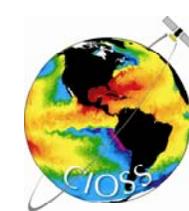
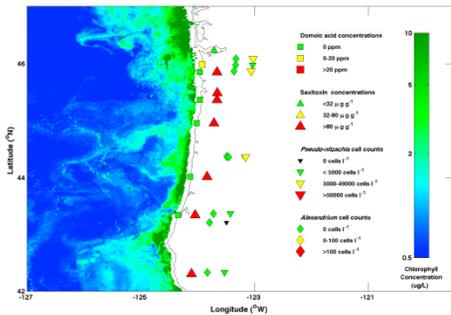


How do we use satellite data to see the ocean?



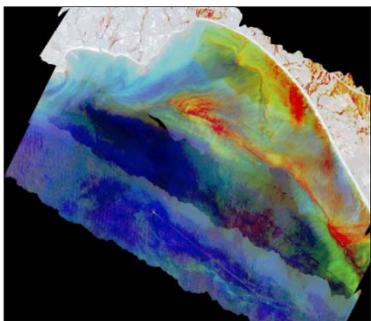
Harmful Algal Blooms (HABs)

Maps of satellite-based chlorophyll can identify and track blooms. Coastal and ship-based samples determine if the bloom is toxic. Circulation models can help predict bloom migration.



This satellite map of chlorophyll (darker green indicates more productive waters) is shown with toxin (domoic acid) and phytoplankton cell density data from coastal samples. Symbols are offset eastward for clarity.

Hyperspectral data can be used to identify, monitor and model HABs, river plumes, oil spills and other features that affect coastal water quality.



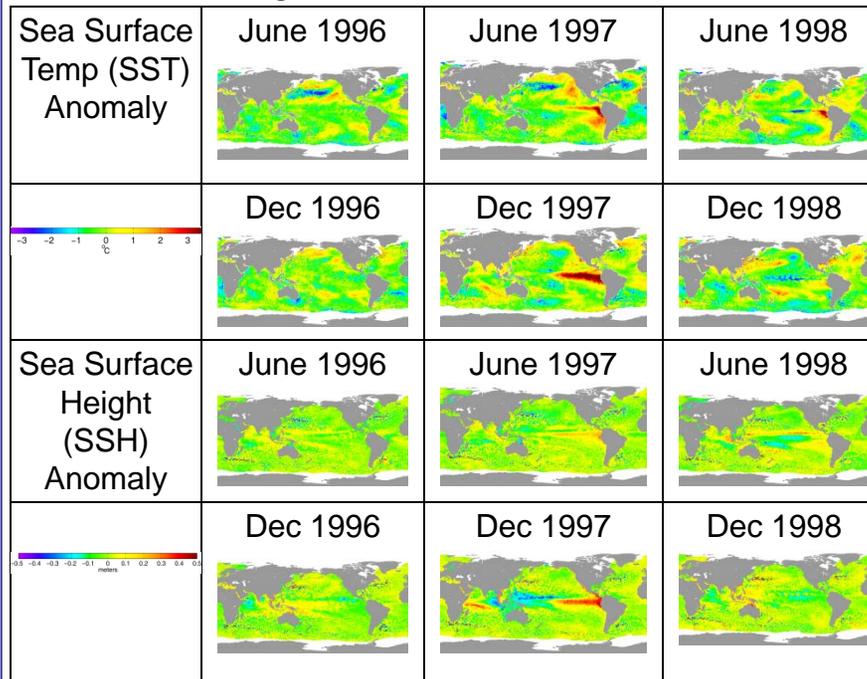
El Niño – SST changes

Southward winds during the Oregon summer cause the upwelling of cold, nutrient-rich water that sustains large fish populations. These winds reverse directions in the winter and cause warmer waters to come close to shore.

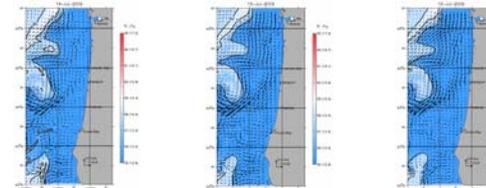
During El Niño years, upwelled water along the west coast of South America is warmer and carries less nutrients, which has important implications for fish populations. Some of these effects extend to Oregon in 1997. NOAA has just declared an El Niño to be starting and underway as of July 1, 2009.

Below, SST and SSH anomalies show what the ocean looks like when the normal seasonal cycle is removed for the 1997 El Niño.

Warmer SST = Higher SSH.



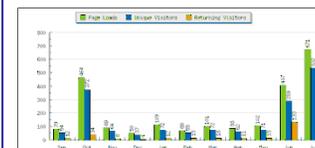
Ocean Temperature & Current Predictions from Models



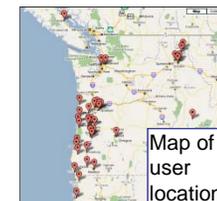
Tuesday Wednesday Thursday

SST and sea surface current for 7/14/09 – 7/16/09, derived from the CIOSS real-time pilot coastal ocean model. This real-time product is tailored to meet the needs of Oregon's recreational tuna fishing community and is published at <http://www.nanoos.org> daily. Tuna prefer water warmer than 58°F, so fishermen in Coos Bay plan their trips to conserve fuel, based on maps such as this.

OR fisherman Ron Seip says in an October 2008 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."



NANOOS tuna model – number of hits from September 2008 to July 2009.



Map of user location

