



Pacific Northwest Harmful Algal Blooms Bulletin

May 20, 2024 HAB risk =

HAB risk key:

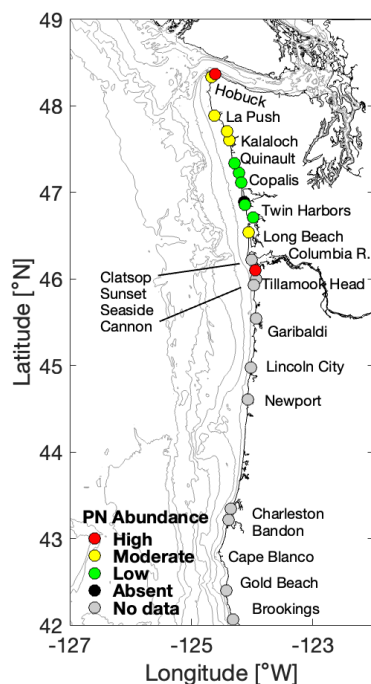
- = low
- = medium
- = high



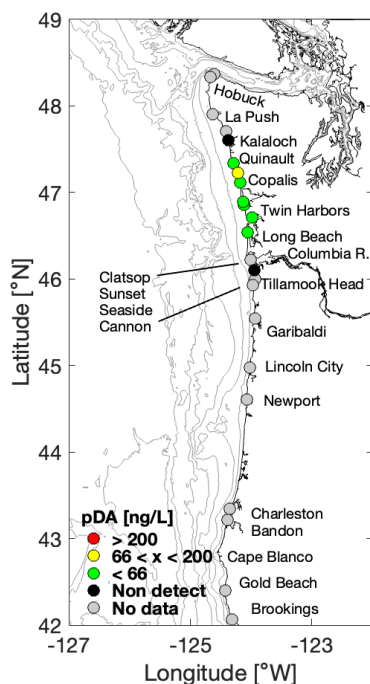
The statements, findings, conclusions, and recommendations do not necessarily reflect the views of NOAA or the Department of Commerce.

Beach Sampling

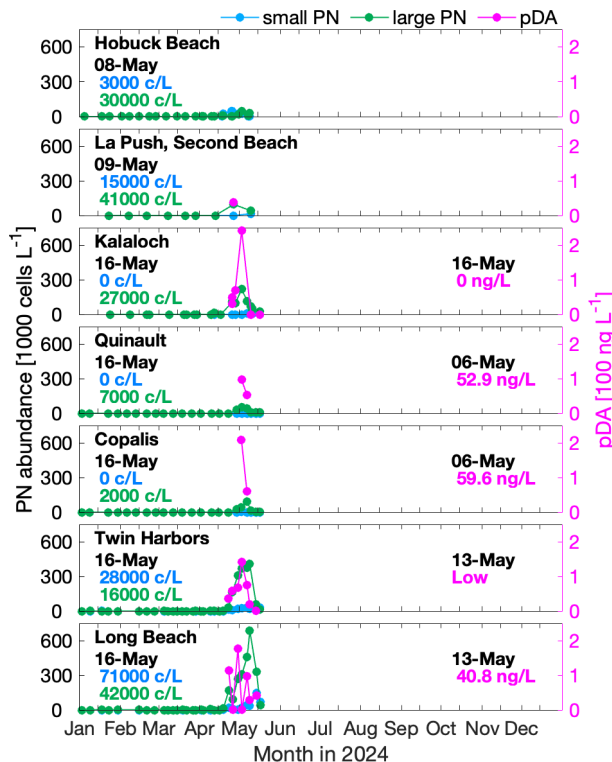
(*Pseudo-nitzschia*)



