



NOAA West Watch: Reporting Regional Environmental Conditions & Impacts in the West

August 9, 2022



Call Agenda

- Project Background (Dan McEvoy)
- Regional Climate and ENSO brief (Dan McEvoy)
- IOOS Nearshore Conditions brief (Jan Newton, Henry Ruhl, Clarissa Anderson)
- Discussion - Environmental conditions and impacts reporting (All)
 - Additional impacts to share?

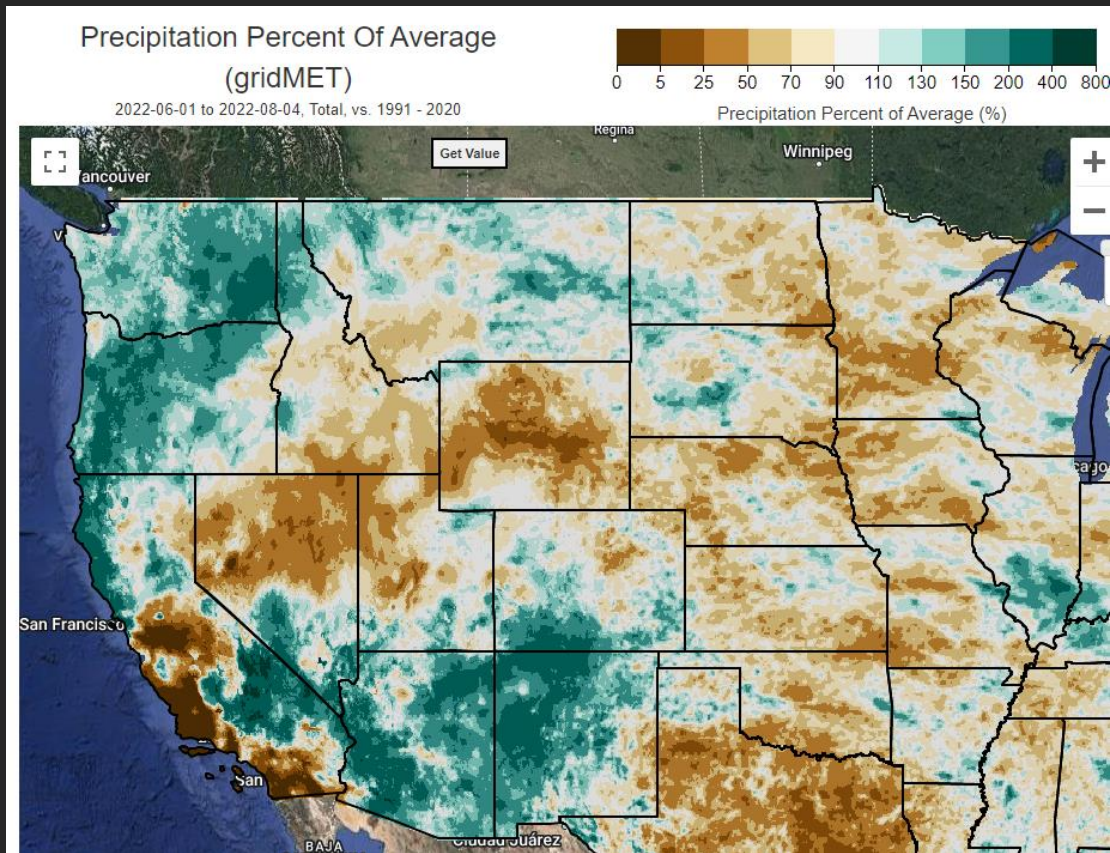
Project Background

- Run by the Western Regional Climate Center, in partnership with the NOAA Western Regional Collaboration Team (NOAA West)
- Standing contributions from the three Integrated Ocean Observing System Regional Associations.
- Project Goals:
 - Serve as forum for bringing together NOAA staff and partners from across the agency and region to share information about regional scale environmental observations and impacts on human systems.
 - Help facilitate interdisciplinary connections and the exchange of information among agency staff and partners on regional climatic and oceanic conditions, particularly departures from normal.

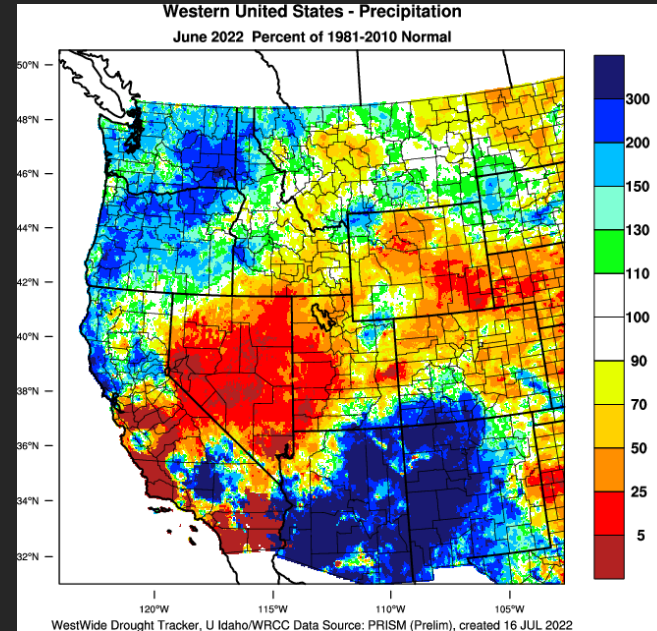
These webinars are not formal public releases of data.

How's your summer going?

June 1-August 4 Precipitation



<https://app.climateengine.com/climateEngine>

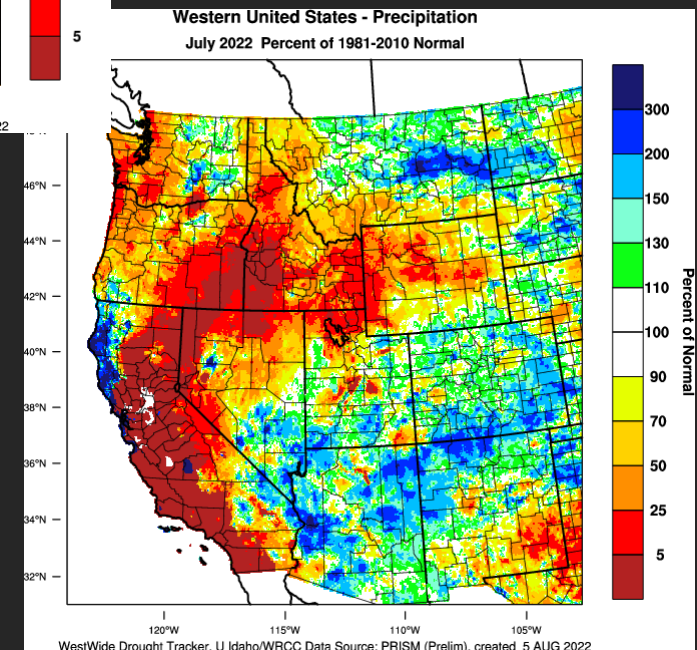


- PNW dries out
- Monsoon more spotty

July Precipitation

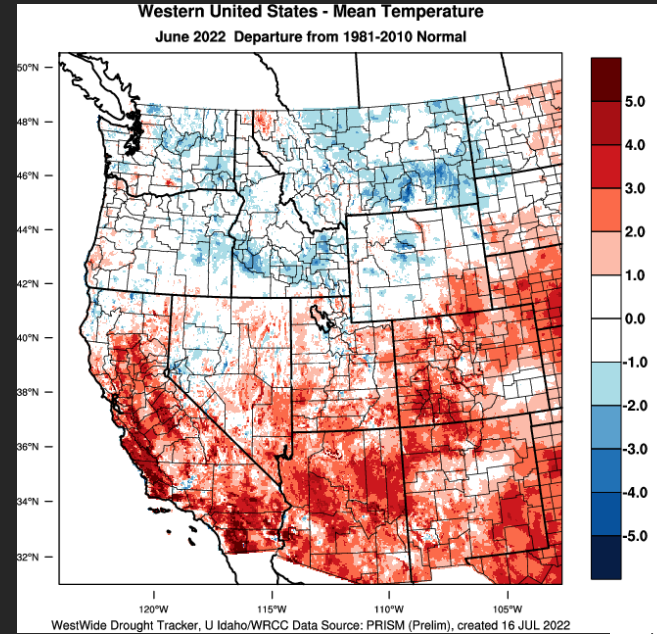
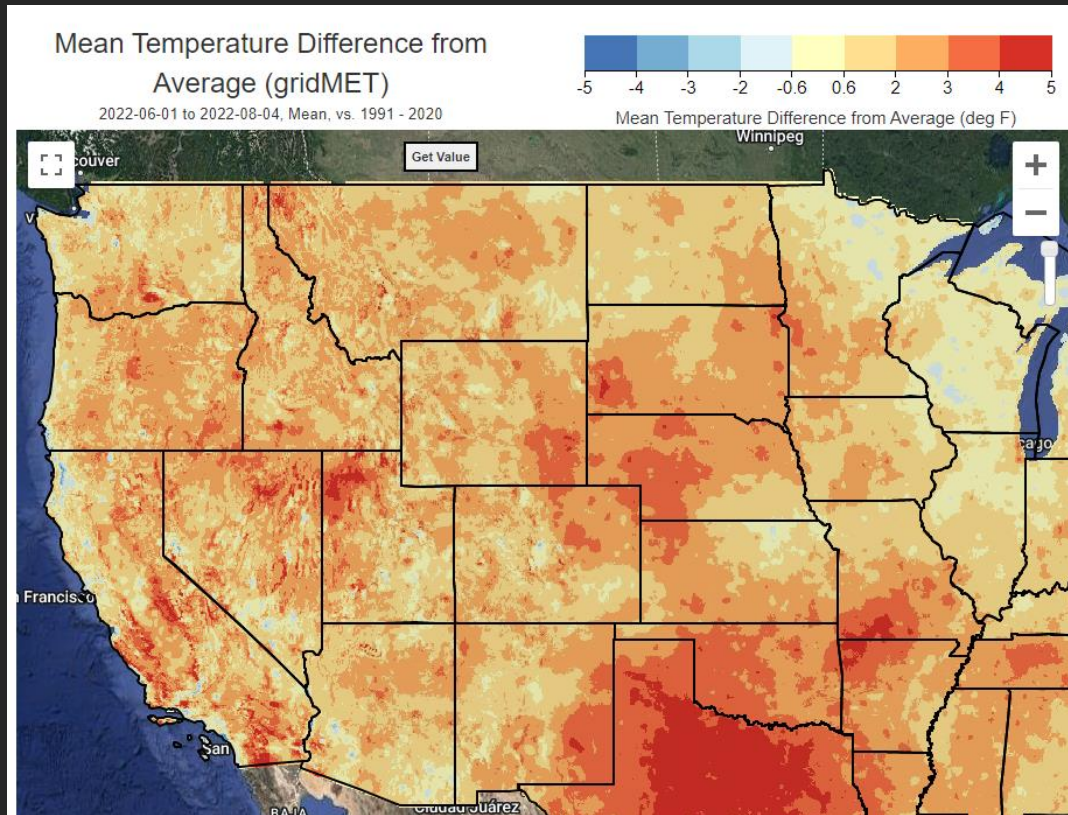
June Precipitation

- Good start to Monsoon
- SW fires reduced
- Wet PNW



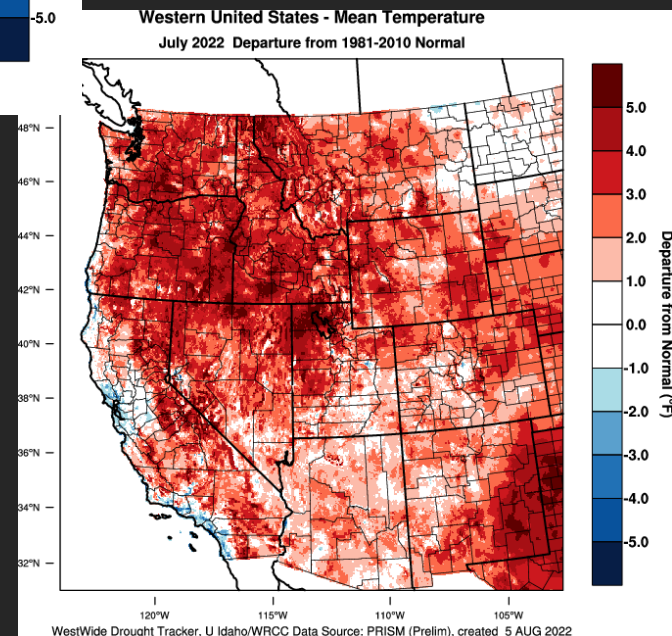
How's your summer going?

June 1-August 4 Temperature



June Temperature

- Cool PNW
- Warm SW



- PNW heats up
- SW stays warm even with active Monsoon

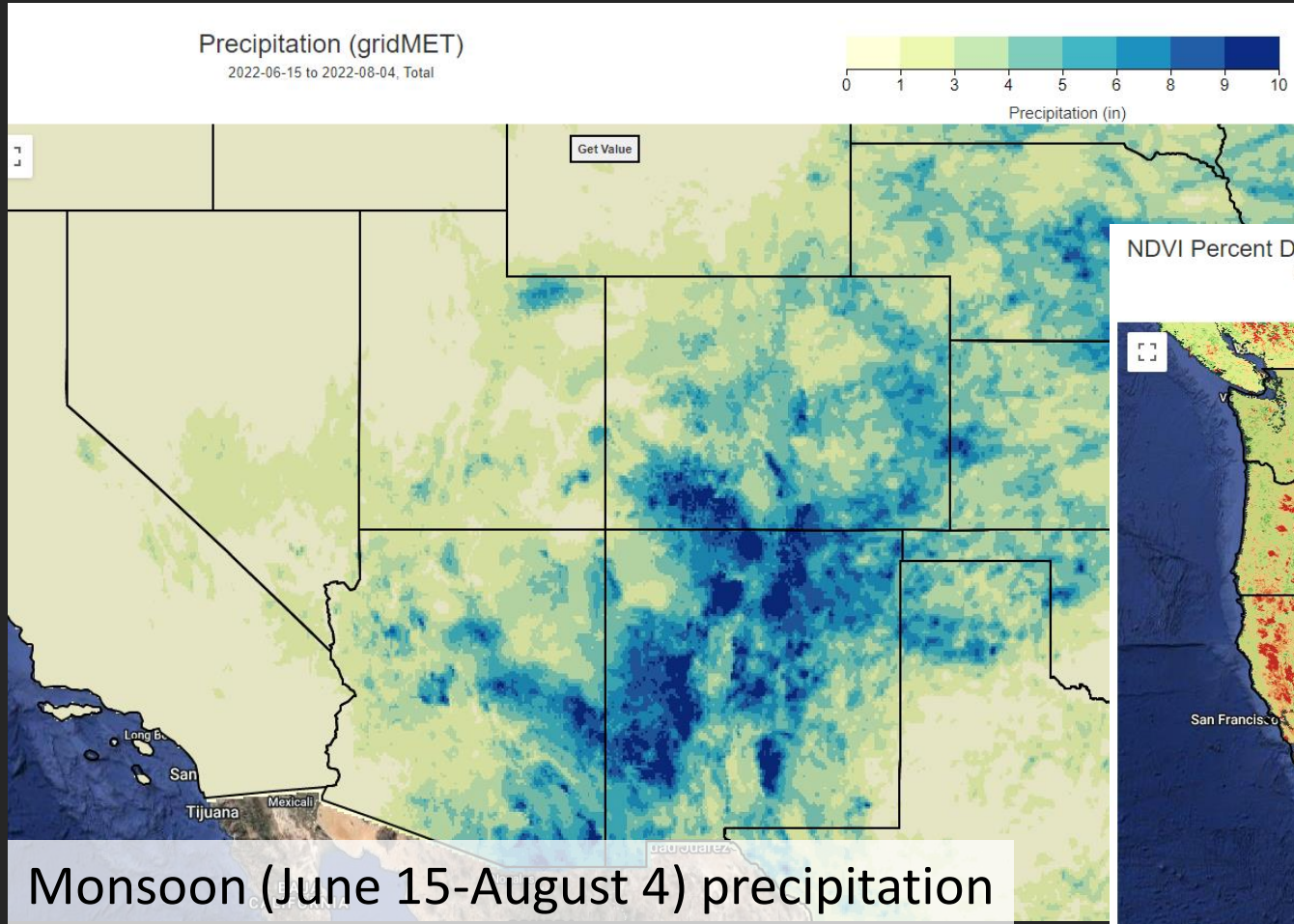
<https://app.climateengine.com/climateEngine>

July Temperature

Snowy Crater Lake, Oregon June 18, 2022



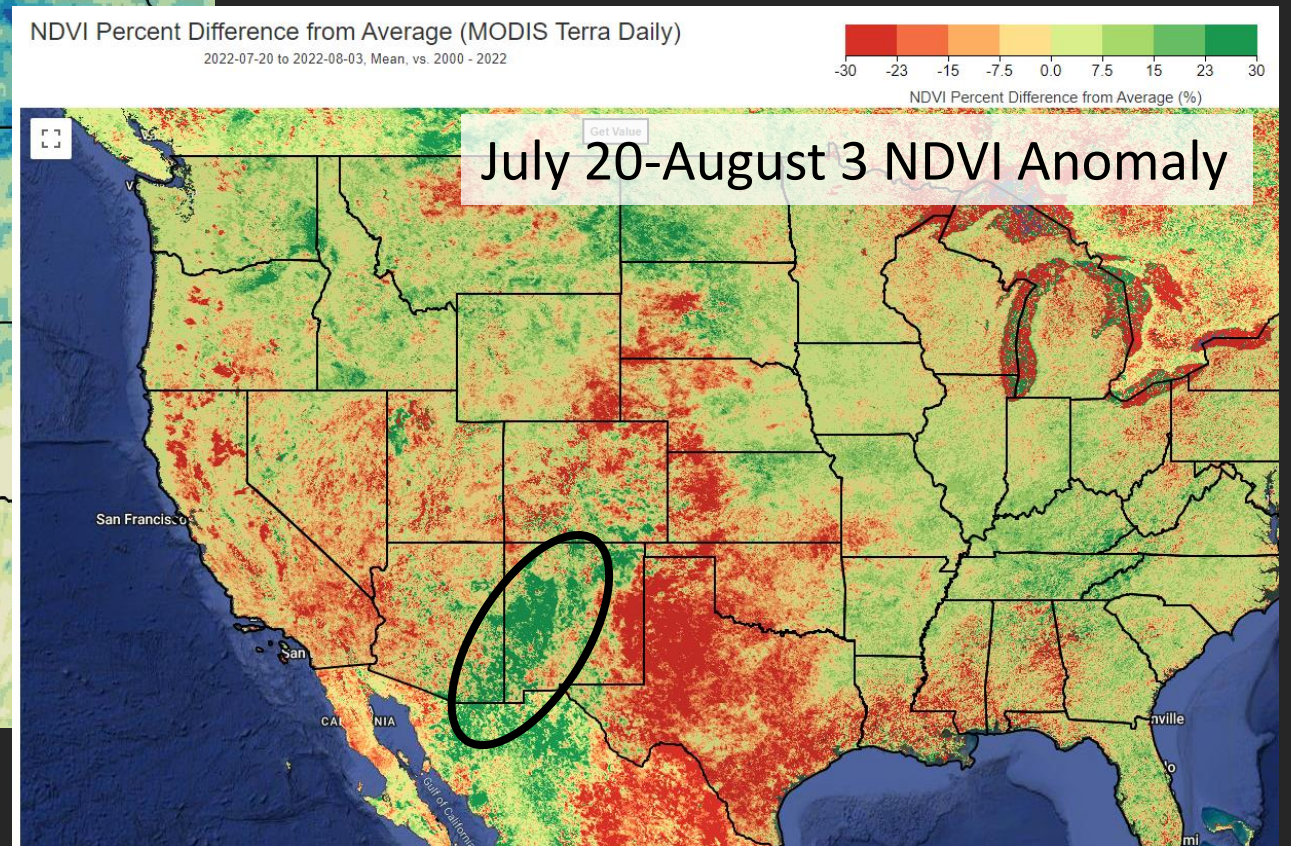
Southwest Monsoon Update



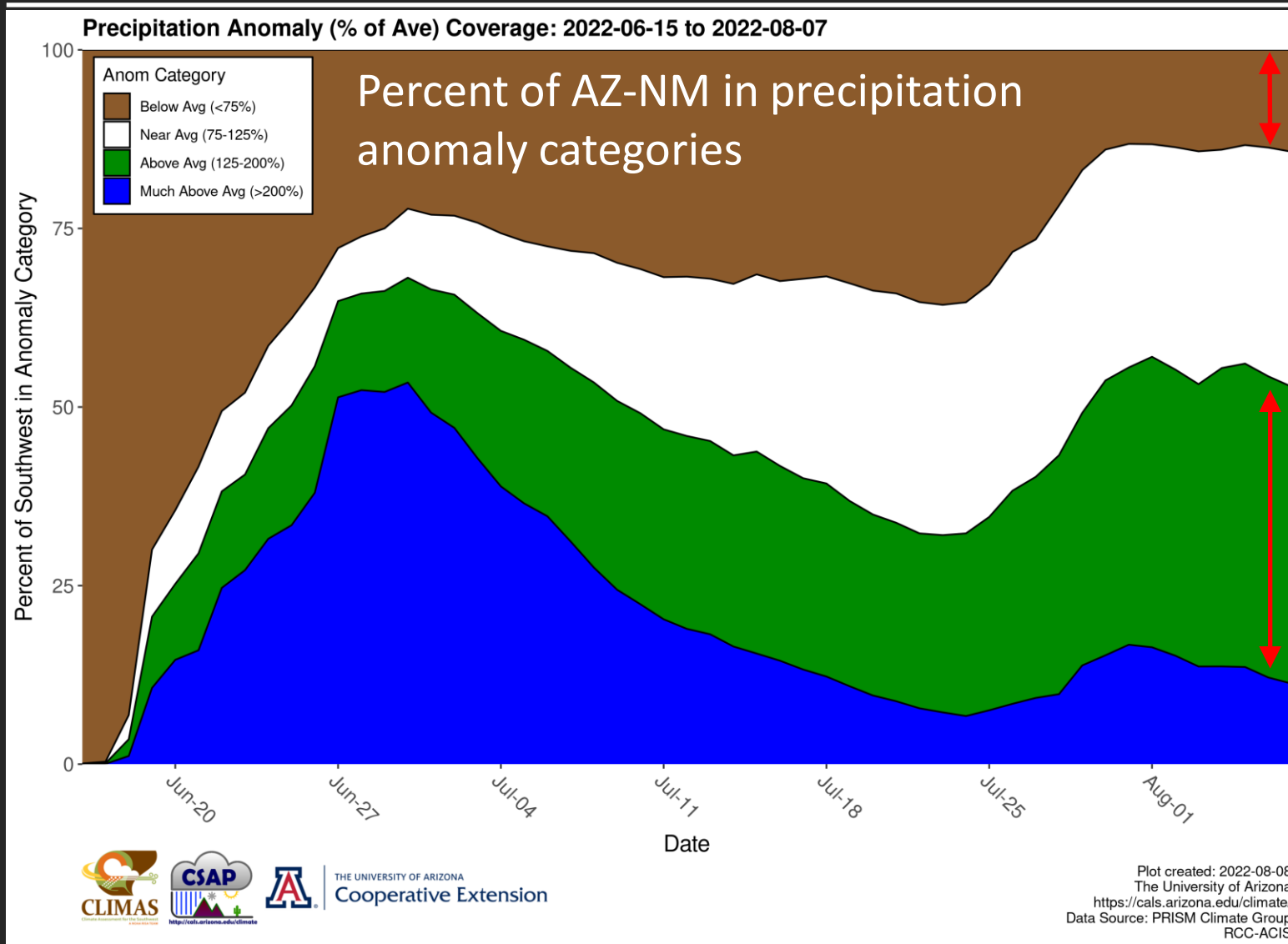
Monsoon (June 15-August 4) precipitation

- 8-10+ inches of rain for some locations

- Clear vegetation response to Monsoon rains; will help range and forest health conditions



Southwest Monsoon Update

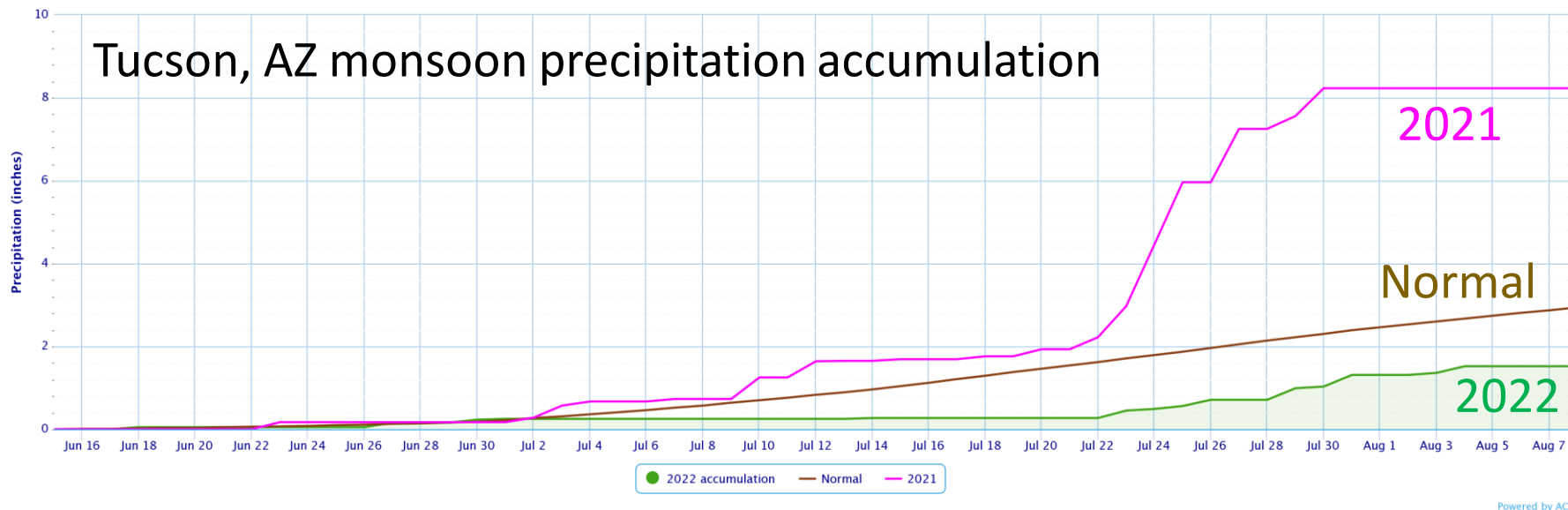


- Small fraction, mostly southeast NM, <75% of average
- Biggest fraction (about 40% of total area) in the 125-200% of average category

Accumulated Precipitation – TUCSON INTERNATIONAL AIRPORT, AZ

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values

Tucson, AZ monsoon precipitation accumulation



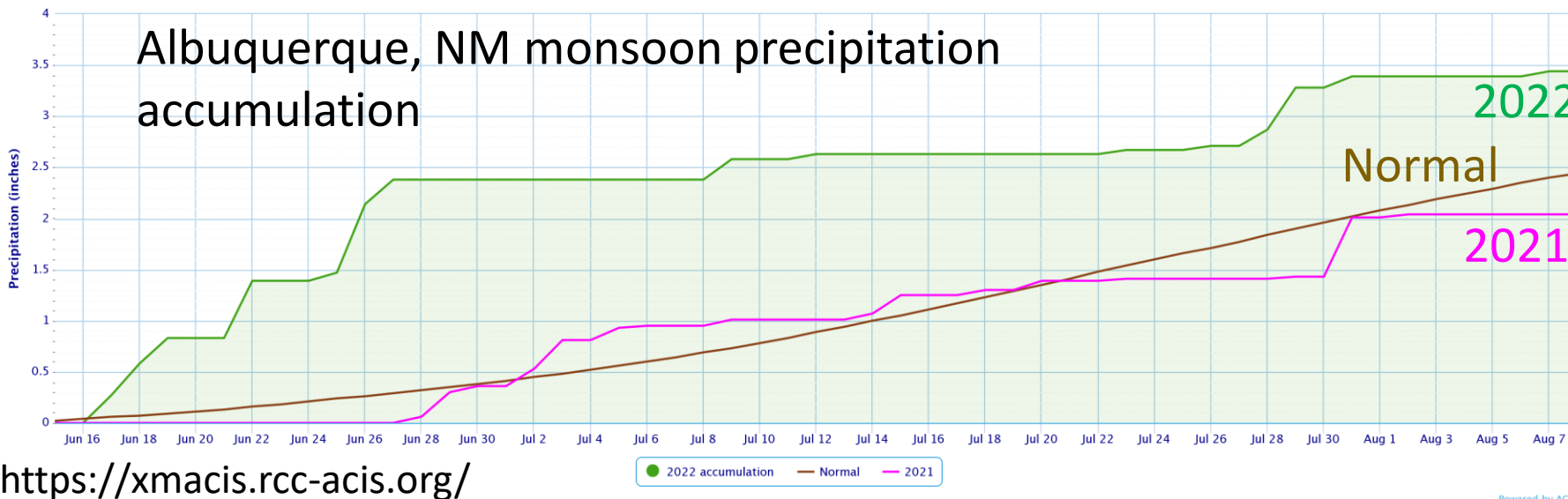
Powered by ACIS

- Tucson, AZ in a bit of a donut hole this year with below normal rainfall

Accumulated Precipitation – ALBUQUERQUE INTL AP, NM

Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values

Albuquerque, NM monsoon precipitation accumulation



Powered by ACIS

- Biggest wet monsoon anomalies this year are in central and northwest NM, including Albuquerque

