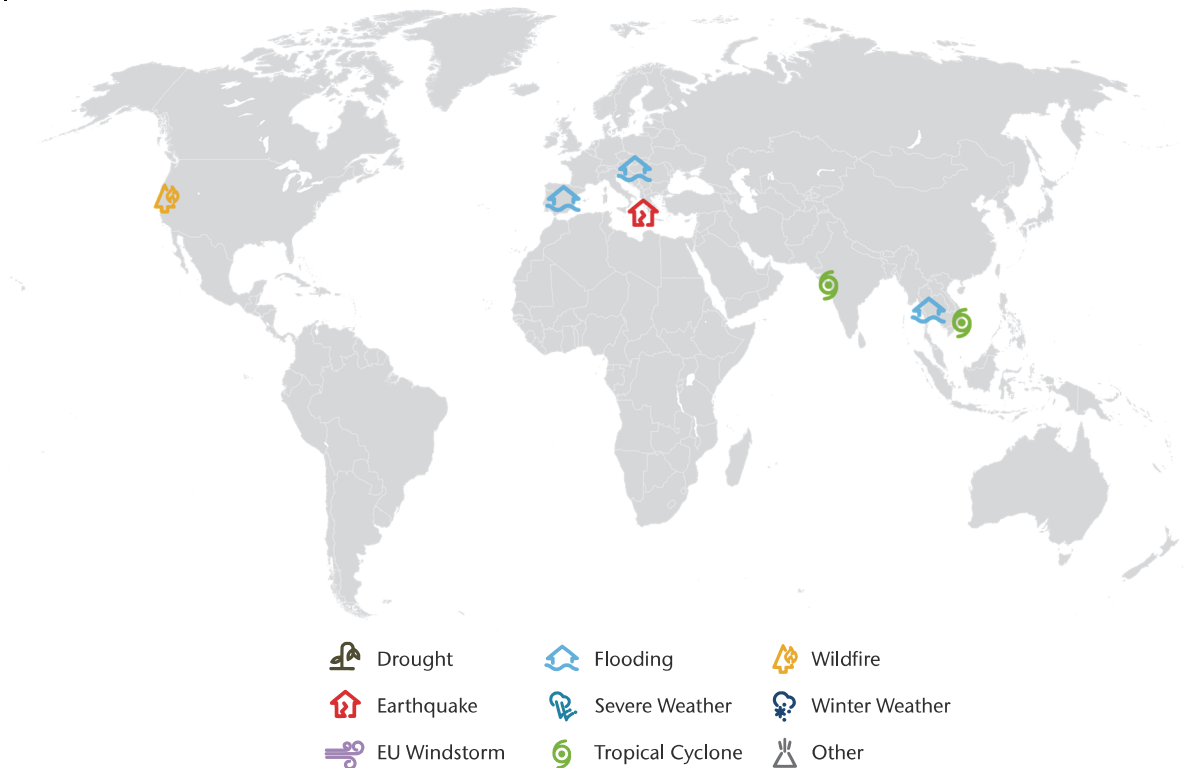


# **Weekly Cat Report**

October 1, 2021



## Executive Summary



Event	Affected Region(s)	Fatalities	Economic Loss (USD)*	Page
Wildfires	United States	0	2+ billion	3
Earthquake	Greece	1+	10s of millions	5
Tropical Storm Dianmu	Thailand	7+	Millions	6
Tropical Storm Gulab	India	20+	Millions	6
Flooding	Spain	0	Millions	6
Flooding	Slovenia	0	Millions	6

*\*Please note that any financial loss estimate is preliminary and subject to change. These estimates are provided as an initial view of the potential financial impact from a recently completed or ongoing event based on early available assessments. Significant adjustments*

Along with this report, we continue to welcome users to access current and historical natural catastrophe data and event analysis on Impact Forecasting's Catastrophe Insight website: <http://catastropheinsight.aon.com>

## Update: California Wildfires

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### Overview

*Abundant fuels resulting from persistent and long-term moderate to exceptional drought conditions combined with periods of unseasonably warm temperatures and gusty winds continued to enhance and ignite dangerous wildfires across California throughout September. As of September 30, CalFire had recorded at least 7,738 fire incidents to-date which had burned 2.44 million acres (987,430 hectares) of land. More than 3,500 structures were damaged or destroyed.*

### Meteorological Recap

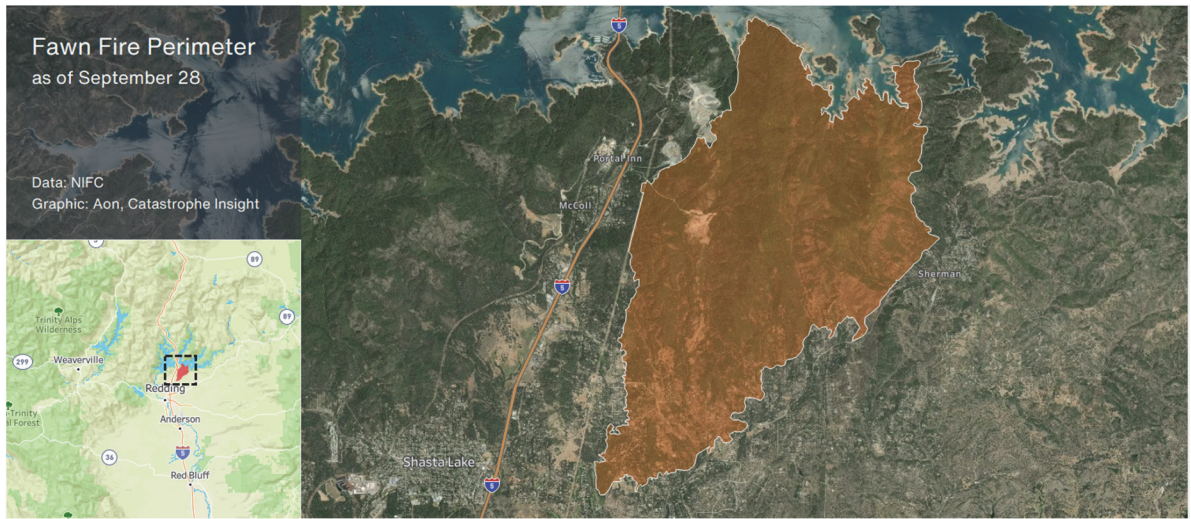
A series of weather disturbances generating minimum precipitation and gusty winds followed by intervals of repeated hot temperatures and low humidity continued to enhance critical wildfire conditions across portions of California throughout the second half of September. According to data from the National Oceanic and Atmospheric Administration (NOAA), California experienced its hottest meteorological summer (June-August) on record in 2021, with an average temperature of 77.3°F (25.2°C) – records extend back through 1895. The previous record of 76.5°F (24.7°C) was set in 2017. In addition to notable warmth, data from the United States Drought Monitor (USDM) indicated the entire state was affected by at least Moderate Drought (D1) conditions by the end of September. Concurrently, nearly 46 percent of the state were experiencing the highest tier Exceptional Drought (D4).

