Weekly Cat Report

July 13, 2018
This Week’s Natural Disaster Events

<table>
<thead>
<tr>
<th>Event &amp; Region</th>
<th>Fatalities</th>
<th>Damaged Structures or Filed Claims</th>
<th>Est. Economic Loss (USD)</th>
<th>Specific Areas</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Asia</td>
<td>200+</td>
<td>25,000+</td>
<td>10s of Millions</td>
<td>Japan</td>
<td>3</td>
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<tr>
<td>- Asia</td>
<td>19+</td>
<td>9,400+</td>
<td>580+ million</td>
<td>China</td>
<td>11</td>
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<tr>
<td>STY Maria</td>
<td>2+</td>
<td>9,300+</td>
<td>430+ million</td>
<td>China, Taiwan</td>
<td>7</td>
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<tr>
<td>Wildfires</td>
<td>1+</td>
<td>Thousands</td>
<td>10s of Millions</td>
<td>California, Colorado, Utah, Oregon</td>
<td>9</td>
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</tbody>
</table>

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: [www.aonbenfield.com/catastropheinsight](http://www.aonbenfield.com/catastropheinsight)
Major flooding inundates parts of Japan; 200+ dead

Historic rainfall prompted significant flash flooding and mudslides across Japan from June 29 to July 8, leading to at least 200 fatalities from 11 separate prefectures. Dozens of others remained missing after more than 1,015 millimeters (40.00 inches) of rain fell across parts of Kochi, Gifu, and Nagano prefectures and Tokushima. The rains, which were heaviest from July 4-7, were spawned by the presence of a seasonal frontal boundary enhanced by remnant moisture from Typhoon Prapiroon. Floodwaters of up to 5.0 meters (16.4 feet) in height led to catastrophic inundation in some areas, and resulted in business disruption for several automobile and electronic manufacturing facilities. Total economic losses were anticipated to be well into the hundreds of millions (USD); likely higher. Government officials noted that this is Japan’s deadliest flood disaster since 1983.

Meteorological Recap

The substantial rains across Japan were initiated by two seasonal meteorological scenarios. Starting in late June, Typhoon Prapiroon began tracking towards southern Japan and the Korean Peninsula. Despite weakening upon arrival on July 2-3, the system prompted initial heavy rainfall across the Japanese archipelago. During this time, Prapiroon’s remnant moisture began interacting with the seasonal “Baiu” rainfall pattern that is highlighted by the presence of a northward moving frontal boundary. This interaction allowed for a substantial amount of moisture and rainfall to initially cover southern and western sections of Japan. As the front traversed northward from July 4-7, the heavy swath of rainfall later tracked through the rest of Honshu and Hokkaido.

In the midst of the event, the Japan Meteorological Agency (JMA) issued an “Emergency Heavy Rain Warning” for eight prefectures on July 6: Fukuoka, Hiroshima, Hyogo, Kyoto, Okayama, Saga, and Tottori. This was the largest issuance of this type of warning since it was implemented by the agency. One JMA official described the rainfall event as “heavy rain at a level that we have never experienced”. The warning was lifted in Fukuoka, Hiroshima, Nagasaki, and Saga on July 7.

The volume of rainfall that fell led to substantial totals. Based on official data from the JMA, no fewer than 15 individual station gauges recorded at least 1,035 millimeters (40.75 inches) of rain from June 28 to July 8 (see table below). Many stations across Japan would eventually set all-time or monthly rainfall records in time increments such as 1-hour, 3-hour, 6-hour, 12-hour, 24-hour, 72-hour, and storm total.

<table>
<thead>
<tr>
<th>Station</th>
<th>Prefecture</th>
<th>Total Rain (mm)</th>
<th>Total Rain (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motoyama</td>
<td>Kochi</td>
<td>1,695.5</td>
<td>66.75</td>
</tr>
<tr>
<td>Yanese</td>
<td>Kochi</td>
<td>1,602.0</td>
<td>63.07</td>
</tr>
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<td>Shido</td>
<td>Kochi</td>
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</tr>
<tr>
<td>Crucible</td>
<td>Tokushima</td>
<td>1,366.0</td>
<td>53.78</td>
</tr>
<tr>
<td>Ootomi</td>
<td>Kochi</td>
<td>1,364.5</td>
<td>53.72</td>
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<td>Torigatayama</td>
<td>Kochi</td>
<td>1,310.5</td>
<td>51.59</td>
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<tr>
<td>Hirugano</td>
<td>Gifu</td>
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<tr>
<td>Ikegawa</td>
<td>Kochi</td>
<td>1,196.5</td>
<td>47.11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Station</th>
<th>Prefecture</th>
<th>Total Rain (mm)</th>
<th>Total Rain (in)</th>
</tr>
</thead>
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<tr>
<td>Nagataki</td>
<td>Gifu</td>
<td>1,193.5</td>
<td>46.99</td>
</tr>
<tr>
<td>Seki Ushidori</td>
<td>Gifu</td>
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<td>Tokushima</td>
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<td>Funato</td>
<td>Kochi</td>
<td>1,035.0</td>
<td>40.75</td>
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</tbody>
</table>

