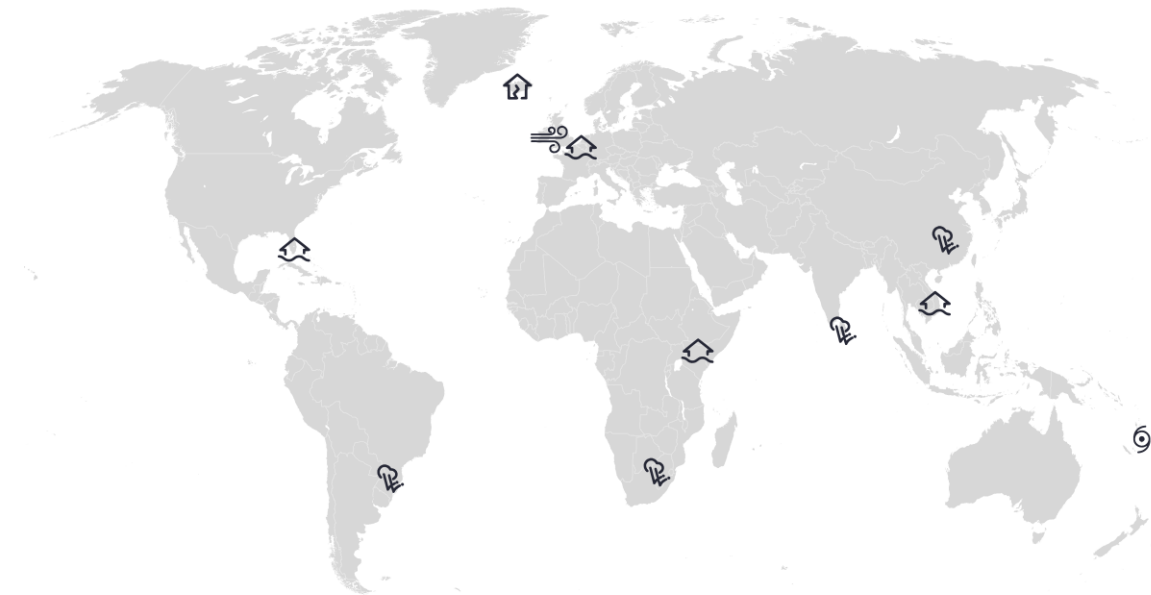


Weekly Cat Report

November 17, 2023



Executive Summary



Event	Affected Region(s)	Fatalities	Economic Loss (\$)	Page
Flooding	Western Europe	0	100s of millions	3
Windstorm Debi	Ireland, UK	0	10s of millions	6
Flooding	United States	0	Millions	7
Seismic Activity	Iceland	0	Unknown	8
Severe Convective Storm	China	0	Millions	10
Severe Convective Storm	South Africa	0	Millions	10
Flooding (Update)	Eastern Africa	103+	Unknown	10
SCS & Flooding	Brazil	0	Millions	10
SCS, Flooding & Landslide (Update)	Sri Lanka	8	Unknown	10
SCS, Flooding & Landslide	Southeast Asia	1	Unknown	11
Cyclone Mal	Fiji	0	Negligible	11
Heatwaves	Worldwide	N/A	N/A	11

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>

Western Europe: Flooding

Overview

The continuous rainy spells related to multiple low-pressure systems have affected Western Europe, triggering severe flooding since the beginning of November. In recent days, portions of France and Belgium have experienced torrential rainfall and widespread flooding that can potentially result in notable economic and insured losses across the region.

Meteorological Recap

Western Europe has experienced a prolonged rainy period since mid-October as successive lows have dominated over the eastern Atlantic Ocean, bringing a significant amount of rain into the region in recent weeks. The strong jet stream blowing from the west toward Western Europe remains in effect and continues to enhance the development of low-pressure systems, increasing rainfall totals consequently.

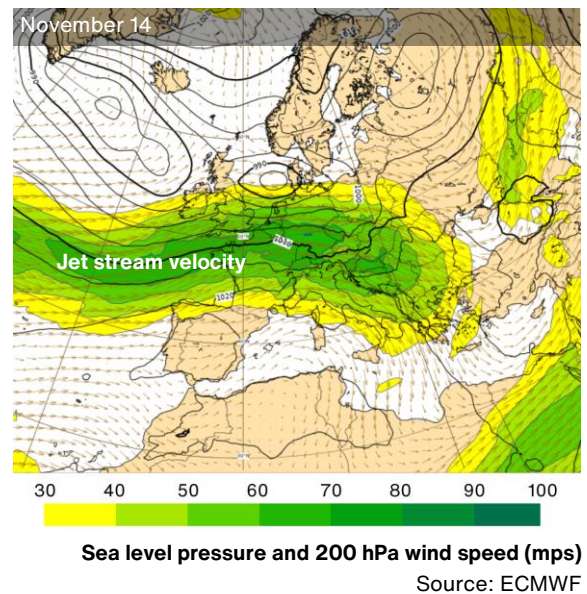
Recently, northernmost France and Belgium have been impacted by torrential rainfall that triggered flooding. According to Météo France, the total rainfall in the department of Pas-de-Calais has locally exceeded **350 mm (13.78 inches)** since October 18, representing an average of 3-4 months of rain, or one-quarter of annual rainfall in this region.

Météo France stated that the entire country recorded an average accumulation of **215.4 mm (8.45 inches)** between October 18 and November 12, marking the national highest rainfall accumulation on record over 26 consecutive days.

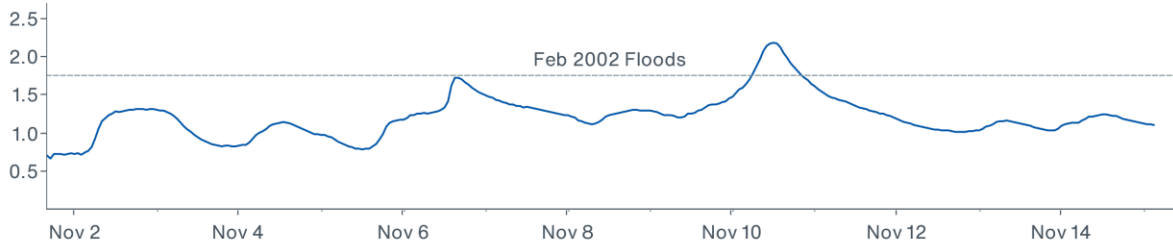
Hydrological Response

In response to persistent heavy rainfall, multiple rivers in the region reached high water levels (see Graphic below). Météo France issued the highest (red) flood warning for several rivers, including rivers of Liane, Canche, Hem, and Aa. In the Pas-de-Calais Department, this red flood warning was in place for six days in a row, from November 6 to November 11. After two days with an orange flood alert, the highest flood warning was retrieved again on November 14. On November 15, a red alert was also issued in the Haute-Savoie Department as Arve River reached flood water levels.

