U.S. DEPARTMENT OF COMMERCE / National Oceanic and Atmospheric Administration

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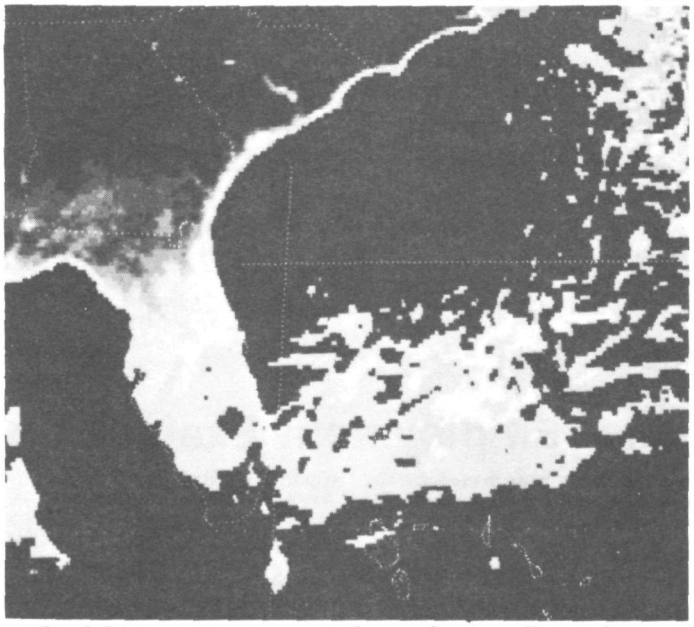
Studies Show Freeze Data From Satellite Possible



This NOAA satellite image of the southeastern United States on January 10 of this year shows freezing temperatures (pure white) extending across central Florida. The solid gray tone in southern Florida represents temperatures between 33 and 40 degrees, while the eight shades in the northern part of the state are assigned varying temperatures between 16 and 31 degrees Fahrenheit. Temperatures below 16 and above 40 are shown as black. The gray and white mass east of Miami is cloud cover.

NOAA's environmental satellites have the capability of providing fruit and vegatable growers with improved temperature information during periods of crop-killing freezes, two parallel studies have shown.

Both efforts—one in Florida, the other in Texas—utilized infrared pictures from the National Environmental Satellite Service, showing surface temperatures in and around fruit and vegatable producing areas. The infrared images are provided every half hour by the GOES-1 satellite, positioned 22,250 miles (35,800 kilometers) above the equator over South America.

Infrared sensors on the spacecraft pick up heat radiation from the ground. In much the same way as broadcast television signals are sent from a TV studio to a set in the home, the information is transmitted to a ground receiving station and converted into a visual image, giving scientists an electronic picture from outer space.

In the Florida experimental program, the image was enhanced by a computer, permitting the varying degree of heat radiation—an indicator of land surface temperature—to be visually displayed as shades of gray. Temperatures between 31 and 33 degrees Fahrenheit—near the freezing point—were displayed as white, while those between 33 and 40 degrees were in mid-gray tone, while those above 40 and below 16 were shown black.

(Continued on page 3)

USDA Agrees To Distribute NWS Material

An agreement calling for cooperative distribution of natural disaster preparedness information to the public in rural and small-town America has been completed by the National Weather Service and the Agriculture Department's Extension Service.

The agreement was signed by Edwin L. Kirby, Administrator of the Agriculture Department's Extension Service; and Dr. George P. Cressman, Director of the National Weather Service.

It calls for cooperation in the design, development, and support of education programs and materials on natural disaster preparedness programs of mutual interest, and for the Extension Service to provide channels of communication and distribution to State Extension Services which

(Continued on page 3)

Ozone Studies Show Several Anomalies

Ozone concentrations in 33 middle-sized American cities show, as could be expected, a strong connection between pollution, heavy traffic, and industry, according to a NOAA scientist.

But there are surprises.

For example, Robert Fankhauser, an ERL meteorologist assigned to the U.S. Environmental Protection Agency, has reported that local meteorological effects in lake-side cities like Milwaukee and New Orleans complicate the movement of ozone over surfaces. And some high ozone concentrations were measured in areas hundreds of miles from any major source, suggesting long-distance transport of the pollutant.

Writing in the August, 1976, issue of the *Journal of the Air Pollution Control Association*, Fankhauser reported on a recent completed analysis of data collected near 33 metropolitan areas east of the Rockies in the summer of 1971.

