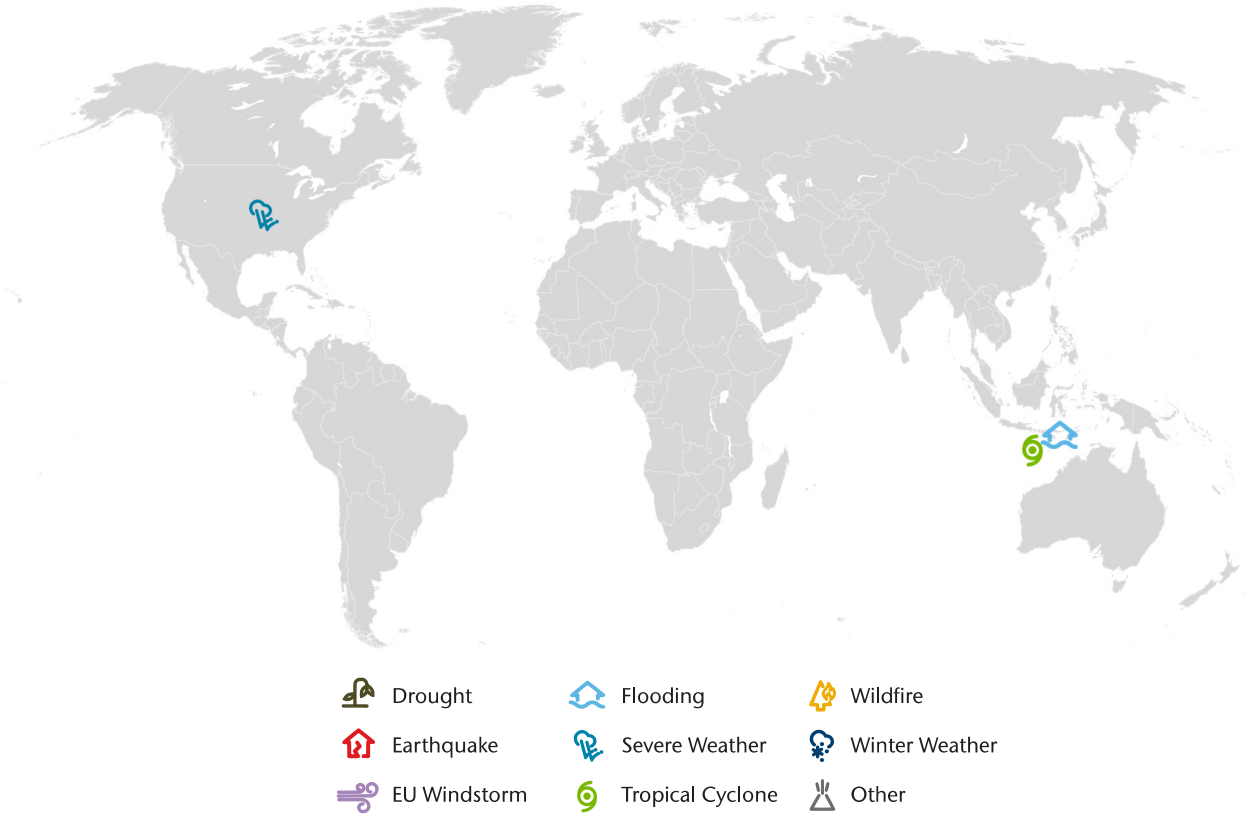
Weekly Cat Report

April 9, 2021

This Week's Natural Disaster Events



Event	Impacted Areas	Fatalities	Damaged Structures and/or Filed Claims	Preliminary Economic Loss (USD)*	Page
Cyclone Seroja	Indonesia, East Timor	207+	15,000+	Millions	3
Severe Weather	United States	0	Thousands	Millions	6

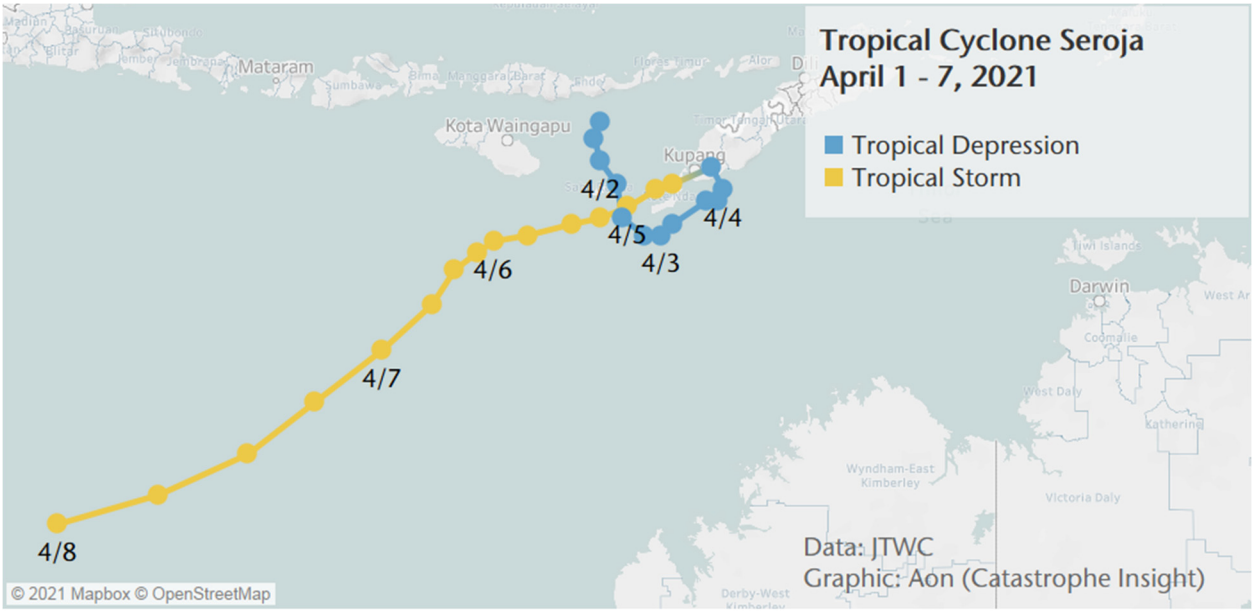
**Please note that these estimates are preliminary and subject to change. In some instances, initial estimates may be significantly adjusted as losses develop over time. This data is provided as an initial view of the potential financial impact from a recently completed or ongoing event based on early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

Cyclone Seroja prompts excessive flooding; 200+ dead

Cyclone Seroja developed and meandered near eastern Indonesia and East Timor from April 3-5, prompting significant rainfall and subsequent flooding. As of this writing, at least 207 fatalities were confirmed in Indonesia (165) and East Timor (42). Dozens of people remain listed as missing. The cyclone's most significant impacts were felt in the Indonesian provinces of East Nusa Tenggara and West Nusa Tenggara, and adjoining parts of East Timor (also known as Timor-Leste). More than 15,000 homes and other structures were inundated by floodwaters and landslides. Gusty winds led to further damage. Total economic damage was estimated in the millions (USD), though most of the damage was expected to be uninsured.

