

CHAPTER IV
FLOOD HISTORY

Republican River

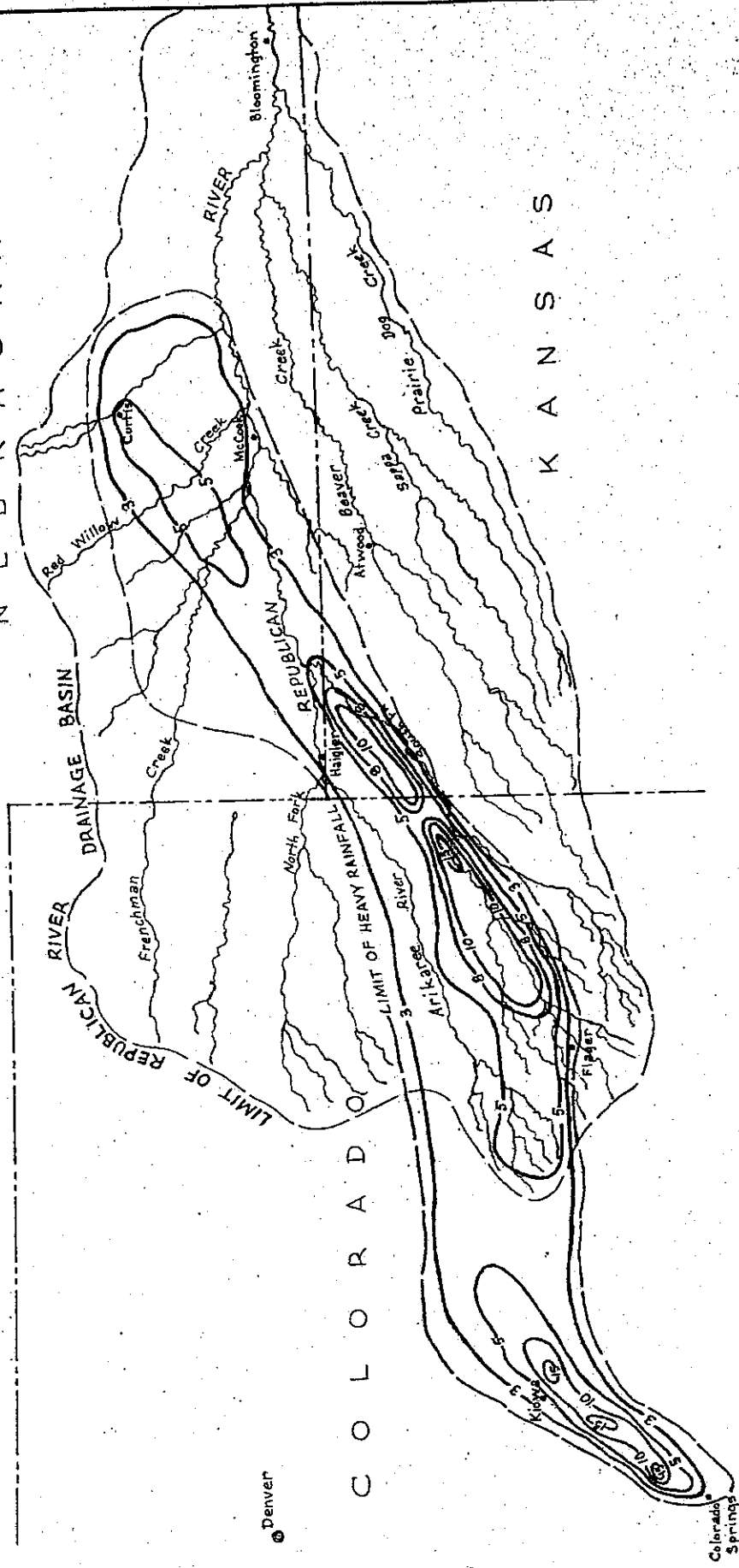
Major floods on Republican River are of comparatively infrequent occurrence, however, storms of high intensity occur frequently over small areas, producing numerous minor floods.

An unusually heavy storm of cloudburst intensity ^{occurred} in eastern Colorado and western Nebraska during the night of May 30-31, 1935, following closely upon two separate periods of moderately heavy to heavy general rainfall over the basin earlier in the month, produced the greatest flood of record in the upper part of this basin. Because of the two earlier rains, the streams had reached high stages a few days before the major flood, and the saturated soil conditions afforded very high runoff from the subsequent storm on May 30 and May 31.

