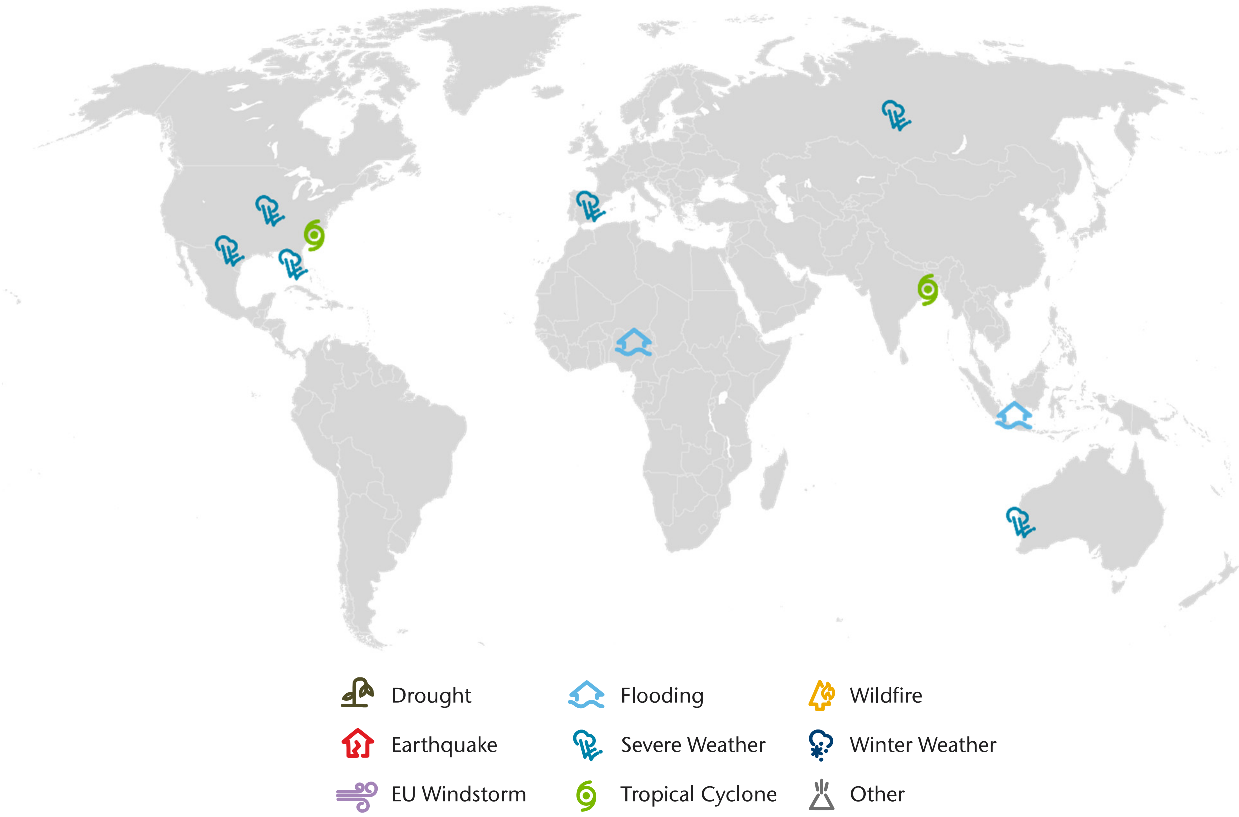
Weekly Cat Report

May 29, 2020

This Week's Natural Disaster Events



Event	Impacted Areas	Fatalities	Damaged Structures and/or Filed Claims	Preliminary Economic Loss (USD)*	Page
Cyclone Amphan	India, Bangladesh	120	1.2+ Million	15+ billion	3
Severe Weather	United States	2	Thousands	1+ billion	7
Tropical Storm Bertha	United States	0	Thousands	10s of Millions+	13
Flooding	Indonesia	2	4,000+	Millions	15
Severe Weather	Australia	0	Hundreds	Millions	15
Severe Weather	Russia	6	Thousands	Millions	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

Update: Cyclone Amphan

Cyclone Amphan made landfall and left devastating impacts across parts of eastern India and Bangladesh from May 20-21. At least 120 people were killed (including 90 in India alone), while no fewer than 1,000 people sustained injuries. Government officials cited damaging impacts to more than 1.5 million homes from strong winds, inland flooding, storm surge, and other coastal inundation during the event. Many of the homes were of poor construction quality. Total economic losses were tentatively estimated to approach USD15 billion, with India's state of West Bengal citing a potential damage cost of INR1 trillion (USD13.2 billion) alone.

Event Details

India

Amphan had a devastating impact on eastern and northeastern states of India. According to the latest media and disaster management agency reports, there were at least 90 fatalities (86 in West Bengal and 4 in northeastern India) and more than 1,000 others injured. Widespread damage occurred in the coastal districts of Odisha and southern West Bengal in India, however, minor damage was reported from the various other regions located in the northern and northeastern parts of India. A total of 658,000 people from the states of Odisha and West Bengal were pre-emptively evacuated owing to preparedness measures related to Amphan.

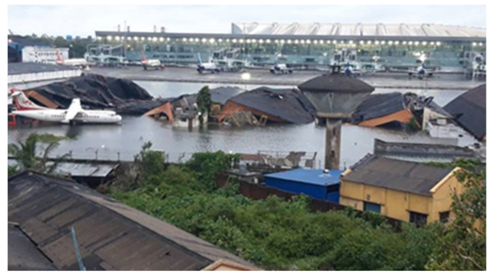
Odisha – Amphan swept across coastal districts of the state of Odisha, leaving thousands of people homeless, washed away roads and bridges, and swamped low lying areas in coastal Odisha. Amphan affected nearly 4.5 million people in 1,000 villages across 10 districts (Balasore, Bhadrak, Kendrapada, Jagatsinghpur, Mayurbhanj, Cuttack, Jajpur, Keonjhar, Khordha, and Puri) in Odisha, India, of which Balasore, Bhadrak, Kendrapada and Jagatsinghpur were most severely affected with wind gusts reaching to 106 kph (66 mph) and heavy rainfall (>200 millimeters). A peak rain total of 384.6 millimeters (15.14 inches) was noted at Bhadrak.

Initial reports of damage came from several parts of the state with significant damage to the power infrastructure and the farm sector mainly due to strong winds and floods. More than 448 power substations including 1,167 kilometers (725 miles) of transmission lines, and 126,540 transformers sustained damage, causing power outages that affected around 3.4 million customers.

Source: Odisha State Disaster Management Agency

According to the Odisha State Disaster Management authority, more than 15,500 homes sustained damage, of which 500 were destroyed. More than 100,000 hectares (247,105 acres) of standing crops were damaged in Odisha, while nearly 1 million livestock were affected, and 6,000 trees uprooted in the wake of Cyclone Amphan. Significant damage to the telecom infrastructure were also noted, that includes partial or complete damage of nearly 5,000 telecom sites in Balasore, Bhadrak, Jagatsinghpur, Kendrapad and Mayurbhanj districts.

West Bengal – Cyclone Amphan became the strongest storm in the decade to make landfall in West Bengal. The storm wreaked havoc in West Bengal by bringing heavy rain and winds with speeds of up to 190 kph (120 mph); ripped apart polythene and tin roofs, swept away corrugated shades, and broke down portions of temporary homes, flattened old houses, uprooted trees, and caused damage to many electricity poles. North 24 Parganas, Purba Medinipur, Howrah, Kolkata, and South 24 Pargana districts in West Bengal were noted to be worst-hit by the storm.



Flooding at Kolkata Airport (Source: Press Trust of India)

Some media reports tentatively reported that 1.5 million homes sustained severe damage, of which nearly 1 million in South 24 Parganas occurred alone. A significant proportion of these damaged homes were of poor construction quality. The scale of damage reportedly has left nearly 14 million people homeless across the state of West Bengal. According to the officials from the Hooghly district, Amphan damaged 95,000 houses, of which 20,000 were destroyed and another 75,000 incurring damage of varying severity. Roughly 5,500 homes in North 24 Parganas, and 50,000 in East Midinapore districts were also damaged. These figures are tentative as damage assessment work continues as of this writing. Torrential rains coupled with strong winds caused severe flooding and wind related damages especially in the Kolkata metro region, resulting in inundation and damage of both public and private infrastructure.

Coastal inundation in several villages in southern districts were also noted, largely due to damage caused to the coastal embarkments. According to the Indian Meteorological Department, severe flooding due to the storm surge of 4 to 5 meters (13 to 16 feet) caused inundation in the Sundarbans – the largest contiguous mangrove forest in the world. Flash floods affected 700 villages, displacing around 80,000 people in North 24 Parganas district alone.

More than 4,000 electricity poles including other electrical infrastructure were severely damaged or destroyed in the wake of the event, causing power outages across West Bengal that affected nearly 10 million residents. Communication in large areas was knocked out due to damaged telecom sites and towers.

According to the local media reports, more than 88,000 hectares (217,453 acres) of rice paddy and 200,000 hectares (494,211 acres) of vegetables and sesame crops were damaged. According to the horticulture department of South 24-Parganas and East Midnapore districts, around 3,500 hectares (8,648 acres) of betel leaves crop with a value of USD500 million was damaged. The event resulted in uprooting of more than 10,000 tress that resulted in road blockades and disrupting traffic in the affected areas. National Disaster Relief Force (NDRF) has already started the restoration work, though the rescue efforts were severely hampered by the prevailing emergency due to COVID-19.

Northeast India – Amphan did bring very gusty winds and flooding rains in the northeastern states of India and adjacent country Bhutan, causing widespread damage in these regions. Assam, Meghalaya, and Arunachal Pradesh are among the severely affected, of which the worst affected state is Assam. According to Assam State Disaster Management Authority (ASDMA), around 300,000 people and 9,800 animals were affected in 11 districts of Assam, of which Goalpara and Nalbari districts were most severely affected. According to the state agriculture department of Assam, paddy cultivation in around 130 hectares had been damaged in Nagaon district alone, damage assessment in other regions is still ongoing. Paddy farmers initially faced difficulties due to coronavirus-induced lockdown, and Amphan-related floods before the monsoon have severely hampered the cultivation. Meghalaya, Assam and Arunachal Pradesh have received extremely heavy rains on May 20-25, causing Brahmaputra and other major rivers of the region flowing above the danger mark. Flash floods and landslides caused damaged to nearly 350 houses in Meghalaya. Torrential rains triggered a landslide in Dibang Valley district of Arunachal Pradesh on May 25, causing 3 fatalities. Heavy rain triggered a landslide in Sikkim on 24 May. At least one person died, and several houses were damaged. Damage assessments in the northeastern states of India are still in their preliminary stages.

