

Preliminary Report
Hurricane Noel
26 September-7 October 1995

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Noel was a 65-knot hurricane that remained at sea over the eastern Atlantic.

a. Synoptic History

Satellite pictures and rawinsonde data show that a tropical wave emerged from western Africa on 22 September. Three days later, as the wave neared 30°W longitude, bands of deep convection associated with the system began to acquire some cyclonic shape and the NHC's Tropical Analysis and Forecast Branch (TAFB) meteorologist gave the first location estimate at 0600 UTC 26 September, remarking "potential surface low looking like it's getting more organized". Twenty-four hours later, TAFB and the Synoptic Analysis Branch (SAB) gave the initial Dvorak classifications. By 1800 UTC on the 26th, the cloud structure was strongly indicative of a low-level circulation and the post-analysis "best track" of Tropical Depression Sixteen begins at this time (Table 1 and Fig. 1) over the eastern tropical Atlantic.

A mid- to upper-tropospheric trough lay in the path of the developing tropical cyclone. Southwesterly shearing due to the upper-level winds ahead of this trough started to affect the depression as early as 27 September. However, these winds were not strong enough to totally offset the development trend and the depression strengthened into Tropical Storm Noel around 1200 UTC on the 27th.

As the cyclone strengthened into a storm, its motion turned from west-northwestward to northwestward, due the influence of the above trough and an accompanying mid- to upper-level low near 28°N 44°W. A northwestward movement continued until about 1800 UTC on the 28th, when Noel began to take a more northerly heading. Even though upper-level outflow was being impeded to the northwest, satellite intensity estimates indicate that Noel strengthened to a hurricane near 1800 UTC 28 September. Development was halted after that juncture by increasing upper-level southwesterly flow. Moving northward to northeastward, Noel maintained minimal hurricane strength until 30 September, when the center became exposed to the southwest of the cluster of convection associated with the cyclone. Gradual weakening took place, and the forward speed slowed to a crawl on 30 September and 1 October. On 2 October, with its maximum winds reduced to 45 knots, Noel moved generally northward at a faster speed. On the 3rd, the steering of Noel was influenced by a mid- to upper-level cyclone centered just to the west, and the storm moved north-northwestward for a while.

Shearing diminished as Noel came into the area of lighter upper-level winds near the center of the mid- to upper-level cyclone, and this allowed the storm to re-strengthen on the 3rd and 4th. By 0000 UTC 5 October, Noel was again a 65-knot hurricane. The system maintained this intensity for about 24 hours while moving slowly northeastward to eastward. The final weakening commenced at 0000 UTC on the 6th, when Noel's winds dropped to just below hurricane strength. A midlatitude trough approached the area, causing Noel to move more rapidly, toward the east-northeast and northeast. Gradually weakening and losing its tropical character as it approached the Azores, the cyclone was absorbed into a cold front near 0000 UTC 8 October.

b. Meteorological Statistics

The post-analysis best track intensities are listed in Table 1 and displayed in Figs. 2 and 3, which show the estimated minimum central pressure and maximum one-minute wind speed, respectively, versus time. These intensity estimates were derived mainly from analyses of satellite images, using the Dvorak technique, performed by meteorologists at the SAB and TAFB (formerly the Tropical Satellite Analysis and Forecast unit, TSAF, as in the figures) and at the Air Force Global Weather Central (AFGWC). In addition, there were some surface observations from ships of opportunity which were used for the intensity estimates. An observation of 65-knot winds from the ship **FNOU** was instrumental in re-upgrading Noel to a hurricane at 0000 UTC 5 October. Table 2 is a listing of ship reports of tropical storm force or higher wind speeds associated with Noel.

c. Casualty and Damage Statistics

Noel did not significantly affect any land areas, and there are no reports of casualties or damage.

d. Forecast and Warning Critique

In general, the track of Noel was reasonably well predicted. At 12, 24, 36, 48, and 72 hours the respective mean official forecast errors were 47, 93, 138, 178, and 229 n mi. These are below the most recent 10-year average errors. Compared to the official forecast, there was no available objective technique which had a lower average error for any of the forecast times.

For the most part, the intensity of Noel was somewhat underpredicted. This was especially true for the restrengthening phase, where there were several 72-hours wind forecasts that were 35 knots too low.

Since this cyclone remained at sea, no watches or warnings were required.

