

AWARE

SPRING 1991

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

MOVING FORWARD

The last issue of the AWARE Report highlighted the need to update our awareness materials and offered a plea for field personnel to be detailed to Headquarters for up to 6 weeks to assist us in the process. I am excited to report that this request generated considerable interest from both the regional staffs and individual field offices.

The Warning and Preparedness Meteorologist (WPM), Barbara McNaught, from the Washington, DC, Weather Service Forecast Office (WSFO) joined our staff on April 30 for the first 6-week detail to develop a winter weather awareness package. Ten other individuals have either been named by their region or have contacted us personally to offer their services.

Input from the Regional Meteorological Services Divisions made it clear that all of our materials need to be updated. Given the realities of the budget and the time available for each visiting WPM, we have elected to focus on the slide sets and brochures with the intent of providing a package for each hazard. All materials in the package will be linked together to reinforce the message and provide a coherent product.

Inside this issue are more details on how the awareness packages will be developed and impressions from Barbara on how the work on winter storms is progressing. Looking ahead, the WPM from Topeka, Bill Fortune, is scheduled to report in August to develop the tornado materials.

Finally, many field personnel have contacted us with innovative things they are doing to advance warning coordination and hazard awareness activities in their local areas. Accordingly, we have replaced the Warning Coordination and Hazard Awareness Bulletin Board with a new section titled "Hazard Community Forum" as a place to highlight these unique efforts.

This will be your section where you can present your ideas to the entire hazards community. We encourage all members of the hazards community, including other Federal, state, and local agencies; emergency managers; local decision makers; and the media to submit items that can be used by all of us to advance our warning and preparedness programs.

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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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HAZARD AWARENESS PROGRAM

Hazard Awareness and Education Packages - *Wernly*

As a first step in our effort to update our awareness materials, we met with the National Oceanic and Atmospheric Administration (NOAA) Office of Public Affairs to seek their support and assistance. By serendipity, one of our meetings included some representatives from a media consulting firm who gave us their impression of our materials. Although they were impressed with the content, they stressed that the brochures, slide sets, videos, and other materials should all be linked together to reinforce the message we were trying to convey. Similarly, the Director of Public Affairs, Reed Boatright, encouraged us to develop internally consistent brochure formats that would present a positive "look" while sending a signal as to the expected content.

With this guidance, we decided to develop hazard awareness and education packages for each hazard that would contain a **slide set, multi-page fold-out brochure, two-sided flier, and a presenter's guide**. Graphics and photographs from the slide set would be used in the brochure and flier to reinforce the message and form a coherent package. In order to ensure continuity, we felt that each visiting WPM should be responsible for a complete package. WPMs would be selected according to their expertise on the hazard involved. Obviously, the WPMs would work with the regions to address all necessary topics.

As we envision the project, each package would be structured as follows.

Slide Set

Each slide set would contain the amount of slides necessary to:

- identify the hazard,
- explain the hazard,
- highlight the impact of the hazard,
- outline the appropriate warning program for the hazard,
- indicate how critical information about the hazard can be received,
- outline the appropriate safety rules, and
- outline the appropriate preparedness actions to be taken before a hazard threatens.

Multi-page Fold-out Brochure

This brochure would address the same points as the slide set. All figures and pictures used in the brochure would come from the slide set.

The format of the brochure would parallel the format of such publications as *USA Today*. The intent would be to tell much of the story in pictures. Furthermore, each

topic should be easily identified so that users could home in on their particular topics of interest.

The last page would always contain preparedness actions. This would enable local communities or sponsors to tailor the page to their local needs and to provide a space for sponsor logos.

Two-sided flier

This would be a 4- by 10-1/2-inch heavy paper or cardstock flier that would have safety rules and watch/warning terminology on one side and preparedness actions on the reverse. A vivid photograph of the hazard would be located at the top front and would correspond to one of the photographs in the multi-page fold-out brochure.

Having preparedness actions always on the back would encourage local communities or businesses to tailor that portion for local needs and to provide a location for sponsor logos. Multi-color printing on glossy cardboard would be encouraged for heightened appeal.

This flier could be used alone as inserts for national publications, such as *Boy's Life*, *Yachting*, etc. NOAA already has an agreement with Times/Mirror to do this.

This flier would also be handed out to each individual attending an awareness talk and is especially useful for school children who might wish to take it home and hang it on their wall or on the family refrigerator.

Presenter's Guide

Today, our slide sets usually come with a script. This, unfortunately, suggests that the entire slide set be used verbatim for each presentation. In actuality, slide sets should be used as a resource of slides from which presentations can be tailored for different audiences.

Accordingly, a **Presenter's Guide** would be developed for each hazard packet which would attempt to show how the slide set, the fold-out brochure, and the flier could be used for various audiences.

For example, the **Presenter's Guide** for winter storms should highlight:

- the intent or goal of the hazard package,
- what slides should be used for various audiences,
- the significance of each slide, and
- how the distribution of handouts could be maximized. (In an elementary school setting, the larger brochure could be left for the teachers and resource personnel while each child could receive the flier to bring the message home.)

- Information for emergency managers on additional available materials on parallel subjects.
- Information for teachers on additional projects that could weave the theme into the curriculum.

An Additional Package

Once all of the hazards packets are developed, a two-sided flier would be available for each hazard. At this time, an additional multi-page fold-out brochure would be prepared to pull all of the hazard fliers into a multi-hazard awareness package. The multi-page brochure would briefly state each hazard and would act as a folder to house all of the fliers.

This package could serve to highlight safety rules and preparedness actions on a multi-hazard basis without requiring handing out or mailing each of the larger brochures. This could also be factored into community action plans.

We are extremely excited about this project and intend to keep everyone informed as to its progress. Whether it is too ambitious for each WPM to tackle one package remains to be seen. Furthermore, as we get further into this project, we might find that the suggested formats need to be altered to better represent what we are trying to communicate. In any event, our goal is to develop a unified concept that will work for all hazards.

Visiting WPM--Winter Storm Preparedness Materials - *McNaught*

Several weeks ago, I arrived at Weather Service Headquarter's (WSH) Warning and Forecast Branch on temporary assignment from the Washington Forecast Office. I was given my own office, phone, and PC and was rapidly oriented to the office and staff. My first goal was to review available materials on winter storms and identify the various aspects of the hazard, such as impacts, safety rules, and preparedness. I contacted each of the regions to ask for their assistance in obtaining good slides and pictures and identifying regional concerns and example storms. I am still awaiting regional materials and am interested in any pictures or ideas people can provide me.

At this stage, I am beginning to pull information together into the various forms in which it will be presented--flier, brochure, etc. Slides, pictures, and graphs will be identified to illustrate the various hazard concerns, impacts, safety, and preparedness points. A graphic artist is prepared to assist with the layout and design of the materials. A draft version will then be distributed to the regions for review. We hope to have the project completed, including printing and distribution, before the '91 winter storm season! It is ambitious, but I think it can be accomplished.

Clearing my schedule from the Washington Forecast Office was not easy, but management has been very supportive. WSFO Washington is currently staffed to cover NEXRAD training giving us some slack in the normal operational shift rotation. Since I

have not left the Washington area, I have handled occasional preparedness activities that were scheduled prior to my temporary assignment. Others at the office have also helped by teaching spotter training classes, attending meetings, etc.

Temporary assignment to the Warning and Forecast Branch has been a valuable experience. In addition to having the opportunity to work on a project with national impact, you get to see how WSH operates and meet the people at the other end of the phone line or memorandum. It is a different perspective. I can also provide them with a field/operational perspective when needed. Also, I am constantly learning of new resources that will help me perform my preparedness activities.

