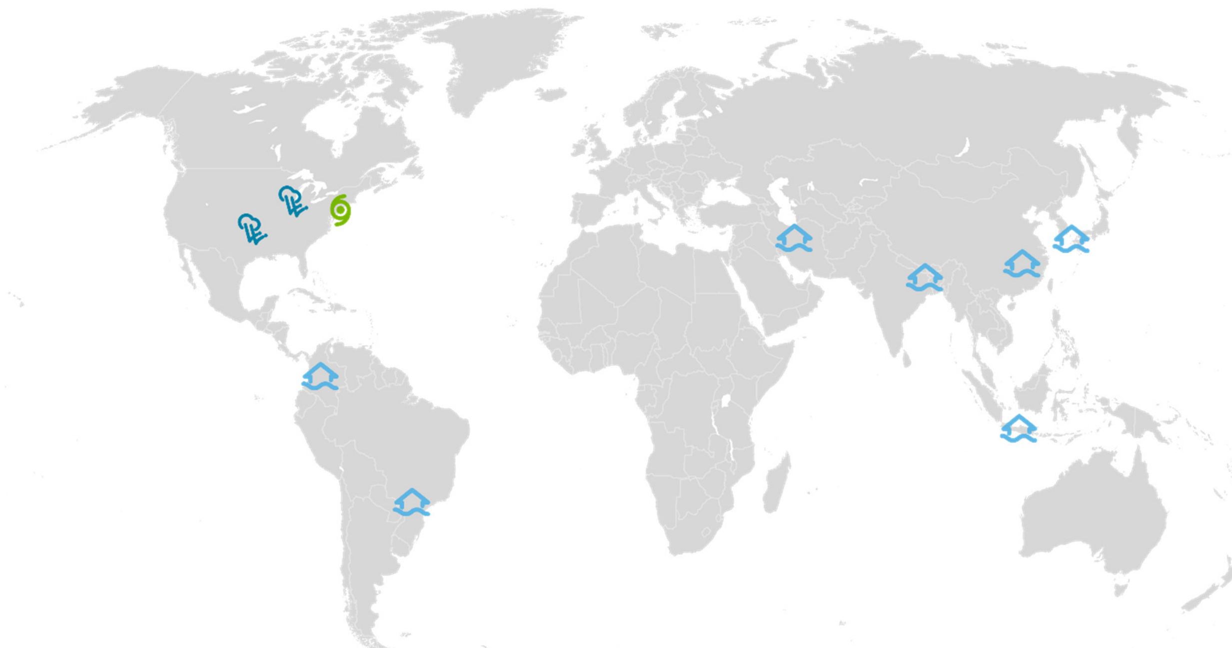
Weekly Cat Report

July 17, 2020



This Week's Natural Disaster Events

Drought | Flooding | Wildfire
Earthquake | Severe Weather | Winter Weather
EU Windstorm | Tropical Cyclone | Other

Event	Impacted Areas	Fatalities	Damaged Structures and/or Filed Claims	Preliminary Economic Loss (USD)*	Page
Severe Weather	United States	0	Thousands	100+ million	3
Tropical Storm Fay	United States	4+	Hundreds	Millions	7
Flooding	China	141	280,000+	12+ billion	11
Flooding	Japan	76+	15,335+	Billions	12
Flooding	India	781+	20,500+	100s of Millions	13
Flooding	Nepal	116+	Hundreds	Unknown	13
Flooding	Pakistan	25+	Hundreds	Unknown	13
Flooding	Bangladesh	6+	Thousands	10s of Millions	14
Flooding	Indonesia	21+	5,000+	Millions	15
Flooding	South Korea	2+	Hundreds	Unknown	15
Flooding	Colombia	11+	2,000+	Millions	15
Flooding	Turkey	6+	Hundreds	Unknown	15

**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

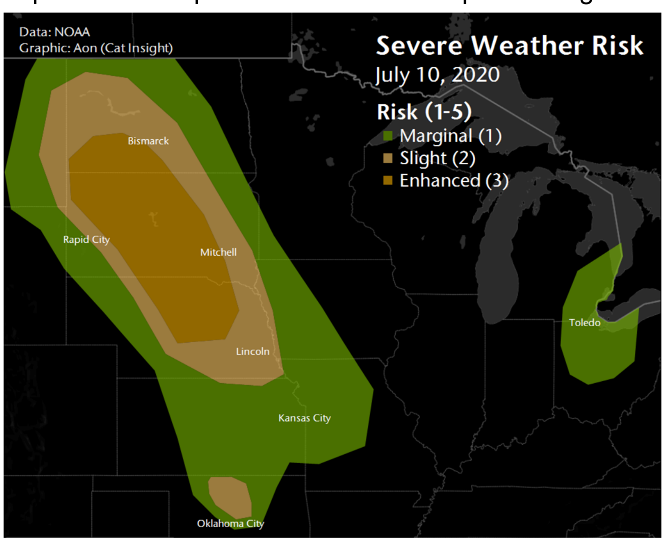
Extended heat wave aids more U.S. severe storms

A series of frontal systems interacting with a hot and humid airmass across the central United States were responsible for several notable severe weather outbreaks between July 10-12. A cold front progressing across the Ohio Valley and Southeastern states on July 10 generated severe storms with strong winds as the primary hazard. A low-pressure system tracking eastward from the northern Rockies in association with a short-wave trough aided in initiating significant severe events across portions of the Central and Northern Plains on July 10, and the Upper Mississippi Valley, Midwest, and Southern Plains on July 11. The primary hazards with these events were large and significant hail (greater than or equal to 2.0 inches), damaging straight-line winds with maximum winds gusts approaching and exceeding 70 to 80 mph (112 to 128 kph), and isolated tornadoes.

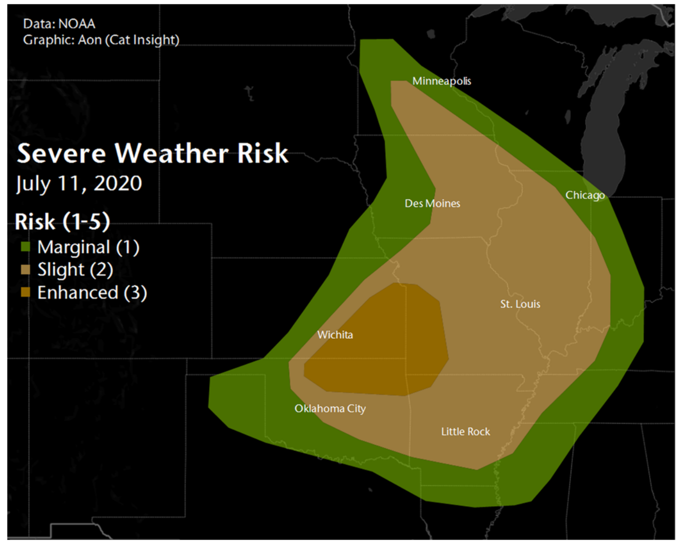
Meteorological Recap

July 10

A strengthening low-pressure system and accompanying cold front and dry line (a boundary that separates a moist air mass from a dry air mass) along with a leading shortwave trough initiated the development of severe storms across portions of the Central and Northern Plains on July 10. The Storm Prediction Center (SPC) indicated a region spanning southeastward from southwest North Dakota through central South Dakota and into northern Nebraska for an Enhanced Risk (level 3 out of 5) for severe weather, inside a broader region on Slight Risk (level 2 out of 5). Sufficient diurnal heating coupled with steep mid-level lapse rates (changes in temperature with height) created an environment conducive for severe hail and strong winds. Regions across Wyoming, South Dakota, Nebraska, Kansas, and Oklahoma were impacted by this event. Most notable was a cluster of severe storms with an embedded supercell which produced numerous reports of high winds with gusts approaching and exceeding 70 mph (112 kph), severe hail approaching 4.0 inches (10.1 centimeters), and isolated tornadoes. The storms generally tracked south-southeastward across southeastern Montana and northeastern Wyoming, through the Black Hill of South Dakota, including the Rapid City metro region, and into central Nebraska during the late afternoon/early evening and into the overnight hours. Further east, a cold frontal boundary progressing across the Ohio River Valley was responsible for several rounds of severe storms, producing wind gusts of at least 60 mph (97 kph). Regions across Ohio as well as western Pennsylvania, Virginia, and North Carolina were most affected, with straight-line winds being the predominant hazard.



July 11-12



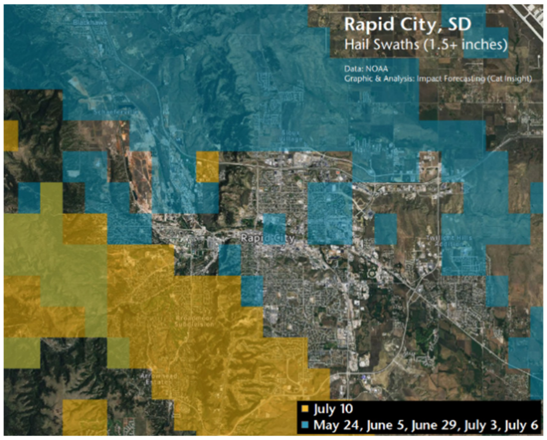
The low-pressure system and primary focal point for severe weather shifted eastward on July 11 toward the middle Mississippi Valley, Midwest, and portions of the Central and Southern Plains. Severe activity was associated with a southeastward advancing cold frontal boundary initially spanning from Illinois through Missouri and Kansas, and a shortwave trough advancing around a significant western high-pressure ridge. In the morning, The SPC highlighted a region containing southeastern Kansas, northeastern Oklahoma, southwestern Missouri, and extreme northwestern Arkansas for an Enhanced Risk (level 3 out of 5) for severe weather, with a much broader region of Slight Risk (level 2 out of 5) spanning from central Oklahoma toward northern Illinois and extending northwestward through eastern Iowa and southern Minnesota.

An initial line of severe storms traversed portions of eastern Minnesota and Iowa in the morning on July 11, producing damaging wind gusts and reports of severe hail. By the early evening hours, surface heating along with an outflow boundary across central Illinois and Indiana led to the development of an aligned cluster of severe storms which progressed southeastward producing severe hail and gusty winds. Meanwhile, a more notable severe threat developed further west ahead of the approaching cold front, where steep mid-level lapse rates and sufficient wind shear led to the expansion of supercell and severe storm clusters across Minnesota and Iowa. The storms quickly organized into a Mesoscale Convective System (MCS) with a bowing structure as they pushed south-southeast through Illinois and Indiana during the evening hours. The main hazards associated with this event were large hail exceeding 2.0 inches (5.1 centimeters) and straight-line winds, with measured gusts over 80 mph (128 kph). This cluster of storms persisted and redeveloped southward by the afternoon on July 12, bringing additional instances of severe weather and high winds, primarily across Alabama.

