



NOAA West Watch

*Reporting Regional Environmental
Conditions & Impacts in the West*

October 24, 2017

Call Agenda



- **Project Recap & Updates (Polly Hicks)**
- El Niño and Regional Climate brief (Dan McEvoy)
- Guest Speaker: Western US wildfire season update (Tim Brown)
- IOOS Nearshore Conditions brief (Jan Newton, Clarissa Anderson, Francisco Chavez)
- 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: January 9, 1-2PM PDT/ 2-3PM MDT

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Happy New Water Year!

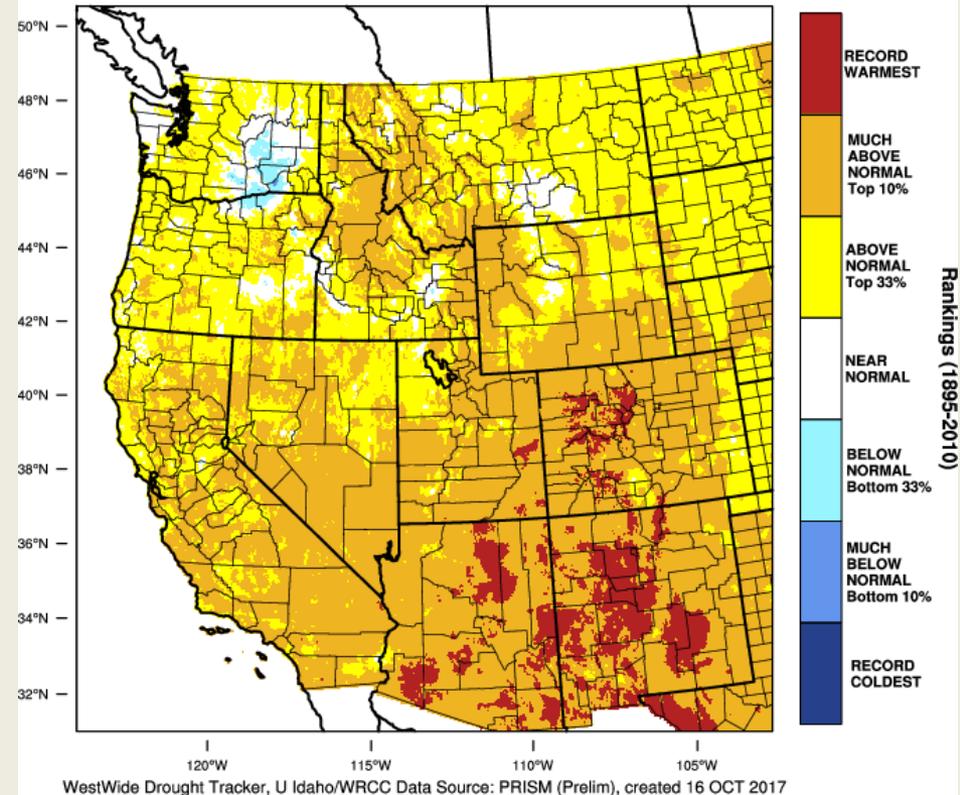
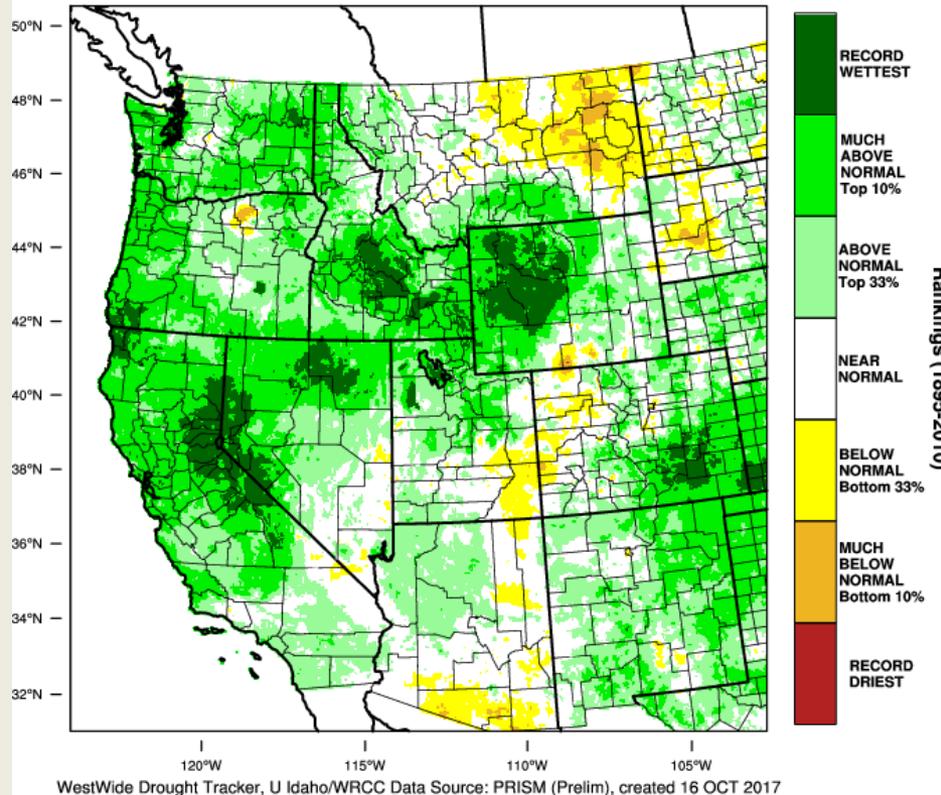


Water Year 2017 precipitation percentiles

Water Year 2017 temperature percentiles

Western United States - Precipitation
October-September 2017 Percentile

Western United States - Mean Temperature
October-September 2017 Percentile

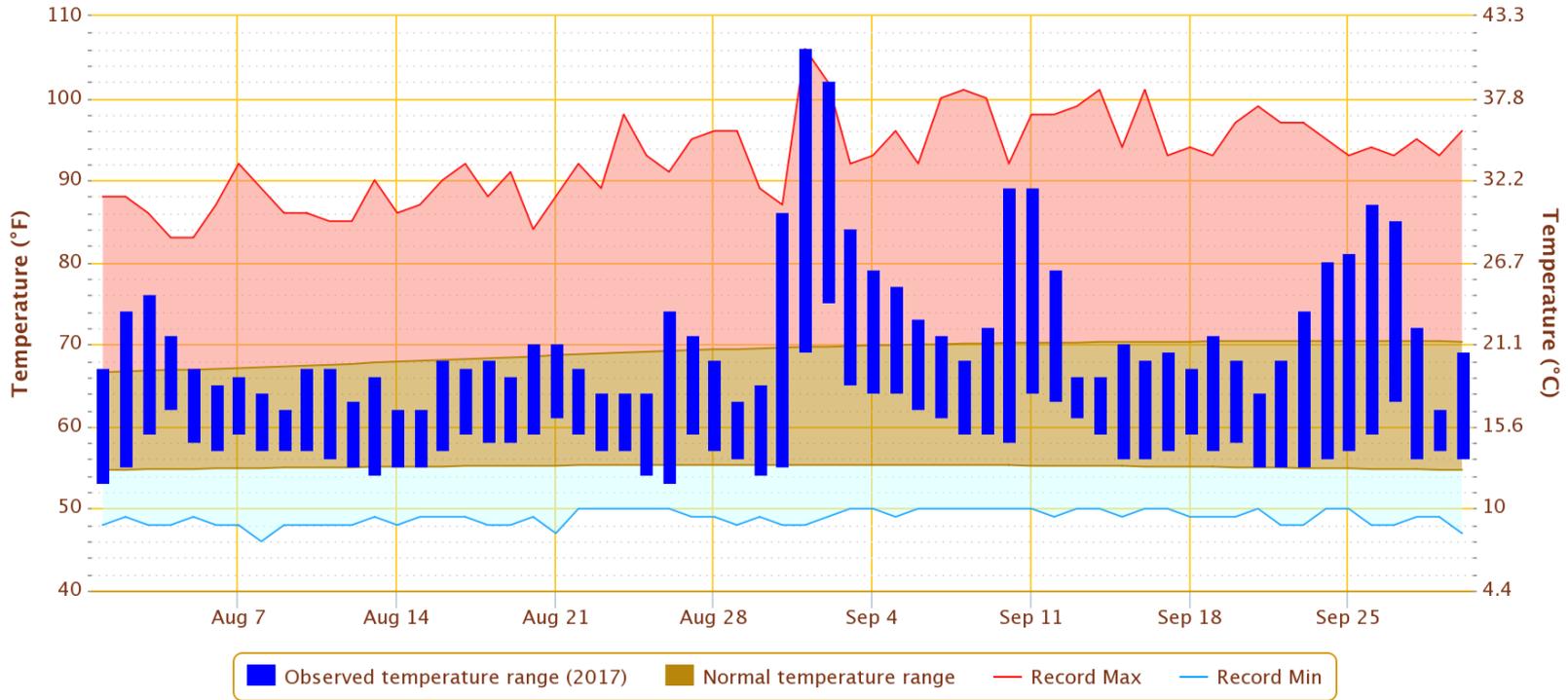


California Heat Wave



Daily Temperature Data – SAN FRANCISCO DWTN, CA

Period of Record – Max temperature: 1874-06-01 to 2017-10-19; Min temperature: 1875-01-01 to 2017-10-19. Normals period: 1981-2010. Click and drag to zoom chart.



Powered by ACIS



<http://scacis.rcc-acis.org/>

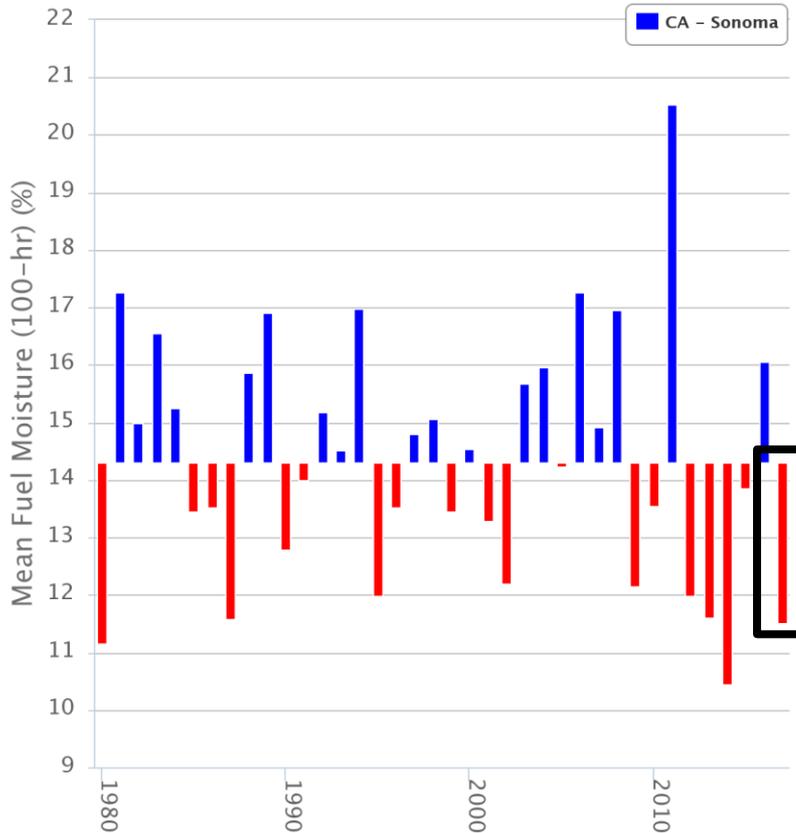
Wet Winter & Hot Summer Sets Stage for Wildfire Outbreak



October 1-8 fire danger indices for Sonoma County

Mean Fuel Moisture (100-hr) (gridMet)

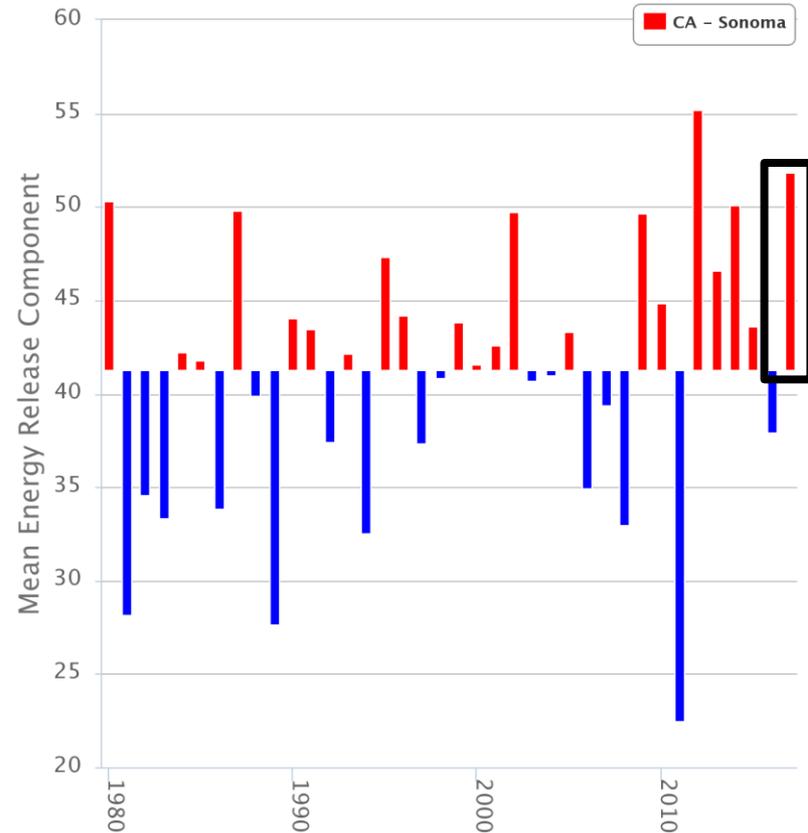
Annual Averages for Oct 1 to Oct 8



ClimateEngine Data Source: METDATA/gridMET 4000 m (1/24-deg) daily dataset (University of Idaho)

Mean Energy Release Component (gridMet)

Annual Averages for Oct 1 to Oct 8



ClimateEngine Data Source: METDATA/gridMET 4000 m (1/24-deg) daily dataset (University of Idaho)

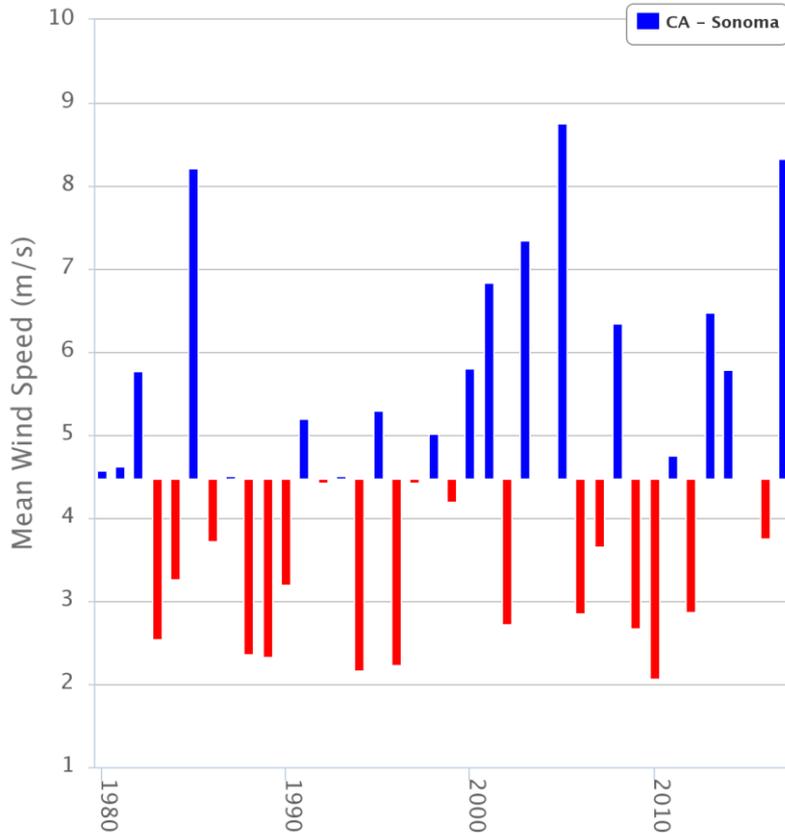
Weather (High Wind) Key to Wildfire Spread



October 8 wind speed for Sonoma County

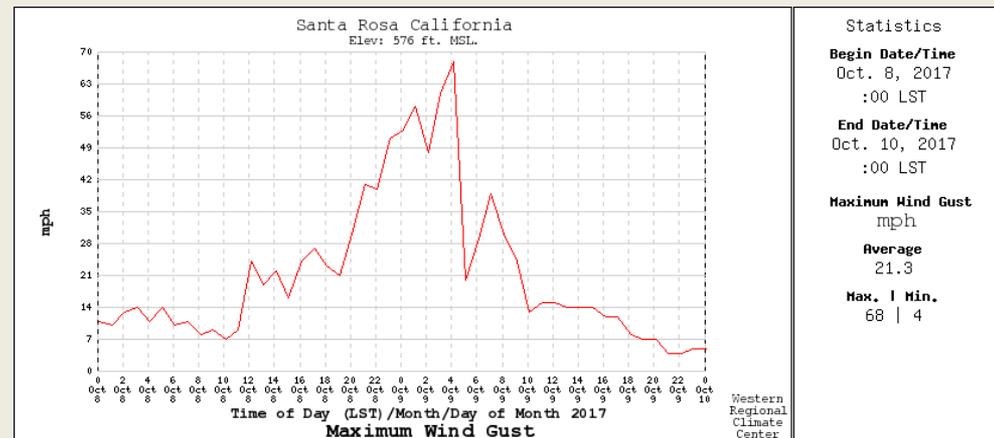
Mean Wind Speed (gridMet)

Annual Averages for Oct 8 to Oct 8



ClimateEngine Data Source: METDATA/gridMET 4000 m (1/24-deg) daily dataset (University of Idaho)

- Max wind gust at Santa Rosa RAWS
- October 8-9
- 68 mph peak



ENSO Status



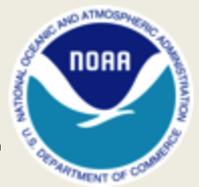
- ENSO Alert System Status: **La Niña Watch**
- ENSO-neutral conditions are present
- Equatorial sea surface temperatures (SSTs) are near-to-below average across the central and eastern Pacific Ocean.
- La Niña conditions are favored (~55%-65%) during the Northern Hemisphere fall and winter 2017-18.*

