



NOAA West Watch

*Reporting Regional Environmental
Conditions & Impacts in the West*

November 27, 2018

Call Agenda



- **Project Recap & Updates (Dan McEvoy)**
- Regional Climate and ENSO brief (Dan McEvoy)
- Guest speaker: Dr. Nina Oakley, *California post-fire debris flow hazards heading into winter 2018/2019*
- IOOS Nearshore Conditions brief (Jan Newton, Alex Harper)
- Discussion - Environmental conditions and impacts reporting (All)
 - Additional impacts to share?
 - Future guest speaker or thematic issue of interest?

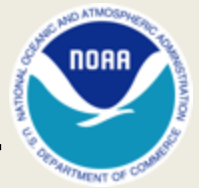
Project Recap and Updates



- NOAA West Watch bi-monthly webinars are a project of the NOAA Western Regional Collaboration Team (NOAA West), in partnership with the Western Regional Climate Center with standing contributions from the three Integrated Ocean Observing System Regional Associations.
- Initiated in 2015, evaluated in 2016 and re-instated as a bi-monthly offering in 2018. Current goals:
 - Serve as forum for bring 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.

Project Recap and Updates



- This is the first webinar offering for Fiscal Year 2019 and the Western Regional Climate Center has taken over leading the webinars
- NOAA West has provided funding to the Western Regional Climate Center to offer three more in Fiscal Year 2019 (November, January & Spring/Summer timeframe). Next webinar: **January 22nd, 1-2PM PDT/ 2-3PM MDT.**
- 2019 is a transitional year. The team is investigating options for permanent hosting. If no permanent host and/or operational funding is found, these webinars will conclude at the end of summer, 2019.
- Request: If you find these webinars helpful, or if you have ideas of in-region entities that may be open to taking on this webinar please let me know: (mcevoyd@dri.edu).

Reminder: NOAA West Watch Survey



- Survey closes THIS FRIDAY, November 30
- PLEASE complete if you haven't done so already

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California Wildfires: Climate and Drought Context



November 6, 2018

(Released Thursday, Nov. 8, 2018)

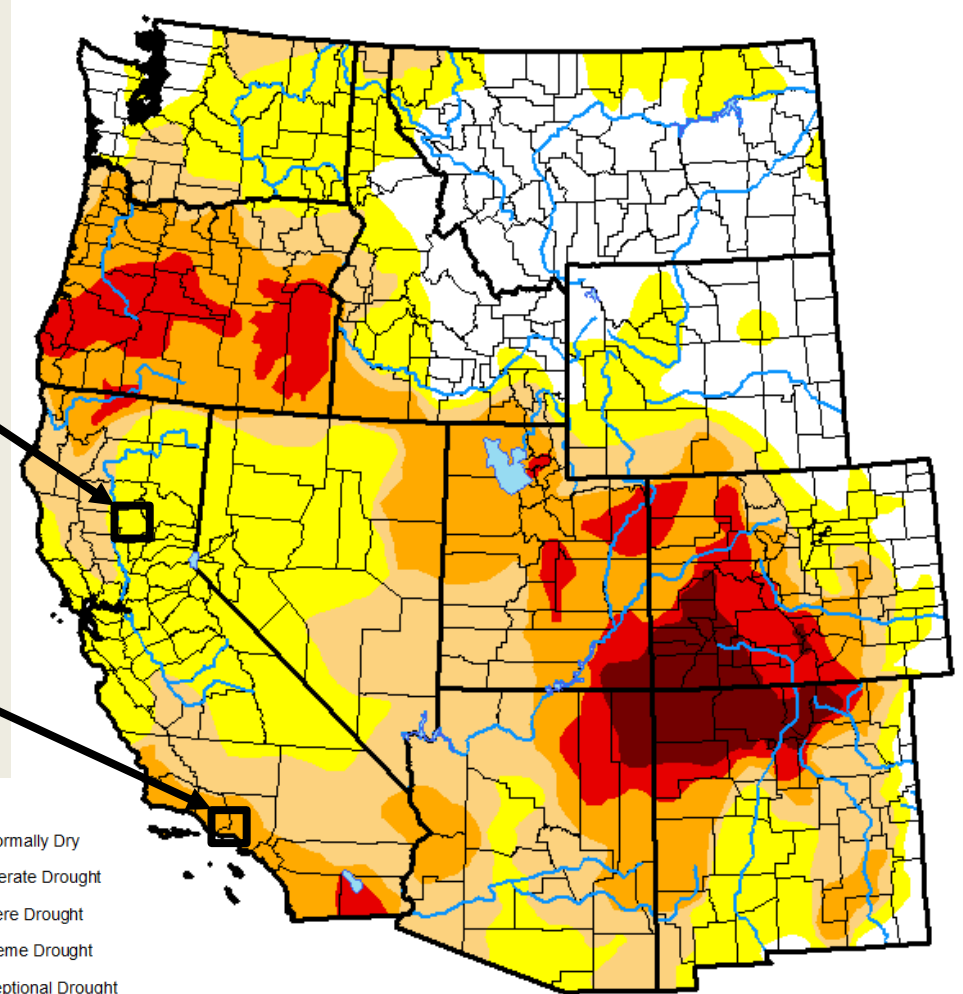
Valid 7 a.m. EST

Camp Fire:

- Start: November 8
- 153,336 acres
- 18,793 structures destroyed
- 85 deaths
- 249 missing
- D0 Abnormally Dry

Woolsey Fire:

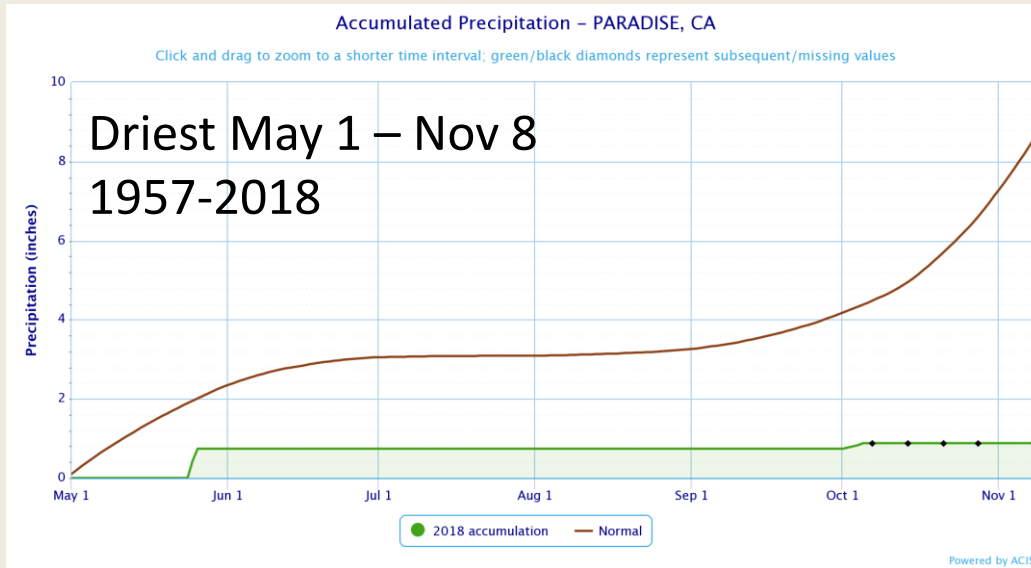
- Start: November 8
- 96,949
- 1,643 structures destroyed
- 3 deaths
- D2 Severe Drought



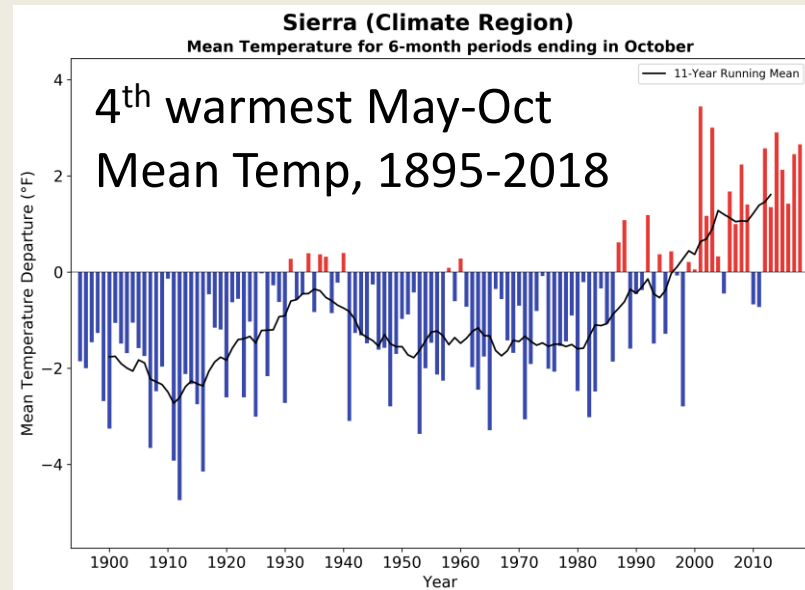
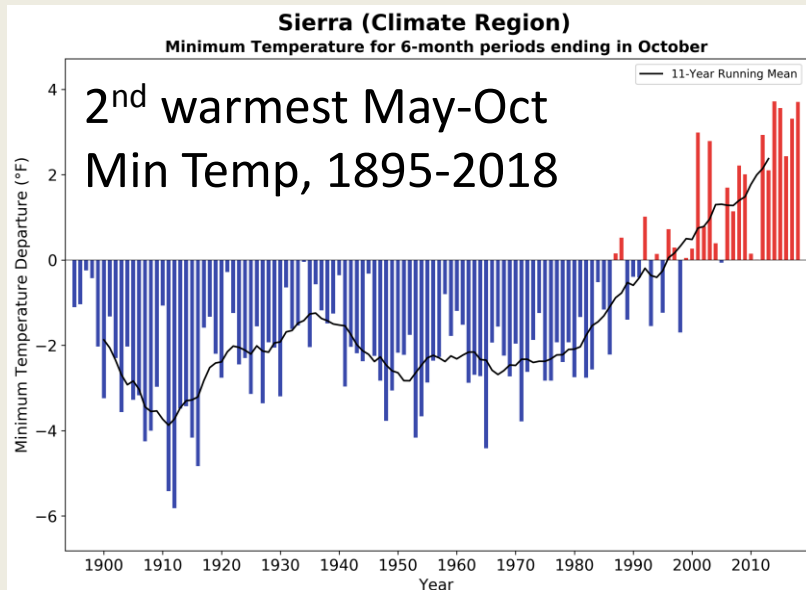
Intensity:

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

California Wildfires: Climate and Drought Context



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

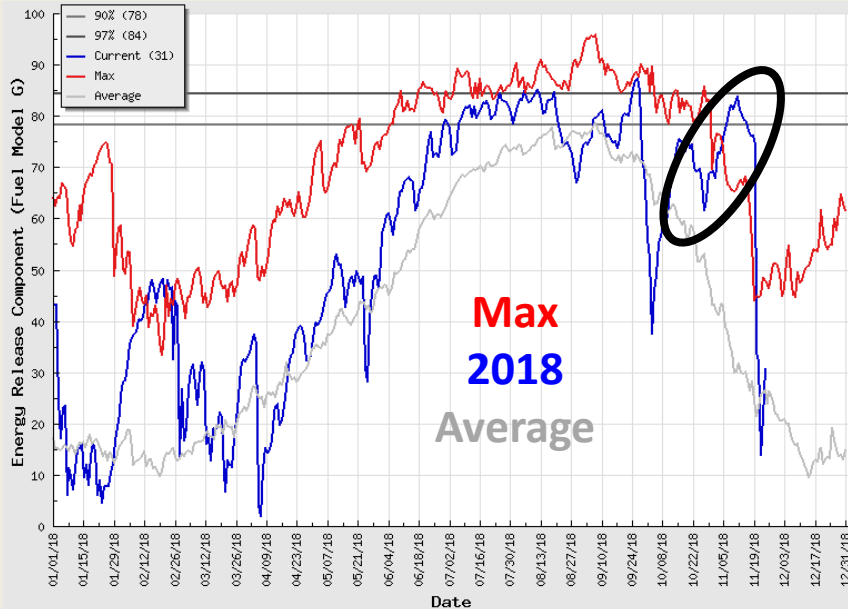


<https://wrcc.dri.edu/Climate/Tracker/CA/>

California Wildfires: Climate and Drought Context

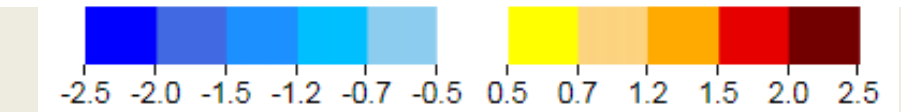
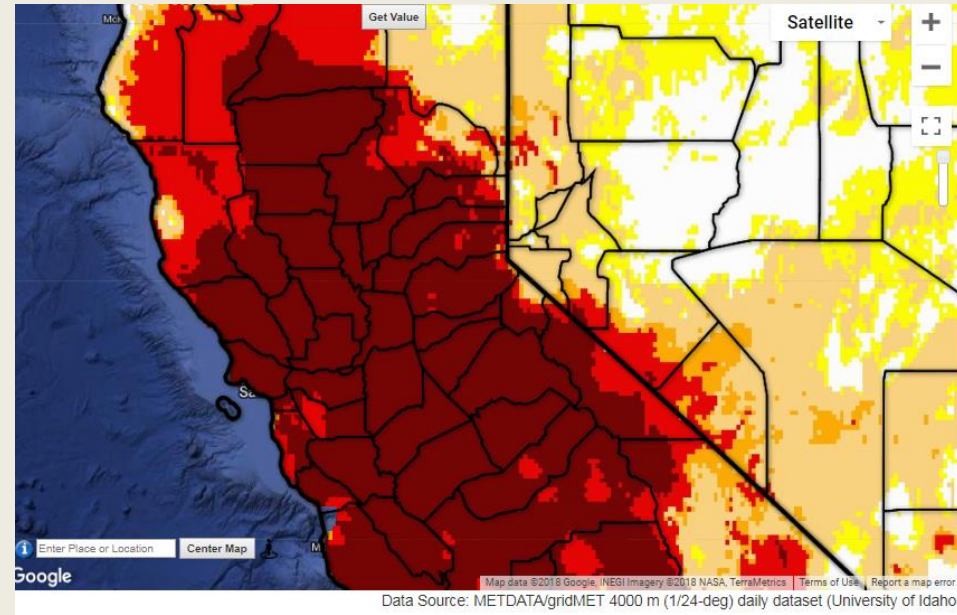


Energy Release Component Sac Valley/Foothills



- Reflects contribution of live and dead fuels to potential fire intensity
- Record high values in week leading up to Camp Fire

Evaporative Demand Drought Index 2-weeks ending November 8, 2018

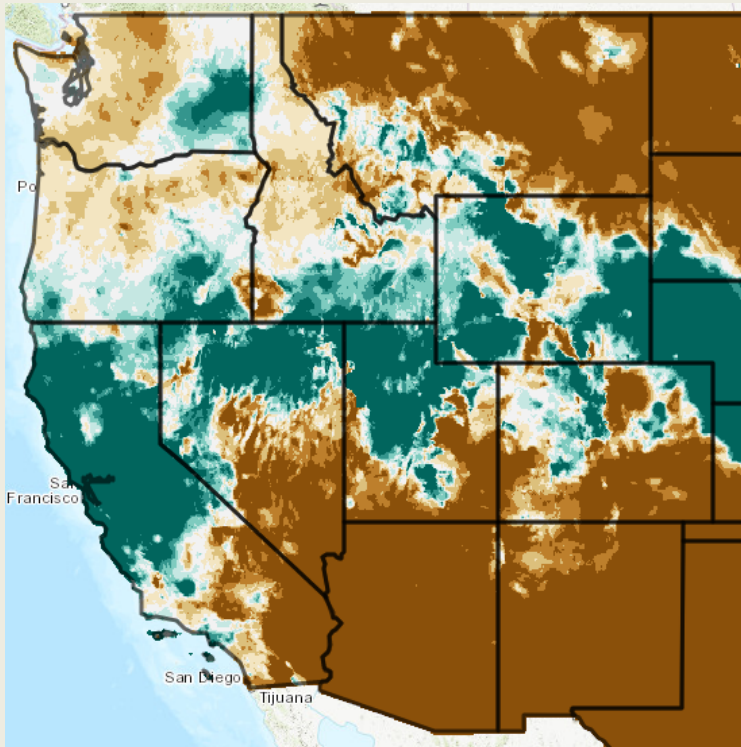


- Temperature, humidity, wind, and solar radiation
- Reflects the drying power of the atmosphere

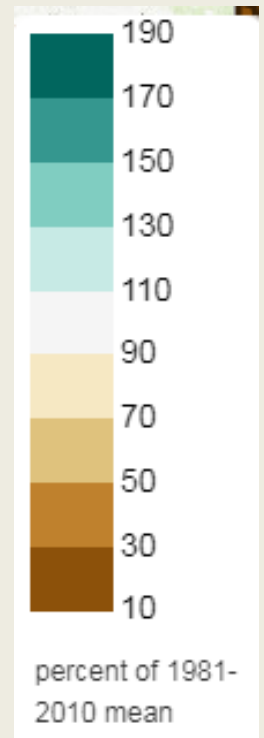
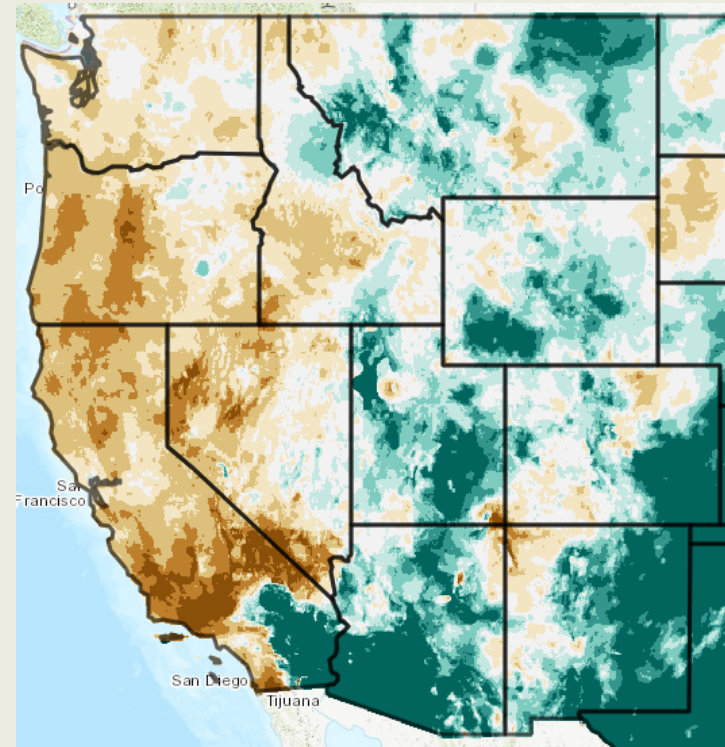
Precipitation



