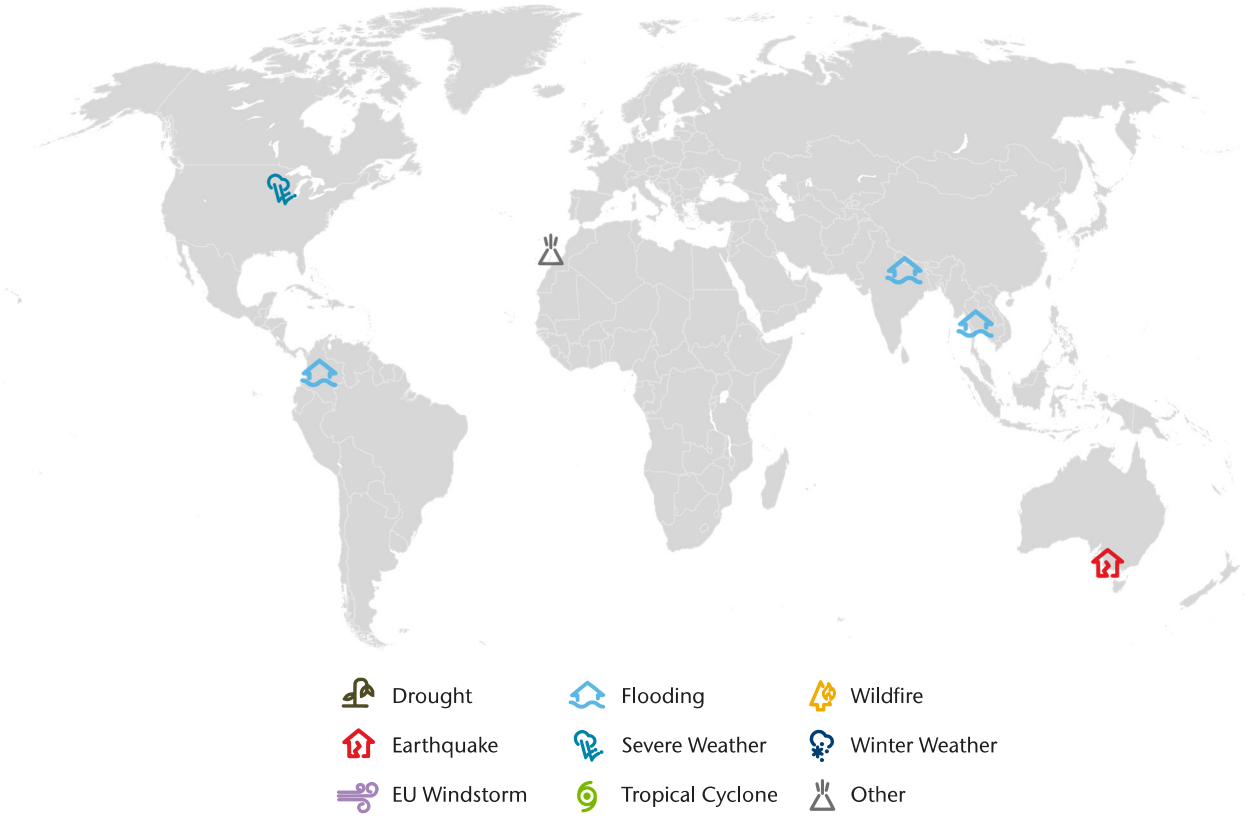
Weekly Cat Report

September 24, 2021

This Week's Natural Disaster Events



Event	Impacted Areas	Fatalities	Damaged Structures and/or Filed Claims	Preliminary Economic Loss (USD)*	Page
Earthquake	Australia	0	Hundreds	Millions	3
Volcano	Spain	0	190+	100s of millions	5
Flooding	Thailand	0	15,600+	Millions	7
Flooding	India	58+	Hundreds	Millions	7
Severe Weather	United States	1	Thousands	Millions	7
Flooding	Colombia	0	Thousands	Millions	7

**Please note that these estimates are preliminary and subject to change. In some instances, initial estimates may be significantly adjusted as losses develop over time. This data is provided as an initial view of the potential financial impact from a recently completed or ongoing event based on early available assessments.*

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

Strong Australia earthquake causes damage in Melbourne

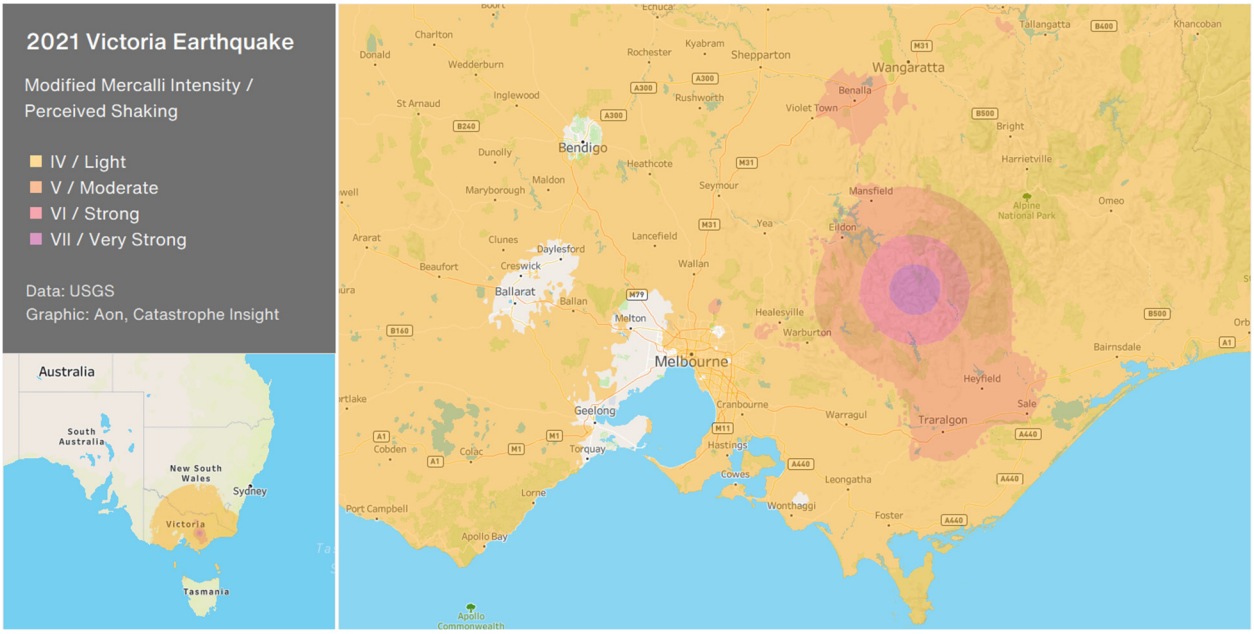
A strong magnitude-5.9 earthquake rattled the Australian state of Victoria on September 22, causing minor but widespread damage. No serious injuries or fatalities were reported. The tremor, which had an epicenter located 53 kilometers (33 miles) SSW of Mansfield in the Victorian Alps, was felt in parts of New South Wales, the Australian Capital Territory, South Australia, and Tasmania. Geoscience Australia noted that it was the strongest earthquake in Victoria in at least 50 years. Total economic and insured losses were expected to reach into the millions (USD).

