

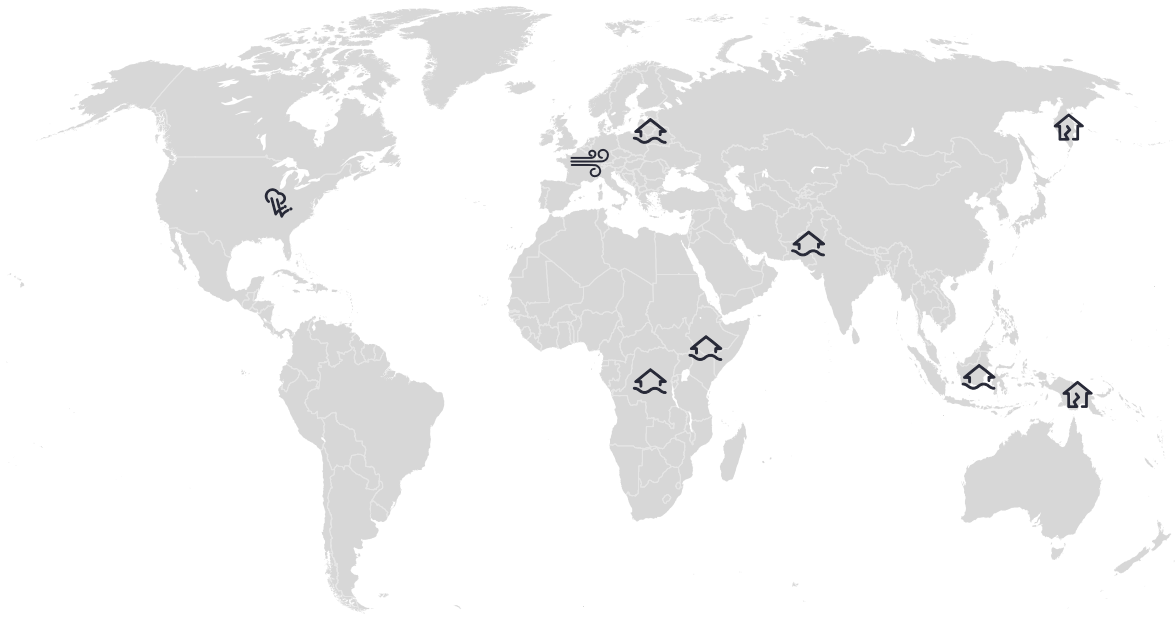
AON

Weekly Cat Report

April 7, 2023



Executive Summary



Event	Affected Region(s)	Fatalities	Economic Loss (\$)	Page
Severe Convective Storm	United States	37	100s of millions	3
Windstorm Mathis	France, Germany, Switzerland	2	10s of millions	7
Landslide	Democratic Republic of Congo	20+	Negligible	8
Flooding	Pakistan	14+	Negligible	8
Flooding	Indonesia	2+	Millions	8
Flooding	Latvia, Belarus	0	Millions	8
Earthquake	Russia	0	Millions	8
Earthquake	Papua New Guinea	4+	Negligible	9
Flooding (Update)	Ethiopia	29+	Unknown	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>

United States: Severe Convective Storm

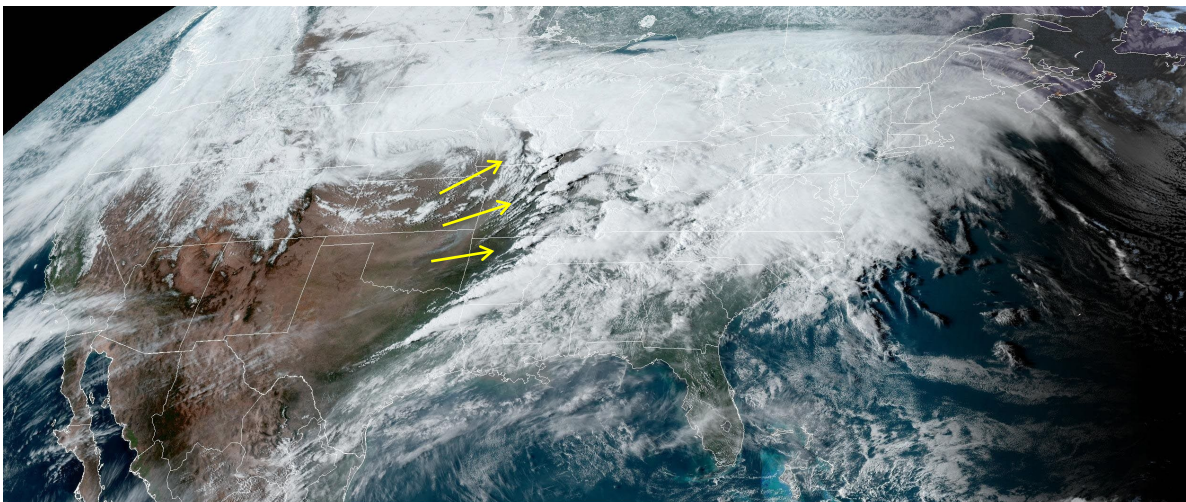
Overview

Another widespread outbreak of severe convective weather affected multiple states in the Midwest and Southeast of the United States on March 31 – April 5. Storms generated several deadly tornadoes and strong wind gusts that claimed at least 37 lives, injured hundreds of others, and caused a notable material damage across the region. Additional damage was incurred due to widespread hail, non-tornadic winds and localized flooding as a result of isolated intense precipitation. Due to a widespread nature of the outbreak and severe structural damage as a result of multiple tornadoes, total economic and insured losses from the event were initially anticipated to reach into the hundreds of millions USD.

Meteorological Recap

March 31 – April 1

Severe Convective storm outbreak on March 31 – April 1 affected much of the central and eastern United States. Atmospheric conditions became extremely favorable for convective storm development over the Mississippi Valley as a powerful mid- to upper-level trough was present, along with abundant moisture and vertical wind shear. A powerful extratropical cyclone developed over the Upper Midwest and a stationary front was present over the area. Supercellular storms started to develop over an extensive region, bringing multiple large-hail swaths, strong winds, heavy rain, and notably, multiple damaging tornadoes; a particularly destructive tornado swept through Little Rock in Arkansas. The storm activity continued overnight into Tennessee and Ohio Valleys.

