Summary of Floods in the United States

During 1957
Prepared under the direction of E. L. HENDRICKS, Chief, Surface Water Branch FLOODS OF 1957

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1652-C

Prepared in cooperation with
Federal, State, and local
agencies

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1963

UNITED STATES DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, Secretary

GEOLOGICAL SURVEY

Thomas B. Nolan, Director

For sale by the Superintendent of Documents, U.S. Government Printing Office Washington, D.C. 20402

CONTENTS

Page
Abstract---------_-__----__--__-__---__-----_____--__-_-_-__---__- Cl
Introduction, ____ 1
Determination of flood stages and discharges. _________________________ 3
Explanation of data____ 4
Summary of floods -in 1957_ _ ______________________________________ 4
Floods of January 29-February 6 in southeastern Kentucky and
adjacent areas____ 4
Floods of February in Washington, Oregon, and Idaho___-__------_ 12 Floods of April-June in Texas and adjacent States-----_-__----_-_- 18 Floods of April-June in Oklahoma and western Arkansas ___________ 24 Storms of April____ 25 Storms of .May _ _ ____ 25
Storms of June____ 27
The floods.---_---_-_______--________-____------_-___-_--- 27
Arkansas River tributary basins in eastern Oklahoma and
western Arkansas.-______________-__--__-_______--__- 36
Cimarron, Canadian, and mainstem Arkansas River basins. 37
Red River basin_______-_-__--__-____-__-_----___--_--- 38
Records of previous floods___--__--__________---__--_---_-_- 39 Frequency of peak discharges_____-__-----_-_-_________-_-_- 41 Floods of May 9 near Denver, Colo______________________________ 43 Floods of May 16-17 in Kansas_--_----_------_----_--------_-_- 44 Floods of May 17,21-23 in southeastern Missouri____-__-___-____- 46 Floods of May and June in Idaho__________--______--___--_-_-__ 48 Floods of June 5-7 on Greybull River, Wyo_________-_-_---_-___- 51 Floods of June 9 at Perry, Fla._. _______________________________ 52
Floods of June 14-17 in Illinois and Missouri_________.____---___- 55
Floods of June 16 on Bazile Creek, Nebr___________-__-____---_- 57
Floods of June 16-18 in Kansas River basin, Kansas and Nebraska.- 58
Floods of June 16-21 in southeastern South Dakota-__-___-___-__ 60
Snowmelt floods of June and July in western Colorado _____________ 63 Floods of June-July in Indiana and Illinois___________--___-___--- 65 Floods of July 1 in the vicinity of Coffeeville, Miss ________________ 69 Floods of July 12-13 in northern Illinois-. ________-____-____-_--- 72 Floods of July 26, 30 on Cherry Creek and July 30 on Kiowa Creek,
Colo.____ 76
Floods of August 3-4 in central New York__--___----------------- 77 Floods of August 13-14 in north-central Arkansas______-_____-_--- 79 Floods of August 24 in vicinity of Santa Fe, N. Mex_______________ 81 Floods of September 18-19 in Harrison County, Missi________-_-_- 82
Floods of October 13-15 in Colorado River basin, Texas...--------- 85
Floods of November 18-21 in Kentucky and adjacent southwest area. 87
References cited.__________________________________--_-----_------_ 93
Index.____ 95

m

IV CONTENTS

ILLUSTKATIONS

FIGURE 1. Map of the United States showing areas and months of occurrence of floods in 1957 for which reports are prepared.________________---_---_--___-____-____ C2
2. Map of flood area on January 29-February 6 in south-
eastern Kentucky and adjacent areas. ___--____-____ 5
3. Volume of water stored in TVA reservoir system. ______ 11
4. Map of flood area during February in Washington,
Oregon, and Idaho_____-_---_-_--__----_---______- 13
5. Discharge hydrographs, Weiser River, February 22-
March 3__.________________________________^_____ 17
6. Discharge hydrographs, Malheur River basin, February
22-March 2__.._____--___---- _-_-_---___________ 17
7. Total precipitation for April-June in Texas and adjacent
States________________-____-_--_-___-___-________ 19
8. Precipitation for April-June in percentage of normal for
1 year in Texas and adjacent States______ ___________ 19
9. Map of flood area during April-June in Texas and adjacent
States__.____ 23
10-13. Isohyetal map showing total precipitation for:
10. April-June 1957 and the mean annual rainfall,
Oklahoma and western Arkansas._____________ 25
11. April in Oklahoma and western Arkansas._______ 25
12. May in Oklahoma and western Arkansas_________ 26
13. June in Oklahoma and western Arkansas.._______ 27
14. Map of flood area during April-June in Oklahoma and
western Arkansas-____---__---_----_---__---_---_- 28
15. Discharge at selected gaging stations during April-June
in Oklahoma and western Arkansas.________________ 31
16. Recurrence intervals of discharges in Oklahoma and
western Arkansas_____--_-_------_-_--_--_____--_- 42
17-21. Map of flood area showing flood determination points:
17. May 9 near Denver, Colo______________________ 44
18. May 16-17 in Kansas___-__-____--__----______ 45
19. May 17, 21-23 in southeastern Missouri. ________ 46
20. May and June in Idaho___-__---_---__----__-_- 48
21. June 5-7 on Greybull River, Wyo____-_-_-___-_- 51
22. Isohyetal map for June 7-8 in the vicinity of Perry, Fla_ _ 53
23-27. Map showing flood area and location of flood-determina-
tion points:
23. June 9 at Perry, Fla_________________________ 54
24. June 14-17 in Illinois and Missouri_________.____ 56
25. June 16 on Bazile Creek, Nebr________________ 58
26. June 16-18 in Kansas River basin, Kansas and
Nebraska.___________________________________ 58
27. June 16-21 in southeastern South Dakota________ 61

CONTENTS V

Page
FIGURE 28. Discharge hydrographs for selected streams on June 16-
21 in southeastern South Dakota_____-_--_-________ C63
29-31. Map showing location of flood-determination points:
29. June-July in western Colorado _________________ 64
30. June-July in Indiana and Illinois _______________ 66
31. July 1 in the vicinity of Coffeeville, Miss_______ 70
32. Rainfall intensity-frequency curves, July 1, vicinity of
Coffeeville, Miss________________________________ 70
33-37. Map showing location of flood-determination points:
33. July 12-13 in northern Illinois_______--_-_----- 73
34. July 26, 30 on Cherry Creek and July 30 on Ki-
owa Creek, Colo____________________________ 77
35. August 3-4 in central New York________________ 78
36. August 13-14 in north-central Arkansas.________ 80
37. August 24 in vicinity of Santa Fe, N. Mex_______ 81
38. Rainfall intensity-frequency curves, September 17-18, Harrison County, Miss_______-_-__-________-_-_--_ 83
39-41. Map of flood area showing location of flood determination points:
39. September 18-19 in Harrison County,Miss.______ 85
40. October 13-15 in Colorado River basin, Texas.___ 86
41. November 18-21 in Kentucky and adjacent south-
west areas_____-_-____-____________--_-_--- 88

TABLES

Page
TABLE 1. Flood stages and discharges during January 29-February
6 in southeastern Kentucky and adjacent areas_____ C6
2. Precipitation at representative locations during February
floods in Washington, Oregon, and Idaho____________ 12
3. Maximum and minimum temperatures at representative
locations during February floods in Washington,
Oregon, and Idaho______________________________ 13
4. Flood stages and discharges during February in Washing-
ton, Oregon, and Idaho.__________________________ 14
5. Flood stages and discharges during April-June in Texas
and adjacent States_____________________________ 20
6. Runoff, in acre-feet, in Oklahoma and western Arkansas,
April-June 1957___._-_-_--__.__....._._-._._._... 29
7-10. Flood stages and discharges:
7. April-June in Oklahoma and western Arkansas_ 31
8. May 9 in Platte River basin near Denver, Colo___ 43
9. May 16-17 in Arkansas River basin, Kansas.__._ 45
10. May 17 and 21-23 in southeastern Missouri-.-.-- 47
11. Precipitation at representative locatipns during May
floods in Idaho.__________________________________ 49

VI CONTENTS

Page
TABLE 12-26, Flood stages and discharges:
12. May and June in Idaho.______________________ C50
13. June 5-7 on Greybull River in Yellowstone River basin, Wyoming.___________________________ 52
14. June 14-17 in Illinois and Missouri____________ 57
15. June 16-18 in Kansas River basin, Kansas and
Nebraska._________________________________ 59
16. June 16-21 in Iowa and southeastern South Dakota. 62
17. June-July in western Colorado _________________ 64
18. June-July in Indiana and Illinois_____-----_____ 67
19. July 1 in Yazoo River basin near Coffeeville, Miss. 71
20. July 12-13 in northern Illinois- _-__---____-_____ 75
21. August 3-4 in central New York._______________ 79
22. August 13-14 in north-central Arkansas.________ 80
23. August 24 in Rio Grande basin, Santa Fe, N. Mex_ 82
24. September 18-19 in Harrison County, Miss____-_ 84
25. October 13-15 in Colorado River basin, Texas.--- 87
26. November 18-21 in Kentucky and adjacent south-
west areas_ _ ________________________________ 90

FLOODS OF 1957

SUMMARY OF FLOODS IN THE UNITED STATES

DURING 1957

ABSTRACT

The total amount of flood losses in the United States during 1957 was the fourth greatest in 55 years of record.
The greatest floods in 1957 were: January-February in southeastern Kentucky and adjacent areas, April-June in Texas and adjacent States, April-June in Oklahoma and western Arkansas, June in the St. Louis area in Missouri and Illinois, and June-July in the Wabash and White River basins in Indiana and Illinois.
Many other smaller but significant floods occurred in scattered areas during the year. In these floods many streams rose to maximum stages and had discharges of rare occurrence.
Reports of 25 floods are presented in chronological order in this annual summary. INTRODUCTION

The purpose of this summary chapter in the series "Floods of 1957" is to assemble into a single volume information relating to all known severe floods in the United States during 1957. Chapters A and B (U.S. Geol. Survey, 1963; Yost, 1963), respectively, describe these floods in detail.
The areas for which flood reports have been prepared for 1957 are shown on figure 1. The areas covered by chapters A and B are shown by hatching, and the areas for the other floods reported in this summary chapter are shown as dotted. The months in which the floods occurred are indicated; thus the location and the time dis-tribution of floods during the year are given.
The floods in this summary chapter were selected as being unusual hydrologic events in which large areas were affected, great amounts of damage resulted, or extreme discharges or stages occurred.
Most of the floods in 1957 were in the lower Mississippi River basin and eastern Texas, and 20 of the 25 floods reported occurred in the 5-month period April-August.
The U.S. Weather Bureau (1957a) has estimated that the total flood damage in the United States during 1957 was $360 million. This Cl

to

FIGURE 1. Map of the United States showing areas and months of occurrence of floods in 1957 for which reports are prepared. Line pattern indicates those areas for which special reports are prepared.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C3

was the fourth greatest loss in 55 years of record and was exceeded only in 1955 ($995 million), 1951 ($1,029 million), and 1937 ($441 million). The national average-annual-flood loss, based on losses during 1942-51 and adjusted to the 1952 price index, is $275 million. A national average of 86 lives was lost owing to floods in the United States (1925-56). The total loss of lives was 82 in 1957, whereas it was 302 in 1955, 51 in 1951, and 142 in 1937.
The continuing investigation of surface-water resources in the areas covered by this report is carried on by the U.S. Geological Survey in cooperation with State agencies, the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, and other Federal or local agencies. Some data in this report were obtained from U.S. Weather Bureau publications.
The collection of data, the computations, and some of the prepara-tion of text were made by the district offices of the Surface Water Branch in whose district the floods occurred. Assistance in prepara-tion of the data for the report was given by the Flood Specialists in their respective areas.
The report was assembled and prepared in the Floods Section, Tate Dalrymple, chief.

DETERMINATION OF FLOOD STAGES AND DISCHARGES

The peak stages and discharges at gaging stations and at miscel-laneous sites given in this chapter are from data which are regularly obtained and compiled in the ordinary procedure of surface-water investigation by the Geological Survey.
The usual method of determining stream discharges at gaging sta-tions is by the application of a stage-discharge rating to the recorded stage. The rating is usually defined by current-meter measurements through as much of the range of stage as possible. The peak dis-charge at a station may be above the range of the stage-discharge rating, and short extensions of the rating may be made by logarithmic extrapolation, by velocity-area studies, or by use of other measurable hydraulic factors.
Peak discharges at gaging stations which are greatly above the range of the rating and peak discharges at miscellaneous sites are generally determined by various methods of indirect measurements at the site. Corbett (1943) describes these indirect methods. Dalrym-ple (1937, 1939) ,and Johnson (1936) give more detailed descriptions with illustrated examples.
During major floods, adverse conditions often make it impossible to obtain current-meter measurements at some sites, in which case peak discharges are measured by indirect methods based on detailed surveys of selected channel reaches.

C4 FLOODS OF 1957

EXPLANATION OF DATA

The floods described herein are given in chronological order. Because of the different characteristics of the floods and because of the varying amounts of information available, no consistent form is used in reporting each event.
The data presented include: a description of the storm, the flood, and the flood damage; a map of the flood area showing the location of flood-determination points and for some storms the location of pre-cipitation stations or isohyets; rainfall data; and flood-peak stages and discharges of the streams affected.
In general, some rainfall amounts are included in the description of the flood. When considerable rainfall data are available, they are presented in tables which give daily or storm tot" s. For the storms where sufficient data are available to determine the pattern and distribution of rainfall, an isohyetal map is shown.
A tabular summary of peak stages and discharges is given for each flood, unless the number of stations in the report is so small that the information is included in the description.
In the summary table, the first column under maximum floods shows the period of known floods prior to the 1957 flood. This period does not necessarily correspond to that in which continuous records of discharge were obtained, but many records extend back to an earlier date. More than one period of known floods are shown for some stations, as periods are shown when they can be associated with a maximum stage even though the corresponding discharge may not be known; a second period of known floods is then given in which both the maximum discharge and stage are known.
The second column under maximum floods shows the year in which the maximum stage or discharge occurred. The third column gives the date of the maximum stage or discharge in 1957.
Q2.33 in the last column refers to the theoretical flood having a recurrence interval of 2.33 years which by definition is the graphical interpretation of the mean annual flood.

SUMMARY OF FLOODS IN 1957

FLOODS OF JANUARY 29-FEBRUARY 6 IN SOUTHEASTERN KENTUCKY AND ADJACENT AREAS

An unusual series of storms occurred from January 20 to February 10 over a large area consisting of the western parts of West Virginia, Virginia, and North Carolina; the northern parts of Georgia, Alabama, and Mississippi; the southern part of Kentucky; and all of Tennessee. Rainfall from these storms produced totals in many places which exceeded previous records for a similar period. From 10 to 25 inches

82°

WEST VIRGINIA

INDIANA

EXPLANATION
. 5

Gaging Station

Miscellaneous measurement site
Numbers correspond to those given
in table 1

Isohyet
Isohyetal interval 2 inches

FIGURE 2. Map of flood area showing location of flood-determination points and precipitation for January 27-February 2. Floods of January 29-February 6 in Tennessee River basin and adjacent areas.

06 FLOODS OF 1957

of rain fell over the eastern half of the flood area, and from 7 to 14 inches fell over the western half in this 3-week period.

The first 3 weeks in January were drier than normal, and there was no snow on the ground when the rains began to fall on January
20. Heavy rains fell January 20-23, particularly on northwestern Tennessee River basin; they were heaviest below Pickwick Landing and caused medium-high stages on some streams. Practically no rain was reported January 24-26.

The heaviest rains fell from January 27 to February 2 (fig. 2) and it was in this period that the greatest discharges occurred. More than 10 inches of rain fell in many localities in the eastern Tennessee River basin, and more than 12% inches fell at Clingmans Dam, N.C. The floods in eastern Kentucky were examples of the violent type of flash floods common in the mountainous reaches of the Big Sandy, Kentucky, Cumberland, and Licking Rivers. Enormous quantities of water ran off the thin soil and rocky slopes, rapidly raising the stages of the narrow streams to flood height. Few reservoirs exist on these streams to control flood flows.

Stages reached maximum heights on many streams and almost all principal towns along the rivers were flooded. Data of stage and discharge at representative stations are shown in table 1. On

TABLE 1. Flood stages and discharges during January 29-February 6 in south-eastern Kentucky and adjacent areas

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before January 1957

Period Year

January-
February
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Qj.33

Kanawha River basin

1

2_______

3_______

4 .

5.... ..

Narrows, Va.

Camp Creek, W.
Va.

Pipestem, W. Va.

W. Va.

305

OOQ

qo n

9.A0.

1878
1938-56

1 QflS 1 A
1938-56

1946-56

1950-56

1918
1 Q°.Q 5A

1878
1949

1955

1Q18

Jan. 29

Jan. 29

Jan. 29

23.5
14.44
16.50
13.0

12.55

6.35

13.86
2 14. 49
37.2
29.42
31.27

(')
13, 700
16, 500
11, 000

12, 900
2,720
3,410

14, 900
2 16, 100
49, 000
32, 300
34, 200

Guyandot River basin

6.......
Man, W. Va.

762 IQQft Rfi 19.11 22.25

3 40, 000
37,600

See footnotes at end of table.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C7

TABLE 1. Flood stages and discharges during January 29-February 6 in south-eastern Kentucky and adjacent areas Continued

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before January 1957

Period Year

January-
February
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to

QJ.»J

Big Sandy River basin

7.......

8.......

9

10......

11-.--..

12- -.

13

14

15- .

Vansant, Va.

Grundy, Va.

Haysi, Va.

Meta, Ky.

Paintsville, Ky.

W. Va.

19.8

235

286

212

1,237

55.7

2,143

502

3,870

1941-56

1926-56

1926-56

1862
1937-56

1941-56

1862
1915-16,
1928-56

1930-56

1938-56

1946

1929

1929

1862
1946

1 QCC

1862
1939

1935

1QKC

Jan. 29

Jan. 29

Jan. 29

Jan. 30

Jan. 29

Jan. 29

Jan. 31

14.5
19.06
18.5
23.17

0)
18.65
52
42.90
52.72
14.28
14.54
46.6
42.15

45.92
19.0
21.60
46.36
44.43

4,550

3 22, 000
33, 200
34, 500
46, 600
30, 000
27, 300
0)
50, 300
85, 500
4,480
4,680

0)
62, 300

69, 700
27, 600
35, 700
89, 400
84, 900

3.3

4.0

2.9

2.4

1.9

1.9

2.8

1.5

Little Sandy River basin

16 Little Sandy River
near Grayson, Ky.

398 1938-56 1950
Jan. 23

27.53
17.09

24, 500
6,400 .6

Tygarts Creek basin

17 Tygarts Creek near
Greenup, Ky.

241 1940-56 1948
Jan. 23

20.35
13.99

12, 800
4,000 .5

Licking River basin

18- . Licking River near
Salyersville, Ky.

140 1938-56 1939
Jan. 30

25.4
20.79

14, 300
5,880 1.4

Kentucky River basin

19

20

21

North Fork Ken-

tucky River at
Hazard, Ky.
Troublesome Creek
at Noble, Ky.

Middle Fork Ken-
tucky River at
Tallega, Kv.

466

177

537

1927
1940-56

1939
1949-56

1930-32,
1939-56

1927
1951

1939
1951

1939
1951

Jan. 29

Jan. 29

Jan. 30

34
27.2
37.54
29
24.78
23.35
40.50

43.33

0)
28, 100
47, 800
0)
15,600
13, 500
0)
35,300
52, 700

2.8

1.7

2.9

See footnotes at end of table.

C8 FLOODS OF 1957

TABLE 1. Flood stages and discharges during January 29-February 6 in south-eastern Kentucky and adjacent areas Continued

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before January 1957

Period Year

January-
February
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Qj.33

Kentucky River basin Continued

22-

23

24

25

26

South Fork Ken-

tucky River at
Booneville, Ky.

Lock 14, at Heidel-

City, Ky.

Ky.

117

722

2,657

362

6,180

1947

1925-31,
1939-56

1925^31,
1936-56

1930-32,
1938-56

1925 56

1947

1947

1939

1938

1 Q^7

do-

Jan. 30
- do-

Jan. 30

Feb. 4

41.70

43.40
35.6

35.00

17.49

40.20

< 44, 000
48,500
50,700

66,100

120,000

116, 000
21, 100

9,110

« 123, 000
6 86, 300

8.1

2.9

1.8

.9

Salt River basin

27

28- - 940

1938-56

1913
1938-56

1928
1948

1913
1945

Feb. 10

Jan. 23

22.2
19.3
12.41
94. 7

22.4
18.39

0)
14, 700

5,290 (')
26, 500
11,000

. 5

. 9

Green River basin

29

30

31

32

Columbia, Ky.

Pageville, Ky.

749

186

'531

M78

1939-56

1939-56

1913
1952

I QKO

1948

Jan. 30

Jan. 29

Jan. 30

Jan. 29

36.2
33.50
25.65
23.8
17.28
27.26
23.76
30.70
31.54

(')
47,000
21, 500
15,900
7,790
70, 000
42,800
30,900
34, 300

1.1

.9

2.3

1.9

Cumberland River basin

33

34

35.-..--

36__

37.

38

39 _-

40 ,. ..

41-._...

Poor Fork at

Cumberland River

near Harlan, Ky.
Straight Creek at
Jensen, Ky.

near Pineville, Ky.

Billows, Ky.

Stearns, Ky.

Ky.

82.3

374

53.8

sno

604

382

954

K 7CQ

5,790

1927

1940-56

- IQOO.KC

1 Q*>A P;«

1 Q9Q

1950 56

1 C9fi_1 Q F1A
IQOnKfi

1927
1946

1946

1 Q47

1929
1 QOQ

1QOQ

1951

1826

Jan. 29

do .

Jan. 29

Jan. 30

Jan. 29

Feb. 13

Feb. 22

10.2
9.65
11.50
22.81
19.89

49.31
47.35
45.48
31.90
41.2
33.58
26.00
52.9
38.50
36.25

8 734. 40

69.5
64.82
21.43

12, 000
7,500
11,800
37, 900
31,000
16,700

57, 900
54,900
46, 800
25, 000
74, 700
44, 300
29, 200
(')
69,600
61, 500
» 4, 960
9 4, 580

(0
162, 000
6 27, 500

2.

2.
4.

3.

1.

1.

1.

See footnotes at end of table.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C9

TABLE 1. Flood stages and discharges during January 29-February 6 in south-eastern Kentucky and adjacent areas Continued

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before January 1957

Period Year

January-
February
1907

Gage
height
(ft)

Discharge

Cfs

Ratio
to
<?2.33

Cumberland River basin Continued

12

13. -

105

7,320 1826-1956
1922-56

1955

1826
1926
do...

Jan. 29

Jan. 29

9.06
10.84
59.2

57.25
30.44

14,100
22, 600
(0
145, 000

6 66, 500

3.2

Tennessee River basin

44

45

46

47

48

49

50

51____ -_

52____ __

53 -

54-

55 -

56 .-

Little Pigeon River
at Sevierville,
Tenn.
South Fork Holston
River at Vestal,
Va.
Middle Fork Holston
River at Sevenmile
Ford, Va.
South Fork Holston
River below South
Holston Dam,
Tenn.
North Fork Holston
River near Gate

City, Va.
Holston River at

Surgoinsville,
Tenn.
Tellico River at
Tellico Plains
Tenn.
Clinch River at
Cleveland, Va.
Guest River at
Coeburn, Va.
Clinch River at
Speers Ferry, Va.
Clinch River above
Tazewell, Tenn.

North Fork Powell
River at Penning-
ton Gap, Va.
Clinch River below
Norris Dam, Tenn.

353

301

132

703

672

2,874

118

528

87.3

1,126

1,474

70

2,913

1875-1956
1920-56

1931-56

1942-56

1867
1951-56

1931-56

1867
1940-56

1840
1925-56

1920-56

1949-56

1895-1956

1862
1918-56

1944-56

1826
1903-56

1875
1928

1955

1947

1867
1953

1940

1867
1944

1840
1951

1926

1956

1902

1862
1923

1946

1826
1917

Feb. 1

Jan. 29

Jan. 29

Feb. 12

Jan. 30

Jan. 30

Jan. 31

Jan. 30

Jan. 29

Jan. 30

Jan. 31

Jan. 29

Feb. 12

18
15.4
14.71
13.73
15.35

9.86
10.75

55
37.70
40.45

14.75
16.73

31
17.48
14.32
15
12.82
13.60
23.0
24.40
10.83
14.20
i°26.6
28.92
24

(')
21.00
12.1
8.70

(0 (>)
11.65

(')

32, 000
28, 300
11, 400
15, 100

6,570
7,680

<>)
6 3, 360
« 8, 270

23, 700
28, 700

0)
59, 600
« 45, 100
21, 500
15, 100
17, 500
26, 500
31, 000
4,020
6,360
42, 000
45, 300
66,000
39, 700
51,100
9,700
4,430

130, 000
87, 000
6 26, 600

1.9

2.0

1 Not determined.
2 Maximum known since 1908.
3 Observed.

4 At site three-quarters of a mile downstream.
5 Affected by backwater from Ohio River.
6 Appreciably regulated by reservoir.
7 Part of drainage area is noncontributing.
8 Elevation in feet.
9 Contents, in thousands of acre-feet.
10 At site 400 ft downstream at datum about 1 ft higher.

upper Levisa Fork the flood exceeded the previously known maximum of 1862. Nine lives were lost and nearly 10,000 families were given flood assistance.

