

TABLE 2.—Free-air resultant winds based on pilot balloon observations made near 5 p. m., E. S. T. (2200 G. C. T.) during May 1946. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second—Continued

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Paul, Minn. (225 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (15 m.)			Sault Ste. Marie, Mich. (225 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity						
Surface.....	31	268	6.1	30	174	1.0	31	202	0.6	31	260	1.6	29	346	3.0	30	236	1.2	30	228	0.8	31	114	3.2	31	264	4.0	27	265	2.3	31	231	1.2	30	305	0.5	27	225	3.1
500.....	31	275	5.0	30	169	1.3	31	193	1.1	31	253	2.5	30	345	2.9	30	245	2.9	30	212	1.2	31	129	3.3	31	274	3.3	27	304	2.8	31	288	1.1	30	239	0.5	26	211	4.7
1,000.....	26	275	3.4	29	183	1.2	28	193	2.4	31	243	3.5	29	347	3.0	28	235	4.4	27	214	2.2	28	149	3.9	25	287	1.6	26	302	2.9	30	263	0.7	30	287	0.3	24	251	6.5
1,500.....	22	310	3.1	26	238	2.6	26	232	3.3	31	236	3.3	29	347	3.1	25	245	4.2	25	222	2.4	24	182	4.2	20	267	2.9	25	317	3.2	27	251	0.4	30	287	0.3	24	251	6.5
2,000.....	22	309	3.3	23	257	4.3	25	265	4.5	31	228	3.5	27	323	2.4	18	250	6.9	21	249	2.2	21	198	4.2	17	241	2.6	22	309	3.9	23	267	0.6	29	320	0.3	24	257	7.6
2,500.....	22	314	2.8	23	263	7.2	19	262	6.3	31	233	4.3	24	271	2.3	14	260	6.9	20	245	2.1	15	231	5.3	17	228	2.5	19	321	5.5	20	242	0.4	26	312	0.8	22	270	8.7
3,000.....	22	310	3.3	23	261	9.1	14	259	6.6	31	235	5.1	17	279	5.6	11	263	7.9	15	230	3.1	13	243	5.9	17	240	2.6	16	327	7.1	19	106	0.8	26	346	1.3	20	270	9.7
4,000.....	20	304	6.1	19	267	14.6	11	257	9.9	31	249	6.7	14	286	7.7	14	266	4.6	10	262	7.6	16	262	7.6	16	302	4.1	14	317	0.4	16	35	0.9	21	334	3.5	16	261	12.4
5,000.....	19	309	7.7	19	270	15.6	10	269	12.7	31	253	6.7	11	285	9.6	11	265	4.8	10	265	4.8	10	262	7.6	16	300	7.6	14	310	11.6	13	325	1.9	15	338	6.1	10	270	14.1
6,000.....	19	303	8.9	15	274	16.2	10	269	11.0	31	253	6.7	11	285	9.6	11	265	4.8	10	265	4.8	10	262	7.6	16	300	7.6	14	310	11.6	13	325	1.9	15	338	6.1	10	270	14.1
8,000.....	16	309	13.5	10	275	17.7	10	269	11.0	31	253	6.7	11	285	9.6	11	265	4.8	10	265	4.8	10	262	7.6	16	300	7.6	14	310	11.6	13	325	1.9	15	338	6.1	10	270	14.1
10,000.....	16	309	13.5	10	275	17.7	10	269	11.0	31	253	6.7	11	285	9.6	11	265	4.8	10	265	4.8	10	262	7.6	16	300	7.6	14	310	11.6	13	325	1.9	15	338	6.1	10	270	14.1

TABLE 3.—Maximum free-air wind velocities (m. p. s.) for different sections of the United States based on pilot balloon observations during May 1946

