

NOAA Observes Fifth Anniversary of Oceanic, Atmospheric, and Environmental Activities

NOAA, the National Oceanic and Atmospheric Administration, celebrated its fifth anniversary 3 October with open house observances at many of the civilian air-sea agency's ships, weather stations, laboratories, and other facilities. Additionally, annual NOAA Awards were made to individuals and units for outstanding achievement.

NOAA was established on 3 October 1970 to create a civil center of strength for expanding effective and rational use of ocean resources; for monitoring and predicting conditions in the atmosphere, ocean, and space; and, for exploring the feasibility and consequences of environmental modification.

Within the agency, largest in the Commerce Department, are the National Weather Service, the National Ocean Survey, the National Marine Fisheries Service, the National Environmental Satellite Service, the Environmental Data Service, the Environmental Research Laboratories, the National Sea Grant Office, the Office of Coastal Zone Management, and the NOAA Corps, the nation's smallest uniformed service.

During its first 5 years, NOAA has become an important environmental management agency, as well as an agency concerned with the environmental sciences. The passage of the Coastal Zone Management Act, the Marine Mammal Protection Act, the Marine Protection, Research, and Sanctuaries Act, and the Endangered Species Act gave NOAA specific responsibilities in environmental management and changed the organization from a strictly scientific and technical agency into one that now deals with many of the social, political, and economic problems that interface with the scientific problems of the environment. NOAA has also emerged as a source of objective information on the environmental effects of various environmental actions.

Highlights of NOAA's first five years include:

1) The launching of NOAA polar-orbiting and SMS-GOES geostationary satellites to provide global coverage of

weather and other environmental phenomena.

2) The institution of MARMAP—for Marine Resources Monitoring, Assessment, and Prediction—a program to keep tabs on the kinds and quantities of living marine resources available to the people of the United States.

3) Protection of marine life by banning commercial whaling from United States ports and intensified efforts to protect porpoises.

4) The designation of a number of Sea Grant Colleges in recognition of high standards in marine research, education, and advisory services.

5) Issuance of life-saving watches and warnings of weather hazards such as hurricanes, tornadoes, floods, and winter storms.

6) Placement of data buoys in the Gulf of Mexico, the Gulf of Alaska, in the western Atlantic, and off the Pacific coast to provide weather and ocean forecasting data.

7) Exploration of the oceans, coastal waters, and estuaries, investigating their currents, the structure and contours of the sea floor, and living and

non-living marine resources.

8) The start of a project in the New York Bight to determine the effects of waste dumping on the ocean and coastal environment and a similar study of Puget Sound which is also examining the consequences of mining manganese-rich nodules from the ocean floor.

9) The banning of seal harvesting from one of the Pribilof Islands in order to study factors affecting survival and abundance of the fur seals.

10) Issuance of coastal zone grants to states which began planning studies; estuarine sanctuaries were established in Coos Bay, Oreg., and Sapelo Island, Ga.; and the site of the wreckage of the U.S.S. Monitor was designated a marine sanctuary.

11) Participation in international experiments such as the U.S.-Canada International Field Year for the Great Lakes, the Global Atmospheric Research Program-Atlantic Tropical Experiment (the greatest international cooperative undertaking in the history of the atmospheric sciences), the Cooperative Investigation of the Caribbean and Adjacent Regions, and the French-American Mid-Ocean Undersea Study.

12) The operation of the most comprehensive data service in the nation through centers for climatic, oceanographic, and geophysical and solar-terrestrial data.

NOAA Units Begin Major Environmental and Energy-Related Research in Puget Sound

Two major investigations of Puget Sound have been initiated by scientists with the Commerce Department's National Oceanic and Atmospheric Administration. The researchers will seek to determine the effects of human activities on the marine life and environment of the Sound in a 5-year program while another group will try to determine the probable ecological impact of increasing oil shipment and refining activities there.

Units participating in the studies include the National Marine Fisheries Service's Northwest Fisheries Center, the National Ocean Survey's Pacific Marine Center, the National Weather Service Forecast Office, and the Pacific Marine Environmental Laboratory of NOAA's Environmental Research

Laboratories. Additional participants will be NOAA's Environmental Data Service, the Sea Grant office at the University of Washington, Seattle, and others. Both studies will be managed and closely coordinated by Howard S. Harris.

ECOSYSTEM STUDY

The Puget Sound ecosystem study, conducted by NOAA's Marine Ecosystems Analysis (MESA) program, seeks to identify and measure the impact of man on the marine environment and its resources. It is the second of its type to be undertaken by NOAA. The first was the New York Bight project, a 7-year study begun in 1973.

Initial emphasis of the Puget Sound project, designed as a 5-year effort, is

toward two major objectives: 1) Determine the impact of treated municipal and other waste discharges on the Puget Sound ecosystem, evaluate the Sound's capacity to assimilate such wastes, and provide a data base for management decisions related to meeting provisions of the Federal Water Pollution Control Act of 1972; and 2) develop a generalized understanding of the physical, geological, chemical, and biological processes operating within the waters of the Puget Sound region as a guide to other management decisions.

