Periodic Report: Activities of CIOSS Fellows at the College of Oceanic and Atmospheric Sciences, Oregon State University
November 22, 2006
*CIOSS Fellows are in bold.

September: Guang Guo, a post-doc student who formerly worked with CIOSS Fellow **Jim Coakley**, is now working at I.M.System Group, Inc. (IMSG). He is involved in the research and operational use associated with GOES satellite data for NOAA.

September 30-31: CIOSS Fellows **Dudley Chelton** and **Ted Strub** attended the NASA Wide-Swath Altimeter planning meeting in Washington DC. Dudley gave a presentation entitled, "Altimeter observations of oceanic eddies." Ted gave a presentation entitled, "Needs for understanding Coastal Zone Processes."

October: CIOSS Deputy Director **Mike Freilich** has assumed the role of Division Director for Earth Science at NASA Headquarters in Washington DC. This comes at a critical time for NASA, and we know Mike will do an outstanding job representing the needs of the Earth science community. He will serve in this role with NASA for at least one or two years, maintaining his status as professor on faculty here at COAS.

October 13: Craig Smith, a PhD student in Atmospheric Sciences of CIOSS Fellow **Eric Skyllingstad**, gave a presentation as part of the COAS Student Seminar Series entitled, " On the Effects of Upstream Boundary Layer Development on Stably Stratified Flow over a 2-D Ridge: Preliminary Results from a Large Eddy Simulation". Abstract follows.

The effects of upstream boundary layer conditions on stably stratified flow over a two-dimensional mountain ridge are explored using high resolution large eddy numerical simulations. Previous modeling studies, which have parameterized turbulence or been run either at significantly lower Reynolds numbers than those found in the atmosphere, indicate that surface friction is a key process in the formation of rotors in the lee of 2-D topography. Our preliminary results verify this result and yield insights into the effects of boundary layer height on downstream flow regimes. Other preliminary results indicate that convective near surface conditions, leading to neutral upstream boundary layers, enhance internal wave breaking and the production of large surface velocities in the lee of the ridge. While the majority of numerical results have yet to be obtained, the goals of this project include a thorough understanding of the role of upstream

surface fluxes and stratification, shear, and boundary layer height on the dynamical regimes initiated by stably stratified flow over a 2-D mountain. Flow regimes, such as vertically propagating waves, vertically trapped waves and internal gravity wave breaking, will be quantified and compared to previous linear and mesoscale modeling efforts based on dynamical similarity of relevant nondimensional numbers such as the vertical Froude number. Modeling results will be also used validate operational mesoscale models, such as the WRF, and provide guidance to forecasters on the likelihood of mountain wave and downslope windstorm events based on upstream soundings. To help bridge the gap between size limited LES results and the relatively large scale Sierra Nevada range, a climatological study of atmospheric conditions upstream of the Sierra Nevada, using soundings from the T-Rex IOP data set, will be done to better understand how variations of Froude numbers, Scorer parameter, critical layer height and boundary layer height, affect mountain wave and wave breaking flows on time scales ranging from diurnal to seasonal.

October 17-19: CIOSS had its 5 year NOAA program review on October 17-19, 2006 in Corvallis. The review panel gave CIOSS a rating of "Outstanding" and recommended continuation for another five years (2008-2013). The review panel Chair, Otis Brown, said it was the best of these types of reviews he has attended. For addition information, please visit the Formal Review web page on the CIOSS website at: http://cioss.coas.oregonstate.edu/CIOSS/review.html.

October 23: Tom Pagano from the Jet Propulsion Laboratory gave a CIOSS sponsored seminar entitled, "Instrument Requirements for the Advanced Remote-sensing Imaging Emission Spectrometer (ARIES), the Next Generation 1 km Resolution Hyperspectral Imaging Spectrometer." Tom is the AIRS project Manager and played a key role in the design of SeaWiFS and MODIS. He talked about ARIES which could provide excellent ocean color data for the future.

