

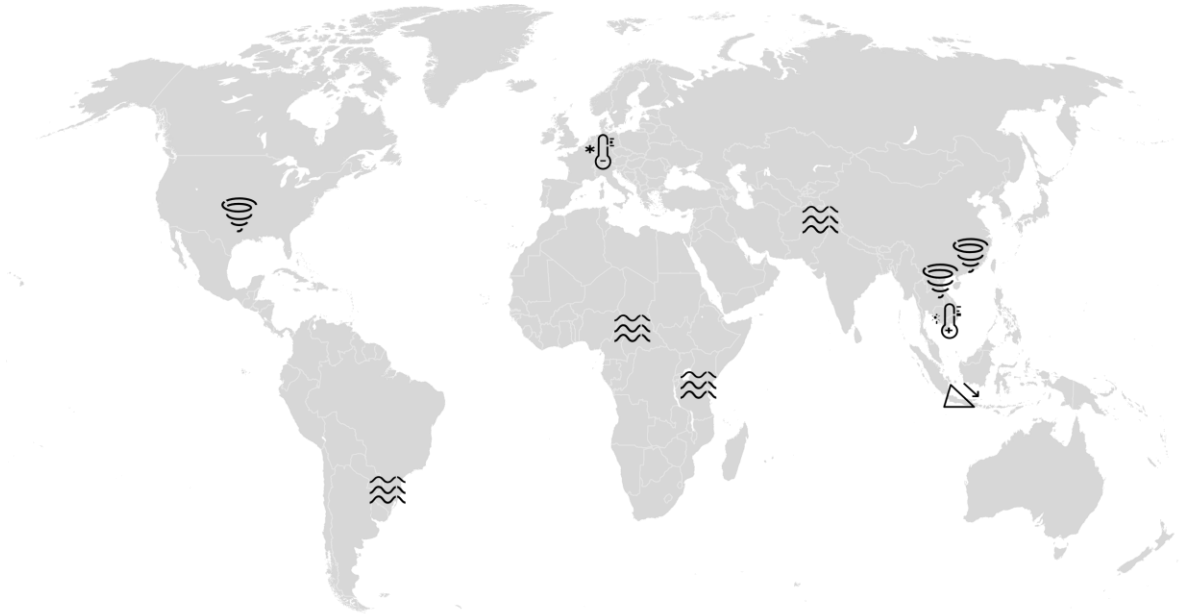
AON

Weekly Cat Report

May 3, 2024



Executive Summary



Event	Affected Region(s)	Fatalities	Economic Loss (\$)	Page
SCS & Flooding	United States	6	Billions	3
Winter Weather (Update)	Europe	0	100s of millions	7
Flooding & Landslide (Update)	Eastern Africa	367+	Unknown	9
Severe Convective Storm	China	53	Millions	11
Flooding & SCS	Brazil	10	Unknown	11
Severe Convective Storm	Vietnam	1	Millions	11
Landslide & Earthquake	Indonesia	12	Millions	11
Flooding	Pakistan	7	Unknown	11
Flooding	Chad	1	Unknown	12
Heatwave	Southeastern Asia	N/A	N/A	12

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 & Flooding

Overview

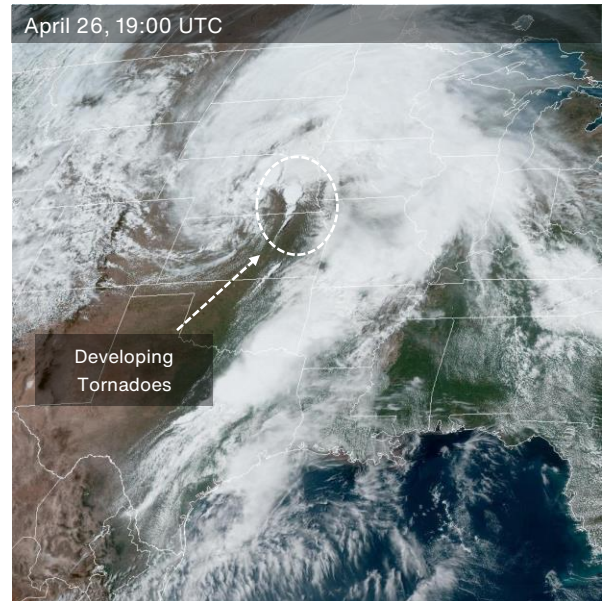
Continuous severe weather and flooding devastated the central United States from April 25 to May 2. Several powerful tornadoes caused catastrophic damage in Nebraska, Iowa, and Oklahoma as many homes and businesses were completely destroyed. Heavy rainfall and flash flooding also impacted parts of Texas, Kansas, and Missouri. Overall, six people were killed and nearly 140 more were injured in the past week. Total economic and insured losses may reach into the billions of USD.

Meteorological Recap

April 25-26

Ahead of a developing low-pressure system along the Rocky Mountain Front Range, two areas of strong storms formed in western Kansas and central Oklahoma on April 25. Despite some parts of western Kansas reporting hail up to 3 inches (7.62 cm), most storms produced minor impacts.

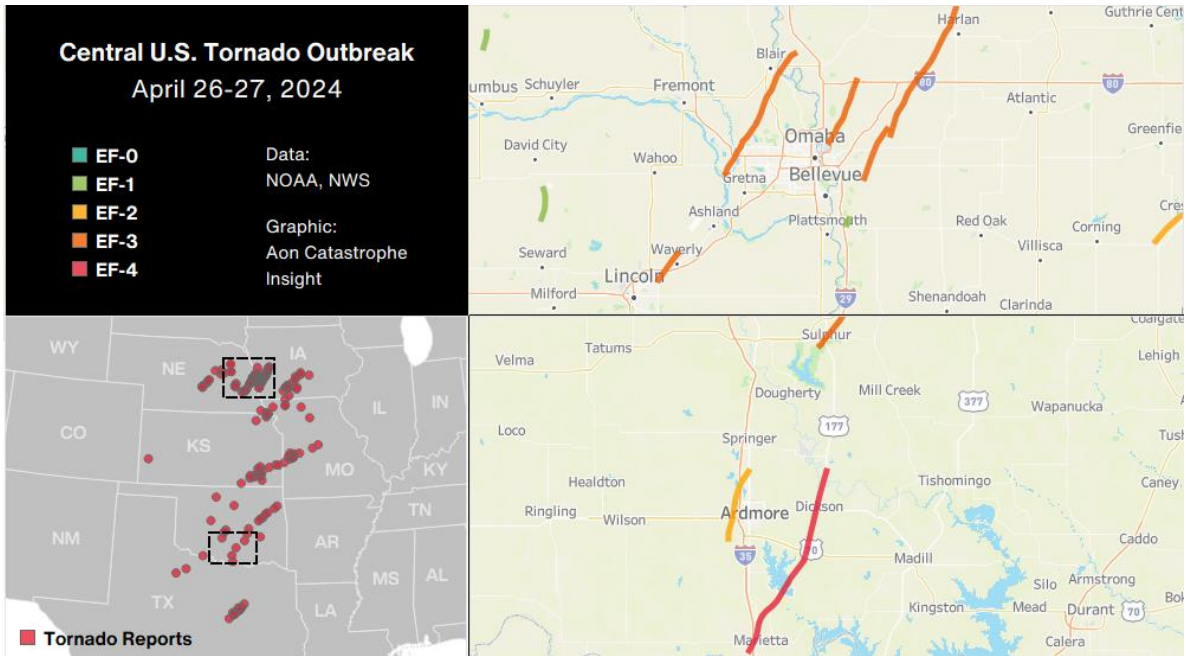
The following day, abundant low-level moisture, wind shear, and daytime heating ahead of the aforementioned low triggered vigorous storms over the Great Plains. These storms kicked off one of the most prolific tornado outbreaks in recent memory as an astonishing 136 preliminary tornado reports were submitted to the Storm Prediction Center (SPC) on April 26 alone. In fact, the NWS office in Omaha (NE) issued 42 tornado warnings for their coverage area on April 26, becoming a new single-day record for their office.



