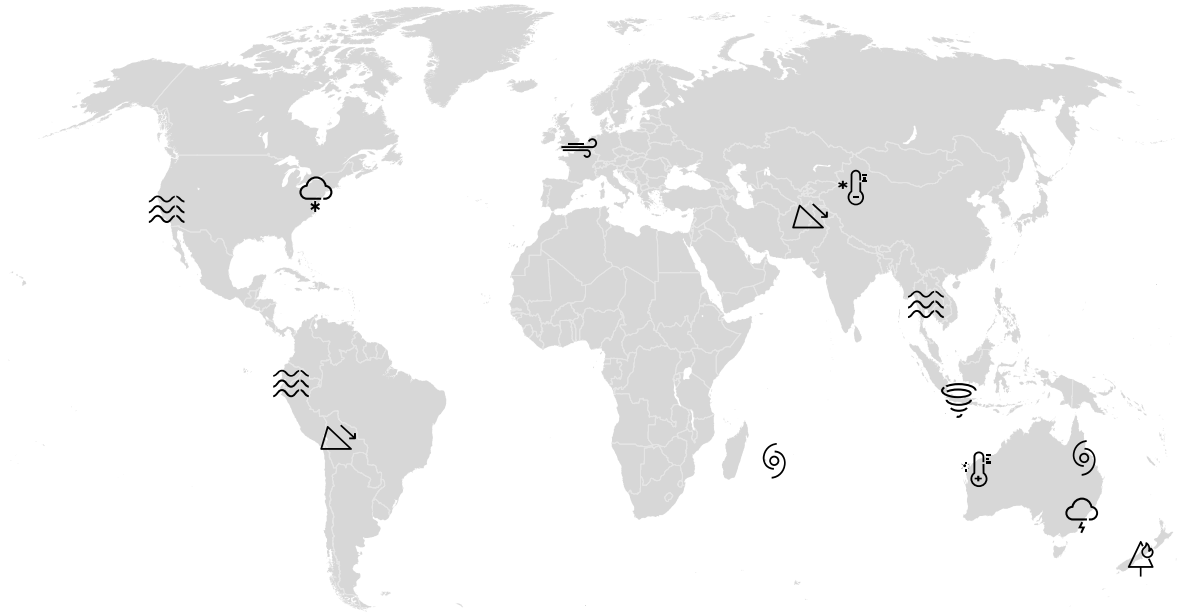


Weekly Cat Report

February 23, 2024



Executive Summary



Event	Affected Region(s)	Fatalities	Economic Loss (\$)	Page
Flooding & Winter Weather	United States	0	Millions	3
Windstorm Louis / Wencke	Western & Northern Europe	1	100s of millions	5
Tropical Storm Lincoln	Australia	1	Negligible	6
Winter Weather	China	1	Unknown	8
Flooding & Landslide	Ecuador, Peru	6	10s of millions	8
Wildfire	New Zealand	0	Millions	8
Landslide & Avalanche	Afghanistan	25	Unknown	8
Severe Convective Storm	Australia	0	Millions	8
Landslides	Bolivia	4	Unknown	9
SCS, Flooding, & Landslide	Indonesia	2	Unknown	9
Flooding & SCS	Thailand	0	Millions	9
Tropical Storm Eleanor	Mauritius	0	Negligible	9
Heatwave	Australia	N/A	N/A	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.

United States: Flooding & Winter Weather

Overview

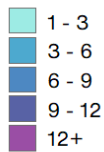
A fast-moving winter storm impacted a large area from Missouri to New Jersey on February 16-17. Snow totals were unexpectedly high over a narrow area in Pennsylvania and New Jersey. Meanwhile, much of California suffered through yet another atmospheric river event on February 19-21. Despite no major damage, localized flooding and landslides were reported from San Francisco to Los Angeles.

Meteorological Recap

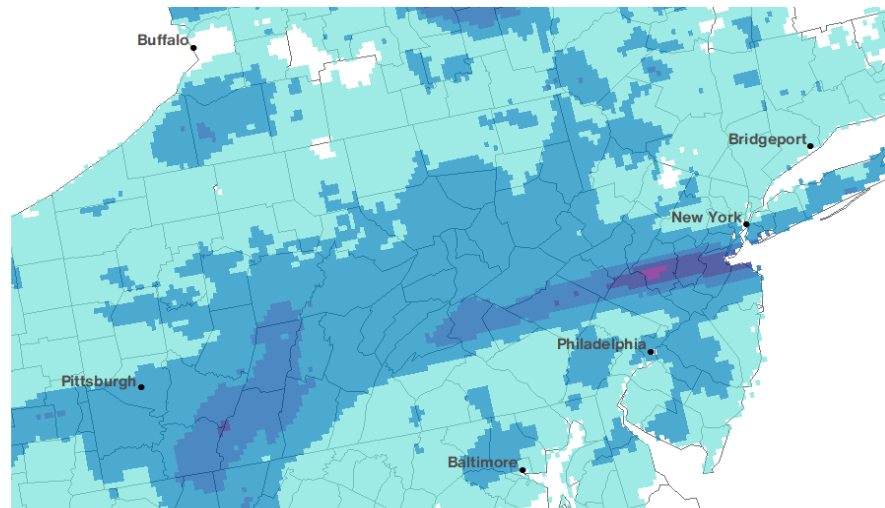
Midwest and Mid-Atlantic

Storm Total Snowfall (inches)

February 16-17,
2024



Data: NOAA



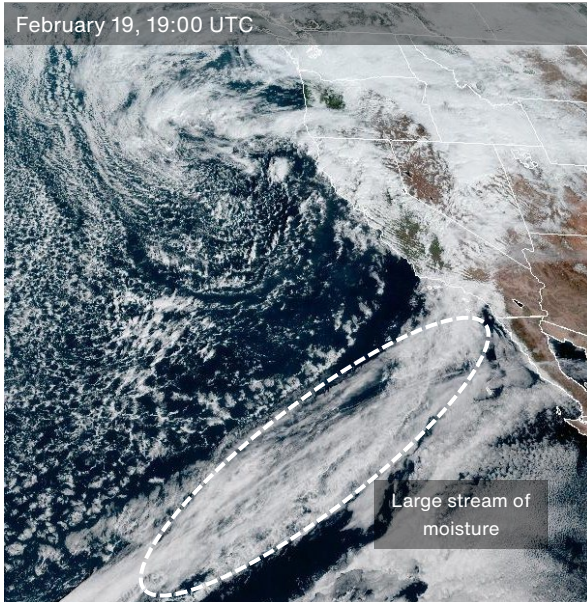
On February 16-17, a winter storm system quickly moved over the Midwest and Mid-Atlantic regions. Most locations spanning from St. Louis, Missouri to Long Island, New York received 3-6 inches (75-150 mm) of snow. However, an intense snow band unexpectedly developed over eastern Pennsylvania and northern New Jersey, where snow rates were as high as 5 inches (125 mm) per hour. As a result, this highly localized area measured over 1 foot (305 mm) of snow, including towns such as Allentown and Macungie in Pennsylvania. In fact, the counties of Hunterdon (NJ), Somerset (NJ), Berks (PA), Bucks (PA), Lehigh (PA), and Northampton (PA) all recorded at least 1 foot of snow.

