



# Hawai'i Ho'ohekili

Skywarn Weather Spotter Newsletter  
National Weather Service, Honolulu, HI



Dry Season Edition, 2017

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Spotter Newsletter Volume 15

**Inside this edition: ENSO prediction, Hawaii drought, King Tides, the Central Pacific Hurricane outlook, and more!!!**

## ENSO-neutral and El Niño are nearly equally favored during the Northern Hemisphere summer and fall 2017.

ENSO-neutral persisted during April, with near-average sea surface temperatures (SSTs) observed across the central equatorial Pacific and above-average SSTs in the eastern Pacific (Fig. 1). The ocean and atmosphere system remains consistent with ENSO-neutral. We're finally starting to get through the spring barrier, when climate models have a harder time making successful forecasts. Forecasters estimate the chance of El Niño forming is about equal to the chance that neutral conditions will continue: both are just shy of 50% through the fall. Unlike two years ago, when the signal that a strong El Niño was developing was clear, most of our prediction tools are suggesting very borderline conditions, making it a tough forecast.

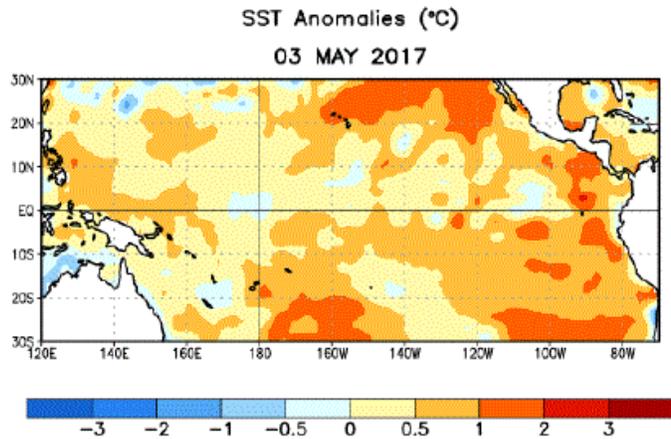


Figure 1. Average sea surface temperature (SST) anomalies (°C) for the week centered on 3 May 2017. Anomalies are computed with respect to the 1981-2010 base period weekly means.

## Quotes from Two Scientists

**Michelle:** Here's the latest NOAA/NCEP CFSv2 model forecast (Fig 2). It's bailing on its previously predicted El Niño. And it's not the only one. The Japanese Meteorological Agency (JMA) said the other day they're 50-50 on El Niño developing. The UK Meteorological Office released a new run of their model, and it shows about half the members sub 0.5°C (rough threshold for El Niño). The Bureau of Meteorology in Australia updated their discussion and they noted the models tend to be retreating as well. So are things falling apart?

**Ken:** Well, this model has really changed its "mind." But several other models maintain their El Niño predictions. You must have a theory for this!

**Michelle:** I wish I did! Unfortunately, in this business it is not uncommon for models to back off or become more aggressive in predicting an ENSO event. This is why we update our official forecasts periodically—to respond to recent conditions. But I noticed that as the CFSv2 began to cool, the short-term forecast in one of the other NOAA/NCEP models is now predicting more anomalous easterly winds (not consistent with El Niño). There is also a suggestion of possible MJO activity, so things could definitely get very interesting coming up here!

ENSO forecast from NOAA/NCEP CFSv2

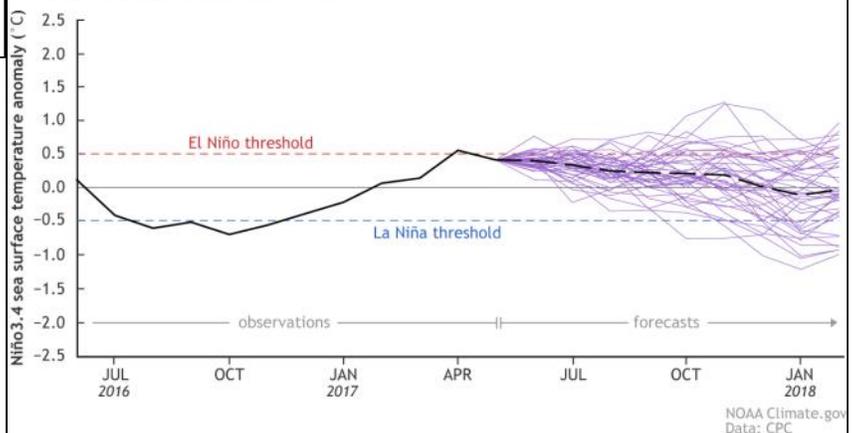


Figure 2. Forecasts of ENSO from the NOAA Climate Forecast System version 2. The solid black line is the observed Niño-3.4 SST data from NCEI. The dashed black line is the average from all the individual forecasts, shown by the purple lines. These forecasts show the spread of different possible outcomes from this model. Values that persist greater than 0.5°C indicate El Niño conditions. Figure provided by Wanqiu Wang (CPC) and modified by Climate.gov.