Many of the strongest tornadoes were spotted in southeast Nebraska and southwest Iowa, including five EF-3 tornadoes. Two of these powerful twisters prompted rare tornado emergencies, the most urgent tornado warning available, to be issued by the NWS Omaha office. Several areas near Omaha (NE) were heavily impacted by these violent tornadoes, including the towns of Elkhorn (NE), Waterloo (NE), Bennington (NE), and Minden (IA).

April 27

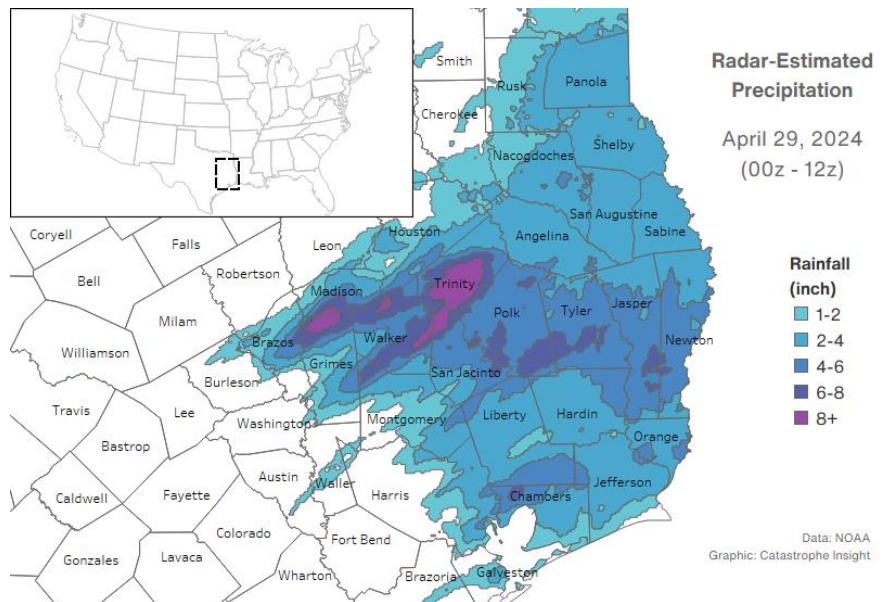
As a new low-pressure system began developing in eastern Colorado on April 27, an atmospheric setup similar to the previous day sparked more severe weather across the Great Plains and upper Midwest. A long line of thunderstorms affected a large area spanning from western Texas to Michigan, with many of the strongest storms occurring after dark. Aside from large hail and strong wind gusts, parts of eastern Kansas and western Missouri received very heavy rainfall due to slow-moving thunderstorms. Localized flash flooding was reported in several locations, including Fort Scott (KS) and Kansas City (MO).



Most notably, these storms also produced another significant tornado outbreak as the SPC received an additional 51 preliminary tornado reports on April 27. A large portion of the outbreak occurred over central Oklahoma, where the NWS Norman office confirmed at least 27 tornadoes and issued 59 tornado warnings. The strongest tornado observed was rated an EF-4, with an estimated peak wind speed of 170 mph (274 kph) that directly impacted the town of Marietta (OK). This was the first EF-4 twister recorded in central Oklahoma in nearly 8 years. Two other notable tornadoes were rated EF-3 by the NWS and caused significant impacts within the towns of Sulphur (OK) and Holdenville (OK).

April 28-29

After lingering storms from the previous night faded, more severe weather reignited over the southern U.S. late on April 28 into early April 29. A new line of strong thunderstorms brought 80 mph (129 kph) wind gusts and a few tornadoes primarily to parts of Texas, Arkansas, and Louisiana. Moreover, these slow-moving storms also dumped torrential rainfall over southeast Texas,



especially for locations near the Trinity and San Jacinto Rivers. Remarkably, up to 10 inches (254 mm) of rain fell in just a few hours in Trinity County (TX), which caused flash flooding and prompted the NWS to issue a flash flood emergency. Many other nearby Texas counties such as Tyler, Polk, Walker, Madison, and San Jacinto also experienced flash flooding. Further south, additional flooding impacts were seen near the Houston metro area.

April 30 – May 2

After a brief break on April 29, another round of severe weather and intense rainfall returned to the central U.S. from April 30 to May 2. Powerful storms featuring wind gusts up to 83 mph (134 kph) and hailstones up to 4.5 inches (11.4 cm) in diameter were seen primarily in Texas, Oklahoma, and Kansas. Another 40 preliminary tornado reports were sent to the SPC, including an EF-3 tornado that struck the town of Westmoreland (KS) with an estimated 140 mph (225 kph) maximum wind speed.

Additionally, more deadly flooding is ongoing in southeast Texas as of this writing. Many locations near the Houston and Beaumont metro areas have received at least 6 inches (152 mm) of rain since May 1, on top of already saturated soils. Since more rain is forecasted in the coming days in this region, more updates on this evolving situation will likely be provided in the next Weekly Cat Report.

Event Details



EF-3 tornado damage in Elkhorn, Nebraska

Source: NOAA DAT

Nebraska & Iowa

According to the NWS Omaha office, the significant tornadoes in southeast Nebraska and southwest Iowa damaged or destroyed hundreds, if not thousands, of homes and businesses across the affected region. Much of this catastrophic tornado damage was seen in the towns of Elkhorn (NE), Waterloo (NE), and Bennington (NE) from a single twister. On the east side of Omaha (NE), another tornado heavily damaged or destroyed 4 hangar buildings and at least 32 aircraft, along with several other buildings. Multiple other tornadoes in Pottawattamie County (IA) damaged around 300 homes and businesses, according to county officials. The most notable damage in the county was seen in Minden (IA), where nearly 50 homes were completely destroyed. Overall, the tornado outbreak caused one death and 36 injuries across Nebraska and Iowa.

Oklahoma

Much of central Oklahoma was also significantly impacted by multiple, violent tornadoes. In Sulphur, a powerful EF-3 twister tore through the heart of downtown, destroying several buildings and numerous vehicles. A separate EF-4 tornado in Marietta caused considerable property damage on the west side of town near Interstate 35. In total, four people were killed in Oklahoma across the towns of Marietta, Sulphur, and Holdenville. State hospitals and local officials also reported at least 100 injuries across the state, 30 of which came from Sulphur alone. Despite the extensive tornado damage, it is widely believed that the low death toll is due to the tireless efforts of NWS staff members, especially those from the Norman (OK) and Omaha (NE) offices.

