



NOAA West Watch

*Reporting Regional Environmental
Conditions & Impacts in the West*

May 22, 2018

Call Agenda



- **Project Recap & Updates (Polly Hicks)**
- El Niño and Regional Climate brief (Dan McEvoy)
- IOOS Nearshore Conditions brief (Jan Newton, Alex Harper, Megan Hepner)
- Environmental conditions and impacts reporting and discussion (Polly Hicks)
- Discussion

Project Recap and Updates



- NOAA West Watch bi-monthly webinars are a project of the NOAA West Regional Coordination Team
- Goals of the project:
 - **Document and share** environmental conditions information and impacts on human systems and NOAA mission at the regional scale
 - **Improve awareness** of environmental observations and human system impacts across NOAA mission lines
 - **Improve regional communication and coordination**
 - **Improve external communication** of regional impacts
- Next webinar: July 24th, 1-2PM PDT/ 2-3PM MDT

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Current Drought Conditions

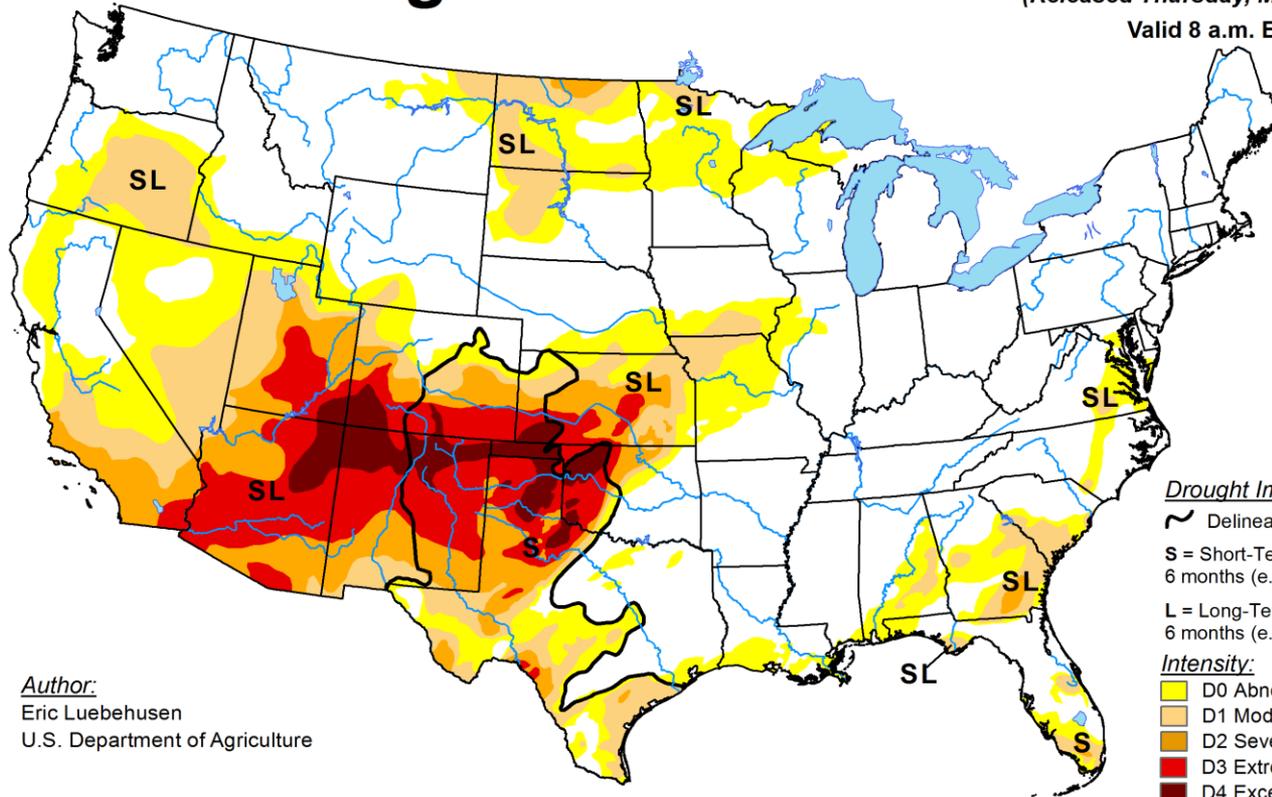


U.S. Drought Monitor

May 15, 2018

(Released Thursday, May 17, 2018)

Valid 8 a.m. EDT



Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

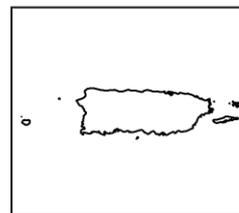
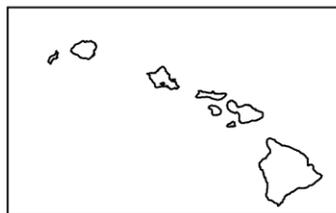
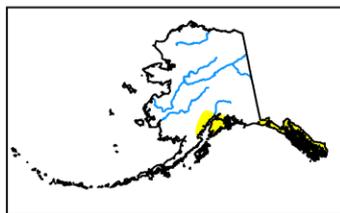
Intensity:

- ☐ D0 Abnormally Dry
- ☐ D1 Moderate Drought
- ☐ D2 Severe Drought
- ☐ D3 Extreme Drought
- ☐ D4 Exceptional Drought

Author:

Eric Luebehusen
U.S. Department of Agriculture

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



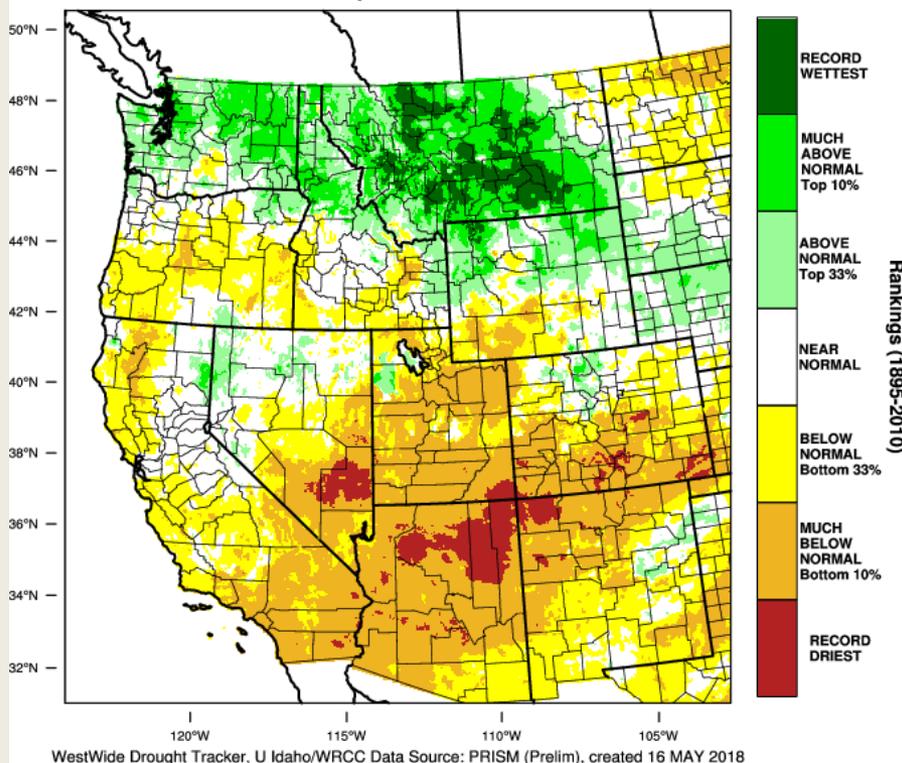
<http://droughtmonitor.unl.edu/>

Precipitation and Temperature



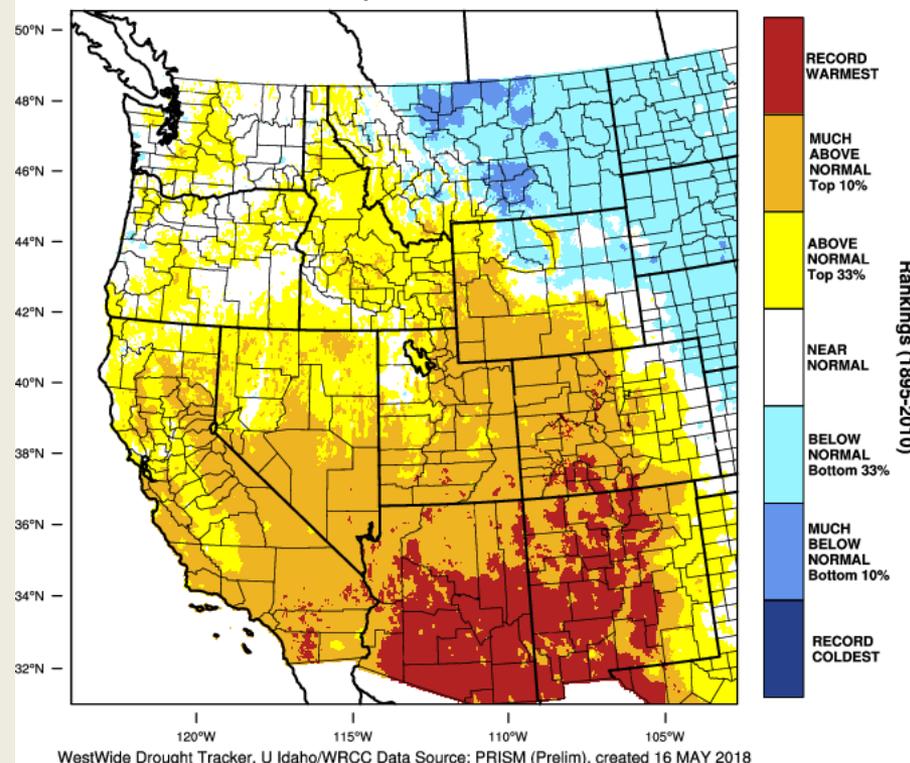
October 2017 – April 2018 Precipitation Percentiles

Western United States - Precipitation
October-April 2018 Percentile



October 2017 – April 2018 Temperature Percentiles

Western United States - Mean Temperature
October-April 2018 Percentile



Precipitation and Temperature

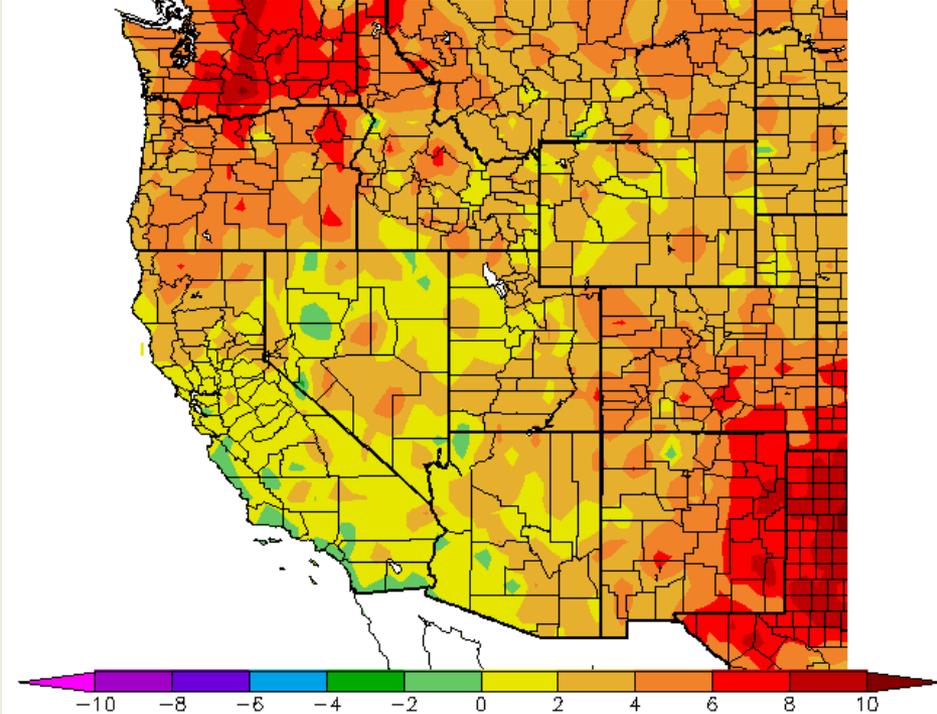
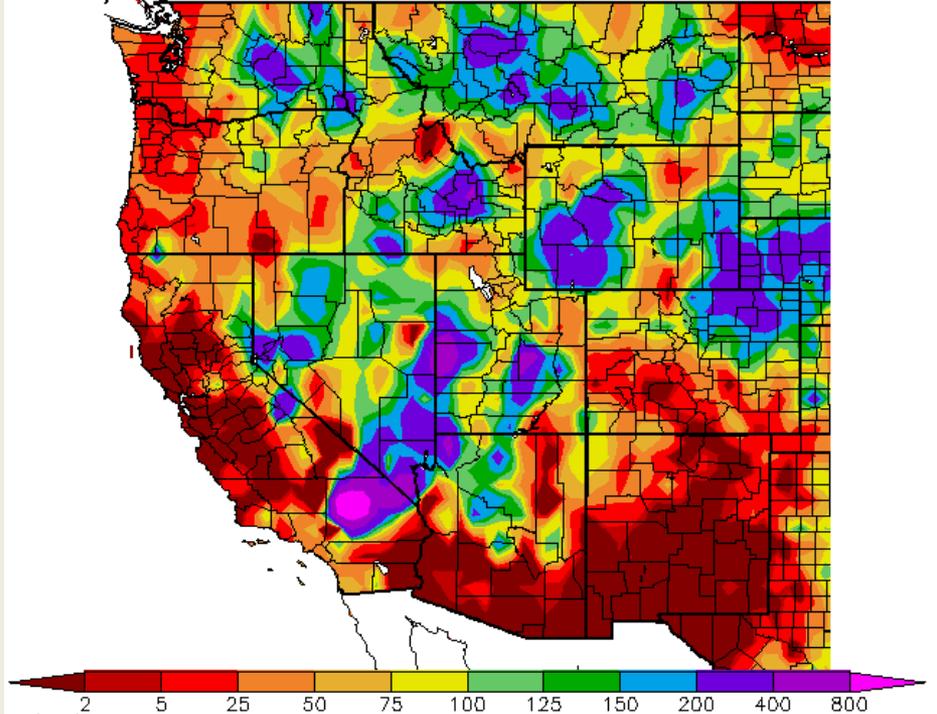