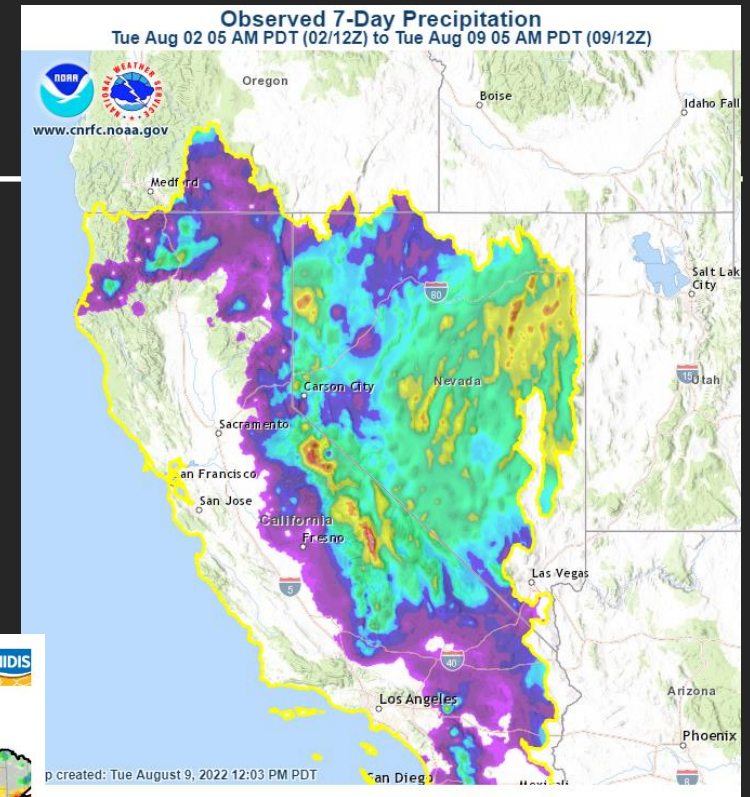
<https://xmacis.rcc-acis.org/>

Monsoonal moisture surges northward

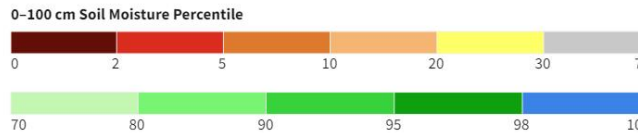
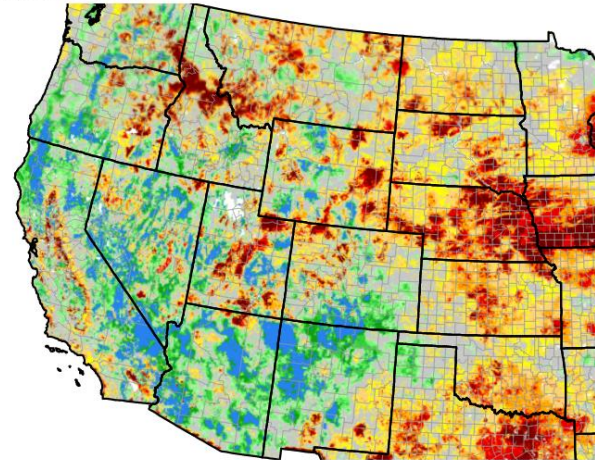


Flooding in Death Valley, NP

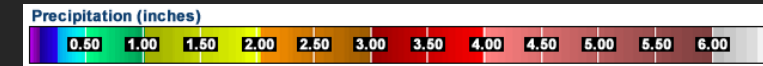
Photos NPS via AP



Current Soil Moisture Conditions: 0-100 cm Soil Moisture Percentile



Source(s): NASA
Updates Daily - 08/09/22
Drought.gov

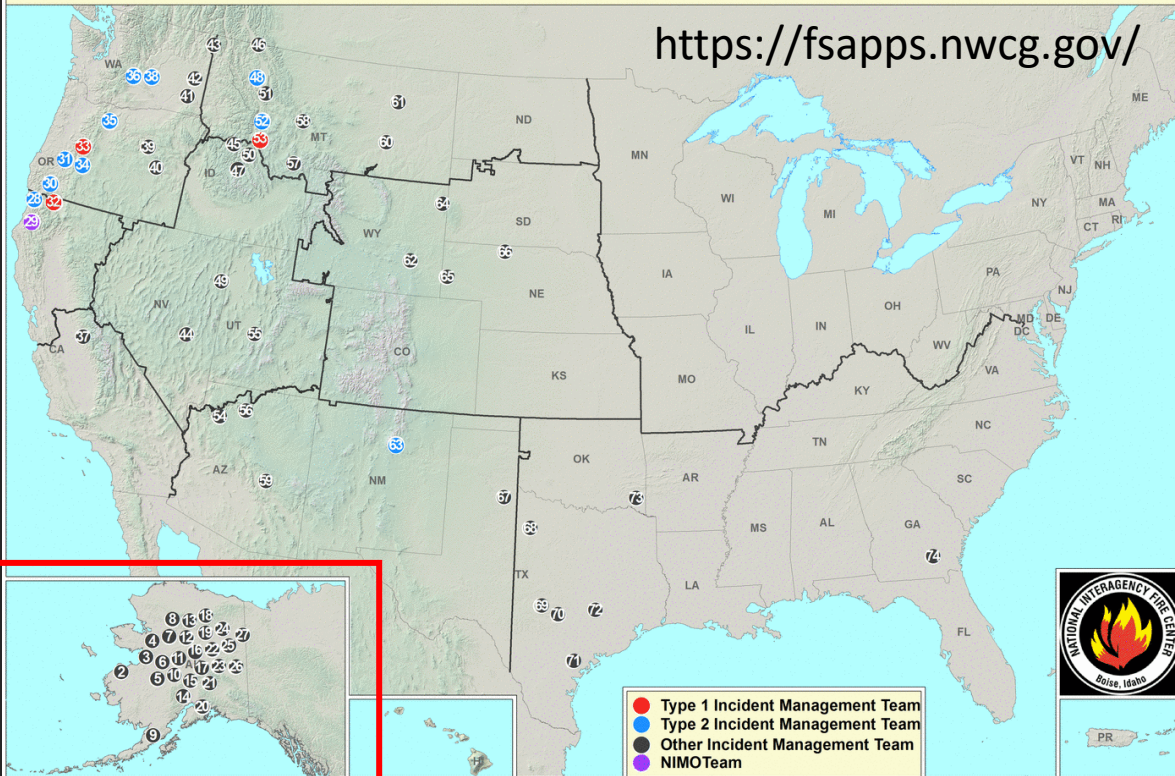


Heavy localized rains over the past week have increased soil moisture in eastern CA and Great Basin

Wildfire Season Update

Current Large Incidents August 08, 2022

<https://fsapps.nwcg.gov/>



From the National Interagency Fire Center:

Year-to-date statistics

2022 (1/1/22-8/08/22)	Fires: 40,412	Acres: 5,847,353
2021 (1/1/21-8/08/21)	Fires: 39,267	Acres: 3,540,703
2020 (1/1/20-8/08/20)	Fires: 33,683	Acres: 2,288,770
2019 (1/1/19-8/08/19)	Fires: 28,331	Acres: 3,583,751
2018 (1/1/18-8/08/18)	Fires: 39,628	Acres: 5,430,771
2017 (1/1/17-8/08/17)	Fires: 40,629	Acres: 6,041,641
2016 (1/1/16-8/08/16)	Fires: 36,103	Acres: 3,569,814
2015 (1/1/15-8/08/15)	Fires: 37,693	Acres: 6,161,928
2014 (1/1/14-8/08/14)	Fires: 35,085	Acres: 2,401,651
2013 (1/1/13-8/08/13)	Fires: 29,205	Acres: 2,558,081
2012 (1/1/12-8/08/12)	Fires: 39,427	Acres: 4,884,522

10-year average Year-to-Date

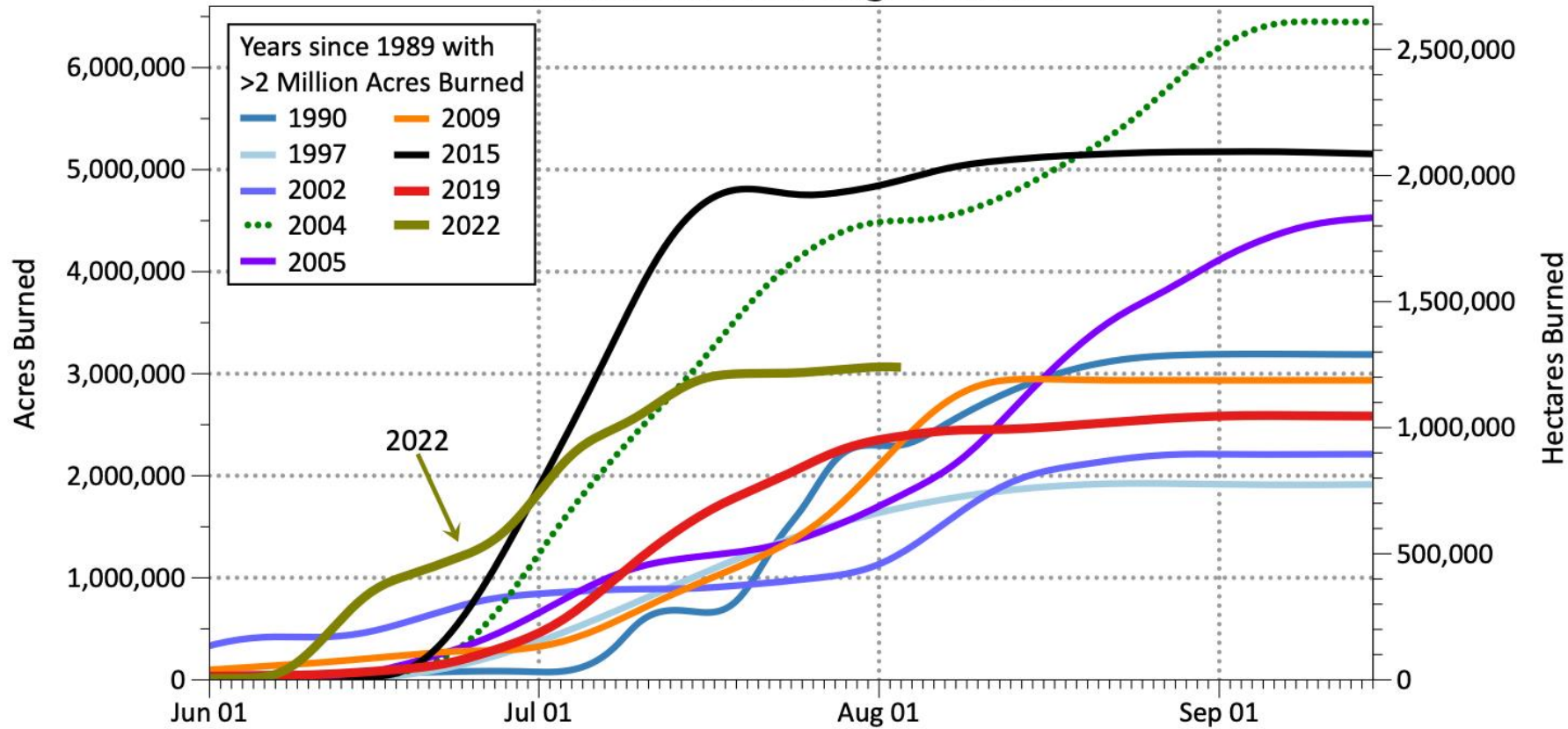
2012-2021	Fires: 35,699	Acres: 3,955,659
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<https://www.nifc.gov/fire-information/nfn>

- Alaska went big in early summer; Western US not so much

Wildfire Season Update

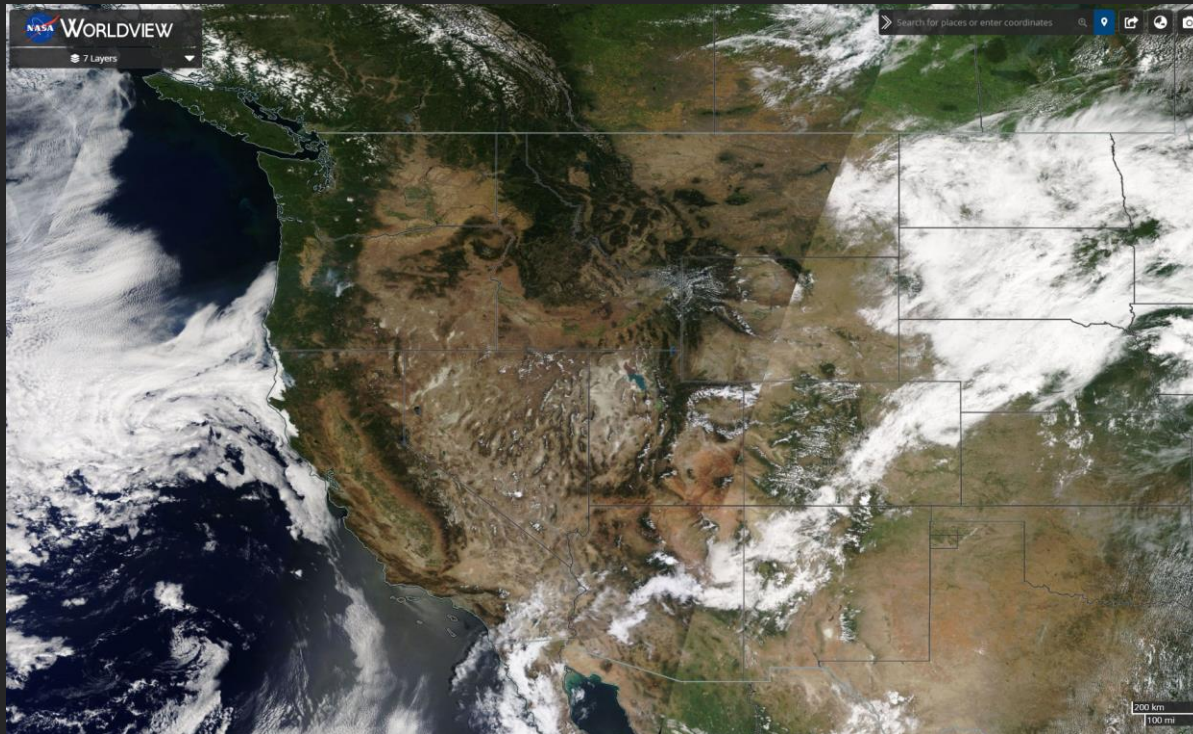
Alaska Wildfire Cumulative Acreage Burned



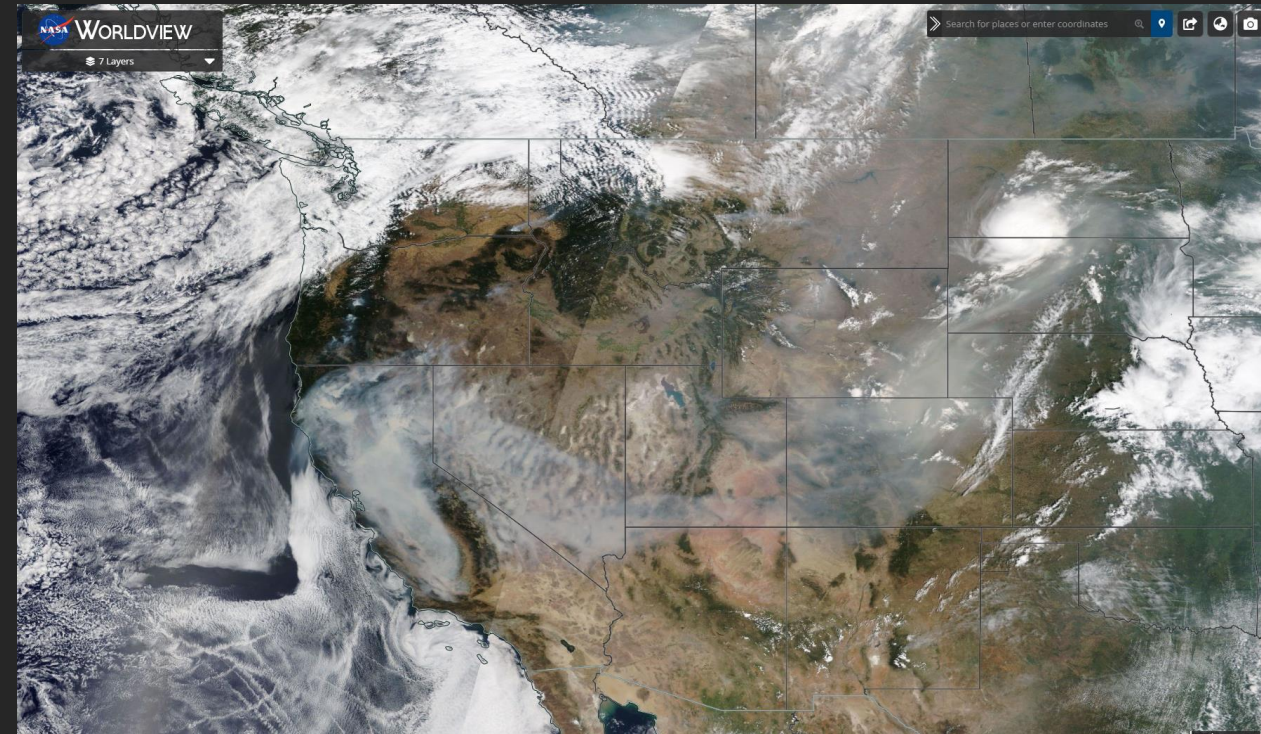
Graphic from
Rick Thoman
Twitter:
[@AlaskaWx](https://twitter.com/AlaskaWx)

Wildfire Season Update

August 7, 2022



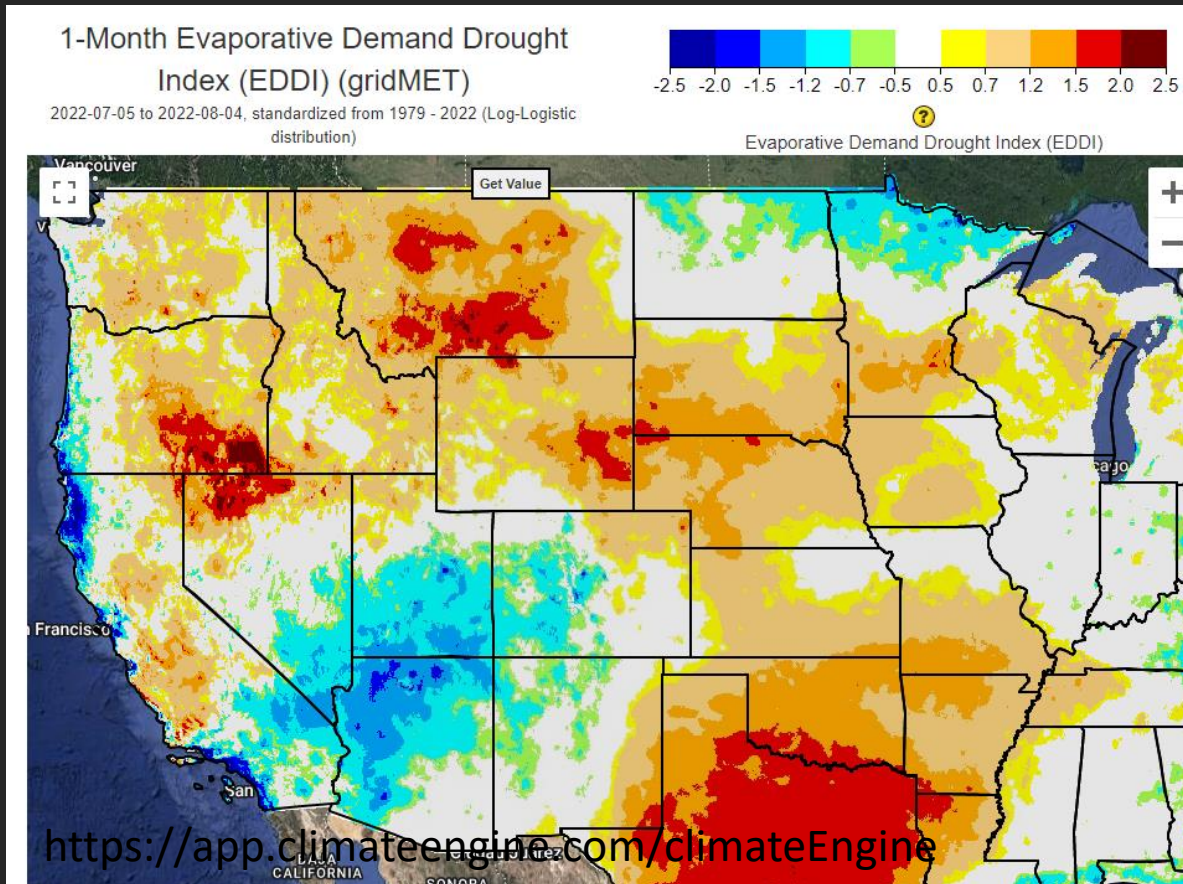
August 7, 2021



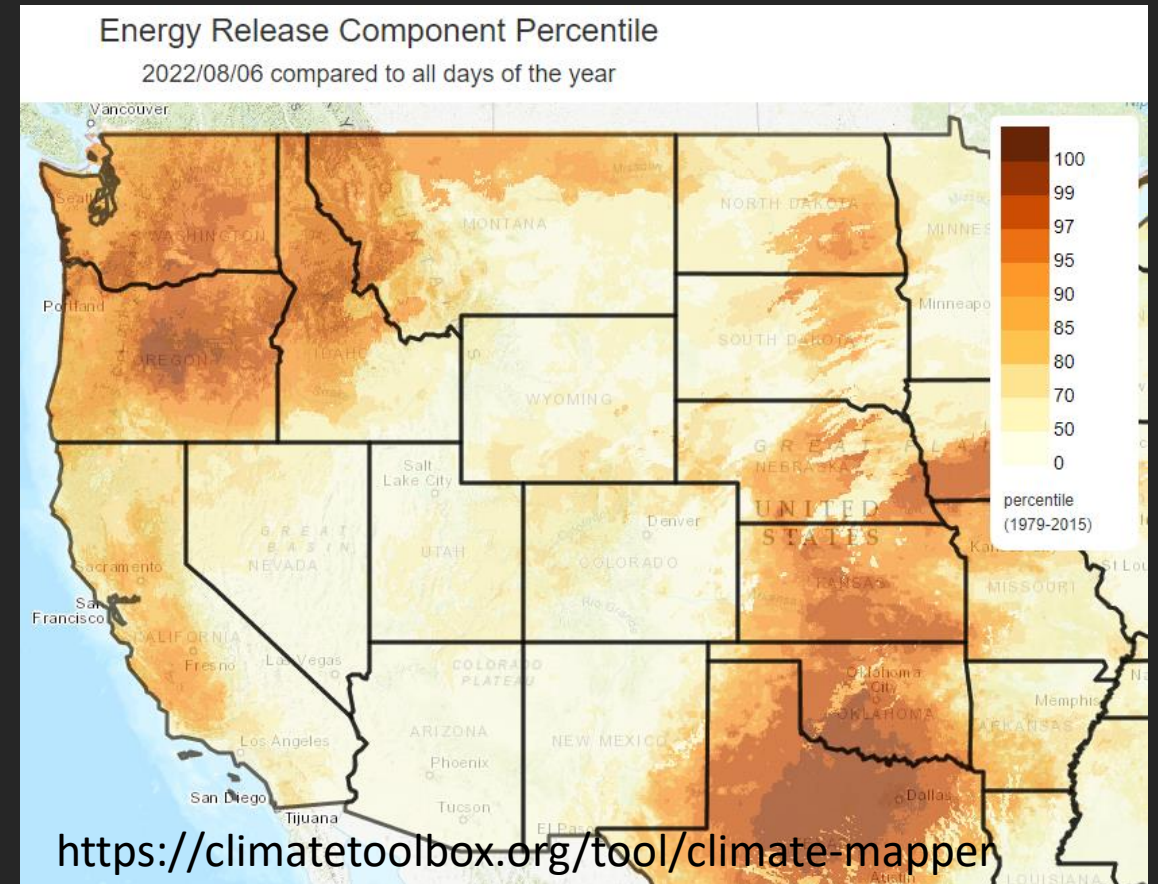
Smoke impacts have been much more localized this summer (so far) compared to 2020 and 2021.

<https://worldview.earthdata.nasa.gov/>

Current Wildfire Danger

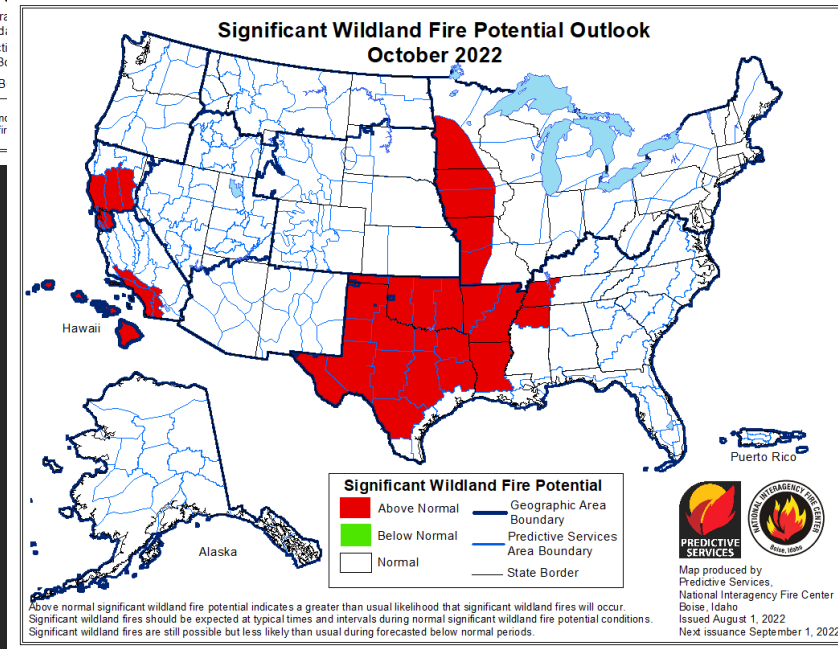
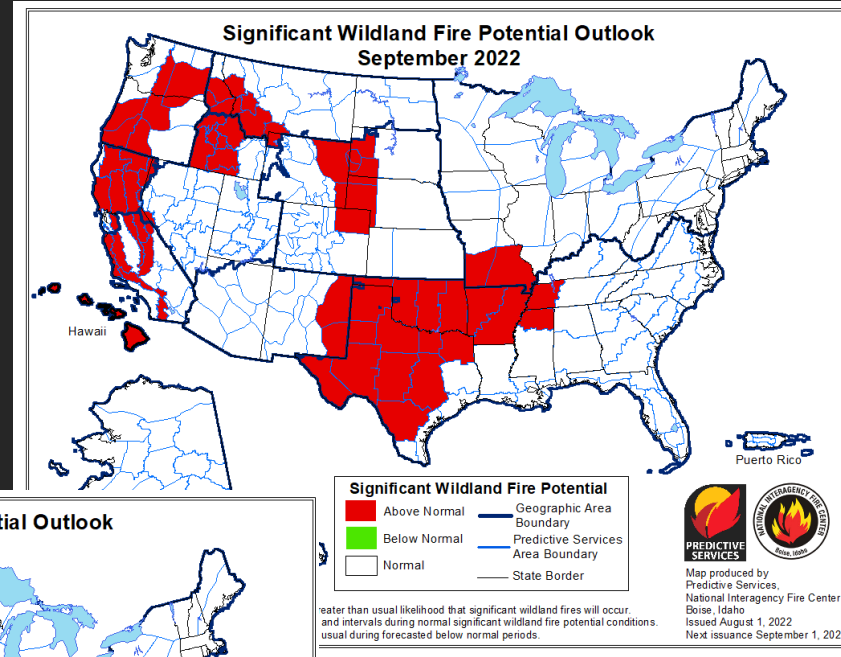
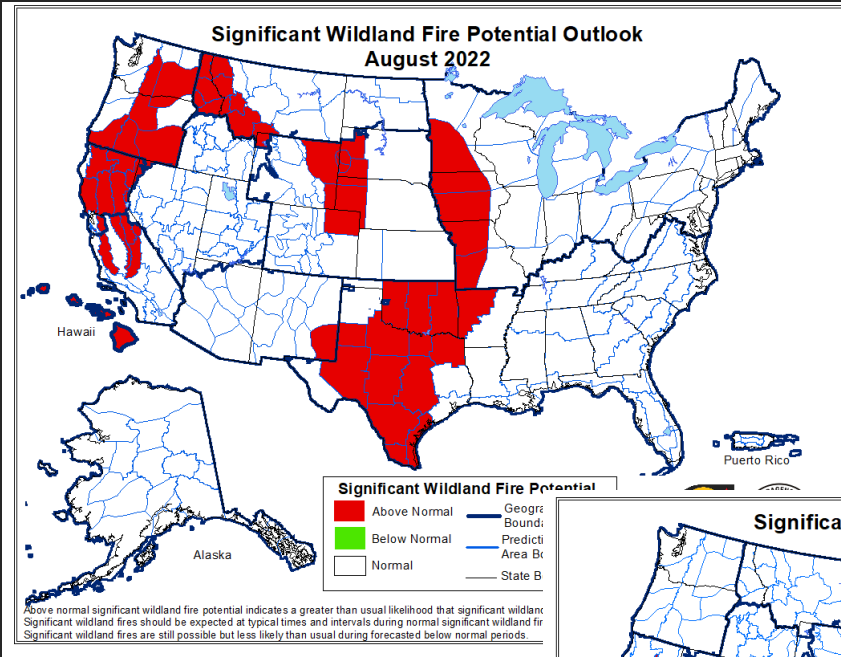


- Fire danger has increased in the PNW with late-July heat wave accelerating drying



- Fire danger lower in the Sierra Nevada, Great Basin, and Southwest

Significant Wildland Fire Potential Outlook



- Above normal *fire potential* still widespread in August-September due to both long-term drought and climatology (dry and hot)

Current Drought Snapshot

U.S. Drought Monitor Western U.S.