### Event Details

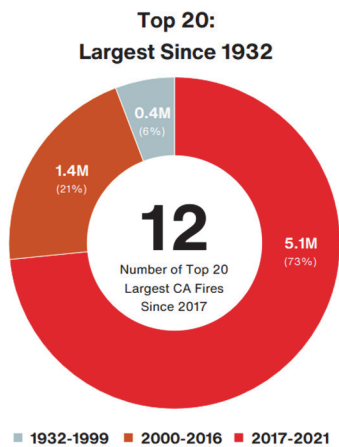
In **Tulare County**, the **Windy Fire** has affected at least 88,068 acres (35,640 hectares) in the Sequoia National Forest since it was sparked by lightning on September 9. The fire impacted several groves of giant sequoias, the world's largest trees, including Long Meadow Grove near the famed 'Trail of 100 Giants' hiking loop and the more remote Peyrone Grove. Structures were impacted near Sugarloaf and Pine Flat. Further north, the **KNP Complex Fire** has affected 49,349 acres (19,970 hectares) since September 10. The fire prompted firefighters to wrap high priority sequoia trees, including the world's largest tree, General Sherman, in aluminum blankets to protect the bark and help them survive encroaching flames. The fires prompted the closure of both Kings Canyon and Sequoia National Parks.

Data from the California Department of Water Resources indicated that the Tulare Basin Precipitation (6-station index) for the 2020-21 water year (ending September 30) was the driest on record since at least 1976-77. The abnormally dry conditions aided in the rapid expansion of wildfires throughout the basin in September.

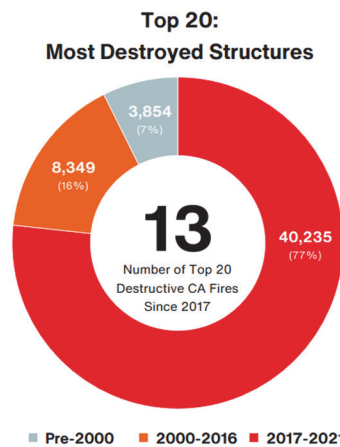
In **Shasta County**, no fewer than 4,000 people were evacuated due to expansion of the **Fawn Fire**, burning near the Shasta-Trinity National Forest north of Redding. The Fawn Fire was first detected on September 22 and has since affected 8,578 acres (3,471 hectares). The fire was believed to have been started by arson. As of this writing, no fewer than 185 structures were destroyed, while an additional 26 were damaged. A majority of the affected homes were situated near Old Oregon Trail between Bear Mountain Road and Sunrise Drive. Three firefighters were injured while battling the wildfire.



Significant containment has been achieved with the **Caldor Fire**, which burned in portions of El Dorado, Alpine, and Amador Counties since mid-August. The latest survey data revealed the fire destroyed at least 1,003 structures, damaged an additional 81, and resulted in five injuries. As of this writing, the fire has affected no less than 221,744 acres (89,740 hectares). The Caldor Fire currently ranks in the 'Top 20' largest (15<sup>th</sup>) and most destructive (16<sup>th</sup>) wildfires in state history since at least 1932.



Data: CalFire | Graphic: Aon (Catastrophe Insight)



\*\*Statistics as of September 29, 2021\*\*

## California Wildfires

Due to Changes in:

- Climate
- Fire Intensity
- Fire Behavior
- Fire Season Length
- Population
- Fire Suppression

### Why?

The combination of reduced precipitation during the standard "dry season" and hotter average temperatures is aiding in the intensification of drought events. This has also been a factor in U.S. West wildfire seasons now regularly being extended by several weeks. California has served as "ground zero" for the increased frequency and intensity of wildfires after ignition occurs.

## Financial Loss

The damage to structures and national parks in California by wildfires in September alone suggests a non-negligible financial toll. This will add to a combined cost of wildfire damage in California YTD which was anticipated to result in a multi-billion-dollar (USD) economic loss.

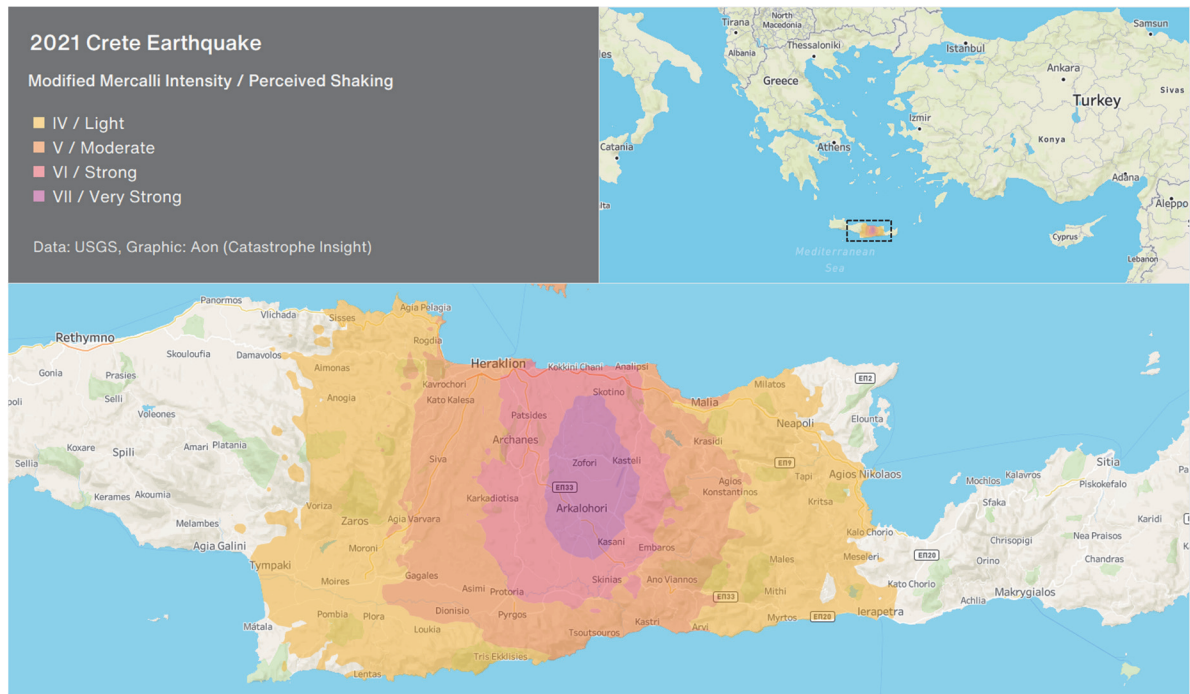
## Greece (Crete) Earthquake

### Overview

Widespread structural damage occurred in Central Crete after a strong earthquake hit the region on September 27, killing one person and injuring 35 others. Several thousand structures were likely impacted, while total losses were expected to minimally reach into the millions EUR.