Texas & Elsewhere

In Texas, Trinity County was among the worst affected areas as a tornado injured three people and damaged multiple homes. More notable damage occurred within the county due to significant flash flooding, leading to inundated roads and several water rescues.

Across the greater southeast Texas area, widespread flash flooding continues to impact dozens of locations, especially those near the San Jacinto and Trinity Rivers. A number of water rescues and mandatory evacuations have taken

place across Tyler, Polk, Walker, Madison, San Jacinto, Harris, and Jefferson counties. Additional flooding impacts within the affected locations include road closures and thousands of power outages.

In Kansas and Missouri, more flash flooding was seen near Fort Scott (KS) and within the Kansas City (MO) metro area. In addition, a tornado tore through the small town of Westmoreland (KS), causing notable impacts. One person was killed, three more were injured, and nearly 40 structures were damaged, including 22 homes that were destroyed according to local county officials.

Financial Loss

Due to relentless tornado activity over the last week, material losses within the central U.S. are expected to be significant. Given the additional severe weather impacts and ongoing flash flooding in Texas, total economic and insured losses may reach into the billions USD.



Flooding in Polk County, Texas

Source: TxDOT Lufkin District

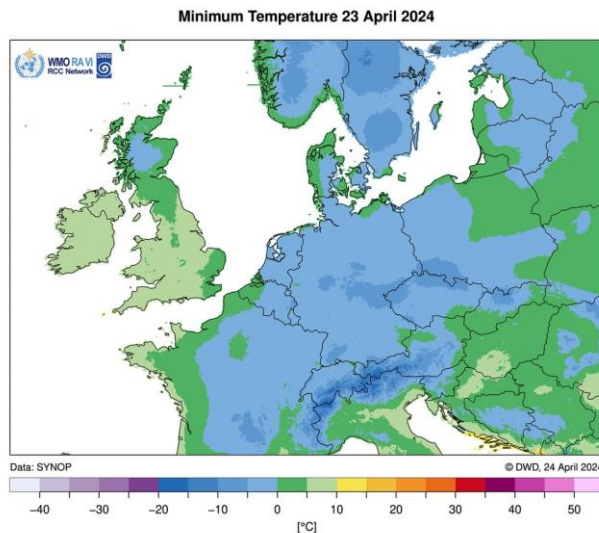
Europe: Winter Weather (Update)

Overview

Morning frost that occurred across large portions of Europe last week extensively devastated the fruit harvest in many countries in the region. The cold blast resulted in notable agricultural losses of at least hundreds of million EUR, potentially higher. Germany, Czechia, and Austria were among the hardest hit.

Meteorological Recap

Europe, particularly western and central parts of the continent, experienced a rapid temperature drop last week, shifting from numerous record-breaking, summer-like temperatures with positive temperature anomalies reaching up to 15°C (27°F) locally to record-breaking late April cold with negative anomalies close to 10°C (18°F). Above-average air temperatures from the first half of the month accelerated tree blooming, therefore, subsequent morning frost caused severe damage to such a large extent. Many locations saw below-zero temperatures several nights in a row, not only at ground level.



Area in Czechia experiencing temperatures below -2°C (28.4°F) during the cold period on April 18-24
Source: CHMI

Event Details

Germany was the worst-hit country as the frost severely affected the vine-growing regions, including the regions of Rheinhessen, Moselle, Ahr, Nahe, Baden, and others.

In **Czechia**, the Ministry of Agriculture reported that the majority of fruit trees were damaged, resulting in a nearly complete loss of harvest, particularly to vineyards across the western part of the country. Damages in Moravia in the eastern part of the territory, were estimated to reach up to 50%. This year's losses are considered to be one of the most severe in decades. The local government promised emergency aid to support the affected producers.

The late frost in recent days caused significant damage to local fruit and vine producers in **Austria**. According to authorities, the federal states of Styria and Lower Austria were the hardest hit.

Fruit damage was reported also in Poland, France, Switzerland, Italy, the Netherlands, and Hungary.

Financial Loss

Aggregate losses due to late frost are estimated to reach hundreds of millions of EUR, potentially higher.

In Germany, the insurance company Vereinigte Hagel estimated the damage to the vine industry across Germany to surpass €500 million (\$535 million). The losses of at least CZK 2.1 billion (\$90 million) to vineyards were reported in Czechia. Austrian authorities and insurance companies reported losses of around €56 million (\$60 million).

There remains a high potential for significant agricultural damage elsewhere across Western and Central Europe, which will likely further increase losses.



Frost damage to vineyards in Germany

Source: Vereinigte Hagel

Eastern Africa: Flooding & Landslide (Update)

Overview

A rainy season accompanied by deadly floods and landslides has continued to severely impact many countries in Eastern Africa. Hundreds of people have already died in various flood-related incidents across the region since late March, with the highest death toll reported in Kenya and Tanzania. As the rainy season is still ongoing over the region of central-east Africa, total material and human losses are expected to rise in the upcoming weeks.

Meteorological Recap

The region typically experiences increased rainfall during its main rainy season lasting from late March to May. This year's season is expected to be amplified due to the naturally occurring El Niño phenomenon. Further heavy rainfall resulting in widespread flooding is likely due to the tropical storm Hidaya that formed over the Mozambique Channel and is expected to reach the eastern African coast on May 5.

Event Details

The latest deadly event occurred on April 28 near the town of **Mai Mahiu** in southwestern Kenya. According to the latest reports from May 1, at least 71 people died and more than a hundred others were injured due to the dam burst after the heavy rainfall that resulted in severe flash flooding. Dozens of people remain missing. This event has increased the seasonal flooding death toll to approximately 170.

Severe flood impacts have been reported over the entire region, including human and material losses to thousands of homes, crops, and local infrastructure in **Tanzania, Burundi, Somalia, Rwanda, and Uganda**. See the table below for more details.



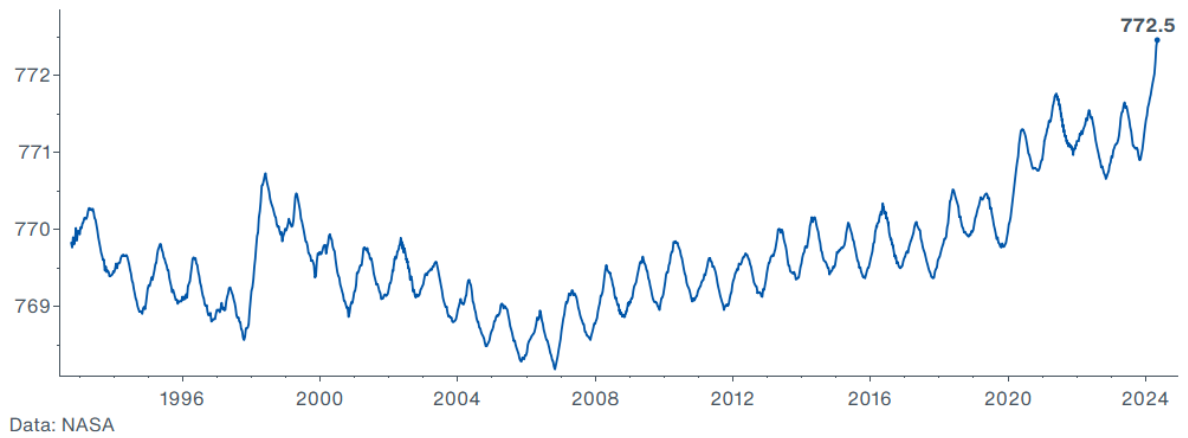
Widespread floods in Tanzania (left), flash flooding after a dam burst near Mai Mahiu, Kenya (right)

Source: IFRC Africa

Widespread areas, including several important ports, have been flooded due to the increasing water level of **Lake Tanganyika**, which stands at its highest level since the satellite measurements began in 1992 (see the graphic below).