CIO FLOODS OF 1957

Flood damage in eastern Kentucky was estimated at $52 million which was more than 80 percent of the total damage in the entire flood area. Damage was estimated at more than $8.5 million in Pikesville, $4.5 million at Hazard, and ,$1.3 million at Barbourville. In Virginia the most severe flooding occurred in the Big Sandy River basin in the narrow and deep headwater streams of Levisa Fork, Russell Fork, and Pound River. Most of the cultural features in this rough country are along the river banks. More than 100 homes were destroyed or damaged along 12 miles of Russell Fork near Haysi. The peak stage at the gaging station at Haysi was 4.7 feet higher than the previous maximum in 32 years of record. Ex-tensive damage occurred in Pound and Grundy, on Pound River, and Levisa Fork.
At three gaging stations on the Clinch River the floods were greater than any known previously. At Speers Ferry the peak stage was 1-foot higher than that of the flood of 1902 which had been the maxi-mum since 1862.

Some tributaries of the New River reached maximum stages and caused floods at Bland and Narrows. Most of the New River basin was outside the storm arear so the main stem had only moderate rises. In southwestern Virginia, about 2,000 families were left homeless by the flood, and more than 800 homes and many business establish-ments were destroyed or heavily damaged. Damage in the Virginia flood area was estimated by the U.S. Army Corps of Engineers to have been nearly $5 million.
In Tennessee the flooding was most severe in the Clinch and Holston River basins and in the smaller streams originating on the western slopes of the Great Smoky Mountains. New maximums for the period of record (33 years and 39 years) occurred on the Clinch River above Tazewell and the Tellico River at Tellico Plains. At Chattanooga the Tennessee River reached flood stage for the first time since 1948, and many families were evacuated from the low-lying sections of the city.
Although an unusually large amount of runoff was produced by the continued heavy rains, most of the crests were relatively moderate. More than 300 families were evacuated at Sevierville, as floodwaters from the Little Pigeon River rose to a depth of 3 feet in the residential and business districts. Floods on the Elk River at Fayetteville and the Duck River at Columbia and Shelbyville forced evacuation of many families from their homes. Lowlands and roads were flooded at scattered points across the State except on the Cumberland Plateau. In southwestern West Virginia the highest flood peaks occurred in the headwaters of the Kanawha, Guyandot, and Big Sandy River basins. Floods in Tug Fork reached stages 2 to 3 feet higher than previous maximums during the periods of record. The peak stage

SUMMARY OF 1957 FLOODS IN THE UNITED STATES Cll

at the gaging station near Kermit was about 3.3 feet higher than the previous maximum since 1934 and about 0.6 foot higher than a flood of unknown date prior to 1915.
A noteworthy feature of the floods was the large volume of runoff produced by the continued heavy rains. Inflow into lakes on Tennes-see River tributaries was the greatest since the dams were built. The total of the maximum volumes stored in the lakes above Chattanooga was 3,700,000 acre-feet, and the total in the entire Tennessee River reservoir system was 6,700,000 acre-feet.
Tennessee Valley Authority officials estimated that if the reservoirs had not been built the peak stage at Chattanooga would have been about 54 feet (412,000 cfs) on February 3, whereas the actual crest was 32.24 feet (208,000 cfs) on February 2. This flood under natural

3600

Hales Bar, Guntersville,
Wheeler, Wilson, and
Pickwick Lakes

Fort Loudoun,
Watts Bar,
and Chicka-
mauga Lakes

Hiwassee-Ocoee
systems

ittle Tennessee system

Cherokee Lake

South Holston, Watauga, Boone, and
Fort Patrick Henry Lakes
10 15
FEBRUARY
1957

FIGURE 3. Volume of water stored in TVA reservoir system. Each graph shows the total storage in all reservoirs indicated below it. From TVA Division of Water Control Planning, River Control Branch. 690184 O 63 2

C12 FLOODS OF 1957

conditions would have been the second highest ever known at Chatta-nooga, being exceeded only by that of 1867.

Figure 3 shows the volume of water stored in the reservoir system during the flood period. Each graph shows the total storage in all reservoirs named below it. The vertical difference between any two graphs represents the storage in the reservoir or group of reservoirs indicated between them. For example, on February 10, the total storage in Norris Lake and the reservoir system upstream from it was 1,530,00 cfs-days and that in Norris Lake alone was 390,000 (1,530,000-1,140,000) cfs-days.
A more comprehensive report of this flood is contained in chapter A of this volume (U.S. Geol. Survey, 1963).

FLOODS OF FEBRUARY IN WASHINGTON, OREGON, AND IDAHO

A number of floods occurred within the Columbia River basin in

eastern Washington, eastern Oregon, and southern Idaho, February 24-28,
Weather in the Pacific Northwest had been cold for several weeks

preceding these floods. The ground was frozen to a depth of several inches at low altitudes where there was no snow cover. A period of general precipitation began on February 20 and extended to February
27. Temperatures remained low February 20-22, and a snow cover accumulated. The temperature moderated considerably on February 23, and warm winds and moderate to heavy rains prevailed until February
27. Precipitation and water from melting snow considerably ex-ceeded the infiltration capacity of the soil, especially in areas where the ground was frozen, and runoff of relatively high intensity occurred. Representative data on precipitation and temperatures are shown in tables 2 and 3.

Peak discharges were determined at many sites (fig. 4), and table 4 lists the peak discharges at these sites.
Severe flooding occurred in Foster Creek, Douglas Creek, and upper Crab Creek basins in eastern Washington. This is the greatest flood known in much of this area since it was settled about 1890.

TABLE 2. Precipitation, in inches, at representative locations during February floods in Washington, Oregon, and Idaho

Stream

Foster Creek __
Douglas Creek. _.
Crab Creek.- _ -
Portneuf River...
Boise River.- . .
Malheur River ...
Weiser River ...
Powder River ...
Prairie Creek ----

Climatic station

Coulee Dam, Wash...
Waterville, Wash.....
Wilson Creek, Wash-.
Pocatello, Idaho ....

Vale, Oreg_-._. __ .
Weiser, Idaho ....
Baker, Oreg.. .
Enterprise, Oreg_. ....

Altitude

(ft)

1,702
2,605
1,276
4,440
2,842
2,240
2,120
3,368
3,760

February

20

0
0
0
Tr.
.42
.03
.11
.06
. 15

21

0
0
0
.04
. 17
.04
.02
.01
Tr.

22

0.07
0
Tr.
.09
. 16
. 19
.21
.28
. 14

23

0.35
.43
.32
.11
. 12
.08
.26
Tr.
.01

24

0
0
0
.20
. 13
.30
0
.07
Tr.

25

0.13
0
Tr.
.32
.02
. 14
. 10
.08
Tr.

26

0.17
.32
.25
. 11
.34
0
.42
. 15
.19

27

0
0
0
. 13
.04
0
~~0~~~

0

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C13

TABLE 3. Maximum and minimum temperatures, in degrees Fahrenheit, at repre-sentative locations during February floods in Washington, Oregon, and Idaho

Stream

Prairie Creek-. .....

Climatic station

Enterprise, Oreg--.... _ _

Alti-
tude

(ft)

1,702
2,605
1,276
4,440
2,842
2,240
2,120
3,368
3,760

February

20

23,13
24, -1
28,11
48,31
35,29
38,30
39,29
27, 0
30,16

21

19, 4
23, -3
28, 4
44,31
29,16
36,10
38, 9
24, -12
22, -1

22

23,12
17,10
26,15
52,32
46,23
38,21
37,25
39,19
33, Ifi

23

29,16
23,14
31,20
50,42
54,34
46,30
42,27
46,35
50,26

24

47,26
48,14
54,25
53,40
54,40
50,34
46,30
50,39
55,38

25

45,33
40,25
52,32
53,39
56,40
53,36
51,30
54,34
54,34

26

56,39
48,27
60,40
49,34
50,42
55,36
49,34
50,34
53,36

27

52,30
47,30

50,38
52,35
58,34
49,27
52,29
49,28

i WASHINGTON

r

EXPLANATION

. 3

Gaging station
Numbers correspond to those
given in table It

50 100 MILES

FIGURE 4. Map showing location of flood-determination points.
Oregon, and Idaho.

Floods of February in Washington,

In Idaho the Portneuf River at Topaz was the highest for the period of record, 1913-14, 1920-57. Peak stages in Spring Valley Creek and Dry Creek near Eagle exceeded previous peaks in a short record started in 1954, and peak stages on Pine Creek near Cambridge in the

C14 FLOODS OF 1957

TABLE 4. Flood stages and discharges during February in Washington, Oregon, and Idaho

Station Stream and place
of determination

Drainage
area

(sq mi)

Maximum floods

Before February
1957

Period Year

Febru-

ary
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Q2.33

Hawk Creek basin

1 Hawk Creek at U.S. Highway 2 at Daven-
port, Wash.

23 Feb. 26 2,200 18

Foster Creek basin

2 .

3-.--...

West Fork Foster
Creek at Deer Hill

Road near Bridge-
port, Wash.
East ForkFoster Creek
2.5 mi. above mouth

near Bridgeport.
Wash.
East Fork Foster Creek

tributary at State
Highway 10 near
Bridgeport, Wash.

25

142

4.75

Feb. 26

do .

do. . 11.7

756

3,600

193

9.5

9.0

Douglas Creek basin

5...

6

Douglas Creek near
Alstown, Wash.

Douglas Creek at State
Highway 10 near
Trinidad, Wash.

114

910

1948
1950-57

1948
1954
Feb. 26
... do

13.05
6.47
5.95

6,420
3,160
1,435
3,620

5.1
1.5

Willow Springs Creek basin

7.-.- _ Willow Springs Creek at State Highway 10,
at Trinidad, Wash.

58 Feb. 27 3,900 2.2

Crab Creek basin

9

10-

11.

12

13-

14

15

Seef

South Fork Crab Creek
tributary, at county
road, at Wauken,
Wash.

South Fork Crab Creek

tributary, 2.2 mi. east
of Edwall, Wash.
South Fork Crab
Creek, 3.1 mi. south-
east of Edwall, Wash.
Crab Creek at Irby,
Wash.
Goose Creek, 1.5 mi.
east of Wilbur, Wash.
Broadax Draw tribu-

tary at State High-
way 4C, near Wilbur,
Wash.
Wilson Creek near Wil-
son Creek, Wash.
Wilson Creek at Wilson
Creek, Wash.

ootnotes at end of tabl(

0.68

4.3

22.8

974

48

1.12

460

470

^

1954-57

1943-57

1955

1951-57

1955

1956

1955

1951

Feb. 26

do. .

do ..

Feb. 27
Feb. 26

Feb. 26

do

Feb. 26

10.02
11.45

9.73
11.94

14.64
9.46

9.59
20.74

29.3
111

446

580

4,170
8,370
3,040

205
77

7,760

1,420
U2, 900

3.9

3.6
28

14

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C15

TABLE 4. Flood stages and discharges during February in Washington, Oregon, and Idaho Continued

Station

Stream and place
of determination

Drainage
area

(sq mi)

Maximum floods

Before February
1957

Period Year

Febru-

ary
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Q2.33

Crab Creek basin Continued

16.

17.

18-_-_-

Crab Creek, 2 mi. west
of Wilson Creek,
Wash.
Crab Creek at east low
canal near Adrian,
Wash.
Crab Creek near Moses
Lake, Wash.

1,680

1,740

2,040 1943-57 1956

Feb. 27

... do.....

Feb. 28

8.19
2 6. 81

12,500

9,810

3,090
10, 400

7.8

5.8

5.1

Portneuf River basin

19

20

Portneuf River at
Topaz, Idaho.

Portneuf River at
Pocatello, Idaho.

570

1,250

1913-14,
1920-57

1897-99,
1912-57

1913

1917

Feb. 25

Feb. 28

26.1

5.71

6.52

902

1,040
2,000

970

2.4

1.2

Boise River basin

21

22

Spring Valley Creek
near Eagle, Idaho
Dry Creek near
Eagle, Idaho

20.9

59.4

1954-57

1954-57

1955

1955

Feb. 26

Feb. 26

2.19
2.85
3.73
4.70

60
244
156
339

3.5

2.0

Malheur River basin

23

24

25-

26

27..

28.-.

29

Drewsey, Oreg.

near Harper, Oreg.

Hope, Oreg.

Warm Springs near
Vale, Oreg.

Vale, Oreg.

Vale, Oreg.

Ontario, Oreg.

910

198

3,010

530

602

3,880

4,680

1922,
1927-57

1904-06,
1910-17,
1922-23

1934,
1938-57

1919

1952

1910

1940

1910

Feb. 24
... do.....

Feb. 24

Feb. 24

Feb. 24

Feb. 25

12.90

13.3

9.00
11.5

8.6

6.60

10.5
19.5

19.67

9,030

10, 700
5,140

8,800
12, 300

6,240

5,600
3,400

8,980
22, 800

20, 800
24, 000

5.8
13

5.3

6.4

Weiser River basin

30___.--

31----

32-.--.-

33__-.--

"YVeiser River near

near Indian Valley,

Midvale, Idaho.

605

54

01 Q

1Q^Q_^7

1938-57

1938-57

1911-16,
1925-57

1955

1948

1925

1910

Feb. 26

Feb. 26

Feb. 26

Feb. 26

U3.9
9.73
23.60
4.17

5.23
28.9

5.03

10, 100
7,600
505
510
1,840

1,480
4,240

3937

1.9

1.6

1.9

See footnotes at end of table.

C16 FLOODS OF 1957

TABLE 4. Flood stages and discharges during February in Washington, Oregon, and Idaho Continued

Station Stream and place
of determination

Drainage
area

(sq mi)

Maximum floods

Before February
1957

Period Year

Febru-
ary
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Qj.33

Weiser River basin Continued

34......

35-.--

36.-.-.

Weiser, Idaho.
Weiser, Idaho.

Weiser, Idaho.

288

1,460

1922-57

1890-91,
1895-1904,
1911-14,
1923-57

1911-13,
1937-57

1925

1QCK

Feb. 26

Feb. 27

Feb. 26

6.8
6.23
11.06

10.81
25.45
3.40

2,350
3,170
19, 900

19, 000
1,540
602 1.3

Powder River basin

37-__

38...

39__

Baker, Oreg.
Sutton Creek at

Baker, Oreg.
Powder River at

Baker, Oreg.

219

57.2
351

1904 14
1927-57

1910
Feb. 24
-.do. _
do

27.05
3.67

1,820
506
1,630
2,460

. 7
7.4
2.3

Grande Ronde River basin

40 Prairie Creek at
Enterprise, Oreg.

80.1 Feb. 24 1,460 4.2

1 Result of dam failure.
2 At different site or datum.
3 Regulated by Crane Creek Reservoir.

Weiser River basin exceeded previous peaks in a record which began in 1938. Little Weiser River near Indian Valley has been higher only once in 25 years of record. Crane Creek at the mouth, near Weiser, had the highest stage since 1920. The peak discharge of Weiser River near Weiser has been exceeded only once in 47 years of record. In eastern Oregon severe flooding occurred in the lower reaches of Malheur River and Powder River basins and on Prairie Creek in the

Grande Ronde River basin. On Malheur River the magnitude of the flood peak approached that of the historic flood of 1910, and at Vale, the main center of damage, the stage was higher than that of 1910. Hydrographs for typical streams in the Weiser River and Malheur River basins are shown in figures 5 and 6, respectively.
Flood damage in the Crab Creek basin was most severe in the town of Wilson Creek where most of the town was under several feet of

water. Damage here was estimated at many tens of thousands of

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C17

22 23 24 25 26 27 28 1 23 FEBRUARY MARCH
1957

FIGURE 5. Discharge hydrographs, Weiser River, February 22-March 3.

Malheur River near Drewsey, Oreg.

Bully Creek near Vale, Oreg

22 28 1 2
MARCH

24 25 26 27 FEBRUARY
1957
FIGURE 6. Discharge hydrographs, Malheur River basin, February 22-March 2.

dollars. Considerable damage also was done to roads and bridges in Foster Creek, Douglas Creek, and Crab Creek basins.
The U.S. Army Corps of Engineers estimated total damage in the Portneuf River basin at $40,000, most of which occurred to highways and county roads.
In the Weiser River basin, the total damage was estimated by the U.S. Army Corps of Engineers at $100,000 most of which occurred to

CIS FLOODS OF 1957

agricultural properties, although the outlying areas of the town of Weiser were inundated. Flood waters damaged fences, irrigation structures, crops, and land.
Flood damage along the Malheur River in eastern Oregon was estimated at $1,640,000. Practically the entire town of Vale was under several feet of water, and parts of the town of Ontario also were inundated. The damage in these towns amounted to $633,000 to residences and $335,000 to commercial establishments. Damage to agricultural property on the flood plain was $397,000 and that to highways and other roads in the valley was $275,000.
Damage along Bully Creek near Vale, which was mostly to agri-cultural properties, was estimated at $156,000. The Union Pacific Railroad, highways, and county roads were damaged in this area. Total damage along Powder River, mostly at Baker, Oreg., was estimated by the U.S. Army Corps of Engineers at $210,000, of which damage to residential property accounted for almost one-half and damage to commercial property amounted to $73,000. The remainder of the damage was to roads and other public property such as the city sewage treatment plant.

FLOODS OF APRIL-JUNE IN TEXAS AND ADJACENT STATES

During April-June 1957, heavy and frequent rains fell over the eastern two-thirds of Texas and parts of Arkansas, Oklahoma, and Louisiana (fig. 7). Weather records do not show another 3-month period in which so much rain occurred over such a large part of the area. In some areas the total 3-month rainfall was greater than that normally occurring in 12 months (fig. 8). This was a sudden change from the drought which had prevailed over practically all the South-west since 1951 and which persisted until above-normal rainfall began in March 1957.
In previous years, rainfall and streamflow had been gradually de-creasing, and the flow of many streams was the lowest in recorded history owing to a combination of the drought and increased ground-water withdrawals. Some of the larger springs in Texas had ceased to flow for the first time in the memory of the oldest residents. Some of the conditions produced by the drought served to modify the floods. The soil was relatively dry, and most of the reservoirs were at alltime low stages. The rainfall in early April produced little runoff. Recurrent rainfall on the saturated soil filled most reservoirs and produced floods on some streams comparable in magnitude and extent to the greatest known in the history of recorded streamflow records. One example was Lake Texoma, which between March 1 and June 6 rose from its record low to its record high since storage

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C19

EXPLANATION
10

Isohyet
Isohyetal interval 5 inches

FIGURE 7. Isohyetal map of flood area showing total precipitation for April-
June in Texas and adjacent States. From U.S. Weather Bureau.

200 o 200 MILES

FIGURE 8. Precipitation for April-June 1957 in percent of normal for 1 year in Texas and adjacent States. From U.S. Weather Bureau.

C20 FLOODS OF 1957

began in 1942. Few peak flows during the flood period exceeded previous maximum peaks. (See table 5.)

The floods were notable for their duration and large volume of run-off rather than for high rates of discharge. The lower reaches of the Red, Trinity, and Brazos Rivers were in flood for 30 to more than 60 days. The total volume of water discharged by each of these major streams during April-June was considerably greater than their average yearly runoff.

TABLE 5. Flood stages and discharges during April-June in Texas and adjacent States

Station Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before April 1957

Period Year

April-
June
1957

Gage
height
(ft)

Discharge

Cfs Ratio
to <?2.33

Red River basin

1-. --

2

3- ---

4 -~

5-

6 -~

7 ~~

8-- ~

9 -_-

10.

11

12-.

at Mangum, Okla.

Denison Tex.

Colbert, Okla.

Talco, Tex.

Texarkana Reser-
voir near Tex-
arkana, Tex.

Qilliam, La.

Ninock, La.

1 1 ggg

1 Of! 709

1 39 7^9 '

i 39 777

'

1,365

3,443

364

91

2,628

IQflrAC

1937-57

mosaic 7

1942-57

1923-57

1944-57

1948^57

1928-57

1QQQ

1941
1951

1943

1Q4.C

1935
1942

1914 i Q";?

1 QAK

... do..

1945

1957

1953

1945

May 16

June 5

May 19

April 27

Apr. 29
do.--

Apr. 29

Apr. 28

May 15

May 13

14.7

14.55

26.53
25.14
44.37

42.30

2 643. 18
45.5

32.0
26.26
27.5

22.28
23.63

16.23

17.23

25.73

23.32
8.26
15.08
43. 95
47.08

45.23

40.70

60,000

72, 000
168,000

102, 000

91, 300
98, 000
3 4, 295
3 5, 991
(4)
201,000

102, 000
(4)

13, 100
32, 900
25, 700

1,800

1,720

6,270

8,200

396
8,130
5 20, 000

17,000
233, 000
197, 000

4.5

1.4

1.0

1.0

2.3

l

Sabine River basin

13-~

14

Sabine River near
Emory, Tex.

Ruliff, Tex.

965

9 ' 440

1900-57
1952-57

1924-57

1943
1953

1S84
1953

Apr. 27

May 20,
21

25.7
20.28
25.06

19.98
15.96

(4)
34, 400
74,000
«

121,000
53,800

5.4

1.2

See footnotes at end of table.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C21

TABLE 5. Flood stages and discharges during April-June in Texas and adjacent
States Continued

Station Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before April 1957

Period Year

April-
June
1957

Gage
height
(ft)

Discharge

Cfs Ratio
to Qz.ss

Neches River basin

15

16

17 -

18--

Neches River near
Neches, Tex.
Mud Creek near
Jacksonville, Tex.

Angelina River near
Zavalla, Tex.

Village Creek near
Kountze, Tex.

1,129

382

2,880

837

1884-1957

1885-19~57
1939-57

1883-1957
1951-57

1913-57
1924-27,
1939-57

1908

1908, 13
1944

1902
1953

1915
1940

May 1

May 1

May 3

May 2

24.3
17.80
20
14.09
10.12
29.4
27.72
27.23
34
27.6

17.96

65, 000

15,800 (4)
23,400
7,040
(*)
37,300
32, 700
(4)
67, 200

10, 700

1.7

.9

2.4

.8

Trinity River basin

19 -

20

21

22- -

23

24. -

West Fork Trinity
River near Jacks-
boro, Tex.
Clear Fork Trinity
River near Aledo,
Tex.
Trinity River at
Dallas, Tex.
East Fork Trinity
River near Cran-
dall, Tex.
Richland Creek near
Richland, Tex.

Trinity River at
Liberty, Tex.

683

246

6,120

1,257

737

17, 539

1900-57
1956-57

1858-1957
1947-57

1840-1957

1949-57

1899-1957
1939-57

1903-57

1941
1956

1922
1949

1908

1950

1913
1948

1942

Apr. 27

May 25

May 26

May 28

Apr. 21

May 12

30
17.27
32.10
34
25.00
29.00
52.6
41.72
22.12
22.81

25.5
24.16
23.11
29.38
29.26

(4)
1,890
35, 100
(«)
15,900
34,000
184, 000
75,300
24, 000
33, 000

(4)
58, 900
44, 600
114, 000
88, 100

6.6

5.0

3.0

2.1

2.0

Brazos River basin

25

26

27. -

28.-

90

30 .

31...

Brazos River at Sey-
mour, Tex.

Hubbard Creek near

Breckenridge, Tex.

Palo Pinto Creek
near Santo, Tex.

North Bosque River
near Clifton, Tex.

Lampasas River at
Youngsport, Tex.

San Gabriel River at
Georgetown, Tex.
Brazos River at
Richmond, Tex.

i 14, 490

1,087

567

971

1,242

415

i 44, 020

1923-57

1925-57
1955-57

1880-1957
1951-57

1887-1957
1923-57

1873
1924-57

1869-1957

1852 1957
1903-06,
1922-59.

