# Biology Department and CINAR

## Woods Hole Oceanographic Institution

# Sponsored Seminar

## Thursday, February 14, 2013

Redfield Auditorium - 12:00 Noon

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***Modeling Seasonal Cycle of Dissolved Oxygen in Chesapeake Bay: Implications for Hypoxia Response to River Flow and Wind Forcing***


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Abstract:

Anthropogenic nutrient enrichment has contributed to the depletion of oxygen from bottom waters in coastal systems worldwide. A major impediment to developing successful strategy to reduce hypoxia is the lack of adequate understanding of complicating effects due to climate variability. In order to predict hypoxia under changing hydrological and meteorological forcing conditions, we develop a coupled 3D hydrodynamic-biogeochemical model. Process-oriented simulations are conducted to investigate the seasonal cycle of hypoxia in Chesapeake Bay. Diagnostic analysis of the oxygen budget reveals a dynamic balance between physical transport and biological consumption. Winds and river flow are important forcing factors to alter the oxygen supply into the hypoxic zone via vertical mixing and horizontal advections. Our findings show that the hypoxic volume changes little over a wide range of river-flow conditions. This implies that the observed large interannual variation of the hypoxic volume may be caused by other factors such as the variability in nutrient loading and winds.