Meteorological Recap



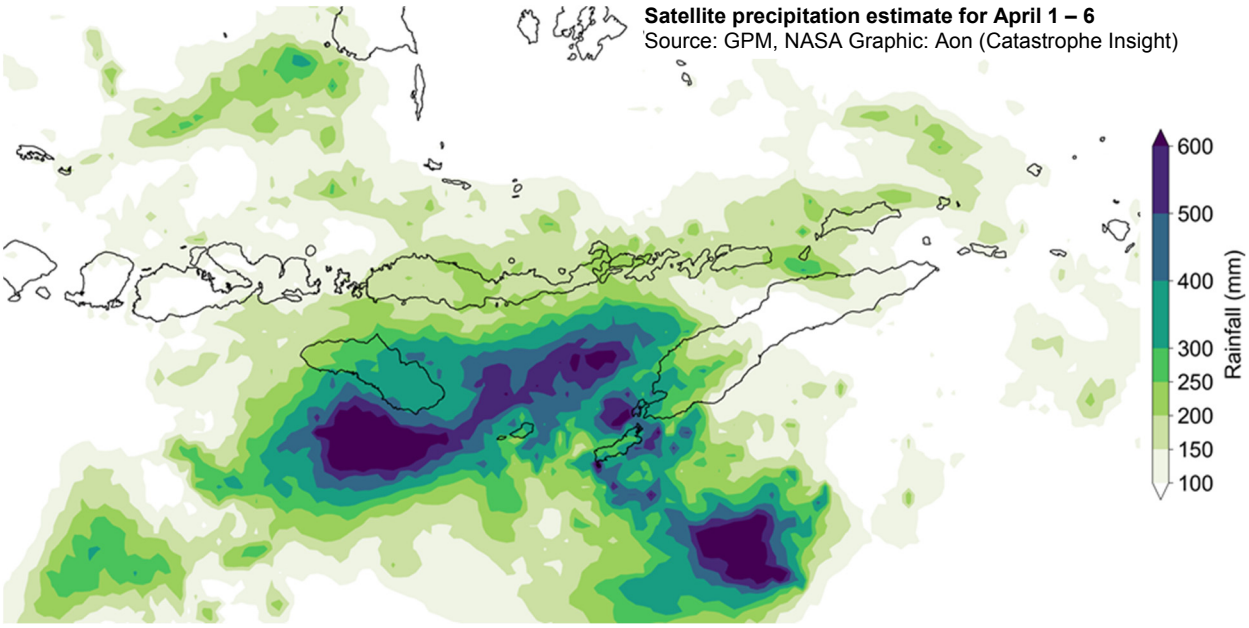
Interaction between an **east–west oriented monsoon trough** to the north of Australian Mainland and an eastward moving **Madden Julian Oscillation (MJO)** near the Maritime Continent spawned a low-pressure area in the Savu Sea early on April 1. Since the system originated in Indonesia's Area of Responsibility (AOR), the Tropical Cyclone Warning Centre (TCWC) of Indonesia's Agency for Meteorology Climatology and Geophysics (BMKG) began monitoring it and started issuing severe weather advisories for southeastern parts of Indonesia. Throughout the next two days, the system became better organized, prompting the Jakarta's TCWC to upgrade it into a **Tropical Low**.

Later, the system was surrounded by a favorable atmospheric and oceanic environment – warm sea surface temperature, abundant moisture, low zonal wind shear, and good equatorward outflow – allowing the central convection pattern to become better organized and the thunderstorm activity in its vicinity to increase. On April 3, environmental conditions aided in further development as the system slowly traversed towards the coast of Timor Island. From April 3-4, the system brought copious rainfall as it turned in an anti-clockwise loop near southeastern portions of Timor Island. Meanwhile, the Joint Typhoon Warning Center (JTWC) issued the first tropical cyclone formation alert on the system on April 4 at 15:00 UTC, assigning it a numerical identifier "26S".

Apart from an overall ragged appearance on satellite imagery, Jakarta's TCWC upgraded it into a **Category 1 Tropical Cyclone** and assigned it an international name "Seroja" on April 4 at 20:00 UTC. At this time, the system was located approximately 95 kilometers (60 miles) north of Rote Island of Indonesian Archipelago. Later, on April 5, Seroja slowly tracked in a west-southwest direction and intensified into a **Category 2 Tropical Cyclone** during the afternoon hours, per the TCWC Jakarta.

Seroja had already entered Australia's area of responsibility and became the 7th Tropical Cyclone of the 2020-2021 Australian Region Cyclone Season. According to the JTWC, Seroja had undergone a moderate intensification cycle from April 6-8 and attained an initial peak intensity of 100 kph (65 mph) 1-minute average sustained winds and a minimum central pressure of 988 millibars on April 8 at 12:00 UTC.

As of this writing, the system was located north-northwest of Learmonth in Australia and tracking southwest. The system is forecast to make landfall in Australia late on April 11; however, a significant amount of uncertainty in Seroja's forecasted track and intensity remained due to possible interactions with another tropical system "27S" in the coming days.



Satellite precipitation estimate for April 1 – 6
Source: GPM, NASA Graphic: Aon (Catastrophe Insight)

Event Details

Tropical Cyclone Seroja brought prolific rainfall, damaging winds, and destructive storm surges in **Indonesia**, with the greatest impacts occurring across the Lembata, Malacca, East Flores, Ngada, West Sumba, East Sumba, Rote Ndao, and Alor administrative regions of **East Nusa Tenggara** province. Additional damage and casualties were reported from **West Nusa Tenggara** province**.** More than 300 millimeters (12 inches) of total rainfall was registered in the East Nusa Tenggara province, with locally higher amounts. According to the BMKG, some isolated locations of East Nusa Tenggara province registered more than 500 millimeters (20 inches) of accumulated precipitation for one 48-hour stretch ending on April 4.

Widespread transportation impacts and power outages occurred as flash flooding severed hundreds of roadways, bridges, and utility poles across the impacted localities. Dozens of communities in the mountainous regions of East Nusa Tenggara were rendered inaccessible, as flooding and landslides severely damaged the road infrastructure. The BNPB deployed several helicopters for handling of flash floods and landslides. Search, rescue, and restoration works remained ongoing, although these operations were severely hampered by the compounded impacts from the stormy weather, blocked roads due to flooding, and the ongoing emergency due to the COVID-19 pandemic.

Flash flooding in East Nusa Tenggara
Source: BNPB, Indonesia

According to the Indonesia's National Board for Disaster Management (BNPB), heavy flash flooding and landslides unleashed by the torrential rains killed more than 163 residents in East Nusa Tenggara and another two in West Nusa Tenggara. In addition, 45 people remained missing as of this writing. As many as 15,000 homes and other structures were damaged. An extensive area of agricultural land was left inundated in the wake of Tropical Cyclone Seroja. The number of casualties and damaged structures was expected to increase as the complete damage assessment takes place in the coming days to weeks.