Credit: CPC

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

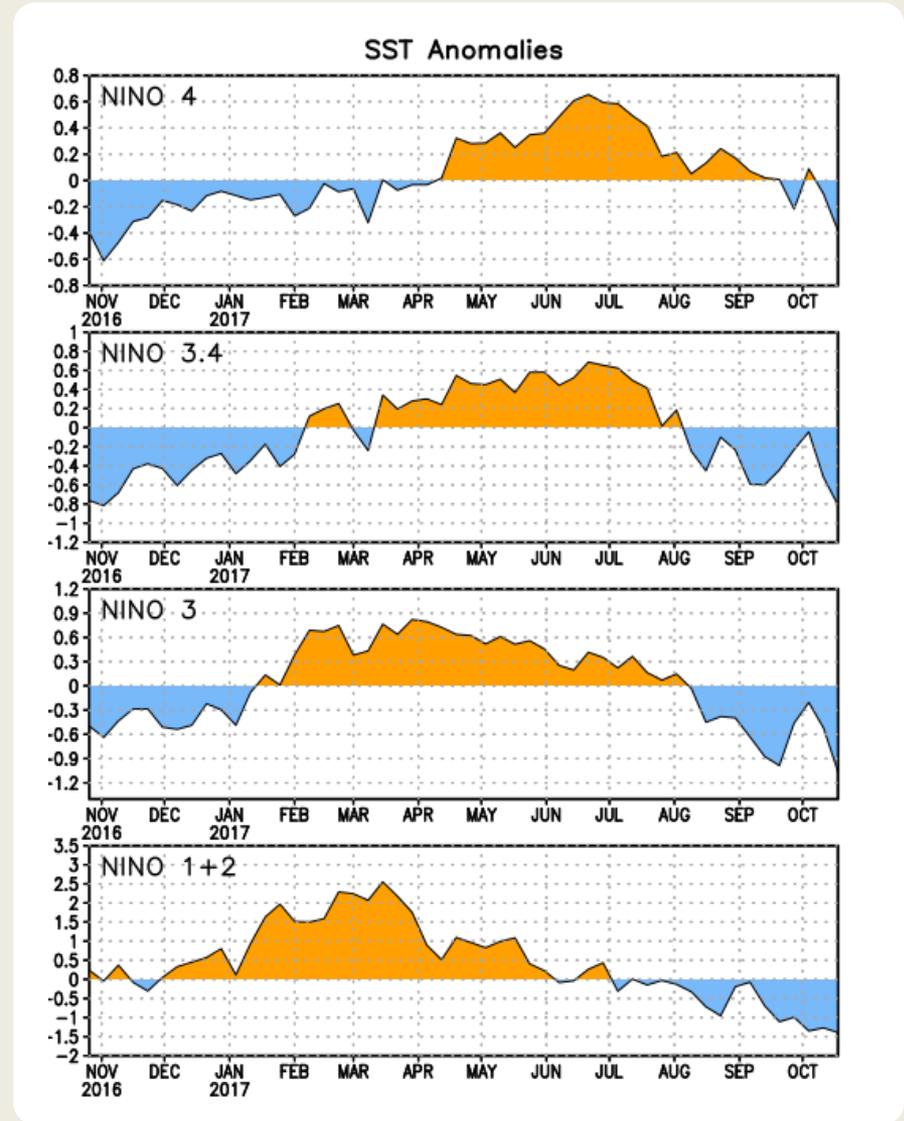
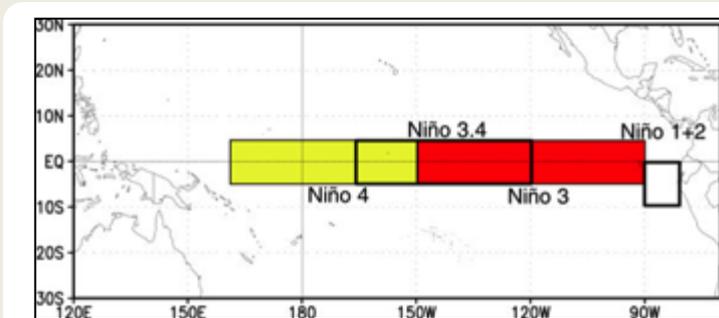
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/.

Niño Region SST Departures (°C) Recent Evolution

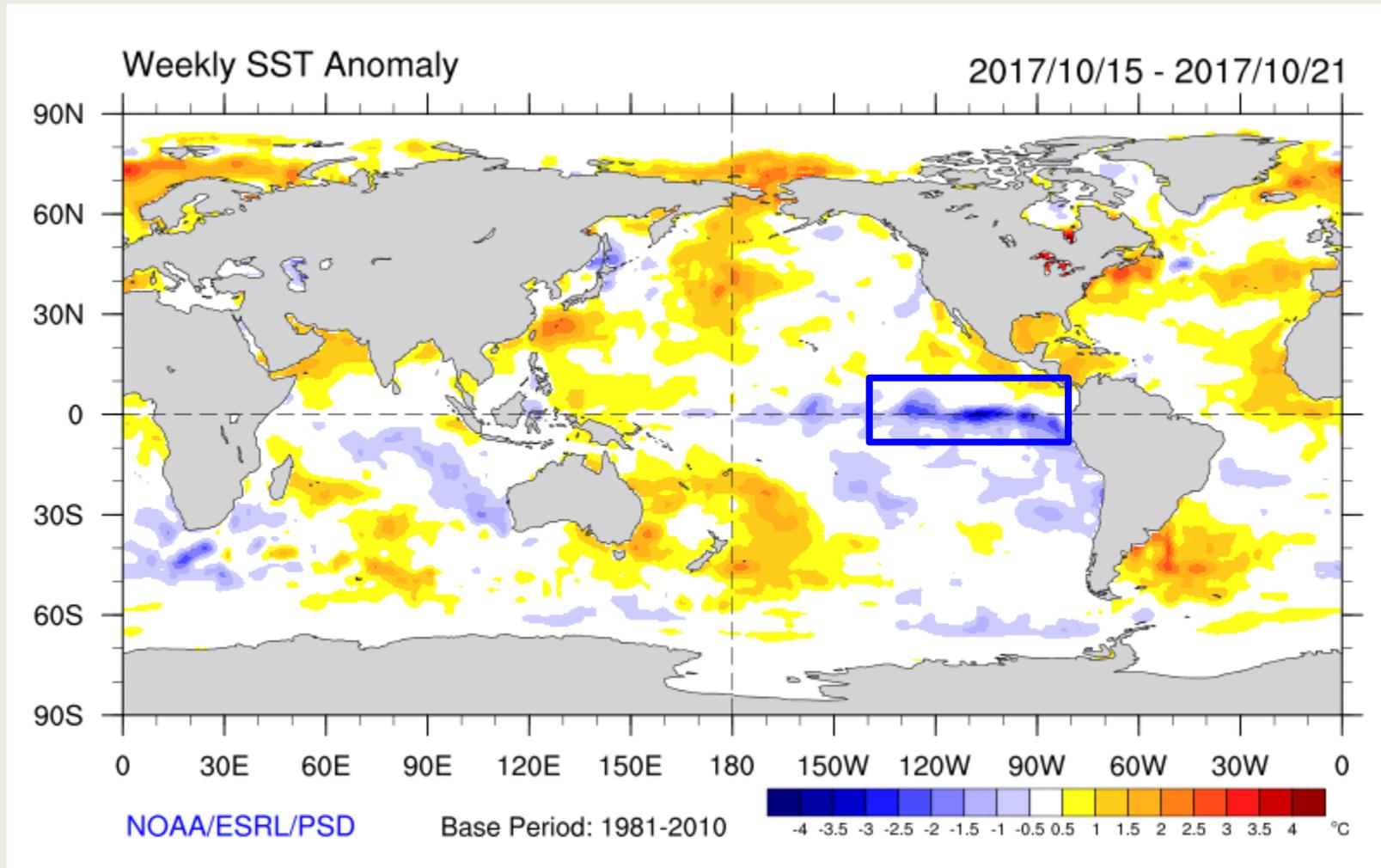


The latest weekly SST departures are:

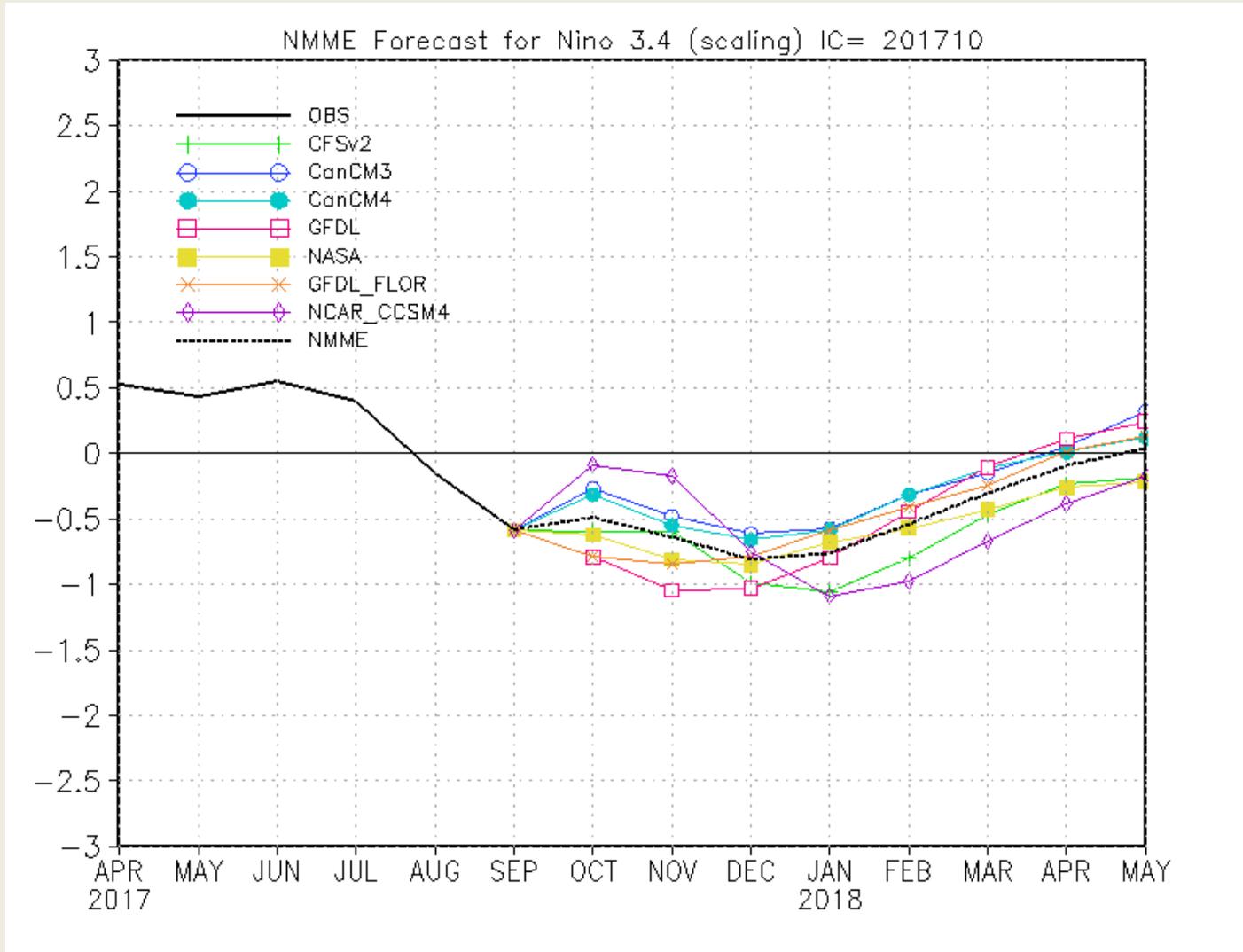
Niño 4	-0.4°C
Niño 3.4	-0.8°C
Niño 3	-1.1°C
Niño 1+2	-1.4°C



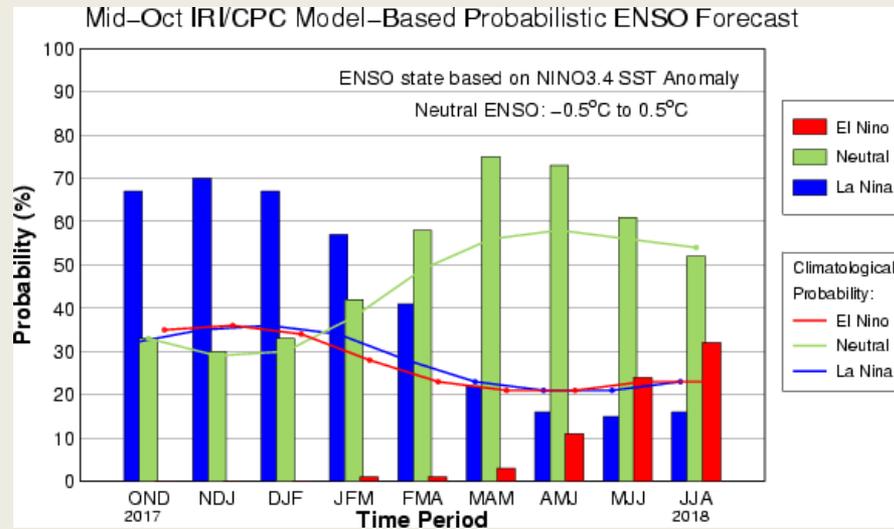
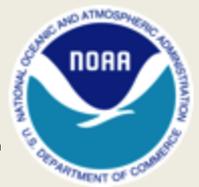
Current Sea Surface Temperatures



ENSO Forecasts

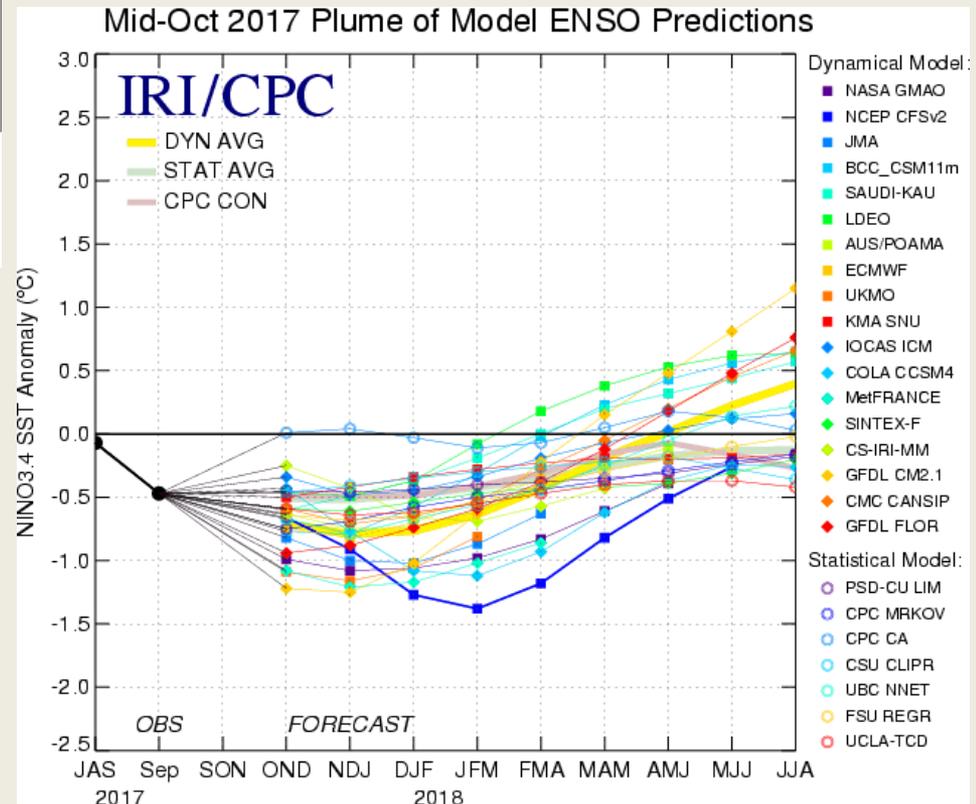


ENSO Forecasts



CPC/IRI El Niño forecast:

NMME models + other dynamical models + statistical models



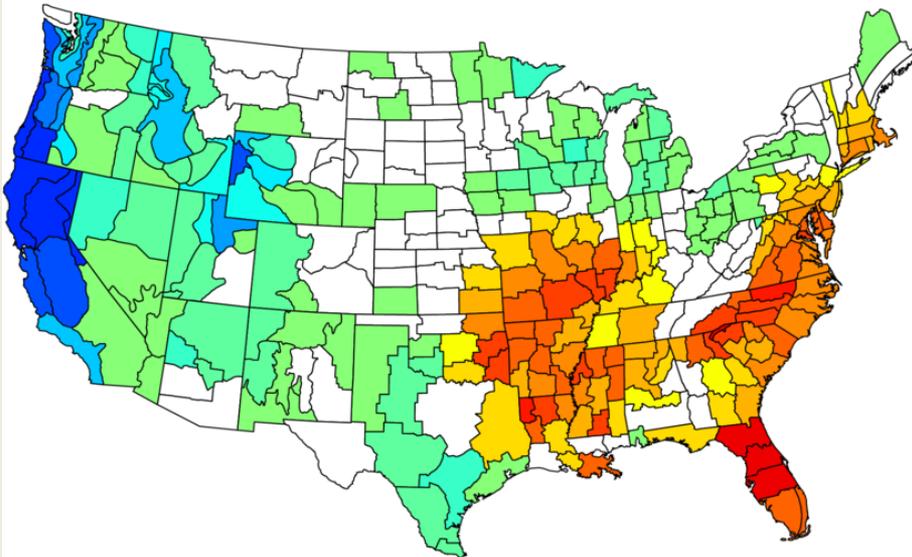
ENSO tells us...???



