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Survey in Texas Reveals Land Sinking of 8 Feet

A maximum land sinking of almost eight feet in the past 30 years, including 3.8 feet in the past decade, has been found in the Houston, Tex., Metropolitan Area by federal and state surveyors in a 1600-mile, four-month $300,000 survey of the Houston-Galveston area. The survey was recently concluded by the National Geodetic Survey with the assistance of the Texas Highway Department and the U.S. Geological Survey. Funding was provided by federal, state and local bodies and by private industry.

The maximum subsidence was found at a point near Jacinto City, 7.8 feet since 1943, when the first overall survey of the Houston-Galveston area was performed by the Coast and Geodetic Survey, predecessor of the National Ocean Survey. Subsequent surveys were made in 1952, 1955, 1958 and 1963. The maximum subsidence during the past decade, 3.8 feet, was found at a point near Deer Park.

In Houston, a maximum subsidence of approximately 4 1/2 feet was found since 1936. At other points, subsidences of 3.8 feet have occurred since 1943.

Land subsidences in the Galveston area

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Ocean Buoys in Gulf of Mexico Maintain Watch on Hurricanes

Two large environmental data-gathering ocean buoys are now strategically deployed in the Gulf of Mexico where they maintain a watch on hurricanes which may endanger the Gulf Coast.

The experimental 40-foot-diameter, 100-ton buoys are being tested and evaluated by the National Ocean Survey's Data Buoy Office, located at the NASA Mississippi Test Facility near Bay St. Louis, Miss. James W. Winchester is the Director of the Data Buoy Office.

EB-10 and EB-12 are two of five large buoys which occupy or will occupy ocean stations around the North American continent in the very near future. They are moored in approximately 1 1/2 to 2 miles of water--the EB-10 since June 1972 in 8,292 feet, 225 miles south of Gulfport, Miss; and the EB-12, deployed last June at a depth of 10,368 feet, 200 miles east of Brownsville, Tex.

The buoys are equipped to relay sea level barometric pressure, air temperature, precipitation, wind velocity, and sea-surface temperatures for use by climatologists and weather forecasters. The data are received by

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World Weather Program Plans For FY 1974 Are Announced

Substantial progress is being achieved through the World Weather Program, President Richard Nixon says in his message to Congress transmitting the plan for U.S. participation in the international effort during fiscal year 1974.

"Operational geostationary satellites," the President points out, "will soon provide a nearly continuous view of storms over a large part of the earth's surface, strengthening our ability to predict and warn of potential natural disasters. Polar-orbiting satellites making vertical measurements of the global atmosphere are already an important aid to weather forecasting.

"Significant advances in computer science are now helping to extend the range, scope and accuracy of weather predictions and to assess the impact of pollution on climate and weather.

"Intensive planning is nearing completion for a large-scale international experiment to be conducted in 1974 in the tropical Atlantic. This experiment will seek a better understanding of the effects of the tropics on global weather patterns. As a result, we expect to gain new insight into the life cycle of hurricanes that affect the coastal areas of the United States.

"Nations are planning to combine their resources in 1977 to observe the entire earth's atmosphere for the first time as a single physical system."

The World Weather Program is an international effort, coordinated by the World Meteorological Organization, to extend the time range

(Continued on page 4)

1972 ERL Lightning Experiments Encourage Continuation of Study

Scientists with the Environmental Research Laboratories are continuing the series of experiments aimed at understanding and learning to apply chaff-seeding techniques to the modification--and eventually, perhaps to the suppression--of lightning.

This summer's experiment, expected to run through August, follows a report of encouraging results from last year's experiments that suggested electric fields below thunderstorms can be reduced by seeding with aluminum-coated nylon chaff.

Aim of the experiments, according to Dr. Heinz W. Kasemir of the Atmospheric Physics and Chemistry Laboratory, is to understand

(Continued on page 5)

Columbia River Program Valuable To Economy of Pacific Coast

Coho salmon production in the Columbia River Fisheries Program returns seven dollars in benefits to the economy for each dollar spent, according to an analysis by the National Marine Fisheries Service, which administers funds for 21 Columbia River fish hatcheries operated by the States of Washington and Oregon and the Bureau of Sport Fisheries and Wildlife in the Department of the Interior. Dr. Fred C. Cleaver is the Director of the Columbia Fisheries Program.

