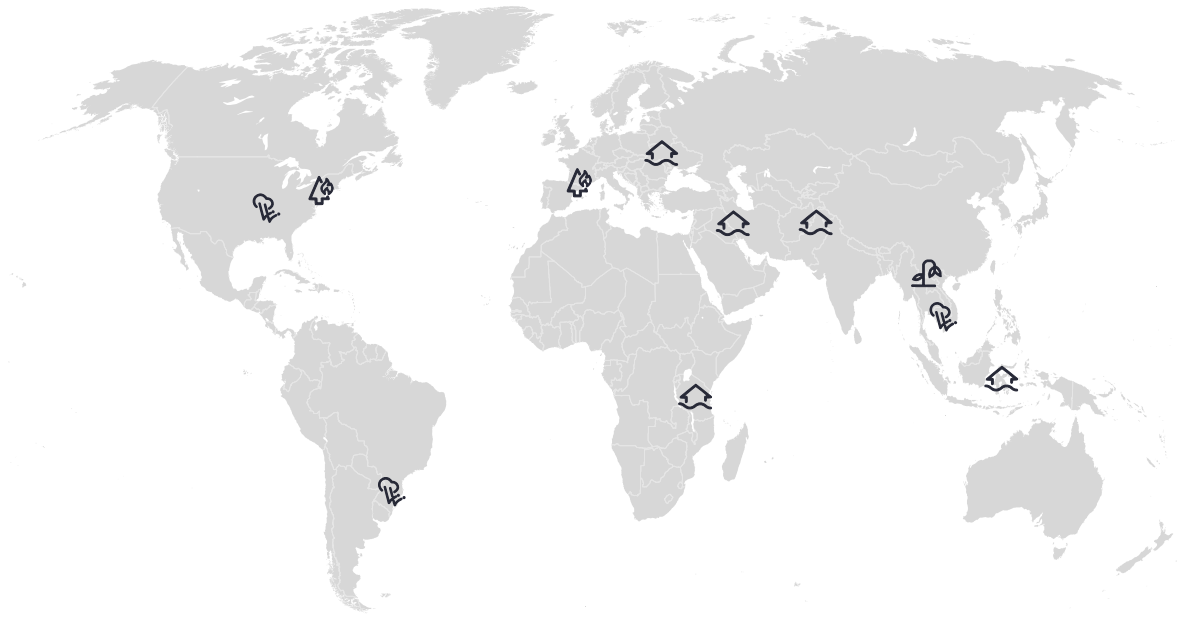


Weekly Cat Report

April 21, 2023



Executive Summary



Event	Affected Region(s)	Fatalities	Economic Loss (\$)	Page
Severe Convective Storm	United States	3	100s of millions	3
Heatwaves	Worldwide	N/A*	N/A	5
Severe Convective Storm	Brazil	0	Millions	7
Severe Convective Storm	Cambodia	0	Millions	7
Wildfire	United States	0	Unknown	7
Flooding & Severe Convective Storm	Ukraine	0	Millions	7
Flooding	Tanzania	7+	Unknown	7
Flooding	Iran, Iraq	6	Unknown	8
Landslide	Indonesia	5	Negligible	8
Landslide	Pakistan	2	Unknown	8
Wildfire	France, Spain	0	Millions	8

* To be assessed in upcoming days/weeks for those countries where human mortality data are available

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

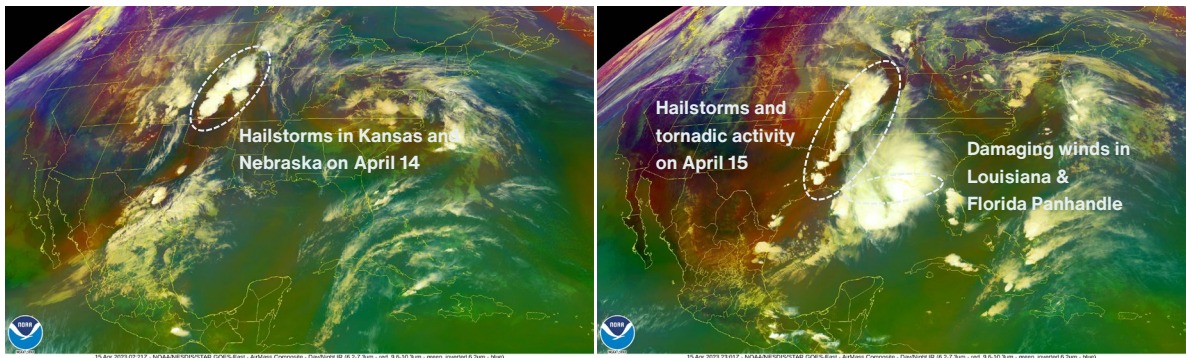
Overview

Severe convective storms, which generated large hail and damaging winds, affected multiple states in the Midwest and South of the United States between April 14-19. Storms caused significant material damage, while three people were killed and several were injured across the region. Total economic losses from the event are anticipated to reach into the hundreds of millions USD.

Meteorological Recap

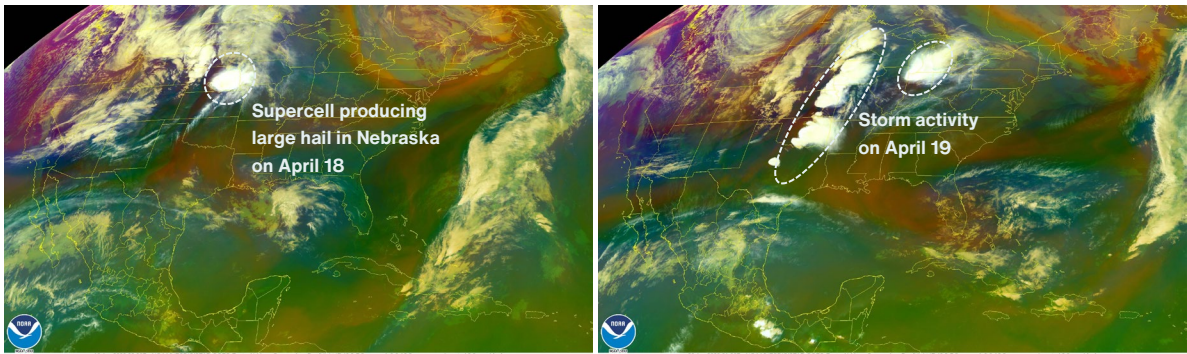
April 14-17

In the late afternoon on April 14, thunderstorm activity developed over the central Great Plains in central Kansas and eastern Nebraska as a cold frontal boundary was moving slowly eastward throughout the day. Ahead of an approaching cold front, warm southerly air from the Gulf of Mexico enhanced favourable conditions for storm development. This front continued to push east and south into the Midwest and through Arkansas and into eastern Texas on April 15. On April 16-17, Florida was hit by severe storms with strong winds of up to 60 mph (100 kph) in the Panhandle and later with some large hail with up to 3 inches (8 cm) in diameter on the eastern coast in St. Lucie and Martin counties.