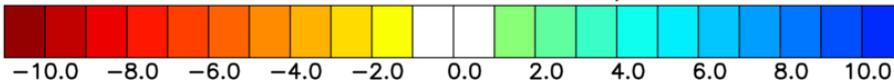
Tale of two weak La Nina years

2016-17

NOAA/NCEI Climate Division Precipitation Anomalies (in)
Nov to Mar 2016-17
Versus 1981-2010 Longterm Average

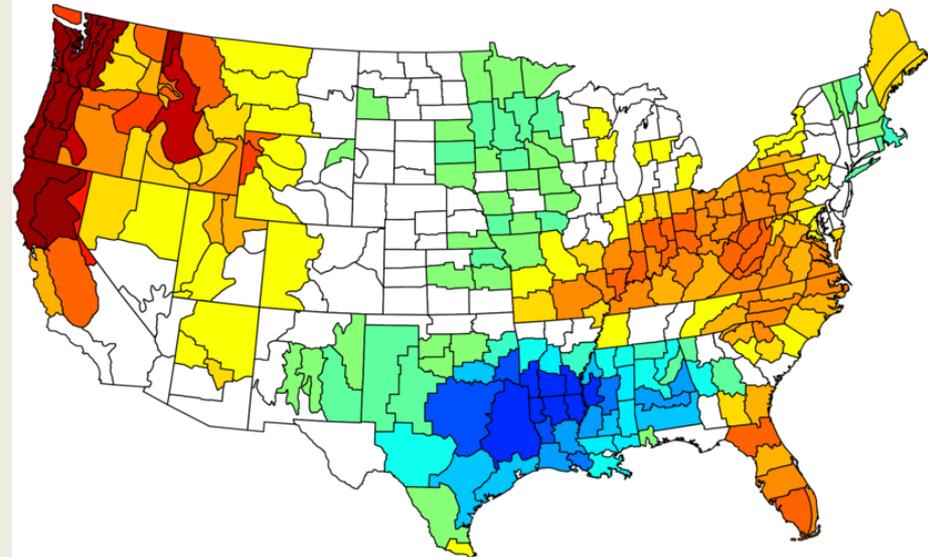


NOAA/ESRL PSD and CIRES-CU

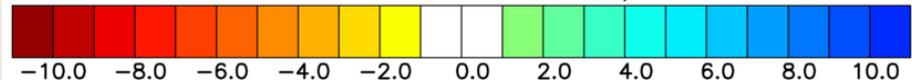


2000-01

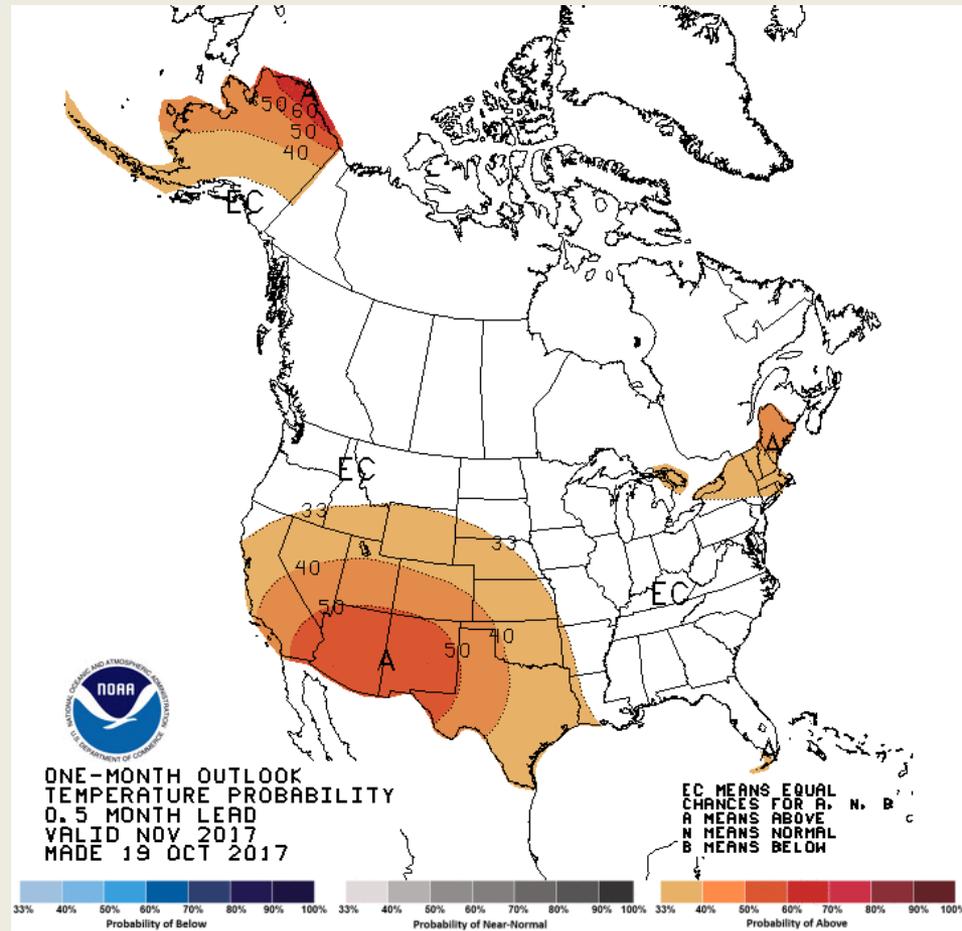
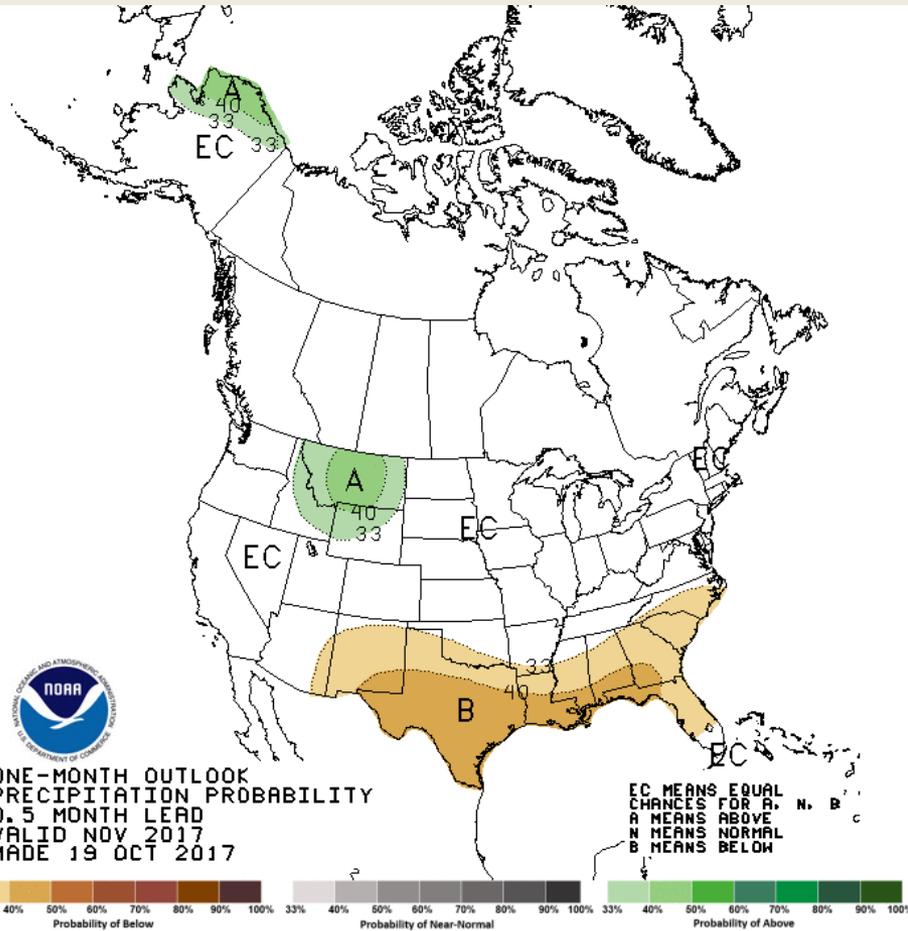
NOAA/NCEI Climate Division Precipitation Anomalies (in)
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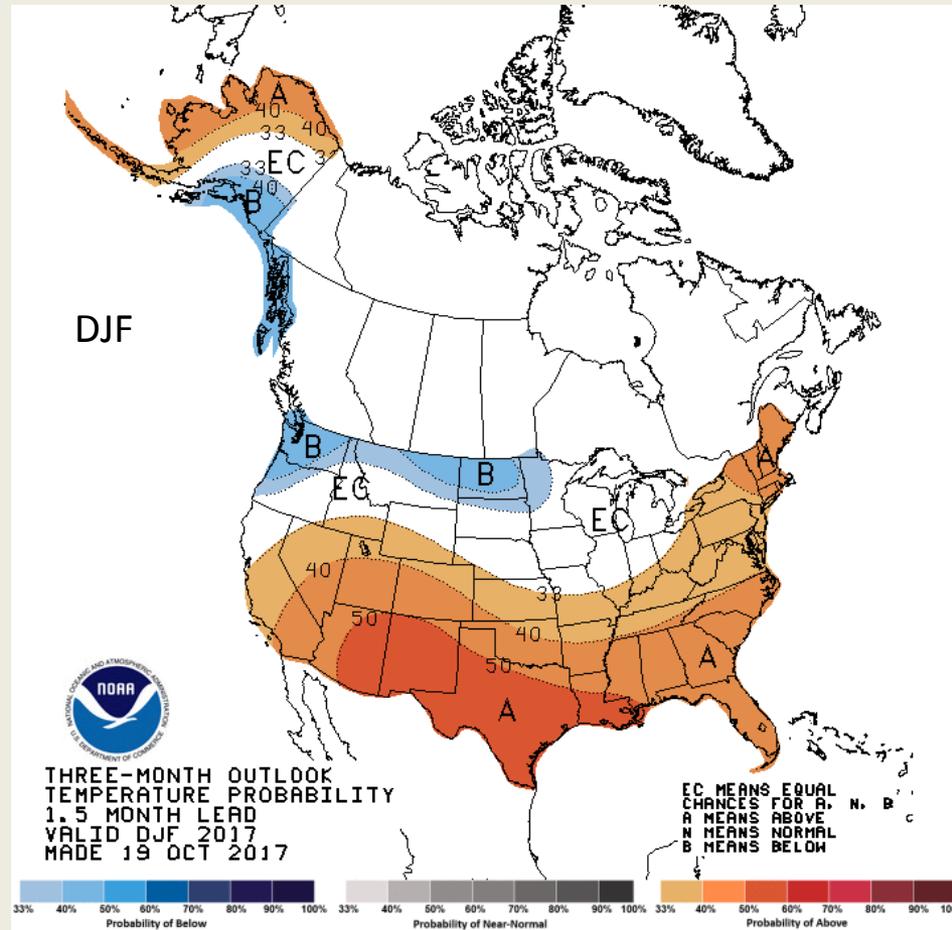
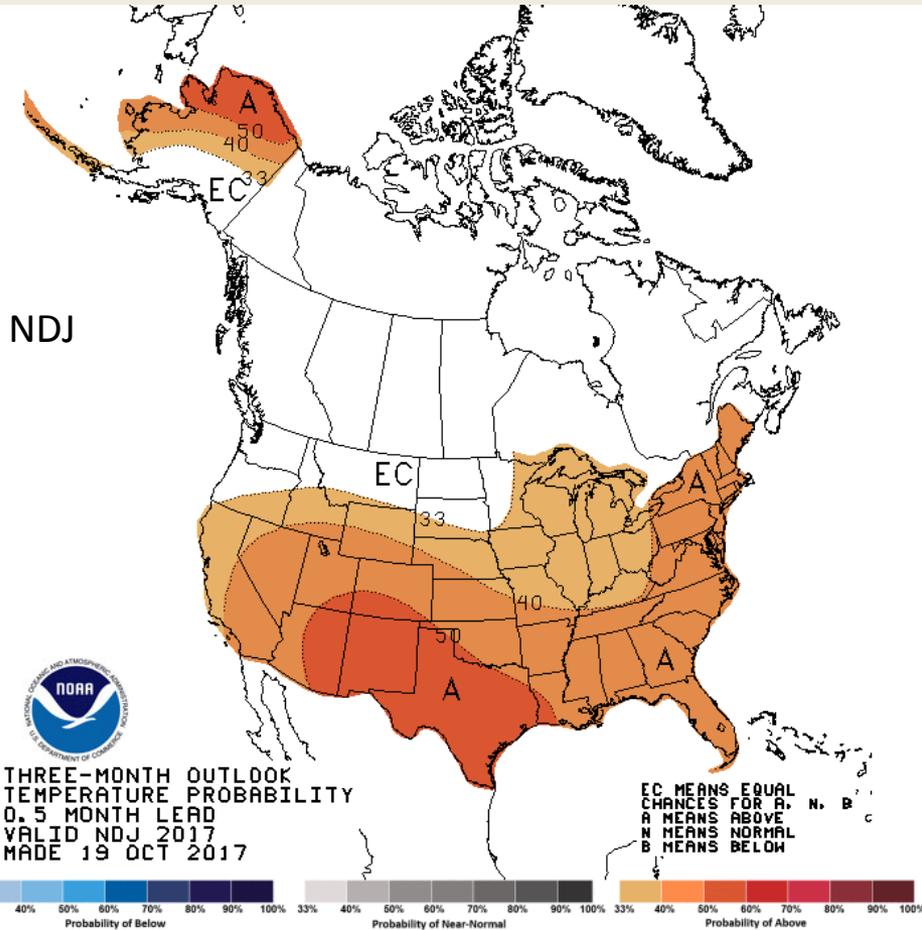
NOAA/ESRL PSD and CIRES-CU



November U.S. Forecasts



U.S. Seasonal Temperature Forecasts



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NOAA West Watch Wildfire Update: 420,002,017th year of biomass burning on Earth (California edition)

Timothy Brown

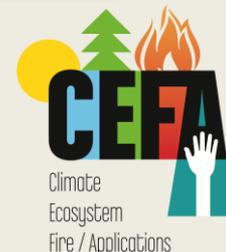
Desert Research Institute, Reno, Nevada
Program for Climate, Ecosystem and Fire Applications
Western Regional Climate Center

24 Oct 2017



**Western Regional
Climate Center**

PROVIDING CLIMATE SERVICES SINCE 1986



Headlines

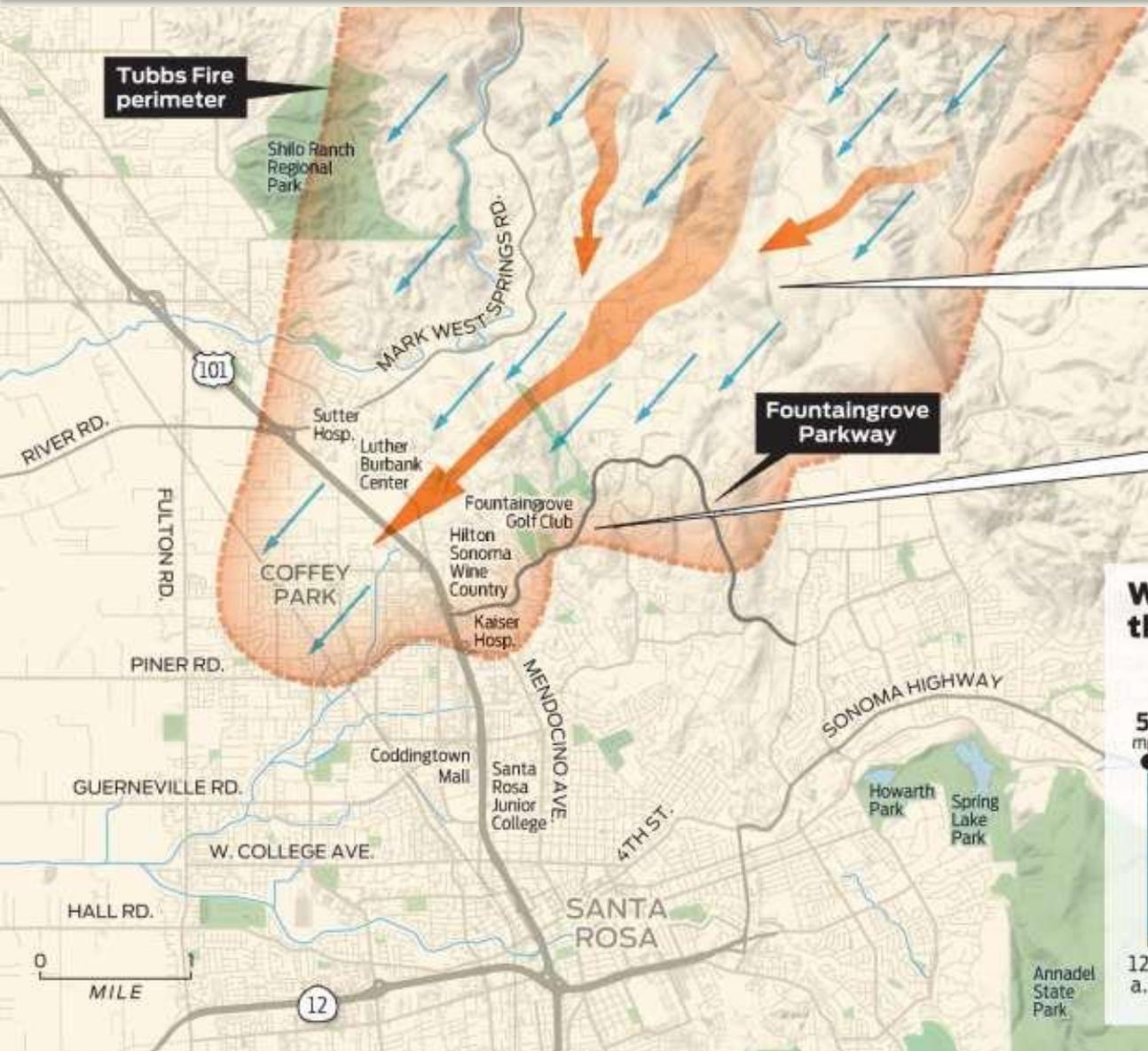


Over 7,000 structures burned in recent California wildfires– where do we go from here?



Source: Wildfire Today and LA Times

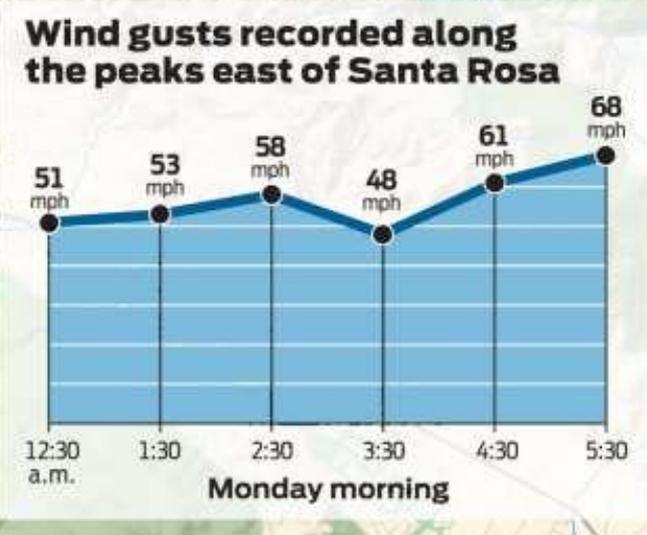
Diablo Wind and the Tubbs fire



Extreme differences of atmospheric high pressure to the east, and low pressure to the west, created strong winds to move in a north-easterly flow.

