



Pacific Northwest Harmful Algal Blooms Bulletin

Nov 7, 2024 HAB risk =

HAB risk key:

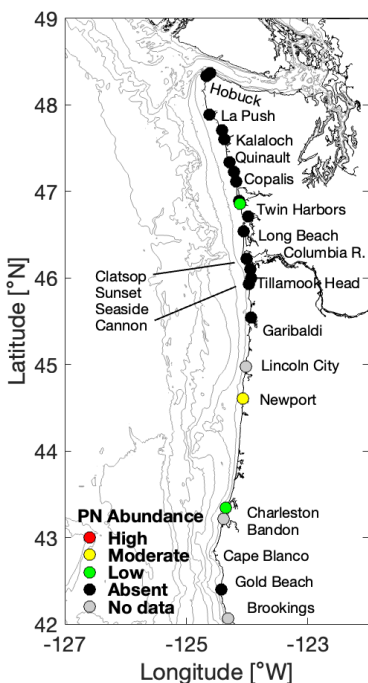
- = low
- = medium
- = high



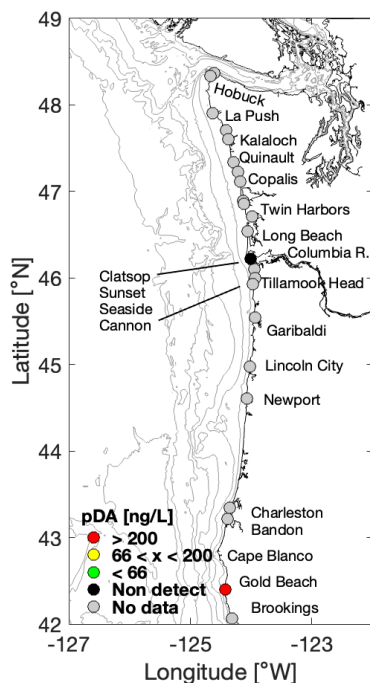
The statements, findings, conclusions, and recommendations do not necessarily reflect the views of NOAA or the Department of Commerce.

Beach Sampling

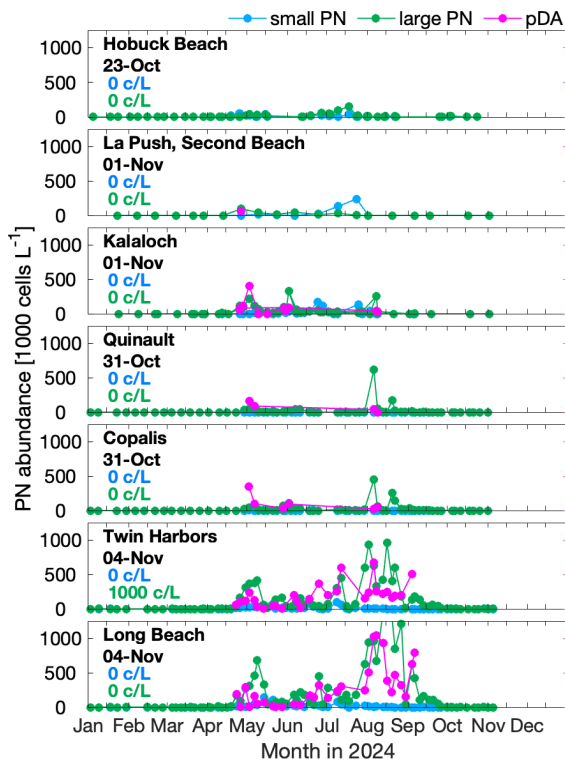
(*Pseudo-nitzschia*)