Precipitation % of Normal
November 19 – November 25, 2018



Precipitation % of Normal
October 1 – November 25, 2018

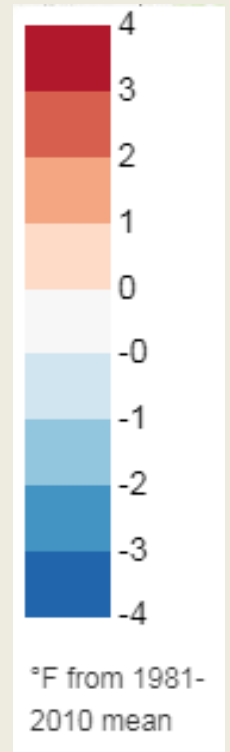
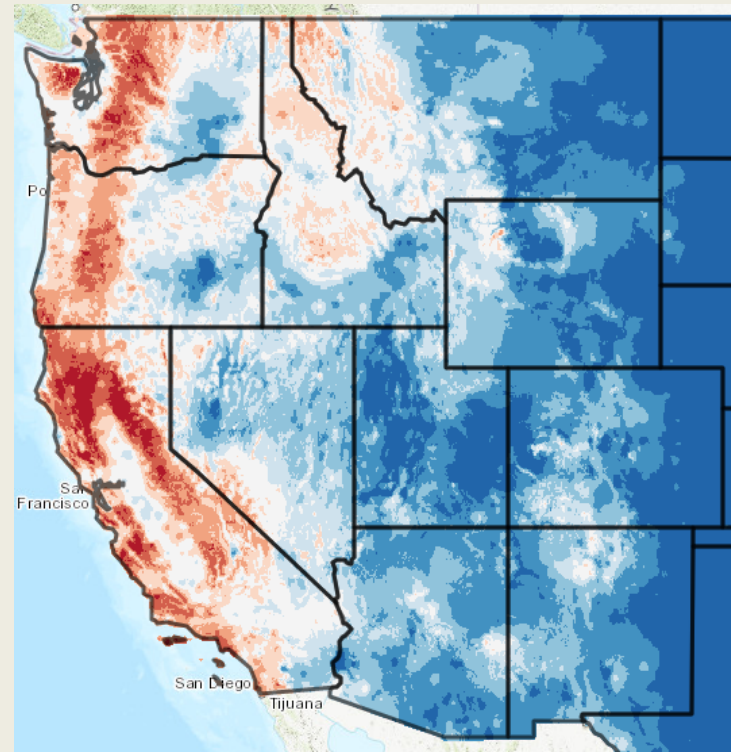
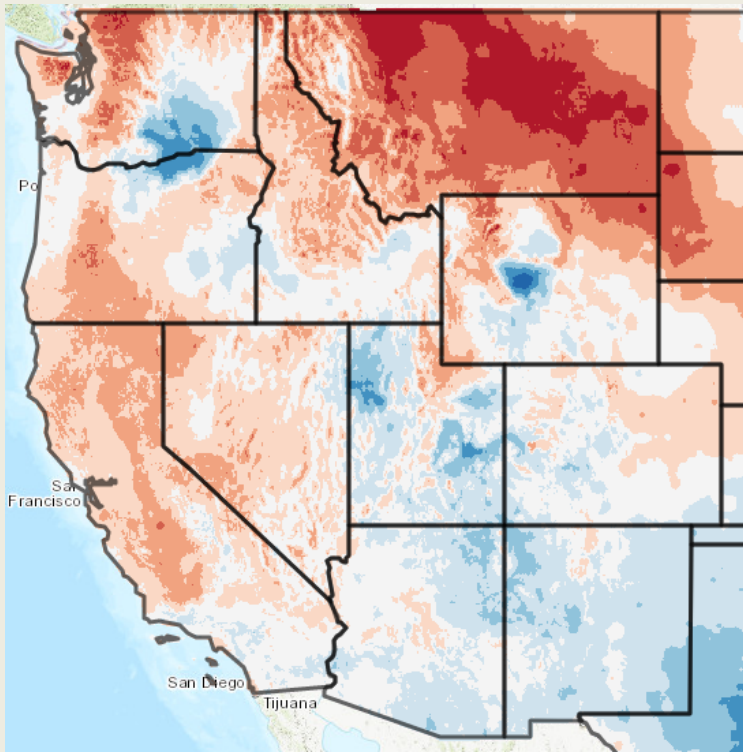


Temperature

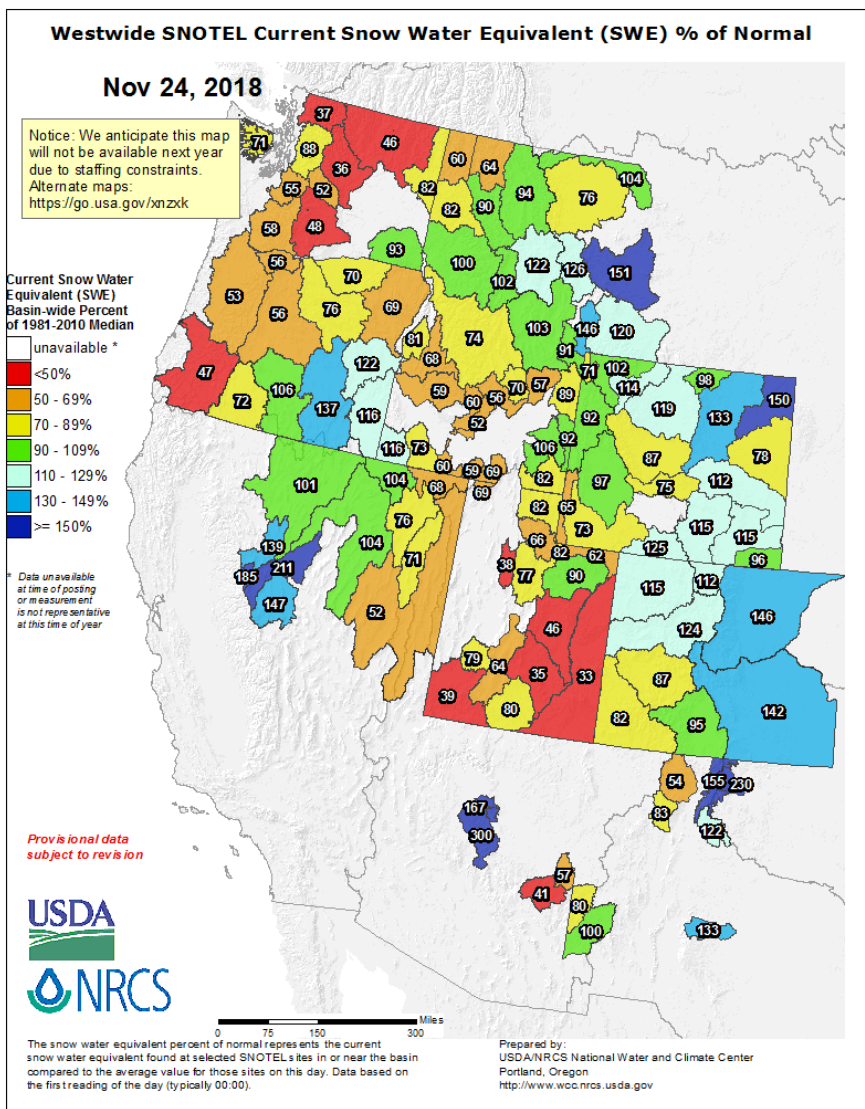


Mean Temperature Anomaly
November 19 – November 25, 2018

Mean Temperature Anomaly
October 1 – November 25, 2018



Snowpack



Colorado ski resorts open early for the first time in nearly 10 years



Accuweather.com November 7, 2018
 Photo: Keystone Resort



- ENSO Alert System Status: **El Niño Watch**
- ENSO-neutral conditions are present.*
- Equatorial sea surface temperatures (SSTs) are above average across most of the Pacific Ocean.
- El Niño is expected to form and continue through the Northern Hemisphere winter 2018-19 (~80% chance) and into spring (55-60% chance).*

Credit: CPC

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

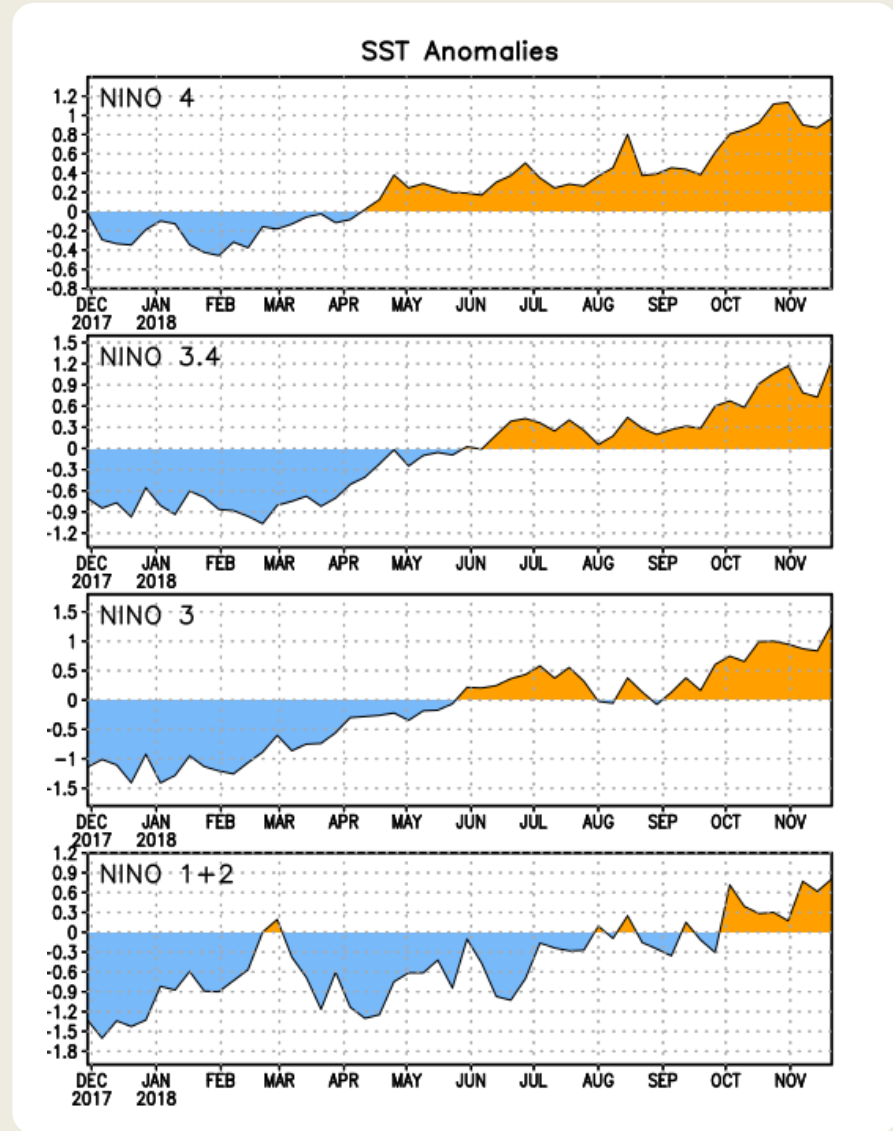
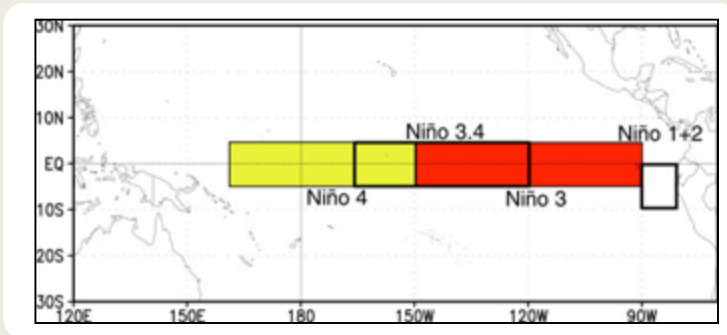
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/.

Niño Region SST Departures (°C) Recent Evolution

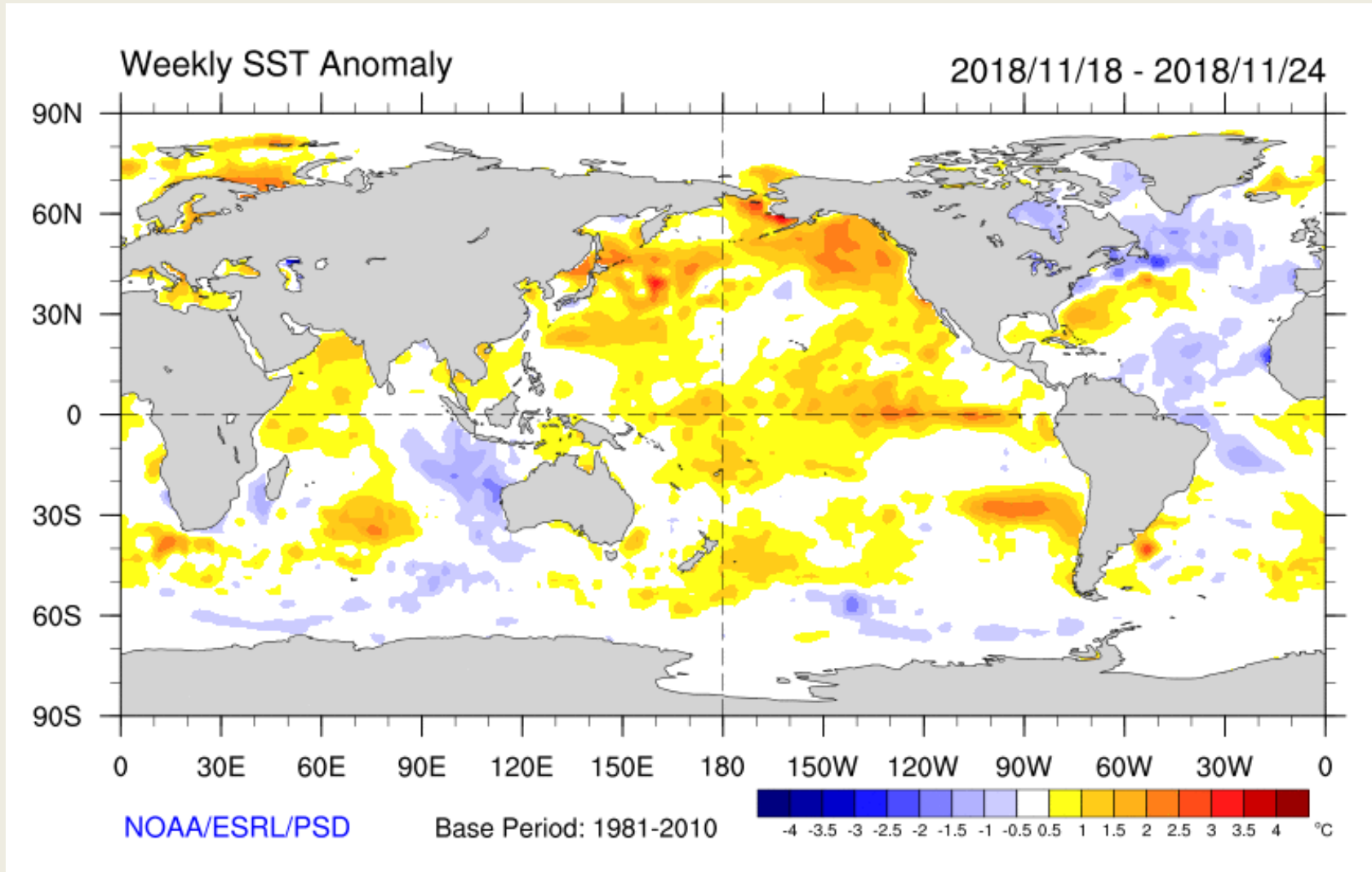


The latest weekly SST departures are:

Niño 4	1.0°C
Niño 3.4	1.3°C
Niño 3	1.3°C
Niño 1+2	0.8°C



Current Sea Surface Temperatures

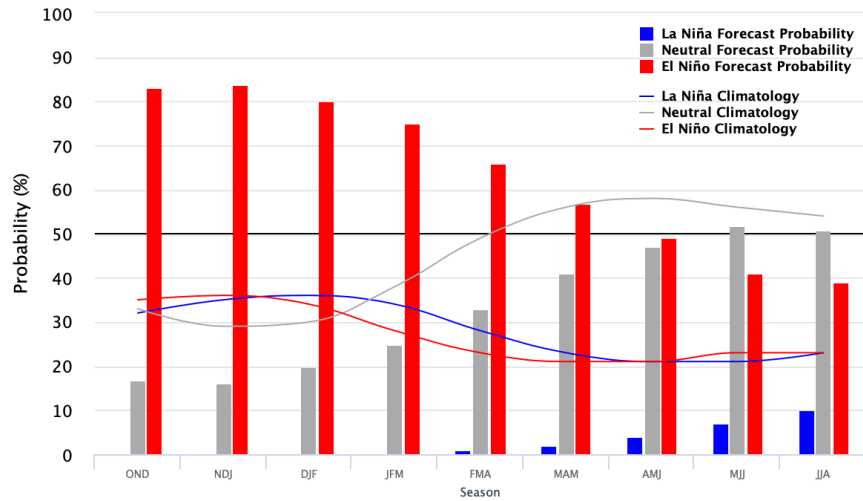


ENSO Forecasts



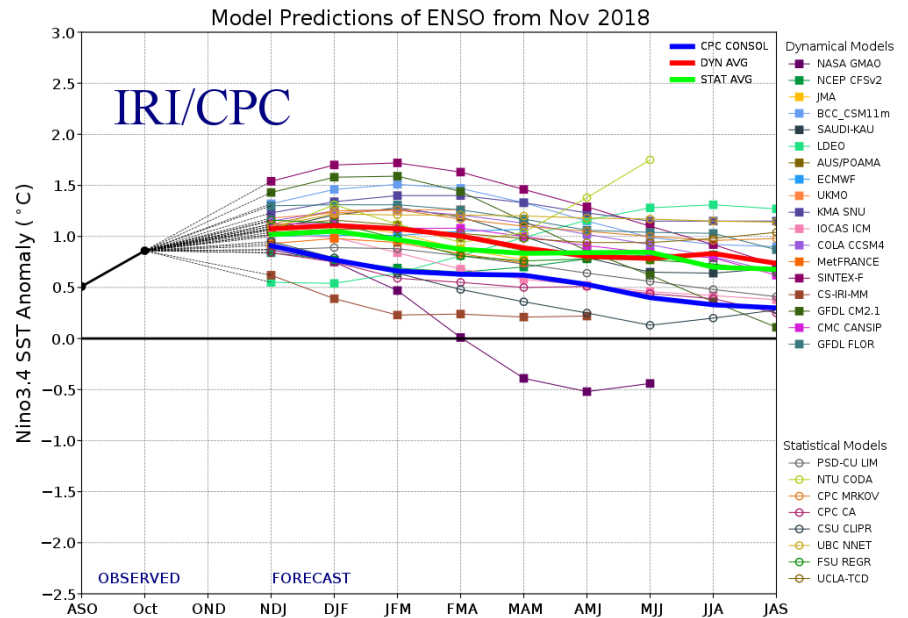
Early-November 2018 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5 °C to 0.5 °C