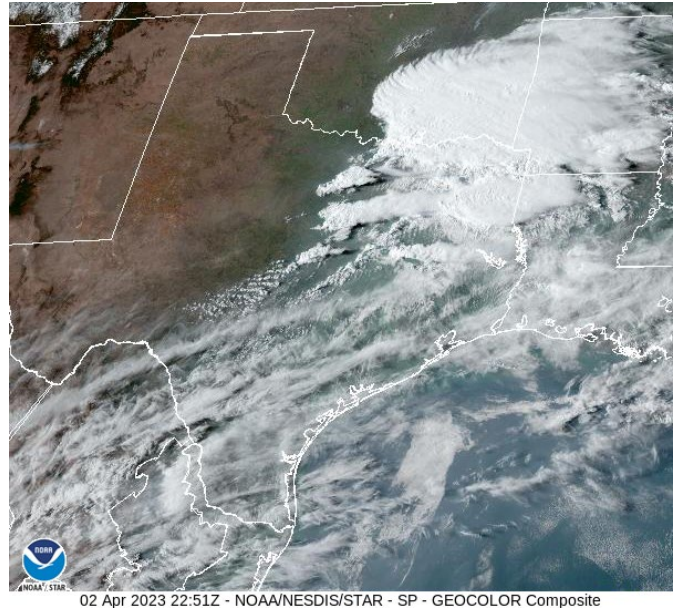


31 Mar 2023 21:56Z - NOAA/NESDIS/STAR GOES-East - GEOCOLOR Composite - Day(0.47 um - blue, 0.64 um - red, and 0.86 um - near IR)

Further round of storms during this progressing outbreak developed later on April 1 as a result of daily heating and the focus shifted further to the northeast; the most significant impacts were reported from Mid-Atlantic and were primarily associated with strong winds.

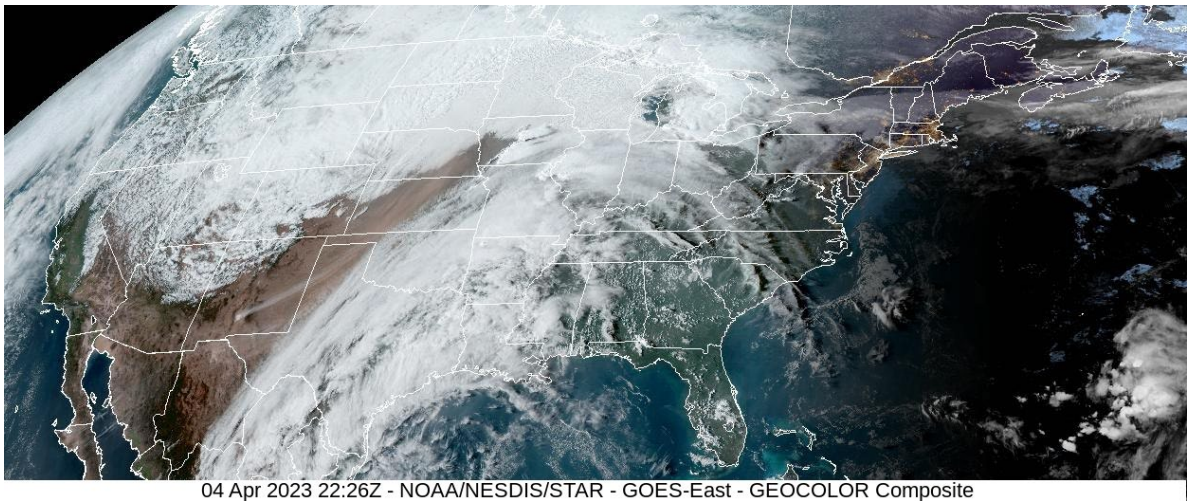
April 2-3

The period of April 2 and 3 was characterized by a relatively subdued, scattered thunderstorm activity, largely limited to the southern and southeastern United States. Primary concern was large hail, as the most significant potential developed in the region around the Dallas-Fort Worth metropolitan area. Hail with maximum diameter of up to 2 inches (5 cm) was reported from North Texas. Later on, the activity progressed eastward through northern Louisiana, central and southern Mississippi and on April 3, the severe storms were practically limited to the border region between Alabama, Georgia and Florida.



April 4-5

On April 4, widespread thunderstorm activity ensued again throughout the Mid- and Upper Mississippi River Valley to Midwest as a strong upper-level trough positioned over the Western United States moved eastward into the Central and Northern Plains. Ahead of the system, low-level moisture increased significantly through the advection from the Gulf of Mexico, providing an important component of the activity across the Plains through Upper Midwest. A surface low-pressure system developed and deepened, and thunderstorms developed along its frontal system and a dryline extending south to Oklahoma and Texas. Associated primary hazards included a mixture of large hail, tornadoes, and strong winds.



Event Details

March 31 – April 1

Widespread material damage and casualties related to the severe weather period were reported from Alabama, Arkansas, Georgia, Illinois, Indiana, Iowa, Kentucky, Mississippi, Ohio, Tennessee, and Wisconsin on March 31.

In **Tennessee**, an EF3-tornado killed one person, injured 28 people, and caused damage on several buildings in residential and industrial areas in line Brighton-Covington.

The deadliest EF3-tornado hit was reported also in Tennessee, crossing Bethel Springs and Adamsville, claiming 9 additional fatalities and no fewer than 23 injured. As of April 5, Tennessee's Emergency Agency confirmed at least 527 damaged structures across the state.

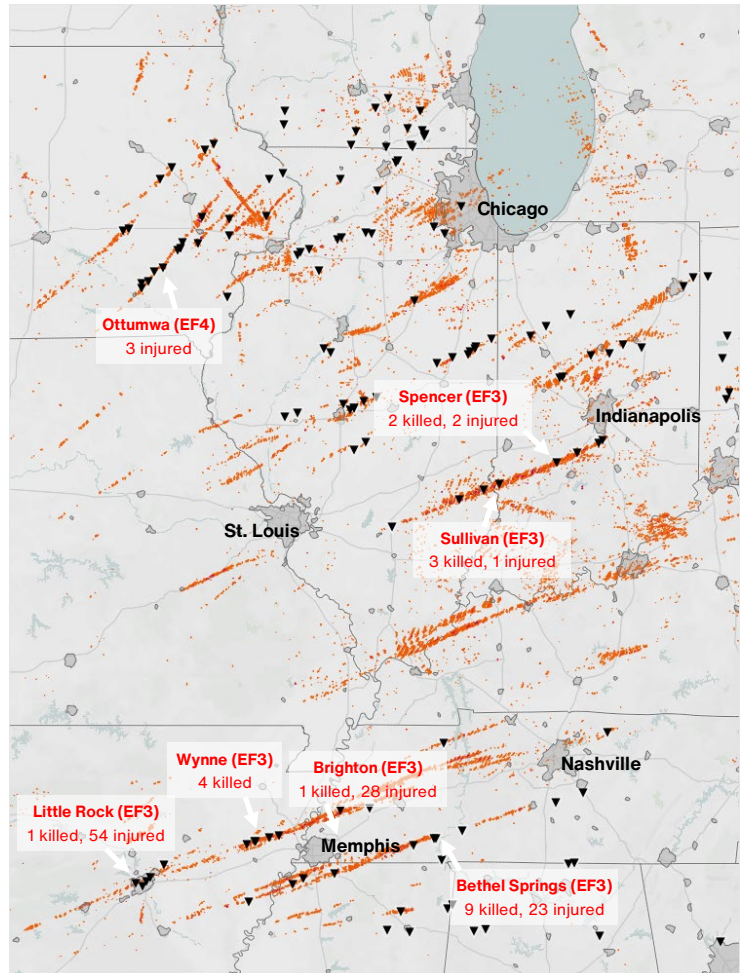
Another intense EF3-tornado left one dead and 54 injured in Little Rock metro area in **Arkansas**. Officials noted that this tornado impacted more than 2,600 structures throughout the area.