### Seismological Recap

A strong, magnitude-6.0 earthquake struck central and eastern parts of the island of Crete in Greece on September 27 at a shallow depth of approximately 8.7 kilometers (5.4 miles). The United States Geological Survey (USGS) noted: *Focal mechanism solutions for the event indicate rupture occurred on a moderately dipping normal fault either striking towards the northeast or towards the southwest. The location of the earthquake places it near the Hellenic subduction zone. The depth indicates this event occurred within the overriding Aegean Sea plate, above the subducting African plate.*



### Event Details

One person was killed and 35 were injured. Strong shaking resulted in significant structural damage to older properties. The most widespread impacts were registered in Arkalochori, where about 1,000 masonry homes were rendered uninhabitable, which constitutes a majority of the settlement. Significant impacts were also reported from Heraklion, the administrative capital of the island, where at least 50 schools and at least 415 residential structures were damaged. Additional impacts were also cited in the municipalities of Minoa Pediada, Gortyna, Hersonissos, Phaistos, and Malevizi.

## Natural Catastrophes: In Brief

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### **Tropical Storm Dianmu (Thailand)**

Heavy monsoonal rainfall enhanced by Tropical Storm Dianmu and its remnants brought flooding across northern and central regions of Thailand between September 23-28. Data from Thailand's Disaster Prevention and Mitigation Department (DDPM) indicated that no fewer than 227,470 households across 30 provinces were affected. As of this writing, seven deaths were reported while at least two remained missing. In the Chaiyaphum Province, no less than 10,000 homes were impacted, while additional notable damages were reported in the Sukhothai and Lopburi Provinces. Rivers exceeded the flooding stage in 39 locations across the impacted regions as of September 27. Rising levels along the Chao Phraya River, enhanced by water releases from upstream dams, were expected to impact portions of Bangkok and the provinces of Lopburi, Saraburi, Ayutthaya, Pathum Thani, and Nonthaburi in the coming days.

### **Tropical Storm Gulab (India)**

Tropical Storm Gulab made landfall along the eastern coast of Andhra Pradesh, north of Kalingapatnam, during the evening of September 26 with 1-minute average sustained wind speeds reaching 75 kph (45 mph). The storm brought gusty winds and locally heavy rainfall to portions of southern Odisha, Andhra Pradesh, Telangana, and Maharashtra through September 27-29. Tens of thousands were evacuated from vulnerable regions as the storm approached. Impacts included rough seas, uprooted trees, landslides, and flash flooding which resulted in power outages, hundreds of damaged homes, and affected a vast area of agricultural land. At least 20 fatalities contributed to adverse weather conditions were reported through September 29. The remnants of Gulab emerged over the Bay of Bengal by September 30 where additional development is possible in the coming days.

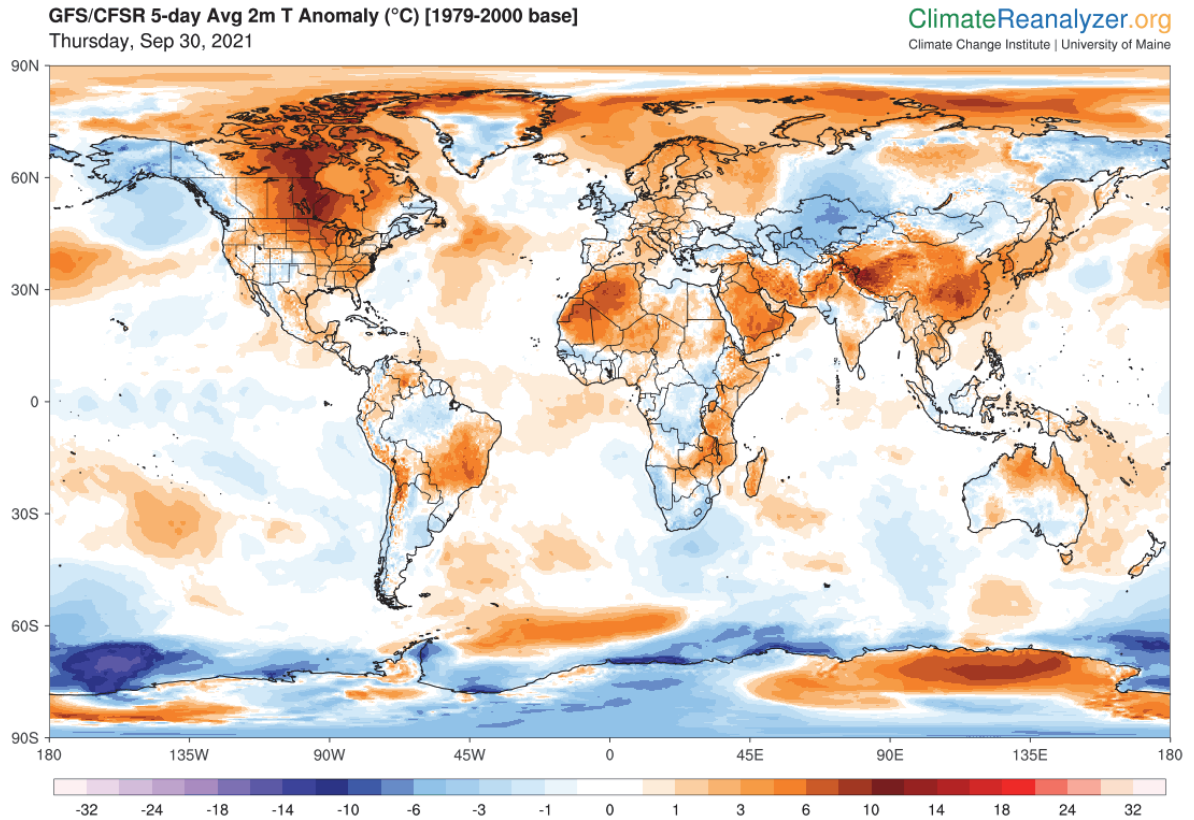
### **Flooding (Spain)**

Hundreds of homes and vehicles were flooded in Spain on September 23, after an episode of heavy rainfall related to a cut-off low-pressure area (known locally as DANA or a cold drop). Among the affected regions were Andalusia, Extremadura and the Balearic Islands. At least 600 interventions were reported in Huelva, the most affected region in Andalusia, while additional effects were felt in Granada, Cordoba and Cadiz. In Extremadura, Badajoz Province was the worst hit as up to 63 millimeters (2.5 inches) fell. Further flooding was also reported from the Balears, particularly Mallorca.

