



Pacific Northwest Harmful Algal Blooms Bulletin

Apr 21, 2025 HAB risk =

HAB risk key:

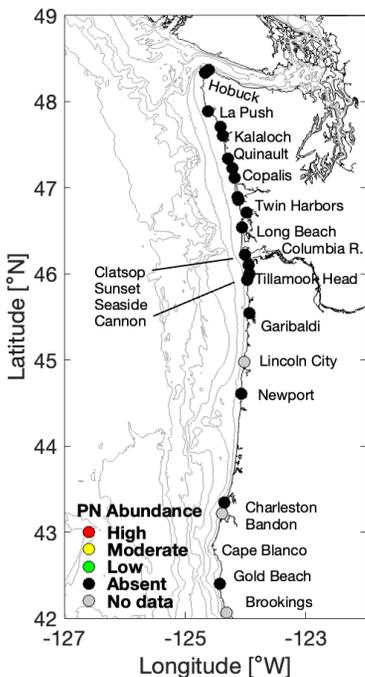
- = low
- = medium
- = high



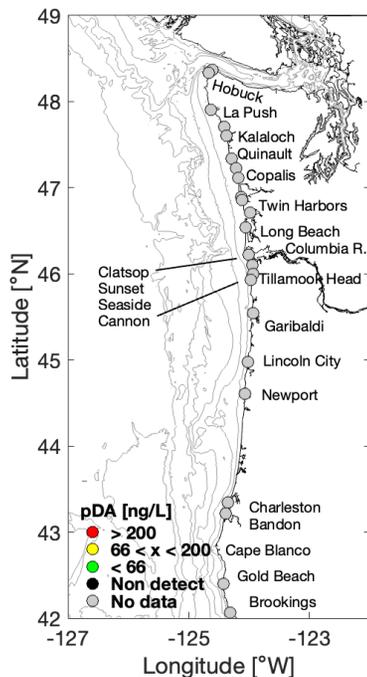
The statements, findings, conclusions, and recommendations do not necessarily reflect the views of NOAA or the Department of Commerce.

Beach Sampling

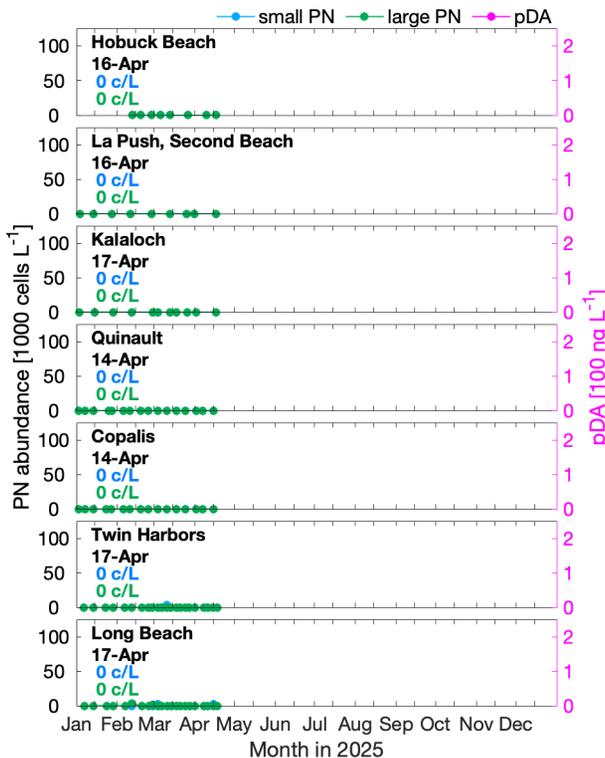
(*Pseudo-nitzschia*)



