



CIOSS Executive Summary

10-12-06

The Cooperative Institute for Oceanographic Satellite Studies (CIOSS) was established at Oregon State University (OSU) in 2003, creating a cooperative (Federal/Academic) center of excellence for research involving satellite remote sensing of the ocean and the air-sea interface. The primary collaborations are between research scientists in the NOAA/NESDIS Center for Satellite Applications and Research (STAR) and the OSU College of Oceanic and Atmospheric Sciences (COAS).

The CIOSS mission is to enhance and improve the use of satellite remote sensing for oceanographic research, operational applications and education/outreach. CIOSS research projects address improvements in satellite sensors and the algorithms used to produce fields of geophysical variables, improvements in models that use the satellite fields, and analyses of combinations of satellite, model and *in situ* data sets. CIOSS outreach includes scientific outreach to members of the research community, and both formal and informal education. By accomplishing its goals CIOSS helps NOAA fulfill its role of leadership for both remote sensing and modeling in the Integrated Ocean Observing System (IOOS). CIOSS works with the NOAA CoastWatch program to help create and improve remote sensing products that will be useful to members of the IOOS Regional Associations.

CIOSS research includes the primary variables measured in oceanographic remote sensing: SST (surface temperature), SSH (surface height), OVW (ocean vector winds), surface chlorophyll concentration (Chl) and other optical variables. In the coastal ocean, CIOSS works to improve the quality and spatial resolution of satellite-derived fields, extending the coverage closer to the coast and into bays and estuaries. Because satellite sensors can only detect surface properties of the oceans, the integration of satellite and *in situ* data is vital to understanding oceanic processes. Models that assimilate these data provide the most complete 3-D picture of the physical and biological fields and also help to fill gaps caused by clouds and adjacent to the coast. CIOSS Fellows are leaders in research needed to address all of the above topics: ocean remote sensing; ocean modeling and data assimilation; and oceanographic *in situ* data collection.

CIOSS research also addresses the design and evaluation of future sensors for OVW, SSH and ocean color. For ocean color, CIOSS scientists are leading the Coastal Ocean Applications and Science Team (COAST), in which national ocean color and optics experts are collecting hyperspectral data sets in U.S. coastal regions. Optical *in situ* and aircraft data were collected in Monterey Bay during September 2006 and similar field programs are planned for the East and Gulf Coasts. These data can be used to develop algorithms in coastal environments for all future color sensors. For OVW, individual research projects and workshops are evaluating the capabilities of present and future wind sensors for both research and operational uses. CIOSS Fellows are also participating in the evaluation of new, high-resolution SSH sensors.

CIOSS workshops and short courses constitute outreach to the scientific community. Examples include workshops and training for NWS forecasters in the use of scatterometer ocean vector wind fields; workshops to help NOAA design future color sensors for coastal ocean applications, and a recent short course in the use of satellite data for NOAA (NMFS and NOS) research scientists. CIOSS is involved in formal education through the Science and Math Interactive Learning Experiences (SMILE) high school program in the state of Oregon, which introduces high school students to oceanographic applications of remote sensing. CIOSS is engaged in informal education of the public through the development of interactive displays for science museums that highlight research in remote sensing of the ocean. The initial CIOSS project in informal education is a display on satellite remote sensing for the Public Wing of the Hatfield Marine Science Center in Newport, OR.