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Institute for Oceanography

The lack of knowledge of interactions between the atmosphere and the ocean is a major obstacle to long-range weather forecasting and to the improvement of ocean wave predictions, water temperatures, coastal currents, and other ocean conditions.

To provide better understanding of the ocean and its relationship with the total physical environment of the globe, Dr. Robert M. White, Administrator, announced the establishment of ESSA's Institute for Oceanography, December 26, 1965.

The Institute for Oceanography, one of ESSA's four Institutes for Environmental Research, will conduct a comprehensive research program designed to gain new knowledge of the ocean and its boundaries with the atmosphere, the shore, and the sea floor. Its wide range of marine research activities includes marine geology and geophysics, physical oceanography, and the interactions between the ocean, the earth, and the atmosphere.

Acting Director Harris B. Stewart, Jr., formerly Chief Oceanographer of the Coast and Geodetic Survey, now heads the new Institute. Headquarters are in Washington, D. C., and field installations are located at Norfolk, Va., Seattle, Wash., and Honolulu, Hawaii. In addition to those oceanographic research projects conducted wholly within the Institute, it will encourage and support cooperative research programs carried out jointly with universities and private institutions.

Working with the Coast and Geodetic Survey, the Institute for Oceanography will continue the SEAMAP scientific exploration and mapping program which is part of the Interagency Committee on Oceanography's U. S. National Plan for Ocean Surveys. These systematic oceanographic surveys will be conducted aboard ships operated by the ESSA Coast and Geodetic Survey. In the past, the SEAMAP program has been limited to the area between the Aleutian and Hawaiian Islands. It will be expanded in 1966 when two new oceanographic vessels are commissioned by ESSA. These two ships -- the Oceanographer and the Discoverer--will be the largest, most modern oceanographic research vessels built in the United States. Each ship will have more than 4100 square feet of laboratory area, providing space for additional scientists from universities and private institutions working with the Institute on cooperative projects.

Date gathered aboard ships of the Coast and Geodetic Survey are used by the Institute's scientists in studies of marine geology and geophysics.

The marine geologists investigate the topography of our continental shelves to learn how they were formed and how they have changed with time. Characteristics and distribution of bottom sediments and the environmental processes that caused them also are studied by the marine geologists. The Institute's geophysical research includes marine gravity and magnetic studies at sea and investigations of seabed structures below the sea floor.

In the field of physical oceanography, Institute scientists investigate ocean circulation, tides, and waves, as well as the physical and chemical properties of sea water. An important task facing the Institute is the development of new methods of predicting the height of tsunamis, in order to improve the accuracy of forecasts issued by the Coast and Geodetic Survey's Seismic Sea Wave Warning System. Seismic sea waves or tsunamic--often mistakenly called tidal waves--sometimes form when earthquakes occur beneath the ocean or along coastlines. The 1964 Good Friday earthquake in Alaska produced the most recent major tsunami, which was observed and reported over the entire North Pacific Ocean and much of the South Pacific. The wave caused many millions of dollars in damage along the Alaska, California, Oregon, and Hawaii coasts and elsewhere.

The Institute's physical oceanographers also conduct basic oceanographic research leading to increased understanding of the dynamic processes at work in the oceans. This knowledge is essential for developing techniques of predicting changes in those ocean characteristics--such as waves, currents, temperature, and the overall marine environment--which are important to the activities of man.

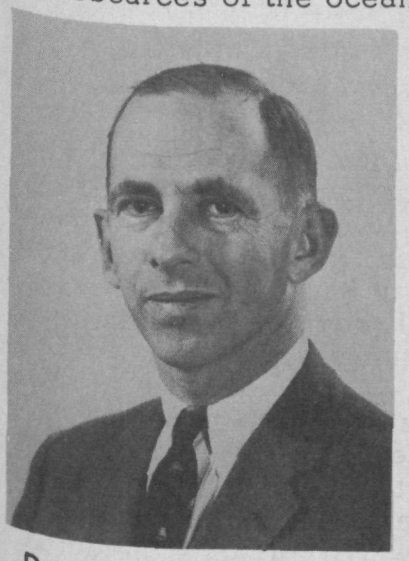
In the Institute for Oceanography, meteorologists and oceanographers will work together to achieve new understanding of the intricate relationships between the ocean and the atmosphere. The atmosphere affects the ocean as much as the ocean affects the atmosphere. A strong wind, for example, not only raises waves, but also modifies the ocean current pattern. The alteration of ocean currents causes a rearrangement of the areas of warm and cold water, which in turn affects the overlying atmosphere. Substantial improvement of weather forecasts must await new understanding of the complex interplay between the air and the sea.