Seismological Recap

On September 22 at 09:15 local time, a shallow magnitude-5.9 tremor struck roughly 50 kilometers (31 miles) southwest of Mansfield, Victoria and resulted in widespread, yet minor structural damage in eastern Victoria and parts of the capital territory and News South Wales. Roughly a million people were exposed to moderate or strong shaking (V and VI) on the Modified Mercalli Intensity (MMI) scale. Extensive portions of Victoria, including the Melbourne metro, were exposed to light shaking.

According to the United States Geological Survey (USGS), the September 22 earthquake occurred as a result of strike-slip faulting. The relatively small rupture was identified along the western edge of the Governor Fault. Local seismologists noted that Australia is situated in the Australian Plate – which is not near any major active plate boundary, where many of the world's earthquakes occur – and this week's tremor likely resulted from an intraplate occurrence. Intraplate activity happens within a tectonic plate as opposed to along a boundary. The Governor Fault is a large intraplate fault that extends from New South Wales along the Murray River Basin before tracking through Victoria towards the Victorian Alps and finally down towards the Gippsland Basin. This fault separates the Melbourne and Tabberabberan zones.

The USGS cited that approximately 16,000 people were exposed to Strong (MMI VI) shaking, 911,000 people exposed to Moderate (V) shaking, and 6.8 million people exposed to Light (IV) shaking. The epicenter occurred in a largely rural region which helped minimize the highest shaking in populated areas.



Event Details

Shingle damage in Essendon, Victoria
Source: Victoria State Emergency Service

There were no immediate reports of serious injuries or fatalities from the event; however, shaking resulted in notable material damage with several thousand residential and commercial structures affected. Impacts included partial building collapses, and damages to chimneys, roofs, and facades. Even though the **Melbourne** metro only experienced light shaking, reports from the area indicated a notable number of homes which sustained structural damage during the event, including churches, libraries, and historical buildings with older constructions. Additional instances of damage to brickwork and cracked pavements were observed across the city.

In the wake of the event, Victoria State Emergency Services responded to no fewer than 180 calls for assistance, of which 120 were pertaining to building damages. There were at least 35,000 power outages across the state of **Victoria**.

Australia rarely experiences strong and costly earthquakes, yet one of the most significant disasters to occur in the country was a magnitude-5.6 tremor in Newcastle in 1989, which claimed 13 lives and resulted in insured losses of AUD862 million (USD682 million) at the time. The 2021 Mansfield tremor was stronger in magnitude but struck an area with significantly lower population density.

Financial Loss

As of September 23, the Insurance Council of Australia (ICAUS) noted 1,700 claims filed due to the event, with 96 percent coming from Victoria, and the rest from the Australian Capital Territory and New South Wales. Eventual economic and insured losses are likely to evolve over the coming days and weeks and expected to reach into the millions (AUD).

Hundreds of homes destroyed in Canary Islands eruption

On September 19, the Cumbre Vieja volcano, located on the La Palma Island in the Canary Islands archipelago, Spain, began a fissure eruption from several vents. Resulting lava flows destroyed several hundred structures in the southwestern part of the island, along with a swath of agricultural land. The event prompted evacuation of thousands of residents and will likely result in significant economic losses. No fatalities were reported.

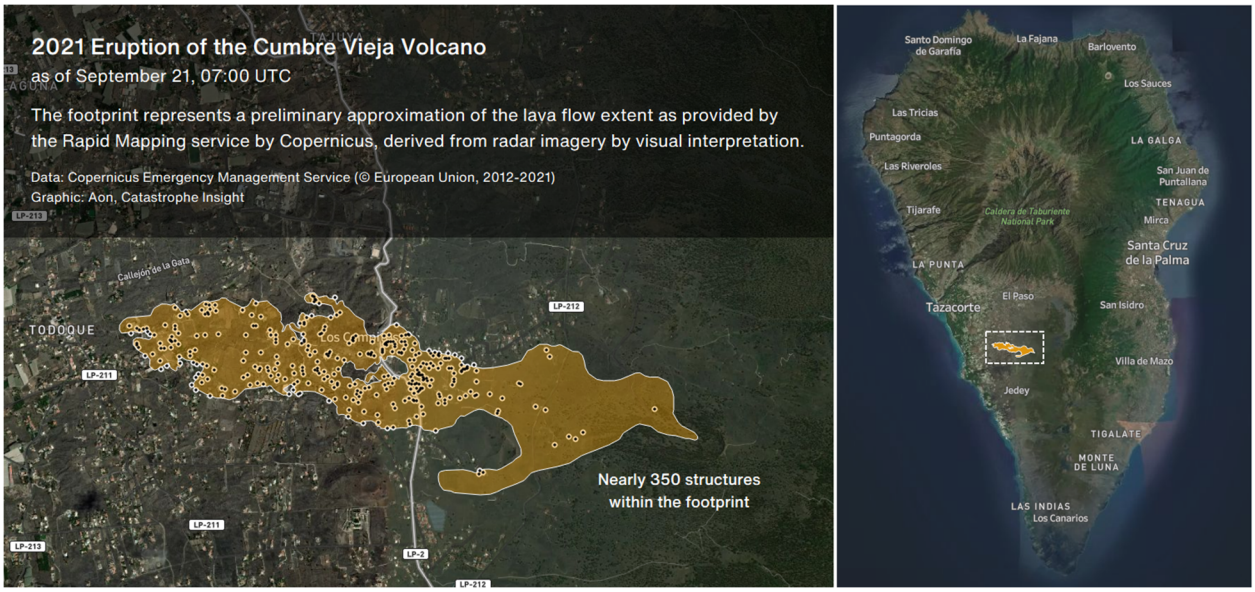
Event Details

Cumbre Vieja Volcano, located on La Palma island, part of the Spanish archipelago of the Canary Islands, started erupting on September 19. The activity was preceded by a swarm of at least 22,000 weak earthquakes since September 11, which prompted a potential volcanic activity warning encompassing 35,000 residents in the vicinity of the volcano.

The fissure eruption started at 14:12 UTC on September 19 in southern parts of the El Paso municipality and generated a significant lava flow, which prompted mandatory evacuation of about 6,000 residents, notably in Alcalá and El Paraíso. The lava flow with an average height of six meters (19.7 feet) and moving speed of up to about 700 meters (0.43 miles) per hour affected approximately 100 homes and adjacent agricultural land during the first two days. Later analysis of radar satellite imagery from September 20 revealed that nearly 200 structures might have been directly impacted. Officials also noted that several vents (at least nine) opened on the volcano. By September 21, the lava flow reached the Todoque neighborhood and was feared to expand further towards the western coast of the island.

Cumbre Vieja was also the source of the last subaerial volcanic eruption on the Spanish territory, which occurred in autumn of 1971. The eruption originated from Teneguía, a different volcanic vent located on the Cumbre Vieja. One fatality was reported, but no significant material damage occurred.

Regional officials tentatively suggested that total economic losses on the island, including damage to housing, agriculture, and infrastructure, might exceed EUR400 million (USD469 million).