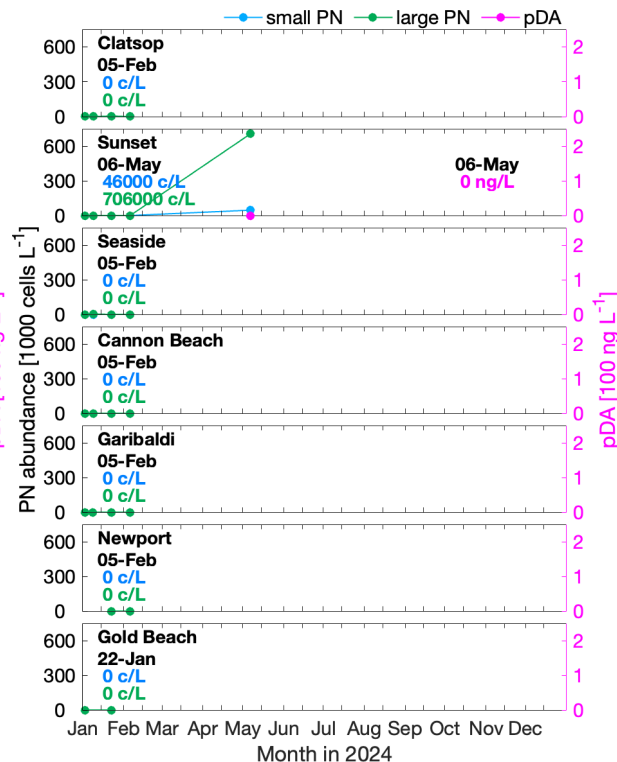
(particulate domoic acid)



WA *Pseudo-nitzschia* & Domoic Acid

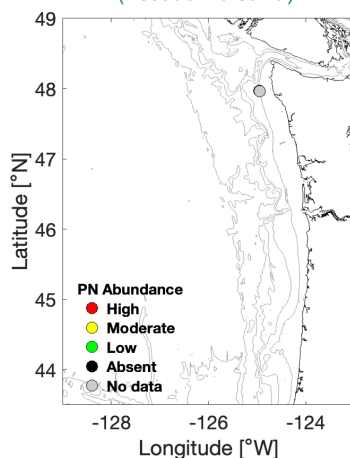


OR *Pseudo-nitzschia* & Domoic Acid

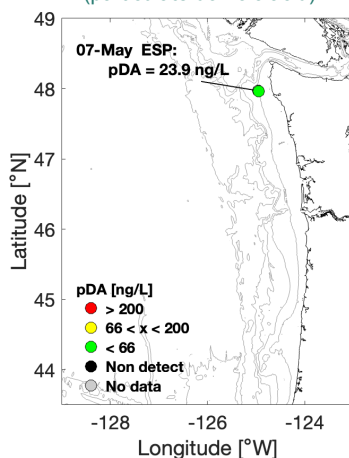


Offshore Sampling

(*Pseudo-nitzschia*)



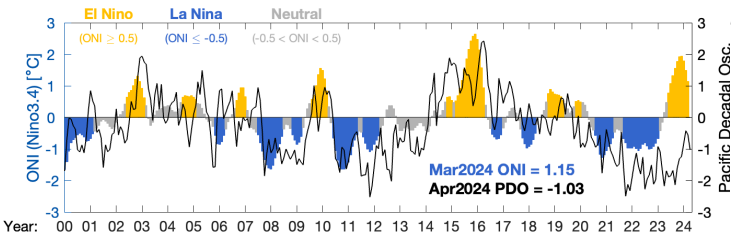
(particulate domoic acid)



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.

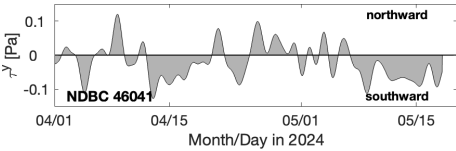
Decisions regarding shellfish harvest closures at individual beaches are made by the Washington Department of Health, the Oregon Department of Agriculture, and Coastal Treaty Tribes after measuring toxin levels in shellfish collected from each beach ([WA link](#); [OR link](#)), and not from the information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



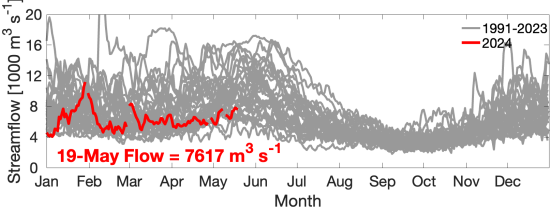
Research has shown that toxic HAB events off WA and OR tend to occur during or following periods of El Niño and/or positive phases of the PDO, when ocean temperatures are relatively warm.