California

Another atmospheric river event brought several rounds of rain and heavy snow to most of California on February 17-21, although the heaviest precipitation was seen primarily on February 19-21. Compared to the historic atmospheric river event earlier this month (see Weekly Cat Report from February 9, 2024), this recent event was less intense overall. However, a large area spanning from San Francisco to San Diego saw several inches of rain (see table below), which added to the historic rain totals seen thus far in February. In fact, after receiving 1.99 inches (50 mm) of rain from this latest event, downtown Los Angeles has now recorded 12.56 inches (320 mm) since the beginning of this month. This makes

February 2024 the wettest month in 26 years and the 4th wettest February on record for Los Angeles, according to NWS. With more rain forecasted for southern California in the next week, the all-time February rainfall record of 13.68 inches (347 mm) for L.A. may be in jeopardy.

Similar to the recent atmospheric river events, very heavy snow was once again seen over the Sierra Nevada Mountain range. Over 40 inches (1.02 meters) of snow was measured in the past week at Bear Valley and near Lake Tahoe in northern California.



Location	Storm Total Rainfall (in/mm)
Santa Barbara	5.60 / 142
Bel Air	5.21 / 132
Ventura	5.01 / 127
Beverly Hills	4.01 / 102
Oxnard	3.86 / 98
Cal State – San Bernardino	3.39 / 86
Santa Monica	3.27 / 84
Pasadena	3.00 / 76
Garden Grove	2.44 / 62
Sacramento	2.20 / 56
Fashion Valley – San Diego	1.11 / 28

Event Details

Overall, California was spared of any major damage, especially compared to the recent atmospheric river events. However, over 130 flooding and landslide incidents were still reported across the state. Many roads were closed due to flooding and landslides, including several parts of the Pacific Coast Highway near Los Angeles, Malibu, and Santa Monica. Santa Barbara airport was closed for several days due to severe flooding.

Despite heavy snow in the Mid-Atlantic region, impacts were limited to minor traffic disruptions and minimal power outages. In the Midwest, numerous vehicles were damaged in multiple crashes, including a large pileup on Interstate 70 near St. Louis.



Landslide in southern California

Source: LA County Fire Department

Financial Loss

Given the widespread, but minor, flooding and landslide incidents in California, economic and insured losses could reach into the millions of USD.

Windstorm Louis / Wencke: Western & Northern Europe

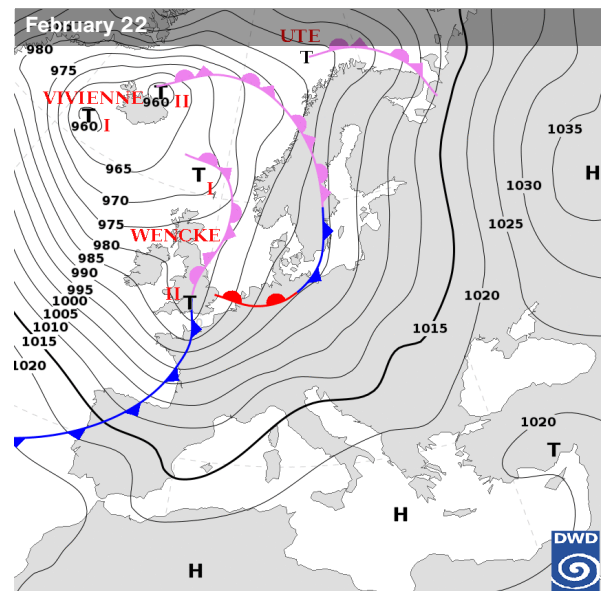
Overview

Windstorm Louis, alternatively named Wencke and Rolf, hit several countries in Western and Northern Europe on February 22-23, generating strong wind gusts, localized heavy rainfall, and flooding. As the event is still ongoing, total losses are being assessed at the time of writing. However, this windstorm is likely to become another notable event for insurers, with total losses expected to run into the hundreds of millions of EUR. It is worth noting that the severity of the event was relatively difficult to forecast and there was little agreement between forecasting models.

Meteorological Recap

A secondary depression developed on February 22 on the southern flank of the extensive low-pressure area named Vivienne with a center over Iceland. The system was internationally named **Louis** by the Météo France. FU Berlin used the alternative name **Wencke**, the Danish Met Institute named the storm **Rolf**. The atypical storm development led to high uncertainties in the maximum wind speed predictions within the individual meteorological models and their runs. Moving east-northeast over the North Sea, the system hit several countries in Western and Northern Europe on February 22-23. The maximum wind gusts of over 110 kph (70 mph) were reported in north-western France. The table below shows the highest wind gusts, according to the Météo France. Elsewhere, particularly in Belgium, the Netherlands, and Germany, wind gusts topped 100 kph (60 mph). Yellow and orange wind warnings were issued by national meteorological services across the affected region. A cold front associated with this low brought localized weak storms over the western parts of the continent.

Location	Wind Gust (kph/mpg)
Chouilly	123 / 76
Tarbes	122 / 76
Plessis-Belleville	117 / 73
Cap de la Hève	116 / 72
Méaulte	116 / 72



Event Details & Financial Loss

France, Belgium, the Netherlands, Germany, Denmark, southern Sweden, and the United Kingdom were among the hardest hit with potentially notable material damage. In France, one flood-related fatality was reported, and more than 90,000 people were left without power. Although the event is still ongoing, the economic and insured losses are already expected to be in the hundreds of millions of EUR, with the potential to increase following further impacts on February 23. More updates will likely follow in the next Cat Reports.