1926
1955

1953
1955

1922
1956

1922
1945

1873
1936

1921

19l3
1929

May 19

May 25

May 26

Apr. 27

May 13

Apr. 24

May 5

21.00
10.10
34.2
30.98
34.00
31
26.08
31.05
25
23.2
22.48
44.2
33.5
36.4
36.1
34.10
« 48. 2
40.6

37.13

95, 400

28, 000
(*)
12, 800
34, 500
(*)
17,600

45,100 (4)
39,000

37,400 (4)
53,200
84,000
160, 000

155, 000 (4)
123, 000

119, 000

.8

3.6

3.5

1.4

3.9

14.5

1.8

Colorado River basin

32

33

34

Colorado River at

Colorado City,
Tex.
South Concho River
at Christoval, Tex.
Spring Creek near
Tankersly, Tex.

i 4, 082

434

734

1910-57

1882-1957

1853-1957
1930-57

1939

1906

1882
1942

May 25

May 9

May 9

35.9
19.71

23
20.82
26
21.37
21.35

66,000
13,000

155, 000
84,000
«

26,900
29,400

1.1

11.7

2.7

See footnotes at end of table.

C22 FLOODS O* 1957

TABLE 5. Flood stages and discharges during April-June in Texas and adjacent States Continued

Station Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before April 1957

Period Year

April-
June
1957

Gage
height
(ft)

Discharge

Cfs Ratio
to Ql.33

Colorado River basin Continued

3S -

36

37

38 -

39-..-

40

North Concho River
near Carlsbad,
Tex.
Concho River near

San Angelo, Tex.
San Saba River at
Menard, Tex.

Llano River at
Llano, Tex.
Pedernales River

near Johnson City,
Tex.
Colorado River at
Austin, Tex.

i 1, 533

i 4, 492

1,151

4,233

947

1 38, 400

1853-1957

1854-57

1880-1957
1915-57

1879-1957

1859-1957

1843-1957

1936

1906

1899
1938

1935

1952

1869

Apr. 28

May 9

Apr. 19

May 27

Apr. 24

June 4

29.1
14.75

47.5
39.8
23.3
22.2
15.97
41.5
16.39
42.5
24.8

46.0
17.60

94,600
8,180

246, 000

106, 000 (4)
130, 000
41,000
380, 000
47, 200
441, 000
125, 000

550, 000
40, 800

.5

4.7

4.1

1.2

6.9

.7

Lavaca River basin

41 Navidad River near
Ganado, Tex.

1,116 1876-1957 1936
Apr. 30

39.8
30.08

94,000
18,100 1.1

Guadalupe River basin

42 -

43

44

45_

Guadalupe River at
Comfort, Tex.
Blanco River at

Wimberly, Tex.

at San Antonio,
Tex.

Selma, Tex.

836

364

42

280

1848-1957

1869-1957

1820-1957

1932

1929

1921

1889
1952

Apr. 24

Apr. 24

May 27

May 27

38.4
24.59
31.10
24.73
20.14
9.23

26
19.37
14.48

182, 000
35, 200
113,000
62,600
15, 300
1,850

0)
36, 400
16, 900

2.7

6.3

2.7

Nueces River basin

46

47

48

49

50.

51

Laguna, Tex.
Frio River at Con-
can, Tex.

D'Hanis, Tex.

Whitsett, Tex.

Del Rio, Tex.

764

405

87.4

1,171

I

9Q *»fin

4,185

ISfifi 10^7

1952-57

Ififil 1QPi7

lio Grande 1

1 Q39 P17

1900-1914.
1923-57

1955

1932

1935
1954

1Q1Q

asin

1Q4.1

1932

May 27

Apr. 24

Apr. 24

May 29

Apr. 26

32.7
8.18
34.44
10.45
26.2
9.30
7.17
41
27.73

20.49
14.55
36.60

9

QK

307, 000
6,490
162, 000
13, 400
(*)
8,110
4,620
50, 000
8,410

20,000
3,800
597, 000

KA 7nn

.5

1.3

1.2

.8

1 Part is noncontributing.
2 Elevation, in feet.
8 Contents, in thousands of acre-feet. 4 Unknown.

5 Daily discharge.
« At site 1,000 ft upstream.

102°
100

Gaging Station
Numbers correspond to those
given in table 5

FIGURE 9. Map showing location of selected flood-determination points. Floods of April-June in Texas and adjacent States.

34°

32°

to
CO

C24 FLOODS OF 1957

Maximum flood stages and discharges occurred in the Red River basin and in several other Texas streams (table 5 and fig. 9).
No floods originated in Louisiana, but moderate rises occurred in April along the Red River. More severe rises occurred in May, when backwater areas along the Red River were inundated as floodwaters from Texas and Oklahoma moved downstream toward the gulf. Millions of dollars of damage and some loss of life resulted. Several thousand families were evacuated, thousands of homes were damaged or destroyed, hundreds of thousands of acres of productive farmland were inundated for prolonged periods, and municipal and industrial property damage was extensive. Most damage to urban property was caused by comparatively small streams. Many highways, highway bridges, and railroad bridges were damaged or destroyed. A few levees were overtopped or broken, and minor damage occurred to small dams.
Although Oklahoma and western Arkansas were included in the arsa of the intense 3-month rains, the floods followed a different time pattern than those in Texas and immediate areas of adjacent States. This flood report therefore covers the closely related areas of Texas and northwestern Louisiana, and a more complete report by Yost (1963) is available.
The floods in the neighboring areas of Oklahoma and western Arkansas are discussed in the following section in this annual summary.

FLOODS OF APRIL-JUNE IN OKLAHOMA AND WESTERN ARKANSAS

The most severe drought of record in the Great Plains occurred from the summer of 1951 to the spring of 1957; 1956 was extremely dry for Oklahoma and western Arkansas, and large parts of the area received less than 50 percent of the average annual precipitation. Precipitation was about average in the first 3 months of 1957 and became heavier in the last week in March. The total precipitation during April-June was outstanding, and precipitation was also heavy in some 24-hour periods. Many stations reporting rainfall accumu-lated a 3-month total equal to the average annual precipitation. The heavy rains of the April-June period were the results of large-scale and persistent abnormalities in the general circulation of the atmos-phere over the western section of the Northern Hemisphere. This circulation brought an abundance of moisture northward from the Carribbean and the Gulf of Mexico over the South-Central States, where the moisture was released as precipitation by various circulatory and convergence mechanisms which persisted within the region. Figure 10, an isohyetal map of the accumulated total precipitation for the 3-months period, also indicates the long-time average annual precipitation for Oklahoma and western Arkansas.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C25

EXPLANATION
30

100 100 MILES

Isohyet, showing rainfall for April-June 1957
Isohyetal interval 5 inches
______ 28-----

Isohyet, showing mean annual rainfall
Isohyetal interval 4 and 8 inches

FIOUBE 10. Isohyetal map showing total precipitation for 3 months April-June 1957 and the mean annual rainfall, Oklahoma and western Arkansas.

Storms of April. Heavy rains in April, principally in the periods April 3-4 and 18-23, occurred in western Arkansas and eastern Oklahoma (fig. 11). The thunderstorms in April were accompanied by tornadoes and hail
Storms of May. A distinguishing feature of the May storms was the unusual persistence of flood-producing precipitation during a 2-week period. Precipitation fell almost every day during this period over much of Oklahoma and western Arkansas.
The storm of May 15-16 occurred over an extensive area in western and central Oklahoma, generally north of the Cimarron River. The

..OKLAHOMA

Isohyet
Isohyetal interval 3 inches

100 MILES

FIGURE 11. Isohyetal map showing total precipitation for April in Oklahoma and western Arkansas.

C26 FLOODS OF 1957

largest amount of precipitation reported at a Weather Bureau station was 13.07 inches at Hennessey, Okla. The maximum amount of precipitation found in a "bucket" survey after the storm was 20 inches, 5 miles southwest of Hennessey, which occurred in the 11-hour period 7 p.m. May 15 to 6 a.m. May 16. Three miles northeast of this observation, 19.9 inches were measured in a large stock tank. Depth-area data for the storm of May 15-16, 1957, near Hennessey and for noteworthy storms of 1940 and 1948 are as follows:

Rainfall depth (inches)

=~5 _ _--_--________-_________ ______ _
>10____ -__-_-_--_______________...__.__

^15-__. -----------_-_--_-_-__--_-_-___ =~20

1940

2,800
1,320
300
7

Area (sq mi)

1948

885
395
145
35

1957

2,460
778
128
8

Other storms occurred during the remainder of the month. A storm on May 17 occurred in the basins of the Washita River and Salt Fork Red River. A second storm in the lower part of the Cimarron River basin occurred on May 20. A storm on May 22-24 occurred along a line from south-central Oklahoma to northwestern Arkansas, and a storm on May 29 centered along the Kansas-Oklahoma border north of Buffalo, Okla.
In western Arkansas and in Oklahoma monthly precipitation for May exceeded the long-term May mean; indeed, many stations reporting rainfall received more than twice this mean. Precipitation at Hennessey was 5% times the long-term monthly mean for May.

Isohyet 100
Isohyetal interval 3 inches I '

100 MILES

FIGURE 12. Isohyetal map showing total precipitation for May in Oklahoma and western Arkansas.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C27

May 1957 was the wettest May of record at many stations. Figure 12 is an isohyetal map for May.
Storms of June. The general storm activity moved into northern and eastern Oklahoma and western Arkansas during June. The storms during this month were many, intense, of relatively small areas, and occurred in waves of 4- or 5-day intervals. Noteworthy storms occurred during the periods June 9-15 and 22-24. An isolated heavy rain storm on the evening of June 22 caused flooding on the North Canadian River and its tributaries in northwest Oklahoma.

The Wolf Creek tributary drains the area covered by this storm, which centered on the Oklahoma-Texas border. Overnight rainfall amounting to as much as 10 inches was obtained from a "bucket" survey in the area of the storm center. Figure 13 is an isohyetal map for June.

ARKANSAS')

EXPLANATION

_ ____________ Q _

Isohyet
Isohyetal interval 3 inches

100 100 MILES

FIGURE 13. Isohyetal map stowing total precipitation for June in Oklahoma and western Arkansas.

The meteorology of these storms is described in detail by the U.S. Weather Bureau (1958).

THE FLOODS

Streamflow in April was above normal over much of the area, and soil moisture was at a high level. Precipitation in May and June contributed directly to streamflow, and floods occurred in all Oklahoma and western Arkansas (fig. 14) except in the Oklahoma panhandle. The floods were record breaking in the Cimarron and Washita River basins. The floods claimed at least 10 lives, inundated hundreds of homes, caused evacuation of hundreds of families from lowlands, destroyed more than 500 county highway bridges and many bridges on main highways and railroads, and caused millions of dollars of
690184 O 63 3

to
00

34°

Miscellaneous measurement site

Numbers correspond to those given in table 7

FIGURE 14. Map of flood area showing location of flood-determination points. Floods of April-June in Oklahoma and western Arkansas.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C29

damage. Highways were impassible during the time of flood crests. Many towns and cities were flooded in residential and business sections. Agricultural lands were extensively damaged owing to erosion of cropland, deposition of infertile sediment, bank erosion, and destruc-tion of growing crops.

The floods of this period were the most widespread and the most sustained major flooding of record in this area. The flood period is characterized by the volume of runoff and the long intervals during which the main rivers stayed above flood stage rather than by ex-tremely high stages.

The runoff, in acre-feet, during April-June constituted a very high proportion of the 1957 annual runoff. At nearly every station in this report, the 3-month runoff exceeded the 10-year average annual runoff at that station.

Table 6 shows the ratio of the 3-month runoff to the 10-year average annual runoff for all stations which had 10 years of discharge records prior to 1957. The maximum ratio in this table is 3.8 for station 2, Black Bear Creek at Pawnee, Okla.

TABLE 6. Runoff, in acre-feet, in Oklahoma and western Arkansas, April-June 1957

Station

!___ -______ _._._. ._._.___ _______
2____ _____________________________
3____ _____________________________
4___ -__________-_-_-_-_-__________
7
13_________ _______________________ 17.__ _____ ___-_____-_-___-_-____

18_________ ___________ ____________ 19 _-

21. _______________________________ 22_____ ___________________________ 24_ _ ____________________________ 25 __ _ -___ 27-_._____ ________________________ 28__--.____ _______________________ 29___ -------_-__________-__-_-_-__ 30_--___--.____ ___________________ 31
32________________. _______________ 33________ ________________________ 34_______ _________________________ 36_____________ ___________________ 38_._ _____________________________ 43___.____________________________ 47_____.__________________________ 50_-_--____-_______________ _______ 51.___ ____________________________

Contributing
drainage area
(sq. mi)

46, 850
576
4,305
813
8,504
11,966
12, 926
31
62, 074
123
3,639
736
424
1,955
6,534
364
340
905
7,911
5,876
2,510
872
10, 335
84, 133
959
1,626
20, 428

Kunoff, April-June 1957

Volume
(thousands of
acre-ft)

4,609
326. 8
35. 62
15.94
624.0
1,777
2, 148
12. 58
8,064
92. 51
1,681
214.4
299. 8
1,228
3,654
339.4
306.4
792.3
4,808
1,806
1,856
858. 2
4,630
19, 480
868. 1
1, 106
380. 7

Ratio to 10-yr
average annual
runoff

1.3
3. 8
.4
. 3
1.9
2.8
2. 7
2.6
1. 7
3.3
1.4
1.2
2. 1
2. 3
1. 8
3. 5
3.3
3.4
2. 0
1. 1
1.7
1. 8
1. 1
1. 6
1. 5
1. 2
1. 1

C30 FLOODS OF 1957

TABLE 6. Runoff, in acre-feet, in Oklahoma and western Arkansas, April-June 1957 Continued

Station

53__ . -_._ _____
54.. _-_-_--____-_-____-______.____
55_____.__.__ _____________________
56-__-_-_-_--__-_---_ --____-_-_--_ 57 __ -__-- --_----__-______ 59--___ _-_---_-----_-_____-_-____ 60_. .-_-_-___-___-_-__-__-________ 62___'__________ ___________________ 63_____-__________________ ________ 64-_-____-_---_____---_ __-__---_._ 66_______ _________________________ 67-_--___-_-___-_ _____________ ____ 69__-________ ____________________ _ 73___ __-_-_____--__-__.___________ 74_________ -_-_-__--______________ 76_-_-_-.___ ______________________ 79__ --_-_____---_-_---_-_-_____.__ 81.._____ _________________________ 82___-_.________ __________________ 86_______________ _________________
89. _____ ---_--------------__--_ 93___ _____________________________ 95__.____ _________________________ 96__--_-_--__-____--_ __________ ___ 97__________ ______________________ 101______ _________________________ 104__-_____ ---______-__-_-_-__ ___. 106_.____- __--______--___-_-______ 111____.___- ______________________ 112___ ____________________________ 113.___ ___________________________ 115______ -___-_-__-_____._________ 116____--_-____- ___-__-__-_-______

Contributing
drainage area
(sq mi)

456
865
23, 151
588
1,386
1,498
9,391
2,018
37, 876
182
200
122
993
128, 242
74
372
131, 466
1,357
1,938
3,845
675
22, 787
28, 846
3, 129
319
5,330
7,202
33, 841
1,087
720
38, 595
1,423
42, 094

Runoff, April-June 1957

Volume
(thousands of
acre-ft)

219.5
608.4
2,035
616.5
166. 1
135. 0
850. 9
1, 141
7, 154
210.3
186.4
131. 6
593. 7
30, 840
104.3
442. 5
32, 990
126. 5
119. 7
402.4
240. 8
4,374
4,964
408.9
19. 41
1,006
2,213
6,308
1, 119
647. 9
10, 480
1, 618
13, 840

Ratio to 10-yr
average annual
runoff

2. 6
2.4
1.9
1. 9
2.4
2. 1
1. 7
2.3
2. 0
1.8
1. 2
1.7
.8
1.8
1. 7
1. 1
1.4
2.0
1. 2
2.0
1. 9
2. 7
2. 6
2. 1
. 6
1.9
2.4
2.0
2. 1
2. 3
2.0
1.3
1. 8

The small ratios for some stations (Nos. 3, 4, 24, 33, 38, 50, 69, 82) indicate that these stations are at the edge of the flood area or are below large reservoirs which stored a large quantity of water during the flood period.
Peak discharges were determined at 116 sites in the flood area (table 7).
The Arkansas Kiver from Muskogee, Okla., to Van Buren, Ark., was continually above flood stage from mid-May to the first week of July. Discharge hydrographs for selected stations are shown on figure 15.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C31

ii i
EXPLANATION

Arkansas River at Tulsa, Oklahoma

Cimarron River at Perkins, Oklahoma

Washita River near Durwood, Oklahoma

Illinois River near Tahlequah, Oklahoma

20 25 30 5 10 15 20 25 31 5 10 15 20 25 30 5 10 15

APRIL MAY JUNE JULY

FIGURE 15. Discharge at selected gaging stations, April-July 1957, Oklahoma and western Arkansas.

TABLE 7. Flood stages and discharges during April-June in Oklahoma and western Arkansas

Sta-
tion

Stream and place
of determination

Drainage
area

(sq mi)

Maximum floods

Before April
1957

Period Year

April-
June
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to

Qa.ss

Arkansas River basin

l--_ -

2.___.__

3___.__.

4.......

5

6-______

7-..--..

8.......

9.......

10_-__.

Seel

Arkansas River at
Ralston, Okla.

Black Bear Creek at
Pawnee, Okla.
Cimarron River near
Mocane, Okla.

Crooked Creek near
Nye, Kans.
Anderson Creek near
Freedom, Okla.
Long Creek near
Freedom, Okla.
Cimarron River near

Waynoka, Okla.

Eagle Chief Creek
near Carmen, Okla.
Hoyle Creek at
Ames, Okla.
Preacher Creek near
Dover, Okla.

ootnotes at end of ta

i 46, 850

576

i 4, 305

1813

28.7

42

i 8, 504

306

26.4

14.5

ble.

1923
1925-57

1943-57

1914
1942-57

1933-57

1914
1903-05,
1937-57

1918-57

1923
1944

1943

1914
1942
1951

1955

1914
1950

1955

May 20

May 18

May 16

May 16
...do.....

...do.....

May 16
...do.....

...do.....

May 15

23.8
23.65
21.41
28.19
25.26
13
10.5
9.94
5.06
8.01
6.24

14
11.40

15.10

4.87
9.1

(2)
179, 000
120, 000
17, 800
12,200
(2)
(2)
53, 400
9,300
13,600
4,220
12, 900

17,300

(2)
70, 000

94, 500
31,800

3 6, 800

<512
6,420

1.7

2.5

1.3

1.7

3.4
10.1

C32 FLOODS OF 1957

TABLE 7. Flood stages and discharges during April-June in Oklahoma and western Arkansas Continued

Sta-
tion

Stream and place
of determination

Drainage
area

(sq mi)

Maximum floods

Before April
1957

Period Year

April-
June
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
02.33

Arkansas River basin Continued

11 -.

12

13.--

14_ _-

15.. .

16..

17.. .

10

19

20__..__

91

22

23_---. .

25......

26......

27

28

29

30-

31

32

33

34

35

36

37

Clear Creek near
Enid, Okla.

Drummond, Okla.
Cimarron River near
Quthrie, Okla.

South Boggy Creek
at Enid, Okla.
Hackberry Creek
near Waukomis,
Okla.

Lovell, Okla.

Perkins, Okla.

Stillwater, Okla.

Tulsa, Okla.

Heyburn, Okla.

Okla.

Lenapah, Okla.
Hulah Reservoir near
Hulah, Okla.

Hulah, Okla.

Copan, Okla.
Caney River near
Ochelata, Okla.

Ramona, Okla.

Claremore, Okla.

Okla.

Skiatook, Okla.
Bird Creek near

Sperry, Okla.

Inola, Okla.
Neosho River near
Commerce, Okla.
Spring River near

Mo.

Elk River near Tiff
City, Mo.
Lake O'The Chero-

Okla.

15.9

248

"11,966

3.7

31

410

i 12, 926

01

i 62, 074

123

3,639

732

736

424

1,753

1 QCK

6,534

364

340

905

5,876

? 2, 510

42

872

10, 298

1Q47 K7

1935-57

1QQO

1949 57

i Q97 £7

1939 57

1Q10 K7

iQfi^_p;7
1QOC^^7

1QCA C7

1940

1QOQ C7

1 QCA C7

1926
1937-57

1943-57

1956-57

1 QQCQQ

1945-57

1943 57
1945 57

1943-57

1Q4.O K7

1QOQ_K7

1QQC

1 939 57

1Q4C
lO/tO. K7

1QQQ_K7

1940-57

1950

1935

1932

1935
1QAQ

1923
1943
1944

1954

1948
1949

1943

1951

1926
1944

1944

1956

1945

1943

in/iq
1 Q/l r

1949

1Q43

1QJQ

1951

1Q4°.

1951

May 16

May 16

May 17
May 16

-_-do,____

May 16

May 17

May 20

May 21

May 25

May 25

June 15

June 23

June 27

June 13

June 13

June 12

June 15

June 12

May 21

June 13

June 16

June 16

May 25

May 21

May 25

20.44
21.61
16.5
12.98
18.58

32.0
28.72
34.58
18.0
15.22
19.53
17.54
17.10
22.8

20.00
21.53
766.65
771. 08
«31.5

8 28. 53
11.08
40.44
31.22
745. 42
764.87
640.2
« 39. 45
33.92
30.58
26.81
6.35
38.82

29.69
55.05
46.51
29.6
21.66
29.00
35.06
34.42
31.68
29.03
54.93
52.75
34.03
20.22
43.4
43.4
27.00-
11.7
8.05
8.21
28.4
24.72
754.96
755. 27

3,890

16, 300

18, 800 (2)
51, 500
158, 000
3,750

16, 500

(3)
11, 100

75, 200 (2)
65, 300
149, 000
18, 000

16, 400 (2)
173, 000

235, 000
s 16. 58
523.72
26, 000
17, 300
17, 300
1,880
137,000
31. 500
s 100. 3
' 293. 4

51, 000
9,240
36, 400
15, 600
174
33,800
38,500

36,700
182, 000
68,500
(2)
15,600
25, 400
14, 200
13, 200
86,500
31, 400
224,000
85,900
267, 000
41,000
(2)
190,000
56, 000
C2)

4,600
5,760
137, 000
70, 800
i 2, 195
5 2, 213

6.8

4.5

19.8

4.1

8.0

2.4

.......4

.8

.5

1.1

1.2

1.3

1.3

2.9

1.6

2.0

1.5

1.3

1.4

3.1

3.8

See footnotes at end of table.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C33

TABLE 7. Flood stages and discharges during April-June in Oklahoma and western
Arkansas Continued

Sta-
tion

Stream and place
of determination

Drainage
area

(sq mi)

Maximum floods

Before April
1957

Period Year

April-
June
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
02.33

Arkansas River basin Continued

jg

59 --

10

U -

19

3

4

5

6 -

7

8

9

o

9

0

5

6

7 -

8

9 -

0

1 .

2

3 .

Gibson, Okla.

son, Okla.

Eldon, Okla.

Gore, Okla.

Gore, Okla.

Norman, Okla.

Krebs, Okla.

Supply Okla.

Whitefleld, Okla.

10,335

466

229

19 J.Q9

635

110

307

1,610

1 9fl 198

OK7

456

865

1 23, 151

588

i 1, 386

1 1, 498

i 9, 391

fiQ

2,018

i 37, 876

1939-57

1944 57

1833-1957

1950-57

1955-57

1Qf\'_ {\7

1935-57

1945
1948-57

1924 26,
1939-57

1914
1944-57

1932
1943-57

1905-34
1935 57

1942-57

1937-57

1923
1937-57

1955-57

1938-57

1898-1957

1943

1943

1943
1945

1951

1951

1943

1950

1956

1956

1950

1945
1950

1955

1QCK

IQOO

1950

1QKA

1951

1950

(2)
1939

1Q93
1945

1956

1943

1943

May 25

May 25

Apr. 3

Apr. 3

May 26

May 25

May 18

May 18

Apr. 27
Apr. 28__

May 25-

May 26.

Mav 1

37.6
34.96
27.81
20.4

19.41
562. 50
581. 68

43.0

37.60

48.20

16.7
14.36
13.05
24.73
8.42
11.52
27.94

23.8
19.51
20.33

666. 36

29.6

13.70

14.60
11. 3C
13.45
28.85

25.58

18.84
33.48
29.80

17.35
14.10
31.9

28.7
8.1
10.0
2, 024. 8
2, 026. 53

15.6
11.60
7.71

26.40
15.00
10.18
13.13
3A K.f\

29.75

18.2

300,000
180, 000
63,000

(2)
17,500
15,700

51,268.0

400,000
133, 000
223, 000

366, 000

10,800
8,650
49,000
1,370
8,780

55,400 (2)
31,000
37,600
5 646. 9
6 1217. 6

180,000

(2)
150,000
40,600

26, 500
(2)
174, 000
134, 000
70, 000
17,400

81, 600
'97.:
« 97. 93

(2)
14, 200

5,020 (2)
66, 000
39, 400

4,410
66, 800
30, 300

176, 000

2.2

2.2

2.3

2.3

1.8

1.9

2.6

1.8

2.2

3.5

.5

1.1

4.8

3.2

1.8

1.6

1.4

9.6

.6

2.4

1.3

1.2

1.4

See footnotes at end of table.