According to Harris, project field work will start in the central basin of the Sound—from Commencement Bay near Tacoma northward to the southern end of Whidbey Island, near Everett. Within the central basin, the study will focus on an area covering about a 5-mile radius from West Point, site of a treatment plant operated by Seattle-METRO.

"In the central basin," Harris said, "we'll be looking mainly at the ecological impact of wastewater, the liquid effluent remaining after sewage treatment. It used to be that most experts believed such discharges did little or nothing to a saltwater ecosystem. Now we are less certain of this."

Sewage flowing into the Sound introduces effluent that contains a variety of chemical substances, including heavy metals, petroleum hydrocarbons, synthetic organic compounds, and chlorine residuals which, at high concentrations, are toxic to or otherwise impair the vital functions of marine organisms. At the concentrations anticipated in Puget Sound, acute toxic effects appear to be less likely than do other effects resulting from long-term exposure or biomagnification—the buildup of a contaminant from one feeding level to a higher one—in the food web.

On the other hand, wastewater discharge is not the only source of contaminants in Puget Sound. Other significant contributors may be river discharge, airborne fallout, storm runoff, accidental spills, and resuspension of contaminated bottom sediments by storm tides or dredging. "The fact is," Harris said, "very little is known about the baseline concentrations of trace contaminants in Puget Sound or their specific chemical forms." He cited

an apparent higher incidence of disease in some marine organisms in areas believed to be contaminated. "Also, we will be giving the public health aspects of this study a very high priority."

ENERGY RESEARCH

Funded by the Environmental Protection Agency as part of a larger, national energy program, the northern Puget Sound energy research project is closely coordinated with the ecosystem study. Impetus behind it is the accelerating oil traffic through the Strait of Juan de Fuca and the inter-island channels, reflecting the Sound's growing role in oil transshipment and refining, and its prospective importance as a terminus for Alaskan oil.

Some estimates have the area's refinery capacity doubling by 1990, and tanker traffic increasing tenfold by the year 2000. At the same time, there has been little experience with oil spills in a cold-water environment like Puget Sound's. "Our primary concern," Harris explained, "is with oil spilled on the water's surface. Later we will characterize the effects of chronic oil seepage into the Sound, as from refinery and tanker terminal operations."

To do this, the researchers will run environmental assessment surveys, gather baseline information on petroleum hydrocarbons now present in the environment, and attempt to determine what happens to such pollutants in this particular ecosystem.

Commerce Finds Mercury Levels Well Within FDA Guides in Most Edible Fish, Shellfish

The vast majority of 106 species of edible fish and shellfish tested for mercury content in a 1975 National Marine Fisheries Service resource survey were found well within interim guidelines established by the Food and Drug Administration, according to the National Oceanic and Atmospheric Administration.

Some 2,400 samples of the 106 species were examined in a program conducted by the NMFS Southeast Utilization Research Center, College Park, Md. More than 94 percent of the samples were below the FDA's guideline of 0.5 parts per million of mercury.

The approximately 6 percent of the

Physical oceanographic studies will be conducted on water mass circulation patterns, particularly the movement of surface layers and surface films as an oil slick, while geological studies will examine the behavior of sediments as traps for pollutant hydrocarbons. These investigations will become more highly focused in areas near refineries (like Cherry Point and March Point), along tanker routes, and around major terminal ports.

Biological assessments will study the distribution and abundance of populations in representative habitats. "Our main objective here," Harris said, "is to identify existing biota, the interrelationships between species, and the possible impacts of oil contamination on these organisms. We also want to identify those elements of the biosystem which constitute a particularly significant resource, either in human economic terms or in ecological ones. This will tell ecosystem managers something about the relative value of these resources, and help balance their decisions between use and conservation in northern Puget Sound."

There will be considerable interaction with the State of Washington Oil Baseline Study now underway in northern Puget Sound. International aspects of the study will involve liaison and cooperation with Canadian research programs being conducted in neighboring waters.

samples found to contain more than 0.5 ppm were from fish not ordinarily sold in the United States for consumption—marlin, sharks, grouper, and little tunny.

The resource survey is the second stage of a planned three-step investigation by the Commerce Department into the occurrence and significance of a number of trace elements in fish available to consumers. The first stage, a product survey, was carried out earlier on 29 species of widely consumed fish for five trace elements. More than 96 percent of the 334 samples examined in this study were within FDA guidelines.

As part of the total investigation, when results from either the product or

resource surveys indicate a species has elevated levels of an element, additional samples will be analyzed to obtain information necessary to define the extent of the problem and to develop a working plan to manage it. When the resource survey is completed, more than 10,000 samples of over 200 species will have been examined for mercury, lead, nickel, manganese, silver, chromium, copper, zinc, cadmium, molybdenum, vanadium, antimony, tin, arsenic, and

selenium. The interim report provides data on nine of these elements in 2,400 samples.