Damaged bridge in Nalbari district of Assam (Source: Press Trust of India)

Bangladesh

Cyclone Amphan affected roughly 2 million people in Bangladesh. Significant damage was cited due to rising water levels in the low lying coastal regions of Bangladesh, even before Amphan made landfall. Most of this damage related to severe storm surge, resulting in breaching the embarkments at several places along coastal Bangladesh, and inundating more than 17 villages across Galachipa, Kalapara, and Rangabali subdistricts.

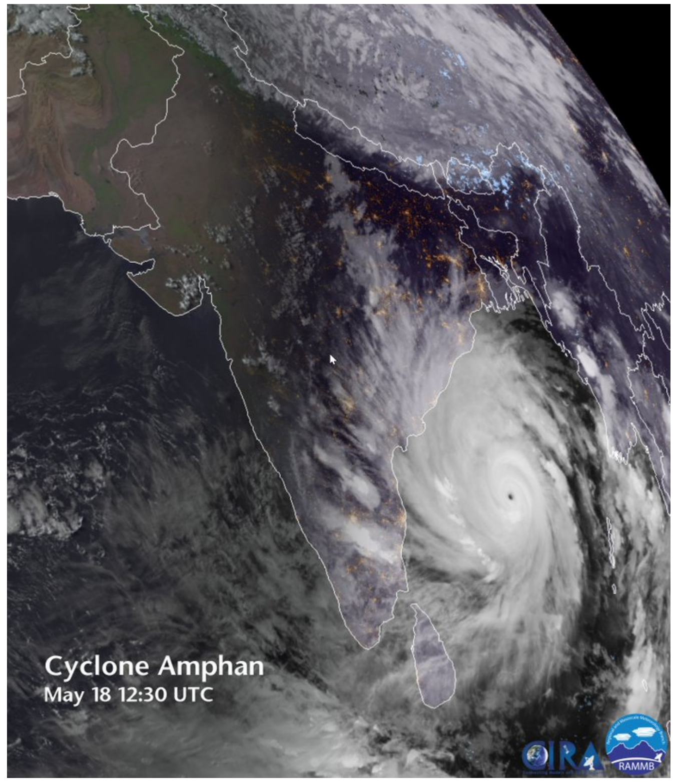
Strong winds, torrential rain, and storm surge caused most of the damage. According to the United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA), more than 220,000 homes were damaged, of which nearly 55,500 were destroyed, and no fewer than 26 casualties in storm-related incidents were reported from Bangladesh. The storm resulted in totally or partially damaging 82,000 houses in Khulna and 60,000 houses in Barishal. Storm surge was particularly impactful in the Noakhali District where water heights rose 3 to 5 meters (10 to 16 feet). More than 700 homes were inundated due to storm surge damaging levees and embarkments, resulting in flash flooding in Barishal, with flood waters of 3 to 4 feet. Storm surge events breached nearly 150 kilometers (93 miles) of flood protection embankments at 84 points in 13 districts, leading to the inundation of roughly 100 villages.

Severe damage to public infrastructure left nearly 1,100 kilometers (680 miles) of roads and more than 200 bridges, 800 electricity poles, and 2,500 network towers affected. More than 22 million customers faced difficulties due the power outages. Amphan also disrupted communication by partially or fully damaging more than 2,500 phone towers across Bangladesh.

According to the Department of Fisheries, 65 freshwater ponds were affected by the intrusion of saline water. Flood related losses were also reported from the crab, finfish, and shrimp industries that resulted in affecting nearly 45,000 farmers in Khulna and Barisal. According to the Ministry of Agriculture, Amphan damaged nearly 176,000 hectares (434905 acres) of farmland. Mango farmers lost 16 percent of their crop due to fallen trees, while significant losses to the industrial trees were also noted. Wind gusts in Satkhira were noted at 151 kph (94 mph) resulting in damaging nearly 70 percent of the mango crop because of fallen trees.

Financial Loss

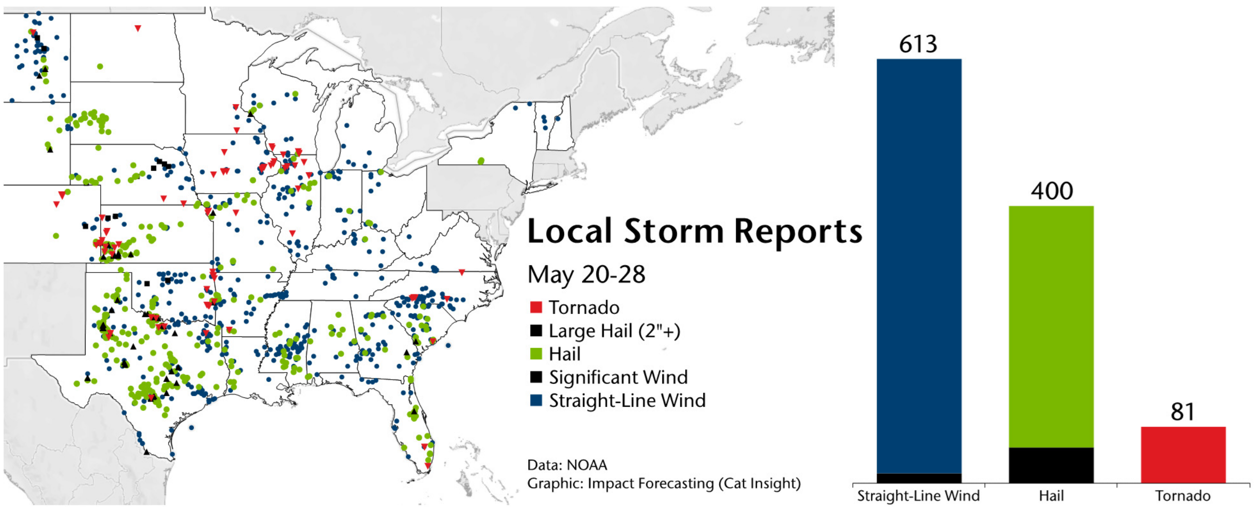
Total economic losses attributed to Cyclone Amphan were tentatively estimated at upwards of USD15 billion. An initial damage assessment report from the Bangladesh government cited that total economic costs in the country were to approach USD1.5 billion. The situation in India was even more severe, with the state of West Bengal citing an economic cost of up to INR1 trillion (USD13.2 billion) alone. Further economic losses reaching into the hundreds of millions (USD) were anticipated in other states such as Odisha. Most of the losses were likely to be uninsured given low insurance take-up in India and Bangladesh.



Amphan became the strongest cyclone on record to occur in the Bay of Bengal during the month of May. The previous record was a storm in 1999 with estimated sustained winds of 260 kph (160 mph) that struck the Indian state of Odisha, that officially resulted in approximately 10,000 fatalities.

More hail & damaging winds impact the U.S.

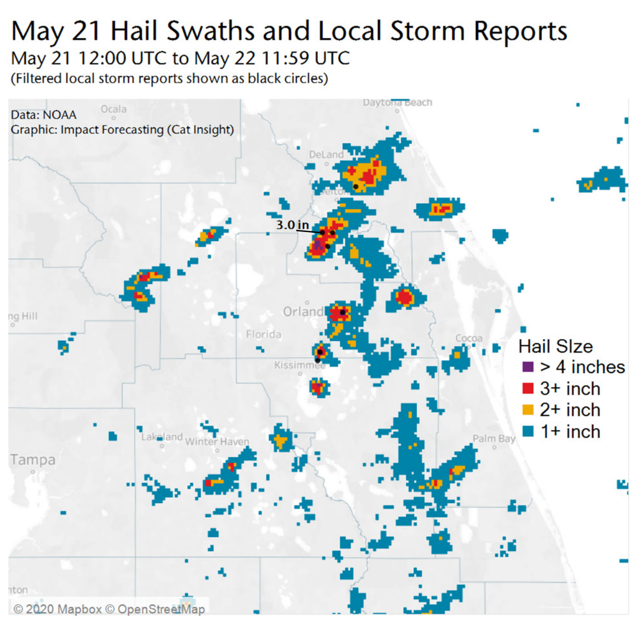
The anomalous upper level cut-off low that brought reports of flooding and severe weather stretching from the Great Lakes to the Carolinas between May 17-21 gradually weakened near the southern Appalachians. In its wake, a broad and slowly progressing trough which eventually became anchored in the Southcentral United States allowed for consecutive days of severe weather outbreaks across the Plains, Midwest, and Southeast. These regions experienced multiple waves of severe thunderstorms between May 22-25, enhanced by warm, moist, tropical air transported northward in southerly flow. A deepening low in the Southern Plains resulted in additional severe storms across Texas on May 27. The main hazards with these events included strong winds, brief tornadoes, and extremely large hail. Throughout the period, two separate noteworthy hail events occurred, the first in Florida on May 21, and the second in Texas on May 22.



Meteorological Recap

May 21

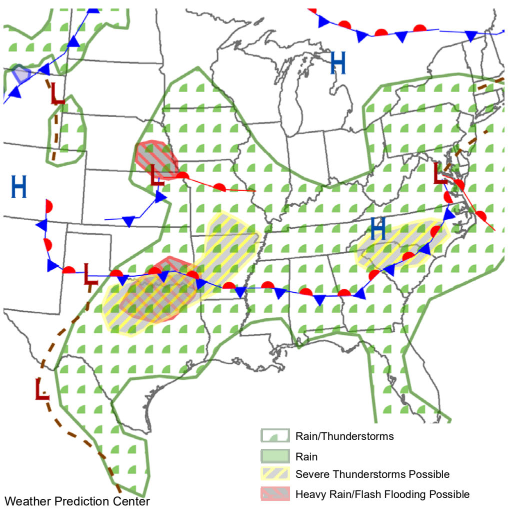
On May 21, in central and southern Florida, an inland progressing sea breeze front, along with strong surface heating and a moist airmass exhibiting dewpoints approaching the lower 70s (°F) led to the development of disorganized but intense severe storms in the late afternoon. Several land spouts were reported with this event; however, the primary hazard was severe and significantly historic large hail, approaching 3.00 inches (7.62 centimeters) in Seminole County, to the north of Orlando (see hail swath map).



In the Central Plains, severe supercells and storm clusters with impressive structure and large hail expanded in the early evening hours across extreme eastern Colorado and southwestern Kansas. Large scale forcing for storm development was enhanced in this region by a short-wave trough and slowly moving surface low progressing east-southeastward into western Kansas. Storm initiation began in the warm sector, south of the surface low and ahead of the approaching dry line and cold front. The environment was exhibiting steep mid-level lapse rates (changes in temperature with height), conducive for the formation of severe and significant hail (hailstones greater than or equal to 2.00 inches). Overnight and into the day on May 22 the initial convection grew into an extensive mesoscale convective complex (MCS) as it tracked east-southeast with the greatest impacts across portions of Kansas, Oklahoma and Arkansas, where strong and severe winds, with maximum gusts approaching 80 mph (128 kph) became the primary hazard.

