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RIVERS AND FLOODS.

FLOODS DURING FEBRUARY.

By ALFRED J. HENRY, Meteorologist.

[Weather Bureau, Washington, Mar. 26, 1921.]

The floods of the month were moderate in character and confined to the south Atlantic and Gulf coast States, with the single exception of a near flood in the Willamette River of Oregon, on the 10th and 13th. The floods in eastern districts were due in each case to heavy rains which fell during the period February 9-12.

The usual details appear in the table below: The property loss was small.

SNOWFALL IN ELEVATED REGIONS.

At the end of February, 1921, the snow cover in the higher Sierra Nevada of California is very nearly up to the normal. In Oregon there is also very nearly the normal snow cover in the higher portions of the Cascades. The precipitation of February was, however, mostly in the form of rain, which was effective in removing some of the snow cover in the lower mountain slopes.

Over the eastern slope of the Sierra Nevada and the high mountain ranges of the Humboldt basin in Nevada, the season's snowfall up to January 31 was slightly greater than normal.

In Colorado the snow covering at the end of February was less than the average in all of the watersheds of that State.

The snow cover in Washington is greater than the average and well packed.

In Utah the snow cover is of good depth in some districts and only fair in others, especially in the southern portion of the State. Somewhat similar conditions prevail in Wyoming.

Estimated loss by flood during February, 1921.

Rivers of--	Tangible property, bridges, roads, buildings, etc.	Estimated loss of crops.		Live stock or other farm property.	Suspension of business.	Value of warnings.
		Matured.	Prospective.			
North Carolina.....	\$5,000			\$500		\$16,000
South Carolina.....	4,000	\$650		1,175	\$565	50,475
Georgia.....	1,200					
Alabama.....	10,000				2,000	5,000
Tennessee.....	800					
Arkansas.....				450		
Total.....	21,000	650		2,125	2,565	71,475

Flood stages during month of February 1921.

River.	Station.	Flood stage.	Above flood stages—dates.		Crest.	
			From—	To—	Stage.	Date.
<i>Atlantic Drainage:</i>						
		<i>Feet.</i>			<i>Feet.</i>	
Roanoke.....	Weldon, N. C.....	30	12	14	36.4	13
Tar.....	Greenville, N. C.....	13	15	17	13.2	16
Neuse.....	Neuse, N. C.....	14	11	15	17.3	13
	Smithfield, N. C.....	14	3	4	14.6	3
		14	11	16	17.8	13
Cape Fear.....	Elizabethtown, N. C.....	22	2	5	25.5	3
		22	11	17	32.3	14
Haw.....	Fayetteville, N. C.....	35	11	14	48.0	12
	Moncure, N. C.....	22	10	11	26.0	11
Waccamaw.....	Conway, S. C.....	7	22	24	7.1	22, 23
Peedee.....	Charaw, S. C.....	27	11	13	36.6	12
Lynches.....	Effingham, S. C.....	14	15	17	16.5	16
Santee.....	Rimini, S. C.....	12	(1)	(2)	23.7	15
	Ferguson, S. C.....	12	(1)	(2)	17.2	16
Catawba.....	Catawba, S. C.....	12	11	12	16.4	11
		24	2	2	24.7	2
Wateree.....	Camden, S. C.....	24	9	14	31.0	14
Congaree.....	Columbia, S. C.....	15	10	13	23.6	12
Broad.....	Blairs, S. C.....	15	9	13	22.2	11
Saluda.....	Pelzer, S. C.....	7	10	12	11.0	11
	Chappells, S. C.....	14	10	14	22.5	11
Savannah.....	Augusta, Ga.....	32	11	12	35.1	11
Broad (Ga.).....	Carlton, Ga.....	11	9	11	22.4	9
Oconee.....	Milledgeville, Ga.....	22	10	12	27.2	11
Ocmulgee.....	Macon, Ga.....	18	10	12	21.6	11
	Abbeville, Ga.....	11	15	20	14.6	17
	Lumber City, Ga.....	15	21	21	15.0	21
<i>East Gulf drainage:</i>						
Apalachicola.....	River Junction, Fla.....	12	11	27	18.8	15
Flint.....	Woodbury, Ga.....	10	11	11	10.0	11
Chattahoochee.....	Norcross, Ga.....	16	10	11	20.4	10
	Alaga, Ga.....	30	12	14	31.9	13
Alabama.....	Montgomery, Ala.....	35	11	16	42.9	13
	Selma, Ala.....	35	12	22	43.5	14, 15
Coosa.....	Rome, Ga.....	30	11	13	33.9	11
	Gadsden, Ala.....	22	10	20	28.3	16
	Lock No. 4, Lincoln, Ala.....	17	10	21	21.9	11
Etowah.....	Canton, Ga.....	11	9	11	21.0	9
Oostanaula.....	Resaca, Ga.....	25	10	14	33.0	11
Tombigbee.....	Demopolis, Ala.....	39	12	28	52.7	19
Black Warrior.....	Tuscaloosa, Ala.....	46	10	14	58.0	12
Pearl.....	Jackson, Miss.....	20	17	(2)	25.1	22
<i>Mississippi drainage:</i>						
Wabash.....	Lafayette, Ind.....	11	9	10	12.7	9
French Broad.....	Asheville, N. C.....	4	10	11	4.3	11
	Dandridge, Tenn.....	12	11	11	13.4	11
Big Pigeon.....	Newport, Tenn.....	6	10	11	6.4	10
Tennessee.....	Knoxville, Tenn.....	12	11	12	17.8	11
	Chatanooga, Tenn.....	33	12	13	34.5	13
	Guntersville, Ala.....	31	14	15	31.4	15
	Florence, Ala.....	18	12	14	18.7	12
	Riverton, Ala.....	32	11	19	37.5	13, 17
	Mendota, Va.....	8	11	11	9.0	11
Holston, North Fork.....	Charleston, Tenn.....	22	11	12	24.2	11
Hiwassee.....	Swan Lake, Miss.....	25	26	(2)	25.3	28
Tallahatchie.....	Danville, Ark.....	20	25	(2)	22.4	26
Petit Jean.....	Patterson, Ark.....	9	23	27	9.3	24, 25
Cache.....	Ringo Crossing, Tex.....	20	20	24	23.0	21
Sulphur.....						
<i>West Gulf drainage:</i>						
Trinity.....	Dallas, Tex.....	25	20	24	33.7	21
	Trinidad, Tex.....	28	24	(2)	32.6	28
<i>Pacific drainage:</i>						
Willamette.....	Eugene, Oreg.....	10	10	11	11.2	10
	Oregon City, Oreg.....	10	21	21	10.0	21
	Oregon City, Oreg.....	12	13	14	12.0	13, 14
Santiam.....	Jefferson, Oreg.....	10	10	11	12.0	10