April 18-19

After a short break on April 17, severe convective activity ensued again in a separate outbreak that started on April 18 and continued to result in SCS impacts through April 20. This was a result of a developing low-pressure system and associated frontal system that extended across the central United States and progressed slowly eastward during the three-day period. A severe weather outbreak mainly impacted the southern and central Great Plains, including a large area where unstable and favourable environment enhanced conditions for supercell development. One of them produced large hailstones up to 2.5 inches (6 cm) in Nebraska on April 18. Advanced storm activity occurred day later when supercell produced several strong tornadoes, including a deadly EF3-tornado in Cole and several EF2-tornadoes, particularly in Oklahoma.



Event Details

April 14-17

Arkansas, Florida, Illinois, Kansas, Louisiana, Missouri, Nebraska, and Texas were affected by the severe weather outbreak in the period between April 14-17. There were multiple tornado reports, including Jefferson and St. Louis counties in Missouri and Monroe, Madison, and St. Clair counties in Illinois. At least five people were injured by EF1-tornado that occurred in Maries county, Missouri, on April 15. Additional material damage due to large hails was incurred throughout the affected area. Damaging hail was reported in St. Lucia, Martin, Broward, and Palm Beach counties in Florida on April 16-17, along with strong wind reports from the Panhandle region.

April 18-19

On April 19, storm impacts were reported in Oklahoma, Kansas, Nebraska, Iowa, Illinois and Texas. The strongest and deadly EF3-tornado was reported in **Cole**, McClain County in Oklahoma, claiming three fatalities, at least 12 injured and significant material damage. Supercell also generated at least two EF2-tornadoes across the state; in Cleveland County (Slaughterville-Etowah) and Pottawatomie County (Shawnee-Meeker). One EF2-tornado claimed injury and several damaged houses in Kansas (Elmdale-Strong City). Tens of thousands of people were left without power as storms passed, almost 23,000 customers in Oklahoma alone. A notable structural and vehicular damages were incurred throughout the affected area.

Financial Loss

The widespread aggregated impacts associated with these two multi-day outbreaks are anticipated to result in notable economic losses, as well as another costly event for insurers. Aggregated effects due to storms were initially anticipated to reach into the hundreds of millions USD.

Worldwide: Heatwaves

Overview

In recent days, many regions of the globe experienced extreme heatwaves and numerous heat records were broken, particularly across south-eastern Asia. Severity and spatial extent of unprecedented high temperatures might be a sign of possible climate-change influence.

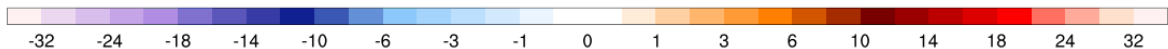
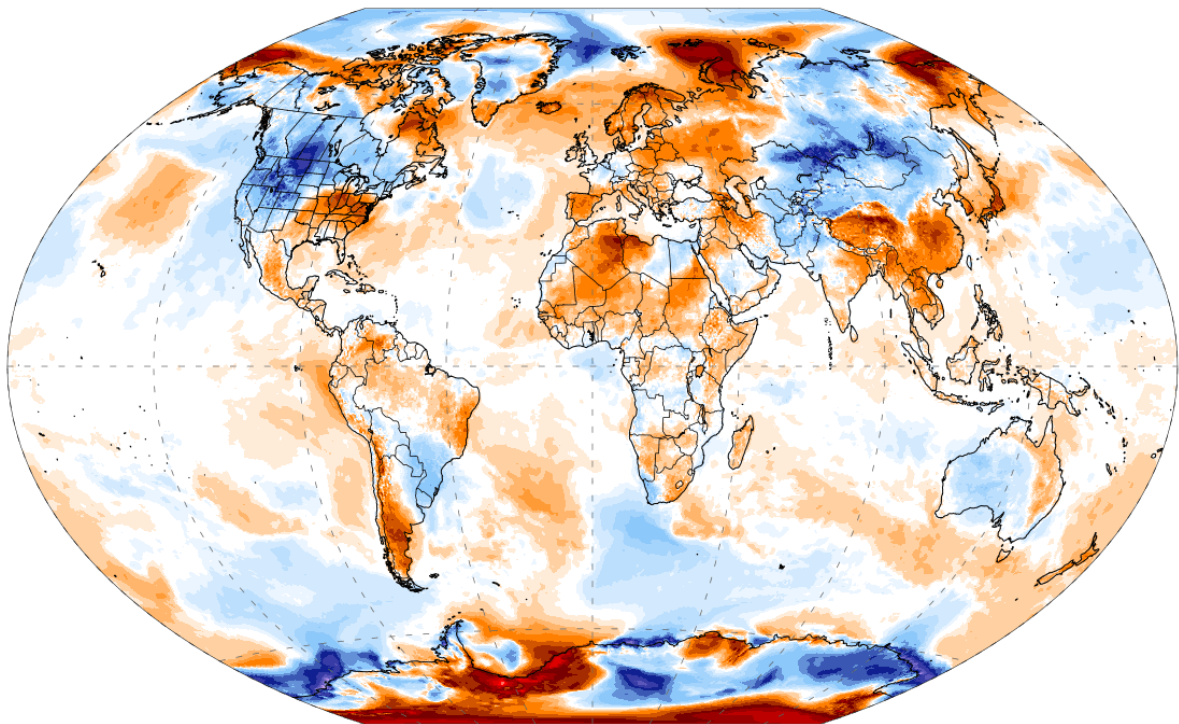
Meteorological Recap

Multiple countries experienced record-breaking heat over the past several weeks. Central and South-eastern Asia were the worst hit by unprecedented early heatwave. National all-time temperature record of 45.4 (113.7°F) was set in Thailand, beating the previous record set in 2016 by 0.8°C (1.4°F). All-time maximum temperature was also exceeded in Laos on April 19. China also saw many temperature records on April 17 as 109 weather stations across 12 provinces broke their monthly record for high temperature for April, according to local meteorologists. This week heatwave is expected to become one of the most extreme that Southeast Asia has ever seen in terms of area, intensity and length.

