NOAA West Watch Update
16 April 2024

NANOOS Update

Roxanne Carini, on behalf of many

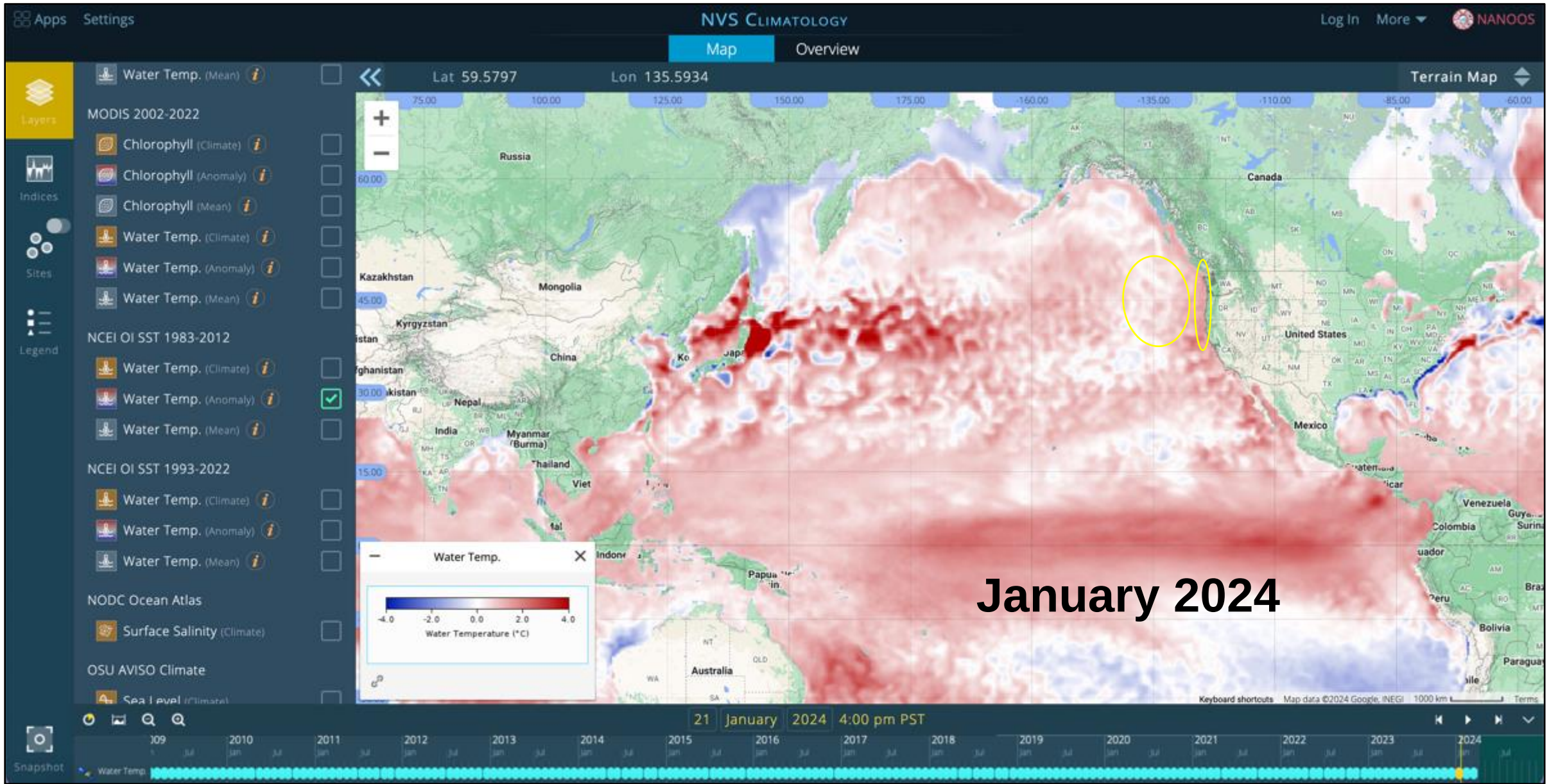
www.nanoos.org

NANOOS: www.nanoos.org *Climatology app:* https://nvs.nanoos.org/Climatology

Sea Surface Temperature Anomaly

NCEI Optimum Interpolation SST

NCEI OI SST 1983-2012



NANOOS: www.nanoos.org *Climatology app:* https://nvs.nanoos.org/Climatology

Sea Surface Temperature Anomaly

NCEI Optimum Interpolation SST

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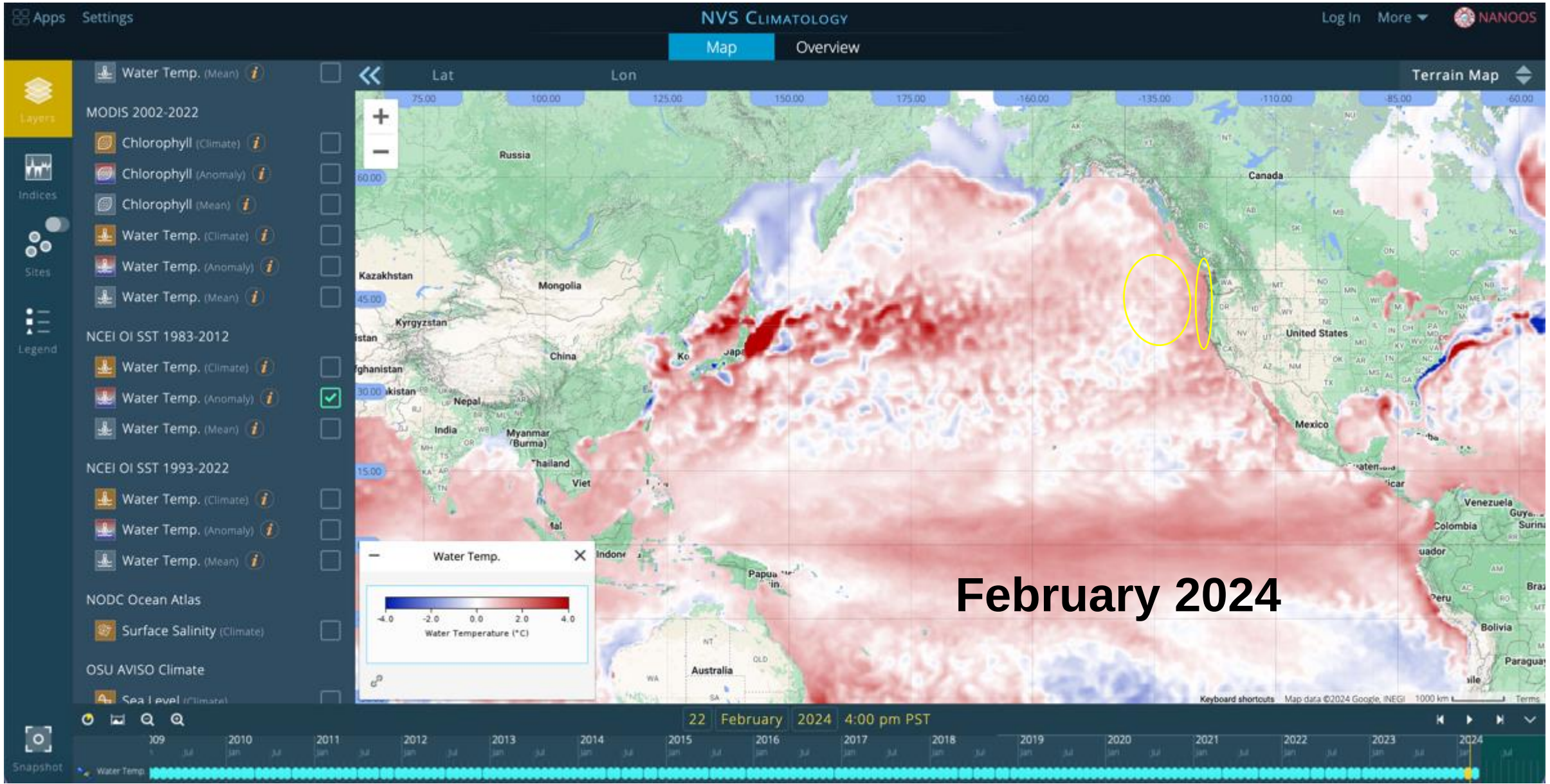

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Sea Surface Temperature Anomaly