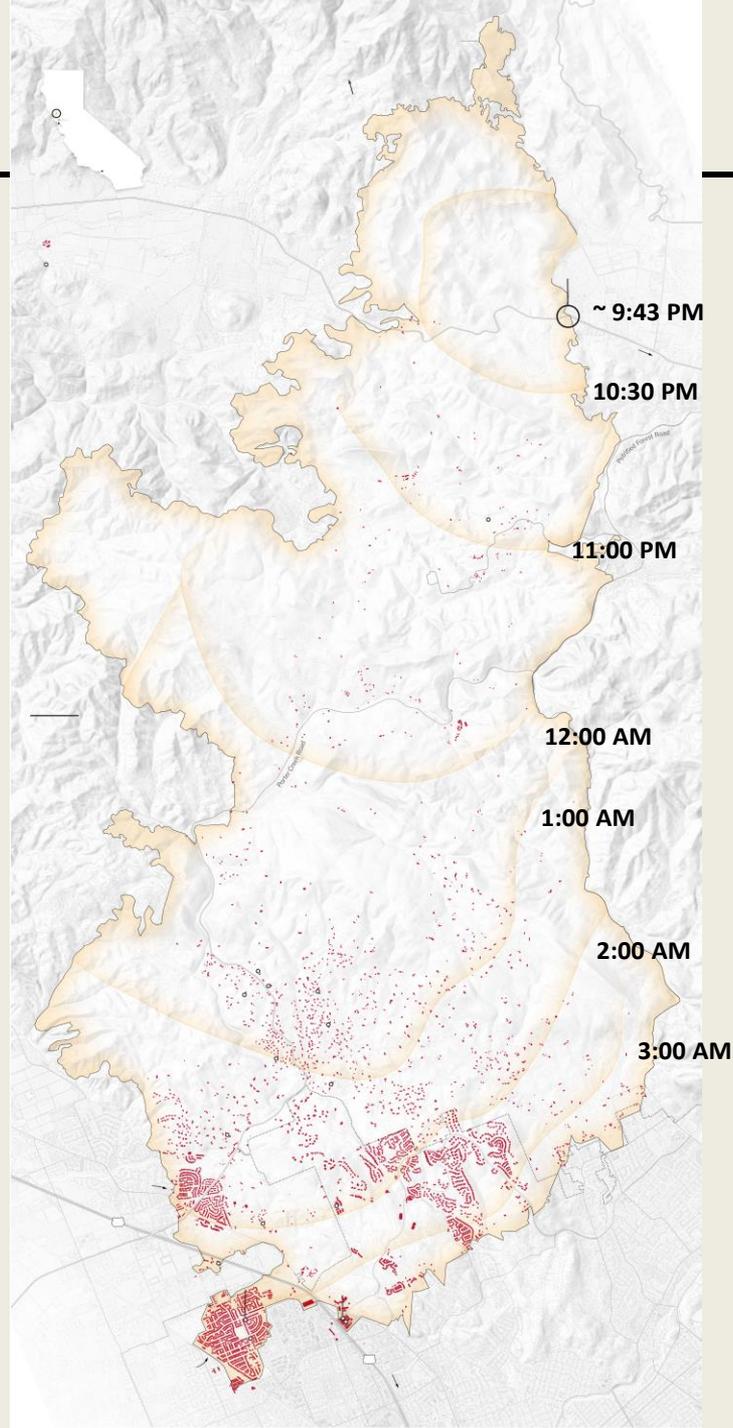
Winds move over the hilltops and funnel down into narrow slots and ravines. (In this instance, a ravine along Fountaingrove Parkway.)

The wind speeds up in a phenomenon called a Venturi effect and pushes flames and burning ash into Santa Rosa neighborhoods.



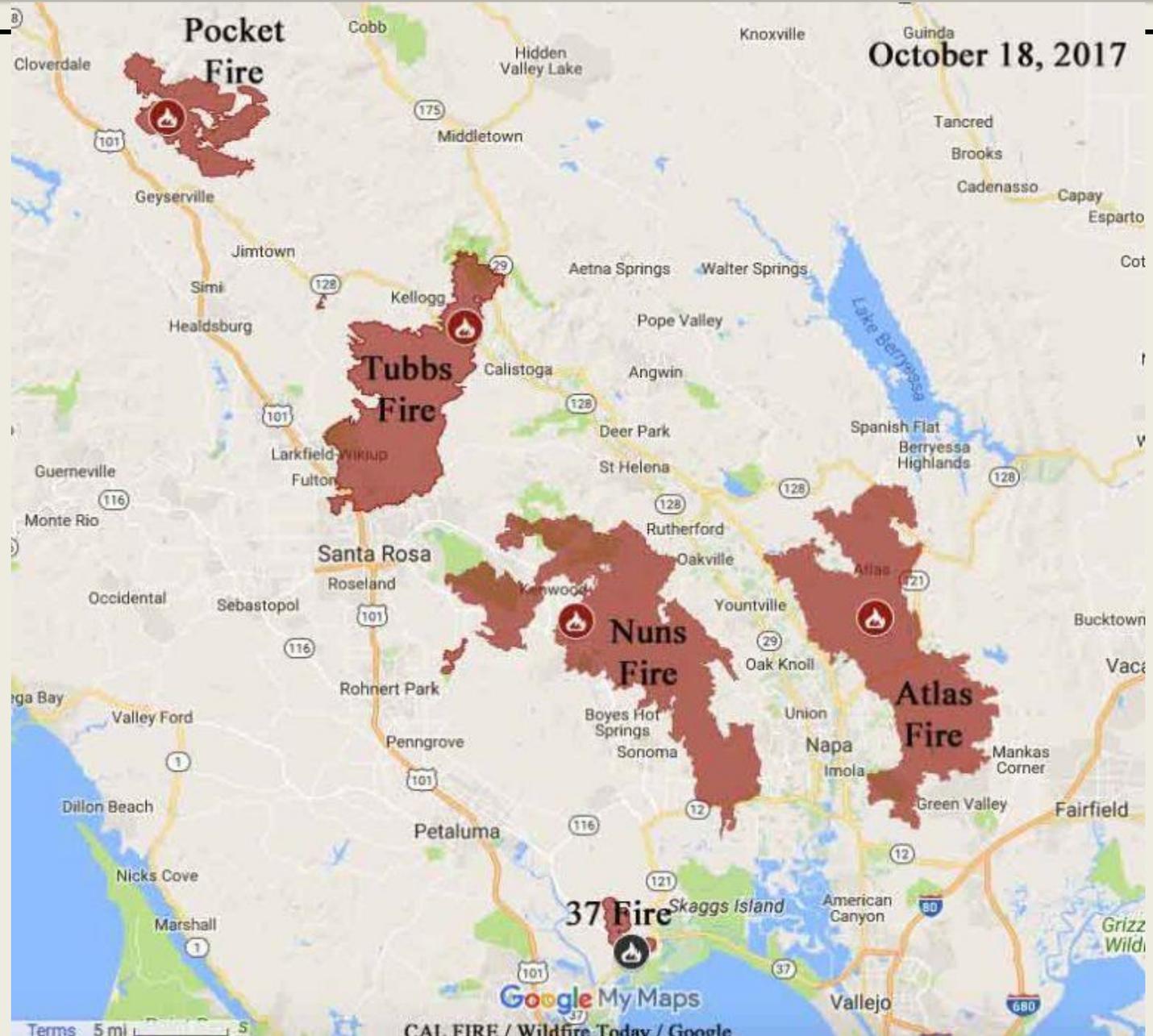


Oct 8-9 Tubbs fire progression

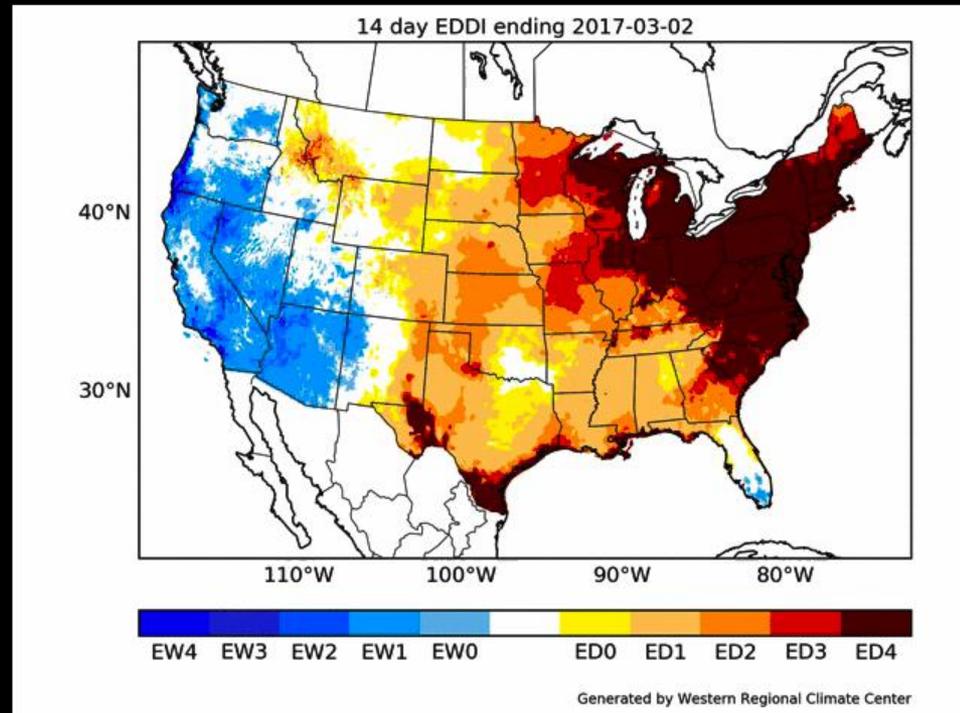


Red dots buildings burned

The 5 fires



The EDDI perspective

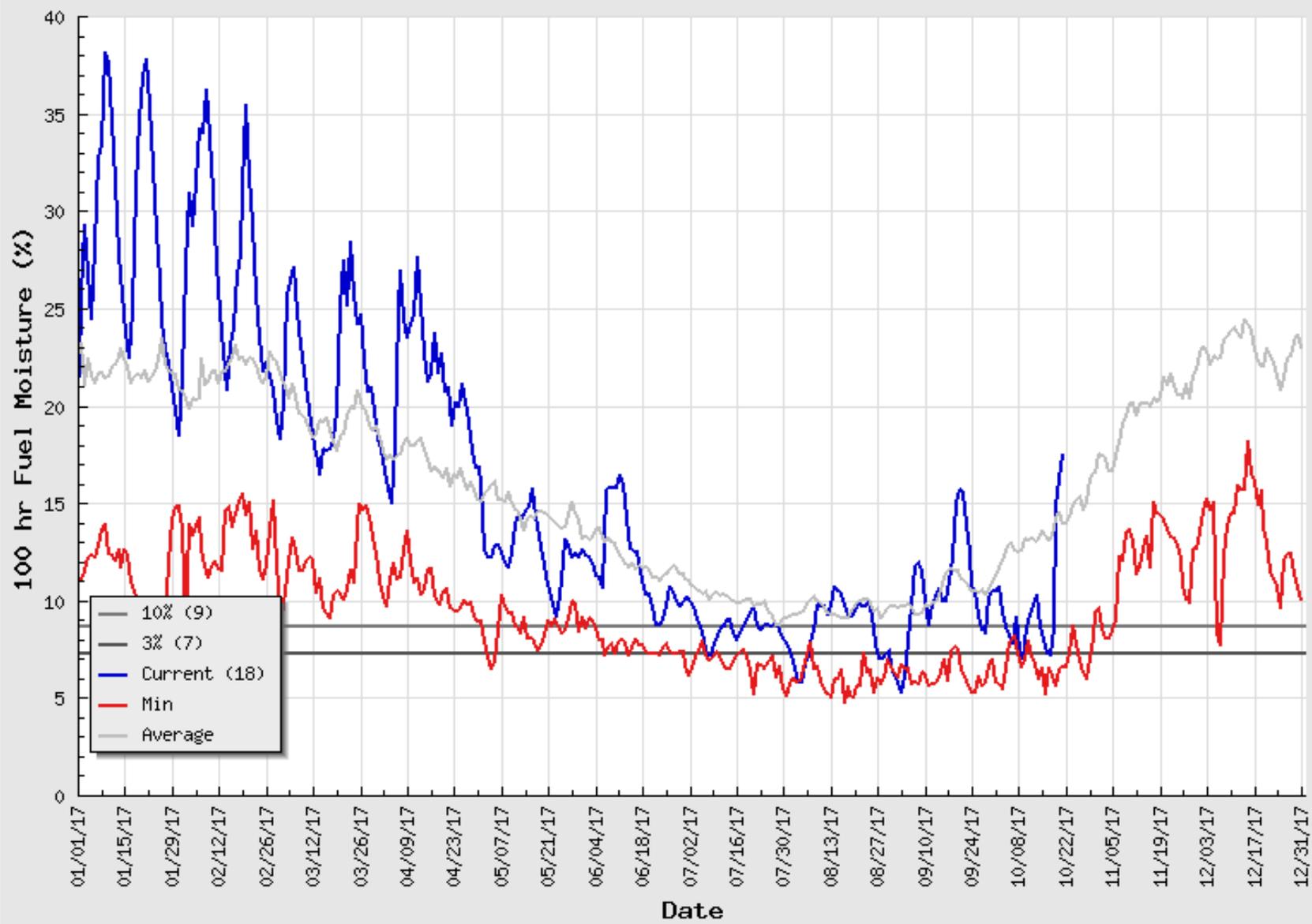


Record low dead fuel moisture



NC02 - Mid Coast To Mendocino

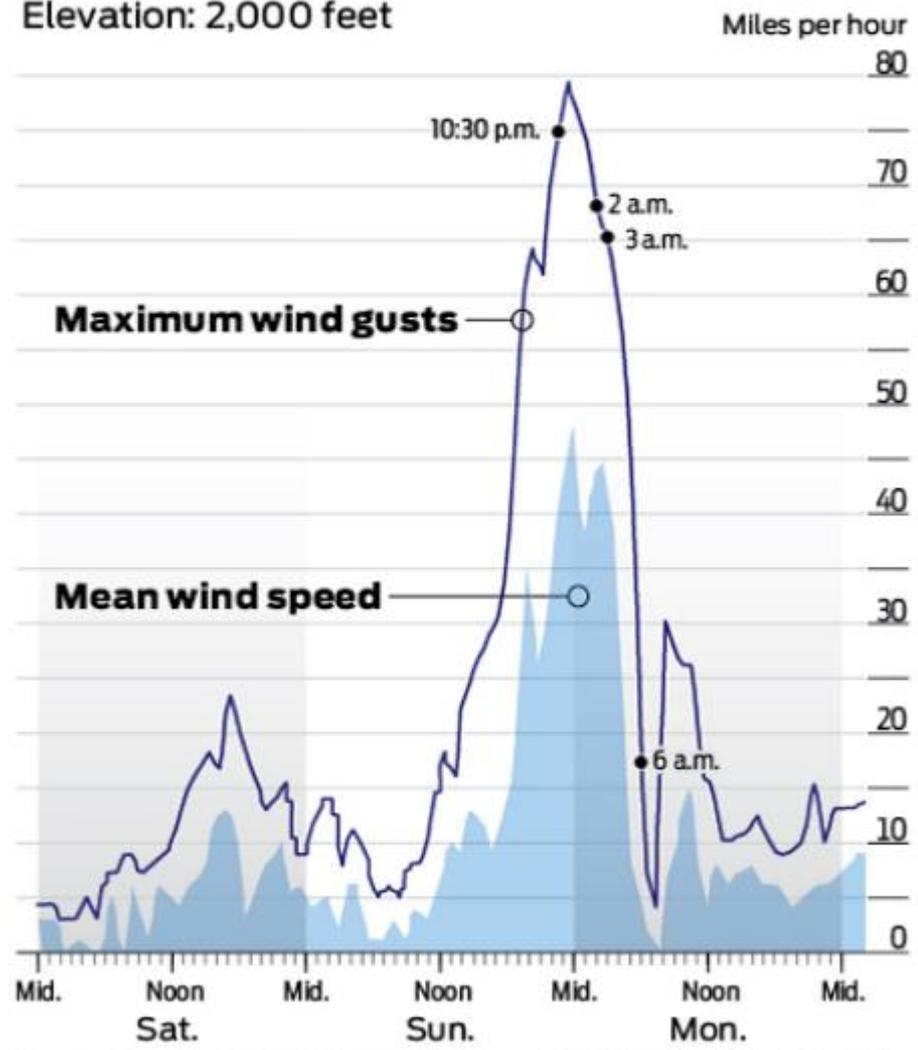
Valid Date: 22-Oct-2017





Wind conditions east of Santa Rosa

Elevation: 2,000 feet

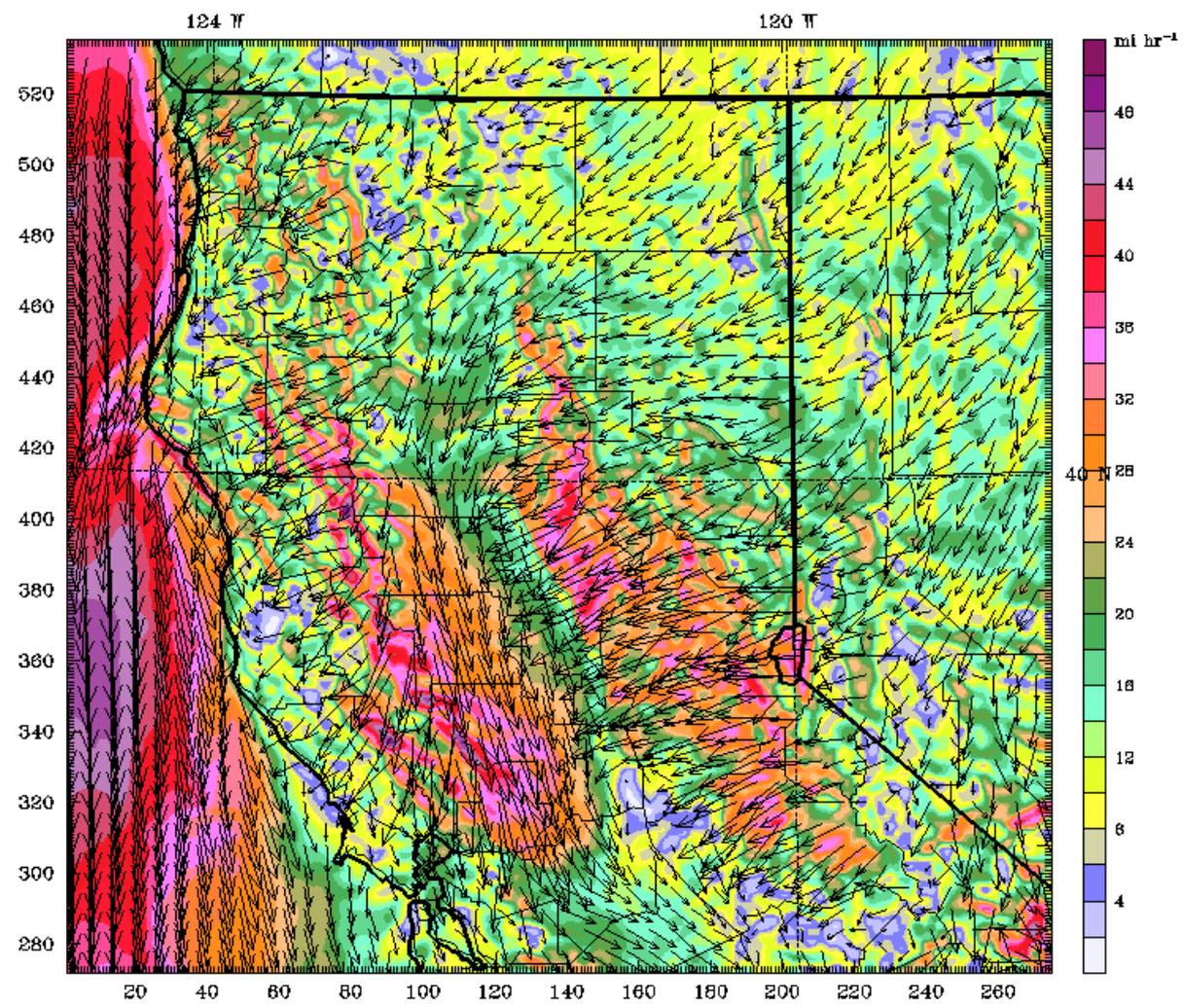


Source: Western Regional Climate Center John Blanchard / The Chronicle

DRI's CANSAC WRF



CANSAC WRF Realtime: Domain 3 (2 km) Init: 0000 UTC Mon 09 Oct 17
Fest: 3.00 h Valid: 0300 UTC Mon 09 Oct 17 (2000 PDT Sun 08 Oct 17)
Horizontal wind speed at height = 0.01 km sm= 1
Horizontal wind vectors at height = 0.01 km sm= 1



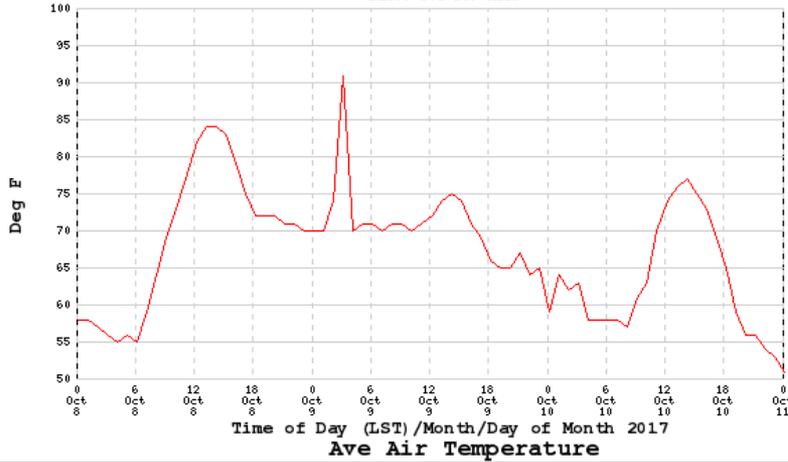
Model Info: V3.5.1 No Cu MYJ PBL Lin et al Noah LSM 2.0 km, 31 levels, 12 sec
LW: RRTM SW: Dudhia DIFF: simple KM: 2D Smagor

MAXIMUM VECTOR: 48.5 m s⁻¹ →

Santa Rosa RAWS



Santa Rosa California
Elev: 576 ft. MSL.