Natural Catastrophes: In Brief

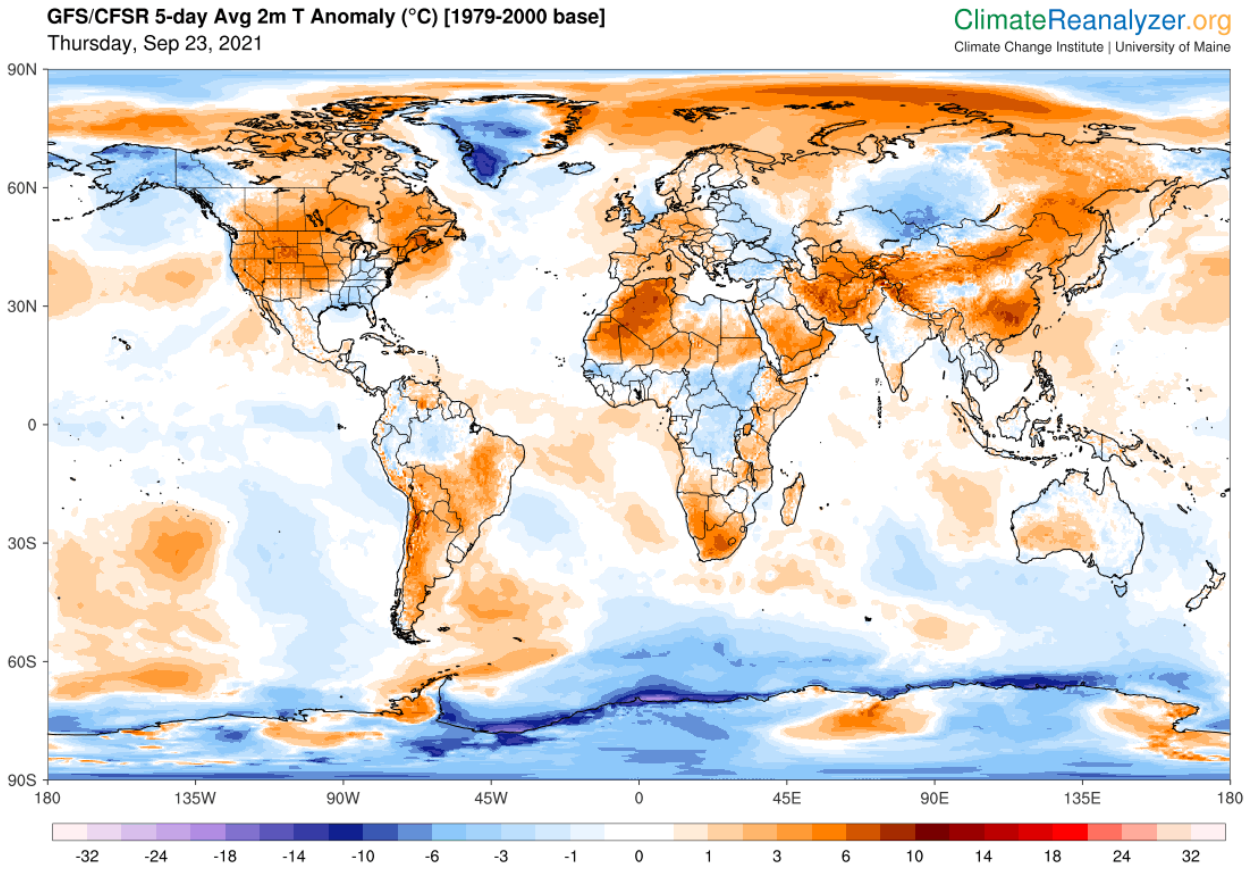
Flooding (Thailand)
Northern and northeastern parts of Thailand have been affected by heavy rainfall since September 16 due to a persistent monsoon trough. According to the data provided by the Department of Disaster Prevention and Mitigation, subsequent flash flooding in 14 provinces resulted in more than 15,600 homes damaged, with the highest proportion located in the provinces of Tak, Phetchabun and Phichit. No fatalities were reported as of this writing.

Flooding (India)
A well-defined low-pressure area, which moved over Madhya Pradesh and Rajasthan states in Central India on September 16-19, spawned significant rainfall in parts of Uttar Pradesh, and resulted in deadly flash flooding. According to the data from the National Emergency Response Centre, at least 58 people were killed in the state and approximately 90,000 were affected in total. Hundreds of homes were likely damaged.

Severe Weather (United States)
An amplifying upper-level trough and associated southeastward progressing cold front triggered severe weather across the Central Plains and Upper Midwest between September 16-17. Severe storm clusters and linear segments generated reports of large hail, strong straight-line winds, and isolated tornadoes in portions of South Dakota, Iowa, Minnesota, and Wisconsin. In Minnesota, at least three brief tornadoes were confirmed in Savage, Apple Valley, and Burnsville, while hailstones approaching 2.5 inches (6.4 centimeters) pelted localities in Morrison County. One fatality was reported. No fewer than 110,000 customers in Minnesota and Wisconsin lost electricity. A second frontal boundary spawned additional severe weather and flooding rainfall spanning from the Middle and Upper Mississippi Valley into the Mid-Atlantic between September 20-23. Total economic losses were expected to well exceed USD100 million.

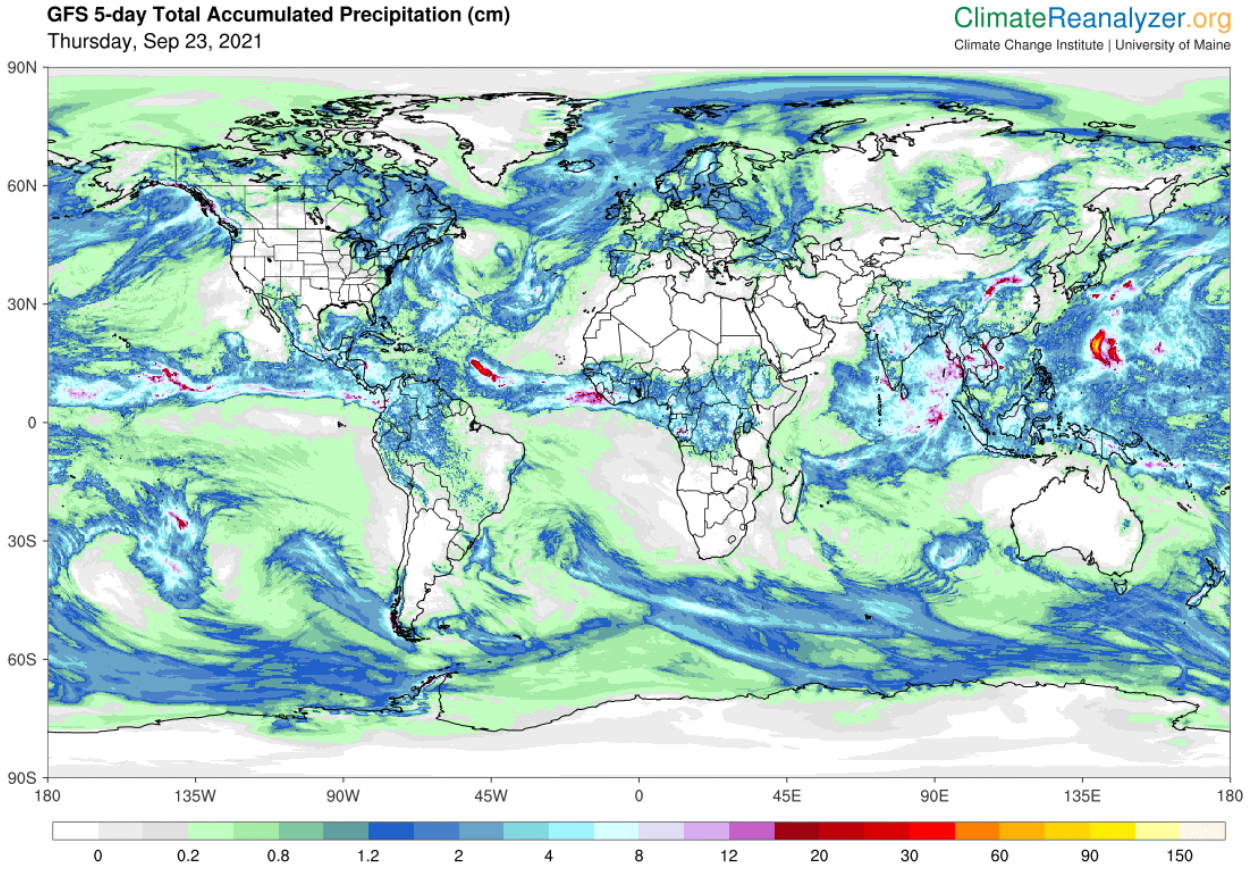
Flooding (Colombia)
Bouts of heavy rainfall associated with the second rainy season in Colombia have affected no less than 50,000 people since the beginning of September. The floods have been most impactful in the departments of Antioquia, Norte de Santander, Bolívar, Cauca, Tolima, and Córdoba. A vast area of agricultural land was inundated, and thousands of livestock had to be relocated along the swollen banks of the Cauca, Magdalena and San Jorge Rivers. According to the National Unit for Disaster Risk Management (UNGRD), no fewer than 5,994 homes were damaged or destroyed by adverse weather since September 1.