The strongest, EF4-tornado tracked line between Ottumwa and Keota in

Iowa, resulting in severe damage on several homes and vehicles. At least three people suffered injuries. Several EF-3 tornadoes tracked across **Indiana**. Fortunately, tornadoes did not directly hit the most populated agglomerations, Memphis, Nashville, or Indianapolis.

Emergency Agency of **Illinois** reported several fatalities and multiple collapsed or damaged buildings across Boone, Crawford Sangamon and Marion Counties. In **Mississippi**, material damages on 182 homes, 8 businesses, and 6 farms were incurred due to severe storms, according to state disaster authorities.

On April 1, the primary hazards were large hail and tornadic winds, notable impacts occurred across the states of Michigan, Delaware, Maryland, Pennsylvania, New Jersey, and Virginia. A strong EF3-tornado, first of such intensity since 1961, hit southern **Delaware**, tacking between Bridgeville and Ellendale, killing one person, and damaging about 60 homes in Bridgeville city. This tornado also substantially impacted a facility of Delaware Department of Transportation. Initial losses on damaged facilities were estimated to exceed \$5 million.



Rotational data for March 31 – indicative of tornadic activity

Data: NOAA, Graphic: Aon Catastrophe Insight



EF3-tornado damage in Sullivan, Indiana (left), and in Covington, Tennessee (right)

Source: NOAA, NWS Damage Assessment Toolkit

April 4-5

Bollinger County in **Missouri** was one of the worst affected by severe convective weather during the additional outbreak on April 4-5, with material damage and casualties. In early hours of April 5, a strong tornado killed at least five people and injured five others. A notable damage on 87 structures was incurred due to the storm, according to local authorities.

According to authorities and the Storm Prediction Centre (SPC) reports as of this writing, at least 37 people died and no fewer than 200 others were injured due to tornadoes or non-tornadic winds across the affected region during this stormy period between March 31-April 5.



Tornado damage in Bollinger County, Missouri

Source: Missouri State Highway Patron

The highest death tolls were reported in Tennessee (15), including McNairy, Shelby, Roane, Tipton, and Henry Counties, and in Indiana (7).

Financial Loss

The widespread impacts associated with this multi-day outbreak are likely to result in notable economic losses, as well as another costly event for the insurance industry. Aggregated effects of the storms were anticipated to reach into the hundreds of millions USD.

France, Germany, Switzerland: Windstorm Mathis

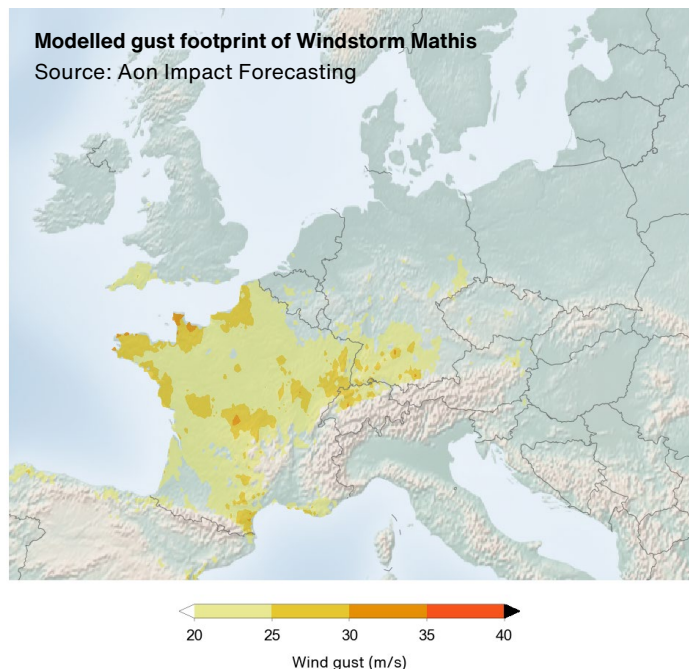
Overview

At the close of the “official” part of the European windstorm season, which ended up well below average from overall loss perspective, a relatively minor windstorm affected parts of France, Germany and Switzerland on March 31. The event was named Mathis by Météo-France and resulted in notable losses for the insurance industry, likely to reach into the tens of millions EUR. Two people were killed in France, multiple injuries occurred in Switzerland due to overturned trains.

Meteorological Recap

Windstorm Mathis, alternatively named Markus by the FU Berlin, developed in the Atlantic and quickly traversed the Ocean eastward in a strong westerly current between the deep trough in the North Atlantic and a pronounced Azores High, while deepening to about 980 mbar before moving over the continent.

The anticipated gusty winds prompted Météo-France to name the storm and issue weather warnings for northern and central parts of the country, and in particular the coastal departments of Manche and Pas-de-Calais with orange (medium) level of warning. Here, the storm produced gusts of around 110-120 kph (68-75 mph).



Event Details

Strong winds resulted in moderate damage and disruption across the northern half of France. Two people were killed by falling trees; one in Vosges and another near Mulhouse in Haut-Rhin. The storm included a notable convective storm component: a short-lived phenomenon, likely either a tornado or a downburst, affected Saint-Jean-de-Sauves in Vienne and Buzançais in Indre. Both occurrences resulted in damage to dozens of buildings and additional tree damage.

Additional damage occurred in Germany and Switzerland. Notably, two trains were overturned in the canton of Bern in Switzerland and 15 people were injured in total. Reports of roof damage, fallen scaffolding and additional impacts were reported from Western and Northern parts of the country.

Financial Loss

The event is anticipated to result in notable insured loss, likely in the tens of millions EUR, considering cumulated effects in France, Germany and Switzerland.

Natural Catastrophes: In Brief

Landslide (Democratic Republic of the Congo)

Authorities of Democratic Republic of the Congo confirmed at least 20 dead and several injured people after a massive landslide occurred on April 2 near the Bulwa village. Country's South Kivu and North Kivu Provinces were the worst affected by heavy rainfall during recent days.

