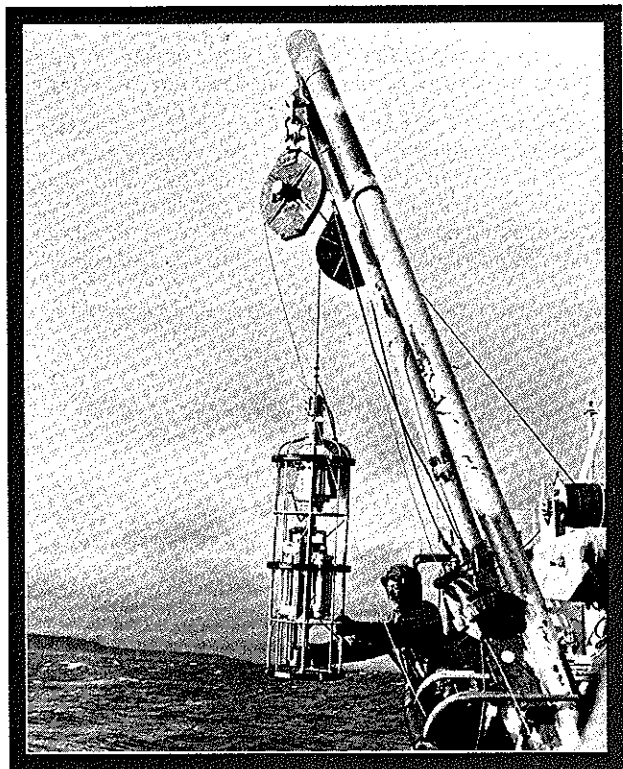


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NOT FOR CIRCULATION THE MILLER FREEMAN

FISHERY RESEARCH VESSEL
of the
UNITED STATES OF AMERICA



U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES

Circular 261

Groundfish:

The Groundfish program is concerned with those stocks in the Pacific Northwest which are either underutilized by U. S. fishermen or subject to international fisheries.

The relation between fish and their environment is being studied to provide scientific findings upon which to base sound fishery regulations. Data are gathered to support the negotiations that will protect our resources and the interests of our fishermen in the face of rapidly expanding foreign fisheries off our coast.

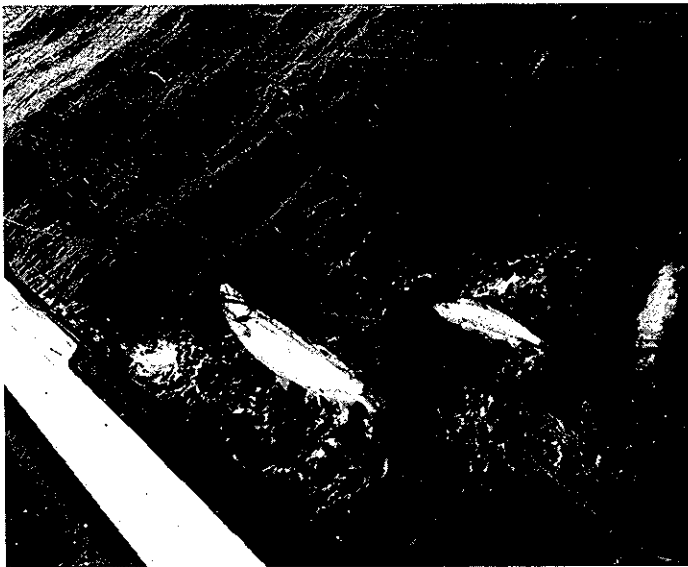
The program is now focusing its attention on the Pacific hake and the Pacific Ocean perch. Both of these species are of increasing importance to the fishing industry of the United States as well as to the distant-water fisheries of Japan and the Soviet Union.

Ocean Distribution of Salmon:

The distribution, abundance, and migration of salmon in the North Pacific Ocean are investigated by members of this program. Designated stations are fished at night with gill nets of various mesh sizes to take all ages and sizes of salmon. (Fish see the nets better in the daytime, and it is easier to catch them at night.) A string of nets may be 2 miles long.

Oceanography:

Oceanographers aboard the *Miller Freeman* will investigate the physical, chemical, and biological features of the North Pacific Ocean. This information will be used to study the relation between the environment and the distribution of salmon and groundfish.



Salmon entangled in gill net

New electronic equipment, such as automatic temperature and salinity sensors installed in free-floating radio buoys, will be released from the *Miller Freeman*. These buoys will allow oceanographers to monitor the marine environment from considerable distances.

