

Weekly Cat Report

December 1, 2023



Executive Summary



Event	Affected Region(s)	Fatalities	Economic Loss (\$)	Page
Storm Bettina	Eastern Europe, Russia, Turkey	23	10s of millions	3
Flooding (Update)	Eastern Africa	250+	Unknown	5
Severe Convective Storm	India	24	10s of thousands	6
Severe Convective Storm	Indonesia	0	Unknown	6
Winter Weather	United States, Canada	4	Negligible	6
SCS, Flooding, Landslides	Philippines	5	Unknown	6
Flooding	Australia	0	100s of thousands	6
Winter Weather	Germany	2	Thousands	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>

Eastern Europe, Russia, Turkey: Storm Bettina

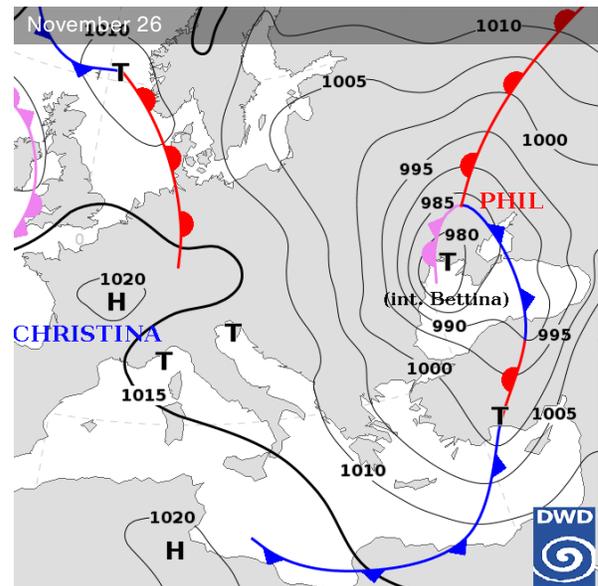
Overview

Storm Bettina rapidly intensified over the Black Sea on November 26-27, resulting in casualties and notable material damage for many Eastern European countries, Russia, and Turkey. Primary hazards included damaging winds, coastal flooding, and blizzard conditions. As of this writing, at least 23 people lost their lives while dozens more were injured. Total economic losses may reach into the tens of millions EUR.

Meteorological Recap

A low-pressure area developed over the Adriatic Sea on November 25 and was named **Bettina** by the Italian Meteorological Service within the Central Mediterranean Group. FU Berlin used an alternative name, **Phil**, for this low. The storm tracked north-eastward along the boundary between a cold Arctic airmass over Europe and warmer moist air southeast of the boundary. Bettina rapidly intensified over the warm waters of the Black Sea on November 26, reaching a low central pressure of 965 hPa.

Bettina brought various hazards into the region. It generated damaging wind gusts up to 120 kph (75 mph). This generated large waves up to 9 meters (30 ft) high, which caused widespread coastal flooding. Multiple locations, particularly Ukraine and Romania, experienced low temperatures, heavy snowfall, and even blizzard conditions. Red and orange warnings due to the above-mentioned hazards were issued by multiple weather agencies across the affected region.



Event Details

Parts of southern **Ukraine**, including the regions of Odesa, Mykolaiv, Cherkasy, and Kirovograd, were particularly hit hard by Bettina. Thousands of people across 16 Ukrainian regions experienced power outages, including many within the capital city of Kyiv. Notably, around 2,500 people in Odesa were rescued after being trapped in their vehicles due to intense blowing and drifting snow.

Significant material damage was incurred within the Krasnodar region of southern **Russia**. The cities of Anapa and Sochi along the Black Sea coast were especially devastated by high waves and coastal flooding. In the Rostov region, more than 500 people were evacuated from flooded areas, and 100,000 people lost power. Another 500,000 people lost power in Crimea, while some vehicular damage due to fallen trees was seen in Novorossiysk city.

In **Bulgaria**, dozens of municipalities declared a state of emergency on November 26 due to heavy snowfall and strong winds that resulted in widespread traffic disruption and power outages to more than 800,000 customers.

Elsewhere, more notable material damage, power outages, and traffic disruptions were reported across **Turkey, Romania, and Moldova**.

As of November 29, the current death toll related to Bettina stands at 23. Fatalities were reported across several countries, including Ukraine (12), Moldova (4), Bulgaria (2), Turkey (2), and Russia (2). Many deaths resulted from hypothermia and winter weather-related car accidents. Another person died after a cargo ship accident due to the storm near Lesbos Island, Greece. Several crew members from the cargo ship remain missing. Dozens of injuries due to Bettina were also reported, most of them in Ukraine (23), Bulgaria (36), and Moldova (10).



Storm damage in Odesa region, Ukraine

Source: National Police

Financial Loss

Due to the significant wind, snow, and flooding damage seen across several countries, total economic losses may reach into the tens of millions EUR.

