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

July 20, 2021
Call Agenda

• 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

- 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

Change from April 20 to July 13, 2021

U.S. Drought Monitor
Western U.S.

July 13, 2021
(Released Thursday, Jul. 15, 2021)
Valid 6 a.m. EDT

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

The Drought Monitor, which is produced by a consortium of NOAA, the U.S. Department of Agriculture (USDA), and the National Drought Mitigation Center (NDMC), uses a five-category drought index to monitor drought severity across the United States. The index ranges from "Normal" to "Exceptional Drought," with "Exceptional Drought" being the most severe condition.

Change from April 20 to July 13, 2021

Intensity:
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

Author:
Adrian Haltman
NOAA/NWS/CDM/CPC

droughtmonitor.unl.edu

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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

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

- 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://sercc.oasis.unc.edu/Map.php?region=wrcc
https://psl.noaa.gov/data/composites/day/
Extreme Heat – Late June Heatwave

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

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

Nearly 800 people believed to have died in Northwest heat wave

King5 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.

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

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

Significant Wildland Fire Potential Outlook
August 2021

Significant Wildland Fire Potential Outlook
September 2021

Above normal significant wildland fire potential indicates a greater than usual likelihood that significant wildland fires will occur. Significant wildland fires should be expected at typical times and locations during normal significant wildland fire potential conditions. Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.
Lake Powell Inflow Forecasts and Observations

UNREGULATED INFLOW INTO LAKE POWELL – JULY FINAL FORECAST DATED 7/1/2021

<table>
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<tr>
<th>FORECASTED WATER YEAR 2021</th>
<th>MILLION ACRE-FEET</th>
<th>% of Normal</th>
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<tr>
<td>3.227</td>
<td>30%</td>
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<table>
<thead>
<tr>
<th>FORECASTED APRIL-JULY 2021</th>
<th>MILLION ACRE-FEET</th>
<th>% of Normal</th>
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<td>1.745</td>
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<th>JUNE OBSERVED INFLOW</th>
<th>MILLION ACRE-FEET</th>
<th>% of Normal</th>
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<td>0.809</td>
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<tr>
<th>JULY INFLOW FORECAST</th>
<th>MILLION ACRE-FEET</th>
<th>% of Normal</th>
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<tbody>
<tr>
<td>0.104</td>
<td>10%</td>
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- 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

https://www.kunc.org/
California Water Supply

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

https://twitter.com/NWSCNRFC/status/1417191649566871569
Southwest Monsoon Update

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

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

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

https://app.climateengine.org/climateEngine
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).

Source: Climate Prediction Center

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

www.nanoos.org
Sea Surface Temperature Anomaly
NCEI Optimum Interpolation SST

NANOOS: www.nanoos.org Climatology app

April 2021
Sea Surface Temperature Anomaly
NCEI Optimum Interpolation SST

NANOOS: www.nanoos.org Climatology app
Sea Surface Temperature Anomaly
NCEI Optimum Interpolation SST

NANOOS: www.nanoos.org Climatology app

June 2021
Marine heatwave tracker
Marine heatwave tracker
Sea Surface Temperature

NDBC Washington

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

Water Temperature °C

Jan | Mar | May | Jul | Sep | Nov
NANOOS: www.nanoos.org Climatology app

Sea Surface Temperature Anomaly
OSU Modis

April 2021

May 2021

June 2021

Water Temperature Anomaly

°C
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.”
NANOOS: [www.nanoos.org](http://www.nanoos.org) Climatology app

**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

*see www.nanoos.org
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
NANOOS: [www.nanoos.org](http://www.nanoos.org) Climatology app

**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
- Hood sport (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
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
NOAA West Watch
Update: July 2021
Eel River

Sea Surface Temperature

Monterey

Santa Maria

https://data.cencoos.org
Temp Anomaly: Shore Sta.

- HSU Trinidad Station
- Bodega Bay (BML_WTS)
- Moss Landing Marine Laboratories Seawater Intake
Ocean Heat Content

California MPA Bioregions

Northern CA: Ocean Heat Content

Central CA: Ocean Heat Content

Southern CA: Ocean Heat Content

Data Source: UCSC 4DVAR ROMS
plot_heat_content_west_coast.ipynb
**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.
Thank you

aharper@mbari.org

NOAA West Watch Update

July 2021
NOAA West Watch Webinar: Southern California
Megan Medina, SCCOOS Program Coordinator
20-Jul 2021
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

All Lines, 10 m, 0 - 200 km

Anomaly of Temperature (°C)

Oceanic Nino Index (°C)


Line 66.7
Line 80.0
Line 90.0
Oceanic Nino Index

DOI: 10.21238/S8SPRAY7292
Rudnick, SIO
CA IFCB Network - progress update

https://sccoos-ifcldb.srv.axds.co/timeline?dataset=CA-IFCB-151 - Scripps Pier (Feb 16 - June 11)
Harmful Algal Bloom Monitoring Alert Program (HABMAP)
C-HARM Probability of particulate Domoic Acid (pDA) for May 1-Jul 19 2021

CDPH Phytoplankton Data

- 5/9/21 51% Pseudo-nitzschia seriata composition at Palos Verdes Rocky Pt, CA
- 5/12/21 = 60% Pseudo-nitzschia seriata composition at Palos Verdes, CA

Only TMMC detected suspect DA strandings in May and June.

sccoos.org/california-hab-bulletin/
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:
  3. Exploring CalCOFI phytoplankton & larval fish data in relation to marine mammal & seabird strandings with summer students - *in progress*
Questions?
Megan Medina
memedina@ucsd.edu
Thank you!  
Next NOAA West Watch:  
October 26, 2021

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