Western
Regional
Climate
Center

Statistics

Begin Date/Time
Oct. 8, 2017
:00 LST

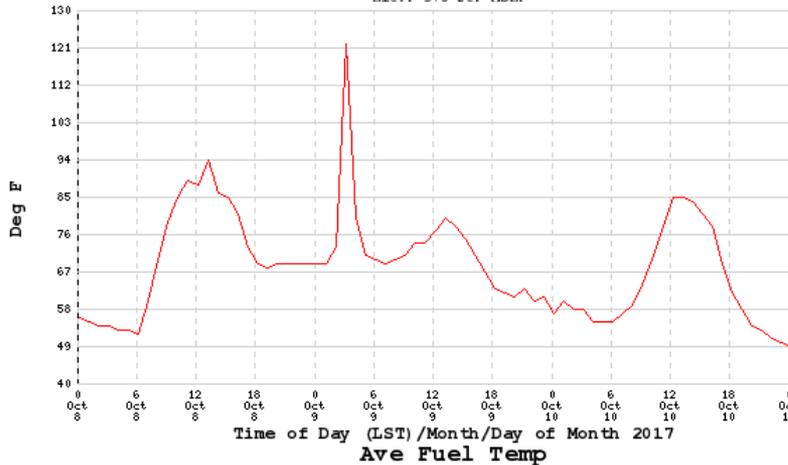
End Date/Time
Oct. 11, 2017
:00 LST

Ave Air Temperature
Deg F

Average
67.3

Max. | Min.
91 | 51

Santa Rosa California
Elev: 576 ft. MSL.



Western
Regional
Climate
Center

Statistics

Begin Date/Time
Oct. 8, 2017
:00 LST

End Date/Time
Oct. 11, 2017
:00 LST

Ave Fuel Temp
Deg F

Average
68.4

Max. | Min.
122 | 49



March 2009

Smoke impacts

Bay Area Air Quality Index

- 0-50** **Good**
No health impacts are expected when air quality is in this range.
- 51-100** **Moderate**
Unusually sensitive people should consider limiting prolonged outdoor exertion.
- 101-150** **Unhealthy for Sensitive Groups**
Active children and adults, and people with respiratory disease, such as asthma, should limit outdoor exertion.
- 151-200** **Unhealthy**
Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
- 201-300** **Very Unhealthy**
Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.

	Worst AQI (THIS WEEK)	Current AQI (6AM PST 10/18/17)
Napa	404	157
San Rafael	292	52
Sebastopol	228	25
Vallejo	238	62
Berkeley Aquatic Park	193	59
Laney College Fwy	163	66
Oakland East	156	64
Oakland West	165	62
San Francisco • Arkansas St	189	51
San Pablo • Rumrill Blvd	254	65
Concord	158	67
Livermore • Rincon Ave	136	74
Redwood City	162	70
Gilroy	154	56
San Jose • Jackson St	152	61
San Jose Fwy	135	77

Graphics by Teodros Hailye / KQED Science
Source: Bay Area Air Quality Management District



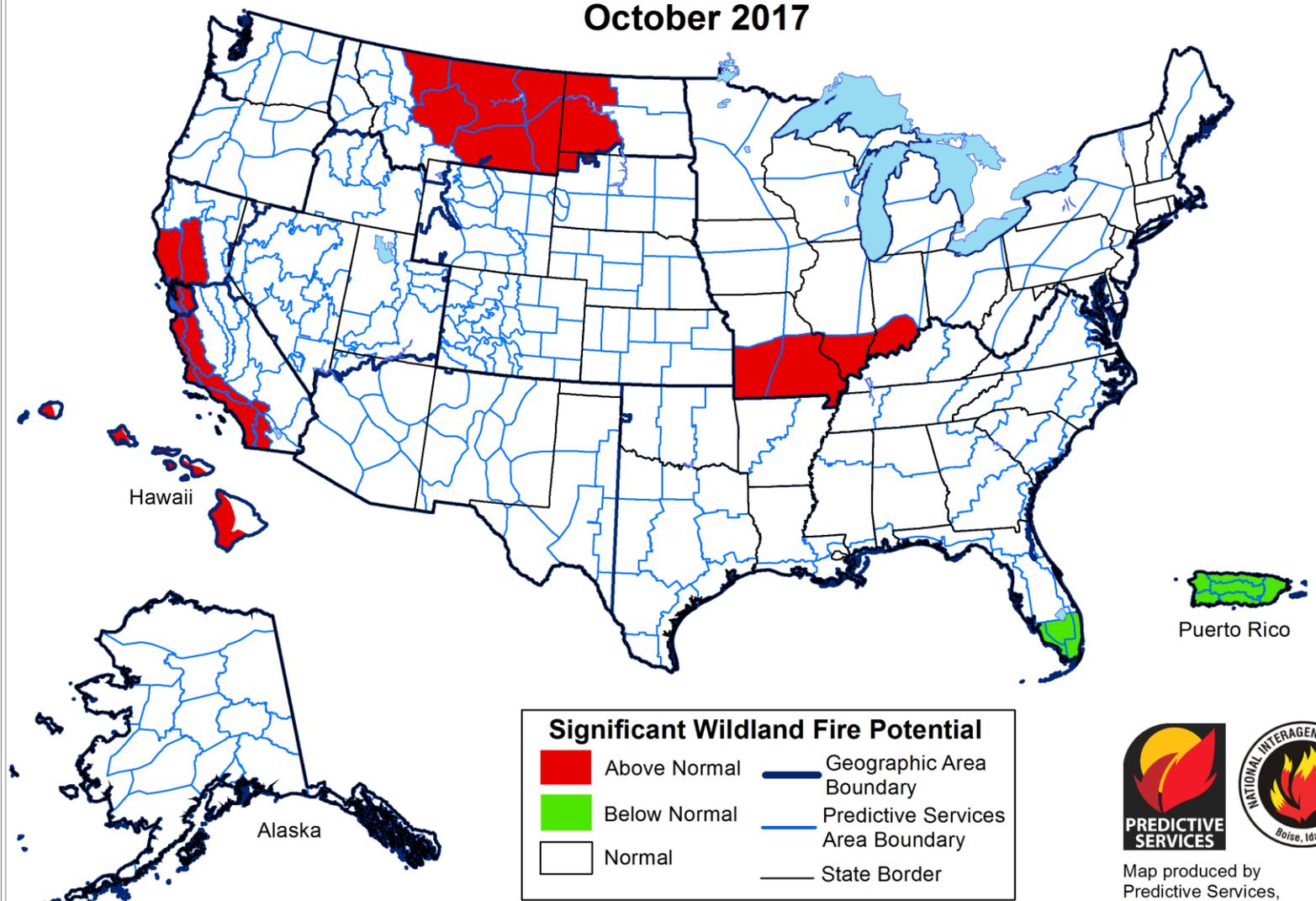
Smoke over Santa Rosa



A brief history of California destructive wildfires



Significant Wildland Fire Potential Outlook October 2017

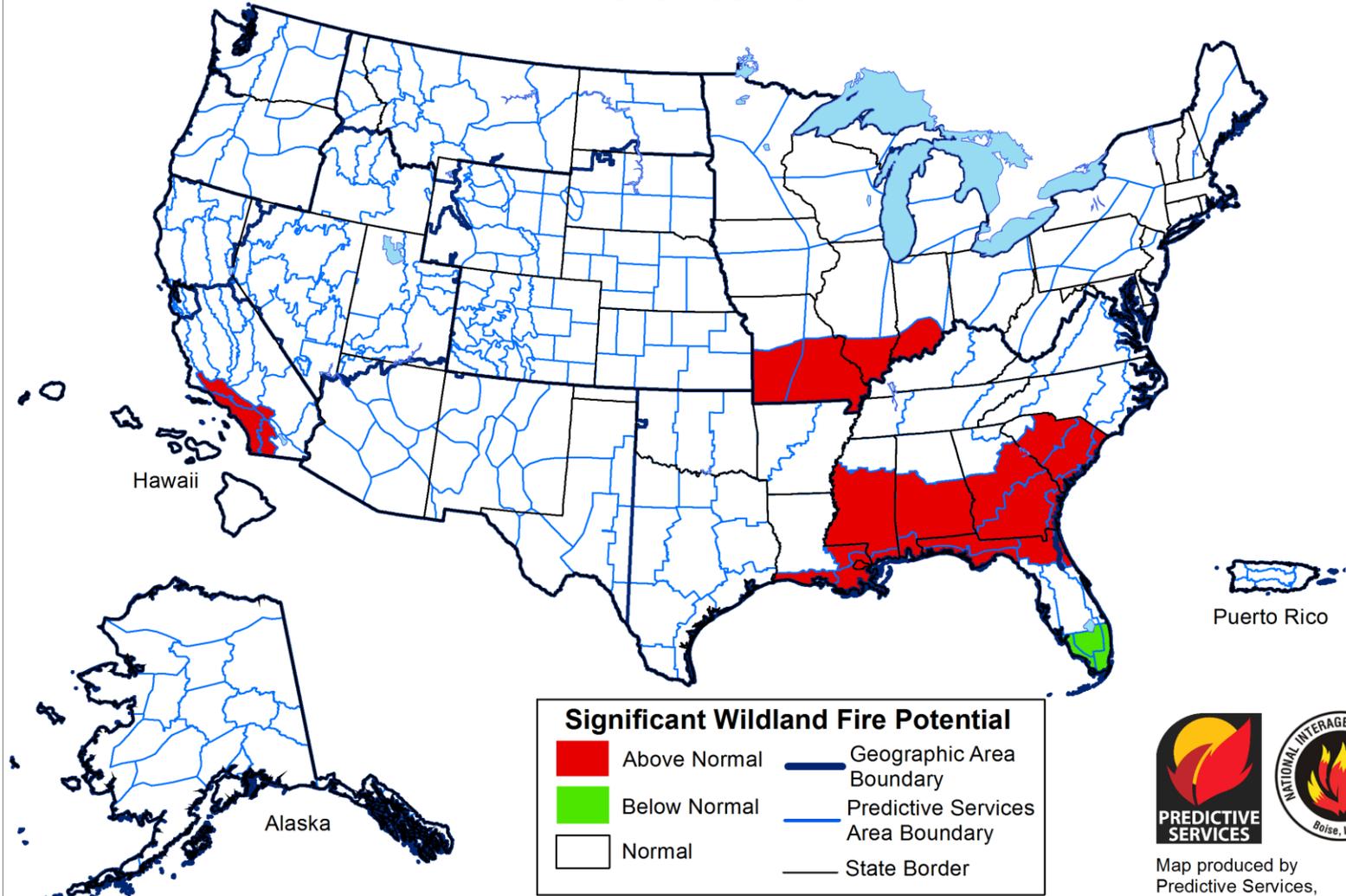


Above normal significant wildland fire potential indicates a greater than usual likelihood that significant wildland fires will occur. Significant wildland fires should be expected at typical times and intervals during normal significant wildland fire potential conditions. Significant wildland fires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



Map produced by
Predictive Services,
National Interagency Fire Center
Boise, Idaho
Issued October 1, 2017
Next issuance November 1, 2017

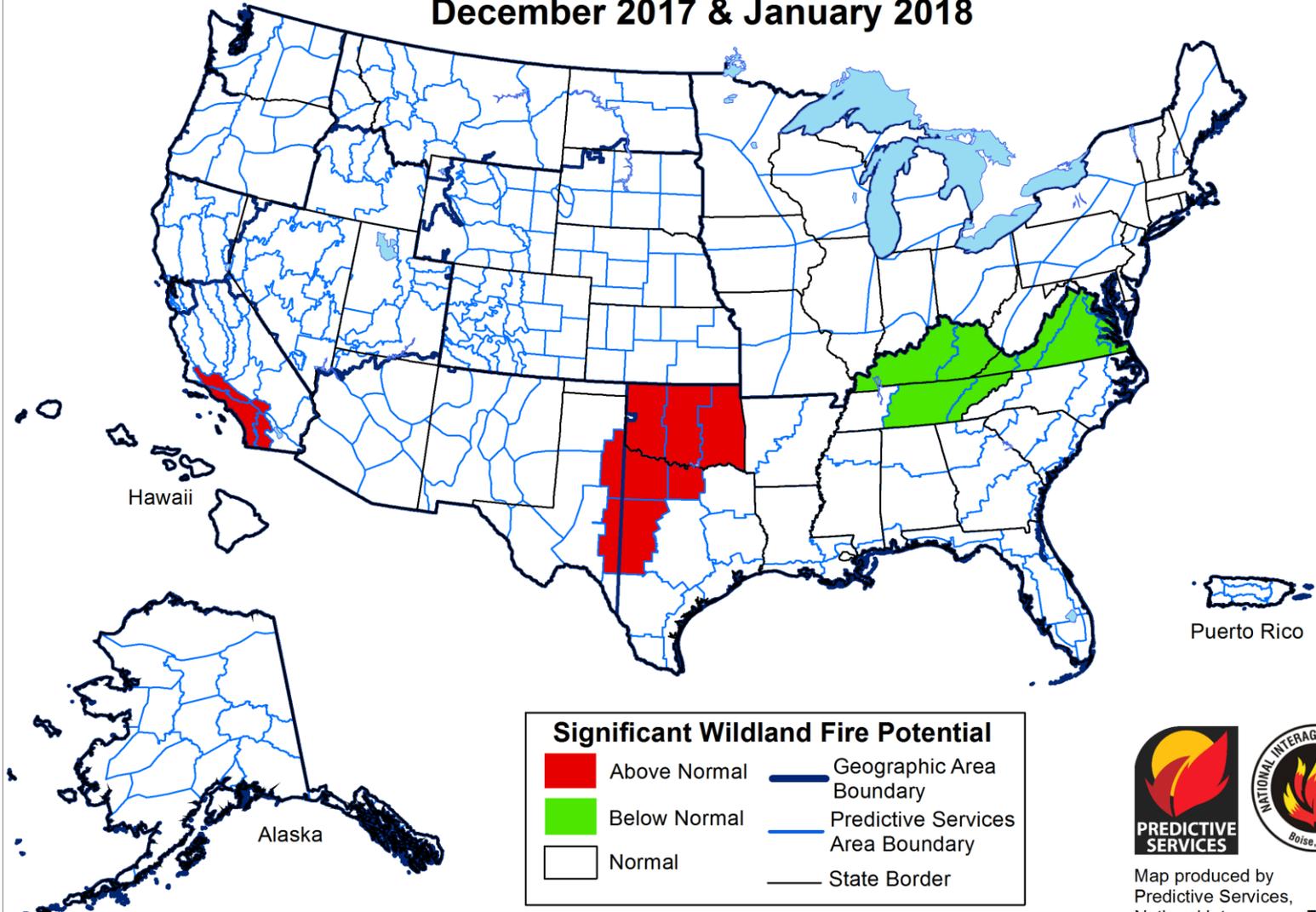
Significant Wildland Fire Potential Outlook November 2017



Map produced by
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Significant Wildland Fire Potential Outlook December 2017 & January 2018



Map produced by
Predictive Services,
National Interagency Fire Center
Boise, Idaho
Issued October 1, 2017
Next issuance November 1, 2017

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 intervals during normal significant wildland fire potential conditions. Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.

Greetings From Reno!