Eastern Africa: Flooding (Update)

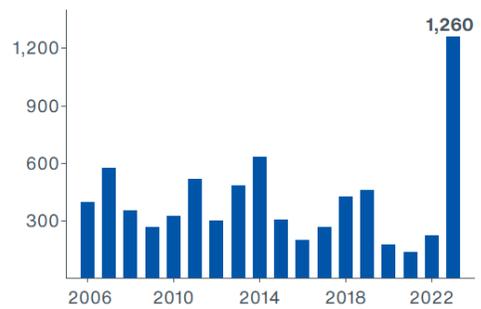
Overview

Heavy seasonal rainfall and widespread flooding continue to significantly impact multiple countries across eastern Africa. Millions of people have been affected, and more than 250 lost their lives. Considerable infrastructural and agricultural losses continue to materialize across the region.

Meteorological Recap

In recent weeks, the 2023 October-December seasonal rains have intensified across much of eastern Africa and continue to trigger severe flooding into late November. The presence of El Niño conditions and a positive Indian Ocean Dipole are likely influencing the enhanced rainfall and flooding seen over this region. The current situation may worsen after additional heavy rainfall that is expected in the upcoming days and weeks. This year's water levels peaked well above the long-term October-November mean and the year-to-date accumulated precipitation mean.

Annual Rainfall at Bardheere Station, Somalia (mm)



Source: FAO SWALIM

Event Details

The ongoing October-December rainy season has already claimed more than 250 lives, affected millions of people, and caused notable material damage across most of eastern Africa.

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

Country	Regions Affected	People Affected	Fatalities	Damaged Houses
Burundi	Makamba	5,000	4	-
Ethiopia	Somali, Afar, Oromia, SNNP	737,000	20	-
Kenya	North Eastern, Eastern	500,000	120	-
Malawi	Nsanje, Machinga	-	1	-
Somalia	South West, Hirshabelle, Jubaland, Galmudug	2,000,000	96	4,700
Tanzania	Arusha, Kigoma, Kagera, Pwani	10,000	12	1,200

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

Severe Convective Storm (India)

Gujarat State in western India was impacted by unseasonably heavy rain and severe weather on November 26-27. Local authorities indicated that some significant property and agricultural damage occurred, primarily due to rain and hail. According to local media, deadly lightning strikes were responsible for 24 deaths and 25 injuries, as of November 28.

Severe Convective Storm (Indonesia)

Parts of central Indonesia, particularly Java Island and Kalimantan on Borneo Island, have been affected by strong winds and heavy rainfall since November 24. According to ADINet, nearly 4,000 homes in West Kalimantan province and another 40 homes in West Java province have been damaged.

Winter Weather (United States, Canada)

Dangerous winter weather on November 24-25 caused dozens of vehicle accidents across the central United States. Blowing snow along Interstate 80 in central Nebraska resulted in at least three vehicle-related deaths. Then, on November 27-29, a heavy lake-effect snow event impacted many areas east of the Great Lakes. At least one person was killed as numerous vehicle crashes occurred in Ohio, New York, and Pennsylvania. Similar impacts were also felt further north in Quebec, Canada where over 148,000 people lost power.

SCS, Flooding, Landslides (Philippines)

An area of low pressure, along with a stagnant wind pattern, has sparked continuous, heavy rainfall over the central and northern Philippines since November 14. Flooding and landslides have especially impacted the Eastern Visayas, Western Visayas, and Bicol Regions, resulting in 5 deaths. According to the NDRRMC, 272 homes have been damaged, and over 76,300 people have been displaced.

SCS & Flooding (Australia)

Extreme rainfall and severe weather have impacted parts of southeast Australia since November 27. Around 30,000 people lost power across South Australia, including 14,000 in the city of Adelaide alone. Multiple locations in New South Wales received record rainfall, which caused about 130 homes to become inundated. In Victoria and South Australia, widespread flooding may have caused significant crop damage as the region enters its peak grain harvest season.

