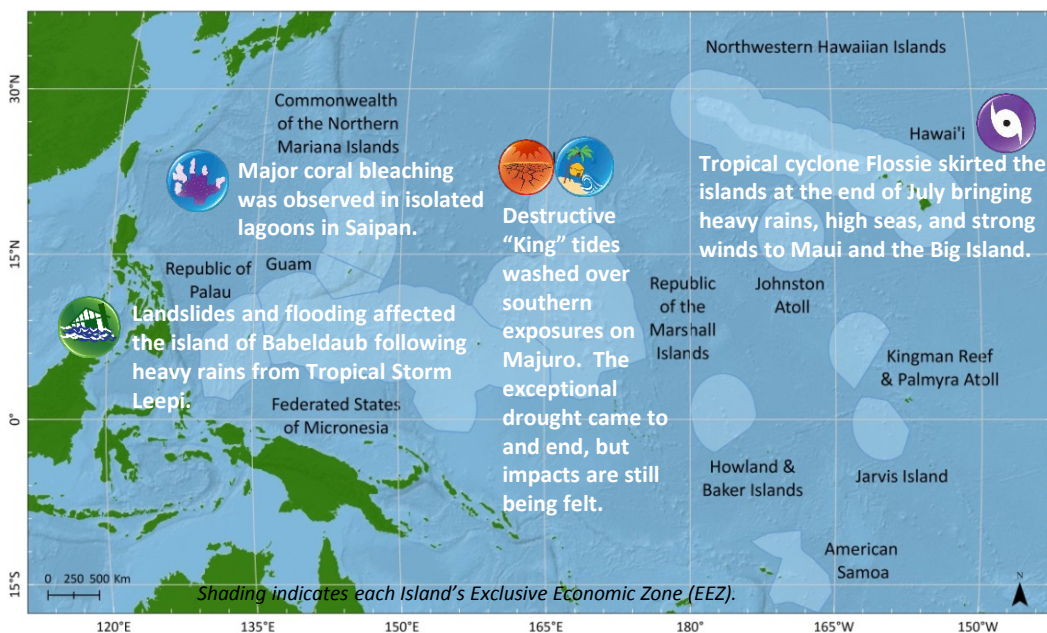


# Climate Impacts and Outlook

# Hawaii and U.S. Pacific Islands Region

3<sup>rd</sup> Quarter 2013

## Significant Events and Impacts for 2<sup>nd</sup> Quarter 2013

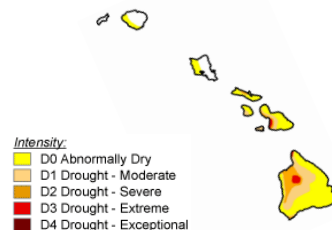
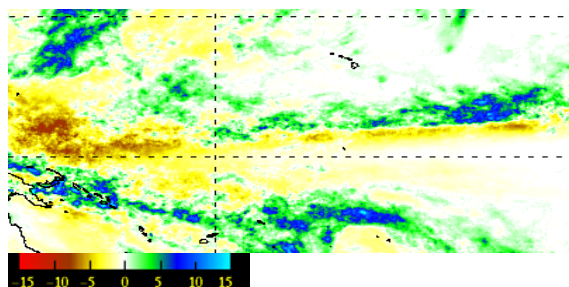
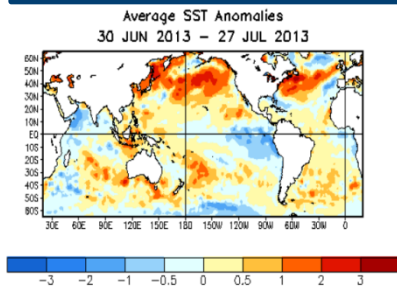


A dry rainy season is in progress, with many areas receiving well below normal rainfall in Guam/Commonwealth of the Northern Mariana Islands (CNMI).

Persistently higher than average mean sea-level continues to be observed in the Federated States of Micronesia (FSM).

Persistently higher than average mean sea-level and rainfall continues to be observed in American Samoa.

## Regional Climate Overview for 2<sup>nd</sup> Quarter 2013



Average sea-surface temperatures anomalies for July, 2013. Source: [www.cpc.ncep.noaa.gov/](http://www.cpc.ncep.noaa.gov/)

U.S. Drought Monitor – Drought Conditions in Hawaii. Source: <http://droughtmonitor.unl.edu>

**ENSO-neutral conditions continued in the Equatorial Pacific Region**, but weather conditions were more in-line with La Niña (e.g., the position of the monsoon trough, reduced tropical cyclone activity and elevated sea level). As of 29 July the Niño 3.4 region anomaly was  $-0.3^{\circ}\text{C}$ .

The monthly mean *sea level* in the 3<sup>rd</sup> quarter continues to show higher anomalies in most of the USAPI stations. Currently, all stations are 4-8 inches higher than normal as a result of persistent low-level easterlies across the Pacific. *Sea-surface temperatures* were generally near-normal except for the waters around the International Dateline and the far eastern Pacific where cooler waters prevailed. NOAA issued coral bleaching watches and warnings in an extensive area across the western Pacific, from the Philippines northeastward across all the Mariana Islands. Localized, major bleaching was observed around Saipan during a period of hot, still, conditions.