In the Southern Plains, a north to south oriented dryline sweeping across Texas was the focal point for additional scattered severe discrete storms and clusters, aided by ample diurnal heating. Although the storms were short-lived, severe and large hail was the main hazard associated with this event.

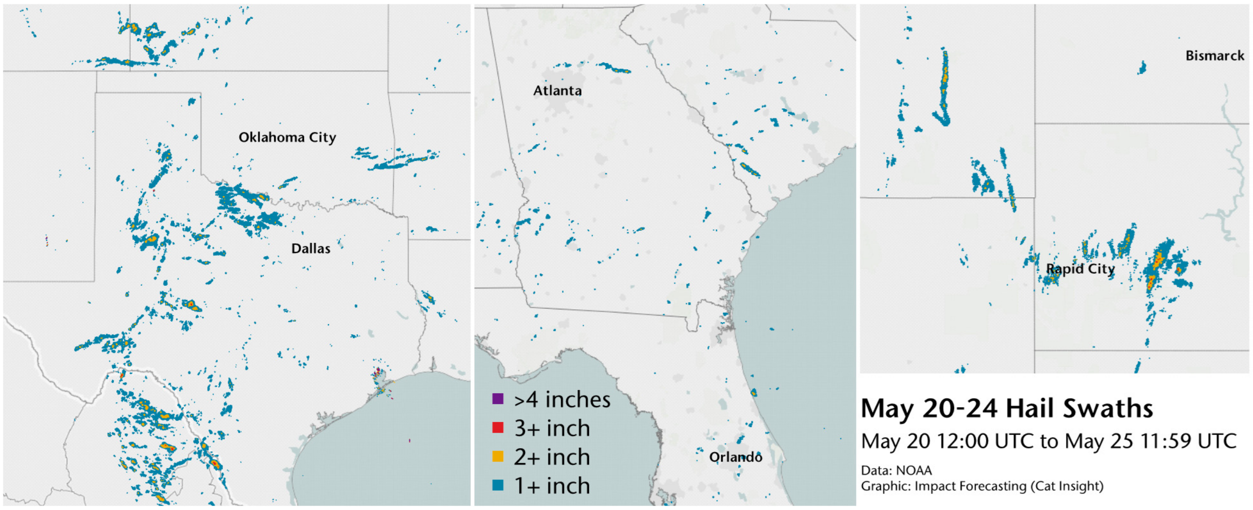
May 22



On May 22 the Storm Prediction Center (SPC) was watching two distinct regions for the development of severe storms. The first across the Central and Southern Plains where an Enhanced Risk for severe weather (level 3 out of 5) was centered on a region in northern Texas and southeastern Oklahoma. The second region focused on the southern Appalachians and Carolinas.

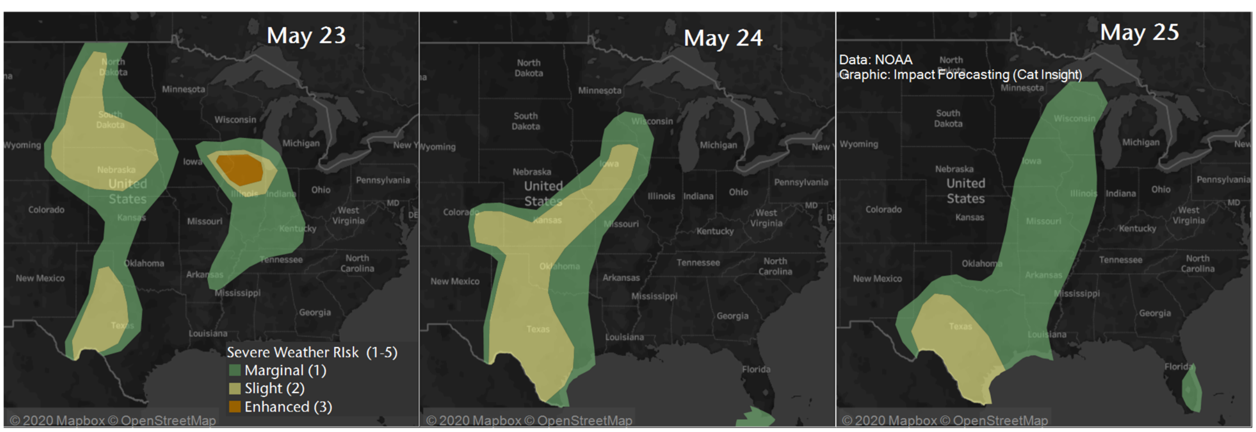
In the Southern Plains, an increasingly unstable environment existed primarily across northern Texas and Oklahoma, aided by a plume of moisture with dewpoints reaching into the 70s (°F). Convection was initiated ahead of a modest surface low located near north-central Texas, in association with an extensive southward progressing outflow boundary, which sustainably decelerated near the Red River Valley. The boundary was remnant from the MCS which passed just north of the region earlier in the day. in northcentral Texas, adjacent to and north of this boundary, bordering the Red River, discrete cells grew into severe convective clusters of storms in an environment characterized by steep lapse rates and significant Convectional Available Potential Energy or CAPE (which Is directly related to the updraft strength in storms). A notable supercell initially produced extremely large hail, approaching and exceeding 5.0 inches (12.7 centimeters), north of Wichita Falls, Texas near the town of Burkburnett (Wichita County). The storms slowly advanced south-eastward throughout the evening, with the greatest hazards initially being significantly large and damaging hail and brief tornadoes, transitioning to a severe wind and flooding threat as the storms matured, especially in regions experiencing training/repeating storms. A second cluster of severe weather materialized toward the northern edge of the moist airmass in western Arkansas and far eastern Oklahoma. The clusters merged into an MCS which swept across portions Louisiana and into Mississippi on May 23.

In the Southeast, spanning the North and South Carolina borders an eastward progressing mid-level trough approached an environment characterized by sufficient surface heating and ongoing moisture advection. By late afternoon, this led to the development of a severe bow-echo which proceeded eastward toward the coast. The main hazards associated with this event were straight-line winds along with isolated tornadoes.



May 23-25

The slowly evolving trough advancing from the Rockies toward the Southern Plains, continued to allow increased instability, associated with persistent humid and moist air advancing northward from the Gulf of Mexico across the Plains and Mississippi Valley, and expanding further east. This set-up, along with a series of low pressure waves, and outflow boundaries allowed for clusters of severe storms and locally heavy rainfall to occur across the Plains, Midwest, and Southeast between May 23-25, as indicated in the daily morning SPC severe weather outlooks. All severe hazards were present with these events including tornadoes, severe hail, damaging winds, and locally heavy rainfall. The greatest impacts occurred in portions of Texas, Oklahoma, Arkansas, Missouri, Kansas, Colorado, Nebraska, South Dakota, Iowa, and Illinois, however isolated repots of severe weather were present across other states from the Ohio Valley to the Southeast.



May 27

Cyclonic (counterclockwise) flow around a low-pressure system near southeastern Oklahoma, created northwesterly flow aloft across much of central and eastern Texas. Combined with southeasterly flow at the surface, steep mid-level lapse rates, and outflow boundaries from previous storms, the environment was favorable for severe weather, including supercells and storm clusters. The main hazards were large and damaging hail and severe winds. The SPC indicated an Enhanced (level 3 out of 5) or Slight (level 2 out of 5) risk for severe storms across a broad area of central Texas. By the late evening hours, a southeastward traveling broken line of severe discrete cells were sweeping across the region. Supercells associated with this event produced swaths of large and significant hail, near San Antonio (Bexar County), to the east and to the northwest of the metro area; where hailstones approaching 2.50 inches (6.4 centimeters) were reported.

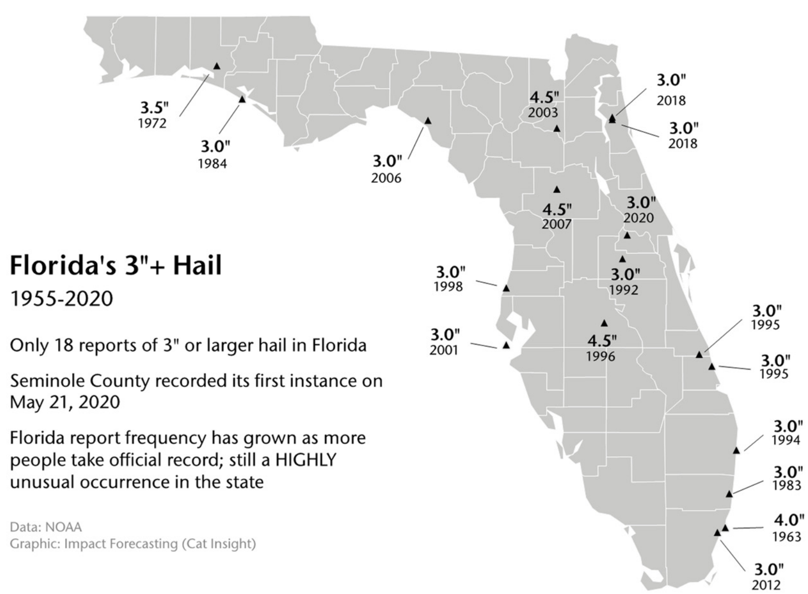
Event Details

May 21

On May 21, 98 reports of severe weather occurred, of which 53 were for hail (14 for significant hail), 31 for wind, and 14 for tornadoes, most of which were brief with minimum damage.

In Florida, most impactful were baseball size hail (3.00 inches, 7.62 centimeters) in Seminole County, near Sanford (north of the Orlando metro area); a rare event for Florida, and east-central Florida in particular. Hail three inches or larger have only been reported in Florida 18 times since 1955. The record largest hail for Florida is 4.5 inches (11.4 cm) which were reported on three separate occasions in Polk, Bradford, and Marion Counties.

Elsewhere large hail was frequent on May 21. Hail approaching 3.00 inches (7.62 centimeters) were reported with the supercell storm in Kansas (Hamilton County). In Texas (Tom Green County), hail approaching 4.00 inches (10.16 centimeters) were reported. In Oklahoma, a straight-line wind gust of 81 mph (130 kph) was measured in Logan County. Impacts to structures including roofing and siding damage were reported.



May 22

On May 22, there were 217 reports of severe weather, of which 130 were for wind, 75 for hail, and 12 for tornadoes. The greatest impacts occurred across Texas, Oklahoma and Arkansas, as well as North and South Carolina.