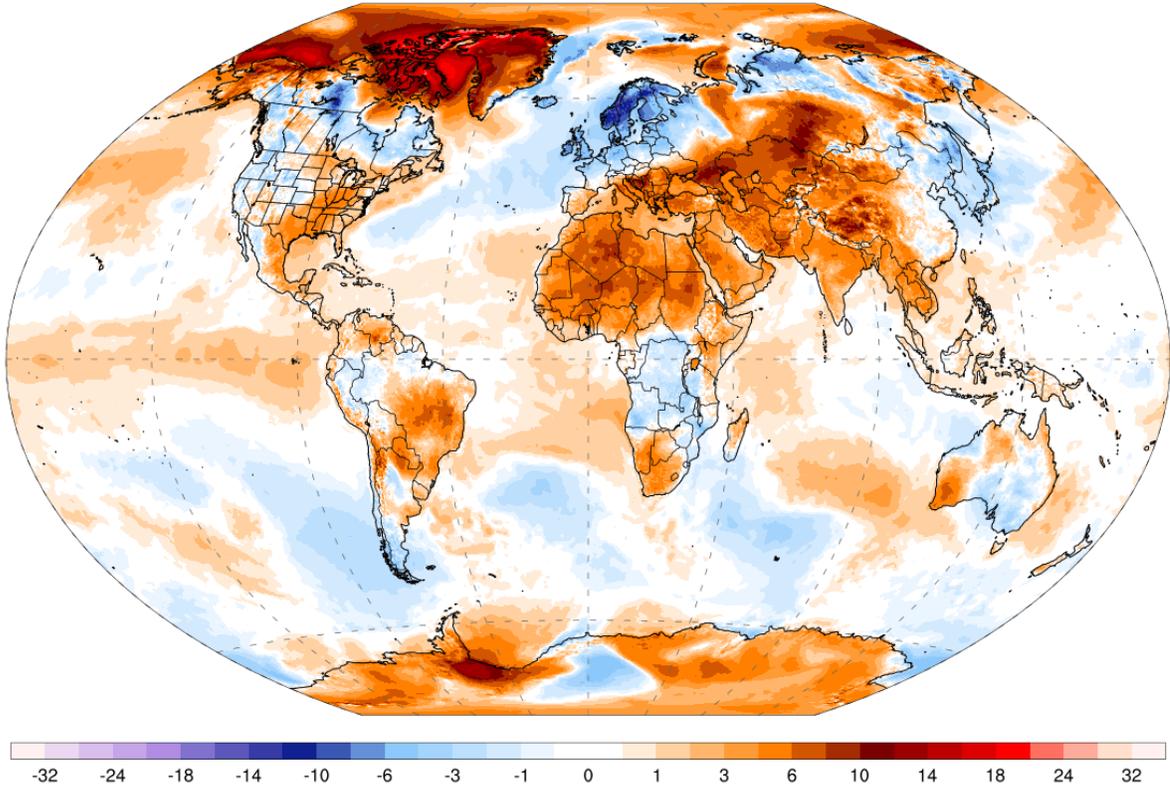
Winter Weather (Germany)

On November 27-28, much of Germany was affected by heavy snow and ice, causing numerous road accidents in states such as Hesse, Baden-Württemberg, and Rhineland-Palatinate. Hesse state was especially impacted as several areas experienced power outages, downed trees, and closed roads. According to officials, two people were killed in separate vehicle collisions.