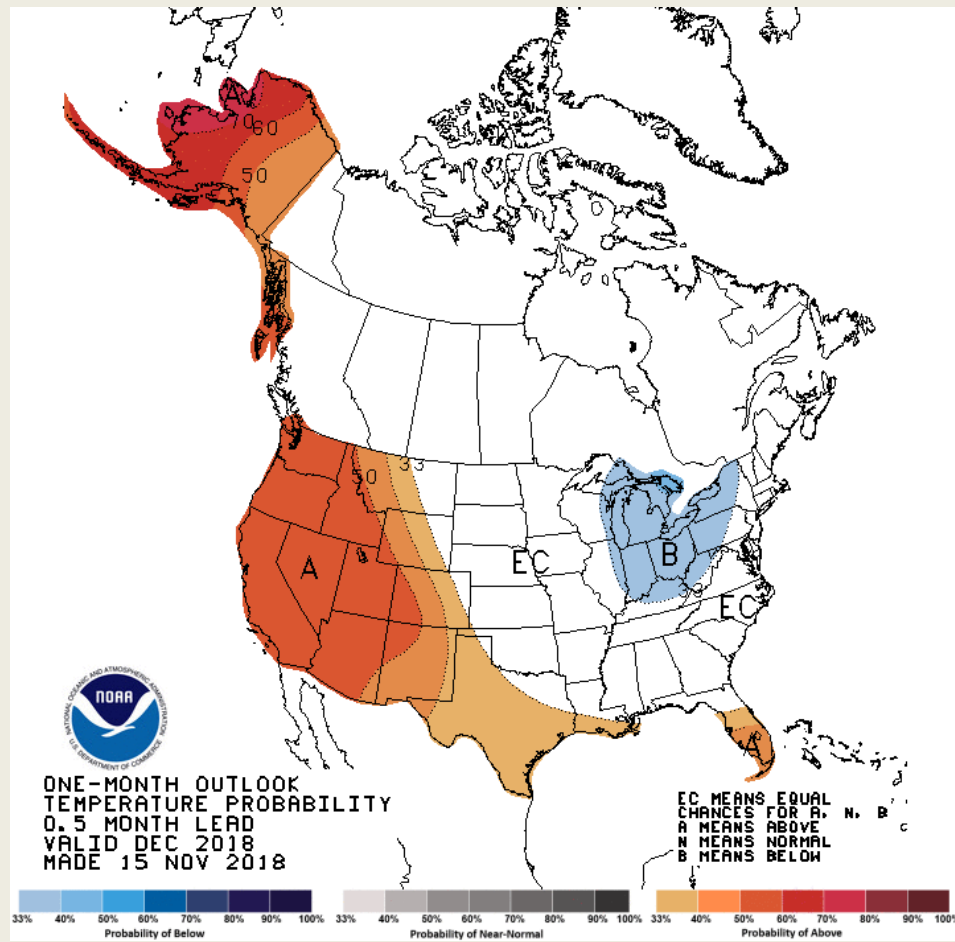
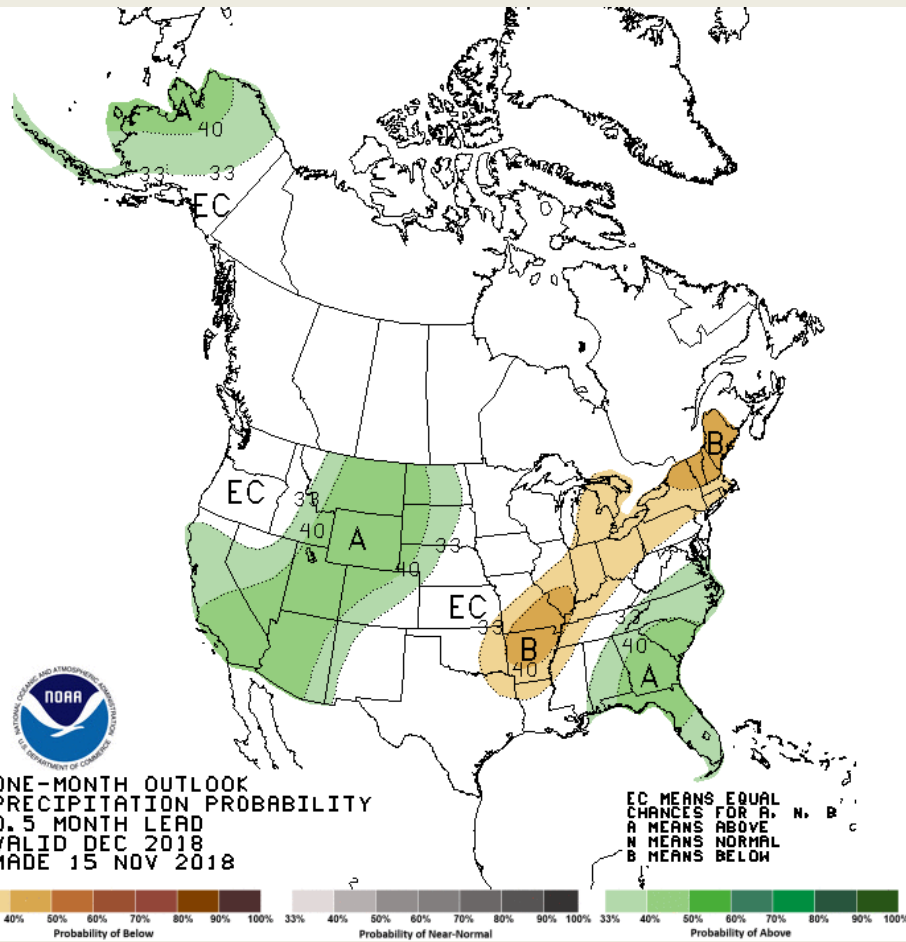


CPC/IRI El Niño forecast:

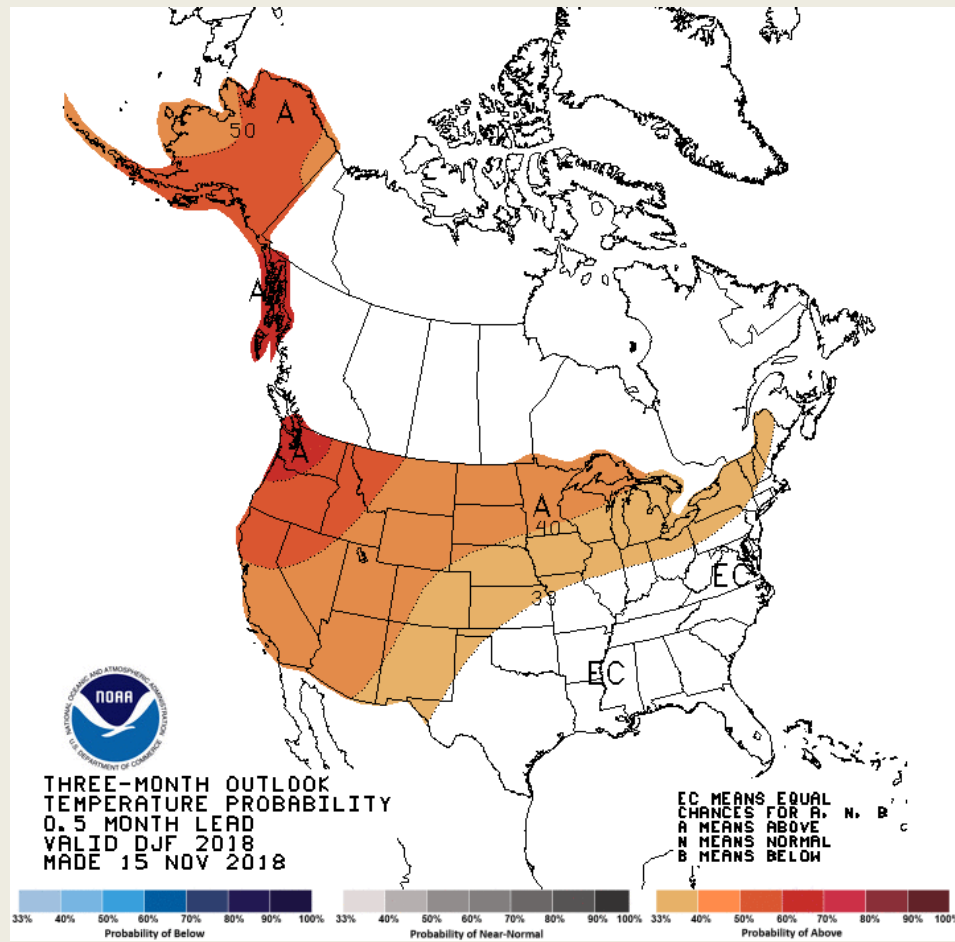
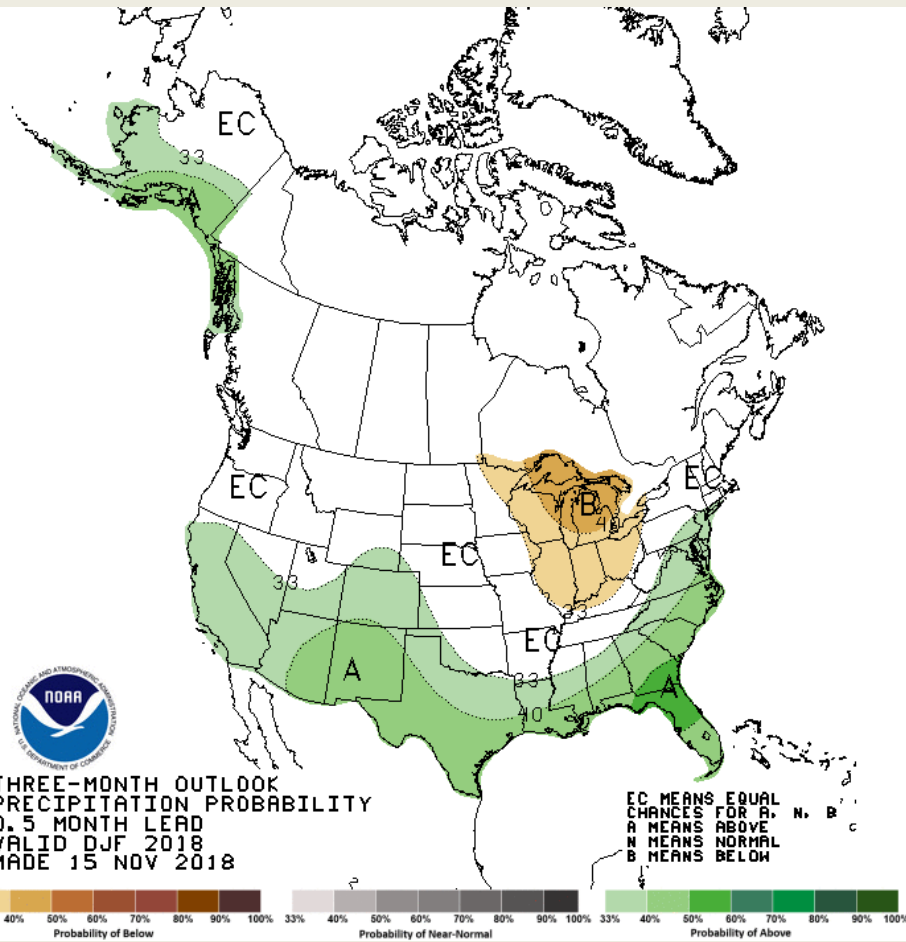
NMME models + other dynamical models + statistical models



December U.S. Forecasts



December-February Forecasts



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California post-fire debris flows hazards heading into winter 2018/2019

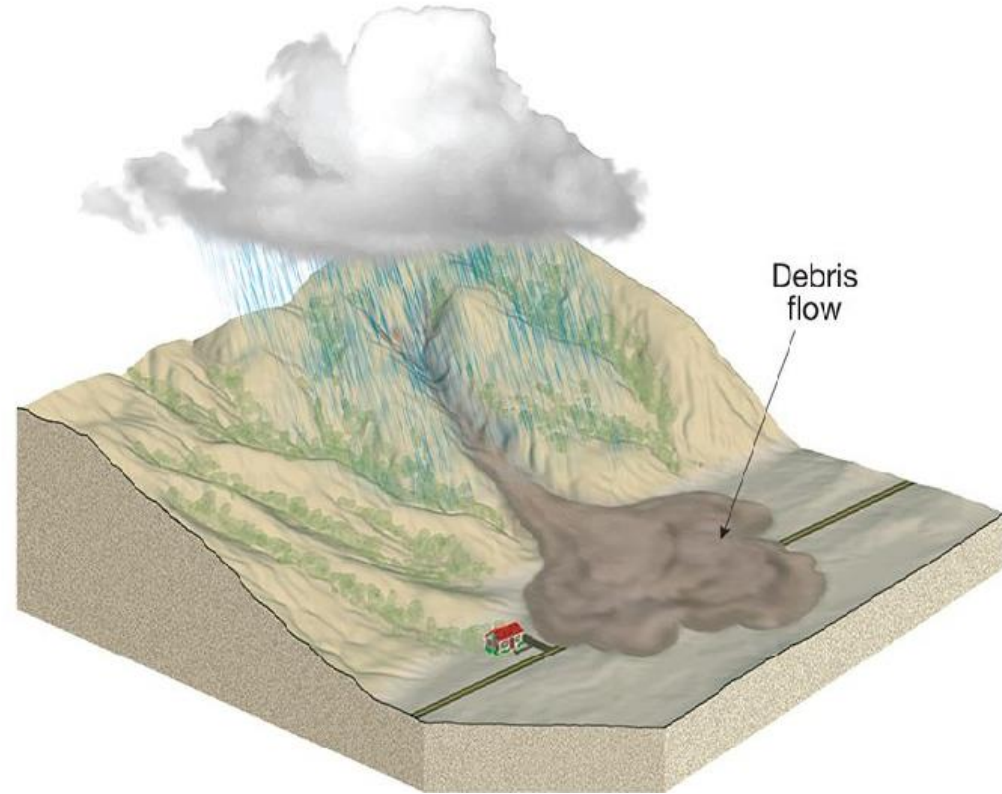
Nina Oakley, Ph.D., WRCC/CNAP

NOAA WestWatch, Nov. 2018

Atmospheric river influenced post-fire debris flow near Santa Barbara, CA, Jan 20 2017



What is a post-fire debris flow?



Triggered by short-duration, high-intensity rainfall

15-min intensity typically best predictor of debris flow activity

Shallow landslide v. post-fire debris flow

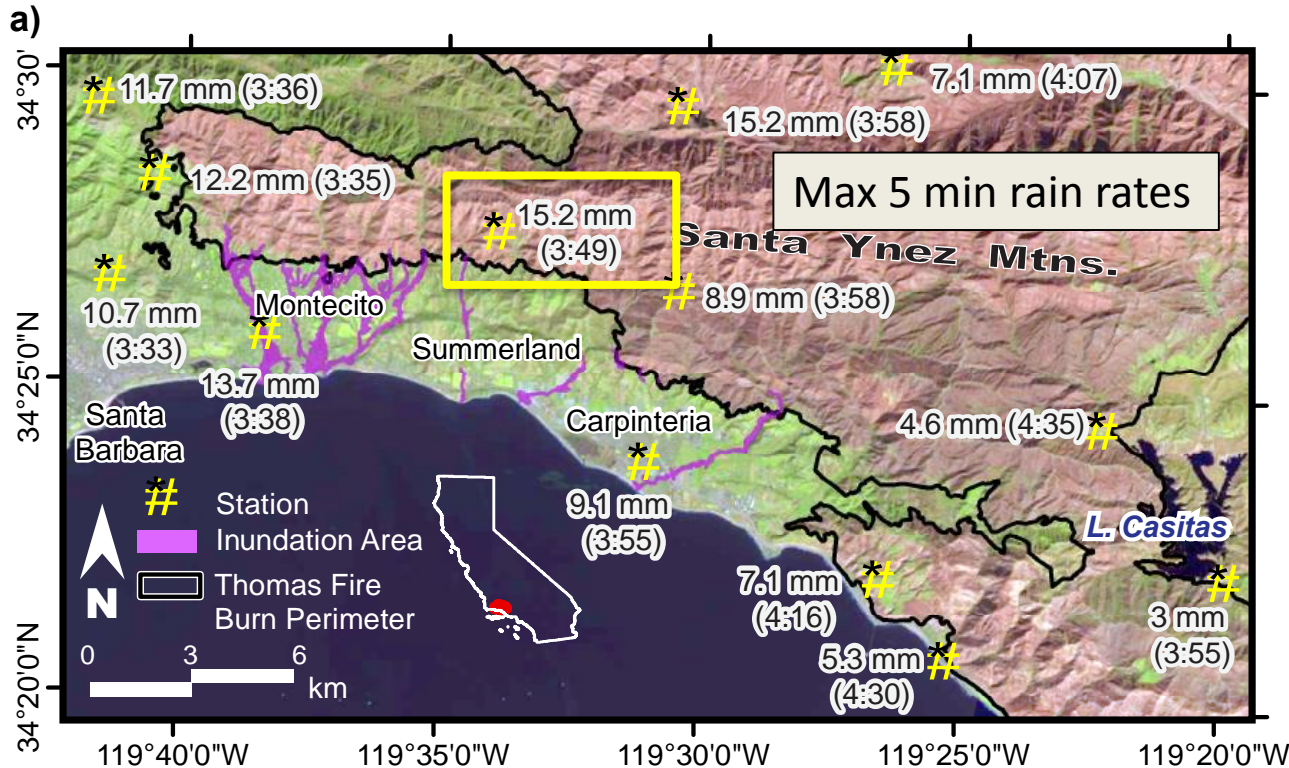


Shallow landslides → debris flows in San Francisco Bay Area *Photo: J.A. Coe, USGS*
Note distinct material source region.
Likelihood related to antecedent moisture.



Looking down on Cold Spring Cyn in Feb 2018, Thomas Fire burn area. No distinct source region. Likelihood NOT related to antecedent moisture.

9 Jan 2018 Montecito Debris Flow

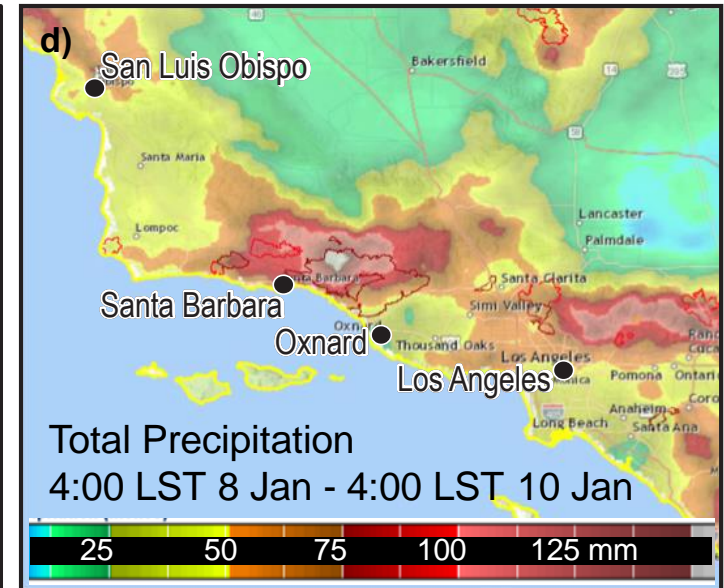
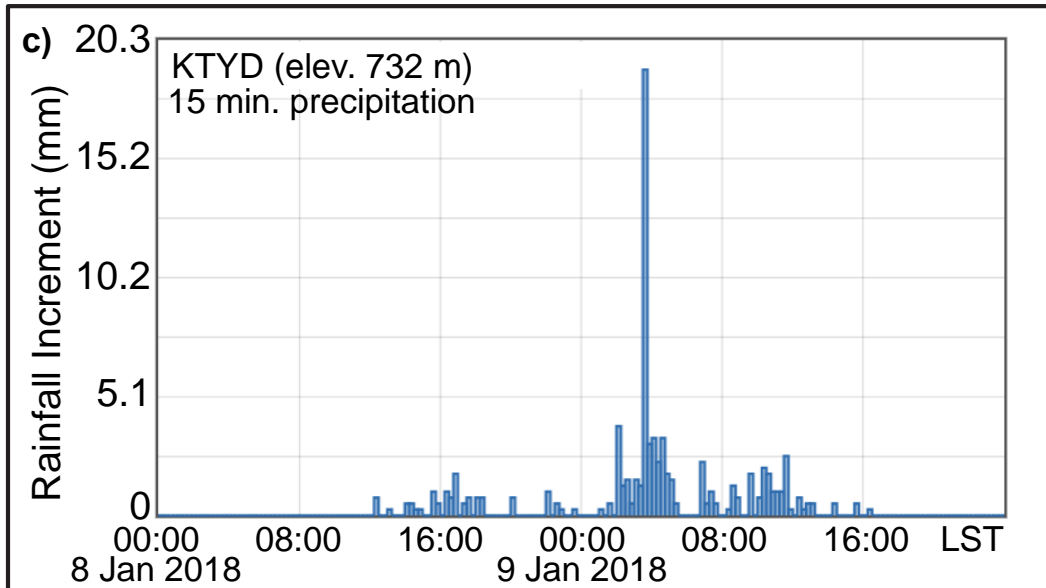


1/9 Maximum rain rates:
5 min: 0.6 in
15 min: 1.03 in

Highest ever recorded in
SB county:
5 min: 0.72 in
15 min: 1.39 in



9 Jan 2018 event precipitation



Most rainfall in storm fell in very short duration
2-day rainfall totals in 2-5 inches, moderate for area

Debris flow hazard persists on Thomas Fire burn area!