Flooding (Pakistan)

Flooding triggered by torrential rainfall resulted in casualties and material damage in Khyber Pakhtunkhwa Province, northern Pakistan, between March 24 – April 6. According to local disaster authority (PDMA), no fewer than 14 people were killed due to flooding or heavy rain in Mardan, Peshawar, South Waziristan, Hangu, Tank and Khyber Districts. At least 27 others were injured, and about 150 houses were destroyed or damaged.

Flooding (Indonesia)

Incessant rainfall between March 29 – April 3 caused widespread flooding in several provinces of Indonesia. According to the National Disaster Management Agency (BNPB), at least two people died in flood-related accidents, no fewer than 40 people were injured in Kapuas District alone. More than 26,000 houses have been inundated across Kalimantan, Jawa, Sulawesi, Nusa Tenggara, Riau and Maluku Provinces.

Flooding (Latvia, Belarus)

Heavy rainfall and snowmelt have triggered widespread flooding along the Daugava River since late March. Floodwaters affected hundreds of people across southern Latvia, particularly in Upper Daugava and Augšdaugava regions. In neighbouring Belarus, hundreds of buildings and several roads and bridges have been inundated across almost all regions in the country. One of the worst affected by flooding was the city of Balashov, where about 140 homes were flooded.

Earthquake (Russia)

The USGS issued a yellow alert after a magnitude-6.5 earthquake jolted near the east coast of the Kamchatka Peninsula in Russia on April 3. According to the initial estimates by USGS's PAGER methodology, the earthquake had a 39 percent likelihood to cause economic losses in the tens of millions USD, and a potential (34 percent) to exceed losses of 100 million USD. However, preliminary assessments reported no casualties and major destruction.

Earthquake (Papua New Guinea)

A strong, magnitude-7.0 earthquake occurred in the northern Papua New Guinea on April 2 (UTC). Its epicentre was located about 97 km (60 mi) from the coastal town of Wewak. Although the affected region is sparsely populated, up to 133,000 people felt very strong shaking, equivalent to level VII on the Modified Mercalli Intensity scale, according to USGS. As of this writing, at least four deaths and 17 injured people were reported, along with damage on about 300 houses throughout the East Sepik Province.

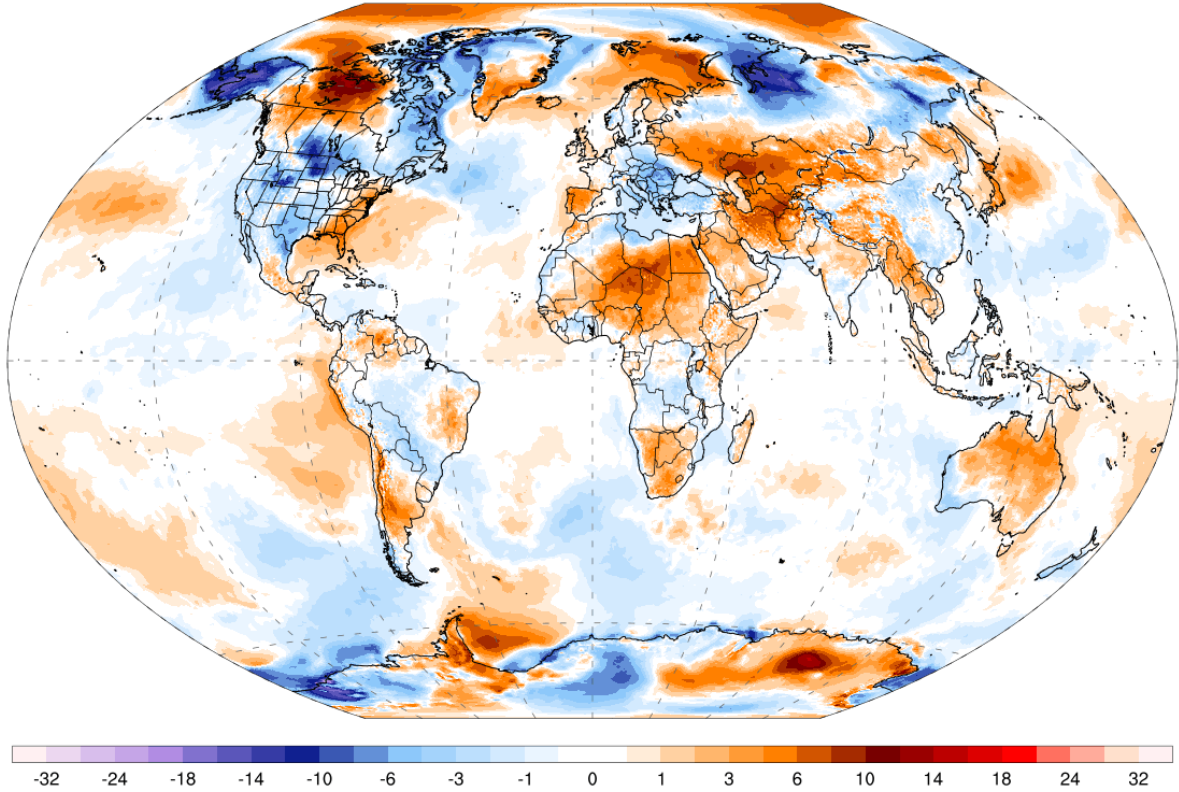
Flooding (Ethiopia) - Update

According to UN OCHA report, death toll related to widespread flooding over the past weeks rose to 29 in Ethiopia. Approximately 240,000 people have been affected or displaced across the regions of Oromia, Afar and Somali, where all fatalities were reported.

