



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

*July 20, 2021*



# Call Agenda

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- Project Background (Dan McEvoy)
- Regional Climate and ENSO brief (Dan McEvoy)
- IOOS Nearshore Conditions brief (Jan Newton, Alex Harper, Megan Medina (Hepner))
- Discussion - Environmental conditions and impacts reporting (All)
  - Additional impacts to share?

# Project Background

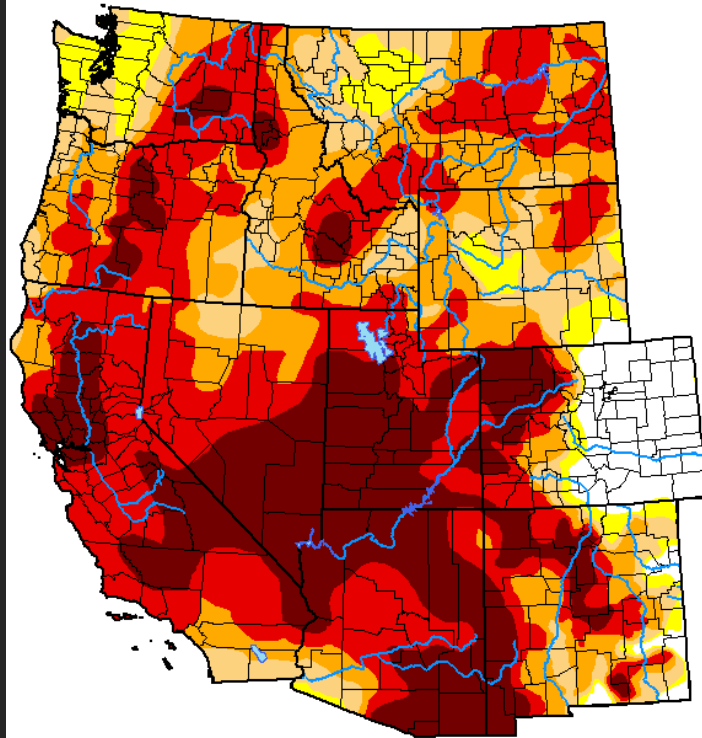
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- Run by the Western Regional Climate Center, in partnership with the NOAA Western Regional Collaboration Team (NOAA West)
- Standing contributions from the three Integrated Ocean Observing System Regional Associations.
- Project Goals:
  - Serve as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

# Drought Expands and Intensifies

## U.S. Drought Monitor Western U.S.



**July 13, 2021**

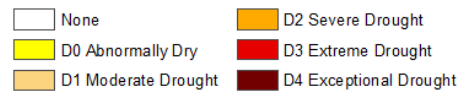
(Released Thursday, Jul. 15, 2021)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	5.72	94.28	89.16	77.82	56.75	24.58
<b>Last Week</b> <small>07-06-2021</small>	5.62	94.38	88.34	76.62	53.18	23.35
<b>3 Months Ago</b> <small>04-13-2021</small>	8.01	91.99	78.21	60.88	41.66	21.05
<b>Start of Calendar Year</b> <small>12-29-2020</small>	11.57	88.43	78.63	65.18	46.49	22.16
<b>Start of Water Year</b> <small>09-29-2020</small>	8.51	91.49	76.07	54.55	33.11	2.31
<b>One Year Ago</b> <small>07-14-2020</small>	31.11	68.89	47.81	23.98	5.91	0.00

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>

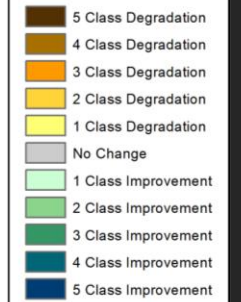
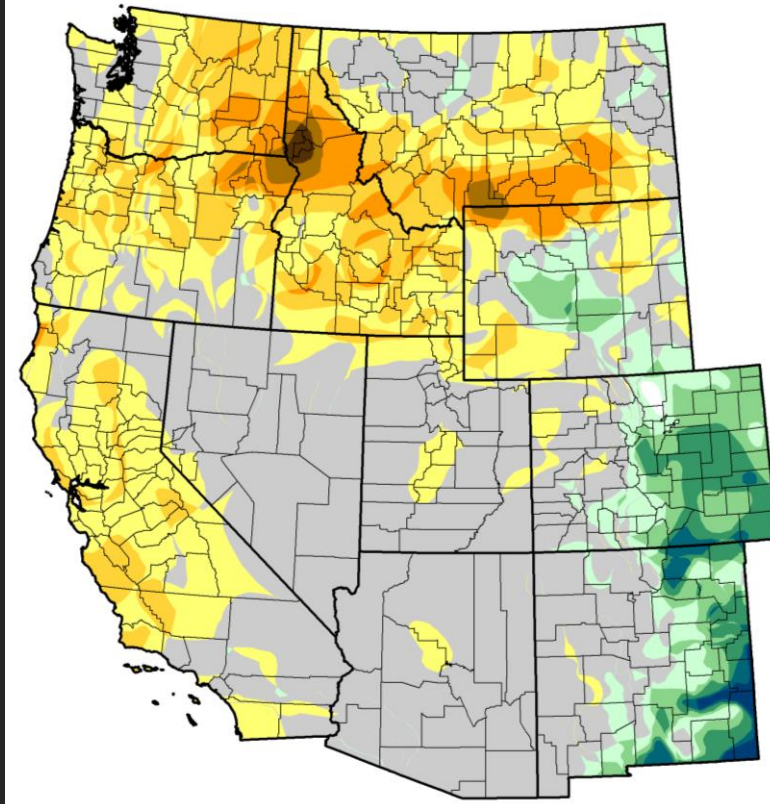
Author:

Adam Hartman  
NOAA/NWS/NCEP/CPC



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

## U.S. Drought Monitor Class Change - Western U.S. 12 Week



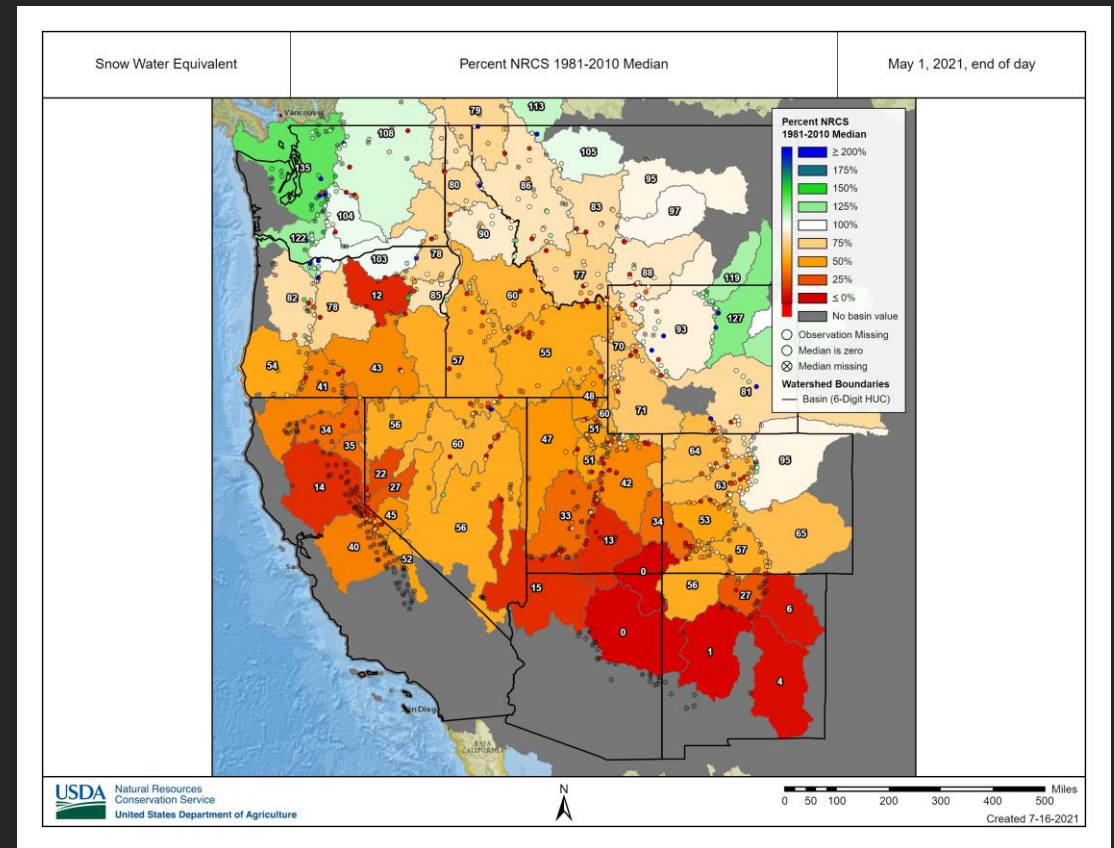
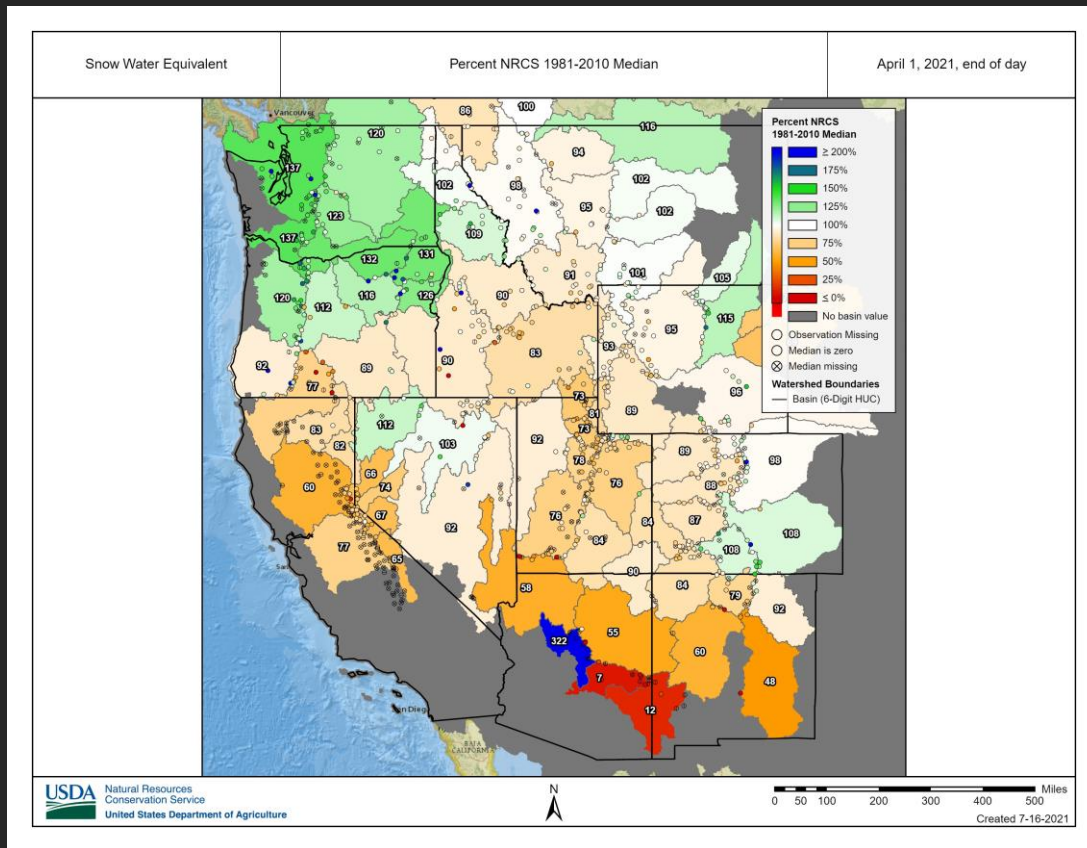
[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

Change from April 20 to July 13, 2021

# Drought Expands and Intensifies – Rapid Spring Snowmelt

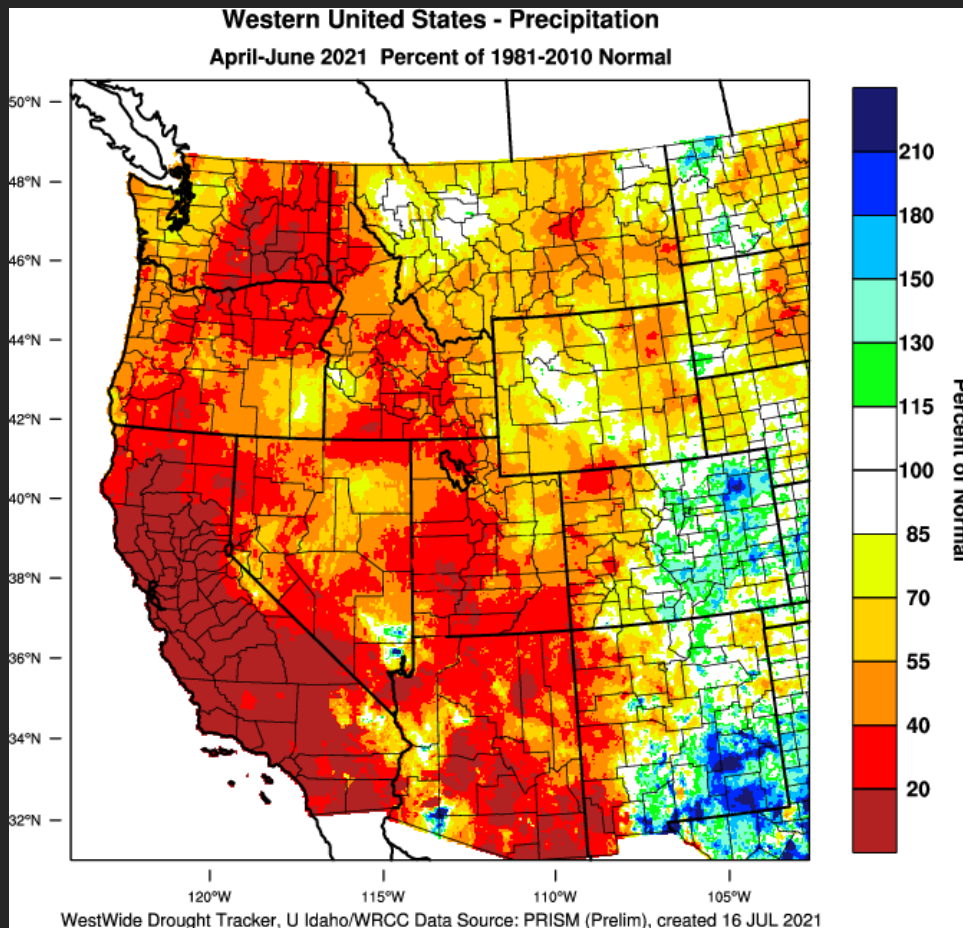
## April 1 Snow Water Equivalent % of normal

## May 1 Snow Water Equivalent % of normal

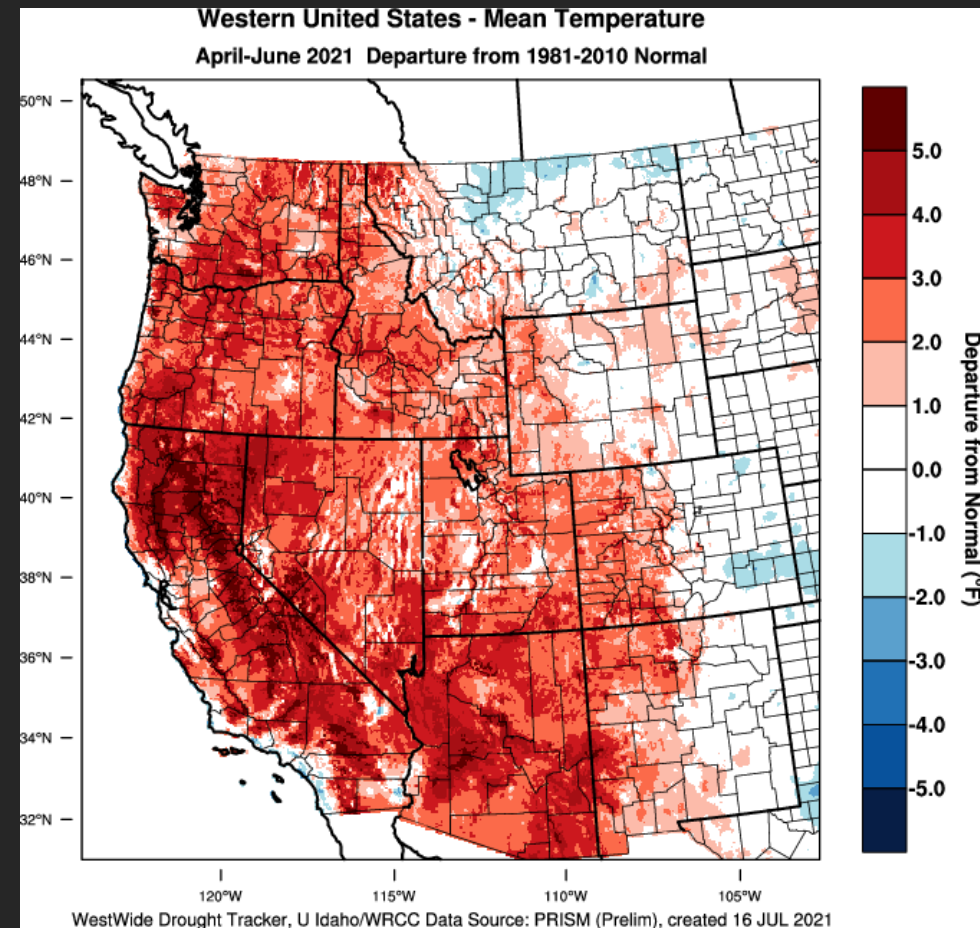


# Drought Expands and Intensifies

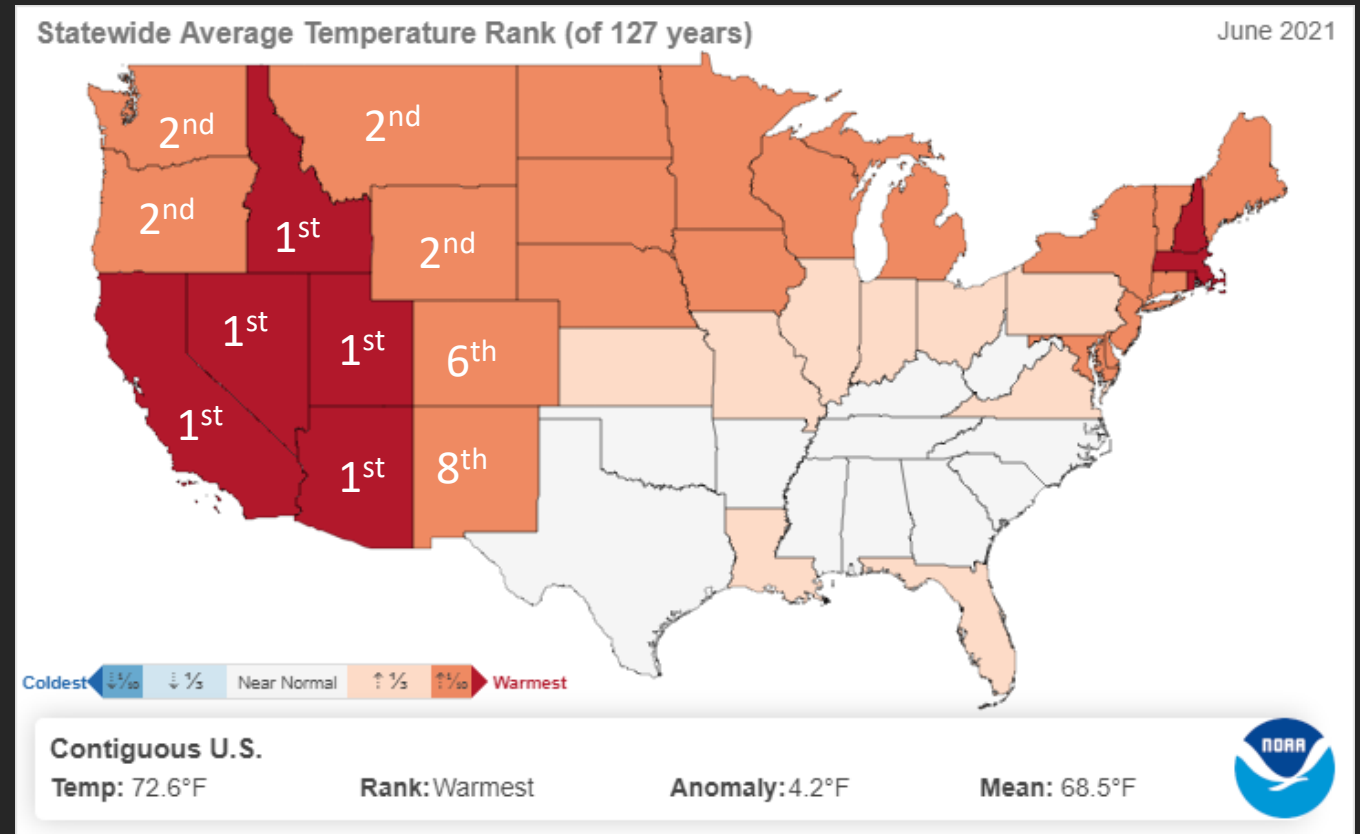
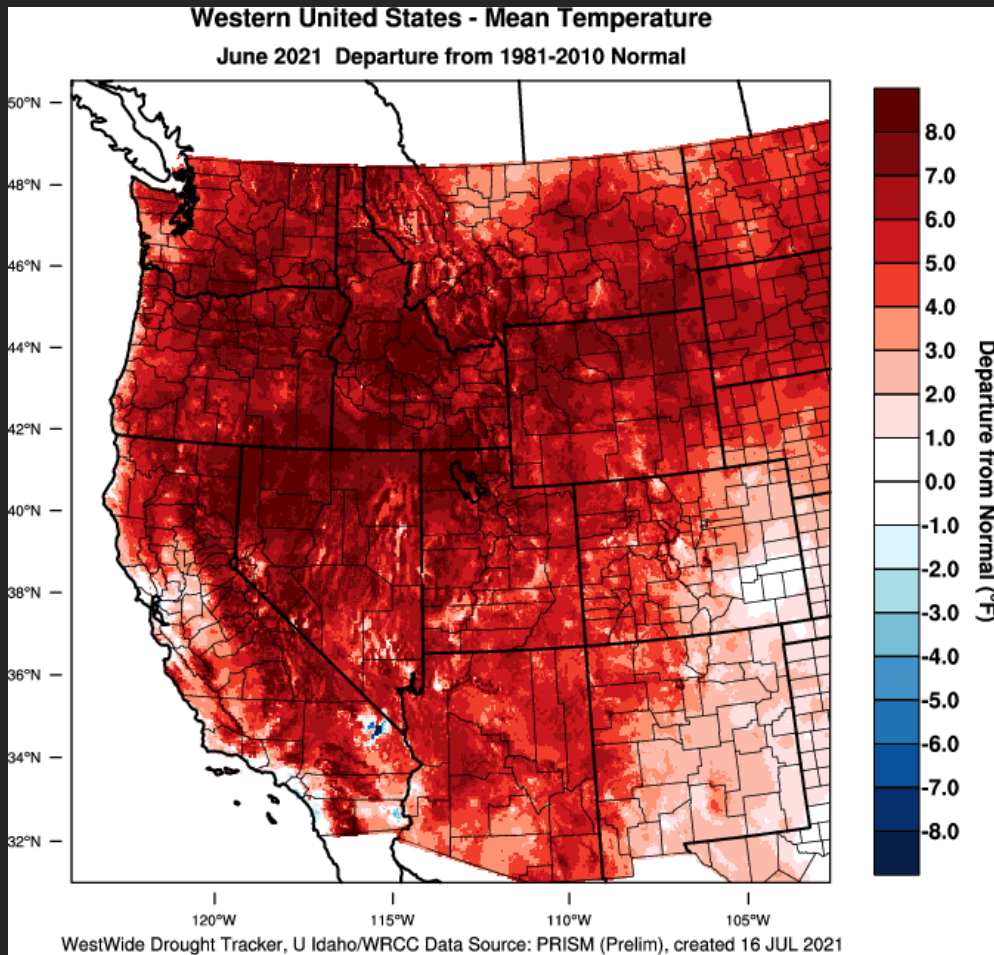
## April-June % of normal Precipitation



## April-June Temperature Anomaly



# Extreme Heat – June Mean Temperatures

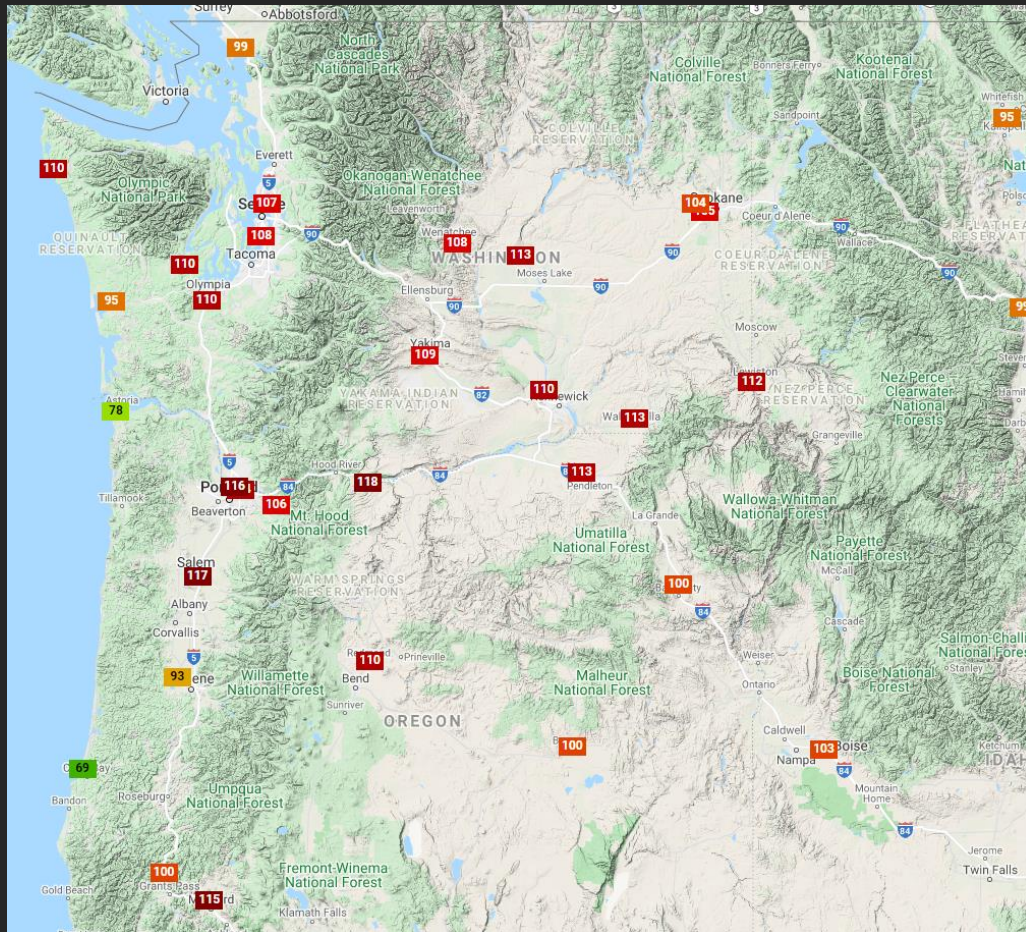


<https://wrcc.dri.edu/wwdt/>

<https://www.ncdc.noaa.gov/cag/>

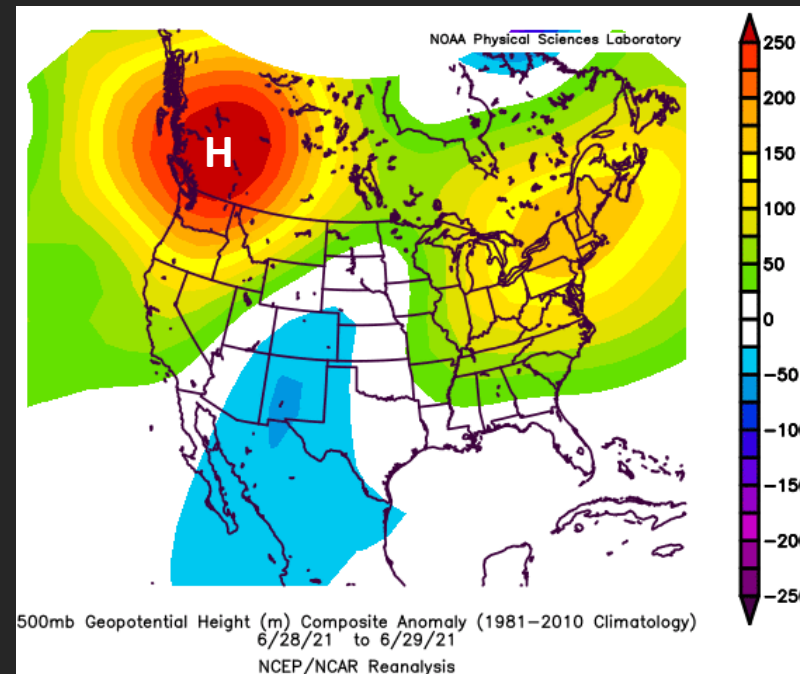
# Extreme Heat – Late June Heatwave

## Observed Maximum Temperatures June 28, 2021



<https://sercc.oasis.unc.edu/Map.php?region=wrcc>

- Dallesport AP, WA: 118 F
  - Will tie all time state record if confirmed by state climate extremes committee
- Salem, OR: 117 F
- Portland, OR: 116 F
- Seattle Tacoma AP, WA: 108