C34 FLOODS OF 1957

TABLE 7.- -Flood stages and discharges during April-June in Oklahoma and western Arkansas Continued

Sta-
tion

Stream and place
of determination

Drainage
area

(sq mi)

Maximum floods

Before April
1957

Period Year

April-
June
1957

Gage
height
(ft)

Discharge

Cfs

Katio
to
Q2.33

Arkansas River basin Continued

64

65

66

67 -

68

69

70-

71

72

73

74

75

76-

77

78 .

79-

Sallisaw, Okla.

Sallisaw, Okla.

Red Oak, Okla.

near Wister, Okla.

Wister, Okla.

Creek, Ark.
Lee Creek at Natural
Dam, Ark.
Lee Creek near Van
Buren, Ark.

Frog Bayou near
Mountainburg,
Ark.

Rudy, Ark.

Mulberry, Ark.

Dover, Ark.

Dardanelle, Ark.

182

1 125, 516

9rtn

loo

993

QQQ

36.9

168

427

74

917

079

274

i 131, 466

1942-57

1940-57
1946-57

1938-57

1935H57

1949-57

1935-57
1938-57

1950-57

1930-57

1833-1957

1936-57

1945-57

1927-57

1927
1 0^9 *\7

1949-57

IfiCft-IQ*?

1945

1943
1950

1935
1949

1935
1942

1950

1935
1945

1950

1945

1945
1943

1945

1Q4K

1927

1927

1Q4.Q

1Q43

May 27.

May 23-

Apr. 26..

May 27-

May 27.

Apr. 3
... do-.

Apr. 3 _

May 28-

May 23.

May 23.

Apr. 3

Apr. 3...

Apr. 3

May 30

e 11. 25
16.50
37.90
31.04
34.80
27.4
23.34
18.73
25.4
22.34
19.02
495. 11
505. 73
838.5
« 37. 16
214. 41
10.50
13.50

35.0
29.37
38.10

36.4
31.06
30.28

18.5
18.04
22.0
15.70
14.7
10.7
15.1
25.6
20.37
34.1
33.6

110,000
38, 400
(»)
442, 000
544, 000
(")
31, 000
10, 300
(2)
26, 300
14, 300
« 278. 0
5 507. 4

(2)
78,600
11, 030
9,510
20, 500
51, 800

112,000
73, 200

850, 000
510, 000
17, 300
13, 700

39, 500
36, 200
59, 000
28, 800
14, 500
7,600
15, 300
80, 000
44, 000
683, 000
471, 000

2.4

1.9

.9

1.7

.4

3.5
3.4

2.6

1.8
"~~~2.~2

3.0

1.7

2.1

2.1

1.7

Red River basin

80

81

82

83

84

85

86

87

Salt Fork Red River

Tex
Salt Fork Red River

at Mangum, Okla.

North Fork Red

Okla.

North Fork Red
River below Altus
Dam, near Lugert,
Okla.

Hobart, Okla.

North Fork Red
River near Head-
rick, Okla.
Otter Creek at
Snyder Lake, near
Mountain Park.
Okla.

1 1, 013

i 1, 357

i \ 938 '

549

i 3, 845

132

1938
1 AGO C7

inncAfi

1937-57

1Q44- *\7

1944 57

1QOO

1930-32,
1950-57

1949-57

1927-57

1903-08,
1951-57

1QOO

1954

1938

1951
1954

1951

1928
1951

1955

( )

May 16

May 16

May 17

May 4

May 18

17.5
16.00
19.00
14.7

14.55

11.24
11.95

1, 559. 53
614.5
12.70

30.75

25. 78
16.1

9.36
19.50

15.73

(2)
95,900
146, 000
60, 000

72, 000
18, 300

25, 300
« 167. 0
s 146. 4
14, 300
16, 100

131
22, 400

4,570
85,000

20, 100
14, 200

4,240

11.5

4.5

2.3

--

1.0

1.2

1.5

See footnotes at end of table.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C35

TABLE 7. Flood stages and discharges during April-June in Oklahoma and western Arkansas Continued

Sta-
tion

Stream and place
of determination

Drainage
area

(sq mi)

Maximum floods

Before April
1957

Period Year

April-
June
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Q2.33

Red River basin Continued

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104 -

105

106

107 -

108 -

109

110----

111- -

112- -

113

East Cache Creek

near Elgin, Okla.
Cache Creek near
Walters, Okla.
Deep Red Run near
Randlett, Okla.

Little Beaver Creek
near Duncan,
Okla.
Beaver Creek near
Waurika, Okla.
Red River near
Terral, Okla.
Walnut Creek near
Lone Grove, Okla.
Red River near
Gainesville, Tex.

Washita River at
Carnegie, Okla.

Pond Creek near
Fort Cobb, Okla.

Sugar Creek near
Gracemont, Okla.

Little Washita River
at Ninnikah, Okla.

Criner Creek near

Payne, Okla.
Washita River near
Pauls Valley, Okla.
Rush Creek near

Maysville, Okla.
Rock Creek at

Dougherty, Okla.

Washita River near
Durwood, Okla.

Lake Texoma near
Denison, Tex.
Red River near Col-
bert, Okla.

Blue River near Blue,
Okla.

North Boggy Creek
near Stringtown,
Okla.
Chickasaw Creek

near Stringtown,
Okla.
McGee Creek near

Stringtown, Okla.
Muddy Boggy Creek
near Farris, Okla.
Clear Boggy Creek
near Caney, Okla.

Red River at Arthur

City, Tex.

248

675

617

158

563

1 22, 787

133

i 28, 846

11 3, 129

319

211

227

55

5,330

206

138

7,202

i 33, 783

i 33, 841

478

139

32.5

84.5

1,087

720

i 38, 595

1955-57

1938-57"

1908-57"
1949-57

1948-57

1889-1957

1938-57

1936-57

1903-57
1938-57

1937
1939-57

1955-57

1951-57

1937-57

1953-57

1956-57

1927-57

1942-57

1906-57
1923-57

1936^57

1955-57

1955-57

1956-57

1937-57

1938
1942-57

1891-1957

1955

1951

1908
1951

1955

1951

1941

1941
1951

1903
1949

1937
1949

1955

1952
1955

1950

1955

1956

1941
1943

1945

1908
1935
1942

1938

1957

1957

1957

1945

1938
1946

1908

May 25

May 26

May 20

May 25

May 26

June 4
May 17

June 5

Apr. 24

Apr. 21

Apr. 23
June 2

May 24
May 17

May 18

May 18

May 17
May 18

May 19

June 5

June 5

May 25
"AprV's"

Apr. 26

Apr. 26

Apr. 26

May 25

June 6

27.51
34.10
29.72

28.80 (9)
27.10
23.74
19.46
19.74

22.7
21.82

22.72

26.53
10 25. 14
6 29
26.21
21.41
19.3
18.72
14.08
8.2
7.7

22.20

29.88
27.34
16.12
23.62
5.60

12 16. 80
44.37

42.30
629. 07
643. 18
45.5

32.6
26.26
31.81
29.43
15.02
17.87

12.98
20.18

8.97
16.79
44.94
40.40
26.9
26.77
24.02
43.2
28.35

13,300
20,400
28, 200
15, 000
(2)
20,300
8,050
39,800
47, 500

65, 300
22,500
197, 000
110, 000
363,000

168, 000

102, 000
(2)
50,000
12,600
(2)
35,000
1,550
905

620

4,860
25, 200
12.600

30,000
35,800
13,700
38, 500
2,260
25, 600

91,300
98, 000
« 4, 295. 0
55,991.3
(2)
201,000

102, 000
34, 400
14, 300
2,610
7,600

3,120
12,300

3,220
10,200
61,900
26,600
(2)
52,800
19,000
100,000
136,000

4.

1.

.

9.

1.

1.
1.

1.

1.

3.
5.

2.

6.

5.

3.

1.

1.
" 1.

1.

3.

1.

1.

I.

See footnotes at end of table.

C36 FLOODS OF 1957

TABLE 7. Flood stages and discharges during April June in Oklahoma and western Arkansas Continued

Sta-
tion

Stream and place
of determination

Drainage
area

(sq mi)

Maximum floods

Before April
1957

Period Year

April-
June
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Q2.33

Red River basin Continued

114--

115- -

116 ~

Miller, Okla.
Kiamichi River near
Belzoni, Okla.

Red River at Index,
Ark.

68

1,423

i 42, 094

1955-57

1915
1925-57

1917-57

1957

1915
1938

1938

May 25

May 26

June 8

12.87
19.03
44.2
44.0
37.60
34.25
29.3

1,700

4,150 <»)
71,400
40,500
297,000
154, 000

.7

1.6

1.2

i Contributing area only.
' Unknown.
» Field estimate.

1 Not necessarily maximum for the period. 5 Contents in thousands of acre-feet.
6 Former site and (or) datum.
7 Includes that of Rock Creek.
8 Date unknown; sometime prior to 1927.
» Exceeded 27 ft.

10 Affected by backwater from Lake Texoma.
11 Includes that of Running Creek.
12 Affected by backwater from Washita River.

ARKANSAS RIVER TRIBUTARY BASINS IN EASTERN OKLAHOMA AND WESTERN ARKANSAS

The first flooding occurred on small streams in northwestern Arkansas and northeastern Oklahoma following the heavy rains of April 3 and 4. Stages rose quickly from normal and reached a peak on April 3. The principal floods occurred on the Illinois River above Tenkiller Reservoir and on small tributaries of the Arkansas River in

western Arkansas. The floods at stream gaging stations on the Barren Fork and upper Illinois River in Oklahoma and on Cove, Lee, Spadra, and Piney Creeks in Arkansas were maxima for the period of record. According to local residents, the flood on upper Lee Creek was the greatest since at least 1890. Streams again reached flood stage fol-lowing the heavy rains of May 22-26, and the floods extended over a wider area than those of April. Pryor and Flint Creeks in Oklahoma, Lost Creek in Missouri, and Frog Bayou at Rudy in Arkansas had maximum discharges during the period of gaging station records. Lake O'The Cherokees on the Neosho River and Wister Reservoir on

the Poteau River reached their maximum content as they held back flood-waters from the already swollen major streams. Tenkiller Ferry Reservoir on the Illinois River reached its maximum content on

June 5 owing to the heavy runoff during the latter part of May. Heavy rains on June 12 in northeastern Oklahoma caused rapid rises in streams that were receding from the previous rise. Backwater from the Caney River caused some flooding at Bartlesville, and Bird

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C37

Creek rose rapidly after a cloudburst. Bird Creek at Avant reached maximum known discharge on June 12, and the Verdigris River near Inola reached a stage on June 16 about 2.2 feet less than the maximum known, although the discharge was much less than that of previous floods. Both Hulah Reservoir on Caney River and Fort Gibson Reservoir on the Neosho River filled to their maximum content as they retarded the flood flows.

CIMARRON, CANADIAN, AND MAINSTEM ARKANSAS RIVER BASINS

Floods during April were scattered, and flood stages occurred at only a few stations. Rains of April 21-23 caused only minor rises on the Cimarron River below Waynoka, Okla., and on small tributaries in the Arkansas River basin between Sallisaw, Okla., and Van Buren, Ark.
Severe to record flooding in many streams followed the generally heavy thunderstorms that occurred May 15-16 over an extensive area in western and central Oklahoma and that centered near Hennessey. Preacher Creek reached a maximum stage at about 11 p.m. on May 15, exceeding any stage known since at least 1918. The entire population of Dover was evacuated as flood waters engulfed the city from the overflow of Turkey Creek. The maximum known discharge of this stream occurred at the gaging station near Drummond. The greatest flood of record on the Cimarron River below Mocane occurred on May 16 and 17. The crest at Waynoka during the afternoon of May 16 was about 1 foot higher than the previous known maximum stage of about 14 feet, which occurred in 1914. The newly opened State highway bridge, on which the gage was located, was partly destroyed shortly before the crest of the flood arrived. The flood crest reached Guthrie early in the morning of May 17 and exceeded by about 5% feet the stage of 12.98 feet in 1949 (peak discharge, three times that of 1949) and exceeded by about 2 feet the stage of 1935 (discharge unknown). Water reached 3-foot depths along the main street of Coyle farther downstream, and several families in the area had to leave their homes. The flood reached Perkins by the evening of May 17, and its stage exceeded that of the record flood of 1926 by 2% feet. The crest at Perkins was further swollen by the flow from Skeleton Creek, a major tributary below Guthrie, which reached a maximum stage on the afternoon of May 16.
Flood waters of the Cimarron River combined with those of the Arkansas River from Kansas produced two crests at Tulsa. The first crest on the morning of May 19, reached a stage of 20.35 feet, and the second on the afternoon of May 21, reached a stage of 21.53 feet. This latter crest produced the maximum discharge for the period of gaging station record, although the stage was not as great as that reached

C38 FLOODS OF 1957

in 1923 prior to the start of streamflow records. There was no serious flooding in the city of Tulsa or vicinity.
Moderate to severe flooding occurred on the Arkansas River below Tulsa. The entire population of Bixby, 19 miles downstream, was evacuated on the evening of May 18. The gaging station near Sallisaw, Okla., had a stage about 3 feet lower than the maximum known stage since 1940 and had the maximum discharge since the start of streamflow records. The town of Moffett, Okla., across the Arkansas River from Fort Smith, Ark., was completely evacuated on May 25-31 and was inundated by nearly 5 feet of water causing substantial losses to residential and commercial properties. Urban areas in Fort Smith and Van Buren, Ark. were not affected because of their levees.
Flooding on the Canadian River was not severe in May. Maximum discharge was reached at Little River below Hog Creek near Norman, where the flow was almost six times the previous maximum known since the gaging station was established in 1952. The gaging station downstream near Tecumseh had a peak discharge equal to the pre-vious maximum discharge since at least 1943 at a gage height of almost a foot less. Farther downstream near Sasakwa the flood crest was lower than the previously known maximum.
The Arkansas River at Ralston rose briefly to flood stage in the middle of June, only to recede and return to flood stage again near the end of the month. The reach of the Arkansas River from Muskogee, Okla., to Dardanelle, Ark., was above flood stage for the entire month. The most noteworthy flood occurred on Wolf Creek in the North Canadian River basin on June 23. Heavy rains during the night of June 22 gave rise to sudden flooding on Wolf Creek, which destroyed the county bridge to which the gage was attached. The peak discharge of Wolf Creek near Fargo exceeded any previously known by about 3% times and was the greatest known since at least 1913, on the basis of information furnished by local residents. Fort Supply Reservoir reached its maximum content on June 25 when the stage rose to within \% feet of spillway crest.
RED RIVER BASIN

Flooding in the Red River basin was generally confined to the last half of May, although several streams reached their annual peak during the last half of April or the first week in May.
Maximum stages occurred on the Salt Fork Red River near Welling-ton, Tex., and at Mangum, Okla., on May 16 from heavy rains that fell over the Texas Panhandle on the previous day. The North Fork Red River reached a record stage on May 17, partly destroying the U.S. Highway 66 bridge near Sayre. In the Washita River basin, maximum discharges were reached at Pauls Valley on May 18 and at

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C39

Durwood on May 19, although stages were 2-3 feet lower than those of previously recorded floods. The towns of Lindsay, Alex, and Pauls Valley were inundated. Flood crests on Rush and Rock Creeks added to the already swollen Washita River near Durwood.
East Cache and Little Beaver Creeks and the Little Washita River

reached maximum stages and discharges after the heavy rains during the night of May 24, and the lower Washita River again had minor flooding.
Flooding on the Red River above Lake Texoma was not serious. No unusually high stages occurred on the lower Red River, although abnormally high flows persisted for unusually long periods from late May through mid-June, causing considerable damage to roads and levees. During the latter part of May, Lake Texoma was no longer able to store the tremendous volume of inflow and spilled over the uncontrolled spillway for the first time since regulated storage began in 1943.

Streams in southeastern Oklahoma, tributary to the Red River, experienced no record flooding but had a series of moderate peaks throughout the period. North Boggy, Chickasaw, and McGee Creeks had maximum flows during April; these flows, however, were not significant, as record had been obtained for only a short period. Other streams in the area reached their annual peak after the flood period.
RECORDS OF PREVIOUS FLOODS

Oklahoma and western Arkansas are a part of the southern Great Plains, in a region where spring and summer thunderstorms often cause floods. Local intense rains which cause floods in scattered small areas are annual occurrences. Because these storms are scat-tered, major flooding occurs often in only parts of the long and rela-tively narrow drainage basins.
Information on early floods is meager, because records of stream-flow are generally less than 20 years in length. A few records date from about 1925> but most date from 1938 or later. The Weather Bureau collected some stage records before gaging stations were established by the Survey or the U.S. Army Corps of Engineers. Some information on historic floods, based on floodmarks or elevations known by local residents, has been collected.
The earliest records of flood stages in the area covered by this report are those on the Arkansas River. Flood stage near Muskogee in June 1833 is known to be probably similar to that of May 21, 1943, the maximum for the period of gaging station record. At Fort Smith, Ark., the flood of 1833 was referenced to a Weather Bureau gage. Spring River, in northeast Oklahoma, reached a stage in 1943 known to be similar to that reached in December 1895. On the

C40 FLOODS OF 1957

Neosho River, to which Spring River is tributary, the flood of 1895 is known to be one of the major floods.
In southwestern Oklahoma, the North Fork Red River is known to have had a major flood in 1903, whereas on the lower Washita, in south-central Oklahoma, a major flood occurred in May 1908.
The flood of May 1914 on the Canadian River at Bridgeport was one of the major floods, although a higher stage may have occurred during the flood of October 1904. The flood of 1904 is known to be the maximum of record at upstream sites in Texas and New Mexico, however, this is not the case at downstream sites in Oklahoma. The maximum stage known since 1898 near Whitefield occurred in May 1943.

A major flood occurred in May 1914 on the Cimarron River in the panhandle and northwestern part of Oklahoma. This flood still represents the maximum known stage at the gaging station near Mocane, and near Waynoka it was approximately equaled by the flood of May 1935 and exceeded only by the current flood. No reference has been found to the flood of 1914 at downstream stations on the Cimarron River, where, prior to the current flood, the station near Guthrie reached a stage of 16.5 feet in May 1935 and the station at Perkins reached a stage of 17 feet in October 1926.
More recent major floods, since continuous gaging-station records have been kept, occurred in May 1943 and May 1951. More in-formation became available on the floods of May 1943 than for any previous flood in Oklahoma because of a growing interest in flood control and expanded activities in collecting streamflow records by the Geological Survey and the U.S. Army Corps of Engineers.
In May 1943, eastern Oklahoma and western Arkansas were swept by two very unusual, if not unprecedented, storms that produced flood stages far in excess of any previously recorded during gaging-station operation in many streams and in some streams were in excess of any previously known. All larger streams in eastern Okla-homa reached unusually high stages following the storm of May 7-11, 1957. Streams in northeastern Oklahoma rose again to record-breaking stages at many points following the storm of May 15^-20, 1957. Unusually high discharges, equaling or exceeding those of previous years, occurred in the lower reaches of all major streams in the storm area.
On the Verdigris River and its tributaries, Caney River, and Bird Creek, stages and discharges in 1943 were higher than any previously known. These maxima have not been subsequently exceeded except at Caney River near Hulah, whose peak was exceeded in 1944. In the Neosho River basin, maxima were reached in 1943 at Commerce and Langley, whereas the Elk River, a tributary from southwestern

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C41

Missouri, did not reach a peak as high as that of 1941. The 1943 maximum at Commerce was exceeded in July 1951. In 1943, maxima also occurred at stations on the Arkansas River from Ralston, Okla., to Little Rock, Ark., on its smaller tributaries in eastern Oklahoma and western Arkansas, and on the lower Canadian River and its tributaries. The peak discharges of many of the small tribu-taries were exceeded by subsequent floods and were not further exceeded in 1957. The maximum of 1943 at Ralston was exceeded the very next year, whereas at Tulsa the maximum of 1943 was not exceeded until 1957. At other stations on the main stem of the Arkansas River, the flood of 1943 has not been exceeded. The floods of 1943 did not extend westward to the Cimarron River and its tributaries.

The flood of March-April 1945 was outstanding in some parts of this report area. Maximum discharges for period of record were recorded on Sallisaw Creek and Barren Fork in eastern Oklahoma, Frog Bayou and Mulberry Creek in west central Arkansas, and on Little River in southeast Oklahoma and southwest Arkansas. This

flood is the greatest known on Sallisaw Creek and Barren Fork in Oklahoma and lower Lee Creek near Van Buren, Ark.
A noteworthy flood occurred in 1951 in some areas of western Oklahoma and has been reported by the U.S. Geological Survey (1954). Recurrent heavy thunderstorms during the period May 13-19 resulted in floods of unusual magnitude over a wide area in western Oklahoma, northwestern Texas, and parts of Kansas and Colorado. Major flooding occurred in the upper parts of the Cimar-ron, North Canadian, and Canadian Rivers and on the Red River and some tributaries above Terral, Okla. At several sites, maxima were established in 1951 which were exceeded by isolated floods in subsequent years.
Some isolated floods were caused by the following small intense storms: The Hammon storm in April 1934, causing the maximum flood on Washita River at Clinton; the Cleveland storm in September 1940, causing a dam failure at Lake Cleveland; the Hydro storm in June 1948, causing severe flooding on Deer Creek and producing the maximum of record on Canadian River at Bridgeport; and the Cheyenne storm in April 1954, causing the maximum of record on the Washita River near Cheyenne and flooding on Rush Creek.

FREQUENCY OF PEAK DISCHARGES

A flood-frequency report (Patterson, 1963) covers the area affected by the floods of April-June 1957. The discharge stations given in this flood report are classified by the frequency report into 4 flood regions and 4 main stem streams. Most of the stations are in three flood regions, defined as A, B, and E, in the frequency report, and

C42 FLOODS OF 1957

are considered representative of the total stations in the flood report. Each flood region has similar flood-frequency characteristics where-by the ratio of a given discharge to the mean annual flood defines the recurrence interval, in years (fig. 16), for the discharge at stations in a given region.
The ratio of the peak discharge of the 1957 flood, at a given station, to the mean annual flood is given in the last column of table 7. The region in which a station is located can be determined from the list given on figure 16, and from these two values the recurrence interval, in years, of the flood peak can be determined.
5.0

1.2 1.5 2 3 4 5 6 8 10 15
RECURRENCE INTERVAL, IN YEARS
FIGURE 16. Recurrence intervals of discharges at stations in flood regions A, B, and E, Oklahoma and western Arkansas.
Region Defines relationship for station numbers (table 7): A_____...__........... 34-36, 44-48, 64, 80-82, 85, 87-90.
B........_..........._ 66, 67, 70-72, 74-78, 103,107-112.
E......................... 2-18, 22, 25, 27-33, 39, 40, 52-54, 56, 57, 60-62, 91, 92, 94, 97-100,102

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C43

FLOODS OF MAY 9 NEAR DENVER, COLO.

Floods of considerable magnitude occurred on May 9 in the Denver area and on tributaries of the South Platte River farther downstream (fig. 17). The flooding occurred as the result of heavy rainfall. At the Denver airport, Weather Bureau records show that 3.26 inches of rain fell from 3 p.m. on May 8 to 10 a.m. on May 9. In the Sand Creek basin, higher stages .occurred than had been experienced for many years. The peak discharge of Sand Creek at the northeast edge of Denver was 25,500 cfs. The drainage area of Toll Gate Creek at East 6th Avenue near Aurora, 4K miles upstream from its mouth, is 35.8 square miles, less than 20 percent of that of Sand Creek; how-ever, it produced a peak discharge of 10,400 cfs. Considerable damage was done to homes and cultivated lands along the stream channels. Three persons living near Toll Gate Creek were drowned.
After the flood in Sand Creek reached the South Platte River, the peak discharge decreased rapidly. The peak discharge at the Hender-son gaging station was 14,800 cfs (table 8), which exceeded the pre-vious maximum in a 31-year record by 38 percent. Considerable overbank flow occurred along the South Platte River downstream from Denver and caused damage to cropland; also many cattle and other livestock were drowned.
St. Vrain Creek, which enters the South Platte River from the west, reached the highest stage since the maximum of record occured in September 1938. Homes built close to the stream and croplands were damaged. More than 100 feet of the railroad between Lyons and Longmont was washed out.

TABLE 8. Flood stages and discharges during May 9 in Platte River basin near Denver, Colo.

