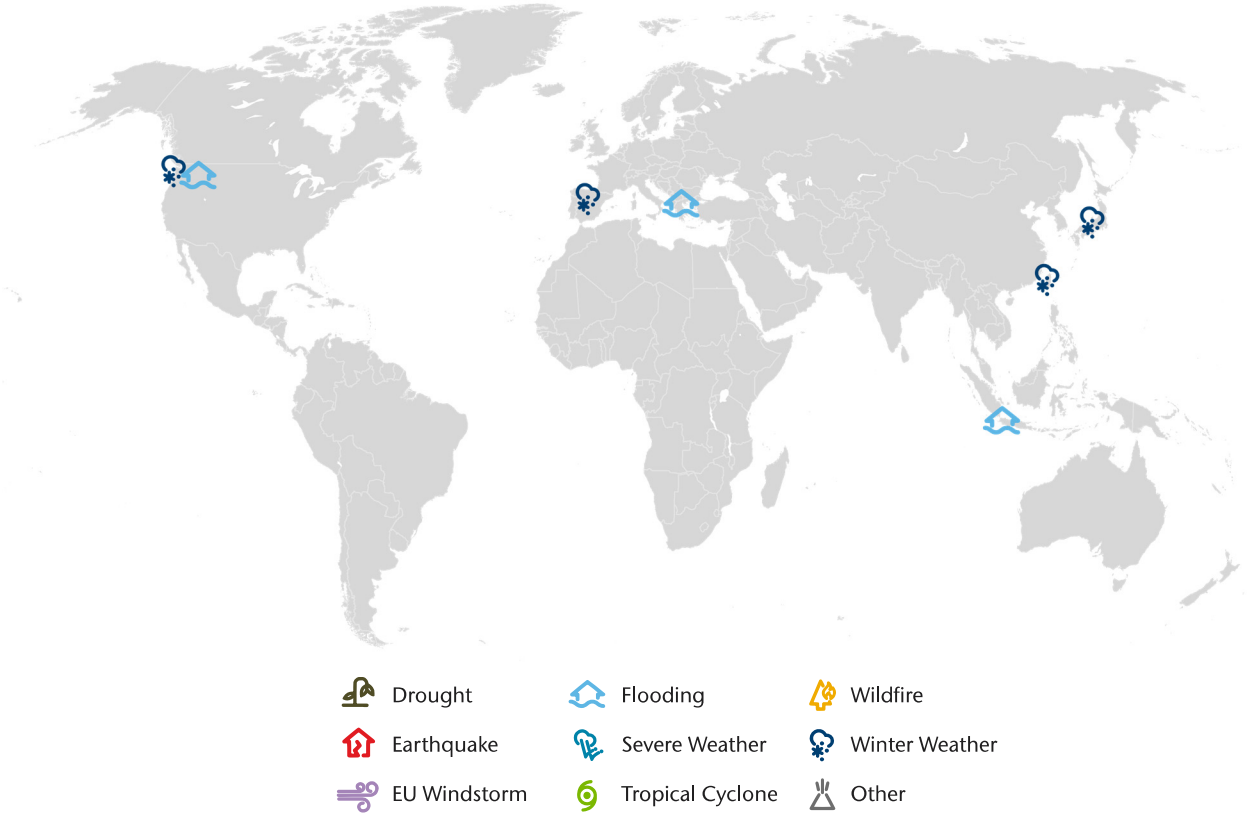
Weekly Cat Report

January 15, 2021

This Week's Natural Disaster Events



Event	Impacted Areas	Fatalities	Damaged Structures and/or Filed Claims	Preliminary Economic Loss (USD)*	Page
Winter Weather	Spain	4+	Thousands	2.0+ billion	3
Winter Weather	Japan	21+	Thousands	100+ million	4
Flooding	United States	1+	Thousands	Millions	5
Flooding	Indonesia	26+	11,000+	Millions	6
Winter Weather	Taiwan	18+	Hundreds	Millions	6
Flooding	Southeastern Europe	0	Hundreds	Millions	6

**Please note that these estimates are preliminary and subject to change. In some instances, initial estimates may be significantly adjusted as losses develop over time. This data is provided as an initial view of the potential financial impact from a recently completed or ongoing event based on early available assessments.*

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

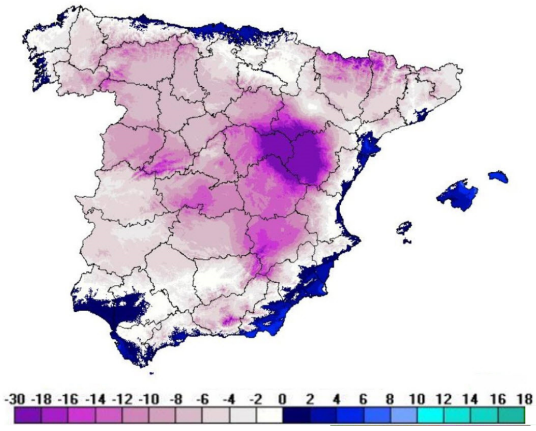
Winter weather outbreaks in Spain & Japan

Exceptional winter weather conditions impacted Spain and Japan during the past week. A low-pressure system "Filomena" traversed Spain and caused severe snowfall, while a subsequent cold spell sent temperatures plummeting. Total costs of the disaster in Madrid, including business interruption and property damage, were initially estimated at nearly EUR1.4 billion (USD1.7 billion). Elsewhere, heavy snowfall and blizzard conditions affected northwestern parts of Japan. At least 21 people were killed and more than 400 others were injured; while agriculture and transportation sectors were heavily impacted. The combined losses were expected to be well into the hundreds of millions (USD).

Spain

The Iberian Peninsula has endured an exceptional winter weather outbreak since January 8, with much of Spain experiencing heavy snowfall and extremely low temperatures. The disturbance started as storm named "Filomena" traversed through the peninsula tracking eastward, bringing abundant moisture from the south and causing locally severe snowfall. After its passage, a strong Atlantic anticyclone took over and provided for an extreme drop in temperatures. According to preliminary data, Spain endured its coldest day since at least 2001 on January 12.

Location	Province	Min temp. (°C)
Bello	Teruel	-25.4
Molina de Aragón	Guadalajara	-25.2
Santa Eulalia d. Campo	Teruel	-23.0
Calamocha	Teruel	-21.3
Teruel	Teruel	-21.0
Daroca	Zaragoza	-18.5
Alhama de Aragón	Zaragoza	-18.0
Sigüenza	Guadalajara	-16.8
Puerto del Pico	Ávila	-16.4
Cuéllar	Segovia	-16.1

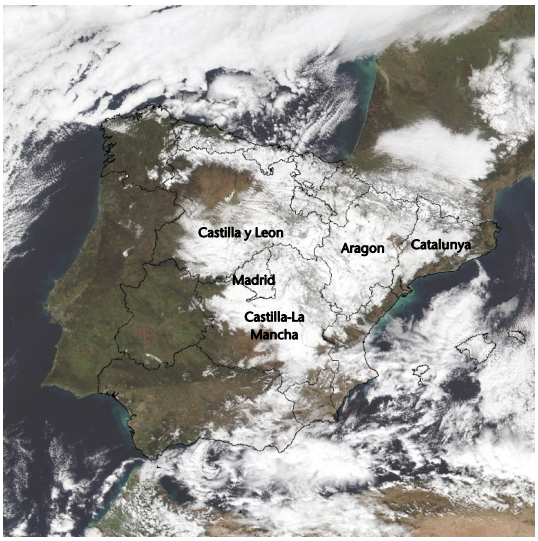


Stations with lowest minimum temperatures on January 12 (left) and map of minimum temperatures (right)
Data: AEMET