Mid-atmosphere  
pressure  
anomaly

June 28-29, 2021

<https://psl.noaa.gov/data/composites/day/>



# Extreme Heat – Late June Heatwave

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## Moody Farms East Satellite AgriMet Station



- Maximum Temperature of 119 F on June 29, 2021
- Ties Oregon state record set twice in 1898
- State climate extremes committee investigating validity of measurement

# Extreme Heat – Human Health Impacts

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## Oregon's heat wave death toll reaches 107 in 'mass casualty' event

*The fatal victims of the heat wave ranged in age from 37 to 97.*

ABC News

## 91 people have died in Washington from recent heat wave, health department says

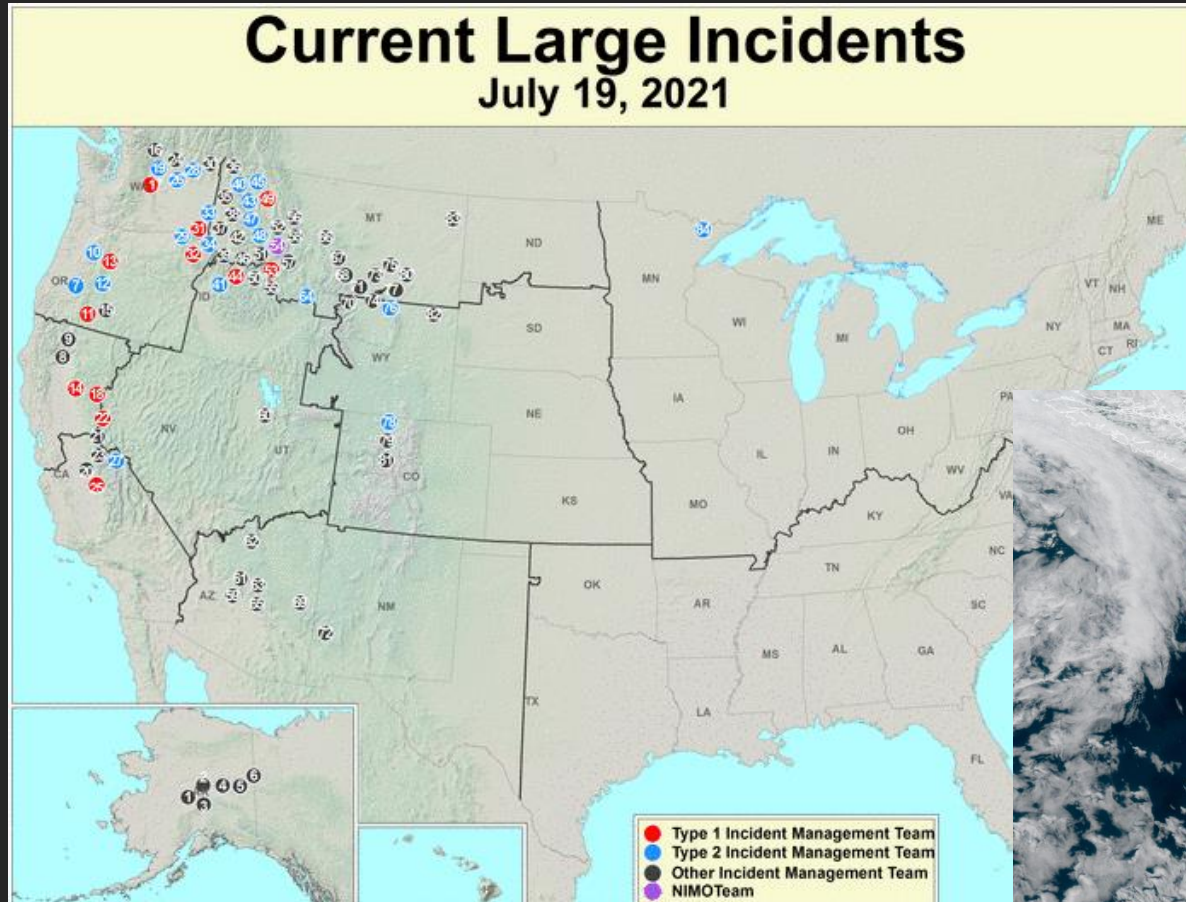
—  
Last year there were just seven heat-related deaths in Washington from mid-June to end of August.

King5 News

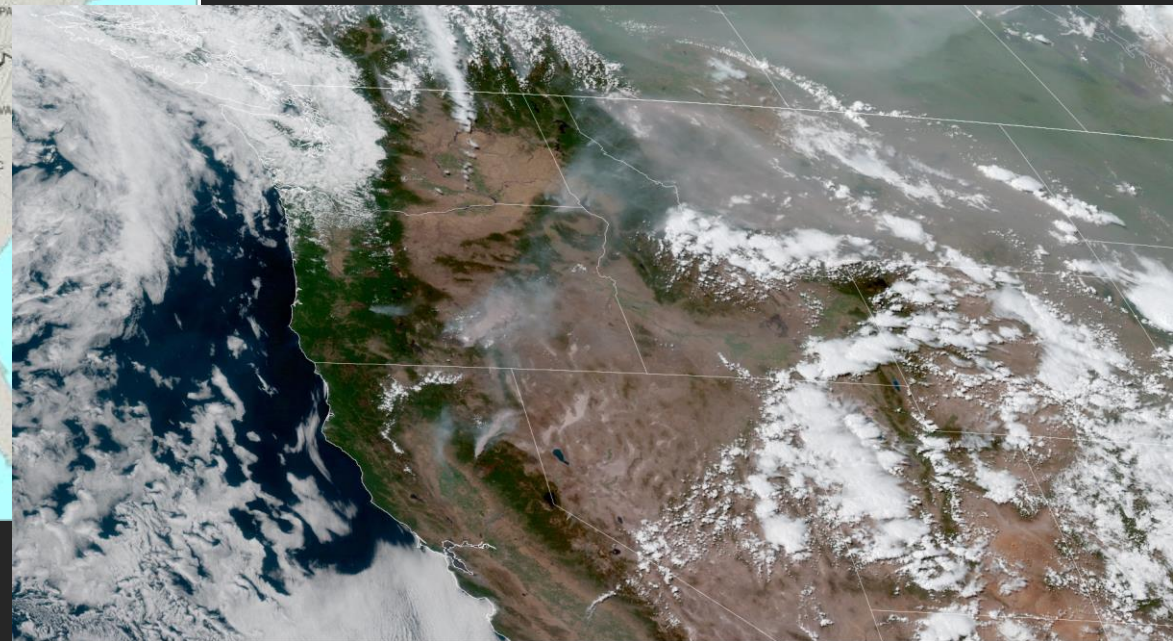
## Nearly 800 people believed to have died in Northwest heat wave

KUOW-NPR

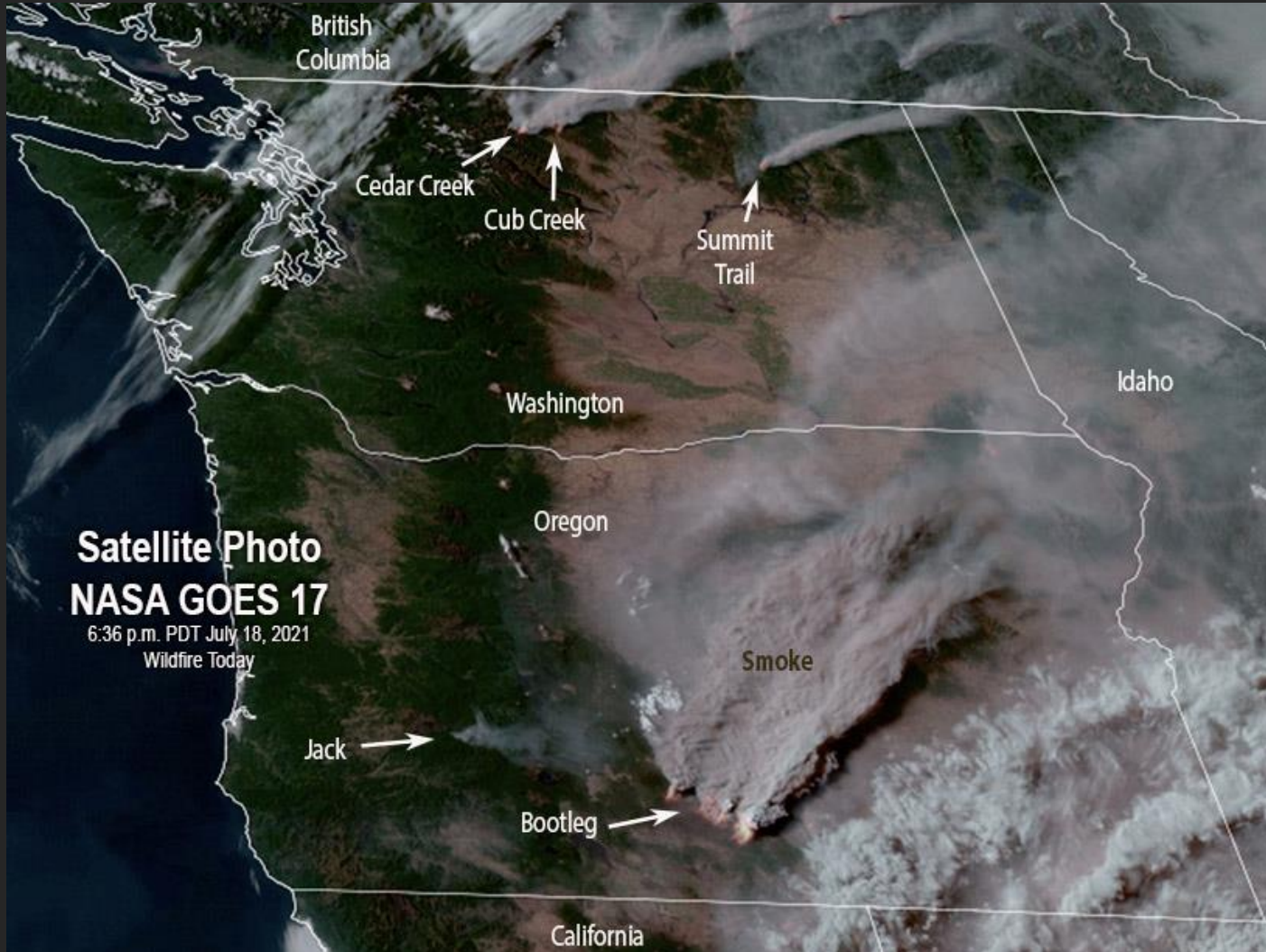
# Wildfire Activity



- Currently at National Preparedness Level 5, highest possible
  - Majority of firefighting resources are committed due to the large amount of wildland fire activity throughout the country



# Wildfire Activity

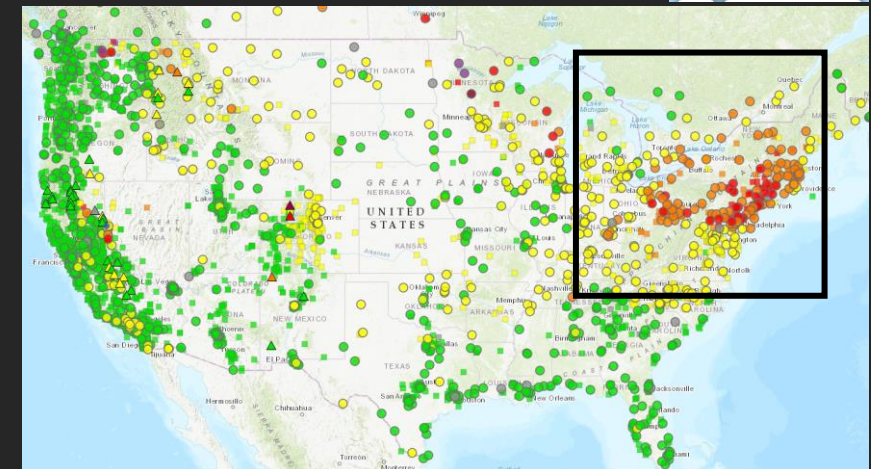
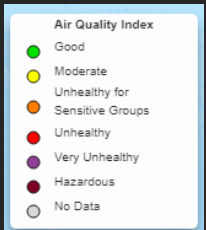


Satellite Photo  
NASA GOES 17  
6:36 p.m. PDT July 18, 2021  
Wildfire Today

## Bootleg Fire:

- 343,755 acres
- 25% contained

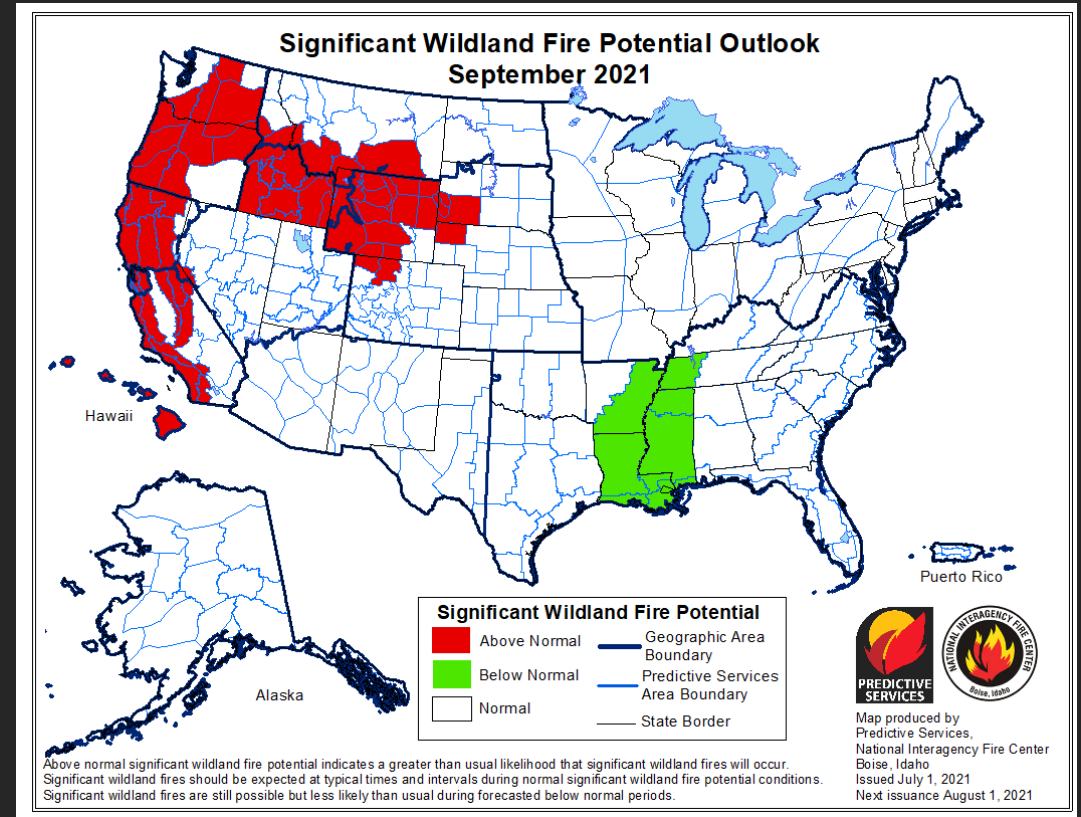
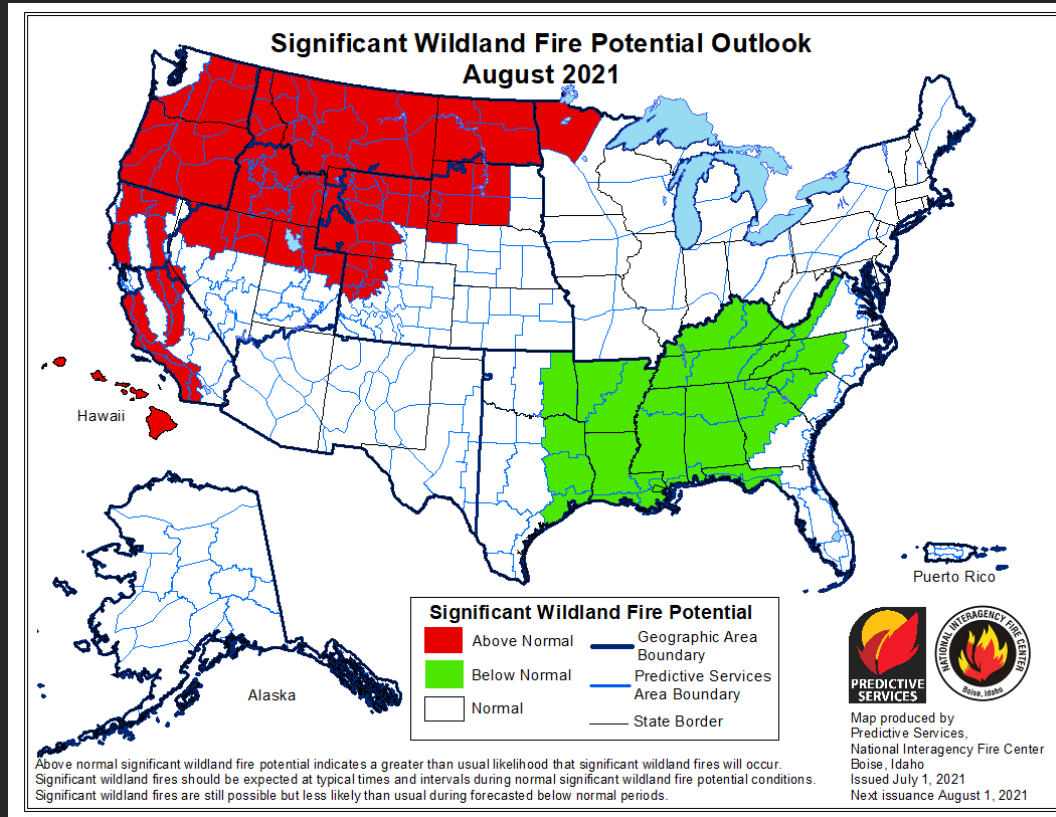
## Air Quality Index July 20, 2021



<https://wildfiretoday.com/tag/bootleg-fire/>

<https://fire.airnow.gov/>

# Wildfire Potential Outlook



# Colorado River Basin Water Supply

## Lake Powell Inflow Forecasts and Observations

UNREGULATED INFLOW INTO LAKE POWELL - JULY FINAL FORECAST DATED 7/1/2021		
	MILLION ACRE-FEET	% of Normal
FORECASTED WATER YEAR 2021	3.227	30%
FORECASTED APRIL-JULY 2021	1.745	24%
JUNE OBSERVED INFLOW	0.809	30%
JULY INFLOW FORECAST	0.104	10%

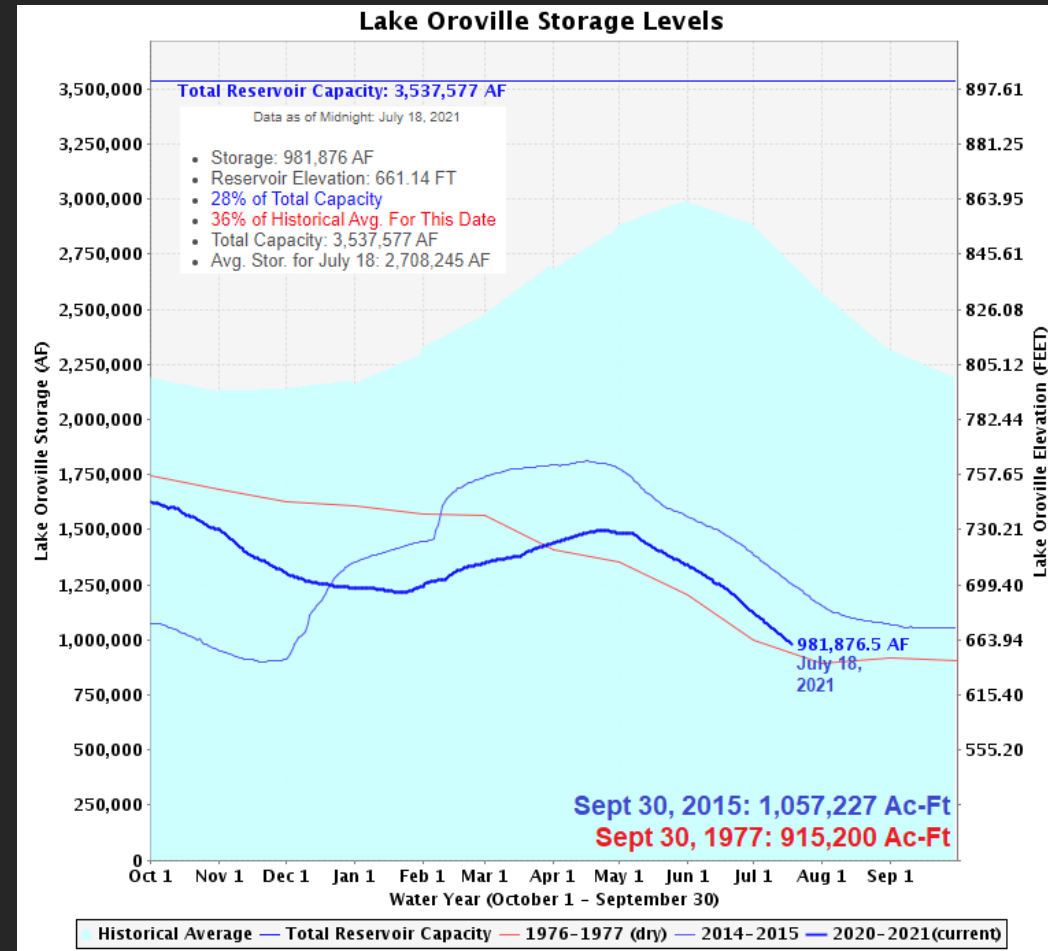
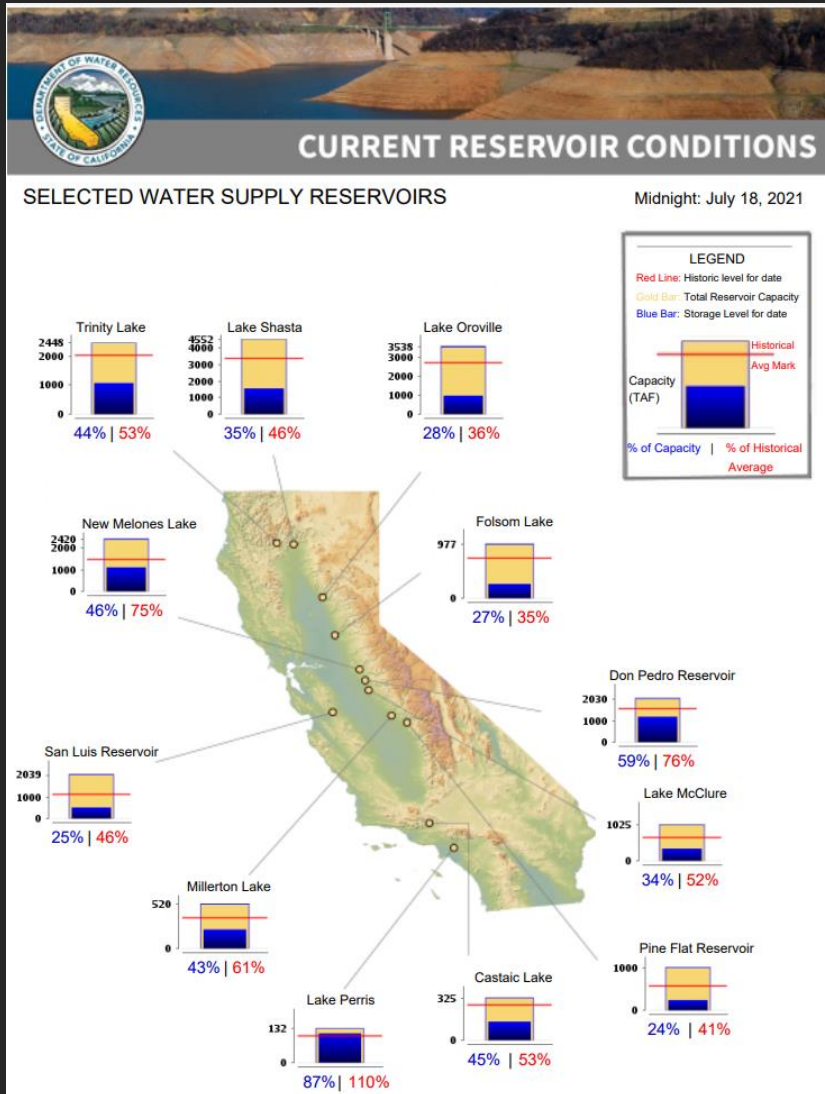
### Colorado River Basin Reservoirs Begin Emergency Releases To Prop Up A Troubled Lake Powell

KUNC | By Luke Runyon  
Published July 15, 2021 at 3:37 PM MDT

<https://www.kunc.org/>

- Releases scheduled or underway for Flaming Gorge, WY, Blue Mesa, CO, and Navajo, NM
- Releases required to maintain hydroelectric generation from Powell
- Lake Powell projected to hit record low in July
- Lake Mead now below Tier I shortage level, the trigger for federal water shortage

