

Weekly Seminar: Spring 2010

Date: Friday April 23

Time: 11:00 AM

Location: Maryland Hall 110

Speaker: Dr. Steve Elgar (Woods Hole Oceanographic Inst.)

Title: *"Wave Dissipation by Muddy Seafloors"*

Abstract

Muddy seafloors cause tremendous dissipation of ocean waves. Here, observations and numerical simulations of waves propagating between 5- and 2-m water depths across the muddy Louisiana continental shelf are used to estimate a frequency- and depth-dependent dissipation rate function. Short-period sea (4 s) and swell (7 s) waves are shown to transfer energy to long-period (14 s) infragravity waves, where, in contrast with theories for fluid mud, the observed dissipation rates are highest. The nonlinear energy transfers are most rapid in shallow water, consistent with the unexpected strong increase of the dissipation rate with decreasing depth. These new results may explain why the southwest coast of India offers protection for fishing (and for the 15th century Portuguese fleet) only after large waves and strong currents at the start of the monsoon move nearshore mud banks from about 5- to 2-m water depth. When used with a numerical nonlinear wave model, the new dissipation rate function accurately simulates the large reduction in wave energy observed in the Gulf of Mexico.