Center for Environmental
& Applied Fluid Mechanics

Weekly Seminar: Spring 2011

Date: **Friday, April 15, 2011**

Time: **11:00 AM**

Location: **Gilman Hall 50 (Marjorie M. Fisher Hall)**

Speaker: **Bruce Sutherland (University of Alberta)**

Title: ***"The Lifecycle of Anelastic Internal Wavepackets"***

Abstract

The diagnoses of internal wave propagation, anelastic growth and breaking in the middle atmosphere are assessed in general circulation models through heuristics based upon observations and the predictions of linear theory. Before wave breaking occurs, however, internal waves grow to moderately large amplitude and so the predictions of linear theory are drawn into question. Weakly nonlinear theory shows that the dominant weakly nonlinear dynamics are determined by interactions between internal waves and the mean flow that they induce (their ``Stokes drift''). Fully nonlinear simulations show, as a consequence, that the nonlinearly modulated nonhydrostatic waves break at lower levels in the atmosphere than predicted by linear theory. Hydrostatic waves, by contrast, break at higher levels. These ideas have been introduced into an efficient parameterization of gravity wave drag in general circulation models thus giving better physical justification for the low tuning of breaking parameters currently being used in climate simulations.