* Continued from January. * Continued into March. * Estimated.

EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS, FEBRUARY, 1921.

By J. WARREN SMITH, Meteorologist in Charge.

[Agricultural Meteorology, Weather Bureau, Washington, Apr. 2, 1921.]

February, 1921, was generally favorable for outdoor operations, except that the soil was too wet for preparation for planting in some south-central districts. Farm work made favorable progress in Central and Southern States, and at the close of the month considerable land had been prepared for corn and cotton. Some gardens and potatoes were planted as far north as southern Nebraska, and spring wheat seeding had commenced in the southern portion of the spring wheat belt.

Winter grains were largely unprotected by snow cover throughout the central portion of the country, but, as

mostly mild temperatures prevailed, there was little complaint of damage to winter wheat or other grains. Winter wheat maintained its previously reported satisfactory condition, although near the close of the month the ground was becoming dry in the western Great Plains, where some harm resulted from the blowing of surface soil.

Cool nights and local frosts retarded the growth of tender truck crops the latter part of the month in some southeastern districts, while truck needed rain in the lower Mississippi Valley and in some of the more south-

eastern sections; otherwise the weather was mostly favorable for these crops.

The prevailing mild weather was favorable for the growth of grass in the Southern States, but there was insufficient moisture for ranges in the far Southwest. The mild weather was generally favorable for stock which, on the whole, continued in very satisfactory condition.

Fruit buds prematurely advanced in central and southern portions of the country. During the latter part of the month freezing temperatures extended as far south as the central portions of the east Gulf States, and some injury was done to early fruit in sections of Alabama and locally in Georgia, while peaches and plums were badly damaged in southwestern Arkansas and portions of Oklahoma by the freeze at the beginning of the third decade.

CLIMATOLOGICAL TABLES.

CONDENSED CLIMATOLOGICAL SUMMARY.

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course the number of such records is smaller than the total number of stations.

Condensed climatological summary of temperature and precipitation by sections, February, 1921.

