AWARE

WINTER 1991/92

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

Change, Change, and More Change

The last issue of the AWARE Report highlighted the incredible amount of activity here at Weather Service Headquarters (WSH) and the significant amount of changes affecting the Warning and Forecast Branch. Well, change has now become the rule. For starters, this January we lost two valued program leaders. Bill Read, our Mesoscale Meteorologist and Modernization focal point was named the Meteorologist in Charge of the Houston Weather Service Office (WSO). At about the same time, John Sokich, our Hurricane and Winter Storms Program Leader, was named to the personal staff of the Deputy Under Secretary for Oceans and Atmosphere.

With change, however, comes opportunity. Bill Alexander has been selected for the Mesoscale Meteorologist and Modernization focal point position and is due onboard March 16. He hails from Southern Region Headquarters where he has been splitting his time between regional warning preparedness duties and support to the Weather Service Forecast Office (WSFO) Norman Risk Reduction Project. The vacancy announcement for the Hurricane and Winter Storm Meteorologist position was bid in early February with a selection expected near the end of March.

The National Weather Service (NWS) modernization continues to advance as the forecast office in Norman, Oklahoma, has begun experimenting with using the WSR-88D to prepare a new product that takes the old radar narrative summary to a higher level by adding a short-term forecast. This is a precursor to the future Area Weather Update (AWU) that will become official once we learn more about our capabilities through tests at Norman and other early WSR-88D offices.

The coming of the AWU will bring further changes to how critical weather information is communicated to our users. As a result, this year will see updates to our warning chapters, such as those for hurricanes, winter storms, high winds, and severe local storms.

The tri-agency effort between the Federal Emergency Management Agency (FEMA), the American Red Cross, and the National Oceanic and Atmospheric Administration (NOAA)/NWS continues to bear fruit. Presently, a new in-depth awareness brochure on "Flash Floods and Floods" has been prepared and is receiving internal review by all three agencies. Additionally, we have targeted Bill Bunting at WSFO Norman and Rainer Dombrowsky from WSFO Minneapolis to develop the next hazard awareness packages for "Tornadoes" and "Thunderstorms and Lightning," respectively.

Although these are changing times, they are exciting times. We'll make every effort to bring the most important changes to your attention.

Donald R. Wernly
Chief, Warning and Forecast Branch

U.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.

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MODERNIZATION

Special Subscribers - *Pierce*

The NEXRAD Information Dissemination Service (NIDS) Implementation Plan outlines the criteria by which NIDS special subscriber status can be granted to individual organizations that meet specific requirements (those that provide direct support to NWS, universities and research organizations). Special subscriber status provides such organizations with lower cost access to WSR-88D data. The Directors of the Offices of Meteorology (OM) and Hydrology (OH) will jointly grant special subscriber status to those organizations that request such status and meet the qualifications outlined in section 6.4 of the NIDS plan. In granting special subscriber status, geographic, political, and operational considerations will also have to be made.

Organizations that desire special subscriber status are required to submit a formal request to the NWS Office of Systems Operations (OSO). (The application form can be obtained from the Observing Systems Branch (OSB) of OSO.) In addition, a narrative statement should be attached to the request, justifying the granting of special status by emphasizing the related benefits to the NWS as well as a description of how the data are to be used. These requests should be submitted to the appropriate NWS regional director who will forward the application and a recommendation to OSB. OSB will forward these to OM and OH for evaluation. Requests for special subscriber status must be renewed annually.

A maximum of 100 special subscribers are allowed upon complete deployment of the WSR-88D. Prior to a complete network of WSR-88Ds, the number of special subscribers will be limited to the number of operational NWS WSR-88Ds. Because of these restrictions, it is not practical for OM and OH to grant one special subscriber per radar site or state each time a WSR-88D is commissioned. The objective is to meet periodically (depending on the number of WSR-88Ds planned for commissioning in a given time period) and consider multiple requests.

WSR-88D Archive - *Pierce*

Archive Level II: Archive Level II is the digital base data from the WSR-88D unit. At Weather Service Headquarters (WSH), OM is one of the offices actively involved with the Operational Support Facility (OSF) in the development of an Archive II implementation plan. However, some limited production sites have already gathered Archive II data due to requests from other agencies or organizations (i.e., NASA and universities). If faced with a request to gather Archive II data, the NWS station manager should coordinate the request through their Regional Headquarters to the OSF. Questions concerning the Archive II device, collection, and storage of the data can be forwarded to the OSF at (405) 366-6500 or send to Operational Support Facility, 1200 Westheimer Drive, Norman, Oklahoma, 73069.

Archive Level III: Archive Level III consists of selected products at the Radar Product Generator. This data will fulfill national radar archive requirements and will be stored at the National Climatic Data Center (NCDC) in Asheville, North Carolina. Collection of Archive III data will begin upon commissioning of a given WSR-88D.

Federal Meteorological Handbook No. 11 (FMH No. 11) - *Pierce*

FMH No. 11, Doppler Radar Meteorological Observations, Parts A, B, and C, have been distributed throughout the NWS. Part D, which completes the document, will be printed and

distributed during the next couple of months. Perhaps the most important to WSR-88D operations is Part A of FMH No. 11. This part specifies the default operational parameters that must be initially set at each Unit Control Position and provides the level of change authority for all adaptation data in the WSR-88D.

FMH No. 11 can be purchased by any government or non-government organization or individual through NCDC. They can be contacted at (704) 259-0682 or write to the National Climatic Data Center, Federal Building, Asheville, North Carolina, 28801.

The WSR-88D Precipitation Processing System - *Peterlin/Shedd, Office of Hydrology*

Radar has been used to track movement of precipitation echoes since the early 1940s. Immediately thereafter attempts were made to measure rainfall quantitatively. By 1947, Wexler and Swingle had derived the radar equation for estimating precipitation relating reflectivity to rainfall rates.

In the late 1950s and early 1960s, the Weather Service installed its network of WSR-57s. In the next decade, WSR-74s followed. In each case, the radars provided a measure of reflectivity that could be used to estimate rainfall over wide areas although the process was statistically crude and coded by hand. The Digitized Radar Experiment (D/RadEx) and later the Radar Data Processor (RADAP II) improved the operational use of radar data as a precipitation estimating tool by using improved computing power, but the network was limited to 12 operational sites. (See Attachment A for RADAP II Network Sites.)

The new radar (WSR-88D) is now being installed across the country, and by 1996, there will be a network of over 100 radars providing revolutionary improvements in the forecast of precipitation estimates and on a temporal and spatial scale never before possible. (See Attachment A, Complete NEXRAD Sites.) The precipitation estimates will be made by algorithms developed at the Hydrologic Research Laboratory of the Office of Hydrology. The improved resolution and narrower beam width of the WSR-88D provides high accuracy reflectivity data that are quality controlled at multiple steps within the Precipitation Processing System (PPS) to ensure an accuracy level never before possible.

Graphical output includes a 1-hour running rainfall total, a 3-hour rainfall total updated on the hour, and a running storm total rainfall that should offer improved guidance for flash flood and flood forecasts by the weather and hydrologic forecaster. Within weeks of the operational availability of the WSR-88D and its precipitation products at Norman, Oklahoma, Forecast Office, a flash flood on Bird Creek in northeastern Oklahoma was pinpointed and early warning provided. The first installation of a WSR-88D Principal User Processor (PUP) at a River Forecast Center (RFC) took place on October 22, 1991, at Tulsa RFC. Within days, another significant frontal system pushed eastward across Oklahoma, and the precipitation algorithm pinpointed heavy rainfall along river basins, allowing the RFC staff to anticipate flooding along the Red River and provide early warning. The NEXRAD era of precipitation estimating has arrived and its use as a flash flood and flood forecasting tool, now in its infancy, will grow as quickly as the WSR-88D installation schedule allows. (See Attachment A, Tulsa River Forecast Center Sites.)

The PPS also outputs a gridded hourly digital rainfall product for use within the Weather Forecast Offices and the RFCs for comparison with rain gages under the radar umbrella and calibration

of the radar rainfall estimates after additional quality control steps. Finally, the RFCs will be able to mosaic individual radar rainfall report and improve areal coverage and basin rainfall totals.