5.33-inch hailstone from Burkburnett, Texas. (Source: Rick Smith)

Most impactful were numerous reports of extremely large and dangerous hail approaching and exceeding 5.00 inches (12.7 centimeters) in diameter across Wichita County (Texas). A hailstone measuring 5.33 inches (13.54 centimeters), larger than a grapefruit, was officially recorded by the National Weather Service (NWS), near the town or Burkburnett, north of Wichita Falls. In one instance, a large hailstone in Burkburnett punctured directly through the roof of home landing in a bathroom. Widespread accounts of damage to windows and structures resulting from hail were reported throughout the region. In Montague County (Texas) an EF1 tornado with maximum wind speeds approaching 95 mph (153 kph), combined with straight-line wind damage, impacted numerous structures near the towns of Bowie and Montague. Straight-line wind damage was responsible for uprooting trees onto several residential properties, in addition to minor structural damage to several commercial buildings. Substantial structural and roofing damage was noted near the Bowie central business district, adjacent the path of the confirmed tornado. A single supercell in far eastern Oklahoma (Le Flore County), was responsible for producing three separate tornadoes.

Across the Carolinas, severe straight-line winds approaching and exceeding 55 mph (88 kph) were recorded, along with several tornadoes which primarily uprooted trees; minimum structural damage was observed. Two storm related deaths occurred in North Carolina.

May 23-25

As of this writing, 482 reports of severe weather occurred, of which 42 were for tornadoes, 281 for wind, and 159 for hail.

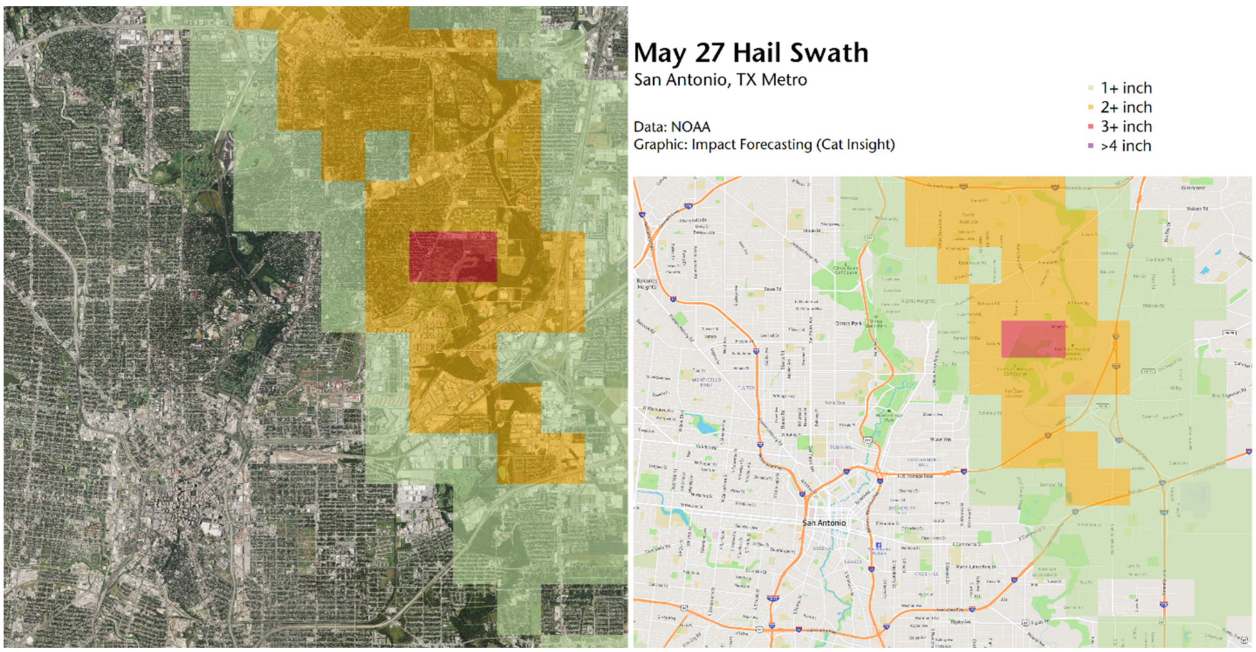
On May 23, multiple tornado touchdowns were confirmed with reported damage to trees and utility poles across eastern Iowa and northern Illinois. Minor damage to several structures and outbuildings were noted, along with one injury due to an overturned car on I-80 in Illinois. In the town of Joliet, Illinois (Will County) severe microburst winds with estimated maximum gusts between 75 and 95 mph (120 and 150 kph) caused roofing damage to multiple structures in the downtown area, including one city building. In Texas, significant hail approaching 3.25 inches (8.25 centimeters) fell in Briscoe County with reports of damage to multiple motor vehicles. Hailstones up to 2.00 inches (5.1 centimeters) were reported near the City of Lubbock. In the overnight and early morning hours, severe storms across Nebraska produced maximum wind gusts of at least 80 mph (128 kph), uprooting numerous trees and resulting in extensive damage to a golf course in Stanton County.

On May 24, significant hail (greater than or equal to 2.00 inches) were reported in Missouri, Texas, and Kansas. Hailstones in Clark County (Kansas) measured 2.75 inches (7.0 centimeters), baseball sized. A maximum wind gust of 85 mph (137 kph) was measured in Thomas County (Kansas), resulting in downed trees and power poles.

On May 25, after consecutive days of widespread showers and storms, flooding and flash flooding was a concern across the southern and central plains, especially in eastern Oklahoma and western Arkansas, where bands of severe storms and heavy rains persisted.

May 27

In Texas, reports of significant hail (greater than or equal to 2.00 inches) occurred in Falls, Caldwell, Williamson and Bexar Counties, which included portions of the northwest and eastern San Antonio metro area. Hail the size of tennis balls, 2.50 inches (6.4 centimeters) were observed in Bexar County. A maximum wind gust of 80 mph (128 kph) was measured in Gillespie County associated with the same storms. Extensive damage to homes, outbuildings, and vehicles were reported in addition to downed trees and power lines. Earlier storms brought severe winds to the Houston metro region, with a measured gust of 65 mph (105 kph) in Harris County.



Financial Loss

The past week of storm events – including stretches from May 16-21, May 20-24, and May 25-28 – will lead to additional significant financial losses. Total combined economic and insured losses from the three noted events above will well surpass USD1 billion; and likely aggregate to a multi-billion-dollar economic impact. Particularly costly hail events are expected in San Antonio, Texas, Lubbock, Texas, and in Seminole County, Florida. Expansive straight-line wind damage will be costly in many other states, too.

Insured severe convective storm damage in the U.S. has already topped USD13 billion through mid-May 2020. This marks the 13th consecutive year that impacts from the peril in the country have surpassed USD10 billion in insured payouts; signifying a “new normal”.

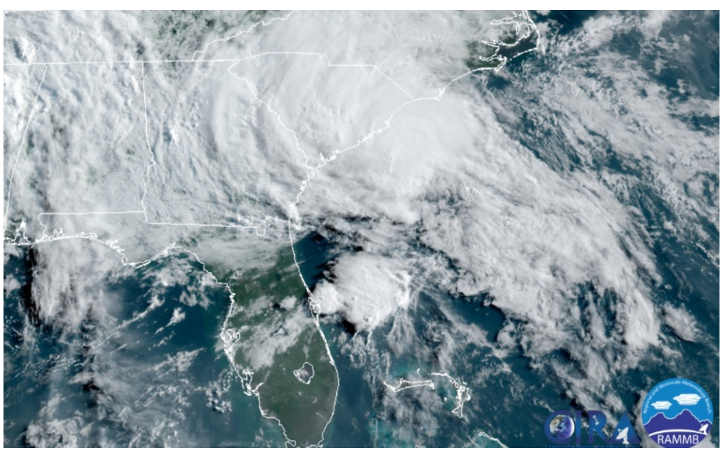
Tropical Storm Bertha makes quick U.S. landfall

Tropical Storm Bertha was the second named storm of the 2020 Atlantic Hurricane Season. 2020 becomes the third year in the satellite era (1965-present) in which two named storms developed in the Atlantic Ocean prior to June 1. The other two years were 2012 (Alberto, Beryl) and 2016 (Alex, Bonnie). Tropical Storm Bertha rapidly organized off the coast of South Carolina where it was officially named a tropical storm on May 27, hours before making landfall east of Charleston as a 50 mph (85 kph) storm. Prior to landfall the low and broad circulation that would eventually become the tropical system was responsible for a significant and dangerous multi-day flooding event across southeastern Florida and the City of Miami.

Meteorological Recap

On May 25, The National Hurricane Center (NHC) began monitoring an elongated trough across southern Florida and the adjacent Atlantic waters for the formation of a surface low. The broad circulation from this disturbance already had a history of producing widespread showers and thunderstorms across southern and central Florida, leading to locally heavy downpours and flash flooding.

This system was significantly impactful for southern Florida and Miami, where historic rainfall totals and flash flooding occurred between May 24-26, aided by southerly flow and abundant tropical moisture. Miami International Airport measured a total of 14.67 inches (37.26 centimeters) of rainfall throughout the three-day period from May 24-26. This was the wettest three-day stretch at Miami International since October 2000.



On May 27, the NHC officially started issuing advisories for Tropical Storm Bertha, as the area of low pressure deepening southeast of Charleston (South Carolina) quickly organized as it approached the Southeast coast. With the formation of Bertha, 2020 becomes the third year in the satellite era (1965-present) in which two named storms developed in the Atlantic Ocean prior to June 1. The other two years were 2012 (Alberto, Beryl) and 2016 (Alex, Bonnie). Tropical Storm Warnings were posted for the coast of South Carolina from Edisto Beach to South Santee River. At 9:30 AM EDT (13:30 UTC) Tropical Storm Bertha officially made landfall near Mount Pleasant, South Carolina (east of Charleston) with maximum sustained winds of 50 mph (80 kph) and a minimum pressure of 1004 millibars.

