



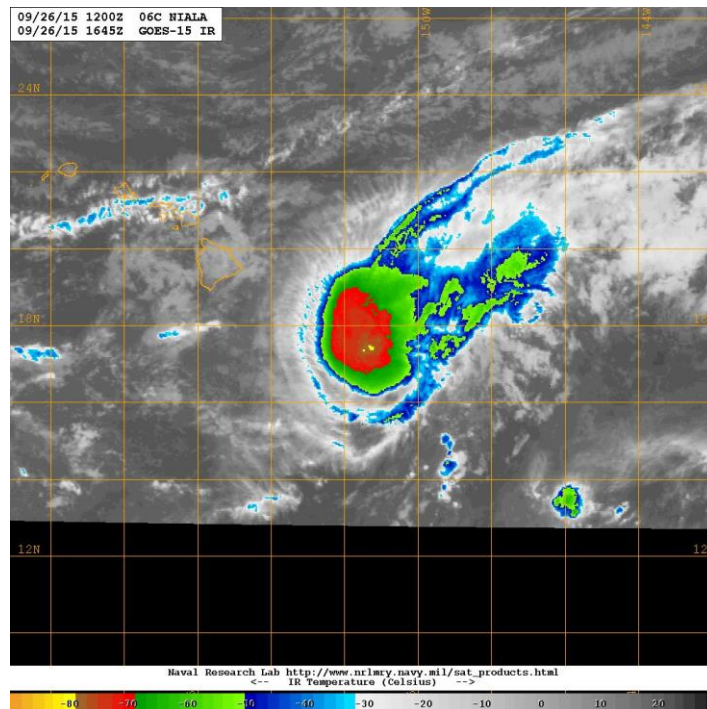
CENTRAL PACIFIC HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL STORM NIALA (CP062015)

25-28 SEPTEMBER 2015

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GOES-15 INFRARED IMAGE OF NIALA AT 1645 UTC SEPTEMBER 2015.
IMAGE COURTESY OF THE NAVAL RESEARCH LABORATORY.



Niala (pronounced nee-AH-la) was a tropical storm that formed in the Central North Pacific basin during the prolific Hurricane Season of 2015.

TROPICAL STORM NIALA

25-28 SEPTEMBER 2015

SYNOPTIC HISTORY

The system that eventually became Niala appears to have originated from a tropical disturbance which was first observed in satellite imagery far southeast of the Main Hawaiian Islands on 20 September. During the next 3 days, this area of disturbed weather initially moved slowly westward, and later west-northwestward south of the subtropical surface ridge. By 23 September, a weak surface low had developed within this area of disturbed weather. However, showers and pulsing thunderstorms in the vicinity of this low remained disorganized as the feature moved slowly northwestward toward a weakness in the subtropical surface ridge during the next couple of days. By 0000 UTC 25 September, showers and thunderstorms in the vicinity of the low increased in areal coverage and became better organized. As a result, the system was named Tropical Depression Six-C, which was the eleventh tropical cyclone in the Central North Pacific basin during the 2015 Hurricane Season. The “best track” chart of the tropical cyclone’s path is provided in Fig. 1. The best track positions and intensities are listed in Table 1¹.

During the next few hours, Six-C continued to become better organized according to infrared and microwave satellite imagery. Also, a swath of scatterometer derived surface winds at 0745 UTC 25 September depicted areas with wind speeds near 35 kt northeast and east of the center of the tropical cyclone. As a result of these observations and the improved organization of the tropical cyclone, the system became a tropical storm as of 0600 UTC 25 September (note that in real-time, Six-C was upgraded to a tropical storm and was named Niala as of 1200 UTC 25 September). Despite the favorable sea surface temperatures of near 29°C and ample ocean heat content values along the forecast track of Niala, there was a large middle and upper level low pressure system far northeast of the Main Hawaiian Islands. This feature, which was moving slowly southward, was producing environmental vertical wind shear values of around 15 kt in the vicinity of Niala when it initially formed. This suggested that only modest intensification might be expected during the next day or two, since the tropical cyclone would likely be impacted by increasingly hostile environmental conditions, despite the warm ocean waters along the forecast track. However, even as estimated shear values increasing to well above 20 kt early on 26 September, Niala continued to gradually intensify along its northwestward track.