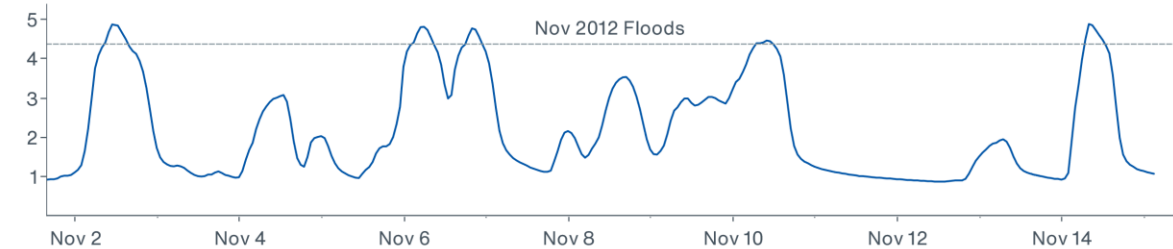
According to the data provided by the Swiss Federal Office for the Environment (FOEN), the Arve River in Geneva, Switzerland, peaked at **1,008 m³/s** on the morning of November 15, marking the highest value since measurements began in 1904, and breaking the previous record set in February 2015.



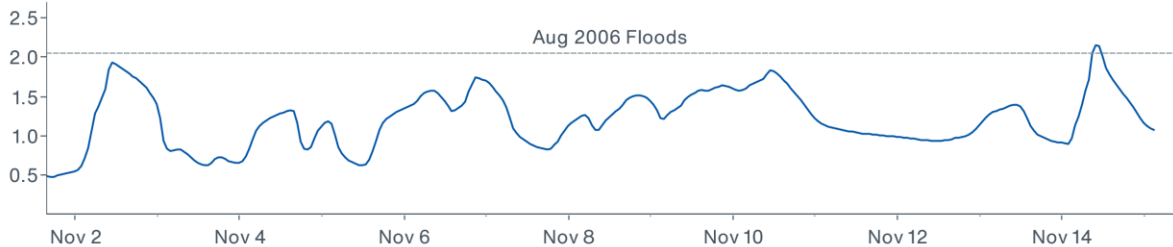
Water Level at Fauquembergues Station, Aa River (meters)



Water Level at Wirwignes Station, Liane River (meters)



Water Level at Guémy Station, Hem River (meters)



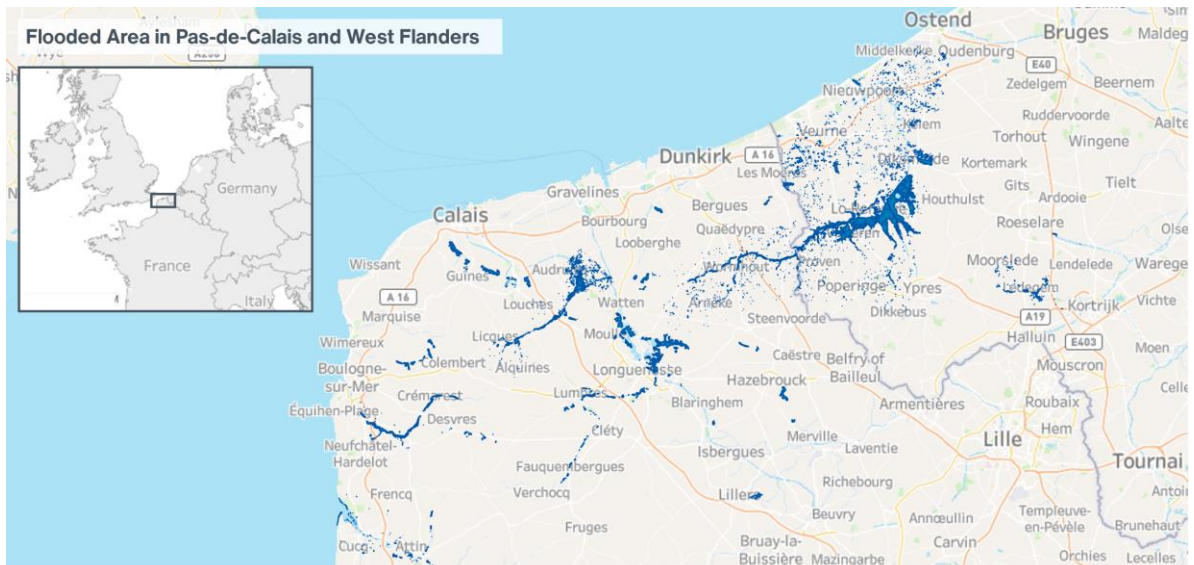
Data: Vigicrues; Graphics: Aon Catastrophe Insight

Event Details

Northernmost portions of France were the most impacted by persistent rainfall accompanied by widespread flooding. According to Copernicus Emergency Management Service, nearly 3,000 ha (7,410 acres) of land was inundated within the **Pas-de-Calais** Department, along with more than 3,500 people affected. A state of natural disaster was declared for 181 municipalities across the department. Local fire brigades intervened 139 times, and more than 2,600 interventions have been carried out in total since November 6. As of November 15, at least four people were injured.

In the **Haute-Savoie** Department, eastern France, fire brigades intervened more than 270 times. Two persons were slightly injured, according to the local authorities.

Widespread flooding was reported also in western Belgium (see map below). Almost 5,000 ha (12,350 acres) was flooded in **West Flanders** Province, including municipalities of Westhoerk, Kachtem, and Wevelgem. Nearly 3,000 people were affected and about 140 buildings were potentially flooded. Regarding the flood extent, notable agricultural losses are expected to be incurred.



Data: Copernicus EMS; Graphics: Aon Catastrophe Insight

Financial Loss

It is still early to estimate the total losses caused by this widespread flooding, as damage assessment remains ongoing in the region. Regarding the flood extent, aggregate losses resulting from the prolonged rainy period can potentially reach into the hundreds of millions EUR. A support fund in the tens of millions EUR provided by the French government has been already promised for affected communities in Pas-de-Calais.

Ireland, United Kingdom: Windstorm Debi

Overview

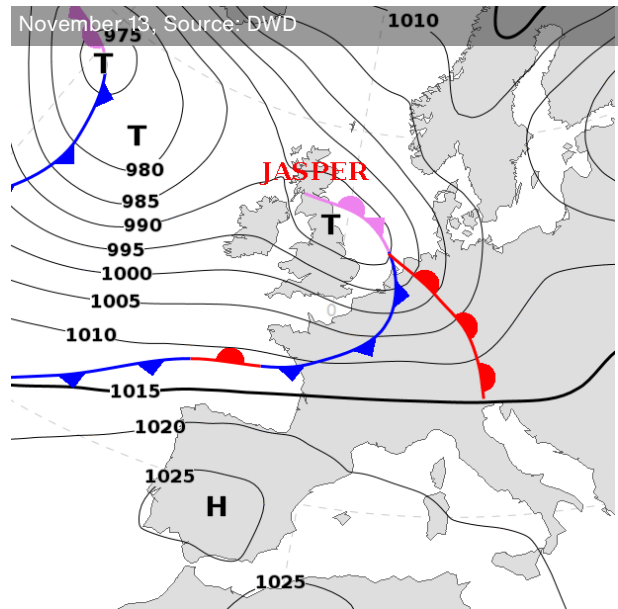
Windstorm Debi, a low-pressure system named by Met Éireann, affected Ireland and parts of the United Kingdom on November 13, generating strong wind gusts and localized heavy rainfall that resulted in material damage and power outages to more than 100,000 people in the region. Total economic losses are expected to be in the tens of millions EUR.

Meteorological Recap

Storm Debi was identified by Irish Met Éireann and named by the UK's Met Office on November 12 as the fourth named storm of the European windstorm season. The alternative name Jasper was given by FU Berlin.

Debi developed rapidly overnight on November 12-13, affecting Ireland and the UK's Northern Ireland with localized heavy rainfall and strong wind gusts. The strongest wind gusts reported by Met Office are included in the table below.