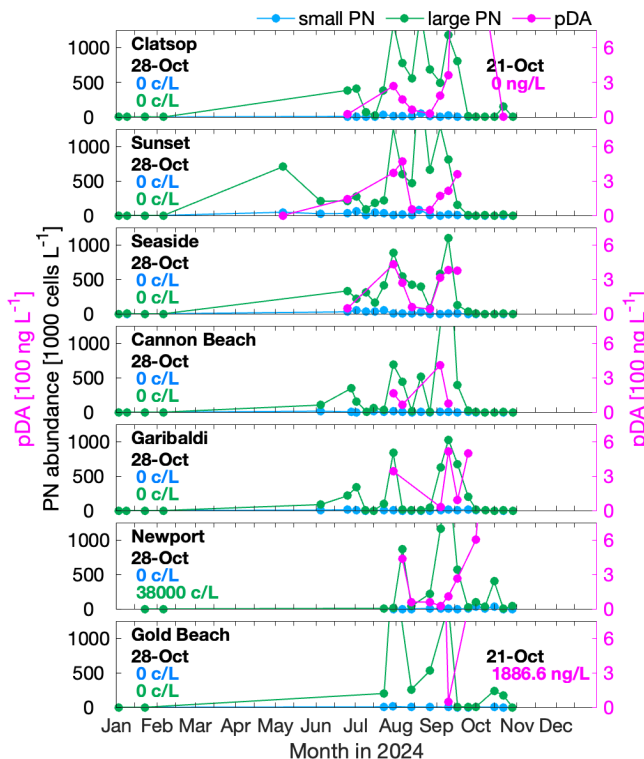
(particulate domoic acid)



WA *Pseudo-nitzschia* & Domoic Acid

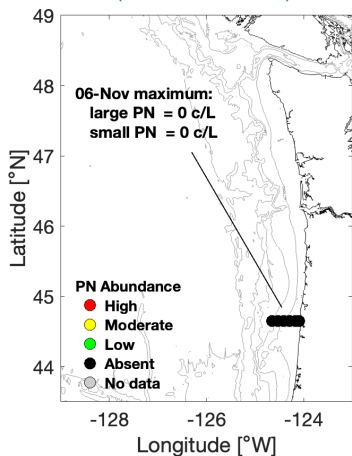


OR *Pseudo-nitzschia* & Domoic Acid

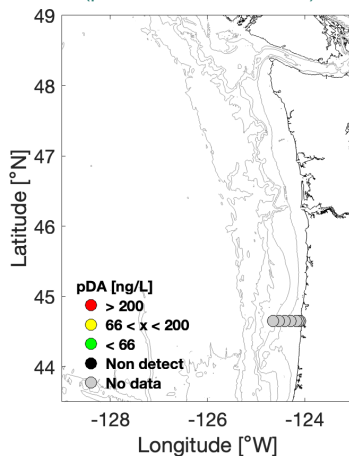


Offshore Sampling

(*Pseudo-nitzschia*)



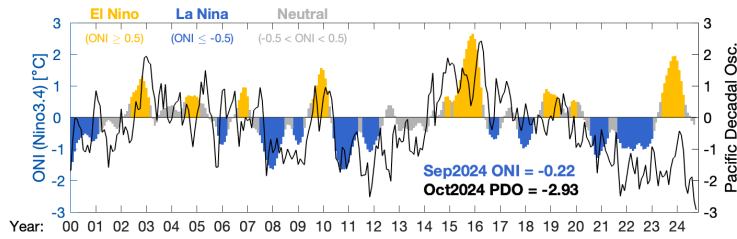
(particulate domoic acid)



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.

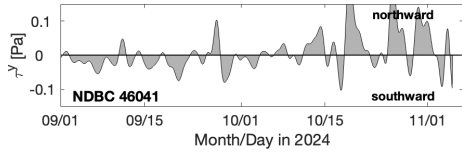
Decisions regarding shellfish harvest closures at individual beaches are made by the Washington Department of Health, the Oregon Department of Agriculture, and Coastal Treaty Tribes after measuring toxin levels in shellfish collected from each beach (WA [link](#); OR [link](#)), and not from the information 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



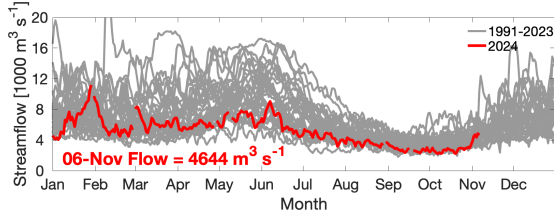
Research has shown that toxic HAB events off WA and OR tend to occur during or following periods of El Niño and/or positive phases of the PDO, when ocean temperatures are relatively warm.

