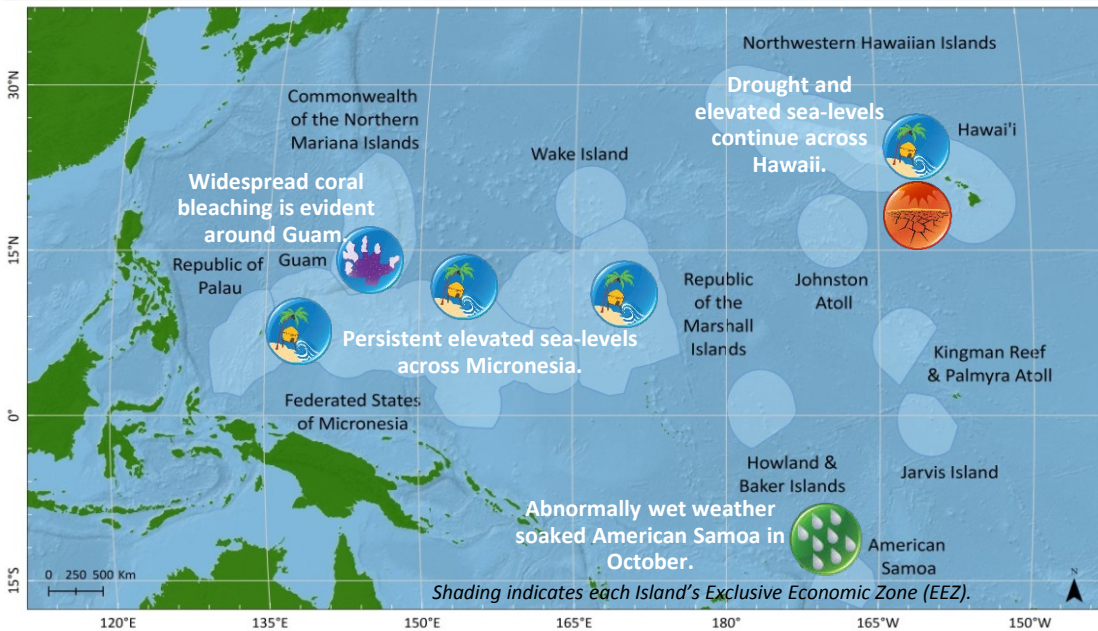


Significant Events and Impacts for 3rd Quarter 2017



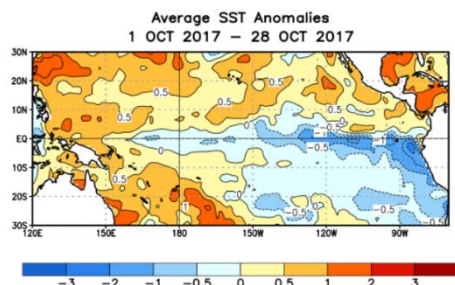
La Niña Advisory

Much above normal rainfall was recorded in American Samoa this quarter.

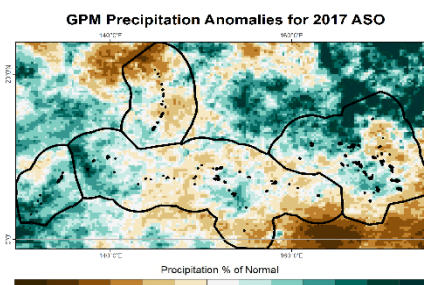
Near normal rainfall fell across the Federated States of Micronesia, Guam, and the Commonwealth of the Northern Mariana Islands, and the Republic of the Marshall Islands. The Hawaiian Islands saw an expansion of moderate to severe drought on the leeward side of the main islands.

Sea-levels remain elevated across the central and western Pacific with periodic inundation events for some atolls.