Table 1. Post-analysis best track, Hurricane Noel,
26 September-7 October, 1995.

Date/Time (UTC)	Position		Pressure (mb)	Wind Speed (kt)	Stage
	Lat. (°N)	Lon. (°W)			
26/1800	10.4	37.7	1007	25	Tropical Depression
27/0000	10.9	39.0	1006	30	" "
0600	11.4	40.0	1005	30	" "
1200	12.1	40.6	1005	35	Tropical Storm
1800	12.8	41.0	1002	40	" "
28/0000	13.5	41.5	1000	45	" "
0600	14.0	42.0	998	50	" "
1200	14.5	42.4	995	60	" "
1800	15.2	42.6	987	65	Hurricane
29/0000	15.9	42.6	987	65	" "
0600	16.5	42.2	987	65	" "
1200	17.4	41.9	987	65	" "
1800	18.2	41.2	987	65	" "
30/0000	18.9	40.6	987	65	" "
0600	19.4	40.3	987	65	" "
1200	19.7	40.2	990	60	Tropical Storm
1800	19.8	40.1	993	55	" "
01/0000	19.9	40.2	994	50	" "
0600	20.0	40.3	995	50	" "
1200	20.1	40.4	1000	45	" "
1800	20.5	40.4	1000	45	" "
02/0000	20.9	40.2	1000	45	" "
0600	21.5	40.1	1000	45	" "
1200	22.4	40.0	1000	45	" "
1800	23.5	40.1	1000	45	" "
03/0000	24.7	40.3	1000	45	" "
0600	25.7	41.0	1000	40	" "
1200	26.7	41.8	1000	45	" "
1800	27.6	42.4	1000	45	" "
04/0000	28.5	42.8	999	45	" "
0600	29.5	43.1	998	50	" "
1200	30.4	43.1	997	50	" "
1800	31.3	43.0	994	55	" "
05/0000	31.9	42.7	987	65	Hurricane
0600	32.2	42.3	987	65	" "
1200	32.4	41.5	987	65	" "
1800	32.4	40.5	987	65	" "
06/0000	32.5	39.4	990	60	Tropical Storm
0600	32.5	38.2	994	55	" "
1200	32.5	36.9	997	50	" "
1800	32.7	35.3	1001	40	" "
07/0000	33.2	33.5	1004	35	" "
0600	34.0	31.0	1000	30	Extratropical
1200	35.0	29.5	997	30	" "
1800	36.0	28.0	995	30	" "
08/0000					Merged with a front

28/1800	15.2	42.6	987	65	Minimum Pressure

TABLE 2. Ship encounters of 34 knots or higher associated with Hurricane Noel.

Tropical Cyclone	Ship Call Sign	Tropical Cyclone Winds (ship encounters of 34 knots or higher)					Wind (kt) Dir/Speed	Pressure (mb)
		Date Mo/Da	Time UTC	Position LatN LonW				
NOEL	3FJE3	9/30	0000	19.2	37.5	160/58	1015.8	
	3FJE3	9/30	0600	18.3	37.8	160/58	1013.1	
	FNPB	10/04	1200	31.7	40.5	130/35	1014.0	
	FNIH	10/04	1800	32.2	43.4	040/52	1002.8	
	FNOU	10/05	0000	31.4	42.7	220/65	998.0	
	FNIH	10/05	0300	31.5	42.2	160/60	994.8	
	FNIH	10/05	0600	31.3	41.9	220/52	994.8	
	FNIH	10/05	0900	31.0	41.9	220/40	1005.3	
	FNIH	10/05	1200	30.6	41.4	220/38	1009.3	
	SHIP	10/06	0000	33.7	41.6	010/35	1007.2	

