RACE/REFM Seminar

February 17, 2015, 10–11 a.m.

Traynor Seminar Room
Bldg 4, Rm 2076

NOAA FISHERIES

Thomas Helser

A 200-Year Archeozoological Record of Pacific Cod Life History as Revealed Through Ion Microprobe Oxygen Isotope Ratios in Otoliths

Fish otolith oxygen isotope ratios (δ18O) are considered "flight recorders," providing records of sea water temperature and habitat use over the animal's life span. We measured $\delta^{18}O$ values in modern and archeological Pacific cod otoliths using a high precision ion microprobe-secondary ion mass spectrometer. Otolith $\delta^{18}O$ signatures along core-to-margin transects showed sinuous and increasing patterns that revealed seasonal temperature changes and an ontogenetic migration from warmer near shore habitat during the first year of life to cooler deeper waters at later ages, a behavior that has not changed over the past 200 years. A decline in the average $\delta^{18}O$ of core spot samples from archeological (200+, 100+ YBP) to modern otoliths suggest increasing sea surface temperatures from the late Little Ice Age to present. Temperatures calculated from the $\delta^{18}O$ in aragonite suggest a 2-3°C rise in coastal marine sea surface temperatures in the Gulf of Alaska over the last 200 years.