

## TROPICAL STORM AMELIA

July 30-31, 1978

The disturbance that became Amelia moved off the African coast as a tropical wave on July 19. It remained a weak system without much deep convection until it reached the central Caribbean Sea on July 26. A marked increase in convection was evident on July 28 as the disturbance approached the Yucatan Peninsula. On July 29th, as the wave moved off the Yucatan Peninsula into the southwestern Gulf of Mexico, convection increased and the cloud mass took on a circular appearance on satellite pictures. No circulation was observed at this time.

By the morning of July 30, the disturbance had turned toward the northwest and cloud banding suggested that a circulation center was developing. This assessment was confirmed by a U. S. Air Force reconnaissance flight during the early afternoon of July 30, at which time the system was designated a tropical depression. Amelia became a tropical storm later in the afternoon after surface winds of 45 kt were estimated by the reconnaissance flight. Lowest surface pressures measured by the flight did not support tropical storm winds, but reports from land stations indicated the pressure might have been as low as 1005 mb. Classification by the Miami Satellite Services Field Station indicated a maximum wind of no more than 30 kt during the life of the storm.

The center of the storm, never well defined, skirted the south Texas coast during the afternoon and evening of July 30, and crossed the coast south of Corpus Christi during the night of July 30-31. The surface center of circulation could be traced inland to the west of San Antonio during the night of July 31 - August 1, after which it became indistinct.

The increase in convection noted on July 26 occurred as the disturbance came under anticyclonic flow at 200 mb. The flow over the developing system became increasingly anticyclonic on subsequent days as it turned toward the northwest, thicknesses in the 1000-200 mb layer increased and the vertical shear decreased. These conditions along with warm sea-surface temperatures favored development. The intensification ended when the center passed over land. The moisture-laden tropical air that moved into Texas during and after the storm's inland passage provided the water which later produced catastrophic flooding over portions of the state.

Brownsville, Texas, the closest United States weather station to the center of the storm at landfall, reported highest sustained winds of 34 kt with gusts to 38 kt. The U. S. Coast Guard at South Padre Island reported 40 kt winds.

At Corpus Christ, highest sustained winds were 33 kt and the peak gust was 50 kt. A Coast Guard Cutter 60 miles southeast of Corpus Christi reported gusts of 65 to 70 kt. Rainfall was generally light in the Brownsville area, mostly less than one-half inch. Amounts of 4 to 5 inches were reported at various points farther north along the coast.

Damage in the coastal areas consisted mainly of the sinking of several shrimp boats and beaching of sail boats off Brownsville. Some trees and fences were blown down and there was an undetermined amount of damage to crops, primarily cotton. Extremely heavy rains fell inland in Texas, after the system no longer had a discernable surface low-pressure center. Disastrous flooding occurred in a number of river basins. Especially hard hit were the Guadalupe river and its tributaries. There were around 30 fatalities and extensive damage occurred. Complete damage and casualty surveys are not available at this writing.

The heaviest rains and most severe flooding did not take place until two to three days after the center of the storm moved inland. For several days there was a continuous flow of moist tropical air from the southeast. As has happened in the past when tropical storms move into Texas, the rainfall was greatly enhanced by the orographic effect of the Edwards Plateau. Amounts up to 30 inches were reported over a two-day period.

J. R. H.

## PRELIMINARY BEST TRACK

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<u>DATE</u>	<u>TIME</u> <u>(GMT)</u>	<u>LAT.</u> <u>(°N)</u>	<u>LON.</u> <u>(°W)</u>	<u>PRESSURE</u> <u>(MB)</u>	<u>MAX.</u> <u>WIND</u> <u>(KT)</u>	<u>CLASSIFICATION</u>
30/15		25.1	96.7	1008	30	TROPICAL DEPRESSION
30/18		25.7	97.0	1006	30	
31/00		26.4	97.4	1005	45	TROPICAL STORM
31/06		27.2	97.8	1007	40	
31/12		28.0	98.2	1008	35	
31/18		28.6	98.7	1010	30	TROPICAL DEPRESSION
01/00		29.3	99.2	1010	25	

