

AWARE

SPRING/SUMMER 1993

NATIONAL WEATHER SERVICE / *Warning Coordination and Hazard Awareness Report*

PARTNERSHIPS

With the change in administration has come a renewed interest in the environment and our stewardship of it. The National Oceanic and Atmospheric Administration (NOAA) senior management is reviewing all of the Agency's operations to assess how we can best meet our mission as the Nation's premier earth science agency regarding the oceans and the atmosphere.

This renewed commitment to our environment and a desire to improve response to natural and technological hazards extends across all involved Federal agencies. To seize upon this initiative, agencies and departments are forming partnerships with like-minded organizations in order to leverage precious resources and get things done that they could not accomplish on their own.

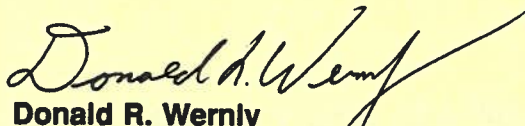
This issue of the AWARE Report has a section devoted to the partnerships that NOAA and the National Weather Service (NWS) are becoming involved in at this time. It is exciting to see so many opportunities developing not only with other Federal agencies but with local government, non-profit organizations, and the private sector as well.

On June 1, 1993, James Lee Witt, the new Director of the Federal Emergency Management Agency (FEMA), met with Mr. Douglas Hall, NOAA's Deputy Administrator, and Dr. Joe Friday, Assistant Administrator for Weather Services, to assess how FEMA and NOAA could re-energize our relationship and create a national emergency partnership with appropriate members of the hazards community.

Concerning the private sector, the NWS has signed a Memorandum of Agreement (MOA) with the Weather Radio Network (WRN) and the Boat Owners Association of the United States (BOAT/US) to make coastal NOAA Weather Radio (NWR) broadcasts available on 900 numbers. Similarly, a Memorandum of Understanding (MOU) has been implemented with REACT International, Inc., a voluntary emergency communications organization, to relay life-saving information.

This past June, the Warning and Forecast Branch conducted a National Warning Coordination/Preparedness Meteorologist Conference in Miami, Florida. The major theme of this Conference was the role of the new Warning Coordination Meteorologists in the modernized Weather Service. These are the people who will forge consortiums and partnerships at the local level to enhance the delivery of service to all users in a Weather Forecast Office's (WFO) area of responsibility.

Increased support from our new leadership offers tremendous opportunities for our ability to prepare and respond to natural and technological hazards. The building of viable partnerships will ensure that the promise becomes a reality.


Donald R. Wernly
Chief, Warning and Forecast Branch

J.S. DEPARTMENT OF COMMERCE • National Oceanic and Atmospheric Administration

AWARE Report is an administrative document, issued by the National Oceanic and Atmospheric Administration, for the information and use of the agency and the natural hazard community.



Table of Contents

Partnerships	3
Modernization	8
Operations and Services	12
International Decade for Natural Disaster Reduction	15
Hazard Awareness Program	17
Hazards Community Forum	19
Hazardous Weather Awareness Weeks	23
Publications and Audiovisuals	24
Statistics	25
Attachment A: Locations of Automatic Local Flood Warning Systems in the United States 1992	A-1
Attachment B: Public Education Material Availability and Ordering Information	B-1
Attachment C: NWS Publications	C-1
Attachment D: AWARE Report Roster	D-1
Attachment E: 53-Year List of Severe Weather Fatalities	E-1

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PARTNERSHIPS

FEMA/NOAA/NWS Initiative—*Ed Gross, Chief, Constituent Affairs and Industrial Meteorology*

On June 1, 1993, Dr. Joe Friday, Assistant Administrator for Weather Services, along with Mr. Douglas Hall, Deputy Administrator, NOAA, and members of their staffs met with Mr. James Lee Witt, Director, FEMA, and his staff to discuss each agency's role and responsibilities. Director Witt's plans focus on five priorities:

1. *Development of an effective disaster response and recovery program.*
 2. *Developing a comprehensive risk-based all hazard emergency management system.*
 3. *Creating a national emergency partnership with other Federal agencies, state and local government, and the private sector.*
 4. *Establishing mitigation as foundation of the Nation's emergency management system.*
 5. *Strengthen state and local emergency management capabilities.*
- ▶ NOAA strongly supports these priorities and is committed to establishing a strong national emergency partnership with FEMA and state and local governments.
 - ▶ NOAA and FEMA have an existing Memorandum of Understanding (MOU) to coordinate emergency related responsibilities. This year's review of the MOU changes will be made to reflect the strengthening of the FEMA/NOAA/NWS partnership.
 - ▶ Director Witt, a former State Director of Emergency Management in Arkansas, has asked the NWS to work with FEMA to immediately help improve our Nation's warning dissemination capabilities.
 - ▶ NOAA/NWS is developing a national approach to serving pre- and post-warning information and communications needs of the hazards community and the public. Three objectives identified:
 - a. *Improve and expand public warning communications capabilities.*
 - b. *Enhance statewide warning communications capabilities.*
 - c. *Ensure effective use of critical pre- and post-warning information by the hazards community and the public.*
 - ▶ Plans are underway to conduct a promotional campaign for NWR.
 - ▶ NWS is working to convert NWR and NOAA Weather Wire Service (NWS) into an all hazard service by incorporating earthquake, volcano, and landslide information along with current hydrometeorological information. This effort is being developed with the U.S. Geological Survey.
 - ▶ A joint training initiative between NOAA and FEMA is being developed.

It is truly evident that Director Witt's commitment to a comprehensive, all-hazards emergency management program, which includes mitigation, preparedness, response, and recovery, fits right in line with many of the mission responsibilities of NOAA.

Through this improved FEMA/NOAA partnership, it is planned to develop a FEMA/NOAA Task Force to develop a national approach to serving the warning and communications needs of the hazards community and the public. This task force will also include other interested Federal agencies.

The task force will assess existing capabilities of the Nation's Emergency Management Network. This would include:

- ▶ Conducting an inventory of existing and planned communications and informational access capabilities.
- ▶ Ensuring the effective use of critical warning information by the hazards community.
- ▶ Developing a plan to enhance statewide warning communications capabilities. This includes the automated exchange of critical text and graphical warning information within hazards community.

The task force will also examine ways of improving public access. This would include the following.

- ▶ Develop a plan to improve public access and receipt of critical hazard related information. This includes converting the NOAA/NWS dissemination capabilities into an all hazards warning system.
- ▶ FEMA/NOAA and other interested Federal agencies, along with the private sector, will develop a plan to encourage citizens to obtain NOAA Weather Radios for their homes.
- ▶ As a first step, FEMA/NOAA will develop a plan to ensure that every school, hospital, and nursing home in the country has a NOAA Weather Radio with automatic turn on capability.

The National Committee on Property Insurance recently endorsed the concept for the broad based use of weather radios and expressed their willingness to participate with NOAA and others in increasing the awareness and use of NOAA Weather Radio.

- ▶ Ensure that the FEMA/NOAA Memorandum of Understanding reflects these goals and other related activities needed to reduce community vulnerability to natural hazards.

NWS/Florida Division of Emergency Management Initiative—Dombrowsky

The state of Florida has embarked on a 5-year project that is intended to improve and coordinate the efforts of Florida's Division of Emergency Management (DEM) and the NWS. The initial goal of this program is to seek out ways of improving existing procedures and techniques for the communication of emergency information. As a first step, the state DEM will be working closely with Florida NWS officials in expanding the broadcast use of the NWR system. This initial step will be followed by stages of upgrading and expansion of both the NWR and NWWS networks within Florida.

The state of Florida and the NWS agree that access to NWR and NWWS networks across Florida is not adequate. As a first step, the state of Florida and the NWS are currently developing a new Memorandum Of Understanding (MOU) defining each agency's responsibility within the framework of a new plan for pre- and post-event emergency information distribution (EID).

This plan is meant to form the basis for the formulation of an all hazards EID system. The state of Florida, in concert with the NWS, are examining the possibility of testing the effectiveness of this plan by conducting a real-time demonstration later this year. If successful, a national prototype for a uniform EID system will have been realized.

It is hoped that the technical aspects of this proposed plan are resolved by late summer. It is hoped that this plan and the MOU are ready for presentation at a meeting of Florida NWS officials, state DEM, and local emergency management officials. At this meeting, state officials will brief NWS officials on the reorganization of the DEM. Officials will then meet to discuss the roles and responsibilities of each agency under this new partnership.

NWS/FEMA Joint Training Course Development Proposal—Adams/Dombrowsky

The NWS and FEMA are discussing jointly creating and conducting four training courses designed to meet the severe weather and flood hazard specific information needs of the emergency management community. The costs would be shared jointly by the NWS and FEMA over the next couple years.

The courses will incorporate many of the current independent field training activities conducted by WPMs, WCMs, and Meteorologists in Charge (MIC). These would be taught in each state as part of FEMA's field training course system. Annually, each state conducts a variety of emergency management training courses utilizing funding support from FEMA. The NWS would provide instructors, in the form of WCMs, WPMs, or Area Managers, as appropriate, to teach these courses.

The sequence of course development will be driven by resource requirements, availability of existing course materials, and budgetary requirements. Some of the materials already exist in some form in the NWS. Development would be guided by an advisory committee representing NWS, FEMA, and state and local emergency managers.

COURSES:

- ***Severe Weather and Flood Hazards*** — One-day field course designed to provide a basic scientific understanding of the specific atmospheric and hydrologic hazards faced by local communities within a state. Participants completing this training will be able to describe the nature and mechanics of the severe weather and flood hazards faced by their communities. Students will also be aware of the weather and flood forecast process and information available to local and state officials.
- ***Severe Weather and Flood Planning and Preparedness*** — One-day field course designed to provide a basic understanding of the unique requirements of severe weather and flood community preparedness. Students will be taught to conduct local hazard analysis of the unique threats posed by severe weather and floods in their communities. They will also be able to describe the critical planning and preparedness activities needed for severe weather and flood hazards. Class participants will be able to outline a proactive community severe weather and flood public education program.
- ***Severe Weather and Flood Warning Coordination*** — Two-day field course designed to provide an overview of the functions of an effective local severe weather and flood warning system. Students will be able to describe the roles and responsibilities of key Federal, state, and local agencies in flood and severe weather warning. Class participants will acquire knowledge on how the NWS and associated restructuring impacts emergency management. Students will be able to discuss the critical organizational elements for effective warning systems. Finally, students will be given information on options to facilitate enhanced community warning systems for severe weather and floods.
- ***Workshop in Emergency Management: Developing Spotter Networks for Severe Weather and Flooding*** — Four-hour workshop on how to develop and maintain spotter groups in support of the NWS public safety mission. Participants will learn the organization and functions of a spotter network as part of a local community warning system. They will be able to identify possible sources of spotters and spotter groups in local communities. Students will understand the training and exercise requirements for an effective spotter program.