Global Temperature Anomaly Forecast

GFS 2m T Anomaly (°C) [CFSR 1979-2000 baseline]
Days 1-3 Avg | Thu, Apr 06, 2023

ClimateReanalyzer.org
Climate Change Institute | University of Maine

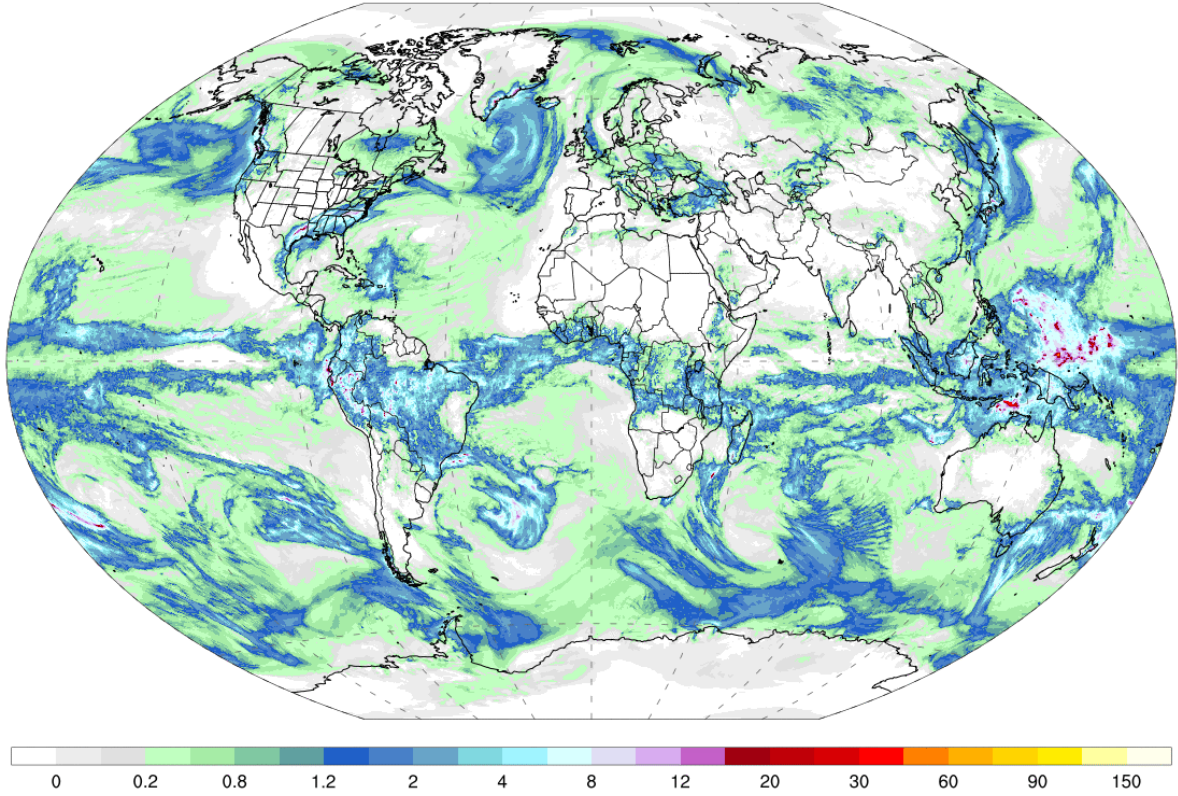


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

Global Precipitation Forecast

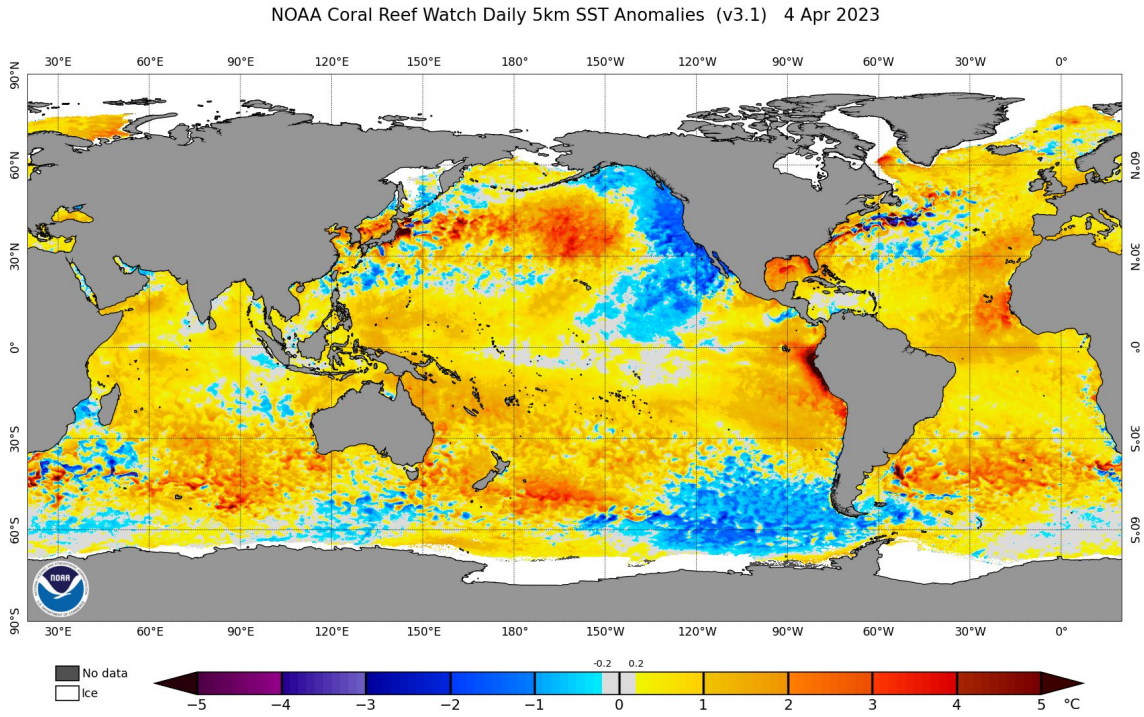
GFS Accumulated Precipitation (cm)
Days 1-3 Total | Thu, Apr 06, 2023

ClimateReanalyzer.org
Climate Change Institute | University of Maine



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

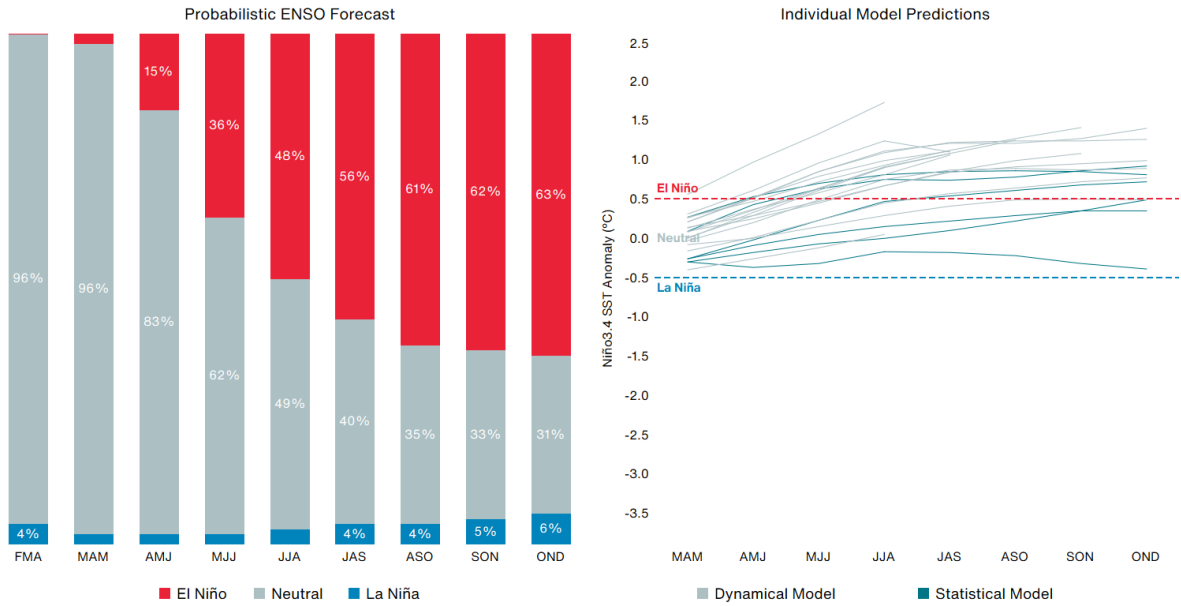
Weekly Sea Surface Temperature (SST) Maps (°C)



El Niño-Southern Oscillation (ENSO)

Probabilistic ENSO Model Projections: March 2023

Data: NOAA & Columbia University (IRI) | Graphic: Catatrophe Insight, Aon



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).

