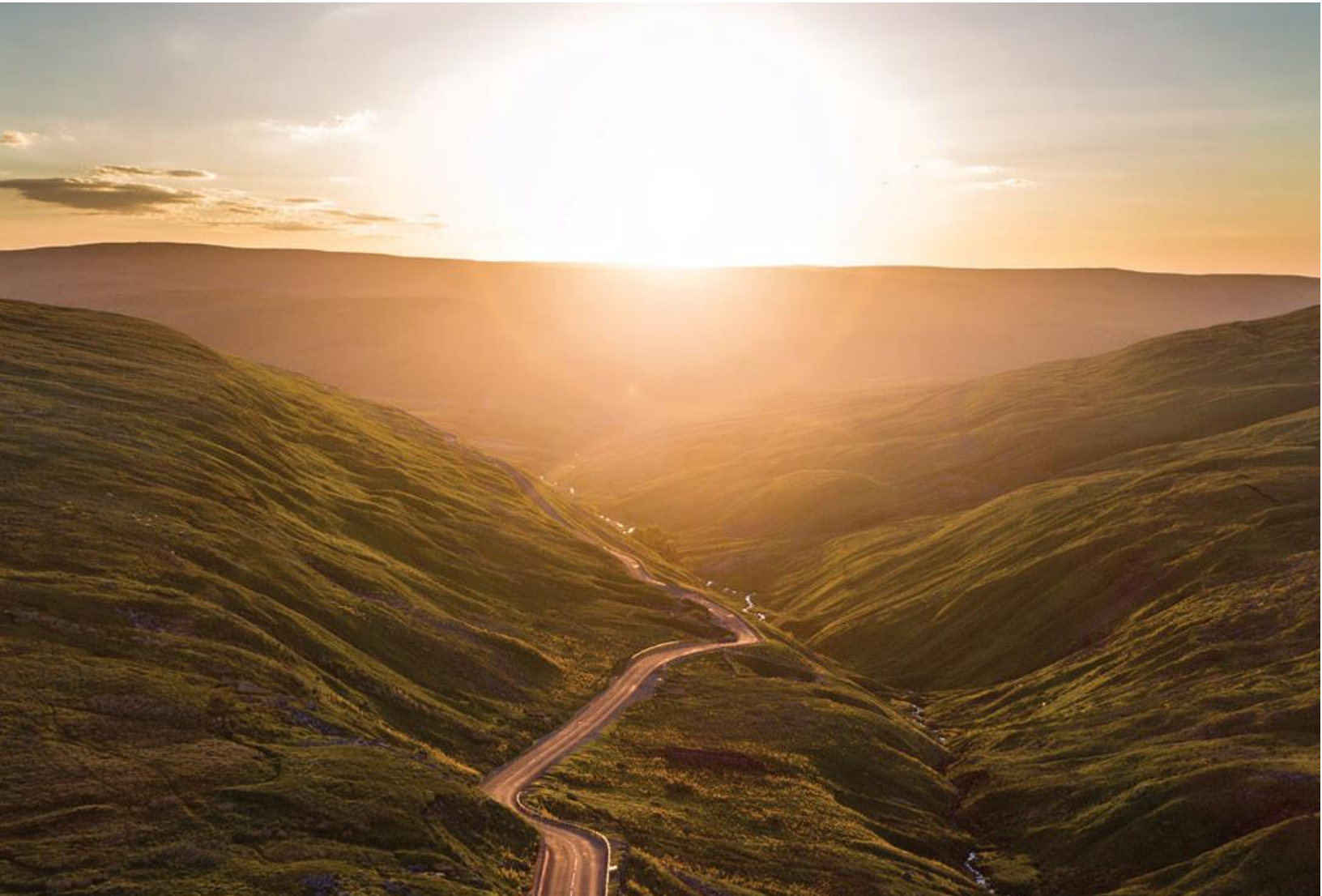


# **Weekly Cat Report**

January 13, 2023



## Executive Summary



Event	Affected Region(s)	Fatalities	Economic Loss (\$)	Page
<b>Flooding</b>	United States	17	100s of millions	3
<b>Winter Weather</b>	India	25+	Negligible	6
<b>Earthquake</b>	Vanuatu	0	Negligible	6
<b>Earthquake</b>	Indonesia	1	Millions	6
<b>Landslide</b>	Colombia	0	Unknown	6
<b>Flooding</b>	Portugal, Spain, UK	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 may inevitably occur. All losses in US dollars (\$) unless noted otherwise.

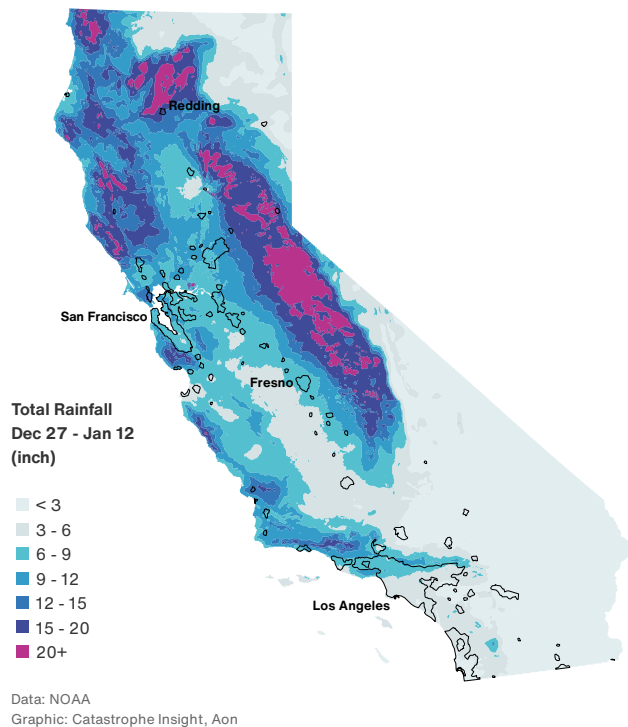
Along with this report, we continue to welcome users to access current and historical natural catastrophe data and event analysis on Impact Forecasting's Catastrophe Insight website: <http://catastropheinsight.aon.com>

