

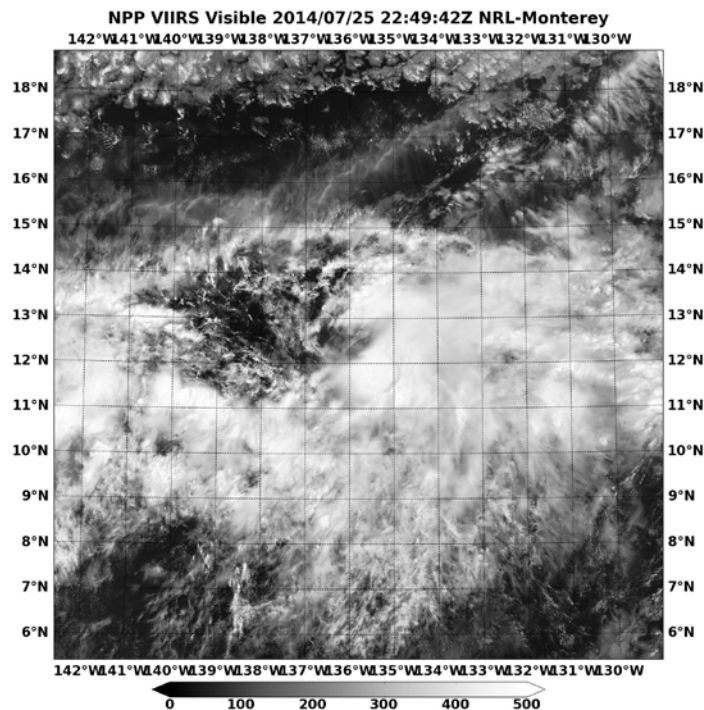


# NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT<sup>1</sup>

## HURRICANE GENEVIEVE (EP072014)

25 July – 13 August 2014

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National Hurricane Center and Central Pacific Hurricane Center  
19 August 2016<sup>2</sup>



VIIRS VSISIBLE IMAGE OF GENEVIEVE AT 2250 UTC 25 JULY. IMAGE COURTESY OF NRL MONTEREY.

Genevieve was a short-lived tropical storm that crossed 140°W into the central Pacific as a depression. It later became a major hurricane in the central Pacific and a super typhoon in the western Pacific.

<sup>1</sup> This report focuses on Genevieve's history in the western hemisphere. Additional information may be available from the Joint Typhoon Warning Center.

<sup>2</sup> Original report date 25 February 2015. Updated 2 May 2016 to include analyses from CPHC and JTWC. Updated 19 August 2016 to include additional data from CPHC.

# Hurricane Genevieve

25 JULY – 13 AUGUST 2014

## SYNOPTIC HISTORY

Genevieve was the first of a sequence of four tropical cyclones that formed in the eastern Pacific over an 11-day period in late July and early August. The cyclone was spawned by a disturbance in the Intertropical Convergence Zone that developed south of Panama on 15 July. Moving westward, the associated convection first showed signs of organization on 20 July. This was followed by the formation of a broad low pressure area on 22 July about 1000 n mi southwest of Cabo San Lucas, Mexico, but the subsequent development was slow during the next few days while a general westward motion continued. On 24 July, the convection and circulation associated with the low became better organized, and this led to the formation of a tropical depression early the next day about 1475 n mi west-southwest of Cabo San Lucas. The “best track” chart of the tropical cyclone’s path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1<sup>3</sup>.

The depression strengthened into a tropical storm a few hours after genesis, and the estimated maximum winds reached a peak (in the eastern Pacific basin) of 40 kt later on 25 July. The storm slowed its forward motion later on 25 July as the subtropical ridge to the north weakened temporarily. When the ridge re-built on 26 July, Genevieve resumed a faster forward motion. Increasing westerly vertical shear caused Genevieve to weaken to a tropical depression on 26 July, and it remained a depression when it moved into the Central Pacific Hurricane Center area of responsibility (140°W to the International Dateline) on 27 July.

Genevieve had the most interesting parts of its life cycle after it left the eastern Pacific. The cyclone degenerated to a remnant low on 28 July, but then regenerated to a tropical depression on 29 July and a tropical storm on 30 July. A similar degeneration to a disturbance occurred on 1 August southeast of the Hawaiian Islands, followed by a second regeneration into a tropical cyclone the next day. Aside from a brief intensification to tropical storm strength on 2 August, the cyclone persisted as a tropical depression through 5 August while passing well south and southwest of the Hawaiian Islands. Rapid intensification started later on 5 August, with Genevieve becoming a hurricane on 6 August and a major hurricane on 7 August (Figure 4). The estimated maximum sustained winds reached 140 kt just after Genevieve crossed the International Dateline to become a supertyphoon in the western Pacific. After reaching peak intensity, the cyclone weakened as it moved generally northward to northwestward. Genevieve

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<sup>3</sup> 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.

finally dissipated on 13 August well to the east of Japan.