A relatively rare red wind warning was issued by Met Éireann for 14 counties in Ireland, as some models were predicting relatively high even extreme wind speeds. Lower orange and yellow warnings were in place for the rest of the country.



Event Details

Approximately 100,000 customers lost their power across Ireland's Midland Region, including the counties of Galway and Longford, which were particularly affected by the storm. About 2,000 additional power outages were reported in the UK's Northern Ireland. The storm caused notable traffic disruptions in both countries, and dozens of flights were canceled.

Location	Wind Gusts (mph, kph)
Aberdaron, Gwynedd	77 / 124
Killowen, County Down	74 / 119
Capel Curig, Gwynedd	74 / 119
Blackpool, Lancashire	73 / 117
St Bees Head, Cumbria	71 / 114

Financial Loss

Windstorm Debi caused lower material losses than initially feared from some forecasting models. Total economic losses in Ireland and the United Kingdom due to the storm are expected to be in the tens of millions EUR.

United States: Flooding

Overview

Much of southeast Florida was heavily impacted by two non-tropical systems on November 14-16. Strong winds and extreme rainfall affected several highly populated cities, including Miami, Fort Lauderdale, and Hollywood. Widespread flooding caused over 100,000 people to lose power, disrupted public transportation, and forced school closures.

Meteorological Recap

A slow-moving low-pressure system over the northern Gulf of Mexico caused anomalously high moisture to pool along its frontal boundaries initially on November 14. These boundaries, stretched across much of Florida, triggered locally heavy rainfall over some areas mainly within Broward and Palm Beach counties. Then, late on November 15, a new surface low near the Florida Keys created more slow-moving rainbands, along with intense wind gusts, that again impacted much of southeast Florida. These two waves of intense rain prompted the NWS to issue flood alerts for nearly 7 million people.

The urban corridor roughly extending from Miami to West Palm Beach saw widespread 48-hour rainfall totals of 4-10 inches (100-250 mm), with some local amounts even exceeding 1 foot (300 mm), according to the NWS (see table below). Additionally, several onshore locations within Broward, Miami-Dade, and Palm Beach counties experienced strong wind gusts up to 55 mph (90 kph).

Location	County	48-hour Rainfall (in, mm)
Lauderdale-By-The-Sea	Broward	13.31 / 338
Fort Lauderdale Executive Airport	Broward	12.20 / 310
Fort Lauderdale-Hollywood	Broward	10.01 / 254
North Miami	Miami-Dade	9.82 / 249
Coral Gables	Miami-Dade	9.37 / 238

Event Details

Several cities and neighborhoods, including Miami, Hollywood, and Fort Lauderdale, saw extensive flooding damage. Around 125,000 people lost power, numerous roads and highways were inundated, and all modes of public transportation within Miami-Dade County were significantly disrupted. The extreme weather conditions also prompted all public schools in Broward County to be closed on November 16.

Financial Loss

Flooding within this urbanized region of Florida could possibly drive economic and insured losses into the millions of USD.



Flooding in Miami Springs
Source: City of Miami Springs

Iceland: Seismic Activity

Overview

A magma intrusion has triggered intense seismic and earthquake activity across the Reykjanes peninsula in southwestern Iceland since late October. So far, elevated seismic activity forced evacuations of thousands of people in Grindavík town and resulted in some infrastructural and property damage. As a potential volcanic eruption is expected to follow, updates related to this notable event will be tracked.

Seismological Recap

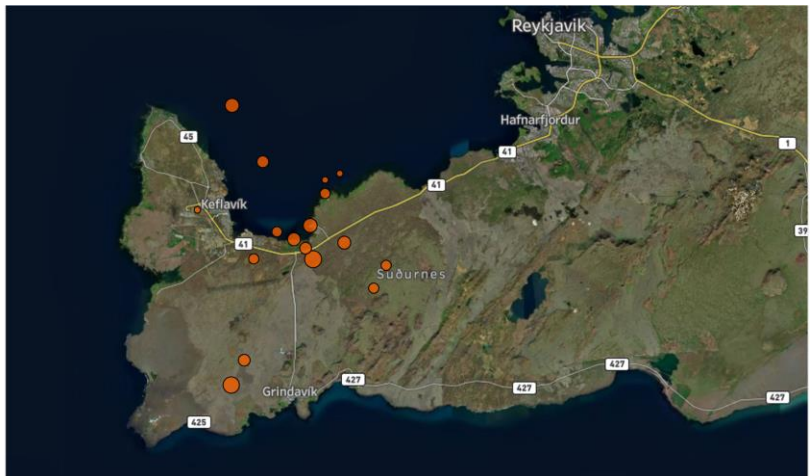
Starting in late October, an intense seismic and earthquake activity due to a magma intrusion underneath the area has occurred in the **Reykjanes peninsula**, southwestern Iceland. This increased activity was concentrated between the towns of Sundhnúkur and Grindavík, along with hundreds of relatively weak and shallow earthquakes reported every day. Over 22,000 earthquakes have been reported since late October. One of the strongest, a magnitude 5.2 earthquake, occurred west of Grindavík on November 10 (see map below), generating a large-scale rupture across the town and the nearest surroundings. Elevated seismic activity also resulted in significant vertical surface movements that have already reached drops up to 1 m (3.3 ft) locally, according to the local agencies.

Reykjanes 4.5M+ Earthquakes
October 25 - November 16

- Magnitude**
- 4.5
 - 4.6
 - 4.8
 - 5.0
 - 5.3

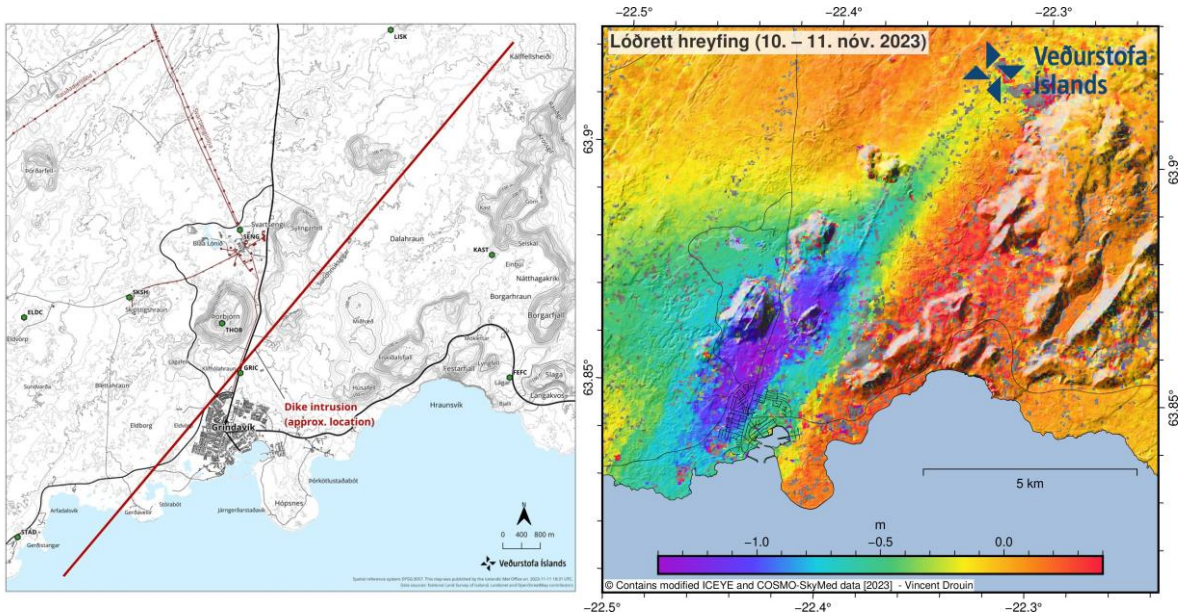


Data: USGS
Graphics: Aon Catastrophe Insight



Local authorities and experts fear that all mentioned above may be the signals of volcanic eruptions, which can potentially occur soon.