(Continued on page 4)

Third-Year Coastal Zone Grant To Florida Totals $722,492

A grant totaling $722,496 has been awarded to the State of Florida by NOAA to continue developing a management program for the land and water resources of the State's coastal zone.

Florida will contribute an additional $194,374 to the Federal grant—the State's third—to create a master plan for guiding future uses of the coast in a rational and orderly manner for recreation, transportation, industrial development, beach home construction, energy facility siting, and various other competing purposes.

In the three grants to Florida, OCZM has awarded close to $2 million, while the State has augmented this with $800,000 in matching funds.

Florida indicated its management program will continue to be developed in concert with the general public, citizen advisory committees, regional planning councils, county governments, and the State Interagency CZM Committee.

Third-year tasks, according to officials, will concentrate heavily on county involvement in the planning process and call for an expanded program for elicting citizen's comments.

Florida plans to conduct a series of public meetings, regional workshops, and hearings to discuss the management plan after it has been presented to the Governor in draft form next January.

The State also plans to identify the potential problems caused onshore by oil and gas development on the Outer Continental Shelf, and recommend probable solutions.

This is the final issue of *NOAA Week*.

After more than six years of publication, the familiar weekly will give way to a new employee newsletter to be known as *NOAA News*. *NOAA News*, to be issued every second week beginning December 10, will be bigger (averaging eight pages and printed on a slightly larger size paper) and, hopefully, brighter with a change in type sizes and styles and a number of new features and departments. (Some of the old ones from *NOAA Week* will be back, too.)

So look for *NOAA News* December 10. We think you'll like it!

personnel perspective

Current Vacancies in NOAA

To insure that NOAA employees are aware of job possibilities throughout the agency, a list of current NOAA-wide vacancies is published below. Employees interested in any of the listed vacancies should contact their servicing personnel office for information on where to apply.

Announcement Number	Position Title	Grade	MLC	Location	Issue Date	Closing Date
77-22	Secretary (Stenography)	GS-6	NOS	Riverdale, Md.	11-22-76	11-30-76
77-23	Computer Specialist	GS-9	NOS	Washington, D.C.	11-22-76	11-30-76
77-24	Secretary (Stenography)	GS-6	HDQS	Rockville, Md.	11-22-76	11-30-76
77-25	Secretary (Stenography)	GS-6	HDQS	Rockville, Md.	11-22-76	11-30-76
77-26	Clerk-Typist	GS-4	HDQS	Rockville, Md.	11-22-76	11-30-76
77-27	Reproduction Tech.	GS-5	NWS	Camp Springs, Md.	11-24-76	12-2-76
76-77	Surveying Tech.	GS-9	NOS	Norfolk, Va.	11-17-76	12-2-76
78-77	Management Analyst	GS-13	HDQS	Rockville, Md.	11-17-76	12-2-76
81-77	Supv. Meteorologist	GS-15	NWS	Honolulu, Hawaii	11-17-76	12-2-76
83-77	Supv. Meteorologist	GS-12	NWS	Cincinnati, Ohio	11-17-76	12-2-76
76-77 (Amended)	Supv. Geophysicist	GS-14	NWS	Honolulu, Hawaii	11-11-76	12-3-76
85-77	Mathematician	GS-11	ERL	Princeton, N.J.	11-18-76	12-3-76
90-77	Operations Research Analyst	GS-12	NMFS	San Diego, Calif.	11-18-76	12-3-76
91-77	Fishery Biologist	GS-12	NMFS	Honolulu, Hawaii	11-22-76	12-7-76
93-77	Physical Science Tech.	GS-10	NWS	Grand Cayman, British West Indies	11-22-76	12-7-76
95-77	Hydrologic Tech.	GS-9	NWS	Cleveland, Ohio	11-22-76	12-7-76
96-77	Meteorological Tech.	GS-10	NWS	Burlington, Vt.	11-22-76	12-7-76
97-77	Meteorologist	GS-12	NWS	Seattle, Wash.	11-22-76	12-7-76
99-77	Oceanographer	GS-12	ERL	Seattle, Wash.	11-22-76	12-7-76
77-77	Supv. Electronics Engineer	GS-12	NOS	Norfolk, Va.	11-17-76	12-9-76
79-77	Computer Specialist	GS-14	EDS	Washington, D.C.	11-17-76	12-9-76
82-77	Electronics Tech.	GS-12	NWS	Honolulu, Hawaii	11-17-76	12-9-76

Summer Employment Examination

Announcement Number 414 "Summer Jobs," has been issued by the Civil Service Commission. The Commission is currently in the process of distributing the announcement and copies should be available soon at all Civil Service Commission Area Offices, Federal Personnel Offices, Federal Job Information Centers, and many college placement offices.