*Excerpt from conversation between Michelle L'Herureux and Ken Takahashi on latest ENSO forecasts. Read the entire conversation at <https://www.climate.gov/news-features/blogs/enso/enso-forecasters-offices-getting-coffee>*

## Summary of Wet Season October 2016 through April 2017

- Started the wet season with pockets of drought over leeward areas of Kauai and Maui.
- Short-lived La Nina returned to ENSO-neutral by the end of winter.
- Wet season forecast issued in October 2016 called for near to above average rainfall and the elimination of drought on Kauai and Maui.
- Erratic wet season with monthly extremes—  
Dry November, January, March  
Wet December, February, April

- There were 22 monthly records broken for wet or dry conditions.

- Big Island missed out on the February wet conditions resulting in three months of dry conditions. Severe drought (D2 category) developed on the leeward slopes. April rainfall lowered drought to moderate category (D1).

### Wet season statistics

- Overall: 14th wettest wet season in the last 30 years (average rankings from 8 sites)
- Kauai - Most rain totals in the range of 50 to 80% of average. Lihue Airport: 15.14 inches, 7th driest Oct - Apr in the last 30 years. April rainfall helped abnormal dryness from March.
- Oahu - Most rain totals between 50 and 80% of average. Honolulu Airport: 14.85 inches, ranked 11th wettest.
- Maui County - Many Maui totals 100+% of average. Most Molokai and Lanai totals 60 to 80% of average. Ulupalakua: 32.38 inches, 4th wettest wet season.
- Big Island – Most windward sites near average despite erratic wet season. Leeward sites mostly from 60 to 90% of average. Hilo Airport: 76.54 inches, 15th wettest wet season.

### Dry season (May through September) outlook

- NOAA Climate Prediction Center's forecast probabilities favor above normal precipitation during the first half of the dry season.
- Wet conditions will mainly affect the windward slopes and the Kona slopes on the Big Island.
- Leeward areas (other than Kona) forecasted to be seasonally dry.
- Expecting an expansion of existing drought or the development of new leeward drought areas.
- Normal brush fire season expected for leeward areas.

### Wet Season Maps On the Web:

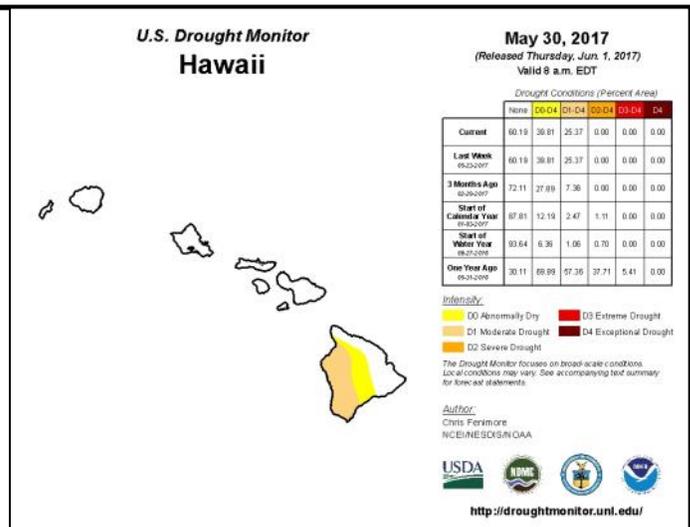
Kauai: [http://www.prh.noaa.gov/hnl/hydro/pages/kauai\\_1617\\_hooilo.gif](http://www.prh.noaa.gov/hnl/hydro/pages/kauai_1617_hooilo.gif)

Oahu: [http://www.prh.noaa.gov/hnl/hydro/pages/oahu\\_1617\\_hooilo.gif](http://www.prh.noaa.gov/hnl/hydro/pages/oahu_1617_hooilo.gif)

