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

August 9, 2022

Desert Research Institute

WESTERN REGIONAL CLIMATE CENTER

NOAA

IOOS | Integrated Ocean Observing System

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

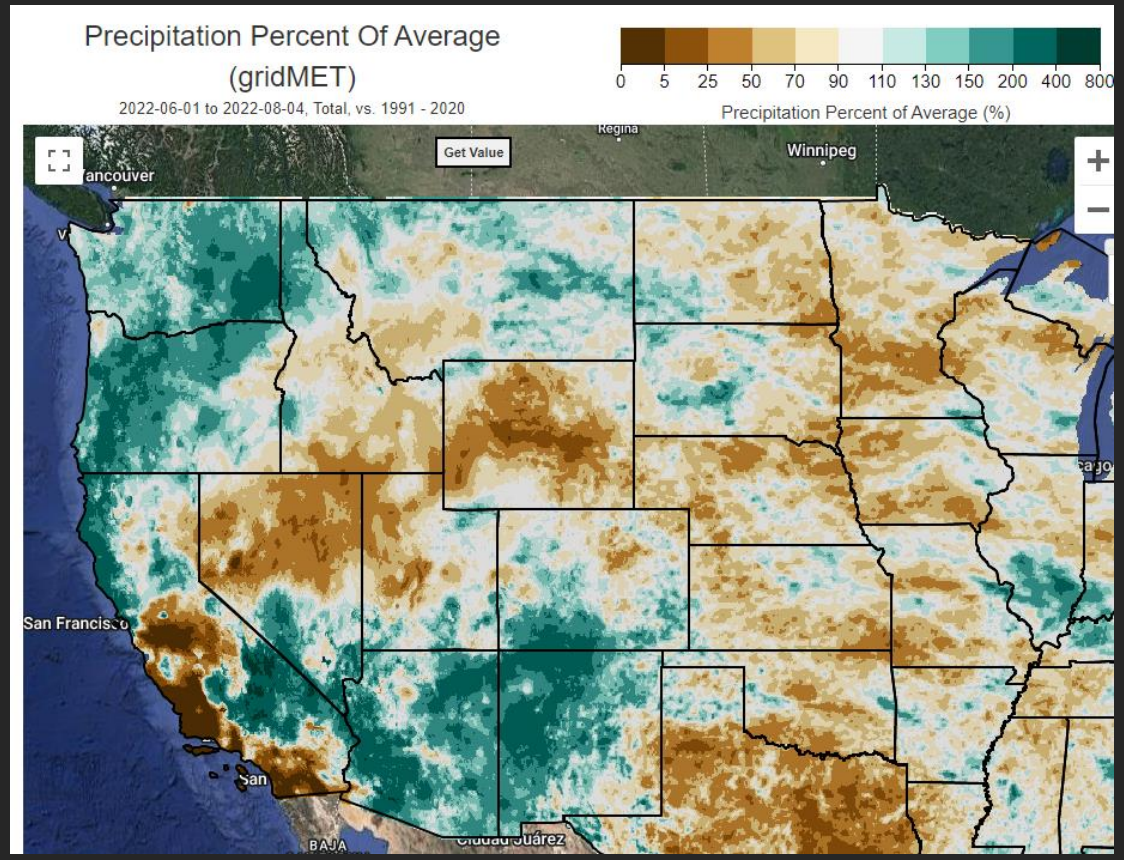
- Run by the Western Regional Climate Center, in partnership with the NOAA Western Regional Collaboration Team (NOAA West)
- Standing contributions from the three Integrated Ocean Observing System Regional Associations.

- 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.

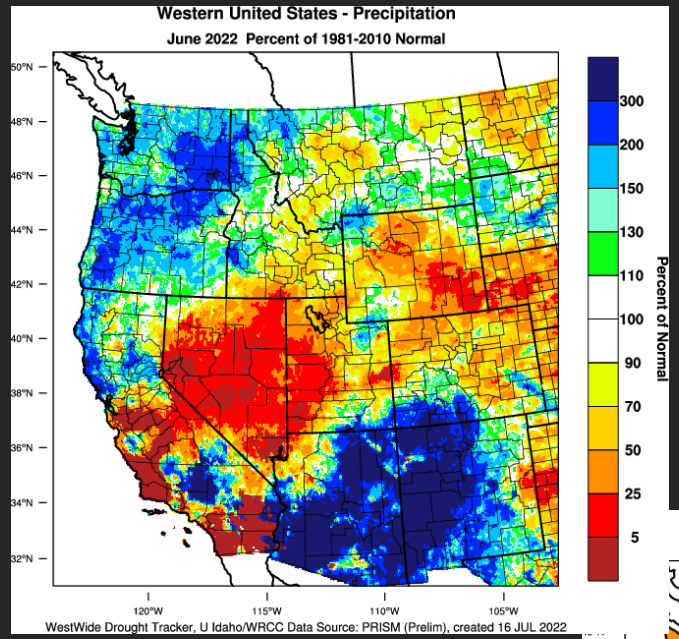
These webinars are not formal public releases of data.

How's your summer going?

June 1-August 4 Precipitation



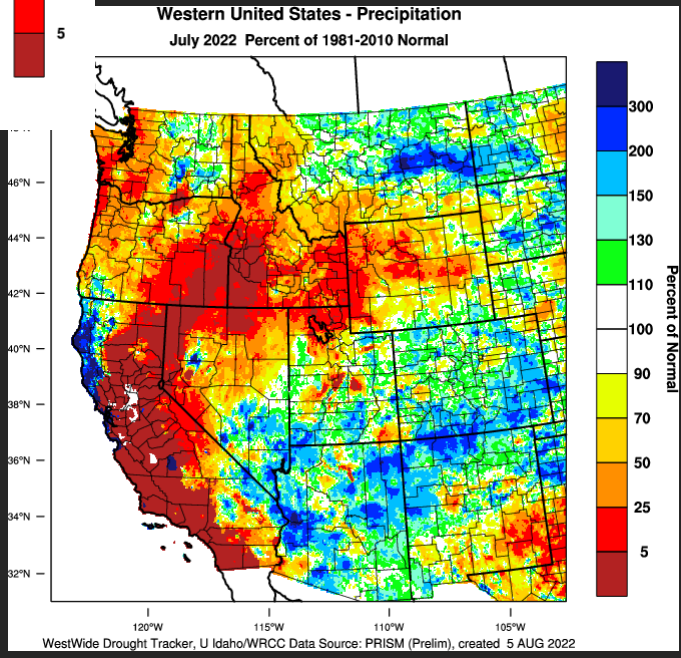
https://app.climateengine.com/climateEngine



June Precipitation

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

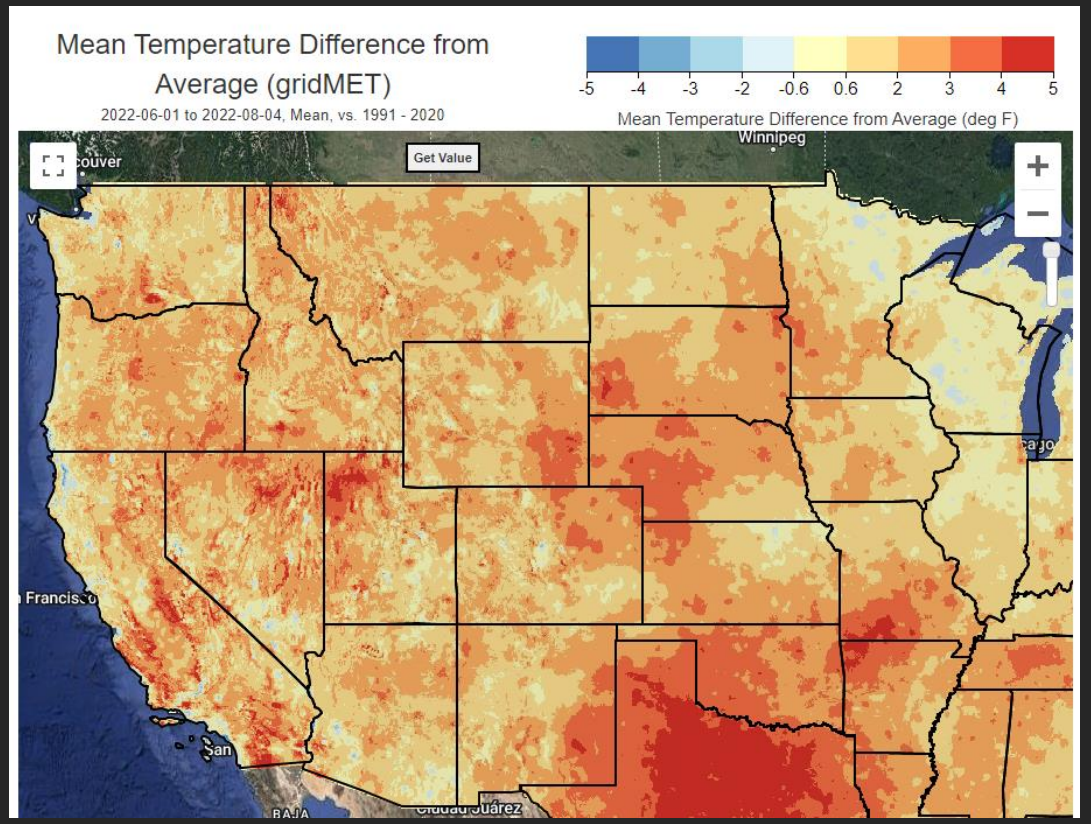
- PNW dries out
- Monsoon more spotty



July Precipitation

How's your summer going?

June 1-August 4 Temperature



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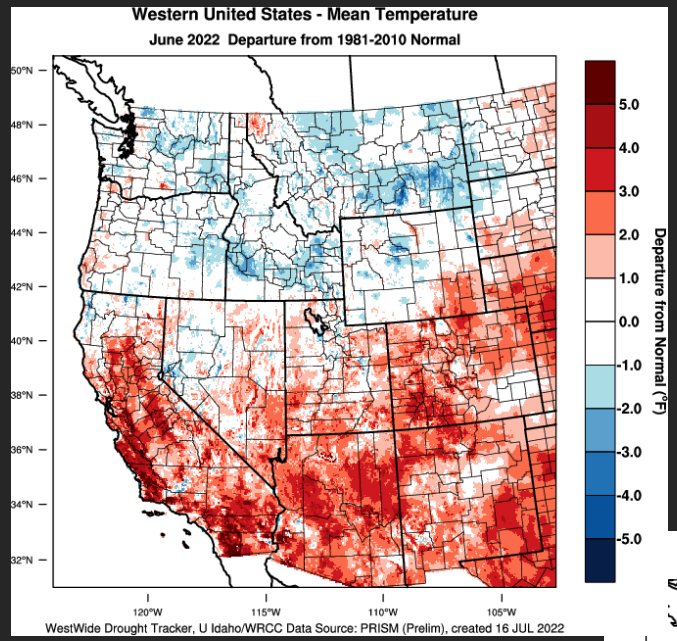
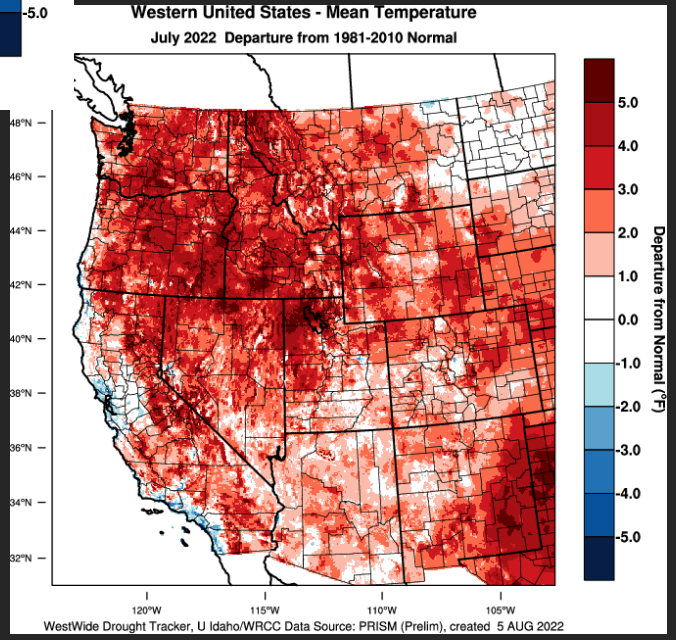


June Temperature

- Cool PNW
- Warm SW

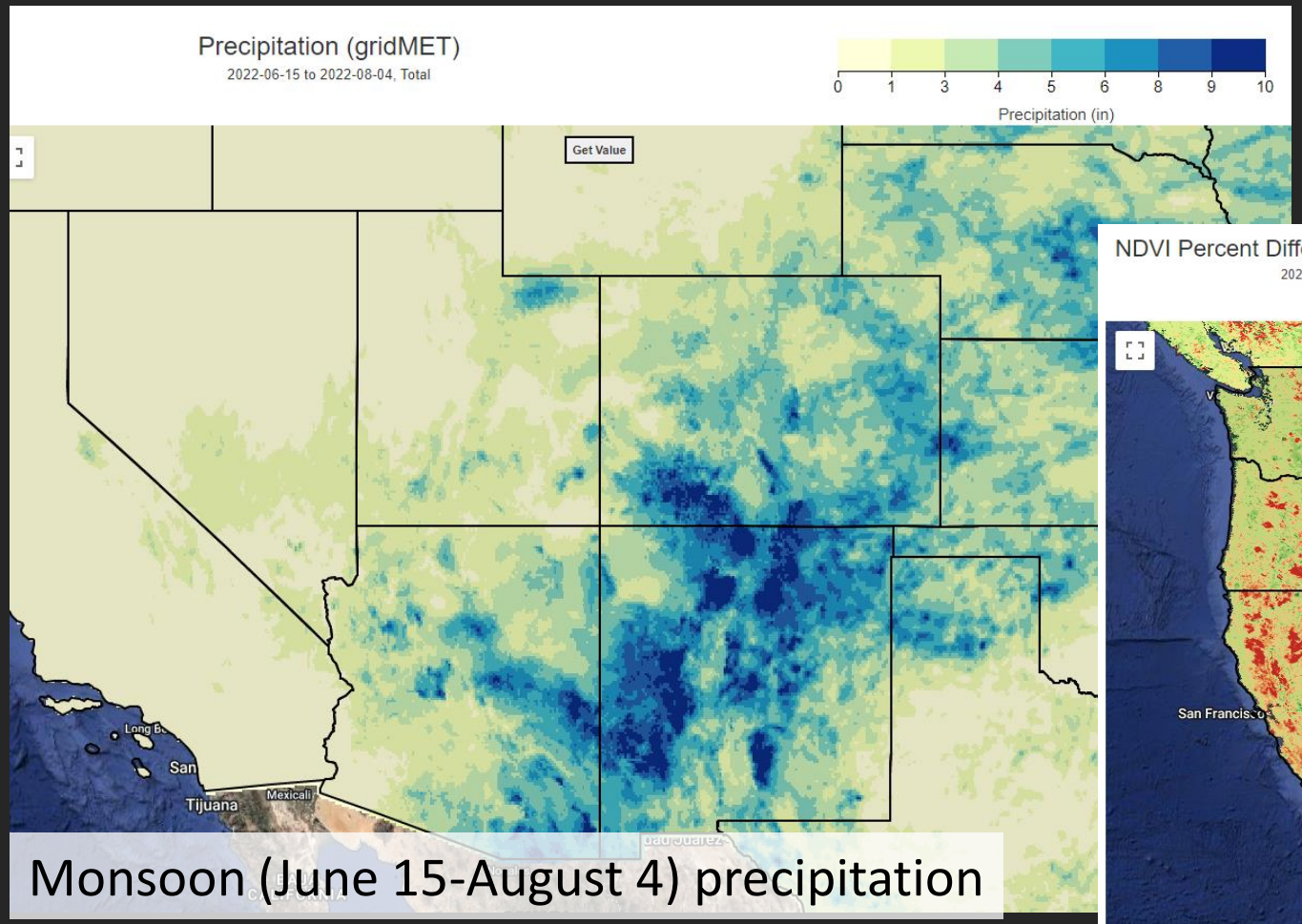
- PNW heats up
- SW stays warm even with active Monsoon



July Temperature

Snowy Crater Lake, Oregon June 18, 2022

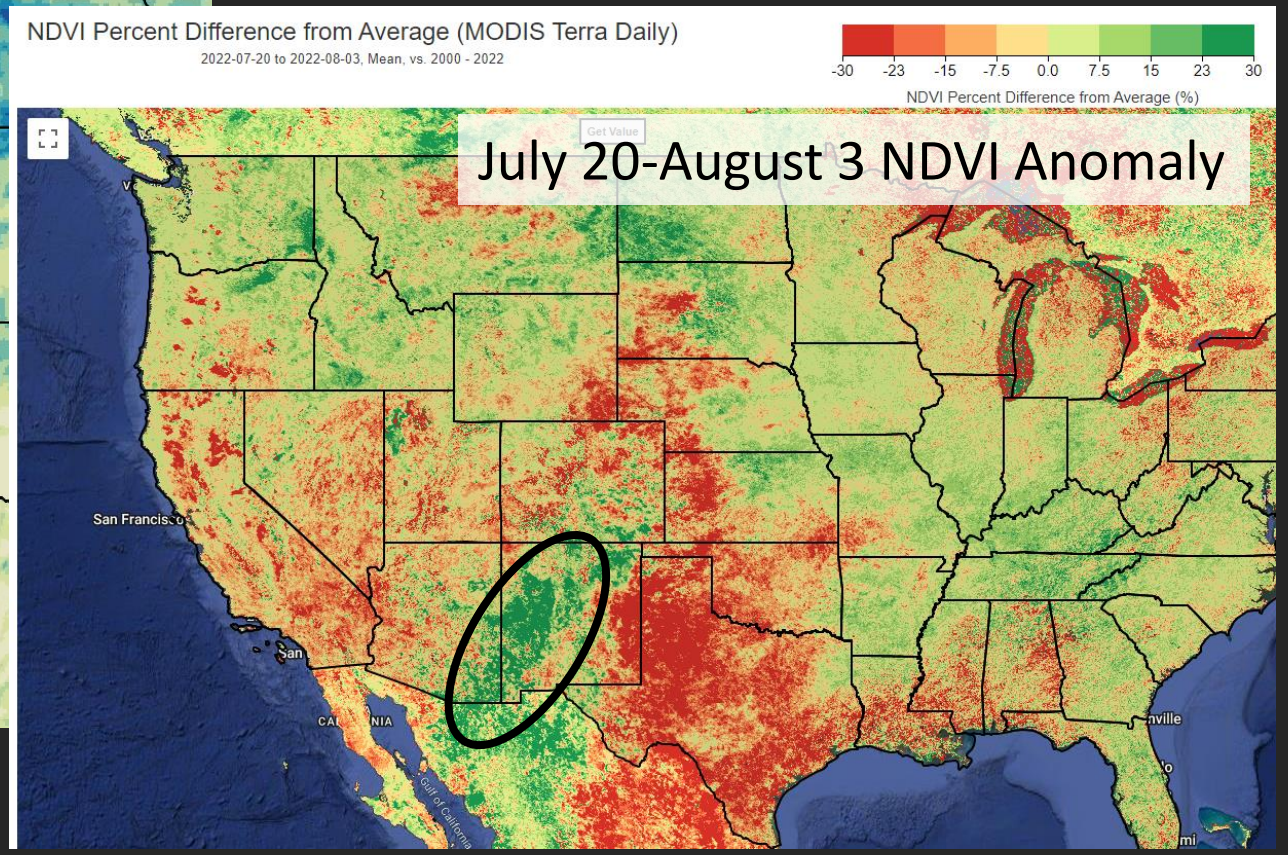
Southwest Monsoon Update



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



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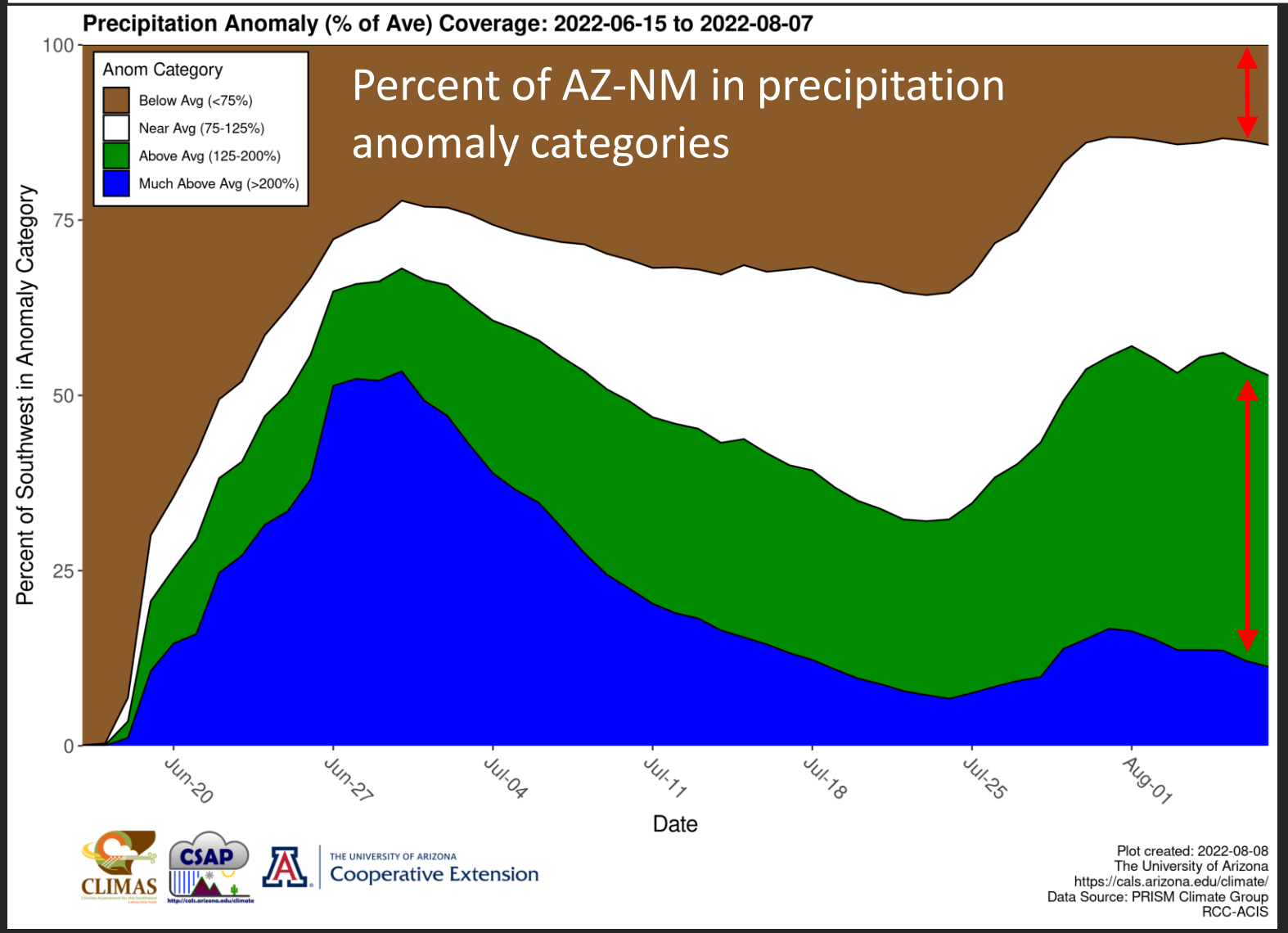
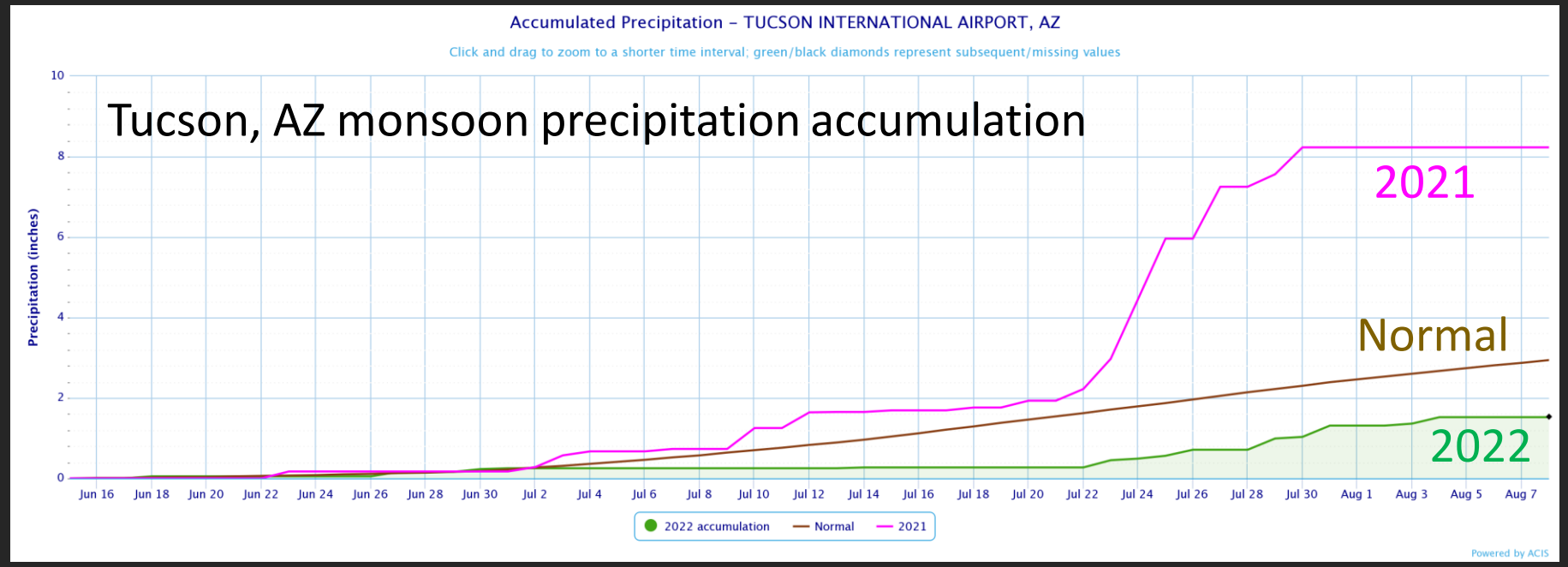
Southwest Monsoon Update

