

ESSA NEWS

U.S. DEPARTMENT OF COMMERCE ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION

C&GS Plane Lands Safely After Tires Blow Out

A Coast and Geodetic Survey photographic aircraft, equipped for photogrammetric mapping, made a safe landing on a foam-covered runway at the McCord Air Force Base in Washington state, after an emergency flight from Annette Island, near Ketchikan, Alaska, August 1.

The twin-engine DeHavilland Buffalo was returning to Annette Island, but blew all of its tires on landing when an apparent malfunction caused loss of lift during the landing approach. The plane bounded into the air again after touchdown. The aircraft could not then make a belly landing since the wheels could not be retracted. A decision was made to fly the plane to McCord Air Force Base, where better emergency and repair facilities existed. There the plane skidded to a safe landing on flat tires.

The plane was engaged in aerial photography of Alaskan airports and coastal areas. In the aircraft at the time of the mishap were: Lt. William M. Noble, Henry J. Pfeiffer, Charlie R. Johnson, and Sterling A. Brizzell.

A fact-finding board headed by Capt. Alfred C. Holmes was named by Rear Adm. Don A. Jones, Coast Survey Director, to conduct an investigation.



C&GS DeHavilland Buffalo aircraft

Harlan Saylor Becomes New NMC Deputy Director



Harlan K. Saylor, chief of the Weather Bureau's Analysis and Forecast Division since 1965, has been appointed Deputy Director of the National Meteorological Center. As Deputy Director, he will share with the Director the responsibility for planning and managing the Center's public service and special user service programs.

Born in Pottstown, Pa., Mr. Saylor joined the Weather Bureau in New York in 1946, after serving in the Air Force during World War II. In 1955, he transferred to Weather Bureau headquarters. Mr. Saylor is the recipient of both the Department of Commerce Gold and Silver Medals for his distinguished service. He holds a bachelor's degree in physics from Penn State, and has done graduate work at the Massachusetts Institute of Technology and George Washington University.

Edwin B. Fawcett has succeeded Mr. Saylor as chief of NMC's Analysis and Forecast Division. Mr. Fawcett first joined the Weather Bureau in 1946, after a tour of duty in the U.S. Air Force. Except for an assignment with the Air Weather Service as a supervisory meteorologist and technical consultant, all of Mr. Fawcett's civilian federal career has been with the Weather Bureau. Born in Glen Ridge, New Jersey, he holds a bachelor's degree in mathematics from Hamilton College, Clinton, New York. Mr. Fawcett was formerly deputy chief of the Analysis and Forecast Division.

Lippold Commands PATHFINDER; Yeager To Head C&GS Division



Captain Lippold



Commander Yeager

Capt. Herbert R. Lippold, Jr., will assume command of the USC&GS Ship PATHFINDER early in August. Capt. Lippold is a veteran officer with more than 20 years of service in the ESSA Commissioned Corps. This will be his second assignment aboard the PATHFINDER. The first was as junior officer in 1951-52. Since then, he has commanded the USC&GS Ship WHITING and served aboard six other vessels. Capt. Lippold's last assignment was as chief of the Coast Survey's Satellite Triangulation Division, where he played a major role in the establishment of a worldwide satellite triangulation network.

Cdr. J. Austin Yeager is the new chief of the Coast Survey's Satellite Triangulation Division. He served in that post during 1967 and 1968, when he assisted in supervising the world satellite triangulation program completed last June. Cdr. Yeager will now be engaged in work on the North American densification program--a two-year project to complete a geodetic survey network linking Canada with Alaska and the lower 48 states.

Bennie Lightsey Buried in Kentucky

The funeral of Bennie Lightsey, Weather Bureau Technician-in-Charge at Ice Island T-3, fatally shot there on July 16, was held in Louisville, Ky., on August 4.

Another man, not associated with the Government, has been charged with murder in Mr. Lightsey's death.