*Rainfall* throughout much of the region was near normal. In Hawaii, rainfall was near- to above-normal in many areas of the state, especially Hilo and Kahului. In Guam and the CNMI, rainfall was below-normal. In the RMI, rainfall was below-normal early, but recent near-normal rains have eased some *drought* concerns in these areas. In the FSM, quarterly rainfall, in terms of percent of normal, was slightly below-normal across all sites: Chuuk (82%), Kosrae (88%), Pohnpei (73%), and Yap (85%). In Palau and Koror, rainfall was also below-normal. In American Samoa, rainfall was well above-normal for the 3<sup>rd</sup> consecutive quarter.

*Drought* conditions continued over the Hawaiian Archipelago and portions of the Republic of the Marshall Islands. As of the end of July, roughly 87% of the state of Hawaii was abnormally dry or in drought, the same as it was the last quarter, despite rains from Flossie. Meanwhile, drought in Kwajalein and Majuro continued during the quarter, while abnormal dryness developed in Kapingamarangi.

*Tropical Cyclone* activity for May-July in the western North Pacific basin was near normal; only locations west of CNMI recorded any typhoons this quarter. The southwest Pacific is seasonally inactive. The central Pacific was dominated by tropical storm Flossie.

## Sectoral Impacts for 2<sup>nd</sup> Quarter 2013

**Agriculture and Husbandry** – Local sustainable crops on the northern atolls of the RMI (i.e., banana and breadfruit) have been damaged or completely destroyed by the drought. About 6,000 people on 15 northern atolls are relying on fish, crabs, other seafood, and relief being provided by USAID and the USDA.

**Water Resources** – The severe drought in the RMI broke in July, but not before affecting water catchments and water storage facilities. Reverse osmosis machines were brought, although several broke down needing repair.

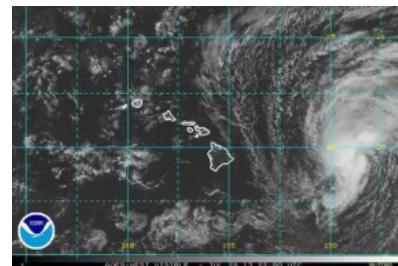
**Facilities and Infrastructure** – Tropical cyclone Flossie caused minor damages/inconveniences in Hawaii: Felled trees and power lines, several reports of boulders falling on roads, and power outages associated with frequent lightning strikes have been listed by the Central Pacific Hurricane Center. Destructive “King” tides washed over parts of Majuro, damaging homes and destroying a portion of the airport seawall. In Palau, The Compact Road was damaged by flooding rains on Babeldaub.

**Tourism** – Tropical cyclone Flossie brought torrential rains and winds to the islands of Hawaii causing the ship ports at Hilo and Kahului to be closed and numerous airline flights to be canceled. Although The Governor declared a State of Emergency to allow the release of disaster recovery funds, the damage sustained due to Flossie was localized and in general, minor.

Coral bleaching has been severe on Saipan. Photo courtesy of Steven Johnson, DEQ.



Dry weather on the northern atolls of the RMI has affected the banana and breadfruit crops.

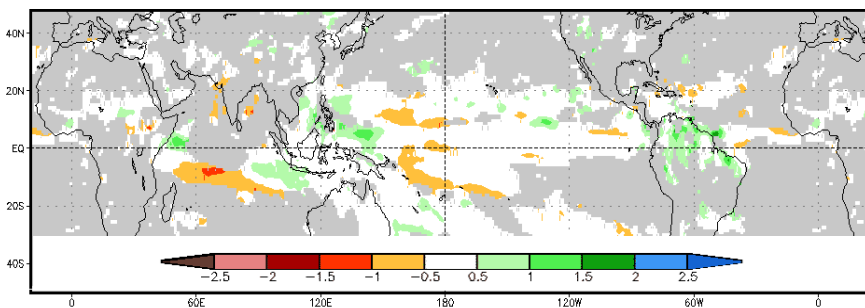


“King” Tides resulted in overwash on Majuro during early July.



Tropical Storm Flossie as seen through GOES WEST satellite, centered on Hawaii.

## Regional Outlook for 3<sup>rd</sup> Quarter 2013 (Aug-Oct)



Precipitation outlook, August-October 2013. Source: <http://www.cpc.ncep.noaa.gov>

**ENSO Neutral conditions expected to continue through the Northern Hemisphere fall 2013.**

The SST anomaly outlook for the 3<sup>rd</sup> quarter indicates near-normal temperatures throughout the region. **Coral bleaching thermal stresses are projected to be high across the western Pacific, especially around CNMI.**

The forecast values for sea level in the 3<sup>rd</sup> quarter indicate that most of the stations in the north Pacific region are likely to be about 2-4 inches higher than normal. American Samoa is likely to be about 3-4 inches higher than normal. In Hawaii, both Honolulu and Hilo are likely to be closer to normal.

**Parts of Guam and CNMI are expected to be drier than normal in the next quarter, while below-normal rainfall is also favored for Hawaii.** Specifically, rainfall is anticipated to be near-normal in the Marshall Islands, Pohnpei, Chuuk, and Kosrae. Near-normal rainfall is expected in Yap and Palau. Rainfall in American Samoa is expected to be near to slightly above-average as they continue through their seasonal dry period. **Drought has left long-term impacts across the RMI, and full drought relief won't likely be realized for several months.**

Tropical cyclone activity in the western North Pacific is expected to be below-normal. Unless El Niño conditions evolve, another quiet typhoon season is on tap for Micronesia.

## 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 NESDIS National Climatic Data Center:  
<http://www.ncdc.noaa.gov/sotc/>

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/>

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/>