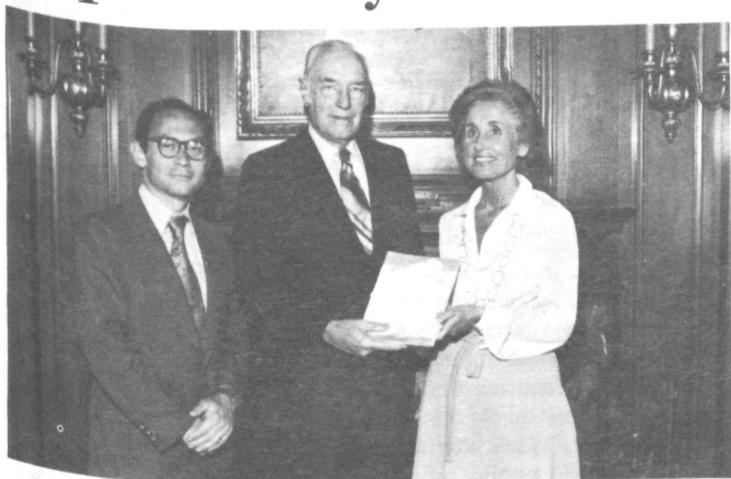


Experts Say Weather Modification Possible



Secretary of Commerce Juanita Kreps receives report from Weather Modification Advisory Board Chairman Harlan Cleveland (center) and NOAA Administrator Richard Frank.

Board Reports

A panel of weather modification experts say that technologies for increasing rain and snowfall and for lessening weather damage are "scientifically possible and within sight."

They predict that scientists will be able to produce 10 to 30 percent increases in mountain snowpack by the early 1980's, and 10 to 30 percent increased rainfall in the High Plains and Midwest by the late 1980's. By the 1990's, they believe, scientists will be able to bring about 10 to 20 percent reduction in hurricane winds and up to 50 percent reduction in the amount of hail in some hailstorms.

"There is an excellent chance in this field to do things right," says the Weather Modification Advisory Board in its report presented July 12, to Secretary of Commerce Juanita M. Kreps. But the Nation now needs a cohesive, 20-year Federal program, reinforced by State and private agencies, to realize the potential benefits of weather resources management.

(Continued on p. 2)

Scientists Try

NOAA may seed one Atlantic hurricane during the 1978 season if the disturbance meets Project Stormfury seeding criteria.

The seeding experiment would be the first since Stormfury scientists seeded Atlantic hurricane Ginger in 1971.

To be eligible for seeding, a hurricane must be predicted to be within 700 nautical miles (1,100 kilometers) of the operating base—Miami or San Juan—for at least 12 hours, and maximum winds in the storm must be at least 65 knots.

Seeding would not be done if the hurricane had more than a 10 percent probability of approaching within 50 nautical

A special section on Project Stormfury begins on page 4.

miles of a populated land area within 24 hours of seeding. This prevents the effects of landfall from complicating the work of detecting the effects of seeding, and allows time for seeding effects to dissipate.

Stormfury will use five aircraft—three from NOAA's Research Facilities Center in Miami, and one each from the National Aeronautics and Space Administration and the Air Force. The Air Force aircraft will not seed, but will fly a modified hurricane reconnaissance mission.

When a hurricane meets Stormfury criteria, seeding will be carried out for a 10-hour period, followed by intensive monitoring by the research aircraft of the storm's characteristics over the next 30 hours.

(Continued on p. 2)

Oil Spill Report Released Today

Oil spilled by the wrecked supertanker Amoco Cadiz last March permeated the marine habitats of the Brittany shoreline to an unprecedented degree, a scientific report released today indicates. The oil's impact varied greatly with time after the spill, and was strongly influenced by the shape and nature of the shoreline involved, according to the report.

These were among preliminary findings of government and university scientists in their analysis of the largest oil spill in maritime history. The report, "The Amoco Cadiz Oil Spill—A Preliminary Scientific Report," was prepared by NDAA, in cooperation with the Environmental Protection Agency. A complete analysis of the incident could take several years.

"We had never seen biological damage of this geographic extent in any previous oil spill," Dr. Almot N. Hess, director of NOAA's Environmental

(Continued on p. 2)

EDS Becomes EDIS And Creates CEAS

On July 16, 1978, the Environmental Data Service officially became the Environmental Data and Information Service (EDIS).

The change was made to more accurately describe the EDIS organization and its functions. The Environmental Science Information Center, one of its major components,

(Continued on p. 3)



New Jersey Governor Brendan Byrne holds copy of the film, *Hurricane Decision*, after presentation by the Disaster Preparedness Unit of the National Weather Service. Copies of the film were made available to the Governors of all the hurricane-prone states. Pictured with Governor Byrne are, from left, Marty Ross, WSO; Edward Yandrich, Jr., WSO; Joseph Piotroski, New Jersey Civil Defense; and William Coffey, WSO.

Stormfury (From p. 1)

The technique used in Stormfury is called "dynamic seeding," which means that forces within the seeded clouds are stimulated by seeding to produce the desired result. Dynamic seeding was pioneered during earlier single cloud seeding experiments and has been refined by NOAA's Florida Area Cumulus Experiment, conducted, like Stormfury, by the National Hurricane and Experimental Meteorology Laboratory in Coral Gables, Fla.

The theory behind the Stormfury seeding experiment is that dynamic seeding of cumulus cloud towers just outside the eyewall of the hurricane—the storm's main vertical conduit for air, moisture, and the exchange of energy that drives the storm—causes those clouds to develop vertically. The seeded clouds ultimately become a new eyewall, replacing the original one, and effectively increasing the diameter of the eye. This effect, through conservation of angular momentum, should reduce the maximum winds in the hurricane. Since much of a hurricane's damage is linked to its highest winds, scientists believe reducing those winds would significantly diminish hurricane damage.