May 1-19
% of Average Precipitation

May 1-19
Temperature Anomalies

Percent of Average Precipitation (%)
5/1/2018 - 5/19/2018

Ave. Temperature dep from Ave (deg F)
5/1/2018 - 5/19/2018

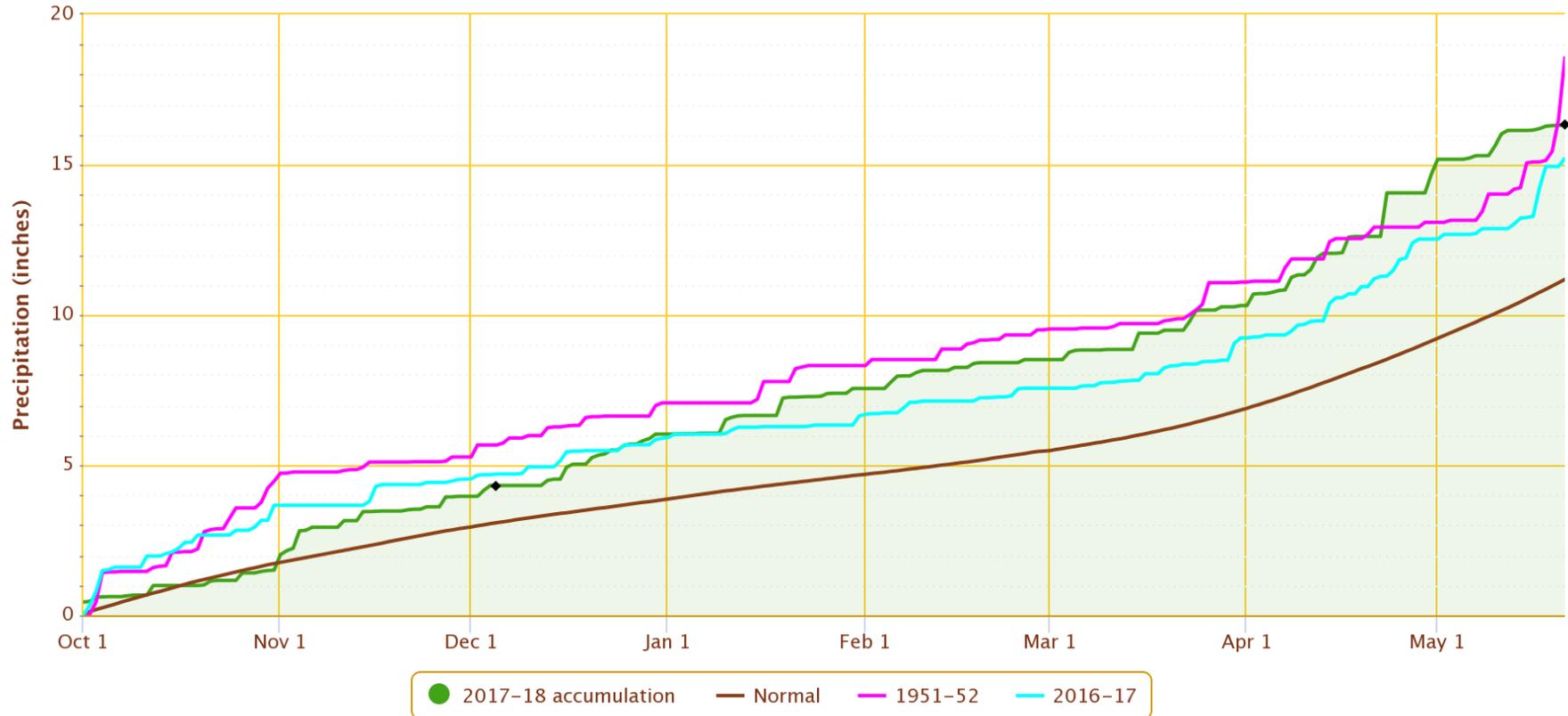


Bozeman, MT Precipitation



Accumulated Precipitation – BOZEMAN MONTANA STATE UNIVERSITY, MT

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



Powered by ACIS

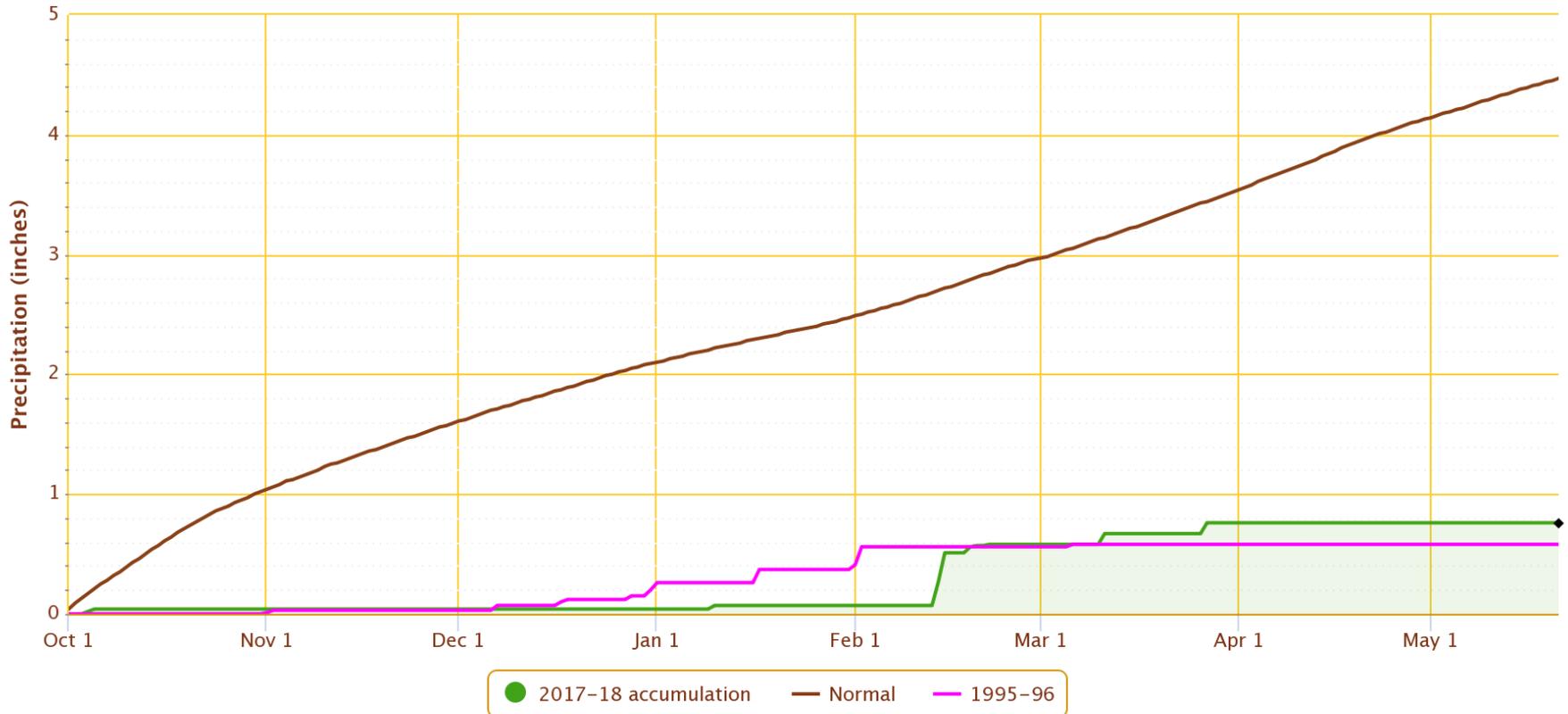
- 2nd wettest water year-to-date (1892-present)

Albuquerque, NM Precipitation



Accumulated Precipitation – ALBUQUERQUE INTL AP, NM

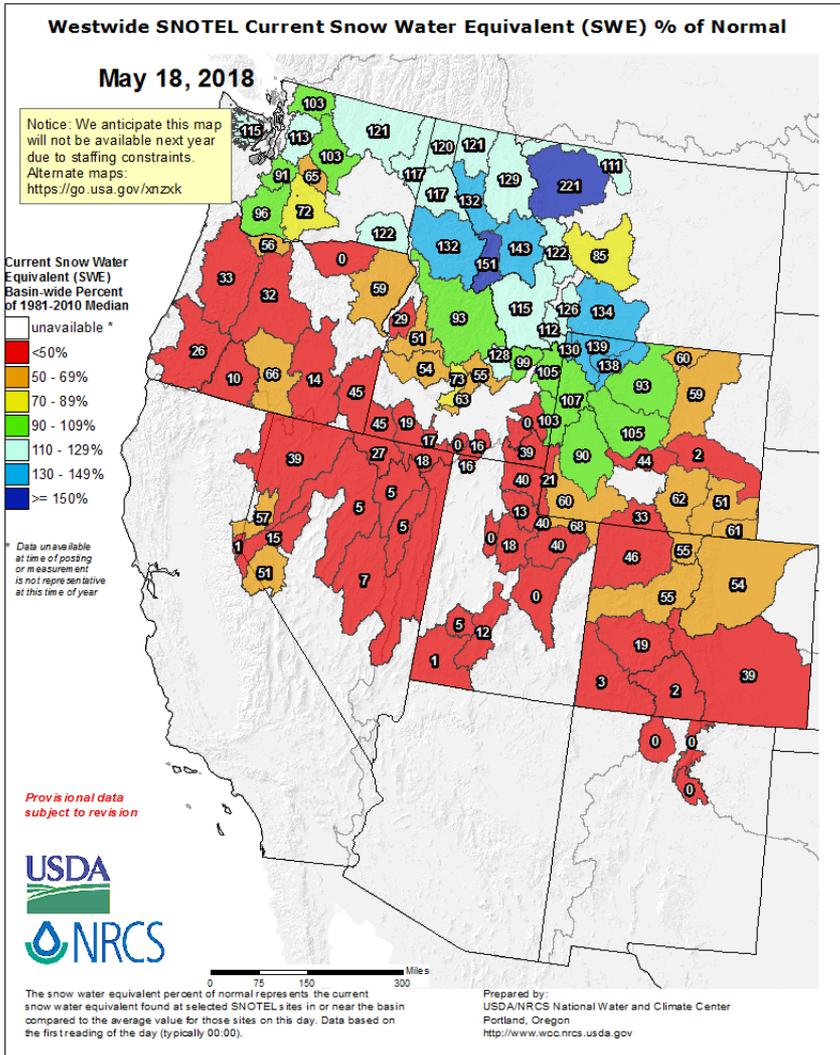
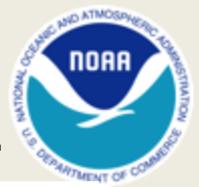
Click and drag to zoom to a shorter time interval; green/black diamonds represent subsequent/missing values



Powered by ACIS

- 3rd driest water year-to-date (1890-present)

Snowpack



Statewide Summary of Snow Water Content

Current Regional Snowpack from Automated Snow Sensors

% of April 1 Average / % of Normal for This Date



NORTH	
Data as of May 21, 2018	
Number of Stations Reporting	30
Average snow water equivalent (inches)	1.4
Percent of April 1 Average (%)	5
Percent of normal for this date (%)	13

CENTRAL	
Data as of May 21, 2018	
Number of Stations Reporting	42
Average snow water equivalent (inches)	2.6
Percent of April 1 Average (%)	9
Percent of normal for this date (%)	18

SOUTH	
Data as of May 21, 2018	
Number of Stations Reporting	27
Average snow water equivalent (inches)	1.6
Percent of April 1 Average (%)	6
Percent of normal for this date (%)	11

STATE	
Data as of May 21, 2018	
Number of Stations Reporting	99
Average snow water equivalent (inches)	1.9
Percent of April 1 Average (%)	7
Percent of normal for this date (%)	15

Statewide Average: 7% / 15%

15% of normal statewide

Data as of May 21, 2018

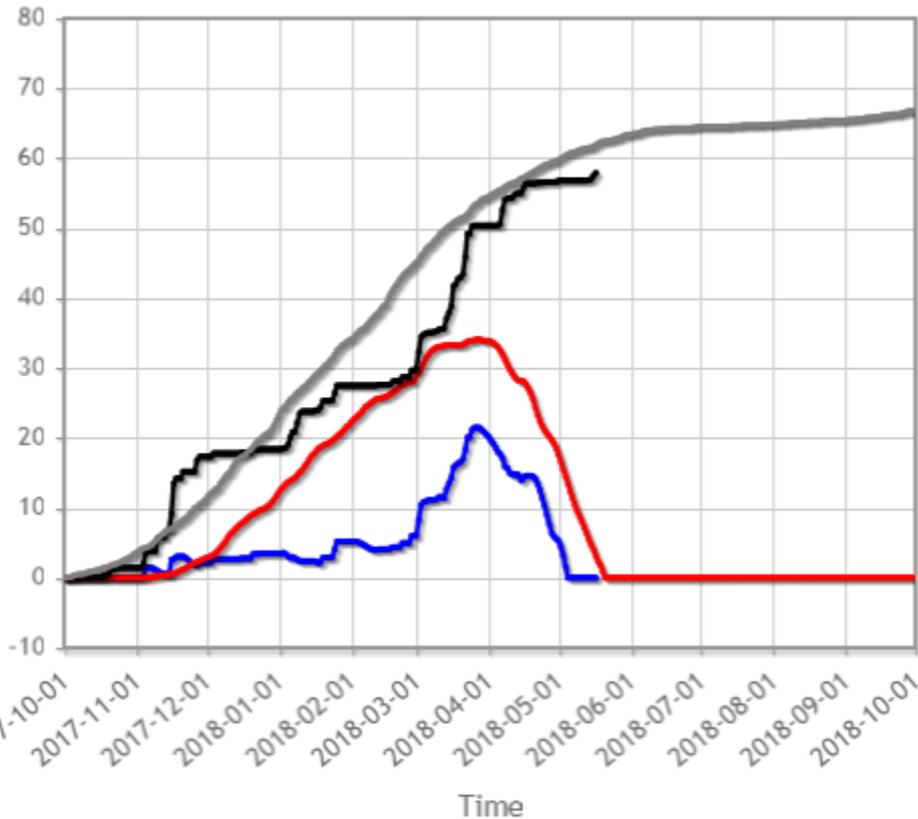
Updated 05/21/2018 11:45 AM

Snowpack

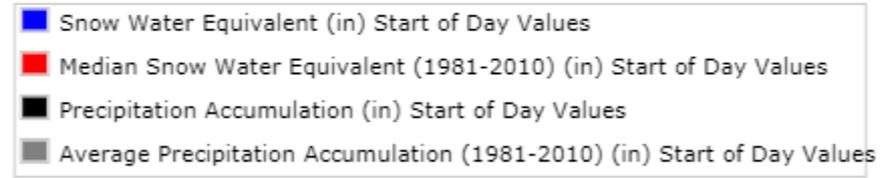


- Central Sierra Snow Lab, CA (Donner Pass)
- Melt out date 2018: May 5
- Normal melt out date: May 21

Css Lab (428) California SNOTEL Site - 6894 ft Reporting Frequency: Daily; Date Range: 2017-10-01 to 2018-09-30



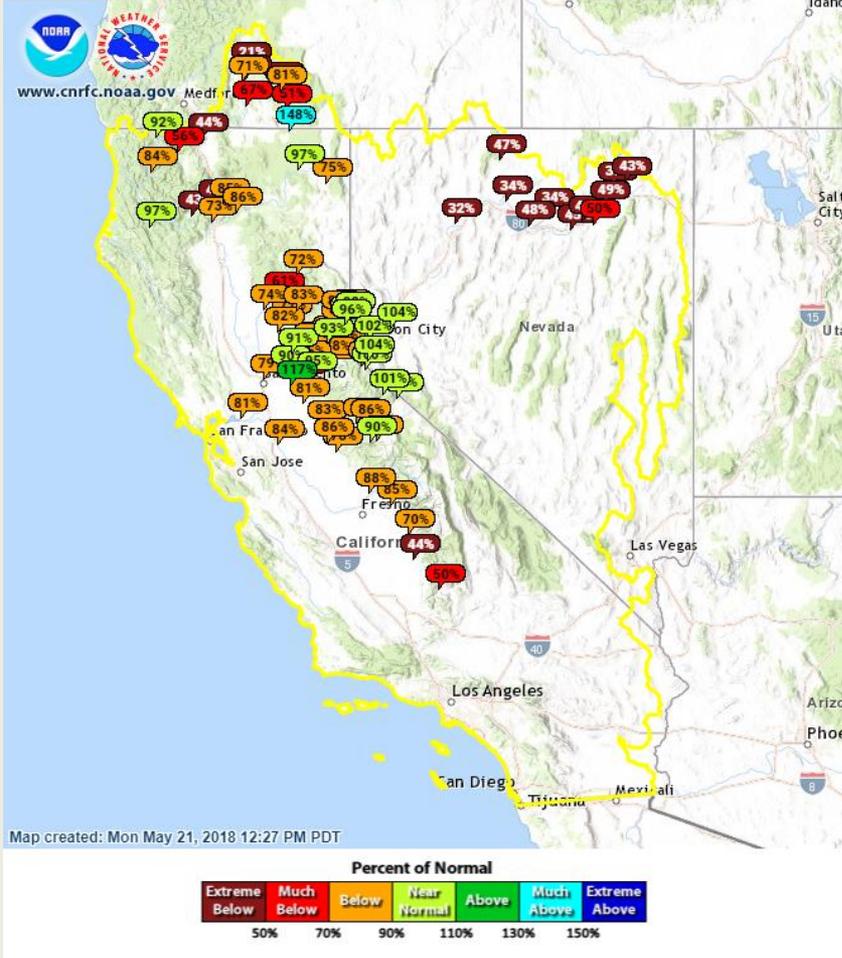
Many locations in Sierra Nevada melting out 2-4 weeks early this year.



