Graduate School of Oceanography - OCG 695
April 14, 2008, 3:30 PM, Corless Auditorium
Seminar Abstract
Scott Stachelhaus

Physical and Radium Isotopic Tracer Analysis of Mid-Shelf Fronts

Mid-shelf fronts are characterized by marked salinity and temperature gradients that separate cool, fresh water at the coast from warmer, more saline water offshore. In the Mid-Atlantic Bight, these fronts typically form during the winter at depths close to the 50-m isobath. An accurate mechanism for the formation of mid-shelf fronts has yet to be determined. Two models for this formation have been proposed: tidal dispersion and bottom boundary layer-trapping. Each of these models provides a different prediction for variability in cross-shelf mixing. Validation of these models can be made through physical and radium-based measurements, which also provide insight to the structure of, and mixing at, the front.

In early 2007, comprehensive observations of multiple physical and chemical parameters, including temperature, salinity, density, and radium activity, were made during three cruises in a mid-shelf front zone off the coast of New Jersey. Frontal location was established by a series of satellite SST measurements. Surface currents within the vicinity of the front were determined by a series of HF radar stations. Frontal hydrography was analyzed by bottom-moored ADCP, CTD, and thermistor instrumentation, as well as through shipboard and towed ADCP and CTD measurements. Underway radium isotope (^{223}Ra, ^{224}Ra, ^{226}Ra, ^{228}Ra) measurements were made in the surface mixed layer along a transect across the front and at multiple depths along this section. Radium isotope analysis from January 2007 has revealed separate diffusive mixing regimes on each side of the front; diffusivity shoreward of the front is approximately 227 m^2/s, while diffusivity seaward of the feature is as low as 29 m^2/s. A preliminary discussion will be made regarding the implications of these tracer-based results for understanding the dynamics of mid-shelf fronts.

Scott Stachelhaus received a B.A. from Boston University in 2006. He entered GSO as a Ph.D. candidate in the fall of 2006. His major professor is S. Bradley Moran.

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:

Evaluator: _____. Please return to Academic Affairs Office, Box 43.