

2009

Internal Chronology: Activities of CIOSS Fellows at the College of Oceanic and Atmospheric Sciences, Oregon State University

*CIOSS Fellows are in bold.

January 6: Ted Strub sent to Chris Brown three "unfunded" project proposal ideas - these would be funded with "end of year" funds that might become available in the May-June time frame. These projects were for: (1) Chelton-DeMaria (Air-Sea Interaction); (2) Batchelder-Brown (Lagrangian statistics off Oregon from the Kurapov model); and (3) Strub-Miller (Coastal Altimetry).

January 7: The Research and Outreach Omnibus proposal was submitted through Grants.gov to Heather Hay, consisting of seven projects that had been discussed with Kent Hughes and others in SOCD over the preceding year.

January 8: Qingtao Song, a postdoc for **Dudley Chelton**, presented a seminar entitled, "Tropospheric Response to SST Perturbations in the Agulhas Return Current Region" as part of the COAS Atmospheric Sciences-Physical Oceanography Seminar series.

January 12: Ted Strub reviewed the Sea Grant "West Coast Regional Marine Research and Information Needs" draft report and sent his comments to Sea Grant and also to Julie Risien, the lead author of the report.

January 13: Ted Strub sent the Omnibus proposal informally to **Kent Hughes**, Chris Brown and Ingrid Guch. Kent forwarded the proposal to CIOSS Fellows and Branch Chiefs within SOCD, asking for their feedback by Feb 13.

January 15: Natalie Perlin, a research associate for **Alexander Kurapov**, presented a seminar entitled, "Ocean-atmosphere coupling in the area of orographically-intensified flow in coastal upwelling modeling studies" as part of the COAS Atmospheric Sciences-Physical Oceanography Seminar series.

January 27: David Rivas, a postdoc for **Roger Samelson**, presented a seminar entitled, "A numerical modeling study of the upwelling source waters along the Oregon coast during 2005" as part of the COAS Physical Oceanography Seminar series.

January 28: Ted Strub, Roberto Venegas and Maria Kavanaugh from CIOSS reviewed the draft "Olympic Coast National Marine Sanctuary Report," in which satellite data were used to characterize oceanographic conditions within the OCNMS. Approximately 10-12 pages of comments were sent to Doug Pirhalla (NOAA/NOS), who responded on February 4 with follow up questions.

Strub and others at CIOSS will continue to give feedback on their analyses and help them where possible.

January 28-February 10: Ted Strub worked with Bill Emery to write a chapter on "Satellite Altimetry Applications off the Coasts of North America." This is to appear in a book on Coastal

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Altimetry, which is one outcome of the series of Coastal Altimetry Workshops that CIOSS and NOAA initiated in February, 2008.

January 30: The [Annual Progress Report for 2008](#) (Year-6, abbreviated as required by the new NOAA CI Reporting Requirements) was submitted through NOAA Grants Online and also sent to Heather Hay, Ingrid Guch, Chris Brown and **Kent Hughes**.

January 30-31: The Winter SMILE High School Teacher Workshop was held over 2 days in LaSells Stewart Center. Teachers were given curriculum to present in their after school clubs to prepare them for the Challenge event on whales and satellite tracking in April 2009. Laura Dover, a Master's student in the Marine Resource Management program presented the activities to the teachers. Amy Vandehey from CIOSS attended to facilitate the event. Activities can be found on the web at: http://oregonstate.edu/~doverl/SMILE_WTW09/.

February 1-15: Fabian Gomez, a Master's student from the University of Concepcion, Chile visited **Ted Strub** and **Ricardo Matano**. On February 10, he gave a seminar entitled, "Environmental variability and small pelagic fishes off Chile."

February 11: **Pete Strutton** provided input for an [article on Harmful Algal Blooms \(HABs\)](#) off the coast of Oregon and Washington. Scientists at a HABs workshop in Portland, OR discussed ways to better monitor and minimize the effects of natural marine toxins.

February 25 (Hot Item for February): CIOSS Researchers Help to Lead West Coast Harmful Algal Blooms Summit.