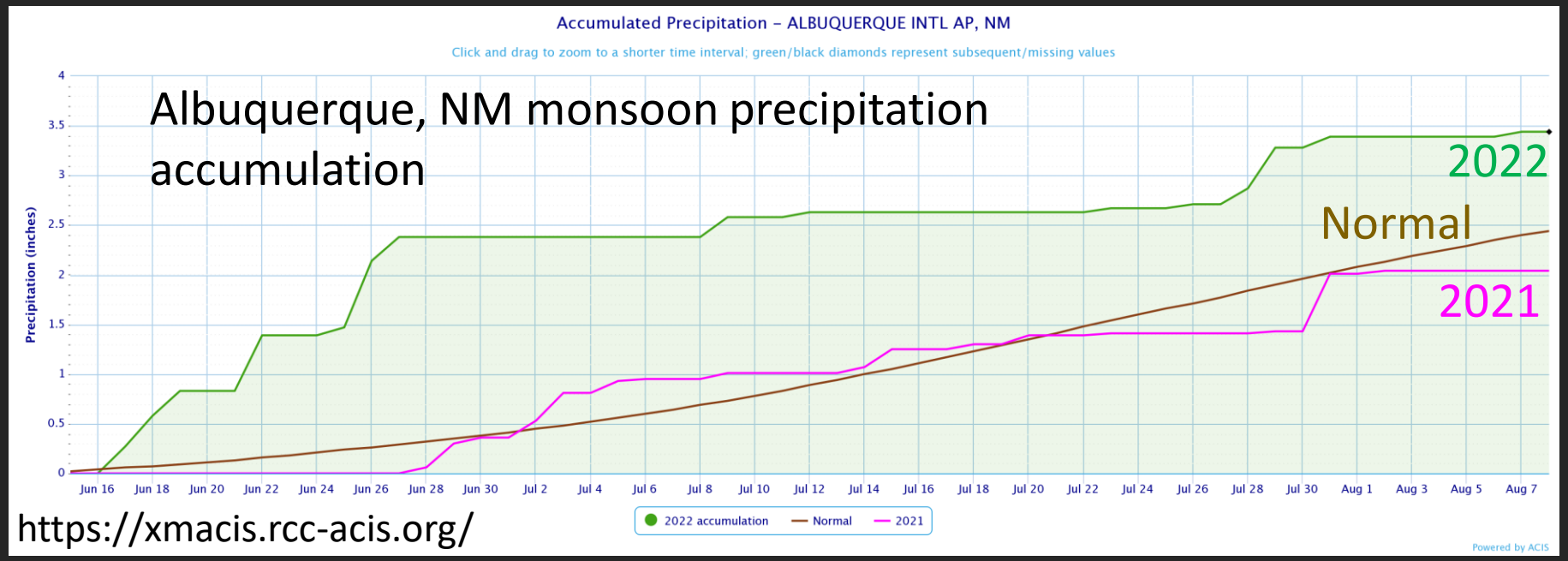


- Small fraction, mostly southeast NM, <75% of average
- Biggest fraction (about 40% of total area) in the 125-200% of average category

https://cals.arizona.edu/climate/misc/SWMonsoonMaps/current/swus_monsoon.html



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



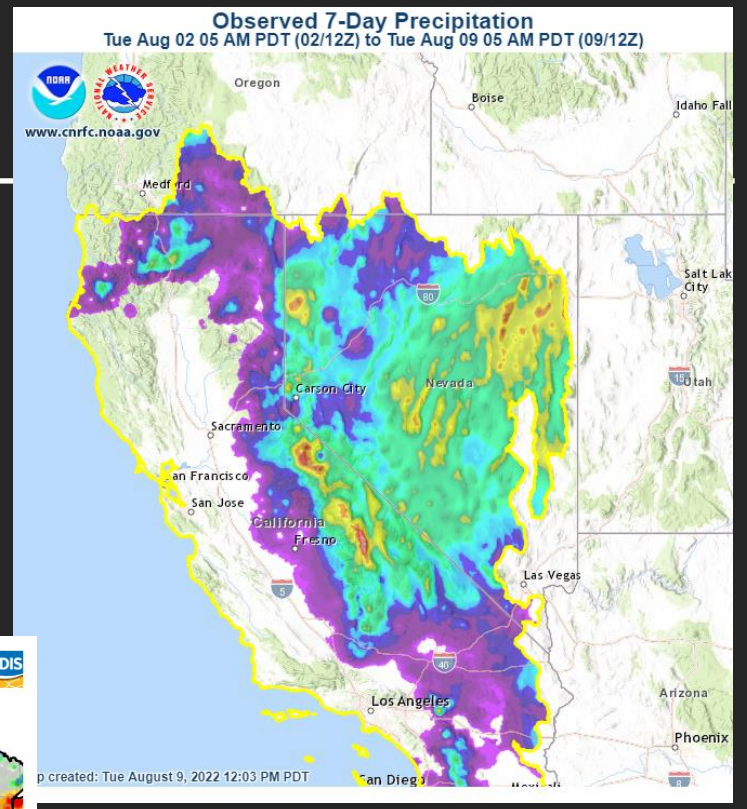
https://xmacis.rcc-acis.org/

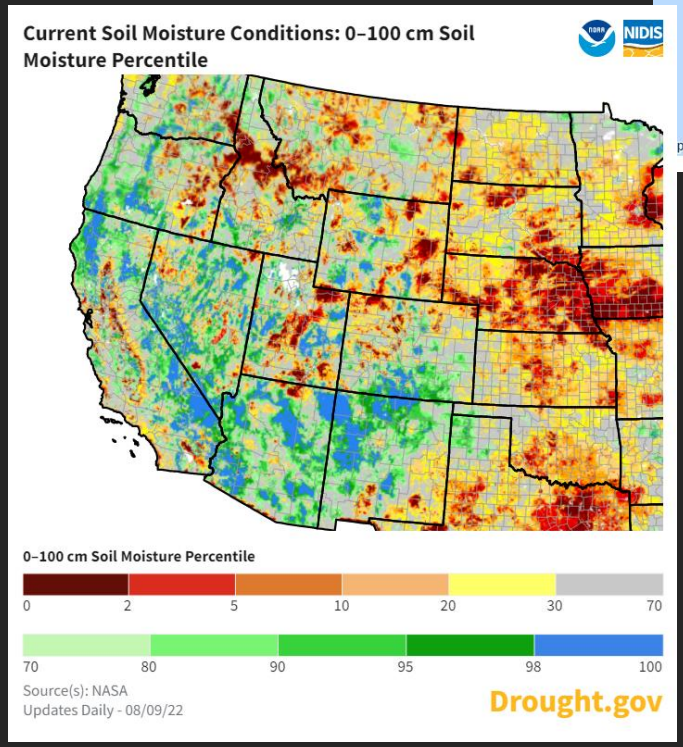
- Biggest wet monsoon anomalies this year are in central and northwest NM, including Albuquerque

Monsoonal moisture surges northward

Flooding in Death Valley, NP

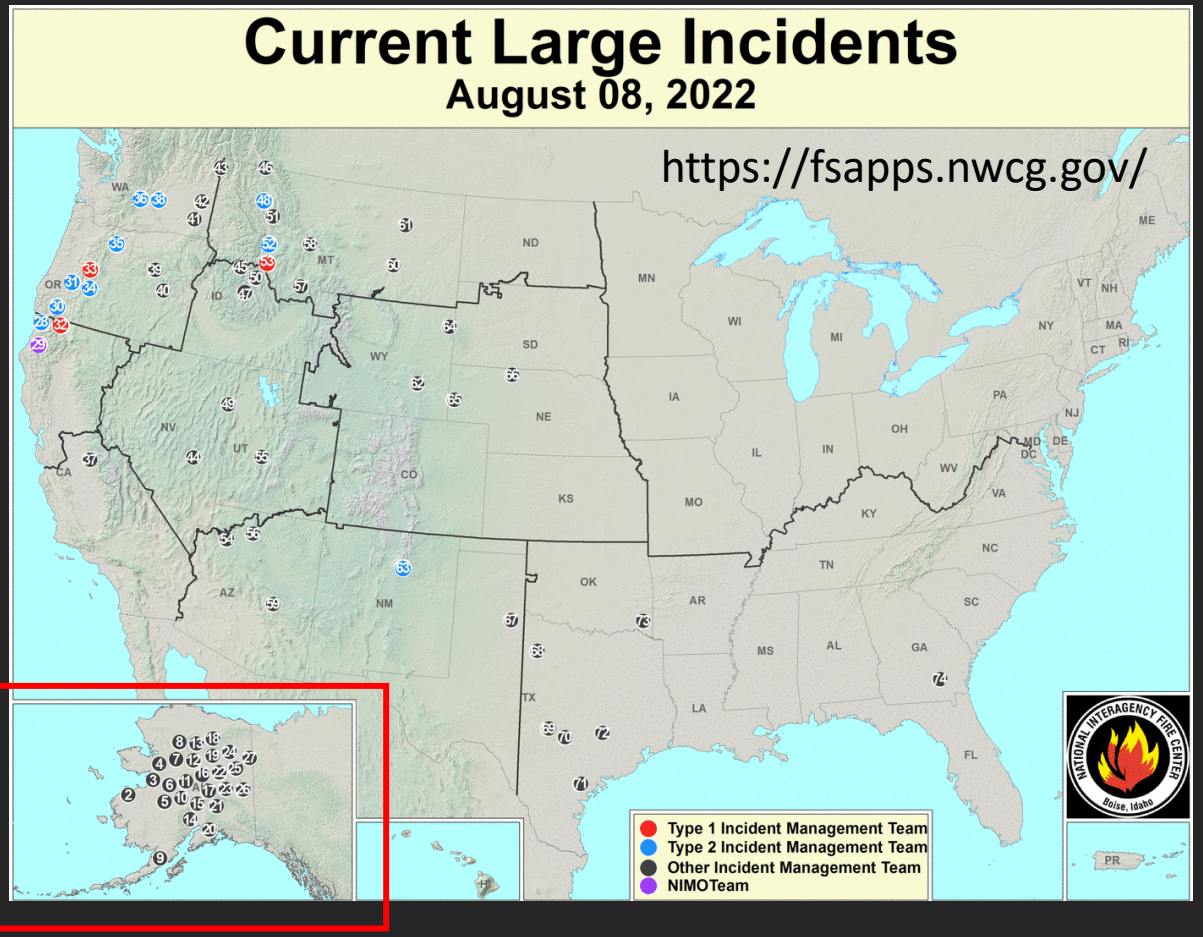
Photos NPS via AP





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

Wildfire Season Update



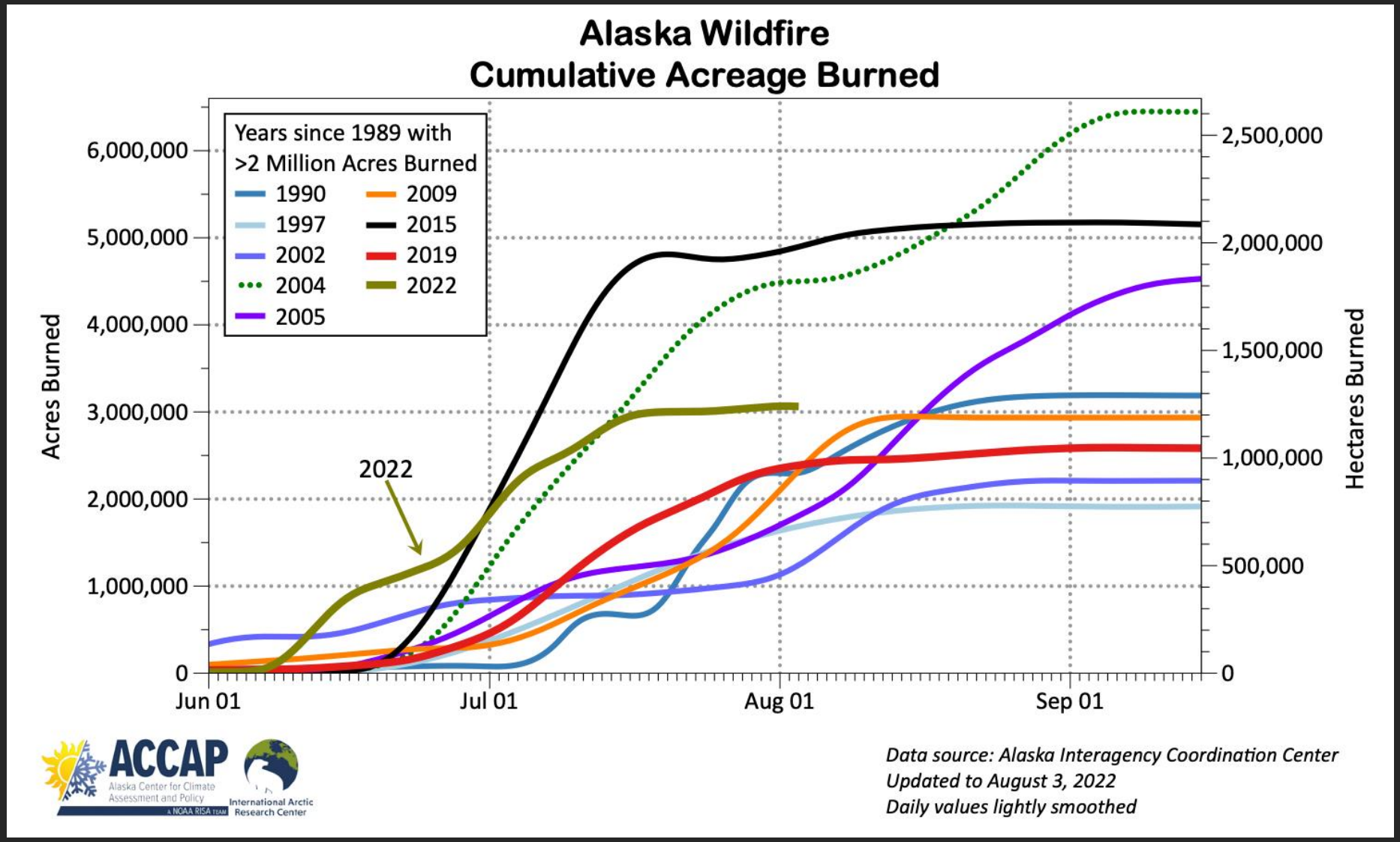
From the National Interagency Fire Center:

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

https://www.nifc.gov/fire-information/nfn

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

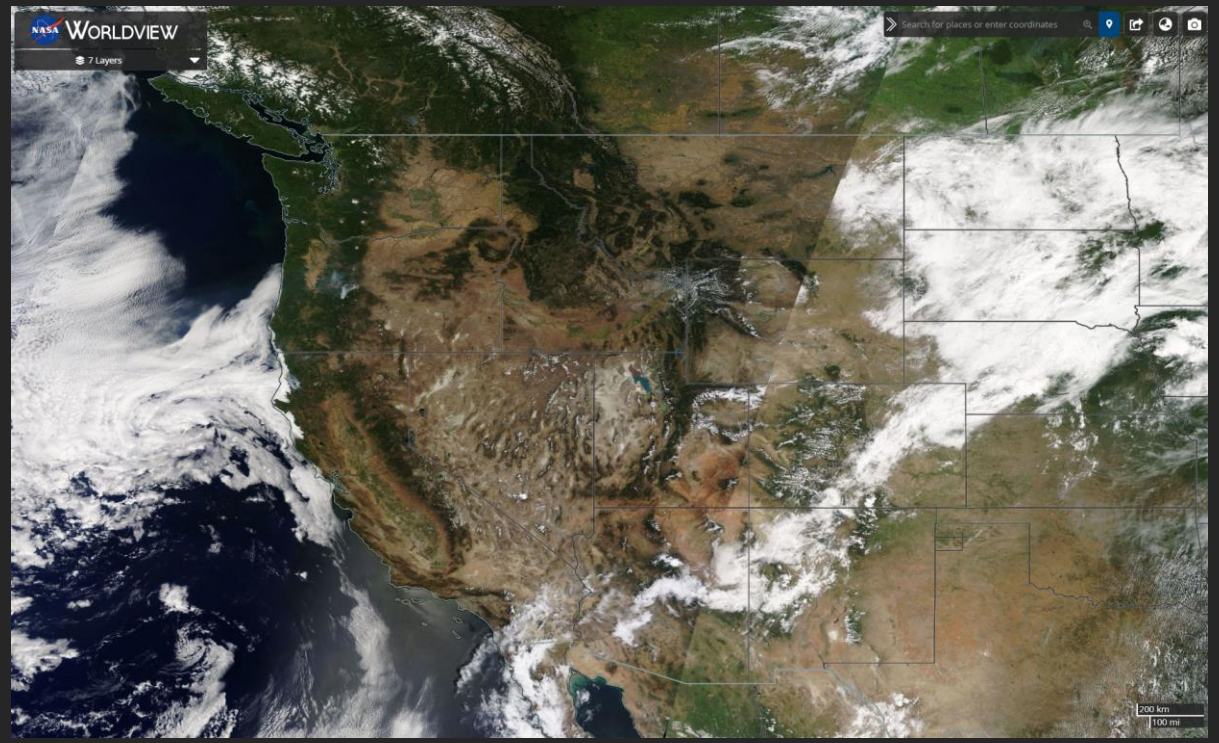
Wildfire Season Update



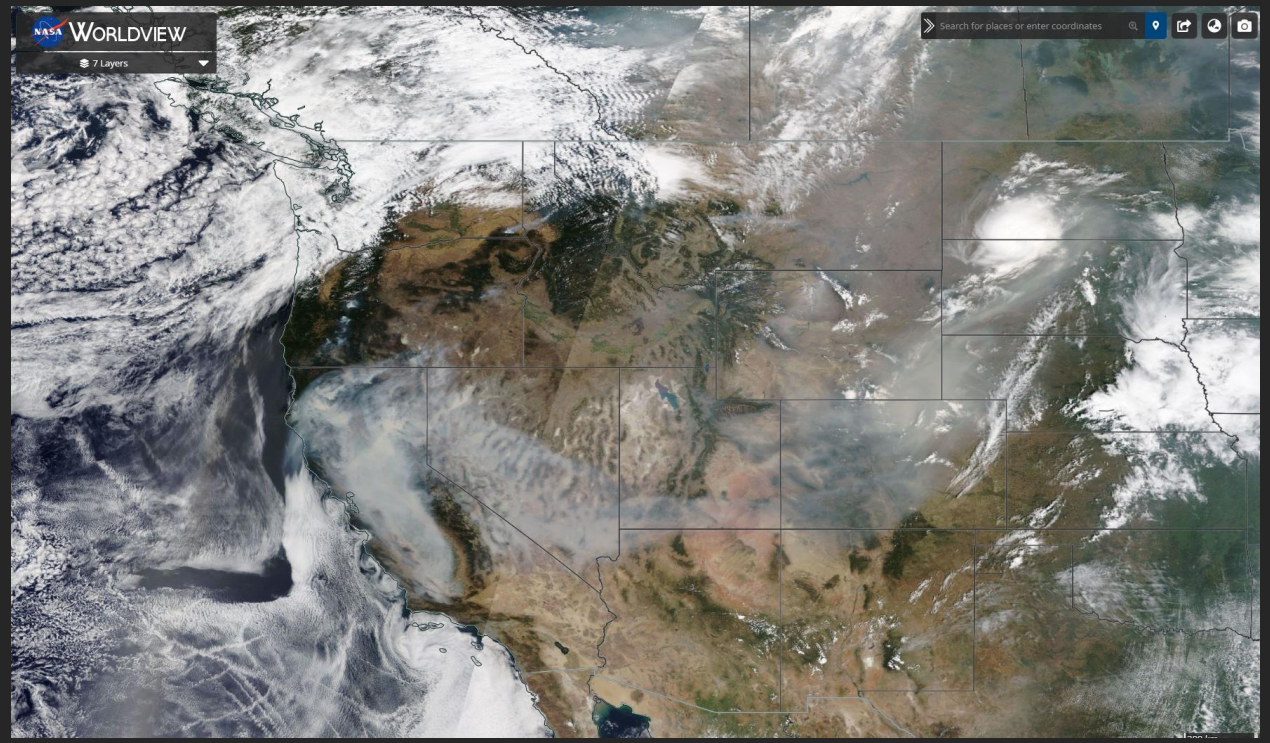
Graphic from
Rick Thoman
Twitter:
@AlaskaWx

Wildfire Season Update

August 7, 2022



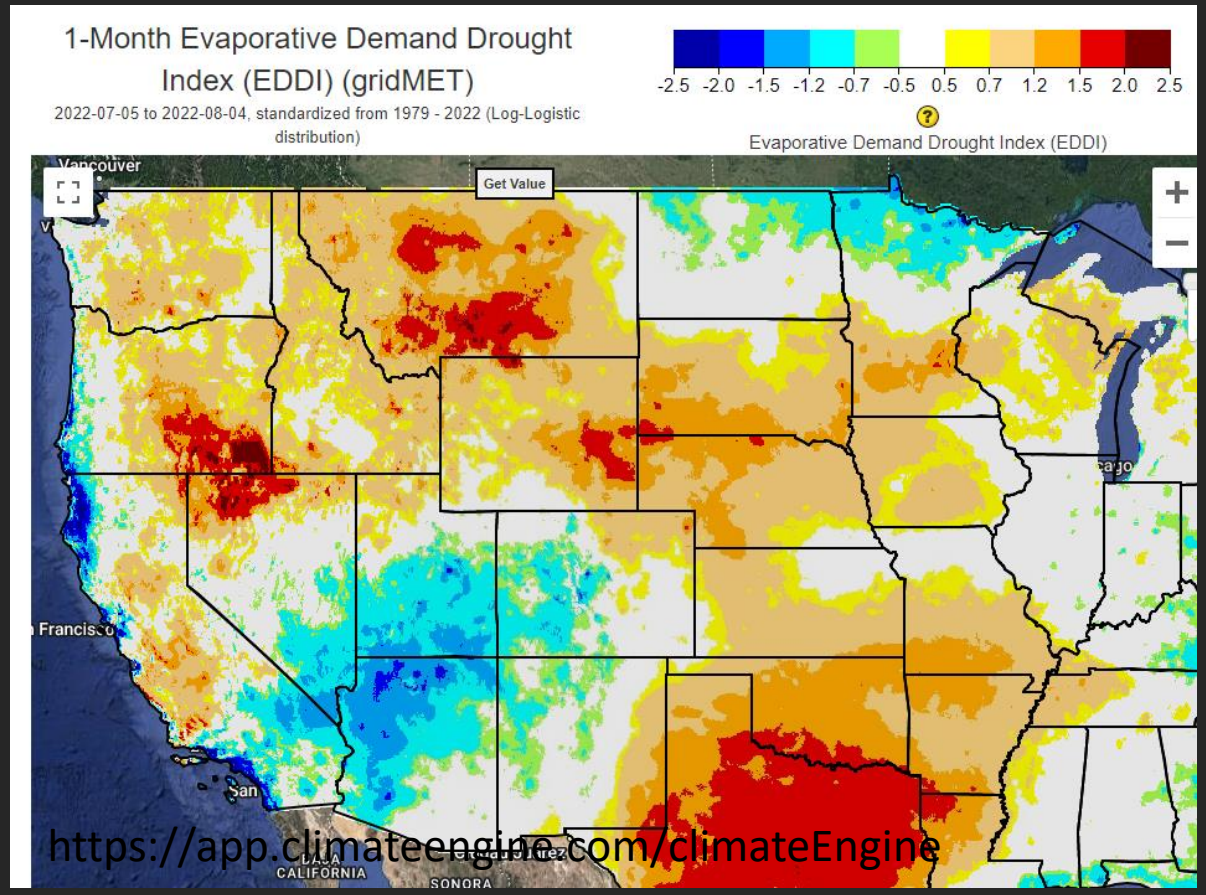
August 7, 2021



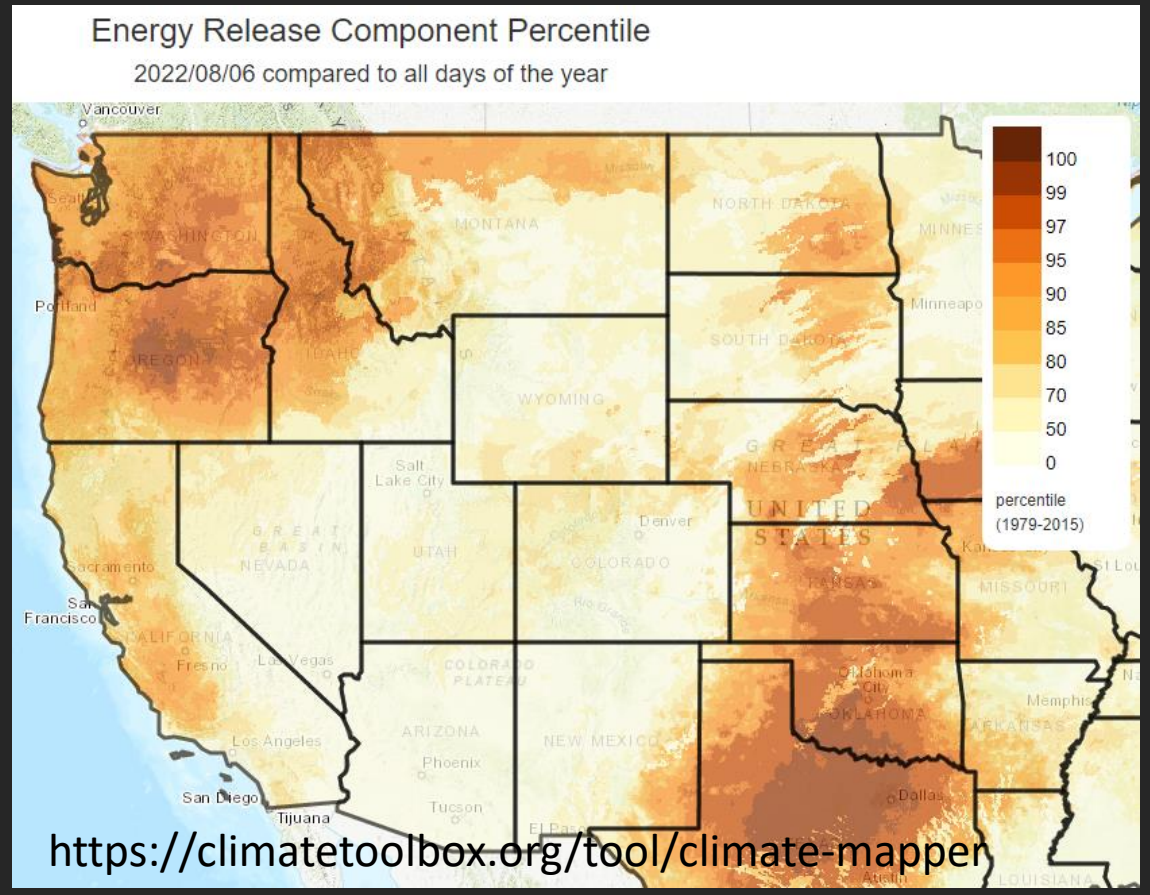
Smoke impacts have been much more localized this summer (so far) compared to 2020 and 2021.

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

Current Wildfire Danger

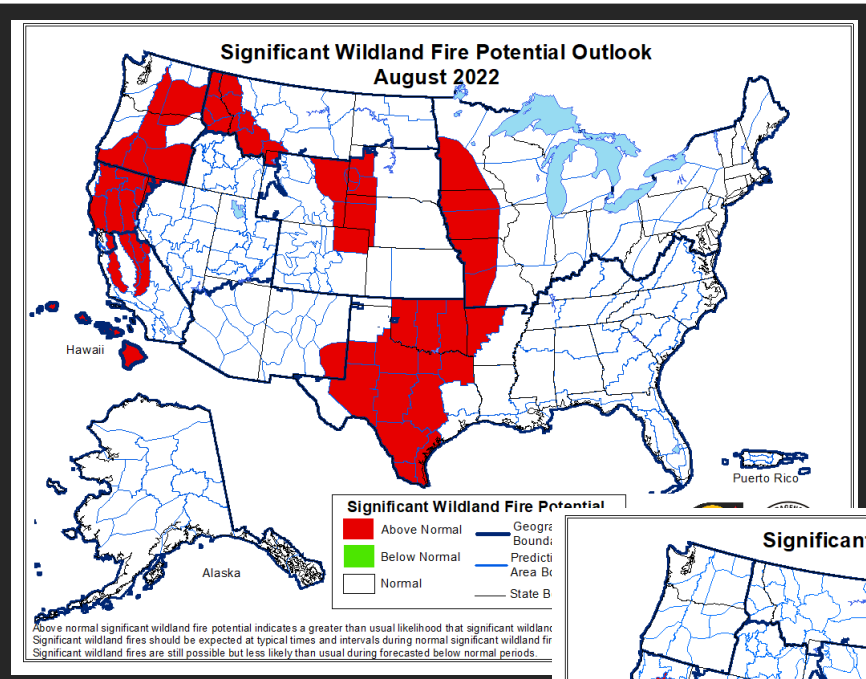


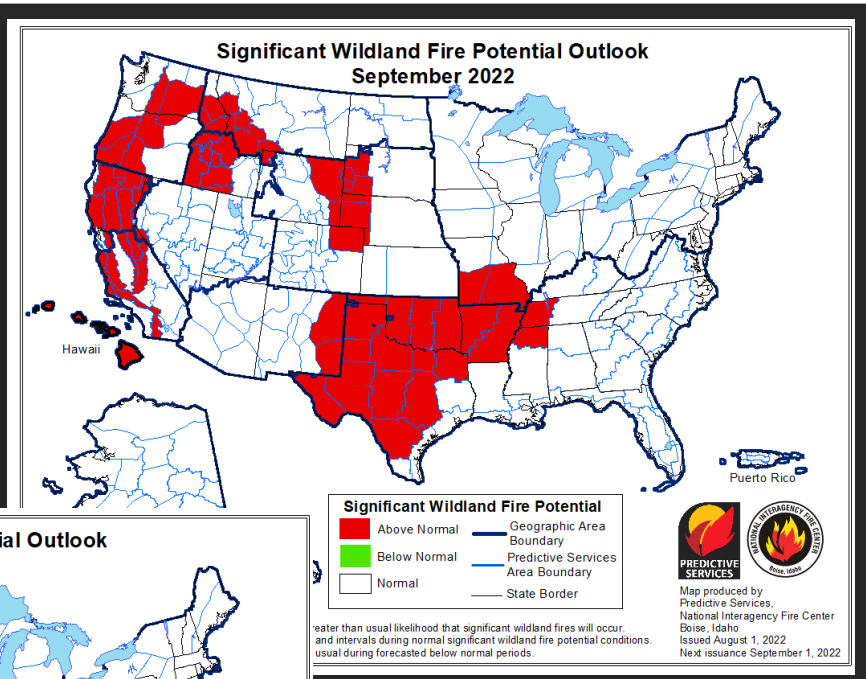
- Fire danger has increased in the PNW with late-July heat wave accelerating drying