Section	Surface to 2,500 meters (m. s. l.)				2,501 to 5,000 meters (m. s. l.)				Above 5,000 meters (m. s. l.)						
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast ¹	39.2	WNW.	2,500	2	Hartford, Conn.....	49.9	WNW.	5,000	3	Boston, Mass.....	73.2	WNW.	6,125	2	Burlington, Vt.
East-Central ²	31.4	SSW.	1,830	16	Knoxville, Tenn.....	36.5	W.	5,000	5	Huntington, W. Va.....	98.0	WSW.	11,830	13	Huntington, W. Va.
Southeast ³	38.0	WSW.	2,142	16	Spartanburg, S. C.....	32.2	W.	2,983	28	Jacksonville, Fla.....	50.0	W.	13,691	12	Charleston, S. C.
North-Central ⁴	34.6	W.	1,908	6	Muskegon, Mich.....	35.3	WNW.	5,000	11	Huron, S. Dak.....	84.5	WSW.	13,897	14	Marquette, Mich.
Central ⁵	45.4	SSE.	1,725	27	Goodland, Kans.....	43.0	W.	3,328	5	Joliet, Ill.....	67.0	SW.	10,499	13	Columbia, Mo.
South-Central ⁶	39.2	WSW.	2,082	23	Amarillo, Tex.....	48.0	WSW.	4,300	20	Burrwood, La.....	92.0	WSW.	8,870	20	Burrwood, La.
Northwest ⁷	46.5	SW.	1,884	7	Burns, Oreg.....	32.9	NNE.	5,000	7	Medford, Oreg.....	74.4	W.	8,801	7	Medford, Oreg.
West-Central ⁸	43.5	SW.	2,500	7	Ely, Nev.....	48.5	SW.	2,580	7	Ely, Nev.....	59.6	W.	7,491	1	Pueblo, Colo.
Southwest ⁹	39.2	SSE.	2,458	27	Roswell, N. Mex.....	36.1	NW.	2,547	29	Sandberg, Calif.....	78.0	W.	12,350	16	Albuquerque, N. Mex.

¹ Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.

² Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.

³ South Carolina, Georgia, Florida, and Alabama.

⁴ Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.

⁵ Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.

⁶ Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.

⁷ Montana, Idaho, Washington, and Oregon.

⁸ Wyoming, Colorado, Utah, northern Nevada, and northern California.

⁹ Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS FOR MAY 1946

C. R. JORDAN

Precipitation during May was above normal over the eastern half of the country except in the western Lakes region. It was also wetter than usual from Nebraska and South Dakota westward through Wyoming, southern Idaho, northern Utah, and large portions of Oregon, Nevada, and northeastern California. Amounts were much above normal in Pennsylvania, the lower Mississippi Valley, and much of Nevada. Rainfall was generally below normal over the northern and southern parts of the western half of the country, with no measurable precipitation reported at several stations in southern Arizona.

Severe floods occurred in western New York and north-central Pennsylvania. All previous flood stages of record were exceeded in many of the headwater tributaries of the Susquehanna River. Drought conditions continued in the southwestern states.

Atlantic Slope drainage.—A major flood occurred in the Susquehanna River Basin during the last few days of May as a result of heavy rain during the period May 26–29, following a period of above-normal rainfall. Many of the northern tributaries of the West Branch of the

Susquehanna River reached heights that exceeded any previously recorded stages by 2 to 4 feet. Flooding was severe on the Tioga, Chemung, and Canisteo Rivers and other smaller streams. Several lives were lost and there was considerable property damage. A more detailed report of this flood will be included in the next issue of the REVIEW.

MISSISSIPPI SYSTEM

Upper Mississippi Basin.—Heavy rains over the headwaters of the Des Moines River during the last week of May caused considerable overflow in the upper reaches of the Raccoon and Des Moines Rivers and contributed to slight overflow downstream on the Des Moines at both Eddyville and Ottumwa, Iowa.

Missouri Basin.—Light to moderate overflow occurred at scattered points in Kansas and Missouri.

An excessively heavy rainstorm occurred in the vicinity of Ewing and Orchard, Nebr., on the afternoon of May 23. Ewing reported 3.57 inches of rain, with approximately 3 inches occurring within an hour. At Orchard the total fall was 5.22 inches, with about 4 inches within an hour. Unofficial reports indicate that the peak rainfall occurred 5 or 6 miles west of Ewing and about the same distance south of Orchard, with amounts ranging up to 7.50 inches.