Meetings with the Federal Emergency Management Agency (FEMA) and The Red Cross on Preparedness Issues - *Wernly*

Starting last April, our branch has been meeting with representatives from FEMA and The Red Cross concerning how our organizations can work together in support of the hazard awareness and education program. FEMA has allocated monies to prepare slide sets and preparedness kits aimed at developing family safety plans. Similarly, The Red Cross is interested in issuing more preparedness brochures.

Some of the goals of this project are:

- FEMA would develop a catalogue outlining the materials available from all three organizations and how they can be obtained.
- The Red Cross has a contract with a private organization that we can use to distribute copies of our preparedness videos.
- FEMA is interested in working with us on the family safety plan preparedness slide sets and kits that could eventually be made available to our local offices for their preparedness work.

This is another exciting opportunity that we hope will provide greater support to our preparedness efforts. We'll keep everyone informed on the progress of this initiative.

Hazard Awareness and Public Schools - *Read*

On Tuesday, April 30, 1991, 15 health education teachers from the Baltimore, Maryland, public school district came to WSH for an all-day workshop on disaster preparedness education. The teachers are planning to incorporate natural hazards preparedness in the health education curriculum in the future. Barbara McNaught and I presented selected slide sets, videos, and other preparedness materials. During the last segment of the workshop, the teachers broke into groups by hazard to develop potential classroom activities. It was fascinating to see the strategies and concepts that the teachers developed to incorporate our materials into their curriculum. The teachers will provide us with a follow-up evaluation of our materials along with suggestions for developing materials to be used in the classroom.

MODERNIZATION

National Severe Storms Forecast Center Media Workshop - *Wernly*

On March 15 and 16, I represented WSH at the National Severe Storms Forecast Center's (NSSFC) Media Workshop. This is a workshop for TV weathercasters that NSSFC puts on every year as a kickoff to the severe weather season. The audience included top television meteorologists as well as representatives from private meteorological dissemination companies.

On the first day, I substituted for Lou Boezi by providing a general overview of modernization as well as an in-depth discussion on the concept of the Area Weather Update (AWU). Following the discussion, I attempted to poll their feelings on the validity of an AWU-type product. The concept was received very favorably, especially the idea of a short-term forecast and the status of current watches and warnings.

On the second day, I led a discussion on how the National Weather Service (NWS) verifies severe weather warnings and emphasized that the media cannot use pure verification numbers to assess an office's warning program. Several case studies were presented that illustrated how warnings generated from spotter reports saved lives and gave substantial lead times before striking communities but received low POD (probability of detection) scores and no lead-time credit because the warning was issued for the county after the tornado was spotted in the county.

What was particularly striking was that I asked the audience how they thought the Weather Service performed in each case before I read what the verification scores were. Literally, the whole audience felt that the warning performance was first rate and were shocked when they found out what the scores were. At least one TV weathercaster mentioned that he would do a story on verification and the warning program on his show.

National Hurricane Conference - *Wernly*

On April 3, Lou Boezi; Al Dreumont, the Area Manager for South Texas; and I led a discussion on the modernized Weather Service at the National Hurricane Conference in Miami. The National Hurricane Conference is sponsored by Federal, state, and local agencies to prepare the entire hazards community for the upcoming hurricane season. The intent of our briefing was to outline the new technologies that were driving the modernization and restructuring effort as well as how the modernization would be implemented.

Major concerns that we attempted to address were: how the new technologies would perform, what new products would be available, how critical information would be shared with the hazards community, and how the local office would function during a hypothetical hurricane threat. As was the case at Kansas City, one of the major discussion points centered around the AWU and how it would relate to the hurricane local statement.

Concerning the AWU in the hurricane program, the present concept envisions that it will:

- be issued hourly when the storm begins affecting the WSR-88D coverage area, and
- highlight present and short-term (up to 3 hours) effects of the storm.

WARNING AND FORECAST BRANCH INITIATIVES

South Atlantic Tropical Cyclone - Sokich

For the first time ever, a tropical system was observed in the Atlantic Ocean *south* of the equator. On April 12, 1991, at 1200Z, the Satellite Analysis Branch (SAB) of the National Environmental Satellite, Data, and Information Service (NESDIS) classified a tropical depression at approximately 7° south latitude and 3° east longitude. The depression reached a T2 on the Devorak classification scale for tropical systems indicating maximum wind speeds near 30 knots. The tropical depression had a low-level clockwise cyclonic circulation and lasted for only 2 days.

East Coast Hurricane Preparedness Tour - Sokich

In preparation for the beginning of the 1991 Atlantic Hurricane season on June 1, one of the two NOAA P-3 airplanes from the Aircraft Operations Center toured the Atlantic coast from Maine to Florida. Stops included Portland, Maine; Providence, Rhode Island; Farmingdale, New York; Atlantic City, New Jersey; Wilmington, Delaware; Norfolk, Virginia; Myrtle Beach, South Carolina; Savannah, Georgia; and Jacksonville, West Palm Beach, and Key West, Florida. This whirlwind tour took only 6 days from Sunday, May 19 to Friday, May 24! Let's hope the hurricane season isn't as active as this tour!

Accompanying Dr. Robert Sheets, Director of the Hurricane Center (NHC), on the NOAA P3 Aircraft was Dr. Susan Zevin, Eastern Region Director, as well as Reed Boatright from NOAA Public Affairs; Miles Lawrence and Herb Lieb from NHC; Mac McLaughlin, Southern Region Headquarters; and Richard Strome, Director, FEMA Region I, and Bill Massey, FEMA Region 4.

Tornado Symposium III, April 2-5, 1991, Norman, Oklahoma - Read

Tornado Symposium III, in honor of Dr. T. T. Fujita, was a resounding success. About three hundred people attended the Symposium, including some 30 NWS meteorologists. The ambitious program included sessions on modelling and theory, observations, detection and warning, climatology, hazard assessment, preparedness and mitigation, structural engineering, and forecasting of tornadoes. In addition, workshops on warning and preparedness and tornado modelling were conducted to conclude the Symposium. The many excellent presentations stimulated considerable after-hours discussions among participants.

Tours of the Norman NWS Forecast Office, the WSR-88D Operational Support Facility, and the National Severe Storms Laboratory were conducted the first evening. The increasingly popular (and spectacular) informal storm video and slide session was held Wednesday evening and ran until midnight. A banquet honoring Dr. Fujita was held Thursday evening. As always, Dr. Fujita gave a fascinating talk on his life work studying tornadoes.

The sponsors of the Symposium are preparing a post-print volume which will include refereed papers. As such, the volume will take some time to prepare and publish and is expected to be finished this coming winter. Copies of the volume will be provided to each NWS forecast office.

Disaster Survey for the Kansas/Oklahoma Tornadoes - *Sokich*

On April 26, 1991, killer tornados struck south-central and southeastern Kansas. A NOAA Disaster Survey Team was assembled to assess the performance of the warning program. The survey includes an assessment of the entire hazards community actions during the event. A NOAA disaster survey is conducted whenever there is major loss of life or extensive property damage/loss due to natural hazards. This team included:

Team Leader, Helen Wood, Director, Office of Satellite Data Processing, NESDIS
"Mac" McLaughlin, Southern Region Headquarters
Lynn Maximuk, Central Region Headquarters
Al Wheeler, MIC, WSFO Portland, Maine
Dave Imy, Operational Support Facility, Norman, Oklahoma
John Sokich, WSH
Steve Zubrick, WSH
Dr. Chris Adams, Consultant, Colorado State University
"Bud" Littin, NOAA Public Affairs.