If the storm's behavior or predicted position changes so that the hurricane no longer meets Stormfury criteria, aircraft and scientists will not seed, but will fly a long-term monitoring mission, keeping the storm under virtually continuous surveillance over periods as long as 60 hours.

GOES Changes

NOAA's GOES-3 satellite, launched into geostationary orbit by NASA from Cape Kennedy on June 16, has been turned over to NESS for operational control, and has been positioned at 135 degree West, over the Pacific Ocean.

As the operational satellite in that position, GOES-3 replaces GOES-1 which is being maneuvered, by stages, to a position over the Indian Ocean for use in next year's Global Weather Experiment.

Weather Advisory Board

(From p. 1)

To carry out the program, the Board recommends the consolidation of all Federal weather modification activities in a National Weather Resources Management Board, to be associated with NOAA, and with sufficient autonomy to carry out a serious, long-term research and development program in what the Board calls "weather resources management." Basic research support at academic institutions would continue to be provided by the National Science Foundation.

The Board recommends against a comprehensive Federal regulatory system for weather resources management at this time, but asserts a clear need to make sure that both research and operational projects are designed and operated on the basis of sound standards.

Pointing out that progress in influencing the weather for human good is dependent upon how hard men and women work "at developing a body of knowledge that is still only a generation old," the Board report states:

"The case for hastening progress along these lines is very strong. The economic benefits of delivering more water in the right places—for dry farming, for

irrigated crops, for hydroelectric power, and for municipal and industrial water use—seem very likely to outweigh the costs by impressive amounts. Large benefits, especially to aviation, can come from dissipating fog on command. Population growth and migration are multiplying the people at risk from hurricanes and other severe storms. If the damage from the weather's occasional fury can be mitigated, the people at risk will insist that the effort be made.

"The public interest requires that deliberate changes in the atmosphere be designed and carried out with environmental prudence and after consultation with the people likely to be most affected. The air and clouds are a public good, belonging to no one. The size and power of atmospheric systems are such that sensible policy must start with Federal responsibility for weather resources management—and a net-work of international arrangements as well."

Recommending a prudent go-ahead signal—a "green light with amber"—the Board points out that new technologies too often run ahead of social and environmental controls.

Oil Spill Report (From p. 1)

According to Hess, the French used more than a thousand tons of dispersants, released from ships outside the 150-foot (50-meter) depth contour, to try to prevent oil from coming ashore. Some quantities of dispersants and detergents were also applied to oiled beaches. "The impact of this heavy use of dispersants," he said, "is not known at this time."

By making the spill the subject of a major study, important new insights were gained into how oil moves and changes in the marine environment.

"The Amoco Cadiz study," Hess said, "should contribute significantly to the next generation of models that predict spilled oil trajectories

and impacts, especially along such complex shorelines."

Research Laboratories, said. He led NOAA's scientific study for several weeks in France, and is editor of the NOAA/EPA report.

An important lesson, Hess said, is that the impact of an oil spill varies greatly over different periods of time. "When the oil first hits the beach the contamination is just beginning. The impacts you see depends largely on being at the right place at the right time. For example, it was more than two weeks after the wreck that we saw millions of dead molluscs, urchins, razor and surf clams, cockles, and other intertidal animals killed by oil, or perhaps by dispersants, that had permeated one beach's ground water."

The Advisory Board, consisting of 17 members from private, public, and academic sectors, was established in 1977 to provide independent and broadbased advice to the Secretary, who—under the National Weather Modification Policy Act of 1976—is responsible for formulating a first-ever national policy on weather modification.

Chairman of the Board is Harlan Cleveland, former diplomat and university president who is Director of International Affairs for the Aspen Institute for Humanistic Studies.

Publication Wins Award

The National Marine Fisheries Service publication, *Anglers' Guide to the United States Pacific Coast* won third prize in the "Technical Publications" category of the 1978 Blue Pencil competition sponsored by the National Association of Government Communicators. The 139-page guide was written by James L. Squire and Susan E. Smith, and designed by Ms. Smith.

NOAA NEWS

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Articles to be considered for publication should be submitted at least 10 days in advance to NOAA News, Room 108, Rock-Wall Bldg., Office of Public Affairs, National Oceanic and Atmospheric Administration, Rockville, Md., 20852.

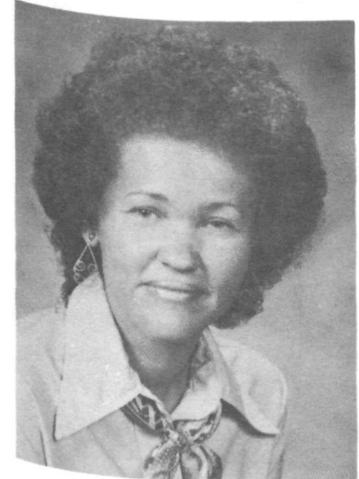
NOAA News reserves the right to make corrections, changes or deletions in submitted copy in conformity with the policies of the paper or the Administration.

Warren W. Buck, Jr., Art Director

ERL Appoints Two EEO Coordinators

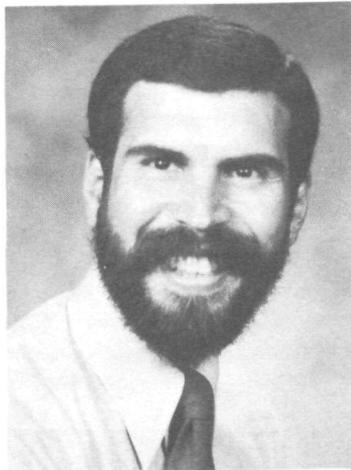
Two coordinators, concerned with the recruitment of Spanish-speaking minorities and women, have recently been appointed to full-time positions with NOAA's Environmental Research Laboratories headquartered in Boulder, Colo.