Torrential rains associated with the Cyclone triggered flash floods and landslides in **Timor-Leste** between April 3-5, with the worst impacts seen in the national capital region of **Dili**. The event was noted as one of the worst flooding events in the recent decades, per government officials. According to preliminary figures from the UN Resident Coordinator's Office (RCO) in Timor-Leste, approximately 10,500 residents belonging to 8 municipalities were affected; most of them were from the Dili Municipality. Power and communication in large areas were knocked out, mainly due to fallen trees and utility poles. No fewer than 42 people were killed in the incidents directly related to Seroja, per government officials. Thousands of homes, roads, businesses, and other public infrastructure were damaged to varying degrees and a vast area of cropland was left inundated. The situation of damage and associated economic losses was not known as the assessments remained ongoing at the time of this writing.

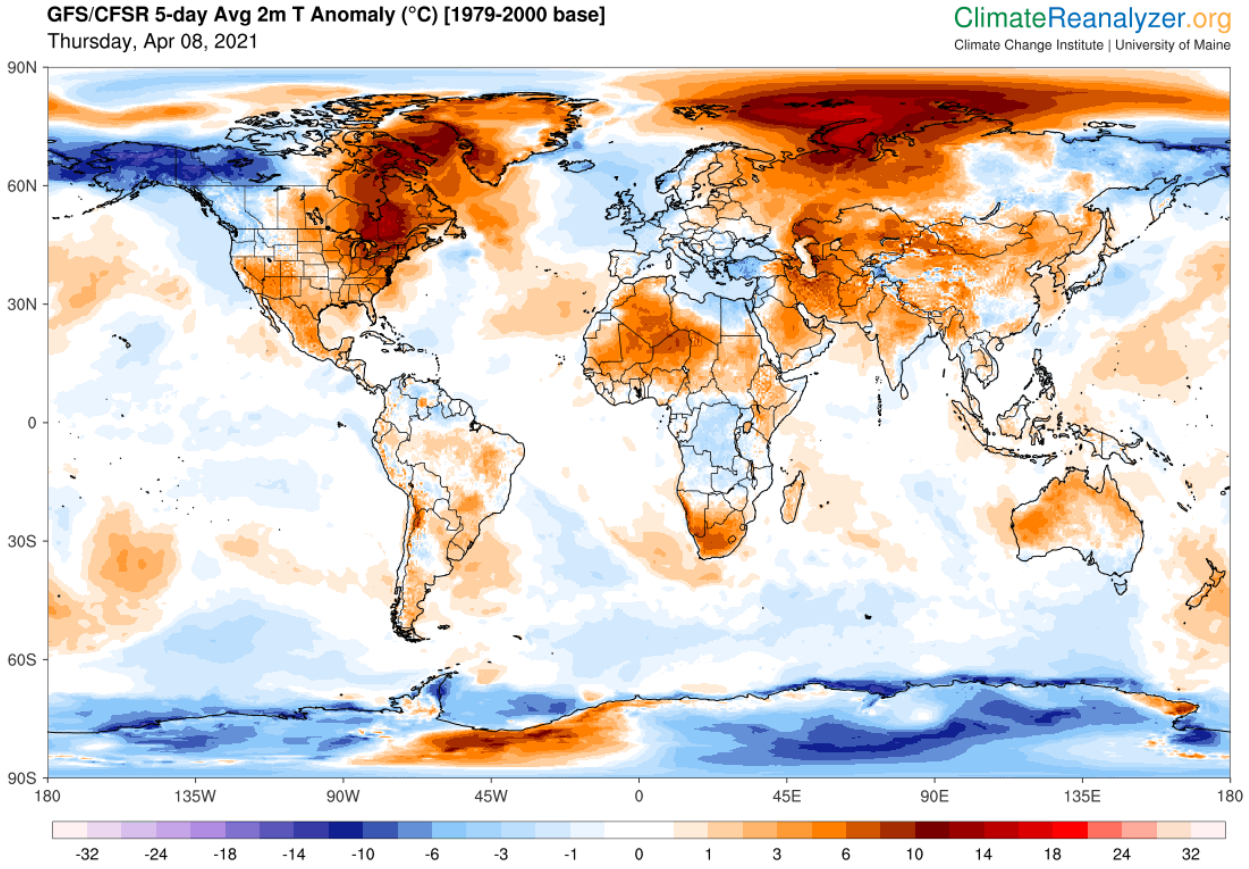
Financial Loss

It was too early to provide a definite economic loss estimate as damage assessments were in their initial stages. However, given the damage footprint in Indonesia, particularly in the East Nusa Tenggara Province, the total economic loss in Indonesia alone was anticipated to be in the millions (USD). In addition, damage costs in Timor-Leste were likely to add additional loss costs to the overall storm total. Given the continued low insurance penetration in these countries, most of these incurred losses were likely to be uninsured.

Natural Catastrophes: In Brief

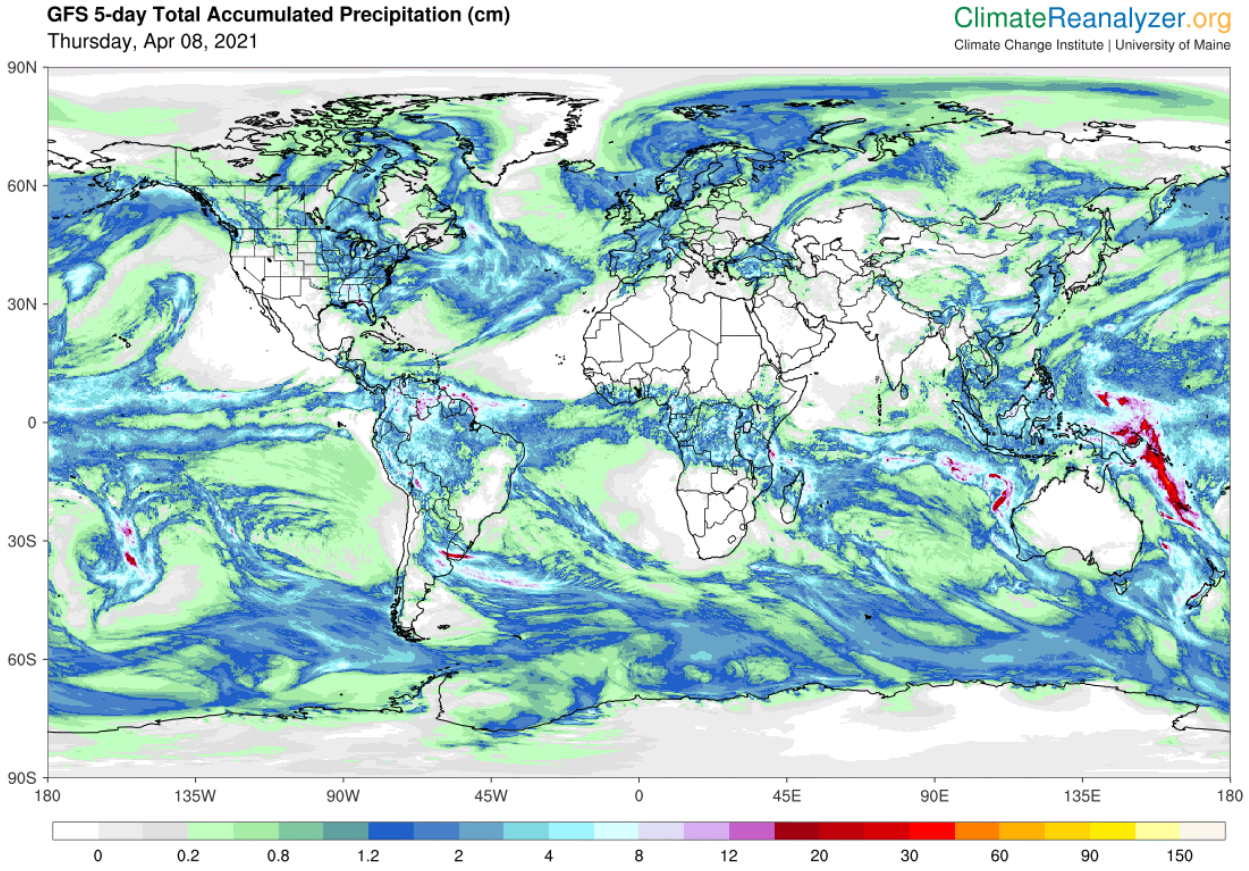
Severe Weather (United States)
Severe storms associated with a deepening low-pressure system and cold front affected portions of the Central Plains and Middle and Lower Mississippi Valley between April 6-8. The predominant perils were large hail and strong straight-line winds with gusts topping 60 mph (96 kph). In Kansas, hailstones approaching and exceeding 2.0 inches (5.1 centimeters) were reported in Ellis and Pawnee Counties on April 6. A linear corridor of heavy rainfall and thunderstorms propagated eastward across the Middle and Lower Mississippi Valley by April 7-8. In Iowa, a brief EF0 tornado affected several structures near Cedar Rapids (Linn County). In Louisiana, a tornado near Bastrop (Morehouse Parish) damaged multiple homes while trapping residents inside. Shortly after, additional residences were impacted, and trees downed near Kilbourne (West Carroll Parish). Total economic and insured losses were expected to reach into the low millions (USD).