Some preliminary trends are given for 7 of the 9 microconstituents. Over one-half of the samples analyzed and assembled for the report had mean mercury values below 0.1 ppm. Except for some species of mollusca, mean cadmium levels were below 0.3 ppm. Muscles of all finfish reported had mean silver levels below 0.05. The majority of the

muscle samples from finfish fell between 0.1 and 0.6 ppm of copper, 2.0 to 6.0 ppm of zinc, 0.1 to 0.3 ppm of nickel, and 0.1 to 0.2 ppm of manganese. There do not appear to be any problems with fish and shellfish in regard to the elements analyzed.

A copy of the interim report on the resource survey is available from the Director, National Marine Fisheries Service, NOAA, Washington, DC 20235.

Foreign Fishery Developments

International Recession Hurts Norwegian Fishing Industry; Some Cutbacks Are Seen

Fishing was the first Norwegian industry to become noticeably affected by the current international recession. Despite general optimism in industry circles at the beginning of 1974, prices and demand in major foreign markets started to fall early in the year, and significant improvement was not then in sight. Four major fish product categories—frozen fillets, fish meal and oil, and canned fish—have been particularly exposed to declining demand and/or prices, but practically all of Norway's exports of fish products are faced with depressed market conditions.

Furthermore, the short-term outlook for the Norwegian fishing industry was not very promising. Foreign markets—which normally absorb about 85 percent of the fish catch—were generally weak, prices were low, industry stocks of fish products were accumulating, and there were few signs of an early recovery. Fishery catch statistics early in 1975 disclosed substantial reductions compared with 1974. Yields of all three major seasonal fisheries concluded in the first half of 1975 were lower than in 1974. Spawning cod and Finnmark young cod fishing, Norway's two major seasonal demersal fisheries, resulted in total landings of 76,100 tons and 25,300 tons, respectively, or 18 percent and 26.5 percent below 1974. Poor weather conditions in January-February reduced the total 1975 catch of winter capelin by 25 percent to 5.6 million hectoliters (543,000 tons) despite the absence of the catch limitations which

were in force the previous year. All but a fraction of the catch (about 4,300 tons of frozen roe capelin which was shipped to Japan for human consumption) was delivered to the reduction industry. The total supply of fish raw stock to the fish meal and oil industry (which includes Norway pout and sandeel) during the first 5 months of 1975 was 7 million hectoliters (660,000 tons) or 25 percent less than corresponding 1974 supplies.

The value of Norway's fish exports fell nearly 25 percent to \$145 million in January-March, compared with the first quarter of 1974. There were some reductions in export volume, but the bulk of the decrease was accounted for by lower prices received for fish products. Average export prices for two major products, frozen fish fillets and fish meal, were, for example, 21 percent and 51 percent lower in January-March 1975 than in the corresponding 1974 period. Brisling sardine export prices rose 13 percent, but export volume fell to 55 percent of 1974 levels, mainly because of sharply reduced deliveries to the United States, Norway's major market.

As a result of these developments, Fisheries Director Knut Vartdal recommended the reduction of the domestic purse seine fleet, which was then composed of 300 vessels, by about 100 vessels. Prospects for purse seining for North Sea herring and mackerel are poor for the next few years. Director Vartdal also suggested that a Norwegian-Soviet catch quota agreement for capelin might be neces-

sary, since the Soviet Union has begun to exploit that stock heavily.

The Ministry of Fisheries has responded to the crisis by increasing government support for the industry. Over \$90 million in subsidies, loans, and support was granted in the first half of 1975, compared with US\$37 million in 1974. In addition, the plan to extend fishing limits to 50 miles in 1975 appeared to have been abandoned. Law of the Sea Minister Jens Evensen in an address to Parliament warned against unilateral measures, but at the same time, spoke about the eventual establishment of a 200-mile economic zone.

Source: U.S. Embassy, Oslo.

Polish Fish Catch off U.S. West Coast Noted

Polish fishermen caught over 36,000 metric tons off the U.S. Pacific coast during the first 6 months of 1975. This area includes waters off the States of Alaska, Washington, Oregon, and California.

In January and February, two Polish stern trawlers fished for Pacific cod and other species (walleye pollock, Atka

Polish fisheries catch off the U.S. Pacific coast (January-June 1975).

| Species | Quantity (metric tons) |
|---------------------|---------------------------|
| Pacific hake | 30,160 |
| Pacific ocean perch | 2,010 |
| Horse mackerel | 961 |
| Pacific cod | 791 |
| Walleye pollock | 631 |
| Atka mackerel | 619 |
| Pacific herring | 268 |
| Arrowtooth halibut | 67 |
| Pacific halibut | 31 |
| Other (unspecified) | 1,049 |
| Total | 36,587 |

Source: Morski Instytut Rybacki, Gdynia, 30 June 1975.