Team members assembled in Kansas City, Kansas, to discuss the itinerary which included stops at NSSFC in Kansas City; Topeka, Kansas, WSFO; and Wichita, Kansas, WSO. Upon completion of the field survey, the team's preliminary findings were briefed to the Kansas Congressional Delegation on Thursday, May 9. A final report on this disaster will be completed and distributed to all NWS offices in the coming months.

Use of Power Company Data to Pinpoint Timing of Tornadoes - *Read*

Mac McLaughlin, a member of the NOAA Disaster Survey Team assessing the April 26, 1991, Wichita tornado, suggested the team contact the local electric company for the times when their lines went down. While in Wichita, Steve Zubrick, also on the NOAA Disaster Survey Team, visited the Kansas Gas and Electric Company and has produced some information that reminded us of a good resource for data following a tornado. They provided him with a map showing time and location of down power transmission lines. Steve estimates the data are accurate within 10 seconds at locating the tornado. WPMs may want to contact major utilities in their area to set up procedures to get similar data after an event--or in near real-time if possible.

NOAA Weather Radio (NWR) - Berger

The Winter 1990/91 issue of AWARE had an article describing the NWR Specific Area Message Encoder (WRSAME). To recap, WRSAME is a device connected to a standard NWR program console that puts a special code at the beginning and end of selected messages broadcast over NWR. The code specifies the type of message and area (by county) that the message applies to. This provides any users with a decoding device within listening range of the NWR signal the ability to choose which site-specific hazardous weather messages will automatically interrupt their normal programming.

Users of WRSAME may include radio and television stations, schools, cable companies, and others. In addition, the Federal Communications Commission, in studying possible equipment upgrades of the Emergency Broadcast System, is investigating use of WRSAME.

The Hollyanne Corporation has designed a Safety Alert Monitor (SAM) system for use within cable television systems which can be automatically activated by WRSAME. The SAM system consists of home receivers and a controller which is installed at the cable company's transmission facility. The SAM receiver operates independently of the cable subscriber's TV set. In fact, the receiver can operate even when no television is present in the home.

Franchise agreements have been recently signed between a number of municipalities and cable companies requiring installation of the SAM system tied to the WRSAME equipment at the local NWR station. At NWR stations not already having WRSAME, Hollyanne has installed the equipment at no charge to the NWS. SAM is already in use in nine cities in eastern Nebraska, and is coming on line in two cities in southwest Nebraska (Grant and Imperial) and in Provo, Utah. Interest in SAM has been high in other areas, such as Pennsylvania, northern Illinois, and southern Kansas. Hollyanne has noted increased interest since recent tornado disasters.

Branch Personnel Change - Wernly

Special Program Meteorologist, Gaudencio (Gody) Rivera, has assumed a comparable position for the entire Operations Division of the Office of Meteorology and is now on the staff of the Division Chief, Jim Travers. Gody did a lot of work for OM11 over the past year and a half by tracking national significant weather events, assisting in the Hurricane Watch Office, and organizing NWS participation in such activities as Public Service Recognition Week on the Mall in Washington, DC. He has also assisted us in preparing the NOAA Strategic Plan, Earth Day festivities, and the NWS Science and History Museum.

In his new position, Gody will be of even greater assistance by being able to support special projects for each branch in the Operations Division. Of course, he will continue his support to OM11 in significant weather event tracking, responding to public requests, and manning the Hurricane Watch Office. We all wish Gody continued success in his new position!

Update on Weather Service Operations Manual (WSOM) Chapters - Becker/
Berger/Sokich

The following is a status report for each of the Warning and Forecast Branch's WSOM chapters.

WSOM CHAPTERS

STATUS

C-10, State and Extended Forecasts

The NWS regions have basically agreed with the Warning and Forecast Branch's initiative to package together the State Forecasts (SFP) and Extended Forecasts (EFP). We all agree this will provide a better service to users at very little workload or resources cost to the NWS. This and other changes will be folded into a revised draft C-10 we hope to have ready for field review by this fall.

C-11, Zone and Local Forecasts

Appendix A, Zone Forecast Area Maps, to C-11 is being revised. The effective date of implementation is August 1, 1991. Many zone forecast changes have occurred since the last issuance in 1987. Primary among them are Michigan and Wyoming. The WSFO at Ann Arbor is already experimenting with the flexibility of the "one county-one zone" configuration in Michigan where county-sized zones are used as building blocks to provide combinations of small zones that best reflects the mesoscale, or short-term, forecast scenario.

A similar experiment will take place in Wyoming starting in October. There, because of terrain features and large county sizes, sub-county zones will be used. Although the Appendix will be operational in August, the included new Wyoming zone map will not become operational until October 1. We will send Family of Services and other national users the new Appendix. We will make it clear, however, that users should continue using the Wyoming zone areas from the last Appendix (1987 version) until the new Wyoming version becomes official.

WSOM CHAPTERS

STATUS

C-20, National Public Weather Products

The entire chapter is being revised to reflect the latest operational procedures. This is mainly a record keeping effort with no major policy issues to resolve. A draft should be ready for field review early this summer.

C-21, Local and Regional Statements, Summaries, and Tables

This entire chapter is also being revised to reflect the latest operational procedures. This is mainly a record-keeping effort with few policy issues to resolve. Some NWS product users have told us they would like more standardization of climatological reports. The draft chapter will strongly recommend standardized formats very similar to those planned in the future when composition of the reports will be automated.

C-41, Hurricane Warnings

Revised pages are being printed. An advanced copy has been sent to the regions and subsequently redistributed to coastal WSFOs and WSOs in the Southern and Eastern Regions. Pages from the printer should arrive in July.

C-42, Winter Weather Warnings

Field reviews have been received and a second draft is being prepared. Still shooting for this chapter to be released for the '91-92 winter season which begins in September.

C-44, Non-Precipitation Weather Hazards

Field reviews have been received and a second draft is being prepared. Aiming for a late August release.

C-49, Warning Coordination and Hazard Awareness Program

This revised chapter has been reviewed by the field and the employees union. The chapter is now being reviewed by the NWS Executive Affairs section. Official issuance should occur by early or mid-summer.

C-64, NOAA Weather Radio Program

This revised chapter is undergoing final review by the Deputy Assistant Administrator's office. Official issuance should occur in June.



INTERNATIONAL DECADE FOR NATURAL DISASTER REDUCTION -

Ed Gross, Chief, Constituent Affairs and Industrial Meteorology

The Federal plan for the International Decade for Natural Disaster Reduction (IDNDR) is in the final phases of completion. The plan now titled "Hazard-Proofing the Nation--Strategy to Reduce Natural Disasters" is being completed and will be presented to the Committee of Earth and Environment Sciences of the President's Office of Science and Technology Policy. Once approved at this level, the plan will be distributed both domestically and internationally and the next phase--implementation of the Decade--will get underway.

As has been reported earlier, Mrs. Marilyn Quayle has been an active participant in the Decade. She was recently appointed as the U.S. representative to a United Nations high level committee on the Decade. On April 24, 1991, Mrs. Quayle was briefed by members of the Federal subcommittee on the Federal plan and expressed her strong support for our activities.

On the international scene, the first session of the IDNDR Scientific and Technical Committee (STC) was held in Bonn, Germany, March 4-8, 1991. Here is the summary report.