North-south Wind Stress



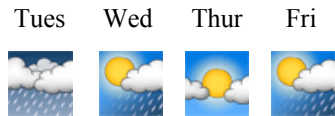
Southward wind stress drives coastal upwelling that can lead to plankton blooms. Northward wind stress tends to push any existing offshore plankton and toxins towards beaches. In addition, summer/fall toxic blooms often occur in years with a moderate cummulative upwelling index (i.e. during years with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

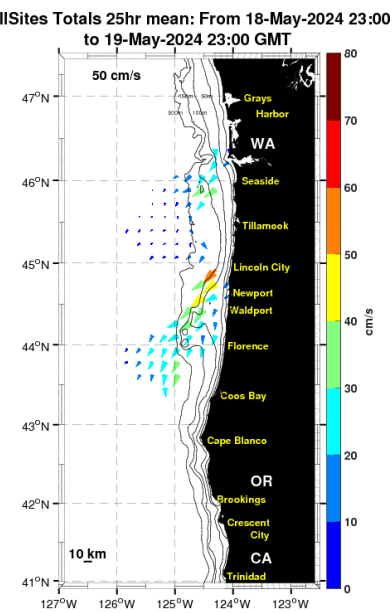
Marine Weather Forecast



Tues - SW wind, 15 kt
Wed - NW wind, 15 kt
Thur - SW wind, 10 kt
Fri - NW wind, 10 kt

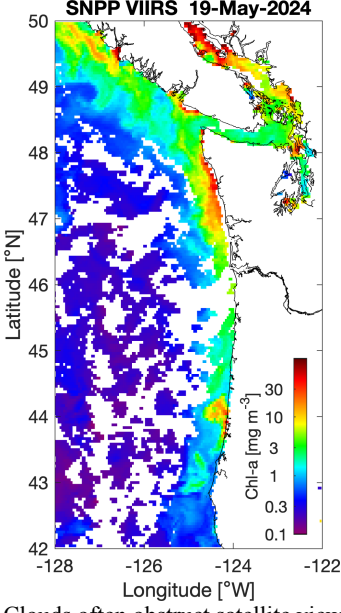
Fair weather can support plankton blooms whereas storms can concentrate any plankton and toxins on beaches.

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 persisted for the last two weeks. As a result, southward along-shelf currents, and upwelling, strengthened. Satellite images indicate highest chlorophyll-*a* concentrations exist off WA. The LiveOcean model suggests that cold, high salinity, nutrient rich water has been upwelling at the coast and that the Columbia River plume extends south off OR. The *Pseudo-nitzschia* (*PN*) bloom that peaked ~1.5–2 weeks ago at the end of the intermittent wind period, produced significant particulate domoic acid (*pDA*) concentrations that exceeded 200 ng/L at a few sites. With the recent upwelling, *PN* cell and *pDA* concentrations decreased markedly at beaches: large size *PN* that were near 700,000 cells/L on 8-May at Long Beach, WA, fell to 42,000 cells/L on 16-May. *PN* were generally in highest abundance at southern WA beaches, but elevated *pDA* was observed at locations throughout WA, from Long Beach to Kalaloch. During the past week, *pDA* was also lower where sampled: 41 ng/L at Long Beach on 13-May, and undetected at Kalaloch on 16-May. The ESP mooring off northwest WA documented 24 ng/L *pDA* on 7-May. No other offshore observations are available. Razor clam *DA* concentrations increased as a result of the toxic *PN*. Highest values (9 ppm) were found at Willapa Spits on 13-May. Samples from Twin Harbors, Copalis, Mocrocks, and Quinalt Beaches all contained 7–8 ppm as of that same date. OR razor clams had similar *DA* increases, with samples from Newport and Coos Bay sites at 9–11 ppm, and Gold Beach at 23 ppm as of 17-May.

Forecast - El Niño conditions currently exist, but neutral conditions are expected imminently. La Niña conditions are favored to develop by August. The PDO remains negative. The recent decreases in *pDA* are likely a result of wind-forced offshore motion during southward upwelling-favorable winds. *PN* and *DA* can remain viable for days. Conditions this week will revert back to intermittent upwelling punctuated by short-lived fronts with northward winds. The first front arrives Tuesday and another front arrives Thursday. The fronts are fast-moving and not particularly strong, but upwelling should relax and offshore (potentially toxic) *PN* will be forced shoreward again; onto local beaches if the winds are sufficiently strong. In the absence of specific offshore information, we recommend extreme caution and vigilance. Continued *pDA* testing during the upcoming razor clam harvest period will help to ensure safety.

LiveOcean Forecast Model