June 28 – July 9 Rainfall Totals (Source: JMA)
The excessive rains would eventually lead to numerous overflowing rivers, streams, and creeks that additionally caused some earthen levees or dams to be overtopped. This led to major flash flooding and mudslides in many spots. The worst rainfall-related impacts were noted in the prefectures of Hiroshima, Ehime, Okayama, Yamaguchi, Kyoto, Gifu, Shiga, Hyogo, Kochi, Fukuoka, and Kagoshima.

Baiu Seasonal Rains

Japan, like many other areas of East Asia, are prone to seasonal rains. The particular summer weather phenomenon that affects Japan is locally known as “Baiu”, or another phrase for “Plum Rains” since this coincides when plums ripen. Around the same time as the seasonal “Meiyu” rains begin to impact Taiwan, the Baiu rains start to fall in southern portions of Japan (see graph for Kagoshima). Throughout June, the Baiu front pushes northward across Japan (see graph for Niigata), reaching as far north as Sakhalin Island by late-July.

The main characteristics of the Baiu front in Japan are fair weather on the northern side of the front, weak cyclonic disturbances that move along the front at approximately three-day intervals, and, to the south of the front, stratus clouds and fog tend to form in the mornings followed by thunderstorms and heavy rainfall in the afternoons. The weather associated with the Baiu front is more mid-latitudinal in nature than that associated with the Meiyu front – which is more common in China.
Event Details

Preliminary data from Japan’s Fire and Disaster Management Agency (FDMA) and other government agencies have indicated that significant damage has occurred. The latest details confirmed that a minimum of 200 people died and no fewer than 45 others officially remained listed as missing. At least another 154 others were injured. Most of the casualties occurred due to being struck by landslides or being swept away by high water due to swollen rivers or flash floods (including in vehicles).

At the peak of the event, 6.3 million people were advised to evacuate or were under flood advisories across 23 prefectures. Many of the casualties occurred due to residents not heeding evacuation warnings. In the aftermath of the floods and mudslides, Japanese officials activated 75,000 members of the Japan Self-Defense Forces, police, and firefighters to assist in the relief and recovery efforts. The Ministry of Land, Infrastructure, Transport and Tourism announced that it had mobilized pump trucks to drain areas with the most water inundation.

This is the deadliest flood disaster in Japan since 1983, when 117 people were killed in heavy rains.

Some of the worst-hit areas included Hiroshima, Ehime, Okayama, Kyoto, Yamaguchi, Gifu, Kochi, and Fukuoka. The extreme rainfall led to rapid rise of several rivers and streams, and many locations reported floodwaters reaching up to 5.0 meters (16.4 feet) in height. This left many residents stranded on the roofs of their homes, as flooding swept through entire villages or isolated residents in their homes given the widespread destruction to local infrastructure. Helicopters and boats were used to retrieve trapped citizens on rooftops or balconies. In Okayama Prefecture alone, at least 1,850 people were rescued from rooftops. In total across Japan, more than 32,000 people were relocated to evacuation shelters.
The latest statistics from FDMA indicated that nearly 26,000 homes and public structures had been damaged or destroyed by flood inundation, though this total was expected to significantly rise as assessments continue. In Okayama’s Mabicho district alone, roughly one-third of the district – and 4,600 homes – were inundated after three dikes failed along the Odagawa River.

