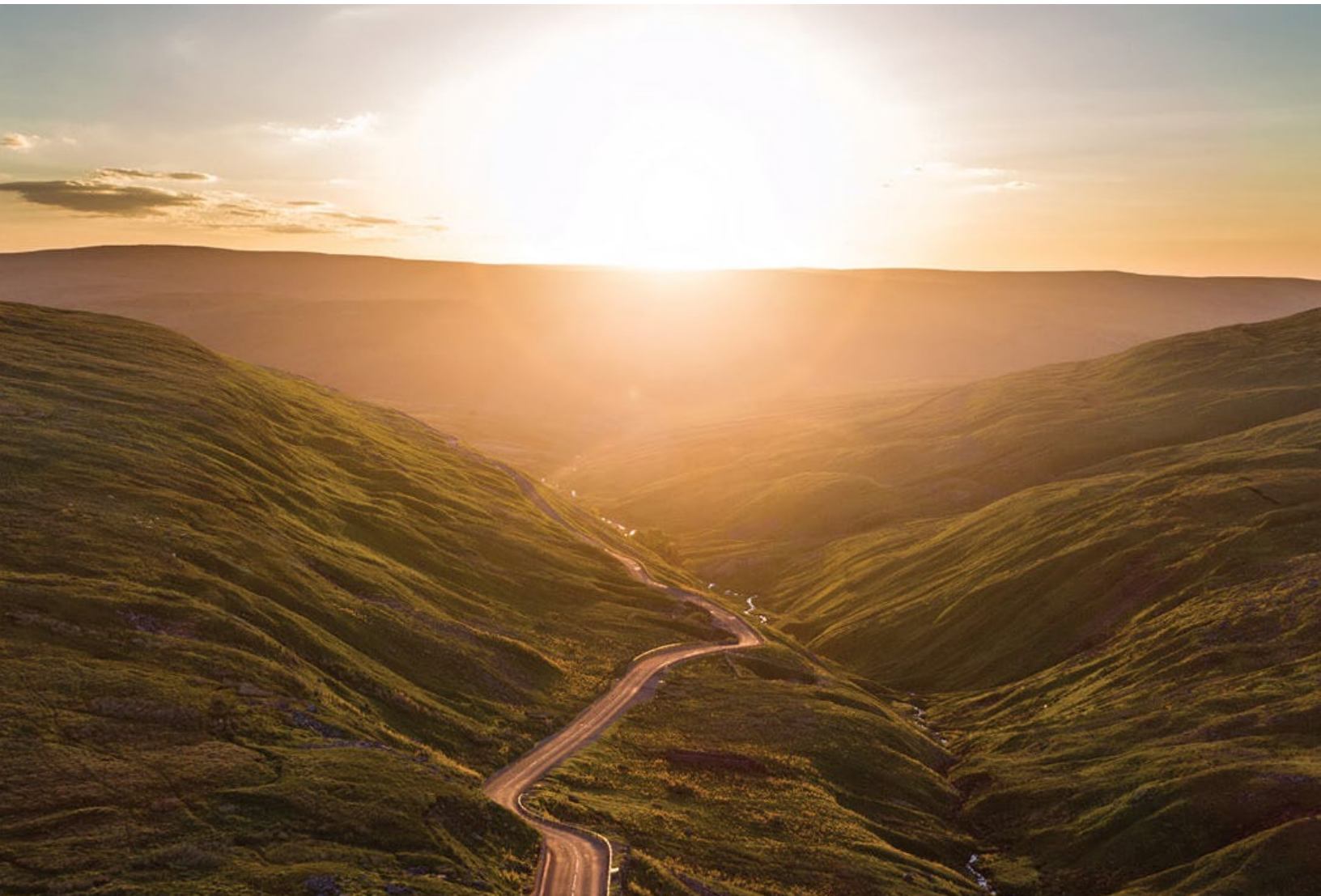
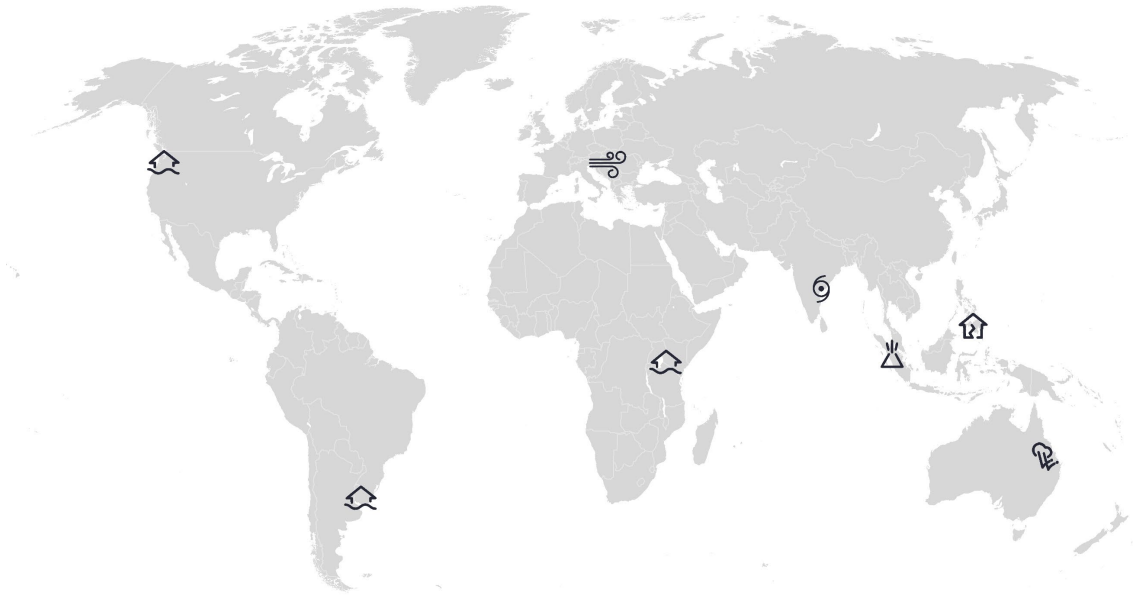
Weekly Cat Report

December 8, 2023



Executive Summary



Event	Affected Region(s)	Fatalities	Economic Loss ($)	Page
Earthquakes	Philippines	3	10s of millions	3
Cyclone Michaung	India	10	10s of millions	5
Flooding & Landslides (Update)	Eastern Africa	377+	Unknown	7
Flooding	United States	2	Millions	9
Volcanic Eruption	Indonesia	23	Negligible	9
Severe Convective Storm	Australia	0	10s of millions	9
Flooding & SCS	Uruguay	0	Millions	9
Winter Weather	Europe	0	Millions	9

