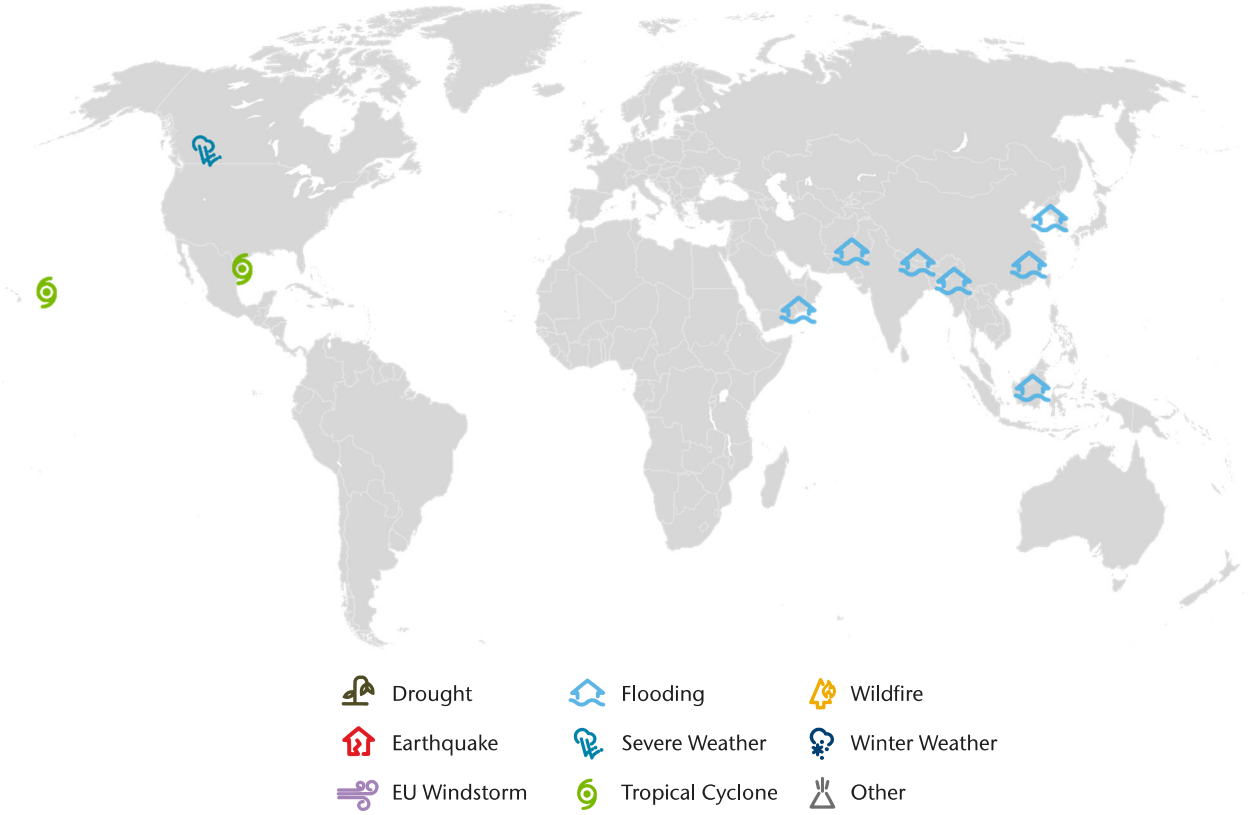
Weekly Cat Report

July 31, 2020

This Week's Natural Disaster Events



Event	Impacted Areas	Fatalities	Damaged Structures and/or Filed Claims	Preliminary Economic Loss (USD)*	Page
Hurricane Hanna	United States, Mexico	4+	Thousands	100s of Millions	3
Hurricane Douglas	United States	0	Negligible	Negligible	10
Severe Weather	Canada	0	Thousands	Millions	12
Flooding	China	158+	410,000+	25+ billion	14
Flooding	Bangladesh	119+	Thousands	100s of Millions	15
Flooding	India	1,054+	61,000+	1+ billion	15
Flooding	Pakistan	13+	Hundreds	Negligible	17
Flooding	Japan	0	Hundreds	Unknown	17
Flooding	South Korea	5+	Hundreds	Unknown	17
Flooding	Myanmar	0	Thousands	Unknown	17
Flooding	Indonesia	0	16,600+	Unknown	18
Flooding	Yemen	17+	Hundreds	Unknown	18

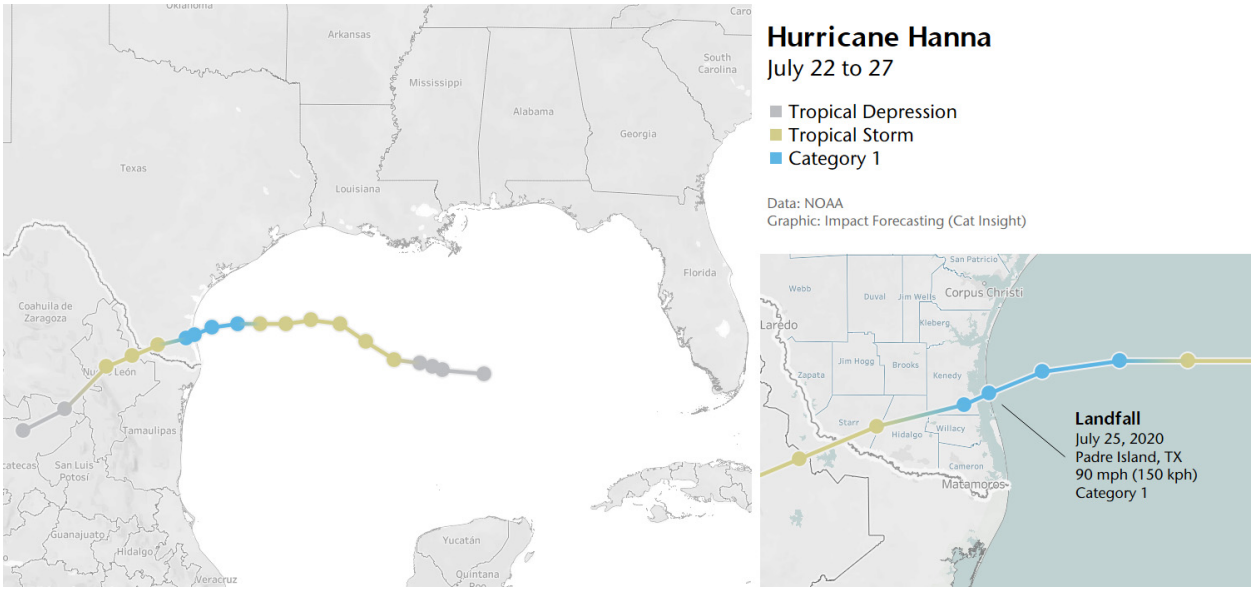
**Please note that these estimates are preliminary and subject to change. In some instances, initial estimates may be significantly adjusted as losses develop over time. This data is provided as an initial view of the potential financial impact from a recently completed or ongoing event based on early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

Hanna becomes first U.S. hurricane landfall of 2020

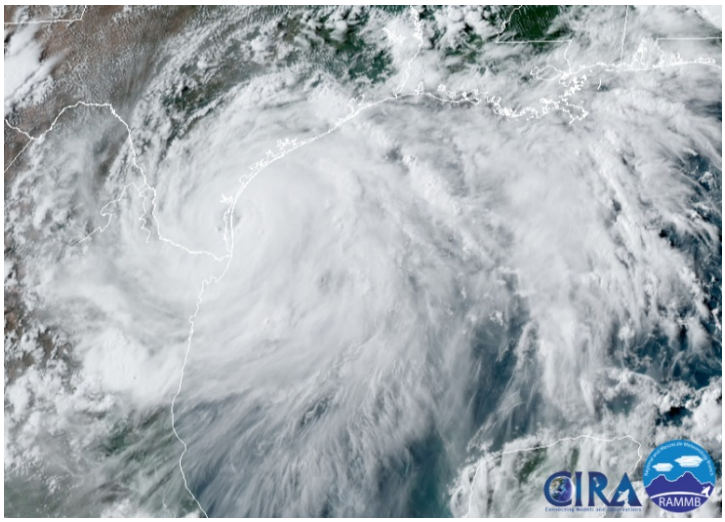
Hanna became the earliest 8th named "H" storm on record in the Atlantic Basin, in addition to the first hurricane of the 2020 Atlantic Season. The system rapidly intensified in the western Gulf of Mexico with maximum sustained wind speeds increasing by more than 35 mph (55 kph) during the 24-hour period prior to landfall. Hanna made landfall along the southern Texas Coast at 5:00 PM CDT (22:00 UTC) on July 25 as a high end a Category 1 hurricane on the Saffir-Simpson Hurricane Wind Scale, with sustained wind speeds of 90 mph (150 kph). Dangerous storm surge occurred along the Texas coastal bend, along with damaging winds and heavy rains that caused flash flooding spanning from the Rio Grande Valley of Texas into northern Mexico. Peak rainfall totals approached and exceeded 12 to 15 inches (300 to 400 millimeters). The total economic loss was minimally anticipated into the hundreds of millions (USD).

Meteorological Recap

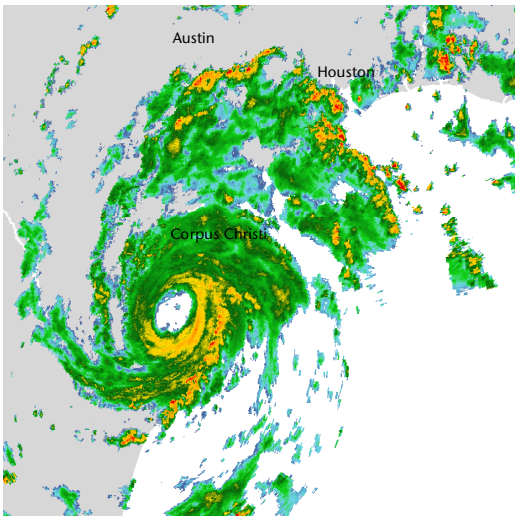


The National Hurricane Center (NHC) began monitoring a tropical wave in the southwest Atlantic on July 19 which produced a broad area of disorganized showers and storms over portions of the Caribbean as it proceeded toward the southeastern Gulf of Mexico by July 21. As the system better organized, advisories for Tropical Depression Eight began on July 22 at 10:00 PM CDT (July 23 at 3:00 UTC). The circulation tracked west-northwest on a trajectory toward the central Gulf of Mexico and ultimately the southern Texas coast, aided by the influence of a sub-tropical ridge anchored over the central United States. Gradual intensification of the storm occurred on July 23 due to favorable environment conditions, including anomalously warm Gulf waters and relatively light wind shear.

By 10:00 PM CDT on July 23 (3:00 on July 24 UTC) hurricane hunter aircraft confirmed the storm had strengthened into Tropical Storm Hanna with initial wind speeds of 40 mph (65 kph) located 385 miles (620 kilometers) east-southeast of Corpus Christi (Texas) and heading west-northwest at 7 mph (11 kph). Tropical Storm Hanna became the earliest 8th named "H" storm on record in the Atlantic Basin – the previous record was Harvey on August 3, 2005. Strengthening continued as Hanna churned toward the southern Texas coast and began to develop banding features over the eastern and southern portions of the circulation.



