1 of the National Research Council/National Academy of Sciences Board on Atmospheric Sciences and Climate (BASC) report *The Atmospheric Sciences Entering the Twenty-First Century*, which states: "*The Federal Coordinator for Meteorological Services and Supporting Research should lead a thorough examination of the issues that arise as the national system for providing atmospheric information becomes more distributed. Key federal organizations, the private sector, academe, and professional organizations should all be represented in such a study and should help develop a strategic plan.*" The Federal Coordinator began this effort by drafting a concept development paper which was provided to thirty agencies and individuals for feedback. The objective was defined to "Plan and promote the effective and efficient availability and distribution of atmospheric information that meets the requirements of all agencies (operational and research)." Major issues were identified to include: roles and responsibilities of the public and private sectors;

availability of data (data receipt and distribution) and archival capabilities; health of the meteorological infrastructure; international commitments for free and open data exchange; and role of academic research, both basic and applied. The methodology would examine major issues in climate, natural hazards, technological hazards, urban meteorology and air quality, ecosystem management and agriculture, and aviation and surface transportation. The forum will be conducted in early December 2001.

UNITED STATES WEATHER RESEARCH PROGRAM

The USWRP mission is to accelerate forecast improvements of high-impact weather and facilitate full use of advanced weather information. The USWRP's vision is to mitigate the effects of weather-induced disasters; reduce the costs associated with routinely disruptive weather; create opportunities for increased productivity through better weather information; and assist the military in the accomplishment of its mission. The current USWRP team includes NOAA as the lead agency, NSF, National Aeronautics and Space Administration, and the United States Navy. The Federal Coordinator has taken steps to contact additional agencies to broaden federal participation in the USWRP in accordance with an action from the Interdepartmental Committee for Meteorological Services and Supporting Research, direction from the Chairman of the Federal Committee for Meteorological Services and Supporting Research, and also recommendation from the National Academy of Sciences/National Research Council Board on Atmospheric Sciences and Climate (BASC). OFCM hosted meetings on expanded agency participation in the USWRP on May 11 and August 24, 2001. The additional agencies included Federal Aviation

Administration, FHWA, USAF, DOE, USDA, and FEMA. These meetings have led to more interaction directly between the leadership of the USWRP and interested agencies to discuss, in more detail, agency specific needs which may be benefited by the program. It is expected that several additional federal participants will join the USWRP and that the USWRP priorities will be expanded to address their needs.

COMMITTEE ON ENVIRONMENT AND NATURAL RESOURCES

OFCM and the Committee on Environment and Natural Resources (CENR) Subcommittee on Natural Disaster Reduction (SNDR) cosponsored the Forum on Risk Management and Assessments of Natural Hazards February 5-6, 2001. The forum theme was *Toward a Safer America: Building Natural Hazard Resistant Communities through Risk Management and Assessments*. It was attended by an unprecedented cross-section of more than 120 weather, natural disaster and risk management professionals, and academia. Consensus was reached to proceed with a national natural hazard assessment and to develop an action plan which would deal with the assessment in manageable pieces. It was also agreed to integrate efforts with the Congressional Natural Hazards Caucus; develop improved partnerships between users and developers; standardize terminology, methodology, and approach within risk assessment and management; compile available risk assessment tools and models; and improve public outreach, education, and training.

AMERICAN METEOROLOGICAL SOCIETY

During FY 2001, OFCM joined nine leading environmental science and service corporations in supporting undergraduate scholarships in the

atmospheric and related oceanic and hydrologic sciences. The scholarships, awarded for the junior and senior years, are designed to encourage outstanding undergraduates to pursue careers in the fields covered by the awards. OFCM plans to continue this support in FY 2002. OFCM also supports American Meteorological Society endeavors by participating in AMS conferences and workshops and other environmental science education and outreach programs.

PUBLICATIONS AND OFCM'S WEBSITE

The following plans and publications were prepared in hardcopy form and also placed on OFCM's website (www.ofcm.gov):

- *The Federal Plan for Meteorological Services and Supporting Research -- Fiscal Year 2001*
- *National Hurricane Operations Plan*
- *55th Interdepartmental Hurricane Conference (Minutes)*
- *Proceedings for the Symposium Weather Information for Surface Transportation, Preparing for the Future: Improved Weather Information for Decision-Makers*
- *Proceedings of the Forum on Risk Management and Assessments of Natural Hazards*
- *National Severe Local Storms Operations Plan*
- *National Aviation Weather Initiatives Tier 3 (Service Design)/Tier 4 (Budgets and Schedules) Baseline Report*

The following documents are planned for publication during FY 2002:

- *The Federal Plan for Meteorological Services and Supporting Research -- Fiscal Year 2002*
- *National Hurricane Operations Plan*
- *56th Interdepartmental Hurricane Conference (Minutes)*

- *Weather Information for Surface Transportation (WIST) Requirements*
- *Proceedings for Workshop on BASC 21st Century Report Recommendation -- A Strategy for Atmospheric Information*
- *National Plan for Post-Storm Data Acquisition*

- *A National Framework for Volcanic Ash Hazards to Aviation*
- During FY 2001, OFCM continued to make substantial progress on its use of the Internet. In addition to information about the office, OFCM has placed its current publications on its website, and keeps the website current

with information regarding workshops and symposia being conducted by the office. OFCM will continue to make information available on the Internet during FY 2002.