Station

1_
2 -
3--
4 -
5 -

6 -

Stream and place of
determination

Sand Creek above Toll Gate Creek near Aurora.
Toll Gate Creek near Aurora __ Sand Creek below Toll Gate Creek at Denver.
South Platte River at Hender-
son.

South Platte River at Fort Lupton.
St. Vrain Creek at mouth near Platteville.

Drainage
area

(sq mi)

122
35.8
196
4,740
5,070

1,000

Maximum floods

Before May 1957

Period

1926-57
1906,
1929-57

igotoe,
1915,
1927-57

Year

1942
1942

1938

May 9, 1957

Gage
height
(ft)

19.40
11.35
17.24
7.57
8.93

8.15

Discharge

Cfs

7,660
10,400
25, 500
10, 700
14, 800
9,000
8,480
11, 300

9,450

Ratio to
02.33

At different site or datum.
690184 O 63 4

C44 FLOODS OF 1957

o Platteville EXPLANATION

Gaging station
Numbers correspond to those
given in table 8

FIOUKE 17. Map showing location of flood-determination points. Flood of May 9 near Denver, Colo.

In Denver many homes were flooded, and people were evacuated. Streets and highways were inundated by the heavy runoff which exceeded the capacity of the storm drains in some areas. The city of Denver and the counties of Adams, Arapahoe, and Weld were declared disaster areas in order to make flood-stricken residents eligible for Federal rehabilitation loans.
FLOODS OF MAY 16-17 IN KANSAS

The most widespread floods in Kansas since 1951 occurred in May 1957. Practically all streams reached bankfull or higher

SUMMARY OF 1957 FLOODS IN THE UNITED STATES 045

stages at some time during the month. Record-breaking floods (table 9) were recorded in south-central Kansas on the Arkansas, Ninnescah, and Chikaskia Rivers (fig. 18).

INDEX MAP

EXPLANATION

. 3

Gaging station
Numbers correspond to those
given in table 9

FIGUEE 18. Map of flood area showing location of flood-determination points. Floods of May 16-17 in

TABLE 9. Flood stages and discharges during May 16-17 in Ark ansas River basin, Kansas

Station

I.. ..

2 -

3._ ~

4-

5 .

6 -

Stream and place of
determination

Little Arkansas

River at Valley
Center.
Arkansas River at
Wichita.

North Fork Nin-
nescah River near

Cheney.
South Fork Nin-
nescah River near
Murdock.
Ninnescah River
near Peck.

Chikaskia River near
Corbin.

Drainage
area

(sq mi)

1,327

40, 420

930

650

2,129

794

Maximum floods

Before May 1957

Period

1877-1957

1877
1934-57

1950-57

1950-57

1923-57
1937-57

1923-57
1950-57

Year

1945

1877
1951

1951

1951

1923
1951

1923
1951

May
1957

May 17

May 17

May 16

May 16

May 17

May 17

Gage
height
(ft)

22.05
19.75

21
13.38
14.68
14.38
15.09

10.03
11.86

26.4
20.73
21.85
28
22.50
22.31

Discharge

Cfs

32,000
1 19, 800

(2)
27,600
3 30, 700
14,800
23,700

7,080
23,600

(2)
25,100
38, 200
(2)
35,100
38,100

Ratio
to
Qj.SJ

2.9

2.8

4.6

3.9

4.2

5.5

1 Total discharge; 15,300 cfs in river, 4,460 cfs in flood way.
2 Not determined.

3 Total discharge; 21,400 cfs in river, 9,280 cfs in Big Slough-Cowskin floodway.

046 FLOODS OF 1957

Frequent precipitation after April 30 raised most stream-levels and created a flood potential. High soil-moisture content set the stage for high runoff rates. The precipitation that was the immedi-ate cause of the midmonth floods was mostly evenly distributed in amount and location and was intense in only a few locations.
The State Highway Commission reported 45 road closures in the flooded areas of south-central Kansas. Heavy damage was caused to crops. In the Wichita area, a newly completed flood control project operated sucessfully, and one-third of the peak discharge of the Arkansas River in Witchita bypassed the river gage through the Big Slough-Cowskin floodway.

FLOODS OF MAY 17, 21-23 IN SOUTHEASTERN MISSOURI

Heavy rainfall on May 17 and 21-23 in southeastern Missouri (fig. 19) caused flooding of many thousands of acres of farmland and damage of several million dollars.
The rainfall on May 17 amounted to as much as 3.5 inches in part of the flood area and that on May 21-23 totaled from 3 to 4 inches, with 1.15 inches recorded in 15 minutes at one site. Maximum discharge and stage during period of operation occurred

20 20 40 MILES

EXPLANATION

* i i i i i_____i____i
Gaging station
Numbers correspond to those
given in table 10

FIGURE 19. Map of flood area showing location of flood-determination points. Floods of May 17, 21-23 in southeastern Missouri.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C47

at several gaging stations, principally on those having small drainage areas (table 10).

The peak discharge on Castor River at Aquilla was about that of a 50-year flood. The peak discharge on Little Beaver Creek near Holla was much greater than that of a 50-year flood, and the peak stage is known to have been the maximum since 1882.

No recurrence intervals can be applied to streams of small drainage areas in this region, but it is apparent the floods on the small streams were of rare occurrence.

TABLE 10. Flood stages and discharges during May 17 and 21-23 in southeastern Missouri

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before May 1957

Period Year

May
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Q2.33

Osage River basin

1

2.. ...

3

4. -

Pomme de Terre

Preston.

near Meta.

99 c

3.85

.75

257

1950-57

1Q«v-K7

--.-.do,....

1937
1947-57

1QK1

1937
1950

May 22

May 17

10 7

15.88
9.56

7.45

99 R

18.21

9

KCfi

12,900
1,400

1,200

0)

20, 000

1.8

1.4

Gasconade River basin

5. ... Little Beaver Creek
near Rolla.

6.41 1882-1957
1947-57

1945
1950
May 21

7.5
6.66
7.57

(')
4,180
5,040 4.7

Meramec River basin

6. Bourbeuse River
near St. James.

21.3 1947-57 1949
May 21

11.08
10.09

8,250
6,330 1.1

St. Francis River basin

7

8

9.

Frederick town
Clark Creek near
Piedmont.

4 03

4 1Q

1955-57

1 Q ^A ^7

1QAK K7

1QKC

1QJ K

1950

May 21
May 22

May 23

7.19
9.62
6.10

14.2
13.45
14.00

900
5,550
1,400

«

3,430
4,100 1.6

White River basin

10 246 1909 IQ^PL,^?

IQfiQ
1956

May 23

15.20
15.57

«

12,400
14, 100 1.9

1 Not determined.

C48 FLOODS OF 1957

FLOODS OP MAY AND JUNE IN IDAHO

Flooding occurred along several tributaries and the main stem in the lower Clearwater River basin on May 20. Record-breaking floods occurred in several streams in southeastern Idaho on May 26 and on June 6-8 (fig. 20).
Winter and early spring precipitation and snow cover were not abnormally high. Snow survey reports by the U.S. Weather Bureau, and the Soil Conservation Service indicated that snow packs were about average on May 1, except for those at high elevations which were generally above average. Soil moisture on the watersheds,

r EXPLANATION

Gaging station
1 Numbers correspond to those
1 given in table 12

50 50 100 MILES

FIOURK 20. Map showing location of flood-determination points. Floods of May-June in Idaho.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C49

however, was reported to be considerably above average in May. Rainfall during May was the highest in more than 40 years at many sites in the State. It exceeded the long-term means by more than 4 inches at several weather stations and was from 2 to 3 times the

mean (table 11).

TABLE 11. Precipitation at representative locations during May floods in Idaho

Stream

Do..
Do.- . . ------
Do..
Teton River...- -
Blackfoot River...-
Do.. - .

Climatic Station

Fenn R. S - _ _

Altitude

(ft)

1,600
3,355
3,411
1,190
2,910
4,968
6,200
4,503
5,066
3,949

Precipitation, in inches

May 18-
21, 1957

2.76
2.60
1.45
2.72
2.86

Monthly May
totals

1957

5.18
8.24
5.32
4.39
5.17
4.23
4.98
2.88
2.60
2.51

Normal

2.99
3.15
2.62
2.20

1.54
1.63
1.32
1.10
1.28

The flood in Blackfoot River on May 26 was caused, to a large extent, by excessive rain falling on saturated ground. The runoff from the rainfall, augmented by the snowmelt, resulted in a peak discharge that was the highest in 45 years of record at the gaging station at Blackfoot (table 12). The U.S. Army Corps of Engineers reported that about 1,340 cfs was being released from Blackfoot-Marsh Reservoir at the time of the peak. At this same time about 1,300 cfs was being lost above the gaging station to canal diversions and percolation.
General flooding occurred in the Teton River basin in the extreme eastern part of Idaho and in Pahsimeroi and Lemhi valleys in the headwaters of the Salmon River basin June 6-8. Various reports state that the area covered by snow was unusually large and that considerable water was stored in the snow fields at high elevations at the end of May. Increased temperatures on June 2-5 combined with wet soil and a large snow pack caused high peak discharges in these areas. Peak discharge at the gaging station on Teton River near St. Anthony was the highest recorded since 1909. This was also true for Pahsimeroi River near May. The peak discharge of Lemhi River near Lemhi was reported to be the highest in at least 34 years.

Clearwater River at Spalding reached a flood peak on May 20 which was exceeded only by the floods of May 1948 and December 1933 in 35 years. South Fork Clearwater River near Grangeville reached a stage which was exceeded in 45 years only by the floods of

C50 FLOODS OF 1957

TABLE 12. Flood stages and discharges during May and June in Idaho

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before May 1957

Period Year

May-
June
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Qi.33

Henrys Fork

1.. .. Teton River near St.

Anthony.

890 1890-93,
1903-09
1920-57

1893

June 6

'6.90

7.03

5,830

4,660 6.8

Blackfoot River basin

2 ...... Blackfoot River near Blackfoot.

1,295 1913-57 1921
May 26 7.04

868
2 1, 040

Salmon River basin

3. ...

4.......

Pahsimeroi River
near May.

Lemhi River near
Lemhi.

845

890

1930-57

1939,
1955-57

1943
1956

1956

June 8

June 7

34.37
3.91
3.51

4.48

454

796
1,090

1,840

2.3

3.2

Clear water River basin

5.......

6 __.

7- ..-

8. ...

9.......

water River near

Granger ville.

Kamiah.

Ahsahka.

Kendrick.

Spalding.

865

2 ' 440

425

9

C7A

1911-17,
1923-57

1Q11 >!7

1 Q97 ^7

1945-57

1927-57

1917

1948

iQqq

1948

1Q4K

May 20

May 20

May 20

May 20

May 20

13.6

10.09
19.22
. 15.85
3<; ^
21.47

10.8
23.76
21.42

15,000

8,910

71,200

40,600

13,000
8,500
177 000
143, 000

1.9

1.3

1.3

1.4

1.5

1 At different site and datum.
2 About 1,300 cfs diverted above station.
s Affected by backwater from the Salmon River.

1912, 1917, and 1948. The major tributaries of the Clearwater River which flow in from the east, were only moderately high during the flood. The heavy rains at lower elevations in the Clearwater basin in the Grangeville-Kamiah area caused floods in some tribu-taries. Cottonwood, Clear, Lawyers, Lolo, Orofino, Big Canyon, and Lapwai Creeks were reported by local residents and by the U.S. Army Corps of Engineers to be at the highest stages in many years. Flood damage in the Teton River basin amounted to "about $100,000, of which the greatest amount was to agricultural property and $20,000 to railroads, county roads, and highways.
In the Blackfoot River basin, the total damage was estimated by the U.S. Army Corps of Engineers at $100,000, of which $31,000 was

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C51

damage to the Fort Hall Indian Reservation. Damage to agricul-tural properties accounted for the major part of the total. Highways and railroads sustained minor damage.
The U.S. Army Corps of Engineers estimated the damage to agri-cultural lands and to roads in the Lemhi River Valley at $135,000. Most ot the damage was to crops, irrigation structures, fences, and farm bridges and included extensive erosion and siltation damage. Some flooding occurred on Clearwater River, but the major damage was along tributaries in the basin. The U.S. Army Corps of Engineers estimated damage at $118,000 for the lumbering industries. Damage to highways and railways consisted of washed-out roadways and destroyed bridges and amounted to $165,000. Residential damage amounted to $33,000 in the towns' of Lewiston, Orofino, and Stites.

FLOODS OF JUNE 5-7 ON GBEYBULL RIVER, WYO.

The warm weather early in June increased the melting of the heaviest snow pack in years in the area southwest of Meeteetse, Wyo. (fig. 21). Official Weather Bureau records do not show much precipi-tation, but there were reports of short, intense, and localized storm activity on June 5 that augmented the runoff.
109° 108°

WYOMING

EXPLANATION

Gaging station
Numbers correspond to those
given in table 13

INDEX MAP

FIGXIRE 21. Map showing location of flood-determination points. Floods of June 5-7 on Greybull Riyer, Wyo.

C52 FLOODS OF 1957

Four gaging stations in the Greybull River basin and one on Dry Creek, the adjacent basin to the north, had maximum or near maxi-mum discharges for their perio4s of record (table 13). Considerable flooding and damage occurred along the lower 20 miles of the Greybull River June 5-7. The Weather Bureau and U.S. Army Corps of Engineers reported that eight homes were evacuated and six were flooded near Burlington and Otto. They estimated damages at $118,500 to 250 acres of crops and 1,750 acres of pasture and at $15,500 to roads and bridges.

and discharges during June 5-7 on Greybull River in
Yellowstone River basin, Wyo.

TABLE 13. Flood

Station

1 ....

2 ....

3------

4 ....

5 .---

Stream and place of
determination

Greybull Eiver near
Pitchfork.
Wood River at Sun-
shine.

OreybuU Eiver at
Meeteetse.

OreybuU Eiver near
Basin.

Dry Creek at Greybull.

Drainage
area

(sq mi)

309

200

690

1,130

417

Maximum floods

Before June 1957

Period

1946-49,
1951-57
1945-57

1897, 1903,
1920-57
1930-57

1951-53,
1955-57

Year

1952

1952

1937

1941
1943
1951

June
1957

June 5
June 6
June 7

June 6

June 7

June 7

Gage
height
(ft)

16.10
6.98
4.85
5.95
27.47
6.78
38.60
5.90
2 4. 06
7.72

Discharge

Cfs

4,000
5,700
2,260
2,040
10, 500
7,710
5,390
""9,166"
860
998

Eatio
to
Q2.33

....-..-

1 At site 30 ft upstream at same datum.
2 At site and datum then in use.

3 At site 200 ft upstream at same datum.
FLOODS OF JUNE 9 AT PERRY, FLA.

After scattered showers, a tropical disturbance brought heavy rains to the Big Bend area in the coastal lowlands of Florida. Heavy rains began about 6 p.m. on June 7 and lasted about 36 hours. Rainfall records were collected at 3 recording and 8 daily stations operated by the Weather Bureau and at 14 daily stations operated by the Florida Forest Service.
The heaviest rainfall reported for the area was 18.9 inches about 20 miles northeast of Perry. More than 18 inches of rain fell on about 15 square miles and more than 12 inches fell on about 1,000 square miles (fig. 22). A total of 16.31 inches of rain fell at Perry during June 1957, of which 11.7 inches fell June 7-8. This monthly total was the second highest known and was exceeded during the month of June 1934 when 16.86 inches of rain fell.
Serious flooding occurred in Perry along Spring Creek and Pimple Creek; about 200 families were evacuated from the lowland areas.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C53

30°

Isohyet
Isohyetal interval 1 and 2 inches

FIGURE 22. Isohyetal map showing total rainfall for June 7-8 in the vicinity of Perry, Fla.

Spring Creek, which flows westward through town, overflowed it's banks, inundated several streets (fig. 23), and caused considerable damage to homes and business property. Floodwaters from Pimple Creek damaged homes and stores in the northern section of town. Several streets were flooded along Pimple Creek and a section of the Atlantic Coast Line Railroad bridge was torn out to relieve the flood-ing upstream. Total property damage was estimated at several mil-lion dollars.

Two indirect measurements of peak discharge were made (fig. 23); one on Spring Creek just downstream from U.S. Highway 19 and 27 and one on Pimple Creek at the North Jefferson Street crossing. Spring Creek has a drainage area of about 24 square miles above the point of the discharge measurement and has an average valley slope of about 7 feet per mile. The normal low-water channel ends in an area of sinkholes about a mile east of town, and the Creek flows

C54 FLOODS OF 1957

1000 1000 2000 FEET EXPLANATION
O
Indirect measurement site

Flooded area

FiorBE 23. Map showing flooded area and location of flood-determination points. Floods of June 9 at Perry, Fla.

as an intermittent stream to a point near Center Street. The peak discharge of 1 360 cfs occurred during the night of June 9. Pimple Creek has a drainage area of about 12 square miles above the point of the discharge measurement and has an average valley slope of about 10 feet per mile. The peak discharge of 1,860 cfs occurred at about noon on June 9.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C55

The drainage systems of both Spring and Pimple Creeks begin in San Pedro Bay. The unit peak discharge of Pimple Creek (155 cfs per sq mi) was greater than that of Spring Creek (57 cfs per sq mi) and is accounted for by the steeper valley slope and the more direct route Pimple Creek follows from San Pedro Bay. The peak stage on Pimple Creek occurred from 8 to 10 hours before that on Spring Creek.

Residents of the Perry area remember two previous floods of noteworthy magnitude, one in 1948 and the other in 1934. The flood of June 9, 1957, was by far the most destructive in the history of the community (Musgrove, 1958). The population of Perry had increased greatly during the few years prior to the 1957 flood, especially adjacent to the channels of Spring and Pimple Creeks. The peak discharge of each creek greatly exceeded that which could be carried without flooding.

FLOODS OF JUNE 14-17 IN ILLINOIS AND MISSOURI

Heavy rains occurred on June 14-15 in a narrow strip extending from Pacific, Mo., where 11.75 inches fell, to Belleville, 111., where 13.75 inches fell (fig. 24), and caused extensive flooding and damage. Unusually heavy rainfall of short duration in the St. Louis, Mo., area on June 14 caused an increase in discharge of 100,000 cfs in 17 hours in the Mississippi River.
The maximum total rainfall for the storm was 16.54 inches in 9K hours which fell 8 miles south of East St. Louis, 111. At Belleville, 111., 13.75 inches of rain fell in 12 hours and more than 12 inches were reported from several localities. The maximum 12-hour rainfall for St. Louis, 8.54 inches, fell during the storm.
The flood damage in Illinois was estimated at more than $15 million in East St. Louis and in St. Clair, Madison, Bond, and Clinton Counties; 10 lives were lost, and at least 30 persons were injured. The damage to crops and soil in St. Louis County, Mo., was estimated at $1 million, and eight lives were lost in St. Louis and Franklin Counties.

All major highways from East St. Louis, 111., were closed to traffic by high water, landslides, and fallen trees, and many washouts occurred on railroad fills. It is estimated that more than 6,000 persons were evacuated from their homes, of which about one half were in St. Louis County, Mo.
Floods in many small creeks in St. Louis, Franklin, Washington, and Jefferson Counties, Mo., damaged bridges and roads. Flood-waters of Heads Creek inundated about 90 percent of the town of House Springs, and Grand Glaize Creek reached the highest stage known and caused $50,000 damage in Valley Park.

C56 FLOODS OF 1957

7

illsboro

EXPLANATION

INDEX MA,P

20 MILES

Gaging Station

Miscellaneous measurement site Numbers correspond to those
given in table 14

Isohyet
Isohyetal interval 1 and 2 inches

FIGURE 24. Map of flood area showing location of flood-determination points and precipitation for June 14-15. Floods of June 14-17 in Illinois and Missouri.

The peak discharge at Caseyville, 111., near the center of the storm, was the maximum in 18 years of record (table 14). A flood-frequency study (Mitchell, 1954) indicates that the recurrence interval for the flood at Caseyville was more than 50 years. Although the peak dis-charge in Indian Creek at Wanda was less than that of 1946, it had a recurrence interval of from 35 to 40 years. Floods in Brush Creek at Pacific, Mo., and Fox Creek at Allentown, Mo., each had recurrence intervals greater than 50 years.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C57

TABLE 14. Flood stages and discharges during June 14-17 in Illinois and Missouri

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before June 1957

Period Year

June
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Q2.33

Salt Spring Creek basin

1. ...... Salt Spring Creek at
Gilead, 111.

1.2 June 14 _ 720 0.8

Illinois River basin

2.......

3 ....

Hurricane Creek near
Roodhouse, 111.
Macoupin Creek near
Kane, 111.

2.33

875

1950-57

1921-33,
1940-57.

1951

1943

June 16.

9.10
11.77
28.5

23.42

310
1,700
40,000

17,500

2.9

1.6

Cahokia Creek basin

4.......

5.......

Indian Creek at
Wanda, 111.
Canteen Creek at

Caseyville, 111.

37.0

22.5

1940-57

1939-57

1946

1946

June 15.

June 15.

18.41
17. 62
20.54
17.81

9,340
7,750
10, 000
10, 200

3.3

5.7

Meramec River basin

6 -...

7 .

8.......

Brush Creek at
Pacific, Mo.
Fox Creek near
Pacific, Mo.
Fox Creek at
Allentown, Mo.

7.84

1.65

15. -8

June 15.

... do . .

... do -

8,220

1,420

21, 200

6.8

11.8

Kaskaskia River basin

9....... Shoal Creek near
Breese, 111.

760 1943
1909-12,
1914,
1945-57.

1943
1950

June 17.

25.6
22.63

22.48

52,000
23, 100

22,600 2.1

FLOODS OF JUNE 16 ON BAZILE GREEK, NEBB.

An intense local storm swept the Creighton area (fig. 25) June 16 and caused a flood of unusual severity on Bazile Creek. Rainfall amounting to 6.45 inches was observed at Creighton, but the magni-tude of the runoff indicates that greater amounts of precipitation fell within the basin. The peak discharge of 68,600 cfs at the gaging station on Ba/jle Creek near Niobrara (drainage area, 440 sq mi) was 2.6 times the previous maximum in 6 years of record, and its magnitude was of unusual occurrence for the locale.

C58 FLOODS OF 1957

98°

Niobraraf a^~\ Flood-determination point

FIGURE 25. Map showing location of flood-determination point. Flood of June 16 on Bazile Creek, Nebr.

FLOODS OF JUNE 16-18 IN KANSAS RIVER BASIN, KANSAS
AND NEBRASKA

The frequent, but not intense, precipitation in May continued into June and practically all areas in Kansas received amounts in excess of their long-term means. Record-breaking floods occurred in central Kansas (fig. 26) on Big Creek and the headwaters of the Saline River. High stages and discharges were recorded on the Smoky Hill River and the South Fork Solomon River.
Big Creek crested on June 16 and 17 (table 15). The business section of Ellis, Kans., was under 4 feet of water, and some parts of Hays, Kans., were inundated. The stage at the gaging station was 0.6 foot higher than that in 1951.

100° 97°

EXPLANATION

Gaging station
Numbers correspond to those
given in table 15

40'

40 MILES

FIGURE 26. Map of flood area showing location of flood-determination points. Floods of June 16-18 in Kansas River basin, Kansas and Nebraska.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C59

Extremely high stages also occurred on the upper Saline River. Near Wilson, the stage was 1 foot higher than that of June 2, 1935, but a foot lower than that of July-August 1928. The crest of 24,300 cfs on June 18 near Wilson diminished rapidly as it moved down-stream and was only 8,440 cfs at Tescott (80 miles downstream) on June 22-23.

Flood damage in the Kansas River basin was estimated by the Weather Bureau at about $2% million, of which more than $1 million occurred along the Saline River.

TABLE 15. Flood stages and discharges during June 16-18 in Kansas River basin, Kansas and Nebraska

Station

1. ------

2 ....

3 -.-.

4. -.--_

5--- -

6. ......

7

8 ..

10...-.

Stream and place of
determination

Republican River
near Guide Rock,
Nebr.

Smoky Hill River
near Arnold, Kans.

Smoky Hill River at
Cedar Bluff Dam,
Kans.

Big Creek near Ogal-
lah, Kans.

Big Creek near Hays,
Kans.

Smoky Hill River
near Russell, Kans.
Saline River near
Wakeeney, Kans.

Saline River near
Wilson, Kans.
South Fork Solomon
River above Web-
ster Reservoir,
Kans.
South Fork Solomon
River at Alton,
Kans.

Drainage
area

(sq mi)

22, 060

5,220

5,530

347

594

6,965

696

1,900

1,036

1,720

Maximum floods

Before June 1957

Period

1929-57
1950-57

1938
1950-57

1952-57

1914-57
1955-57

1907-57

1938-57

1879-1957
1955-57

1928-57

1908-57

1919-25,
1928-32,
1942-57.