Satellite image of Hurricane Hanna making landfall in Texas
Source: NOAA/RAMMB

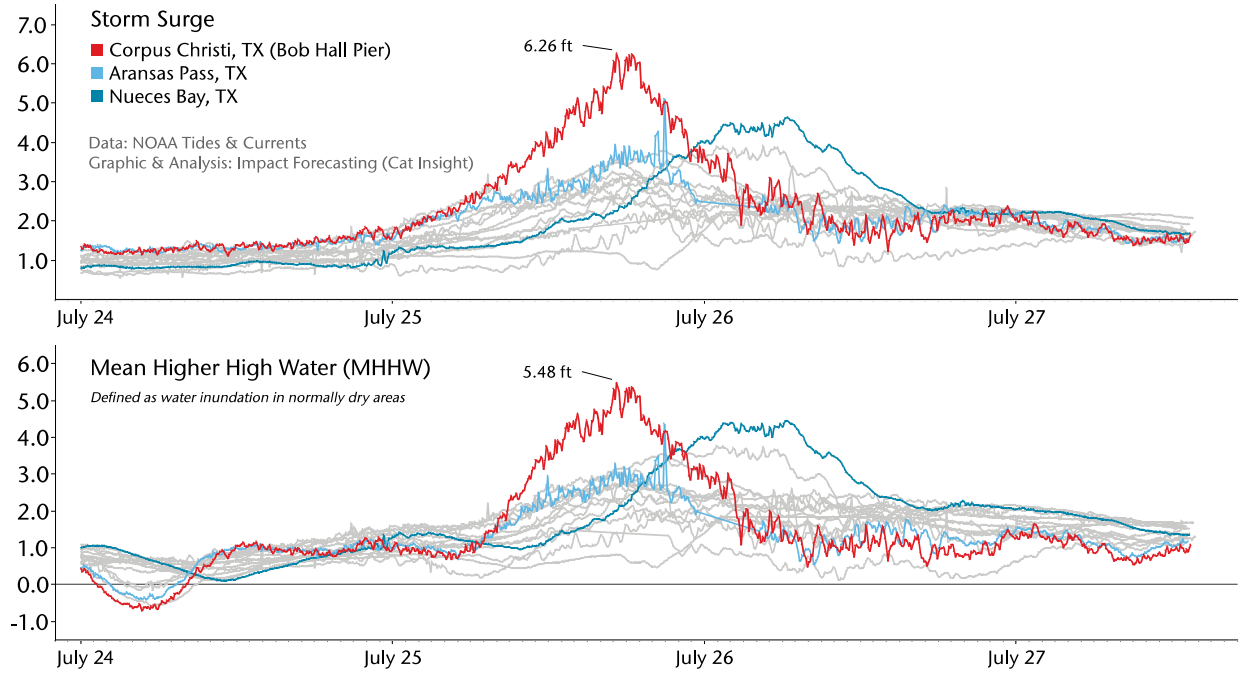


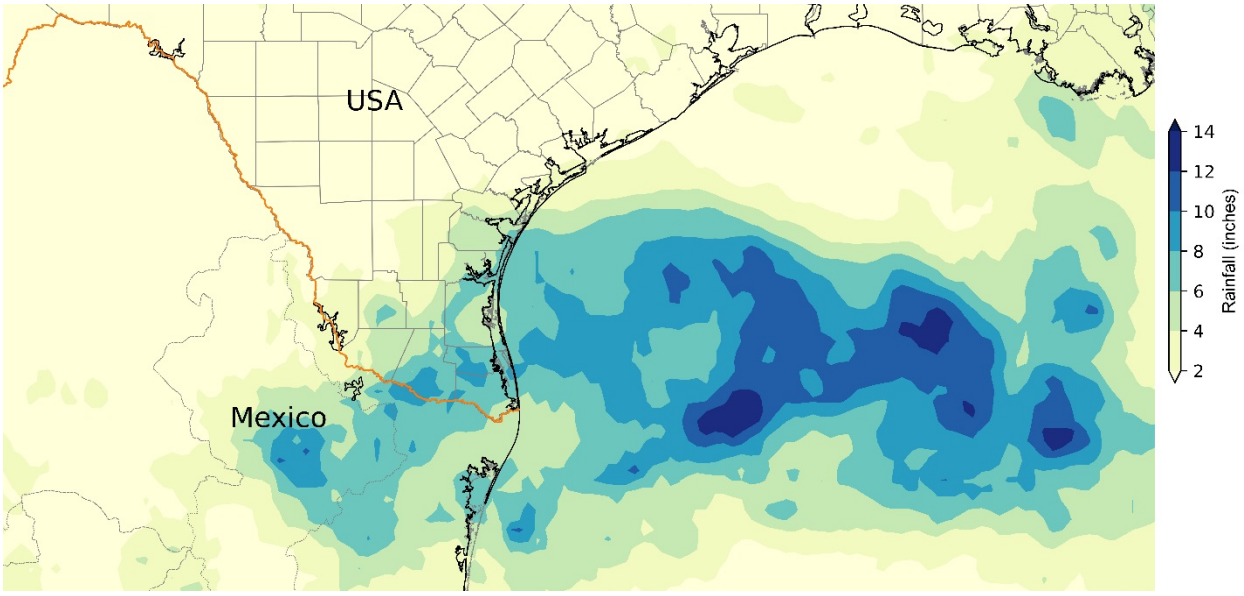
NEXRAD Radar composite of Hanna's landfall

Hanna was officially recognized as a hurricane on July 24 at 7:00 AM CDT (12:00 UTC) with maximum sustained winds of 75 mph (120 kph), equal to a Category 1 hurricane on the Saffir-Simpson Hurricane Wind Scale and becoming the first hurricane of the 2020 Atlantic Season. Hurricane Hanna was initially traveling west at 9 mph (15 kph) with a minimum pressure of 982 millibars. Storm Surge Warnings were posted from Port Mansfield to Sargent (Texas), with a Hurricane Warning for Port Mansfield to Mesquite Bay (Texas), and a Tropical Storm Warning for Barra el Mezquital (Mexico) to Port Mansfield (Texas) as well as Mesquite Bay to Sargent (Texas). Hurricane Hanna quickly developed a large well-defined closed eyewall appearance on radar imagery – with a diameter approaching 35 miles (55 kilometers), as environmental and oceanic conditions remained conducive for additional strengthening prior to landfall. The outer bands of Hanna were associated with heavy rains over portions of the central Gulf Coast.

On July 25, the eye of Hanna officially made landfall on the southern Texas Coast along Padre Island about 15 miles (20 kilometers) north of Port Mansfield at 5:00 PM CDT (22:00 UTC), as a Category 1 hurricane with maximum sustained winds of 90 mph (150 kph) and a minimum pressure of 973 millibars. Prior to landfall, Hanna qualified as a storm which had undergone rapid intensification, as winds increased by more than 35 mph (55 kph) during a 24-hour period. Shortly after the first landfall, Hanna made a second landfall at 6:15 PM CDT (23:15 UTC) in eastern Kenedy County (Texas), 15 miles (25 kilometers) north-northwest of Port Mansfield (Texas) with maximum sustained winds remaining at 90 mph (150 kph).

The greatest hazards associated with Hurricane Hanna were dangerous storm surge approaching 2 to 6 feet (0.6 to 1.8 meters), hurricane force sustained winds – with offshore gusts approaching and exceeding 100 mph (160 kph), and prolonged periods of heavy rainfall with maximum storm totals between 12 to 15 inches (300 to 400 millimeters), with locally higher amounts. The greatest initial impacts were observed in portions of southern Texas, particularly the flood prone Rio Grande Valley, as feeder bands continued to produce heavy rainfall through the evening hours on July 26. After landfall, Hanna progressed west-southwest, crossing the Rio Grande as a Tropical Storm, while rapidly weakening prior to dissipating over the rough terrain of northern Mexico on July 27. The greatest impacts in northern Mexico occurred in the states of Coahuila, Nuevo León, and Tamaulipas where the most affected regions reported storm total rainfalls exceeding 15 inches (400 millimeters).

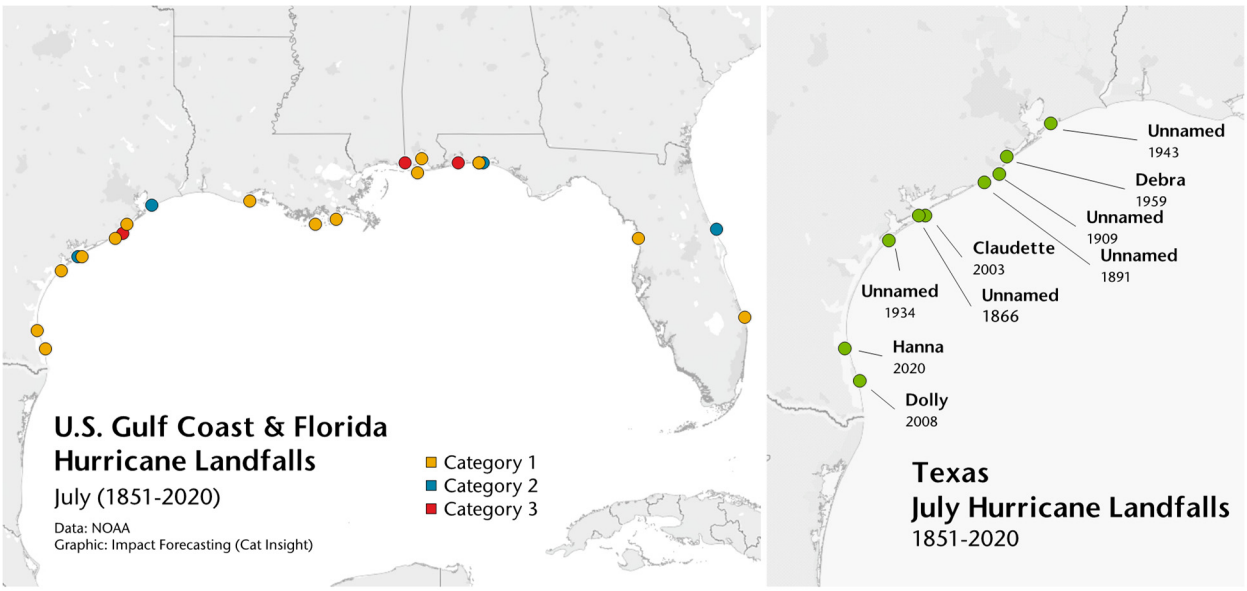




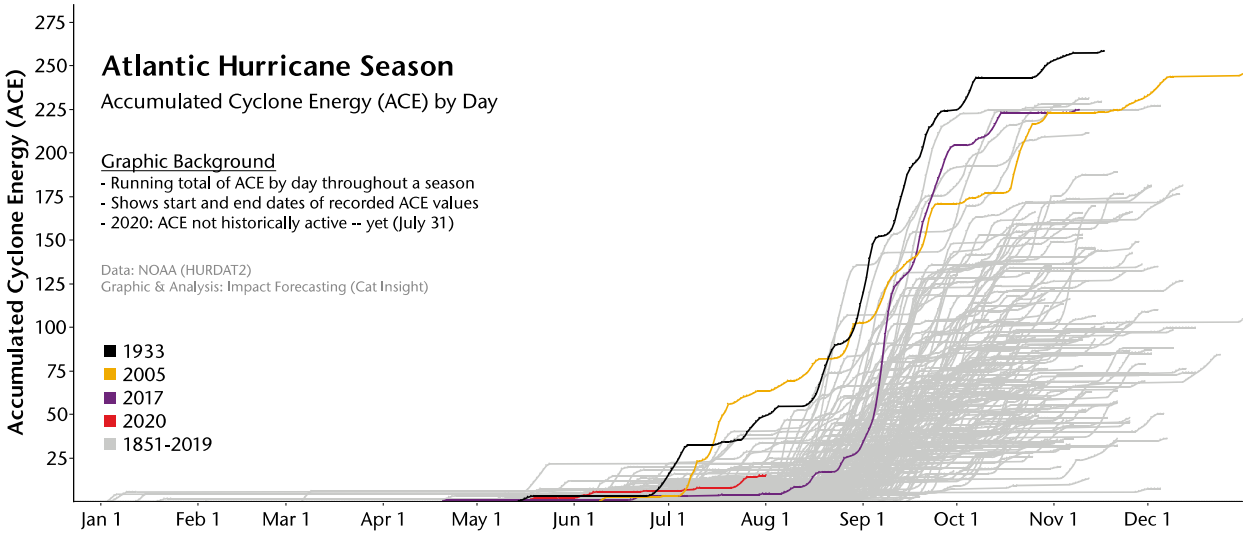
Hurricane Hanna's rainfall totals (July 23-27)
Data: NASA; Graphic & Analysis: Impact Forecasting (Cat Insight)

Miscellaneous

Hanna became the ninth officially recorded hurricane to make landfall in Texas during the month of July. Of the nine July landfalls recorded since 1851, seven were Category 1, two Category 2, and one Category 3 (Unnamed; 1909). Hurricane landfalls elsewhere across the Gulf Coast and Florida are also fairly rare in July. Texas leads with nine, followed by Florida (6), Louisiana (4), Alabama (2), and Mississippi (1). North Carolina (4) and South Carolina (3) are the lone July hurricane landfalls along the U.S. East Coast.



The 2020 Atlantic Hurricane Season continues its historically early start in terms of number of named storms. This has not yet translated to historic values of Accumulated Cyclone Energy (ACE) – which is a measure of storm and seasonal intensity and longevity. Hanna is the only hurricane of the eight named storms thus far, and the other seven storms were generally short-lived or weak tropical storm events. However, atmospheric and oceanic conditions are primed for a well-above average season during the peak development months of August, September, and October.



Event Details

United States (Texas)

Even though the center of Hanna struck in a sparsely populated region between Brownsville (Cameron County) and Corpus Christi (Nueces County), the storms far-reaching impacts left at least 194,000 customers across south Texas without power. In many instances power was not restored for several days. The governor of Texas issued a disaster declaration for 32 counties following the storm, while the Federal Emergency Management Agency (FEMA) approved additional federal emergency assistance. Voluntary evacuation orders were issued for several communities in Kleberg County, and officials urged anyone who needed to leave their homes for safety reasons to continue to consider public health guidelines related to the COVID-19 pandemic.