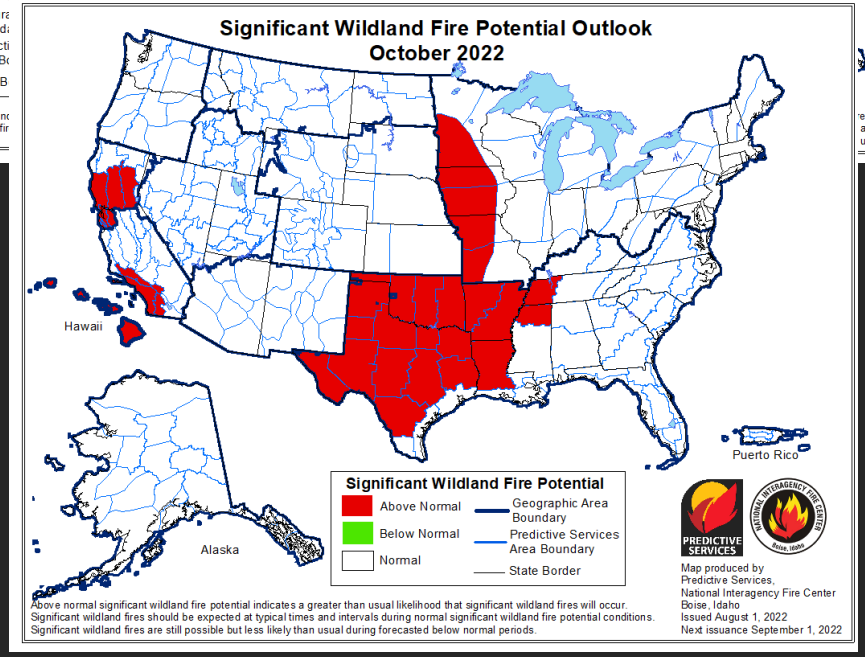


- Fire danger lower in the Sierra Nevada, Great Basin, and Southwest

Significant Wildland Fire Potential Outlook

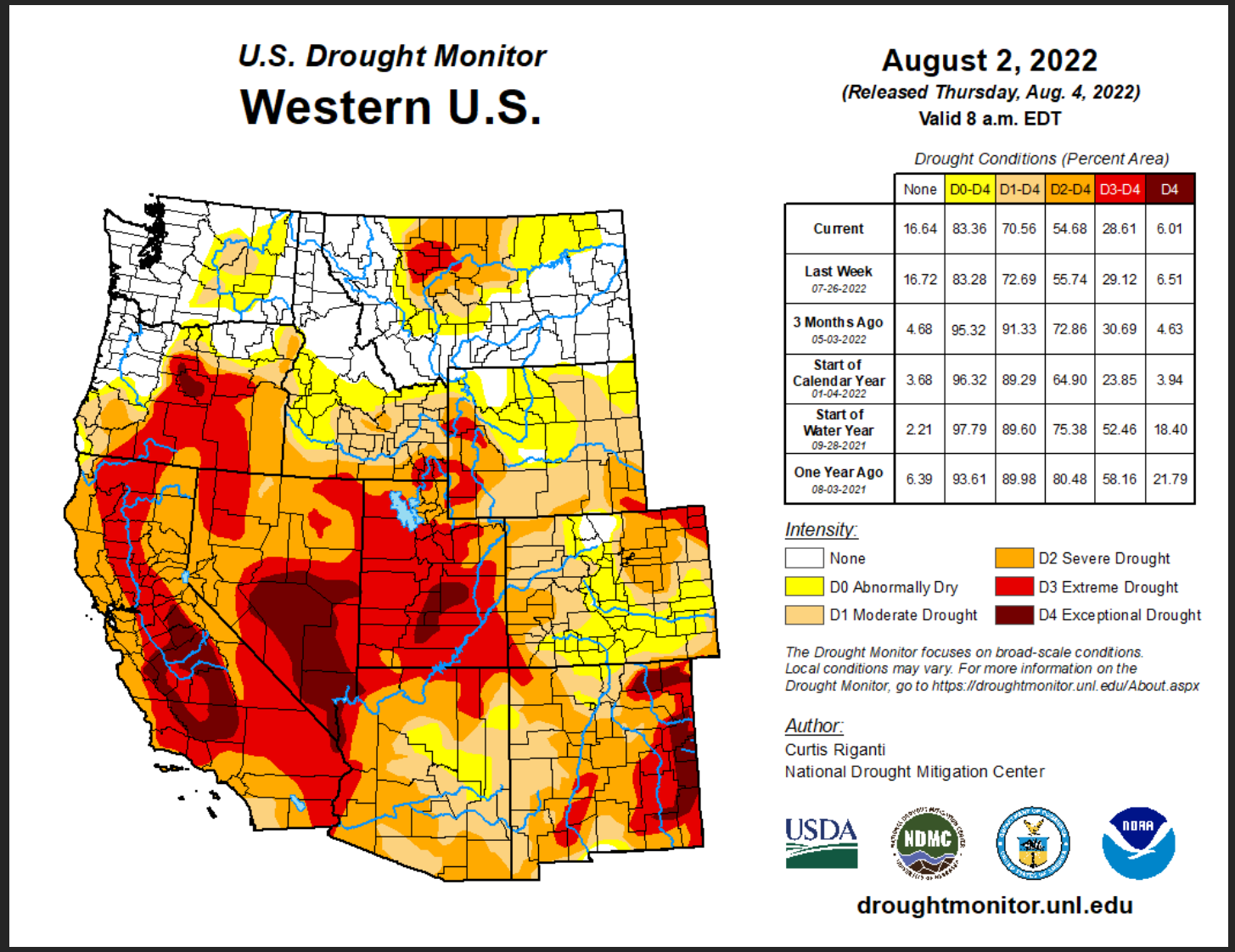






- Above normal *fire potential* still widespread in August-September due to both long-term drought and climatology (dry and hot)

Current Drought Snapshot



- 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

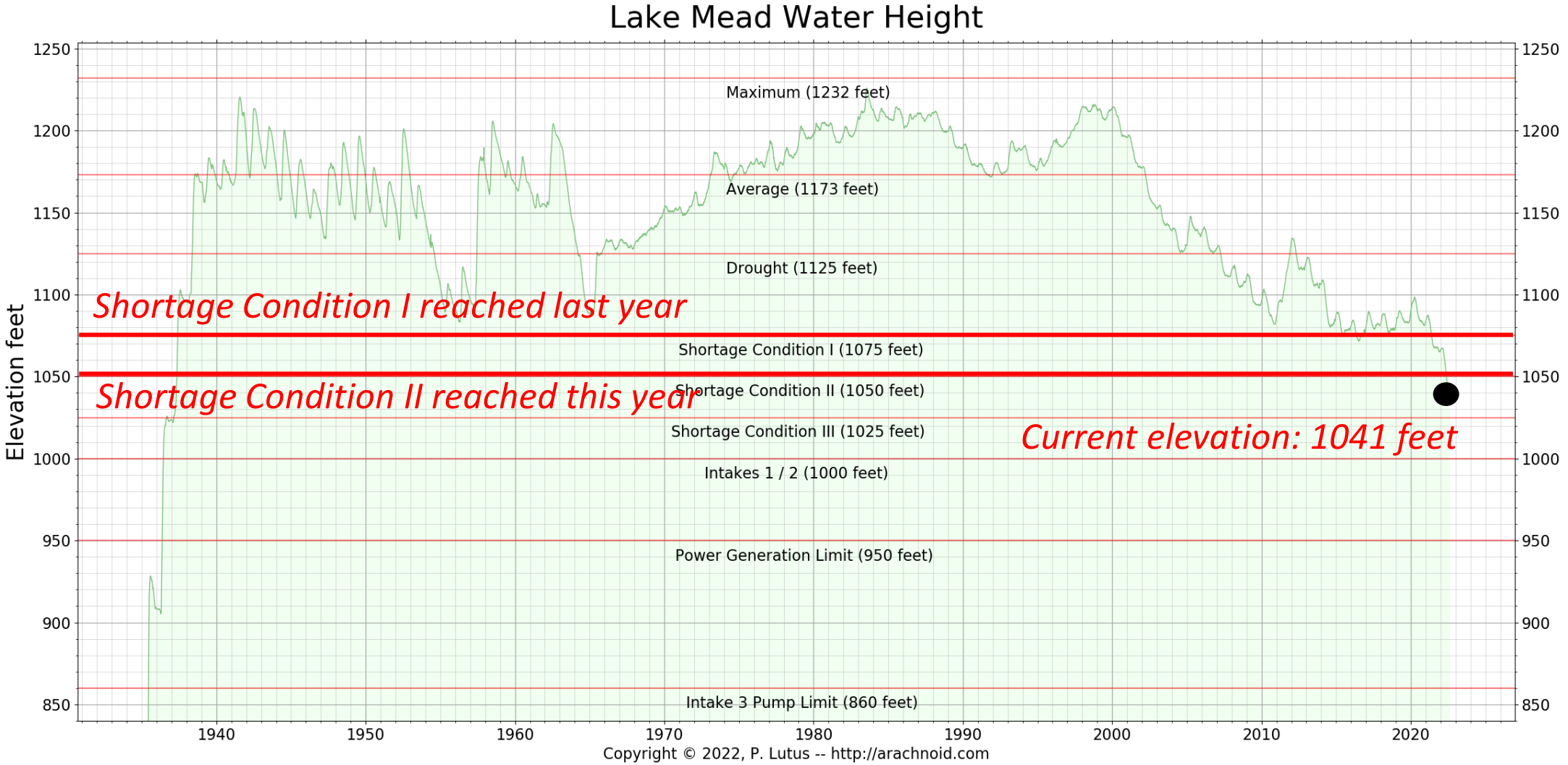
Skeletal human remains continue to be discovered as Lak rapidly decline.

Scott L. Hall Scott L. Hall, USA TODAY

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

https://earthobservatory.nasa.gov/images/150111/lake-mead-keeps-dropping

Colorado River Water Supply



Colorado River Water Supply

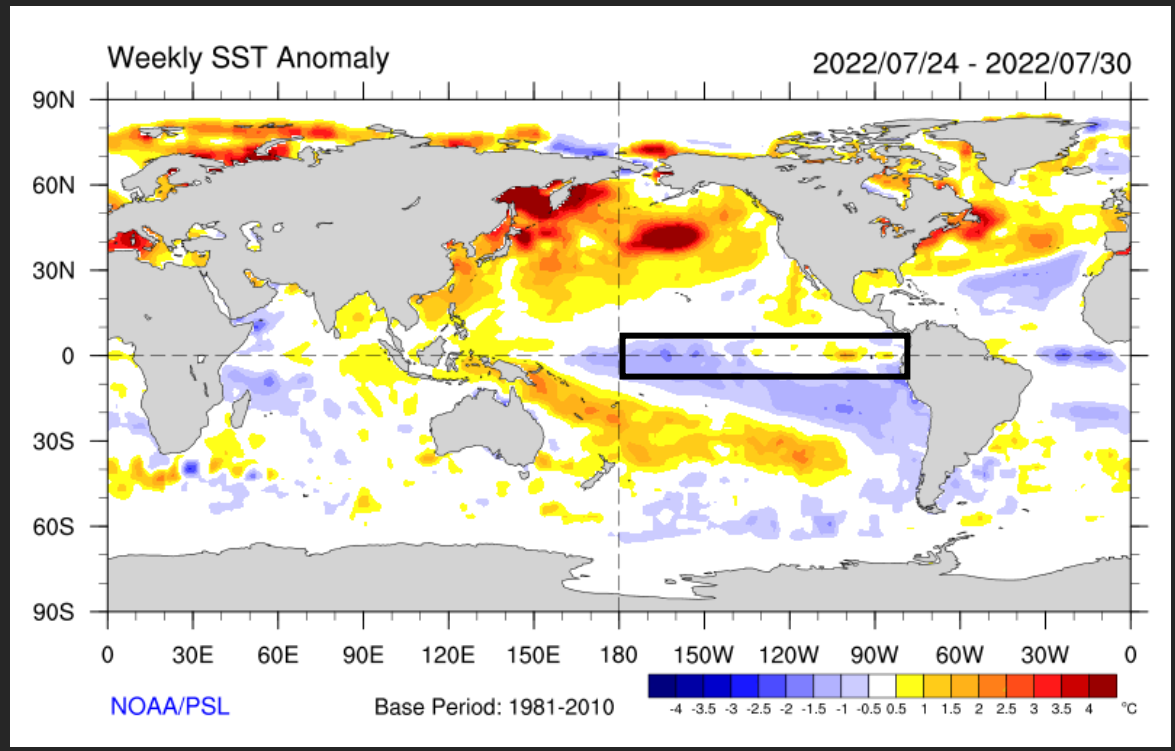
- Stage I shortage water cuts already in place for Arizona, Nevada, and California

- 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

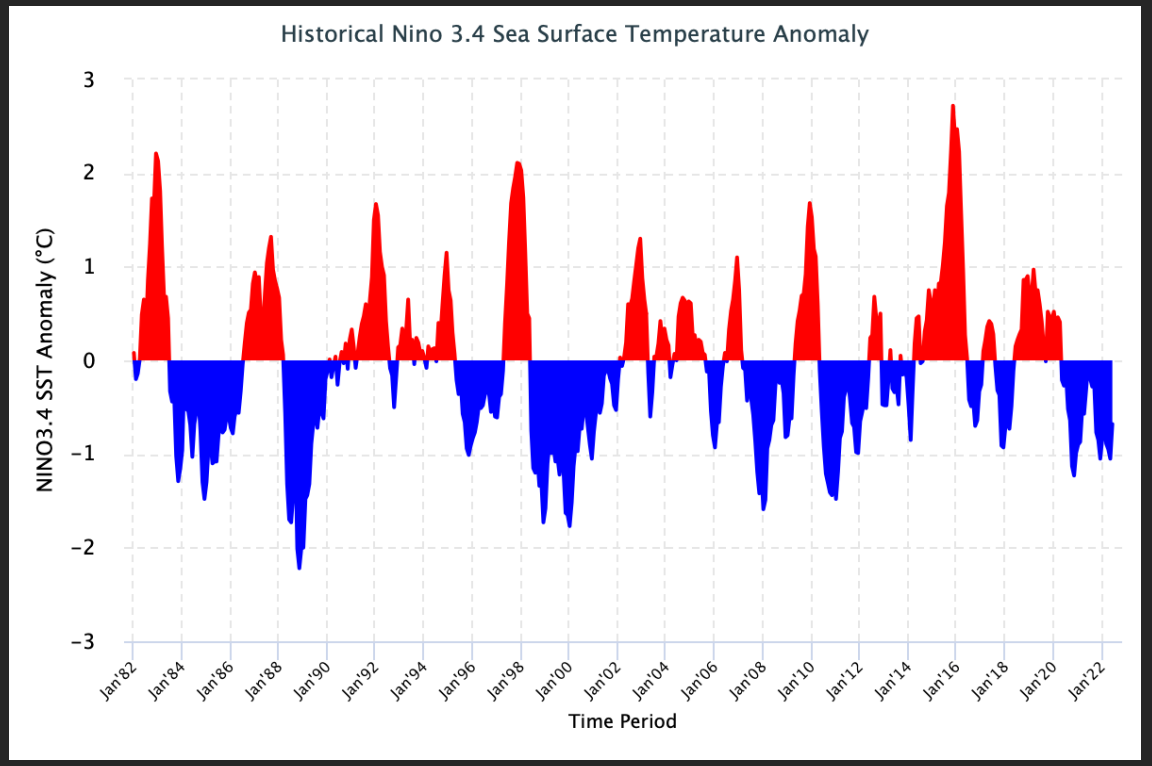
- ENSO Alert System Status: **La Niña Advisory**
- La Niña is present.
- Equatorial sea surface temperatures (SSTs) are below average across most of the Pacific Ocean.
- The tropical Pacific atmosphere is consistent with La Niña conditions.

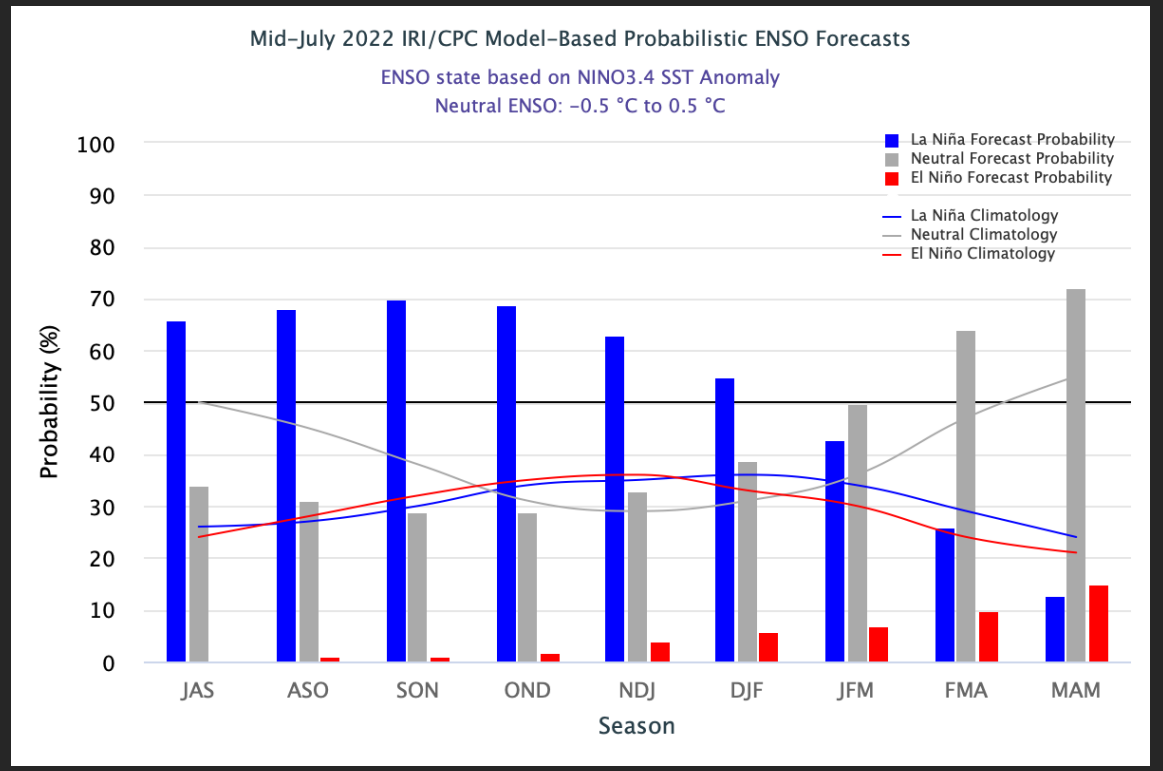


- La Niña is favored to continue through 2022 with the odds for La Niña decreasing into the Northern Hemisphere late summer (60% chance in July-September 2022) before increasing through the Northern Hemisphere fall and early winter 2022 (62-66% chance).

Source: Climate Prediction Center

ENSO—La Niña Conditions Persist

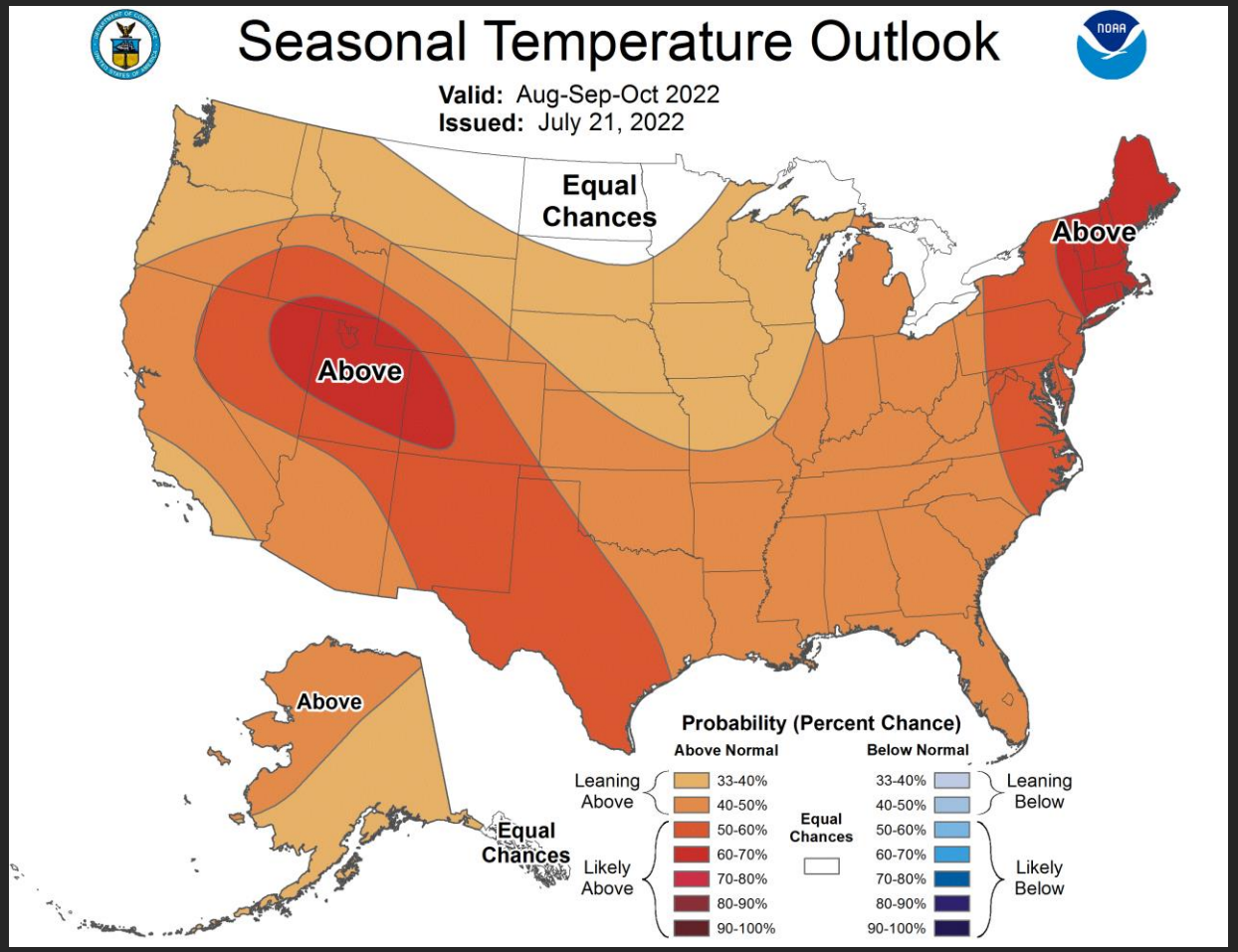


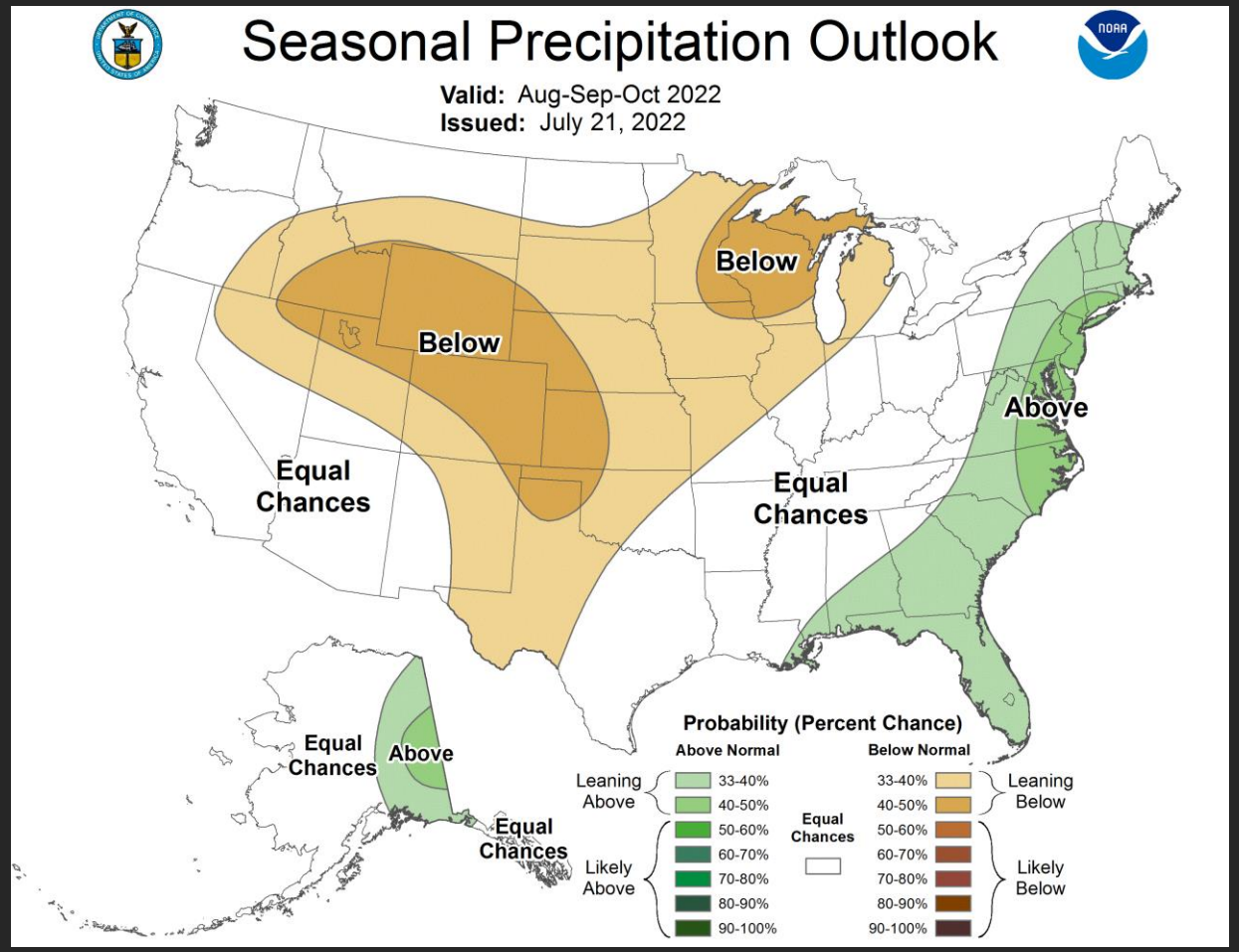


- La Niña conditions still present with below average SSTs in the eastern equatorial Pacific
- La Niña likely to continue into autumn; lower confidence for winter

https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/

Aug-Oct Temperature and Precipitation Outlook





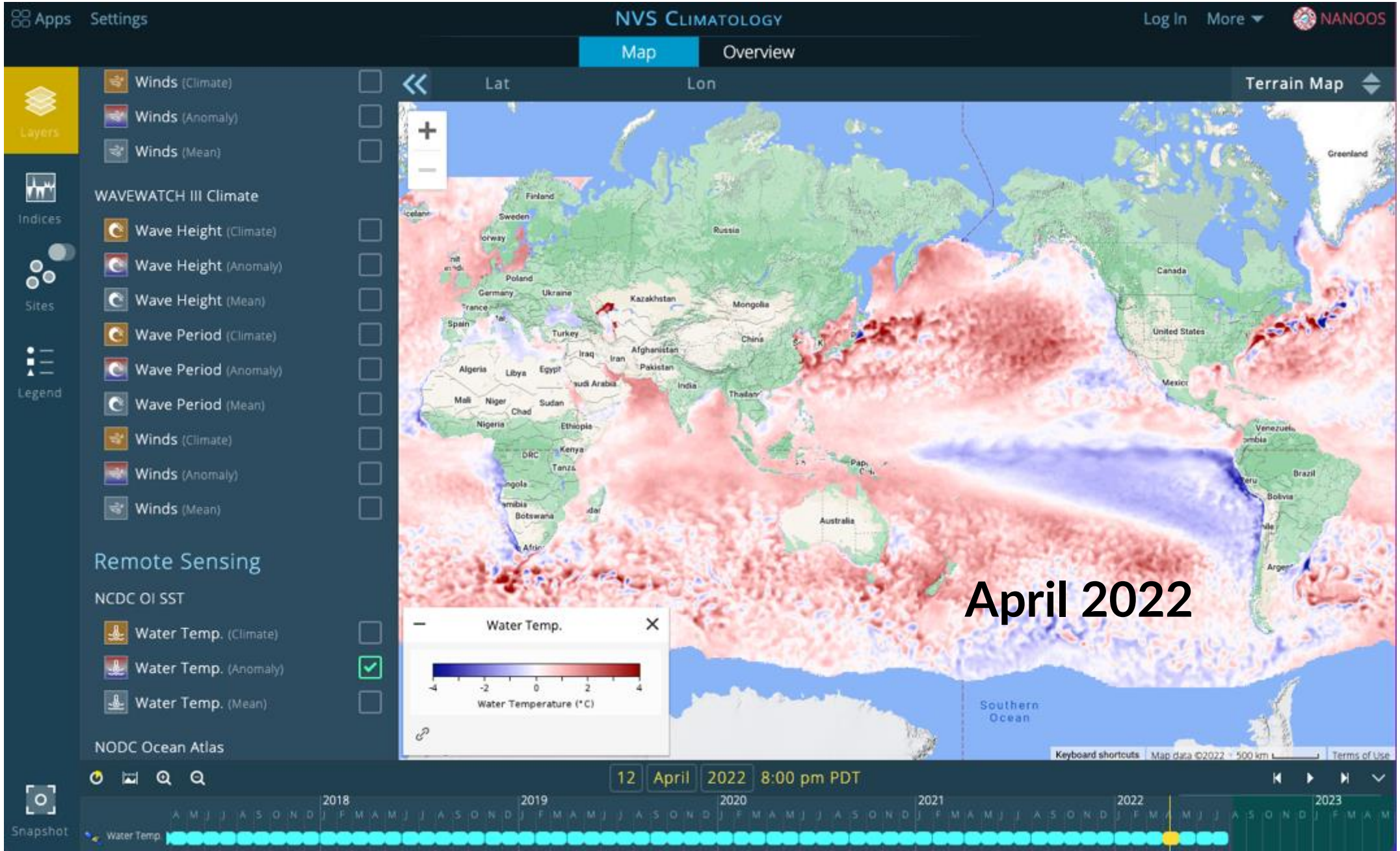
NOAA West Watch
Update 9 August 2022

Jan Newton, NANOOS Executive Director

www.nanoos.org

NANOOS: www.nanoos.org Climatology app

Sea Surface Temperature Anomaly
NCEI Optimum Interpolation SST



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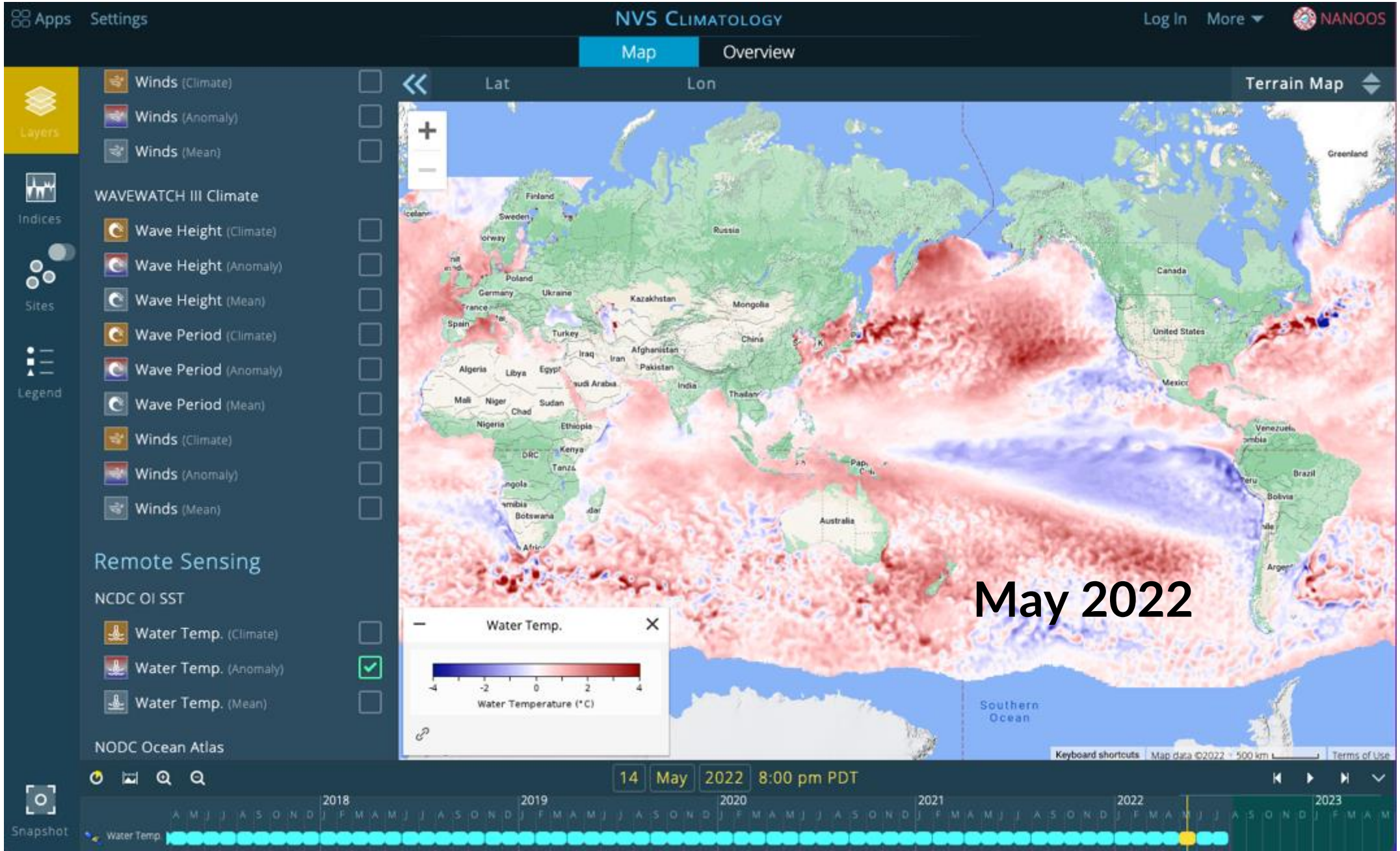

