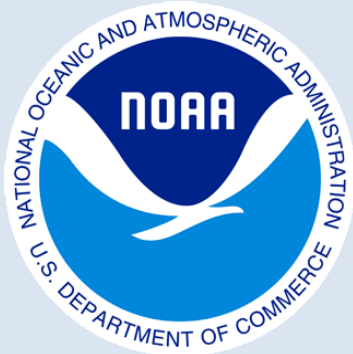


# NOAA Climate Science & Services

## Monthly Climate Update



**Ahira Sánchez-Lugo**

Climatologist, NOAA National Centers for  
Environmental Information

**Nick Nauslar, Ph.D.**

Fire weather forecaster, NOAA/NWS  
Storm Prediction Center

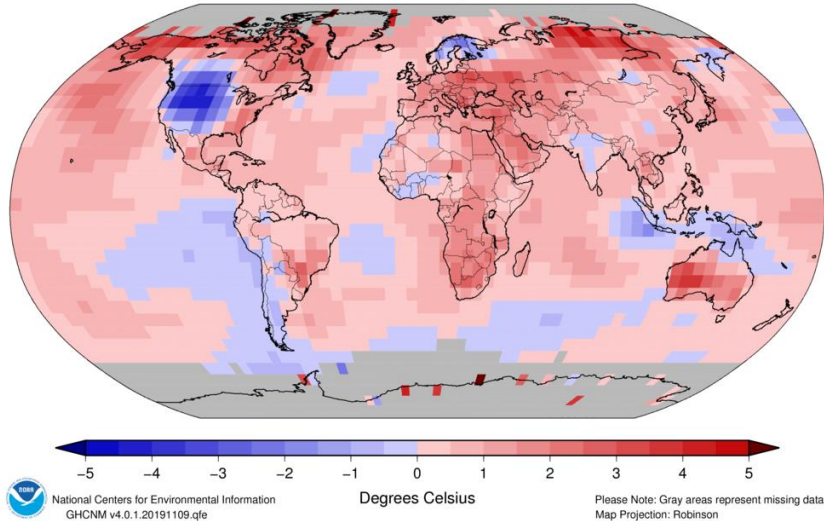
**Stephen Baxter**

Meteorologist, NOAA Climate Prediction Center

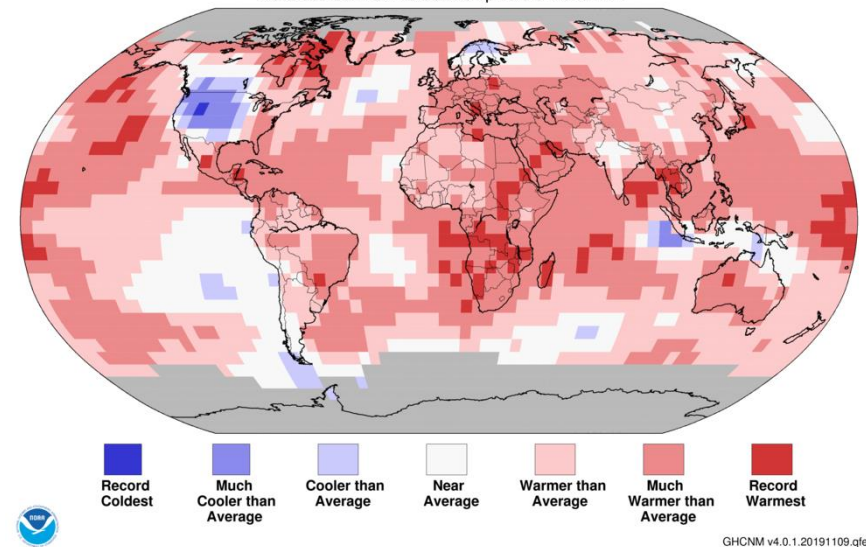
# Global Temperature October 2019

The global temperature record dates back to 1880 (140 years)

Land & Ocean Temperature Departure from Average Oct 2019  
(with respect to a 1981–2010 base period)  
Data Source: NOAA GlobalTemp v5.0.0–20191111



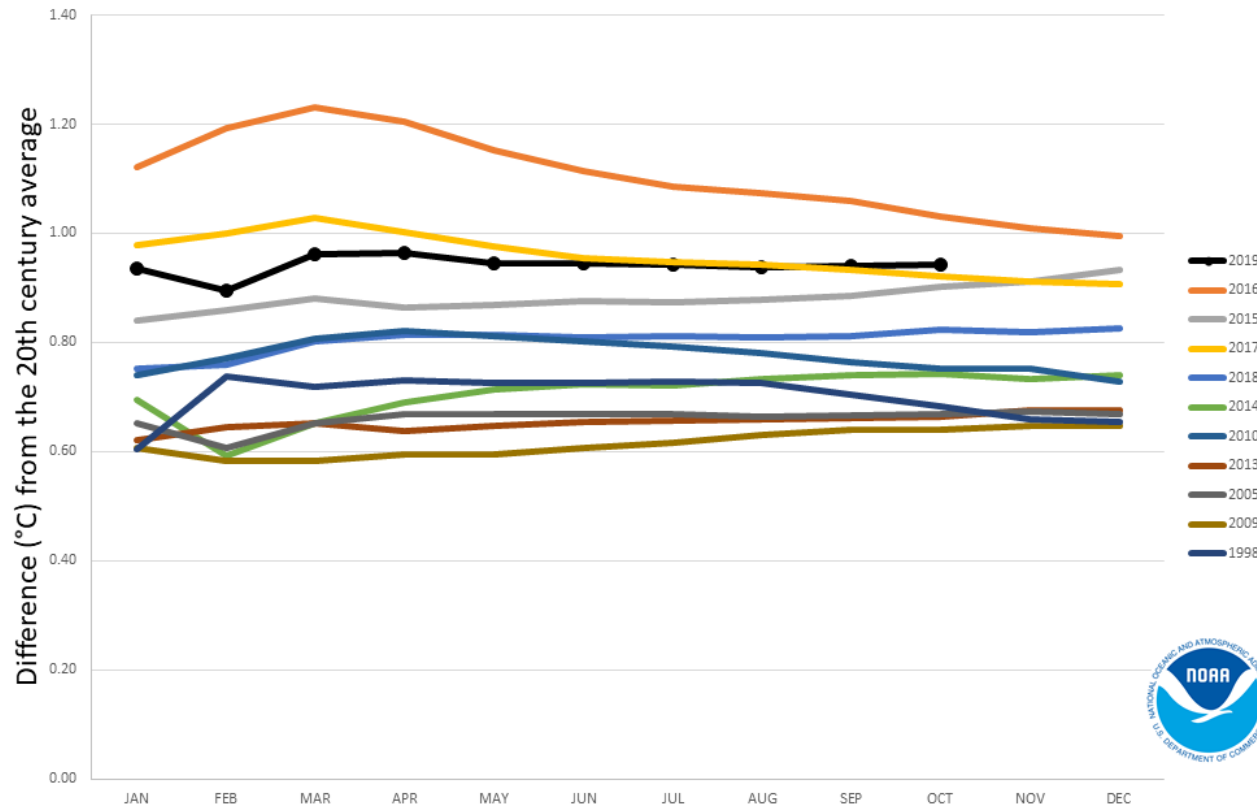
Land & Ocean Temperature Percentiles Oct 2019  
NOAA's National Centers for Environmental Information  
Data Source: NOAA GlobalTemp v5.0.0–20191111