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

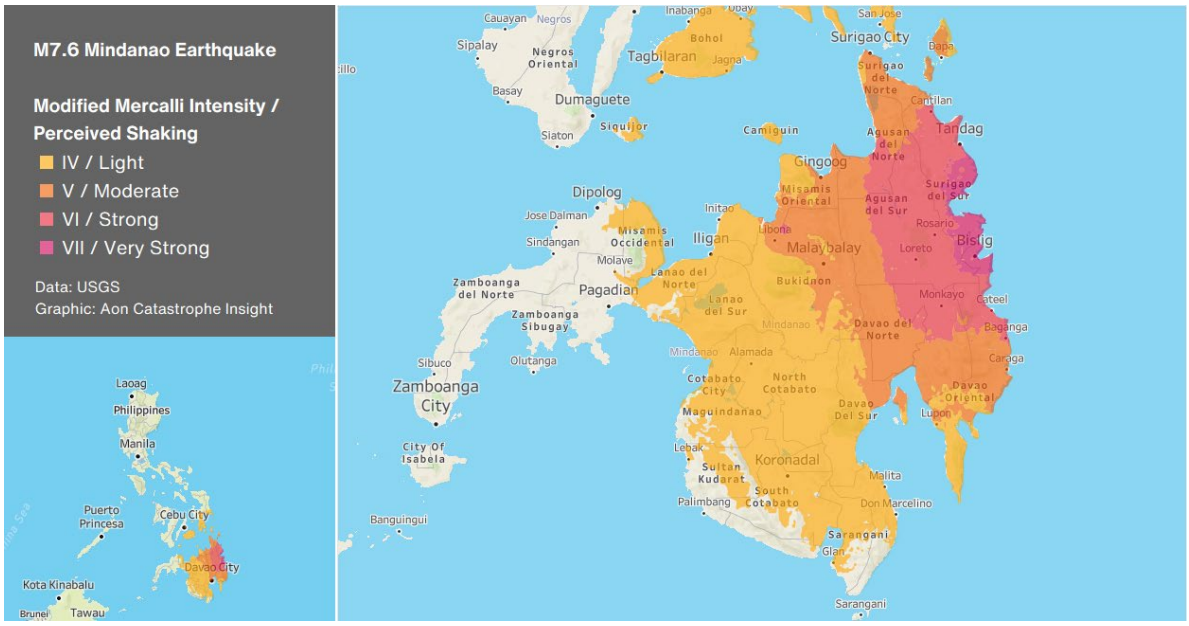
Philippines: Earthquakes

Overview

A series of strong earthquakes jolted the southern Philippines's Mindanao Island on December 2-3. A main shock with a magnitude of 7.6 occurred close to the southeast coast of the island. Tremors caused notable structural damage to nearly 5,300 residential properties, left at least three people dead, and injured dozens of others.

Seismological Recap

The main magnitude-7.6 shock occurred on December 2, 2:37 PM (UTC) at a depth of 33 km (20.5 miles), with an epicenter southeast of Mindanao Island, southern Philippines. The main shock was followed by several strong earthquakes of magnitude above 6, and thousands of weaker tremors were recorded between December 2-3. According to the USGS, the earthquakes were a result of oblique reverse faulting at a shallow depth of about 75 km (47 miles) west of the Philippine Trench. The Philippine Sea plate is bordered by the larger Pacific and Eurasia plates and the smaller Sunda plate. Regarding many subduction zone plate boundaries, the Philippines frequently experiences moderate to large earthquakes. Historically, there have been about 250 M7.0+ and 7 M8.0+ events, according to the USGS records.



Event Details

Following the strongest tremors on December 2, almost 830,000 people felt very strong shaking (intensity VII on the Modified Mercalli Intensity scale). As of December 8, the local disaster authority (NDRRMC) reported 3 deaths, and at least 65 injuries. Nearly 5,300 houses suffered various levels of damage, along with additional damage to infrastructure.

Below is the breakout of damage and casualties by region, provided by the National Disaster Risk Reduction and Management Council:

Region	People Affected	Killed	Injured	Homes Damaged	Homes Destroyed
CARAGA	641,254	2	51	4,731	377
Region 11	1,943	1	14	157	24
Region 10	23	0	0	0	5
TOTAL	**643,220**	**3**	**65**	**4,888**	**406**

Financial Loss

USGS's PAGER methodology estimated potential economic losses in the millions of USD, however, given many damaged structures, total losses can reach even higher. Officials noted that the cost on the public infrastructure alone might reach at least PHP500 million ($9 million).

India: Cyclone Michaung

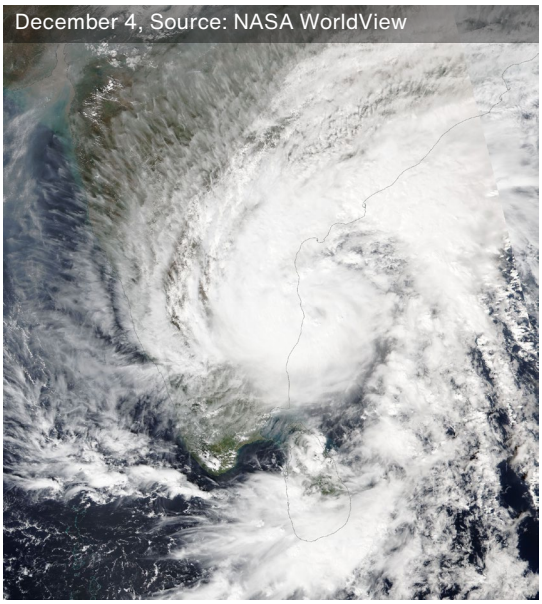
Overview

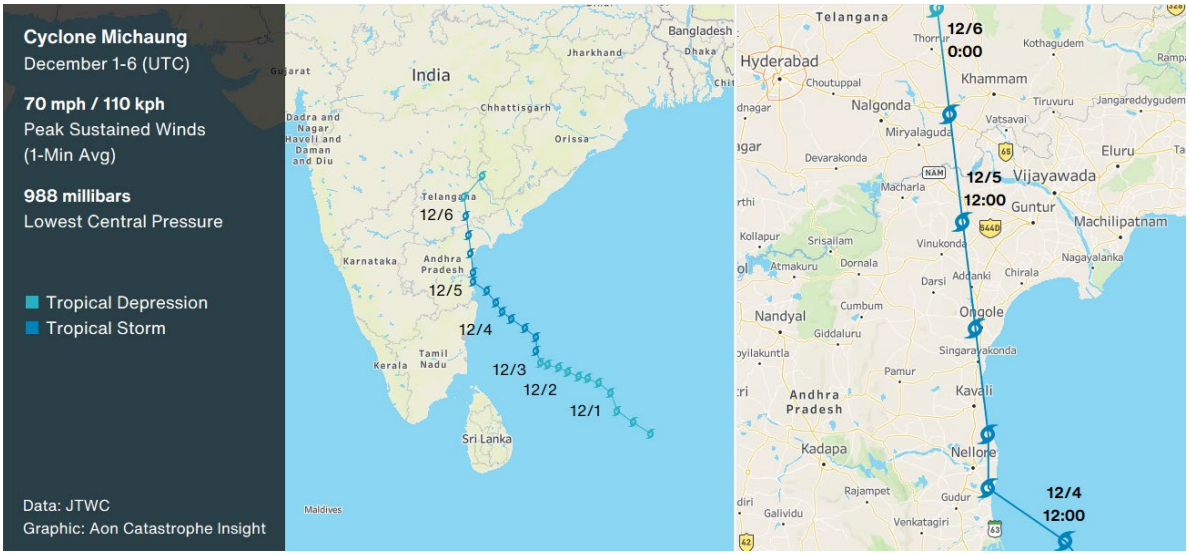
Cyclone Michaung, the sixth named cyclonic storm of the North Indian Ocean season, generated heavy rainfall and strong winds across several states in southeast India on December 4-6. The storm claimed at least 10 lives, caused notable material damage, and forced tens of thousands of people to be evacuated. Total economic losses can potentially reach the tens of millions of USD.

