

Tropical Cyclone Report  
Subtropical Storm  
25-29 October 2000

Jack Beven  
National Hurricane Center  
27 November 2000

a. Synoptic history

An extratropical low pressure system formed just east of the Turks and Caicos Islands near 0000 UTC 25 October in response to an upper level cyclone interacting with a frontal system. The low initially moved northwestward, and in combination with a strong surface high to the north developed into a gale center six hours later. By 1800 UTC that day it had developed sufficient organized convection to be classified using the Herbert-Poteat subtropical cyclone classification system, and the best track of the subtropical storm begins at this time (Table 1 and Figure 1).

Upon becoming a subtropical storm, the cyclone turned northward. This motion continued for 24 h while the system slowly intensified. The storm jogged north-northwestward late on 26 October, followed by a north-northeastward turn and acceleration on the 27<sup>th</sup>. During this time, satellite imagery indicated intermittent bursts of central convection while Air Force Reserve Hurricane Hunter aircraft indicated a large (75-100 n mi) radius of maximum winds. This evolution was in contrast to that of Hurricane Michael a week-and-a-half before. Although of similar origin to the subtropical storm, Michael developed persistent central convection and completed a transition to a warm-core hurricane.

After reaching a 50 kt intensity early on 27 October, little change in strength occurred during the next 24 h. The storm turned northeastward and accelerated further on the 28<sup>th</sup> in response to a large and cold upper-level cyclone moving southward over southeastern Canada. A last burst of organized convection late on the 28<sup>th</sup> allowed the storm to reach a peak intensity of 55 kt. A strong cold front moving southward off the New England coast then intruded into the system, and the storm became extratropical near Sable Island, Nova Scotia, around 0600 UTC 29 October. The extratropical center weakened rapidly and lost its identity near eastern Nova Scotia later that day. It should be noted that the large cyclonic circulation that absorbed the subtropical storm was responsible for heavy early-season snowfalls over portions of the New England states and southeastern Canada.

b. Meteorological statistics

Table 1 shows the best track positions and intensities for the subtropical storm, with the track plotted in Figure 1. Figures 2 and 3 depict the curves of minimum central sea-level pressure and maximum sustained one-minute average “surface” (10 m above ground level) winds, respectively, as a function of time. These figures also contain the data on which the curves are based: satellite-based Hebert-Poteat and experimental extratropical transition intensity (Miller and Lander, 1997) estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch

(SAB) of the National Environmental Satellite Data and Information Service (NESDIS), and the Air Force Weather Agency (AFWA), as well as data from aircraft, ships, buoys and land stations.

The Air Force Reserve Hurricane Hunters flew two mission into the storm with a total of four center fixes. Central pressures on both flights were in the 997-1000 mb range, and the maximum flight level (1500 ft) winds were 60 kt on the first flight and 61 kt on the second. A weak temperature gradient was observed in the system on the first flight, suggesting that the cyclone still had some baroclinic characteristics. The second flight showed a uniform airmass within 100 n mi the center with temperatures of about 20-22C.

The storm had a large envelope, and many ships reported 34 kt or higher winds. Table 2 summaries these observations. There were few observations near the central core. Canadian buoy 44137 reported winds 160/39 kt with a pressure of 979.1 mb at 0200 UTC 29 October, which is the basis for the lowest pressure. Other reports from this buoy indicate that the winds increased in the last hour before the center passed, suggesting that some kind of inner wind maximum was present even as the storm was becoming extratropical. Earlier, a drifting buoy about 35 n mi southeast of the center reported a pressure of 996.6 mb at 2051 UTC 27 October, which showed that the storm had begun to deepen.

Sable Island, Nova Scotia, reported a pressure of 980.6 mb as the center passed over at 0600 UTC on the 29<sup>th</sup>. Maximum sustained winds were 35 kt after the center passage at 0700 and 0800 UTC. Several other stations in eastern Nova Scotia and southwestern Newfoundland reported sustained 35-50 kt winds around 1200 UTC on the 29<sup>th</sup>.