To find out what the taxpayer is getting for the nearly $40 million spent on Columbia River salmon and steelhead hatcheries over the past 22 years (presently $2.5 million annually) the Fisheries Service analyzed data gathered by marking a known proportion of hatchery fish with a finclip or combination of finclips. The number of marked fish caught was then used to determine the hatchery contribution to each fishery. Values of the fish released by the hatchery were compared with the cost of rearing fish to determine the benefit-cost ratio.

A similar analysis of the data from hatchery contributions of fall chinook is nearly complete. Preliminary estimates indicate that for every dollar spent rearing fall chinook in Columbia River hatcheries, the Pacific Coast economy gained at least three dollars. The benefit-cost ratios for the two species are not directly comparable because of different time periods and methods used to determine value, but the ratios provide fisheries personnel with solid indications of the value of the hatchery program to the Pacific coast.

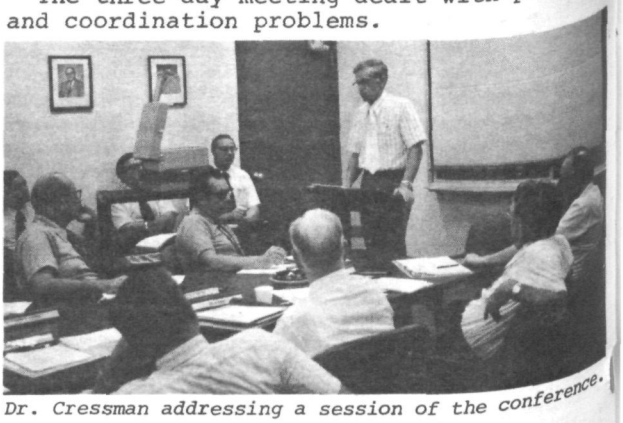
New Surface Physical-Chemical Data System Uses Historical Oceanographic Data From ICES

The Environmental Data Service's National Oceanographic Data Center is using a unique file of historical oceanographic data acquired from the International Council for the Exploration of the Sea several years ago to establish a new surface Physical-Chemical Data System. The ICES data cover the period 1904 through 1966 and consist primarily of about 300,000 observation sets of single-paired temperature and salinity values, usually taken at the surface or sampled at the ship's water intake. The data were contributed by various ICES member nations (mainly European) collecting observations made throughout the North Atlantic Ocean and the North Baltic, Norwegian, and Barents Seas, as well as some observations from the Caribbean Sea and the Western Mediterranean. About 200,000 ICES data sets have already been incorporated into the new system. The end product in the processing scheme is a geographic sort of the data stored on magnetic tape. Requests for these data or portions thereof may be addressed to the NODC, Rockville, Md. 20852. Those wishing to contribute new data to this file should contact EDS/NODC to make the necessary arrangements.

Forecast Reorganization In Central Region Completed

Dr. George P. Cressman, Director of the National Weather Service, participated in a recent conference marking the completion of the Forecast Reorganization in the Central Region. This largest of the NWS Regions (land area) is second in population and first in agricultural productivity and now has 14 Weather Service Forecast Offices, a Regional Weather Coordinating Center, and two functioning FA (aviation weather forecast) units. The 14 WSFO's, the RWCC, and FA units are fully staffed and ready to bring to the Central Region the finest forecast and warning service system it has ever had. Every state is served by one WSFO located within its borders.

The three-day meeting dealt with planning and coordination problems.



Dr. Cressman addressing a session of the conference.

Ocean Buoys in Gulf (Continued from page 1)

a Coast Guard station in Miami, Fla., and re- broadcast to the National Weather Service for use in weather forecasts and warning advisories. EB-12 is also equipped with underwater sensors which report conductivity (salinity), current velocity, water pressure, and water temperature at five ocean depths.

EB-10's performance has been especially noteworthy during the past year. This was demonstrated Feb. 9, 1973, when a severe storm developed in the Gulf of Mexico. The storm later paralyzed much of the southeast with abnormal amounts of snowfall. According to the National Meteorological Center, the data were very useful in determining the start and intensity of the storm.

A March 24, 1973, storm that brought strong winds, high water, and much damage to the Gulf Coast illustrated the ability of EB-10 to survive and transmit useful environmental information during adverse sea conditions. Winds in excess of 65 miles per hour and waves of six to eight feet were reported along the Gulf Coast during the height of the storm. EB-10 reported data throughout the storm and assisted the NWS in providing more accurate weather forecasts for the region.