NOAA Weather Radlo (NWR) Promotions--Update--Becker

The following activities are beginning to expand promotion of NWS products and NWR and eventually should propel NWR into the public's consciousness to a degree unprecedented in its history. In particular, Weather Radio Network (WRN) and its first "media partner," the Boat Owners Association of the United States (BOAT/U.S.), are constantly seeking innovative ways to further promote the network (and by extension, NWR!). Add to this the recently announced plan by Commerce Secretary Brown to, among other initiatives, expand cooperation between NOAA and FEMA to use NWR for broadcasts of critical disaster information.

- **NOAA/FEMA Initiative.** As discussed earlier in two related articles in this issue of "AWARE," an improved weather warning system for the state of Florida, including the provision of NWRs in all schools, hospitals, emergency management agencies, etc., and a nationwide initiative to use NWR to broadcast critical pre- and post-disaster information on such areas as food and shelter locations will have enormous impact in expanding the role of NWR. This initiative is in its earliest stages. We will inform you of its progress as details are worked out over the coming months.
- **Weather Radio Network (WRN).** Along with total United States coastal, Great Lakes, and selected inland NWR coverage, the WRN has added NWR stations Anchorage, Valdez, and Juneau, Alaska, and Honolulu, Hawaii, to bring the total to 73 in the nationwide network. WRN also includes the "Hurricane Hotline" for the Atlantic and Eastern Pacific as well as the WWV Time Reference Signal from Fort Collins, Colorado. Possibilities for the near future include a summary message of significant winter weather when the Hurricane Hotline is non-operative and expansion of the network to more inland NWR stations. WRN's number is "1-900-884-6622." If you want more information on the network, you may call WRN's free "1-800-662-6622" number. This 1-800 number also offers "voice capture" to allow a caller to leave a name and address and be sent NWR and WRN brochures and pricing on WRN's new pre-paid 1-800 subscription service that is a lower cost alternative to the normal 1-900 number. The subscription service has the added advantage of being usable from a cellular phone, pay phone, or any other phone where it may not be possible to use a 1-900 number.
- **The Boat Owners Association of the United States.** BOAT/U.S., the Nation's largest organization of recreational boaters with a membership base of 435,000 and readership that extends to several million, is also offering the nationwide NWR network service to the boating community through its own Weather Watch "1-900-933-BOAT" telephone number. Contact Dave Pivelait of BOAT/U.S. at (703) 461-2864 for more information.
- **American Telephone and Telegraph.** AT&T's national quarterly newsletter, "Multiquest," is devoted to describing innovative 1-900 telephone applications. The next issue will carry an article on the BOAT/U.S. Weather Watch weather-by-telephone service supplied to them by WRN.
- **Cable Television.** A syndicated half-hour TV program, "Boating Today...The TV Show," is produced by Sun Telepictures in selected east coast and Great Lakes cable TV markets. A 30-second TV commercial, aired twice during the broadcast, features the BOAT/U.S.-sponsored Weather Watch NWR telephone service.
- **Television Spots.** WRN has produced two 30-second and two 10-second promotional spots about the nationwide NWR network and the hurricane hotline, respectively. The spots will soon air in selected TV markets in coastal areas and when hurricanes threaten.
- **A.M. WEATHER.** A.M. WEATHER provides a 15-minute comprehensive weather broadcast each weekday morning on over 300 public television stations. It is a national program service of Maryland Public Television produced in cooperation with NOAA. A.M. WEATHER is considering the feasibility of becoming a media partner with WRN and broadcasting, on a time-available basis, brief promotional spots of the NWR network. We will let you know when further information is available.

REACT/NWS Memorandum of Understanding (MOU)—Alexander

A MOU has been implemented between REACT International, Inc., and the NWS. REACT is a volunteer emergency communications organization utilizing Citizens Band, Amateur Radio, General Mobile Radio, Marine Radio, and other frequencies to relay important potentially lifesaving information. The MOU with the NWS formalizes a mutual agreement to allow local REACT teams to work cooperatively with the NWS to enhance hazardous weather data gathering and distribution.

Copies of the signed MOU will be distributed to NWS warning offices through Regional Meteorological Services Divisions.

The following is a message from REACT:

Can your staff and volunteers summon help by radio in a personal or operational emergency? REACT urges you to make sure that they can. Someday lives may depend on it. Cellular telephones and other means of communication were of limited use in the disaster area immediately after Hurricane Hugo struck. REACT was founded in 1962 to aid travelers in distress on the Citizens Band radio emergency Channel 9. REACT has over 9,000 members and more than 630 teams across the United States. Their members are well trained in handling two-way communications in local emergencies or major disasters. REACT members handle emergency radio traffic daily so their skills are being utilized and rehearsed constantly.

REACT teams no longer communicate only on Citizens Band radio. Many teams use General Mobile Radio Service, Marine Radio Service, and Amateur Radio Service frequencies and maintain capabilities on any of these services. This makes them better prepared for their disaster communications role.

If your organization is not already planning to use REACT for communications support in emergencies, contact your local REACT team, or REACT International, Inc., Post Office Box 998, Wichita, Kansas, 67201, or telephone (316) 263-2100/FAX (316) 263-2118 for the name, address, and telephone number of a team in your area.

MODERNIZATION

Warning Coordination Meteorologist/Warning Preparedness Meteorologist (WCM/WPM) Conference—Alexander

The 1993 National WCM/WPM Conference was held at the Hyatt Regency Hotel in Miami, Florida, June 7-11. The main theme of the conference was the difference in responsibilities between the Warning Preparedness Meteorologist position and the expanded role of the Warning Coordination Meteorologist position. In essence, the WCM is the service representative for all users of NWS products in WFO's area of responsibility. The WCM must assess user requirements, define how the local office can meet those requirements, assist the users in making best use of the information, and review local office services to ensure that they meet the intended purpose and fulfill user expectations. Similarly, the WCM will be the individual charged with forging partnerships with various organizations and users. The development of these partnerships will be essential toward ensuring that common goals are reached, resources are used as effectively as possible, and that actions are conducted in a coordinated and consistent manner.

A major concern of each attendee was that this was too big of a job for any one person. It was pointed out that the WCM was expected to delegate work and manage the WFO staff to meet agreed upon objectives. The actual division of work would be the responsibility of the WFO management team made up of the MIC, the Science and Operations Officer (SOO), and the WCM. It was extremely exciting to note how enthusiastic field personnel were in the modernization and the opportunities it presents. This was so evident during the poster session when there was so much cross talk that the session was finally brought to a close 40 minutes late. Among the more pertinent issues brought out included the modernization (automation) of Storm Data, NIDS access and Special Subscribers, QPF and the RFC in the modernized environment, and WCM workload. From the week of talking came several important action items, many for Headquarters to address but those so indicated should be addressed at the Regional level. Some of those items include:

- Ensuring training for WCMs on all aspects of disaster surveys.
- Better definition on how to handle direct deaths versus indirect deaths.
- More guidance on verification of flash floods.
- Ensuring that Paradox Software is incorporated on AWIPS.
- Storm Data—use of dollar damage versus categories.
- Criteria for severe thunderstorms—should they be raised? (Regional)
- Bidding of WCM positions—should they be 13/14 or just 14?
- Universal Generic Codes in special weather statements (counties or zones?).
- Downsizing of zones in intermountain region. (Regional)
- Training for WCMs to cover WSEO (Weather Service Efficiency Officer) functions.
- Creation of new spotter video.
- Funds for local offices to print newsletters and other mailings in support of modernization. (Regional)
- Budget for video projectors for SKYWARN training. (Regional)
- Facilities issue on conduits and cable for spotter-based stations. (Regional)
- Resolve the issue of amateur radio tower heights for ARRL (Amateur Radio Relay League).
- Ensuring that the slide set by Dr. Scott Lillibridge, Centers for Disease Control, is made available to WCM/WPMs nationwide.

Zone Forecast Area Reconfiguration--Update--Becker

The Eastern, Southern, and Central Regions will reconfigure their zone forecast areas at 1200 Universal Coordinated Time (UTC) (8 AM EDT) on October 1, 1993. This includes all states mainly from the Rocky Mountains eastward. We sent this announcement to NWS employees, the NWS Employees Organization, and external users on June 2, 1993, through a Public Information Statement (PNS) on the AFOS (Automation of Field Operations and Services), the NOAA Weather Wire Service, and the Family of Services. On or about August 1, we will send national users and the regions and field offices computer generated forecast zone area maps, including lists of county/zone names, numbers, Universal Generic Codes (UGC) and other pertinent information. Field offices will send this information to local users. Eventually, this information will be incorporated into a revised Appendix A, "Zone Forecast Area Maps," to Weather Service Operations Manual (WSOM) Chapter C-11, "Zone and Local Forecasts," which will also be sent to national users.

The reconfiguration will use the "flexizone" or "building block" concept, where each county becomes a separate zone (some large or topographically diverse counties will be further subdivided into two or more zones). This "one county-one zone" concept will allow forecasters the necessary flexibility to group zones that more accurately depict the ongoing weather.

Each zone will be identified uniquely within each state by a plain language name (typically the county name or some other geographically recognizable name, if the zone is not coincident with the county) and number. The numbers will run sequentially generally from west to east and north to south, i.e., from 1 in the northwest part of the state to the highest number in the southeast part of the state. Some variation to this numbering scheme will occur because of non-standard state orientation. (The number will not use the Federal Information Processing Standard (FIPS) for the Eastern Region as reported in the Winter 1992/93 issue of "AWARE.") The zones will use the "Z" form of the UGC. See the June 2nd PNS for details, including information on the UGC for other affected NWS products.