In recent days, extreme temperatures were reported also across North-eastern U.S. and Canada. Another hotspot with above-average temperatures was located in southern or western Africa.

GFS 2m T Anomaly (°C) [CFSR 1979-2000 baseline]
1-day Avg | Thu, Apr 20, 2023

ClimateReanalyzer.org
Climate Change Institute | University of Maine



Event Details

Table below highlights selected notable temperature records set worldwide between April 13-20.

Country	Location	Temperature (°C)	Detail
Thailand	Tak	45.4 (113.7°F)	National all-time record
Myanmar	Kalewa	44.0 (111.2°F)	Station monthly record
Bangladesh	Ishurdi	43.0 (109.4°F)	Station monthly record
Laos	Sayabouly	42.9 (109.2°F)	National all-time record
Turkmenistan	Uchadzhi	42.2 (108.0°F)	National monthly record
Bangladesh	Dhaka	40.4 (104.7°F)	Station highest since 1965
China	Yunhe, Zhejiang Province	38.2 (100.8°F)	Province monthly record
China	Wufeng	37.0 (98.6°F)	Station monthly record
United States	Hartford, Connecticut	35.6 (96.0°F)	Tied state monthly record
Mauritius	Agalega Island	35.3 (95.5°F)	National monthly record
Canada	Petersborough	30.6 (87.1°F)	Station monthly record
Japan	Minamata	30.2 (86.4°F)	Station monthly record

As of April 20, 13 people were reported died due to high temperatures in India. However, the death toll throughout the affected area is expected to rise in coming days or weeks.

Natural Catastrophes: In Brief

Severe Convective Storm (Brazil)

Southern Brazil, particularly state of Rio Grande do Sul, was badly affected by stormy weather on April 16-17. Hailstones of size up to 10 cm (3.9 inches) in diameter and damaging wind gusts exceeding 100 kph (60 mph) caused notable material damage on hundreds of structures, notably in towns of Barra do Ribeiro (200 damaged houses), Guaíba (100), Serrinha (100), and Porto Alegre (50). Additional damage was incurred throughout the affected area due to flooding triggered by heavy rainfall.

Severe Convective Storm (Cambodia)

Thunderstorms accompanied by heavy rainfall and damaging winds affected 24 provinces across Cambodia on April 16. According to the National Committee for Disaster Management, more than 3,000 houses were damaged or destroyed due to severe weather.

Wildfire (United States)

Record-breaking spring heat occurred across north-eastern part of the United States, enhancing the wildfire condition in the region. The National Interagency Fire Centre (NIFC) issued a significant wildfire risk throughout April for this area. On April 11, a new wildfire, named Jimmy's Waterhole fire, occurred in the Manchester Township, New Jersey, forcing residents from 170 homes to be evacuated. A wildfire was fully contained later on April 13, causing no injuries or damage on structures, according to the fire officials. However, area of more than 3,800 acres (1,500 hectares) was burned.

Flooding & Severe Convective Storm (Ukraine)

Several rivers across Ukraine have overflowed their banks and caused widespread riverine flooding. Hundreds of houses were inundated across regions of Volyn, Dnipropetrovsk, Kyiv, Rivne, Poltava, Cherkasy, Chernihiv and Zhytomyr. Flooding generated substantial damage on agricultural land, including more than 10,000 hectares (24,700 acres) in Volyn and Rivne regions alone. Additional material damage on 19 houses and power lines was caused by tornado that hit Petrishevka village, western Ukraine, on April 15. One person suffered injuries.

Flooding (Tanzania)

Severe flooding continues to affect several countries across central Africa, including Tanzania, where at least seven people lost their lives and several others were injured due to flooding, several people remain missing, according to authorities. Notable damages multiple buildings, local infrastructure and crops were incurred, particularly in Rukwa, Mara and Mtwara regions.

Flooding (Iran, Iraq)

Heavy rain triggered severe flash flooding in north-western Iran and Iraq on April 12-13. In Iran, hundreds of people were displaced, at least three people were killed and dozens of flooded homes were reported in provinces of West Azerbaijan, Bukan, Mehran, Kermanshah, Ilam, Qazvin and Lorestan. Flooding also affected Kirkuk, Sulaymaniyah and Erbil Governorates in Iraq, along with three additional deaths in Babil Governorate.

Landslide (Indonesia)

Several landslide events caused by torrential rainfall resulted in casualties and material damage across Indonesia on April 15. According to the authorities (BNPB), at least five people died after landslide occurred in Parigi Moutong Regency, Central Sulawesi. No fewer than 26 houses were damaged by another landslide in Purwakarta Regency, Western Jawa.

Landslide (Pakistan)

A massive landslide slipped on a main highway near Torkham, north-western Pakistan, on April 18, leaving two fatalities and eight injured people. Event resulted in notable vehicular damage as at least 20 trucks were buried under landslide.