Scientists at the Data Buoy Office hailed the performance of EB-10 as indicative of the ability of data buoys to assist in tracking hurricanes and to enhance the meteorologist's capability to forecast the weather.

Buoys similar to the EB-10 are deployed also in the North Atlantic off Norfolk, Va., and in the Gulf of Alaska.

Robert W. Schoning Takes Oath As Fisheries Service Director

Dr. Robert M. White, NOAA Administrator, administers the oath of office as Director of the National Marine Fisheries Service to Robert W. Schoning, as Mrs. Schoning and their children, (from left) Kerry, Randy, James, and Kip, watch.

Series of Climatic Data Publications For Normal Period 1941-70 Being Issued

The Environmental Data Service's National Climatic Center is currently preparing a series of climatic data publications for the 30-year normal period 1941-70. The first publication of this new series, "Monthly Averages of Temperature and Precipitation for State Climatic Divisions 1941-70", issued during July 1973, presents the normals as well as the monthly and annual divisional averages of temperature and precipitation for each year of the period. Each value published is the simple arithmetic average of the data for all stations in the climatic division that furnish both temperature and precipitation records. This publication was prepared in 44 parts, each contains data for a State or group of States, following the same grouping (excluding Hawaii) as the monthly Climatological Data publication. Copies are available from the National Climatic Center at a cost of 10 cents per part.

The second publication in the series, "Monthly Normals of Temperature, Precipitation and Heating and Cooling Degree Days 1941-70", to be issued during August 1973, contains monthly normals for each of the cooperative stations that has data available for the entire 30-year period, 1941-70, and for the National Weather Service First Order Stations. It will be prepared in 45 parts, each containing data for a state or group of states (following the same grouping as the monthly Climatological Data publication). Copies of this publication will be available from the NCC at a cost of 25 cents per part.

During the next few months, NCC will publish "Daily Normals of Temperature and Heating and Cooling Degree Days, 1941-70." Daily normals will be prepared only for National Weather Service First Order Stations.

Weather Information Center Test Is Conducted at Minooka, Ill.

A marketing study, recently conducted in a cooperative effort between the National Weather Service and the 3-M Company, exceeded expectations. The study was to determine the feasibility of establishing "Weather Information Centers" along interstate routes. Establishment of these centers would fill a void of weather information available to motorists. Currently, motorists hear local forecasts on car radios while traveling through communities. Vital information for their routes, such as fog and snowstorms, is rarely available.

The NWS/3-M test was conducted along Interstate 80 at Minooka, Ill. Highway signs directed motorists to the "Weather Information Center." The "Center" consisted of a display which included a VHF-FM receiver. The motorists obtained the latest weather information by listening to the NWS continuous weather broadcasts. The NWS Forecast Office in Chicago included special motorists weather forecasts in their messages.

Each user was interviewed for his opinion of the service. About 85 percent expressed complete satisfaction with WSFO Chicago's messages. More than 80 percent want Weather Information Centers to be established elsewhere. From a marketing standpoint, the respondents clearly showed weather centers to be an excellent advertising media. The 3-M Company plans to distribute interstate route maps at the Centers. Financial support would be derived from classified advertising on the maps of interstate services.

Plans are now underway to expand Weather Information Centers. Concentration will be given first to state rest stops, and later restaurants, motels, gas stations, and the like, along interstate routes will be enlisted for these Center.

Eileen M. Gavin, one of the 3-M Company interviewers for the study, with the Weather Information Center display at Minooka. VHF-FM receiver, located in the upright, provides motorists with highway weather information. A desk, protruding from the display, contains a map depicting reference points for radar weather reports.

My, How Times Have Changed!!

Inflation? Consider this: In 1841, a builder offered to construct a 91 1/2-foot cutter for the Treasury Department for $17,000. The 90-foot NOAA Ships Rude and Heck each cost $850,000 when constructed in 1967.

C. F. Ellingwood Named To Head NGS Vertical Network Division

Cecil F. Ellingwood has been named Chief of the National Geodetic Survey's Vertical Network Division. The Division is in charge of the national vertical network of elevations which, with the national horizontal network of distances, provides the basis for determining land boundaries, mapping natural resources, developing the land, and planning the alignment of highways and public utilities.