## United States: Flooding (Update)

### Overview

Continuation of the wet spell has brought widespread flooding and mudslides, affecting much of California in the United States over the last two weeks. Severe weather, along with damaging strong winds, has resulted in 17 fatalities so far, event-related material losses are expected to increase, potentially into hundreds of millions (USD).

### Meteorological Recap



Current wet conditions are related to **atmospheric rivers** that brought several successive frontal systems into the region. Atmospheric rivers are described by National Weather Service (NWS) as “relatively narrow regions in the atmosphere that are responsible for most of the transport of water vapor from the tropics. Atmospheric rivers come in all shapes and sizes but those that contain the largest amounts of water vapor and strongest winds are responsible for extreme rainfall events and floods. This type of hydrologic event can affect the entire west coast of North America. These extreme events can disrupt travel, induce mudslides, and cause damage to life and property. Not all atmospheric rivers are disruptive. Many are weak and provide beneficial rain or high elevation snow that is crucial to the water supply.”

Several record-breaking heavy rainfall events, along with strong winds and storms, impacted many parts of California last week (see previous Weekly Cat Report). The latest spell that hit area on January 9-10 brought additional moisture to an already saturated region. California has seen above average rainfall totals over the past weeks with totals of 400-600 percent above average values, according to NWS. Some of the severe weather impacts may potentially be worsened by prior drought conditions, which could have decreased the ability of soils to absorb higher quantity of rainfall in a short period of time. As a result, California is now extremely vulnerable to flooding. Table below summarizes the highest 2-day rainfall totals on January 9-10, according to NWS Los Angeles.

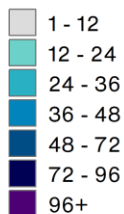
Location	County	Rainfall total (in)	Rainfall total (mm)
Nordhoff Ridge	Ventura	16.89	429
Matilija Dam	Ventura	16.69	424
San Marcos Pass	Santa Barbara	16.57	421
White Ledge Peak	Santa Barbara	15.75	400
Rose Valley	Ventura	14.13	359

Additionally, localized strong wind gusts up to 70 mph (113 kph) occurred as the frontal boundary passed. At higher elevations, weather pattern brought even higher wind gusts up to 90 mph (145 kph) and enormous amount of snow. Parts of the Sierra Nevada have gotten more than 8.3 ft (250 cm) of snow in just the past few weeks. Water supplies accumulated in snow will likely alleviate the severe drought conditions in the state.

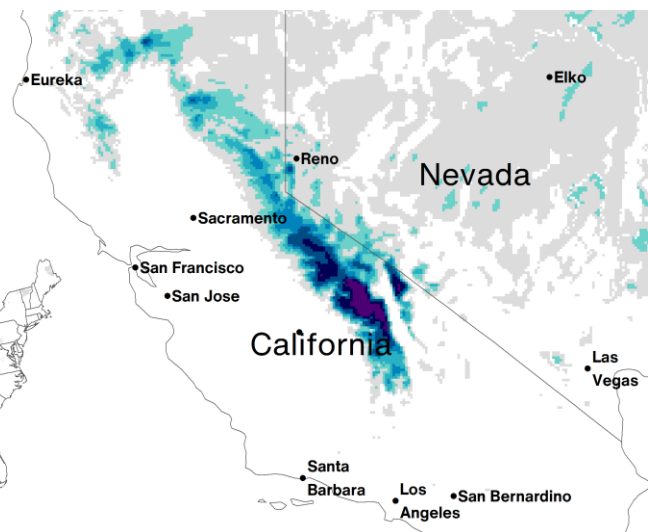
### Total Snowfall (in)

(1 inch or greater)

from 00 UTC January 8  
to 00 UTC January 11



Data: NOAA



### Event Details

Emergency conditions resulting from successive and severe storms, flooding, and mudslides were declared on in **California**. As of January 10, over 34 million people were under flood watches, 90 percent of the state's population. 31 of California's 58 counties declared disasters conditions. More than 30,000 people across the state have been evacuated from their homes, particularly counties of Sacramento, El Dorado, Monterey, Santa Cruz, Santa Clara and Alameda were under evacuation warning. More than 200,000 customers experinced with power outages due to wind gusts and lightning strikes.

In Santa Barbara County, at least 15 homes were damaged due to flooding, rescue services responded to more than 200 calls here. About 400 schools were closed due to flooding across the state. Dozens of roads were blocked by debris and floodwater. The death toll from an onslaught of violent storms and flooding rose to 17, according to authorities.



**Flood and storm damage in Montesito (left) and Pasadena (right)**

Source: Montesito and Pagadena Fire Department

### **Financial Loss**

Though it is too early to estimate, the cost to repair the damage from storm series and flooding could reach into hundreds of millions (USD), or even exceed \$1 billion.