- **Global Land & Ocean:**  $+0.98^{\circ}\text{C}$  /  $+1.76^{\circ}\text{F}$ ; 2<sup>nd</sup> warmest Oct on record, behind 2015.
- **Global Land:**  $+1.46^{\circ}\text{C}$  /  $+2.63^{\circ}\text{F}$ ; 2<sup>nd</sup> warmest Oct on record.
- **Global Ocean:**  $+0.80^{\circ}\text{C}$  /  $+1.44^{\circ}\text{F}$ ; 2<sup>nd</sup> warmest Oct on record.
- **NH Land & Ocean:**  $+1.21^{\circ}\text{C}$  /  $+2.18^{\circ}\text{F}$ ; Tied with 2015 as the warmest Oct on record.
- **SH Land & Ocean:**  $+0.74^{\circ}\text{C}$  /  $+1.33^{\circ}\text{F}$ ; 3<sup>rd</sup> warmest Oct on record, falling behind 2015 and 2018.
- **Regions:** Europe, Africa, Oceania, the Caribbean and Hawaiian regions had an October temperature departure that ranked among the top 3 warmest Oct on record.

# Global Temperature Jan-Oct 2019

## Year-to-Date Global Temperatures for 2019 and the ten warmest years on record



- Virtually certain (>99.9%) 2019 will end among the 5 warmest years on record.
  - ~ 85% chance of 2<sup>nd</sup> warmest
  - ~ 15% chance of 3<sup>rd</sup> warmest
- 95% confidence interval of 2<sup>nd</sup> to 3<sup>rd</sup> warmest year on record.



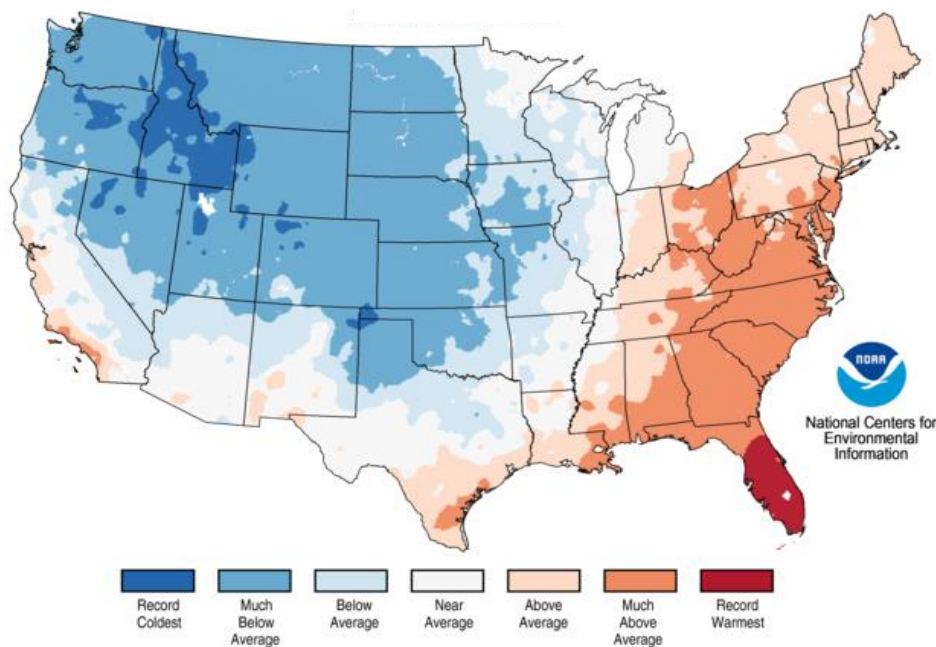
# Contiguous U.S. October 2019

**Temperature:** 52.3°F or 1.8°F below average, coldest Oct since 2009

**Precipitation:** 3.14" or 0.98" above average; 8th wettest Oct on record

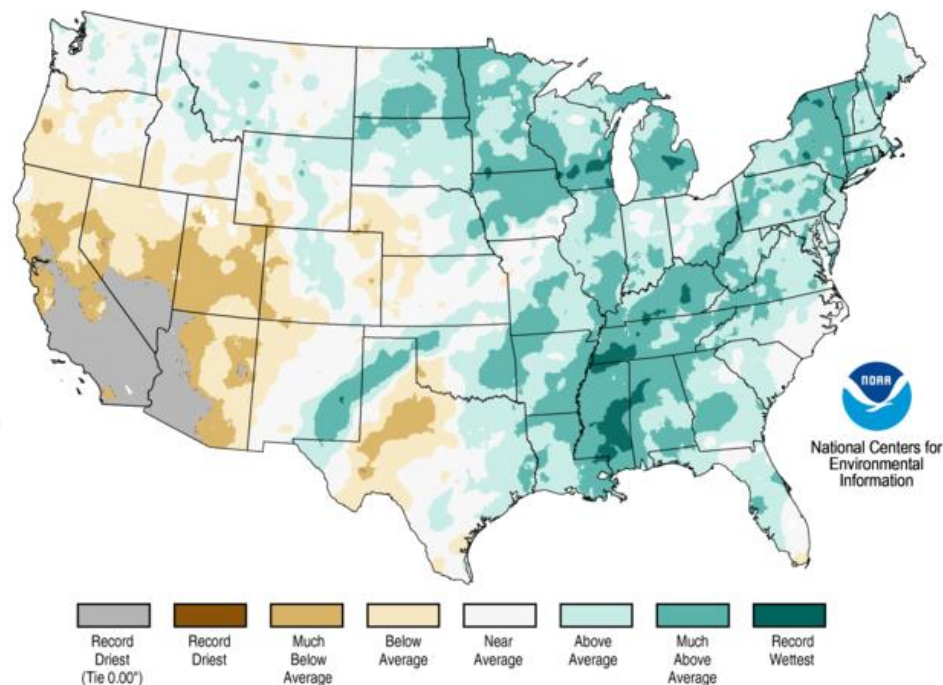
Temperature Percentiles October 2019

Period: 1895-2019 (125 years)



Precipitation Percentiles October 2019

Period: 1895-2019 (125 years)