## METEOROLOGICAL STATISTICS

Observations in Genevieve (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB), the Central Pacific Hurricane Center (PHFO), and the Joint Typhoon Warning Center (JTWC). The figures 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 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 best track of Genevieve.

There were no observations of tropical-storm-force winds or other impacts from Genevieve.

## CASUALTY AND DAMAGE STATISTICS

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

## FORECAST AND WARNING CRITIQUE

The genesis of Genevieve was generally well forecast. The precursor disturbance was first mentioned in the Tropical Weather Outlook (TWO) on 20 July about 114 h before genesis (Table 2). At that time, it was given a low (<30%) chance of development in both the 48-h and five-day time frames. The genesis probability was raised to medium (30-50%) for the five-day time frame 102 h prior to genesis, but subsequently decreased back to a low chance. The five-day genesis probability was again raised to medium 66 h before genesis. At 60 h before genesis, the probability was also raised to medium for the 48-h forecast. The development potential was raised to high (>50%) 54 h before genesis for the five-day range and 42 h before genesis for the 48-h range.

A preliminary verification of NHC official track forecasts for Genevieve is given in Table 3a. Official forecast track errors were significantly lower than the mean official errors for the previous 5-yr period at all forecast times except 48 h. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. The official forecasts were generally better than the guidance models, although the consensus model TVCE had lower errors at 12, 72, 96, and 120 h.

A preliminary verification of NHC official intensity forecasts for Genevieve is given in Table 4a. Official forecast intensity errors were also significantly lower than the mean official errors for the previous 5-yr period at all forecast times. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. None of the guidance models had consistently lower errors than the official forecasts, although several models occasionally had lower errors.

A verification of CPHC official track forecasts for Genevieve is given in Table 5a. Official forecast track errors were lower than the mean official errors for the previous 5-yr period at all forecast times except for 12 h. A homogeneous comparison of the official track errors with selected guidance models is given in Table 5b. The consensus model TVCE outperformed the official track forecast at all forecast times.

A verification of CPHC official intensity forecasts for Genevieve is given in Table 6a. Official forecast intensity errors were higher than the mean official errors for the previous 5-yr period at all forecast times except at 12 h. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 6b. The interpolated HWRF model (HWFI), the decay SHIPS model (DSHP), and the intensity consensus IVCN had lower errors at all forecast times than the official forecasts.

There were no coastal watches or warning issued for Genevieve.

## ACKNOWLEDGEMENTS

The best track and verification data for the part of the track west of 140W was provided by the Central Pacific Hurricane Center and the Joint Typhoon Warning Center.



Table 1. Best track for Hurricane Genevieve, 25 July – 13 August, 2014. Best track data west of 140°W longitude was provided by the Central Pacific Hurricane Center and the Joint Typhoon Warning Center.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage*
22 / 1800	10.4	121.4	1008	25	low
23 / 0000	10.6	122.8	1008	25	"
23 / 0600	10.8	124.2	1008	25	"
23 / 1200	11.1	125.6	1008	25	"
23 / 1800	11.4	127.0	1008	25	"
24 / 0000	11.6	128.0	1007	30	"
24 / 0600	11.8	129.2	1007	30	"
24 / 1200	12.0	130.6	1007	30	"
24 / 1800	12.2	132.1	1007	30	"
25 / 0000	12.2	133.1	1007	30	tropical depression
25 / 0600	12.2	134.0	1006	35	tropical storm
25 / 1200	12.2	135.0	1004	40	"
25 / 1800	12.1	135.7	1004	40	"
26 / 0000	12.1	135.9	1004	40	"
26 / 0600	12.2	136.3	1005	35	"
26 / 1200	12.3	136.8	1006	30	tropical depression
26 / 1800	12.4	137.6	1006	30	"
27 / 0000	12.5	138.7	1006	30	"
27 / 0600	12.4	139.7	1006	30	"
27 / 1200	12.4	140.9	1006	30	"
27 / 1800	12.4	142.2	1007	30	"
28 / 0000	12.5	143.5	1008	25	low
28 / 0600	12.6	144.6	1008	25	"
28 / 1200	12.6	145.5	1009	25	"