Global Temperature Anomaly Forecast

GFS 2m T Anomaly (°C) [CFSR 1979-2000 baseline]
Days 1-3 Avg | Thu, Nov 30, 2023

ClimateReanalyzer.org
Climate Change Institute | University of Maine

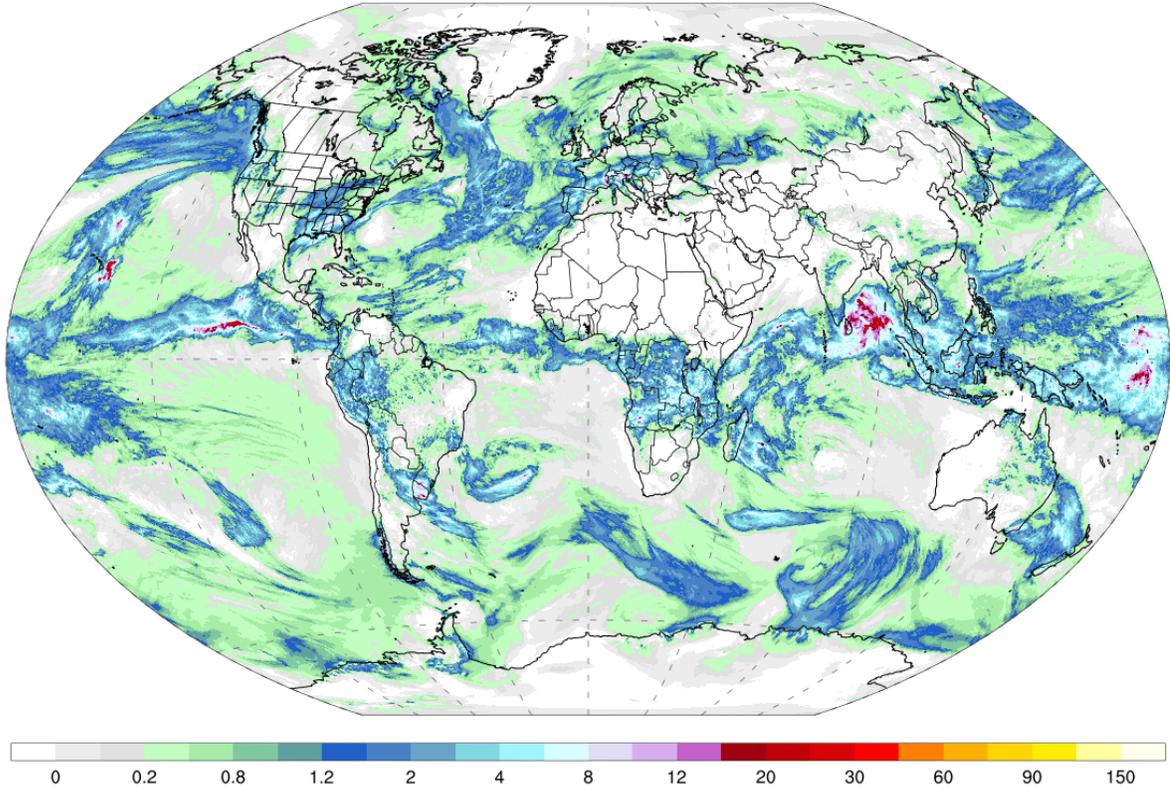


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

Global Precipitation Forecast

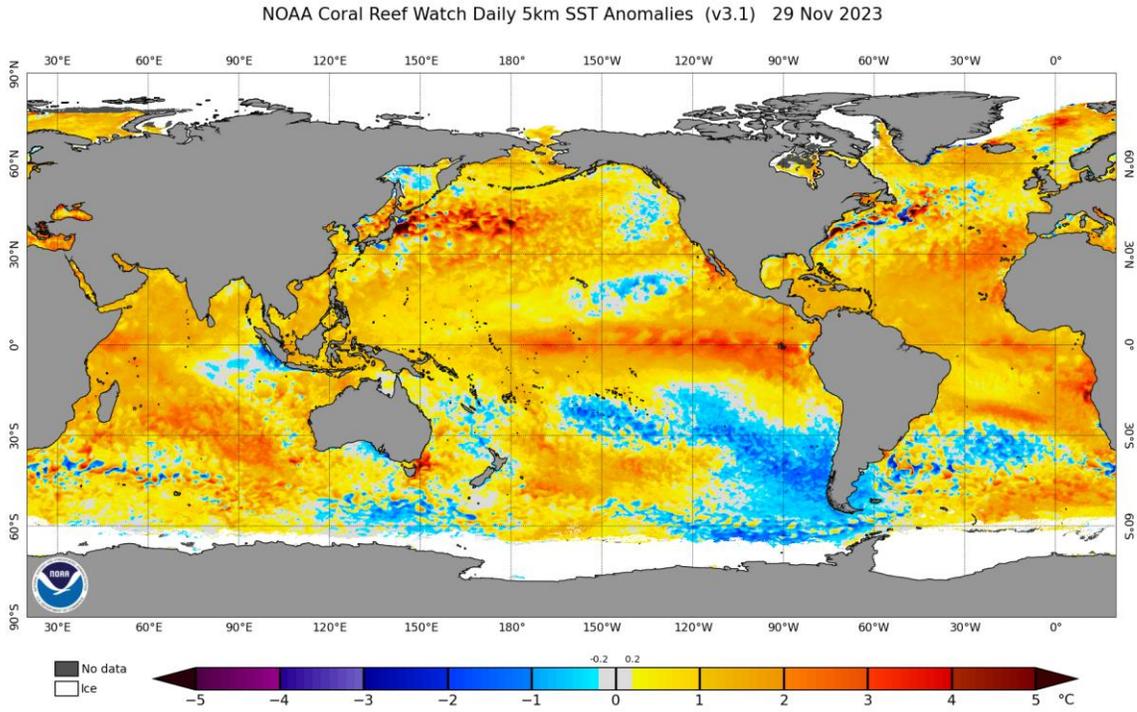
GFS Accumulated Precipitation (cm)
Days 1-3 Total | Thu, Nov 30, 2023