Meteorological Recap

The storm formed from a low-pressure area over the Bay of Bengal on November 29, gradually intensifying into the tropical storm status and tracking northwest towards the coast of India. The storm was named Michaung by the Myanmar Meteorological Service on December 2. It made landfall near Bapatla in India's Andhra Pradesh on December 5 as a high-end tropical storm on the Saffir-Simpson scale with maximum wind gusts of 110 kph (70 mph).

Michaung brought strong winds along India's southeast coast, particularly affecting Andhra Pradesh and Tamil Nadu states. The storm generated torrential rainfall up to 390 mm (15.4 inches) locally. Rainfall and wind intensities were lower across the Chhattisgarh, Telangana, and Odisha states as the storm moved inland later on December 6. India's meteorological department (IMD) issued a red alert for the region.





Event Details

As of December 6, a report from India's Ministry of Home Affairs (MOHA) stated that over 25,000 people from more than 100 municipalities were evacuated across the coastal states of **Tamil Nadu** and **Andhra Pradesh** as the storm approached on December 4-5. Between both states, at least 10 storm-related fatalities occurred, and 196 houses were either partially or fully destroyed. The city of Chennai, Tamil Nadu's capital, was especially impacted by widespread flooding, leading to significant transportation and power disruptions. Local authorities were prompted to close an international airport as well as all schools across the city through December 7. Additionally, extensive crop damage to at least 60,400 acres (25,500 hectares) was seen in Andhra Pradesh and Odisha.

Financial Loss

While damage assessments are still ongoing, total economic and insured losses from Michaung could potentially reach into the tens of millions of USD.

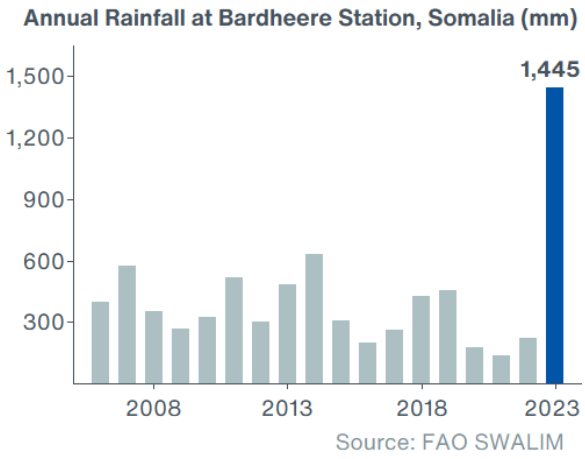
Eastern Africa: Flooding & Landslides (Update)

Overview

Multiple countries in Eastern Africa have been hit by continuous rainfall and widespread flooding since the beginning of October. Most recently, the Manyara region in northern Tanzania was devastated by flash flooding and landslides. Considerable infrastructural and agricultural losses continue to materialize across the entire region, including increased losses in Somalia, Ethiopia, and Kenya.

Meteorological Recap

In recent weeks, the 2023 October-December seasonal rains have intensified across much of eastern Africa and continue to trigger severe flooding and landslide events into early December. The presence of El Niño conditions and a positive Indian Ocean Dipole are likely influencing the enhanced rainfall and flooding seen over this region. This year's water levels peaked well above the long-term October-November mean and the year-to-date accumulated precipitation means at multiple locations across Somalia. In recent days, the heaviest rains moved further south into northern Tanzania, where material damage and casualties due to flooding and landslides occurred between December 2-3.



Event Details

Flooding and landslides in Hanang District, Tanzania
Source: Tanzania Red Cross Society

Tanzania's Manyara region has been one of the hardest hit since December 2. Notably, a recent landslide near the Katesh village in the Hanang district left more than 56 people dead, at least 120 injured, and several people remain missing. Additional material damage, such as hundreds of hectares of inundated crops and more than 1,100 flooded homes, was incurred. The full seasonal, flood-related death toll stands at 63 in Tanzania as of this writing.

Losses also continue to increase in **Ethiopia**, **Kenya**, and **Somalia**. More than 2.4 million people have been affected and more than 1 million have been displaced across at least 36 country districts. As of December 4, no fewer than 110 people died.

The ongoing October-December rainy season has already claimed more than 370 lives, affected and displaced millions of people, and caused notable material damage across most of eastern Africa.

The Table below summarizes the seasonal flood-related impact within individual countries and regions, according to the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) and local authorities.

Country	Regions Affected	People Affected	Fatalities	Damaged Houses
Burundi	Makamba	5,000	4	-
Ethiopia	Somali, Afar, Oromia, SNNP, Gambela	1,500,000	57	-
Kenya	North Eastern, Eastern	500,000	136	-
Malawi	Nsanje, Machinga	-	1	-
Somalia	South West, Hirshabelle, Jubaland, Galmudug	2,400,000	110	26,000
Tanzania	Arusha, Kigoma, Kagera, Manyara, Pwani	10,000	69	2,350

Financial Loss

Although considerable infrastructural and agricultural losses have already occurred, it remains too early to determine the full economic impact of the current seasonal flooding situation. Nevertheless, the current flooding crisis will continue to be a significant humanitarian risk for millions of people within this highly vulnerable region.

Natural Catastrophes: In Brief

Flooding (United States)

Multiple atmospheric rivers brought several rounds of heavy rain and snow to the Pacific Northwest on December 1-6. The heaviest precipitation fell over Oregon and Washington on December 4-6, where several locations saw 6-10 inches (150-250 mm) of rain, according to the National Weather Service. The ensuing floods stranded numerous vehicles, damaged several roads, and inundated at least 40 homes across both states. Hundreds of people were evacuated or rescued, and two flood-related fatalities were confirmed as of December 7.