Section.	Temperature.						Precipitation.									
	Section average.		Departure from the normal.		Monthly extremes.				Section average.		Departure from the normal.		Greatest monthly.		Least monthly.	
					Station.	Highest.	Date.	Station.					Lowest.	Date.	Station.	Amount.
Alabama.....	51.0	+ 3.4	Troy.....	81	15	Florence.....	16	18	5.21	+ 0.04	Maple Grove.....	9.67	Alaga.....	1.05		
Arizona.....	45.6	+ 2.1	Mohawk.....	96	25†	Springville.....	16	8	0.39	- 0.63	Oracle.....	1.82	6 stations.....	0.00		
Arkansas.....	48.3	+ 6.3	Texarkana.....	85	24†	Dutton.....	- 3	20	3.59	- 0.18	Georgetown.....	8.90	Whitecliffs.....	1.00		
California.....	49.4	+ 0.9	Indio.....	97	25†	Squirrel Inn.....	- 7	15	2.23	- 2.18	Crescent.....	13.44	5 stations.....	0.00		
Colorado.....	29.8	+ 3.6	Rocky Ford.....	78	25	Gunnison.....	- 28	9	0.68	- 0.47	Savage Basin.....	4.75	3 stations.....	0.00		
Florida.....	62.1	+ 3.0	Homestead.....	89	6	De Funiak Springs.....	27	26	1.77	- 1.56	Hypoluxo.....	5.92	Long Key.....	0.36		
Georgia.....	51.8	+ 3.9	Glennville.....	85	8	2 stations.....	20	3†	4.43	+ 0.54	Toccoa.....	10.77	St. George.....	0.83		
Hawaii (January).....	68.5	+ 0.3	2 stations.....	88	5†	Walmea.....	46	5	24.43	+ 18.14	Hononu.....	82.87	Olowalu.....	2.84		
Illinois.....	29.2	+ 0.9	Murphy.....	66	14	Felt.....	- 33	7	1.75	0.00	Prichard.....	5.03	Sugar.....	0.35		
Indiana.....	38.3	+ 8.7	Carbondale.....	77	14	Freeport.....	8	18	0.83	- 1.26	Shawneetown.....	4.42	Havana.....	0.15		
Iowa.....	36.2	+ 7.0	Mount Vernon.....	74	15	Goshen.....	2	1	1.73	- 0.92	Huntingburg.....	5.57	Crawfordsville.....	0.23		
Kansas.....	31.0	+ 10.5	Pella.....	76	15	Washta.....	- 5	7	0.77	- 0.38	Belmond.....	2.00	Olin.....	T.		
Kentucky.....	40.2	+ 9.0	Newton.....	83	14	Tribune.....	0	8	0.26	- 1.01	Elkhart.....	1.10	11 stations.....	T.		
Louisiana.....	41.3	+ 5.7	2 stations.....	77	14	3 stations.....	11	25†	3.20	- 0.40	Brownsville.....	5.20	Cloverport.....	1.83		
Maryland-Delaware.....	56.8	+ 4.3	Kelley.....	86	7	Calhoun.....	24	20	2.04	- 2.28	Dodson.....	4.51	Angola.....	0.16		
Michigan.....	37.8	+ 5.0	Western Port, Md.....	84	16	Oakland, Md.....	- 15	21	2.92	- 0.35	Friendsville, Md.....	4.11	Hancock, Md.....	2.02		
Minnesota.....	20.7	+ 10.5	Winona.....	67	15	Roseau.....	- 38	19	0.52	- 0.15	Brainerd.....	2.53	2 stations.....	0.00		
Mississippi.....	52.5	+ 4.2	2 stations.....	83	6†	4 stations.....	24	3†	4.25	- 0.66	Aberdeen.....	8.04	Pascagoula.....	1.41		
Missouri.....	40.1	+ 9.1	Bolivar.....	86	16	Dean.....	5	20	0.94	- 1.33	Caruthersville.....	5.53	Tarkio.....	0.02		
Montana.....	30.2	+ 8.9	Foster.....	77	24†	Hebgen Dam.....	- 29	7	0.47	- 0.30	Heron.....	3.62	Townsend.....	0.00		
Nebraska.....	33.9	+ 9.1	Auburn.....	83	14†	Gordon.....	- 13	7	0.44	- 0.30	Brewster.....	1.50	Beaver City.....	0.00		