Year

1935
1951
1955

1938
1951

1952

1950
1956

1951

1938

1950
1956

1928

1951

1951

June
1957

June 16

June 16

June 19

June 16

June 17

June 18

June 17

June 18

June 17

June 17

Gage
height
(ft)

(')

10.15
15. 73
19.0
3 12. 57
12.61
3.39
4.77

14
6.32
19.02
21.46
22.07
29.0
16.64
27
17.20
19.40
26.8
25.83
314.9
12.02

27.1

20.60

Discharge

Cfs

250, 000
14, 300

2 29, 200
0)
23, 800
20, 400
*475
s 1,850

(')
346
18, 500
19, 900
22, 400
70, 000
12, 900
(»)
7,480
13,000
25, 700
24, 300
55, 200
25, 100

91, 900

« 20, 400

Ratio
tO Q2.33

3.6

10.6

9.1

4.5

4.7

7.6

1 Not determined.

2 From an undetermined part of 1,300 sq mi below dam.
3 Site and datum then in use.

4 Regulated by Cedar Bluff Reservoir.
5 Daily discharge.
8 No flow through Webster Reservoir.

The reductions of the flood crests by both Cedar Bluff Reservoir on the Smoky Hill River and Webster Reservoir on South Fork Solomon River were considerable. The Smoky Hill River above the reservoir near Arnold, Kans., crested at 20,400 cfs on June 16. The outflow from Cedar Bluff Reservoir was completely controlled to a maximum daily discharge of only 1,850 cfs on June 19. The peak discharge of 12,900 cfs near Russell, Kans., on June 18 was almost entirely from the
690184 0 63 5

C60 FLOODS OF 1957

drainage area of 1,665 square miles downstream from Cedar Bluff Reservoir.
The maximum flow from South Fork Solomon River into Webster Reservoir was 25,100 cfs. This inflow was completely controlled, and no releases were made. Runoff from the 684 square miles downstream from Webster Reservoir produced a peak discharge of 20,400 cfs at Alton, Kans.
A separate localized storm occurred on June 15-16 in an area in Nebraska adjacent to the Kansas flood areas. More than 6 inches of rain fell in a small area around Red Cloud, Nebr., (fig. 26) causing a flash flood on the Republican River. The peak discharge (29,200 cfs) at the Guide Rock gaging station was the greatest since 1950. This peak discharge was unique in that it was generated almost entirely from the drainage area below Harlan County Reservoir. Water was being released from the reservoir June 16 at the rate of 1,440 cfs. Practically the entire peak discharge of 29,200 cfs at Guide Rock consisted of surface runoff from an undetermined part of the 1,300 square miles between the dam and the gage. A flood of such magnitude is very unusual in this region and would be equivalent to about 12 times the mean annual flood.

FLOODS OF JUNE 16-21 IN SOUTHEASTERN SOUTH DAKOTA

Record breaking rains began at 6 a.m. on June 16 and continued for about 24 hours in the southeastern corner of South Dakota. The rains were concentrated along an arc extending from Tyler, Minn., through Colton, S. Dak., to near Yankton, S. Dak. Figure 27, an isohyetal map compiled by the U.S. Corps of Engineers, shows the amounts and distribution of rainfall during the June 16-17 storm and the points at which peak discharges were determined.
The most noteworthy runoff occurred in and around Sioux Falls on June 17, when Skunk Creek produced a peak discharge of 29,400 cfs, and Big Sioux River, 3 miles downstream from Skunk Creek, crested at 16,200 cfs (table 16). This flood occurred during the time that an extensive flood-control project was under construction. Dikes had been constructed along the Big Sioux River in the reach above and below the mouth of Skunk Creek and for a short distance upstream along Skunk Creek. During the rapid rise these dikes confined the water which came almost entirely from Skunk Creek but were breached or overtopped as the crest occurred. This per-mitted the storage of a large quantity of water in the flood plain outside the dikes. As a result there was an abnormally large reduc-tion in peak discharge from 29,400 cfs on Skunk Creek to 16,200 cfs on the Big Sioux River at Sioux Falls. A second peak at Sioux

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C61

Miscellaneous site
Numbers correspond to those
given in table 16
SOUTH DAKOTAJMINNESOTA

- ^J~ IOWA
MHCY MAP ^ .

Isohyet
Isohyetal interval 1 inch
10 20 MILES

FIGURE 27. Map showing total rainfall June 16-17 and location of flood-determination points. Floods oi June 16-21 in southeastern South Dakota. Isohyets compiled by U.S. Army Corps of Engineers.

Falls on June 19, caused mainly by the crest moving down the Big Sioux River, was also appreciably reduced between Dell Rapids (15,500 cfs) and Sioux Falls (10,300 cfs) by diverting water through a bypass canal across the loop of the Big Sioux River on which the the gaging station is located and by normal channel storage in the flood plain between the two stations. Discharge hydrographs for streams in the Sioux Falls area are shown on fig. 28.

C62 FLOODS OF 1957

TABLE 16. Flood stages and discharges during June 16-21 in Iowa and south-eastern South Dakota

Station

Stream and place of
determination

Drainage
area

(sqmi)

Maximum floods

Before June 1957

Period Year

June
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to

QJ.M

Marne Creek basin

1-- .... Marne Creek at
Yankton, S. Dak.

30.7 June 16 4,450

James River basin

2....... James River near
Scotland, S. Dak.

21,550 1928-57 1942
1952
June 17

16.23
9.48

10,800

1,960 0.8

Vermillion River basin

3....... Vermillion River
near Wakonda. S.
Dak.

1,680 1945-57 1947
1954
June 21

16.63

16.48

3,790
2,990 1.0

Big Sioux River basin

4.......

5__-____

6 ---.

7_-___.

%.......

9 ...

10--....

11......

Brookings, S. Dak.

Dell Rapids, S.
Dak.

tributary near Dell
Rapids, S. Dak.

tary near Colton,
S. Dak.

Sioux Falls, S.
Dak.

Sioux, Falls, S.
Dak.

Sioux Falls, S.
Dak.

i 4, 420

1 5, 060

.68

5.80

con

i 5, 750

i 9

' Q3Q

1 QW 57

1888-1957

1943-57

1951-57

1 O9fi V7

1952

1952

1952

1952

1952
1954

June 18

... do_.__

June 17

June 17

June 19

June 20
June 21

9.79
11.67
14.85
14.93

17.78

14.50
16.01

14.26

19.95
19.77

1,970
5,320
15, 400
15,500

948

2,550

5,770
29,400

213,500
3 16, 200

* 2, 800
2,820

33,000

19, 400

1.6

3.9

20

3.1

1.6

1 Includes about 1,970 sq. mi. which is probably noncontributing.
2 Total discharge, 11,000 cfs in main channel, 2,500 cfs in bypass canal.
3 Total discharge, 16,100 cfs in main channel, 146 cfs in bypass canal.
4 Daily discharge.

Five lives were lost during the flood, two by drowning and three in an automobile accident resulting from a road washout. Property damage was very heavy. Direct urban damage in Sioux Falls from the flood have been estimated by the U.S. Army Corps of Engineers at about $840,000, and damage to the partially completed flood-control project near Sioux Falls amounted to $375,000. Damages

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C63

30

25

55&J 20

OK

X LU l-°- 15

-HI
LU LL.
cc Mo
< CD

10

EXPLANATION

Skunk Creek near Sioux Falls, S. Dak.

Big Sioux River near Dell Rapids, S. Dak.

Big Sioux River at Sioux Falls, S. Dak. (main channel only)

Big Sioux River bypass canal
at Sioux Falls, S. Dak.

16 17 18 19 20 JUNE 1957

21 22 23

FIGURE 28. Discharge hydrographs for selected streams, Big Sioux River basin, South Dakota. Floods of June 16-21 in southeastern South Dakota.

totaling many thousands of dollars were also sustained by other smaller cities, towns, farmsteads, and highways. About 20,000 acres of crops were destroyed, and many thousands of acres were damaged so that growth and maturity of crops were retarded.
The floods on Marne Creek at Yankton and on Big Sioux River and its tributaries between Dell Rapids and Sioux Falls were the greatest within the memory of residents living in the area. The peak discharge of Skunk Creek greatly exceeded that of the previous maxi-mum during 10 years of record and was about 6.5 times that of a 25-year flood.

SNOWMELT FLOODS OF JUNE AND JULY IN WESTERN COLORADO

Spring precipitation at most Weather Bureau stations in western Colorado ranged from 150 to 250 percent of normal. This condition, together with high soil moisture caused by previous high precipita-tion, was a stimulus for above-normal snowmelt runoff which occured on many streams.
The Gunnison River near Grand Junction (fig. 29) reached a stage on June 6 that was the highest since the maximum peak of record which occurred in 1920 (table 17). Most of north Delta was inun-dated, causing damage to homes and business establishments. Dude ranches and tourist courts near the stream were damaged; however, the damage upstream from Delta along the Gunnison River was relatively minor.

C64 FLOODS OF 1957

108° 107°

39° 30' -

39°00r

Gaging station
Numbers correspond to those
fiven in table 17
10 o 10 20 MILES

FIGURE 29. Map showing location of flood-determination points. Snowmelt floods of June and July in western Colorado.

TABLE 17. Flood stages and discharges during June-July in western Colorado

Sta-
tion

Stream and place
of determination

Drainage
area

(sq mi)

Maximum floods

Before June 1957

Period Year

June-

July 1957

Gage
height
(ft)

Discharge

Cfs

Katio
to

Qa.ss

Gunnison River basin

I-..-.

2.-----

3.

Somerset.

Grand Junction.

63

521

8,020

1954-57

1896-99
1901-06,
1916-57

1956

1941

1920

or6

2.62

0)
6.30
6.14

14.95

13.78

292
1,200

5,850
7,860

35, 700

27, 800

Roaring Fork basin

4 -

Glenwood Springs.

225

1,460

1935-57

1910-57

1938
1953

1921

Julyl

Julyl

9.03
9.24
8.7

8.64

4.400

4,390
17, 600

19, 000

1 Not determined.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C65

The maximum discharge of 7,860 cfs on June 4, 1957, on the North Fork Gunnison River near Somerset exceeded the previous maximum of a 24-year period of record by 34 percent. The Smith Fork also was high.
On July 1, high stages occurred in the Roaring Fork basin (fig. 29). The maximum discharge in 53 years of record occurred on the Roaring Fork at Glen wood Springs (table 17). The Crystal River was flood-ing at the same time, and at Redstone the flood peak almost equaled that of June 1938 which was the maximum peak since at least 1935. Damage along these streams was limited to overbank flooding, inundation of farmland, loss of small bridges, and damage to build-ings in the flood plain.

FLOODS OF JUNE-JULY IN INDIANA AND ILLINOIS

Heavy rains on June 27-29 over central Indiana and east-central Illinois produced floods which exceeded those previously known on some of the tributaries of the Wabash and the White Rivers, on South Fork Sangamon River, and on the Kaskaskia River.
At many Weather Bureau precipitation stations June was one of the wettest months of record. The weather was generally fair im-mediately preceding the storm of June 27 and 28, Intermittent showers occurred, however, over most of the area June 22-25 and a few scattered stations reported light showers on June 26. On June 27 and 28 southerly moisture-bearing winds, associated with Hurri-cane Audrey, collided with a front that lay across central Indiana and caused flood-producing rainfall ranging from 6 to 10^ inches in central Indiana and as much as 12 inches in east-central Illinois

(fig. 30). Many Weather Bureau stations reported more than 3 inches of rain during a 24-hour period. Rockville, Ind., received 10.15 inches of rain during the storm period, and Whitestown, Ind., re-ceived almost 8 inches of rain in about 12 hours.
Heavy flooding occurred on most tributary streams in the central White and Wabash River basins in Indiana and in South Fork Sanga-mon River and the Kaskaskia River in Illinois. The flooding, how-ever, was most severe over the Eagle Creek and Raccoon Creek basins in Indiana. The crest stage at the gaging station on Raccoon Creek at Mansfield, Ind., was the highest since the station was estab-lished in May 1939 and, according to information by local residents, was at least 0.3 foot higher than that of the greatest known flood in the area which occurred in 1875. The peak stage at the gage on Eagle Creek was the maximum since at least 1913 and was nearly 0.4 foot higher than that of the flood of March 1913. Floods were moderate on the central and lower main stems of the White and

Miscellaneous measurement site
Numbers correspond to those
given in table 18

Isohyet
Isohyetal interval 2 inches

FIGURE 30. Map of flood area showing location of flood-determination points and precipitation for June 27-29. Floods of June-July in Indiana and Illinois.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C67

Wabash Rivers, having been exceeded by several floods during the past 25 years. See table 18.

TABLE 18. Flood stages and discharges during June-July in Indiana and Illinois

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before June 1957

Period Year

June-

July
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Q2.83

Illinois River basin

1 .

2

3

South Fork Sanga-
mon near Nokomis,
111.
Flat Branch near

Taylorville^ 111.
South Fork Sanga-
mon River at Kin-
caid, 111.

10.8

276

510

1950-57

1949-57

1917-33,
1944-57

1951

1950

1917

June 28

June 29

June 29

10.94
14.84

16.77
19.55
26.88

30.02

1,510
8,600

9,400
13,000
14, 100

21, 500

6.9

2.1

2.5

Kaskaskia River basin

4. _ ...
5. _

6

7.

8

9

Shelbyville, 111.

Tower Hill, 111.

Oconee, 111.

Beecher City, 111.

Vandalia, 111.

7.93

1,030

7.46

10.4

28.6

1,980

1950-57

IQflS-19
1914,
1940-57

IQflft 19
1914-57

1956

1Q43

1Q4.Q

1951

... do.....

...do... .

6.66
10.66
21.17

22.37

27.39
25.67

515

25,000

25,900
4,530

7,670

7,010

52, 200
~"62,~766~

1.5

3.2
4.3

6.3

3.5

~""§"6

Wabash River basin

10

11 ......

12

13

14 _

15.

16

17

18

19

20

21

22.. __

23

24.

Covington, Ind.
Walnut Fork near
Mace, Ind.

Crawfordsville,
Ind.

Montezuma, Ind.

Ladoga, Ind.

Fincastle, Ind.

South Fork Little
Raccoon Creek at
Guion, Ind.

Coxville, Ind.

Mecca, Ind.
Brouilletts Creek at
Blanford, Ind.

Terre Haute, Ind.

8,208

32.4

Kf\Q

668

11,100

54.4

25.2

91 ^

28.6

133

440

9.38

263

19 9nn

1 Q Iftft

1913-57

1913-57

\QAf\- *V7

1956-57

1956-57

1956-57

1828-1957

1Q1Q

1938-57

1913

1Q1O

1943

1913

1957

1957

1957

1Q1Q

1913
1943

July 3

June 29

___do_.._.

...do.....

___do__

... do._

July 2

35.1
21.46

17.3
14.48

20.68
22.98
34.0
26.11

12.09
19.87

13.24
18.27
13.86
21.23

31.1
25.04
26.4
29.36
22.00

200, 000
36,200
5,710

36, 000
26,300

28,700
32,200
230, 000
77, 100
9,820

12,900

5,690
40,500
21,600

4,180
53,400
10,100
108, 000
6,450

35,200

245, 000
82,000
250, 000
201, 000
81,800

0.6
2.8

2.2

2.3

1.2
3.4

7.6

5.9
12.0

11.1

10.0
7.2

4.5

1.1

1.3

See footnotes at end of table.

C68

TABLE 18. Flood

FLOODS OF 1957

and discharges during June July in Indiana and Illinois Continued

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before June 1957

Period Year

June-

July
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Qi.33

Wabash River basin Continued

25

26

27

28

29

30 .

31

32

33

34

35

36

37

38

39

40

41

42

43...--.

44

45

46

47

48

49

50

51-.-- -

ne£T Redmon, 111.

River near Barton,
111.

Toledo, 111.

Ca?ev, 111.

Ste Marie, 111.

Oblong, 111.

Noblesville, Ind.

Nora, Ind.

White River at
Indianapolis, Ind.

Eagle Creek at
Rosston, Ind.
Eagle Creek near
Clermont, Ind.
Eagle Creek at
Indianapolis, Ind.

Centerton, Ind.

White River at
Spencer, Ind.
Middle Fork Big
Walnut Creek at
North Salem, Ind.
Owl Creek near
Morton, Ind.

near Reelsville,
Ind.

Cataract, Ind.

Eel River at Bowl-

White River at
Petersburg, Ind.
Little Wabash River

near Effingham, 111.
Little Wabash River
at Wilcox. 111.

10 7AT1

ft Q°.

63.6

57.2

7 60

1 540

304

242

814

1 9ftft

26.4

155

179

2

4°.c

9 Qfift

11.6

6 OQ

oqo

241

909

844

n i^o

217

1,130

1912-57

1950-57

1909-12
1914-57

1940-57

1913-57

1Q07_C7

1950-57

1913
1925-26,
1929-57

1912-57

1913 57

1913
1930-32,
1946-57

1875-1957

1949-57

1 949-57

1 Q7C

1 QQO K7

1Q7C 1QK7
1 Q°.1 ^7

1Q10 C7

1914-57

1Q1Q

1943

1951

1950

1Q13

1927

1937
1956

1 QK7

1913
1943

1Q19.

1913

1913
1950

1Q1 D

1952

1950

1875
1950

1913

1950

July 4

...do.....

June 30

June 29

June 29

June 28

June 30

June 30

do.....

June 28

June 30

July 1
June 28

do....

June 28

June 29

June 27
June 28

June 29

July 6
June 28

July 1

29.33
23.70

10.00
10.55

25.54

22.11

19 6
8.35
16.3
15.93
15.6
8.98
11.86
12.37
15.26
99 4

18.19

18.04
690.0

679. 03

16.0
16.38
21.9

(')

16.06
28.5
21.50

17.96
18.63

21.35
19.64
21.0
18.38

3 15. 18
30.0
23.53
23.39
on K

22.16

26.67
22.40

255 000

69,400
2,100

14,200

11,900

2,650
2,360
44, 800

39,800
27, 100
25, 000

20,000
5,880
27, 200
20, 800
0)
1,540
6,720
3, 660
9,800

32, 400

30, 400
70, 000

28, 000
8,040

42, 400

19,000
28, 800
2 90, 000
43, 000

34, 700
100, 000
37, 700
6,860

5,550

15, 700
30, 700

9,480
7,180
0)
8,960
2,540

(0
34, 000
33, 400
235, 000
63, 200
34, 400

47, 000
16, 800

1.1
2.1

4.7

4.2

2.2

2.1

4.3

1.0

1.6

2.7

2.8

2.1

1.4
4.5

7.6

4.9

1.4

1.2
6.8

7.5

3.1

1.1

.3

2.3

.8
6.1

1.2

Not determined.
At site 8J4 miles downstream.

1 Affected by backwater from Deer Creek and Big Walnut Creek.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C69

The last column in table 18 gives the ratio of the peak discharge of the 1957 flood to the mean annual flood. Ratios of 2.5 in Indiana and of 3.6 in Illinois indicate a 50-year flood; therefore, many of the peak discharges on tributary streams during the 1957 flood greatly exceeded that of a 50-year flood.
Most streams began to rise early on June 28 and the crest was reached on the same day. Previous maximum stages during the period of known floods were exceeded at many gaging stations. Although the peak stage on Big Walnut Creek near Reelsville, Ind., was only 0.67 foot higher than the previous maximum stage during the period of record, the corresponding discharge was nearly doubled. Virtually the entire flow in Mill Creek near Cataract, Ind., whose peak discharge of 7,180 cfs was 2,300 cfs less than that of January 5, 1950, the maximum for the period of record, was stored in Cagles Mill Reservoir (storage began December 1952) and was not released until after the crest on Eel River had passed Bowling Green, Ind. The peak discharge at Bowling Green during the present flood was 33,400 cfs which was slightly less than that of January 4, 1950 (34,000 cfs) the maximum in the period of record starting in 1931.
In Indiana 6 persons were drowned in the raging waters that dam-aged 1,282 dwellings, flooded 125 business places, washed out dozens of highway and railroad bridges and their approaches, and flooded a million acres of crops. Thousands of acres of cultivated land were flooded to a depth of more than 6 feet. In Illinois 2 persons were drowned and 150,000 acres of farmland were inundated.
A report by Schoppenhorst (1958), prepared in cooperation with the State of Indiana, describes the flood in Indiana in more detail.

FLOODS OF JULY 1 IN THE VICINITY OF COFFEEVILLE, MISS.

Heavy rains fell from about 11 p.m. on June 30 to 8 a.m. on July 1 in the Coffeeville-Grenada area in north-central Mississippi. Rain totaling about 5 inches above normal had fallen in the 2 weeks prior to the storm, and the ground was saturated. The intensity of the storm was greatest from about midnight to 2 a.m. July 1, when 3.60 inches of rain was recorded at Grenada Dam, 12 miles southwest of Coffeeville. The maximum rainfall recorded during the storm was 6.29 inches at Grenada. The rainfall at Coffeeville totaled 5.37 inches and that at Enid Dam, 20 miles northwest of Coffeeville, totaled 2.97 inches (fig. 31).
Most of the U.S. Weather Bureau rain gages are in the area of intense storm, and several are located on the outer edges. Rainfall totals during various time intervals at Grenada Dam, Grenada, and Coffeeville are related to frequency curves (fig. 32) which were developed from data of the U.S. Weather Bureau (1957a). Hourly

C70 FLOODS OF 1957

90°00' 89° 30'

34° 00'

MISSISSIPPI

INDEX MAP

Miscellaneous measurement site
Numbers correspond to those
given in table 19

Isohyet
Isohyetal interval 1 inch

FIGURE 31. Map of flood area showing precipitation for June 30-July 1 and location of flood-determination points. Floods of July 1 in the vicinity of Coffeeville, Miss.

5-year

EXPLANATION

O
Grenada Dam
Q
Grenada
A
Coffeeville

012345678

DURATION, IN HOURS

FIGURE 32. Kainfall intensity-frequency curves for July 1, vicinity of Coffeeville, Miss. Data from U.S. Weather Bureau.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C71

records of rainfall are complete at Grenada Dam. Data from the three stations indicate that the rainfall in the area for 1- to 8-hour

periods was probably generally more intense that that of a rainfall of a 25-year frequency. The rainfall during both 2- and 8-hour periods at Grenada exceeded that of a 100-year frequency, and the rainfall during the 8-hour period at Coffeeville was about equal to that of a 50-year frequency.
Peak discharges were determined at many sites in the area (table 19). The gates of Grenada Dam (on the Yalobusha River) were closed at 1 a.m. on July 1, so the peak discharges below the gates were caused by runoff from drainage areas below the dam.

TABLE 19. Flood stages and discharges during July 1 in Yazoo River basin near Coffeeville, Miss.

Station

1 ....

2 .-__

3-- .
4. ___

5,. ..

6......

7 .

8.......

9 .

10 .

11..-.-.
12 .

Stream and place
of determination

Snake Ditch near Coffeeville-.

Golden Ditch near Coffeeville-

York Creek near Coffeeville ...

Spearman Creek near Coffee-
ville.

Caney Creek near Coffeeville.

Turkey Creek at Coffeeville

Turkey Creek near Coffee-
ville.

Cypress Creek near Coffee-
ville.

Perry Creek near Torrence ....

Yalobusha River at Grenada
Dam near Grenada.
Yalobusha River at Grenada..
Yalobusha River near Hoi-
comb.

Drainage
area

(sq mi)

0.398

.197

13.4
5.38

1.97

66.4

70.2

22.3

21.2

1,320

1,550
1,645

Maximum floods

Before July 1957

Period

1955-57

1955-57

1955-57

1906-57

1941-42,
1948,
1955-57

1955-57

Year

1955

1955

1955

1955

1955

1955

July 1, 1957

Gage
height
(ft)

17.24
18.43
7.31
7.51
18.78
12.19

16.61
18.91
237. 85
237. 36
30.22

24.72

26.09
229.2
228.6

18.65
147. 56

Discharge

Cfs

255
372
145
165
6,300
4,200

1,040

1,560 (')
0)
27, 300

8,150

10, 900
15, 000
12,000
2 45, 000

3 7, 000
3 13, 200

Ratio
to Qa.33

4.2

6.3

5.2

6.0
1.6

1 Not determined.

2 Computed peak flow into Grenada Reservoir by U.S. Army Corps of Engineers.
3 Contributed by drainage area below Grenada Dam.

The ratios of the peak discharge to the mean annual flood (table
19) were high in the area (the ratios for drainage areas less than 10 sq mi can not be computed), and five of the peak discharges can be compared with those of the noteworthy flood of March 21, 1955. Flood history of Turkey Creek at Coffeeville (drainage area, 66.4 sq mi) goes back at least 50 years. The following elevations of flood peaks on Turkey Creek were determined from information by a long-time resident.