Australia: Tropical Storm Lincoln

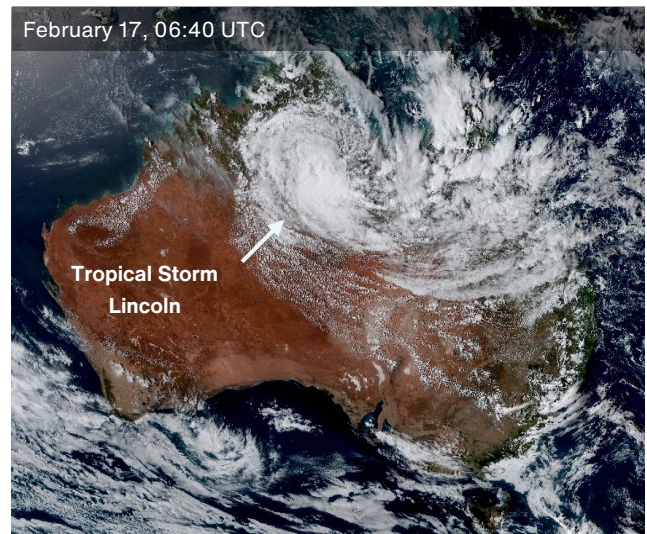
Overview

Tropical Storm Lincoln, Australia's 3rd cyclonic storm of the season, made landfall on February 16 in the Northern Territory. Despite rapid weakening, heavy rainfall and flooding occurred over the states of Queensland, Northern Territory, and Western Australia. Lincoln is forecasted to restrengthen and make a second landfall over Western Australia in the coming days.

Meteorological Recap

The storm was named Lincoln by BoM on February 15 after strengthening over seawater. The system made landfall in the Northern Territory of Australia the following day as a Category 1 cyclone, based on the Australian cyclone scale (an equivalent to tropical storm intensity on the Saffir-Simpson scale), with peak gusts up to 80 kph (50 mph).

Over the next few days, the remnants of Lincoln continued to bring heavy rainfall to the states of Queensland, Northern Territory, and Western Australia. Some areas recorded over 100 mm (3.94 inches) of rainfall in just 24 hours. The system moved into the southern Indian Ocean on February 21.



Forecasts from BoM call for Lincoln to reintensify into a Category 2 cyclone (still the tropical storm intensity on the hurricane scale) and make a second landfall in Western Australia state by February 24-25.

Event Details

As of this writing, 1 fatality related to the storm was reported in Duchess Town in western Queensland. Dozens of people have been evacuated as the storm passed. Regarding the subsequent storm impacts in Western Australia, potential updates will follow in the upcoming weekly report.

Natural Catastrophes: In Brief

Winter Weather (China)

Much of China has been battling extreme cold and hazardous weather since February 17. Strong winds and dust storms caused widespread traffic disruptions from Xinjiang to Shaanxi. Then, most of northern China experienced a rapid drop in temperatures, including in Xinjiang where a new record low for the region was set at -52.3 °C (-62.1 °F). Additionally, blizzard and freezing rain conditions were reported throughout northern and central China, leading to one death in Hebei. In the next few days, dangerous cold air is forecasted to spread further into southern and northeast China.

Flooding & Landslide (Ecuador, Peru)

Much of Ecuador has been impacted by heavy rainfall, flooding, and landslides since January 29. According to the national authorities (SGR), at least 6 people have died, 6 others have been injured, and more than 27,000 people have been affected. More than 5,400 houses have been destroyed or damaged due to widespread floods and landslide events. Most of the losses have been reported in the provinces of Guayas, Los Ríos, Esmeraldas, Manabí, and El Oro. Material losses due to heavy rainfall and flooding have been reported also in northern Peru since February 19. According to the National Institute of Civil Defense (INDECI) of Peru, hundreds of people have been affected and notable infrastructural and structural damage to more than 110 buildings have been incurred, particularly in the Tumbes Region.

Wildfire (New Zealand)

A large fire south of Christchurch in New Zealand has been burning since February 13. Around 650 hectares (1,600 acres) of land were burned, which prompted local officials to declare a state of emergency through February 21. About 100 homes were evacuated, and a public health warning was issued by officials due to large plumes of smoke. While no material damage was reported, an estimated \$1.67 million was spent on helicopters responding to the fire alone, according to Fire and Emergency New Zealand (FENZ).

Landslide & Avalanche (Afghanistan)

Within the Nuristan Province in eastern Afghanistan, the village of Nakre was devastated by a deadly landslide late on February 18. The large flow of snow and rubble is responsible for at least 25 deaths, 8 injuries, and approximately 20 destroyed or heavily damaged homes. Continued heavy snowfall has hampered rescue operations, and local officials fear the death toll may increase.

Severe Convective Storm (Australia)

On February 19, strong thunderstorms packed with powerful winds, heavy rain, and lightning affected parts of New South Wales. Notably, lightning over Sydney injured 4 people and set multiple homes on fire. Over 10,000 homes and businesses lost power while over 350 flights were canceled or delayed due to severe weather. Meanwhile, the number of claims related to Victoria's storms between February 12 and 15 rose to more than 14,360, according to the Insurance Council of Australia (ICA).

Landslides (Bolivia)

Since February 17, heavy rainfall and landslides have been impacting parts of western Bolivia, especially within the La Paz department. In Achocalla, a deadly landslide on February 17 was responsible for three deaths, 10 damaged homes, and the evacuation of 60 people. Another person was killed due to a separate landslide in the San Antonio district on February 22.

SCS, Flooding, & Landslide (Indonesia)

Heavy rainfall, flooding, and landslides have been affecting much of Java Island in Indonesia since February 16. A landslide in West Java was responsible for 2 deaths and 2 injuries, while 24,000 people have been displaced from the Demak Regency in Central Java due to flooding. On February 21, a tornado swept through several districts of Sumedang and Bandung regencies in West Java, injuring no fewer than 22 people and damaging around 60 buildings.

Flooding & SCS (Thailand)

Severe weather with thunderstorms and heavy rainfall has affected thousands of people and resulted in material damage to more than 280 houses across central and north-eastern Thailand since February 17. Provinces of Kamphaeng Phet, Nong Bua Lamphu, and Nakhon Sawan were among the worst affected, according to the ASEAN Disaster Information Network (ADINet).