ClimateReanalyzer.org
Climate Change Institute | University of Maine

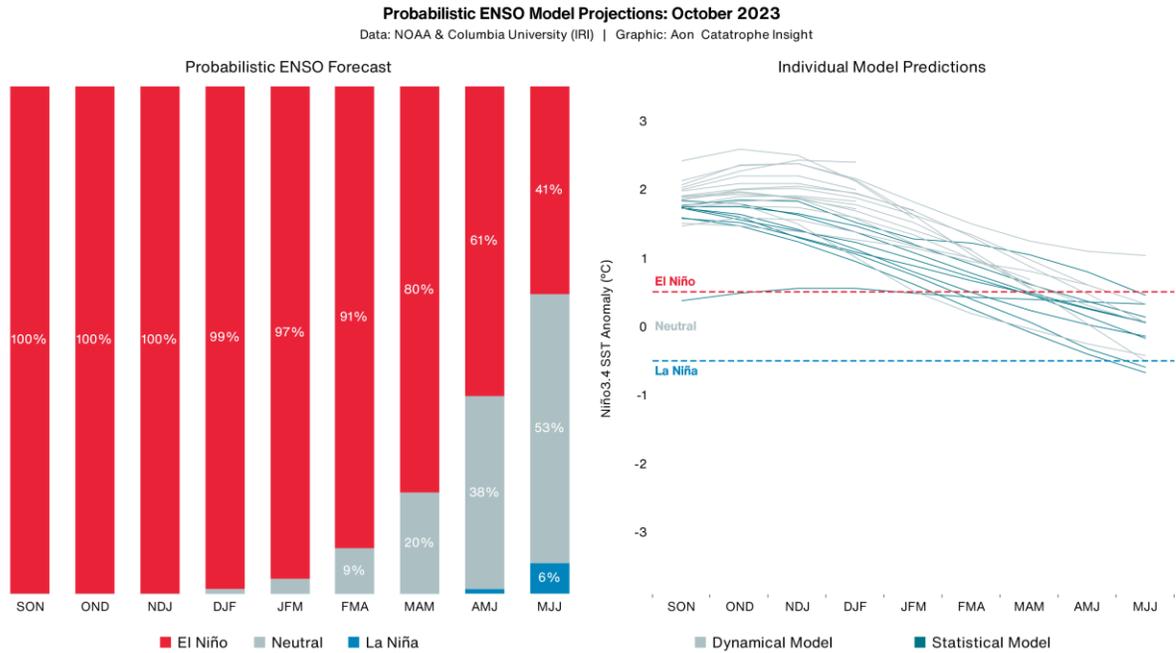


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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



El Niño-Southern Oscillation (ENSO)



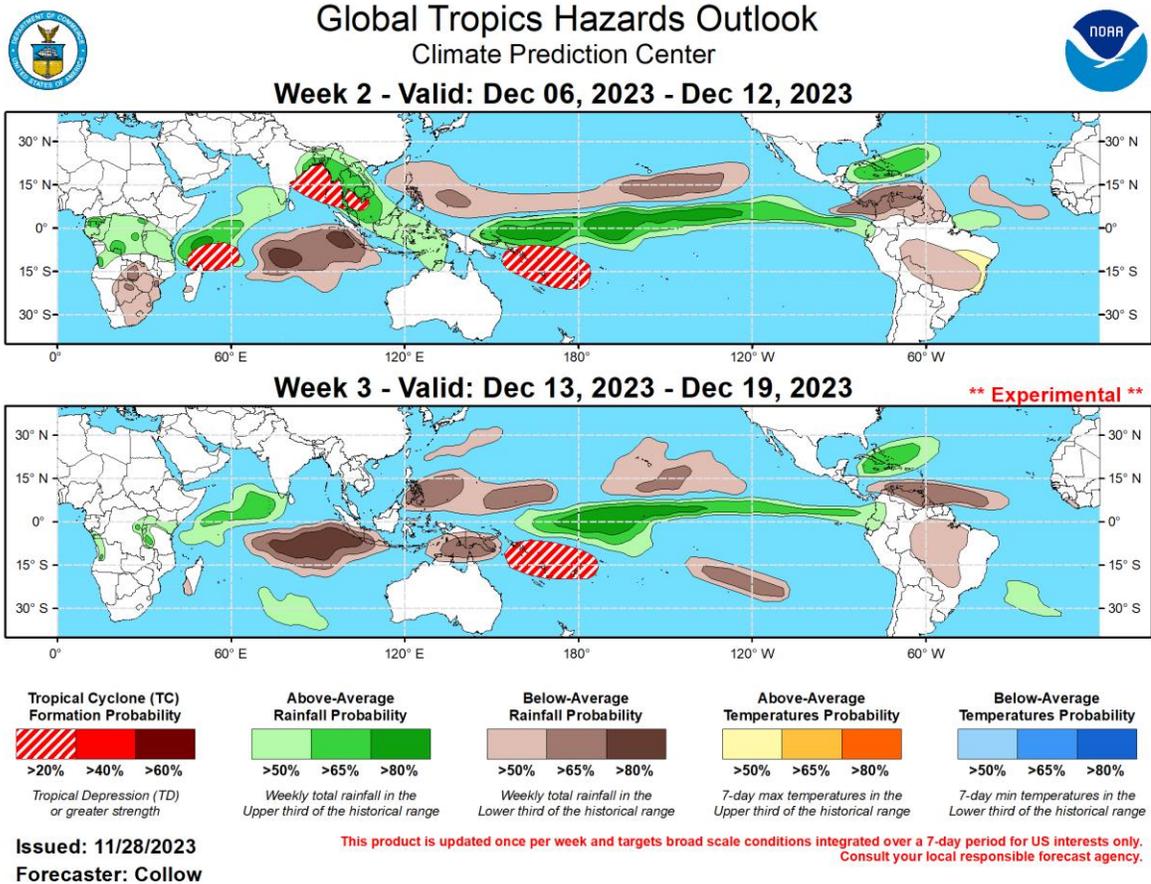
El Niño: Warm phase of an ENSO cycle. Sea surface temperatures of +0.5°C occur across the east-central equatorial Pacific.

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.