Global Temperature Anomaly Forecast



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

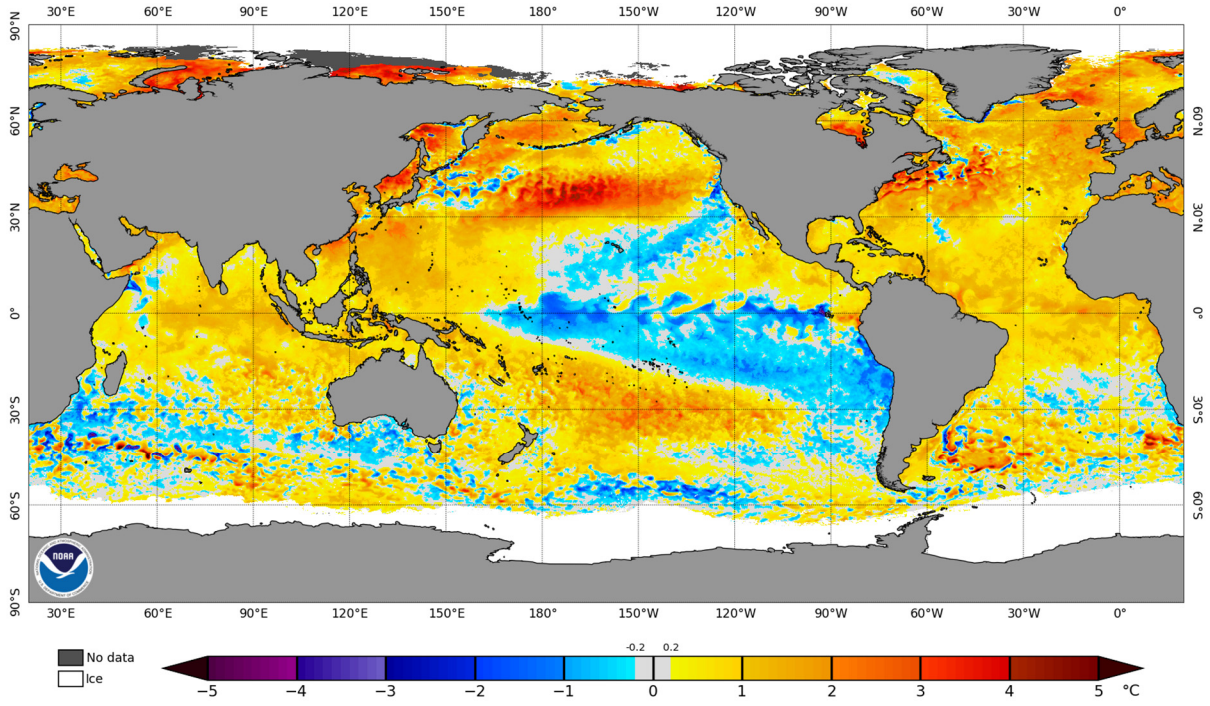
Global Precipitation Forecast



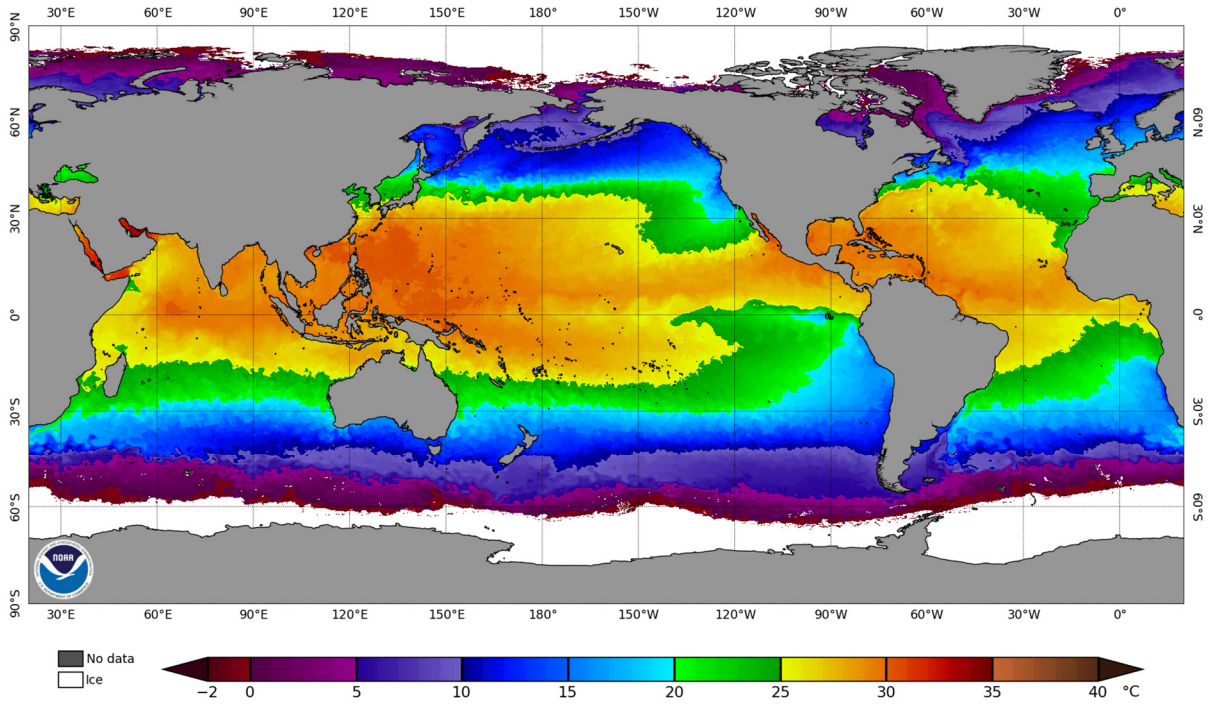
Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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

NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 21 Sep 2021

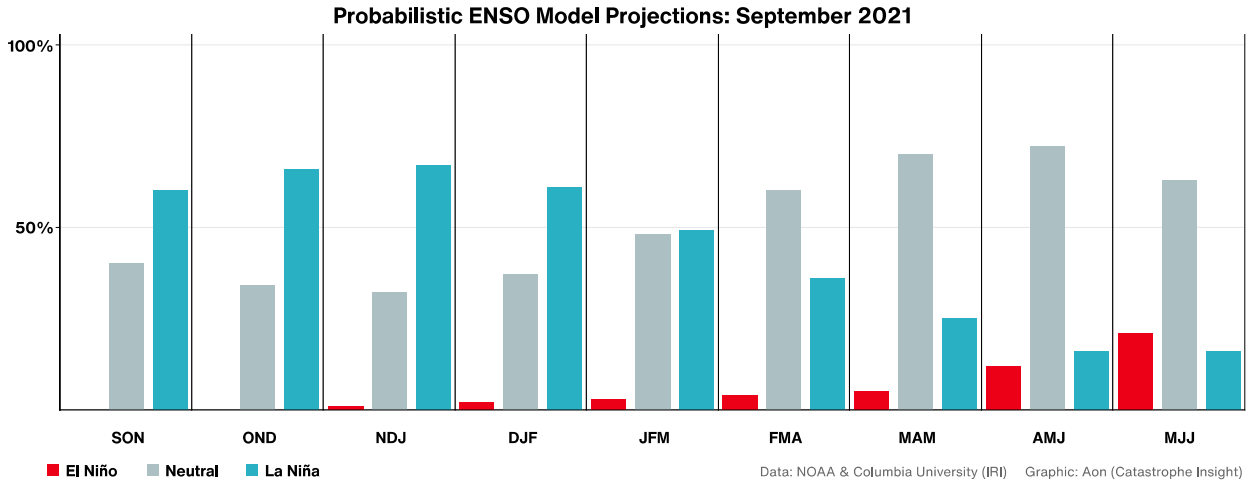


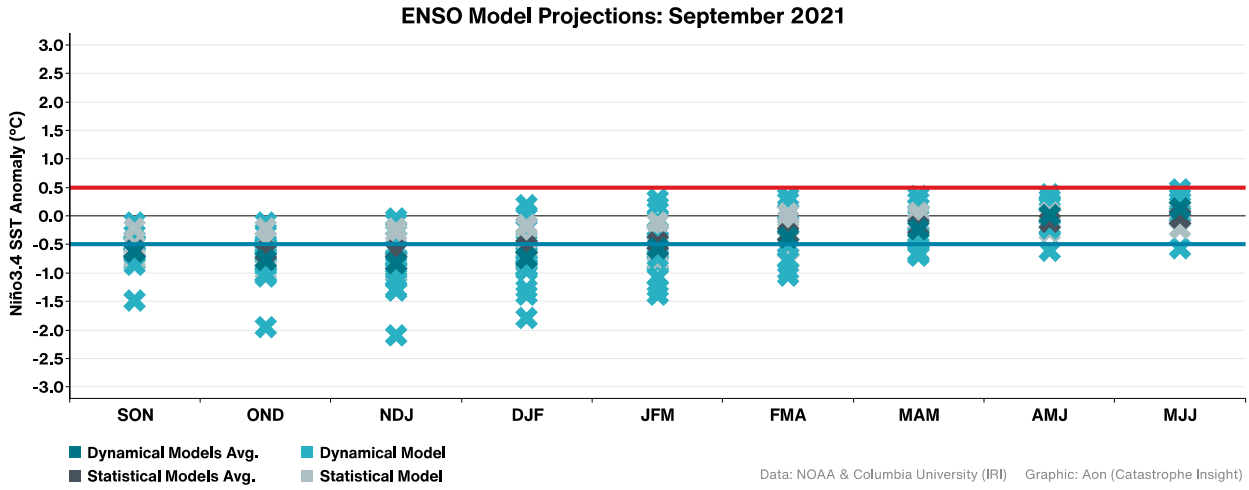
NOAA Coral Reef Watch Daily 5km Sea Surface Temperatures (v3.1) 22 Sep 2021



El Niño-Southern Oscillation (ENSO)

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, and a ~70 percent chance of La Niña emerging in September and lasting into early 2022.





El Niño *refers to the above-average sea-surface temperatures (+0.5°C) that periodically develop across the east-central equatorial Pacific. It represents the warm phase of the ENSO cycle.*

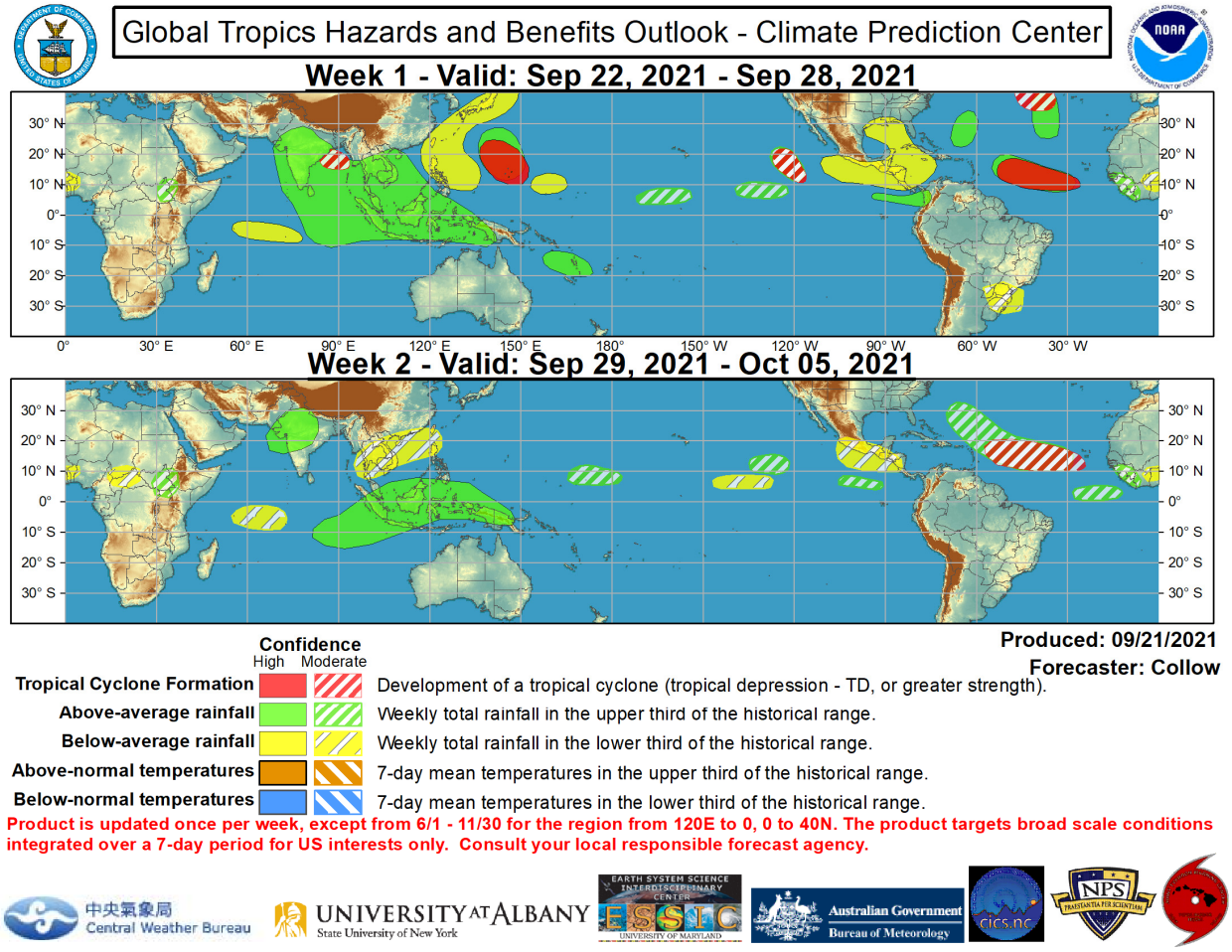
La Niña *refers to the periodic cooling of sea-surface temperatures (-0.5°C) across the east-central equatorial Pacific. It represents the cold phase of the ENSO cycle.*