# California Water Supply

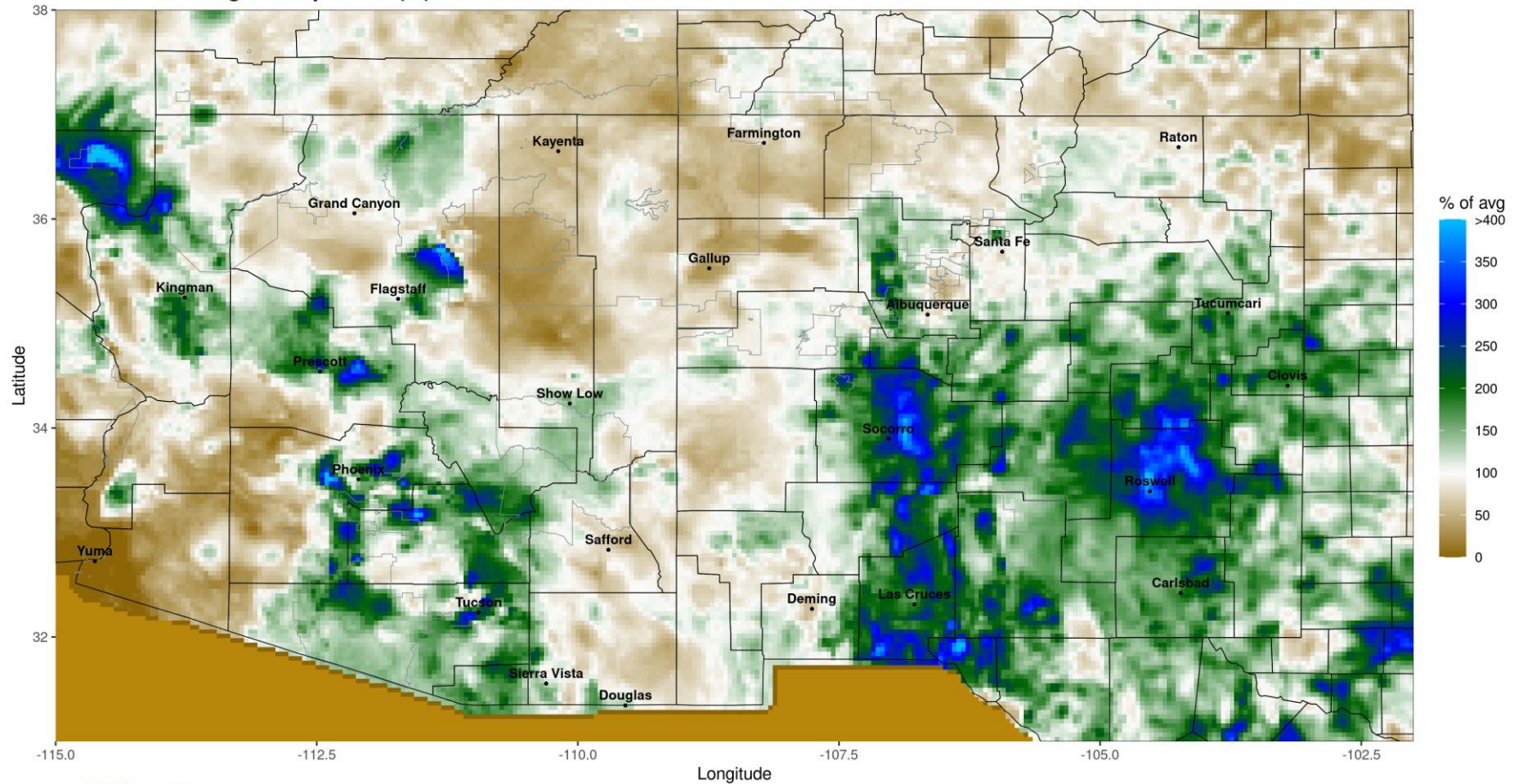


<https://twitter.com/NWSCNRFC/status/1417191649566871569>

<https://cdec.water.ca.gov/reservoir.html>

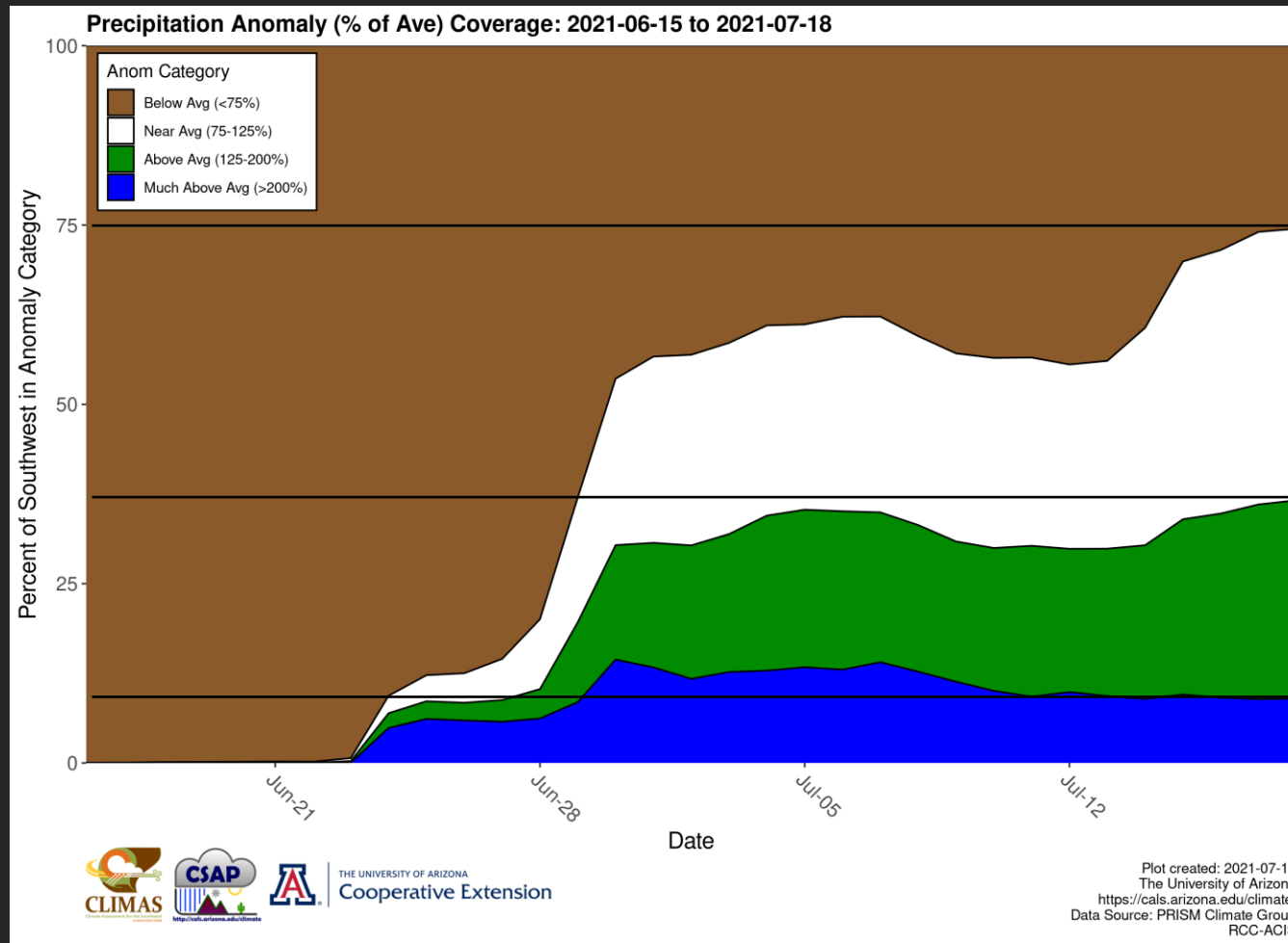
# Southwest Monsoon Update

Percent of Average Precipitation (%): 2021-06-15 to 2021-07-18





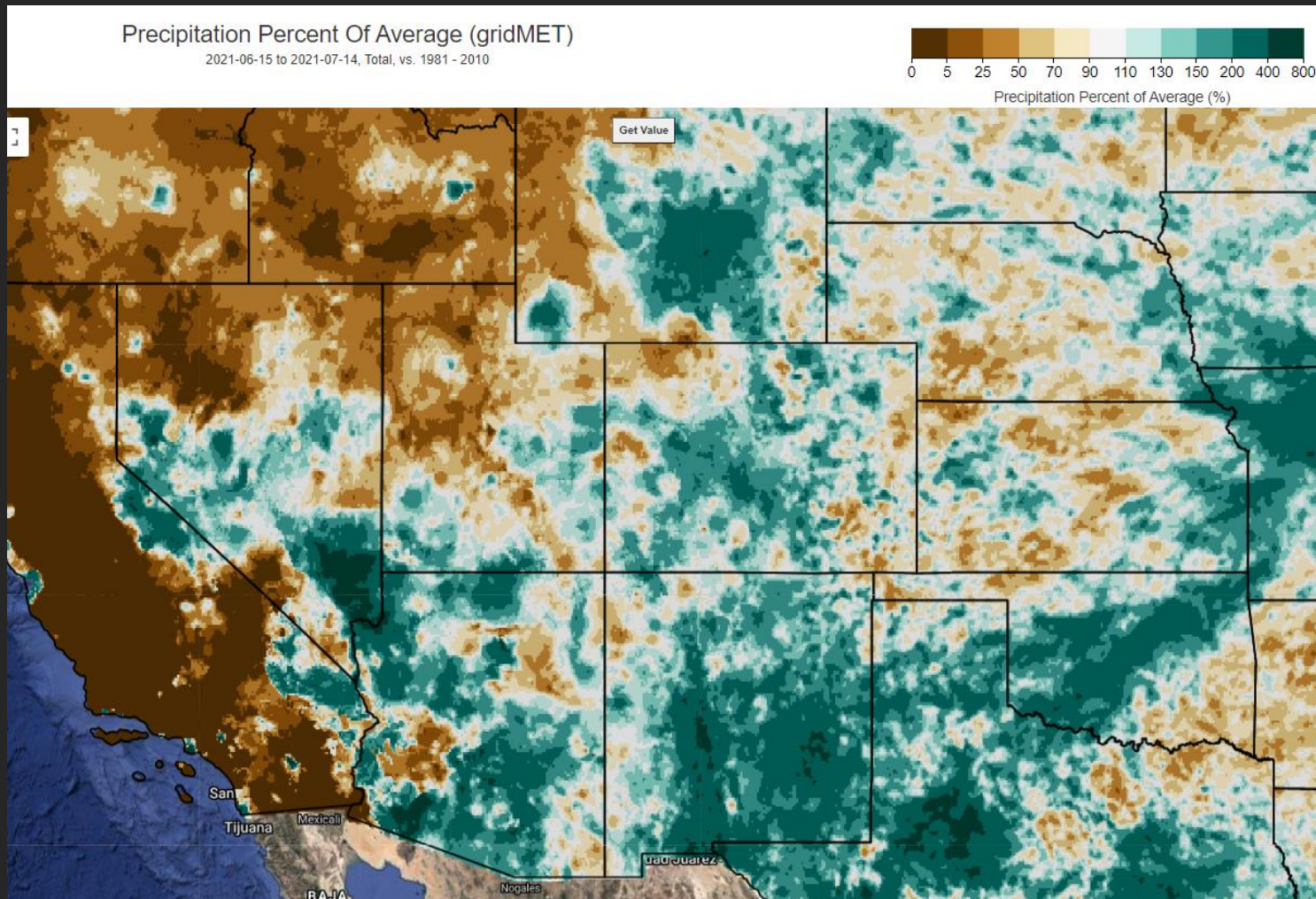
# Southwest Monsoon Update



- ~25% area below avg (<75%)
- ~37% near avg (75-125%)
- ~30% above avg (125-200%)
- ~8% much above avg (>200%)

# Southwest Monsoon Update

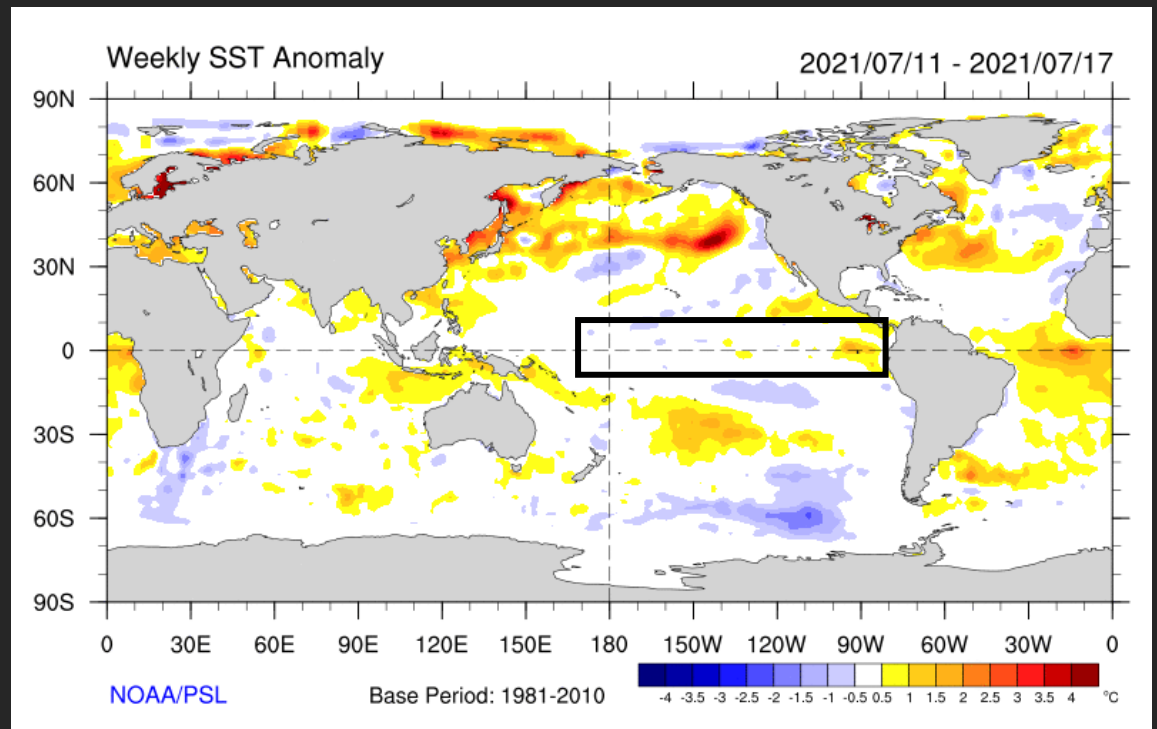
June 15 – July 14



Above normal precipitation for parts of eastern California, Nevada, Utah, and Colorado in addition to Arizona and New Mexico

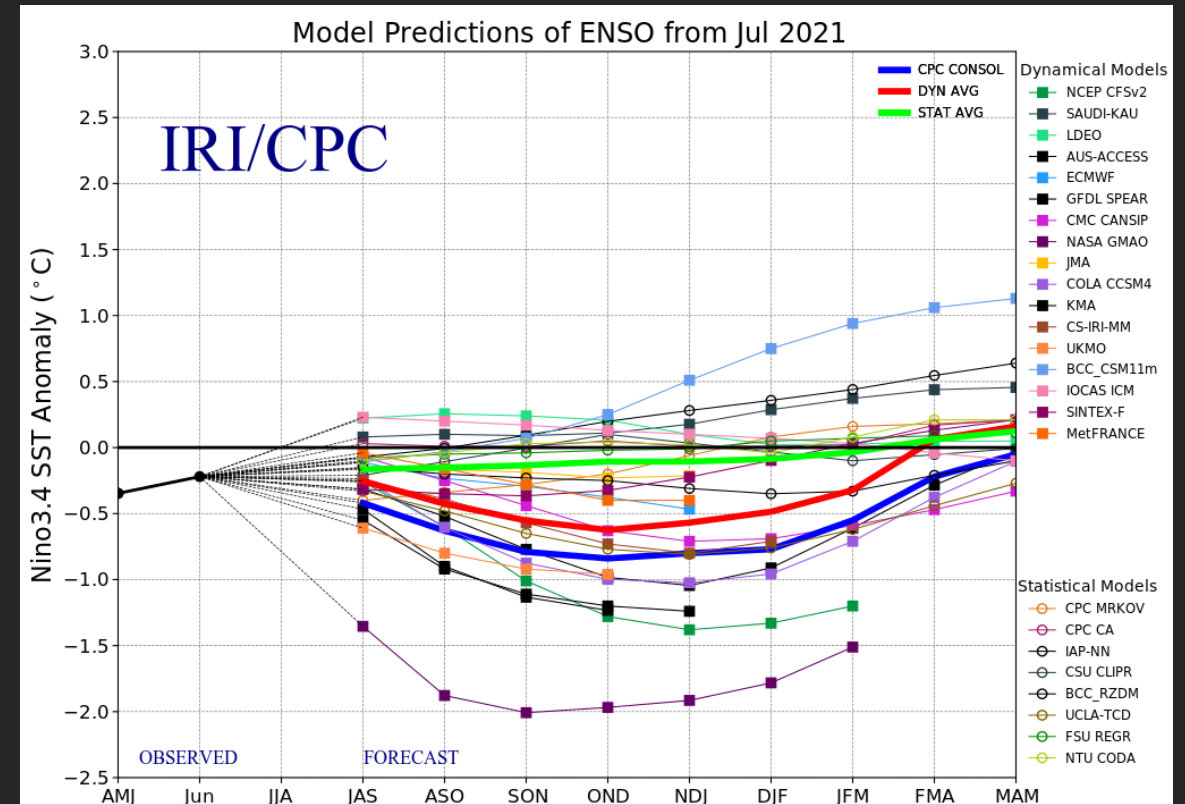
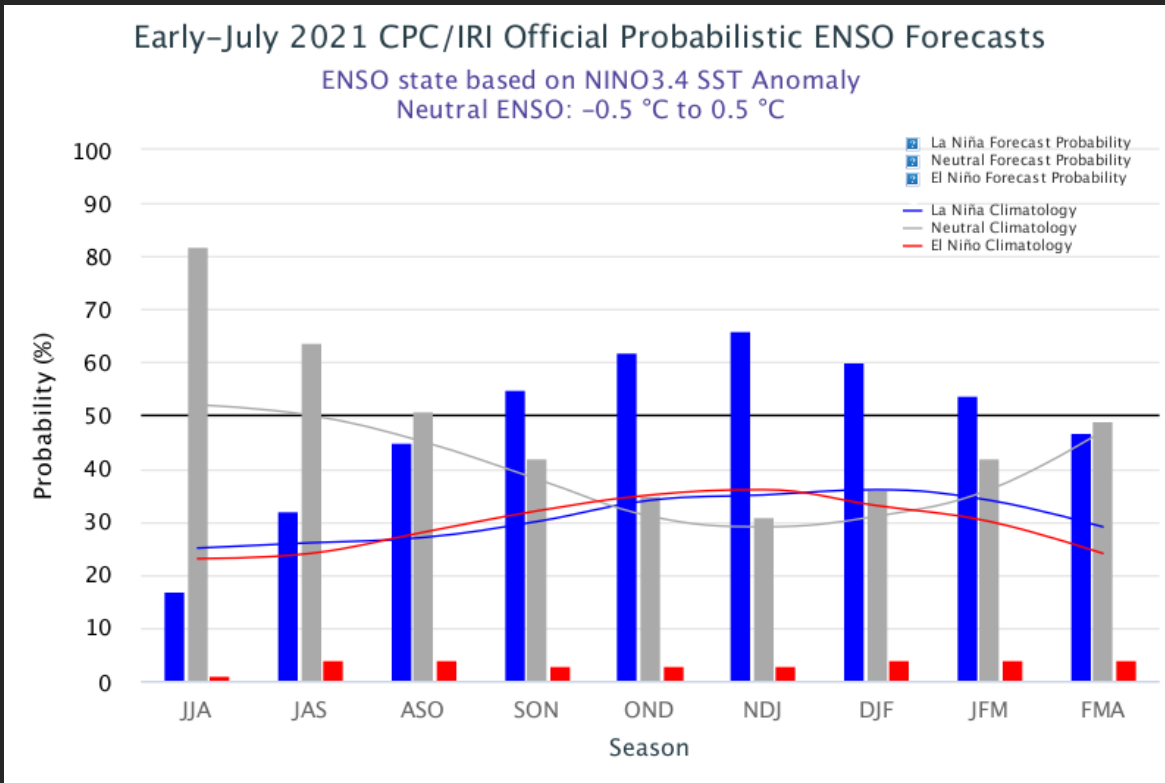
# ENSO Update

- ENSO Alert System Status: **La Niña Watch**
- ENSO-neutral conditions are present.
- Equatorial sea surface temperatures (SSTs) are near average across most of the Pacific Ocean.
- ENSO-neutral is favored through the Northern Hemisphere summer and into the fall (51% chance for the August-October season), with La Niña potentially emerging during the September-November season and lasting through the 2021-22 winter (66% chance during November-January).



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

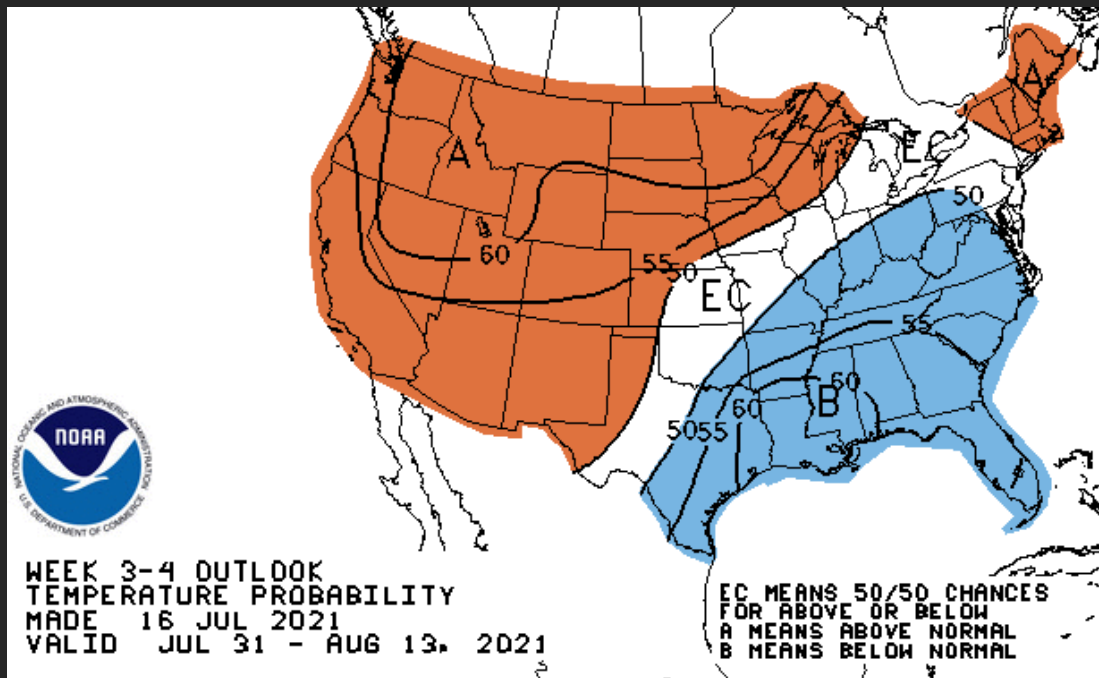
# ENSO Outlook



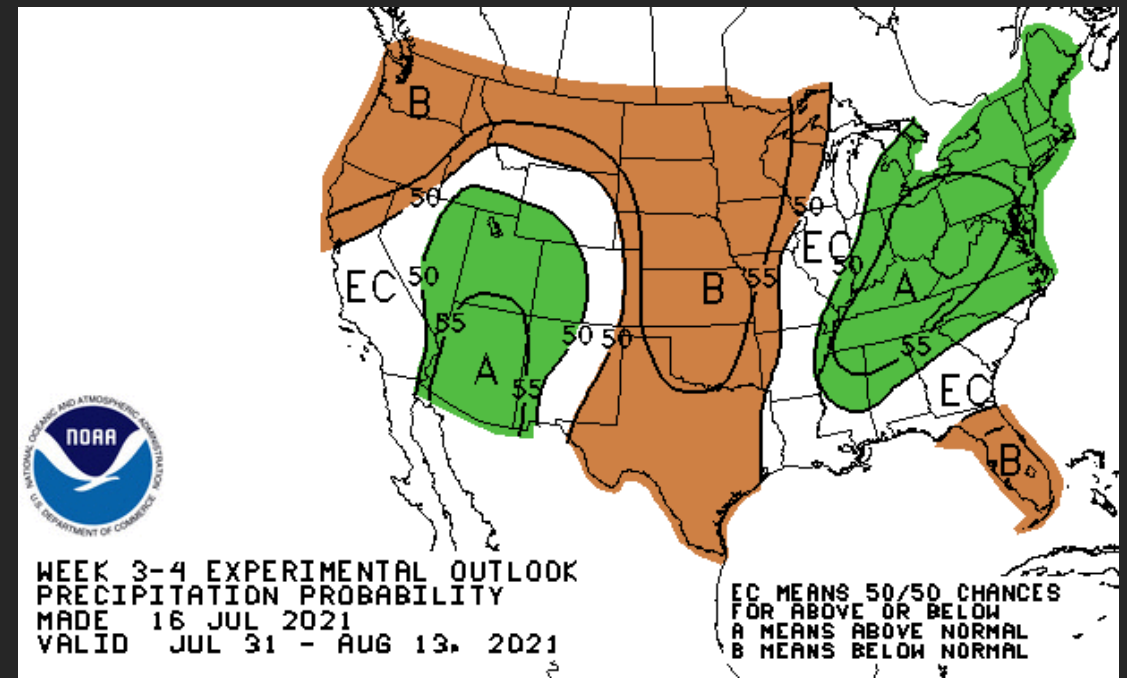
<https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>

# Week 3-4 Outlook: July 31 – August 13

## Temperature Probability



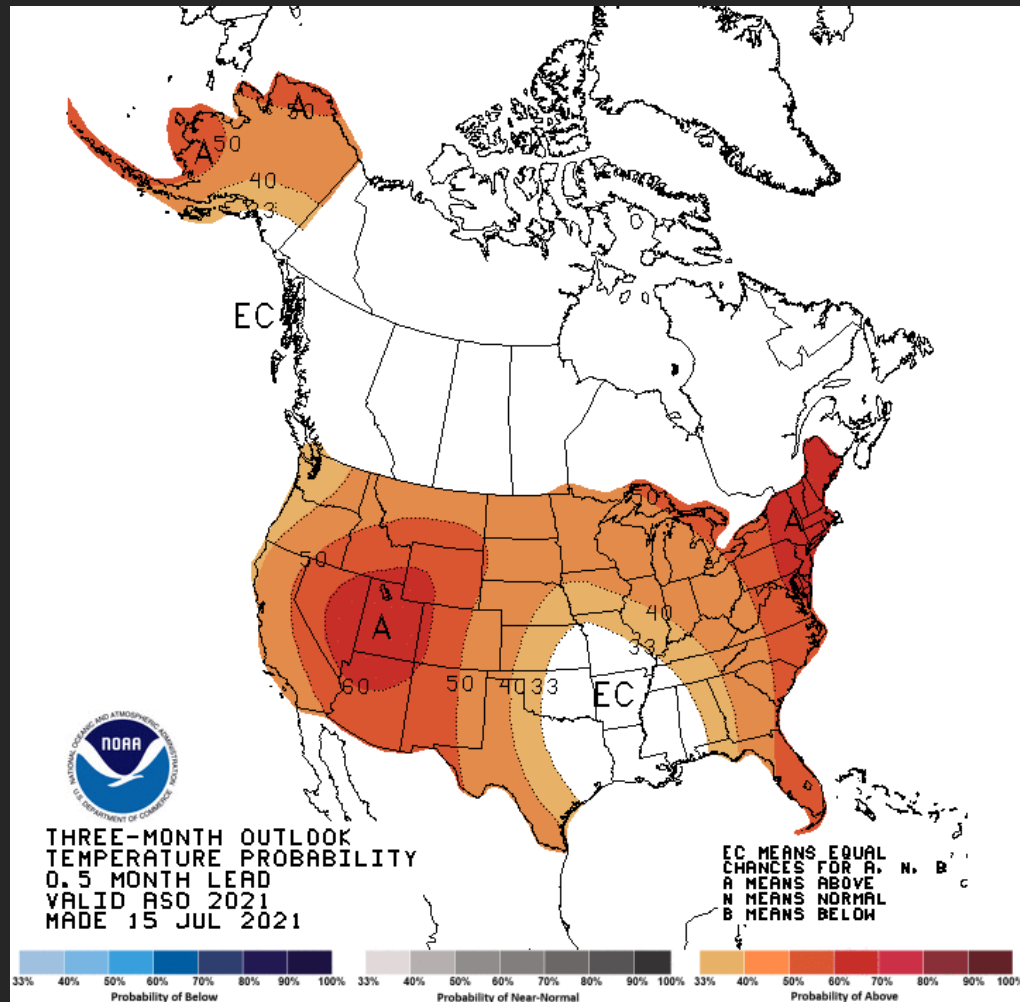
## Precipitation Probability



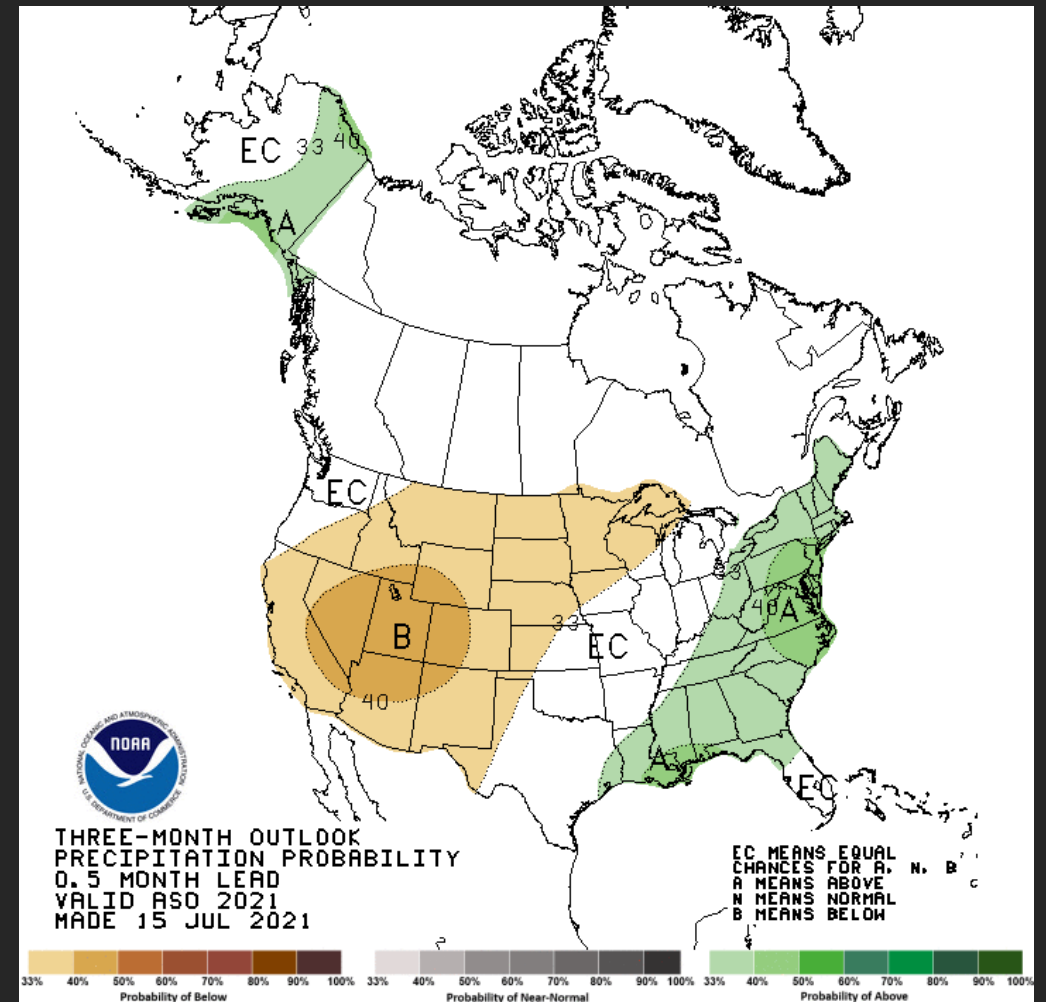
<https://www.cpc.ncep.noaa.gov/products/predictions/WK34/>