In support of the West Coast Governors' Agreement (WCGA) on Ocean Health, NOAA's Center for Sponsored Coastal Ocean Research convened the West Coast Regional Harmful Algal Bloom Summit in Portland, OR, February 10-12, 2009. Attendees included 80 scientists, resource managers and public health officials from California, Oregon, Washington as well as representatives from NOAA. Harmful algal blooms (HABs) represent a significant ecological and economic threat to coastal communities nationwide. Drs. **Peter Strutton** and **Michelle Wood**, Fellows at the Cooperative Institute for Oceanographic Satellite Studies (CIOSS) at Oregon State University, have been funded by NOAA since 2004 to improve our understanding and predictive capability for Oregon HABs. Research in this field uses satellite data to identify and track HABs, including the development of new satellite products.

Background: Algae are vitally important to marine and fresh-water ecosystems, and most species of algae are not harmful. However, HABs can occur when certain types of microscopic algae grow quickly in water, forming visible patches that may harm the health of the environment, plants, or animals. HABs can deplete the oxygen and block the sunlight that other organisms need to live, and some HAB-causing algae release toxins that are dangerous to animals and humans.

Among other key actions, the WCGA Action Plan directs the participating states to "Exchange information between experts in all three states on management tools and techniques to promote development and operation of predictive capabilities of HABs and hypoxia. Support the expansion of ocean observing system monitoring efforts amongst the three states for these

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purposes. Convene a HAB workshop... to reach consensus on the present state-of-knowledge and prioritize the information needed by decision makers to lessen the impacts of the HAB events on humans and critical marine resources.”

Significance: This summit was the first gathering of HAB scientists and managers from the west coast states. CIOSS Fellows gave presentations on the state of current knowledge for Oregon and current forecasting capabilities; led breakout groups; served on the summit steering committee; participated in a panel discussion and generated media releases. The summit produced a white paper summarizing the state of knowledge for west coast HABs. In coming months, the steering committee will develop an action plan for the implementation of a monitoring, alert, and response network. This research supports NOAA Mission Goal 1 – Protect, Restore, and Manage the Use of Coastal and Ocean Resources through an Ecosystem Approach to Management.
<http://www.coas.oregonstate.edu/habs>
<http://news.opb.org/article/4254-scientists-work-forecasting-red-tides/>

February 26: Dudley Chelton gave a seminar entitled “A 25-Cent Empirical Coupled Model of an Idealized Eastern Boundary Current” as part of the Atmospheric Sciences-Physical Oceanography joint seminar.

Mid-February to Mid-March: REU applications were reviewed and students were selected for the 2009 summer program.

March 24-26: Ted Strub, Hal Batchelder and Amy Vandehey attended the annual All-NOAA CI Directors and Administrators Meeting held in Silver Spring, MD. The [agenda](#) is available on the web.

March 24: At the CI Directors Meeting, **Ted Strub** and **Hal Batchelder** met with Al Powell and Ingrid Guch and discussed the projects in CIOSS' Year-7 Omnibus Proposal, in the context of the SOCD comments on those projects. In those comments, SOCD recommended the termination of support for three projects: the SMILE High School Challenge, the extension of the pilot coastal circulation prediction to include ecosystem and hypoxia dynamics and the air-sea interaction project that examines the effect of SST on winds above the atmospheric boundary layer. The general consensus was that CIOSS should support these projects within the limitations imposed by the 16% cut to the Omnibus budget caused by the mandate for SOCD to support the MOBY optical buoy with part of its ORS funds.

March 26: After the Directors' Meeting, **Hal Batchelder** presented a seminar entitled “Coupled biophysical modeling in the Northern California Current: GLOBEC results and future directions” at the Silver Spring NOAA offices. The seminar was arranged by Beth Turner and other in NOS interested in ecosystem forecasts. After the seminar, Hal met with Frank Aikman, Rich Patchen and Beth and made tentative plans to hold a small workshop on Lagrangian statistics in coastal models.

March 31-April 1: Curt Davis co-led the Calibration and Validation of Ocean Color Products for Coastal Waters Workshop with Bob Arnone (NRL) and Rick Stumpf (NOAA). It built on the results of an earlier workshop on the cross calibration of OCM and MERIS data with MODIS

and SeaWiFS to extend the useful data sets for coastal monitoring. This workshop expanded the discussion to include protocols for the use of above-water and in-situ instrumentation and approaches for validation of products for the coastal ocean and related issues such as validating atmospheric correction for coastal locations.