Post-fire runoff/debris flow impacts

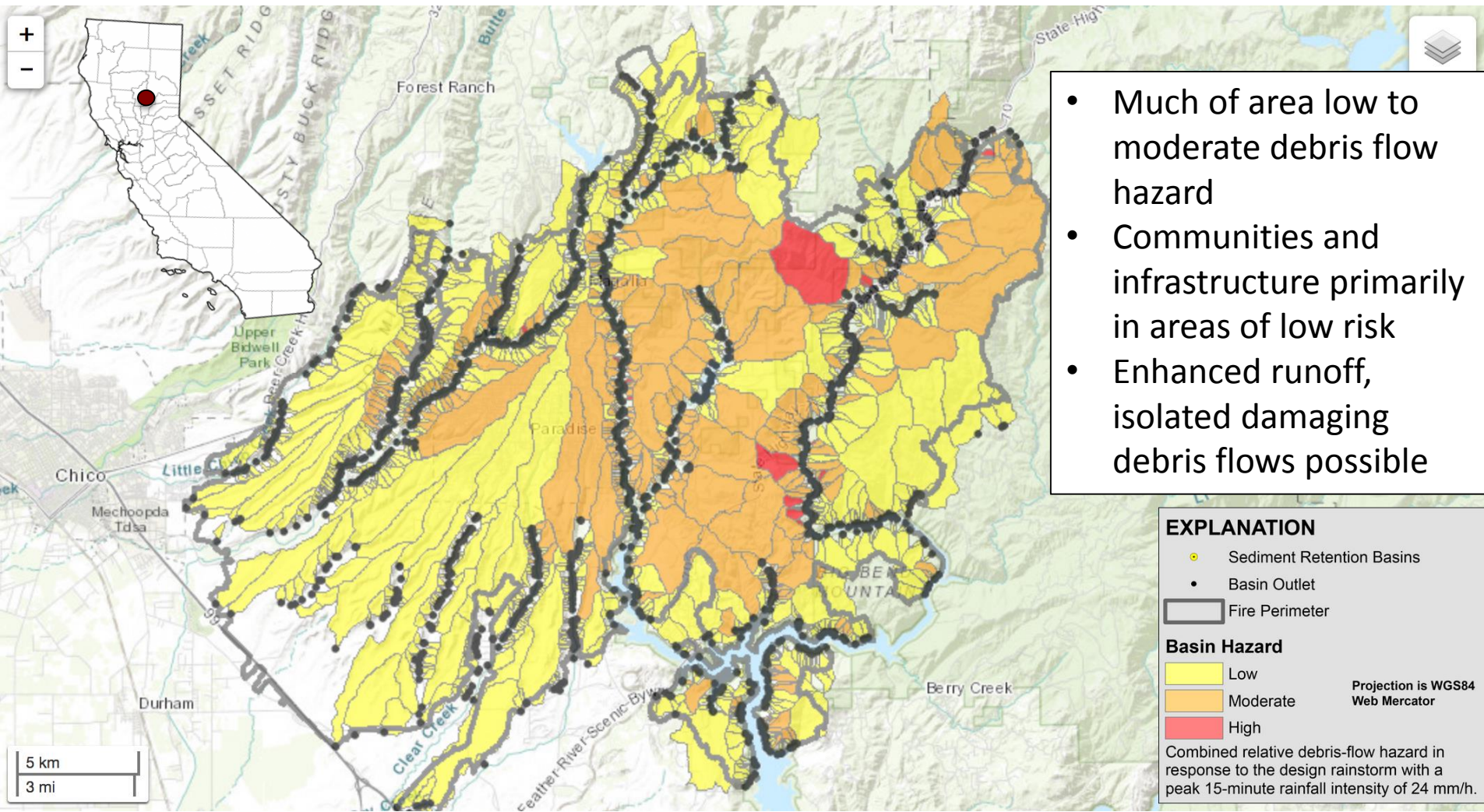
- Debris flows threaten life, property, and infrastructure
- Water quality
- Increased erosion
- Contaminants/turbidity can have ecosystem impacts



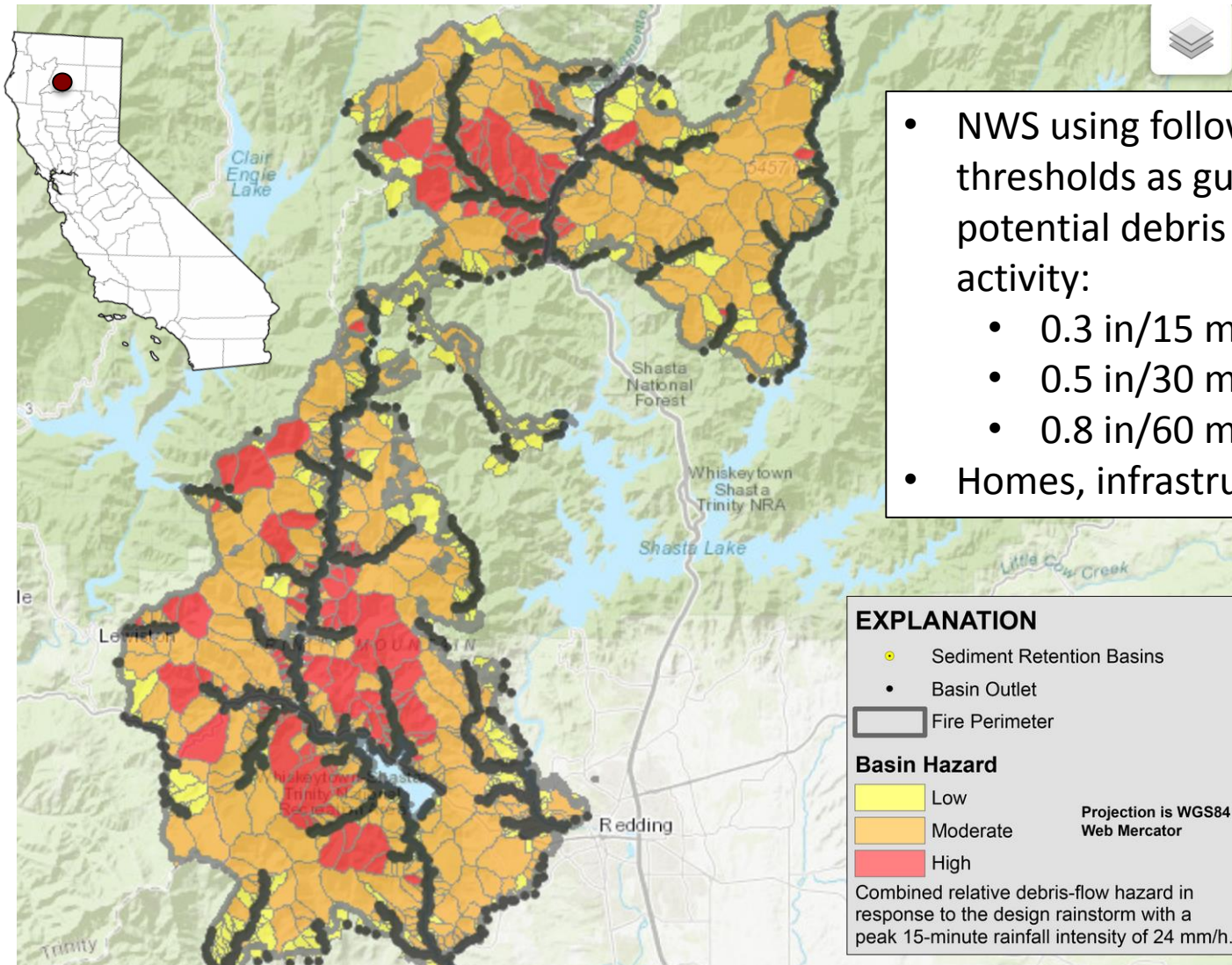
Dead rainbow trout in Big Tujunga watershed following 2009 Station Fire in southern CA. Photo: USGS

- Debris flow impacts commonly occur in first year after fire, burn area susceptible 2-5 years

USGS Preliminary Hazard Assessment: Camp Fire

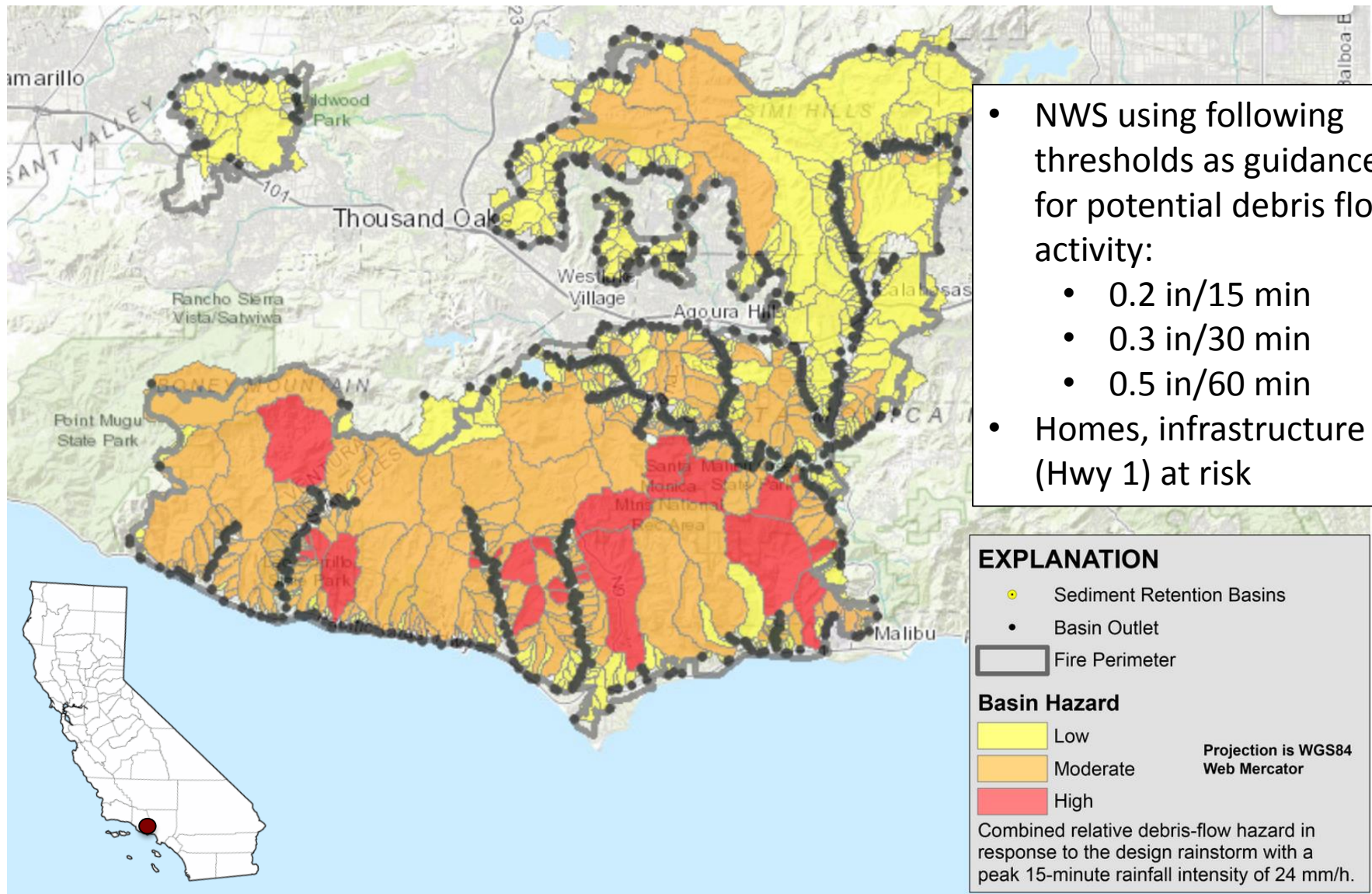


USGS Preliminary Hazard Assessment: Carr/Herz



- NWS using following thresholds as guidance for potential debris flow activity:
 - 0.3 in/15 min
 - 0.5 in/30 min
 - 0.8 in/60 min
- Homes, infrastructure at risk

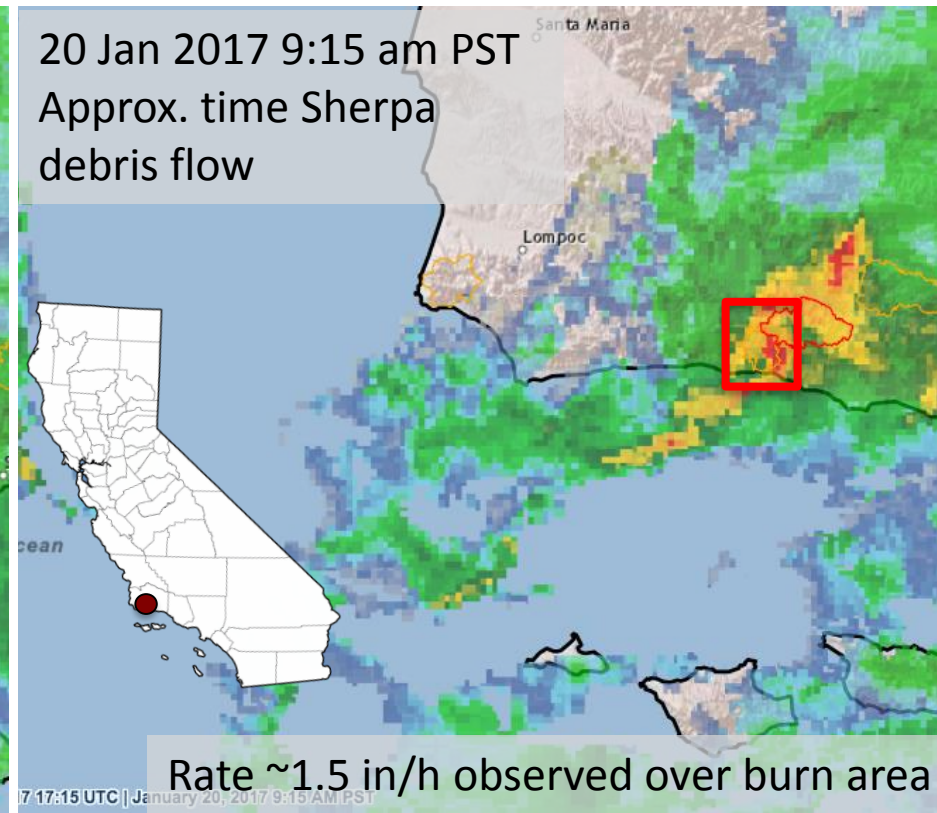
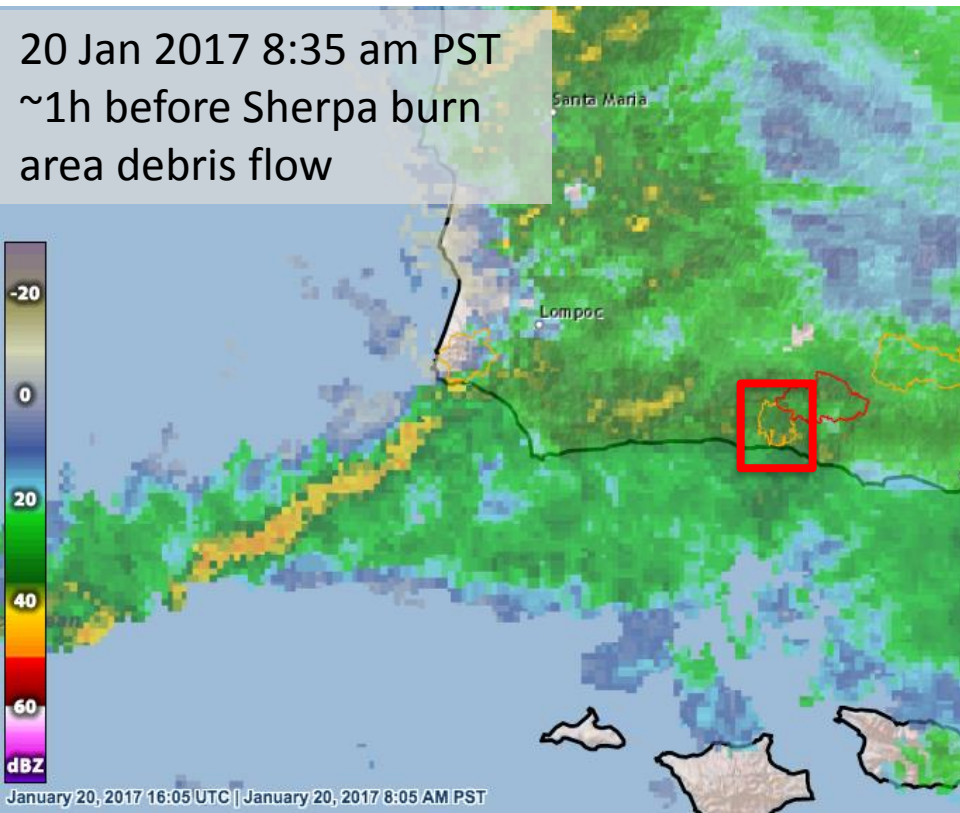
USGS Preliminary Hazard Assessment: Woolsey



- NWS using following thresholds as guidance for potential debris flow activity:
 - 0.2 in/15 min
 - 0.3 in/30 min
 - 0.5 in/60 min
- Homes, infrastructure (Hwy 1) at risk

High-intensity rainfall

- A couple days out, can identify potential for high-intensity rainfall in storm
- Very difficult to assess whether it will intersect with burn area, <1 to several hours out
- Weather models can struggle with timing, location of intense rainfall



Take-Home Messages

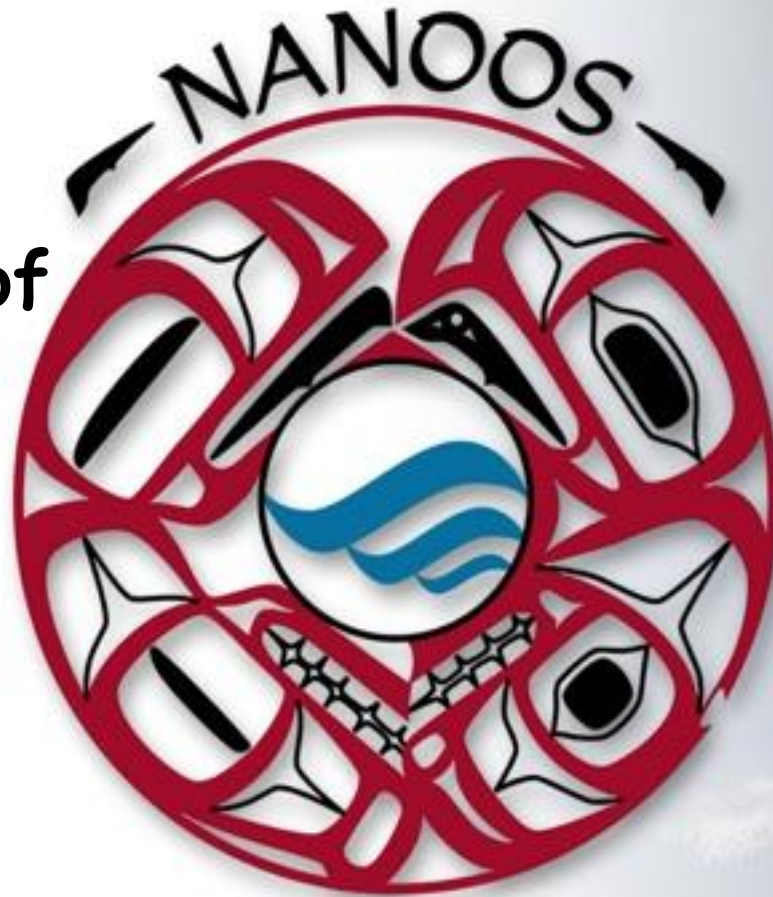
- Recent burn areas in CA at risk for enhanced runoff, impactful flooding, and debris flows
- Do not need “big storm” for damaging debris flow, just short-duration, high-intensity rainfall
- Large/destructive fire not necessarily greater debris flow hazard
 - Burn severity, geology, topography, values at risk
- If in area of potential concern:
 - Pay attention to NWS forecasts, watches, warnings
 - Heed warnings from your state, county, local officials

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Northwest Association of Networked Ocean Observing Systems