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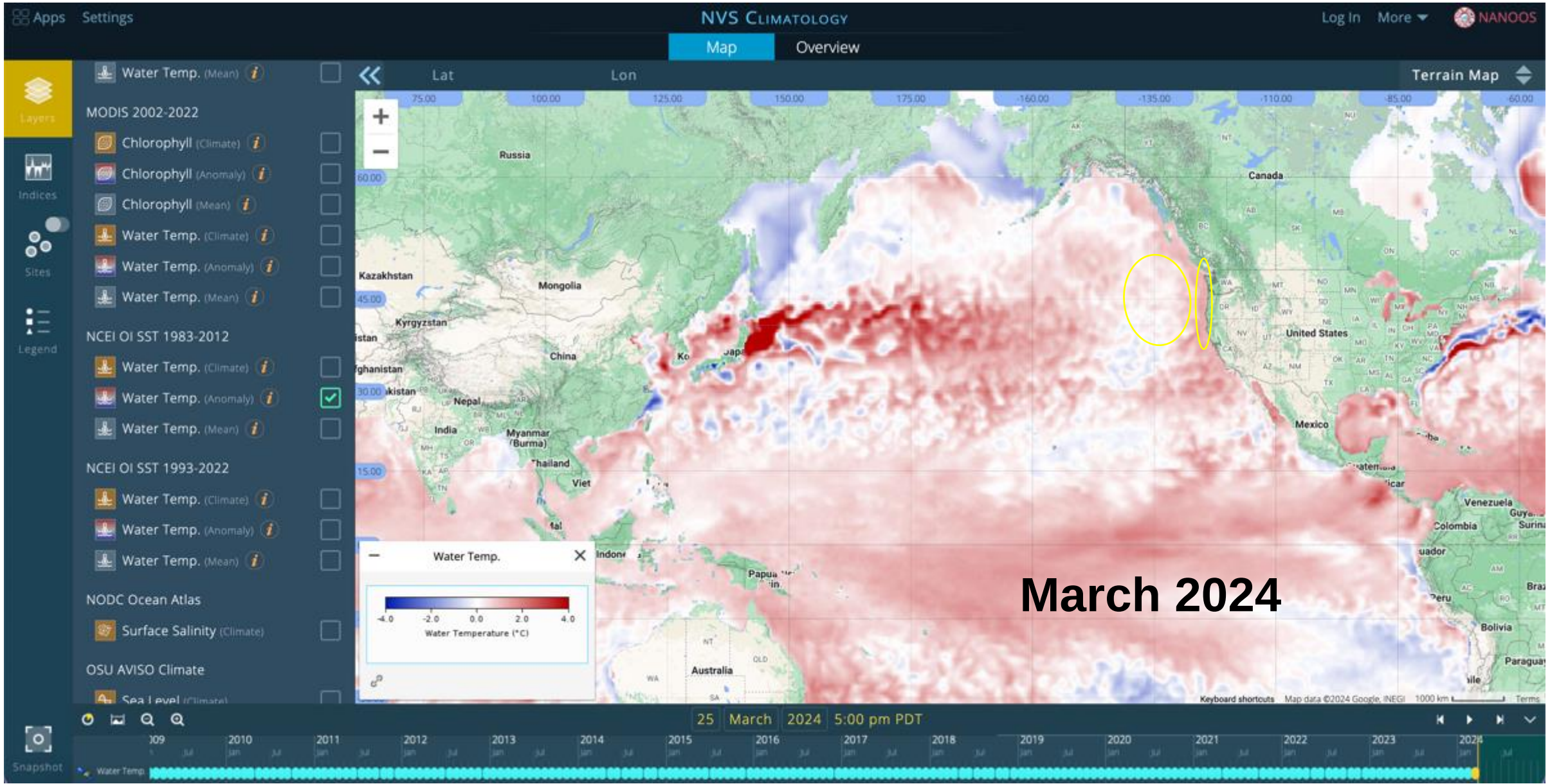
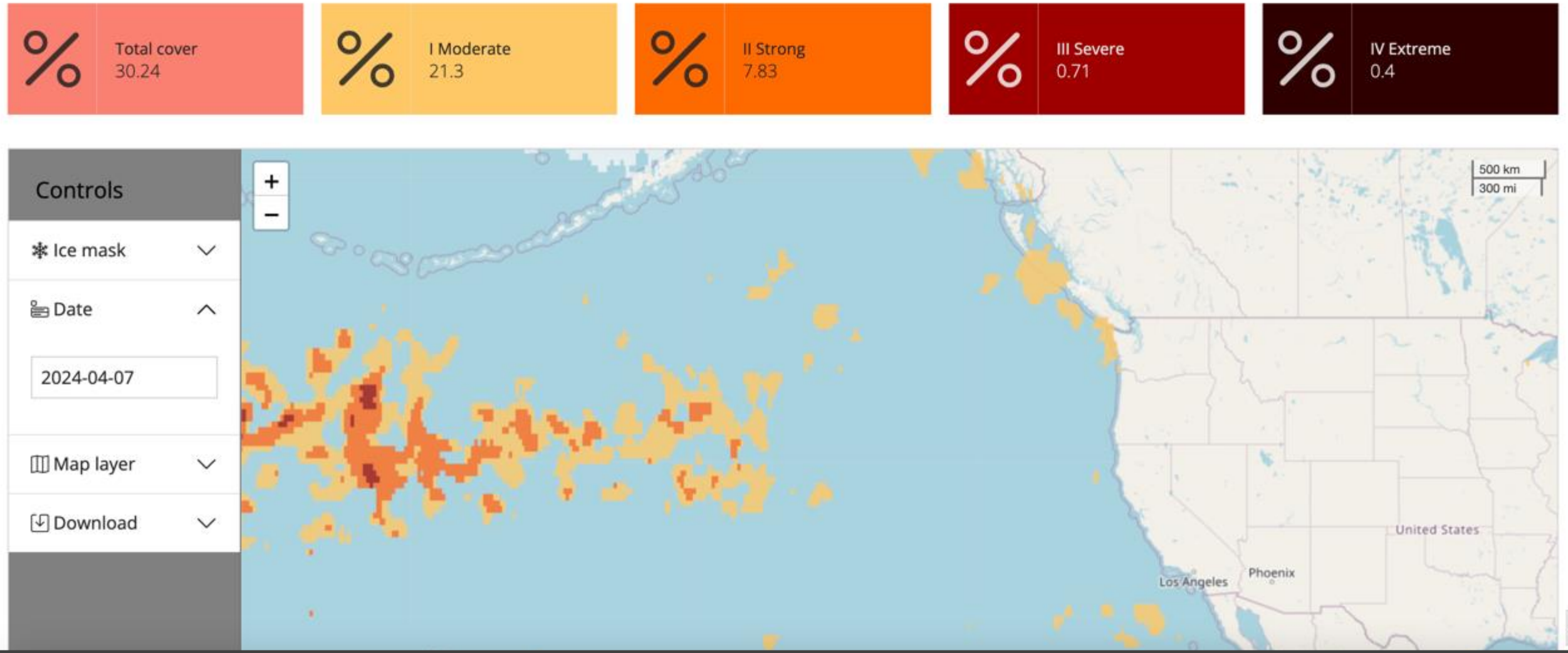


MARINE HEATWAVES International Working Group

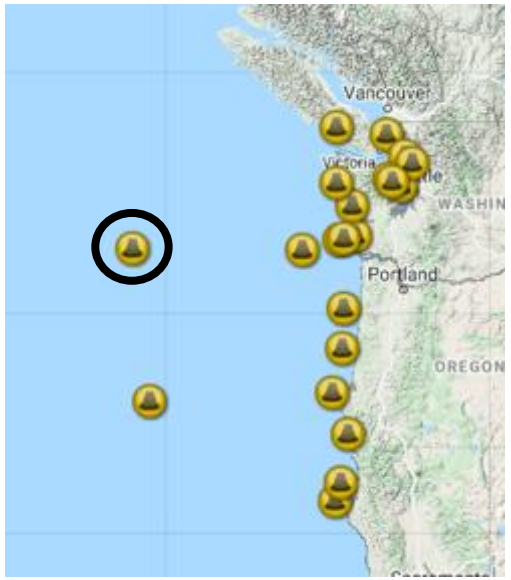


http://www.marineheatwaves.org/tracker.html

NANOOS: www.nanoos.org

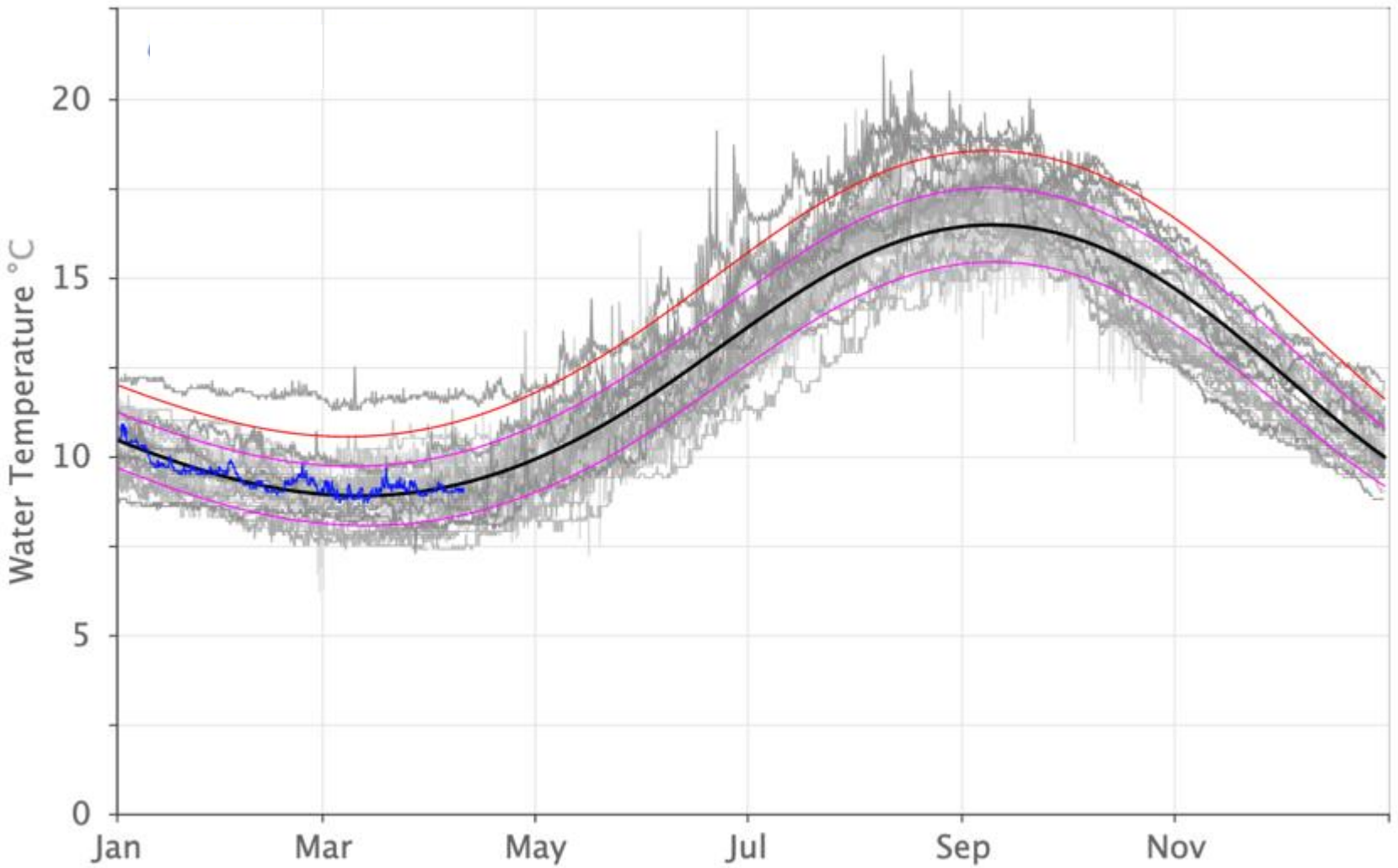
Climatology app: https://nvs.nanoos.org/Climatology

