

Weekly Cat Report

March 15, 2024



Executive Summary



Event	Affected Region(s)	Fatalities	Economic Loss (\$)	Page
SCS, Flooding, WW	United States	2	100s of millions	3
Low Monica / Elfi	Southern & Western Europe	13	10s of millions	5
Flooding & Landslides	Indonesia	32	23+ million	7
Tropical Storm Filipo	Mozambique	4	Unknown	8
Severe Convective Storm	Turkey	0	Negligible	8
Flooding (Update)	Bolivia	51	Millions	8
Flooding & SCS	Argentina	0	Unknown	8

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>

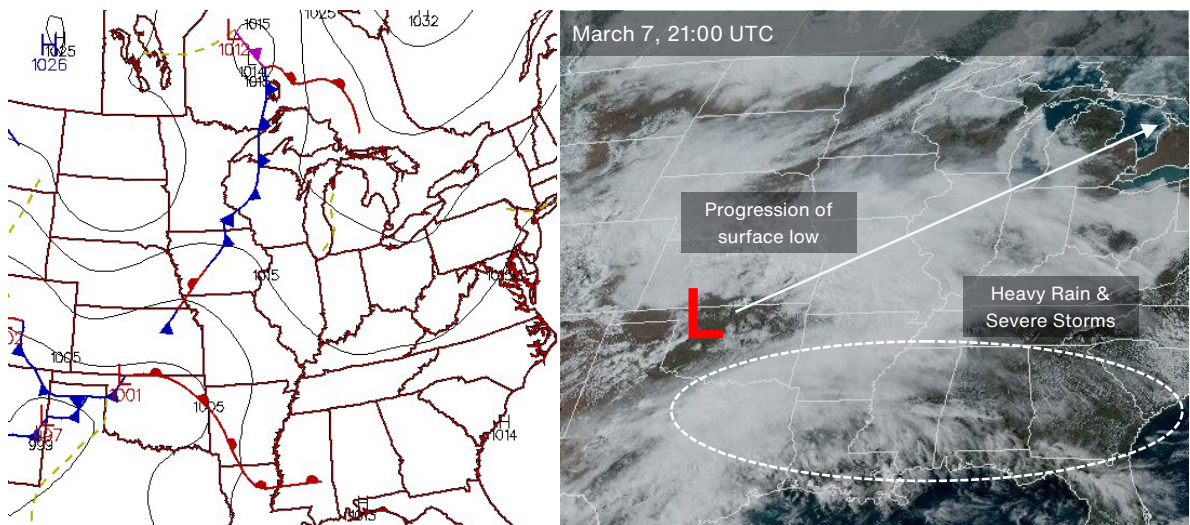
United States: SCS, Flooding, Winter Weather

Overview

Two storm systems heavily impacted the central and eastern United States on March 7-14. Very large hail and tornadoes were seen over the Great Plains, Midwest, and Southeast. Flooding and strong winds affected multiple Atlantic states from the Carolinas to New England. Heavy snow was also observed in the Intermountain West. Power outage and property damage reports were widespread, and economic and insured losses could reach into the hundreds of millions USD.

Meteorological Recap

March 7-10



Ahead of an upper-level trough, a low-pressure system began developing over the Great Plains on March 7. Abundant moisture and daytime heating ahead of this feature allowed strong thunderstorms to develop over the central U.S. later that day. Aside from scattered hail reports in northern Texas and southern Oklahoma, impacts from these storms were relatively minor.

However, the slow progression of this surface low and its associated fronts allowed more severe storms to develop on March 8-10, particularly in the Southeast. Notably, three tornadoes were reported within southern Alabama and Georgia, including a high-end EF-2 tornado near the town of Nahunta (GA) with an estimated peak wind speed of 130 mph (210 kph).

Aside from severe storms, several Southeast states also received heavy rain. Much of the heaviest rain fell across Mississippi, Alabama, Georgia, and South Carolina where localized rainfall totals exceeded 4 inches (100 mm). In fact, downtown Charleston (SC) shattered their 75-year-old previous March 9th daily rainfall record of 1.43 inches after recording 3.63 inches (90 mm) of rain, according to the NWS.

Further up the Atlantic Coastline, strong winds and high tide combined to bring coastal flooding to New Hampshire and Maine. Notably, the town of Hampshire (NH) experienced coastal flooding for the second time this year. Strong winds also impacted locations further inland, including parts of Connecticut.

March 12-15

Another storm system generated additional rounds of severe weather over the central U.S. on March 12-15. Moisture pooling along a complex, stalled frontal boundary helped initiate severe storms containing very large hail. In fact, several locations from Oklahoma to Illinois, including the Kansas City metro area, were hit by hailstones at least 3 inches (7.6 cm) in diameter (see table).

Notably, several reports of strong tornadoes have emerged near the time of this writing. While this is a developing situation, initial key details include significant tornado-related impacts in Indiana and Ohio, including a possible half-mile (0.8 km) wide tornado within Crawford and Huron counties in Ohio.

Moreover, this same storm system is also responsible for an ongoing, heavy snow event over parts of the Intermountain West. Although snow continues to fall, Colorado has received the heaviest snowfall thus far. Some higher elevations have already recorded over 3 feet (0.9 meters) of snow while the Denver metro area has received nearly 10 inches (255 mm) of snow as of late March 14. Additional updates will be provided in the next weekly report.

Location	Hail Diameter (in/cm)
Ada, OK	4.50 / 11.4
Alma, KS	4.00 / 10.2
Spavinaw, OK	
Sulphur Springs, AR	
Nortonville, IL	
Bonner Springs, KS	3.00 / 7.6

Event Details

Severe weather and flooding affected several states across the Southeast and New England. In Georgia, the EF-2 tornado near the town of Nahunta was responsible for 5 injuries and extensive damage to multiple mobile homes. In nearby Charleston (SC), strong winds and heavy rain caused some property damage and flooded roads, which prompted at least a dozen rescues. More flooding and wind impacts were felt in New Hampshire, Maine, and Connecticut as 38,000 people lost power.