Marathon Kansas City Meeting - *Wernly*

During the last week of January, Roger Tanner and Lenny Dimmick from NCDC; Chris Adams, consultant; Bill Alexander, Southern Region Headquarters; Therese Pierce, and I met with representatives from the National Severe Storms Forecast Center (NSSFC), NWS Training Center, and Central Region Headquarters to address the following topics.

o ***AUTOMATION OF STORM DATA*** — Work continues at NSSFC and NCDC on a project that will provide for the automation of storm data and generation of hazard statistics by NSSFC. NSSFC is currently developing tables within PARADOX that will allow each WSFO to input storm data into PARADOX and import text files from word processing programs. An end to end test in Kansas is tentatively planned for September 1992. During this test, each office in Kansas will prepare July 1992 Storm Data using PARADOX and OMNET the data to NSSFC. NSSFC will automatically transfer the data to NCDC, and NCDC will print the output. A second phase of this test is desired in October of 1992, using a different field site in a different NWS region.

The goal of this project is that each WSFO will be provided with the run time version of PARADOX and be able to use this to input Storm Data by early 1993. In addition, it is anticipated that NSSFC will generate hazard statistics from a common database accessible by the remainder of NWS. A presentation of the PARADOX software and the entire automated process will be introduced at the Warning Preparedness Meteorologist's Conference planned for November 1992.

o ***WARNING COORDINATION METEOROLOGIST (WCM) TRAINING*** — The curriculum for the WCM course and the attendant handbook was reviewed and validated. Rich McNulty and Peter Chaston of the NWS Training Center assisted us in outlining the objectives of the course and incorporating suggestions from those who took the prototype short course. The proposed curriculum includes presentations and interactive sessions on:

-- the severe weather information chain,
-- the structure of the hazards community,
-- public response,
-- capabilities of hydromet technologies,
-- capabilities of communications technologies,
-- internal and external coordination,
-- developing effective spotter networks,
-- adult education concepts,
-- conducting storm damage surveys,
-- preparing Storm Data,
-- hydrologic aspects of the WCM program,
-- development of community and private sector action plans,
-- administrative skills, and
-- communication skills.

It is expected that the next course will be conducted at the NWS Training Center in Kansas City during the summer of 1993. The course length is tentatively set at 2 weeks. It will be

taught by field personnel, external subject matter authorities, and individuals from the regions and the NWS Training Center. Many of the instructors and presenters have already been chosen, and a first pass at the manual is well underway. The course has been slipped until 1993 due to the hiring freeze for modernization positions.

- ***WARNING PREPAREDNESS METEOROLOGIST (WPM) CONFERENCE*** — We are tentatively planning on the next WPM Conference to be conducted this coming November in Miami, Florida. It will be aimed at present WPMs and WCMs and will target items of interest to all WPMs/WCMs as well as coastal concerns. Some of the suggested topics include:

  -- station drills,
  -- the automation of Storm Data,
  -- the advanced spotter video,
  -- storm damage surveys,
  -- the American Meteorological Society's Master Teacher initiative,
  -- application of the WSR-88D in the coastal environment,
  -- coastal emergency management issues,
  -- involvement of the Centers for Disease Control in natural disaster assessment,
  -- graphical hurricane decision making,
  -- National Hurricane Center (NHC) models, and
  -- inland effects of tropical cyclones.

  The Conference is planned to occur just before the NOAA/NWS Hurricane Conference and would include tours of NHC, the Atlantic Oceanographic and Meteorological Laboratories, and a NOAA P3 research aircraft.

- ***NEXT GENERATION SELS WATCHES*** — Fred Ostby and Jim Henderson presented a proposal for the next generation of SELS watches. The emphasis will be on SELS to issue a guidance watch message that would include all of the counties that would be covered in the watch. This message would be sent to WSFOs who would make appropriate changes and then send it back to SELS. SELS would then use these modified counties to prepare the actual SELS watch message. Much work needs to be done yet on this project. However, its benefits include greater involvement and coordination between local offices and SELS in the formulation and dissemination of future watch products. The target date for implementation is the 1994 severe weather season.

- ***RADAR CODED MESSAGE*** — Fred Mosher briefed us on the status of NSSFC's work to ingest the Radar Coded Message (RCM) from each WSR-88D, mosaic the data into a national grid and graphically edit this grid using satellite, rain gage, and surface data. Three sets of software have been written and tested by NSSFC: (1) software to ingest the WSR-88D data and merge it with the current manually digitized radar (MDR) data; (2) software that automatically takes the RCM and compares it to satellite and radar observations (ROB), and (3) the output software that produces the pseudo MDR and ROB from a WSR-88D RCM to input into the current National Radar Summary Chart. The next step needed is to write the software that will enable graphic editing of the WSR-88D RCM. This is a major undertaking that if fully implemented would require considerable resources. It will be posed to the Directors in early March for an agency decision.

The State Forecast Discussion (SFD) and a New Weather Service Operations Manual (WSOM) Chapter on Forecast Coordination - *Auciello/Read*

The SFD is a product whose format varies from office to office nationwide. In response to forecaster requests and a formal Line Forecasters Technical Advisory Committee recommendation, the Warning and Forecast Branch has developed uniform guidelines for the SFD.

The SFD should be primarily used for coordinating the important aspects of the forecast package with WSOs/NEXRAD Weather Service Offices (NWSO) under the WSFO/NEXRAD Weather Service Forecast Office (NWSFO) preparing the SFD, adjacent WSFOs/NWSFOs, and national centers. The narrative discussion should be a concise, plain language explanation of forecast reasoning. The discussion should concentrate on the following significant aspects concerning the forecast:

- -- reasons for watch/warning issuance;
- -- reasons for varying significantly from guidance products (model, model output statistics, or national center manually-produced guidance;
- -- reasons for significant change from the previous forecast;
- -- expected timing of events, such as beginning or ending of precipitation; and
- -- discussion of the level of uncertainty.

The new WSOM chapter, entitled "Forecast Coordination," will provide general policy guidelines for forecast discussion products issued by the National Meteorological Center (NMC), NHC, and NSSFC, in addition to the SFD. Current SFD guidelines appear in WSOM Chapter C-42, Winter Weather Warnings.

A preliminary draft of the new chapter is in the review process at WSH. This spring, the draft will be forwarded to all regional offices for review and distribution to field offices for comments. All comments will be reviewed and incorporated into the chapter as appropriate. The Forecast Coordination WSOM is expected to be sent out to all offices later this year.

State Redistribution Survey - *Read*

Dr. Christopher Adams, in conjunction with OM and the Regions, conducted a national survey last year to document how state emergency management agencies redistribute NWS warning and forecast products. The survey was conducted through a questionnaire sent to each WSFO. The questionnaires were returned and various analyses were performed on the data. In addition, four states were selected for detailed study by Dr. Adams. The states selected were considered to have redistribution systems most effective in getting NWS warning and forecast information to local emergency managers.

A report documenting the results of the survey and detailed studies will be ready for distribution soon. All WSFOs, regions, and interested emergency management officials will be included in the distribution. WSFOs are encouraged to share this information with their state emergency management agencies.

HAZARD AWARENESS PROGRAM

Authors Named to Two New Hazard Packages - *Wernly*

In the interest of continuing the momentum on developing new hazard packages, two additional field personnel have been named to assist us in this project. Bill Bunting from WSFO Norman has agreed to put together the "tornado" package while Rainer Dombrowsky from WSFO Minneapolis will develop the "thunderstorm and lightning" materials.

Since our budgets have been less than optimum, we have had to explore different ways to get the job done. As a result, these two gentlemen will be expected to do a lot of the initial work at their local office. They will be encouraged to work with the various NWS regions to ensure that the materials have a national flavor. Then, beginning next fiscal year, they will each come to Headquarters for a 2-week stint to do those things that cannot be done at their home station.

The work done in Washington will involve coordination with FEMA and the American Red Cross as well as work with NOAA Public Affairs on the actual design and layout. This will also be a time to ferret out slides and other materials from such sources as the Red Cross files and the resources of the Smithsonian and National Geographic Society.

Potential Expansion of the Hazard Awareness Consortium - *Wernly*

We have begun discussions with The Weather Channel concerning their potential involvement with FEMA, the American Red Cross, and NWS in support of hazard awareness efforts. During the first week in February, representatives from each organization met in Silver Spring to show Belinda Sym-Smith and Marilyn Manely of The Weather Channel what our tri-agency efforts have accomplished toward the development of consistent hazard awareness materials.