Tropical Storm Eleanor (Mauritius)

Tropical Storm Eleanor passed east of Mauritius on February 22, bringing localized heavy rainfall and wind gusts up to 100 kph (60 mph) over the east coast of the island. The Mauritius Meteorological Service issued a Class 3 cyclone warning (the second highest level on the local scale), however, the storm impacts were significantly lower than initially feared, including grounded flights and closed schools mainly.

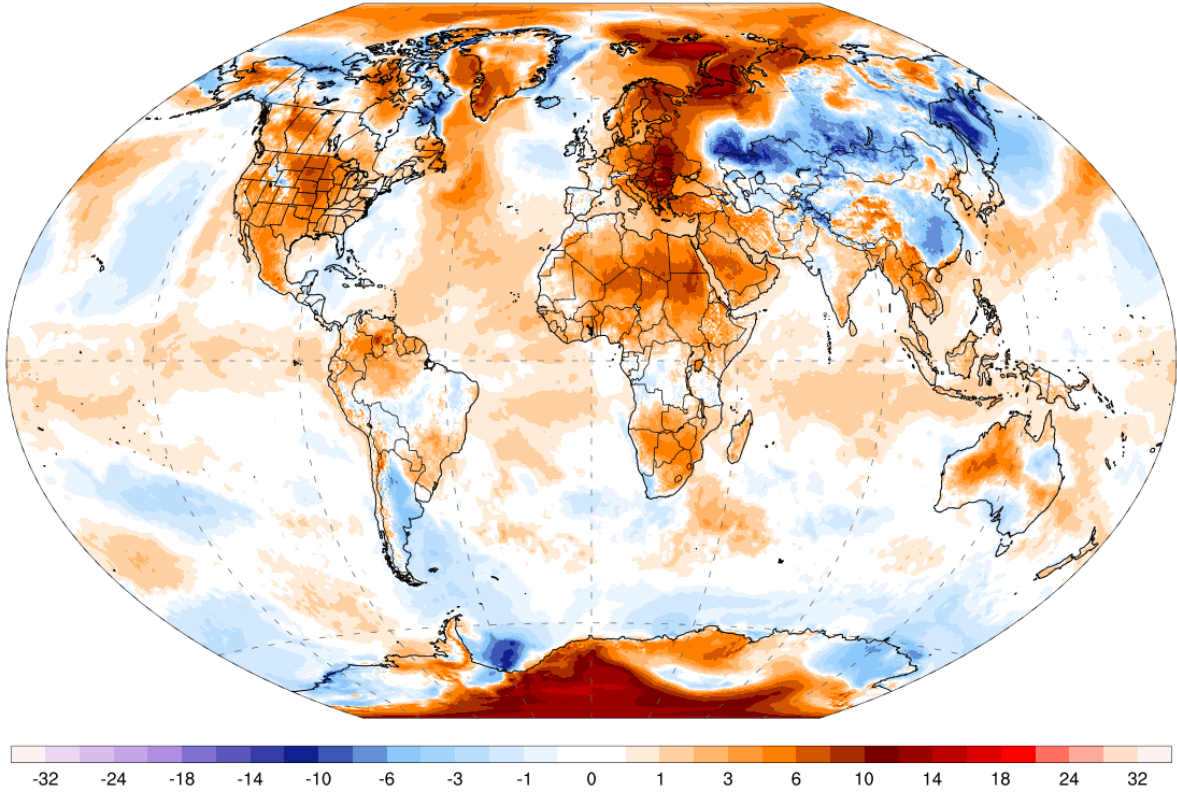
Heatwave (Australia)

Much of Western Australia, including the city of Perth, faced severe heatwave conditions between February 16 and 21. The maximum temperatures reached the 40s in many locations across the state, which resulted in dozens of all-time temperature records and localized extreme heat warnings issued by the Australian Bureau of Meteorology (BoM). On February 19, Carnarvon town soared to 49.9 °C (121.8 °F), the world's highest temperature recorded this year and one of the highest ever recorded in Australia.