Molokai/Lanai: [http://www.prh.noaa.gov/hnl/hydro/pages/molan\\_1617\\_hooilo.gif](http://www.prh.noaa.gov/hnl/hydro/pages/molan_1617_hooilo.gif)

Maui: [http://www.prh.noaa.gov/hnl/hydro/pages/maui\\_1617\\_hooilo.gif](http://www.prh.noaa.gov/hnl/hydro/pages/maui_1617_hooilo.gif)

Big Island: [http://www.prh.noaa.gov/hnl/hydro/pages/bigis\\_1617\\_hooilo.gif](http://www.prh.noaa.gov/hnl/hydro/pages/bigis_1617_hooilo.gif)



## King Tides bring coastal flooding

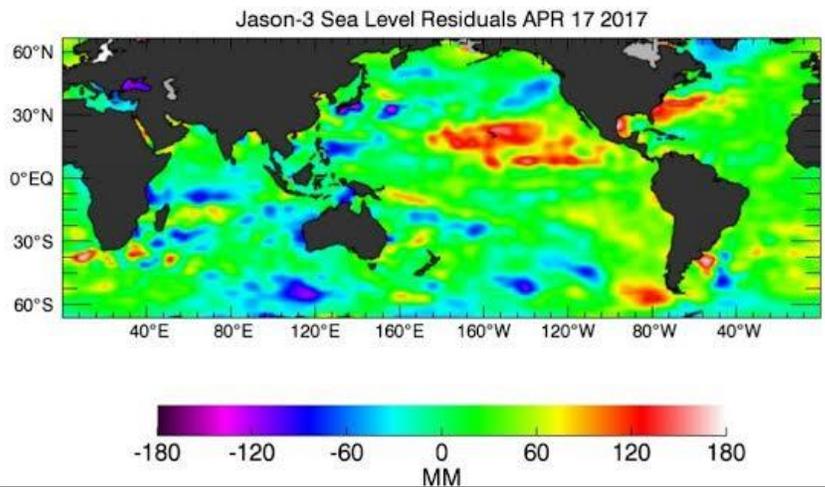
At the end of April and May, the highest water levels ever recorded at Honolulu were observed during the King Tides. During the high tide cycles, water levels ended up flooding beaches and coastal roadways. Some impacts associated with these high water levels included boats being forced to dock elsewhere, water on roadways and canceled beach events. Looking ahead through the summer months (when the typical King Tides for Hawaii occur), much of the same is anticipated during the highest monthly tide cycles that are scheduled to occur within the last week of each month (June and July).



Kalakaua Avenue (Photo: Alexis Inso)

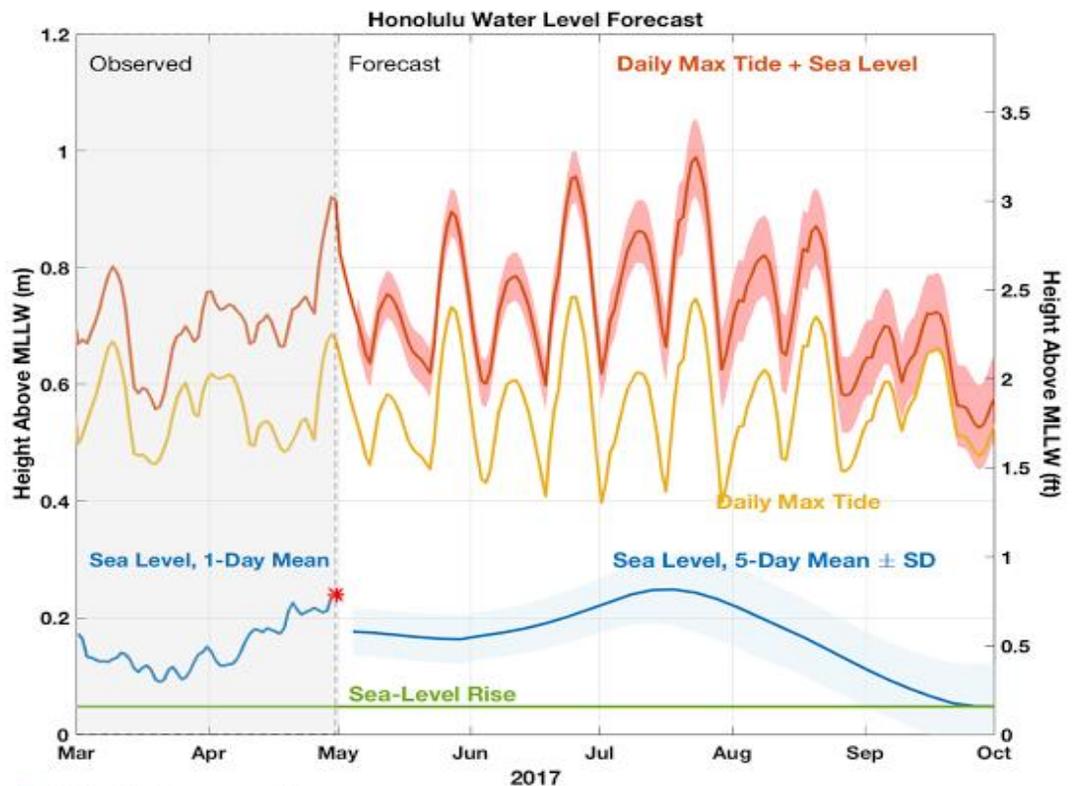
Along with the King Tides, out normal tides have been running higher than predicted for several months, from a 1/2 to 3/4 foot higher.