Global Temperature Anomaly Forecast



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

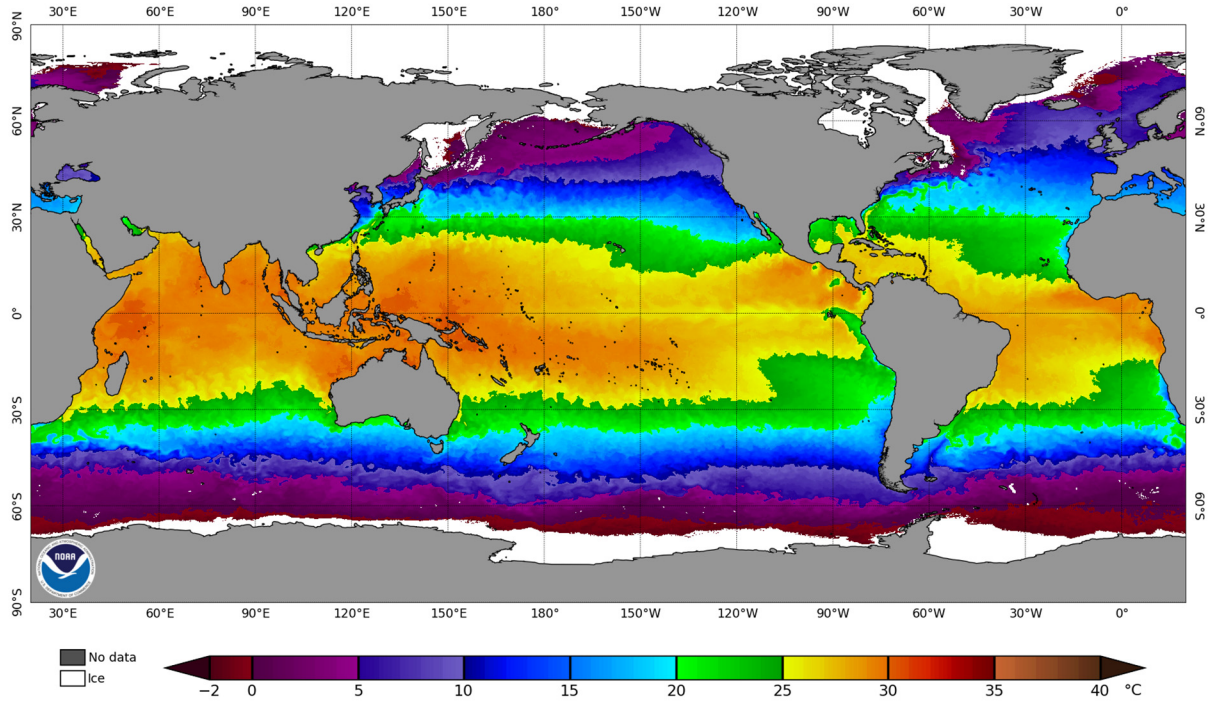
Global Precipitation Forecast



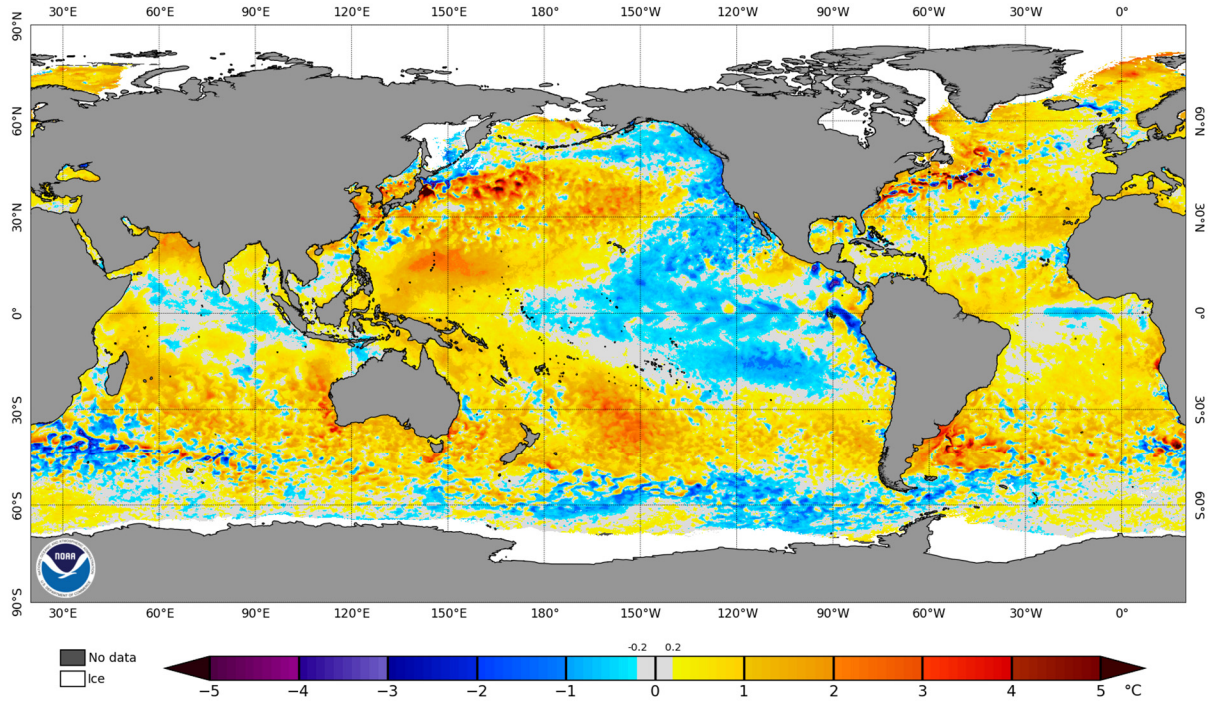
Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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