Computerized Aircraft, Storms Test Safe Flight Through Clouds

Elmer Schuman of ERL's Atmospheric Physics and Chemistry Laboratory is flying mathematical airplanes and rockets through mathematical clouds in a computer to investigate ways of protecting real vehicles from lightning. These computerized vehicles are used to determine the exact limits of safe flight through electrically charged clouds.

Predicting the possibility of lightning strikes to rockets or aircraft requires an exact knowledge of how each individual vehicle distorts the electrical field inside a shower or thunderhead. That is, scientists need to know where on the vehicle the electrical field will interact with that of the cloud.

Mr. Schuman has devised a simplified method of producing computer-drawn pictures of the imaginary surfaces of equal potential that form around an object in an electric field. Called equipotential surfaces, these pictures define the electric potential of voltage distribution in the cloud around the vehicle. Thus, the computer can generate, for any specific vehicle in any specific electric field, the shape of an imaginary surface around the moving vehicle on which the voltage is equal at any point. The same pictures define the distortion of the cloud's electric field, because the electric field is always perpendicular to the equipotential surface at all points.

Once the equipotential surfaces are formed and the field concentration factors deduced, it is possible to vary the computer's "electric field" to examine the range of combination of vehicle and storm and thus determine the limits of safe flying.

"For natural lightning to occur," Mr. Schuman says, "cloud fields must be some 300-500 thousand volts per meter. Our calculations indicate that fields as low as 10-30 thousand volts per meter may produce lightning when the field is distorted by an aircraft. Furthermore, a rocket--with its highly conductive exhaust plume--may be able to induce lightning in a field as low as 3000 volts per meter." Schuman's calculations will be checked in actual flight at the National Aeronautics and Space Administration's Kennedy Space Center. The computer study is part of the Laboratory's work under a NASA contract for studying ways to predict and prevent lightning hazards to rockets.

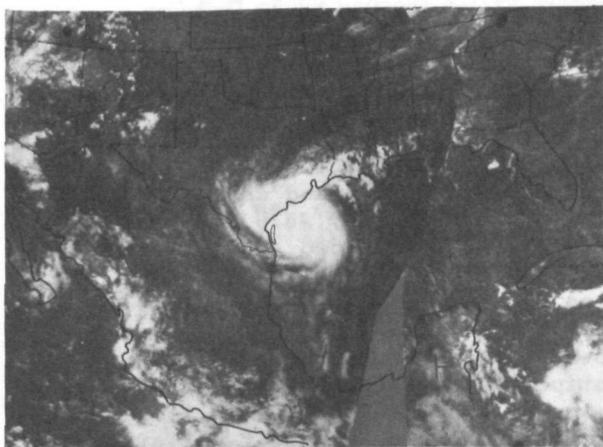
Interagency Fire Center Dedicated in Boise, Idaho

The Boise Interagency Fire Center--the only one of its kind in the nation--was formally dedicated at Boise, Idaho, July 25. The Center is administered by the Department of Interior's Bureau of Land Management, in cooperation with the Department of Agriculture's Forest Service and the Weather Bureau, to provide a more effective means of fighting forest fires on federal lands throughout the western states and Alaska. The Weather Bureau provides special fire-related forecasts to the Forest Service and the Bureau of Land Management through a staff of fire-weather meteorologists located at the Center. Participating in the dedication ceremonies were: Dr. George P. Cressman, Weather Bureau Director; H. H. Bedke, Director, Weather Bureau Western Region; Boyd L. Rasmussen, Director, Bureau of Land Management; Edward P. Cliff, Chief of the Forest Service; Idaho Governor Donald Samuelson and Jay S. Amylx, Mayor of Boise.

Schedule Set for Mobile Van Air Pollution Soundings

The first operational sounding taken from an air pollution mobile van in the Eastern Region was in Philadelphia on July 23. Mobile soundings from these vans are now being taken every Tuesday in Washington, Philadelphia, and New York City.

ESSA Satellites Sight Celia



ESSA satellites photograph Hurricane Celia approaching Texas coast on Monday, August 3.