They, in turn, discussed their initiatives to bring weather education into the Nation's schools. Their emphasis has been on grades 5 through 9 and involve complete lesson plans and materials for teacher use. The materials are basically free and distributed by local cable companies.

At the end of the meeting, we outlined what we felt the consortium's goals should be and what audiences we expected to reach. The next charge was for each of us to explore what we could bring to the group to ensure that each organization would do what they did best and that all messages and materials would support each other and contain a consistent message.

"Flash Floods and Floods" Brochure - *Pierce*

Roger Stairs (WPM, WSFO Pittsburgh) was at WSH during the month of November and successfully completed the in-depth flash flood brochure. We were very impressed with the quality of Rogers' work. Roger will continue to work at his home station in an effort to complete the slide set and presenters guide this summer.

The brochure provides important information on flash flooding and floods. It includes information about what individuals and communities can do to prepare for this hazard, and what they should do to survive if caught in a flash flood. Many interesting historical facts are also found in the brochure. The NWS regions are currently reviewing the brochure. This review is very important because the awareness materials must be useful nationwide.

Our plan is to print the flash flood brochure this summer. The cost is quite expensive, $25,000 for 50,000 copies. With current budget problems we do not have the total funds to accomplish this. Our hope is that we can get some private support to help with the cost of printing. We have two sets of negatives for the brochure; one set that will produce a four-color brochure on good quality paper, the other set will produce it in two colors on lesser quality paper. The latter costs less to produce.

My Temporary Assignment to Weather Service Headquarters - *Roger Stairs, WPM, WSFO Pittsburgh, Pennsylvania*

Let me begin by saying that I feel very fortunate to have been selected to update our flash flood/flood awareness materials. For any serious WPM/WCM, the opportunity to have a national impact in such a significant manner is a dream come true.

Upon my arrival to WSH, I was introduced to the staff, shown the resources at hand, and given my own office. My office was mixed in with the Marine and Applied Services Branch which is around the corner from the Warning and Forecast Branch. At first, I thought it an inconvenience to be a distance from the printer that is located in the Warning and Forecast Branch, but as time went on, I discovered that being located in a different branch had its advantages. For example, I was able to meet people that I would not have come in contact with if I had been located in the Warning and Forecast Branch. My neighbors were working on SWIS, MICROSWIS, ASOS, and fire weather.

For future selectees, I strongly recommend learning WordPerfect 5.1 before your arrival since all your composing and pamphlet layout will be done using it. I arrived without any knowledge of WordPerfect so the first order of business was for Linda Kremkau to give me a quick lesson. Tim Wugofski, OM computer expert, was also a tremendous help. With their patience and my diligence, it all worked out very well.

In an attempt to acquire input and assemble the best product possible, I called each regional office, many individual offices, The Weather Channel, and met with the American Red Cross and FEMA. The input that I received was very good, and I attempted to incorporate everyone's ideas and thoughts. Each of the regions, the American Red Cross, and FEMA will receive a draft copy for their perusal. I am excited and proud how the "Flash Floods and Floods" in-depth brochure turned out.

Working at WSH from the inside looking out has given me a whole new perspective. From the view of a field meteorologist, it sometimes appears as though the wheels are turning so very slowly at WSH. After being there I now realize the process involved with national scope products and the wide range of input that must be considered. I observed everyone working very diligently and got a real "sense of teamwork" from all those with which I came in contact. Aside from having the opportunity to work on this national project, the other great aspect of this temporary assignment is that now I am able to associate a face to the name I see on a memorandum.

In conclusion, I want to express my sincere appreciation to all those that contributed to my endeavor while at WSH. For fear of leaving out a name, I dare not attempt to mention everyone that supplied input, but I do wish to take this opportunity to say "THANK YOU."

SKY AWARENESS WEEK 1992 - *Kremkau*

Efforts are currently underway in 33 states and the District of Columbia to have state officials declare the week of April 26-May 2, 1992, as SKY AWARENESS WEEK. The governors of North Carolina, Ohio, Maryland, Maine, Oregon, and Colorado have already agreed to sign a proclamation, and the governor of Missouri and other states are giving it serious consideration.

SKY AWARENESS WEEK is designed as a celebration of the sky and atmosphere. Meteorologists, television weathercasters, educators, environmentalists, governmental officials and others are being asked to call attention to the sky as a natural resource, a vehicle for studying science, and an object of natural beauty. According to Mike Mogil, Certified Consulting Meteorologist, who initiated the effort, this week should complement the various severe weather weeks which NWS will be involved in earlier this year.

The entire week of April 26-May 2 (also being celebrated as National Science and Technology Week) was chosen to celebrate the sky in order to ensure that different sky phenomena can be observed. East of the Rockies, several different weather systems might pass by during this time of year enabling teachers, students, and sky advocates to witness almost every type of cloud. Residents along coastal sections of the west coast may experience considerable fog and low clouds in the morning, but bright sunshine in the afternoon. People in the interior of the west may not see most of the cloud types, but they should see cirrus, contrails, and possibly other clouds, depending upon the weather patterns. Late April and early May is also when the spring rebirth has taken place. Clouds and blue sky make an appealing backdrop for the annual display of spring colors. Regardless of what clouds or phenomena are seen, people looking up should feel upbeat, recognize the value of the sky to our well-being, learn about the sky, and develop a sense of what the sky is about.

Dr. Joe Friday, Assistant Administrator for Weather Services, believes "the concept is certainly an exciting one." And he welcomes the involvement of local offices to participate as part of their local educational and public relations activities. Discussing the sky on NOAA Weather Radio, distributing public information statements on Weather Wire, and talking about the sky during school visits would all serve to bring others into the celebration.

To assist teachers, Mike and his wife, Barbara (an early childhood teacher) have prepared a small teacher's guide entitled "101 Ways to Celebrate Sky Awareness Week." The guide describes multi-disciplinary, hands-on and mind-on activities for teachers and students (grades K-12) to undertake during SKY AWARENESS WEEK and year 'round. It includes ideas about identifying clouds, using clouds to predict the weather, understanding sky colors, and much more. To offset costs of printing and mailing the guide, requestors are asked to send $2. However, the guide can be reproduced by teachers and shared within their schools. Additional information about SKY AWARENESS WEEK, including a list of various state coordinators, can be obtained by writing to Mike Mogil, c/o HOW THE WEATHERWORKS, 1522 Baylor Avenue, Rockville, MD, 20850.

WARNING AND FORECAST BRANCH INITIATIVES

Universal Generic Coding to be Added to Severe Weather Watch Redefining Statements - *Berger*

Certain classes of NWS products require more specific geographical information than provided by the product identifier for easy automated access and redistribution to site-specific locales.

These classes include products whose geographical boundaries can shift within a warning or forecast area, such as severe local warnings and statements, and products under one identifier but consisting of a collection of forecasts or other information, each pertaining to a different geographical area, such as zone forecasts, certain extended forecasts, and state weather roundups.

To meet user needs and to prevent a different code from being used for each product, one code has been devised for all products. This is called the Universal Generic Code (UGC). It has been employed for all the above mentioned classes of products. In effect, it specifies more precisely (down to the zone or county level) where the affected area is located.

By spring, the UGC will be added to the severe weather watch redefining statements (SLS) that describe parts of the state affected by the watch in terms of whole counties, parishes, and independent cities. Automated output for the SLS is available at nearly all forecast offices by using one of three computer programs available: SEV (run from NSSFC), and the locally run programs GDMBOX and REDEFINE. All these programs are being modified to include the UGC codes. Tom Ardrey from the WSFO in Columbia, South Carolina, has written the added programming for REDEFINE and SEV, and Warren Sunkel of Central Region Headquarters has modified his GDMBOX program. All the modifications are currently undergoing testing and should be ready to provide UGC coding to the SLSs by spring.

Fix-ups to SRWARN - *Berger*

Brian Peters (Deputy MIC at Birmingham, Alabama), author of the SRWARN computer applications program used by many offices to compose severe local storm and flash flood warnings, has made some minor modifications to improve the program's utility.

The "New Year's bug" that occurs on New Year's Eve between midnight Universal Coordinated Time and midnight local time has been fixed. This should make for a happier new year for NWS employees unfortunate enough to have to issue warnings on the next New Year's Eve.

