Preliminary Report
Tropical Storm Alex
27 July - 02 August 1998

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Alex was the first tropical cyclone of the 1998 season and remained over the open waters of the tropical Atlantic throughout its lifetime.

a. Synoptic History

A well-organized tropical wave emerged from the west coast of Africa on 26 July and moved westward at 15 to 20 knots. Early on 27th, ship reports and satellite scatterometer winds supported the presence of a surface circulation in association with the wave. On this basis, it is estimated that the system attained tropical depression status around 1200 UTC 27 July while located about 300 n mi south-southwest of the Cape Verde Islands.

The depression changed little in organization on 27 July and most of the 28th, with minimal deep convection near the center, while moving on a general west-northwestward track at 15 to 20 knots. During this period, satellite imagery characterized the depression as a large and elongated circulation which was still involved with the Intertropical Convergence Zone. By the evening of the 28th, deep convection increased near the center and meteorologists from both the Tropical Analysis and Forecast Branch (TAFB) at the Tropical Prediction Center and the Satellite Analysis Branch (SAB) from the National Environmental Satellite, Data, and Information Service assigned Dvorak T-numbers of 2.5, i.e., 35 knots. Consequently, the system was upgraded to Tropical Storm Alex at 0000 UTC 29 July.

Alex continued to move on a general west to west-northwest course at 10 to 15 knots in response to a deep-layer ridge over the tropical eastern Atlantic. During the next several days, Alex's development was hampered by a mid- to upper-level trough, and attendant cyclonic circulation, located to its north and west. By 30 July, satellite imagery indicated that Alex was experiencing southerly vertical wind shear. During the evening of the 30th, satellite imagery showed a burst of deep convection just east of the center. It is estimated that Alex reached a peak intensity of 45 knots from 1800 UTC 30 July to 0600 UTC 31 July, and a minimum central pressure of 1002 mb near 0000 UTC 31 July. Shortly thereafter, increased southerly vertical wind shear induced by the mid- to upper-level tropospheric trough to the west of Alex curtailed further strengthening.

Over the next few days the vertical wind shear took its toll with the low-level center of Alex becoming fully exposed south of the remaining deep

convection on 1 August. Alex turned toward the northwest later that day and continued to gradually weaken. Alex was downgraded to a depression by midday on the 2nd. Later that afternoon, data from an Air Force Reserve Hurricane Hunter reconnaissance aircraft showed that the system no longer had a closed low-level circulation, and the system dissipated.

b. Meteorological Statistics

The "best-track" intensities in Table 1 were obtained from the data in Figures 2 and 3 which depict the curves of minimum central sea-level pressure (mb) and maximum sustained one-minute average "surface" (10 meters above ground level) wind speed, respectively, as a function of time. These figures also contain data upon which the curves are based; United States Air Force Reserve (USAFR) aircraft reconnaissance data, satellite-based Dvorak-technique intensity estimates from TAFB, SAB, and Air Force Global Weather Agency (AFGWA in figures).

There were no surface observations of tropical storm force winds in association with Alex.

c. Casualty and Damage Statistics

Alex is not known to have caused any casualties or damages.

d. Forecast and Warning Critique

The official track forecast errors, listed in Table 2, were below the most recent 10-year average. The average 12-, 24-, 36-, 48-, and 72-hr official forecast errors and associated number of cases (in parenthesis) were 44 (17), 75 (15), 90 (13), 96 (11), and 136 (7) n mi respectively. The 36 to 72 hr errors are 31% to 45% lower than the most recent 10-year average track errors.

The average 12-, 24-, 36-, 48-, and 72-hr official intensity forecasts ranged from about 5 to 10 knots between 12 and 36 hours, near 20 knots at 48 hours, and 25 knots at 72 hours. The 12 to 36 hr errors are 20% to 30% lower than the most recent 10-year average intensity errors while the 72 hr errors were 10-15 % higher. SHIFOR had the best performance scores with average intensity errors generally less than 10 knots. The 12 to 48 hr SHIPS errors were generally below the official forecast while the GFDL and GFDI had lower errors only at 48 hr. With the exception of SHIFOR, all the 72 hr model errors were larger than official forecast errors.

No watches or warnings were issued for Alex.