Beyond the broad impact to the residential sector, the floods and mudflows additionally led to widespread damage and/or disruption to the commercial sector. Reports from some automobile, electronics and other manufacturers cited that the combination of facility water inundation, employee safety issues, and damaged nearby infrastructure prompted the temporary suspension of many facilities. Several facilities were closed simply out of caution or due to supply chain disruption, but did not incur any direct physical damage. Below is a select list of companies affected:

- **Daihatsu (Toyota)**: Suspension of operations at two factories in Kyushu and three in Kansai, including the main factory in Osaka
- **Mazda**: Suspension of two main operations in Hiroshima
- **Mitsubishi Motors**: Suspension of operations in Okayama
- **Panasonic**: Closure of operations in Okayama due to ground floor water inundation and power outage.
- **Mitsubishi Electric**: Suspension of operations at four facilities
- **Kubota**: Partial inundation at one facility in Osaka
- **Amazon Japan**: Temporary suspension of operations in Okayama
- **Asahi Breweries**: Temporary suspension of operations in Okayama

The event additionally left substantial impacts to local infrastructure. Government officials cited that landslides and flash floods had washed away portions of roadways, bridges, and other vital transportation channels across southern and western sections of the country. This severely limited rescue efforts in some of the hardest-hit areas.

The transport ministry noted that 13 separate railroad operators suspended services on 56 routes in western Japan. This was primarily due to debris covering tracks, or some sections of tracks being washed away. At one point, no bullet trains were running west of the Shin-Osaka Station and the West Japan Railway Company did not immediately know when service would resume. The shutdown of train lines many people stranded, which forced some train cars to be temporarily used as makeshift hotels.

Additionally, the event left nearly 270,000 homes in 11 prefectures with water shortages. At least 11,200 customers were without electricity and there were concerns given high temperatures – up to 30°C (86°F) – would affect the population without power.
Financial Loss

With damage assessments ongoing, it remains too preliminary to provide any economic or insured loss estimate at this time. However, the scope of damage to physical property, vehicles, and infrastructure alone suggests the financial cost reaching substantially into the hundreds of millions of dollars (USD), and almost certainly higher.

In terms of flood insurance, the peril is often bundled with homeowner or commercial property insurance policies. There is likely to be some insured business interruption losses as well given the multi-day shutdowns for some manufacturing facilities.

Maria makes China landfall & spawns inland flooding

Typhoon Maria made landfall in China’s Fujian province on July 11 as a Category 2 storm on the Saffir-Simpson scale, bringing periods of torrential rainfall and hurricane-force wind gusts. At least one person was killed and several others were injured. Maria and its remnants would later spawn heavy rain and widespread inland flooding in China’s Yangtze River Basin that inundated homes and damaged agricultural land. Total economic losses from Maria were preliminarily estimated at CNY994 million (USD150 million), though this total was expected to rise. Prior to striking China, Maria grazed Taiwan, Guam, and Japan’s Ryukyu Islands.

Meteorological Recap

The Joint Typhoon Warning Center (JTWC) first began monitoring an area of low pressure near the Marshall Islands in the Western Pacific Ocean on June 26 (UTC time). As the cluster of thunderstorms became better organized, it was officially deemed a Tropical Depression on July 2 while located to the southeast of Guam. By July 4, atmospheric and oceanic conditions became much more conducive for development as the JTWC noted that Tropical Storm Maria was born. Rapid intensification commenced, with Maria maintaining tropical storm strength for 18 hours before reaching typhoon status on July 5.

The cyclone would maintain a significant intensification trend into July 6, where it reached its first peak intensity as a 260-kph (160-mph) Category 5 Super Typhoon while in the open waters of the Pacific. During the next 24-36 hours, Maria underwent an eyewall replacement cycle that caused its wind speeds to slightly reduce to Category 4 strength.

By July 8, Maria once again re-attained Super Typhoon status while quickly tracking towards the west-northwest. It hit a second peak intensity of 260 kph (160 mph) winds before once again undergoing a second eyewall replacement cyclone on July 9. During this time, Maria began to approach Southern Japan’s Ryukyu Islands and Taiwan while traversing ocean waters with cooler sea surface temperatures. By July 10 into July 11, Maria skirted Taiwan and neared Eastern China. Land interaction of Maria’s outer bands helped further weaken the storm prior to officially making its first landfall on July 10 over the small Japanese island of Miyakojima.
Maria would finally come ashore in China at approximately 9:10 AM local time (01:10 UTC) on July 11 in Fujian Province’s Liangjiang County. The JTWC noted that the typhoon had 1-minute sustained winds of 175 kph (110 mph) – Category 2 intensity – at the time of landfall. Rapid decay of the tropical-based structure commenced after coming ashore, with Maria’s winds quickly diminishing. However, moisture associated with Maria’s remnants would later spawn torrential inland rainfall across several provinces.