Unusually heavy snowfall paralyzed central and northeastern parts of the country including the capital of Madrid, causing significant disruption of traffic and infrastructure. Perhaps the most notable impacts were felt in sectors already adversely affected by the COVID-19-related economic crisis, including the **hospitality industry and retail**. Beside actual direct property damage, significant business interruption costs and loss of sales occurred in otherwise one of the busiest periods for those sectors. Due to the compound nature of the crises, it is difficult to determine economic losses related directly to Filomena, yet initial sectoral estimates tentatively expected the toll in the hundreds of millions EUR. Impact of the disaster in Madrid alone was initially estimated by the local government at EUR1.4 billion (USD1.7 billion).

Significant damage was also expected on **agricultural** production due to low temperatures and snow. Most affected crops were vegetables such as artichoke, broccoli, cauliflower, spinach and lettuce. Further impacts were also expected due to loss of livestock in freezing temperatures. Most notable effects were expected in Castilla-La Mancha, Madrid, Valencian Community, Aragon, Catalonia, Navarra, La Rioja and Murcia.

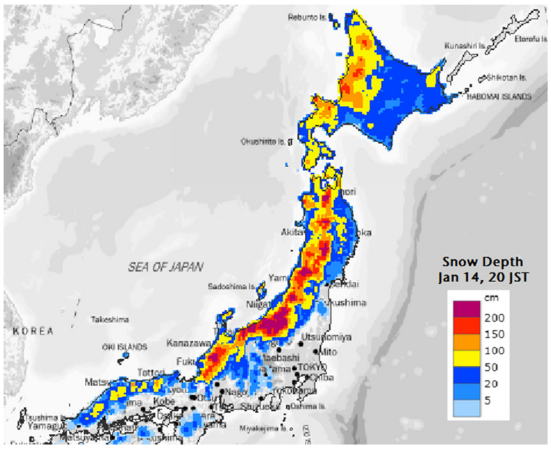
The **insurance sector** generally expected losses to be lower than those caused by the historic DANA (cut-off low) in September 2019. This is mainly due to the 2019 event primarily being a flood event, whereas Filomena's impacts were largely attributed to heavy snowfall – which is not included in the extraordinary weather risks covered by the CCS (Insurance Consortium). Flood damage was expected as thaw occurs in the coming days and weeks.



Snow cover on a satellite image from January 11
Data: NASA

Japan

A severe winter weather outbreak – due to interaction between a low-pressure area in the Sea of Japan and a west-to-east moving cold front – spawned periods of heavy snowfall and blizzard conditions in western and northern prefectures of Japan between January 8 -14. The moisture-laden cold air from the Sea of Japan traversed through mainland Japan, resulting in enormous snow totals ranging from 100 to 200 centimeters (3.3 to 6.6 feet). These snowstorms were particularly impactful in western Japan – prefectures located along the coast of Sea of Japan – with some locations registering highest snowfall since the Japan Meteorological Agency (JMA) started keeping records in 1961. For example, for one 72-hour stretch ending on January 14, snow accumulations in the Gunma's Minakami town exceeded 2.2 meters (7.1 feet) while Yuzawa town of Niigata prefecture registered 1.8 meters (6 feet) of snow. In the coming few days, the JMA has issued advisories for snow and gale for almost all the prefectures located in northern parts of Japan.



Snow accumulation in Japan as of Jan 14
Data: Japan Meteorological Agency

Some of the worst affected prefectures included Hokkaido, Iwate, Niigata, Yamagata, and Fukui. These prefectures registered deaths as well as transport disruptions due to visibilities dropping to almost zero. Thousands of vehicles were stranded on various sections of the Hokuriku Expressway for multiple days. Japan's Self Defense Forces were deployed for the rescue operations. Bullet train and metro services were either cancelled or operated at reduced speeds. Snapped power lines and poles led to more than 44,000 customer outages. Several communities located along the mountainous regions were cut off, with thousands of households inaccessible due to blocked roads because of fallen trees and utility poles. Japan's Fire and Disaster Management Agency (FDMA) noted 21 fatalities and at least 360 others injured. Thousands of structures were damaged to varying degrees. In addition, notable losses were inflicted in the agriculture sector and on the public infrastructure.

“Atmospheric river” & high winds impact U.S. and Canada

An exceptional atmospheric river event and potent low-pressure system impacted the Pacific Northwest, Intermountain West and Northern Plains, and Western Canada between January 11-14. Heavy precipitation coupled with a high-end wind event resulted in widespread power outages, localized flash flooding, landslides, downed trees, and property damage. Total economic and insured losses were anticipated to reach well into the millions (USD).

Meteorological Recap

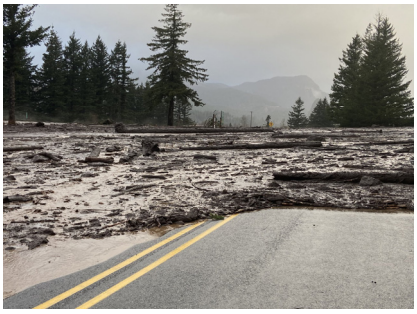
An anomalous atmospheric river event generated heavy precipitation across regions of the Pacific Northwest between January 11-13. The atmospheric river, a conveyor belt of exceptional moisture extending from the western Pacific tropics toward the Northwestern United States, prolonged a historic stretch of wet weather across the region. By January 13, 48-hour precipitation totals in eastern Washington and Oregon approached and exceeded 4 to 6 inches (100 to 150 millimeters), with accumulating snowfall at higher elevations. A weather station in the Washington Willapa Hills region reported a 48-hour precipitation total of 9.63 inches (245 millimeters).

This event was accompanied by a powerful jet stream, intensifying wave of low-pressure, and well-defined cold frontal boundary which produced very strong winds spanning from the Pacific Northwest into the High Plains and Canadian Prairies. Numerous wind gusts topping 80 mph (130 kph) were measured as the low tracked across southern Canada between January 13-14. Preliminary maximum wind gust reports from the National Weather Service (NWS) are displayed in the table. Several gusts were enhanced by mountainous terrain. Winter storm and blizzard warnings were in effect as the low continued to consolidate across portions of the Midwest through January15.

Location	Gust (mph)
Mount Sentinel, Montana	125
Wasatch Peaks, Utah	109
Natural Fort, Wyoming	105
Mount Aeneas, Montana	101
Atlantic City, Wyoming	101
Hornet Mountain, Montana	96
Judith Peak, Montana	95
Arlington, Wyoming	94
Williston, North Dakota	94
Buffalo, South Dakota	93

Event Details

In **Canada**, no less than 212,000 customers across southern **British Columbia** were left without power. Property damage was observed in the Okanagan and Kootenay regions, while damage to structures and vehicles were reported in Metro Vancouver. Further east, impacts to multiple outbuildings and grain bins were reported across southern **Alberta**. Motorists in **Saskatchewan** were stranded due to whiteout conditions from blowing snow. Roof damage was reported at the Flight Museum in Saskatoon.