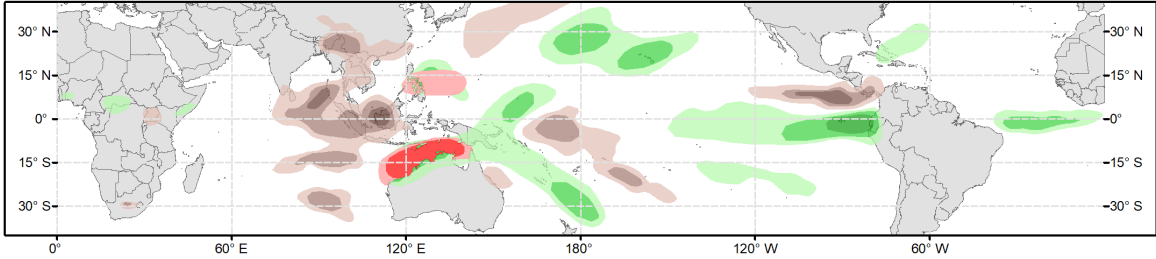
Global Tropics Outlook



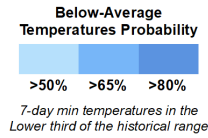
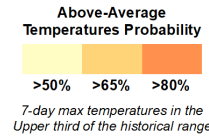
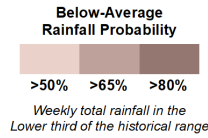
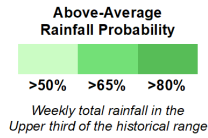
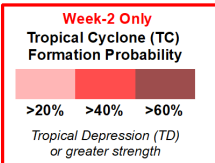
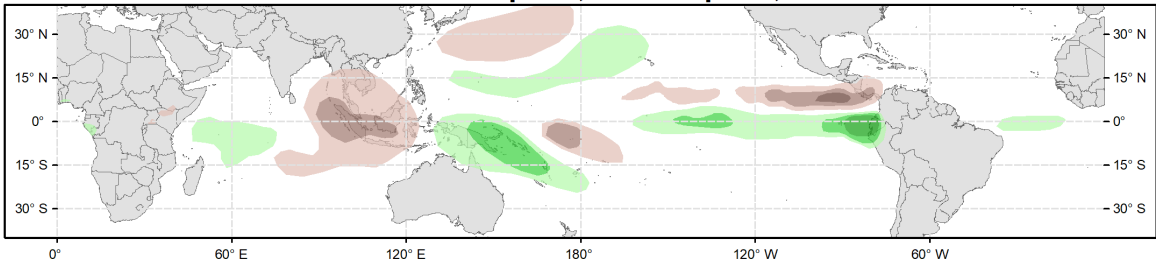
Global Tropics Hazards Outlook Climate Prediction Center



Week 2 - Valid: Apr 12, 2023 - Apr 18, 2023



Week 3 - Valid: Apr 19, 2023 - Apr 25, 2023

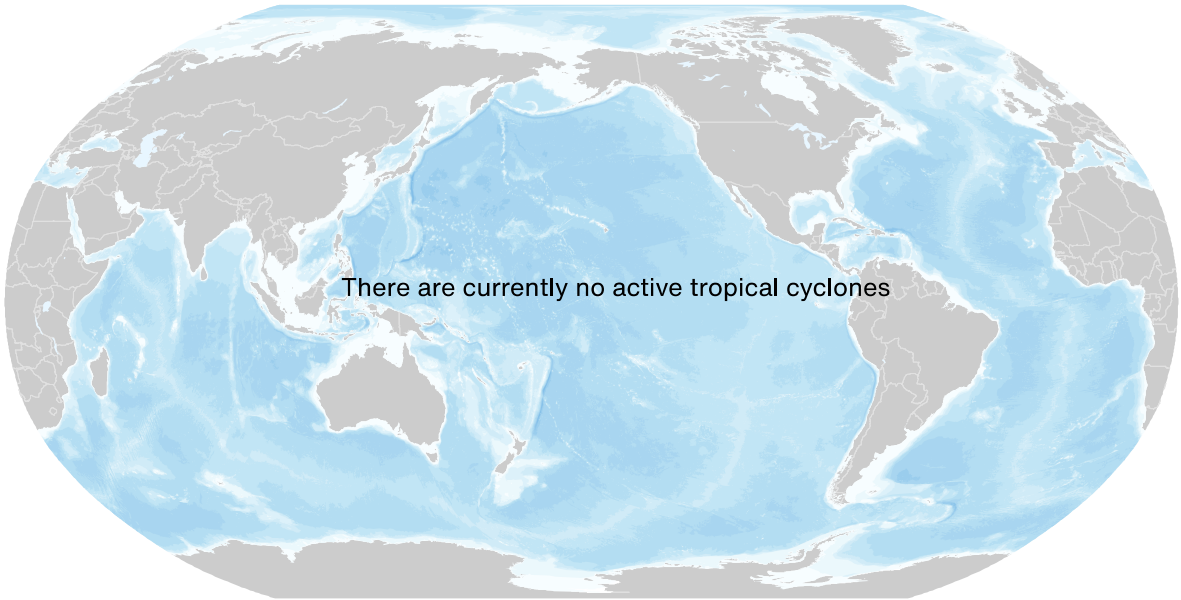


Issued: 04/04/2023
Forecaster: Collow

This product is updated once per week and targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.

