NANOOS Observer

FALL 2009

Newsletter of the Northwest Association of Networked Ocean Observing Systems

Welcome to the inaugural edition of the *NANOOS Observer,* your update for new products, news items, and ocean-related issues affecting the NANOOS region of the Integrated Ocean Observing System.

Products/Tools

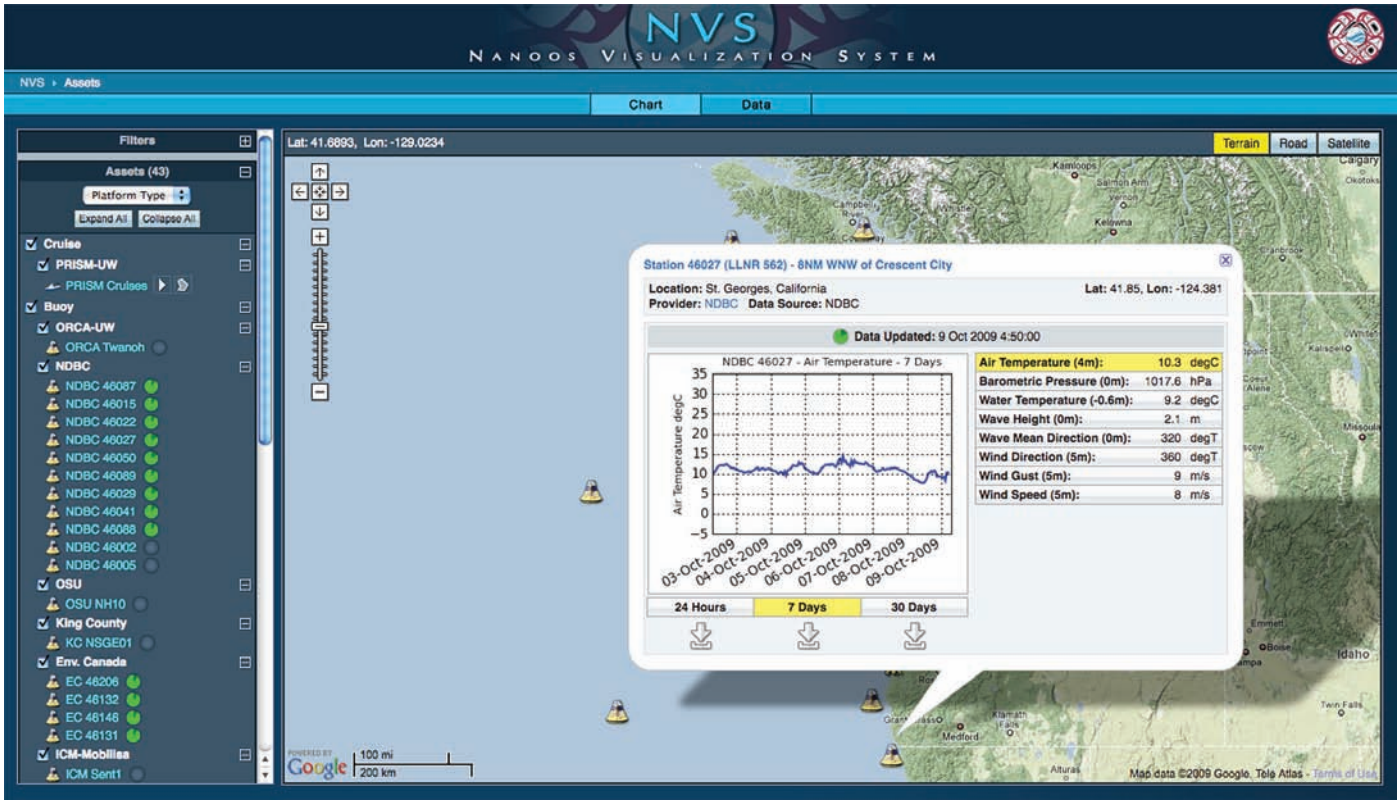
Watch for the NANOOS Visualization System or NVS, a New Tool Coming to the NANOOS Web Portal

Coming fall 2009, NANOOS will release the NANOOS Visualization System or **NVS** on the NANOOS web portal, **www.nanoos.org**. Users can select locations on the map-based interface to get ocean observing data that includes real-time and near-real-time observations from buoys, shore stations, and coastal land based stations; model forecast and satellite data; and ship-board cruise data.