Meanwhile, severe and winter weather significantly impacted much of the central United States. Large hail caused property and vehicle damage across Kansas and Missouri, while heavy snow and winds in Colorado have caused 51,000 power outages thus far. Notably, recent developments from March 14 have pointed to a tornado-related mass casualty situation unfolding in Logan County (OH), where officials have reported two deaths so far. More powerful tornadoes were reported in Randolph and Delaware counties (IN), including in the town of Selma where up to half of the town's structures are believed to be damaged.



Tornado damage in Brantley County, Georgia

Source: NOAA DAT

Financial Loss

Although reports of strong tornadoes continue to emerge at the time of writing, initial assessments from officials indicate substantial damage. Given the additional wind, hail, flooding, and snow impacts from this past week, total economic and insured losses could reach into the hundreds of millions USD.

Low Monica / Elfi: Southern & Western Europe

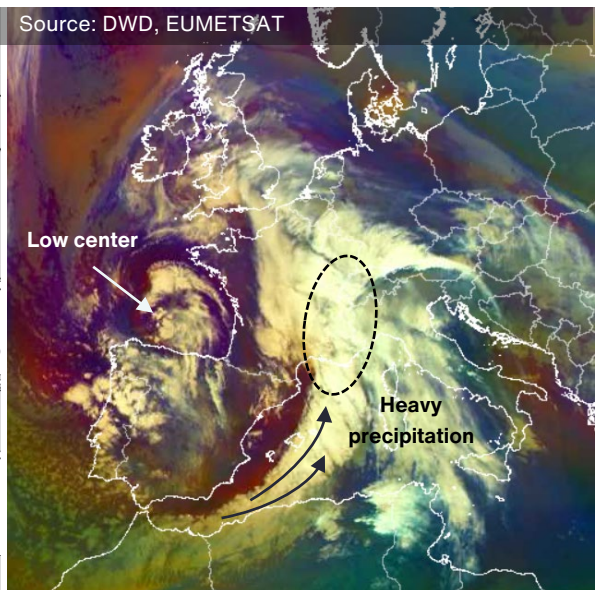
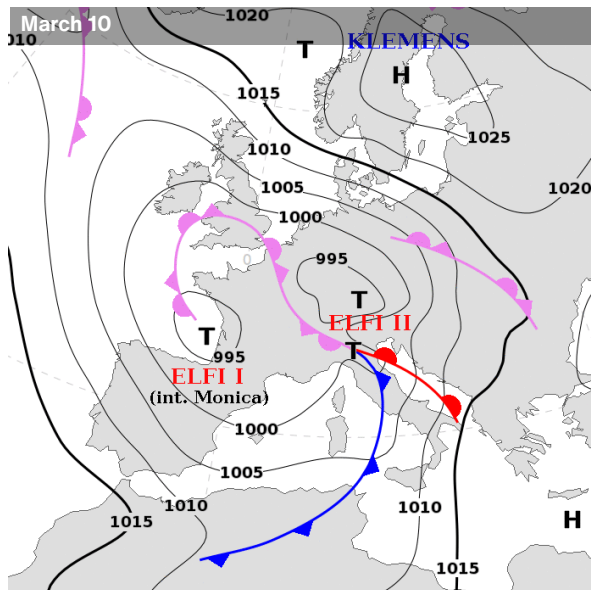
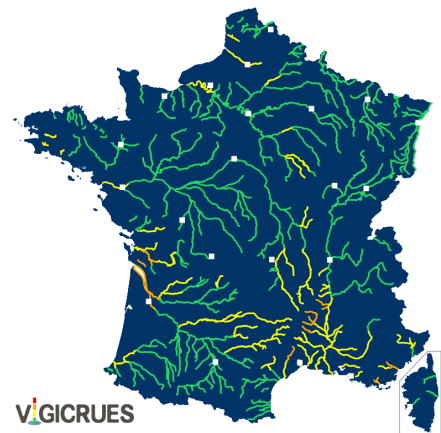
Overview

Low-pressure system Monica, alternatively named Elfi, affected several countries in Southern and Western Europe between March 8 and 11 with localized strong wind gusts and heavy precipitation that triggered deadly floods in southern France and elevated avalanche activity in the Western Alps. Aggregated losses from recent severe weather can potentially reach into the tens of millions USD.

Meteorological Recap

Large portions of Southern and Western Europe have been impacted by weather-related hazards associated with a low-pressure system that started to affect the continent on March 9. The system was named **Monica** by Météo France, and FU Berlin used an alternative name **Elfi**. Strong southern winds with gusts up to 100 kph (60 mph) drove moist air from the Mediterranean over southern France, resulting in torrential rainfall and flooding in the region. Exposed locations saw over 300 mm (11.8 inches) of rain just in two days.

Orange warnings due to heavy rain, floods, and strong winds have been in effect for several departments in southern France since March 9. In response to heavy rainfall, multiple rivers in southern France, particularly the Rhône River tributaries, reached high water levels (see map by France's Vigicrues). The Rhône River in Avignon peaked slightly above 5 m level (16.4 ft), fortunately, far from historic flood events.



Apart from that, heavy snowfall was recorded at higher elevations in the Western Alps and Cévennes, triggering dangerous avalanches. The system generated high winds and relatively strong storms in Portugal, Spain, and Italy on March 8-11.

Event Details

Widespread flood impacts were reported across **southern France**. Departments of Gard, Ardèche, Hérault, and Var were among the worst impacted. As of March 12, the Interdepartmental Crisis Management Operational Centre (COGIC) reports 6 flood-related fatalities (5 in the Gard Department alone), several injuries, and almost 100 people evacuated in the Var Department. Local emergency services carried out hundreds of interventions across the affected regions. More than 10,000 customers experienced power outages.