# Seasonal Outlook: August-October

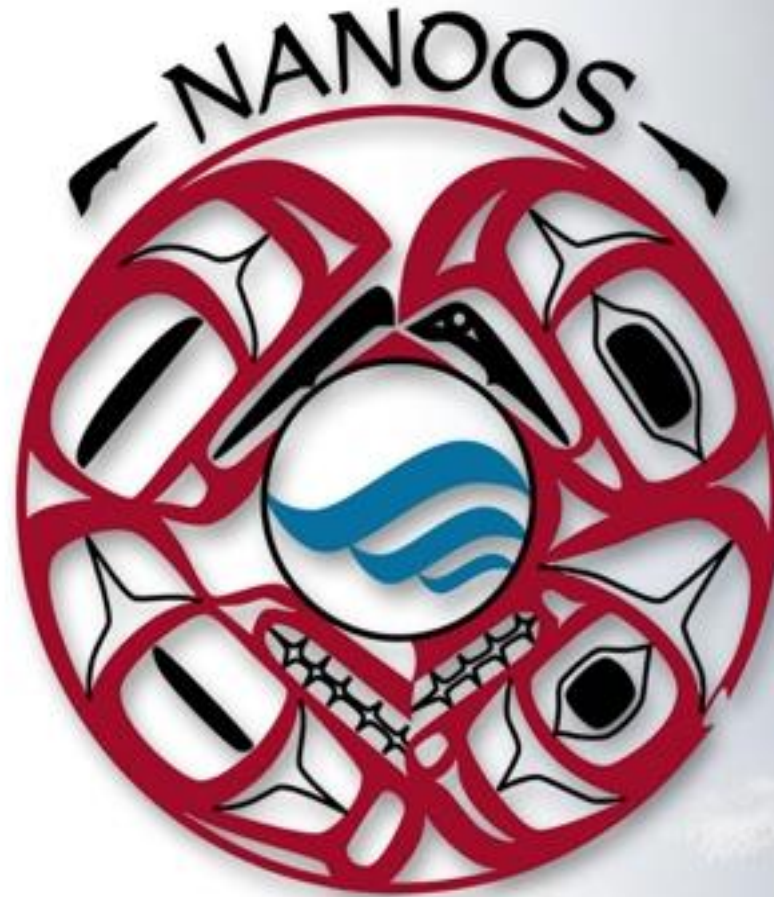
## Temperature Probability



## Precipitation Probability

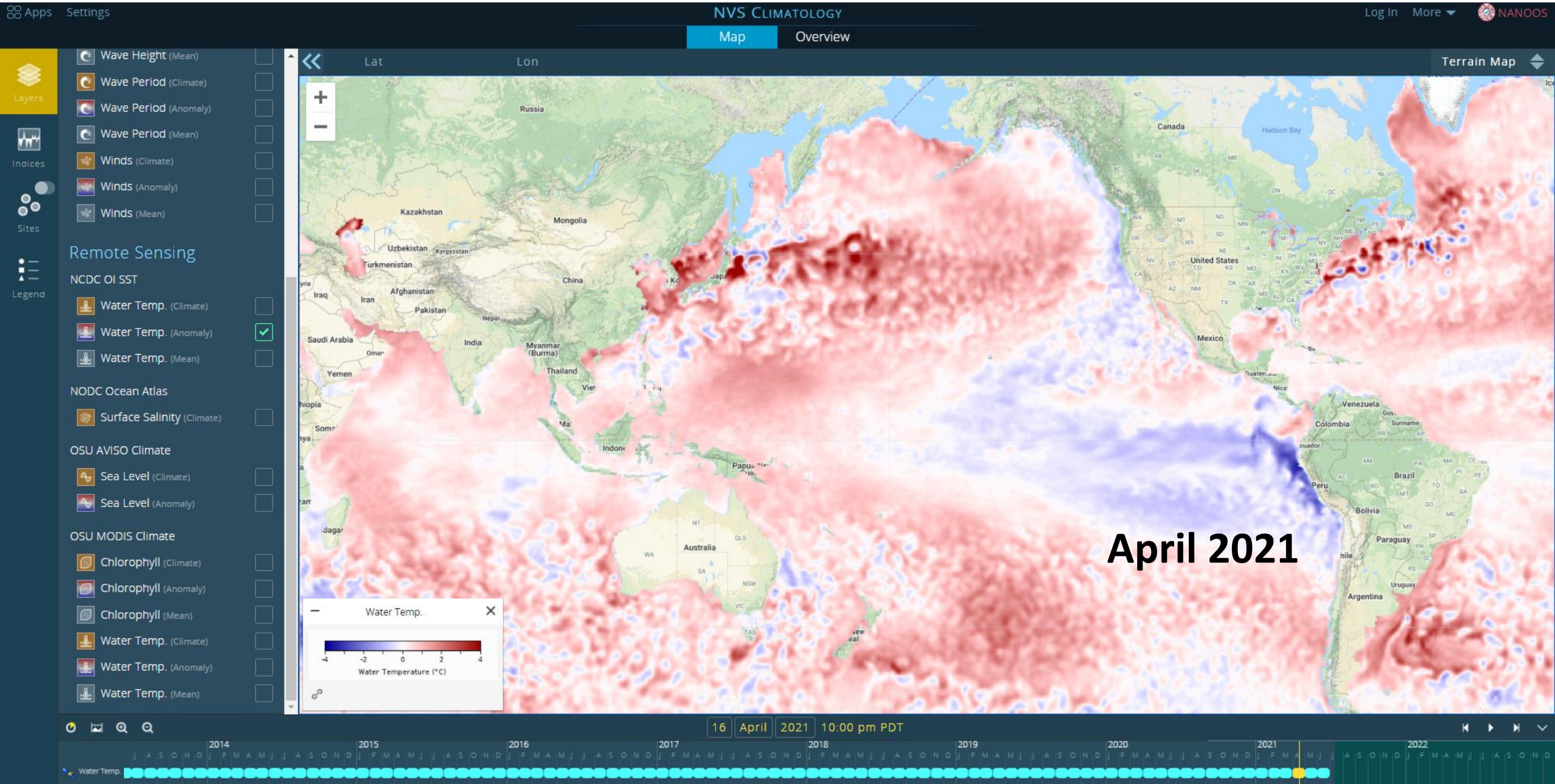


# Northwest Association of Networked Ocean Observing Systems

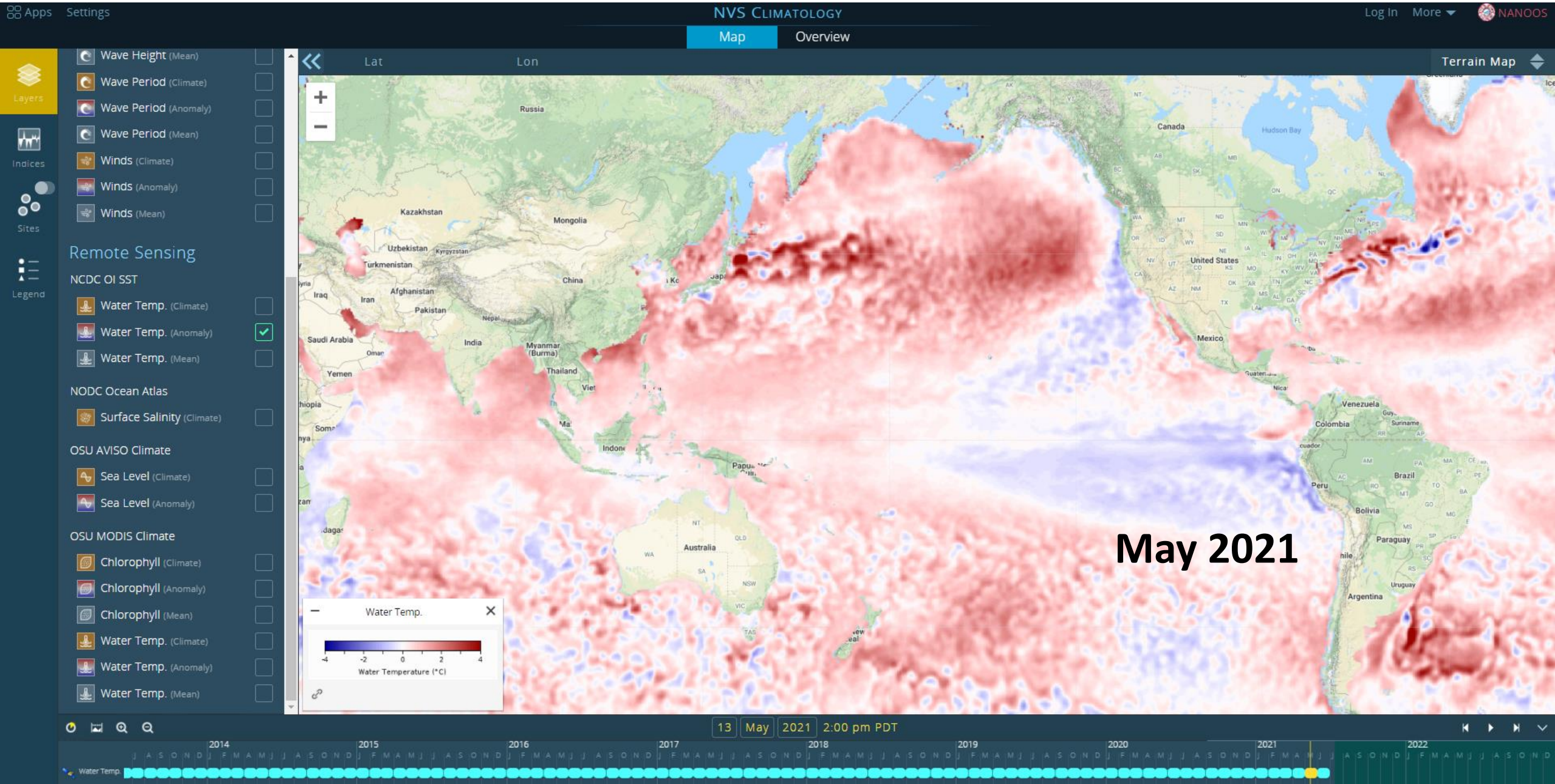


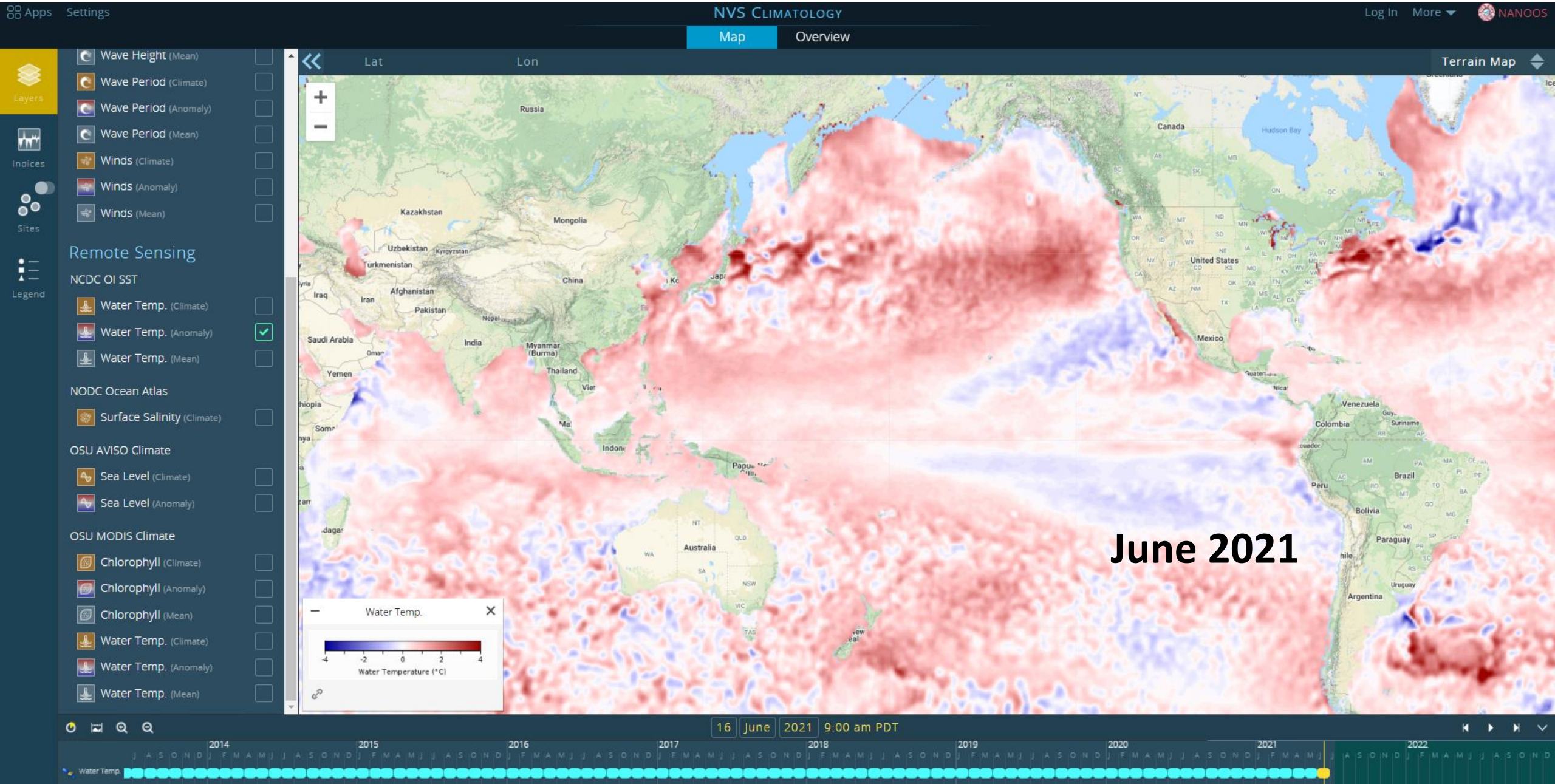
NOAA West Watch Update 20 July 2021:  
Washington / Oregon Observations

*Jan Newton, NANOOS Executive Director*

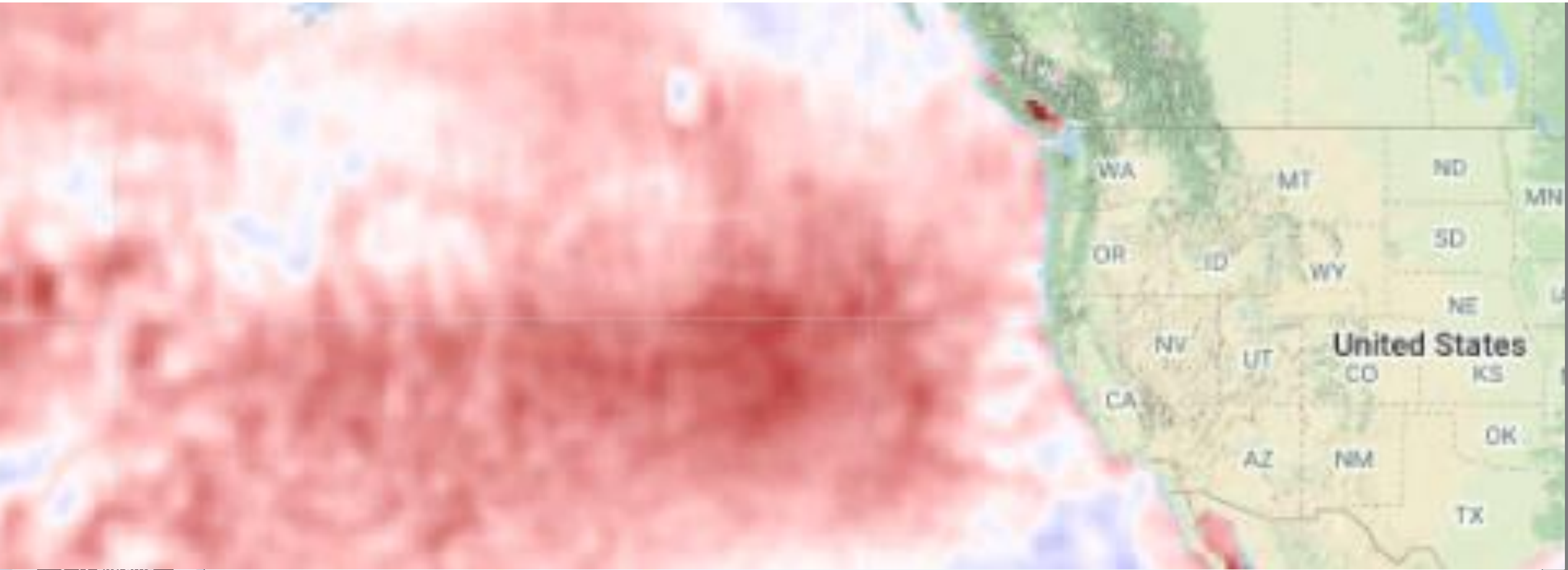








# Marine heatwave tracker



# Marine heatwave tracker

## MENU

### Controls

2021-07-14

Animate

Map layer ▾

Map data ▾

Background ▾

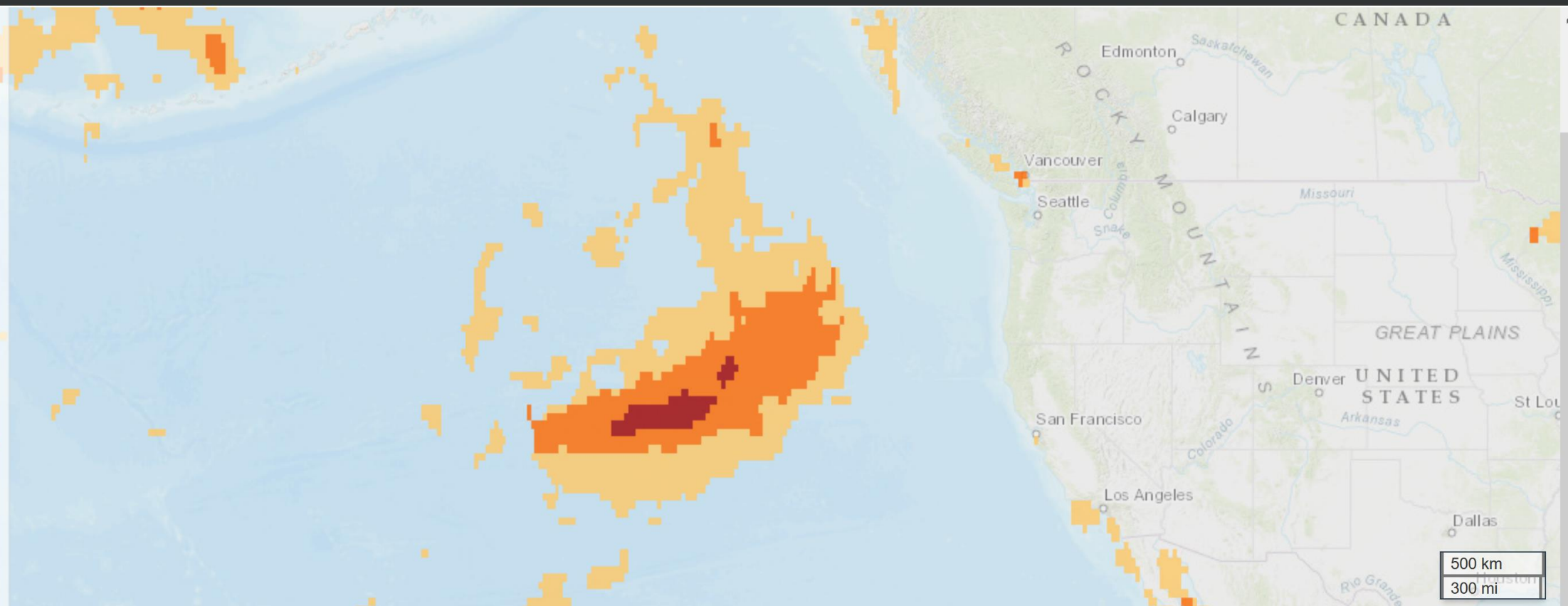
Coordinates ▾

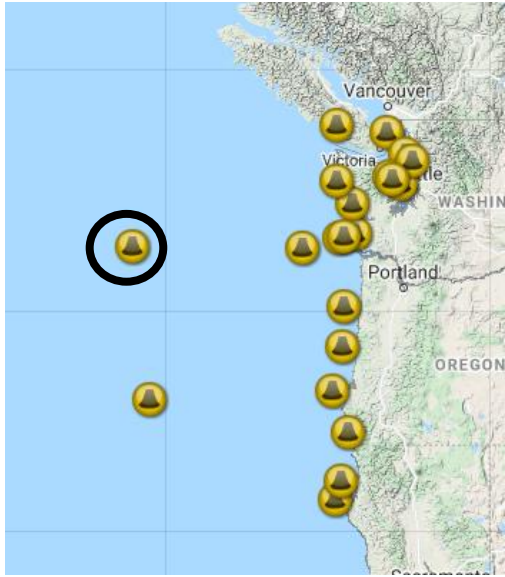
✓ I Moderate

✓ II Strong

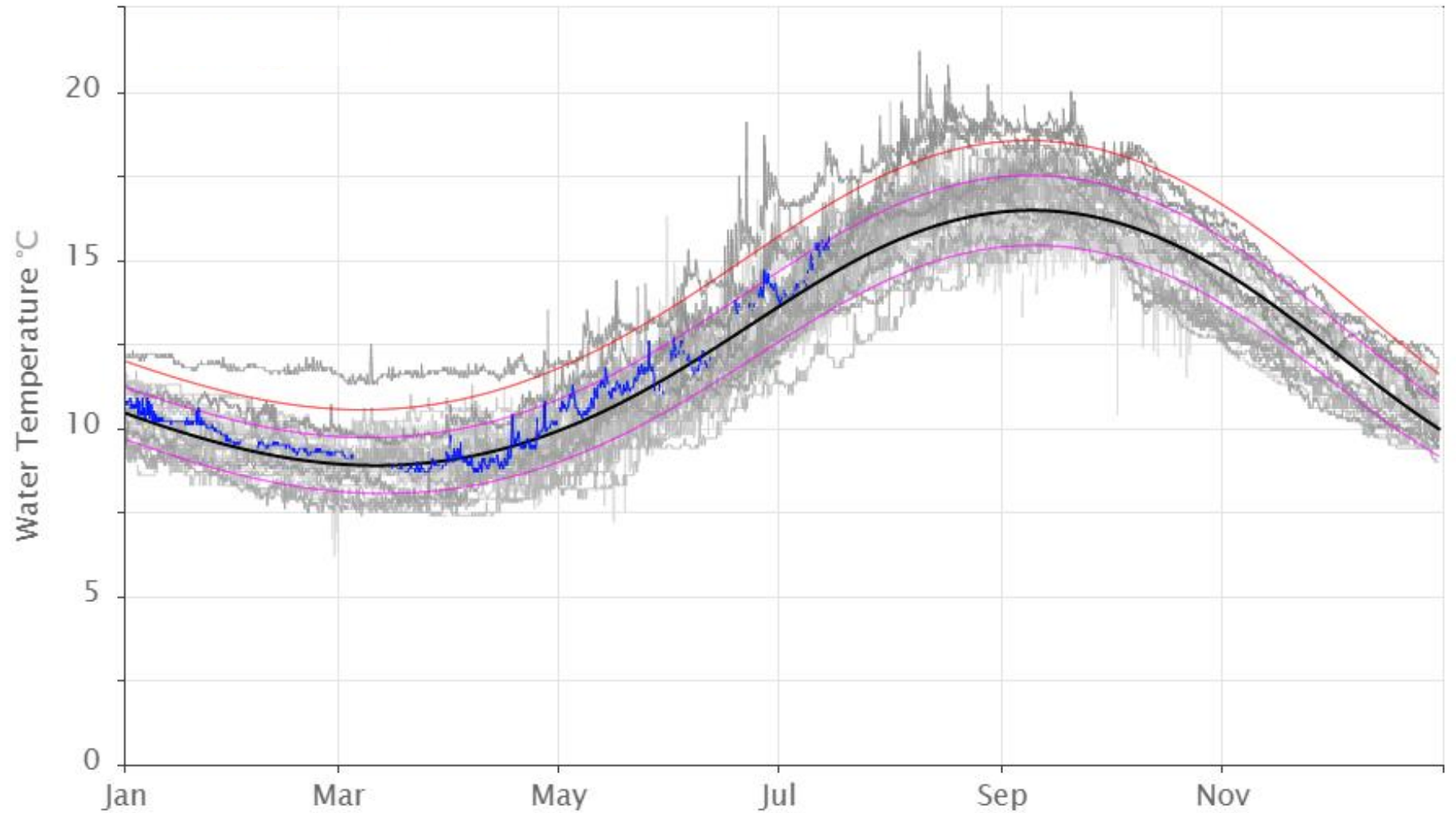
✓ III Severe

✓ IV Extreme



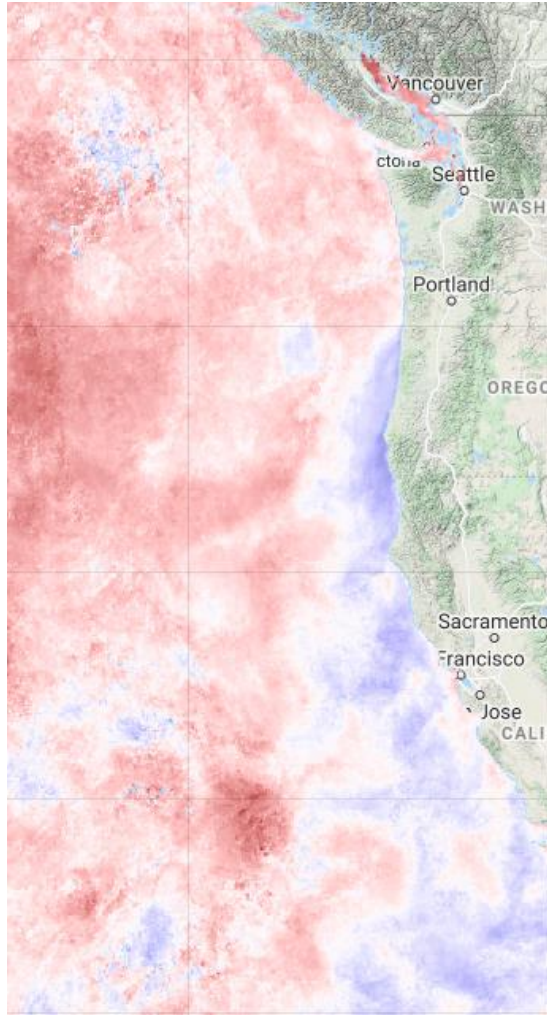


### NDBC Washington

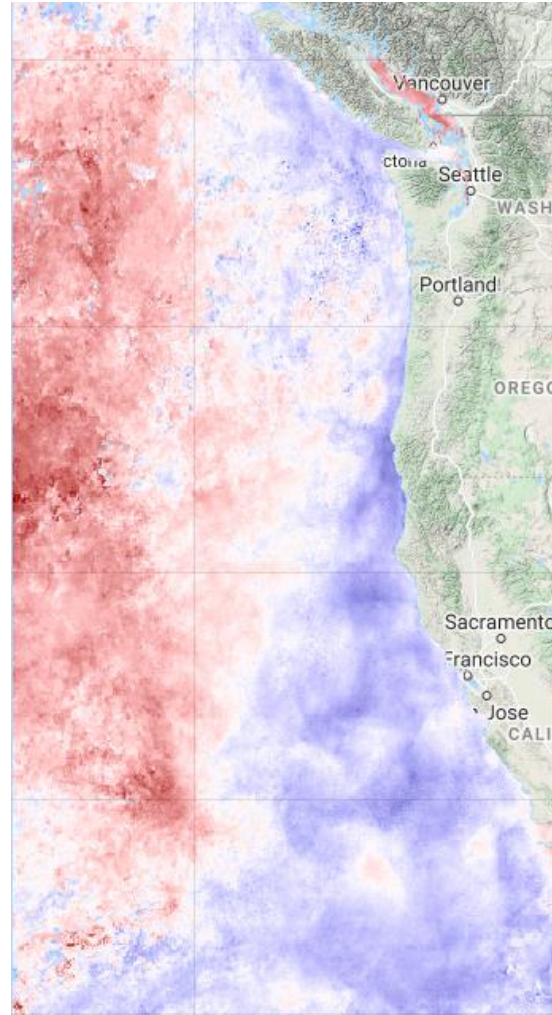


- Seasonal Cycle  
n=45 Yrs
- -1 STD
- +1 STD
- +2 STD
- 2021

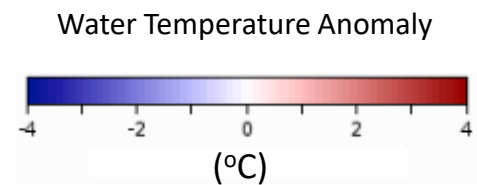
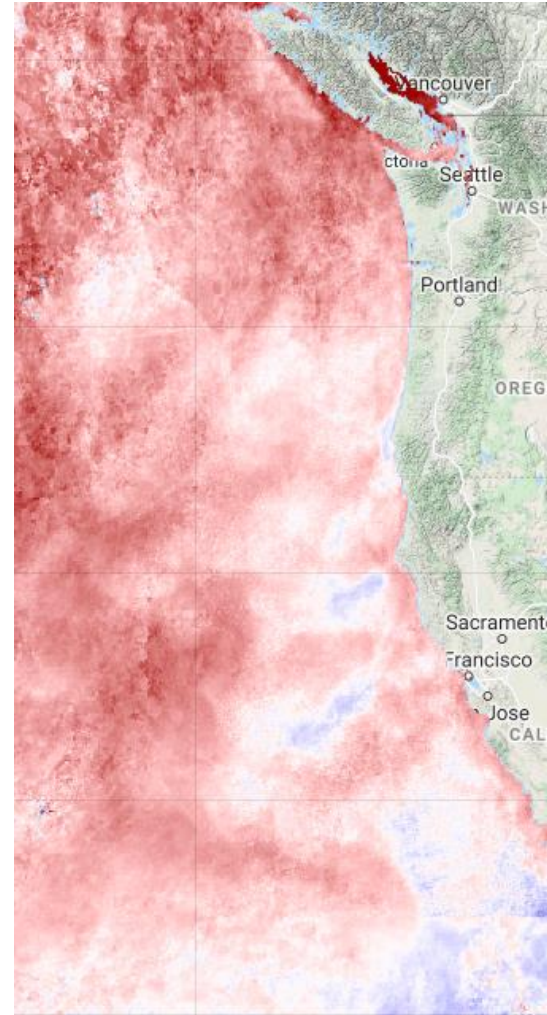
April 2021