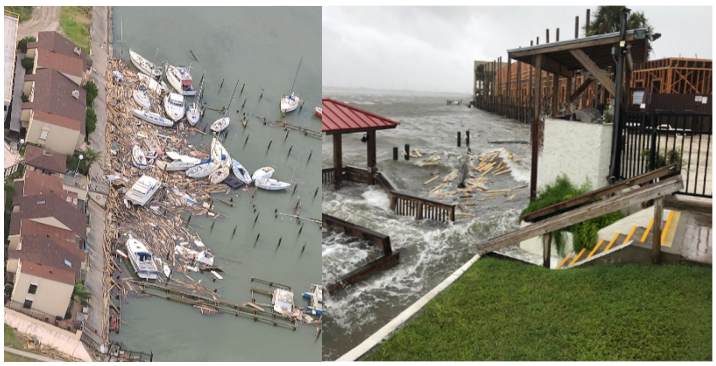
As Hanna approached landfall an offshore observation station at Rincon Del San Jose reported a wind gust of 103 mph (166 kph), while another east of Port Mansfield measured a gust of 87 mph (140 kph). Along the coast 60 to 80 mph (96 to 128 kph) wind gusts were common, with a station in Baffin Bay reporting an 81 mph (130 kph) gust as the storm approached. Many coastal locations experienced storm surges of 2 to 6 feet (0.6 to 1.8 meters). Notable tidal flooding was observed near Corpus Christi and Baffin Bay. Maximum storm surge at the Bob Hall Pier near Corpus Christi reached 6.26 feet (1.89 meters) on July 25.

Station	Wind Gust (mph)	Wind Gust (kph)
Rincon Del San Jose	103	165
Port Mansfield	87	140
Baffin Bay	81	130
Texas Agriscience	73	118
Laguna Shored	70	112
Corpus Christi	68	110
Aransas Pass	68	110
Corpus Christi NAS	66	106
Packery Channel	65	105

Station	Rainfall (in)	Rainfall (mm)
Mission	15.60	396
Sullivan City	14.56	370
Mission Northwest	13.60	345
Palmview	11.65	296
Harlingen	10.97	279
Falcon Lake	9.84	250
McAllen	9.14	232
Harlingen West	8.82	224
Mercedes	8.79	223
Santa Ana	8.68	220

Rainfall associated with Hanna was most intense across deep southern Texas and the Rio Grande Valley, where flash flooding was common. Incessant rains associated with the hurricane continued over portions of Texas for prolonged periods, as feeder bands continued to produce locally heavy rainfall through the evening hours on July 26. A station near Sullivan City (Hidalgo County) reported a 72-hour precipitation total of 14.56 inches (370 millimeters) ending the evening of July 27. Most notably, a station in Mission measured a 48-hour rainfall total of 15.60 inches (396 millimeters). On July 26, record daily maximum rainfall totals were exceeded at both McAllen Airport and Brownsville with daily measurements of 4.13 inches (105 millimeters) and 3.44 inches (87 millimeters) respectively.

Flooding in the Rio Grande Valley on July 28.
Source: Texas Governor/Greg Abbott



Marina del Sol (left) and Mustang Island (right) Corpus Christi.
Source: Brandi Rae Merritt, Kaleb Krejcarek, NWS

In Matagorda County, storm surge breached sand dunes at Sargent Beach flooding and washing debris onto local roadways. Education Pier sustained moderate damaged from the rough waters. In Nueces County, significant impacts were observed in Corpus Christi where both the Lawrence Street and Peoples Street T-heads in addition to North Beach were inundated by storm surge. Storm debris and floodwaters covered local roadways, particularly where seawalls were breached – including minor impacts to the Art Museum of South Texas, and the Texas State Aquarium. On Padre Island, the Bob Hall Pier sustained major damage and the end portion collapsed into the rough seas. Damage was also noted at Harbor Del Sol Marina where portions of the pier were destroyed, and several boats submerged. Along the shores of Baffin Bay (Kenedy and Kleberg Counties), storm surge and strong wind led to induration of surrounding areas and substantial damage to private piers and docks. In Willacy County, high winds blew shingles and roofs off coastal homes near Port Mansfield.

The most substantial flooding impacts occurred across regions of Jim Hogg, Zapata, Star, Hidalgo, Willacy and Cameron Counties. In Cameron County, officials reported at least three water rescues in La Feria. An EF0 tornado was reported in Brownsville, with maximum estimated wind speeds between 70 to 75 mph (112 to 120 kph), resulting in damage to hangars and a garage at the Brownsville Airport. The damage survey also reported two homes with notable roofing impacts.

In Hidalgo County, the City of Mission was particularly hard hit with significant flash flooding resulting in the National Weather Service (NWS) issuing a Flash Flood Emergency. The city reported multiple water rescues and widespread damage. On July 27, at least 120 residents were evacuated due to continued flooding. Notable flooding impacts along with a Flash Flood Emergency also occurred in the nearby city of McAllen. To the north, high winds tore a portion of a roof from a funeral home in Edinburg. Further east, in Mercedes, entire neighborhoods including numerous homes, structures, roadways, and vehicles were inundated by floodwaters. Portions of at least 32 roadways throughout the county were impacted according to transportation officials.

Mexico

The greatest hazards from Hanna in northern Mexico were heavy rainfall leading to flash flooding, with the most notable impacts occurring in portions of Coahuila, Nuevo León, and Tamaulipas. Five-day precipitation totals from the Servicio Meteorológico Nacional in Mexico between July 23-27 reported a maximum measurement of 557 millimeters (22 inches) from the Observatorio de Nuevo León, with 434 millimeters (17.1 inches) measured at Cadereyta, and 418 millimeters (16.4 inches) at El Canadá, all three stations are in Nuevo León.

In Nuevo León, prolonged periods of heavy rainfall flooded the streets of Monterrey, the capital city, while rising waters led to the temporary closure of a main highway linking Monterrey with Reynosa (Tamaulipas). Multiple rescues were performed for stranded motorists, in addition to people swept away by flood waters. Inundation on several roadways approached one meter (3.2 feet). Wind gusts of 80 kph (50 mph) were measured in the metropolitan area, resulting in impact to trees and billboards, as well as minor exterior damage to the Doctors Hospital.

In Tamaulipas, a maternity hospital was damaged due to heavy rains in the Mexican border city of Reynosa, where several patients had to be moved and others evacuated. According to officials, at least 45 neighborhoods in Reynosa were impacted by Hanna, leaving 200 residents displaced. In the City of Matamoros, tents at refugee camp housing an estimated 1,300 asylum seekers sustained damage. At least two storm related fatalities were reported in the state.

In Coahuila, a mother and her daughter were killed after their vehicle was swept away by strong currents resulting from the heavy rainfall. The governor reported at least 268 flooded homes in the state, along with damage to portions of the Saltillo to Monterrey highway.

Financial Loss

With damage assessments still ongoing across southern Texas and northern Mexico, it remains too preliminary to provide an economic or insured loss estimate at this time. Given the wind impacts, and the even more notable prolonged inland flooding and coastal storm surge impacts, it is safely assumed that the economic costs will reach into the hundreds of millions (USD).

Hurricane Dolly (2008) struck a similar portion of southern Texas and northern Mexico and left an economic tally of USD1.8 billion (2020 USD). Public and private insurance entities covered roughly USD650 million of that total.

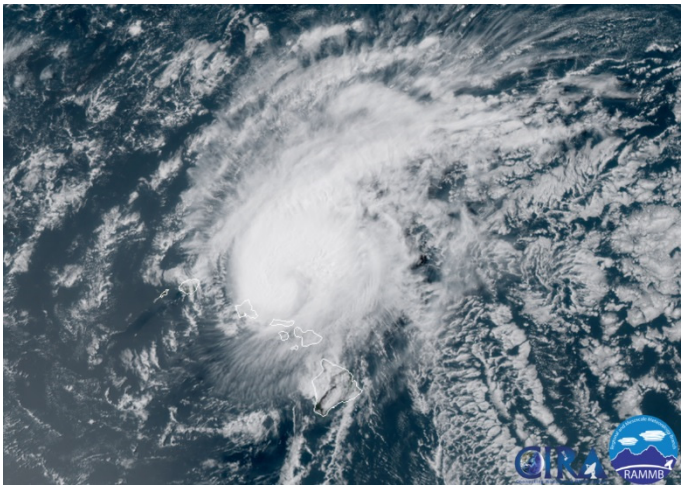
Hurricane Douglas narrowly misses Hawaii landfall

Hurricane Douglas, the first hurricane of the 2020 Eastern Pacific season, reached maximum intensity over the open waters of the Pacific Ocean on July 23 with wind speeds of 130 mph (215 kph) – equal to a Category 3 hurricane on the Saffir-Simpson Hurricane Wind Scale. The storm steadily weakened by July 26 as it narrowly passed the Hawaiian Islands with maximum wind speeds of 90 mph (150 kph). Spared a direct hit from the powerful storm, the main island chain only experienced minimal impacts from Douglas, as its outer bands brought gusty winds and locally heavy rainfall. Total losses will be negligible.

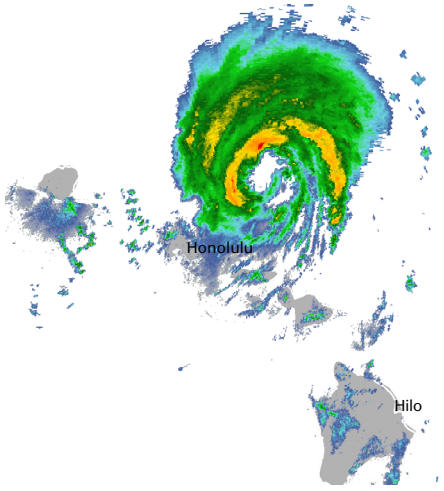
Meteorological Recap

Hurricane Douglas began as a tropical wave in the Eastern Pacific, well to the southwest of the southern tip of Baja California on July 19. As the area of showers and thunderstorms associated with the wave became better organized, Tropical Depression Eight-E was recognized by the National Hurricane Center (NHC) on July 20 at 5:00 AM HST (15:00 UTC) and upgraded shortly after to Tropical Storm Douglas at 5:00 PM HST (3:00 UTC July 21), with maximum sustained winds of 65 mph (100 kph). Influenced by a ridge to the north, Tropical Storm Douglas remained on a generally western track as intensification continued due to low vertical wind shear, ample moisture, and favorable sea surface temperatures. By 5:00 AM HST (15:00 UTC) on July 22 Douglas became the first hurricane of the 2020 Eastern Pacific season, as maximum wind speeds reached 75 mph (120 kph) – this is the 4th latest date on which the first hurricane of the season has formed. Now exhibiting a discernable eye, Douglas rapidly intensified becoming a major hurricane by 11:00 PM HST (9:00 UTC July 23) with maximum wind speeds of 120 mph (195 kph) - equal to a Category 3 hurricane on the Saffir-Simpson Hurricane Wind Scale.

After reaching a peak intensity of 130 mph (215 kph) over the open Pacific in the afternoon on July 23, Douglas remained in a steady state for a brief period while continuing west-northwest toward the Hawaiian Islands – remaining under the influence of the large ridge over the eastern and central Pacific. Despite gradual weakening between July 24-25 as the circulation passed over a region with relatively cooler sea surface temperatures and enhanced vertical wind shear, Douglas persisted as a powerful hurricane. However, this disruption allowed Douglas's eye to become cloud filled on satellite imagery. By the morning of July 26, Douglas neared the Hawaiian Islands with a maximum intensity of 90 mph (150 kph), equal to a Category 1 hurricane on the Saffir-Simpson Hurricane Wind Scale.



