

Townsend Cromwell Charts Guam, Marianas Marine Resources

The NOAA ship *Townsend Cromwell* operated by the National Ocean Survey and attached to the National Marine Fisheries Service in Honolulu, returned to Honolulu on 21 July after completing a 10-week survey and assessment cruise to waters around Guam and the Northern Mariana Islands. The primary mission for the cruise was to investigate the marine resources around these islands and identify those that have the greatest potential for early development. According to Richard S. Shomura, Director, Honolulu Laboratory, National Marine Fisheries Service, NOAA, this cruise was a joint effort of NMFS, the Guam Division of Fish and Wildlife, the University of Guam Marine Laboratory, and the Northern Marianas Fishing Authority. This timed major survey of the waters around Guam and the Northern Marianas will provide information which the governments of Guam and

the Northern Marianas can use in planning their fishery development programs, said Shomura.

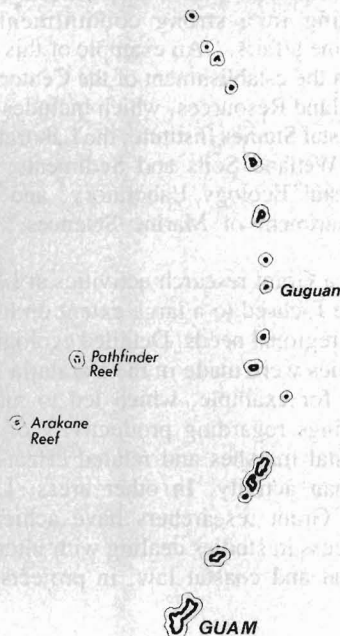
Using a variety of fishing gear including traps, handline, bottom trawls, and trolling lines, scientists aboard the *Townsend Cromwell* found relatively few areas with high densities of commercially valuable species such as ulua or jacks, snappers, and pandalid shrimps. However, bigeye scad or akule was notably abundant along the seamounts such as Arakane Reef, Pathfinder Reef, and other unnamed seamounts. Night "jigging" for bigeye scad during the dark moon phases of the month was particularly effective at some of the night-light fishing stations over the seamounts, said Richard N. Uchida, Chief Scientist on the cruise. Handline fishing produced good catches of gindai and ulua at several of the offshore seamounts.

The survey also revealed that rela-

tively high densities of pandalid shrimps occur in certain areas around Guam and the Northern Marianas. According to Uchida, these shrimps were caught in pots set in waters ranging from 365 to 820 m in depth. The catch rate was highest in waters off Guguan Island where it reached 175 shrimps per pot at depths of 640-730 m.

Trolling was also very productive over some of the offshore seamounts and catches included yellowfin tuna, skipjack tuna, and rainbow runner. Of 226 fish caught by trolling, 114 were tagged and released. When recaptured, these tagged fish will provide information on migration patterns and growth.

In general, it appeared that the offshore seamounts were more productive fishing grounds compared with locations close to the high islands, said Uchida. The handlining catch reached 1.9 fish per line-hour over the seamounts, whereas it was only 1.0 fish per line-hour at stations near the high islands. Of course, these catch rates are based only on the results of one cruise and may be due to seasonal variation in the distribution and abundance of the fish, cautioned Uchida. It was also noted that two species of spiny lobsters are known to occur in the Northern Marianas and both were taken in lobster traps during the cruise. However, these species are primarily reef-dwelling forms and very few were caught in the offshore zone where the *Townsend Cromwell* fished. Likewise, trawling for bottom fish using a Norwegian fish trawl was generally unproductive. The *Townsend Cromwell* also conducted coral-drag operations in depths ranging from 42 to 450 m of water, but no potentially valuable precious coral grounds were located.



COMPUTERS MAY AID FISHING INDUSTRY

Can computers reduce the risk of failure in the fishing business? Economists at five universities across the country, supported by a \$138,100 grant from NOAA, think so and are setting out to prove it.

Ned A. Ostenso, Director, Office of Sea Grant, said aquaculture and fishing ventures traditionally have been subject to financial loss or failure because of unexpected rises in costs, and other problems. "This project aims to develop a computer-model budget and the necessary data base to help the fishing industry improve its chances of success," he said.

