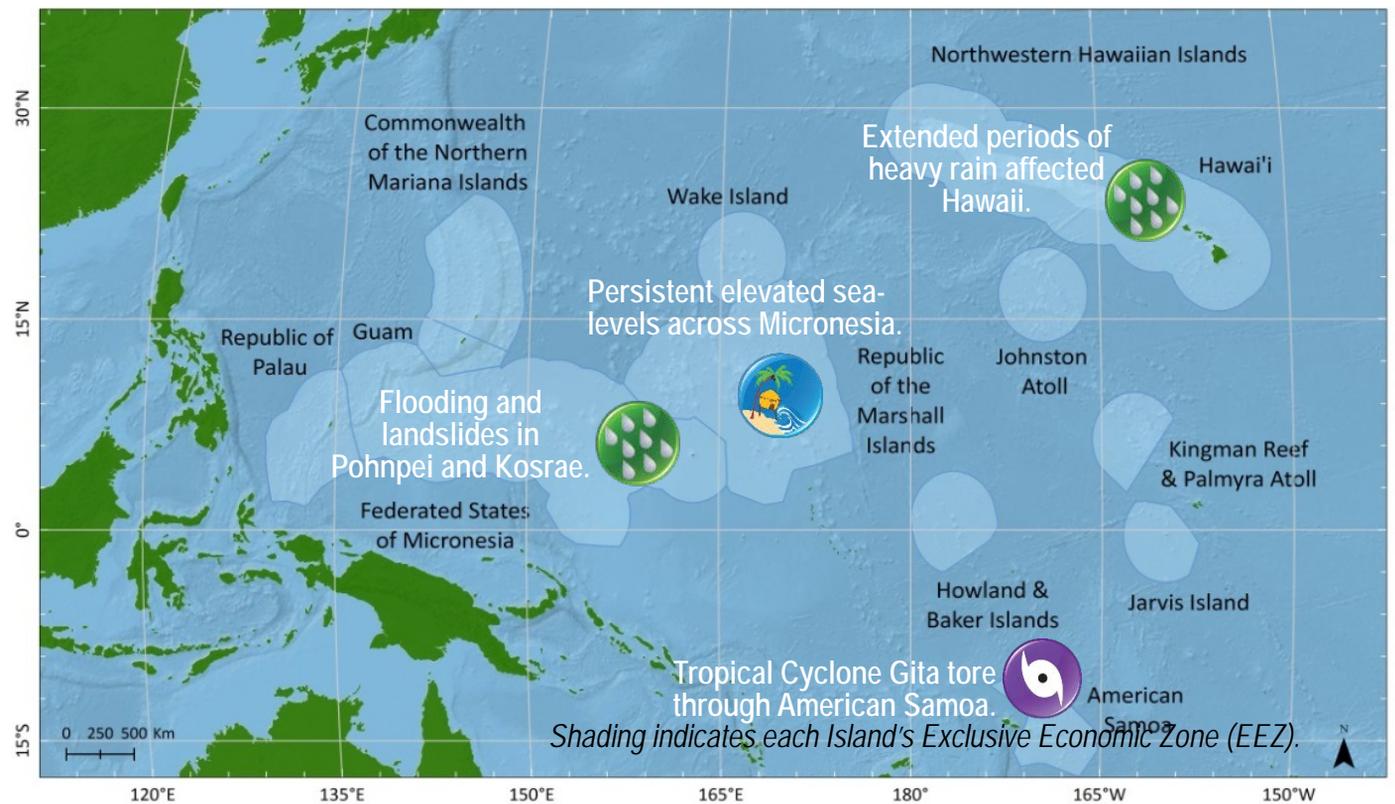




Significant Events – For February 2018-April 2018



Highlights for Hawaii and the U.S. Affiliated Pacific Islands

- Tropical Cyclone Gita made a direct hit on American Samoa this quarter. It made landfall during an active monsoon period, bringing flash flooding to the island.
- Above normal rainfall fell across eastern Federated States of Micronesia and the Republic of the Marshall Islands.
- After a period of abnormally dry conditions, near normal rainfall was observed in Guam and the Commonwealth of the Northern Mariana Islands.
- Abundant, and at times excessive, rains affected much of the Hawaiian Islands this quarter, bringing the state entirely out of drought for the first time in five years.
- In mid-March, 48 continuous hours of rainfall occurred in Pohnpei. Reports of flooding of rivers, roads and residential areas were received throughout the whole state of Pohnpei.
- Sea-levels remain elevated across the western Pacific with periodic inundation events for some low-lying atolls.