Satellite image of Hurricane Douglas passing north of Hawaii
Source: NOAA/RAMMB



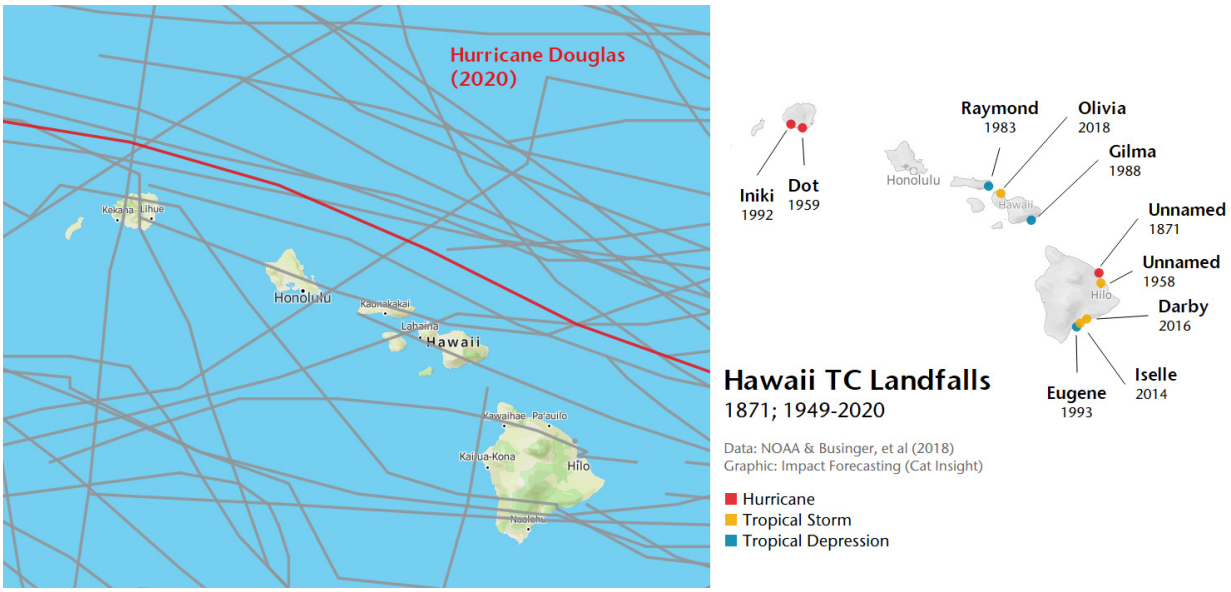
NEXRAD Radar composite of Hurricane Douglas passing north of Oahu

With a slight northward shift in its track, the center of Douglas passed dangerously close to the Hawaiian Islands on July 26, while avoiding a direct impact. Fortunately, the Islands only experienced minimal affects from Douglas, mainly resulting from gusty winds and locally heavy rainfall present in the outer bands of the storm. Direct hurricane landfalls on the Hawaiian Islands are considerably rare, with only three previously recorded, of which two were in the modern era. The most recent being Hurricane Iniki in September 1992, which made landfall on Kauai as a Category 4 hurricane – becoming the costliest hurricane in Hawaiian state history.

By the morning of July 27, having passed the main Hawaiian Island chain, Douglas, situated between a ridge to the east and a trough to the west remained steady as it impacted portions of the Papahanaumokuakea Marine National Monument.

Miscellaneous

As mentioned previously, hurricane landfalls in Hawaii are quite rare. Only three known and officially recorded hurricanes have struck the archipelago: Iniki (1992), Dot (1959), and Unnamed (1871). A handful of additional tropical storms have struck, including: Olivia (2018), Darby (2016), Iselle (2014), and Unnamed (1958). The official NOAA dataset extends to 1949, though a 2018 academic paper discovered and reanalyzed a Category 3 landfall on the Big Island in 1871.



Event Details

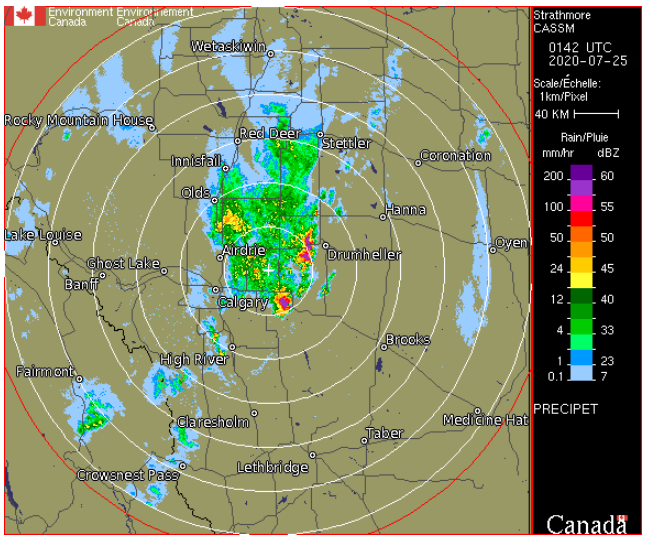
As Hurricane Douglas passed north of Hawaii the main island chain was spared a direct hit and significant impacts from the storm. Data from the National Weather Service (NWS) indicates that sustained tropical storm force winds were within 10 miles of the northern tip of Oahu during the closest approach of Douglas. Strong wind gusts were measured in multiple locations across the island chain. In Hawaii County, a 70 mph (112 kph) gust was reported at Nene Cabin, while a 69 mph (111 kph) gust was measured in Maui County near Kula. Maximum 24-hour rainfall totals from Douglas reached 5.16 inches (131.1 centimeters) in Maui County near Puu Kukui, with 3.69 inches (93.7 centimeters) measured at Kapahi in Kauai County. Minor transportation impacts were reported on the islands of Molokai, Maui, and Oahu as several inches of flood water, debris, and sand briefly blocked local roadways. The total economic and insured loss impact from Hurricane Douglas were each expected to be negligible.

Severe storms impact Canadian Prairies, Calgary

An upper-level trough advancing eastward across the western Canadian Rockies combined with a ridge of high pressure building to its east, allowed for several days of unsettled weather across the Prairies between July 22-24. Regions of central and southern Alberta were notably impacted by storm clusters and supercell thunderstorms throughout this period brining multiple rounds of strong winds, heavy rainfall, and large hail. Storms were particularly impactful near Calgary, where multiple localities were affected by significant severe weather on two consecutive days, July 23 and 24. Most notably, a large cell impacting the southeastern portion of the City on July 24 produced severe and damaging hail resulting in substantial impacts. Total economic and insured losses were likely to reach well into the millions (USD).

Meteorological Recap

Seasonably warm temperatures associated with a sizeable ridge building across the Canadian Prairies, aided in producing several days of severe weather ahead of an approaching upper-level trough. On July 23, a severe storm which impacted the town of Lamont, northeast of Edmonton, brought damaging straight-line winds approaching 130 kph (80 mph), along with small hail, and heavy downpours. Further south, several rounds of storms moved across the Calgary Metropolitan Region producing sizable hail and flooding rainfall – where 24.5 millimeters (0.96 inches) were measured. Environment and Climate Change Canada (ECCC) issued a Tornado Warning for one of the supercells, which resulted in a confirmed funnel cloud and gustnado.



Severe cells merging east of Calgary on July 24 (July 25 UTC)

Two notable severe cells impacted the Calgary region again on July 24. One of the cells tracked through the southeastern portion of the metro region, while the second initiated north of the City, toward Airdire. Hailstones approaching the size of tennis balls, 6.4 centimeters (2.5 inches) were reported with the cell tracking across southeastern Calgary. The two severe cells merged as they propagated eastward toward Drumheller, where 28.4 millimeters (1.12 inches) of rainfall, along with wind gusts reaching 93 kph (58 mph) were reported.

Event Details


Hailstone southeast of Calgary on July 24
Source: Kyle Brittain @KyleTWN

The rotating storm which passed over Lamont on July 23 brought reports of power outages along with notable damage to trees and buildings, which resulted primarily from straight-line winds. Nearby in Edmonton, inundated roadways as well as flooding at several commercial buildings were reported. Further south, Calgary was impacted by hailstones ranging from pea to ping-pong ball (3.5 centimeters, 1.5 inches) in size.

On July 24, the severe storms brought significant hail impacts across southeast Calgary, as widespread instances of hailstones ranging from 2.5 to 5.1 centimeters (1.0 to 2.0 inches) were observed, with the largest hailstones reaching 6.4 centimeters (2.5 inches). The hail was responsible for extensive damage to structures and vehicles, including roofing and siding, as well as dents and broken windshields. Numerous occurrences of damage to crops, gardens, and vegetation were also reported. Localized heavy rainfall led to minor transportation impacts which included flooded roadways across portions of Calgary and Drumheller. Northwest of Calgary, three campers were injured when the storms caused a tree to fall on their tent.

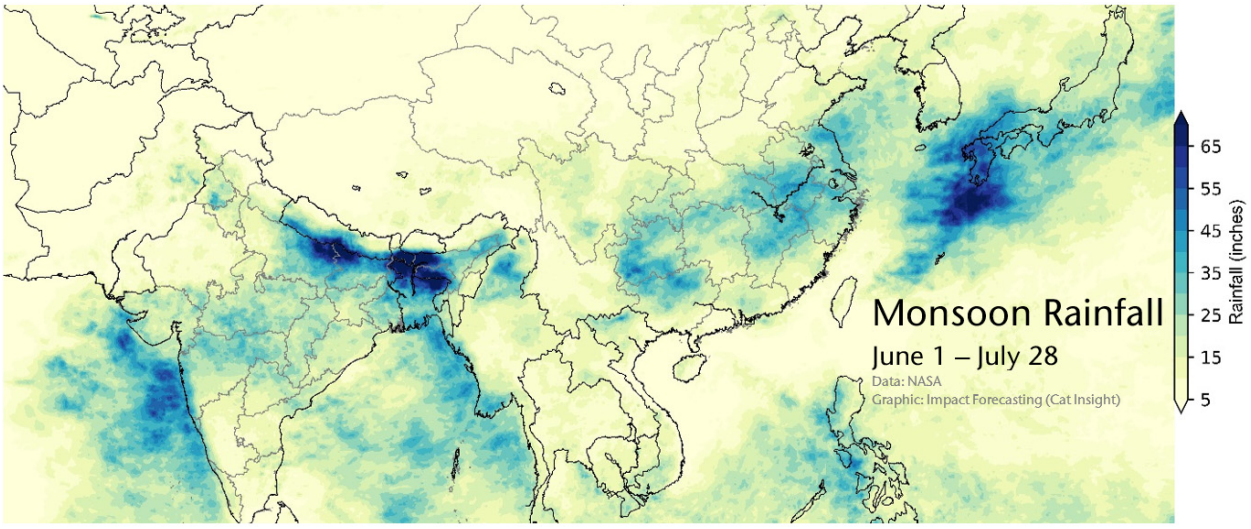
Financial Loss

The hailstorm which impacted Calgary on July 24 will add to what has already been an active and costly hail season for Canadian insurers. It comes just over a month after an historic hailstorm hit the city on June 13, becoming the costliest hailstorm on record for Canada. The total economic loss from the severe weather between July 22-24 was anticipated to reach well into the millions (USD).

Update: Monsoon flooding in Asia

Seasonal monsoon rainfall continued to affect parts of East and South Asia this week as more physical damage and financial implications were noted in at least seven countries, with China, India, Bangladesh, and Japan among the worst-hit. Major rivers across these Asian countries broke their banks, causing widespread inundation to at least a half-million homes and other properties. According to the latest combined tally provided by federal government agencies, more than 1,500 people have died and nearly 70 million people directly affected during the current flood season in Asia. Total combined economic losses due to flooding were already estimated beyond USD25 billion on the continent since June 1.

Meteorological Recap



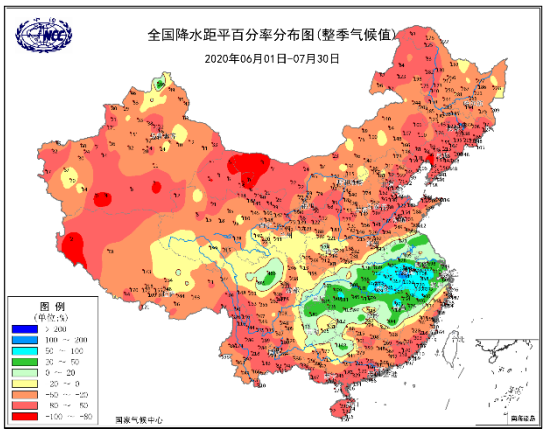
For a complete recap of the meteorological conditions which have evolved from the current monsoon season, users are encouraged to review previous Weekly Cat Reports. The below is a quick summary of the meteorological background of the ongoing event.

Torrential rainfall associated with the East Asian rainy season, colloquially known as Mei-yu or Plum rains, were initially concentrated in southeastern China from June 1-15, according to the China Meteorological Administration. Notable precipitation was recorded in southern and southwestern China, along with the provinces among the Yangtze River Basin. After a gradual poleward shift of the monsoon rain-belt, the rainy season started in the Sichuan, Hubei, and Hunan provinces in central China and Shanghai and Jiangsu province in eastern China. Since July 1, the rainfall along the Mei-yu front was located along its eastern parts, affecting the central and eastern Chinese provinces, particularly the Hubei and Anhui provinces – and also into southern Japan. By July 24, the monsoon rains along the Mei-yu front further shifted eastward, affecting more of the Japan archipelago and South Korea.

Since the arrival of monsoon across South Asia on June 1, heavy rainfall affected nearly 15 states in the Indian subcontinent along with neighboring nations. The monsoon rainfall exhibited oscillations in both zonal and meridional directions, causing widespread inundation damage in India, Nepal, Pakistan, Myanmar, and Bangladesh since the onset of rainy season over South Asia.

