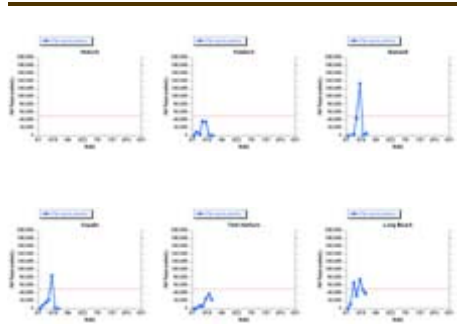


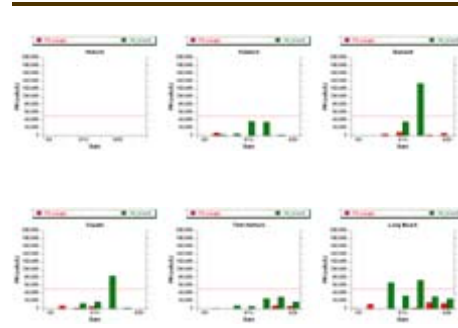
## ORHAB Sample Sites



## Pseudo-nitzschia Totals



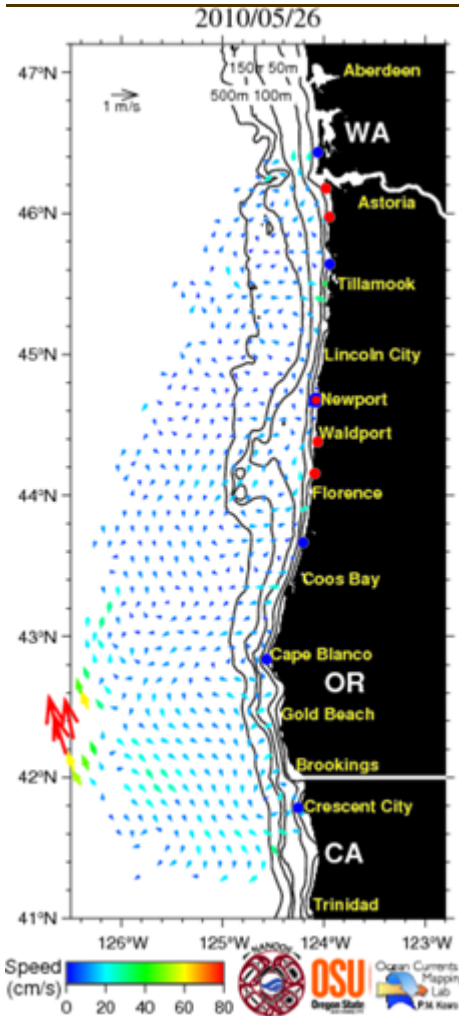
## Pseudo-nitzschia Species



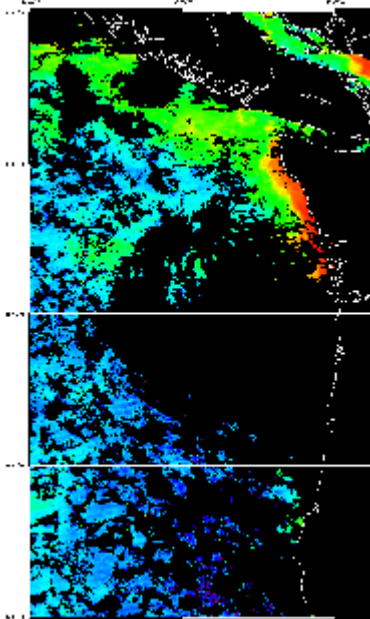
*Pseudo-nitzschia* (PN) totals are identified by light microscopy and grouped by PN Large and PN Small. The 50k cells/L threshold level for large PN that triggers toxin testing is indicated by a red line across the PN plots. (The trigger for toxin testing for small PN is 1 million cells/L)

**Summary** – The recent PN spp. (small cell type) bloom in the outer WA coast surf zone has largely disappeared. The highest cell count in the most recent samples is 39,000 cells/L at Long Beach on 5/24 and is comprised of 2/3 small cell type and 1/3 large cell type. DA levels in razor clam tissue remain extremely low. WDOH reports the highest DA level found in razor clam tissue is 2ppm at MocRocks Beach on 5/10. *Alexandrium* spp. have been spotted in samples from Long Beach, MocRocks, and Kalaloch, all of which were 2000 cells/L in the most recent 10x whole water samples. PSP is elevated in razor clams from the Willapa Spits dropping from 74 µg/100g tissue on 5/4 to 57 µg/100g tissue on 5/10 and in CA mussels from La Push, Second Beach at 50 µg/100g tissue on 5/4. *Dinophysis* spp. have also been detected recently in ORHAB samples from the central WA coast. Cell counts were 1000 cells/L *D. acuminata* at Kalaloch, and 1000 cells/L of *D. fortii* at Copalis and MocRocks on 5/25. *Attheya armatus* and *Asterionellopsis* spp. are dominant in the surf zone along the southern and central Washington coast.

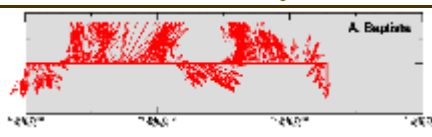
## Surface Currents



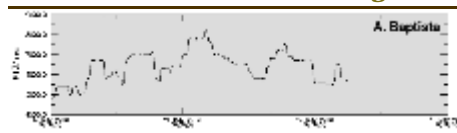
## Chlorophyll-a



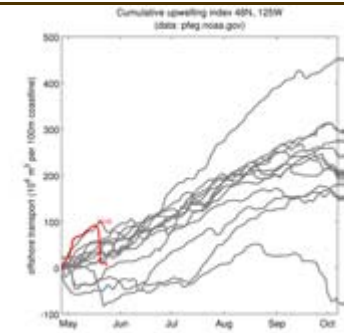
## Winds - NDBC Buoy 46029



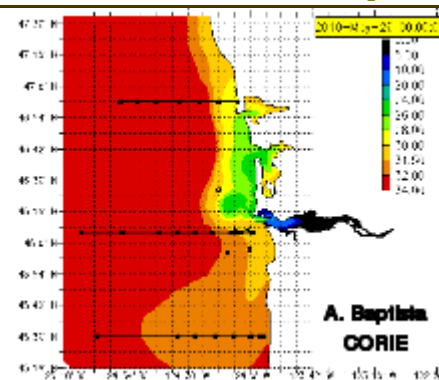
## Columbia River Discharge



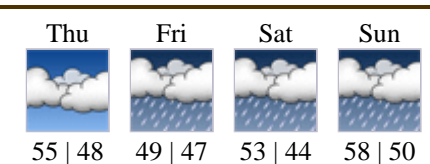
## Cumulative Upwelling Index



## Columbia River Model Output



## Weather Forecast - Ocean Shores



Recent weeks have been characterized by northward, downwelling-favorable winds, interrupted by brief upwelling-favorable wind events. As a result, model results show the Columbia river plume extending northward over the inner shelf of Washington. Because the climatological upwelling season has only been underway for a month, the Juan de Fuca eddy is likely not present or weak. On May 21, satellite-derived chlorophyll-a was high near the coast, but not high along the rim of the eddy region as is typical during late summer. Surface currents over the outer shelf are weak, not strongly southward as during late summer.

**Forecast** – This upcoming week, northward winds are forecast to resume on Sunday. The likelihood of toxic cells, originating from the Juan de Fuca eddy region, arriving on Washington beaches is low.