Sea Surface Temperature



Seasonal Cycle
n=45 Yrs
-1 STD
+1 STD
+2 STD
2024

NDBC Washington

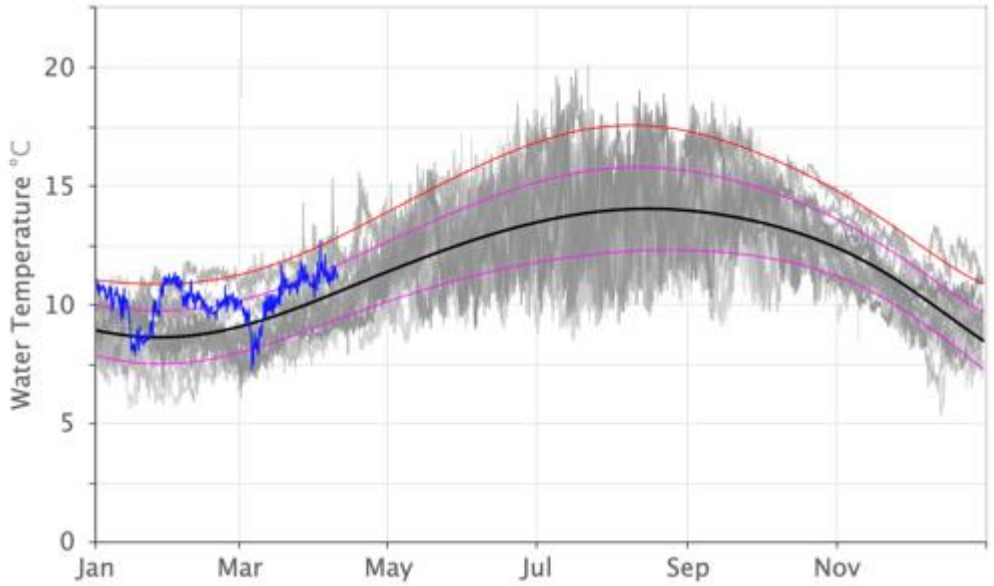


IOOS

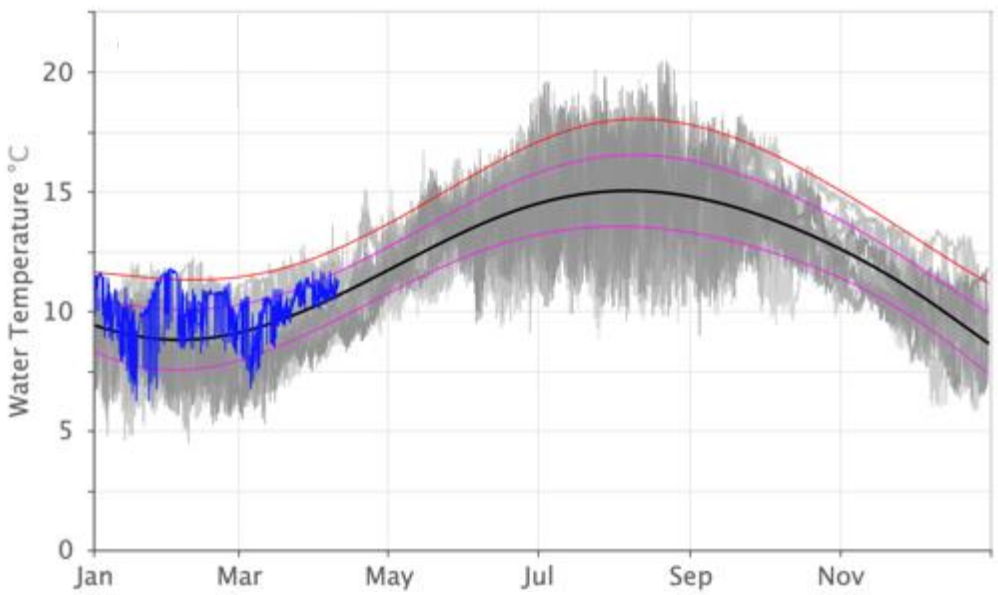
NANOOS: www.nanoos.org *Climatology app:* https://nvs.nanoos.org/Climatology