Volcanic Eruption (Indonesia)

Mount Merapi, a volcano on the Indonesian island of Sumatra, spewed a 3-kilometer (9,800 ft) ash cloud into the air following its eruption on December 3. According to the local authorities, 75 hikers were in the area during the initial eruption. As of December 6, 23 hikers have been confirmed dead and at least 12 others were injured.

Severe Convective Storm (Australia)

Severe thunderstorms containing large hailstones caused notable property, vehicular, and agricultural damage in Queensland on December 3. Local emergency services responded to numerous severe weather-related incidents as the Fraser Coast, Gympie, and Sunshine Coast regions reported hail larger than 10 cm (4 inches) in diameter. Hundreds of claims related to the event have already been reported by major insurers, and total losses will likely reach into the millions of AUD.

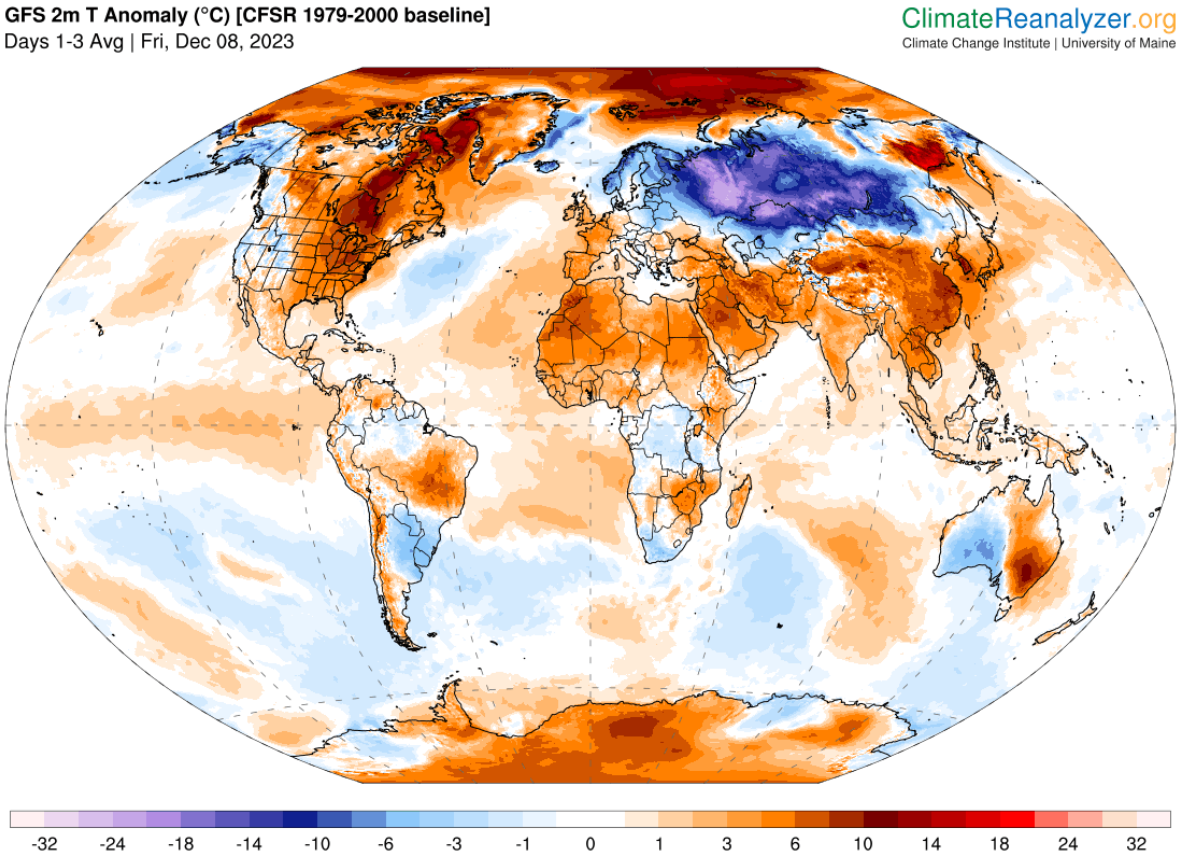
Flooding & SCS (Uruguay)

On December 1, intense thunderstorms dumping up to 100 mm (4 inches) in just 2 hours impacted Montevideo, the capital city of Uruguay. Subsequent flash flooding, along with wind gusts exceeding 100 kph (60 mph), caused widespread property and vehicle damage across the metro area. Notably, floodwaters within a hospital caused significant damage while forcing 70 patients to be relocated.

Winter Weather (Europe)

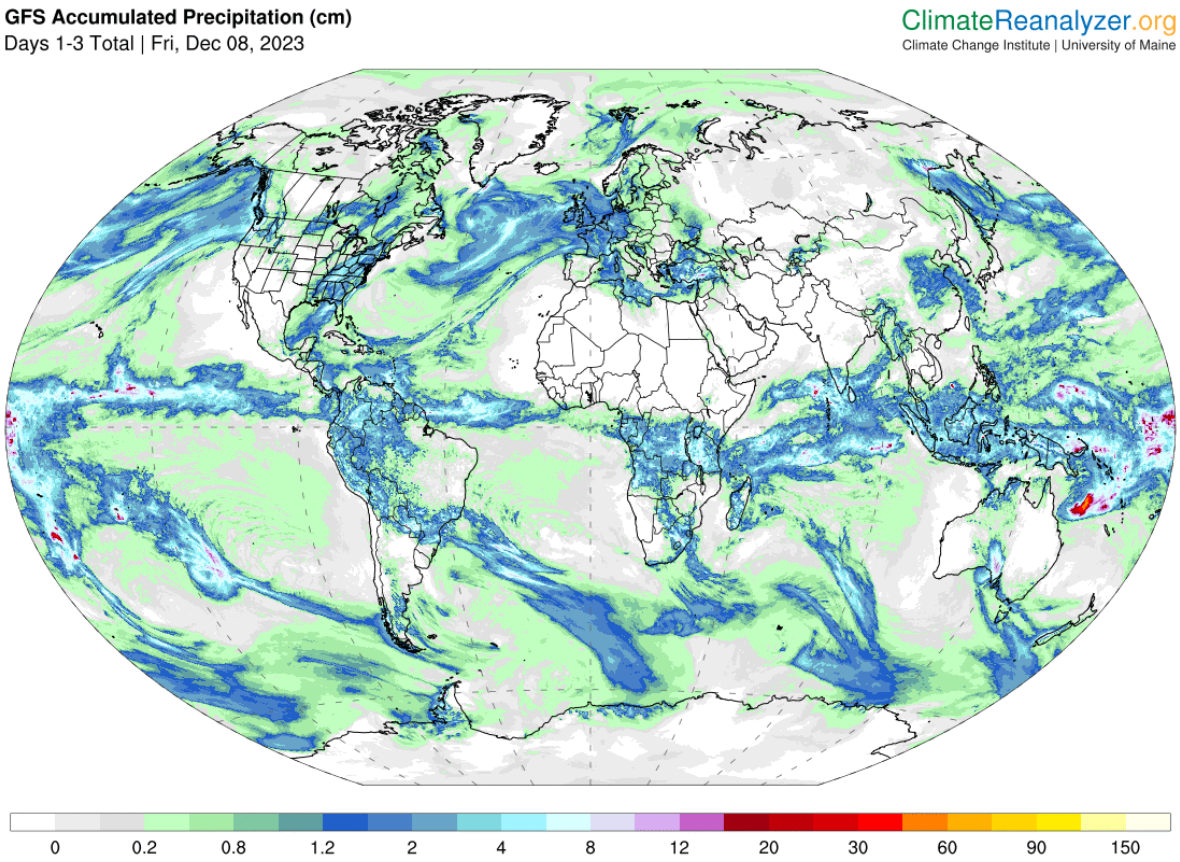
On December 1, a low-pressure area developed over northern Italy and was named Ciro by the Italian Meteorological Service. Ciro slowly tracked northeastward, generating various hazards across Central and Southeastern Europe, including strong wind gusts, heavy rainfall accompanied by localized flooding, and intense snowfall. A red rain warning was issued for the regions of Liguria and Tuscany in Italy. A rare red snow and ice warnings were in place for parts of Poland and the Czech Republic. Heavy snowfall of up to 40 cm resulted in notable disruption in the Czech Republic and southern Germany, thousands of customers were left without power in multiple countries, including Romania. The notable disruption occurred in the city of Munich.