### **Flooding (Slovenia)**

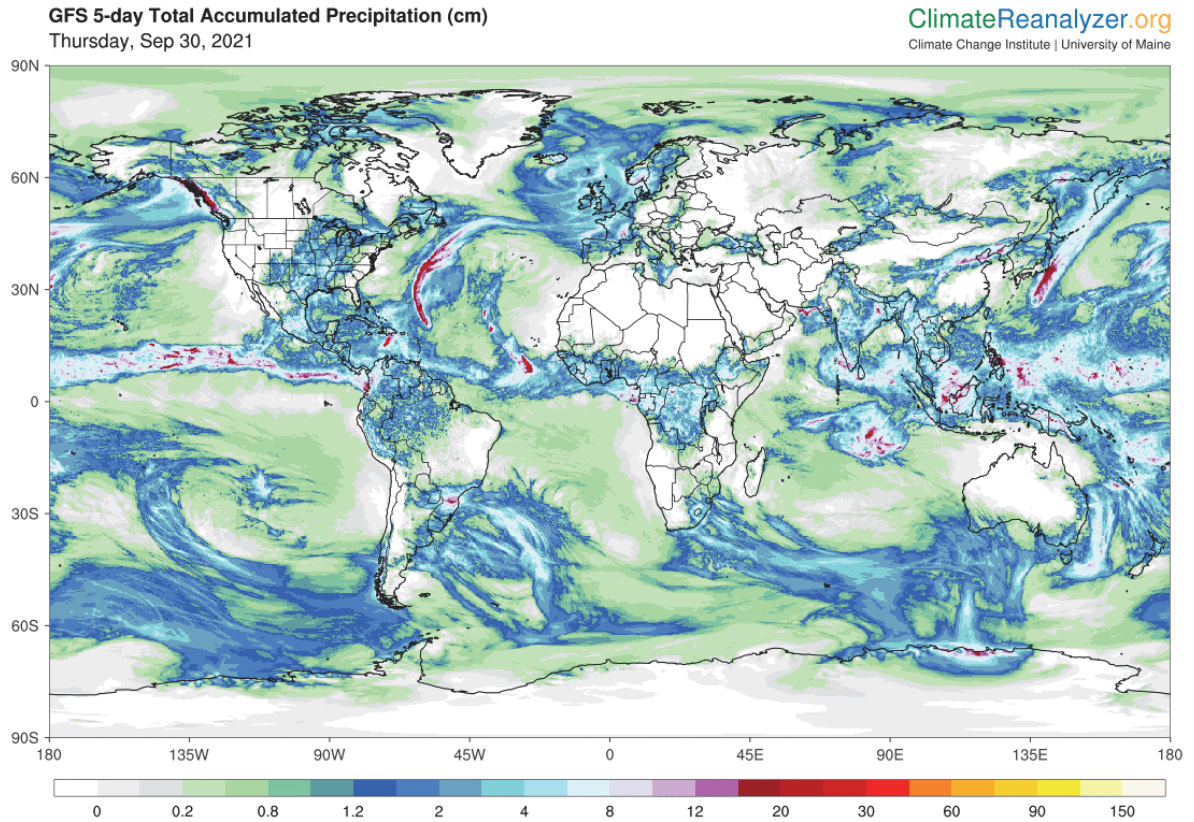
Widespread urban flooding occurred in Ljubljana, the capital of Slovenia on September 29, after a period of extremely intense rainfall. The station in Bežigrad received nearly 100 millimeters (3.9 inches) of precipitation in one hour, 63 millimeters (2.5 inches) fell within a 30-minute period. Local emergency services received at least 2,700 calls for assistance and at least 500 homes were initially reported as flooded. Further effects were felt due to a number of flooded vehicles on inundated streets and underpasses. Affected locations included a medical center, gallery, and a university.

## Global Temperature Anomaly Forecast



Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

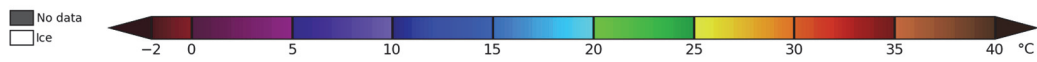
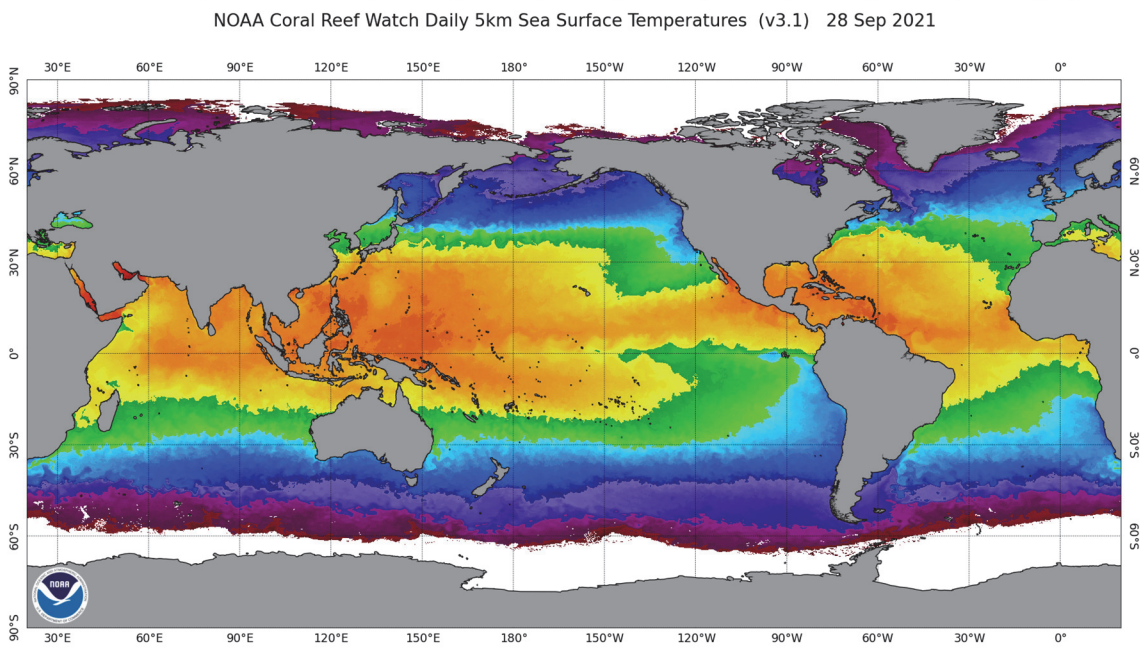
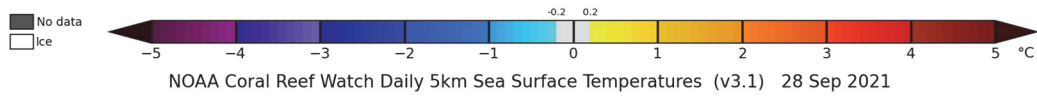
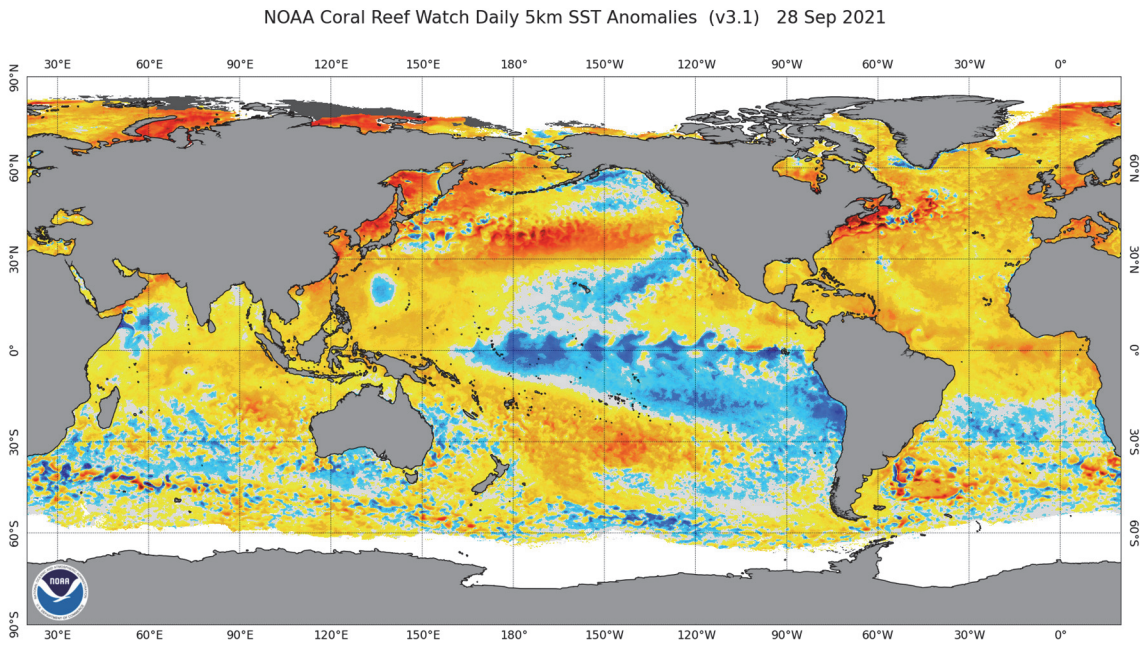
## Global Precipitation Anomaly Forecast



Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA



## Weekly Sea Surface Temperature (SST) Maps (°C)



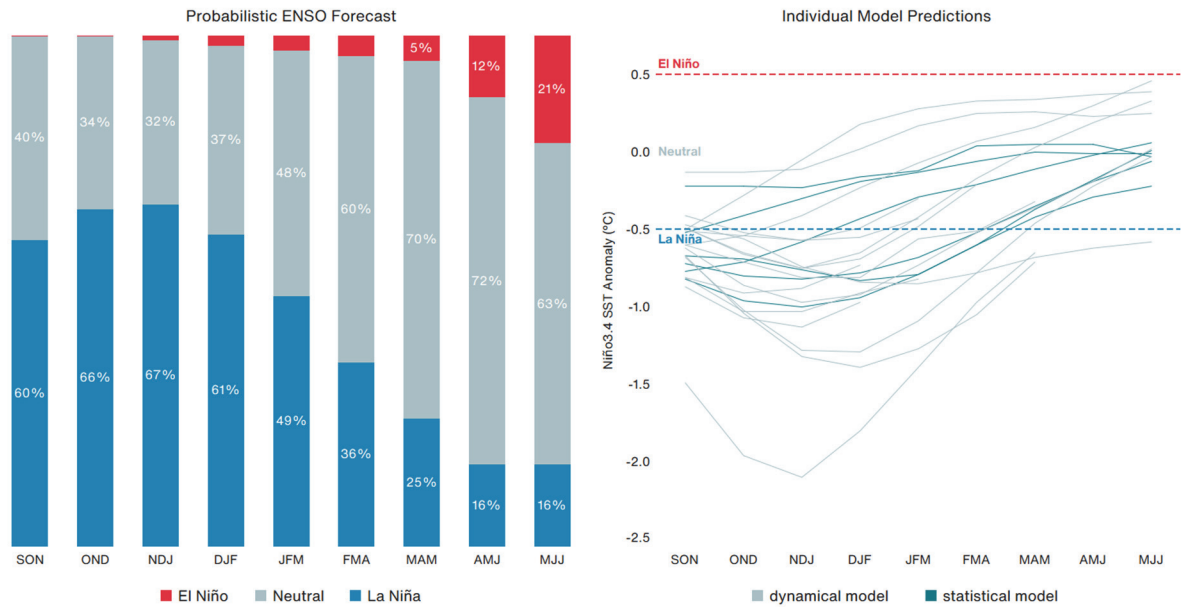
# El Niño-Southern Oscillation (ENSO)

## Overview

ENSO-neutral conditions are currently present, though NOAA has issued a La Niña Watch. NOAA notes a ~60 percent chance that neutral conditions will persist through the Northern Hemisphere summer and into September. There is a ~70 percent chance of La Niña emerging in September and lasting into early 2022.

### Probabilistic ENSO Model Projections: September 2021

Data: NOAA & Columbia University (IRI), Graphic: Aon (Catastophe Insight)



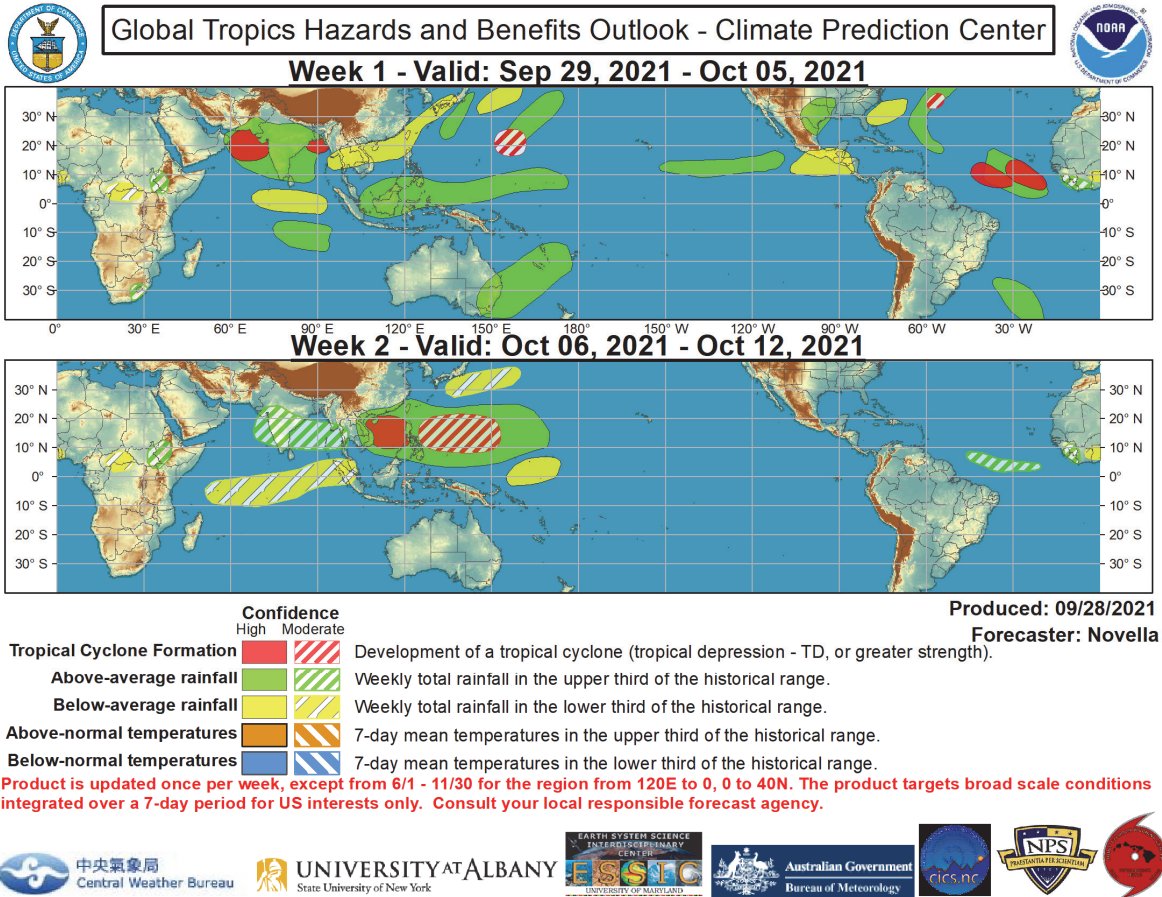
**El Niño:** Warm phase of an ENSO cycle. Sea surface temperatures of +0.5°C occur across the east-central equatorial Pacific.

