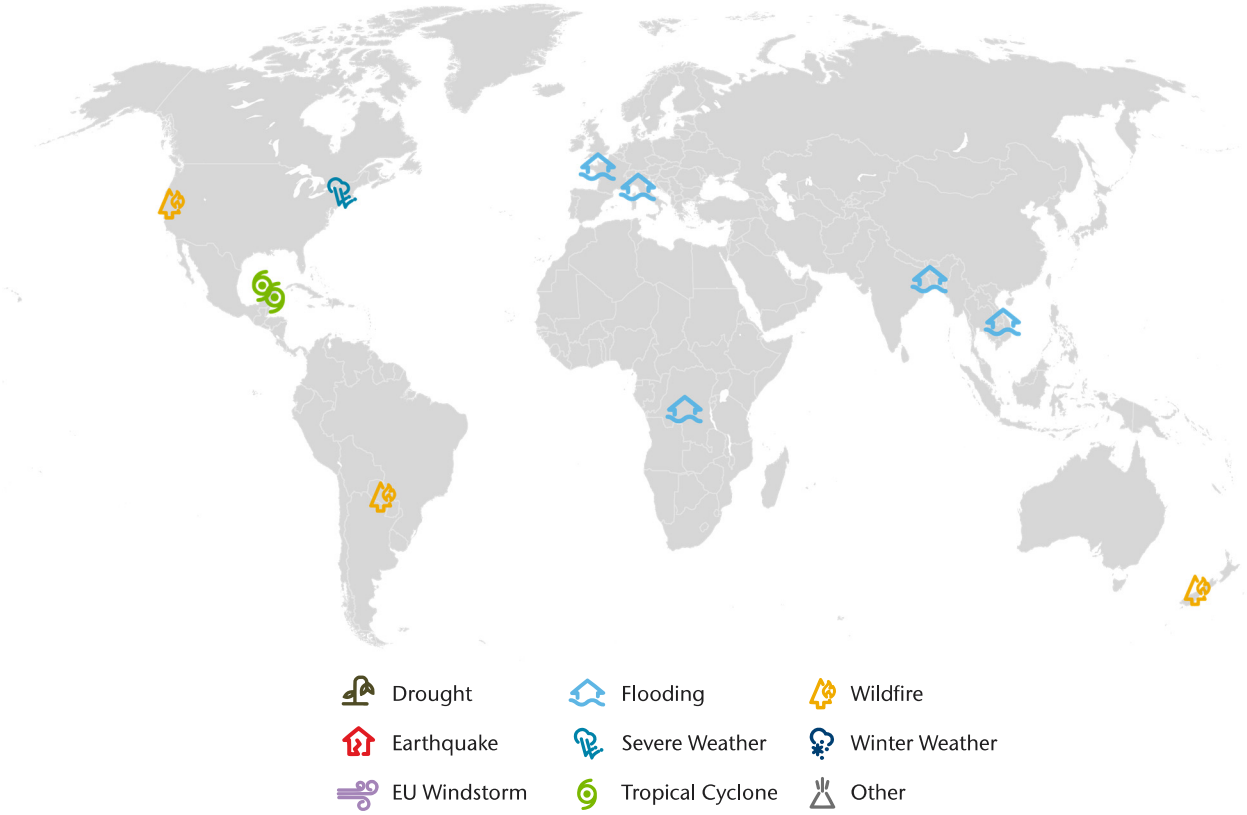
Weekly Cat Report

October 9, 2020

This Week's Natural Disaster Events



Event	Impacted Areas	Fatalities	Damaged Structures and/or Filed Claims	Preliminary Economic Loss (USD)*	Page
Hurricane Delta	Mexico	1+	Thousands	Millions+	3
Storm Alex	France, Italy	16+	Thousands	2.9+ billion	6
TS Gamma	Mexico	6+	Thousands	Millions	11
Wildfires	United States	43+	Thousands	Billions	13
Severe Weather	United States	0	Thousands	Millions	13
Wildfires	New Zealand	0	Dozens	Unknown	13
Flooding	India	12+	2,300+	Unknown	13
Flooding	Vietnam	6+	Hundreds	Unknown	14
Flooding	Democratic Republic of the Congo	11+	Unknown	Unknown	14

**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

Hurricane Delta strikes Mexico; takes aim at the U.S.

Hurricane Delta became the ninth hurricane of the 2020 Atlantic season, and the third to reach Category 4 status on the Saffir Simpson Hurricane Wind Scale. Delta rapidly intensified at a historic rate in the Caribbean, as sustained winds increased by 70 mph (110 kph) during the first 24 hours after it became a named storm. Delta reached a peak intensity of 145 mph (230 kph) before weakening prior to reaching the Yucatán Peninsula of Mexico. Delta made landfall along the northeastern coast of the Yucatán Peninsula near Puerto Morelos on October 7 as a Category 2 storm, with maximum sustained winds of 110 mph (175 kph). The hurricane brought damaging winds and heavy rains to portions of Quintana Roo, Yucatán, and Campeche. As of October 8, Delta was re-strengthening in the Gulf of Mexico as it heads north towards a likely landfall in Louisiana on October 9.

Meteorological Recap

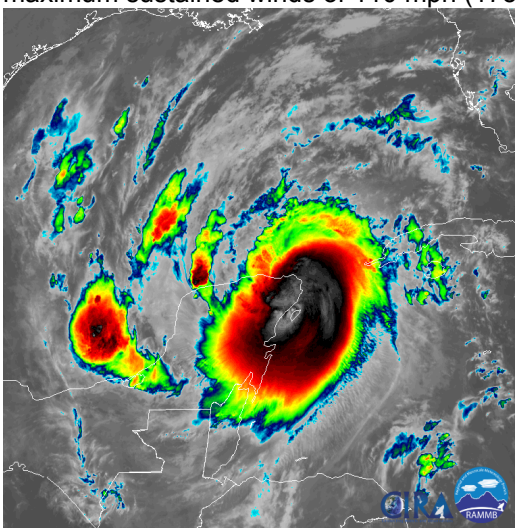
The National Hurricane Center (NHC) began to monitor a tropical wave located several hundred miles east of the Lesser Antilles on September 30. The system proceeded to produce a large area of disorganized showers and thunderstorms as it propagated westward between September 30 - October 4, while gradually becoming better organized. Tropical Depression Twenty-Six was officially designated at 11:00 PM EDT on October 4 (3:00 UTC October 5), with maximum sustained winds of 35 mph (55 kph). The storm was located 75 miles south-southwest of Kingston (Jamaica), and moving west-northwest at around 9 mph (15 kph). The depression was able to quickly strengthen as it traversed the warm waters of the Caribbean Sea, while northeasterly wind shear substantially abated.

The depression strengthened into Tropical Storm Delta on October 5 at 8:00 AM EDT (12:00 UTC) with maximum sustained winds of 40 mph (65 kph), while exhibiting a vastly improved convective structure on satellite imagery. Tropical Storm Delta became the 25th named storm of the 2020 Atlantic season, and the earliest 25th Atlantic named storm on record – the previous record was set on November 15, 2005. By 8:00 PM EDT (0:00 UTC on October 6) data from NOAA Hurricane Hunter aircraft confirmed that Delta had further intensified into a hurricane, with maximum sustained winds of 75 mph (120 kph) – equivalent to a Category 1 storm on the Saffir-Simpson Hurricane Wind Scale. Delta became the 9th hurricane of the 2020 Atlantic season.

On October 6, the compact core of Hurricane Delta continued churning west-northwest in the Caribbean, progressing in the flow between a subtropical ridge over the western Atlantic, and the remnants of Post Tropical Cyclone Gamma over the Yucatán Peninsula. Delta continued to rapidly intensify due to extremely favorable environmental conditions consisting of low vertical wind shear, high amounts of moisture, and very warm sea surface temperatures - approaching 30 °C (86 °F). In the first 24-hours since becoming a named storm, Delta intensified by 70 mph (110 kph), while the cyclones minimum central pressure dropped at least 42 millibars.

By 11:00 AM EDT (15:00 UTC) the NHC reported Delta had become a major Category 3 hurricane with sustained winds of 115 mph (185 kph). Shortly after, additional data from NOAA Hurricane Hunter aircraft indicated that Delta continued to rapidly intensify, as the storm exhibited a very symmetrical structure along with a pinhole eyewall spanning approximately 4 miles (6.4 kilometers). At 11:20 AM EDT (15:20 UTC) Hurricane Delta was further upgraded to a dangerous Category 4 storm, with maximum sustained winds approaching 130 mph (215 kph) and a minimum central pressure of 954 millibars. This made Delta the 3rd hurricane of the 2020 season to reach Category 4 status. Hurricane Delta maintained its trajectory toward the Yucatán Peninsula of Mexico with a speed of 16 mph (26 kph). The Yucatán Peninsula was still dealing with the remnants of Tropical Storm Gamma, which made landfall near Tulum (Quintana Roo) on October 3. Hurricane Warnings were in effect from Tulum to Dzilam (Mexico), including Cozumel.

Reaching a peak intensity of 145 mph (230 kph) in the late afternoon hours on October 6, Hurricane Delta weakened prior to reaching the Mexican coast as it encountered notable mid-level shear, and exhibited a partial dissipation of its eyewall. Hurricane Delta made landfall along the northeastern coast of the Yucatán Peninsula near Puerto Morelos (Quintana Roo) at 5:30 AM CDT (10:30 UTC) on October 7 with maximum sustained winds of 110 mph (175 kph) – equivalent to a Category 2 storm on the Saffir-Simpson Hurricane Wind Scale, with a minimum central pressure of 972 millibars. Delta brought hurricane force wind gusts and heavy rainfall to portions of Mexico with the greatest impacts in Quintana Roo and Yucatán.