## Natural Catastrophes: In Brief

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### **Winter Weather (India)**

A cold spell affected north-western India, particularly states of Punjab, Haryana, Uttar Pradesh and Rajasthan, between January 5-9. Local meteorological institute issued warning for low temperature as the lowest temperatures dropped below 4°C (39.2°F) in many parts in the region. In Kanpur, Uttar Pradesh, at least 25 deaths and 723 injuries were related to cold weather conditions. Winter weather caused traffic disruptions and left several schools closed.

### **Earthquake (Vanuatu)**

A magnitude-7.0 earthquake hit Vanuatu on January 8, affecting about 12,000 people by very strong shaking, and about 45,000 by strong shaking. Despite a relatively high magnitude of the earthquake, there was a low potential to cause notable material damage or losses on lives, according to USGS's PAGER methodology.

### **Earthquake (Indonesia)**

A very strong earthquake of magnitude 7.6 occurred close to Maluku Islands, eastern Indonesia, on January 10 (local time). Based on PAGER methodology by USGS, about 36,000 people were exposed to very strong shaking, and up to 76,000 felt strong shaking. As of January 11, National Disaster Agency (BNPB) reported at least one dead, eight injured and damage to at least 400 structures, particularly in Southwest Maluku and Tanimbar Islands Regencies in the Maluku Province. According to PAGER assessment, an event will probably result in economic losses of millions (USD) or lower.

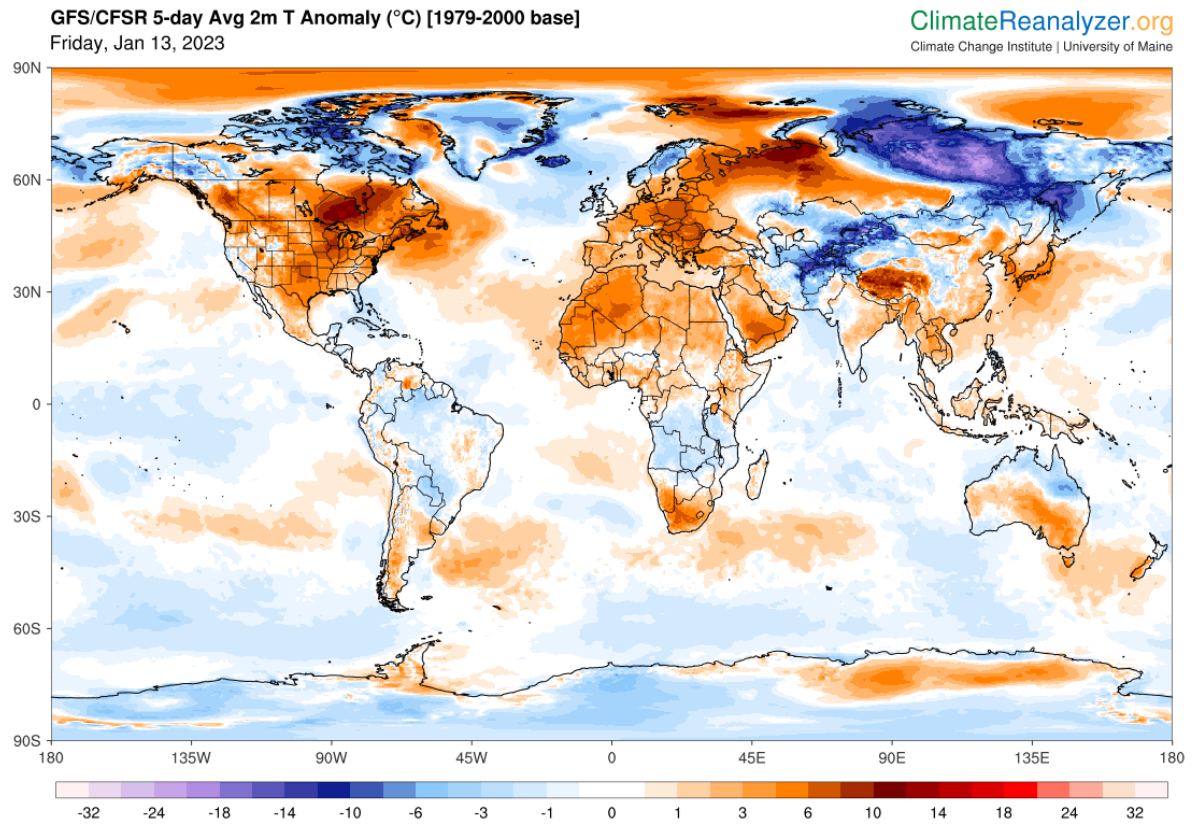
### **Landslide (Colombia)**

A large-scale landslide, likely triggered by heavy rainfall, affected more than 700 people in the Rosas Cauca municipality, western Colombia, on January 10. Landslide that was approximately 850 meters (2,790 feet) wide and 900 meters (2,950 feet) long and completely destroyed at least 64 homes, according to local disaster authorities (UNGRD).