The baud rate transfer from the Personal Computer (in which SRWARN is run) to the AFOS computer can now be user set up to 9600 baud.

A small modification was made to support the goal of NSSFC to create a periodic graphic product of locations of severe weather. Since some warning messages contain actual severe weather reports, a feature was added allowing the composer of the message to place a "transparent" flag on such warnings. This will assist NSSFC in collating information to create the graphic.

Three NOAA Natural Disaster Survey Teams Formed - *Kremkau*

-- ***Halloween Nor'easter of 1991***—Between October 27 and November 1, 1991, a combination of meteorological phenomena over the North Atlantic generated huge oceanic swells that battered shorelines from the Maritime Provinces of Canada to Puerto Rico. Millions of dollars in damage and at least four deaths resulted from this nor'easter. The home of President George Bush in Kennebunkport, Maine, was one of the structures heavily damaged. A NOAA Disaster Survey Team (DST) was convened to review the events and the NWS response to these events. Headed by Dr. Donald Scavia, Director of NOAA's Coastal Ocean Program, the team visited and interviewed local NWS staff, state and local emergency service personnel, and members of the various news media from North Carolina to Maine. A written report on the Halloween Nor'easter of 1991 will be available later this year. Early indications, however, are that the NWS people did their job very well.

-- ***Texas Floods of December 1991/January 1992***—The Guadalupe, Colorado, Brazos, and Trinity River basins in Texas experienced catastrophic flooding in late December 1991. A NOAA DST recently visited the NWS offices that provided flood and flash flood warning services to the affected region. The team also interviewed media representatives, county and local government officials, including emergency operations centers, local and Federal river and reservoir authorities, and private citizens. Preliminary DST findings are that overall the NWS did an outstanding job in providing warnings, watches, and forecasts for the entire event.

The media received our watches and warnings and passed them on with sufficient time for the public to take appropriate action. While significant amounts of property were damaged and/or lost, individuals were able to take advantage of the timely warnings and remove their possessions. Fifteen lives were lost. As is frequently the case, most of the deaths were due to individuals driving into moving waters which swept their vehicles downstream.

-- ***Puerto Rico Flash Flood of January 5, 1992***—Thunderstorms associated with a quasi-stationary cold front across Puerto Rico resulted in substantial amounts of rain over the island on the afternoon and evening of January 5. Rainfall amounts were in the 10- to 12-inch range with 19.5 inches of rain reported from Cayey municipality. This intense rainfall resulted in severe flash flooding and river flooding across Puerto Rico except the northwest portion.

The flooding resulted in 20 fatalities. Eighteen of the 20 deaths occurred when residents drove past police and civil defense (CD) barricades in an attempt to return home for Three Kings Eve (Puerto Rico's most celebrated holiday). Three persons remain missing. Total damage estimates are placed at 72 million dollars. Most of the damage was to bridges and roads.

A NOAA DST, led by Jennifer Joy Wilson, Assistant Secretary and Deputy Administrator, was dispatched to Puerto Rico from January 12 to 18 to assess how the integrated warning program functioned prior to and during the flooding. The integrated warning program includes the detection and warning of the flash flood event, the communication of this critical information to the community, and the public response. A preliminary evaluation indicates that the WSFO at San Juan issued timely flash flood watches and warnings.

Wichita/Andover, Kansas, Tornado Disaster Survey Report - *Sokich*

The NOAA Disaster Survey Report for the Wichita/Andover, Kansas, Tornado that occurred on April 26, 1991, has arrived at Weather Service Headquarters. The report reflects very positively on the preparedness, watch, and warning efforts of all NWS offices involved in the forecast/warning process, including SELS, WSFO Topeka, and WSO Wichita. The report also describes the performance of the Norman, Oklahoma, WSR-88D and how a most efficient severe weather warning program will integrate the new NWS technologies with an extensive preparedness and spotter program. If you wish to obtain a copy, please contact the Warning and Forecast Branch at (301) 713-0090.

1991 Hurricane Season - *Sokich*

The 1991 Atlantic hurricane season had eight tropical cyclones, four of which became hurricanes. This is a marked decrease from the 14 named storms and 8 hurricanes of 1990. Only three storms formed from African waves. Another rarity of this season was the lack of any storms in the Gulf of Mexico.

Hurricane Claudette was the strongest storm but spent its entire life at sea. Hurricane Bob made landfall in New England with highest sustained winds of 90 mph and a central pressure of 962 mb. The total number of deaths associated with Bob is 18, and preliminary total damage estimate for the United States is $1.5 billion.

The Pacific hurricane season had the earliest start on record beginning on May 16 with the formation of Tropical Storm Andres. The season also finished very late with Hurricane Nora forming in November. Nora is the only eastern Pacific hurricane to form in November since the beginning of routine satellite surveillance in 1966. All of the East Pacific storms had their origins with tropical waves.

1991 NOAA/NWS Hurricane Conference - *Sokich*

The 1991 NOAA/NWS Hurricane Conference took place from December 10 through 12. Many issues were discussed, including additional breakpoints along the mid-Atlantic coast, new probability formats, and the relation between the hurricane local statements and the AWU and short-term weather summary and forecast products. As a result of the decisions made at the Conference, many changes to the WSOM Chapter C-41, Hurricane Warnings, are necessary. A draft revision has been distributed to the regions for review.

Update on WSOM Chapters - *Berger*

WSOM CHAPTERS	STATUS
C-10, State Forecasts	A revised draft will be sent out for review by spring. Approval is expected by summer. The state forecasts will be for 1 to 5 days, incorporating extended forecast information.
C-12, 6- to 10-day, 30-day, and 90-Day Outlooks	A draft revision will be sent out this spring. Approval is expected this summer.
C-20, National Public Weather Products	A second draft will be sent out for review this spring. Approval is expected this summer.
Operations Manual Letter (OML) to C-21, Local and Regional Statements, Summaries, and Tables	An OML on the AWU and its precursor products was sent out for review in December. Reviews were completed on January 10, 1992. Approval is expected in early March around the start of the AWU Risk Reduction in Norman, Oklahoma.
C-21, Local and Regional Statements, Summaries, and Tables	A second draft revision will be sent out for review late winter. Approval is expected by late spring.
OML to C-40, Severe Local Storm Warnings	An OML will be prepared this spring authorizing Universal Generic Coding in the severe weather watch redefining statement. A new version to accommodate the AWU will be developed this spring for a November implementation date.
C-41, Hurricane Warnings	A draft revision will be sent out this winter. Approval is expected this spring in time for the next hurricane season.
C-42, Winter Weather Warnings	A second draft will be sent out this spring. Approval is expected this summer before the next winter weather season.
C-44, Non-Precipitation Weather Hazards	A second draft will be sent out this spring. Approval is expected this summer before the next winter weather season.
C-47, County Warning Areas	A draft will be sent out for review by late spring. Approval is expected in the fall.
C-49, Warning Coordination and Hazard Awareness	An OML will be sent out this spring that allows emergency management organizations to order NWS publications through their local WSFO/WSOs or the WSH only and not directly from the National Logistical Supply Center (NLSC) in Kansas City, Missouri.
New Forecast Coordination Chapter	A draft will be sent out this spring. Approval is expected this summer.

HAZARD COMMUNITY FORUM

WPM Goes to Jail - *Jim Kramper, WSFO Little Rock, Arkansas*

Over the past 2 years, I have been able to set up some regularly scheduled spotter training sessions at a couple of Arkansas Department of Corrections facilities. Every 6 months, a session is held at the Alexander Youth Services Center (a juvenile facility) and once a year at the Wrightsville State Prison (a medium security facility for men). The sessions at Alexander are for their staff and for the staff at another juvenile center in Pine Bluff. Both facilities have developed excellent emergency plans that include actions taken during watch or warning situations.

The training session held at Wrightsville has been opened up to all employees of the Corrections Department across the state. They also routinely invite various law enforcement agencies, both on the state and local level. There has never been fewer than 70 people attend a training session at Wrightsville.

I must admit at first I was a little apprehensive about going to "prison." It definitely is a different type of environment. The efforts have proven successful. The Wrightsville facility is especially in a good area for spotting severe weather. Their guard towers offer excellent visibility in all directions. We have received quite a few timely reports as a result of this training. So going to prison has not been so bad after all. However, I do get a little nervous when the "guests" come out to carry in my equipment. I prefer to walk well behind them and stay as close to the guards as possible.