Table A.1 Current OFCM Publications

<u>Publication Title</u>	<u>Date</u>	<u>Number</u>
<i>Federal Plan for Meteorological Services and Supporting Research, Fiscal Year 2001</i>	June 2000	FCM-P1-2000
National Plan for Space Environment Services and Supporting Research: 1993-1997	August 1993	FCM-P10-1993
<i>National Severe Local Storms Operations Plan</i>	May 2001	FCM-P11-2001
<i>National Hurricane Operations Plan</i>	May 2001	FCM-P12-2001
<i>National Winter Storms Operations Plan</i>	November 2000	FCM-P13-2000
<i>Federal Plan for Cooperative Support and Backup Among Operational Processing Centers</i>	May 1996	FCM-P14-1996
National Plan for Stratospheric Monitoring, 1988-1997	July 1989	FCM-P17-1989
National Aircraft Icing Technology Plan	April 1986	FCM-P20-1986
National Plan to Improve Aircraft Icing Forecasts	July 1986	FCM-P21-1986
Federal Plan for the Coordination of Automated Weather Information System Programs	May 1988	FCM-P23-1988
Federal Plan for Meteorological Information Management	July 1991	FCM-P24-1991
<i>National Plan for Tropical Cyclone Research and Reconnaissance (1997-2002)</i>	January 1997	FCM-P25-1997
National Aviation Weather Program Plan	September 1992	FCM-P27-1992
National Geostationary Operational Environmental Satellite (GOES) Data Collection System (DCS) Operations Plan	August 1997	FCM-P28-1997
Federal Plan for Marine Environmental Data, Services, and Supporting Research	June 1996	FCM-P29-1996
<i>The National Space Weather Program: Strategic Plan</i>	August 1995	FCM-P30-1995
<i>The National Space Weather Program: Implementation Plan - 2nd Edition</i>	July 2000	FCM-P31-2000
<i>National Aviation Weather Strategic Plan</i>	April 1997	FCM-P32-1997
<i>National Aviation Weather Initiatives</i>	February 1999	FCM-P34-1999
<i>National Aviation Weather Initiatives, Final Baseline Tier 3 and 4 Report</i>	April 2000	
<i>Federal Meteorological Handbook No. 1 - Surface Weather Observations and Reports</i>	December 1995	FCM-H1-1995
Federal Meteorological Handbook No. 2 - Surface Synoptic Codes	December 1988	FCM-H2-1988
Surface Synoptic Code Tables (Update)	July 1990	FCM-T1-1990

Table A.1 Current OFCM Publications (cont.)

<u>Publication Title</u>	<u>Date</u>	<u>Number</u>
<i>Federal Meteorological Handbook No. 3 - Rawinsonde and Pibal Observations</i>	May 1997	FCM-H3-1997
Federal Meteorological Handbook No. 10 - Meteorological Rocket Observations	December 1988	FCM-H10-1988
Federal Meteorological Handbook No. 11 - Doppler Radar Meteorological Observations		
Part A - System Concepts, Responsibilities and Procedures	June 1991	FCM-H11A-1991
Part B - Doppler Radar Theory and Meteorology	June 1990	FCM-H11B-1990
Part C - WSR-88D Products and Algorithms	February 1991	FCM-H11C-1991
Part D - WSR-88D Unit Description and Operational Analysis	April 1992	FCM-H11D-1992
<i>Federal Meteorological Handbook No. 12 - United States Meteorological Codes and Coding Practices</i>	December 1998	FCM-H12-1998
<i>Directory of Atmospheric Transport and Diffusion Consequence Assessment Models</i>	March 1999	FCM-I3-1999
<i>Federal Directory of Mobile Meteorological Equipment and Capabilities</i>	December 1995	FCM-I5-1995
<i>A Guide to WMO Code Form FM 94 BUFR</i>	March 1995	FCM-I6-1995
Tropical Cyclone Studies	December 1988	FCM-R11-1988
Tropical Cyclone Studies Supplement	August 1989	FCM-R11-1988S
<i>Interdepartmental Meteorological Data Exchange System Report, IMDES</i>	August 1998	FCM-R12-1998
Federal Meteorological Requirements 2000	October 1990	FCM-R13-1990
<i>U.S. Wind Profiler: A Review</i>	March 1998	FCM-R14-1998
Standard Formats for Weather Data Exchange Among Automated Weather Information Systems	November 1994	FCM-S2-1994
Standard Telecommunication Procedures for Weather Data Exchange (under revision)	October 1991	FCM-S3-1991
<i>Federal Standard for Siting Meteorological Sensors at Airports</i>	August 1994	FCM-S4-1994
54th Interdepartmental Hurricane Conference (Minutes)	May 2000	
<i>Proceedings of the Workshop on Multiscale Atmospheric Dispersion Modeling within the Federal Community</i>	June 2000	
<i>Proceedings of the Aviation Weather User Forum--Aviation Weather: Opportunities for Implementation</i>	July 2000	
<i>Proceedings for the Weather Information for Surface Transportation: Delivering Improved Safety and Efficiency for Tomorrow Symposium</i>	February 2000	
<i>Proceedings of the Symposium on the Weather Information for Surface Transportation -- Preparing for the Future: Improved Weather Information for Decision Makers</i>	March 2001	
<i>Proceedings of the Forum on Risk Management and Assessment of Natural Hazards</i>	July 2001	

Italics = publication available online at www.ofcm.gov