### **Flooding (Portugal, Spain, UK)**

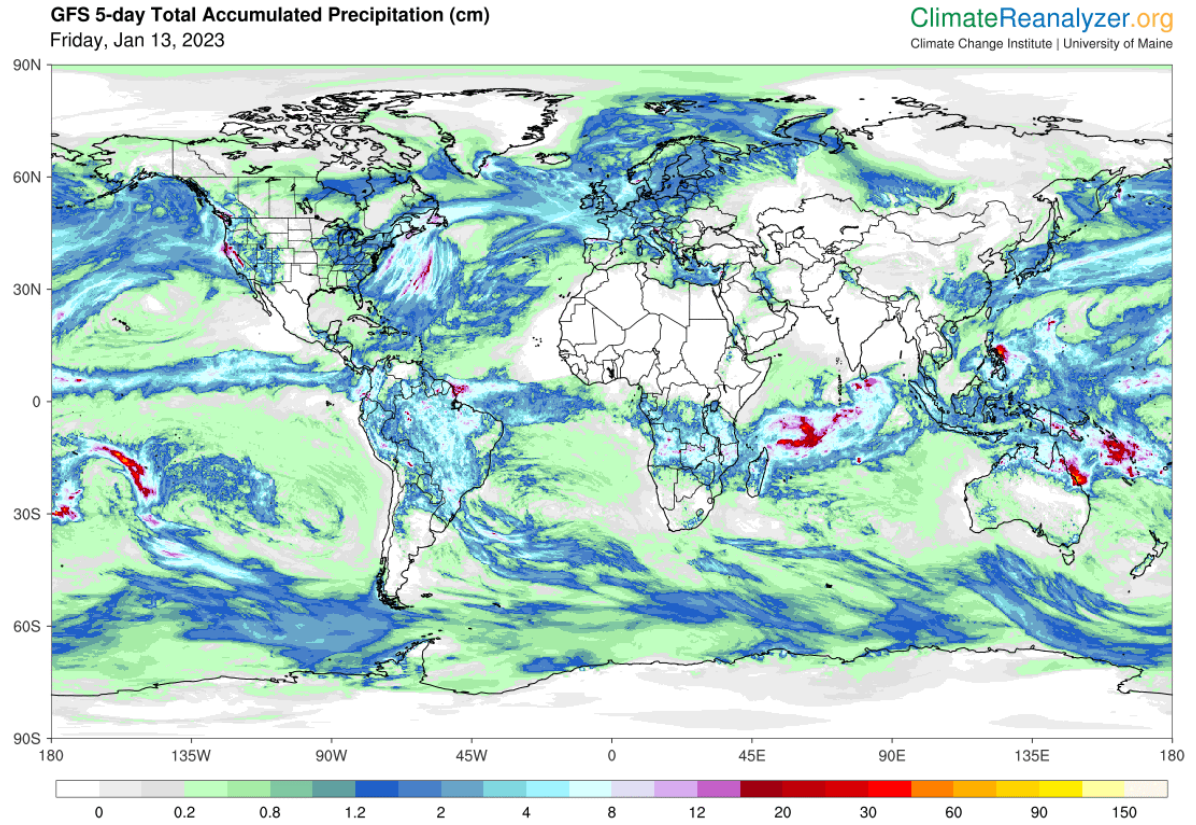
Parts of Western Europe were affected by heavy rainfall as an active cyclonic pattern established in early to mid-January. Frontal system associated with a low-pressure system named Constantin resulted in localized flooding on the Iberian Peninsula on January 8, particularly around Porto in Portugal and in Salamanca Province in Spain. Later, on January 12, another low (named Egbert) brought strong winds and heavy rainfall to parts of the United Kingdom. Resulting floods affected parts of Wiltshire, Somerset and Gloucestershire. An active pattern was expected to continue in the coming days as relatively strong winds were anticipated in parts of the UK, France and Germany.