Hurricane Delta making landfall in Mexico
Source: NOAA/RAMMB

After traversing the northeastern Yucatán Peninsula, a weakened Hurricane Delta emerged over the warm waters of the southern Gulf of Mexico in the early afternoon hours on October 7, into an environment conducive for gradual strengthening. Delta remained a well-organized hurricane on October 8, with a central dense overcast as it continued northwest around the periphery of an Atlantic subtropical ridge, with maximum sustained winds reaching 105 mph (165 kph). Hurricane warnings were in effect for East of Sabine Pass to Morgan City (Louisiana) as Delta neared the U.S Gulf Coast.

Impact Forecasting will continue to send regular Cat Alerts on Hurricane Delta through its anticipated landfall in Louisiana on October 9. A complete meteorological recap and full damage details will be included in next week's Weekly Cat Report.

Event Details

On October 5, oil companies began to evacuate essential personnel from offshore oil platforms across portions of the Gulf of Mexico in expectation of Hurricane Delta.

Mexico

In anticipation of the impacts from Hurricane Delta, the Mexican government mobilized no less than 10,000 military and civilian personnel to the Yucatán Peninsula, including the states of Quintana Roo and Yucatán. On October 6, the Governor of Quintana Roo gave evacuation orders for portions of Cancun - including the Hotel Zone, Puerto Morelos, Isla Holbox, and other coastal locations further south. At least 32,000 tourists were among those under evacuation orders. Cancun International Airport temporarily closed by the evening hours on October 6. At least 2,700 people in the states of Quintana Roo and Yucatán took refuge in storm shelters. The storm knocked out power to no less than 266,000 customers.

In **Quintana Roo**, a weather station near Puerto Morelos reported a minimum pressure of 972 millibars and calm winds as eye of hurricane Delta came ashore. Government officials indicated at least 1,000 fallen trees and 187 power poles across the state. In Puerto Morelos, significant flooding and extensive tree damage, in addition to impacts to vehicles and structures were reported. In Cancun, a weather station measured sustained winds of 135 kph (84 mph), with a peak gust reaching 170 kph (106 mph). Widespread power outages were reported, as strong winds toppled trees and covered roadways in debris. Multiple instances of damaged vehicles, structures, and broken windows were observed. Notable flooding also occurred in Cozumel and Playa del Carmen. A weather observing site in Cozumel reported hurricane force wind gusts, while a weather station in Playa Del Carmen reported a 3-day precipitation total ending the morning on October 7 of 179 millimeters (7.0 inches).

Damage in Quintana Roo from Hurricane Delta
Source: Governor Carlos Joaquin

In **Yucatán**, the State Civil Protection Coordinator indicated that 334 localities in 81 municipalities were impacted by Delta. Damage to homes and boats were common, as well as notable impacts to cropland and drinking water infrastructure.

In **Campeche**, at least 10 rural towns were affected by flooding from Delta, where State Civil Protection officials indicated that no less than 50 homes were flooded, leaving 150 homeless.

Financial Loss

Total economic and insured losses from Hurricane Delta across the Yucatán Peninsula of Mexico were expected to be in the millions (USD), further damage assessments are currently ongoing. Impacts, however, were much less than initially feared. The storm brought back memories of the damage incurred from Hurricane Wilma (2005), which cost Mexican insurers USD2.5 billion (2020 USD); the costliest event on record for the country's insurance industry.

Devastating floods in France & Italy in wake of Storm Alex

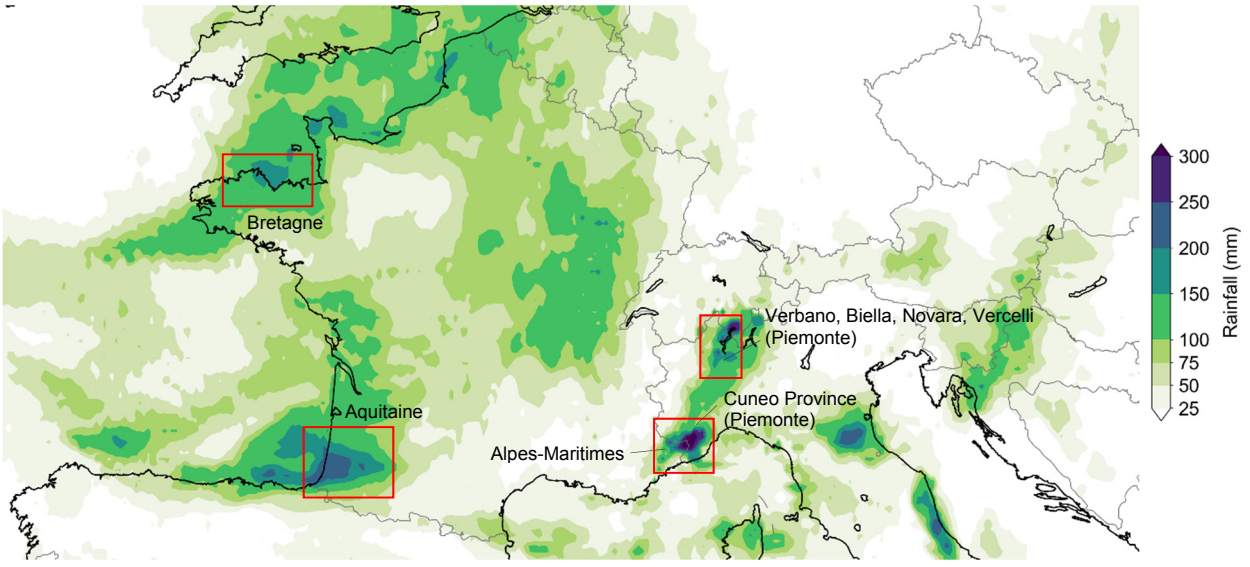
Windstorm Alex impacted northwestern France with strong gusts in the night of October 1-2. However, the main impacts associated with the system were triggered by extremely intense rainfall during a 'Mediterranean episode' in the Alpine regions of Alpes-Maritimes in France and Piemonte in Italy on October 2. At least 16 people were killed in the flash floods, and more were missing. Local infrastructure was severely impacted by raging torrents, along with severe damage of property, resulted in an expected multi-billion economic toll. Insurance payouts were not yet determined, but are expected to reach into the hundreds of millions EUR.

Meteorological Recap

Windstorm Alex hit the Bretagne (Brittany) region in Northwestern France in the night from October 1 to 2, after rapidly deepening to about 975 millibars while approaching the coast. It was officially the first named storm of the season in France, which started on October 1. The highest gust recorded during the storm was observed on the exposed Belle-Île island and reached 186 kph (116 mph), setting a new historical record for the station and beating the old record from February 1990, reached during the damaging Windstorm Herta.

Station	Gust (kph)	Gust (mph)
Belle-Île	186	116
Groix	157	98
Granville	142	88
Sarzeau	135	84
Vannes	131	81
Rennes	116	72

The storm also produced notable rainfall across Brittany, with a 24-hour peak recorded on Saint-Brieuc station in Côtes-d'Armor with 54 millimeters (2.1 inches). The station recorded a total of 151 millimeters (5.9 inches) of rain on October 1-3, while Pommerit-Jaudy observed 159 millimeters (6.3 inches). Notable rainfall was also noted in the Aquitaine region in southeastern France



Satellite precipitation estimate for October 1-4.
Data: GPM, NASA. Graphic: Impact Forecasting (Cat Insight)

However, the most extreme precipitation amounts were observed in a spatially limited area in the border region of Alpes-Maritimes department in southeastern **France** and Piemonte in Northwestern Italy. Météo-France noted an exceptional amount of 500.2 millimeters (19.7 inches) of rainfall within a 24-hour period in Saint-Martin-Vésubie, which constitutes a departmental record of 24-,48- and 72-hour rainfall in any month of the year. This amount of precipitation was described to occur only once in 100 years or even more.

Stations with the highest precipitation totals, as provided by Météo-France, are in the table below:

Station	Rainfall (mm)
Saint-Martin-Vésubie	500
Andon	380
Clans	355
Tende	343

Station	Rainfall (mm)
Coursegoules	336
Mas	319
Breil-sur-Roya	271
Sospel	199

Météo-France described the pattern that led to the flash flooding in Alpes-Maritimes as an exceptional case of a '**Mediterranean episode'**, unprecedented for the region. This term describes a phenomenon that brings violent storm systems to southern France, Spain or Italy, usually 3 to 6 times a year, mostly during autumn months. The sea is still warm at this time of the year and the water evaporates. If there is a low-pressure system over Western Europe, a mass of moist, warm air is pulled from the Mediterranean Sea northwards and is pushed against the mountain ranges. There it meets colder air lying north, creating instability, which is favorable for convective storm generation. Warm air rises and water vapor condenses, often creating significant rainfall. Moreover, the storms can continue to develop for hours or even days over the same location, releasing an equivalent of several months' precipitation.

Until October 4, exceptional precipitation continued in parts of **Northwestern Italy**, mainly concentrated in two areas of the Piemonte region: Province of Cuneo (adjacent to Alpes-Maritimes in France) and northern Piemonte. Regional Environmental Protection Agency (ARPA) provided a summary of rainfall for most affected stations, summarized in the table below. Please note that some of these stations are located in high altitude. On several of these stations, **more than 50 percent of average annual rainfall was observed, and some recoded rainfall with a return period of more than 200 years**.