Mudslide in Multnomah County, Oregon
Source: Multnomah Sheriff's Office

In the **United States**, no less than 700,000 customers lost power by the afternoon of January 13, of which at least 550,000 were in Washington. Across the **Pacific Northwest**, high winds coupled with saturated soils resulted in numerous reports of downed power lines and trees. Moderate river flooding and mudslides/landslides blocked multiple roadways and interstates. As of this writing, one fatality was confirmed in Washington due to a fallen tree, while one person remained missing after a significant landslide in Oregon (Multnomah County). In **Montana**, windblown dust severely reduced visibilities on highways, multiple trucks were toppled along portions of I-15 near Shelby, and widespread tree and roofing damage was indicated.

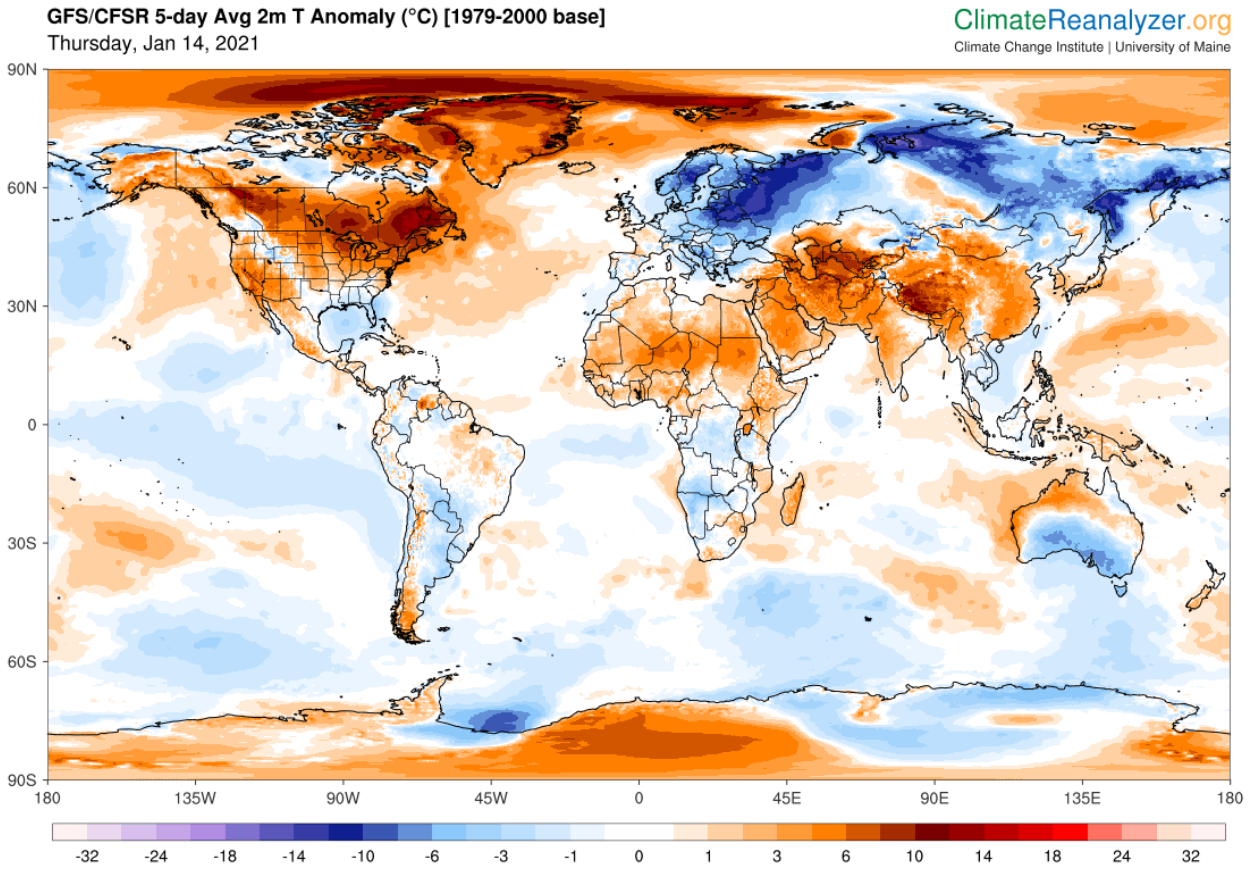
Natural Catastrophes: In Brief

Flooding (Indonesia)
Unabated seasonal rains triggered flash flooding and prompted landslides in Indonesia's Bandung and Sumedang Regencies in West Java Province from January 9–11. According to the Indonesian National Board for Disaster Management (BNPB), at least 26 people were dead or missing while 18 others were injured following multiple landslides that struck Cimanggung District located in Sumadang Regency during the morning hours of January 9. Heavy precipitation caused the Citarum River to break its banks at several locations, causing notable inundation damage to approximately 11,000 residential buildings, roads, and local businesses. Notable losses were inflicted in the agriculture sector and on public infrastructure.

Winter Weather (Taiwan)
Extremely low temperatures and snowfall affected western and northern parts of Taiwan from January 8-12; the national capital Taipei was noted as the worst hit. Local media cited at least eighteen casualties. Property losses were anticipated to be minimal; however, notable impacts to the transportation and agriculture sectors were expected.