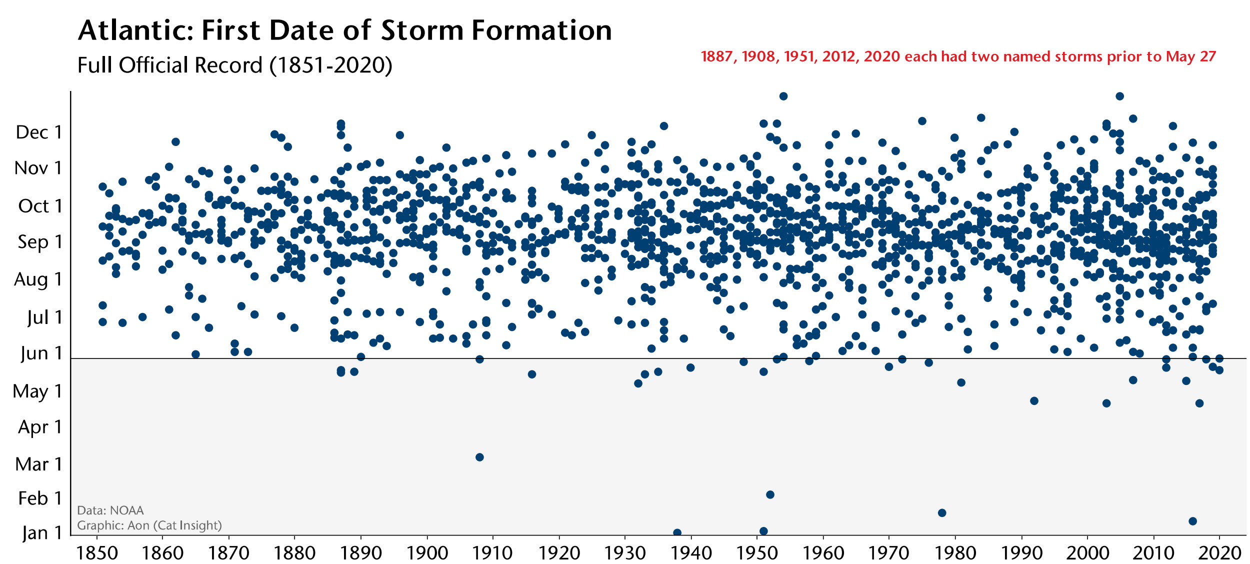
Bertha weakened while progressing inland on May 27-28, with the primary hazard being locally heavy rainfall resulting in flooding/flash flooding. Flood warnings and watches were issued across coastal South Carolina, northward through central North Carolina, and into southwestern Virginia. Many of these regions were already dealing with elevated stream flows and saturated soils, due to heavy rainfall from the previous weeks cut-off low pressure system.

Event Details

In Florida, the broad circulation which eventually developed into Tropical Storm Bertha was responsible for several days of locally heavy rain and thunderstorms, resulting in dangerous and significant flash flooding across portions of southeastern Florida and the City of Miami. Miami International Airport reported 14.67 inches (37.26 centimeters) of rainfall between May 24-26, with 7.40 inches (18.8 centimeters) falling on May 26. This was the wettest three-day stretch for Miami International since October 2000. Multiple weather stations along the coast in Miami-Dade, Broward, and Palm Beach Counties reported 72-hour rainfall totals ending the morning of May 27 in excess of 8.00 inches (20.3 centimeters). The Brickell neighborhood of Miami was particularly hard-hit. Across the city numerous roadways were inundated with water, including portions of Biscayne Boulevard. Flooded vehicles had to be towed from roadways, and water levels in canals rose to extremely high levels. Pumping stations across the region had a difficult time keeping up with the deluge.

In eastern South Carolina, and southeastern North Carolina Bertha was responsible for heavy rainfall totals adjacent to and north of the landfall location, where 2 to 4 inches (5.1 to 12.7 centimeters), with locally higher amounts were reported. A weather station in the Cainhoy Peninsula (South Carolina) recorded a total of 4.8 inches (12.2 centimeters). A buoy off the coast of South Carolina measured a wind gust of 58 mph (93 kph), while along the coast wind gusts were generally 35 to 45 mph (56 to 72 kph).

The graphic below highlights the start date of every named storm in the official record in the Atlantic Ocean Basin since 1851. 2020 joins 1887, 1908, 1951 and 2012 as the only years with two named storms developing from January 1 to May 27 of the calendar year.



Financial Loss

The total financial impact from Bertha's official landfall in South Carolina – and residual rainfall into parts of the Mid-Atlantic and Midwest – will be negligible on economic and insured loss basis. The pre-event rains in Florida did lead to notable damage, particularly in Miami-Dade County. Damage costs there are likely to run well into the millions of dollars (USD). Officials cited the floods as the worst in the county from a rainfall event since 2000.

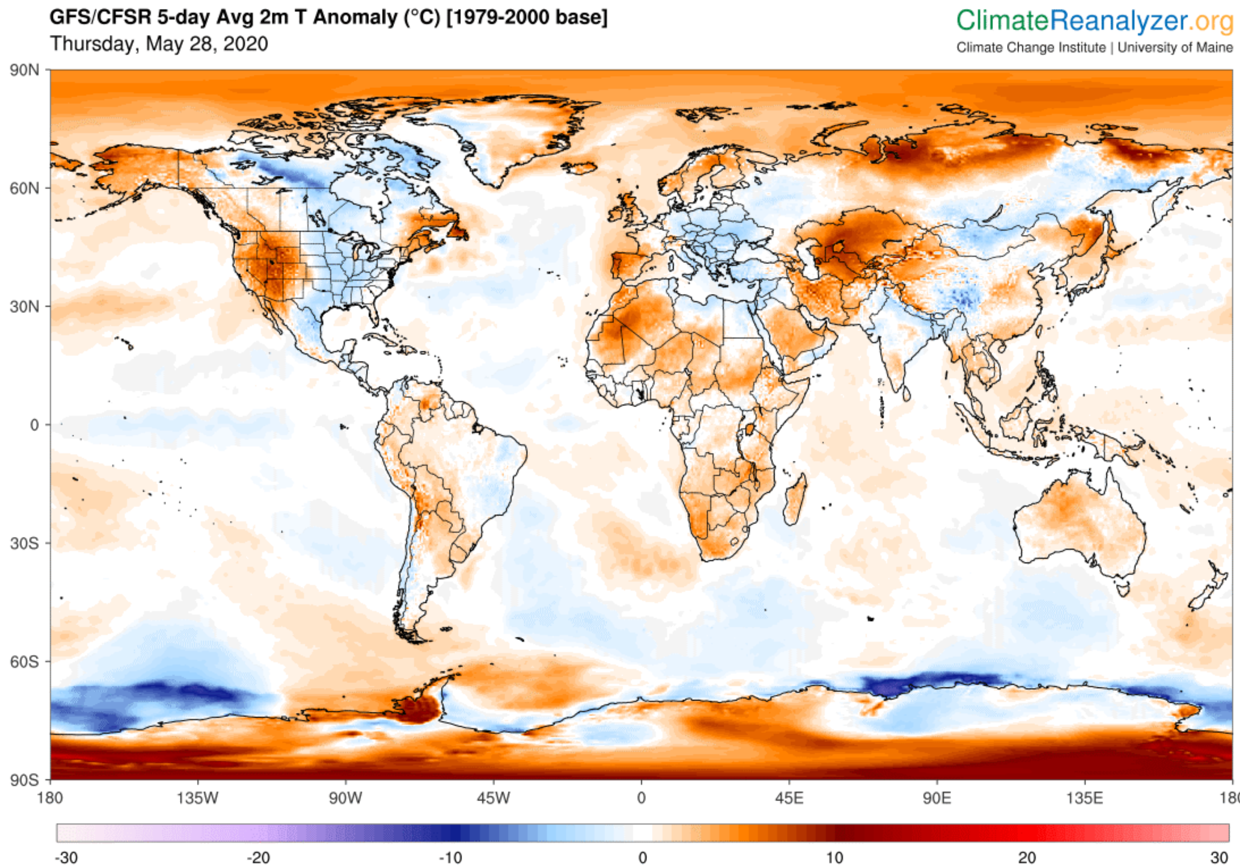
Natural Catastrophes: In Brief

Flooding (Indonesia)
Torrential rains coupled with strong wind, and thunderstorms swept across several regions of Indonesia between May 18-25, resulting in casualties and widespread damage. Flash floods occurred in East and South Kalimantan provinces on May 22-25, particularly in North Samarinda and Sungai Pinang districts. According to the local media reports, nearly 3,500 homes were inundated, and traffic was disrupted due to flooding of main roads, after 800 mm rainfall fell within 48 hours. Further economic losses occurred elsewhere; in South and East Sulawesi and South Sumatra. Additionally, 2 people were killed and no fewer than 9 were injured when a tornado struck Tulang Bawang Regency in southern Sumatra on May 19; 233 homes were reported to be damaged.

Severe Weather (Australia)
Heavy rains and strong winds swept across western Australia on May 25. The event occurred as remnants of Tropical Cyclone Mangga interacted with a cold front, later hitting southwestern Australia. Widespread power outages ensued, as power was cut to nearly 62,000 homes across the state and the restoration took almost three days in severely affected areas. As the Bureau of Meteorology warned of "damaging, locally destructive winds", Gooseberry Hill in Perth recorded peak gust of 117 kph (73 mph). Notable coastal damage was caused by abnormally high tide, particularly around Perth. No human casualties were reported, and impact on property and motor was subject to further assessments.

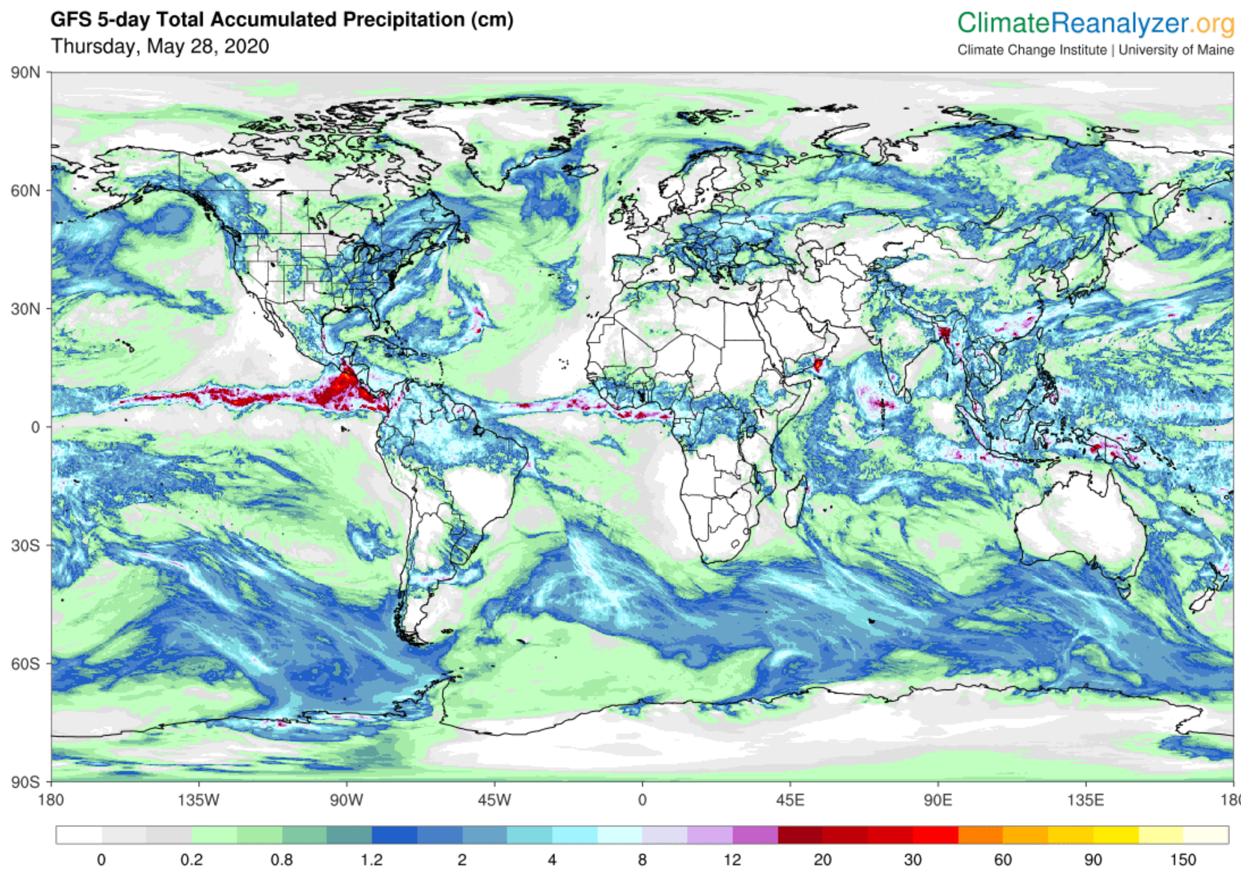
Severe Weather (Russia)
Several parts of central Russia were affected by an outbreak of severe weather on May 25-26. Squally winds, large hail and heavy rain were associated with convective storms, which formed along the frontal system of an extratropical cyclone that originated in southern part of European Russia and progressed north towards Ural and Western Siberia. Sverdlovsk, Kurgan, Chelyabinsk, Tyumen and Perm regions were affected on May 25. Four people were killed in Sverdlovsk region, as it experienced strong winds and large hail with diameter of up to 40 millimeters (1.6 inches). Structural and vehicle damage was also reported from Yekaterinburg and elsewhere. Power supply was cut to more than 130,000 people in 23 municipalities. On May 26, the storms resulted in widespread impacts further east in Tomsk, Novosibirsk, Krasnoyarsk and Transbaikal regions; a tornado in Kemerovo region destroyed at least 18 homes. One person died and at least 40,000 homes lost power in Novosibirsk area and hundreds of homes were damaged. Total economic losses were yet to be determined but will likely amount to millions USD.