Mr. Ellingwood joined the Coast and Geodetic Survey, predecessor of the National Ocean Survey, in 1940, following employment with the U.S. Army Engineers and the City of Hartford, Conn. He has been Assistant Chief of the Vertical Network Division since 1969.

He received an engineering degree from the University of New Hampshire.

World Weather Program (Continued from page 1)

and scope of weather predictions, to develop means for assessing the consequences to global environmental quality of man's pollution of the atmosphere, to determine the feasibility of large-scale weather modification, and to establish new bonds of international cooperation.

NOAA coordinates U.S. participation in the World Weather Program, which has two major components--the World Weather Watch and the Global Atmospheric Research Program--supported by a Systems Design and Technological Development effort.

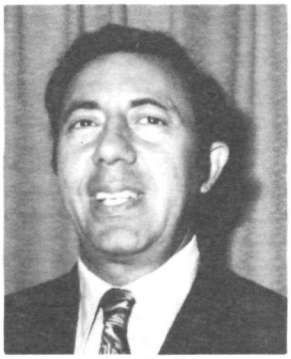
Other agencies contributing, each of whose proposed participation is described in "The World Weather Program Plan for Fiscal Year 1974", are the Departments of Defense, State, and Transportation, the Atomic Energy Commission, Environmental Protection Agency, National Aeronautics and Space Administration, and National Science Foundation.

The major U.S. contributions to the World Weather Watch during the coming year include expanding the capability of the current operational satellite system, developing new techniques for processing satellite data, establishing an atmospheric baseline monitoring station, and providing assistance to the meteorological services of developing nations.

NASA will launch two Synchronous Meteorological Satellites, prototypes for NOAA's Geostationary Operational Environmental Satellite system. These spacecraft will permit virtually continuous observation of the environment over the U.S. and large areas of the Atlantic and Pacific Oceans, and also will collect and relay data from remote platforms such as buoys, ships, automatic stations, aircraft, and balloons.

"The World Weather Program Plan for Fiscal Year 1974" is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, for 75 cents, or in GPO bookstores for 50 cents.

Joseph R. Vazzo Appointed OIC Of WSO at Youngstown, Ohio



Mr. Vazzo

Joseph R. Vazzo has been appointed Official in Charge at the Weather Service Office in Youngstown, Ohio, where he has served as a meteorological technician since 1955. He succeeds Richard A. Foster, who recently retired after 31 years of federal service.

Mr. Vazzo entered the Weather Service in 1950 as a meteorological aid and subsequently served at Winston-Salem, N.C., and Pittsburgh, Pa., before going to Youngstown.

He graduated from the Spartan School of Aeronautics in Tulsa, Okla.; received additional meteorological training from Penn State University; and attended Youngstown State University.

Survey in Texas (Continued from page 1)

during the past decade were generally found to be minimal--at one point the land has apparently sunk one foot since 1906 and only one-tenth of a foot since 1963.

The 1973 survey involved measurements at points which had previously been measured and identified by brass markers placed in the top of concrete posts imbedded in the ground and structures. Approximately 2400 points were measured this year.

"With the information available from the survey, engineers, geologists, land use planners and others concerned with the development of the greater Houston-Galveston area can make future projections necessary for the orderly development and the planning of corrective measures," said Rear Admiral Allen L. Powell, NOS Director.

The survey was conducted from February to May by eight field parties under the overall supervision of the NGS. The project was coordinated in Houston by the Houston-Galveston Area Council and by Pliny Gale of the American Society of Civil Engineers' Houston Chapter.

In addition to NOAA, which funded more than half the cost of the survey, 26 other organizations and one individual participated in underwriting the program. They included the U.S. Geological Survey; Texas Highway Department; Federal Insurance Administration; Army Corps of Engineers; National Aeronautics & Space Administration; cities of Baytown, Bellaire, Houston, Texas City and Galveston; Harris and Galveston counties; Clear Lake City Water Authority; Harris County Flood Control District; Port of Houston Authority; Brownwood Civic Association; Champion Paper Co.; Diamond Shamrock Corp.; Houston Lighting and Power Co.; EXXON Friendswood Development Co.; Olin Chemical Corp.; Union Carbide Corp.; Dow Chemical Co.; Atlantic Richfield Co.; Shell Oil Co.; Sinclair-Koppers Chemical Co.; and Frank Kokesh.