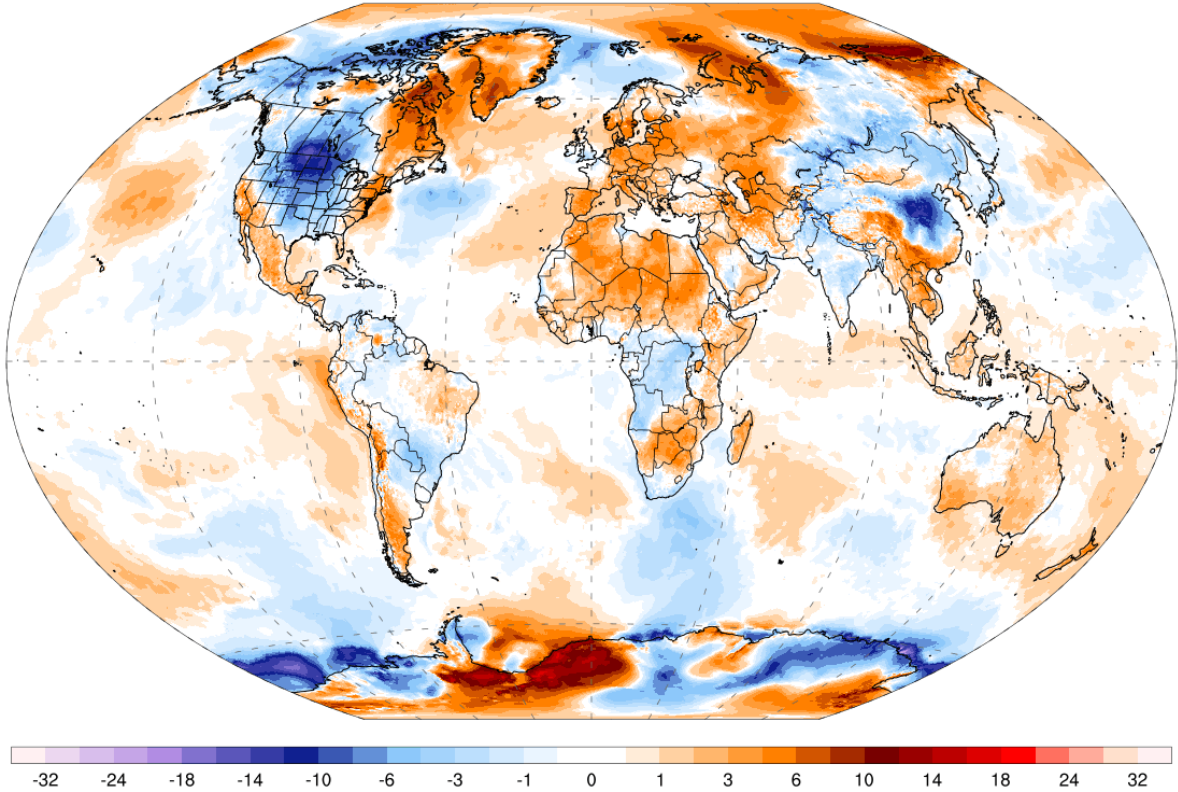
Wildfire (France, Spain)

A wildfire that started on April 15 near French-Spanish border in Pyrénées-Orientales Department burned approximately 1,000 hectares (2,500 acres) of land and forced hundreds of people to leave their homes. Fire caused damage on two houses and resulted in 1,200 power outages across the affected area. Nearly 600 firefighters helped the fire to be contained on April 16.