Station	Commune	Province	Oct 1	Oct 2	Oct 3	Oct 4	Total rainfall (mm)
Sambughetto	Valstrona	Verbano-Cusio-Ossola	1	504	143	22	**671**
Candoglia Toce	Mergozzo	Verbano-Cusio-Ossola	1	463	140	22	**626**
Piedicavallo	Piedicavallo	Biella	5	470	123	14	**612**
Limone Pancani	Limone	Cuneo	-	549	33	7	**589**
Fobello	Fobello	Vercelli	2	349	195	13	**559**
Oropa	Biella	Biella	4	421	59	21	**505**
Pizzanco	Bognanco	Verbano-Cusio-Ossola	10	260	179	36	**485**
Camparient	Trivero	Biella	4	333	110	15	**462**
Cicogna	Cossogno	Verbano-Cusio-Ossola	2	311	107	39	**460**
Mottarone – Baita Cai	Stresa	Verbano-Cusio-Ossola	5	368	63	22	**458**
Monte Berlino	Garessio	Cuneo	-	414	19	7	**439**
Boccioleto	Boccioleto	Vercelli	1	240	165	10	**416**
Diga Del Chiotas	Entracque	Cuneo	-	357	19	0	**377**
Piaggia	Briga Alta	Cuneo	1	326	24	11	**363**
Ponte Di Nava Tanaro	Ormea	Cuneo	-	310	10	6	**325**

Event Details

France

Wind-related impacts of Windstorm Alex were spatially limited to northwestern departments, particularly the coastal areas of Morbihan in Bretagne and Loire-Atlantique in Pays-de-la-Loire, as the storm first moved over the mainland during the night of October 1-2. Further property damage was also reported from other adjacent departments, while about 80,000 customers were left without power. Even though the storm generated record-breaking gusts on the exposed island and coastal stations, the overall impact was generally minor and is expected to only reach into the tens of millions EUR.

Further problems were caused by intense precipitation, as the storm affected France for several days before finally dissipating and exiting towards the North Sea. Notable rainfall accumulations were noted in northern Bretagne, and in Landes and Pyrénées-Atlantiques in Aquitaine. However, resulting flooding was not significant.

The most devastating impacts occurred in a small area in the extreme southeast of continental France, limited to Roya, Vésubie and Var valleys in the Alpes-Maritimes department. Extremely intense precipitation, orographically enhanced in the southern part of the Alpine range, and generated by a phenomenon called the “Mediterranean episode”, swelled local torrents and resulted in significant flash flooding. As a result, officials confirmed six fatalities as of October 8, while six people were still missing. Another 13 were “believed to be missing”.

Flooding damage in Alpes-Maritimes
Source: Ministry of Interior, France; Fire Brigades of Alpes-Maritimes

Perhaps the most notable destruction from an economic standpoint was noted on regional infrastructure, as raging torrents destroyed long stretches of important roads at the bottom of the Roya, Vésubie and Var valleys. Tens of kilometers of roads are to be rebuilt in a complicated mountainous terrain with multiple bridges and supporting structures. In Métropole Nice Côte d'Azur alone (an administrative entity including Nice and the Vésubie Valley), damage on the road network was preliminarily estimated at EUR435 million (USD513 million) out of a total expected toll of EUR600 million (USD708 million). Similar destruction was also noted in the Roya valley further east, where 35 kilometers (22 miles) of departmental roads were destroyed at a cost of approximately EUR500 million (USD590 million).

Significant damage also occurred on residential and commercial property, and vehicles; however, authorities have yet to determine the total number of homes that were affected. Several homes were completely destroyed as the force of the torrents undermined the stability of their banks. Other properties were left in a risk of structural failure and uninhabitable. Municipalities in the affected areas also noted effects on public property and institutions, whose economic impacts were being assessed. Also notably, cemeteries in Tende, Saint-Martin Vésubie and Saint-Dalmas were partially destroyed and washed away. At least 15,000 homes were without power and further problems with water supply were noted.

The disaster required a mobilization of nearly 1,000 firefighting personnel. Nearly a thousand people were evacuated to safety, including at least 581 by helicopters

First, tentative estimate of economic losses provided by regional officials was determined at nearly EUR1.5 billion (USD1.75 billion). This includes EUR600 million (USD706 million) in damage noted in the Métropole Nice Côte d'Azur and nearly EUR900 million (USD1.06 billion) in the rest of the department of

Alpes-Maritimes. It is important to note that exact determination of economic impact might take several weeks or months. The state of natural disaster was declared in the department on October 7 for 55 communes, which has important implications for compensation of damage.

Italy

Main impacts in Italy were associated with flash flooding in basins of Toce and Sesia Rivers in northern Piemonte and Tanaro and Vermenagna in Cuneo province. ARPA noted that water levels on Sesia were the highest in the automatic measurement record. The floods were much more significant than those of 2000 and 1993 and had a magnitude comparable to the largest historical flood of the last 100 years which occurred in 1968. Toce crested in Candoglia at 9.34 meters, beating an old record of 9.16 meters from 2000.

At least 10 people were killed in weather-related incidents, of which six were in Liguria. Widespread devastation occurred in parts of Piemonte region. Among the worst affected were the Vermenagna and Tanaro valleys in the Province of Cuneo. The town of Limone was hardly hit by the raging Vermenagna River - multiple structures collapsed and there was a disruption in water and power supplies in the area. The town lies on the northern side of the Alps, opposite to Tende of the Roya valley in France. Both towns are connected by a Col de Tende Road Tunnel, an important connection between the two countries. Ski resorts were significantly affected in Cuneo area with towns of Garessio and Limone.

Source: Civil Protection of Piemonte

River Tanaro isolated and severely damaged Ormea further east. Further downstream in Bagnasco, the torrent partially destroyed a Roman bridge, restored after a flood in 1994. Significant damage was also reported further northeast from Vercelli, Biella and Novara areas in northern Piemonte, in Toce and Sesia River basins. Many areas were isolated due to landslide and flood-related damage on critical infrastructure, including the Valsesia area. Heavy rains and subsequent flooding also resulted in about 55,000 power outages.

Additional damage was reported elsewhere, including Valle d'Aosta. Minor flood and landslide activity was reported from Bergamo in Lombardia. Ticino, a neighboring canton of **Switzerland**, was also affected, although authorities have not reported significant damage – even though Camedo station in Centovalli recorded 421 millimeters (16.6 inches) within 24 hours This is the second highest value ever recorded in Switzerland after that of August 26, 1935 (455 millimeters / 17.9 inches).

The total economic impact of the flooding in Piemonte was tentatively estimated by the region's president at EUR1.0 billion (USD1.2 billion). This estimate is an aggregation of ongoing damage assessments conducted in about 120 municipalities affected across the region and contains damage to "public works, those suffered by individuals, families and companies in the industry, trade, crafts and agriculture sectors". Of this amount, EUR300 million (USD353 million) was requested for conducting emergency operations and restoration of critical infrastructure. Significant effects were expected in the agricultural sector alone. An industry association Coldiretti announced a preliminary estimate of nationwide economic losses to farmers at EUR300 million (USD353 million).

Financial Loss

Wind-related impacts of Storm Alex in northwestern France were not expected to be significant for the insurance industry, as it only affected a relatively small coastal area. Total economic impact was expected to reach into the tens of millions EUR.

The flood-related impacts, which resulted from the interaction of Alex's frontal system with meteorological and marine conditions in Western Mediterranean, will be a major event from a financial standpoint Despite being limited to a relatively small area, extremely intense precipitation resulted in record-breaking floods and severe damage to infrastructure and property. Preliminary publicly available estimates of economic damage from regional officials as of October 8 were EUR1.4 billion (USD1.7 billion) in France and EUR1.0 billion (USD1.2 billion) in Italy.

Considering these estimates, the event might even surpass Windstorm Ciara (Sabine) as the costliest event in Europe of 2020 to date. It will likely result in notable payouts for local insurers - however, it is important to note that much of the flood damage is expected to be uninsured, as a large part of the losses in France were attributed to damage on infrastructure; and also due to very low insurance take-up in Italy.

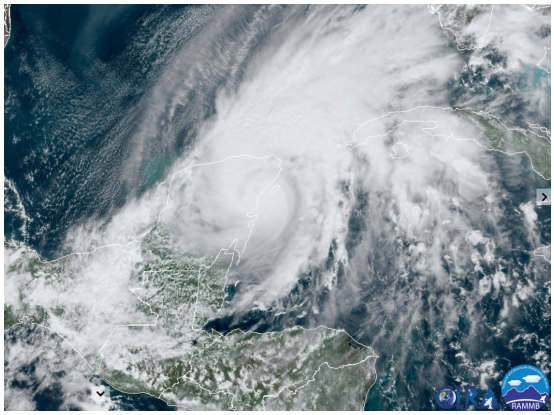
Tropical Storm Gamma impacts Mexico

Tropical Storm Gamma continued to intensify in the warm waters of the Caribbean until it made landfall along the northeastern coast of Mexico's Yucatán Peninsula, near Tulum, on October 3 with maximum sustained winds of 70 mph (110 kph), and a minimum central pressure of 980 millibars. The tropical storm, along with an associated frontal boundary produced several days of heavy rainfall across southeastern Mexico between October 1-6, with the greatest impacts occurring in the Mexican States of Quintana Roo, Yucatán, Chiapas, Campeche, and Tabasco.

Meteorological Recap

On September 29 the National Hurricane Center (NHC) was monitoring a westward progressing tropical wave over the central Caribbean Sea. The wave continued its trajectory, while interacting with a frontal boundary to produce a broad area of low pressure in the west-central Caribbean, north of Honduras between September 29 - October 1. By October 2, visible satellite imagery showed convective banding features and a defined circulation as the low became better organized. Tropical Depression Twenty-Five was designated at 11:00 AM EDT (15:00 UTC) on October 2, with maximum sustained winds of 35 mph (55 kph) and moving northwest at around 9 mph (15 kph). Additional intensification occurred as the depression, located 220 miles (335 kilometers) southeast of Cozumel (Mexico), traversed very warm waters surrounded by an environment characterized by relatively low wind shear.