Fire near Tim's house

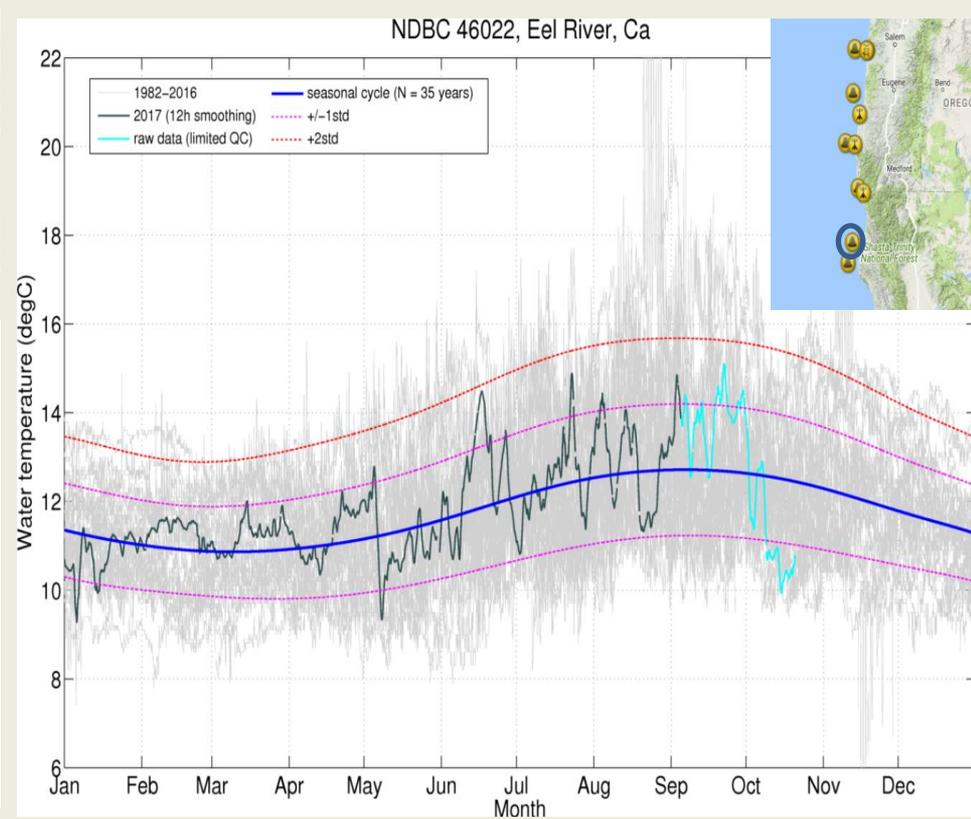
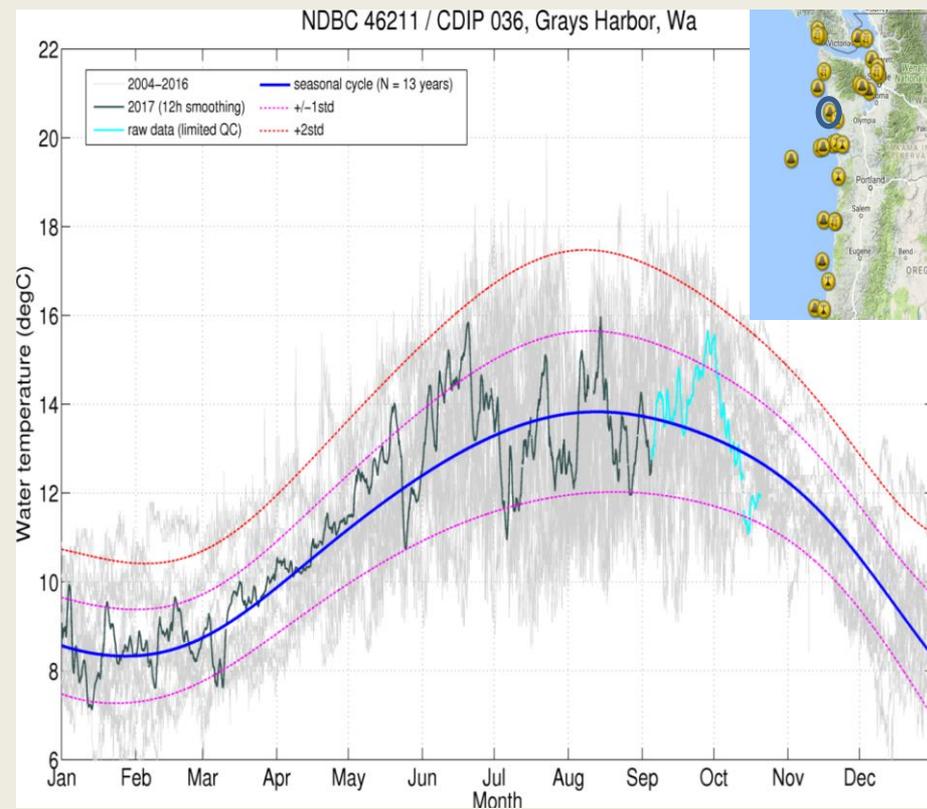


Call Agenda

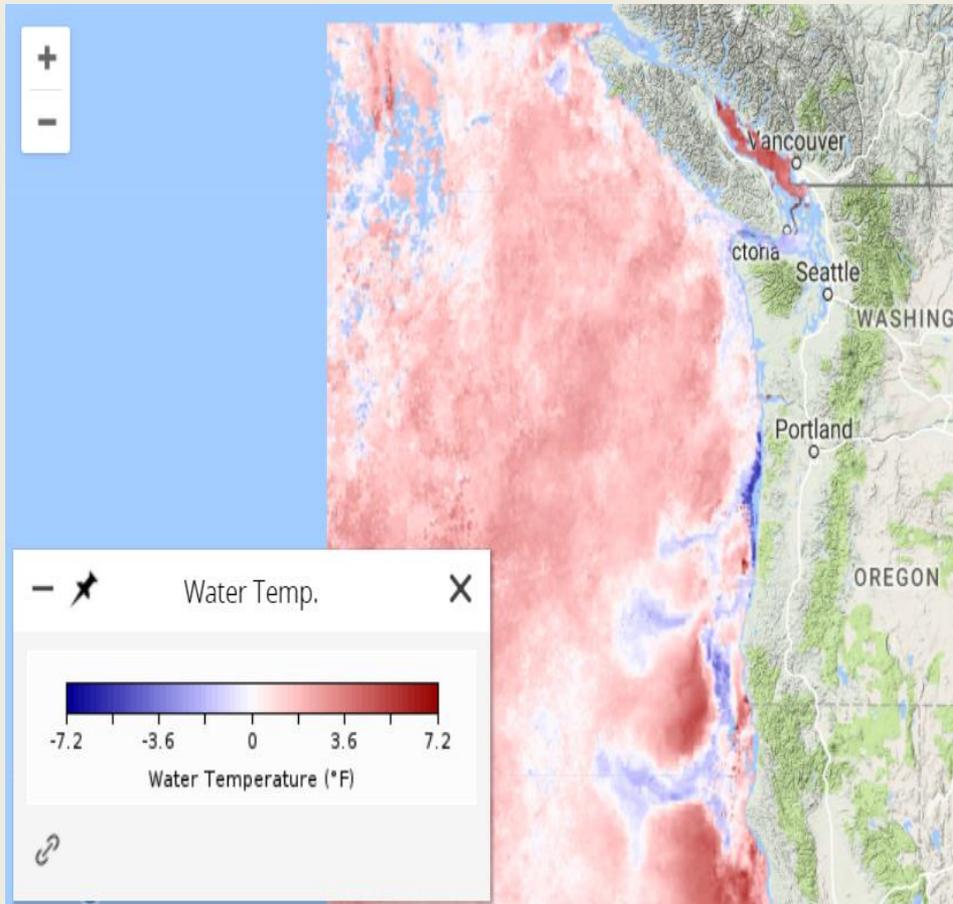


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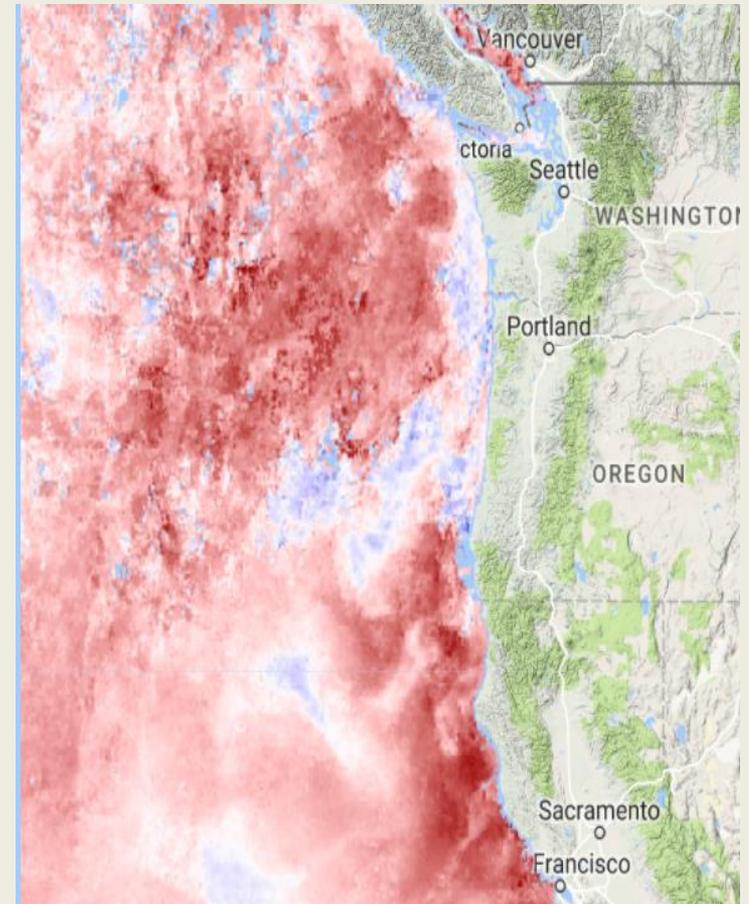
SST from buoys: cooling, *evidence of La Niña?*



Satellite Temperature Anomaly



August 2017



September 2017

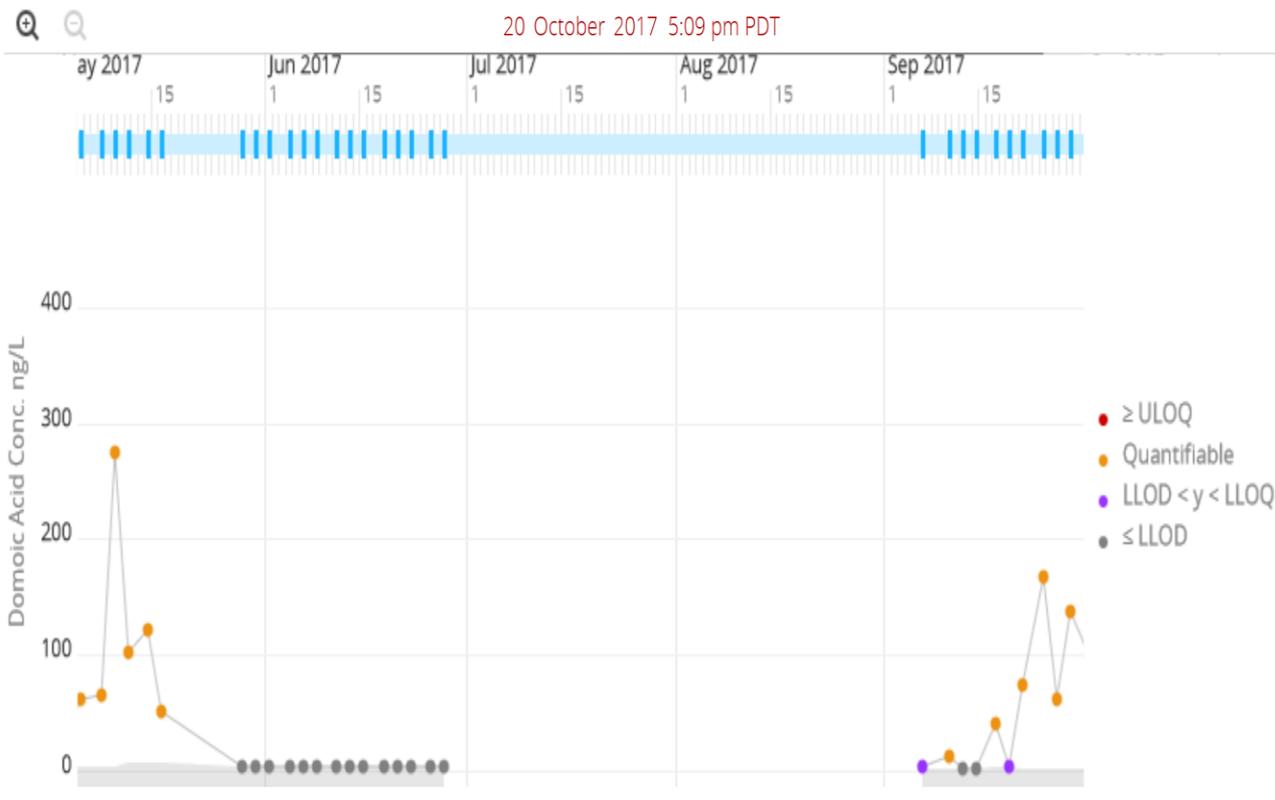
NANOOS Update, www.nanoos.org Real-Time HABs



HABs and Domoic Acid detected from ESP (~13 mi off La Push, WA)

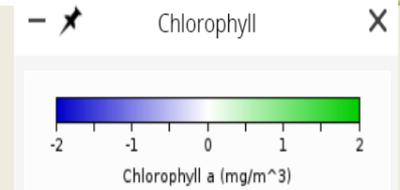
Sept. Satellite Chlorophyll Anomaly

Domoic Acid Concentration

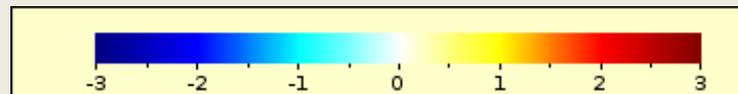
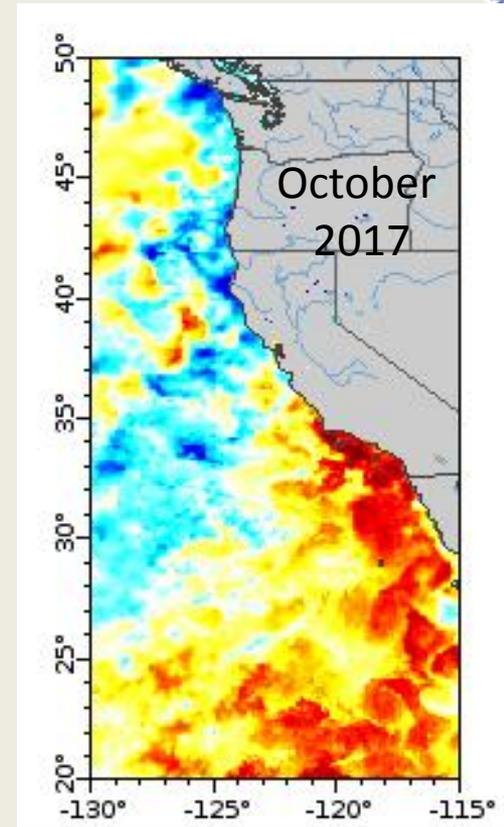
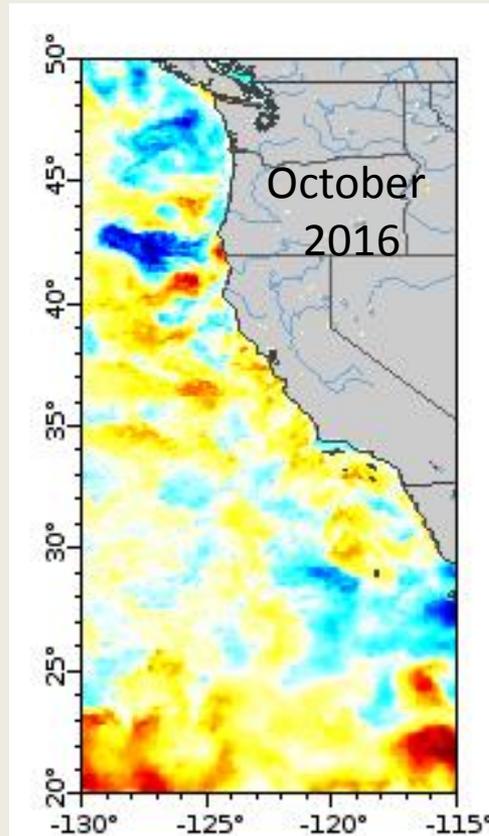
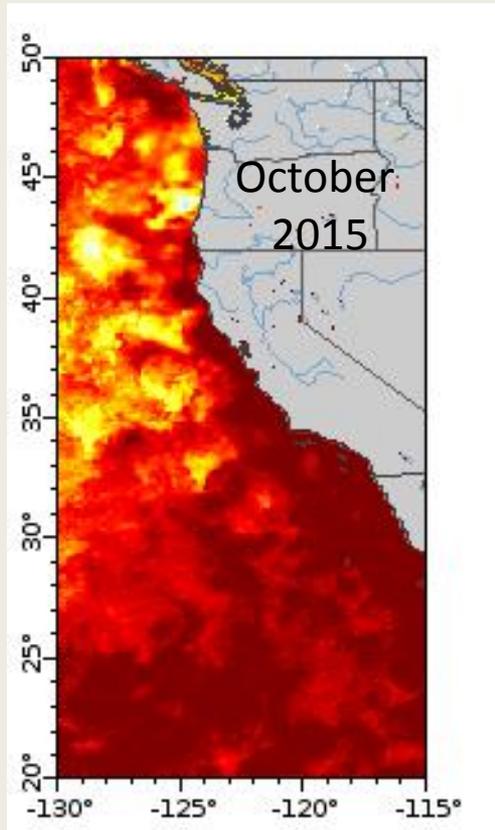


~100,000 cells/L of *Pseudo-nitzschia pungens*

ESP funded by U.S. IOOS Ocean Technology Transfer award

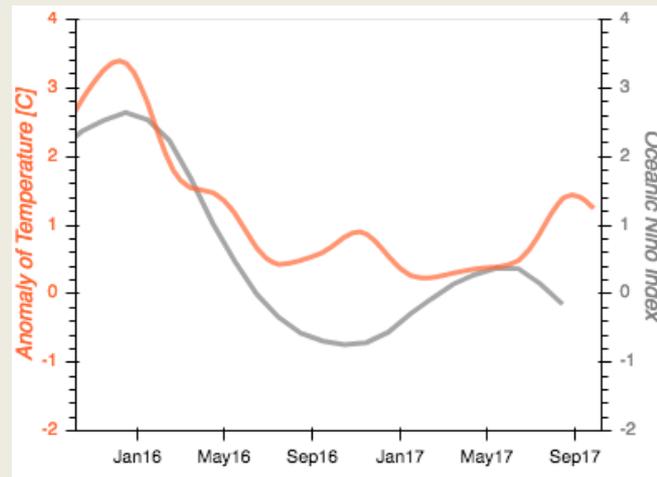
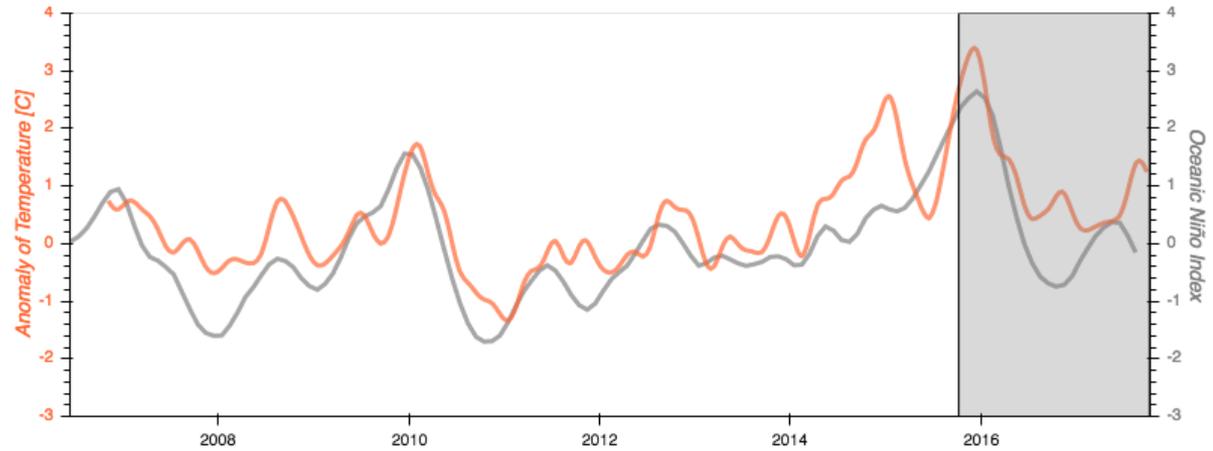
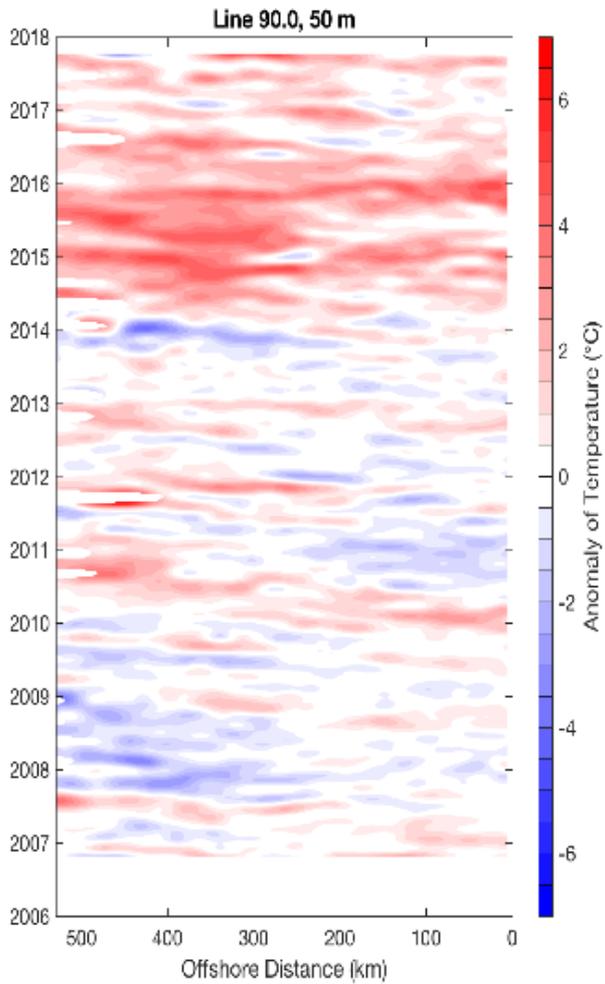