Further southwest along the frontal boundary, in the Central and Southern Plains, strong daytime heating coupled with ample wind shear and large values of Convective Available Potential Energy or CAPE (which is related to the updraft strength in thunderstorms) favored the development of supercells and severe storms clusters, capable of producing large and damaging hail along with strong winds. In the afternoon hours on July 11, southward tracking supercells which initially developed in northern Kansas and headed toward eastern Oklahoma and western Arkansas were responsible for multiple reports of hailstones exceeding 2.0 inches (5.1 centimeters). Severe storm development was similarly underway across the Texas panhandle. Throughout the evening hours, convective activity rapidly expanded in coverage across Oklahoma resulting in additional instances of severe hail and damaging straight-line winds, with measured gusts of 70 to 80 mph (112 to 128 kph).

Event Details

July 10

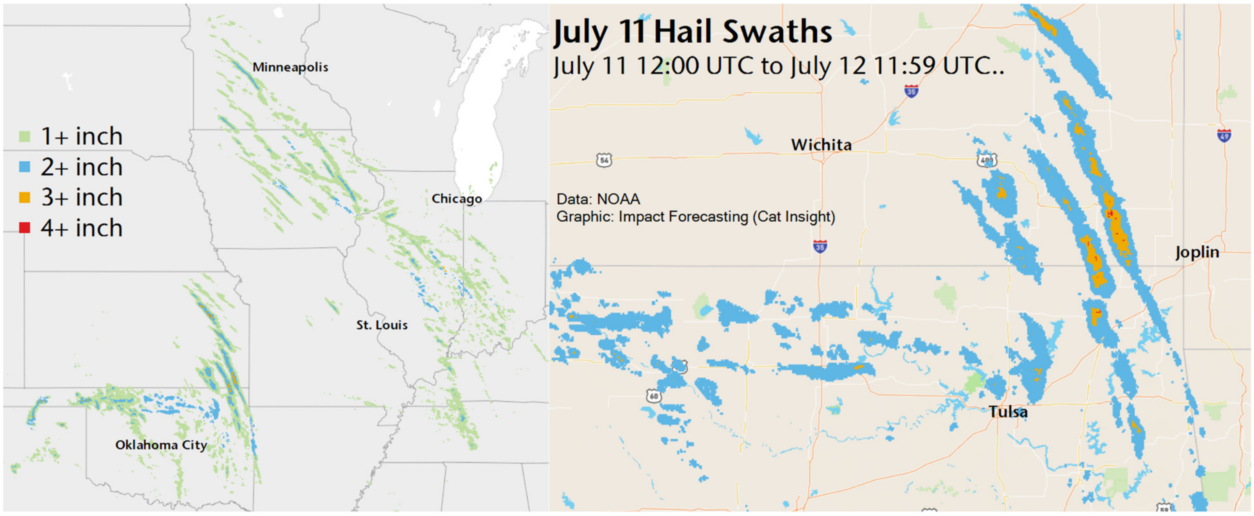


There were 231 instances of severe weather reported on July 10, of which 191 were for wind and 38 for hail. In South Dakota, hail approaching 4.0 inches (10.2 centimeters), softball sized, were observed in Bennett County near the town of Swett. 3.25-inch hailstones were reported near downtown Rapid City (Pennington County), resulting in the 6th day since May 2020 in which hailstones greater than 1.5 inches (3.8 centimeters) affected portions of Rapid City. Hail damage was noted to vegetation, crops, and vehicles throughout the region. Maximum wind gusts approaching 100 mph (160 kph) were recorded in Nebraska (Custer County) - where significant crop damage was noted around Ansley and Mason City. A 97 mph (156 kph) gust was measured in South Dakota (Todd County). Widespread instances of wind gusts between 60 to 70 mph (96 to 112 kph) were reported in portions of Wyoming, South Dakota, and Nebraska. A medical center in South Dakota (Oglala Lakota County) sustained extensive roofing damage, resulting in at least one injury. Straight lines winds caused additional impacts to tress, power lines, and structures among the most affected regions. An EF-1 tornado was confirmed in South Dakota (Bennett County) with maximum peaks winds estimated around 110 mph (177 kph) resulting in moderate structural damage. Further east, across the Ohio River Valley, strong winds resulted in downed trees which impacted several structures and outbuildings, multiple utility poles, and blocked roadways. Falling tree limbs impacted at least two structures in Ohio.

July 11

There were 381 reports of severe weather on July 11, of which 246 were for wind and 129 for hail. There were 17 reports of hailstones 2.50 inches (6.35 centimeters) or larger across four states (Minnesota, Iowa, Illinois, and Kansas). The largest hailstones which approached and exceeded 4.0 inches (10.2 centimeters), were observed in Kansas (Wabaunsee, Coffey, and Wilson Counties), where noted damage to vehicles and windshields were observed. In Illinois (Champaign County), significant property damage associated with large hailstones occurred at a local car dealership, along with considerable areawide siding and roofing damage – including a tree which fell through a house in nearby McLean County. In Iowa (Story County), baseball-sized hail lasting for up to 10 minutes resulted in exterior damage to multiple structures. Impacts to crops, vehicles, and structure exteriors were present throughout multiple localities affected by the severe hail. Straight-line wind gusts of 80 mph (128 kph) or greater were measured in three states (Iowa, Illinois, and Oklahoma), with a maximum gust of 90 mph occurring in Iowa (Scott County), where multiple trees were downed, and power poles damaged. Strong winds on July 11 resulted in considerable loss to crops and outbuildings, in addition to homes - including impacts to roofing and siding. A weak EF-0 tornado was confirmed in Texas (Randall County), near Amarillo. An EF-0 tornado with maximum estimated wind speeds of 80 mph (128 kph) touched down in Minnesota (Nicollet County) impacting crops, uprooting trees, and damaging at least one structure.

July 10, 2020 hailstone from Swett, SD
Source: NWS Rapid City/ Kaitlyn Rayhill



Financial Loss

The past weeks stretch of notable severe events between July 10-12 will lead to additional significant financial losses. Total combined economic and insured losses from this period will reach into the hundreds of millions (USD). Particularly costly hail events are expected in portions of South Dakota, Iowa, Illinois, Kansas, and Oklahoma.

The United States has endured a particularly active start to 2020 for the severe convective storm peril. Through the first half of 2020, the country had recorded at least 10 individual billion-dollar events due to thunderstorm-related events.

Impact Forecasting's Catastrophe Insight team will be releasing its "Global Catastrophe Recap: First Half of 2020" report on July 22.

Fay makes rare July landfall in the U.S. Northeast

Tropical Storm Fay, the earliest sixth-named “F” storm on record in the Atlantic Ocean made landfall along the New Jersey coast, north of Atlantic City, on July 10 with maximum sustained winds of 50 mph (85 kph). The greatest hazards associated with Fay were strong winds, locally heavy rainfall and flash flooding primarily along coastal and inland regions of Maryland, Delaware, New Jersey, New York and Pennsylvania. Total economic losses were expected to exceed USD100 million.

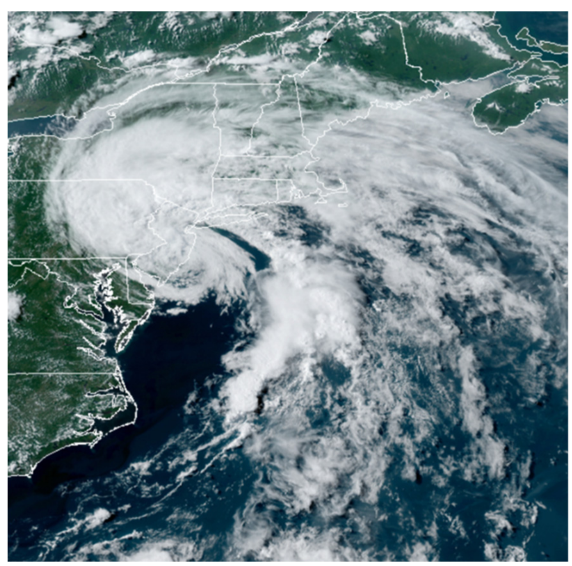
Meteorological Recap

The National Hurricane Center (NHC) began monitoring an area of low pressure in the northern Gulf of Mexico on July 4 which proceeded inland over the Southeastern United States, producing several days of locally heavy rainfall and storms. As the elongated area of low pressure emerged off the coast of the Carolinas on July 8 it began to track northward in the Atlantic where environmental conditions were favorable for additional development. On July 9 at 5:00 PM EDT (21:00 UTC) the NHC began issuing advisories for Tropical Storm Fay. This made Fay the earliest sixth-named “F” storm on record in the Atlantic Ocean; data records extend back to 1851. The previous record was Tropical Storm Franklin on July 22, 2005.

With initial maximum sustained winds of 45 mph (65 kph) Fay continued to move northward at about 8 mph (13 kph) between a ridge of high pressure located over the western Atlantic Ocean and an approaching mid-latitude trough, on a track very close to the Mid-Atlantic coast. The warm waters of the Gulf Stream and an environment characterized with light westerly wind shear allowed Fay to strengthen, obtaining maximum sustained winds of 60 mph (95 kph) and a minimum pressure of 999 millibars by the morning of July 10 - with a slight increase in northward speed. Tropical Storm Warnings were posted for portions of the Mid-Atlantic and Northeastern coasts, extending from Fenwick Island (Delaware) to Watch Hill (Rhode Island), including Long Island and Long Island Sound, in addition to the southern Delaware Bay. Fay's center of circulation consisted of a compact low-level center rotating inside a much broader flow, with deep convective activity displaced to the north and southeast of the center.

At 5:00 PM EDT (21:00 UTC) on July 10 Tropical Storm Fay made landfall along the coast of New Jersey about 10 miles (15 kilometers) north-northeast of Atlantic City – near the landfall location of Sandy in 2012 and Irene in 2011. At landfall, Fay exhibited maximum winds of 50 mph (85 kph). The greatest hazards with this storm included tropical storm force wind gusts, minor storm surge along coastal regions, in addition to locally heavy rainfall and thunderstorms producing coastal and inland flooding - rainfall totals generally ranged between 2 to 6 inches (5.1 to 15.2 centimeters) in the most affected regions. Once inland, Fay quickly degenerated to a post-tropical low-pressure system by the morning of July 11 as it continued to have an impact on portions of eastern New York and northern New England.

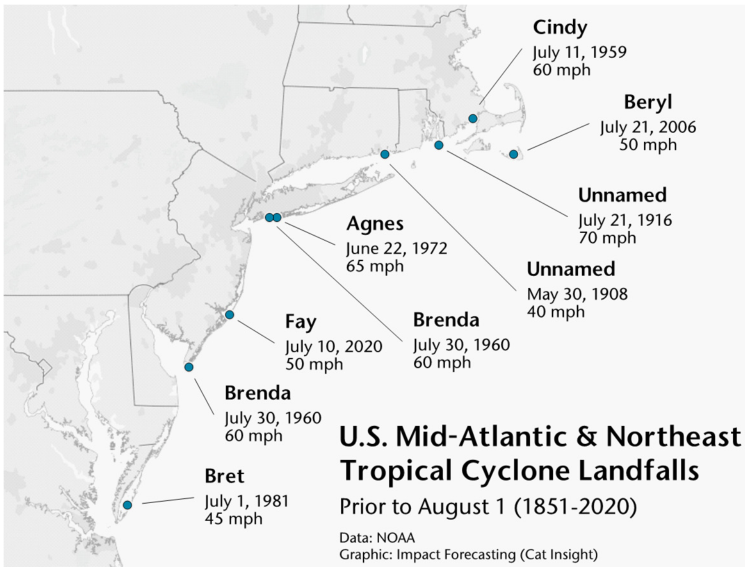
Remnant rainfall would later enter into Canada.

