In connection with the Connecticut River it is interesting to note that all records for continuous navigation of the lower river have been surpassed, the river having been open without intermission since March 24, 1923.

The second flood of importance was that of the Wabash River of Indiana and Illinois. It was caused by the heavy rains of March 13 and 14 over the Wabash drainage basin. At Lafayette, Ind., the crest stage of 22 feet on March 15, was 11 feet above the flood stage, while below Lafayette the crests averaged from 4 to 5 feet above the flood stages.

As there were no growing crops in the lowlands the losses were small, probably as much as $20,000, mostly through enforced suspension of certain business activities in the urban districts. The reported value of the property saved through the Weather Bureau warnings was $30,000.

An ice gorge about 5 miles in length and 20 feet in height formed between March 3 and 5 in the Missouri River from the mouth of the Niobrara River westward. Bottom lands in some places were under 12 feet of water, but fortunately the ice gave away in about 36 hours and the river gradually receded. Warnings were issued promptly upon receipt of the first advices and the reported losses were only $2,500, while the saving of property by reason of the warnings was estimated at $8,000.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC DRAINAGE					
Connecticut:	*Feet*			*Feet*	
White River Junction, Vt.	15	28	(2)	22.5	29
Bellows Falls, Vt.	12	30	30	13.4	30
Holyoke, Mass.	9	31	(2)	9.4	31
Hartford, Conn.	16	30	(2)	20.5	31
Unadilla, New Berlin, N. Y.	8	15	15	8.2	15
Santee:					
Rimini, S. C.	12	20	23	12.8	22
Ferguson, S. C.	12	1	1	12.0	1
		21	25	12.3	23, 24
EAST GULF DRAINAGE					
Cahaba, Centerville, Ala.	25	18	18	25.0	18
Tombigbee, Lock No. 4, Demopolis, Ala.	39	19	27	47.0	24
Pearl, Jackson, Miss.	20	21	30	25.5	25
GREAT LAKES DRAINAGE					
Maumee:					
Fort Wayne, Ind.	15	14	20	19.7	15
Napoleon, Ohio	10	16	16	10.0	16
St. Joseph, Montpelier, Ohio	10	15	16	11.5	15
		20	21	11.9	20
Auglaize, Defiance, Ohio	10	16	16	10.9	16
MISSISSIPPI DRAINAGE					
Tuscarawas, Gnadenhutten, Ohio	9	20	20	9.4	20
Scioto, LaRue, Ohio	11	15	15	11.0	15
Green, Lock No. 2, Rumsey, Ky.	34	(1)	3	36.6	1
Wabash:					
Lafayette, Ind.	11	14	22	22.0	15
Terre Haute, Ind.	16	15	25	20.9	19
Vincennes, Ind.	14	19	29	19.5	22, 23
Mount Carmel, Ill.	16	19	28	20.5	23, 24
White, West Fork:					
Elliston, Ind.	19	16	18	20.9	18
Edwardsport, Ind.	14	17	21	17.3	19
Illinois:					
Peru, Ill.	14	(1)	6	15.3	Feb. 25
		18	31	15.8	Mar. 23
Henry, Ill.	7	(1)	(2)	9.6	24, 25, 26
Peoria, Ill.	16	23	31	16.4	25, 26
Havana, Ill.	14	24	(2)	14.3	27–30
Beardstown, Ill.	12	(1)	(2)	15.4	28, 29
Cache, Patterson, Ark.	9	2	6	9.9	4

[1] Continued from last month.
[2] Continued at end of month.

MEAN LAKE LEVELS DURING MARCH, 1925

By UNITED STATES LAKE SURVEY

[Detroit, Mich., Apr. 7, 1925]

The following data are reported in the "Notice to Mariners" of the above date:

Data	Lakes [1]			
	Superior	Michigan and Huron	Erie	Ontario
Mean level during March, 1925:	*Feet*	*Feet*	*Feet*	*Feet*
Above mean sea level at New York	600.80	578.38	570.91	245.20
Above or below—				
Mean stage of February, 1925	−0.16	+0.14	+0.42	+0.79
Mean stage of March, 1924	−0.26	−0.31	−0.31	+0.32
Average stage for March last 10 years	−0.85	−1.46	−0.71	−0.21
Highest recorded March stage	−1.52	−4.57	−2.94	−2.61
Lowest recorded March stage	+0.14	−0.31	+0.08	+0.90
Average relation of the March level to—				
February level		+0.1	+0.2	+0.2
April level		−0.3	−0.6	−0.6

[1] Lake St. Clair's level: In March, 1925, 573.41 feet.

FLOOD PROTECTION IN WICHITA, KANS.

By S. P. PETERSON

[Weather Bureau, Wichita, Kans.]

The city of Wichita is situated at the confluence of the Big Arkansas and the Little Arkansas Rivers, the Big Arkansas River passing through the southwestern part of the city with a southeasterly trend and the Little Arkansas flowing in a very winding course southward through the northwestern part of the city and emptying into the Big Arkansas River a short distance to the northwest of the central business section. To the east of these two rivers lies about two-thirds of the city, and this part is bisected by Chisholm creek and its continuation, the drainage canal, which flows in a general southward direction through it, emptying into the Big Arkansas River a short distance below the city.

The site of the city of Wichita has been subjected to three extensive floods, one in 1877, one in 1904, and the last in 1923. There have also been several minor floods. In extensive flooding the overflow waters of the three streams tend to merge and form a shallow lake, covering much of the city and surrounding territory.