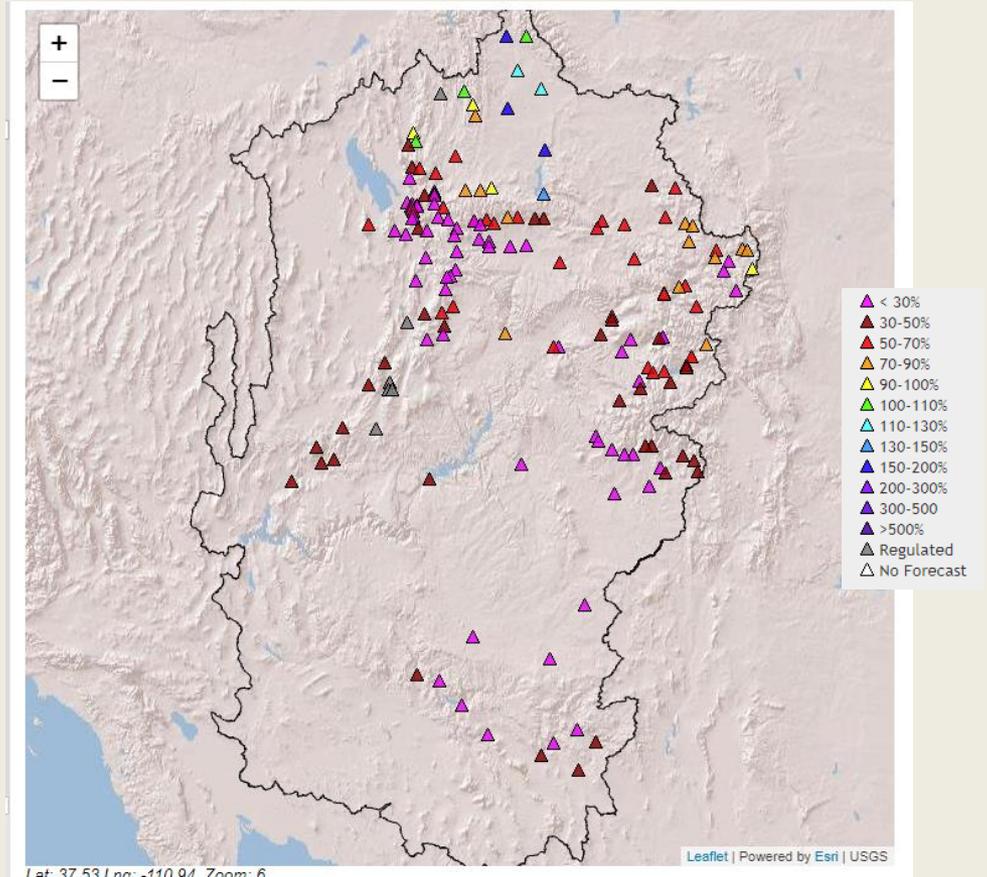
April-July Streamflow Forecasts, May 21



Forecast ESP Water Supply Seasonal Volume (WY2018)



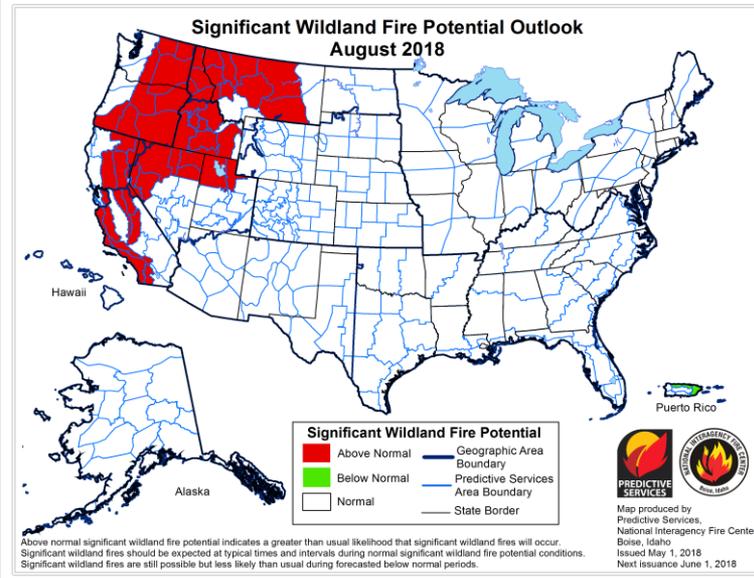
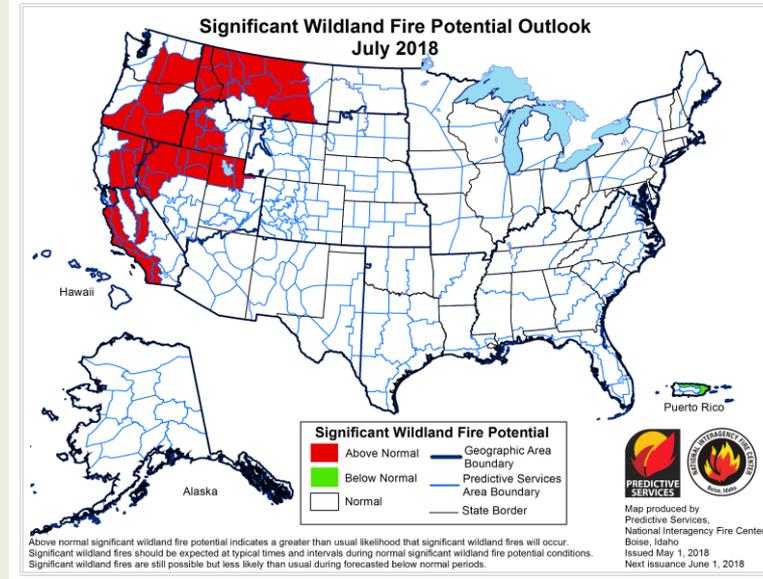
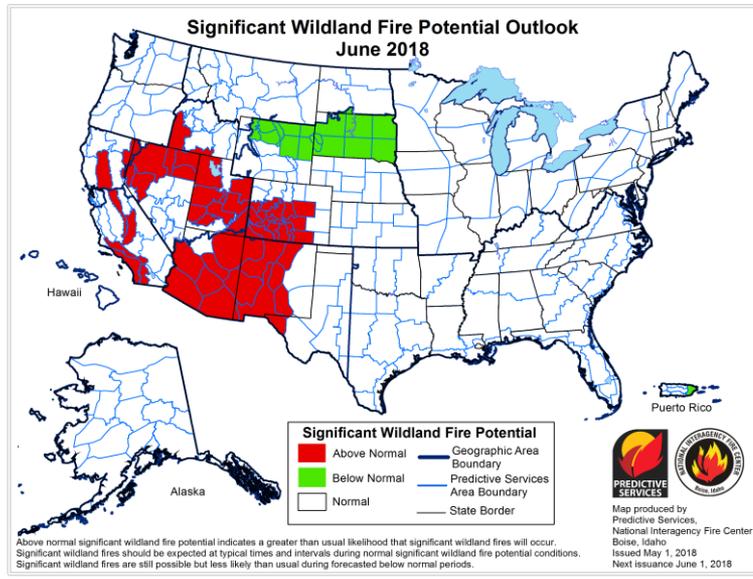
Colorado River Basin



<https://www.cbrfc.noaa.gov/>

<https://www.cnrfc.noaa.gov/>

Significant Wildland Fire Potential Outlook



ENSO Status



- ENSO Alert System Status: **Final La Niña Advisory**
- ENSO-neutral conditions are present. *
- Equatorial sea surface temperatures (SSTs) are near-to-below average across the eastern Pacific Ocean.
- ENSO-neutral is favored through September-November 2018, with the possibility of El Niño nearing 50% by Northern Hemisphere winter 2018-19.

Credit: CPC

* Note: These statements are updated once a month (2nd Thursday) in association with the ENSO Diagnostics Discussion, which can be found here:

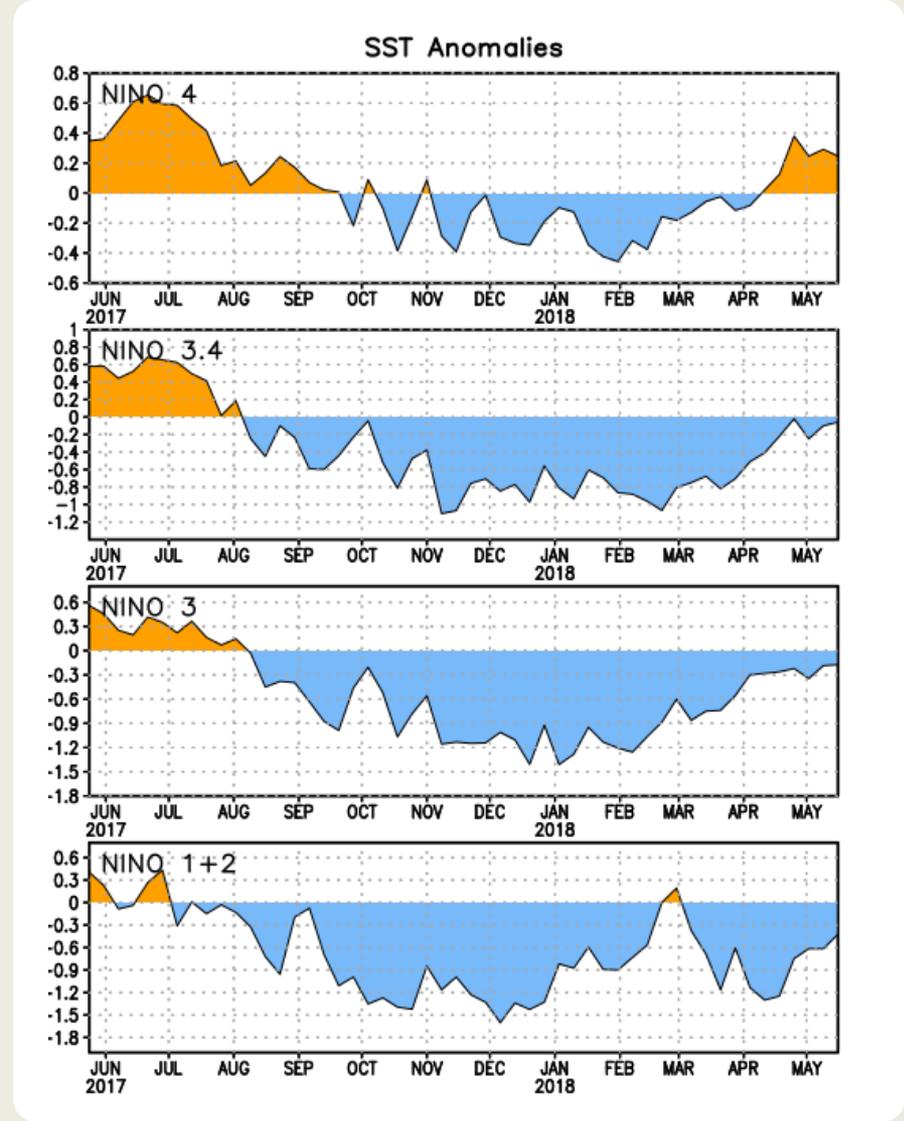
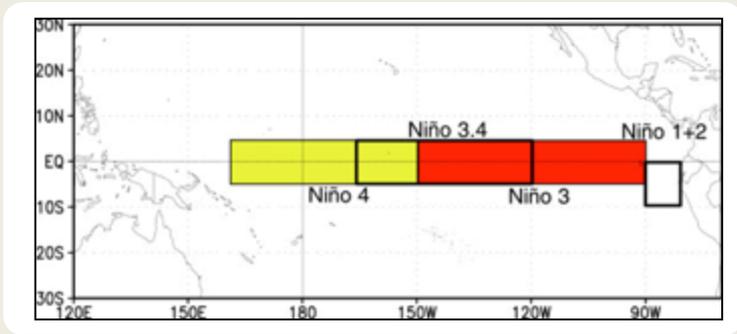
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/.

Niño Region SST Departures (°C) Recent Evolution

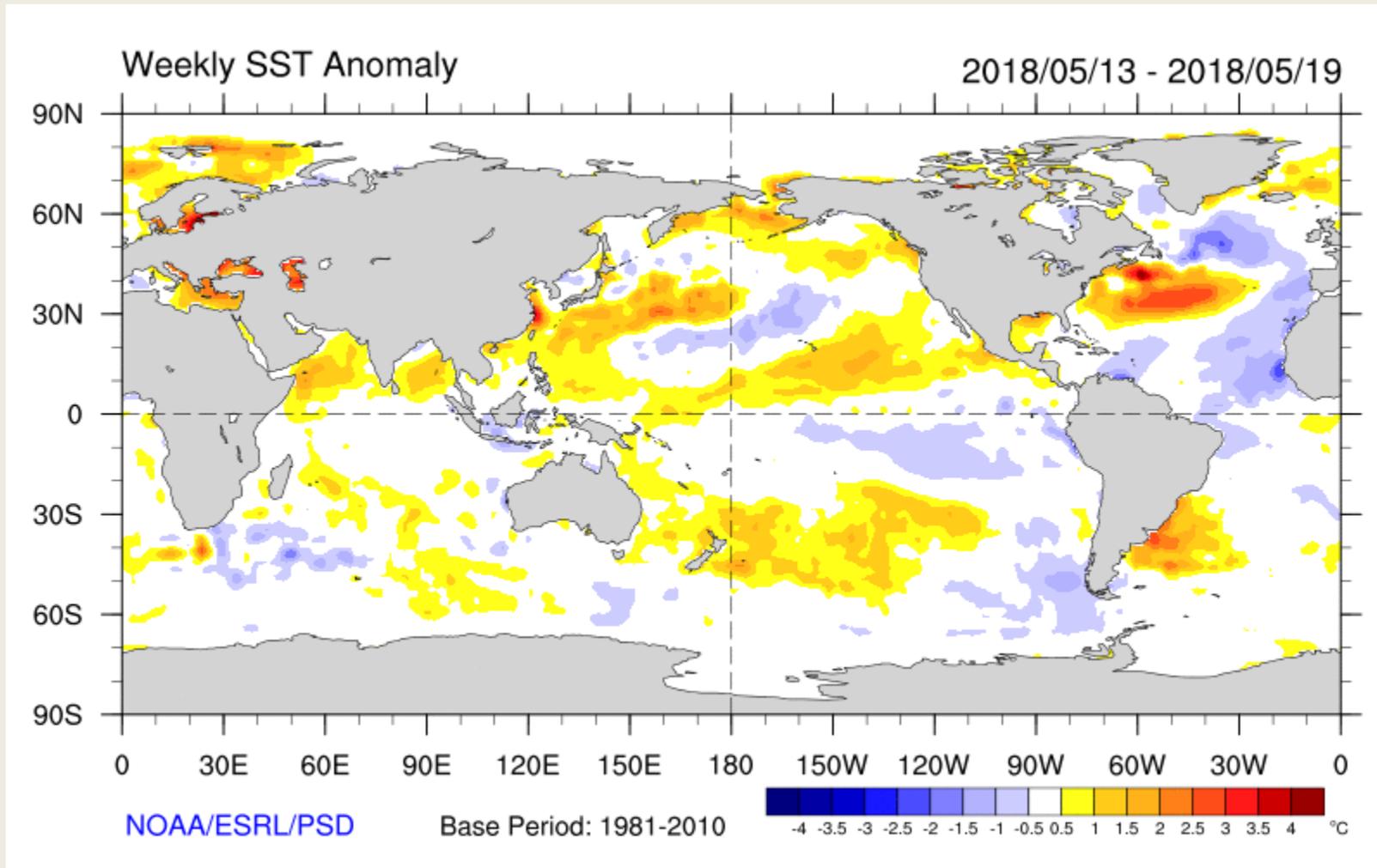


The latest weekly SST departures are:

- Niño 4 0.2°C
- Niño 3.4 -0.1°C
- Niño 3 -0.2°C
- Niño 1+2 -0.4°C



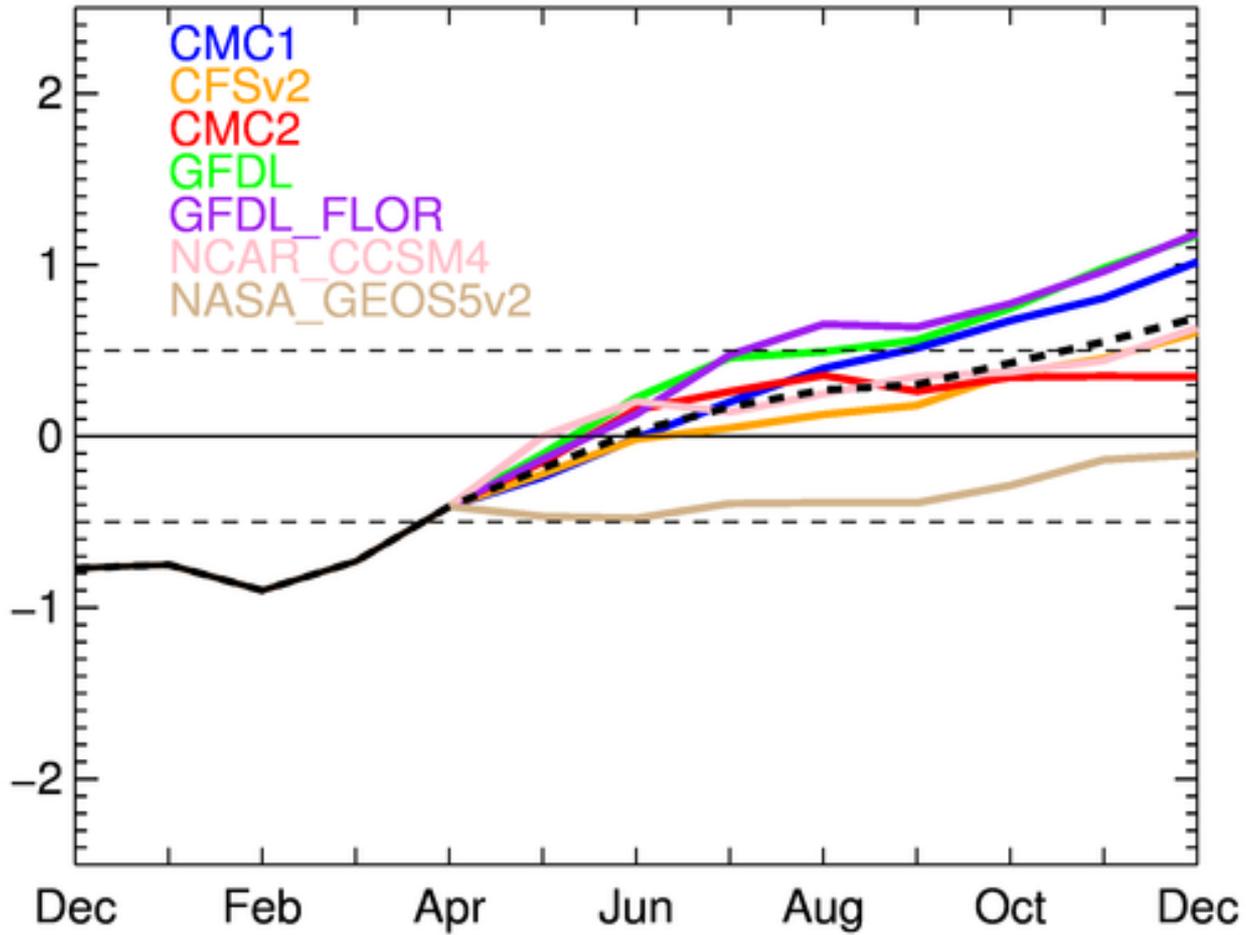
Current Sea Surface Temperatures



ENSO Forecasts



NMME scaled Nino3.4, IC=201805

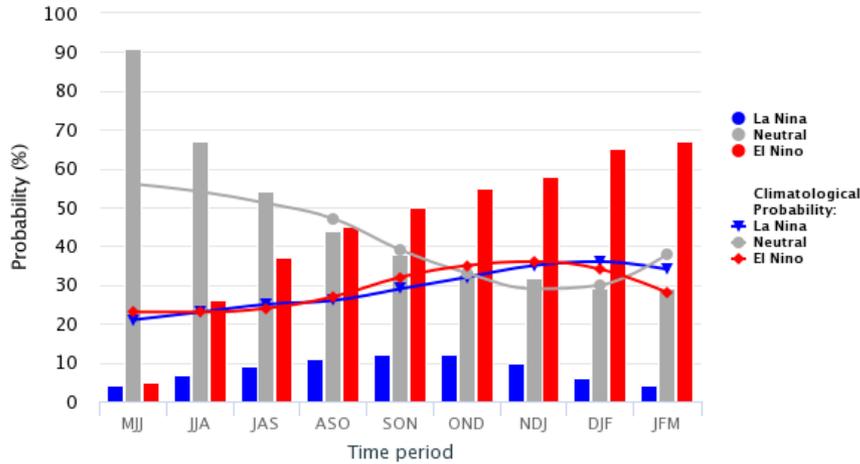


ENSO Forecasts



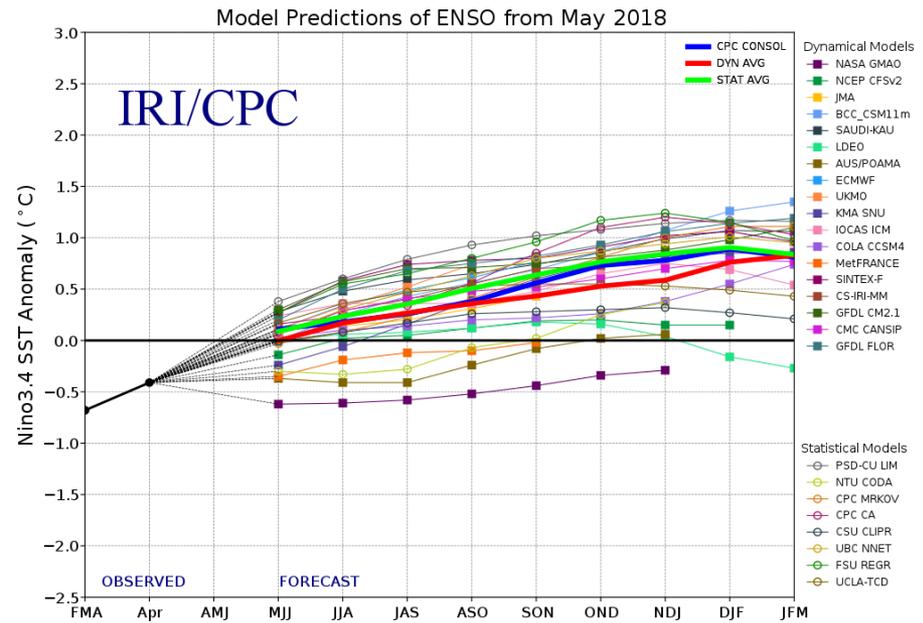
Mid-May IRI/CPC Model-Based Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: $-0.5\text{ }^{\circ}\text{C}$ to $0.5\text{ }^{\circ}\text{C}$

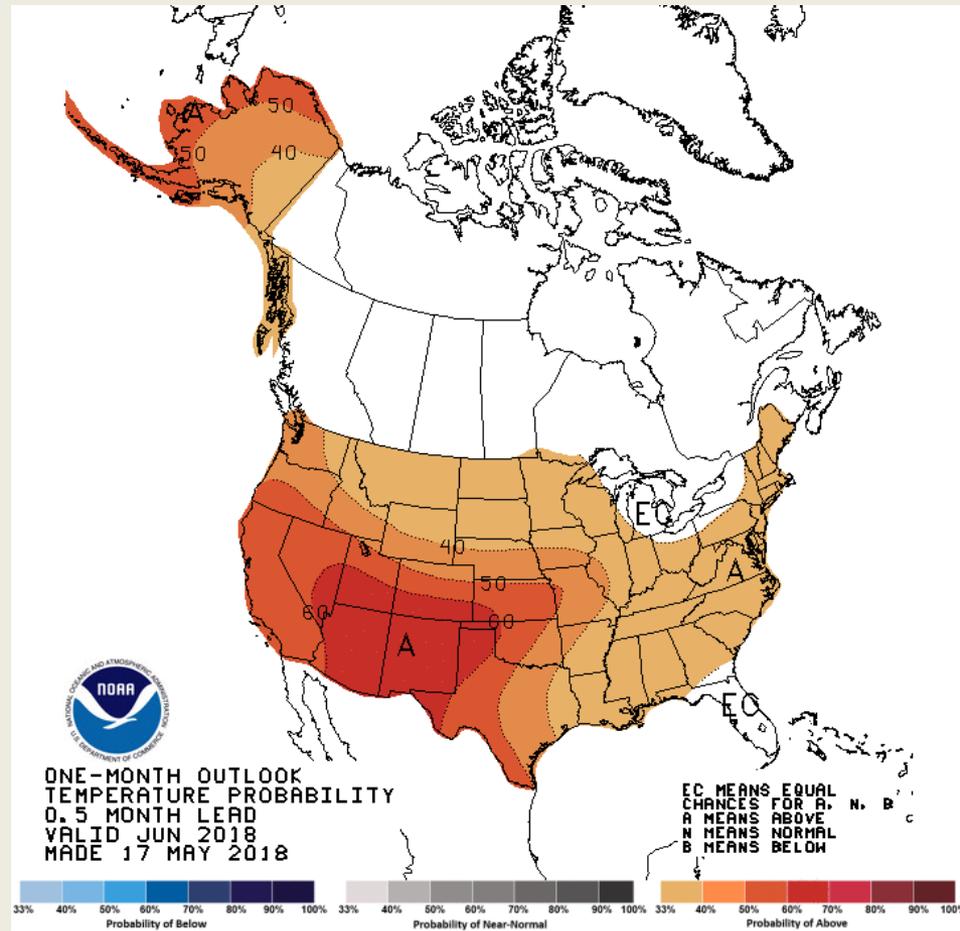
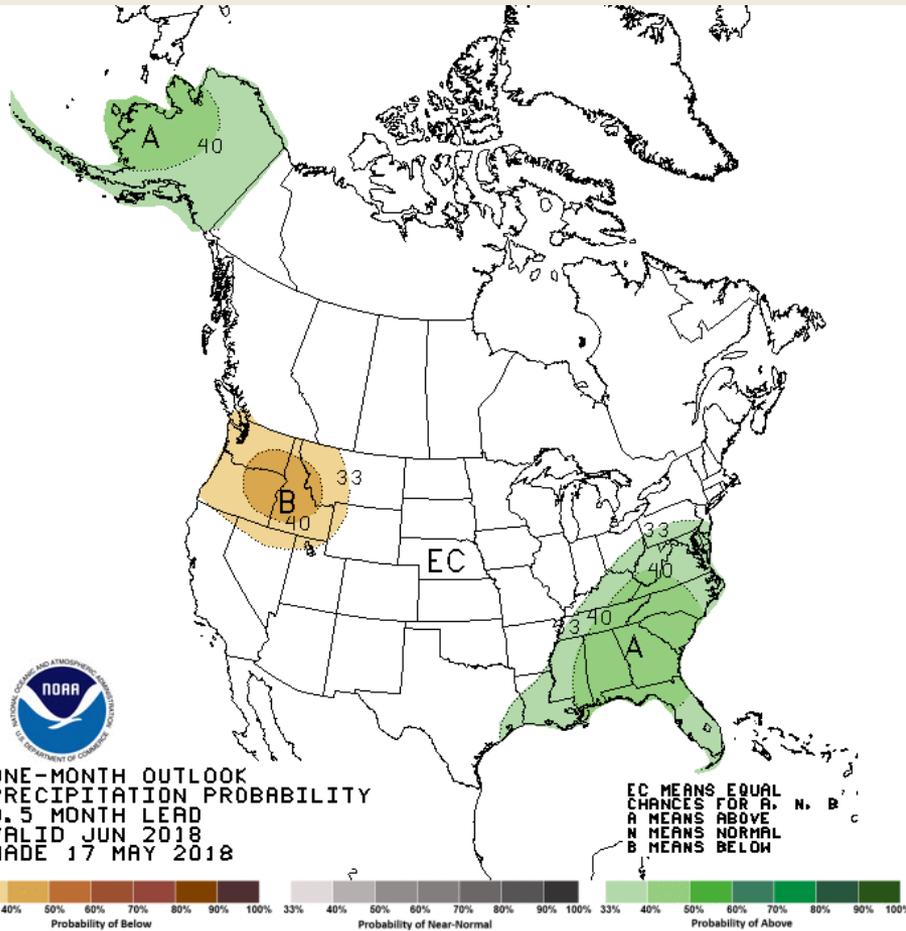


CPC/IRI El Niño forecast:

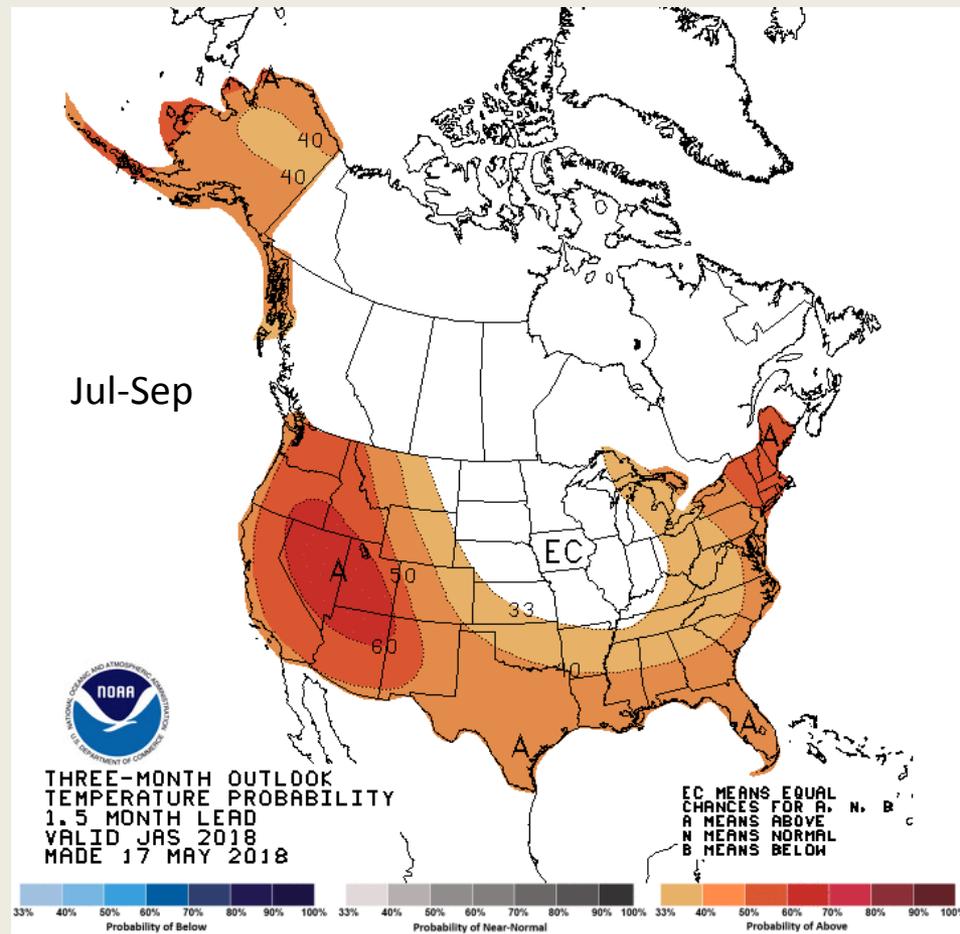
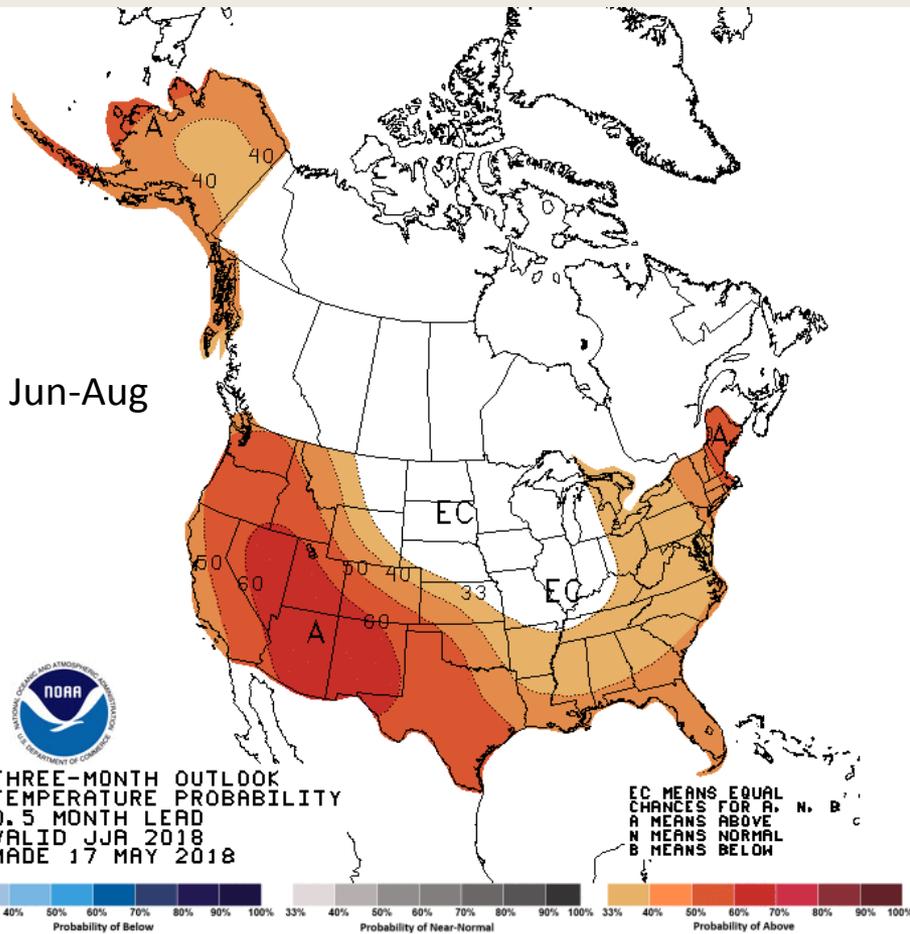
NMME models + other dynamical models + statistical models



