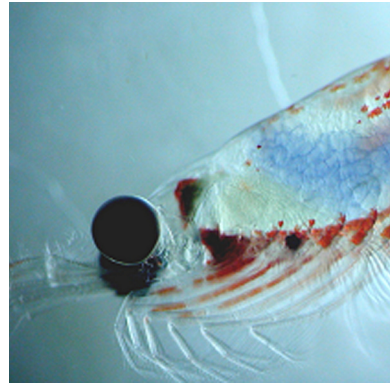
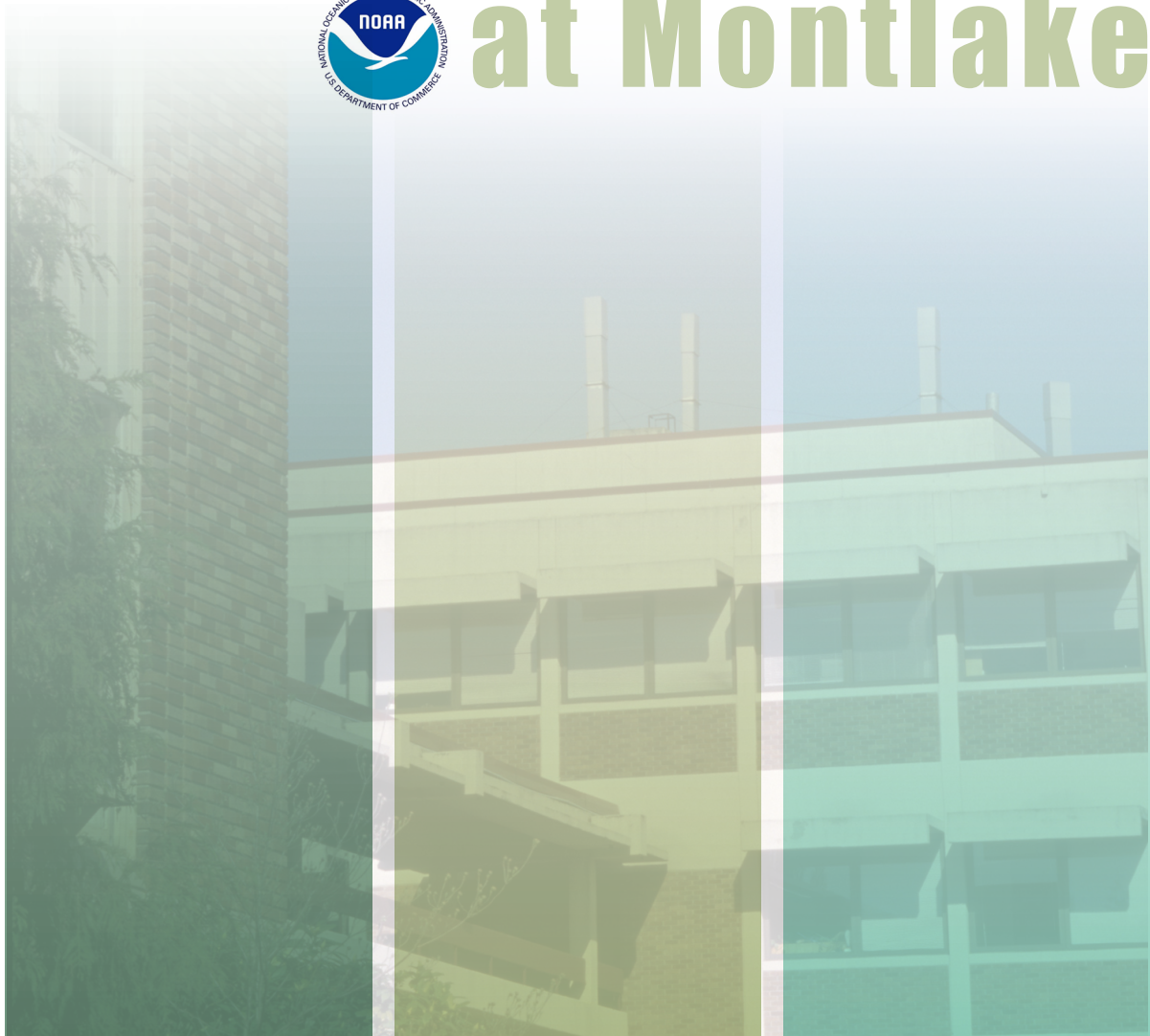


NOAA Fisheries Service | National Oceanic and Atmospheric Administration | Department of Commerce

Northwest Fisheries Science Center



at Montlake



Making Critical Connections 2008

The Pacific Ocean is a living marine laboratory of amazing creatures and habitats, from rocky cliffs to bright-colored sponges and camouflaged rockfish. Protecting these resources is critical to sustaining commerce, our livelihoods, public health, and quality of life.