Event Details

China



The Yangtze River Basin in China is currently experiencing one of its worst flooding episodes in decades. Heavy monsoon rains continued to affect provinces in central, eastern, and southwestern parts of China since July 24. Among the hardest-hit areas came in Chongqing municipality. One recent stretch of heavy rains from July 26-30 caused significant inundation throughout the upper reaches of Yangtze River in southwestern China, which also included parts of Anhui and Hubei provinces. This was the third episode of flooding in Chongqing, and the deluge was noted to be the worst since the start of the yearly flood season. According to the Changjiang Water Resources Commission, Ministry of Water Resources of China, the water level in Cuntan hydrologic station rose to 1.5 meters (5 feet) above the flood warning level. Flooding in the Jialing River – a tributary of the Yangtze – saw its heaviest flooding this year, resulting in inundating the ancient town of Ciqikou and Chaotianmen Square. Recent rains in Chongqing claimed four additional lives. Several emergencies were reported across the affected areas and no fewer than 4,500 people were evacuated by local flood control authorities. Nearly 750 homes collapsed, and thousands of houses sustained damage to various degrees.

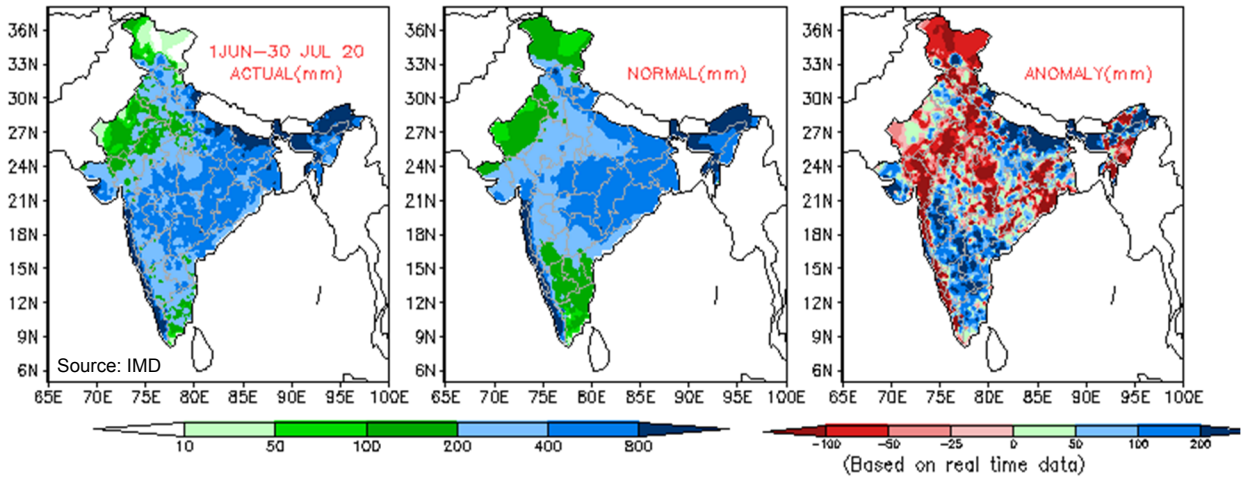
According to the Ministry of Emergency Management (MEM), floods affected around 55 million people in 27 provincial-level regions since the arrival of East Asian monsoon. Government estimates noted 158 casualties, and that 3.8 million people had been relocated. Hundreds of river locations swelled to above the flood stage, causing widespread damage to infrastructure and agricultural land. MEM cited that 410,000 homes were either damaged or destroyed, and a vast area of agricultural land – 5.2 million hectares (13 million acres) – submerged underwater. The direct economic losses were estimated at CNY144.5 billion (USD21 billion); most of which has been incurred during the month of July. A significant proportion of these combined losses were anticipated to be uninsured, given the continued low insurance penetration in China. With more rain in the forecast, more physical and fiscal impacts were likely.

Bangladesh

Heavy monsoon precipitation since June 15 has led to flooding and landslides in 31 districts in northern, northeastern, and southeastern Bangladesh. According to the Flood Forecasting & Warning Centre, Bangladesh, monsoon rains prompted swelling of the Brahmaputra River along with several other smaller rivers at hundreds of locations, causing widespread inundation damage to hundreds of thousands of houses, businesses, roads, bridges. Vast areas of cropland were also affected. The National Disaster Response Coordination Center (NDRCC), Bangladesh, cited that flooding had affected nearly 5 million people to date, and no fewer than one million residents living in the poor-quality houses were displaced. Road communication was interrupted due to heavy waterlogging across Bangladesh, isolating several sub-districts and affecting the rescue operations and restoration works by disaster authorities. Communication in large areas were knocked out and residents suffered a shortage of drinking water. As many as 119 people have died thus far.

India

Monsoon rains continued to affect the northern and northeastern parts of India, particularly the states of Bihar, Uttar Pradesh, West Bengal, Assam, and Kerala. According to the latest information by Disaster Management Division, Ministry of Home Affairs, India, the Ganga River and its tributaries along with several other small- and medium-sized rivers swelled to above the severe flood warning levels at more than 23 locations in 10 districts across Bihar, causing widespread inundation damage in more than 700 villages. An estimated 1.7 million people were affected. In Uttar Pradesh, at least 11 districts had been affected from July 24-30 and three people were killed. Recent rounds of heavy rains have inundated more than 50 villages. Heavy rains since July 24 enhanced the flooding situation in the state of West Bengal along with northeastern states in India. According to the Assam State Disaster Management Authority (ASDMA), recent rounds of rains have claimed 49 fatalities in Assam (4) and West Bengal (45).



According to the latest information by the National Disaster Management Authority, India, as many as 11 million people in 10,000 villages were directly affected during the current monsoon season. The table below includes latest seasonal statistics provided by the Disaster Management Division, Ministry of Home Affairs, India. Note: An additional 333 casualties were reported in lightning-related incidents.

State	Fatalities	Population Affected	Damaged Structures	Crop Area (Acres)
Assam	133	5,671,000	39,494	638,300
West Bengal	196	199,000	11,404	N/A
Karnataka	73	520	3,709	99,000
Meghalaya	12	1,613,000	2,319	4,500
Gujarat	85	2,800	1,122	N/A
Nagaland	8	3,500	995	188
Kerala	26	150	529	N/A
Uttar Pradesh	3	143,000	366	5,500
Arunachal Pradesh	16	37,000	333	34,000
Madhya Pradesh	55	N/A	227	N/A
Uttarakhand	37	N/A	221	N/A
Chhattisgarh	15	N/A	214	N/A
Punjab	6	N/A	182	13,220
Maharashtra	48	N/A	N/A	N/A
Bihar	8	3,386,000	N/A	N/A
Total	**721**	**11,055,376**	**61,115**	**794,431**

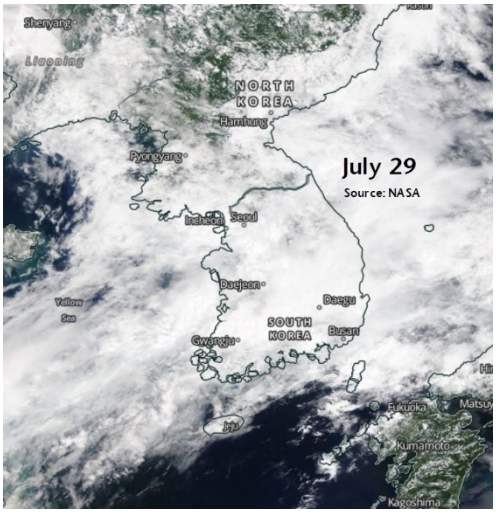
Pakistan

Torrential rainfall prompted landslides and flash floods in Karachi city and Punjab province of Pakistan from July 27-30. According to the Pakistan Meteorological Department, nearly 75 millimeters (3 inches) of rainfall occurred during a 24-hour stretch ending on July 27 was recorded in Karachi. The rains left hundreds of buildings inundated or destroyed and at least 10 people were killed. Nationally, as many as 100,000 people were directly affected due to recent spells of rain. Heavy rains in Punjab province prompted a landslide in Orakzai District July 27 that killed three people. Data comes via the National Disaster Management Agency of Pakistan.

Japan

Torrential rains triggered flooding and mudslides in Yamagata prefecture in northeastern Japan from July 27-30. According to the Japan Meteorological Agency (JMA), several weather stations in Yamagata recorded more than 200 millimeters (8 inches) of rainfall in a 24-hours of stretch ending on July 28. Heavy rainfall in Okura village triggered a landslide and spawned damage to hundreds of houses in the village. Mogami River – the seventh longest river in Japan – broke its banks at several locations and flooded hundreds of houses, businesses, and roads in several areas including the towns of Oishida and Okura.

South Korea



On July 23, incessant monsoon rains triggered flash flooding in South Korea, particularly in the city of Busan. A weather station in Busan recorded more than 200 millimeters (8 inches) of rainfall. According to the Korean Meteorological Administration, these rains were associated with an area of low pressure that had formed along the seasonal rain front, colloquially known as Jangma in South Korea. According to the Disaster Management Centre, South Korea, roughly 200 homes in Busan were flooded, and roads submerged underwater at more than 45 locations. Several emergencies were reported, and a total of 195 people were evacuated to safety by the local disaster officials. Government officials noted three fatalities. Torrential rains triggered flash floods in South Chungcheong and North Jeolla provinces and Daejeon city in northern South Korea on July 29-30. According to local media reports, at least two people died. The Korea Meteorological Agency cited that more than 200 millimeters (8 inches) of rainfall was recorded during a 24-hour period in Daejeon city ending on July 30. More than 100 buildings in the Daejeon city were damaged and two people were killed.

Myanmar

Monsoon rains triggered flash floods in Myanmar during a nearly two-week stretch from July 19-30. More than 4,000 houses in Amarapura Township were flooded alone due to the breaking of a river embarkment. Thousands of people were evacuated and 1,000 families affected. Heavy rains also caused the Ayeyarwady River to break its banks in Sagaing Region, affecting around 6,500 people. No casualties were reported.

Indonesia

Heavy rains prompted flash flooding and triggered landslides in Sumatra and Sulawesi islands in Indonesia from July 24-30. According to the Indonesian National Board for Disaster Management (BNPB) and local media reports, no fewer than 30,000 people were directly affected during the recent rounds of flash floods. More than 3,600 combined houses sustained inundation damage in Aceh and Bengkulu Provinces in northern Sumatra, while around 13,000 houses were damaged in Gorontalo Province in the Sulawesi archipelago.

Financial Loss

The total combined economic cost of flood-related damage in China, Japan, India, Nepal, Pakistan, Myanmar, Indonesia, and Bangladesh was already north of USD25 billion since June 1. A significant portion of these losses were directly incurred in China. The latest government estimate cited seasonal costs of at least CNY145 billion (USD21 billion).

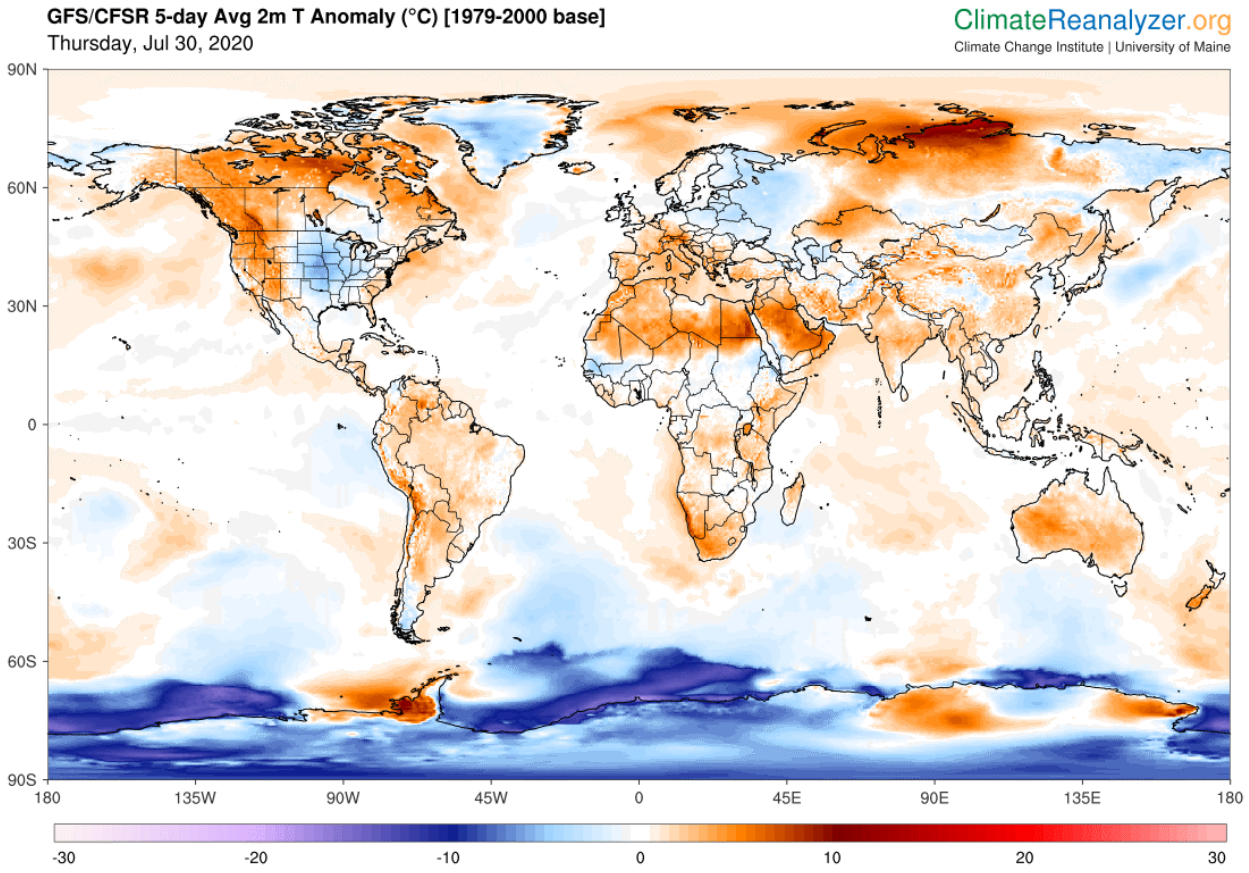
Elsewhere, the aggregate damage tally in India continued to rise, particularly in northern, eastern, and northeastern parts of the country. The total economic cost in India was likely to exceed USD 1 billion, but this was not as financially expensive as floods in recent years. The total economic toll across South Korea, Japan, Nepal, Myanmar, Indonesia, and Bangladesh were anticipated to aggregate into the hundreds of millions (USD) – with most damage costs in Bangladesh. This does not include the multi-billion-dollar impact of early July floods across Japan’s Kyushu region.