Opportunities for summer jobs are very limited. There are many more applicants than there are positions available. For example, last summer in the Washington, D.C., area, only one eligible in four obtained Federal employment and 70 percent of those who were employed were qualified typists. Considering current Government-wide budget and hiring restrictions, it appears probable employment opportunities will again be limited this coming summer. Therefore, when advising anyone to apply for summer work with the Federal government, they should be cautioned not to rely solely on this examination to find employment for the summer. The following eligibles should have a fair to good chance of receiving consideration for employment: (1) Typists, (2) Stenographers, (3) Statistics and Computer Science Majors, (4)Accounting Majors and (5) Engineering Majors.

Applicants who are not in one of these groups have a relatively poor chance of being considered for summer employment.

Typist and Stenographer Applicants:

Applicants applying for typist, stenographer, or other office machine operator positions are required to provide proof that they have the required skills to do the job. They will be asked to furnish proof to the agency when they are considered for employment that they meet the following requirements:

For Typist (Trainee) positions at the GS-1 level, they must be able to type at least 30 words per minute.

For Typist positions at grades GS-2, GS-3, and GS-4, they must be able to type at least 40 words per minute.

For Stenographer positions at all grade levels, they must be able to take dictation at the rate of 80 words per minute.

It would be to their advantage to obtain this proof as soon as possible. Any of the following is acceptable proof of proficiency:

A notice of rating from a typist or stenographer examination administered within the last three years by a State or local employment service office; or by a Civil Service Commission office.

A certificate of proficiency based on a performance test administered in a public, parochial, or properly accredited private high school; or a business, commercial, or secretarial school; or a college or junior college; or a school approved by the Veterans Administration for the education of veterans and their dependents.

Written tests for summer employment have been scheduled as follows for the Washington, D.C., metropolitan area ONLY:

Applications Received by:	Test will be Scheduled for:
December 9, 1976	January 8, 1977
January 13, 1977	February 12, 1977

Applications postmarked after January 13, 1977, will not be accepted. For test information in other parts of the country, applicants should contact the Federal Job Information Center servicing the location where they wish to take the written test. A list of Area Offices and their test points is included in the Announcement No. 414.

Special Notice:

Reemployment of Previous Year's Summer Hires. To expedite the hiring of employees who worked for an agency the previous summer, the Civil Service Commission has modified the summer employment hiring procedures. Beginning with the 1977 Summer Employment Program, a summer employee from the previous summer may be reappointed in the same agency without the necessity of the employee recompeting in subsequent Summer Employment Examinations and without recertification by Commission examining offices. The employee may be reappointed up to grade GS-4 provided the individual meets the qualification requirements for the position to be filled.

If the agency cannot or does not wish to rehire an employee, or the employee does not wish to return to the same agency, the individual will be required to recompete in the Summer Employment Examination to be considered for employment in another agency. Personnel Offices are cautioned not to offer appointments for the next year to current employees unless they are assured the commitment can be honored.

New SF-171 Gives Greater Privacy

The Civil Service Commission has discontinued the practice of requesting medical information on forms used in recruiting and examining applicants for the competitive service.

The May 1975, edition of Standard Form 171, "Personal Qualifications Statement," omits the question, "Do you have, or have you had, heart disease, a nervous breakdown, epilepsy, tuberculosis, or diabetes?"

Because many older editions of the form, which ask this question, are still in existence, the Commission has required all agencies to cross out the question on the form before giving it to an applicant.

The candidate's medical fitness may be determined at the time of the appointment depending on the nature of the job and placement requirements. The change was designed to afford applicants greater privacy.

Meetings Held To Explain CZM Program

Five of the nation's largest cities hosted public meetings on NOAA's coastal zone management program this month.

The purpose of the meetings—in Atlanta, Boston, Chicago, New Orleans, and San Francisco—was to explain the national program to the public and solicit comments which could aid in the development of program regulations.

The five regional meetings featured an overview of the CZM Act and the status of the total program, a discussion on new amendments, public comments on expanding and strengthening the national program, comments on the new Coastal Energy Impact Program and citizen's views on the draft environmental impact statement for the Impact Program.

Robert W. Knecht, NOAA Assistant Administrator for Coastal Zone Management, and Richard Gardner, OCZM Associate Director, conducted the meetings.

