



# NEWS

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## EDITORIAL

During my trip around the country in early October, I discussed with field officials the possibility of geographical moves. I pledged then to do my utmost to ensure that all individuals who might be involved in such moves would be alerted as far in advance as possible.

Insofar as field activities are concerned, there probably will be very few moves. There will, however, be geographical moves of various components not connected with the field structure.

The first major groups to be affected will be the Geodetic Data Center and the Seismological Data Center of the Environmental Data Service. Early in 1966, both Centers will be moved from the Washington area to Asheville, North Carolina, where they will be co-located with the National Weather Records Center.

Other moves are scheduled for the Institutes for Environmental Research. Headquarters of the Institutes will be at Boulder, Colorado, where our largest research group -- the Institute for Telecommunication Sciences and Aeronomy -- is already located.

In January 1966, several staff members of the Atmospheric Physics and Chemistry Laboratory of the Institute for Atmospheric Sciences will begin operations at Boulder. The remainder of that Laboratory -- with the exception of the Experimental Meteorology Branch and the Ozone Section -- will move to Boulder during the spring and summer, closing out Washington activities by September.

Also in 1966, the headquarters of the Institute for Earth Sciences will move to Boulder, as will the Geomagnetic Laboratory of that Institute.

Boulder offers many advantages as a site for the Institutes. In addition to the fact that ESSA possesses an existing facility there, Boulder is the home of growing academic activity. It is also an expanding center for research in the environmental sciences. Cooperation and collaboration with the university and the National Center for Atmospheric Research will permit a constant flow of ideas and results between the university community and the ESSA Institutes.

Through the Institutes, we hope to establish close ties with the university and scientific community, with whom we must interact in many ways to ensure the vitality of our research and the training of environmental scientists on whom the future of our organization depends.

Although the headquarters for the Institutes will be Boulder, some laboratories -- and even Institutes -- will be geographically separated as required to study the various environmental phenomena, such as hurricanes, tornadoes, earthquakes, and oceans, or to take advantage of special facilities of association with special groups.

## THE INSTITUTE FOR EARTH SCIENCES

The Institute for Earth Sciences was formally established on November 22, 1965, with Dr. Leroy R. Alldredge as its acting director. The purpose of this new Institute, a primary subdivision of the Institutes for Environmental Research, is to conduct advanced and applied research in the fields of seismology, geomagnetism, and geodesy.

A major task of the Institute will be to seek new knowledge of the earth's interior and develop methods of using this knowledge to predict earthquakes. The present lack of such an earthquake prediction system constitutes a major gap in ESSA's public warning capabilities.

The Institute's principal research programs are conducted in three laboratories -- the Earthquake Mechanisms Laboratory, the Geodetic Laboratory, and the Geomagnetic Laboratory.

The Earthquake Mechanisms Laboratory in San Francisco is under the direction of Dr. Don Tocher. This laboratory was established by the Coast and Geodetic Survey in 1964 as the Advanced Seismic Experiments Group. Its functions include the study of the earth's internal structure and the mechanisms that cause earthquakes, and the applications of the knowledge gained by these studies to the problems of earthquake prediction. The laboratory also analyses the origin and distribution of earthquakes in the island areas around the Pacific Basin.

The Geodetic Laboratory, located in Washington, D. C. and headed by Dr. Hellmut Schmid, seeks to improve the accuracy of measurements of the earth's size and shape, studies gravitational fields, and investigates the size, shape, and other geodetic aspects of the moon and the planets, as the need arises in our national space programs.

The Geomagnetic Laboratory, currently located in Washington, D. C., works to determine the distribution of the earth's magnetic field, both in space and in time, and to discover the laws governing this phenomena. It is planned to emphasize the study of the sources of this magnetic field and of its secular changes. The configuration of the earth's magnetic field determines the paths followed by cosmic rays as they approach earth and shapes the zones of intense radiation that encircle our planet -- factors vitally related to every aspect of space science.