Global Temperature Anomaly Forecast



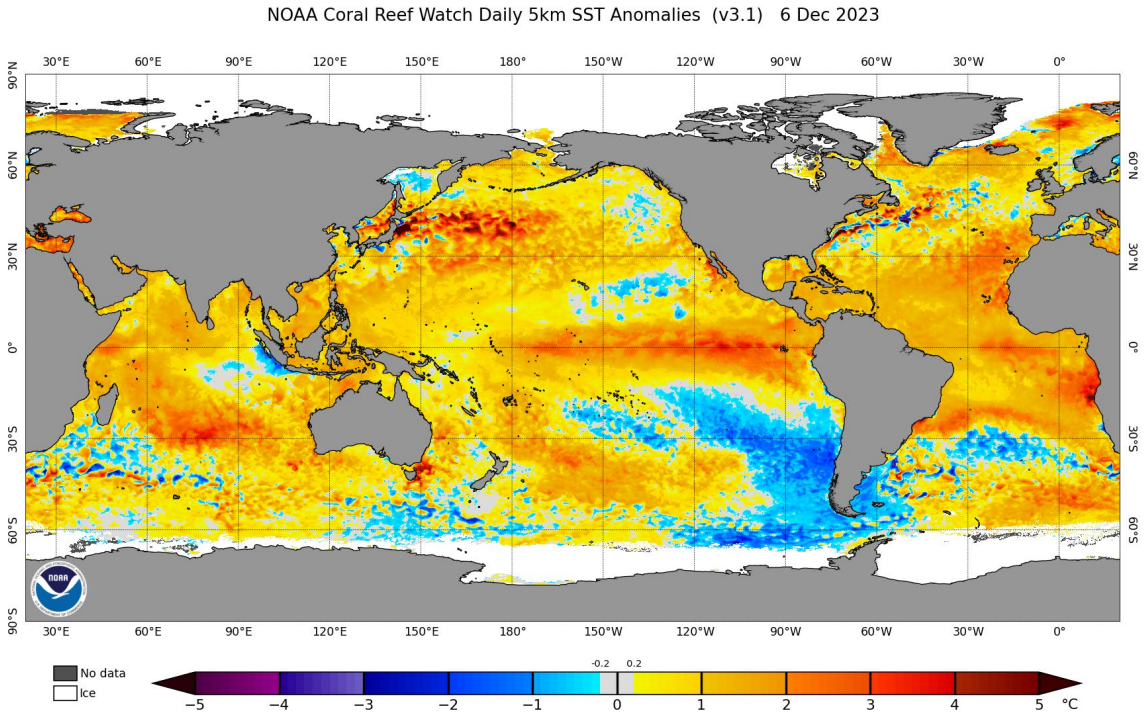
Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

Global Precipitation Forecast

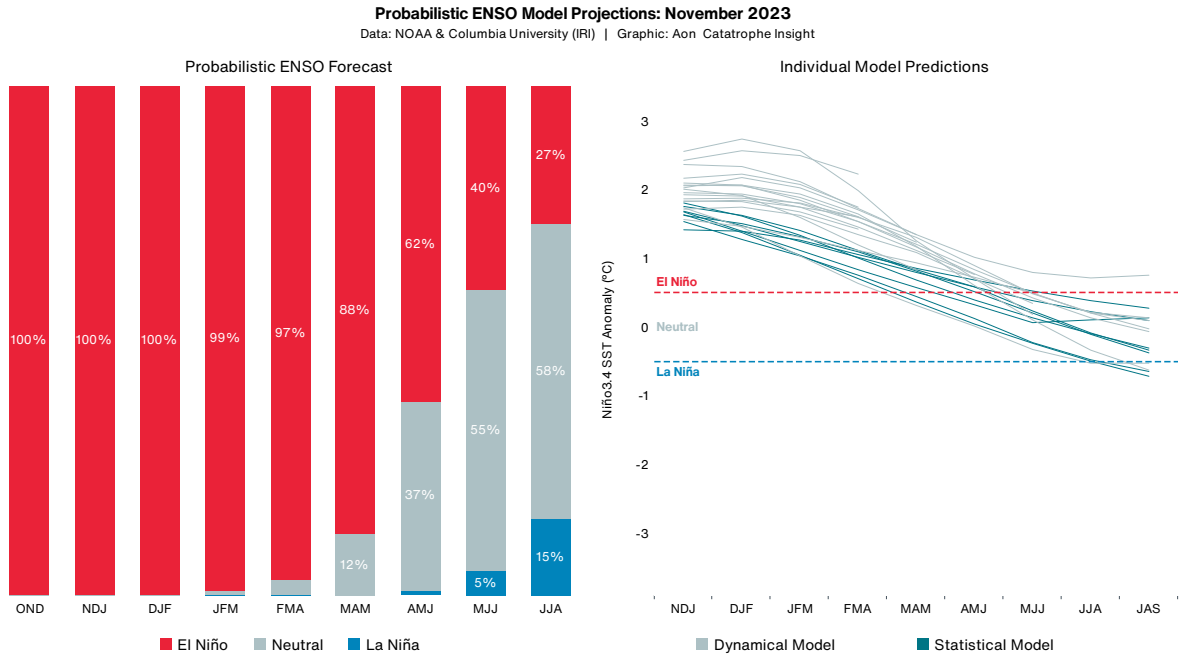


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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