28 / 1800	12.7	146.1	1010	25	"
29 / 0000	12.8	146.5	1011	25	"
29 / 0600	12.9	146.9	1010	25	"
29 / 1200	12.9	147.4	1009	25	"
29 / 1800	12.9	147.8	1007	30	tropical depression
30 / 0000	12.9	148.2	1007	30	"
30 / 0600	12.8	148.6	1006	30	"
30 / 1200	12.7	148.9	1005	35	tropical storm
30 / 1800	12.6	149.3	1005	35	"
31 / 0000	12.6	149.7	1007	30	tropical depression
31 / 0600	12.7	150.0	1008	30	"
31 / 1200	12.8	150.3	1008	30	"
31 / 1800	12.8	150.8	1008	30	"
01 / 0000	12.8	151.3	1009	25	low
01 / 0600	12.8	151.8	1009	25	"
01 / 1200	12.8	152.4	1009	25	"
01 / 1800	12.6	153.0	1009	25	"
02 / 0000	12.4	153.6	1009	25	"
02 / 0600	12.0	154.4	1008	30	tropical depression
02 / 1200	11.5	155.6	1006	35	tropical storm
02 / 1800	10.7	156.8	1005	35	"
03 / 0000	10.2	157.8	1007	30	tropical depression
03 / 0600	9.8	158.8	1007	30	"
03 / 1200	9.6	159.5	1007	30	"
03 / 1800	9.3	160.6	1007	30	"
04 / 0000	9.1	162.0	1006	30	"
04 / 0600	9.2	163.4	1006	30	"
04 / 1200	9.4	165.0	1006	30	"
04 / 1800	9.8	166.6	1006	30	"



05 / 0000	10.1	168.0	1006	30	"
05 / 0600	10.4	169.3	1006	30	"
05 / 1200	10.8	170.7	1004	35	tropical storm
05 / 1800	11.2	172.2	1003	40	"
06 / 0000	11.6	173.6	1001	45	"
06 / 0600	12.0	175.0	997	55	"
06 / 1200	12.5	176.3	990	65	hurricane
06 / 1800	13.1	177.6	980	75	"
07 / 0000	13.9	179.2	965	100	"
07 / 0600	14.5	179.8E	926	130	supertyphoon
07 / 1200	15.1	178.7E	918	140	"
07 / 1800	15.6	177.4E	918	140	"
08 / 0000	16.3	176.4E	918	140	"
08 / 0600	16.9	176.0E	922	135	"
08 / 1200	17.5	175.9E	926	130	"
08 / 1800	18.4	176.0E	929	125	typhoon
09 / 0000	19.6	176.4E	933	120	"
09 / 0600	21.1	176.8E	937	115	"
09 / 1200	23.1	177.0E	944	105	"
09 / 1800	24.8	176.9E	948	100	"
10 / 0000	26.7	176.1E	952	95	"
10 / 0600	28.4	175.0E	959	85	"
10 / 1200	30.5	173.3E	963	80	"
10 / 1800	31.8	171.8E	970	70	"
11 / 0000	33.0	170.2E	978	60	tropical storm
11 / 0600	33.9	169.2E	985	50	"
11 / 1200	34.4	168.3E	993	40	"
11 / 1800	34.8	167.5E	996	35	"
12 / 0000	35.0	166.7E	996	35	"



12 / 0600	35.2	166.1E	996	35	"
12 / 1200	35.4	165.5E	1000	30	tropical depression
12 / 1800	35.7	165.0E	1004	25	"
13 / 0000	36.3	164.8E	1004	25	subtropical depression
13 / 0600	36.8	164.8E	1004	25	"
13 / 1200					dissipated
07 / 1200	15.1	178.7E	918	140	minimum pressure and maximum winds





Table 2. Number of hours in advance of formation for Tropical Storm Genevieve associated with the first NHC Tropical Weather Outlook forecast in the indicated likelihood category. Note that the timings for the “Low” category do not include forecasts of a 0% chance of genesis.