Sea Surface Temperature

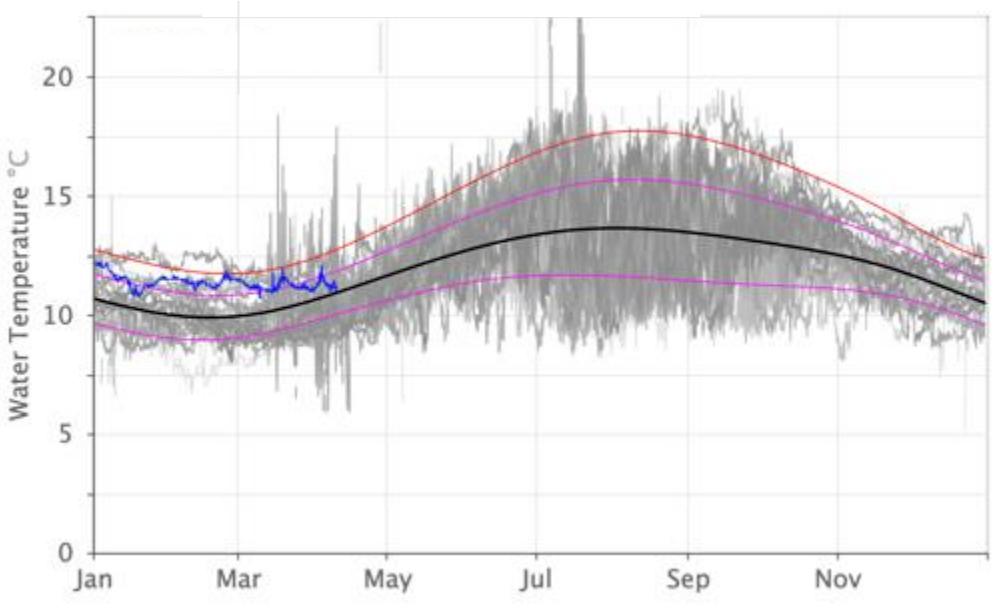
CDIP Grays Harbor ● 17 yrs



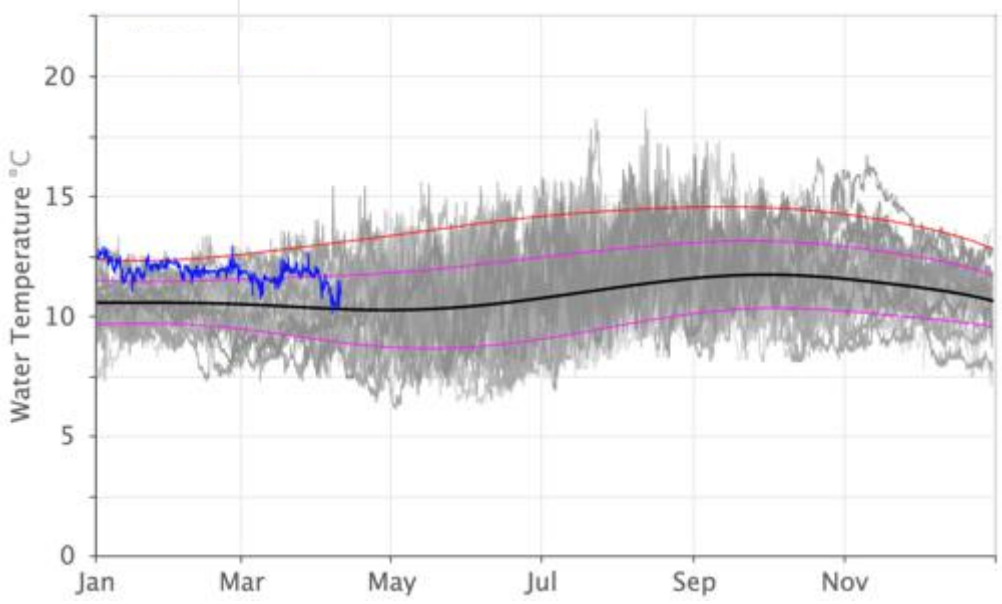
CDIP Clatsop Spit ● 12 yrs

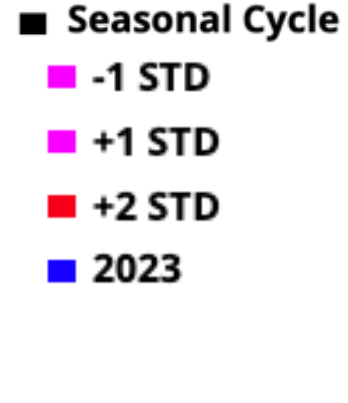


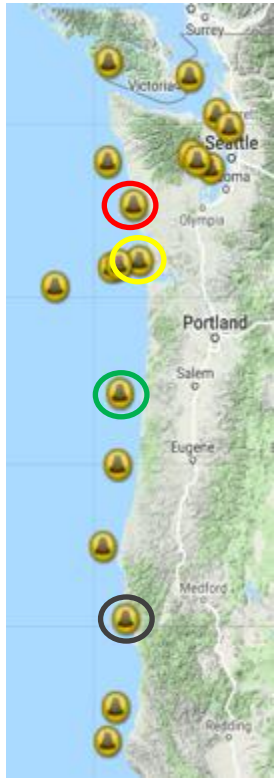
NDBC Stonewall Bank ● 34 yrs



NDBC St. Georges ● 38 yrs

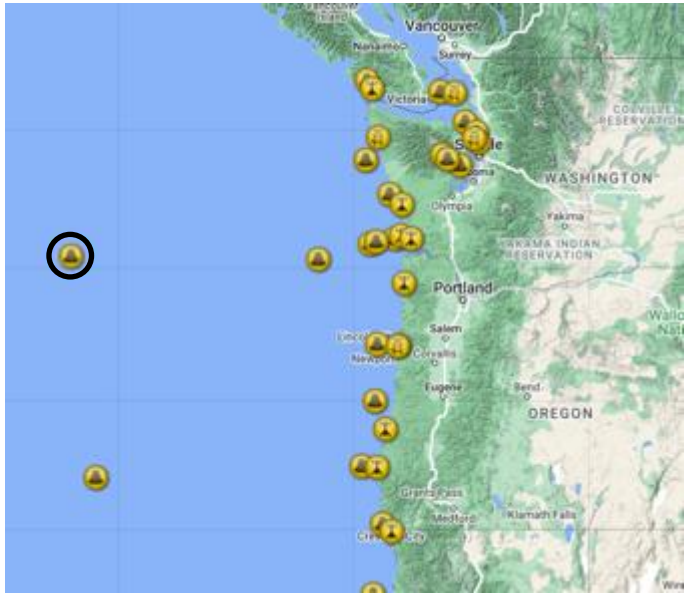


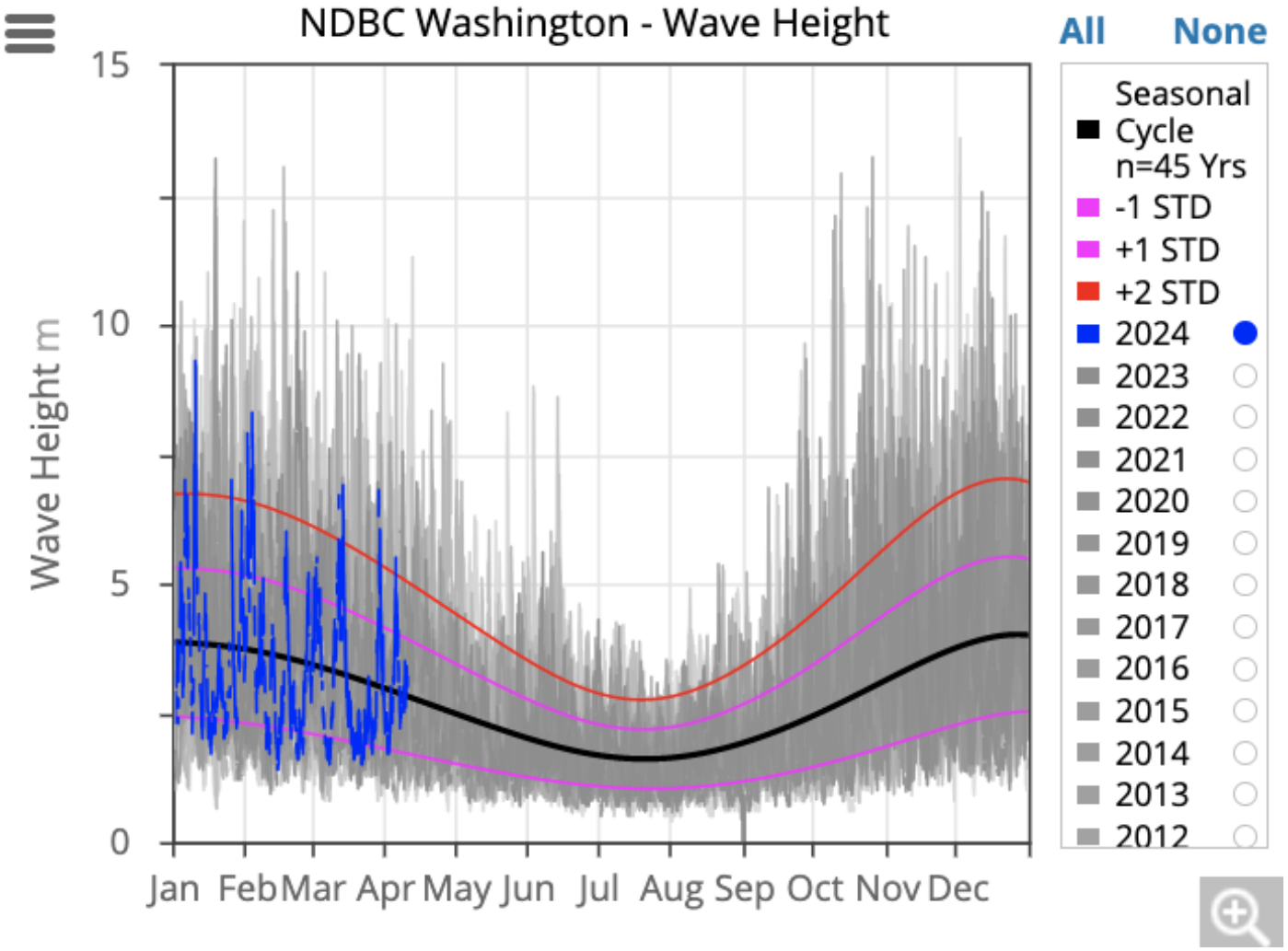




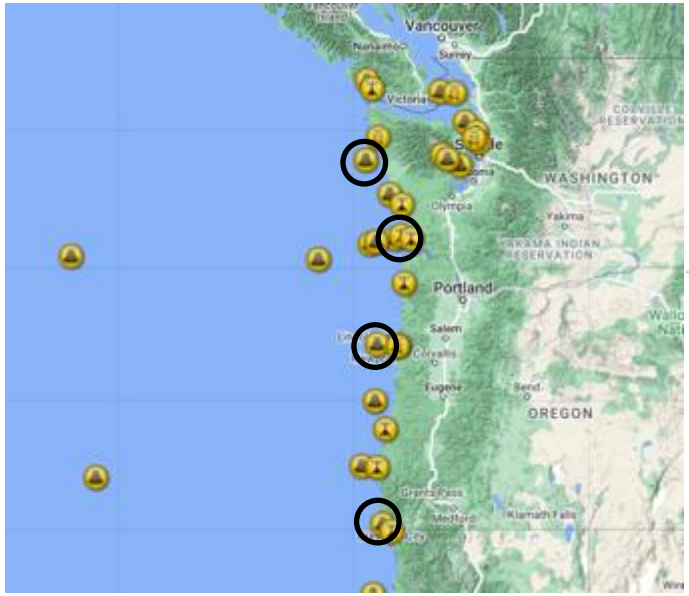
IOOS

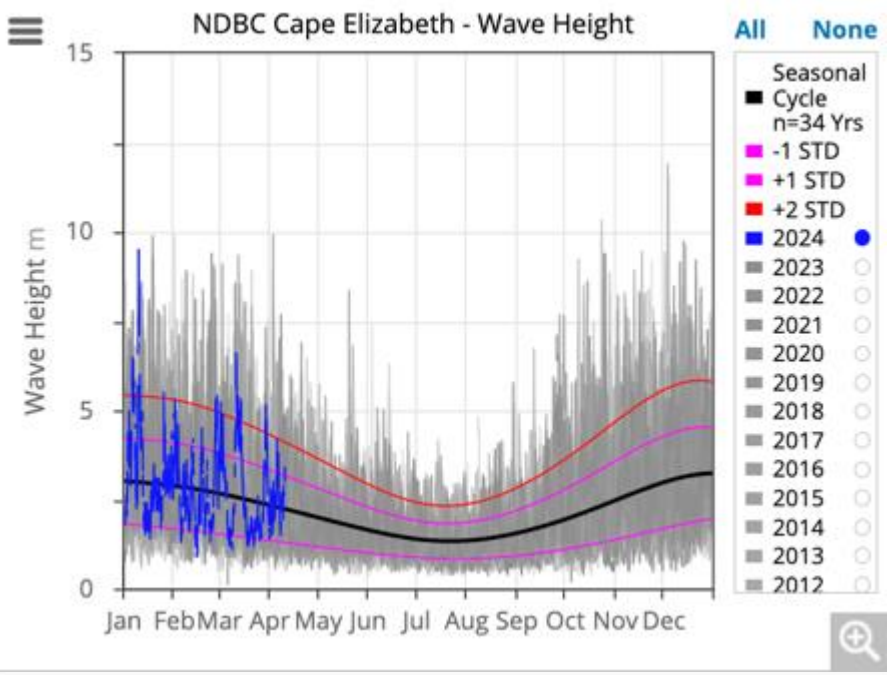
Waves

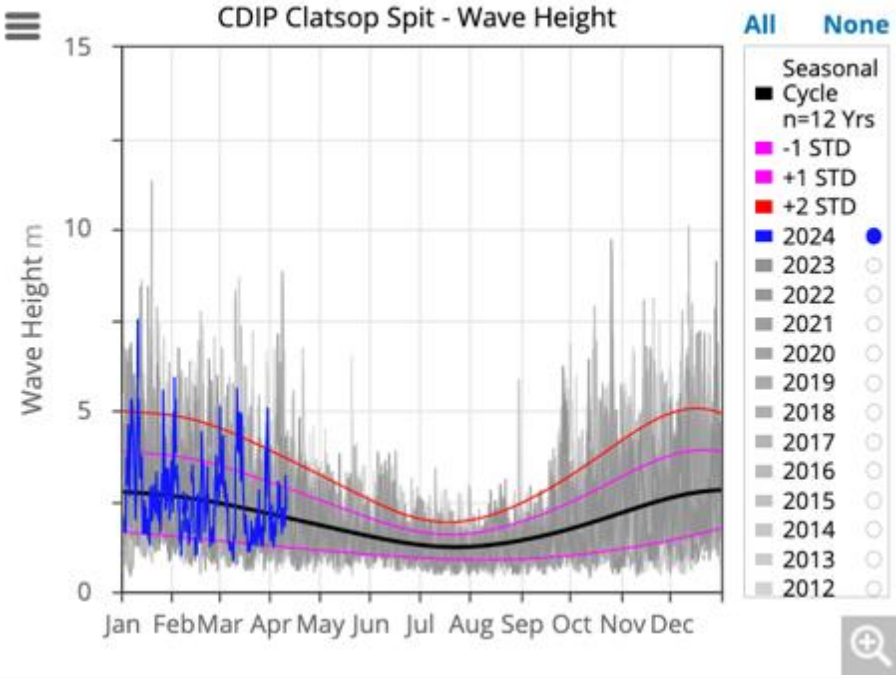

Vancouver
Victoria
WASHINGTON
Olympia
Yakima
Portland
Salem
Eugene
Bend
OREGON
Medford
Klamath Falls