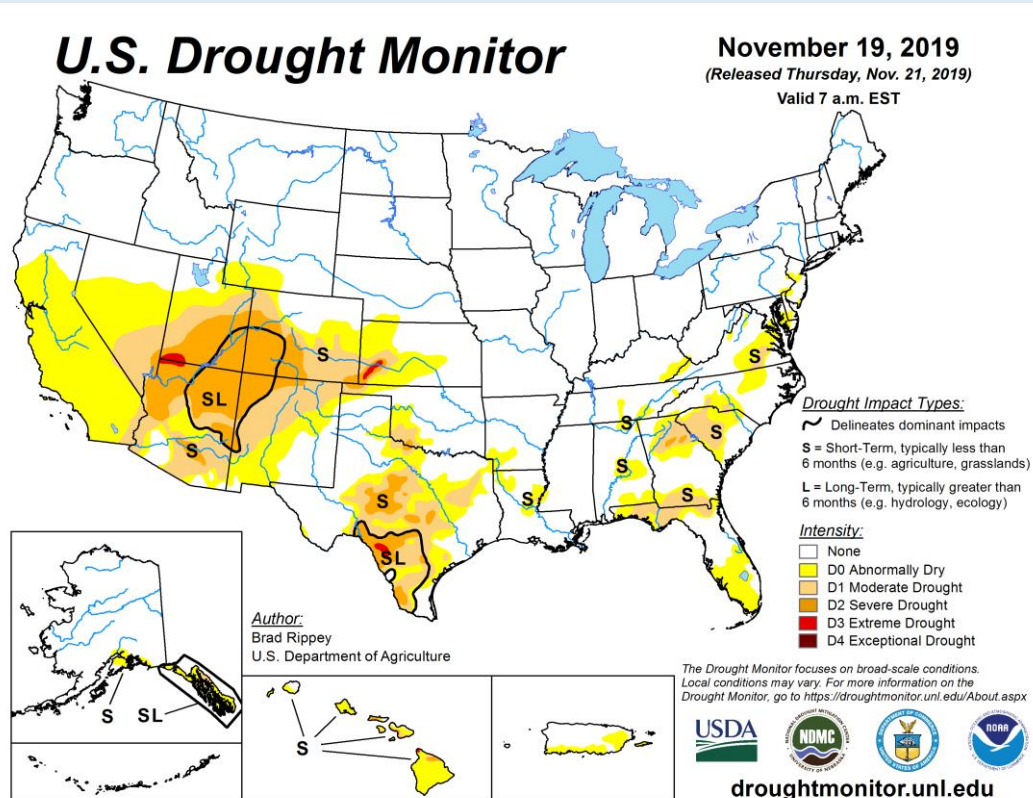
- 12 states had an October temperature that ranked among the eight coldest Octobers on record.
- Idaho had a record cold Oct temperature.
- WA, UT, and WY had their 2<sup>nd</sup> coldest October on record.

- Much of the eastern half of the contiguous U.S. had above-average precipitation. Mississippi had its wettest Oct.
- Below-average conditions were present across the West. Arizona and California had their 8<sup>th</sup> & 10<sup>th</sup> driest Oct, respectively.

# Current U.S. Drought

14.4% of Contiguous U.S. in Drought

↓ 6.6 percentage points since late Oct



- **Improvement:** Southern Plains, the Southeast, and mid-Atlantic region