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



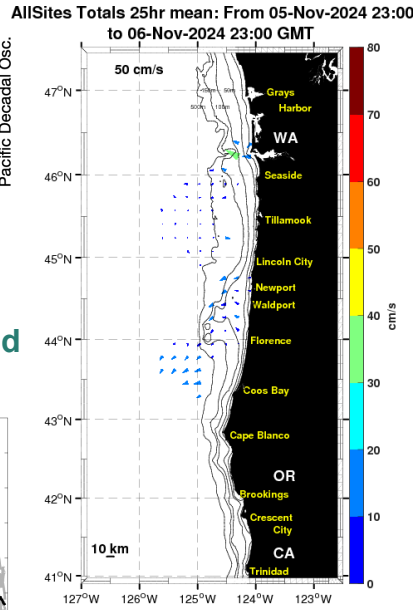
The Columbia River plume can help transport HABs and toxins from the south, northward along the WA coast. However, the plume can also serve as a protective barrier by preventing offshore toxins from reaching beaches.

Marine Weather Forecast



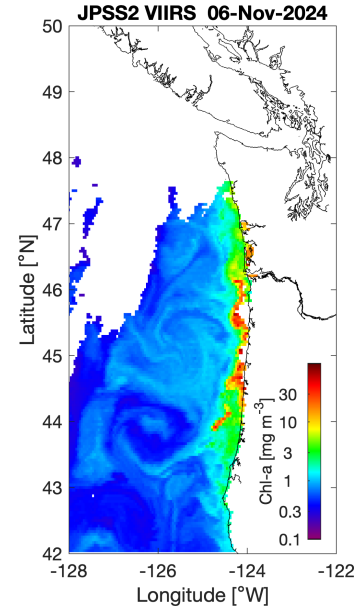
Fair weather can support plankton blooms whereas storms can concentrate any plankton and toxins on beaches.

Ocean Surface Currents



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

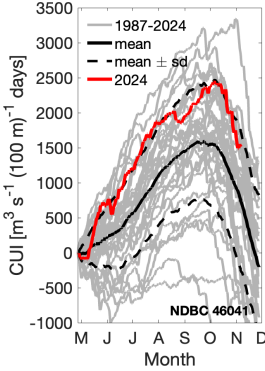


Clouds often obstruct satellite views, but the extent of phytoplankton blooms can at times be seen from space. Blooms do not necessarily reflect the presence of toxins.

Summary - The latter half of October was marked by the onset of storms with strong northward winds, initiating the transition to fall. Columbia River outflow has increased, and according to the LiveOcean model, the majority of plume water now extends along the WA coast. Despite this, near surface ocean currents remain relatively weak and shelf bottom temperatures are still somewhat cool. Additional storms will be required to fully transition the coastal ocean to its winter state. Clear satellite images have been sparse. Images from late Oct indicate moderate chlorophyll-a concentrations nearshore with high values just south of Newport, OR. Images from 6-Nov show elevated values in northern OR. Recent *Pseudo-nitzschia* (*PN*) cell concentrations have been low at beaches. Highest values in WA were only 1,000 cells/L of large size *PN* at Twin Harbors on 4-Nov. Samples from OR beaches also contained few to no *PN* on 28-Oct, the exception being Newport (38,000 cells/L large *PN*), consistent with satellites. Given the low *PN* concentrations, few seawater particulate domoic acid (pDA) samples have been analyzed. *PN* concentrations were higher the week prior (21-Oct) at OR beaches, with elevated pDA (1887 ng/L) detected at Gold Beach, OR. Particulate DA was below detection limits at the Columbia River South Jetty site on 21-Oct, despite *PN* concentrations of 151,000 cells/L. No *PN* were detected offshore of northern WA on 23-Oct, or offshore of Newport, OR, on 6-Nov. Razor clam DA concentrations in WA remain low, ≤4 ppm as of 21-Oct at central and southern WA beaches. In OR, razor clam DA exceeded the regulatory limit at Coos Bay North Jetty (52 ppm) and Newport Agate Beach (45 ppm) on 25-Oct. Sunset Beach razor clam DA fell from 16 ppm on 20-Sep to 12 ppm on 25-Oct.

Forecast - Conditions remain ENSO-neutral. A weak La Niña is forecast to develop imminently and is expected to persist through Feb. The PDO is strongly negative. A series of storms will inundate the region into next week. Weak northward winds will strengthen as a front approaches Friday and passes Saturday. Stronger storms with northward winds are forecast to arrive Sunday and Wednesday. Any plankton and toxins will certainly get pushed onshore and northward during these events, though forecast high seas (>12 ft) might help to dissipate any such aggregations. Since recent observations have shown high DA impacting southern OR, risk during this period is moderate there, but otherwise appears low.

Cumulative Wind Stress



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.

LiveOcean Forecast Model