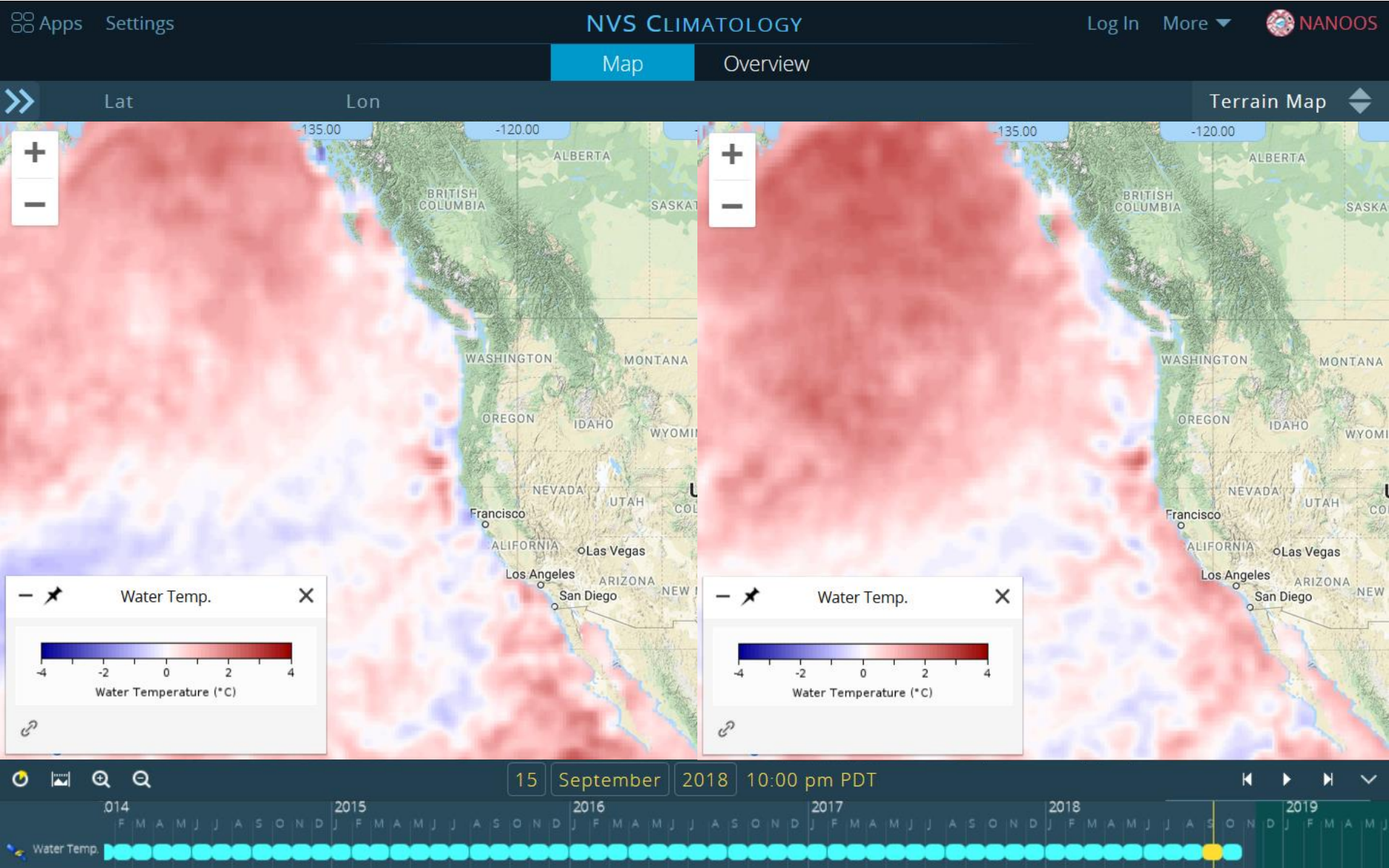
**NOAA West Watch Update 27 November 2018:
Washington / Oregon Observations**

Jan Newton, NANOOS Executive Director

Sea Surface Temperature Anomaly

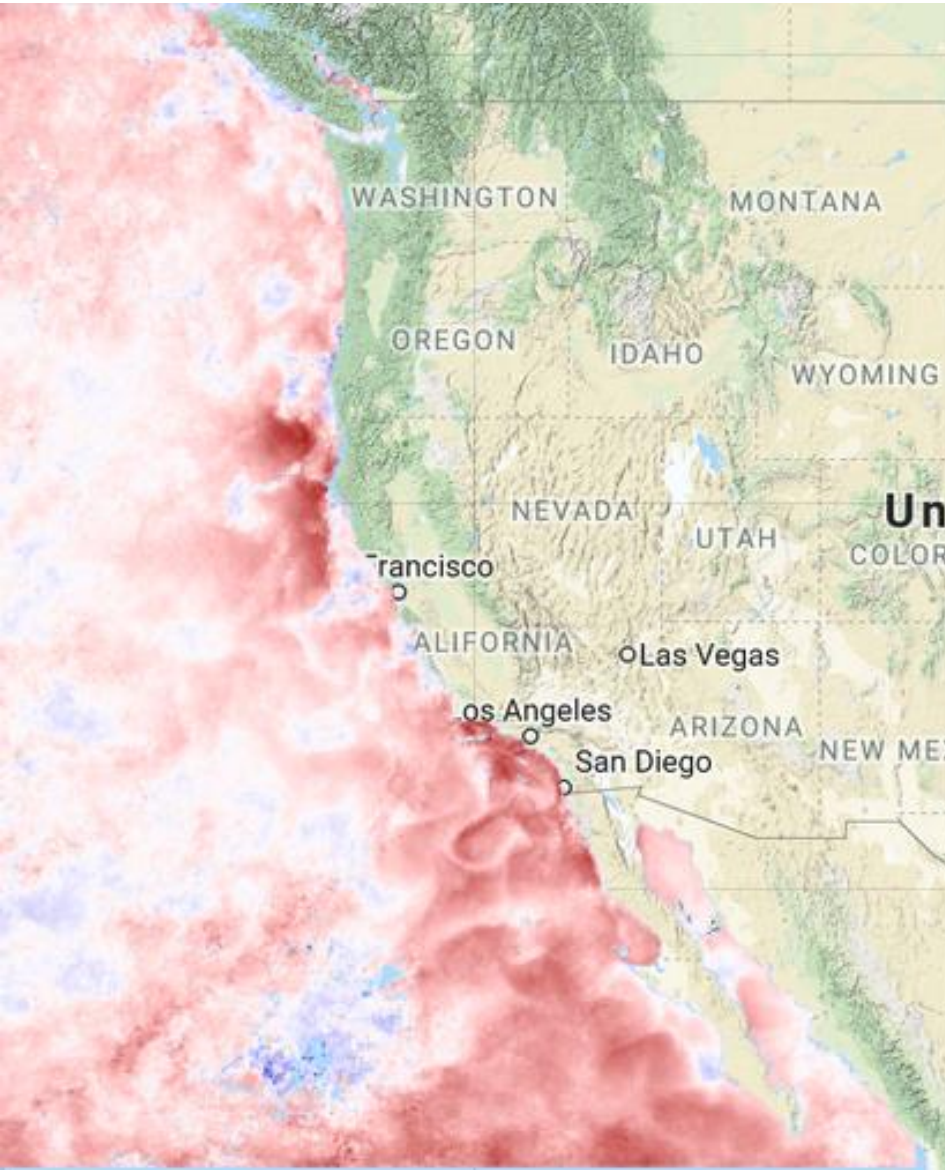
Sept 2018

Oct 2018

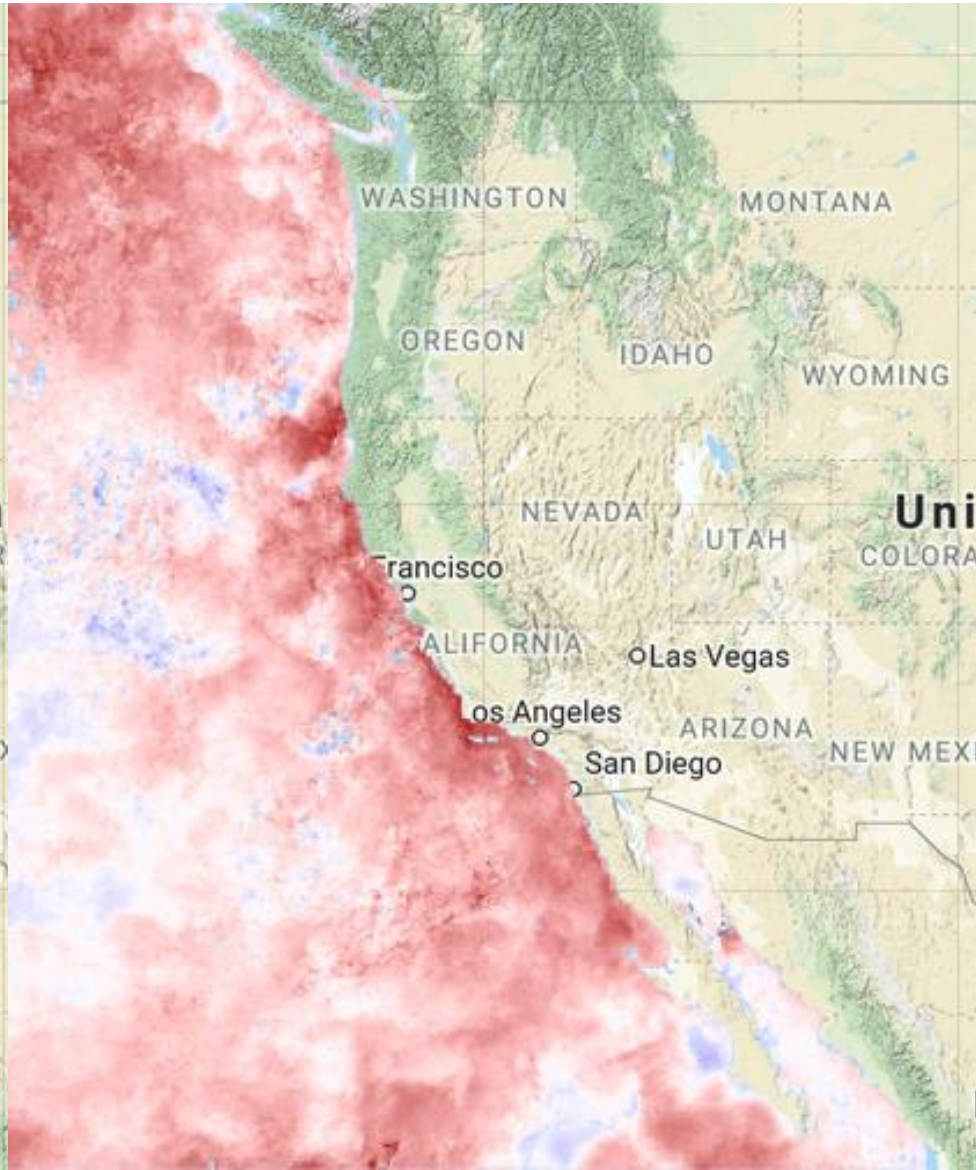


Sea Surface Temperature Anomaly

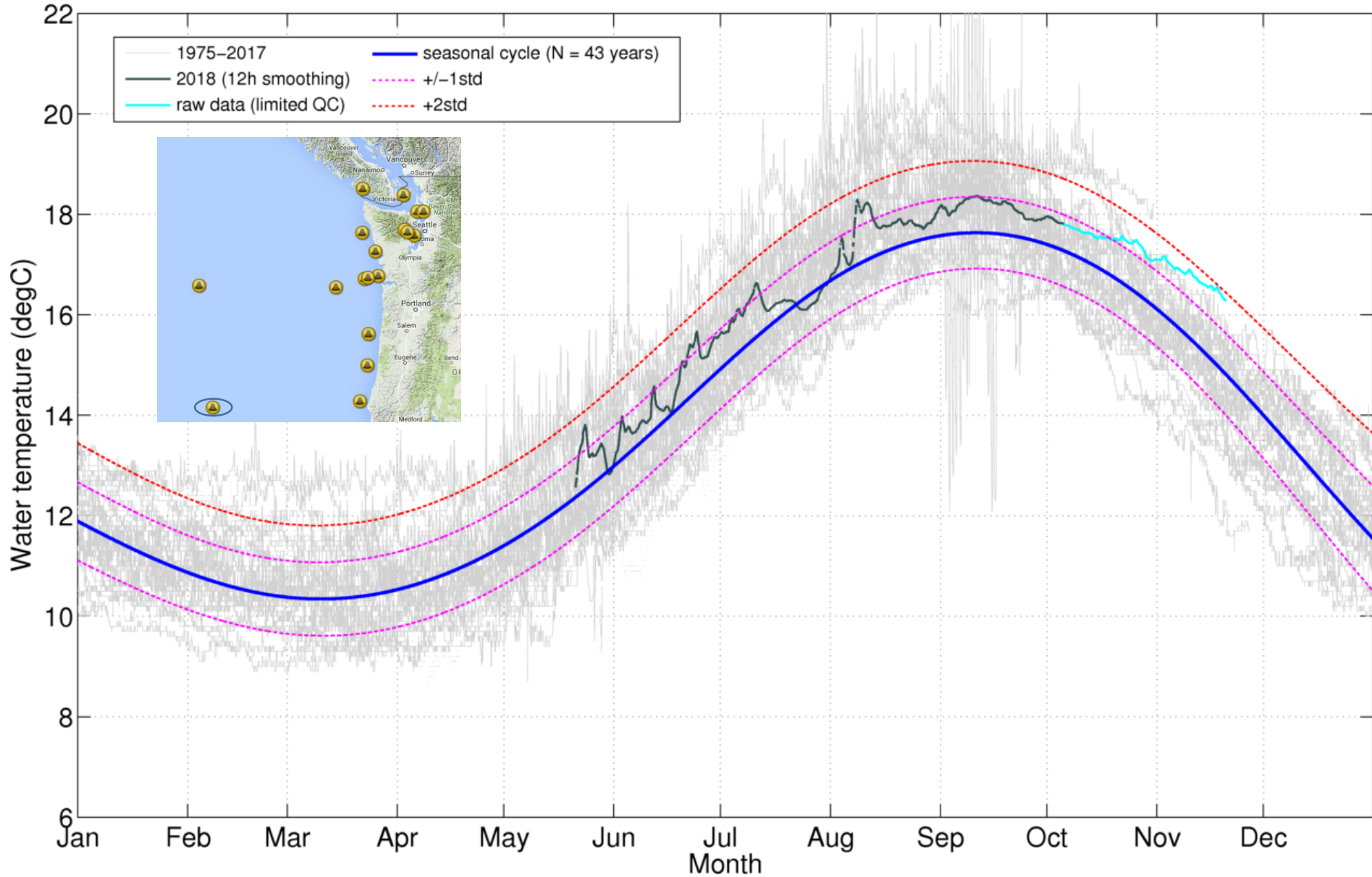
Sept 2018



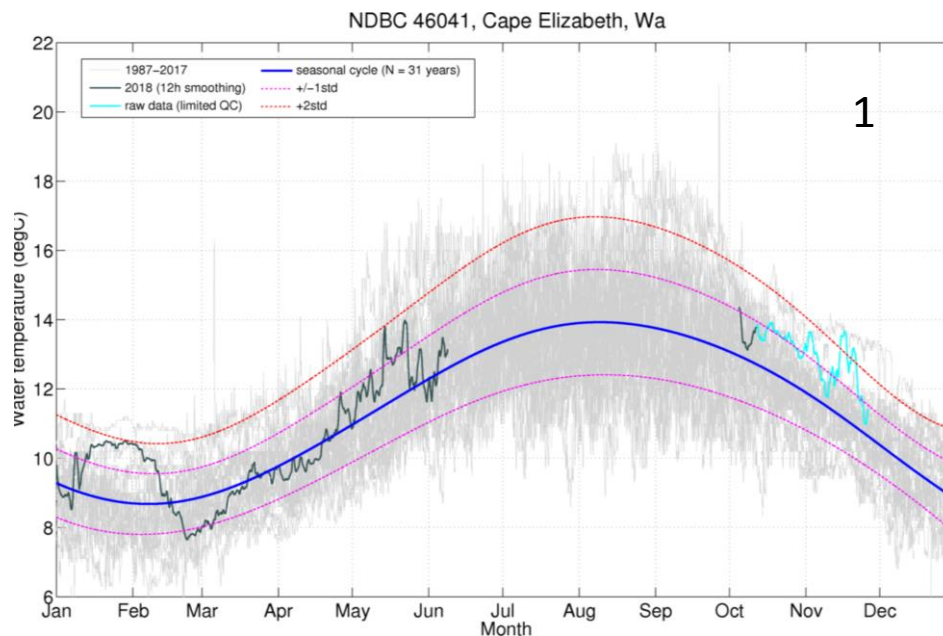
Oct 2018



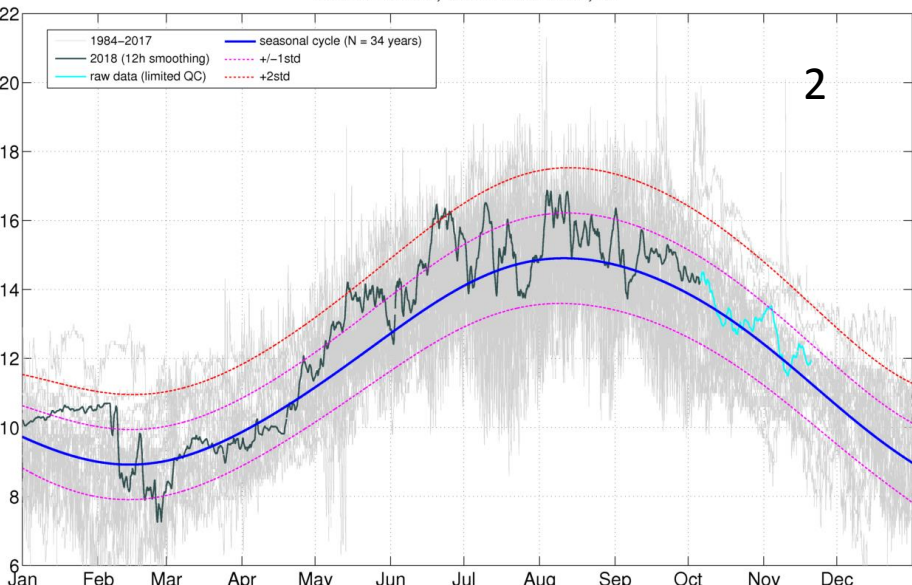
NDBC 46002, Oregon, Or



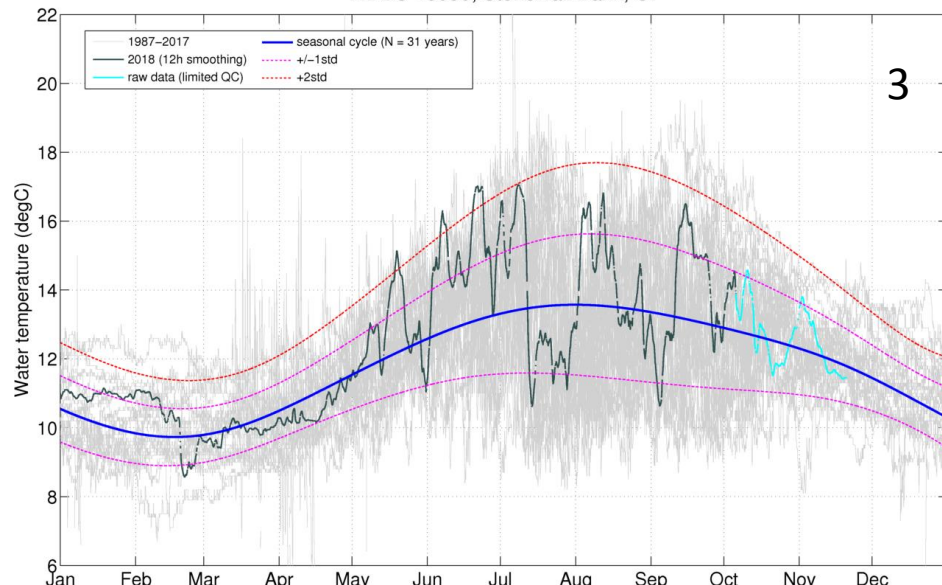
Sea Surface Temp



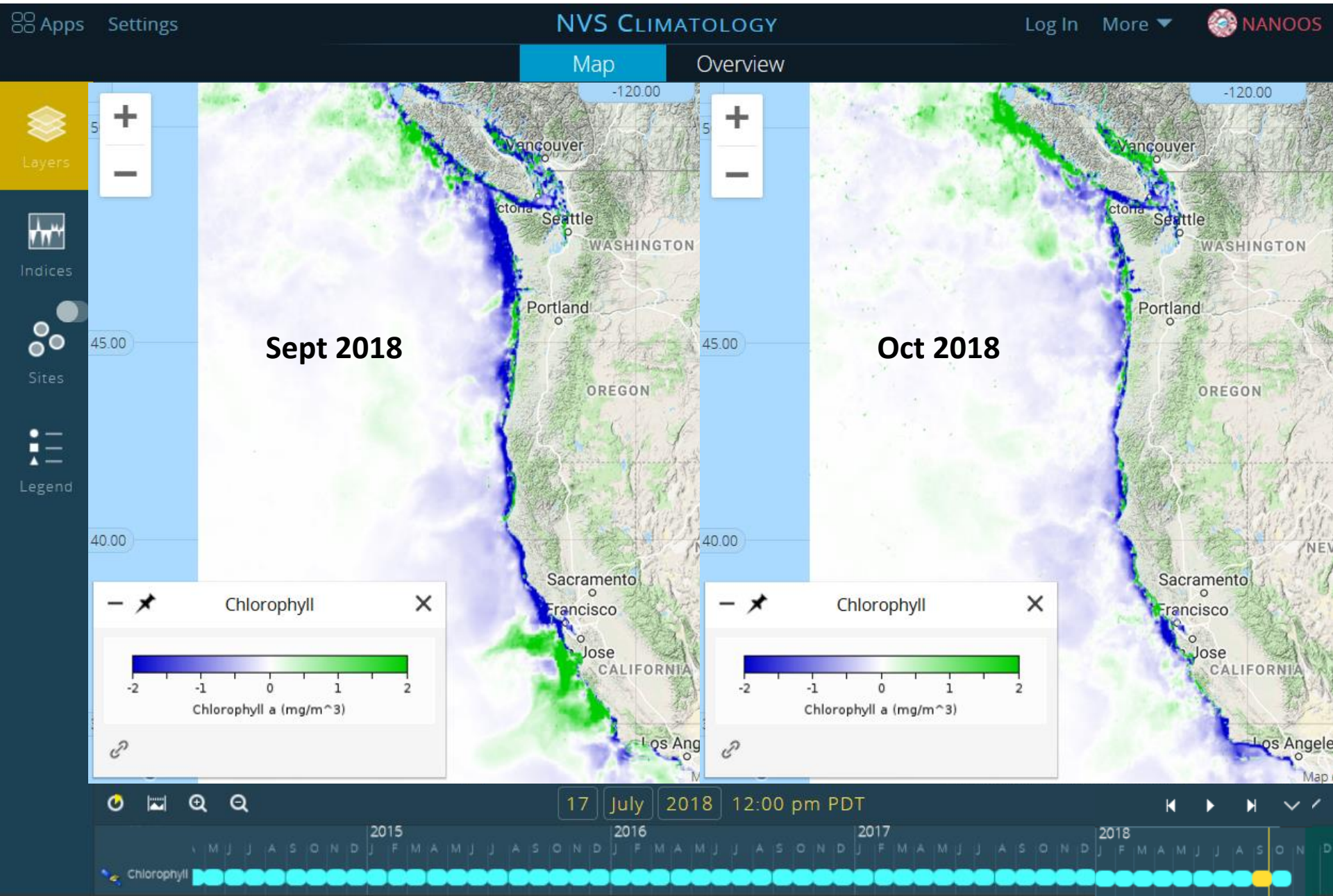
NDBC 46029, Columbia River, Or



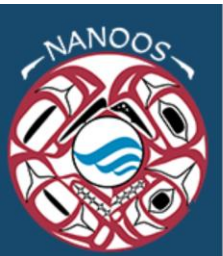
NDBC 46050, Stonewall Bank, Or



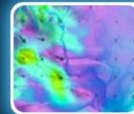
Chlorophyll Anomaly



LiveOcean forecast model



Welcome to NANOOS, the Northwest Association of Networked Ocean Observing Systems.