The zone reconfiguration will affect the Local Forecast Product (LFP) program to some extent. LFPs will be retained in the Eastern and Central Regions at least through the early stages of the reconfiguration. In the Central Region, LFPs for several major metropolitan areas, which typically include several county-zones, will be retained, while LFPs for smaller cities, which are encompassed by one county-zone, will be eliminated. After experience is gained with the zone reconfiguration and user needs are identified, the regions, in coordination with the Office of Meteorology (OM), will decide whether further LFP eliminations should occur.

Pacific Region Headquarters Modernization Initiatives--Pierce

Due to the early WSR-88D delivery to Hawaii, I was invited to participate in the local Unit Radar Committee (URC) meeting in Honolulu to discuss WSR-88D operations. The URC wanted to learn as much as possible about tri-agency WSR-88D operations, including the problems encountered and solutions sought operating WSR-88Ds in the continental United States. The URC was provided with guidance to determine the best initial operating parameters, based upon the input we have received from the OSF, other URCs, and the procedures outlined in the Federal Meteorological Handbook (FMH) No. 11.

The Hawaii, Alaska, and Puerto Rico URCs are faced with a unique situation. The WSR-88Ds will be owned and maintained by the Federal Aviation Administration (FAA) but operated by the NWS. The FAA will install a Unit Control Position (UCP) in their office to accomplish maintenance. In order to operate the WSR-88D, the NWS is purchasing an additional UCP to be placed in the Weather Service Forecast Office (WSFO). A switching mechanism on the UCP will be needed to alternate between FAA maintenance activities and NWS operation. At the Honolulu URC meeting, it was suggested that a separate Memorandum of Agreement between the FAA and NWS be developed to explicitly define the agencies responsibilities for the Hawaii, Alaska, and Caribbean WSR-88Ds.

reductions on Guam in FY 95. With 85 percent of the civilian weather services provided by the Navy for Guam and Micronesia, the NWS may be faced with taking over some of these services. We will be working on this issue with Pacific Region Headquarters.

Quantitative Precipitation Forecast (QPF)—Pierce

The Hydrometeorological Information Working Group (HIWG) will be re-vitalized to develop an implementation strategy and track the progress of regional programs for the production of QPF in the modernized NWS. I will be the focal point in OM for this effort. Each regional headquarters will have a representative on the HIWG. OM and the Office of Hydrology are working with the regions to identify these individuals. We will attempt to move quickly since this is an important effort in the modernization, and there are many issues that must be resolved.

Working Group for Doppler Radar Meteorological Observations (WGDRMO)—Pierce

Under the Office of the Federal Coordinator for Meteorology and Supporting Research, Committee for Basic Services, the WGDRMO was tasked with the development of FMH No. 11. The document contains policies and procedures for operation of the WSR-88D by the Departments of Commerce, Defense, and Transportation. The FMH No. 11 has been well received and provides policy regarding such items as default parameters for adaptation data, the change authority for these parameters, and specifies the products routinely generated to dial-in users.

With the field experience gained using the WSR-88D, it is apparent that minor changes to the FMH No. 11 are needed. One area that needs updating is the adaptable parameters designated for Program Management Committee change authority. As a result, we are in the process of designating new members to the WGDRMO. I will represent NWS and vote for the Agency on matters brought forth to the Committee. A meeting of the WGDRMO will be held late August to discuss these changes and future activities.

WSR-88D Generation and Distribution Control—Pierce

Two new products have been added to the WSR-88D Generation and Distribution Control List from all WSR-88Ds: the lowest two elevation angles of Storm Relative Mean Radial Velocity--Map, and the lowest elevation angle of Base Reflectivity, 1.1 nautical mile. This means that these products are valid dial-in requests from a Principal User Processor (PUP).

Dial-in users of the Storm Relative Mean Radial Velocity Map must keep in mind that they will receive the product with the default storm motion subtracted out as computed by the WSR-88D. You will not be receiving the same product a forecaster would if he/she subtracts out a different storm motion from an associated PUP.

WSR-88D Radar Coded Message (RCM)—Pierce

Work continues at the National Severe Storms Forecast Center (NSSFC) to ingest RCM data from the WSR-88Ds, nationally composite the data, edit the composite using an automated procedure, and produce radar observations and digitized radar data to be used to input into the current National Radar Summary Chart (NRSC). We have been working with NSSFC to ensure the necessary funding is provided to continue the software development and purchase the needed hardware to ingest the RCMs. Plans are that NSSFC will be able to conduct an operational assessment of their procedures early this fall. If successful, NWS will be able to continue producing radar observations and the NRSC products during the transition without elaborate radar backup procedures.

During our coordination with NSSFC, we found that Paramax had set default generation times of the RCM at H+15 and H+45. The problem this causes is that the H+15 observation is a little too early to use for integration with current observations taken around H+30, and the H+45 observation will be received at

NSSFC too late to be used in the NRSC. As a result, the field sites have been instructed to change the default generation times to H+20 and H+50.

Because the exact time of generation is dependent upon the completion of the volume scan, the H+20 RCM may actually be produced later. In addition, once the RCM is generated, there is a 2-minute time lag before it is available for distribution. Setting the generation time at H+20 and RCM Time Out to Edit adaptable parameters at 1 minute each (the minimum) should allow enough flexibility for all this to take place and still be received by NSSFC in a timely manner.

Archive II Request for Change—Pierce

The Office of Meteorology has initiated a Request for Change to purchase Archive II recording devices on NWS WSR-88Ds. We feel recording of the digital base data is important to enhancing the WSR-88D system and to ultimately regionalize or localize products and algorithms. A decision on this request is not expected until late this year.

Tri-agency Committee Meets to Prioritize Changes to the WSR-88D—Pierce

Delivery of the WSR-88Ds are up to four per month now! These systems are being delivered with software build 6.0 and the MicroV CPUs and VME hardware. Except for software build 7.0, which will be developed and installed by Paramax for the WSR-88D redundant systems, new software builds will be coming from the Operational Support Facility (OSF) in the future. As a result of this, I recently attended a tri-agency meeting in Norman, Oklahoma, to review and prioritize changes to the WSR-88D for new releases. Approximately 40 changes or corrections were targeted by the committee to be made in the first release by the OSF. The schedule for this release has not been determined.

I was impressed with people sent to represent the various WSR-88D user agencies. I found, as I often do in the NEXRAD program, that while the missions of the agency's are different, our operational needs and requirements are very similar. As a result, it was not difficult to reach tri-agency agreement on the priority with which these changes and corrections will be made.

NEXRAD Information Dissemination Service (NIDS)—Pierce

The Offices of Meteorology and Hydrology will be reviewing applications from organizations requesting special subscriber status and providing recommendations to the Assistant Administrator for Weather Services for final decision. When the applications have been reviewed by the Office of Systems Operations (OSO) for completeness, they will be provided to OM and the Office of Hydrology for review. We plan to review the applications approximately every 3 to 4 months, based on applications received and the upcoming WSR-88Ds expected for commissioning. We hope to move quickly on these reviews and ensure timely decisions are made. Through OSO, we will try to keep an applicant informed about the status of their request. Please bear with us for any delays as we spin up this process.

OPERATIONS AND SERVICES

Growth in Automated Local Flood Warning Systems—*Eugene A. Stallings, Office of Hydrology*

Flash floods can and do occur at any hour of the day or night often with little or no warning. Historical flood information indicates that these devastating events occur just about everywhere in the United States. One non-structural method of mitigating these events has been the installation and operation of automated local flood warning systems. These systems rely on radio as the communication medium to transmit rainfall/streamflow data from remote locations to NWS offices and Emergency Management Centers. This information not only serves to trigger some flash flood warnings but helps to augment radar observations and gives officials and the public additional information that shortens warning lead time and triggers the movement of people out of harms way.

All of the automated local flood warning systems operate in the VHF/UHF radio band 169-171 MHz and 406-412 MHz allocated by the U.S. Government for hydrologic data collection and relay purposes. The NWS Office of Hydrology serves as the standing chair of the interagency Hydrologic Radio Frequency Coordination Group and maintains record files on all systems in the country that operate on these frequencies in the United States.

There are literally hundreds of communities subject to flash flooding which cannot be adequately served by the usual flood warning service. The majority of these communities are located in the headwaters of streams where the flood peak occurs only minutes to a few hours after the occurrence of intense rainfall. The establishment of cooperative community automated flash flood warning systems has been one successful solution that helps minimize the loss of life and property from such events. The number of these automated systems has grown from a little more than 300 in 1990 to over 500 at the end of 1992 (see attachment A).

The NWS has had the responsibility to issue the Nation's public river and flood warnings and forecasts since it was mandated by a congressional act of 1890. This act, called the Organic Act of 1890, established the agency now known as the National Weather Service. The NWS now issues river forecasts for some 3,000 points nationwide.

WSOM Chapter F-42, Storm Data and Related Reports—*Alexander*

WSOM Chapter F-42 is waiting on the Paradox Runtime 4.0 Storm Data software. Also, a few clarifications are being integrated into the text regarding direct versus indirect weather related fatalities. After much discussion over the subject at the WCM/WPM Conference in June, no clear consensus was established. The chapter will specify that if the weather phenomenon itself caused the fatality, it is direct. If the weather phenomenon caused an intermediary condition that brought on the fatality, it is indirect. Examples of **indirect** fatalities include those associated with automobiles (in an ice storm, dense fog, etc.). Tentatively, an effective way to record the fatality may be either to include it in the header strip with an asterisk, the asterisk meaning that the data is to be used with discretion, or to include the fatality only in the narrative. We will keep you posted.

Emergency Broadcast System (EBS) Upgrade--Update—*Becker*

The Federal Communications Commission (FCC) is in the process of determining the nationwide system upgrade for the EBS. A final report, including results of extensive tests of various enhanced emergency alerting systems for the proposed EBS upgrade, will be submitted to test participants (including the NWS) for review in the fall with final decisions expected in the spring of 1994. The FCC's goal is to begin the year-long phaseover to the upgraded system beginning in July of 1994 with the nationwide upgrade in place by late 1995.