In mid-1966, both the Geomagnetic Laboratory and the headquarters of the Institute for Earth Sciences will move to Boulder, Colorado.

There are some areas in the earth sciences not covered by the programs of these three laboratories such as rock mechanics, heat flow, volcanology, and others, in which the Institute may later wish to establish programs. To provide this growth potential, provisions have been made for a fourth component, the Geophysical Research Staff. Its functions will be to seek basic knowledge in such areas, to advise the Institute's Director of the need for new research programs, and eventually to develop such programs. Another major function of the Staff will be to stress the development and use of interdisciplinary methods in the study of earth science problems, particularly in the field of earthquake prediction.

The Institute for Earth Sciences will work closely with the Coast and Geodetic Survey's Office of Seismology and Geomagnetism. This office provides the seismic and magnetic data gathered by ESSA's world-wide observation networks and, in conjunction with the Office of Geodesy and Photogrammetry, another major subdivision of the Coast and Geodetic Survey, applies geodetic, gravitational, and earth-movement data to the earthquake prediction problem.

The Institute for Earth Sciences, its components, and its staff will maintain close contact with counterpart units, individuals, and interested parties in industry, other government organizations, and the academic community, particularly those groups and individuals active in the national effort to develop earthquake prediction methods.



DR. LEROY ALLDREDGE

Dr. Leroy R. Alldredge, the Acting Director of the Institute for Earth Sciences, joined the Coast and Geodetic Survey as a research geophysicist in mid-1959. A major accomplishment of Dr. Alldredge during his service with C&GS was the design and development of an automated magnetic observatory which will considerably reduce the manual labor required at these observatories and will also improve the accuracy of the data collected. In February of this year he received the Department of Commerce Gold Medal for Distinguished Achievement.

Dr. Alldredge began his Government service in the Federal Communications Commission in 1941 and served as a wartime radio monitor. He left FCC in 1944 to work for the Carnegie Institute of Washington, testing newly designed

magnetic exploder devices for depth charges, torpedoes, and mines -- work he continued when he joined the Naval Ordnance Laboratory in 1945. Later he headed the Naval Ordnance Laboratory's Electricity and Magnetism Research Division, which conducted pioneer studies of the rapid fluctuation of the earth's magnetic field. Under Dr. Alldredge's direction, this division developed the Universal Airborne Magnetometer, an instrument which, when airborne, is capable of continuously recording the magnetic components of the earth's magnetic field. The Magnetometer has been widely used by C&GS, the Air Force, and the Navy.

In 1947, Dr. Alldredge took part in Project VOLCANO, which involved taking airborne magnetic measurements over the Aleutian Islands, Midway, Wake Island, Kwajalein, Bikini Atoll, Eniwetok, and Hawaii. In 1950, he was a member of an expedition to Greenland and was in charge of making special acoustic and electromagnetic measurements.

Author of many scientific papers and associate editor of the Journal of Geophysical Research, Dr. Alldredge is a former president of the Geomagnetism and Aeronomy Section of the American Geophysical Union. He is currently the General Secretary and Director of the Central Bureau of the International Association of Geomagnetism and Aeronomy, and a member of the Institute of Electrical and Electronic Engineers, Sigma Xi, Phi Kappa Phi, and Pi Mu Epsilon.



DR. HELLMUT SCHMID

Dr. Hellmut H. Schmid, who is in charge of the Geodetic Laboratory, joined the Coast and Geodetic Survey as a scientific advisor in the Office of Research and Development in 1963. The high-precision satellite tracking system used by the Coast and Geodetic Survey was designed around the Wild BC-4 ballistic camera developed by Dr. Schmid.