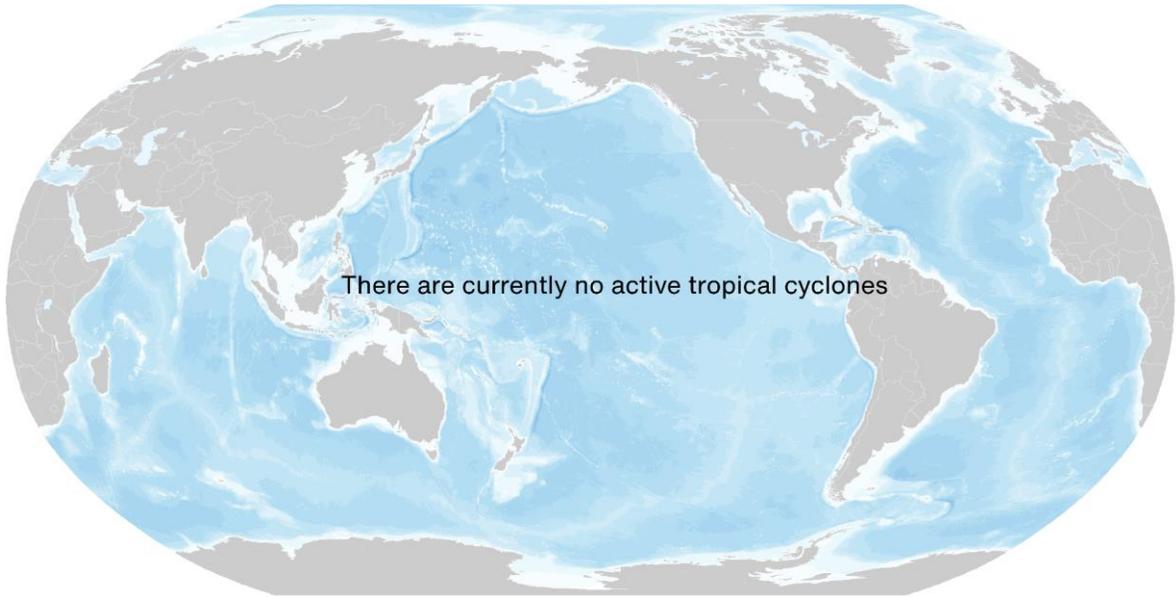
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

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

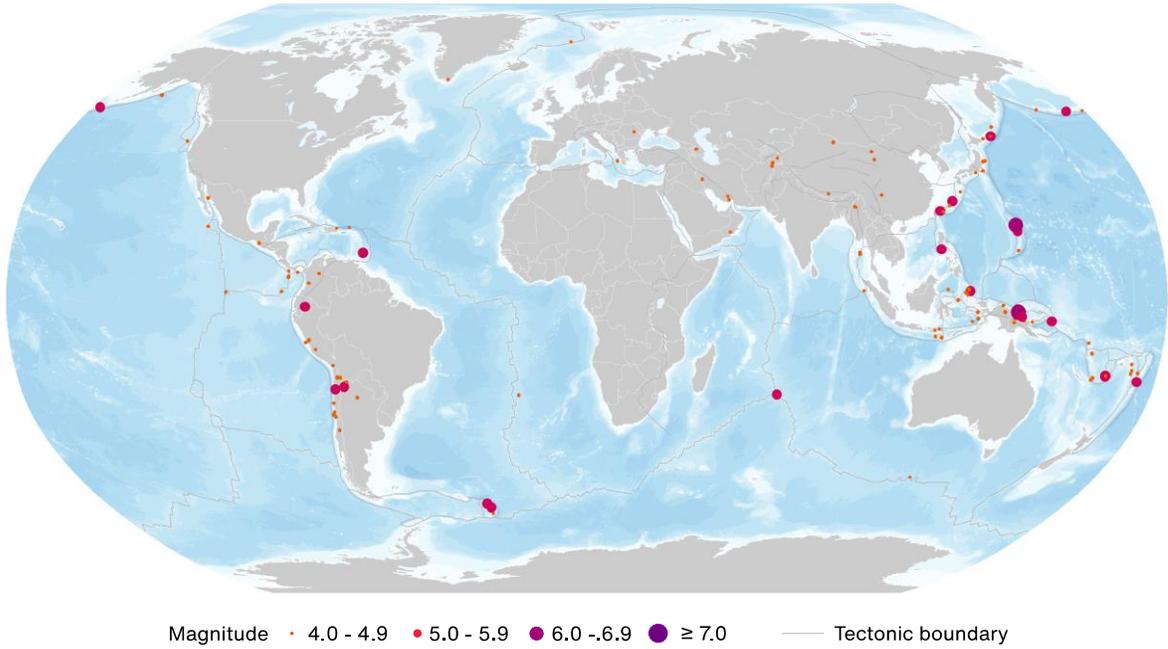
Name	Location	Winds	Center

* 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)