"NVS will bring consistency and integration of data across the NANOOS geographical region," says Emilio Mayorga, NANOOS' NVS data manager.

According to Troy Tanner, designer of the NANOOS web delivery system, "NVS is a tool that makes data access easier for researchers and the public. We're trying to build innovative ways to compare, compile, and download data."

Participants: *Emilio Mayorga and Troy Tanner, Applied Physics Laboratory, UW; Craig Risien, Oregon State University; Jonathan Allan, OR Dept. of Geology and Mineral Industries (DOGAMI), Alex Jaramillo, Center for Coastal Margin Observation & Prediction (CMOP), and Rick Blair, The Boeing Co.*



Products/Tools, cont'd.

Learning Tool: Rhythms of the Coast Now Available on the NANOOS Web Portal

Rhythms of the Coast, an online interactive learning tool, lets users explore how salinity within the Yaquina Bay Estuary changes over the course of a year (daily and seasonally). Designer Sarah Mikulak, part of NANOOS' Education and Outreach team, says the tool seeks to "… facilitate the public's understanding of the natural variability within an estuary, ultimately helping them make more informed decisions about the environment.

The learning tool uses data from NANOOS member WET Labs' Land/Ocean Biogeochemical Observatory (LOBO)'s sensor from 2006 — 2008, and rainfall data averaged over 10+ years from USGS. Rhythms of the Coast, developed with funds from WET Labs and partially supported by NANOOS, is also a computer-based exhibit at the Hatfield Marine Science Center Visitors Center in Newport, OR. See **http://www.nanoos.org/education/learning_tools/lobo/lobo_exhibit.php**.

New Capabilities: Field & Lab

Measuring Salinity in the Columbia River Estuary

The Columbia River Estuary, where the Columbia River meets the Pacific Ocean, can inform our understanding of the workings of the CR ecosystem where two very different water bodies mix. With funds from the Coastal Margin Observation & Prediction (CMOP) at Oregon Health & Science University, a NANOOS member, Tom Sanford's group at the Applied Physics Laboratory, University of Washington is developing the Sigma Profiler (Fig. 1). The new instrument measures the salinity, or saltiness, of the entire water column so scientists can learn how the mixing functions, which affects oxygen and nutrients.

Fig. 1 Sigma Profiler being deployed in the Columbia River Estuary.

Salinlity, cont'd.

Traditional methods of measuring salinity don't work well in the Columbia and other rivers because of strong currents, waves, debris from the river, and rapid environmental changes. Sanford has figured out how to measure the salinity from the bottom to the surface, by sending out an electrical signal of known strength, and then precisely measuring how the subsequent reflected signal differs from the initial signal.

The Columbia River Estuary has strong tidal flows that are partly salt water, partly fresh. The dense salt water tends to be overlain by the lower-density fresh water from the Columbia: as the tide flows shoreward, bringing salt water, a wedge-shaped layer of this dense salty water flows miles up into the estuary, hugging the bottom (Fig. 2). As the tides rise and fall the back-and-forth movement of this "salinity wedge" causes organisms living along the bottom to be covered with fresh, then salt, then fresh water.

The Columbia's flow is seaward: when the tide is coming up the estuary, the surface fresh-water is going the opposite direction from the wedge. Where the two drag over one another, underwater "internal" waves occur. Internal waves often break underwater – just like surf waves, but in slow motion. Breaking causes powerful mixing between the water types, carrying oxygen downwards and nutrients upwards.

To work in this dynamic environment, the Sigma Profiler is robust and simple: a couple pieces of electrical cable laid on the bottom, plus transmitter, recorder, and power pack. No moving parts, no boat, no crew, no winch, and, it can store the data, or send it ashore via acoustic telemetry.