At 7:00 PM CDT on October 2 (0:00 UC October 3) the depression had strengthened into Tropical Storm Gamma, with maximum sustained winds of 40 mph (65 kph) as the storm continued to slowly move toward the Yucatán Peninsula of Mexico. Gamma became the 24th named storms of the 2020 Atlantic Season, and the earliest 24th named storm on record, breaking the old record set on October 27, 2005. Observations from NOAA Hurricane Hunter aircraft confirmed that Gamma continued to intensify prior to landfall, prompting the Government of Mexico to issue a Hurricane Warning for portions of the northeastern Yucatán Peninsula, which comprised coastal regions north of Punta Allen to Cancun, including Cozumel. Tropical Storm Gamma made landfall near Tulum, Mexico at 12:00 PM CDT (17:00 UTC) on October 3, with maximum sustained winds of 70 mph (110 kph), and a minimum central pressure of 980 millibars. Gamma brought heavy rainfall and strong winds across portions of the Yucatán Peninsula, while moisture associated with the cyclone and an accompanying frontal boundary produced several days of locally heavy rainfall across southeastern Mexico.



Tropical Storm Gamma making landfall in Mexico
Source: NOAA/RAMMB

By 1:00 AM CDT (6:00 UTC) on October 4, Tropical Storm Gamma emerged over the extreme southern Gulf of Mexico. Once in the Gulf, Gamma struggled against the impacts of southerly wind shear and dry air intrusion, as the circulation meandered off the coast of northern Yucatán for a considerable period. By October 5, a gradual west-southwestward shift in movement began as a ridge briefly built over the eastern and central Gulf of Mexico, steering the weakening tropical storm back toward the northern Yucatán coast. Gamma further weakened to a Post Tropical Cyclone by 10:00 PM CDT on October 5 (3:00 UTC October 6), while its remnants continued to produce scattered showers and heavy rain across portions of the Mexican states of Yucatán, Campeche, and Tabasco.

Event Details

The Federal Electricity Commission of Mexico (CFE) reported that at least 250,408 customers in Campeche, Quintana Roo, and Yucatán were impacted by power outages related to Tropical Storm Gamma.

In **Quintana Roo**, a weather station at Xel-Ha Park reported a wind gust of 109 kph (68 mph) with a sustained wind of 89 kph (55 mph) on October 3. Ferry services between Cancun and Playa del Carmen with the islands of Cozumel and Isla Mujeres were suspended. A church, Maria Star of the Sea, located north of Cancun was collapsed by the storm. The Ministry of the Navy preformed multiple water rescues.

Mexican Navy assists residents affected by Gamma
Source: Secretaría de Marina (SEMAR)

In **Yucatán**, fallen trees and downed power lines caused power outages throughout the region, while damaged access roads and debris led to the closure of archeological sites Chichén Itzá and Ek Balam. Torrential rains from Gamma brought severe flooding to the City of Tizimín, which led to impassable roadways and inundated homes, in some instances water levels reached several feet (meters) high. A weather station in Tizimín reported a 24-hour rainfall total ending the morning of October 4 of 290 millimeters (11.4 inches).

In **Chiapas**, at least four people were killed near Pajaltón as a landslide triggered by the heavy rains buried their home. Officials from Chiapas Civil Protection preliminarily reported 543 homes impacted by the event, 207 of which sustained major damage. Additionally, 326 road sections, and 420 linear meters of water pipelines were impacted, at least 2 bridges were damaged.

In **Tabasco**, a three-day precipitation total, ending the morning of October 2, of 525 millimeters (20.6 inches) was recorded at a station in Villahermosa. As of this writing, four rivers across the state (Teapa, Sierra, Pichucalco, and San Pedro) overflowed their banks, prompting the government to declare an emergency for all 17 municipalities – while the municipality of Centro was most affected. Two drowning deaths were reported, while no less than 600,000 people were affected by the rains.

Financial Loss

Total economic and insured losses from Tropical Storm Gamma and related flooding events across southeastern Mexico were anticipated to reach into the millions (USD).

Natural Catastrophes: In Brief

Wildfire (United States)
High pressure continued to dominate the atmospheric pattern across the Western United States throughout the first week of October, prolonging a stretch of abnormally dry and warm weather. In California, the **Glass Fire** (Napa and Sonoma Counties) expanded to 67,420 acres (27,284 hectares), destroying 1,536 structures while damaging an additional 280. The **August Complex**, burning in Mendocino, Shasta-Trinity, and Six Rivers National Forests has scorched 1,017,546 acres (411,786 hectares). Cal Fire reported that full containment was reached at the **LNU Lightning Complex** on October 2. As of this writing, the 2020 wildfire season has resulted in at least 8,400 wildfires in California, which have burned no less than 4 million acres (1.6 million hectares), resulting in 31 fatalities, and destroying 9,200 structures. Fire weather conditions are anticipated to briefly improve in the coming week as a trough moves across the Western United States, bringing moderating temperatures and increased moisture to the region.

Severe Weather (United States)
A severe squall line with embedded bowing segments progressed across regions of the Northeast during the afternoon and early evening hours on October 7, with the greatest impacts occurring in portions of east central New York and continuing through southern New England. The storms formed along a strong cold frontal boundary extending from a surface low-pressure system traversing southern Quebec (Canada). The primary hazard was severe and damaging straight-line winds, with gusts approaching and exceeding 60 to 70 mph (96 to 112 kph), with a maximum gust of 82 mph (132 kph) measured in Massachusetts (Norfolk County). The severe winds damaged and toppled numerous trees and powerlines across the region, significantly affecting transportation, while leaving no less than 360,000 customers across New York and Massachusetts without power, while additional outages occurred in Rhode Island and Connecticut. Damage to vehicles, as well as exterior structural impacts were observed in the most affected areas. As of this writing, there were 122 instances of severe winds reported. Total economic and insured losses were each anticipated to minimally be in the tens of millions (USD).

Wildfire (New Zealand)
Wildfires erupted in the South Island of New Zealand on October 4, affecting roughly 5,600 hectares (14,000 acres) of land in Canterbury Region. According to the media reports and Fire and Emergency New Zealand, three separate forest fire incidents were reported from the South Island, one each in the Tasman, Lake Ohau, and Livingstone regions. According to the local authorities, approximately 50 houses were destroyed, and residents of more than 100 households were evacuated to safety from the severely affected areas.

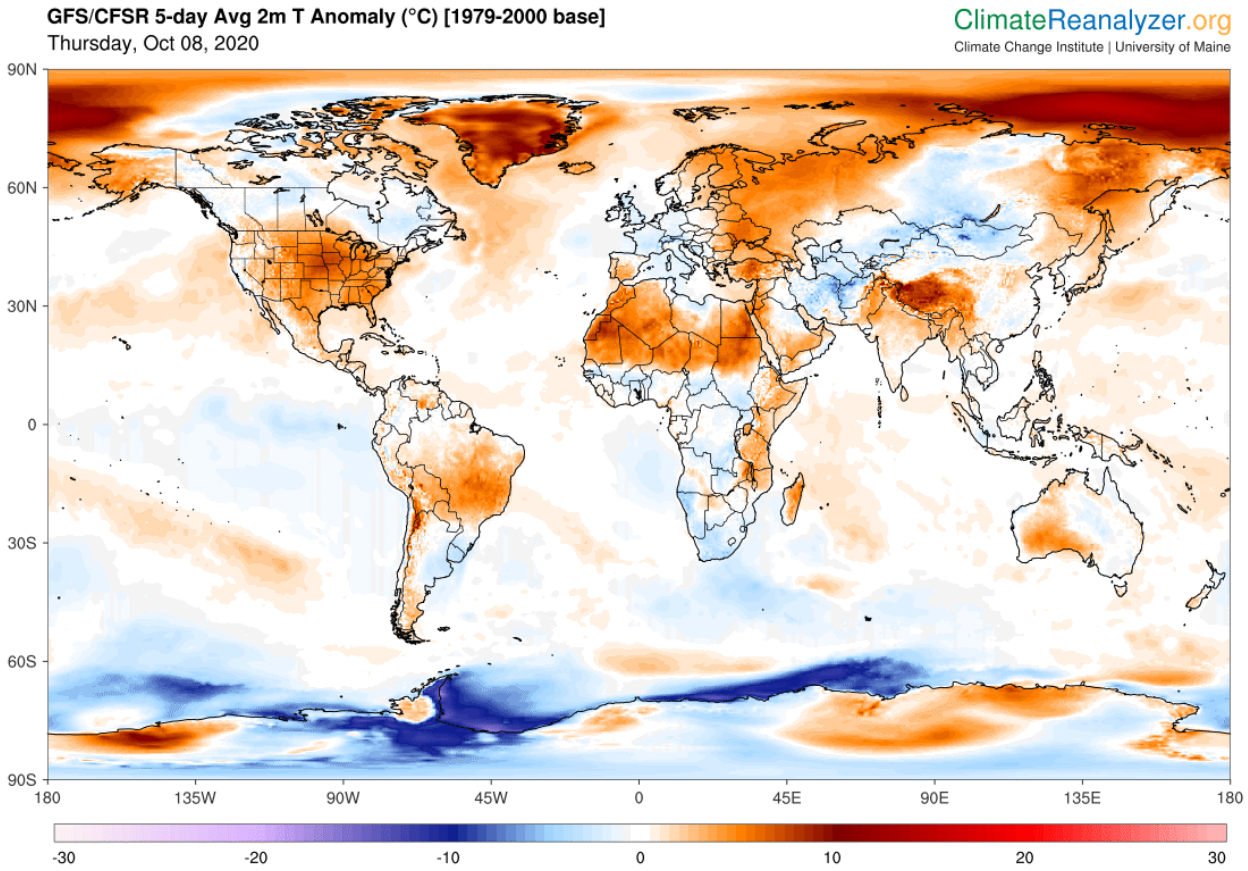
Flooding (India)
Heavy rainfall from October 2-8 associated with a low-pressure system in Bay of Bengal affected the Indian states located along the eastern coast; particularly affected were Andhra Pradesh, Odisha, and Assam. No fewer than 12 people were killed and approximately 2,300 homes were either damaged or destroyed, according to the latest information provided by the Disaster Management Division, Ministry of Home Affairs of India.