Lydia R. Stubbs, a native of Washington, D.C., was named Federal Women's Program



Lydia R. Stubbs

Coordinator, and Anthony J.L. Tafoya, an equal employment opportunity specialist for the Hispanic employment program.



Anthony J.L. Tafoya

Both appointees will carry out their programs at the NOAA research laboratories spread throughout the contiguous United States, Alaska, Hawaii, and American Samoa.

Before joining NOAA, Stubbs was an employment officer with the Navy in Point Magu, Calif., for three years. She previously had worked for the Department of Defense, the Department of Housing and Urban Development, and the Department of Labor.

Tafoya, whose hometown is Sante Fe, New Mexico, was the Spanish-speaking program coordinator at Rock Island Arsenal in Illinois before joining NOAA.

He also taught English as a second language and Spanish to students at Black Hawk College in Moline, Ill. during most of his tenure at Rock Island Arsenal. Between September 1967 and July 1970, Tafoya was a research aid with the United States Embassy in Caracas, Venezuela.

U.S.-Canadian Mapmakers

Meet in Norfolk

The NOAA Atlantic Marine Center, Norfolk, Va., recently hosted the Canada-United States Mapping and Charting Committee.

The National Ocean Survey's Office of Aeronautical Charting and Cartography played a major role at the meeting which covered the military and civilian mapping and charting products of the two countries and their adequacy for the defense of the North American continent.

Grant Roundup

OCZM Awards Over \$3 Million

Washington, first state in the Nation to receive Federal approval of a coastal management program, has received a \$1,450,000 grant from the Office of Coastal Zone Management to continue implementing its coastal policies which have earned Federal praise for involvement of local governments in carrying out the State's program. The award will be shared by local governments, State agencies, Indian tribes, the University of Washington, and at least one private firm.

In June of last year, Oregon became the second state to have its coastal management program approved by the Federal government and this year has received a grant from CZM of \$1.5 million to carry out the provisions of its program which also involves local government participation, and cooperation with the State of Washington to complete a management plan for the Columbia River estuary.

CZM has also awarded a \$279,129 grant to Alabama to help preserve and develop its coastal area by allowing State officials a fourth year to complete coastal management plans for federal approval.

Another grant awarded by NOAA of \$59,200 allows the New England Marine Advisory Service to establish a special task force designed to improve communications among fishermen and fisheries

organizations in the Northeast. Recognizing controversy exists among New England fishermen concerning limitations imposed under the 200-mile limit, the task force will focus much of its effort toward resolving the issues, using workshops and other programs.

Research grants totaling \$89,235 were awarded to the University of Michigan by the Environmental Research Laboratories, including: supplemental grants of \$32,285 to the university's Great Lakes Research Division to continue research on metabolic activities of particular species of floating plant and animal life which abound in the Great Lakes for determining which form of nitrogen most enhances the growth of phytoplankton in the lakes; \$30,000 to the biological station at Pellston for scientists to continue studying the eating habits of rotifers—tiny multi-celled organisms—for assessing their role in pollution processes taking place in the Great Lakes; and, \$26,950 to the Department of Electrical Engineering at Ann Arbor to simulate the effects of ice crystal formation, such as that which results from jet aircraft vapor, in the laboratory. Results of their experiments can be applied to equations of radiative transfer involving a cloud of ice particles for research conducted at the NOAA laboratories.

EDS Becomes EDIS

(From p. 1)

provides literature-based scientific and technical information products and services which complement the data products and services provided its other service centers. Collectively, these centers provide a comprehensive source for both environmental data and information.

The same trend that currently characterizes scientific data management—namely, the evolution from archiving and dissemination to emphasis on applications to solve national problems—also characterizes the scientific and technical information field. Scientific and technical information is an essential element of EDIS environmental assessments and evaluations related to the energy crisis, environmental pollution, world food problems, climatic anomalies, and many other national and international problems.

In another change reflecting the scope of its service capabilities and commitments, EDIS combined the Center for Experiment Design and Data Analysis (CEDDA) and the Center for Climatic and Environmental Assessment (CCEA) into a single new Center for Environmental Assessment Services (CEAS).

CEAS will provide assistance to managers of critical National resources by assessing the impacts of climatic variations on food, transportation, and energy resources, and of offshore energy developments on marine environments and resources.

The consolidation of CCEA and CEDDA into a single Center gives organizational recognition to the considerable collaboration and sharing of functions which has already occurred, and will allow optimum use of the interdisciplinary expertise and experience developed in each Center.

STORMFURY: Brains vs. Brawn as Scientists Pitting Their Skills Against the Greatest Storms on Earth

The hurricane seeding experiments that evolved into Project Stormfury began in 1961. Project Stormfury was formally established in 1962, as a combined Department of Commerce and Department of Defense program, carried out by what is now NOAA and the U.S. Navy. Additional support over the years has come from the National Science Foundation and from the U.S. Air Force, which became an active partner in the late 1960's. In 1973, the Defense Department decided hurricane modification was not a primary responsibility and discontinued their joint sponsorship of the experiment.

Since then Stormfury has been primarily a Department of Commerce project, and has focused mainly on developing better insights into the physical processes which drive hurricanes, through computer modelling and research probes of the storms. NOAA has also used this period to improve its hurricane research and seeding capabilities through the acquisition of two WP3D Orion aircraft.

The NOAA C-130 carries conventional meteorological instrumentation, and an advanced unit called the Airborne Weather Reconnaissance System (AWRS), a computerized data acquisition and display system developed by the Air Weather Service of the U.S. Air Force.