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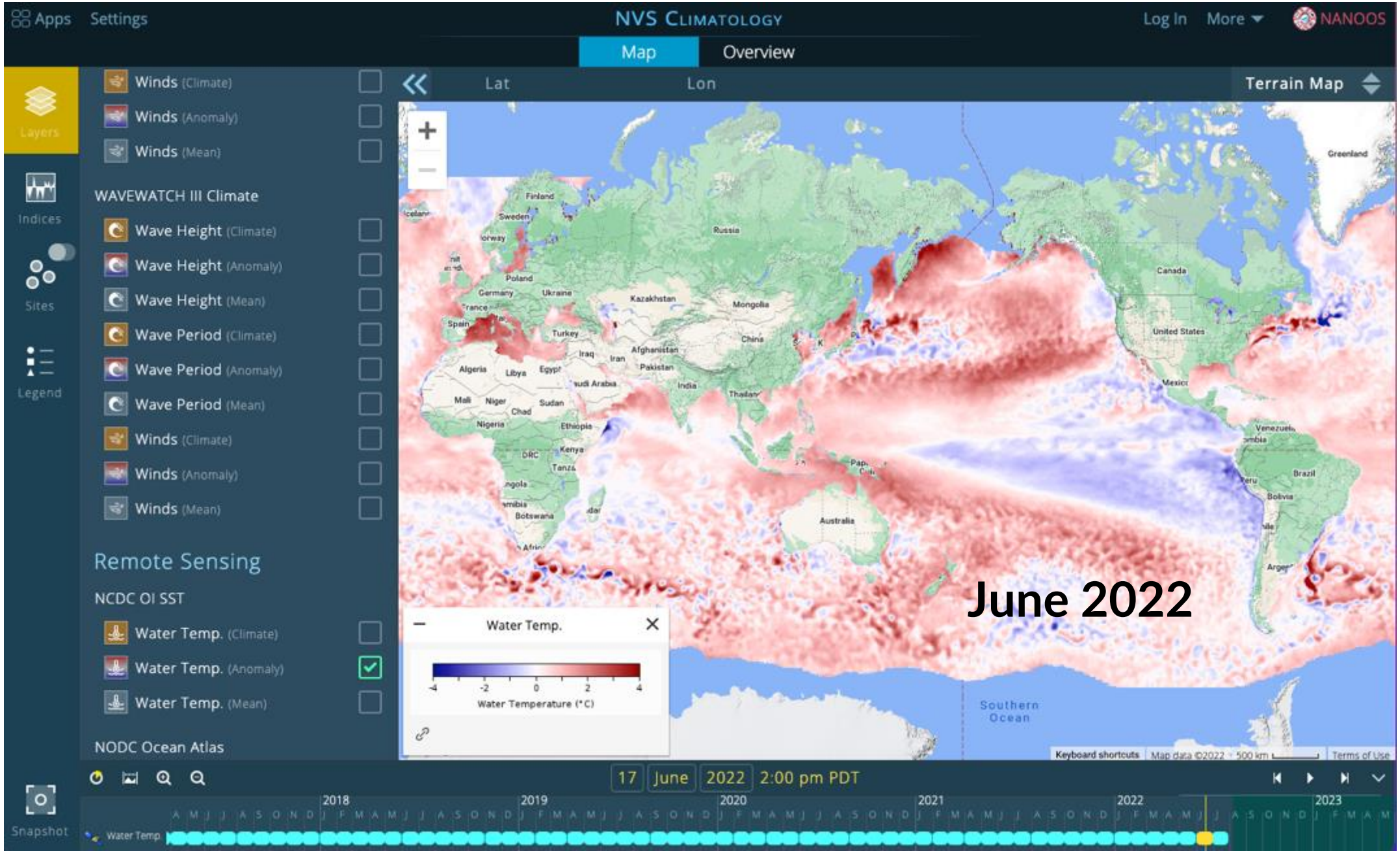

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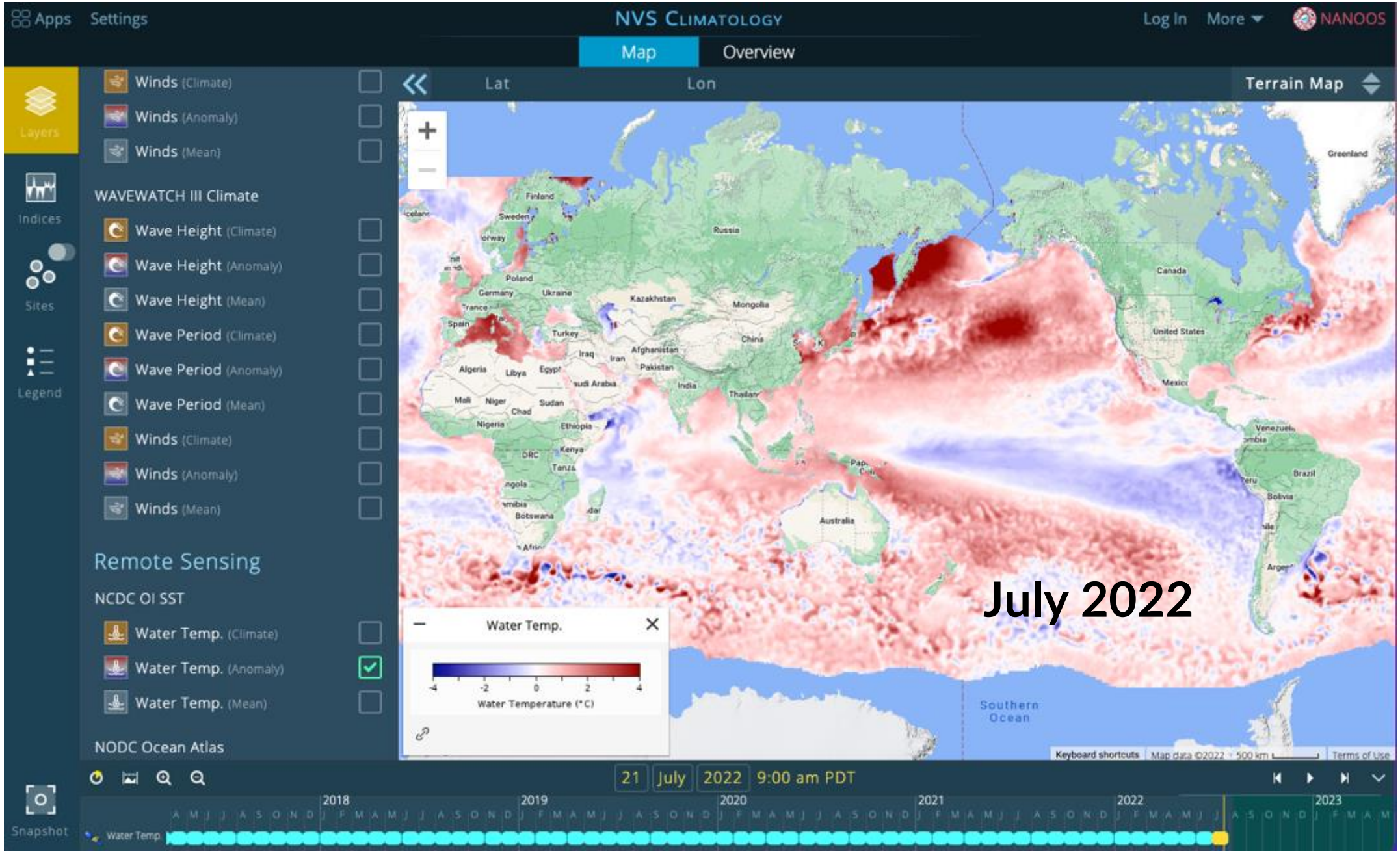
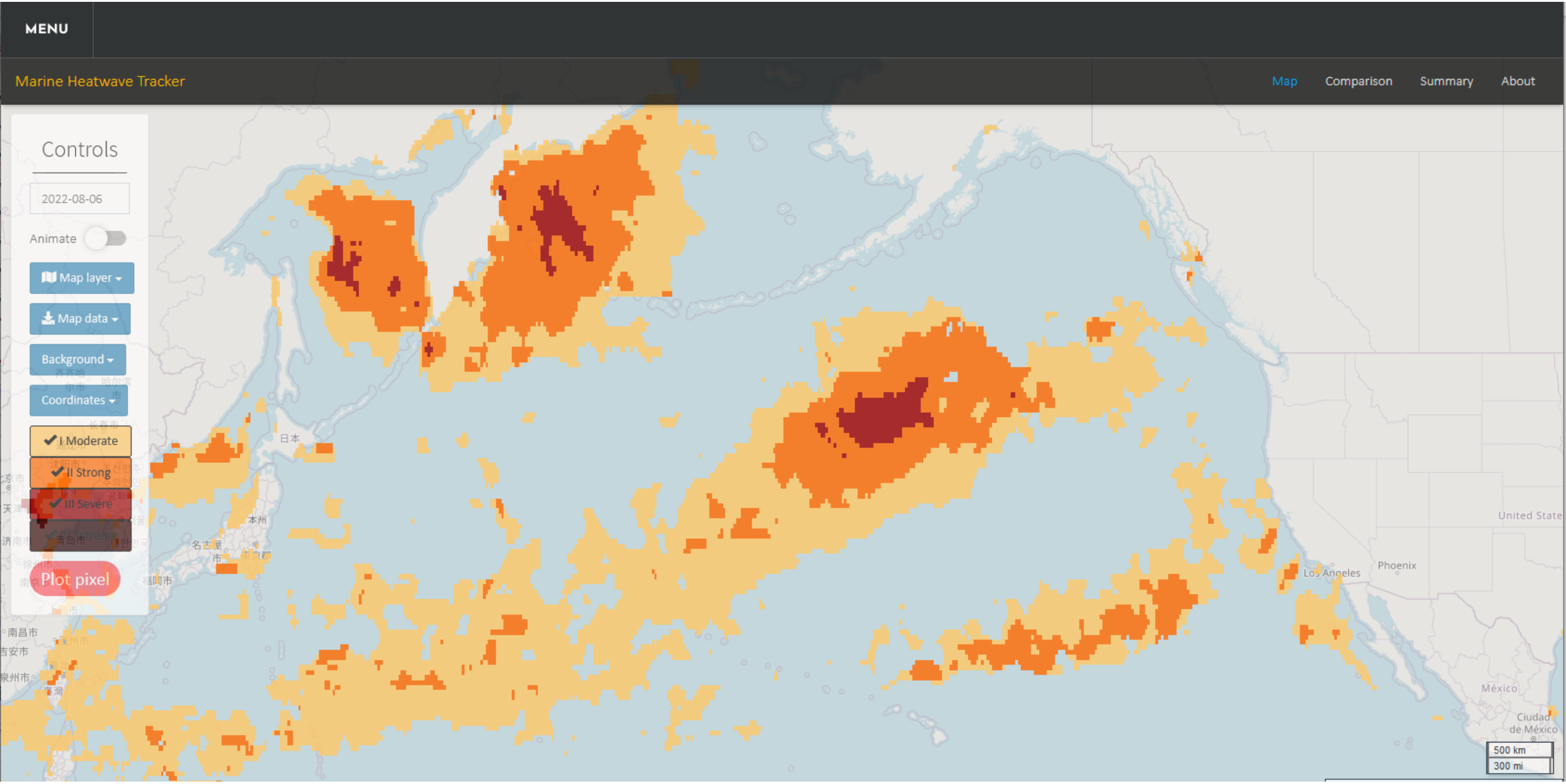


http://www.marineheatwaves.org/tracker.html

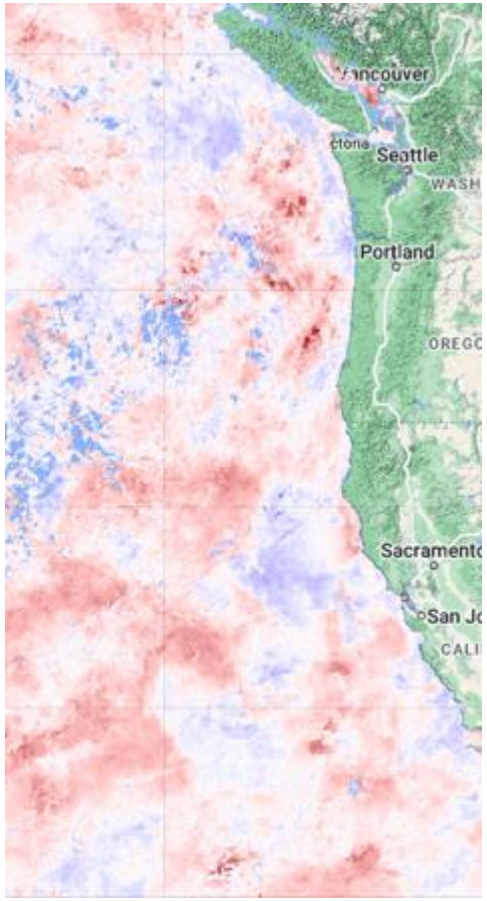


Each of these four colors corresponds to increasing categories of MHWs as first proposed in Hobday et al. 2018.

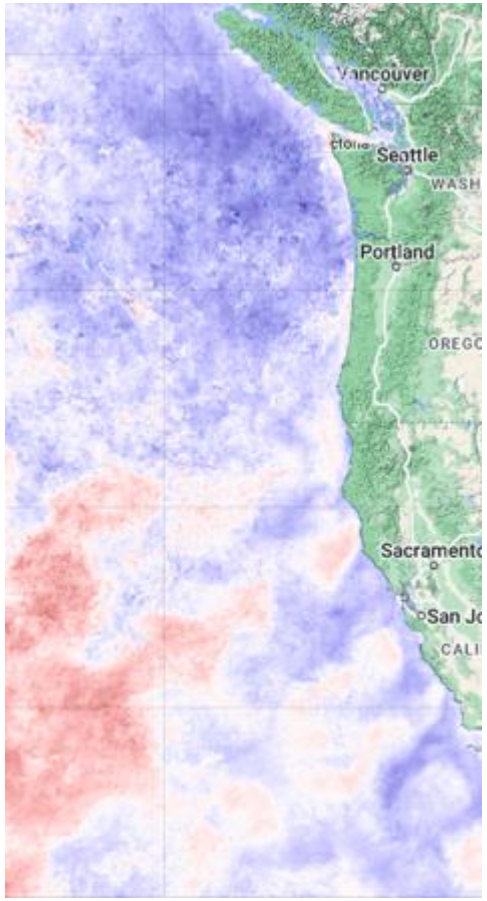
NANOOS: www.nanoos.org Climatology app

Sea Surface Temperature Anomaly
OSU MODIS

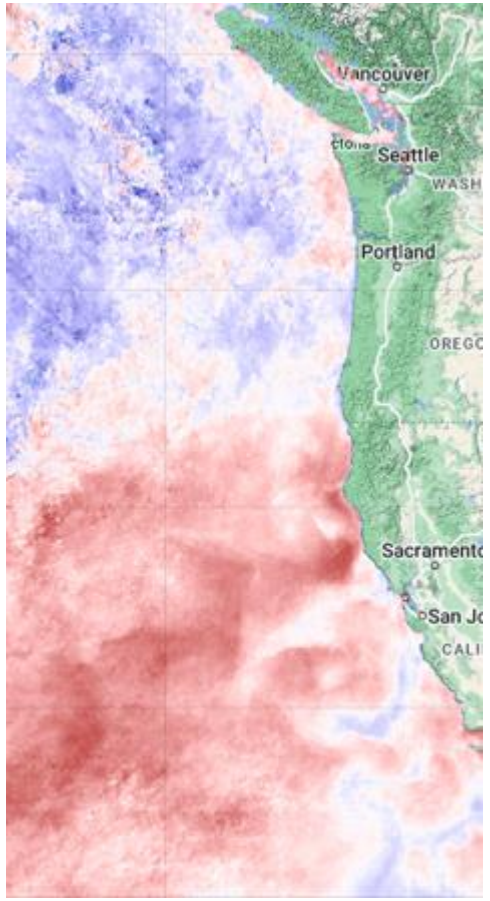
April 2022



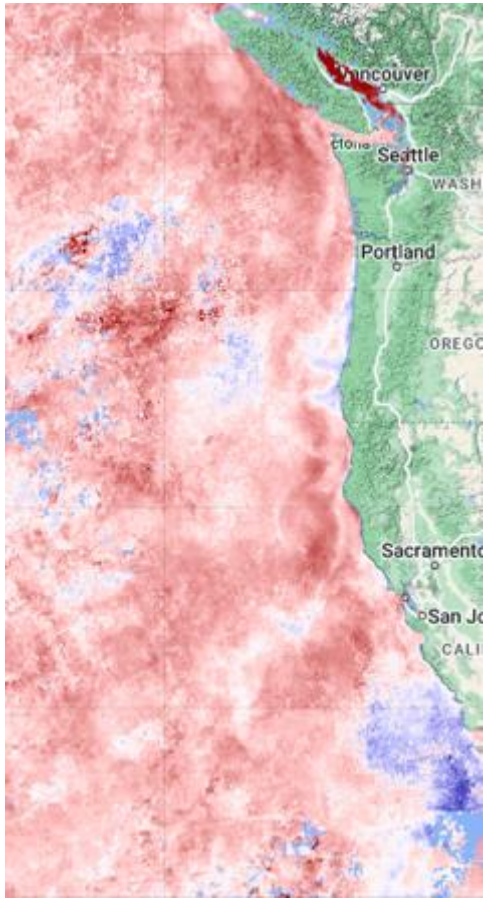
May 2022

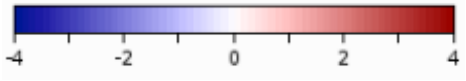


June 2022



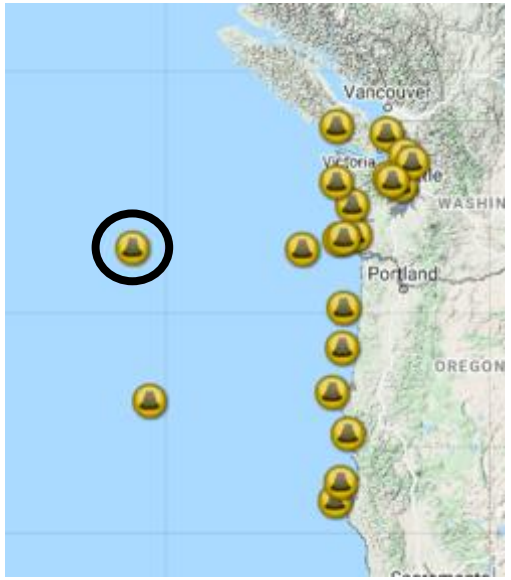
July 2022



Water Temperature Anomaly  (°C)

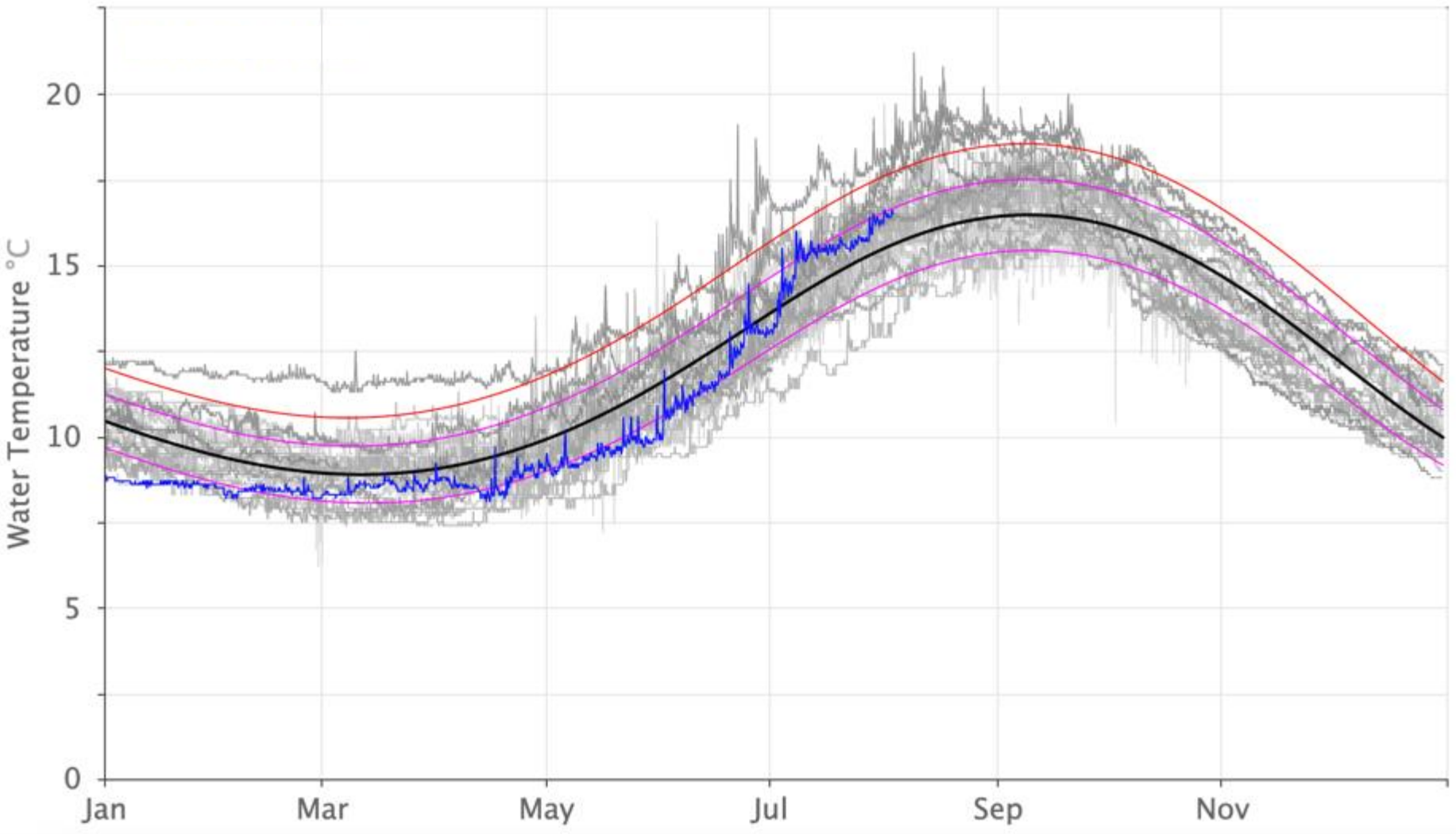
NANOOS: www.nanoos.org Climatology app

Sea Surface Temperature



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

NDBC Washington



IOOS

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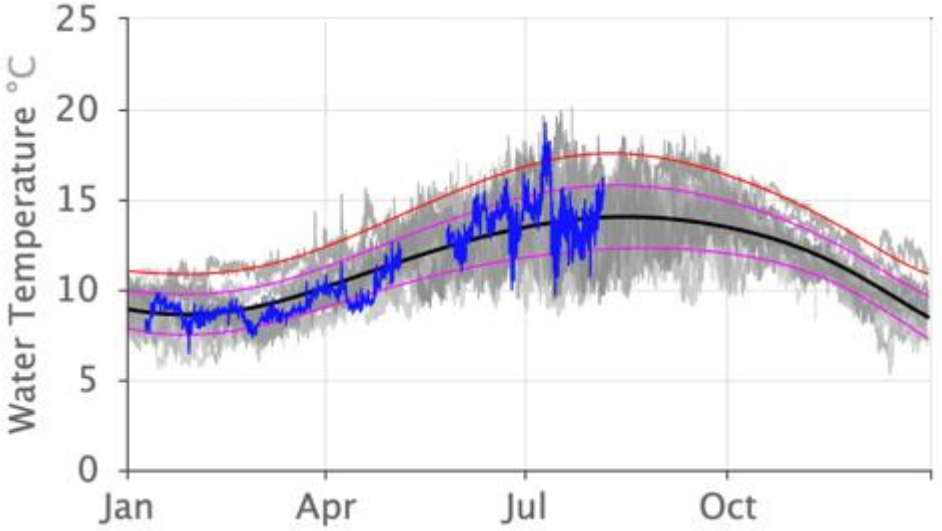
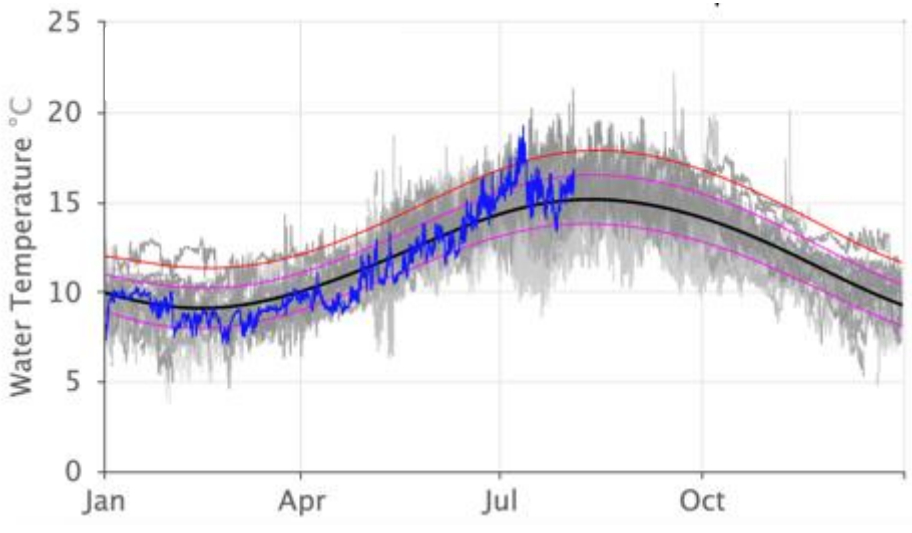
Sea Surface Temperature