El Niño and La Niña episodes typically last nine to 12 months, but some prolonged events may last for years. While their frequency can be quite irregular, El Niño and La Niña events occur on average every two to seven years. Typically, El Niño occurs more frequently than La Niña.

ENSO-neutral *refers to those periods when neither El Niño nor La Niña conditions are present. These periods often coincide with the transition between El Niño and La Niña events. During ENSO-neutral periods the ocean temperatures, tropical rainfall patterns, and atmospheric winds over the equatorial Pacific Ocean are near the long-term average.*

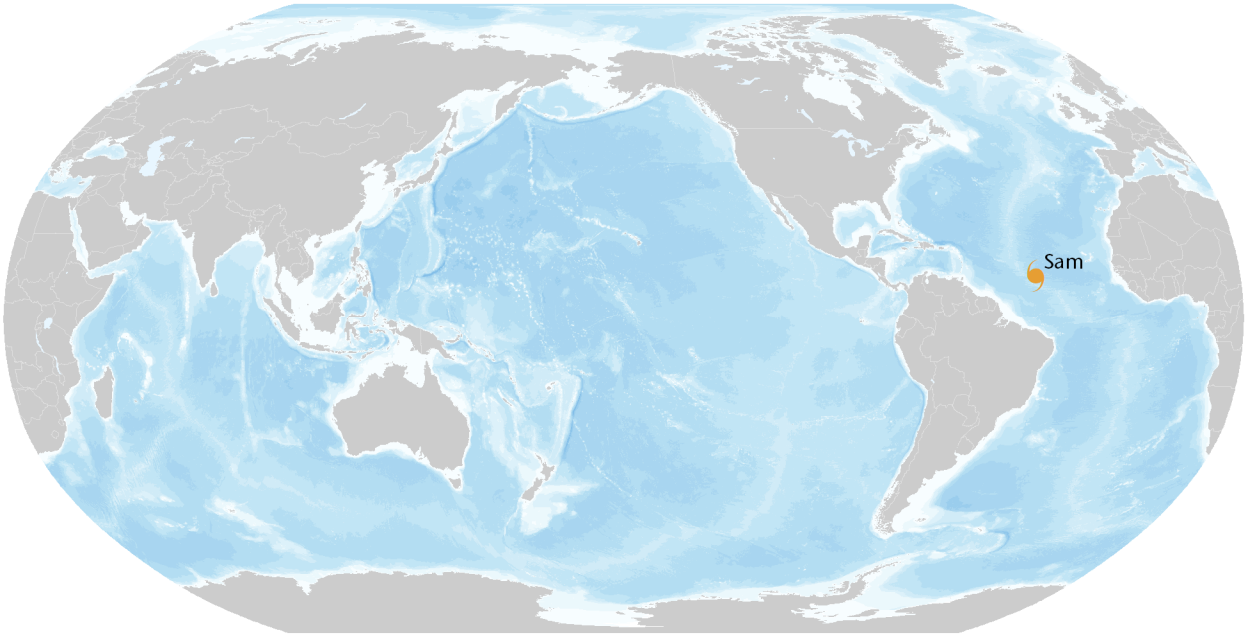
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

Global Tropics Outlook



Source: Climate Prediction Center

Current Tropical Systems



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

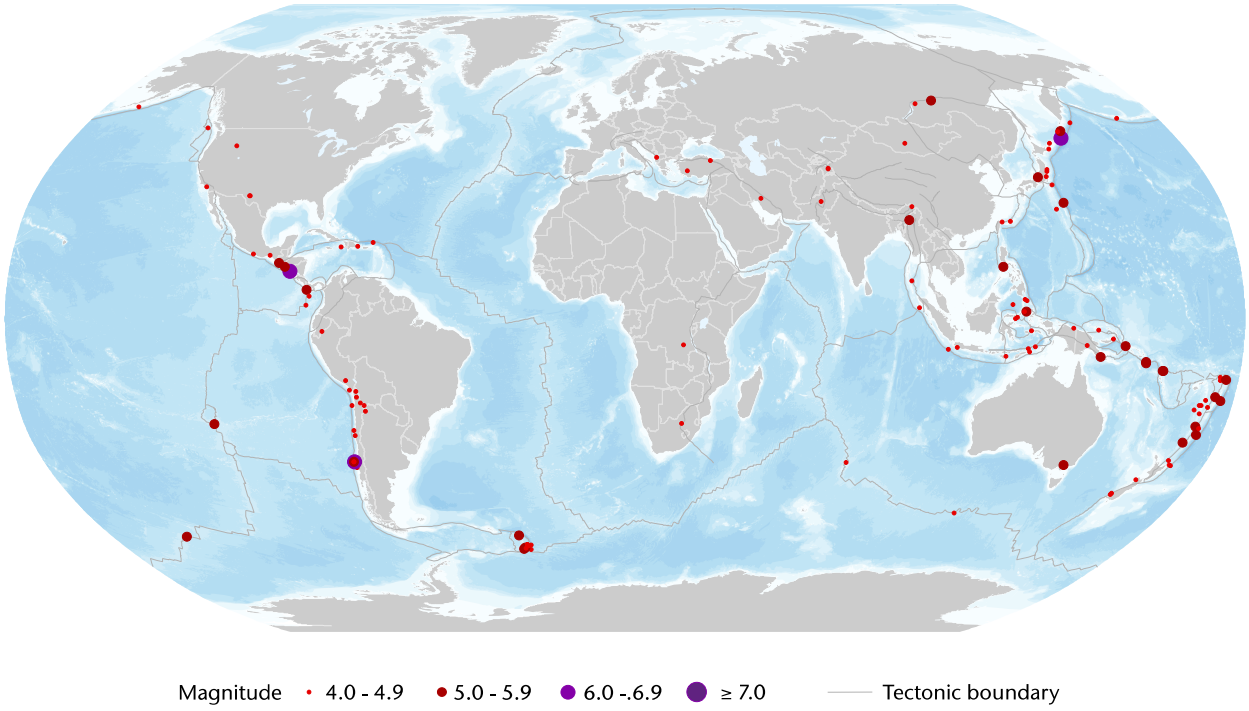
Location and Intensity Information

Name*	Location	Winds	Storm Reference from Land	Motion**
HU Sam	11.0°N, 39.1°W	60 mph	995 miles (1600 kilometers) N from Sao Luis, Brazil	W at 17 mph