The first session of the Scientific and Technical Committee for the International Decade for National Disaster Reduction was a very productive event. Agreement was reached on specific targets for the Decade, on the scope and framework of a Decade program, on means of stimulating National Committees and other participants, on an information strategy, and on a dozen international demonstration projects to launch the Decade's technical activities. The STC also attached importance to dealing with natural disasters as an integral part of national development plans, and in a coherent manner with environmental issues. These conclusions of the STC will be put forward as recommendations to the U.N. Secretary General later in the year, along with further proposals agreed upon at the STC second meeting, September 16-20, 1991.

As targets for the Decade, the Committee adopted the following.

By the year 2000, all countries, some through regional arrangements, should have in place, as part of their plans to achieve sustainable development:

1. National assessments of risks of populations to various types of disasters (e.g., floods, droughts, earthquakes, tropical cyclones, volcanoes, landslides, etc.).
2. National and/or local prevention and preparedness plans.
3. Access to global, regional, national and local warning systems.

Procedures for evaluating progress towards these targets were also agreed.

As an acronym to describe the overall program, the STC adopted Hazard PREEMPT (Prevention, REduction, Environmental safeguarding, Mitigation, Program, and Targets). From experience in a few countries, it is estimated that achieving such targets could reduce losses of life by more than 50 percent and damages in the short-term could be reduced by from 10-40 percent, depending on the nature of the hazard. Present global losses have been estimated by the World Bank as being in the range of 250,000 deaths per year and \$40 billion in damages. In addition, the longer lasting economic effects of a single major disaster can set back economic progress by as much as 5 years in some developing countries. One recommendation of the Committee is for an urgent effort to quantify more accurately the economic losses due to disasters and the benefits of disaster reduction programs.

The Framework Program that was adopted has seven major categories of technical projects, and three key supporting activities: (1) education, training, and public information; (2) transfer of technology; and (3) research on technology and policy. Projects will be conducted at global, regional, national, and local levels. The Committee decided not to adopt an activity structure based on types of disasters (floods, earthquakes, tropical storms, droughts, volcanoes, etc.), but on the activities which are common to all types of natural disasters.

Criteria for determining whether projects fit within the framework of the Decade were also adopted. The main criterion is that projects must be designed to lead to reduction of impact of disasters and must contribute to achieving the specific targets of the Decade. In addition, a number of desirable criteria, such as cost-effectiveness, contribution to self-reliance in developing countries, advances in science, and engineering and their applications, etc., were recognized.

The Committee adopted an Information Strategy for the Decade involving use of the public media, and the Newsletter, improvement of information exchange and means to achieve a major impact from IDNDR Day 1991 (October 9). IDNDR Day 1991 will focus on the theme: "National Disasters: Development: Environment--A Common Commitment" to emphasize the need for all countries to incorporate disaster preparedness in national development plans, and the close linkages between natural disasters and environmental issues, such as deforestation, decertification, global warming, and so on.

Active National Committees. Some 77 National Committees had been formed, or focal points designated, as of March 11, 1991. Among the proposals approved, subject to funding availability, were the holding of regional conferences of representatives of National Committees, and a global conference in late 1993 or in 1994. Steps to involve more actively the private sector, including the insurance industry, international nongovernmental organizations, such as the League of Red Cross and Red Crescent Societies, as well as organizations of the U.N. system were also endorsed.

HAZARD COMMUNITY FORUM

FEMA Region III Hurricane Exercise--WSFO Washington, DC - *Barbara McNaught, WPM, WSFO Washington, DC*

While it may not be uncommon for a state, county, or city to test its hazard response plan, it is not too often that a region of the country joins together to exercise its disaster preparedness. In a widespread disaster, such as a hurricane, decisions made by one county or state (evacuation, sheltering, road closures, rescue services, resources, etc.) impact what happens in neighboring counties and states. To operate effectively in a real disaster, counties, states, and Federal agencies have to pull together their plans and resources and coordinate their response.

The Washington, DC, WSFO is assisting FEMA to develop a hurricane scenario for FEMA Region III (Delaware, Maryland, District of Columbia, Virginia, West Virginia, and Pennsylvania). The exercise is proposed for 1992 before the Atlantic hurricane season. Many of the states have recently received, or are about to receive, their Hurricane Evacuation Study prepared by the Army Corp of Engineers and are updating their local and state plans. Some of the states have recently implemented the HURIVAC program. HURIVAC is a computer program used by local emergency managers as a tool to help them make the decision to evacuate. HURIVAC uses decision arcs which incorporate the hurricane storm track and evacuation zones based on SLOSH simulations.

The idea for the exercise was introduced to the states at a FEMA Region III Conference at Ocean City, Maryland, on April 22 and 23, 1991. The exercise will be coordinated between FEMA; NWS Offices in FEMA Region III; state, county, and city governments; and other critical groups within the region, such as police, The Red Cross, RACES (Radio Amateur Civil Emergency Service), schools, media, etc. The exercise will give them a chance to familiarize, test and refine new and old programs and plans, communication networks, and cross-jurisdictional and -agency cooperation. The hurricane will be as close to a real scenario as possible. The storm's actual path and severe weather impact will not be known to those participating in the exercise. They will be receiving NWS forecasts and statements on a real-time basis. The storm will impact all states in the region in one way or another, including storm surge and coastal flooding, high winds, downbursts and tornadoes, flash floods and river floods, or some combination.

Public Service Recognition Week (PSRW) - *Gody Rivera, Weather Service Headquarters*

This year's celebration was held on the Washington, DC, National Mall grounds from May 6-12, 1991. Opening ceremonies on Thursday, May 9, were attended by several Cabinet Secretaries, local U.S. Senators and Representatives, and VIPs. NOAA/NWS participation, along with other Department of Commerce (DOC) offices, consisted of displays and exhibits from several of the offices. The Office of Hydrology presented graphs and pictures of the drought problems in the western states; the Office of Systems Operations displayed the portable NOAA Weather Wire and Interactive Weather Display

(Prototype) being developed for the U.S. Congress; and the Office of Meteorology provided weather balloons, brochures, static displays, and volunteers for the 3-day display/exhibit in the DOC booth. The NOAA trailer held videotape sessions throughout the 3-day period staffed by the NOAA Personnel and Civil Rights Office.

Teaching Aid for Children - *Charlie Liles, MIC, WSFO Albuquerque*

Much of our preparedness effort is centered around adults and adolescents, and very little time is spent teaching small children. Furthermore, many behavior patterns are shaped very early in life. When talking to a young group of children, you may want to use a story line (see attachment A) as a teaching aid I developed recently. This sample lesson on weather is ideal for young children.

New "Tornado Safety Rules" Videotape - *Bob Collins, Port Meteorological Officer, Chicago WSFO*

Herb Hoffman (Physical Scientist), WSFO Chicago, and I, working with the cooperation of Chicago Access, a public access production studio in Chicago, have developed a new videotape depicting the "tornado safety rules." The video incorporates photos, text with voice over, and cartoon characters to illustrate the safety rules. The video was completed in February 1991. The cost is \$35 for a 3/4-inch tape.

The videotape has been shown at 11 public access stations, serving over 100 communities in northeast Illinois. In addition, the video has been shown at the popular FERMI Lab Tornado Seminar at Batavia, Illinois. Tom Skilling, TV weatherman for WGN-TV, hosts the show each year. Over 2,000 people were in attendance.

Furthermore, several of the Emergency Services Disaster Agency units in the metropolitan area have copies of the tornado video and are using it as part of their training.