NANOOS Visualization System

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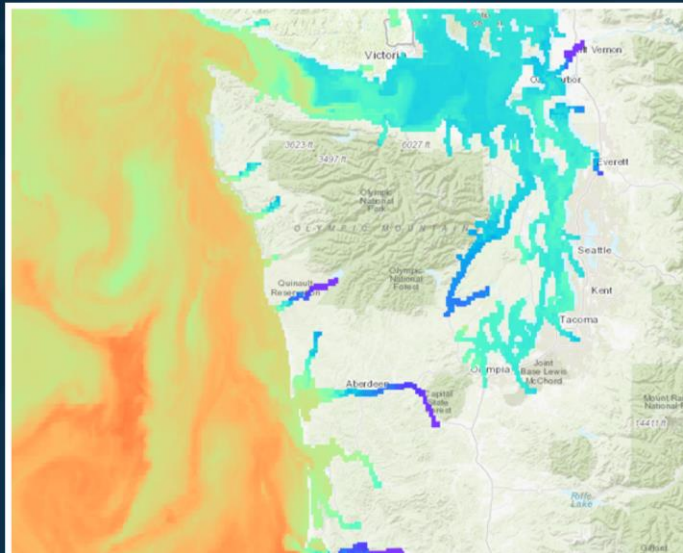
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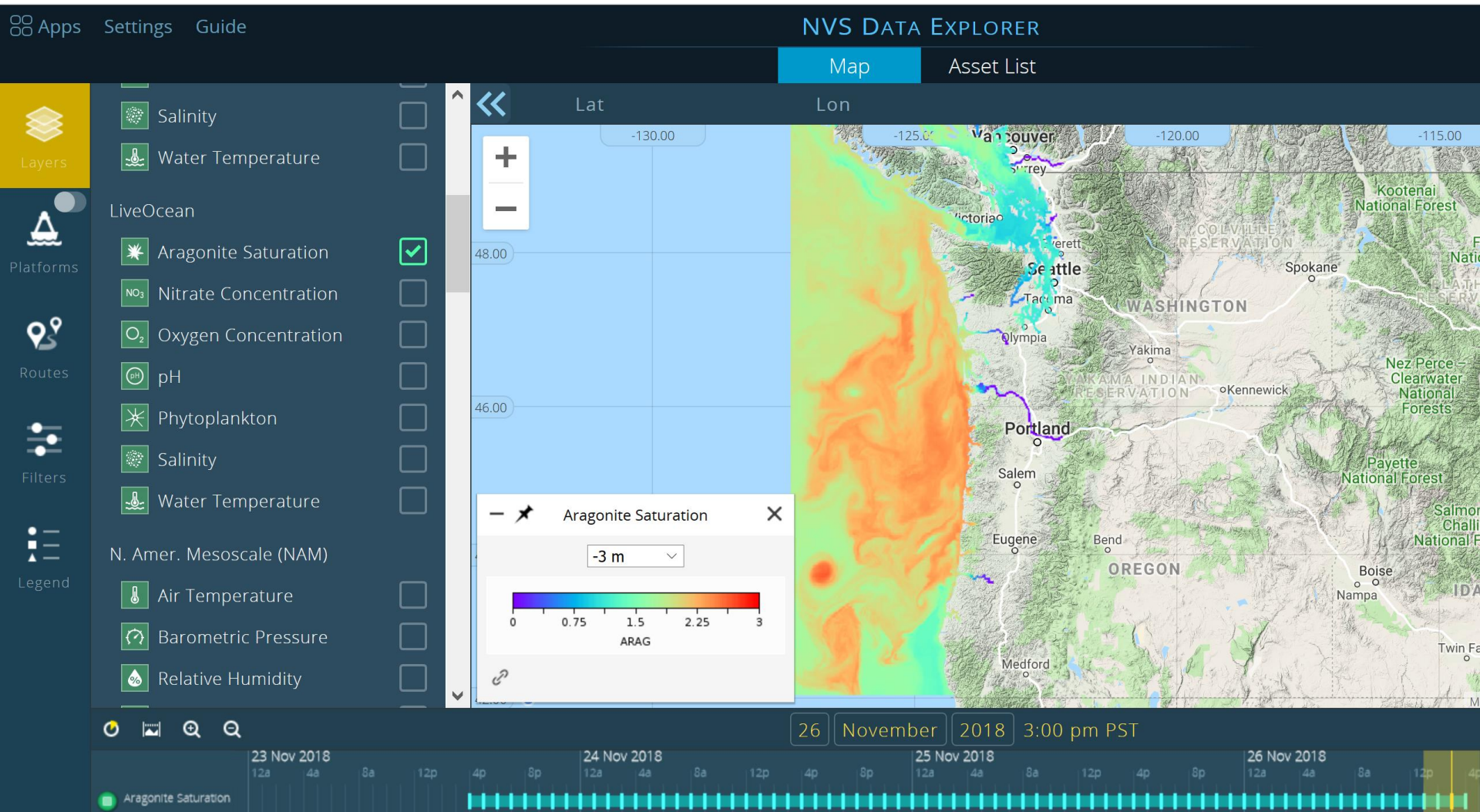
LiveOcean comes to the Salish Sea!

A new version of the UW Live Ocean model has been released! Alongside greater spatial resolution comes the coverage of the Salish Sea in the model's 3-day forecasts of variables like aragonite saturation state, oxygen, nutrients, and phytoplankton. Forecasts are available for many depths, including a bottom contour. See the LiveOcean homepage link below for more information and some great animations.

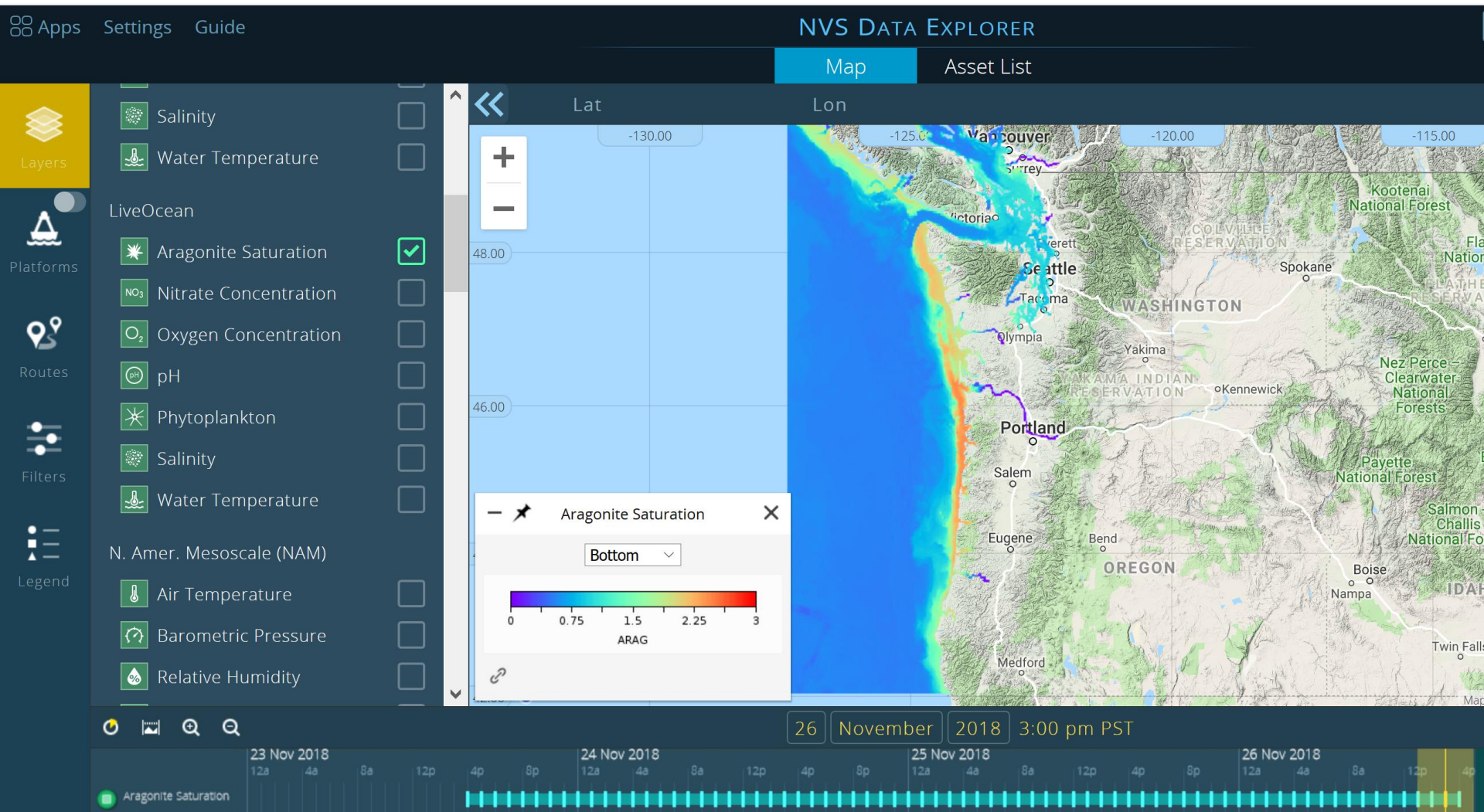
[NVS LiveOcean](#)

[LiveOcean Homepage](#)