Preparedness Pays Off in Northern California - *John Quadros, WPM, WSFO San Francisco*

Some forecasters scoff at the need for a WPM program here where "it never rains in California." Well, just as the popular song went on to warn, "it pours." Unfortunately, the deluge this fall and winter has not been precipitation. The state is now in its sixth year of drought. Other weather related events, however, have pushed the death and injury toll to levels not often seen even in tornado alley.

In late October, high Diablo winds fanned the flames of a small brush fire into an inferno that destroyed over 3,300 homes in the Oakland-Berkeley hills while taking 25 lives and injuring 150. A little over a month later, 17 commuters lost their lives and 119 were injured in a 104-vehicle pile-up on Interstate 5 near Coalinga in blowing dust. Before, during, and after these events, the WPM program, based at the San Francisco WSFO, was active in dealing with the emergency management community. Although the death and injury toll were high in these two events, it may have been worse had no contact been made. Subsequent blowing dust and dense fog episodes have not seen major accidents.

The preparedness program at the WSFO in conjunction with that at the embedded WSO set up a series of meetings with each of the counties in the WSO area of responsibility. Various teams were sent by the NWS, schedules permitting. Representing the NWS were AM Norm Hoffmann, DMIC Roger Williams, WPM John Quadros, Hydrologist Gary Barbato, and Met Intern Paul Hamilton. These meetings were held generally at County OES Headquarters. Quite often, representatives from the sheriff's department, water control agency, planning department, and

other county staffs attended these half-day meetings. Besides giving the parties a chance to meet face-to-face, short presentations were made to let these officials know just how to reach us when the weather forecast is critical, what services we can provide, and what types of weather they need be concerned about.

Just days after the meeting in Alameda County, the fire in the hills broke out. Forecasters and county officials were in touch through the next several days exchanging critical information which helped fight the fire. The WPM was invited to participate as a member of FEMA's Hazard Mitigation Team. Previous contacts with many of the officials who made up the team allowed the NWS voice to be heard more loudly. One key recommendation was to urge the Federal government to keep a strong Fire Weather Forecast Program.

After several fatal accidents in dense fog in early 1991, the WPM and other NWS officials, including then Fresno MIC, Lyle Hammer, and Stockton OIC, Don Maker, met with California Department of Transportation and Highway Patrol officials. One outcome was a pamphlet on dense fog which is being widely distributed this winter. A similar pamphlet on blowing dust will be ready for the 1992-93 winter season. This will be the primary teaching tool in educating the driving public on the dangers of driving through areas with reduced visibilities. Another outcome of the close cooperation between agencies was the establishment by the state of Traffic Operations Centers (TOC) to coordinate activities of the Department of Transportation and the Highway Patrol, and the training of the staff of the TOC by the WPM. One training session has already been held hosted by new Fresno MIC Elizabeth Morse.

In late December, a dust storm again reduced visibilities in the central valley. It had been forecast well in advance by the WSFO and WSOs at Bakersfield and Fresno. The decision was made by the state agencies to close over 100 miles of Interstate 5, the busiest north-south highway on the west coast. There were minor accidents on secondary roads, but no lives were lost. Preparedness had paid off!

Now Where Did I Put That Publication? - *Martin Ross, WPM, WSFO Philadelphia, Pennsylvania*

I have no idea how many pieces of preparedness material that the NWS gives out to the public every year. The material is read and then either discarded or filed. Usually, the person saving the material doesn't remember where they saved it when they want to review it at a later date, particularly as the seasons change. I suggest that the Warning and Forecast Branch consider highlighting the following on the NWS brochures:

> "For future reference, we suggest that you file this with your telephone directory or yellow pages."

(Note from OM11: This is a very interesting thought and an excellent idea. We will take this under consideration when developing future publications. Furthermore, this is good advice even when giving presentations to suggest that these publication have useful information and to place them where they can be easily found.)

SKYWARN - *Barbara McNaught, WPM, WSFO Washington*

Below is a press release concerning the modernized SKYWARN amateur radio station located at the Washington, DC, WSFO at Sterling, Virginia.

March 1992 will mark the installation and dedication of a modernized SKYWARN amateur radio station in the NWS Washington Forecast Office. The new amateur radio station was funded primarily by a grant from The Foundation for Amateur Radio, Inc., a non-profit organization representing over 50 national capital area amateur radio clubs.

SKYWARN is a national program of trained, volunteer severe weather spotters. SKYWARN volunteers support their local community and government by providing the NWS with timely reports of severe weather so that communities can be quickly informed of the proper actions to take. In the national capital area, hundreds of trained SKYWARN spotters are also amateur radio operators. Amateur radio volunteers have always played an active role in public service and have become an integral part of the National Weather Service's SKYWARN program.

The National Weather Service Washington Forecast Office activates SKYWARN when severe weather is expected. During many SKYWARN activations, SKYWARN amateur radio operators are requested to man the radio station in the forecast office. Severe weather reports from SKYWARN spotters, made via amateur radio, are rapidly relayed to forecasters and are used in issuing severe weather warnings and statements.

The new amateur radio station will permit multiple SKYWARN severe weather nets to be simultaneously run on 2 meters and 440 mhz, in both voice and digital packet modes. In a communication emergency, long distance HF can also be run from the new station. This communication capability allows severe weather forecasters to be in contact with SKYWARN spotters across a multi-state area spanning from the eastern panhandle of West Virginia, across northern Virginia, most of Maryland, and the District of Columbia.

The new station will get a complete workout in March during Hurricane Exercise I.E. Zelda, an emergency management exercise sponsored by FEMA with participation by NWS, state and local emergency preparedness agencies. The station is expected to be of great help in assisting the NWS in their mission of saving lives and property through the dissemination of timely and accurate severe weather information to the public.

SEVERE WEATHER AWARENESS WEEKS - *Kremkau*

State	Campaign	Date	Drill
Central Region			
Michigan	Flood	Feb. 23-29, 1992	
Kansas	Severe Weather	Mar. 2-6	Mar. 3
Missouri	Severe Weather	Mar. 2-6	Mar. 3
Nebraska	Severe Weather	Mar. 15-21	Mar. 19
Indiana	Severe Weather	Mar. 15-21	Mar. 19
Iowa	Severe Weather	Mar. 30-Apr. 3	Apr. 2
Michigan	Severe Weather	Mar. 29-Apr. 4	Apr. 1
Wisconsin	Severe Weather	Apr. 5-11	
Wyoming	Severe Weather	Apr. 6-10	Apr. 8
South Dakota	Severe Weather	Apr. 13-17	Apr. 15
Eastern Region			
North Carolina	Severe Weather	Feb. 23-29	
South Carolina	Severe Weather	Feb. 24-29	
Maryland	Severe Weather	Mar. 22-28	
Delaware	Severe Weather	Mar. 22-28	
Virginia	Severe Weather	Mar. 22-28	
District of Columbia	Severe Weather	Mar. 22-28	
Ohio	Tornado	Mar. 22-28	
Western Pennsylvania	Severe Weather	Mar. 22-28	
Central Pennsylvania	Severe Weather	Mar. 17-19	
Ohio	Flood	May 3-9	
Southern Region			
Alabama	Severe Weather	Feb. 10-14	
Mississippi	Severe Weather	Feb. 10-14	
Louisiana	Severe Weather	Feb. 10-14	
Georgia	Severe Weather	Feb. 24-28	
Florida	Hazardous Weather	Feb. 24-28	
Arkansas	Severe Weather	Mar. 1-7	
Tennessee	Severe Weather	Mar. 1-7	
Oklahoma	Severe Weather	Mar. 1-7	
South Texas	Severe Weather	Mar. 9-13	
North Texas	Severe Weather	Mar. 9-13	
New Mexico	Severe Weather	Mar. 16-20	
West Texas	Severe Weather	Apr. 5-11 (tentative)	
Alabama	Hurricane	May 18-22	
Florida	Hurricane	May 18-22	
New Mexico	Lightning/Flash Fl.	June 1-5	

PUBLICATIONS AND AUDIOVISUALS - *Kremkau*

FEMA's "When Disaster Strikes" Videotape

FEMA recently released a 20-minute video entitled "When Disaster Strikes," which was developed under the auspices of the Office of Civil Defense's Family Protection Program. The purpose of this video is to increase public interest in emergency preparedness. Copies were provided to each participating state and local Emergency Management Assistance jurisdiction. Its intent is to show it on the local television broadcasting stations or cable companies as a public service. In addition, this videotape can be used in addressing local groups and audiences. If you have any questions concerning "When Disaster Strikes," please contact the Family Protection Program Manager, Dr. B. Wayne Blanchard, at (202) 646-3549, or write to him at FEMA, Room 602, 500 C Street, SW, Washington, DC, 20472.