An interesting feature of these buoys is that they can record signals from manmade satellites encircling the globe. When complete, this system of buoys drifting in the ocean currents will relay satellite signals, enabling scientists to fix the exact positions where the information was gathered.

by: **KENNETH N. THORSON**
Fishery Biologist

and

RAE R. MITSUOKA
Writer-Editor

Created in 1849, the Department of the Interior — a department of conservation — is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that non-renewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States — now and in the future.

Washington, D. C.
April 1967

UNITED STATES DEPARTMENT OF THE INTERIOR
Stewart L. Udall, *Secretary*

BUREAU OF COMMERCIAL FISHERIES, Harold E. Crowther, *Acting Director*

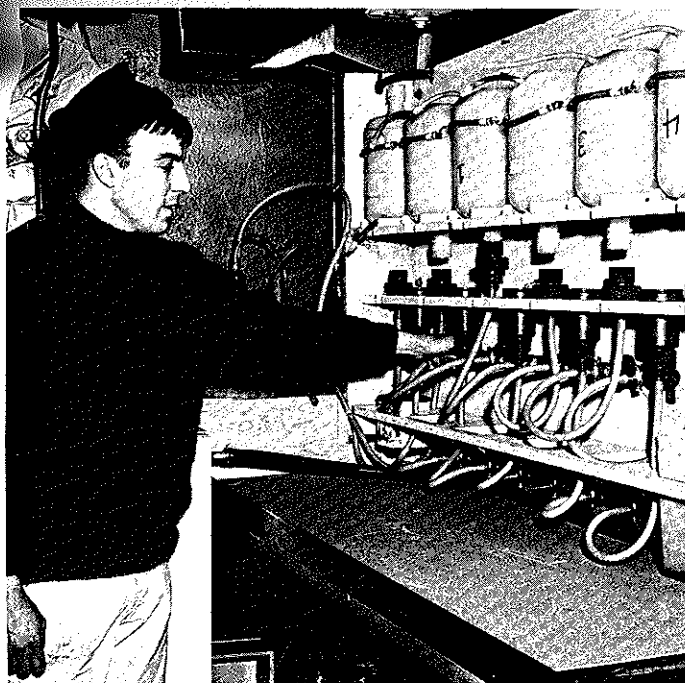
ABOUT THE VESSEL

The **Miller Freeman** — latest ocean-going research vessel of the Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service — will be based at Seattle, Washington. From home port she will carry scientists engaged in fishery and oceanography research over the North Pacific Ocean and the Bering Sea.

The ship was named for Miller Freeman (1875-1955), who was highly regarded by both the scientific and fishing communities of the Pacific Coast. A noted publisher, he actively supported the concept of conservation by international fishery treaties.

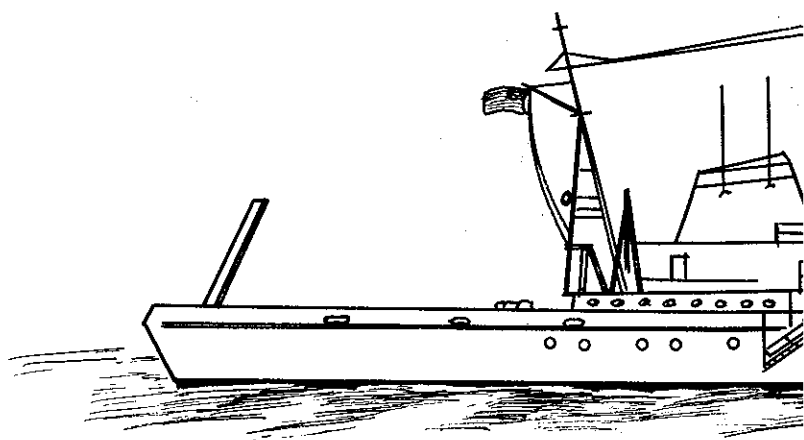
Designed as a research vessel, the **Miller Freeman** will carry 10 scientists and a crew of 26. She is equipped with biological, oceanographic, and electronic laboratories and is rated for unrestricted ocean service with a cruising radius of 13,000 miles. The specially designed stern-ramp configuration of the ship makes it possible for those on board to engage in deep-sea trawling.