El Niño-Southern Oscillation (ENSO)



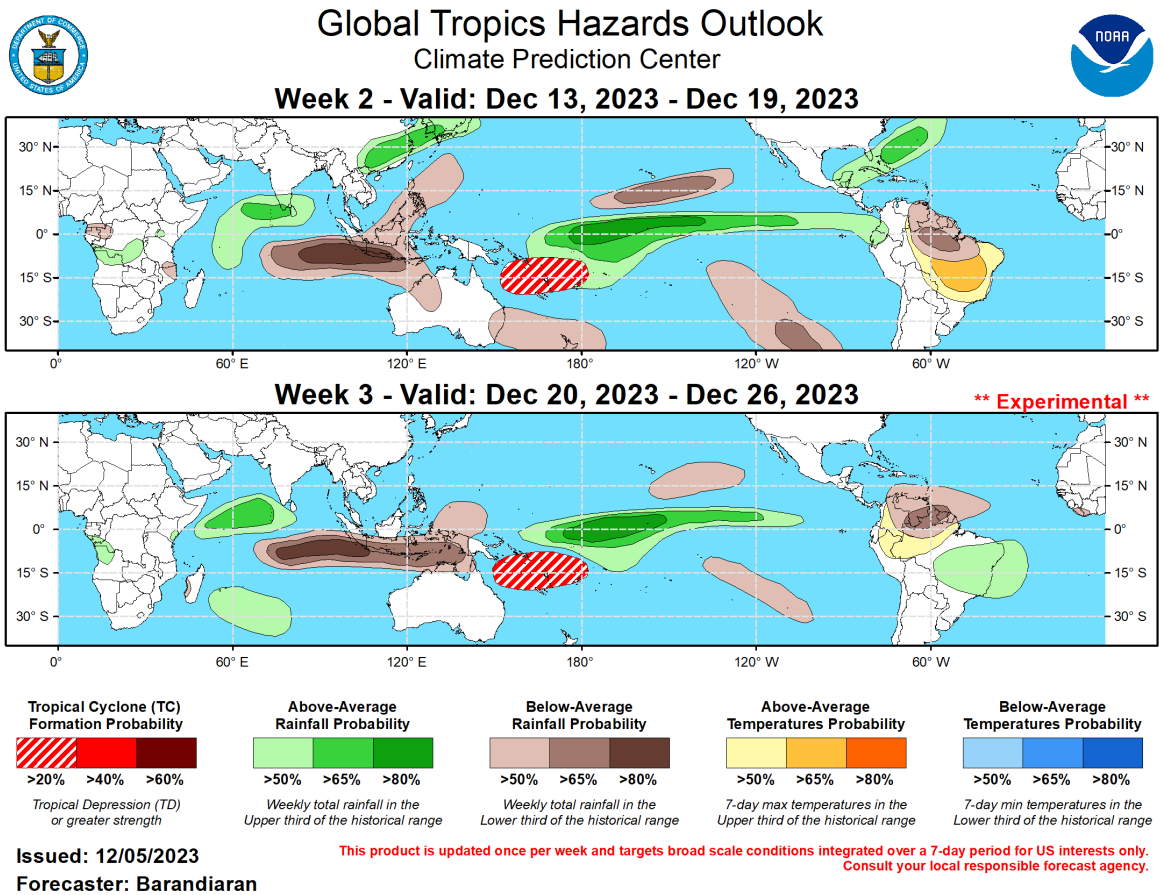
El Niño: *Warm phase of an ENSO cycle. Sea surface temperatures of +0.5°C occur across the east-central equatorial Pacific.*

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.*

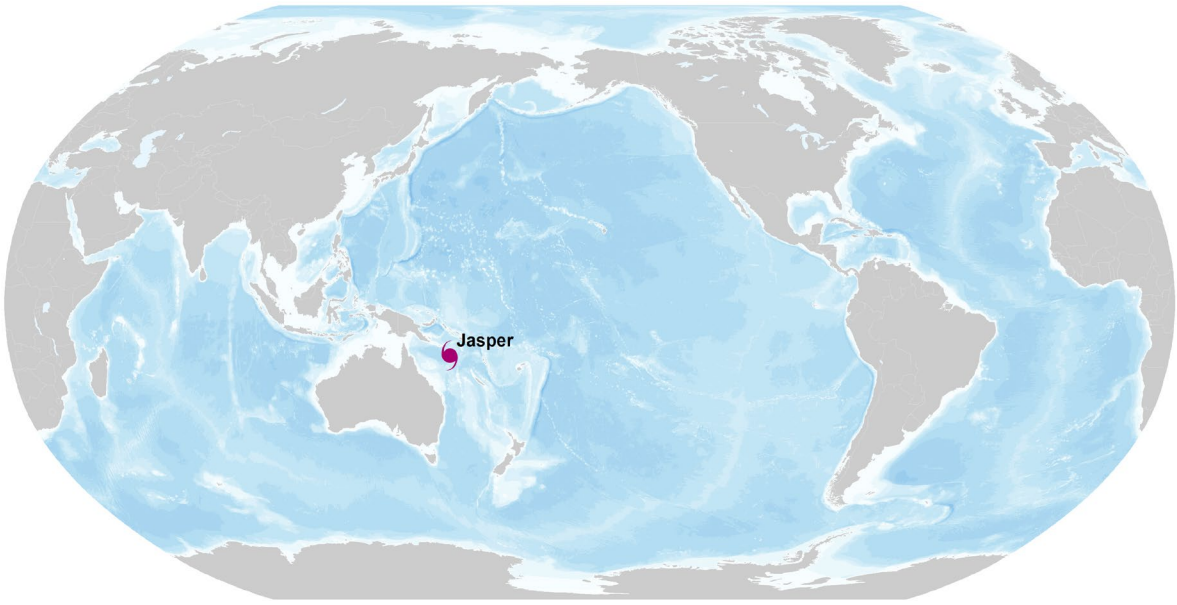
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

Global Tropics Outlook



Source: Climate Prediction Center (NOAA)