May 2021



June 2021



# Office of the Washington State Climatologist

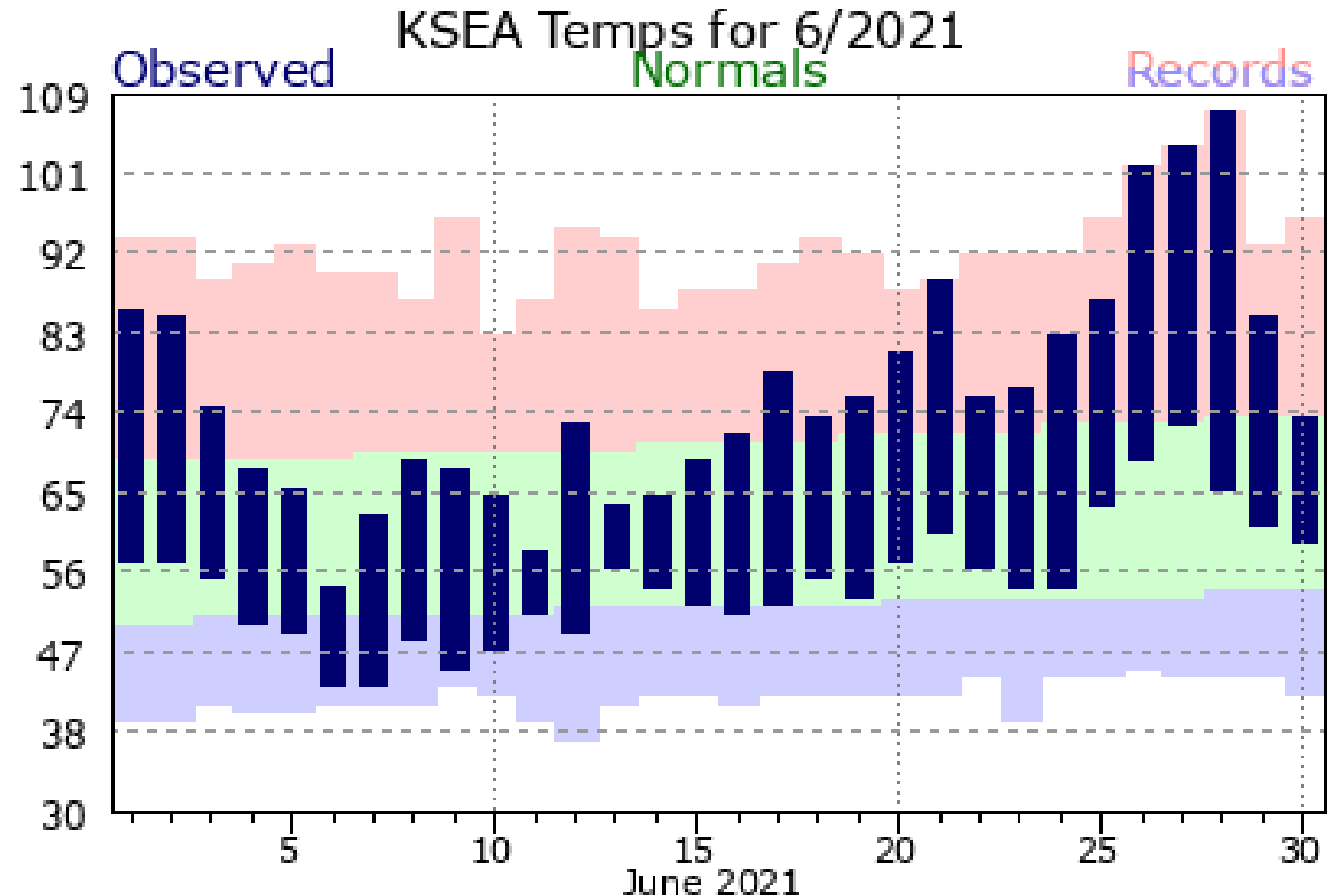
## July 2021 Report and Outlook

July 8, 2021

<http://www.climate.washington.edu/>

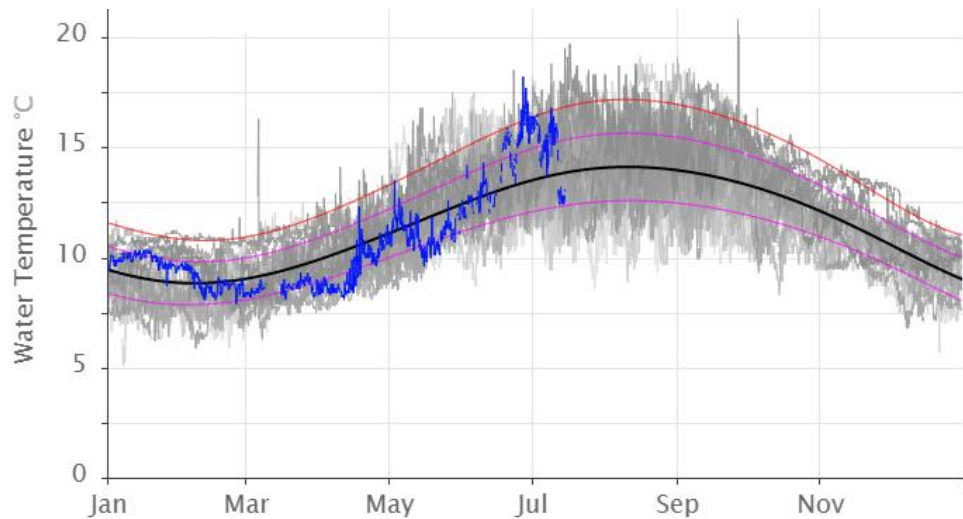
### ***PNW Heat Dome:***

“Temperatures soared across the state from the **25th through the 30th June** as an extremely strong ridge of high pressure set up over our region. This ridge is a classic and notable feature of our PNW heat waves, but the strength of the ridge (at least as measured by the upper air sounding at Quillayute) was unprecedented in the record.”

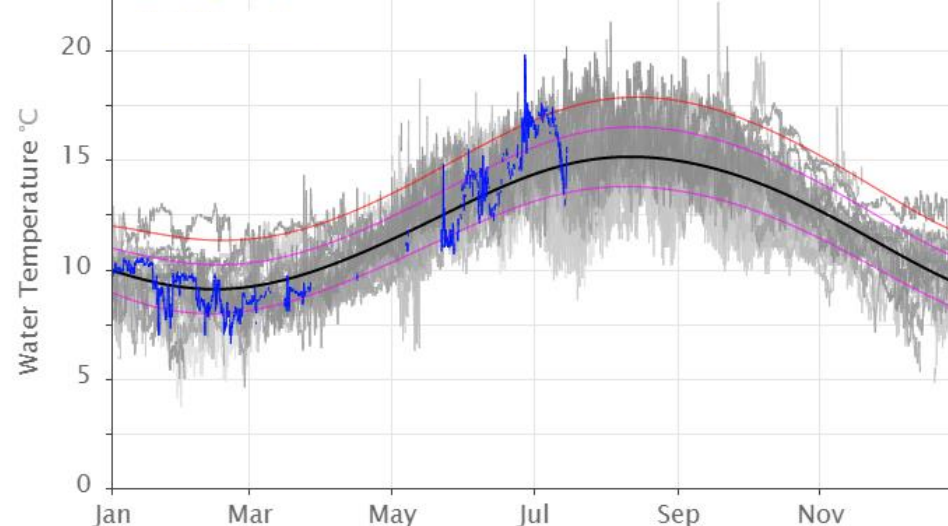


# Sea Surface Temperature

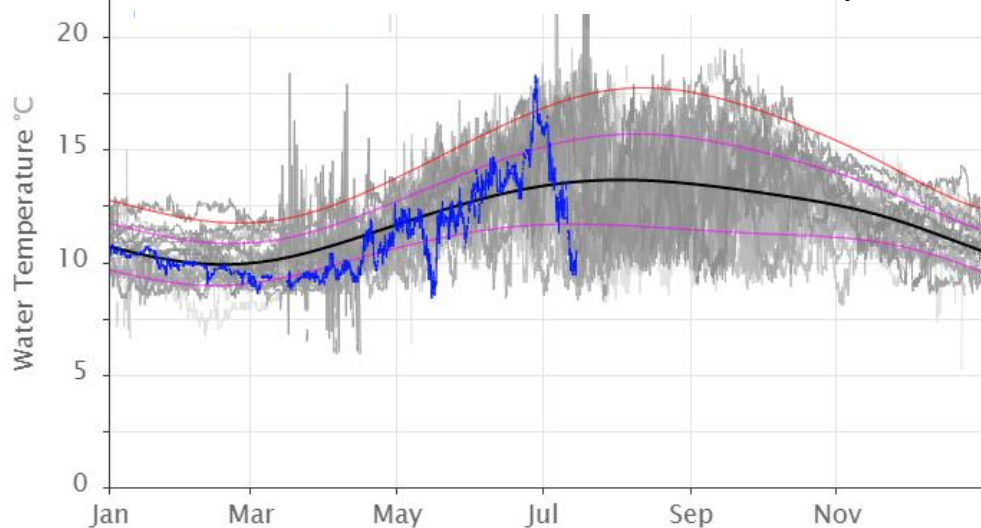
NDBC Cape Elizabeth ● 34 yrs



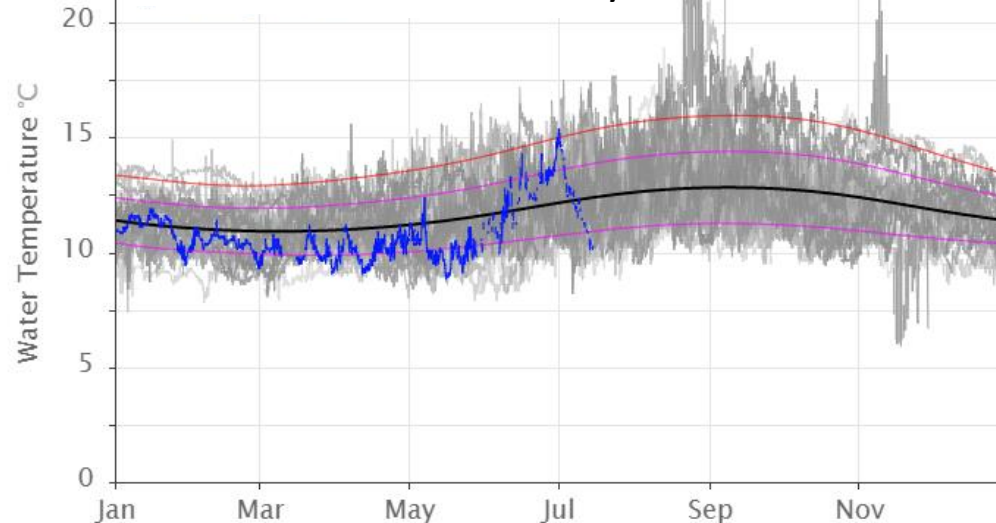
NDBC Columbia River Bar ● 37 yrs



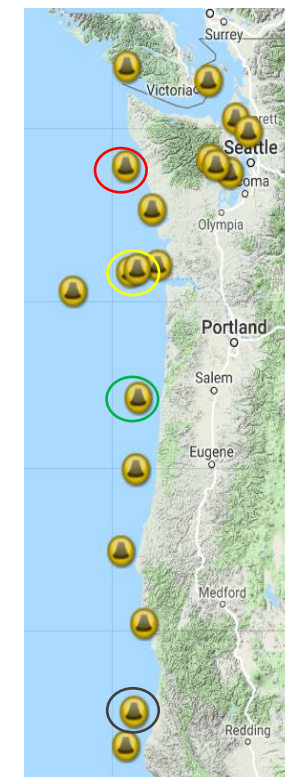
NDBC Stonewall Bank ● 34 yrs



NDBC Eel River ● 39 yrs

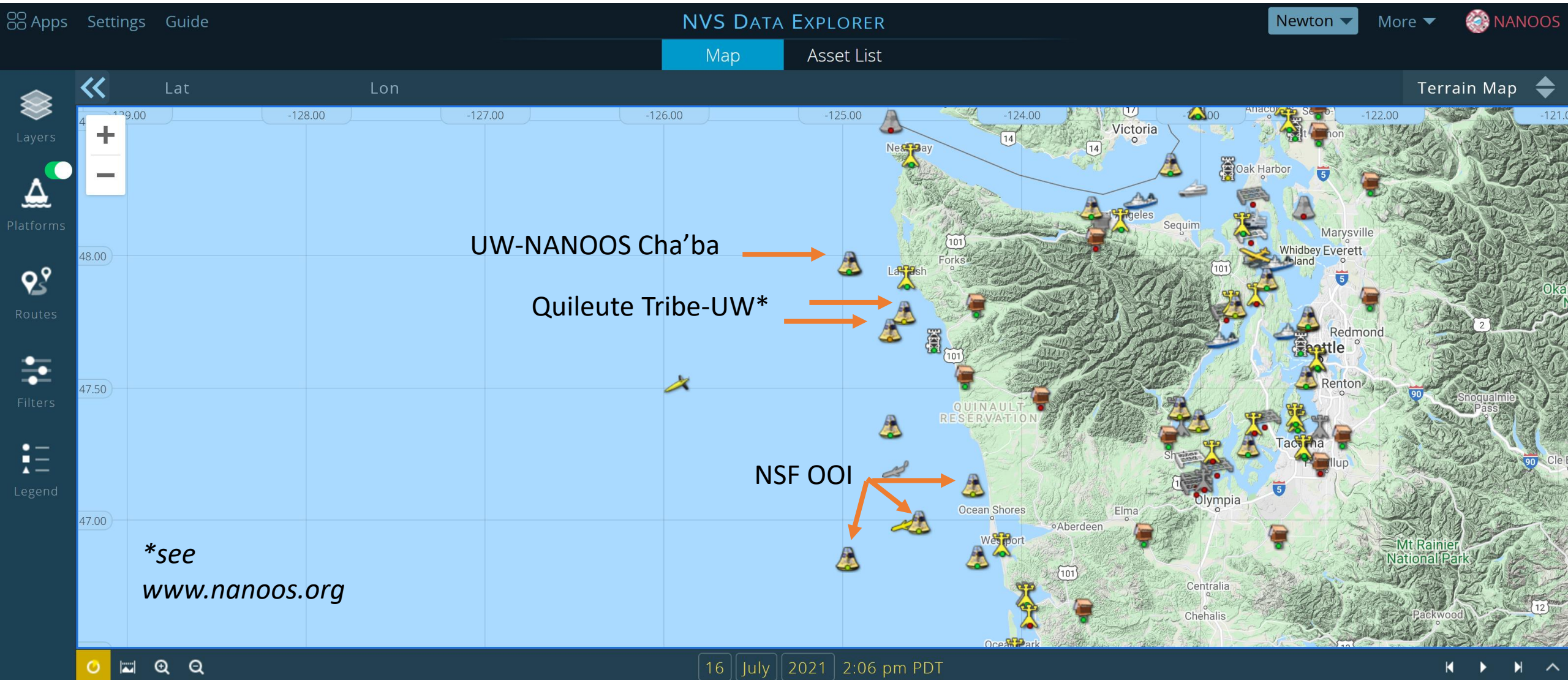


- Seasonal Cycle n=34 Yrs
- -1 STD
- +1 STD
- +2 STD
- 2021

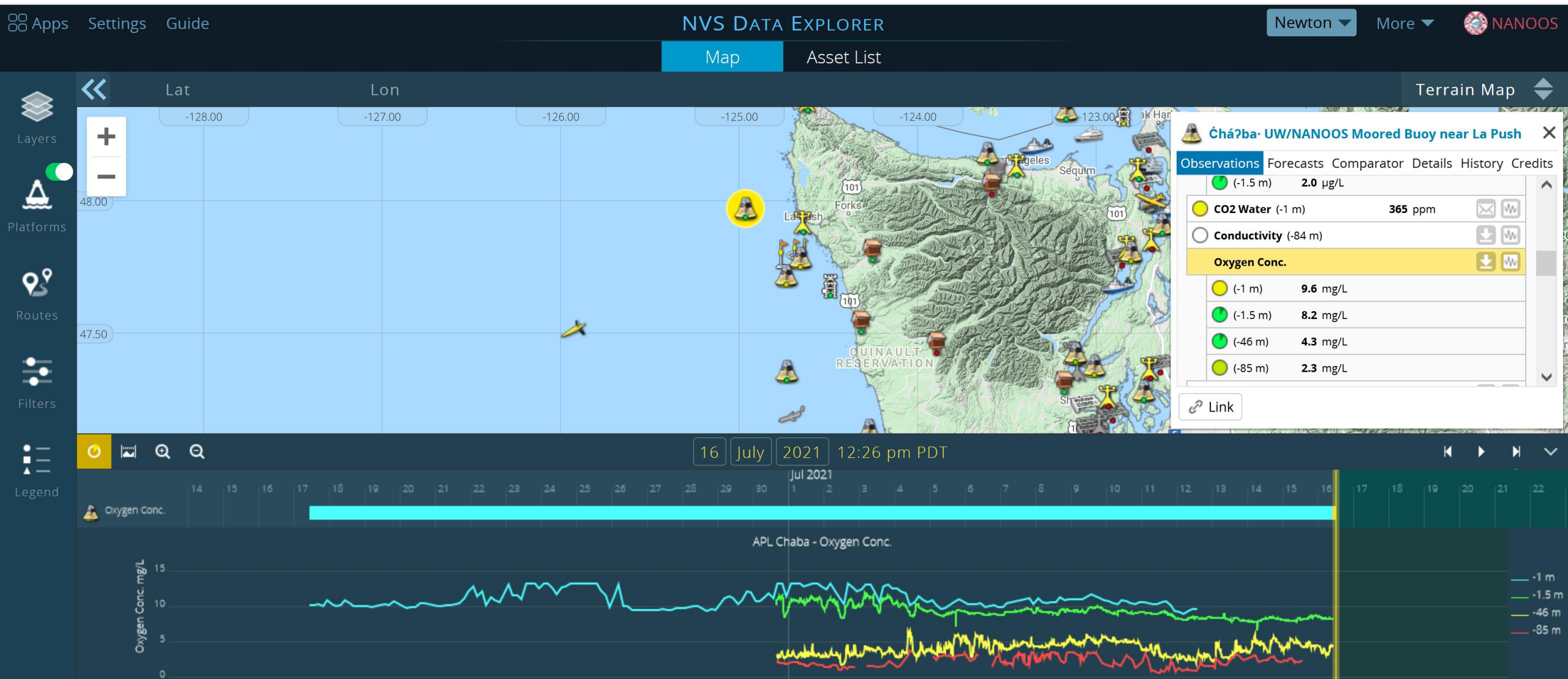




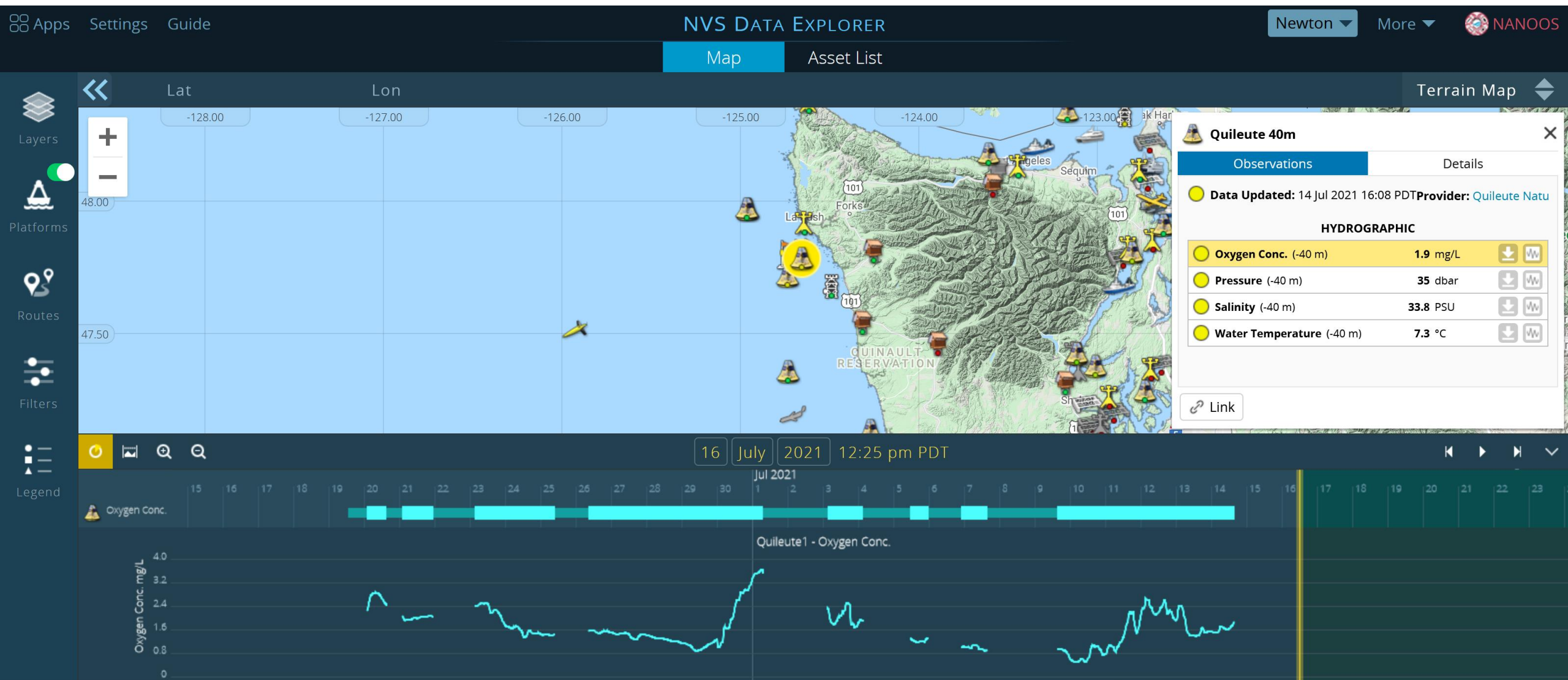
# PNW Coastal Moorings with Real-Time Oxygen



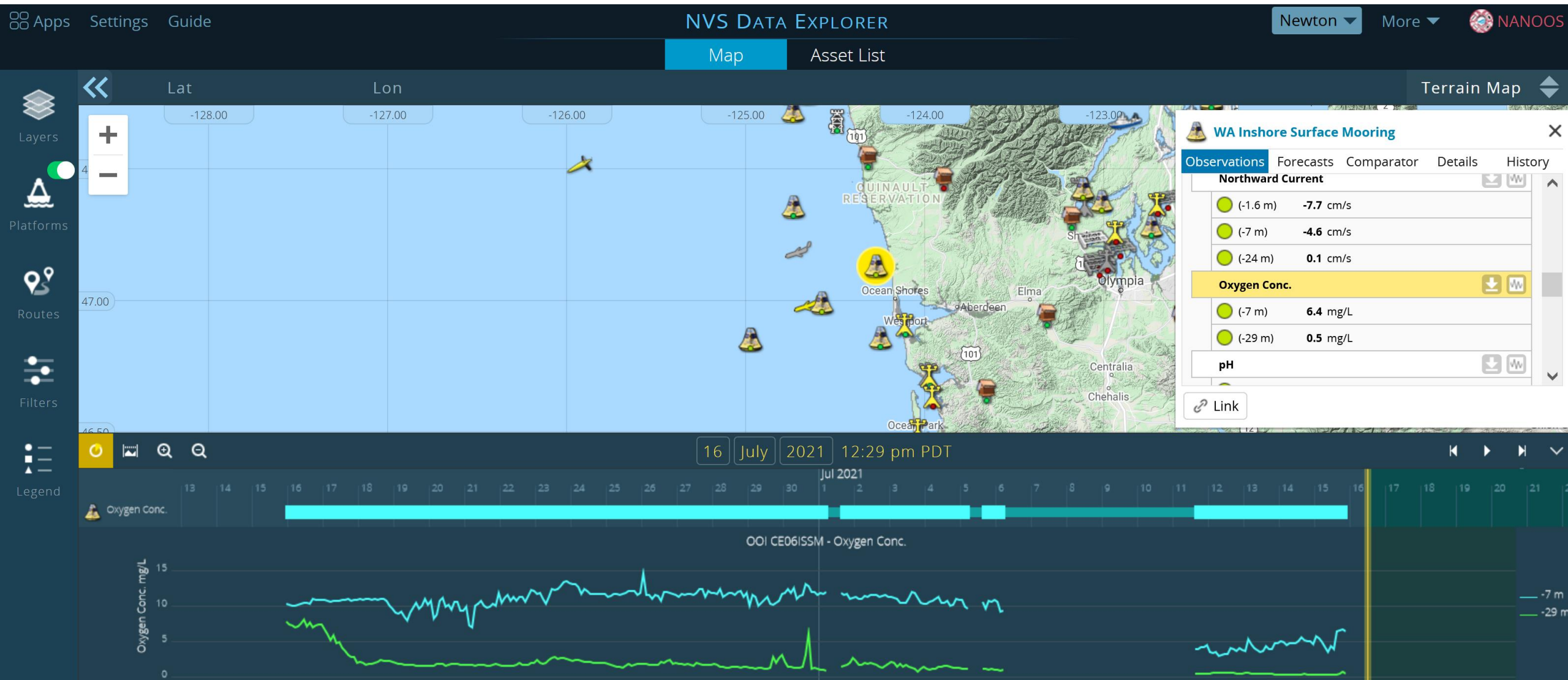
# Cha'ba: 100 m water depth, 85 m sensor