Although seismic activity accompanied by earthquakes occurs frequently in Iceland as the island is located at the boundary of the Eurasian and North American tectonic plates, the recent swarm was more extensive than usual. Three volcanic eruptions within various volcanic complexes have occurred in the Reykjanes peninsula since 2021.



Location of dike intrusion (left) and the vertical displacement due to the magma intrusion between Nov 10-11 (right)
 Source: Icelandic Met Office, National Land Survey of Iceland

Event Details

Following an elevated seismic activity, the local civil protection has declared a state of emergency, and preventively evacuated about 3,700 residents from the town of Grindavík on November 10. The rupture and earthquakes have caused considerable damage to properties and infrastructure in the town.

Natural Catastrophes: In Brief

Severe Convective Storm (China)

Strong storms containing large hail, intense winds, and heavy rain affected parts of southeast China early on November 9. Hailstones of 3-5 cm (1-2 inches) in diameter were seen in Changsha, the capital city of China's Hunan province. Video and images circulating from the event show considerable damage to numerous buildings and cars.

Severe Convective Storm (South Africa)

Late on November 13, intense thunderstorms were seen over much of Gauteng and Mpumalanga provinces in South Africa. Most notably, large hail up to 4 cm (1.6 inches) in diameter caused extensive infrastructure and vehicle damage across the Johannesburg metro area. Johannesburg Emergency Services said the Midrand, Braamfontein, Sandton, and Paulshof municipalities were especially impacted, and that 1 person was reportedly injured.

Flooding (Eastern Africa) - Update

Recent heavy rainfall has worsened the flood situation across Eastern Africa, particularly in Kenya and Somalia. The Kenyan counties of Samburu, Wajir, Isiolo, Marsabit, Mandera, and Garissa have been the hardest hit by ongoing seasonal flooding. The death toll rose to 46, and more than 58,000 people have been forced to leave their homes, according to the latest reports by authorities. The widespread flooding has caused notable damage to local agriculture and infrastructure. In Somalia, three more fatalities have been reported in recent days, increasing the total death toll to 32. According to UN OCHA, over 5,800 homes have been damaged or destroyed, and over 456,800 people have been displaced. See the previous Weekly Cat Report for more details.

SCS & Flooding (Brazil)

Since November 11, intense rainfall and strong storms have impacted parts of southern Brazil, leading to numerous severe weather and flooding incidents. In Rio Grande do Sul state, more than 100 buildings were impacted around the Porto Alegre metro area. Municipalities such as Balneário Camboriú, Camboriú, and Blumenau within Santa Catarina state were also affected by flooding.

SCS, Flooding & Landslide (Sri Lanka) - Update

Severe weather has continued to significantly impact most of Sri Lanka since the start of November. Strong winds, flooding, and landslides have resulted in 8 deaths, 9 injuries, and 960 damaged homes, according to the National Disaster Relief Centre (NDRSC). Some of the worst impacted districts include Kurunegala, Kandy, Puttalam, Ratnapura, and Anuradhapura.

SCS, Flooding & Landslide (Southeast Asia)

Heavy rainfall and thunderstorms have impacted the southern Philippines since November 7. The Davao region has seen the worst impacts as 2 people have been injured and nearly 400 homes have been damaged. In central Vietnam, severe flooding and landslides occurred within the Quang Tri, Thua Thien Hue, and Ha Tinh provinces on November 13-14. According to ADINet, 1,364 homes were damaged, 69 hectares (170 acres) of crops were inundated, and more than 1,000 livestock losses were reported. Additionally, since November 13, Indonesia's Aceh and North Sumatra provinces have been devastated by intense flooding. Between both provinces, one person has been killed, 102 people have been injured, and at least 210 homes have been damaged.

Cyclone Mal (Fiji)

Cyclone Mal, equivalent to a Category 1 storm on the Saffir-Simpson scale, passed close to Fiji on November 14. The storm brought strong wind gusts up to 140 kph (85 mph) and heavy rainfall that resulted in relatively minor material damage, downed trees and power lines, and the evacuation of more than 6,000 people. Mal is forecasted to transition to an extratropical cyclone by November 16.

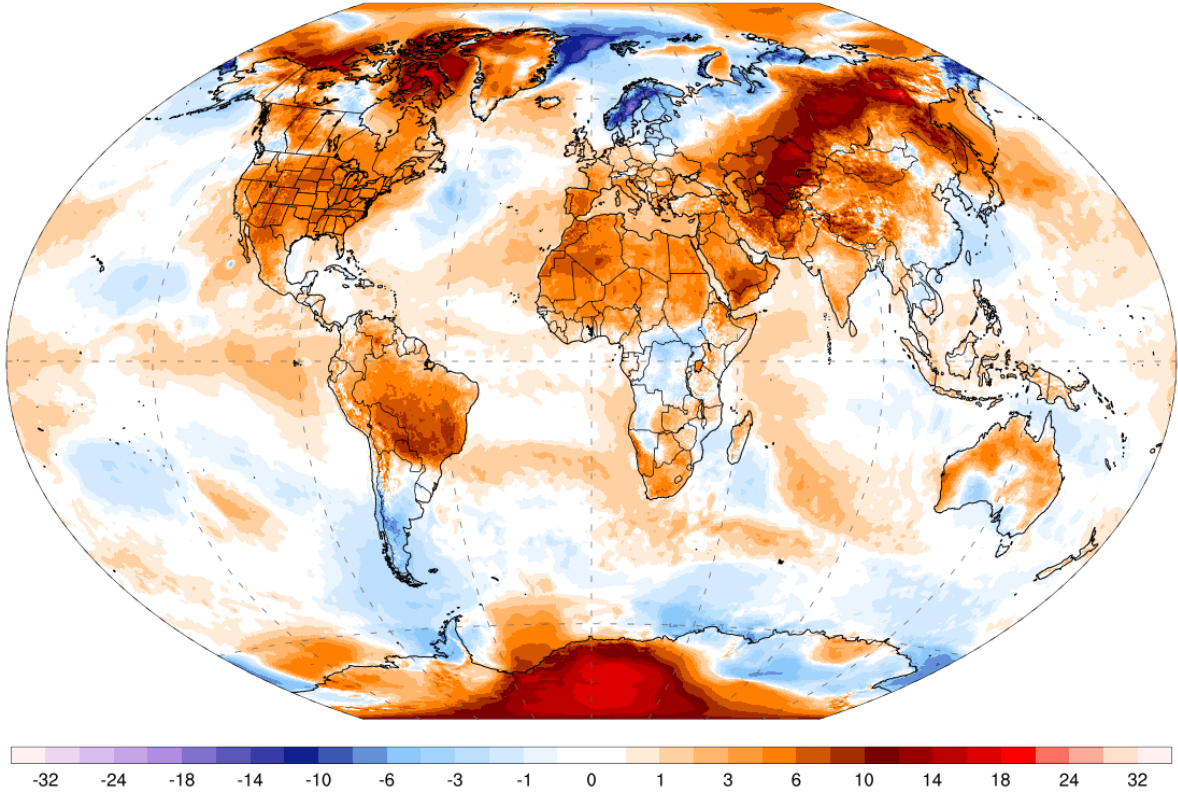
Heatwaves (Worldwide)

Multiple countries in the southern hemisphere have been experiencing intense heatwaves during their spring season. Parts of Queensland in northeast Australia have seen daytime temperatures reach at least 44 °C (111.2 °F) on November 15-16, which has increased the ongoing wildfire danger. In South Africa, some municipalities within the Northern Cape and Eastern Cape provinces have recently seen temperatures as high as 35 °C (95 °F). Additionally, on November 14, Rio de Janeiro in southeast Brazil measured a heat index of 58.5 °C (137 °F), which became the highest heat index ever recorded in the city.