NOAA Coral Reef Watch Daily 5km Sea Surface Temperatures (v3.1) 7 Apr 2021

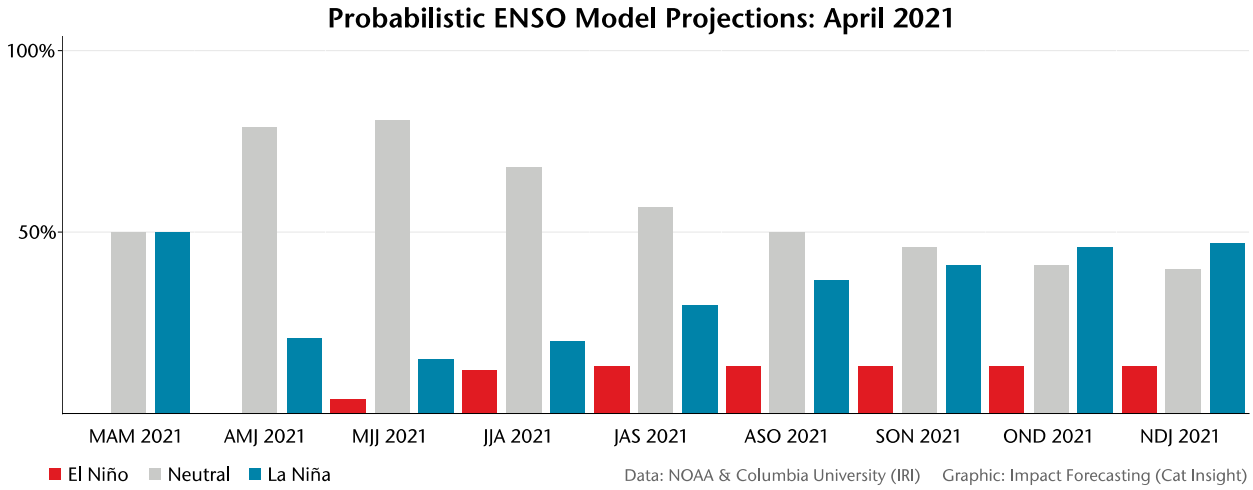


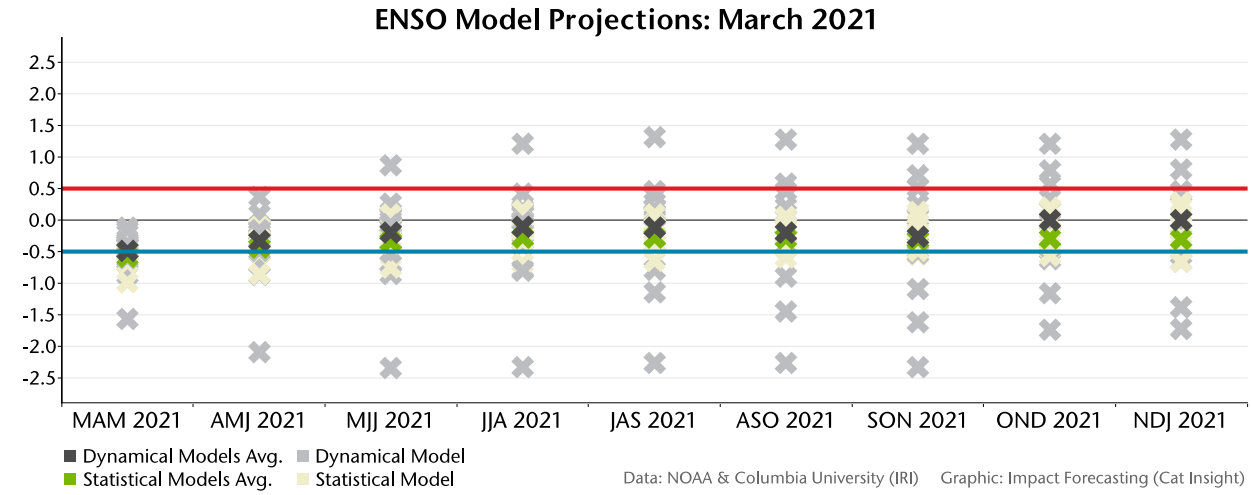
NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 7 Apr 2021



El Niño-Southern Oscillation (ENSO)

La Niña conditions are currently present, though NOAA has officially issued a **La Niña Advisory**. NOAA notes a 60 percent chance of a transition to ENSO-neutral conditions by 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.*