The Northwest Fisheries Science Center (NWFS) studies living marine resources and their habitats in the Pacific Northwest (off the Washington and Oregon coasts and in freshwaters of Washington, Oregon, and Idaho) to understand their biology and ecology. They conduct this research using state-of-the-art tools to study salmon, groundfish and killer whales on many levels, from DNA molecules on up.

As a result, Center scientists can assist resource managers to make sound decisions that build sustainable fisheries, recover endangered and threatened species, and sustain healthy ecosystems.



The Center is organized into five research divisions that together conduct research in five primary areas:

Status of Stocks

Stock assessments determine the status (e.g., abundance and age distribution) of fish and marine mammal stocks. Scientists integrate information from a variety of sources (e.g., observers, resource and habitat surveys, and fishers), analyze the information, and draw scientific conclusions from the results. For instance, the Center conducts cooperative groundfish surveys from the U.S.-Canada to the U.S.-Mexico borders to target important species using acoustic technologies, fixed gear, and midwater and bottom trawls. These assessments are one tool used by managers to set biologically sustainable harvest levels and help monitor and rebuild overfished and threatened stocks.

Human-caused Stress/Risks

Living marine resources face a number of human-caused risks, from toxic chemicals in sediments to hydropower systems and physically and chemically degraded habitats. Each life stage (e.g., egg, juvenile, or adult) and species is affected differently. Center scientists conduct research to better understand how salmon, marine fish and marine mammals are affected by these stresses and to quantify, assess, and minimize the risks they encounter during their lives. This research helps

provides the underpinning for national, state, and tribal management decisions, including how to minimize impacts of hydropower systems on salmon, what habitats to restore, and when to close and open a fishery after an oil spill. For example, for over 50 years Center scientists have developed tags and modeling tools to study fish migration and survival and used this data to understand the impacts of dams on salmon.

Ecosystem Observations & Climate Impacts

Living marine resources in the Pacific Northwest use and depend on a variety of ecosystems from freshwater streams and rivers to estuaries and the ocean. Center scientists conduct research to better understand how environmental fluctuations impact living marine resource productivity and the complex interactions between living marine resources and their habitats. For example, scientists collect plankton samples, an important prey source for salmon and other fishes, to understand its impact on fish productivity and marine ecosystems. By collecting samples over several decades, the Center is able to track long-term changes in plankton species and salmon in the Columbia Basin and Oregon coast.

1931

US Bureau of Fisheries
Montlake Laboratory opens to
focus on Pacific Coast fishery



1960s

First venture in aquaculture at
Manchester Research Station;
pioneering work leads to
emergence of salmon farms



NWFSC'S HISTORY OF INNOVATIVE SCIENCE

1940s

Bureau of Fisheries reorganizes to
form US Fish and Wildlife Service;
interruption of work by WWII

1950s

Exploratory cruises on John C. Cobb
in North Pacific Ocean, leading to
discovery of vast groundfish fishery

Center begins studying hazards
faced by migrating salmon in the
Columbia hydropower system



1970s

Center develops process for
making surimi, a valuable
fish byproduct

Scientists identify sources of
food-borne pathogens such
as Listeria

Recovery & Rebuilding

Over the last several decades, certain living marine resources have become depleted and, in some cases, are in danger of extinction. Recovering and rebuilding these stocks is important for ecological, economic, and cultural reasons. Center scientists conduct research to understand the population structure of salmon, marine fish, and killer whales; captive broodstock programs to propagate salmon species; and culture techniques to raise marine fish in captivity. In addition, Center scientists are directly involved in salmon recovery efforts on the West Coast; they chair Technical Recovery Teams that assess the factors responsible for salmon decline and develop criteria for delisting endangered and threatened salmon populations.