Studies leading toward the understanding and prediction of the effects of waves, tides, and currents on the Continental Shelf and along the coasts also are being undertaken by the Institute.

An oceanographic laboratory, co-located with the Coast and Geodetic Survey Marine Center at Seattle, Wash., is a field facility of the Institute. This laboratory carries out programs in physical and geophysical oceanography and marine geophysics in cooperation with the Institute's other laboratories and with the Coast and Geodetic Survey.

In addition, the Institute for Oceanography includes two small specialized research groups--one located at the University of Hawaii, and the other at the University of Washington--which have been established so that Institute and university scientists can work closely on problems of mutual interest.

Through the activities of the new Institute, the Coast and Geodetic Survey and its other scientific groups, ESSA expects to move vigorously forward to achieve the understanding of our ocean environment so that it can provide improved oceanographic services as required by the nation to support its marine operations, to serve those who are concerned with the pollution of our harbors and estuaries, to serve those who are concerned with the use of the oceans for recreation, and to serve those who are concerned with preservation of the natural beauty of our shore areas and with the exploitation of the resources of the oceans--of its fish, and its minerals.



Dr. Harris B. Stewart, Jr.

Dr. Harris B. Stewart, Jr., Acting Director of the Institute for Oceanography, joined the Coast and Geodetic Survey as an oceanographer in 1957. He became Deputy Assistant Director of the Office of Oceanography in 1961, when his responsibilities included the planning and coordinating of all C&GS oceanographic programs (other than oceanography for navigational charting purposes).

Before entering the Survey, Dr. Stewart was project director of extensive surveys of the currents off San Diego. He also worked as a diving geologist (mapping the California offshore area for oil companies), as an instructor at the Hotchkiss School in Lakeville, Conn., and as a hydrographic surveyor with the U. S. Navy Hydrographic Office on an expedition to the Persian Gulf.

After serving from 1942 to 1946 as a pilot in the Army Air Force in the South Pacific, Dr. Stewart obtained a bachelor's degree in geology from Princeton University in 1948, and he received his master's degree in oceanography (1952) and his Ph.D. degree (1956) from the Scripps Institution of Oceanography.

Since joining the Coast and Geodetic Survey, Dr. Stewart has received the C&GS Distinguished Service Award (1959) and the U. S. Department of Commerce Meritorious Service Award (Silver Medal, 1960) and Exceptional Service Award (Gold Medal, 1965). The latter award cited his "exceptional service of national and international significance" in planning, organizing, and executing the program of American participation in the International Indian Ocean Expedition.

The author of a book, The Global Sea, Dr. Stewart also has written numerous scientific papers on sedimentation, submarine geology, and physical oceanography. He is Chairman of the Survey Panel of the Interagency Committee on Oceanography and of the National Oceanographic Data Center Advisory Board, and has been a member of the U. S. delegation to the four sessions of the Intergovernmental Oceanographic Commission.

An elected Fellow of the American Association for Advancement of Science, he is a member of the New York Academy of Sciences, American Geophysical Union, the American Association of Petroleum Geologists, the Geological Society of America, the Research Society of America, and the Geological Society of Washington.

ESSA Participates in California Flood Control and Seismic Projects. ESSA's Coast and Geodetic Survey is assisting in the Los Angeles County flood control project by installing and servicing county-owned accelerographs and seismoscopes. During the past six months, the Survey has installed three accelerographs and 23 seismoscopes along the base of the San Gabriel Mountains in Los Angeles County where 10 dams are located. The accelerographs are equipped with safety devices to send an alarm to responsible authorities. These installations are part of an extensive instrumentation program to provide geodetic, earth deformation, dam seepage, and other measurements about dams in the Los Angeles area.

In another project, the C&GS is conducting seismic measurements in cooperation with the California Department of Water Resources. One aspect of this program is the measurement of seismic attenuation across a known geological fault to determine acceleration and displacement at the fault and short distances from it. One array of four accelerographs and 10 siesmoscopes recently has been installed between Lake Hughes and Castaic. Within a few weeks, a similar array will be installed near Cholame, north of Bakersfield. These arrays, the first installed across an active fault, will provide scientific information about ground movements close to the earthquake source.