The maximum intensity of this system is uncertain. Satellite intensity estimates late on the 28<sup>th</sup> and early on the 29<sup>th</sup> along with a 35-40 kt forward motion indicate the possibility of 65-75 kt sustained winds. However, this is not supported by surface observations near the center early on the 29<sup>th</sup>. The maximum intensity is estimated to have been 55 kt.

#### c. Casualty and damage statistics

No reports of casualties or damage have been received at the National Hurricane Center (NHC).

#### d. Forecast and warning critique

No advisories were written on this storm, as a decision was made operationally to handle it in marine forecasts as an extratropical storm. Post-analysis of satellite imagery and of 27 October aircraft data are the basis for classifying the system now as subtropical. Due to the operational handling, there are no formal NHC forecasts to verify. Large-scale numerical models generally performed well in forecasting the genesis and motion of this cyclone. The models did mostly underestimate the intensification that occurred north of the Gulf Stream. However, this strengthening was fairly well forecast by the GFDL model.

No tropical cyclone watches or warnings were issued for this storm. Marine gale and storm

warnings were issued in high seas and offshore forecasts from Marine Prediction Center and the TAFB of the TPC. Gale warnings were also issued for portions of the North Carolina coastal waters by local National Weather Service offices.

#### References

Miller, D. W and M. A. Lander, 1997: Intensity estimation of tropical cyclones during extratropical transition. JTWC/SATOPSTN-97/002, Joint Typhoon Warning Center/Satellite Operations, Nimitz Hill, Guam, 9 pp.

Table 1. Best track, Subtropical Storm, 25-29 October 2000.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
25 / 0000	21.5	69.5	1009	30	extratropical low
25 / 0600	22.5	70.0	1007	35	extratropical gale
25 / 1200	23.5	70.9	1006	35	"
25 / 1800	24.5	71.7	1005	35	subtropical storm
26 / 0000	25.7	71.7	1004	35	"
26 / 0600	26.6	71.7	1003	35	"
26 / 1200	27.4	71.8	1002	40	"
26 / 1800	28.3	72.1	1000	45	"
27 / 0000	29.2	72.5	997	50	"
27 / 0600	30.0	72.6	997	50	"
27 / 1200	30.9	72.5	997	50	"
27 / 1800	32.6	71.6	996	50	"
28 / 0000	34.2	70.7	994	50	"
28 / 0600	35.7	69.9	992	50	"
28 / 1200	36.5	68.1	990	50	"
28 / 1800	38.0	65.5	984	55	"
29 / 0000	40.5	62.6	978	55	"
29 / 0600	44.0	60.0	980	50	extratropical
29 / 1200	46.0	59.5	992	45	"
29 / 1800					absorbed into larger extratropical low
29 / 0200	41.7	61.6	976	55	minimum pressure

Table 2. Selected ship observations of subtropical storm or greater winds associated with the subtropical storm, 25-29 October 2000.

