



Pacific Northwest Harmful Algal Blooms Bulletin

Sep 13, 2024 HAB risk =

HAB risk key:

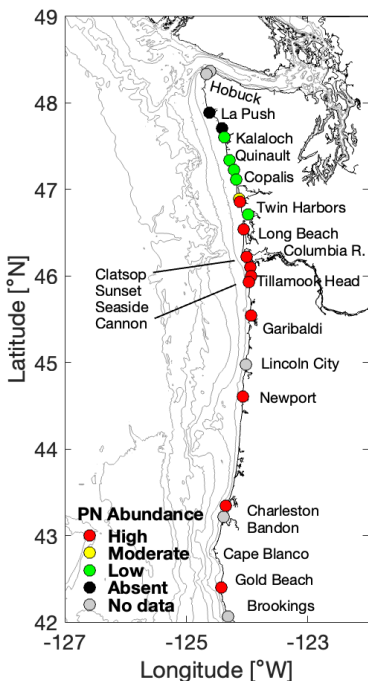
- = low
- = medium
- = high



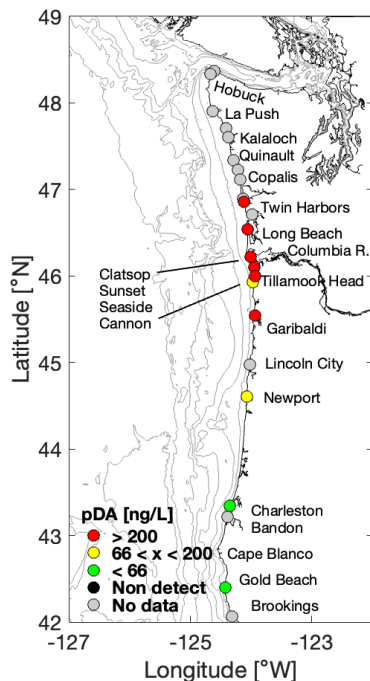
The statements, findings, conclusions, and recommendations do not necessarily reflect the views of NOAA or the Department of Commerce.

Beach Sampling

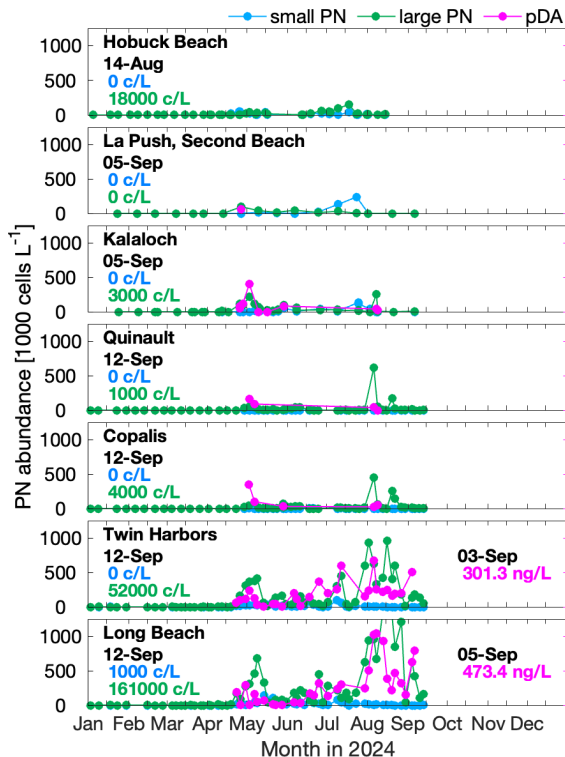
(*Pseudo-nitzschia*)