- **Degradation:** Parts of the Southwest and southern Rockies
- **Outside CONUS:** Drought expanded in Hawaii, while conditions improved slightly across southern PR and Alaska.

Kincadee Fire, Sonoma County, California, USA - October 27th, 2019 - Enhanced natural colors with IR overlay - Contains modified Copernicus Sentinel data [2019], processed by Pierre Markuse

# October California Fires

Nick Nauslar, Ph.D.

Matt Elliott

NOAA/NWS/NCEP Storm Prediction Center

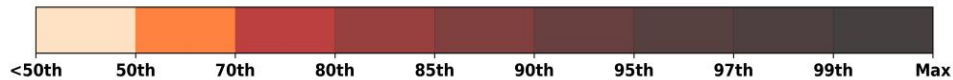
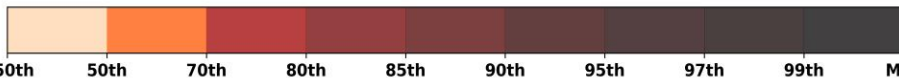
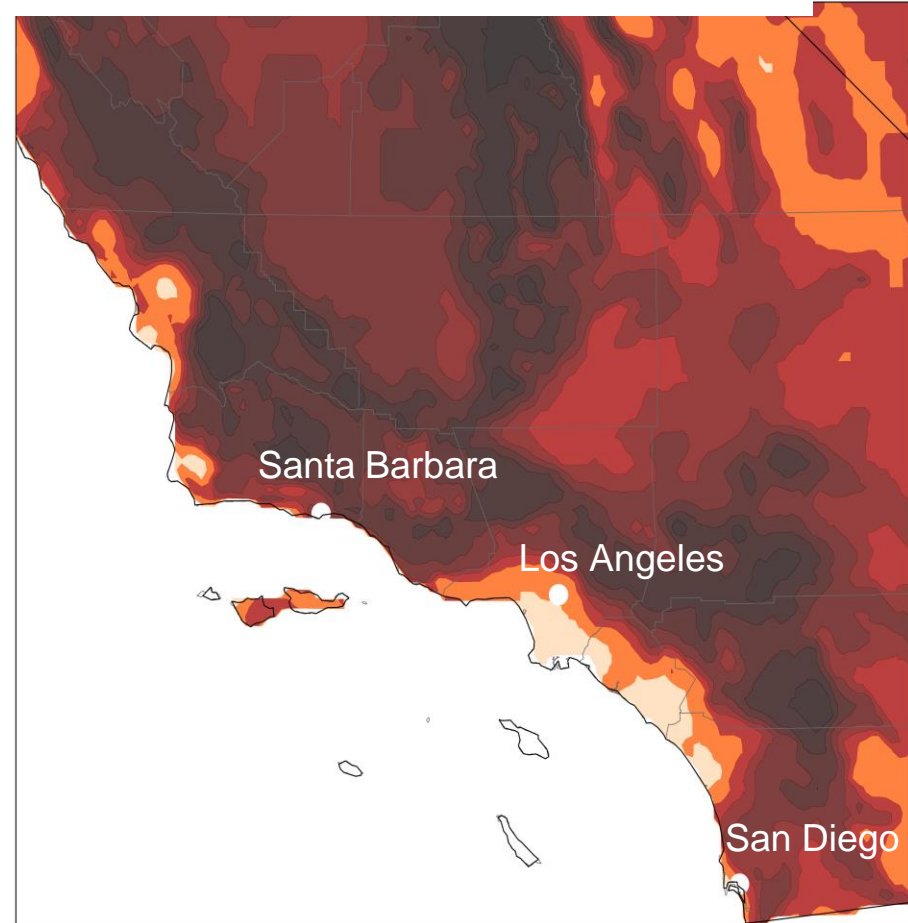
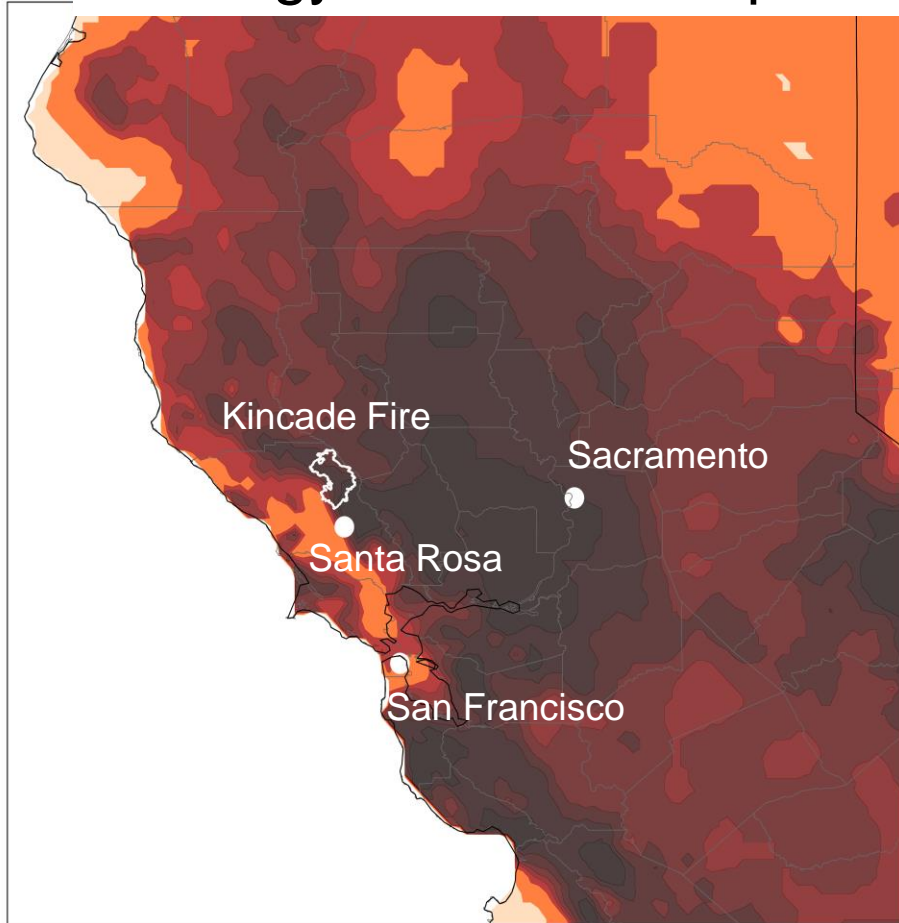