From an insurance viewpoint, it was anticipated that majority of the infrastructure and agriculture related damage to be uninsured, given the low take-up rates in China, India, and Bangladesh.

Natural Catastrophes: In Brief

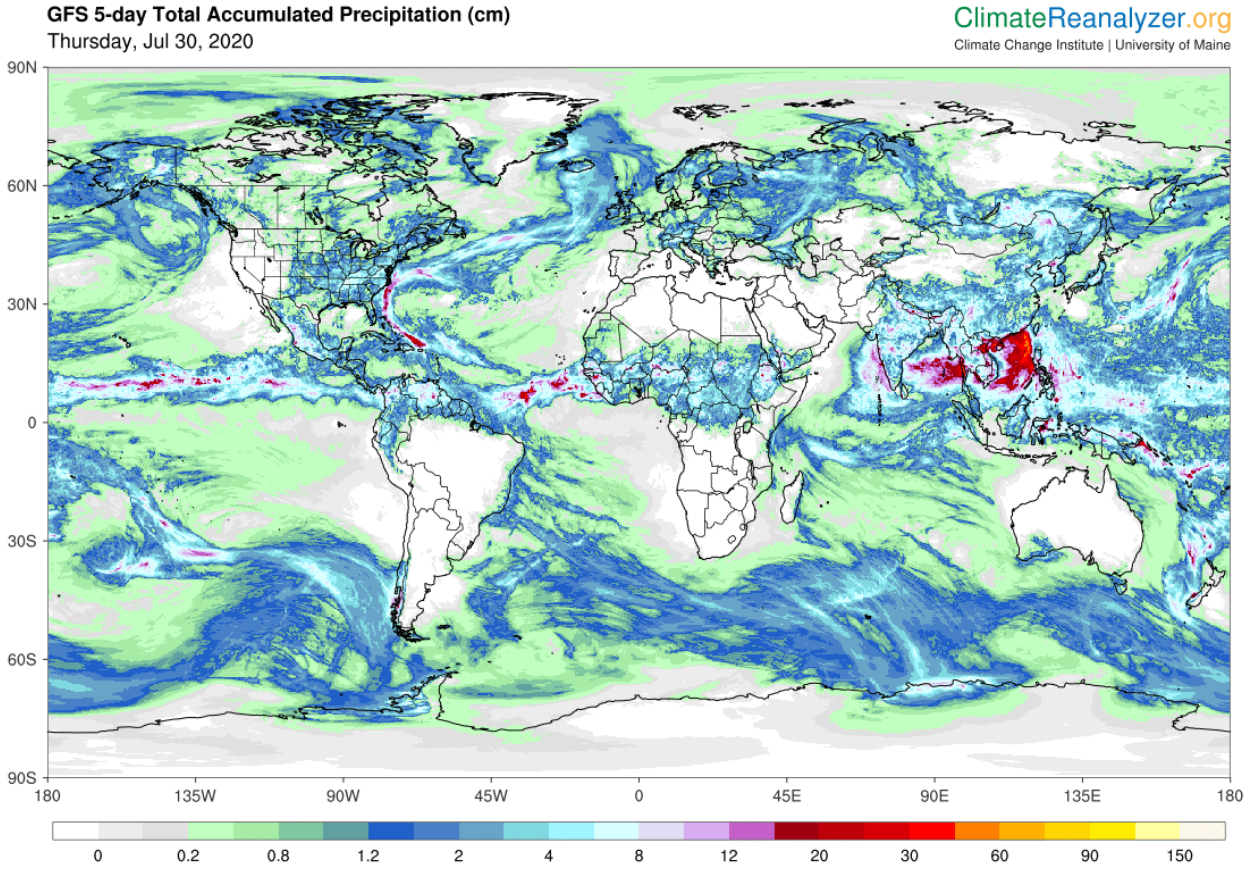
Flooding (*Yemen*)
Heavy rainfall on July 22-25 resulted in notable flash flooding in parts of Yemen and at least 17 fatalities. The western governorate of Al Hudaydah was the most affected with 13 lives lost. Further effects were felt in governorates Lahij, Ibb, Shabwah, Abyan and Sana'a (the nation’s capital). Notably, the downpour reportedly damaged more than 90 structures in the historical town of Shibam in Hadhramaut Governorate, a UNESCO World Heritage site with high-rise mudbrick buildings. The full extent of damage remained difficult to determine due to a lack of reliable information from the country. Local media reports noted at least multiple dozens of structures damaged or destroyed.

Global Temperature Anomaly Forecast



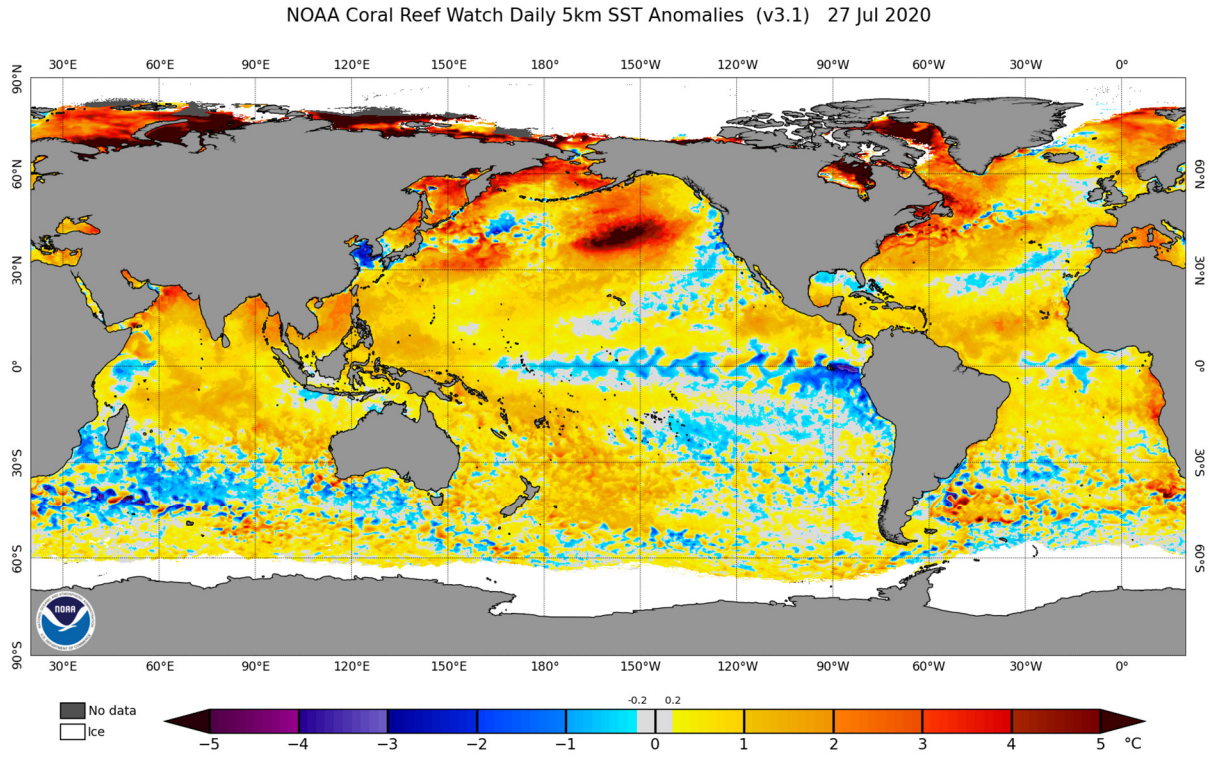
Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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.

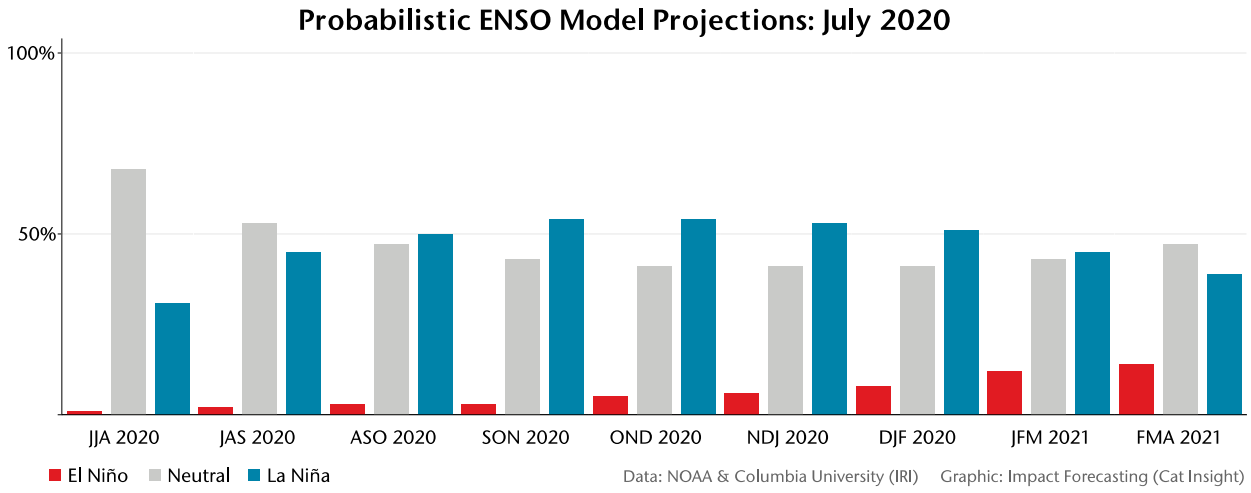
Select Current Global SSTs and Anomalies

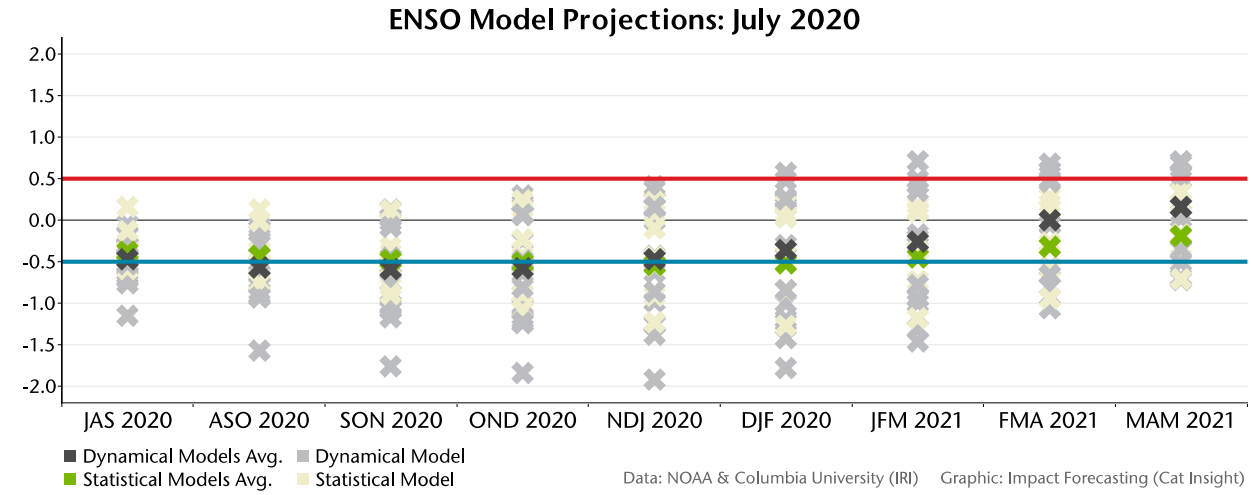
Location of Buoy	Temp (°C)	Departure from Last Year (°C)
Eastern Pacific Ocean (1,020 miles SW of San Salvador, El Salvador)	24.5	-1.3
Niño3.4 region (2°N latitude, 155°W longitude)	28.0	-1.2
Western Pacific Ocean (700 miles NNW of Honiara, Solomon Islands)	29.9	+0.2