Global Temperature Anomaly Forecast

GFS 2m T Anomaly (°C) [CFSR 1979-2000 baseline]
Days 1-3 Avg | Thu, Nov 16, 2023

ClimateReanalyzer.org
Climate Change Institute | University of Maine

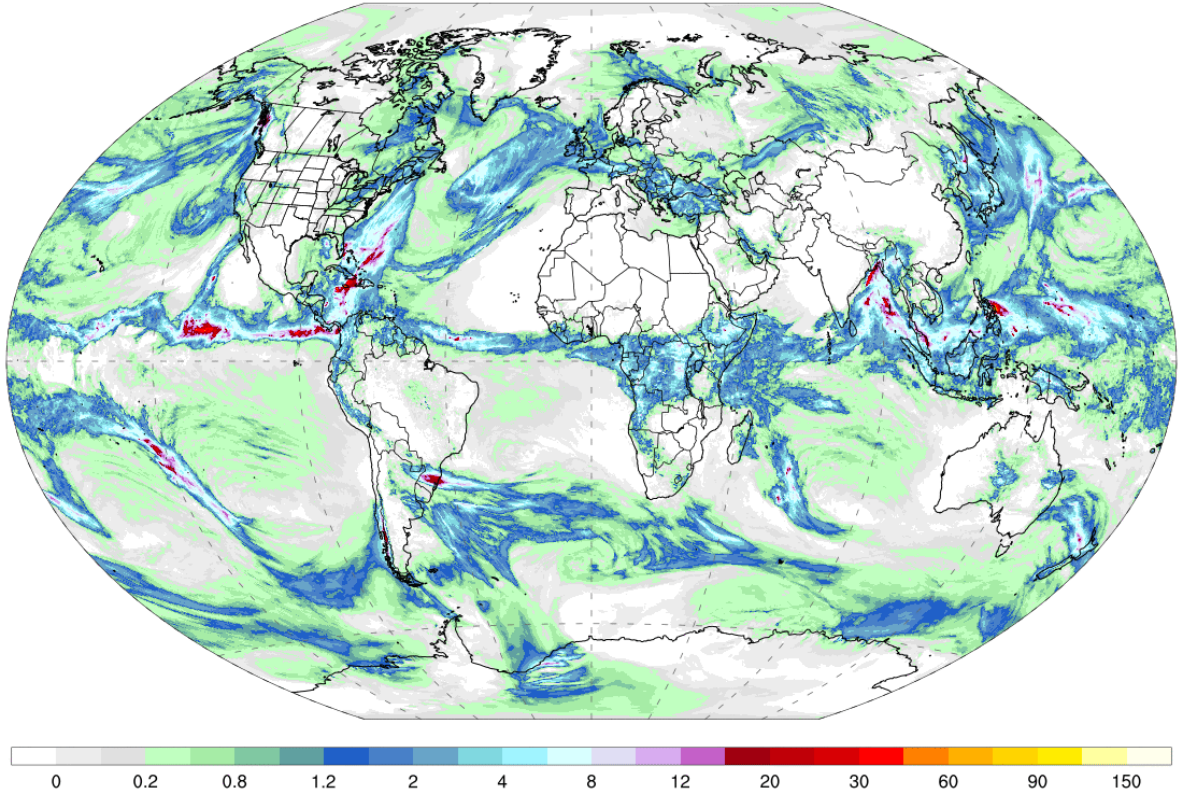


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

Global Precipitation Forecast

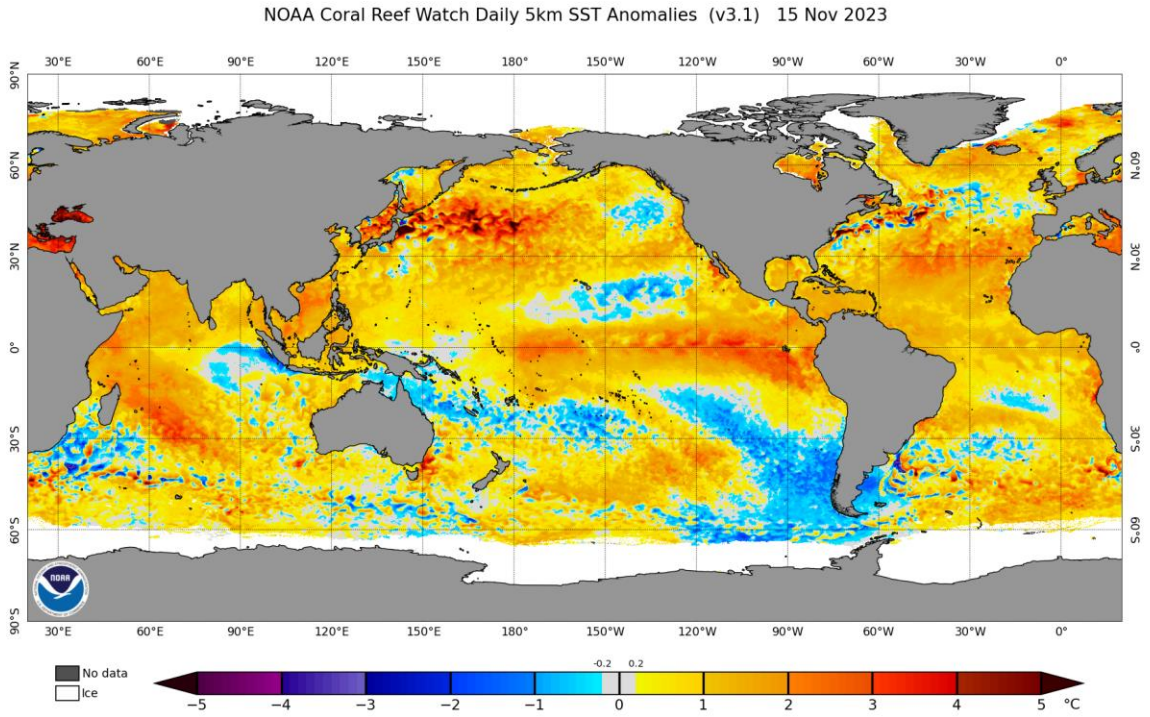
GFS Accumulated Precipitation (cm)
Days 1-3 Total | Thu, Nov 16, 2023