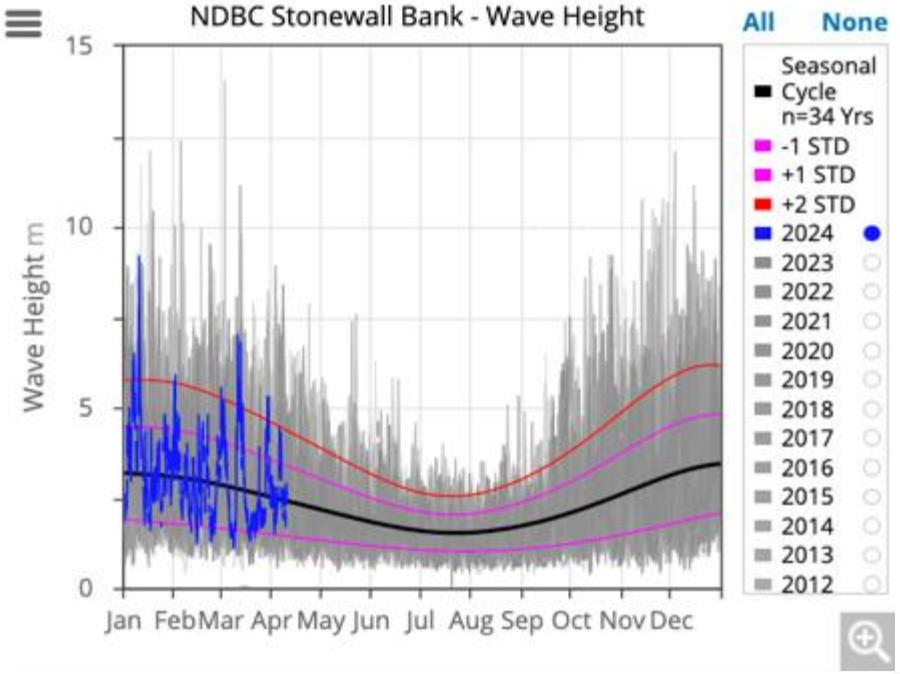

NDBC Washington - Wave Height
Wave Height m
15
10
5
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
All
None
Seasonal Cycle n=45 Yrs
-1 STD
+1 STD
+2 STD
2024
2023
2022
2021
2020
2019
2018
2017
2016
2015
2014
2013
2012

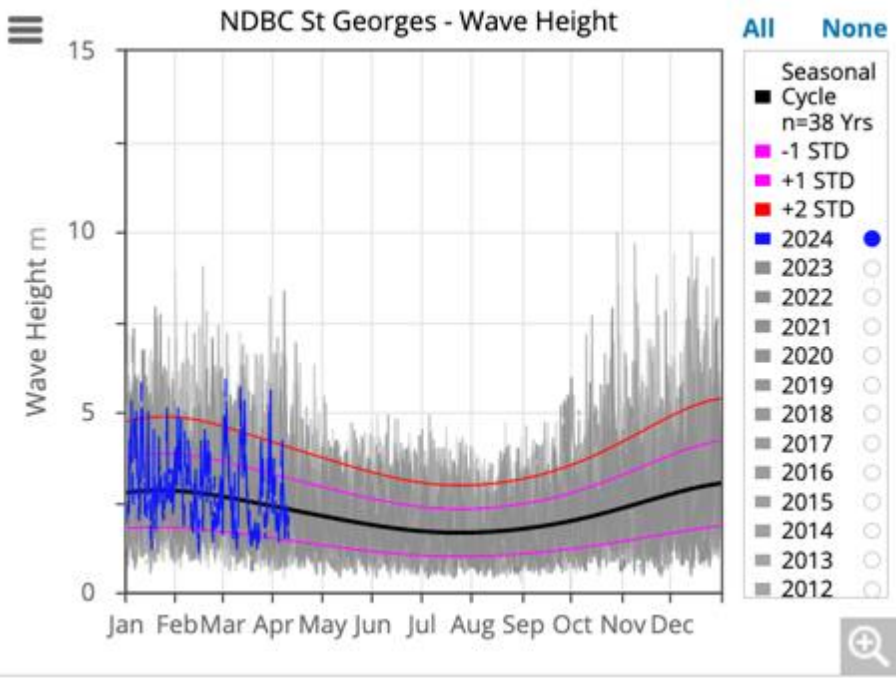
Waves


Vancouver
Victoria
WASHINGTON
Olympia
Portland
Salem
Eugene
OREGON
Bend
Klamath Falls


NDBC Cape Elizabeth - Wave Height
All
None
Wave Height m
15
10
5
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Seasonal Cycle n=34 Yrs
-1 STD
+1 STD
+2 STD
2024
2023
2022
2021
2020
2019
2018
2017
2016
2015
2014
2013
2012


CDIP Clatsop Spit - Wave Height
All
None
Wave Height m
15
10
5
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Seasonal Cycle n=12 Yrs
-1 STD
+1 STD
+2 STD
2024
2023
2022
2021
2020
2019
2018
2017
2016
2015
2014
2013
2012

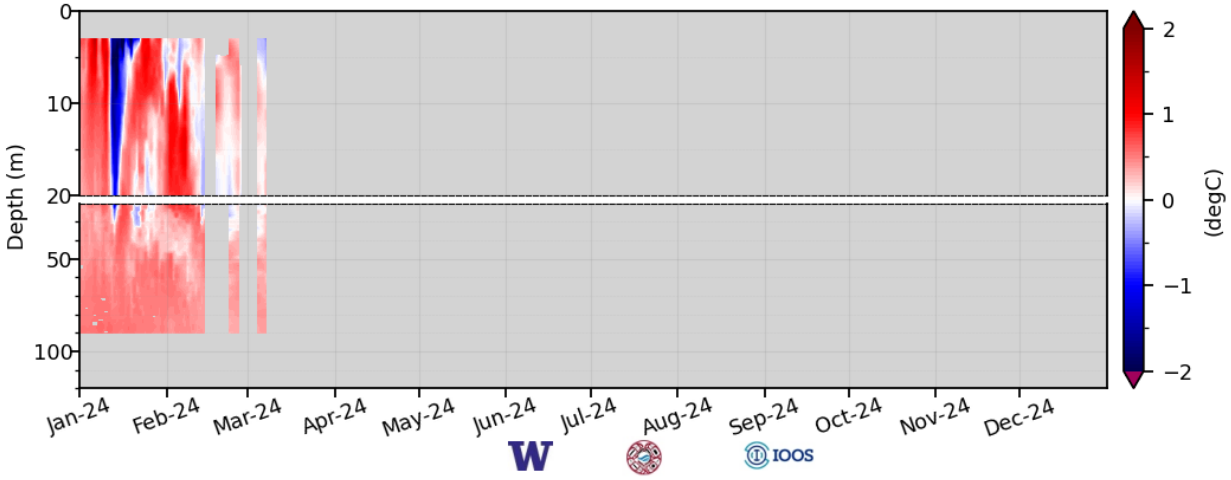

NDBC Stonewall Bank - Wave Height
All
None
Wave Height m
15
10
5
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Seasonal Cycle n=34 Yrs
-1 STD
+1 STD
+2 STD
2024
2023
2022
2021
2020
2019
2018
2017
2016
2015
2014
2013
2012


NDBC St Georges - Wave Height
All
None
Wave Height m
15
10
5
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Seasonal Cycle n=38 Yrs
-1 STD
+1 STD
+2 STD
2024
2023
2022
2021
2020
2019
2018
2017
2016
2015
2014
2013
2012

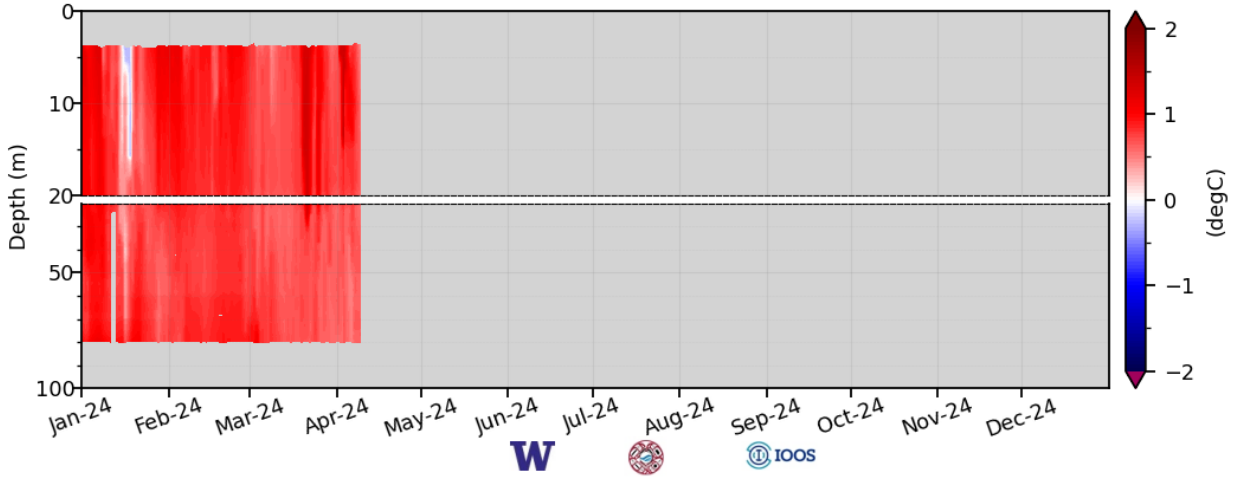
Temperature Anomalies

Puget Sound Profiling Buoys

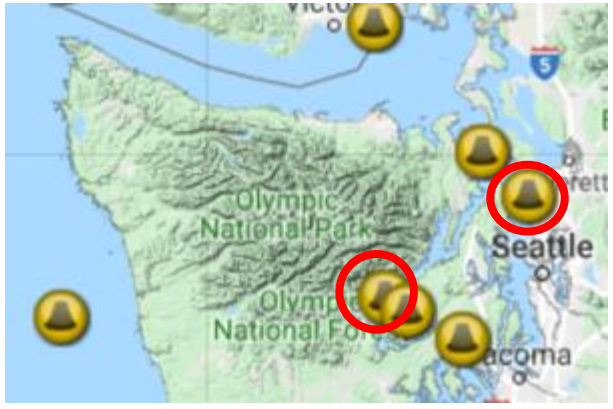
Hoodsport Temperature Anomaly, 2023, 16 years