## Global Temperature Anomaly Forecast



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

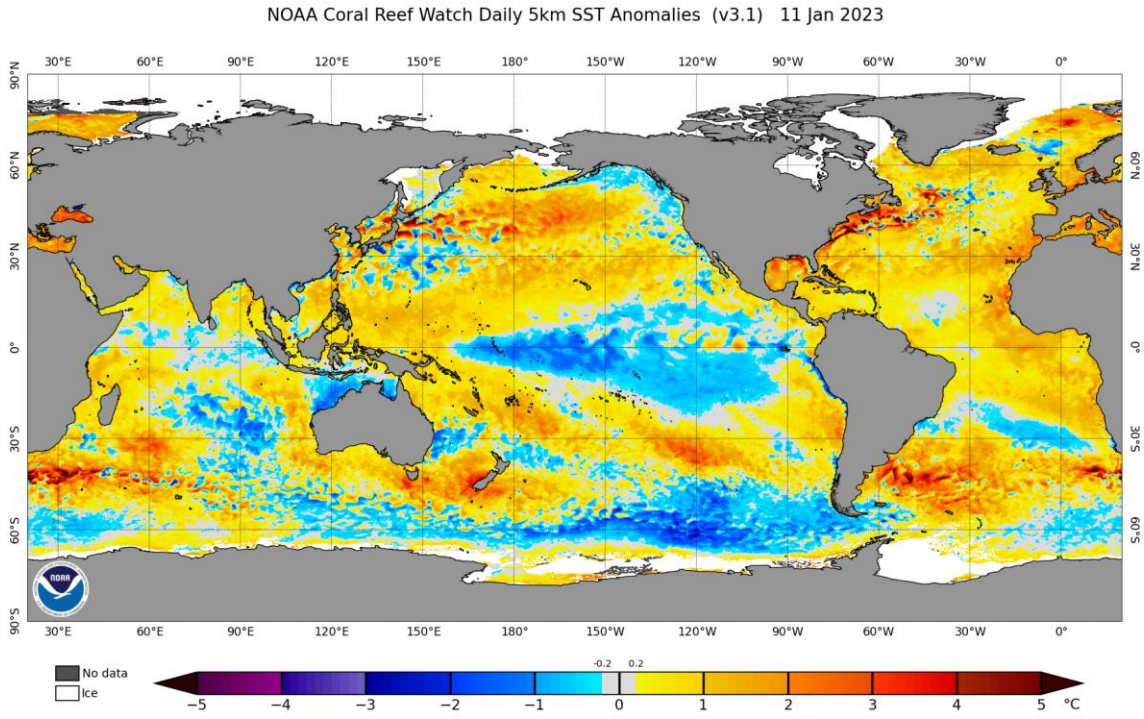
# Global Precipitation Forecast



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

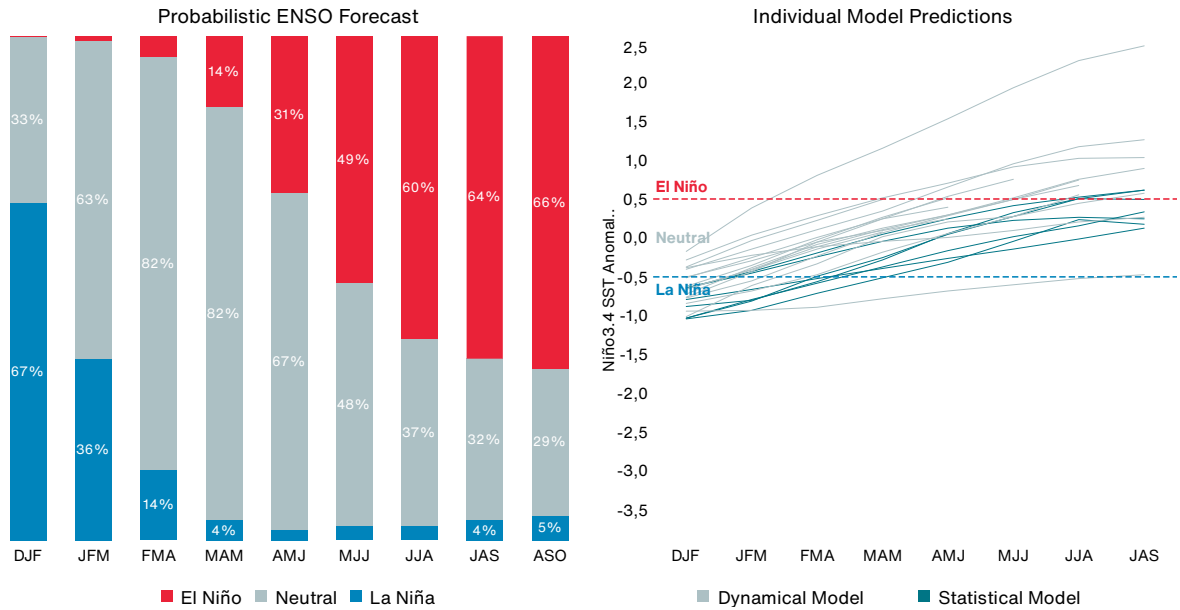


## Weekly Sea Surface Temperature (SST) Maps (°C)



## El Niño-Southern Oscillation (ENSO)

Probabilistic ENSO Model Projections: Mid-December 2022



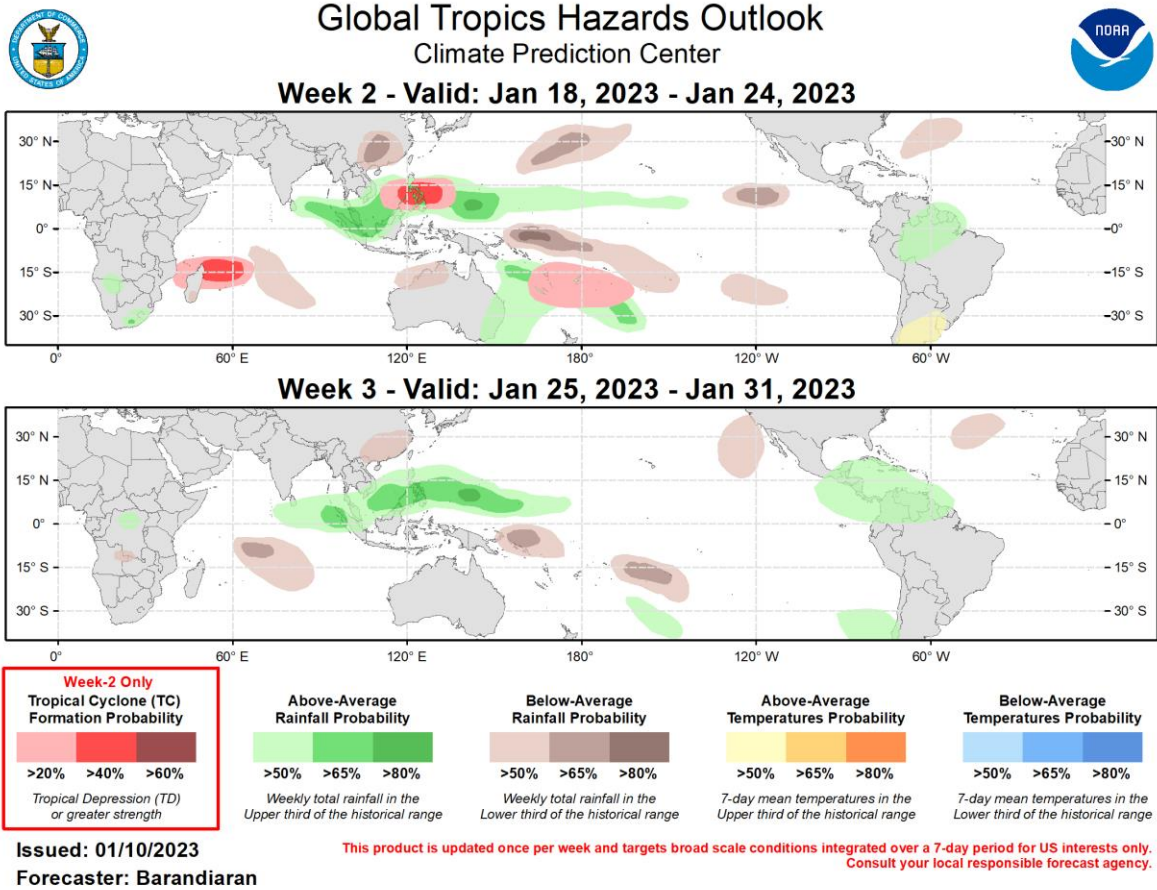
**El Niño:** Warm phase of an ENSO cycle. Sea surface temperatures of +0.5°C occur across the east-central equatorial Pacific.

