THE TAMPA BAY STORM OF MAY 8, 1979

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The first six months of 1979 provided the Tampa Bay area with its share of anomalous weather patterns that not only confused and amazed professional meteorologists, but served the complacent public with notice that "it can happen here!" While all of the climatic variances that occurred during this period are noteworthy, the subject of this paper is the anomalous storm that occurred along a narrow band of unforecastable convergence in Pinellas and Hillsborough counties on Tuesday, May 8, 1979.

The Storm and Its Causes

To fully comprehend the meteorological complexity of the May 8th storm, it was necessary to investigate the weather conditions that existed on the previous day. This was accomplished by comparing surface and upper level charts for May 7, 1979. An examination of the 0700 (EDT) United States Weather Service surface chart of May 7 reveals no significant variation from a normal late spring day[1] (Fig. 1). Although a weak stationary front was located immediately north of Florida, extending from New Orleans to the Atlantic Coast, no unusual weather resulted from its presence. A relatively weak ridge of high pressure extended over most of the peninsula, causing a general southeast flow of moist tropical air across the state and resulting in seasonal afternoon thundershowers. One tenth of an inch of precipitation was recorded at the official Weather Service station at the Tampa International Airport. These conditions, in conjunction with an above-normal surface barometric pressure average, gave no indication of the impending severe weather change.

A study of the May 7, 0700 (EDT), 500 mb chart reveals a normal westerly flow across most of the continental United States, with one important exception[2] (Fig. 2). The 19,100' contour shows a definite convergence area located over the northern Gulf of Mexico and extending southward approximately 300 miles from the Mississippi border. While the convergence circulation was weak (convergence less than fifteen knots) and no closed isobars are in evidence, this strong dip in the westerlies does not normally occur this late in the spring season. This convergence area was also visible on the 300 mb chart and confirmed by the U.S. Weather Service radiosonde soundings taken at Ruskin, Florida, on this date.

Utilizing these charts and other available meteorological information, the official forecast for Tuesday was for typical late spring weather in regard to both temperature and pressure, with a slight increase in the possibility of precipitation. This official forecast was affirmed by local television weather forecasters during the Monday evening programs.

During the early morning hours of Tuesday, May 8, the weather pattern changed (Fig. 3). A low pressure area developed at the surface in the central Gulf region, approximately 500 miles west of the Tampa Bay area, and

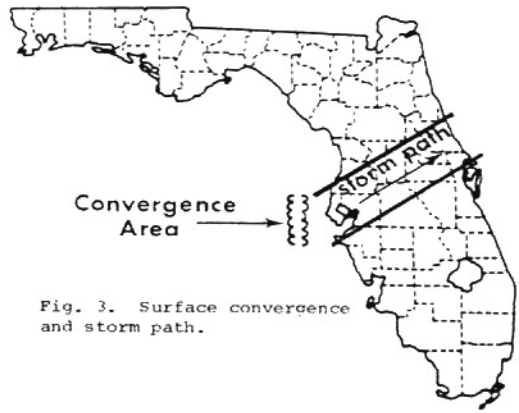

Fig. 3. Surface convergence and storm path.