This height increase can be attributed to several factors. Physical oceanographic forcings associated with this anomalous pattern include: sea-level rise (20%), ocean circulation (rossby waves) (23%), transient anticyclonic (warm core) eddies (largest contribution = 40%) and inverse barometer (17%). The largest contribution, the anticyclone eddy, is moving slowly through the islands from east to west and should exit to the west by the fall. See the Jason-3 figure showing the anomalously high sea levels around Hawaii.



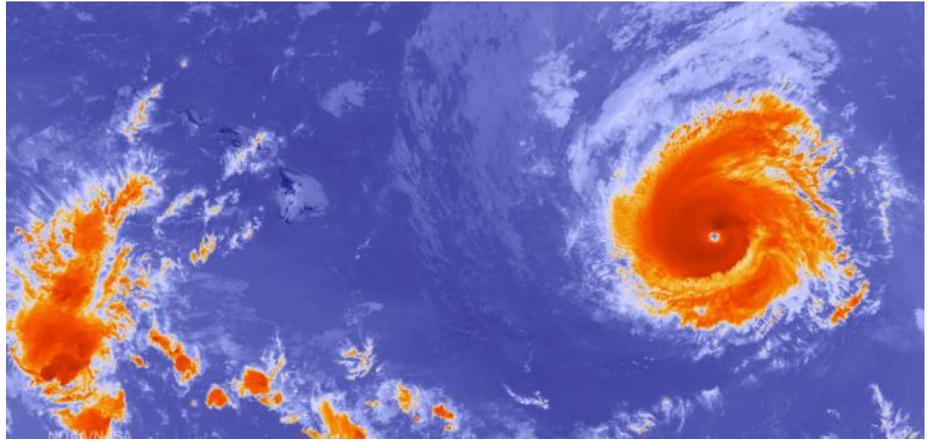
## Honolulu Water Level Forecast

Outlook through summer months: The chart to the right shows the observed and forecast water levels at Honolulu. The red line is the daily max tide plus sea level while the yellow line is the normal max tide. Taking the difference between the two gives the blue line near the bottom of the graphic (with a 5 day running mean). Note the daily max tide plus sea level is predicted to grow larger through July before slowing falling to near the normal max tide in the fall.



\* Highest level ever recorded

## NOAA predicts a near, or above normal 2017 Central Pacific hurricane season



For 2017, the outlook calls for a 70 percent probability of 5 to 8 tropical cyclones, which includes tropical depressions, tropical storms and hurricanes. An average season produces 4 to 5 tropical cyclones.

"As a Florida resident, I am particularly proud of the important work NOAA does in weather forecasting and hurricane prediction," said U.S. Secretary of Commerce Wilbur Ross. "These forecasts are important for both public safety and business planning, and are a crucial function of the federal government."

El Nino decreases the vertical wind shear over the tropical central Pacific, which favors the development of more and stronger tropical cyclones. El Nino also favors more westward-tracking storms from the eastern Pacific into the central Pacific.

"This outlook reflects the possible transition to a weak El Nino during the hurricane season, along with near- or above-average ocean temperatures in the main hurricane formation region, and near- or weaker-than-average vertical wind shear in that area," said Gerry Bell, Ph.D., NOAA's lead seasonal hurricane forecaster at the Climate Prediction Center. Bell added, "If El Nino develops, it may become strong enough to produce an above-normal season."