	Hours Before Genesis	
	48-Hour Outlook	120-Hour Outlook
Low (<30%)	114	114
Medium (30%-50%)	60	102
High (>50%)	42	54

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Genevieve, 25 July – 13 August 2014. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	<b>25.3</b>	<b>38.5</b>	<b>44.5</b>	76.2	<b>69.4</b>	<b>85.8</b>	<b>128.6</b>
OCD5	44.7	97.4	120.2	120.1	148.8	214.1	300.3
Forecasts	9	7	5	3	3	7	7
OFCL (2009-13)	25.7	41.4	55.0	68.6	97.8	134.2	167.1
OCD5 (2009-13)	37.2	74.8	118.0	162.5	249.4	332.6	413.3

Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Hurricane Genevieve, 25 July – 13 August 2014. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 3a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	25.3	38.5	44.5	76.2	69.4	85.8	128.6
OCD5	44.7	97.4	120.2	120.1	148.8	214.1	300.3
GFSI	<b>23.0</b>	45.3	89.2	153.3	128.6	160.8	164.5
GHMI	33.9	65.8	106.9	135.5	121.7	190.7	222.7
HWFI	29.6	46.3	78.5	107.1	<b>56.5</b>	141.0	283.0
TVCE	<b>22.5</b>	39.2	55.3	88.0	<b>66.1</b>	<b>85.1</b>	<b>128.5</b>
LBAR	49.1	97.5	119.6	136.2	197.4	284.2	361.6
AEMI	<b>25.0</b>	45.2	60.5	<b>75.4</b>	89.8	122.7	132.5
BAMS	34.9	58.1	69.0	<b>62.2</b>	106.4	131.0	178.6
BAMM	35.0	57.3	63.0	99.9	130.7	184.9	226.4
BAMD	47.7	87.1	128.0	180.8	159.8	222.4	267.9
Forecasts	9	7	5	3	3	7	7

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Genevieve, 25 July – 13 August 2014. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	<b>2.8</b>	<b>7.1</b>	<b>6.0</b>	<b>3.3</b>	<b>3.3</b>	<b>3.6</b>	<b>6.4</b>
OCD5	4.9	10.7	18.2	22.7	16.7	21.3	23.4
Forecasts	9	7	5	3	3	7	7
OFCL (2009-13)	6.1	10.4	13.4	14.5	15.0	16.4	16.1
OCD5 (2009-13)	7.7	12.7	16.4	18.8	20.5	20.3	20.8

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Hurricane Genevieve, 25 July – 13 August 2014. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 4a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	2.8	7.1	6.0	3.3	3.3	1.0	7.5
OCD5	4.9	10.7	18.2	22.7	16.7	23.6	23.0
HWFI	4.1	<b>6.7</b>	7.8	8.7	5.3	5.4	<b>2.8</b>
GHMI	5.6	8.1	12.0	14.3	11.7	19.4	<b>6.5</b>
DSHP	4.7	<b>7.0</b>	6.0	5.0	9.0	7.8	7.8
LGEM	4.4	7.3	<b>5.2</b>	4.3	9.0	6.0	<b>4.8</b>
IVCN	4.4	<b>6.3</b>	6.2	6.3	4.0	6.4	<b>2.0</b>
GFSI	4.2	<b>6.4</b>	10.2	9.0	8.3	14.4	7.5
Forecasts	9	7	5	3	3	5	4

Table 5a. CPHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Genevieve, 25 July – 13 August 2014. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	37.0	<b>49.7</b>	<b>49.5</b>	<b>55.7</b>	<b>112.8</b>	<b>178.3</b>	<b>257.9</b>
OCD5	53.6	114.4	183.3	261.4	426.1	649.7	919.9
Forecasts	26	24	23	24	28	30	28
OFCL (2009-2013)	35.0	60.3	89.0	124.8	234.7	346.5	451.7

Table 5b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Hurricane Genevieve, 25 July – 13 August 2014. Errors smaller than the CPHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 5a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	38.0	49.7	48.8	54.8	112.8	177.6	255.8
OCD5	54.0	115.7	186.1	265	426.1	659.2	936.1
BAMD	41.3	59.8	76.5	107.4	194.9	306.0	455.5
BAMM	38.6	58.4	78.4	109.3	167.8	250.4	351.5
BAMS	<b>37.2</b>	57.5	84.1	114.3	172.3	269.1	382.2
HWFI	<b>31.2</b>	<b>46.9</b>	58.5	73.0	145.8	238.8	367.1
GFSI	<b>26.1</b>	<b>39.2</b>	<b>46.0</b>	<b>49.4</b>	<b>103.4</b>	<b>163.7</b>	265.9
AEMI	<b>25.4</b>	<b>38.1</b>	52.1	63.1	116.0	<b>174.3</b>	<b>249.2</b>
TVCE	<b>24.8</b>	<b>32.7</b>	<b>40.4</b>	<b>52.0</b>	<b>92.8</b>	<b>140</b>	<b>209.8</b>
Forecasts	24	23	22	23	28	29	27

