



King Tides: Special Issue Bulletin—May 15, 2017 (Update to PEU newsletter issued 2nd Quarter 2017, Vol 23, No. 2)

The **Hawaiian Islands** saw high spring-tides and above-normal sea levels in April. Even higher tides—**King tides**—will occur in May, June, and July (see next page: Table1) (*King tides is a non-scientific term people often use to describe exceptionally high tides*). When high tides and sea levels combine to exceptionally high water levels, coastal flooding can occur such as salt water coming onto roadways and into landscaping or even buildings, sometimes causing substantial damage. When high water levels, combined with wave action, meet a natural or man-made barrier, like beaches, dunes, or seawalls, erosion often occurs. King tides by themselves are not sufficient to cause inundation, but they do facilitate inundation when a significant wave event or high sea level event occurs at the same time.

Several factors contribute to the total water level at the coast. Astronomical, climatic, and meteorological fluctuations occur naturally, e.g., daily tides, King tides, sea level fluctuations sometimes associated with El Niño, wave set-up, and storm surge (Fig. 1). Our primary concerns currently for Hawaii are large tides and high relative sea levels as, on April 27–30, above-normal sea levels combined with the monthly highest tides and a large South Swell to cause wave run-up in Waikiki. Similar high tides were observed in **Majuro** but sea levels were closure to normal there which limited the impact.



King tides are not related to climate change—they are natural tide cycles—but they do provide a preview of what we could experience with higher future sea levels. According to some researchers, it is possible that by mid-century tides of the magnitude of this summer's King tides could occur every month due to sea level rise induced by warming oceans and melting land ice.

Hawai'i Sea Grant is engaging citizen scientists to document today's high water level events, i.e., King tides, to better understand tomorrow's impacts from sea-level rise and other coastal high water events. NOAA's Tide Predications program has been utilized to forecast highest high tides—King tides—for May, June, and July of 2017 (See Table 1; and <http://ccsr.seagrant.soest.hawaii.edu/King-tides>).

The University of Hawaii Sea Level Center (UHSLC), Pacific Island Ocean Observing System (PaciOOS), and the Pacific ENSO Applications Climate (PEAC) Center are closely monitoring the high sea level event and providing forecasts of its evolution on weekly, monthly, and seasonal timescales.

Table 1: NOAA Tide Predictions for the USAPIs in June-July 2017
 (Source: and <http://csr.seagrant.soest.hawaii.edu/King-tides>)



University of Hawai'i Sea Grant College Program, Center for Coastal and Climate Science and Resilience | *Hawai'i and Pacific Islands King Tides Project*

NOAA Tide Predictions for Hawai'i May-July 2017

https://tidesandcurrents.noaa.gov/tide_predictions.html?gid=1399

O'ahu

	May 25	May 26	June 23	June 24	July 21	July 22
Hale'iwa	3:18 PM (1.94 ft.)	4:05 PM (1.97 ft.)	3:05 PM (2.07 ft.)	3:50 PM (2.06 ft.)	2:06 PM (2.04 ft.)	2:49 PM (2.06 ft.)
Moku o Lo'e Kāne'ohe	3:15 PM (2.60 ft.)	4:03 PM (2.65 ft.)	3:09 PM (2.72 ft.)	3:52 PM (2.74 ft.)	2:15 PM (2.63 ft.)	2:54 PM (2.69 ft.)
Honolulu	4:20 PM (2.42 ft.)	5:07 PM (2.46 ft.)	4:07 PM (2.58 ft.)	4:52 PM (2.58 ft.)	3:08 PM (2.55 ft.)	3:51 PM (2.58 ft.)
Wai'anae	4:40 PM (2.25 ft.)	5:27 PM (2.28 ft.)	4:27 PM (2.40 ft.)	5:12 PM (2.40 ft.)	3:28 PM (2.37 ft.)	4:11 PM (2.40 ft.)

Also note that Maui, Moloka'i, Lana'i, O'ahu, Kaua'i will also experience King-tides on May 25-26; June 23-24; July 21-22. See <http://csr.seagrant.soest.hawaii.edu/King-tides> for more about Hawaiian stations.

US-Affiliated Pacific Islands (USAPI)

American Samoa [Pago Pago 📍: June - 6:46 AM]

https://tidesandcurrents.noaa.gov/tide_predictions.html?gid=1771#listing

	June 23, 2017	June 24, 2017	July 22, 2017	July 23, 2017
Pago Pago Harbor, Tutuila Island	6:29 AM (3.5 ft.)	7:24 PM (3.5 ft.)	6:14 AM (3.4 ft.)	7:07 AM (3.4 ft.)
Tau Island, Manua Islands	6:04 AM (5.0 ft.)	6:59 AM (5.0 ft.)	05:49 AM (4.9 ft.)	6:42 AM (4.9 ft.)

Guam [📍: June - 5:55 AM; July - 6:03 AM]

https://tidesandcurrents.noaa.gov/tide_predictions.html?gid=1749#listing

	June 24, 2017	June 25, 2017	July 23, 2017	July 24, 2017
Pago Bay	6:24 AM (1.98 ft.)	6:33 AM (1.96 ft.)	5:32 AM (1.98 Ft.)	6:23 AM (1.96 ft.)
Apra Harbor	6:33 AM (2.7 ft.)	7:21 AM (2.6 ft.)	6:18 AM (2.6 ft.)	7:10 AM (2.6 ft.)

Marshall Islands [📍: June - 6:20 AM; July 6:26 AM]

https://tidesandcurrents.noaa.gov/tide_predictions.html?gid=1749#listing

	June 25, 2017	June 26, 2017	July 24, 2017	July 25, 2017
Majuro Atoll	4:46 AM (5.4 ft.)	5:28 AM (5.4 ft.)	4:36 AM (5.4 ft.)	5:16 AM (5.3 ft.)

Questions? Contact, Matthew Gonser (gonserm@hawaii.edu), Extension Agent, Hawai'i Sea Grant.