Born in Dresden, Germany, in 1914, Dr. Schmid became a naturalized U. S. citizen in 1955. He attended the Technical University of Dresden from 1934 through 1941, earning a Ph.D. in geodesy and photogrammetry. In late 1941 Dr. Schmid was ordered to Peenemunde to work on geodetic and photogrammetric problems connected with the development of a long-range rocket. When the war ended, Dr. Schmid went to work for the U. S. Army at the Ballistic Research Laboratories, Fort Bliss, Texas. In 1950 he was appointed a section chief in the Ballistic Measurement Laboratory at the Aberdeen Proving Grounds in Maryland. Here he developed a new method of analytical aerial triangulation considered a milestone in photogrammetry.

In 1962, Dr. Schmid became the Chief Scientific Advisor to the Army's Engineers Research Center at Ft. Belvoir, Virginia. Dr. Schmid's work has been applied to a wide variety of problems in fields that range from guided and ballistic missiles to satellite programs and water table development. His specific contributions to the science of photogrammetric measurements and techniques have expedited the geodetic satellite program and have ensured the quality and precision of the data obtained.

Dr. Schmid is a member of the Committee on Geodesy of the Space Science Board of the National Academy of Sciences and acts as consultant to the Ballistic Research Laboratories, Aberdeen Proving Ground, Aberdeen, Maryland, and to the U. S. Army Engineer, Geodesy Intelligence and Mapping Research and Development Agency. He is also Chairman of the Manned Space Science Geodesy/Cartography Working Group for the National Aeronautics and Space Administration. He is a member of the American Geophysical Union, the American Society of Photogrammetry, and the International Society of Photogrammetry. Dr. Schmid is the author of many scientific papers. He holds the Fairchild Award of the American Society of Photogrammetry (1958); the Robert H. Kent Award, Army Ordnance Corps (1962); and the Colbert Medal of the Society of American Military Engineers.



DR. DON TOCHER

The Earthquake Mechanisms Laboratory is directed by Dr. Don Tocher, who joined the Coast and Geodetic Survey in early 1964.

Previously, Dr. Tocher had worked as a research seismologist for the University of California at Berkeley, where he was chief scientist for a project involving seismological experiments concerned with earthquakes in the California-Nevada region. He had also served as a consultant on seismology, seismological engineering, and related problems for Government, industry, and the U. S. Air Force.

A native of Hollister, California, Dr. Tocher majored in seismology, first at Harvard, then at the University of California, where he received his B. A. in 1945, his M. A. in 1952, and his Ph.D. in 1955. He was on active duty with the Navy from mid-1943 through August 1946, and was recalled in early 1952 for the Korean War, serving until January 1954.

Dr. Tocher has published numerous papers on seismology and holds the Grove Karl Gilbert Award in Seismic Geology. He is a member of the Seismological Society of America, the Geological Society of America, the American Geophysical Union, the American Geological Institute, the Society of Exploration Geophysicists, the Geochemical Society, the American Association for the Advancement of Science, the Royal Astronomical Society, and Sigma Xi.

SATELLITE LAUNCHED FOR GEODETIC STUDIES. On November 6, NASA's Explorer XXIX was launched from Cape Kennedy. This 385-pound satellite, popularly known as GEOS I, is designed exclusively for geodetic studies. The spacecraft has five independent optical and electronic geodetic tracking systems which will be operated simultaneously to allow cross-checking of the systems so as to improve the accuracy of the data derived from each one. These data are needed to establish a more precise model of the earth's gravitational field and to aid in mapping a world coordinate system relating points on or near the earth's surface to the common center of the earth's mass.

One of the five tracking systems involves photographing flashing lights on the satellite against the background of the stars. During a calibration period which ended November 29, stellar exposures were made at several of the Coast and Geodetic Survey's Satellite Triangulation Stations. There will be a total of 99 opportunities for operational star-satellite photography by the eight C&GS stations through December 6. With the exception of the station at Beltsville, Maryland, all C&GS Satellite Triangulation Stations are presently located in Canada.