Country	Affected Regions	Fatalities	Affected Population
Kenya	Garrisa, Kajiado, Marsabit, Nairobi, Tana River, West Pokot	170+	220,000
Tanzania	Arusha, Mbeya, Morogoro, Pwani, Rukwa	155+	200,000
Burundi	Bujumbura Maria, Bujumbura Rural, Rumogne	25+	237,000
Rwanda	Nationwide	10+	-
Somalia	Hiraan, Hirshabelle, Jubaland, Lower Juba, Lower Shabelle	7+	127,000

Lake Tanganyika Water Level (meters MSL)



Natural Catastrophes: In Brief

Severe Convective Storm & Flooding (China)

At least 5 people died and 33 others were injured due to a tornado that struck the city of Guangzhou, southern China, on April 27. According to authorities and media, extensive damage to more than 140 commercial buildings was incurred, along with notable traffic and flight disruptions, and power outages across the densely populated city.

The province of Guangdong is still recovering from heavy rainfall that resulted in widespread flooding across the region (see the latest Weekly Cat Report). Early on May 1, heavy rainfall triggered a highway collapse near Meizhou, resulting in 48 fatalities, 30 injuries, and damage to 23 vehicles, according to the media reports from May 2.

Flooding & SCS (Brazil)

The Rio Grande do Sul state in southern Brazil has been impacted by heavy rainfall, severe weather, and floods over the past few days which have led to casualties and damage. Floods prompted displacements of thousands of people in more than 100 municipalities across the state. As of this writing, 10 people have died, dozens remain missing, along with notable damages to local infrastructure.

Severe Convective Storm (Vietnam)

Thunderstorms accompanied by heavy rainfall and strong winds, have affected northern Vietnam since April 30. According to the ASEAN Disaster Information Network (ADINet), one person has died, and more than 2,000 houses have been damaged across the provinces of Lao Cai, Yen Bai, Ha Giang, Cao Bang, Bac Kan, Tuyen Quang, Phu Tho, Thai Nguyen, and Quang Ninh. More than 1,200 hectares (3,000 acres) of agricultural lands have been also affected or damaged.

Indonesia (Landslide & Earthquake)

Heavy rainfall triggered deadly landslide events across Indonesia on April 25-26. Notably, landslides in Tallang Sura village in South Sulawesi province, and Talagajaya village in West Java province left at least 12 people dead, 6 injured, and several destroyed houses, according to the local disaster authorities (BNPB).

Meanwhile, an earthquake of magnitude of 6.2 (6.1M reported by USGS) hit the southern coast of West Java province, resulting in 11 injuries and material damage to more than 250 houses. Most of the earthquake-related losses were reported in the Garut regency.

Flooding (Pakistan)

Heavy rainfall and floods have continued to affect north-western Pakistan, particularly the Khyber Pakhtunkhwa province, over the recent few days. The Provincial Disaster Management Authority (PDMA) reported an additional 7 fatalities, 9 injured people, and more than 60 damaged houses across the province.

Flooding (Chad)

Provinces of Mandoul and Logone Oriental Heavy in southern Chad have experienced heavy rainfall and flooding since March that resulted in casualties and significant material damage. As of April 29, UN OCHA reported thousands of affected people, one flood-related death, no fewer than 45 injured people, and damage to nearly 700 houses across the affected area.

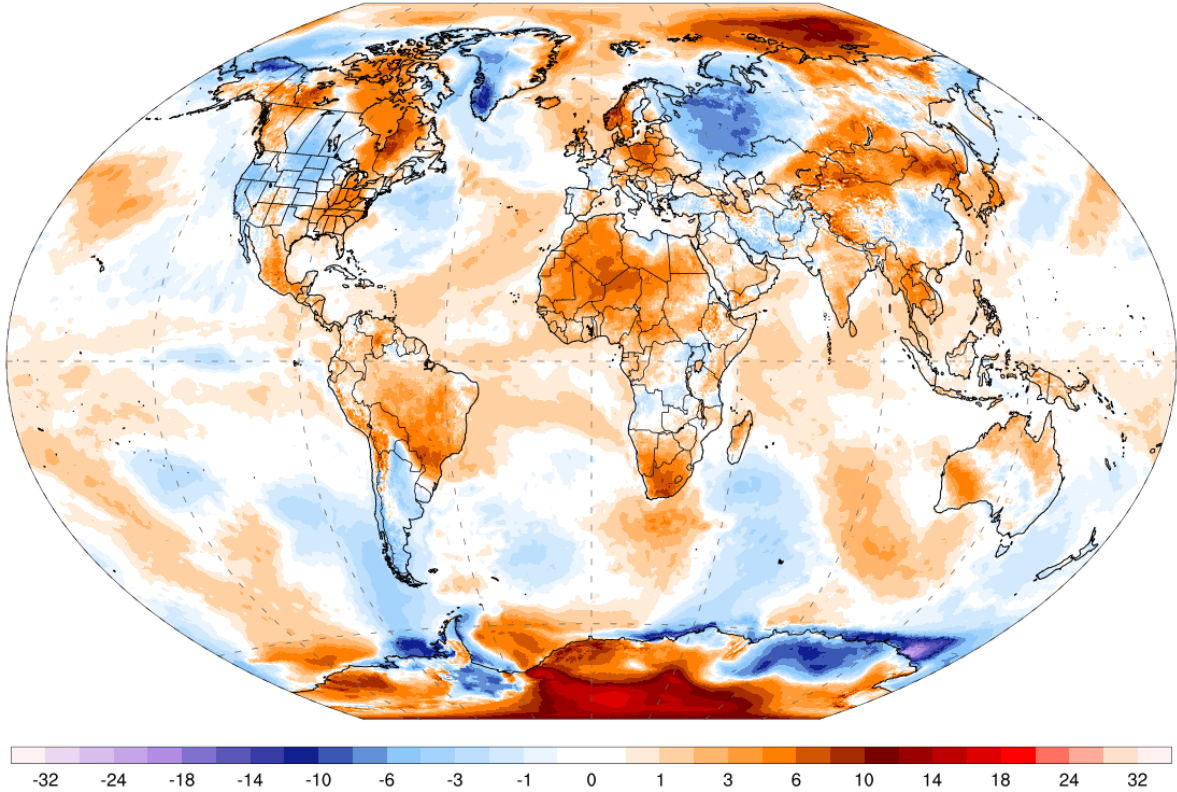
Heatwave (Southeastern Asia)

In recent days, Southeastern Asia has seen a notable heatwave with maximum temperature surpassing 40°C (104°F), breaking dozens of absolute and monthly temperature records across the region. Notably, Laos broke the all-time national temperature record with 43.6°C (110.5°C) measured in Tha Ngon and Seno. Extreme heat and many records have been reported in Vietnam, the Philippines, Thailand, Cambodia, and elsewhere.