August 2, 2022
(Released Thursday, Aug. 4, 2022)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	16.64	83.36	70.56	54.68	28.61	6.01
Last Week <i>07-26-2022</i>	16.72	83.28	72.69	55.74	29.12	6.51
3 Months Ago <i>05-03-2022</i>	4.68	95.32	91.33	72.86	30.69	4.63
Start of Calendar Year <i>01-04-2022</i>	3.68	96.32	89.29	64.90	23.85	3.94
Start of Water Year <i>09-28-2021</i>	2.21	97.79	89.60	75.38	52.46	18.40
One Year Ago <i>08-03-2021</i>	6.39	93.61	89.98	80.48	58.16	21.79

Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Curtis Riganti
National Drought Mitigation Center



droughtmonitor.unl.edu

- Long-term drought (into year 3 or longer) still present across much of the west
- Monsoon has brought some relief vegetation/soil moisture in Southwest but contributes little to CO River Basin water supply
- Wet/cool spring and early summer brought improvement to the PNW

Colorado River Water Supply

More human remains discovered in Lake Mead's receding waters

By Nouran Salahieh and Elizabeth Wolfe, CNN

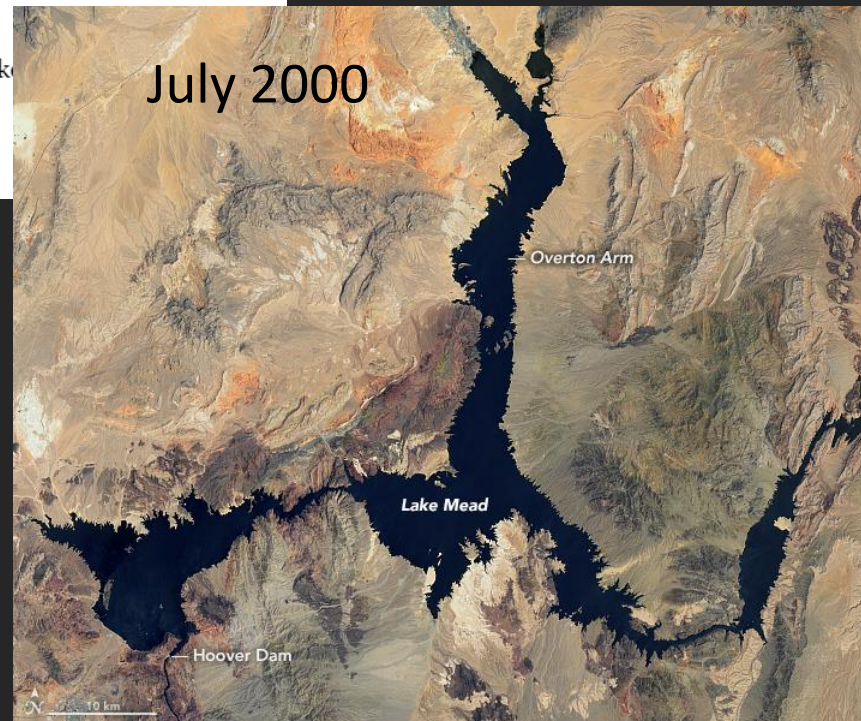
Updated 8:21 AM ET, Sun August 7, 2022

Lake Mead's low water levels reveal dead bodies, sunken boats, and ghost towns

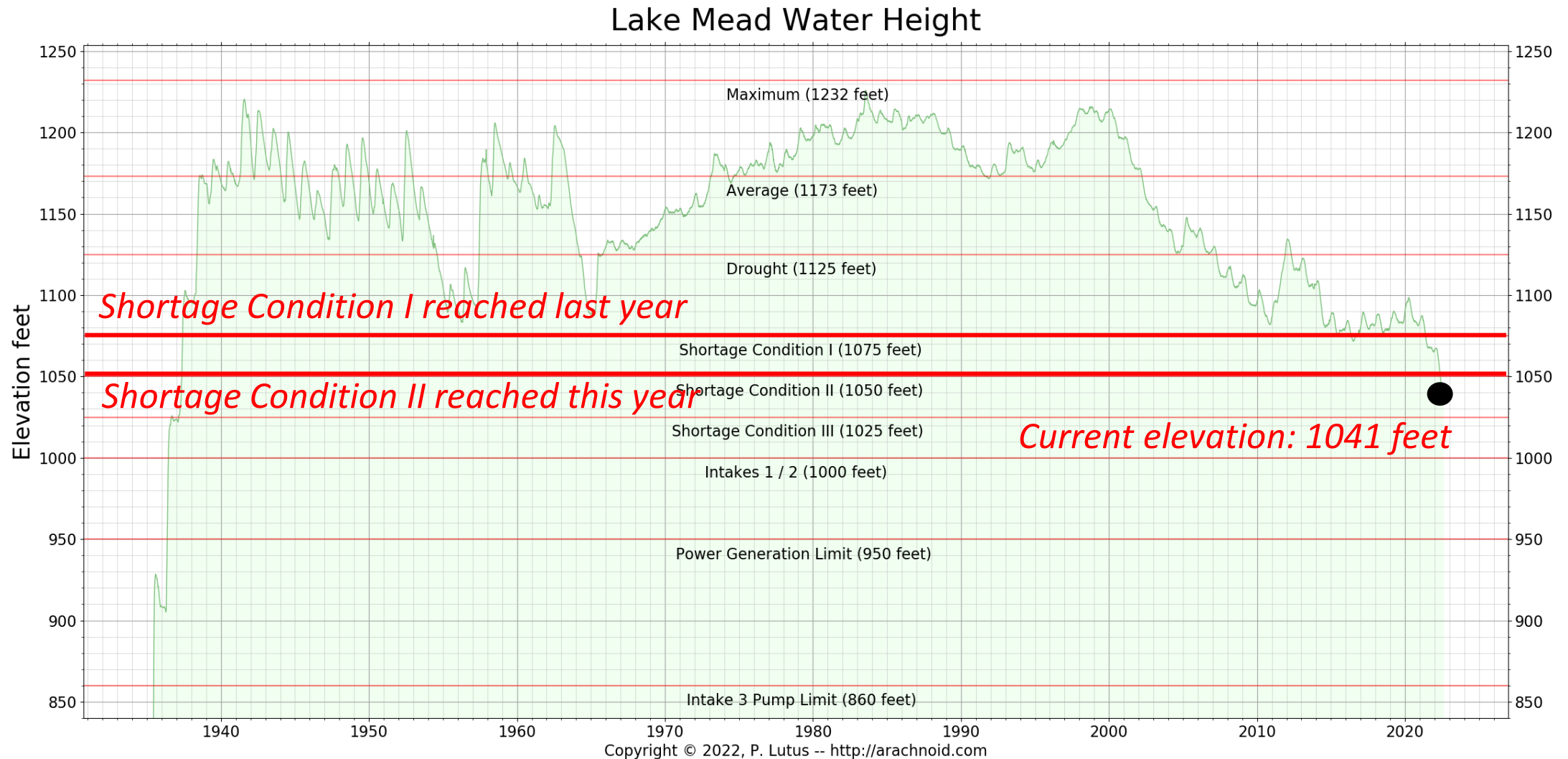
Skeletal human remains continue to be discovered as Lake Mead's water levels rapidly decline.

Scott L. Hall, USA TODAY

Published 3:41 p.m. ET Aug. 8, 2022



Colorado River Water Supply



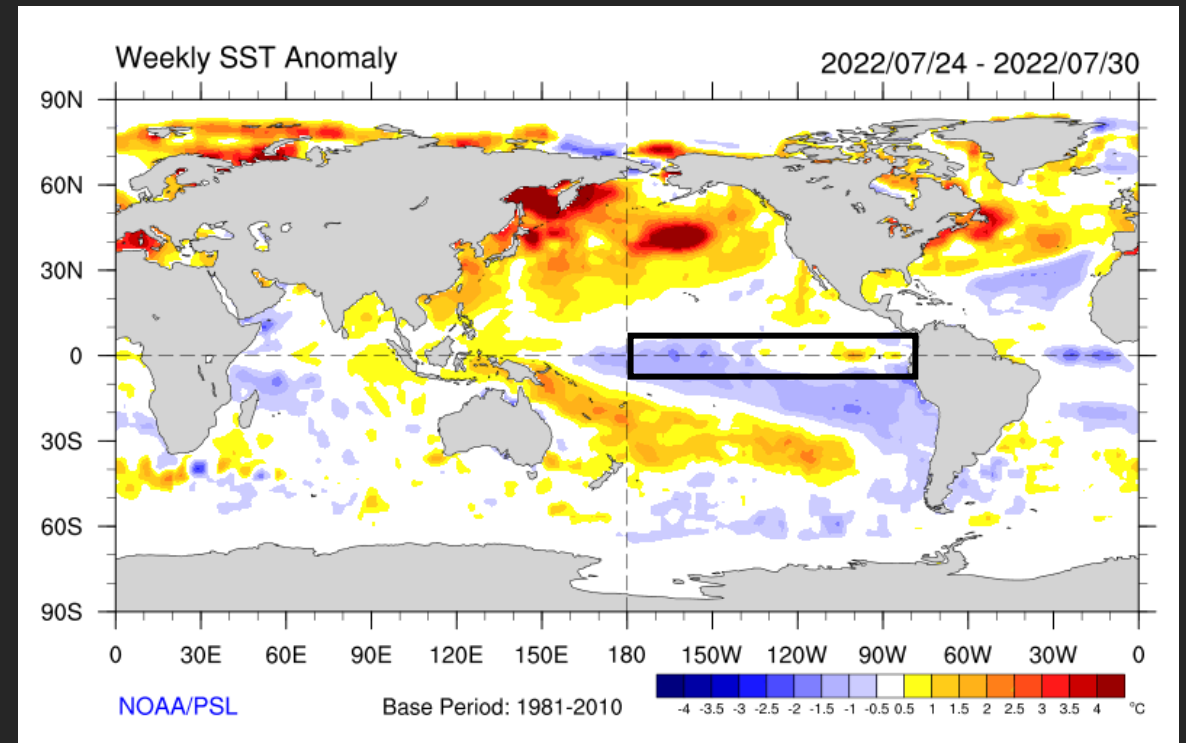
Colorado River Water Supply

- Stage I shortage water cuts already in place for Arizona, Nevada, and California
- Talks between all basin states now underway to cut 2-4 million acre-feet next year
 - Perspective: California gets about 4.4 million acre-feet per year and Arizona about 2.8 million acre-feet per year
- State decisions on how much each state will cut should be reached sometime this month

ENSO Update

<https://psl.noaa.gov/map/clim/sst.shtml>

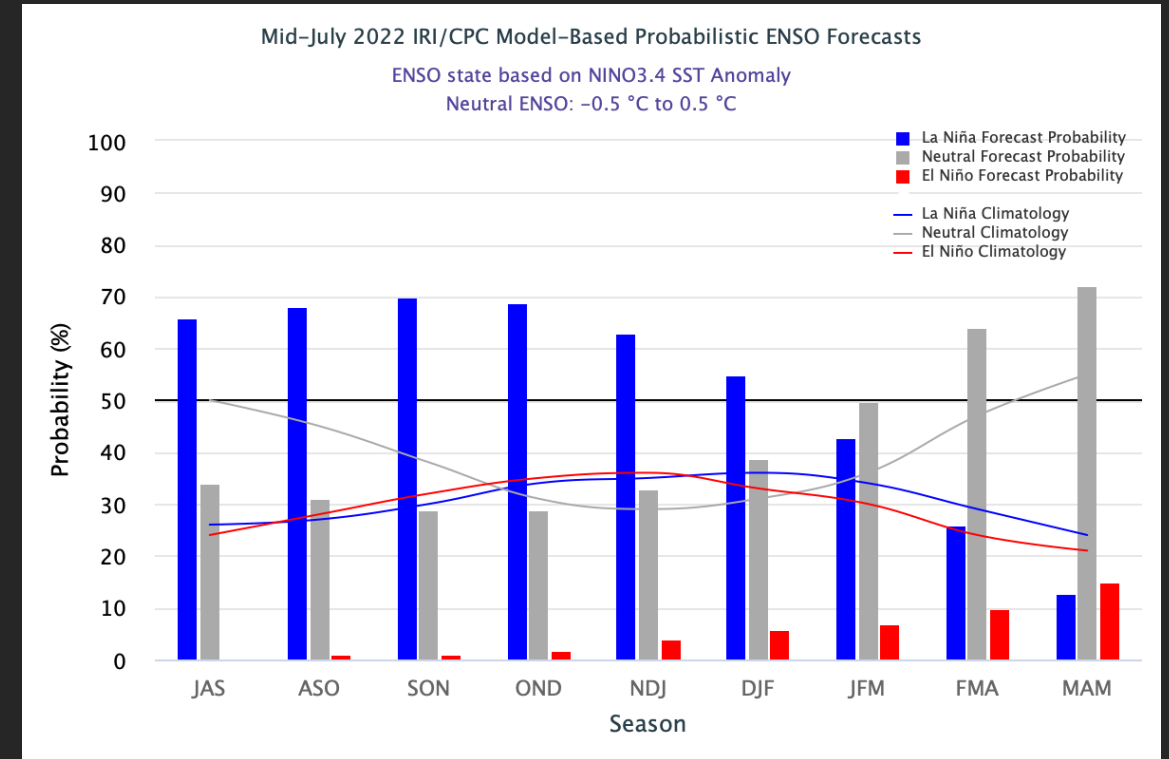
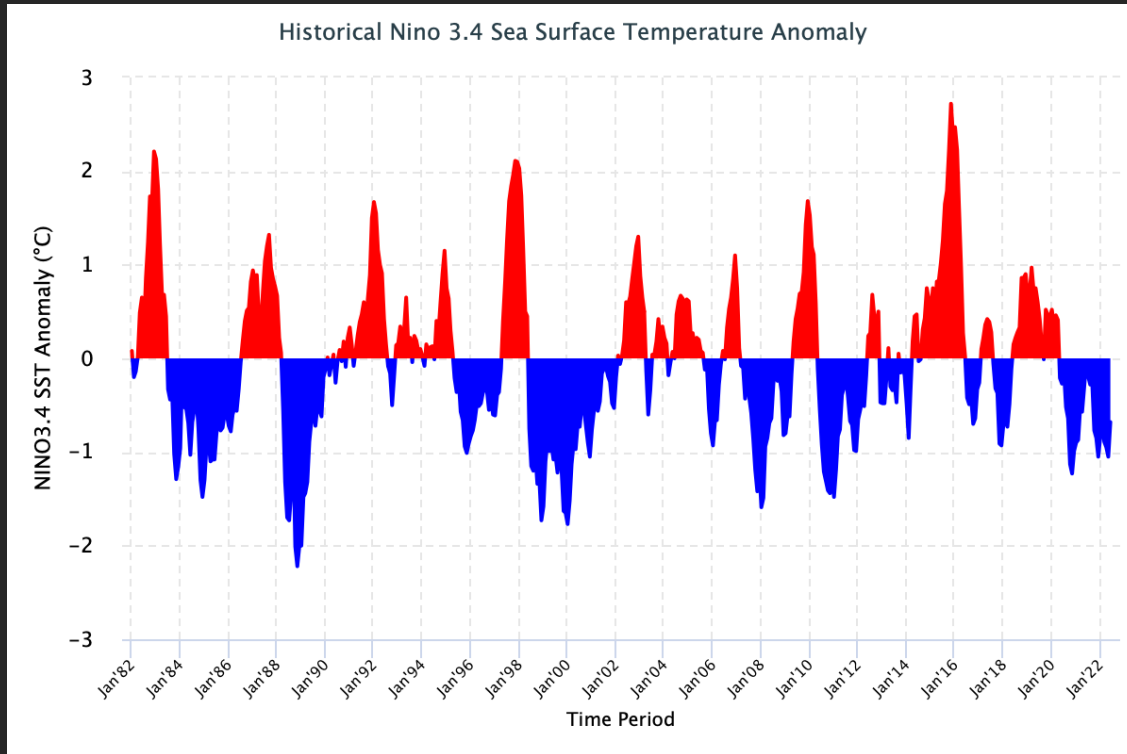
- ENSO Alert System Status: **La Niña Advisory**
- La Niña is present.
- Equatorial sea surface temperatures (SSTs) are below average across most of the Pacific Ocean.
- The tropical Pacific atmosphere is consistent with La Niña conditions.



- La Niña is favored to continue through 2022 with the odds for La Niña decreasing into the Northern Hemisphere late summer (60% chance in July-September 2022) before increasing through the Northern Hemisphere fall and early winter 2022 (62-66% chance).

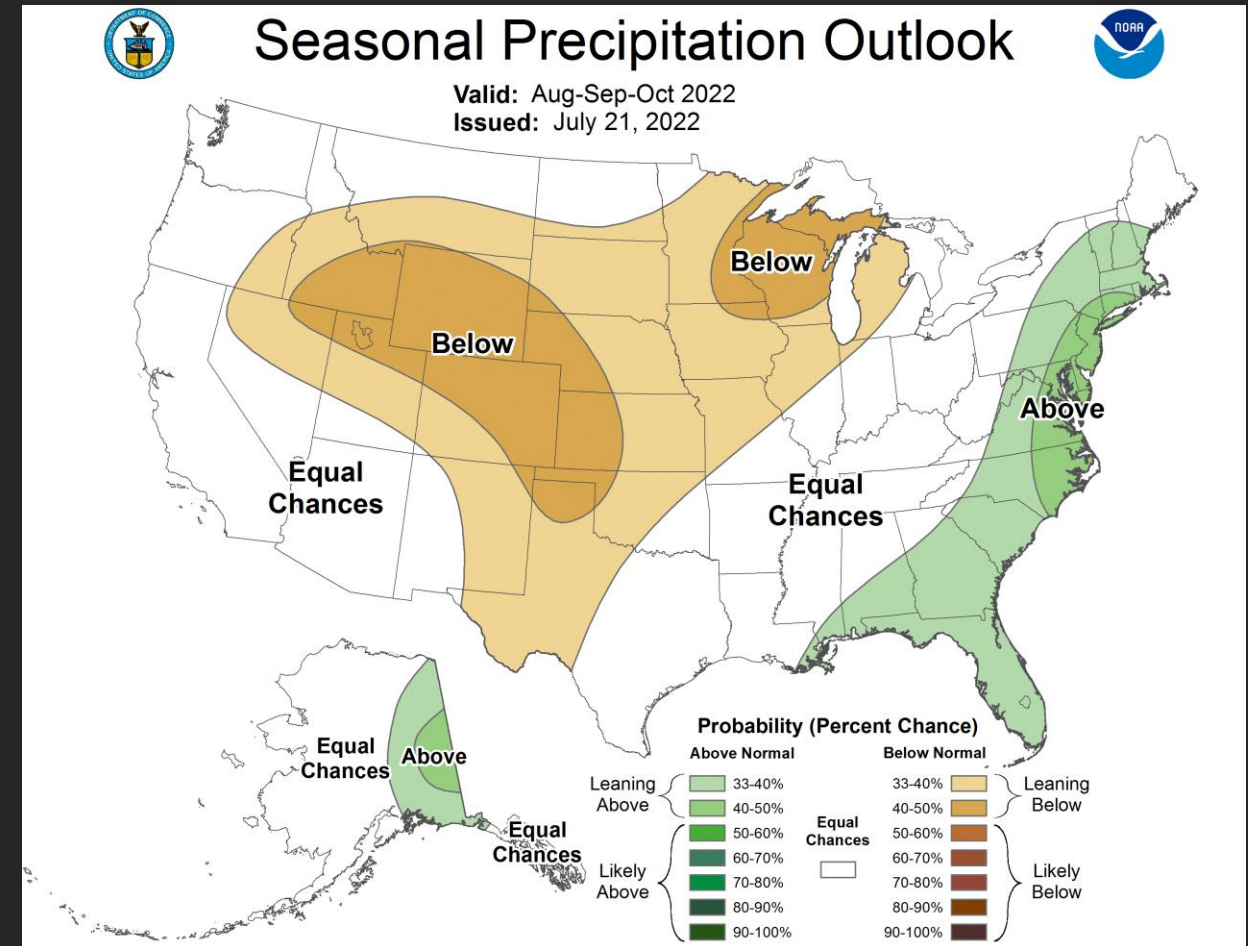
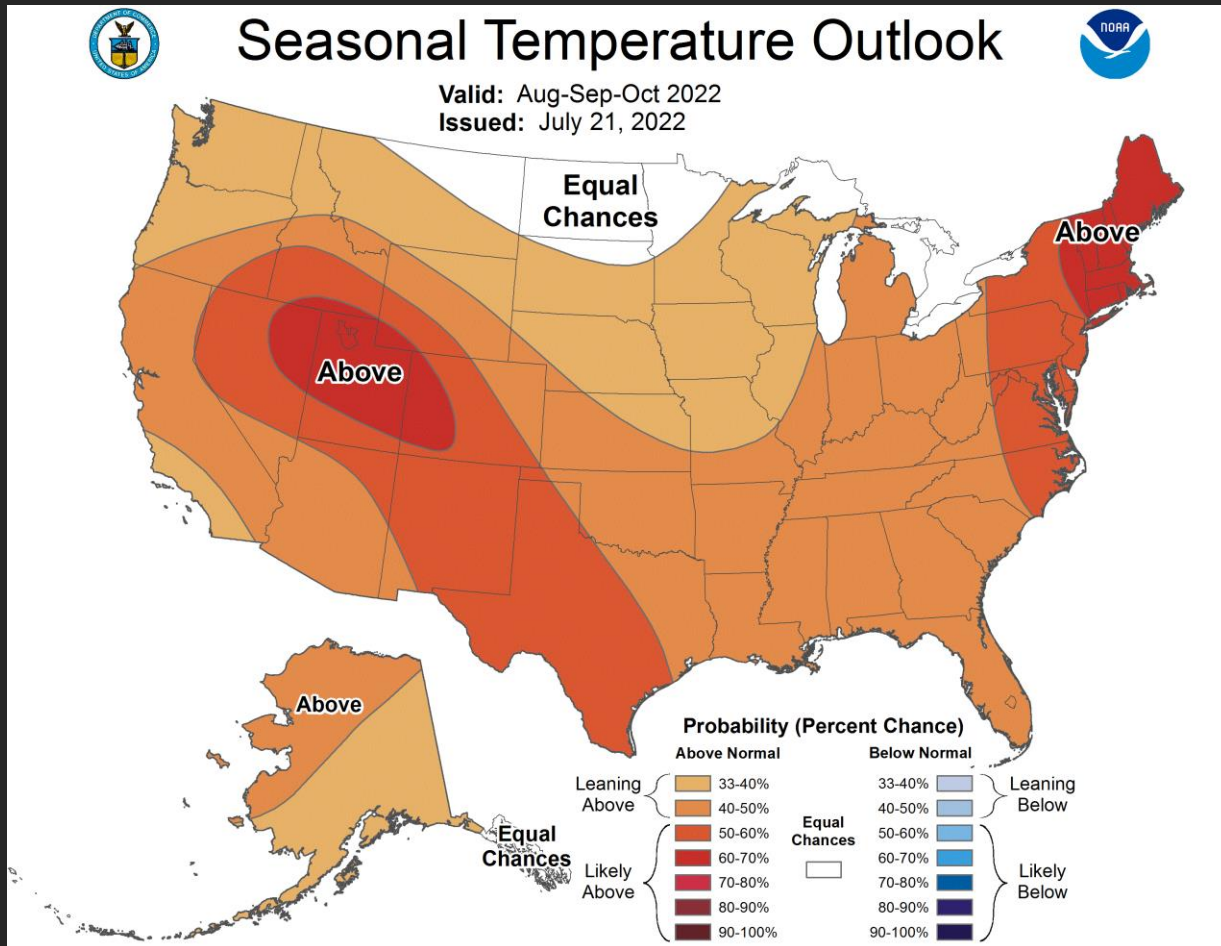
Source: Climate Prediction Center

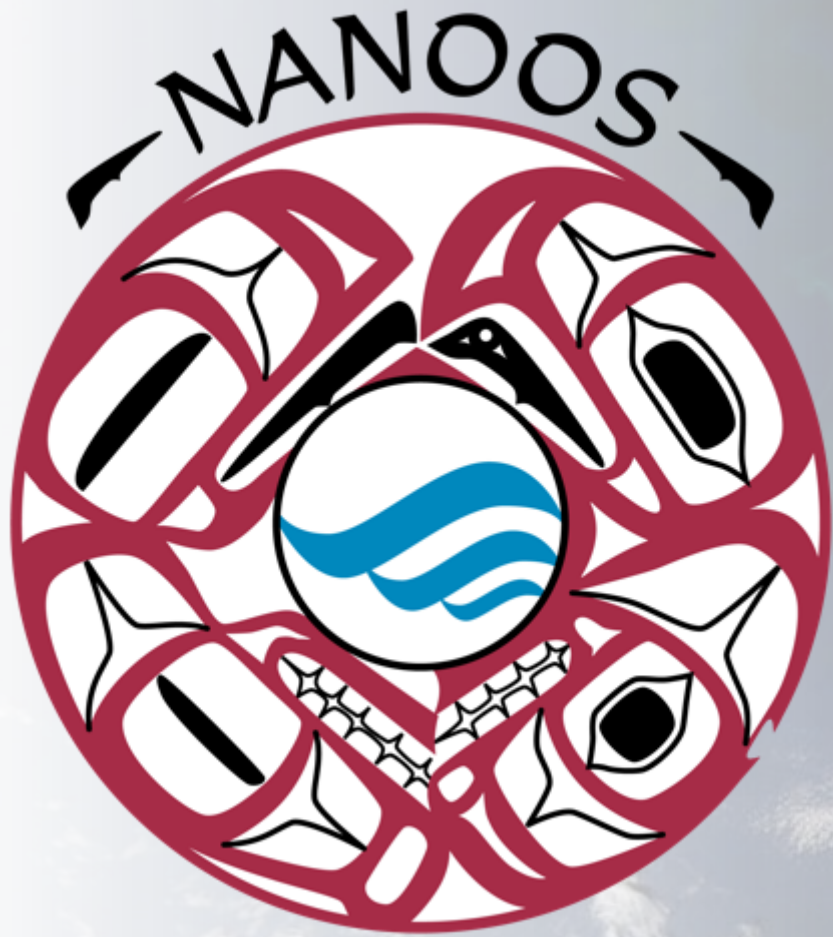
ENSO—La Niña Conditions Persist



- La Niña conditions still present with below average SSTs in the eastern equatorial Pacific
- La Niña likely to continue into autumn; lower confidence for winter