A second WC-130B—the other AWRS-equipped airplane—will also participate in Stormfury, operating for NOAA from the Air Force 53rd Weather Reconnaissance Squadron at Kessler Air Force Base, Miss. This Hurricane Hunter will not engage in seeding, but will perform a monitoring role similar to the hurricane reconnaissance missions routinely provided to NOAA by the Air Force.

NASA's Galileo II, a Convair 990 outfitted to scientific research, provides the high-altitude capability needed

in Stormfury. The airplane is operated by NASA's Ames Research Center, Mountain View, Calif., and has been specifically modified with cloud physics instrumentation, radar, and seeding equipment for Stormfury.

The Seeding Decision

Once a storm has been identified as a possible candidate for seeding by the Stormfury scientific director, the decision to seed is weighed by the Director of NOAA's Environmental Research Laboratories, and then by a board comprising that director, NOAA's associate administrator, and the assistant administrator for research and development. The final decision to seed is made on the scene by the Stormfury scientific director. But the seed decision can be rescinded at any time by any member of the Stormfury board.

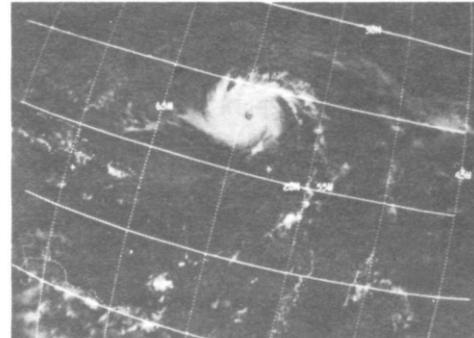
Dr. Robert C. Sheets, of NOAA's National Hurricane and Experimental Meteorology Laboratory in Coral Gables, Fla., is scientific director of Stormfury-1978.

Seeding

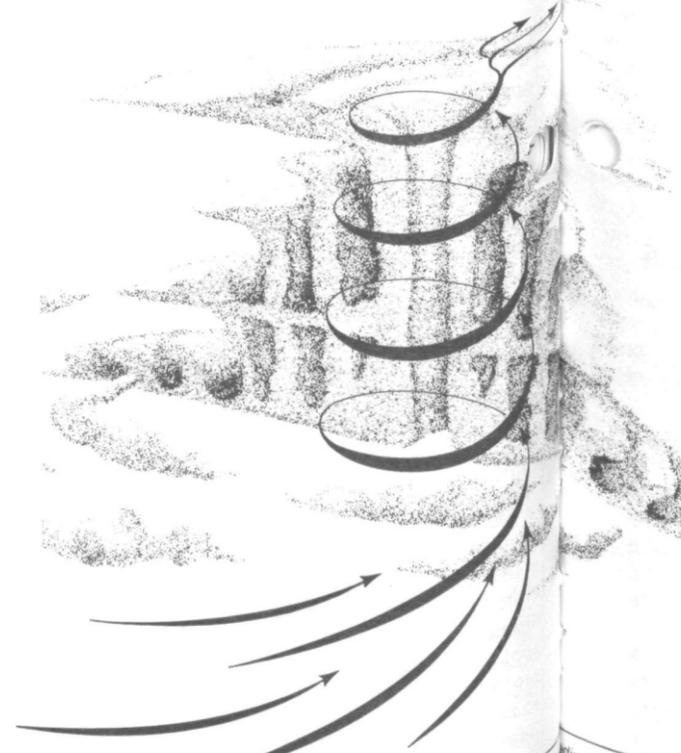
Seeding is conducted at an altitude of 27,000 to 30,000 feet (8,100 to 9,000 meters), in an area just outside the eyewall of the storm, where a hurricane has its worst winds. Seeding supercooled water in the immature cumulus cloud towers outside the eyewall induces the water to freeze, liberating its latent heat into the cloud systems. This makes the seeded clouds more buoyant and enhances their vertical development. As they build up to the hurricane's outflow layer, they replace the original eyewall as the main vertical conduit of the storm. The original eyewall, meanwhile, dissipates, leaving an eye of greater diameter, with reduced maximum winds in the new eyewall.

Silver iodide, the seeding agent, is deployed in small

(pencil-sized) pyrotechnic flares that release large quantities of silver iodide as they burn. The flares burn for a few thousand feet after the Stormfury plane drops them. In a Stormfury seeding sequence, some 8,000 to 10,000 of these rounds are used, at a rate of up to two per second. This method disperses about 500 pounds (225 kilograms) into the storm per seeding.

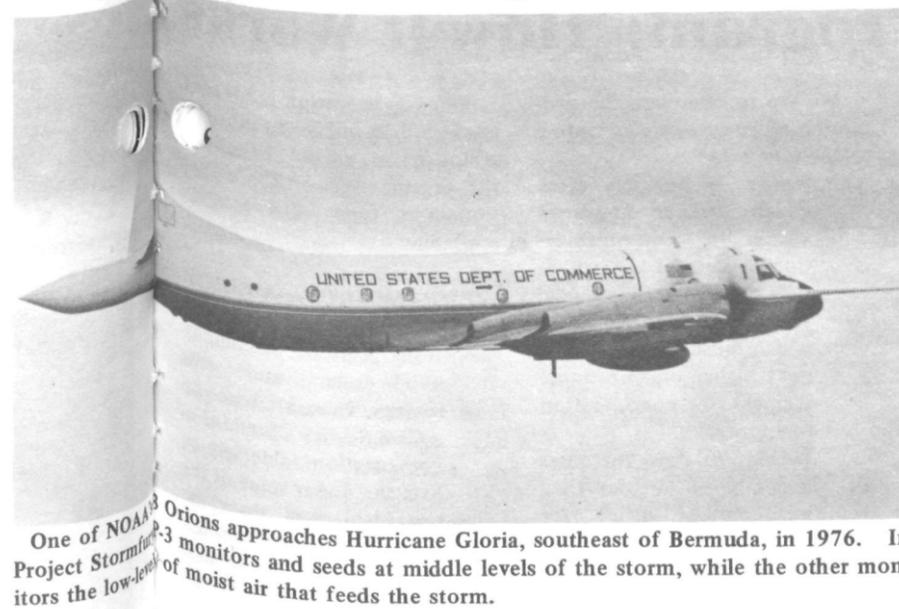


Hurricane Debbie: Were changes "natural?"