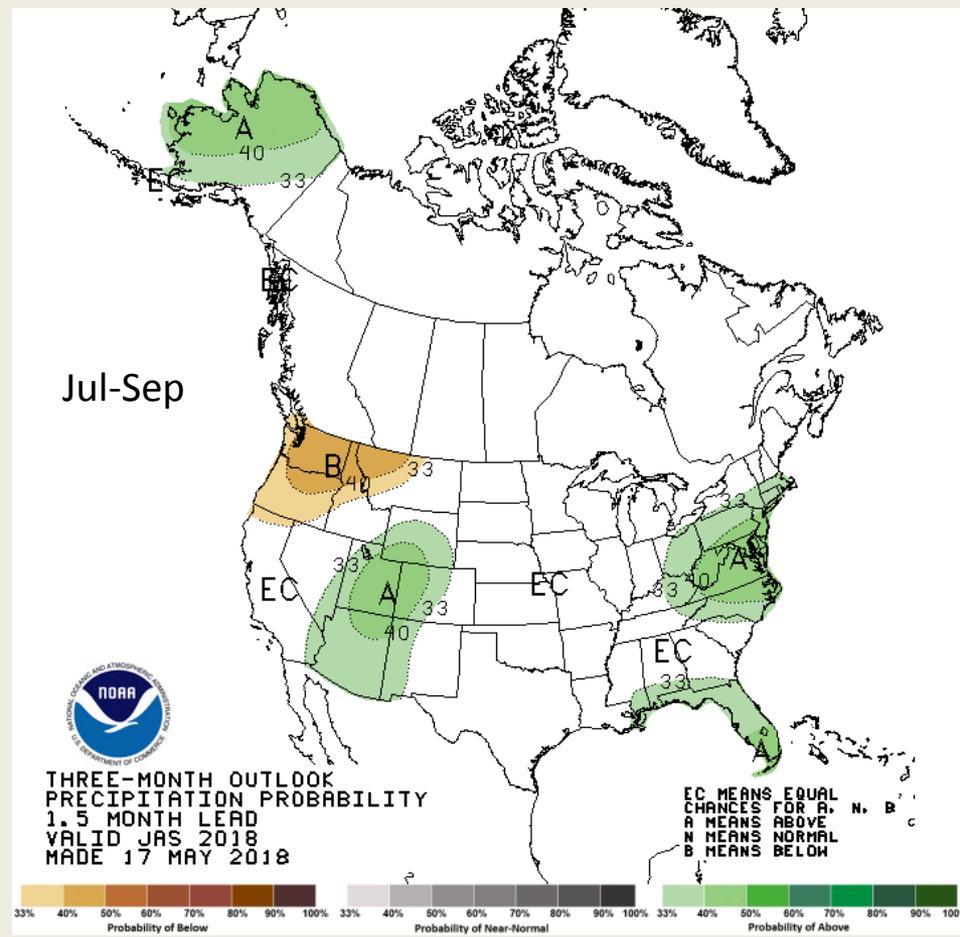
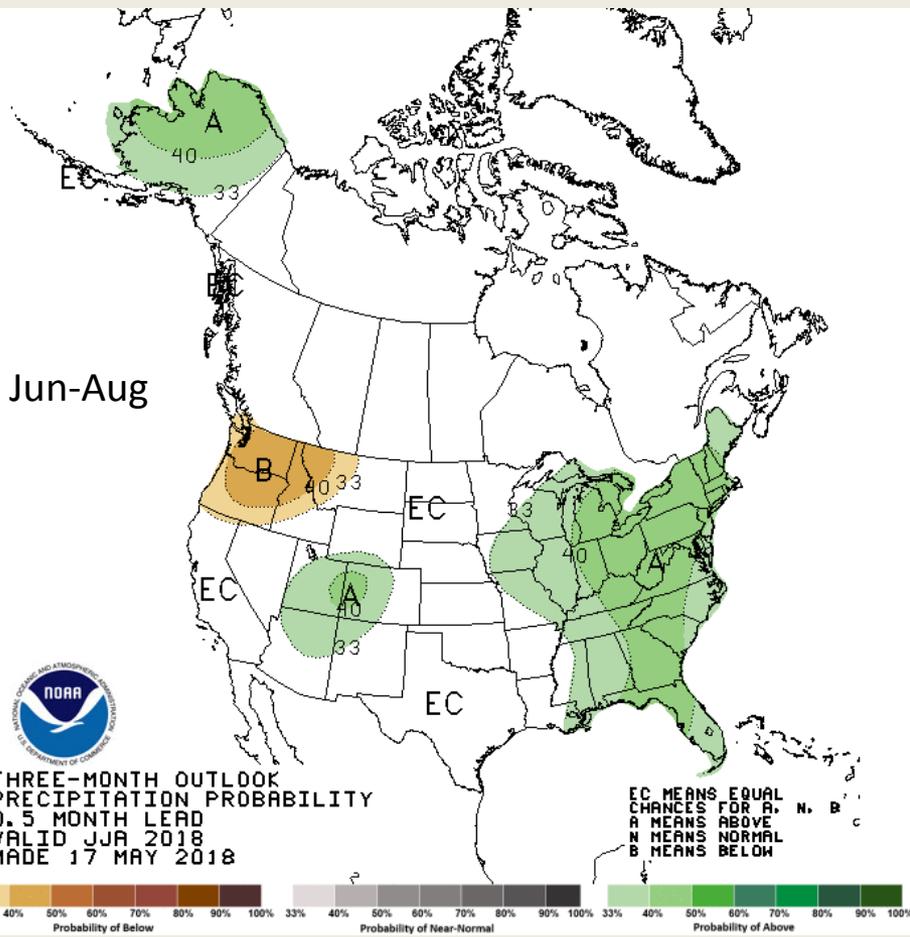
June U.S. Forecasts



U.S. Seasonal Temperature Forecasts



U.S. Seasonal Precipitation Forecasts

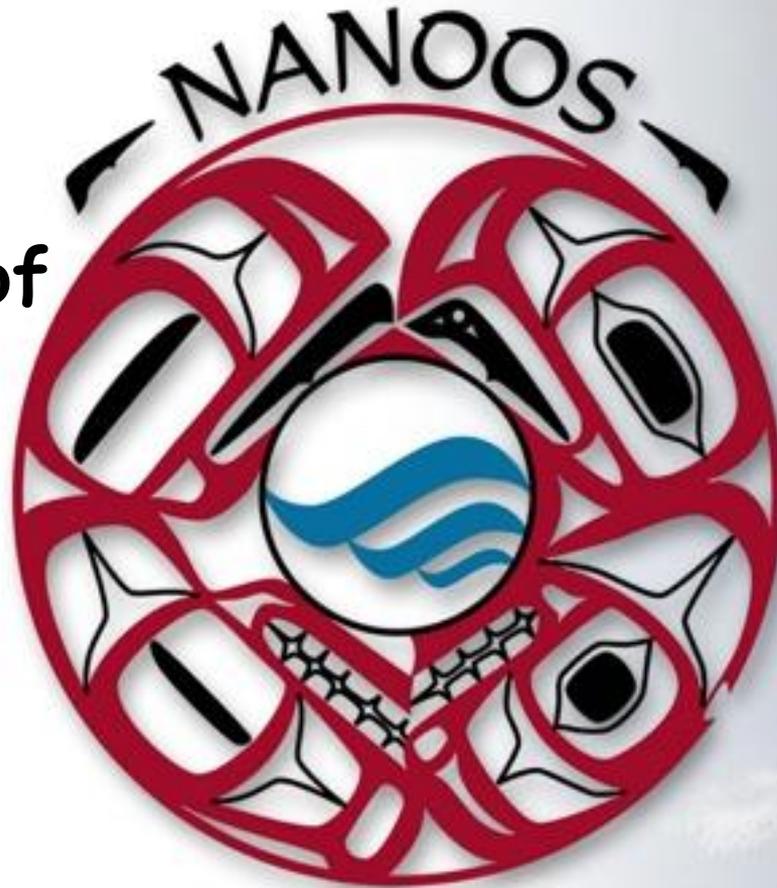


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Northwest Association of Networked Ocean Observing Systems

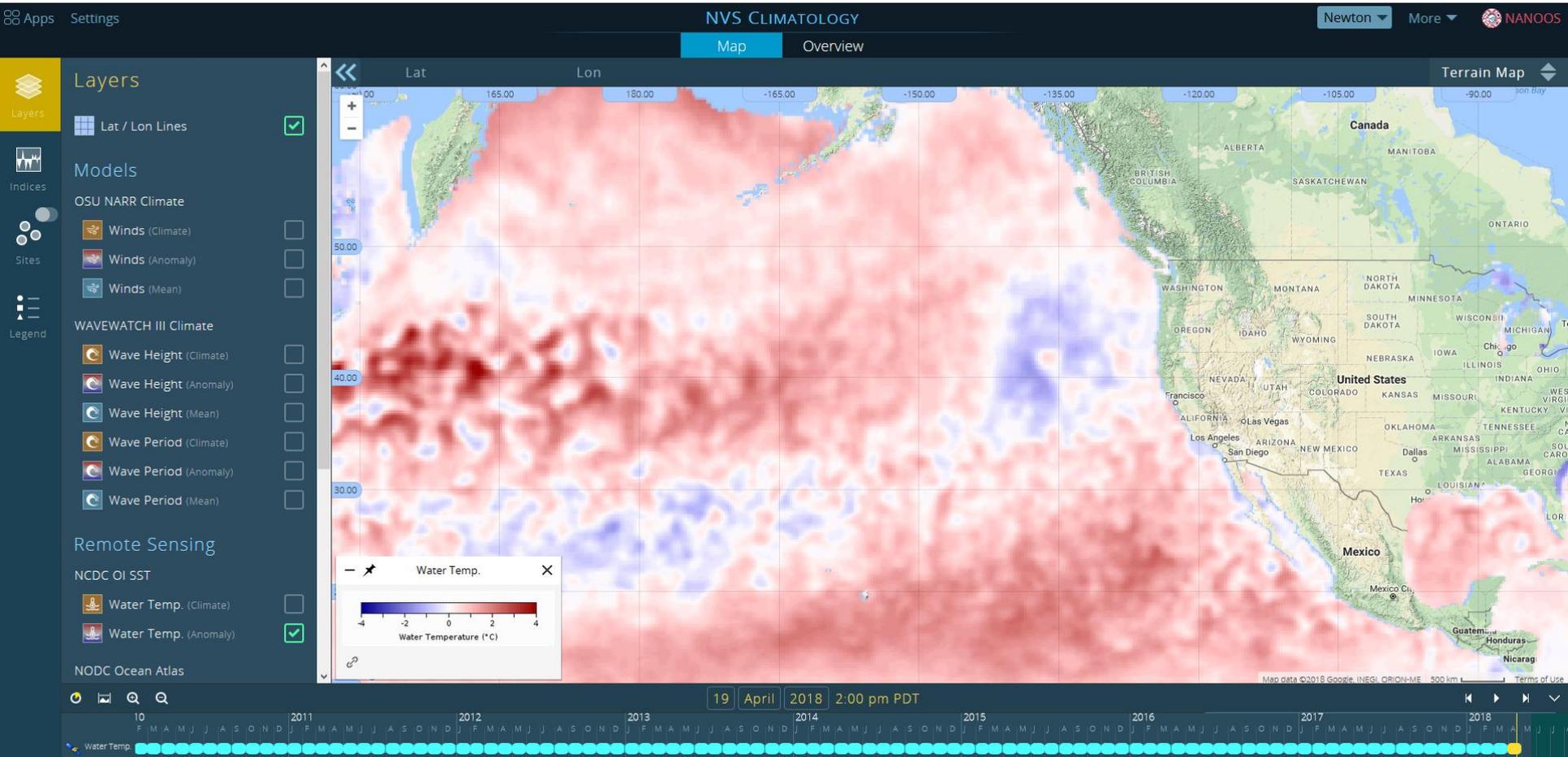


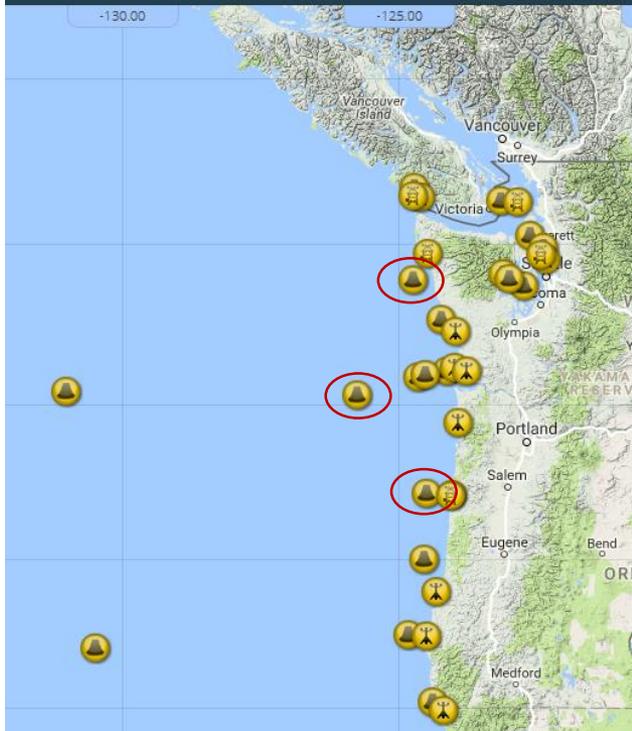
**NOAA West Watch Update 22 May 2018:
Washington / Oregon Observations**