Source: Climate Prediction Center (NOAA)

Current Tropical Cyclone Activity



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

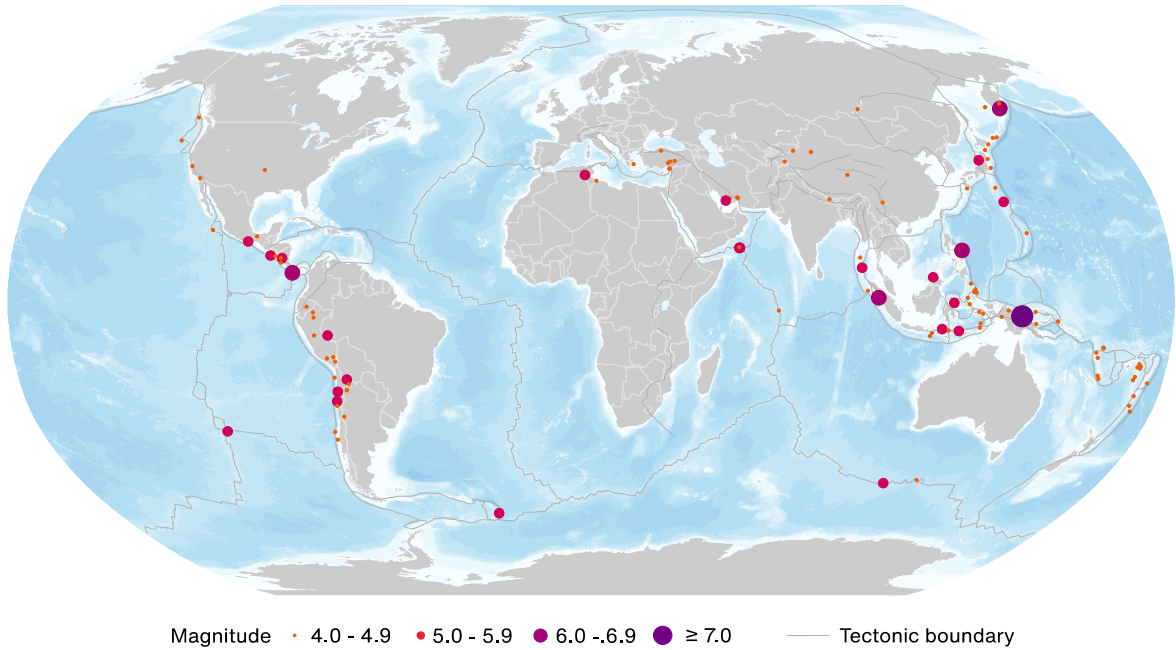
Storm Name	Location	Winds	Location from Nearest Land Area

* 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)

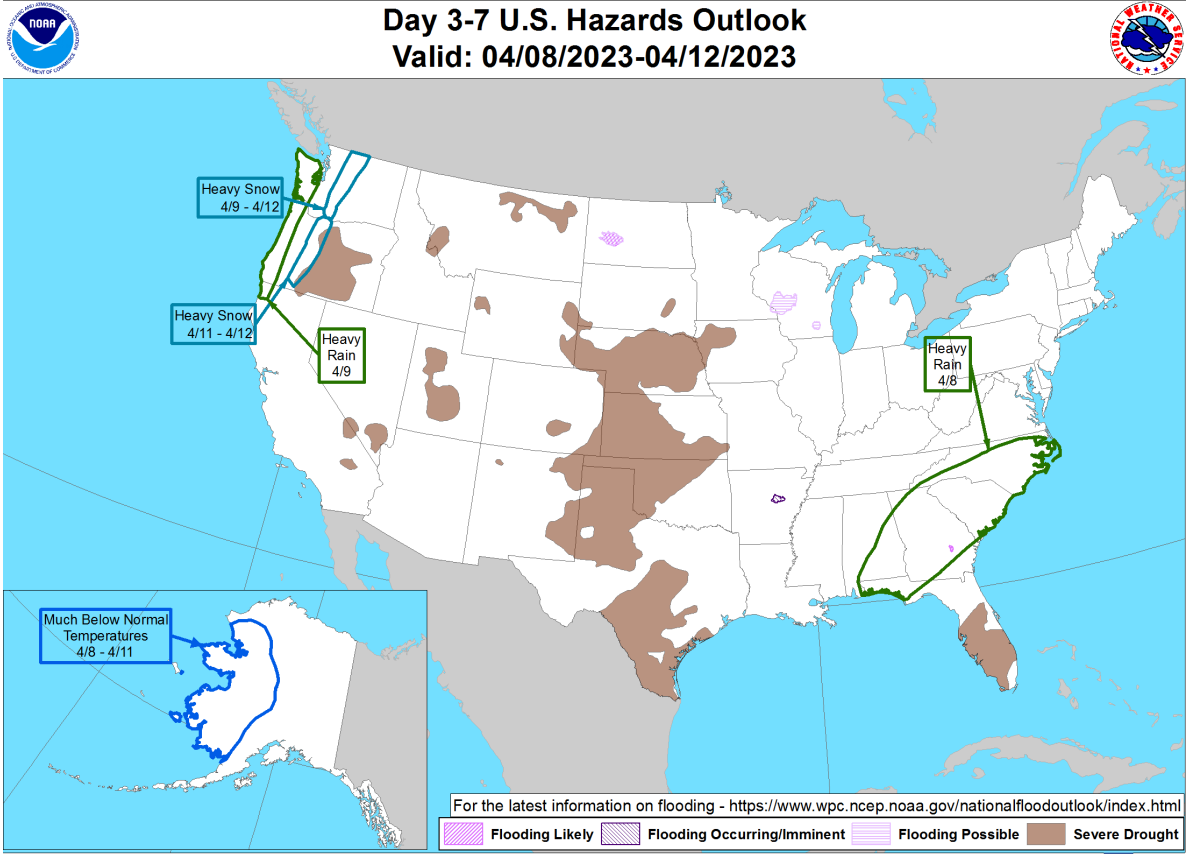
Global Earthquake Activity ($\geq M4.0$): Mar 31 - April 6



Date (UTC)	Location	Magnitude	Epicenter
4/2/2023	4.29S, 143.16E	7.0	97 km (60 miles) SW of Wewak, New Guinea
4/3/2023	52.78N, 158.48E	6.5	near E coast of the Kamchatka Peninsula, Russia
4/3/2023	0.89N, 98.84E	6.1	72 km (45 miles) SW of Padangsidempuan, Indonesia
4/4/2023	13.75N, 125.54E	6.2	12 km (7 miles) E of Gigmoto, Philippines
4/4/2023	7.58N, 82.32W	6.3	71 km (44 miles) S of Boca Chica, Panama