Minnesota Girl Named ESSA Administrator for a Day



Phoebe Pederson of Minneapolis, Minn., visited ESSA headquarters on Friday, July 31, in her role as Girls Nation's "ESSA Administrator of the Day." Miss Pederson, a bright high school senior, attends Minnehaha Academy in Minneapolis, where she is secretary and president of the German Club, SNO-DAY chairman, a member of the student council, the National Honor Society, Alpha Beta Society, the band, and a folk group. While officiating as ESSA Administrator, Miss Pederson presented a plaque to Theodore P. Gleiter, ESSA Assistant Administrator for Administration and Technical Services.

Girls State, culminated by Girls Nation, is a youth citizenship training program sponsored annually by the American Legion Auxiliary to give high school juniors practical experience in the processes of government and, in turn, a clear understanding of their approaching citizenship responsibilities.

Ground Elevations Surveyed in Utah

A 15-man C&GS field party headed by Clarence Symns, Jr., is conducting a two-month, 230-mile survey of ground elevations from Salt Lake City to Milford, Utah. Using modern instruments and techniques, the party will determine elevation changes which may have occurred at points originally established by a survey over 60 years ago along the route of the Union Pacific Railroad.

Donald Kuehl, Hydrology Expert, Selected for Thailand Mission



David W. Rockwood (left), Chief Hydrology and Hydraulics Section, North Pacific Division, Corps of Engineers, and Donald W. Kuehl, Hydrologist, Weather Bureau Forecast Center, both of Portland, Oreg., are shown making last minute preparations for their three-month mission to Bangkok, Thailand. Experts in the field of hydrology and hydraulics, they were selected as consultants in the establishment of a flood forecasting system for the Lower Mekong River, by the Committee for Coordination of Investigations for the Lower Mekong River, sponsored by the United Nations and representing Thailand, Laos, Vietnam, and Cambodia.

Miller Commended by FAA for Assistance

Charles W. Miller, meteorological technician at the Mansfield, Ohio, Weather Bureau Office, has received a letter of commendation from the Federal Aviation Administration for his alertness and response in averting an aircraft accident. While driving to work on July 11, Mr. Miller heard an aircraft circling the Mansfield Airport apparently trying to land. The weather was ceiling and visibility zero and had been for approximately three hours. Mr. Miller notified the tower controller and was told that tower personnel were not in touch with the plane. They immediately transmitted on all available frequencies to any aircraft circling the airport. The plane's pilot was contacted and given clearance to land. Due to heavy fog, the controller was unable to assist the pilot in taxiing along the runway. Mr. Miller guided the pilot to the ramp.

ERL Instruments Hear Explosion in Alabama

When 2000 cases of dynamite exploded in Alabama on July 9, ERL scientists "heard" the explosion some 90 minutes later in Colorado. Vernon Goerke of the Wave Propagation Laboratory described the event as his infrasound recorders at Table Mountain near Boulder heard it: "Between 1:54 and 2:02 a.m. Thursday, our recorders registered an unusually loud noise. By comparing the time when the noise started at each of four recorders, we were able to deduce the direction from which the noise originated. Although we did not know exactly what created the noise, we did know it was a big bang arriving from the southeast. The next day's newspapers told us what it was--a dynamite plant explosion in Oneonta, Alabama."

The ESSA instruments record infrasonic waves which are too low to be heard by the human ear. They can be detected for great distances as evidenced by the 90-minute delay in moving from Alabama to Colorado, some 1200 miles.

Dailey and Pack Named Adjunct Professors

Paul W. Dailey, State Climatologist for Pennsylvania, has been appointed to an adjunct professorship by Penn State University. Dr. A. B. Pack, New York State Climatologist, has received an extension of his appointment as an adjunct by Cornell University.