# Factors at play

- Record dry fuels
  - Delayed cool season precipitation
- Record fire weather conditions
  - Similar conditions in northern California October 2017 (North Bay Fires)
- Climatology
  - Fuels tend to be driest across much of California right before cool season precipitation arrives
  - Also tend to have weather conditions conducive for offshore flow

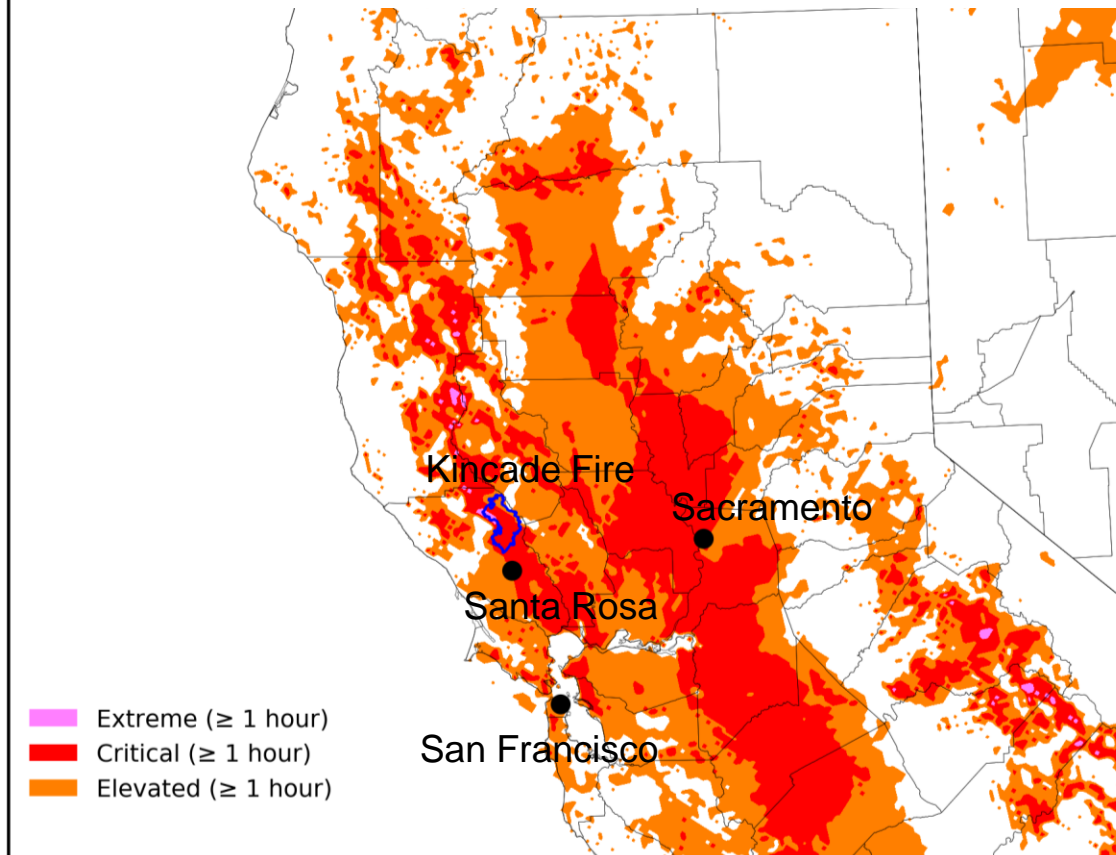
# Record Dry Fuels in California

## Energy Release Component Percentiles on October 28



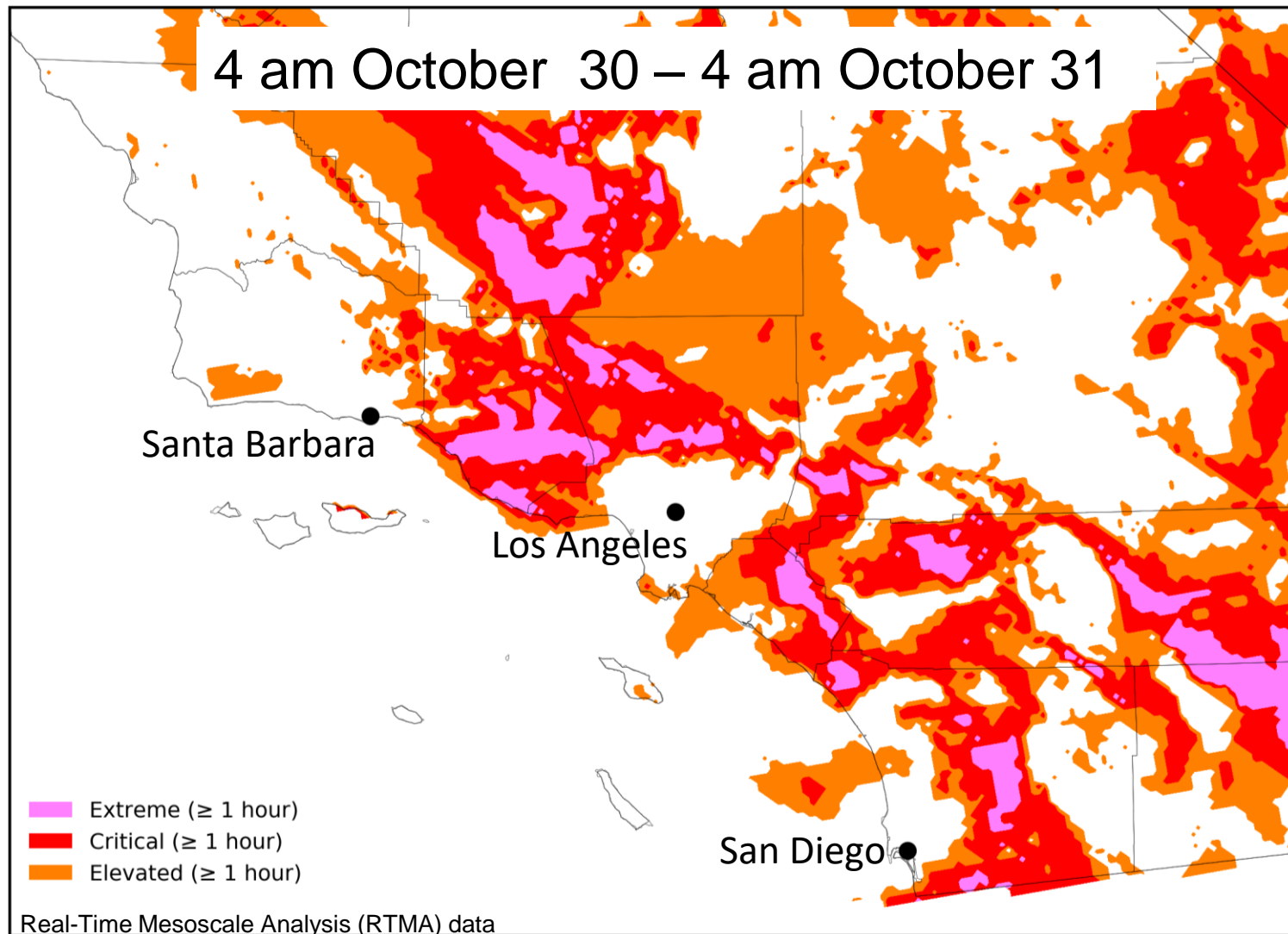
# Extreme Fire Weather Conditions

4 am October 27 – 4 am October 28



Real-Time Mesoscale Analysis (RTMA) data

# Extreme Fire Weather Conditions



# Climatology

- Fuel dryness peaks in August/September across much of California
- Delayed cool season precipitation continues drying trend
- Offshore winds more prevalent Fall – Spring
- Weather pattern that delays precipitation (eastern Pacific/West Coast Ridge) also usually conducive to offshore winds
  - “Inside sliders” and surface high pressure in interior western US

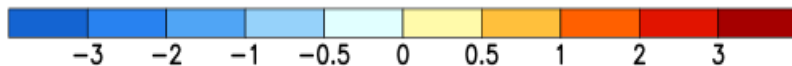
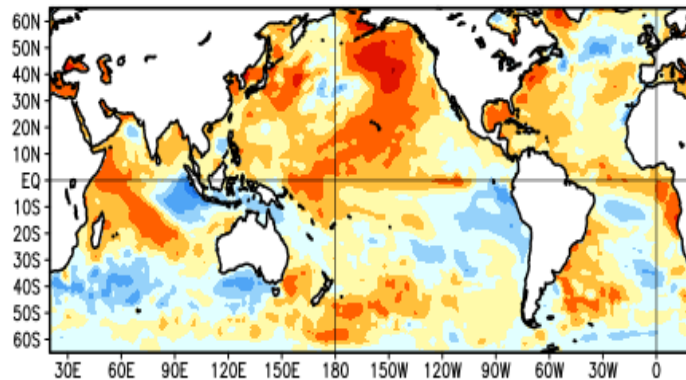
# Results and Impacts

- Kincade Fire burned 77,758 acres north of Santa Rosa, CA
- Multiple large, high profile fires in southern California (e.g., Getty, Easy, Tick, Maria Fires)
- Millions of people without power and hundreds of thousands evacuated
- “Extreme” Red Flag Warning issued by NWS Oxnard
- Extremely critical areas issued by Storm Prediction Center 7 of 8 days in California (October 24– 31)