**La Niña:** Cool phase of an ENSO cycle. Sea surface temperatures of -0.5°C occur across the east-central equatorial Pacific.

**Neutral:** A period when neither El Niño nor La Niña conditions are present.

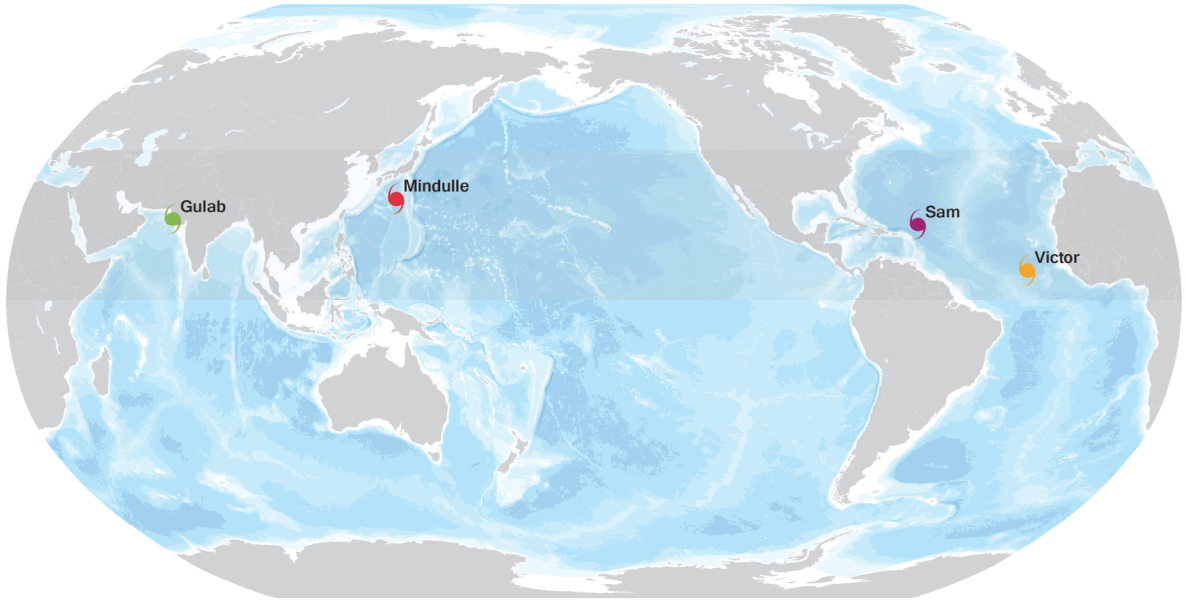
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

## Global Tropics Outlook



Source: Climate Prediction Center (NOAA)

## Current Tropical Cyclone Activity



● Tropical Depression 
 ● Tropical Storm 
 ● Category 1 
 ● Category 2 
 ● Category 3 
 ● Category 4 
 ● Category 5

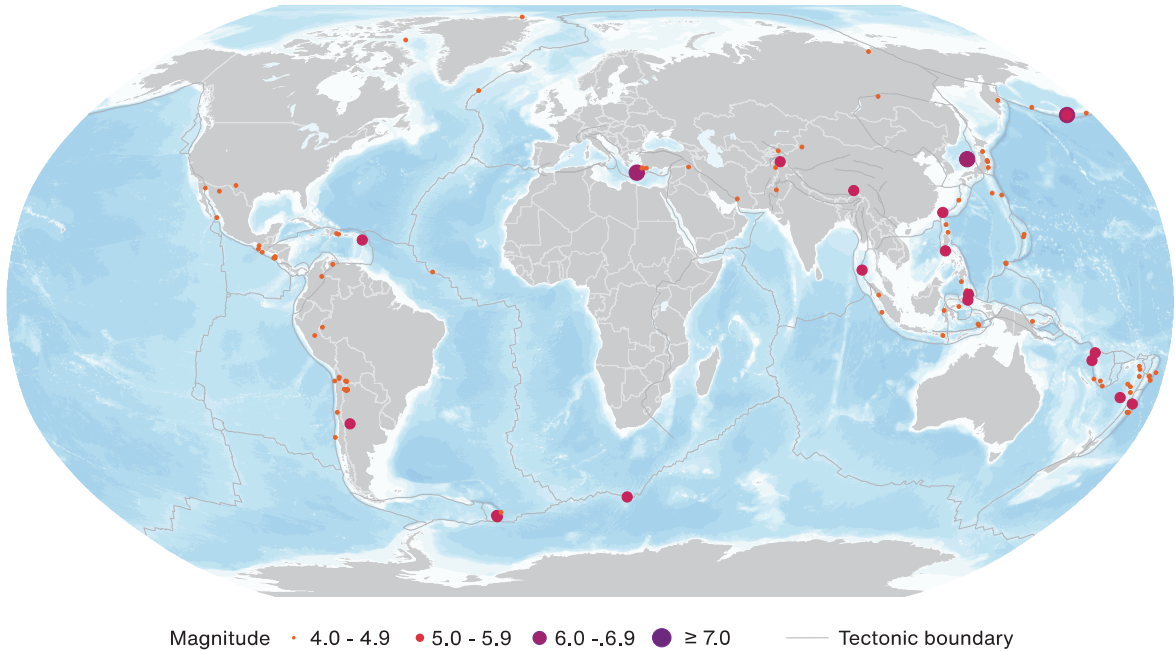
Storm Name	Location	Winds	Location from Nearest Land Area
TS Victor	8.5°N, 26.8°W	45 mph	495 mi (795 km) SW from Praia, Cape Verde
HU Sam	21.0°N, 58.8°W	145 mph	335 mi (535 km) NE from Antigua and Barbuda
TY Mindulle	28.0°N, 137.3°E	105 mph	475 mi (770 km) S from Kobe, Japan
TD Gulab	22.5°N, 68.2°E	30 mph	180 mi (290 km) SE from Karachi, Pakistan