Aug-Oct Temperature and Precipitation Outlook



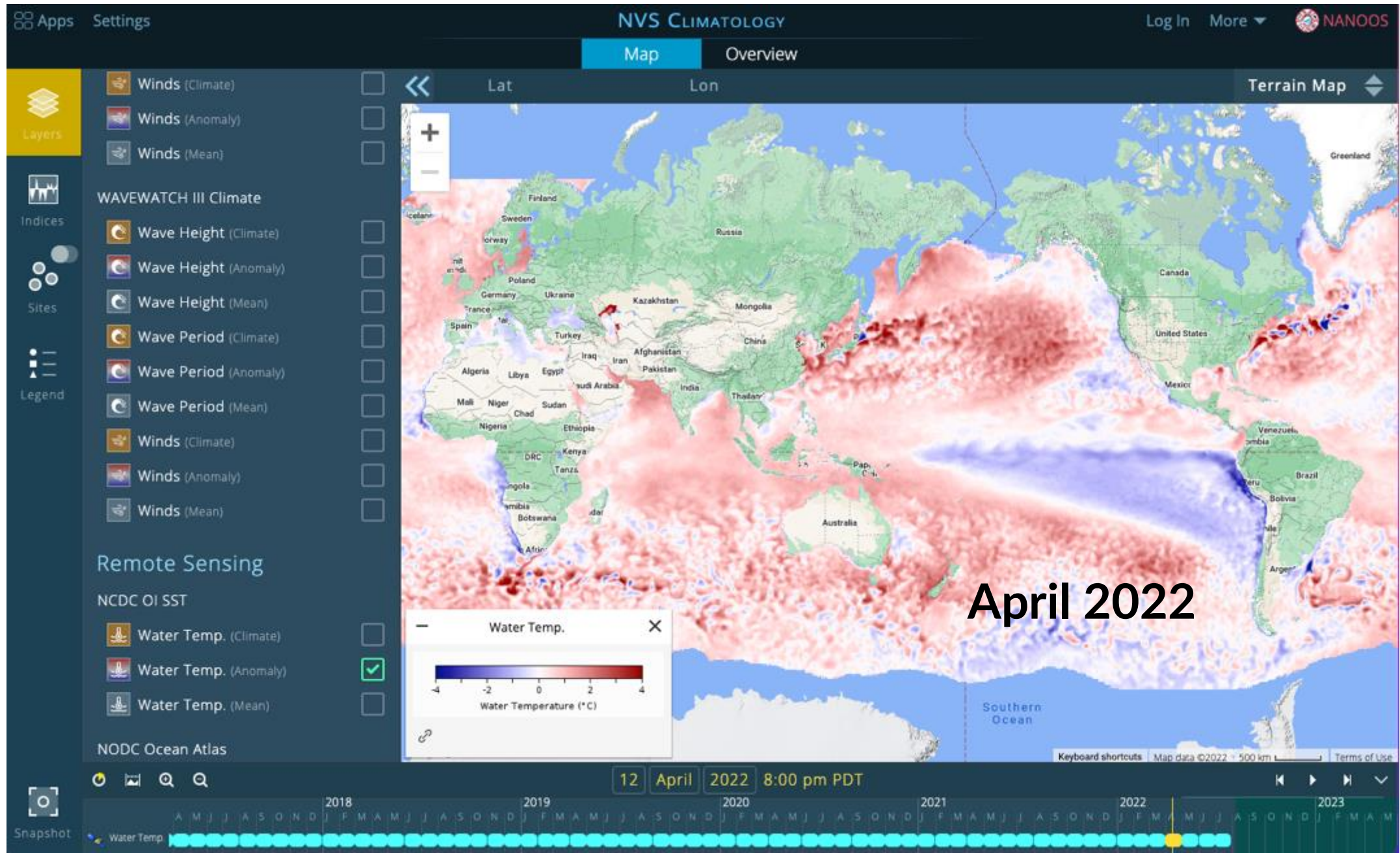


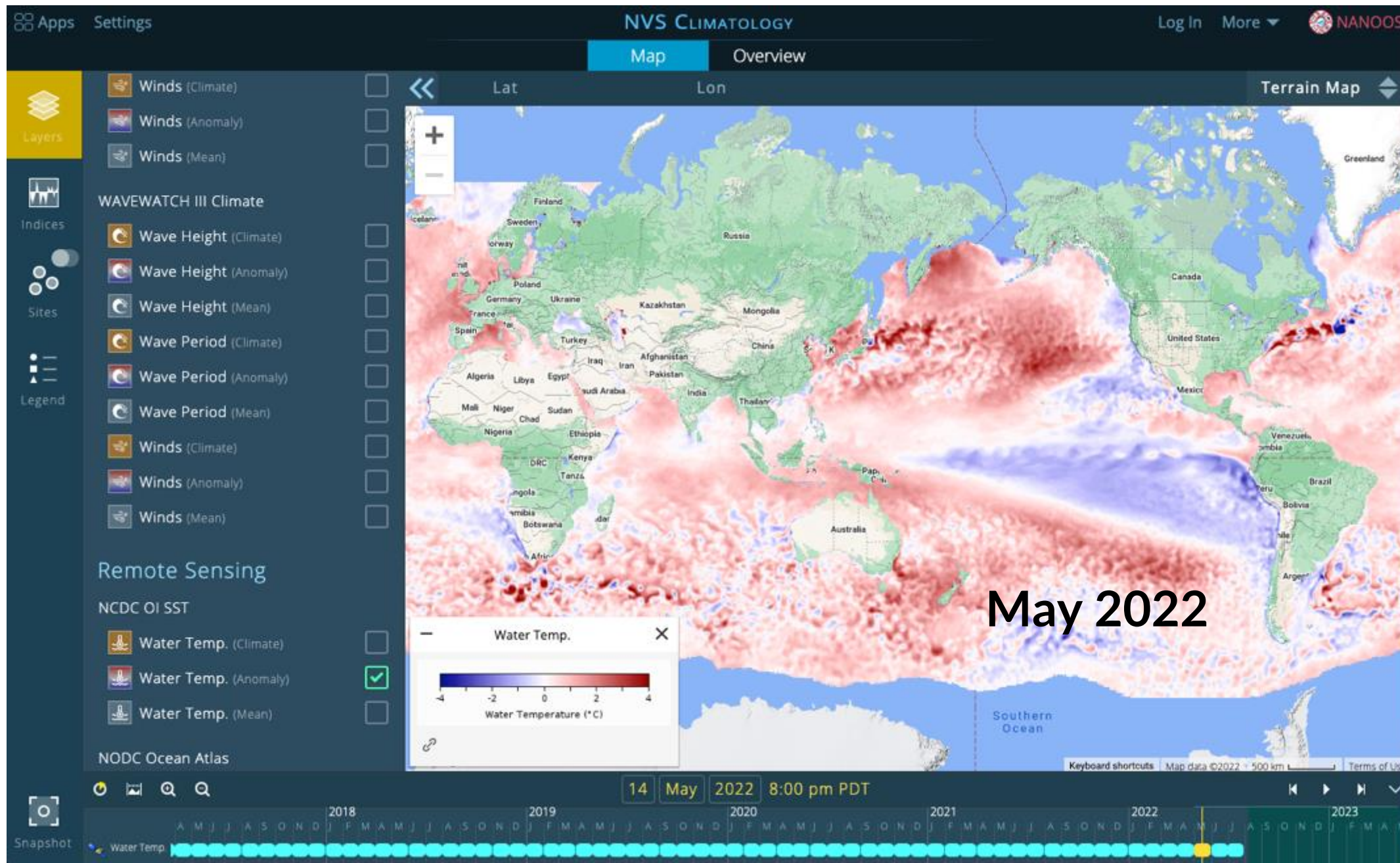
NOAA West Watch Update 9 August 2022

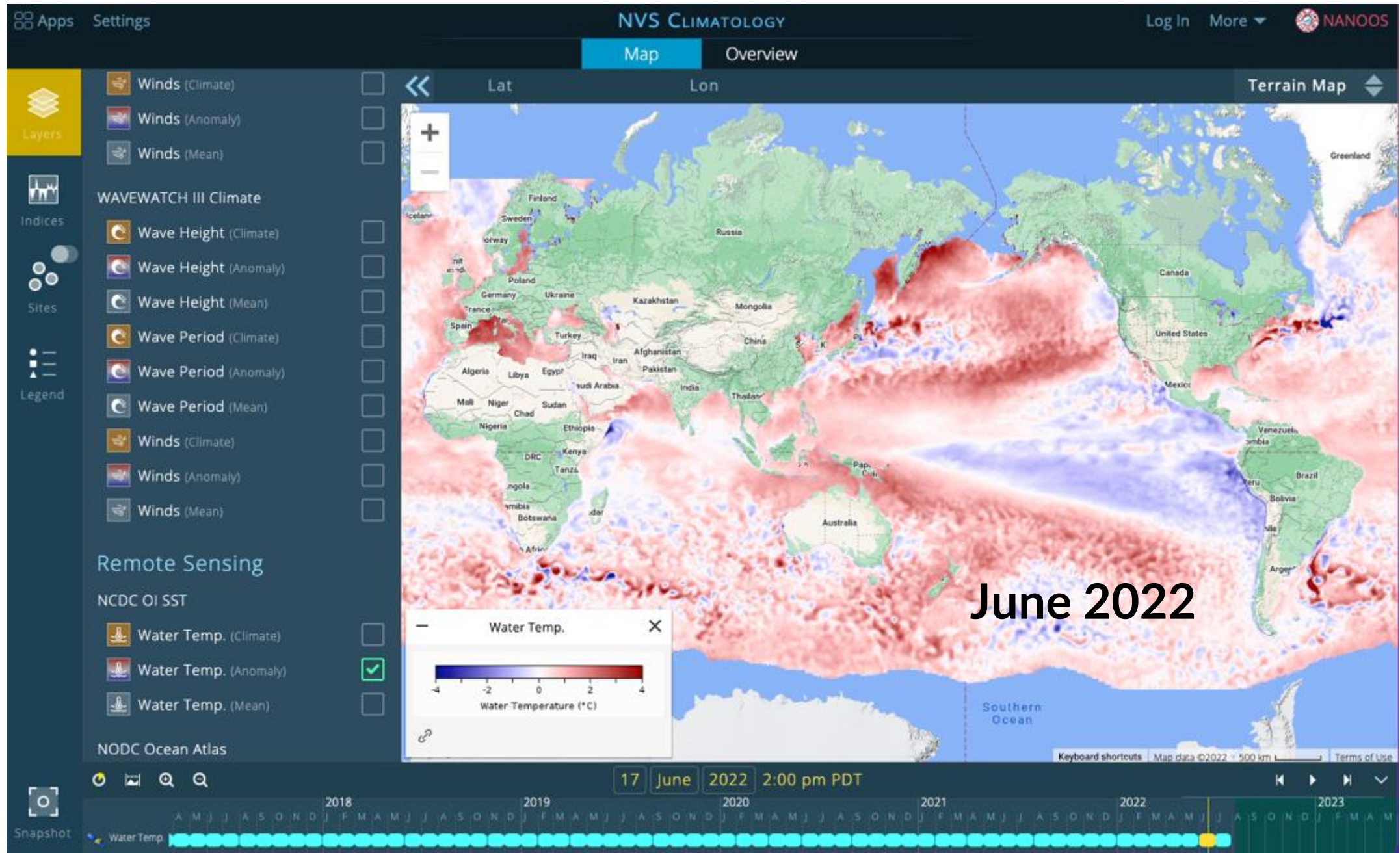
Jan Newton, NANOOS Executive Director

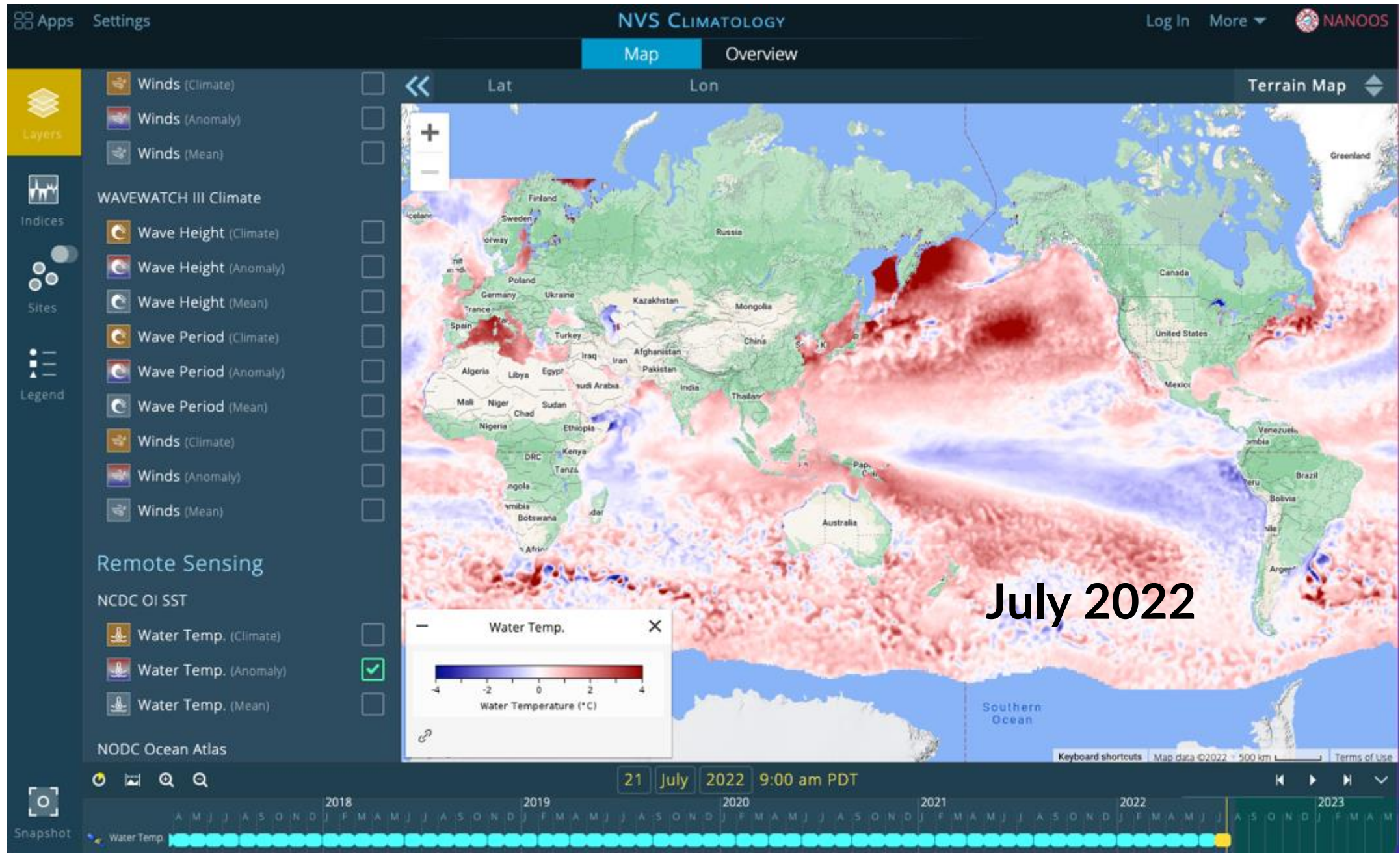
www.nanoos.org











Controls

2022-08-06

Animate

Map layer

Map data

Background

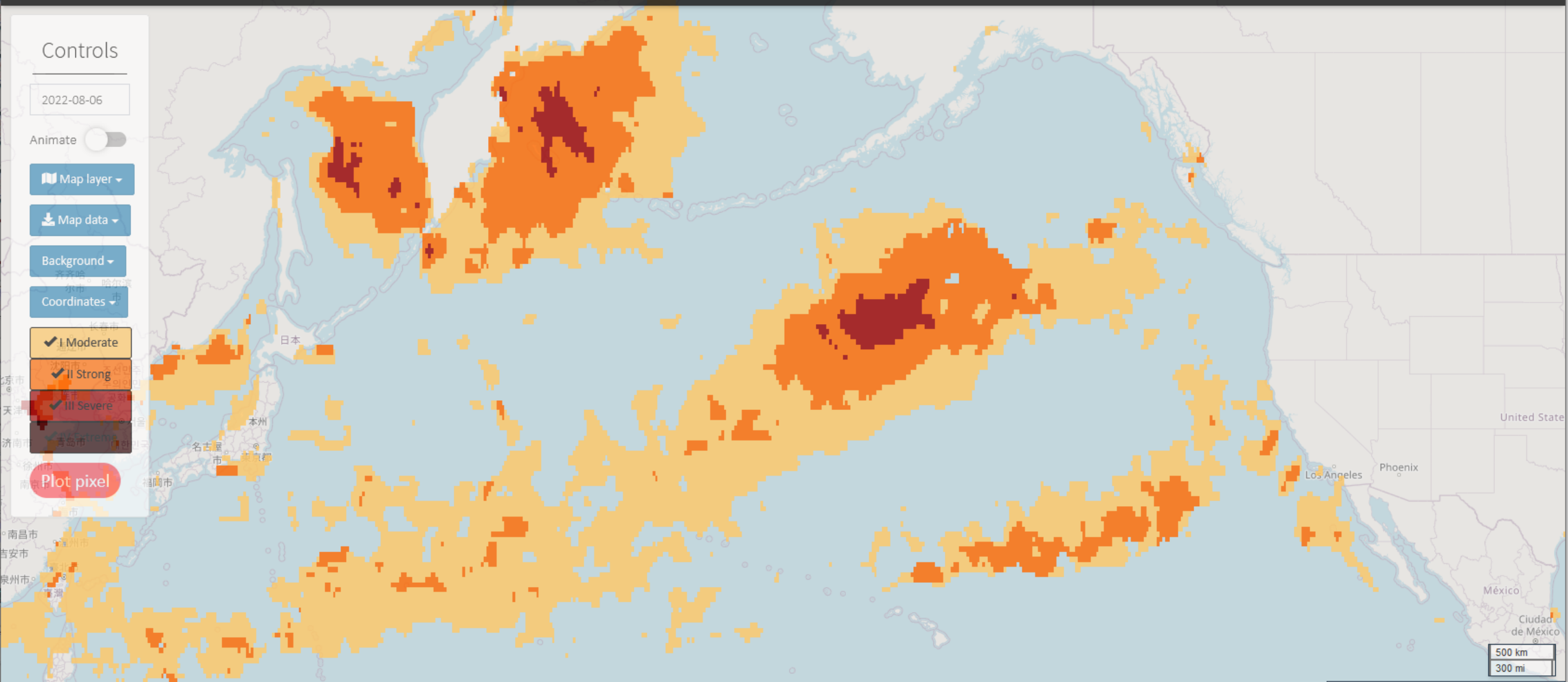
Coordinates

I Moderate

II Strong

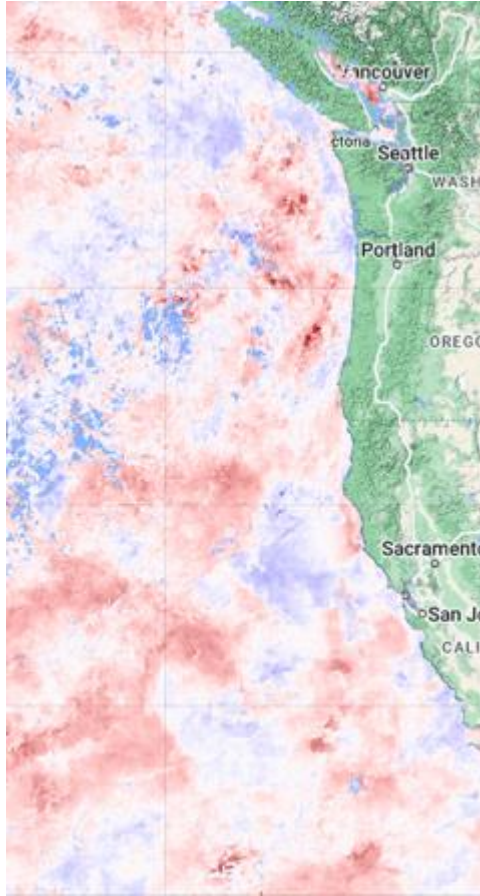
III Severe

Plot pixel

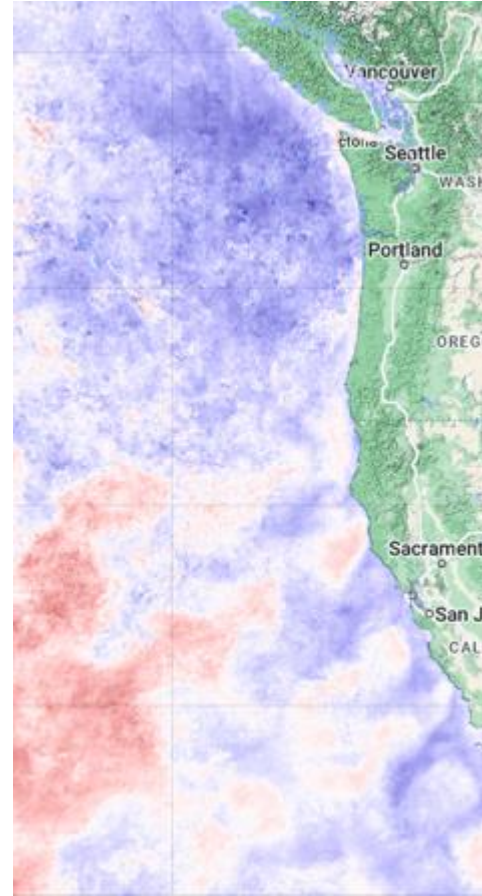


Each of these four colors corresponds to increasing categories of MHWs as first proposed in [Hobday et al. 2018](#).

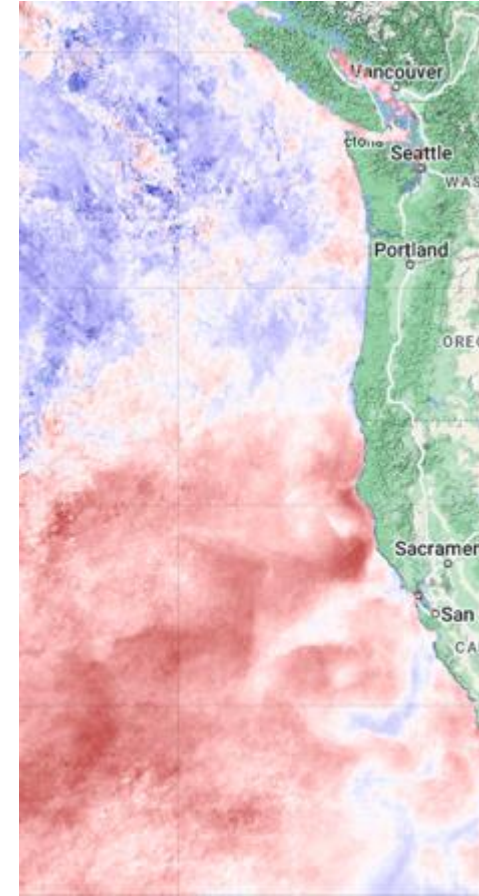
April 2022



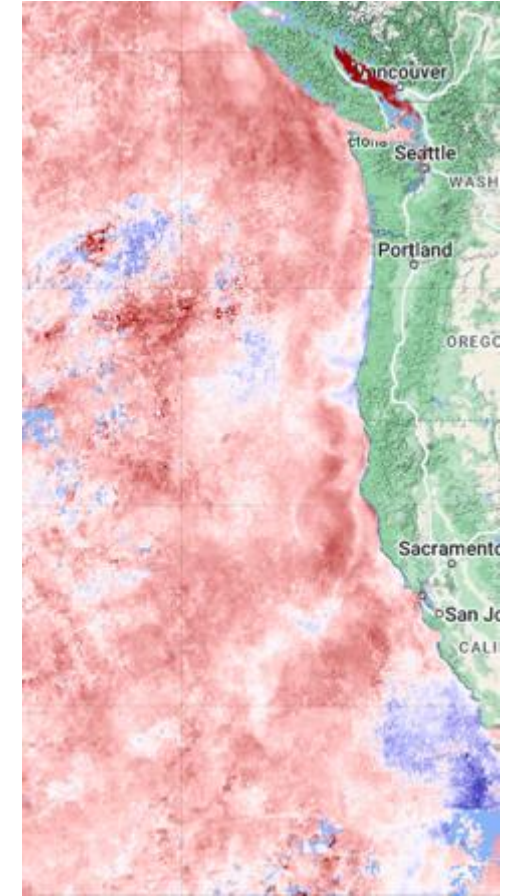
May 2022



June 2022

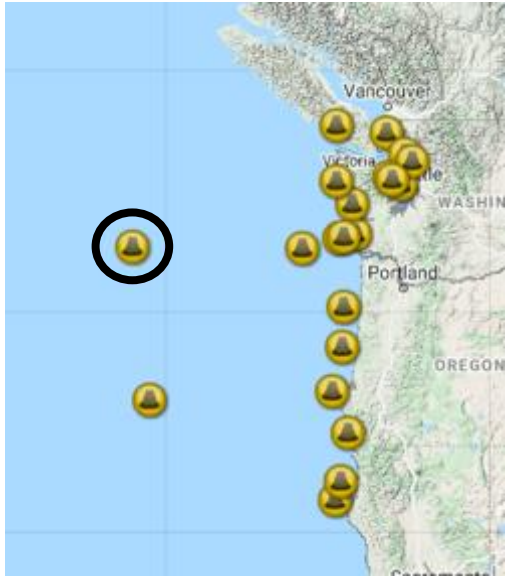


July 2022

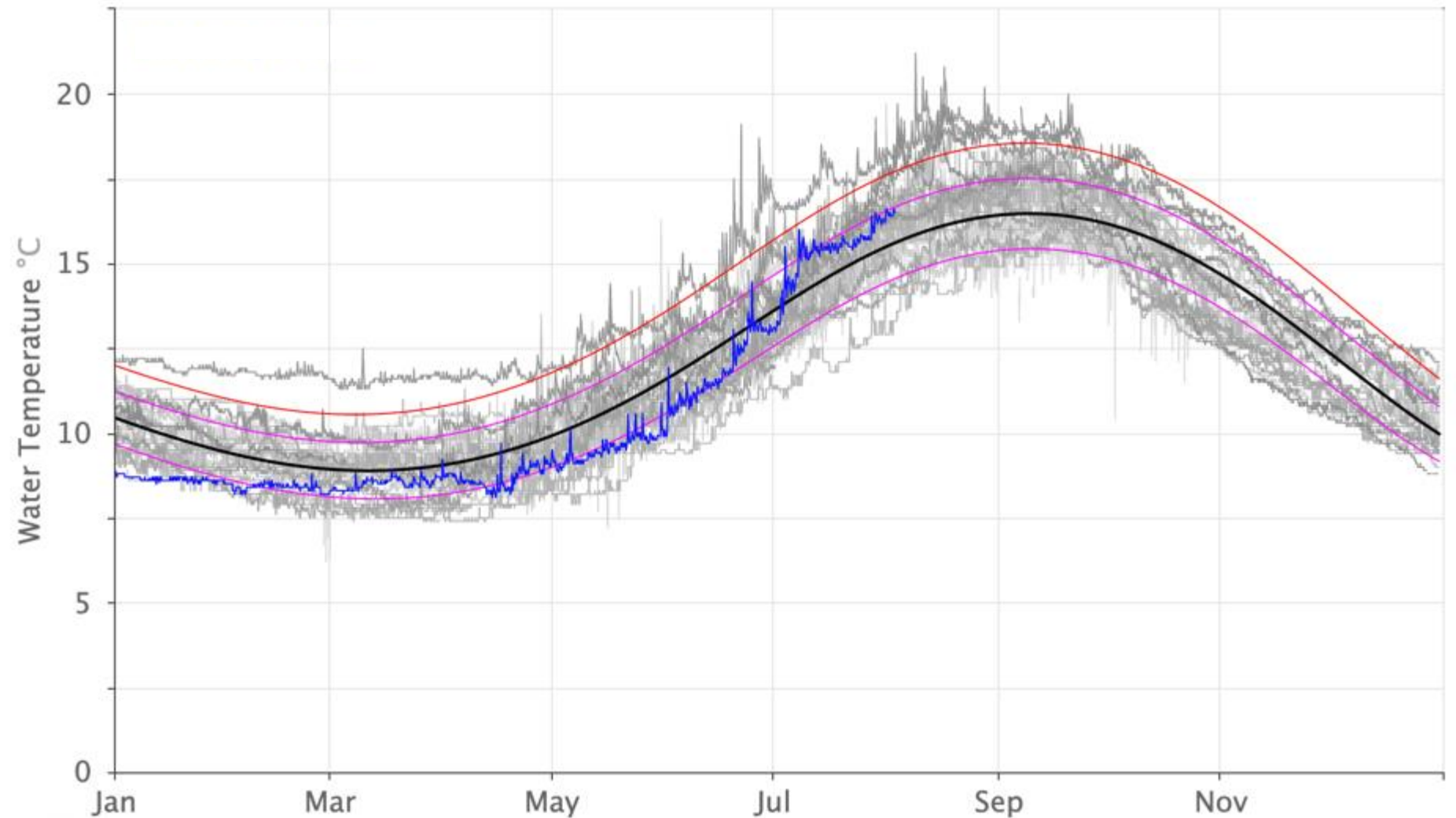


Water Temperature Anomaly  (°C)