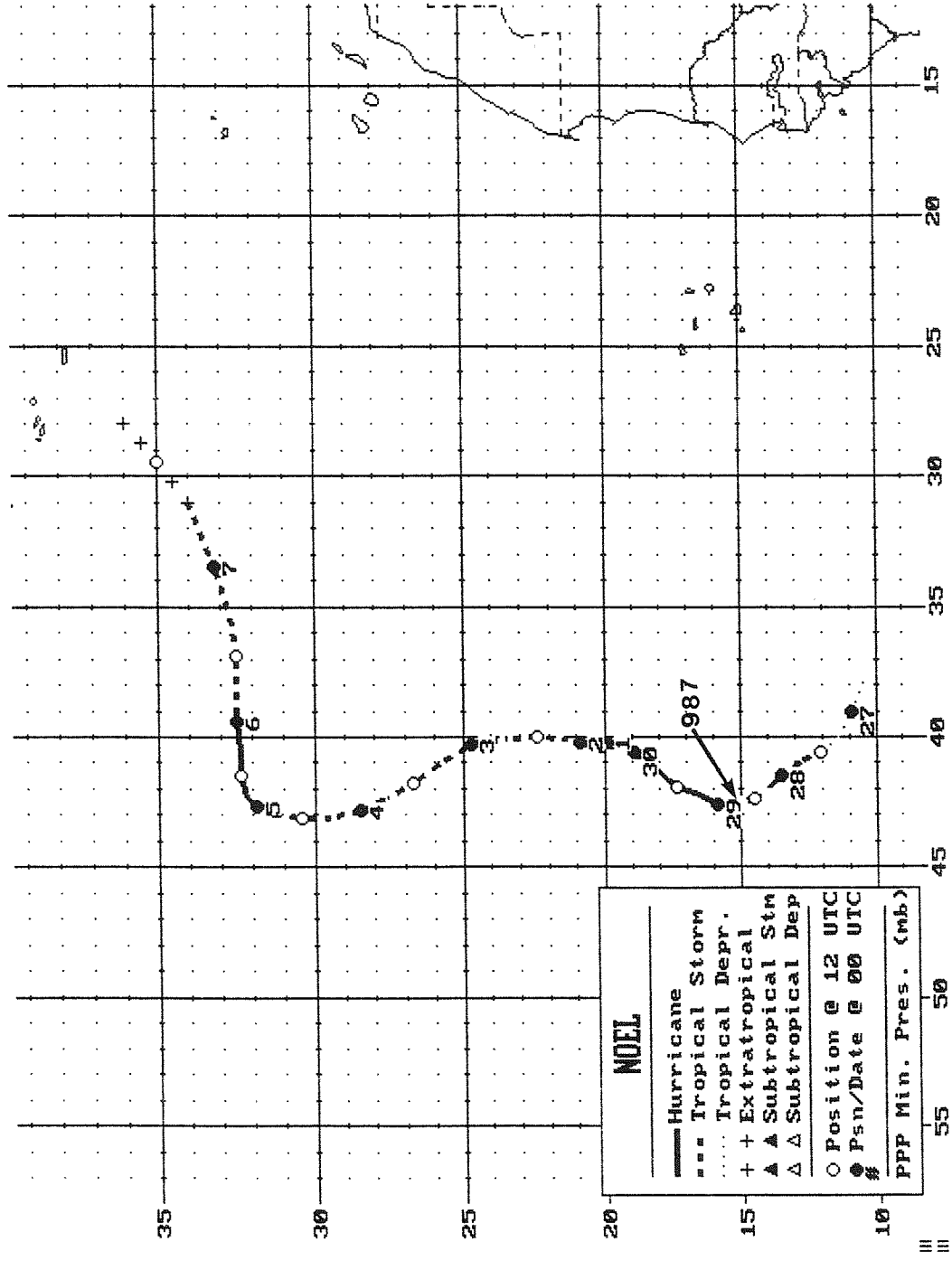


Figure 1. Post-analysis best track of Hurricane Noel, 1995.