The storm Monica resulted in human losses and disruption elsewhere across the region between March 9 and 10. The canton of Valais within the southern **Swiss Alps** suffered through deadly winter weather conditions. A significant amount of fresh snow and high winds trapped a ski group near Tête Blanche Mountain, where 5 people died and one person remains missing. Another person was killed due to a separate avalanche near Val Ferret. In **Italy**, one death and three injured people were reported in the Triora Municipality, Liguria Region, due to an avalanche on March 10. Flooding and landslides also blocked several roads, isolated at least 200 people, and caused 4,000 customers to lose electricity within the Liguria and Piedmont Regions. On March 11, a small tornado hit several farms near the municipality of Sabaudia in the Lazio Region, causing notable damage to greenhouses and other structures.

Financial Loss

Due to the aggregated flooding, wind, and snowfall impacts, total economic and insured losses could reach into the tens of millions USD.

Indonesia: Flooding & Landslides

Overview

Indonesia's West Sumatra and Central Kalimantan Provinces have been severely affected by torrential rainfall since March 7, triggering deadly flooding and landslide events that killed at least 32 people and prompted evacuations of nearly 80,000 people. Flooding and landslides resulted in widespread infrastructural and property damage to more than 3,000 homes, putting estimated economic losses into tens of millions of USD.

Meteorological Recap

Since March 7, extremely heavy rainfall has been affecting Sumatra and Kalimantan Islands in Indonesia, resulting in flooding and landslides. Local rainfall rates as high as 50 mm (2 inches) of rain per hour have been observed with previous storms.

Event Details

West Sumatra Province in western Indonesia was the worst impacted by recent heavy rainfall, floods, and landslides. Almost 80,000 people have been evacuated across the regencies of Pesisir Selatan, Padang Pariaman, Limapuluh Kota, Agam, Solok, West Pasaman, and Pasaman. Five regencies have declared emergency response status. Search and rescue operations are still ongoing in the area.

In the latest update from March 12, the Indonesian National Disaster Management Agency (BNPB) confirmed 27 fatalities, 8 injured, and at least 5 people who are still missing. BNPB also reported over 3,000 buildings with various levels of damage, along with infrastructural damage to dozens of bridges and roads. Widespread losses to more than a million hectares (2.5 million acres) of crops have been also incurred, according to the disaster agency.

Additional flood-related losses were reported in the **Central Kalimantan Province** after torrential rains that hit the region on March 11. Flash flooding damaged over 1,500 houses and forced evacuations of more than 500 people, particularly in the Palangkaraya City. At least 5 people died.



Floods in Palangkaraya, Central Kalimantan Province

Source: BNPB

Financial Loss

Although damage assessments remain ongoing throughout the impacted area, the aggregated economic loss is expected to be significant. Regional governments have already received operational assistance and financial support for disaster emergency management in the amount of tens of millions of IDR. Total economic losses are anticipated to be close to IDR 366 billion (\$23 million), including damages to local infrastructure above IDR 226 billion (\$15 million), according to the disaster authorities.

Natural Catastrophes: In Brief

Tropical Storm Filipo (Mozambique)

Tropical Storm Filipo made landfall in southern Mozambique, over the northern Inhambane Province, on March 12, generating wind gusts up to 120 kph (75 mph). The National Institute for Disaster Management and Reduction (INGD) reported almost 3,000 affected people, 7 injured, and hundreds of affected buildings from which 12 were damaged. Additional minor damages occurred in the Gaza Province. 4 people died due to lightning in Nampula Province.

Severe Convective Storm (Turkey)

Parts of the Antalya Province in southwest Turkey were hit hard by severe weather on March 6. Notably, strong tornadoes and hailstorms in the Kumluca district caused 6 injuries while damaging 15 buildings, 20 vehicles, and 30 hectares (75 acres) of farmland in an initial damage assessment. Separate tornadoes in Kalkan damaged several more buildings while some localized flooding was reported in the city of Antalya.

Flooding (Bolivia) - Update

Seasonal rainfall and flooding have continued to significantly impact Bolivia, especially the La Paz department. According to the latest media updates, 51 people have been killed while 43,000 families have been affected. Disaster declarations were issued for 23 municipalities, including La Paz where approximately \$6.2 million of government emergency funds will be invested in flood cleanup efforts.

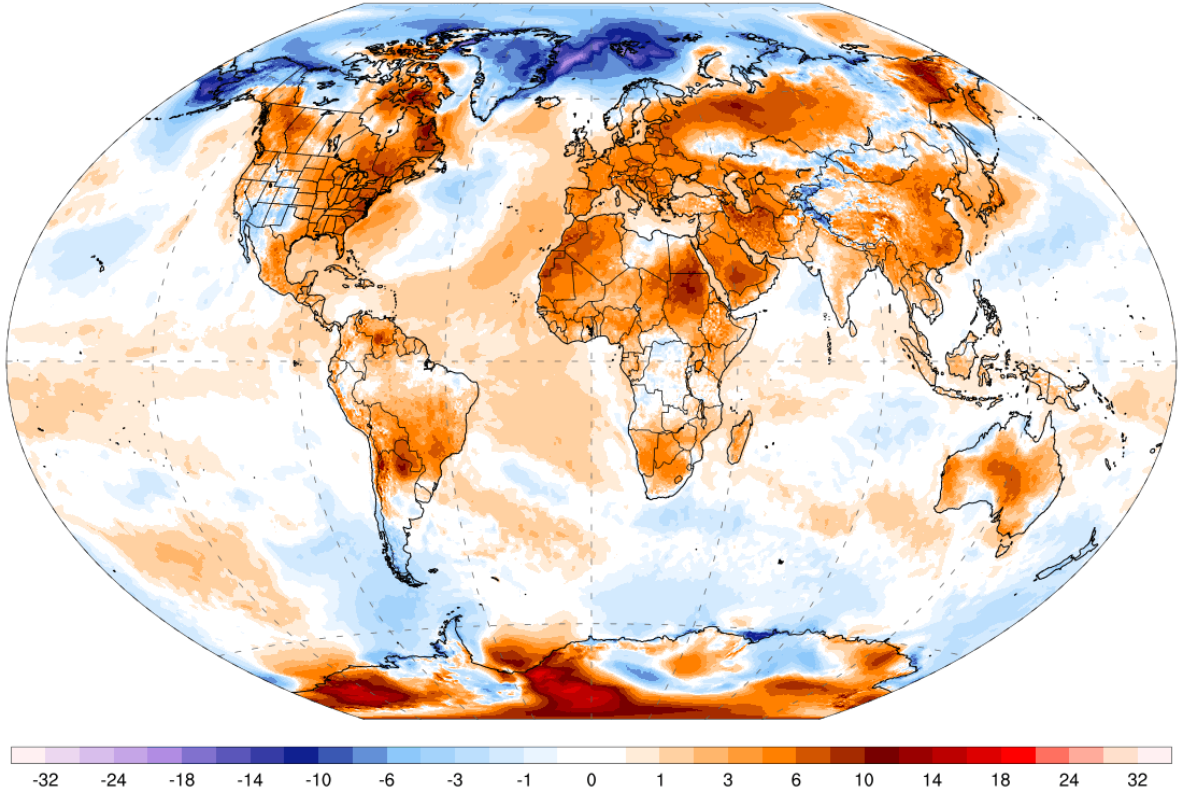
Flooding & SCS (Argentina)