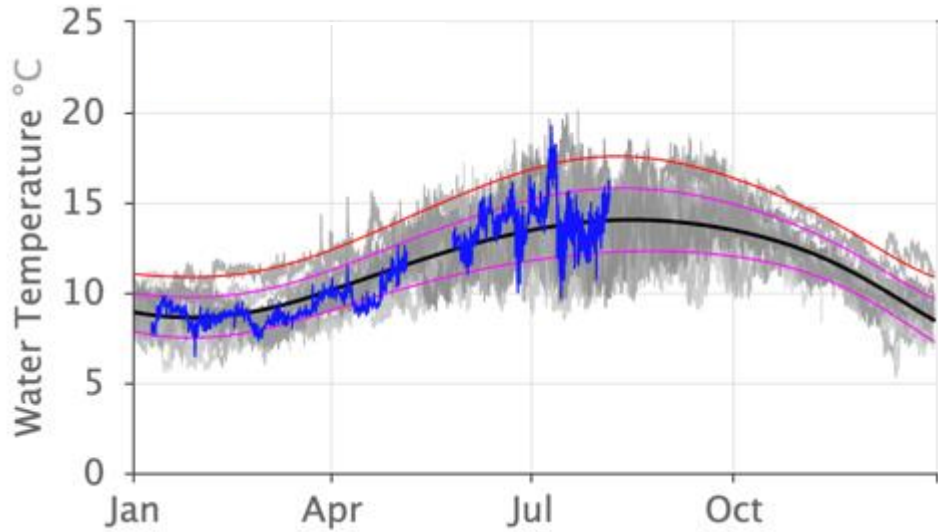
NDBC Washington



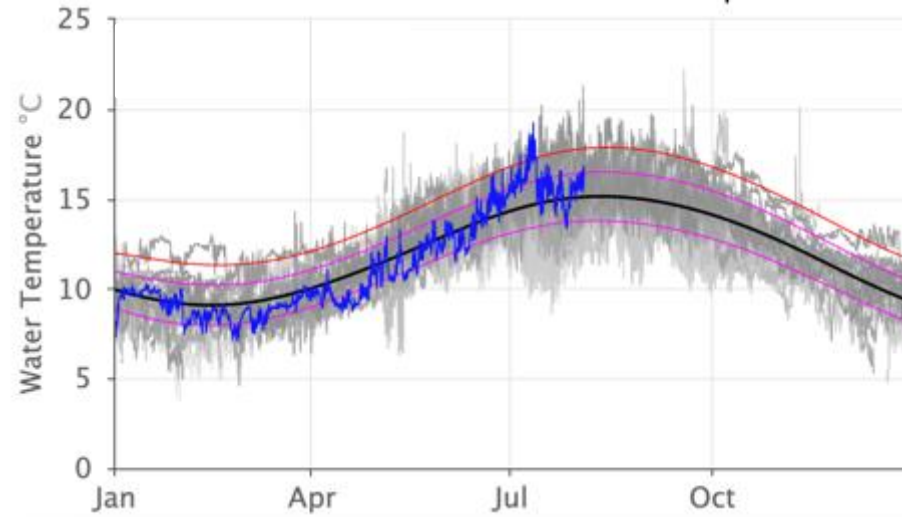
- Seasonal Cycle
n=45 Yrs
- -1 STD
- +1 STD
- +2 STD
- 2022



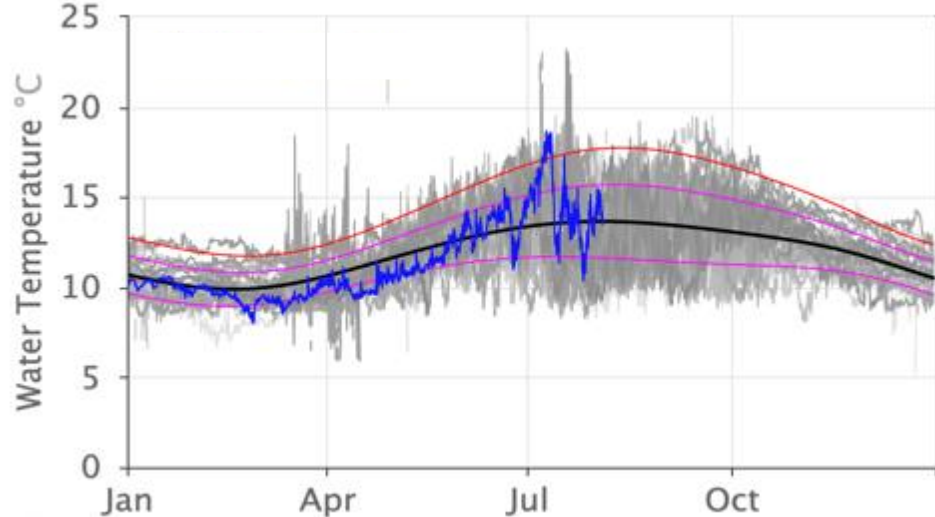
CDIP Grays Harbor ● 17 yrs



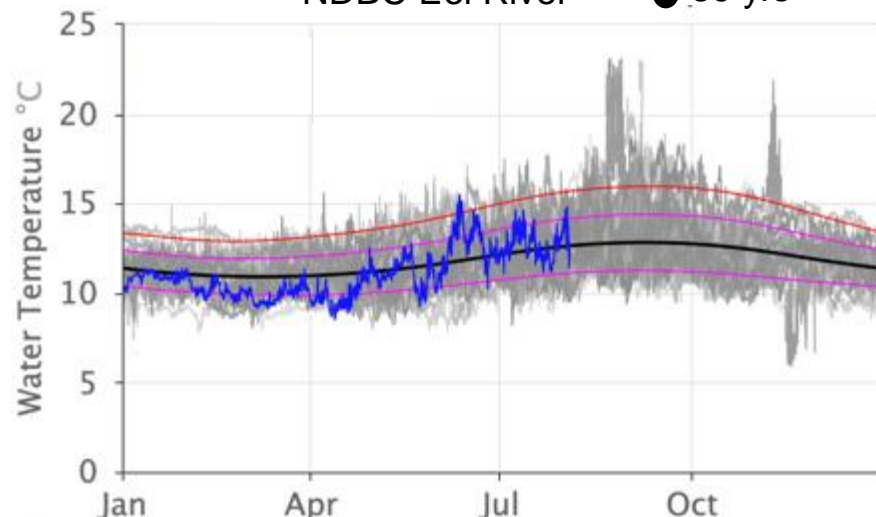
NDBC Columbia River Bar ● 37 yrs



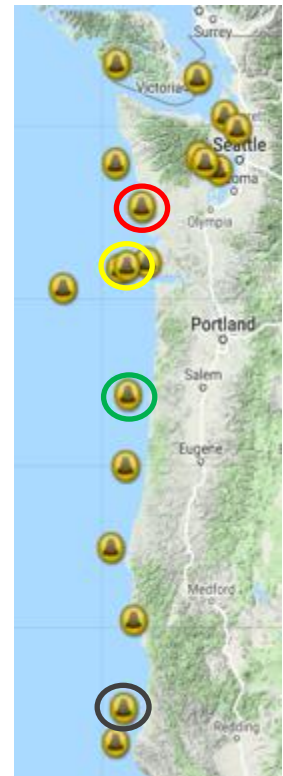
NDBC Stonewall Bank ● 34 yrs



NDBC Eel River ● 39 yrs



- Seasonal Cycle
- -1 STD
- +1 STD
- +2 STD
- 2022



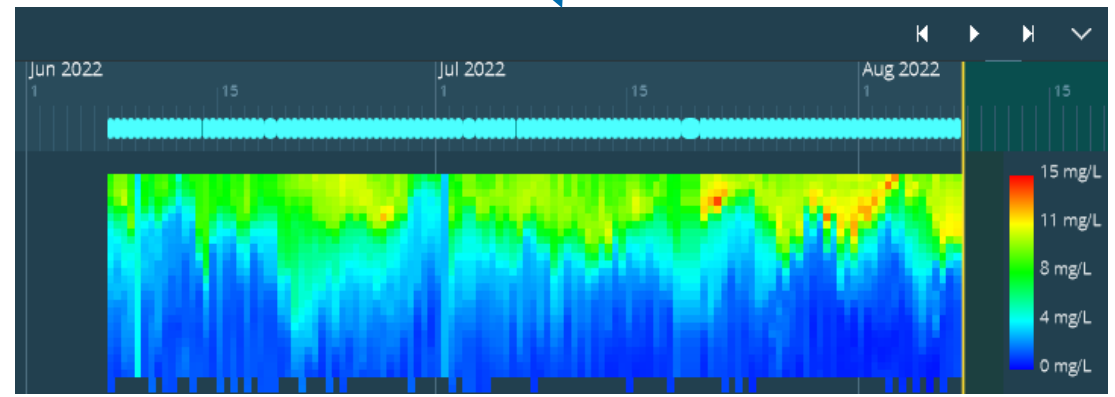
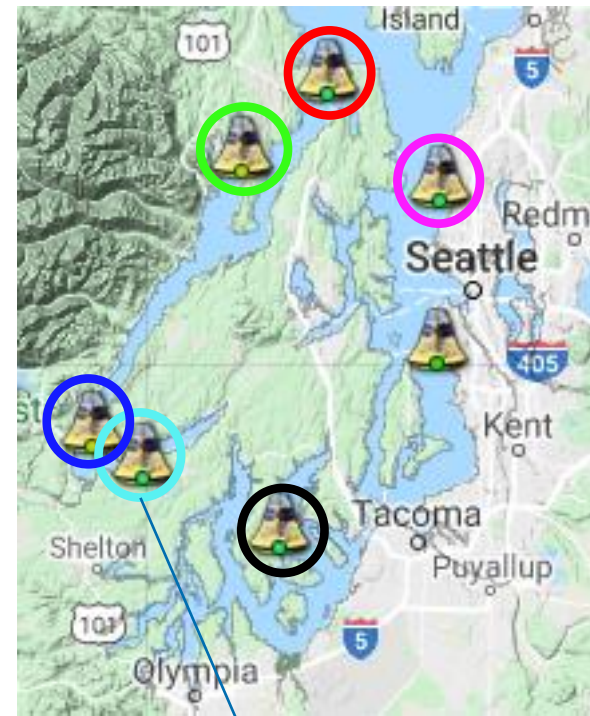
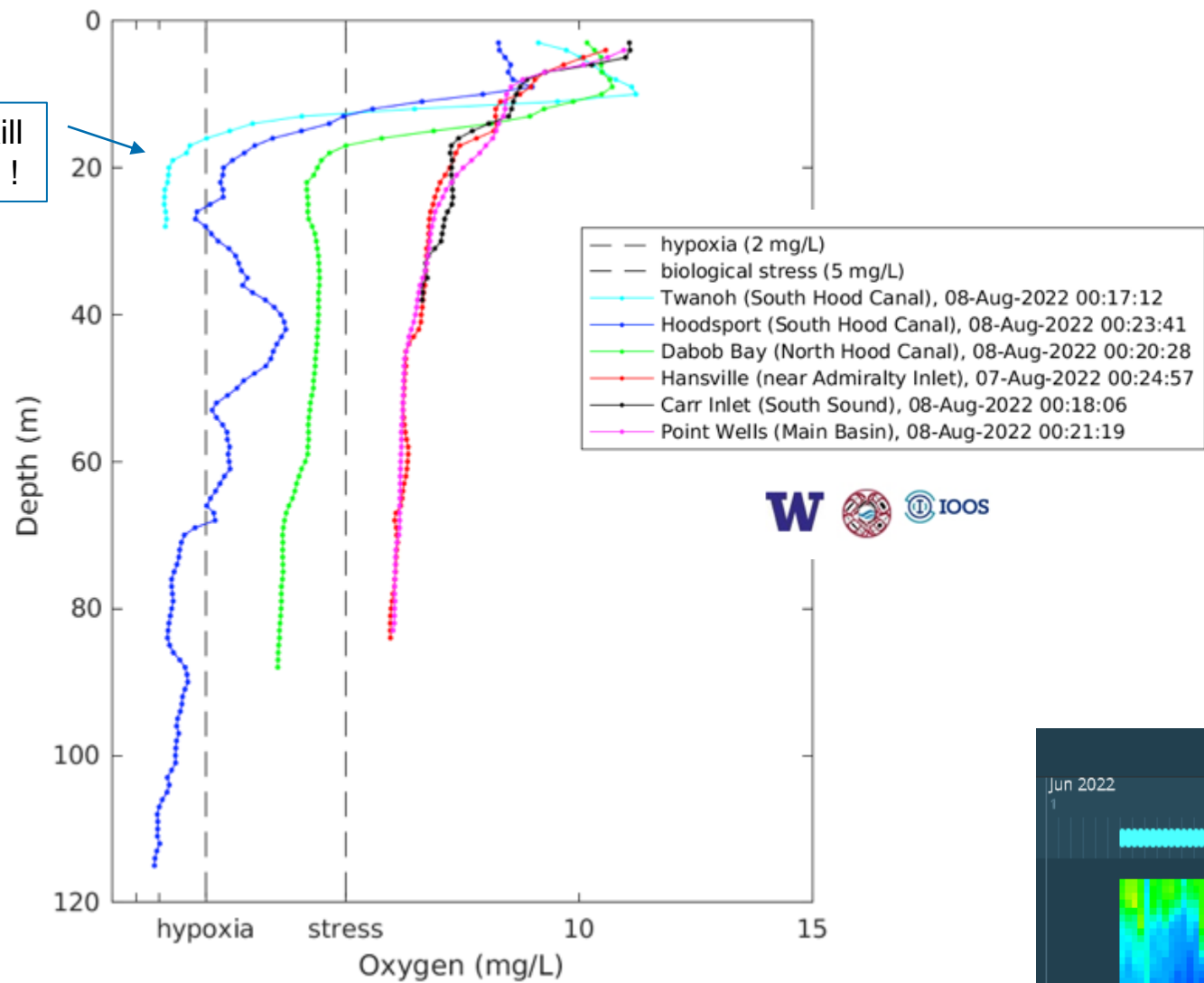
NWEM: <https://nwem.apl.washington.edu/index.shtml>

NANOOS: www.nanoos.org Data Explorer

Dissolved Oxygen

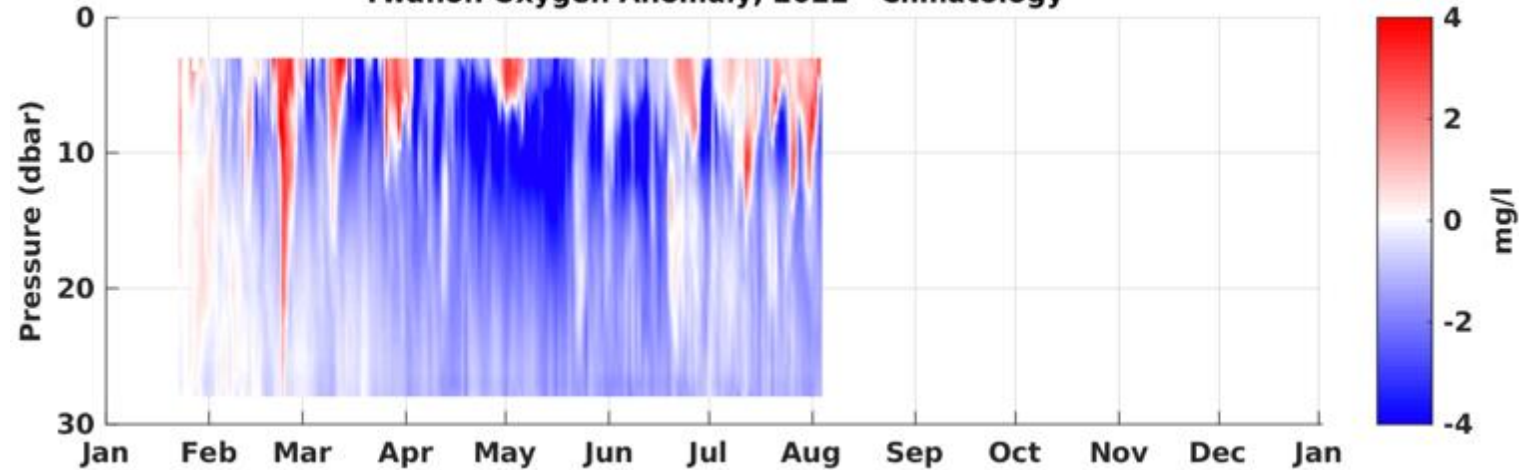
Puget Sound Profiling Buoys

Fish Kill Watch !

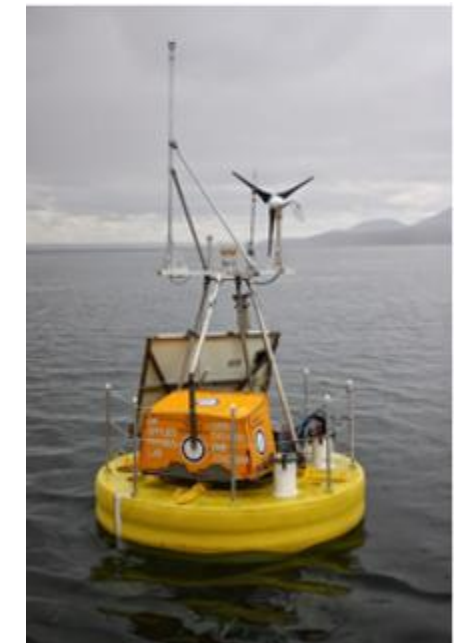
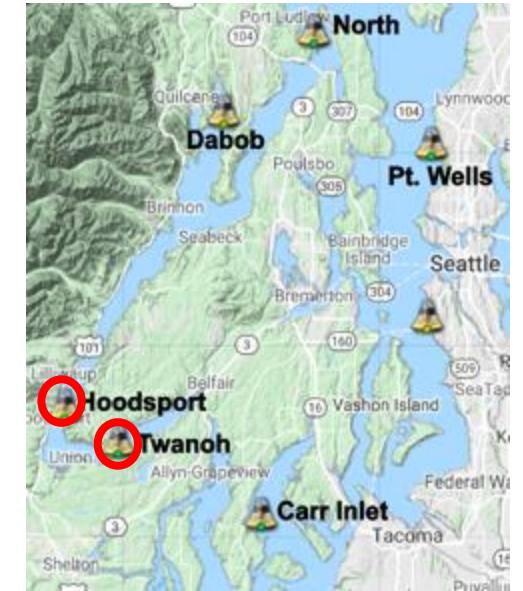
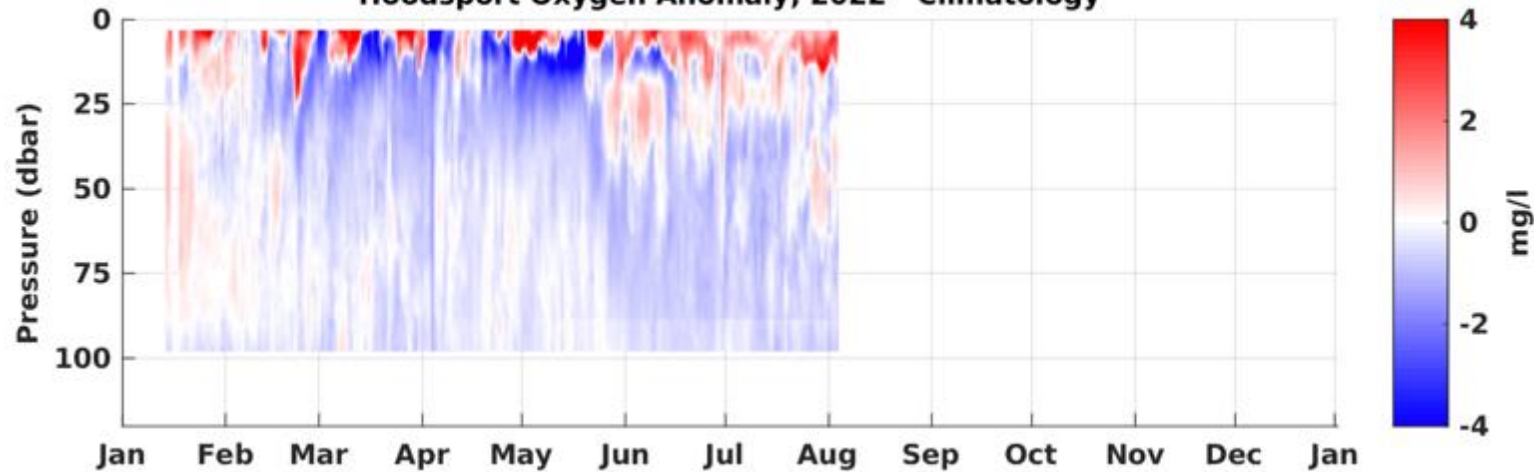


Hood Canal Oxygen

Twanoh Oxygen Anomaly, 2022 - Climatology



Hoodsport Oxygen Anomaly, 2022 - Climatology





Oxygen

Chá?ba buoy

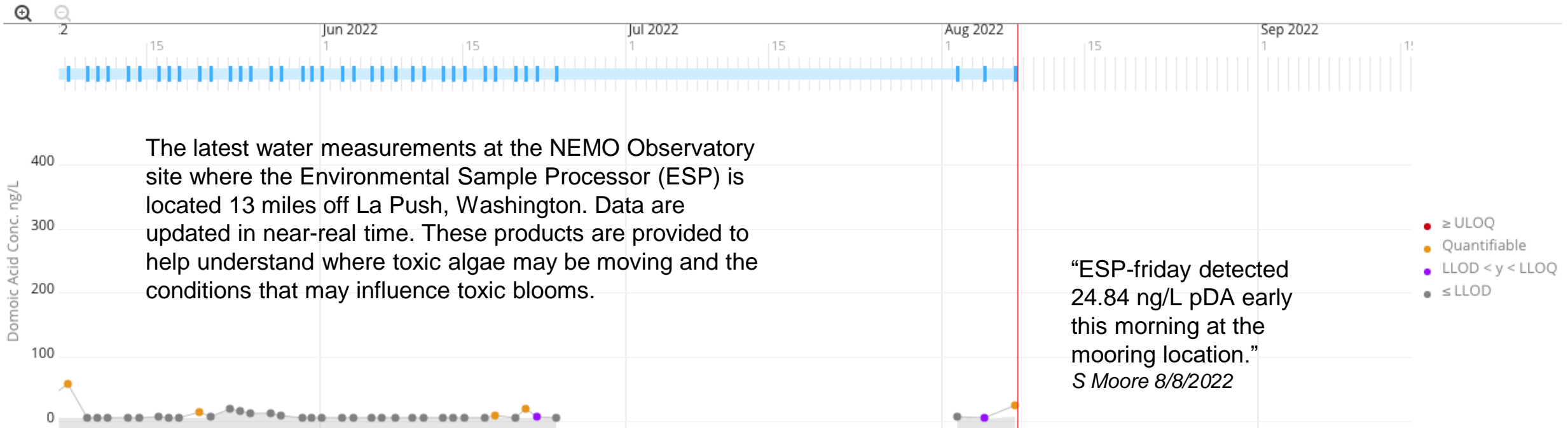
Off La Push, WA



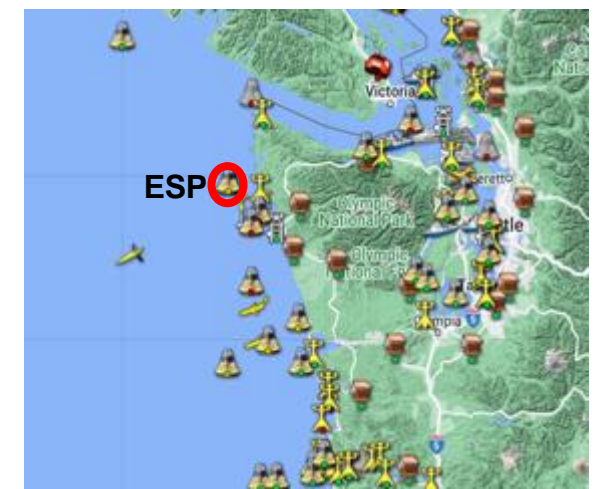
ESP Deployment

http://www.nanoos.org/products/habs/real-time/esp_now/hab_measurements.php

Domoic Acid Concentration



This project is funded jointly by the U.S. Integrated Ocean Observing System (IOOS) and the NOAA National Centers for Coastal Ocean Science (NCCOS) Monitoring Event Response for Harmful Algal Blooms (MERHAB) program. The project has a multi-sector team of partners that bring expertise from academia, the sensor-building industry, government and the private sector.



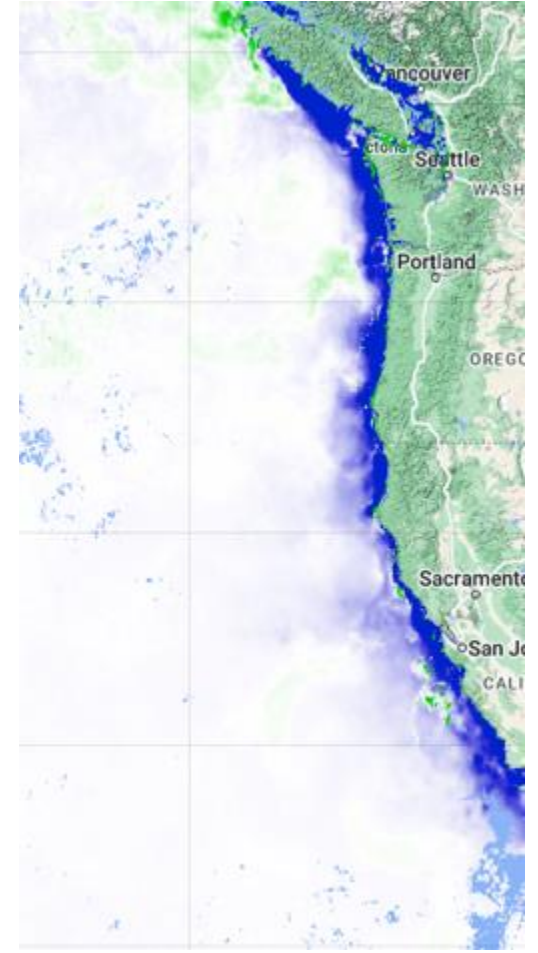
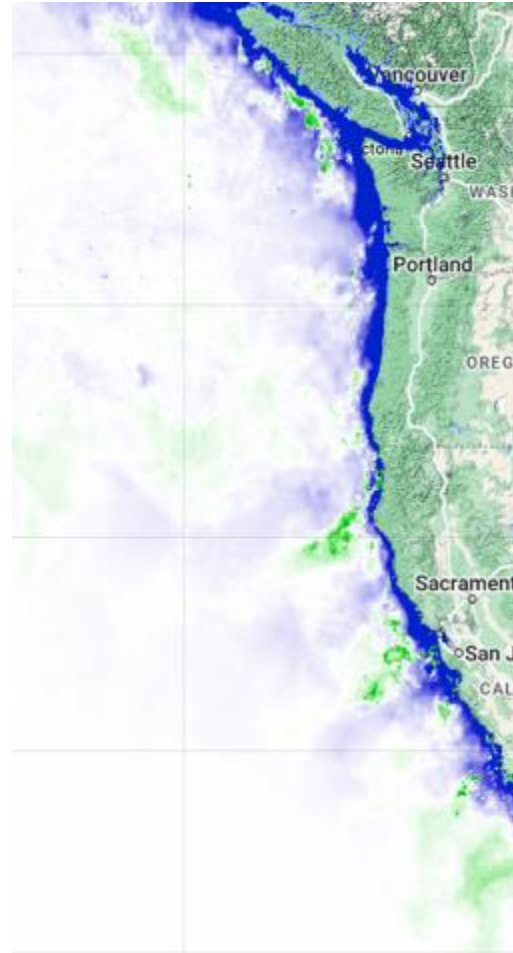
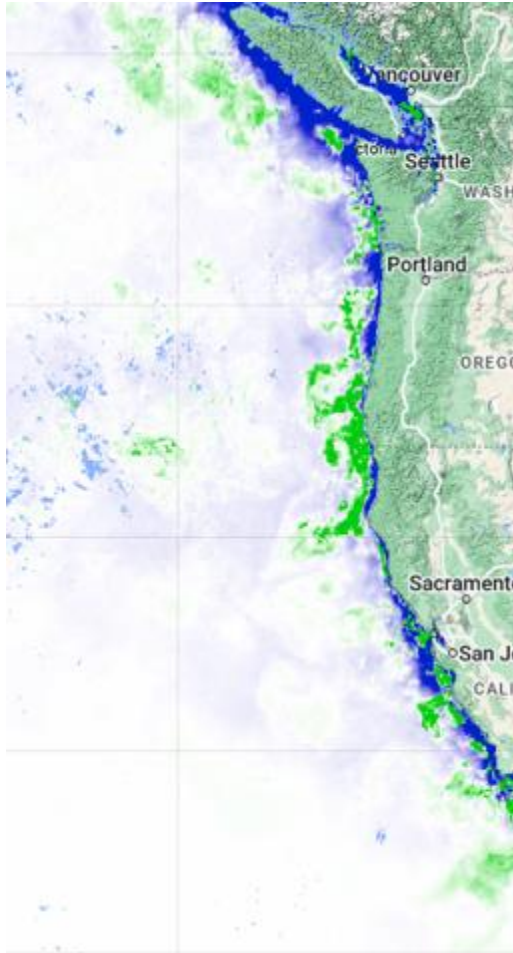
S. Moore (NOAA) and J. Mickett (UW), lead PIs

April 2022

May 2022

June 2022

July 2022





To summarize:

Temperature

- La Niña signature continues at equatorial Pacific
- Heat anomaly in mid-Pacific persists; classifies as marine heat wave category II-III (strong – severe)
- Coastal WA & OR predominantly cool anomalies in May, transitioning to warm anomalies by July, near coast shows more fluctuation in July consistent with upwelling

Hypoxia watch

- Hood Canal became hypoxic earlier than typical and is ~1 mg/L, though below ~20 m
- La Push WA deep oxygen values below 3 mg/L, looks to be trending downwards