Table 1.
Preliminary Best Track - Tropical Storm Alex, 27 July - 02 August 1998.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
27/1200	11.3	25.4	1009	25	Tropical Dep.
1800	11.7	27.2	1009	25	" "
28/0000	12.2	29.2	1009	25	" "
0600	12.6	31.3	1008	25	" "
1200	12.9	33.3	1007	30	" "
1800	13.1	35.1	1006	30	" "
29/0000	13.3	36.8	1005	35	Tropical Storm
0600	13.5	38.5	1005	35	" "
1200	13.7	40.0	1005	35	" "
1800	13.9	41.3	1005	35	" "
30/0000	14.2	42.6	1005	35	" "
0600	14.4	43.9	1003	40	" "
1200	14.7	45.0	1003	40	" "
1800	15.1	46.1	1003	45	" "
31/0000	15.4	47.1	1002	45	" "
0600	15.6	48.1	1003	45	" "
1200	15.7	49.2	1003	45	" "
1800	15.8	50.4	1005	40	" "
01/0000	15.9	51.7	1007	35	" "
0600	16.3	53.1	1009	35	" "
1200	16.9	54.3	1009	40	" "
1800	17.7	55.4	1012	40	" "
02/0000	18.4	56.5	1012	35	" "
0600	19.0	57.7	1012	35	" "
1200	19.9	58.6	1012	35	" "
1800	21.0	59.3	1014	30	Tropical Dep.
03/0000					Dissipated
31/0000	15.4	47.1	1000	50	Minimum Pressure

Table 2.

Preliminary track forecast evaluation of Tropical Storm Alex - heterogeneous sample. Errors in nautical miles for tropical storm and hurricane stages with number of forecasts in parenthesis. Numbers in bold italics represent forecasts which were better than the official forecast.

Forecast Technique*	Period (hours)				
	12	24	36	48	72
CLIP	***43*** (17)	87 (15)	120 (13)	138 (11)	173 (7)
GFDI	45 (16)	89 (14)	122 (12)	124 (10)	148 (6)
GFDL**	45 (17)	80 (15)	115 (13)	136 (11)	***120*** (7)
LBAR	***37*** (17)	***65*** (15)	99 (13)	124 (11)	***124*** (7)
AVNI	45 (17)	67 (15)	***86*** (13)	98 (11)	225 (7)
BAMD	50 (17)	93 (15)	155 (13)	222 (11)	381 (7)
BAMM	46 (17)	86 (15)	132 (13)	173 (11)	198 (7)
BAMS	***41*** (17)	75 (15)	102 (13)	124 (11)	*125* (7)
NGPI	52 (15)	82 (13)	113 (10)	144 (8)	149 (6)
UKMI	61 (14)	118 (12)	143 (12)	149 (10)	***123*** (6)
A98E	***42*** (17)	***71*** (15)	***86*** (13)	116 (11)	167 (7)
NHC Official	44 (17)	75 (15)	90 (13)	96 (11)	136 (7)
NHC Official 10-Year Average (1988-1997)	47 (1838)	88 (1633)	127 (1449)	165 (1284)	248 (1006)