Severe storms brought heavy daily rainfall up to 130 mm (5.1 inches) and large hailstones on March 11-12, resulting in flash flooding in the Buenos Aires Metropolitan Area and elsewhere in Argentina. Flooding caused notable traffic disruption, flight cancellations, and evacuations of dozens in the Argentine's capital. Over 30,000 people experienced power outages. Downpours and hailstorms are expected to continue in the upcoming days and weeks and may result in significant crop losses.

Global Temperature Anomaly Forecast

GFS 2m T Anomaly (°C) [CFSR 1979-2000 baseline]
Days 1-3 Avg | Fri, Mar 15, 2024

ClimateReanalyzer.org
Climate Change Institute | University of Maine

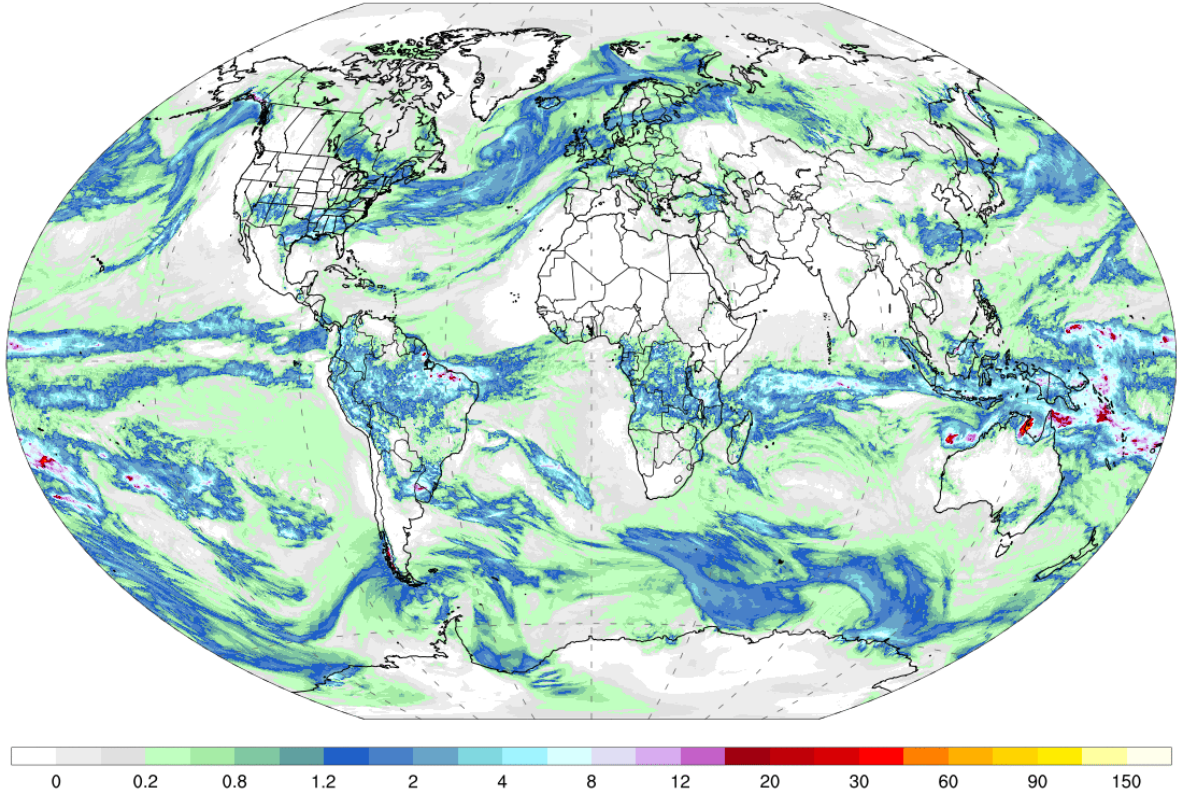


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

Global Precipitation Forecast