Pacific Natural Disaster Warning Program Eyed. A three-man ESSA survey team consisting of Capt. Harley Nygren, Paul Kutschenreuter, and Rutlage Brazee visited various agencies in Hawaii as the first step in developing a program for consolidating and strengthening ESSA's natural disaster warning functions in Hawaii. The tsunami warning program, which includes the entire Pacific Basin area, was emphasized. Similar survey visits will be made shortly to all of the Pacific coast states including Alaska.

TIROS IX Snaps Back. The tape recorder of the second camera system of TIROS IX began operating again on December 24, five months after its failure in July. TIROS IX is being used operationally now, as are TIROS satellites VII, VIII, and X.

ESSA to Aid State Department. The State Department has requested the assistance of ESSA (Coast and Geodetic Survey) in performing survey operations in the Persian Gulf as a necessary preliminary step to the delimitation of a median line between Saudi Arabia and Iran. ESSA is sending a team of specialists, including tidal and photogrammetric experts, to Saudi Arabia to obtain tide-controlled, low-low water, infrared photography of that part of the Saudi Arabian coast which is involved. The United States is conducting this survey at the request of the Saudi Arabian Government, since it is to the United States' benefit to promote resolution of the median-line question.

Research Oceanographer Named. Dr. Donald V. Hansen has been appointed a research oceanographer with ESSA's Institute for Oceanography. Prior to this appointment, Dr. Hansen was a research assistant professor at the University of Washington's Department of Oceanography, where he has worked and taught in various capacities for the past six years. Also, he has served in the Army as a lieutenant, worked as an engineer with the Boeing Airplane Company, and taught in the Seattle public schools. He received his bachelor's, master's, and doctor's degrees at the University of Washington.

Weather Bureau Represented at Canadian Conference. Hazen H. Bedke, D Director of the Weather Bureau's Western R gion, and Wilbert R. Krumm, Western Fire-Weather Coordinator, were delegates to the Western Forestry Conference at Vancouver, B. C., December 8-9. Bedke presented the "ESSA Story" and also described the Weather Bureau's fire-weather program to the 700 assembled delegates.

Meteorologist to Train for ESSA Commissioned Corps. Colin F. Campbell, a meteorologist at WBAS Oakland, Calif., and former Weather Bureau student trainee, has been accepted for training in the commissioned corps of ESSA.

Wire Drag Ships Get New CO. Lt. Cdr. Charles H. Nixon has been appointed Commanding Officer of the C&GS wire drag ships, the Wainwright and the Hilgard. Formerly executive officer of the Bowie, he was commissioned in June 1959 following graduation from the University of Massachusetts with a degree in civil engineering. He also has served aboard the Cowie and the Pathfinder. The Wainwright and Hilgard are two of the 14 ships in ESSA's "white fleet". The two 66-foot, 48-ton sister ships are the only ones of their kind in the United States. The peacetime version of minesweepers, they work as a team, dragging between them a wire which locates sunken wrecks, jutting rocks, and other undersea hazards to navigation. The ships recently completed emergency surveys of the Mississippi River to chart the changes wrought by hurricane Betsy.

ESSA To Go Into Orbit. The first satellite in the TOS (Tiros Operational Satellite) System is scheduled to be launched in early February. If launched successfully, it will become ESSA I (Environmental Survey Satellite).

ESSA Launches Exhibit at Boat Shows. ESSA is displaying educational exhibits at numerous boat shows in the next several months as a public service to promote safe navigation by the Nation's estimated 4 3/4 million motor boats. The exhibits will be manned by meteorologists and personnel experienced in nautical chart construction. The Coast and Geodetic Survey exhibit will feature charts of interest to mariners in each area, and at the Atlantic and Gulf Coast shows will include a catalog handout listing all C&GS nautical charts of the inland and coastal waters of the Atlantic and Gulf Coasts, Puerto Rico, and the Virgin Islands. The Weather Bureau display will explain, pictorially, the taking of surface and upper-air weather observations and the collection, processing, and analyzing of data essential for issuing marine weather forecasts. Also the exhibit will show the Very High Frequency (VHF) radio communications system devoted exclusively to continuous FM transmissions of weather bulletins, which are especially valuable to boatmen afloat and ashore. The following schedule indicates where and when the boat shows will take place:

Houston	Jan. 11-16	Miami	Feb. 18-23
New York City	12-23	Washington	19-27
Seattle	15-23	Philadelphia	19-27
Dallas	28-Feb. 6	Asbury Park	19-27
Baltimore	Feb. 3-8	Richmond	23-27
San Francisco	4-13	Boston	26-Mar. 6
Los Angeles	18-27	Tampa	Mar. 5-12
		Mobile	10-13

ITSA Official Assigned To ESSA Headquarters. Dr. Ernest K. Smith, Director of the Aeronomy Laboratory, ESSA Institute for Telecommunication Sciences and Aeronomy, has been assigned temporarily to direct the Liaison Office for ITSA at the Washington ESSA headquarters. Holder of a B. A. degree from Swarthmore College and master's and doctor's degrees from Cornell University, Dr. Smith has been with the Central Radio Propagation Laboratory since 1954.