Chlorophyll-Phytoplankton

- HAB ESP deployed off La Push monitoring domoic acid in near real-time; quantifiable
- Ocean color indicates lower than average biomass along the west coast, but pockets of high



www.nanoos.org

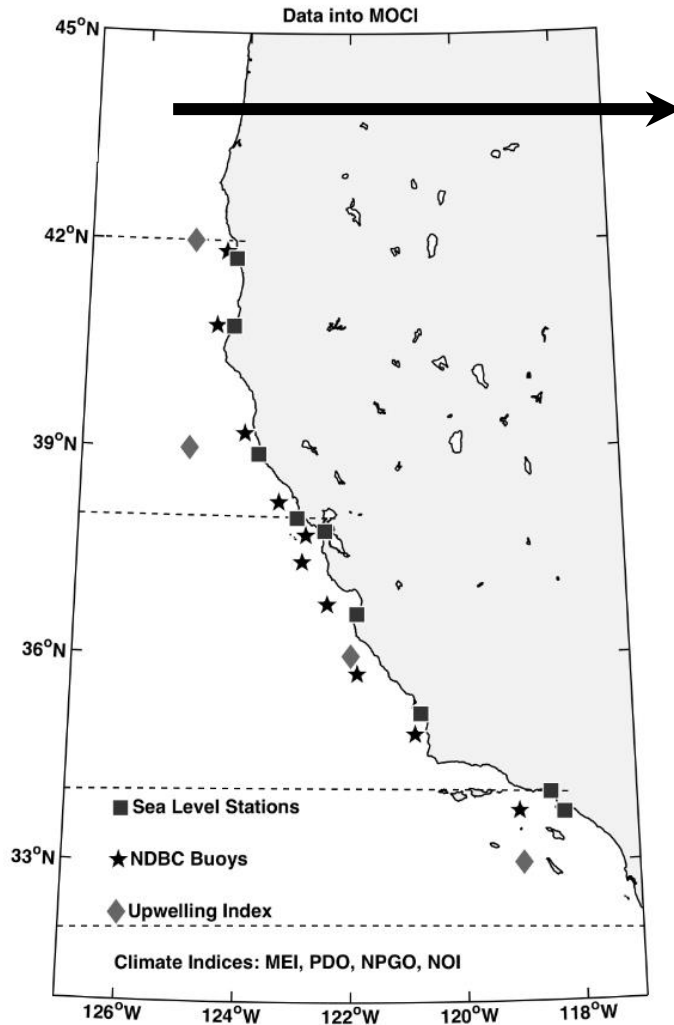
jnewton@uw.edu



The Central and Northern California Ocean Observing System: West Watch Update

hruhl@mbari.org





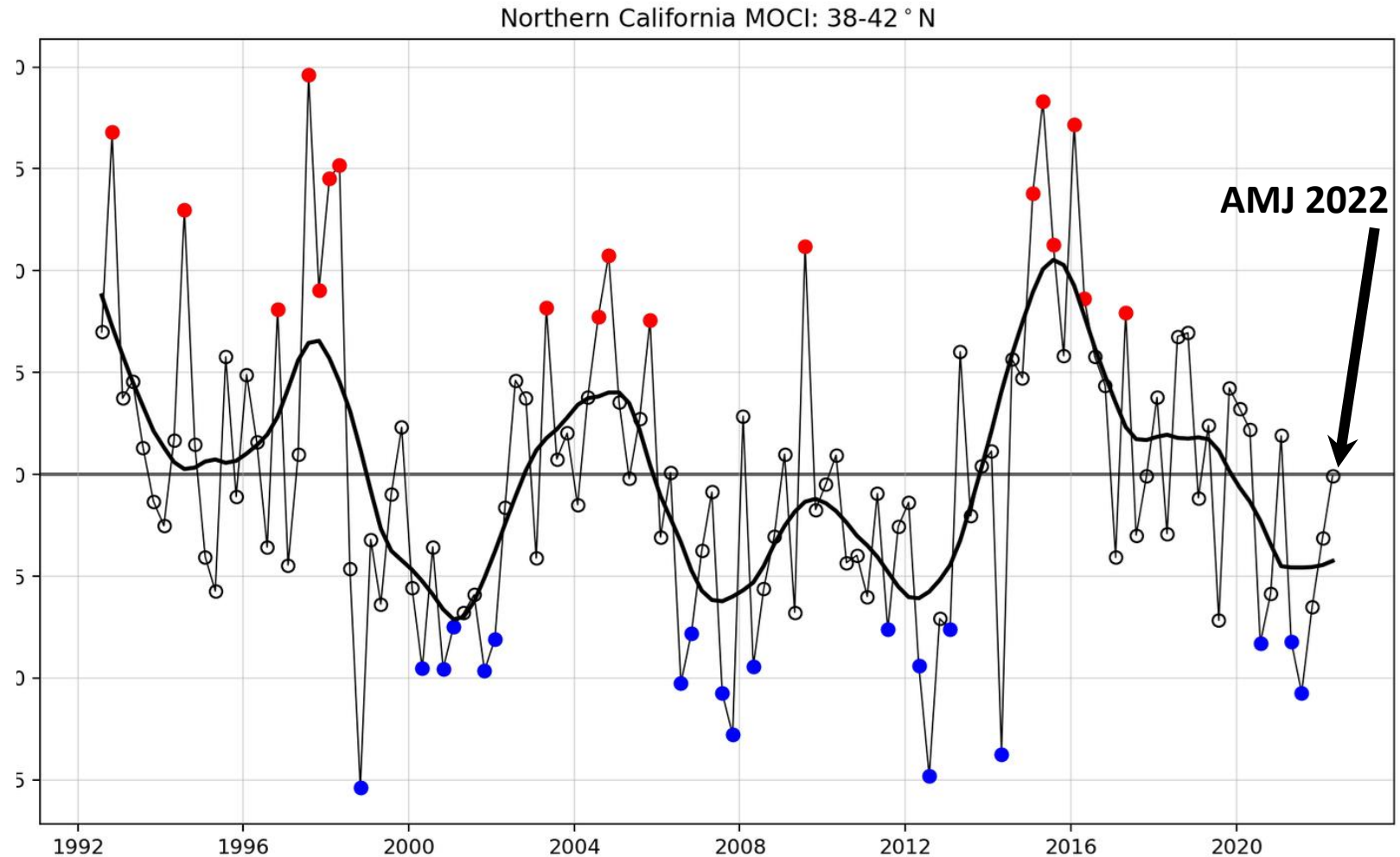
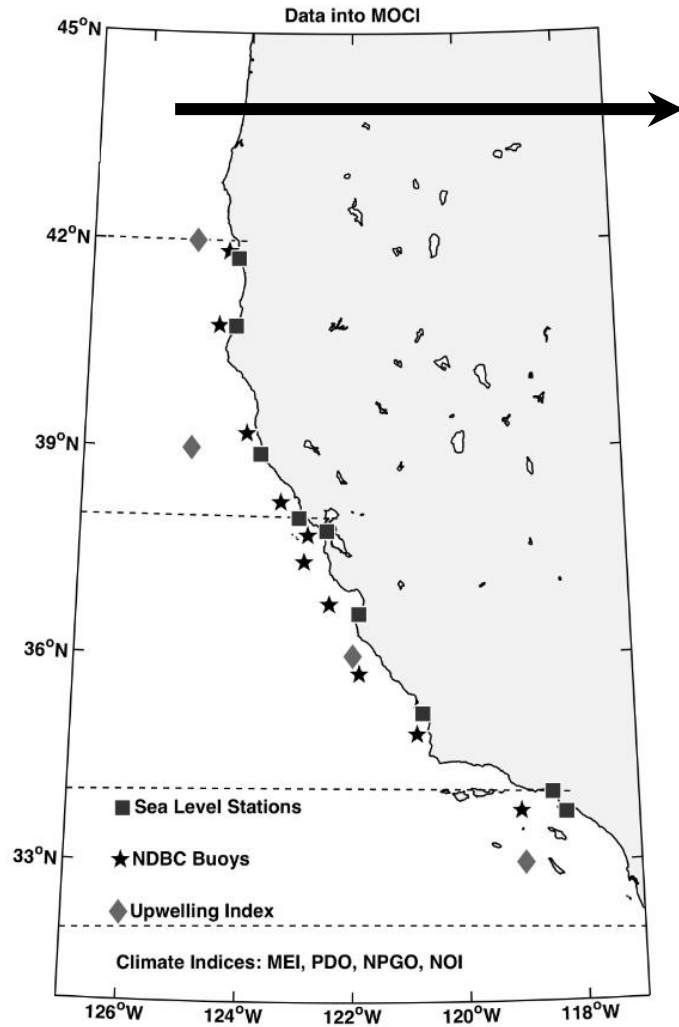
MOCI include seasonal averages of the following data:

- Upwelling Index, NOAA
- Sea level from shore stations
- Alongshore wind, sea surface temperature, air temperature, sea level pressure from NOAA buoys

Regional climate indices:

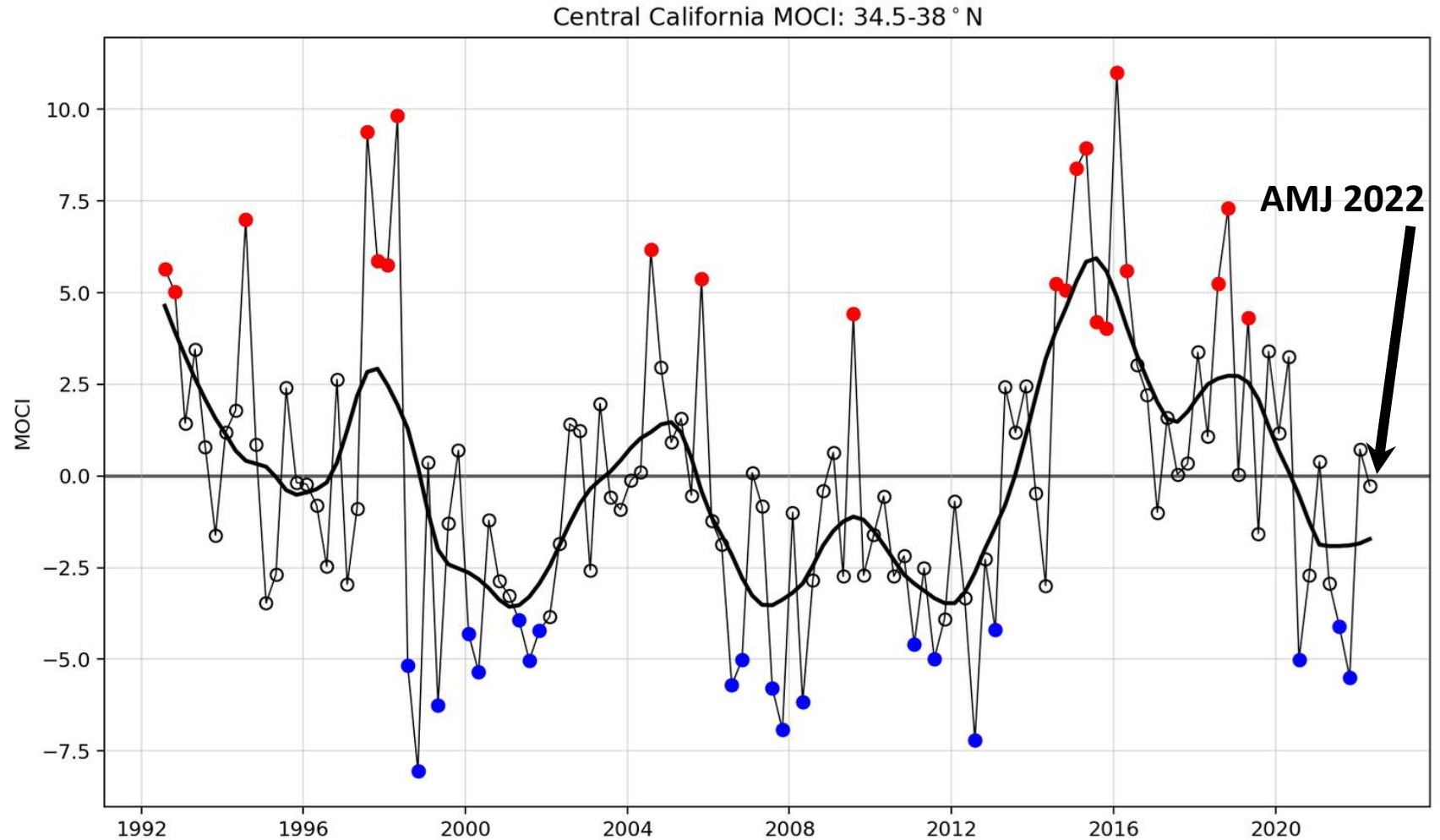
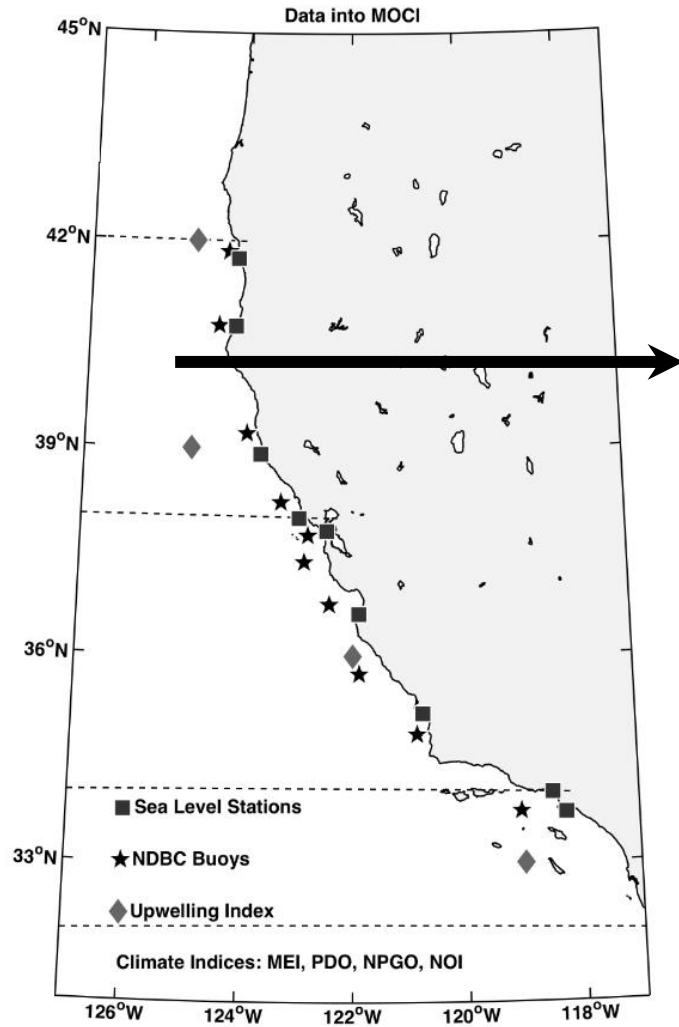
- MEI: Multivariate ENSO Index
- PDO: Pacific Decadal Oscillation
- NOI: Northern Oscillation Index

Multivariate Ocean Climate Index (MOCI)

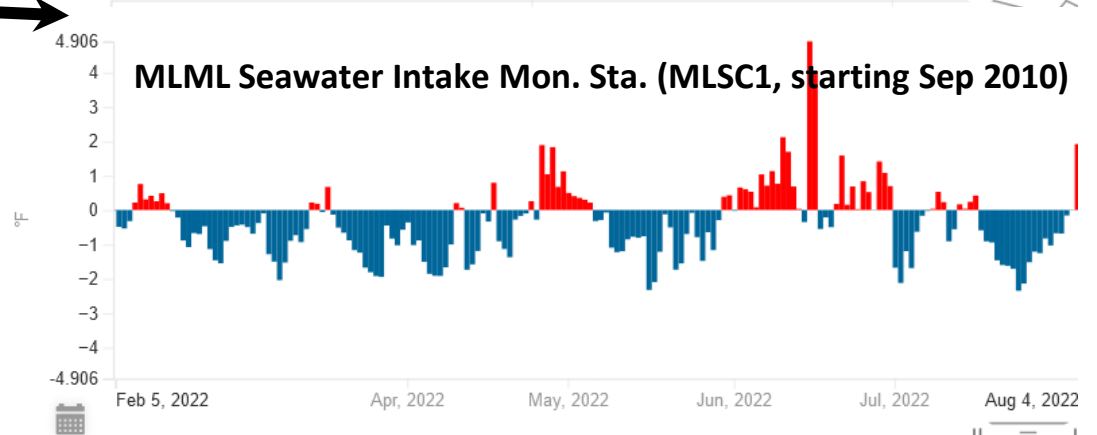
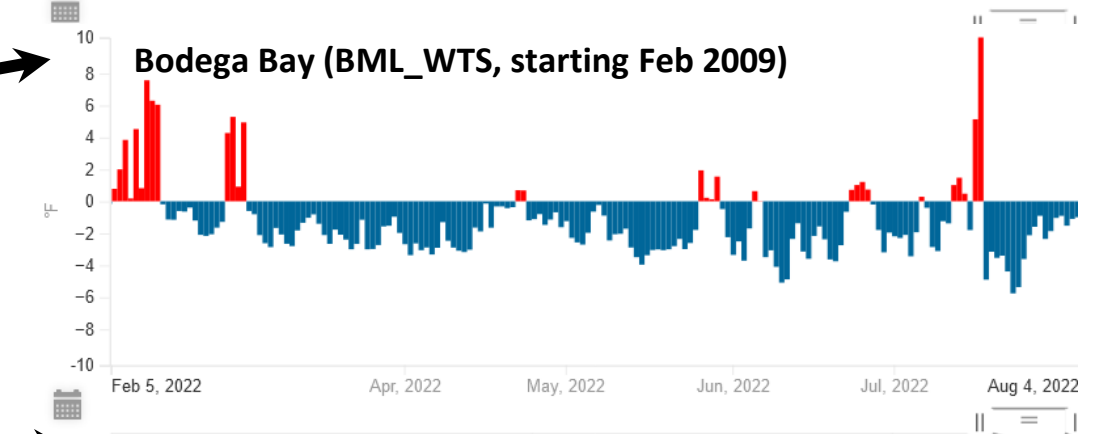
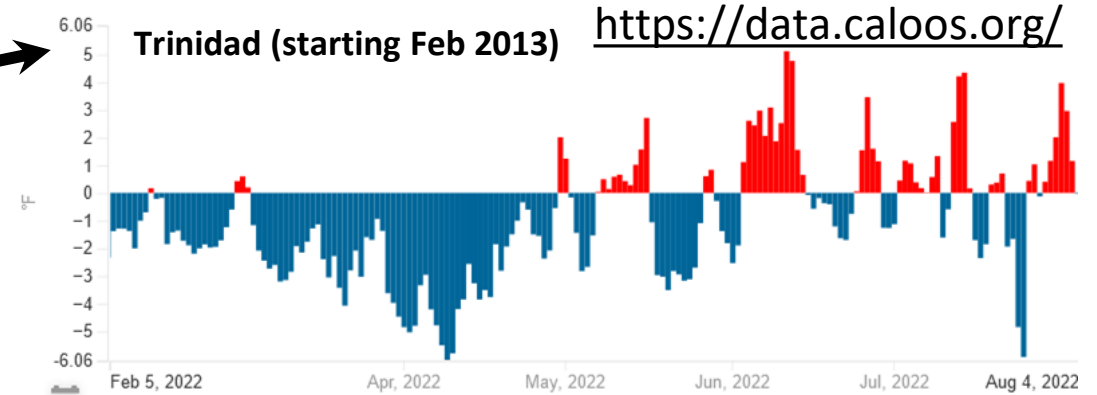
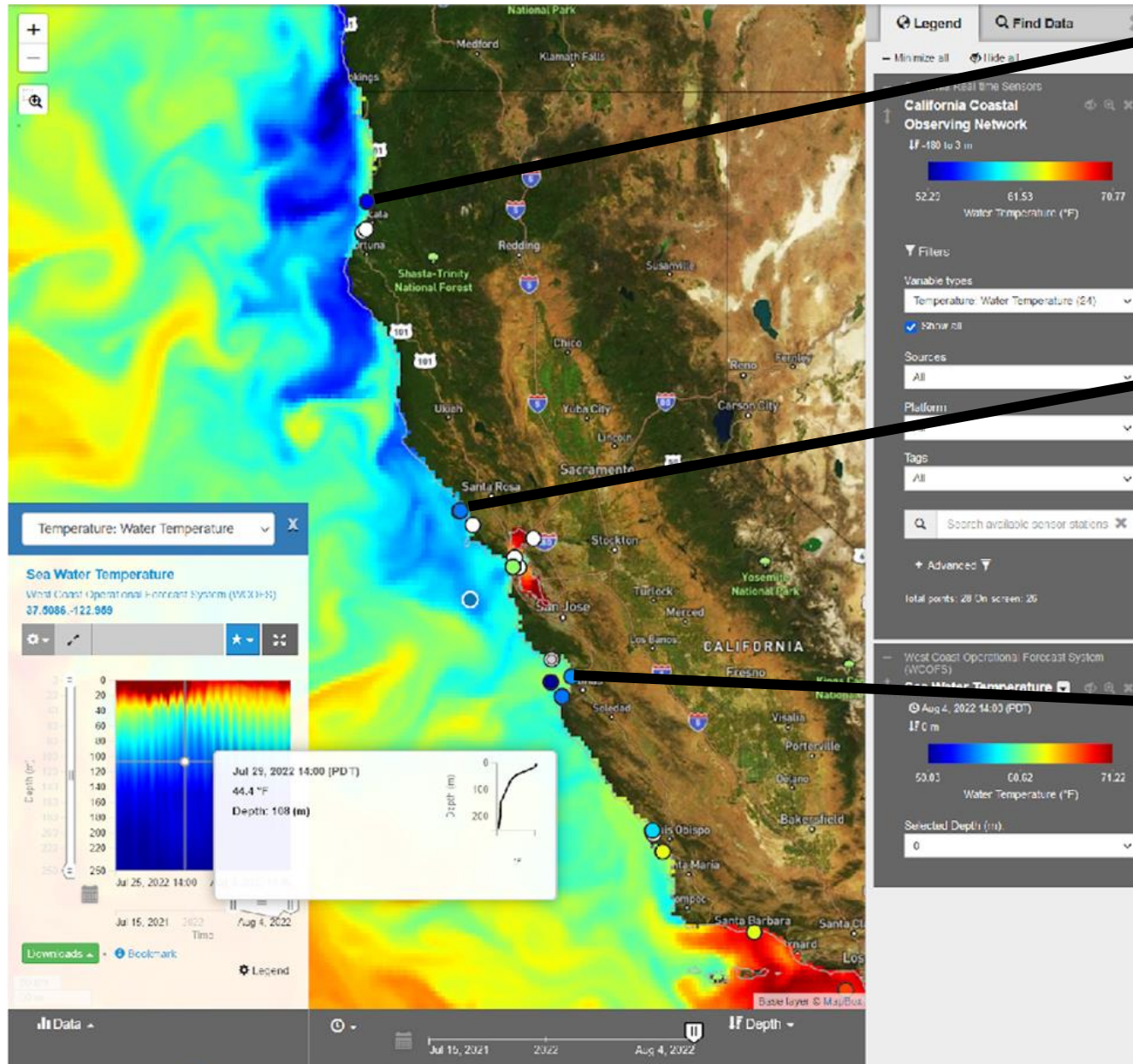


García-Reyes M, Sydeman WJ. (2017). *California Multivariate Ocean Climate Indicator (MOCI) and marine ecosystem dynamics*. *Ecological Indicators*, 72, 521-529.

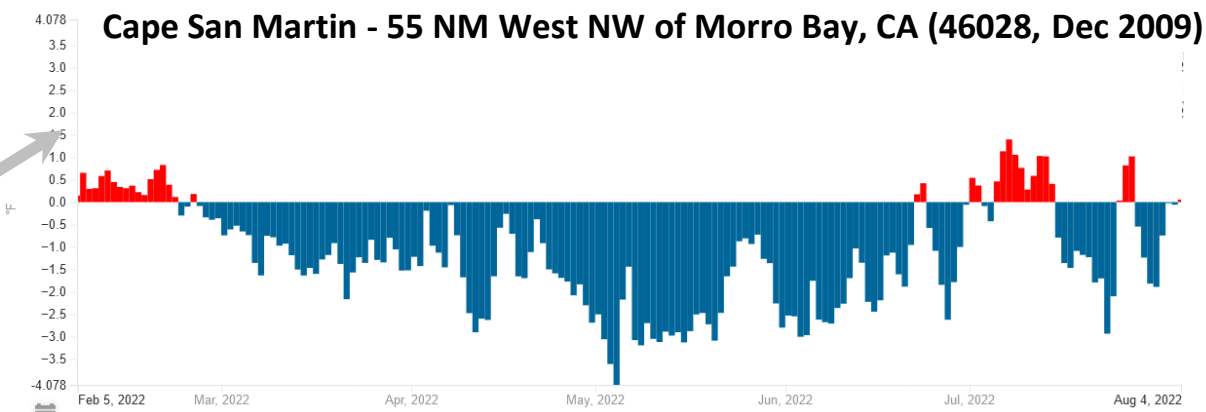
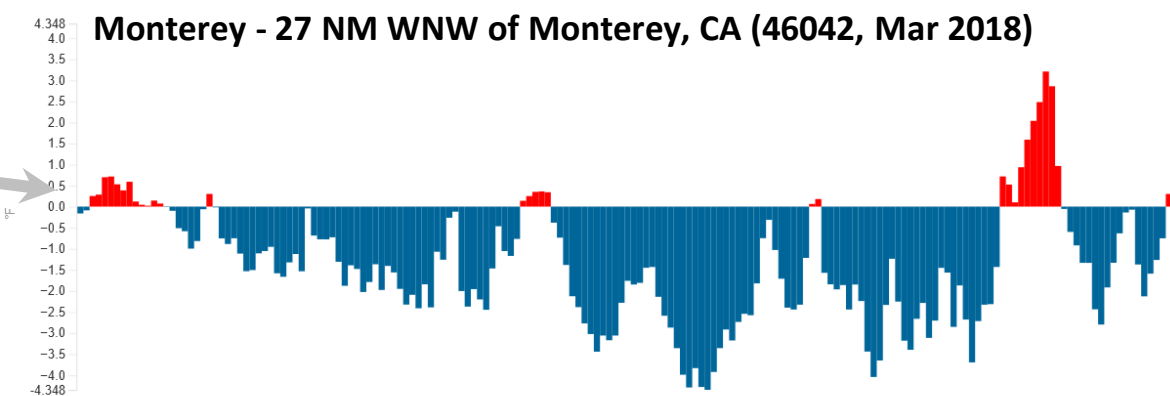
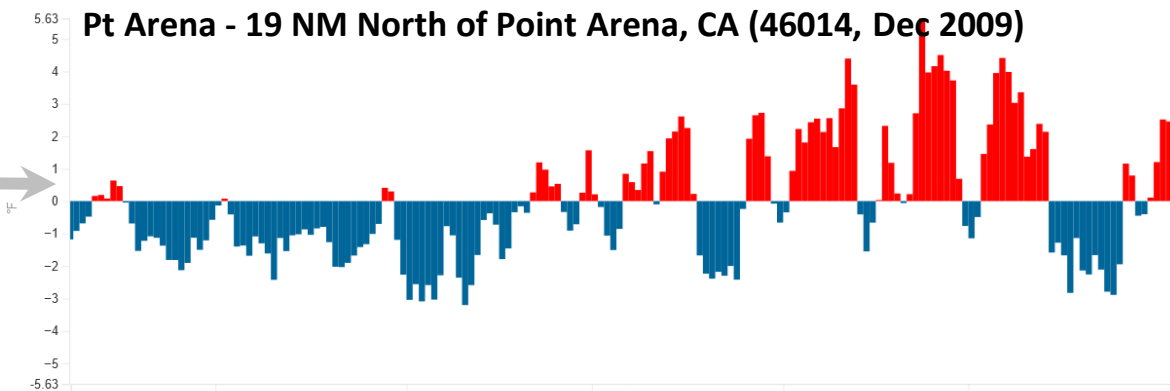
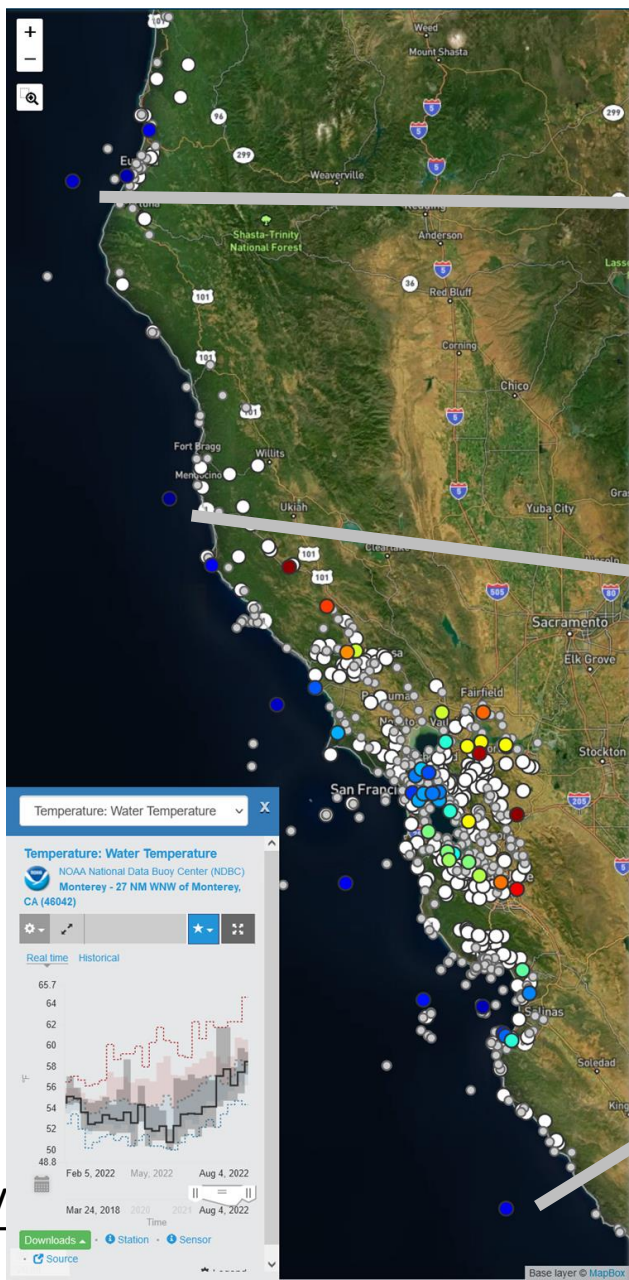
Multivariate Ocean Climate Index (MOCI)



García-Reyes M, Sydeman WJ. (2017). *California Multivariate Ocean Climate Indicator (MOCI) and marine ecosystem dynamics*. *Ecological Indicators*, 72, 521-529.

