

## U.S. Fish Catch Up in 1978

The United States' 1978 catch of fish increased by 13.8 percent over 1977, according to preliminary figures released by the Food and Agriculture Organization of the United Nations in Rome. In 1978, U.S. fishermen landed 3,511,719 metric tons (t) of fish and shellfish. This was an increase of

426,508 t over the 1977 landings of 3,085,211 t.

The U.S. increase is in sharp contrast to the small gain in worldwide catches for the same period. In 1978, the world's total catch was 72,379,500 t, a 1.6 percent gain over the 71,212,900 t caught in 1977. Just as the United

States, all major countries of the Western Hemisphere—Canada, Mexico, Peru, Chile, Argentina, Uruguay, Cuba, and Brazil—had substantial increases in catches in 1978. Islands and archipelagic nations like Greenland, Iceland, Indonesia, and Papua, New Guinea, also did exceptionally well. In most other parts of the world there were no discernible trends, except in Europe where the catches in the most important fishing countries declined sharply. The hardest hit regions were Eastern Europe and the Soviet Union.

## NOAA Aids Atlantic Salmon Restoration

The National Oceanic and Atmospheric Administration (NOAA) and the U.S. Fish and Wildlife Service are using the fertilized eggs of Atlantic salmon raised in the Pacific Northwest in an attempt to replenish New England's stock of the fish. This new effort will complement the large-scale program of the Fish and Wildlife Service to rehabilitate the runs of these salmon into New England waters.

During the next 10 years, NOAA's National Marine Fisheries Service and the Fish and Wildlife Service, a part of the Interior Department, anticipate shipping up to five million such eggs annually to the Northeast from Washington State.

Under the program, young Atlantic salmon from New England are being flown to the NMFS Aquaculture Experiment Station at Manchester, Wash., and raised in saltwater pens in Puget Sound. When mature, the fish are spawned and their eggs shipped to Fish and Wildlife hatcheries in New England where the fish are hatched, reared, and released into streams entering the Atlantic Ocean.

The first batch of 120,000 eggs were fertilized in November by 50 mature male salmon air shipped to Manchester from Penobscot Bay, Maine. These eggs came from 30 mature female salmon raised in Puget Sound during an earlier experiment to develop an Atlantic brood stock in the Northwest which

the National Marine Fisheries Service launched at its Northwest and Alaska Fisheries Center in Seattle in 1970. These fertilized eggs were incubated in Seattle and flown to Berlin, N.H., where they will be cared for until they are large enough for liberation. Every shipment of fish and eggs is certified by a fish pathologist to assure maximum protection against the transmitting of diseases.

NOAA has found that the pen-reared salmon grow rapidly because of the moderate, year-round seawater temperatures of Puget Sound which range from 42° to 60°F (6-16°C). Seawater temperatures in New England are colder in winter and warmer in summer.

Past Federal, State, and private efforts to develop self-supporting runs of

salmon in New England were relatively unsuccessful due to a lack of enough eggs and young fish to liberate. Even though streams were cleared, sources of pollution cleaned up, dams removed, and hatcheries built, adult salmon did not return to their natural streams in enough numbers to establish viable runs. The new program is expected to provide the large, dependable source of eggs needed to establish self-sustaining runs.

The Committee for Anadromous Fishery Management of the Merrimack River and the Connecticut River Policy Committee have endorsed the program. It also has gained wide support from the States involved as well as private organizations concerned with replenishing Atlantic salmon stocks.



NMFS Aquaculture Experiment Station, Manchester, Wash.

## NOAA Ship *Oceanographer* Works in Chinese Waters

The first U.S. Government vessel in more than 30 years to work in Chinese waters and to visit the People's Republic of China was scheduled to arrive in Shanghai in June, according to Richard A. Frank, Administrator of the National Oceanic and Atmospheric Administration.

The NOAA ship *Oceanographer*, 303-foot flagship of NOAA's research fleet, this summer will work together with a Chinese research vessel in studies of sediment dynamics, biology, and ocean chemistry in the East China Sea, operating from Shanghai. U.S. and Chinese scientists will work aboard both vessels. Frank described the voyage as "an historic joint research venture in an area that offers unique opportunities for scientific exploration of value to both countries.

"The United States will benefit from this research," Frank said, "because this area provides a unique opportunity to study intense sedimentation in a shallow sea. The sediment discharge on the Chang Jiang River is large and the continental shelf off this estuary is one of the widest in the world. By studying the mechanisms of sedimentation in this area, we will gain an understanding of the processes—physical, chemical, and geological—that have formed sediments in our own country and worldwide. Similar processes occur off the U.S. coast, but nowhere on a scale comparable to that in the East China Sea."

This is an important outgrowth of a protocol signed in Beijing (Peking) on 8 May 1979 by NOAA Administrator Frank for the United States and Shen Zhendong, Director of the National Bureau of Oceanography, for China. "Marine sedimentation processes were a major area of activity agreed upon under the Protocol on Cooperation in the Field of Marine and Fishery Science and Technology, and this cruise will get the program off to a fitting start," said the NOAA Administrator.

Ferris Webster, NOAA Assistant Administrator for Research and Development, returned from China early this year where, during a meeting in

Beijing 22-24 January, he obtained agreement for the *Oceanographer* cruise. John Milliman of the Woods Hole Oceanographic Institution, Woods Hole, Mass., will be the U.S. Scientific Project Coordinator. A team of Chinese scientists visited the United States in March to arrange the details of the joint research effort. The *Oceanographer* began its research off China in late May on a transit from Subic Bay in the Philippines, and was to depart Chinese waters in mid-July. Port calls were made in Shanghai to change scientists, compare data, calibrate instruments, and reprovision.

Owing to the extreme shallowness and gentle slope of the ocean bottom in the area, the deep-draft (18 feet) *Oceanographer* will do research on the continental shelf away from shore, and the Chinese vessel will work close in to shore and in the estuaries. The continental shelf in that area is one of the widest in the world—stretching out as much as 400 miles and including all the Yellow Sea and much of the East China Sea.

The sediment dynamics study will concentrate on the area within and bordering the Chang Jiang (Yangtze) River estuary. The Chang Jiang is the fourth largest river in the world in the quantity of sediment transported to the ocean. It is the third largest in water discharge, and is the major fresh water source in the China Sea. Great seasonal differ-

ences in both the ocean and river systems affect the interactions of sediments, water, and biological organisms. None of these processes are well understood at present, and will be closely studied by oceanographers of the two nations.

The U.S.-Chinese activity will include measuring currents and the movement of sediments, bottom profiling, and taking core samples for geological and biological purposes. A modeling program will also be initiated to help guide research in later stages of the project.

Project plans call for further cooperative work over a three-year period, culminating in a joint symposium to present work results and joint publication of the findings.

The *Oceanographer* was in the North Pacific in February studying mixing and internal-wave processes. It returned to San Diego, Calif., 11 March. The ship was to then go to Kwajalein Atoll and on to Davao, Philippines. This leg of its journey was to be devoted to looking at apparent relationships between sea-surface temperature anomalies and global climate trends. From 30 April to 21 May the research vessel was to undertake internal wave experiments in the Sulu Sea between the Philippines and Borneo, and on 24 May she left Subic Bay for Shanghai. The home port of the *Oceanographer* is Seattle, Wash.



The *Oceanographer*.