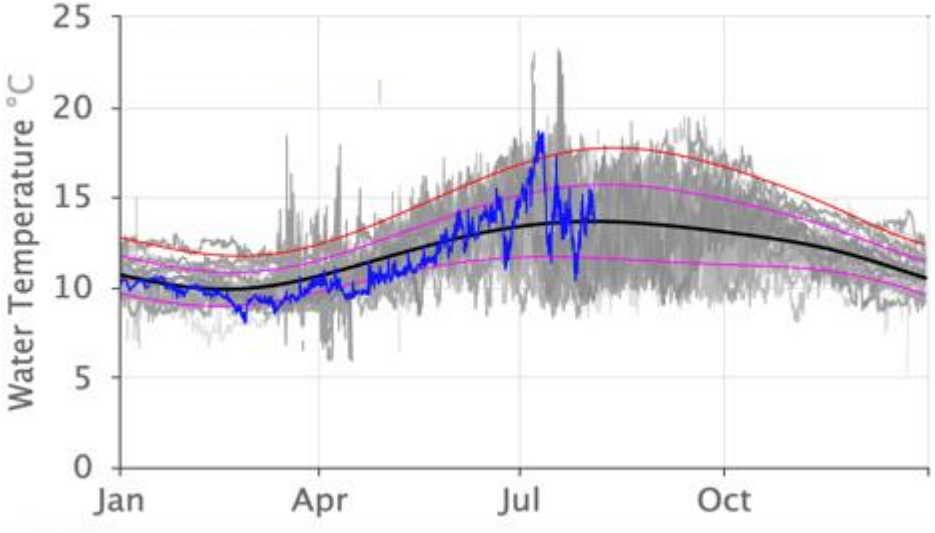
CDIP Grays Harbor ● 17 yrs



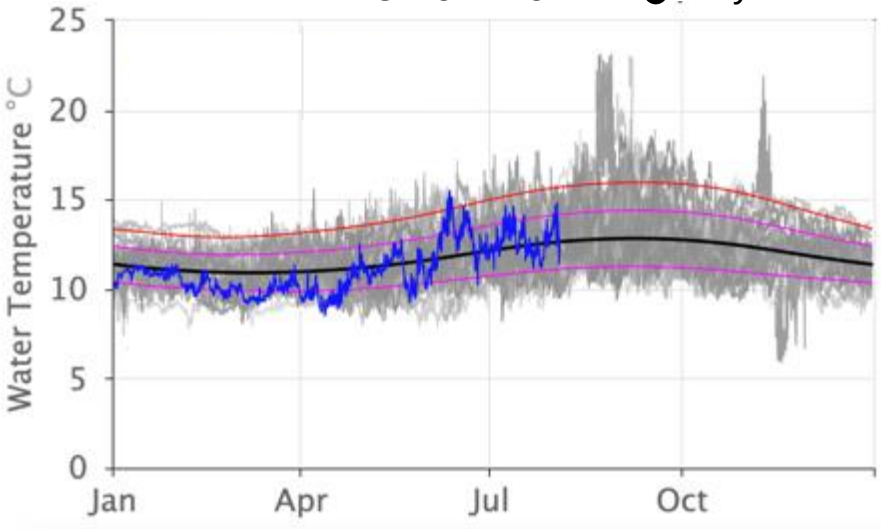
NDBC Columbia River Bar ● 37 yrs



NDBC Stonewall Bank ● 34 yrs



NDBC Eel River ● 39 yrs



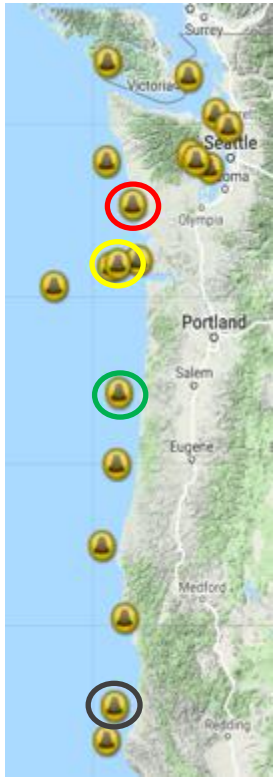
Seasonal Cycle

-1 STD

+1 STD

+2 STD

2022



IOOS

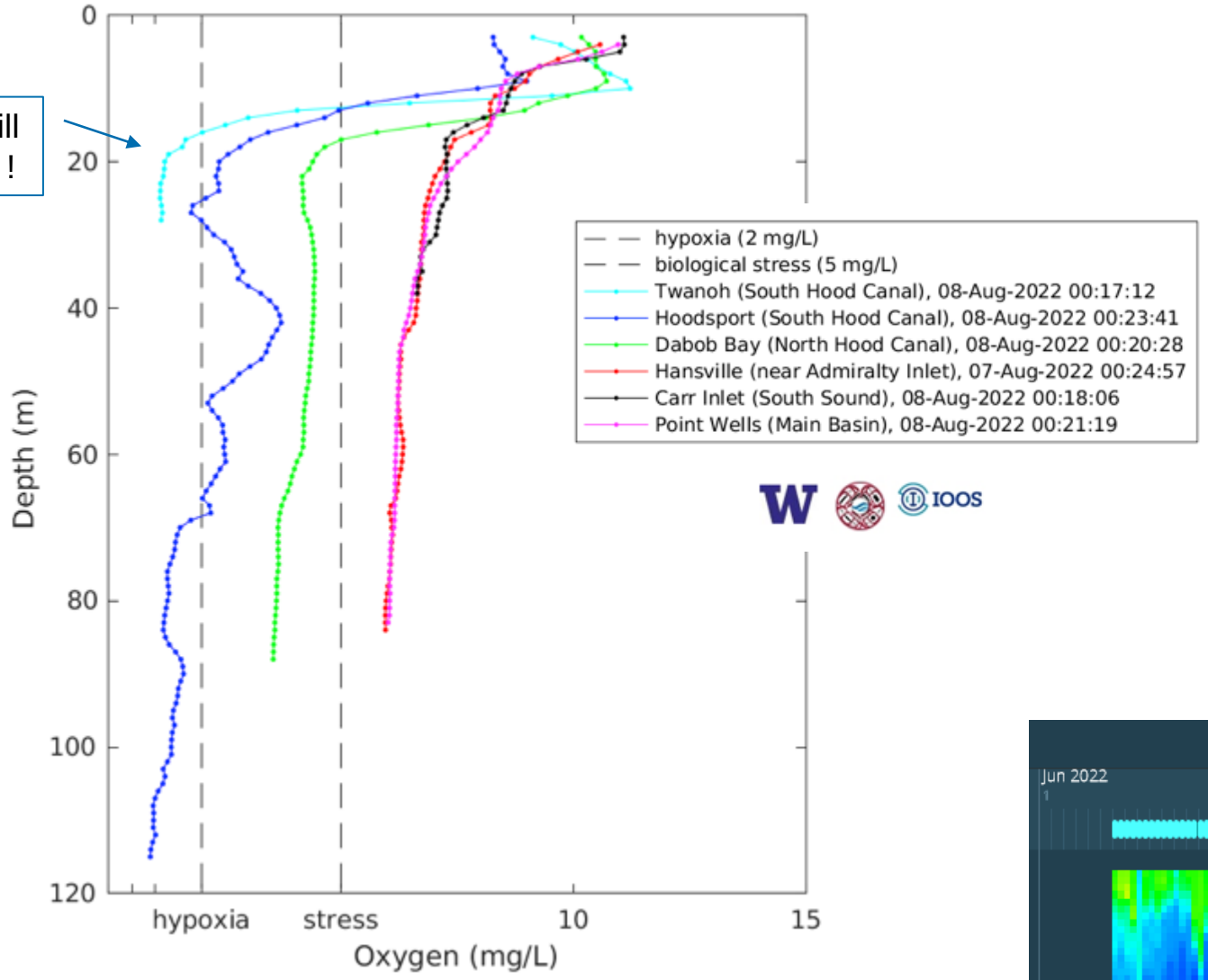
NWEM: https://nwem.apl.washington.edu/index.shtml

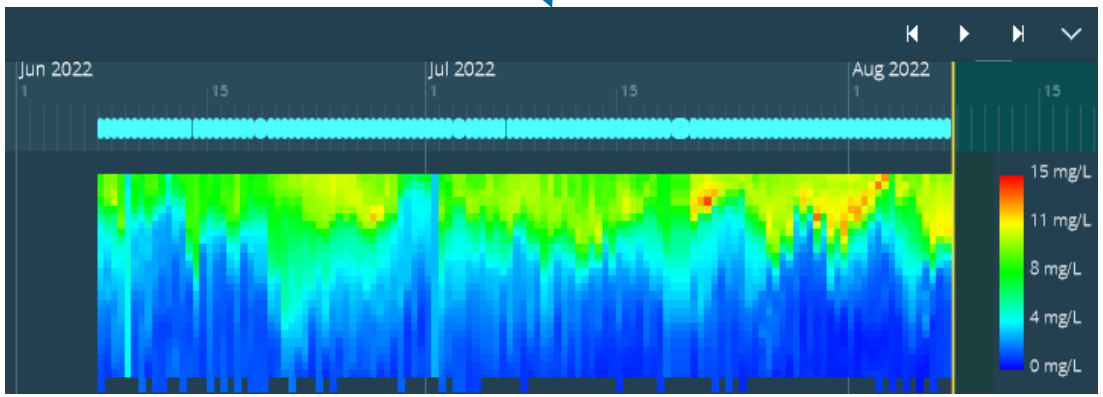
NANOOS: [*www.nanoos.org*](http://www.nanoos.org) *Data Explorer*

Puget Sound Profiling Buoys

Dissolved Oxygen

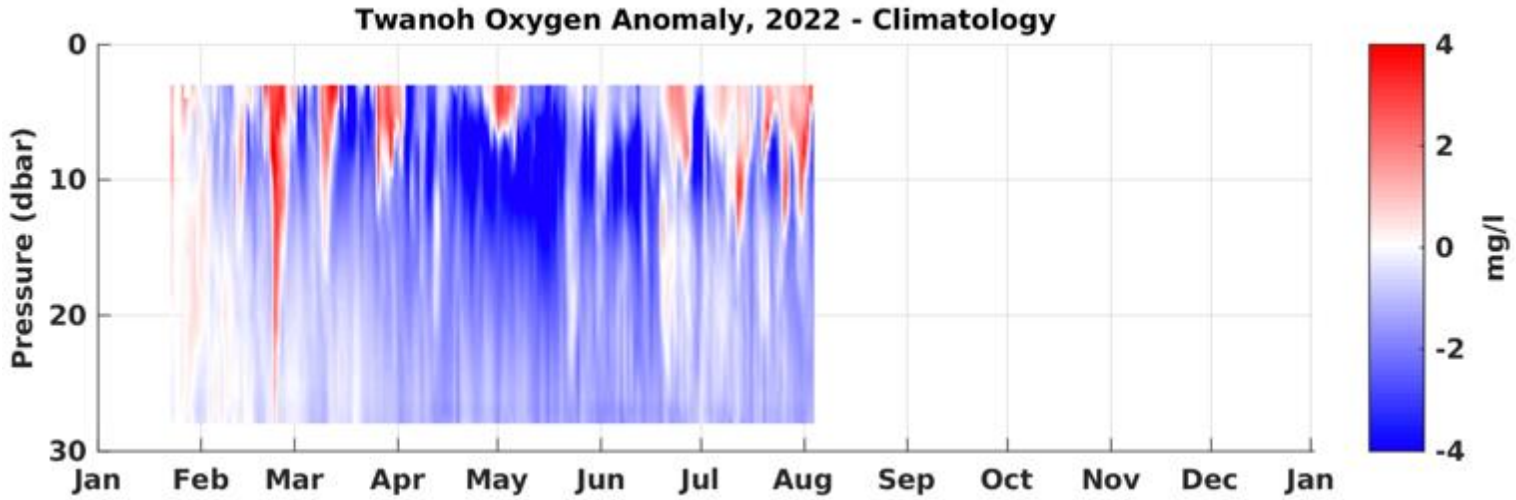
Fish Kill Watch !

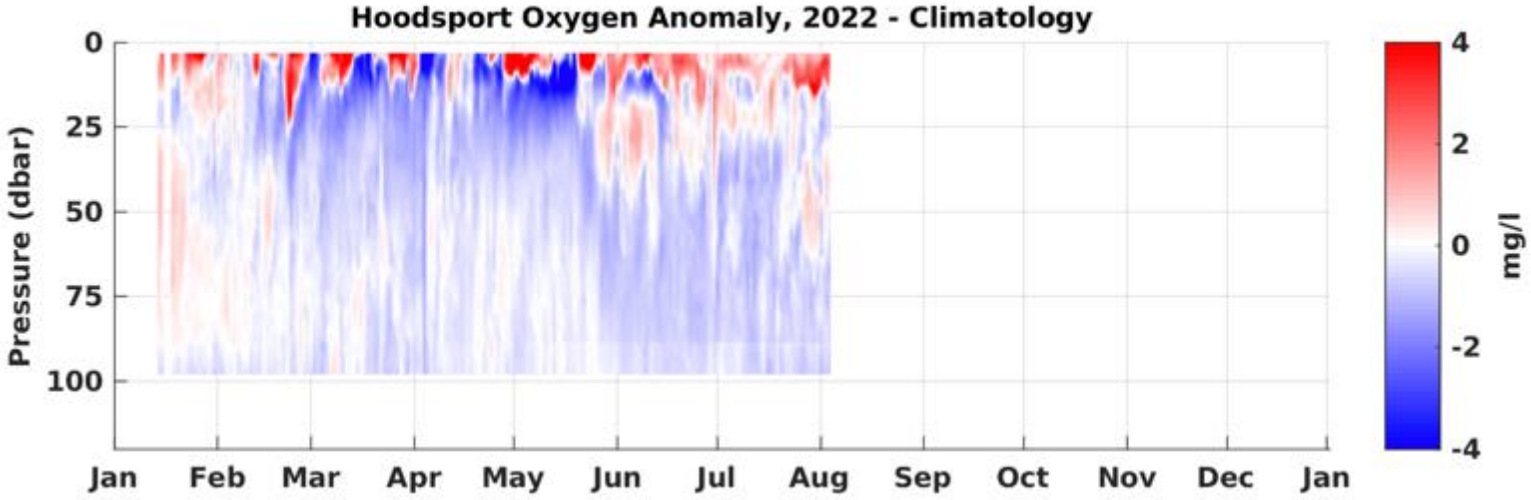


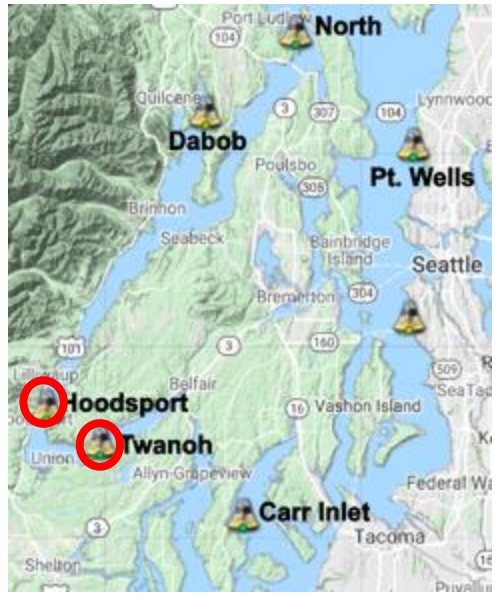


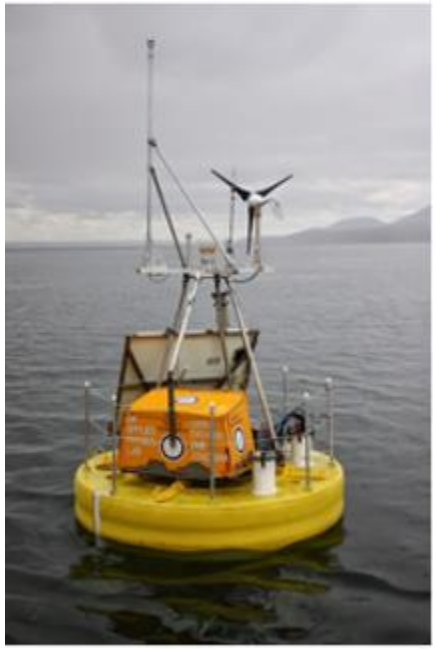
NANOOS: www.nanoos.org Climatology app

Hood Canal Oxygen





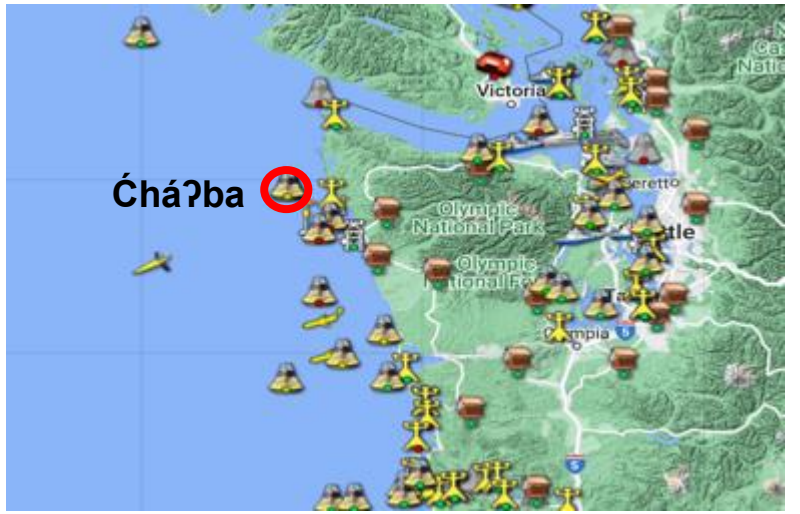


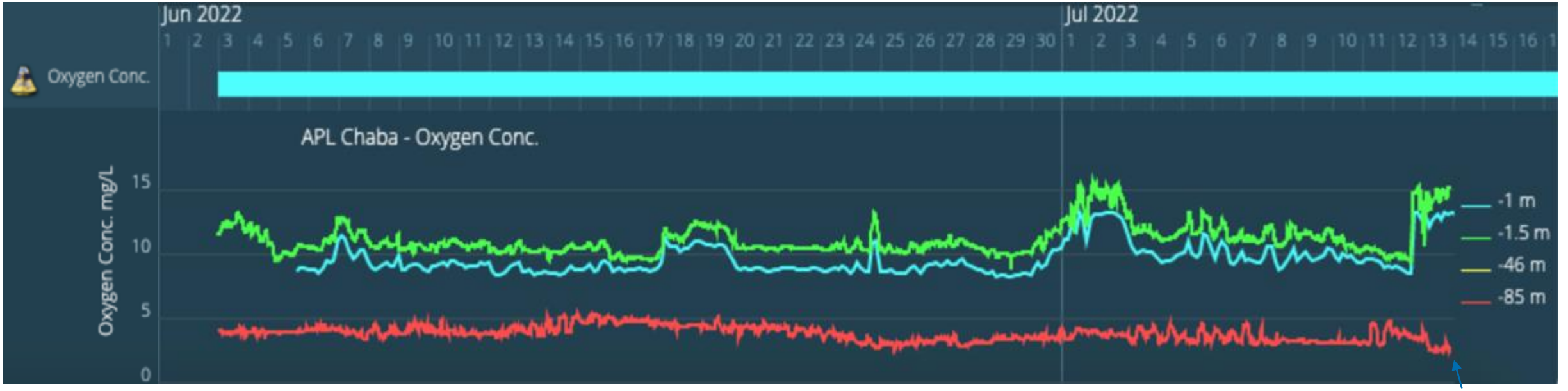


Oxygen

Ćháʔba buoy

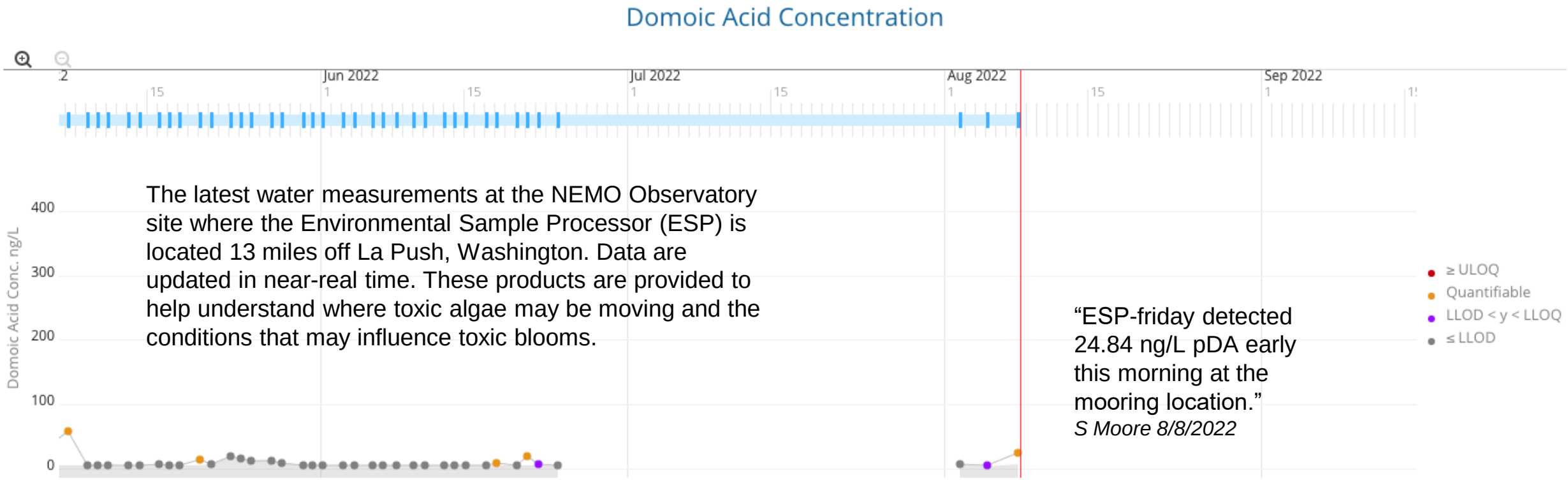
Off La Push, WA





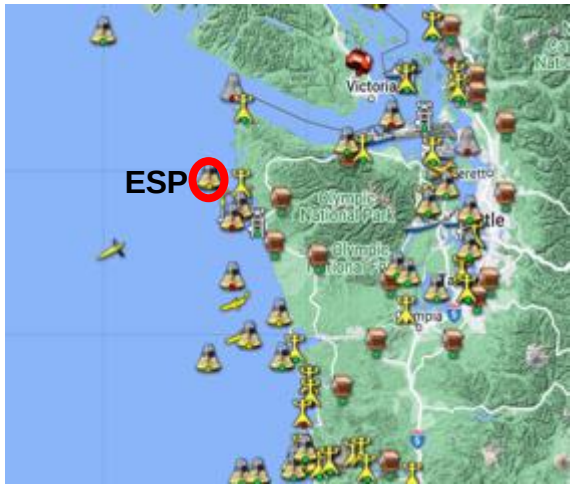
ESP Deployment

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



The latest water measurements at the NEMO Observatory site where the Environmental Sample Processor (ESP) is located 13 miles off La Push, Washington. Data are updated in near-real time. These products are provided to help understand where toxic algae may be moving and the conditions that may influence toxic blooms.

"ESP-friday detected 24.84 ng/L pDA early this morning at the mooring location."
S Moore 8/8/2022



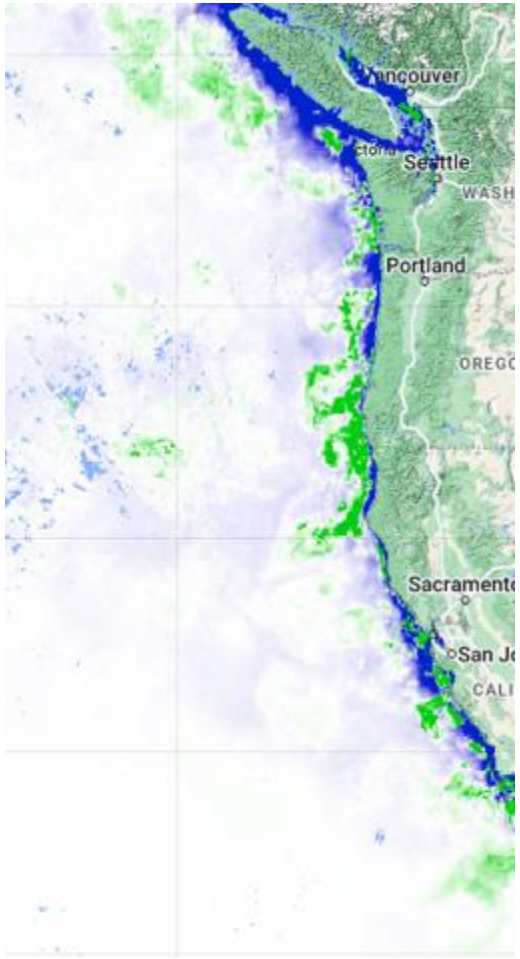
This project is funded jointly by the U.S. Integrated Ocean Observing System (IOOS) and the NOAA National Centers for Coastal Ocean Science (NCCOS) Monitoring Event Response for Harmful Algal Blooms (MERHAB) program. The project has a multi-sector team of partners that bring expertise from academia,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

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

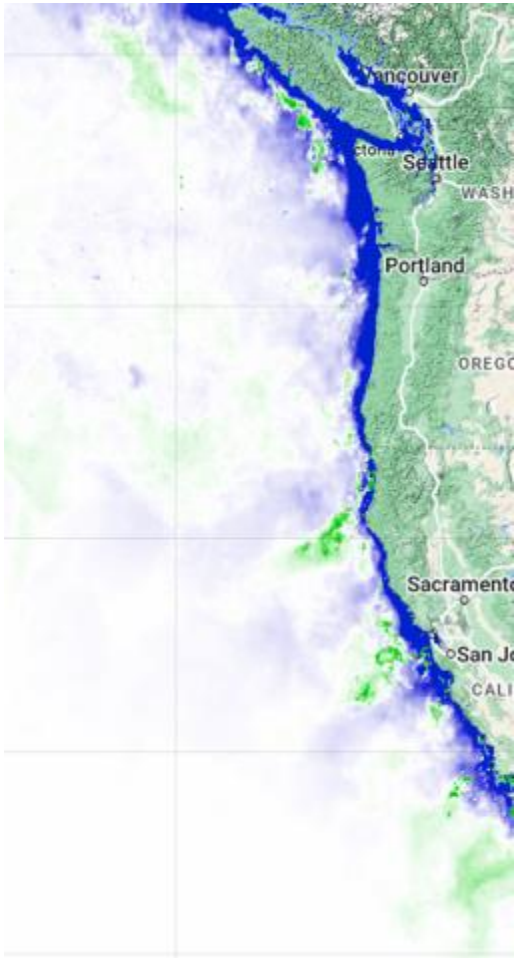
NANOOS: www.nanoos.org Climatology app

Sea Surface Chlorophyll Anomaly
OSU MODIS

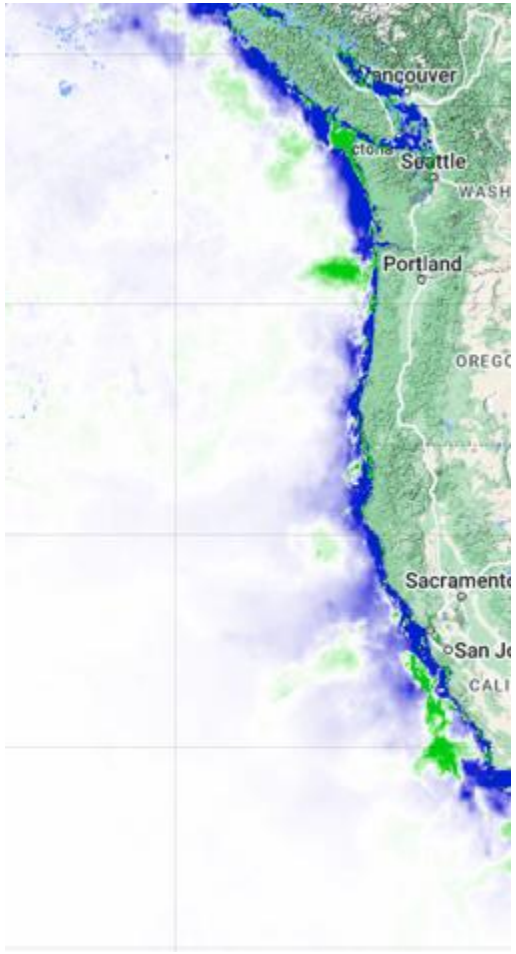
April 2022



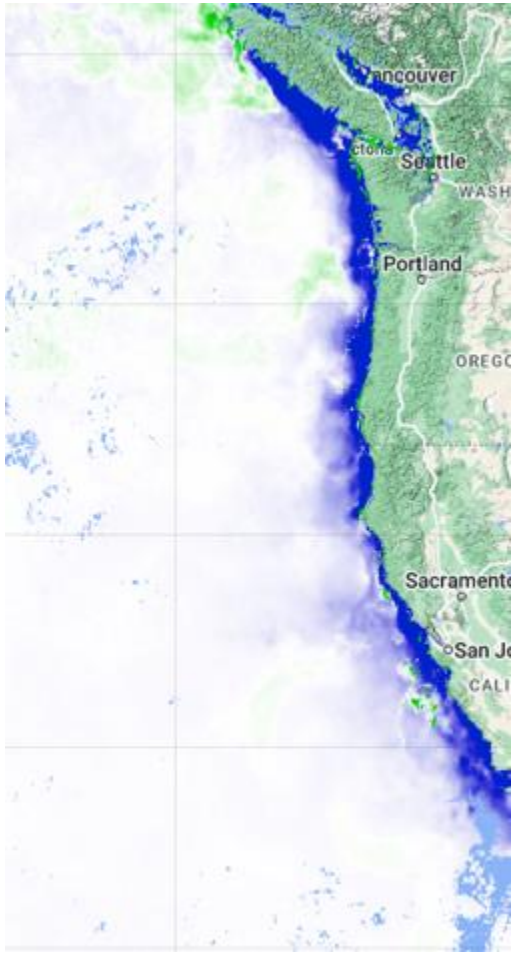
May 2022

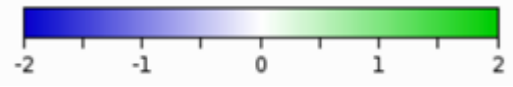


June 2022



July 2022



Chlorophyll *a* Anomaly  (mg/m^3)