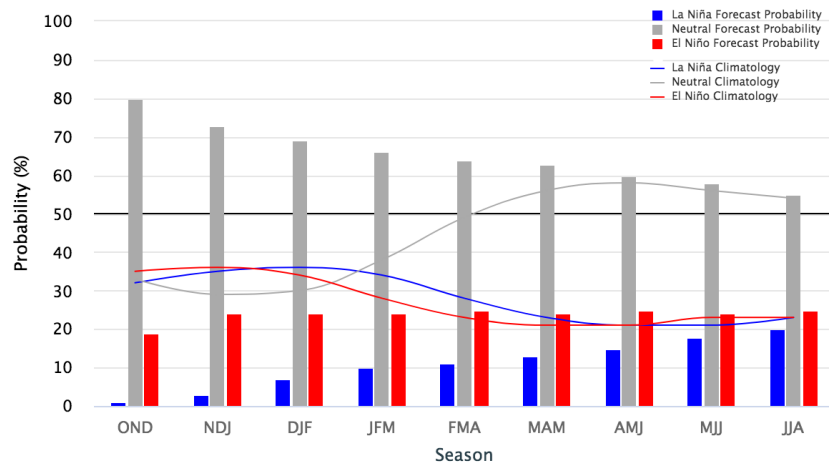
# Sea Surface Temperatures & ENSO

Average SST Anomalies  
20 OCT 2019 – 16 NOV 2019



Early–November 2019 CPC/IRI Official Probabilistic ENSO Forecasts

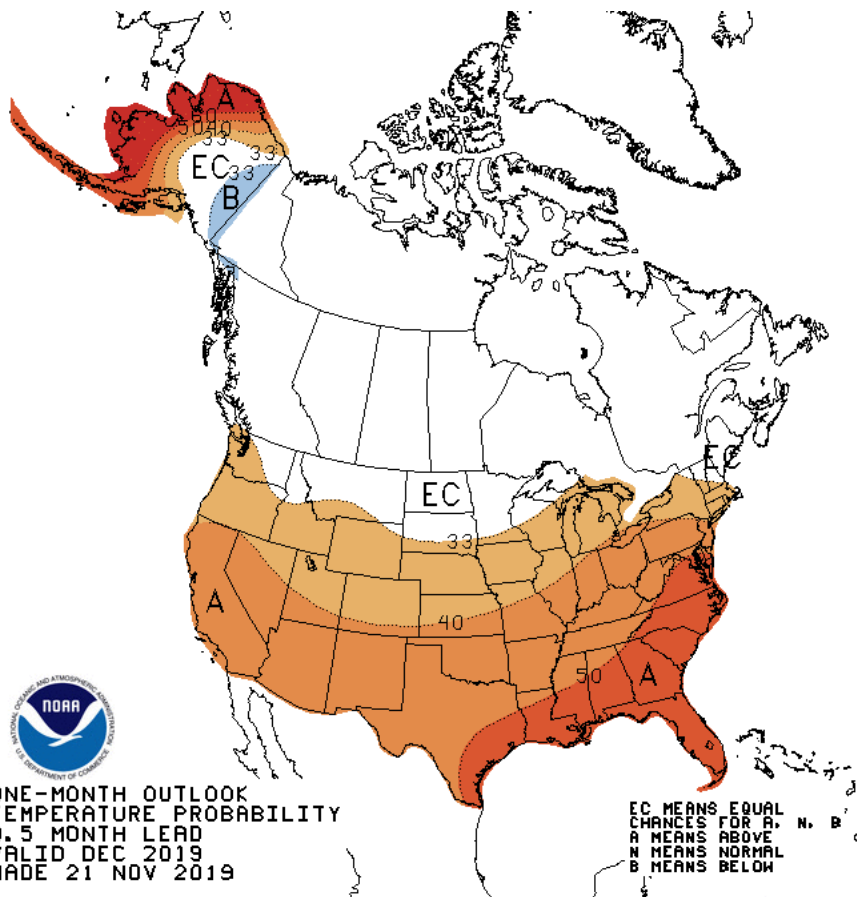
ENSO state based on NINO3.4 SST Anomaly  
Neutral ENSO:  $-0.5^{\circ}\text{C}$  to  $0.5^{\circ}\text{C}$



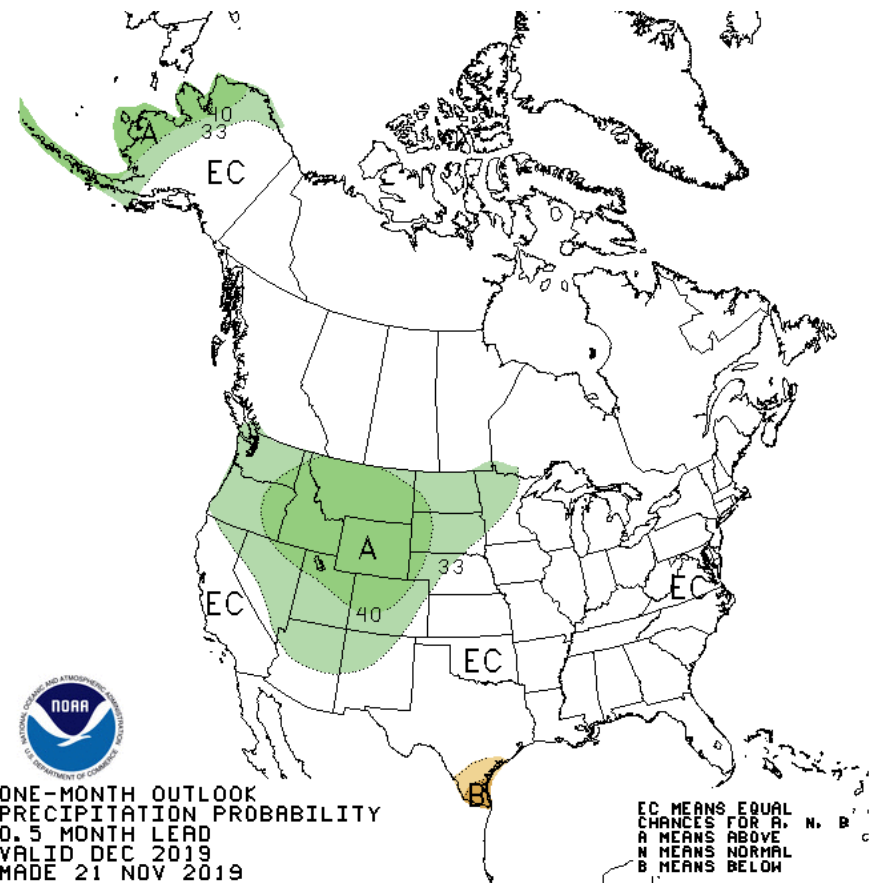
- Sea surface temperatures
  - Above normal SSTs over much of the equatorial Pacific
  - Above normal SSTs extend from Northeast Pacific southwestward
  - Strong Indian Ocean Dipole (IOD) signal is observed
  - ENSO neutral conditions are present
- ENSO forecast
  - ENSO neutral is likely to persist through summer 2020