Global Temperature Anomaly Forecast

GFS 2m T Anomaly (°C) [CFSR 1979-2000 baseline]
Days 1-3 Avg | Fri, May 03, 2024

ClimateReanalyzer.org
Climate Change Institute | University of Maine

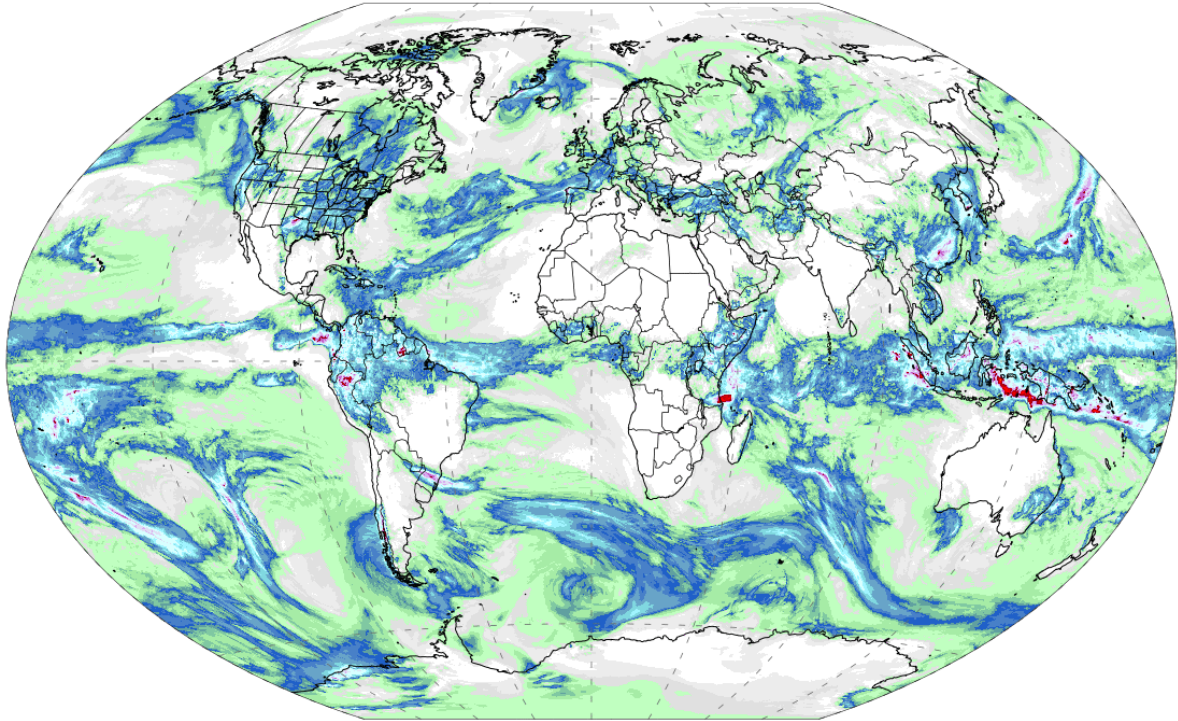


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

Global Precipitation Forecast

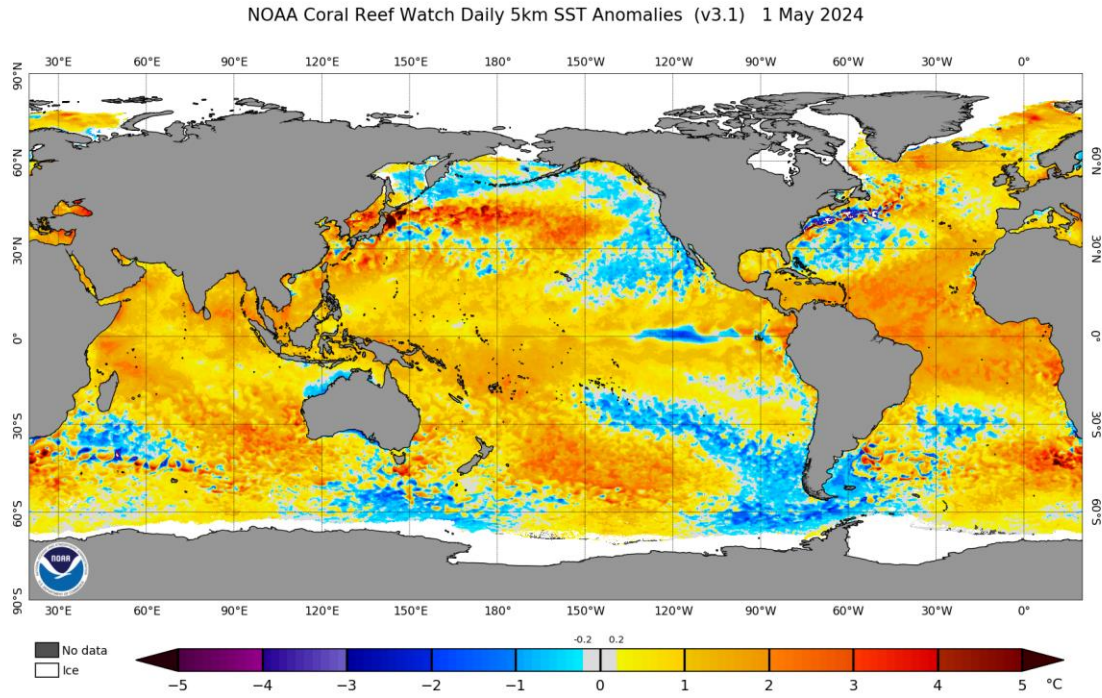
GFS Accumulated Precipitation (cm)
Days 1-3 Total | Fri, May 03, 2024

