

---

Woods Hole Oceanographic Institution  
**Biology Department Seminar**



Thursday, September 28, 2023 – 12:00 Noon

---

## **Climate-Driven Shifts in Abundance, Distribution, and Composition of the Pelagic Fish Community in a Rapidly Changing Pacific Arctic**

**Robert Levine**

**Research Physical Scientist, NOAA Alaska Fisheries Science Center**

Age-0 Arctic cod (*Boreogadus saida*) have historically dominated the pelagic fish community in the Chukchi Sea in summer, with few adults present in the region. Recent reductions in sea ice and increases in warming and transport have led to an increase in Pacific-origin waters on the Chukchi shelf in summer. To examine the potential effects of these environmental changes on the pelagic community, we conducted autonomous and ship-based surveys in summer 2017, 2018, and 2019. Throughout this period, bottom-moored echosounders continuously measured fish abundance and movement at several locations. Together, these observations indicate that the abundance and composition of the pelagic community on the Chukchi Sea shelf are highly variable over seasonal and annual time scales. Summer surveys found that age-0 Arctic cod were the most abundant pelagic fish in all four survey years. Age-0 walleye pollock (*Gadus chalcogrammus*), which were scarce and confined to the southern Chukchi in previous years, were present in high abundance throughout the Chukchi shelf in 2017 and 2019. We hypothesize that the changes in abundance and species composition are tightly coupled to recent changes in temperature and the transport of Bering Sea waters onto the Chukchi shelf. The substantial increase in age-0 pollock in recent years suggests that environmental conditions now allow this species to extend its northern range into the central and southern Chukchi Sea, at least on a seasonal basis. Seasonally, fish abundance was very low in winter, increased in May, and reached peak abundance in late summer. Age-0 gadids were displaced to the northeast, consistent with the dominant advection on the shelf. Fish speeds and headings were strongly correlated with local currents, providing evidence that behavior plays a limited role in the displacements of these populations.

VIRTUAL ONLY! Zoom: <https://whoi-edu.zoom.us/j/95825629706> Meeting ID: 958 2562 9706 By phone:  
Find your local number: <https://whoi-edu.zoom.us/u/aKkOlijZ4T>