Nevada.....	36.8	+ 2.8	Logandale.....	84	14†	Owyhee.....	- 20	7	0.84	- 0.39	Lamolle.....	3.07	2 stations.....	0.00		
New England.....	25.0	+ 3.5	Waterbury, Conn.....	74	4	Van Buren, Me.....	- 30	1	2.62	- 0.55	Westboro, Mass.....	4.80	Van Buren, Me.....	1.01		
New Jersey.....	34.0	+ 4.4	Vineand.....	71	16	Culvers Lake.....	- 12	25	3.82	+ 0.25	Little Falls.....	5.82	Bridgeton.....	2.58		
New Mexico.....	38.3	+ 1.1	3 stations.....	82	13†	Tres Piedras.....	- 13	8†	0.47	- 0.30	Harveys Upper Ranch.....	1.50	6 stations.....	T.		
New York.....	27.0	+ 5.4	Dansville.....	66	16	Raquette Lake.....	- 26	25	2.57	- 0.26	Mohonk Lake.....	5.16	Ogdensburg.....	0.60		
North Carolina.....	44.8	+ 3.2	2 stations.....	79	16†	Highland.....	11	24	4.31	+ 0.22	Highlands.....	9.37	Scotland Neck.....	2.36		
North Dakota.....	19.8	+ 11.9	Beach.....	64	12	Langdon.....	- 33	19	0.39	- 0.10	Walhalla.....	1.30	2 stations.....	T.		
Ohio.....	34.3	+ 6.4	2 stations.....	77	15†	Montpelier.....	2	1	2.05	- 0.58	Prospect.....	3.97	Wauseon.....	0.91		
Oklahoma.....	45.1	+ 6.1	2 stations.....	88	13†	3 stations.....	2	8†	1.52	+ 0.13	Poteau.....	6.39	Blackwell.....	T.		
Oregon.....	39.1	+ 1.9	Marshfield.....	72	23	Wallowa.....	- 18	17	5.06	+ 1.31	Government Camp.....	15.58	Andrews.....	0.49		
Pennsylvania.....	32.8	+ 5.5	Everett.....	76	16	Ebensburg.....	- 15	21	2.59	- 0.26	Philadelphia (d).....	4.79	Brooksville.....	1.41		
Porto Rico.....	74.1	+ 0.7	4 stations.....	91	7†	Arbonito.....	48	12†	2.70	- 0.81	Vieques Island.....	6.60	Utado.....	0.10		
South Carolina.....	49.4	+ 2.4	Yemassee.....	85	8	Santuck.....	- 19	21	4.73	+ 0.37	Walhalla.....	9.68	Charleston.....	1.26		
South Dakota.....	29.3	+ 12.4	Spearfish.....	71	14	Pollock.....	- 18	7	0.14	- 0.41	Oelrichs.....	0.93	3 stations.....	0.00		
Tennessee.....	45.2	+ 5.1	4 stations.....	79	14	Crossville.....	16	24	5.37	+ 1.21	Lynnville (near).....	8.15	Union City.....	2.88		
Texas.....	53.9	+ 3.9	Encinal.....	95	6	Dalhart.....	4	19†	1.51	- 0.29	Fort Clark.....	6.15	3 stations.....	0.00		
Utah.....	32.6	+ 2.6	Springdale.....	81	25	Blacks Fork.....	- 29	7	0.93	- 0.39	Silver Lake.....	4.81	4 stations.....	0.00		
Virginia.....	40.8	+ 4.6	2 stations.....	76	16	Woodstock.....	1	21	2.91	- 0.20	Williamsburg.....	4.56	Broad Run.....	0.75		
Washington.....	36.7	+ 2.3	Olympia.....	71	7	Snyders Ranch.....	- 15	16	4.42	+ 0.75	Cedar Lake.....	17.00	Wenatchee.....	0.30		
West Virginia.....	37.4	+ 5.4	Moorefield.....	79	16	Lost Creek.....	- 10	21	2.61	- 0.45	Raleigh.....	4.90	Brandywine.....	1.10		
Wisconsin.....	24.1	+ 8.6	Richland Center.....	67	15	2 stations.....	- 18	3†	0.65	- 0.54	High Falls.....	1.70	Belott.....	0.05		
Wyoming.....	26.5	+ 5.1	Cody.....	75	12	do.....	- 40	7†	0.39	- 0.48	Moran.....	1.77	Dubols.....	0.00		

* For description of tables and charts, see this REVIEW, January, 1921, p. 41.
 † Other dates also.