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

janewton@uw.edu

The Central and Northern California Ocean Observing System:

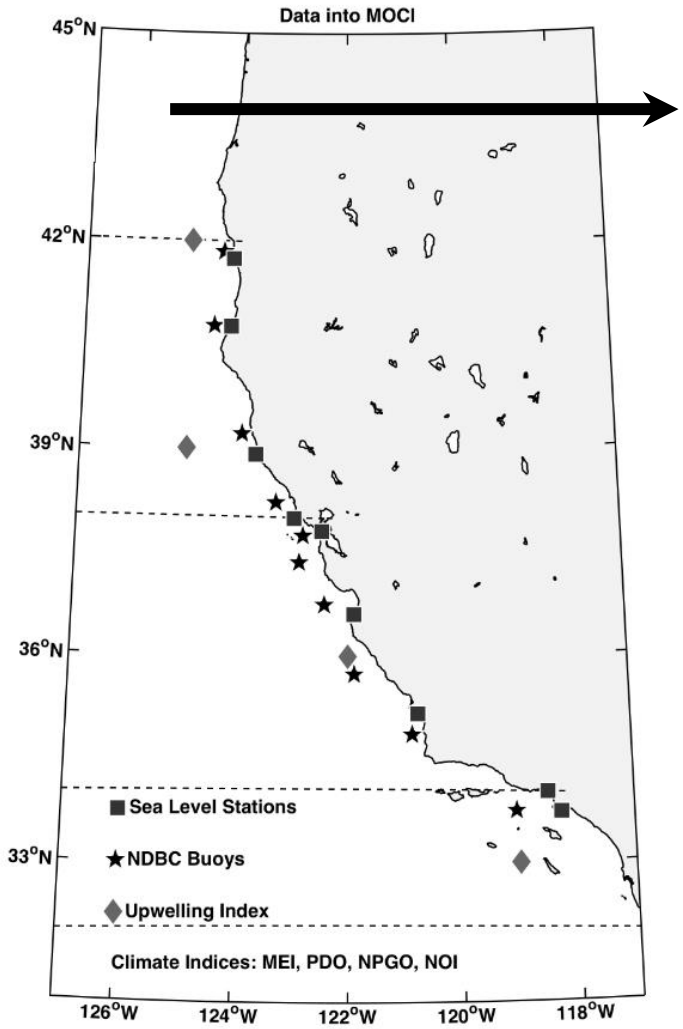
West Watch Update

hruhl@mbari.org

IOOS Integrated Ocean Observing System

CENTRAL & NORTHERN CALIFORNIA OCEAN OBSERVING SYSTEM

Multivariate Ocean Climate Index (MOCI)



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

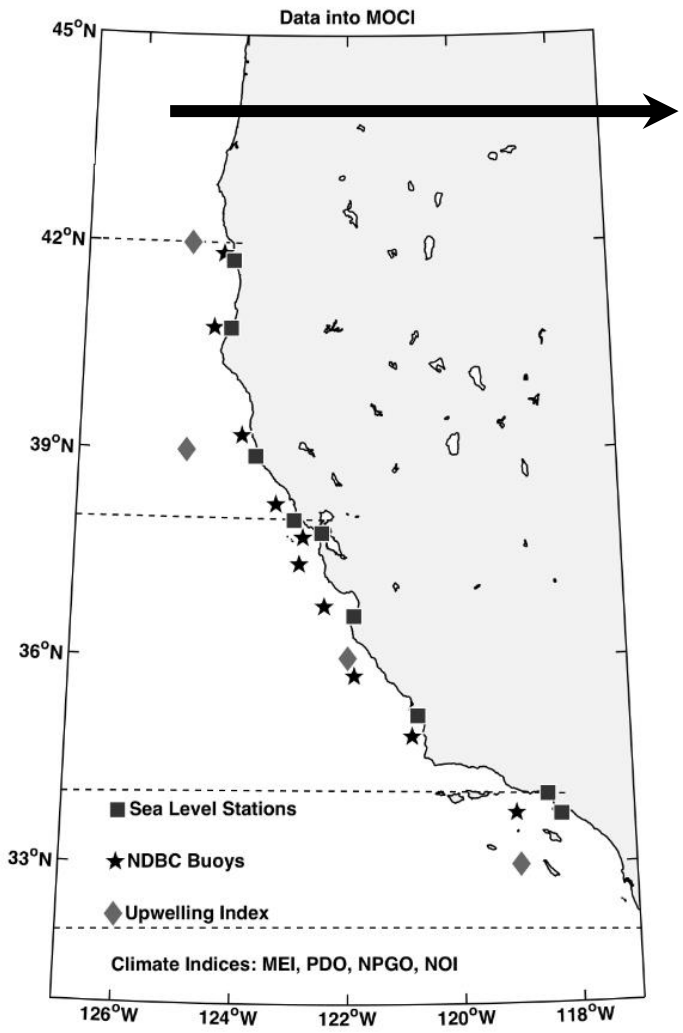
Regional climate indices:

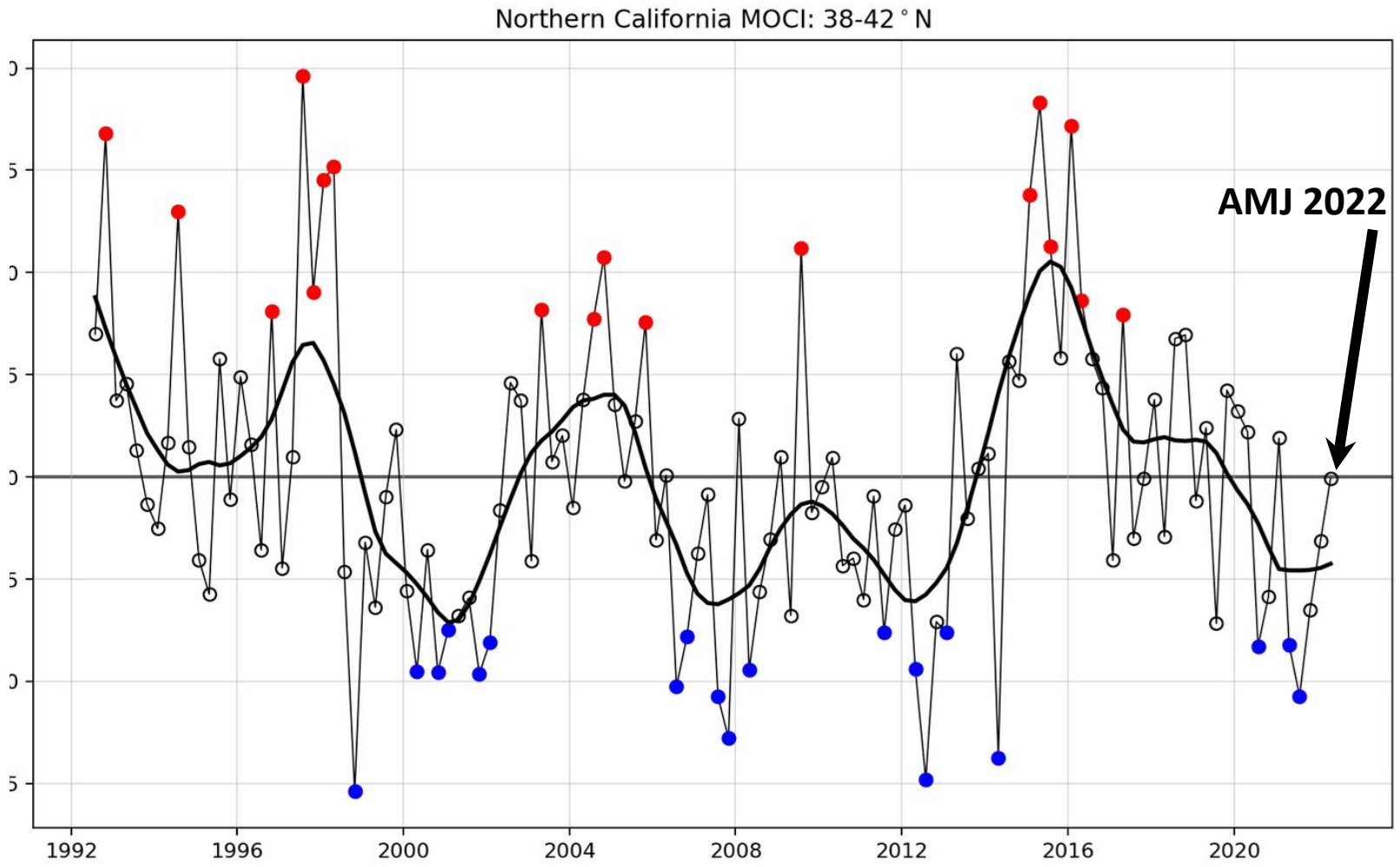
- MEI: Multivariate ENSO Index
- PDO: Pacific Decadal Oscillation
- NOI: Northern Oscillation Index

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

CENTRAL & NORTHERN CALIFORNIA OCEAN OBSERVING SYSTEM

Multivariate Ocean Climate Index (MOCI)

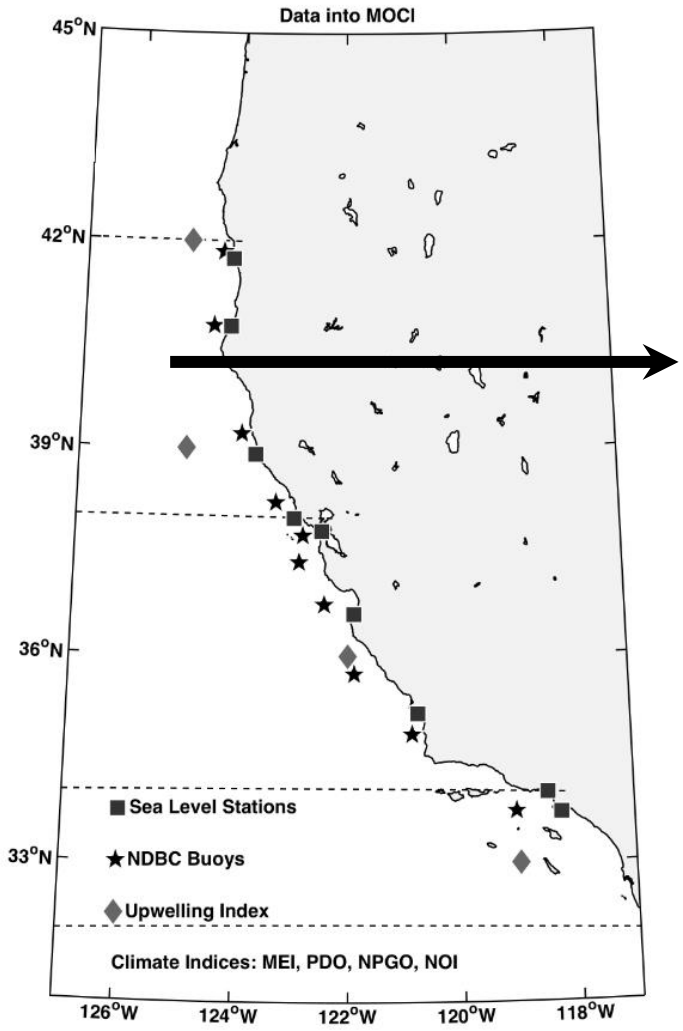


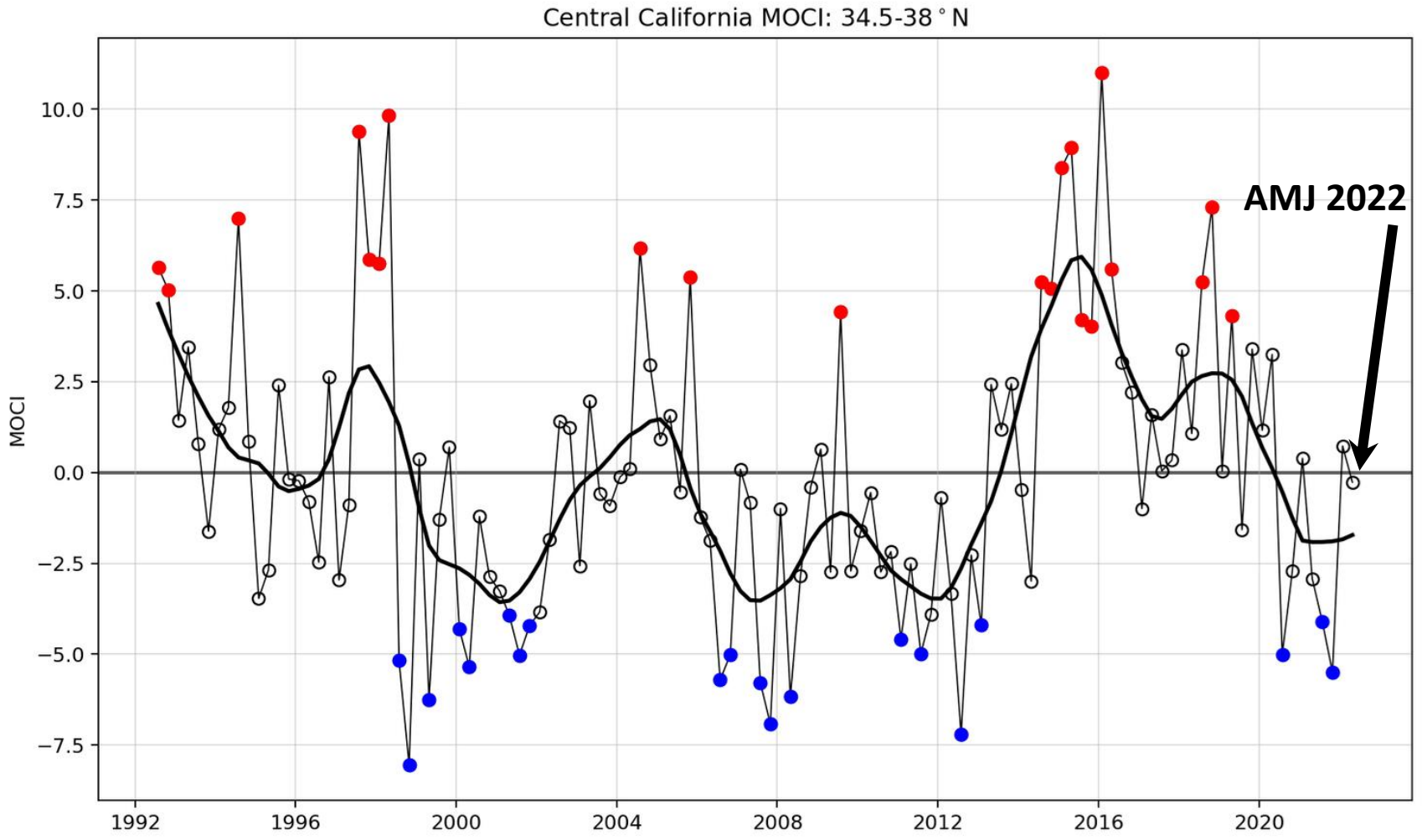


García-Reyes M, Sydeman WJ. (2017). *California Multivariate Ocean Climate Indicator (MOCI) and marine ecosystem dynamics*. Ecological Indicators, 72, 521-529.

CENTRAL & NORTHERN CALIFORNIA OCEAN OBSERVING SYSTEM

Multivariate Ocean Climate Index (MOCI)



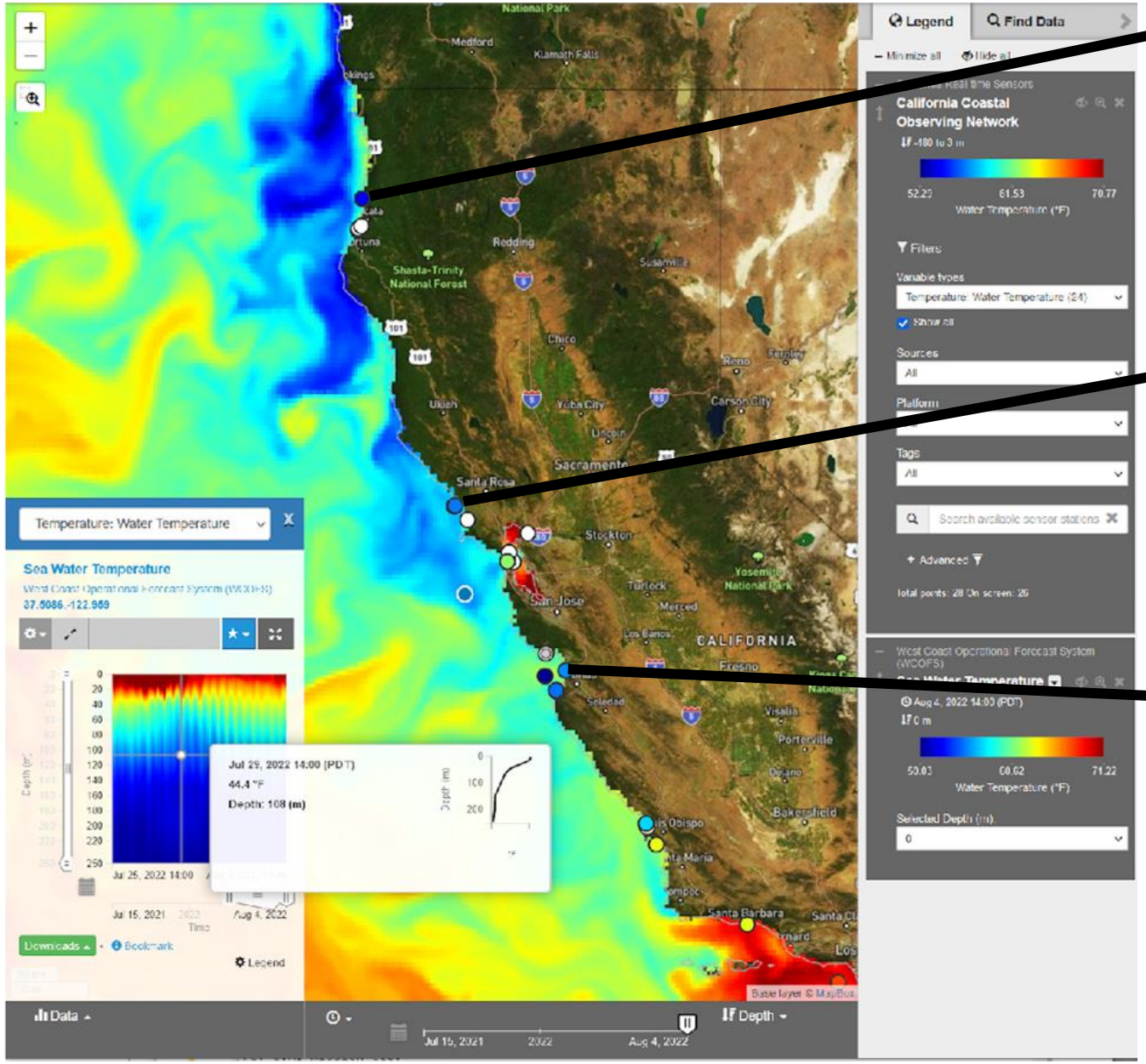


García-Reyes M, Sydeman WJ. (2017). *California Multivariate Ocean Climate Indicator (MOCI) and marine ecosystem dynamics*. Ecological Indicators, 72, 521-529.