Event Details

Maria hit Guam on July 4 as a Tropical storm with maximum sustained one-minute winds of 93 kph (58 mph). Multiple aircrafts were damaged in the local US Air Force Base during the passage of the storm. On July 10, Japan’s southern islands were affected by the typhoon when the eye of Typhoon Maria passed over Miyakojima. The typhoon also brought rain to Taiwan and local media attributed one fatality to the typhoon. According to Central Emergency Operation Center of Taiwan, 8 people were injured and more than 1,000 people remained in evacuation centers on July 11. At the peak of the storm, nearly 60,000 houses remained without power in Taiwan. Maria is expected to have caused minimal damage in Taiwan.

The most prolific impacts from Maria came in eastern China as the storm make landfall as a Category 2 storm. Initially, the provinces of Zhejiang and Fujian experienced heavy rainfall and high winds. Preliminary data indicated that nearly 37,300 hectares (92,000 acres) of cropland was affected. Sea-side infrastructure including a road suffered damage due to the typhoon, and roughly 580,000 people were evacuated as the storm came ashore. The high winds toppled nearly 2,000 trees across the Fujian province. Over 9,300 houses were damaged or destroyed in the two provinces. Ningde City in Fujian suffered significant agriculture loss and as many as 184 businesses had to suspend production in the city. Additionally, one fatality was reported in Jiangxi province.

Financial Loss

The city of Ningde in Fujian suffered a total economic loss of CNY959 million (USD143 million) of which agricultural damage alone was estimated to be CNY698 million (USD107 million). Industrial loss from Ningde was estimated to be around CNY8.76 million (USD1.31 million). Overall, the total economic loss from Maria was preliminarily assessed to be CNY 2.88 billion (USD 432 million) and the total was expected to significantly rise.
Wildfires continue to rage across the U.S. West

Early season wildfires continued to burn throughout multiple states across the Western U.S. this week, as assessments remained ongoing. The fires, which were the most destructive in parts of Colorado, California, Utah, and Oregon, destroyed hundreds of homes and torched hundreds of thousands of acres (hectares) of land. The total combined financial toll – including the cost to fight the fires and the quantification of damage to homes, vehicles and other structures – was well in excess of USD100 million.

Event Details

Colorado

The third largest wildfire on record in Colorado – the Spring Creek Fire – continued to burn in parts of Costilla and Huerfano counties in southern sections of the state. The blaze had covered 107,967 acres (43,692 hectares) of land and was listed at 83 percent containment. Full containment was estimated by InciWeb on July 31. Local officials noted that at least 132 structures were destroyed and another 110 were damaged. The fire, which was ignited on June 27, grew wildly out of control as temperatures soared to well above normal levels and were fueled by high winds and copious amounts of available brush fuel. Firefighters determined that the wildfire was human-caused.

California

Large number of wildfires sparked across California. The County Fire, the largest current fire in the state, affected Napa and Yolo counties, which were previously affected by catastrophic wildfires in October 2017. According to data from CalFire, at least 20 structures were destroyed and 90,288 acres (36,500 hectares) of land were burned. However, all evacuation orders were lifted and containment was listed at 92 percent.

The most destructive ongoing fire is the Klamathon Fire in northern California near the border with Oregon. The blaze was ignited in Siskiyou County on July 5 and burned 36,500 acres (14,750 hectares). CalFire noted that at least 82 structures had been destroyed and another 12 were damaged. One person was killed and four others were injured. Increasing humidity levels were aiding firefighters in containing the fire, which was listed at 70 percent.

Utah

The Dollar Ridge Fire in Utah’s Duchesne County was ignited on June 27 and was caused by an abandoned campfire. Local officials noted that the blaze had grown to 56,687 acres (22,940 hectares) and was 60 percent contained. The fire was responsible for the destruction of no fewer than 74 structures, in addition to 131 camp trailers and 158 sheds or agricultural buildings. The area hardest-hit by the fire is a popular fishing reservoir.

Another fire in the state, the West Valley Fire, grew to 11,771 acres (4,763 hectares) and was 55 percent contained.
Miscellaneous

The United States continues to cope with an active, and early, start to wildfire season. As of July 11, the U.S. was running nearly 20 percent higher in terms of acres burned than the recent 10 year average: 3.36 million (2018 YTD) versus 2.83 million (10-year average). The number of fires, however, is down thus far in 2018 (32,000 versus 34,500). This means that the fires that are burning are bigger at a larger rate than normal.