EXPANDED INTERNATIONAL WEATHER PROGRAMS URGED. At the White House Conference on International Cooperation, held in Washington from November 28 through December 1, prospects for the field of meteorology were described by a group of the most eminent U. S. atmospheric scientists as "exciting", "challenging", "revolutionary", and "of enormous potential benefit". A report presented to the conference by the National Citizens' Commission Committee on Meteorology urged the full development of a World Weather Watch and the achievement of more complete scientific understanding of the general circulation of the global atmosphere. The Committee is one of 30 groups appointed to examine various aspects of the United States' programs in international cooperation during the International Cooperation Year. On November 30, a panel of experts chaired by Dr. Jerome Wiesner discussed the Committee's report. Others on the panel were Dr. Thomas F. Malone (Chairman of the National Citizens' Commission on Meteorology), J. Herbert Hollomon, Robert M. White, Jule G. Charney, Verner E. Suomi, and Emanuel R. Piore.

INSTITUTE DIRECTORS MEET AT BOULDER, COLORADO. On November 29-30, the Council of Directors of the Institutes for Environmental Research (IER) held its second meeting at Boulder, Colorado. The Council is composed of the Directors or Acting Directors of each of the four Institutes, the Acting Director of the ESSA Office of Science and Engineering, and the Acting Director of the IER Administrative and Support Services. In addition to the business meetings for coordinating policies of the four Institutes, the council members heard detailed briefings on the research activities of the Institute for Telecommunication Sciences and Aeronomy (ITSA) and met with representatives of various departments of the University of Colorado concerned with the physical and geophysical sciences. The afternoon of November 30 was spent visiting the facilities of

the National Center for Atmospheric Research (NCAR) in Boulder and hearing a summary of its program

In attendance at the meeting were Dr. C. Gordon Little, Director of ITSA and chairman of the council; Dr. Leroy Alldredge, Acting Director of the Institute for Earth Sciences; Dr. Joseph Smagorinsky, Acting Director of the Institute for Atmospheric Sciences; Dr. Harris B. Stewart, Acting Director of the Institute for Oceanography; Dr. Floyd L. Taylor, Acting Director for Administrative and Support Services, IER; and Dr. John S. Rinehart, Acting Director of the Office of Science and Engineering. Also attending from Washington were R. N. Culnan, Institute for Atmospheric Sciences, and Wilbur Eskite and William E. Phelps of the Institute for Earth Sciences. Among the senior ITSA participants were Dr. J. R. Wait, A. H. Shapley, W. F. Utlaut, R. S. Kirby, R. W. Knecht, and Dr. E. K. Smith.

CONSTRUCTION BEGINS ON HYDROGRAPHIC SHIP. Vice Admiral H. Arnold Karo (Deputy Administrator of ESSA), Rear Admiral James C. Tison, Jr. (Director of the Coast and Geodetic Survey), and Commander Allen L. Powell (Chief, C&GS Facilities Division) attended keel-laying ceremonies for a new ESSA hydrographic ship, the Fairweather. The ceremonies were held November 30 at Jacksonville, Florida, where the 231-foot vessel is being constructed by Aerojet-General Shipyards.

NEW MIC FOR PHOENIX WEATHER BUREAU. Robert S. Ingram, Meteorologist in Charge (MIC) at Burlington, Vermont, has been chosen to fill the MIC position at the Phoenix, Arizona, Weather Bureau Airport Station. Mr. Ingram is a graduate of Williams College and also attended Massachusetts Institute of Technology and the U. S. Department of Agriculture Graduate School. He served for four years as an aerological officer in the Navy. Mr. Ingram entered the Weather Bureau in 1948 and worked at Boston, Kansas City, Honolulu, and Sterling, Virginia, before his appointment as MIC at Burlington in 1961.

SPECIAL WEATHER FORECASTS FOR THE CUBAN REFUGEE EXODUS. During the period when large numbers of Cubans were leaving the island in small boats, the Tropical Meteorological Center at Coral Gables, Florida, issued daily 24-hour weather forecasts for the Florida Straits, between Cuba and the Florida Keys. These forecasts, prepared for the U. S. Coast Guard, were used in planning ship and aircraft movement in support of search and rescue operations.