Besides private citizens, others attending the meetings included state program managers, federal agency officials, and special interest group representatives.

WS Material

(Continued from page 1)

will make the information available to the rural public.

Herbert S. Lieb, Chief of Disaster Preparedness for the National Weather Service, said the agreement "forges another link in the chain of communication to the U.S. public about ways to cope with hurricanes, tornadoes, flash floods and other natural disasters."

Raymond C. Scott, Assistant Administrator of USDA's Extension Service, called the agreement "an important step in improving cooperation between the agencies so the public can be served more efficiently in preparing for and recovering from disasters."

noaa week

Published weekly at Rockville, Md., by the Office of Public Affairs for the information of employees of the Commerce Department's National Oceanic and Atmospheric Administration.

Articles to be considered for publication should be submitted at least a week in advance to **NOAA Week**, Room 221, WSC 5, Office of Public Affairs, National Oceanic and Atmospheric Administration, Rockville, Md. 20852.

NOAA Week 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

Transcontinental Survey Nears Completion

An upgrading of the national network of horizontal control will be completed this month by the National Geodetic Survey. The survey line (dark lines on map) runs through parts of 44 states in its 13,660 mile route.

A 15-year transcontinental survey to upgrade the national network of horizontal control which is the basis for all other surveying in the continental United States will be completed this month.

A field party from the National Geodetic Survey will close a gap in the network between Gaylord and Mt. Pleasant, Mich., before December 1, completing an effort begun in 1961 at Cape Canaveral, Fla.

Capt. Leonard S. Baker, Director of the NGS said the project's completion will represent "the most accurate survey of this size ever done in any country on earth, and its results will serve our surveyors, engineers, and scientists for many years into the future."

Known as the High-Precision Transcontinental Traverse, the project provides data for tracking space satellites and missiles, and for detecting and evaluating long-term crustal movements. It also provides the network which is the basis for all types of surveying, including locating permanent boundaries, planning the alignment of highways and public utilities, and mapping natural resources.

The survey was begun at Cape Canaveral to position satellite tracking cameras along the east coast of the United States. In order to meet accuracy requirements, a system of high-precision traverse networks was developed, permitting measurements so precise that error was less than one inch (2.5 centimeters) in 10 miles (16 kilometers).

The 17-man survey party in Michigan, headed by Lester H. Williams, is working at night, when atmospheric distortion is at a minimum. They survey from portable steel towers, up to 10 stories in height, permitting them to use lasar beams for greater accuracy in measurements.

Satellite Freeze Data (Continued from page 1)

The resulting "picture" of Florida on a typical cold January night, at an hour when frost was spread across the state from Tampa through Orlando, showed a white band in that section, with increasing darkening shades to the north and a solid gray area on the southern edge.

The imagery obtained at frequent intervals last winter has been analyzed by a team of NASA Kennedy Space Center, University of Florida, and National Weather Service scientists and verified against information collected by University of Florida personnel on the ground in areas studied.

This research was funded by NASA, and conducted by the National Weather Service Environmental Studies Service Centers at Auburn, Ala., and College Station, Tex., the University of Florida, and the NASA Earth Resources Division at Kennedy Space Center, Fla.

The Florida study is seen as having great potential in helping growers make crucial decisions concerning steps to take in protecting their crops from frost. Heating orchards in Florida, for example, is an expensive operation which can cost the state's fruit growers as much as $5,000,000 a night. Improved temperature information, permitting better and more timely management decisions, could result in great savings to growers, and at the same time, conserve energy.

The experimental system for produce growers in the Lower Rio Grande Valley of Texas is a joint research project involving NOAA's National Environmental Satellite Service, the National Weather Service Environmental Studies Service Center at College Station, and the Department of Agriculture Research Service at Weslaco, Tex.

The basic source of information was the same as in the Florida experiment—from the satellite—but the details differed.

Rather than using a picture composed of shades of gray to delineate the frost zone, and thus requiring equipment capable of receiving a picture by electronic means—such as a photo facsimile machine—the Texas study utilized characters found on a typewriter keyboard.

Upon receipt of data from the satellite's infrared sensor, scientists assigned characters from the typewriter keyboard to the varying temperature levels as sensed by the satellite. For example, temperatures between 31 and 33 degrees Fahrenheit were assigned one character, while 30-degree temperatures were assigned another character, 29 degrees a different character, and so on.