Source: United States Geological Survey

U.S. Hazard Outlook



Weather Prediction Center

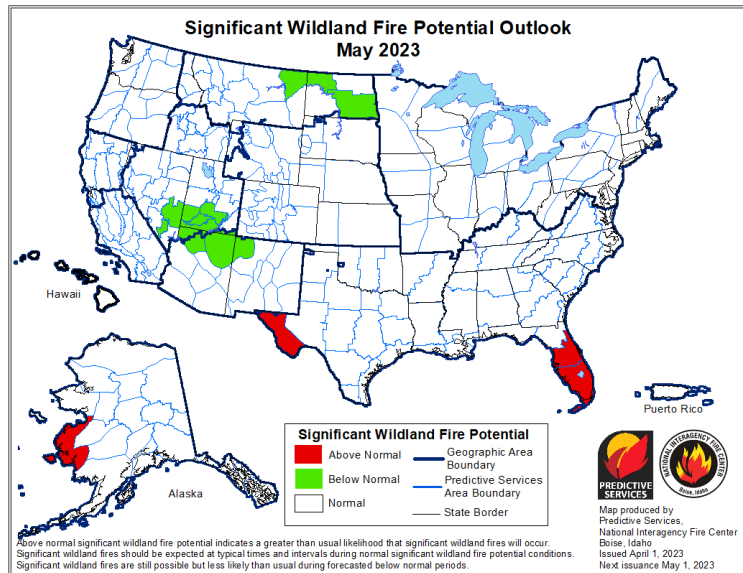
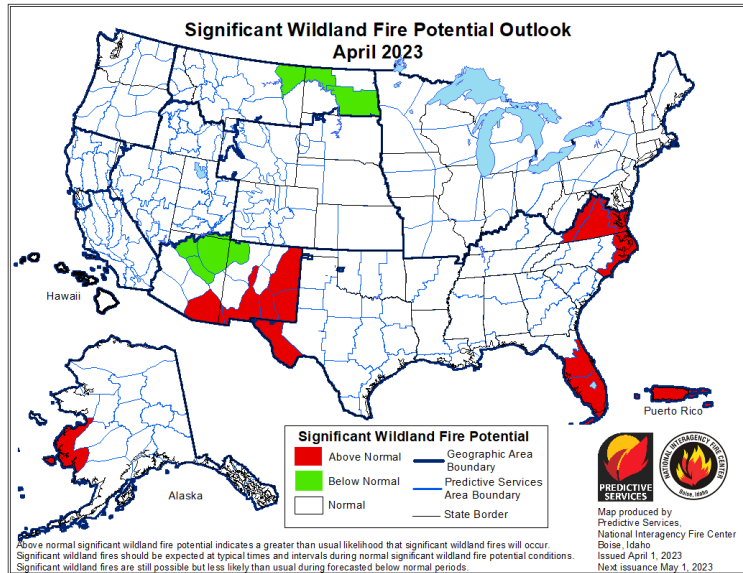
Made: 04/05/2023 3PM EDT

Source: Climate Prediction Center (NOAA)

Follow us:

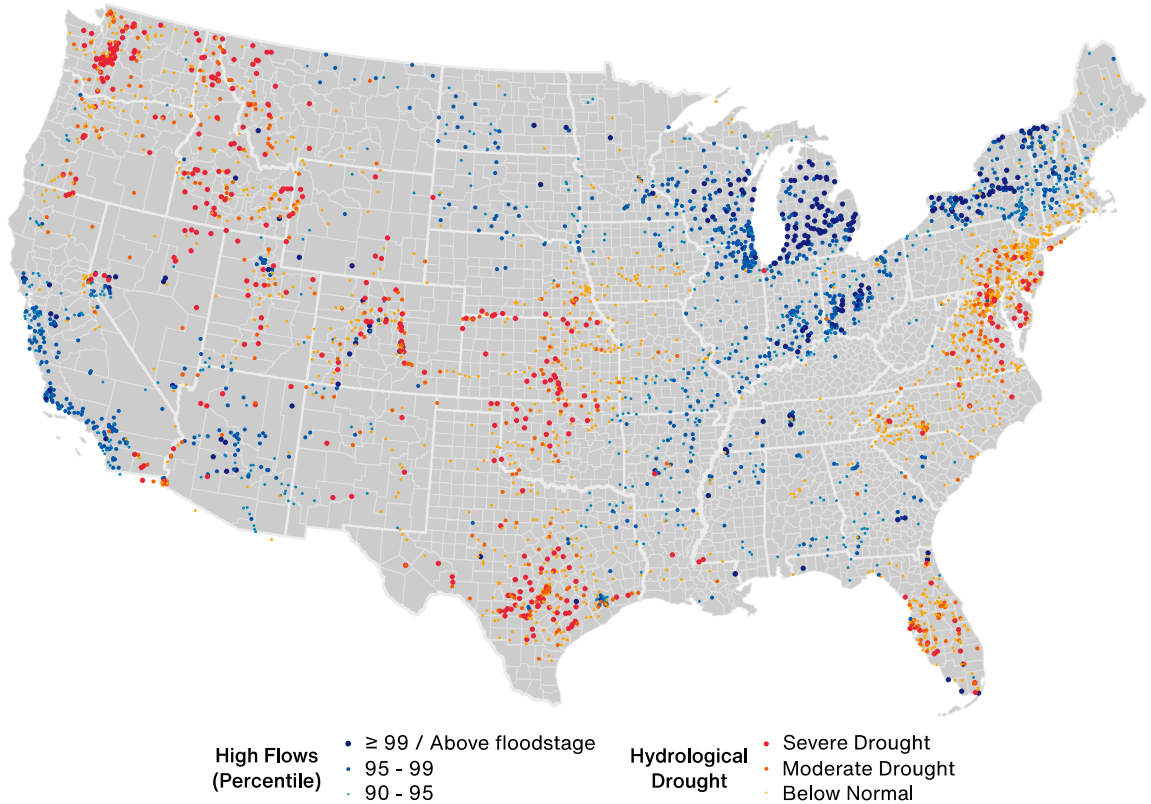
www.wpc.ncep.noaa.gov

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



Source: NIFC

U.S. Current Riverine Flood Risk



A $\geq 99^{\text{th}}$ 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

United States: Severe Convective Storm

Federal Emergency Management Agency (FEMA)

Mississippi Emergency Management Agency (MSEMA)

Storm Prediction Centre (SPC)

National Weather Service (NWS)

NOAA

Sussex County begins recovery from Saturday tornado, *Delaware Public Media*

Missouri tornado kills at least 5 people, causes widespread damage, *CBS News*

France, Germany, Switzerland: Windstorm Mathis

Météo-France

Mathis storm: tornadoes, regions affected, damage. RTL

Natural Catastrophes: In Brief

Floodlist

The U.S. Geological Survey (USGS)

The United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA)

The Provincial Disaster Management Authority of Khyber Pakhtunkhwa (PDMA)

Indonesian National Disaster Management Agency (BNPB)

Papua New Guinea East Sepik province hit by 7.1 magnitude earthquake, four dead, *ABC News*

Three people were evacuated from a flooded area in Svente Parish, *Latvian Public Media*

142 houses may be flooded in Balashov, *Balashov News*

Floods in Belarus: Houses and bridges flooded, people evacuated, *Malanka Media*

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