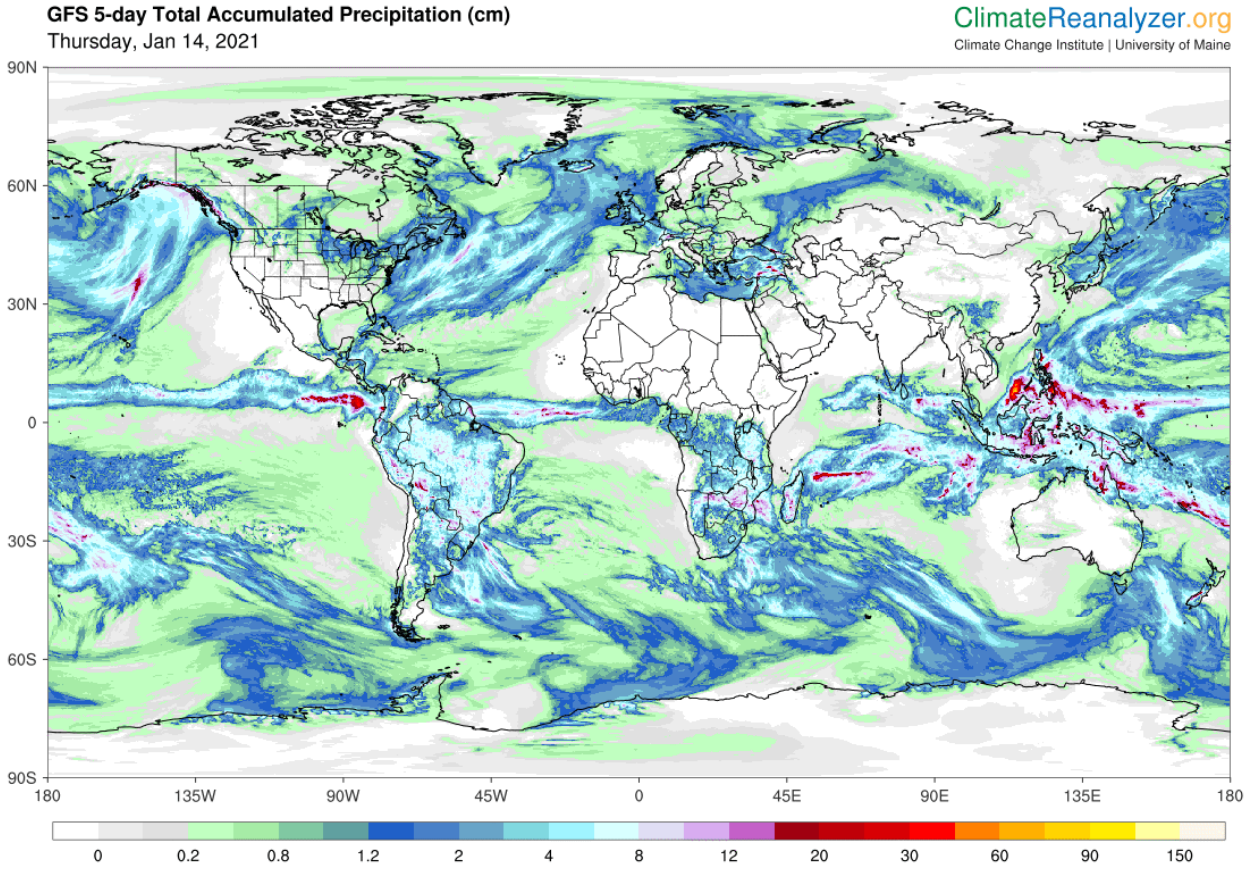
Flooding (Southeastern Europe)
Heavy rain and snowfall over the recent days has resulted in notable regional flooding in several countries of Southeastern Europe since January 6. Among the most affected were parts of Albania, Serbia, Bulgaria and Greece. Local reports included dozens of evacuations, large power outages, and damage on infrastructure. Economic losses were not yet determined.

Global Temperature Anomaly Forecast



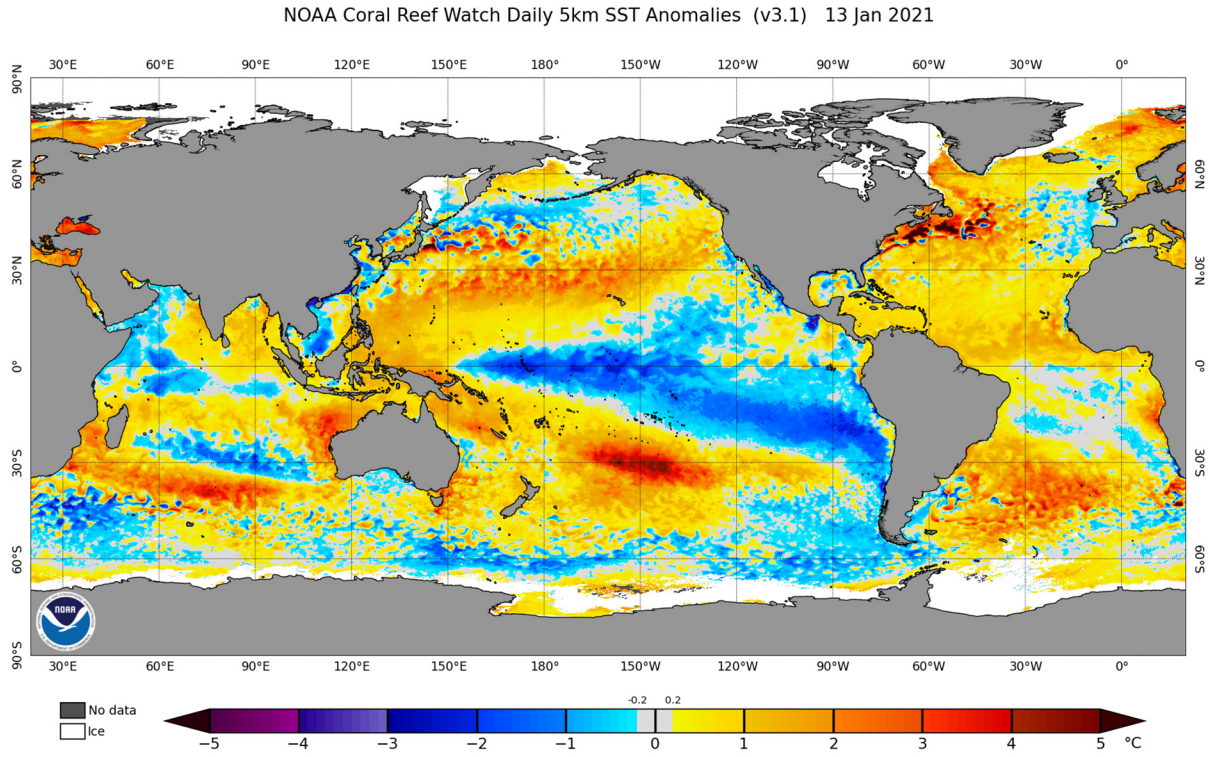
Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

Global Precipitation Forecast



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

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



The SST anomalies are produced by subtracting the long-term mean SST (for that location in that time of year) from the current value. This product with a spatial resolution of 0.5 degree (50 kilometers) is based on NOAA/NESDIS operational daily global 5 kilometer Geo-polar Blended Night-only SST Analysis. The analysis uses satellite data produced by AVHRR radiometer.

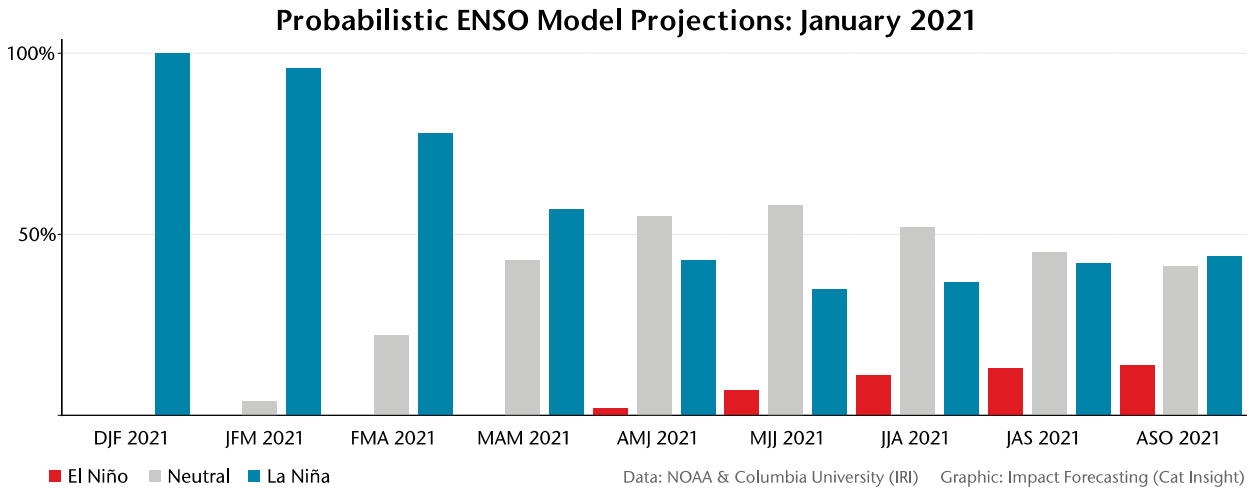
Select Current Global SSTs and Anomalies