Family Protection Program Poster

FEMA now has available a Family Protection Program Poster on the family disaster preparedness theme of "Don't Let Disaster Tear Your Family Apart." This poster is primarily an awareness raising tool meant to encourage families to think more seriously about having a family disaster plan as well as to serve as a tool for neighborhood program organizers in promoting local meetings or activities.

Roughly 19,000 of these posters are being distributed to the Federal, state, and local civil defense/emergency management community, to national volunteer organizations active in disaster, and to major public libraries (8,000 libraries are receiving a copy). A copy can be obtained by writing to FEMA, P.O. Box 70274, Washington, D.C., 20024. Ask for Poster #11.

The Weather Channel's "Best of" Documentaries

Attachment B is an order form to obtain teacher guides for The Weather Channel's "Best of" documentaries. These five documentaries discuss many different weather disasters and safety procedures. The Weather Channel aired these documentaries during the week of February 10-14. They are listed below.

"Within Our Power" (Solar Energy)
"Force Four" (Hurricane Hugo)
"Aftershock" (Earthquakes)
"The Unforgiving Sky" (Drought)
"Danger's Edge" (Hurricanes)

If you are interested in obtaining a copy of any of these guides, use the attached order form and return it to The Weather Channel using the address below. The programs are cleared of copyright restrictions, so you may order the video, dub it, then return it to The Weather Channel within 30 days. A fee of $5 is required for shipping and handling. If you decide to keep the tape, the cost will be $25.

The Weather Channel
2600 Cumberland Parkway
Atlanta, Georgia 30339-9990
Tel: (404) 434-6800

Other NWS Hazard Awareness Materials

-- The English/Spanish translation of the Natural Hazard Watch/Warning Poster (NOAA PA 86001) has finally arrived at NLSC. Please remember to limit the maximum number of copies to 300.

-- The Spanish version of "Are You Ready for a Winter Storm?" (NOAA PA 91004) is now available from NLSC. The American Red Cross provided 50,000 copies for distribution to the field offices.

-- Currently, we are preparing the paperwork for several brochures to be printed in the near future:

Dust Storm Driving Safety Wallet Card	NOAA PA 82002	20,000 copies
Heat Wave	NOAA PA 85001	30,000 copies
SKYWARN Spotter ID Card	NOAA PA 84001	50,000 copies
Spotter's Guide	NOAA PA 81011	50,000 copies
Storm Surge and Hurricane Safety	NOAA PA 78019	75,000 copies
Naming of Hurricanes	NOAA PA 79017	10,000 copies
Hurricane Tracking Chart	NOAA PA 77020	20,000 copies
Hurricane! A Familiarization Booklet	NOAA PA 91001	10,000 copies

-- Concerning the wallet cards, "Lightning Safety" has recently been depleted and will not be restocked. But the negatives for this wallet card and others can still be obtained from the Warning and Forecast Branch and loaned out to the private sector for printing. These wallet cards are still current, but because of limited resources, we have to focus our funds on the NWS in-depth brochures.

-- For a new list of NWS publications, see attachment C.

Private Sector Help

We appreciate the NWS field office's endeavors to get private sector funding to print brochures and to develop new natural hazard materials for local distribution. Below are a few examples of the publications that have recently been produced by NWS field offices and the private sector. Organizations like these can provide needed help in NWS preparedness efforts during these times of restricted budgets. We want to thank all the individuals involved for their superb effort. Incidentally, anyone interested in assisting the Weather Service in printing NWS brochures should contact the Warning and Forecast Branch at (301) 713-0090. Most of the negatives can be loaned to outside interests.

-- ***Arkansas NOAA Weather Radio Brochure*** — The Farm Bureau has agreed to print 5,000 copies of a new Arkansas NOAA Weather Radio brochure, giving 2,500 to the Little Rock WSFO. The tri-fold brochure, with a multi-colored state map inside, was co-designed by WSFO Little Rock (Jim Kramper, WPM) and members of the Farm Bureau safety staff and print shop. More will be printed in the future as demand dictates.

-- ***Tule Fog Brochure*** — Attachment D is a copy of a brochure developed in cooperation with CALTRANS, the California Highway Patrol, the California Trucking Association, and of course, the NWS offices in San Francisco, Sacramento, Stockton, and Fresno in California. This was a true multi-agency effort to raise awareness of the dangers of driving in fog. Tule (after the bulrush called tule) fog represents a major hazard to motorists in the central valley.

-- ***"Northwest Winters" Brochure*** – One-thousand copies of this brochure were printed by Hinds Instruments, Inc., at no cost to the NWS! This project was a joint venture by WPM Tom Ainsworth and Area Manager George Miller.

-- ***Taco John's and Winter Weather Safety*** – Last fall, Mike Weiland (WSFO Cheyenne, Wyoming) contacted Taco John's International, which has its headquarters in Cheyenne, about printing winter safety brochures. Taco John's was very interested in getting winter safety information to their customers and others in Wyoming. WSH supplied the negatives for the wallet card "Riding Out Winter Storms," and Taco John's printed 4,000 copies. Of those, 2,000 were given to WSFO Cheyenne to distribute and the rest will be distributed by area Taco John's restaurants.

-- ***"Stalled...But Safe" Pamphlet*** – This is a small but very well-written brochure on what to do to prepare for and while stranded in a car during a winter storm. The size makes it very convenient for the glove compartment of a car or truck. Lou Bennett, OIC, WSO Fargo, was the driving force behind getting Blue Cross and Blue Shield to undertake this project. He is working with the agency to produce a similar publication for summer storm hazards.

-- ***Hawaiian Hurricanes and Safety Measures*** – Several months ago, the Hawaii State Civil Defense obtained NWS's negatives of the "Hawaiian Hurricanes and Safety Measures" (NOAA PA 85002) publication and produced 50,000 copies for internal distribution. These copies differ from the original mainly in size (they're a bit larger), being in booklet form (rather than a fold-out), and in bearing FEMA and State of Hawaii logos. State CD's have already distributed substantial supplies to county CD agencies and other organizations, and they have offered to give the Pacific Region copies as their supply runs out.

"DEAR ABBY"

Recently, "DEAR ABBY" ran an article entitled "Where Are You, WXYZ?" This column concerns travelers driving on highways through strange towns and cities and not knowing what town or county they were near when severe weather alerts were broadcast over the radio.

We thought it appropriate to reproduce this article as attachment E. Universal Press Syndicate was gracious enough to grant us permission to reprint this DEAR ABBY column on a one-time-only basis. WPMs are encouraged to contact their local broadcasters to see whether specific locations, such as main highways or towns, can be provided to travelers during severe weather events.

AWARE Report Roster

Attachment F is the AWARE Report Roster. Please notify Linda Kremkau at (301) 713-0090 (note new phone number) of any changes to the telephone numbers or new WPMs or focal points. Also, if you know of someone who would like to be on the AWARE Report distribution list, please have him or her contact the Warning and Forecast Branch.

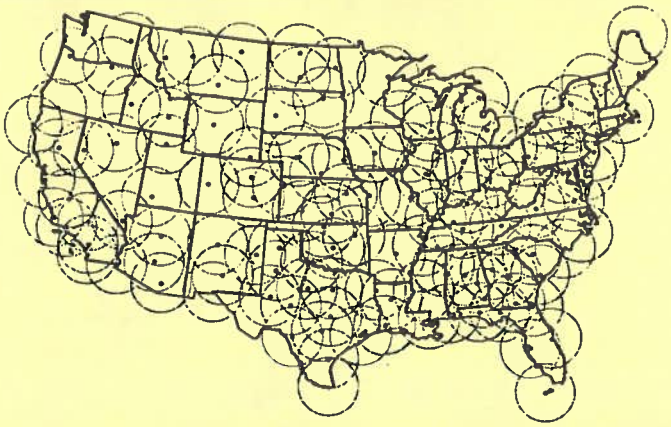
STATISTICS - *Kremkau*

The "Summary of Natural Hazard Deaths for 1990 in the United States" will be forthcoming in March. The summary, which includes deaths, injuries, and damage costs, will be sent out under separate cover using the AWARE Report distribution list. Additional copies can be obtained from the Warning and Forecast Branch. The statistics for 1991 hopefully will be available by early summer.