To satisfy the FCC's rigorous requirements, two test sites were chosen: Denver, Colorado, June 27-30; and Baltimore, Maryland, to be held September 12-15, 1993. In Denver, originators of the test signals were the State Emergency Operations Center, the Denver WSFO, and Teller County "Mobile Van." Test recipients included two television stations, one cable television facility, and two FM and two AM radio stations. Equipment and/or delivery systems tested included NOAA Weather Radio Specific Area Message Encoder (WRSAME) and other "in-band" systems very similar to WRSAME, Radio Data Broadcast System (RDBS) using FM subcarrier satellite, state microwave, telephone, and CATV. Nineteen separate tests were conducted through the 4-day period. Other changes the FCC was examining: allowing each broadcast station to determine its level of automation and which types of emergencies it wants automated; shortening the EBS two-tone alert to eight seconds; requiring built-in silent testing capability and on-air monthly operational area tests; and reducing emergency warning time to the public by directly turning on and off radio and televisions.

At the conclusion of the tests in Denver, the FCC held a major press luncheon on June 30. Attendees included participants from the origination sites, broadcast stations, cable systems, manufactures, observers and certain members of the press. Manufacturers presented brief talks. All test participants were invited to submit a Statement of Record within 10 days of the tests. Similar protocols will be in place for the Baltimore tests.

Arlene—First Tropical Storm of the 1993 Season—*Southern Region Headquarters*

Satellite imagery indicated that a tropical depression had formed over the southwestern Gulf of Mexico by 10 pm CDT, Thursday, June 17, 1993. By 7 am, Saturday, June 19, with 40 mph winds, the disturbance became Tropical Storm Arlene. Arlene moved slowly west-northwest. Little change in intensity was forecast. Landfall occurred around 7 am, Sunday, June 20, about 50 miles south of Corpus Christi. The main threat from this storm was heavy rainfall with 5- to 10-inch forecast. However, in northeast Texas, nearly 20 inches fell in the Henderson, Texas (Rusk County), throughout south and east Texas and portions of Louisiana. Some flooding damage was also noted west and north of Brownsville, in the Houston area, and around Shreveport, Louisiana. Winds were mostly 20-30 mph with gusts to near 40. Tides were 4-5 feet which resulted in coastal flooding but caused little damage. No tornadoes were reported. Crop damage may be high in south Texas. The event was handled very well by all offices involved. The SRH Hurricane Watch Office was opened to coordinate the deployment of any needed additional personnel to coastal offices, handle problems that arose, and quality control public releases.

Update on WSOM Chapters—Berger

WSOM CHAPTERS

STATUS

C-01, Basic/Public Weather Service Program

A draft will be sent out for review this fall or winter. Approval expected next winter or spring.

Appendix A, Zone Forecast Area Maps, to C-11, Zone and Local Forecasts

Revised Appendix will be issued in October 1993 for zone reconfiguration.

C-12, 6- to 10-Day, 30-Day, and 90-Day Outlooks

A second (and final) draft has been reviewed. Approval is expected this fall.

Operations Manual Letter (OML) to C-21, Local and Regional Statements, Summaries, and Tables

The OML on short-term forecasts was approved and distributed last March.

C-40, Severe Local Storm Warnings

This chapter is undergoing some final modifications before a full-scale second draft circulation in the field by late summer. Some of the recent inclusions are new examples in accordance with new concepts of information management and flow, and the development of a standardized format for the Local Storm Report (LSR).

C-41, Hurricane Warnings

This chapter was approved and distributed in June, at the beginning of the 1993 hurricane season.

C-45, Meteorological Discussions and Coordination

A second draft has been reviewed. Approval is expected this fall.

C-47, County Warning Areas

Approval expected by fall, in time for expected WSR-88D commissionings. Necessary updates of county warning area changes will continue to be sent as needed by letter, NWWS, and the Family of Services.

OML to C-49, Warning Coordination and Hazard Awareness Program

An OML will be issued this fall to update section 6, Coordination During Transition to a Modernized NWS, and section 7.2, Non-NWS Material Requests.

F-42, Storm Data

A second draft for review is awaiting the final version of PARADOX software, expected to arrive late this summer. However, implementation is not expected until January 1994.



INTERNATIONAL DECADE FOR NATURAL DISASTER REDUCTION

Federal Government Activities in the International Decade for Natural Disaster Reduction—Ed Gross, Chief, Constituent Affairs and Industrial Meteorology

The Subcommittee for Natural Disaster Reduction (SNDR) comprised of 15 Federal Government agencies involved in various aspects related to hazard mitigation released a document titled "Reducing the Impacts of Natural Hazards—A Strategy for the Nation" in May of 1992. It presented a balanced research and application approach while identifying gaps and needs to reduce community vulnerability to natural hazards. Today the SNDR is involved in three specific activities:

1. Conducting an inventory of Federal Hazard Mitigation programs.

The inventory is an essential first step in improving programs while helping to define needs for additional activities and identifying linkages between Federal, state, and local governments, private and academic sectors, and international partners.

2. Developing plans for a United States Natural Disaster Reduction Program (USNDRP) and the identification of natural disaster reduction priorities.

A review of the inventory in relation to the identified gaps and needs revealed the following themes for the USNDRP.

- o Increase knowledge of causes and effects of natural hazards and means for reducing impacts.
- o Improve natural hazard warning system.
- o Improve public awareness of and capacity to respond to natural hazards.
- o Prepare or complete assessments of community vulnerability.
- o Prepare a complete preparedness plan for high risk areas.
- o Promote long term mitigation measures through adoption of land use policies and building practices.
- o Assist developing countries in reducing loss from and in preventing natural hazards.

The themes connected to community level action plans would focus the USNDRP in the following areas:

Natural Disaster Research; Coordination; Communications; Information Systems and Technology Bases; Education Outreach; Public Policy Options; International Activities.

3. Working with the National Academy of Sciences Board in natural disaster in preparation for the World Conference on Natural Disaster Reduction to be held in Yokohama, Japan, May 23-27, 1994.

International Day for Natural Disaster Reduction—G. O. P. Obasi, Secretary-General, World Meteorological Organization (WMO)

The International Day for Natural Disaster Reduction will be observed on Wednesday, October 13, 1993, under the theme "Stop Disasters: Focus on Schools and Hospitals." The major objective behind the theme is to promote:

- (a) The undertaking of measures which will reduce the vulnerability of schools and hospitals to disaster; and
- (b) The use of schools as focal points for training in disaster preparedness and prevention.

The experience of countries which have been exposed to earthquakes, tropical cyclones, floods, and other sudden on-set disasters strongly indicates that it is of great importance to reduce the vulnerability of health facilities to disasters so that they will continue to be operational during and in the aftermath of disasters, thus maintaining their capacity to continue services for existing patients and victims of disasters and avoiding the need for evacuation.

The large number of occupants which schools accommodate on any school day and the significant amount of resources required each year for the maintenance of schools, particularly in areas which are affected by seasonal cyclones, also make the construction and maintenance of disaster-resistant school buildings a priority issue. On the other hand, if properly designed and constructed, their size makes them ideal centers for shelter and protection for all community members during disaster events.

The theme for the observance of the International Day for Natural Disaster Reduction thus provides an opportunity for mobilizing the support of the community in the introduction or reactivation of design and construction techniques and other disaster response capacities which will make hospitals and schools safe against disaster.

The second and related opportunity which the theme provides is the promotion of the concept of disaster preparedness and prevention in schools and among school age children. The introduction of sessions on disaster preparedness and prevention in school curricula, emergency drills, and other practical actions related to disaster preparedness and prevention are some of the activities which can be planned at national level in relation to the type of disaster which prevails in each country or locality.

My purpose in writing is to encourage all national Meteorological and Hydrological Services to participate actively in the observance of the International Day for Natural Disaster Reduction on Wednesday, October 13, 1993, and to do so in collaboration with National Committees for the International Decade for Natural Disaster Reduction (IDNDR) where these have been established.

World Meteorological Organization (WMO) Disaster Preparedness Booklet—Adams/Dombrowsky

The International Decade for Disaster Reduction has brought attention to issues and activities meteorologists can address to better prepare their countries for the inevitable disasters caused by hazardous weather. This represents an effort by the NWS on behalf of the WMO to provide an introduction to disaster preparedness for meteorologists and hydrologists of all countries. It is our hope that this will motivate our international colleagues to become more active partners in their Nation's disaster preparedness efforts. Meteorologists and hydrologists must become leaders in their countries in building active emergency preparedness partnerships with the other agencies with a disaster preparedness or response function. They are seen as the scientific experts for hazardous weather events. As such, they must educate others as to the hazards and risks, help develop mitigation efforts, facilitate preparedness programs, and provide accurate and timely prediction and detection capabilities for the disaster response team.

A draft of this booklet will be circulated to the regions and office directors for comments. It is scheduled to be sent to the WMO in the fall.

HAZARD AWARENESS PROGRAM

Lightning Deaths May be Underreported—*Ron Holle, National Severe Storms Laboratory, Norman, Oklahoma*

A recent study headed by scientists Raul Lopez and Ronald Holle of NOAA's National Severe Storms Laboratory found that the number of deaths caused annually in the United States by lightning, averaging 83, may be underreported by nearly 30 percent. Additionally, injuries caused by lightning are underestimated by more than 40 percent. They were assisted by colleagues from the Denver WSFO and St. Anthony Hospital Lightning Data Center, also in Denver. The group analyzed lightning death and injury statistics for Colorado from a variety of sources.

The findings underscore a need for more effective lightning safety educational efforts and community awareness of lightning danger. Even using understated mortality figures, lightning causes more deaths annually than do tornadoes and hurricanes together. Except for flash floods, lightning kills more people in the United States on the average than any other meteorological phenomenon.

Update on New Publications—*Kremkau*

Below are some of the projects the detailed WPM's have been working on this spring. You'll realize that this is an aggressive and ambitious effort on our part, but with patience and understanding and funding, we hope to provide you with the fruits of our labor.