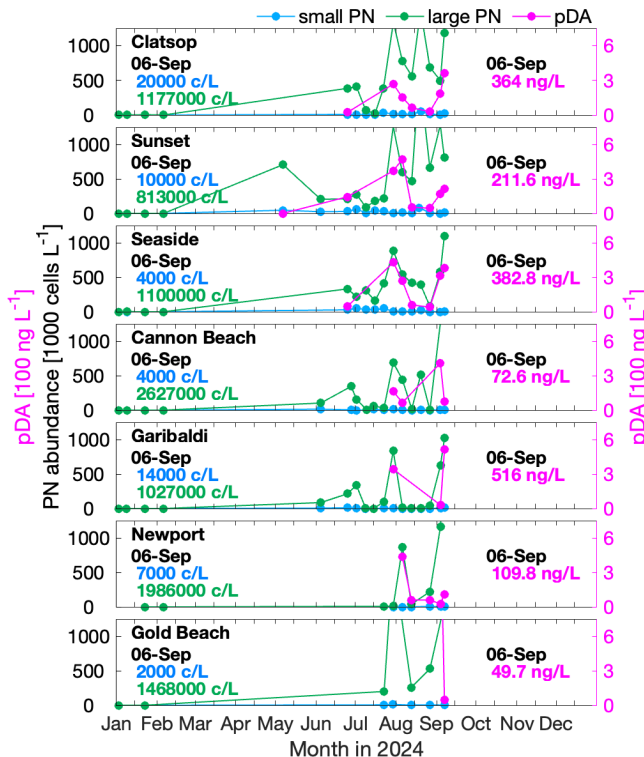
(particulate domoic acid)



WA *Pseudo-nitzschia* & Domoic Acid

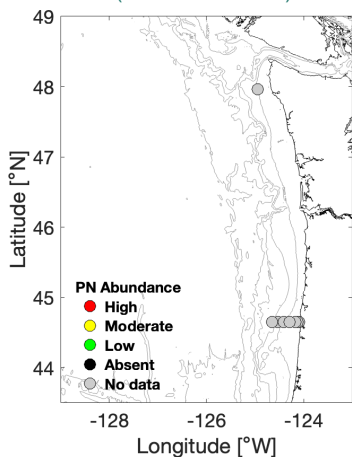


OR *Pseudo-nitzschia* & Domoic Acid

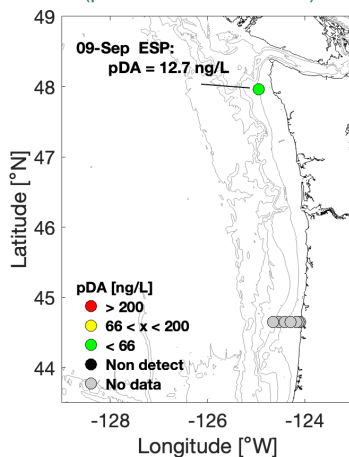


Offshore Sampling

(*Pseudo-nitzschia*)



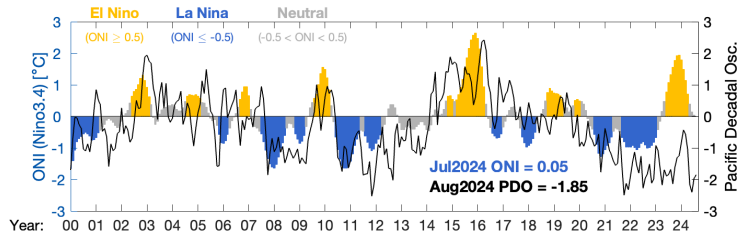
(particulate domoic acid)



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.

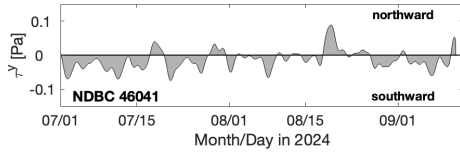
Decisions regarding shellfish harvest closures at individual beaches are made by the Washington Department of Health, the Oregon Department of Agriculture, and Coastal Treaty Tribes after measuring toxin levels in shellfish collected from each beach (WA link; OR link), and not from the information presented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



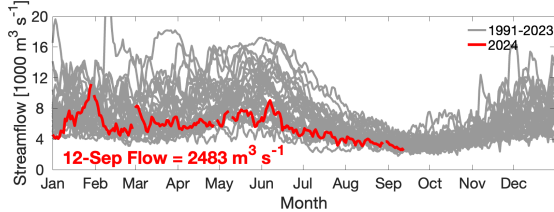
Research has shown that toxic HAB events off WA and OR tend to occur during or following periods of El Niño and/or positive phases of the PDO, when ocean temperatures are relatively warm.