# Quileute Indian Tribe: on seabed; 40 m sensor

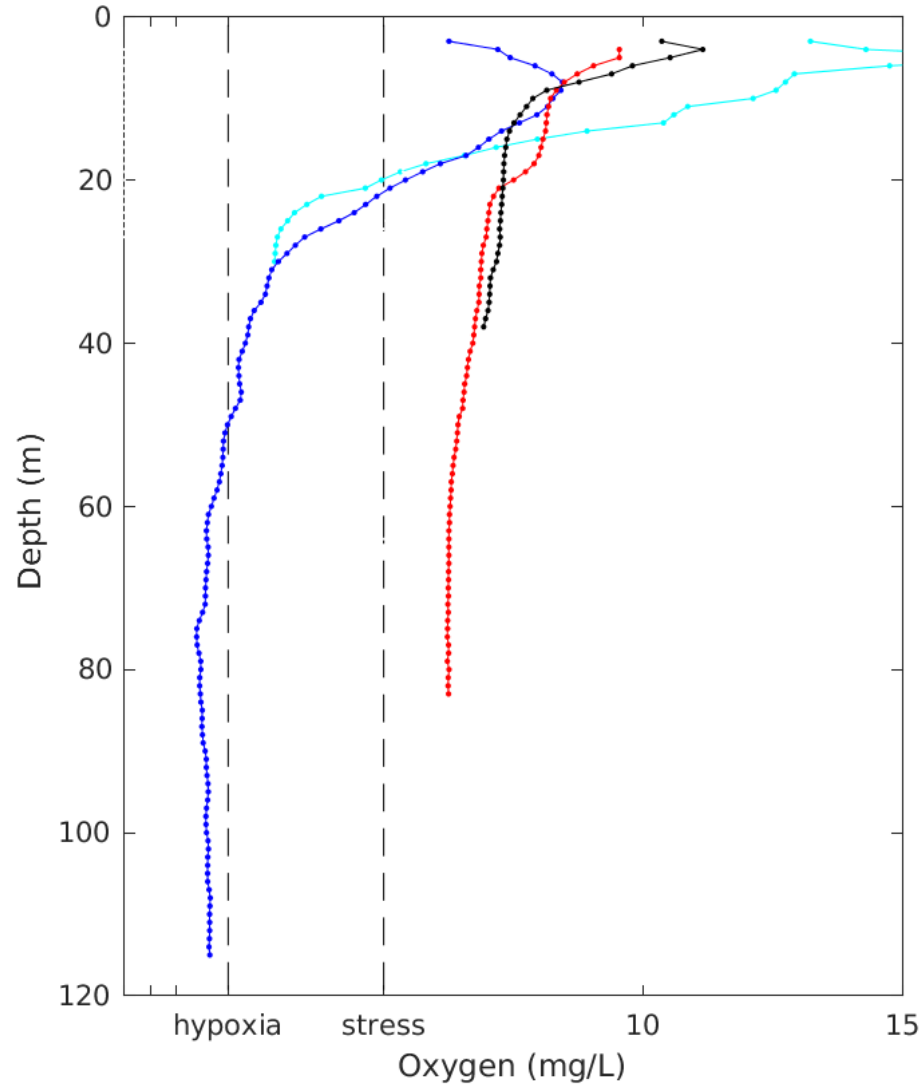


# NSF OOI WA Inshore: 29 m water depth/sensor



# Puget Sound profiling buoys

## Dissolved Oxygen

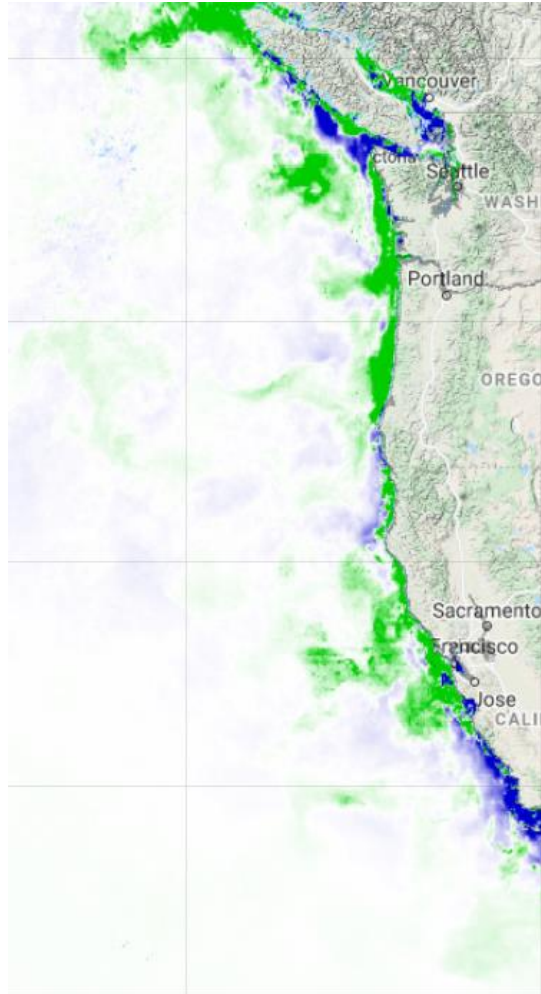


- — hypoxia (2 mg/L)
- — biological stress (5 mg/L)
- Twanoh (South Hood Canal), 16-Jul-2021 06:16:57
- Hoodsport (South Hood Canal), 16-Jul-2021 00:24:42
- No recent Dabob Bay (North Hood Canal) profile
- Hansville (near Admiralty Inlet), 16-Jul-2021 00:22:39
- Carr Inlet (South Sound), 16-Jul-2021 00:17:53
- No recent Point Wells (Main Basin) profile

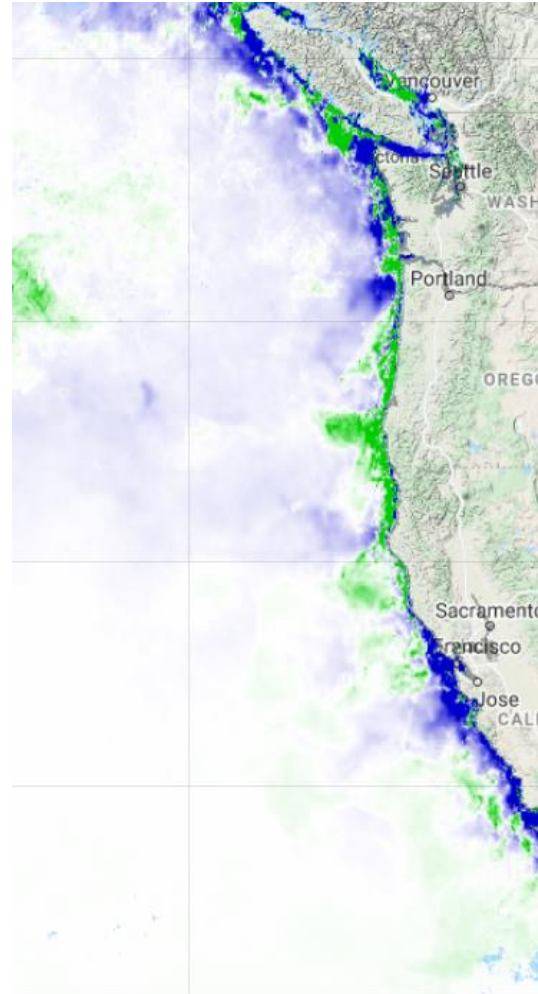
# Chlorophyll Anomaly

OSU Modis

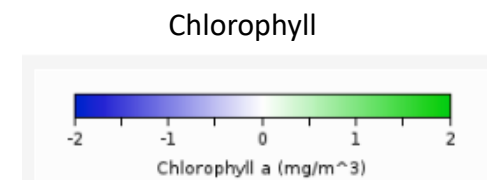
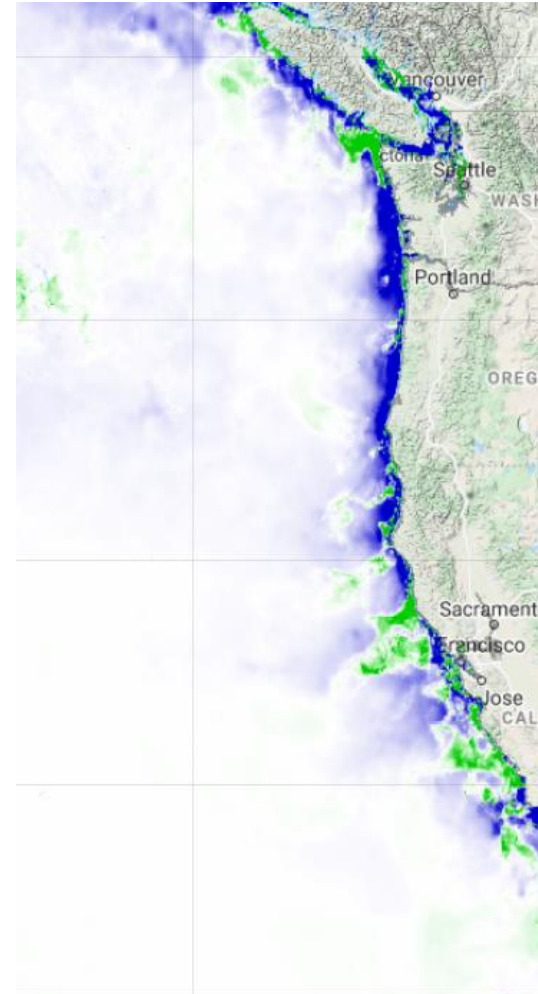
April 2021



June 2021



July 2021



*To summarize, right now we have:*

- Heat
- Hypoxia
- But also, real-time data with which to visualize and track these conditions, allowing informed responses.



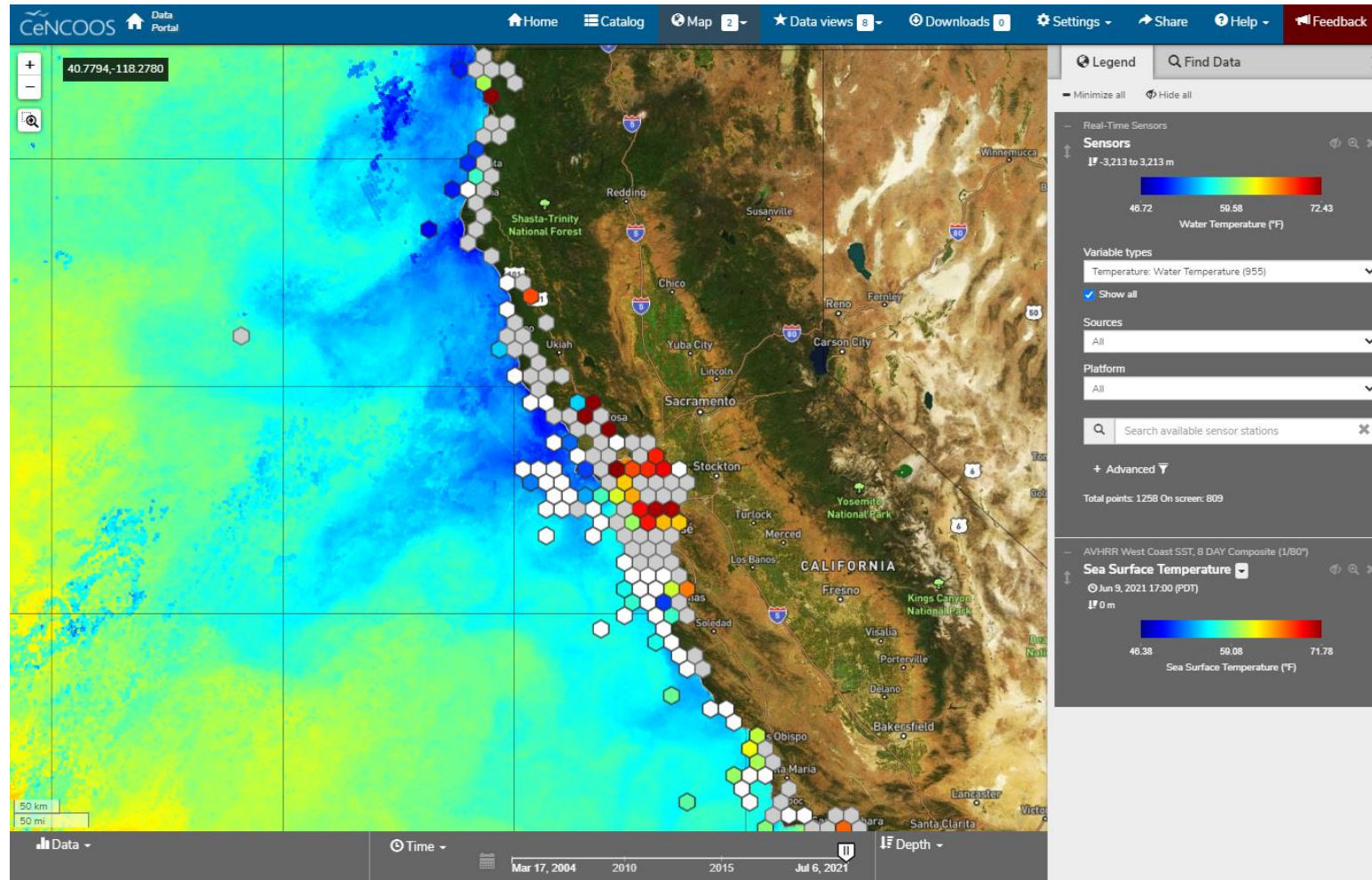
[www.nanoos.org](http://www.nanoos.org)





CENTRAL & NORTHERN  
**CALIFORNIA OCEAN  
OBSERVING SYSTEM**

# NOAA West Watch Update: July 2021



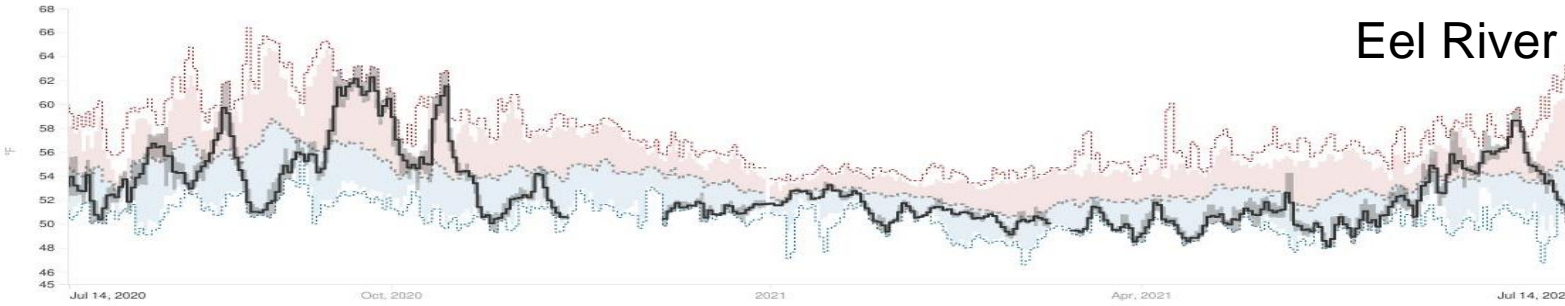


NOAA National Data Buoy Center (NDBC)  
46022 - EEL RIVER - 17NM WSW of Eureka, CA  
Temperature: Water Temperature

Time bin : days

Eel River

Sea Surface Temperature



NOAA National Data Buoy Center (NDBC)  
Monterey - 27 NM WNW of Monterey, CA (46042)  
Temperature: Water Temperature

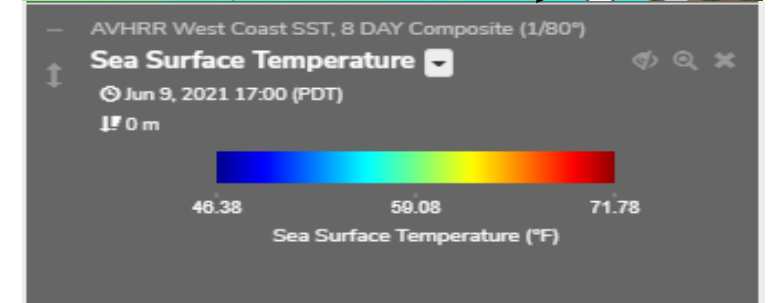
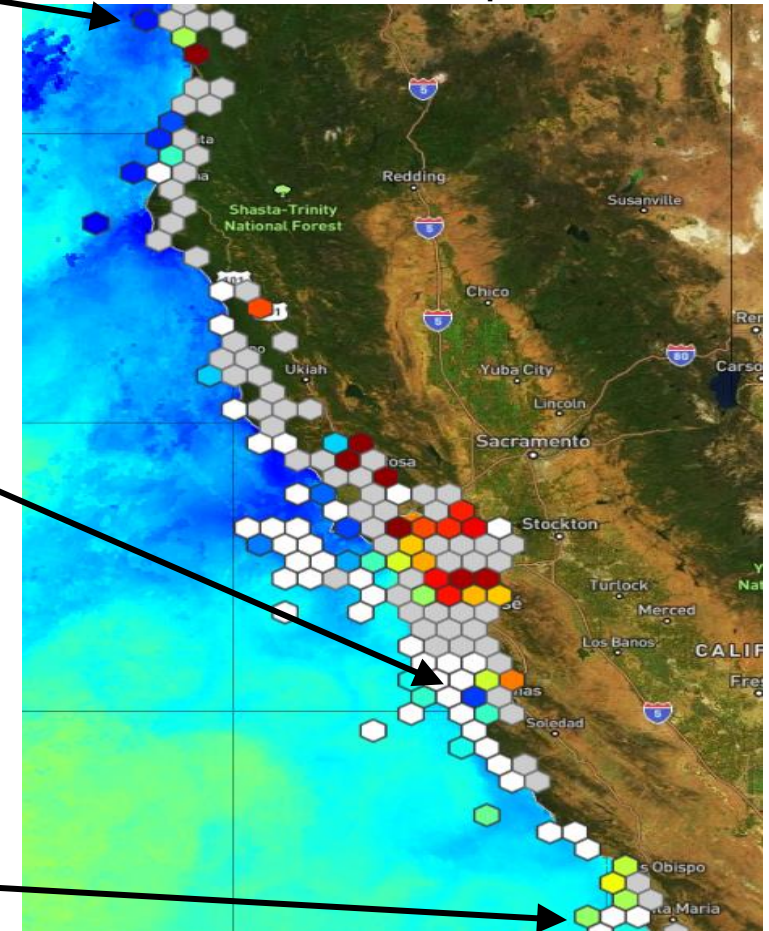
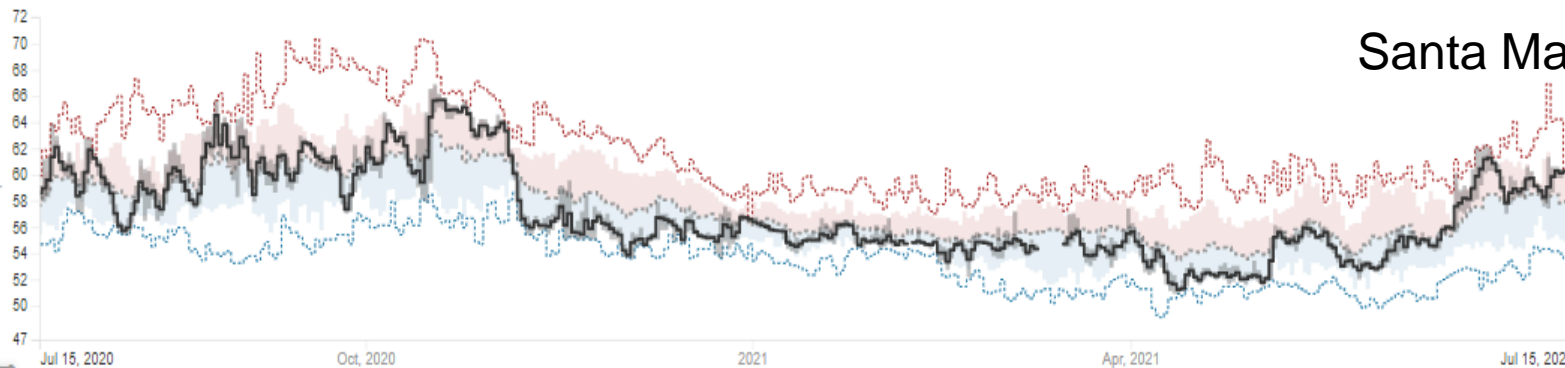
Time bin : days

Monterey

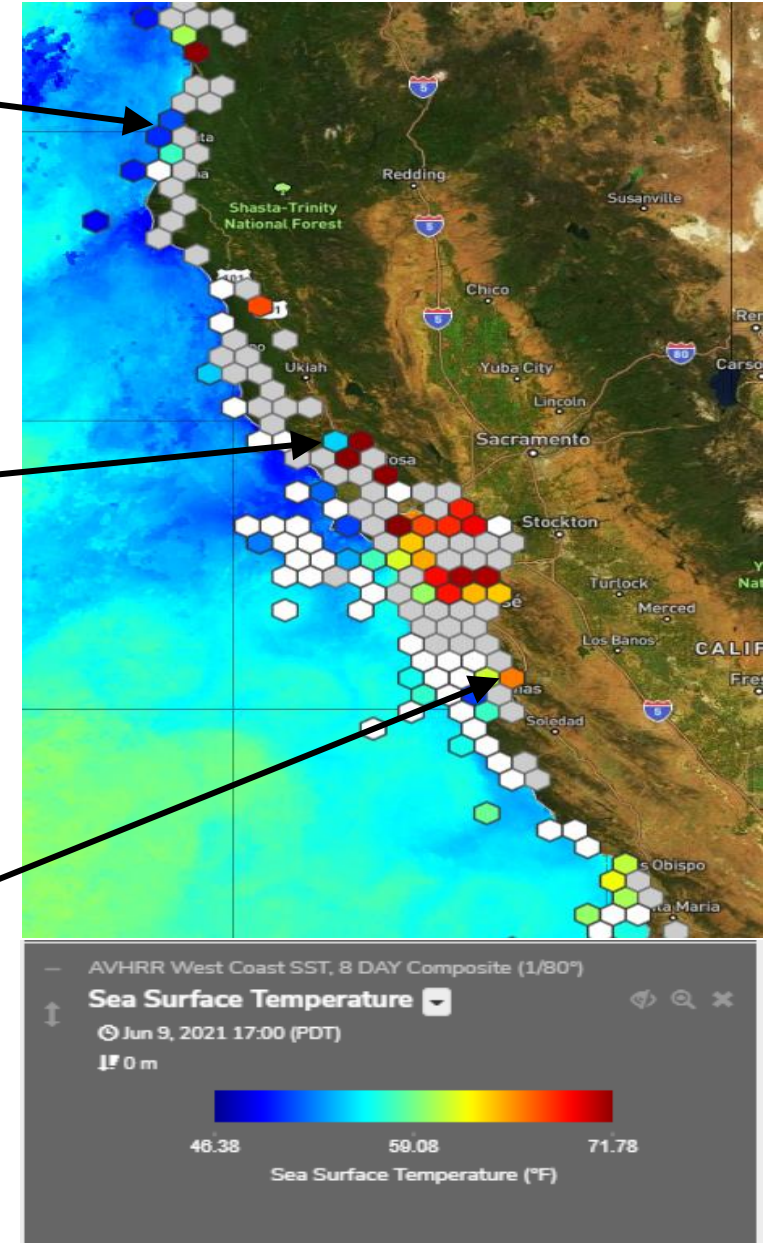
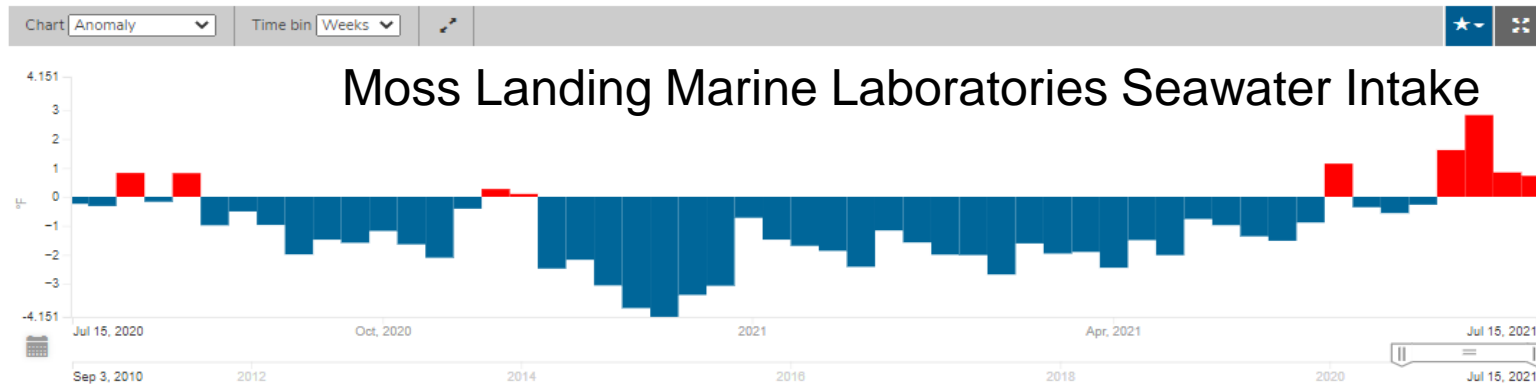
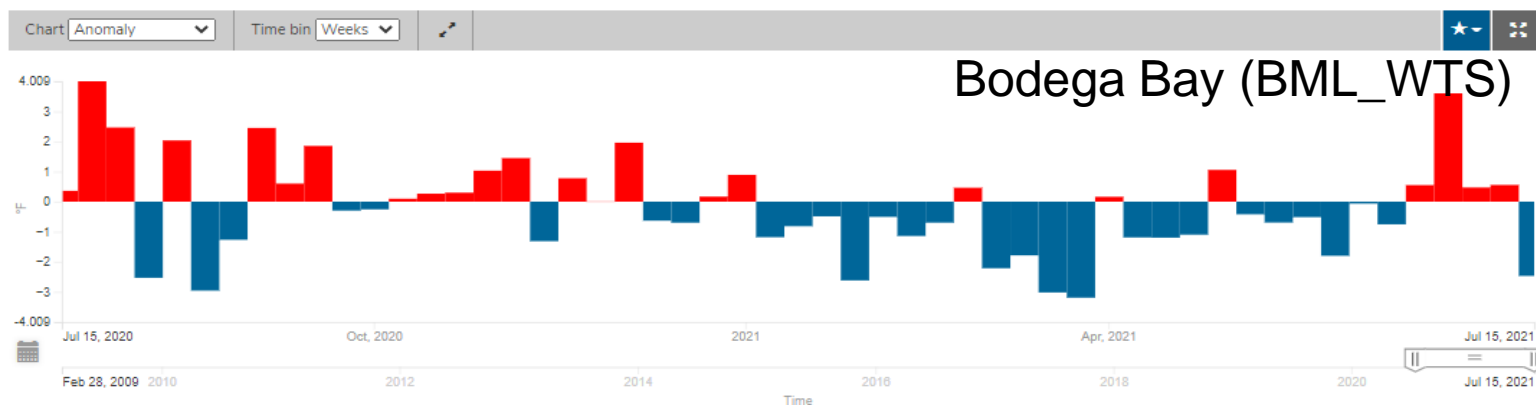
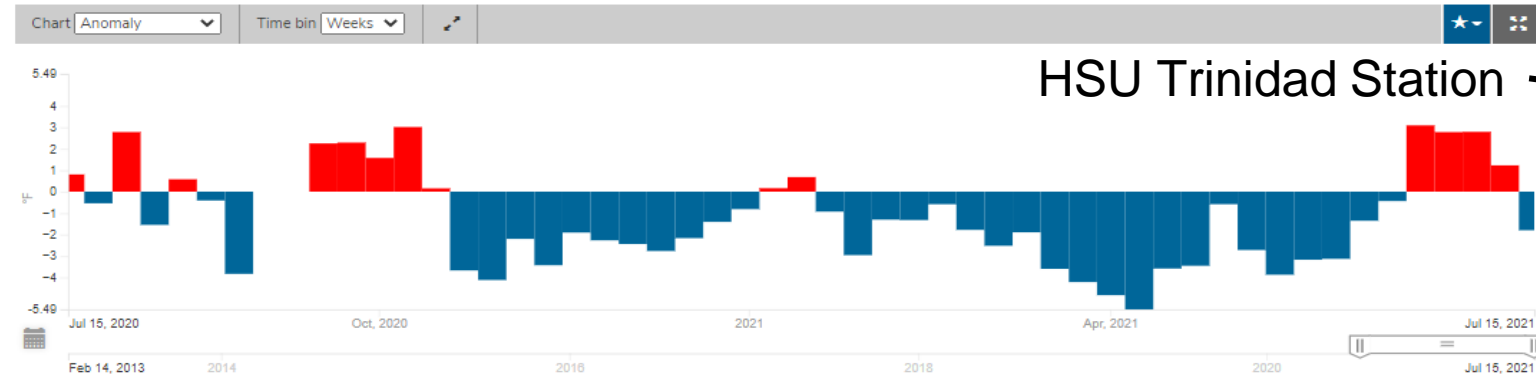


NOAA National Data Buoy Center (NDBC)  
Santa Maria - 21 NM NW of Point Arguello, CA (46011)  
Temperature: Water Temperature