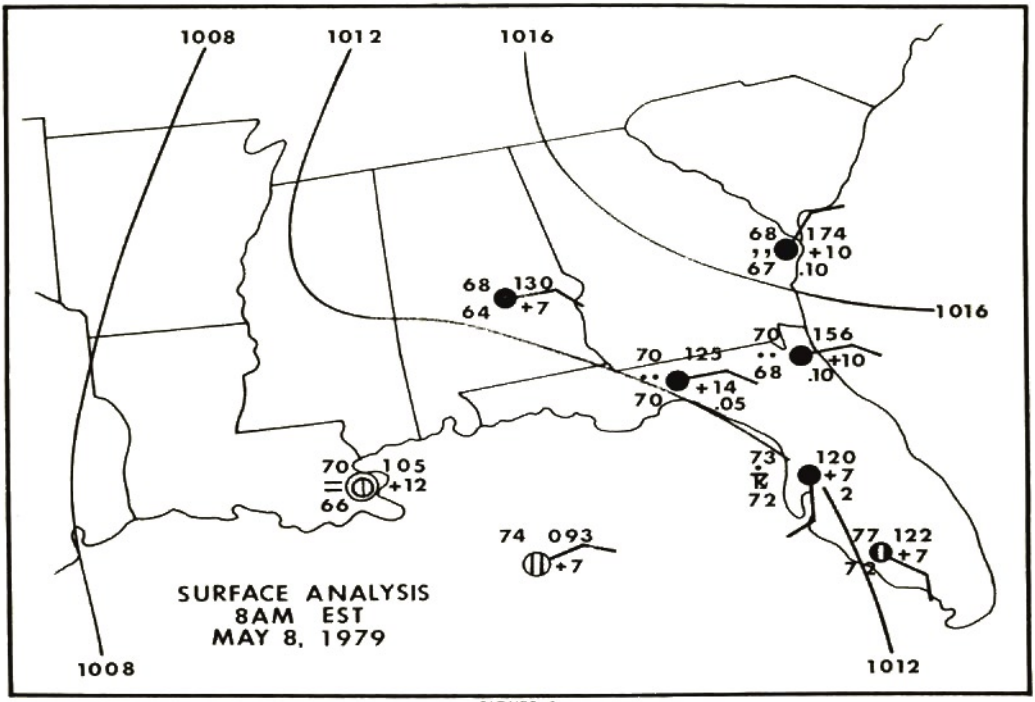

FIGURE 4

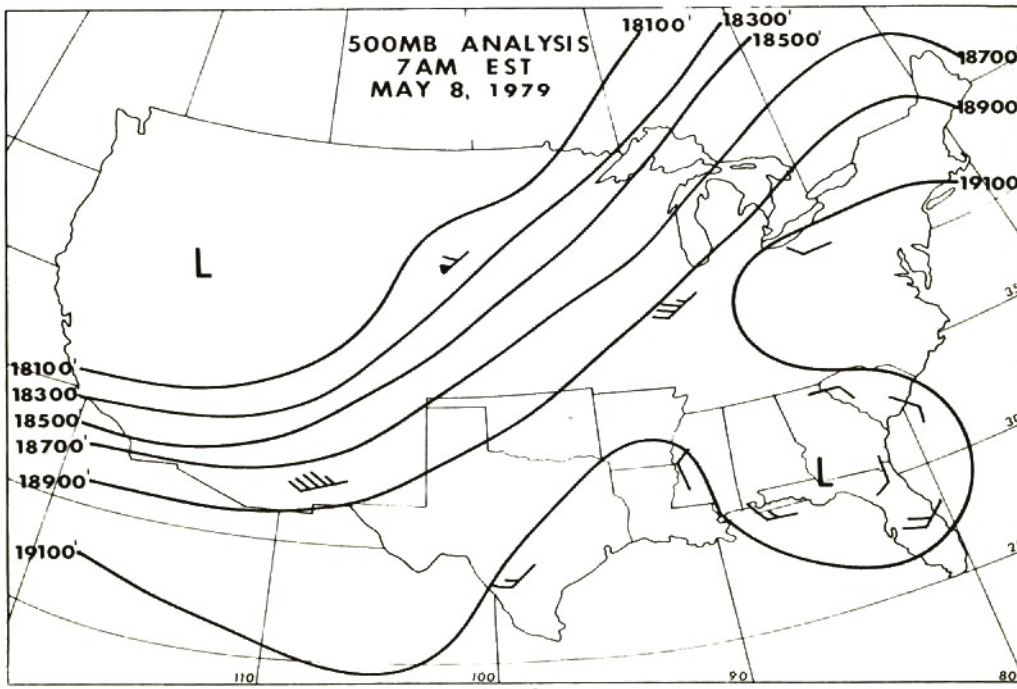

FIGURE 5

a narrow surface convergence zone developed thirty to fifty miles offshore, directly west of St. Petersburg. The first wave from the zone reached the coast at approximately 0400 (EDT) Tuesday morning. This wave was followed by three additional ones extending over a twelve-hour period. Although heavy precipitation was recorded during these waves, intermittent rain continued throughout the twelve hours.

It is interesting to note the geographical extent of this convergence zone. It extended from the northern section of Manatee County northward to the southern part of Pasco County, a distance of approximately forty miles. This narrow band then extended in a northwesterly direction across the state. The three succeeding waves also were confined to this region. The heaviest precipitation occurred along the immediate coastal sections during all of the waves and declined rapidly after reaching the eastern border of Hillsborough County, thus confining the main damage from the storm to an area of approximately forty square miles.

The effects of the first wave continued in the area for about an hour and ten minutes (0400-0510 EDT). During this period wind speeds that were officially measured exceeded thirty knots and were accompanied by 0.93 inches of rain.[3] Many coastal residents were awakened by machine-gun-like claps of thunder and strong strokes of lightning, resulting from numerous cumulonimbus clouds whose tops were estimated to have exceeded 30,000 feet.

