

CLIMATOLOGICAL DATA FOR JUNE, 1913.

DISTRICT NO. 8, TEXAS AND RIO GRANDE VALLEY.

B. BUNNEMEYER, District Editor.

TORRENTIAL RAINFALL AT MONTELL, TEX.

On the 28th a Gulf disturbance of moderate intensity moved inland near Corpus Christi, where a wind velocity of 50 miles per hour from the southeast was recorded. The storm apparently broke up over the upper Nueces watershed after giving copious rains in that section. The center of heaviest precipitation was at Montell, Uvalde County, where from 2.30 p. m. June 28 to 9 a. m. June 29 the fall amounted to 20.60 inches, being equivalent to an average rate of 1.11 inches per hour for 18½ consecutive hours. Uvalde, in the same county, and less than 30 miles southeast of Montell, reported a rainfall of 8.50 inches from 1 p. m. June 28 to 6 a. m. June 29. These rains caused considerable damage in that section, flooding the lowlands, washing away houses and stock, and interrupting traffic and communication by telegraph and telephone for several days. One person was drowned in the vicinity of Montell.

The rainfall at Montell is the heaviest 24-hour precipitation of record in Texas, and the next heaviest is 18 inches, occurring at Fort Clark on June 14-15, 1899. It is remarkable that these torrential rains should have occurred in the same section of the State and in corresponding months. Fort Clark, although in Kinney County, is only about 30 miles southwest of Montell. The normal rainfall for June in that section is less than 3 inches, and for the year does not exceed 24 inches.

THE STORM OF SEPTEMBER 3, 1913, IN EASTERN NORTH CAROLINA.

By LEE A. DENSON, Section Director, Raleigh, N. C.

The morning weather map of September 1, 1913, revealed the presence of a disturbance, apparently of very moderate force, central in the Atlantic Ocean about 300 miles southeast of the coast of North Carolina in which the lowest pressure was about 29.9 inches. On the morning of the 2d this storm was evidently approaching the coast, the pressure having fallen to 30.05 inches at Hatteras, with high northeast winds and rain. The center of the disturbance moved inland between Hatteras and Beaufort, N. C., took a westerly course, and passed south of Raleigh about 2 p. m. of the 3d. The barograph trace at this station is of interest in showing the rapidity of the fall and rise of pressure, although the lowest pressure reached was only 29.37 inches at 2.10 p. m. of that date. After leaving the coast section the storm diminished rapidly in intensity and finally spent its force before reaching the mountain region. Over the main portion of the eastern half of the State it was attended by high winds and a rainfall of from 2 to 5 inches, but the rainfall was not heavy after reaching the Cape Fear watershed. Great damage to property and crops resulted over the eastern portion of the State, especially in the Pamlico Sound section, owing to the high waves from the Sound. The highest wind velocity registered was 74 miles from the southeast at Hatteras. At Raleigh the maximum velocity was 37 miles from the northeast, at Wilmington 30 miles from the west, while at Charlotte there was no wind of any consequence.

The greatest loss of property occurred in the vicinity of Washington and Newbern, where the water driven by northeast to southeast gales is reported to have risen 10 feet above previous high-water marks. The bridge of the Norfolk & Southern Railroad at Washington, a mile in length, was washed away, and also a similar bridge at Newbern, and many other small bridges and trestles. The loss by inundation of the lower streets, also to small boats and fishing craft, was very heavy. Telegraph and telephone lines were prostrated or damaged over a wide area. Crops suffered severely, there being considerable damage even as far west as Wake and Durham Counties. At Farmville, N. C., two boys were killed by the collapse of a warehouse, and several people were injured. The total loss of property was probably over \$3,000,000.

In the vicinity of Norfolk, Va., the damage by wind was not great. In the open country telegraph and telephone poles and trees were blown down, and at Ocean View, Newport News, and Old Point, Va., a number of small houses were unroofed. There were no marine disasters in Hampton Roads.

WEATHER FORECASTS AND WARNINGS.

By H. C. FRANKENFIELD, Professor of Meteorology.

mained high over New England and the northeast winds on the North Carolina and Virginia coasts were increasing. On the morning of September 3, the storm center was very near the northeastern North Carolina coast, a radiogram from a vessel near Hatteras reporting a wind velocity of 56 miles an hour from the south, while at Cape Henry, Va., at the same time it was 46 miles an hour from the northeast. The rains had extended into North Carolina and Virginia and pressure had fallen considerably to the northward, but there were no high winds north of the Virginia Capes. Northeast storm warnings were then ordered extended from Norfolk to New York. By 1 p. m. of the 3d the storm center had passed inland to Raleigh, N. C., where the barometer reading was 29.44 inches, and the wind velocities ranged from 38 to 48 miles an hour between Raleigh and Cape Henry. Directly eastward to the coast the storm was more severe and telegraph communication had ceased early in the day. By 8 p. m. of the 3d, the storm, central over interior North Carolina, had spent its force, without any high winds north of Virginia, and on the following morning it was central as a very moderate low over the mountains of North Carolina. Later it drifted westward without further change, and was lost over eastern Texas during the 6th without effect during the last three days of its existence other than general and frequently heavy showers in the south Atlantic and Gulf States. While the storm caused only a few marine disasters, it did great damage in eastern North Carolina and the loss of 5 human lives was reported. The losses were of the character usually experienced during great storms and they are said to have amounted to four or five millions of dollars.