Global Temperature Anomaly Forecast



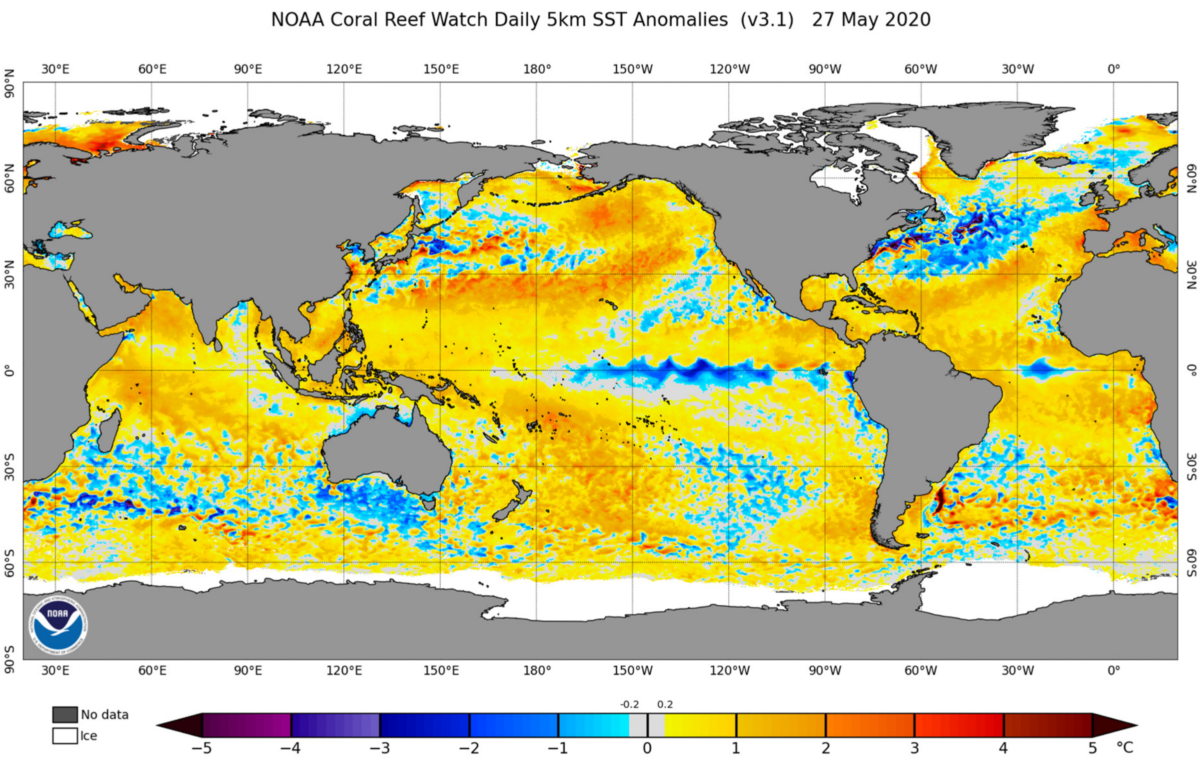
Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

Global Precipitation Forecast



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

Weekly Sea Surface Temperature (SST) 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.

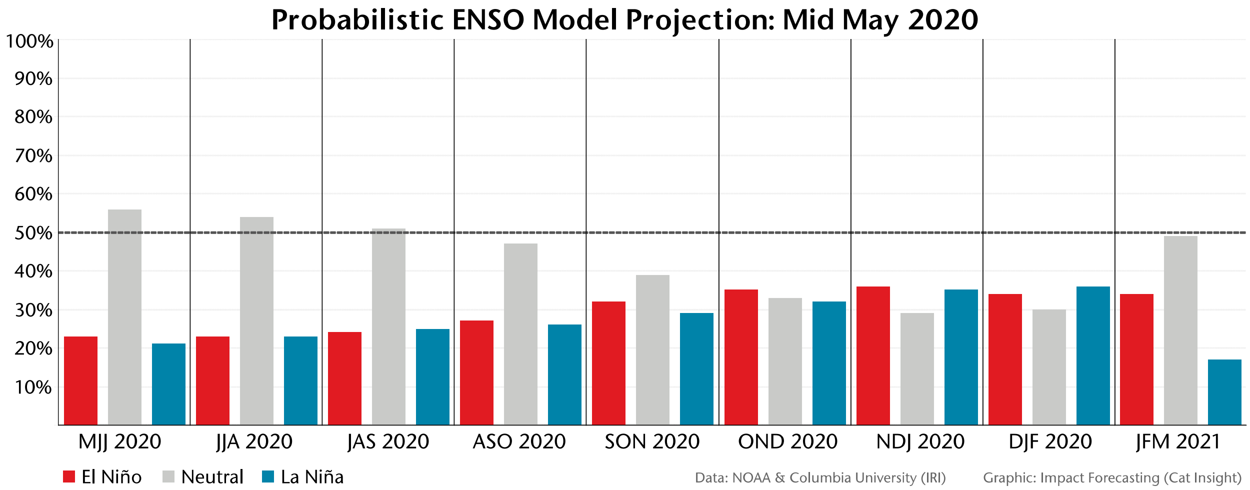
Select Current Global SSTs and Anomalies

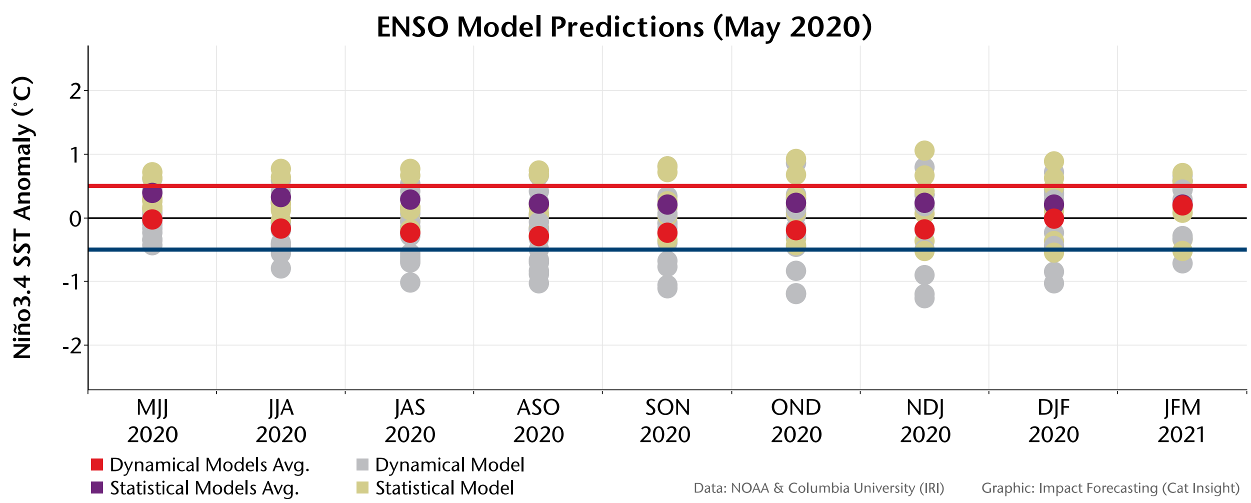
Location of Buoy	Temp (°C)	Departure from Last Year (°C)
Eastern Pacific Ocean (1,020 miles SW of San Salvador, El Salvador)	24.7	+0.4
Niño3.4 region (2°N latitude, 155°W longitude)	26.2	-1.7
Western Pacific Ocean (700 miles NNW of Honiara, Solomon Islands)	30.3	+0.3

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 65 percent chance of neutral conditions lingering through the Northern Hemisphere (boreal) summer months. The agency further states that a decreasing chance (lowering to 45 to 50 percent) into the boreal autumn.





