

## Recent and Upcoming Events

Cooperative Institute for Oceanographic Satellite Studies (CIOSS)  
College of Oceanic & Atmospheric Sciences (COAS)  
Oregon State University (OSU)

### Past events

#### 2005

**February 8-10:** A workshop was hosted by CIOSS (Dudley Chelton and Mike Freilich), NESDIS (Paul Chang) and the National Hurricane Center at the Florida International University in Miami, titled: Satellite Measurements of Ocean Vector Winds: Present Capabilities and Future Trends. The workshop brought together research and operational users to examine present and potential future missions and data sets related to near-surface ocean vector wind measurements. Participants established the measurement requirements for research and operational applications of satellite observations of ocean vector winds. Participants formulated and provided recommendations to NASA and NOAA regarding their development of future missions, new data products, and support for new scientific investigations. PowerPoint presentations and the agenda of the workshop can be found on the CIOSS web page (<http://cioss.coas.oregonstate.edu/>) under "Workshops/Miami (FL) Workshop on Ocean Winds, Feb 2005".

**February:** Two COAST workshops, hosted by CIOSS in Corvallis and Portland, Oregon, have resulted in recommendations for the sensor specifications, a white paper describing applications that will become possible due to data from this sensor, modifications to the GOES-R Risk Reduction Plan that address needs in the coastal ocean, and a brochure that can be used to educate members of the community about the benefits of a HES-CW sensor. The brochure is called Coastal Waters Imaging on GOES-R. It features Coastal Monitoring in the Next Generation of GOES, Satellite Imagery for Coastal Resource Management and efforts for the future. The plans for risk reduction for GOES-R ocean data products were presented by Curt Davis and Mark Abbott at the Annual GOES-R Risk Reduction meeting in Silver Spring, MD on February 22-23. The brochure and a PowerPoint presentation summarizing the GOES-R HES-CW plans can be found on the CIOSS web page (<http://cioss.coas.oregonstate.edu/>) under "Workshops/Portland (OR) COAST GOES-R Workshop, Jan 2005".

**March 1-3:** CIOSS Fellow Dudley Chelton co-authored a poster at the CLIVAR Climate Model Evaluation Project (CMEP) Meeting in Honolulu, Hawaii. The poster was presented by Eric Maloney. The title of the poster was "SST Influence on Surface Wind Stress in Coupled Climate Models."

**March 23-25:** CIOSS Fellow Dudley Chelton attended the NASA Ocean Vector Winds Science Team (OVWST) meeting in Seattle, Washington and gave a presentation titled "An Assessment of the Accuracy of SST Influence on Low-Level Winds in the ECMWF and NCEP Numerical Weather Prediction Models."

**March:** The CIOSS Council met as a review panel and selected the proposed project to forward to Eric Bayler, which was approved with minor modifications. The CIOSS omnibus proposal for year 3 was then submitted on March 25.

**March 28:** The new CIOSS Administrative Specialist, Amy Vandehey, started in the CIOSS Office.

**March 30-31:** CIOSS Fellow Dudley Chelton visited NESDIS in Camp Springs, MD to participate as a member of the Hiring Committee for the Branch Chief of the Ocean Dynamics and Data Assimilation Branch (formerly known as the Laboratory for Satellite Altimetry). While in Camp Springs, Dudley also gave a seminar in the Joint Center for Satellite Data Assimilation (JCSDA) seminar series. The title of the seminar was "The Impact of SST Specification on Surface Winds in Numerical Weather Prediction Models."

Abstract:

Satellite observations of surface winds and SST from QuikSCAT and the AMSR reveal that the ocean exerts a strong influence on boundary layer winds in regions of SST fronts associated with ocean currents. This ocean-atmosphere interaction is clearly evident in the surface wind fields of the NCEP and ECMWF operational models, albeit with reduced intensity and increased spatial scale. From comparisons with QuikSCAT, the accuracy of SST-induced perturbations of surface winds in the ECMWF model improved dramatically after May 2001 when the SST boundary condition was changed from the Reynolds SST analyses to the higher resolution and more accurate Real-Time Global SST analyses.

Dudley is working with Dick Reynolds on methods to increase the horizontal resolution of the fields produced at NOAA.

**April:** The following article, which was partially supported by CIOSS funds, just appeared in the April issue of the Journal of Physical Oceanography.

Choboter, P. F., R. M. Samelson, and J. S. Allen, 2005. A new solution of a nonlinear model of upwelling. *Journal of Physical Oceanography*, 35, 532-544.

**April 14-15:** CIOSS and The Science and Math Investigative Learning Experience (SMILE) Program are collaborating on developing a curriculum for the 12 high school after-school clubs that meet throughout the school year. The new curriculum is focused on oceanography, remote sensing and mapping. SMILE has held two teacher-training workshops on the Oregon State University campus to introduce teachers from SMILE's rural and minority school districts to oceanography, remote sensing, and mapping. The culmination of these after-school club meetings was the SMILE High School Challenge during April 14-15, a one-and-a-half-day event, during which SMILE high school club members, teachers, and volunteers convened at Western Oregon University and Oregon State University to play out a disaster scenario. This year's challenge was called, "Reaction, Action and Remediation of an Oil Spill". Members of the NOAA/NOS HazMat team in Seattle contributed to the scenario by making available the

GNOME trajectory model, which the students used to assess the possible paths the oil spill might take.

**April 25-29:** CIOSS Fellows Jack Barth and Dudley Chelton, along with graduate student Renato Castelao, attended the European Geophysical Union (EGU) Meeting in Vienna. Renato presented results of an ongoing collaboration with Tim Mavor in NESDIS: "Spatial and temporal variability in sea surface temperature fronts in the California Current System from satellite observations".