ClimateReanalyzer.org
Climate Change Institute | University of Maine



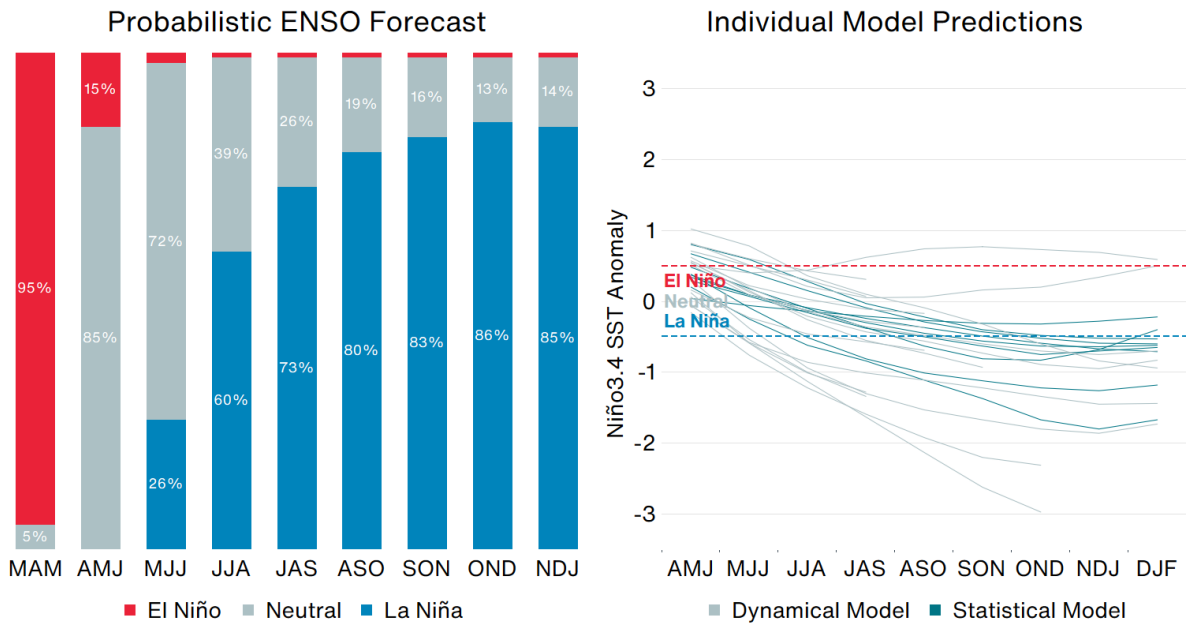
Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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



El Niño-Southern Oscillation (ENSO)

Probabilistic ENSO Model Projections: April 2024



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

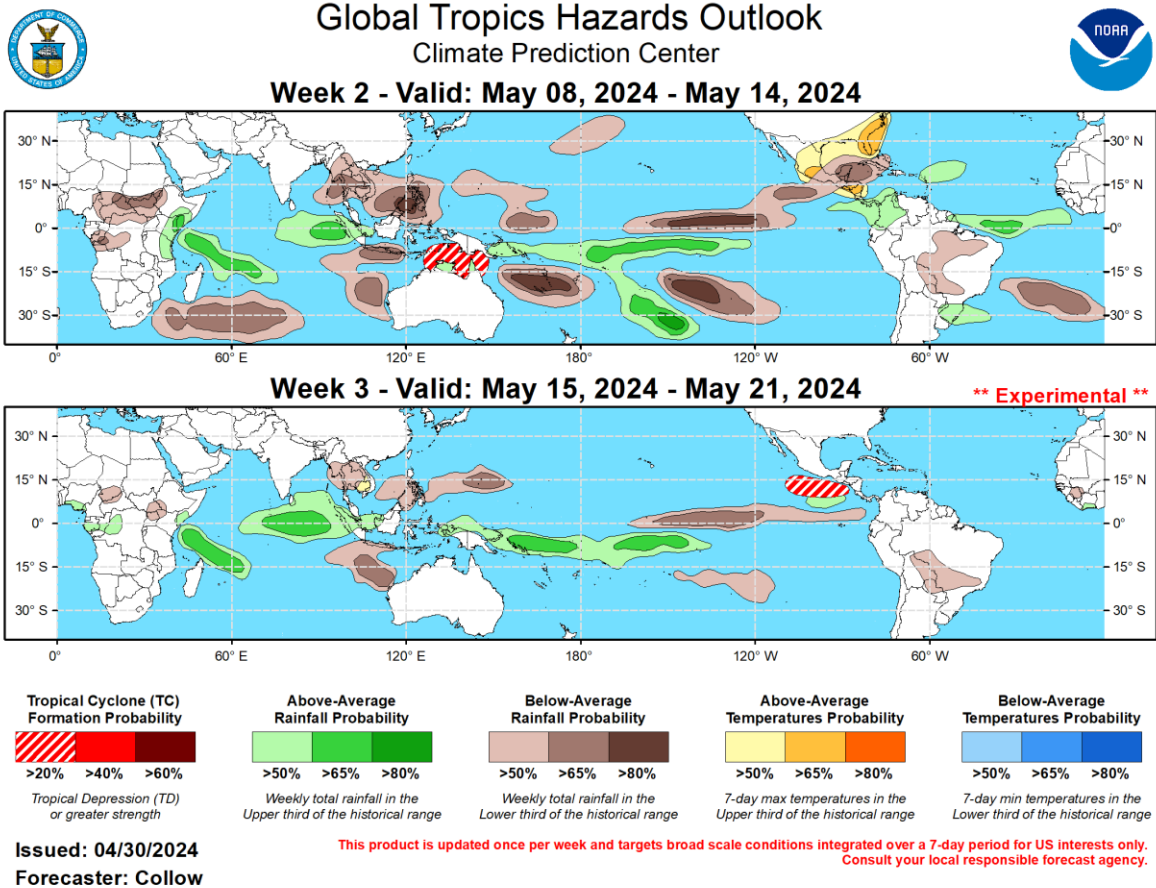
La Niña: Cool phase of an ENSO cycle. Sea surface temperatures of -0.5°C occur across the east-central equatorial Pacific.

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).

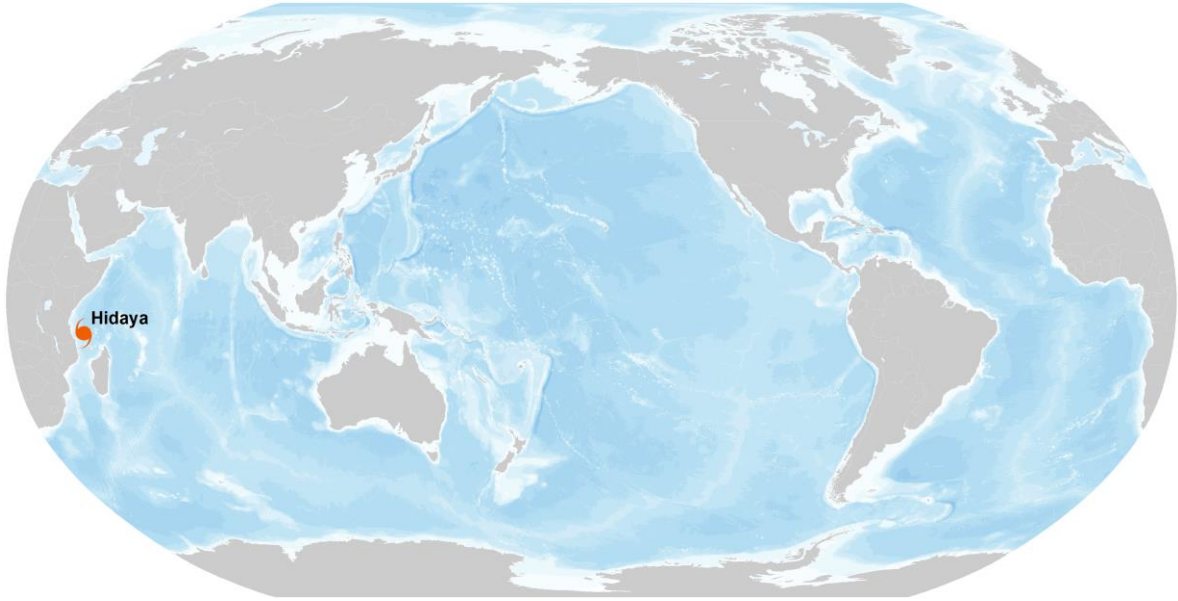
Source: NOAA, Columbia University | Graphic: Aon Catastrophe Insight