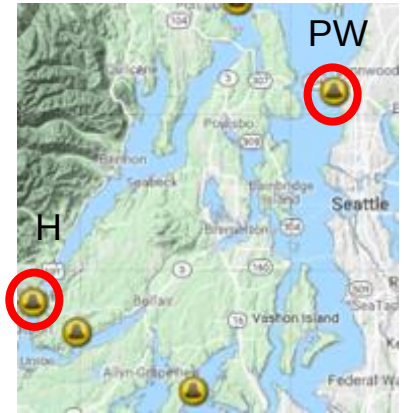


Point Wells Temperature Anomaly, 2023, 11 years



January 13–16, 2024 North American winter storm



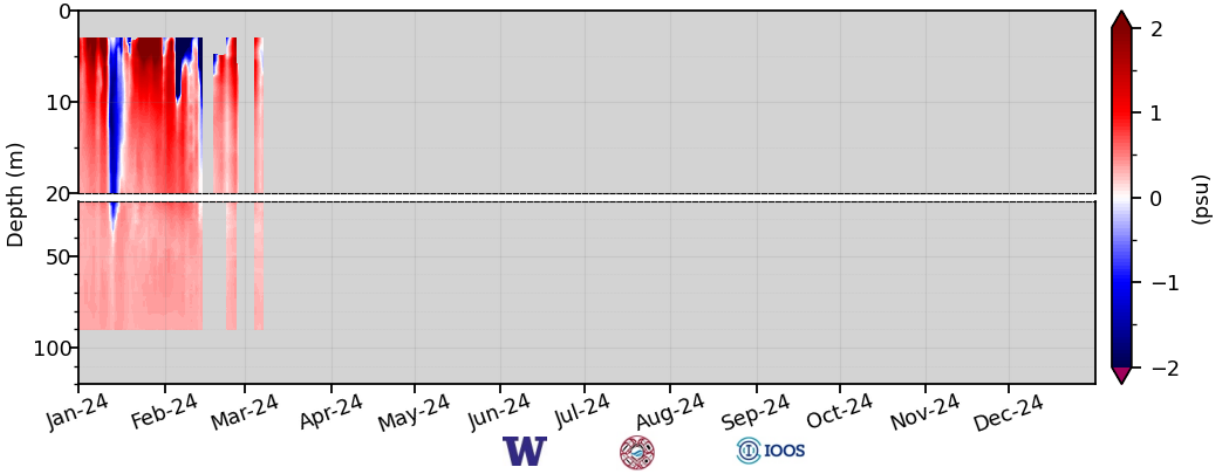


IOOS

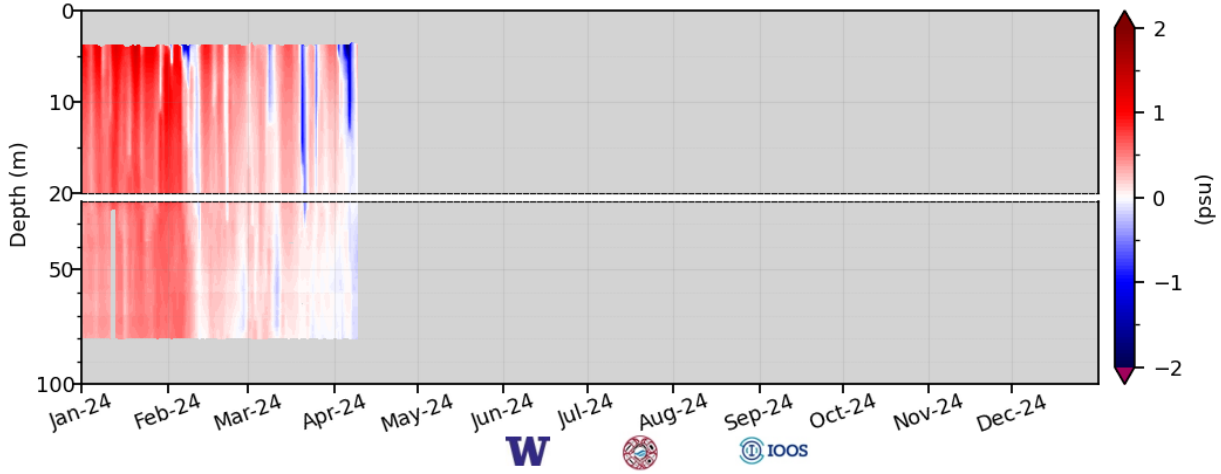
Salinity Anomalies

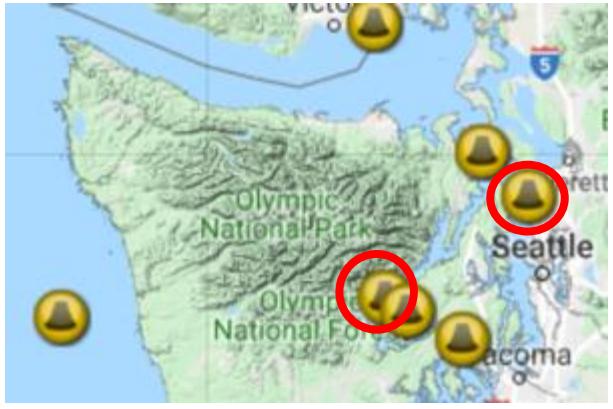
Puget Sound Profiling Buoys

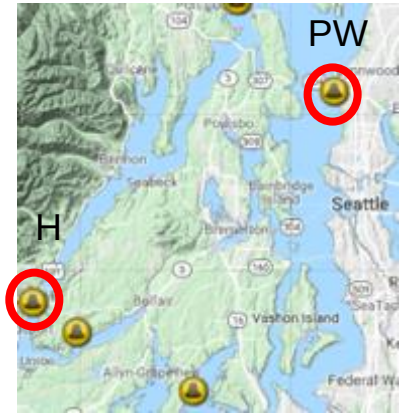
Hoodsport Salinity Anomaly, 2023, 16 years



