



CENTRAL PACIFIC HURRICANE CENTER TROPICAL CYCLONE REPORT

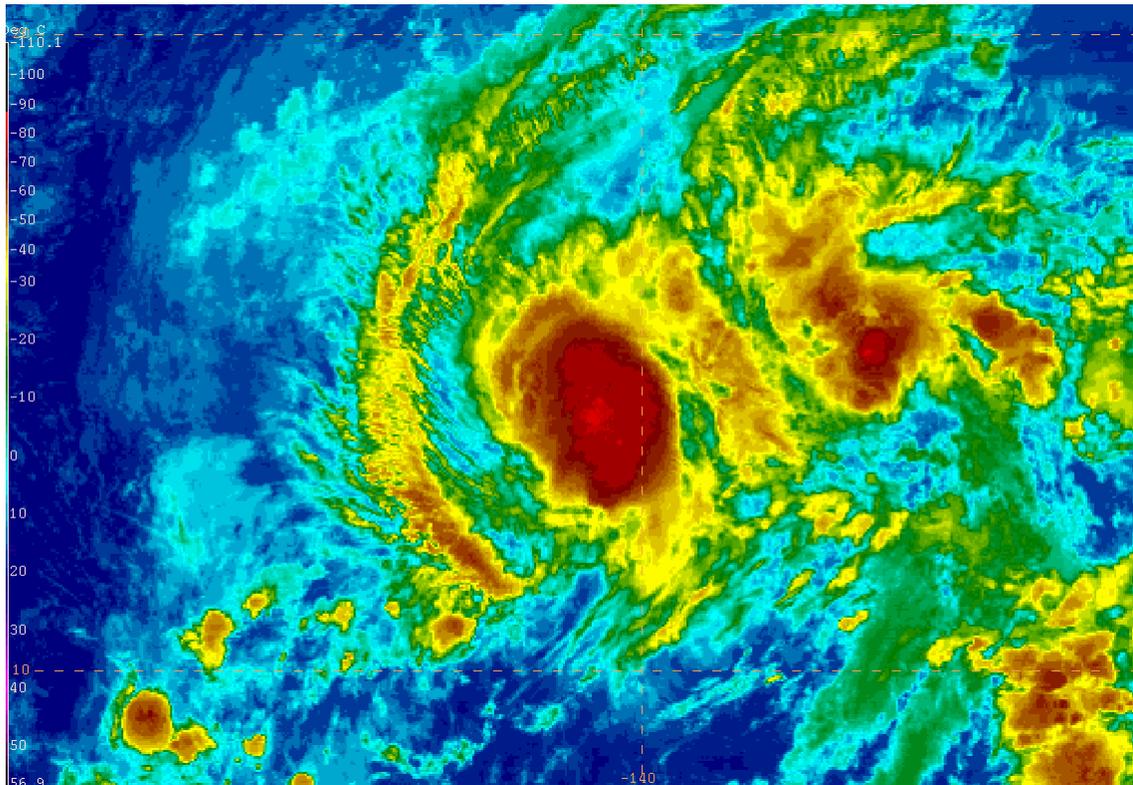


TROPICAL STORM WALI (CP012014)

17 – 19 July 2014

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24 March 2015



GOES-15 ENHANCED INFRARED IMAGE OF TROPICAL STORM WALI AT 0600 UTC ON 18 JULY 2014

Wali was a short-lived system that formed over the central North Pacific Ocean, briefly reaching tropical storm strength before dissipating. Although Wali dissipated far southeast of the main Hawaiian Islands, remnant moisture reached the main Hawaiian Islands, producing heavy rainfall and flooding on Oahu.

TROPICAL STORM WALI

17 – 19 JULY 2014

SYNOPTIC HISTORY

The circulation which eventually became Tropical Storm Wali formed near the western edge of an area of intense but disorganized deep convection from 08N to 13N between 135W and 142W which had been persistent for at least a week through mid-July. The Central Pacific Hurricane Center (CPHC) first recognized potential for development in this area, in coordination with the National Hurricane Center (NHC), in its 0600 UTC 13 July Tropical Weather Outlook, with deep convection gradually becoming more organized over the next few days. The entire suspect area crossed into the central North Pacific basin by 1800 UTC 16 July. Deep convection coalesced sufficiently for CPHC to issue bulletins for Tropical Depression One-C at 2100 UTC 17 July. Within marginally conducive sea surface temperatures of 26C to 27C, One-C developed to tropical storm strength and peaked at 40 kt intensity for the 0000 UTC and 0600 UTC 18 July bulletins as Tropical Storm Wali. A sharp upper trough west of the main Hawaiian Islands and a mid-level ridge to the north of Wali provided just enough steering flow to push Wali slowly to the northwest, while increasing westerly shear hindered further system development. Satellite loop showed system circulation becoming increasing asymmetrical after 0600 UTC 18 July, with a plume of low level moisture and cloud cover spreading westward away from the center toward the main Hawaiian Islands while the center itself remained trapped east of 144W. Wali began to weaken by 1200 UTC 18 July, becoming a tropical depression again with the 2100 UTC 18 July CPHC bulletin issuance. The final bulletin for Tropical Depression Wali was issued by CPHC at 0000 UTC 19 July, with the center identified only by a remnant swirl of low clouds.