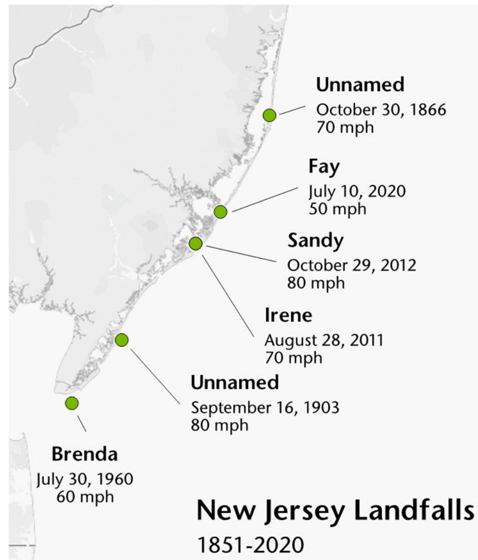


Fay making landfall in New Jersey on July 10. Source: NOAA/RAMMB

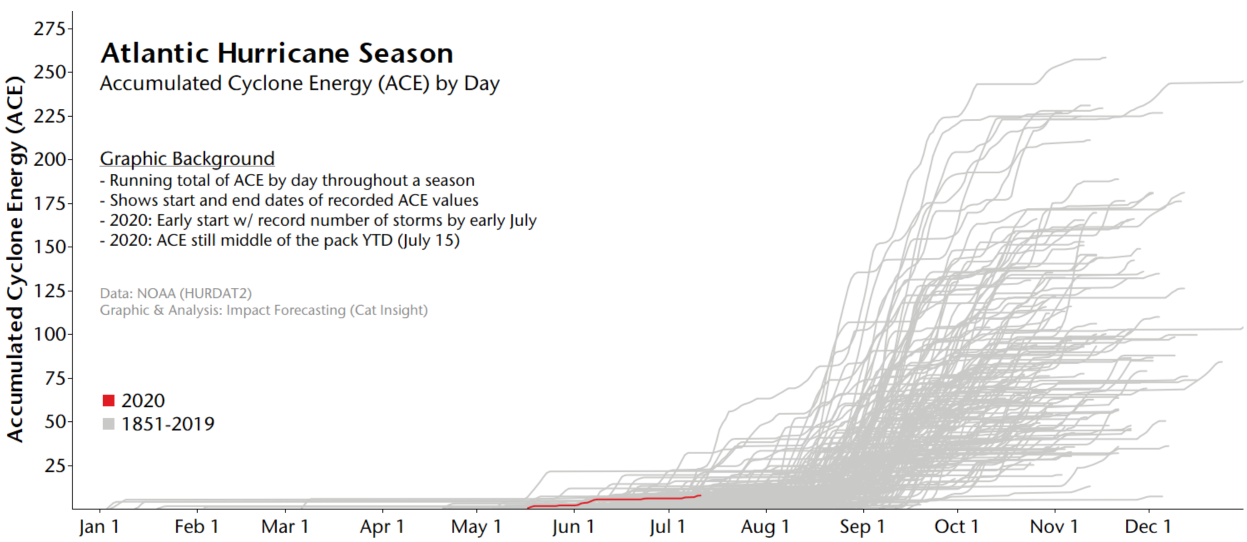
Miscellaneous

Fay became just the eighth named storm on record to make landfall north of North Carolina prior to August 1. None of the storms came ashore at intensities greater than tropical storm-strength. Fay's landfall location was very close to recent landfalling events such as Sandy (2012) and Irene (2011).



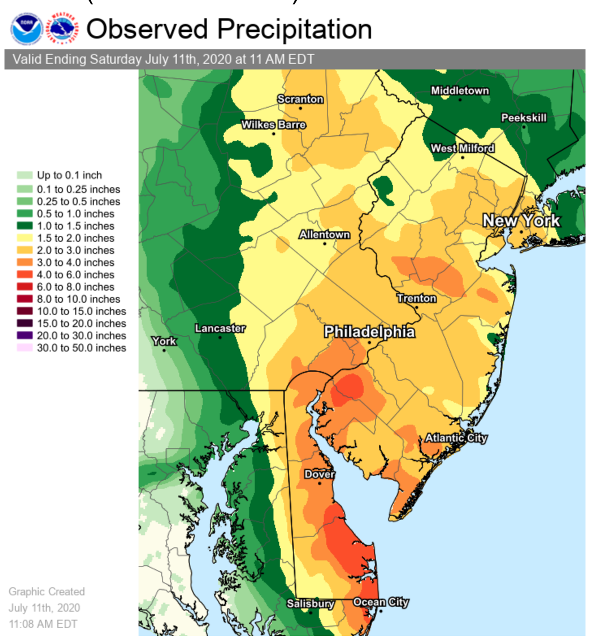


Fay became the earliest sixth named storm on record since 1851 – beating the previous record (Franklin; July 22, 2015) by nearly two weeks. However, 2020 joins 2002, 2011, and 2013 as the only seasons since 1950 to have none of its first six storms reach hurricane intensity. When measuring 2020 in terms of Accumulated Cyclone Energy (ACE), which details how much energy a season or individual storm may have, the year was generally in the middle tier of seasons since 1851. Regardless, the peak development months remain upcoming – August, September, October – and a consensus of hurricane forecasters anticipate well-above average activity given very favorable atmospheric and oceanic conditions in place.



Event Details

Coastal regions of Maryland, Delaware and New Jersey were most affected by strong winds and locally heavy rainfall, leading to flooding and flash flooding. In **Maryland**, wind gusts topping 40 mph (64 kph) along with 5.48 inches (13.9 centimeters) of rainfall were recorded at the Ocean City Municipal Airport (Worcester County), prompting a flash flood warning and inundated local roadways. In **New Jersey**, 5.86 inches (14.9 centimeters) or rain were measured near Wildwood (Cape May County), and 5.84 inches (14.8 centimeters) near Mullica Hill (Gloucester County). In **Delaware**, Lewes (Sussex County) recorded a storm total precipitation of 6.97 inches (17.7 centimeters) and wind gusts of at least 57 mph (92 kph). In nearby Bethany Beach, local roadways were inundated with 1.0 to 2.5 feet (0.3 to 0.8 meters) of water.



Elsewhere, in **Pennsylvania**, Philadelphia International Airport (Philadelphia County) received 4.15 inches (10.5 centimeters) of precipitation, where three creeks (Wissahickon, Pennypack, and Frankford) exceeded their flood stage. In **New York**, a wind gust of 52 mph (84 kph) was measured in New York Harbor northeast of St. George on Staten Island. Heavy rains across Manhattan led to flooding of several subway stations. Rough waters and rip currents resulting from Fay were blamed for at least four fatalities.

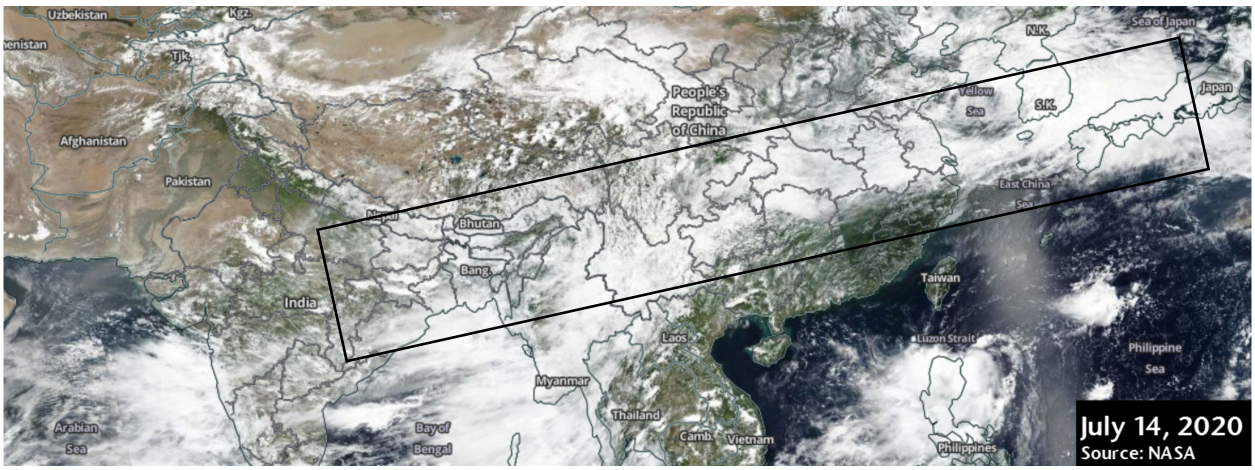
Financial Loss

The total financial impact from Fay's official landfall in New Jersey – and locally heavy rainfall and flooding into portions of the Mid-Atlantic and Northeast – is expected to exceed USD100 million. Given relatively low National Flood Insurance Program (NFIP) take-up in the U.S. Northeast and Mid-Atlantic, most storm surge and inland flood damage to residential properties was likely to be uninsured. The low-pressure system which eventually developed into Tropical Storm Fay produced several days of storms and flooding rains across portions of the Southeastern United States.

Historical monsoon flooding ravaged Asia

Torrential monsoon rains which started on June 1 and continued into July 16, triggered flooding and landslides in multiple countries in South Asia, causing widespread damage and claiming hundreds of lives. Major rivers in China, India, Japan, and Bangladesh swelled above flood stage at hundreds of locations, causing widespread inundation damage to hundreds of thousands of homes, businesses, roads, and bridges. Vast areas of agricultural land and infrastructure has also been affected. Official reports from government agencies note that monsoon rains now claimed more than 1,000 lives in Asia and directly affected more than 50 million people. The combined economic cost across the South Asian nations were estimated minimally at USD16 billion; most of which has been incurred in China and Japan.