Since there were no Weather Bureau Precipitation Stations in the areas of heaviest rainfall, information on intensities and amounts of rainfall were obtained from local residents who had measured the rainfall in stock tanks, buckets, cans and other improvised rain gages. As much as 24 inches of precipitation was reported near the headwaters in Colorado, occurring chiefly during the afternoon of May 30. An isohyetal map on the following page shows the distribution of rainfall for the cloudburst storm of May 30-31, 1935, as shown on page 28 of the Geological Survey Water Supply Paper 796-B by Robert Follansbee and J. B. Spiegel.

N E B R A S K A

K A N S A S



CLONDBURST STORM IN UPPER PART OF REPUBLICAN RIVER DRAINAGE BASIN, MAY 30-31, 1935
 U.S. Geological Survey - Water Supply Paper 796-B.

This Republican River flood of May and June 1935, was the maximum of record, having a momentary peak flow of 260,000 second-feet a few miles below Cambridge, and was 360 percent greater than any other recorded flood. Peak flows and corresponding mean daily discharges at various locations in the basin for the 1935 flood are as follows:

Stream and Station	Date	Maximum Discharge C.F.S.	
		Momentary	Mean Daily
North Fork. State line	6/1	367	275
Arikaree. Haigler	5/31	50,000	17,000
South Fork. Benkelman	5/31	150,000 ¹	---
Frenchman Creek Culbertson	5/31	15,000 ¹	5,500
Blackwood Creek At Mouth	5/31	15,000	---
Republican River.			
. . . Max, Nebraska	5/31	190,000	85,000
. . . McCook, Nebraska	5/31	245,000 ²	---
. . . Cambridge, Nebraska	5/31	260,000 ²	---
. . . Bloomington, Nebraska	6/1	260,000	116,000
. . . Hardy, Nebraska	6/2	225,000	117,000
. . . Scandia, Kansas	6/2	215,000	115,000
. . . Clay Center, Kansas	6/3	195,000	103,000
. . . Junction City, Kansas	6/3	168,000	---

1 Originated on the lower end of Frenchman Creek

2 Below the mouth of Medicine Creek

This flood transformed the usually quiescent Republican River, with a normal water surface about three to four hundred feet wide and little more than a foot deep, into a raging torrential wall of water, as deep as 20 feet and as wide as two miles at some points, demolishing or obliterating everything in its path; killing scores of persons; tearing out miles of railroad track and bending the rails like wire; washing out hundreds of miles of highway; twisting and tearing bridges from their abutments; drowning thousands of livestock and other animals; wrenching homes and buildings from their foundations to float crazily down the valley until shattered by other floating objects; inundating farm lands;

destroying crops, and depositing large quantities of sand and silt on thousand of acres of previously good farm lands, making them impossible or impracticable to farm. Power and communication lines were broken, and water supply systems were destroyed or contaminated to add to the complexity of the problems and discomfiture of the residents of the basin.

In addition to the destruction wrought by the abnormally heavy rainfall and flood waters, a tornado appeared in the vicinity of McCook, Nebraska, at the time of the flood crest and a strong east wind brought clouds of dust to that area to further harrass the residents of the valley, leaving in its wake a trail of wrecked buildings.

The following tables showing losses incurred due to the 1935 flood were taken from the U. S. Geological Survey Water Supply Paper 796-B "Flood on Republican and Kansas Rivers May and June 1935":

SUMMARY OF LOSSES IN COLORADO AND NEBRASKA

	Colorado	Nebraska
Lives lost.	6	94
Livestock lost.	300	8,100
Poultry lost.	*	46,500
Highways damaged. miles . . .	/5	341
Highway bridges damaged	/6	307
Crops damaged acres . . .	**	42,000
Farm land damaged do . . .	15,000	57,000
Total value of property loss.	##\$790,000	##\$7,532,000

- * No record.
- / Estimated.
- / Does not include county bridges.
- ** Area damaged in Colorado was chiefly hay land and is included under farm land damaged.
- ## Includes damage to county bridges and roads.
- ## Includes \$1,500,000 loss of Burlington Railroad directly chargeable to the flood, a small part of which occurred in Colorado.

SUMMARY OF LOSSES IN KANSAS

Lives lost	10
Livestock lost	12,193
Homes flooded	1,485
Buildings flooded, other than homes	1,552
Fence washed out	1,549
Crops damaged or destroyed	221,507
Farm land damaged	202,615
Highway damaged	484
Highway bridges damaged or destroyed	202
Railroads damaged	171
Railroad bridges damaged or destroyed	83
Levees and flood protection works damaged or destroyed	42

A summary of the 1935 flood damages at the various towns in the Republican River Basin is shown in the following table taken from the Report on Survey for Flood Control, Republican River by the U. S. Engineer Office, Kansas City District, Kansas City, Missouri:

ESTIMATED FLOOD DAMAGE AT TOWNS--1935 FLOOD

Towns	Population	Homes and Business Buildings	Utilities and Major Industries	Total
<u>Kansas</u>				
Clay Center	4,386	\$ 5,000	\$ 70,800	\$ 75,800
Junction City	7,407	---	500	500
St. Francis	944	---	8,000	8,000
Scandia	608	2,500	---	2,500
<u>Nebraska</u>				
Alma	1,235	1,000	6,500	7,500
Arapahoe	1,017	---	21,550	21,550
Bartley	465	400	200	600
Benkelman	1,154	2,000	1,100	3,100
Bloomington	431	---	400	400
Cambridge	1,203	35,000	7,900	42,900
Culbertson	820	14,000	---	14,000
Edison	329	6,000	400	6,400
Franklin	1,103	---	400	400
Guide Rock	690	600	1,400	600
Haigler	535	---	---	1,400

ESTIMATED FLOOD DAMAGE AT TOWNS--1935 FLOOD, CONT'D.

Towns	Population	Homes and Business Buildings	Utilities and Major Industries	Total
<u>Nebraska</u>				
Holbrook	488	\$ 2,500	\$ 600	\$ 3,100
Inavale precinct	472	1,500	---	1,500
Indianola	815	20,000	3,800	23,800
Max township	519	---	900	900
McCook	6,688	20,000	253,530	273,530
Naponee	252	1,000	700	1,700
Orleans	985	---	2,200	2,200
Parks	90	4,000	---	4,000
Red Cloud	1,519	1,500	2,800	4,300
Republican City	417	---	400	400
Riverton	328	5,500	1,300	6,800
Stratton	663	14,000	150	14,150
Superior	3,044	---	67,800	67,800
Trenton	865	13,000	2,800	15,800
<u>Colorado</u>				
Burlington	1,280	---	1,000	1,000
Wray	1,785	---	500	500
TOTAL	42,537	\$149,500	\$457,630	\$607,130

Indian legend and tradition indicates the occurrence in 1826 of a major flood comparable in magnitude to the 1935 flood. Statements handed down from several different sources claim a flood occurred about 1826 with flood water "extending from bluff to bluff." A published statement in the spring of 1826 refers to a "tremendous rise, like a wall of water" coming down the Kansas River. Another statement, in a letter from the superintendent of missions among the Osage Indians, mentions extremely high water on the Noesho River in March 1826, and a still greater rise, 10 feet higher than the earlier flood stage, in September of the same year. The information cited above and other

references lend credence to the flood reported by the Indians. This also would indicate that the 1935 flood could be classed as one of the 100-year type.

Other major floods of record on Republican River occurred in 1903, 1905, 1915, and 1923. A comparison of these and earlier floods with the flood of 1935 was obtained at a house near Oxford, Nebraska. This house was built on the same location as one built in 1865, and prior to 1935, flood waters had never reached the house, however, a lean-to about 10 feet high attached to the house was completely submerged during the 1935 flood. This indicates that the 1935 flood was at least 12 feet higher than any previous flood since 1865.

The 1903 flood was caused by general rains over the entire basin, with the principal damage occurring on the lower portion. The maximum discharge was 71,000 second-feet on May 30, at Junction City, Kansas. The total volume of runoff at Junction City during the period May 26 through June 6 was 944,000 acre-feet. The discharge at Superior, Nebraska, was estimated at 14,000 second-feet on May 29, 1903.

The flood of 1905 was of slightly greater magnitude with a river stage of 10.4 at the gaging station at Bostwick, Nebraska, for which stage the discharge was estimated at 24,500 second-feet.

The 1915 flood produced the highest stages of record, next to those of 1935, throughout the upper part of the basin, however, no data are available as to the discharges.

Heavy rains over the upper portions of the Republican River Basin in May and June, 1923, caused floods in this section which approached the 1915 flood in magnitude. Eight highway bridges across the South

Fork of the Republican between St. Francis, Kansas and Benkelman, Nebraska, were destroyed. No stream gaging records are available for the upper Republican River, but the momentary peak at Scandia was 16,700 second-feet. Upstream peak flows were probably considerably higher.