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

El Niño-Southern Oscillation (ENSO)

ENSO-neutral conditions are currently present. NOAA notes that these neutral conditions will likely linger through the Northern Hemisphere (boreal) summer months. The agency further states that there is a 50 to 55 percent chance that a weak La Niña will emerge in the boreal autumn and last through the 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.*

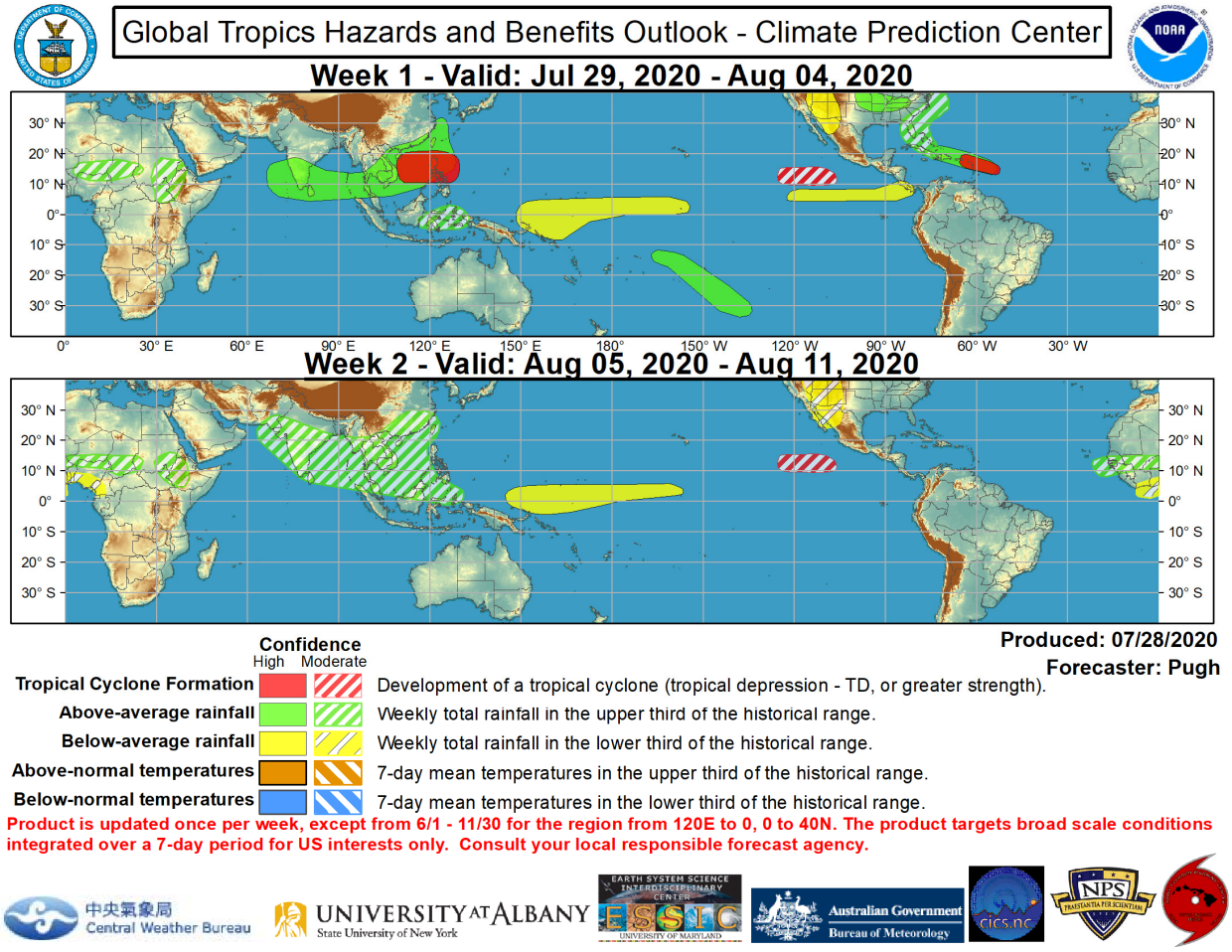
La Niña *refers to the periodic cooling of sea-surface temperatures (-0.5°C) across the east-central equatorial Pacific. It represents the cold phase of the ENSO cycle.*

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.*

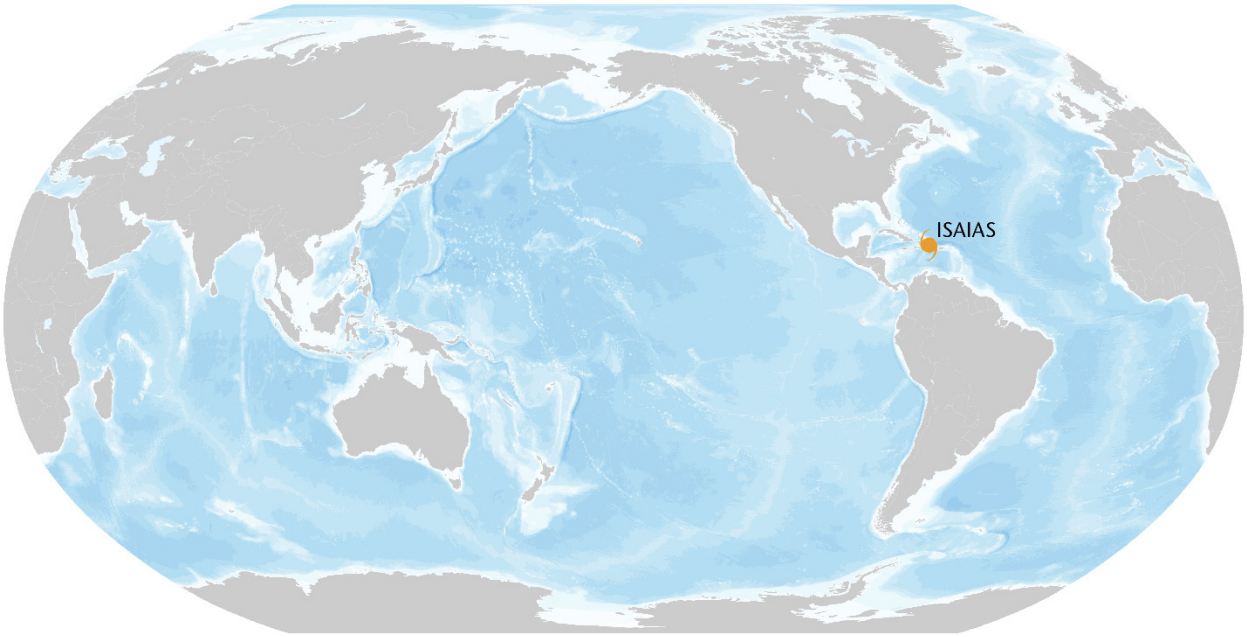
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

Global Tropics Outlook



Source: Climate Prediction Center

Current Tropical Systems



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

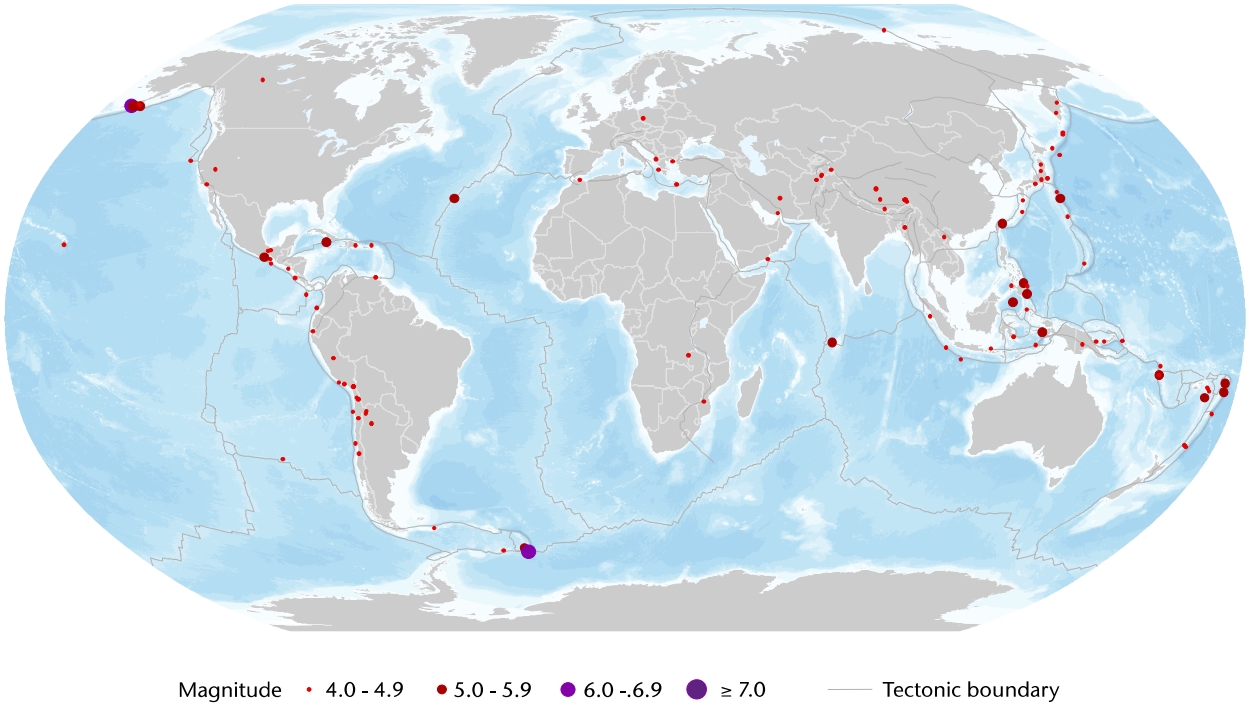
Location and Intensity Information

Name*	Location	Winds	Storm Reference from Land	Motion**
TS Isaias	19.5°N, 70.6°W	60 mph	250 miles (40 kilometers) SE from SE Bahamas	NW at 20 mph

* 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 24 – 30

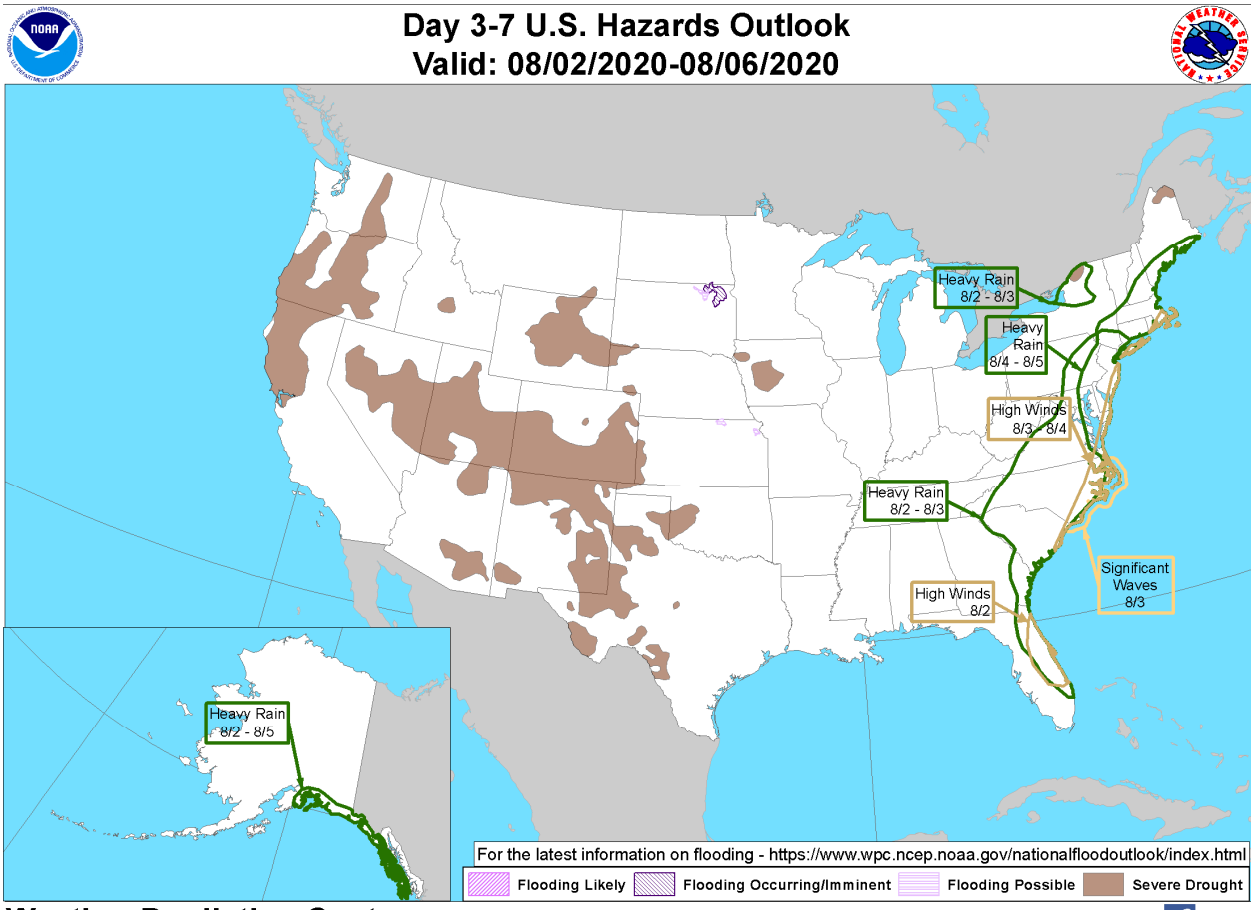


Significant EQ Location and Magnitude (≥M6.0) Information

Date (UTC)	Location	Magnitude	Depth	Epicenter
7/26/2020	60.78°S, 25.31°W	6.3	10 km	South Sandwich Islands region
7/28/2020	54.87°N, 161.14°W	6.1	41 km	66 kilometers (41 miles) SW of Sand Point, Alaska