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

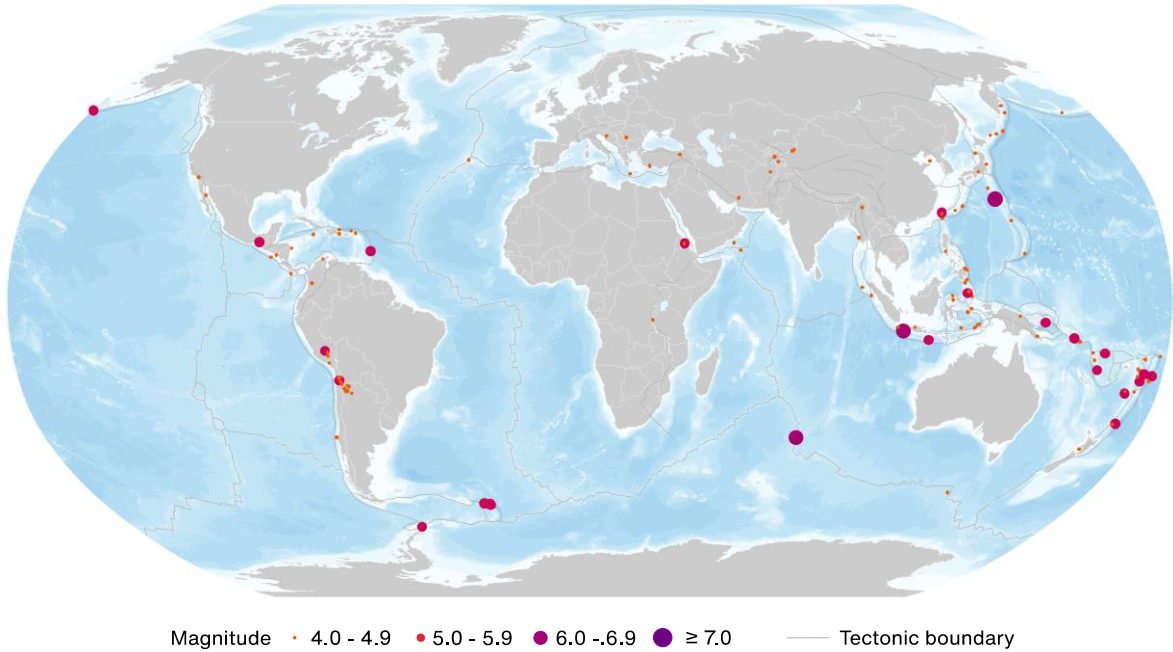
Name	Location	Winds	Center
CY Hidaya	8.8S, 43.3E	85	200 mi (320 km) N from Moroni, Comoros

* 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)

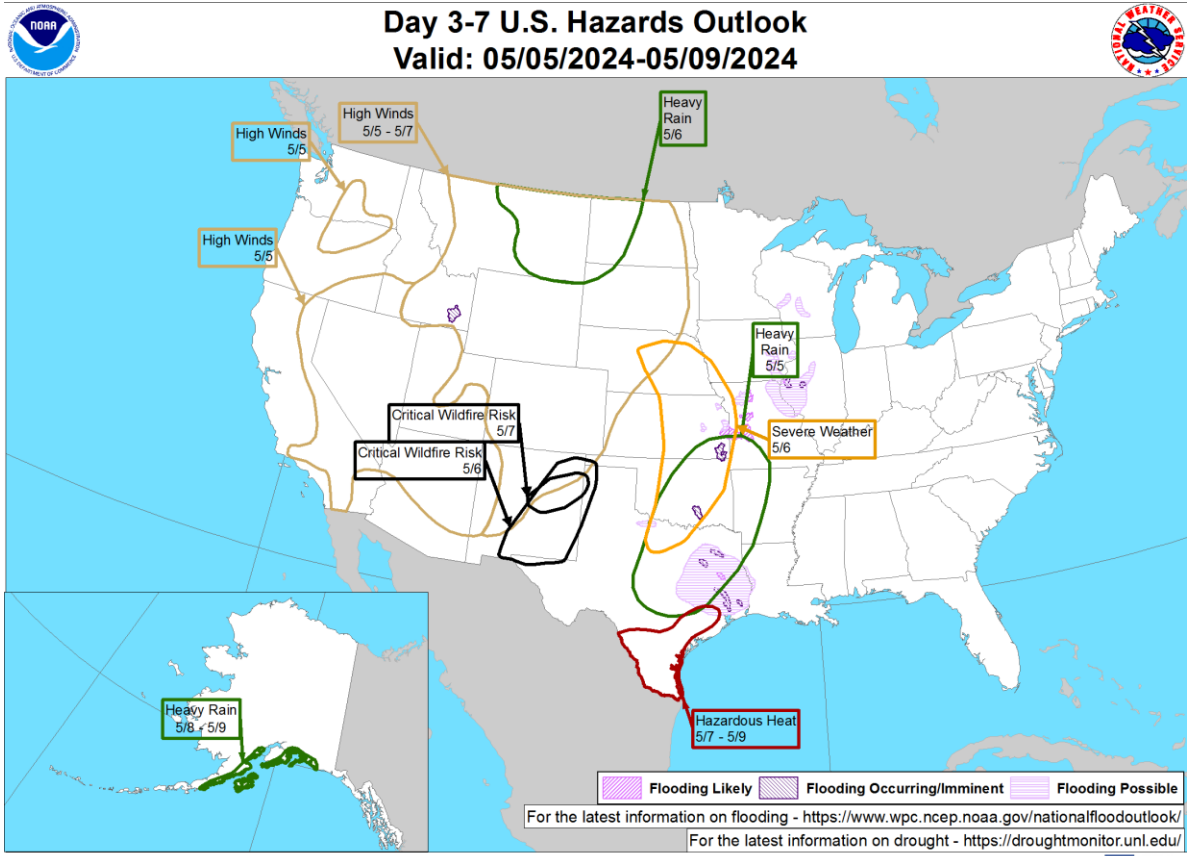
Global Earthquake Activity ($\geq M4.0$): April 26-May 2



Date (UTC)	Location	Magnitude	Epicenter
4/26/2024	37.05S, 78.17E	6	Mid-Indian Ridge
4/27/2024	27.83N, 139.57E	6.5	Bonin Islands, Japan region
4/27/2024	8.11S, 107.27E	6.1	10 km (6 mi) S of Banjar, Indonesia