- **Roger Stairs**, Lead Forecaster, WSFO Pittsburgh, Pennsylvania, ventured to Weather Service Headquarters in June to continue work on the flash flood/flood slide set and presenter's guide. With the current flooding along the Mississippi River, it is our goal to obtain slides from this most recent flooding event to incorporate into this new slide presentation. Because of this effort, the project will probably take several more weeks to finalize. If you know of a flash flood or flood slide that would fit well into the slide set, please notify Linda Kremkau of the Warning and Forecast Branch (301) 713-0090. We would greatly appreciate your help. We are now looking into the fall for delivery of this flash flood/flood package.
- **Bill Bunting**, WCM, WSO Pleasant Hill, Missouri, will be devoting the last week of July at Weather Service Headquarters to develop the "Thunderstorms and Lightning" brochure (NOAA PA 92053). This publication, unfortunately, was delayed in getting off the ground. He and Todd Heitkamp, WPM, WSFO Denver, outlined a draft of the brochure earlier this spring, and now Bill will spend time completing a first draft for region and field review next month. Delivery of printed copies at the earliest will be sometime early next year.
- **Nick Leivers**, WPM, WSFO Los Angeles, California, submitted a draft of the revised SKYWARN Spotter ID card last spring. Nick was able to get feedback on his first attempt from Alan Fisher (MIC/CWSU Aurora, IL), Todd Heitkamp (WPM/WSFO Denver), Barbara McNaught (WCM, WSFO Washington, DC), and Steve Schurr (WCM/WFO Wichita). After their comments were included, Nick sent OM the package. At this time, the regions are taking their first look at it. It appears that a final product will be available sometime late fall.
- Also this spring, **Mary Jo Parker** (WPM, WSFO Columbia, SC) met with Max Mayfield at the National Hurricane Center to start on the new hurricane brochure. Mary Jo is scheduled to spend 1 week the latter part of August to continue working on this package. The regions and field staff should see a first cut by fall 1993. Our goal is to have a finished product in time for the 1994 hurricane season.

Editor's note: Below is an abstract of Ron Murphy and Brian Peters' paper which will be sent in its entirety to the regions for distribution to each WCM, WPM, or focal point.

Most preparedness information dealing with weather safety is distributed to state agencies, schools, special interest groups, and the media. Rarely does the information go directly to the public whom the NWS deals with on a daily basis. The information becomes subject to modification and change and may not always be attributed to the original source. At WSFO Birmingham, we have reached at least part of the public directly through the use of computer bulletin board systems, or BBSs. This method is not intended to replace the usual means of information distribution. However, with computers becoming common place in many homes, this is another means that the NWS can use to place weather safety information directly in the hands of the people we serve.

This paper provides a step by step guide on the distribution of preparedness files to bulletin board systems. The paper also includes ways to obtain additional information about BBSs, the final format of the preparedness file, and an example of an initial logon to a bulletin board system.

In summary, several BBSs were chosen from local and state list acquired from a bulletin board system in the Birmingham area. Each of the chosen BBSs were logged onto with the use of NWS registered communications software program called Procomm Plus. After the initial BBS user questions were answered, the operators of the bulletin board systems, or SYSOPs, were left an electronic message asking for their cooperation in the further distribution of the file to other BBSs across their local area. Various preparedness files, concerning severe thunderstorms, tornadoes, hurricane awareness, and winter weather, were then transmitted or uploaded to each of the BBSs throughout the year. After the passage of the preparedness campaign, each SYSOP cooperating with WSFO Birmingham was contacted for feedback about the preparedness information or any questions from their users concerning the file. In addition, a questionnaire was included with the preparedness file so that readers could respond to the file's content and manner of distribution either via mail carrier or electronically.

HAZARDS COMMUNITY FORUM

Progress of the Hearing Impaired Weather Warning Project—*Beverly Poole, MIC WSO Cincinnati, Ohio*

Interest in the Weather Warning Project for the Hearing Impaired Population, piloted from successes encountered through the assistance of the Cincinnati Weather Service Office, is expanding according to MIC Beverly Poole and Colonel Rodney Jackson, Founder of the Project. Private sector interest has been overwhelming, including such recognized major corporations as:

- * Marathon Oil, located in 19 states
- * Super X/Hook's Pharmacy, located in 22 states
- * Long John Silvers Restaurant Chain
- * Skyline Chili Restaurants
- * Kentucky Fried Chicken
- * Yellow Cab Corporation
- * American Motorcycle Association
- * McDonalds
- * Greyhound Corporation

Participants in the program to date include: police agencies, fire departments, automobile dealerships, school districts, local pharmacies, night clubs, golf courses, hospitals, office building administrations, restaurants, banks, hair salons, and shopping malls. In addition, Dr. Sandy Eustis, representing Xavier University in Cincinnati, has come forward with major financial support.

In April 1993, Colonel Jackson presented the Weather Warning Project for the Hearing Impaired, featuring the Universal Weather Emergency Flag at the Annual Fire Instructors Conference in Cincinnati, Ohio. The conference hosted over 10,000 participants, many of which were international fire officials. The response to the program was very positive—equal to that received at the International Association of Chiefs of Police Conference that was held in Michigan in the fall of 1992.

A poster session focusing on Special Populations and the Hearing Impaired Project was presented in Miami, Florida, in early June at the National WPM/WCM Conference. Beverly Poole and Colonel Jackson made many contacts among fellow NWS personnel to spread the word about the program.

The Cincinnati Northern Kentucky Police Association, which Colonel Jackson presides over as President, received a letter from Colonel Jack Skidmore, representing the U.S. Department of the Army. The letter served to inform Colonel Jackson that the military was in the process of adopting the Hearing Impaired Project of warning the deaf on their military bases through the use of the Universal Weather Warning Flag.

Surprisingly, Colonel Jackson has found that in his work to get the word out about an emergency preparedness program that was designed to serve the deaf community, interest lies well anchored within the hearing community as well. Anyone wanting further information on the Hearing Impaired Project should contact Beverly Poole, MIC, WSO Cincinnati at (606) 292-3101 or Colonel Rodney Jackson at (513) 281-8623.

1993 East Coast Hurricane Liaison Tour—*Rocky Lopes, Disaster Services, American Red Cross National Headquarters*

I was privileged to join Dr. Robert Sheets, NHC Director, on this year's East Coast Hurricane Liaison Tour on May 16 to 20, 1993. We stopped in nine cities over 5 days, giving a presentation each morning and evening to crowds from 23 to 1,500. Primary transportation was provided on the NOAA Orion P-3 Hurricane Research Aircraft. What an adventure! The professional crew were both a pleasure to meet and quite well informed about the science behind hurricanes. At each tour stop, Dr. Sheets presented his

reflections about Hurricane Andrew, and what happens when hurricanes of this magnitude make landfall. It was enlightening to find out just how damaging wind can be in addition to storm surge.

I made a presentation at all but one site on what people need to do to prepare for hurricanes.

- ✓ Make plans NOW for what you will do if ordered to evacuate.
- ✓ Take steps to protect homes from wind damage by obtaining shutters or marine plywood to cover every window of the home.
- ✓ Assemble a Disaster Supplies Kit, containing essential supplies a family would need during and immediately after the storm—either if they evacuate or stay home;
- ✓ Create a Family Disaster Plan, reflecting decisions on four key steps of emergency preparedness for all types of disaster events.

FEMA and the American Red Cross have developed two brochures for the public that are available to you—"Your Family Disaster Plan" and "Your Family Disaster Supplies Kit."

Supplies of these brochures are available from FEMA or by contacting your local American Red Cross chapter. Get the brochures—help us help people know how to prepare! (See related article elsewhere in this report for information on how to get these brochures).

In addition to making public presentations, we also flew low along the east coast, looking at just how vulnerable we are to the effects of hurricanes. Dr. Sheets took over 3,600 slides of our coastline. Our country was very challenged in the fall of '92 by Andrew and previously by Hugo, not to mention other hurricanes and extratropical storms. But as Dr. Sheets states, we were "lucky" that Andrew tracked 20 miles south of Miami. Had it tracked just a little more north, we would have seen damage and destruction beyond comprehension. (This is not to diminish the pain and suffering that tens of thousands of people in south Dade are still recovering from.)

We need to get the word out—*GET READY NOW*. The probability of something happening this hurricane season is the same. Now is the time to get ready. The more prepared we are, the better we'll be able to cope with the potential effects of one of nature's most powerful storms.

WCM/WPM Conference, Miami, Florida—*Rocky Lopes, Disaster Services, American Red Cross National Headquarters*

Continuing to build relationships between the NWS and the American Red Cross is important to many of us. On June 7-11, the WCM/WPMs convened in Miami to learn more about the modernization of the NWS and their roles, including an important role in public education and preparedness.

My colleague from FEMA, Wayne Blanchard, and I presented information about the materials available from FEMA, the American Red Cross, and NOAA/NWS to educate the public and help them prepare ahead of time for a variety of disasters. In addition, I made a presentation about just what the public perceives about disasters and their own vulnerability.

Recognizing that people do not want to believe it can happen to them, there are a frightening number of people who are woefully unprepared for natural disasters. WPMs and WCMs spend countless hours attempting to change behavior so people will know how to prepare and how to respond.

I have a deep respect for your role and stand ready to guide you on the support your American Red Cross can bring to you. There are thousands of Red Cross paid and volunteer staff who are "out there" educating the public, too. Many of you are already working closely with your local Red Cross people. If you aren't, try giving your local Red Cross chapter a call. Ask for the Disaster Services department.

At the WCM/WPM Conference, we distributed copies of many of our public education items. Many people did not know the Red Cross and FEMA had so many different items available. I've included a handy "cross-reference" guide (see attachment B) that gives the title and stock numbers for items available for public education and awareness activities as well as ordering information. Most of the items are available

from multiple sources. Look over that list—there may be some items you may want to use the next time you venture into the public education arena!

I remind you that you should place orders for Red Cross products through your local Red Cross chapter. I don't have the resources to handle outside orders in my office. But if I can be of any other assistance, please call or write: Rocky Lopes, American Red Cross Disaster Services, National Headquarters, 615 N. St. Asaph Street, Alexandria, Virginia, 22314, (703) 838-8822.

The Best Way to Help Flood Victims—*Rocky Lopes, Disaster Services, American Red Cross National Headquarters*

Many people ask how they can help victims of floods and other natural disasters. In their haste to help, people often clean out closets and cupboards and send items that aren't really needed. In fact, we've heard that more than 100,000 tons of donated clothing to victims of Hurricane Andrew had to be buried in landfills because nobody wanted it.