C72 FLOODS OF 1957

Elevation of peak
Date (feet)
Mar. 21, 1955______________________________ 237.85
July 1, 1957_______________________!____-__________ 237. 36
Nov. 19, 1948__________________________.___ 235.6
The resident stated that the 1948 flood resulted from 8.12 inches of rainfall in 14 hours and was the greatest flood prior to 1955 which he can remember.
The 1957 peak stage on Cypress Creek, upstream from State Highway 7, near Coffeeville, was 1.4 feet higher than that of March 21, 1955, and was at least 3 feet higher than that of February 13, 1948. The Soil Conservation Service estimated the flood damage in the area adjacent to Coffeeville as follows:
Crops and pastures by inundation.__________________-__--_--_--_- $148, 600 Fences, farm bridges, and farm roads_____________________________ 11, 750
County, State, and Federal roads and bridges.__________-___-----_- 2, 700
Crops and pastures by sediment deposits._________________________ 1, 450
Uprooted crops___-____-___-____-_______________-__-__--__--_- 7, 000

Total._______________________..________-_.__.___-_-- $171, 500

Damage to stores and other buildings in Grenada was estimated at almost $100,000.
A more detailed report of these floods was prepared by the Jackson district office and released to the open files in August 1959.
FLOODS OF JULY 12-13 IN NORTHERN ILLINOIS

During the night of July 12-13, 1957, the Chicago area was swept by a storm which caused the second major flash flood in less than 3 years. Rainfall was comparable in amount to that of the October 1954 storm, but it occurred in a shorter period. This storm was therefore the most intense storm in 87 years of Weather Bureau records at Chicago. In the Weather Summary for Illinois (U.S. Weather Bureau, 1957c), the storm was summarized as follows: The principal heavy rain period lasted about 10-15 hours during the after-noon and night of July 12-13 with the heavy rain shifting slowly southward during that time. The Weather Bureau station at Midway Airport Chicago set a 6-hour record of 5.50 inches and a 24-hour record of 6.24 inches (actually occurring in 12}£ hours). Two other official gages in Chicago measured more than 7.50 inches during the storm. The core of maximum rainfall occurred farther south over Kankakee where more than 10.00 inches occurred. The prin-cipal axis of heaviest rainfall extended from Kankakee northward into Will County and southeastward toward Watseka. [See fig. 33.]

More than 7 inches of rain fell in the extreme northern part of Iroquois County, in the central three-fourths of Kankakee County, in about one-third of Will County, in most of the Chicago suburbs (except near Lake Michigan), in parts of northwestern and extreme southern Cook County, and in a small area southwest of Joliet. Chicago's Midway Airport was flooded and out of service for 24 hours, temporarily stranding 2,500 travelers. The Congress Street

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C73

88°

Miscellaneous site
Numbers correspond to those
given in taKle 20

Isohyet
Isohyetal interval 1 and 2 inches

10 10 20 MILES

FIGURE 33. Map of flood area showing location of flood-determination points and precipitation for July 12-13. Floods of July 12-13 in northern Illinois. Isohyets from map published by Illinois State Water Survey.

Expressway in Chicago was blocked by water as much as 3 feet deep in several places, marooning hundreds of motorists. Edens Express-

C74 FLOODS OF 1957

way and North and South Lake Shore Drives were also impassable. All forms of transportation were seriously affected or completely halted by the flooding of highways, railroads, and underpasses. The Dearborn Street Subway filled with water, which caused suspension of service for 2 days. The Chicago Transit Authority kept the State Street Subway in operation by heavy pumping.
The Chicago River rose 5.5 feet in 7 hours, and for the second time in 3 years (also the second time since 1900) lock gates at Lake Michi-gan were opened to permit flow of the river water into the lake. Lock gates at Blue Island on the Calumet-Sag Channel and locks and tur-bines at Lockport on the Chicago Sanitary and Ship Canal were opened to permit increased flow from the Chicago River. All the Chicago beaches on Lake Michigan were closed because of the danger of pollution but were reopened when tests indicated the water was safe. The city water supply, taken from cribs out in the lake, was not affected. Control measures were effective in keeping the damage in Chicago much below those in the October 1954 flood. Even so, losses in the Chicago area were estimated at more than $5 million. Nine lives were lost. Newspapers reported 40,000 basements flooded, interruption of electric service to 50,000 customers, and 67,000 telephones out of service.
Another million dollars in damage, exclusive of large unknown crop losses, was estimated in the Kankakee area. Soldiers Creek flooded a square mile in the northeastern part of Kankakee, and other low-lying parts of the city were inundated by the record-breaking flood on the Kankakee River. About 600 families were evacuated. Because of the level land and slow drainage, fields and highways were flooded in a large surrounding area.
In Joliet, more than 300 families were evacuated from the south-eastern part of the city owing to widespread flooding of Hickory and Spring Creeks. All major highways were blocked by flood waters, isolating the city for several hours. Damage was estimated at al-most a million dollars.

Most of the gaging stations in the area have less than 10 years of record (table 20). At most of the stations having longer periods of record, part of the basins were outside the areas of heaviest rainfall and peak discharges were not outstanding; however, at Kankakee River near Wilmington the flood was the highest in 22 years of record, and downstream at Illinois River at Marseilles the flood was the highest in 38 years of record. Data in the State flood-frequency report (Mitchell, 1954) indicate that the recurrence interval for the flood at Kankakee River near Wilmington and Hickory Creeks at Joliet is greater than 100 years. By the use of techniques given in the aforementioned report and developed for stations having relatively

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C75

short periods of record, the recurrence interval for the flood was probably 100 years or more at Willow and McDonald Creeks in northern Cook County, at Thorn Creek at Glenwood, in southern Cook County, and at Terry Creek tributary to the Kankakee River between Kankakee and Wilmington. At all these stations the peaks were appreciably higher than those in October 1954, which had been outstanding. (See Daniels and Hale, 1958.)

TABLE 20. Flood stages and discharges during July 12-18 in northern Illinois

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before July 1957

Period Year

July 1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Q2.33

Streams tributary to Lake Michigan

1.......

2.. __

3. ...

4------

5.......

6 ....

7. ......

8-

Thorn Creek at
Glenwood.
Deer Creek near
Chicago Heights.
Butterfleld Creek at
Flossmoor.
Lansing Ditch near
Lansing.

North Creek near
Lansing.

Thorn Creek at
Thorn ton.
Little Calumet River
at South Holland.

Midlothian Creek at
Oak Forest.

24.6

23.2

23.4

8.7

16.7

104

14.0

1949-57

1948H57

1948-57

1948-57

1948-57

1947-57

1947-57

1950-57

1954

1948

1954

1948
1954

1948
1954

1947

1947
1954

1954

July 13-

July 13..

July 13-

July 13-

July 13-

July 13-

July 14-

July 13-

9.88
11.14
11.52
11.75
10.92
11.78

10.18
8.85

8.96
8.85
14.34
16.00

19.39
20.11
8.49
9.00

1,180
2,460
663
1,380
1,480
2,550
461

240
730

515
4,200
4,700
4,760

4,440
569
550

3.7

2. 6

3.3

1.2

1.4

2.4

1.1

Illinois River basin

9 ....

10 ...

11- -

12---.--

13. -

14 -.

15......

16

17.-_-_

18 ...

19----

20-

Seef

Kankakee River at
Momence.

Iroquois River at
Iroquois.
Sugar Creek at
Milford.
Iroquois River near
Chebanse.

Terry Creek near
Ouster Park.
Kankakee River near

Wilmington.

Buftalo Creek near

Wheeling.
Des Plaines River
near Des Plaines.

McDonald Creek

near Mt. Prospect.
Weller Creek at Des
Plaines.
Willow Creek near

Park Ridge.
Salt Creek near

Arlington Heights.
ootnotes at end of tal

6-90184 O 63 6

2,340

682

430

2,120

12.0

5,250

19.4

359

7.52

13.1

19.6

33.7

lie.

1905-06,
1914-57

1944-57

1948-57
"1913"""

1923-57
"1949^57""

1883, 1887
1935-57

1952-57
"1938""""""

1940-57

1952-57

1950-57

1950-57
"1950^57"""

1930
1950

1951

1951
""1913"""

1933
"""1950""

1883, 1887
1943
1949

1954
~"~I938"~

1950

1954

1954

1954
""1954""

July 13..

July 13..

July 13..

July 15-

July 13..

July 13-

July 12..

July 13-

July 13-

July 13-

July 13-

Juiy 13..

18.09
5.06
3.99
23.30
22.79
20.90
23.22
19.6
18.1
15.53
6.29
11.15
16.73
8.87
' 11. 57
11.40
5.40
6.26
9.7
7.78
5.18
7.31
8.04
10.83
12.37
8.32
9.40
8.43
9.82

10,100
6,960
6,460
5,600
22,900
16,700
34,000
27,000
19,900
162
545

(2)
48,000

75,900
268
430
5,500
4,040
2,610
146
430
535
395
738
1,300
540
572

0.7

1.1

3.9

2.0

5.1

9

1.3

1.0

2.7

.9

C76 FLOODS OF 1957

TABLE 20. Flood stages and discharges during July 12-13 in northern Illinois Continued

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before July 1957

Period Year

July 1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
02.33

Illinois River basin Continued

21......

22

23

24

25

26

27

28

29

30 .

31

32

33

Western Springs.

Bellwood.

Riverside.

Flag Creek near
Willow Springs.

Deerfleld.

North Branch

Chicago River at
Northbrook.
North Branch Chi-
cago River at
Niles.

Lockport.

Lemont.

Joliet.

Joliet.

122

18.2

635

16.2

20.7

11.5

IftO

11.3

20.8

84.0

107

7,640

1945-57

1950-57

1914-57
1943-57

1951-57

1QKO C7

1952-57

1950-57

1951-57

1900-57

1944-57

1916
1919-57

1948

1954

1919
1948

1954

IQK'7

1954

1Q54

1954

1947

1916
1950

July 14..

July 13..

July 14..

July 13. _

July 13

July 13

July 13

July 13

July 13

July 13

July 13

July 14

8.06
7.39
9.48

8.69 (2)
8.28
8.00
6.88
6.89
Q HO
8.97

8.56
9.65

9.28

10.30

9.91
9.37

10.68
12.77
825.4
14.91
15.20

1,920
1,020
598
560
7,450
6,510
5,950
1,300
1,350
284
195

411
930

1,700
1,850

1,120
695
24,600
23,400

3,160
2,390
11,700

10,200
15,200

83,300
93,900

.9

1.2

3.1

4.8
6.1

7.1

2.7

1 Ice jam, at site one-quarter mile upstream at same datum.
2 Not determined.
' Ice jam.

FLOODS OF JULY 26, 30 ON CHERRY CREEK AND JULY 30 ON KIOWA CREEK, COLO.

Frequent rains during July southeast of Denver, Colo., made con-ditions suitable for flooding. Intense, but localized, thunderstorms occurred late on July 25 and July 30. The storm on July 25 was centered north of Castle Rock and Franktown in the Cherry Creek drainage (fig. 34). The peak discharge at the gaging station near Franktown (drainage area, 172 sq mi) was only 81 cfs, while that near Melvin (drainage area, 369 sq mi), about 20 miles downstream, was 9,950 cfs.

The reverse situation occurred on July 30 when the storm struck upstream from Franktown and on the headwaters of Kiowa Creek. The peak discharge of Cherry Creek near Franktown was 5,380 cfs, while that near Melvin was 3,480 cfs.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C77 105°00' 104°00'

39°30'

39 "00'

Cherry Creek
. } Helvin Reservoir

EXPLANATION

Gaging station

0 10 20 MILES!

FIGURE 34. Map showing location of flood-determination points. Floods of July 26, 30, on Cherry Creek and July 30 on Kiowa Creek, Colo.

A storm which started about 5:30 p.m. on July 30 and which lasted about 45 minutes occurred at the headwaters of Kiowa Creek. The rain gage at K-79 Reservoir on Kiowa Creek (fig. 34) recorded 1.78 inches. Amounts at nearby locations ranged from 0.5 inch to 4.5 inches. This intense storm produced a computed maximum inflow for a 5-minute interval of 5,250 cfs into K-79 Reservoir. This rate is equivalent to 1,640 cfs per sq mi from the 3.2 square-mile drainage area. Precipitation, as much as 0.7 inch per day, occurred on 10 of the 12 days preceding the storm and was a major factor contributing to the high rate o.f runoff. The total volume of runoff into the reservoir was only 270 acre-feet.
K-79 Reservoir (capacity, 130 acre-feet at spillway elevation) re-duced the inflow peak of 5,250 cfs to a maximum outflow of 1,560 cfs, which in turn was only 211 cfs at the gaging station at Elbert, 11 miles downstream. Farmers reported a small amount of damage to hay and a small amount of erosion to croplands. The Agricultural Research Service reported that the reduction of the flood flow by K-79 Reservoir prevented damage to additional crops, roads, and bridges.
FLOODS OF AUGUST 3-4 IN CENTRAL NEW YORK

Severe floods occurred August 3-4 in central New York (fig. 35). The thunderstorm was described by a county highway official as being

078 FLOODS OF 1957

76°

43

4\oMerrillsville

10 MILES

EXPLANATION

Gaging Station

Miscellaneous site
Numbers correspond to those
given in table 21

FIGURE 35. Map of flood area showing location of flood-determination points. Floods of August 3-4 in
central New York.

the worst storm to occur in the area since 1922. Rainfall totaling 6.9 inches between 5 p.m. August 3 and 6 a.m. August 4 was measured unofficially.
The torrential rains caused several streams to overflow. Bridges and sections of many roads were washed out, electric power was cur-tailed, numerous cellars were flooded, families were forced to evacuate their homes, and two persons died as a direct result of the floods. Damage to Madison County highways was estimated at about $250,000.
Streams draining the northern escarpment of the Appalachian Pla-teau washed out bridges, eroded farmlands, and caused considerable damage to crops. Small streams showed evidence of abnormally high velocities.
Raging floodwaters in Canaseraga Creek washed out a small dam and a bridge at Perryville, and farther north a large part of Canaseraga park was extensively damaged by inundation and a bridge in the park was destroyed.
At the gaging station on Chittenango Creek near Chittenango the peak discharge was the fourth highest in a short period of record, but a tributary to the Creek caused inundation of Madison Street in Chit-

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C79

tenango when it broke through a long culvert and caused a section of a road to collapse.
Along Cowaselon Creek in the Merrillsville-Lenox area three bridges were washed out, and almost every road in the area was damaged by washouts or slides. The peak discharge in Oneida Creek at Oneida was the second highest in the period of record beginning in 1949. The peak discharge in Onondaga Creek at Syracuse was the maxi-mum since the station was established in 1951.

Peak discharges were determined at four gaging stations and four miscellaneous sites. (See table 21.)

TABLE 21. Flood stages and discharges during August 3-4 in central New York

Station

1- ...

2-
3-~
4.
5 -
6 .

7 -

8 -

Stream and place of
determination

Onondaga Creek at
Dor win Avenue,
Syracuse.
Oneida Creek at
Oneida.
Canaseraga Creek
near Chittenango.
Cowaselon Creek at
Merrillsville.
Clockville Creek at
Lenox Furnace.

Chittenango Creek
near Chittenango.
Tributary to Chit-
tenango Creek near
Chittenango.
Limestone Creek at
Fayetteville.

Drainage
area

(sq mi)

88.9

112
11.1
9.24
11.1
67.7

2.96

285.7

Maximum floods

Before August 1957

Period

1951-57

1949-57

1950-57

1939-57

Year

1952
1956
1950

1950
1956

1950

August
1957

Aug. 4
Aug. 4
Aug. 3

... do

Aug. 3
... do

Aug. 4

Gage
height
(ft)

4.64
4.31
13.78
13.32

7.18
6.24

7.78
6.86

Discharge

Cfs

1,440
11,280
7,440
6,520
929

2,740
488

2,760
2,400
170

7,010
3,800

Ratio
to
02.33

1.7
1.3
4.6
.7

9.1

1.2

1 Affected by reservoir regulation.
2 Not including 15.7 sq mi of Middle Branch Tioughnioga Creek basin, flow from which may be completely diverted from Limestone Creek basin through Deftuyter Reservoir

FLOODS OF AUGUST 13-14 IN NORTH-CENTRAL ARKANSAS

Heavy rains fell over much of Arkansas on August 12-13, causing severe floods on tributaries of the Arkansas and the White Rivers in

north-central Arkansas (fig. 36).
In the Little Red River basin, the highest stages known occurred on South Fork Little Red River and its principal tributary, Archey Fork, causing severe flooding in the town of Clinton. The flood on Middle Fork Little Red River was the third highest in the period of record beginning in 1939. The crest stage of Little Red River near Heber Springs was not as high as those in 1943, 1949 or April 1957, but it was notable as it was the fourth highest in the period of record beginning in 1927 (table 22).

C80 FLOODS OF 1957

93°

Gaging station
Numbers correspond to those
given in table 22

Isohyet
Isohyetal interval 1 and 2 inches 20

FIGURE 36. Map of flood area showing location of flood-determination points and precipitation for August 12-13. Floods of August 13-14 in north-central Arkansas.

TABLE 22. Flood and discharges during August 13-14
Arkansas

north-central

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before August 1957

Period Year

August
1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Q2.33

White River basin

1- -

2---...

3......

Middle Fork Little
Red River at

Shirley.
South Fork Little
Red River near
Clinton.

Heber Springs.

9Q4

316

1939-57

- IQQQ C7

1927-57

1949

1Q4Q

1949

Aug. 13

Aug. 13

Aug. 14

31.0
26.03

26.55
28.16

46.53
40.84

101, 000
51, 700

54, 900
59, 500

117, 000
87, 500

2.3

2.6

1.6

Arkansas River basin

4- ..

5 ....

Creek near Guy.

1ft7

1943
1947-57

1954-57

1QJQ
1QJQ

1956

Aug. 13

Aug. 14

24.6
24.60
16.80

24.95

0)
77, 000
21, 100
8,070
18,600

1.1

1.7

1 Not determined.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C81

In the Arkansas River basin highest stages known occurred on Point Remove and Cadron Creeks. Moderate flooding occurred on Illinois Bayou, where the stage was third highest in the period of record beginning in 1947. In the Arkansas River basin severe local flash floods occurred in the towns of Russellville and Clarksville. Two persons were drowned when Cypress Creek, a tributary to Cadron Creek, overflowed its banks and washed their house off the foundations.

FLOODS OF AUGUST 24 IN VICINITY OF SANTA FE, N. MEX.

Heavy thunderstorms occurred in and around the northern and eastern parts of Santa Fe during the afternoon of August 24. The total rainfall in the eastern part of Santa Fe was estimated at 2.5 inches, of which about 2.0 inches fell in half an hour. Only 0.45 inch was recorded at the Weather Bureau gage in southwest Santa Fe. Damage caused by this flood was estimated at $100,000; about half of the damage was to roads, bridges, and utilities. Some houses were damaged in the area where Canada Ancha joins the Santa Fe River. Almost all the flow in the Santa Fe River at the eastern end of town came from Canada Ancha and other nearby arroyos below Twomile Reservoir on the Santa Fe River (fig. 37). Damage totaling

EXPLANATION

Flood-determination point
Numbers correspond to those
given in table 23

FIGURE 37. Map of flood area showing location of flood-determination points. Floods of August 24 in vicinity of Santa Fe, N. Mex.

about $12,000 occurred in downtown Santa Fe when a temporary road detour across the Santa Fe River consisting of a temporary fill and small culverts caused water to be diverted into some nearby business buildings. A few houses bordering Rio Tesuque near the town of Tesuque were damaged.

C82 FLOODS OF 1957

A discharge of 632 cfs (table 23) on Tesuque Creek, above diversions, near Santa Fe was the highest recorded since the record began in 1936. The maximum measured runoff from the storm occurred on Arroyo de los Frijoles near Santa Fe which was 5,340 cfs from a drainage area of 2.92 square miles, or a discharge of 1,830 cfs per sq mi.

TABLE 23. Flood and discharges during August 24 in Rio Grande basin, Santa Fe, N. Mex.

Station

1 ....

2-. .

3 .

. 4 .

5. ---
6.

9 .
10
11 _ ...
12

Stream and place of determination

Tesuque Creek, above diversion, near Santa Fe.

Little Tesuque Creek near Santa Fe.

Rio Tesuque tributary near Tesu-que.

Arroyo de la Piedra at Santa Fe...

Arroyo de los Frijoles at Santa Fe Arroyo de los Frijoles near Santa Fe.

Drainage
area (sq mi)

11.6

8.28

22

.71

1.66
137.4

.61
2.76
1.02
6.25
1.30
2.92

Maximum floods

Before August 1957

Period

1936-57

1938-41

1952

Year

1938

1940,
1941

1952

August 24, 1957

Gage
height
(ft)

4.2
5.26

1.90

5.4

14.6

Discharge

Cfs

425
632
1,060

500

1,490
633

800
635
1,450
520
1,600
1,100
3,040
1,900
5,340

Ratio to
Ql.33

8.5
17

15

1 About 6 sq mi below Twomile Reservoir.

FLOODS OF SEPTEMBER 18-19 IN HABBISON COUNTY, MISS.

During the late afternoon of September 17 rains began to fall on the Mississippi gulf coast as the forward part of Hurricane Esther moved into the area. The most intense rains occurred at Biloxi

during the early morning of September 18. The rains gradually diminished until early morning of September 19 when they ceased. Daily totals and storm totals of rainfall at seven Weather Bureau stations are shown in the following table :

Rainfall, in inches, Mississippi Gulf Coast area

Station

Bay St. Louis. _
Biloxi City _ __ _ _______ ___
Gulf port Naval Center __ _ __ __ McHenry _____
Saucier Experimental Forest __
Standard _____
Vancleve

18

10. 26
4. 39
10. 00
4. 20
4. 25
6. 05
5. 00

19

0. 14
6. 13
.03
5. 43
5. 67
3. 00
7. 02

20

0. 74
. 06
. 75
. 05
.41
. 10
. 22

18-20

11. 14
10. 58
10. 78
9. 68
10. 33
9. 15
12. 24

September

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C83

Two recording rain gages are in the area, at Biloxi and at Saucier Experimental Forest. Maximum rainfall for selected time intervals during September 17-18 at these stations may be compared with U.S. Weather Bureau (1957a) frequency curves (fig. 38). This was a 11

10

^ 7

Saucier Experimental
Forest

06 12 IB 24 DURATION/IN HOURS

FIGURE 38. Rainfall intensity-frequency curves for September 17-18, Harrison County, $fiss.

storm of rare occurrence. The rainfall at Saucier for the 10- to 20- hour period exceeded that for a recurrence interval of 50 years, and the rainfall at Biloxi for the 14- to 24-hour period exceeded that for a 25- year recurrence interval. The fact that the nonrecording rain gages at Bay Saint Louis, Gulfport, and Vancleve measured greater totals than did the recording gages indicates that storms of greater recur-rence intervals may have occurred at these places.
Peak discharges of the flood were determined at seven sites (fig. 39), two gaging stations, and five miscellaneous sites. The relatively low peak discharge in Turkey Creek can be attributed to the swampy terrain along the lower reaches which is capable of storing large quantities of water.
Information from long-time residents provided the following flood history of several streams in the flood area: Floods of 1916 and 1928 on the Biloxi River had about the same peak stages and they were

C84 FLOODS OF 1957

at least 8% feet higher than that of September 18, 1957, at a point about 1 mile upstream from the gage at Wortham. A flood in 1948 reached a peak stage about 2.2 feet higher than that at the gage during the 1957 flood. The 1957 peak stage in Tuxachanie Creek, half a mile upstream from the gage, was the greatest since the peak stage of the flood of 1906, which was about 1 foot higher. The peak stage in Tchoutacabouffa River at the old ferry crossing (2.7 miles upstream from State Highways 55 and 57) was 4 inches higher in the 1906 flood than it was in the 1957 flood.

The ratio of peak discharge to the mean annual flood (table 24) indicates that the floods of September 1957 were of rare occurrence, because a ratio of 2.9 indicates a 50-year flood and one of 1.9 indicates a 10-year flood.
A more detailed report of these floods was prepared by the Jackson district office and released to the open file in August 1959.

TABLE 24. Flood stages and discharges during September 18-19 in Harrison County, Miss.

Station

Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before September 1957

Period Year

Septem-
ber 1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
02.33

TchoutacaboulTa River basin

1 .-.

2.......

Tuxachanie Creek near
Biloxi.

Tchoutacabouffa River
north of Biloxi.

