



# Pacific Northwest Harmful Algal Blooms Bulletin

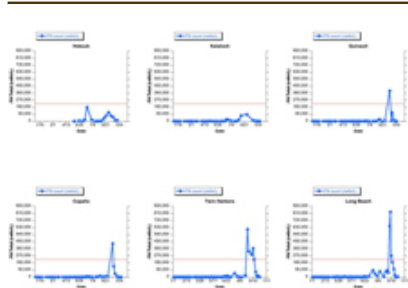
October 14, 2011



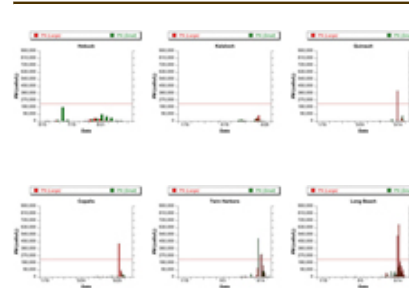
## ORHAB Sample Sites



## Pseudo-nitzschia Totals

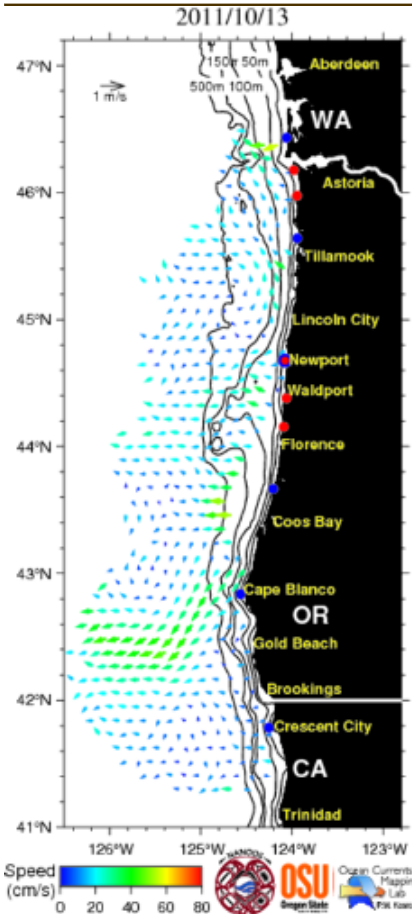


## Pseudo-nitzschia Species

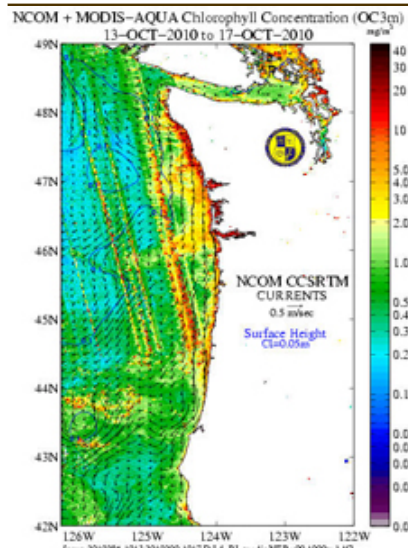


*Pseudo-nitzschia* (PN) totals are identified by light microscopy and grouped by PN Large and PN Small. The 50k cells/L threshold level for large PN that triggers toxin testing is indicated by a red line across the PN plots. (The trigger for toxin testing for small PN is 1 million cells/L)

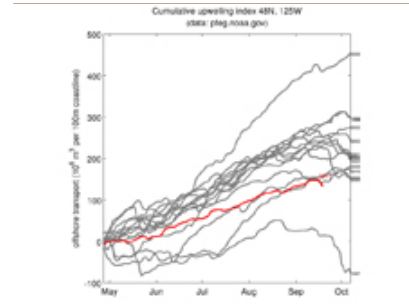
## Surface Currents



## Surface Currents and Chl-a



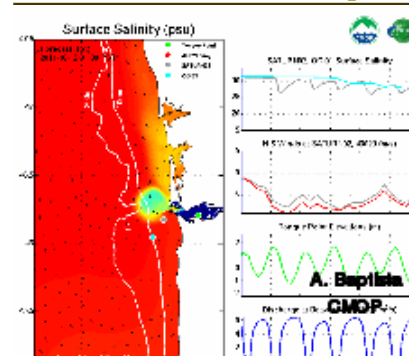
## 09/22/2011 Cumulative Upwelling



**Summary** – *Pseudo-nitzschia* spp. cell counts have decreased significantly in recent weeks. The highest cell counts in the most recent samples were found at Long Beach on 10/10 at 4000 cells/L of the small cell type. No other HAB species were observed in recent samples. DA levels in razor clams are < 2 ppm along the outer WA coast. PST levels remain elevated in razor clams at Twin Harbors at 61 µg/100g on 10/10, and in CA mussels at La Push Second Beach at 52 µg/100g on 9/29. *Attheya armatus* is dominant coast-wide with *Asterionellopsis socialis* the predominant species in the surf zone.

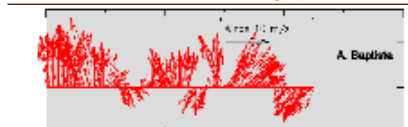
The summertime upwelling system has begun to break down over the past two weeks, following a series of fall storms. Currents in surface layers will likely have switched to northward during the storms, although they have now returned to southward. Toxic cells that might have resided within the eddy two weeks ago would likely have been transported northward along the Vancouver Island coast. A strong coastal plume from the Columbia likely extended along the coast, possibly providing some protection from onshore bloom transport.

## Columbia River Model Output



**Forecast:** Weather patterns over the next few days suggest that good weather has returned - winds will be primarily from the north in the next few days. However, there is insufficient time for new blooms to develop and become toxic prior to the razor clam dig scheduled for this weekend. Moreover, expected surface currents are likely to send any nearshore blooms AWAY from the coast rather than ONSHORE onto the beaches (see Columbia model figure).

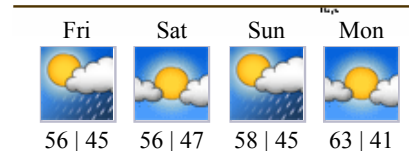
## Winds - NDBC Buoy 46029



## Columbia River Discharge



## Weather Forecast - Ocean Shores



Condition is green.