Program Fact Sheet

NOAA FISHERIES

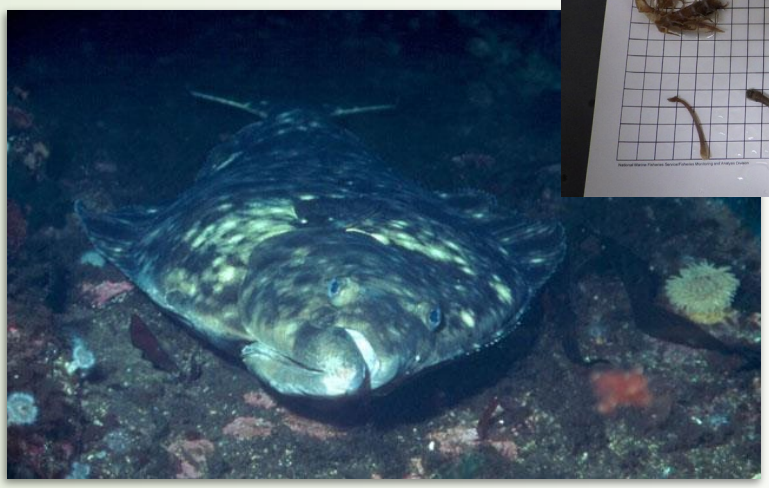
Alaska Fisheries Science Center

Resource Ecology and Fisheries Management Division

Resource Ecology and Ecosystem Modeling Program

What We Do

The Resource Ecology and Ecosystem Modeling program has monitored the diets of Alaskan groundfish for over 40 years on groundfish surveys and through collaboration with fishing industry partners. We provide critical data on the productivity and growth of high-value commercial species with data from over 500,000 fish stomach samples. These data are the core inputs for multispecies stock assessment and food web models used for annual fishery management decisions for Alaska groundfish species. Each year, we produce ecosystem status reports (ESRs) for three Alaska marine ecosystems including information from over 120 contributors across a wide range of disciplines. Information from these reports is used in Risk Tables included in all stock assessments, and directly informs the Acceptable Biological Catch for each stock, increasing stakeholder confidence in fisheries decisionmaking. The program also provides key scientific support for the monitoring, reporting, and reduction of seabird bycatch in Alaskan fisheries, enabling Alaska fisheries to operate sustainably.

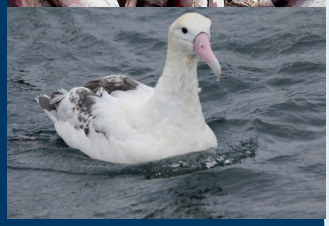


2024 Accomplishments

- Measured and reported predation rates on Bering Sea snow crab by Pacific cod to forecast near-term recovery of the Bering Sea snow crab fishery. Estimated predation for Bering Sea octopus assessment, directly used to set quotas and prevent closures in Pacific cod fisheries.
- Working with industry partners, collected fish food habits photographs to develop a training set for AI-assisted identification of prey, expected to reduce s costs of prey identification.
- Collected 4,917 groundfish stomachs from the eastern Bering Sea and 3,414 groundfish stomachs from the Aleutian Islands and analyzed 8,925 fish stomachs including Pacific cod, walleye pollock, arrowtooth flounder, Pacific halibut, sablefish, skates, and rockfish species.
- Identified 288 diet samples from Alaska seabird colonies.
- Produced oceanographic model hindcast and near-term forecast results for fisheries managers. Provided climate and ecosystem data to support adaptive and resilient fisheries in response to changing environmental conditions.
- Led development, production, and communication of Ecosystem Status Reports and In Briefs for the eastern Bering Sea, Gulf of Alaska, and Aleutian Islands; produced 17 species-specific risk tables for stock assessments, increasing use of environmental data in the stock assessment process, providing transparency and justification for quotas based on external risk factors.
- Organized and hosted the Preview of Ecological and Economic Conditions (PEEC) meeting (May 2024) with over 80 attendees and 45 speakers including community and industry representatives, providing a valuable early look at 2024 fish stock and ecosystem conditions.
- Updated 4 whole-ecosystem food web models for Gulf of Alaska and Bering Sea regions to support policy and management and analyze fishing and Optimal Yield for groundfish.
- Developed and applied new genetic applications to link birds accidentally caught in fisheries back to island colonies where they were born, informs management of species across NOAA, USFWS, and state agencies. This was a collaboration across all federal fishery management council and observer programs in the North Pacific.
- Collaborated with USGS and U.S. Fish and Wildlife avian influenza experts and resource managers to assess risks to observers collecting specimens or interacting with seabirds.

2025 Preview

- Continued development of AI tools to improve and lower costs of stomach data collection.
- Continued collaboration with industry and observers to examine the role of the expanding Bering Sea Pacific cod stock predation on key commercial species (crab and pollock).
- Investigation of the role of food supply on changing quality (weight at length, or condition factor) of fish stocks, and potential industry impacts.
- Collection of fish stomachs from 2025 Bering Sea and Gulf of Alaska bottom-trawl surveys.
- Produce and present to the North Pacific Fisheries Management Council annual Ecosystem Status Reports, in-brief summaries, and risk tables.
- Release new generation of food web modeling software (a NOAA top ten breakthrough) that will support healthy and profitable US Fisheries. Use the models to investigate the potential of raising or lowering the Bering Sea's existing 2 million mt cap on groundfish yield.
- Lead NOAA response coordination to enable commercial fisheries to quickly respond and take steps to avoid short-tailed albatross (an endangered species) in U.S. commercial fisheries.
- Lead NOAA response to minimize risk of avian influenza exposure to crew and fish catch from by-caught seabirds, protecting health of fishing communities and supporting seafood safety.
- Release and publication of the “Surveyjoin” R package that enables rapid, combined queries of bottom trawl survey data from the US west coast, British Columbia, Canada, and Alaska. This package increases data availability and use to address coast-wide questions of estimated groundfish biomass, distribution, and environmental relationships.



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