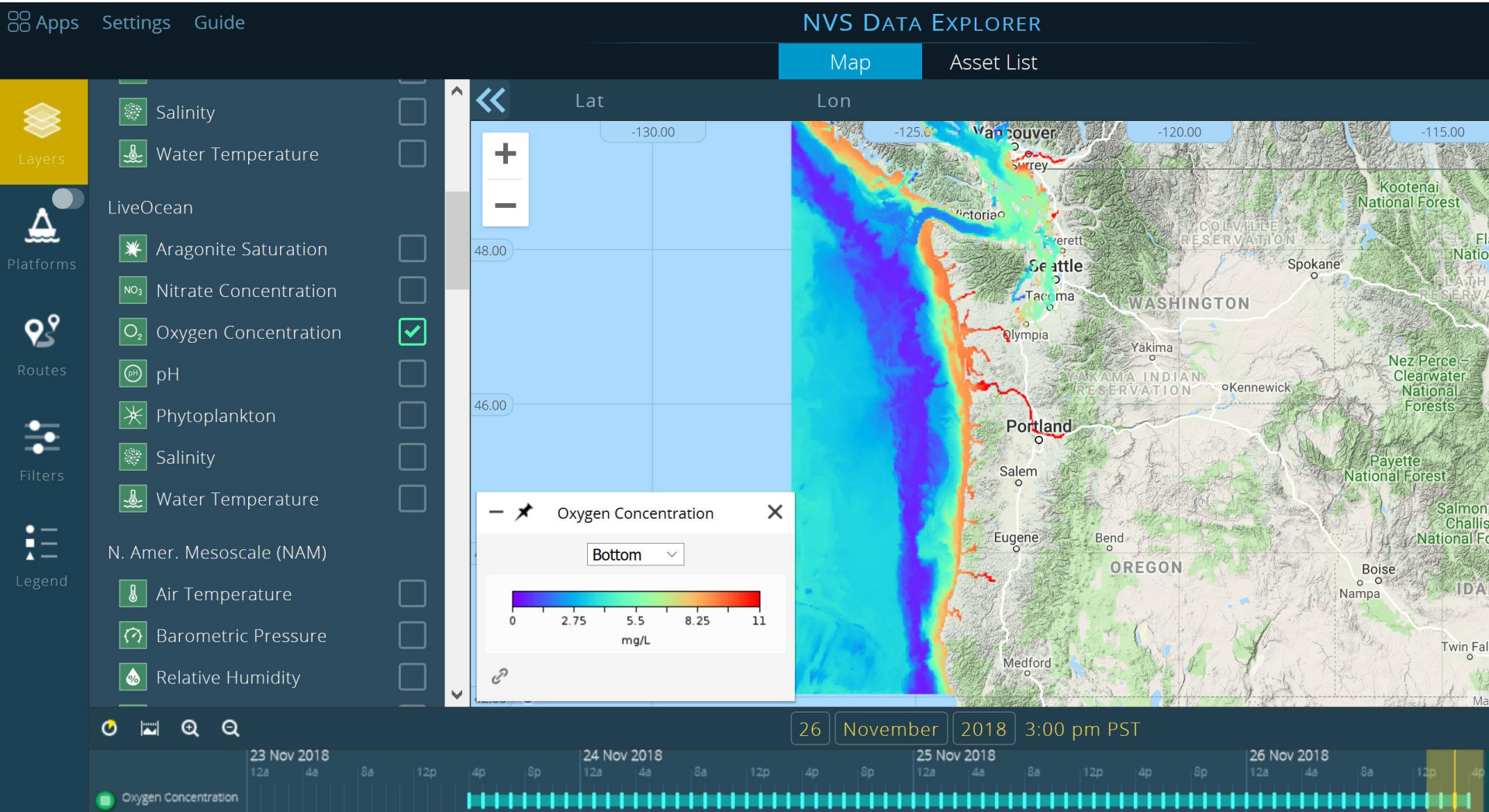
LiveOcean forecast model



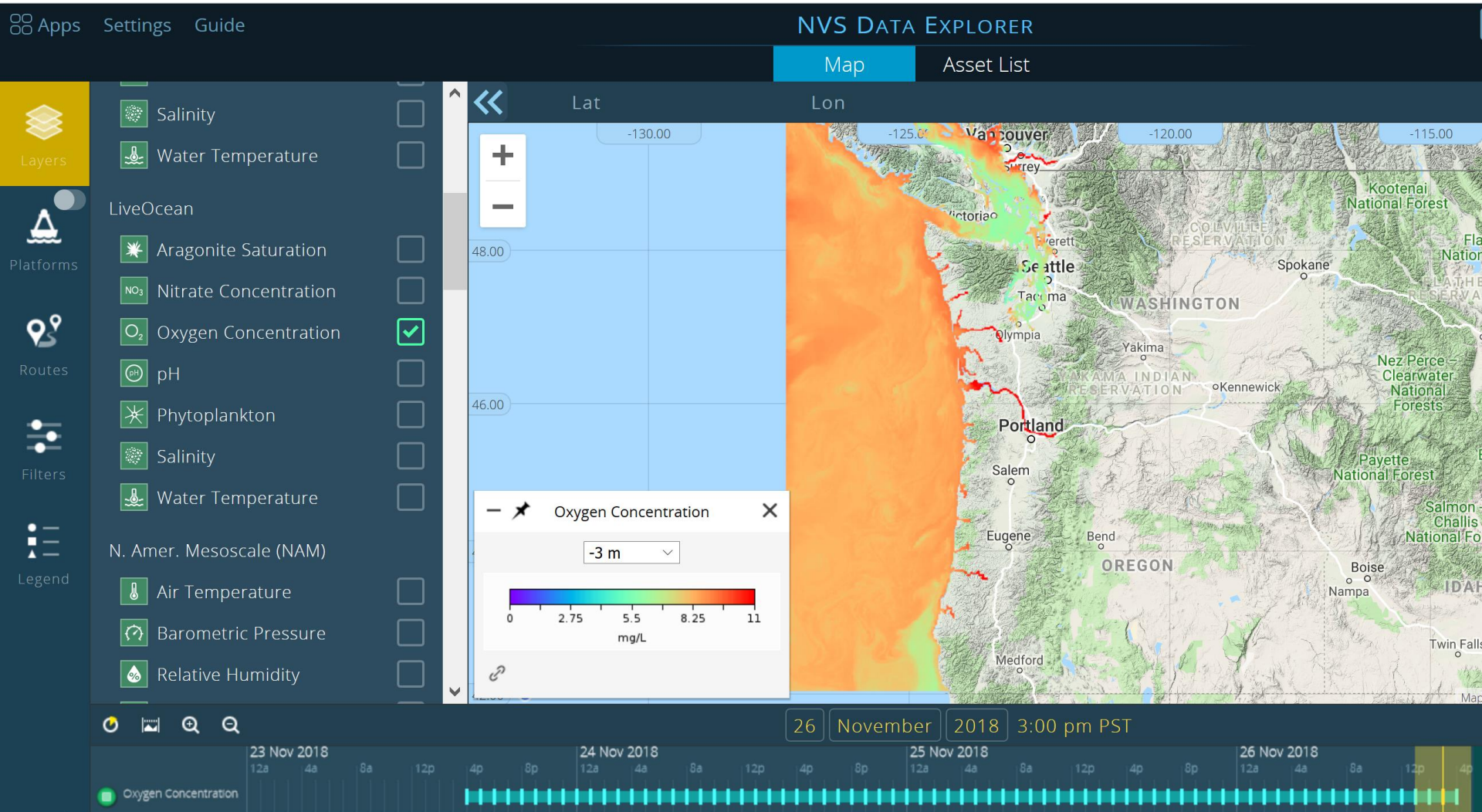
LiveOcean forecast model



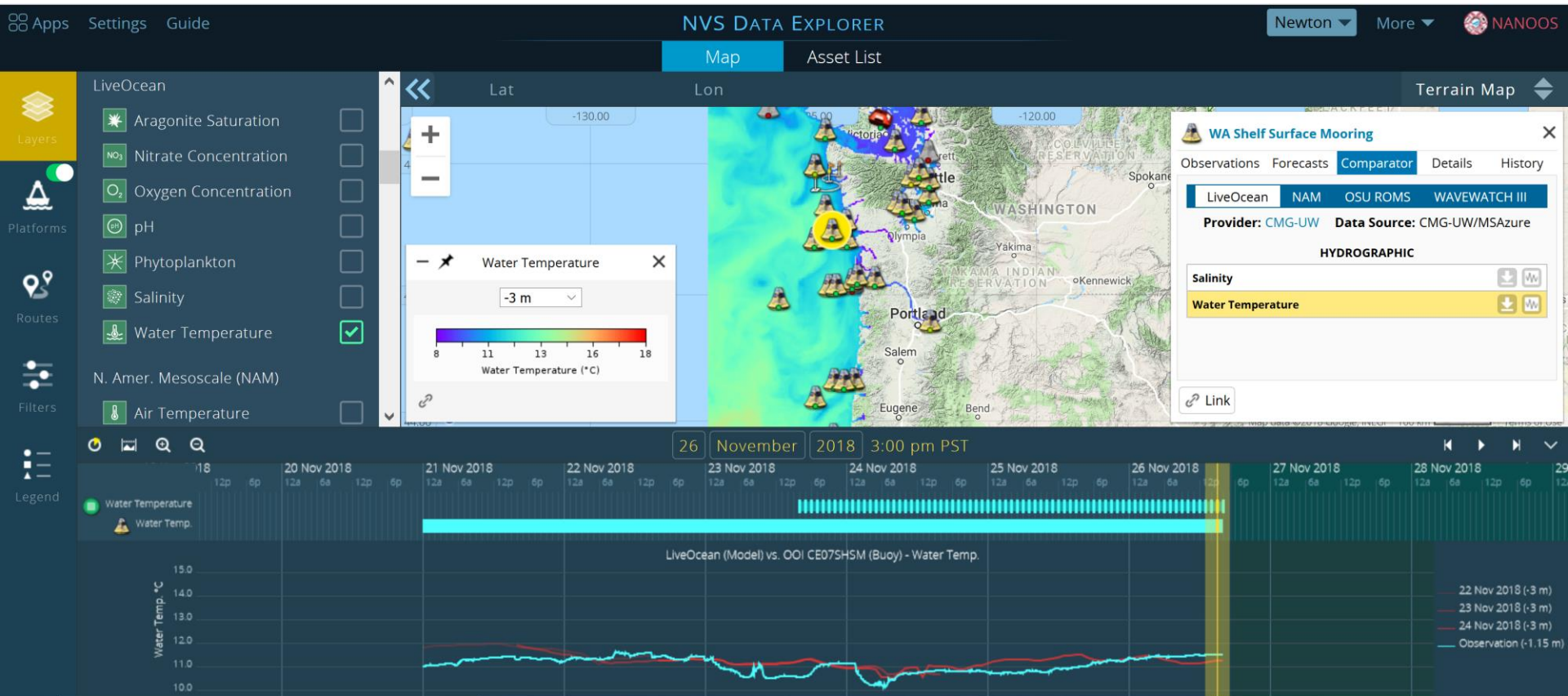
LiveOcean forecast model



LiveOcean forecast model



LiveOcean forecast model

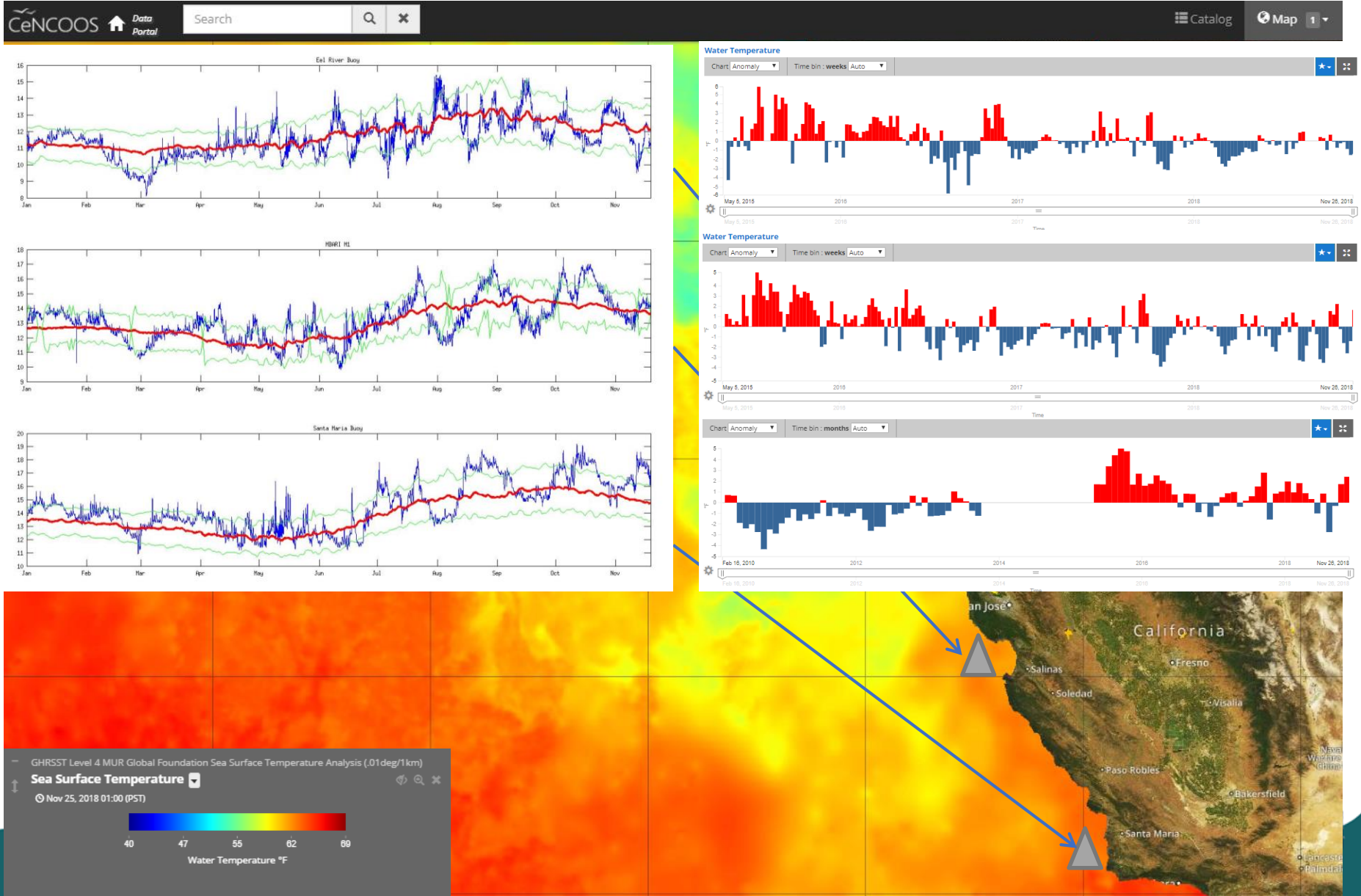




NOAA West Watch Update: Central & Northern California Update

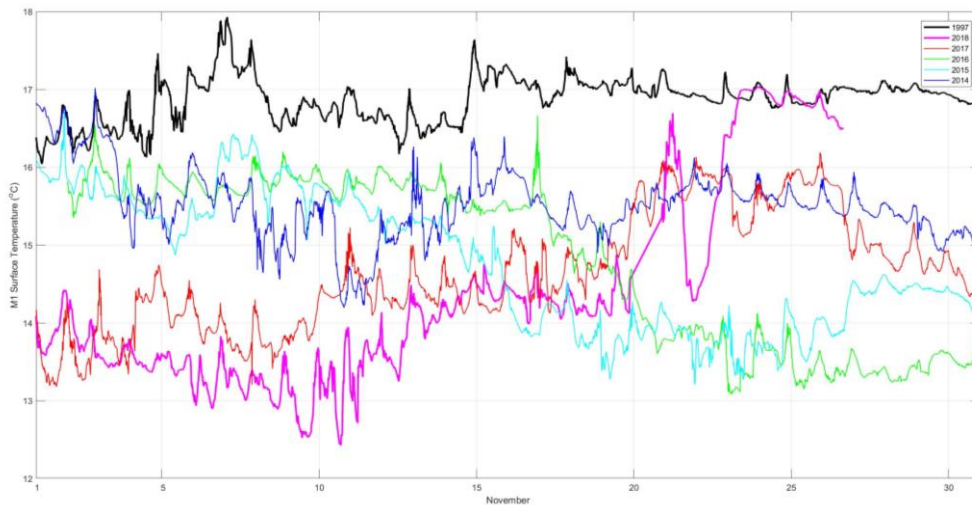
Presented by: Alex Harper, CeNCOOS Program Manager

CeNCOOS Climatology

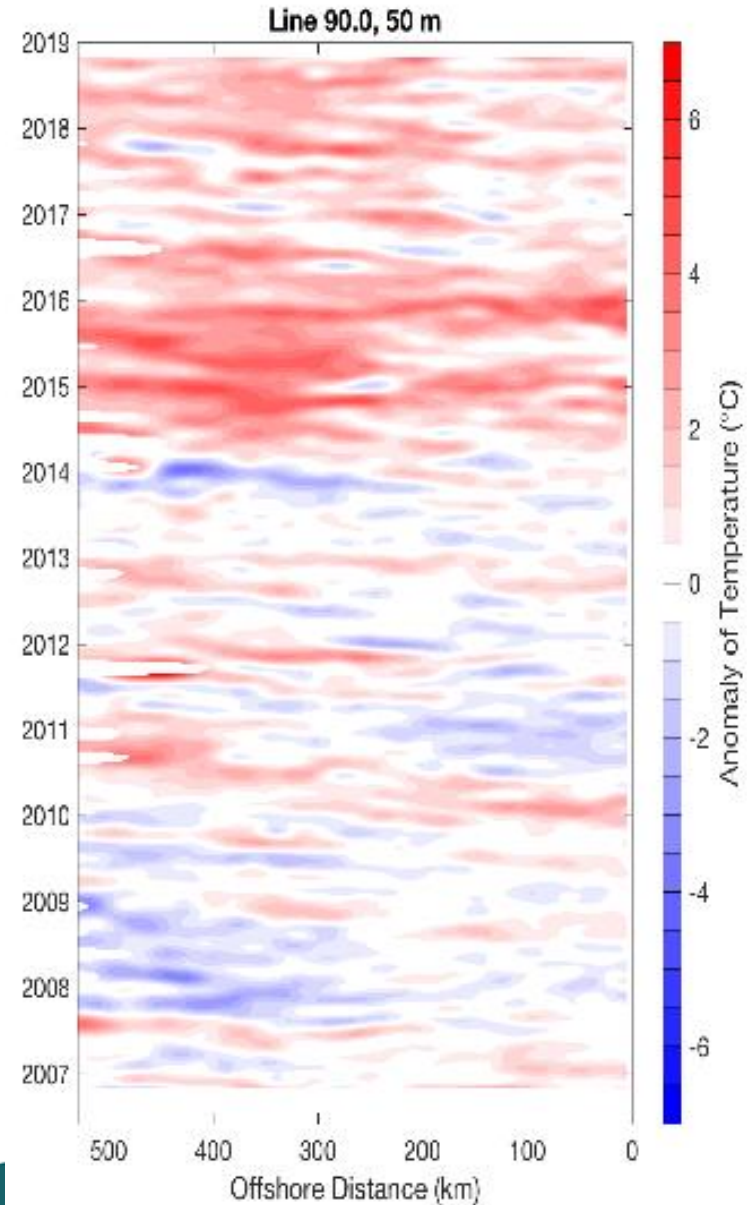
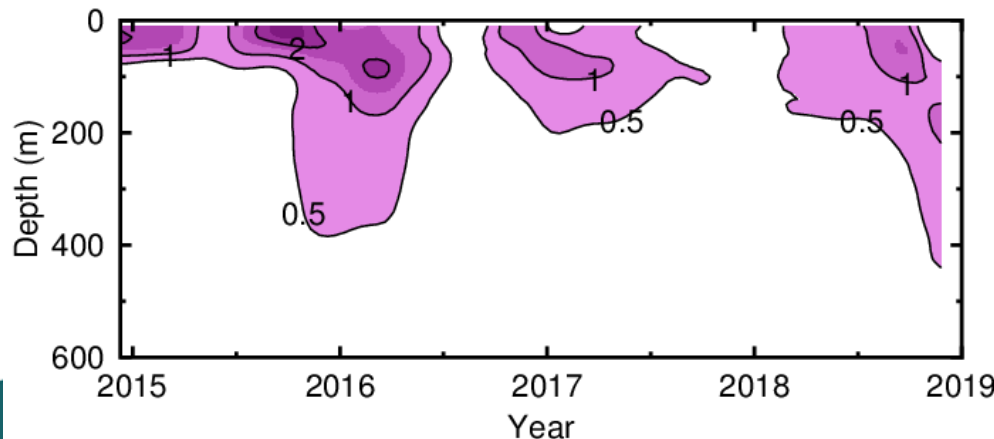


El Nino/Warm Anomaly Watch on the CA Coast

- Recent warming in Monterey Bay
- Trinidad Head temperature anomalies



Trinidad Head temperature anomaly averaged over inshore 200 km



California Camp Wildfire

- 100% contained within 153,336 acres
- Potential for mudslides with winter storms approaching

Large quantities of smoke from several destructive fires in California obscure the Pacific Ocean to the southwest of that state in the above 11 November 2018 Suomi-NPP/VIIRS composite.

COAMPS® Real-Time Forecasts for Central and Northern California
 in Support of the Central & Northern California Ocean Observing System (CeNCOOS)

Forecast Archive COAMPS Home

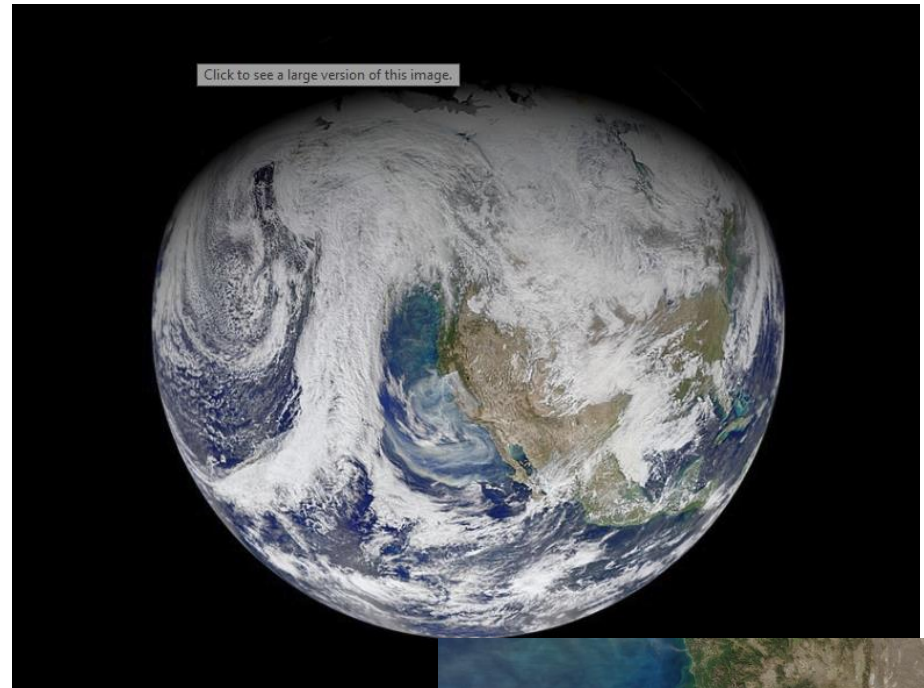
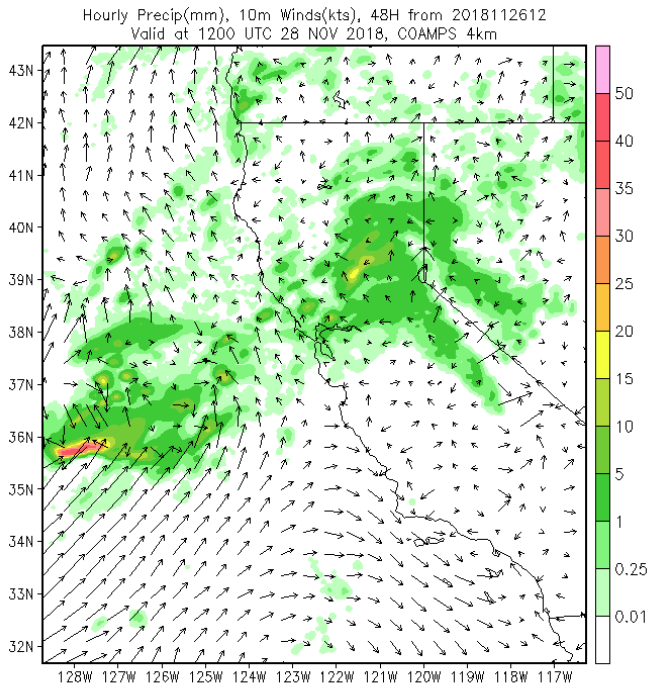
Surface 3D Fields Meteogram

Forecast starting at 2018112612
 Surface fields with hourly output

10mWinds&SLP Latent Sensible 2mTemp 2mRH Precip PrecipAC Cloud Top Cloud Base LWP

SFC Temp Winds(MRY) Winds(North) Winds(Central) Winds(South)

0h 3h 6h 9h 12h 15h 18h 21h 24h 27h 30h 33h 36h 39h 42h 45h 48h Loop



Dungeness Crab in California

- The Dungeness crab (*Metacarcinus magister*) season is open from **Nov 3, 2018** through **June 30, 2019** south of the Mendocino-Sonoma county border and through **July 30, 2019** north of the Mendocino-Sonoma county border.
- The opening of the commercial Dungeness crab fishery from Bodega Head, Sonoma County north to the Sonoma/Mendocino county line was delayed due to elevated levels of domoic acid.

California Dungeness Crab Fishing 2018-19 Best Practices Guide to Minimize Whale Entanglement Risk



The National Marine Fisheries Service (NMFS) has confirmed a significant increase in reports of large whale entanglements over the last few years, specifically in California Dungeness crab fishing gear. This situation threatens the stability of the fishery and coastal fishing communities. Shifts in fishing practices toward increased surface line and the use of multiple surface buoys have been observed. Review of documented entanglements show a potential connection between slack surface line and the number of trailer buoys contributing to whale entanglements. In response, a Working Group developed this Best Practices Guide to highlight voluntary actions believed to be an important step towards reducing the risk of whale entanglement in commercial and recreational fishing gear. New regulatory measures limiting gear at the surface are currently in place for the 2018-2019 California commercial Dungeness crab season.



UNDERSTANDING WHALE ENTANGLEMENTS OFF THE U.S. WEST COAST

400% increase of confirmed whale entanglements

Record increases in whale entanglements in recent years. Confirmed whale entanglements on the WA, OR, CA coast increased 400% to a historic high of 50 in 2015, from an average of 10 per year pre-2014.

While many entanglements in recent years have been reported in Central CA, we know at least some of these entanglements occurred elsewhere along the West Coast.

Changes in Ocean Conditions

- Persistent marine heat wave
- Massive bloom of toxic algae

Changes in Whales' Prey

- Lower krill abundance off shelf break
- Switch to low abundance anchovies nearshore
- Humpback whales seek other prey further north

Changes in Whale Presence & Abundance

- Recovering whale populations
- Humpback whales switched prey, found closer to shore

Changes in Dungeness Crab Fishery

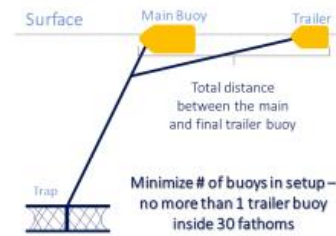
- Harmful algal bloom delayed opening of fishery in 2016
- More crab fishing gear when whale concentrations were high

Fishing Gear

Most of the whale entanglements are due to unknown types of fishing gear; of the fishing gear that we can identify, trap/pot fisheries are the primary source.

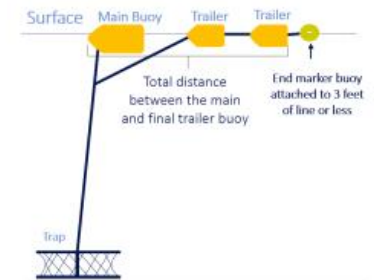
Gear from the commercial Dungeness crab fishery, the largest trap fishery off the West Coast, has the highest number of confirmed entanglement reports.