The top 10 states with the most acres burned through July 11 included:

<table>
<thead>
<tr>
<th>State</th>
<th>Acres Burned</th>
<th>State</th>
<th>Acres Burned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oklahoma</td>
<td>579,616</td>
<td>Alaska</td>
<td>272,085</td>
</tr>
<tr>
<td>Colorado</td>
<td>432,008</td>
<td>California</td>
<td>215,350</td>
</tr>
<tr>
<td>Texas</td>
<td>423,945</td>
<td>Oregon</td>
<td>124,835</td>
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<tr>
<td>Nevada</td>
<td>388,118</td>
<td>Florida</td>
<td>114,944</td>
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<tr>
<td>New Mexico</td>
<td>350,258</td>
<td>Utah</td>
<td>103,910</td>
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</table>

Source: NIFC

Financial Loss

The total combined financial toll – including the cost to fight the fires and the quantification of damage to homes, vehicles and other structures – was well in excess of USD100 million.
Natural Catastrophes: In Brief

Flooding (China)
Torrential rainfall swept across China’s Sichuan and Gansu provinces on July 10-11, leaving at least 19 people dead or missing. The storms were associated with a frontal boundary that spawned significant flooding and landslides in several areas. Local government officials cited that the storms damaged at least 9,400 homes and left nearly 50,000 hectares (123,552 acres) of cropland inundated. In total, nearly two million people were directly affected by the event. Total economic losses were preliminarily listed at CNY3.87 billion (USD580 million).

Severe Weather (United States)
The seasonal Southwest Monsoon brought rounds of severe weather and torrential rainfall to the state of Arizona from July 8-10. Most of the damage resulted from damaging straight-line winds that gusted up to 80 mph (130 kph), including in the greater Phoenix metro region. The high winds downed trees and power lines onto homes, businesses, vehicles, and other structures. Additional damage reports resulting from hail and isolated flash flooding were also noted. Total economic and insured losses were estimated to reach well into the millions of dollars (USD).

Landslide (Turkey)
Prolonged heavy rain triggered a landslide in north-western Turkey on July 8 resulting in a train derailment. More than 100 people were reported to be injured and 24 people were killed. The accident occurred near Sarilar village in Tekirdag province, as the train travelled from Edirne to Istanbul. Officials confirmed that the main cause of the disaster was torrential rain, although official investigation is still underway.

Severe Weather (Canada)
A series of thunderstorms accompanied by strong winds and hail formed across Alberta and Saskatchewan in Canada between July 7-10 with as many as eight tornadoes reported to have touched down. Several houses were damaged in Morin Lake. On July 10, Val Marie in Saskatchewan experienced hail up to the size of baseballs and wind gusts of up to 81 kph (50 mph) damaged multiple vehicles. Lightning from the storms caused many as three separate fires and damaged several trees. In Kindersley, Saskatchewan, wind gusts of up to 89 kph (55 mph) broke power lines, toppled grain storages and damaged multiple RVs. Saskatchewan Government Insurance received at least 485 claims for vehicle damage and at least 196 claims for property damage. Separately, Saskatchewan Crop Insurance Corporation received 180 pre-harvest claims for crop damage. Environment Canada has forecast the possibility of more thunderstorms in the coming days triggered by a warm-front advancing northeast from Montana. Between July 29-10, heatwave conditions affected parts of southern Canada due to an upper ridge of high pressure which allowed warm air from western United States to move in over the region. Several towns suffered record-high temperatures including Val Marie which recorded an all-time high temperature of 39.3°C (102.7°F). Quebec was the worst affected where temperatures reached as high as 35°C (95°F) and at least 70 deaths were attributed to heat-related incidents.