Please remember, stores are usually open and have groceries and new clothing available in disaster-affected areas. When people can buy the items they want, that match their tastes and personal choices, it helps them recover better psychologically.

That's why the American Red Cross asks for financial contributions for disaster victims. All gifts to the American Red Cross are tax-deductible, and 100 percent of the gift is placed in a restricted account to be used to provide disaster relief assistance.

We appreciate that you want to help. To give a gift to the American Red Cross to help us help disaster victims, you may call (800) 842-2200, or send a check to your local Red Cross chapter earmarked "disaster relief." Or, you may send your check to: American Red Cross, P.O. Box 37243, Washington, DC, 20013. Thank you!

Another way to help flood victims, in particular, is to make sure that each of them gets the brochure, "After A Flood: The First Steps," which gives essential information on how to stay safe and where to get help immediately after a flood. And, for home owners who need advice on how to deal with the damage flooding brought to their homes, they should get a copy of "Repairing Your Flooded Home." (See related article elsewhere in this report for information on how to get these items).

We can be more effective together than we can be separately. Please help us get this important information to flood victims. They'll be glad you did, and both FEMA and the American Red Cross will appreciate your assistance!

Helping Children Cope with Disaster (Spanish Edition)—*Wayne Blanchard, Family Protection Program Manager, FEMA*

FEMA has available a new publication, **Helping Children Cope with Disaster** (Spanish edition). This is a 4-page, trifoldsize brochure produced by FEMA's Family Protection Program in cooperation with American Red Cross Disaster Services Community Disaster Education, which provided this Spanish translation. Presenting important information on how children respond to disaster, it also advises parents how to explain potential disaster hazards to their children and how to talk to them after a disaster has occurred. FEMA is distributing over 13,000 single copies to emergency management and fire services communities, and to national volunteer organizations active in disaster and response. As a FEMA-stocked item, the brochure can be obtained through the FEMA Printing and Publications ordering system. Use a FEMA Form 60-8 or write to FEMA, P.O. Box 70274, Washington, DC, 20024, requesting L-196S.

NWS Field Offices and Private Sector Initiatives—*Kremkau*

A note to the WCM/WPMs—take the time to write an article for the AWARE Report concerning your awareness activities, such as working with local community, the private sector, the media, etc., in developing new awareness materials or printing NWS brochures. Make use of this AWARE Report to gain

ideas and further expand your efforts. I encourage you to submit articles to your region, and they will, in turn, forward them to the Warning and Forecast Branch. Listed next are examples illustrating the WPM's successes with the private sector in promoting our hazard awareness program.

■ **Reproduction of NWS Brochures**—*Jim Allsopp, WCM, WSFO Chicago*

Over the last few years, the DuPage County Office of Emergency Management has been a strong supporter of the NWS's severe weather program. In early 1991, they established a communications hub to pass severe weather information between NWS and county and municipal governments in northeast Illinois.

The county also has its own print shop. They volunteered last year to print about 10,000 copies of each of the following NWS pamphlets: NOAA Weather Radio, Spotter's Guide, Tornado Safety, Thunderstorms and Lightning, and Tornado Safety Rules in Schools.

Having this large supply of pamphlets makes it easy for the NWS to promote severe weather safety at schools, businesses, scouts, and other civic groups. During this spring's Illinois tornado preparedness campaign, 1,100 of the tornado safety pamphlets were mailed out to the media. WSFO Chicago also provides extra copies to the other WSOs/WMSO in Illinois to support their public education and spotter training efforts.

Early this year, the new color pamphlet, "Tornadoes...Nature's Most Violent Storms" (NOAA PA 92052) was made available by NWS, Red Cross, and FEMA. Unfortunately, the NWS can only print a limited number of pamphlets, and they are high in demand. The DuPage County Office of Emergency Management stepped in again and volunteered to print 15,000 copies of the color pamphlets for the NWS.

Other NWS offices around the country should look for support from their county or state governments. The state of Illinois also has a print shop. They were willing to print several thousand of the new Winter Storms pamphlet for a statewide preparedness campaign last fall but were able to find the quantity they needed from the Red Cross. But they left me an open invitation to print any other preparedness materials I might need in the future. Large businesses in your area may also have printing facilities and may be willing to print pamphlets for you. Most of the negatives can be borrowed from the Warning and Forecast Branch.

■ **Cooperative Printing of Lightning Safety Wallet Card**—*Roger Lamoni, WPM, WSFO Reno, Nevada*

Several months ago, the local Reno CBS television affiliate (KTVN) began using real-time lightning detection graphics in their weathercasts. To help publicize their new graphics, they approached the NWS about developing a lightning safety brochure. After some discussion, we agreed that it would be most cost-effective to simply reprint the wallet card using the negatives available from WSH.

Over 2,000 copies of the wallet card were printed. As part of our agreement, WSFO Reno received 400 copies at no charge. Other than the addition of a small advertisement for KTVN's weathercasts and lightning detection graphics, the wallet card was unchanged. Rather than a screened one color printing, KTVN opted for a slightly more expensive two-color printing, with portions of the card highlighted in red and the rest in blue. This option added considerable visual impact to the card.

KTVN has already distributed several hundred of the wallet cards to viewers and at promotional events. KTVN's weathercasters will also make the cards available at school talks and luncheon speaking dates with community groups. Likewise, we will be distributing our copies of the wallet card at upcoming events, such as the Nevada State Fair and the Reno Air Races. As this wallet card would otherwise not be available, we feel this cooperative effort has been very successful. If just one life is saved, our work will have been well justified.

■ **Cable TV Initiative**—Stanley M. Levine, WPM WSFO Albany, New York

Over the past few months, I began building new relationships with the four cable television companies serving the Capital District of New York (including the cities of Albany, Schenectady, and Troy). I also contacted a cable TV company which serves Pittsfield, Massachusetts (Berkshire County). Specifically, I've spoken to general managers, program managers, and advertising managers. My goal was to introduce this growing segment of the media to the NWS's Warning Program, and to solicit their help in disseminating hazardous weather awareness information to their customers. With such a large percentage of households with cable television hookups, I thought that this might be a good way to reach out to the general public.

The results of my contacts have been rewarding. Four of five companies have been regularly showing NWS-produced Public Service Announcements (PSA) on winter storm warnings (featuring Willard Scott) during local commercial time segments. (Just like the relationship which exists between the "over the air" television networks and their affiliates, several "cable" television networks allow the local companies a certain amount of air time to run local commercials and announcements.)

In addition, all of the cable companies have run the NWS documentaries "Terrible Tuesday" and "The Awesome Power" on their local access channels. While local access channels are mandated by law, cable television companies are not necessarily required to broadcast any show submitted to them.

I obtained the video tapes from both the WSH Warning and Forecast Branch (in VHS format) and from the NOAA Public Affairs Office (in 3/4-inch video format). The 3/4-inch format is the preferred format among the cable companies because of the superior video quality. You can get more information on the videotapes from Jay Tebeau at NOAA Public Affairs Office (202-482-6090).

The people I have contacted at the cable television have been very friendly and cooperative. In the future, I'm hoping to work with them on additional projects. For instance, some cable TV companies have their own studios. I've been exploring the possibility of locally producing PSAs or shows dealing with severe weather or flood awareness. In fact, I've already appeared as a guest on the locally produced program "Talking Amateur Radio." Another project might be to have the company print hazardous weather awareness fliers to be used as envelope "stuffers" when the bills are sent out. Finally, probably the most important project would be to convince the companies to send severe weather and flood warnings over their all-channel override systems. With this system, cable viewers would receive potentially lifesaving weather information no matter which cable station they're watching.

HAZARDOUS WEATHER AWARENESS WEEKS

<u>State</u>	<u>Campaign</u>	<u>Date</u>
<u>Eastern Region</u>		
Virginia	Hurricane	July 18-24
North Carolina	Hurricane	July 4-10
Massachusetts	Hurricane	July 19-23
New Hampshire	Hurricane Seminar	August 4
<u>Southern Region</u>		
Alabama	Hurricane	Aug. 1-7
Puerto Rico	Hurricane/Flash Flood	Aug. 1-7
<u>Pacific Region</u>		
Hawaii	Hurricane	June 1993

PUBLICATIONS AND AUDIOVISUALS

Aviation Publications—Charlie Sprinkle, Aviation Services Branch

Several aviation related publications are now or soon will be available to order from NLSC in Kansas City, Missouri. The long anticipated *Key to ASOS/AWOS Observations* (NOAA PA 93057) and *ASOS Guide to Pilots* (NOAA PA 93058) have just arrived, but quantities are limited (25 per order). Copies for the FAA users should be obtained through FAA Headquarters. These pamphlets will be very meaningful for user education and technical coordination with ASOS (Automatic Surface Observing System) users. The Transition Program Office has initiated printing of an additional 100,000 copies of each publication.

About 100,000 copies of the revised *Key to Manual Aviation Weather Observations/Forecasts* (NOAA PA 93055) are now available from NLSC. In addition, the *Pilots Guide to Aviation Weather Services* (NOAA PA 93056) will be ready soon. These publications join the *Key to New International Aerodrome Forecast (TAF)* and *New Aviation Routine Weather Report (METAR)* (NOAA PA 93054).

(As a side note, these Aviation publications have been added to the list of "NWS Publications" shown on attachment C.)

Other NWS Hazard Awareness Materials—Kremkau

- May brought a new supply of "**Flash Floods and Floods...The Awesome Power**" (NOAA PA 92050) and "**Tornadoes...Nature's Most Violent Storms**" (NOAA PA 92052) to the Kansas City warehouse but found out that was short lived. All 50,000 copies of each of these brochures were depleted by the end of June. Because of the great demand for our in-depth brochures, the Office of Public Affairs assisted us with another printing of 75,000 copies of each of these two publications plus the **Winter Storms...The Deceptive Killers** (NOAA PA 91002). Copies should be available again by the end of August 1993.
- Also in May, the American Red Cross made available to the NWS 100,000 copies of their new "**Are You Ready for a Thunderstorm?**" pamphlet (NOAA PA 93051). In addition, 10,000 copies of the same brochure but in Spanish (NOAA PA 93052) were provided as well as 5,000 copies of the poster (NOAA PA 93053) which is in English and Spanish.
- The following NWS publications were printed this spring.

