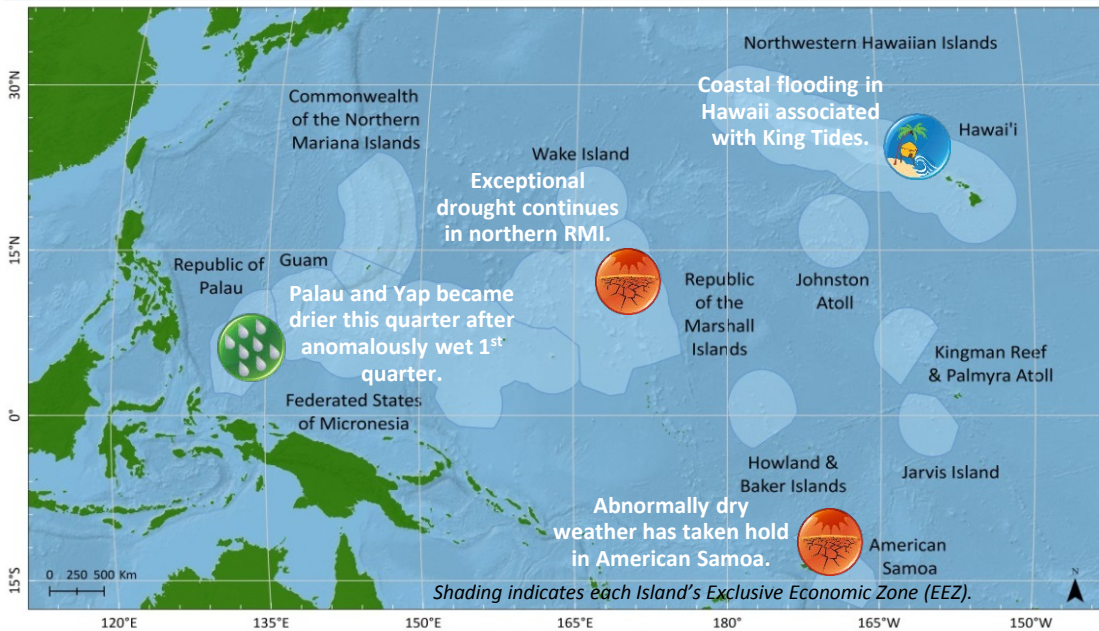


Significant Events and Impacts for 2nd Quarter 2017



Much above normal rainfall was recorded across Palau and Yap.

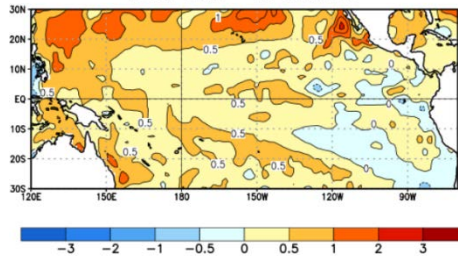
Near normal rainfall fell across the Federated States of Micronesia, Guam, and the Commonwealth of the Northern Mariana Islands. Meanwhile, the northern Marshall Islands continued to be much drier than normal. Below normal rains were also observed in American Samoa.

Sea-levels were elevated across the central and western Pacific.

So far in 2017, there have been 14 tropical cyclones in the western North Pacific.

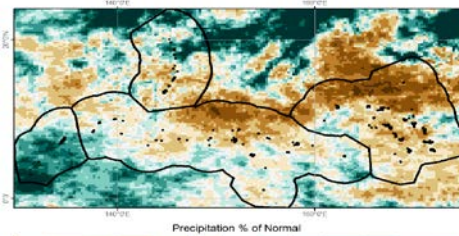
Regional Climate Overview for 2nd Quarter 2017

Average SST Anomalies
2 JUL 2017 – 29 JUL 2017

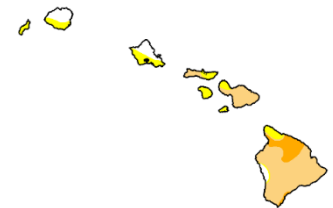


Sea-Surface Temperature Anomalies, valid August 1, 2017. Source: <http://www.cpc.ncep.noaa.gov/>

GPM Precipitation Anomalies for 2017 MJJ



May-July 2017 precipitation anomalies. Source data [NASA](http://www.nasa.gov/) GPM. Brown areas are dry; green areas wet.



Intensity:
D0 (Abnormally Dry) D1 (Moderate Drought) D2 (Severe Drought) D3 (Extreme Drought) D4 (Exceptional Drought)

U.S. Drought Monitor for Hawaii, valid 1 August 2017. Source: <http://droughtmonitor.unl.edu>

There are no active ENSO advisories in effect. As of August 1st, the Niño 3.4 region anomaly was +0.4° C, supporting a marginally-neutral state.

Sea-surface temperatures are above normal across much of the Pacific, with a small localized region of cold anomalies along the equatorial eastern Pacific. The warmest anomalies exceeding 1.0° C were located just north of the Hawaiian Islands, with 0.5° C anomalies across American Samoa, western FSM, and the CNMI. Positive anomalies of at least 0.25° C are prevalent everywhere west of 120° W, including eastern FSM and the RMI. **Sub-surface water temperature** anomalies are close to normal with a localized area of -2° C centered near 150° W between 50 and 200 m depth.

High sea levels are occurring around the Hawaiian Islands and parts of eastern Micronesia. Above-normal sea levels continue around the Hawaiian Islands and high sea levels are propagating westward near the equator. In the north-central Pacific away from the equator, sea levels have slightly fallen since last month. Record sea levels were observed at the Honolulu tide gauge. The anomaly was +20 cm during April, +17 cm during May, and +9 cm during June and July.