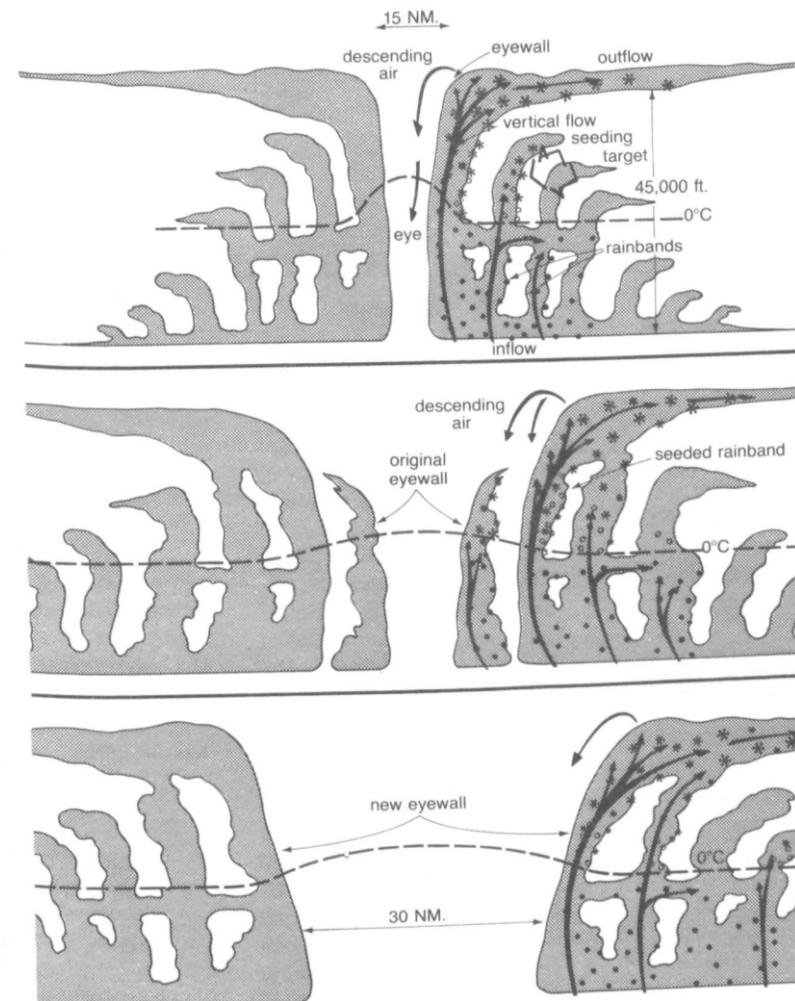


Hurricane structure and dynamics. Moist air flows into the mature hurricane near the surface, spiralling inward toward the violent maelstrom of wind and water around the calm eye. Vertically developed cloud systems form the eyewall, and are the storm's main conduit for vertical transport of incoming air. As this air is lifted and cooled, its cargo of condensing and freezing water releases large quantities of heat into the storm—this is the energy that drives the hurricane.

Stormfury hypothesis. Seeding supercooled water in the immature cumulus cloud towers outside the eyewall induces the water to freeze, liberating its latent heat into the cloud systems. This makes the seeded clouds more buoyant, and enhances their vertical development. As they build up to the hurricane's outflow layer, they replace the original eyewall as the main vertical conduit of the storm. The original eyewall, meanwhile, dissipates, leaving an eye of greater diameter, with reduced maximum winds in the new eyewall.



One of NOAA's Orions approaches Hurricane Gloria, southeast of Bermuda, in 1976. In Project Stormfury, WP-3 monitors and seeds at middle levels of the storm, while the other monitors the low-levels of moist air that feeds the storm.



Aircraft

Both NOAA WP-3D's and the NOAA WC-130B will participate in Stormfury. The Orions carry what is probably the world's most advanced atmospheric instrumentation, including digitized, video-recording radar. This high-technology radar gives scientists aboard the airplanes a continuous, three-dimensional look at hurricanes from the inside, permitting them to isolate cells of various intensities. Since the Stormfury seeding concept is built on the ability to identify and seed specific, seedable cloud towers, this radar information is vital.

The WEP-3D's also carry full arrays of cloud physics instrumentation to measure cloud droplets, liquid water, ice, and a host of other parameters related to the amount and form of water in a hurricane. Because water from the sea carries the

heat energy that powers the storm, these are very significant measurements.

In addition, the Orions are equipped with versatile radiation and sea-surface temperature sensors, and expendable instruments to profile the atmosphere between the airplane and the surface and to measure ocean temperatures from the surface to depths of several hundred feet.

Results to Date

Only four storms have been seeded by Project Stormfury: Esther, seeded on September 16 and 17, 1961; Beulah, on August 23 and 24, 1963; Debbie, on August 18 and 20, 1969; and Ginger, on September 26 and 28, 1971. Perceived changes in these storms after seeding all fell within the broad range of natural variability characteristic of hurricanes. In no case was a seeded storm observed to increase in strength.

But hurricane Debbie showed results rarely observed in unseeded storms. After seeding on August 18, 1969, maximum winds decreased by about 30 percent, and radar showed the eyewall had expanded to a larger diameter shortly after seeding. After hurricane Debbie regained strength on August 19, the storm was seeded again on August 20. Following the second seeding, maximum winds decreased by about 15 percent.

