

## MONTHLY PRECIPITATION SUMMARY

State of Hawaii

MONTH: July 2014

PREPARED: August 18, 2014

Note: This summary uses the arithmetic mean, or average, for "normal" rainfall values.

State:

Trade winds prevailed over the Hawaiian Islands during most of July as one would expect in the heart of the summer season. Ample showers embedded within the trades along with two heavy rain events resulted in very wet conditions in many areas of the state. The most significant rain event started late on July 19 and continued into July 21 as deep tropical moisture associated with the remnant circulation of Tropical Storm Wali moved over the island chain. An unseasonably strong upper level trough destabilized the underlying warm and very moist airmass which produced heavy rainfall over the windward slopes. Oahu received the most intense and widespread rainfall late on July 19 and into the early morning hours of July 20. Event totals at several sites were in the range of 5 to 10 inches with peak amounts nearly reaching 14 inches. Several gages on the windward slopes of the Koolau Range reported rain rates greater than 4 inches per hour with a peak rate of 5.48 inches per hour at the Hakipuu Mauka site. Flash flooding forced the closure of Kamehameha Highway from Hauula to Kaneohe for several hours including a large section near Waikane due to the overflow of Waikane Stream. Several vehicles were stranded on the highway by the overflow but fortunately there were no serious injuries. Property damage from the flooding occurred in several locations, such as Pokiwai Place near Hauula where several homes became inundated by over a foot of water. Heavy rainfall also affected east Molokai near Halawa Valley and along the windward slopes of the West Maui Mountains. Flash flooding in Kahakuloa Stream overtopped the bridge in Kahakuloa town and briefly closed Kahekili Highway.

A less severe but still notable heavy rain event occurred during the week prior to the Wali remnant flash flood event. In this case, a surface trough that included deep tropical moisture moved over the state from the southeast and produced heavy rainfall over the east-facing slopes of the Big Island on July 13. The trough and tropical moisture were part of a large-scale pattern that also included the remnants of Tropical Storm Fausto. Gages from Laupahoehoe to Glenwood recorded 4 to 6 inches of rain in 24-hours but only minor flooding issues were reported in Hilo.

The last week of July also featured the passage of Tropical Depression

Genevieve south of the state. Genevieve was too far away from the island chain to have any impact on local weather conditions.

#### Island of Kauai:

Rain gages along the leeward areas of the island posted near to above average rainfall totals for the month of July while windward sites recorded near to below average totals. The U.S. Geological Survey's (USGS) Mount Waialeale gage had the highest monthly total of 28.74 inches (74 percent of average) and the highest daily total of 5.87 inches on July 14.

Rainfall totals for 2014 through the end of July remained in the near to above average range for most of the gages on Kauai. Mount Waialeale's total of 158.47 inches (70 percent of average) was the highest year-to-date accumulation on Kauai and was the second highest in the state.

#### Island of Oahu:

July was a very wet month on Oahu with most locations reporting above average rainfall totals. However, a few leeward sites to the west of a line from Haleiwa to Waianae reported below average totals. The U.S. Fish and Wildlife Service's Oahu Forest National Wildlife Refuge (NWR) gage had the highest monthly accumulation of 31.29 inches (171 percent of average) and the highest daily total of 10.43 inches during the July 20 heavy rain event. The Waimanalo gage (6.69 inches, 376 percent of average), Punaluu Pump gage (15.07 inches, 393 percent of average), and the USGS' Poamoho Rain Gage No. 1 (30.19 inches, 167 percent of average) set new records for the wettest July. The Waimanalo and Punaluu Pump totals are especially impressive because the data records for these sites go back to 1908 and 1913, respectively. Kunia, Waipio, Kamehame, and Hawaii Kai Golf Course also set new wettest July records but all of these have much shorter data collection periods of 20 to 25 years. Honolulu Airport and the Pacific Tsunami Warning Center both had their highest July totals since 1992.

Rainfall totals for 2014 through the end of July were in the near to above average range at most of the gages on Oahu. The Oahu Forest NWR gage had the island's highest year-to-date total of 152.04 inches (122 percent of average), which was third highest in the state.

#### Maui County:

Most of the totals for the month of July fell into the near to above average range across Maui County. The USGS' Puu Kukui gage had the highest monthly total of 26.99 inches (82 percent of average) and the highest daily total of 3.17 inches on July 2. The Kula Branch Station site set a new record for the wettest July in a data archive going

back to 1978. Kahului Airport and Puu Kukui had their highest July totals since 2005.

All of the Maui County totals for 2014 through the end of July remained in the near to above average range. Puu Kukui's 193.47 inches (86 percent of average) marked the highest total in the state so far in 2014.

#### Island of Hawaii:

There was quite a range of rainfall conditions on the Big Island during July. Windward sites along with most of the interior and Kau District gages reported above average totals. Most of the gages on the slopes of the Kohala Mountains as well as the Kona slopes posted near to below average totals. The Piihonua gage in upper Hilo had the highest monthly total of 27.14 inches (161 percent of average) while the Kulani NWR gage had the highest daily total of 5.66 inches on July 13. The Piihonua rainfall total set a new record for the wettest July in a data archive going back to 1991. Hilo Airport and Waiakea Uka had their highest July totals since 1997.

Most of the gages on the Big Island had near to above average rainfall totals for 2014 through the end of July. The USGS' rain gage at Kawainui Stream had the highest year-to-date total of 138.51 inches (152 percent of average), which was the fourth highest total in the state.

Data Sources: Data used in this report are largely from National Weather Service sources including climate network weather observation stations at Lihue, Honolulu, Kahului, and Hilo, the Hydronet and Ua Net networks of automated rain gages, and selected Cooperative Observer sites. Additional data come from automated rain gages operated by the State of Hawaii Department of Land and Natural Resources, the U.S. Geological Survey, the U.S. Bureau of Land Management, the U.S. National Park Service, the Department of Defense, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture, as well as manual observations from the Community Collaborative Rain, Hail, and Snow Network (CoCoRaHS). Averages come from the National Climatic Data Center (1981-2010 series) and the Rainfall Atlas of Hawaii (<http://rainfall.geography.hawaii.edu/>). Data presented here are not certified and should be used for informational purposes only.

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