The end result when produced by a computer on a printout bore startling similarity to an enhanced image, except that boundaries of differing temperature were delineated by typewriter characters rather than shades of gray. The end product, however, could be transmitted over teletypewriter machines, more commonly available than photo facsimile equipment.

The Florida project was in test and evaluation during the past winter, while the Texas study was in the preliminary research stage.

EDS Now Offers Prepackaged Data

International Policies, Agreements, Law, Regulations, and Cooperation Relating to the Oceans (No. 76-1); and *Manganese Nodules (No. 76-2)* are the first of a planned series of computer-produced prepackaged literature searches available from EDS' Environmental Science Information Center. *No. 76-1* contains about 280 citations, and *No. 76-2* cites 175 references.

Subject areas planned for future prepackaged searches, which are available without charge, include climate and health, the coastal zone, heavy metals, marine minerals, ocean dumping, ocean mining, and weather modification.

Ozone Studies Show Several Anomalies (Continued from page 1)

The data analysis was made by scientists from the ERL's Air Resources Laboratories who are assigned to the EPA's Environmental Research Center at Research Triangle Park, N.C.

"Before 1970," Fankhauser says, "EPA surface ozone data for urban areas came from CAMP (Continuous Air Monitoring Program) stations located in six major cities. We saw the ordinary diurnal sequence–high ozone by day, and nearly zero at night. But we also noted some ozone measurements from outside the cities that were higher than the urban measurements."

A study was begun in cities having 1970-census municipal populations of at least 200,000 but with inadequate (at that time) ozone monitoring capabilities. Ozone sensors were placed downwind from high traffic areas, and hourly measurements were made around the clock for about three months during the summer and early fall.

The primary objective of the study, conducted by the EPA's Environmental Monitoring and Support Laboratory, was to determine which cities had ozone concentrations exceeding the national standard, and to provide guidance in developing air quality control plans in those cities.

At the earth's surface, ozone is a corrosive, crop-damaging air pollutant. It is photochemically forged by sunlight from hydrocarbons and nitrogen oxides injected into the atmosphere by automobiles, powerplants, and other sources.

Ozone in the stratosphere, however, is beneficial because it shields the earth's surface from hazardous ultraviolet radiation.

Fankhauser's analysis of the ozone measurements shows that high ozone concentrations tend to occur with dense populations, automobile traffic, and heavy industry.

Natural background levels of ozone near the surface are about two parts per hundred million (40 micrograms per cubic meter). The EPA-established national standard is set at a maximum of eight parts per hundred million (160 micrograms per cubic meter) for not more than one hour each year.

Cities with highest measured ozone levels were: Milwaukee (12 parts per hundred million, 240 micrograms per cubic meter); Dayton (11.5 parts per hundred million, 230 micrograms per cubic meter); Corpus Christi, Louisville, Rochester, Toledo (11 parts per hundred million, 220 micrograms per cubic meter); Columbus (10.5 parts per hundred million, 210 micrograms per cubic meter); and Indianapolis, Pittsburgh, Houston, and San Antonio (10 parts per hundred million; 200 micrograms per cubic meter).

Cities with measured ozone concentrations above the national standard for the highest percentage of observing hours were Dayton, Ohio, (7 percent; 168 observations out of 2,395 exceeded the standard), Toledo (6.6 percent; 156 out of 2,342), and Columbus (5 percent; 112 out of 2,214). Other relatively high-ozone cities were Rochester, N.Y. (4.6 percent; 110 out of 2,391); Pittsburgh, Pa. (4 percent; 105 out of 2,629); and Louisville, Ky. (4 percent; 74 out of 1,836).

During the study period, only six of the cities in the study did not exceed the national ozone standard: Miami and Tampa, Fla.; Honolulu, Hawaii; Minneapolis, Minn.; Omaha, Neb.; and San Juan, Puerto Rico. Fankhauser cautions, however, that some of these southern cities may show different ozone levels in winter when atmospheric ventilation patterns change significantly.

Ozone concentrations higher than all but one percent of the measurements taken (99th percentile) at each location tended to follow population and industry. The highest concentrations were along a broad band from about the longitude of Milwaukee eastward to Rochester, with lesser but still high concentrations to the south along the Mississippi River and the Texas Gulf coast.

Plotting average ozone values (50th percentile) produced some surprises; however, population density and industry seemed not to be much of a factor. Instead, a band of relatively high average ozone concentrations reached diagonally across the country from Rochester to El Paso. Albuquerque, El Paso, and Oklahoma City tied for the highest average values at three parts ozone per hundred million (70 micrograms per cubic meter).