Climate Overview – For February 2018–April 2018

The 1 May Niño 3.4 region anomaly was exactly 0.0° C. Strong lagged coupling between the ocean and atmosphere is contributing to prolonged La Niña characteristics.

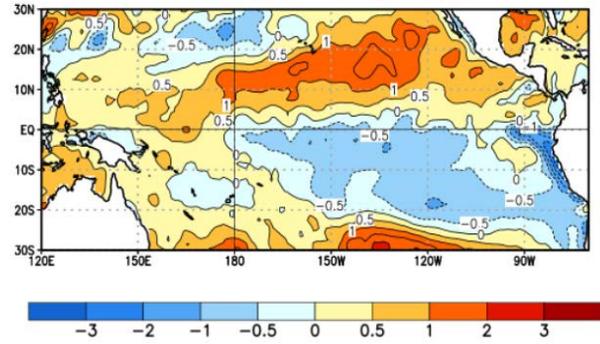
Sea-surface temperatures are above normal across the central Pacific with anomalies exceeding $+1.0^{\circ}$ C south of Hawaii from the Date Line east across Johnston Atoll. An area of weakening cold SST anomalies continues along and south of the equator in the southeastern Pacific. **Sub-surface water temperature anomalies** continue to dramatically recover, with positive anomalies now extending to a depth of 200m from 170° E to 120° W.

Above-normal sea levels are occurring in both hemispheres of the tropical western Pacific including most islands in southern Micronesia and west of American Samoa. Hawaii sea levels returned to normal after many months of being elevated.

In Hawaii, **rainfall** for the quarter was: Honolulu (176%), Lihue (239%), Kahului (210%), and Hilo (112%). In early April, an unseasonal upper level low pressure system brought extreme rains to Kauai, **with an unofficial 24-hour rainfall total near Hanalei of 49.69"**. If verified, this value would set the new National record. Elsewhere, from February-April, Saipan was above normal at 173% and Guam was above normal (106%). In Kwajalein and Majuro in the RMI, rainfall was above normal, with 242% and 196% of average respectively. In the FSM, rainfall from Feb-Apr was distributed as follows: Chuuk (104%), Kosrae (136%), and Pohnpei (232%) of normal. Pohnpei reported 57.92" in the month of March! Further west, Feb-Apr rainfall at Yap was 143% of normal and Palau was 82%. In American Samoa, rainfall was above normal for the quarter (160%), with 17.00" of rain falling in the active monsoon prior to the arrival of TC Gita, with an addition 6" falling in association with the storm.

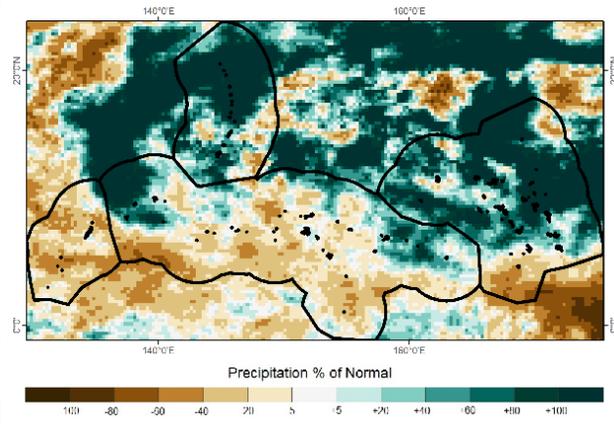
Tropical Cyclone (TC) activity in the western North Pacific basin was near normal with three (3) named storms, the most significant of which was Super Typhoon Jelawat with maximum sustain winds of 150 mph passing just northwest of Guam and Saipan in early April. In the southwest Pacific, seven (7) named storms were logged, four of which were major storms on the Australian intensity scale, with one storm, Gita, attaining Australian Category 5 status with maximum sustained winds of 145 mph. Warm SSTs and positive oceanic-atmospheric linkages resulted in a slightly above normal late-season TC period for named storms.