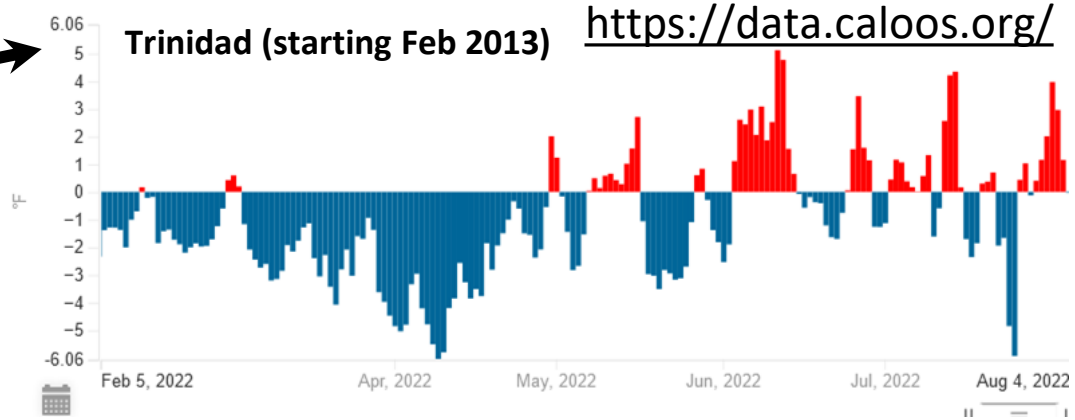
CENTRAL & NORTHERN CALIFORNIA OCEAN OBSERVING SYSTEM

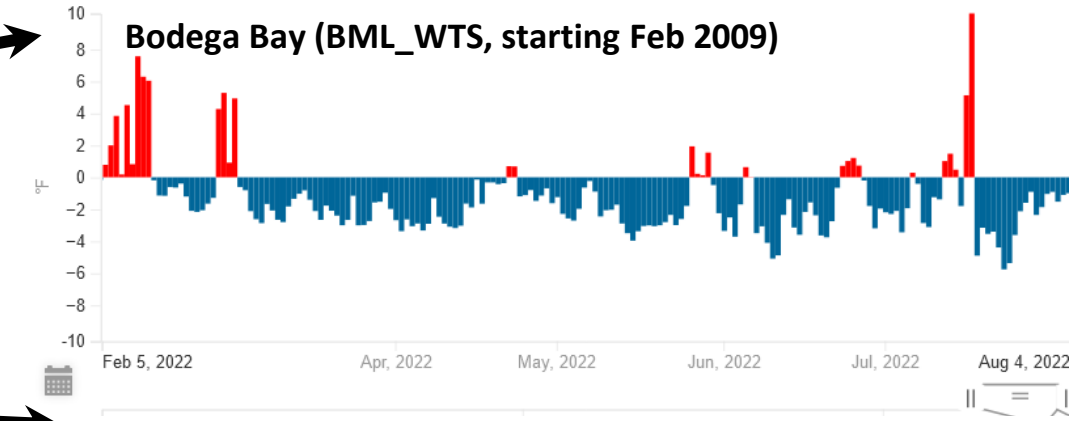
WCOFS – 4 Aug

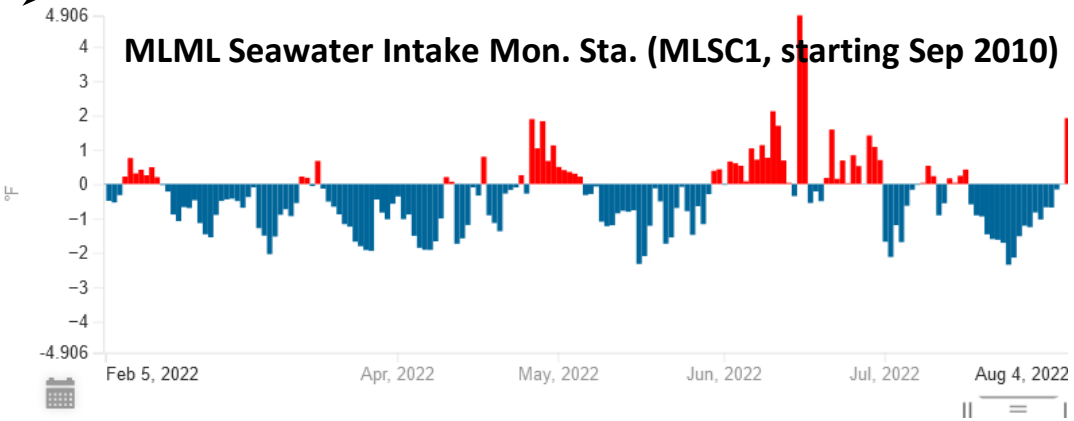
Shore Stations – Last 180 days



https://data.caloos.org/

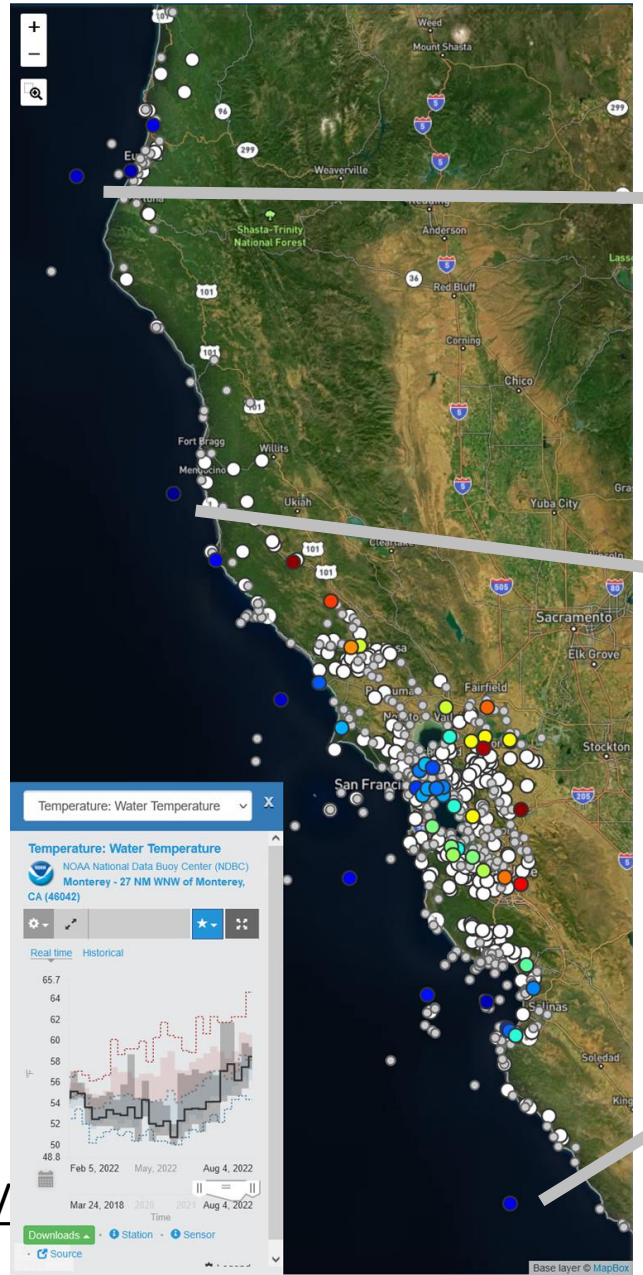




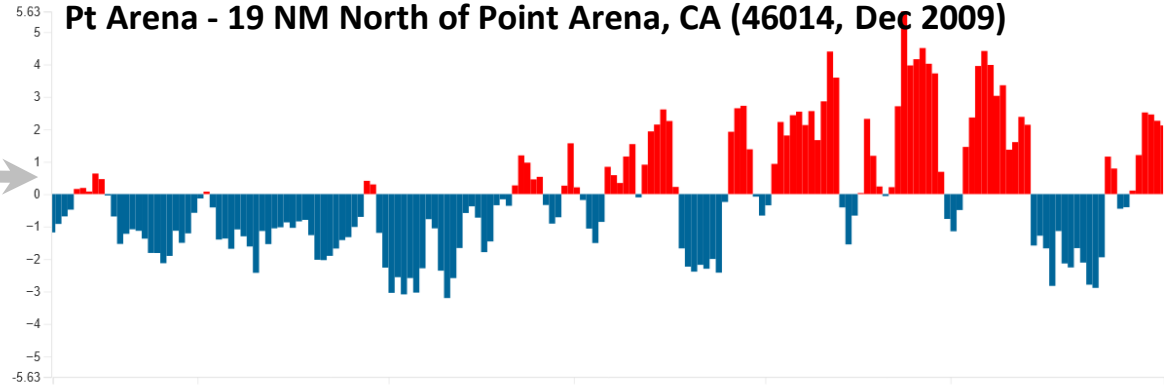


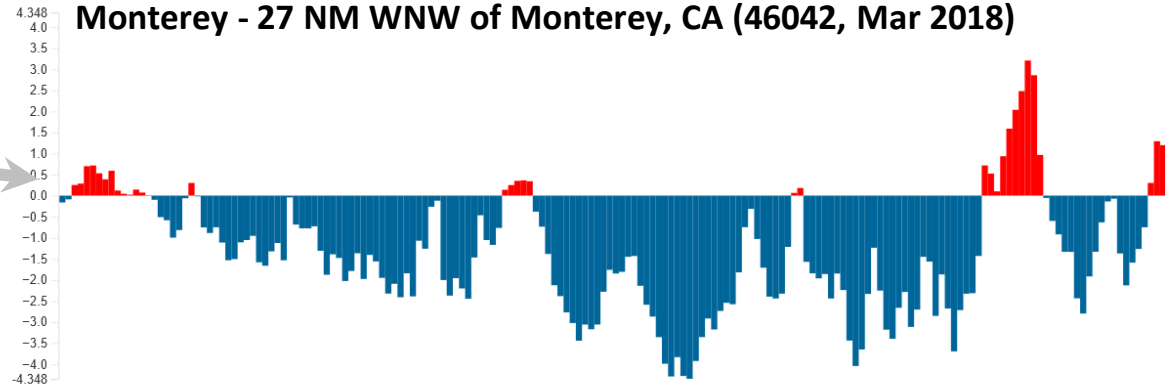
CENTRAL & NORTHERN CALIFORNIA OCEAN OBSERVING SYSTEM

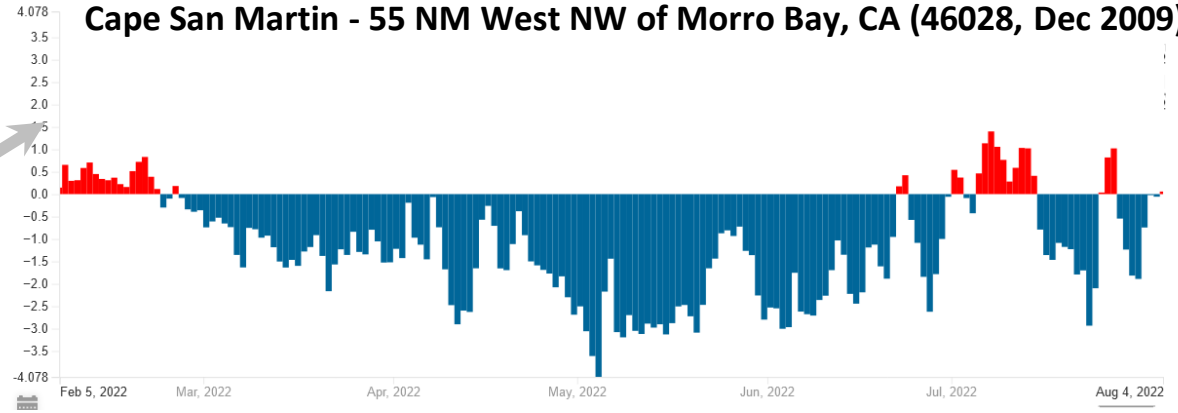
NDBC Sea Surface Temp – Last 180 days



https://

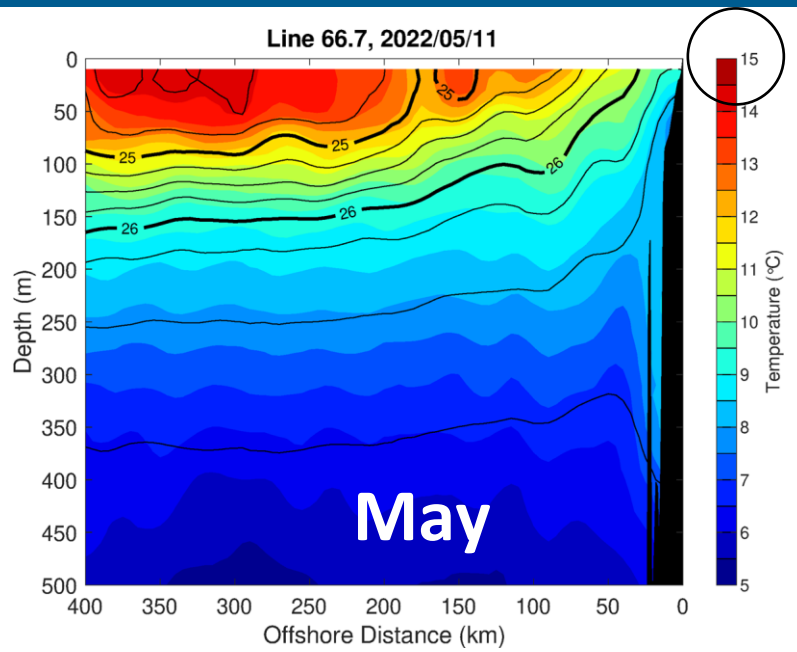


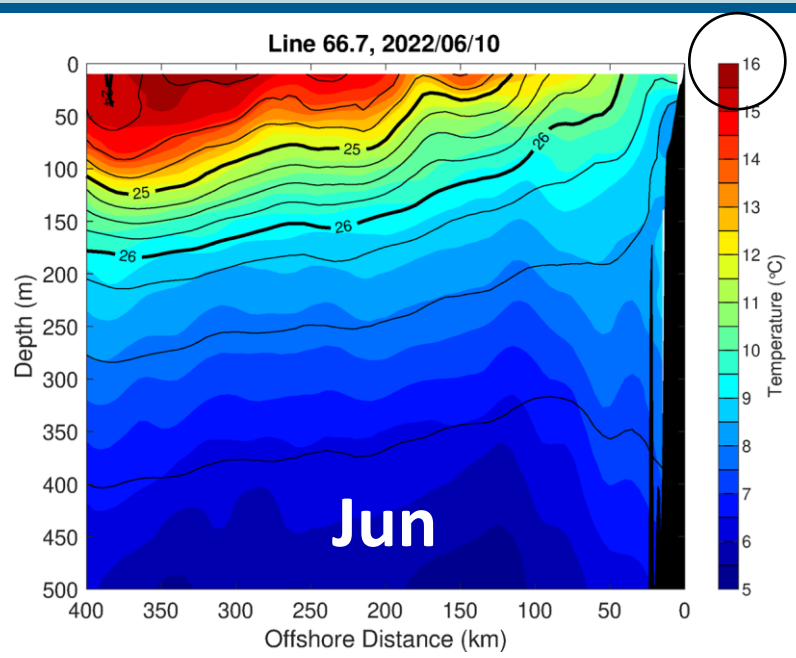


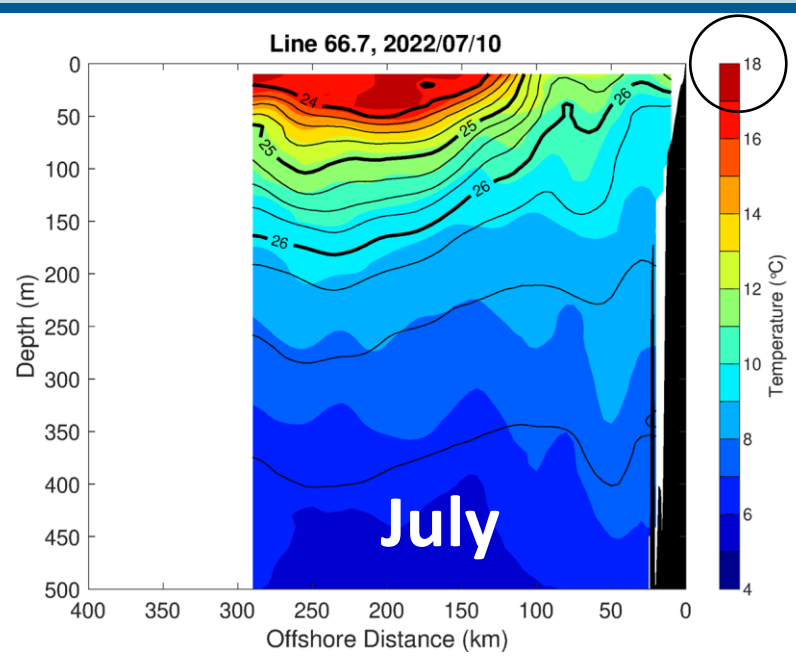


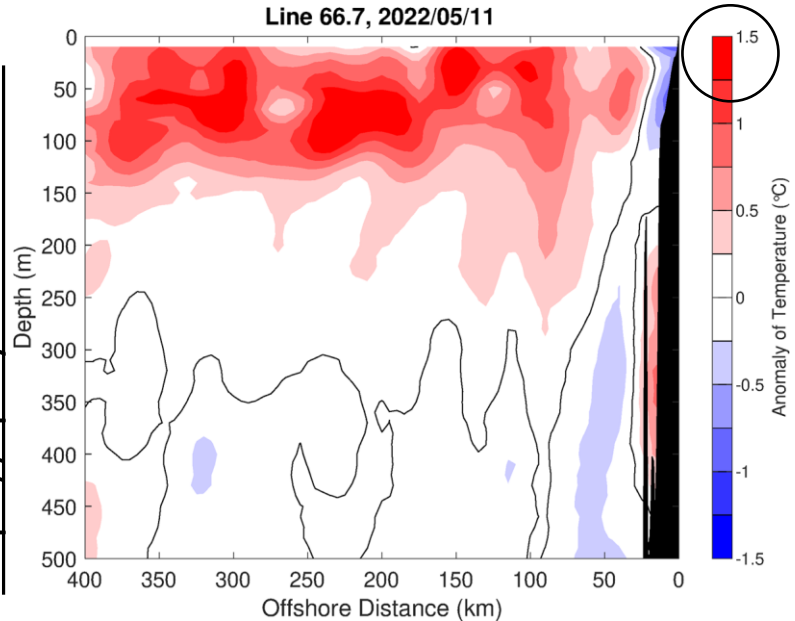
CENTRAL & NORTHERN CALIFORNIA OCEAN OBSERVING SYSTEM

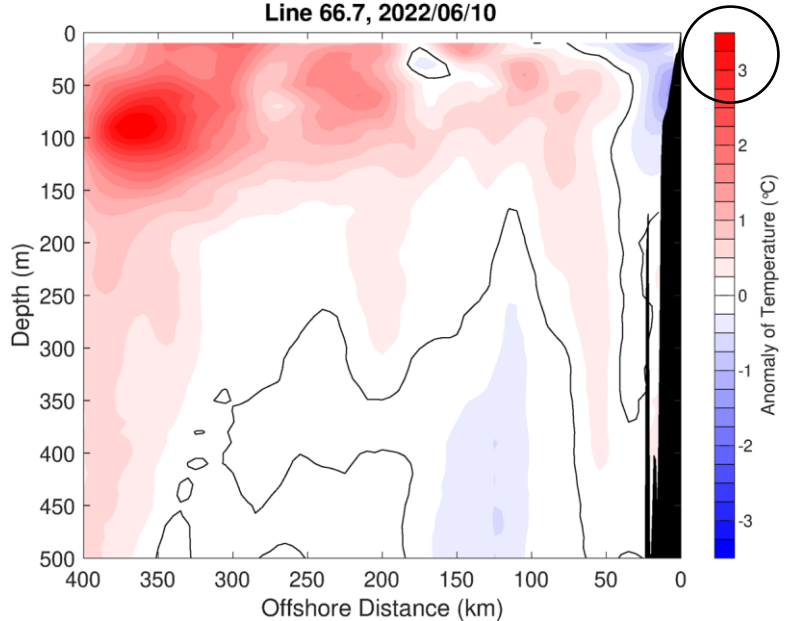
Gliders – Monterey Bay Temps

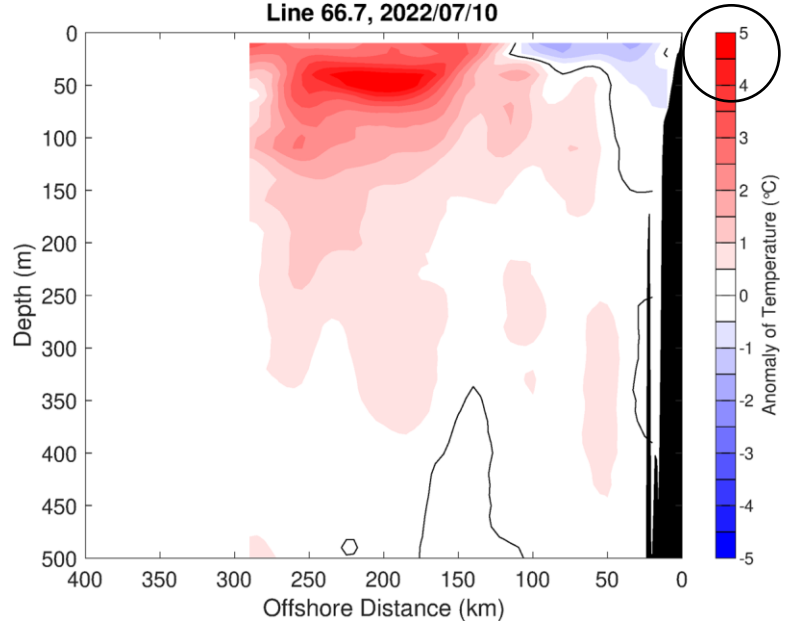












https://spraydata.ucsd.edu

Heatwave Classification

- 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

CENTRAL & NORTHERN CALIFORNIA OCEAN OBSERVING SYSTEM

Headlines

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

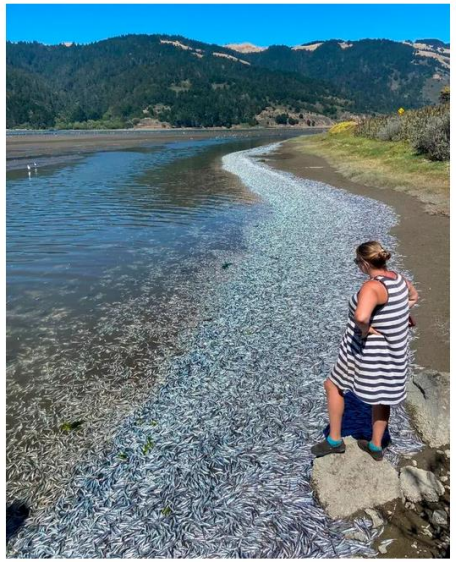
Hunter Nguyen, a deckhand aboard a fishing boat named the Nautilus, pulls in a halibut during a fishing trip in San Francisco Bay on Thursday.
Stephen Lam/The Chronicle

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

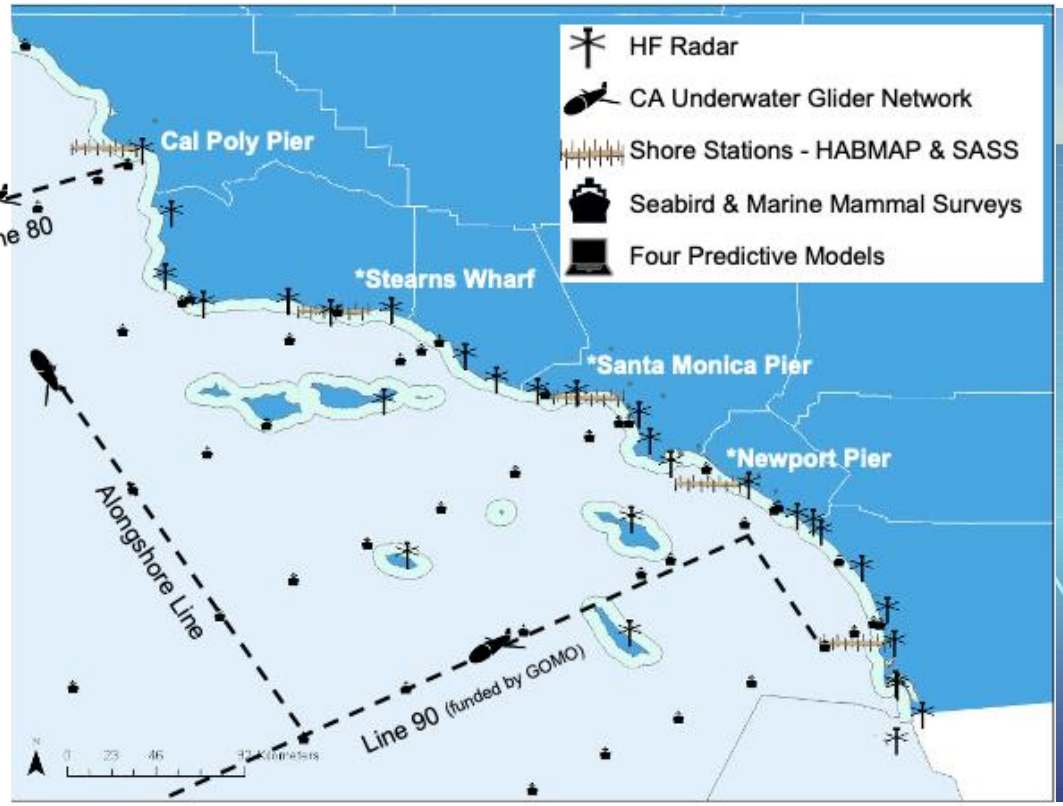
MORE

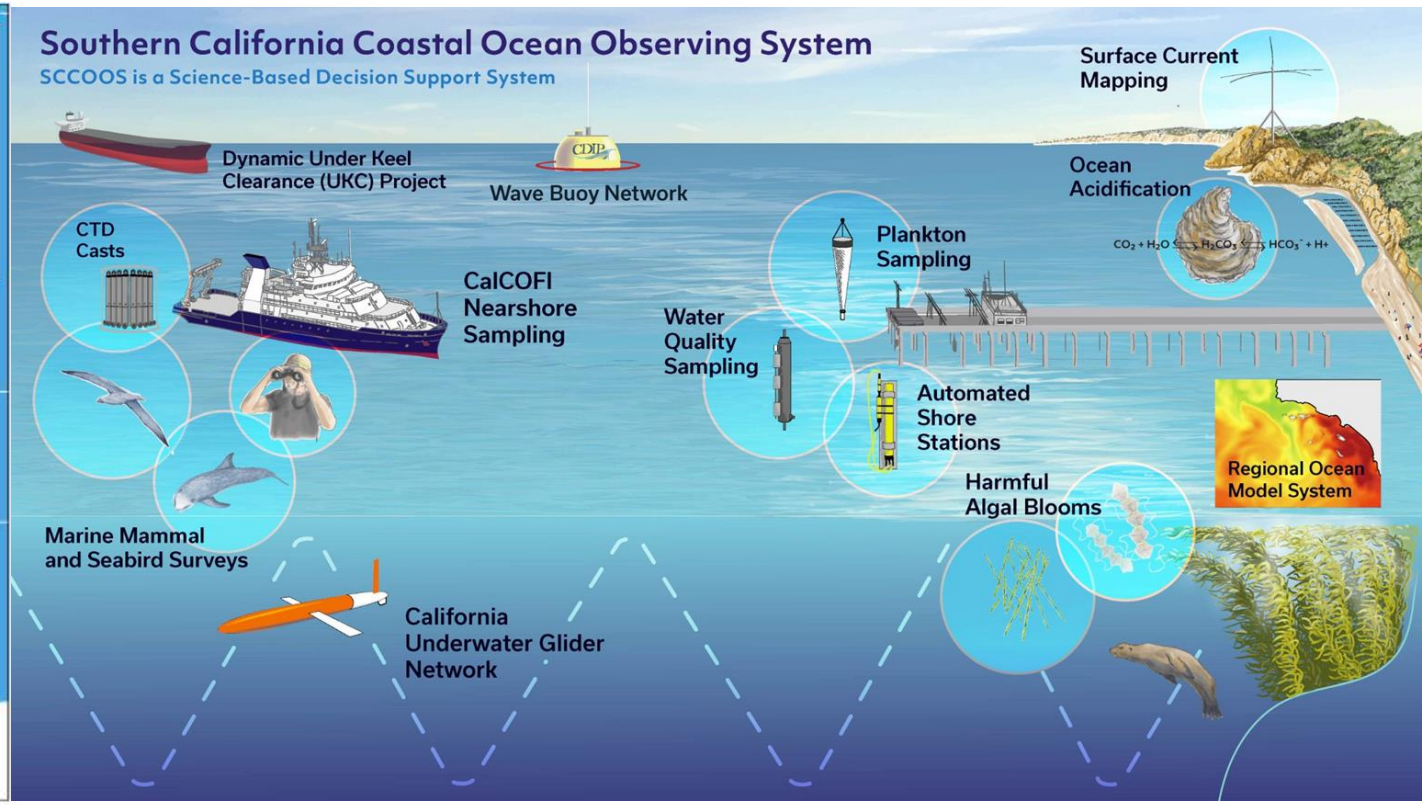
Noyo Center for Marine Science; MMPA/ESA Permit No. 18786-06

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





NOAA West Watch Update: Southern California

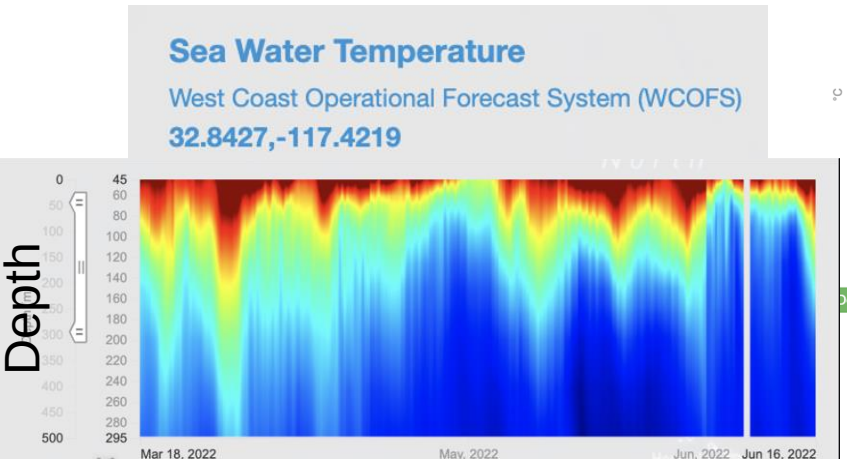
Clarissa Anderson, SCCOOS Executive Director

9-Aug 2022

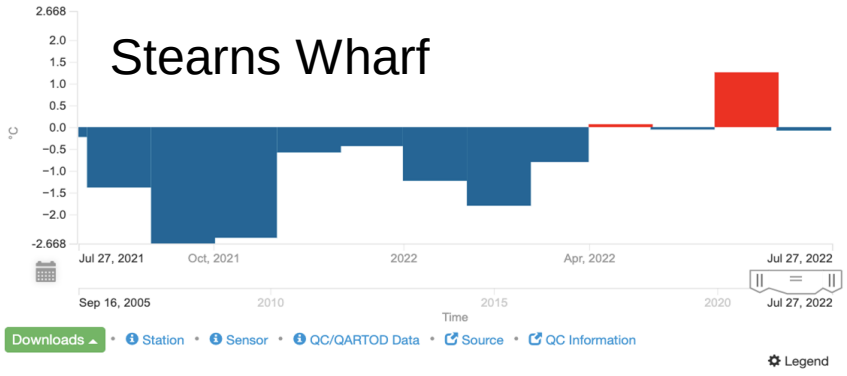
SCCOOS Automated Shore Stations

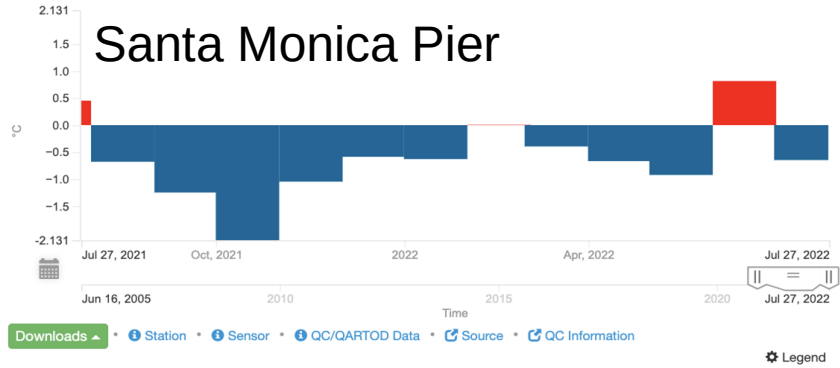
Sea Surface Temperature Anomalies

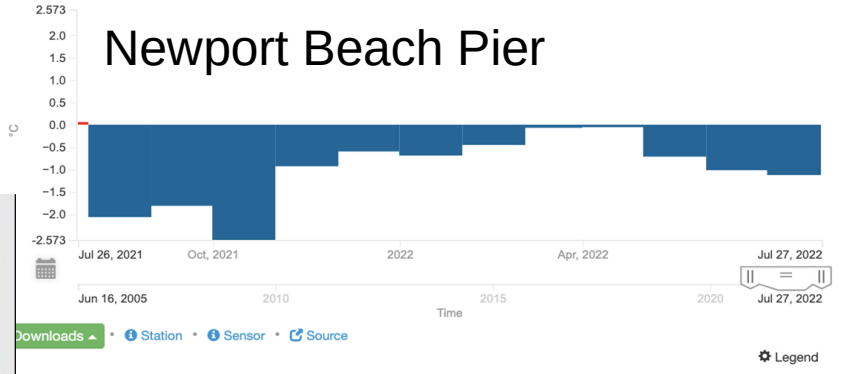
- SCCOOS shore stations ~ 17 years of data
- Ocean temps have been cooler for ~12 months, with a warm anomaly in the spring and early summer at most stations.
- WCOFS simulated temperature to 500m captures shoaling of the thermocline in May during peak upwelling season, with smaller pulses in early June

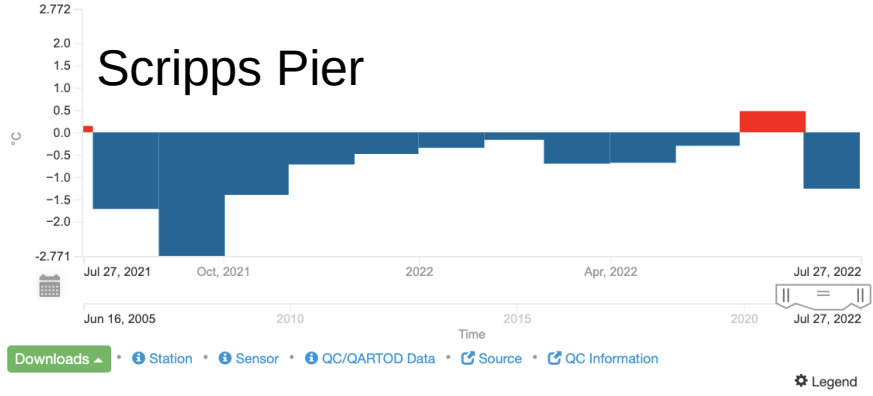


March May 2022 June







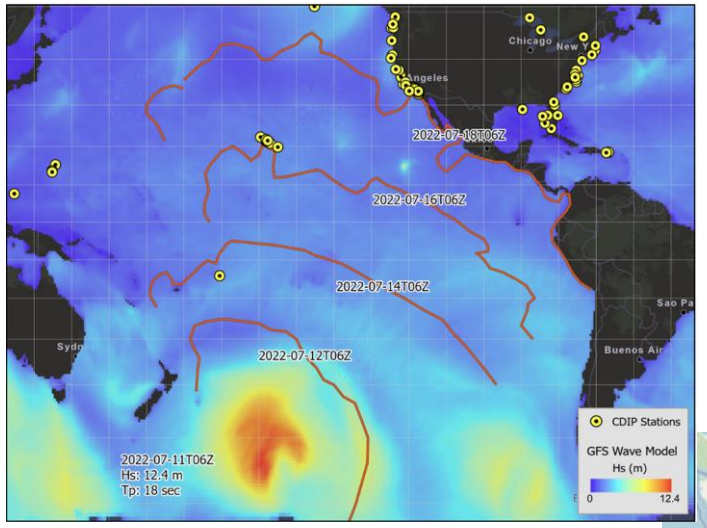


https://data.caloos.org/

Coastal Data Information Program (CDIP)

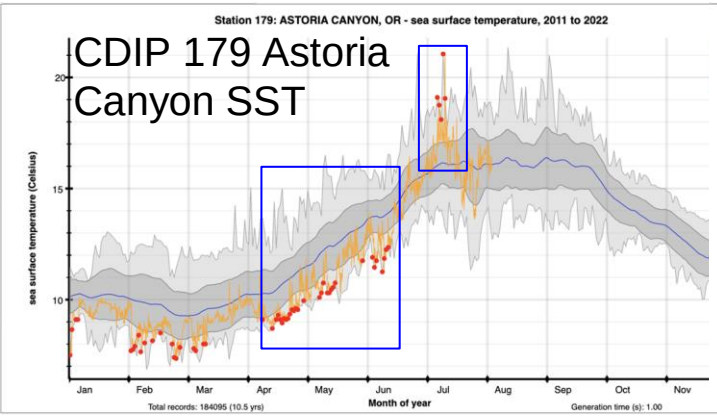
West Coast wave activity in 2022 follows the long term climate trend.