Immediately after the flood of 1904 action was taken to control the flood waters, especially of the Little Arkansas River and Chisholm Creek (then flowing in its natural winding course southward through the eastern portion of the city) as these two streams caused the most damaging overflows. This control was accomplished to a certain extent by constructing dykes along the portion of the Little Arkansas River from which the overflow waters moved toward the central business section and by clearing the channel of that portion of the stream of such obstructions as would hinder the streamflow, while through the section drained by Chisholm Creek, a canal (the present drainage canal) was dug from the Stock Yards district, near the extreme northern portion of the city to the mouth of the stream, eliminating the windings of this stream within most of the city, making a straight course for the streamflow and also a considerably larger channel capacity than

the original creek. The streamflow capacity of the Big Arkansas River was increased mainly by the pumping of sand from the bed of that stream, thus lowering the river bed, the pumping being done by private companies for the commercial value of the sand. While this was not a part of the flood-protection scheme, yet it was none the less effective. The river bed was lowered in places about 7 feet.

The flood of 1923 found the city prepared to the extent indicated, with the result that the main business section entirely escaped overflow, though the residence sections along the middle and upper course of the Little Arkansas River were extensively overflowed. The section in the Chisholm Creek drainage was overflowed as extensively as in 1904, but the straight-away lead and the larger carrying capacity of the drainage canal through that section caused the flood waters to recede quickly. The Big Arkansas River did not overflow within the city except in limited places in the extreme southern portion of the city.

The carrying capacity of the drainage canal at the time of the 1923 flood was 2,500 second-feet, though this was considerably restricted by the low arches of the bridges that spanned it. The estimated flow of the 1923 flood through that section was about 6,500 second-feet.

The carrying capacity of the Little Arkansas River at the time of the 1923 flood was 10,000 second-feet, but the estimated flow of that flood in the lower section of this stream was about 12,500 second-feet.

The carrying capacity of the Big Arkansas River, within the city of Wichita, was not reached in the 1923 flood, except in limited areas, as indicated, and the flow passing through it was estimated at 17,000 to 18,000 second-feet below its confluence with the Little Arkansas River.

The general slope of the land downstream in this section is about 5 feet to the mile.

The present plan of flood protection contemplates widening and deepening the drainage canal to a capacity flow of 8,000 second-feet, widening and diking the Little Arkansas River to a capacity flow of 12,500 second-feet throughout its entire course within the city, and widening certain obstructed sections of the Big Arkansas River, increasing its capacity to 20,000 second-feet, with a 3-foot freeboard for each stream as a further margin of safety. This work is now fairly under way, and it is expected that it will be completed early in 1926. The entire cost of this project will be about $800,000.

EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS, MARCH, 1925

By J. B. KINCER

General summary.—The mild, dry weather during much of March made conditions unusually favorable for farm operations in nearly all sections of the country, and both vegetation and farm work were considerably ahead of an average season. Two cool spells temporarily checked growth, especially the unseasonably low temperatures in the Southeast near the beginning of the month, and some local damage was done by frost. In general, however, the harm from low temperatures was not extensive and vegetation made good progress. Much plowing was accomplished in the interior valleys, while spring planting advanced rapidly in the South, except in the dry Southwest where the moisture situation was largely unrelieved at the close of the month. Good rains were beneficial during the first half over the interior States and in southeastern districts showers were helpful during the latter part of the month.

Small grains.—Winter wheat and other fall-seeded grains made satisfactory progress in the principal producing areas, except in portions of the western and southwestern Winter Wheat Belt where it was too dry. Moisture was especially lacking in Texas, most of Oklahoma, and parts of Kansas and Nebraska. It was generally favorable for cereal crops in the Atlantic and east Gulf States and also in the far Northwest, but it was too dry in west Gulf districts.

Spring wheat seeding advanced rapidly the latter part of the month, under favorable weather conditions, and was completed in some southern sections of the belt. Oat seeding also advanced favorably, especially in the upper Mississippi Valley and northern Great Plains, with the early-seeded germinating well in the central valley States.

Corn and cotton.—Considerable corn ground was prepared in the interior valleys, with favorable soil condition, and at the close of the month planting had advanced northward to extreme southern Kansas, Tennessee, and North Carolina. Planting was retarded, however, in Texas and Oklahoma, and the soil was too dry in those States for proper germination. In the Southeast conditions were generally favorable for germination and corn had come up to a good stand.

The preparation for cotton planting made good progress, and seeding had become general in Gulf coast sections. Some cotton was planted as far north as southern North Carolina and the central portion of Arkansas. In Texas seeding made slow advance and conditions were unfavorable for growth of early cotton, except in the extreme South and the northeast.

Ranges, pastures, and livestock.—The weather was generally favorable for grazing interests in central and northern sections of the western grazing country, but it was mostly unfavorable in the South because of deficient moisture. Rainfall was sufficient during the latter part of the month to improve the range in eastern Oklahoma, parts of northern Texas, Arizona, and southern California, but elsewhere in the Southwest there was little relief from the drought and the range outlook was poor. In the eastern half of the country meadows and grass lands were in satisfactory condition generally.

Fruit.—Influenced by the persistent mild temperatures, early fruit continued to advance prematurely in the central portions of the country, though buds remained dormant in much of the upper Ohio Valley. There was some frost damage in parts of the South and the far West, but on the whole this was not extensive. Early fruits were setting well in Southern States, and reports on citrus were favorable. Strawberries were being marketed at the close of the month in the extreme lower Mississippi Valley, and shipments were active in northern Florida.

Miscellaneous crops.—Early gardens and truck crops were being planted in the Middle Atlantic and central valley States, while in the Southeast growth was generally favorable. Truck was thriving in California, but it was too dry in the west Gulf area.