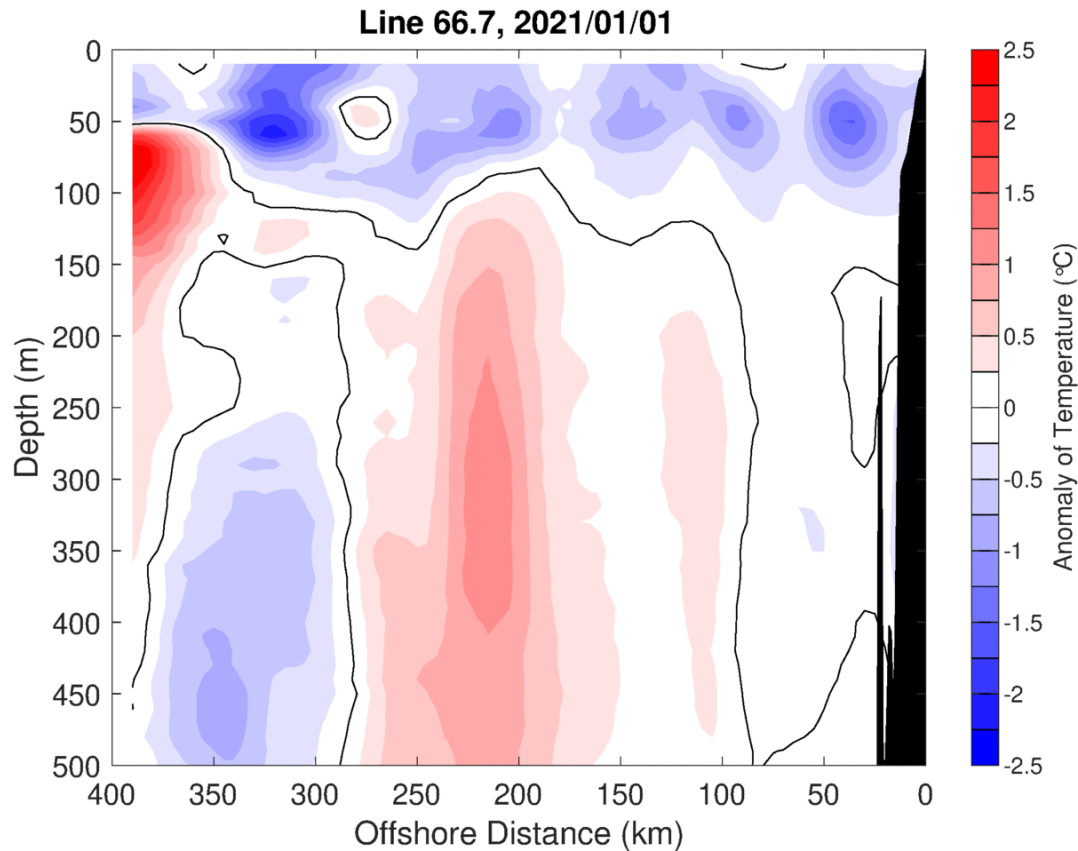
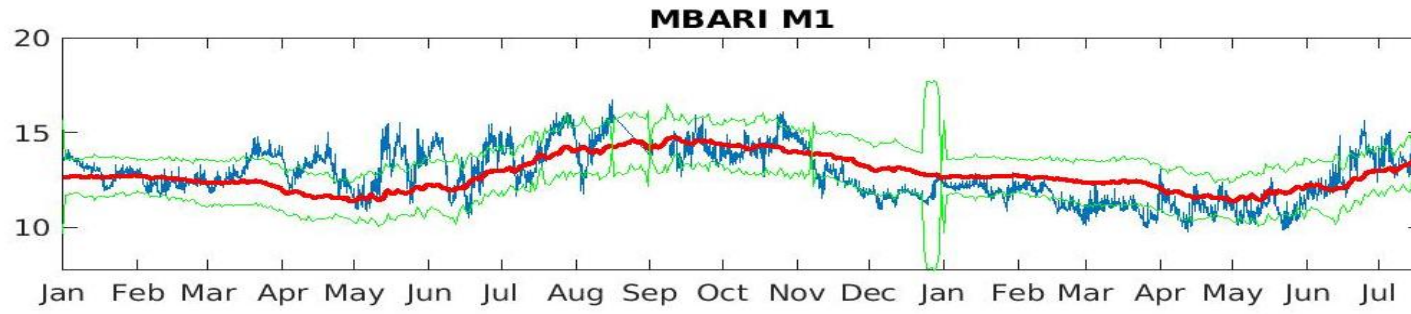
Santa Maria



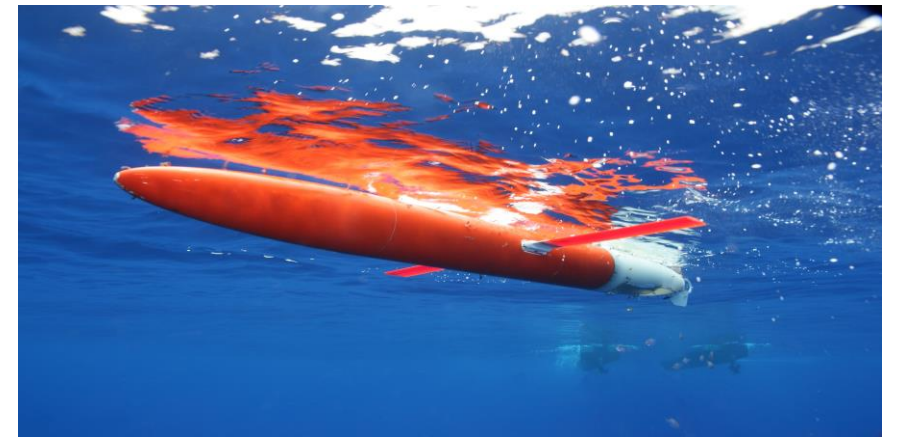
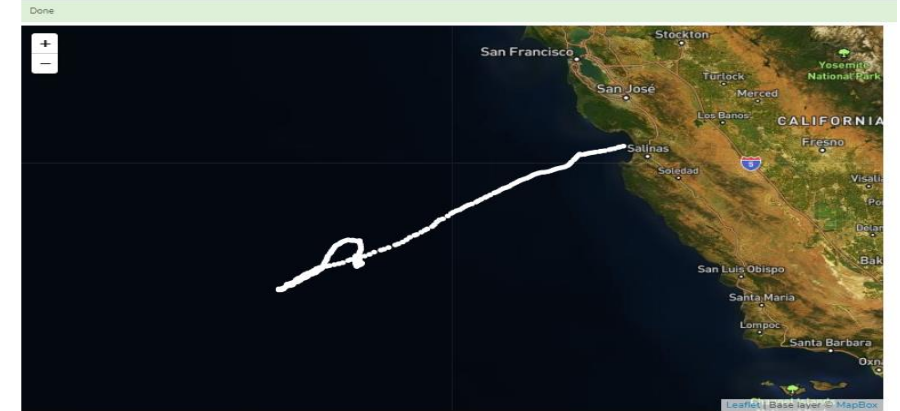
# Temp Anomaly: Shore Sta.



# M1 and Line 67

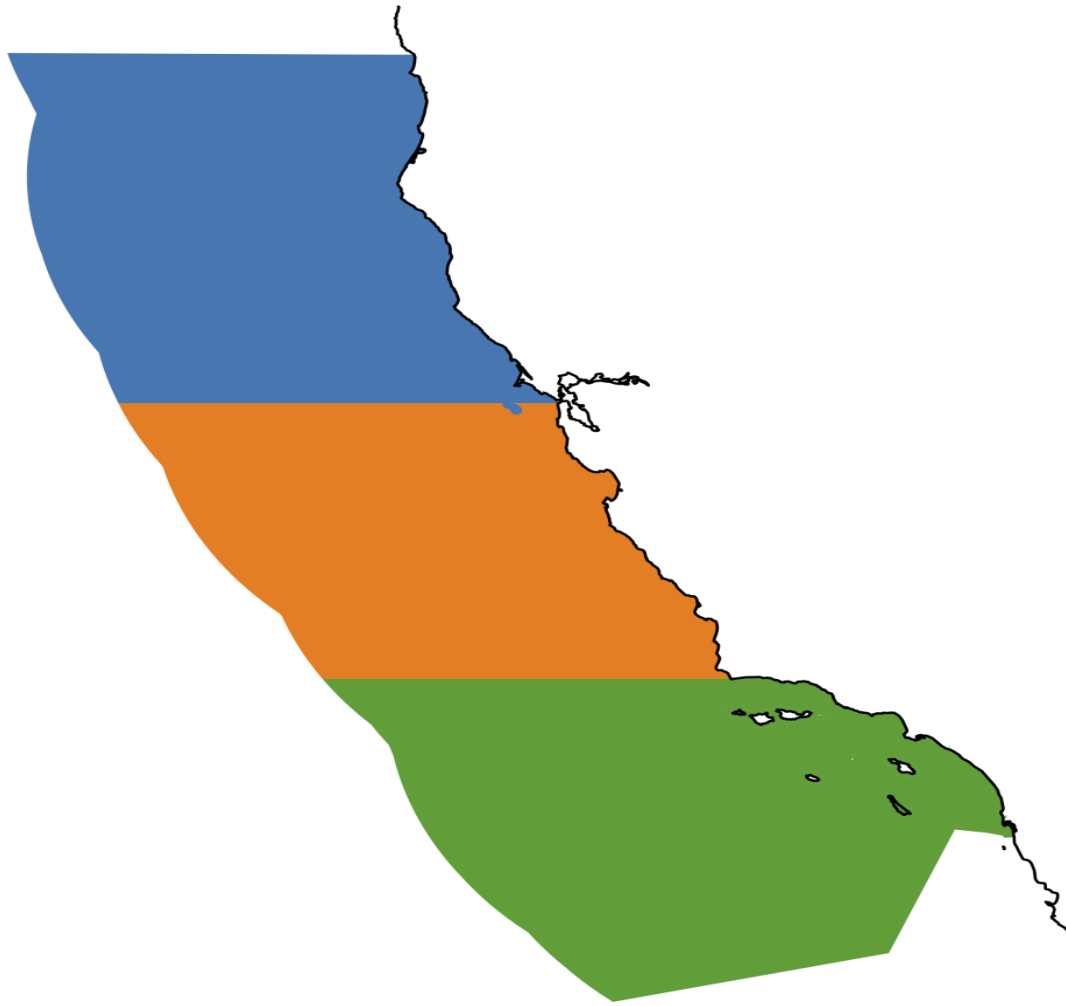


sp040-20210218T2325 (platform)

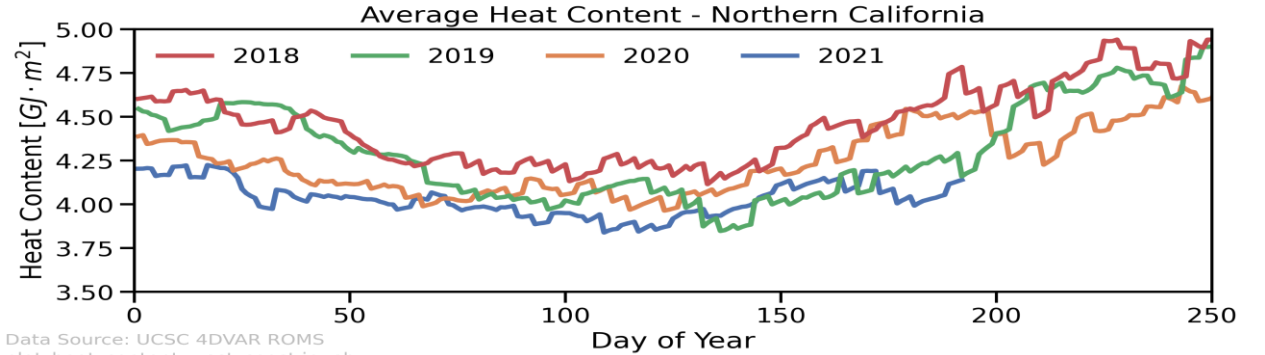


# Ocean Heat Content

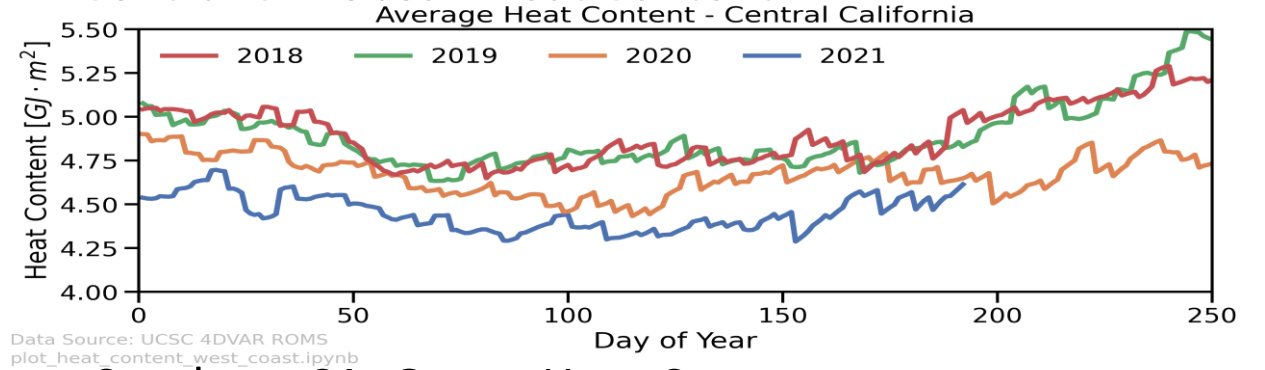
## California MPA Bioregions



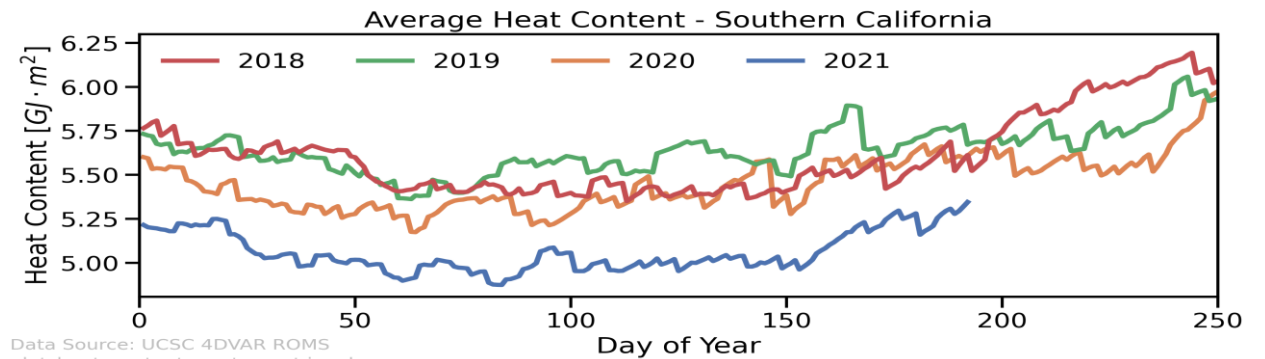
### Northern CA: Ocean Heat Content



### Central CA: Ocean Heat Content



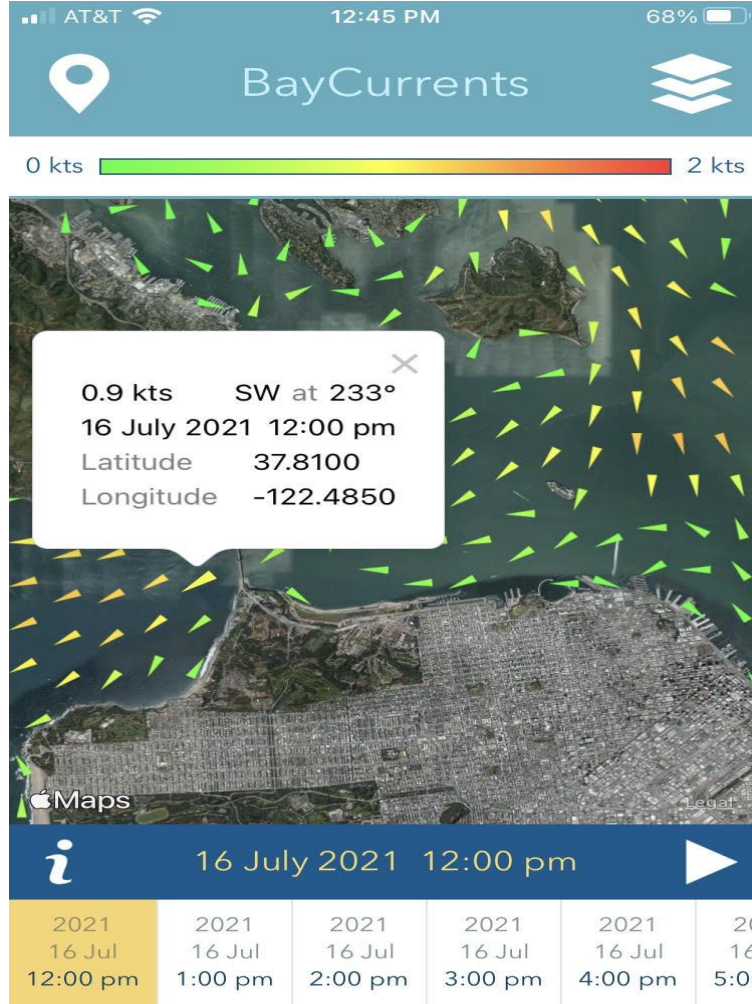
### Southern CA: Ocean Heat Content



# SF BayCurrents App



**BayCurrents** is a mobile app for displaying maps of surface currents within the San Francisco Bay. The app is intended to support a wide range of maritime activities, from recreational fishing and sailing to the operation of professional transport vessels.



The source for the surface current data is SFBOFS operated by NOAA. The model assimilates oceanographic high-frequency radar (HFR) measurements from the CeNCOOS HFR Network, along with other observations such as tides and wind.

Sponsors





CENTRAL & NORTHERN  
**CALIFORNIA OCEAN  
OBSERVING SYSTEM**

Thank you

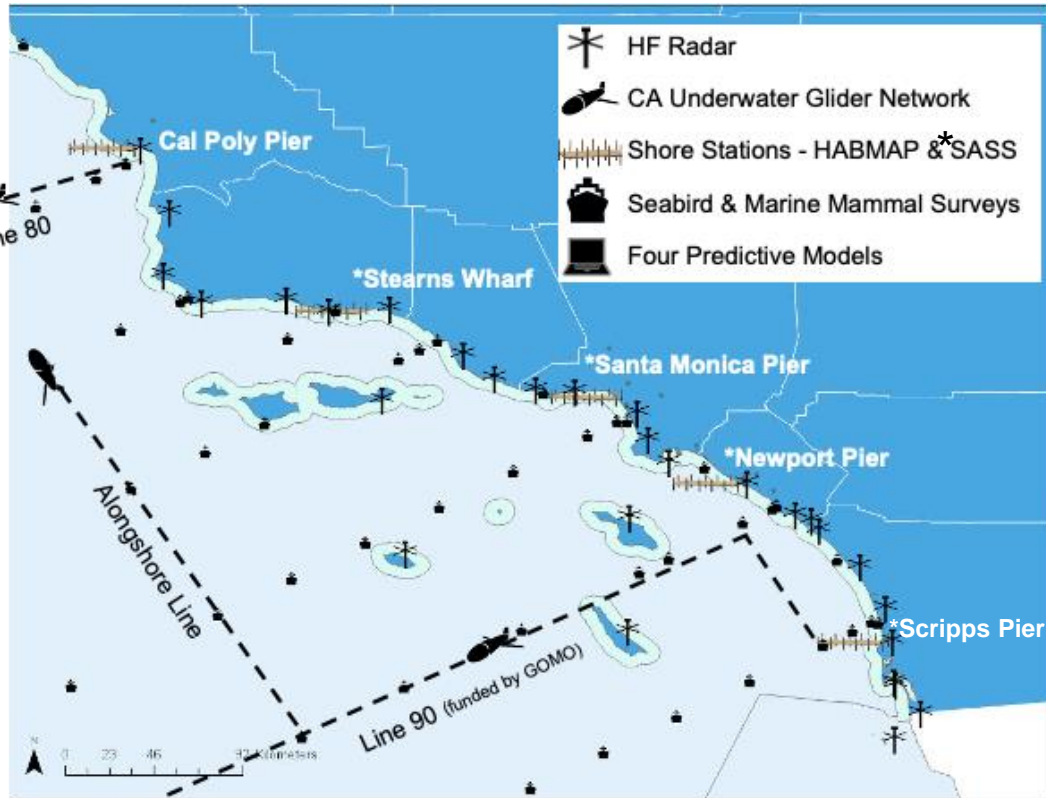
aharper@mbari.org

NOAA West Watch Update

July 2021

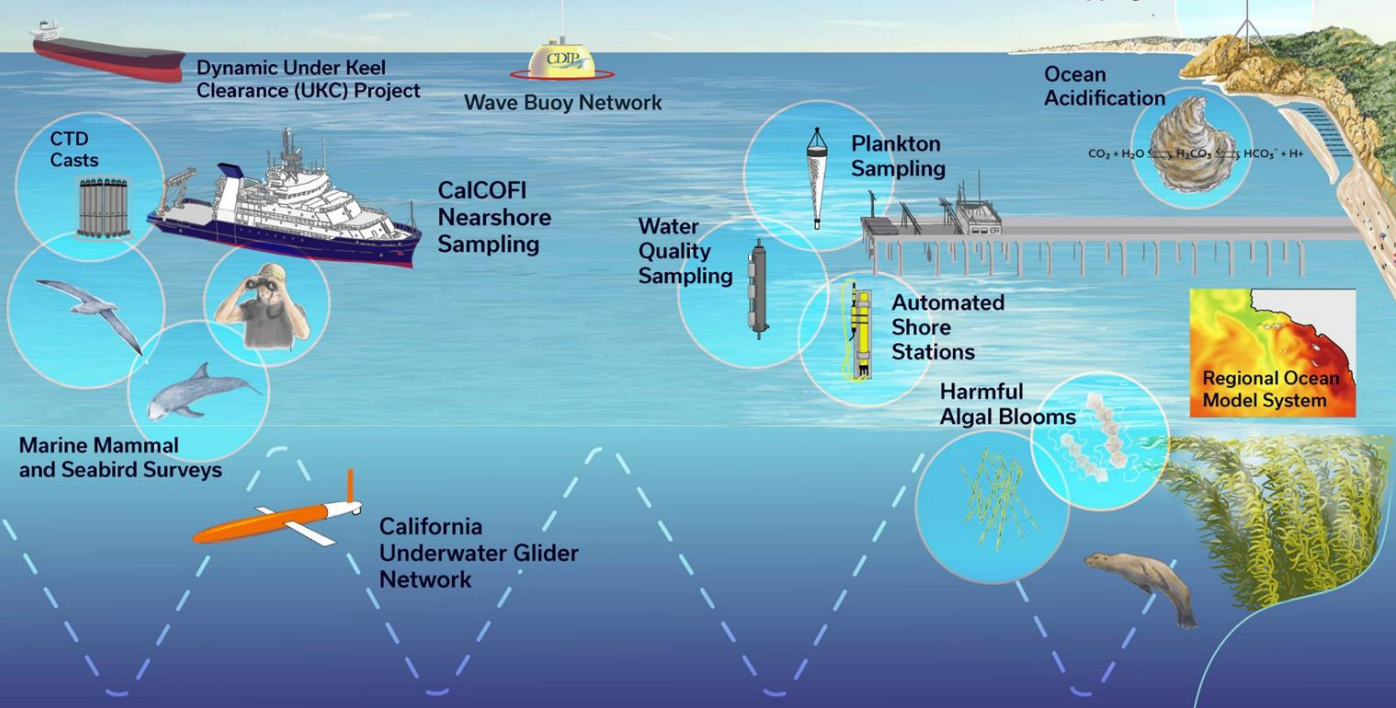


# SOUTHERN CALIFORNIA COASTAL OCEAN OBSERVING SYSTEM



## Southern California Coastal Ocean Observing System

SCCOOS is a Science-Based Decision Support System



## NOAA West Watch Webinar: Southern California

Megan Medina, SCCOOS Program Coordinator

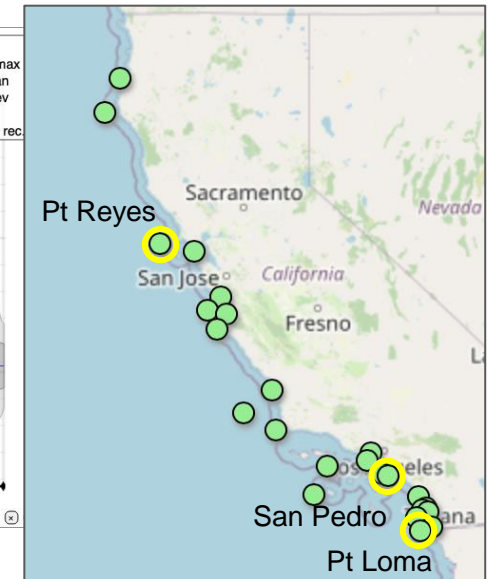
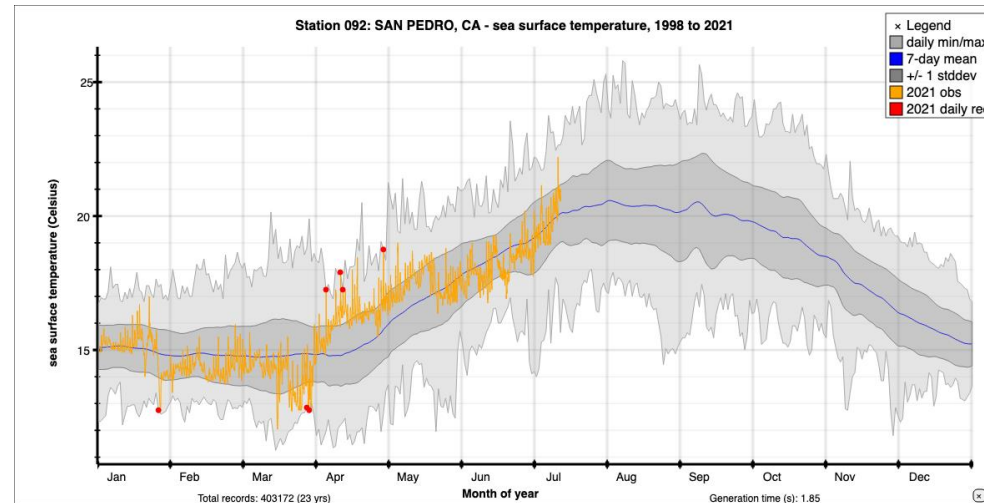
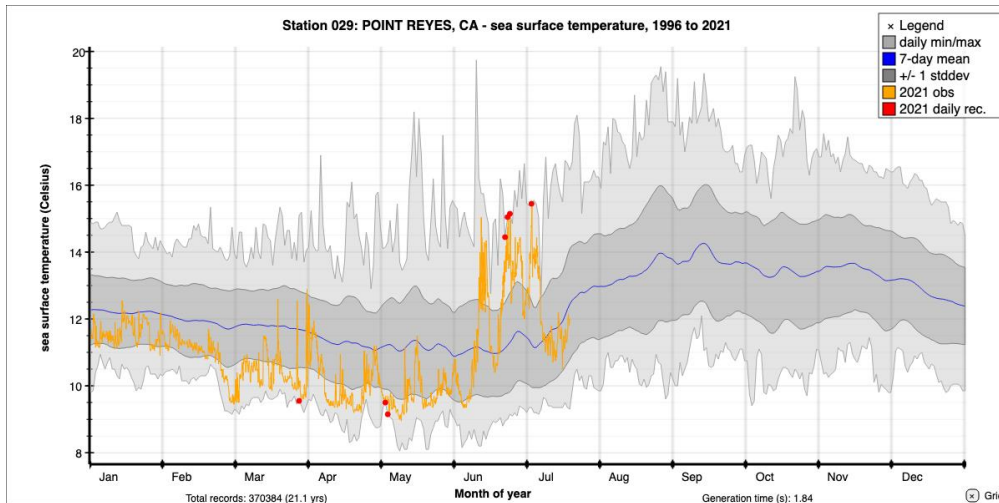
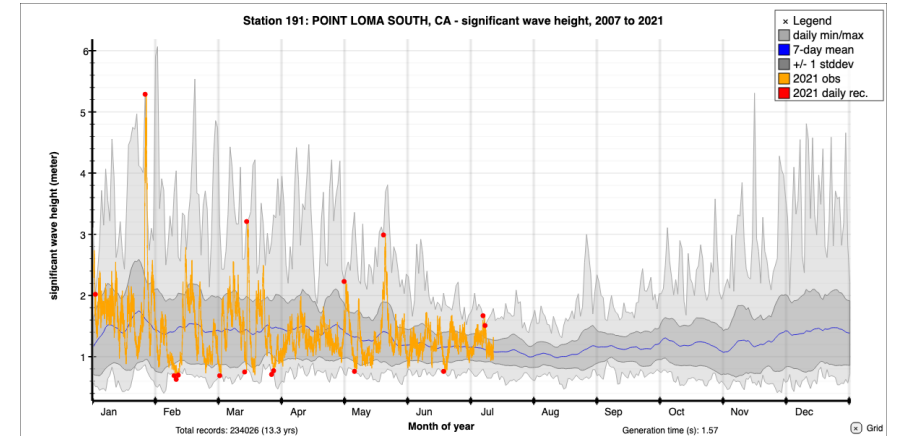
20-Jul 2021

# Coastal Data Information Program (CDIP)

California wave activity in 2021 has been following the long term climate trend.