Additional videotapes covering floods, lightning, heat wave, and winter weather safety are in the formative stages. These programs can be put together by the Chicago WSFO staff with the aid of Chicago Access.

Herb and I, working with Chicago Access, have arranged for the Chicago WSFO staff to conduct 13 half-hour weather programs this fall on a show called "Hot Line." The format was a straight call-in show where you answer questions from callers. The training took place in May 1991. The staff has to be trained on the operation of the "Hot Line" studio and the TV cameras and phone lines as the staff will be running the entire studio. These projects are an effective way to interact with the community while providing valuable information and services at the same time.

Publication Success on Services - *Todd Heitkamp, WPM, WSFO Denver*

I was very successful in getting the Colorado Public Service Company to include detailed tips on winter safety in their monthly mailing. The company has over a million customers. Prospects are good they will repeat this process for the convective season and tornado/lightning/flash flood safety.

"The Way Weather Works, A Story with the Weather Woodles" - *Carolyn Gurney, Meteorological Technician, WSO Colorado Springs*

"The Way Weather Works, A Story With the Weather Woodles" is a cartoon slide presentation I created in 1980 for elementary school children (see attachment B). This presentation consists of 39 slides, and it is estimated that it has been shown to over 30,000 children in the past decade.

I felt that the NWS has many publications they could use to talk to older children and to use for adults but were lacking in elementary school age material. Since I do free lance cartooning and graphic artwork, I decided to use my cartoon character, the "Woodle," and present him in a Weather Service setting. Since the "Woodle" character is my own creation and since I created the slide presentation on my own time, I obtained a copyright for the character and the presentation. I then granted the NWS a copyright release and gave them permission to use the slide program as they saw fit to educate children as to what the NWS is all about.

The fuzzy little "Weather Woodles" lead children through a narrated story about what the NWS and its employees do. They explain various types of weather and weather phenomena, weather safety rules, and what types of weather equipment the NWS uses to measure weather data and issue forecasts. One thing that always amazes the children is the fact that the National Weather Service employees work around the clock and that even in the middle of the night a Weather Service employee can turn on the NOAA Weather Radio in the child's home to warn his family of threatening weather. Even those children who have heard of the weather radio have not usually heard of the alert feature that is available, so after the presentation, most questions relate to the weather radio and where they can get one for their own home.

The slide presentation has been used in Western Region since 1980 as I was stationed in Pocatello, Idaho, when I created it. It is currently being used in Colorado Springs, Colorado, where I am presently stationed. We are working with some local contacts to possibly convert the "Weather Woodles" into a videotape presentation complete with animation of the character. The idea has also been suggested to use the "Weather Woodle" character for future NWS pamphlets and safety rules posters.

If any office is interested in viewing the slide presentation or would like to have additional information mailed to them when the videotape becomes available, please contact me at National Weather Service, 1599 Aviation Way, Colorado Springs, CO, 80916.

PUBLICATIONS AND AUDIOVISUALS

NWS Warning and Preparedness Materials - *Kremkau/Rivera/Sokich*

- The Warning and Forecast Branch has obtained most of the negatives from NOAA Public Affairs for the NWS hazard publications that our branch has responsibility for printing. This will enable us to act quickly and efficiently to reprint a publication when the stock is running low at NLSC.
- Two brochures which had been out of stock for quite some time have been replenished at NLSC. "Storm Surge and Hurricane Safety" (NOAA PA 78019) and "Tornado Safety" (NOAA PA 82001) are now available for reordering. All back orders will be filled automatically.
- "Watch Out, Storms Ahead" (NOAA PA 82004) and "Spotter's Guide" (NOAA PA 81011) are currently out of stock. Plans are to have both reprinted in the near future.
- The Hurricane Tracking Chart for the Atlantic (NOAA PA 77020) and the "Naming of Hurricanes" (NOAA PA 79017) have been reprinted and 5,000 copies of each have been sent to NLSC for distribution. See attachment C for a copy of the "Naming of Hurricanes." Also included as attachment D is the latest list of Eastern Pacific Tropical Cyclone Names.
- The Spanish translation of the Natural Hazard Watch/Warning Poster (NOAA PA 86001) is still progressing. The Public Affairs Office is in the process of preparing the artwork and layout for the poster and should have it to us for review within a few weeks. Hopefully, it should be printed by Summer 1991.
- Attachment E is the most recent list of NWS publications available from NLSC. Please feel free to make a copy and post nearby. Remember, the maximum number of copies you can order at one time for each brochure is still 300. For further information concerning NWS brochures, please call Linda Kremkau at FTS 427-8090.

AWARE Report Roster - *Kremkau*

Attachment F is the AWARE Report Roster. Please notify Linda Kremkau, Warning and Forecast Branch, at FTS 427-8090 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.

Attachment A

A WEATHER STORY FOR YOUNG CHILDREN

After getting them settled and seated on the floor, I tell them that we are going on an adventure and ask them if they all brought their imaginations along. Several children claim that they have no imagination, and those who have lots of it are asked to loan their classmates some. I tell them that when I snap my fingers, they will no longer be people. Instead, they will be little water drops with little water drop faces but no mouths to speak. I then draw (chalk board or whatever I have to work with) mountains, a river, and a long ditch leading down to the river from near the mountains. Then, I snap my fingers and tell them the story!

You are all little water drops, lying on your backs as if you are floating in an innertube in a pool of water. You are lazily stretched out, feeling the warmth of the morning summer sunshine on your little water face as you float gently down the river. You occasionally look up into a deep blue sky, just taking it easy. (During this stage, the children should be instructed to lay flat on the floor.)

You notice the sun gradually feeling warmer and warmer on your little water face, and after a little while it feels almost hot. You open your eyes, look around and notice that you are no longer floating on the river. Instead, you are floating slowly up into the air like a bubble or a tiny hot air balloon. Not only that, you notice that you have become INVISIBLE! (This seems to excite the children.) It feels exciting to float slowly upward into the sky, and nobody can see you, but you can see them. As you float higher and higher, the people and cars and houses and roads get smaller and smaller on the ground down below. After awhile, you look out and notice that you are as high as the tops of the mountains. Not only that, you look around and notice that you have become VISIBLE once again, but you are very tiny!

As you look around, you see other tiny water drops becoming visible all around you. In just a few minutes, more and more water drop friends show up all around you. All of you together have become a puffy little cloud. (I draw a puffy little cumulus cloud just above the mountain tops, and some of the children appear to be quite proud.) Far down below, with your tiny, tiny, but excellent water drop eyes, you see people going about their normal business. Every once in a while, someone looks up at you for just a second and then goes back to what he or she was doing.

More and more water drop friends show up. Pretty soon, you can hardly see up anymore because there are so many of you. It gets harder and harder to see much of anything because there are so many of you. (The children usually start rubbing up against each other.) Every once in a while, you are able to see the ground, and you notice people are looking up at you a little more all the time. Some of them are coming outside of the houses, looking up at you, and then going back into their houses. (I draw a much bigger cumulus cloud with a dark base.)

As you look around, you notice that something very strange seems to be happening. You are not as tiny as you once were, and everyone seems to be getting bigger. (This brings on attempts by the children to puff out their stomachs and faces.) After another few minutes, you have all gotten so big that you are having a hard time moving around at all without bumping into one another. (A few groans of agony from the more dramatic children.)

