

AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE in charge]

By B. FRANCIS DASHIELL

NOTE.—The text and tables for this section will be published in a later issue of the REVIEW.—*Ed.*

RIVERS AND FLOODS

[River and Flood Division, MERRILL BERNARD in Charge]

By THOMAS S. SOUTHWICK

Rainfall during June was generally above normal in the eastern part of the country except for the Northeast. Rainfall was much less abundant in July, above normal rainfall occurring only in the Ohio Valley region, portions of the south Atlantic coast and the Far West. In the Northeast, rainfall was very scanty and streams in New England were at quite low stages.

Floods were not numerous nor especially severe except for an extraordinary "flash" flood in Kentucky early in July. The floods during June and July were generally the result of locally intense rainstorms characteristic of summer. Flood stages were usually of short duration and of local extent except in the low lying rivers of the lower Mississippi basin.

Detailed damage figures are given in a table at the end of this article.

Atlantic Slope drainage.—Locally heavy rains occurred over the South Atlantic States from July 19 to 22 in association with frontal activity. Streams were at fairly low stages and flood stage was exceeded only on the Cape Fear and Neuse Rivers. Flooding was slight with practically no damage.

East Gulf of Mexico drainage.—High stages continued to prevail on the Tombigbee River with flood stage being attained during the first week in June at some stations and throughout its length at various dates from June 16 to 28. These floods were the result of the rises of May occasioned by the heavy rains during the last 2 weeks of May, augmented by the rainfall from frequent and widely distributed thundershowers of June. Stages were moderate on the Tombigbee, although extreme stages were reported on some of the Northeastern tributaries. However, these floods, occurring as they did during the growing season, caused widespread damage, estimated at over 3 millions of dollars. Approximately 200,000 acres of land were inundated.

The Bogue Chitto and Pearl Rivers went above flood stage early in June. Stages and consequent damage were moderate.

Mississippi System—Upper Mississippi Basin.—A progression of lows across the basin from June 11 to 22 resulted in enough rainfall to raise the streams, but the only flood situation was in the lower Chippewa River. The river at Durand, Wis., was only slightly above flood stage on June 22 and 23, and only slight damage resulted from the flooding of basements.

In northeastern Missouri the passing of a low resulted in heavy and fairly widespread rains on the night of June 20-21. This rain caused a rapid rise in the Salt River which resulted in the flooding of considerable farm land and extensive damage to crops and other farm property.

The Salt River went slightly above flood stage on July 26 as the result of thunderstorm rains. There was nominal damage to prospective crops.

Heavy showers resulted in the Republican, Big Blue, and Grand Rivers going above floodstage during the

period June 22 to 28. Except for the lower reaches of the Grand River, the period above flood stage at each point was only 1 or 2 days. Stages were slight to moderate with little damage reported.

In July, local rains caused slight flooding at Chillicothe, Mo., on the Grand River on the 5th and at Beloit, Kans., on the Solomon River on the 27th. There was no damage.

Ohio Basin.—Cyclonic development over Ohio on June 18 caused heavy showers in the upper portions of the Scioto and Olentangy Rivers. The rainfall averaged between 4 and 5 inches, but the low stages prevailing at the time caused only minor flooding to take place. There was some damage to prospective crops.

A local, but devastating "flash" flood occurred in eastern Kentucky on July 5. Very heavy rains resulted from thunderstorms associated with a cold front. The towns of Farmers, Clearfield, Morehead, and Keck were inundated by the sudden overflow. There were 79 lives lost according to the American Red Cross. The flood occurred on small streams on which the Weather Bureau does not maintain river gages; hence no stages are listed. This disastrous flood is described by W. C. Devereaux, official in charge at the Cincinnati, Ohio Weather Bureau Office as follows:

Torrential rains, varying in amount from 2.5 inches to more than 9 inches, fell in a few hours over portions of eastern Kentucky during the night of July 4-5, 1939. The topography of this section of the State is mountainous. The mountain ranges extend in a northeast-southwest direction and are separated from each other by deep and narrow valleys. It is therefore not surprising that rainfalls of the proportions mentioned above, falling in from 2½ to 4 hours, should cause the normally placid creeks and small streams to become raging torrents causing destruction to life and property. The floods were nearly all confined to the creeks and small streams entering the upper Licking and upper Kentucky Rivers. The only river gaging station on the Licking River in this district to report flood conditions was at Farmers, Ky., where a crest of 25.25 feet was recorded at 10:06 a. m., on July 5th, 0.25 foot, above flood. At Jackson on the upper Kentucky River 3.75 inches of rain fell between 3:15 a. m. and 8 a. m. on July 5th. The crest stage of the river was 20.40 feet, at 6 p. m. on the 5th (flood stage 28 feet).

Heavy rainfall associated with a low that traversed Indiana on the night of July 17-18 resulted in one of the flashiest floods of record in the middle upper reaches of the Wabash River. Rainfall amounts, in a relatively small area centered over Covington, Ind., averaged 3 inches. The Wabash River at Covington rose 11.6 feet in 24 hours, but fortunately the local extent of the rain and the low summer stages then prevailing prevented other than minor flooding. Moderate damage was reported.

White, Arkansas, and Red River Basins.—The White River below Georgetown, Ark., was slightly above flood stage at the beginning of June from the rains of April and May. Moderate stages on the lower Mississippi River during the first half of May delayed run-off in the lower White River. This condition, augmented by normal rainfall during May and early June, maintained the river above flood stage for about 2 weeks. Little damage was reported.

Heavy rains over the North and South Canadian Rivers during the last 10 days of June caused flash floods at several localities. Moderate damage was reported. The North Canadian River at Canton, Okla., went slightly above flood stage again on July 4.

The Sulphur River at Ringo Crossing, Tex., went slightly above flood stage on June 2, as the result of moderate local rains.

Lower Mississippi Basin.—The Coldwater River at Coldwater, Miss., went slightly above flood stage from June 13 to 16 and again from July 4 to 6 as the result of local rains.

The Tallahatchie River rose above flood stage at Swan Lake, Miss., on June 25 from moderate rains and remained above flood stage until July 12. The crest stage of 28.5 feet was not excessive, but a considerable acreage was flooded. This overflow, coming as it did during the growing season, resulted in an appreciable amount of damage.

West Gulf of Mexico drainage.—Heavy rains over a portion of the upper watershed of the Colorado River caused flash floods at Snyder, Tex., and Colorado City, Tex., on June 20 and 21. As the Weather Bureau does not maintain any river gages in this section no stages are listed. Damage was extensive, a railroad bridge, 8 tank cars and a number of houses being demolished. The flood water was impounded above Buchanan Dam, and stages downstream changed but little.

Correction.—In the March 1939 issue of the MONTHLY WEATHER REVIEW, on page 74, in the description of the Ohio River flood, it was incorrectly stated that higher stages were reached on the Walhonding River than in 1937. The crest stage at Walhonding, Ohio, was 16.2 feet on March 13, 1939, as compared with a crest of 16.9 feet on January 15, 1937.

Flood damage—June–July 1939

Drainage and river	Tangible property	Matured crops	Prospective crops	Livestock and other movable property	Suspension of business	Total
EAST GULF OF MEXICO DRAINAGE						
Tombigbee.....						\$3,500,000
Pearl.....	\$5,000	\$1,000			\$5,000	11,000
MISSISSIPPI SYSTEM						
<i>Upper Mississippi Basin</i>						
Chippewa.....	1,645		\$70,000		5,500	1,645
Salt.....						75,300
<i>Missouri Basin</i>						
Republican.....		5,000				5,000
Big Blue.....	8,500					8,500
<i>Ohio Basin</i>						
Olentangy.....			10,000			10,000
Scioto.....			52,000			52,000
Wabash.....	10,000	3,000	2,600	\$500		16,100
<i>White Basin</i>						
White ¹			6,800	500		7,100
<i>Arkansas Basin</i>						
North Canadian.....	14,800	7,500	22,950			42,250
South Canadian.....	28,000	4,100	4,000			36,100
<i>Lower Mississippi Basin</i>						
Tallahatchie.....			125,000			125,000
WEST GULF OF MEXICO DRAINAGE						
Colorado.....	350,000					350,000

¹ Survey by United States engineers; includes floods of May 1939.
² Includes damage for April and May.