Global Temperature Anomaly Forecast

GFS 2m T Anomaly (°C) [CFSR 1979-2000 baseline]
Days 1-3 Avg | Fri, Apr 21, 2023

ClimateReanalyzer.org
Climate Change Institute | University of Maine

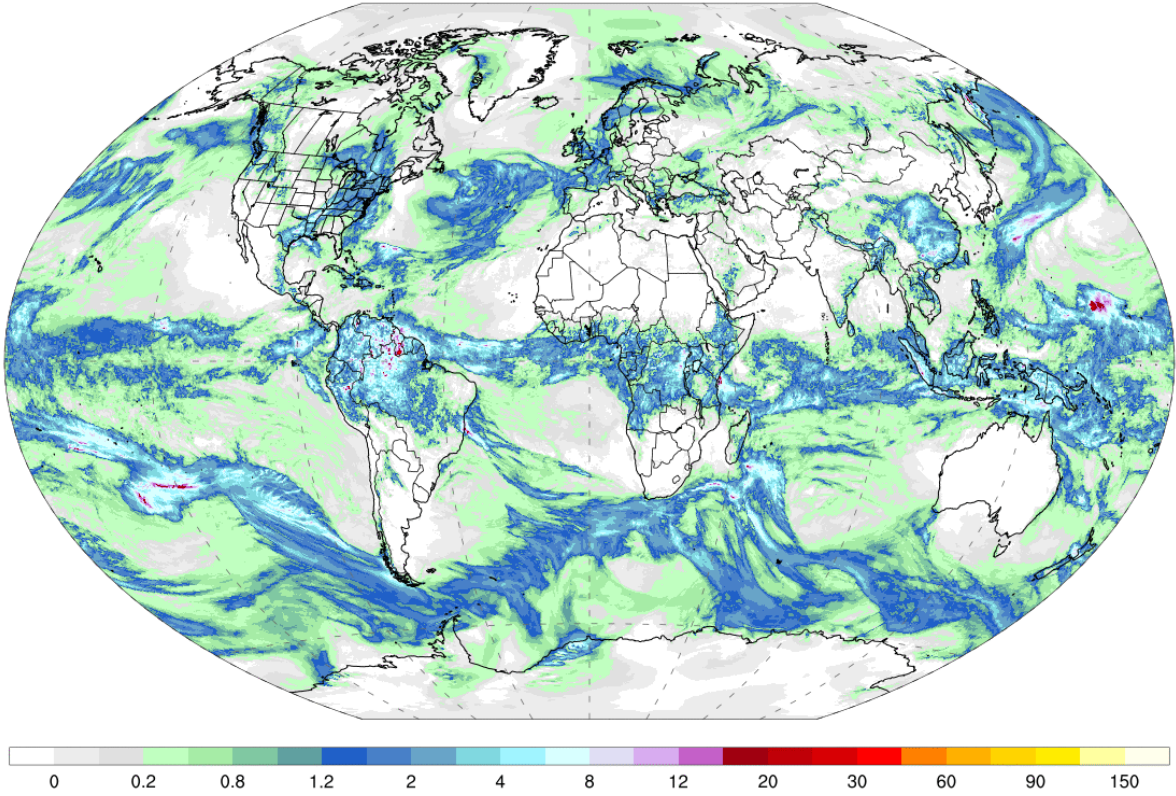


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

Global Precipitation Forecast

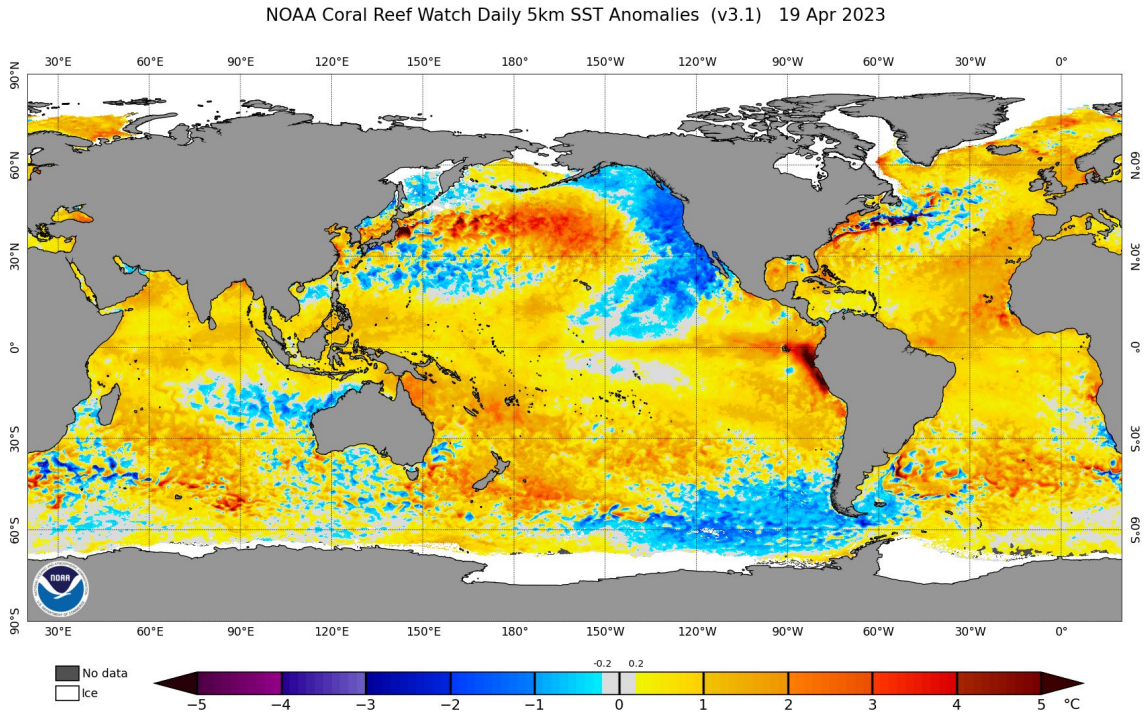
GFS Accumulated Precipitation (cm)
Days 1-3 Total | Fri, Apr 21, 2023

ClimateReanalyzer.org
Climate Change Institute | University of Maine



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

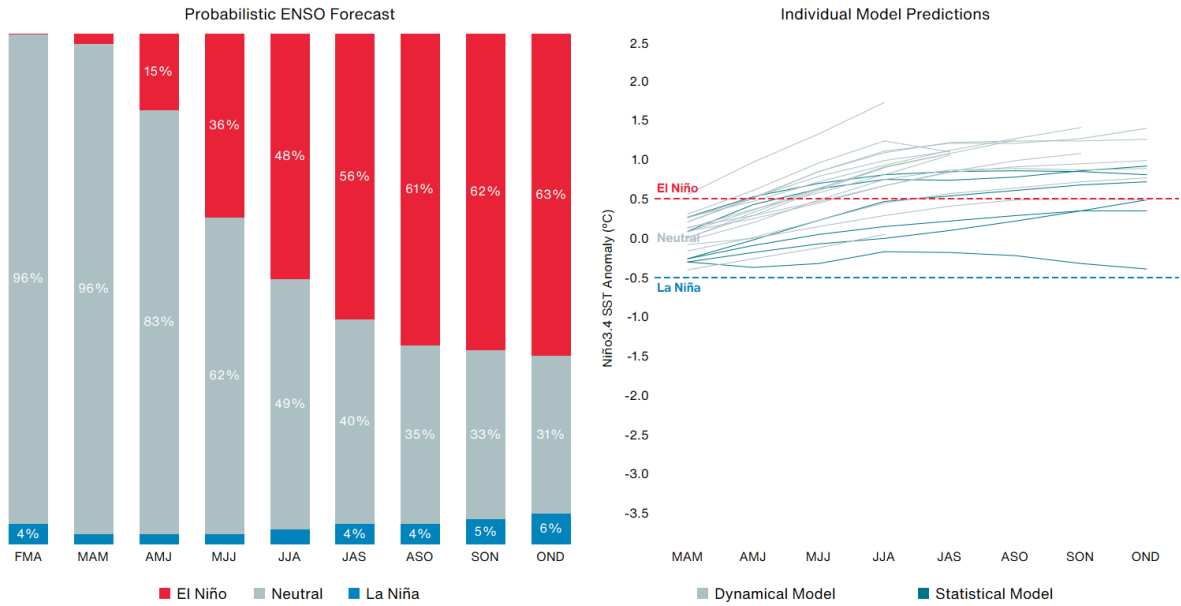
Weekly Sea Surface Temperature (SST) Maps (°C)



El Niño-Southern Oscillation (ENSO)