ClimateReanalyzer.org
Climate Change Institute | University of Maine

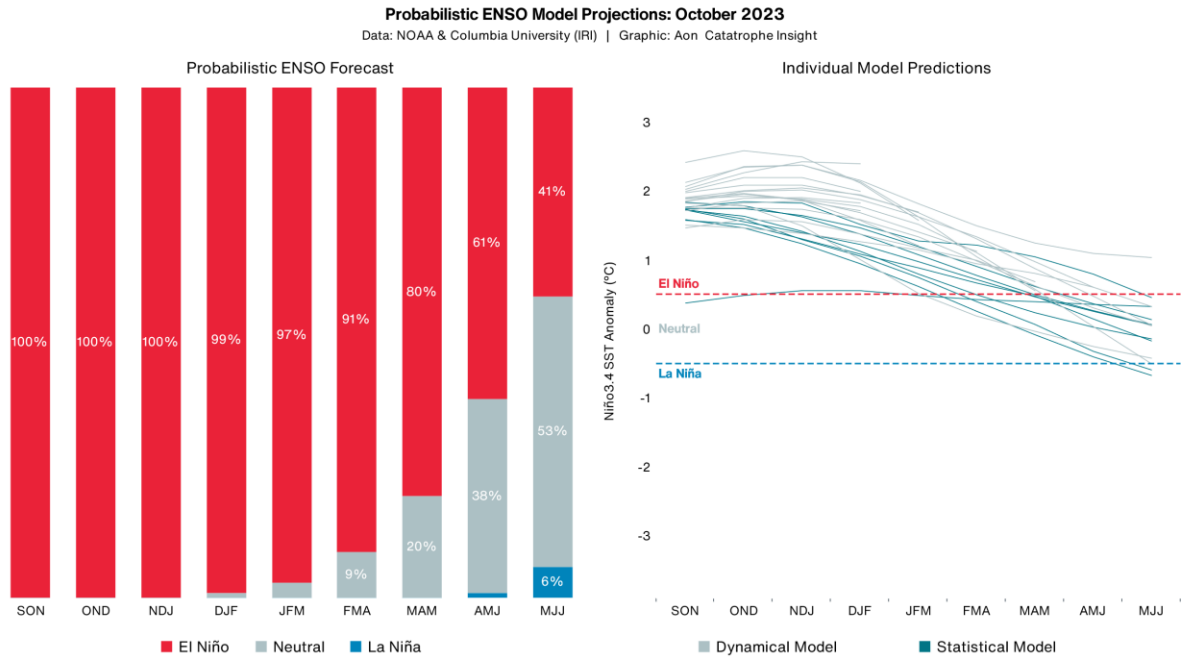


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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



El Niño-Southern Oscillation (ENSO)



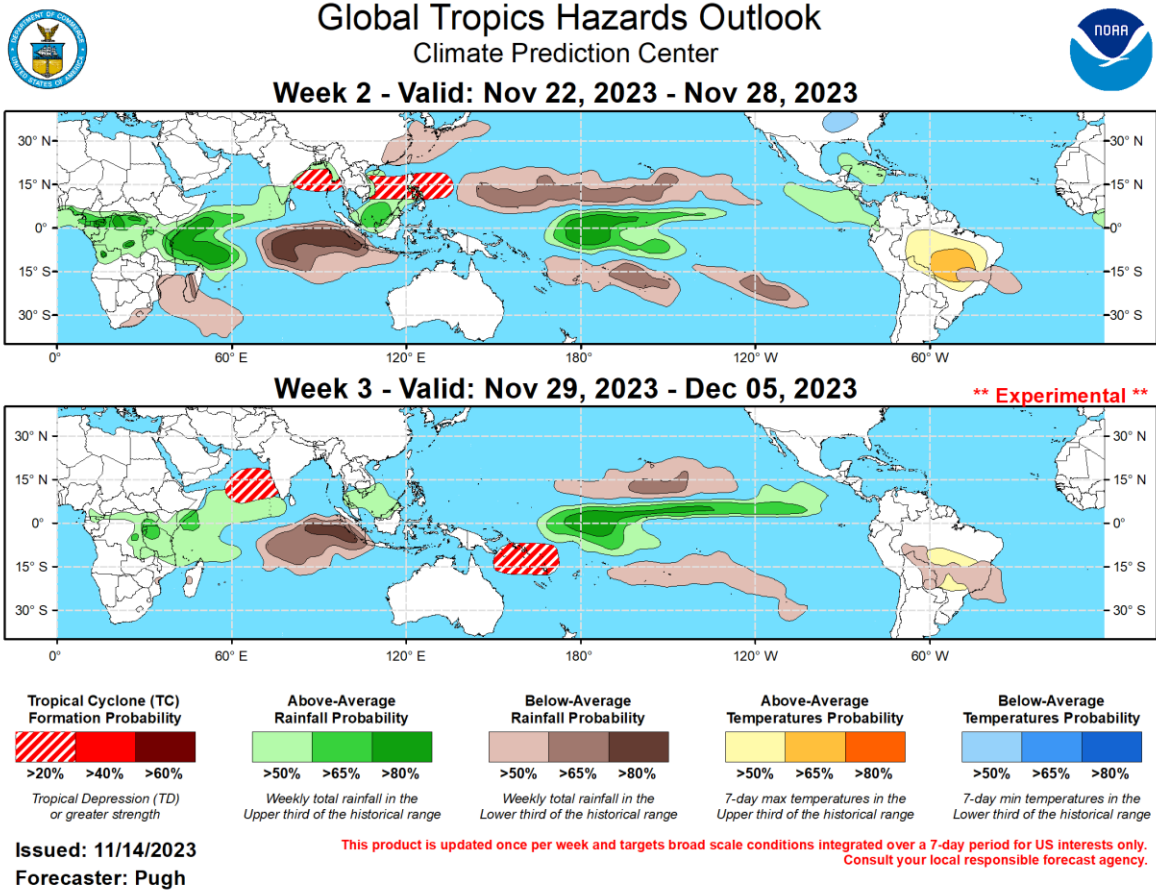
El Niño: Warm phase of an ENSO cycle. Sea surface temperatures of +0.5°C occur across the east-central equatorial Pacific.

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.

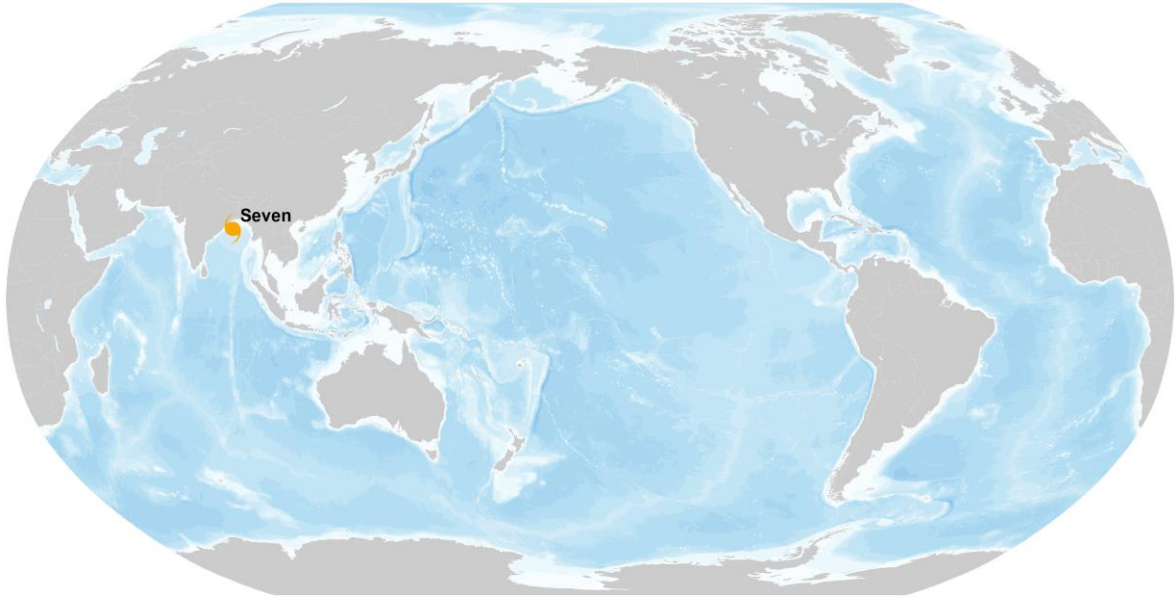
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