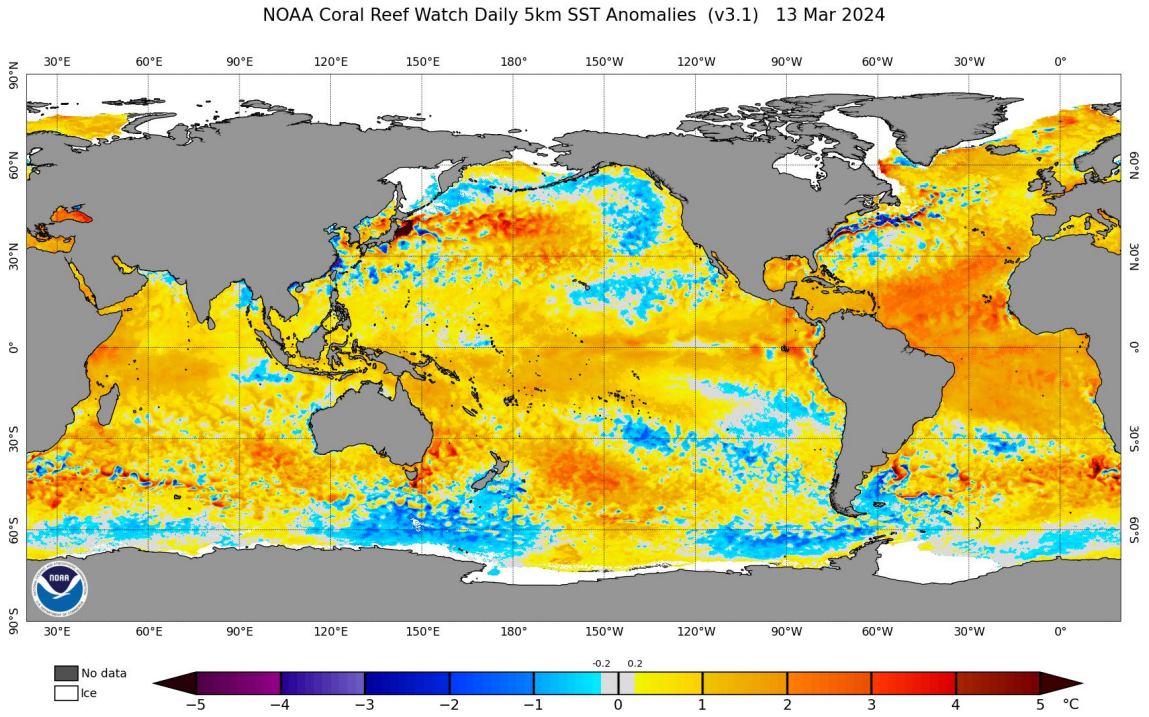
GFS Accumulated Precipitation (cm)
Days 1-3 Total | Fri, Mar 15, 2024

[ClimateReanalyzer.org](https://climatereanalyzer.org)
Climate Change Institute | University of Maine

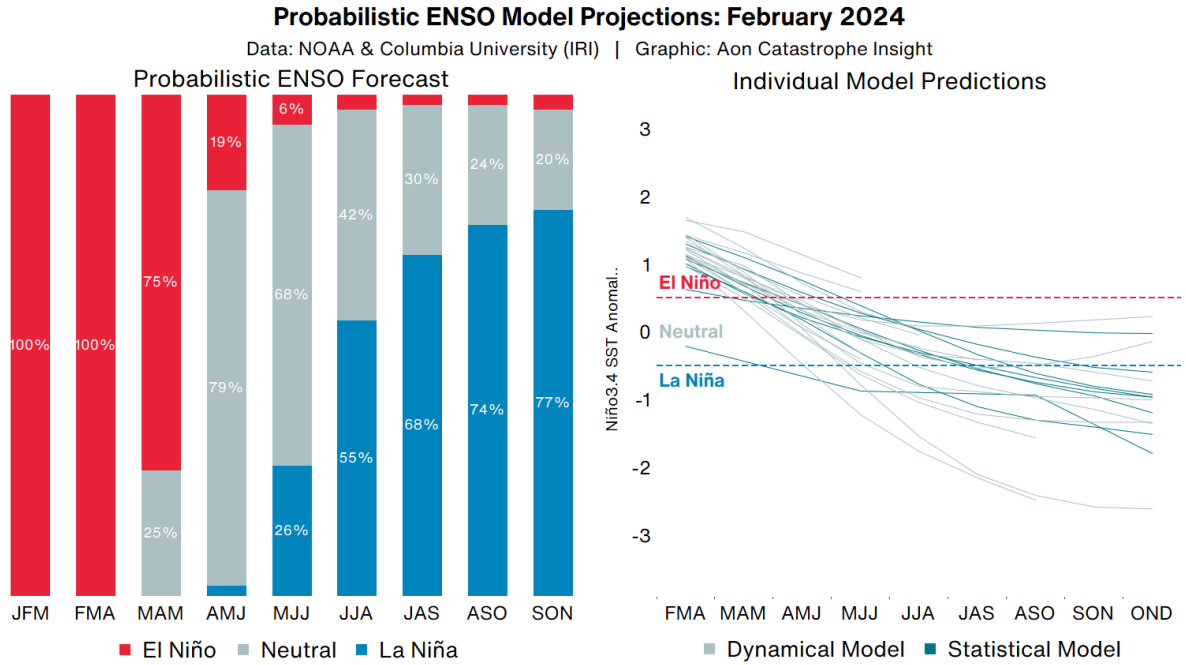


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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).

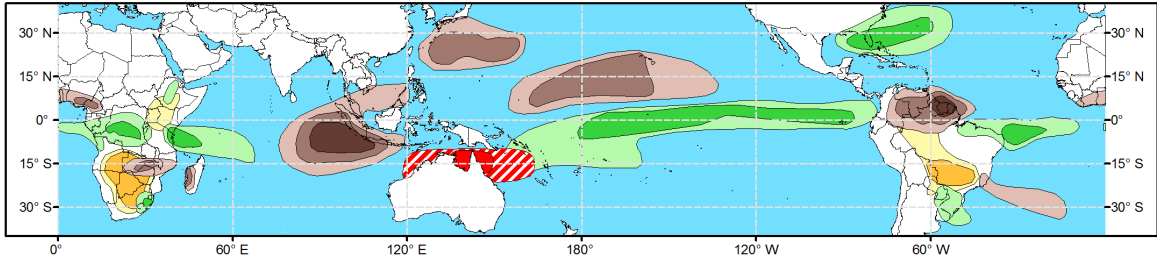
Global Tropics Outlook



Global Tropics Hazards Outlook Climate Prediction Center

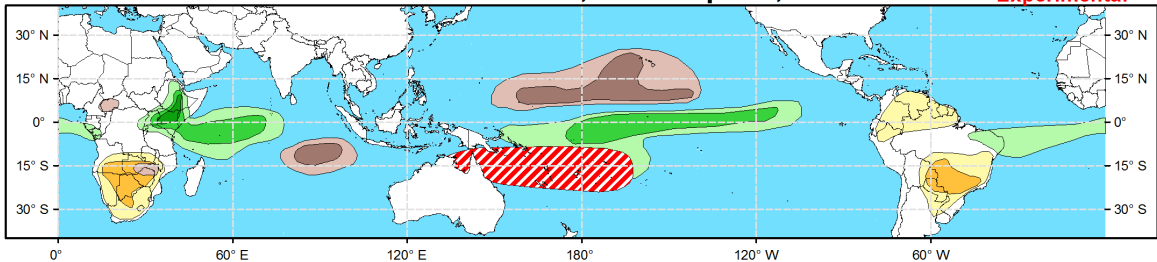


Week 2 - Valid: Mar 20, 2024 - Mar 26, 2024

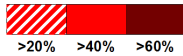


Week 3 - Valid: Mar 27, 2024 - Apr 02, 2024

**** Experimental ****



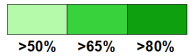
**Tropical Cyclone (TC)
Formation Probability**