To get a clearer picture of ozone distribution and sources in the cities, ozone measurements were compared with wind data. This permitted Fankhauser to confirm that, in most cases, increased ozone levels occurred downwind of areas of high traffic and heavy industry.

But the study also pointed up some peculiar exceptions.

In Milwaukee, maximum ozone usually occurred when winds were blowing from the heavy traffic and industrial areas to the south. But the researchers also found surprisingly large concentrations when the wind was from the east and southeast–that is, from the supposedly unpolluted area over Lake Michigan.

Fankhauser theorizes that the land-to-lake breeze during the night and early morning moved chemical precursors out over the lake. Then, when the breeze reversed in the morning, photochemical reactions generated ozone, and lake breezes brought the ozone back over the city.

New Orleans also presented some surprises. There, the highest ozone concentrations occurred when winds blew from the north, although the only nearby ozone source was the heavy traffic south of the sampling site. Fankhauser believes the flow of ozone and other pollutants from the traffic could be diluted by absorbing vegetation in City Park, located between the sensor and high traffic areas. "If that is the case," he says, "it would demonstrate the value of green belts in cities." The high values blown in from the north were apparently caused by circulation peculiarities between the city and Lake Pontchartrain.

Other anomalous results cannot be explained by local meteorological effects. For example, some areas had inexplicably high values at night– and others far from identifiable sources had high daylight ozone levels.

An investigation of the ozone-producing abilities of thunderstorms indicate that these storms do produce ozone–the aftersmell of a lightning strike is the odor of ozone–but not enough to push levels above the national standard.

Another possible explanation was long-distance transport, in which distant cities would be the source of ozone measured hundreds of miles away. "If a particular mass of air started out under stable atmospheric conditions and contained a high concentration of ozone precursors," Fankhauser explains, "and, if it followed a path free of contaminants which destroy ozone, it is possible that streams of ozone could travel great distances with little reduction."

Lake Michigan Buoys Removed For Winter

Three spherical buoys which have been floating in Lake Michigan off Milwaukee and Muskegon to help NOAA weathermen and researchers keep an eye on the lake's wave actions, are being removed this week.

The buoys, deployed in September by the Great Lakes Environmental Research Laboratory in Ann Arbor, Mich., flashed continuous wave measurements to the laboratory over a radio-telemetry and telephone link.

Scientists at Ann Arbor applied the wave information to a long-term ecological study of the lake–and also relayed it to the Chicago Weather Service Forecast Office. There, the information became a timely portion of Chicago's four-times-daily Lake Michigan wave forecast.

According to Ray Waldman, Meteorologist in Charge at Chicago, the wave information was a valuable forecasting aid.

"Having actual wave information has been extremely helpful in making sure that our forecasts were on the mark," he says. "It also gave us a better look at what kind of wave heights to expect under varying wind conditions over the lake."

Paul Liu, the Environmental Research Laboratories oceanographer who leads the project, said the buoys served the Chicago weathermen during October and November, when Lake Michigan tends to get its highest waves.

The buoys are being removed to avoid damage or loss due to winter ice.

obituaries

Marvin Baynard

Marvin Baynard, a transportation specialist in the Travel and Transportation Branch, Administrative Operations Division, died November 11 in Washington, D.C. Mr. Baynard had been with the Department of Commerce for 30 years, serving first with the Civil Aeronautics Board and, after duty in the U.S. Army in the early 1950's, with the Coast and Geodetic Survey beginning in 1963. He had received several outstanding achievement awards.

Gerard E. McGrath

Gerard E. McGrath, retired Electronics Technician at Athens, Ga., died October 3, 1976. He has served in the U.S. Navy for 22 years and was with the Bureau of Standards at Washington, D.C., for five years before coming to the Weather Service in 1970. He retired in 1973.

Samuel R. Hurlbut

Samuel R. Hurlbut, retired National Weather Service employee, died in Apalachicola, Fla., October 23. Mr. Hurlbut retired from the NWS in the fall of 1972 after more than 40 years of service. He served at New Orleans and Chattanooga before moving to Apalachicola in 1959.

Andrew P. Keller

Andrew P. Keller, retired Weather Service meteorologist, died recently at his home in Syracuse, N.Y. Mr. Keller joined the Weather Service in 1917 in Sandusky, Ohio. He transferred to Buffalo, N.Y., and then to Syracuse. He was Meteorologist in Charge of the station at the time of his retirement 13 years ago.

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