Current Tropical Cyclone Activity

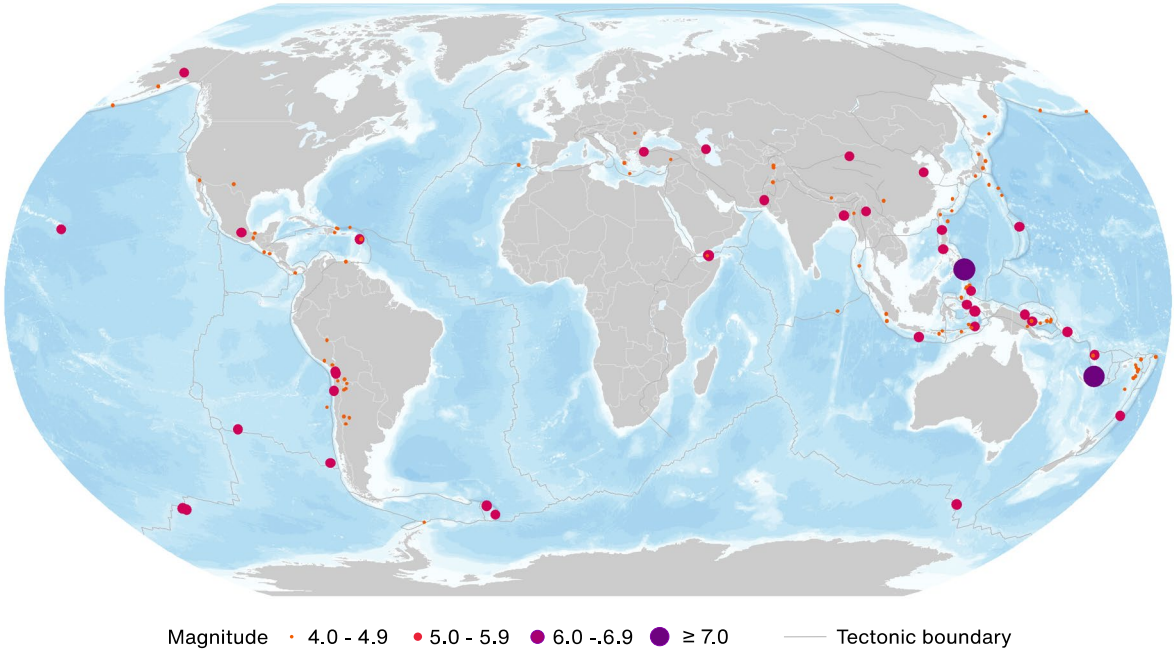


Name	Location	Winds	Center
CY Jasper	14.2S, 156.6E	135	400 miles (640 km) SW from Honiara, Solomon Islands

* 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)

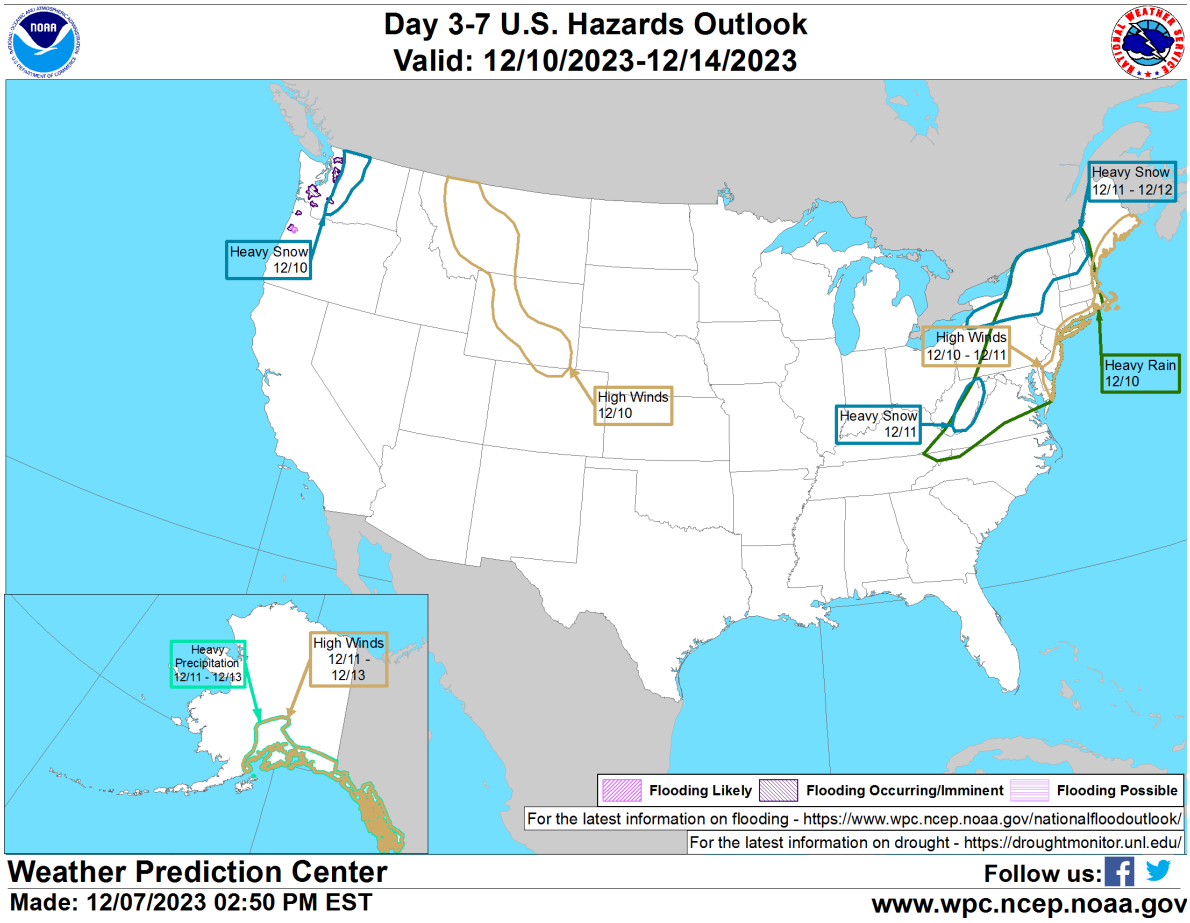
Global Earthquake Activity (≥M4.0): December 1-7



Date (UTC)	Location	Mag	Epicenter
12/2/2023	8.53N, 126.45E	7.6	Mindanao, Philippines
12/2/2023	8.41N, 126.78E	6.4	47 km (29 miles) NE of Barcelona, Philippines
12/2/2023	8.50N, 127.20E	6.9	92 km (57 miles) ENE of Barcelona, Philippines
12/2/2023	8.38N, 126.75E	6.1	near Philippines
12/2/2023	8.45N, 126.96E	6.2	66 km (41 miles) ENE of Barcelona, Philippines
12/2/2023	8.43N, 126.77E	6.0	47 km (29 miles) NE of Barcelona, Philippines
12/3/2023	8.45N, 126.72E	6.6	43 km (27 miles) ENE of Hinatuan, Philippines
12/3/2023	8.95N, 126.61E	6.9	near Philippines
12/7/2023	20.66S, 169.21E	7.1	12 km (7 miles) S of Isangel, Vanuatu