\* TD: Tropical Depression, TS: Tropical Storm, HU: Hurricane, TY: Typhoon, CY: Cyclone

\*\* N: North, S: South, E: East, W: West, NW: Northwest, NE: Northeast, SE: Southeast, SW: Southwest

Source: National Hurricane Center, Joint Typhoon Warning Center, Central Pacific Hurricane Center (NOAA)

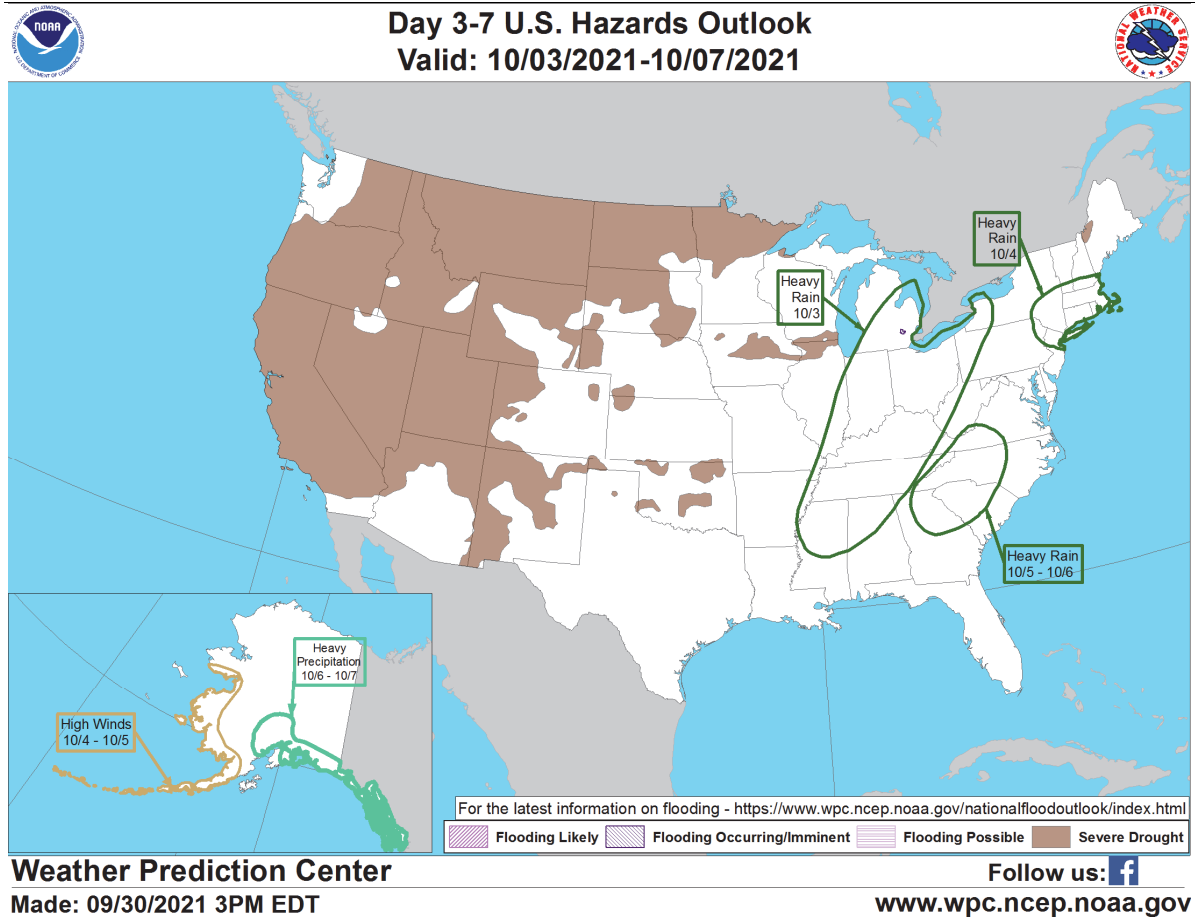
## Global Earthquake Activity ( $\geq M4.0$ ): September 24-30



Date (UTC)	Location	Magnitude	Epicenter
09/24/2021	51.20°N, 179.03°W	6.1	18 km (11 mi) WSW of Adak, Alaska
09/27/2021	35.25°N, 25.26°E	6.0	7 km (4 mi) NNW of Thrapsanón, Greece
09/29/2021	38.87°N, 135.46°E	6.1	24 km (15 mi) NNW of Nanao, Japan

Source: United States Geological Survey

## U.S. Hazard Outlook

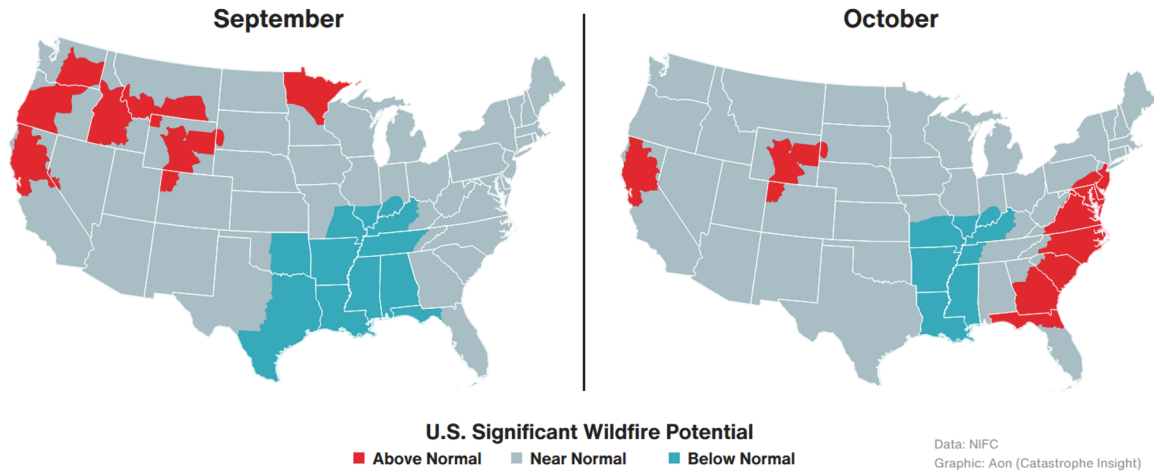


### Potential Threats

- A slow-moving storm system and frontal boundaries will trigger heavy rainfall across the Tennessee and Ohio Valleys and the Great Lakes on October 3. Heavy rainfall along an associated stationary front will impact the Northeast by October 4.
- As the pattern evolves southeastward, heavy rainfall aided by a cold front and upper-level low is expected across regions of the southern Appalachians and Southeast between October 5-6.
- Severe drought conditions will persist across much of the West and Northern Tier throughout the medium range forecast. Pockets of drought are expanding in portions of the Midwest and Southern Plains.