This cloudburst caused a rapid rise in the Elkhorn River to bankful stage at, and for a few miles below, Ewing. The rise amounted to only about 4 feet at Clearwater, approximately 15 miles downstream. No flood damage was reported due to overflowing of streams. However, extensive damage to newly planted corn resulted from the intensity of the rainstorm, and many fields will have to be replanted in the Ewing-Clearwater-Orchard area.

Ohio Basin.—The heavy rain near the end of May over southern New York and northern Pennsylvania caused several widely separated flash floods in headwater tributaries of the Allegheny River. Coudersport and Port Allegany, Pa., and Olean, N. Y., had the highest floods since July 1942. The most serious flooding occurred at New Castle, Pa., on the Neshannock Creek; Oil City on Oil Creek; Coudersport, Port Allegany, and other smaller towns on the headwaters of the Allegheny River. Damage was extensive, amounting probably to more than a million dollars.

Flood stage was not reached on the Ohio River at or below Pittsburgh, Pa.

There was some light overflow of the Scioto River in the vicinity of Picketon, Ohio.

General heavy rainfall in central and southern Indiana on May 1 and 2 caused a considerable rise in the lower Wabash, the lower West Fork of White, and the main White Rivers. Frequent rains thereafter, with heavy amounts rather general on the 11th and the 16th, caused several moderate rises in the upper portions and sustained high water in the lower portions of these streams during much of the latter part of the month. A few upper Wabash stations barely reached flood stage, and this occurred on only one or two days. Mt. Carmel was the only lower Wabash station reaching flood stage, and the crest here was only 1.5 feet above flood stage. On the lower West Fork and on the main White the excess above flood stage was several feet. Damage from this flood was slight.

White, Arkansas, and Red Basins.—Light overflow occurred at most stations in the White River Basin in Arkansas and moderate flood stages were reached on the Ouachita River. Rains were frequent over eastern Texas, and flood stages were exceeded several times on the Sulphur and Cypress Rivers, with numerous crests reported at most stations.

West Gulf of Mexico.—Frequent heavy rainfall over eastern Texas and Louisiana caused overflow of most streams in the area, with rather severe flood stages on the Sabine and upper Trinity Rivers. The greatest damage or loss caused by the floods was probably the suspension of farming activities and the delay of planting of crops. The floods in the Sabine and Trinity Rivers continued at the end of the month.

Pacific Slope drainage.—Severe local damage was caused by a cloudburst that occurred on May 26, near Kendrick, Idaho. The sudden heavy rainfall hit American Ridge, near Kendrick, late in the afternoon, sending a 6-foot high wall of water rushing down Brady Gulch. Considerable damage was reported to automobiles, buildings, and highways.

An early melting of the above-normal snow cover in the Columbia River Basin caused a seasonal peak earlier than usual. Peak stages were reached in the Columbia River during the closing days of May or early in June. Flood stages were exceeded slightly at The Dalles, Oreg., and Vancouver, Wash., on the Columbia, and at Portland, Oreg., on the Willamette. The Kootenai River at Bonners Ferry, Idaho, reached the third highest stage in the past 30 years, but the crest was about one-half foot under flood stage.

FLOOD STAGE REPORT FOR MAY 1946

[All dates in May unless otherwise specified.]