**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.

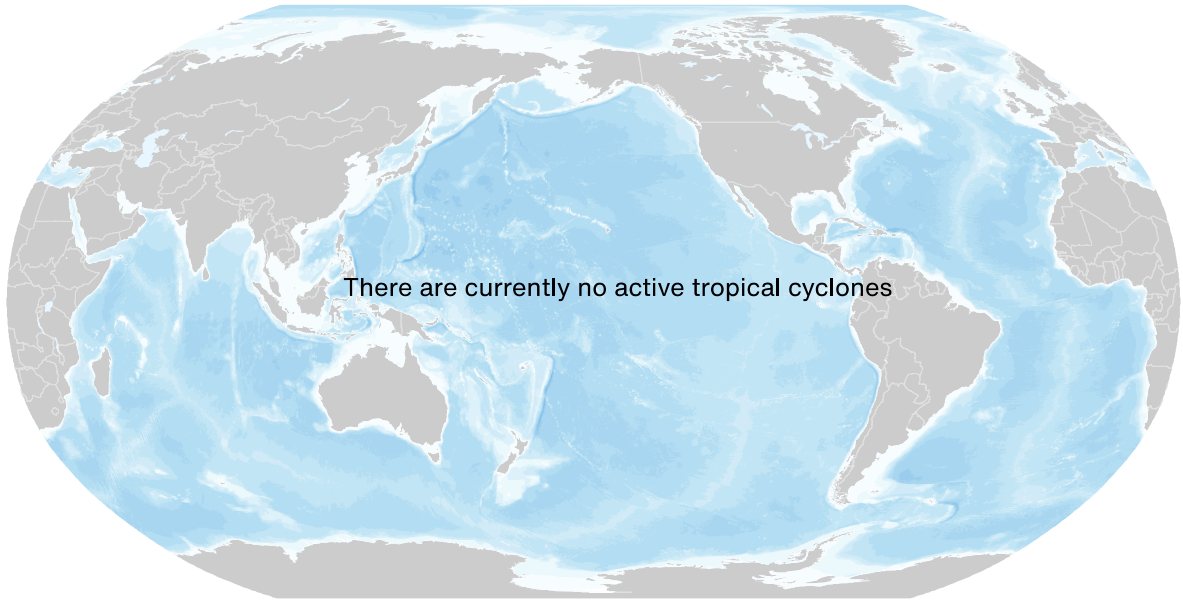
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

## 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

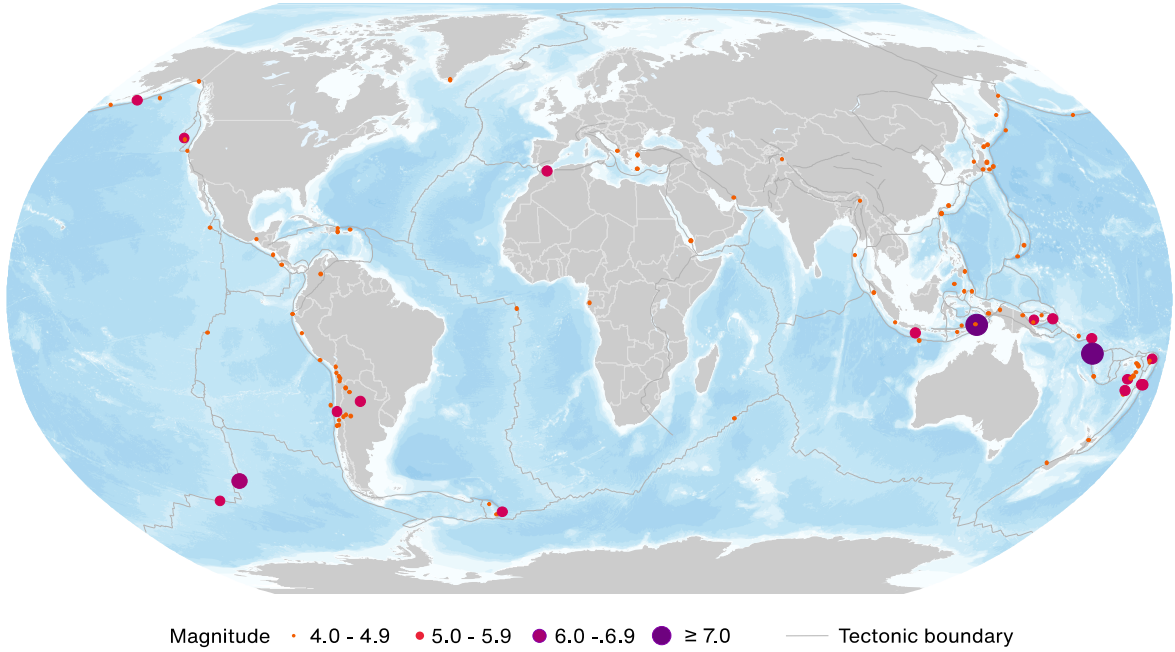
Storm Name	Location	Winds	Location from Nearest Land Area