Global Tropics Outlook



Source: Climate Prediction Center (NOAA)

Current Tropical Cyclone Activity



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

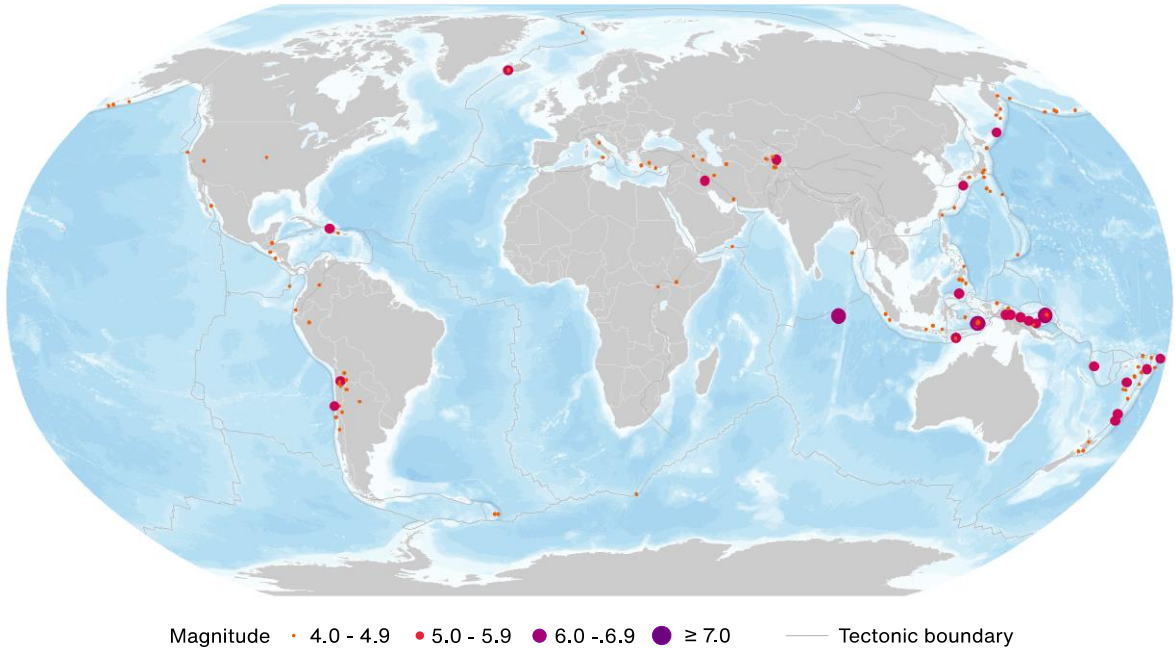
Name	Location	Winds	Center
CY Seven	19.3N, 88.1E	40	160 miles (260 km) SE from Bhubaneswar, India

* 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)

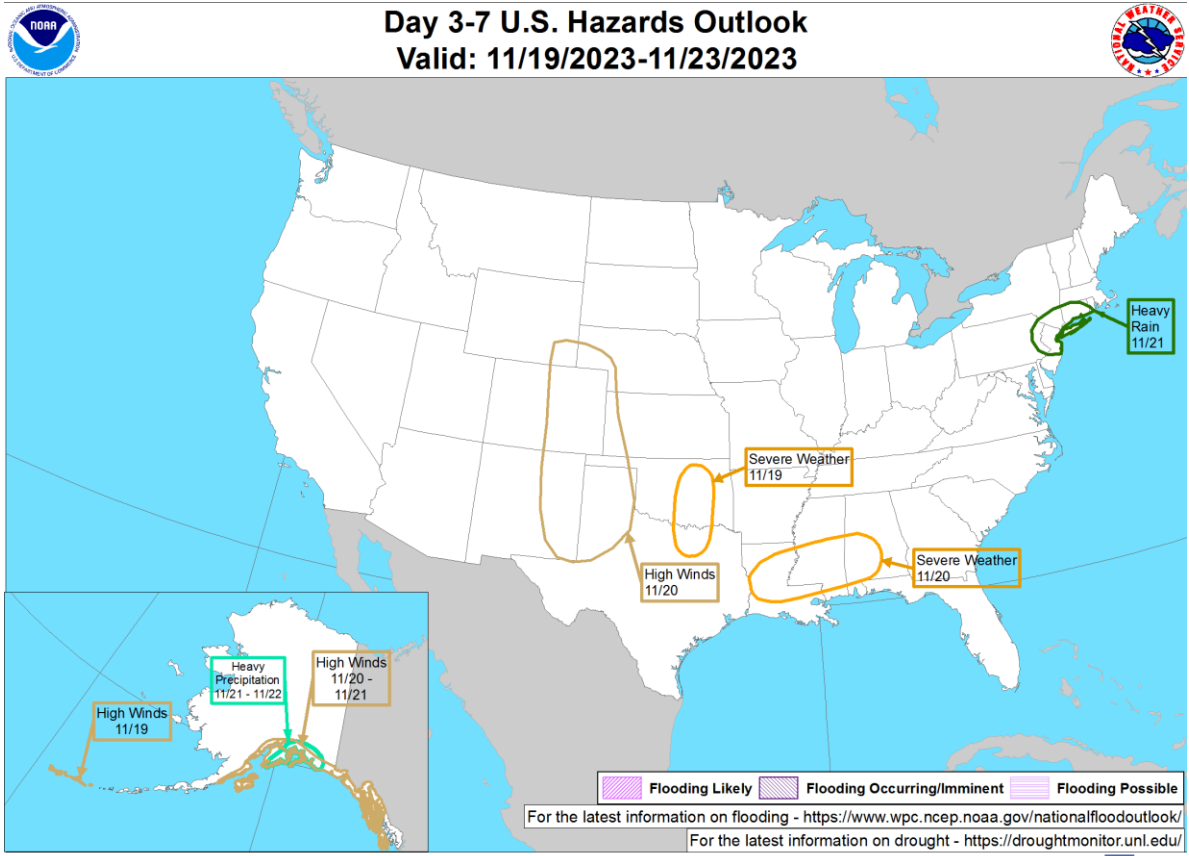
Global Earthquake Activity ($\geq M4.0$): Nov 10-16



Date (UTC)	Location	Mag	Epicenter
11/10/2023	6.11S, 130.06E	6.1	Banda Sea
11/13/2023	3.92S, 150.97E	6.1	13 km (8 miles) WNW of Rabaul, Papua New Guinea
11/14/2023	4.04S, 87.08E	6.1	South Indian Ocean