Flooding (Vietnam)
Heavy rains prompted landslides and flash floods in central Vietnam on October 4-8, causing widespread damage and casualties. According to the National Centre for Hydro-Meteorological Forecasting, multiple weather observatories located along the central parts of Vietnam recorded more than 400 millimeters (16 inches) of precipitation accumulation during a 24-hour stretch ending on October 7. According to the Vietnam Disaster Management Agency, at least 24 landslides had occurred in Quang Nam province. At least three people were confirmed dead and another three were missing, while hundreds of houses were damaged or destroyed in rain-related incidents.

Wildfire (Paraguay)
Thousands of wildfires were ignited in the midst of deteriorating drought conditions and extended heat in Paraguay from September 30 – October 6. The Pozo Hondo Meteorological Observatory recorded a 45.5°C (113.9 F) temperature during the afternoon hours on September 26. According to meteorological records, this became the hottest temperature ever recorded in Paraguay. Nearly 8,300 individual wildfire breakouts were recorded in Paraguay between September 30 – October 1; most of them were reported from the Chaco dry forest region located along the western parts of the country. Approximately 25,000 wildfire breakouts were reported in Paraguay in the year 2020. Owing to the devastating nature of these fires, Paraguay's government declared a national emergency on September 27. Neighboring countries of Argentina and Bolivia along with Brazilian Amazon also saw historic-level fires due to the persistently prevailing drought and dry weather conditions. Bolivia further declared a “natural disaster” due to wildfires that have severely affected regional forests and agriculture. The extent of total burned area and associated damage and casualties were not available as of this writing.

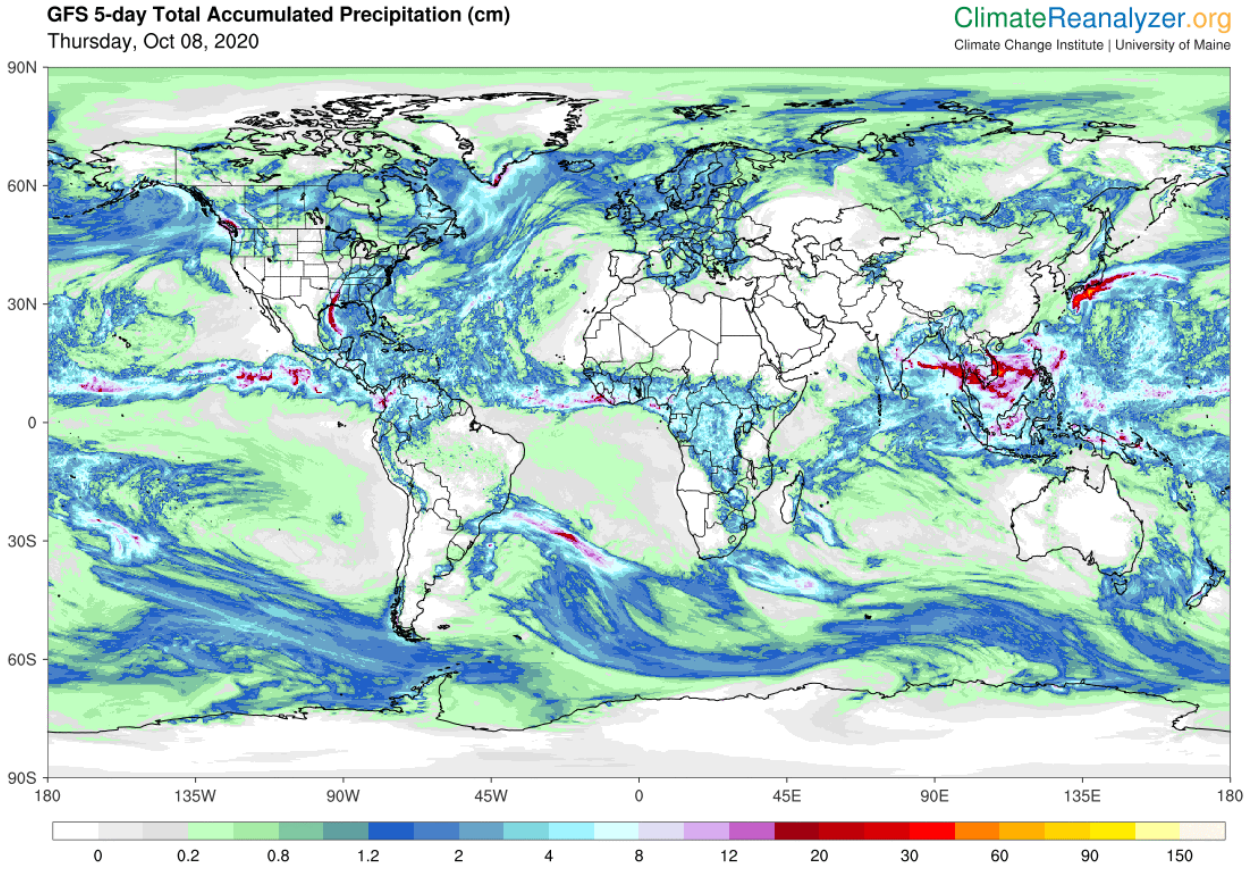
Flooding (Democratic Republic of the Congo)
Heavy rains on October 1-2 caused notable regional flooding in North Kivu Province of the Democratic Republic of the Congo, claiming at least 11 lives. The worst affected was the town of Sake, located west of Goma on Lake Kiwu. There was notable material damage, but the full extent was not determined by local authorities.

Global Temperature Anomaly Forecast



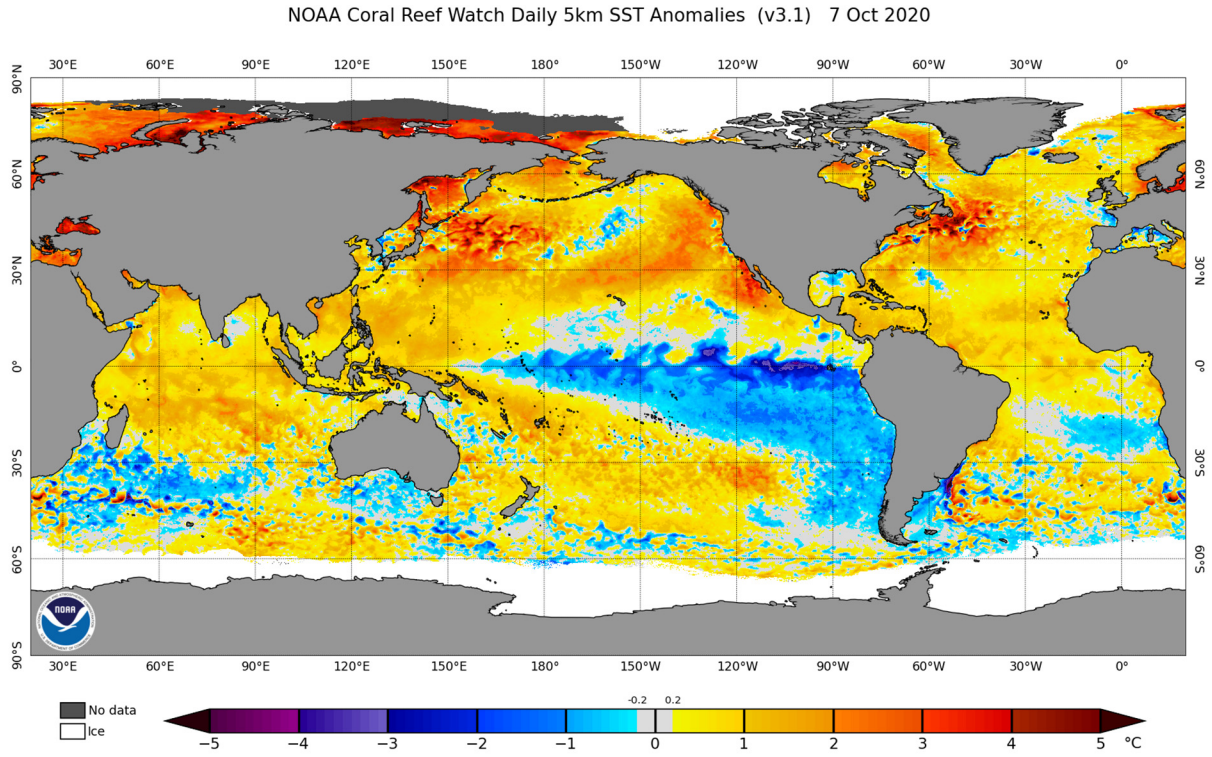
Source: Climate Reanalyzer, Climate Change Institute, University of Maine, USA

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.