\* 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 ( $\geq M4.0$ ): Jan 6-12

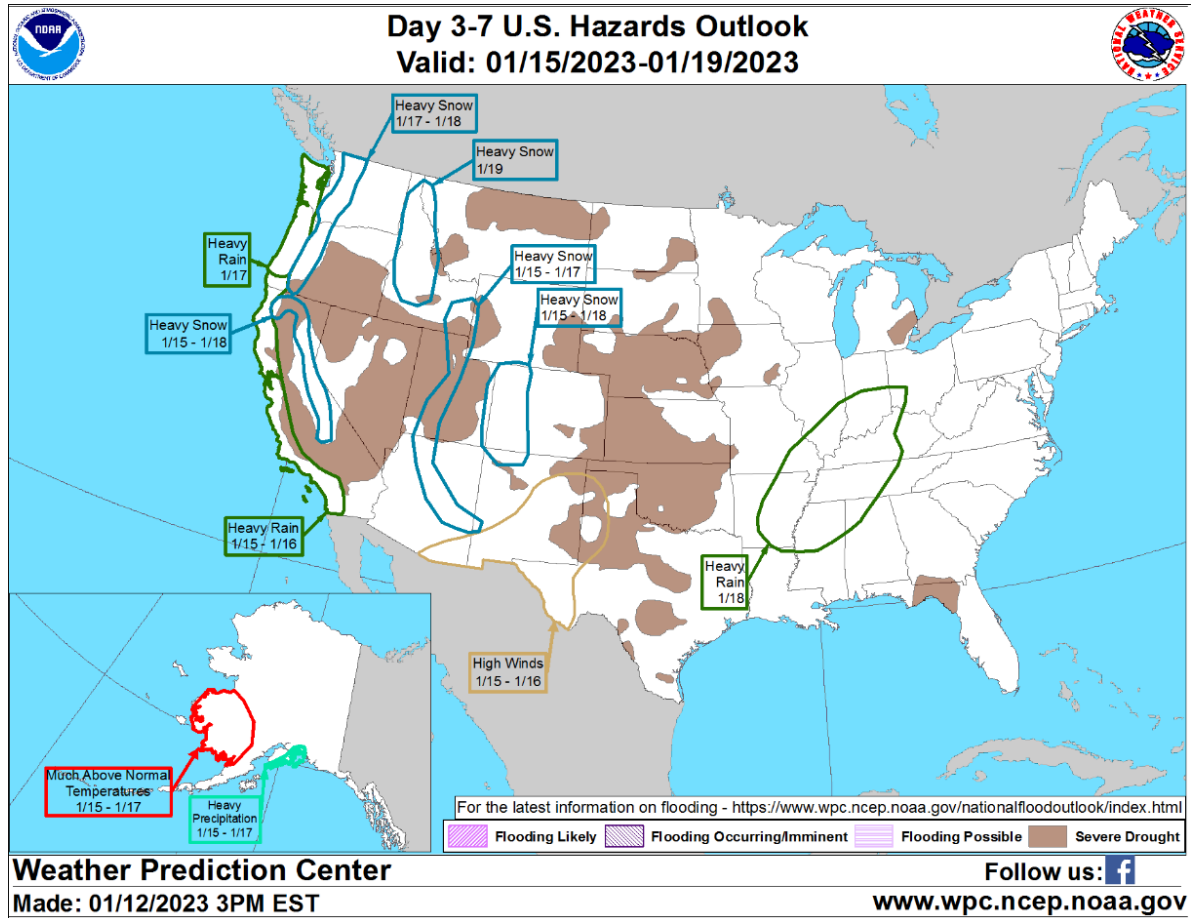


Date (UTC)	Location	Magnitude	Epicenter
1/8/2023	14.94S, 166.88E	7.0	23 km (14 miles) WNW of Port-Olry, Vanuatu
1/9/2023	7.05S, 130.04E	7.6	Pulau Pulau Tanimbar, Indonesia
1/11/2023	49.86S, 114.30W	6.0	southern East Pacific Rise