Probabilistic ENSO Model Projections: March 2023

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



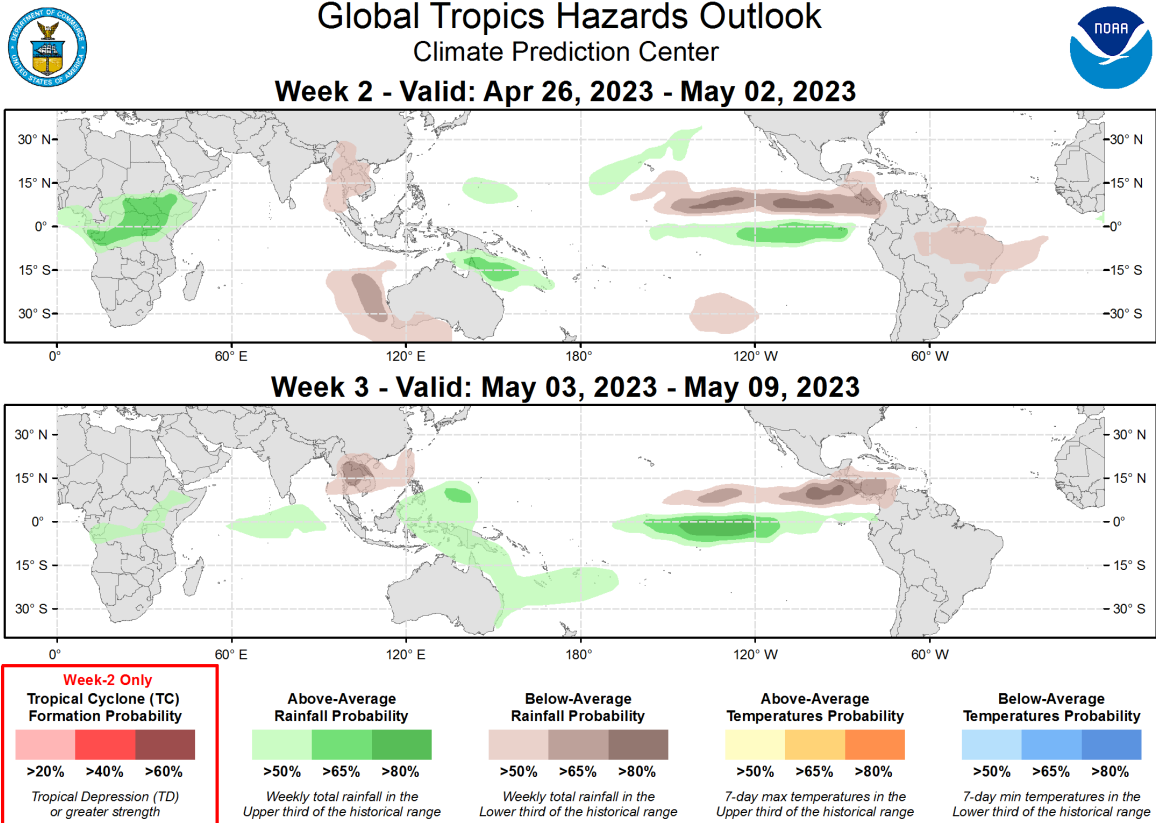
El Niño: Warm phase of an ENSO cycle. Sea surface temperatures of +0.5°C occur across the east-central equatorial Pacific.

