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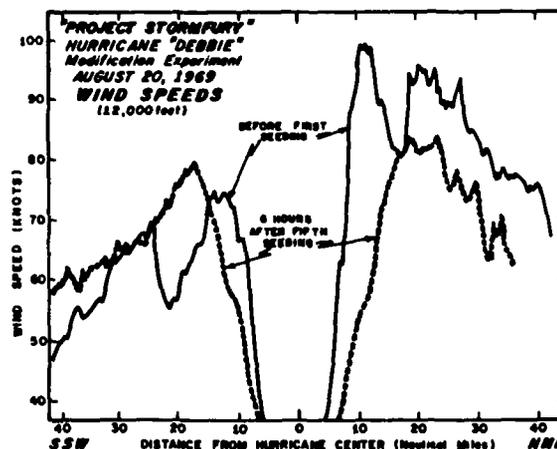
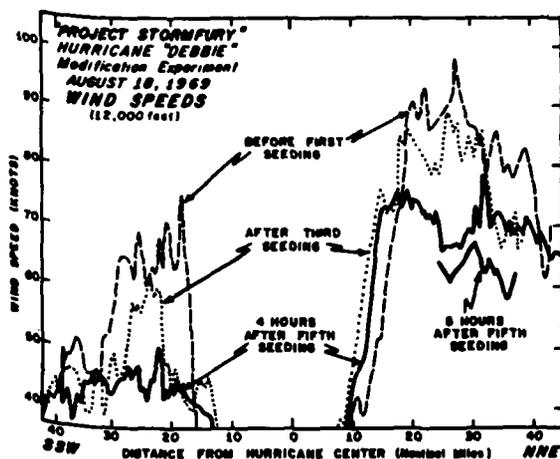
# ESSA NEWS

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## Secretaries Stans and Chafee Report on Project Stormfury; 1969 Seeding Results Hailed as Potential Breakthrough



After being seeded by Project Stormfury last summer, Hurricane Debbie weakened measurably, heightening the hopes for ultimate hurricane modification, the Secretaries of Commerce and the Navy announced yesterday.

Secretary Maurice H. Stans of the Department of Commerce and John H. Chafee of the Navy revealed that the hurricane weakened significantly on August 18 and moderately on August 20 after seeding operations over the Atlantic, several hundred miles northeast of Puerto Rico.

The Secretaries emphasized that scientists cannot now be certain whether the dramatic changes in Hurricane Debbie occurred as a result of seeding or through coincidence. If it was accomplished by seeding, they said, a major breakthrough in man's struggle against deadly storms has been achieved. They pledged an intensified effort next year to determine the source of the hurricane's temporary weakening.

Maximum winds decreased by 31 percent for a few hours after seeding on August 18 and by 15 percent after seeding on August 20, the Secretaries said. On both days, the storm was seeded and monitored by ESSA, Navy, and Air Force aircraft, flying from Roosevelt Roads Naval Station, Puerto Rico.

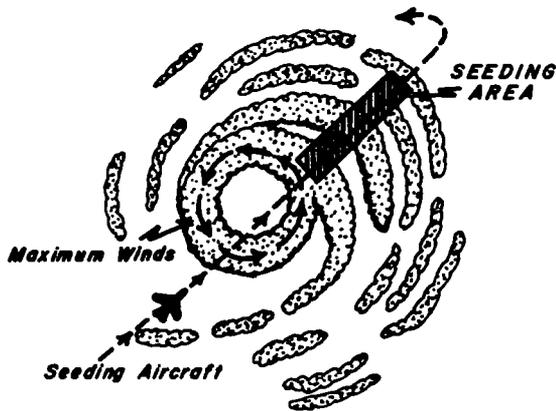
On August 18, before the first seeding, maximum winds at 12,000 feet were 98 knots. After the second seeding and again after the third, measured winds showed a decrease in intensity. Five hours after the fifth seeding, they were 68 knots.

