

## NOAA Satellite Helps Find Salmon and Tuna

An environmental satellite operated by the National Oceanic and Atmospheric Administration (NOAA), able to measure the surface temperature of the ocean, is helping tuna and salmon fishers along California's northern coast find productive fishing areas.

Early results of a pilot project using satellite infrared imagery to locate areas of "upwelling" off the coast—areas where colder, nutrient-rich bottom water rises to the surface—indicate that fishers can save both time and fuel in finding these ever-shifting spots favored by salmon and tuna. The technique may also have applications for fishers in many parts of the world. The research project is being conducted by NOAA's National Environmental Satellite Service and the NOAA-supported Sea Grant program at Humboldt State University in Arcata, Calif. NOAA is an agency of the Commerce Department.

Fishers and oceanographers have known for years that as strong winds from the north and northwest blow along California's coast, coastal surface water is moved offshore and is replaced through upwelling. Bottom water, according to Fred Jurick, a Sea Grant marine advisory agent at Humboldt State, is rich in nutrients which, when they come to the surface, cause huge blooms of plankton, the primary food source for marine life. This attracts bait fish, which in turn attract tuna and salmon.

In recent years, efforts to plot the location of upwelling have included taking infrared temperature readings from aircraft. Such attempts often were successful, but had drawbacks such as weather restrictions on operations, limited aircraft range, and high cost.

NOAA's polar-orbiting satellite, equipped with both visual and infrared sensors, passes over the coastal area twice daily, relaying environmental data, including sea surface temperatures back to earth. This information, according to NESS Oceanographer Larry Breaker, is converted into images displaying a number of gray shades, each shade representing a particular interval of temperature. As a result, thermal fronts, where cold,

upwelled water meets the warmer offshore surface water, show up clearly as gray-shade boundaries.

The locations of thermal fronts are transferred to navigation charts, copies of which are then furnished to fishers at various northern California ports. One such user, Ron Andriani, who fishes for albacore tuna out of Ft. Bragg, Calif., has high praise for the satellite-provided information: "In spite of the bad weather last season," he said, "every time I used one of those

charts the fish were right where they were supposed to be. You can't ask for anything better than that."

The NESS-Sea Grant program is only one of several projects utilizing NOAA satellites and aimed at assisting fishers. A second effort shows promise of pinpointing concentrations of algae in water by satellite infrared identification of the chlorophyll in the marine plants. Many kinds of fish tend to congregate in algae-rich waters. The chlorophyll project uses infrared sensors aboard NOAA satellites which are in geostationary orbit above the equator.

## CAPITAL CONSTRUCTION FUND RULES PUBLISHED

Tax regulations, both final and proposed, pertaining to the Capital Construction Fund program have been published jointly by the Commerce Department and the Internal Revenue Service. The program permits fishers to accumulate funds for construction, improvement, or, in limited cases, acquisition of fishing vessels by letting them defer paying Federal taxes on income from operation of their fishing vessels. These deferred taxes, in effect, amount to an interest-free loan.

The fishing vessel portion of the Capital Construction Fund program is administered by the National Oceanic and Atmospheric Administration's National Marine Fisheries Service. The regulations were originally proposed in June 1972. Parts have been adopted and are now considered final, while the remainder were materially revised and repropounded.

The final and proposed regulations both appeared in the *Federal Register* on 29 January 1976.

## Capital Construction Fund Booklet Available

A booklet for commercial fishers about a program which allows them to accumulate funds for construction or improvement of their fishing vessels has been published by the National Oceanic and Atmospheric Administration's National Marine Fisheries Service.

**Capital Construction Fund** is a 24-page booklet of most-asked questions, and detailed answers, concerning the NMFS program which provides tax deferrals for commercial fishers to construct, reconstruct, or, under limited circumstances, acquire fishing vessels. The program permits fishers to defer payment of Federal

taxes on taxable income from the operation of their fishing vessels, thus, in effect, giving them an interest-free loan from the Government for the construction or improvement of fishing vessels.

The Department of Commerce booklet may be obtained from NOAA, National Marine Fisheries Service, Financial Assistance Division, Washington, D.C. 20235, or from Financial Assistance Officers at the NMFS regional offices in Seattle, Wash.; Terminal Island, Calif.; Gloucester, Mass.; St. Petersburg, Fla.; and Juneau, Alaska.

*Foreign Fishery Developments*

## NEAFC Discusses Fish Stocks, Sets Quotas

The Northeast Atlantic Fisheries Commission (NEAFC) met in London 11-18 November 1975 and established catch quotas (see table) for North Sea cod, haddock, whiting, sprat, and herring. The status of those species was also discussed, and three nations,

Italy, Finland, and Cuba, sent observers for the first time.

The North Sea cod quota for 1976 was set at 236,000 metric tons, the same level as in 1975. Cod catches have declined since 1972 when 350,000 metric tons were landed; by 1974, only