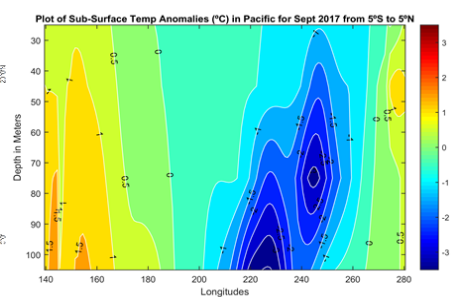
Regional Climate Overview for 3rd Quarter 2017



Sea-Surface Temperature Anomalies, valid October 28, 2017. Source: <http://www.cpc.ncep.noaa.gov/>



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



Sub-Surface Temperature Anomalies from 140° E to 100° W. Source: <https://www.esrl.noaa.gov/>

The region is under a **La Niña Advisory**. As of November 1st, the Niño 3.4 region anomaly was -0.5°C , supporting a weak La Niña state.

Sea-surface temperatures are above normal across the western Pacific with anomalies near 0.5°C , but with **growing area of cold anomalies from 150°E all the way to 85°W along the equator**. The coldest anomalies below -1.0°C were located east of the Howland & Baker Islands to the coast of South America. Positive anomalies of at least 0.25°C are prevalent everywhere north of 10°N and west of 120°W , including the Hawaiian Islands, most of FSM, CNMI, and the RMI. **Sub-surface water temperature anomalies are significantly below normal**, by as much as -4°C to a depth of 150m, especially between 160°W and 130°W .

Elevated sea levels are still occurring around the Hawaiian Islands westward through much of Micronesia. The tide gauge in Majuro recorded water levels exceeding 10 cm above-normal during September. Satellite and model analyses continue to show high sea level anomalies ($>15\text{ cm}$) stretching across the Pacific in a narrow band north of the equator. Sea level anomalies are smaller in the Southern Hemisphere.

In Hawaii, rainfall for the quarter was: Honolulu (153%), Lihue (59.8%), Kahului (37.9%), and Hilo (101%). Much of the western half of Big Island of Hawaii is in at least moderate drought, with areas of extreme drought on the northern and southern shores. From August-October, Saipan was below normal at 72% and Guam was near normal with 99% of average rainfall. In Kwajalein and Majuro in the RMI, rainfall was above normal, with 114% and 136% of average rainfall respectively. In the FSM, rainfall from Aug-Oct was distributed as follows: Chuuk (105%), Kosrae (124%), and Pohnpei (81%) of normal. Further west, Aug-Oct rainfall at Yap was 93% of normal and Palau was 119%. In American Samoa, rainfall was much above normal for the quarter (141%), and Pago Pago recorded their 5th wettest October since records began in 1966. From 3-12 August, Lihue, Kauai set or tied 10 consecutive days of daily maximum temperatures. The high temperatures each day ranged from 88 to 90°F .

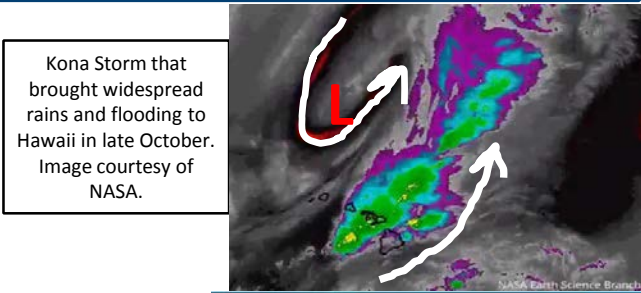
Tropical Cyclone (TC) activity in the western North Pacific basin was well below average, as storms were displaced northward and westward of the USAPI, consistent with the development of La Niña. There were no TCs in the southwest Pacific for the period August-October, which is also normal.

Sectoral Impacts for 3rd Quarter 2017

Facilities and Infrastructure – A recent Kona Storm brought heavy rain and lightning strikes to Hawaii in late October. The island of Maui was completely in the dark following numerous lightning strikes on 24 October. Critical infrastructure such as hospitals, airports, and police operations were the first to be restored. In addition, flooding rains from the storm closed several roads as rainfall rates exceed 2 inches per hour. The stormy weather closed campgrounds and back-country camping in Haleakala National Park.