Eastern States Plagued by Air Pollution

Due to a stagnating high pressure system, high air pollution potential began in the New York City, Philadelphia area on July 24, and as the high built southward, the high potential spread to the southeastern states and as far west as Birmingham, Ala., by July 29. Sea breeze effects reduced the pollution concentrations in the New York City area by July 28 when the smog moved out over the Atlantic Ocean. The smog also moved out of the Southern states and an antipollution alert was called off in Georgia. The Weather Bureau issued local statements of high air pollution potential to the public and appropriate pollution control groups in the affected areas.

Kotsch and Best Command Military Weather Services



Capt. William J. Kotsch (left) has become the Navy's top weatherman, relieving Capt. Edwin T. Harding as Commander, Naval Weather Service Command, in a change of command ceremony held at the Washington Navy Yard. Capt. Kotsch has served as Deputy Commander of the

Naval Weather Service Command since 1969. He has broad experience in meteorology, having served as Commanding Officer of various Navy Weather Centrals and as meteorologist on a number of major staffs.

Brigadier General William H. Best, Jr., assumed command of the U.S. Air Force Air Weather Service, a technical service of the Military Airlift Command, in ceremonies held at Scott Air Force Base, Ill., July 27. General Best, vice commander of the global weather service since promotion to general-officer rank last February, became the 12th officer to command the weather service since its activation 33 years ago. He succeeded Major General Russell K. Pierce, Jr.

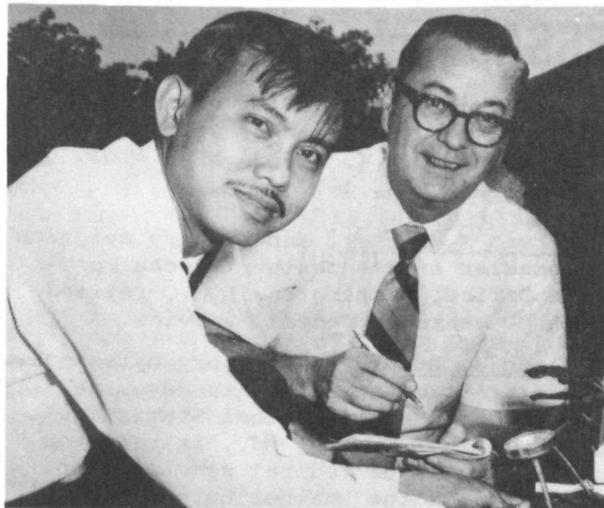
C&GS Division Compiles Notable Record

The Coast and Geodetic Survey's Photogrammetry Division compiled a notable record during the 1970 fiscal year which ended June 30. Its two air photo missions photographed 13,550 miles of flight lines, of which 5440 miles were for airport obstruction charting and 8100 for the marine navigation mapping and charting programs. One hundred and fifty airport obstruction charts were compiled and published and approximately 110 shoreline surveys and chart topography drawings were completed for the marine charting program. Cdr. Richard H. Houlder, chief of the Photogrammetry Division, is in charge of the program. H. R. Cravat heads the division's flight operations. The air photo missions are headed by Lt. William M. Noble and Lt. Cdr. Walter S. Simmons.

C&GS Seismic Risk Map Becomes Part of Uniform Building Code

A seismic risk map of the United States, prepared by the Coast Survey, has been incorporated into the Uniform Building Code--the authoritative construction guide of the building industry. The map, developed by Dr. S. T. Algermissen, chief of the Coast Survey's Geophysics Research Group, was issued last year, and shows the areas of the contiguous United States most vulnerable to earthquakes. A seismic risk map was first made a part of the Uniform Building Code in 1949, but was withdrawn from circulation by the Coast Survey in 1952 as being too general to satisfy the requirements of many users. The Uniform Building Code contains "Earthquake Regulations" which, together with the map, provide a technical guide to the different factors to be taken into consideration in designing structures in earthquake-prone areas. Dr. Algermissen has emphasized that the map is subject to continual revision as new research developments occur.

