

MISSISSIPPI SYSTEM

Upper Mississippi and Missouri Basins.—Temperatures considerably above normal throughout the Upper Mississippi and Missouri River Basins caused an early spring break-up. The rapid thawing of the snow combined with above normal precipitation, except in southwestern South Dakota and western Nebraska, produced extremely heavy run-off. Ice was unusually heavy in many streams, particularly in the Missouri River Basin, and local flooding resulted from backwater from ice gorges that formed during the break-up. Ice was heavy in the Knife and Heart River Valleys, causing ice jams and heavy local flooding. The most serious damage occurred along the highway between Bismarck and Mandan, N. Dak., because the ice and water could not get into the frozen Missouri River. The highway and adjacent bottom lands were completely covered with cakes of ice from 1 to nearly 3 feet in thickness. The highway was covered with about 4 feet of water from March 13 through March 18 and was opened for traffic on the 19th. Property damage along the Heart River amounted to about \$60,000.

An ice gorge also developed on the main Missouri River at what is known as Michaelsen Bend about 5 miles below Blair, Nebr., causing a rise at Blair on the 12th. A stage of 19.25 feet, believed to be approximately the crest, was reached about noon. By 6 p. m. the river had fallen to a stage of 17.2 feet.

Flood stages were experienced in many of the Mississippi and Missouri River tributaries in Minnesota, Wisconsin, North and South Dakota, Iowa, Nebraska, Kansas, Missouri, and Illinois, as shown by the table at the end of this report. Flood stages were also exceeded on the Mississippi River from Minneapolis, Minn., downstream and on the Missouri River at and below Waverly, Mo.

Damage from these overflows was comparatively light since they occurred well in advance of the crop season, in contrast to the floods of May and June 1944. There was some damage to bridges, highways, fences, railroads, etc., mainly from ice action, but aggravated by rapidly rising water.

THE OHIO RIVER FLOOD OF MARCH 1945

At the great industrial center of Pittsburgh, Pa., the waters of the Allegheny and Monongahela Rivers join to form the Ohio River, one of America's most picturesque streams and a very important inland waterway. From Pittsburgh, the Ohio River flows in a general south-westerly direction to its confluence with the Mississippi at Cairo, Ill., a distance of 981 miles, through a relatively narrow valley with a gentle slope throughout its length, except in the vicinity of Louisville, Ky., where there is a fall of 26 feet in 3 miles. The average fall of the river is about 0.4 foot per mile. The river is controlled at low stages by navigation improvements of the U. S. Engineers and never goes below the 9-foot navigation stage, but at appreciably higher stages the navigation dams are lowered, allowing the water to flow freely.

The Ohio Basin, embracing parts of 14 States, is a densely populated region, one of the principal industrially developed areas in the United States. It is also noted for its rich agricultural lands. Because of the large and extensively developed coal fields in the basin, the outstanding development has been the iron and steel industry centered at Pittsburgh, and extending up the Monongahela and down the Ohio. Cincinnati, Louisville, and Wheeling are only a few of the other centers of industry on the river. Railroads, highways, and other public developments, as well as industries and private improve-

ments, have been located along the river, largely through necessity, and many are susceptible to flooding. However, flood protective works built along the river front at many points in recent years serve to reduce the damage from floods.

The Ohio Basin receives a greater annual precipitation (an average of 44 inches) than any other major subdivision of the Mississippi System, except the Lower Alluvial Valley of the Mississippi. The annual amount varies from 80 inches in portions of the southern Appalachians to 35 inches in the northwestern section of the basin. Flood stage is reached or exceeded at some point along the Ohio practically every year. Damaging floods which have exceeded flood stage by 5 feet or more over considerable stretches of the river have occurred about 30 times in the last 64 years. Property damage from floods ranks higher in the Ohio Basin than in any other major river basin in the country. For the 30-year period from 1924 to 1943, inclusive, the property loss from floods in the Ohio Basin amounted to approximately \$670,000,000 with loss of life of 472 persons. Of the property damage, more than \$400,000,000 occurred in the flood of 1937 alone. (See MONTHLY WEATHER REVIEW SUPPLEMENT No. 37, the Ohio and Mississippi River Floods of January-February 1937, by Bennett Swenson, for a report of this flood.) Other outstanding floods during the last 64 years occurred in 1936, 1913, 1907, 1884, and 1883.