Flooding (Puerto Rico, Dominican Republic)
Remnants of Hurricane Beryl brought heavy rain to Puerto Rico and the Dominican Republic after the storm was downgraded to a tropical wave. From July 9-11, southeast Puerto Rico received between 2-8 inches (5-23 centimeters) of heavy rains accompanied by wind gusts. The inclement weather triggered flash flooding in the area and exacerbated the power outage issue that the region has experiencing since the hurricane season of 2017. In Dominican Republic, flooding affected the provinces of San Cristóbal and Santo Domingo (including Distrito Nacional) since July 9. At least 3 bridges were damaged and 4 houses were completely destroyed. More than 1,500 additional houses were affected and nearly 8,000 people were displaced.
Severe Weather (China)
Severe convective weather since July 7 spawned thunderstorms over parts of northern China. The provinces of Hebei, Shanxi, Inner Mongolia, Jilin, and Heilongjiang experienced strong winds, hail and heavy rain which triggered flash floods. The inclement weather caused substantial damage to agriculture, affected nearly 77,500 hectares (191,500 acres) of cropland. The majority of damage was reported in Heilongjiang. More than 300 houses were damaged in Shanxi and one fatality was reported in Inner Mongolia. The total economic loss was estimated to be CNY220 million (USD33 million).

Flooding (India)
Heavy monsoonal rain triggered flash floods and landslides in parts northern and north-eastern India between July 7-11. According to India Meteorological Department, parts of Dehradun, in the state of Uttarakhand, received up to 87 millimeters (3.4 inches) of rain in an hour. It was reported that rain-related events caused 11 deaths and destroyed at least two buildings and a suspension bridge. Landslips blocked 37 roads and 3 state highways in the state. Heavy rain also damaged a 100-meter stretch of the national highway connecting the states of Manipur and Nagaland and caused at least 3 separate landslides in Manipur which killed 9 and injured 7 more. In 2017, flash floods and landslides had caused an estimated loss of USD 20 million in Manipur alone.

Landslide (Afghanistan)
Melting snow caused a mountain lake in Panjshir, Afghanistan to overflow its banks and trigger a landslide on July 12. At least 10 people were killed and nearly 400 houses were damaged or destroyed. Given the remote location of the event, the economic impact of the event is likely to be minimal.
Global Temperature Anomaly Forecast

This product interprets an ensemble of 40 different numerical model forecasts to produce guidance for a probabilistic prediction of the mean surface air temperatures (2 meters above the surface). Probabilities indicate the percent of ensemble members that predict temperatures significantly above normal, near normal, or significantly below normal.

Source: Climate Prediction Center
Global Precipitation Anomaly Forecast

This product interprets an ensemble of 40 different numerical model forecasts to produce guidance for a probabilistic prediction of accumulated precipitation. Probabilities are derived from the fraction of ensemble precipitation forecasts exceeding various thresholds.

Source: Climate Prediction Center
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 km Geo-polar Blended Night-only SST Analysis. The analysis uses satellite data produced by AVHRR radiometer.

Select Current Global SSTs and Anomalies

<table>
<thead>
<tr>
<th>Location of Buoy</th>
<th>Temp (°C)</th>
<th>Departure from Last Year (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Pacific Ocean (1,020 miles SW of San Salvador, El Salvador)</td>
<td>27.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Niño3.4 region (2°N latitude, 155°W longitude)</td>
<td>27.5</td>
<td>-0.3</td>
</tr>
<tr>
<td>Western Pacific Ocean (700 miles NNW of Honiara, Solomon Islands)</td>
<td>30.6</td>
<td>+0.5</td>
</tr>
</tbody>
</table>

Sources: ESRL, NOAA, NESDIS, National Data Buoy Center
El Niño-Southern Oscillation (ENSO)

An El Niño Watch is in effect by NOAA. ENSO-neutral conditions are currently present, and are expected to continue through the North American summer months. There is a 65 percent chance of El Niño occurring by the North American fall and a 70 percent chance of El Niño lasting through the boreal winter of 2018/19.

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

Week 1 - Valid: Jul 11, 2018 - Jul 17, 2018

Week 2 - Valid: Jul 18, 2018 - Jul 24, 2018

Product is updated once per week, except from 6/1 - 11/30 for the region from 120E to 0, 0 to 40N. The product targets broad scale conditions integrated over a 7-day period for US interests only. Consult your local responsible forecast agency.

Source: Climate Prediction Center
Current Tropical Systems

There are currently no active tropical systems

<table>
<thead>
<tr>
<th>Name*</th>
<th>Location</th>
<th>Winds</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

* 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
Global Earthquake Activity (≥M4.0): July 6 – 12

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

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Magnitude</th>
<th>Depth</th>
<th>Epicenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/6/18</td>
<td>51.613°N, 157.854°E</td>
<td>6.1</td>
<td>79.8 km</td>
<td>93 kilometers (58 miles) E of Ozernovskiy, Russia</td>
</tr>
</tbody>
</table>

Source: United States Geological Survey
U.S. Weather Threat Outlook

Potential Threats

- Excessive heat, including well above normal daytime temperatures and uncomfortably hot heat indices given moisture levels, will impact several sections of the country through the middle of next week. In the Midwest and Northeast, the heat will be aided by the approach of a frontal boundary which will help pull warm, moist air northward ahead of the divide. Heavy rain and storms are likely along this front.