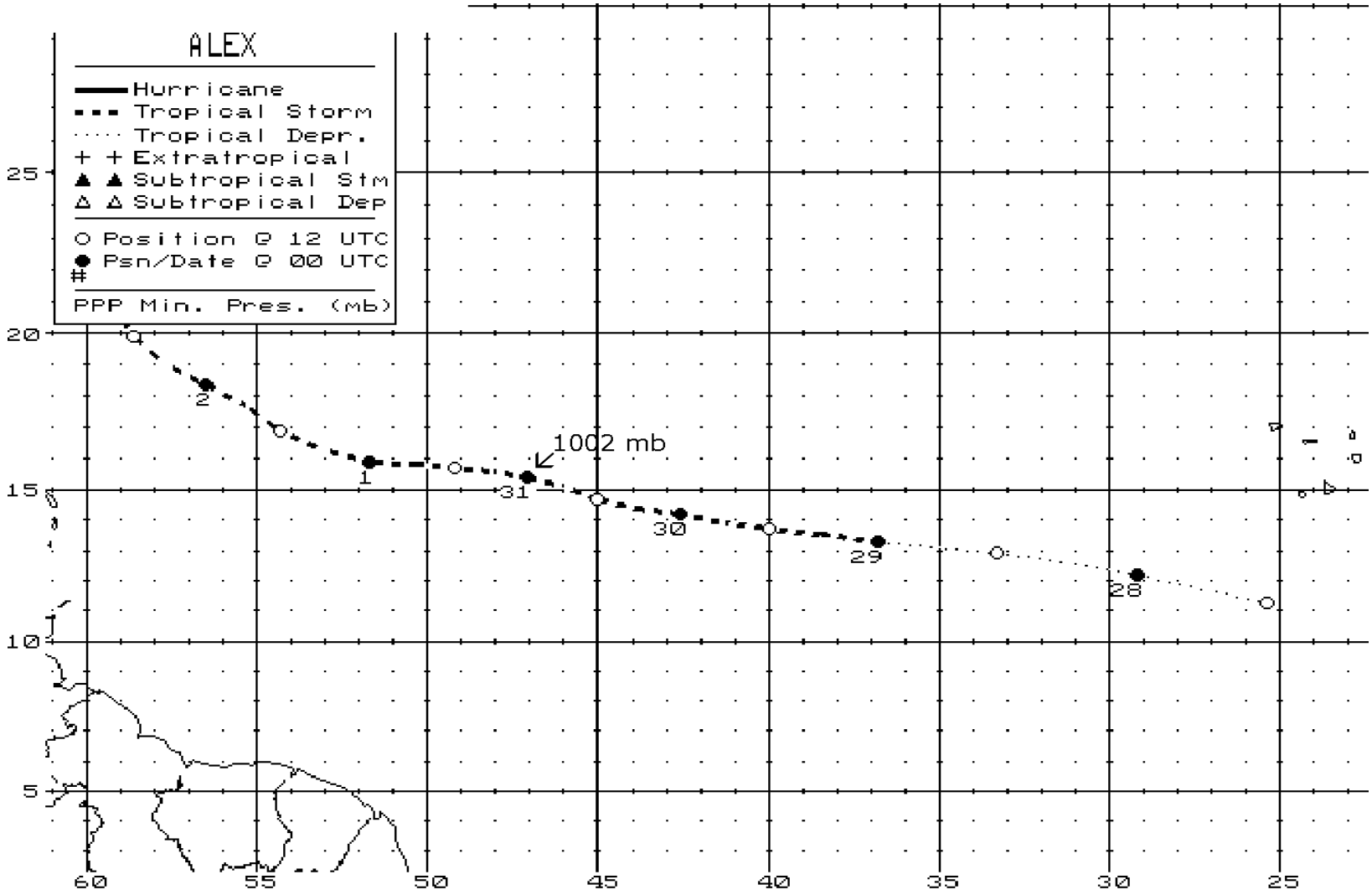

Figure 1. Best track of Tropical Storm Alex, 27 July - 02 August 1998.