GRHSST Level 4 Analysis - SST Anomaly Fv04.1 Global 0.01° (JPL)



SST Anomaly °C

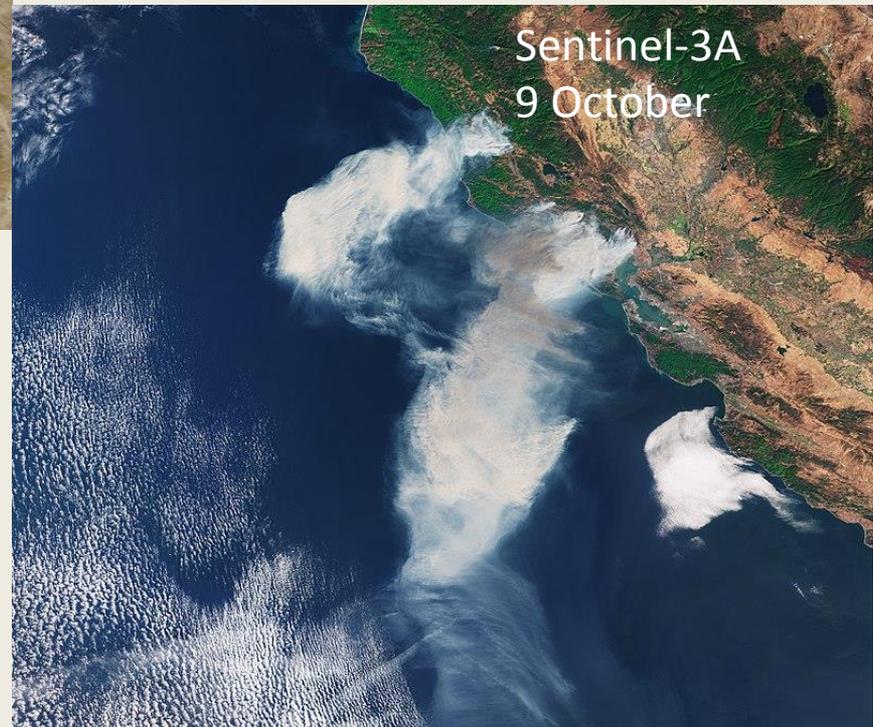
Spray Glider on CalCOFI Line 90 – D. Rudnick





LNU Complex Fire Northern California October 2017

so far has burned ~250k acres

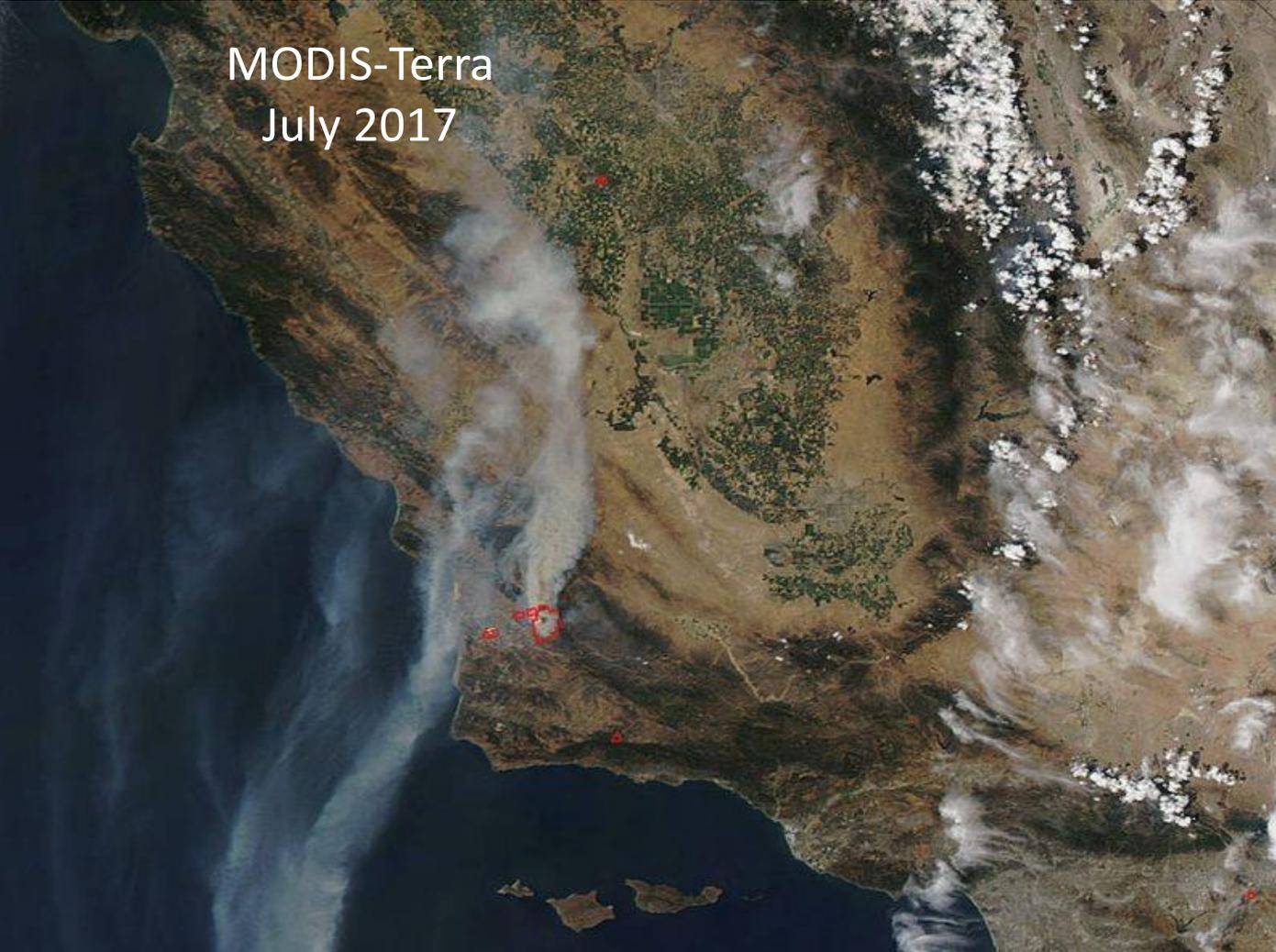


NASA research “showed that the increase in brown-and-black-carbon-producing wildfires that rage across the U.S. every year could be a symptom of a warming world. A 2015 analysis of 35 years of meteorological data confirmed that fire seasons have become longer. In addition, climate models predict fire seasons will continue to increase in length and strength across the U.S. in the next 30 to 50 years.”

<https://www.nasa.gov/feature/langley/smoke-from-wildfires-can-have-lasting-climate-impact>



MODIS-Terra
July 2017

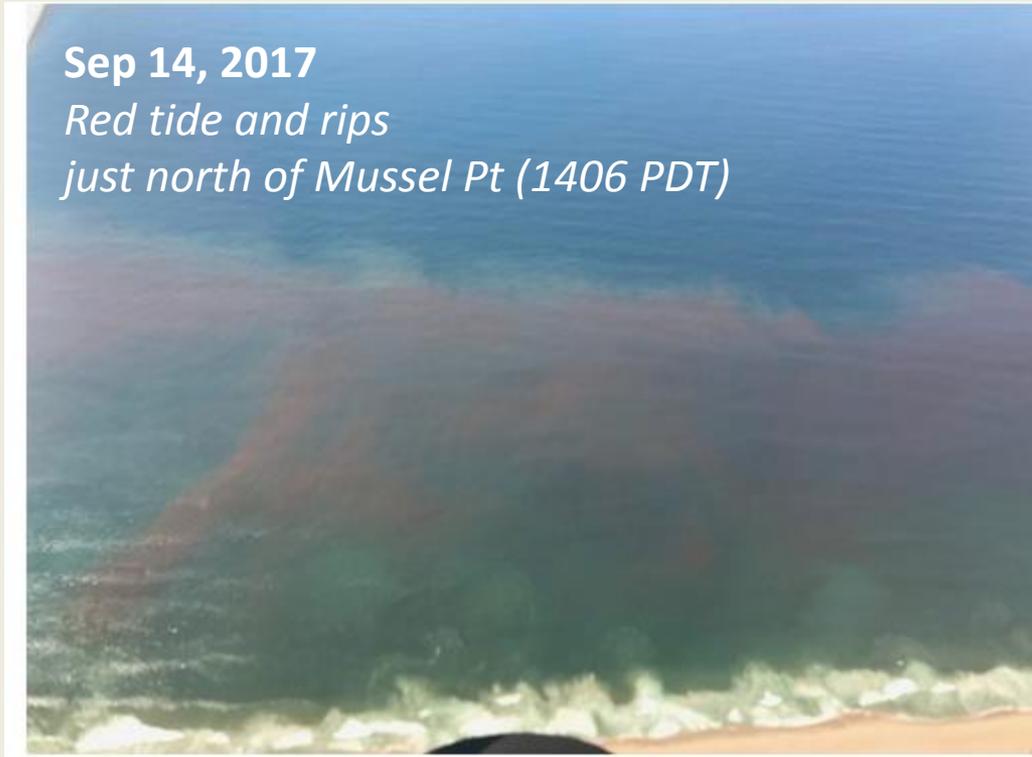


Alamo Fire
SLO County
July 2017

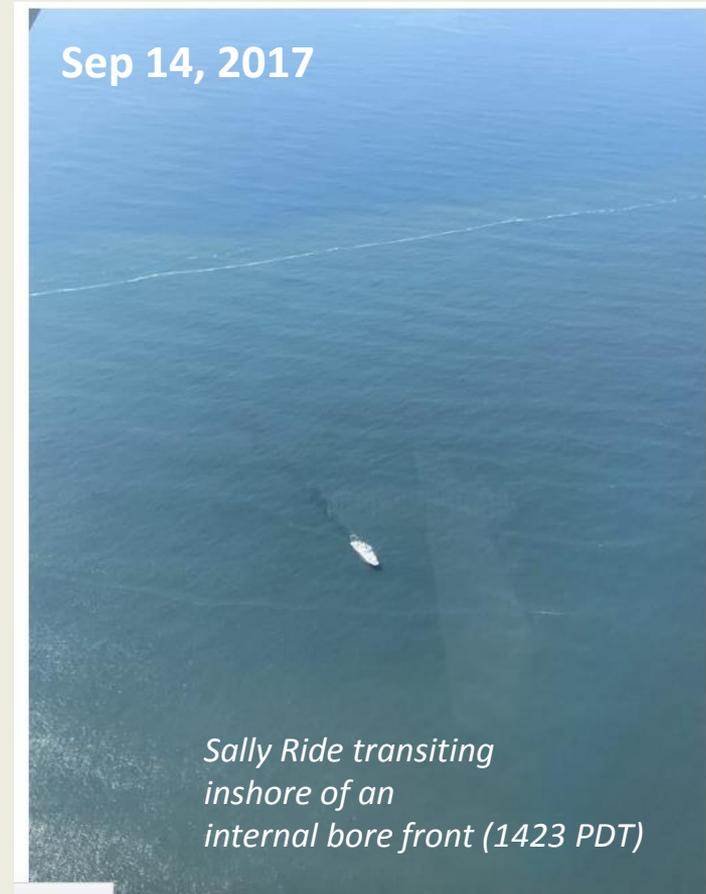
burned 28,687
Acres

1 residence destroyed
1 structure damaged

Summer 2017 – Large Red Tide in Central California



Stearns Wharf – *Lingulodinium polyedrum*
Cal Poly Pier – *Prorocentrum micans*, *Ceratium* spp.
now *Lingulodinium polyedrum*