Jan Newton, NANOOS Executive Director

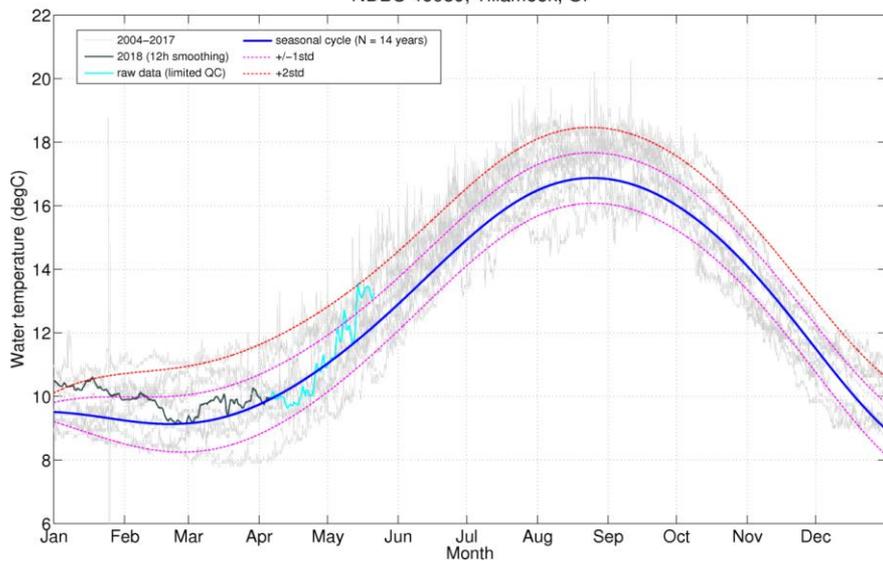
NANOOS: www.nanoos.org Climatology app

Sea Surface Temperature Anomaly



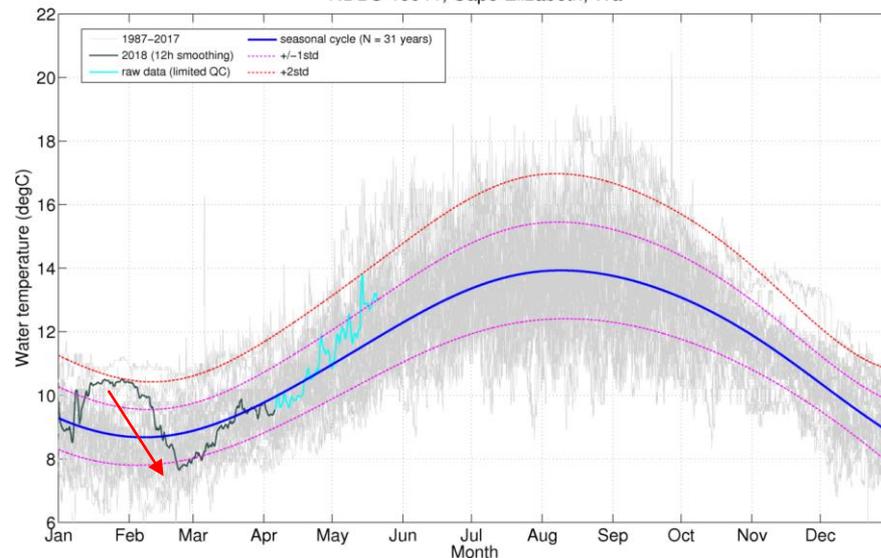


NDBC 46089, Tillamook, Or

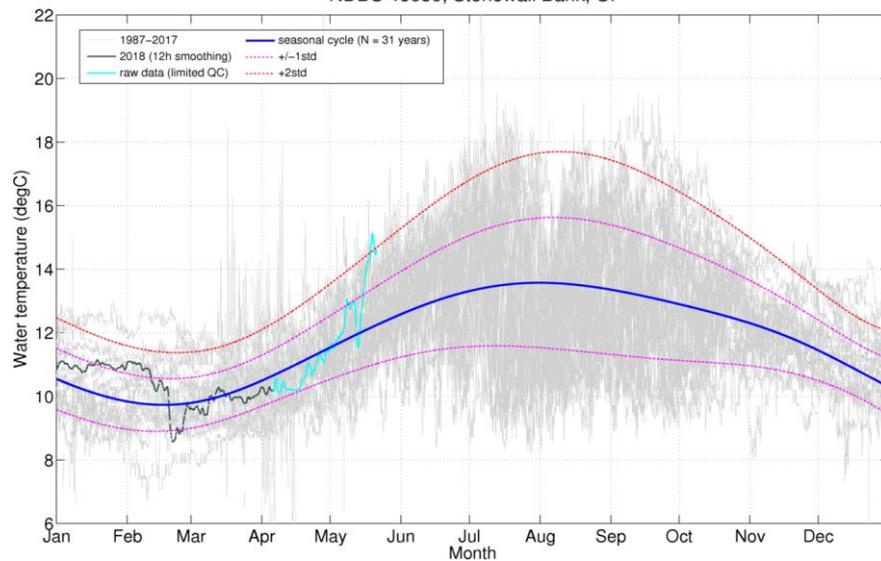


Water Temp

NDBC 46041, Cape Elizabeth, Wa

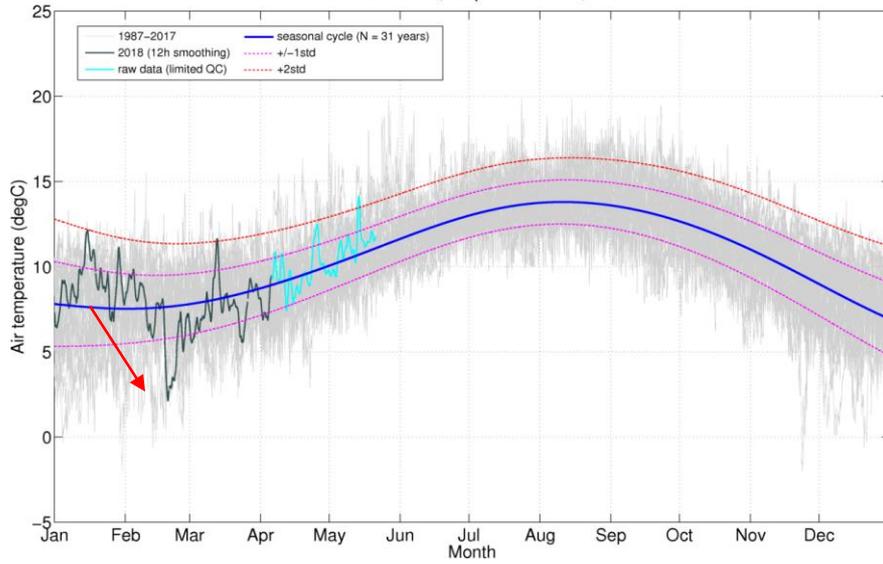


NDBC 46050, Stonewall Bank, Or



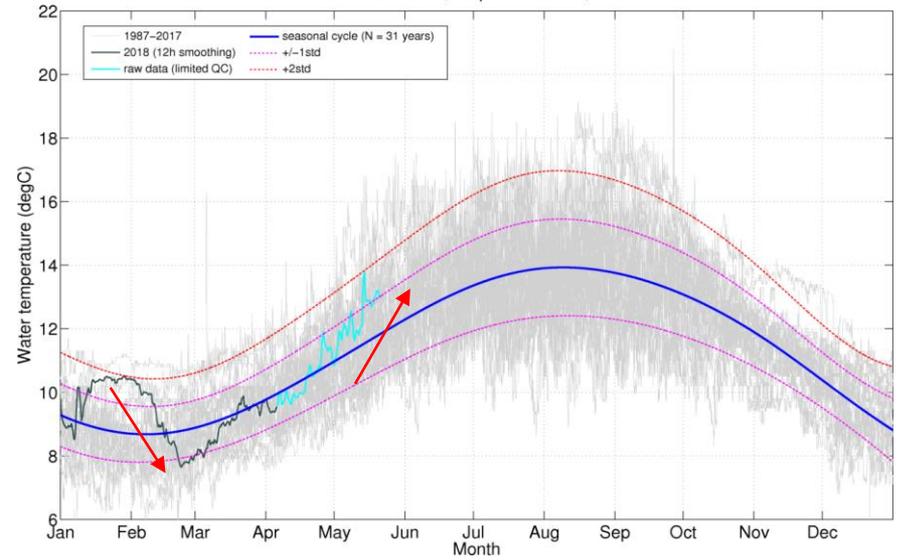
Air Temp

NDBC 46041, Cape Elizabeth, Wa

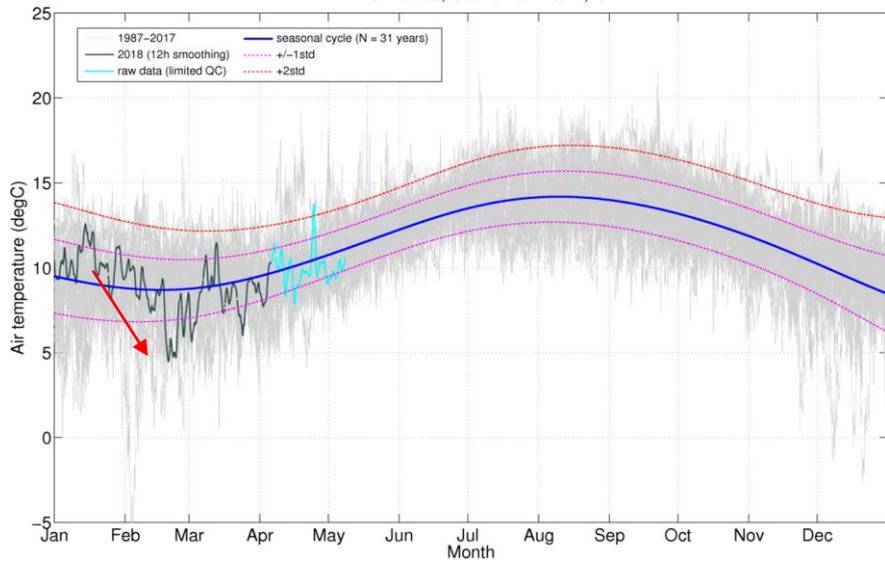


Water Temp

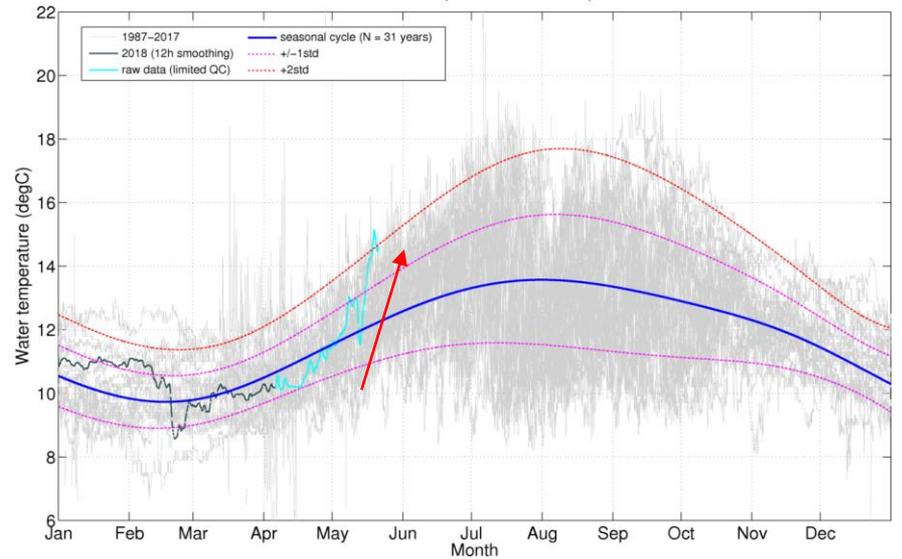
NDBC 46041, Cape Elizabeth, Wa



NDBC 46050, Stonewall Bank, Or

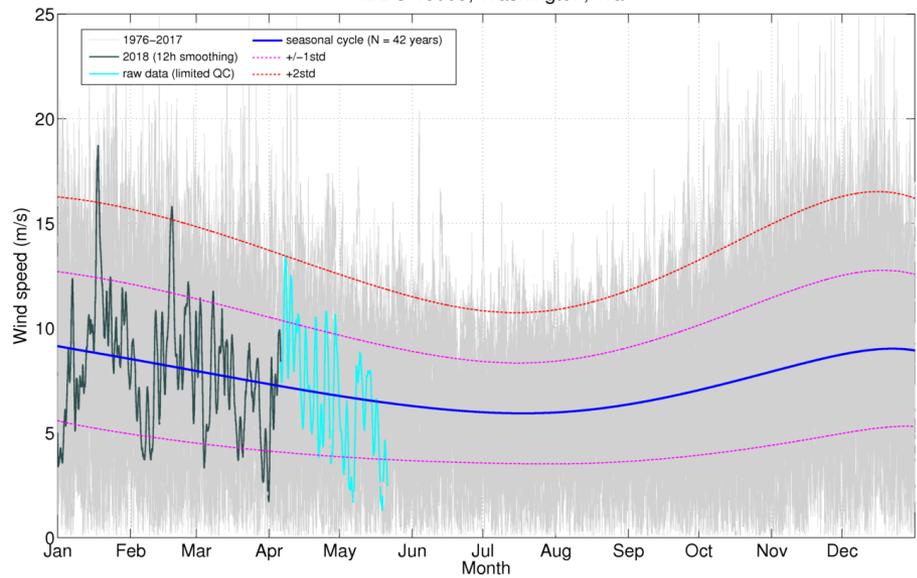


NDBC 46050, Stonewall Bank, Or

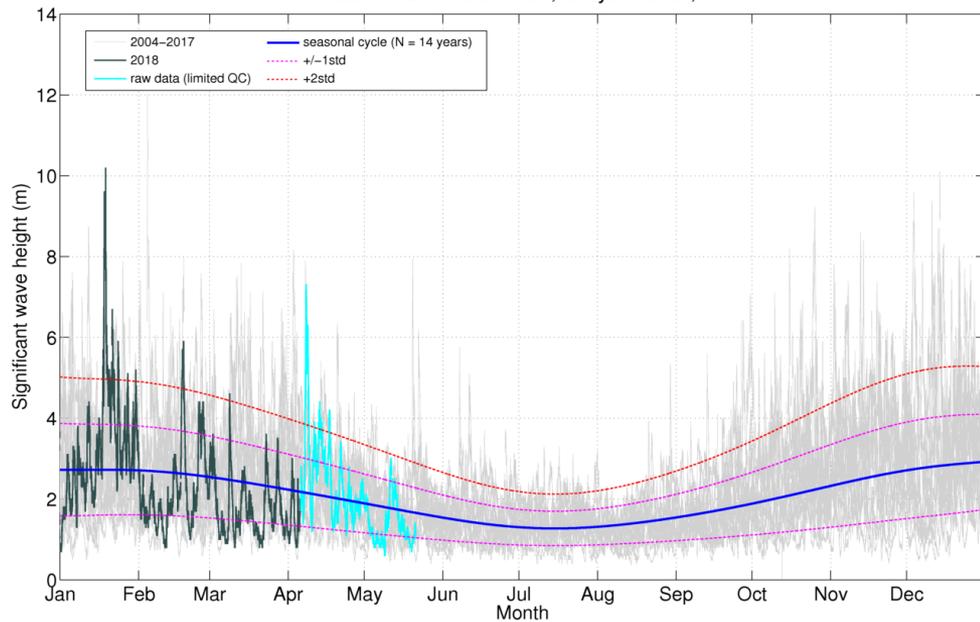




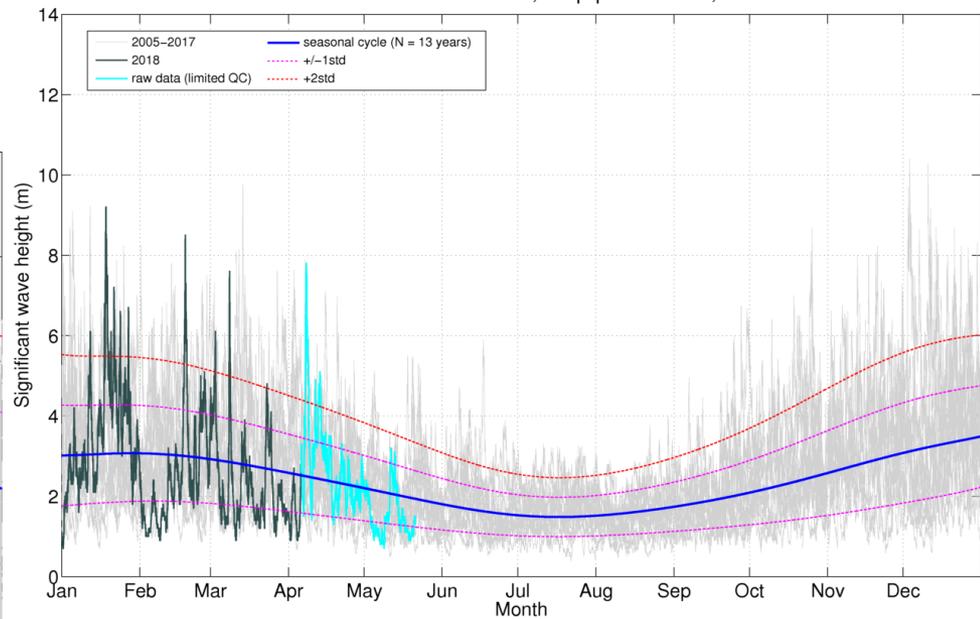
NDBC 46005, Washington, Wa

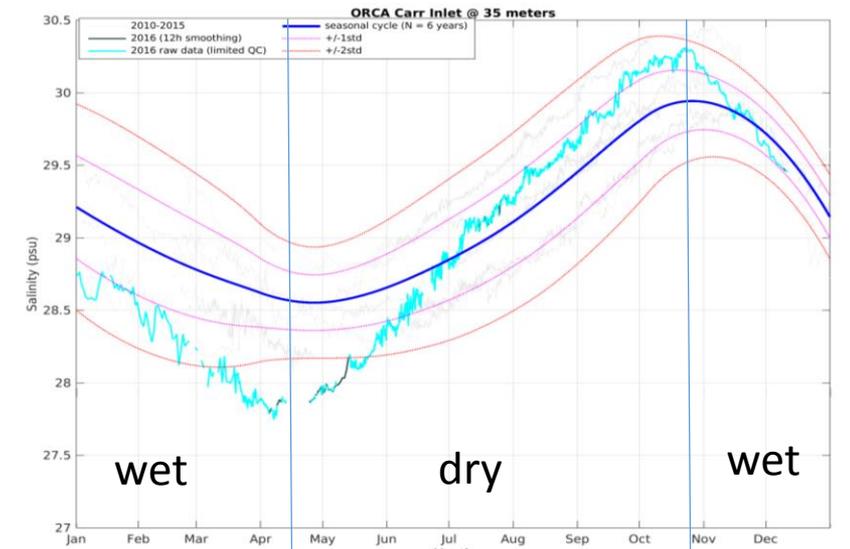
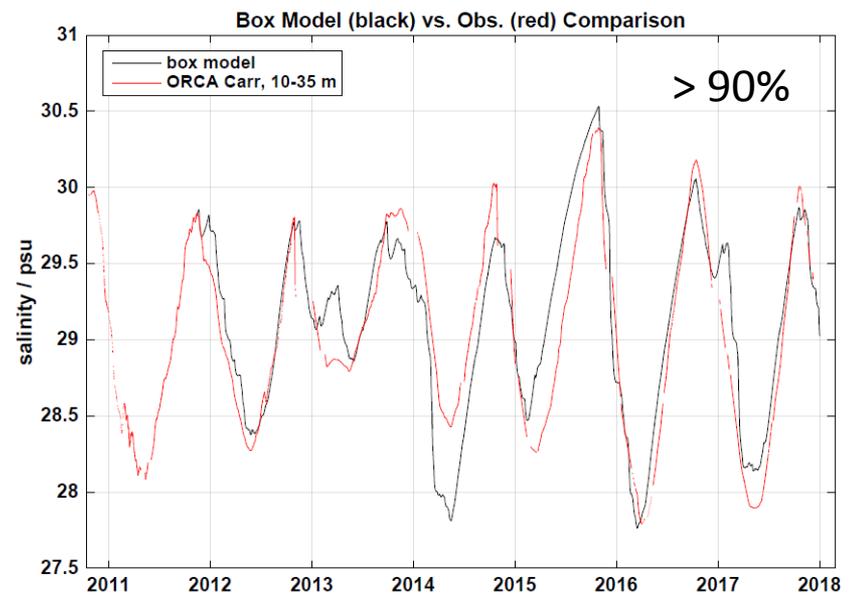
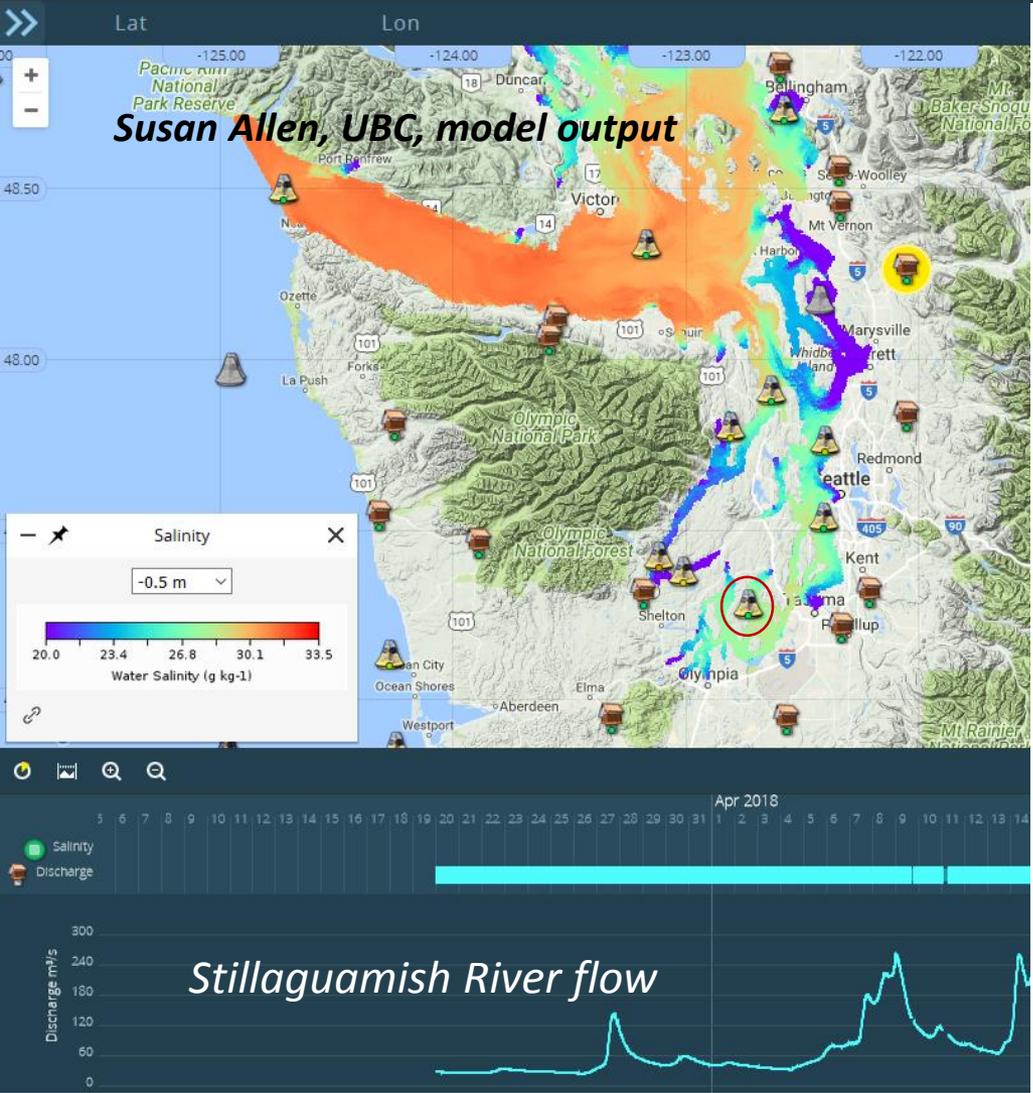