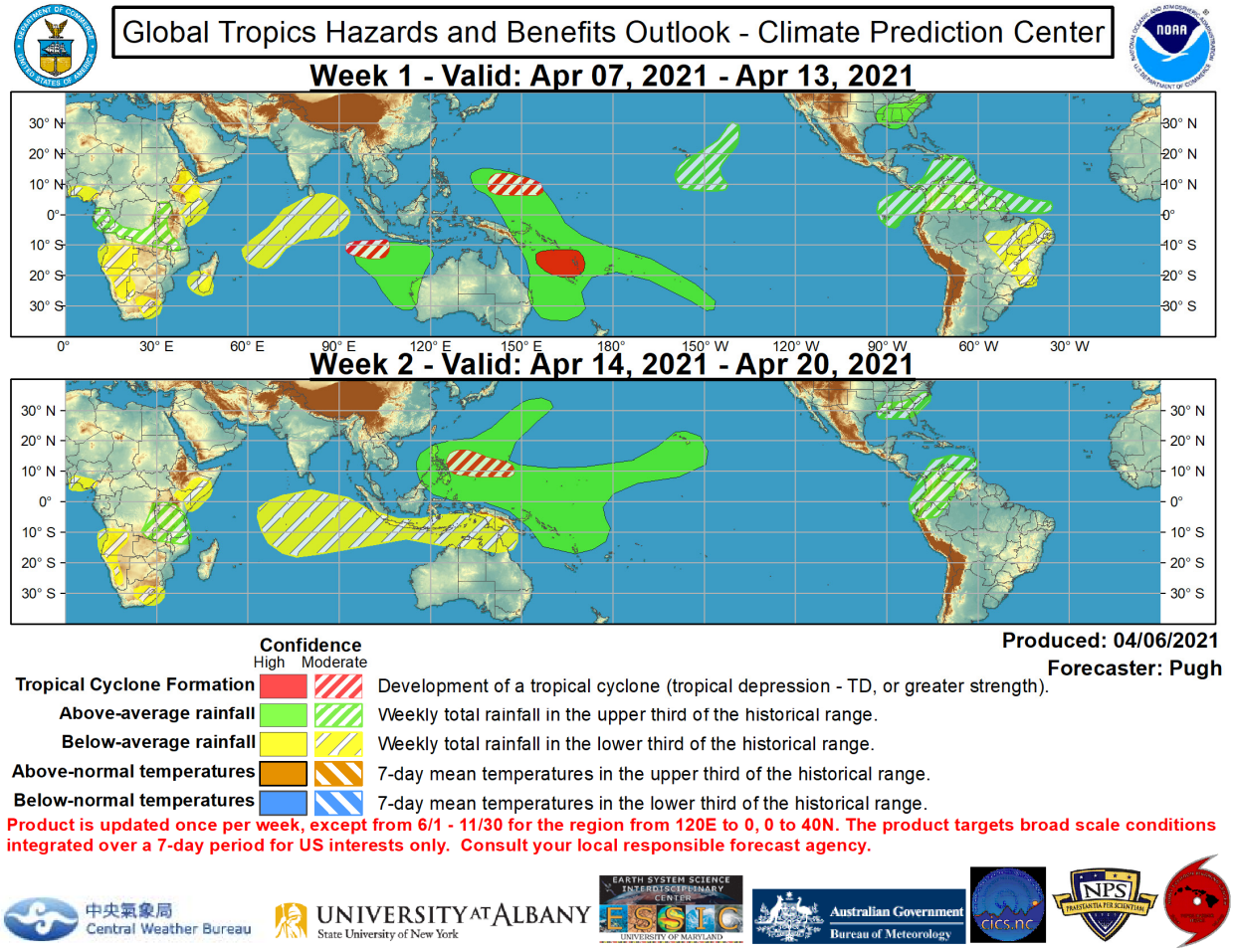
La Niña *refers to the periodic cooling of sea-surface temperatures (-0.5°C) across the east-central equatorial Pacific. It represents the cold phase of the ENSO cycle.*

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.*

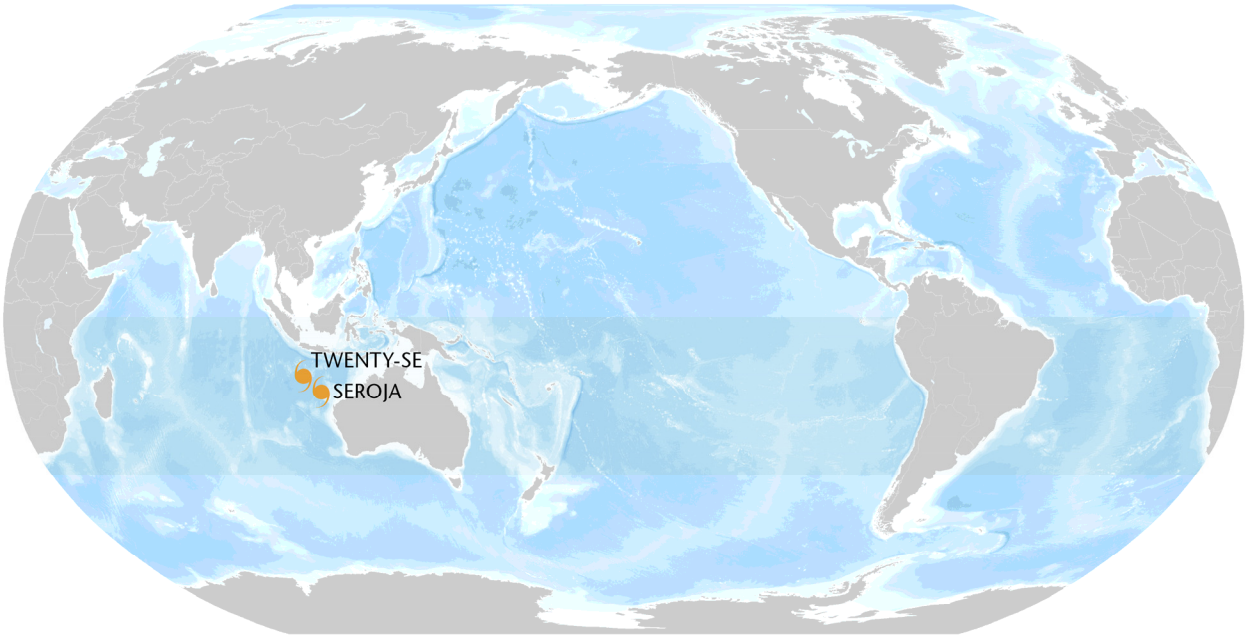
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

Global Tropics Outlook



Source: Climate Prediction Center

Current Tropical Systems



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

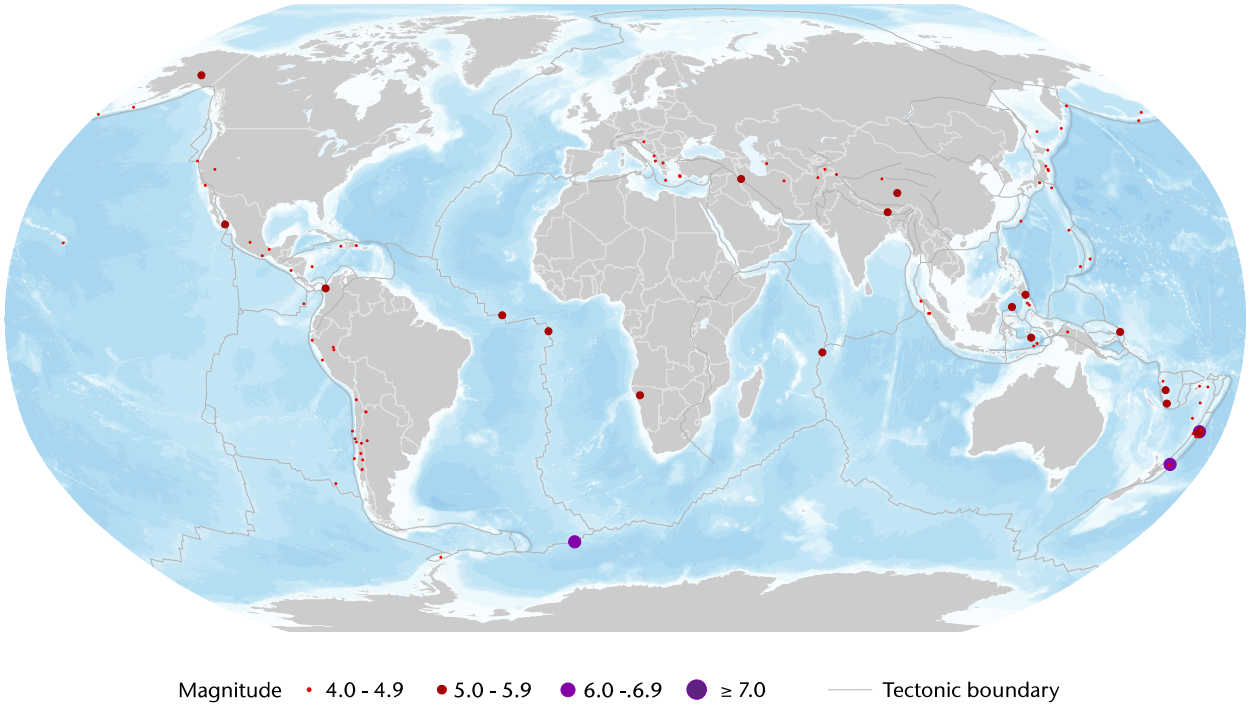
Location and Intensity Information

Name*	Location	Winds	Storm Reference from Land	Motion**
CY 27	14.3°S, 106.3°E	45 mph	510 miles (825 kilometers) S from Bandung, Indonesia	N at 7 mph
CY Seroja	18.4°S, 111.0°E	50 mph	730 miles (1170 kilometers) SW from Denpasar, Indonesia	SW at 9 mph