In addition to actual seeding experiments, Stormfury scientists have been testing their theories on computer models of hurricanes—mathematical formulas capable of stimulating key properties of the big storms. These tests indicate that seeding outside the eyewall decreases maximum winds in the model hurricanes, and that seeding has little or no effect on the model storm's track or net rainfall production. The effects of seeding are transient, disappearing from both seeded hurricanes and models 12 to 24 hours after seeding.

Employee Suggestion Program: How It Works

From time to time articles have appeared in Personnel Perspective about the Employee Suggestion Program. In this article we are covering how suggestions are processed, the types of awards given and how they are computed. We have included a checklist you can use to develop a complete suggestion.

The Flow of Your Suggestion

1. Employee submits suggestion to Suggestion Program Office.
2. Suggestion received and registered.
3. Eligible suggestions are numbered.
4. Suggestions are acknowledged by returning acknowledgement form to suggestor.
5. Response prepared for ineligible suggestions and sent to suggestor.
6. Eligible suggestions are forwarded to appropriate area for evaluation.

7. Evaluation prepared and returned to Suggestion Program Office.

8. Adopted suggestions are prepared for presentation of award.

9. Non-adopted suggestion letter sent to suggestor stating reasons for non-adoption.

10. Check ordered for adopted suggestion cases.

11. Award presented at appropriate ceremony or by supervisor.

We try to complete the processing of suggestions according to the following:

- Within 30 days for cases which can be approved within the same organizational segment in which they originated.
- Within 60 days for cases which must be sent to the next higher organizational segment for consideration or approval.
- Within 90 days for cases which must be sent to a headquarters office for consideration or approval.

Once a suggestion is adopted an award is made to the suggestor based on the benefit to the organization of the suggestion. Two types of awards are available:

TANGIBLE AWARDS:
Awards given for suggestions resulting in computable dollars and cents savings. These are based on a Civil Service Commission computation table, which lists the dollar value of the benefit derived from the suggestion and the amount of the award. This table is contained in NOAA Personnel Handbook Chapter 10, Exhibit A.

INTANGIBLE AWARDS:
These awards are given for suggestions having no readily computable benefits. These are also based on Civil Service Commission guidelines which take into consideration the:

(Continued on p. 11)

Checklist for a Complete Suggestion

Does your suggestion:

- | | |
|---|---|
| <input type="checkbox"/> describe the present situation? | <input type="checkbox"/> clearly state the benefits of your idea? |
| <input type="checkbox"/> define your proposed change? | <input type="checkbox"/> state the extent of application? |
| <input type="checkbox"/> discuss how your proposed solution will improve the operation? | <input type="checkbox"/> provide any necessary drawings, copies of materials, etc; if possible? |

NOAA Personnel Division Lists Current Vacancies

Announcement No.	Position Title	Grade	MLC	Location	Issue Date	Closing Date
AR 78-14	Meteorological Technician	GS-09	NWS	Cold Bay, Alaska	7/26/78	8/09/78
NASO 78-19	Supervisory Employee Relations and Development Specialist	GS-12/13	NWS	Seattle, Wash.	8/03/78	8/24/78
NASO 78-20	Fishery Biologist (Research)	GS-12	NMFS	Seattle, Wash.	7/26/78	8/09/78
SR 78-24	Electronics Technician	GS-10	NWS	Mobile, Ala.	7/24/78	8/07/78
SER 78-25	Fishery Biologist	GS-12	NMFS	Galveston, Tex.	7/24/78	8/07/78
SR 78-25	Meteorologist (Leading Forecaster)	GS-13	NWS	Atlanta, Ga.	7/24/78	8/07/78
SR 78-26	Meteorologist (Leading Forecaster)	GS-13	NWS	Fort Worth, Tex.	7/26/78	8/09/78
WR 78-26	Hydrologist	GS-12	NWS	Portland, Ore.	7/24/78	8/07/78
WR 78-28	Meteorologist (Research Meteorologist)	GS-13	NWS	Las Vegas, Nev.	7/26/78	8/09/78
NOS 78-31	Supervisory Cartographer	GS-12	NOS	Silver Spring, Md.	8/02/78	8/16/78
NWS 78-32	Supervisory Electronics Engineer	GS-13	NWS	Silver Spring, Md.	7/24/78	8/14/78
NOS 78-32	General Engineer	GS-14	NOS	Rockville, Md.	8/02/78	8/23/78
NOS 78-33	Supervisory Cartographer (Photogrammetry)	GS-13	NOS	Rockville, Md.	8/02/78	8/16/78
NWS 78-34	Communications Management Specialist	GS-13	NWS	Silver Spring, Md.	7/24/78	8/14/78
NWS 78-35	Supervisory Mechanical Engineer	GS-13	NWS	Silver Spring, Md.	8/02/78	8/16/78
EDS 78-39	Ecologist	GS-11	EDS	Washington, D.C.	7/24/78	8/07/78
HQS 78-51	Public Affairs Specialist	GS-12	HQS	Rockville, Md.	8/03/78	8/17/78
HQS 78-55	Physical Scientist	GS-15	HQS	Washington, D.C.	8/03/78	8/24/78
ERL 78-207	Physicist	GS-13	ERL	Boulder, Colo.	7/26/78	8/09/78
NOS 78-246	Supervisory Geodesist	GS-15	NOS	Rockville, Md.	8/03/78	8/24/78

NOTES ABOUT PEOPLE

Cdr. Jeffrey G. Carlen, Brooklyn, N.Y., has been appointed NOAA Liaison Officer to the U.S. Army Field Artillery School at Ft. Sill, Okla. In his NOAA Corps career, he has served as Chief of the Coastal Mapping Division at NOAA's Atlantic Marine Center, Norfolk, Va.; as Commanding Officer aboard the NOAA Ship Whiting; and as Executive Officer on NOAA Ships Whiting, Mt. Mitchell, and Marmer. He has also served with various satellite triangulation and geodetic survey field parties.