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



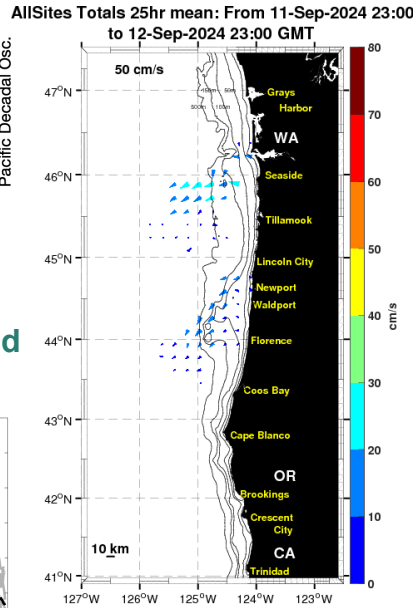
The Columbia River plume can help transport HABs and toxins from the south, northward along the WA coast. However, the plume can also serve as a protective barrier by preventing offshore toxins from reaching beaches.

Marine Weather Forecast



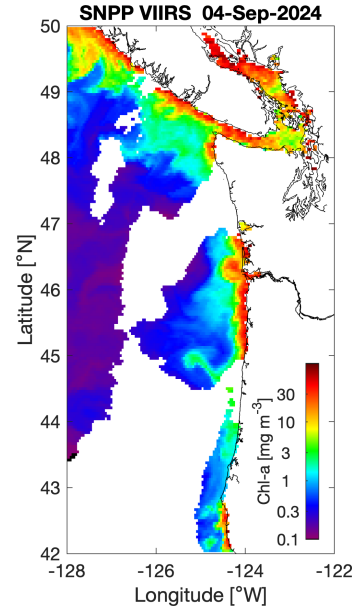
Fair weather can support plankton blooms whereas storms can concentrate any plankton and toxins on beaches.

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

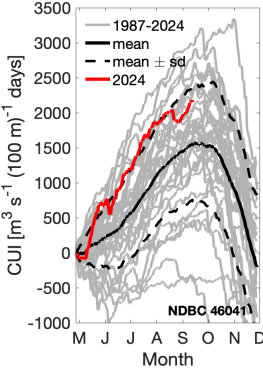


Clouds often obstruct satellite views, but the extent of phytoplankton blooms can at times be seen from space. Blooms do not necessarily reflect the presence of toxins.

Summary - Upwelling-favorable winds resumed over the past few weeks. Shelf bottom temperatures remain cold, but have started to warm as the fall transition approaches. Columbia River plume water is positioned off northern OR and southern WA. Recent satellite images have provided only fragmented views, but chlorophyll has been highest along the southern WA / northern OR coast, and along the southernmost OR and northernmost WA shores. *Pseudo-nitzschia* (PN) concentrations generally decreased at WA beaches in concert with the upwelling-favorable winds. Highest concentrations have been in southern WA (Long Beach: 161,000 cells/L large PN on 12-Sep). In OR, large PN concentrations were much higher, >1,000,000 cells/L at most sampling sites on 6-Sep. Seawater particulate domoic acid (pDA) concentrations have been somewhat variable at OR beaches: values ranging from 200–500 ng/L were recorded along the northern coast, while samples from other beaches were <75 ng/L; Gold Beach pDA values were extremely high on 26-Aug (5969 ng/L), but decreased to 50 ng/L on 6-Sep. In WA, samples from Long Beach and Twin Harbors had recent increases in pDA concentrations to >300 ng/L as of 3-Sep. Low pDA has been intermittently detected at the ESP mooring off northern WA (12.7 ng/L on 8-Sep). As of 6-Sep, Gold Beach, OR razor clams were well over regulatory DA limits (430 ppm), as were mussels (24 ppm), suggesting an ongoing toxic event. Otherwise, the highest recent OR razor clam DA values were at Seaside (7.6 ppm). WA razor clams were ≤5 ppm at Quinalt, Mocrocks, Copalis, and Twin Harbors as of 12-Sep.

Forecast - Conditions are currently ENSO-neutral. La Niña is favored to develop before year's end. The PDO remains strongly negative. Southward winds (upwelling-favorable) generally dominate the forecast. The winds are not particularly strong and will vary from southward to onshore and back. The exception is Tuesday when a storm arrives with northward winds. That system is expected to pass quickly and winds should return to upwelling-favorable, but cells and any toxins could get pushed shoreward and northward as the front moves toward shore. Since pDA has recently increased at many beaches to levels at which we expect accumulation in shellfish tissue, we do recommend diligence in monitoring pDA concentrations throughout the following harvest period. Risk appears high in OR. In central WA, risk appears moderate.

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