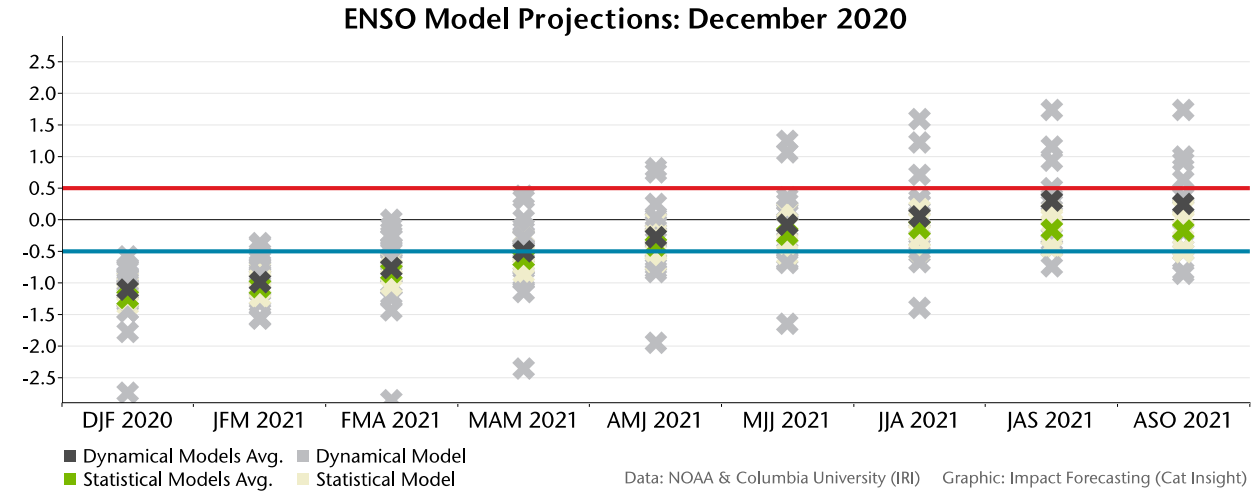
Location of Buoy	Temp (°C)	Departure from Last Year (°C)
Eastern Pacific Ocean (1,020 miles SW of San Salvador, El Salvador)	23.0	-0.6
Niño3.4 region (2°N latitude, 155°W longitude)	24.4	-1.8
Western Pacific Ocean (700 miles NNW of Honiara, Solomon Islands)	28.8	-0.8

Sources: ESRL, NOAA, NEIS, National Data Buoy Center

El Niño-Southern Oscillation (ENSO)

La Niña conditions are currently present, though NOAA has officially issued a **La Niña Advisory**. NOAA notes a 95 percent chance that La Niña conditions will persist through boreal (Northern Hemisphere) winter of 2020 / 2021, and a 55 percent chance that these conditions will linger into the spring months.





El Niño *refers to the above-average sea-surface temperatures (+0.5°C) that periodically develop across the east-central equatorial Pacific. It represents the warm phase of the ENSO cycle.*

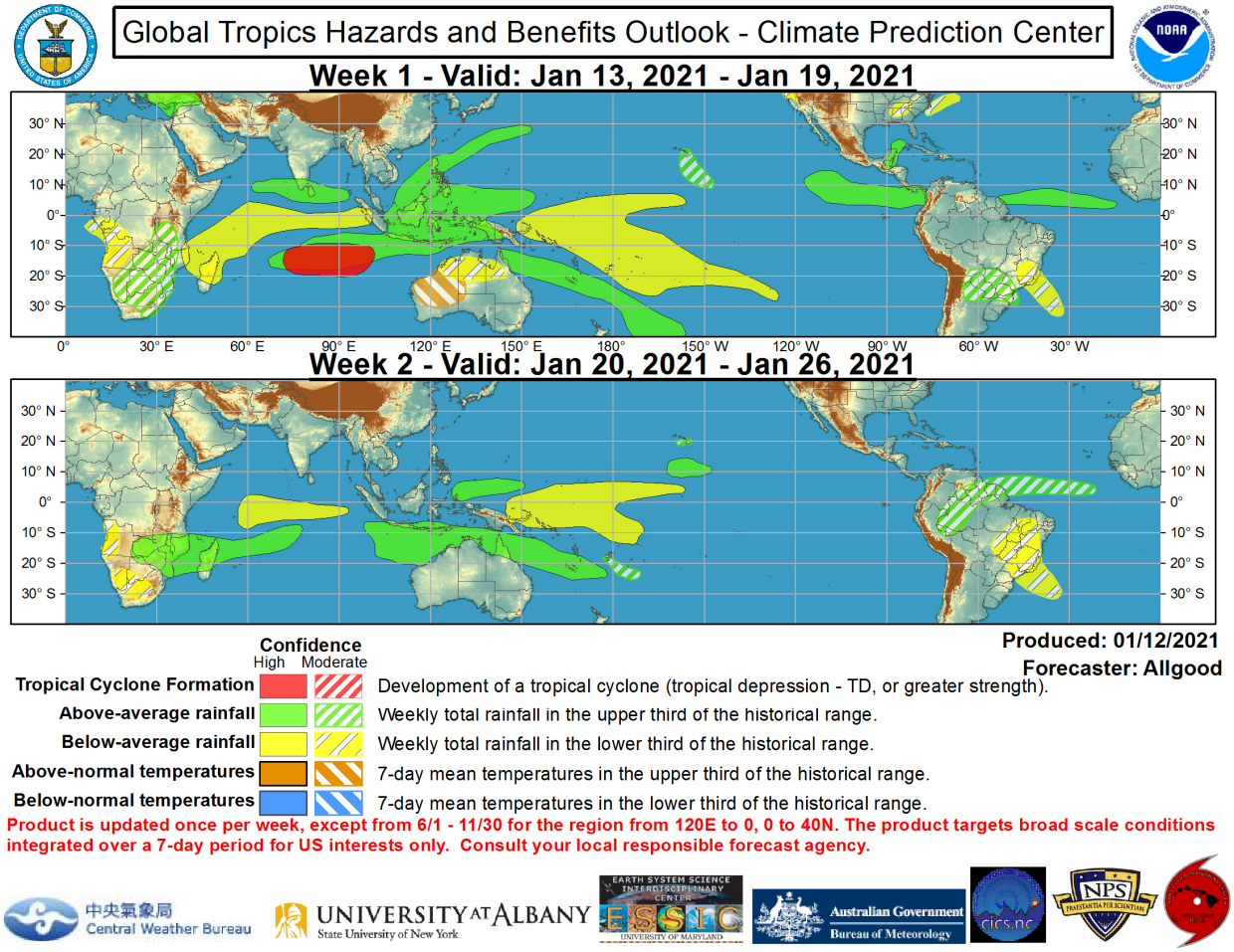
La Niña *refers to the periodic cooling of sea-surface temperatures (-0.5°C) across the east-central equatorial Pacific. It represents the cold phase of the ENSO cycle.*

El Niño and La Niña episodes typically last nine to 12 months, but some prolonged events may last for years. While their frequency can be quite irregular, El Niño and La Niña events occur on average every two to seven years. Typically, El Niño occurs more frequently than La Niña.