* TD = Tropical Depression, TS = Tropical Storm, HU = Hurricane, TY = Typhoon, STY = Super Typhoon, CY = Cyclone
** N = North, S = South, E = East, W = West, NW = Northwest, NE = Northeast, SE = Southeast, SW = Southwest

Sources: National Hurricane Center, Joint Typhoon Warning Center, Central Pacific Hurricane Center

Global Earthquake Activity (≥M4.0): September 17-23

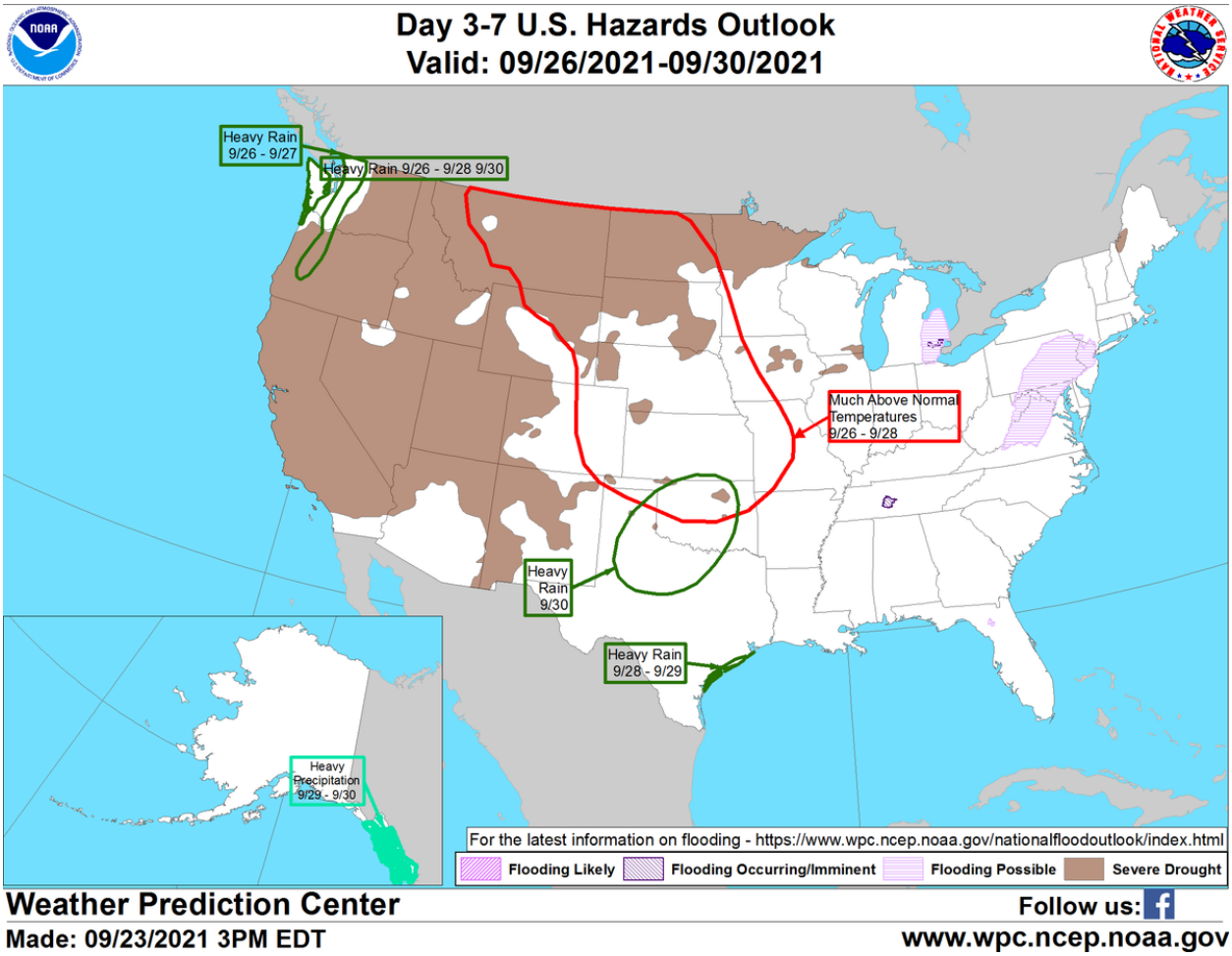


Significant EQ Location and Magnitude (≥M6.0) Information

Date (UTC)	Location	Magnitude	Depth	Epicenter
09/20/2021	46.41°N, 152.41°E	6.0	25 km	Kuril Islands
09/21/2021	36.79°S, 73.96°W	6.4	17 km	75 kilometers (47 miles) W of Talcahuano, Chile
09/22/2021	12.16°N, 87.85°W	6.5	31 km	78 kilometers (48 miles) SW of Jiquilillo, Nicaragua

Source: United States Geological Survey

U.S. Weather Threat Outlook



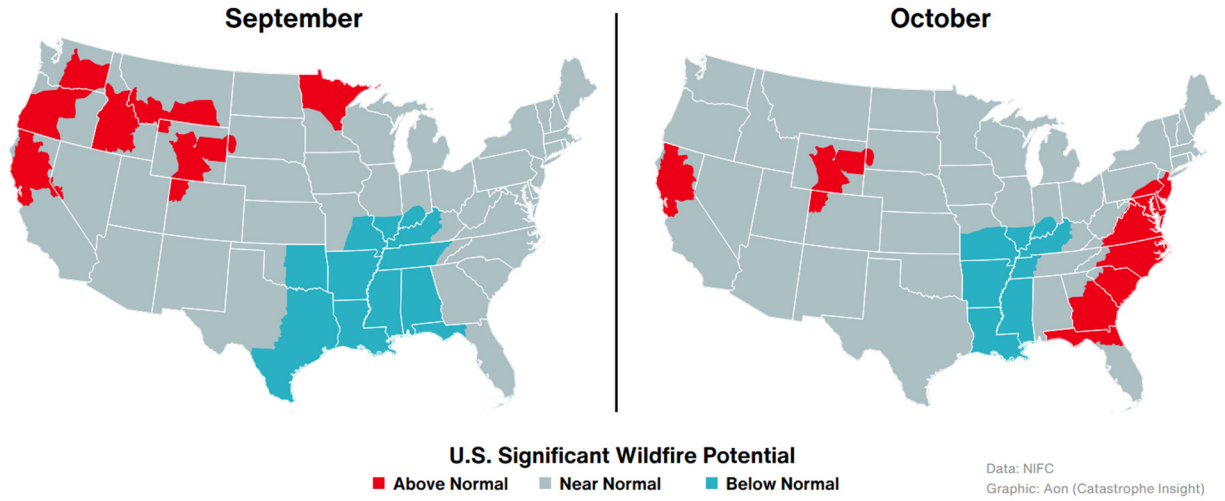
Potential Threats

- An upper-level disturbance will trigger heavy rainfall across the Pacific Northwest between September 26-28, followed by a second wave which is expected to bring heavy rains to the Olympic Peninsula by September 30.
- An upper-level ridge of high pressure will aid in several days of unseasonably warm temperatures across much of the Northern and Central Plains between September 26-28.
- Tropical moisture pushing northward from the western Gulf of Mexico beginning September 28-29, will subsequently produce heavy rainfall across the Southern Plains by September 30.
- Flooding is possible across the Mid-Atlantic through September 28, after a prolonged period of locally heavy rainfall associated with a slow-moving frontal system.