All of a sudden, there is a bright flash!! (I draw a lightning bolt from the cloud to the ground.) The flash doesn't hurt you because you are a water drop and you can't be hurt. But, the people down on the ground are quickly running inside their houses because they know that the lightning bolt can hurt them. (This is the place where some child will blatantly break the rule of water drops not having mouths...they want to know a little more about the lightning. I explain that lightning is not bad, but it has a job to do, and those people must not get in lightning's way!)

There are a few more flashes, and all of a sudden you realize that you have gotten so big and heavy that it's very difficult to stay floating in the air any longer. You start to fall toward the ground, but notice that all the other water droplets are falling too. You know that the ground can't hurt you because you are a water drop, but you still just naturally reach out and grab the hand of your water drop friend at your side. Different groups of you reach out and grab hands as you fall. (The children are instructed to form groups of three or four...which they hastily do.)

You see the ground getting closer and closer as you fall. A few people are still outside even though they shouldn't be, and they are looking directly at you as you drop toward them. (I draw a rain band out of the cloud.)

You hit the ground but it doesn't hurt. As soon as you hit the ground, you start rolling down a hill. (The children roll in whatever area they can.) Even though you are rolling, every once in a while, you are able to look out and see that many other water drops are also coming down the hill. Other drops and groups of drops are joining you from streets, parking lots, and the rooftops of houses and buildings.

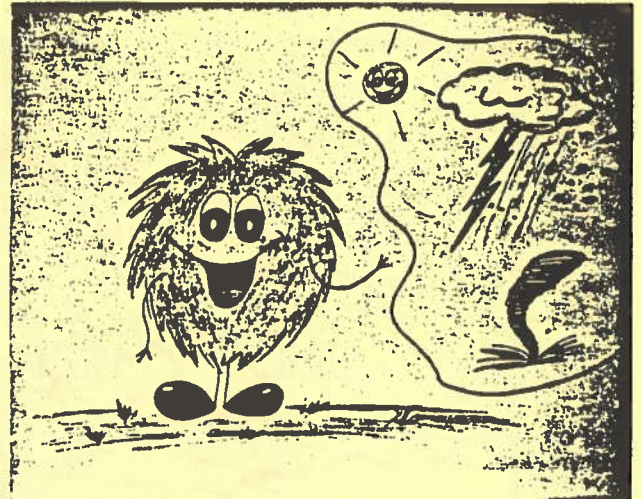
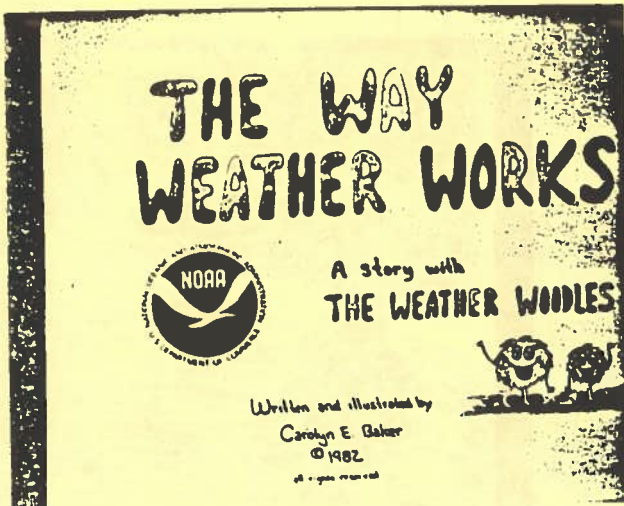
As you roll down the hill, you go faster and faster (this may require a little warning not to hurt yourself or a friend), and all of a sudden you slide down into an arroyo, and you are going very fast. It's like your favorite fast ride at the state fair. (I add a stream of water to the arroyo in my picture.)

Pretty soon, there are so many of you in the arroyo, you have made your own river this deep (show them 2 feet or so). You are moving so fast, and there are so many of you, you have become so powerful that you will sweep away anything in your way, even people and cars! You know that there should not be any people or cars in the arroyo, but if they are, they must get out of the way before you get to them!

You float rapidly down the arroyo for awhile and are happy that no one got in your way and that you didn't bump into anything on the way. Suddenly, you notice that you are going slower and slower. The arroyo is getting wider and wider, and you float easily into the river. (I show this on the drawing.)

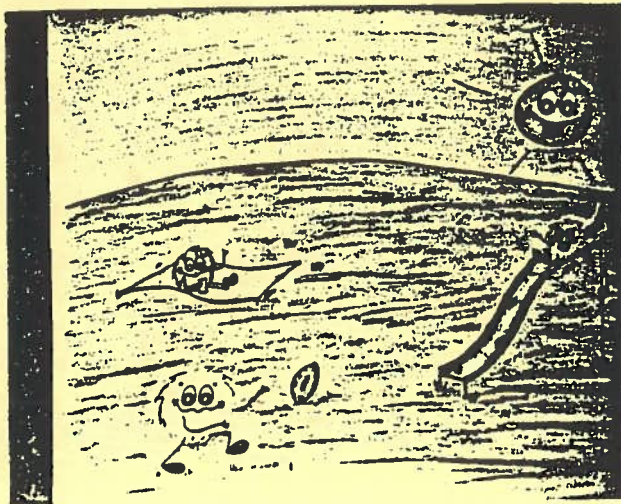
As you float out into the middle of the river, you suddenly realize that you have grown very tired from your journey. You feel as if you are floating lazily on an inner tube in the middle of a pool, and you close your eyes to take a nap. The sun is setting through patches of clouds, and turning the mountains rose colored. You fall asleep, knowing that you will be awakened by the warm sunshine of another summer morning, and you want to be ready for another adventure.

Attachment B

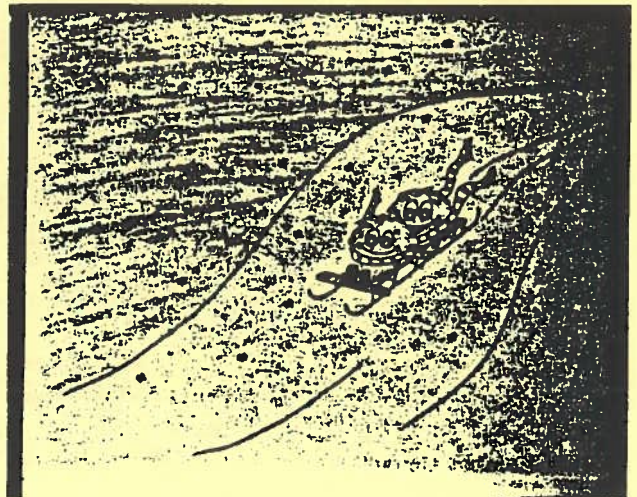


This is a story called "The Way Weather Works." These little fuzzy things are Weather Woodles. They and their friends will be showing you different kinds of weather, how weather works, and what the people who work at the National Weather Service do.

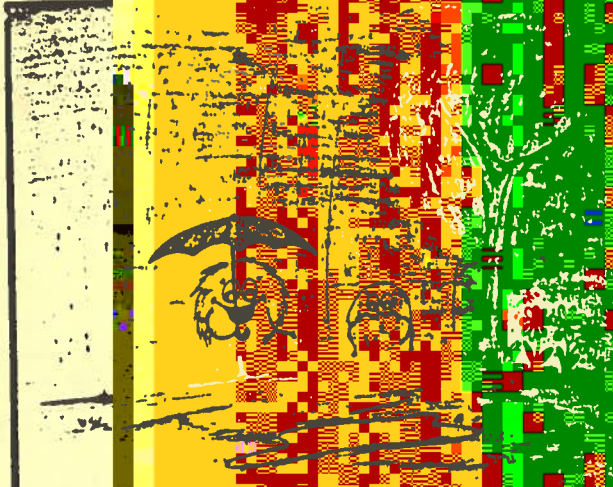
The weather affects everyone's life...that is why people always want to know what the weather will be like. How many different kinds of weather do you know of? (Get response from audience.)