>20% >40% >60%

Tropical Depression (TD)
or greater strength

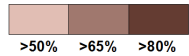
**Above-Average
Rainfall Probability**



>50% >65% >80%

Weekly total rainfall in the
Upper third of the historical range

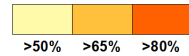
**Below-Average
Rainfall Probability**



>50% >65% >80%

Weekly total rainfall in the
Lower third of the historical range

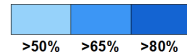
**Above-Average
Temperatures Probability**



>50% >65% >80%

7-day max temperatures in the
Upper third of the historical range

**Below-Average
Temperatures Probability**



>50% >65% >80%

7-day min temperatures in the
Lower third of the historical range

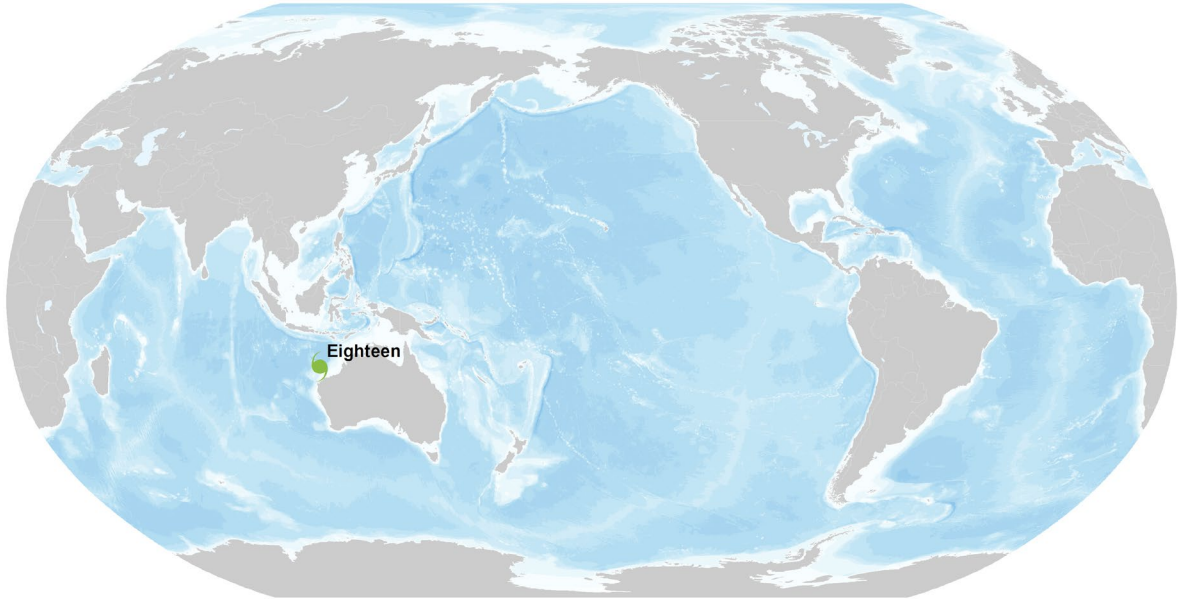
Issued: 03/12/2024

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

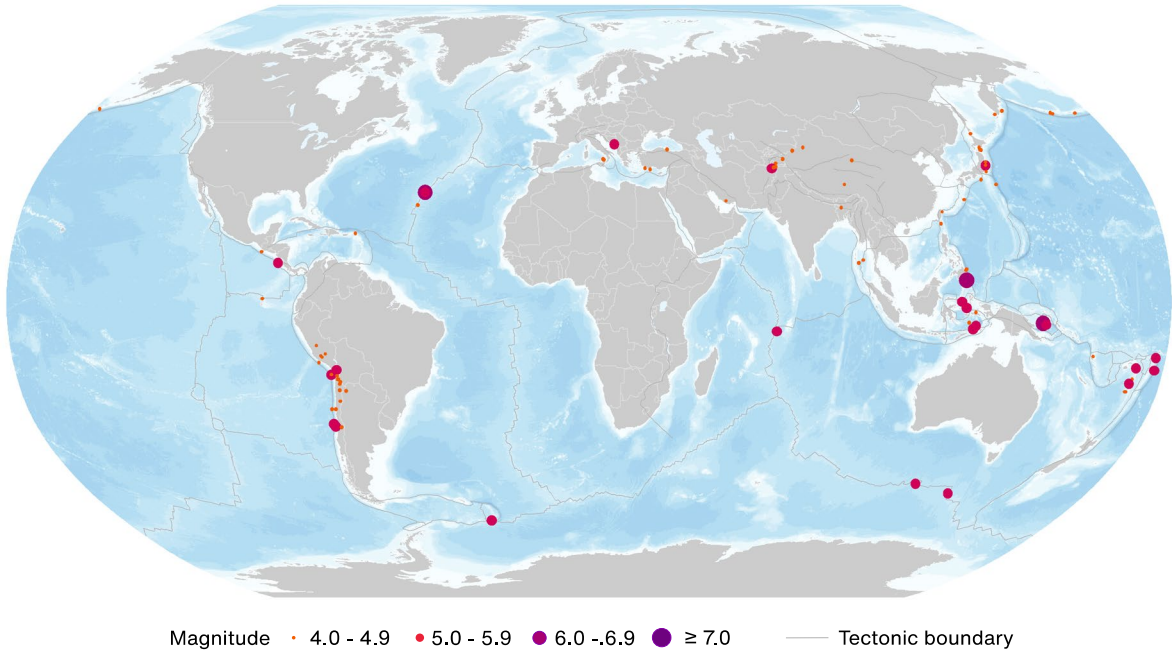
Name	Location	Winds	Center
TD Eighteen	17.7S, 115.2E	35	620 miles (1,000 km) S from Denpasar, Indonesia