NDBC 46211 / CDIP 036, Grays Harbor, Wa



NDBC 46229 / CDIP 139, Umpqua Offshore, Or





Strong atmospheric forcings:

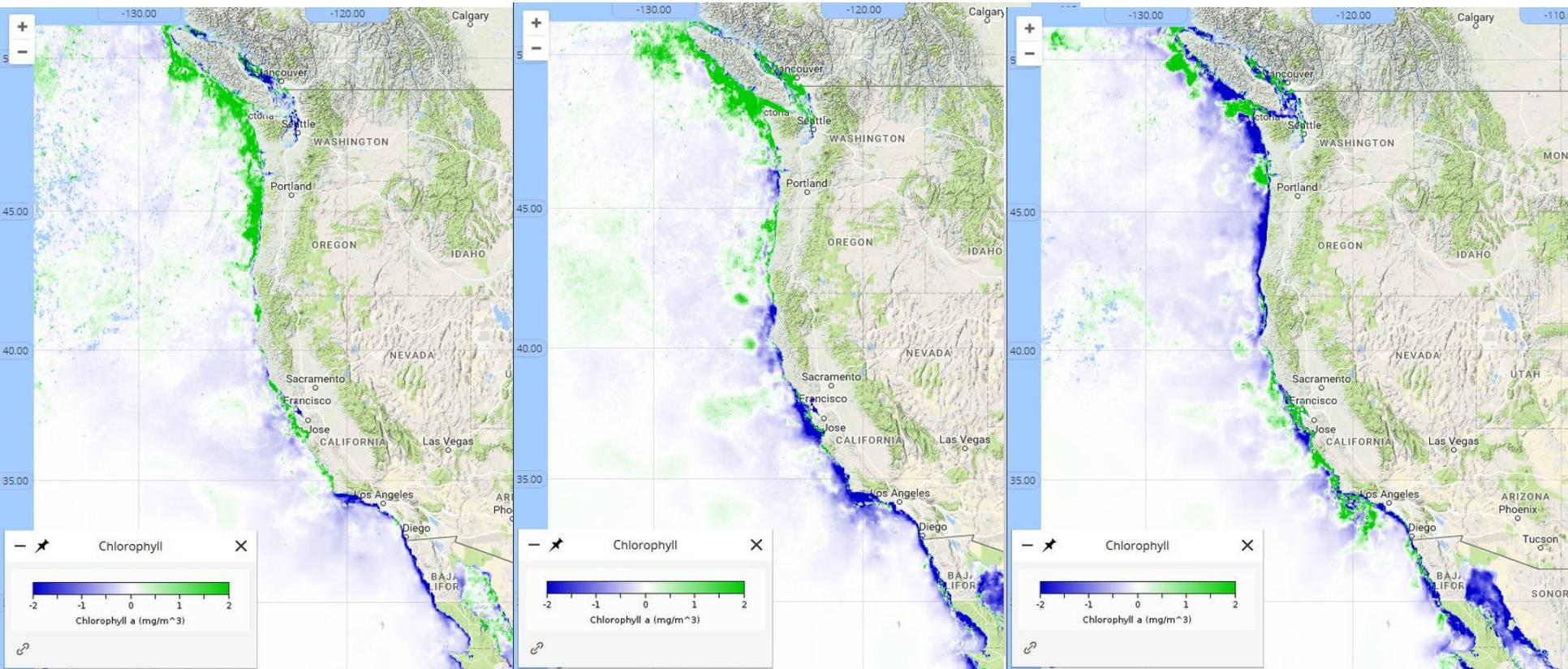
- Air temperature on surface water temperature
- Winds on wave height
- River flow on salinity

Chlorophyll Anomaly

February

March

April





NOAA West Watch Update: Central & Northern California Update

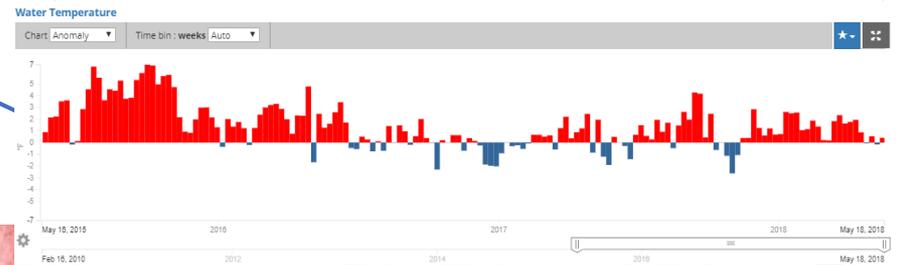
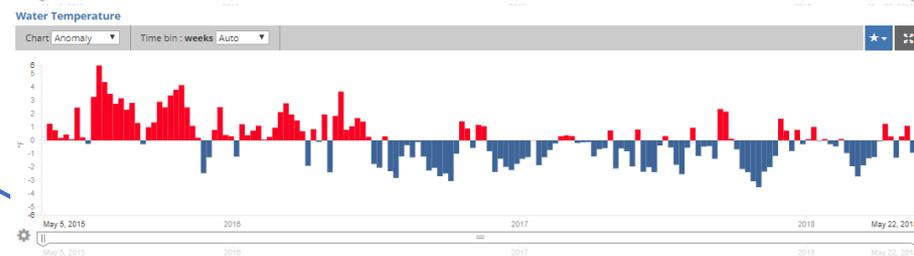
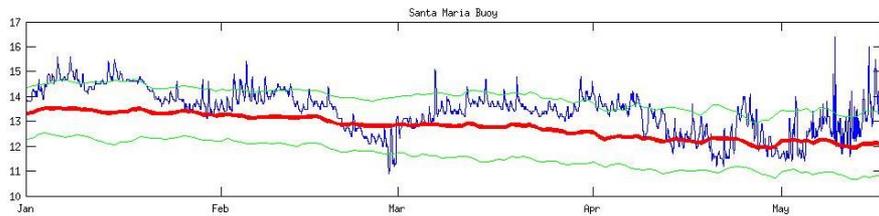
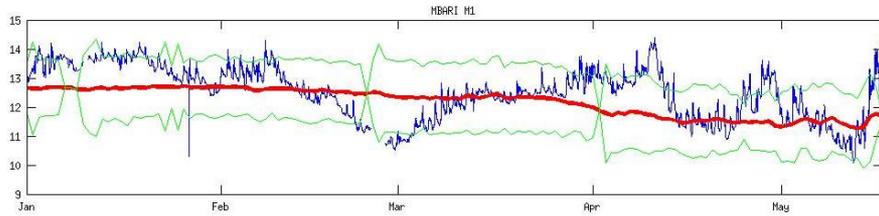
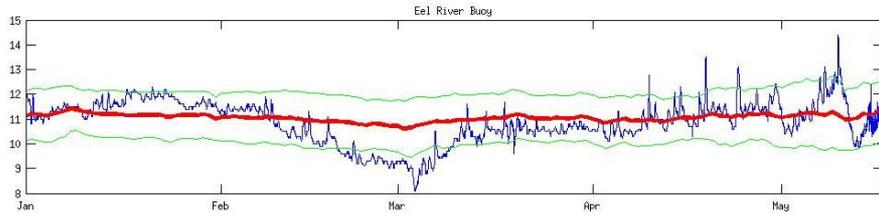
Presented by: Alex Harper, CeNCOOS Program Manager

Climatology

Settings NVS CLIMATOLOGY

Map Overview

Wave Height (Climate) << Lat Lon

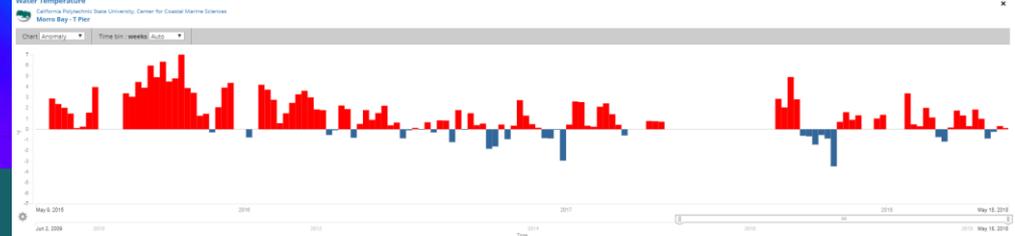
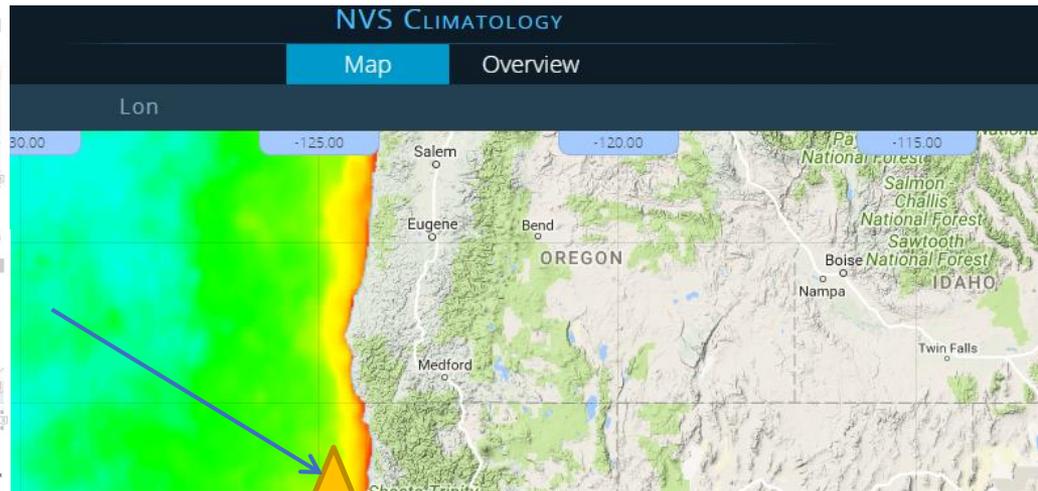


OSU MODIS Climate

- Chlorophyll (Climate)
- Chlorophyll (Anomaly)
- Water Temp. (Climate)
- Water Temp. (Anomaly)



Chlorophyll in Northern CA??



- NODC Ocean Atlas
 - Surface Salinity (Climate)
- OSU AVISO Climate
 - Sea Level (Climate)
 - Sea Level (Anomaly)
- OSU MODIS Climate
 - Chlorophyll (Climate)
 - Chlorophyll (Anomaly)
 - Water Temp. (Climate)
 - Water Temp. (Anomaly)



Atmospheric Marine Layer Returns

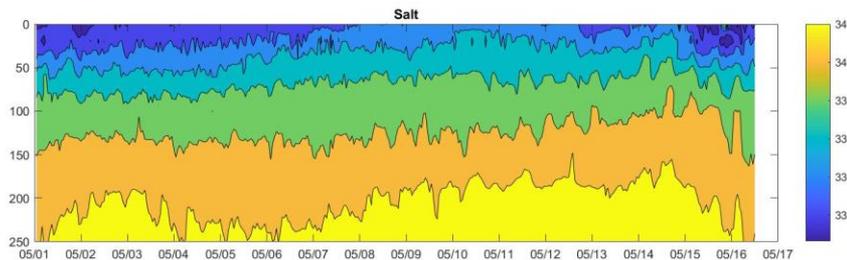
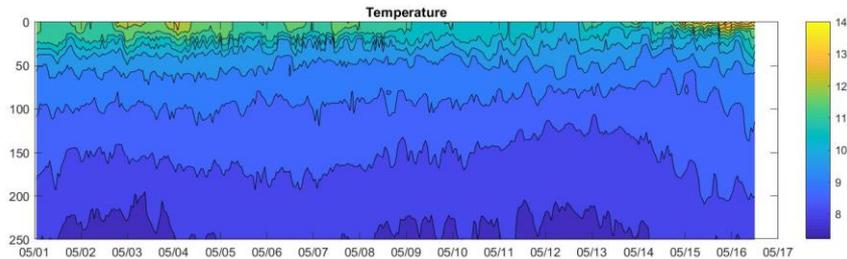
SFGATE LOCAL NEWS SPORTS REAL ESTATE BUSINESS A&E FOOD LIVING TR

'May gray' is here to stay, say San Francisco Bay Area forecasters

By Amy Graff, SFGATE Updated 9:57 am, Monday, May 14, 2018



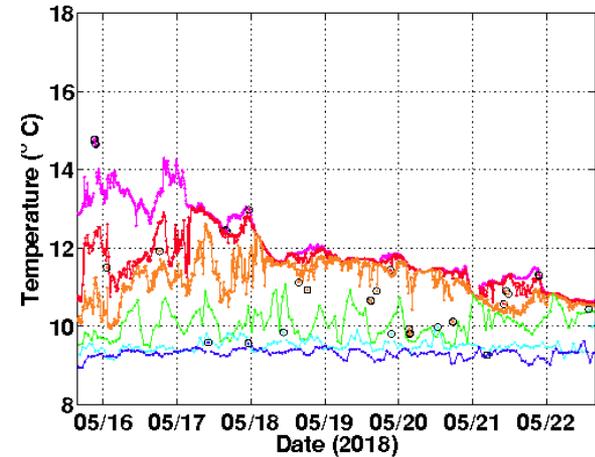
Monterey Bay Mooring (M1)



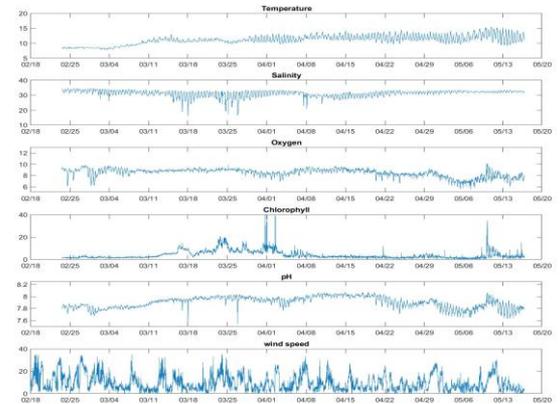
Monterey Bay Mooring M1

Temperature from the Surface to 80m

Surface, 10m, 20m, 40m, 60m, 80m



Humboldt Shore Station (Chevron Dock)