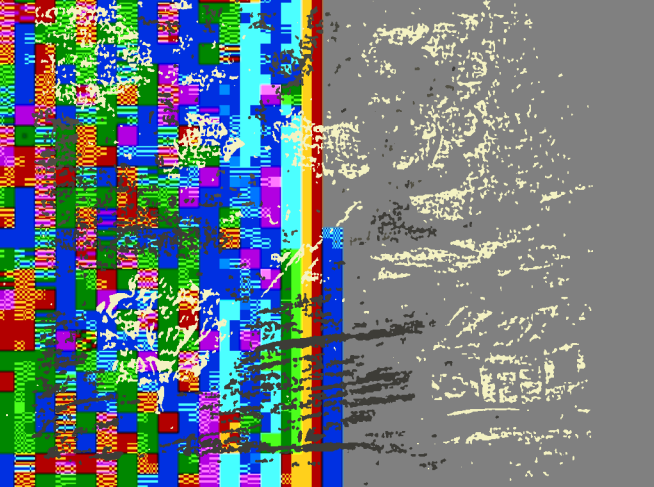
A kind of weather that most of us like the best... is a nice, sunny, warm day. Then we can have fun outside, like playing in the park...throwing frisbees, going fishing, or just sitting in the warm sun and relaxing. These Weather Woodles seem to be having a lot of fun in the sun.



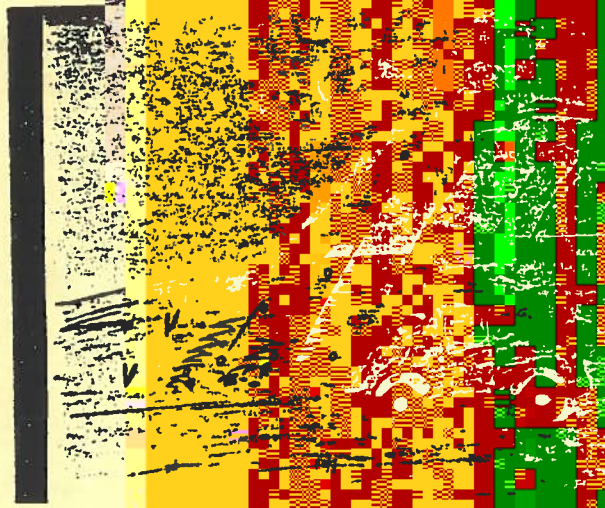
Some of us like snowy days better...then we can go skiing, sledding, ice skating, or build snowmen. These Weather Woodles are having a lot of fun with their sled on a big hill.



Not many of us like rainy days, but rain is another type of weather. We need the rain for flowers and trees to grow. Farmers need the rain for their crops to grow. We also need the rain so that there will be plenty of water in our rivers and lakes.



There are other types of weather that nobody really likes. One type is a thunderstorm. This Weather Woodie stays safe in his house during thunderstorms but he is doing one thing that he should not do. He should stay back away from his window during a thunderstorm.



Thunderstorms sometimes produce hail. Hailstones are frozen balls of ice that fall from clouds during thunderstorms. Hail can destroy farmers' crops...damage cars and trucks...and break windows. Sometimes the hailstones are so big that they can kill animals and people that are caught outside when they are falling.



Another type of weather that sometimes comes out of real bad thunderstorms is a tornado. Tornadoes are very dangerous and destroy anything in their paths...houses...cars...trees...EVERYTHING!! Always stay in your basement or other safe places during a tornado. This Weather Woodie family is safe in their basement.



The Naming of

Hurricanes

U.S. DEPARTMENT OF COMMERCE

NOAA - National Weather Service

Present Procedure in the North Atlantic, Caribbean, and Gulf of Mexico

The National Hurricane Center near Miami, FL, keeps a constant watch on oceanic storm-breeding areas for tropical disturbances which may herald the formation of a hurricane. If a disturbance intensifies into a tropical storm - with rotary circulation and wind speeds above 39 miles per hour - the Center will give the storm a name from one of the six lists below. A separate set is used each year beginning with the first name in the set. After the sets have all been used, they will be used again. The 1990 set, for example, will be used again to name storms in 1996. The letters Q, U, X, Y, and Z are not included because of the scarcity of names beginning with those letters.

The name lists have an international flavor because hurricanes affect other nations and are tracked by the public and weather services of countries other than the United States. Names for these lists are selected from library sources and agreed upon by nations involved during international meetings of the World Meteorological Organization.

The Six-Year List of Names for Atlantic Storms

1991	1992	1993	1994	1995	1996
Ana	Andrew	Arlene	Alberto	Allison	Arthur
Bob	Bonnie	Bret	Beryl	Barry	Bertha
Claudette	Charley	Cindy	Chris	Chantal	Cesar
Danny	Danielle	Dennis	Debby	Dean	Diana
Erika	Earl	Emily	Ernesto	Erin	Edouard
Fabian	Frances	Floyd	Florence	Felix	Fran
Grace	Georges	Gert	Gordon	Gabrielle	Gustav
Henri	Hermine	Harvey	Helene	Humberto	Hortense
Isabel	Ivan	Irene	Isaac	Iris	Isidore
Juan	Jeanne	Jose	Joyce	Jerry	Josephine
Kate	Karl	Katrina	Keith	Karen	Klaus
Larry	Lisa	Lenny	Leslie	Luis	Lili
Mindy	Mitch	Maria	Michael	Marilyn	Marco
Nicholas	Nicole	Nate	Nadine	Noel	Nana
Odette	Otto	Ophelia	Oscar	Opal	Omar
Peter	Paula	Philippe	Patty	Pablo	Paloma
Rose	Richard	Rita	Rafael	Roxanne	Rene
Sam	Shary	Stan	Sandy	Sebastien	Sally
Teresa	Tomas	Tammy	Tony	Tanya	Teddy
Victor	Virginie	Vince	Valerie	Van	Vicky
Wanda	Walter	Wilma	William	Wendy	Wilfred

Names of particular individuals have not been chosen for inclusion in the list of hurricane names.

Why Hurricanes Are Named

Experience shows that the use of short, distinctive given names in written as well as in spoken communications is quicker, and less subject to error than the older more cumbersome latitude- longitude identification methods. These advantages are especially important in exchanging detailed storm information between hundreds of widely scattered stations, airports, coastal bases, and ships at sea.

The Naming of

Hurricanes

The use of easily remembered names greatly reduces confusion when two or more tropical storms occur at the same time. For example, one hurricane can be moving slowly westward in the Gulf of Mexico, while at exactly the same time another hurricane can be moving rapidly northward along the Atlantic coast. In the past, confusion and false rumors have arisen when storm advisories broadcast from one radio station were mistaken for warnings concerning an entirely different storm located hundreds of miles away.

History of Hurricane Names

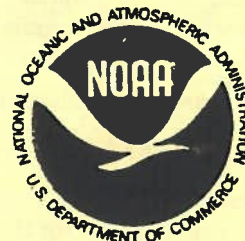
For several hundred years many hurricanes in the West Indies were named after the particular saint's day on which the hurricane occurred. Ivan R. Tannehill describes in his book "Hurricanes" the major tropical storms of recorded history and mentions many hurricanes named after saints. For example, there was "Hurricane Santa Ana" which struck Puerto Rico with exceptional violence on July 26, 1825, and "San Felipe" (the first) and "San Felipe" (the second) which hit Puerto Rico on September 13 in both 1876 and 1928.