Table 6a. CPHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Genevieve, 25 July – 13 August 2014. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	6.9	15	23.3	26.7	29.8	30.2	32.0
OCD5	9.0	16.1	23.3	27.7	38.3	42	34.2
Forecasts	26	24	23	24	28	30	28
OFCL (2009-2013)	4.8	8.5	11.3	13.6	22.2	26.0	27.9

Table 6b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Hurricane Genevieve, 25 July – 13 August 2014. Errors smaller than the CPHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 6a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	6.3	15.5	24.5	28.4	30.4	31.4	33.7
OCD5	8.2	16.7	24.7	29.5	38.3	43.3	35.9
HWFI	6.8	<b>14.6</b>	<b>20.9</b>	<b>22.1</b>	<b>21.0</b>	<b>21.8</b>	<b>25.7</b>
DSHP	6.5	<b>15.2</b>	<b>23.4</b>	<b>26.1</b>	<b>23.1</b>	<b>21.2</b>	<b>25.2</b>
GFSI	8.6	18.1	26.5	32.4	34.8	36.3	33.9
IVCN	6.6	<b>15.2</b>	<b>23.1</b>	<b>27.1</b>	<b>23.9</b>	<b>21.1</b>	<b>24.4</b>
Forecasts	24	22	21	22	27	28	26