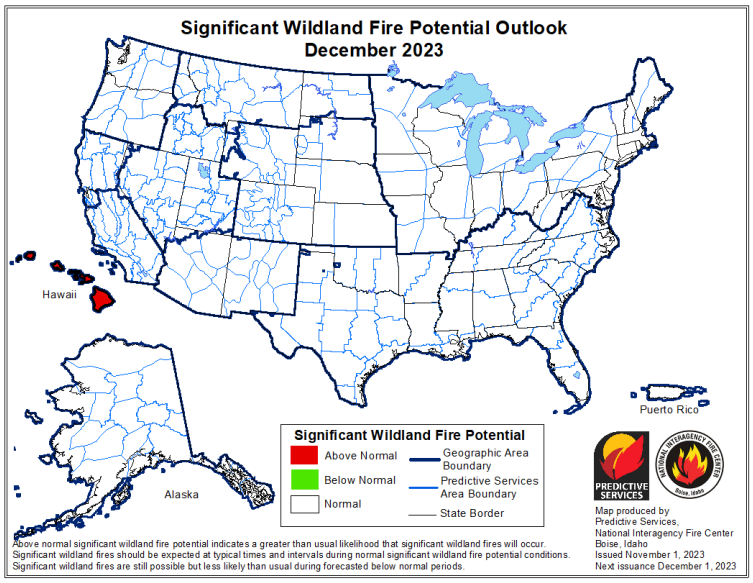
Source: United States Geological Survey

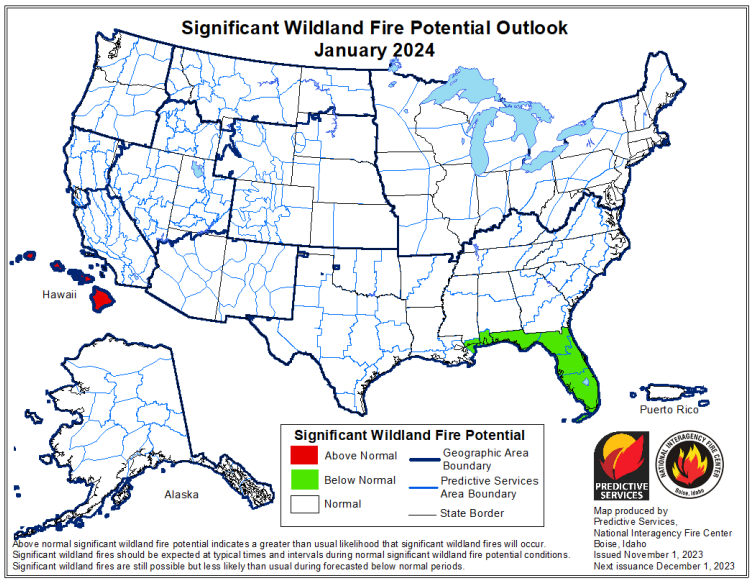
U.S. Hazard Outlook



Source: Climate Prediction Center (NOAA)

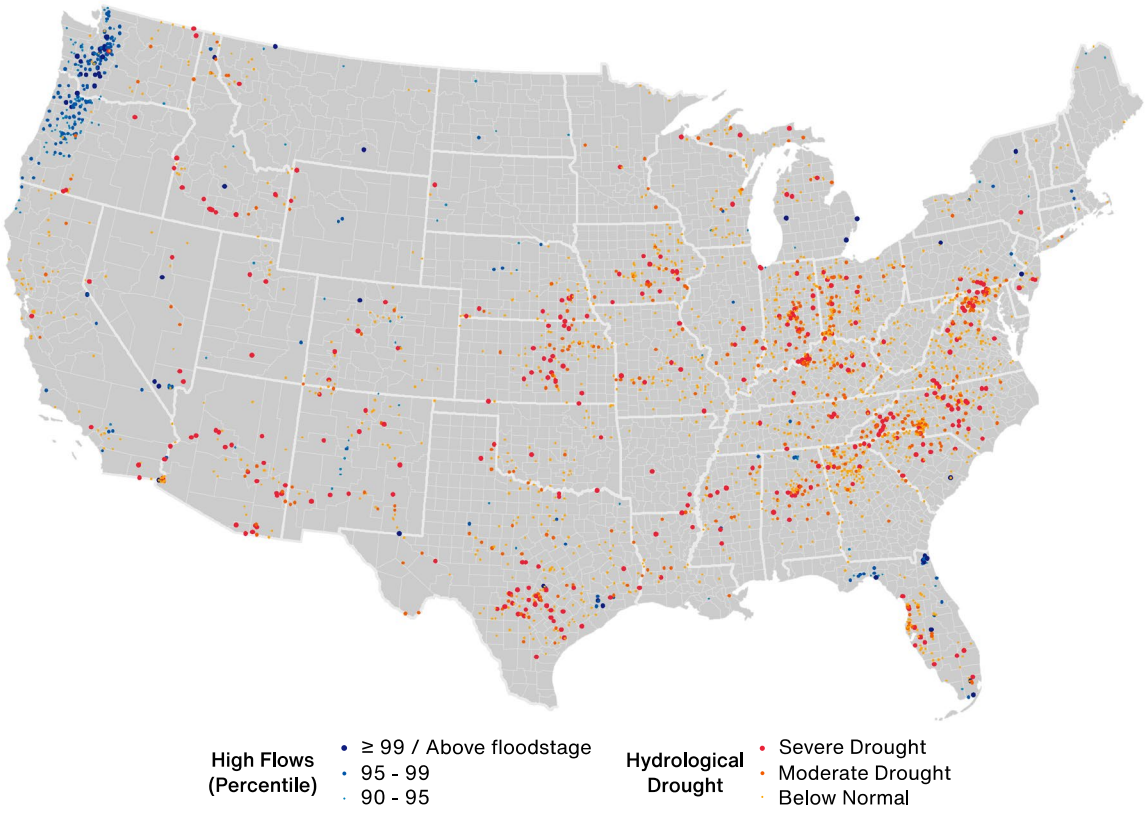
U.S. Wildfire: Significant Fire Risk Outlook & Activity





Source: NIFC

U.S. Current Riverine Flood Risk



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.

Source: United States Geological Survey

Source Information

Philippines: Earthquake

USGS
NDRRMC

India: Cyclone Michaung

Ministry of Home Affairs Disaster Management Division of India
Cyclone Michaung: Rajnath Singh surveys flood damage as schools shut in Chennai, *India Today*
Cyclone Michaung flattens crops in Andhra Pradesh, leaves farmers in despair, *The Economic Times*
JTWC
IMD

Eastern Africa: Flooding & Landslides (Update)

FAO SWALIM
UN OCHA
Tanzania Red Cross Society
Ministry of Interior of Kenya
More than 300 killed as heavy rains wreak havoc across East Africa, *CNN*

Natural Catastrophes: In Brief

NWS
Atmospheric river brings heavy rain, flooding to Pacific Northwest, *CBS News*
ADINet
Indonesia BNPB
Death toll rises to 23 after surprise eruption of Indonesia's Mount Marapi, *NBC News*
Tanzania floods: Heavy rain and landslides kill 47 in Hanang district, *BBC News*
Chaos in Montevideo due to the storm: Cosse attributed flooding to drainage and climate change, *El Pais Uruguay*
ESWD

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