Meteorological Recap



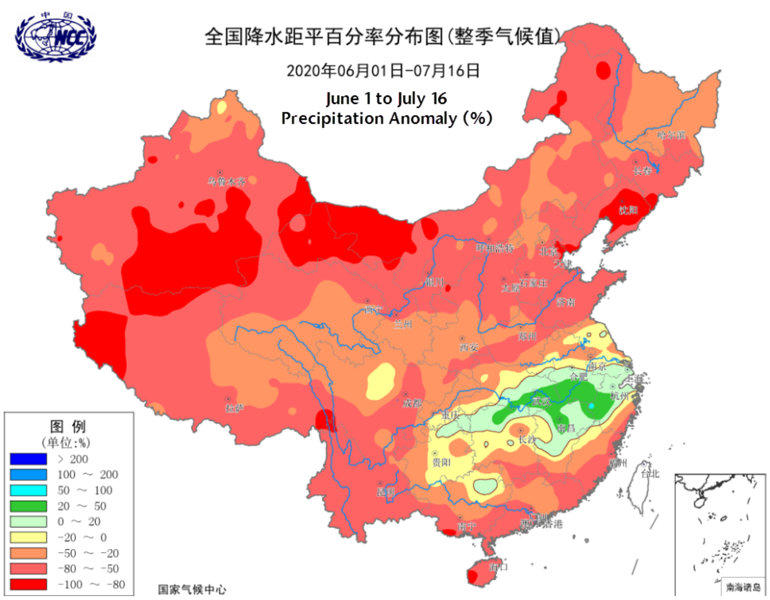
The East Asian rainy season (Mei-yu rains) officially began on June 1; roughly 8 days earlier than the long-term average, according to the China Meteorological Administration. Early June monsoon rains were initially concentrated across several provinces in southeastern and central China. These heavy rains were caused by strong convective weather associated with the development of the Mei-yu front – also known as the arrival of the East Asian monsoon across China. The rainfall was most concentrated south of the Yangtze River on June 1-15. Guangxi, Guizhou, Hunan, Chongqing Municipality, and Guangdong in southern China, along with the other provinces in the southern Yangtze River Basin received notable precipitation. The monsoon migrated northward in mid-June and the rainy season started in the Sichuan, Hubei, and Hunan provinces in central China and Shanghai and Jiangsu province in eastern China. It later reached Jiangxi, Anhui, and Zhejiang provinces on July 1. Nationwide, rivers and lakes have reached flood warning levels at 433 locations and more than 30 locations set new record heights.

On July 3, mesoscale convective systems embedded in the Mei-yu (or Baiu) front moved eastward, bringing torrential rains into the Japanese Archipelago. The rains were most significant from July 3-6 across the Kyushu Island Region in southern Japan. According to the Japan Meteorological Agency (JMA), several rain gauges in the Kyushu islands recorded their highest ever hourly and daily precipitation as rainfall in Kumamoto and Kagoshima prefectures exceeded 500 millimeters (20 inches); with locally higher amounts. The landslide risk in southern Kyushu was noted from high to extreme which prompted the JMA to issue its highest-level warnings for floods and landslides in Kumamoto and Kagoshima. Further rain affected Gifu and Oita Prefectures from July 7-9, causing widespread inundation in the affected areas. This torrential rainfall was caused by a stationary front – Mei-yu (or Baiu) front.

The arrival of monsoon over South Asia was further declared on June 1. Several states in southern and western parts of the Indian subcontinent received more than average precipitation until June 15. After that time, the rain-belt shifted northward to affect the central, northern, and northeastern parts of India, Bangladesh, Nepal, and Pakistan. According to the India Meteorological Department, several meteorological observation stations in the northeastern parts of the country recorded heavy to very heavy rains during the current southwest monsoon season.

Event Details

China



The monsoon rain-belt shifted eastward along the Yangtze river basin in mid-June, affecting provinces in central and eastern China. Hubei, Hunan, Jiangxi, Anhui, and Zhejiang were worst-hit. According to the China's Meteorological Agency (CMA), a vast area in the central and eastern China recorded more than 500 millimeters (20 inches) of rainfall since July 1, leading to swelling of additional rivers above flood warming levels at 100 locations, according to the data from Ministry of Water Resources, China. Heavy rains prompted landslides and flash flooding, resulting in widespread inundation damage to public and private infrastructure in the affected provinces. Heavy monsoon rainfall since July 1 has affected no fewer than 45 counties and cities in the Hubei province in central China. Jingzhou and Wuhan cities were worst affected as the Yangtze river was noted to flow 1 meter above the warning level at several locations. Since July 1, more than 8 people have died due to a landslide in Huangmei County, 40 were missing, and around 9 million people were affected due to heavy flooding, according to the Flood Control and Drought Relief Headquarters, Hubei province.

In the Jiangxi province in eastern China which is downstream on the Yangtze River, the water levels in the biggest freshwater lake – the Poyang Lake – rose by 3.5 meters (11.5 feet), breaking the previous record in the year 1998, and causing widespread inundation in the Poyang county and in surrounding areas. Around 2,500 kilometers of embankments in Jiangxi province had seen water levels exceeding the flood warning levels, according to the provincial flood control and drought relief headquarters. Since July 6, at least 5.5 million people were affected due to heavy monsoon rains in the Jiangxi province while more than 300,000 people were relocated to shelters by the province's disaster officials. Recent rounds of heavy rainfall affected millions of residents in Anhui, Zhejiang, and Hunan provinces and caused widespread inundation damage to thousands of houses, businesses, and roads.

According to the latest updates from China's ministry of water resources, 433 rivers had swelled to above the flood warning level since June 1. At around 140 locations, it was noted as unprecedented including 33 locations where the highest recorded water levels in this season have broken all the historical records. Upper reaches of the Yangtze river – Yellow, Xijiang, and Beijiang Rivers – mainstream under the Jianli River, and Dongting, Poyang, and Taihu Lakes experienced historical flooding during the current East Asian monsoon season. Around 40 million residents were affected, more than two million were evacuated, and 200,000 people required life-assistance. Government estimates noted around 141 fatalities while several others were noted missing as search operations continue. Heavy monsoon rains affected more than 27 provincial regions in China on May 29 – July 15. Widespread inundation damage to around 280,000 homes, businesses, roads, bridges, and a large area of cropland – 3.5 million hectares (8.7 million acres).

Japan

Incessant monsoon rains wreaked havoc in 23 prefectures in southwestern and central parts of the Japanese archipelago since July 3. Kumamoto, Fukuoka, Oita, and Kagoshima prefectures along with several other prefectures in the Kyushu islands were noted to be worst-hit; additional damage was noted in the Nagano and Gifu prefectures in central Japan. Torrential rains prompted Kuma and Hida Rivers along with 103 smaller rivers to break their banks at more than hundreds of locations in 14 prefectures, leading to inundation damage to no fewer than 15,300 houses, businesses, bridges, and roads.

Kumamoto Prefecture (Source: Kyodo News via AP)

Government estimates noted 76 fatalities and several others were reported missing as of July 16. According to the Land, Infrastructure, Transport and Tourism Ministry, Japan, at least 315 mudslide events had occurred in 27 prefectures in the Kyushu islands and central Japanese Archipelago since July 3. Kumamoto prefecture was hit by the highest number of 56 landslides, followed by Kagoshima, Nagano, Nagasaki prefectures with 44, 27, and 24 landslide events, respectively. More than 500,000 people were either relocated or instructed to take refuge due to the heavy flooding, and around 4 million people were directly affected across southern and central Japan.

The table below includes statistics from Japan's Fire and Disaster Management Agency as of July 16.

Prefecture	Fatalities	Damaged and/or Flooded Structures	Prefecture	Fatalities	Damaged and/or Flooded Structures
Iwate		4	Shimane		82
Tochigi		2	Hiroshima	2	65
Gunma		1	Yamaguchi		210
Chiba		1	Tokushima		1
Kanagawa		2	Ehime	2	70
Toyama		1	Fukuoka	2	4,939
Nagano	1	36	Saga		107
Gifu		422	Nagasaki	1	188
Shizuoka	1		Kumamoto	65	8,167
Aichi		28	Oita	2	562
Mie		3	Miyazaki		3
Nara		3	Kagoshima		434
Wakayama		4	**Grand Total (Nationwide)**	**76**	**15,335**

India

Heavy monsoon rains continued to affect the northeastern parts in India since July 9. Assam, Meghalaya, West Bengal, and Arunachal Pradesh were worst-hit during the recent spells of heavy rainfall; additional casualties and damage were reported from the states of Gujrat, Karnataka, Bihar, and Uttar Pradesh. According to the local media reports and National Disaster Management Agency (NDMA), India, 8 additional casualties were noted in Arunachal Pradesh due to landslides at 7 different locations. Heavy monsoon rains have caused the Brahmaputra river – one of the largest rivers in the world – along with several other small- and medium-sized rivers to break their banks at hundreds of locations in Assam, West Bengal, and Arunachal Pradesh, causing inundation damage to thousands of houses, businesses, and roads. Heavy flooding claimed more than 214 lives in these states during current southwest monsoon season 2020. More than 3 million people were affected across the northeastern states in India, of which a major proportion – around 2.2 million residents – belong to the state of Assam. More than 15,500 houses, roads, and businesses were submerged due to heavy flooding in eastern and northeastern India, according to the local media reports and NDMA. Since July 1, the flooding has ensued in the states of Gujrat and Karnataka, in western India, as heavy monsoon rains intensified. According to the India Meteorological Department, rainfall totals crossed the 500 millimeters mark in several districts in Karnataka; with locally higher amounts. These torrential rains triggered landslides and flooding in a vast area, leading to 143 casualties, and inundation damage to more than 3,200 houses. Since the onset of the southwest monsoon this year, anomalous rains in India have affected more than 5.2 million people across 6,200 villages. No fewer than 757 people were killed in lightning- and rain-related incidents, according to the data provided by NDMA. At least 20,300 homes were either damaged or destroyed, and a vast area of cropland was affected – 244,943 hectares (605,000 acres).

Nepal

Torrential monsoon rains which started in mid-June and continued into July 16, prompted flash flooding and landslides in 12 districts in Nepal. According to the National Disaster Risk Reduction and Management Authority (NDRRMA), at least 116 people died and 60 others were listed as missing. More than 140 others were injured. Myagdi District in Western Nepal was noted to be worst affected with 27 deaths. Heavy rains have triggered severe flash flooding in at least 15 locations in the affected districts. Around 74 landslide events resulted in damaging bridges and roads across Nepal. A vast area affected due to landslides was isolated due to road blockades caused by debris flow. Relief operations were severely hampered by the road blockades, bad weather, and incessant rains. More than 550 houses, businesses, and roads were damaged by the monsoon rains this year.

Pakistan

Torrential monsoon rains coupled with strong winds caused notable damage in Pakistan since July 5. According to the local media reports, at least 25 people died, and several others were injured due to monsoon flooding. According to the Pakistan Meteorological Department (PMD), heavy rainfall was recorded in the Karachi subdivision and neighboring areas since July 6. These heavy monsoon rains triggered flash floods inundating hundreds of houses, businesses, and roads. Glacial lake outburst flood (GLOF) triggered flash flooding in Lower Chitral district of Khyber Pakhtunkhwa, Pakistan on July 13. Significant damage to electrical and road infrastructure was noted. According to the local media reports and the Provincial Disaster Management Authority (PDMA) of Khyber Pakhtunkhwa, at least two dozen buildings sustained damage to various degrees. Heavy monsoon rains in South Waziristan district on July 13 claimed 2 lives, while 50 houses were damaged.

Bangladesh

Torrential monsoon rains triggered flooding in several districts across northeastern, northern, and central Bangladesh since June 20. According to the Water Development Board and Flood Forecasting and Warning Centre (FFWC), Bangladesh, flooding prompted the Brahmaputra and the Ganges Rivers – in addition to other smaller rivers in its watershed – to break their banks at more than 20 locations, causing widespread inundation damage to thousands of houses, businesses, and roads in more than 20 districts. According to the local media reports, one-third of Bangladesh is underwater after the heaviest rains in decades hit the country since July 10. More than one million people were displaced and 1.8 million people were affected due to monsoon related flooding. Six people were killed. Initial damage assessment reports suggest that the total economic toll is expected to cross the USD100 million mark.