ESSA BOARD OF EXAMINERS ESTABLISHED. Guy H. Dorsey, Chief, Personnel Division, is Chairman of the U. S. Civil Service Board of Examiners, located at ESSA headquarters. The ESSA Board, which includes the former Weather Bureau and Coast and Geodetic Survey Boards, is responsible for six Civil Service announcements: Meteorologist, GS-5/15; Meteorological Technician, GS-4/9; Geodesist, GS-5/15; Geophysicist, GS-5/15; Surveying Aid, GS-2/4; and Printing Plant and Lithographic Trainee, WP-4. Registers for the examinations are maintained by the Board and Certificates of Eligibles are issued to various Federal personnel offices for employment purposes.

INTERNATIONAL TSUNAMI INFORMATION CENTER. At the Fourth Session of the Intergovernmental Oceanographic Commission, attended by Vice Admiral Karo and Dr. H. B. Stewart, Jr., the ESSA Coast and Geodetic Survey Tsunami Warning System's headquarters at Honolulu was designated as the International

Tsunami Information Center. The Commission also established an International Coordinating Group to assist in furthering international cooperation in the Tsunami Warning System.

HELP WANTED AROUND THE WORLD. President Johnson has often expressed his desire that Federal agencies participate actively in staffing international organizations. At the present time, the United Nations Technical Assistance Recruitment Services has openings for a hydrogeologist in Honduras; an exploration geophysicist for an aerogeophysical survey in Swaziland; and an economic geologist, a spectrographic analyst, a geochemist, and two field geologists for a mineral survey in the Azuero area of Panama. Further information on these positions is available from the Employment Branch, Personnel Division, at ESSA headquarters.

RECORDED TELEPHONE FORECASTS NOW AVAILABLE THROUGHOUT NEW JERSEY. On November 14, 1965, recorded weather forecasts via telephone became available to residents of the entire State of New Jersey through the cooperation of the Weather Bureau Forecast Center at New York City and the New Jersey Bell Telephone Company. Heretofore, this type of automatic answering service has been provided only in certain metropolitan areas. If successful, the service soon may be extended to other states. In addition to forecasts, the recorded announcements include hourly temperature reports; warnings of heavy snows, flooding, high winds, and other severe or hazardous weather conditions; and ocean temperature reports from mid-May to mid-October.

OCEANOGRAPHERS DIVE BELOW GULF STREAM. ESSA Coast and Geodetic Survey oceanographers Robert S. Dietz and John W. Kofoed were aboard the Reynolds Aluminaut, a new deep-sea research vehicle, for two dives to depths of 375 and 420 fathoms beneath the Gulf Stream in the Florida Strait. During the three-hour dives, the scientists saw numerous, bizarre planktonic animals. They were particularly interested in observing a bottom current of one-third of a knot, which runs counter to the direction of the Gulf Stream on the surface.

ACTING DIRECTOR APPOINTED FOR INSTITUTES' ADMINISTRATIVE SERVICES. Dr. Floyd L. Taylor has been named acting director of Administrative and Support Services of the Institutes for Environmental Research. Dr. Taylor's organization, located at Boulder, Colorado, will provide support to the four ESSA research institutes. A former president of the College of Guam, Dr. Taylor is a graduate of York College, Nebraska (A.B.), and the University of Southern California (M.A.). He received his Ph.D. from the University of Nebraska in 1952. His teaching and administration at the college level includes chairman of the department of mathematics, Southern Oregon College, and visiting professor of mathematics at the University of New Mexico. Dr. Taylor joined the National Bureau of Standards in 1963 as assistant division chief in Upper Atmosphere and Space Physics and in the following year became manager of the Boulder Laboratories' computer facility.

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# **National Oceanic and Atmospheric Administration**

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