ENSO-neutral *refers to those periods when neither El Niño nor La Niña conditions are present. These periods often coincide with the transition between El Niño and La Niña events. During ENSO-neutral periods the ocean temperatures, tropical rainfall patterns, and atmospheric winds over the equatorial Pacific Ocean are near the long-term average.*

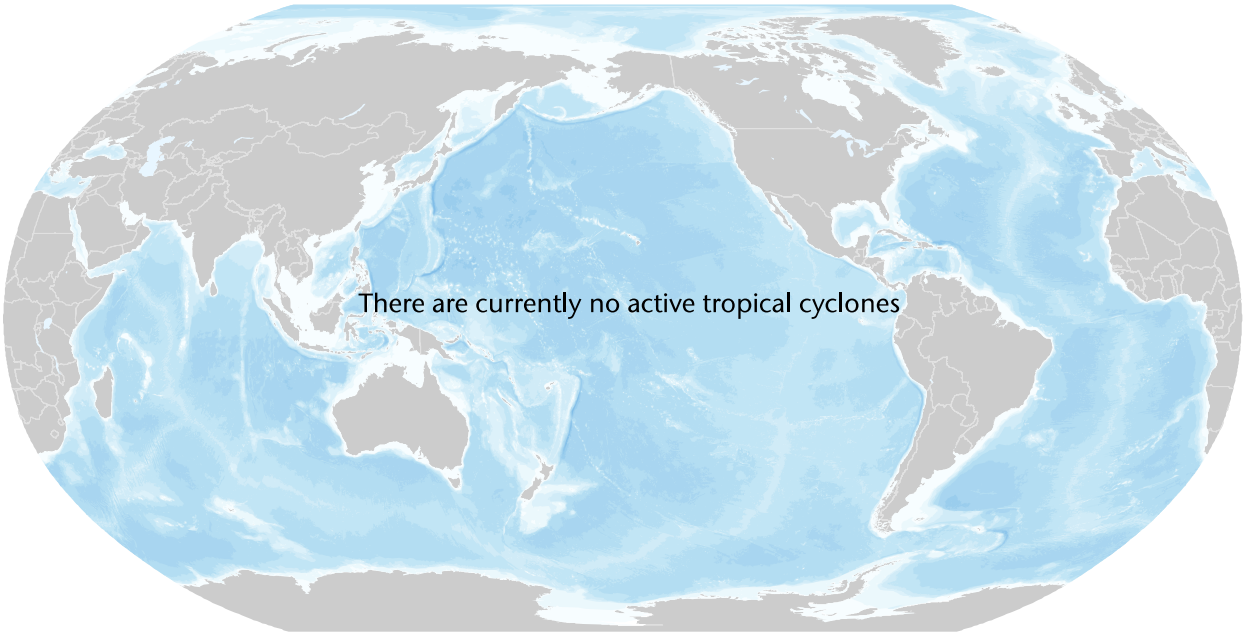
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

Global Tropics Outlook



Source: Climate Prediction Center

Current Tropical Systems



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

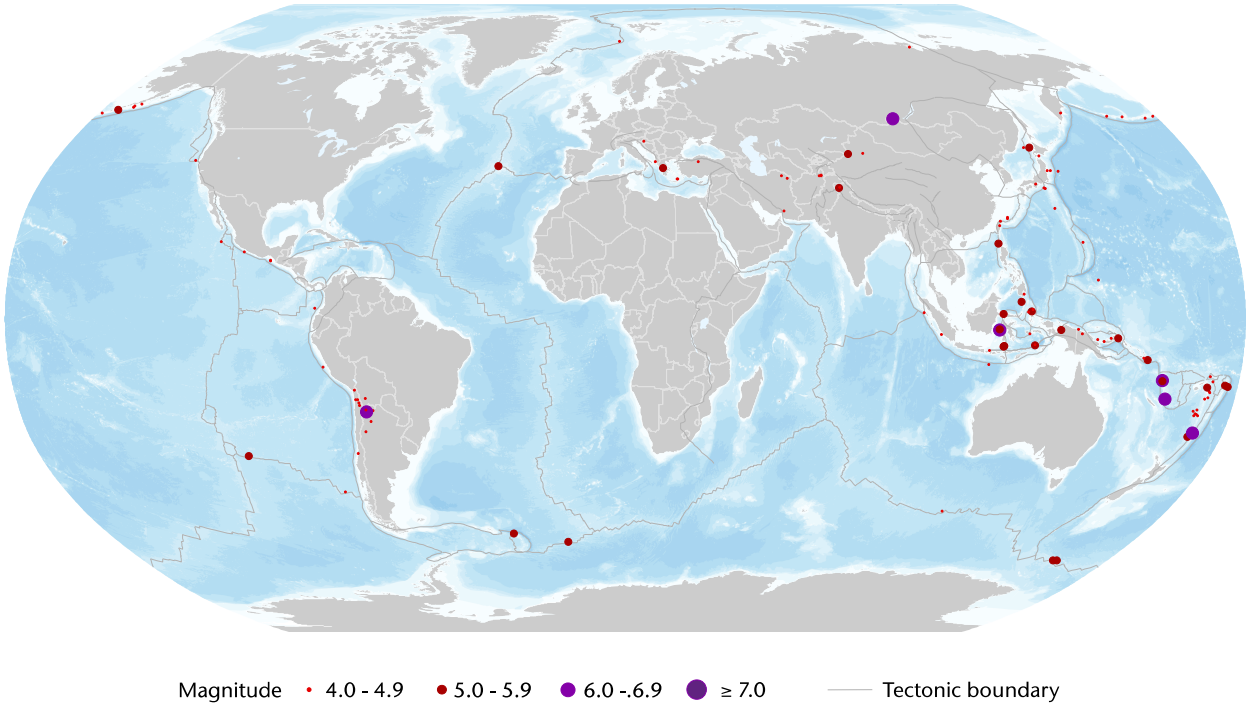
Location and Intensity Information

Name*	Location	Winds	Storm Reference from Land	Motion**

* TD = Tropical Depression, TS = Tropical Storm, HU = Hurricane, TY = Typhoon, STY = Super Typhoon, CY = Cyclone
** N = North, S = South, E = East, W = West, NW = Northwest, NE = Northeast, SE = Southeast, SW = Southwest

Sources: National Hurricane Center, Joint Typhoon Warning Center, Central Pacific Hurricane Center