By 1800 UTC 26 September, Niala had intensified to a 55 kt tropical storm around the same time that it began to slow its forward motion and turn toward the west. However, 6 h later, the debilitating effects of the shear had become apparent as the partially exposed low-level circulation center began emerging to the west of the deep convection. This was also the beginning of a significant weakening trend, as well as a turn toward the southwest as the exposed circulation center was being steered by the lower level winds rather than the deeper tropospheric flow. Niala continued to gradually weaken as it moved toward the southwest during the next 30 h. By 1200 UTC 28 September, Niala was downgraded to a tropical depression, and then a post-tropical remnant low at 0000 UTC 29 September. This weak low, which was tracked in the High Seas Forecasts issued by the NWS Forecast Office in Honolulu, continued to move slowly southwestward during the next couple of days before it dissipated on 1 October.

¹ A digital record of the complete best track, including wind radii, can be found on line at <ftp://ftp.nhc.noaa.gov/atcf>. Data for the current year’s storms are located in the *bt* directory, while previous years’ data are located in the *archive* directory.

METEOROLOGICAL STATISTICS

Observations in Niala include subjective satellite-based Dvorak technique intensity estimates from the Satellite Analysis Branch (SAB), the Central Pacific Hurricane Center (CPHC), and the Joint Typhoon Warning Center (JTWC). They also include 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 European Space Agency's Advanced Scatterometer (ASCAT), and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Niala.

There were no surface observations of tropical-storm-force or greater winds from Niala.

CASUALTY AND DAMAGE STATISTICS

There were no reports of damage or casualties associated with Niala.

FORECAST AND WARNING CRITIQUE

The genesis of Niala was rather well forecast, although the system developed slightly slower than expected. Niala's precursor disturbance was first mentioned in the Tropical Weather Outlook issued by CPHC at 1200 UTC 20 September. This was 108 h before the time of genesis in the best track, when it was given a low (30% or less) chance of development. The development chance was raised to medium (40-60% chance) 84 h before genesis, and was upgraded to high (70% or greater) 72 h before genesis. The forecasts might have been slightly faster than expected due to the disorganized, but pulsing deep convection associated with the precursor surface low. Showers and thunderstorms, which flared up around the low on 23 September, decreased significantly early on 24 September. However, by 25 September, a concentrated area of persistent deep convection developed near the center of the low, so advisories were initiated by CPHC for Tropical Depression Six-C.

A verification of CPHC official track forecasts for Niala is given in Table 2a. The CPHC track forecast errors were lower than the 5-yr mean forecast track errors at the 12 and 72 h forecast periods, but were greater than the 5-yr mean track errors during the 24-48 h forecast periods. Table 2b shows a homogeneous comparison of the official track errors with errors associated with select track guidance models. The official track forecast errors were generally lower than the model guidance errors, especially for the 12 h track forecast period. However, the variable consensus model TVCE and the FSSE model each had lower errors than the official track forecast errors for each of the 24-72 h forecast periods.

A verification of CPHC official intensity forecasts for Niala is given in Table 3a. The CPHC intensity forecast errors were less than the 5-yr mean forecast intensity errors for all forecast periods during 12-72 h. As with the track errors described in the previous paragraph, Table 3b shows a homogeneous comparison of the official intensity errors with errors associated with select intensity guidance models. The official forecasts had lower errors than all of the intensity guidance errors at 12 h forecast period.

The official intensity forecast errors were generally lower than most of the model guidance errors for the 24-72 h forecast periods, with the exception of the variable consensus models ICON/IVCN and the FSSE model, which had lower values.

Table 4 provides a summary of the tropical cyclone watches issued for Niala as it approached the Main Hawaiian Islands. A tropical storm watch was issued for the Big Island of Hawaii at 2100 UTC on 25 September. Niala continued to track far south of the Big Island during the next couple of days. Also, the system began to weaken at the same time it started to move toward the southwest starting on 27 September. As a result, the tropical storm watch for the Big Island was cancelled at 1500 UTC 27 September.