Abstract:

Three and a half years (2001-Jun 2004) of Geostationary Operational Environmental Satellites (GOES) sea surface temperature (SST) frontal data over the shelf and slope along the U.S. west coast are used to analyze variability in the California Current System. Maps of seasonal probability of detecting a front (SPDF) reveal significant temporal and spatial variability in the area. Winter is characterized by very low SPDF along the entire coast. In spring, SPDF is still low north of Cape Blanco (43N), but increases considerably south of it. This is consistent with the wind stress seasonal cycle and the seasonal development of upwelling fronts. The SPDF reaches maximum values in summer. The continuous input of energy from the wind to the system leads to intensification of the fronts and of the coastal upwelling jet. High SPDF are found around the 200 m isobath north of Cape Blanco, but span a much wider area south of it, presumably due to instability of alongshore currents and the generation of meanders and eddies, which increase in scale as the system adjusts toward equilibrium. During fall, the SPDF decreases considerably, but the offshore extent of the area of higher activity is maximum. The interaction of the flow with major topography perturbations seems to strongly control the position of the fronts. Off Oregon, for example, high values of SPDF in 2001 are found inshore of the pinnacles of the Heceta Bank complex (44.2N) during spring, but move over and seaward of the pinnacles during summer. Mooring observations show that the coastal jet moves seaward of the pinnacles over a period of ten days in early July during a strong upwelling favorable wind event. A similar offshore shift is observed in the daily GOES-derived SST fronts position. Flow topography interactions in the vicinity of topography perturbations are investigated in more detail using a numerical model.

Dudley Chelton's presentation was titled "The dispersion characteristics of westward propagating sea surface height variability".

Abstract:

The accuracy and 12-year duration of the merged TOPEX/POSEIDON, ERS-1, ERS-2 and Jason altimeter datasets have allowed detailed investigations of westward propagating sea surface height (SSH) variability with high spatial resolution throughout the world ocean. Outside of the equatorial waveguide, analyses of the altimeter data in the space-time domain have consistently found that the observed propagation speeds are faster than predicted by the classical theory for extra-tropical Rossby waves. In this study, SSH variability along a variety of extra-tropical latitudes is examined in the zonal wavenumber-frequency domain to investigate the dispersion characteristics of westward

propagating SSH variability. The resulting spectra are sorted according to a nonlinearity parameter computed from hydrographic data and the standard deviation of SSH variability. It is found that the westward propagation in regions of higher nonlinearity tends to be nondispersive over the range of wavenumbers resolved by the SSH fields computed from the merged altimeter datasets. The results are compared with predictions from theories that have recently been proposed to explain the discrepancies between the observations and the classical linear waves.

**April-May:** CIOSS efforts are expanding within two NOAA initiatives: (1) The Research-to-Observations (R2O) project led by Stan Wilson (NESDIS); and (2) the GOES-R Risk Reduction (GOES-R3) research led by Paul Menzel (NESDIS). Supplemental proposals have been submitted for four R2O projects concerning improved wind fields for operational use (two projects), specifications for ocean color Climate Data Records and evaluation of re-engineering plans for the next ocean color cal/val buoys (MOBY2). A supplemental proposal is being prepared by members of the COAST team for further GOES-R3 projects, to be directed by Curt Davis in CIOSS and to include Principal Investigators at OSU, NESDIS and other academic and federal institutes. Curt will be visiting CIOSS May 9-10 to work on the proposal and make further plans for his move to Corvallis in June.

**May:** Recent progress on the Oceans and Human Health project: "Oceans and Human Health: Optical tagging and tracking of water masses for prediction of human health hazards." PIs: Peter Strutton (OSU) and Michelle Wood (UO). Michelle reports that:

A toxic phytoplankton bloom is currently occurring off the Oregon coast. Michelle Wood's group plans to sample this event on a cruise later this month.

Last month, Michelle and two students from the University of Oregon visited the laboratories of Mary Silver and Raphael Kudela at the University of California at Santa Cruz where they learned methods for collecting samples and detecting domoic acid in seawater, suspended particulates and animal tissues. These techniques will be combined with phytoplankton sampling and sampling for saxitoxin to provide data on the extent to which phytoplankton blooms that carry toxins can be detected and/or predicted using remote sensing.

### **Looking ahead:**

**May:** The first meeting of the Executive Board for CIOSS scheduled for May 25-26 has been postponed due to scheduling conflicts until late summer with the date TBD. The Board will meet to review progress of CIOSS in its first two years, and to make suggestions of what needs to be changed or added before the major review about two years from now. The goal is to get a consensus on a fairly specific and realistic list of objectives and milestones to accomplish over the next two years.

**June 2-3:** The Cooperative Institute Directors' meeting in New York City this year will be hosted by CREST. The Administrator's portion of this meeting was postponed to October 26 and 27, 2005 because of scheduling conflicts.

**June:** Curt Davis, Executive Scientist of the COAST project, will be joining COAS from NRL as a Senior Research Faculty, working with Ricardo Letelier and Mark Abbott.

**Summer 2005:** Three new post-docs will be starting this summer to work on projects involving: (1) assimilation of altimeter and coastal radar data into high resolution models of coastal circulation (working with John Allen, Gary Egbert and Robert Miller); (2) improvement in the resolution of scatterometer wind fields (working with Mike Freilich); and (3) combinations of altimeter SSH and coastal radar surface velocities to examine the details of mesoscale circulation in the coastal ocean off Oregon (working with Ted Strub and Mike Kosro).

**Summer 2005:** CIOSS will welcome visiting scientists Dick Reynolds and Laury Miller to work with Dudley Chelton, Ted Strub, and other CIOSS fellows on specific research projects and to look more generally at how interactions with NOAA research scientists can be enhanced by visits – both short and long – to CIOSS.