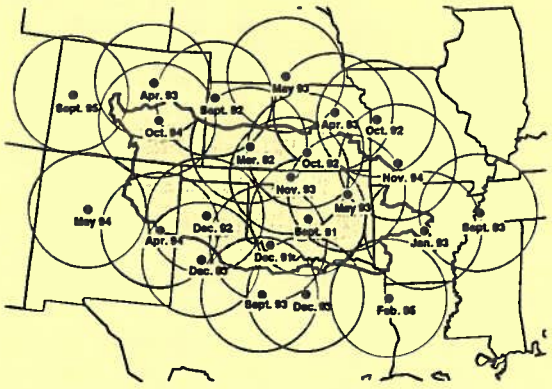
Attachment A

National Weather Service
RADAP II Network Sites: 230km Radius

National Weather Service
Complete NEXRAD Sites: 230 km Radius



Tulsa River Forecast Center: Sites, EED & 230 km Radius



"Best of" Documentaries Video Order Form

Name _____

Title _____

School Name _____

School Address _____
(No P.O. Boxes, Please)

City _____ State _____ Zip _____

Phone _____

Videos Needed (VHS Format):

- ☐ "Within Our Power" (Solar Energy) (ID#19059)
- ☐ "Force Four" (Hurricane Hugo) (ID#19060)
- ☐ "Aftershock" (Earthquakes) (ID#19061)
- ☐ "The Unforgiving Sky" (Drought) (ID#19062)
- ☐ "Danger's Edge" (Hurricanes) (ID#20439)

Teacher Guides Needed:

Unless otherwise indicated, The Weather Channel will send only one copy of each.

- ☐ Project: Environment (ID#19017) "Within Our Power" Quantity: ____
- ☐ Project: Hurricane (ID#19018) "Force Four" Quantity: ____
- ☐ Project: Earthquake (ID#18844) "Aftershock" Quantity: ____
- ☐ Project: Drought (ID#18845) "The Unforgiving Sky" Quantity: ____
- ☐ Project: Hurricane Update '91 (ID#18847) "Danger's Edge" Quantity: ____

Please Indicate Method of Payment:

- ☐ $25.00 per tape enclosed (check payable to: THE WEATHER CHANNEL)
- ☐ Bill me for $25.00 per tape
- ☐ Send tape; I will dub and return it within 30 days. If it is not returned within 30 days, I understand that we will be billed $25.00 for each tape.

PLEASE ENCLOSE $5.00 FOR SHIPPING AND HANDLING COSTS.

Dept. 98

MAKE CHECK PAYABLE TO : THE WEATHER CHANNEL

Attachment C

NWS Publications

NOAA PA	NAME
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 Repentinas (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
81010	Floods, Flash Floods, and Warnings
81011	Spotter's Guide for Identifying and Reporting Severe Local Storms
82001	Tornado Safety
82002	Dust Storm Driving Safety (Wallet Card)
82004	Watch Out Storms Ahead
83001	Thunderstorms and Lightning
84001	SKYWARN 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)
	SKYWARN Decal
91001	Hurricane! Booklet
91002	Winter Storm...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)

CALIFORNIA HIGHWAY INFORMATION NETWORK (CHIN)

City/Location	Phone No.
Bakersfield (N)	805/393-1582
Bakersfield (S)	805/393-7350
Chico	916/895-8111
Fresno	209/227-7264
Marysville	916/743-4681
Merced	209/383-4291
Modesto	209/521-2240
Sacramento •	916/445-7623
Stockton	209/948-7365

• Cities with Touch Tone Feature

Caltrans Highway Information Broadcast Network (CHIBN)

KFBK/KAER - 1530 AM / 92.5 FM - Sacramento
KRAK - 1140 AM / 105.1 FM - Sacramento
KGNR/KCTC - 1320 AM / 96.1 FM - Sacramento
KOVR TV - Channel 13 - Sacramento
KPAY - 1060 AM / 95.1 FM - Chico
KBLF/KALF - 1490 AM / 95.7 FM - Chico
KHOP - 104.1 FM - Modesto
KAAT - 107.1 FM - Oakhurst

D-1

Pete Wilson
Governor

Carl D. Covitz
Secretary California Business,
Transportation and Housing Agency

James W. van Loben Sels, Director
California Department of Transportation

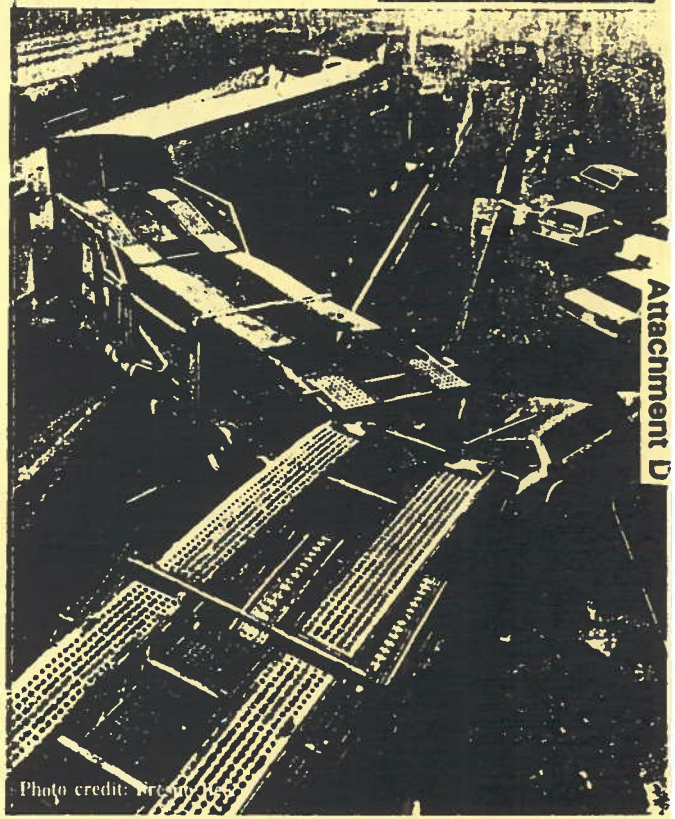
Caltrans

Produced in cooperation with:
Caltrans Districts 3, 6, and 10
California Highway Patrol
California Trucking Association.
National Weather Service
National Oceanic and Atmospheric Administration

Graphics by Kris Binger

A KILLER!

CENTRAL VALLEY TULE FOG



Attachment D

FACTS AND TIPS

CALTRANS * CHP * CTA * NOAA

CALIFORNIA TULE FOG

As the storm track moves further south during the winter months, rain begins to spread over the San Joaquin Valley. Radiation fog (called tule fog) forms during the night and morning hours during the winter months across the Central Valley.

On clear nights (when the ground is moist and winds are calm) the ground cools rapidly. This in turn causes the air adjacent to the ground to cool and condense into fog. As successive layers of air cool, the deeper the fog layer becomes. During the day, the sun heats the airmass and ground. The fog then begins to evaporate and "lift" which is responsible for improved visibilities.

The visibility in "tule fog" can often be less than 1/8 mile (660 feet) and can be as little as 10 feet! Valley bottoms are prime areas for tule fog formation. The coldest air always settles and these areas will experience the densest fog. Please keep this in mind as you travel in rolling terrain or through a basin area.

Exercise extreme caution if you must travel in a tule fog situation. Visibilities can deteriorate rapidly at any time. Multi-car accidents could occur if you do not keep your distance and reduce your speed.