* 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)

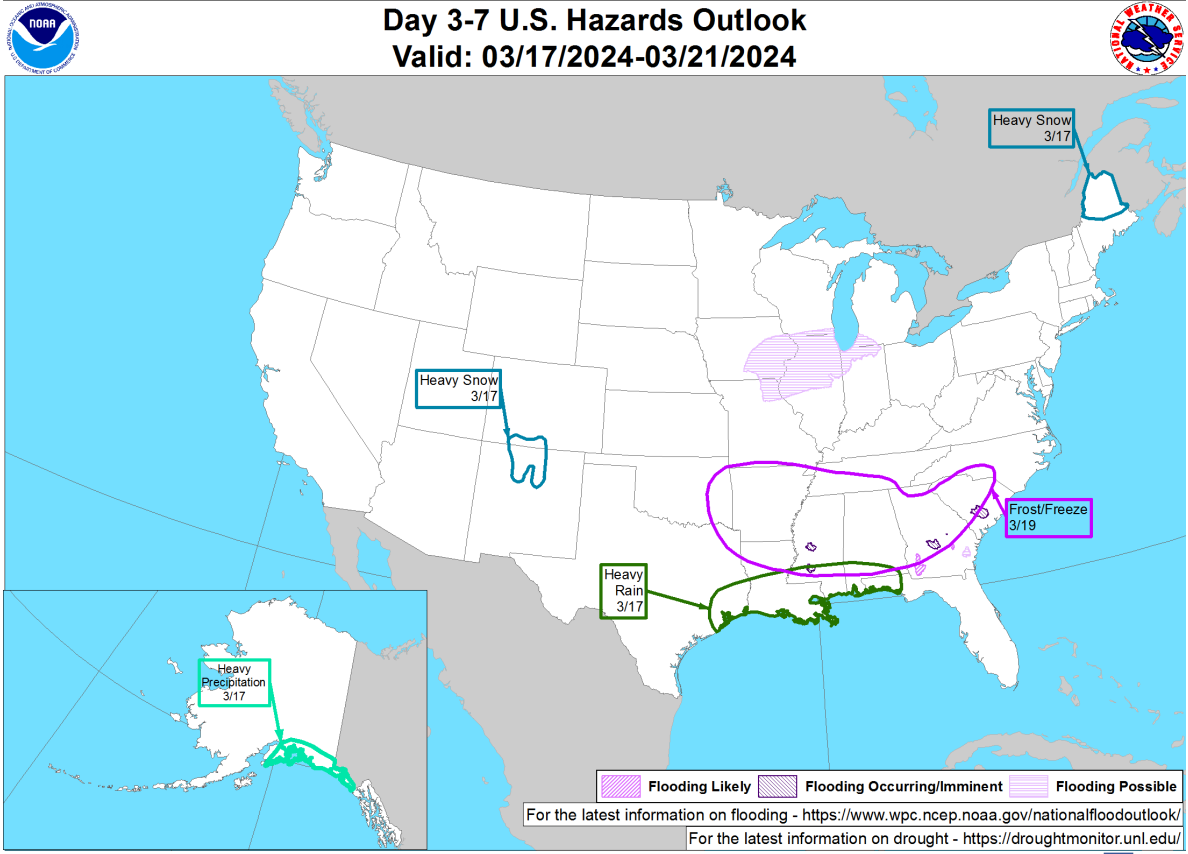
Global Earthquake Activity ($\geq M4.0$): March 8-14



Date (UTC)	Location	Magnitude	Epicenter
3/8/2024	5.82N, 126.88E	6.0	98 km (61 miles) SE of Pondaguitan, Philippines
3/13/2024	5.87S, 150.63E	6.0	65 km (40 miles) ESE of Kimbe, Papua New Guinea
3/14/2024	29.83N, 42.66W	6.0	Northern Mid-Atlantic Ridge

Source: United States Geological Survey

U.S. Hazard Outlook

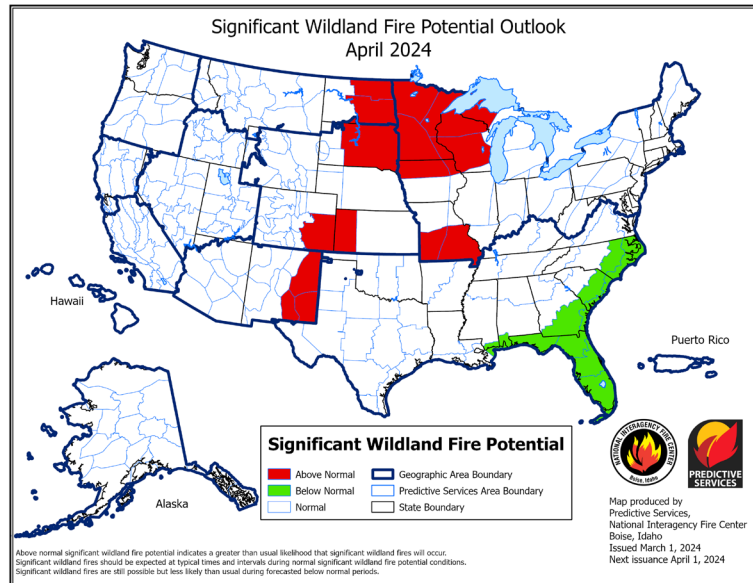
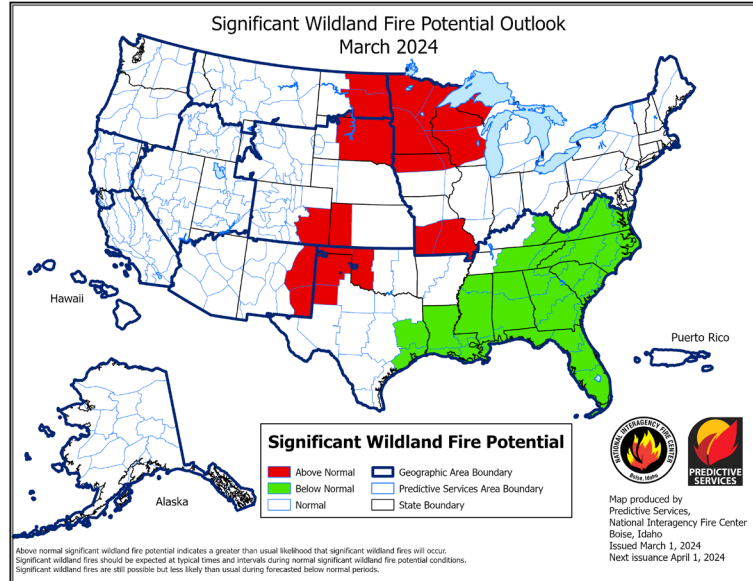