Point Wells Salinity Anomaly, 2023, 11 years

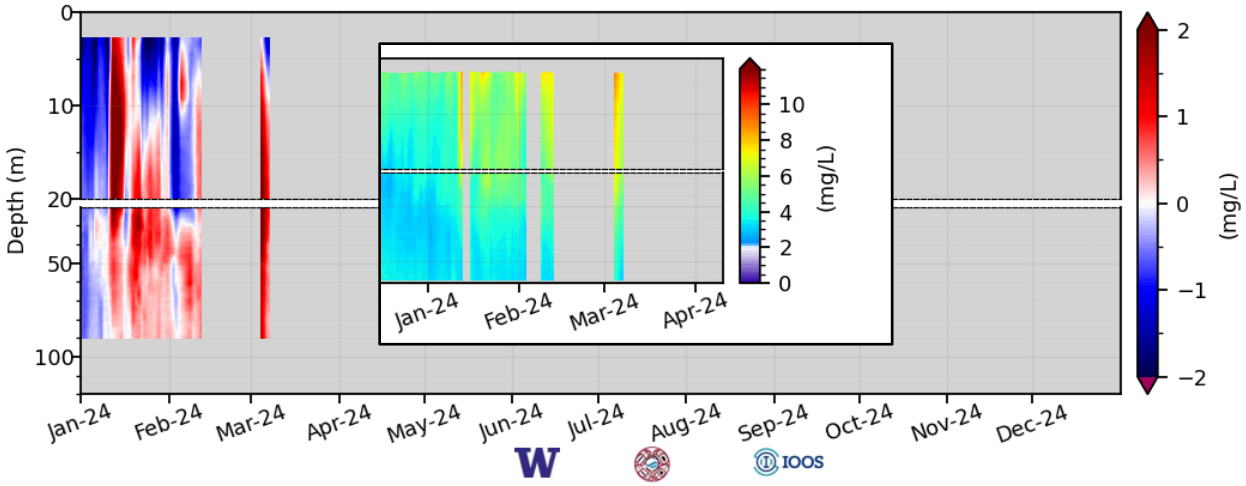


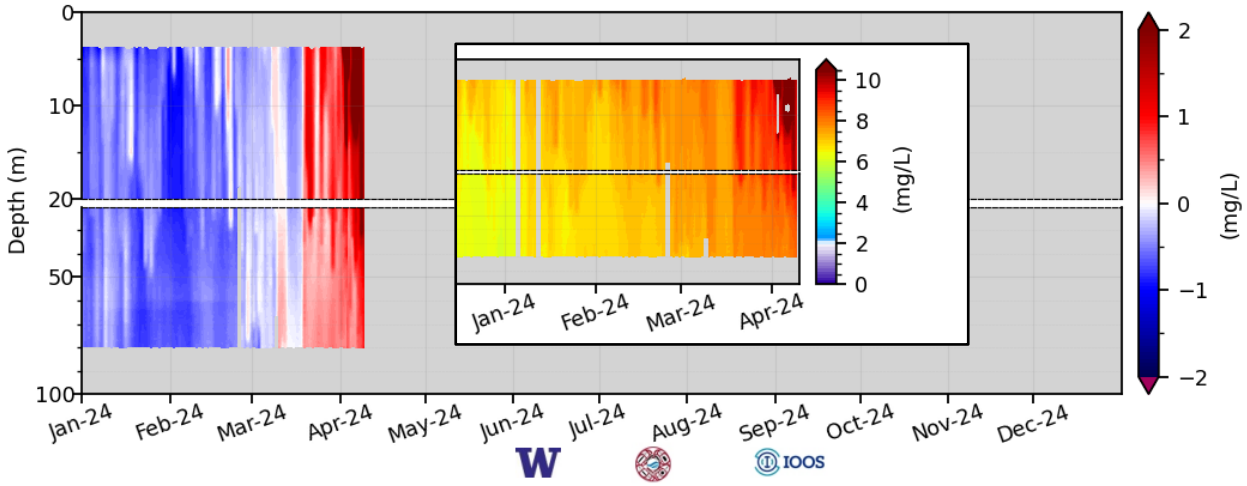


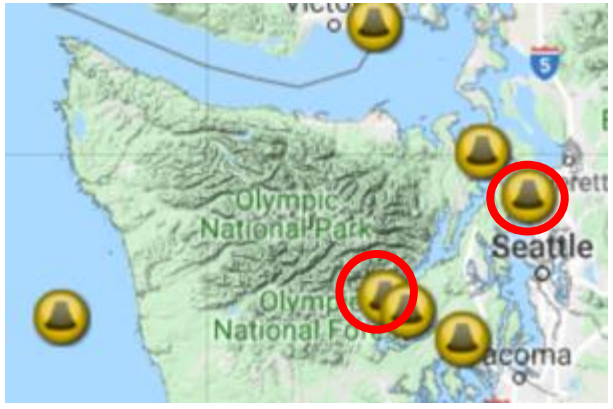


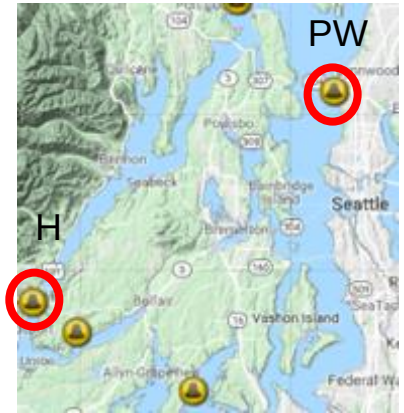
Oxygen Anomalies

Puget Sound Profiling Buoys





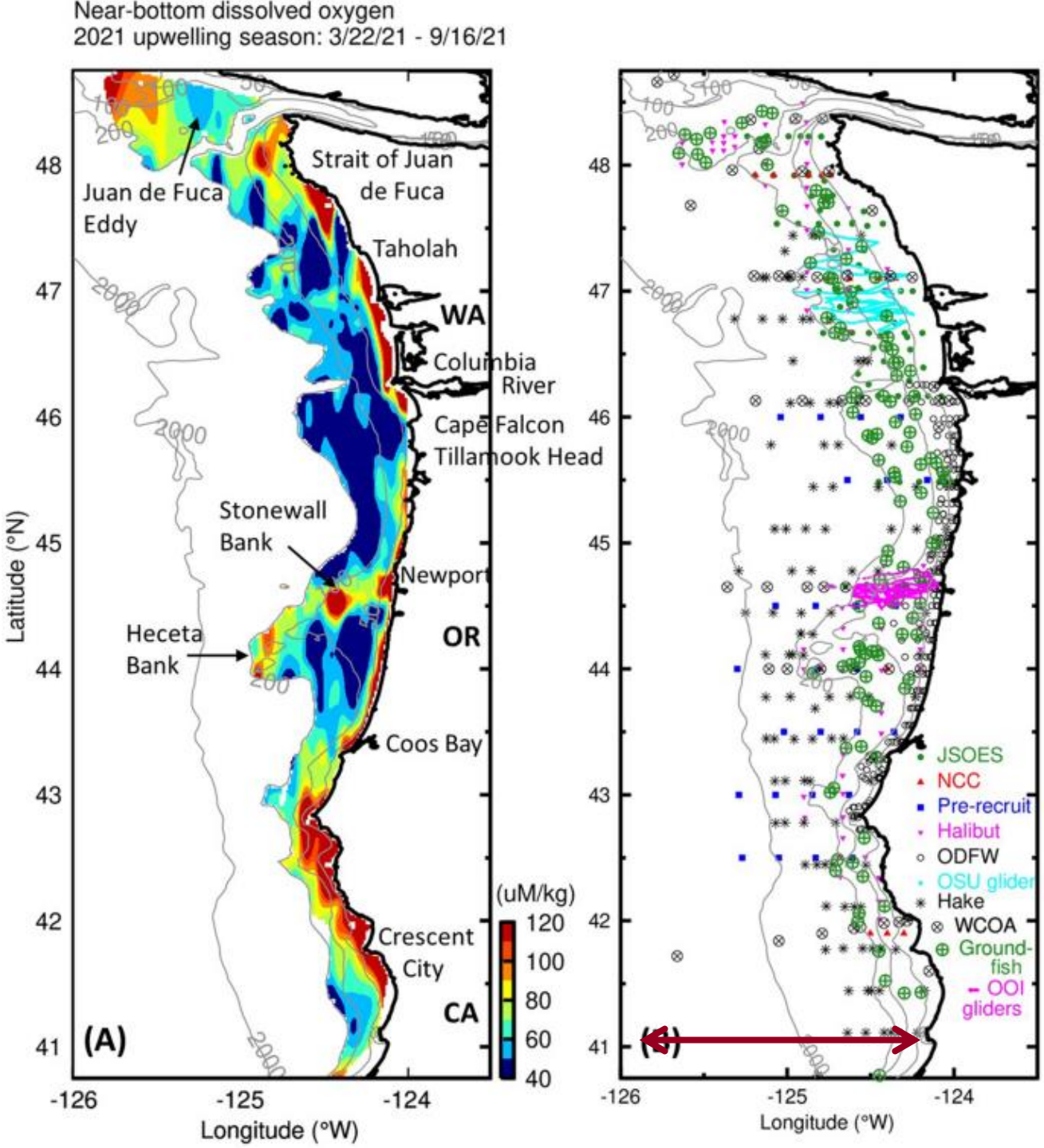




West Coast Hypoxia

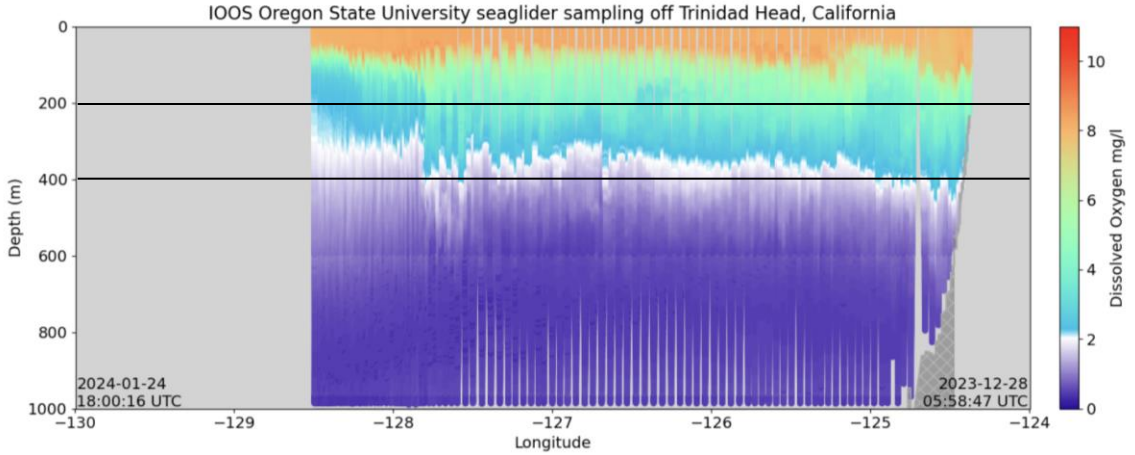
- *Nature Scientific Reports*
- Barth, J.A., Pierce, S.D., Carter, B.R. *et al.* Widespread and increasing near-bottom hypoxia in the coastal ocean off the United States Pacific Northwest. *Sci Rep* 14, 3798 (2024). https://doi.org/10.1038/s41598-024-54476-0

Figure 1. Maps of dissolved oxygen and sample locations during summer 2021. (A) Near-bottom dissolved oxygen in µmol kg−1; the blue-cyan transition at 61 µmol kg−1 denotes the hypoxia threshold. (B) Sample locations color-coded by program. Bottom depth in m; the 200-m isobath marks the edge of the continental shelf. Maps created with the Gri scientific graph language (Version 2.12.23).