Global Temperature Anomaly Forecast

GFS 2m T Anomaly (°C) [CFSR 1979-2000 baseline]
Days 1-3 Avg | Fri, Feb 23, 2024

ClimateReanalyzer.org
Climate Change Institute | University of Maine

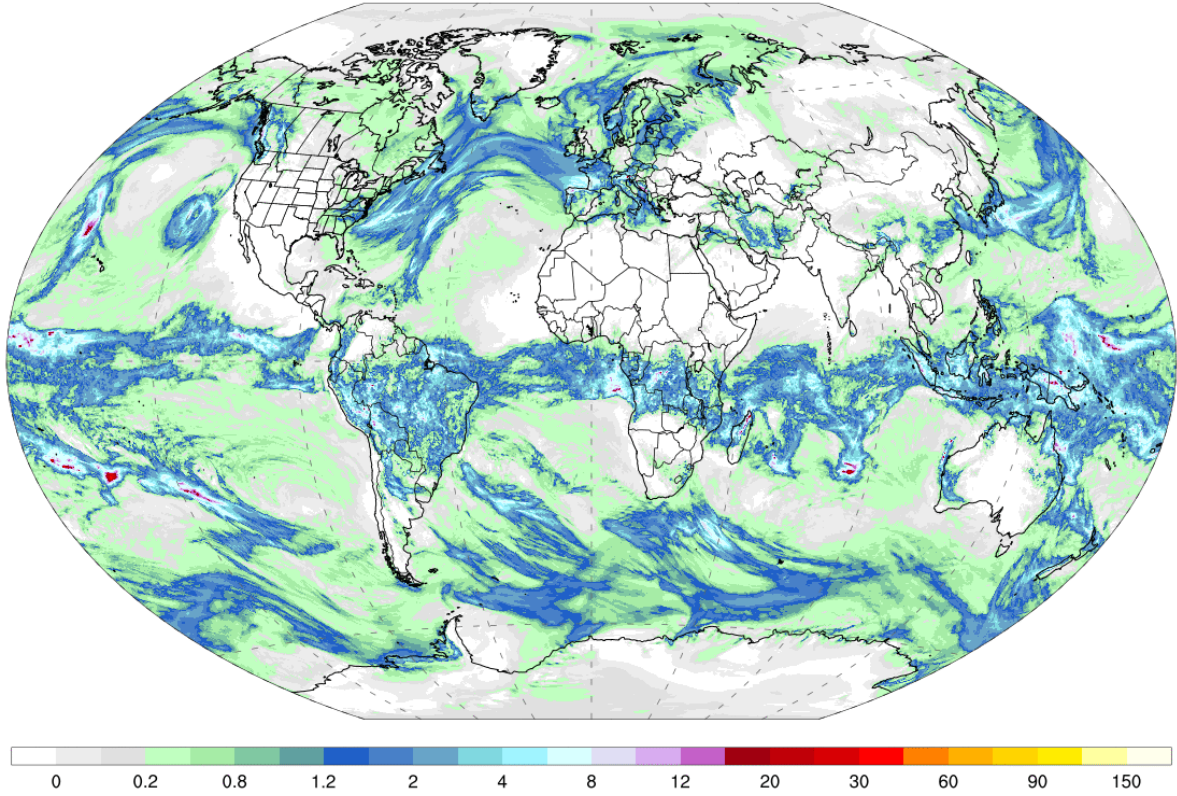


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

Global Precipitation Forecast

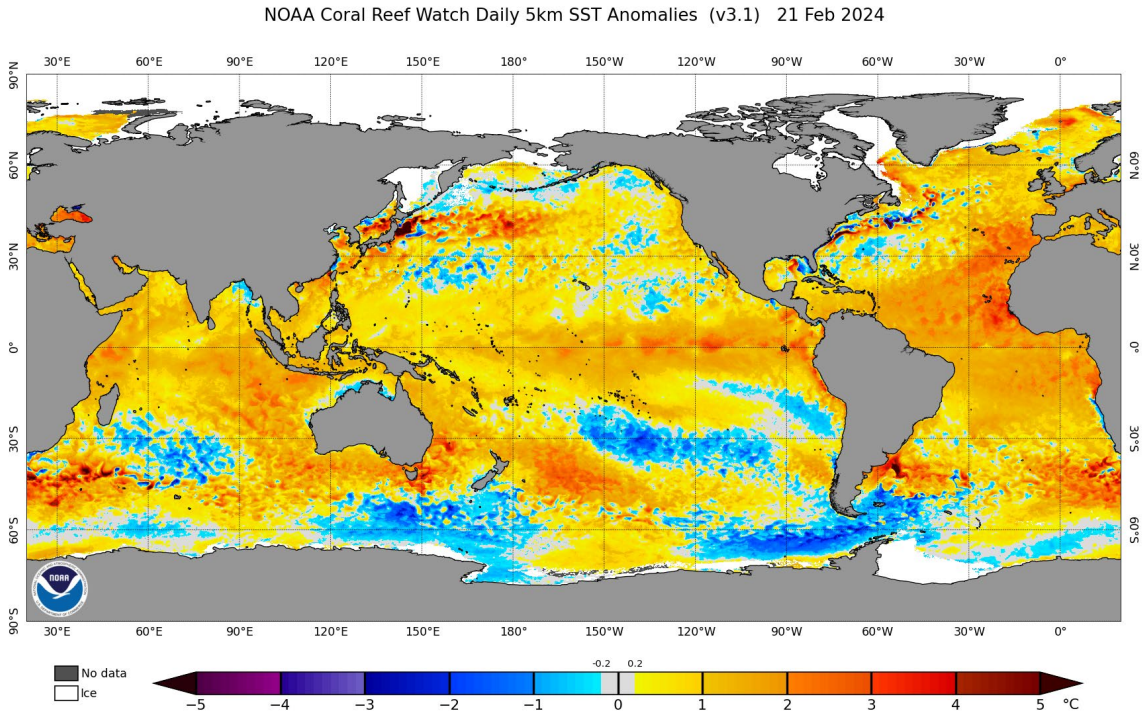
GFS Accumulated Precipitation (cm)
Days 1-3 Total | Fri, Feb 23, 2024

ClimateReanalyzer.org
Climate Change Institute | University of Maine

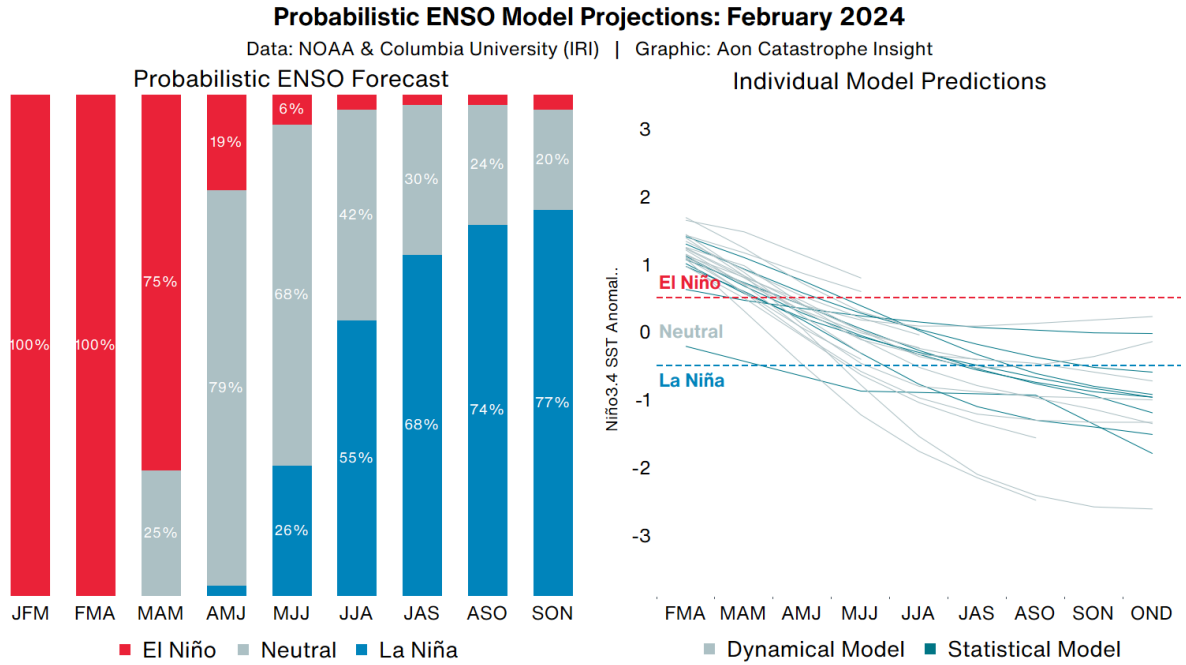


Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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



El Niño-Southern Oscillation (ENSO)



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).

