
Woods Hole Oceanographic Institution
Biology Department Seminar



Thursday, October 10, 2024 – 12:00 Noon

**Modeling *Calanus finmarchicus* Population Variability on
the Northeast U.S. Shelf: An Analysis of Synchrony and
Shifting Phenology in a Warming Ocean**

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The copepod *Calanus finmarchicus* plays a critical role in the subarctic food web, particularly in the rapidly warming waters of the Gulf of Maine in the Northeast U.S. Shelf (NES). This presentation integrates findings from recent statistical modeling studies to shed light on the patterns and mechanisms influencing the population dynamics of this important species. First, spatial analyses of *C. finmarchicus* synchrony reveals that populations in the well-connected NES ecosystem are highly variable and predominantly driven by local habitat heterogeneity rather than region-wide environmental conditions. Notably, populations connected via advection are not necessarily synchronized, highlighting the importance of small-scale environmental factors. Furthermore, analyzing the temporal dynamics of *C. finmarchicus* shows how shifting phenological events, particularly the timing of the annual phytoplankton bloom in the Gulf of Maine, impacts population dynamics in the inner basins throughout the year. Early bloom initiation leads to higher spring abundance, which consequently leads to a decline in fall populations due to density-dependent predation pressure. These findings highlight the complexity of zooplankton population responses to environmental drivers, providing valuable insights to improve projections for the future of this foundational zooplankton species in the changing North Atlantic shelf ecosystem.

HYBRID! **In Person:** Redfield Auditorium **Zoom:** <https://whoi-edu.zoom.us/j/97000865816> Meeting ID: 970 0086 5816 **By phone:** Find your local number: <https://whoi-edu.zoom.us/u/adlvMow3LQ>