Global Earthquake Activity (≥M4.0): January 8 – 14

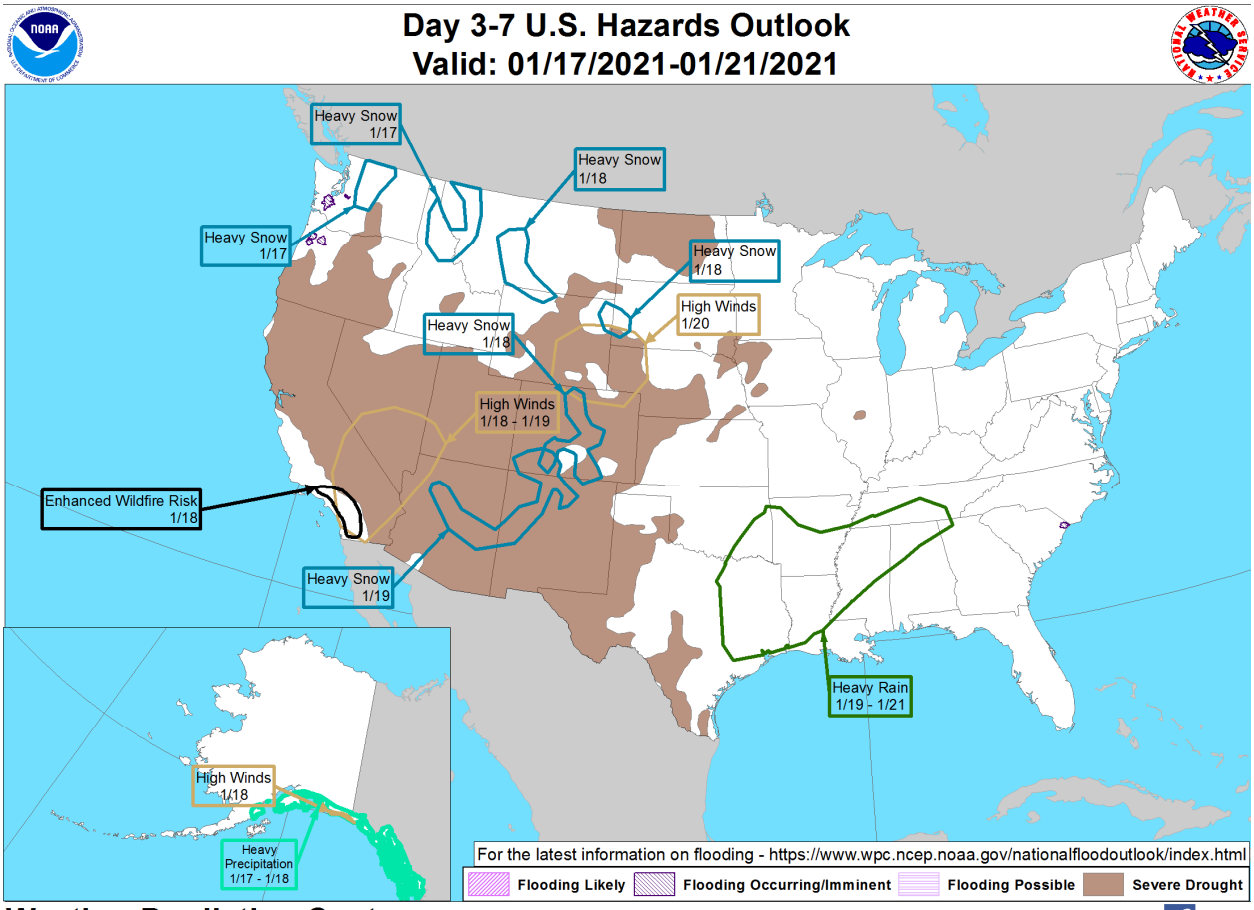


Significant EQ Location and Magnitude (≥M6.0) Information

Date (UTC)	Location	Magnitude	Depth	Epicenter
01/08/2021	29.48°S, 178.70°W	6.3	224 km	Kermadec Islands, New Zealand
01/08/2021	20.73°S, 169.88°E	6.1	118 km	14 kilometers (9 miles) SSE of Isangel, Vanuatu
01/10/2021	24.04°S, 66.63°W	6.1	217 km	37 kilometers (23 miles) WNW of San Antonio de los Cobres, Argentina
01/10/2021	16.04°S, 167.85°E	6.1	160 km	47 kilometers (29 miles) E of Lakatoro, Vanuatu
01/11/2021	51.24°N, 100.44°E	6.7	10 km	33 kilometers (21 miles) SSW of Turt, Mongolia
01/14/2021	3.00°S, 118.92°E	6.2	18 km	36 kilometers (22 miles) S of Mamuju, Indonesia

Source: United States Geological Survey

U.S. Weather Threat Outlook

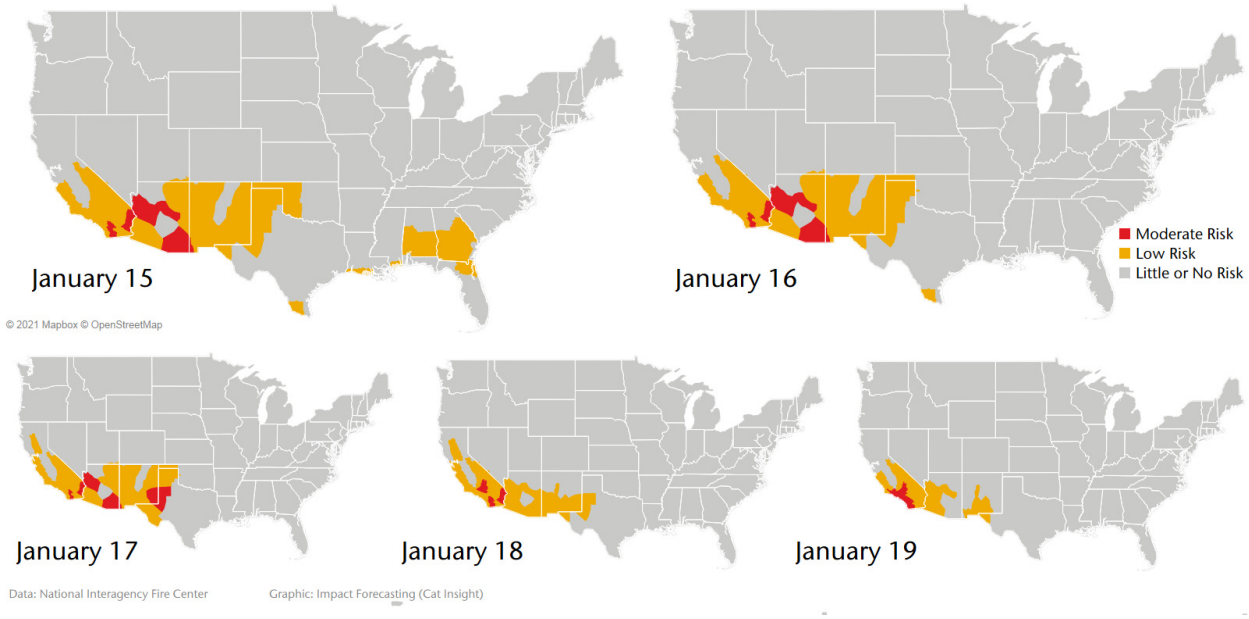


Potential Threats

- A frontal system will aid in generating heavy snowfall across the Northern Cascades and Northern Rockies on January 17.
- As the system advances southward, heavy snowfall is anticipated to develop in the Central and Southern Rockies between January 18-19.
- A strong pressure gradient spanning the Great Basin and Southern California will produce high winds and enhanced fire weather conditions on January 18-19.
- Heavy rain is expected throughout the Southern Plains and Lower Mississippi Valley between January 19-21 as a plume of Gulf moisture is advected toward the region.