The Weather Service surface facsimilie map received at the University of South Florida Weather Station at 0800 (EDT) confirmed the developing weather pattern[4] (Fig. 4). The map showed the lowest center of barometric pressure to be 1009.3 mb. This center was located at 26°N. latitutde and 90° W. longitute. An examination of the 0700 (EDT) 500 mb chart (Fig. 5) reveals the convergence area was still well developed and the dip extended to approximately fifty miles south of the Tampa Bay area.[5]

The second wave arrived over the coast at about 0715 (EDT) and continued until approximately 0815 (EDT). The heaviest concentration of rain, 3.23 inches, was officially recorded during this time.[6] Shortly after 0900 (EDT) the third wave arrived and brought 2.97 inches of rain.[7] A tornado touched down at Tampa International Airport, causing the air traffic controllers to leave the tower posts for approximately fifteen minutes. During this period, several of the local weather communications systems ceased functioning, either temporarily or for the remainder of the storm.

A total of nineteen tornadoes were reported from various local sources, although only fourteen were confirmed by the United States Weather Service in Ruskin, Florida (Fig. 6). Multiple touch-

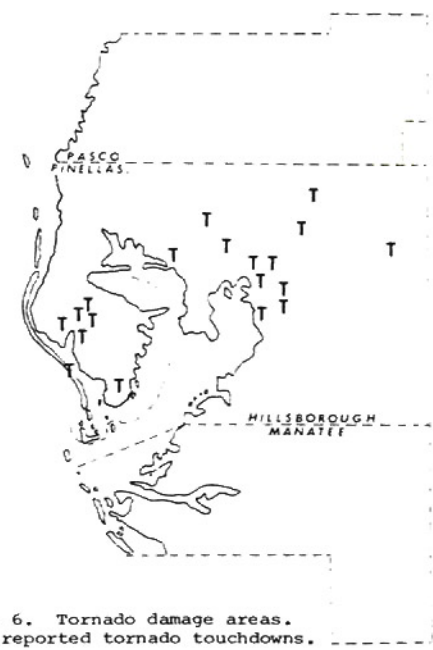

Fig. 6. Tornado damage areas.
T = reported tornado touchdowns.

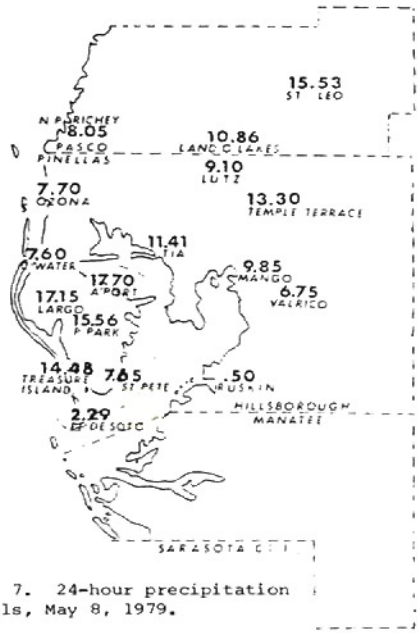

Fig. 7. 24-hour precipitation totals, May 8, 1979.

downs of the same tornado would explain the discrepancy. These severe storms were present in each of the four waves, but the most destructive ones occurred between 0730 and 1200 (EDT) hours Tuesday morning. One of the most destructive touchdowns occurred near Fowler Avenue, about four miles east of the University and was confirmed by the barograph chart at the University's Weather Station. The damage was extensive and will be discussed later.

This storm, in summary, broke all of the existing precipitation records for storms occurring in the month of May in Tampa. Tampa normally averages 2.85 inches of precipitation, making May the sixth driest month of the year. The total official precipitation recorded at the Tampa airport was 11.41 inches, approximately four times the normal average for this month[9] (Fig. 7). The previous official twenty-four-hour precipitation maximum for May was 3.97 inches, established in 1971.[10] Although the total official precipitation was 11.41 inches, rainfall totals varied over the four-county area from a low recording of 0.10 inches in Sarasota to 17.70 inches at the Pinellas County Airport.[11] This diversity of rainfall within the storm band was the result of the differing precipitation potential of individual storm cells.

The storm originated from a convergence area which formed in a dip of the southern flow of the westerlies at the 500 mb level, which, in turn, caused the formation of a low pressure area in the northern Gulf. This series of causal meteorological phenomena, in conjunction with the storm pattern, must be considered a noteworthy seasonal anomaly.

Consequences of the Storm

The subsequent storm damage was extensive within the prescribed geographical area. As a result of three deaths, millions of dollars in damage, and extensive cost of evacuation and rebuilding, Governor Robert Graham succeeded in having Pinellas and Hillsborough counties declared a Federal Disaster Area on May 15, 1979.

Throughout the two-county area thousands of cars were abandoned as flooding closed streets, highways, and several major exits of I-275. Over 100 homes were destroyed and close to 2,000 damaged by water and wind.[12] Businesses were literally swept away. Electric and telephone service was disrupted. SPCA "animal rescue" teams cruised the area. And, funseekers at Busch Gardens were turned away for the first time since 1973.