Water Resources – A typical pattern of summer rainfall helped ease dry conditions that occurred during the first half of 2017 in some isolated areas, including some of the northern atolls of Chuuk State, and some of the atolls of the northern RMI.

Natural Resources – On 10 October there was a multi-species fish kill incident inside the pools at the Pago Pago airport runway, however it is unknown what caused the fish to die. On the main island of Tutuila, the annual Palolo worm (*Eunice viridis*, a cultural delicacy) spawning was observed in low numbers during the month of October, however it was observed in relatively higher numbers in the Manu'a Islands. For coral reefs, HotSpots around Guam and the CNMI peaked in August, persisted in September, and diminished in October. This is the fifth consecutive year Guam and the CNMI have reached bleaching alert level 2 and Guam has reported widespread bleaching.



Kona Storm that brought widespread rains and flooding to Hawaii in late October. Image courtesy of NASA.

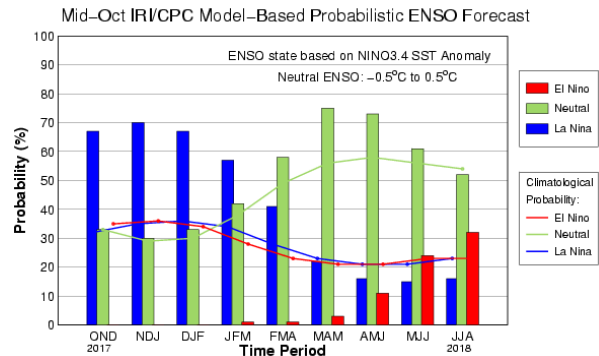


Coral bleaching near Guam. Photo courtesy of David Burdick, University of Guam Marine Lab



A bucket of palolo worms. Photo courtesy of the Samoa Observer.

Regional Outlook for 4th Quarter 2017 (Nov-Jan)



ENSO Probabilities, Valid mid October 2017. Source: <http://iri.columbia.edu/our-expertise/climate/forecasts/ens0/current/>

Following the latest ENSO prediction models, there is a 70% chance of La Niña conditions prevailing through February 2018.

The SST anomaly outlook for the 4th quarter indicates +0.5° C anomalies stretching from Yap northeastward toward Hawaii, including areas of CNMI, FSM, and RMI. In the South Pacific, SST anomalies near American Samoa are also projected to be near +0.5° C. NOAA's Coral Reef Watch most recent four-month Bleaching Outlook projects that heat stress will diminish in the FSM and RMI, while increasing to Alert Level 1 in American Samoa by mid-January.

High sea levels are affecting some tropical northwestern Pacific Islands and likely will persist until the beginning of 2018. From November through January, sea levels are likely to be above-normal (10–25 cm) for Majuro, Pohnpei, and Chuuk. It is uncertain whether the high sea levels will propagate as far west as Yap and Malakal. The likelihood is increasing for rising sea levels in parts of the South Pacific, including American Samoa, by March 2018.

Near to slightly above-average rainfall is projected for Yap, Koror, northern CNMI, Pohnpei, Chuuk, the Hawaiian Islands, and American Samoa. However, rainfall in Guam, Kapingamarangi and the northern and southern atolls in the RMI may be below normal due to the influence from La Niña.

Under the influence of La Niña, tropical cyclone (TC) activity in the western north Pacific is expected to be below average in the 4th quarter. Meanwhile, in the southwest Pacific, activity from Nov 2017 to Jan 2018 is projected to be near normal, except for two possibly elevated activity regions from the Gulf of Carpentaria north into the Coral Sea, as well as the area to the southeast of Fiji.

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/>
- University of Hawaii Sea Level Center: <https://uhscl.soest.hawaii.edu/>