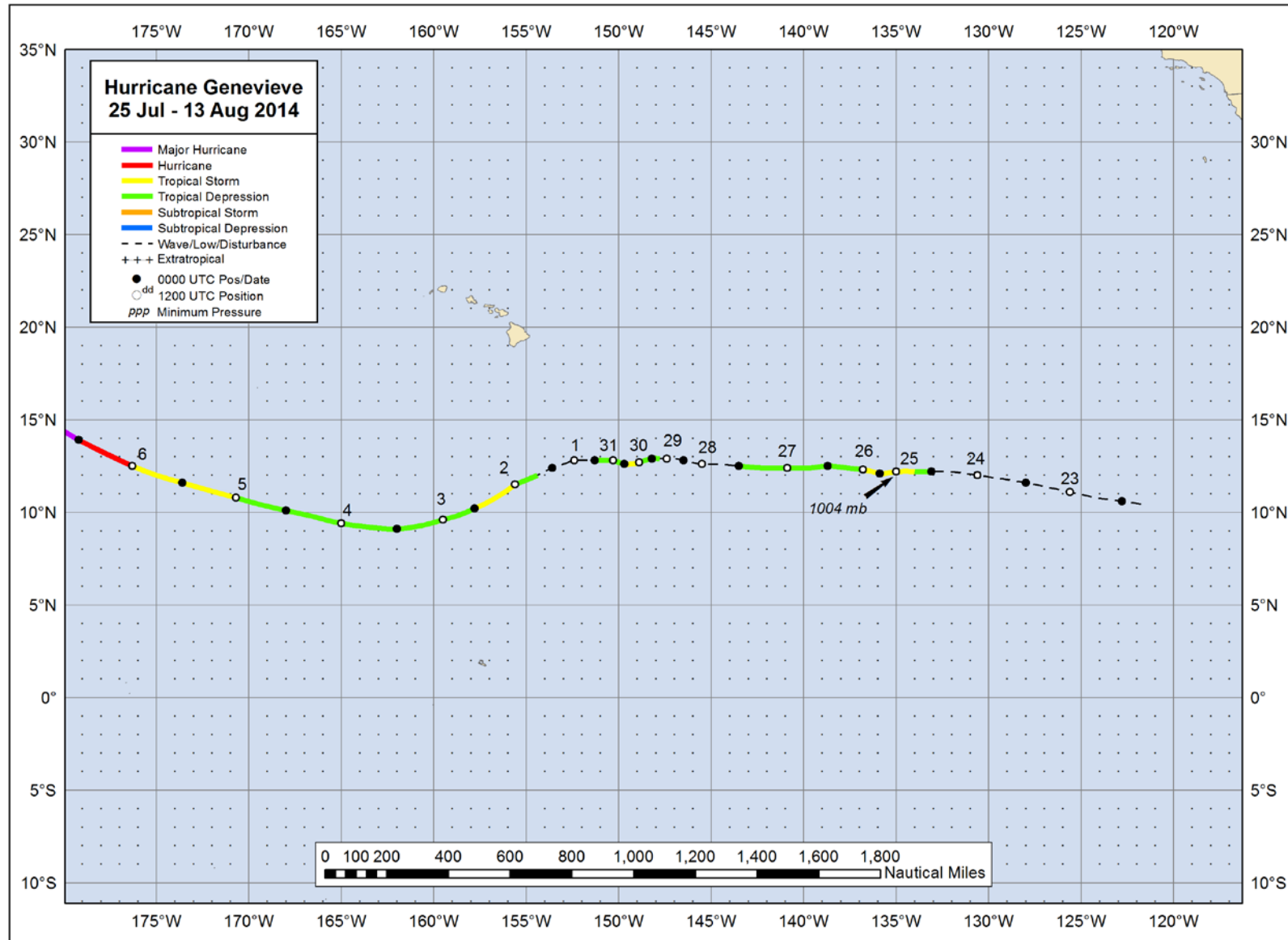


Figure 1. Best track positions for Hurricane Genevieve, 25 July – 13 August, 2014. Best track data west of 140°W longitude was provided by the Central Pacific Hurricane Center and the Joint Typhoon Warning Center.