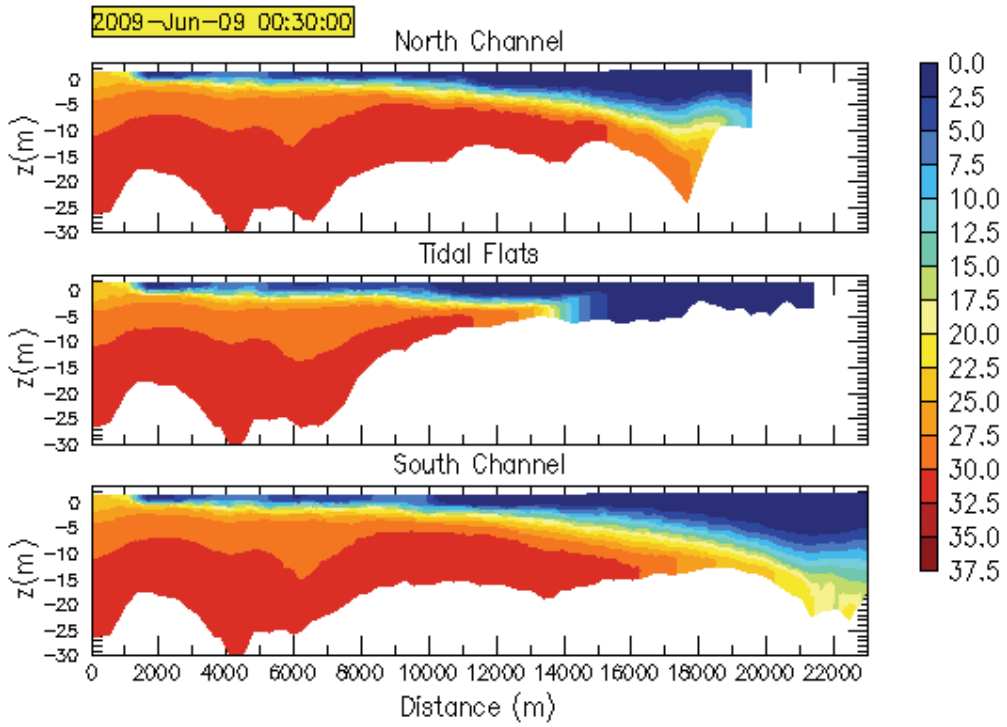


Fig. 2 Cross-section of salinity in 22 km of the Columbia River Estuary. High-salinity "wedge" is the red near the bottom. Blue is low-density fresh water from the Columbia River floating on the bottom wedge.

Member Spotlight

Thank You New Members

Since 2005, NANOOS has grown to over 40 members. In the past year, NANOOS has added 10 new members: WA Dept. of Fish and Wildlife, Northwest Aquatic and Marine Educators (NAME); Seattle Aquarium; NOAA's Northwest Marine Fisheries Service Center; Olympic Coast National Marine Sanctuary; Pacific Ocean Shelf Tracking Project (POST), Portland State University; University of Victoria and Victoria Experimental Network Under the Sea (VENUS) Program; and Port Gamble S'Klallam Tribe.

Port Gamble S'Klallam Tribe

Located on the northern tip of the Kitsap Peninsula in Washington State east of Hood Canal, the Port Gamble S'Klallam Tribe is active in both finfish and shellfish fisheries. Paul McCollum, Director of Natural Resources Administration for the tribe, oversees environmental protection and the management of programs designed to preserve and enhance Tribal natural resources. McCollum's goal over the next few years is to contribute to NANOOS by "… offering our expert staff for various projects, assistance with partnerships and grants, and possibly one or two high-tech ocean observation buoys [including a] system deployed from the Hood Canal bridge."

Happenings

New Ocean Observing Assets Funded

The Murdock Charitable Trust has given $500K to the University of Washington for Drs. Newton, Alford, Devol, and Martin to build ocean-observing assets (surface and profiling buoys and subsurface glider) off the coast of Washington, near La Push. Studies will include coastal dynamics, hypoxia, HABs, and ocean acidification. Murdock made a similar award recently to the CMOP center for sensor enhancements on the SATURN observing network proposed by Dr. Baptista at Oregon Health & Science University, also part of NANOOS.

New Staff

Sarah Mikulak, recent graduate of Oregon State University's Marine Resource Management master's program, has joined the NANOOS Education and Outreach team. Mikulak will focus on education in informal settings.

CERF Conference in November

The Coastal and Estuarine Research Federation Biennial Conference will be held on 1-5 November in Portland, OR. The theme of this national conference is "Estuaries and Coasts in a Changing World." Numerous NANOOS members will be presenting in various sessions.

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