Buoy Setup: Best Practices (Recommended)



RECREATIONAL	Shortest as possible, max of 2 fathoms (12 ft) at any depth
Inside 30 fathoms	Shortest as possible, max of 3 fathoms (18 ft)
30 – 50 fathoms	Shortest as possible, max of 4 fathoms (24 ft)
Outside 50 fathoms	Shortest as possible, max of 5 fathoms (30 ft)

Buoy Setup: Regulations 2018-19 Dungeness Crab Season



RECREATIONAL	No Regulation
COMMERCIAL	
Inside 35 fathoms	Max of 4 fathoms (24 ft)
Outside 35 fathoms	Max of 6 fathoms (36 ft)

https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=150177&inline&fbclid=IwAR0_06YNYofCoo2O2uthcq_NRRoFb1ajQyO6rR8N8wnZF0kYpGEBG5yNDek



Thank you!

Email Alex Harper at aharper@mbari.org





U.S. West Coast Biological Observations Workshop

**NANOOS-CeNCOOS-SCCOOS
ATN-MBON-OTN**

**November 7-9, 2018
Hotel Paradox
Santa Cruz, California**

WORKSHOP OBJECTIVES

- Identify and prioritize stakeholder monitoring and observational needs in the West Coast Region
- Identify the existing observing assets and capabilities in the Region
- Document stakeholder specific uses of telemetry/biodiversity data
- Identify the infrastructure and data management challenges and opportunities that exist in this Region

WORKSHOP AGENDA

Day 1 (Weds. Nov 7, 2018)

7:30 - 8:30 Check-in, light breakfast

8:30 - 8:45 **Welcome, introductions, review objectives/agenda** – Henry Ruhl, Director, CeNCOOS & Bill Woodward, U.S. ATN Coordinator

8:45 - 9:15 **Overview of ATN, MBON and OTN Programs**

- **Animal Telemetry Network** – Bill Woodward, U.S. ATN Coordinator
- **Marine Biodiversity Observation Network** – Gabrielle Canonico, U.S. IOOS
- **Ocean Tracking Network** – Fred Whoriskey, Exec. Director OTN

9:15 - 10:15 **Session 1, RESEARCH SECTOR Moderator: Dan Costa**

- **Barbara Block** – Hopkins Marine Station, Stanford University
- **Bob Miller** – Marine Science Institute, UC Santa Barbara
- **Barb Lagerquist** – Marine Mammal Institute, Oregon State University

Group Discussion

10:15 - 10:30 Break

10:30 - 11:30 **Session 2, NATURAL RESOURCE/CONSERVATION MANAGEMENT SECTOR Moderator: Gabrielle Canonico**

- **Donna Schroeder** – BOEM Pacific Region Lead, Santa Barbara Channel
- **Andrew DeVogelaere** – Monterey Bay National Marine Sanctuary
- **Steve Weisberg** – Southern California Coastal Water Research Project

Group Discussion

11:30 - 12:30 **Session 3, COMMERCIAL/PRIVATE SECTOR Moderator: Henry Ruhl**

- **Justin Luedy** – Port of Long Beach
- **Pete Nelson** – H.T. Harvey & Associates
- **Nancy Black** – Monterey Bay Whale Watch

Group Discussion

Day 3 (Fri. Nov 9, 2018)

8:00 - 9:00 Breakfast

9:00 - 9:30 **U.S. IOOS Vision & Strategy for an Integrated Sustained Biological Observing System**

Carl Gouldman – Director, U.S. Integrated Ocean Observing System Program Office

9:30 - 10:30 **WEST COAST INTEGRATED OBSERVING SYSTEM: EXAMPLES, OPPORTUNITIES and VISIONS** Moderator: Woody Turner

- Pete Raimondi – MARINE, UC Santa Cruz
- Ralf Goericke – CalCOFI-SIO Supervisor, IOD/Scripps Institution of Oceanography
- Joshua Brown – Western & Pacific Regional Program Coordinator at NOAA Sea Grant
- Bill Douros – National Marine Sanctuaries West Coast Region Director

Group Discussion

10:30 - 10:45 Break

10:45 - 11:30 **PLENARY DISCUSSION** – Vision for a U.S. West Coast Biological Observing Network

11:30 - 12:00 **WRAP UP/NEXT STEPS**

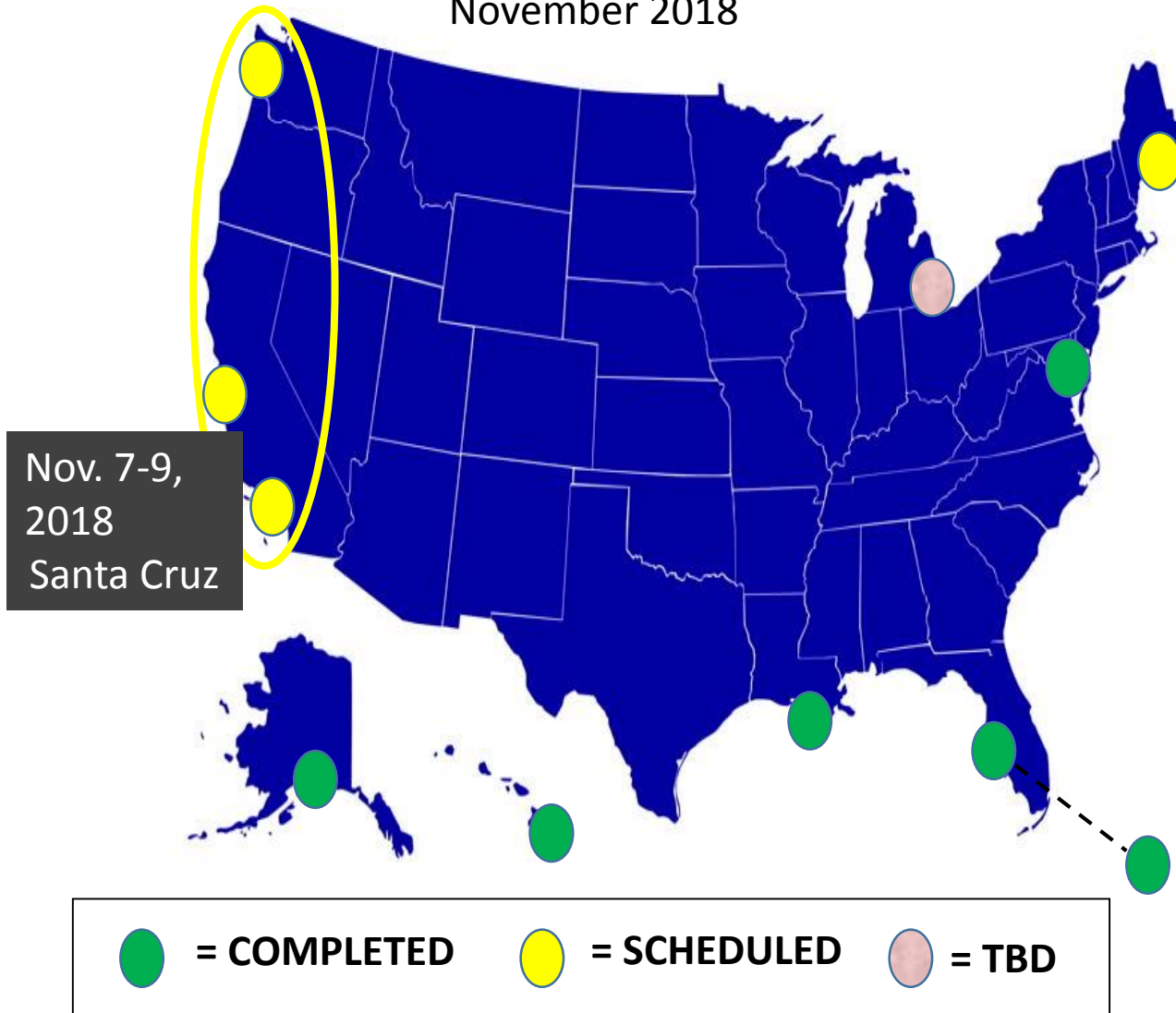
12:00 **WORKSHOP CLOSES. Lunch provided.**

<https://www.cencoos.org/about/events/2018/atn-mbon-otn-biological-observation-workshop>

WORKSHOPS TO ID PRIORITY ANIMAL TELEMETRY OBS AND ASSETS

Status

November 2018



ATN GOAL

To maximize the benefits from the considerable amount of Marine Animal Telemetry Infrastructure and Expertise that exists in the U.S. but that currently is limited in its coordination and connectivity

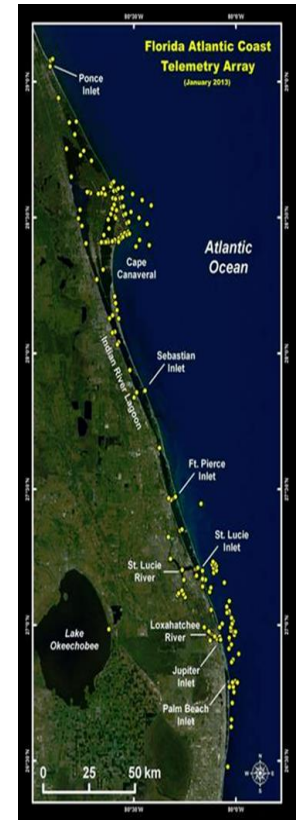
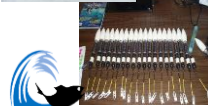
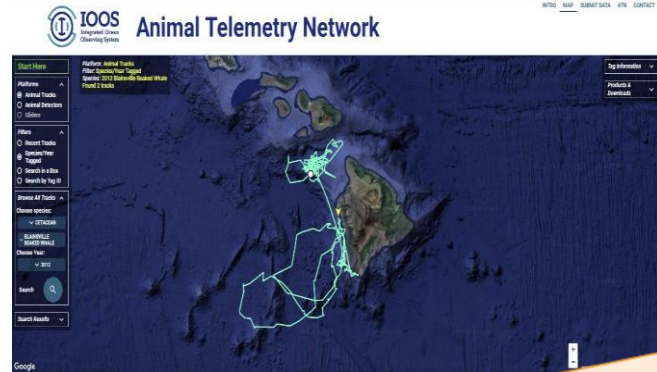
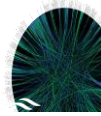


Image: Marine CSI

THREE ATN COMPONENTS

- ✓ BUILD ALLIANCES AND COLLABORATIONS
- ✓ PROVIDE TELEMETRY DATA MANAGEMENT & DELIVERY WITH AN OPERATIONAL DAC
- ✓ SUPPORT STAKEHOLDER REQ'D BASELINE ANIMAL TELEMETRY OBSERVATIONS



"Help to keep existing efforts going and to add to them as needed and defined through our Workshops and our ATN Steering Group"



OCEAN TRACKING NETWORK

Headquartered at Dalhousie University, Canada

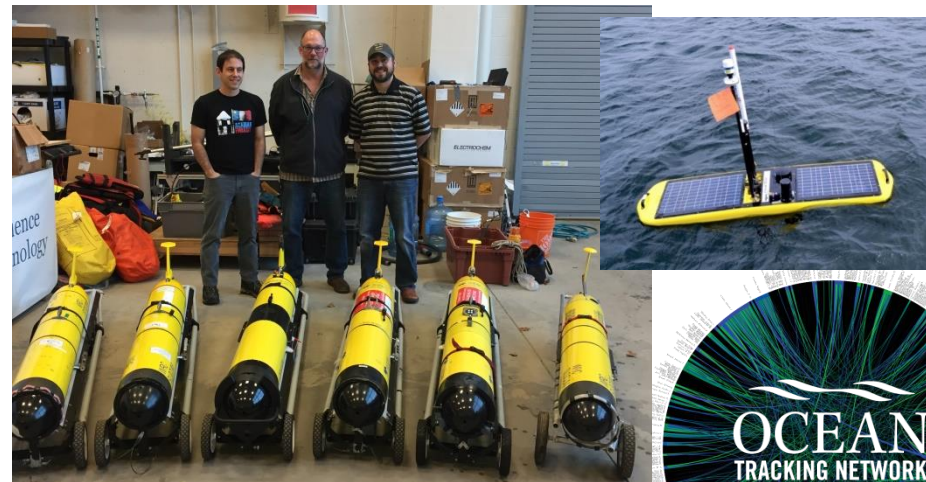
The Ocean Tracking Network: Global infrastructure and research network for aquatic animal research

Fred Whoriskey
Executive Director, Ocean Tracking Network



OTN infrastructure and data system

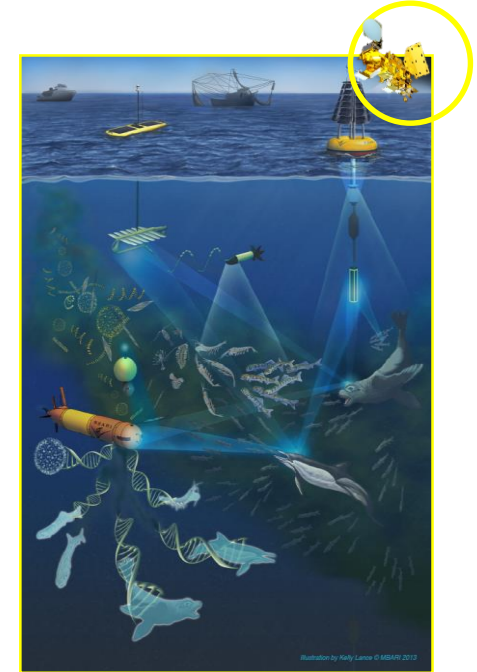
- Global acoustic telemetry infrastructure
- World class glider and data teams
- Associate Data Unit of the IOC's IODE, and Tier 2 OBIS node



Marine Biodiversity Observation Network (MBON)

MBON is:

A long-term, multi-sector (federal, academic, NGO, etc.) network to observe marine life and ecosystem interactions – how those are changing and how that affects us.



Courtesy: MBARI



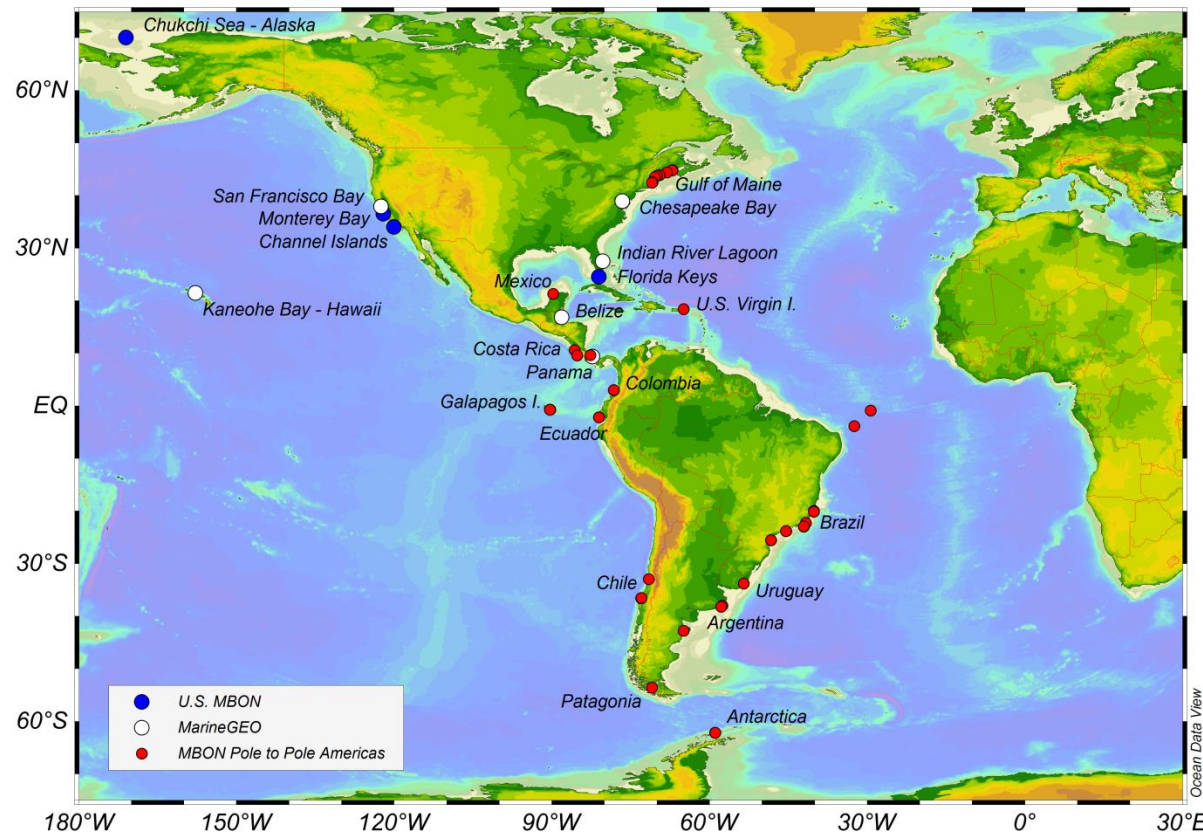
MBON Core Activities



- Integrate existing monitoring, fill gaps
- Integrate remote sensing with *in situ* observations
- Advance new approaches (Seascapes, eDNA, imagery)
- Share protocols and data
- Meet user needs

US MBON Demonstrations

- 2014 initial demos: Santa Barbara Channel; Arctic; Sanctuaries (Florida Keys, Flower Garden Banks, Monterey Bay)
- ~17M: NASA, NOAA, BOEM, NSF, Shell Oil
- US IOOS full-time leadership
- USGS, Smithsonian/MarineGEO partnership
- Global contributions



- Building communities through alliances and collaborations
- Supporting baseline observations
- Advancing data management and delivery
- Meeting user and stakeholder needs
 - Research
 - Resource management and conservation
 - Federal/state/tribal agencies
 - Commercial and private sector (eg energy, recreation, health)
 - Public outreach and education

Integrated Bio Obs - Visioning

- Together we can advance “IOOS Biology”
- Need both regional and national leadership & commitment
- Understanding regional needs and capabilities for animal telemetry and biodiversity information is key
- West Coast well position to lead nationally and even globally

Next steps:

- Establish a steering committee (completed)
- Develop a west coast “vision” and framework for a biological observing network
- Organize additional, targeted workshops as needed

**** ATN SEAL OF APPROVAL ****



THANK YOU !

Call Agenda



- Project Recap & Updates (Dan McEvoy)
- Regional Climate and ENSO brief (Dan McEvoy)
- Guest speaker: Dr. Nina Oakley, *California post-fire debris flow hazards heading into winter 2018/2019*
- IOOS Nearshore Conditions brief (Jan Newton, Alex Harper)
- **Discussion - Environmental conditions and impacts reporting (All)**
 - **Additional impacts to share?**
 - **Future guest speaker or thematic issue of interest?**

California Wildfires



Photo: Noah Berger/AP



Photo: Kathleen Ronayne/AP

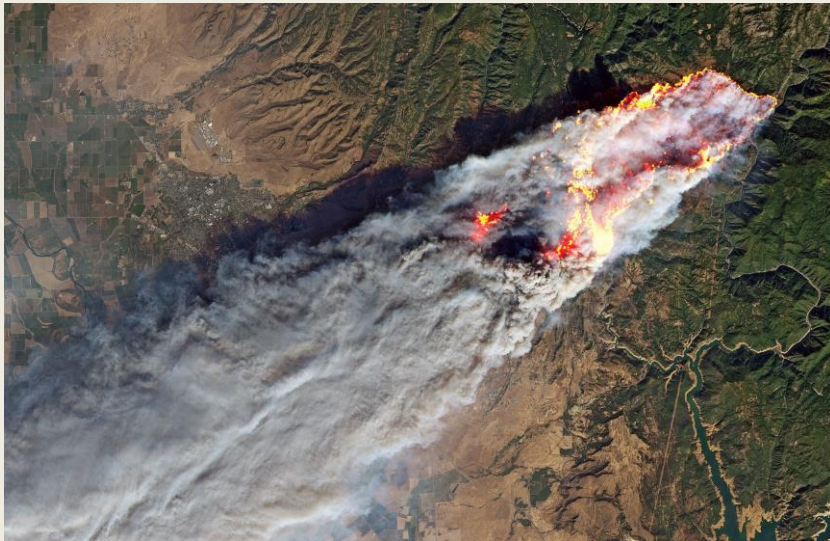


Photo: USGS, Processing by Pierre Markuse

Other environmental impacts from fires?

Other non-fire impacts to report from the group?

Reminder: NOAA West Watch Survey



- Survey closes THIS FRIDAY, November 30
- PLEASE complete if you haven't done so already

Call Agenda



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- Discussion - Environmental conditions and impacts reporting (All)
 - Additional impacts to share?
 - Future guest speaker or thematic issue of interest?
- **Next webinar: Tuesday, January 22nd**

THANK YOU!