Table of flood stages during June and July 1939

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
Cape Fear: Lock No. 2, Elizabethtown, N. C.....	<i>Feet</i> 20	July 23	July 23	<i>Feet</i> 22.0	July 23.
Nense:					
Smithfield, N. C.....	13	July 21	do	14.0	July 22.
Goldsboro, N. C.....	14	July 24	July 27	15.4	July 26.
EAST GULF OF MEXICO DRAINAGE					
Tombigbee:					
Aberdeen, Miss.....	34	June 19	June 22	37.0	June 20.
Lock No. 4, Demopolis, Ala.....	39	June 3	June 7	41.4	June 5.
Lock No. 3, Ala.....	33	June 19	June 25	43.7	June 22.
Lock No. 2, Ala.....	46	May 31	June 13	43.4	June 5.
Lock No. 1, Ala.....	31	June 16	June 20	45.7	June 22.
Bogue Chitto: Franklinton, Ala.....	11	June 20	June 21	46.9	June 23.
Pearl: Pearl River, La.....	12	June 3	June 13	32.8	June 9.
		June 4	June 28	32.8	June 24–25.
		June 20	June 6	13.6	June 4.
		June 1	June 14	15.6	June 8.
MISSISSIPPI SYSTEM					
<i>Upper Mississippi Basin</i>					
Chippewa: Durand, Wis.....	11	June 22	June 23	11.4	June 22.
Salt: New London, Mo.....	19	June 21	do	22.5	Do.
		July 26	July 26	20.6	July 26.
<i>Missouri Basin</i>					
Colomon: Beloit, Kans.....	18	July 27	July 27	18.6	July 27.
<i>Republican:</i>					
Guide Rock, Nebr.....	9	June 22	June 23	9.4	June 22.
Scandia, Kans.....	9	June 23	do	9.4	June 23.
Concordia, Kans.....	8	do	do	8.0	Do.
Big Blue: Randolph, Kans.....	19	June 26	June 26	19.8	June 26.
<i>Grand:</i>					
Gallatin, Mo.....	20	June 22	June 23	22.1	June 23.
Chillicothe, Mo.....	18	June 21	June 24	26.6	Do.
Brunswick, Mo.....	12	July 5	July 5	19.1	July 5.
		June 21	June 28	15.4	June 25.
<i>Ohio Basin</i>					
Olentangy: Delaware, Ohio.....	9	June 18	June 20	14.0	June 19.
<i>Scioto:</i>					
La Rue, Ohio.....	11	June 20	do	11.8	June 20.
Prospect, Ohio.....	10	June 21	June 21	10.0	June 21.
Chillicothe, Ohio.....	16	do	June 22	17.4	June 22.
<i>Wabash:</i>					
Covington, Ind.....	16	July 18	July 18	16.4	July 18.
Terre Haute, Ind.....	14	July 29	July 30	14.1	July 20
<i>White Basin</i>					
White:					
Georgetown, Ark.....	21	May 19	June 7	23.0	June 1–2.
Clarendon, Ark.....	26	May 26	June 14	27.8	June 5–6.
St. Charles, Ark.....	25	June 1	June 15	25.8	June 6–9.
Arkansas Basin					
North Canadian:					
Woodward, Okla.....	5	June 25	June 25	5.4	June 25.
Canton, Okla.....	9	do	June 26	10.0	June 26.
Yukon, Okla.....	8	July 4	July 4	9.3	July 4.
East Oklahoma City, Okla.....	14	June 24	July 18	12.6	June 28; July 6.
		June 28	June 29	15.0	June 28.
Red Basin					
Sulphur: Ringo Crossing, Tex.....	18	June 2	June 2	20.6	June 2.
Lower Mississippi Basin					
Coldwater: Coldwater, Miss.....	13	June 13	June 16	13.6	June 15.
Tallahatchie: Swan Lake, Miss.....	26	July 4	July 6	13.5	July 5.
		June 25	July 12	28.5	July 1–2.