The firm of Philip F. Spaulding and Associates, Inc. of Seattle, Washington, designed the vessel; construction was completed in 1967 by the American Ship Building Company of Lorain, Ohio. Costs of construction and complete equipment of the vessel will come to about \$4 million. Statistics pertaining to the ship are presented here:



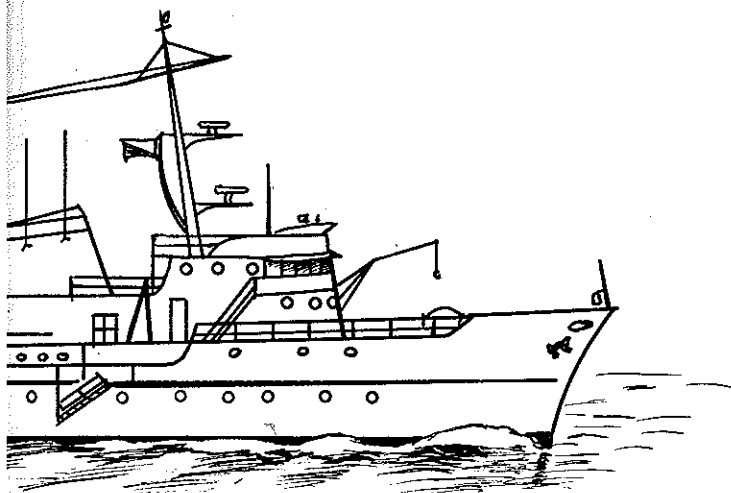
Sea-water samples aboard ship

Cover Photo: Lowering temperature, salinity, and depth sensors



Sketch of Miller Freeman

Length overall, moulded	215 feet, 10 inches
Length between perpendiculars	192 feet, 0 inches
Breadth, moulded at draft load water level (DLWL)	42 feet, 0 inches
Draft moulded amidships	16 feet, 2 inches
Draft aft to DLWL	17 feet, 7 inches
Full displacement at designed load draft	1,782 long tons
Trim speed	15.5 knots
Service speed	14 knots
Cruising radius	13,000 miles
Fuel oil capacity	110,000 gallons
Number of propellers	One; controllable pitch, 122-inch 3-bladed, turning at 188 r.p.m.
Main engine	Geared diesel with clutch, turning at 800 r.p.m., rated at 2,150 shaft horsepower (SHP) at shaft output coupling
Auxiliaries	Two (500 HP each), with 350-kw. generators
Scientist complement	10
Crew complement	26



Miller Freeman

Unique Features:

The Miller Freeman has many unique features. A centerboard (like those on sailboats) provides stability. The board can be raised or lowered to a maximum depth of 12 feet under the keel. This is the first major ship known to use this device; model tests indicate that it should be effective in reducing roll while the ship is on station (fishing or obtaining oceanographic data at a designated site).

A variable-pitch propeller, although fairly common in Europe, is found on only a few modern vessels in the United States. The pitch of the propeller is controlled from the wheelhouse by hydraulic action. Changing the propeller's pitch enables the ship to be held steady or moved ahead or astern at desired speeds without the use of a clutch or by the shifting of gears. Control of engine speeds, start and stop, and propeller pitch can be performed from either wing of the bridge and from the after steering station, as well as from the wheelhouse.

Two evaporators distill fresh water from sea water for cooking and bathing at the rate of 3,600 gallons a day. A bow probe (or salt-water intake) provides a constant supply of uncontaminated sea water for chemical analyses and for the ship's aquariums. The live-tank facility — as large as a moderate-sized living room — can be completely filled with water under pressure to carry live specimens. The ship has been specially constructed and ballasted to carry this large volume of water safely while at sea.

Future Plans:

Future plans for the Miller Freeman entail various types of equipment, much of which will be installed at her home port. The ship now has one radar and one loran; standby units will be added later. Sonar, or echo ranging equipment, used to locate fish and to measure ocean depths, will also be added. Electronic salinity and temperature probes will permit rapid sampling of water conditions. Computers will allow the scientists to make immediate analyses of data, thereby eliminating delays until the vessel returns to port.

A retractable bow thruster, to be used in maintaining position of the vessel, has a propeller which can be trained in any direction. The bow thruster will be able to move the vessel at a speed of 4 knots independent of her main engine. Trawl equipment, such as trawl winches, auxiliary winches, and a movable hydraulic gantry crane, will also be installed.

ABOUT THE RESEARCH

Three programs of the Bureau of Commercial Fisheries Biological Laboratory in Seattle will be major users of the vessel. They are the Groundfish, Ocean Distribution of Salmon, and Oceanography programs, highlighted as follows:



Hauling in gill net with power gurdy

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES
WASHINGTON, D. C. 20240

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