Financial Loss

The totality of the flood event across South Asia was quickly leading to a substantial economic toll. Combined damage and government-allocated funds to cover direct impacts in China, Japan, India, Nepal, Pakistan, and Bangladesh had already neared USD17 billion. A majority of the economic toll was incurred in China, where the government had cited seasonal flood damage since June 1 at CNY86.2 billion (USD12.3 billion). These impacts were felt across 27 separate provincial regions, though the greatest damage was within the Yangtze River Basin.

While no official event loss statistics were yet available from Japan, the government allocated JPY400 billion (USD3.7 billion) to help with direct damage and recovery efforts across the hardest hit areas of Kumamoto and neighboring prefectures. The overall economic toll was expected to be even higher.

Economic losses across India, Pakistan, Nepal, and Bangladesh were anticipated to aggregate into the hundreds of millions (USD) – with most damage costs in India.

From an insurance viewpoint, it was expected that most of the economic flood damage was likely to be uninsured. Low take-up rates in China, India, Nepal, Bangladesh, and Pakistan suggest that a small fraction of inundation to physical property and agriculture will receive an indemnity payout. In Japan, the General Insurance Association of Japan (GIAJ) had yet to release any initial claims information as of July 16. It was anticipated that a notable volume of property and automobile claims from Kyushu will be filed.

Natural Catastrophes: In Brief

Flooding (*Indonesia*)
Torrential monsoon rain triggered flash floods and landslides in several provinces of Indonesia since July 9. At least 21 people died and 46 others were listed as missing. Several emergencies were reported from the affected areas and more than 5,000 people were evacuated by disaster authorities. Since July 13, heavy rains prompted Masamba, Rongkang, and Sungai Rada Rivers to break their banks which affected several districts in North Luwu Regency in South Sulawesi Province, and caused inundation damage to hundreds of houses and businesses. One person died in Pematangsiantar, North Sumatra during a flash flood event on July 11. Heavy rains caused 1-meter deep flooding in Tanah Laut Regency, South Kalimantan. More than 5,000 combined homes were inundated in Indonesia from July 9-16.

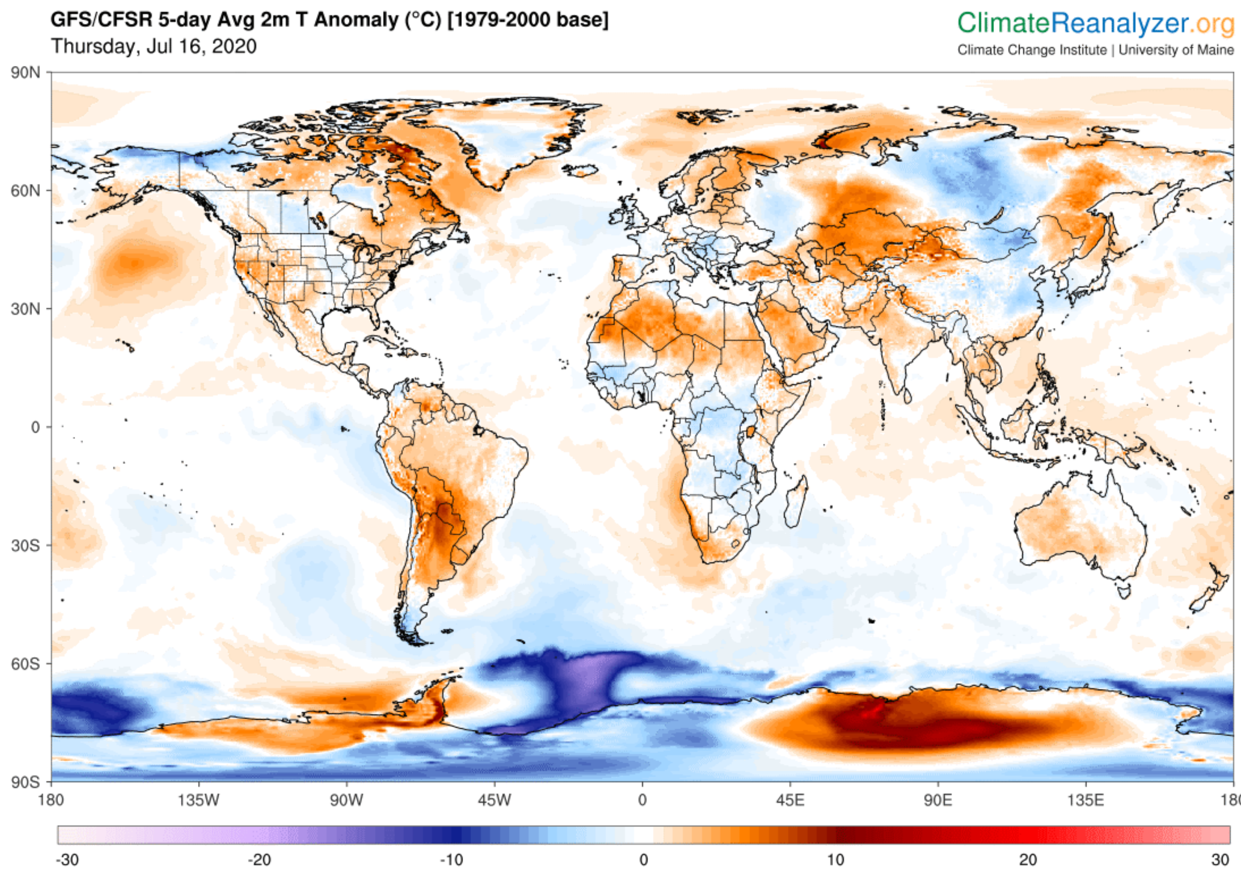
Flooding (South Korea)
Heavy rains coupled with strong winds affected southern parts of South Korea on July 13-14. According to the Korea Meteorological Administration (KMA), more than 275 millimeters of rain was recorded in Sancheong of South Gyeongsang province during a 24-hours of stretch ending on the afternoon of July 14, causing inundation damage to hundreds of homes. Heavy rains triggered landslides and flash flooding in South Gyeongsang, the North Jeolla, and the South Jeolla Provinces in South Korea. According to local media reports, more than 2 people have died in Hamyang county in South Gyeongsang Province. Hundreds of houses and roads were damaged, and several road blockades were reported from the Gyeongsang Province which left several residents stranded and affected the help and rescue operations.

Flooding (*Turkey*)
Heavy rainfall prompted flash floods and landslides in Artvin and Rize provinces of northeastern Turkey on July 12-14. Four people were killed in Yusufeli district of Artvin, as a landslide hit a dam construction site and reportedly buried dozens of vehicles. Çayeli district of Rize was affected on July 13-14, as local meteorological authority noted 273 millimeters (10.7 inches) of rainfall in the area. There were two additional fatalities, as floods affected several municipalities. Hundreds of houses, businesses, and roads were inundated, according to local reports. Several hundreds of residents were rescued or evacuated.

Flooding (Brazil)
Heavy rains resulted in notable flooding in the Rio Grande do Sul state of Brazil during the first half of July. Flooding in more than 30 municipalities forced more than 7,000 people to leave their homes. Significant flooding occurred along Taquari, Uruguay and Cai rivers. Authorities expected hundreds of homes inundated during the event. Further rains were expected in the coming days.

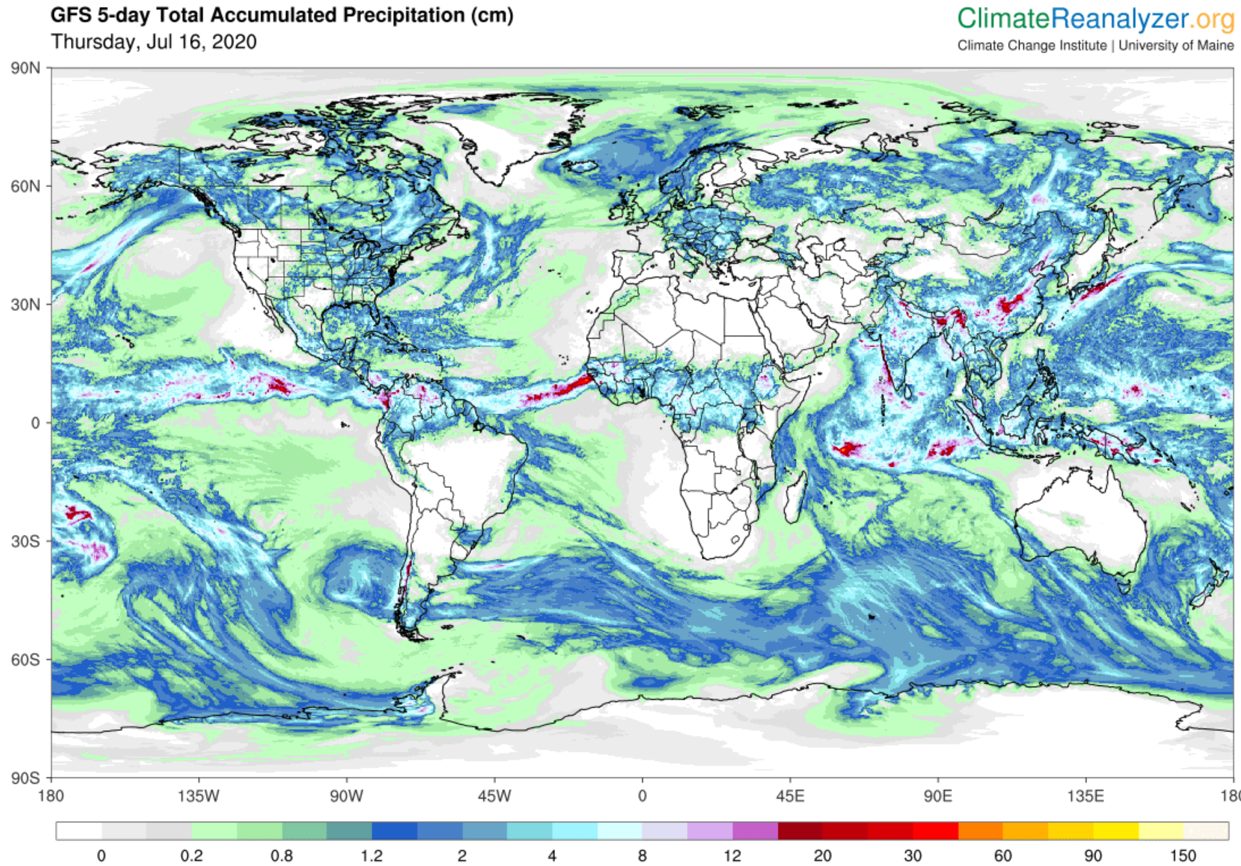
Flooding (Colombia)
Increased precipitation in recent weeks has led to notable flooding in parts of Colombia since early July. The event left 5,500+ families affected in 19 departments of the country. According to the information from the National Unit for Disaster Risk Management (UNGRD), 11 people were killed and three were injured. Among the worst affected were departments of Antioquia, Meta, Putumayo, Tolima, Choco and Caldas. Meta department experienced notable flooding, with more than 2,000 families affected and at least 654 homes damaged or destroyed. Similar extent was reported from Antioquia. Hundreds of homes were damaged in the Putumayo department. Further losses were incurred on local infrastructure and agriculture.