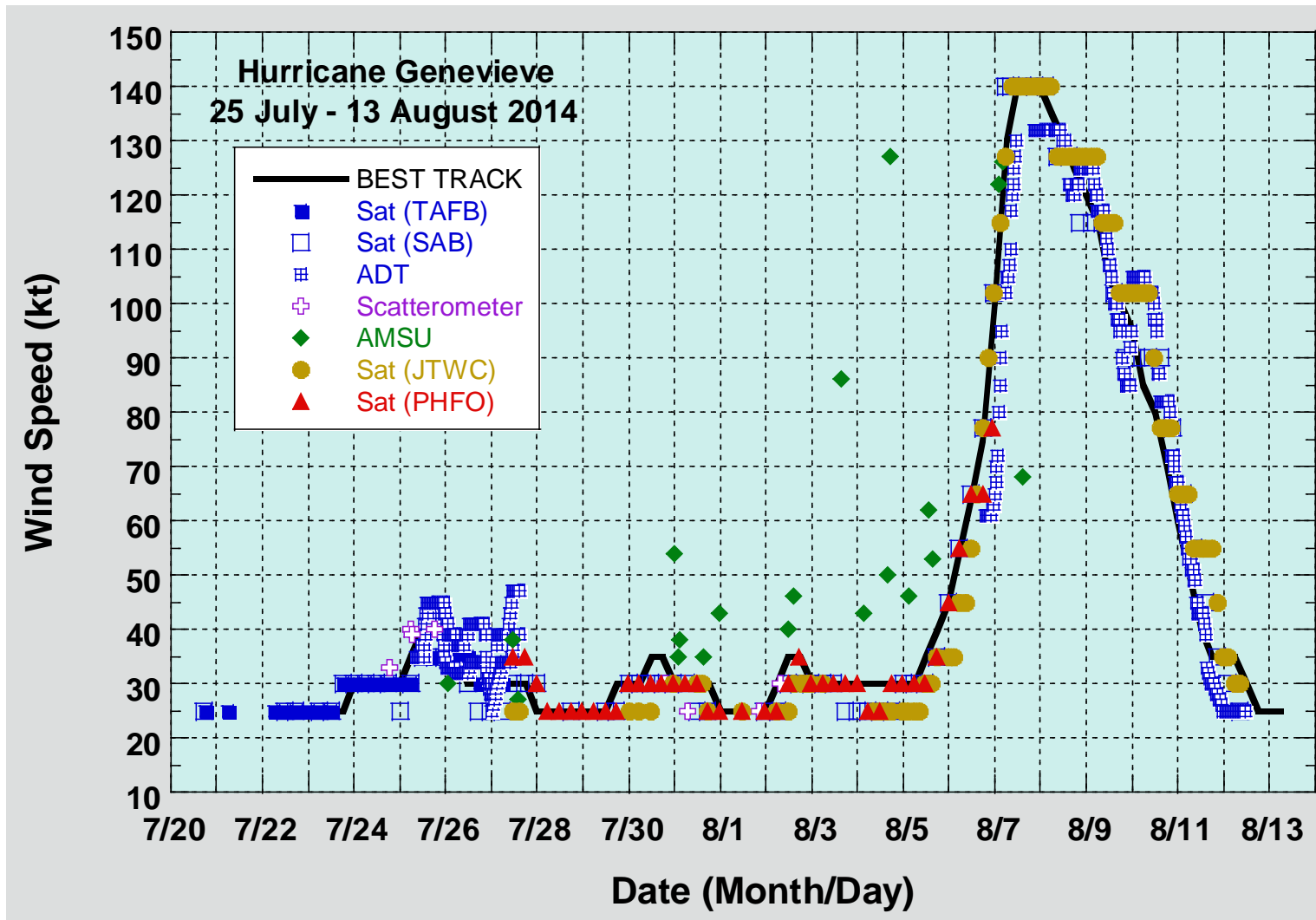


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Genevieve, 25 July – 13 August 2014. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Dashed vertical lines correspond to 0000 UTC. Best track data west of 140°W longitude was provided by the Central Pacific Hurricane Center and the Joint Typhoon Warning Center.

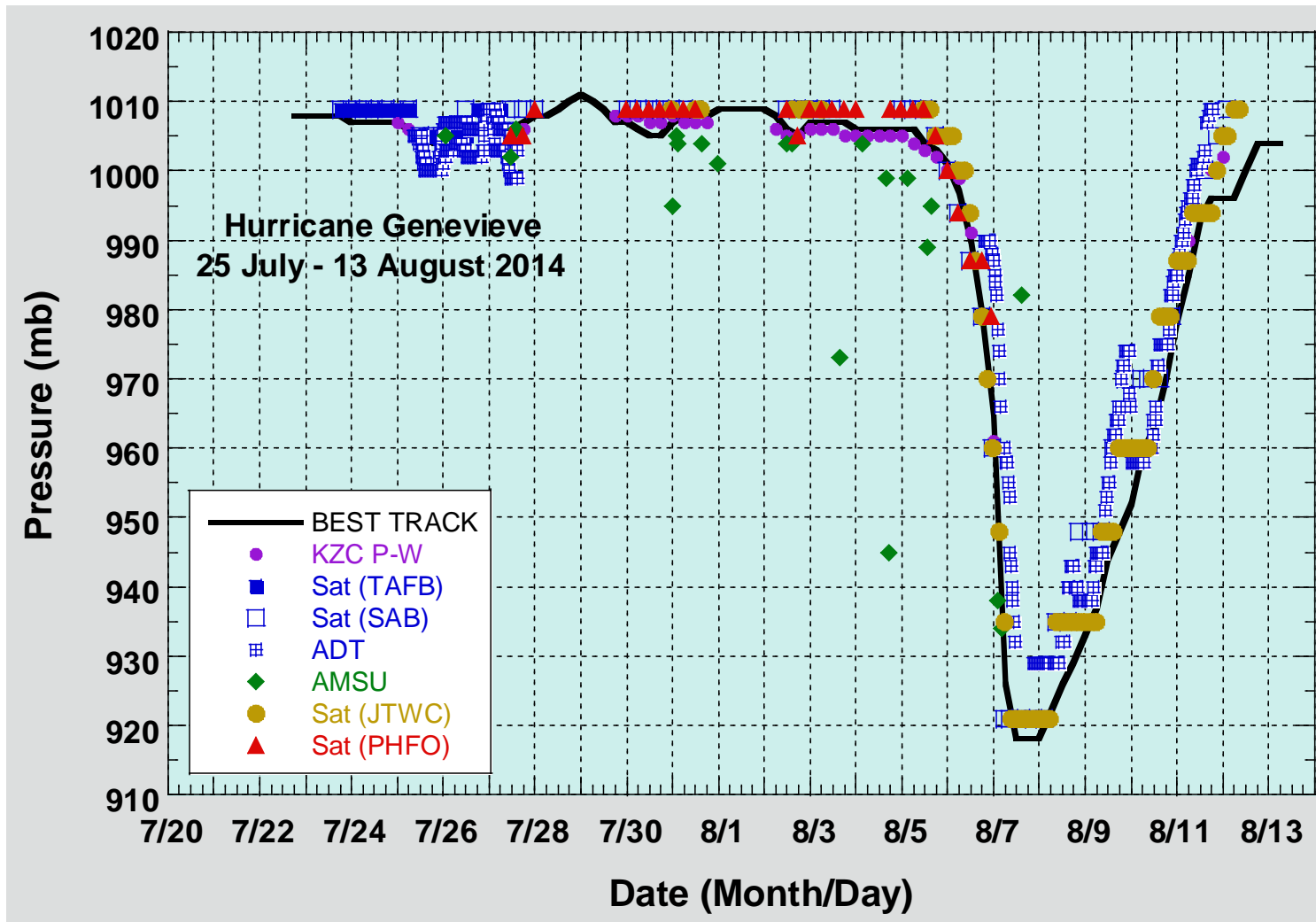


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Genevieve, 25 – 13 August 2014. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC. Best track data west of 140°W longitude was provided by the Central Pacific Hurricane Center and the Joint Typhoon Warning Center.