Source: United States Geological Survey

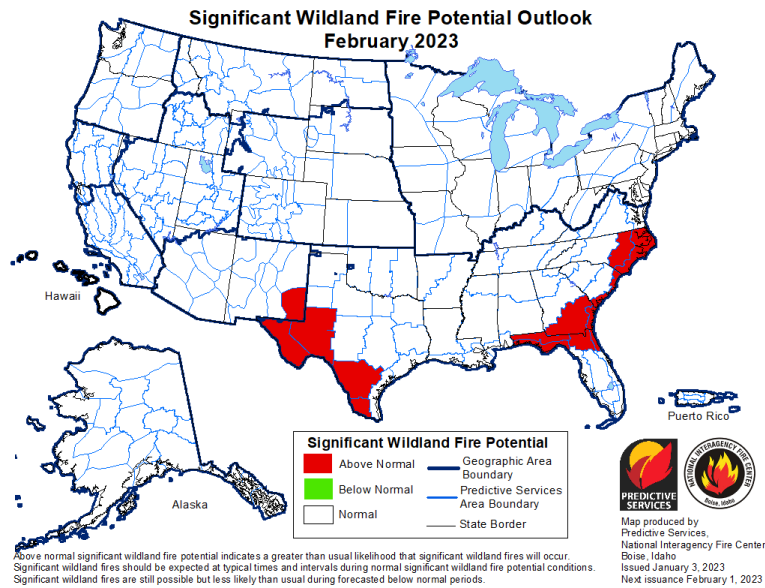
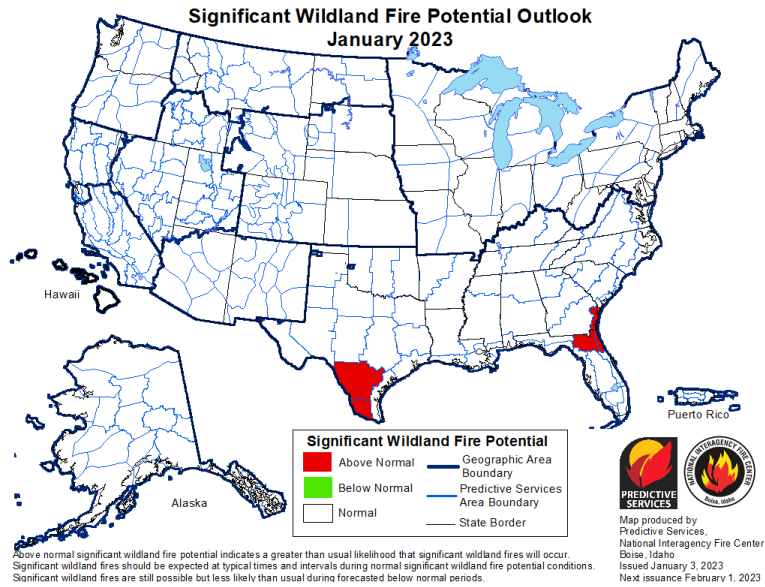


## U.S. Hazard Outlook



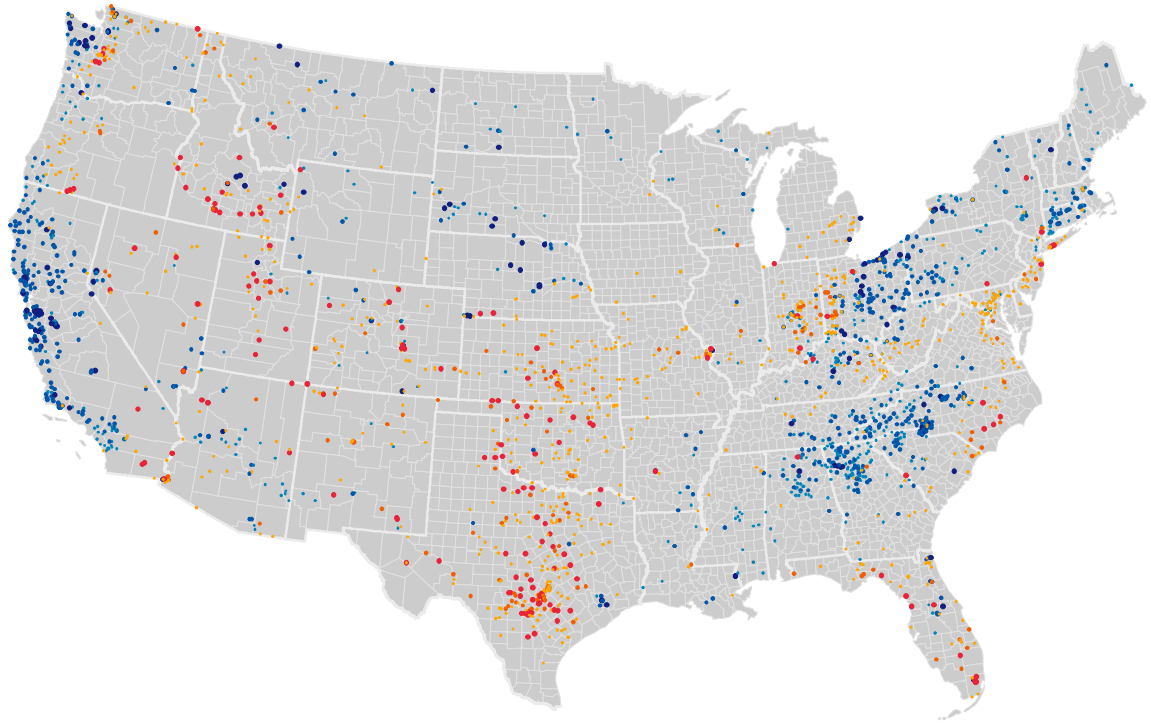
Source: Climate Prediction Center (NOAA)

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



Source: NIFC

## U.S. Current Riverine Flood Risk



- |                            |                           |                         |                    |
|----------------------------|---------------------------|-------------------------|--------------------|
| High Flows<br>(Percentile) | • ≥ 99 / Above floodstage | Hydrological<br>Drought | • Severe Drought   |
|                            | • 95 - 99                 |                         | • Moderate Drought |
|                            | • 90 - 95                 |                         | • Below Normal     |

*A ≥99<sup>th</sup> 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.*

Source: United States Geological Survey

## Source Information

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### **United States: Flooding (Update)**

U.S. National Weather Service (NWS)

90% of Californians are under flood watches as another storm threatens mudslides, power outages and deadly inundation, CNN

California storm death toll reaches 17 as floods and extreme wind wreak havoc, *Los Angeles Times*

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

Noticeable cold spell in north-west India, *CatNat.net*

U.S. Geological Survey (USGS)

Indonesian Agency for Disaster Management (BNPB)

Colombian Agency for Disaster Management (UNGRD)

UK weather: flooding and travel disruption after heavy rain, Guardian

## Contacts

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