The Central Pacific basin may also be shifting toward a longer-term period of increased tropical cyclone activity, in response to changes in global sea surface temperatures patterns in both the Atlantic and Pacific Ocean which historically last anywhere from 25 to 40 years.

This outlook is a general guide to the overall seasonal hurricane activity in the central Pacific basin and does not predict whether, or how many, of these systems will affect Hawaii. Hurricane season begins June 1 and runs until November 30.

"The 2017 hurricane season marks 25 years since Hurricane Iniki, which brought life-changing impacts that have lasted more than a generation," said Chris Brenchley, director of NOAA's Central Pacific Hurricane Center. "Considering the devastation we saw from Iniki, as well as the more recent impacts from Hurricane Iselle and Tropical Storm Darby, make sure you and your family are prepared for hurricane season. Become weather-ready by signing up for weather alerts, developing and practicing a family emergency plan and restocking your emergency kit before hurricane season begins."

The Central Pacific Hurricane Center continuously monitors weather conditions, employing a network of satellites, land- and ocean-based sensors and aircraft reconnaissance missions operated by NOAA and its partners. This array of data supplies the information for complex computer modeling and human expertise that serves as the basis for the hurricane center's track and intensity forecasts that extend out five days. The seasonal hurricane outlook is produced in collaboration with NOAA's Climate Prediction Center.

## Helping Communities Understand the Danger of Hurricanes

Every year the National Weather Service in Honolulu assists emergency managers and first responders in communicating the potential for devastating impacts to the state of Hawaii from tropical cyclones, and preparing for the upcoming hurricane season. This year, Senior Forecaster and Hurricane Specialist Jon Jelsema presented the HHARP (Hawaii Hurricane Awareness and Resiliency Program) hurricane refresher training to the communities of Hawaii Kai on the island of Oahu, and Lahaina on the island of Maui. The goal of the HHARP training is to enhance community resilience to multiple hazards through a facilitated education and outreach program that promotes hazard understanding and awareness, and offers tools and informational resources to guide mitigation, preparedness, response and recovery. The hurricane portion of the HHARP program focuses on explaining what a tropical cyclone is and what conditions are necessary for development and intensification. It also explains the life cycle of a tropical system, common characteristics and potential impacts.

Although Hurricanes and tropical cyclones are not an every year occurrence in the Hawaiian Islands, they do pose a significant threat that could lead to devastating and potentially catastrophic damage. On average the central Pacific Ocean, which encompasses the area north of the equator, between 140 degrees west longitude and the International Date Line, will see 4-5 tropical cyclones each year. The 2015 hurricane season was particularly active, with 16 tropical systems, 15 named storms (tropical storms or stronger), 9 hurricanes and 4 major hurricanes, all which were records for the central Pacific basin. In 2016, the hurricane season wasn't nearly as active, with only 7 tropical systems, but one, Tropical Storm Darby, made landfall near Pahala on the Big Island. Additionally, two hurricanes barely missed the Aloha State, when Hurricane Madeline and Hurricane Lester passed one after the other within a hundred miles to the south and north of the island chain, respectively.

The HHARP Hurricane training reviewed the past two tropical seasons, and explained the potential dangers of a tropical system impacting the state. This included information on specific hurricane hazards such as strong winds, heavy rainfall, flooding, large breaking waves/high seas, as well as storm surge, and what can be done to prepare for the worst while hoping for the best. In addition, the training gave the audience a realistic worst case scenario of what could be expected if a major hurricane made landfall in their community.

Hurricane season runs from June 1st and continues through November 30th, and all residents of the Hawaiian Islands are encouraged to prepare for a potential tropical system before it's too late. Hawaii is particularly vulnerable to tropical cyclones, as it lies in the middle of the Pacific Ocean, thousands of miles away from the mainland of the United States. This poses quite a challenge for response and recovery, as most of the aid would need to be shipped or flown in from the mainland, and this could take several weeks to a month and possibly longer, if the worst case scenario was realized.

For more information on hurricane season and what you can do to best prepare yourself and your family for the worst case scenario, visit the Central Pacific Hurricane Center and Hawaii Emergency Management websites below:

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

<http://dod.hawaii.gov/hiema/>



Credit: The Maui News

Senior Forecaster/Hurricane Specialist Jon Jelsema presenting the HHARP Hurricane training in Lahaina, Maui, Hawaii.