Ralph Robb was appointed earlier this year to Official in Charge of the National Weather Service Office at Waterloo, Iowa. Robb began his meteorological training in the Air Force in 1959. He joined NWS in 1967 at St. Cloud as a Weather Service Specialist and went on to serve in Dubuque, Lihue (Hawaii) and Pueblo.

Nine National Ocean Survey personnel have been selected for one-year full-time university assignments beginning fall 1978. They are: Jean F. Aker, Jr., John F. Isner and Brian G. Cooper to University of Maryland; David B. Zilkoski and Helen E. Sharpe to Ohio State University; Carl G. Nixon to George Washington University, Washington, D.C.; Michael D. Kanis to American University, Washington, D.C.; Bruce A. Parker and Alexandra Backus to Johns Hopkins University.

Personnel

- extent of application (how many people or offices the suggestion affects), and
- the value of the benefit (Moderate, Substantial, High or Exceptional).

Intangible awards range from \$25 to \$5000. A combination of the two types of awards is possible. For instance, a suggestion could propose a solution that has both dollar savings and also produces

beneficial results which affect an operation in a more abstract way. When you prepare a suggestion, you should try to include an estimate of the tangible and intangible benefits resulting from your idea. The evaluating office will confirm and/or make a computation of those savings. If there are costs involved in implementing a suggestion, those may be factored in with the projected savings, producing a "revised" savings on which the award would be based.

Lt. Robert G. Willisroft presented two scientific papers at the Fifty-ninth Annual Meeting of the American Association for the Advancement of Science on



Lt. R.G. Willisroft

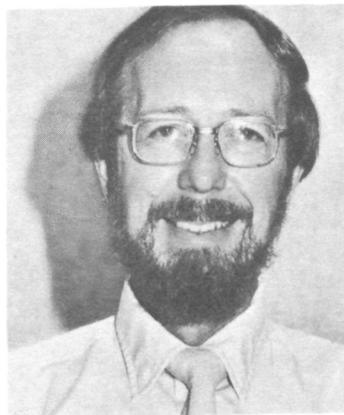
June 15 at University of Washington in Seattle. The papers were entitled *A New Technology for Diver Operated Underwater Surveying* and *A Non-acoustic Long Distance Underwater Communications System*.

(From p. 6)

beneficial results which affect an operation in a more abstract way.

When you prepare a suggestion, you should try to include an estimate of the tangible and intangible benefits resulting from your idea. The evaluating office will confirm and/or make a computation of those savings. If there are costs involved in implementing a suggestion, those may be factored in with the projected savings, producing a "revised" savings on which the award would be based.

Larry Rolufs is the new chief of the Reproduction Division, Office of Aeronautical Charting and Cartography, National Ocean Survey. Rolufs was formerly the Chief of the



Larry Rolufs

Printing Branch, U.S. Geological Survey. Prior service includes positions in commercial enterprise, State universities, the Internal Revenue Service, and the U.S. Geological Survey.

Internationals

Get Weather Satellite Training

Training in maintenance and operation of weather satellite receiving equipment began this month at the Goddard Space Flight Center in Maryland for 24 electronics technicians and engineers from 23 developing nations. This training is part of the World Meteorological Organization's Voluntary Assistance Program. New ground stations, donated by the U.S., are being installed in the participating countries and will be compatible with NOAA's latest polar orbiting (TIROS-N) and geostationary (SMS/GOES) satellites.

OBITUARY

Ezral Broers

Ezral "Tom" Broers, 61, retired Electronics Technician, WSFO, Des Moines, died June 28. He began work with the weather service in 1962 after 20 years in the military. He retired in 1973. He is survived by his wife, Mrs. Adna Broers, 214 Cedar St. Place, Norwalk, Iowa 50211.

Frank P. Margiotta of the Coastal Mapping Division at NOAA's Atlantic Marine Center in Norfolk, Va., recently received AMC's first Employee of the Year Award at the Center's annual picnic. Margiotta also had his name placed on a plaque displayed in the main building and on a bronze disk emplaced in the walk adjacent to the AMC flag pole and cannon. He was presented the award by AMC's director, R. Adm. Robert C. Munson who praised him for generating spirit in the AMC Team by initiating, planning and coordinating employee social functions that "have made AMC a friendlier place to work and contributed greatly to a comradeship so essential to employee morale."

HCMM Satellite Data Used In NESS Study

Three scientists from the Environmental Sciences Group, NESS, are evaluating the use of data from a recently-launched NASA satellite in estuarine water circulation studies, soil moisture measurements, and snow thermal properties studies.

Principal investigator Donald R. Wiesnet, assisted by Dr. David F. McGinnis and Michael Matson, will compare data from the Heat Capacity Mapping Mission (HCMM) satellite—launched in April—with ground truth information. The objective is to study the effect of soil moisture changes on thermal radiation; to monitor estuarine tidal currents; and, to study thermal radiation from snow.

The NESS team's work is supported by a grant from NASA. The studies of snow thermal properties are being conducted through a cooperative arrangement with the State University of New York, Syracuse.

The NESS study is one of 12 evaluations of HCMM-provided data being done in the U.S.

