



Outreach at the Cooperative Institute for Oceanographic Satellite Studies

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Students at the 2005 High School Challenge.

Outreach is an integral activity at the Cooperative Institute for Oceanographic Satellite Studies (CROSS), the newest cooperative institute sponsored by NOAA/NESDIS.

Located in the College of Oceanic and Atmospheric Sciences at Oregon State University (OSU), CROSS addresses outreach to the scientific community through workshops related to its four Research Themes: **Satellite Sensors and Techniques, Ocean-Atmosphere Fields and Fluxes, Ocean-Atmosphere Models and Data Assimilation, and Ocean-Atmosphere Analyses.**

CROSS addresses outreach to the general public through its fifth theme, **Outreach**, consisting of: **Formal Education; Informal Education; and Data Products and Access.** Improved data products and data access are primarily accomplished through collaborations with the NOAA CoastWatch/OceanWatch program.

This poster presents examples of CROSS efforts in formal and informal education.



The touch tank at HMSC Visitor's Center.

Formal Education in the SMILE Program:

CROSS is helping the Science and Math Investigative Learning Experiences program to develop its high school curriculum and activities in the thematic area of Oceanography and Remote Sensing.

The SMILE Program works to address issues of higher education readiness, access and diversity through academic enrichment and outreach in science and mathematics for pre-college students in grades 4–12. The work of SMILE is intended to significantly improve the educational outcomes of underrepresented and underserved students.

The High School SMILE Program culminates in an annual High School Challenge Event, where SMILE club members work in teams of students from around the state on a community-based scenario. The 2005 Challenge featured a realistic oil spill scenario. Students examined data to learn the extent of the spill, the direction of coastal currents, weather impacts, and the marine and coastal ecology of the area involved. Students collected data pertinent to the developing situation, examined options for oil recovery or remediation, developed a plan informed by the data, and implemented strategies to communicate that plan. They had to defend that plan to “community members, experts and other stakeholders,” as played by teachers, OSU students and faculty.



An oil tanker sinking off the coast.



Collecting data for environmental sensitivity maps.



Developing an oil-spill remediation plan.



Defending the plan to the public.

Informal Education at Hatfield Marine Science Center:

CROSS is helping HMSC to build an interactive public display that will highlight the use of remote sensing to monitor the coastal ocean off Oregon and in other coastal locations.

Located on the coast, approximately 75 minutes from OSU, the Hatfield Marine Science Center houses marine science laboratories from OSU, NOAA, EPA and the State Department of Fish and Wildlife. It also houses the OSU Hatfield Marine Science Visitor Center—a unique, dynamic environment for lifelong exploration and discovery. The Visitor Center encourages adults and children to enjoy marine science.



Aerial view of the OSU Hatfield Marine Science Center.

The Visitor Center also provides opportunities for conducting research on devices, methods, and concepts for informal science education that will advance the art of public education. It effectively provides a “laboratory” for informal education.

CROSS is supporting the development of an interactive display on oceanography and remote sensing. This activity forms the research for the PhD thesis of OSU student Molly Phipps. An interactive, touchscreen display will allow visitors to explore satellite data sets showing the surface of the ocean, as well as in situ data sets that allow the visitor to fly through the ocean underneath the surface.



An existing interactive exhibit.



Exploring marine science at different scales.



Shoebbox Satellites

Students in each team created a landscape out of papier-mâché and exchanged landscapes with other teams. They then created a topographic map of their unseen landscape using an altimeter. The altimeters were made out of bamboo skewers with centimeter markings and the landscape was “explored” by probing through holes in a lid, like a satellite altimeter would sample the changing sea surface height. From their data, students created a contour map, which would represent the circulation in the real ocean. The students finally examined the actual landscape to explore the limitations of their sampling grid's resolution. This activity was adapted from “Shoe Boxes to Satellites” by Bonnie Briggs of Creswell High School, in *The Oregon Mathematics Teacher*, Dec. 1996.



Papier mâché topography.



Sampling the topography with bamboo “altimeters.”

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More information:

Cooperative Institute for Oceanographic Satellite Studies (CROSS)
 Hatfield Marine Science Center (HMSC)
 Science and Math Investigative Learning Experiences (SMILE)

<http://closs.oregonstate.edu>
<http://hmhc.oregonstate.edu>
<http://smile.oregonstate.edu>