The westward-spreading plume of remnant moisture reached the main Hawaiian Islands by 1200 UTC 19 July, feeding into an already unstable air mass beneath the eastern flank of an upper trough. This triggered thunderstorms across the Big Island during the afternoon of 19 July, then fueled a major rainfall event on Oahu between 0600 UTC and 1400 UTC 20 July, when over 12 inches of rainfall was recorded on a number of windward gauges.

METEOROLOGICAL STATISTICS

The best track for Wali is listed in Table 1. Observations of Wali included subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB), the CPHC, and the Joint Typhoon Warning Center (JTWC), and objective Advanced Dvorak Technique (ADT) estimates from the Cooperative Institute for Meteorological Satellite Studies/University of Wisconsin-Madison. Data and imagery from NOAA polar-orbiting satellites including the Advanced Microwave Sounding Unit (AMSU), the NASA Tropical Rainfall Measuring

Mission (TRMM), the European Space Agency's Advanced Scatterometer (ASCAT), and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the short best track of Wali.

There were no ship reports of winds of tropical storm force associated with Wali.

CASUALTY AND DAMAGE STATISTICS

There were no reports of damage or casualties associated with Wali while this system was recognized as such by the CPHC. However, after dissipation, the remnant moisture plume reached the main Hawaiian Islands and, after triggering thunderstorms on the Big Island, fueled a major rainfall event on Oahu. The Punaluu Pump rain gauge on windward Oahu recorded a 4.16 inch per hour rainfall rate at 1015 UTC 20 July, while the 1900 UTC 20 July rainfall summary reported total rainfall in excess of 12 inches over the previous 12 hours at no fewer than five gauges across windward Oahu from Kahuku to Waimanalo. Stretches of the Kamehameha Highway along windward Oahu were reported closed as late as 1545 UTC 20 July, even after the heaviest rains had ended. Storm Data showed numerous reports of stalled cars on the closed sections of Kamehameha Highway. There were no flood fatalities. However, a swimmer was killed near Molokini Island, just south of Maui, on 19 July when outflow from a collapsing thunderstorm north of Maui whipped up rough seas across Maalaea Bay. Almost all of the moisture from Wali had passed west of Kauai by mid-afternoon on 20 July.

FORECAST AND WARNING CRITIQUE

A verification of CPHC official track forecasts for Wali is given in Table 2. There are no forecasts beyond 24 hours given the short best track length. Wali was a tropical storm for only four best track points, from 1800 UTC 17 July through 1200 UTC 18 July. In general, CPHC track forecasts were better than GFDL and GFS. European and consensus models had less track error.

A verification of CPHC official intensity forecasts for Wali is given in Table 3. CPHC initially forecast Wali to intensify rapidly once formed, and the single 24 hour forecast available after Wali became a tropical storm reflects that. Unfortunately, the short best track length did not allow additional 12 and 24 hour forecasts to mitigate the 10 and 20 kt errors, respectively. As a consequence, CPHC was outperformed by all intensity guidance at both tau.

There were no coastal watches or warnings issued in association with Wali.



Table 1. Best track for Tropical Storm Wali, 17 – 19 July 2014.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
17 / 0000	11.5	140.1	1008	25	low
17 / 0600	11.8	140.1	1008	25	"
17 / 1200	12.2	140.2	1007	30	"
17 / 1800	12.4	140.4	1005	35	tropical storm
18 / 0000	13.2	140.8	1003	40	"
18 / 0600	14.3	141.5	1003	40	"
18 / 1200	15.1	142.6	1005	35	"
18 / 1800	15.6	143.6	1007	30	tropical depression
19 / 0000	16.1	144.4	1008	25	low
18 / 0000	13.2	140.8	1003	40	maximum wind and minimum pressure

Table 2. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Wali, 17 – 19 July 2014. Errors smaller than the CPHC official forecast are shown in boldface type.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	47.6	54.5					
OCD5	87.4	163.7					
GFSI	48.7	58.8					
GHMI	71.6	109.5					
HWFI	45.8	73.4					
EGRI	42.2	-					
EMXI	36.7	24.0					
CMCI	19.7	45.8					
TCON	65.2	-					
TVCA/TVCE	51.7	58.6					
AEMI	48.0	42.8					
BAMS	30.3	13.0					
BAMM	55.4	51.0					
BAMD	58.1	62.5					
Forecasts	3	1					

Table 3. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Wali, 17 – 19 July 2014. Errors smaller than the CPHC official forecast are shown in boldface type.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	10.0	20.0					
OCD5	10.0	9.0					
HWFI	4.7	5.0					
GHMI	8.3	7.0					
DSHP	8.0	7.0					
LGEM	9.3	4.0					
ICON	7.7	6.0					
IVCN	7.7	6.0					
Forecasts	3	1					