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

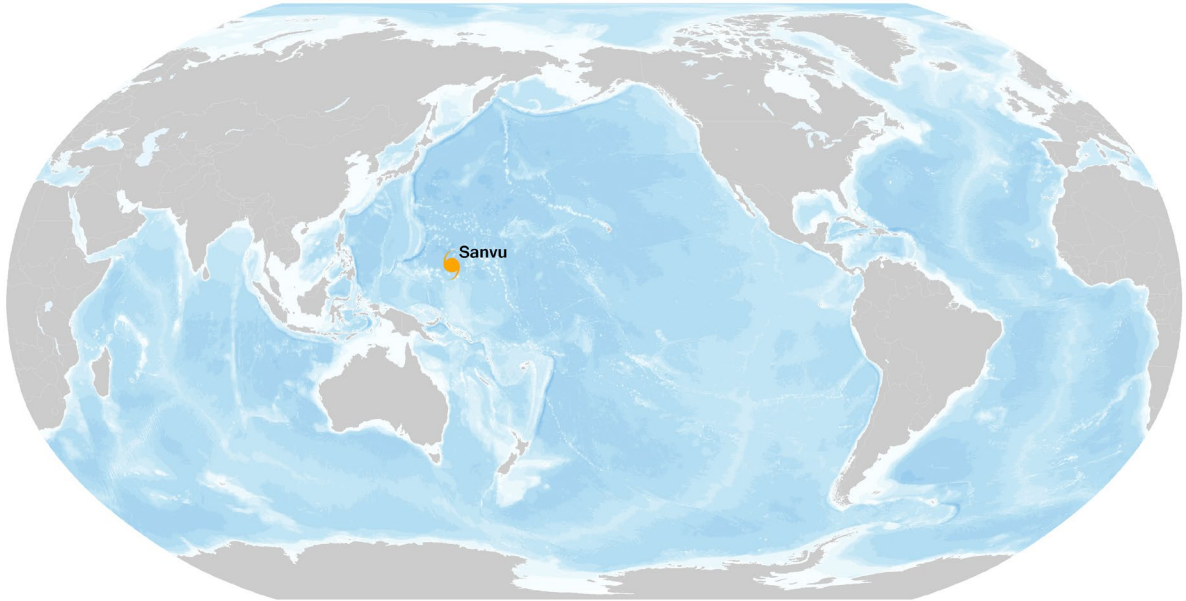


Issued: 04/18/2023
Forecaster: Allgood

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

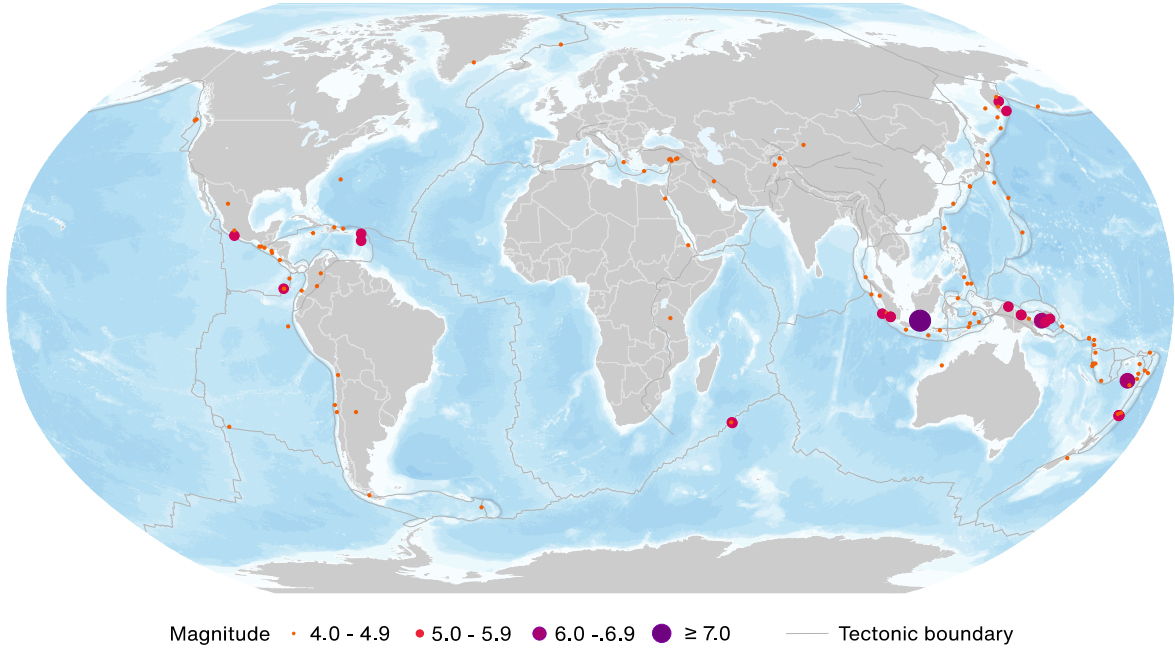
Storm Name	Location	Winds	Location from Nearest Land Area
TS Sanvu	10.0N, 156.2E	50	250 mi (405 km) NW from Palikir, F.S. of Micronesia

* 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)

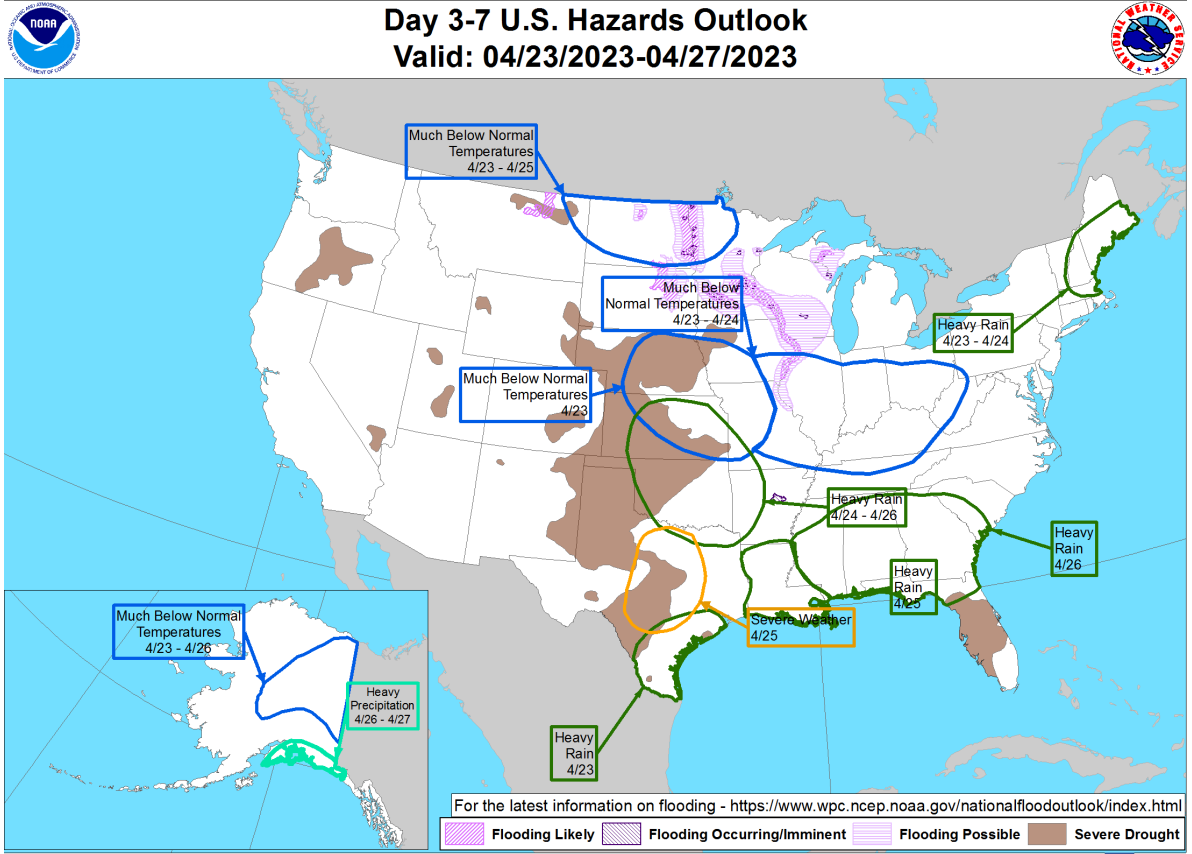
Global Earthquake Activity ($\geq M4.0$): April 14-20



Date (UTC)	Location	Magnitude	Epicenter
4/14/2023	6.03S, 112.03E	7.0	96 km (60 mi) N of Tuban, Indonesia
4/18/2023	22.30S, 179.46E	6.7	south of the Fiji Islands
4/19/2023	6.00S, 149.61E	6.3	23 km (14 mi) NNE of Kandrian, Papua New Guinea