In Hawaii, **rainfall** was below normal for the quarter across the state: Honolulu (69%), Lihue (60%), Kahului (30%), and Hilo (62%). From May-July, Saipan was below normal at 85.7% and Guam was below normal with 81.7% of average rainfall. In Kwajalein and Majuro in the RMI, rainfall was near normal, with 99.8% and 94.7% of average rainfall respectively. In the FSM, quarterly rainfall was distributed as follows: Chuuk (82.5%), Kosrae (95.3%), and Pohnpei (110.4%) of normal. Further west, rains continued to fall across the islands of Yap (88.2%) and Palau (105.4%). In American Samoa, rainfall was above normal for the quarter (145.9%). Pohnpei had their 14th wettest June in the last 66 years following a 7.17 inch rain event in 48 hours.

Tropical Cyclone (TC) activity in the western North Pacific basin was near normal with 8 named storms but all remained well north and west of the USAPI. In the southwest Pacific, the period May-July was unusually active with 2 named storms (Donna and Ella). Donna was particularly noteworthy as it was the most intense SW Pacific basin TC in May in recorded history with maximum sustained winds of 115 knots.

Sectoral Impacts for 2nd Quarter 2017

Facilities and Infrastructure – King Tides, (the annual maximum of spring tides), coincided with above average mean sea levels in Hawaii for the new moons May-July. The anomalies associated with the mean sea level varied in time and location within the islands, but notable coastal flooding was observed. Above average southerly swell generated in the austral mid latitudes enhanced coastal flooding on southern exposures in Hawaii May 26-28 and June 19-22. Numerous roads were awash with seawater and area beaches, especially Waikiki beach, recorded anomalous flooding.

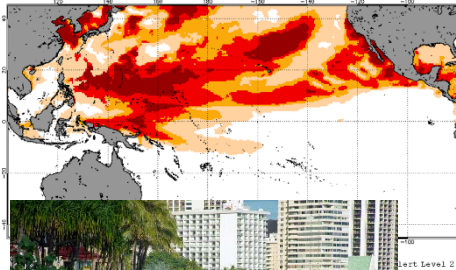
Water Resources – Drought continues in the northernmost atolls of the RMI with exceptional drought now occurring on Utirik and severe drought on Wotje. Household rain tanks have gone dry and emergency short-term assistance has been provided by the RMI Government. Meanwhile in American Samoa, despite the current dry weather, May brought major flooding across the territory, turning creeks into raging rivers, forcing evacuations, and bringing flood waters up to car windows.

Natural Resources – From a fisheries perspective, overall longline catches decreased toward the end of July. Bigeye was the primary component of the landings higher than usual catches for yellowfin tuna were also observed. Shallow-set longline effort was low as it typically is during this time of the year. Meanwhile, there was an algal bloom in Pago harbor and also some fish kills inside a pool on the airport runway that may have been related to the annual minimum of spring tides.

High run-up at Kaimana Beach, Oahu. Photo courtesy of Hawaii Sea Grant.



2017 Aug 8 NOAA Coral Reef Watch: 60% Probability Coral Bleaching Thermal Stress for Aug–Nov 2017

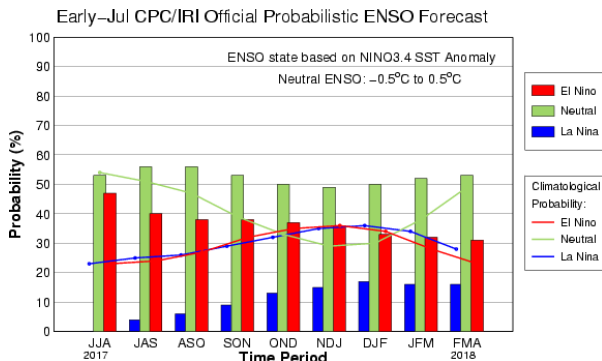


Coral Reef Watch Aug–Nov heat stress outlook.



High waves at Waikiki Beach, Oahu. Photo courtesy of Hawaii Sea Grant.

Regional Outlook for 3rd Quarter 2017 (Aug–Oct)



ENSO Probabilities, Valid early July 2017. Source: <http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>

Following the latest ENSO prediction models, there is a 55% chance of ENSO neutral conditions and a 35% chance of an El Niño developing from August through October.

The SST anomaly outlook for the 3rd quarter indicates 1+° C above-normal values near Hawaii, with widespread 0.5° C warm anomalies in RMI, FSM, Guam, CNMI, and American Samoa. NOAA's Coral Reef Watch most recent four-month Bleaching Outlook indicates that mass bleaching will continue in the North Pacific Ocean through the boreal summer season, including in Guam and the CNMI, and the Hawaiian Islands. The northern half of the Main Hawaiian Islands is expected to reach Alert Level 2 by October and the Federated States of Micronesia are predicted to hit Alert Level 1 by mid-October as well; these conditions may persist through November.

There remains the likelihood of high sea levels affecting the islands of Majuro, Pohnpei, Chuuk, Yap, and Malakal (Palau) during late summer and fall. Above-normal anomalies around Hawaii are forecast to continue to diminish.

Near to above-average rainfall is projected for Yap, Koror, Guam, and CNMI, while most of the northern RMI and American Samoa will be below normal. Near-normal rainfall is projected for the Hawaiian Islands, Pohnpei, Kosrae, Chuuk, and Majuro.

Tropical cyclone (TC) activity in the western north Pacific is expected to be near-normal in the 3rd quarter with increased chance for typhoons in CNMI in August and September. In the southwest Pacific, with the period from August–October being climatologically the least active period of the year, there is no expectation of TC activity occurring in the upcoming 3-month period.

Regional Partners

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/>