



Northwest Fisheries
Science Center

West Coast Groundfish Program



Exciting Science Critical Challenges

The West Coast groundfish fishery includes some 80 commercially fished stocks off the Washington, Oregon, and California coasts and supports millions of dollars in economic activity and many livelihoods. In recent years the abundance of some of these stocks has seriously declined, affecting fishing communities, consumers, and the marine ecosystem.

The Northwest Fisheries Science Center (NWFSC) coordinates the NOAA Fisheries Groundfish Program on the West Coast. The Center provides the best available scientific information on groundfish species, their habitats, and the fishery to support management decisions.

The NWFSC's West Coast Groundfish Program has six primary components:

- **groundfish surveys**
- **an observer program**
- **ecosystem and habitat surveys**
- **stock assessments**
- **socioeconomic assessments**
- **innovative approaches and cooperative research.**

To accomplish key activities in each of these areas, the Center works in close collaboration with state agencies, the Pacific States Marine Fisheries Commission, the Pacific Fishery Management Council, universities, the fishing industry and community, and various constituent groups.



Groundfish Surveys

The Center conducts groundfish surveys to target important species from the U.S.-Canada to the U.S.-Mexico borders using acoustic technologies, fixed gear, and midwater and bottom trawls. These surveys provide information about distribution, abundance, and age structure of groundfish populations. This year, the Center used chartered commercial fishing vessels to survey for Dover sole, sablefish, shortspine and long spine thornyheads, and other groundfish inhabiting the continental shelf and slope. Increasing the number and frequency of groundfish surveys will improve our ability to track trends in the abundance of key groundfish species.

Observer Program

The Center coordinates the West Coast Groundfish Observer Program. As part of this program, fisheries observers are placed on commercial fishing vessels to monitor and record catch data, including species composition of retained and discarded catch. They also collect critical biological data such as fish length, sex, weight, and age. The Center currently deploys observers coastwide on the permitted trawl and fixed-gear groundfish fleet, as well as on some vessels that are part of the open-access groundfish fleet. Observers improve

our understanding of fishing activities and help provide accurate accounts of total catch, bycatch, and discard associated with different fisheries and fish stocks.

Ecosystem and Habitat Surveys

Changes in marine ecosystems influence groundfish populations. The Center conducts ecosystem and habitat surveys to help determine how natural fluctuations in the marine ecosystem affect fishery productivity, how human-caused stress affects the ecosystem and fishery, and the complex interactions between fish and their habitats. For example, the Center recently co-lead a team of scientists on an expedition to study and compare Astoria Canyon, an unexplored submarine canyon off the mouth of the Columbia River, with Heceta Bank, a historical groundfishing location and submarine plateau off Oregon's coast. Scientists mapped, explored, and documented the physical, chemical, and biological systems of Astoria Canyon. Information collected will enable scientists to answer important questions about the distribution of invertebrates and fishes, the differences and similarities between fish and invertebrate populations in Astoria Canyon and Heceta Bank, and more generally, how the structure of the



Canyon influences the distribution and abundance of biological life.

Stock Assessments

Center scientists integrate information from observers, groundfish surveys, ageing studies, and fishermen into mathematical models and draw conclusions from the results. These assessments are one tool used by managers to identify overfished and threatened stocks and set biologically sustainable harvest levels for healthy stocks. Last year, Center scientists completed stock assessments for canary and yelloweye rockfish. In addition, Center scientists aged otoliths to assist with assessments on

darkblotched rockfish, Pacific hake, Pacific Ocean perch, and sablefish. The Center is expanding the number of assessments it conducts, as well as refining the certainty of the information it uses in assessments.

Socioeconomic Assessments

Socioeconomic information and analyses (e.g., operating costs of commercial fishers and processing centers) help determine the economic impacts of proposed management actions on various constituent groups—who will be affected and how? The Center is building core expertise and partnerships with other institutions to conduct research in this important area.

Innovative Approaches

Innovative techniques, applications of technologies, and partnerships offer the potential to explore new areas and develop more cost-effective and accurate methods to accomplish research objectives. For example, Center scientists are using acoustic (sonar-based) technologies with high-frequency sound pulses to measure groundfish abundance and map their distribution. These technologies are improving our understanding of groundfish stocks and are enabling scientists to study groundfish in many more areas of the ocean. The Center is also exploring the artificial propagation of marine species, which could broaden the range of recovery options available to managers. Center scientists are developing culture techniques for some depleted rockfish species.



Cooperative Research Program

The NWFSC values cooperative research opportunities with fisheries partners. Since 1998, the Center has conducted a slope resource survey in cooperation with commercial fishing vessels. The Center is expanding its cooperative research activities. This year, the Center partnered with the Pacific States Marine Fisheries Commission, Pacific Fishery Management Council, and the Pacific Marine Conservation Council to create a new cooperative research website.



Many groundfish are long-lived, with some species living upwards of 100 years. It is critical that we continue to monitor these valuable species and their ecosystems. Having scientific information on groundfish species and the ecosystems within which they exist is key to building sustainable groundfish fisheries.

A close-up photograph of a green fishing net floating on blue water. A red buoy is attached to the net. The net is made of thick green rope with a diamond-shaped mesh. The water is a deep blue color with some ripples. The buoy is bright red and cylindrical. The net is stretched across the frame, with the buoy positioned in the lower right quadrant.

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The Northwest Fisheries Science Center conducts the science needed to conserve and manage living marine resources and their habitats in the Pacific Northwest. It is one of six NOAA Fisheries science centers in the nation. Center scientists study key living marine resources (e.g., salmon and marine fish) in the Pacific Northwest to understand their biology and ecology. They also study human-made and natural hazards that can impact these resources (e.g., harmful algal blooms, fishing operations, point and non-point source pollutants, climate change and other environmental factors). The Center's research brings together a number of disciplines, including fisheries science, marine biology and ecology, genetics, biochemistry, molecular biology, oceanography, and physiology. Research is conducted at the Center's headquarters in Seattle, WA, as well as at its five research stations in Washington and Oregon.