FROM THE GALLEY



CHILLED SHRIMP SALAD IN TOMATOES

1 pound cooked, peeled, and deveined small shrimp, fresh or frozen
 1 1/2 cups diced celery
 1 cup chilled cooked peas
 1/3 cup sliced green onion
 3/4 cup salad dressing or mayonnaise
 2 tablespoons catsup

1 tablespoon horseradish
 1 tablespoon lemon juice
 1/4 teaspoon salt
 4 large tomatoes
 Salad greens
 Additional salad dressing or mayonnaise, optional
 Watercress or mint springs, optional

Thaw shrimp if frozen. Combine celery, peas, and green onion in a bowl. Combine salad dressing or mayonnaise, catsup, horseradish, lemon juice, and salt; mix well. Pour over vegetables; toss lightly. Fold in shrimp. Wash tomatoes; remove blossom end. Cut tomatoes, not quite through, into 6 even wedges. Press wedges open and place tomatoes on salad greens. Fill each tomato with about 1 cup of salad mixture. If desired, top with a dollop of salad dressing or mayonnaise. Garnish with watercress or mint sprigs, if desired. Makes 4 servings.

BEST FISH BUYS

According to the NMFS National Fishery Education Center in Chicago, the best fish buys for the next week or so are likely to be fresh dressed mackerel and pollock fillets along the Northeast Seaboard; fresh pan-dressed croaker and sea trout in the Middle Atlantic States, including the D.C. area; fresh small shrimp and fresh whole mullet in the Southeast and along the Gulf Coast; frozen cooked shrimp and frozen grouper fillets in the Midwest; frozen dressed trout and frozen catfish steaks in the Northwest; and frozen small shrimp and fresh dover sole fillets in the southwest.

Definitive Study

NOS Publishes Flood Work

A definitive study of the origin, nature, and impact of severe tidal flooding of lowland

coastal regions caused by a combination of astronomical and meteorological forces has been published by the National Ocean survey.

Satellite Data Aides Research

Digital satellite data interpreted by the NESS Satellite Field Services Station in Miami, Fla., to provide the maximum possible temperature and spacial resolution of the Gulf Stream off Florida have been successfully used in operational support of an oceanographic mission.

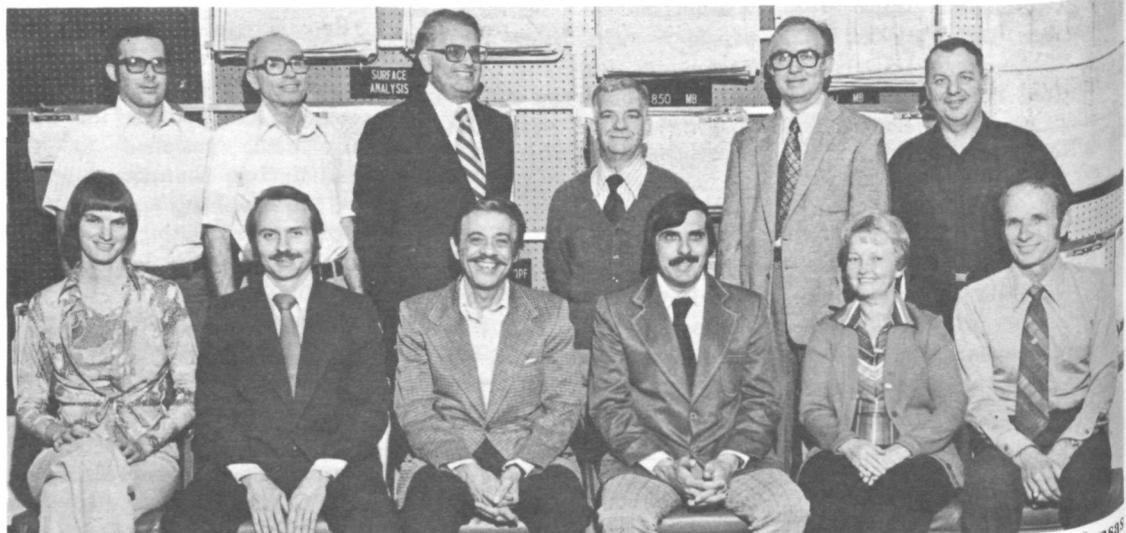
Part of an experimental GOES digital data base developed by Dr. Mark Waters of NESS' Computer Techniques Branch, the effort is only the second time such information has been used operationally.

In this instance the data, interpreted by Dr. Steve Baig of the Miami SFSS, was provided to researchers from the University of Miami's Rosenstiel School of Marine and Atmospheric Science aboard the research vessel S.S. Advance II. The research team was mapping the properties of a transient Gulf Stream spin-off eddy, and the digital satellite data showed the growth and movement of the eddy.

"The Strategic Role of Perigean Spring Tides in Nautical History and North American Coastal Flooding, 1635-1976," was written by Fergus J. Wood, a former research associate of NOAA's National Ocean Survey. The 538-page volume documents more than a hundred major coastal flooding events of the past, and discusses the related hazards to maritime commerce, seashore habitations, and the coastal environment.

The historical, practical, and environmental aspects of perigean spring tides are summarized in a less technical discussion for the non-scientist, and for the historian, Wood has documented events of the past that were influenced by perigean spring tides.

Copies of "The Strategic Role of Perigean Spring Tides in Nautical History and North American Coastal Flooding, 1635-1976" are sold at \$10.75 per copy (Stock Number 003-017-00420-1) by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.



The first Equipment Familiarization Seminar was conducted at the NWS Training Center in Kansas City, Mo., May 9-11. Attending the course, conducted for non-technical personnel, were (standing from left) Ron Thorwart, Silver Spring, Md.; Cecil Esneault, Kansas City, Mo.; Al Kerner, Garden City, Mo.; John Gullivan, Silver Spring, Md.; Charlie Miller, Kansas City, Mo.; William H. Barth (Instructor); (seated from left) Nancy Graves, Silver Spring, Md.; Hal Henegar, Silver Spring, Md.; Stan Loring, Silver Spring, Md.; Mike Tucker, Silver Spring, Md.; Carmyn Stewart, Silver Spring, Md.; and Gene Haston (Instructor).

National Oceanic and Atmospheric Administration

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