The project will bring together experienced economists from Texas A&M University, the University of Massachusetts, Oregon State University, Louisiana State University, and the University of Rhode Island to develop necessary analytical tools and techniques that others can use.

A general computer program will be developed that can be applied to most aquaculture systems and many different fishing vessels to predict the probable outcome of a particular venture. Economic analyses then will be prepared for high priority species of fish within each region of the country represented by the participating scientists.

Data for the aquaculture phase of the project will include such species as salmon, marine shrimp, oysters, freshwater prawns, and lobster. Information on vessels which fish specifically for lobster, groundfish, shrimp, snapper-grouper, tuna, crabs, salmon, and halibut also will be included. Problems will range from determining which type of equipment would be most cost effective for a particular aquaculture venture to assessing the effect of changes in tax laws for vessel owners with respect to crews and imported products used in fishing. The five cooperating universities will provide \$82,400 in matching funds.

LSU DESIGNATED A SEA GRANT COLLEGE

Louisiana State University (LSU) has been designated a Sea Grant College, Secretary of Commerce Juanita M. Kreps has announced, in recognition of the excellence of the institution's marine resources program. LSU is the 13th institution in the United

States to attain Sea Grant College status.

"The Sea Grant program at Louisiana State University, now in its eleventh year, has served as the stimulus for development of a broad program in marine affairs," Secretary Kreps said. "The focus of education, research, and marine advisory service components of the program is on the wise use, management, and conservation of renewable natural resources offshore and in the coastal zone."

Ned A. Ostenso, Director of the National Sea Grant Program, an element of the National Oceanic and Atmospheric Administration (NOAA), said the designation underlines the institution's strong development in marine resource activities and the cooperation between the University, the State, and the Federal Government. The National Sea Grant Program has awarded grants to universities, laboratories, and other institutions since 1968, supporting research, education, and advisory services that foster development of the nation's marine resources. Operating under a matching fund arrangement, the Sea Grant Program includes more than 690 projects at approximately 130 colleges, universities, and institutions.

The Sea Grant Program at LSU is centered on the University's Baton Rouge campus, where, according to LSU System President Martin D. Woodin, it has had a deep influence resulting in a strong commitment to marine affairs. "An example of this has been the establishment of the Center for Wetland Resources, which includes the Coastal Studies Institute, the Laboratory for Wetland Soils and Sediments, the Coastal Ecology Laboratory, and the Department of Marine Sciences," he said.

Sea Grant research activities at LSU have focused to a large extent on local and regional needs. Detailed ecological studies were made in the Barataria Basin, for example, which led to major findings regarding productivity of the coastal marshes and related effects of human activity. In other areas, LSU Sea Grant researchers have achieved success in studies dealing with international and coastal law, in projects on

rearing of shrimp and crawfish, in a program of immunization for farm-raised alligators, in expansion of public understanding of the oceans at all age levels, and in a marine advisory service program designed to uncover problems faced by fishermen, aquaculturists, food processors, and other marine users for presentation to researchers and for relaying research results to those users.

SATELLITE CHECKS OCEAN POLLUTION

Two highly complex instruments carried into space with the launch of the Nimbus-G satellite in late 1978 hold promise of providing scientists with the answers to two basic questions of importance to mankind: 1) How polluted are the world's oceans becoming, and 2) is the earth warming up or cooling down? The instruments are vital to studies being conducted by scientists with the National Oceanic and Atmospheric Administration (NOAA), as well as to other researchers concerned with the oceans and the atmosphere.

Nimbus-G, a research and development satellite managed for the National Aeronautics and Space Administration by its Goddard Space Flight Center, Greenbelt, Md., was scheduled for launch from NASA's Western Test Range in Lompoc, Calif. One instrument, the Coastal Zone Color Scanner, is expected to aid oceanographers in determining the content of water, important in monitoring water pollution, according to Warren A. Hovis, Jr., Director of the Satellite Experiment Laboratory of NOAA's National Environmental Satellite Service. NOAA is a Commerce Department agency.

The scanner, sensing the colors in water beneath the polar-orbiting satellite, will permit content analyses to be made of large areas of coastal or ocean waters, "letting oceanographers view the ocean as never seen from ships," Hovis said. The instrument will be used to determine how well water pollution—such as oil spills, sewage and industrial waste dumpings, and river sediment—can be detected and tracked.