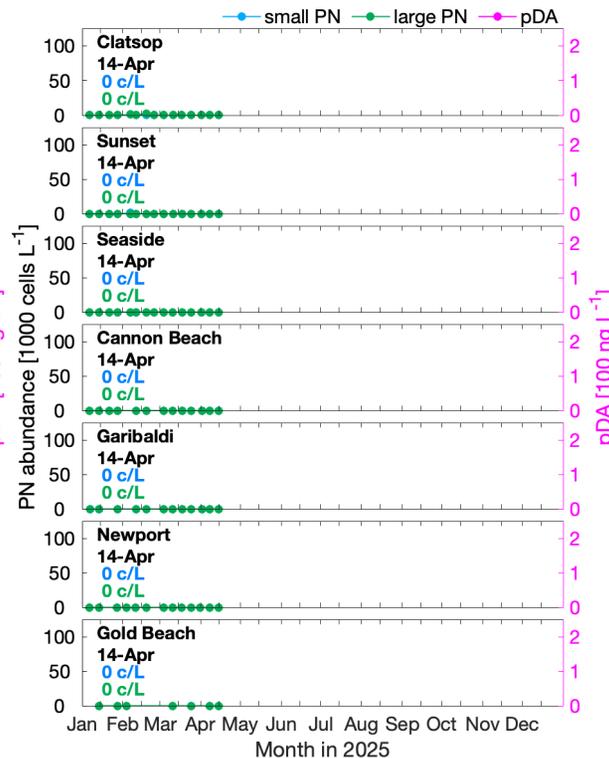
(particulate domoic acid)



WA *Pseudo-nitzschia* & Domoic Acid

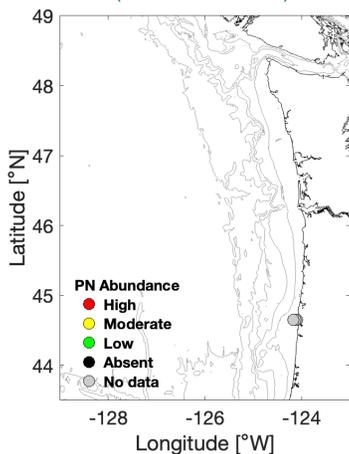


OR *Pseudo-nitzschia* & Domoic Acid

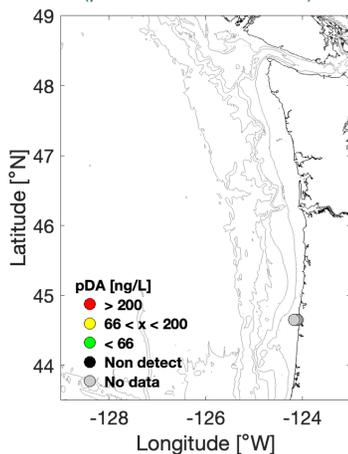


Offshore Sampling

(*Pseudo-nitzschia*)



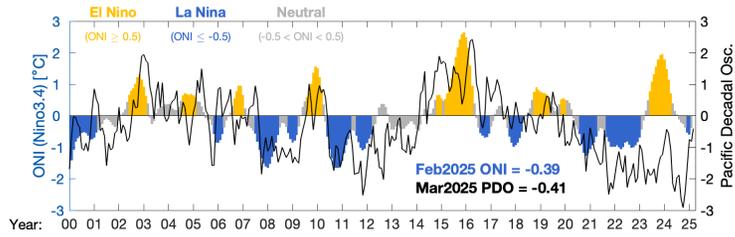
(particulate domoic acid)



Pseudo-nitzschia (PN) abundances are quantified for large and small cell morphologies using light microscopy. Threshold values: 50,000 cells/L for large PN; 1,000,000 cells/L for small PN; which trigger additional testing for seawater particulate domoic acid (pDA). Seawater pDA values >200 ng/L lead to toxin accumulation in shellfish such as razor clams. Sampling sites, colored by relative PN abundance (*high*: > threshold value for either cell morphology; *moderate*: > 1/3 threshold; *low*: < 1/3 threshold) and pDA, are shown in the upper left two panels. “No data” indicates that there were no data within the previous 15 days. Time series of PN abundance (cells per liter = c/L) and pDA at select beaches are shown in the upper right main two panels. Offshore samples (lower left) are collected and analyzed at ~2 week intervals during late summer/early fall. Additional samples are collected by a remotely operated Environmental Sample Processor (ESP) that is moored off La Push, WA, in late spring and late summer.