Oceanographic Data Systems Completed. Two new oceanographic data-acquisition systems have been completed. One system is the ODESSA (ESSA's Oceanographic Data Acquisition System), suitable for collecting oceanographic data in estuarine and open ocean studies. The second is a highly sophisticated current-measuring system intended for internal recording of ocean current measurements and/or telemetering this information to remote areas. Now undergoing laboratory tests before field operational tests, these systems will form the basis of an oceanwide data acquisition system for ESSA's various bureaus and institutes.

New Jersey Has Automatic Weather Reporting System. New Jersey is now the only state where a person can get an up to the minute (recorded) local weather forecast by phoning from anywhere within the state. This automatic weather reporting system, using the traditional WE 6-1212 number, was established recently through arrangements with the New Jersey Bell Telephone Co.

Foreign Visitors Use Air Resources Laboratory. Bruce Hicks of Australia is spending three months with ESSA's Air Resources Laboratory (ARL), conducting research in micrometeorology and in the use of radionuclides in the atmosphere. Michael Rindsberger, a WMO fellow from the Israeli Meteorological Service, has departed from ARL after one month's stay to spend this month in the ARL office in Cincinnati. Dr. Andre Bouville, University of Toulouse, France, has joined ARL for a nine-month study period.

Spaceflight Meteorology Group Aided Gemini 6/7. The Spaceflight Meteorology Group, of the Weather Bureau's Space Operations Support Division, provided weather forecasts to the National Aeronautics and Space Administration for the Gemini 6 and 7 spaceflights, as the group has done in previous manned space missions. Good weather was expected and observed for both launches and both recoveries, but in addition to those forecasts, the Group predicted winds, sea conditions, clouds, and visibilities for two or three possible emergency landing areas on each revolution of the spacecraft around the earth. Also, forecast maps were prepared several times each day for all areas beneath the track, both for possible emergency landings and for the scheduling of experiments which required clouds or clear weather.

In addition to Alan Sanderson, head of the Spaceflight Meteorology Group, key personnel supporting the flights were Ernest Amman, J. R. Gulick, and Richard Brintzenhofe--leaders of the group sections at Cape Kennedy Space Center, Miami, and Suitland, respectively. Also, assistance was given by the National Meteorological Center and the National Environmental Satellite Center (NESC)--both at Suitland--and the Weather Bureau Airport Station at Honolulu.

Besides participating in the various briefings and other operational support

activities, Kenneth M. Negler, chief of the Space Operations Support Division, was a co-experimenter, along with Stanley D. Soules of NESC's Meteorological Satellite Laboratory, in the weather photography experiments on both spaceflights. A large number of photographs of cloud systems was obtained, augmenting those taken on earlier flights.

Data From Air Samples Studied. Dr. Lester Machta, head of ESSA's Air Resources Laboratory, will examine the data derived from air samples which were collected on an around-the-world flight over both poles in November. After the flight, the samples were sent to the University of Stockholm, where they are being analyzed. ESSA Director of Aviation Affairs Newton A. Lieurance obtained the air samples at various levels during the world flight for measurement of carbon dioxide content. Mr. Lieurance also operated a continuous recording ozone sensor (designed and built by Walter Komhyr of ESSA) to measure the amount of ozone present in the atmosphere.

New Building Slated At Boulder. Dr. C. Gordon Little, Director of ESSA's Institute for Telecommunication Sciences and Aeronomy (ITSA) presided at the groundbreaking ceremonies on December 17 for a new $600,000 plasma physics building at Boulder. Scheduled for completion in late 1966, the building will have a two-story, U-shaped front section (for offices and small laboratories) and a main laboratory which will extend from the base of the "U" over a full basement. It is expected to house both ITSA programs and plasma physics activities of the Radio Standards Laboratory (National Bureau of Standards).