Table 1. Best track for Tropical Storm Niala, September 2015.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
23 / 0600	11.3	146.3	1007	25	low
23 / 1200	11.4	146.6	1006	25	"
23 / 1800	11.6	147.0	1006	25	"
24 / 0000	11.8	147.5	1006	25	"
24 / 0600	12.3	147.9	1006	25	"
24 / 1200	12.9	148.2	1006	25	"
24 / 1800	13.6	148.6	1006	25	"
25 / 0000	14.0	149.1	1004	30	tropical depression
25 / 0600	14.4	149.5	1002	35	tropical storm
25 / 1200	14.8	149.8	1002	35	"
25 / 1800	15.6	150.2	1001	40	"
26 / 0000	16.0	150.6	999	45	"
26 / 0600	16.5	151.0	999	45	"
26 / 1200	17.1	151.5	997	50	"
26 / 1800	17.1	151.9	992	55	"
27 / 0000	16.9	152.6	995	50	"
27 / 0600	16.6	153.2	999	45	"
27 / 1200	16.3	153.6	999	45	"
27 / 1800	16.1	154.3	999	45	"
28 / 0000	15.7	155.2	1004	40	"
28 / 0600	15.4	155.8	1005	35	"
28 / 1200	15.0	156.6	1007	30	tropical depression
28 / 1800	15.1	157.5	1008	25	"
29 / 0000	15.4	158.4	1009	25	low
29 / 0600	15.5	159.2	1009	25	"
29 / 1200	15.6	159.9	1009	25	"
29 / 1800	15.4	160.4	1008	25	"
30 / 0000	15.1	160.8	1008	25	"
30 / 0600	14.7	161.2	1008	25	"
30 / 1200	14.2	161.6	1008	25	"

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
30 / 1800	14.1	162.2	1009	20	low
01 / 0000					dissipated
26 / 1800	17.1	151.9	992	55	maximum winds and minimum pressure

Table 2a. CPHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Niala, 25-28 September 2015. Mean OFCL forecast errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the OFCL 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL (CPHC)	26.2	52.5	74.7	102.0	124.7		
OCD5	33.8	71.0	118.3	175.9	228.1		
Forecasts	14	12	10	8	4		
OFCL (2010-14)	27.9	44.1	56.7	73.9	132.3	183.7	258.9

Table 2b. Homogeneous comparison of errors for select track forecast guidance models (in n mi) for Tropical Storm Niala, 25-28 September 2015. Errors smaller than the CPHC official track forecast errors (OFCL) for each forecast period are shown in boldface type.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	26.2	52.5	74.7	102.0	124.7		
OCD5	33.8	71.0	118.3	175.9	228.1		
GFSI	30.3	62.1	87.3	129.4	154.1		
GHMI	41.9	77.1	113.5	135.7	220.3		
HWFI	27.2	39.5	50.1	84.2	149.9		
NVGI	28.9	58.8	95.1	117.0	155.1		
EGRI	27.5	51.0	74.6	108.7	197.8		
EMXI	26.7	47.2	66.9	86.1	85.9		
CMCI	36.1	55.8	76.6	94.1	99.6		
TCON	27.4	48.8	66.7	96.3	142.9		
TVCE	24.1	43.4	61.5	87.9	123.6		
FSSE	23.1	40.0	52.2	76.2	116.5		
AEMI	31.2	54.6	71.3	91.9	112.8		
LBAR	65.0	159.3	177.7	434.5	704.0		
BAMS	51.6	97.3	146.3	194.4	261.0		
BAMM	60.4	119.2	184.2	257.7	349.1		
BAMD	112.5	247.0	407.7	613.3	958.3		
Forecasts	14	12	10	8	4		

Table 3a. CPHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Niala, 25 – 28 September 2015. Mean OFCL intensity forecast errors for the previous 5-yr period are shown for comparison. Official forecast errors that are smaller than the OFCL 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL (CPHC)	3.9	3.8	6.0	7.5	7.5		
OCD5	5.3	7.4	10.2	9.8	5.3		
Forecasts	14	12	10	8	4		
OFCL (2010-14)	4.8	8.6	11.6	13.8	18.5	19.3	20.4

Table 3b. Homogeneous comparison of errors for select intensity forecast guidance models (in kt) for Tropical Storm Niala, 25 – 28 September 2015. Errors smaller than the CPHC official intensity forecast errors (OFCL) are shown in boldface type.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	3.9	3.8	6.0	7.5	7.5		
OCD5	5.3	7.4	10.2	9.8	5.3		
HWFI	4.6	3.8	5.5	4.9	6.8		
GHMI	4.8	3.3	6.3	6.1	9.8		
DSHP	3.9	5.3	6.9	6.8	5.0		
LGEM	4.9	6.6	8.9	9.6	7.5		
ICON	4.2	3.5	5.9	5.1	6.3		
IVCN	4.2	3.5	5.9	5.1	6.3		
GFSI	5.3	5.4	8.3	7.3	4.8		
EMXI	5.2	7.2	8.6	8.3	5.5		
FSSE	4.7	2.1	4.3	3.0	12.0		
Forecasts	14	12	10	8	4		

Table 4. Watch and warning summary for Tropical Storm Niala, 25-28 September 2015.