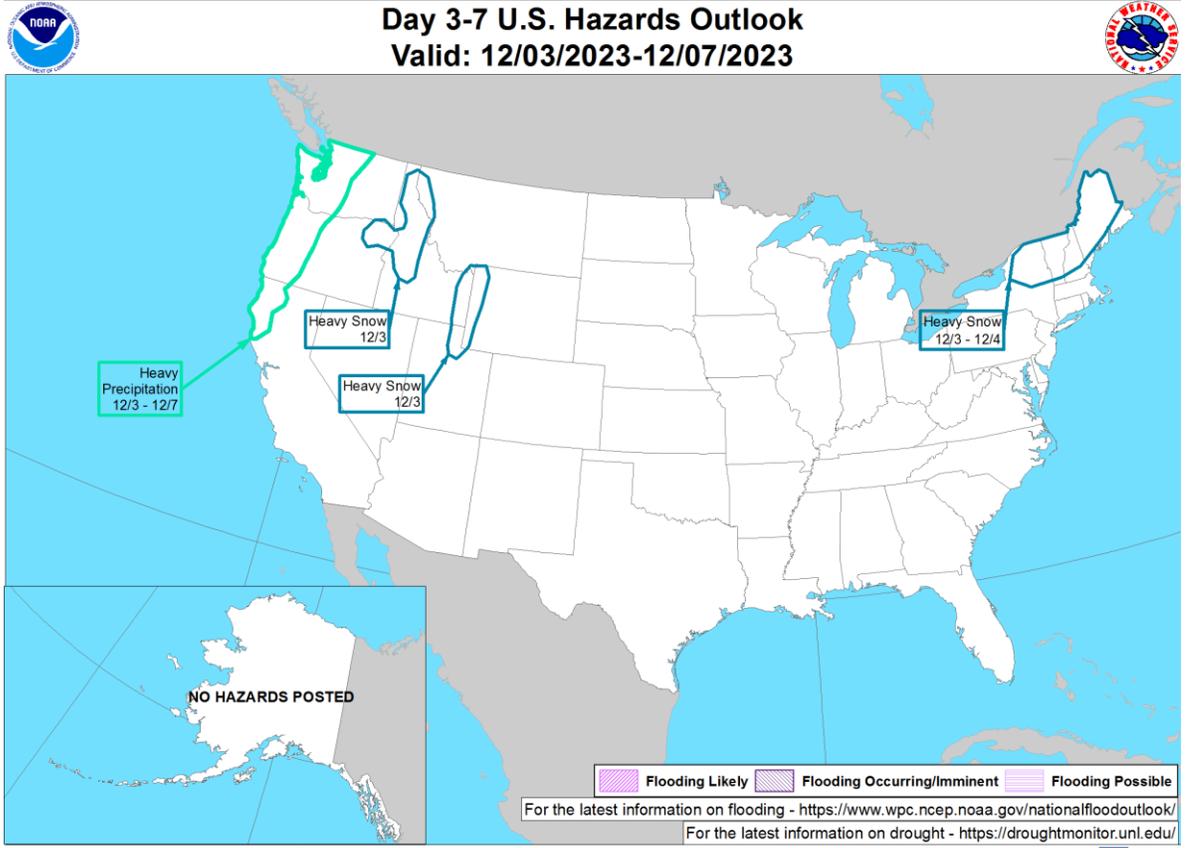
Global Earthquake Activity ($\geq M4.0$): Nov 24-30



Date (UTC)	Location	Mag	Epicenter
11/24/2023	20.16N, 145.55E	6.9	Maug Islands region, Northern Mariana Islands
11/27/2023	3.57S, 144.04E	6.5	45 km (28 miles) E of Wewak, Papua New Guinea

Source: United States Geological Survey

U.S. Hazard Outlook

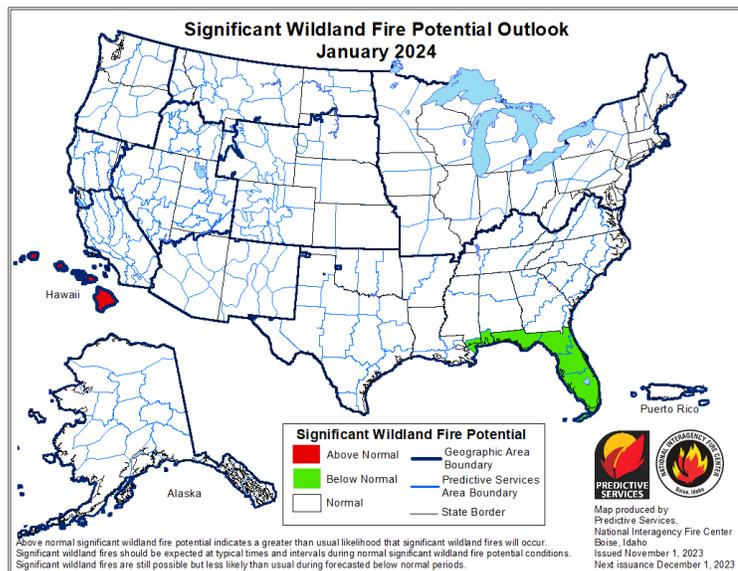
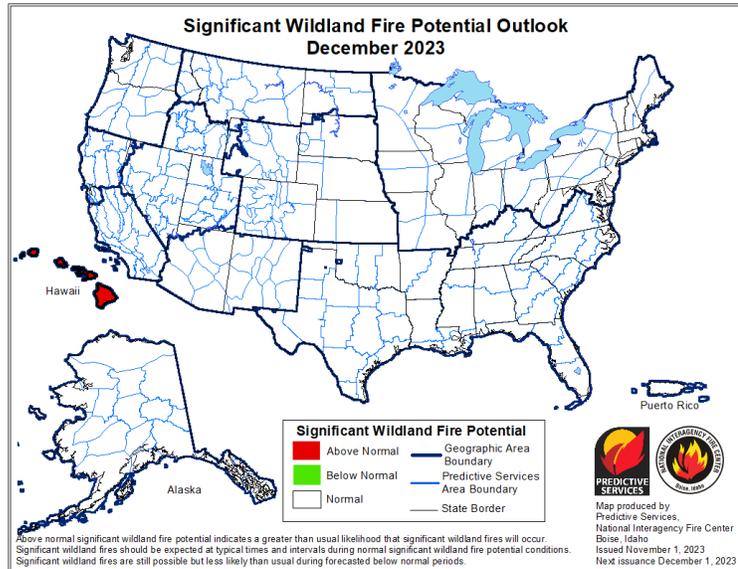