The Ohio River normally shows a rise in stage during the winter months, reaching a peak in March and falling steadily to the lowest point during the summer months. The past 12-month period was no exception to this rule; in fact, it was an extreme example. Most of the Ohio Basin suffered from a serious drought after May 1944, resulting in relatively low river stages. A series of heavy rains from the second week of February to March 7 over most of the Ohio River Basin, aided to some extent by snow-melt in northern sections, produced a major flood in the Ohio River during March. Rapidly rising flood waters resulted in loss of life and heavy damage by flooding of large areas of low farmlands, by closing of coal mines and many industrial plants manufacturing essential war

TABLE I.—Snowfall in Upper Ohio Basin, 1944-45

Station	Inches				
	December	January	February	March	Total
Port Allegany, Pa.....	20.0	18.0	10.0	12.0	60.0
Olean, N. Y.....	29.0	20.0	10.3	14.8	74.1
Warren, Pa.....	33.5	18.5	11.5	2.0	65.5
Meadville, Pa.....	47.3	27.2	15.5	5.5	95.5
Franklin, Pa.....	37.0	20.0	10.5	5.5	73.0
Glen Hazel (nr.), Pa.....	30.8	22.0	11.3	6.5	70.6
Ridgway, Pa.....	30.0	19.5	10.0	3.0	62.5
Clarion, Pa. (Piney).....	35.2	17.0	8.3	4.5	65.0
Parkers Landing, Pa.....	28.0	18.0	3.0	1.0	50.0
DuBois, Pa.....	40.0	25.4	11.8	3.5	80.7
Punxsutawney, Pa.....	25.4	27.7	10.0	2.4	65.5
Mosgrove, Pa.....	24.5	14.8	4.3	T	43.6
Hooversville, Pa.....	37.7	25.4	9.3	1.5	73.9
Ebensburg, Pa.....	28.1	16.0	4.6	1.3	50.0
Seward, Pa.....	31.0	28.0	6.0	3.0	68.0
Blairsville, Pa.....	38.3	31.4	9.9	4.5	84.1
Boswell (nr.), Pa.....	53.0	52.0	19.0	8.0	132.0
Latrobe, Pa.....	27.0	17.3	5.2	T	49.5
Saltsburg, Pa.....	30.5	27.0	6.0	T	63.5
Vandergrift, Pa.....	23.0	13.4	3.8	T	40.2
Schenley, Pa.....	26.3	15.0	3.1	T	44.9
Natrona, Pa.....	27.5	22.1	4.3	T	53.9
Lake Lynn, Pa.....	14.0	11.5	2.2	4.0	31.7
Greensboro, Pa.....	26.2	17.6	7.2	0.8	51.8
Meyersdale, Pa.....	37.5	21.0	10.0	3.0	71.5
Confluence, Pa.....	27.0	14.2	7.8	1.0	50.0
Sutersville, Pa.....	28.0	14.5	4.5	T	45.0
McKeesport, Pa.....	21.5	14.5	2.5	T	38.5
Bruceston, Pa.....	23.7	19.9	5.7	2.0	51.3
Pittsburgh, Pa.....	26.0	19.2	3.8	T	49.0
Beaver Falls, Pa.....	20.5	15.2	2.5	1.0	39.2
Midland, Pa.....	24.0	17.3	2.5	4.0	47.8
Claysville, Pa.....	27.8	16.7	4.0	1.0	49.5
Somerset, Pa.....	39.1	16.0	11.0	3.0	69.1