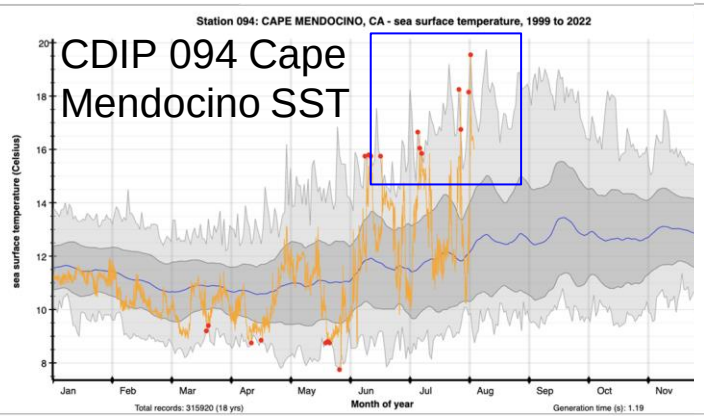
- Powerful long period south swell in July affected some west coast stations.

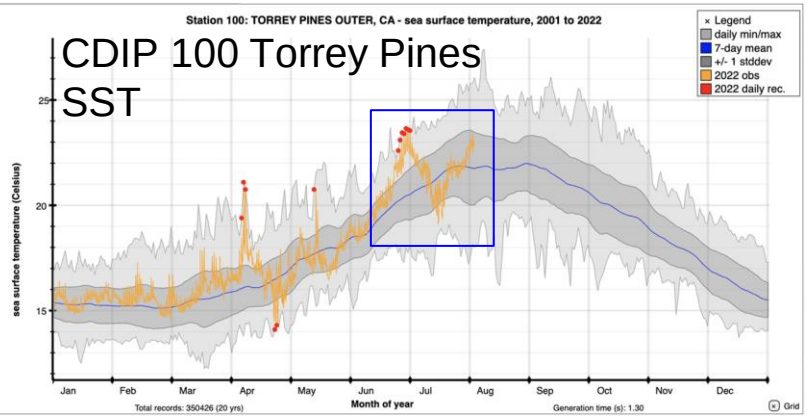


West Coast sea surface temperatures (SST) also following the long term climate trend.

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







cdip.ucsd.edu

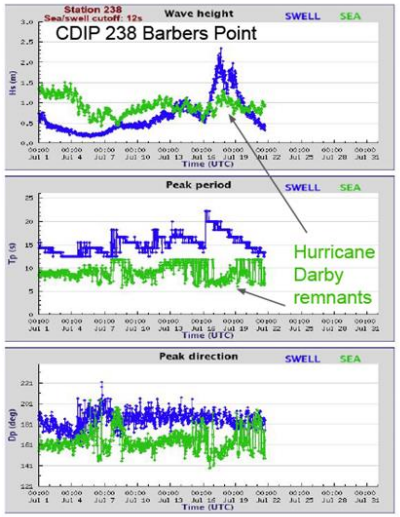
J. Behrens, SIO

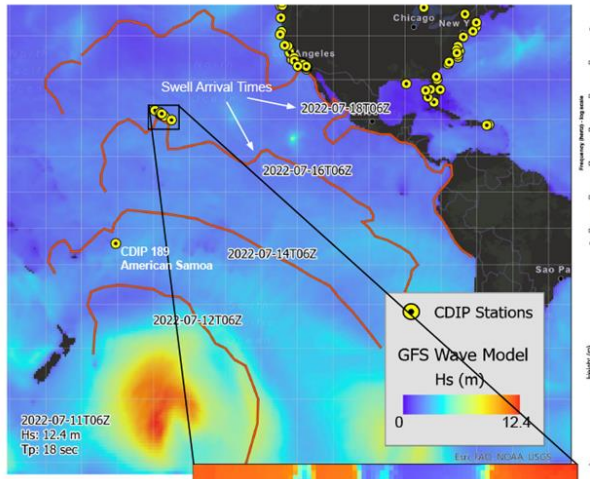
Coastal Data Information Program (CDIP)

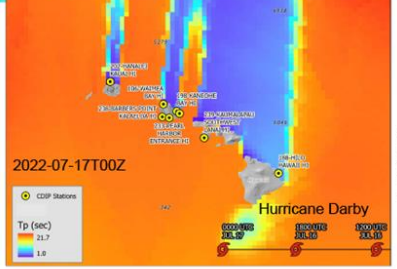
CDIP
coastal data information program
cdip.ucsd.edu

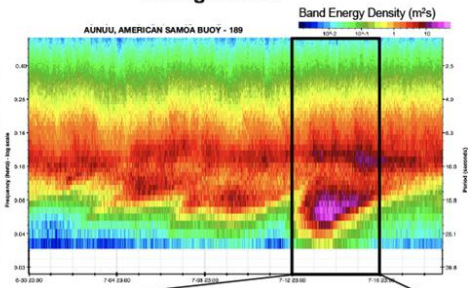
CDIP Wave Observations:
Powerful Long Period Pacific Swell Event
July 11-20, 2022

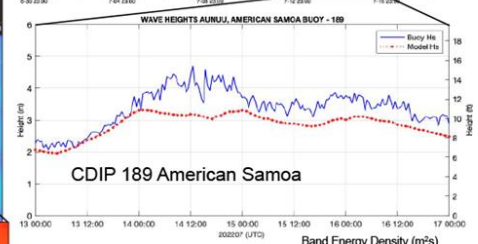
US Army Corps of Engineers

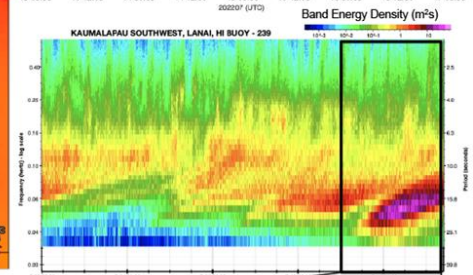


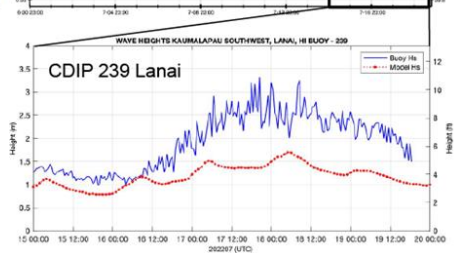




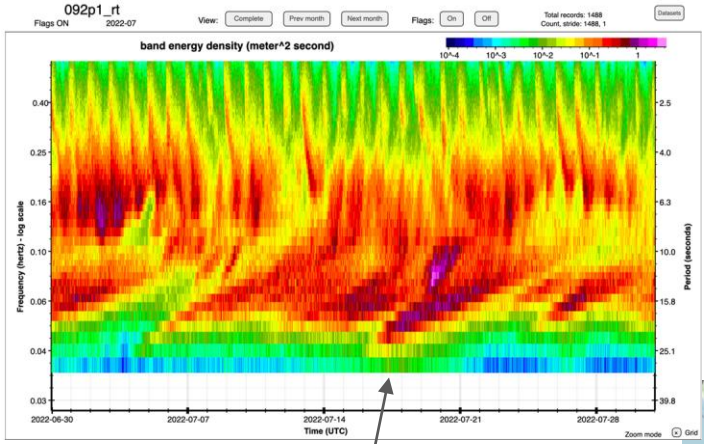




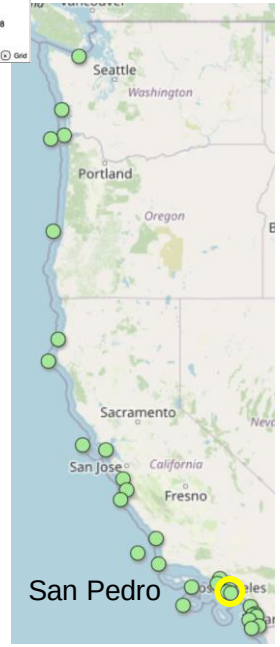




- A powerful extratropical storm in the South Pacific generated waves >15 m Hs (significant wave height) at its source.
- These waves traveled across the Pacific, impacting coastlines across the ocean basin, with measured Hs exceeding the NOAA NCEP GFS operational wave model, shown in these plots.
- 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.



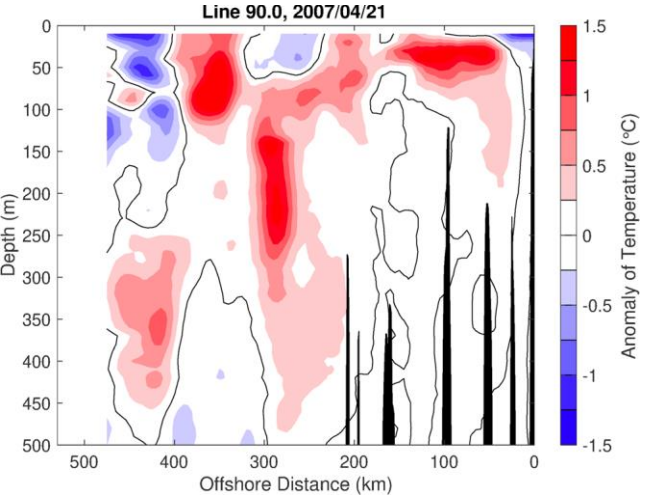
UC San Diego | SCRIPPS INSTITUTION OF OCEANOGRAPHY | PacIOOS

CDIP hurricane and storm reports:
cdip.ucsd.edu/themes/cdip?d2=p12

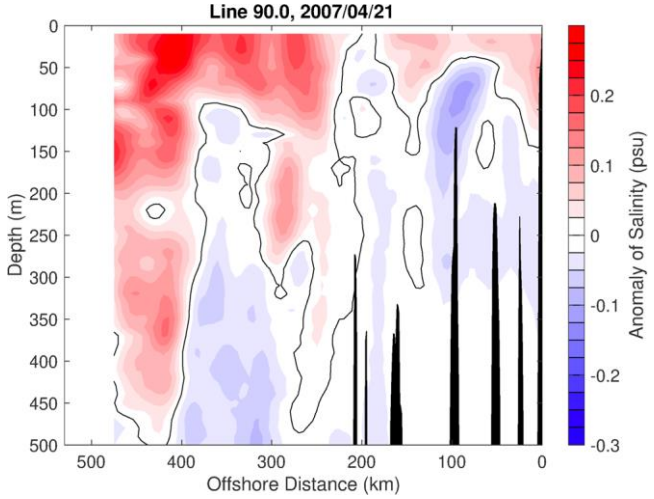
cdip.ucsd.edu

J. Behrens, SIO

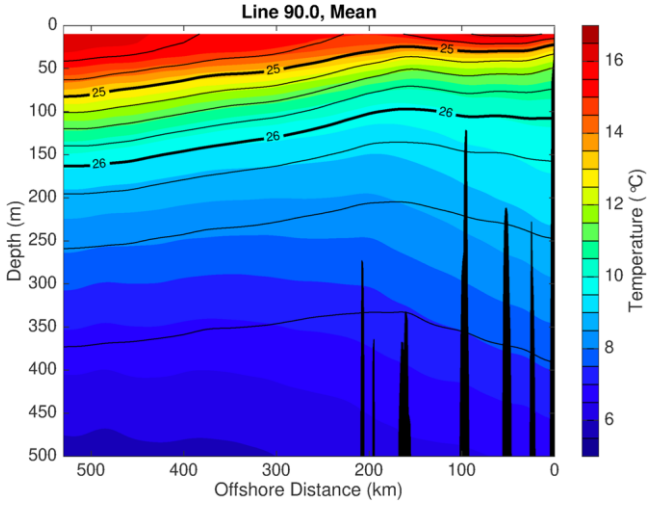
California Underwater Glider Network



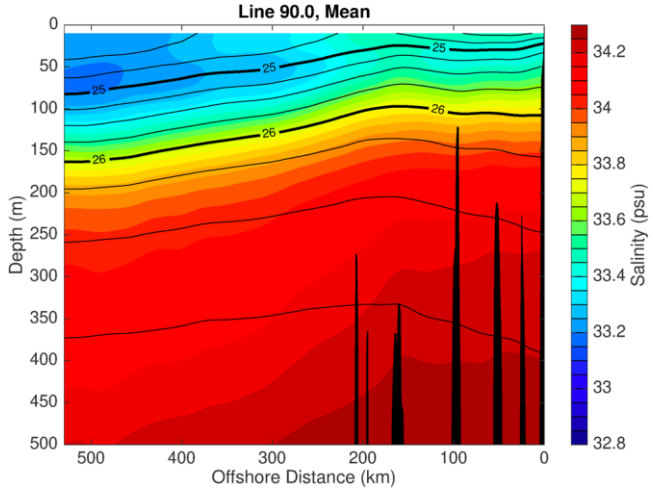
Line 90 Temperature (Interannual anomaly)



Line 90 Salinity (Interannual anomaly)



Line 90 Mean Temperature



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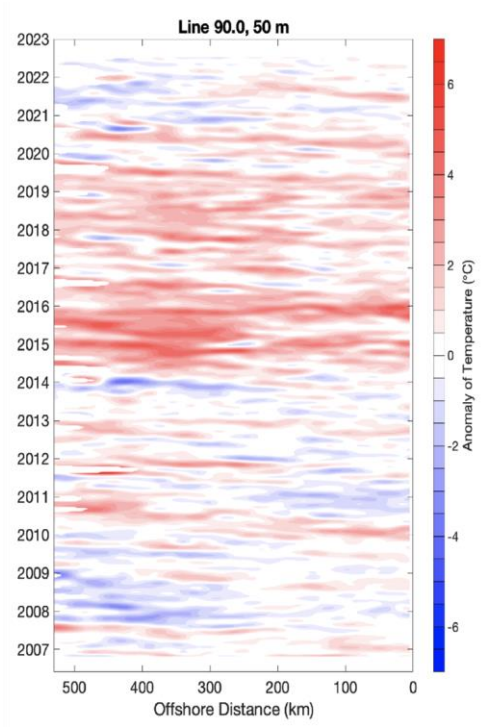
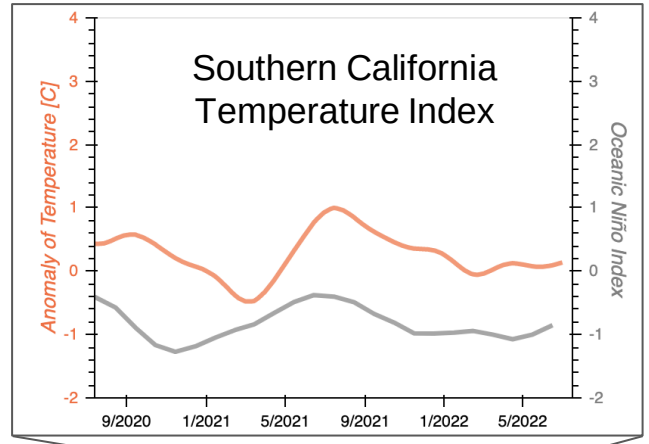
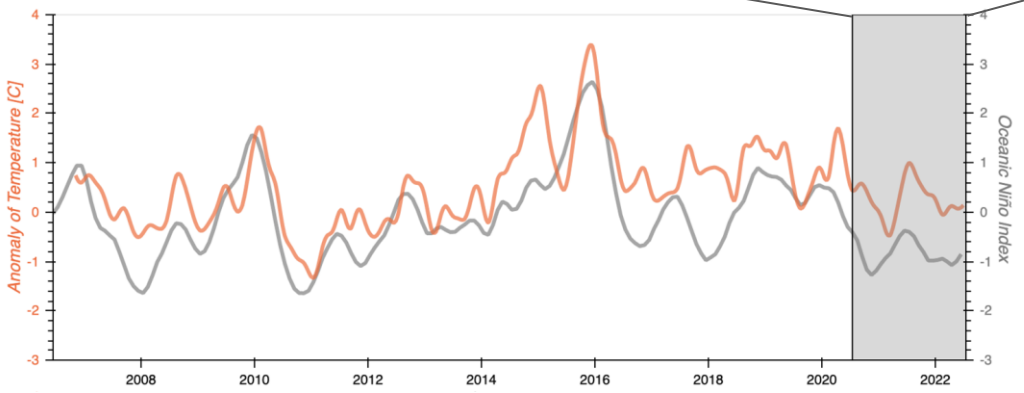


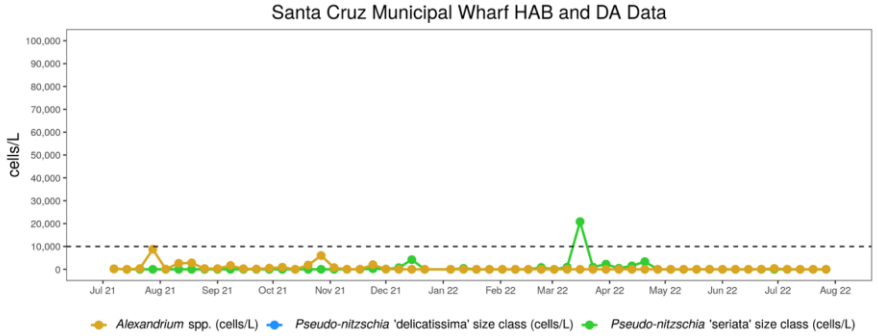
Line 90 Temperature Anomaly

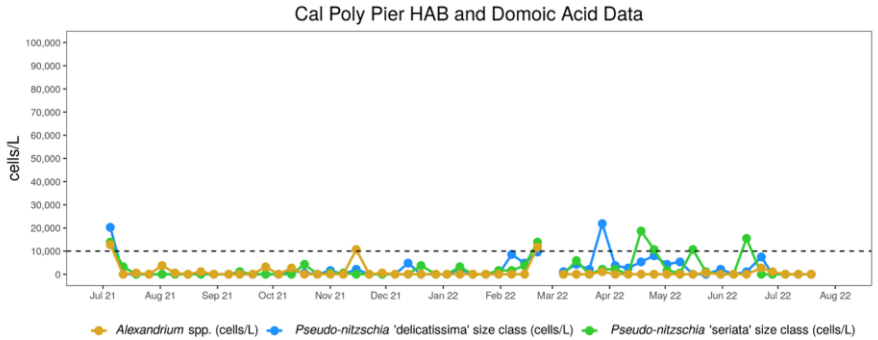


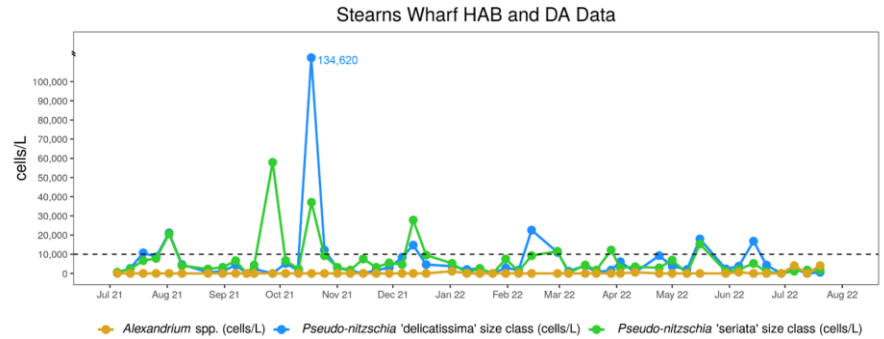


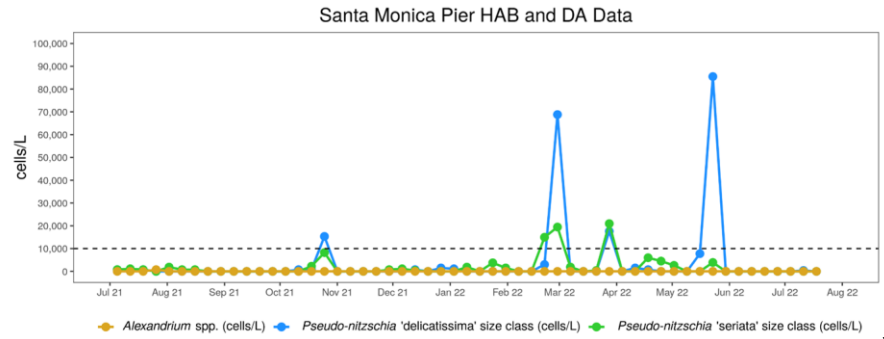
Harmful Algal Bloom Monitoring Alert Program (HABMAP)

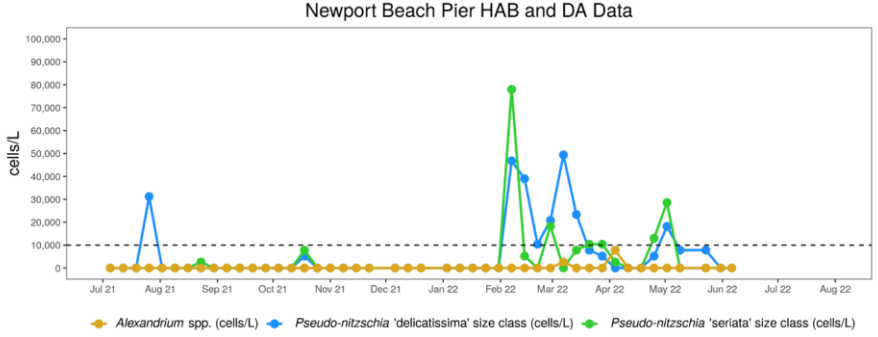
Pseudo-nitzschia spp. blooming more at southern California sites Feb-June. Upwelling intensity will peak in July-August north of Pt. Conception, meaning we can expect this pattern to reverse in favor of larger blooms from San Luis Obispo County to the Oregon border.

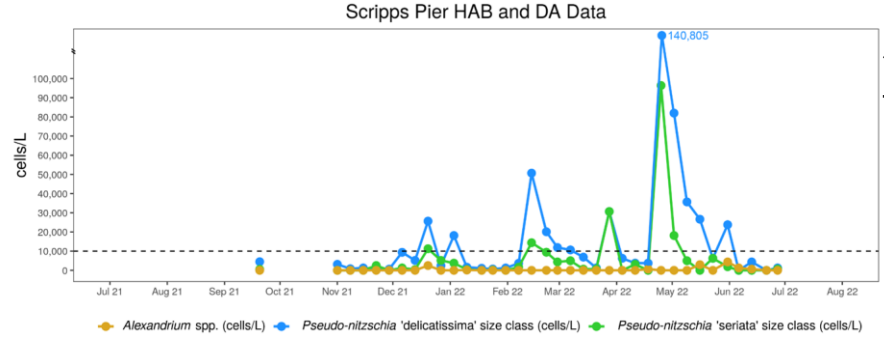


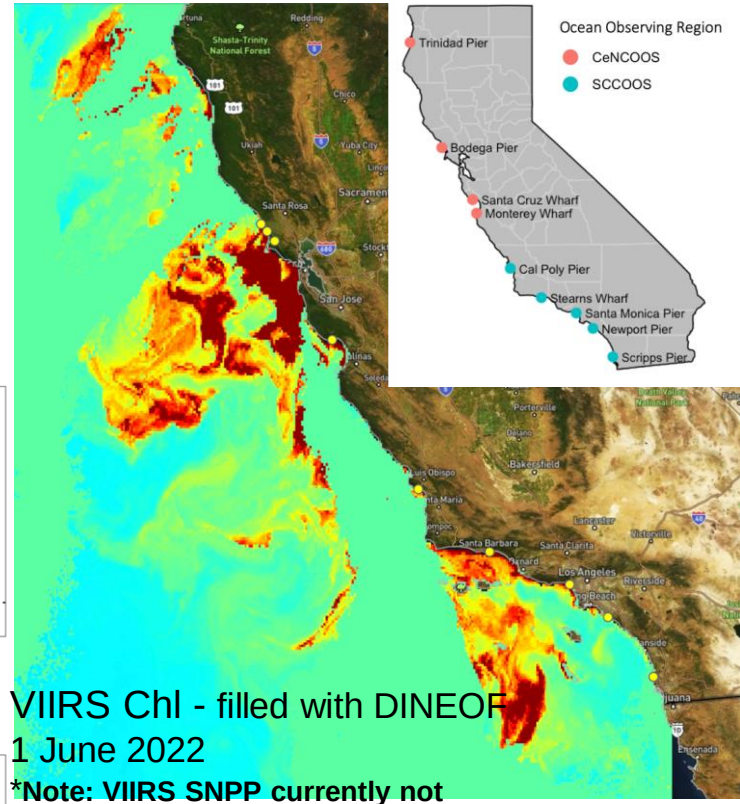












VIIRS Chl - filled with DINEOF
1 June 2022

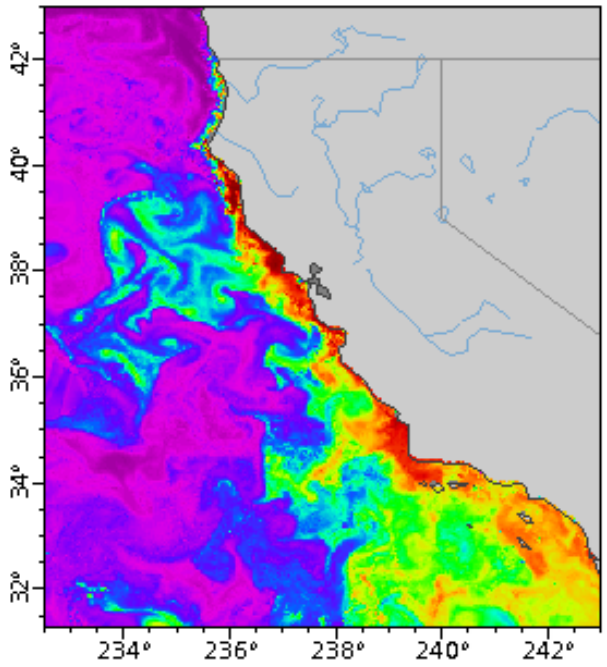
***Note: VIIRS SNPP currently not transmitting data; in safe-mode state**

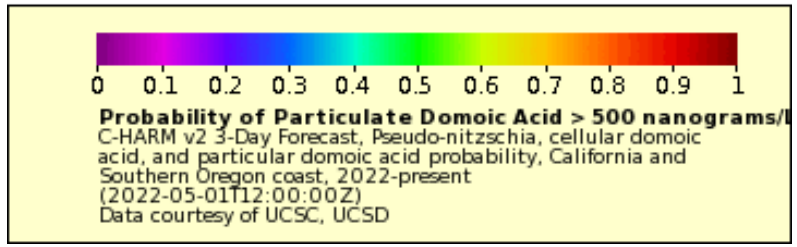
CENTRAL & NORTHERN CALIFORNIA OCEAN OBSERVING SYSTEM

SOUTHERN CALIFORNIA COASTAL OCEAN OBSERVING SYSTEM

CA HAB Bulletin

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





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

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

The Marine Mammal Center · Channel Islands Marine & Wildlife Institute · Marine Animal Rescue Nonprofit • Since 1985 · California Wildlife Center · Marine Mammal Care Center Los Angeles Est 1992 · Pacific Marine Mammal Center · SeaWorld San Diego

sccoos.org/california-hab-bulletin/

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

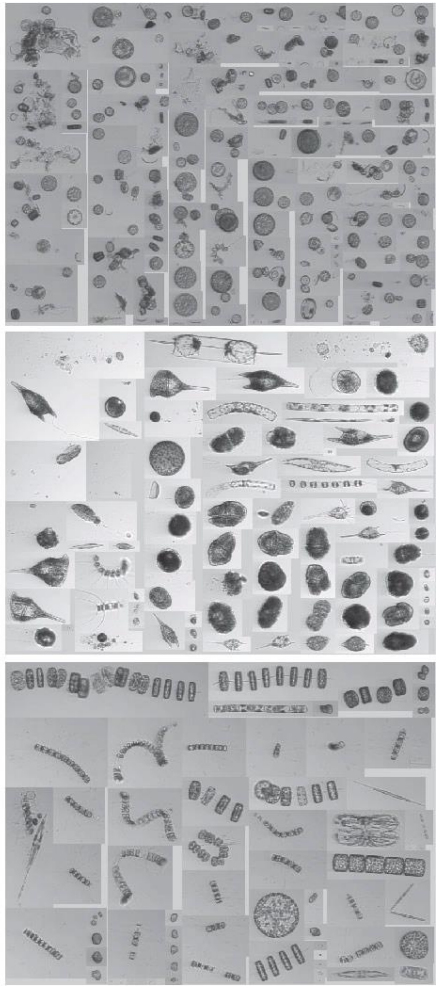
Mosaic from **June** illustrates a range of diatom and dinoflagellate species, including *Pseudo-nitzschia* spp.

https://ifcb.caloos.org/dashboard

Bodega Bay

Santa Cruz Wharf

MBARI Power Buoy



NCCOS IOOS Integrated Ocean Observing System OCEAN PROTECTION COUNCIL

CENTRAL & NORTHERN CALIFORNIA OCEAN OBSERVING SYSTEM

SOUTHERN CALIFORNIA COASTAL OCEAN OBSERVING SYSTEM

SOUTHERN CALIFORNIA COASTAL OCEAN OBSERVING SYSTEM

https://data.caloos.org/

CalOOS Science Impact And Stakeholder Engagement Meeting held in May

Questions?

info@sccoos.org

IOOS Integrated Ocean Observing System

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

Next NOAA West Watch:

Tentative date: October 18, 2022

Thanks!