<b>Ship (Name or ID)</b>	<b>Date/Time (UTC)</b>	<b>Lat. (°N)</b>	<b>Lon. (°W)</b>	<b>Wind dir/speed (deg/kt)</b>	<b>Pressure (mb)</b>
<b>Advantage</b>	25/0600	26.8	70.1	050/37	1011.0
<b>Dock Express 20</b>	25/1200	27.0	68.9	050/45	1009.0
<b>Splendour of the Seas</b>	25/1800	28.6	65.2	070/40	1015.0
<b>Guayama</b>	26/1200	27.1	74.6	010/40	1007.0
<b>Pacific Crane</b>	27/0600	35.4	67.5	110/38	1015.6
<b>Iver Express</b>	28/0000	29.3	71.1	230/38	1007.5
<b>Wilson</b>	28/0000	29.1	69.7	250/35	1011.5
<b>Mignon</b>	28/0000	35.0	73.8	020/44	N/A
<b>Charles Island</b>	28/1800	40.5	67.9	360/35	1000.0
<b>Buoy 44008</b>	28/1900	40.5	69.4	350/35 <sup>a</sup>	1005.7
<b>Nomzi</b>	29/0000	37.3	65.8	320/46	1004.7
<b>Buoy 44137</b>	29/0200	41.8	60.9	160/39 <sup>b</sup>	979.1
<b>WCY5331</b>	29/0300	43.8	60.6	130/45	985.7
<b>Buoy 44141</b>	29/0500	42.1	56.2	170/37 <sup>b</sup>	998.1
<b>Northern Venture</b>	29/0600	40.1	58.3	180/42	1001.3
<b>Buoy 44144</b>	29/0900	43.8	60.7	250/43 <sup>b</sup>	993.6
<b>3FSN8</b>	29/0900	44.0	60.0	250/44	994.4
<b>Buoy 44255</b>	29/1100	47.3	57.4	050/43 <sup>b</sup>	997.9