River and station	Flood stage	Above flood stages—dates		Crest 1	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
	<i>Feet</i>			<i>Feet</i>	
Lehigh: Lehighon, Pa.	9	28	28	9.0	28
Pine Creek: Cedar Run, Pa.	12	27	28	14.4	28
West Branch:					
Renovo, Pa.	16	27	28	20.2	28
Lock Haven, Pa.	21	27	29	26.85	28
Williamsport, Pa.	20	27	29	29.6	28
Lewisburg, Pa.	18	27	30	29.0	29
Susquehanna:					
Towanda, Pa.	16	27	30	25.1	29
Wilkes-Barre, Pa.	22	28	30	32.0	29
Danville, Pa.	20	28	31	26.0	29
Sunbury, Pa.	16	28	30	23.0	29
Harrisburg, Pa.	17	28	30	21.8	29
James: Columbia, Va.	10	5	8	15.4	5
Roanoke: Williamston, N. C.	10	21	(?)	10.6	26, 31
Nense: Smithfield, N. C.	13	28	29	14.6	29
Cape Fear: Lock No. 2, Elizabethtown, N. C.	20	2	2	20.6	2
Saluda: Pelzer, S. C.	6	4	6	11.0	5
Altamaha: Charlotte, Ga.	12	26	28	12.2	28
EAST GULF OF MEXICO DRAINAGE					
Apalachicola: Blountstown, Fla.	15	{ Apr. 26	8	15.6	Apr. 28-29
		17	(?)	20.6	24
Choctawhatchee:					
Geneva, Ala.	23	23	23	23.6	23
Caryville, Fla.	12	20	27	13.3	24
Tombigbee:					
Lock No. 4, Demopolis, Ala.	39	22	25	41.1	23
Lock No. 3, Ala.	33	20	27	43.7	23-24
Lock No. 1, Ala.	31	21	28	33.0	25
Pascagoula: Merrill, Miss.	22	{ 18	20	22.3	19
		21	22	22.1	22
Pearl:					
Jackson, Miss.	18	19	(?)	27.4	27
Pearl River, La.	12	16	(?)	14.9	22
MISSISSIPPI SYSTEM					
<i>Upper Mississippi Basin</i>					
Raccoon: Jefferson, Iowa.	12	26	29	13.4	27
Boone: Webster City, Iowa.	10	26	26	10.8	26
Des Moines:					
Eddyville, Iowa.	15	30	31	16.4	31
Ottumwa, Iowa.	9	31	31	9.4	31
<i>Missouri Basin</i>					
Grand: Chillicothe, Mo.	18	{ 3	5	25.5	4
		6	7	23.5	7
Osage:					
Quenemo, Kans.	27	-----	-----	31.7	11
Ottawa, Kans.	24	10	11	25.0	10-11
Osawatimie, Kans.	28	11	12	30.5	11
La Cygne, Kans.	25	11	14	27.2	12-13
Gasconade: Jerome, Mo.	15	26	26	17.0	26
<i>Ohio Basin</i>					
Allegheny:					
Olean, N. Y.	10	28	(?)	17.3	29
Port Allegany, Pa.	9	28	29	11.6	28
Parkers Landing, Pa.	20	28	28	20.3	28
Lock No. 8, Mosgrove, Pa.	24	28	28	24.4	28
Lock No. 5, Schenley, Pa.	24	28	30	29.5	28
Lock No. 4, Natrona, Pa.	24	28	29	27.4	28
Lock No. 3, Acemtonia, Pa.	25	28	29	27.4	28
Scioto: Picketon, Ohio.	16	18	18	16.8	18
West Fork:					
Anderson, Ind.	10	-----	-----	10.0	17
Elliston, Ind.	18	17	23	22.8	20
		3	7	15.1	5
Edwardsport, Ind.	12	{ 13	29	19.7	21
				15.8	16
White:					
Petersburg, Ind.	16	18	26	19.9	23
Hazleton, Ind.	16	18	27	20.7	24
Wabash:					
Bluffton, Ind.	10	29	(?)	11.2	30
Wabash, Ind.	12	30	30	12.1	30
LaFayette, Ind.	11	19	19	11.2	19
Terre Haute, Ind.	14	20	21	14.2	20
Mt. Carmel, Ill.	17	21	26	18.5	24
Ohio: Dam No. 7, Midland, Pa.	30	20	29	32.6	29
<i>White Basin</i>					
Black:					
Leeper, Mo.	11	25	25	13.1	25
		2	4	17.8	3
Poplar Bluff, Mo.	16	{ 18	20	18.2	18
		26	28	20.0	26
Black Rock, Ark.	14	2	(?)	23.5	26
White:					
Cotter, Ark.	21	28	28	21.3	28
		17	17	21.2	17
Calico Rock, Ark.	19	{ 26	26	21.7	26
		28	29	20.8	29
		17	18	27.7	17
Batesville, Ark.	23	{ 25	30	27.6	26
		19	(?)	30.0	30