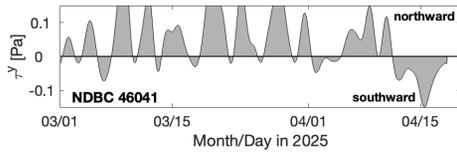
Decisions regarding shellfish harvest closures at individual beaches are made by the Washington Department of Health, the Oregon Department of Agriculture, and Coastal Treaty Tribes after measuring toxin levels in shellfish collected from each beach (WA [link](#); OR [link](#)), and not from the information presented here. However, the information presented here aids coastal managers in better understanding and predicting the onset, duration, and magnitude of toxin outbreaks as well as their impacts.

Pacific Ocean Indices



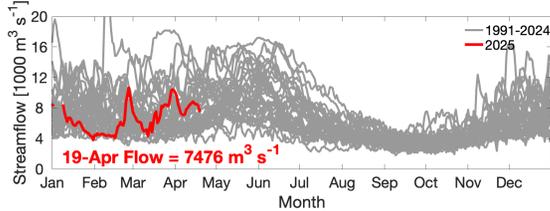
Research has shown that toxic HAB events off WA and OR tend to occur during or following periods of El Niño and/or positive phases of the PDO, when ocean temperatures are relatively warm.

North-south Wind Stress



Southward wind stress drives coastal upwelling that can lead to plankton blooms. Northward wind stress tends to push any existing offshore plankton and toxins towards beaches. In addition, summer/fall toxic blooms often occur in years with a moderate cumulative upwelling index (i.e. during years with fluctuating winds) rather than in years with sustained upwelling or downwelling winds.

Columbia River Discharge



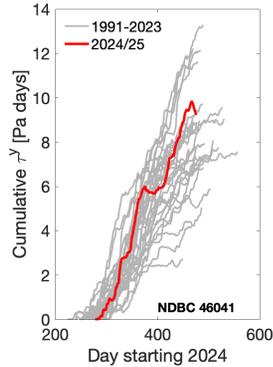
The Columbia River plume can help transport HABs and toxins from the south, northward along the WA coast. However, the plume can also serve as a protective barrier by preventing offshore toxins from reaching beaches.

Marine Weather Forecast



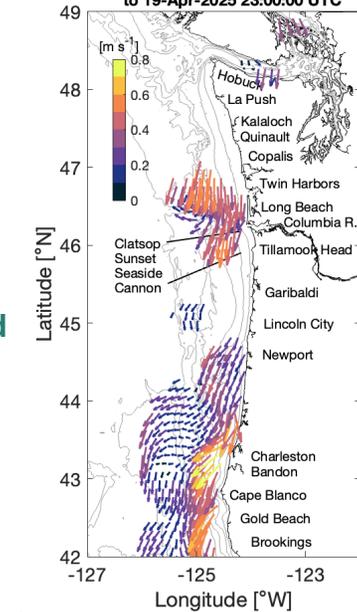
Fair weather can support plankton blooms whereas storms can concentrate any plankton and toxins on beaches.

Cumulative Wind Stress



Ocean Surface Currents

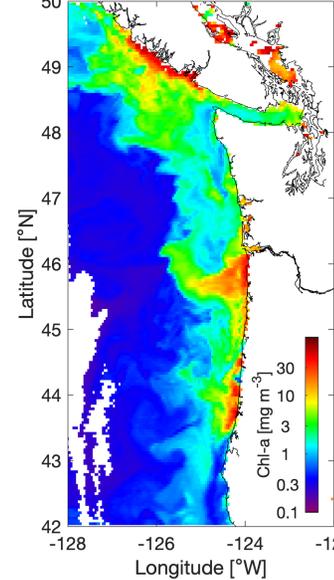
25hr mean: 18-Apr-2025 23:00:00 to 19-Apr-2025 23:00:00 UTC



Primary currents flow north and south in winter and summer, respectively, except within ~10 km of shore, where fluctuations follow changes in wind direction.