Global Temperature Anomaly Forecast



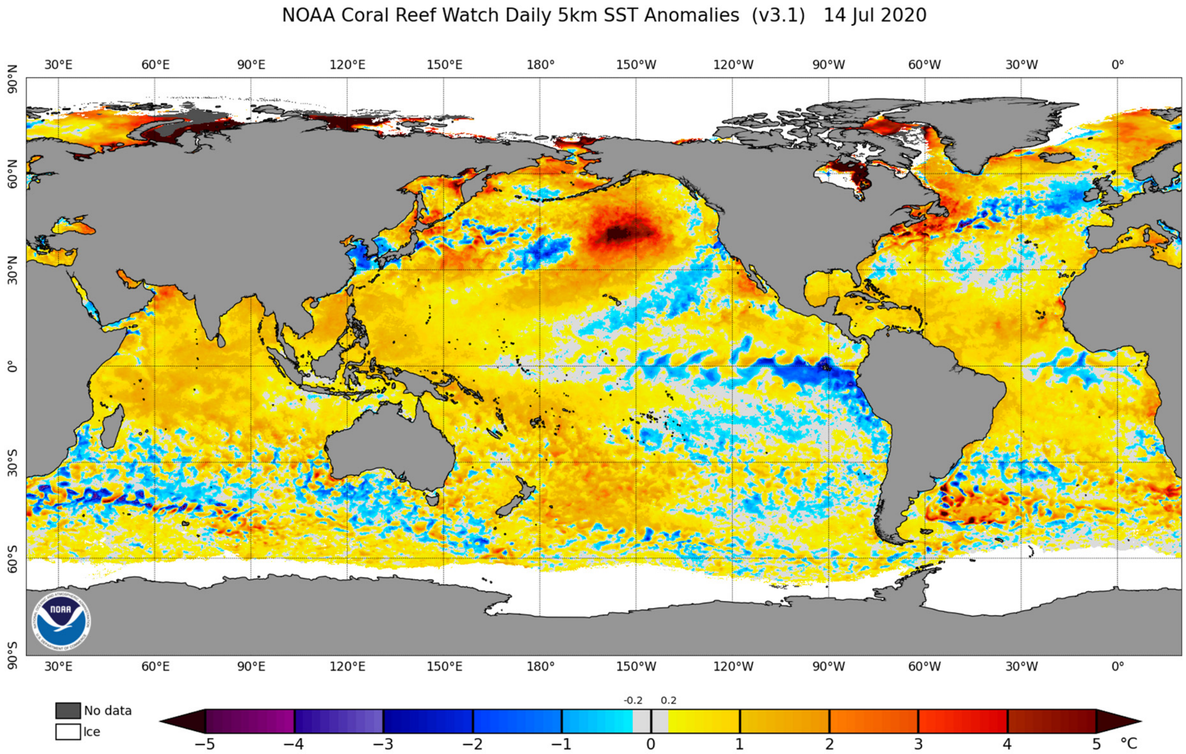
Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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.

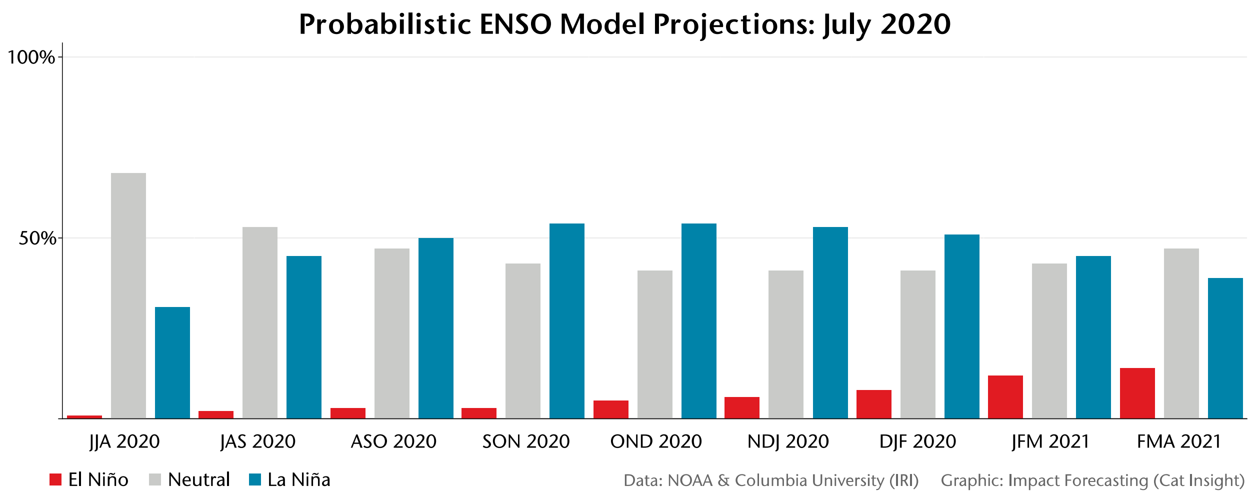
Select Current Global SSTs and Anomalies

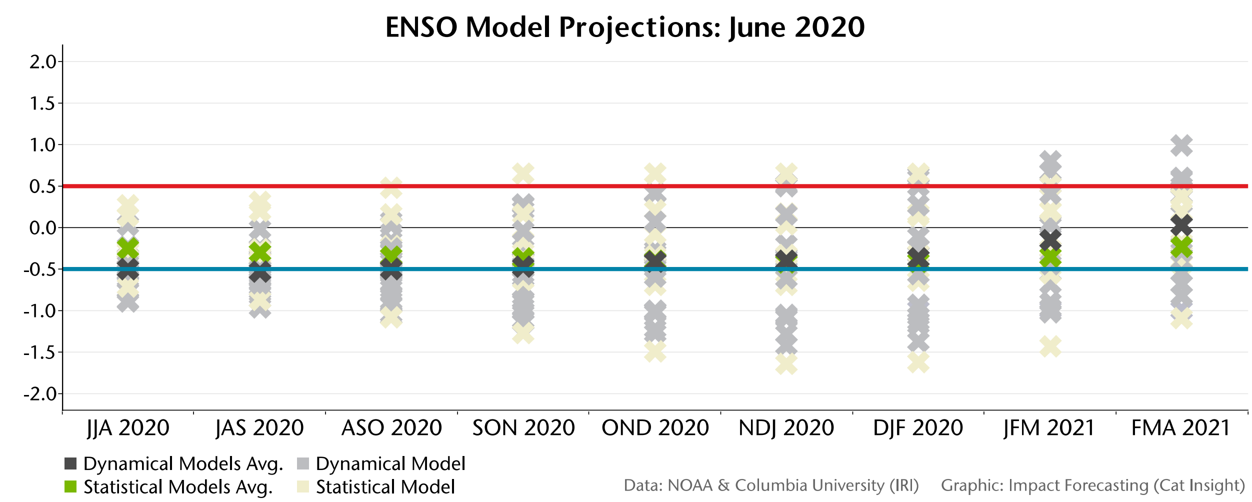
Location of Buoy	Temp (°C)	Departure from Last Year (°C)
Eastern Pacific Ocean (1,020 miles SW of San Salvador, El Salvador)	27.9	+0.1
Niño3.4 region (2°N latitude, 155°W longitude)	27.7	-1.5
Western Pacific Ocean (700 miles NNW of Honiara, Solomon Islands)	30.3	+0.6

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

El Niño-Southern Oscillation (ENSO)

ENSO-neutral conditions are currently present. NOAA notes that there is a roughly 60 percent chance of neutral conditions lingering through the Northern Hemisphere (boreal) summer months. The agency further states that there is a nearly equal chance (~40 to 50 percent) of a weak La Niña or ENSO neutral into the boreal autumn and winter (2020/21).





***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.*

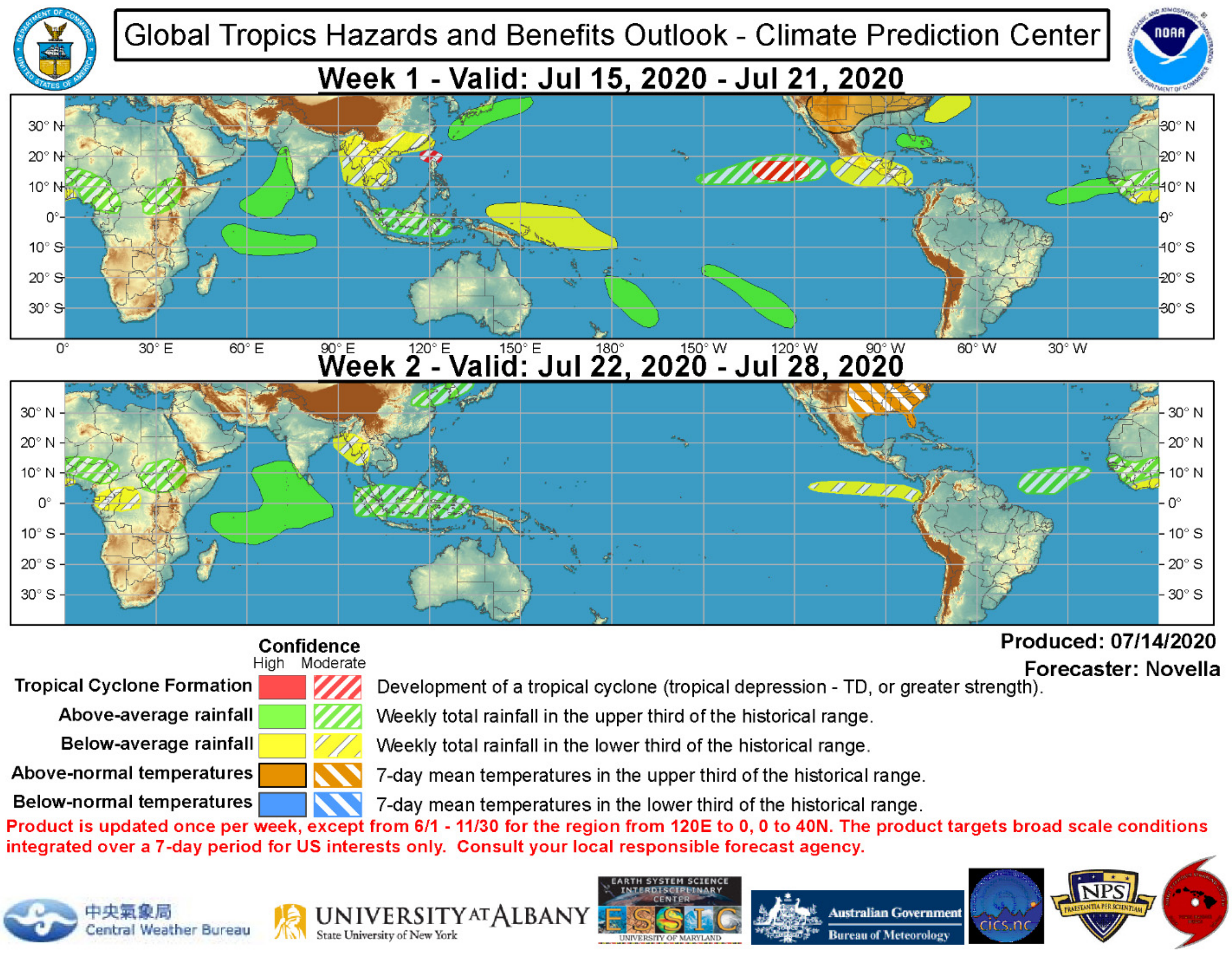
***La Niña** refers to the periodic cooling of sea-surface temperatures (-0.5°C) across the east-central equatorial Pacific. It represents the cold phase of the ENSO cycle.*