FOG SEASON

Months that tule fog is most likely:
November through February

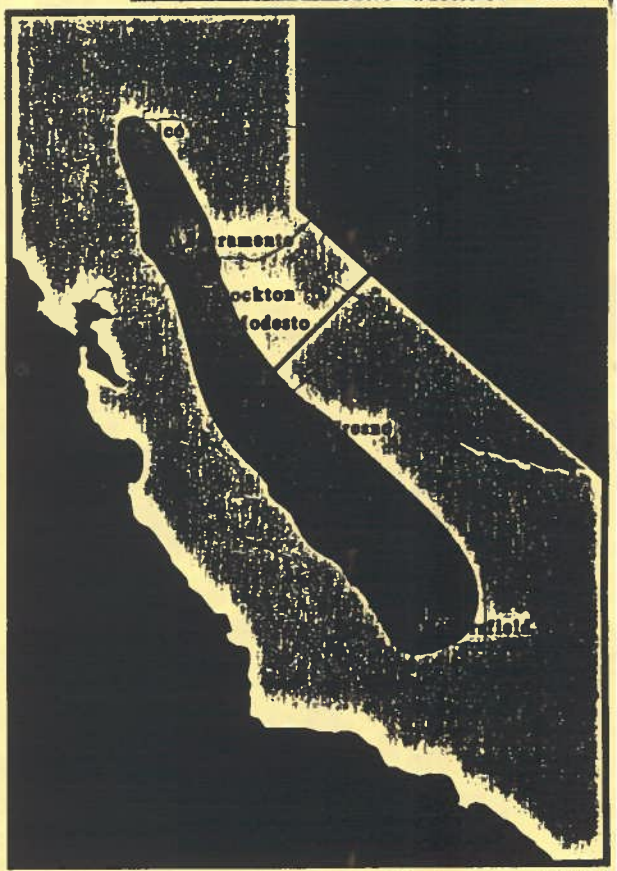
Typical number of Fatal Fog days:

November--6 days / December--12 days
January--12 days / February--6 days

FOG DRIVING TIPS

1. Drive with lights on low beam. Never drive with just your parking or fog lights.
2. Reduce your speed.
3. Avoid crossing traffic unless absolutely necessary.
4. Listen for traffic you cannot see.
5. Use wipers and defroster as necessary for maximum vision.
6. Be patient! Don't pass lines of traffic.
7. Unless absolutely necessary don't stop on any freeway, or other heavy travelled road.
8. If your car stalls or is disabled, move away from the vehicle to avoid personal injury.
9. Consider postponing your trip until the fog clears.

CENTRAL VALLEY FOG PRONE AREAS



EXPECT
CHP led truck convoys through dense fog in urban commute areas

Where are you, WXYZ?

DEAR ABBY: My husband and I travel the highways a lot and listen to the radio for weather reports. This can be very frustrating. The station call letters are broadcast (for example: XXXX), but never do they disclose the city they are from.

They give weather alerts and name the affected counties, but never the cities they are near or in! When you are driving down strange highways (never traveled before) and hear the weather alerts (but no city or town named), it is impossible to read a map and try to find the name of the county, which is in small print.

This has happened to us twice. We drove right into tornado warnings not realizing it.

The sky grew darker and darker and then the storm hit. Have you ever tried driving through St. Louis, road construction, blinding rain and lightning? I did. And I was a nervous wreck by the time I got through St. Louis. We couldn't even see the white lines on the highway. Our turnoff was blocked by road construction and we had to sit on the berm until the storm passed.

There should be an FCC regulation that forces radio stations to include their location and, if a weather alert arises, announce which main highways are included in the alert area.

Please have pity on the poor traveler going through your state. I'm sure others feel as we do.

— Indiana Travelers

DEAR TRAVELERS: Your transmission has been received loud and clear — so now hear this: This is Station ABBY in Los Angeles, imploring other broadcasters to mention their location along with their call letters.

The information could be a lifesaver.

DEAR ABBY

ABIGAIL VAN BUREN

Abigail Van Buren is a columnist for Universal Press Syndicate. Write to her at P.O. Box 69440, Los Angeles, Calif. 90069.

Attachment F
AWARE Report Roster

WINTER 1991/92

NWS Headquarters Staff, W/OM11	(301) 713-0090	
Donald Wernly	Chief, Warning & Forecast Branch	
Linda Kremkau	Editor	
Vacant	Synoptic Scale Meteorologist	
Bill Alexander	Mesoscale Meteorologist	
Therese Pierce	OM NEXRAD Radar Focal Point	
Rodney Becker	Public Weather & Dissem. & Program Leader	
Ron Berger	Public Weather & Dissem. Met.	
Estella Speaks/LaShone Darden	Secretary/Clerk Typist	

Eastern Region		FTS
Sylvia Graff	Regional (Focal)	649-5123
Solomon Summer	(Acting) Regional Hydrologist	649-5113
Mike Eckert	Cleveland (WPM)	942-4949
Mary Jo Parker	Columbia, SC (WPM)	677-5501
Martin Ross	Philadelphia (WPM)	597-3696
Rod Gonski	Raleigh (WPM)	670-5566
Barbara McNaught	Washington (Focal)	920-0202
Anthony Gigi	New York City (Focal)	662-5340
Stanley Levine	Albany (WPM)	562-6586
Walter Drag	Boston (Focal)	828-5752
Tom Dunham/Rich Webber	Buffalo (Focal)	437-4800
Roger Stairs	Pittsburgh (Focal)	722-2882
Fred Ronco/John Rimkunas	Portland, ME (Focal)	833-3552
Jerry Orchanian	Charleston, WV (Focal)	930-5201

Southern Region		
Buddy McIntyre	Regional (WPM)	334-2812
Dave Smith	Regional Hydrologist	334-2674
Patricia Brown	Atlanta (WPM)	246-7886
Charles Terrell	Birmingham (WPM)	229-0838
Mike Mach	Fort Worth (WPM)	334-3884
Ron Stagno	Houston (WPM)	COMM 713-534-2157
James Butch	Jackson (WPM)	490-4639
Vacant	Little Rock (WPM)	740-5331
Gary Woodall	Lubbock (WPM)	738-7361
Dennis Decker	Melbourne (WCM)	COMM 407-254-6083
Andrew Sniezak	Memphis (WPM)	222-2964
Jim Purpura	Norman (WCM)	736-6583
Mario Valverde	San Antonio (WPM)	730-5026
Ada Monzon	San Juan (WPM)	498-4586
Larry Vannozzi	Albuquerque (Focal)	474-2170
Mike Koziara	New Orleans (Focal)	682-2808
Wayne Colin/Cliff Brock	Miami (Focal)	350-4303
Jose Garcia	Amarillo (WCM)	335-1360
Vacant	Tulsa (WCM)	745-7748

Central Region		FTS
Larry Krudwig	Regional (WPM)	867-3239
Lee Larson	Regional Hydrologist	867-3220
Jim Allsopp	Chicago (WCM)	815-834-0600
David Runyan	Ann Arbor (Focal)	378-2220
Joe Sullivan	Des Moines (Focal)	862-4496
Shawn Harley	Indianapolis (Focal)	331-4035
Norman Reitmeyer	Louisville (Focal)	352-5210
Jim Kramper	St. Louis (Focal)	751-1876
Mike Dircksen	Sioux Falls (Focal)	782-4244
Vacant	Topeka (Focal)	752-2630
Todd Heitkamp	Denver (Focal)	564-0661
Mike Weiland	Cheyenne (Focal)	328-2376
Rainer Dombrowsky	Minneapolis (Focal)	725-3741
John Haase	Milwaukee (Focal)	362-3243
Richard May	Bismarck (Focal)	783-4224
Gary Wiese	Omaha (Focal)	864-4207

Western Region		
Richard Douglas	Regional (WPM)	588-4000
Bob Tibi	Regional Hydrologist	588-5137
Maux Barnes	Boise (Focal)	554-9860
Constantine Pashos	Los Angeles (Focal)	793-7215
John Lovegrove	Phoenix (Focal)	261-4607
Tom Ainsworth	Portland (Focal)	423-2340
Roger Lamoni	Reno (Focal)	470-5794
Mike Lewis	Salt Lake City (Focal)	588-5133
John Quadros	San Francisco (Focal)	466-7767
Robert Doherty	Seattle (Focal)	392-6087
Lynn Valtinson	Great Falls (Focal)	COMM 406-453-9957

Alaska Region		
Jim Kemper	Regional (WPM)	8-868-5130

Pacific Region		
Saul Price	Regional (WPM)	8-551-1671
Robert Larson	Hydrology (Focal)	8-551-1671
Thomas Heffner	Honolulu (Focal)	8-551-1698

NCDC - Storm Data		
Vacant		8-672-0458
Vince Miller		H 404-977-7603
		W 404-433-5134/5