There was no seeding on August 19, and on that day the hurricane reintensified. On August 20 the storm had a double eye structure, something unusual in hurricanes and complicated to handle with present seeding techniques. However, maximum wind speed before the first seeding was 99 knots. After the final seeding, it had dropped to 84 knots.

continued

## Project Stormfury (continued)

## FLIGHT TRACK FOR SEEDING AIRCRAFT



**208 SILVER IODIDE GENERATORS DROPPED  
IN AREA ON EACH SEEDING.  
(FIVE SEEDINGS ACCOMPLISHED AT 2 HOUR  
INTERVALS)**

Hurricane Debbie was the first tropical cyclone to be seeded in Project Stormfury since 1963. The experiment is based on the hypothesis that conversion of liquid cloud particles to ice will bring the sudden release of the latent heat of fusion of the droplets which, if accomplished in the proper areas of a hurricane, may cause redistribution of the storm's energy and a reduction in maximum wind velocities.

In other years, seeding began directly at the eyewall with a single line of 80 large canisters of silver iodide dropped into the hurricane. This year, aircraft penetrated the eyewall to the area of maximum winds before starting to seed. Then, 208 smaller but more efficient silver iodide generators were dropped five times at two-hour intervals on a line extending across the outer wall and into the adjacent feeder bands which help fuel the storm. The seeded storm was monitored by specially instrumented aircraft at several levels from 1000 to 37,000 feet, from four hours before the first seeding until six hours after the last one. During this period, winds were measured at frequent intervals. Data from the 12,000-foot level, which is considered representative, forms the basis for the conclusions reported.

Hurricane Debbie was ideal for the experiment. She was far enough at sea so that seeding could pose no problem for the mainland. She was mature and rela-

tively stable in intensity, although slowly growing stronger until about the time of the first seeding. From early August, Stormfury scientists, planes, and flight crews had been on 48-hour alert for suitable seeding conditions, with up to 16 planes awaiting a call to action.

It was emphasized that much more analysis must be undertaken to determine whether Debbie's temporary weakening was manmade or natural. Toward this end, data from NASA's ATS-III satellite, from radar, from the water content of clouds, and from temperature and pressure readings will be studied. It was emphasized also that Stormfury's objective is not to destroy hurricanes (whose force is so great that no tools or techniques now known could dissipate them), but to achieve better understanding and improved prediction, and to determine whether and to what degree modification is possible.

As prediction and preparedness improve, hurricanes claim fewer and fewer lives. However, their toll in property damage is tremendous and growing, and there is every reason to expect the trend to continue as long as more and more expensive structures are built in hurricane-prone areas.

Hurricane damage is created by wind, wind-driven storm surge which sends the sea onto the land, rain and flood. If the wind speed, and hence the wind force, of hurricanes can be lessened as they approach land, both death and damage may be materially reduced.

Stormfury scientists estimate that if Federal hurricane modification research continues at the present level for a decade and if, in that time, one severe hurricane such as Camille can be weakened so that its damage is reduced as little as 10 percent, the investment will have been returned tenfold.

Overall responsibility for the Stormfury program rests with Dr. Robert M. White, ESSA Administrator, and Captain E. T. Harding, USN, Commander of the Naval Weather Service Command. Dr. R. Cecil Gentry, head of ESSA's National Hurricane Research Laboratory in Miami, is Project Director. Associated with Dr. Gentry as Assistant Director and Navy Project Coordinator is Commander L. J. Underwood, USN, Commanding Officer of the Fleet Weather Facility at Jacksonville, Florida. Dr. Pierre St. Amand is Project Manager at the Naval Weapons Center, China Lake, California, where the silver iodide pyrotechnics used for seeding were designed and developed.