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

The National Interagency Fire Center has highlighted an expansive risk area for significant wildfire activity across much of the U.S. West and the Northern Tier. Continued summer-like conditions are maintaining wildfire conditions across much of the U.S. West. The ongoing historic drought and subsequent fire weather conditions in these areas has accelerated seasonal wildfire statistics for the Lower 48, though 2021 is now running behind the pace of 2020.

**Please note that NIFC has stopped releasing daily U.S. Wildfire Outlook shapefiles



Annual YTD Wildfire Comparison: September 23

Year	Number of Fires	Acres Burned	Acres Burned Per Fire
2017	48,782	8,529,044	174.84
2018	48,523	7,341,480	151.30
2019	38,264	4,352,891	113.76
2020	43,917	7,027,861	160.03
2021	45,407	5,988,174	131.88
10-Year Average (2011-2020)	**45,583**	**6,439,420**	**141.27**

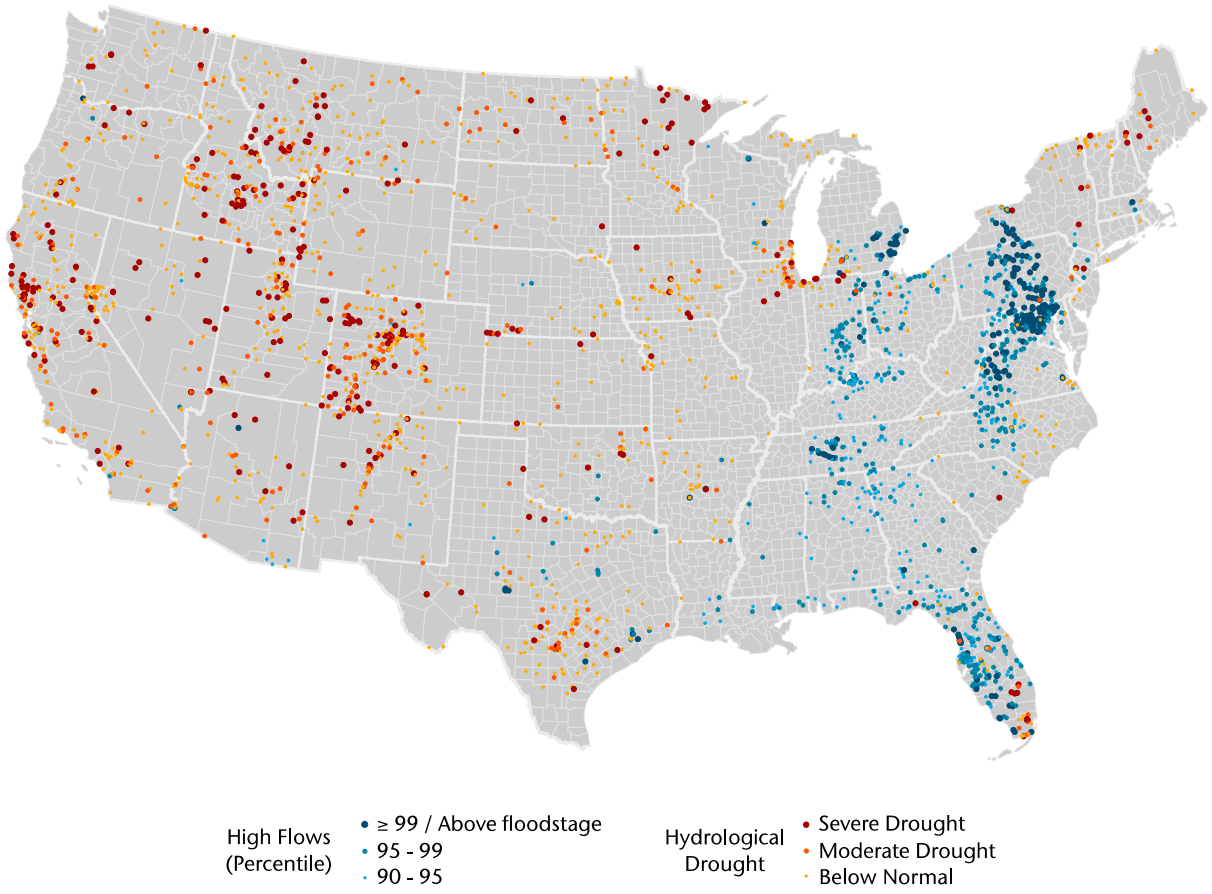
Source: National Interagency Fire Center

Top 5 Most Acres Burned by State: September 23

State	Number of Fires	Acres Burned	Acres Burned Per Fire
California	7,963	1,742,237	218.79
Montana	2,311	684,656	296.26
Oregon	1,700	669,285	393.70
Arizona	1,642	529,440	322.44
Idaho	1,221	423,128	346.54

Source: National Interagency Fire Center

Current U.S. Streamflow Status



A ≥99th percentile indicates that estimated streamflow is greater than the 99th percentile for all days of the year. This methodology also applies for the other two categories. A steam in a state of severe drought has 7-day average streamflow of less than or equal to the 5th percentile for this day of the year. Moderate drought indicates that estimated 7-day streamflow is between the 6th and 9th percentile for this day of the year and 'below normal' state is between 10th and 24th percentile.

Top 5 Rivers Currently Nearing or Exceeding Flood Stage

Location	Current Stage (ft)	Flood Percentile
West Branch Susquehanna River at Bower, Pennsylvania	8.43	99.07
Sinnemahoning Creek at Sterling Run, Pennsylvania	3.81	99.07
Lycoming Creek near Trout Run, Pennsylvania	7.37	99.07
East Fork White River at Shoals, Indiana	7.85	99.07
Juniata River at Williamsburg, Pennsylvania	9.05	99.05

Source Information

Strong Australia earthquake causes damage in Melbourne

An earthquake has hit Victoria, Melbourne and Australia's south-east — here's what we know so far, ABC
Melbourne earthquake: Tremor rattles southeast Australia, BBC News
Earthquake in Australia damages buildings in Melbourne, The New York Times
Victoria State Emergency Service
United States Geological Survey

Hundreds of homes destroyed in Canary Islands eruption

Canaries volcano blasts lava into the air as ash blankets area, Reuters
Hundreds more evacuated as lava spews from Canary Islands volcano, Al Jazeera

Natural Catastrophes: In Brief

Department of Disaster Prevention and Mitigation, Thailand
Latest news from the volcano erupting on La Palma. El Pais
At least one dead as severe storms bring widespread damage to Minnesota, western Wisconsin, MPR News
U.S. Storm Prediction Center
National Unit for Disaster Risk Management (UNGRD)
Colombia – Over 50,000 Affected by Floods in North as Rivers Overflow, Floodlist

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