The other instrument, the Earth

Radiation Budget experiment, makes a variety of measurements of the radiation coming from the sun and the earth. Of particular interest to scientists is the observation of variations in the radiative heat exchange between the sun and earth with time, with location on the earth, and over the entire globe.

NOAA's Herbert Jacobowitz, of the Satellite Service's Meteorological Satellite Laboratory, said such observations can help in monitoring, and perhaps eventually anticipating, the fluctuations in climate from months to a few years. This, he explained, is because this radiative heat exchange creates the basic energy source for the atmospheric and oceanic circulations that determine climate. For example, variations in radiative heating between the tropics and higher latitudes, or between the oceans and continents, may yield important clues as to the types of winters or summers that may be expected to occur in the United States or other parts of the world.

New Technique Tracks Sewage Dumped At Sea

National Oceanic and Atmospheric Administration (NOAA) scientists have identified a biochemical technique that can be used to trace sewage in coastal areas, a matter of vital interest to environmental managers in heavily populated parts of the coast. The newly identified technique uses coprostanol, a steroid thought to be produced exclusively by bacteria in the intestines of mammals, to measure sewage in offshore sediments.

According to Patrick G. Hatcher, Philip A. McGillivray, and NOAA Corps Lieutenant Commander Larry E. Leister, all of NOAA's Atlantic Oceanographic and Meteorological Laboratories in Miami, the coprostanol method promises to become the standard for sewage-pollution detection. Hatcher and his colleagues developed the technique as part of a major ecosystem study NOAA has conducted in the New York Bight, the 15,000-square-mile (39,000-km²) continental shelf area off the New York-New Jersey coast.

Because sewage sludge, the end product of waste-water treatment, is dumped in the Bight, scientists and citizens are concerned about sewage contamination there. But sewage is difficult to trace in the chemically complex marine environment, Hatcher said. The Commerce Department researchers turned to steroids, biochemical compounds that resist deterioration in the environment. The steroid coprostanol was found to be present in contaminated marine sediments, but not in uncontaminated sediments, and appeared to be stable enough to be used as a tracer of sewage. Subsequent work led to a "percent-coprostanol" term that permits the scientists to estimate how much of a sample's organic matter is sewage-derived.

With the technique, a map of the New York Bight has been developed showing sewage pollution centered in a basin near the sewage-sludge dump site, and diminishing rapidly with distance away from the dump site. The highest value found was 15 percent coprostanol in the highly contaminated black muds near the dump site. Pure sewage contains more than 30 percent.

Substances From Sea Creatures May Have Medical Applications

Twelve chemical compounds recently discovered in such sea creatures as sponges, sea cucumbers, and sea hares potentially are valuable in treating cancer, central nervous system disorders, and cardiovascular problems, researchers supported by the National Oceanic and Atmospheric Administration (NOAA) believe. The scientists, from the University of Oklahoma, have isolated and identified the compounds during the past 15 months, and now are beginning further study on their application to disease. The research is supported by a \$116,500 Sea Grant from NOAA, a Commerce Department agency, and \$58,258 in supplemental funds from the University.

One of the most promising substances for the treatment of nervous

disorders is found in the sea hare—a member of the shellfish family—and is known as dactylene. The substance may inhibit the breakdown in the body of barbiturates, which are used to induce sleep and can be addictive. Inhibition of their breakdown would prolong their effects and permit use of smaller and safer doses. Dactylene has been tested on rats and mice, and increases the length of time the laboratory animals sleep after being given a barbiturate.

Other newly identified compounds suppress cellular growth in tissue and are candidates for possible anticancer treatment, according to the research team. The scientists are now conducting experiments on laboratory animals to validate the effects of the substances.

Chemicals taken from a number of Caribbean invertebrates and algae have, in the laboratory, inhibited the growth of experimental tumors in mice, and also mitigated cardiovascular and central nervous system disorders induced in small mammals. Isolation and identification of these substances will continue under the NOAA grant.

The newly discovered compounds may serve as models for the synthesis of new drugs. Additionally, the chemical information gained from the research will increase knowledge of the chemistry of marine animals and plants, and define the types of compounds released into seawater from natural sources.

Elephant's ear sponge.

