Woods Hole Oceanographic Institution

Special Biology Department Seminar

Tuesday, March 14, 2017
Redfield Auditorium – 2:00 PM

Long term shift in cod phenology linked to water clarity and delayed spring bloom onset

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Climate warming is known to promote earlier onset of spring activities such as plant flowering, animal migration and breeding. Contrary to these patterns, the high latitude spring bloom system of the North Sea and Norwegian Sea shelf areas appear to have experienced a delay in spring bloom onset by ca 0.5 days year^{-1} since the 1930s. At high latitudes the available window for timing life history events with resource availability is particularly narrow, and phenological shifts at lower trophic levels are hypothesized to promote trophical mismatch, such as that between food resources and early life stages. However, evidence for this is equivocal, and the role of individual plasticity to accommodate climate variability is poorly understood. Here we show that spawning phenology of the Northeast Arctic cod population is tracing the long-term shift in bloom timing, potentially as far back as the 1870s. Based on weekly fisheries catch and roe landing data we were able to reconstruct a 140 year long time series of seasonal development in female gonad size, which suggests a delay in spawning time matching that of the spring bloom onset. Our results indicate that cod are able to trace seasonal variation in multiple environmental ques and possibly time gonadal development and spawning to maximize overlap between offspring hatch date and predicted resource availability.

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Dr. Opdal's talk will be followed by a slide presentation by Ms. Johanna Myrseth Aarflot, Ph.D. candidate at the Institute of Marine Science, Bergen, Norway. She will discuss zooplankton in the Barents Sea.