Weather Prediction Center
Made: 11/30/2023 02:40 PM EST

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

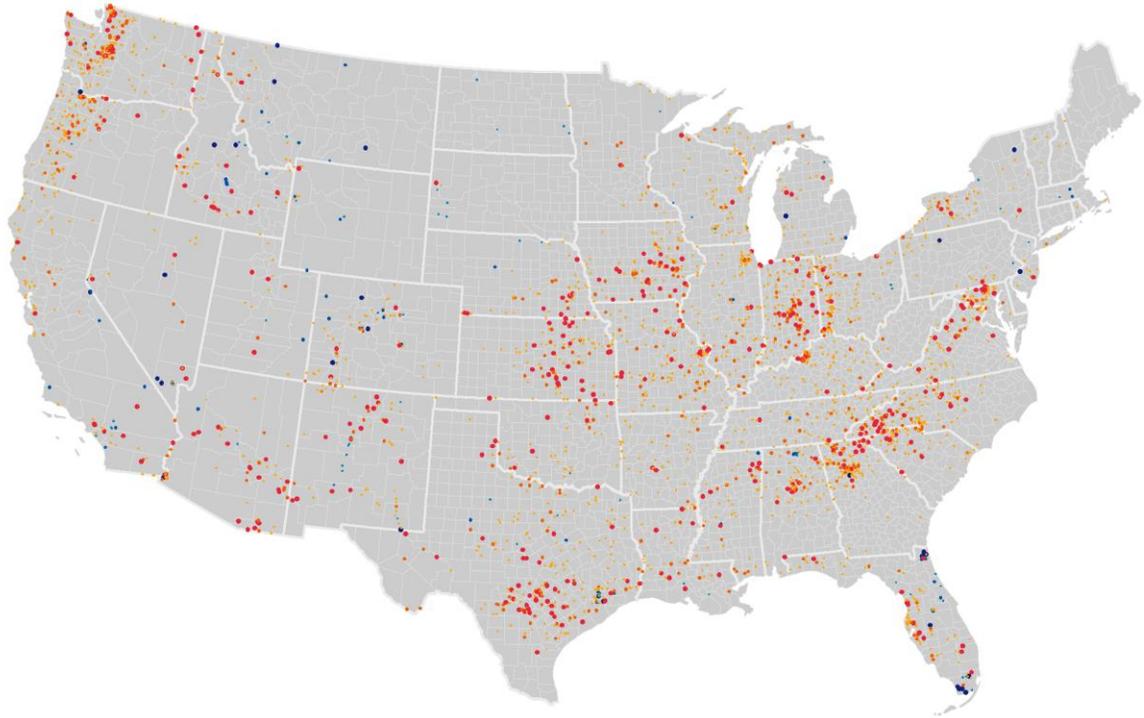
Source: Climate Prediction Center (NOAA)

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

Eastern Europe, Russia, Turkey: Storm Bettina

Ukraine's National Police

Bare wires, broken trees and destroyed beaches: how Novorossiysk suffered from the elements, *Bloknot-Novorossiysk*

Eastern Africa: Flooding (Update)

UN OCHA

FAO SWALIM

The Watchers

Natural Catastrophes: In Brief

Lightning strikes kill 24 people in India amid unusually heavy rain storms in Gujarat state, *CBS News*
ASEAN Disaster Information Network (ADINet)

Lake-effect snowstorm turns deadly in Pennsylvania after dumping more than 3.5 feet of snow in New York, *Fox News*

Snow storm knocks out power to 148,000 Hydro-Quebec customers, *CTV News Montreal*

International Federation of Red Cross (IFRC)

National Disaster Risk Reduction and Management Council (NDRRMC)

Storms roll across eastern Australia, flooding communities from Queensland to Victoria, *ABC News*

Heavy rain causes damage during critical SA, Victoria harvest season, *ABC News*

Winter arrives in Northern Europe, with dangerous roads in Germany and record lows in Scandinavia, *AP News*

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