WEATHER IN THE UNITED STATES.

On the morning of September 1, when pressure was high over New England and low west of the Mississippi River, radiograms from vessels in approximately latitude 33° north and longitude 75° west showed falling pressure and strong north winds, indicating the presence of a disturbance a short distance to the southeastward. On August 29 there was a slight pressure fall over the Windward Islands to the southeastward and the fall probably drifted normally to the northwestward without attaining true cyclonic development until assisted by the heat and moisture of the Gulf Stream during the night of August 31-September 1. Storm warnings were ordered from Wilmington, N. C., to Norfolk, Va., and on the morning of September 2, while no radiograms from the vicinity were received, it was apparent that the storm center was approaching the North Carolina coast. Pressure re-

WEATHER, FORECASTS, AND WARNINGS.

By EDWARD H. BOWIE, District Forecaster.

NORTHERN HEMISPHERE PRESSURE.

On the evening of the 6th there were some indications of a disturbance off the Carolina coast, and advices were accordingly disseminated to ports along the Atlantic coast. By the morning of the 7th pressure had fallen slightly, and further advices were issued to coast cities to the effect that high shifting winds were to be expected off the Carolina and Georgia coasts. By the morning of the 8th the pressure at Charleston had fallen to 29.66 inches, wind northwest, 34 miles an hour, and during the next 12 hours the disturbance passed inland north of Charleston. The storm decreased in intensity and remained over the South Atlantic States until the 12th as a very weak disturbance. It then moved northward to a position off Nova Scotia by the morning of the 13th. This storm regressed slightly to a position off Nantucket and remained off the New England coast until the evening of the 16th, causing storm winds on the Atlantic coast from New York northward, warnings for which were disseminated on the 14th. Precipitation occurred in connection with this storm throughout the Atlantic States.

The following extracts are taken from the report of the Weather Bureau official at Charleston, S. C., regarding this storm:

The storm center evidently moved inland just south of Georgetown, S. C., about noon of the 8th. The best obtainable description of the storm at that place is taken from the log of the U. S. dredge, *Winyah Bay*, which was in Georgetown Harbor. The weather changes there noted are corroborated in less complete reports by the storm warning displayman at South Island and Georgetown. A synopsis of the report furnished by Capt. DeWitt C. Conklin of the dredge is given below:

Tuesday, October 7.—Fresh north to strong northwest wind, hauling to north again during the afternoon. Barometer 29.86 at 7 a. m., and falling during the day.

Wednesday, October 8.—Barometer, 7 a. m., 29.35; 8 a. m., 29.29 and unsteady, ranging from 29.29 to 29.35. Strong northerly gales and violent squalls with heavy rain. About 10 a. m., wind moderated and weather improved. Wind hauling to northeast. Toward noon wind moderated to light breeze hauling more to the east. During the afternoon wind increased to fresh gale from southeast with squalls, rain and slowly rising barometer.

Thursday, October 9.—At 10 a. m., barometer 29.75; 5 p. m., 29.75, remaining about same all day. Fresh gales from south-southeast and heavy squalls with heavy rain, breaking away about noon and wind moderating. Weather cloudy during afternoon and light squalls with rain about 5 p. m., wind having hauled to southeast to south.

By comparison with the morning weather map of October 7, it is roughly estimated that the barometer used by Capt. Conklin gave readings about 0.10 inch too low.

At Charleston the wind shifted in the opposite direction. It was highest during the morning of the 8th and held northwest until about noon, then went west till about 3.30 p. m., southwest until about 11 p. m., then south. During the early morning the wind increased to a maximum velocity of 37 miles from the northwest at about 9.30, subsequently diminishing very gradually to velocities below 25 miles an hour after 5 p. m. With the shift to south, it again increased in velocity, reaching a maximum of 34 miles shortly after midnight of the 8th. The lowest barometer reading was 29.58 inches at 2 p. m. However, if we eliminate the effect of the regular diurnal variation, it appears that the lowest pressure due to the storm occurred about 11 a. m. to 1. p. m.

Torrential rains accompanied the storm, the total amount at Charleston on the 8th and 9th being 4.48 inches, and reports indicate that amounts were greater farther north.

There was practically no damage either at Georgetown or Charleston, or, so far as reports indicate, at any point. The storm warnings disseminated on the 7th enabled owners of floating property to take the necessary precautions. Owing to failure of telegraph and telephone wires, the hurricane warnings were not received at Georgetown.