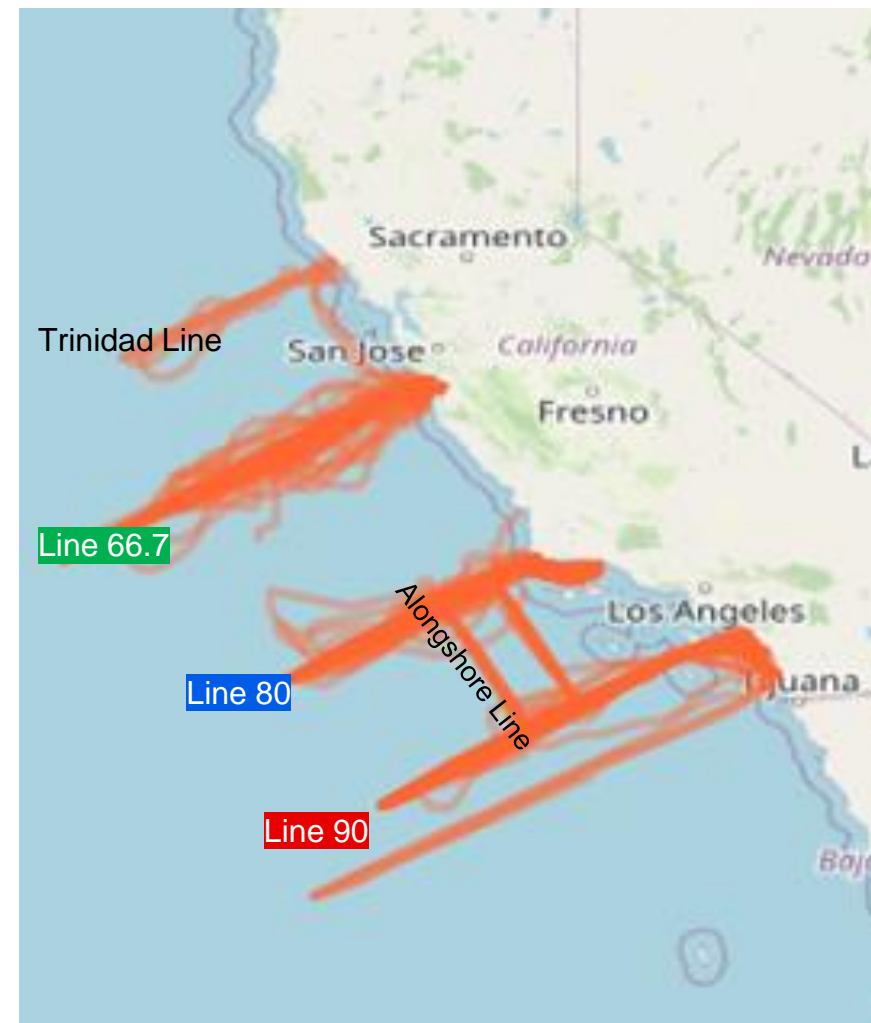
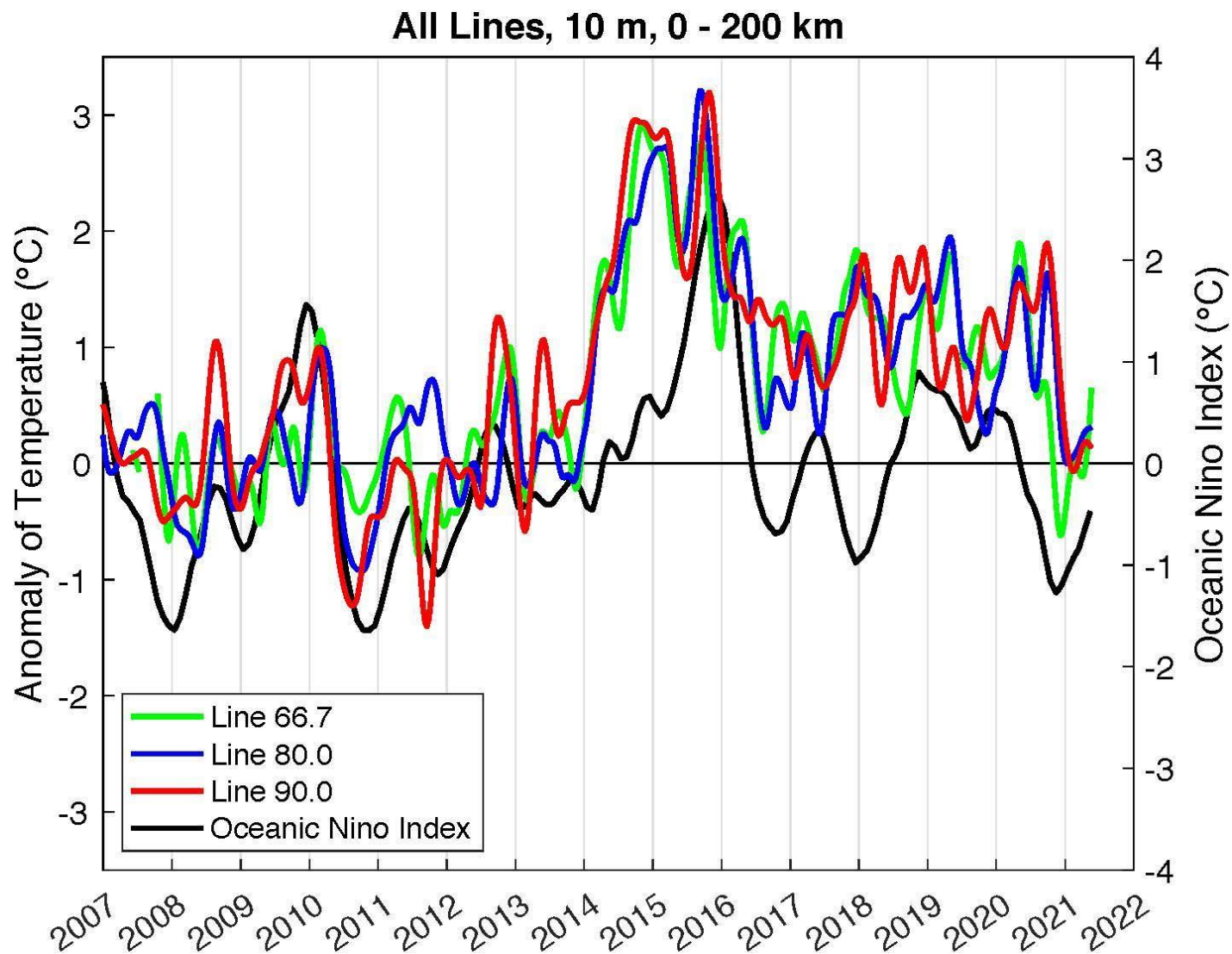
- A few late season NW swells in May and June, but within the climate trend.
- July-August = minimum wave energy in CA wave climate.

California sea surface temperatures are exhibiting extremes in both warm and cold in the climate signal at different locations along the coast.

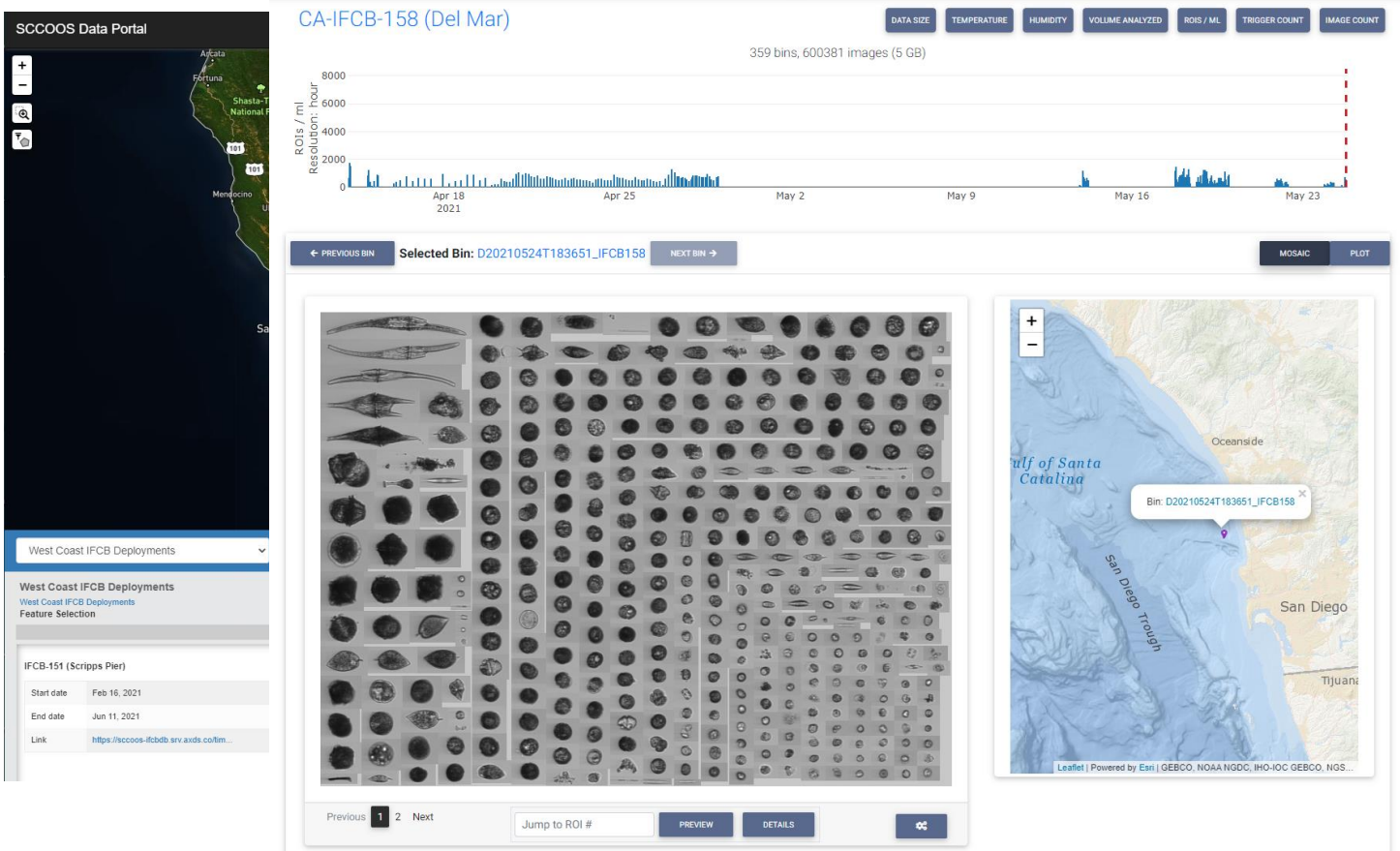




# California Underwater Glider Network



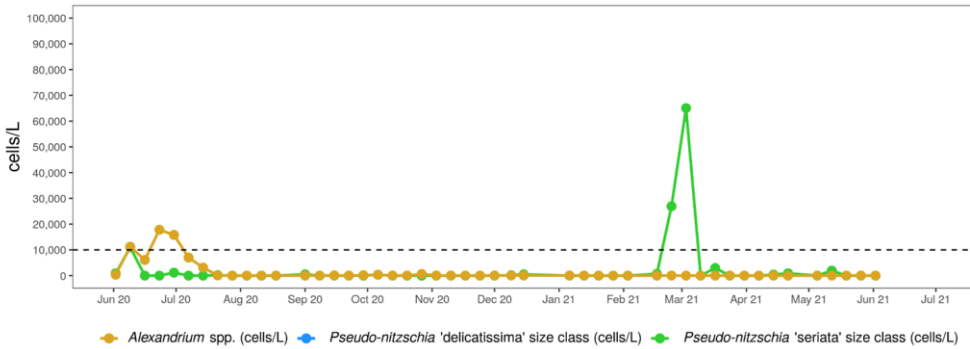
# CA IFCB Network - progress update



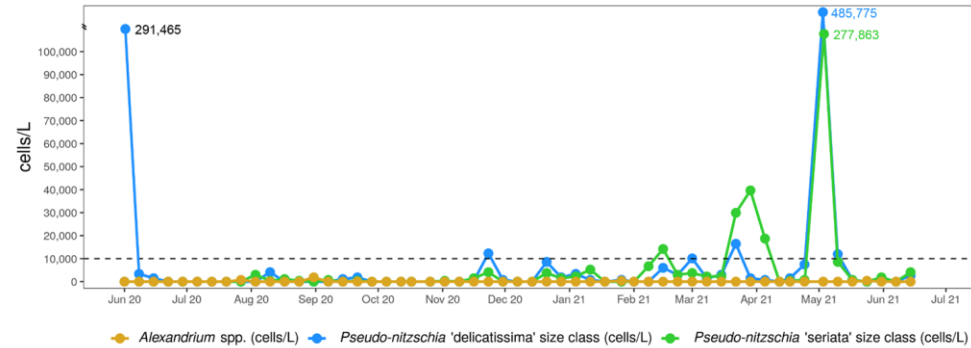
<https://sccoos-ifcbdb.srv.axds.co/timeline?dataset=CA-IFCB-151> - Scripps Pier (Feb 16 - June 11)  
<https://sccoos-ifcbdb.srv.axds.co/timeline?dataset=CA-IFCB-158> - Del Mar Mooring (Apr 13 - May 24)

# Harmful Algal Bloom Monitoring Alert Program (HABMAP)

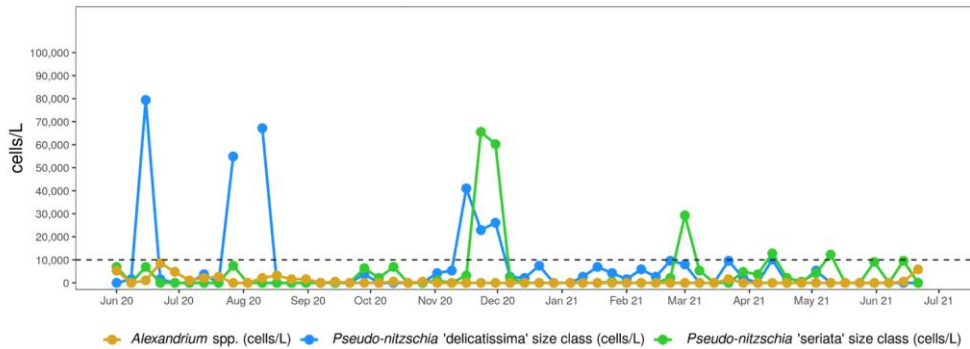
Santa Cruz Municipal Wharf HAB and DA Data



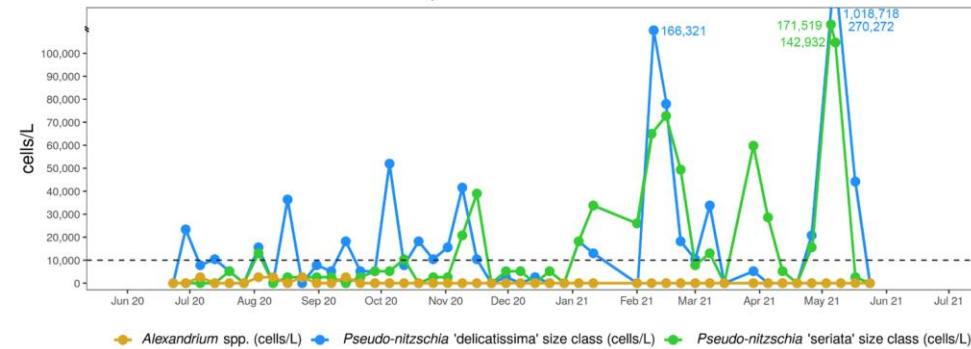
Santa Monica Pier HAB and DA Data



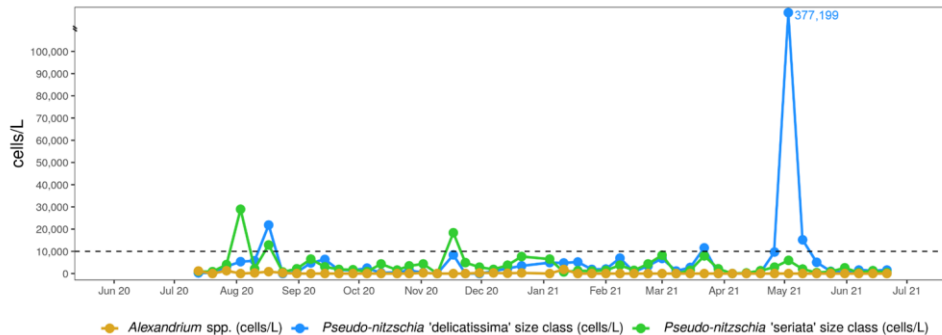
Cal Poly Pier HAB and Domoic Acid Data



Newport Pier HAB and DA Data

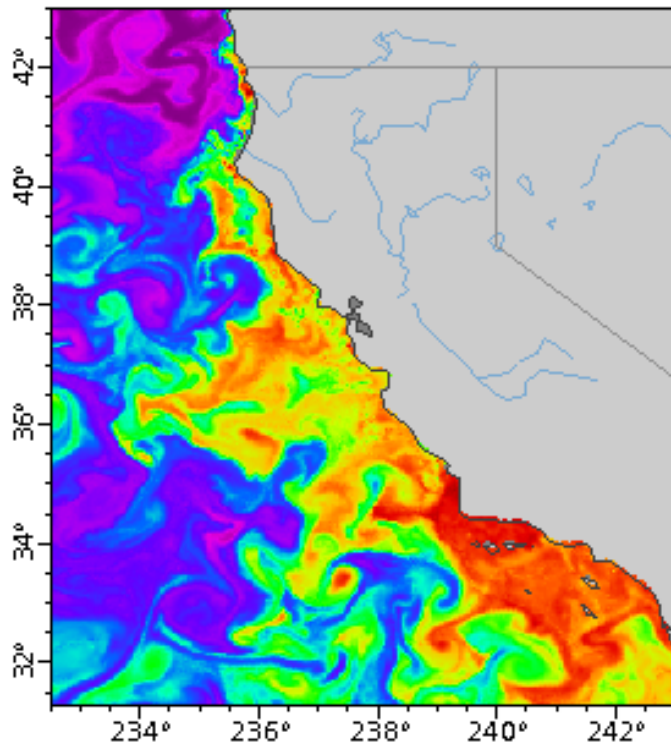


Stearns Wharf HAB and DA Data



# CA HAB Bulletin

## C-HARM Probability of particulate Domoic Acid (pDA) for May 1-Jul 19 2021



**Probability of Particulate Domoic Acid > 500 nanograms/l**  
 C-HARM: Pseudo-nitzschia, cellular domoic acid, and particular domoic acid probability, California and Southern Oregon coast, 2018-present, 3-Day Forecast (2021-05-01T12:00:00Z)  
 Data courtesy of UCSC, UCSD

## CDPH Phytoplankton Data



The Marine Mammal Center

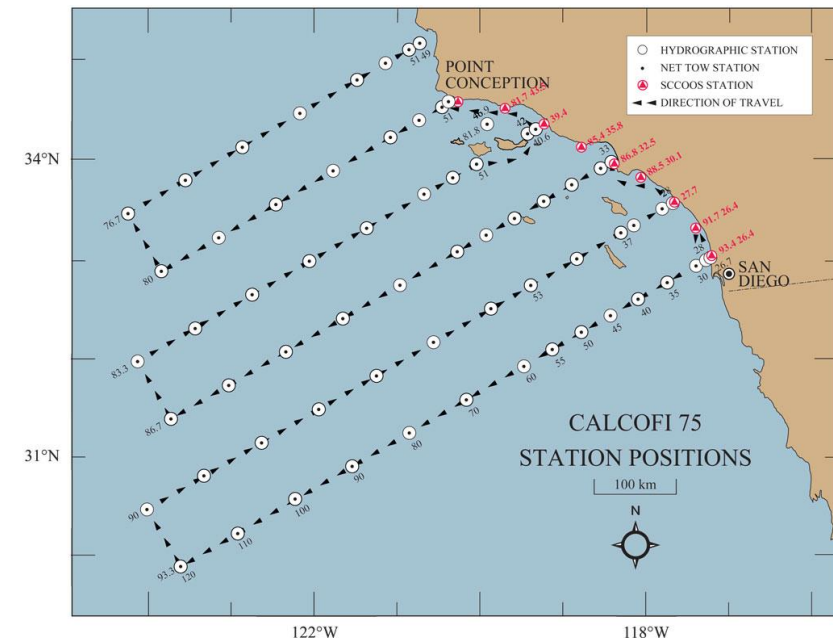
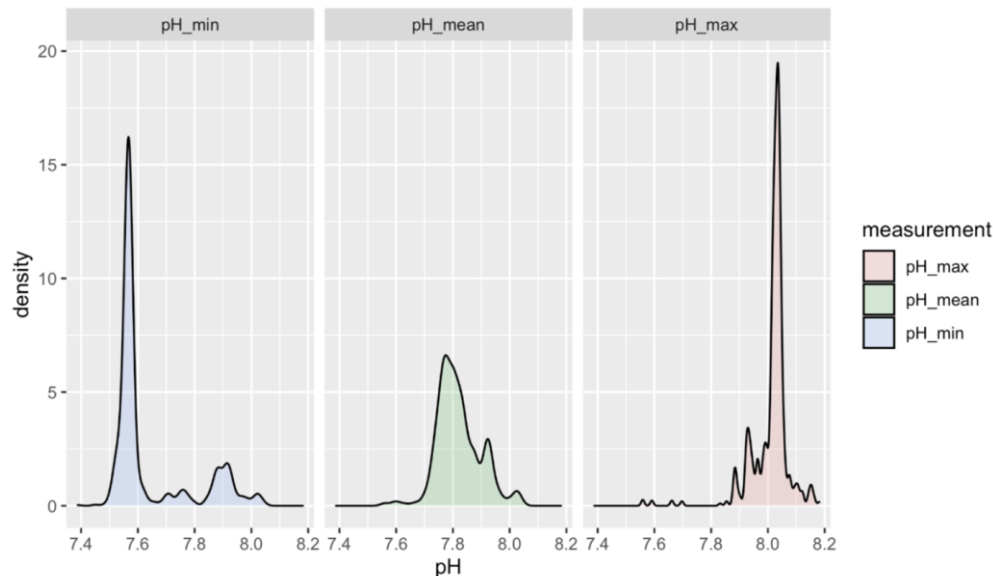
Channel Islands  
**Marine & Wildlife**  
 INSTITUTE



Only TMMC detected suspect DA strandings in May and June.

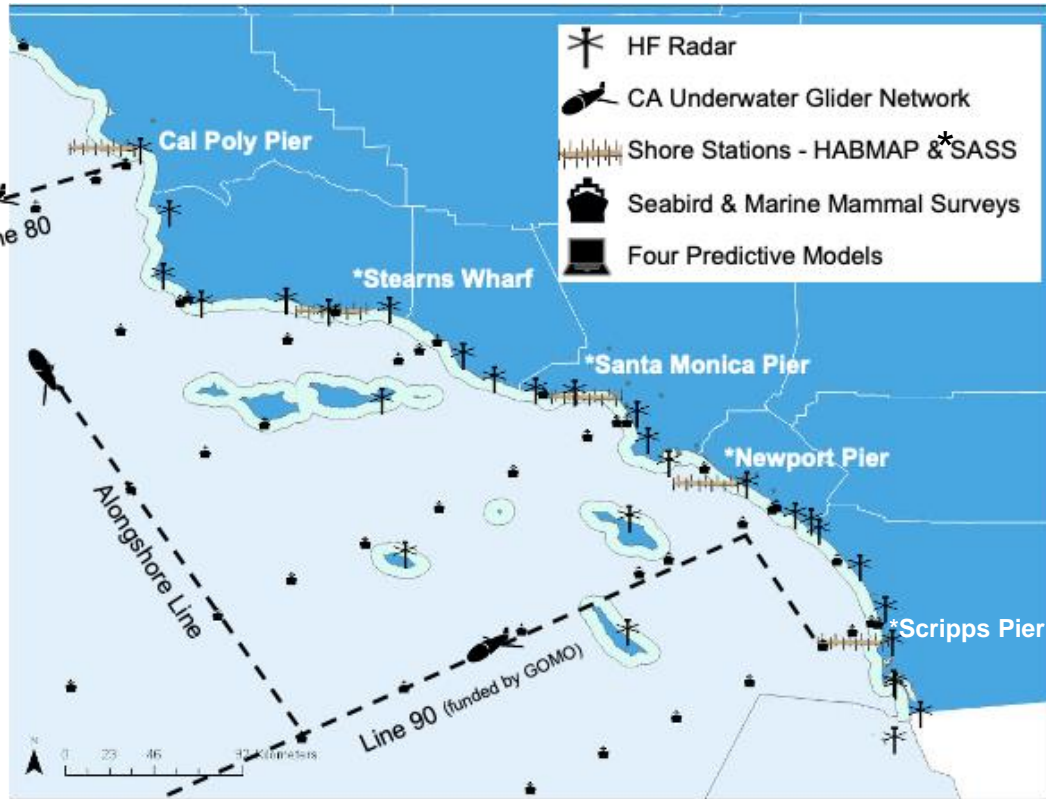
# CalCOFI- progress update

- *Cruise*: sampling the standard 75 station survey pattern this summer (July -Aug)
- *Data visualization*: Developing dashboard of CalCOFI data in partnership with NMS: climate stressors & ecosystem health
- *Exploratory Data analysis*: CalCOFI collaborated with UCSB & UCSD data science students on data science projects using CalCOFI data:
  1. Understanding pH in relation to fish larvae in the California Current (2008-2015): preliminary results do not show clear correlation between pH & larval fish
  2. Exploring fisheries catch data in relation to larval fish (1987-2019): Relationship between sardine larvae 1 year earlier & sardine caught ( $R^2 = 0.59$ ,  $p < 0.001$ ) : <https://reznikovl.github.io/calcofi1-book/intro.html>
  3. Exploring CalCOFI phytoplankton & larval fish data in relation to marine mammal & seabird strandings with summer students - *in progress*



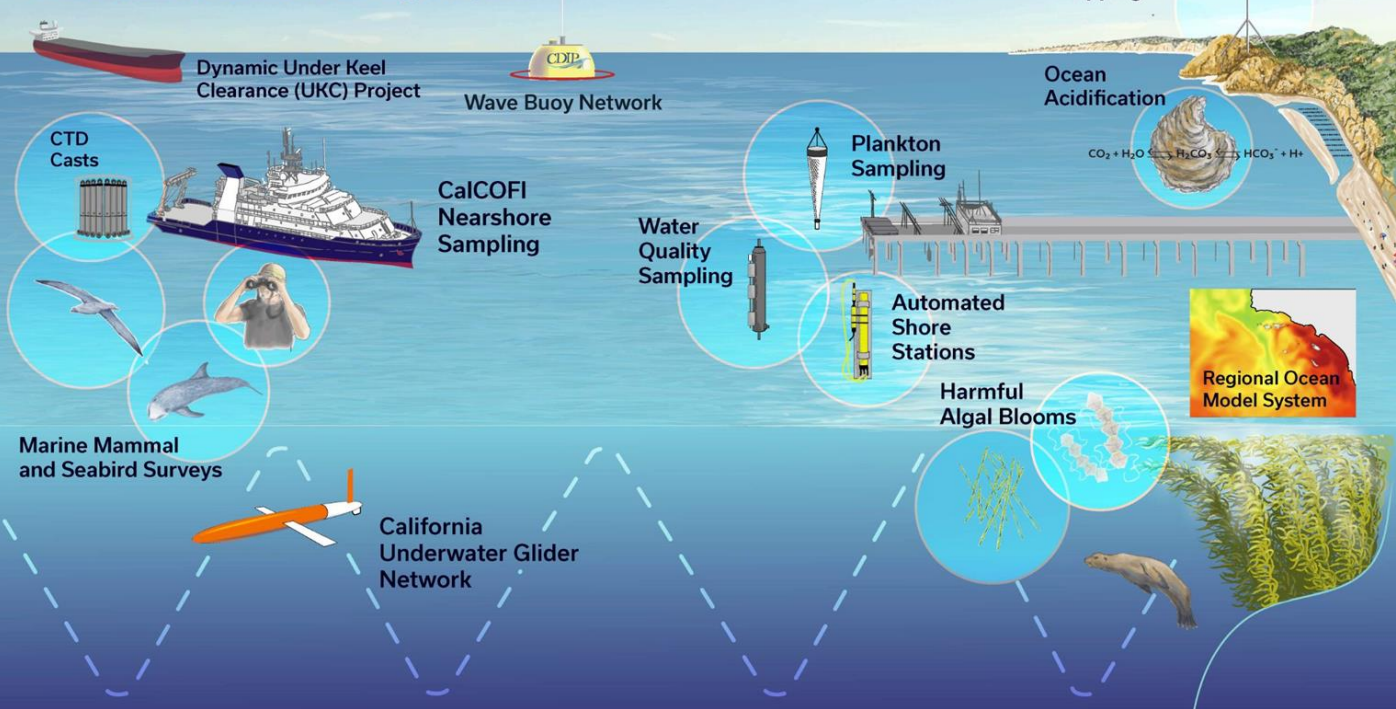


# SOUTHERN CALIFORNIA COASTAL OCEAN OBSERVING SYSTEM



## Southern California Coastal Ocean Observing System

SCCOOS is a Science-Based Decision Support System



Questions?

Megan Medina

[memedina@ucsd.edu](mailto:memedina@ucsd.edu)



Thank you!      Next NOAA West Watch:  
October 26, 2021

Photo: East Shore Lake Tahoe, April 2021  
Credit: Dan McEvoy