National Marine Fisheries Service Regional Directors Hold Meeting

Attending a recent meeting of National Marine Fisheries Service Regional Directors at Fredericksburg, Va., were (from left, front row) Donald R. Johnson, Director, NMFS Northwest Region; Harry L. Rietze, Director, NMFS Alaska Region; Robert W. Schoning, Director, NMFS; Dr. Robert M. White, NOAA Administrator; Jack W. Gehringer, Director, NMFS Southeast Region; Gerald V. Howard, Director, NMFS Southwest Region; (from left, back row) James W. Brennan, Acting General Counsel, Department of Commerce; Dr. William F. Royce, NMFS Associate Director for Resource Research; Joseph W. Slavin, NMFS Associate Director for Resource Utilization; Kenneth Goodwin, Chief, Plans and Policy Development Staff, NMFS; Russell T. Norris, Director, NMFS Northeast Region; Steven E. Schanes, Assistant to the NMFS Director for Special Projects; Dr. Robert F. Hutton, NMFS Associate Director for Resource Management; Robert K. Crowell, Executive Officer of NMFS; Steve Powell, NOAA Attorney; and Winfred H. Meibohm, Staff Assistant to the NMFS Director.

1972 ERL Lightning Experiments Encourage Continuation of Study (Continued from page 1)

the physical processes involved and then to determine whether man can suppress the lightning that sets off devastating fires in the West during dry seasons. (About 70 percent of the world's forest fires are lightning-caused.) Other benefits might include suppression of lightning at Kennedy Space Center during spacecraft launches, protection of exposed explosive stores, and the like.

In July and August 1972, Dr. Kasemir and other scientists flew into and under thunderstorms in a specially equipped and instrumented B-26 aircraft,dispersing millions of the spiderweb fine pieces of aluminized chaff. While the old but sturdy airplane bucked through the turbulent storm areas,they measured electric fields with an instrument called a "field mill." Repeatedly, the chaff reduced the electric fields significantly.

This summer's experiment also uses a chaff-spreading, instrumented B-26. But experiments will be more sophisticated, in that inertial navigation systems in the airplane and ground radar will allow more precise location of the aircraft at any given time.

"We are also better able now to recognize the storms that will be most fruitful for our experiments," Dr. Kasemir says, "and we hope to get a much larger total statistical sample than we now have from last year's experiments. We also will use a different and more effective seeding pattern."

Two essential conditions must be fulfilled before the chaff can be a successful lightning suppressor. First, the corona discharge from chaff fibers must begin in an electric field of less strength than that required for lightning to occur. Second, the discharge current caused by the chaff must be able to prevent the building of lightning-igniting electric fields in the storm. Laboratory work and theoretical analysis suggested the chaff would meet both conditions--as well as cause the more rapid electric field reduction in stronger fields than in weaker.

Nine storms are described in the recently completed report. Five of them were seeded with chaff and the other four were used as controls. In all but one instance, the seeding was done directly under the storms instead of in them. In most cases, the electric fields under the storms did not exceed 100,000 volts per meter, but one storm produced a field of 300,000 volts per meter, where the rapid decay occurred.

Since actual lightning suppression will have to be conducted inside the clouds, where the highest fields build up, last summer's single test inside a cloud may be important, says Dr. Kasemir.

Experiments in actual lightning suppression may begin next year, says Dr. Kasemir. It is possible, he says, that an "armored" aircraft will be needed for the work inside the clouds. During last year's experiment, lightning knocked a hole in the wing of the B-26 when the craft was inside a cloud. Fortunately, damage was not serious.

The recent report on last summer's experiments was jointly authored by Dr. Kasemir and F. James Holitza, also of the Atmospheric Physics and Chemistry Laboratory.

notes about people

Dr. Thomas S. Austin, Director of the Environmental Data Service, chaired the Seventh Session of the UNESCO Intergovernmental Oceanographic Commission (IOC) Working Group on International Oceanographic Data Exchange, which met at United Nations headquarters in New York City recently. The meetings were attended by 57 representatives of 26 nations and eight international organizations.

The U.S. delegation included Robert Ochinero (Chairman), Director of the EDS National Oceanographic Data Center; Thomas Winterfeld, Acting Director of NODC's Development Division; Robert Junghans, Acting Director, Oceanographic Services, NOAA, and the U.S. National Coordinator for the International Global Ocean Station System; and Elaine Collins, head of NODC's biology section.