Source: United States Geological Survey

U.S. Hazard Outlook



Weather Prediction Center

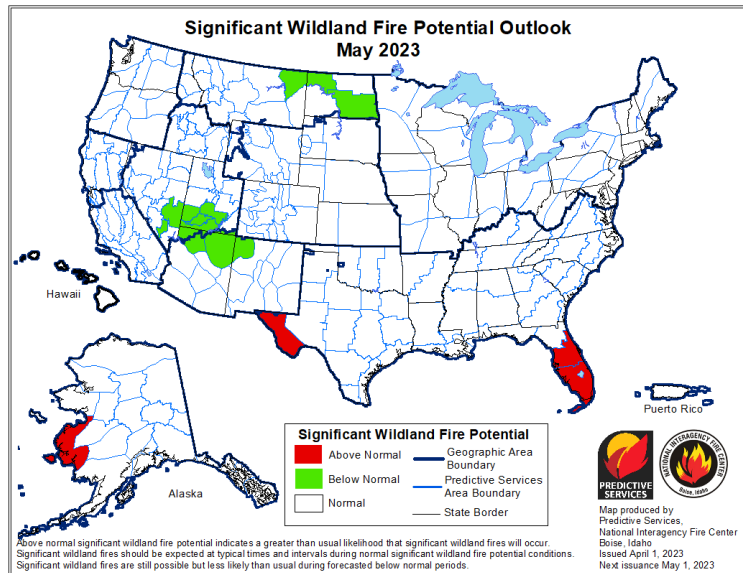
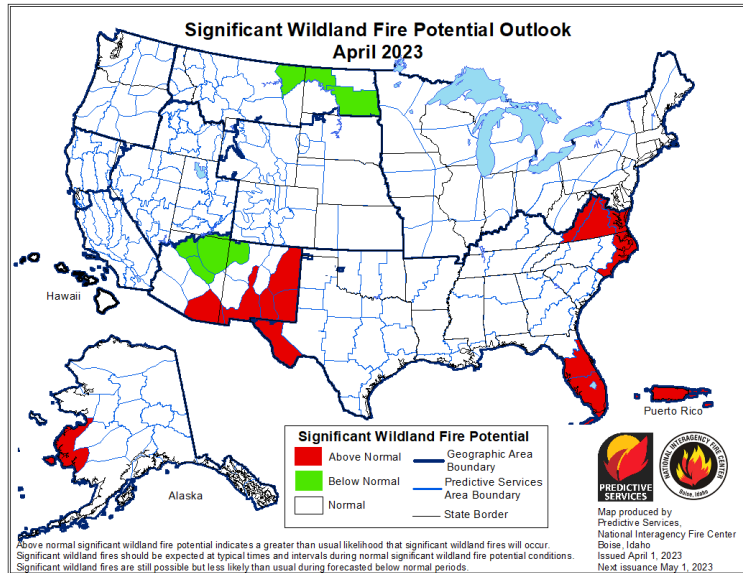
Made: 04/20/2023 3PM EDT

Source: Climate Prediction Center (NOAA)

Follow us:

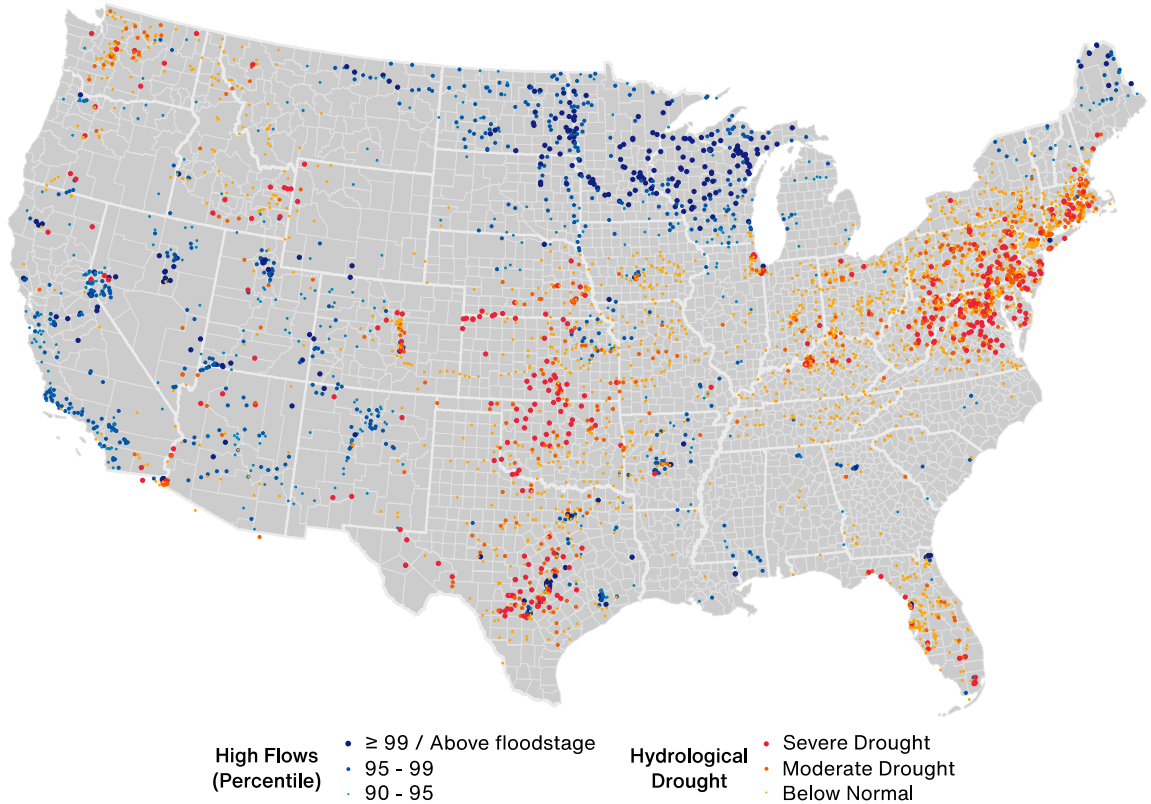
www.wpc.ncep.noaa.gov

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

The National Weather Service (NWS)

Two killed as tornadoes, storms rip through Oklahoma, *Reuters*

At Least 3 Dead as Tornadoes Strike Oklahoma, *The New York Times*

Worldwide: Heatwaves

Extreme Temperatures Around The World

Historic Asia heat breaks hundreds of records, with extremes in Thailand and China, *The Washington Post*

Natural Catastrophes: In Brief

European Severe Weather Database (ESWD)

Floodlist

The Indonesian Disaster Management Agency (BNPB)

The National Interagency Fire Centre (NIFC)

ASEAN Disaster Information Network (ADINet)

N.J. wildfire that burned nearly 4,000 acres 100% contained, *CBS News Philadelphia*

Severe heatwave engulfs Asia causing deaths and forcing schools to close, *The Guardian*

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