- The seasonal Southwest Monsoon will bring further heavy rain, flash flooding, and isolated severe thunderstorm chances throughout the Four Corners region.

- Recent heavy rain has led to elevated river levels and excessively moist soil levels for parts of the Desert Southwest, Plains, and Midwest.

- Severe drought conditions persist across the West, Rockies, Plains, and the Midwest. Heavy rains associated with the Southwest Monsoon will aid in lessening the severity of the drought. Though given the ongoing drought conditions and the prospect of heavy rains, the dry soils will be very conducive for flash flooding.

Source: Climate Prediction Center
Current U.S. River Flood Stage Status

Top 5 Rivers Currently Nearing or Exceeding Flood Stage

<table>
<thead>
<tr>
<th>Location</th>
<th>Flood Stage (ft)</th>
<th>Current Stage (ft)</th>
<th>% of Full Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Des Moines River at Estherville, Iowa</td>
<td>8.00</td>
<td>14.12</td>
<td>177%</td>
</tr>
<tr>
<td>Redwood River near Redwood Falls, Minnesota</td>
<td>6.00</td>
<td>8.27</td>
<td>138%</td>
</tr>
<tr>
<td>Ocklawaha River near Orange Springs, Florida</td>
<td>5.00</td>
<td>5.99</td>
<td>120%</td>
</tr>
<tr>
<td>Des Moines River at Emmetsburg, Iowa</td>
<td>11.00</td>
<td>13.13</td>
<td>119%</td>
</tr>
<tr>
<td>Des Moines River near Windom, Minnesota</td>
<td>19.00</td>
<td>21.62</td>
<td>114%</td>
</tr>
</tbody>
</table>

Source: United States Geological Survey
Source Information

Major flooding inundates Japan: 175+ dead:
Death toll from west Japan downpours and flooding reaches 126, The Japan Times
At least 66 dead, 61 missing as record rains devastate parts of Japan, Japan Today
Rescuers race to find survivors after Japan floods kill at least 114, Reuters
Death toll reaches 88 as Japan begins to tackle flood damage, The Associated Press
Japan flood: Death toll rises to 199, dozens missing after worst disaster in three decades, Financial Express
Japan’s Fire and Disaster Management Agency
Japan’s Cabinet Office
Japan’s Ministry of Land, Infrastructure, Transport and Tourism

Maria makes China landfall & spawns inland flooding:
Typhoon in Guam damages several KC-135s, Defense News
 Fatal fall in New Taipei first reported death from Typhoon Maria in Taiwan, Taiwan News
8 injured due to Typhoon Maria (update), Focus Taiwan
City suffers $143 million economic loss from Typhoon Maria, ECNS China
Joint Typhoon Warning Center
Central Weather Bureau, Taiwan
Central Emergency Operation Center, Taiwan
Ministry of Civil Affairs, China
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Wildfires continue to rage across the US West:
Fire crews tallying up the damage, and firefighting costs, from massive Utah fire, Salt Lake City Tribune
CalFire
InciWeb
National Interagency Fire Center

Natural Catastrophes: In Brief:
Sichuan, Gansu bear brunt of deadly floods, China News Service
Train accident death toll rises in NW Turkey, Anadolu
Puerto Rico deals with rain and flooding as remnants of Beryl move over the island, CNN
RVs flip over in Kindersley storm, News Saskatoon
Weekend storms cause extensive damage in parts of Saskatchewan, Global News Canada
Sask. village pummelled with baseball-sized hail, CBC
Heat breaks records in Saskatchewan, Global News Canada
Estimated 70 deaths linked to Canada's heat wave, MPR News
Eleven killed as heavy rains lead to floods and landslides in Uttarakhand, FirstPost
Manipur landslides: Nine killed, seven injured in Tamenglong town, Financial Express
10 People Killed In Deadly Chain Of Disasters In Panjshir, Tolo News
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U.S. National Weather Service
U.S. Storm Prediction Center
Ministry of Civil Affairs, China
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