Richard Morse, EDS Associate Director for Marine Sciences, attended the meetings as Chairman of the IOC joint task team on interdisciplinary and inter-organizational data and information management and referral and of the ad hoc group for marine pollution data; William Haggard, Director of the EDS National Climatic Center, was an observer for the World Meteorological Organization's Committee on Marine Meteorology. John W. Sherman,III of the National Environmental Satellite Service's Spacecraft Oceanography Group presented an illustrated lecture on the use of satellite observations in oceanography.

Representatives of the delegations from Japan, France, the United Kingdom, Sweden, Norway, East Africa, and South Korea are currently visiting (or soon will visit) EDS headquarters and the NODC in Washington, D.C., for orientation briefings and follow-up meetings and conferences on data management matters.

Dr. George C. Reid, Acting Deputy Director of the Environmental Research Laboratories' Aeronomy Laboratory, has been appointed Space Physics Editor for the American Geophysical Union's Journal of Geophysical Research. An internationally recognized authority in the field of upper-atmosphere research, he has received numerous awards and has published many scientific papers on ionospheric physics and solar-terrestrial relationships.

Vincent J. Oliver, Chief of the Applications Group in the National Environmental Satellite Service, presented a paper on the use of satellites in forecasting the weather at the recent Symposium on Meteorological Satellites sponsored by the Centre National d'Etudes Spatiales in Paris, France.

Dr. Gordon G. Bowman, Research Associate with the Cooperative Institute for Research in Environmental Sciences (CIRES) from the University of Queensland, Brisbane, Australia, has joined the Data Systems Division of the Environmental Data Service's National Geophysical and Solar-Terrestrial Data Center as a guest worker for one year. He will specialize in ionospheric data studies.

Elden V. Jetton, Meteorologist in Charge of the Weather Service Forecast Office in Little Rock, Ark., has received his Ph.D. in civil engineering from the University of Texas at Austin. He began his course work in 1967 when he was Principal Assistant at El Paso, Tex., where he subsequently became MIC. He had a NOAA scholarship for the academic year 1970-1971, and shortly after his return to El Paso, he was transferred to Little Rock as MIC of the new WSFO there. Since then, he made frequent trips to Austin in connection with his dissertation, which was entitled "Climatology of the Upper Rio Grande Basin and the Development of Spring Runoff Forecast Equations."

Robert J. Grace, Meteorologist in the Aviation Branch of the National Weather Service Weather Analysis and Prediction Division, is the new Codes Specialist in the NWS Communications Division. In this position, he will be involved in the development and coordination of international and domestic meteorological codes. He succeeds Charles G. Reeves, who has retired after 43 years' federal service.

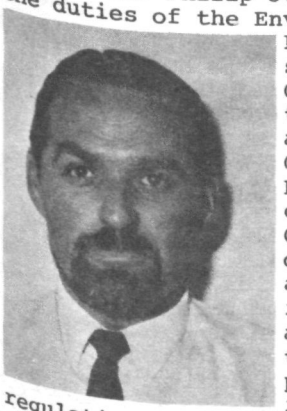
Dr. Harris B. Stewart, Jr., Director of the Environmental Research Laboratories' Atlantic Oceanographic and Meteorological Laboratories, has been elected for a three-year term as Vice-President, Exploration and Ocean Operations, on the Council of the Marine Technology Society.

National Geodetic Survey Vehicles Have Been Updated

Rear Admiral Harley D. Nygren, Director of the NOAA Corps, inspects some of the new vehicles in the fleet of vehicles used by the National Ocean Survey's National Geodetic Survey. On the right is an earlier model.

ERL NOAA Corps Liaison Officer Is Commander Philip J. Taetz

Commander Philip J. Taetz has assumed the duties of the Environmental Research



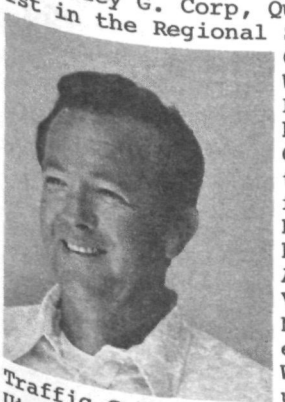
Laboratories Commissioned Corps Liaison Officer, serving as the focal point for all NOAA Commissioned Corps matters within ERL. His duties include management of Corps funding, coordination of officer assignments, and serving as advisor to Labs and officers assigned to ERL on all matters pertaining to the Corps, including Corps travel regulations and health benefits. The Liaison Officer function is located in the Office of Research Support Services. The office is temporarily located in Room 363, RB#3,and his phone number is X-6280 or 6431 in Boulder.