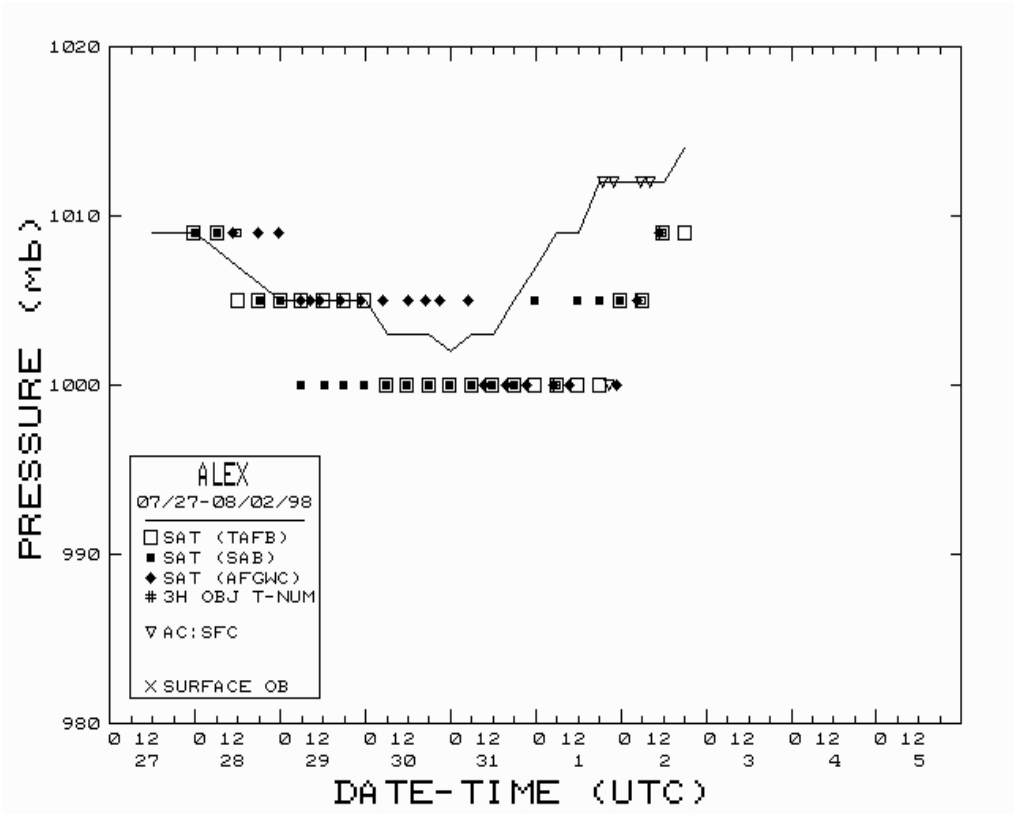

Figure 2. Best track minimum central pressure curve for Tropical Storm Alex, 27 July - 02 August 1998.

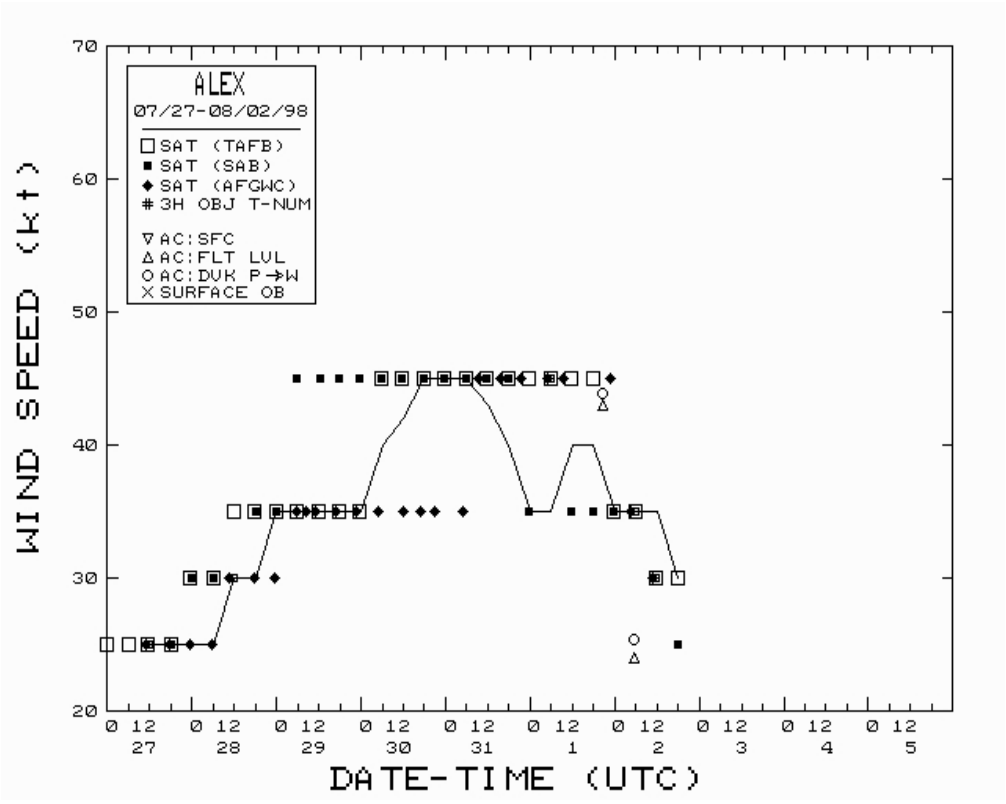

Figure 3. Best track maximum sustained 1-minute 10 meter wind speed curve for Tropical Storm Alex, 27 July - August 1998.