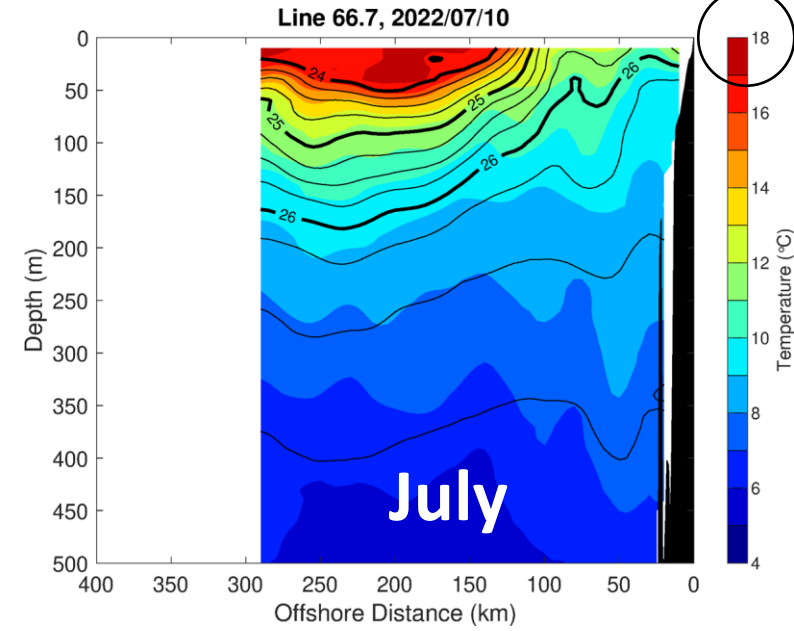
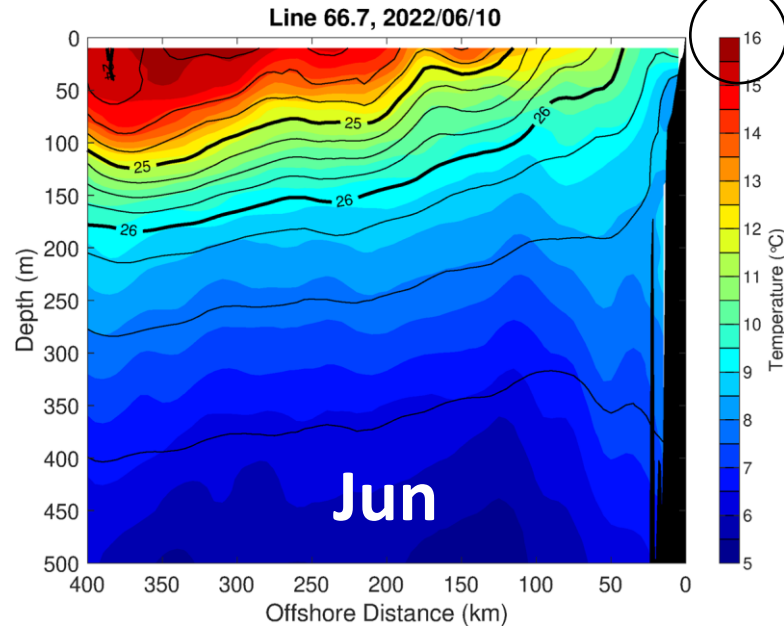
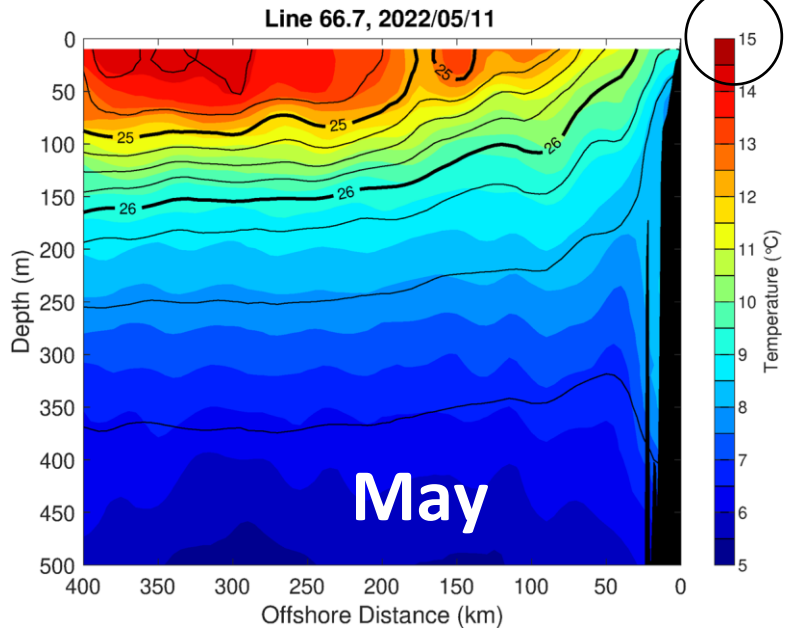


NDBC Sea Surface Temp – Last 180 days

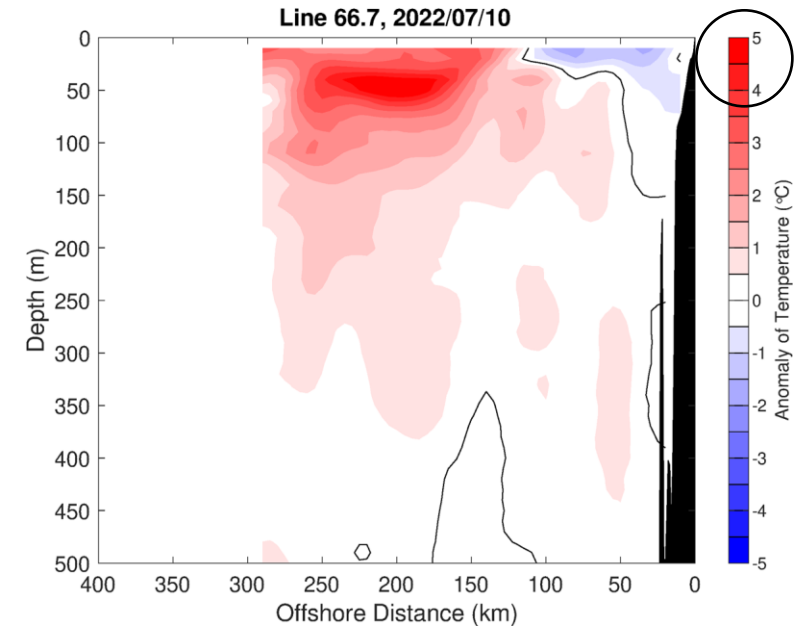
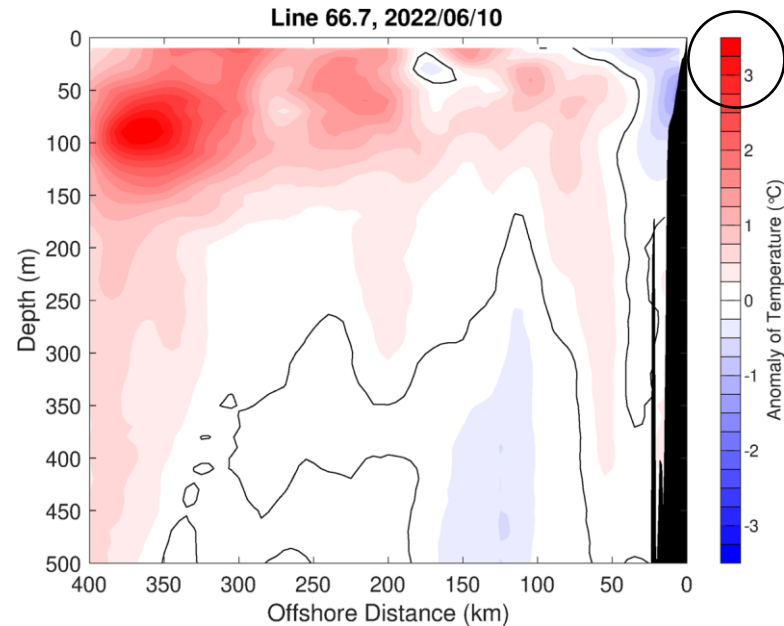
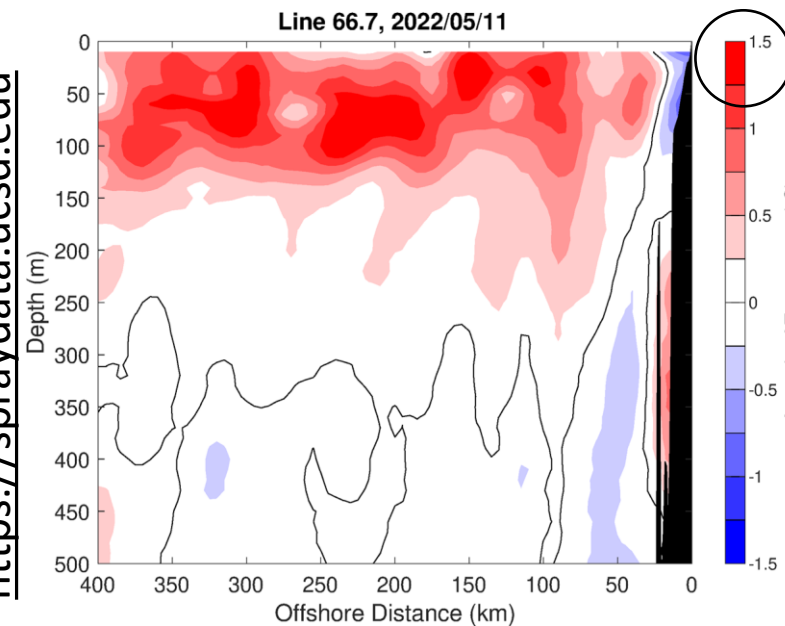


<https://>

Gliders – Monterey Bay Temps



<https://spraydata.ucsd.edu>



- Adaptation of Hobday et al.
- “...we consider an anomalously warm event to be a MHW if it lasts for five or more days, with **[100 m integrated heat content]** warmer than the 90th percentile based on a **[42-year]** historical baseline period.”
- Soon to include 3-day heatwave forecast via WCFOS
- *Connects investment in HFR, gliders, tagging, and more through assimilation....to tools for a climate-ready Blue Economy*
- Hobday, A.J. et al. (2016), A hierarchical approach to defining marine heatwaves, Progress in Oceanography, 141, pp. 227-238, doi: 10.1016/j.pocean.2015.12.014

San Francisco Chronicle

CLIMATE

Halibut fishing is 'incredible' in San Francisco Bay right now



Tara Duggan
June 10, 2022 | Updated: June 14, 2022 10:41 a.m.



1 of 2

Hunter Nguyen, a deckhand aboard a fishing boat named the Nautilus, pulls in a halibut during a fishing trip in San Francisco Bay on Thursday. Stephen Lam/The Chronicle

The New York Times

First, the Fish Fell From the Sky. Then They Washed Ashore.

In the past month, dead anchovies have been spotted on the streets of San Francisco. Last week, thousands appeared at the edge of a lagoon about 30 miles north.

Give this article



Thousands of anchovies piled up on the eastern shore of Bolinas Lagoon in Marin County, Calif., at the end of June. Ed Mann/National Park Service



By **Livia Albeck-Ripka**

July 7, 2022

THE MENDOCINO VOICE

Rare sperm whale sinks on journey to beach: "This is not the end of the story"

By **Kate Fishman** | 12 seconds ago

MORE



Noyo Center for Marine Science; MMPA/ESA Permit No. 18786-06

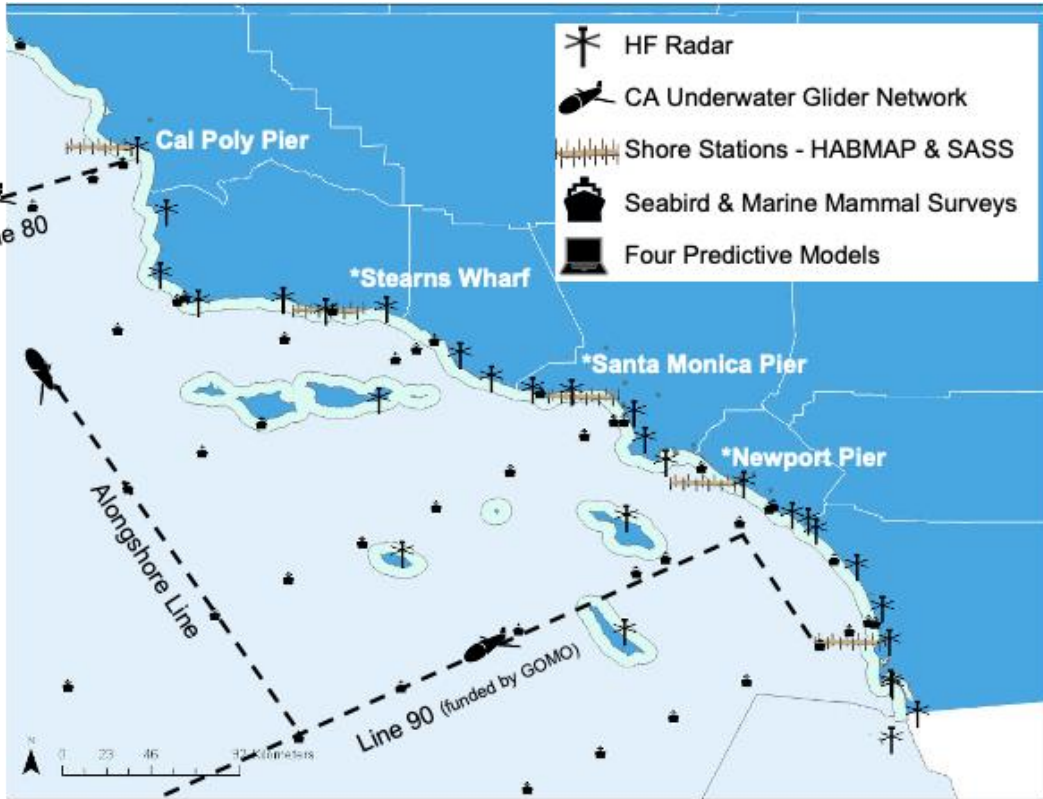
A sperm whale discovered washed ashore near Portuguese Beach sank as scientists tried to tow it, the Noyo Center for Marine Science reported.



hruhl@mbari.org

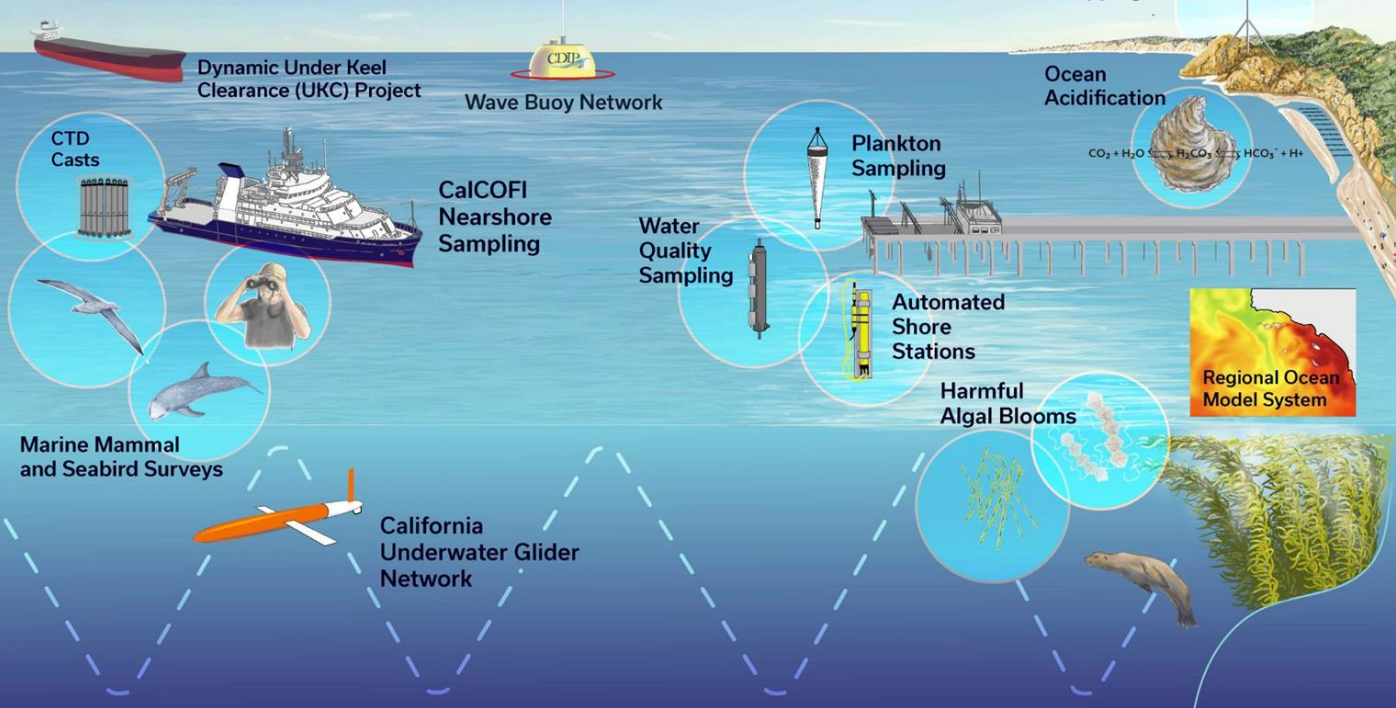


SOUTHERN CALIFORNIA COASTAL OCEAN OBSERVING SYSTEM



Southern California Coastal Ocean Observing System

SCCOOS is a Science-Based Decision Support System



NOAA West Watch Update: Southern California

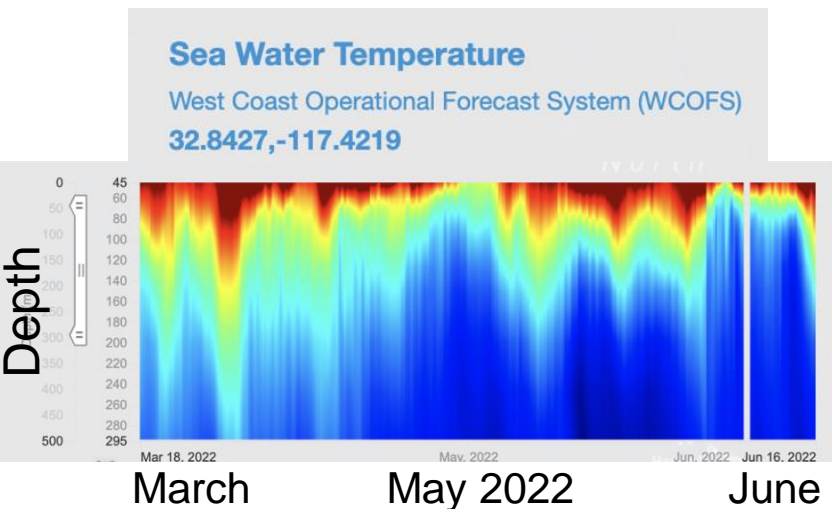
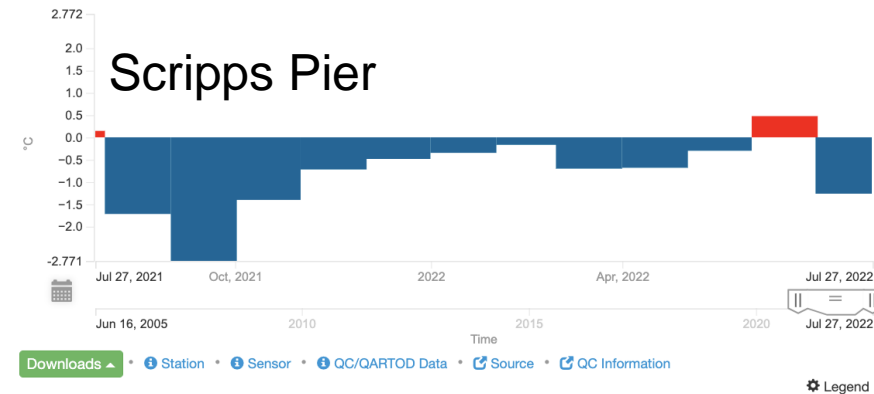
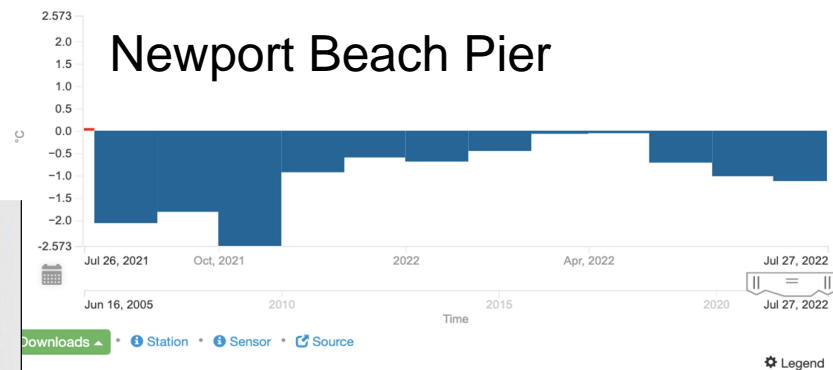
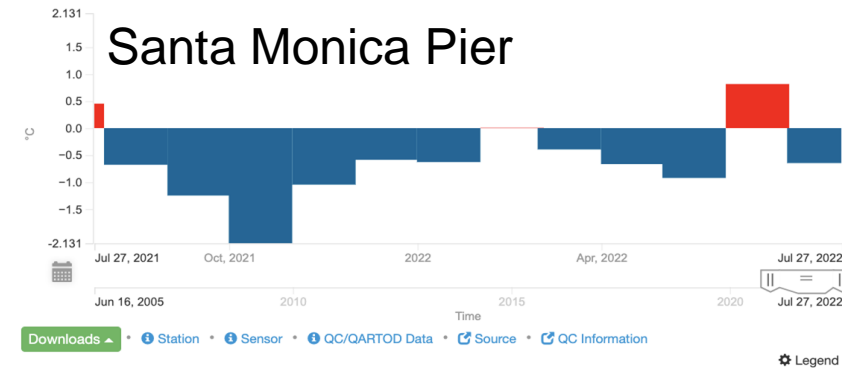
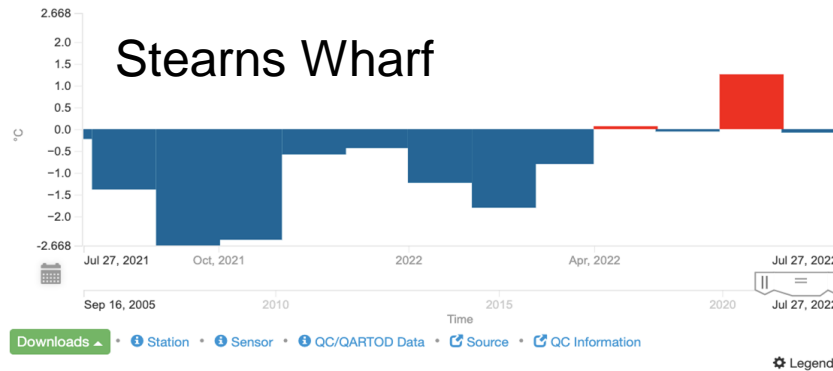
Clarissa Anderson, SCCOOS Executive Director

9-Aug 2022

SCCOOS Automated Shore Stations

Sea Surface Temperature Anomalies

- SCCOOS shore stations ~ 17 years of data
- Ocean temps have been cooler for ~12 months, with a warm anomaly in the spring and early summer at most stations.
- WCOFS simulated temperature to 500m captures shoaling of the thermocline in May during peak upwelling season, with smaller pulses in early June



Coastal Data Information Program (CDIP)

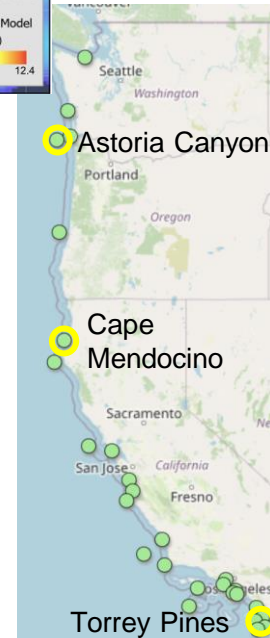
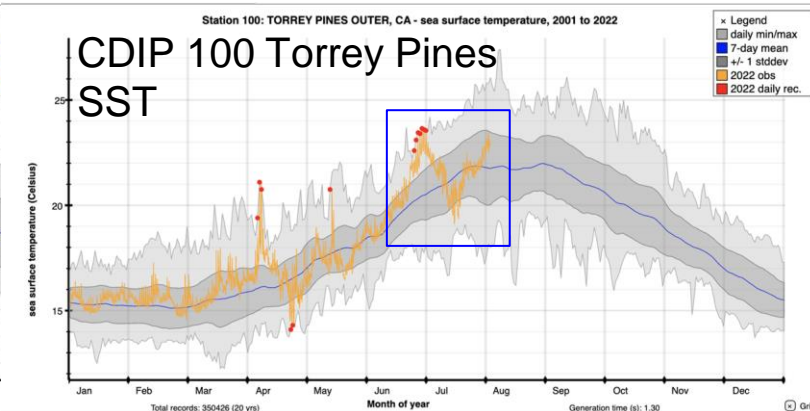
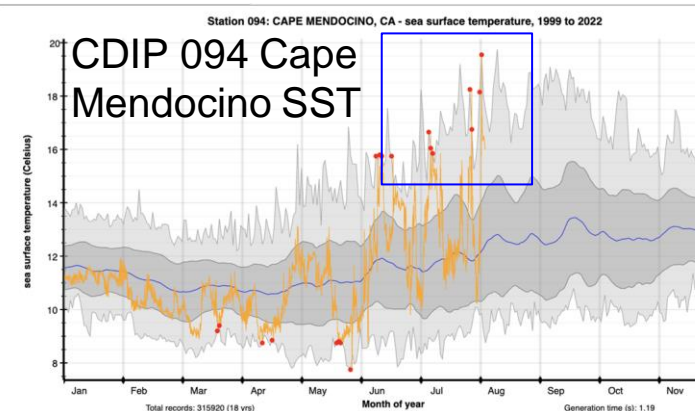
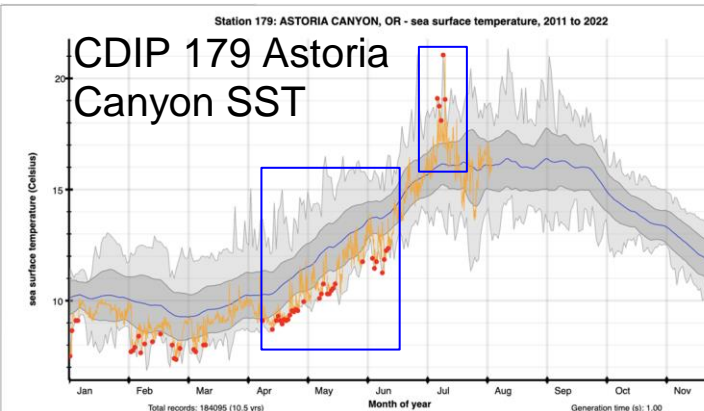
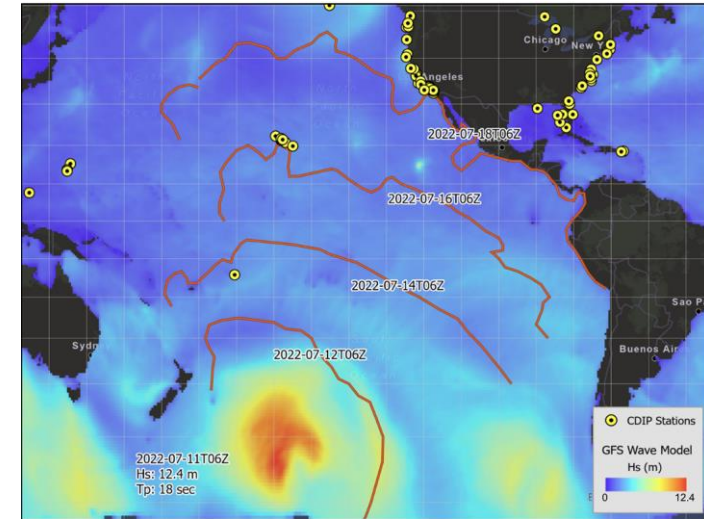


West Coast wave activity in 2022 follows the long term climate trend.