Indonesian Trains at Clemson Weather Office



G. Sarjono (left) and A. Kish

Gatul Sarjono--a young Indonesian interested in advancing his country's agriculture--is observing Weather Bureau operations at Clemson University, Clemson, S.C. Mr. Sarjono will be at Clemson for six weeks of field training under a one-year United Nations scholarship. He previously studied at the University of California at Davis. Alex Kish, meteorologist in charge of the Clemson Weather Bureau, is host for Mr. Sarjono's visit.

Tomlinson and Hilliard Win Commerce Cost-Cutter Awards



Two Coast Survey employees--Raymond Tomlinson, Geodesy Division, and James Hilliard, Distribution Division--are winners in the Commerce Department's "Cost-cutter of the Quarter" suggestion competition for the quarter ending March

30, 1970. Each was presented with an inscribed pen set by Assistant Secretary of Commerce for Administration, Larry A. Jobe, in a ceremony held May 5. Shown left to right: B. K. Meade, Raymond Tomlinson, Charles Davies, James Hilliard, and Assistant Secretary Larry A. Jobe.

ESSA Employees Retire

Listed below are additional ESSA employees whose retirements were effective July 31, 1970. (See ESSA NEWS, Vol. 6, No. 32, July 31, 1970)

Marvin N. Hunter, supervisory aviation forecaster at the Weather Bureau Forecast Office, Washington, D.C., retired with 30 years of federal service.

Glenn W. Brier, supervisory mathematical statistician in the Air Resources Laboratory, Meteorological Statistics Group, Silver Spring, Md., is retiring with 34 years of federal service. Mr. Brier joined the Weather Bureau in 1942.

Charles S. Peterson, electronic engineer in the Institute for Telecommunication Sciences, is retiring with 27 years of federal service. Mr. Peterson joined the National Bureau of Standards in 1963.

William Q. Crichlow, supervisory electronic engineer in the Institute for Telecommunication Sciences, is retiring with 28 years of service. Mr. Crichlow joined the National Bureau of Standards in 1946.

Gilbert L. St. Clair, supervisory meteorologist at the Washington, D.C.,

Weather Bureau Forecast Office, retired with 34 years of federal service.

John K. Temperley, meteorological technician at the Allentown, Pa., Weather Bureau Office, retired with 34 years of federal service.

Harold C. McComb, chief, Administrative and Technical Services Division in the Weather Bureau's Central Region headquarters, has retired with 29 years of service in the Weather Bureau. Mr. McComb joined the agency in 1941. His other assignments were in Burlington, Iowa; Des Moines, Iowa; Buffalo, N. Y.; and Columbia, Mo.

Carl F. Steffan, meteorologist at the Denver, Colo., Weather Bureau Forecast Office, is retiring after 32 years of federal service. Mr. Steffan joined the Weather Bureau in 1937.

Thelma L. Briscoe, bindery worker in the Coast Survey's Reproduction Division, is retiring with almost 30 years' service. All of Mrs. Briscoe's service has been with the Coast Survey and ESSA.

Albert J. Schultz, administrative officer at the Coast Survey's Mid-Continent Field Office, retired with almost 42 years of federal service. Mr. Schultz had been with the Coast Survey for six years.

(continued)

Annie L. King, support services assistant in the Coast Survey's Observatories Division, Office of Seismology and Geomagnetism since 1967, is retiring with more than 20 years of federal service. Mrs. King joined ESSA in 1965.

Gene Michael, budget and program coordinator on the Coast Survey's Executive and Technical Services Staff, is retiring after almost 40 years' service. Mr. Michael's first government position was with the Bureau of Census in 1930. He transferred to the Coast Survey in 1958.

Frank R. Dameron, lithographic pressman in the Coast Survey's Presswork Branch, Office of Aeronautical Charting and Cartography, is retiring with almost 30 years' service, 25 of which was spent with the Coast Survey.

Clement M. Woodard, cartographer in the Coast Survey's Aeronautical Chart Division, joined the Coast Survey in 1942 as an engineering draftsman. Mr. Woodard's entire career, except for a tour of duty with the U.S. Navy, has been with the Coast Survey and ESSA.