Source: United States Geological Survey

U.S. Weather Threat Outlook



Potential Threats

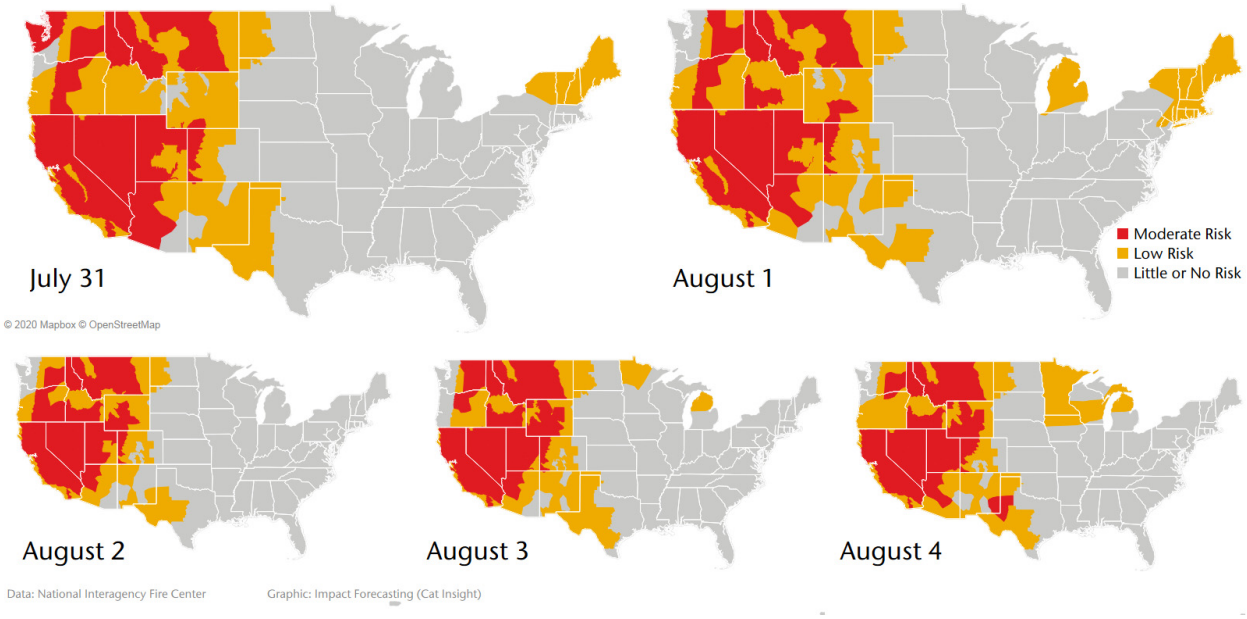
- The greatest threat in the medium range forecast is the potential for heavy rain expanding northward along the East Coast between August 1-5. An upper level low pressure system and associated frontal boundary will linger across the Eastern United States and has the potential to interact with Tropical Storm Isaías, as the latest guidance brings the storm close to the eastern seaboard with impacts spanning from Florida to Maine.

- Most coastal regions along the East Coast are forecasted to experience high winds as Isaias churns northward between August 2-4, while regions offshore of the Carolinas can anticipate high seas and significant waves arriving by August 3.

- Long-term severe drought conditions spanning from the Great Basin through the Southern Plains in addition to the Northern California Coast and Interior Northwest are ongoing. A pocket of severe drought has also been persistent in central Iowa.

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, and Midwest during the first week of August. Continued summer heat will maintain the heightened chance of wildfire ignition, including due to dry lightning, as drought conditions become more expansive.



Annual YTD Wildfire Comparison: July 30*

Year	Number of Fires	Acres Burned	Acres Burned Per Fire
2016	38,617	5,409,500	140.08
2017	37,591	4,772,098	126.95
2018	25,465	3,179,054	124.84
2019	31,438	1,973,005	62.76
2020	37,799	3,802,418	100.60
10-Year Average (2010-2019)	**38,617**	**5,409,500**	**140.08**

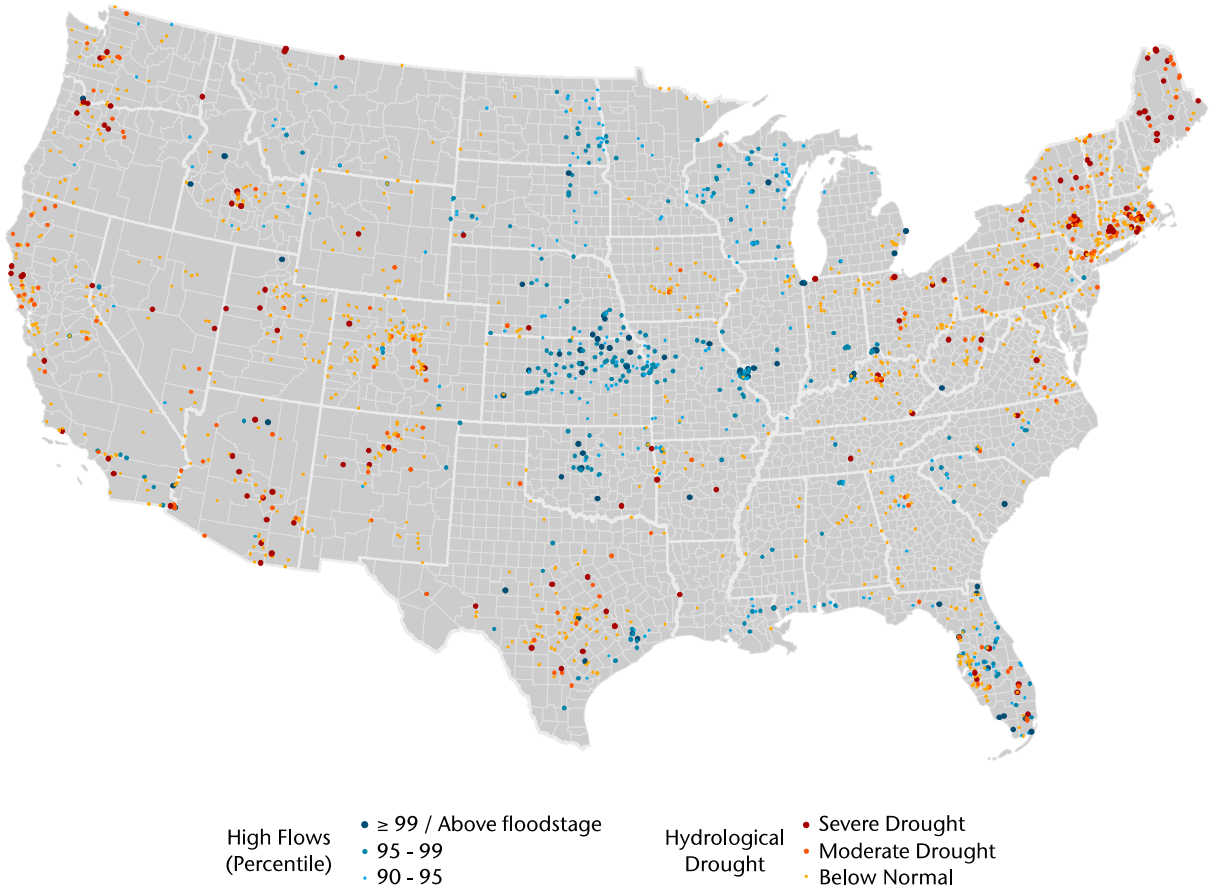
**Last available update from NIFC*
Source: National Interagency Fire Center

Top 5 Most Acres Burned by State: July 30

State	Number of Fires	Acres Burned	Acres Burned Per Fire
Arizona	1,480	601,175	406.20
Utah	872	181,542	208.19
Alaska	313	179,238	572.65
Nevada	465	175,654	377.75
Texas	2,814	149,405	53.09

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
Chippewa River at Chippewa Falls, Wisconsin	10.73	99.23
Umatilla River near Umatilla, Oregon	2.56	99.13
Oconto River near Gillett, Wisconsin	3.84	99.09
Menominee River near Florence, Wisconsin	5.54	99.07
Chippewa River near Bruce, Wisconsin	8.27	99.07

Source: United States Geological Survey

Source Information

Hanna becomes first U.S. hurricane landfall of 2020

U.S National Weather Service
U.S National Hurricane Center
U.S Weather Prediction Center
City of Mission, Texas
Matagorda County Pct. 6 Constable's Office
Hanna hammers South Texas, hit hard by coronavirus, with flooding rains, The Washington Post
Corpus Christi responds to Hurricane Hanna damage, Caller Times
Hurricane Hanna aftermath: Storm surge, flooding causes widespread damage along South Texas coast, KIIITV South Texas
Tropical Storm Hanna hits South Texas with high winds and heavy rain as coronavirus cases surge, CBS News
Civil Protection Nuevo León
CONAGUA Weather
Hanna weakens after leaving 4 dead, 6 missing in Mexico, Latina American Herald Tribune

Hurricane Douglas narrowly misses Hawaii landfall

Central Pacific Hurricane Center
U.S National Weather Service
Hawaii 'breathing a sigh of relief' as Douglas pulls away after just grazing islands, The Washington Post
Hurricane Hanna: they found the bodies of a mother and her daughter dragged by the current along with all their family, Infobae
Hawaii Department of Transportation

Severe storms impact Canadian Prairies, Calgary

A cloud larger than Mount Everest spun over Calgary on Thursday. It was a supercell thunderstorm, The Washington Post
CatIQ
Environmental and Climate Change Canada (ECCC)
Severe storm hits campground northwest of Calgary, hospitalizing 3 teens, The Weather Network

Update: Monsoon flooding in Asia

China's worst floods in decades, South China Morning Post
Fresh floods hit China's Chongqing, Xinhua
Videos show Chongqing hit by biggest flood of year, Taiwan Times
China's Worst Flooding in Decades Puts Pressure on Three Gorges Dam, That's Beijing
Assam flood: Death toll rises to 133 as three persons drown; 16.55 lakh remain affected, The New Indian Express
'A critical situation': Bangladesh in crisis as monsoon floods follow super-cyclone, The Guardian
Half of Bangladesh Affected by Devastating Floods; 119 Dead, The Weather Channel
Ministry of Emergency Management, China
Chinese National Climate Center Climate System Monitoring, Diagnosis, Forecast, Evaluation, China Meteorological Agency
Provincial Disaster Management Authority, Chongqing
Flood Control and Drought Relief Headquarters, Chongqing
Japan Meteorological Agency (JMA)
Fire and Disaster Management Authority, Japan
India Meteorological Department (IMD)
National Disaster Management Agency, India
Assam State Disaster Management Authority (ASDMA)
Pakistan Meteorological Department (PMD)
National Disaster Management Authority, Pakistan
National Disaster Risk Reduction and Management Authority, Nepal
Bangladesh Water Development Board
Flood Forecasting and Warning Centre, Bangladesh
Korean Meteorological Administration
Emergency Response Coordination Centre (ERCC)
Floodlist

Natural Catastrophes: In Brief

Yemen flooding kills 14, washes away houses. Arab News

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