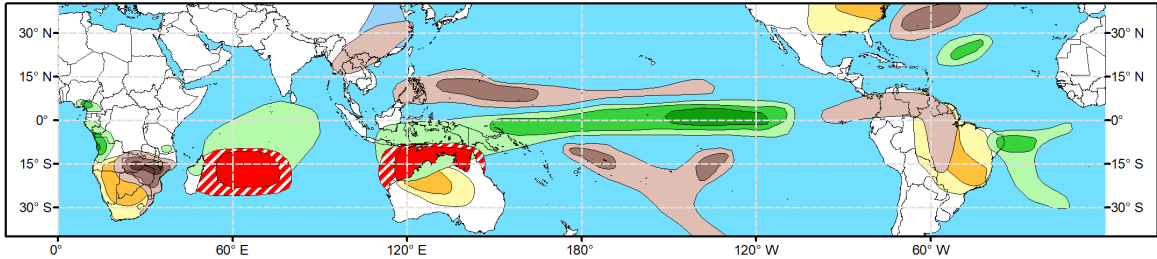
Global Tropics Outlook



Global Tropics Hazards Outlook Climate Prediction Center

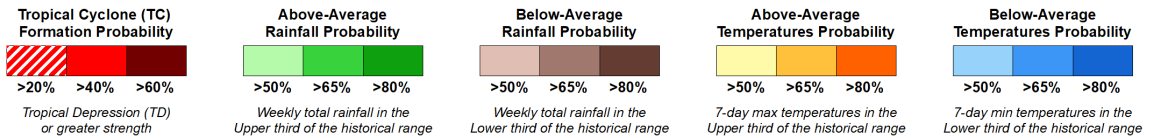
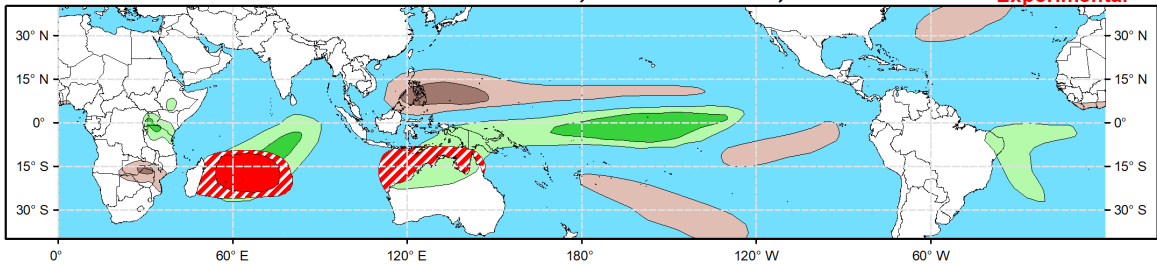