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.*

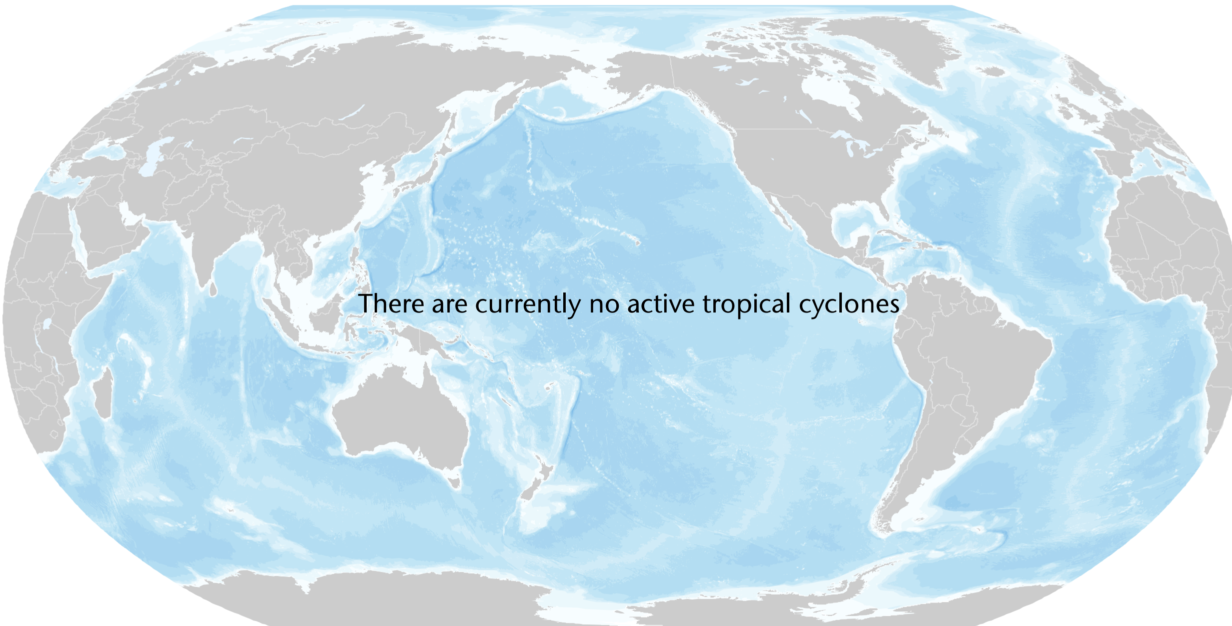
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

Global Tropics Outlook



Source: Climate Prediction Center

Current Tropical Systems



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

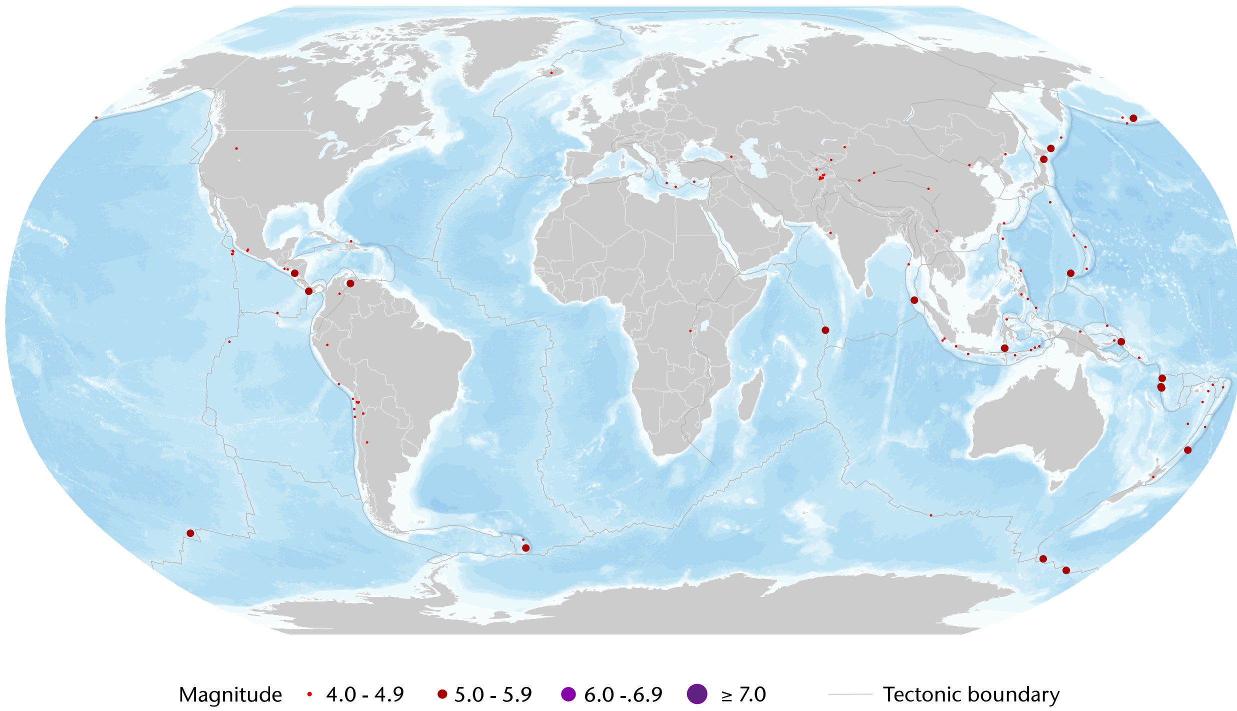
Location and Intensity Information

Name*	Location	Winds	Storm Reference from Land	Motion**

* TD = Tropical Depression, TS = Tropical Storm, HU = Hurricane, TY = Typhoon, STY = Super Typhoon, CY = Cyclone
01 ** 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): July 10 – 16