* 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): April 2 – 8

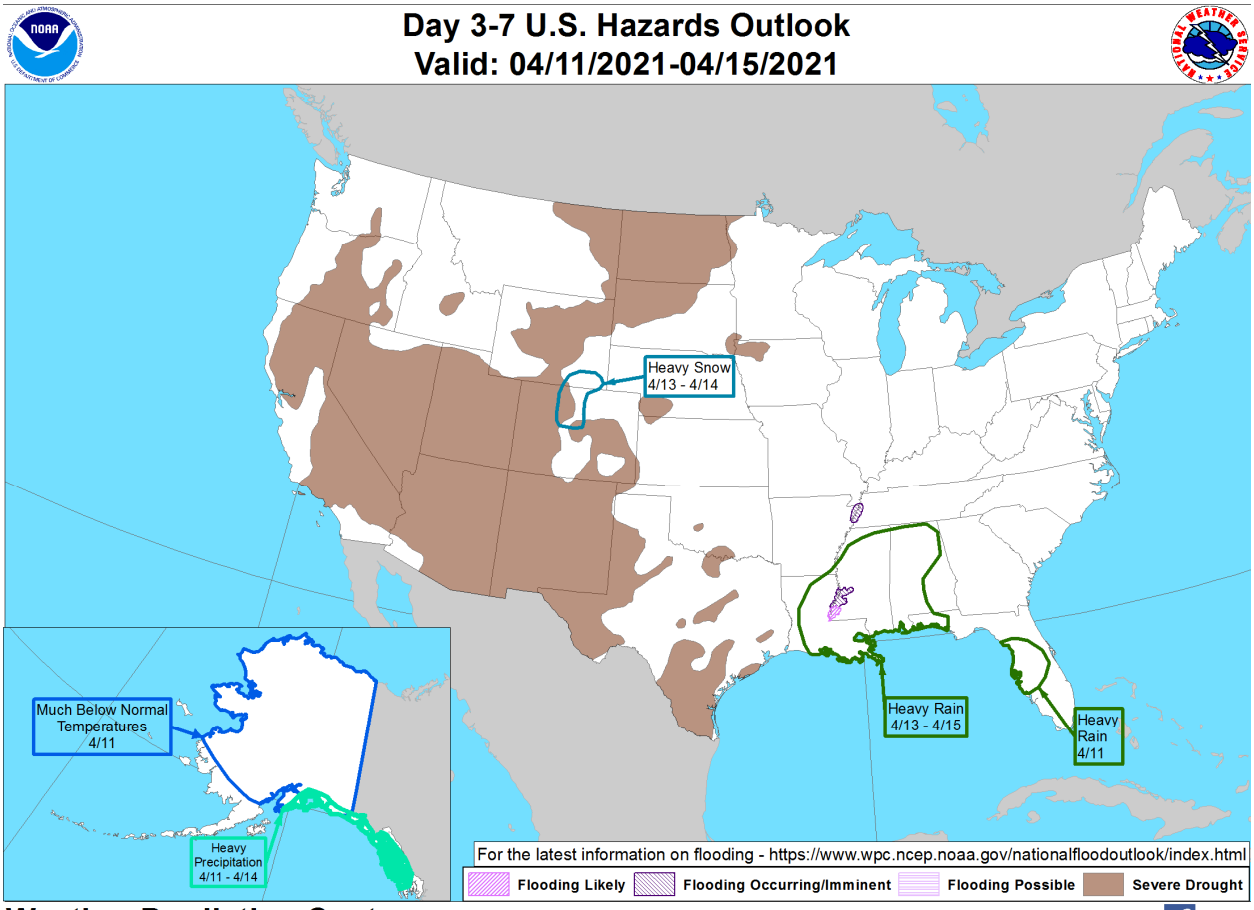


Significant EQ Location and Magnitude (≥M6.0) Information

Date (UTC)	Location	Magnitude	Depth	Epicenter
04/03/2021	57.99°S, 7.81°W	6.6	10 km	east of the South Sandwich Islands
04/05/2021	37.52°S, 179.67°E	6.0	10 km	19 kilometers (12 miles) NE of Gisborne, New Zealand
04/07/2021	29.10°S, 176.67°W	6.0	10 km	Kermadec Islands region