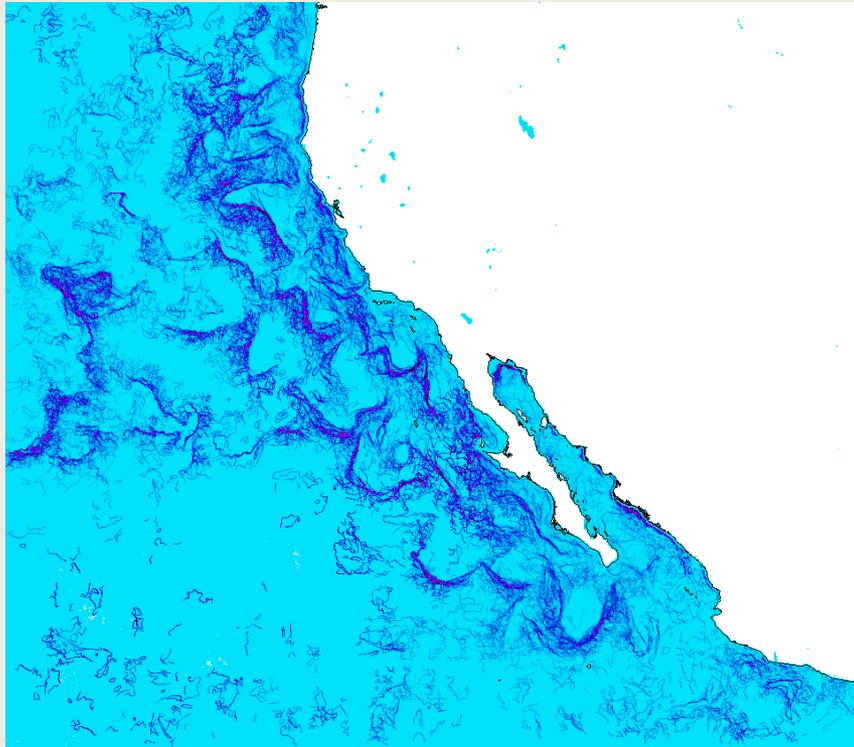


images courtesy of Chris Chickadel, APL and Melville lab, SIO

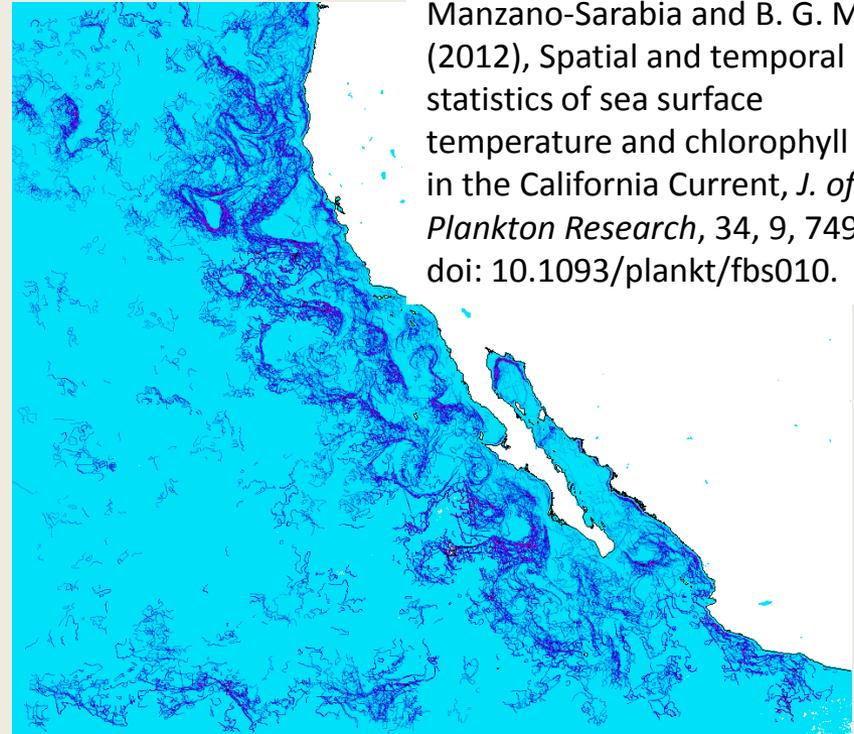


Satellite-derived Fronts

New product by Mati Kahru, Scripps Institution of Oceanography



Frontal Frequency from Sea Surface Temperature
September 2017

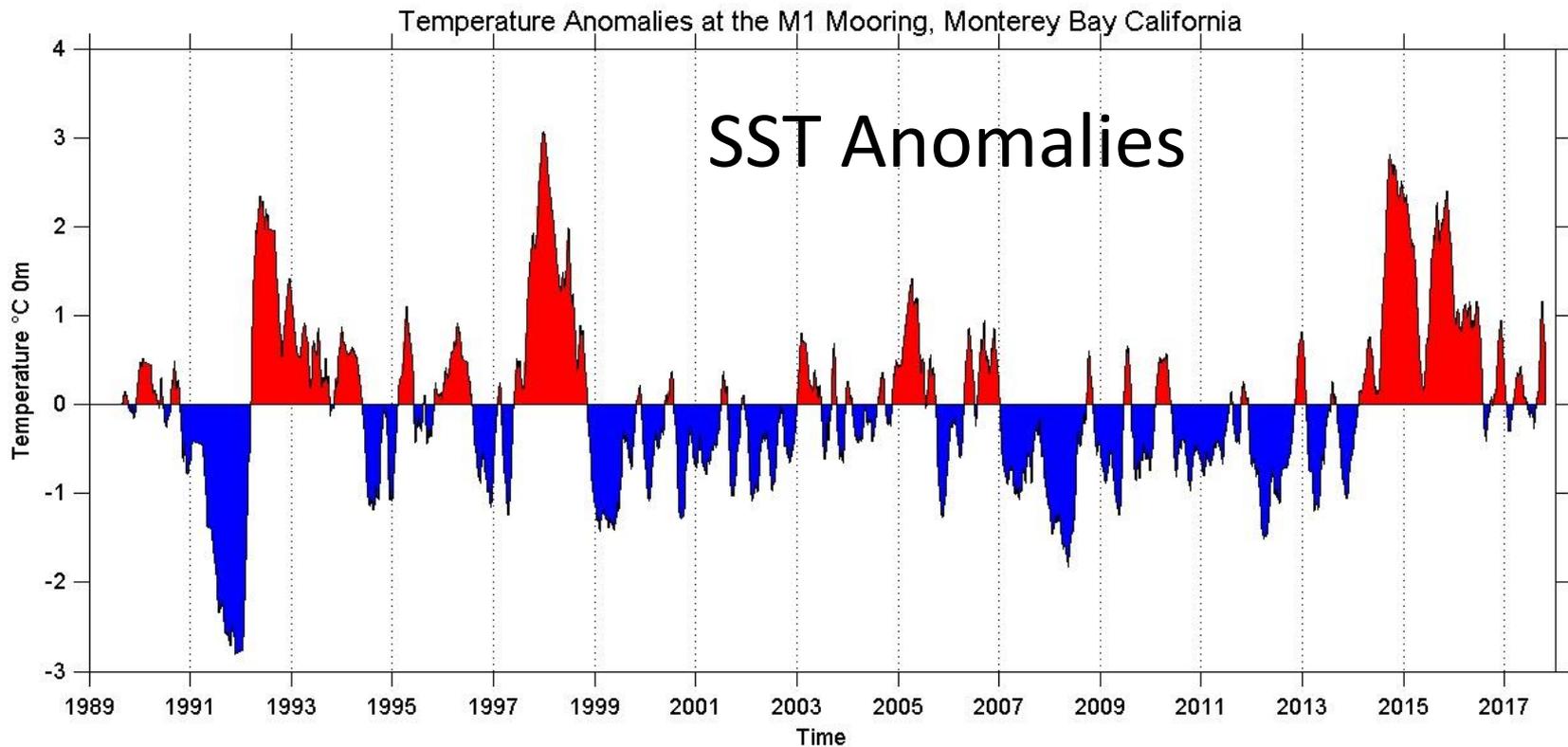


Frontal Frequency from Chlorophyll-*a*
September 2017

Kahru, M., E. Di Lorenzo, M. Manzano-Sarabia and B. G. Mitchell (2012), Spatial and temporal statistics of sea surface temperature and chlorophyll fronts in the California Current, *J. of Plankton Research*, 34, 9, 749-760, doi: 10.1093/plankt/fbs010.



CeNCOOS update



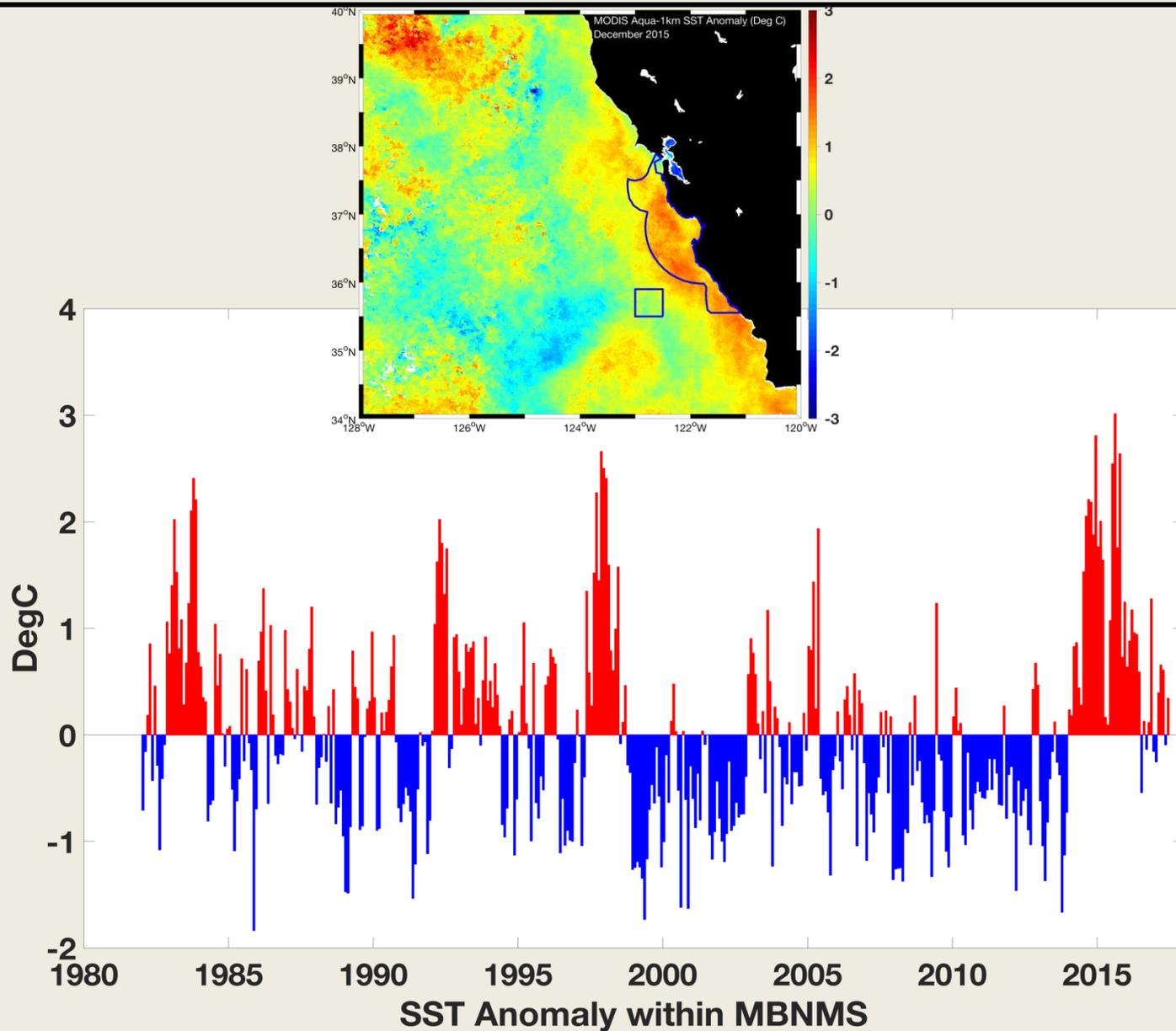
Note: 60 point moving average applied to daily averaged values.

Monterey Bay Aquarium Research Institute

Updated: 23-Oct-2017

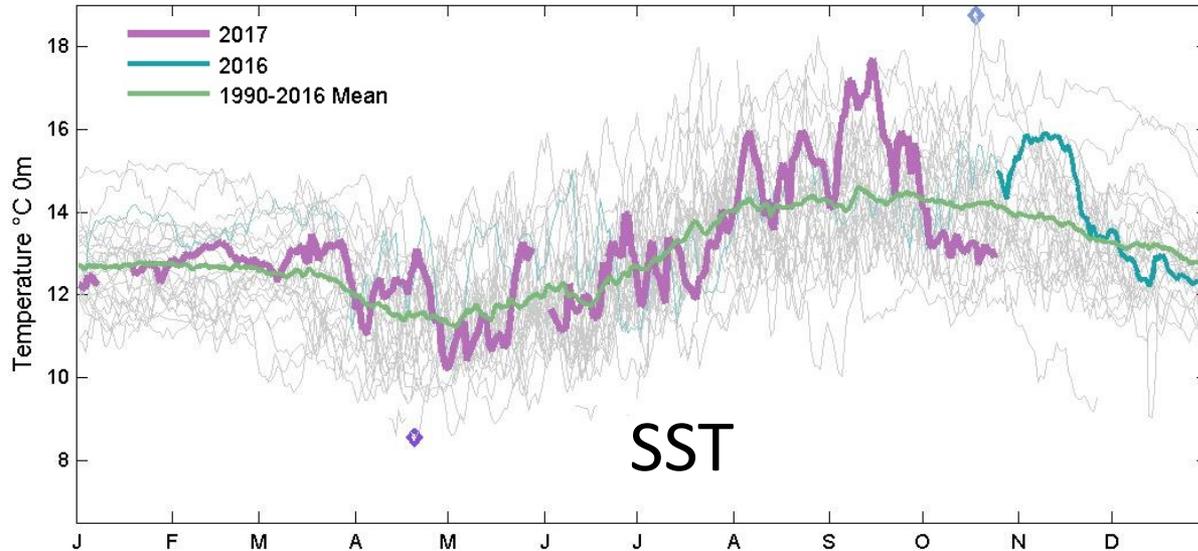
<http://www3.mbari.org/bog/Projects/MOOS/M1.html>

Sanctuary Products

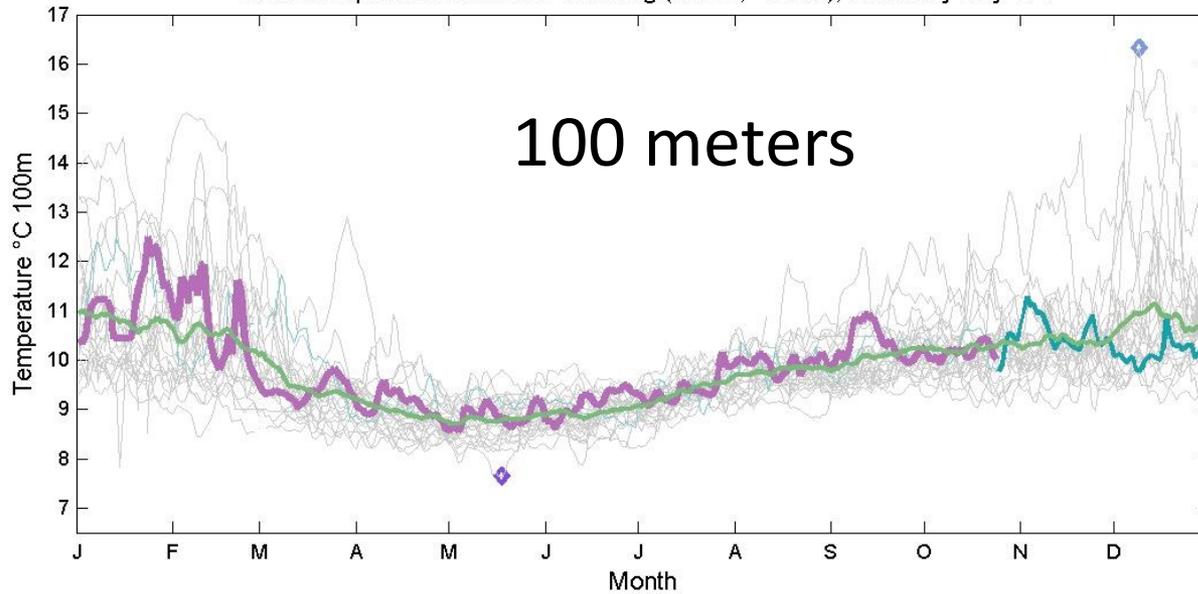


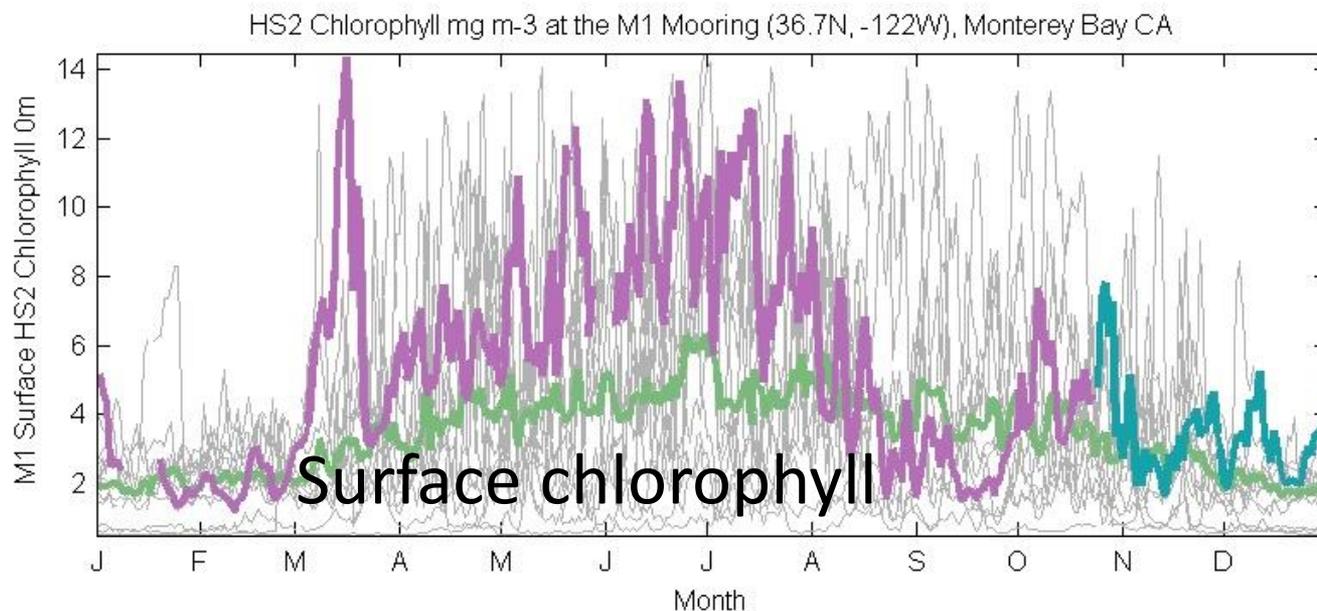
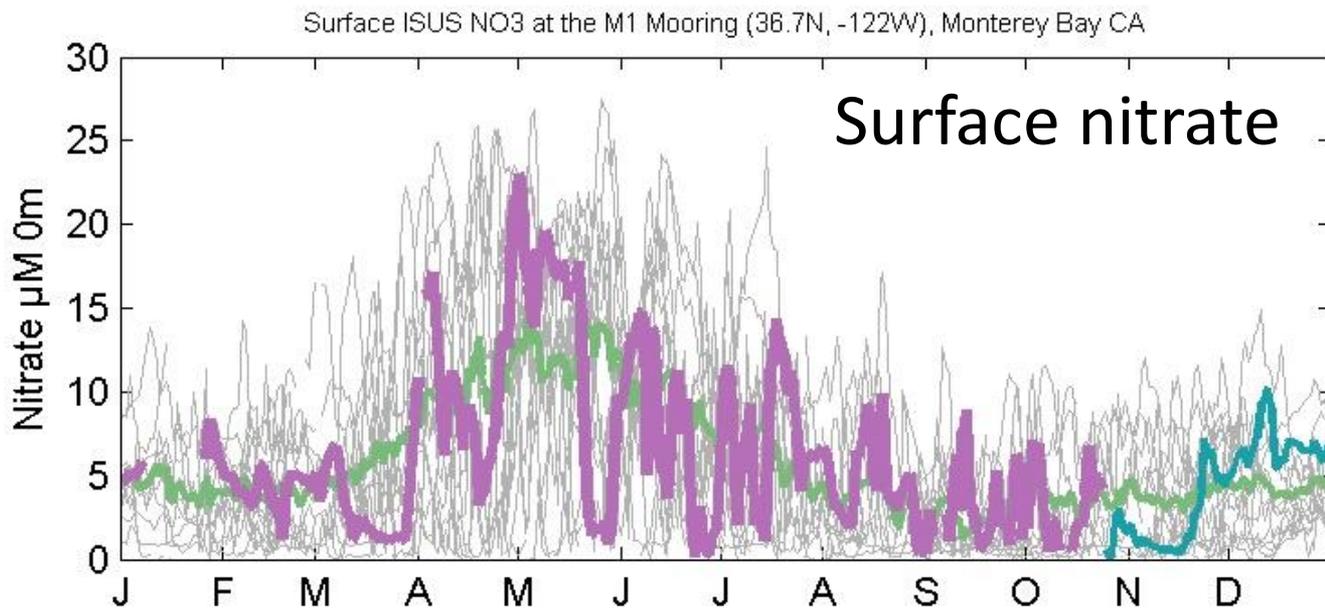


Surface Temperature at the M1 Mooring (36.7N, -122W), Monterey Bay CA



100m Temperature at the M1 Mooring (36.7N, -122W), Monterey Bay CA





High concentrations of anchovies and whales

Call Agenda



- Project Recap & Updates (Polly Hicks)
- El Niño and Regional Climate brief (Dan McEvoy)
- Guest Speaker: Western US wildfire season update (Tim Brown)
- IOOS Nearshore Conditions brief (Jan Newton, Clarissa Anderson, Francisco Chavez)
- **Environmental conditions and impacts reporting and discussion (Polly Hicks)**
- Discussion

Regional Impacts Summary



Reporting Status:

- 47 entries since August 22, 2017

Environmental Conditions

- Drought
- Wildfires and Smoke
- Wind/Dust Storms
- Severe Weather
- Heat Wave
- Blizzard
- Rockslide

Human & Environmental Impacts

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

Impacts in Pictures



Major fires in Northern California have completely leveled some areas. More than 200,000 acres burned in these recent fires. Warm offshore diablo winds fanned the flames bringing low humidity and winds up to 70 mph. The death toll has risen to 42. Officials say this is now the deadliest week of wildfires in state history. Sonoma County expects damages to cost more than \$3 billion with approximately 7,000 structures destroyed.



Impacts in Pictures



Many parts of San Francisco Bay have experienced the worst air quality ever recorded due to ongoing fires.



Impacts in Pictures



About 6.3 billion dead trees in 11 western states are hindering firefighting efforts and pose a threat to firefighters if they fall. A massive beetle infestation accounts for about 20% of the standing dead trees. The rest were killed by drought, disease, fire or other causes.



Impacts in Pictures



An early season blizzard resulted in widespread power outages and downed trees in parts of Montana. Havre, Montana saw 13 inches of heavy, wet snow, breaking its 2 day record for October snow and causing town-wide power outage due to downed trees. Zortman, MT also set a daily October record with 14" and Missoula, MT set a record for earliest recorded measurable snow in 34 years. The largest accumulated total was 30" at Rocky Boy, MT with drifts up to 8 feet high.



Impacts in Pictures



An EF-0 tornado touched down in the Willamette Valley in Oregon. The twister flipped two planes at the Aurora airport and damaged a couple greenhouses.



Impacts in Pictures



A dust storm blew through the town of Pahrump, NV with winds of 50-60 mph with one location reporting 70 mph gusts.



Call Agenda



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

Next NOAA West Watch: January 23rd, 1-2pm PDT/ 2-3pm PDT