Commander Taetz was assigned to the Earth Sciences Laboratories in July 1972 following nearly three years as Executive Officer on the NOAA Ship Surveyor. Prior to that, he served for three years as Chief, Commissioned Personnel Branch, in Rockville.

He holds a B.S. in civil engineering from the University of Missouri, Rolla, and spent a year at Stanford University on a National Institute of Public Affairs Fellowship.

Stanley G. Corp Named OIC at Havre, Mont., WSO

Stanley G. Corp, Quality Control Specialist in the Regional Substation Management



Group at the National Weather Service Western Region Headquarters, has been selected as Official in Charge at the Weather Service Office in Havre, Mont. His earlier assignments have been at Vandenberg Air Force Base; Las Vegas, Nev.; Winnemucca, Nev.; the Pacific Weather Patrol; and with the Weather Service radar unit at the Air Route Traffic Control Center in Salt Lake City, Utah.

Geodetic Survey Underway in Washington State

A 20-man National Geodetic Survey party, headed by James W. Taylor,is conducting a 350-mile geodetic survey in Washington State from the Canadian border through Bellingham, Everett, Seattle and Tacoma to Neah Bay. The estimated cost of the four-month project is $120,000.

Heights of over 350 sites will be determined to update the NGS national network for use in mapping and engineering projects. The network is resurveyed periodically because of changes in elevation resulting from earth movement.

Disaster Preparedness Seminar Is Held in Columbia, S.C.

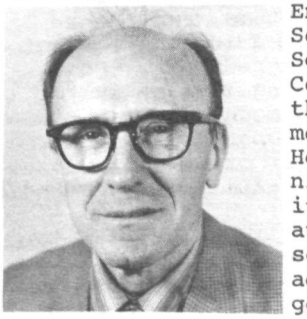
More than 200 persons concerned with preparedness planning, action, and public safety attended a day-long seminar, primarily directed toward natural disaster preparedness against hurricanes and coastal and inland flooding from heavy rains and storm surge, held in Columbia, S.C., on July 23. The meeting, arranged by Meteorologist in Charge John Purvis in cooperation with the South Carolina Disaster Preparedness Agency and Gerald Shak, User Services Representative of the National Weather Service Eastern Region Headquarters, was co-chaired by David Coveney, Deputy Director of the NWS Eastern Region, and General Fred Craft, Director of the South Carolina Disaster Preparedness Agency.

The comprehensive agenda included a review by Dr. Robert Simpson, Director of the National Hurricane Center, of the processes involved in forecasting movement and intensity of hurricanes and the current evaluations of forecast accuracy. Professor Benjamin McLuckie, of the Department of Sociology at the University of Delaware, spoke on the social science aspects of the storm warning process; and Everett Ramey, Technical Assistant in the National Ocean Survey's Coastal Mapping Division, introduced the newly issued storm evacuation maps for the coastal area from Savannah, Ga., to Charleston, S.C. He also described the maps the NOS prepared for the Federal Insurance Administration.

Mr. Purvis gave a brief account of significant hurricane climatology and the potential effects of flooding if the northeast rainfall of tropical storm Agnes had been transposed to the rivers in the Carolinas. General Craft concluded the program with a resume of the South Carolina DPA's effort in preparedness and its work on on-site assistance to local and county organizations.

Malcolm Rigby Receives Commerce Bronze Medal

Malcolm Rigby, who retired recently as the Staff Advisor to the Director of the



Environmental Data Services' Environmental Science Information Center, has received the Department of Commerce's Bronze Medal. He was cited "in recognition of creative editorship, meritorius authorship and devoted service significantly advancing the use of geophysical science."