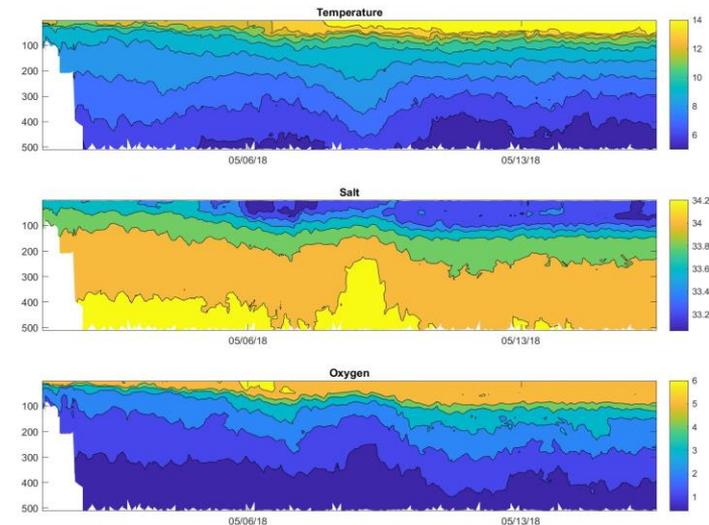
CeNCOOS Glider Deployments

- Spray glider continuously along CalCOFI Line 67 and Sea Glider along Trinidad Head line
- Glider applications include: Climate/models, HABs, Biogeochemical cycles, Ocean acidification/hypoxia, Internal tides/sediment resuspension
- Glider deployment strategies: Continuous (lines – how long, grids – scale) Process experiments, Rapid response

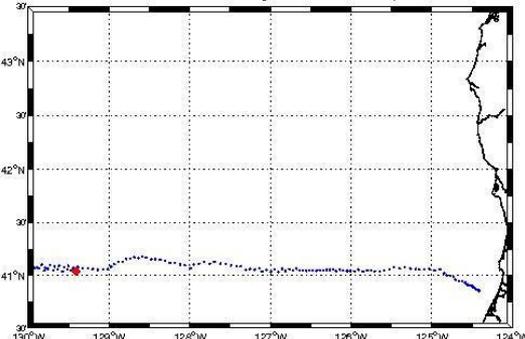
Trinidad Head Glider Redeployment



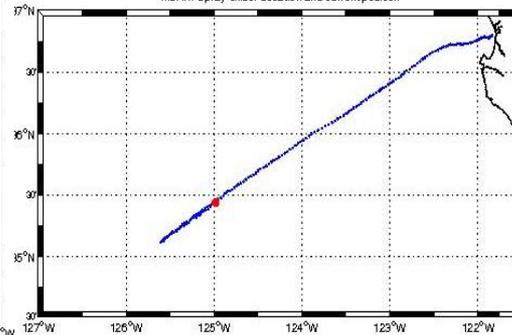
Monterey Bay Glider Line (67)



OSU/CeNCOOS/NAOOS SeaGlider Location and current position

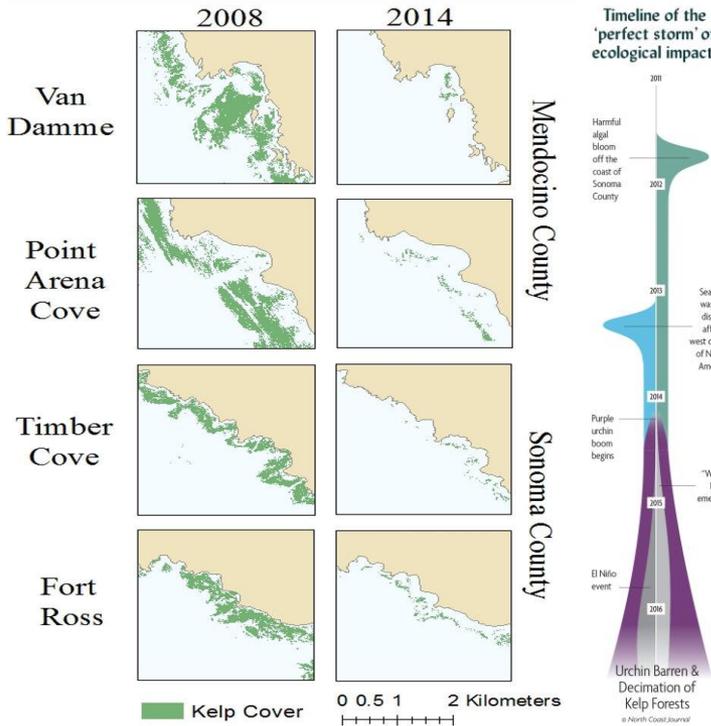


MBARI Spray Glider Location and current position



Biology & Ecology Update

Kelp, urchins, and whales



4-MINUTE READ

How music led Daniel DeLeon to study the ocean with machine learning

Daniel didn't know what engineering was when he started community college. Now he's making breakthroughs, using machine learning to track endangered whales.



MBARI using machine learning to classify marine mammal calls from deep sea observatory hydrophone.

google.com/about/stories/soundwaves/

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Check out these insanely close photos of killer whales in Monterey Bay

By [Alix Martichoux](#), SFGATE Updated 7:24 am, Wednesday, May 16, 2016

Facebook Twitter Pinterest Google+ Email Print





Questions?

Email Alex Harper at aharper@mbari.org



ACIDD: Across the Channel Investigating Diel Dynamics



Co-PIs Kelsey Bisson and Nick Huynh, UCSB



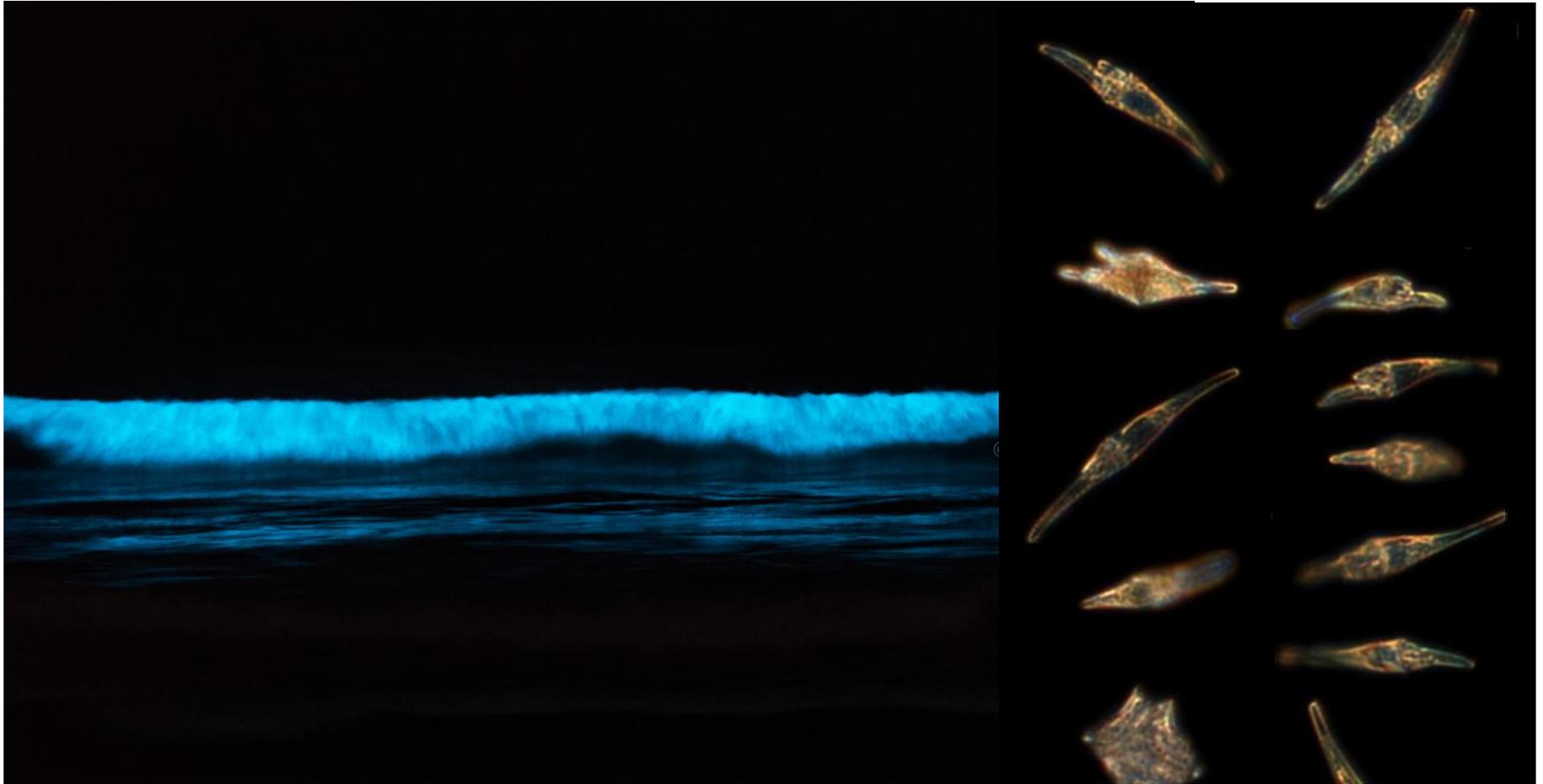
California wildfires
December 5th, 2017 - Mixed natural color-NIR/SWIR view, enhanced contrast and saturation
Terra MODIS data through NASA Worldview
Processed by Pierre Markuse

Thomas Fire Smoke Plume, 5 Dec 2017



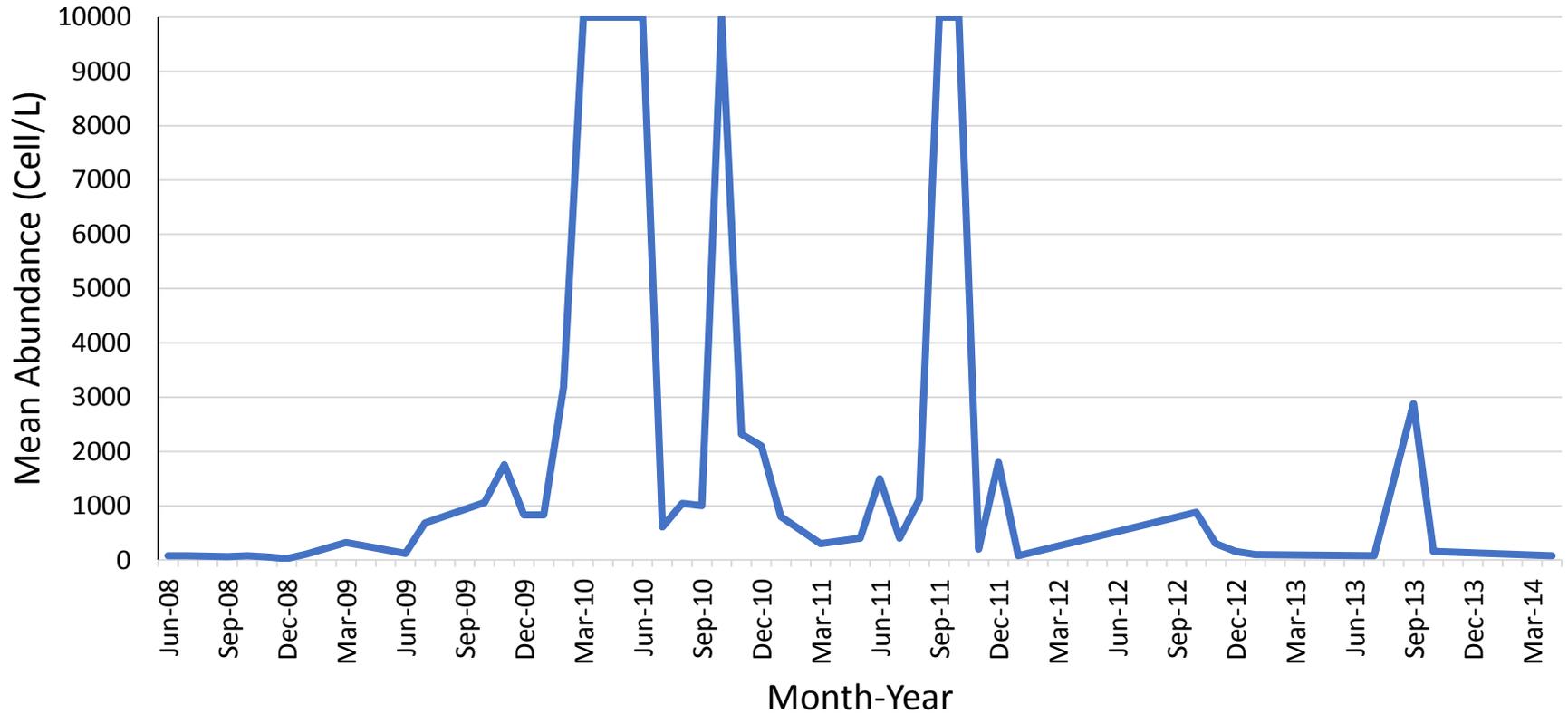
R/V Sally Ride

Red Tide – La Jolla, May 7th 2018



Lingulodinium polyedra

L. polyedra Mean Abundance at Scripps Pier



Sick Pelicans – Pepperdine University, April 28, 2018



Photo credit: Grant Gorman

Call Agenda



- Project Recap & Updates (Polly Hicks)
- El Niño and Regional Climate brief (Dan McEvoy)
- IOOS Nearshore Conditions brief (Jan Newton, Alex Harper, Megan Hepner)
- **Environmental conditions and impacts reporting and discussion (Polly Hicks)**
- Discussion

Regional Impacts Summary



Reporting Status:

- 73 entries since March 21, 2018

Environmental Conditions

- Drought
- Water Allocations
- Flooding
- Severe Weather
- Record High Temperatures
- High Ozone Levels
- Snowfall Records
- Vog
- Wildfire

Human & Environmental Impacts

- Property damage/Loss of property
- Impacts to recreational access
- Evacuations
- Increased human health risks
- Power outages
- Agriculture
- Loss of livestock
- Water Restrictions

Impacts in Pictures



Two EF-0 tornadoes touched down in Colusa County, California. One in the town of Williams left a 1-mile long damage track. Six homes were damaged along with reports of damage from flying debris. The tornadoes were part of a strong atmospheric river that swept through California causing flooding, road closures, airport delays and cancelations, and rockslides in Northern California.



Photo: CHERI ROSS



Photo: SEAN MATTSON

Impacts in Pictures



Unprecedented rainfall and landslides forced water rescues and strand entire towns on Kauai where water rose 5-8 feet due to severe thunderstorms and flash flooding. Wainiha broke their 24 hour rainfall total by almost 3 inches at 19.54 inches. Hanalei saw 28.15 inches in 24 hours. Two homes were torn from their foundations with many others flooded. Sarah Blane, chief of staff to Kauai's mayor said "It's the worst natural disaster to occur on Kauai in 25 years, since Hurricane Iniki."

An Extremes Committee is being convened to evaluate the observation of 49.69 inches of rain in 24 hours in Waipa, Kauai on April 14-15 as a new US 24-hour record. The standing record is 43 inches observed at Alvin, Texas in 1979 during Tropical Storm Claudette.



Impacts in Pictures



Drought conditions in the panhandle of Alaska are showing up on the US Drought Monitor due to a winter of below-average snowfall, a dry autumn, and early spring. This is unusual because the area is located in the world's largest temperate rainforest. Ketchikan was running 30-40 inches of rain below normal. This lack of precipitation can impact hydropower, water supplies and snowpack. In March, the City of Wrangell was forced to implement water restrictions because the city was down to about a one month's supply at one point in time.



https://commons.wikimedia.org/wiki/File:Ketchikan_Alaska_Panoramic.jpg

Impacts in Pictures



Gov. Jay Inslee declare a state of emergency Saturday for 20 counties throughout Eastern Washington due to rain and severe snowmelt flooding. He said "Flooding caused by recent rains and snowmelt has fouled water and sewage treatment facilities, threatened state highways and local roads, and caused some people to leave their homes"

Authorities told residents in the town of Leavenworth to prepare for evacuations as a dam is threatened by rising waters. About 50 homes are threatened.



Photos by Brock Hires/The Omak-Okanogan County Chronicle

Impacts in Pictures



Record snowfall in parts of Northern Montana has begun to melt and is causing very high river levels along the Clark Fork River in Missoula, Montana. So far, the river has risen to major flood stage at its highest levels since 1908. The river has receded some but further rises are expected. Because of this, 800 people remain under evacuation notice. The river has since been closed to recreation due to downed power lines and other debris.



Water from the Clark Fork River floods onto Tower Street in Missoula, May 7, 2018
Josh Burnham, Montana Public Radio

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- **Discussion (all)**
 - Additional impacts to report?
 - Observations on recent environmental anomalies?

Next NOAA West Watch: July 24th, 1-2pm PDT/ 2-3pm PDT