

# NOAA FISHERIES

Alaska Fisheries  
Science Center

Resource Assessment  
and Conservation  
Engineering Division

## Alaska Fisheries Science Center: Midwater Assessment and Conservation Engineering

### What We Do

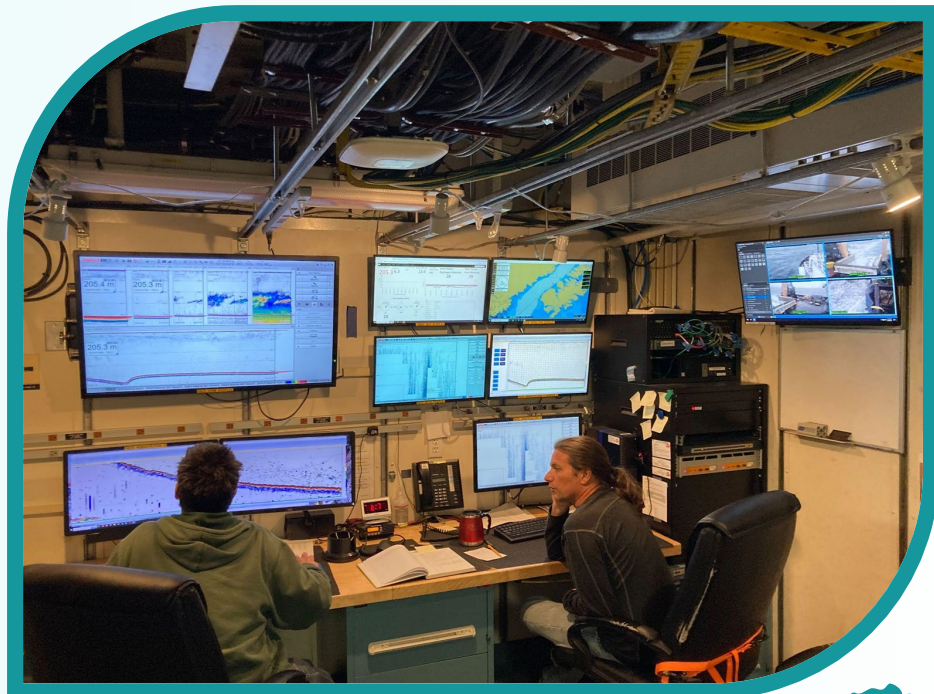
The Midwater Assessment and Conservation Engineering Program supports fisheries management through world-class applied scientific, technological, gear, and data-driven activities. We conduct acoustic-trawl surveys, combining midwater and bottom trawling with acoustic technology, to assess the distribution and abundance of Alaska walleye pollock for the Eastern Bering Sea, Gulf of Alaska, and Bogoslof Island region stock assessments. These data support the Eastern Bering Sea pollock fishery, the largest single commercial fishery in the United States, and communities in the Gulf of Alaska. Our data also contribute to an understanding of lower food web components of the Bering Sea and Gulf of Alaska ecosystems. We conduct cutting-edge research on acoustic technologies; camera systems; moored, mounted, and mobile uncrewed systems; gear performance; and data acquisition, processing, and automation.



Top: Deployment of a trawl-resistant echosounder mooring to evaluate movement of pollock into, and out of, the U.S. EEZ.

Middle: Scientists examining Methot trawl catch on the eastern Bering Sea shelf.

Bottom: The CamTrawl camera being installed in the midwater trawl.



▲ Acoustics Lab aboard the NOAA Ship Oscar Dyson.



## 2024 Accomplishments

- Completed four Acoustic-Trawl Surveys that supported three walleye pollock stock assessments (Gulf of Alaska, Eastern Bering Sea, Bogoslof Island area) and an international pollock convention (Convention on Pollock Resources in the Central Bering Sea)
- Supported the Eastern Bering Sea stock assessment with an Acoustic-Vessel-of-Opportunity summer midwater pollock index using acoustic data collected during Alaska Fisheries Science Center's Bottom Trawl Survey
- Participated in the Optics Strategic Initiative to formulate plans to commercialize a developed trawl camera, develop a long-duration camera mooring, and develop other cameras systems
- Participated in the Active Acoustics Strategic Initiative to formulate plans for a low-frequency echosounder system, echo classification, and a cloud-based data pipeline
- Expanded and refined survey data products
- Improved the optical (towed, lowered, and gear-mounted camera systems) and acoustic (acoustic moorings) systems we design, build, and deploy
- Published manuscripts on survey-related research and development in scientific journals. A notable example is entitled "Acoustic observations of walleye pollock migration across the U.S.-Russia boundary in the northwest Bering Sea" (ICES JMS 81(6)) that highlighted a significant seasonal flux of pollock across the boundary, which could have implications for the management of pollock

## 2025 Preview

- Support stock assessments through winter and summer acoustic-trawl surveys, and generation of a pollock estimate using opportunistically-collected acoustic data
- Implement acoustic resonance classification to estimate fish size. If successful, this will reduce reliance on trawling and allow greater use of uncrewed systems in surveys
- Use machine learning and data from an uncrewed system to estimate krill abundance
- Develop a low-cost echosounder mooring to characterize seasonal movements of fish
- Improve trawl-resistant echosounder moorings to track movement of commercial stocks, including across exclusive economic zone boundaries
- Operationalize use of broadband acoustic signals and probabilistic echo classification methods in Acoustic-Trawl Surveys to improve species identification
- Develop an efficient and scalable cloud computing data management and processing pipeline for echo classification methods
- Develop methods to estimate fish species, size, and densities from cameras in trawls
- Field-test a towed camera system to estimate fish abundance in untrawlable habitat
- Deploy cameras on longline gear and catch protection devices to support methods to reduce whale depredation in Alaska's halibut fisheries
- Contribute to at-sea research on the utility of eDNA for surveys
- Develop automated methods to detect pollock and detect or track salmon in videos
- Characterize uncertainty in acoustic-trawl surveys for use in stock assessment models
- Develop best practices for using spatiotemporal models for survey estimates and improve efficiency by enabling flexible survey designs and changes in survey coverage
- Update the Catch Logger for acoustic midwater surveys application to improve data and reduce collection effort in Alaska Fisheries Science Center and Northwest Fisheries Science Center-Southwest Fisheries Science Center surveys



**Howard Lutnick**  
Secretary of Commerce

**Vice Admiral Nancy Hann**  
Deputy Under Secretary for Operations and performing the duties of Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator

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