Spotter's Guide	NOAA PA 81011	100,000 copies
Watch Out, Storms Ahead	NOAA PA 82004	50,000 copies
Hurricane Tracking Chart (Atlantic)	NOAA PA 77020	50,000 copies
Hurricane! A Familiarization Booklet	NOAA PA 91001	30,000 copies
Advanced Spotter's Field Guide	NOAA PA 92055	10,000 copies

- The much awaited "**Hurricane Andrew Slide Presentation**" has been reproduced and packaged for distribution to the regions and their field offices. Of course, the coastal offices will receive the majority of the slide sets for their use, but all regions will receive at least one complete package. OM will maintain several sets for loan. The package consists of a box containing 111 slides and a printed script. The script summarizes the entire event for Florida and Louisiana.

Should you have any questions concerning these brochures and their availability, please contact Linda Kremkau or Rainer Dombrowsky at (301) 713-0090.

AWARE Report Roster—Kremkau

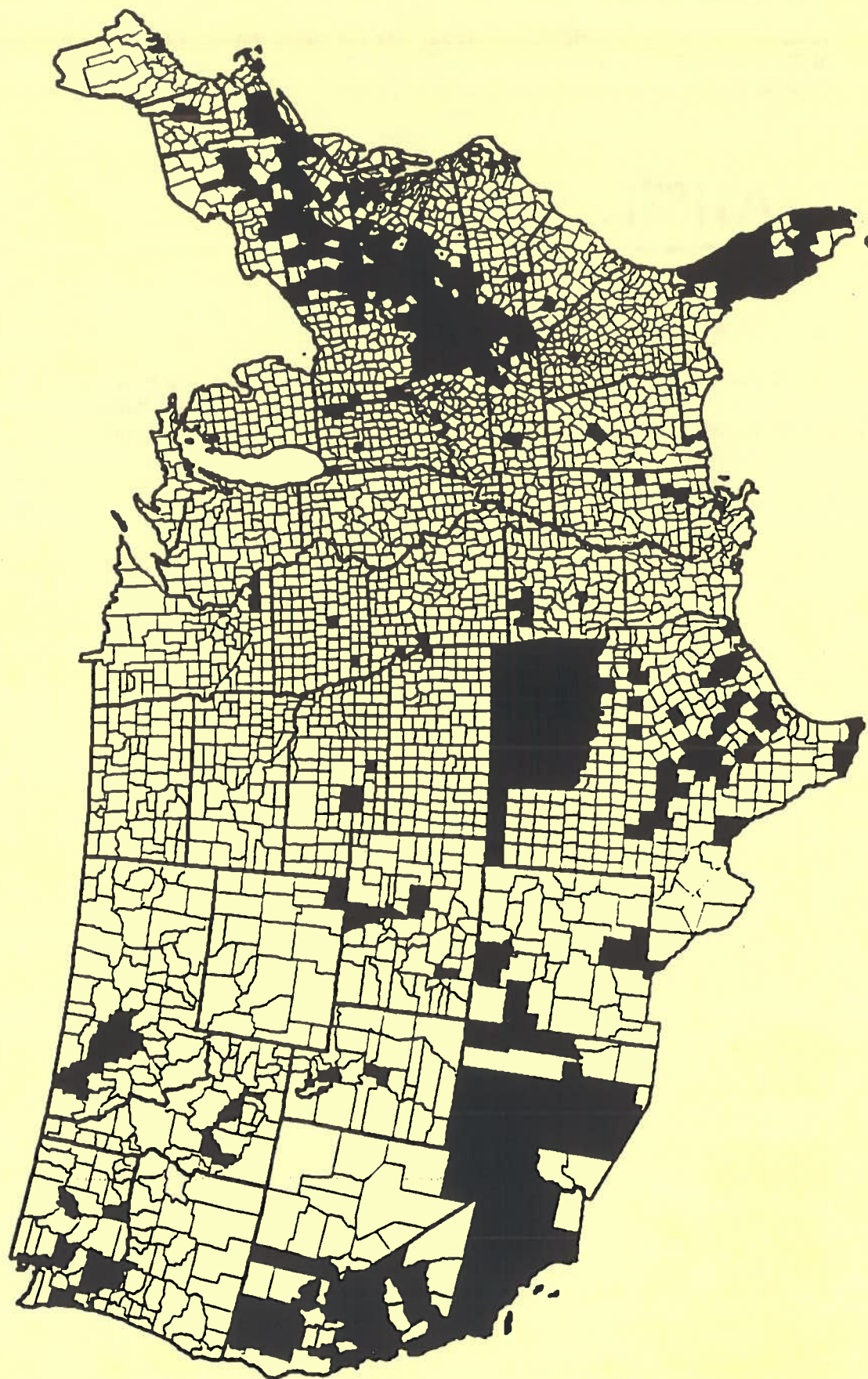
Attachment D is the AWARE Report Roster. Please review the list of telephone numbers, and notify me at 301-713-0090 if there are any changes. Also, if you know of someone who would like to be on the AWARE Report distribution list, please have him/her contact the Warning and Forecast Branch.

STATISTICS

Severe Weather Fatalities—Kremkau

The 53-year list of severe weather fatalities for lightning, tornadoes, floods/flash floods, and hurricanes is included as attachment E. Over the last 30 years, floods/flash floods have remained the number one killer, averaging 139 deaths annually. Flood/flash flood deaths have shown a significantly higher amount of deaths since the 70's because of the growing population living in flood-prone areas. Ranking second is lightning with 93 deaths annually. Looking at the list, the lightning deaths have diminished remarkably since the 40's primarily because of our hazard awareness and preparedness efforts.

Location of Automatic Local Flood Warning Systems in the United States 1992



Plans are currently underway to add automated local warning systems in many other counties.

Attachment B

PUBLIC EDUCATION MATERIAL AVAILABILITY AND ORDERING INFORMATION

<u>Title</u>	<u>Red Cross</u>	<u>FEMA</u>	<u>NOAA/NWS</u>
<i>Are You Ready for a Tornado?</i> <i>¿Está preparado para un tornado?</i> 2-pg, 4-color awareness-raising brochure (pk/25)	ARC 4457 ARC 4457S	N/A N/A	NOAA/PA 92057 NOAA/PA 92058
<i>Tornadoes...Nature's Most Violent Storm</i> 12-pg, 4-color in-depth brochure (pk/10)	ARC 5002	N/A	NOAA/PA 92052
<i>Are You Ready for a Tornado? (Poster)</i> English/Spanish (pk/5)	P-944	N/A	NOAA/PA 92061
<i>Are You Ready for a Flood?</i> <i>¿Está preparado para un inundación</i> <i>o para una inundación súbita?</i> 2-pg, 4-color awareness-raising brochure (pk/25)	ARC 4458 ARC 4458S	N/A N/A	NOAA/PA 92059 NOAA/PA 92060
<i>Flash Floods and Floods...the Awesome Power!</i> 12-pg, 4-color in-depth brochure (pk/10)	ARC 4493	N/A	NOAA/PA 92050
<i>Are You Ready for a Flood? (Poster)</i> English/Spanish (pk/5)	P-945	N/A	NOAA/PA 92062
<i>After a Flood--The First Steps</i> Brochure on immediate steps to take after being flooded (pk/25)	ARC 4476	L-198	N/A
<i>Repairing Your Flooded Home</i> 60-page booklet on how to perform simple home repairs after flooding. (pk/10)	ARC 4477	FEMA-234	N/A
<i>Are You Ready for a Winter Storm?</i> <i>¿Está preparado para una tormenta de invierno?</i> 2-pg, 4-color awareness-raising brochure (pk/25)	ARC 4464 ARC 4464S	N/A N/A	NOAA/PA 91003 NOAA/PA 91004
<i>Winter Storms...The Deceptive Killers</i> 12-pg, 4-color in-depth brochure (pk/10)	ARC 4467	N/A	NOAA/PA 91002
<i>Are You Ready for a Winter Storm? (Poster)</i> English/Spanish (pk/5)	P-947	N/A	NOAA/PA 91005
<i>Are You Ready for a Thunderstorm?</i> <i>¿Está preparado para una tormenta?</i> 2-pg, 4-color awareness-raising brochure (pk/25)	ARC 5009 ARC 5009S	N/A N/A	NOAA/PA 93051 NOAA/PA 93052
<i>Are You Ready for a Thunderstorm? (Poster)</i> English/Spanish (pk/5)	P-4001	N/A	NOAA/PA 93053
<i>Are You Ready for a Hurricane?</i> <i>¿Está preparado para un huracán?</i> 2-pg, 4-color awareness-raising brochure (pk/25)	ARC 4454 ARC 4454S	N/A N/A	N/A N/A
<i>Are You Ready for a Hurricane? (Poster)</i> English/Spanish (pk/5)	P-941	N/A	N/A
<i>Are You Ready for an Earthquake?</i> <i>¿Está preparado para un terremoto?</i> 2-pg, 4-color awareness-raising brochure (pk/25)	ARC 4455 ARC 4455S	N/A N/A	N/A N/A
<i>Are You Ready for an Earthquake? (Poster)</i> English/Spanish (pk/5)	P-942	N/A	N/A
<i>Earthquake! Do Something!</i> 8-page pictographic brochure, urban setting (pk/25)	ARC 5007	N/A	N/A
<i>Earthquake! Do Something!</i> 8-page pictographic brochure, rural setting (pk/25)	ARC 5006	N/A	N/A
<i>Earthquake! Do Something!</i> Pictographic poster (urban one side/rural other side) (pk/5)	P-4000	N/A	N/A
<i>Earthquake! Do Something!</i> Video [English] 13-minute videotape (each)	ARC 5004	N/A	N/A