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

The National Interagency Fire Center has highlighted a limited volume of potential fire risk across much of the country during the next week. The arrival of more seasonal precipitation and temperatures should minimize any significant fire chance for the rest of the winter months, though continued drought conditions in the Desert Southwest will keep a lingering threat.



Annual YTD Wildfire Comparison: January 8

Year	Number of Fires	Acres Burned	Acres Burned Per Fire
2017	100	2,946	29.46
2018	456	4,795	10.52
2019	75	128	1.71
2020	209	2,591	12.40
2021	176	841	4.78
10-Year Average (2011-2020)	167	5,838	34.96

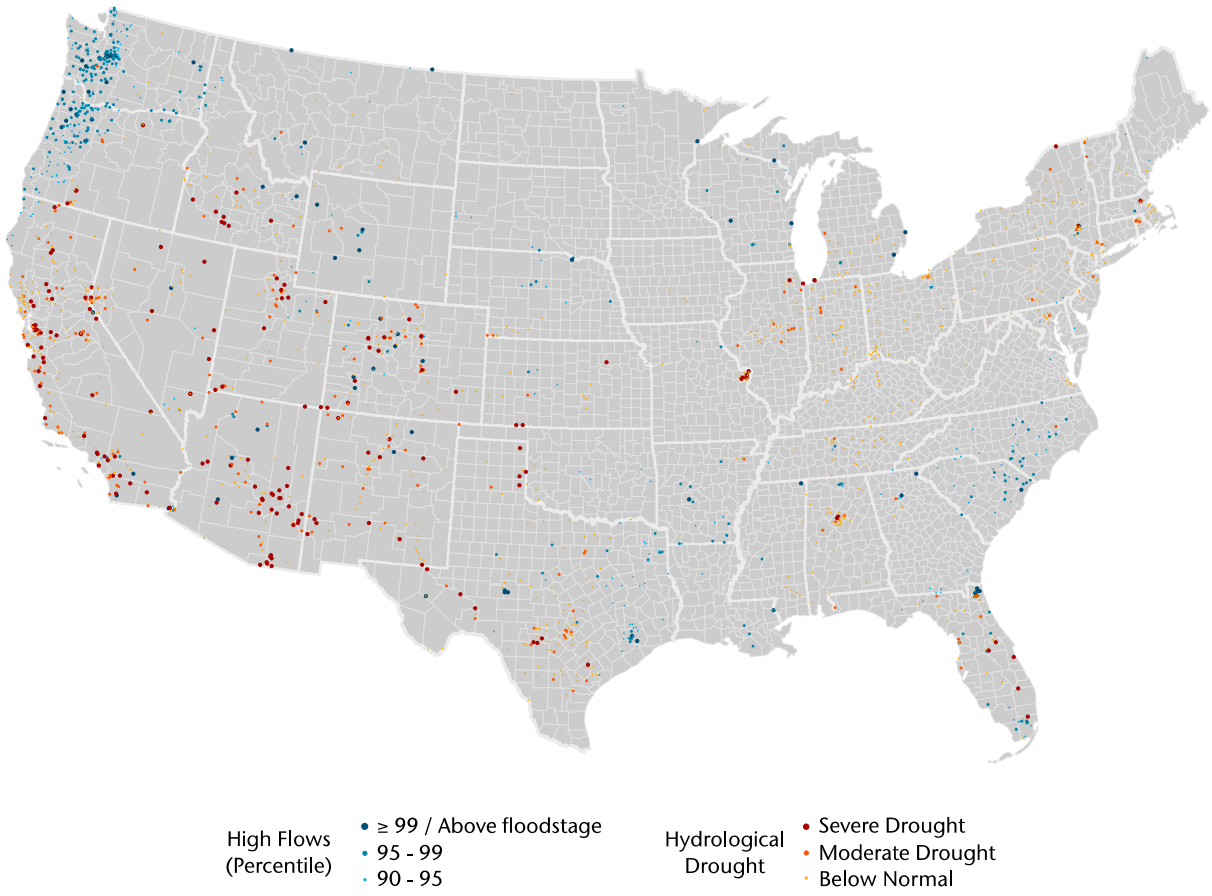
Source: National Interagency Fire Center

Top 5 Most Acres Burned by State: January 14

State	Number of Fires	Acres Burned	Acres Burned Per Fire
Florida	63	806	12.79
Texas	40	160	4.00
Montana	4	158	39.50
Mississippi	12	142	11.86
Arizona	19	82	4.32

Source: National Interagency Fire Center

Current U.S. Streamflow Status



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 steam 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.

Top 5 Rivers Currently Nearing or Exceeding Flood Stage

Location	Current Stage (ft)	Flood Percentile
Red Lake River at Crookston, Minnesota	7.39	99.16
Weber River near Oakley, Utah	6.00	99.15
Yampa River at Steamboat Springs, Colorado	1.80	99.1
Oconto River near Gillett, Wisconsin	3.52	99.09
Taylor River at Almont, Colorado	2.14	99.09

Source: United States Geological Survey

Source Information

Winter weather outbreaks in Spain & Japan

Sales of shops and bars in Madrid fall another 24% due to Filomena after a Christmas marked by Covid. El Espanol
Filomena, the last straw for the Spanish economy? ABC
The mayor of Madrid estimates the impact of the storm on the capital at at least 1,398 million euros. El Pais
13 dead, hundreds injured as record snowfall blankets Japan, Xinhua
Japan: 1,000 vehicles trapped overnight by record snowfall, DW
Spanish Insurance Consortium
Agroseguro
Japan Meteorological Agency
Fire and Disaster Management Agency, Japan

Atmospheric river, high winds impacts U.S. and Canada

U.S. National Weather Service
Catastrophe Indices and Quantification Inc. (CatIQ)
Poweroutage.US
Damaging windstorm buffets much of central, western U.S. with gusts to 80 mph, The Washington Post
One Person Dead, One Missing After Wind And Rain Pummel Pacific Northwest, The Weather Channel

Natural Catastrophes: In Brief

Indonesian National Board for Disaster Management (BNPB)
Emergency Response Coordination Centre (ERCC)
Sebanyak 26 Warga Masih Dinyatakan Hilang Pascalongsor Cihanjuang, BNPB

Contact Information

Steve Bowen
Director & Meteorologist
Head of Catastrophe Insight
Impact Forecasting
Aon
steven.bowen@aon.com

Brian Kerschner
Senior Catastrophe Analyst
Impact Forecasting
Aon
brian.kerschner@aon.com

Michal Lörinc
Senior Catastrophe Analyst
Impact Forecasting
Aon
michal.lorinc@aon.com

Gaurav Srivastava
Catastrophe Analyst
Impact Forecasting
Aon
gaurav.srivastava6@aon.com

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