Source: Climate Prediction Center (NOAA)

## U.S. Wildfire: Significant Fire Risk Outlook & Activity



### Annual YTD Wildfire Comparison: September 30

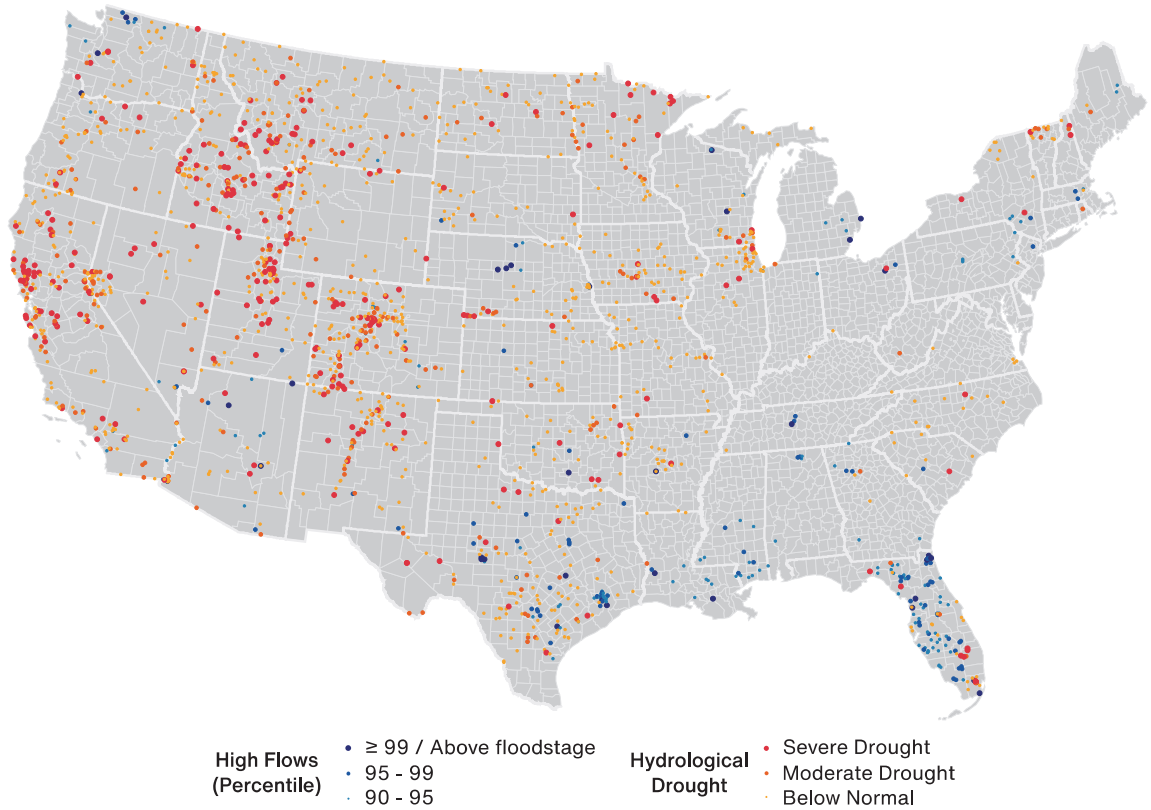
Year	Number of Fires	Acres Burned	Acres Burned Per Fire
2017	49,523	8,464,884	170.93
2018	49,299	7,781,236	157.84
2019	40,056	4,367,481	109.03
2020	44,253	7,672,398	173.38
2021	46,190	5,911,020	127.97
<b>10-Year Average (2011-2020)</b>	<b>46,705</b>	<b>6,596,842</b>	<b>141.24</b>

### Top 5 Most Acres Burned by State: September 30

State	Number of Fires	Acres Burned	Acres Burned Per Fire
California	8,107	1,859,671	229.39
Arizona	1,649	529,126	320.88
Idaho	1,235	431,980	349.78
Montana	2,338	695,320	297.40
Oregon	1,613	672,076	416.66

Source: National Interagency Fire Center

## U.S. Current Riverine Flood Risk



A  $\geq 99^{\text{th}}$  percentile indicates that estimated streamflow is greater than the 99<sup>th</sup> percentile for all days of the year. This methodology also applies for the other two categories. A stream in a state of severe drought has 7-day average streamflow of less than or equal to the 5<sup>th</sup> percentile for this day of the year. Moderate drought indicates that estimated 7-day streamflow is between the 6<sup>th</sup> and 9<sup>th</sup> percentile for this day of the year and 'below normal' state is between 10<sup>th</sup> and 24<sup>th</sup> percentile.

### Top 5 Rivers / Creeks: Highest Percentile for Water Height

Location	Current Stage (ft)	Percentile
Bouie Creek near Hattiesburg, Mississippi	8.80	98.81
Spring Creek near Spring, Texas	76.39	98.80
Cypress Creek nr Westfield, Texas	67.10	98.72
Sacandaga River near Hadley, New York	5.39	98.70
Long Pine Creek near Riverview, Nebraska	3.88	98.63

Source: United States Geological Survey



## Source Information

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### **Update: California Wildfires**

California Department of Forestry and Fire Protection (Cal Fire)

InciWeb

U.S. National Weather Service

*Four Guardsmen safe, but giant sequoia burns; cabins threatened*, Los Angeles Times

*New evacuation warnings issued as Windy Fire grows in Sequoia National Forest*, ABC 30 Action News

### **Greece (Crete) Earthquake**

*Earthquake in Crete: Uninhabitable 8 out of 10 houses inspected - Autopsies continue*, Kathimerini

United States Geological Survey

### **Natural Catastrophes: In Brief**

Thailand – Tropical Storm Dianmu Brings Flooding to North and Central Regions, Floodlist

*Cyclone Gulab Crosses East Coast*, The Weather Channel

*1 dead, many evacuated as Gulab makes landfall*, Times of India

*2 reported killed in India as Cyclone Gulab triggers heavy rains*, Xinhua News Agency

*Thailand Issues New Flood Warnings From Seasonal Rain*, The Washington Post

India – Severe Flooding in 4 States After Rain From Cyclone Gulab, Floodlist

*The cold drop leaves strong floods in Andalusia, Extremadura and the Balearic Islands*, El Pais

*Damage due to the downpour at the University Medical Center Ljubljana amounts to hundreds of thousands of euros*, RTV

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