***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.*

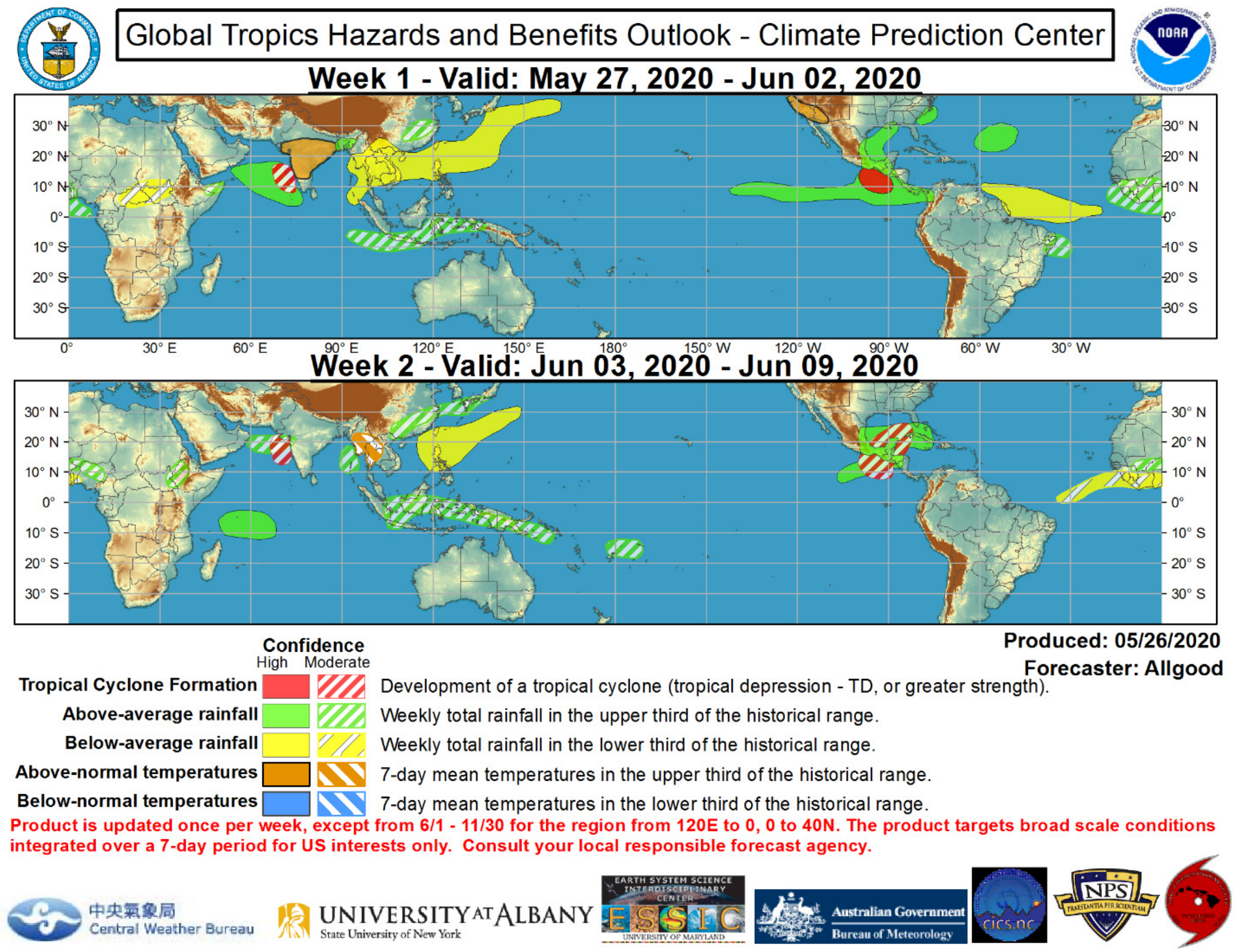
***La Niña** refers to the periodic cooling of sea-surface temperatures (-0.5°C) across the east-central equatorial Pacific. It represents the cold phase of the ENSO cycle.*

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.*

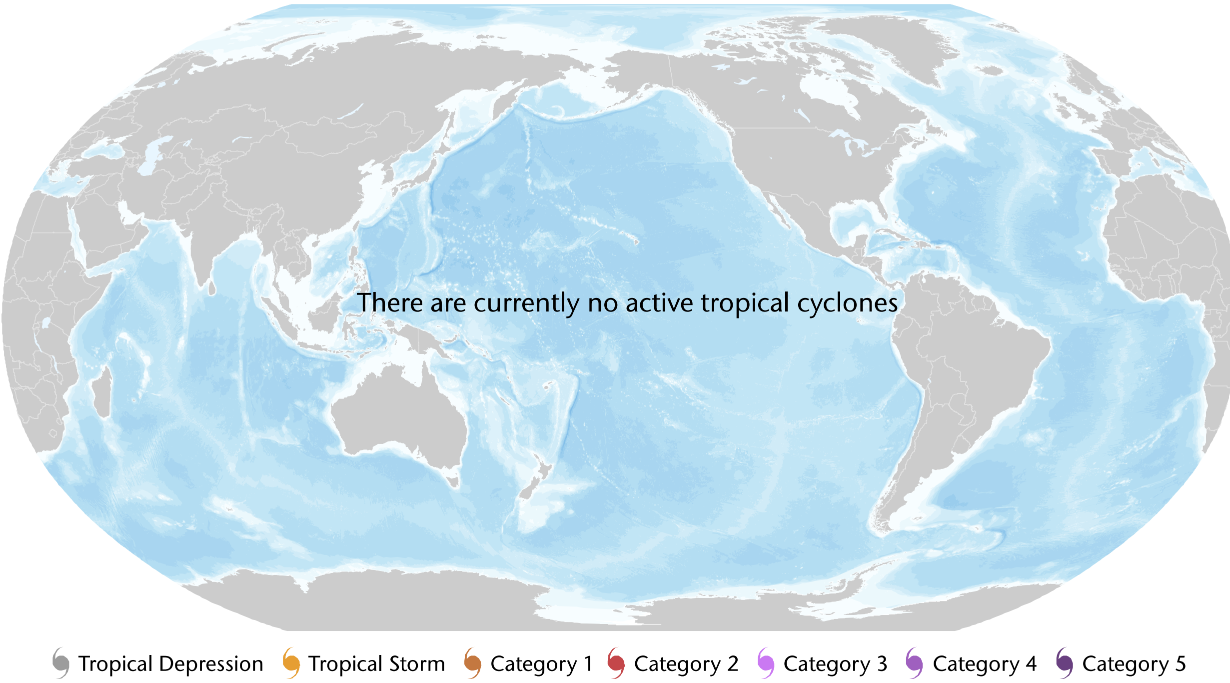
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This standard of measure is known as the Oceanic Niño Index (ONI).