Average SST Anomalies
25 MAR 2018 – 21 APR 2018

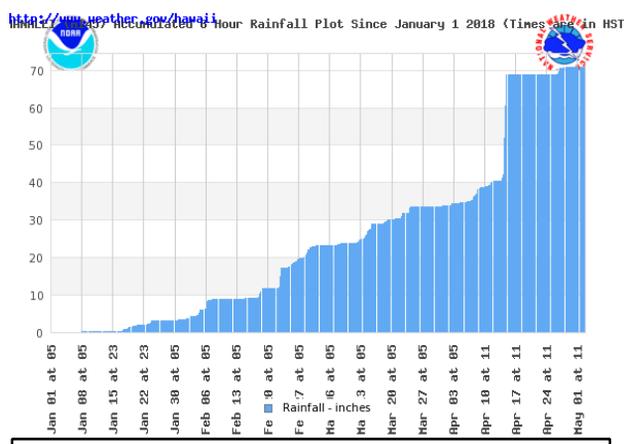


Sea-Surface Temperature Anomalies, valid April 21, 2018. Source: <http://www.cpc.ncep.noaa.gov/>

GPM Precipitation Anomalies for 2018 FMA



Feb'18-Apr'18 precipitation anomalies. Source data [NASA](http://www.nasa.gov/) GPM. Brown areas are dry; green areas wet.



Rainfall accumulation from Jan 1- Apr 30 2018 at Hanalei, Hawaii, showing 70+” so far this year. Image courtesy of NWS Honolulu.



Severe flooding on Kauai in mid-April. Photos courtesy of social media (Instagram and Twitter).



Roof damage commonly seen in Tutuila, American Samoa, in the aftermath of TC Gita. Photo courtesy of the Samoa News.



Mudslide in Pohnpei from excessive rainfall. Photo courtesy of WSO Pohnpei.

Facilities and Infrastructure – On 9 February, Tropical Cyclone Gita made landfall in American Samoa, bringing heavy rains and severely damaging homes across the island of Tutuila. The storm actually passed over the islands and then doubled back, bringing more rain and winds. Channeled winds led to enhanced strong wind gusts nearby mountainous terrain. Flooding, debris and loss of power were the main impacts. Over 90% of the island was without power and freshwater as the storm raged. Total damages were estimated to exceed US \$10 million.

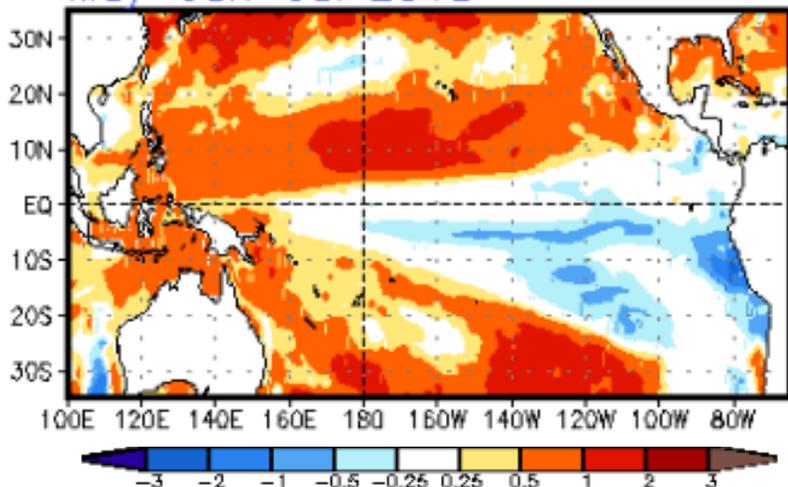
Meanwhile, heavy rains fell 17-18 March across Pohnpei, which resulted in washed out roads and numerous mudslides covering roads and damaging homes. Multiple homes were reported flooded in every municipality on main island of Pohnpei.