## Sixth Hurricane Conference Attended by ESSA Scientists

The Sixth Technical Conference on Hurricanes, sponsored by the American Meteorological Society, was held in Miami, Dec. 2-4. Following welcoming remarks by Dr. R. Cecil Gentry, Director of ERL's National Hurricane Research Laboratory, and Chairman of the Greater Miami Chapter of AMS on Dec. 2, the sessions were devoted to discussions covering all aspects of tropical cyclones.

ESSA participants presenting papers or chairing sessions during the three-day conference were: Dr. R. H. Simpson, NHC; Shigemi Fujiwhara, NMC; John R. Hope, NHC; Charles J. Neumann, Spaceflight Meteorology Group; Paul Hebert, NHC; Banner I. Miller, NHRL; Arnold L. Sugg, NHC; Joanne Simpson, ERL; Toby N. Carlson and Robert C. Sheets, NHRL; Stanley L. Rosenthal, NHRL; Jerome Namias, NMC; Jose A. Colon, WB; Neil Frank, NHRL; Thomas H. Carpenter, ERL; Ronald L. Holle, ERL; H. McClure Johnson, NHC; Gilbert Jager, NESG; Syukuro Manabe, J. Leith Holloway, Jr., and Hugh M. Stone, GFDL; Harry F. Hawkins, NHRL; Dr. John W. Townsend, Jr., ESSA; Richard A. Anthes, NHRL; W. L. Smith, NESG; H. M. Woolf, NMC; Harold A. Bedient, James E. McDonell, Thomas Flattery, and Joseph Irwin, NMC; Lloyd W. Vanderman, NMC; William H. Haggard and Frank T. Quinlan, NWRC; William L. Woodley, Experimental Meteorology Laboratory.

## Hurricane Camille Shore Changes Indicated on New C&GS Chartlets

The Coast Survey issued the first of a series of nautical chartlets on Nov. 15 showing changes caused by Hurricane Camille along the Gulf Coast. The chartlets show the effect of the hurricane on water depths and on shorelines; offshore features, and manmade structures. The first chartlets issued cover damaged areas on Ship and Cat Islands off Gulfport, Miss., and in the entrance to Gulfport. Other chartlets will show changes to Horn and Petit Bois Islands near the entrance to Pascagoula, Miss., and Dauphin, Pelican and Sand Islands near the entrance to Mobile Bay. Others may be necessary as investigations by Coast Survey field parties continue along the Alabama and Mississippi coasts.

## New Radar Facility Dedicated in Maine



Gordon W. Harris

As part of the Federal Government's plan to provide the maximum integration of current and future weather radar facilities, the Weather Bureau formally commissioned a Weather Search Radar installation at the Naval Air Station, Brunswick, Me., Dec. 5.

On that date, the Weather Bureau officially assumed operation of the Naval Weather Services' radar. The newly modified radar is now a part of the Weather Bureau's basic observations network used for the detection of precipitation within its operating range of 250 miles. Information obtained from weather radars is important to identify, track, and estimate the intensity of squall lines, tornadoes, hurricanes and other destructive storms. The radar reports are used by meteorologists to issue forecasts and warnings to the public, industry, governmental agencies and special interests, including flight planning.

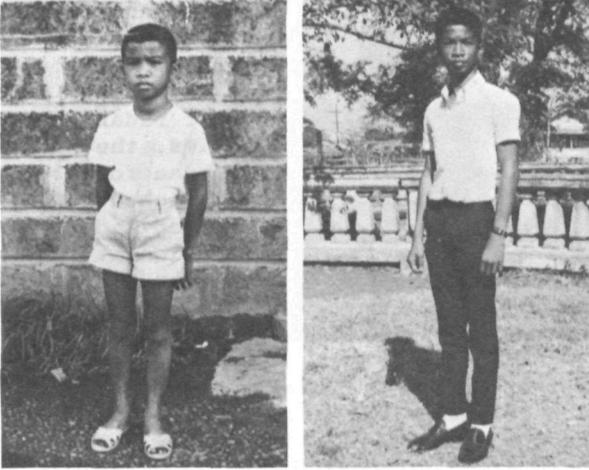
Gordon W. Harris, formerly a radar meteorologist at Washington National Airport, Washington, D.C., has been appointed meteorologist in charge of the new facility. Mr. Harris began his weather Bureau career in Washington in 1951 as a surface observation specialist and map plotter.