Comparatively little damage had been done to municipalities by floods previous to 1935, but a summary of all flood damages in the Republican River Basin for which data has been compiled from 1902 through 1935 is given in the following table taken from the U. S. Engineer Report on Survey for Flood Control Republican River:

SUMMARY OF FLOOD DAMAGES--(1902-1939)

<u>Year</u>	<u>Damages</u>
1902	250,000
1903	600,000
1904	200,000
1905	300,000
1908	400,000
1915	3,000,000
1919	100,000
1923	600,000
1927	300,000
1931	5,000
1932	30,000
1933	5,000
1935	9,054,000
1936	200,000
1937	119,000
1938	69,000
1939	107,000
TOTAL	\$15,339,000

Frenchman-Creek

Although the May 30-31 storm in 1935 produced the greatest flood of record on the Republican River and on the lower reaches of Frenchman

Creek, long time residents claim the flood of June 6, 1940, exceeded all others on Frenchman Creek above Hamlet, Nebraska. Below this point, however, valley storage apparently reduced the crest and less damage was done through the lower reaches of the stream. The following table from a report by the Bureau of Agricultural Economics summarizes by counties, the estimated damages done by the June, 1940, flood on Frenchman Creek:

FLOOD DAMAGE ON FRENCHMAN CREEK, 1940

Type of loss	Logan County Dollars	Phillips County Dollars	Chase County Dollars	Hayes County Dollars	Hitchcock County Dollars	Total Dollars
Cropland	600	1,800	10,190	6,160	1,875	20,625
Hay land	---	---	2,717	1,085	313	4,115
Livestock	---	---	2,365	---	---	2,365
Fence	---	1,400	5,038	2,470	660	9,568
Bank cutting	---	---	2,500	300	---	2,800
Private bridges	---	---	4,231	---	---	4,231
Other agricultural	---	750	8,423	50	---	9,223
County bridges	1,400	3,500	16,500	1,050	215	22,665
State bridges	---	---	5,000	8,700	---	13,700
Power and Irrigation Co.	---	---	17,050	1,400	1,400	19,850
Village businesses	---	---	15,053	---	---	15,053
Village homes	---	---	14,625	115	---	14,740
Village property	---	---	2,700	---	---	2,700
Railroads	---	---	3,388	3,388	---	6,776
TOTAL	2,000	7,450	109,780	24,718	4,463	148,411

Medicine Creek

The June 1940 flood on Medicine Creek also did considerable damage in that tributary basin. The U. S. Engineer Department, Kansas City, Missouri, estimated the damages from this storm, from the proposed dam site to the mouth of the Republican River, at \$32,930. The damages above

the proposed dam site were estimated at \$59,788 by the Bureau of Agricultural Economics. The following table summarizes the damages in the Medicine Creek Basin for this storm amounting to a total of \$92,718.00:

FLOOD DAMAGE ON MEDICINE CREEK, 1940

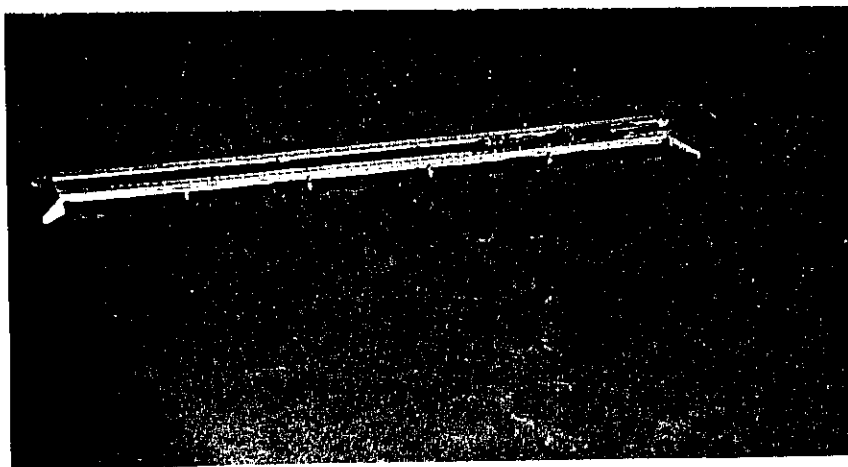
Type of loss	Frontier County Dollars	Lower 8 miles of stream 1/ Dollars	Total Dollars
Cropland	15,955	26,730	42,685
Livestock	1,750	---	1,750
Fence	1,842	500	2,342
Bank Cutting	2,800	300	3,100
Private bridges	832	---	832
Other Agricultural 2/	418	---	418
County bridges	23,000	4,400	27,400
State bridges	8,000	---	8,000
Village businesses	---	500	500
Village property	---	500	500
Railroads	5,191	---	5,191
TOTAL	59,788	32,930	92,718

1/ U. S. Engineering Department, Kansas City, Missouri, unpublished.

2/ Buildings, feeders, feed yards and machinery.



FC-56. Aerial view of Cambridge, Nebraska, during the flood of June 1, 1935.



FC-57. Aerial view of people marooned on highway bridge across the Republican River at McCook, Nebraska, by flood of June 1, 1935.



FC-69. Aerial view of Republican River south of Arapahoe, Nebraska, during the Flood of June 1, 1935.