Workshop Objectives:

1. Address the issues of calibration and validation of ocean color products for coastal waters.
2. Build on the results of an earlier workshop on the cross calibration of OCM and MERIS data with MODIS and SeaWiFS to extend the useful data sets for coastal monitoring.
3. Expand the discussion to include protocols for the use of above-water and in-situ instrumentation and approaches for validation of products for the coastal ocean and related issues such as validating atmospheric corrections for coastal locations.
4. The product of the workshop will be a set of recommendations for algorithms and approaches for validation of SeaWiFS, MODIS and MERIS and in the future the Hyperspectral Imager for the Coastal Ocean (HICO) and VIIRS coastal products, including atmospheric corrections relevant to coastal areas, recommendations for coastal validation site selection and use, and requirements for new instrumentation for coastal validation.
5. The long term goal is to develop a set of automated procedures for coastal product validation for all ocean color sensors.

The results of the workshop are summarized in a report on the CIOSS web site (<http://cioss.coas.oregonstate.edu/CIOSS/>) under “Workshops and Meetings.”

April 13: CIOSS submitted revised budgets, budget justifications and work plans for its Year-7 core funding (Task 1 and Omnibus Task 2-3). These budgets conformed to the totals set by the 16% cuts to all SOCD projects using the ORS line of funding.

April 16-17: The SMILE High School Challenge event was held at Western Oregon University and Oregon State University. This year’s challenge focused on whales and satellite tracking. [Club activities](#) and a [review of the event](#) are available on the web.

May 6: The [CIOSS Year 5 1-year no-cost extension Progress Report](#) for the period April 1, 2008 – March 31, 2009 (not final) was submitted through NOAA Grants Online.

May 16-17: The Spring SMILE High School Teacher Workshop was held over 2 days at LaSells Stewart Center.

May 19: CIOSS Post-doc Andrey Koch, working with **Alexander Kurapov** gave a presentation entitled, “Modeling Analysis of a Separated Jet in the Coastal Transition Zone off Oregon” as part of the Physical Oceanography Seminar series.

June 16-17: **Ted Strub** and Amy Vandehey attended the annual NESDIS CI Directors and Administrators Meeting held at CIRA in Fort Collins, CO. The meeting consisted of briefing the attendees on guidance and policy updates that directly impact the research and administrative process of each of the CIs. [Action items](#) for this meeting are posted on the web.

June 25: Pete Strutton gave a seminar entitled, “Satellite Techniques for Determining the Air-Sea Flux of CO₂: North American West Coast and the Southern Ocean” as part of the Research Experiences for Undergraduates (REU) Seminar Series.

July 18: CIOSS participated in OSU College of Oceanic and Atmospheric Sciences’ 50th Anniversary celebration and open house with a booth focused on how satellite data is used to see the ocean. Two computers showed sea surface temperature and height on Google Earth as a loop of images from 1996-1998, highlighting the 1997 El Nino event. A [poster](#) behind the tables gave further explanations and described CIOSS Fellows’ work with Harmful Algal Blooms (Pete Strutton) and an Ocean Pilot Prediction Model (Alexander Kurapov). Shawn Rowe from Hatfield Marine Science Center provided a model of a satellite for display.

July 28 (Hot Item for August):

CIOSS Researchers Develop Pilot Ocean Prediction System

Supported by NOAA/NESDIS/STAR’s Satellite Oceanography and Climatology Division, Research Fellows led by **Alexander Kurapov** at the Cooperative Institute for Oceanographic Satellite Studies (CIOSS) at Oregon State University have developed three-day forecasts of ocean conditions off Oregon and Northern California. Forecast fields have been available on the IOOS/NANOOS web site (<http://www.nanoos.org/>) since July 2009 through efforts of CIOSS Fellow **Jack Barth** and Craig Risien. These fields have been enthusiastically used by tuna fishers since their introduction in late-summer 2008

(http://www.noanews.noaa.gov/stories2008/20081014_tunamodel.html). Improvements (under development) include the assimilation of satellite data, along with the addition of ecosystem components and dissolved oxygen models, to allow forecasts of algal blooms and hypoxic conditions.

Background: The fishing community has long been aware that conditions favoring tuna catch occur near surface fronts of temperature (SST) and chlorophyll concentrations. Although visible in satellite images, clouds obscure these images for days at a time. However, coastal ocean models produce cloud-free fields of SST, currents and (eventually) chlorophyll that can be made more realistic by assimilating the sparse satellite data.

CIOSS Fellows are improving both remote-sensing methods and modeling techniques, which have resulted in a coastal ocean forecast system (initially without data assimilation). Use of forecast fields of SST and currents has spread during 2009 among fishers, whose suggestions have enhanced the usefulness of the combined model and satellite fields (<http://www.ifish.net/board/showthread.php?p=2639973>).

