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)

- **Global Land & Ocean:** +0.98°C / +1.76°F; 2nd warmest Oct on record, behind 2015.
- **Global Land:** +1.46°C / +2.63°F; 2nd warmest Oct on record.
- **Global Ocean:** +0.80°C / +1.44°F; 2nd warmest Oct on record.
- **NH Land & Ocean:** +1.21°C / +2.18°F; Tied with 2015 as the warmest Oct on record.
- **SH Land & Ocean:** +0.74°C / +1.33°F; 3rd 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

Virtually certain (>99.9%) 2019 will end among the 5 warmest years on record.

- ~ 85% chance of 2nd warmest
- ~ 15% chance of 3rd warmest

95% confidence interval of 2nd to 3rd 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

- 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 2nd 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 8th & 10th 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.
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

Kincade Fire
Santa Rosa
San Francisco
Sacramento

Orange: Elevated (≥ 1 hour)
Red: Critical (≥ 1 hour)
Magenta: Extreme (≥ 1 hour)
Extreme Fire Weather Conditions

4 am October 30 – 4 am October 31

Real-Time Mesoscale Analysis (RTMA) data

Santa Barbara
Los Angeles
San Diego
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

- **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

Trends:
- **EC** means equal.
- **A** means above normal.
- **B** means below normal.

**One-Month Outlook Temperature Probability**
0.5 Month Lead
Valid Dec 2019
Made 21 Nov 2019

**One-Month Outlook Precipitation Probability**
0.5 Month Lead
Valid Dec 2019
Made 21 Nov 2019
Seasonal Forecast (Dec.-Jan.-Feb.)

Dec-Jan-Feb Average Temperature Probability

Dec-Jan-Feb Total Precipitation Probability

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THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID DJF 2019
MADE 21 NOV 2019

EC MEANS EQUAL
A MEANS ABOVE
B MEANS BELOW

Probability of Below
Probability of Near-Normal
Probability of Above

THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID DJF 2019
MADE 21 NOV 2019

EC MEANS EQUAL
A MEANS ABOVE
B MEANS BELOW

Probability of Below
Probability of Near-Normal
Probability of Above

21 November 2019 | Monthly Climate Webinar
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

Author:
Yun Fan
NOAA/NWS/NCEP/Climate Prediction Center

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short-lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

http://go.usa.gov/3eZ73
TODAY’S PRESENTATION:

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

NOAA’s National Centers for Environmental Information: [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)


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](https://pmel.noaa.gov)


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

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