Week 2 - Valid: Feb 28, 2024 - Mar 05, 2024



Week 3 - Valid: Mar 06, 2024 - Mar 12, 2024

**** Experimental ****



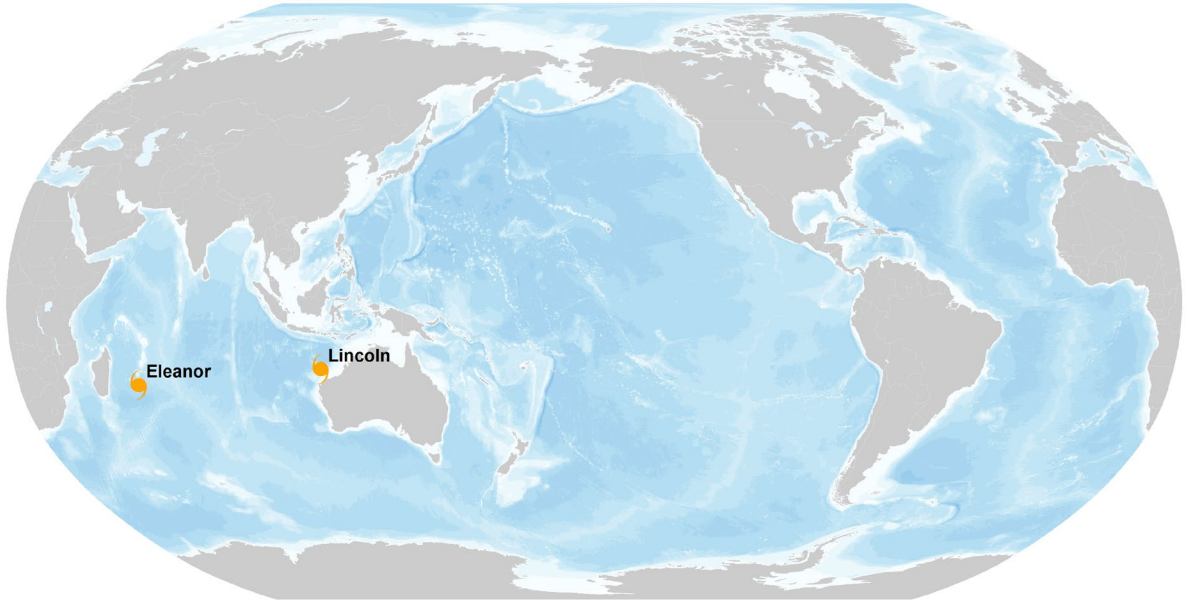
Issued: 02/20/2024

Forecaster: Barandiaran

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

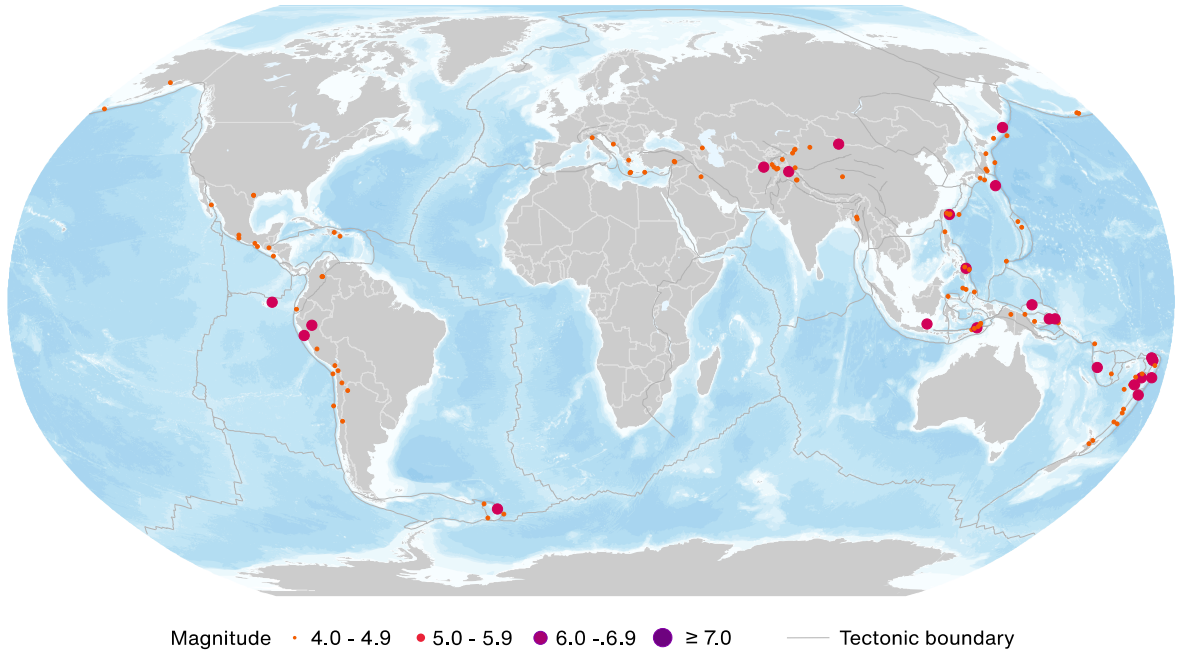
Name	Location	Winds	Center
TS Eleanor	22.3S, 57.5E	60	145 mi (235 km) S from Port Louis, Mauritius
TS Lincoln	18.0S, 115.1E	40	645 mi (1,035 km) S from Denpasar, Indonesia

* 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

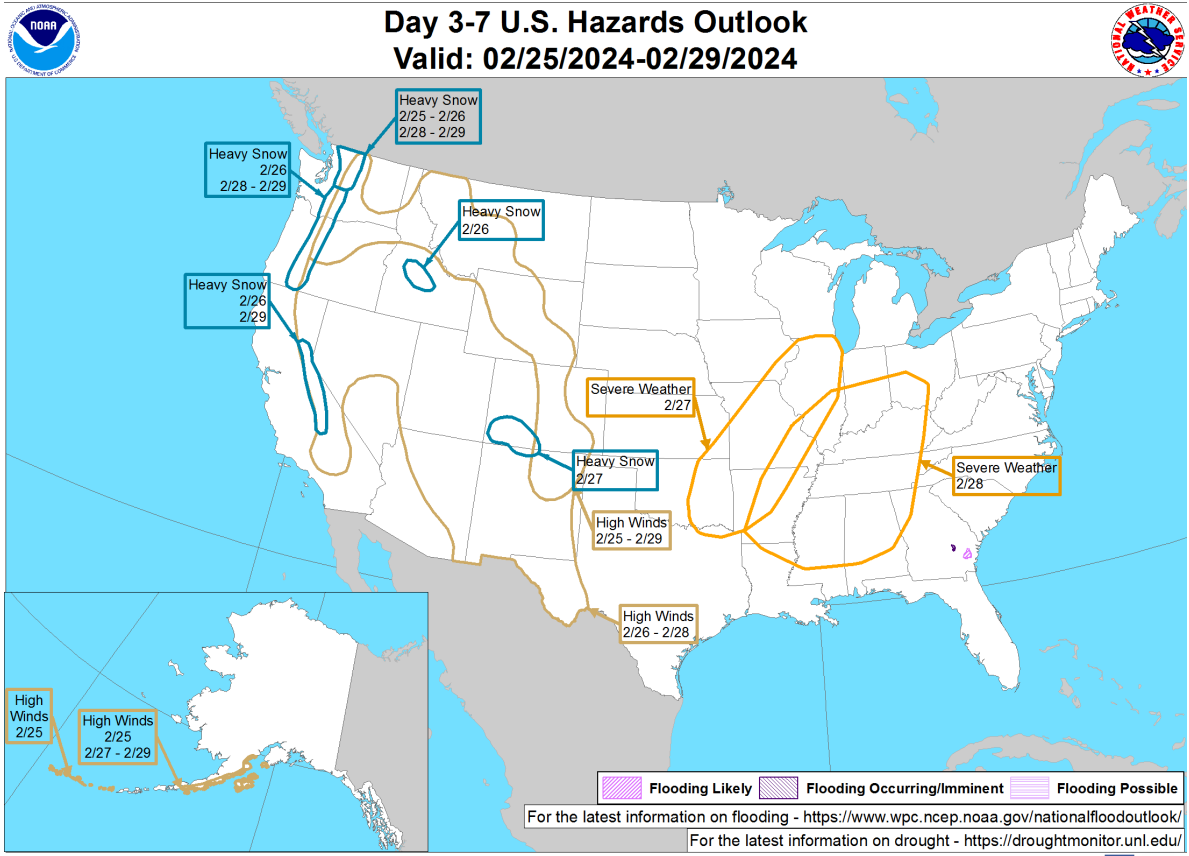
Source: National Hurricane Center, Joint Typhoon Warning Center, Central Pacific Hurricane Center (NOAA)