In Hawaii, flood damage in Kauai and parts of Oahu was significant following a mid-April deluge. Several homes in Hanalei were washed away in fast-flowing elevated rivers. The flooding also washed out numerous roads and forced the evacuation of 425 people. A federal disaster declaration for Kauai and Oahu was signed by the President.

Natural Resources – Strong to near gale trades on 1 March created combined seas and swell to 15' off of east Oahu. The rough surf in combination with full moon high tides resulted in above average coastal wave wash during peak tides. A commercial fishing vessel named Princess Hawaii sank due to large waves about 400 miles north of Hilo on 25 March (no fatalities). Meanwhile, the rate of loggerhead turtles interactions in the shallow-based fishery decreased as the fishery is moving closer to Hawaii and the turtles continue to follow the transition fronts further north. The current count is 33 for a hard cap of 34.

Health – On 15 February, a young man drowned due to rip currents at Ritidian Point, Guam, while trying to rescue two distressed swimmers, who made it back to shore safely. In March, a similar incident happened near Maui due to high surf where a man drowned. Then, on 3 April, rough seas (triggered by Super Typhoon Jelawat) caused a woman to be swept out beyond the reef at Guam's Shark's Hole. She was later rescued and pronounced dead from drowning.

May–Jun–Jul 2018



Sea-Surface Temperature Anomalies for May-July 2018. Source: <http://www.cpc.ncep.noaa.gov/>

Following the latest ENSO prediction models, there is a 75% chance of ENSO neutral conditions from May-July.

The SST anomaly outlook indicates +0.5° C anomalies across Palau, FSM, RMI, and eastward to the Hawaiian Islands. Above normal SSTs are also projected for the waters around American Samoa. **NOAA's Coral Reef Watch 4-month bleaching outlook projects continued heating around FSM and RMI (Alert Level 2) through August but no bleaching elsewhere due the lack of pre-existing heat stress.**

From May-July, in the northwestern Pacific, sea levels are forecast to rise further (+10 to +25 cm by July). In the southwestern Pacific, sea levels are forecast to rise and expand in area (+10 to +20 cm) during the next six months. Sea levels exceeding 30 cm during July and August are possible in the far southern Marshall Islands. **Inundation events are possible across southern RMI and southern FSM over the next several months.**

During the period May-July, rainfall is projected to be above normal across Palau, Guam and CNMI, FSM, northern RMI, and the Hawaiian Islands. Near-normal rainfall is expected for the southern RMI, while near to below normal rainfall is projected for American Samoa.

Tropical cyclone (TC) activity in the western north Pacific is expected to be more active than either 2016 or 2017 – about 25 named storms. In the southwest Pacific, TC activity is projected to be near normal, with no named storms expected during the usually quiet southern hemisphere late autumn to mid-winter months.

Pacific ENSO Applications Climate Center:

<http://www.prh.noaa.gov/peac/>

NOAA NWS Weather Forecast Office Honolulu:

<http://www.prh.noaa.gov/pr/hnl/>

NOAA NWS Weather Forecast Office Guam:

<http://www.prh.noaa.gov/pr/guam/>

NOAA National Centers for Environmental Information:

<http://www.ncei.noaa.gov/>

NOAA NMFS Pacific Island Fisheries Science Center:

<http://www.pifsc.noaa.gov/>

NOAA OceanWatch - Central Pacific:

<http://oceanwatch.pifsc.noaa.gov/>

NOAA Coral Reef Watch:

<http://coralreefwatch.noaa.gov/>

USGS Pacific Islands Water Science Center: <http://hi.water.usgs.gov/>

USGS Science Center – Pacific Coastal and Marine Science Center:

<http://walrus.wr.usgs.gov/>

University of Hawaii - Joint Institute of Marine and Atmospheric Research:

<http://www.soest.hawaii.edu/jimar/>

University of Guam - Water and Environmental Research Institute:

<http://www.weriguam.org/>

University of Hawaii Sea Level Center:

<https://uhslc.soest.hawaii.edu/>