Leo S. Straw, chief of the Coast Survey's Chart Review Group, is retiring with 40 years of federal service. Mr. Straw, a civil engineer, joined the Coast Survey in 1930 and served until called to active duty in the U.S. Army in 1941. He returned to the Coast Survey in 1945.

Minnie E. Retter, fiscal clerk in the Weather Bureau's Overseas Operations Division, is retiring. She joined the Weather Bureau in 1956.

Anthony Lushene, geodetic technician in the Coast Survey's Geodesy Division, is retiring with 35 years of federal service. Mr. Lushene began his career in 1930 as a helper on a geodetic field party. Many years of his service with the Coast Survey was spent in the field.

John A. Webb, chief of the Coast Survey's Geodetic Data Section, Kansas City, Mo., retired with almost 34 years of service. Mr. Webb had had extensive duty with C&GS on geodetic field parties in every state except Rhode Island and Hawaii.

Fred B. Engelbrecht, chief of the Coast Survey's Nautical Data Branch, retired after more than 30 years of service. Mr. Engelbrecht began his career with the Coast Survey in 1939. He received the Commerce Bronze Medal in 1967 for his superior service.

David G. Eyre, research mechanical engineer in the Atmospheric Physics and

Chemistry Laboratory, is retiring with 16 years of service. Mr. Eyre joined ESSA in 1966.

Joseph J. Crubaugh, meteorological technician in the Weather Bureau's Data Acquisition Division, is retiring with more than 30 years' service. Mr. Crubaugh, who joined the Weather Bureau in 1938, has held other positions in Iowa, Nevada, Missouri, and Colorado.

Virginia G. Wicks, voucher examiner in ESSA's Finance Division, began her career with the Coast Survey in 1945. She is retiring with 25 years of federal service.

Norman F. Braaten, supervisory geodesist in the Coast Survey's Office of Geodesy and Photogrammetry, is retiring with 40 years with the agency. Mr. Braaten's first position was as an assistant scientific aid. All of Mr. Braaten's service has been in the Washington, D.C., area, except for a tour of duty in Phila., in 1939.

Joseph J. Slaughter, photo lithographer in the Coast Survey's Reproduction Division, is retiring after 37 years of service with the Coast Survey and ESSA.

Donald L. Jorgensen, supervisory research meteorologist in the Weather Bureau's Techniques Development Laboratory, is retiring with 30 years' federal service. Mr. Jorgensen, who joined the Weather Bureau in 1940, has held other positions in California and Washington.

Arne J. Erickson, meteorological technician in the Air Resources Laboratory, Las Vegas, Nev., is retiring with 23 years of service. Mr. Erickson joined the Weather Bureau in 1951.

A. B. Arnett, meteorologist in the Air Resources Laboratory, Las Vegas, Nev., is retiring with 27 years of service. Mr. Arnett joined the Weather Bureau in 1959.

Mary P. Palmer, secretary in the Research Flight Facility, Miami, is retiring with 33 years of service. Mrs. Palmer joined the Weather Bureau in 1959.

Torrence H. MacDonald, research meteorologist in NESCS's Radiation Branch, is retiring after 40 years of federal service. Mr. MacDonald joined the Weather Bureau as a minor observer in 1929 at Helena, Mont. His other assignments were in Montana and California.

Jonh J. Hildebrand, meteorological technician in NESCS, is retiring with 30 years' federal service. Mr. Hildebrand, a retired U.S. Navy veteran, joined the Weather Bureau in 1960.

Ralph H. Colby, meteorological technician at Fargo, North Dakota, retired after 26 years of service with the Weather Bureau. Mr. Colby formerly served at Marquette, Mich., and Williston, North Dakota.

George E. Daniel, supervisory meteorologist at Weather Bureau Central Region headquarters, Kansas City, Mo., retired with 41 years of federal service. Mr. Daniel's other assignments were at St. Louis, Mo., and New York.

Eleanor C. Feiring, secretary at the Weather Bureau Technical Training Center, Kansas City, Mo., retired after nine years of federal service.