Peirce Completes South Carolina Sound Survey

The NOAA Ship Peirce has completed a hydrographic survey of the St. Helena Sound area of South Carolina, the first such survey since 1920. The ship's two hydrographic survey launches were used for the survey and ran a total of 672 nautical miles of hydrography. The Peirce is commanded by Commander Ralph J. Land, and carries a complement of 39 officers and crew.

recipe of the week

SEAFOOD BAKE WITH ZUCCHINI AND TOMATOES

2 pounds ocean perch or other fish fillets, fresh or frozen
1-1/2 cups sliced onions
1 clove garlic, minced
1/4 cup cooking oil
2 cups sliced zucchini (1/2-inch)
2 tablespoons flour
1-1/2 teaspoons salt
1/4 teaspoon pepper
1 can (1 pound) tomatoes or tomato wedges
1 can (8 ounces) tomato sauce
1 teaspoon basil
4 ounces spaghetti (raw weight) cooked and drained
1/2 cup shredded Parmesan cheese

Thaw frozen fish. Cut fish into 1-inch pieces. Cook onions and garlic in 2 tablespoons oil in 10-inch frypan until tender but now brown. Add fish and cook, turning carefully, until fish is firm. Remove from pan. Add remaining 2 tablespoons oil to pan. Add Zucchini and cook until thoroughly heated. Sprinkle with flour, salt, and pepper; mix well. Add tomatoes, tomato sauce, and basil. Cook until sauce is thickened and zucchini is almost tender, stirring occasionally. Combine with fish, mix carefully. Layer half of the spaghetti, fish mixture, and cheese in baking dish, 12 by 8 by 2 inches. Repeat layers to use remaining ingredients. Cover with aluminum foil, crimping it tightly to edges of dish. Bake in a moderate oven, 350° F., for 20 minutes. Uncover and continue baking 20 minutes longer or until zucchini is tender and fish flakes easily when tested with a fork. Makes 6 servings.

Delbert A. Unger Dies

Delbert A. Unger, Weather Service Specialist at the National Weather Service Office in Sioux City, Iowa, died on July 24. He had served the NWS for 25 years. He is survived by his wife, Nancy, of 1520 South Lakeport, Sioux City, and four children.

WWVH Marine Weather Broadcast Expanded by NWS and NBS

The National Weather Service and National Bureau of Standards have expanded the WWVH marine weather broadcast by adding a third time slot and coverage of the South Pacific. With its Pacific-wide broadcast capability and weather coverage, and its being the only voice broadcast for vast portions of this area, and the universal availability of receiving equipment aboard all vessels on the high seas, WWVH thus becomes a most significant weather service to mariners on the high seas, particularly those without other means of communication.

WWVH is the NBS Time and Frequency Standard Services Radio Station at Kokole Point, (near Kekaha) Kauai, Hawaii. Weather information is superimposed on the basic WWVH time signals in brief time slots between the minute time announcements. As of August 1, these became the first 45 seconds of the 47th, 49th, and 51st minutes of every hour.

The specific weather coverage will be the entire North Pacific and the South Pacific to 25°S between 110°W and 160°E.

The scripts are prepared by the Marine Unit of the Weather Service Forecast Office in Honolulu. They must be kept short as possible, limited to brief information on storms and, only as time permits, to less intense systems. For information outside the Honolulu area of marine forecast responsibility, WSFO draws upon bulletins issued by the Fleet Weather Central/Joint Typhoon Warning Center, Guam, and other meteorological services. The scripts are sent by teletypewriter to NBS, WWVH Kauai, where they are recorded for broadcast by WWVH personnel. These are updated at 0000 GMT and every six hours, and anytime in between when availability of additional information warrants. The broadcast goes out on five frequencies simultaneously, 2.5, 5, 10, 15, and 20 MHz at a power of 5, 10, 10, 10, and 2.5 KW of power, respectively.

While this marine weather broadcast is intended primarily for mariners on the high seas, particularly those who have only voice communications, it can also be of service to residents of remote islands and, of course, to anyone who desires the information.

NOAA Mixed Duckpin League To Resume

The NOAA Mixed Duckpin League will resume its recreational activities beginning Thursday, September 6, at 6 p.m., at the Bethesda Bowl, 7651 Old Georgetown Rd., Bethesda, Md. There is room for full teams or individual bowlers. Further information can be obtained from Philip Domras (IDS Code 161-77283), Grace Sollers (IDS Code 14-68387), or Frances Mayhugh (IDS Code 14-68660).

Items to be considered for publication in NOAA WEEK should be submitted to:
Office of Public Affairs, NOAA, Room 221, Bldg. 5, Rockville, Md. 20852. Phone (301) 496-8243.

National Oceanic and Atmospheric Administration

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