VHF Radio Network Expanded. A network of 15 additional very high frequency radio stations operated from ESSA Weather Bureau offices along the Atlantic and Gulf coasts will be established before the start of the 1966 hurricane season next June. Weather bulletins will be prepared by Weather Bureau personnel and tapes will be updated every three hours, or more frequently during rapidly changing weather situations. Operating on a frequency of 162.55 megacycles, the stations will be able to reach any craft carrying a suitable FM receiver within an approximate 40-mile radius of the following cities: Miami, Boston, Washing, D. C., Norfolk, Atlantic City, Jacksonville, Charleston, S. C., Providence, Wilmington, N. C., New Orleans, Tampa, Lake Charles, La., Brownsville, Galveston, and Corpus Christi. The Weather Bureau already operates continuous VHF broadcast stations in New York, Chicago, and Kansas City.

Meteorological Laboratory is Tribute to Weatherman. A meteorological laboratory, to assist agricultural students in studying the relationship of weather conditions to farming activities, will be established as a perpetuating tribute to Don E. Coleman, who retired in November after 37 years with the U. S. Weather Bureau. He had been in charge of the Toledo Weather Bureau Office since 1946. The gift from the Toledo Blade, to be known as the Coleman Weather Station, will be in the vocational agricultural shop at the new Penta-County Vocational School.

Geophysicists Come In From Cold. After spending the past year working on the geomagnetism program in the Antarctic, three ESSA (Coast and Geodetic Survey) geophysicists have returned to the Fredericksburg Geomagnetic Center, where they will complete their reports of the year's activities. They are Leroy W. Pankratz, R. W. Manzel, and T. L. Hardiman. Replacement personnel

are continuing the work at Byrd and South Pole Stations and at the newly activated Polar Plateau Station, which replaced Eights Station. This work is sponsored by the U. S. Antarctic Research Program of the National Science Foundation.

Eppley To Head New Geophysical Observatory. Robert A. Eppley, of the Office of Seismology and Geomagnetism at ESSA headquarters, has been named observer-in-charge of the Coast and Geodetic Survey's new Northwest Observatory at Newport, Wash., and the seismic array facilities at Baker, Oregon. Mr. Eppley received his bachelor of science detree from the University of Miami in 1951, and joined the C&GS the same year. The new observatory is part of a network of 14 similar observatories maintained by the C&GS from Point Barrow, Alaska, to the South Pole and from Puerto Rico to Guam. It monitors the continual time changes of the earth's magnetic field and records the minute ground vibrations generated by distant earthquakes.

Gulf Stream Study Reported. Dr. Harris B. Stewart, Jr., Acting Director of the Institute for Oceanography, who is coordinating a one-year study of the Gulf Stream, has announced preliminary findings from data obtained during the first quarter of investigation He said that the Gulf Stream expands and contracts like a living thing, an undulating body, but that these fluctuations are irregular and not predictable so far. During the initial three-month period of the study (September through November), the position of the stream fluctuated as much as 250 miles, changing at times 15 to 20 miles a day. Ships, planes, and scientists of ESSA's Institute for Oceanography, Coast and Geodetic Survey, and Weather Bureau are participating in this study, the most intensive of its kind ever attempted. Twelve other Governmental and private groups also are included in the investigation, which will continue until next summer.

Galveston-Houston Weather Radar Link Upcoming. Houston's Weather Bureau forecasters soon will be using pictures televised directly from the Bureau's powerful WSR-57 weather radar at Galveston. The Galveston-Houston link will be the first use of the Weather Bureau's recently developed Radar and Telephone Transmission System. In the new system, the radarscope display is televised at the radar set. The optical image is converted to electrical signals, which then are transmitted over commercial telephone lines. At the receiving end, the electrical signals are reconverted to an optical image and displayed on TV monitors. The system ultimately is expected to provide improved short-period forecasts and warnings of adverse weather conditions detected by radar.

Explorer Gets New CO. Commander Emerson E. Jones is the new commanding officer of the Coast and Geodetic Survey's ocean survey ship Explorer, which is now participating in a year-long study of the Gulf Stream. This is Cdr. Jones' second tour of duty on the Explorer. He was Executive officer of the ship in 1961. Jones joined the C&GS in 1941 following graduation from the University of Washington. In 1963 the Karo Trophy for "outstanding contribution in the engineering and scientific field" was awarded by the Society of American Military Engineers to Cdr. Jones and personnel of the ship Marmer and a tidal current survey party for their joint work in determining the circulatory pattern of the Charleston, S. C. harbor.

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National Oceanic and Atmospheric Administration

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