Graduate School of Oceanography - OCG 695
April 21, 2008, 3:30 PM, Corless Auditorium
Seminar Abstract
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Distribution of Anthropogenic Nitrogen in Macroalgae of Lower Narragansett Bay

Narragansett Bay is described as a well-mixed estuary with north-south gradients in phytoplankton abundance and anthropogenic pollutants. Due to inputs of nitrogen (N) from wastewater treatment facilities and other sources in the Blackstone and Providence Rivers, concentrations of N are high at the head of the bay and decrease toward the mouth. The distribution of N likely influences the gradient seen in phytoplankton abundance, which also decreases from head to mouth. The incorporation of human-derived N by primary producers can be detected by the use of stable isotopes of ^{15}N. The isotopic signature of anthropogenic N is heavy (>10‰) compared to that of N derived from seawater (~5‰). Previous studies describing the general circulation of the lower bay suggest that in the summer water from Rhode Island Sound (carrying seawater N) flow into the bay through the eastern edge of the East Passage, while water (carrying anthropogenic N) flows out through the western edges of the East and West Passages. Therefore north-south and east-west gradient from heavy to light signatures were expected in the lower bay. During August of 2007, I collected attached macroalgae from 11 sites on the coastlines of Narragansett, Jamestown, and Newport, and analyzed them for ^{15}N. Isotopic signatures were heavy in the mid-bay and became progressively lighter toward Rhode Island Sound, ranging from 10.7‰ to 7.1‰. Heavy signatures were seen in the western edges of the East and West Passages, with values around 9.0‰ extending as far south as Point Judith. Additionally, an east-west gradient was discernable at the mouth of the bay, with 7.1‰ in southern Newport and 9.0‰ at the Narragansett Town Beach. These results appear to be consistent with the emerging view of water circulation in the lower bay.

Leanna Heffner received a B.A. from Vassar College in 2004. She entered GSO as a Ph.D. candidate in the fall of 2006. Her major professor is Scott Nixon.

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0=Decline to Evaluate 2=Above Expected Standards 4=Below Expected Standards
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A. Quality of Abstract _____
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