Date/Time (UTC)	Action	Location
25 / 2100	Tropical Storm Watch issued	Island of Hawaii
27 / 1500	Tropical Storm Watch discontinued	Island of Hawaii

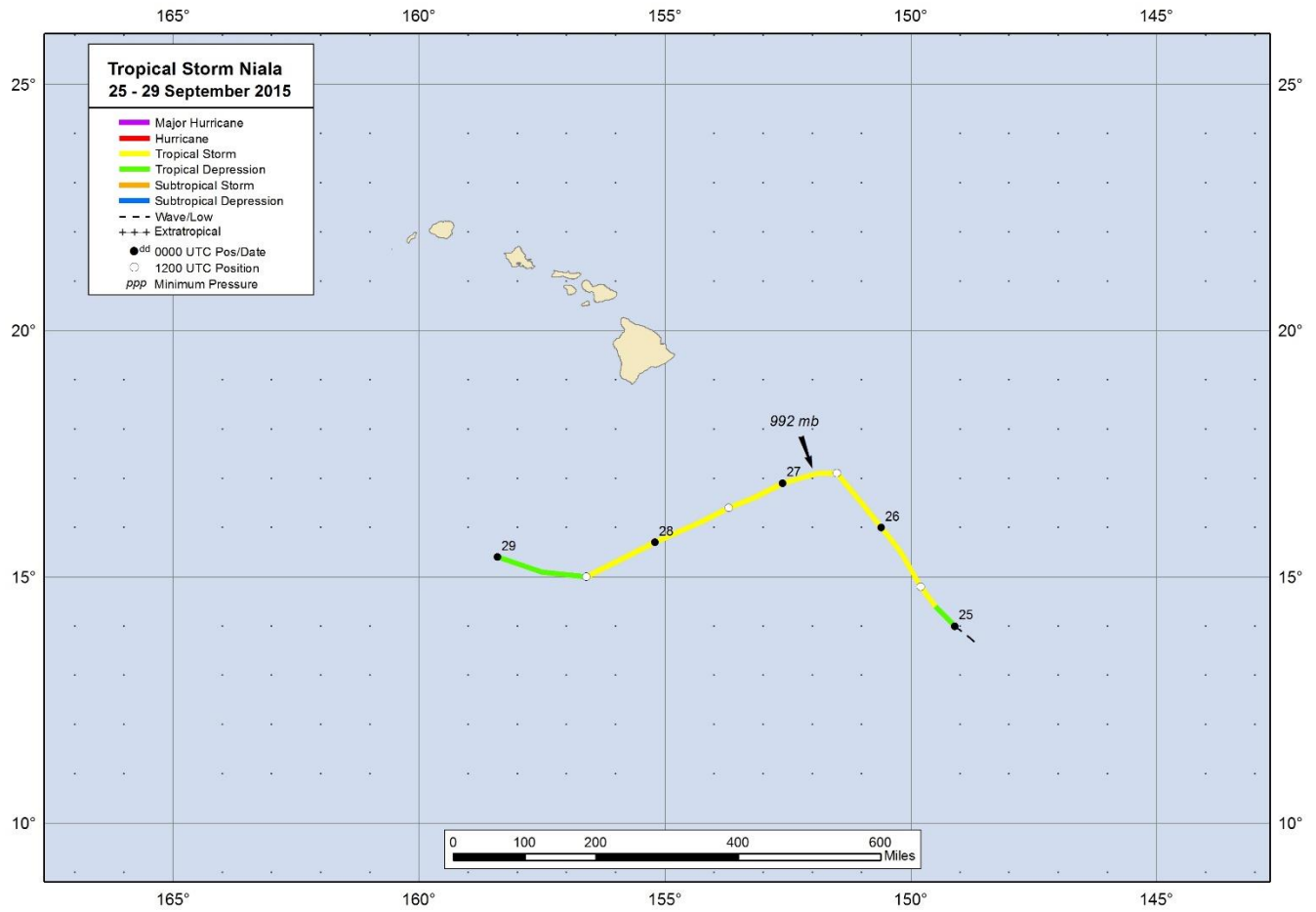


Figure 1. Best track positions for Tropical Storm Niala, 25-28 September 2015.