Program Fact Sheet

NOAA FISHERIES

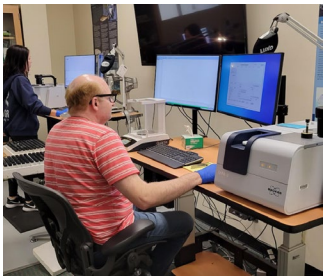
Alaska Fisheries Science Center

Resource Ecology and Fisheries Management Division

Age and Growth Program

What We Do

The Age and Growth Program derives fish age estimates from otoliths (fish ear bones) to provide a broader understanding of the life history and population dynamics of fishes. The program is pioneering the use of spectroscopy and machine learning to increase operational efficiency to produce data for use in fish stock assessment models in support of sustainable fishery management.



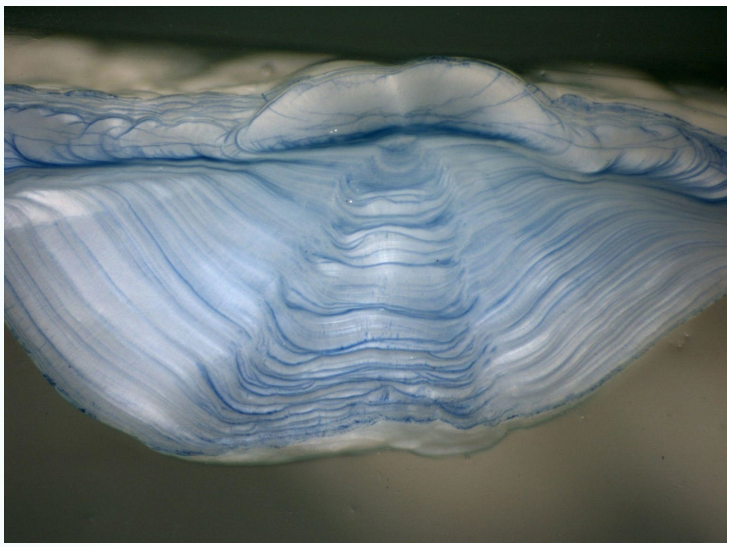
Determining the Age of fish using innovative near-infrared spectroscopy (top image). Fish otoliths (second image). Close up of otolith rings, counting rings enables scientists to determine fish's age.

2024 Accomplishments

- Spearheading national efforts to use a revolutionary near-infrared technology to generate ages for stock assessments with more precision and efficiency.
- Paired deep machine learning artificial intelligence models with otolith spectra to explore complex patterns within these data to improve the predictive accuracy of fish age estimates.
- Published a comprehensive report on the use of spectroscopy to estimate fish age, across NOAA fisheries regional offices, and hosted a national symposium on modern advances in age estimation.
- Processed over 30,000 otolith samples to estimate age using traditional microscopic techniques and scanned over 25,000 samples using near infrared spectrometers in FY24. This included over 9,000 samples from walleye pollock, the largest fishery in Alaska, alone.
- Conducted research expanding the suite of species this tool can be used to estimate age for and researched spectroscopic approaches to rapidly collect important life history data such as maturity or spawning status.

2025 Preview

- Center for Independent Experts (CIE) peer review of “Machine Learning Coupled with Fourier Transform Near-infrared Spectroscopy of Otoliths to Age Fish: Readiness to Operationalize for Stock Assessments” February 11-23, 2025.
- Full implementation of near-infrared spectroscopy predicted ages for eastern Bering Sea walleye pollock and Pacific cod increasing programmatic efficiency and timeliness of data production.
- Continued development of near-infrared spectroscopy to expand age estimation to additional species such as northern rockfish, yellowfin sole, and sablefish (black cod).



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February 2025

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