Source: United States Geological Survey

U.S. Hazard Outlook

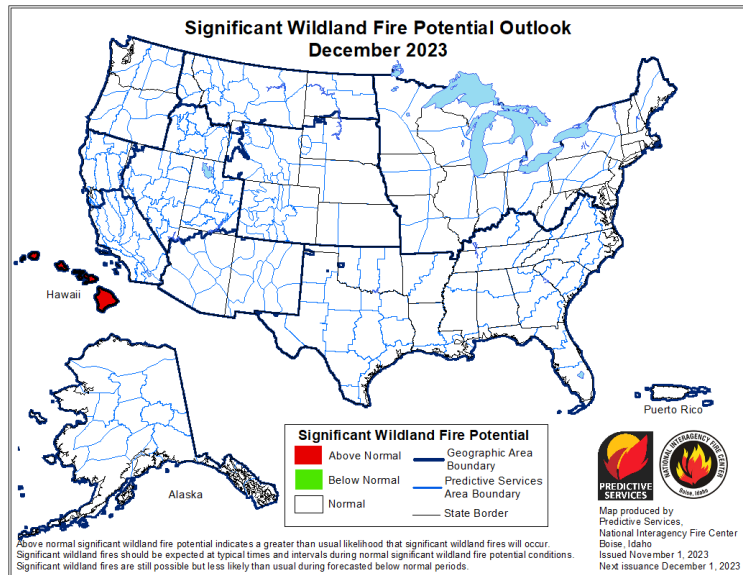
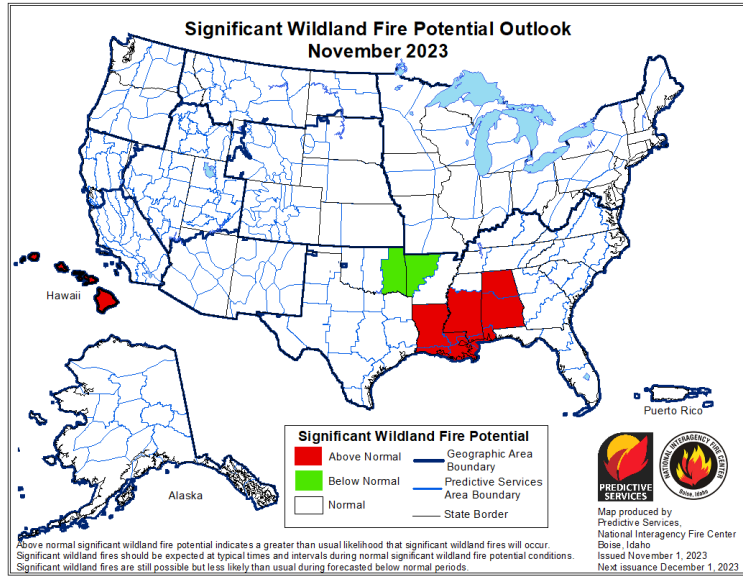


Weather Prediction Center
Made: 11/16/2023 02:29 PM EST

Follow us:  
www.wpc.ncep.noaa.gov

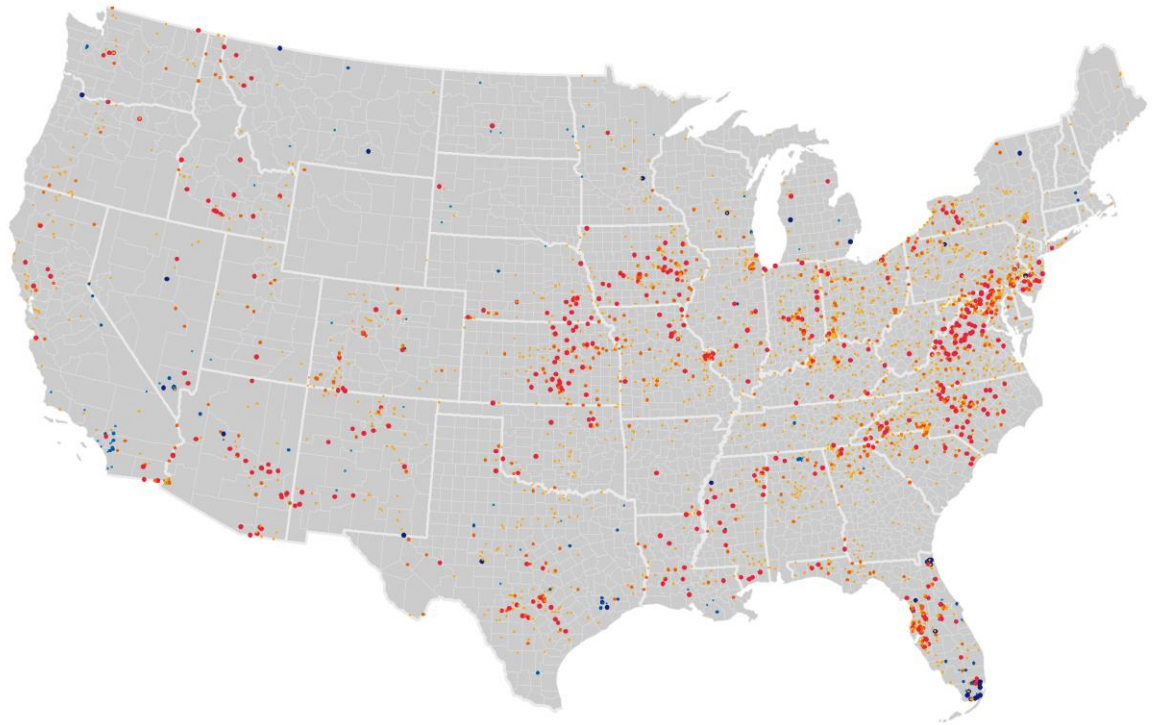
Source: Climate Prediction Center (NOAA)

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



Source: NIFC

U.S. Current Riverine Flood Risk



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

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 stream 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

Western Europe: Flooding

Copernicus EMS
Météo-France
Vigicrues
Prefect of Pas-de-Calais and Haute-Savoie
Federal Office for the Environment (FOEN)
ECMWF
ESWD

Ireland, United Kingdom: Windstorm Debi

Met Office
Met Éireann
ESWD
Storm Debi: 77mph gusts hit UK as railways disrupted, *The Telegraph*

United States: Flooding

City of Miami Springs
Florida grappling with flooding and high winds, more than 100K customers without power after intense rain, *NBC News*
High winds, flooding rain leave over 70,000 without power in South Florida on Thursday, *Fox Weather*

Iceland: Seismic Activity

Icelandic Met Office
USGS

Natural Catastrophes: In Brief

Why did hail suddenly fall in many places in Hunan this morning? Interpretation by meteorological experts, *Rednet.cn*
One injured after hailstorm pummels Joburg and other areas, *The Citizen*
UN OCHA
INMET
National Disaster Relief Centre (NDRSC)
Floodlist
ASEAN Disaster Information Network (ADINet)
Queensland swelters under heatwave, warnings of increased fire risk, *9 News*
Friday's weather: Thunderstorms to bring strong wind, heavy rains in parts of SA as heatwave persists, *News 24*
It's not yet summer in Brazil, but a dangerous heat wave is sweeping the country, *Associated Press*

Contacts

Michal Lörinc

Head of Catastrophe Insight

michal.lorinc@aon.com

Ondřej Hotový

Catastrophe Analyst

ondrej.hotovy@aon.com

Antonio Elizondo

Senior Scientist, Catastrophe Insight

antonio.elizondo@aon.com

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