ITEM	ARC NUMBER	FEMA	NO. COPIES
<i>Earthquake! Do Something!</i> Video [Spanish]	ARC 5003S	N/A	N/A
<i>Earthquake! Do Something!</i> [Multilanguage]	ARC 5005	N/A	N/A
One tape divided into five segments. Cantonese (Chinese), Mandarin (Chinese), Tagalog (Filipino), Vietnamese, and Korean.			
<i>Are You Ready for a Fire?</i>	ARC 4456	N/A	N/A
<i>¿Está preparado para un incendio?</i>	ARC 4456S	N/A	N/A
2-pg, 4-color awareness-raising brochure (pk/25)			
<i>Are You Ready for a Fire?</i> (Poster)	P-943	N/A	N/A
English/Spanish (pk/5)			
<i>Your Family Disaster Plan</i>	ARC 4466	L-191	N/A
<i>Su plan para el hogar en caso de desastres</i>	ARC 4466S	L-191(S)	N/A
4-pg, 3-color brochure on disaster planning (pk/25)			
<i>Your Family Disaster Supplies Kit</i>	ARC 4463	L-189	N/A
<i>Su equipo de suministros para la familia en caso de desastres</i>	ARC 4463S	L-189(S)	N/A
4-pg, 3-color brochure on supplies to have (pk/25)			
<i>Family Disaster Plan and Disaster Supplies Kit</i>	ARC 4498	N/A	N/A
2-segment video; 13 min. section on creating a family disaster plan; 8-min segment on assembling a Disaster Supplies Kit. (each)			
<i>Emergency Preparedness Checklist</i>	ARC 4471	L-154	N/A
<i>Lista de verificación</i>	ARC 4471S	L-154S	N/A
4-pg, 3-color brochure on home prep (pk/25)			
<i>A Checklist For People With Mobility Problems</i>	ARC 4497	L-194(M)	N/A
4-pg, 3-color brochure (pk/25)			
<i>Helping Children Cope With Disaster</i>	ARC 4499	L-196	N/A
4-pg, 3-color brochure (pk/25)			
<i>Wildfire—Are You Prepared?</i>	ARC 5020	L-203	N/A
4-pg, 3-color brochure on wildfire prep (pk/25)			
<i>Talking Points for Disaster Education Presentations—Hurricane, Earthquake, Residential Fire, Tornado, and Flood</i>	ARC 4461T	N/A	N/A
Set of 5 sample presentations (pk/10)			
<i>Natural Hazards Risk Profile: Hurricanes, Floods, Tornadoes, Lightning, Earthquakes</i>	ARC 4461P	N/A	N/A
Set of 5 speaker "backgrounders" (pk/10)			
<i>Safe Living In Your Manufactured Home</i>	ARC 4465	N/A	N/A
Brochure on tornado, flood, and fire safety for mobile home dwellers (pk/25)			
<i>Community Disaster Education Guide</i>	ARC 4331	N/A	N/A
98-page guide for creating a community disaster education plan (each)			
<i>Surviving the Cold</i> Video, 3/4" U-matic	321708	N/A	N/A
16-minute video on winter storm survival (Cost \$15.53) (each)			
<i>Surviving the Cold</i> Video, 1/2" VHS	321709	N/A	N/A
(Cost \$5.03) (each)			

AMERICAN RED CROSS ORDERING INFORMATION

All materials come in packages. It's important to order the number of packages you want, rather than the number of individual items. Place all orders through your local American Red Cross chapter, and specify the stock number as shown. Not all chapters have all items in stock, but the can order them for you. Unless otherwise specified, items are available at no charge. Local chapters are charged for shipping 30 days after receipt of the order. If placing a large order, it would be helpful to offer to pay shipping charges. Usual shipping time is less than two weeks from date of order.

FEMA ORDERING INFORMATION

Federal Emergency Management Agency (FEMA) produced items can be ordered through State Offices of Emergency Management and the respective FEMA Regional Office. Unlike the Red Cross, FEMA-stocked items do not come in packages—they are available in issue units of "each". Order the total number of items you want, rather than the number of "packages."

FEMA Regional Offices can order items using FEMA Form 60-8, which results in a more timely delivery. These items may also be obtained by writing: FEMA, Printing and Publications, P.O. Box 70274, Washington, DC 20024. Requests using this method may take 3 to 4 months or longer to be filled.

NWS Publications

July 1993

<u>NOAA PA</u>	<u>NAME</u>
70027	Survival in a Hurricane (Wallet Card)
74025	Tornado Safety Rules in Schools
76015	NOAA Weather Radio
77014	Flash Flood (Wallet Card)
77015	Flash Flood (Wallet Card) Inundaciones Repentinias (Spanish 77014)
77020	Hurricane Tracking Chart (Atlantic)
77021	Hurricane Tracking Chart (Eastern and Central Pacific)
78019	Storm Surge and Hurricane Safety with North Atlantic Tracking Chart
79017	Naming of Hurricanes
81011	Spotter's Guide for Identifying and Reporting Severe Local Storms
82002	Dust Storm Driving Safety (Wallet Card)
82004	Watch Out Storms Ahead
84001	Spotter ID Card
85001	Heat Wave
85002	Hawaiian Hurricane Safety Measures with Central Pacific Tracking Chart
85005	Tornado Safety Tips (Como Protegerse En Caso De Tornado) (WC)
85006	Survival in a Hurricane (Como Sobrevivir En Un Huracan) (Spanish 70027) (WC)
86001	Natural Hazard Watch & Warning Poster (English/Spanish)
91001	Hurricane! A Familiarization Booklet
91002	Winter Storms...The Deceptive Killers
91003	Red Cross - Are You Ready for a Winter Storm?
91004	Red Cross - Are You Ready for a Winter Storm? (Spanish Version)
91005	Red Cross Poster - Are You Ready for a Winter Storm? (English/Spanish)
92050	Flash Floods and Floods...The Awesome Power!
92051	SKYWARN Decal
92052	Tornadoes...Nature's Most Violent Storms
92053*	Thunderstorms and Lightning...The Underrated Killer!
92054	FEMA's Emergency Preparedness Materials Catalog
92055	Advanced Spotter's Field Guide
92056	Mariner's Guide to Marine Weather Services
92057	Red Cross - Are You Ready for a Tornado?
92058	Red Cross - Are You Ready for a Tornado? (Spanish)
92059	Red Cross - Are You Ready for a Flood or a Flash Flood?
92060	Red Cross - Are You Ready for a Flood or a Flash Flood? (Spanish)
92061	Red Cross Poster - Are You Ready for a Tornado? (English/Spanish)
92062	Red Cross Poster - Are You Ready for a Flood or a Flash Flood? (E/S)
92501	NOAA Brochure
93051	Are You Ready for a Thunderstorm?
93052	Are You Ready for a Thunderstorm? (Spanish)
93053	Are You Ready for a Thunderstorm? (Poster)
93054	Key to New International Aerodrome Forecast (TAF) and New Aviation Routine Weather Report (METAR) (Card)
93055	Key to Manual Weather Observations and Forecasts (Card)
93056**	A Pilot's Guide to Aviation Weather Services (replaces PA 71005) (Booklet)
93057	Key to ASOS (Automated Surface Observing System) Weather Observations (Card) and AWOS (Automated Weather Observing System) Observations (FAA Card)
93058	ASOS Guide for Pilots (Booklet)
93059*	A Change in the National Weather Service

* Available winter 1993/94.

** Available late summer 1993.

Please contact Linda Kremkau, WSH, (301) 713-0090, before placing orders with NLSC on any (*) publications.

Attachment D

AWARE Report Roster

SPRING/SUMMER 1993

NWS Headquarters Staff, W/OM11

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Bill Alexander	Mesoscale Meteorologist
Therese Pierce	Radar Hydrometeorologist
Rod Becker	Public Weather Meteorologist
Ron Berger	Dissemination Meteorologist
Chris Adams	Senior Social Scientist
Estella Speaks	Secretary
LaShone Darden	Office Automation Clerk
Kina Wallace	Student Aide
Tori Garten	Office Automation Clerk

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James Butch	Jackson (WPM)	601-965-4639
Vacant	Little Rock (WPM)	501-834-0308
Vacant	Lubbock (WCM)	806-743-7361
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Steve Schurr	Wichita (WCM)	316-942-3102
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Tim McClung	Salt Lake City (Focal)	801-524-5133
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David Goldstein	Anchorage (Focal)	907-271-5102
David Hefner/ John Lingaas	Fairbanks (Focal)	907-456-0247
Robert Mosley	Juneau (Focal)	907-586-7493
George Carte	Palmer (ATWC)	907-745-4212

Pacific Region

James Partain	Regional (WPM)	808-541-1671
Robert Larson	Hydrology (Focal)	808-836-1831
Thomas Heffner	Honolulu (Focal)	808-541-1698

NCDC - Storm Data

Lanny Dimmick	704-271-4458
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**Attachment E
53-Year List of Severe Weather Fatalities**

<u>Year</u>	<u>Lightning Deaths</u>	<u>Tornado Deaths</u>	<u>Flood Deaths</u>	<u>Hurricane Deaths</u>
1940	340	65	60	51
1941	388	53	47	10
1942	372	384	68	8
1943	432	58	107	16
1944	419	275	33	64
1945	268	210	91	7
1946	231	78	28	0
1947	338	313	55	53
1948	256	140	82	3
1949	249	212	48	4
1950	219	70	93	19
1951	248	34	51	0
1952	212	230	54	3
1953	145	515	40	2
1954	220	36	55	193
1955	181	126	302	218
1956	149	83	42	21
1957	180	191	82	395
1958	104	66	47	2
1959	183	58	25	24
1960	129	47	169	65
1961	149	51	93	46
1962	153	28	53	4
1963	165	31	41	11
1964	129	73	142	49
1965	149	296	188	75
1966	110	98	56	54
1967	88	114	53	18
1968	129	131	57	9
1969	131	66	445	256
1970	122	72	131	11
1971	122	156	68	8
1972	94	27	555	121
1973	124	87	178	5
1974	102	361	111	1
1975	91	60	127	4
1976	74	44	193	9
1977	98	43	210	0
1978	88	53	125	36
1979	63	83	121	22
1980	74	28	82	4
1981	66	24	84	0
1982	77	64	155	0
1983	77	34	204	22
1984	67	122	126	4
1985	74	93	166	30
1986	68	15	94	11
1987	88	59	70	0
1988	68	32	31	9
1989	67	50	85	38
1990	74	53	142	0
1991	73	39	61	19
1992	<u>41</u>	<u>39</u>	<u>62</u>	<u>27</u>
Total Since 1940	8358	5770	5888	2061
30-Yr. Average 1963-92	93	82	139	28

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