Global Earthquake Activity ($\geq M4.0$): February 16-22



Source: United States Geological Survey

U.S. Hazard Outlook

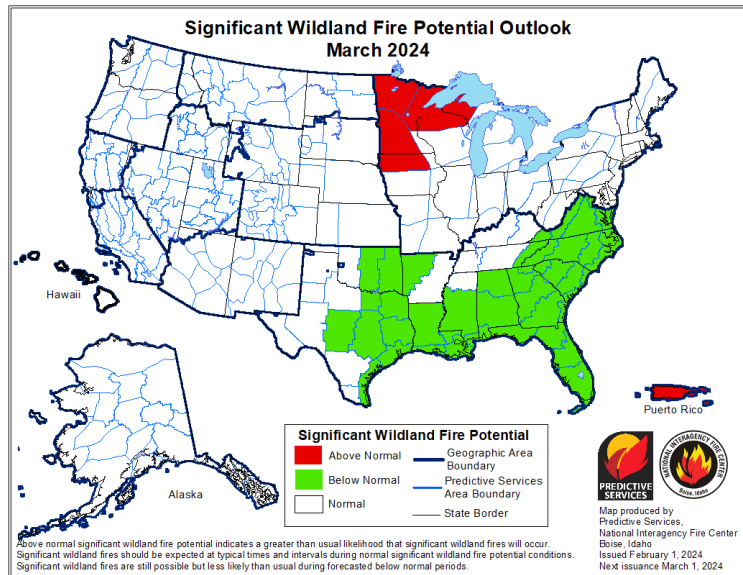
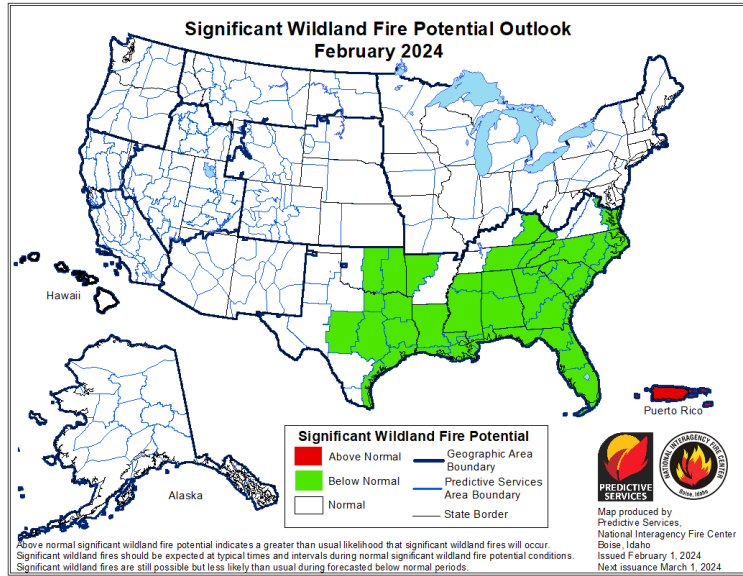


Weather Prediction Center
Made: 02/22/2024 02:59 PM EST

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

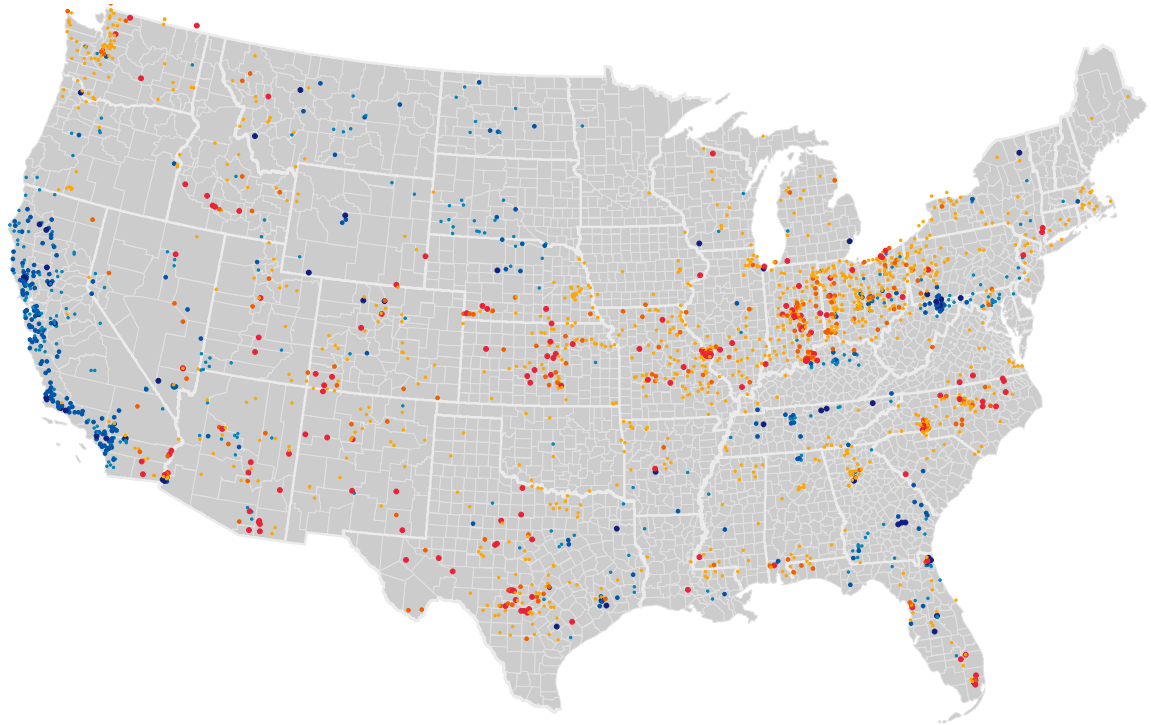
Source: Climate Prediction Center (NOAA)

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

United States: Flooding & Winter Weather

National Weather Service (NWS)

Los Angeles County Fire Department

Winter storm slams parts of Northeast, leaving more than a foot of snow in Pennsylvania, *ABC News*

Storm Brings Snow to Northeast and Mid-Atlantic, Again, *The New York Times*

Snow squalls pummel Northeast in wake of winter storm that dumped foot of snow in Pennsylvania, New Jersey, *Fox Weather*

California is waterlogged after yet another drenching atmospheric river, *The Washington Post*

Saturated California gets more rain and snow but so far escapes severe damage it saw only weeks ago, *ABC News*

Windstorm Louis / Wencke: Western & Northern Europe

Météo France

DWD

Australia: Tropical Storm Lincoln

Australian Bureau of Meteorology (BoM)

JTWC

Natural Catastrophes: In Brief

UN OCHA

ADINet

Ecuador's Risk Management Secretariat (SGR)

National Institute of Civil Defense of Peru (INDECI)

Australian Bureau of Meteorology (BoM)

Insurance Council of Australia (ICA)

Fire and Emergency New Zealand (FENZ)

China's Xinjiang battles harshest cold spell in over six decades, *Reuters*

A Blanket of White: Heavy Snowfall Paralyzes Northern and Central China, *BNN*

Six dead and more than 27,000 affected by the rains in Ecuador, *Infobae*

More than \$1.6 million spent on helicopters at Port Hills fire, *1 News*

Four people struck by lightning, flights delayed as intense thunderstorms sweep Sydney, *SBS News*

25 Killed, 8 Injured In Afghanistan Landslide Caused By Snowfall, *NDTV*

WA experiences extreme weather yet again with scorching heat and cyclone predicted, *ABC News*

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