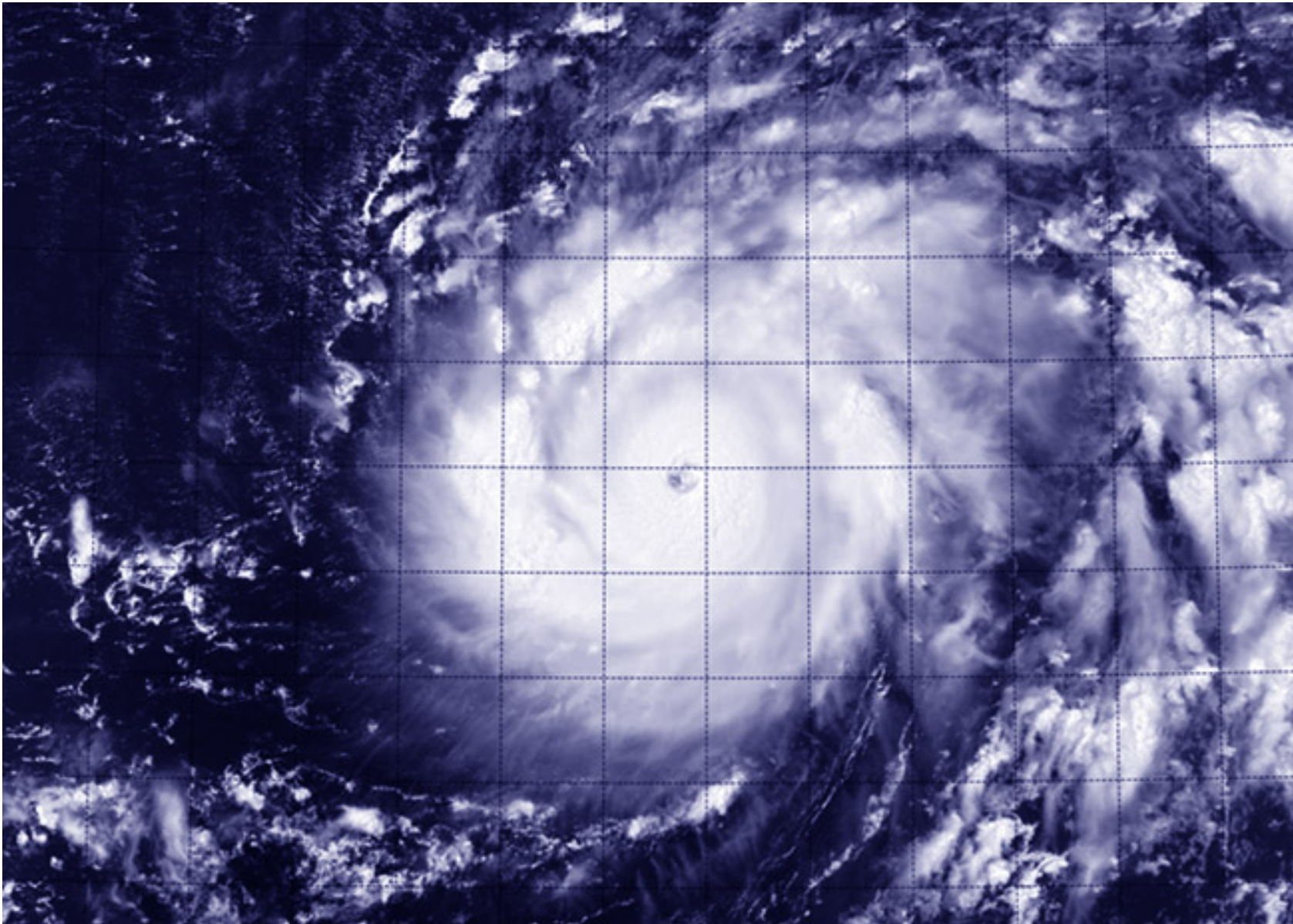


Figure 4. VIIRS visible image of Hurricane Genevieve from the Suomi-NPP satellite at 0134 UTC 7 August 2014. Image courtesy of NASA and NOAA.