Tannehill also tells of Clement Wragge, an Australian meteorologist who began giving women's names to tropical storms before the end of the 19th century.

An early example of the use of a woman's name for a storm was in the novel "Storm" by George R. Stewart, published by Random House in 1941, and since filmed by Walt Disney. During World War II this practice became widespread in weather map discussions among forecasters, especially Air Force and Navy meteorologists who plotted the movements of storms over the wide expanses of the Pacific Ocean.

In 1953, the United States abandoned as confusing a two-year old plan to name storms by a phonetic alphabet (Able, Baker, Charlie) when a new, international phonetic alphabet was introduced. That year, this Nation's weather services began using female names for storms.

The practice of naming hurricanes solely after women came to an end in 1978 when men's and women's names were included in the Eastern North Pacific storm lists. In 1979, male and female names were included in lists for the Atlantic and Gulf of Mexico.



Attachment D

EASTERN PACIFIC TROPICAL CYCLONE NAMES

<u>1991</u>		<u>1992</u>		<u>1993</u>	
Andres	ahn DRASE	Agatha		Adrian	
Blanca	BLAHN kah	Blas		Beatriz	BEE a triz
Carlos		Celia		Calvin	
Delores		Darby		Dora	
Enrique	anh REE kay	Estelle		Eugene	
Fefa	FAY fa	Frank		Fernanda	fer NAN dah
Guillermo	gee YER mo (gee as in geese)	Georgette		Greg	
Hilda		Howard		Hilary	
Ignacio	eeg NAH cio	Isis	EYE sis	Irwin	
Jimena	he MAY na	Javier	ha VEEAIR	Jova	JOE vah
Kevin		Kay		Knut	ka NOOT
Linda		Lester		Lidia	
Marty		Madeline		Max	
Nora		Newton		Norma	
Olaf	OH lah f	Orlene	or LEAN	Otis	
Pauline		Paine		Pilar	
Rick		Roslyn		Ramon	rah MONE
Sandra		Seymour		Selma	
Terry		Tina		Todd	
Vivian		Virgil		Veronica	
Waldo		Winifred		Wiley	
Xina	ZEE nah	Xavier	ZAY vier	Xina	ZEE nah
York		Yolanda	yo LAHN da	York	
Zelda	ZEL dah	Zeke		Zelda	ZEL dah
<u>1994</u>		<u>1995</u>		<u>1996</u>	
Aletta	ah LET ah	Adolph		Alma	AL mah
Bud		Barbara		Boris	
Carlotta		Cosme	COS may	Cristina	
Daniel		Dalilia	da LEE lee uh	Douglas	
Emilia	ee MILL ya	Erick		Elida	ELL ee dah
Fabio	FAH bee o	Flossie		Fausto	FOU sto
Gilma	GIL mah	Gil		Genevieve	
Hector		Henriette	hen ree ETT	Hernan	her NAHN
Ileana	ill ee AHN ah	Ismael	ees mah EL	Iselle	ee SELL
John		Juliette		Julio	HOO lee o
Kristy		Kiko	KEE ko	Kenna	
Lane		Lorena	low RAY na	Lowell	
Miriam		Manuel	mahn WELL	Marie	
Norman		Narda		Norbert	
Olivia		Octave	AHK tave	Odile	oh DEAL
Paul		Priscilla		Polo	
Rosa		Raymond		Rachel	
Sergio	SIR gee oh	Sonia	SONE yah	Simon	
Tara		Tico	TEE koh	Trudy	
Vicente	vee CEN tay	Velma		Vance	
Willa		Winnie		Willis	
Xavier	ZAY vier	Xina	ZEE nah	Xavier	ZAY vier
Yolanda	yo LAHN da	York		Yolanda	yo LAHN da
Zeke		Zelda	ZEL dah	Zeke	

Attachment E

NWS Publications

<u>NOAA PA</u>	<u>NAME</u>
70027	Survival in a Hurricane (Wallet Card)
74025	Tornado Safety Rules in Schools
76015	NOAA Weather Radio
76018	Lightning Safety (Wallet Card)
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
79013	Public's Guide to General Weather Information
79018	Winter Storms
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)
	SKYWARN Decal
	Naming of Hurricanes

**Attachment F
AWARE Report Roster**

SPRING 1991

NWS Headquarters Staff, W/OM11

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Linda Kremkau
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Rodney Becker
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Estella Speaks/LaShone Darden
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Editor
Synoptic Scale Meteorologist
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David Runyan
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Mike Dirksen
Bill Fortune
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Mike Weiland
Rainer Dombrowsky
John Haase
Richard May
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Regional Hydrologist
Chicago (WCM)
Ann Arbor (Focal)
Des Moines (Focal)
Indianapolis (Focal)
Louisville (Focal)
St. Louis (Focal)
Sioux Falls (Focal)
Topeka (Focal)
Denver (Focal)
Cheyenne (Focal)
Minneapolis (Focal)
Milwaukee (Focal)
Bismark (Focal)
Omaha (Focal)

867-3239
867-3220
353-4680
378-2220
862-4496
331-4035
352-5210
751-1876
782-4244
752-2630
564-0661
328-2376
725-3741
362-3243
783-4224
864-4207

FTS

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Solomon Summer
Mike Eckert
Mary Jo Parker
Martin Ross
Dennis Decker
Barbara McNaught
Anthony Gigi
Stanley Levine
Walter Drag
Tom Dunham
Roger Stairs
Fred Ronco/John Rimkunas
Jerry Orchanian

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(Acting) Reg. Hydrologist
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Columbia, SC (WPM)
Philadelphia (WPM)
Raleigh (WPM)
Washington (WPM)
New York City (Focal)
Albany (WPM)
Boston (Focal)
Buffalo (Focal)
Pittsburgh (Focal)
Portland, ME (Focal)
Charleston, WV (Focal)

649-5123
649-5113
942-4949
677-5501
597-3696
672-4436
COMM 703-260-0209
662-5340
562-6586
835-4662
437-4800
722-2882
833-3552
930-5201

FTS

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Dave Smith
Patricia Brown
Charles Terrell
Mike Mach
Ron Stagno
James Butch
James Kramper
Gary Woodall
Robert Goree
Andrew Sniezak
Jim Purpura
Mario Valverde
Ada Malo
Mike McLaughlin
Frank Revitte
Jim Lushine
Jose Garcia

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Reg. Hydrologist
Atlanta (WPM)
Birmingham (WPM)
Fort Worth (WPM)
Houston (WPM)
Jackson (WPM)
Little Rock (WPM)
Lubbock (WPM)
Melbourne (WCM)
Memphis (WPM)
Norman (WCM)
San Antonio (WPM)
San Juan (WPM)
Albuquerque (Focal)
New Orleans (Focal)
Miami (Focal)
Amarillo (WCM)

334-2812
334-2674
246-7886
229-0837
334-8505
526-5834
490-4639
740-5331
738-7362
COMM 407-254-6923
222-6441
736-6583
730-5025
498-4586
474-2170
682-6891
350-4303
735-1360

8-868-5130
8-551-1671
8-551-1698

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Carven Scott

8-868-5130

Pacific Region

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W 404-433-5134/5