## "Floating Classroom" Graduates Hired

Twenty-two young men--members of the first class to be graduated from the USC&GS Ship EXPLORER--were recently hired by the U.S. Naval Oceanographic Office as physical science aides, ocean charting aides, and as trainees in chart printing and production.

The EXPLORER--a 219-foot, 1900-ton vessel decommissioned last year at the C&GS Atlantic Marine Center--was transferred to the U.S. Office of Education for use as a floating classroom to train unemployed disadvantaged young men from the Washington, D.C., area.

## WXAP Foster Parents Aid Youth in Philippines



Alejandro in 1964 (left) and 1969 (right)

In the fall of 1964, Allen D. Pearson, now Director of the National Severe Storms Forecast Center, Kansas City, Mo., organized a Foster Parents group in the Weather Analysis and Prediction Division at Weather Bureau headquarters. Ten-year-old Alejandro A. Nangka, who lives in Pasay City, a suburb of Manila in the Philippine Islands, was assigned as their foster child. Although changed by transfers into and out of the Division, the group has continued to support Alejandro, who is now 15 years old and in his second year of high school. The local social worker reports that the assistance provided by the group has helped keep the family together and other children of the family in school.

It is anticipated that with a few more years of assistance, the family will be entirely self-supporting.

## Brewster, Retired NWRC Employee, Dies

Sherman M. Brewster, who retired in 1965 as chief of EDS' Climatic Information Section, National Weather Records Center, Asheville, N.C., died Nov. 25. Mr. Brewster joined the Weather Bureau in 1926 and served at stations in Texas, New Mexico, and Louisiana.

## Apollo 12 Splashdown Forecasts Accurate

As support to the Apollo 12 mission, the Weather Bureau's Spaceflight Meteorology Group made the predictions for the landing. The important weather forecast was that made on Nov. 23 about 34 hours prior to the splashdown. The 34-hour forecast called for scattered to broken clouds at 1800 feet, high scattered clouds, ten-mile visibility, winds from 120 degrees at 15 knots, four-foot seas, five-foot swells and scattered showers. Only minor changes were made to the forecast. The observations at the time of the recovery operation indicated conditions very much like the forecast.

Satellite information indicated that there was a convergence area with numerous showers and at times thunderstorms near the planned impact point throughout most of the flight. The evidence from ESSA 9, ATS-1, and NIMBUS infrared pictures noted improvement in the weather. NMC's 500-millibar analyses and reports from two Navy reconnaissance flights also contributed to the accurate forecasts.

## Miss RuzECKi Lauds Women in Government

Mary Ann RuzECKi of NESC's Planning and Coordination Group was one of five invited consultants at a Physics Conference for Women at Knox College, Galesburg, Ill., Nov. 8-9. Miss RuzECKi spoke on the opportunities for women scientists in Government. Approximately 40 women representing 29 colleges attended. She also spoke to about 1,500 students of the Franklin Park, Ill., public school system on ESSA and the environmental satellites.

## Retirement and Health Benefit Costs Rise

Most Health Benefit Plans will increase in cost to employees, beginning with the pay period of Jan. 11, 1970. During the same pay period, retirement deductions will increase from 6½ to 7 percent.

Both deductions will be reflected in the pay checks employees will receive on or about Feb. 5, 1970.

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Items to be considered for ESSA NEWS must be received by Monday for publication the following Friday. Send material to: Office of Public Information, ESSA, Room 804, Bldg. 5, Rockville, Md. 20852. Phone (301) 496-8243.

# **National Oceanic and Atmospheric Administration**

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