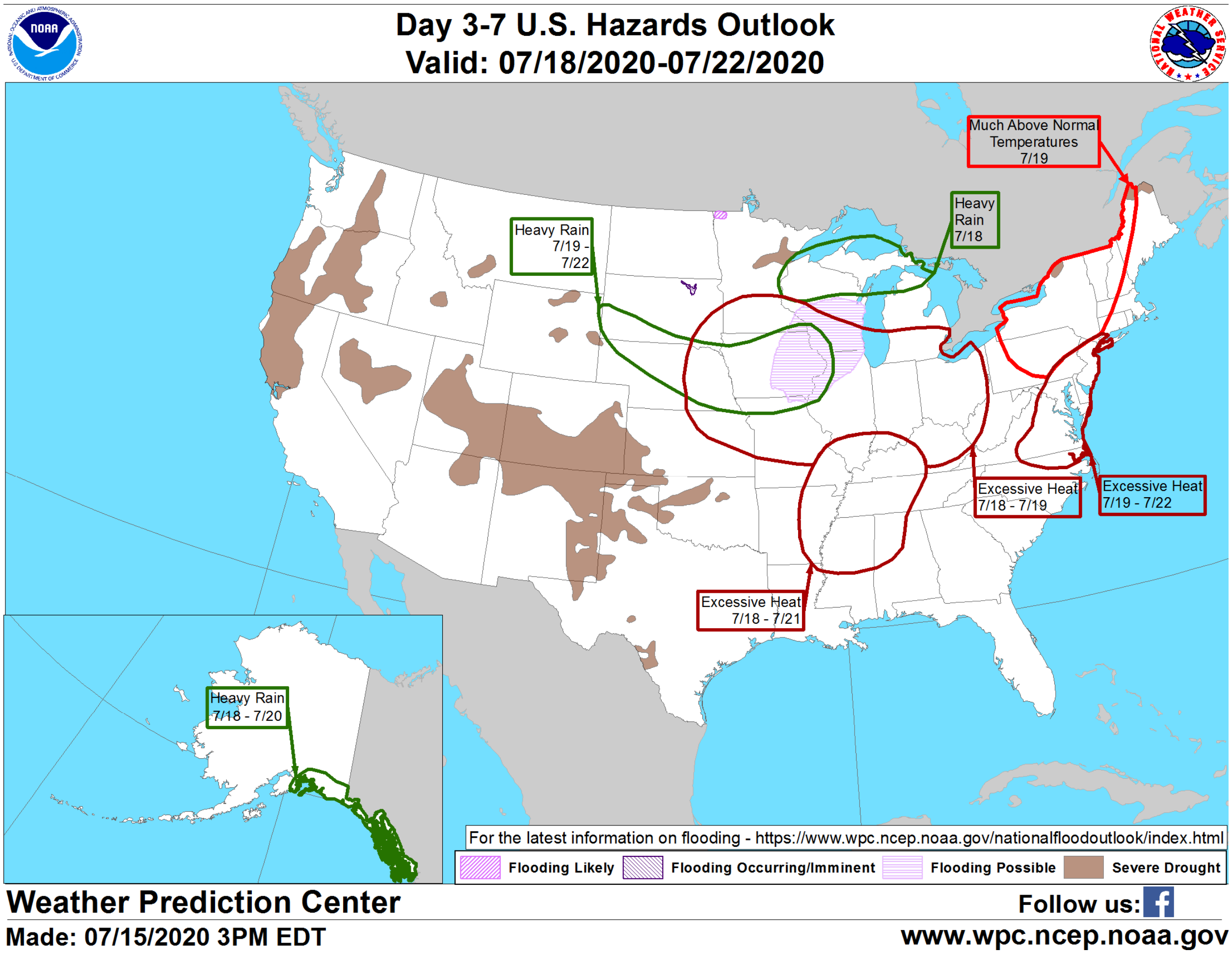


Significant EQ Location and Magnitude (≥M6.0) Information

Date (UTC)	Location	Magnitude	Depth	Epicenter

Source: United States Geological Survey

U.S. Weather Threat Outlook



Potential Threats

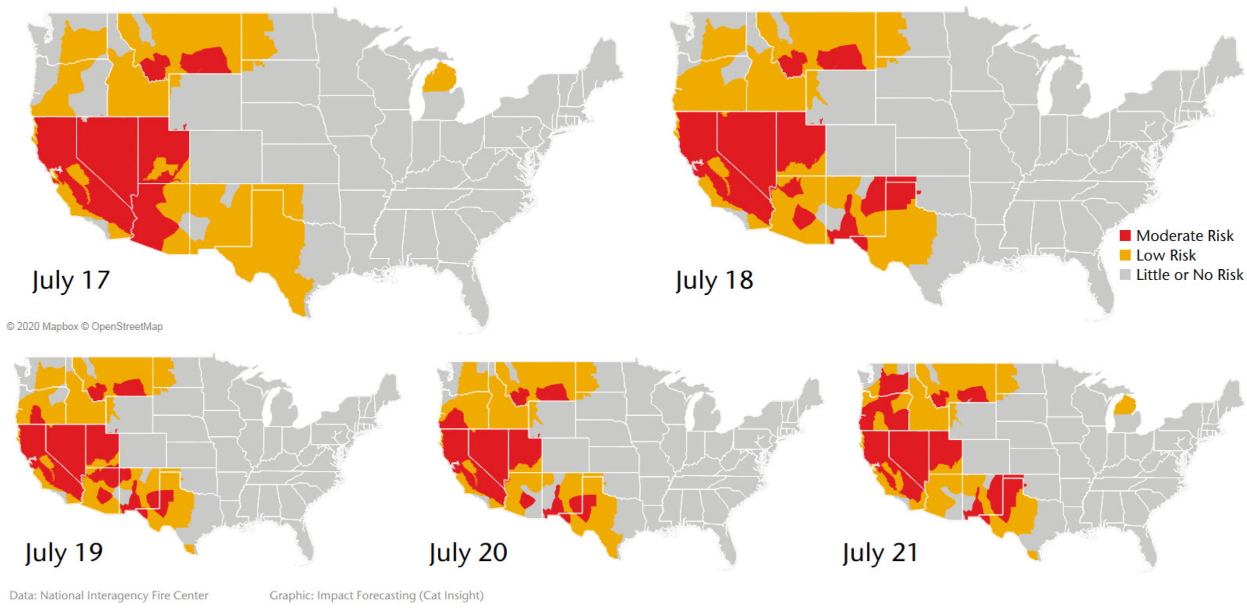
- The greatest threat in the short-range forecast continues to be prolonged heat. An expanding ridge of high-pressure will result in excessive heat and much above normal temperatures for the Central and Upper Mississippi Valley, spreading into the Mid-Atlantic and Northeast from July 18-22. Combined with high dewpoints, heat indices above 100°F are expected.

- A series of frontal boundaries associated with low pressure systems traversing the Canadian Prairies are anticipated to bring opportunities for convective activity, heavy rainfall, and possible flooding to the north-central United States. These systems will impact the Great Lakes on July 18, and the Central Plains between July 19-22.

- Severe drought continues to be a threat across portions of the Plains and Rockies, as well as regions along the Northern California and Oregon coasts, and the interior Northwest. Anticipated monsoonal flow across the Southwest has the potential to bring storms to some affected regions in the coming weeks.

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

The National Interagency Fire Center has highlighted an extended risk of elevated wildfire conditions across parts of the West, Desert Southwest, southern Plains, Midwest, and Northeast during the middle portion of July. An ongoing period of extreme heat persists across much of the United States. Such conditions will maintain the heightened chance of wildfire ignition, including due to dry lightning, as drought conditions will become more expansive.



Annual YTD Wildfire Comparison: July 16*

Year	Number of Fires	Acres Burned	Acres Burned Per Fire
2016	29,613	2,611,963	88.20
2017	34,586	4,371,693	126.40
2018	34,181	3,409,055	99.74
2019	23,054	2,191,960	95.08
2020	27,941	1,710,408	61.21
10-Year Average (2010-2019)	**31,070**	**3,122,501**	**100.50**

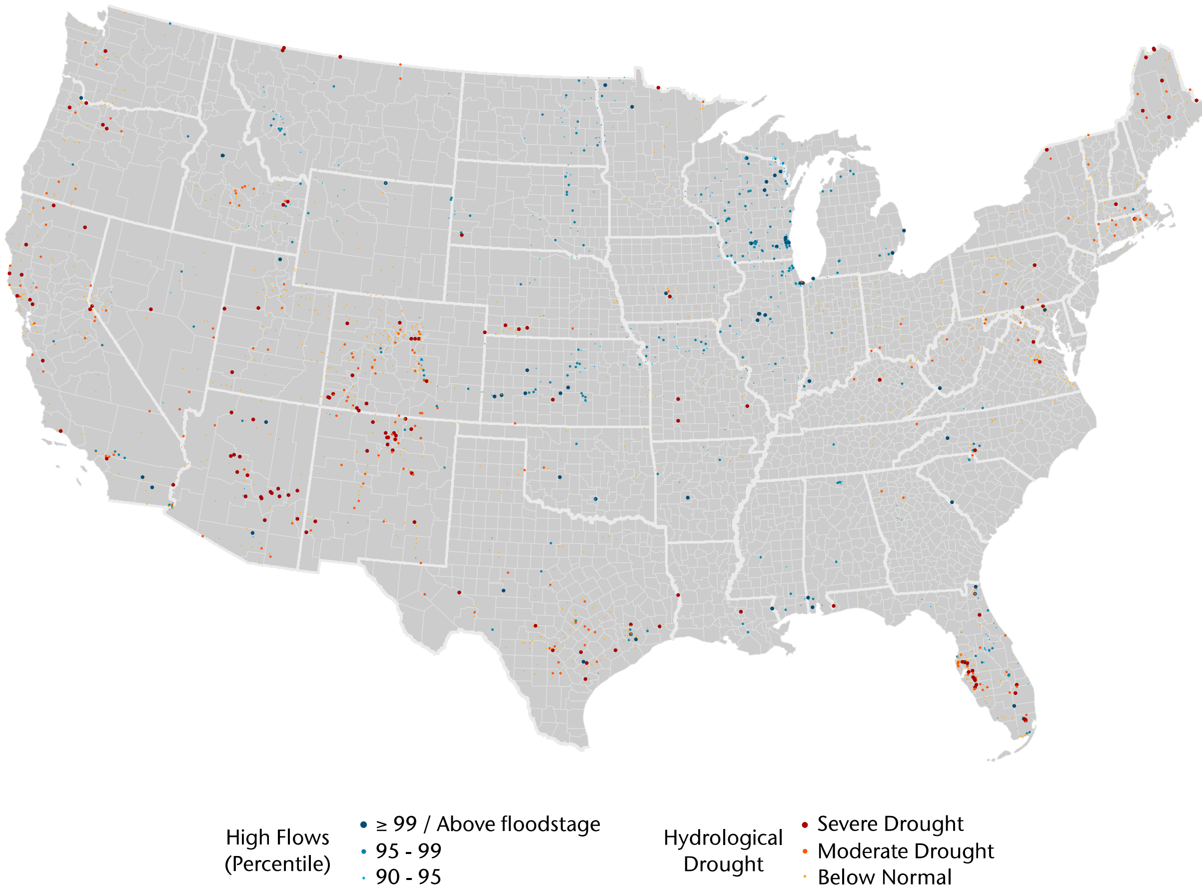
**Last available update from NIFC*
Source: National Interagency Fire Center

Top 5 Most Acres Burned by State: July 16

State	Number of Fires	Acres Burned	Acres Burned Per Fire
Arizona	1,300	573,418	441.09
Alaska	301	176,548	586.54
Utah	682	156,494	229.46
Nevada	339	147,935	436.39
Texas	2,382	127,750	53.63

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
Wisconsin River at Rothschild, Wisconsin	19.07	99.07
Wisconsin River at Wisconsin Rapids, Wisconsin	6.35	98.96
Embarrass River near Embarrass, Wisconsin	5.17	98.94
Eau Claire River at Kelly, Wisconsin	3.08	98.94
Black River at Neillsville, Wisconsin	9.10	98.79

Source: United States Geological Survey

Source Information

Extended heat wave aids more U.S. severe storms

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

Tropical Storm Fay

U.S National Weather Service
U.S Storm Prediction Center
U.S National Hurricane Center
Fay downgraded to post Tropical Storm after leaving damage behind in NYC, New York and New Jersey, ABC7
After deluging the northern Mid-Atlantic coast, Tropical Storm Fay heads inland and weakens, The Washington Post

Historical monsoon flooding ravaged Asia

Xinhua Headlines: China battles unprecedented floods around its largest freshwater lake, Xinhua
China has just contained the coronavirus. Now it's battling some of the worst floods in decades, CNN
Devastating China flooding puts controversial Three Gorges Dam under new scrutiny, FOX News
Flooding affects over 6.4 mln people in east China province, Xinhua
China floods: 'wartime' measures brought in to tackle worst deluge in decades, The Guardian
China on highest flood alert as 38m people evacuated, Nikkei News
China floods: Over 140 dead as Yangtze River bursts banks, DW
A third of Bangladesh underwater' after heavy rains, floods, Aljazeera
Abe assesses damage in Kumamoto, pledging ¥400 billion to aid flood-hit region, The Japan Times
PM Abe visits rain-hit Kumamoto to assess damage for recovery measures, Kyodo News
Nepal: 60 dead, 41 missing in floods, landslides, The Times of India
7 killed in season's first monsoon rain in Karachi, Gulf Times
Rain Emergency Imposed Amid Monsoon Arrived in Pakistan, Weekly Technology Times, Pakistan
As Pakistan glacier melt surges, efforts to cut flood risk drag, Pakistan Times
Ministry of Emergency Management, China
Chinese National Climate Center Climate System Monitoring, Diagnosis, Forecast, Evaluation
China Meteorological Agency (CMA)
Provincial Disaster Management Authority, Hubei
Flood Control and Drought Relief Headquarters, Hubei province
Japan Meteorological Agency (JMA)
Fire and Disaster Management Authority, Japan
India Meteorological Department (IMD)
National Disaster Management Agency, India
Karnataka State Natural Disaster Monitoring Centre (KSNDMC)
Pakistan Meteorological Department (PMD)
United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA)
National Disaster Risk Reduction and Management Authority, Nepal
Bangladesh Water Development Board
Flood Forecasting and Warning Centre, Bangladesh
Emergency Response Coordination Centre (ERCC)
Floodlist

Natural Catastrophes: In Brief

The rains wreaked havoc in 19 Colombian departments. El Tiempo
Defensa Civil, Rio Grande do Sul; Brazil
National Unit for Disaster Risk Management, Colombia
Floods kill 21 in South Sulawesi, forces more than 2,600 to evacuate as coronavirus worsens in Indonesia, ABC News
Indonesia flood death toll rises, dozens still missing, New Daily
Indonesian National Board for Disaster Management (BNPB)
Southern South Korea hit by devastating downpours, Yonhap News Agency
Korea Meteorological Administration (KMA)

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

About Aon

Aon plc (NYSE:AON) is a leading global professional services firm providing a broad range of risk, retirement and health solutions. Our 50,000 colleagues in 120 countries empower results for clients by using proprietary data and analytics to deliver insights that reduce volatility and improve performance.

Cat Alerts use publicly available data from the internet and other sources. Impact Forecasting® summarizes this publicly available information for the convenience of those individuals who have contacted Impact Forecasting® and expressed an interest in natural catastrophes of various types. To find out more about Impact Forecasting or to sign up for the Cat Reports, visit Impact Forecasting's webpage at impactforecasting.com.