- Powerful long period south swell in July affected some west coast stations.

West Coast sea surface temperatures (SST) also following the long term climate trend.

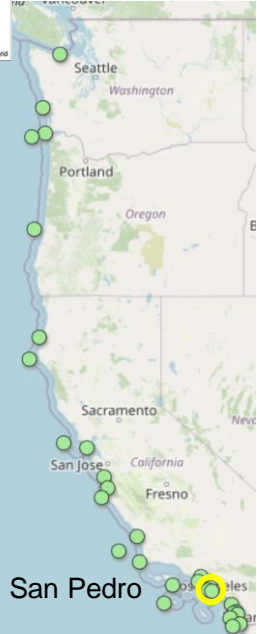
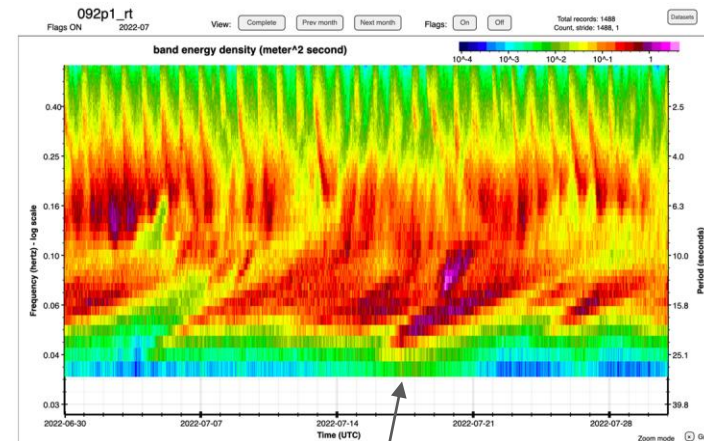
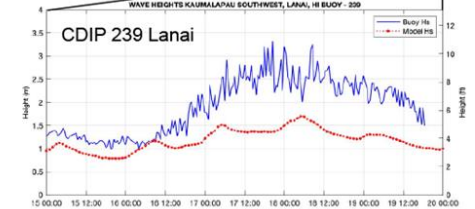
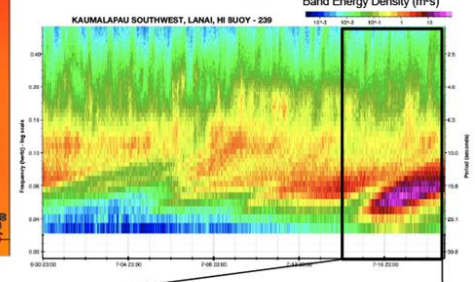
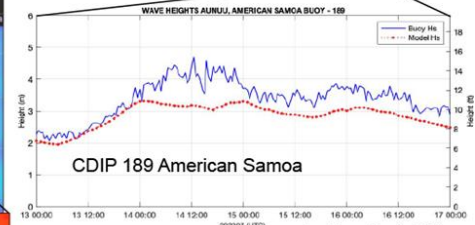
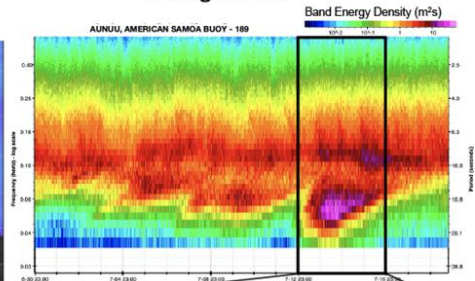
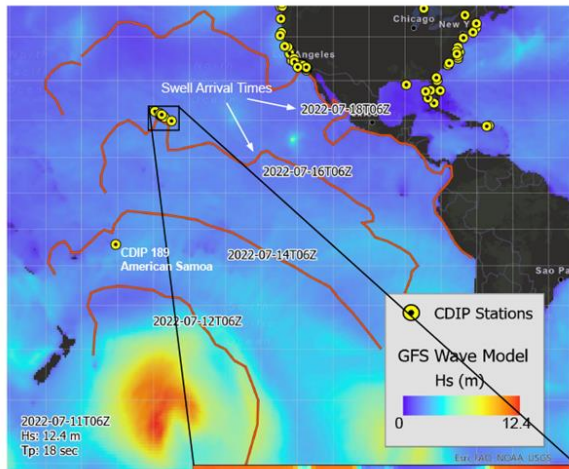
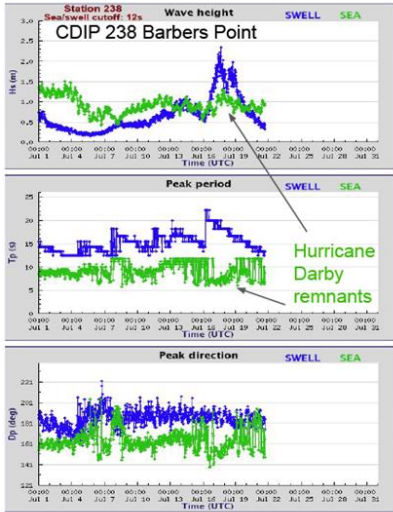
- Warm early summer conditions in SoCal Bight, then closer to normal.
- Warm pulses at some northern sites after a cool spring.



Coastal Data Information Program (CDIP)



CDIP Wave Observations: Powerful Long Period Pacific Swell Event July 11-20, 2022



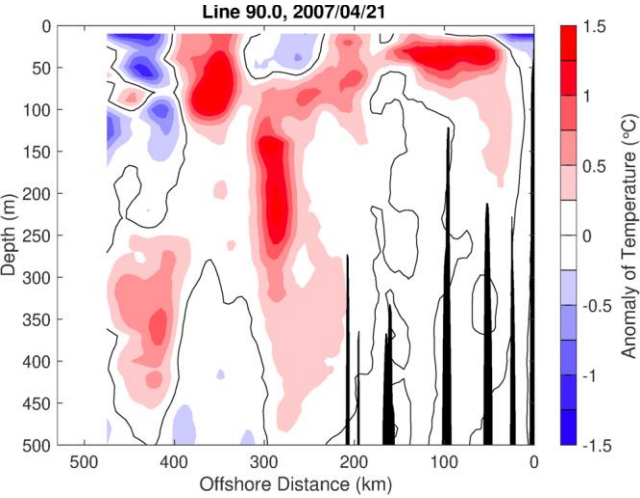
- A powerful extratropical storm in the South Pacific generated waves >15 m Hs (significant wave height) at its source.
- These waves traveled across the Pacific, impacting coastlines across the ocean basin, with measured Hs exceeding the NOAA NCEP GFS operational wave model, shown in these plots.
- South facing CDIP buoy stations in American Samoa and Hawaii recorded historically powerful waves at the longest periods measurable with the gauges, 20-30 seconds.
- Southern coasts of Hawaii experienced severe coastal erosion, inundation, and damage to homes and infrastructure.
- Waves from the remnants of Hurricane Darby were also measured in Hawaii at the same time, at shorter periods.

Long period swell recorded by west coast CDIP stations, too, e.g. 092 San Pedro, CA, but at more typical overall local energy levels.

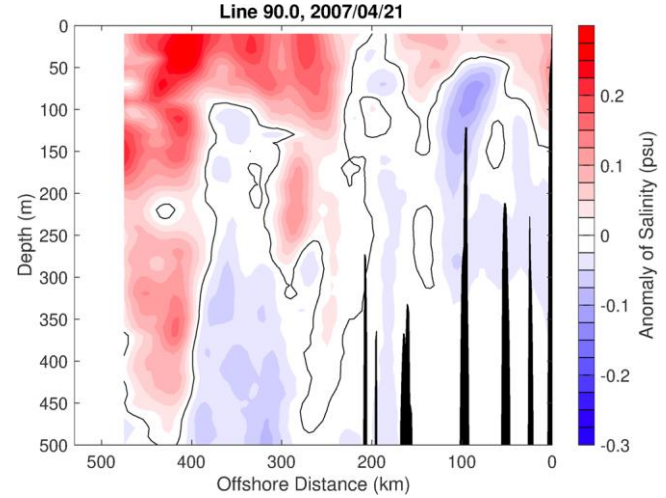
cdip.ucsd.edu

J. Behrens, SIO

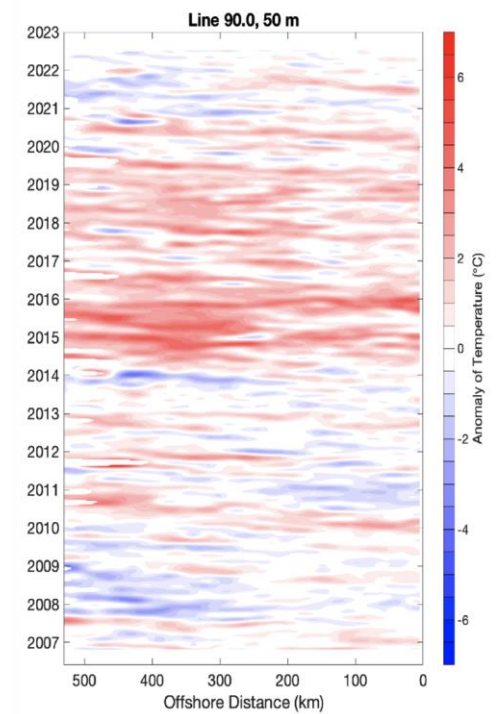
California Underwater Glider Network



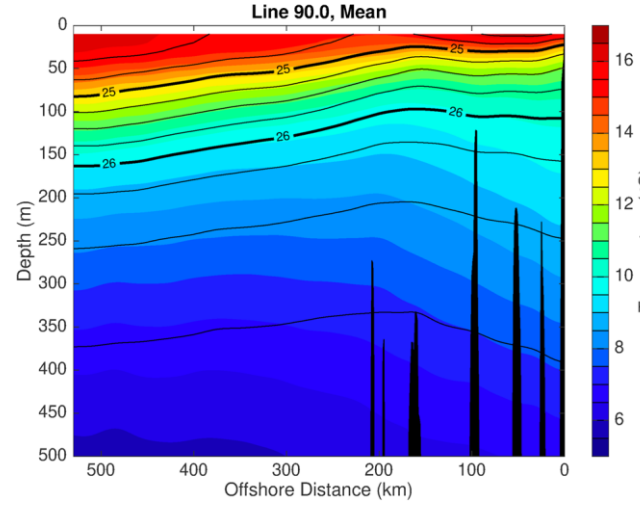
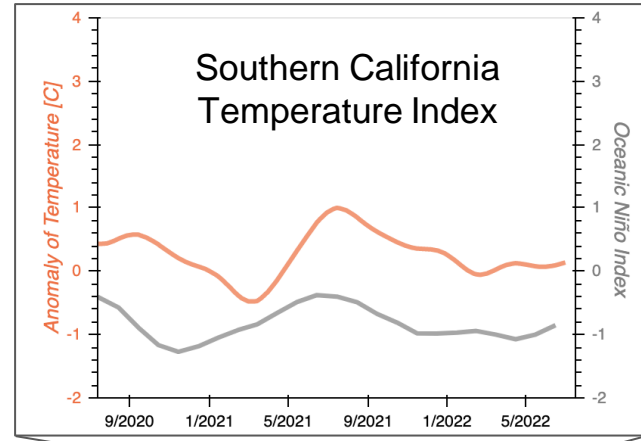
Line 90 Temperature
(Interannual anomaly)



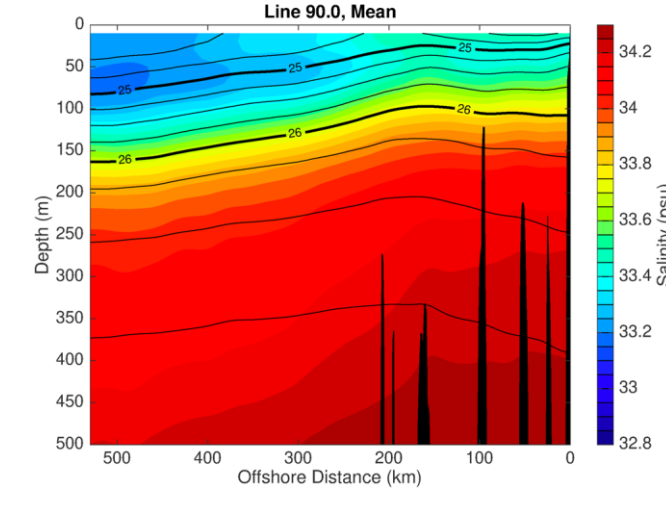
Line 90 Salinity
(Interannual anomaly)



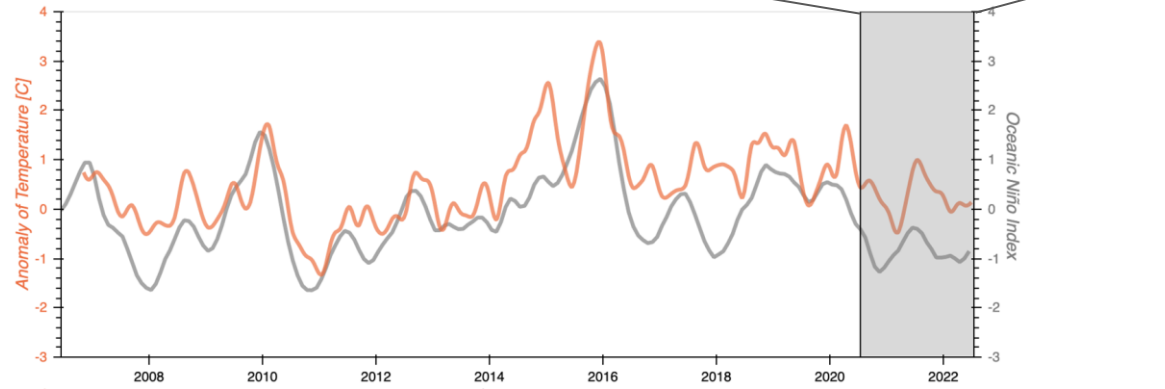
Line 90
Temperature
Anomaly



Line 90 Mean Temperature



Line 90 Mean Salinity

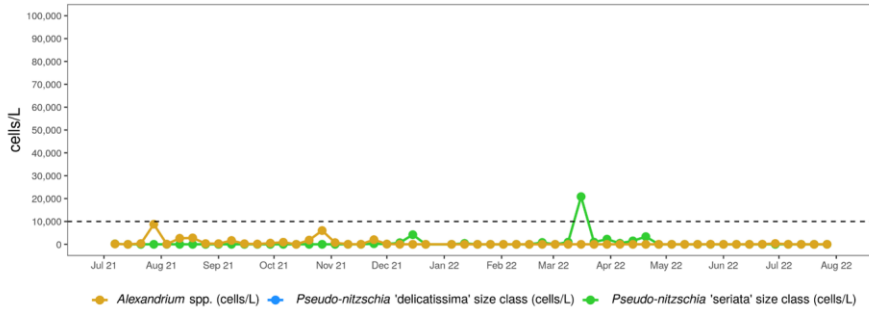


Harmful Algal Bloom Monitoring Alert Program

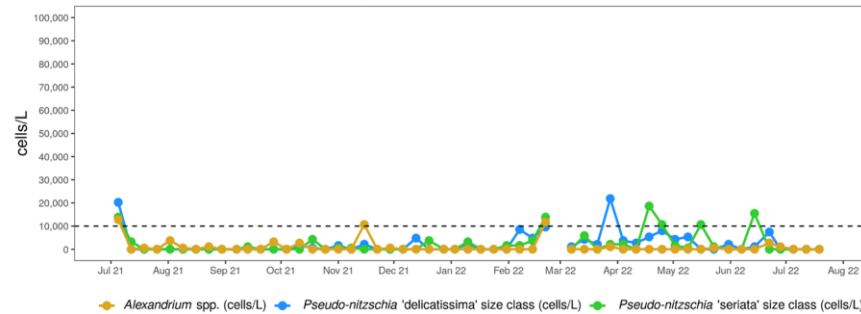


Pseudo-nitzschia spp. blooming more at southern California sites Feb-June. Upwelling intensity will peak in July-August north of Pt. Conception, meaning we can expect this pattern to reverse in favor of larger blooms from San Luis Obispo County to the Oregon border.

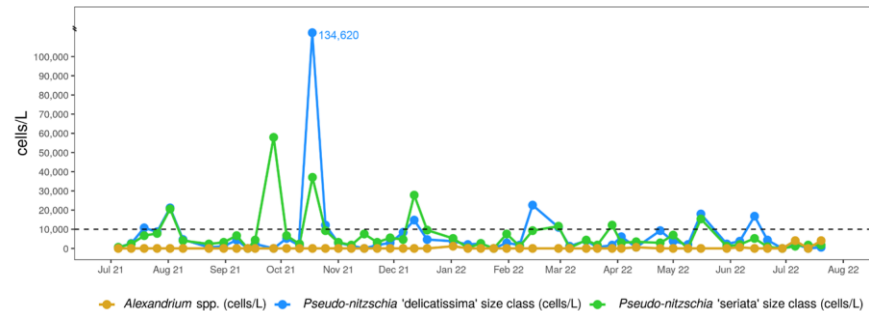
Santa Cruz Municipal Wharf HAB and DA Data



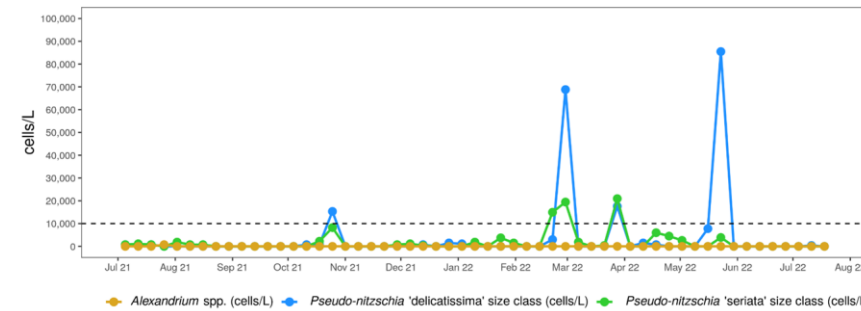
Cal Poly Pier HAB and Domoic Acid Data



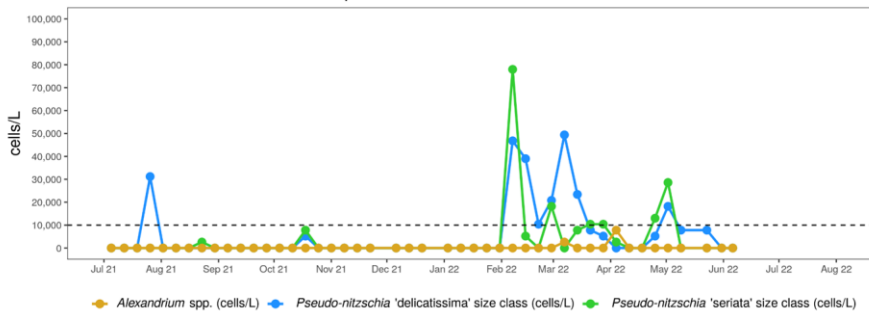
Stearns Wharf HAB and DA Data



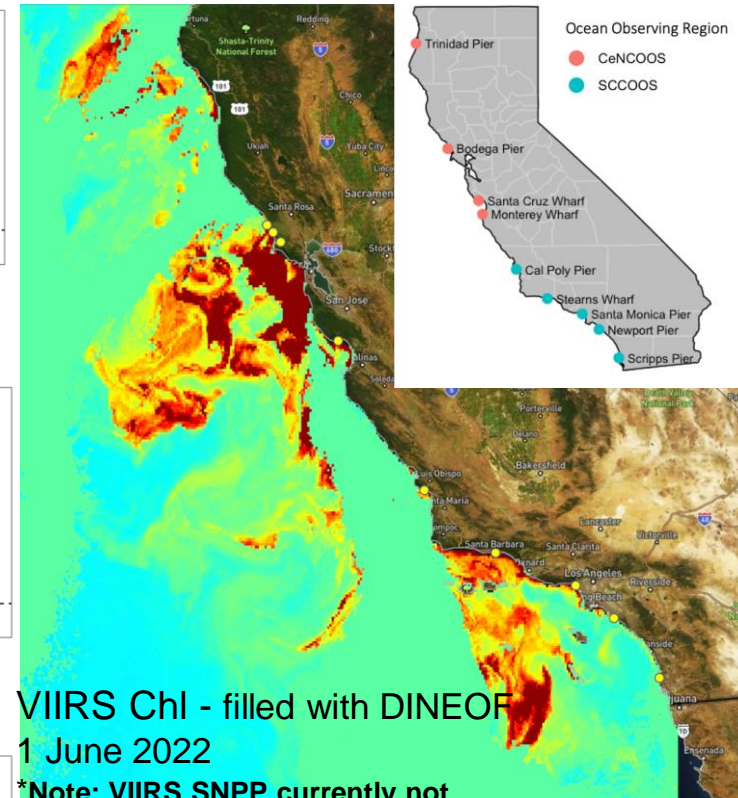
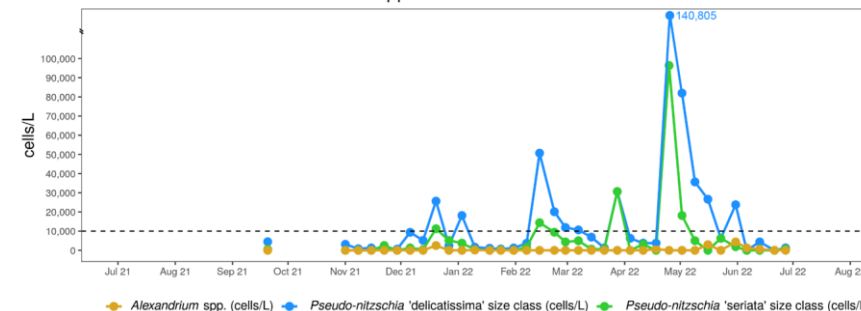
Santa Monica Pier HAB and DA Data



Newport Beach Pier HAB and DA Data



Scripps Pier HAB and DA Data

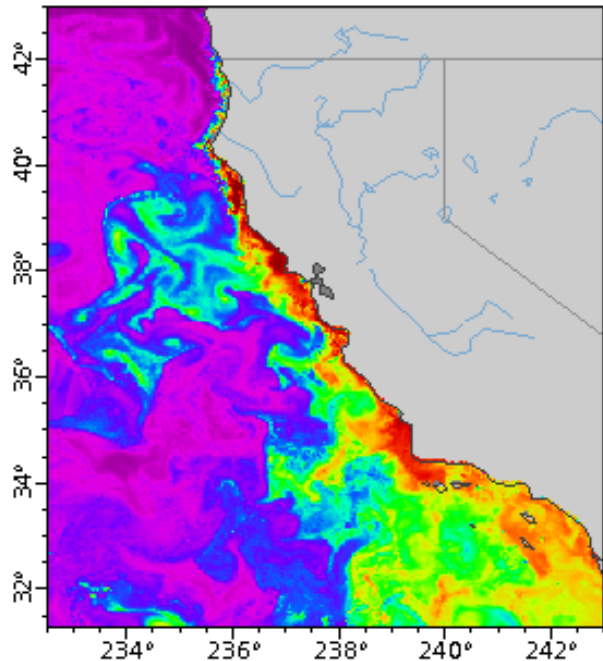


VIIRS Chl - filled with DINEOF
1 June 2022

*Note: VIIRS SNPP currently not transmitting data; in safe-mode state

CA HAB Bulletin

C-HARM Probability of particulate Domoic Acid (pDA) for May 1-Aug 5 2022



0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

Probability of Particulate Domoic Acid > 500 nanograms/l
 C-HARM v2 3-Day Forecast, Pseudo-nitzschia, cellular domoic acid, and particulate domoic acid probability, California and Southern Oregon coast, 2022-present
 (2022-05-01T12:00:00Z)
 Data courtesy of UCSC, UCSD

May 2022 Pelican Stranding Event, 700 birds
 -Domoic Acid eliminated as causative factor by CDFW

Uptick in California Sea Lion and Northern Guadalupe Fur Seal strandings from potential DA toxicosis in Central and Southern California in May and June

DAILY NEXUS

Thursday, August 4, 2022 UNIVERSITY OF CALIFORNIA, SANTA BARBARA
 NEWS SPORTS OPINION ARTSWEEK SCIENCE & TECH DATA ON THE MENU PHOTO VIDEO NEXUSTENTIALISM LA VISTA ABOUT Q

SCIENCE & TECH

Pelicans in Peril: Recent Brown Pelican Die-off in Santa Barbara Seemingly Related to Starvation

July 11, 2022 at 4:35 pm by Emma Holm-Olsen



While the exact cause of starvation is still unknown at this time, a few theories include abnormally strong winds (Santa Barbara gusts reached 19 mph in June) in the past few months making it difficult for the pelicans to forage, as well as the possibility of increased competition for food due to surges in brown pelican populations in the last few years. / Courtesy of Valerie Kushnerov

CDFW Provides Update On California Brown Pelican Stranding Event
 June 24, 2022



CA IFCB Network - progress update

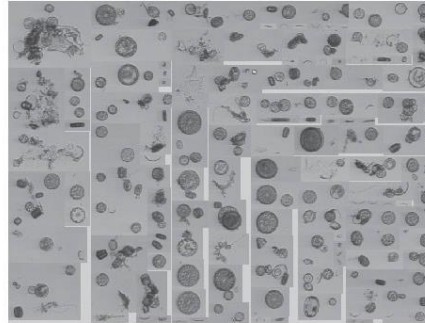
Roll out of stations:

- Bodega Marine Lab
- San Francisco Pier 17
- San Francisco Bay Cruises
- Santa Cruz Wharf
- MBARI Power Buoy - MB Bay
- Stearns Wharf
- Newport Beach Pier
- Del Mar Mooring - offshore
- Scripps Pier

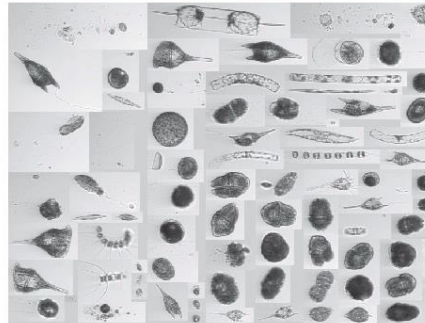
Mosaic from **June** illustrates a range of diatom and dinoflagellate species, including *Pseudo-nitzschia* spp.

<https://ifcb.caloos.org/dashboard>

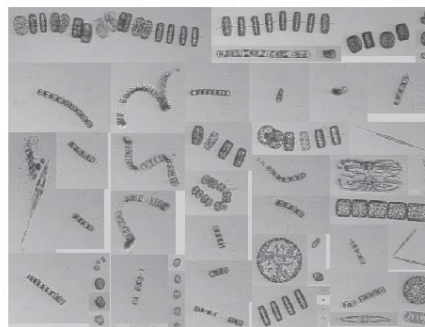
Bodega Bay



Santa Cruz Wharf



MBARI Power Buoy





SOUTHERN CALIFORNIA COASTAL OCEAN OBSERVING SYSTEM

<https://data.caloos.org/>

California Ocean Observing System Data Portal
Integrated Ocean Observing for a Changing California Coastline

EXPLORE REAL TIME DATA | SEARCH 1100+ DATASETS | GLIDERS

California Ocean Observing System Data Portal
Welcome to the CeNCOOS and SCCOOS statewide data portal.

The Central and Northern California Ocean Observing System (CeNCOOS) and the Southern California Coastal Ocean Observing System (SCCOOS) are two of eleven regions that contribute to the national U.S. Integrated Ocean Observing System (IOOS). The regional observing systems work to collect, integrate, and deliver coastal and ocean observations in order to improve safety, enhance the economy, and protect the environment. The principal goal of CeNCOOS and SCCOOS is to provide observations and products to a diverse stakeholder community of managers and planners, operational decision makers, scientists, and the general public. CeNCOOS and SCCOOS have developed the capabilities to support short-term decision-making and long-term assessment by implementing and leveraging biological, chemical, and physical observations and models, many of which are available in near real-time. This interactive catalog and map provides a place to explore and download publicly available oceanographic and coastal datasets in California.

Explore map | Catalog | Glider deployments



CalOOS Science Impact And Stakeholder Engagement Meeting held in May

Questions?
info@sccoos.org



Next NOAA
West
Watch:

Tentative
date:
October 18,
2022

Thanks!

Photo: Tahoe Rim Trail, October 7, 2021
Credit: Dan McEvoy