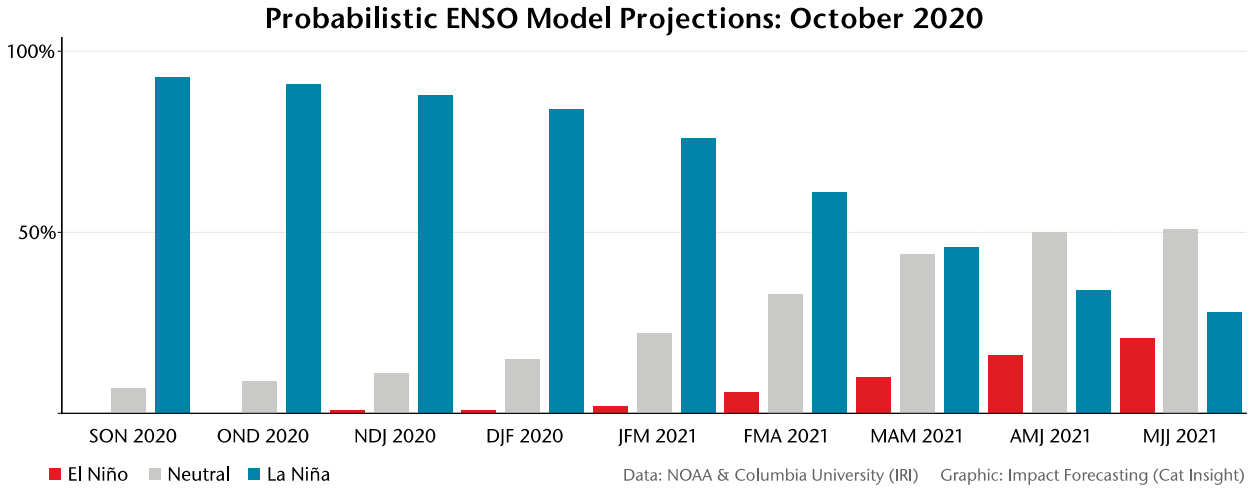
Select Current Global SSTs and Anomalies

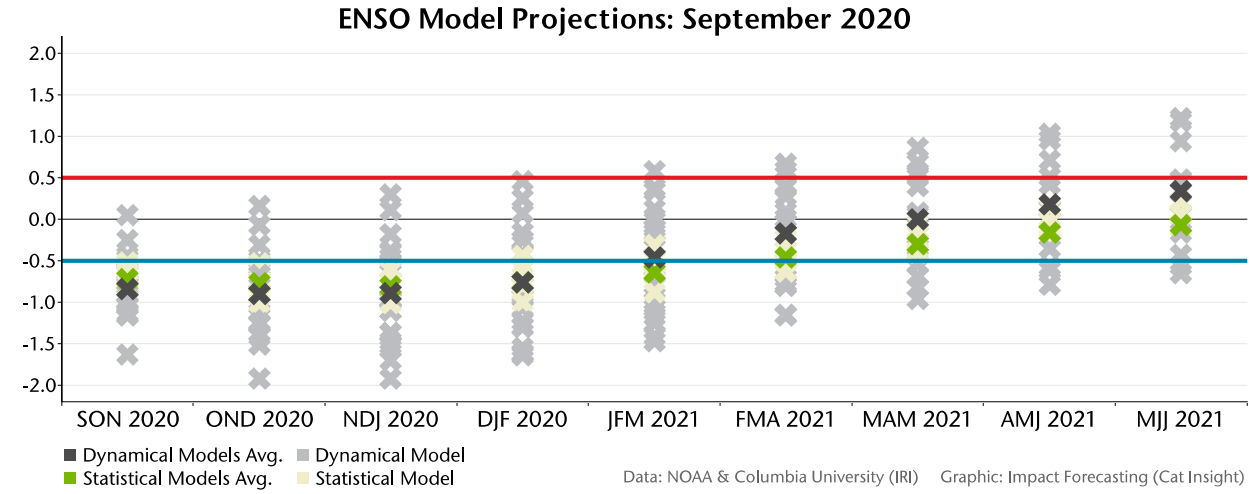
Location of Buoy	Temp (°C)	Departure from Last Year (°C)
Eastern Pacific Ocean (1,020 miles SW of San Salvador, El Salvador)	24.2	-0.4
Niño3.4 region (2°N latitude, 155°W longitude)	24.8	-1.5
Western Pacific Ocean (700 miles NNW of Honiara, Solomon Islands)	29.2	-1.4

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

El Niño-Southern Oscillation (ENSO)

La Niña conditions are currently present, though NOAA has officially issued a **La Niña Advisory**. NOAA notes that there is a 75 percent chance that La Niña conditions will persist through emerge in the boreal (Northern Hemisphere) winter of 2020 / 2021.





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.*

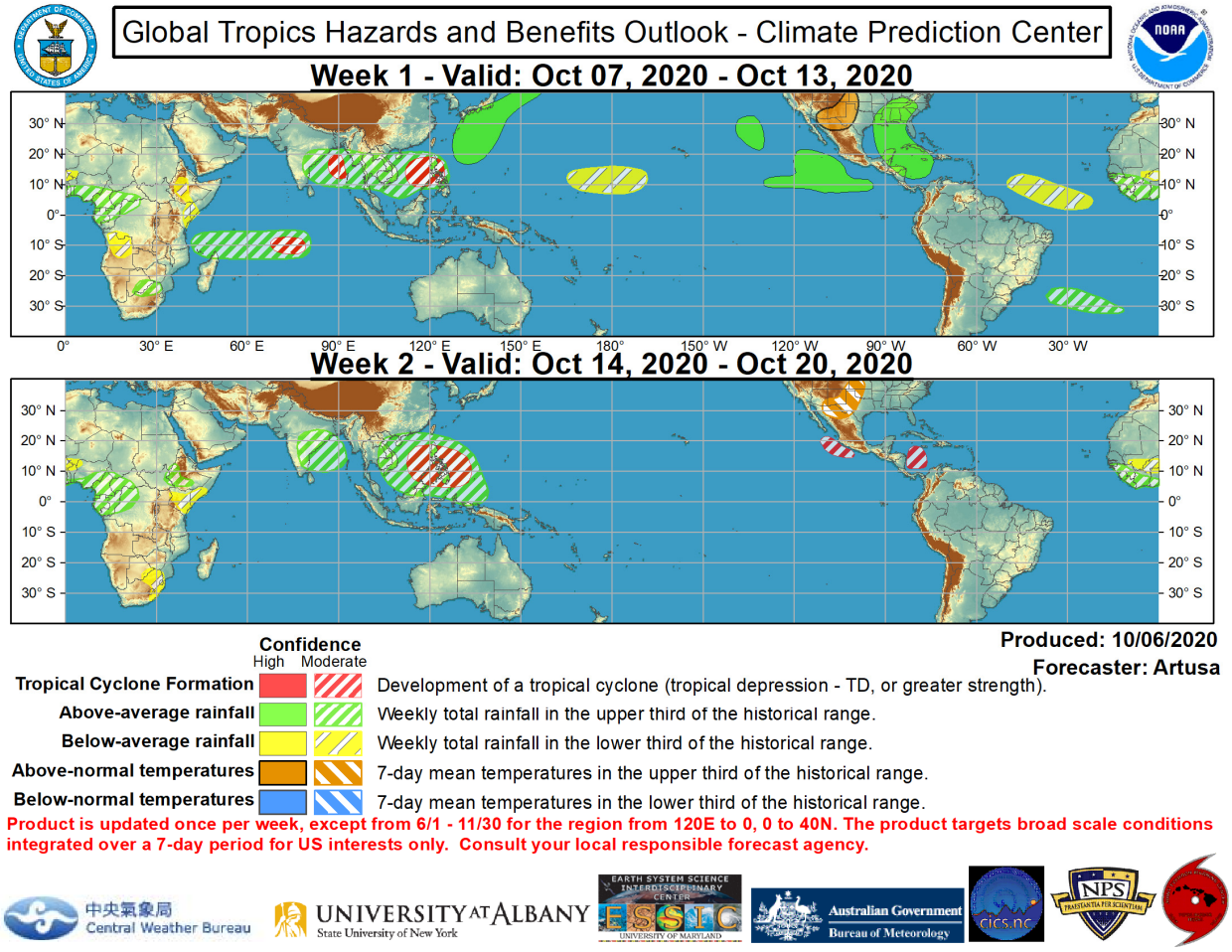
La Niña *refers to the periodic cooling of sea-surface temperatures (-0.5°C) across the east-central equatorial Pacific. It represents the cold phase of the ENSO cycle.*

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.*

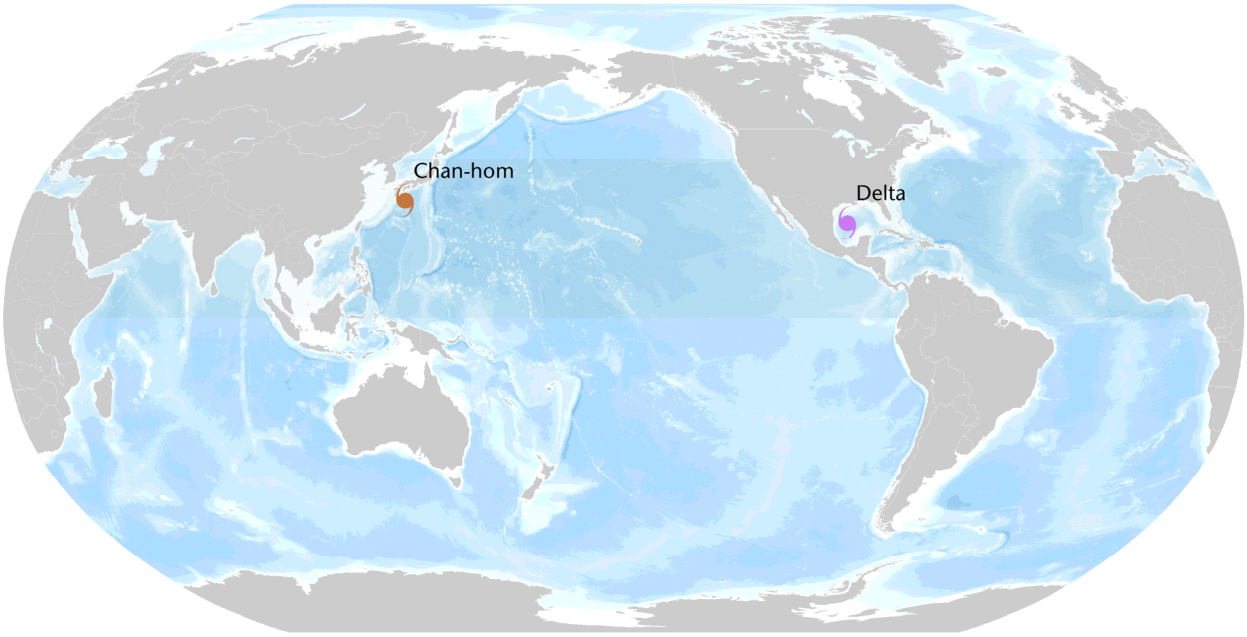
El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above the threshold of +0.5°C (-0.5°C). This is known as the Oceanic Niño Index (ONI).