Significance: As Oregon fisherman Ron Seip says in a NOAA press release, “We use this site to decide how far to go to fish for tuna, where to go, or whether to go at all. It is invaluable, especially in light of the cost of fuel.” There have also been inquiries from those responsible for hazardous spill predictions. Model and satellite fields are expected to find numerous other applications, as they are combined and improved through data assimilation and made available through IOOS and CoastWatch web sites.

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July 30: Ted Strub gave a seminar entitled, “Ocean Remote Sensing: Wind and Water - The Bird's Eye View” as part of the Research Experiences for Undergraduates (REU) Seminar Series.

August 11-13: The Summer SMILE High School Teacher Workshop was held over 3 days at LaSells Stewart Center. Teachers were given curriculum to present in their after school clubs to prepare them for the Challenge event in April 2010. This year's theme is large-scale climate cycles, and the relationship between impacts of El Niño events and watershed management.

August 18-19: CIOSS sent Andrey Koch (post-doc for **Alexander Kurapov**) and Peter Gaube (graduate student for **Dudley Chelton**) to the [NESDIS CoRP Science Symposium](#), which was held at the CREST campus in NYNY. Andrey gave a presentation on “Near-surface dynamics of the coastal jet separated off Oregon” and Peter gave one on “Observations of Surface Chlorophyll Advection by Mesoscale Ocean Eddies.” **Ted Strub** also attended and presented a poster by Alexander Kurapov on “Assimilation of Along-Track Altimeter SSH into a Coastal Ocean Model.”

August 19-21: After attending the NESDIS CoRP Symposium, **Ted Strub** attended a workshop on Scatterometry and Climate in Arlington, VA, to assess the requirements for ocean vector winds climate data records.

August 19: The 12 participants in the COAS Research Experience for Undergraduates program presented results from their summer projects. CIOSS sponsored 3 students:

- Sarah Dewey, advised by **Ted Strub**, “Satellite Observations of Oregon Coastal Upwelling”
- Meghan Flink, advised by **Jack Barth**, “Anomalies and Upwelling on the Newport Hydrographic Line in 2008”
- Brandon Reichl, advised by **Pete Strutton**, “Biological Productivity in the Central Equatorial Pacific: Mixing vs. Thermocline Variability”

August 31: A meeting of the local CIOSS Council of Fellows members was held in Corvallis to prepare for the Executive Board meeting at the end of the week. A [summary](#) is available on the CIOSS website.

September: A new [spreadsheet](#) is available that summarizes the CIOSS Fellows' areas of expertise, grouped by scientific theme. It also includes contact information and is useful for NOAA program officers looking for possible collaboration opportunities and a quick reference for potential Research Experiences for Undergraduates (REU) students and NOAA student exchanges. This can be found on a permanent link under "Personnel" on the navigation bar.

September 4: A CIOSS Executive Board meeting was held at the NOAA offices in Silver Spring, MD. It was intended to summarize CIOSS activities and partnerships for the Board members and ask for guidance that would help CIOSS gain support for activities and partnerships that extend beyond SOCD to other NESDIS and NOAA offices. A summary of the meeting and connections of points made to CIOSS activities can be found [here](#).

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September 16-18: ESA/ESRIN Frascati, Italy. **Ted Strub** attended the 3rd Coastal Altimetry Workshop that reviewed the ongoing progress in the use of coastal altimetry, especially in the context of the completion of the European PISTACH and COASTALT projects, making use of reprocessed data from those projects.

October: Laura Dover, former Master's student with the SMILE program, has made a [new website](#) describing past High School Challenges, along with photos and teacher activities.

November 11 & 25: **Ted Strub** and Amy Vandehey met with Ryan Collay and others from the SMILE group to talk about themes and directions for the afterschool club activities and Highschool Challenge event in April 2010. The theme this year is watersheds and large scale climate variations. Ted and Amy gave suggestions for how El Niño satellite data could be incorporated and possible speakers. We were introduced to the new Marine Resource Management student, Gina Shure, who took over for Laura Dover in helping to coordinate SMILE activities and the challenge event.

December 2: The local CIOSS Council of Fellows met to discuss recent communications with NOAA, attempts to establish partnerships and projects to be included in the Year 8 Omnibus proposal. A [summary](#) is available on the CIOSS website.