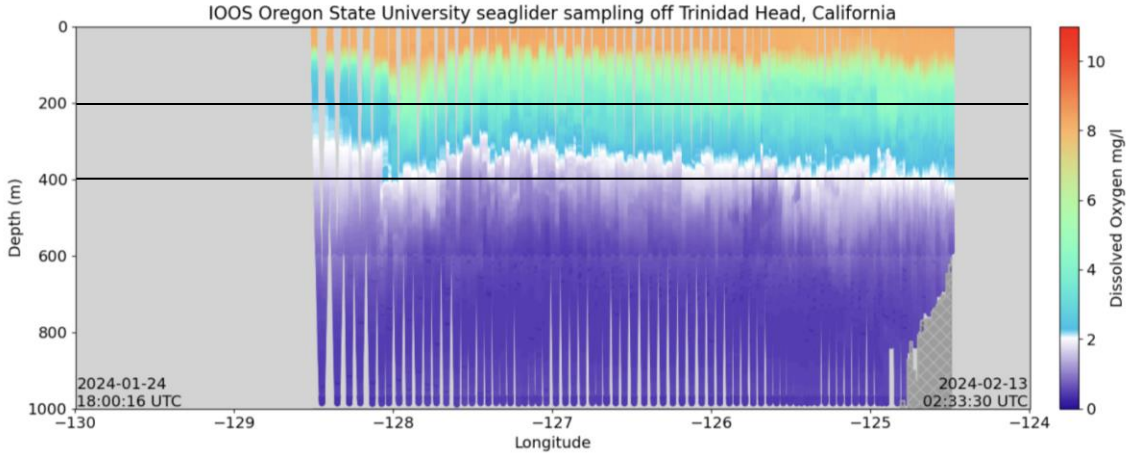


Trinidad Head DO plots

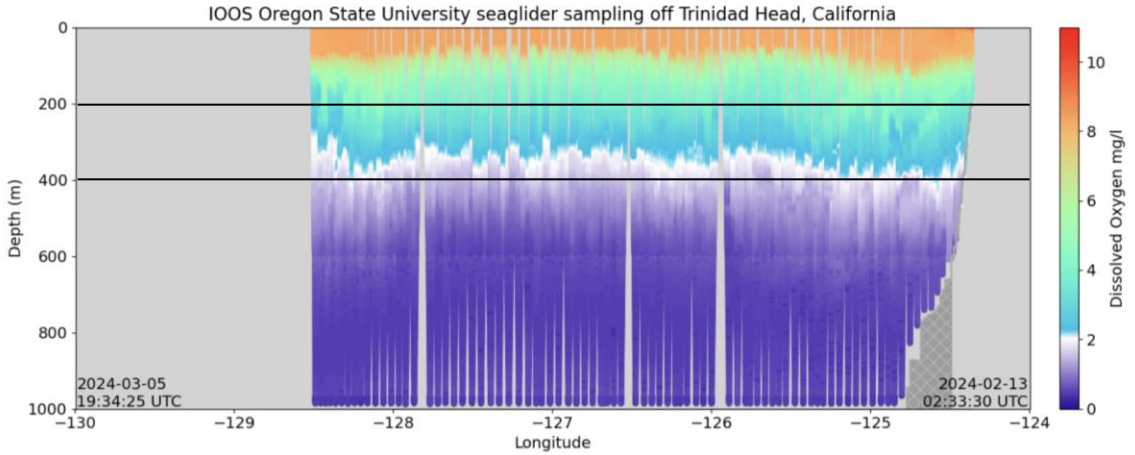
DEC - JAN



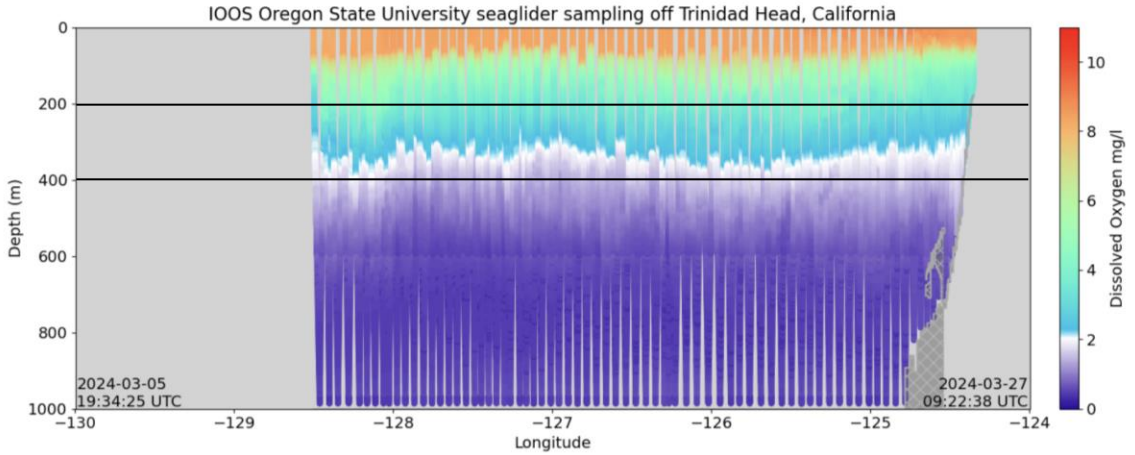
JAN - FEB



FEB - MAR



MAR



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Chlorophyll Anomaly

OSU Modis

January 2024

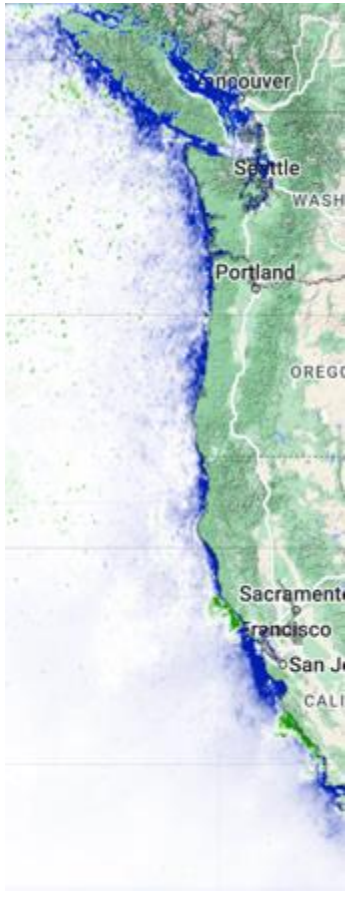
OSU MODIS 2002-2022

February 2024

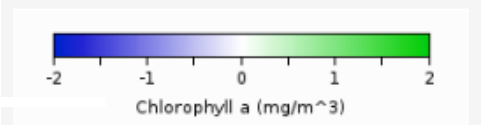
OSU MODIS 2002-2022

March 2024

OSU MODIS 2002-2022



Chlorophyll



HABs

Pacific Northwest Harmful Algal Blooms Bulletin

Apr 2, 2024 HAB risk =

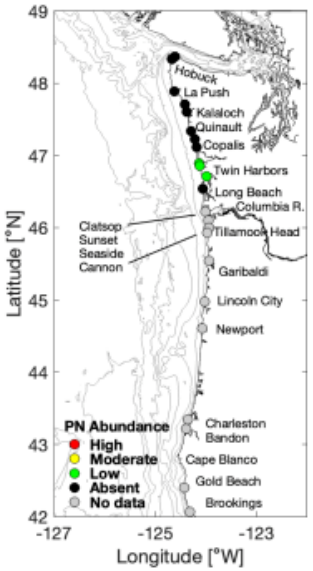
HAB risk key:
- *= low*
- *= medium*
- *= high*

Cooperative Institute for CLIMATE, OCEAN & ECOSYSTEM STUDIES

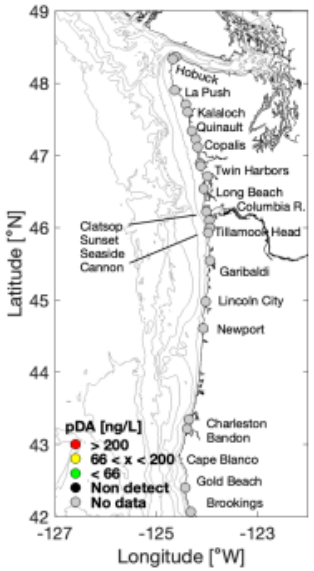
The statements, findings, conclusions, and recommendations do not necessarily reflect the views of NOAA or the Department of Commerce.

Beach Sampling

(*Pseudo-nitzschia*)

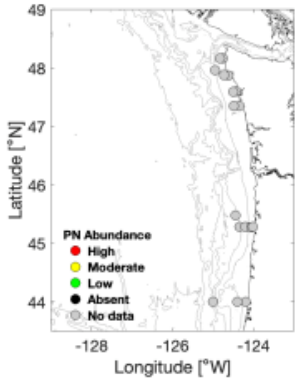


(particulate domoic acid)

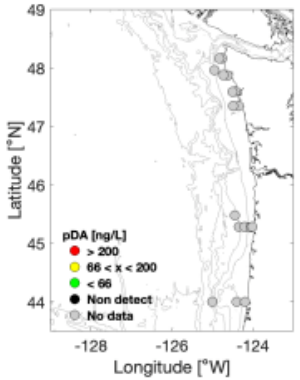


Offshore Sampling

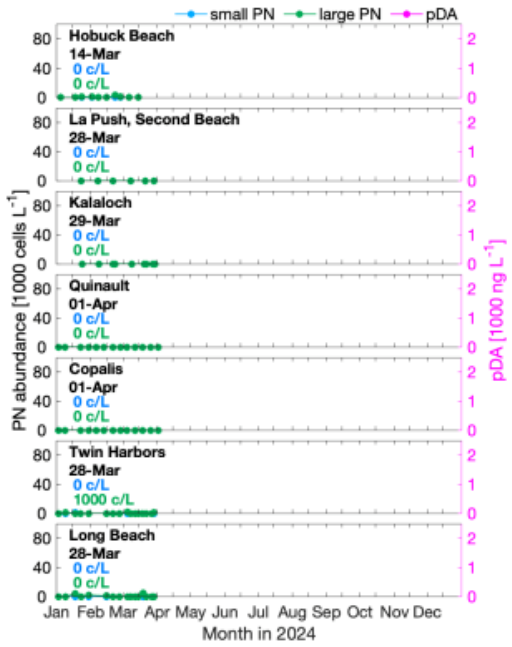
(*Pseudo-nitzschia*)



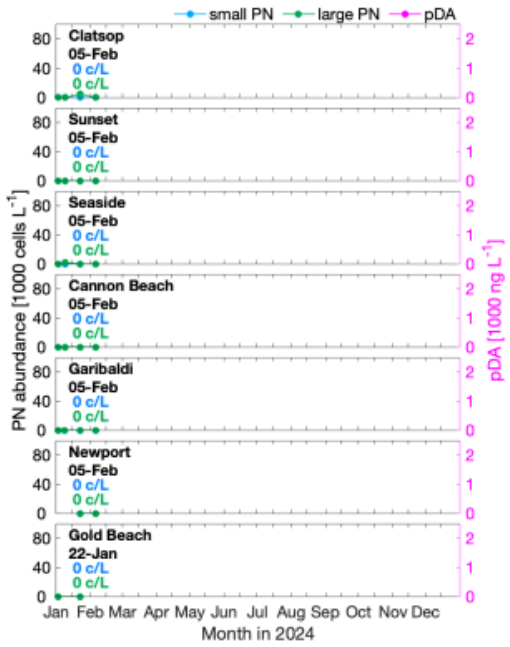
(particulate domoic acid)



WA *Pseudo-nitzschia* & Domoic Acid



OR *Pseudo-nitzschia* & 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.

To summarize:

Coastal conditions

- El Niño weakening; no major MHWs along the coast; transition to neutral/La Niña predicted.
- Offshore WA NDBC coastal buoy shows average T; inshore buoys show 1SD warmer than average with spikes to 2SD above average.

Waves

- Average wave conditions with some storms.

Puget Sound

- Temperature and salinity anomalies continue warm and salty.
- Mid-January storm with strong cool, fresh, higher oxygen conditions.

Coastal Dissolved Oxygen

- Trinidad Head glider and WA Shelf glider can track low DO water and upwelling onto the shelf.

Chlorophyll & HABs

- Satellite shows mostly lower than average ocean color values Jan-Mar.
- HAB risk low, no domoic acid in samples.

www.nanoos.org

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