Innovation & Technology

Innovations can lead to new or better ways to conduct research and understand species and their habitats. Center scientists develop and apply new technologies, techniques, and tools to support management, conservation, recovery, and rebuilding of the Pacific Northwest's living marine resources. For example, scientists are using sonar to determine groundfish abundance and distribution and tagging technologies to improve understanding of movement, habitat use, reproduction, and survival of marine and freshwater fish. New detection tools for harmful algal bloom toxins in shellfish also helps scientists address seafood safety concerns.

The Center's research brings together many disciplines, including fisheries science, marine biology and ecology, genetics, biochemistry, molecular biology, oceanography, and physiology. In addition, many of the Center's research projects are conducted in cooperation with other organizations, including federal, state, local, and tribal agencies and universities throughout the region, nation, and world.

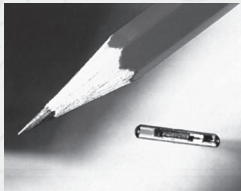
The Center's headquarters in Seattle, WA and its five research stations in Washington and Oregon are home to more than 500 scientists and staff. The NWFSC is one of six regional science centers for the National Marine Fisheries Service (NOAA Fisheries). NOAA Fisheries is part of the National Oceanic and Atmospheric Administration, which is part of the U.S. Department of Commerce.



1980s

Cutting-edge work on the effects of pollution in Puget Sound; new detection tools help assess damage from Exxon Valdez oil spill

Development of PIT tag technology for tracking salmon migration revolutionizes fisheries research



1990s

Captive broodstock program prevents extinction of Redfish Lake sockeye salmon

Center coordinates all groundfish programs on West Coast

Sweeping review of West Coast salmon leads to listing of 26 Evolutionarily Significant Units (ESUs) under ESA



Current

Marine Mammal Program forms to study risk factors affecting killer whales

Center designated as NOAA's West Coast Center of Excellence in Oceans and Human Health

Center leads sampling effort for contaminants and seafood safety post-Hurricane Katrina

Northwest Fisheries Science Center



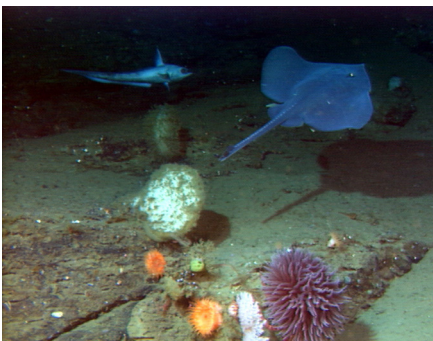
at Montlake

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Dr. Usha Varanasi | Science & Research Director

Key Living Marine Resources

Groundfish

Groundfish are fish that live on or near the bottom of the ocean, hundreds to thousands of feet below the water surface. There are over 80 different groundfish species that are commercially fished off the West Coast of the U.S. Groundfish include species of rockfish, flatfish, roundfish, sharks, and skates. Many groundfish are long-lived, with some species living upwards of 100 years. In recent years the abundance of some of these stocks has seriously declined, affecting fishing communities, consumers, and marine ecosystems.



Salmon and Steelhead

Salmon are anadromous fish that live part or the majority of their lives in saltwater, but return to freshwater to spawn. There are five species of salmon on the West Coast—commonly referred to as coho, pink, chum, sockeye, and chinook. Steelhead are a species of anadromous trout. Both salmon and steelhead play a major role in aquatic and terrestrial ecosystems, are a central part of Native American spiritual and cultural identity, and support the Pacific Northwest and nation's economy.

Over the past several decades, wild salmon and steelhead populations have declined dramatically. These declines have been the result of many factors, including overharvest, hydropower systems, habitat destruction, and over-reliance on hatcheries, as well as ocean variability and other environmental factors. Twenty-six groups of salmon and steelhead populations in Washington, Oregon, Idaho, and California are currently protected under the Endangered Species Act.



Killer Whales

Killer whales are marine mammals in the dolphin family. Killer whales are divided into two distinct forms: residents and transients, which differ in diet, morphology, behavior, etc. In the Pacific Northwest there are two known resident communities as well as several transient pods. Killer whales are at the top of the food chain and are thus an important indicator of ocean health. Between 1997 and 2001, Southern resident killer whales experienced a significant population decline and are currently listed as depleted under the Marine Mammal Protection Act and endangered under the Endangered Species Act.



Sharing our work with other scientists, with policymakers, and with the public is important to us. To learn more about what we do, please visit our website at www.nwfsc.noaa.gov or call 206-860-3200.