Global Tropics Outlook



Source: Climate Prediction Center

Current Tropical Systems



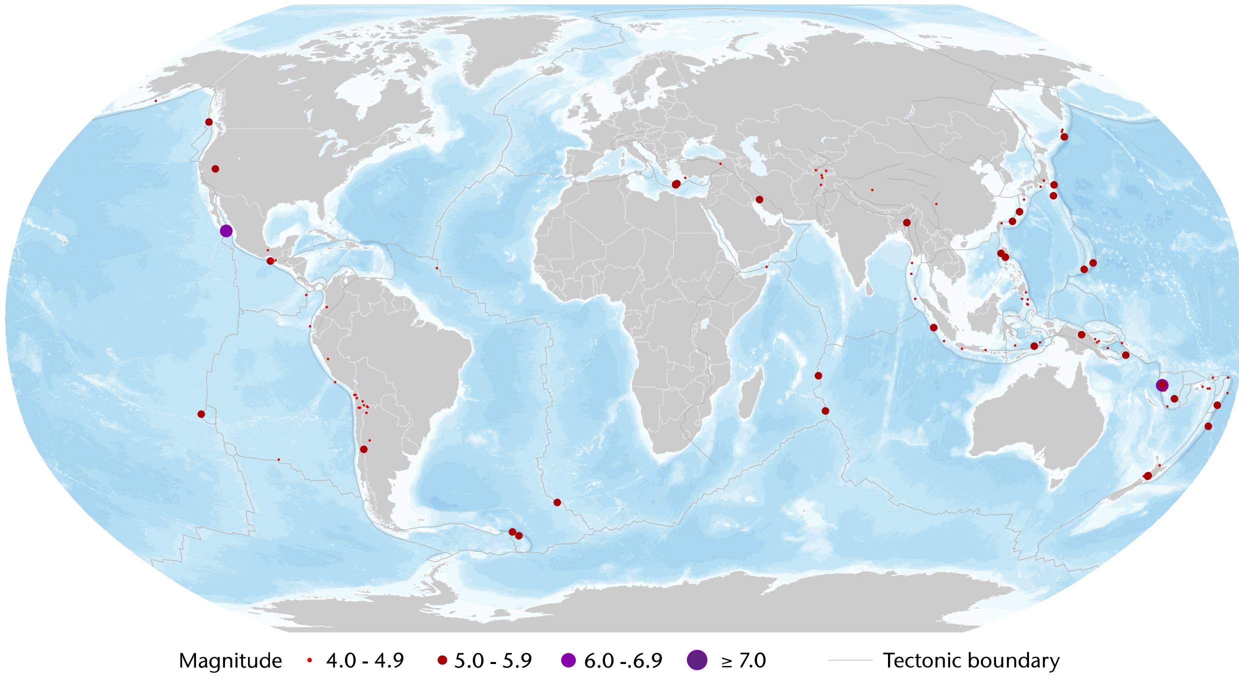
Location and Intensity Information

Name*	Location	Winds	Storm Reference from Land	Motion**

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

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

Global Earthquake Activity (≥M4.0): May 22-28

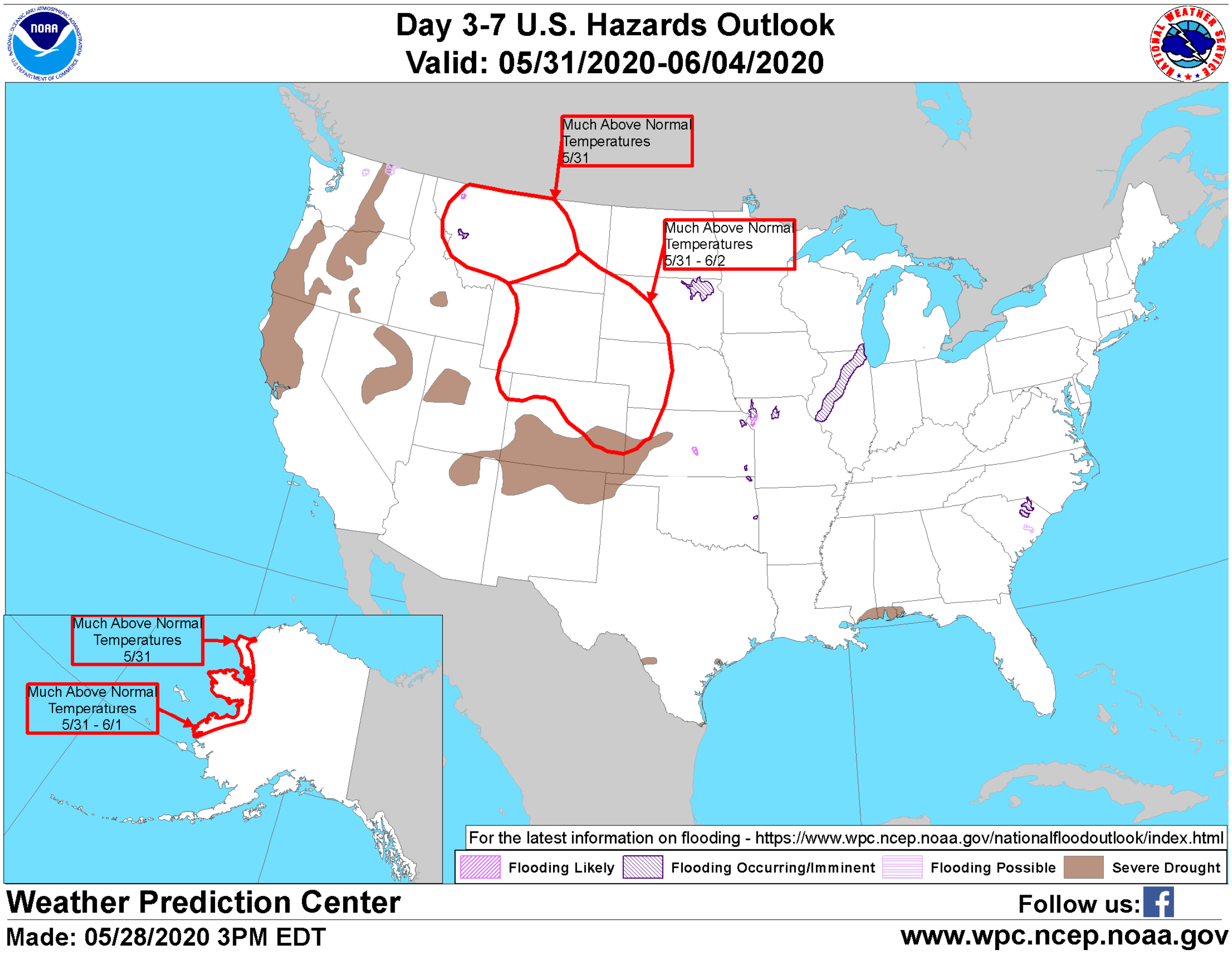


Significant EQ Location and Magnitude (≥M6.0) Information

Date (UTC)	Location	Magnitude	Depth	Epicenter
05/22/2020	22.40°N, 108.16°W	6.1	10 km	17 kilometers (11 miles) ESE of San Jose del Cabo, Mexico
05/27/2020	17.16°S, 167.86°E	6.1	10 km	80 kilometers (50 miles) NW of Port-Vila, Vanuatu

Source: United States Geological Survey

U.S. Weather Threat Outlook

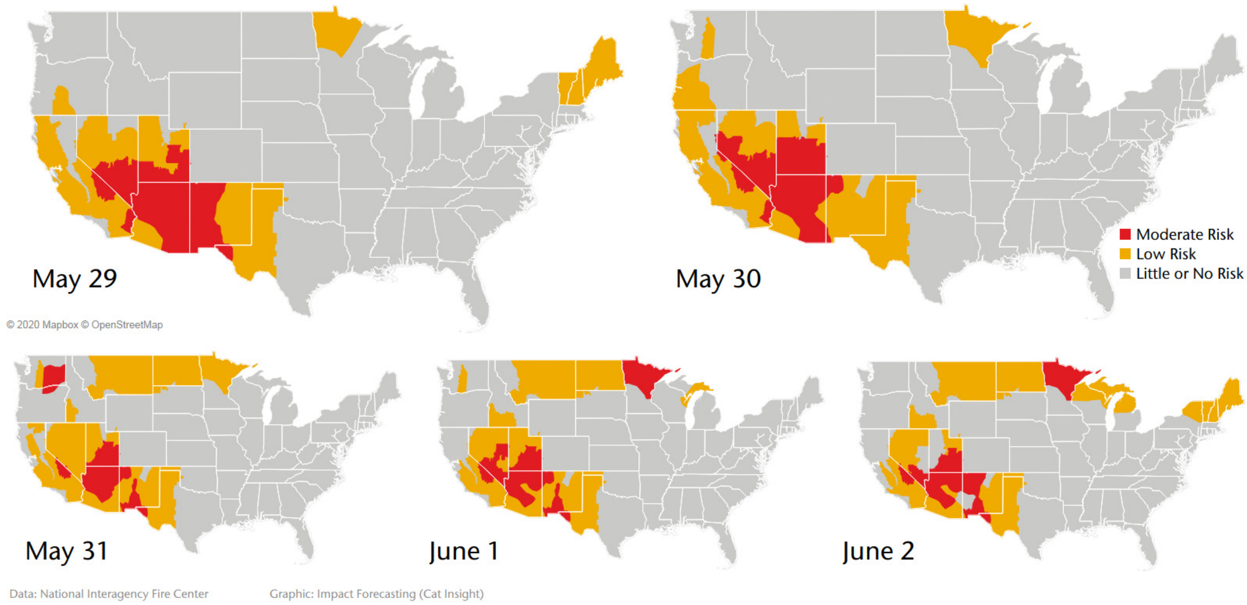


Potential Threats

- Much above normal temperatures are anticipated across the Central and Northern Plains between May 31–June 2, as a strong upper level ridge continues building eastward.
- Flooding is ongoing and imminent across portions of the Central Plains, Midwest, Great Lakes and eastern South Carolina resulting from recent episodes of enhanced rainfall.
- Severe drought conditions continue across portions of the Central Plains and Rockies, in addition to regions near the northern California and southern Oregon coasts, as well as the Intermountain West.

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 Desert Southwest, Plains, Southeast, and Midwest through the end of May into early June.



Annual YTD Wildfire Comparison: May 28*

Year	Number of Fires	Acres Burned	Acres Burned Per Fire
2016	19,965	1,584,061	79.34
2017	24,162	2,205,478	91.28
2018	23,505	1,708,549	72.69
2019	14,180	262,948	18.54
2020	18,021	373,424	20.72
10-Year Average (2010-2019)	**21,621**	**1,106,628**	**51.18**

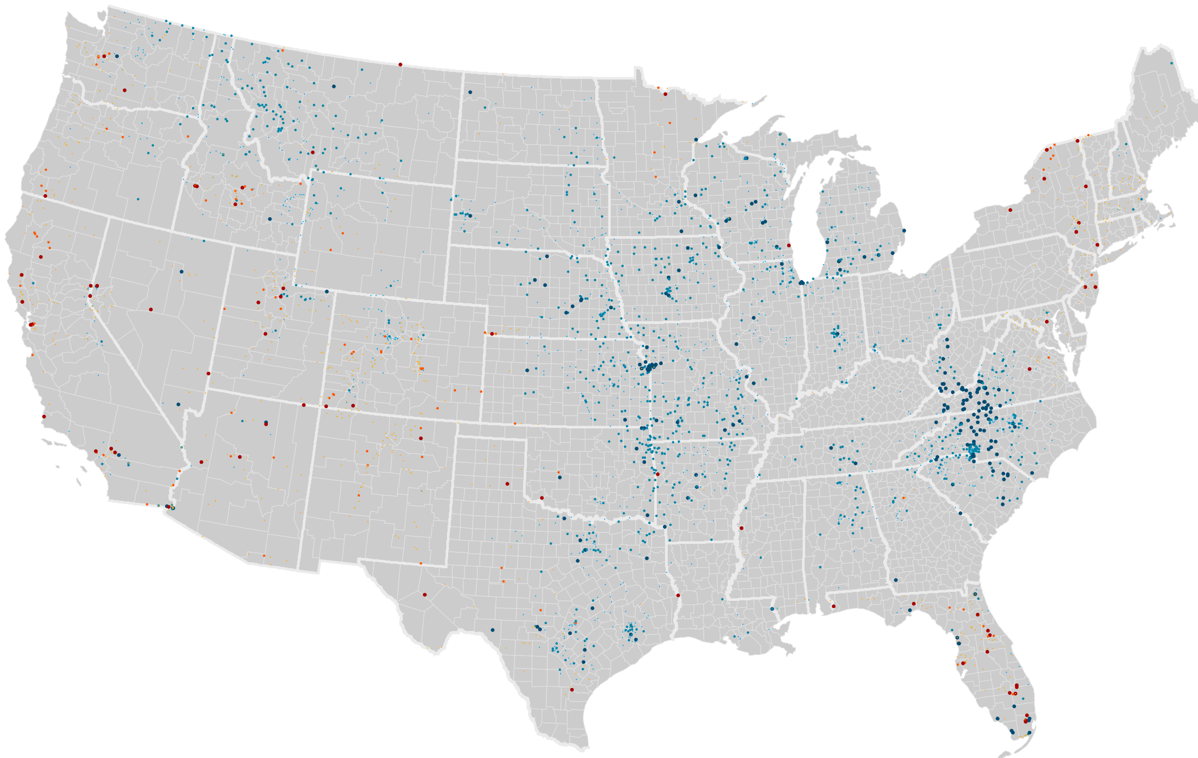
**Last available update from NIFC*
Source: National Interagency Fire Center

Top 5 Most Acres Burned by State: May 28

State	Number of Fires	Acres Burned	Acres Burned Per Fire
Oklahoma	526	74,815	142.23
Texas	1,272	51,609	40.57
Florida	1,567	51,435	32.82
Arizona	695	48,918	70.39
Kansas	34	21,796	641.06

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
St. Croix River near Danbury, Wisconsin	3.98	99.03
James River at Galena, Missouri	10.95	98.98
Deep River at Ramseur, North Carolina	6.56	98.97
Big Spring near Van Buren, Missouri	3.56	98.95
Red Cedar River at Menomonie, Wisconsin	9.30	98.93

Source: United States Geological Survey

Source Information

Update: Cyclone Amphan

Cyclone Amphan loss estimated at $13 billion in India, may rise in Bangladesh: Officials, Hindustan Times
Betel leaf farms razed to ground, The Telegraph
Toll 86, over 10 lakh homes gone, The Telegraph
Assam: Over 2 lakh affected in flash floods triggered by Cyclone Amphan; more rainfall predicted for next 2-3 days, DNA
Cyclone Amphan: Death toll rises to 26, Dhaka Tribune
Ministry of Disaster Management and Relief, Bangladesh
Odisha State Disaster Management Authority
Bureau of Meteorology, Australia

More hail & damaging winds impact the U.S.

U.S. National Weather Service
U.S. Storm Prediction Center
Hailstones bigger than grapefruit pummeled a north Texas town on Friday, The Washington Post
Severe weather kills 2 in Carolinas, tornado threat possible in Midwest Saturday, ABC News

Tropical Storm Bertha makes quick U.S. landfall

U.S. National Hurricane Center
U.S National Weather Service
Flooding rains drench South Florida, with coastal Carolinas next in line, The Washington Post
Miami-Dade scrambling to repair damage from some of the worst floods in two decades, Miami-Herald

Natural Catastrophes: In Brief

Strong wind led to blackout in the homes of 40 thousand residents of the Novosibirsk region. TASS
In Novosibirsk, a man died after the fall of a poplar branch during a hurricane. TASS
National Board for Disaster Management, Indonesia
Bureau of Meteorology, Australia
Hydrometeorological Centre of Russia

Contact Information

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

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

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