<sup>a</sup> 8 minute average wind

<sup>b</sup> 10 minute average wind

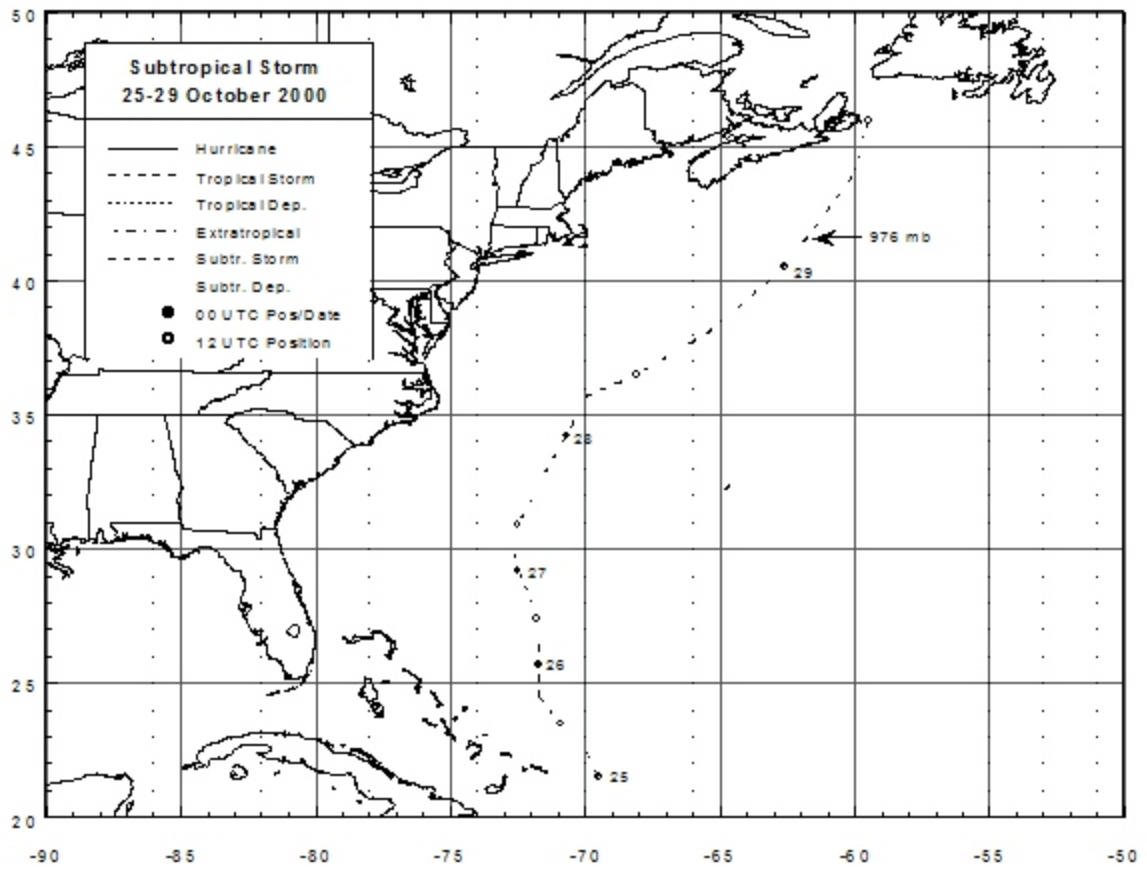


Figure 1. Best track for the subtropical storm, 25-29 October 2000.

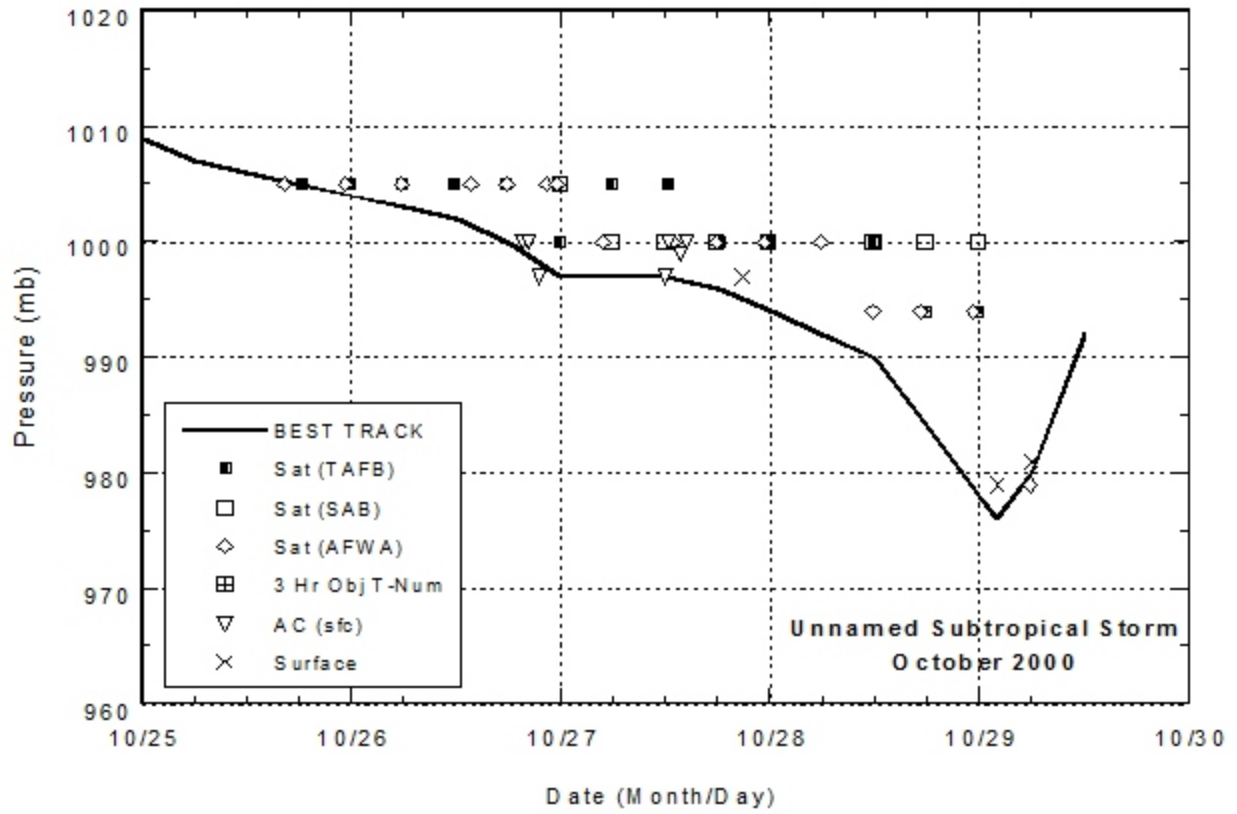


Figure 2. Best track minimum central pressure curve for the subtropical storm, 25-29 October 2000.