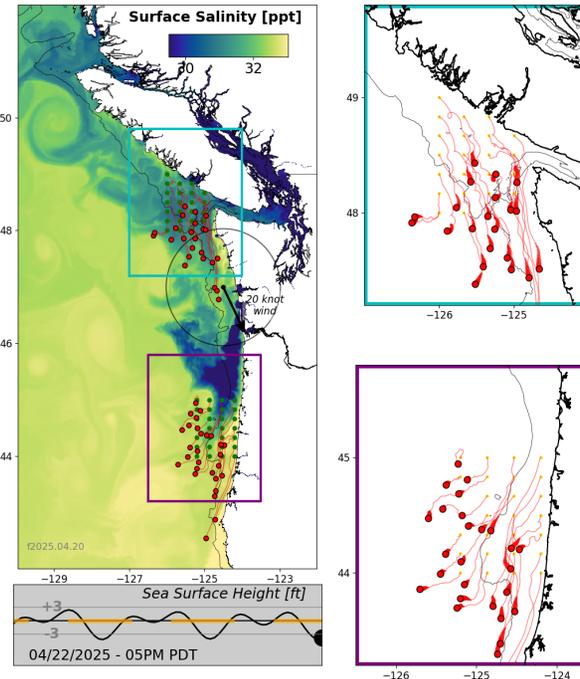
Satellite Chlorophyll-a

JPSS1 VIIRS 17-Apr-2025



Clouds often obstruct satellite views, but the extent of phytoplankton blooms can at times be seen from space. Blooms do not necessarily reflect the presence of toxins.

LiveOcean Forecast Model



Model predicted sea surface salinity with particles released near the Juan de Fuca eddy and Heceta Bank and tracked three days into the future. Red dots indicate particle end points.

Summary - After a front passed through the region over a week ago, winds all along the coast turned primarily southward and have remained so since. Ocean surface currents now flow south over the shelf, and mid shelf bottom temperature is $<8^\circ\text{C}$ off both WA and OR. According to the LiveOcean model, Columbia River plume water resides off OR. In other words, the spring transition to seasonal large-scale upwelling is well underway. Recent satellite images confirm increased chlorophyll-a concentrations off both WA and OR, with highest recent values off northern and central OR and comparatively low values off northern WA. With the steady upwelling-favorable winds over the last week, *Pseudo-nitzschia* (PN) cells have not yet appeared in large concentrations at beaches. The only site with PN in recent samples was Long Beach, WA, where 2,000 cells/L of small morphology PN were observed on 14-Apr; all other sampled locations throughout WA and OR contained no PN. No recent offshore samples were available and with the lack of PN cells, seawater particulate domoic acid (pDA) has not yet been quantified at beaches or offshore. Razor clam DA values have remained low throughout WA as of 14-Apr, with highest concentrations of 2 ppm from Quinalt, Mocrocks, Twin Harbors, and Long Beach, WA. In OR, DA in razor clams from Sunset Beach was below detection limits on 18-Apr. Razor clams from Newport Agate Beach (33 ppm) and Coos Bay North Jetty (37 ppm) were still well above harvest closure limits as of 18-Apr, a remnant from the 2024 toxic bloom.

Forecast - Conditions are currently ENSO neutral and are expected to remain so through summer. The PDO index has decreased to a relatively weak, but still negative, value. Predominantly upwelling-favorable winds are expected through Thursday. By Friday, forecasts suggest that a low-pressure system will result in northward winds off OR and WA that could last through Saturday. Longer-term forecasts indicate a return to upwelling-favorable winds the following week. No currently available data indicate elevated risk of a HAB, and the likelihood of highly toxic PN existing offshore, after the recent period of persistent upwelling-favorable conditions, appears low. The forecast northward winds (Fri-Sat) will certainly push plankton and any toxins shoreward, so toxicity of any PN could likely be confirmed from samples collected early the following week if PN remain absent at beaches prior to then.