Global Tropics Outlook



Source: Climate Prediction Center

Current Tropical Systems



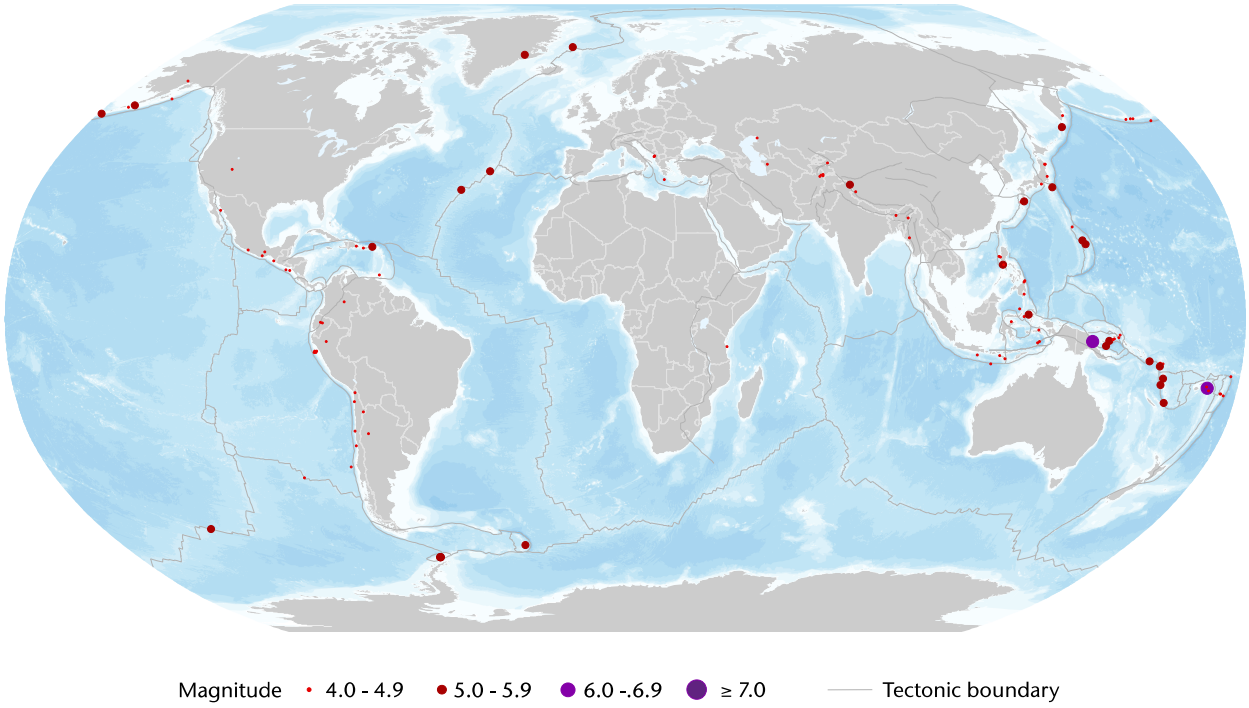
Location and Intensity Information

Name*	Location	Winds	Storm Reference from Land	Motion**
HU Delta	24.8°N, 93.4°W	115 mph	345 miles (555 kilometers) S of Cameron, Louisiana	NW at 12 mph
TS Chan-hom	30.5°N, 133.7°E	90 mph	500 miles (805 kilometers) SW of Yokosuka, Japan	NNE at 9 mph

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

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

Global Earthquake Activity (≥M4.0): October 2 – 8

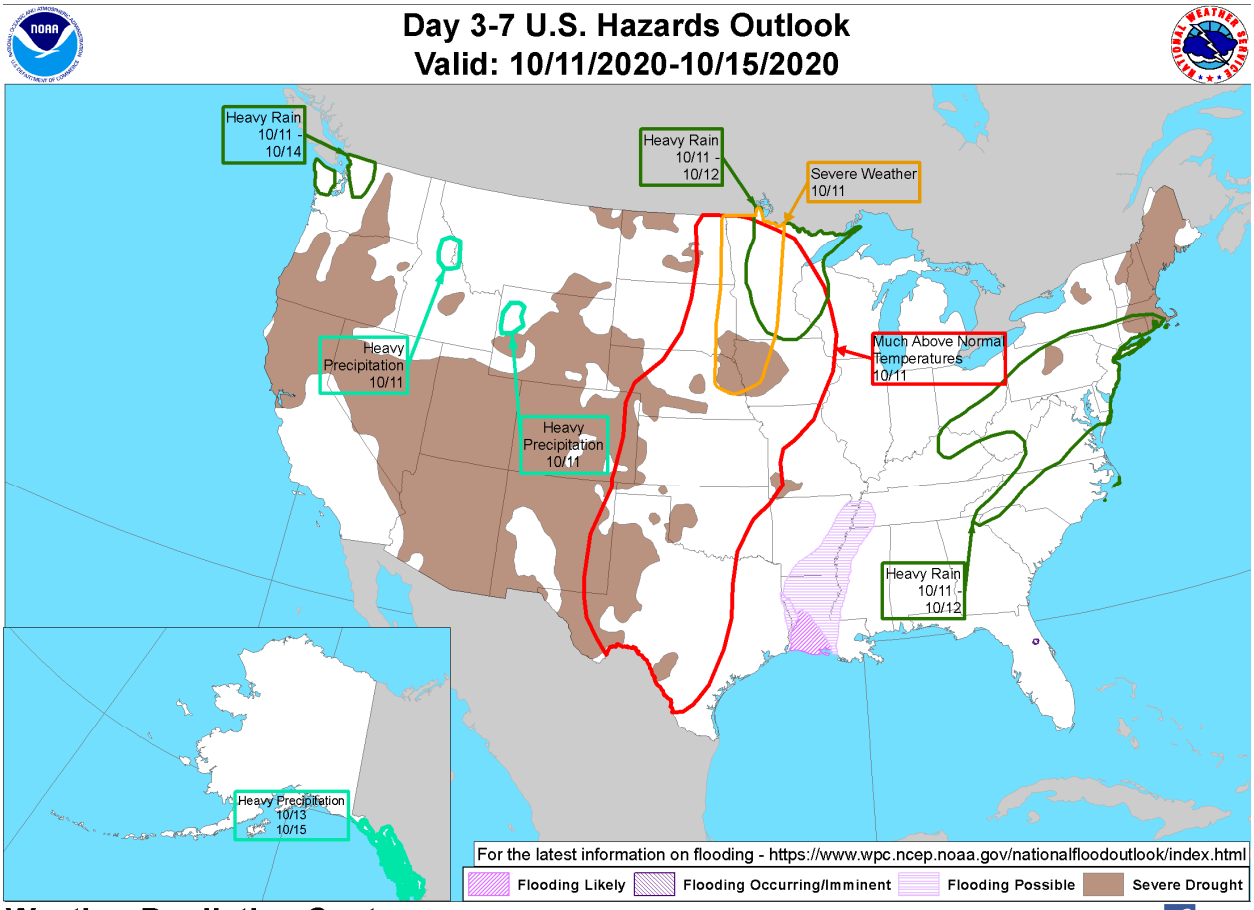


Significant EQ Location and Magnitude (≥M6.0) Information

Date (UTC)	Location	Magnitude	Depth	Epicenter
10/06/2020	18.02°S, 178.49°W	6.0	629 km	23 kilometers (14 miles) E of Levuka, Fiji
10/08/2020	6.11°S, 146.17°E	6.3	103 km	38 kilometers (24 miles) ENE of Kainantu, Papua New Guinea

Source: United States Geological Survey

U.S. Weather Threat Outlook



Potential Threats

- In the wake of Hurricane Delta, flooding is anticipated and likely to be ongoing across portions of the Lower Mississippi and Tennessee Valleys between October 11-13. Heavy rains from the cyclone will push northeastward into the Appalachians, Mid-Atlantic, and southern New England by October 11-12.

