Graduate School of Oceanography - OCG 695
April 14, 2008, 3:30 PM, Corless Auditorium
Seminar Abstract
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Summer stratification, bloom occurrence, and oxygen depletion in Narragansett Bay

Continuous monitoring data has established that hypoxic events in Narragansett Bay occur as intermittent episodes during summer months. These episodes are initiated by stratification and broken by high-energy mixing events. Stratification is driven by weak tidal cycles, decreased wind, increased river flow, and increased surface water temperature. These stratification drivers are also current climate change trends. As such, it is likely that stratification will increase in the Bay during the summer months as the climate changes.

In this study, bloom cycles and associated hypoxic events at two stations in upper Narragansett Bay were examined over two summers, 2006 and 2007. Differences in phytoplankton bloom occurrence, stratification, and bottom water oxygen concentration were compared. A high volume of freshwater input in 2006 led to a greater stratification of the water column. Intense blooms during both summers only occurred when stratification passed a threshold of 8 kgm^{-3} density difference between the surface and the bottom water. As such, summer 2006 had larger, more frequent blooms than summer 2007. Total summer production during 2006 was 224 gCm^{-2} and 166 gCm^{-2} for the two stations whereas in 2007 it was much less at 131 gCm^{-2} and 98 gCm^{-2} respectively. Stratification was also linked to bottom oxygen depletion. For 2006, bottom oxygen decreased sharply early in the summer to hypoxic levels while the stratification was high and increased after a mixing event in mid-July. In 2007, stratification was weak and bottom oxygen decreased gradually throughout the summer with no significant hypoxic events. These results support a connection between blooms and stratification and highlight the importance of stratification as a factor in determining vulnerability to hypoxia.

Leslie Smith received a B.S. in Biology with a minor in Philosophy from Davidson College in 2006. She entered GSO as a Ph.D. student in the fall of 2006. Her major professor is Candace Oviatt.

Please rank the abstract and presentation in areas A-G using the scale below:

0=Decline to Evaluate 2=Above Expected Standards 4=Below Expected Standards
1=Outstanding 3=Acceptable 5=Poor

A. Quality of Abstract _____
B. Preparation of Material _____
C. Timing _____
D. Scientific Content _____
E. Quality of Verbal Communications _____
F. Adequacy of Visual Aids _____
G. Ability to Handle Questions During Discussion _____

Comments and Suggestions:

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