# Monthly Forecast (December)

## December Average Temperature Probability

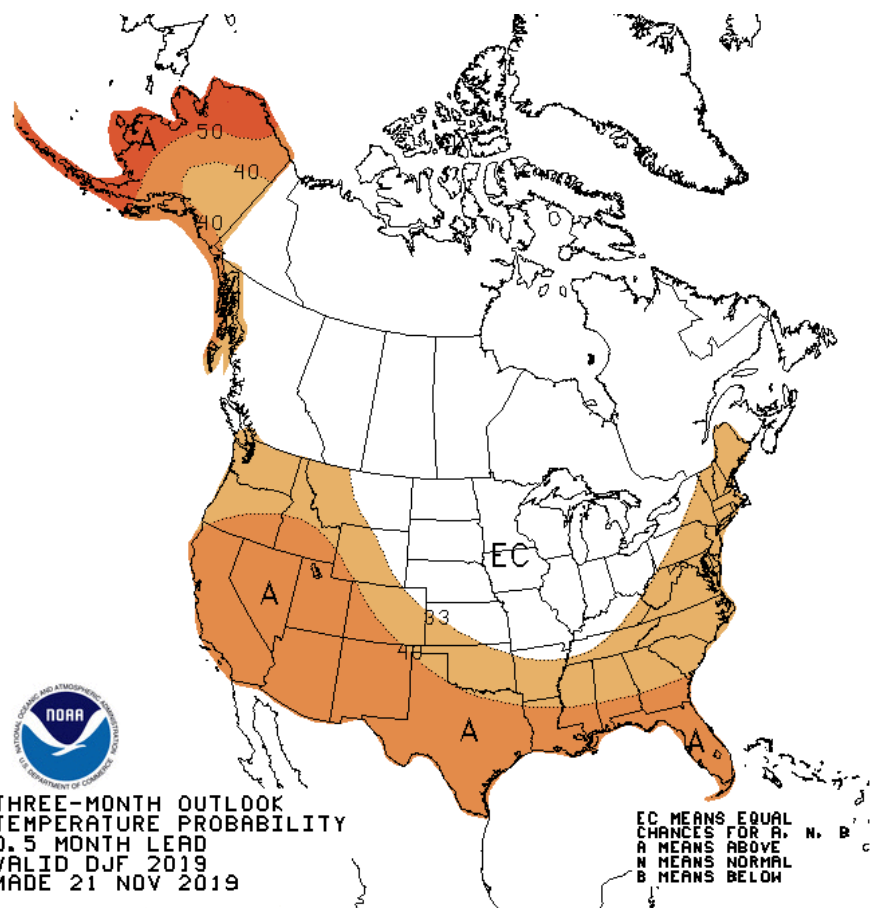


## December Total Precipitation Probability

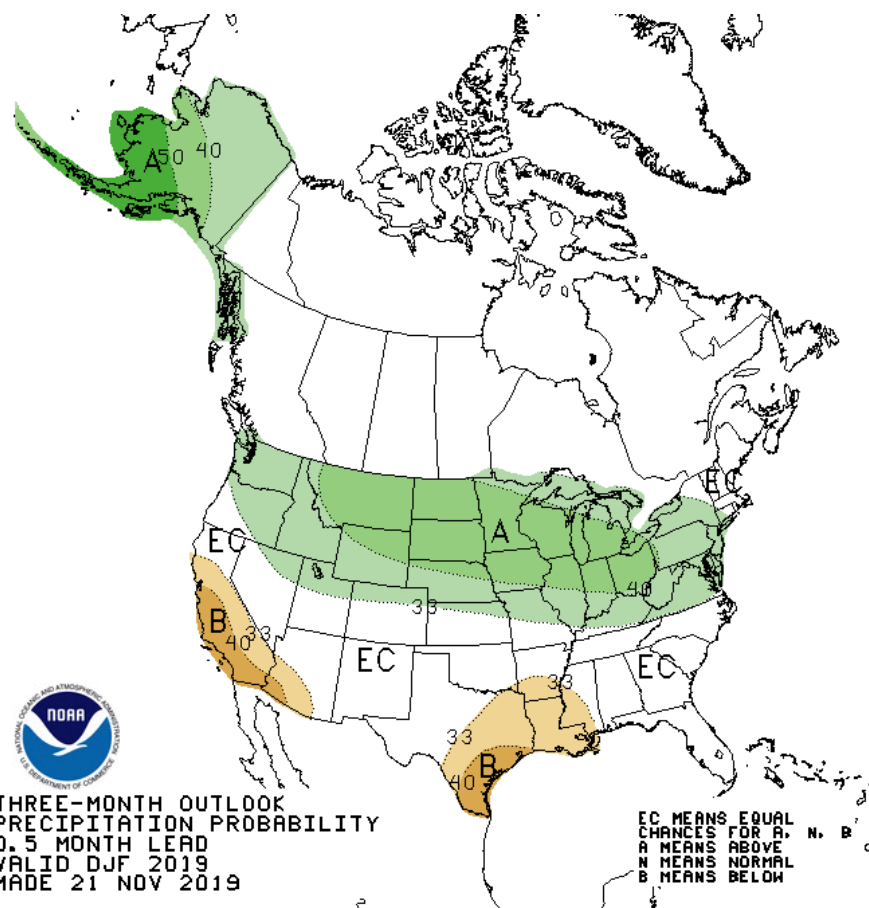


# Seasonal Forecast (Dec.-Jan.-Feb.)

## Dec-Jan-Feb Average Temperature Probability

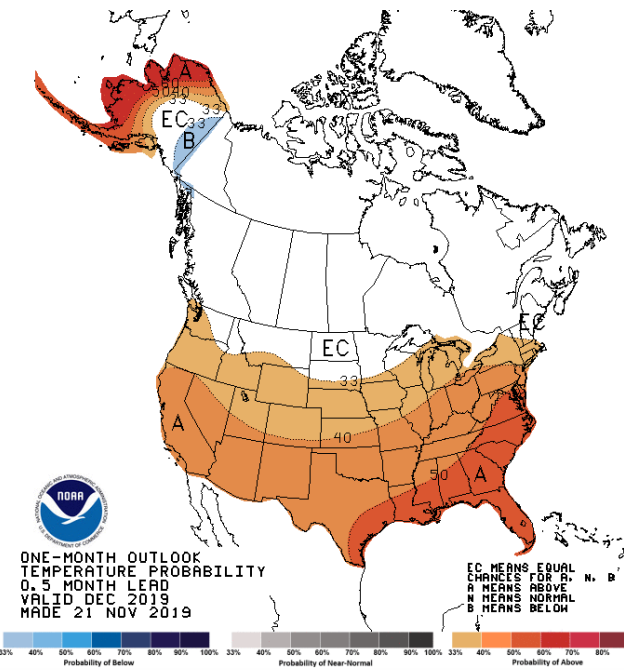


## Dec-Jan-Feb Total Precipitation Probability

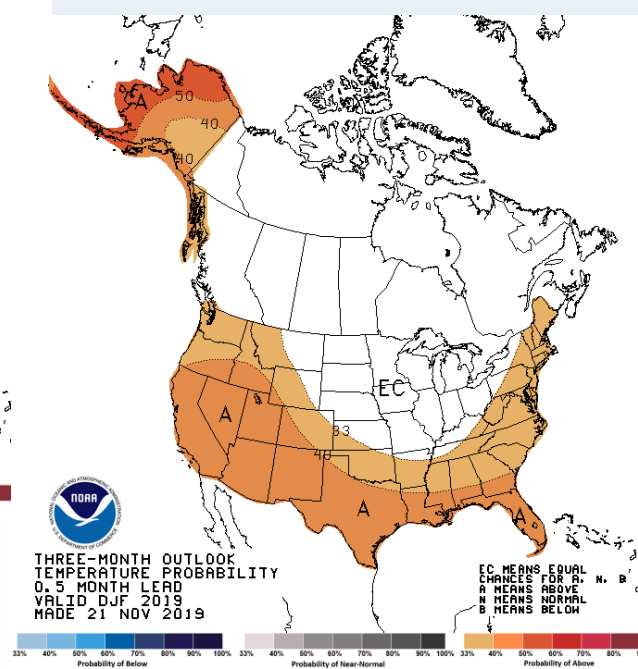


# Forecast Temperature Evolution

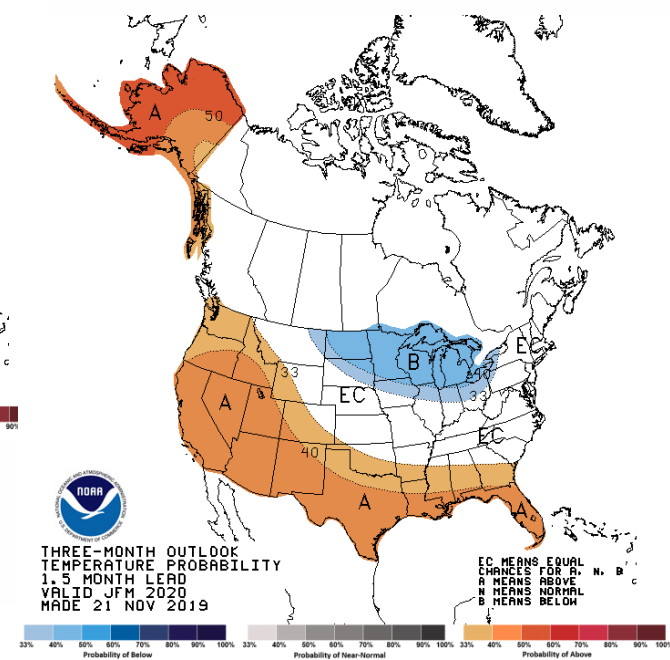
December



Dec-Feb



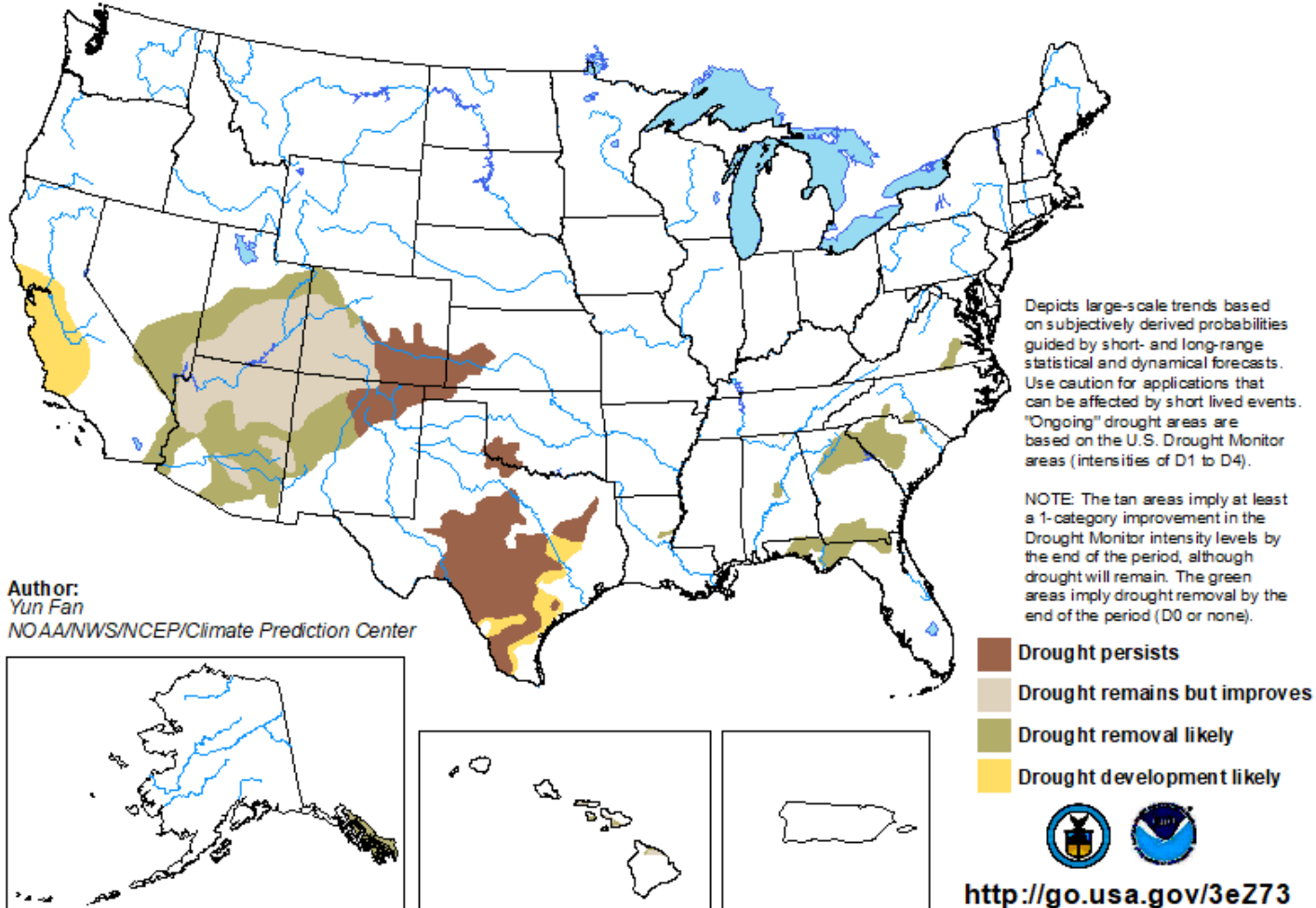
Jan-Mar



# U.S. Drought Outlook

## U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for November 21, 2019 - February 29, 2020  
Released November 21, 2019



# For More Information



## TODAY'S PRESENTATION:

- <http://www.ncdc.noaa.gov/sotc/briefings>

## NOAA's National Centers for Environmental Information:

[www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

- Monthly climate reports (U.S. & Global): [www.ncdc.noaa.gov/sotc/](http://www.ncdc.noaa.gov/sotc/)
- Dates for upcoming reports: <http://www.ncdc.noaa.gov/monitoring-references/dyk/monthly-releases>

NOAA's Climate Prediction Center: [www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)

NOAA/OAR Pacific Marine Environmental Laboratory: <https://pmel.noaa.gov>

U.S. Drought Monitor: <http://drought.gov>

Climate Portal: [www.climate.gov](http://www.climate.gov)

NOAA Media Contacts: [john.jones-bateman@noaa.gov](mailto:john.jones-bateman@noaa.gov), 301-713-9604 (NOAA/NESDIS PAO)