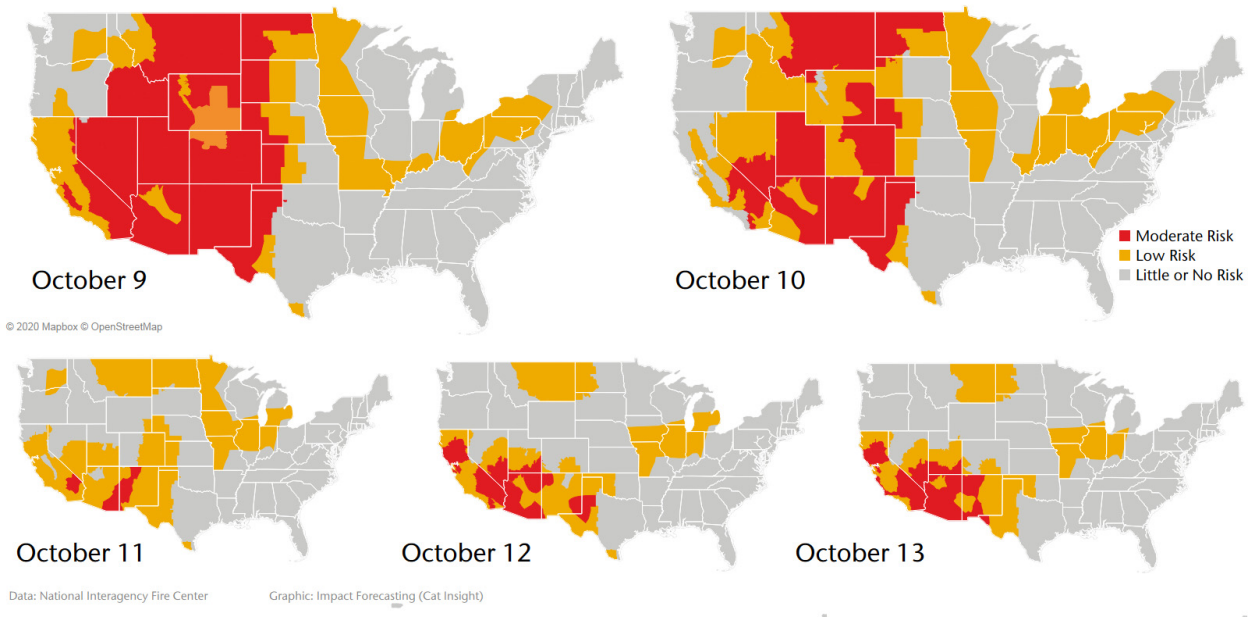
- A strong trough and frontal boundary will bring the potential for heavy mixed precipitation to localities across the Rockies on October 11. Severe storms and heavy rain associated with the cold front are expected across the Northern and Central Plains, and Great Lakes between October 11-12.

- Prior to the passage of the cold front, much above normal temperatures spanning the Plains and portions of the Rockies will persist through October 11.

- An active pattern will allow frequent heavy rains across regions of the Pacific Northwest, particularly northwestern Washington, between October 11-14.

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

The National Interagency Fire Center has highlighted an extended, yet lowered risk of elevated wildfire conditions across parts of the West and Desert Southwest during the middle of October. Several fires continue to burn across parts of California as the peak of the wildfire season has now arrived. However, a return of some moisture will lower the fire risk in California and the Pacific Northwest during the next week. Fire conditions will remain elevated in the Rockies and Desert Southwest.



Annual YTD Wildfire Comparison: October 8

Year	Number of Fires	Acres Burned	Acres Burned Per Fire
2016	46,831	4,742,132	101.26
2017	50,552	8,450,249	167.16
2018	48,690	8,150,352	167.39
2019	42,174	4,405,306	104.46
2020	45,196	7,928,100	175.42
10-Year Average (2010-2019)	**48,841**	**6,538,543**	**133.87**

Source: National Interagency Fire Center

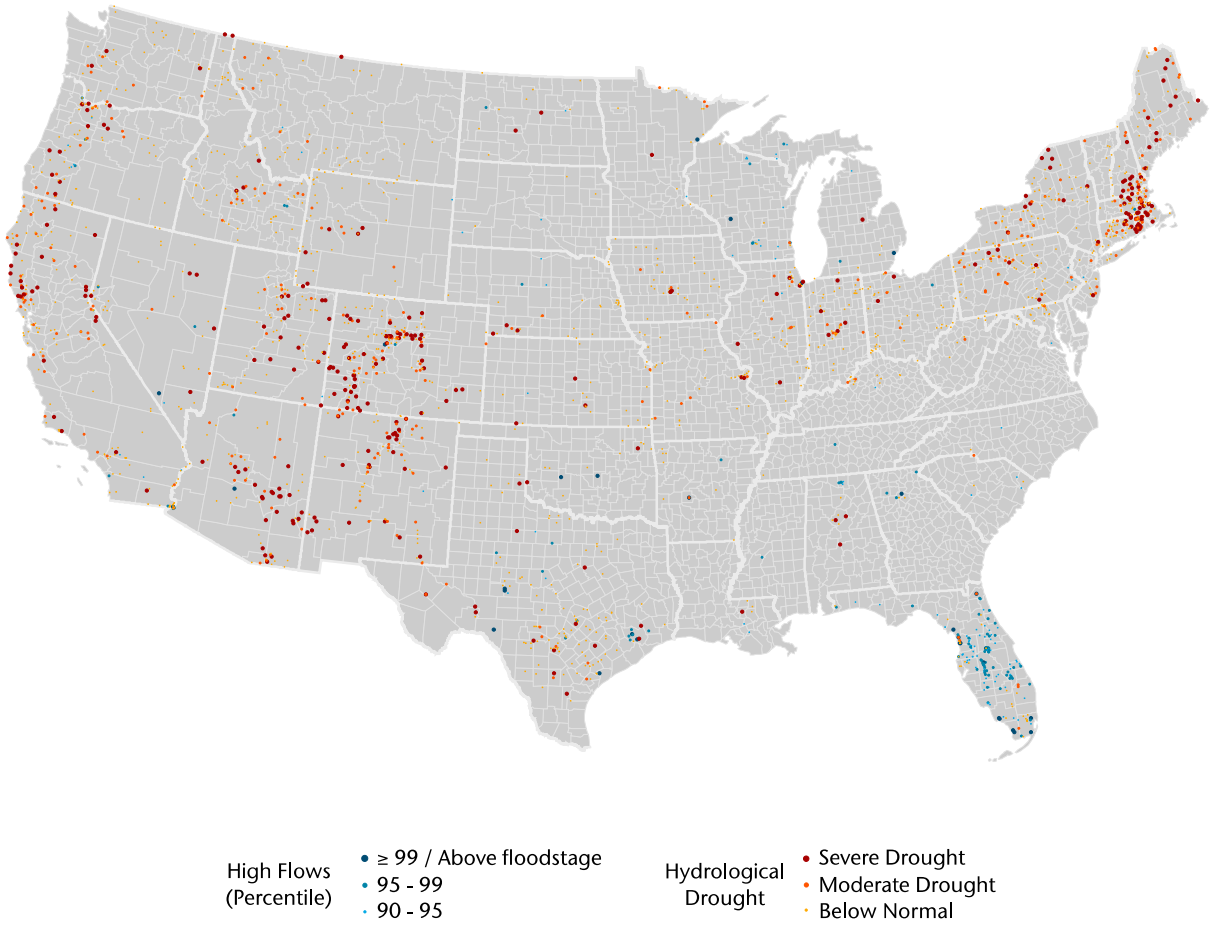
Top 5 Most Acres Burned by State: October 8

State	Number of Fires	Acres Burned	Acres Burned Per Fire
California	8,707	2,924,337	335.86
Arizona	2,165	893,037	412.49
Washington	1,551	769,245	495.97
Oregon	1,819	658,731	362.14
Montana	2,248	393,008	174.83

Source: National Interagency Fire Center

Note: There is often a multi-day lag between NIFC and the California Department of Forestry and Fire Protection (CAL FIRE)

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
Calcasieu River near Oberlin, Louisiana	9.81	98.82
Calcasieu River near Glenmora, Louisiana	12.68	98.72
Marshyhope Creek near Adamsille, Delaware	3.01	98.67
Petit Jean River at Danville, Arkansas	14.81	98.67
Priest River near Priest River, Idaho	3.48	98.61

Source: United States Geological Survey

Source Information

Hurricane Delta strikes Mexico; takes aim at the U.S.

U.S National Weather Service
U.S National Hurricane Center
Servicio Meteorológico Nacional
Cancun on hurricane alert: more than 30 thousand tourists evacuated, La Palabra del Caribe
Hurricane 'Delta' hits Cancun tourist area, La Jornada
Hurricane Delta enters Gulf after lashing Mexico, Associated Press
No fatalities from 'Delta'; hundreds of fallen trees: CNPC, La Jornada

Devastating floods in France & Italy in wake of Storm Alex

Storm Alex: communities estimate the damage at more than a billion euros. Le Parisien
Alpes-Maritimes: damage from storm Alex will exceed 1.5 billion euros. TPBM
Maltempo Piemonte, Cirio: "Estimated damage of 1 billion, 300 million for works of great urgency". MeteoWeb
Regional Environmental Protection Agency, Piemonte
Alpes-Maritimes Prefecture
Civil Protection, Italy
Coldiretti

Tropical Storm Gamma impacts Mexico

U.S National Hurricane Center
Servicio Meteorológico Nacional
Secretariat of Security and Civilian Protection
Tropical Storm Gamma leaves Cancun, Riviera Maya behind with only minor damage, Rivera Maya News
Severe flooding of streets and houses leaves "Gamma" in Tizimín, Diario De Yucatán
Almost 600 thousand affected in Tabasco by the rains, La Jornada
CFE restored electricity in 3 states after the 'Gamma' storm, La Jornada

Natural Catastrophes: In Brief

Lake Ōhau Village fire: Owners await news on return home, Timaru Herald
Paraguay Declares State of Emergency as Forest Fires Rage, U.S.News
Wildfires tear through drought-racked Paraguay amid record heat, The Guardian
Con 45,5 grados, Pozo Hondo marca récord histórico nacional, La Nacion
California Department of Forestry and Fire Protection (Cal Fire)
U.S National Weather Service
Fire and Emergency New Zealand
Disaster Management Division, Ministry of Home Affairs, India
National Centre for Hydro-Meteorological Forecasting
Vietnam Disaster Management Agency

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