Ivan W. Brunk, meteorologist in charge of the Chicago, Ill., Weather Bureau Office, retired with 32 years of service with the Weather Bureau. Mr. Brunk's other weather assignment was in Seattle.

Jacob W. Morgan, supervisory meteorologist at the Chicago Weather Bureau Forecast Office, retired after 32 years of federal service. Mr. Morgan joined the Weather Bureau in 1938.

Kenneth R. Kiser, meteorological technician at Lander, Wyo., retired after 30 years with the Weather Bureau. Mr. Kiser formerly served at Burlington, Iowa, Malden, Mo., and Kansas City, Mo.

Herbert H. Bomalaski, meteorologist in charge of the Green Bay, Wis., Weather Bureau Office, retired after 41 years of federal service. Joining the Bureau in 1930, Mr. Bomalaski has held weather assignments in Evansville, Ind., Cleveland, Ohio, and Chicago, Ill.

Floyd H. Pearson, meteorologist at Detroit, Mich., retired after 43 years of service with the Weather Bureau. Mr. Pearson's other weather assignment was at Omaha, Nebr.

Clarence C. Lamoureux, meteorologist in charge at Des Moines, retired from the Weather Bureau after 46 years. Mr. Lamoureux, who joined the Bureau in 1923, held assignments at Ithaca, N.Y.; Syracuse, N.Y.; New Orleans, La.; Oakland, Calif.; Washington, D.C.; and Raleigh, N.C.

Ralph M. Evans, meteorological technician at the Weather Bureau Forecast Office, Raleigh, N.C., retired with 30 years of federal service.

Lucy M. Gunter, personnel staffing specialist in the Weather Bureau Eastern Region headquarters, New York., retired with 30 years of federal service.

Paul T. Lynch, meteorologist at the Weather Bureau Office, Albany, N.Y., retired with 30 years of federal service.

Joseph E. Mancini, meteorological technician at the Syracuse, N. Y., Weather Bureau Office, retired with 28 years of federal service.

James F. McCloy, supervisory meteorologist at Weather Bureau Eastern Region headquarters, New York, retired with 40 years of federal service.

William B. Sabre, electronic technician in charge at the Newark, N.J., Weather Bureau Office, retired after 31 years of federal service.

Helen E. Senter, secretary at the Albany, New York, Weather Bureau Office, retired with 30 years of federal service.

Samuel Smith, administrative officer at the Weather Bureau's Eastern Region headquarters, New York, retired with 41 years of federal service.

Clarence A. Woollum, administrative assistant at the Washington, D.C., Weather Bureau Forecast Office, retired after 33 years of federal service.

Arland W. Ewing, meteorological technician at the Harrisburg, Pa., Weather Bureau Office, retired with 42 years of federal service.

S. Clifton Wagner, meteorologist in the Weather Bureau Forecast Office, New York, retired with 31 years of federal service.

Mart G. Baldwin, meteorologist at the Harrisburg, Pa., Weather Bureau Office, retired with 32 years of federal service.

Clayton L. Rock, meteorologist at the Harrisburg, Pa., Weather Bureau Office, retired with 40 years of federal service.

Mary P. May, secretary at the Weather Bureau's Eastern Region headquarters, retired with 16 years of federal service.

Warren B. Kennedy, meteorologist at the Harrisburg, Pa., Weather Bureau Office, retired with 29 years of service with the Weather Bureau.

Dana Blandin, supervisory electronic equipment inspector, Philadelphia, Pa., weather office, retired with 30 years of federal service.

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

ERRATA NOTICE

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages

Faded or light ink

Binding intrudes into the text

This has been a co-operative project between the NOAA Central Library and the Climate Database Modernization Program, National Climate Data Center (NCDC). To view the original document, please contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or Library.Reference@noaa.gov

HOV Services
Imaging Contractor
12200 Kiln Court
Beltsville, MD 20704-1387
July 23, 2010