Source: United States Geological Survey

U.S. Hazard Outlook

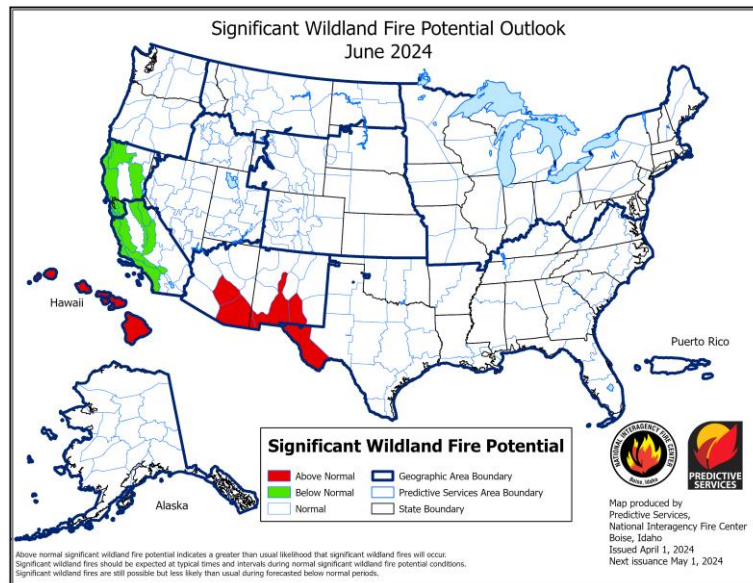
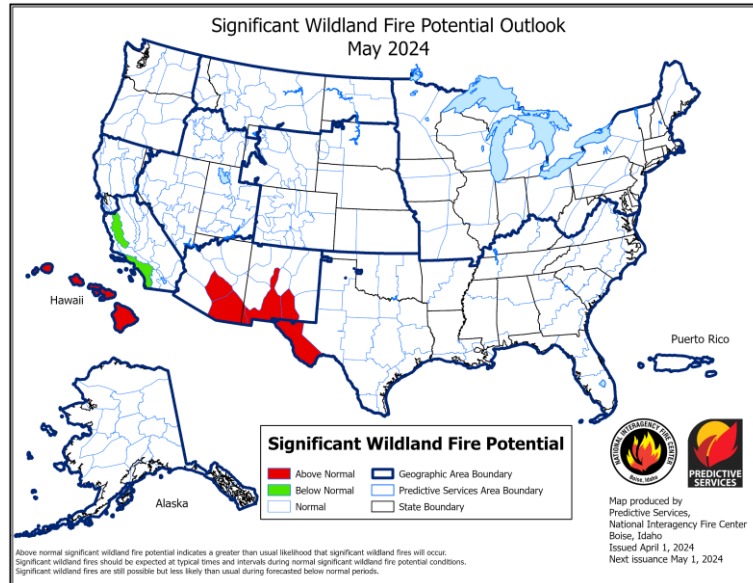


Weather Prediction Center
Made: 05/02/2024 03:31 PM EDT

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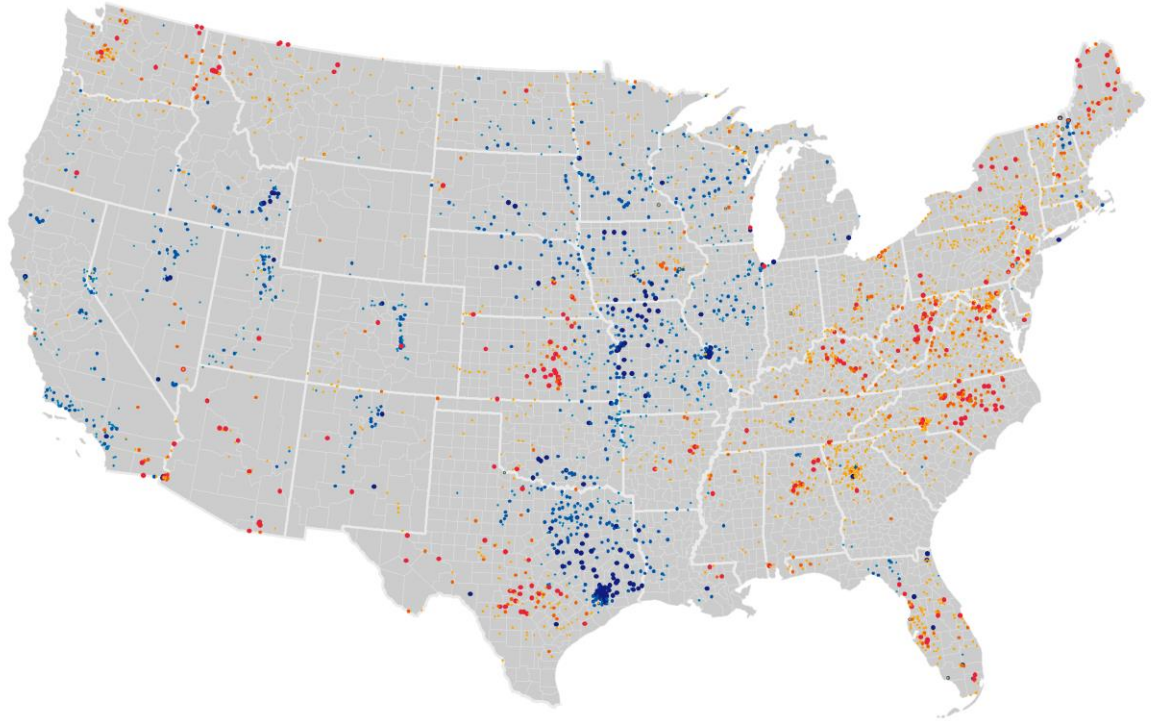
Source: Climate Prediction Center (NOAA)

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 $\geq 99^{\text{th}}$ 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 & Flooding

National Weather Service (NWS)

Storm Prediction Center (SPC)

NOAA Damage Assessment Toolkit (DAT)

Pottawattamie County, Iowa

Texas Department of Transportation (TxDOT) Lufkin District

Tornado Outbreak Spawned 130 Tornadoes, Including Oklahoma EF4, Nebraska and Iowa EF3s, *The Weather Channel*

Deadly storms, tornadoes and flash floods hammer Plains states and Texas, *NBC News*

Tornado causes extensive damage in Marietta, Oklahoma, *CBS News*

Oklahoma towns hard hit by tornadoes begin long cleanup after 4 killed in weekend storms, *ABC News*

Ft. Scott faces challenges after intense rainfall & flooding, *KSN 16*

Officials prepare for continued flooding while assessing current flood damage, *KBTX*

Evacuations ordered in Texas due to life-threatening flooding after torrential rainfall, *Fox Weather*

Tornado hits a Kansas town, leaving at least 1 dead and several hurt, *CNN*

Rescue operations underway in Tyler, Polk counties in wake of weekend flooding, *KTRE 9*

Europe: Winter Weather (Update)

German Hail Insurance (Vereinigter Hagel)

Austrian Hail Insurance (Österreichische Hagelversicherung VVaG)

Ministries of Agriculture

Czech Hydrometeorological Institute (CHMI)

Frost affects fruit growers in many parts of Europe, *Fresh Plaza*

Frosts Hit European Vineyards. Germany Worst Affected, *Meininger's International*

Eastern Africa: Flooding & Landslide (Update)

IFRC Africa

Kenya Red Cross

UN OCHA

ReliefWeb

Dozens killed in Kenya as weeks of heavy rain devastate region, *CNN*

Natural Catastrophes: In Brief

Tornado kills at least 5, injures 33, in Chinese metropolis as region battles deadly floods, *CNN*

Highway collapse kills dozens in southern China, *CNN*

ASEAN Disaster Information Network (ADINet)

National Disaster Management Agency (BNPB)

Khyber Pakhtunkhwa Disaster Management Authority (PDMA)

UN Office for the Coordination of Humanitarian Affairs (UN OCHA)

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