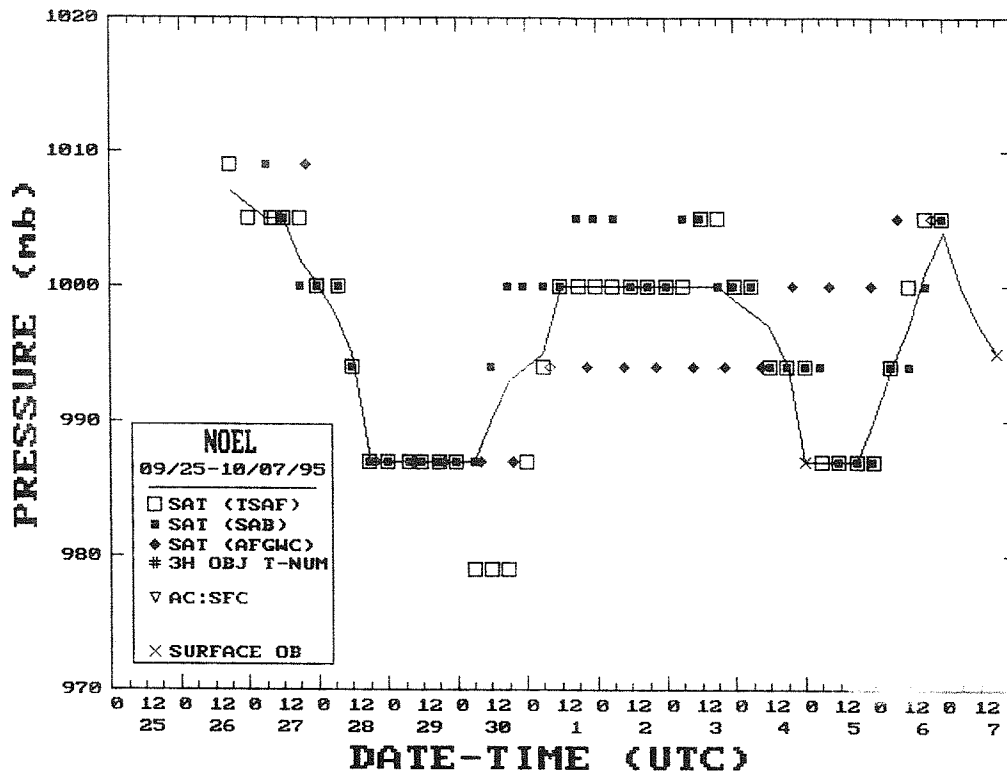


Figure 2. Minimum central pressure curve for Hurricane Noel, 1995.

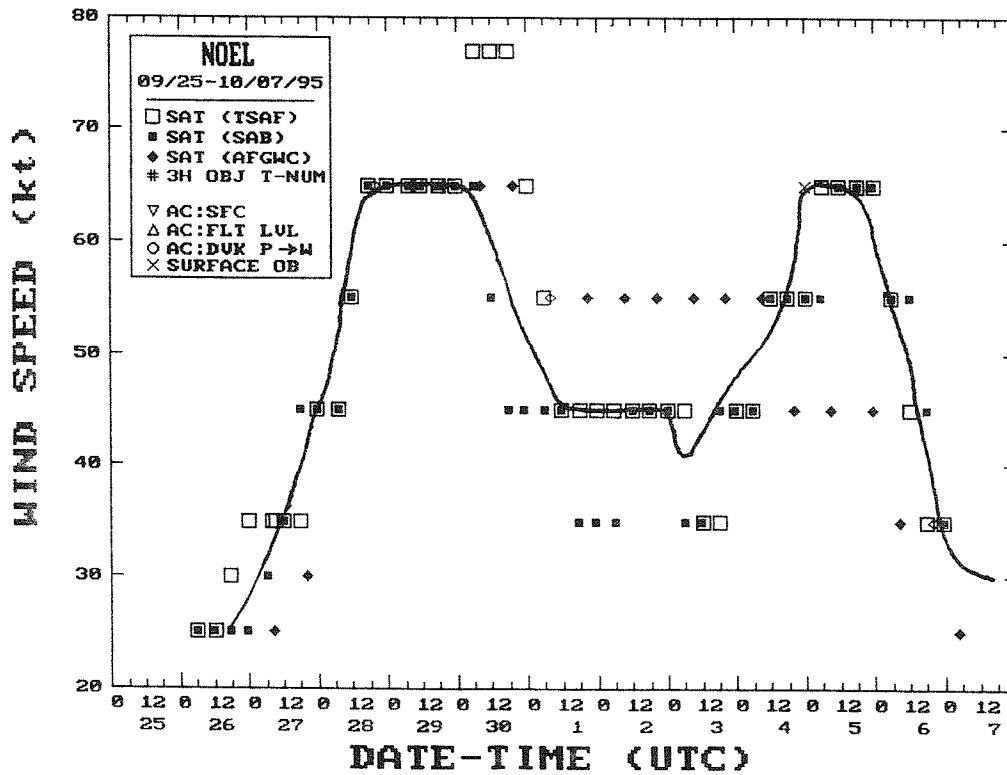


Figure 3. Maximum one-minute wind speed curve for Hurricane Noel, 1995.