In Pinellas County heavy rains combined with low terrain, inadequate drainage and high tides to produce the most severe flooding. The geographical makeup of the region was the single most important causal factor. Pinellas County ranges in elevation from seventy-eight feet above sea level in the north

to a few feet above sea level in the south. The presence of extensive Gulf-connected waters in this region (Tampa Bay, Hillsborough Bay, Boca Ciega Bay, etc.) plus lowlying causeways make the surrounding environs particularly vulnerable to flooding that results from strong storm tides.

The landscape includes a maze of swamps, marshes, bayous, small lakes, canals, and porous soils which contribute to the overall run-off problem. Local drainage systems were designed to accommodate 6.68 inches in a twenty-four-hour period. County-wide systems were designated to accommodate eight inches of precipitation during the same period.[13] In addition, recent urban development has altered the natural drainage pattern by covering much open land with concrete and asphalt.

These factors, in conjunction with a precipitation that exceeded planned expectancy by at least 3.5 inches, resulted in general flooding. Many areas were submerged by two or three feet of water, and some areas were waist-deep with the additional overflow from lakes, creeks, and canals.

Hillsborough County sustained less flood damage than Pinellas County due to higher elevation, although 111 people were evacuated to three public shelters. The heaviest flooding occurred in the Interbay and East Tampa areas. In the northeast part of the county the new Tampa By-Pass Canal, though only eighty-five percent complete, helped minimize flooding.

The first confirmed tornado was sighted on the ground at Treasure Island (Pinellas County) with the storm's first onshore movement at 0400 (EDT). A lull ensued until the second storm wave of 0700 (EDT), when a tornado partially destroyed the Lamplighter Trailer Park on Fowler Avenue in Tampa. The tornado destroyed twelve and damaged 300 of the 600 trailers in the park before skipping through the adjacent area selectively damaging homes and businesses.[14] During the third wave, tornado activity began in eastern Hillsborough County where dozens of homes were razed, three chicken farms were destroyed, and Brooker Elementary School in Brandon was damaged. Most tornado activity closed with a flurry at noon in East Tampa and central Pinellas County. Ironically, the last confirmed touchdown occurred on Treasure Island at 1330 (EDT).

In the storm's aftermath the immediate concern was clean-up and the availability of aid. The Red Cross set up several shelters and would ultimately expend $270,000 in assistance grants.[15] National Flood Insurance protected many homes and businesses, but for those who thought they were safe because they "weren't low enough" coverage now amounted to two feet of water rather than a check. On May 17, 1979, federal and state agencies were mobilized under the FDAA to process applications for Federal Disaster assistance. Of 979 applications in the two counties, 395 loans were approved for approximately $2 million.[16]

Conclusion

This anomalous storm of May 8, 1979, which brought to the Tampa Bay area record rainfall and fourteen accompanying tornadoes, delivered an ominous warning. The "it can't happen here" attitude has at least temporarily been squelched. The resulting flooding and tornado damage has placed the populace on notice that proper storm preparedness is essential. City and county planning commissions are being forced by public clamor to take a second look at existing drainage systems and building codes. If propitious steps are taken, then the lessons learned from this unforecastable storm of May 8, 1979, could be a blessing in disguise.

* * *

1. U.S. Department of Commerce, *Daily Weather Maps--Weekly Series* Washington, D. C.: Government Printing Office, 7 May, 1979).

2. Ibid.

3. U.S. Weather Service, Officials Records (Ruskin, Florida, 8 May 1979).

4. National Weather Service, Surface Analysis Facsimile Map No. 75 (12Z Tues., 8 May 1979).

5. Department of Commerce, *Weather Maps*, 8 May 1979.

6. Weather Service, Official Records.

7. Ibid.

8. Ibid.

9. Ibid.

10. U.S. Department of Commerce/NOAA, "Climate in Florida," *Climates of the States* No. 60-8 (Washington, D.C.: Government Printing Office, June, 1972), p. 20.

11. Weather Service, Official Records.

12. *St. Petersburg Times*, 16 May 1979, p. A12.

13. Interview with Tom McGrew, Pinellas County Engineering Department, Clearwater, Florida, 30 August 1979.

14. *Tampa Tribune*, 9 May 1979, p. A1.

15. Interview with Bill Scarpitta, Hillsborough County Emergency Preparedness Office, Tampa, Florida, 5 September 1979; *St. Petersburg Times*, 26 May 1979, p. B5.

16. Scarpitta, interview; interview with Guy Danes, Pinellas County Civil Defense Office, Clearwater, Florida, 6 September 1979; Small Business Administration, FDAA Records 8 May 1979 Storm, Tampa, Florida.