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Department of Marine Sciences  
Presents a Seminar By

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### **Seasonal Variability of the Block Island Sound Estuarine Plume**

Buoyant discharge coming out of Long Island Sound (LIS) forms a seasonal plume front outside Block Island Sound (BIS) between the coast of Long Island and the denser shelf waters. The front's seasonal variability and its response to tides, winds and surface heating are investigated through a series of process-oriented experiments with the Regional Ocean Modeling System (ROMS). In winter and spring, the plume front is intermediate with a large surface offshore extension detached from the bottom, while in summer, the front is bottom-advected with most of the width in contact with the bottom and is featured with steep isopycnals. The strong summer insolation together with the weak buoyant discharge and weak winds generates the narrowest and steepest summer front. In addition, the small changes in tidal currents over the spring-neap cycle cause significant, monthly fluctuations in turbulent mixing and vertical stratification in central BIS, and modulate the freshwater dispersions, which generates episodic light water patches moving downstream along the southern shore of Long Island and toward Rhode Island Sound (RIS) between the gap between Block Island and Point Judith. Observational evidence of the detached patches is also discussed in this study.

**Host:** Jim O'Donnell

**Time & Date:** 11:00 am, Friday, February 27, 2015

**Place:** Marine Sciences Building, Seminar Room 103

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