Weather Prediction Center
Made: 03/14/2024 03:36 PM EDT

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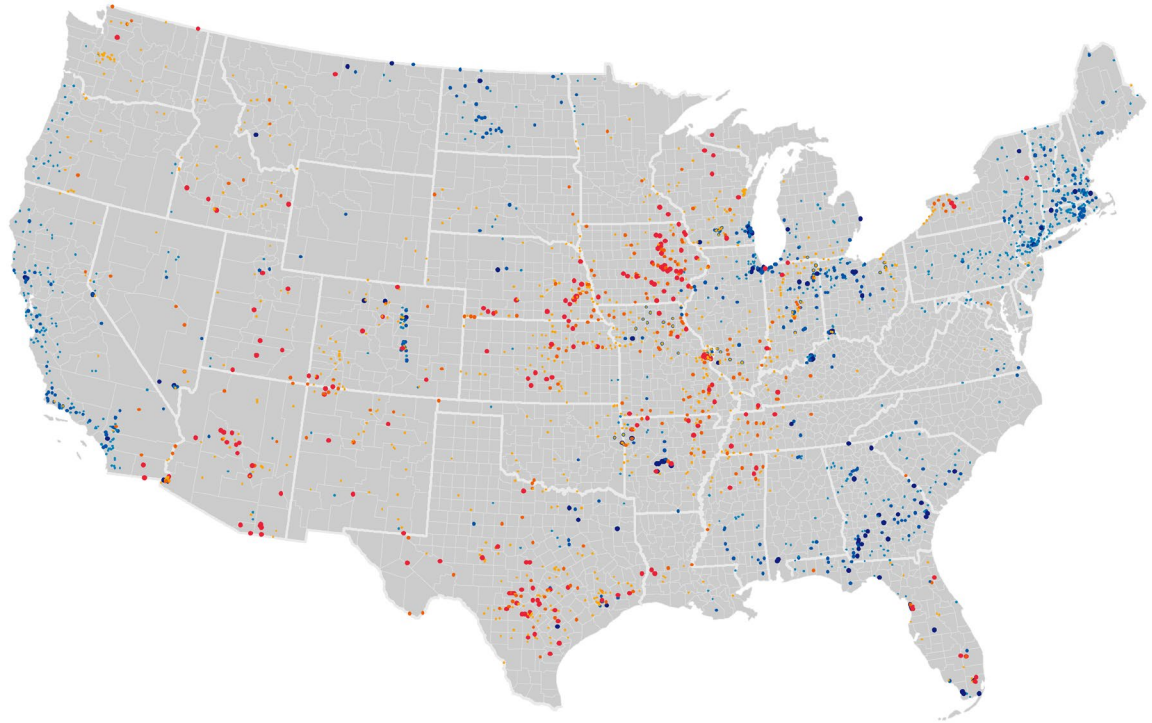
Source: Climate Prediction Center (NOAA)

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



Source: NIFC

U.S. Current Riverine Flood Risk



High Flows (Percentile)

- ≥ 99 / Above floodstage
- 95 - 99
- 90 - 95

Hydrological Drought

- Severe Drought
- Moderate Drought
- 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, Winter Weather

Storm Prediction Center (SPC)

NOAA Damage Assessment Toolkit (DAT)

National Weather Service (NWS)

Record Rainfall Douses Charleston, South Carolina, as People Rescued Out of Flood Waters, *TIME*

Streets closed when high tide causes more flooding in Hampton, *Boston.com*

Thousands of CT power outages reported as gusty winds down trees and wires, *CT Insider*

Officials say EF2 tornado struck Southeast Georgia Saturday, *First Coast News*

'Gorilla hail' pelts Kansas, Missouri with ice chunks as big as baseballs, *The Washington Post*

Snowstorm continues to pound Colorado, Second wave of moisture reaches Denver, *CBS News*

2 dead in Ohio, severe damage in Indiana as suspected tornadoes hit Midwest, *NBC News*

Mass casualty incident in Logan County northwest of Columbus after possible tornado, *The Columbus Dispatch*

Low Monica / Elfi: Southern & Western Europe

The European Severe Weather Database (ESWD)

Météo France

Vigicrues

The Interdepartmental Crisis Management Operational Centre (COGIC)

Five skiers found dead and one missing in Swiss Alps, *BBC*

Saas Valley cut off from the outside world – skier dies in Val Ferret, *20 Min*

Indonesia: Flooding & Landslides

Indonesian National Disaster Management Agency (BNPB)

Natural Catastrophes: In Brief

Mozambique's National Institute for Disaster Management and Reduction (INGD)

Showers, storms and tornadoes were effective in Antalya: The moment of the tornado was captured on camera, *TRT Haber*

Rains leave more than 51 dead and 43,000 families affected in Bolivia, *Los Tiempos*

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