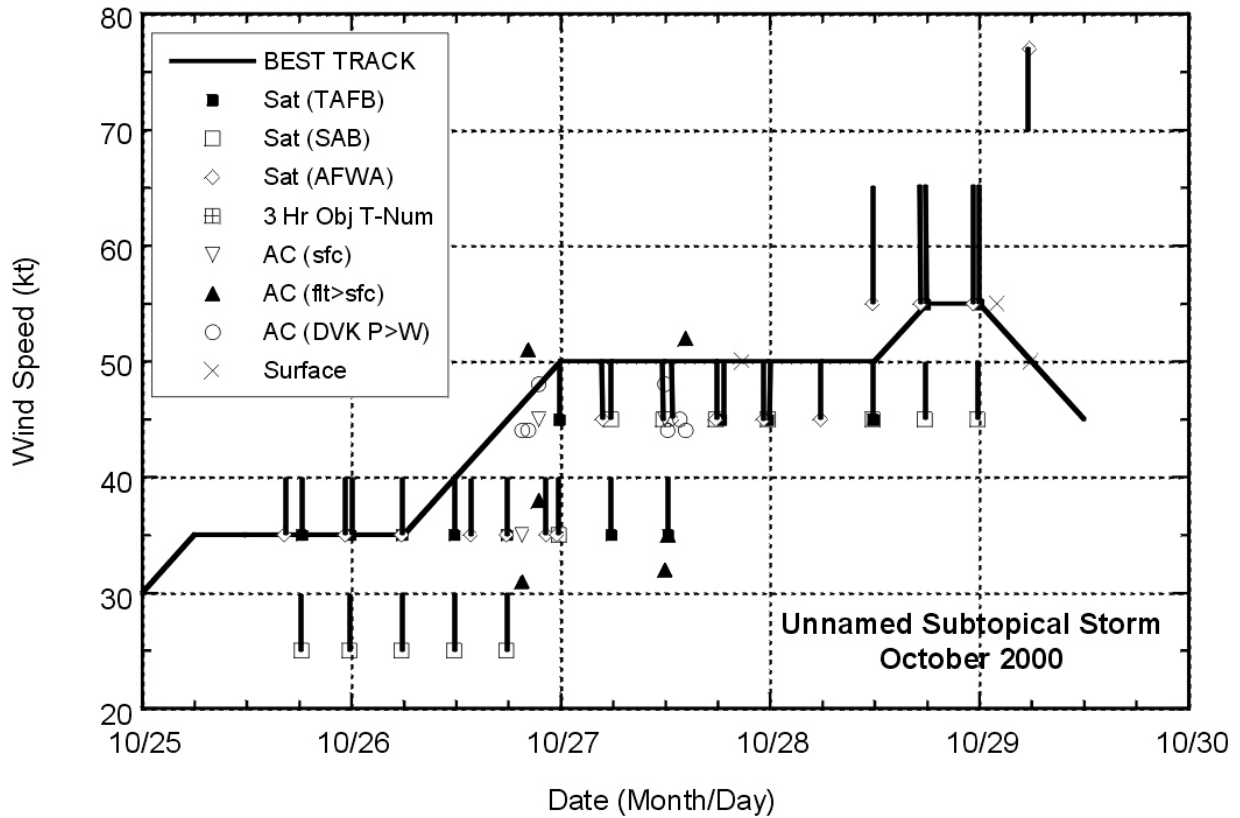


Figure 3. Best track maximum sustained 1-minute 10 meter wind speed curve for the subtropical storm, 25-29 October 2000. Vertical black bars denote wind ranges in subtropical and extratropical satellite intensity estimates.