Source: United States Geological Survey

U.S. Weather Threat Outlook

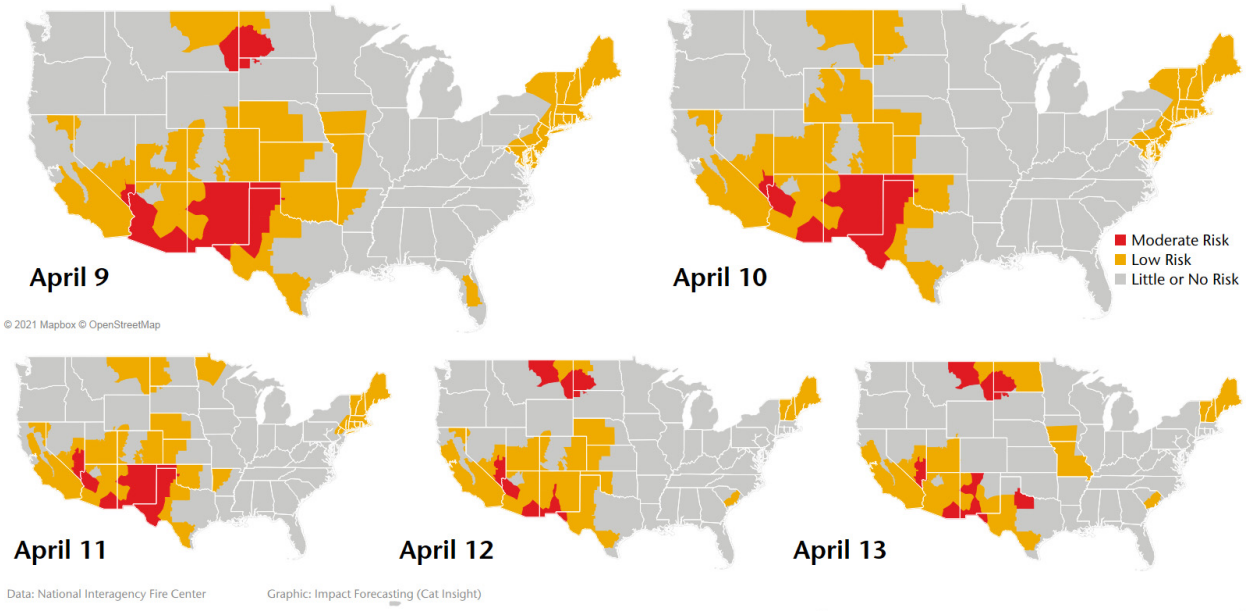


Potential Threats

- A trailing cold front associated with a broader low-pressure system will generate heavy rain in central Florida on April 11.
- Heavy rainfall is anticipated along the central Gulf Coast and Lower Mississippi Valley between April 13-15, as Gulf moisture overruns a nearly stationary frontal boundary.
- Heavy snowfall is possible across portions of southern Wyoming and northern Colorado on April 13-14, as an upper level low is expected to impact the region.
- Persistent drought conditions endure across much of the Western U.S., while drought conditions expand in the Northern Plains.

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 combination of high winds and lower humidity will result in continued enhanced fire risks across the Southwest. Much of the western U.S. remains mired in a significant drought which is aiding in the potential for conflagration.



Annual YTD Wildfire Comparison: April 8

Year	Number of Fires	Acres Burned	Acres Burned Per Fire
2017	14,833	2,182,757	147.16
2018	13,057	526,823	40.35
2019	7,456	180,031	24.15
2020	8,136	190,079	23.36
2021	12,947	402,850	31.12
10-Year Average (2011-2020)	**11,612**	**537,746**	**46.31**

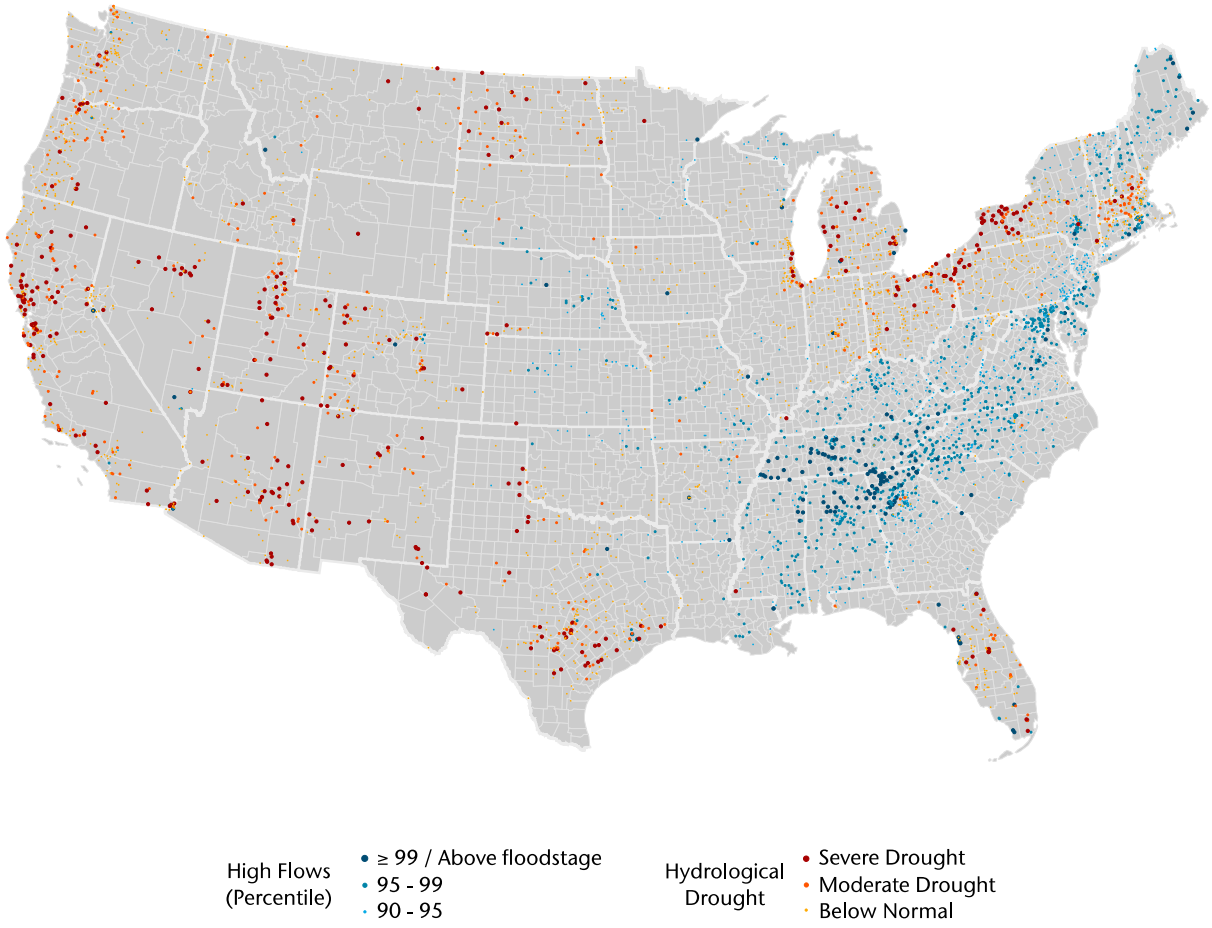
Source: National Interagency Fire Center

Top 5 Most Acres Burned by State: April 8

State	Number of Fires	Acres Burned	Acres Burned Per Fire
Oklahoma	836	86,696	103.70
Texas	1,421	55,214	38.86
South Dakota	44	37,690	856.59
Kansas	34	25,517	750.50
Minnesota	516	24,678	47.83

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
Thompson River at Davis City, Iowa	8.43	98.84
South River near Ackworth, Iowa	14.20	98.75
Bear Creek near Marcelline, Illinois	9.42	98.70
Cow Creek near Lyons, Kansas	11.57	98.63
Black Vermillion River near Frankfort, Kansas	11.29	98.53

Source: United States Geological Survey

Source Information

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Tropical Cyclone Warning Centre (TCWC) of Jakarta, Indonesia
Indonesia's Agency for Meteorology Climatology and Geophysics (BMKG)
Joint Typhoon Warning Center (JTWC)
Bureau of Meteorology, Australia
UN Resident Coordinator's Office (RCO) Timor-Leste
Bandara El Tari Kedatangan Bantuan 15 Ton Penanganan Darurat Wilayah NTT, BNPB
Death toll in Indonesia and Timor-Leste from catastrophic floods rises to 157, The Guardian
Cyclone Seroja: At least 157 dead in Indonesia, East Timor, Anadolu Agency
More Than 150 People Dead in Indonesia and East Timor in Wake of Tropical Cyclone Seroja, VoA
Timor-Leste precisa de um helicóptero e mais apoio, RTP Noticias

Natural Catastrophes: In Brief

U.S. National Weather Service
U.S. Storm Prediction Center

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