November 9: CIOSS Fellow **Curt Davis** attended the Analysis of Alternatives (AoA) kickoff meeting at NOAA Headquarters in Silver Spring, MD. CIOSS Director **Ted Strub** participated by phone. This AoA study will analyze alternatives to satisfy sounding and coastal imaging requirements as specified in the Consolidated Observing Requirements List (CORL) which remain unmet now that the Hyperspectral Environmental Suite (HES) is no longer included as part of GOES-R. Curt Davis was asked to lead the coastal waters part of the AoA with support from the Coastal Ocean Applications and Science Team (COAST) and NOAA ocean color data users.

November 14-16: CIOSS and JIMO jointly sponsored a workshop concerning "Climate Impacts on the California Current Ecosystems" held in La Jolla, CA. This workshop was requested by the NOAA Climate and Ecosystems Goals Teams and planned by an organizing committee that included CIOSS Fellows **Jack Barth** and **Ted Strub**. Other CIOSS Fellows attending included **Dudley Chelton, Roger Samelson** and **Yvette Spitz**. Dudley Chelton gave a presentation entitled, "Air-sea interaction in the California Current System."

The meeting addressed research and monitoring in the California Current that are pertinent to the following:

(1) methods for describing the physical state of the California Current System and predicting inter-seasonal to decadal changes in that state;

(2) testing predictions of climate impacts on selected trophic levels that are now possible to see whether they are reliable enough to inform management decisions; and

(3) improving knowledge and models of other trophic levels so that climate impacts on them can also be predicted.

The "Climate Impacts on the California Current Ecosystems" workshop was meant to address (1) efforts within NOAA to integrate research under the Climate and the Ecosystems Goal Teams, (2) the need for coordination of climate and ecosystem monitoring and data dissemination between the three West Coast proto Regional Associations, (3) efforts within the Pacific Coast Ocean Observing System to develop a program of observation, analysis and data management for California Current Large Marine Ecosystem, and (4) the emerging consensus that single-species management must expand to include awareness of all elements of an ecosystem including climate forcing.

JIMO and CIOSS called this workshop to develop specific plans for carrying forward a coordinated research program on assessing and predicting climate impacts on marine resources and ecosystems along the west coast of the continental U.S., including both the California Current and inshore waters. The meeting intended to identify the highest priorities for the following:

(1) modeling ocean physics and the selected trophic levels of the region with the intent (a) to eventually develop forecasts for selected fish species under the varying climate of the California Current, (b) to describe the physical

manifestations of the varying climate and relate these to biological observations of key species such as krill and commercially important fish, and (c) to develop and test a capability to predict elements of the ecosystem from nutrients and pollutants through planktonic and fish populations;

(2) augmenting the present sustained ocean and meteorological observations needed to initialize and constrain models and initialize prediction schemes; and

(3) expanding sustained biological and chemical observations needed to (a) test model descriptions of nutrients and plankton populations and (b) provide impetus to the development of stock assessment and ecosystem models with the objective of predicting climate impacts on the entire ecosystem.

November 21: CIOSS Fellow **Jack Barth**, along with Francis Chan from the OSU Zoology Department, gave a seminar entitled, "Oregon Shelf Hypoxia 2006: What we Know and Don't Know."

November 27-December 1: CIOSS Director **Ted Strub** will attend a conference on the Humboldt Current System in Lima, Peru, giving a presentation entitled, "A Satellite Study of the Oceanic Circulation in the Southeast Pacific."

December 11-15: The 2006 AGU Fall Meeting will be held in San Francisco, CA. Many CIOSS Fellows and students will attend and give oral or poster presentations. The meeting provides an opportunity for more than 12,000 researchers, teachers, students, and consultants to present and review the latest issues affecting the Earth, the planets, and their environments in space. This meeting will cover topics in all areas of Earth and space sciences.