92.4

220

1906-57
1952-57

1906-57

1906
1955

1906

Sept. 19

Sept. 19

23
19.48
22.22

(2)
13.08

0)
10,700
17, 700
0)
35, 000

4.5

3.9

Biloxi River basin

3_---.._

4. ..-.

5 .

Flat Branch tributary
near Saucier.
Biloxi River at
Wortham.

Little Biloxi River near
Lyman.

1.07

98.3

67.4

1916, 1928
1952-57

1916, 1928

1916, 1928
1955

1916, 1928

Sept. 18

Sept. 18

Sept. 18

8.71

(3)
19.33
21.08

(<)
39.12

653

(')
7,460
7,740
(')
6,600

1.9

2.4

Turkey Creek basin

6..---.

7. .- -.

Bayou Benard near
Gulfport.
Turkey Creek near
Gulfport.

15.8

25.0

Sept. 18

...do.....

21.50

13.99

6,100

3,350

4.4

2.0

1 Not determined.

2 About 0.3 ft higher than that of Sept. 19,1957, at site 2.7 miles upstream. 3 At least 8.5 ft higher than that of Sept. 18,1957, at site 1 mile upstream. 4 Considerably higher than that of Sept. 18,1957.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C85

Saucier Experimental Forest

Gaging station
6
o

Miscellaneous measurement site Xj^,
Numbers correspond to those y
given in table 24

FIGURE 39. Map of flood area showing locati on of flood-determination points. Floods of September 18-19 in Hairison County, Miss.

FLOODS OF OCTOBER 13-15 IN COLORADO RIVER BASIN, TEXAS

Heavy showers and thunderstorms on October 12-15 over west-central Texas caused excessive floods primarily on tributary streams in the upper Colorado River basin above Winchell.
The heavy precipitation covered a large area of west-central Texas, and several U.S. Weather Bureau observers in the area reported total precipitation of more than 3 inches for the period October 12-15. Unofficial reports indicated even greater totals for this 4-day period at several locations. A total of 8.40 inches of rainfall was recorded in the 24 hours ending at 6 a.m. on October 13 at Robert Lee, which is at the center of the affected area. The isohyets on figure 40 are based on official rainfall totals for Texas (U.S. Weather Bureau, 1957b).
Extreme flooding occurred on the North Concho and the Middle Concho Rivers above San Angelo and on Elm Creek and the Colorado River at Ballinger. Heavy rains in the Water Valley-Sterling City area caused the highest peak stage and discharge in 21 years on the North Concho River near Carlsbad, which were exceeded only by those of the 1936 flood peak whose stage was the greatest known since at least 1853. The same storm produced the highest peak since 1949

99°

EXPLANATION

Gaging station
Numbers correspond to those
given in table 25

Isohyet
Isohyetal interval 1 and 2 inches

10 10 20 30 MILES

INDEX MAP

FIGURE 40. Map of flood area showing precipitation for October 12-15 and location of flood-determination points. Floods of October 13-15 in Colorado River basin, Texas.

on the Middle Concho River near Tankersly. The flood on Elm Creek reached the highest stage not affected by backwater from the Colorado River since 1904 at the gaging station at Ballinger, and was about 0.4 foot lower than the stage of August 1906, which from information by local residents, was affected by backwater from the Colorado River. The flood peak on the Colorado River at Ballinger, was the second highest peak during the period of station record which begins in 1907, and was exceeded only by the flood of September 18, 1936. The October floods caused Oak Creek Reservoir near Blackwell and San Angelo Reservoir at San Angelo to reach their maximum content since storage began in these reservoirs in 1953 and 1952, respectively.
Moderate floods occurred at all other gaging stations in the area but were not of such outstanding magnitude as those just mentioned. Detailed information on maximum stages and discharges for 12 gaging stations and on maximum stages and contents for 3 reservoirs is presented in table 25.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C87

*"**

Deism, l excts

Station

2

5

6

t. ......

g

10

11

19

13

14

15 -

Stream and place of
determination

Colorado River near
Silver.

Oak Creek Reservoir
near Blackwell.
Colorado River at

Ballinger.

Elm Creek at
Ballinger.

South Concho River
at Christoval.

Middle Concho
River near

Tankersly.
Lake Nasworthy
near San Angelo.
North Concho River
at Sterling City.

North Concho River
near Carlsbad.

San Angelo Reservoir
at San Angelo.
North Concho River

at San Angelo.

Concho River near

San Angelo.

Concho River near
Paint Rock.

Mukewater Creek at
Trickham.

Colorado River at
Winchell.

Drainage
area (sq.
mi)

1 15, 480

222

i 16, 840

458

434

1 1, 280

i 2, 659

1690

11,533

11,790

1 1, 795

i 4, 492

i 5, 538

70.4

i 24, 580

Maximum floods

Before October 1957

Period

1891-1957
1956-57

1953-57

1882-1957
1907-57

1906
1932-57

1882-1957
1930-57

1900-57
1930-57

1930-57

1891-1957
1939-57

1853-1957
1924-57

1952-57

1936
1915-31,
1947-57

1853-1957
1915-57

1853-1957
1915-57

1919-57
1951-57

1882-1957
1923-34,
1939-57

Year

1922
1957

1957

1884
1936

1906
1956

1906
1938

1922
1946

1936

1948
do..

1936
.. do

1957

1936
1930

1906
1936

1936
do_.

1927
1956

1936
1930

October
1957

Oct. 13

Oct. 13

Oct. 14

Oct. 13

Oct. 13

Oct. 13

Oct. 14

Oct. 13

Oct. 13

Oct. 14

Oct. 13

Oct. 13

Oct. 15

Oct. 14

Oct. 15

Gage
height
(ft)

32
24.19
18.30
42,002.10
2, 003. 80
36
28.6
« 27. 90
614.6
11.90
'14.20
23
21.95
6.44
27.2
24.30
23.78
38.36
31.80
23.70
23.70
22.70
29.1
29.1
27.'3
41,902.70
41,916.47
34.6
9 22. 52

.56
47.5
46.6
19.06
43.4
43.4
19.50
18
15.83
2.94
62.2
51.8

44.56

Discharge

Cfs

23,200
10,600
* 44, 540
5 49, 100
CO
75,400

59, 000 (2)
38,500
50,000
(2)
100, 000
3,880
(2)
27,500
22,500
526,900
i 11, 750
(8)
16, 300

13,600 (8)
94,600
79,200
» 93, 240
5 174, 100
184, 000
47,000

1022

8 246, 000
230,000
10 19, 600
(8)
301,000
10 15, 100
(2)
15,000
169

(2)
76, 100

i 57,600

Cfs per
sqmi

36.0
32.7

314.4
s 11. 3

84.1
109

230
8.9

324.4
319.9

326.5
322.1

367.1
356.2

3110

328.1

354.5
34.6

3 57.2
32.9

213
2.4

36.0

34.5

1 Part is noncontributing.
2 Not determined.

s From contributing area.
4 Elevation, in feet.
s Contents, in acre-feet.
6 Affected by backwater.
7 Highest stage not affected by backwater since 1904.
8 Peak discharge of this flood not necessarily maximum of the period.
9 At different site and datum.

10 Affected by reservoir regulation.

FLOODS OF NOVEMBER 18-21 IN KENTUCKY AND ADJACENT SOUTHWEST AREA

From 3 to 8 inches of rain fell over an area including central and western Kentucky, western Tennessee, the northeastern corner of Arkansas, and the boot heel of Missouri on November 17-18 and caused severe floods in part of the area. The storm had been preceded by general rains on November 7-9 and 13-16, and the wet ground was

EXPLANATION

Gaging station
Numbers correspond to those
given in table 26

Isohyet
Isohyetal interval 1 and 2 inche

o
oo
oo

FIOUBE 41. Map showing location of flood-determination points and precipitation for November 17-19. Floods of November 18-21 in Kentucky and

adjacent southwest areas.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C89

conducive to high runoff. In a large part of the storm area, the total rainfall from the beginning of the month was the greatest for a similar period in any November of record. Rain totaling 6.66 inches fell at Mammoth Cave Park, Ky., on November 18, and 7.25 inches fell at Martin Junior College, Tenn., on November 19.
An isohyetal map (fig. 41) was prepared from Weather Bureau data. Four lives were lost and damage totaling million of dollars occurred as a result of the storm and consequent floods. Five counties in Kentucky were declared disaster areas.
Floods on large rivers were minor but widespread and caused heavy losses of mature crops. Flood damage to crops was extensive in the lowlands of western Tennessee and in the Missouri boot heel.
Flash floods were numerous on small streams; the more outstanding ones originated on the Cumberland plateau. Spring City, Tenn., on the Piney River, was badly damaged as a result of torrential rains on November 18. The mayor of Spring City reported that 12 homes and 5 commercial establishments were destroyed and that 135 homes and 11 commercial establishments were damaged. Flood damage in the city was estimated at $395,000.
Maximum discharges of record occurred at many gaging stations in Kentucky (table 26), and the 1937 flood was exceeded on Bear Creek at Leitchfield, Rough River near Madrid, East Fork Pond River near Apex, and the South Fork Little River at Hopkinsville.
In the area of Kentucky south of the Green River extending west-ward just past the Tennessee River, a ratio of the peak discharge to the mean annual flood of 2.4 represents a 50-year flood, whereas in the remainder of the State a ratio of 1.9 represents a 50-year flood. With two exceptions, all stations in the area enclosed by a line joining the following stations West Bays Fork at Scottsville, Ky., Rose Creek at Nebo, Ky., and Mayfield Creek at Lovelaceville, Ky. had floods with a recurrence interval of at least 50 years.
Rough River Reservoir was under construction at the time of the flood and had an appreciable effect on the flood discharge downstream. The peak discharge in Rough River near Madrid, Ky., on November 18 of 14,800 cfs was about equal to that of a 15-year flood and was the maximum in a 20-year period of record, whereas the peak discharge of 4,900 cfs at Falls of Rough, below the reservoir, was about equal to a 1-year flood.
In Tennessee the ratios of a flood to the mean annual flood of 2.4 and 3.1 represent a 25-year flood and a 50-year flood, respectively.

C90

TABLE 26. Flood

FLOODS OF 1957

and discharges during November 18-21 in Kentucky and adjacent southwest areas

Station Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before November
1957

Period Year

Novem-
ber 1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
QlM

Salt River basin

1...

2----.

3 ....

4

5. ...

6 .

7- ...

8_.

9- .

Salt River near Har-

rodsburg, Ky.

Salt River near Van
Buren, Ky.

Floyds Fork at Fish-
erville, Ky.

Salt River at Shep-
herdsville, Ky.

Rolling Fork near
Lebanon, Ky.

Beech Fork near

Springfield, Ky.
Beech Fork at Bards-
town, Ky.
Rolling Fork near
Boston, Ky.

Pond Creek near

Louisville, Ky.

139.4

U92

138

1,197

239

85.9

669

1,299

64

1952-57

1928
1938-57

1937
1944-57

1937
1938-57

1913
1938-57

1939H>Y

1937
1938-57

1937
1944-57

1956,
1957

1928
1948

1937
1950

1937
1943
1945

1913
1945

1957

1949

1937
1948
1950

1937
1948
1957

Nov. 18

Nov. 18

Nov. 18

Nov. 19
Nov. 20

Nov. 18

Nov. 18

Nov. 19

Nov. 20
Nov. 21

Nov. 18

15.0

15.1
22.2
19.3
19.12
16.8
13.12
11.52
847.3

38.04

30.32
24.7
22.4
21.24
26.0
27.0
39. 25
39.5
*55.2

46.6

45.8
319

17.78

14.01

4,140

4,190
20, 000
14, 700
14, 400
(2)
11, 500
7,950
f2)
50,000

29, 800

(2)
26, 500
20,200
7,280
8,280
27, 100
27, 600
(2)
41,300

37, 500

(2)

2,290
2,590

0.9

1.4

.9

1.0

1.7

1.2

1.3

1.2

1.4

Green River basin

10-....

11-....

12

13 ___

14

15---. ..

16

17 __.

18 .-.

19

20......

21

McQills Creek near
McKinney, Ky.
Green River near

McKinney, Ky.
Green River near

Mount Salem, Ky.
Green River at

Greensburg, Ky.

Russell Creek near

Columbia, Ky.
South Fork Little
Barren River at

Edmonton, Ky.
Green River at

Munfordville, Ky.

McDougal Creek
near Hodgenville,
Ky.
North Fork Nolin

River at Hodgen-
ville, Ky.
Nolin River at Wax,
Ky.
Green River at Lock
6, at Brownsville,
Ky.
Bear Creek near

Leitchfield, Ky.

2.14

22.4

36.3

736

'173

18.3

1 1, 493

5.34

135.6

1380

1 2, 072

30.8

1951-57

1951-57

1953-57

1913
1939-57

1~939-5Y

1941-57

1913
1915-22,
1927-31,
1936-57.

1953-57

1941-57

1936-57

1924-31,
1936-57

1937
1949-57

1952

1952

1955

1913
1952

1952

1949

1913
1937

1957

1955

1937

1937

1937
1952

Nov. 18

Nov. 18

Nov. 18

Nov. 20

Nov. 18

Nov. 18

Nov. 21

Nov. 18

Nov. 18

Nov. 19

Nov. 21

Nov. 18

5.40
5.60
8.93
8.85
9.40
11.11
36.2
33.50
27.21
23.8
17.58
10.00
7.90

54.0
50.40

39.40
5.30
6.27

14.87
14.84

32.26
30.93
44.94

34.15
21
18.6
21.33

950
1,030
10, 400
9,600
5,300
11,700
(2)
47,000
25, 600
15,900
8,090
2,140
1,510

87, 000
72,200

36, 500
1,370
2,100

6,840
6,370

22, 000
18,000
120,000

55, 300
(2)
5,700
8,070

3.3

5.3

4.6

1.3

1.0

1.6

1.2

1.7

1.5

1.5

2.3

See footnotes at end of table.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C91

TABLE 26. Flood stages and discharges during November 18-21 in Kentucky and adjacent southwest areas Continued

Station Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before November
1957

Period Year

Novem-
ber 1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Q2.33

Green River basin Continued

22 -.

23

24 _-

25

26 ...

27- ..

28... .__

29 ...

30

31...-,.

32 ...

Barren River near

Pageville, Ky.
West Bays Fork at
Scottsville, Ky.
Drakes Creek near

Alvaton, Ky.
Barren River at

Bowling Green,
Ky.

Mud River near

Lewisburg, Ky.
Rough River near
Madrid, Ky.

North Fork Rough
River near West-
view, Ky.
Rock Lick Creek
near Qlen Dean,
Rough River at Falls
of Rough, Ky.

Caney Creek near
Horse Branch, Ky.
East Fork Pond
River near Apex,
Ky.

1512

7.47

1358

1 1, 358

181.5

1158

122.6

20.1

1394

124

194

1939-57

1950-57

1939-57

1913
1938-57

1939-"5Y

1937-57

1954-57

1956-57

1937-57
1939-57

195&-57

1937
1940-57

1952

1952

1957

1913
1952
... do..

1952

1937
1952

1956

1957

1937
1950

1957

1937
1951

Nov. 18

Nov. 18

Nov. 19

Nov. 20
...do.....

Nov. Is

Nov. 19

Nov. 18

Nov. 18

Nov. 19
...do....

Nov. 18

Nov. 19

27.26
19.26
6.09
6.06
31.54
28.37
52.2

44.63

34.32
21.1
22.53
38.6

40.54
16.14
16.79

16.65
14.43
34.06
28.87

24.38
12.96
3 14. 43
19.6
19.40
20.70

70,000
17 700
1,640
1,720
34,300
22,400
(2)
77,400

30,700

9,600
12,200

13, 800
14,800
2,280
2,520

4,730

2,210 (2)
12,400
4,900

9,020
10,000
(2)
17,500
21,800

1.0

2.2

1.6

.8

2.6

1.9

0.8

.8

.5

1.5

3.5

Tradewater River basin

33 _..

34......

Olney, Ky.

Ky.

1246

2.10

1937-57

1951-57

1937

1956

Nov. 19

Nov. 18

19.27
17.53
7.06
7.46

17,000
7.960
884
1,230

1.1

1.9

Cumberland River basin

35 -

36--...

37 ...

38 .-.

39 ...

40

Shopville, Ky.

West Fork Obey

Tenn.

Tenn.

Cadiz, Ky.

165

382

e 115

19.2

135.5

1952-57

1929
1934-57

1942-57

1954-57

1937
1949-57

1956

1929
1939

1955

1956

1937
1951

Nov. 19

Nov. 15

Nov. 18

Nov. 18

Nov. 18

Nov. 19

15.72
19.55
541.2
33.58
27.24
16.30
12.65

10.32
10.56

20.4
19.17
21.51
21.00
20.69

10,800
14,900
74,700
44.300
31.700
15, 100
9,510

3,240
3,370

(2)
5,670
9,320
14,200
13,600

1.9

1.9

1.8

2.4

3.5

2.5

See footnotes at end of table.

690184 O 63

C92 FLOODS OF 1957

TABLE 26. Flood stages and discharges during November 18-21 in Kentucky and adjacent southwest areas Continued

Station Stream and place of
determination

Drainage
area

(sq mi)

Maximum floods

Before November
1957

Period Year

Novem-
ber 1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to
Qi.33

Tennessee River basin

41......

42

43

44.-...

Whites Creek near
Glen Alice, Term.

Piney River at
Spring City, Term.

East Fork Clarks

River at Murray,
Ky.
East Fork Clarks
River near Benton,
Ky.

123

98.3

89.7

227

1929
1934-57

1927-31,
1954-57

1961-67

1937-57
1938-57

1929
1949

1929

1952

1937
1952

Nov. 18

Nov. 18

Nov. 18

Nov. 19

27.1
19.45
25.1

(2)

18.00
15.20
15.20

17.8
16.68
17.10

66,000
19,000
51,000
16,500

32,200
32,300
32,300

(2)
27,600
36,000

4.4

5.5

7.7

5.4

Mayfield Creek basin

45 -

46 ...

Perry Creek near
Mayfleld, Ky.

Mayfleld Creek at
Lovelaceville, Ky.

1.72

212

1952-57

1937-57

1952
1955

1937

Nov. 18

Nov. 19

10.3
7.12
6.74
21.1
19.64

(2)
846
763
19,800
11,200

1.3

1.7

Obi on Creek basin

47 ... Obion Creek at
Pryorsburg, Ky.

36.8 1949
1951-57

1949
1952
1957
Nov. 18

13.0
11.50

12.60

(2)

3,900
5,330 2.0

Bayou Du Chien basin

48 -

49 ...

50- -

51 __

52 -

Clinton, Ky.

River near Green-
fleld, Tenn.

River near Union
City, Tenn.

Obion, Tenn.

68.7

431

i Rftn

110

1 Q3Q_ 17

1Q9QC7

1Q9Q-.17

1QOQ_ K7

1Q1ft_17

1Q11

- 1007

1007

1007

1Q17

Nov. 18

Nov. 18

Nov. 19

Nov. 20

Nov. 18

14.89
17.82
16.74

22.0
21.59

25.4
22.25
14.42
14.83

6,880
6,470
25,600
14,900

49,200
40,000

99,500
53,600
5, 970 ,
6,690

1.7

1.4

3.3

2.1

2.4

St. Francis River basin

53

54---.-.

55

56 -..

57 --.

58

near Kennett, Mo.
Little River ditch 1

Little River ditch 251

111

235

9^<;

175

» 883

QQ n

1926-57

1926-57

1945-57

1945-57

1926-57

1Q9fi_fi7

1Q97

1937

1945

1Q4C

i957
... do

1Q97

Nov. 19

Nov. 20

Nov. 18,
19

Nov. 18

Nov. 20

Nov. 20

11.86
16.80

16.26
15.6
14.72

14.2

12.78
21.70

21.18
15.57
11.40

?2,760
2,440
~"s~7f~660~

6,070
3,200
3,150

4,100
2,480
~~~~7~600~

8,380

2,720

1.3

1.7

.9

.9

.9

1.8

See footnotes at end of table.

SUMMARY OF 1957 FLOODS IN THE UNITED STATES C93

TABLE 26. Flood stages and discharges during November 18-21 in Kentucky and adjacent southwest areas Continued

Station Stream and place of
determnation

Drainage
area

(sq mi)

Maximum floods

Before November
1967

Period Year

Novem-
ber 1957

Gage
height
(ft)

Discharge

Cfs

Ratio
to

QJ.M

White River basin

CO

60

61- -

Middle Fork Little
Red River at

Shirley, Ark.

Clinton, Ark.

Ark.

294

316

1,141

IQQQ W

1939-57

1927 57

1949

1957

1949

Nov. 18

Nov. 18

Nov. 18

01

17.39
28.16
17.84
46.53
30.30

101 000
13,800
59,500
19,500
117 000
46,600

1.5

2.0

2.1

1 Contributing drainage area.
2 Not determined.

3 Affected by backwater.
* 1,400 ft upstream at same datum.
5 1,200 ft upstream at datum 3.41 ft higher.
6 Includes 34 sq mi without surface drainage.
7 Includes some overflow from St. Francis River.
8 Includes some overflow from ditches 66, 66A, and 251 near Kennett, Mo.
9 Includes that of ditches 66 and 66A near Kennett, Mo.
1° Includes some overflow from Mississippi River.

REFERENCES CITED

Corbett, D. M. and others, 1943, Stream-gaging procedure, a manual describing methods and practices of the Geological Survey: U.S. Geol. Survey Water-Supply Paper 888, 245 p.
Dalrymple, Tate and others, 1937, Major Texas floods of 1936: U.S. Geol. Survey Water-Supply Paper 816, 146 p.
, 1939, Major Texas floods of 1935 in Contributions to the hydrology of United States, 1937: U.S. Geol. Survey Water-Supply Paper 796-G, p. 223- 290.

Daniels, W. D., and Hale, M. D., 1958, Floods of October 1954 in the Chicago area, Illinois and Indiana in Floods of 1954: U.S. Geol. Survey Water Supply Paper 1370-B, p. 107-200.
Johnson, Hollister, 1936, The New York State flood of July 1935 in Contributions to the Hydrology of the United States, 1936: U.S. Geol. Survey Water-Supply Paper 773-E, p. 233-268.
Mitchell, W. D., 1954, Floods in Illinois, Magnitude and Frequency: Springfield, 111., Illinois Department of Public Works and Buildings, Division of Water-ways.

Musgrove, Rufus H., 1958, Floods of June 9, 1957 at Perry, Florida: Circ. 17, Florida Geol. Survey.
Patterson, J. L., 1963, Magnitude and frequency of floods in the United States, pt. 7, Lower Mississippi River basin: U.S. Geol. Survey Water-Supply Paper 1681. (In press.)
Schoppenhorst, C. E., 1958, Floods of June-July 1957 in Indiana: Geol. Survey Circ. 407, 32 p.

C94 FLOODS OF 1957

U.S. Geological Survey, 1954, Floods of May 1951 in western Oklahoma and north-western Texas in Floods of 1951: U.S. Geol. Water-Supply Paper 1227-B,
p. 135-199.
1963, Floods of January-February 1957, southeastern Kentucky in Floods of 1957: U.S. Geol. Survey Water-Supply Paper 1652-A. (In press.)
U.S. Weather Bureau, 1958, Rainfall and Floods of April, May, and June 1957 in the South-Central States: U.S. Weather Bur., Tech Paper 33, 350 p.
1957a, Rainfall Intensity Frequency Regime: U.S. Weather Bur., Tech Paper 29.
1957b, Climatological Data for Texas, October 1957: 28 p.
- 1957c, Climatological Data for Illinois, July 1957: 14 p.
Yost, I. D., 1963, Floods of April-June 1957 in Texas and adjacent States in Floods in 1957: U.S. Geol. Survey Water Supply Paper 1652B. (In press.)

INDEX

Abstract ______________________ Cl Allentown, Mo __________________ 56 Arkansas, floods of April-June. ________ 24 floods of August 13-14.. __________ 79 Arkansas River _________________ 41,46
at Ralston _________________ 38 from Muskogee, Okla. __________ 30 Arkansas River basin ____________ 31,37,80 tributary basins in eastern Oklahoma and western Arkansas __ ______ 36
Arnold, Kans ___________________ 59 Aurora, Colo. __________________ 43

B

Baker, Oreg ____________________ 18 Ballinger, Tex. __ . __ . __ . __ . _ . _ 86 Barbourville, Ky _________________ 10 Bayou Du Cbien basin ____________ 92 Bazile Creek, floods of June 16-. ________ 57 near Niobrara, Nebr.. __________ 57 Bear Creek at Leitchfleld, Ky __ ..... __ .. 89 Bibliography ___________________ 93 Big Sandy River basin. ____________ 7 Big Sioux River... ____ ..... . ___ .... 61 Big Sioux River basin ______________ 62 Big Walnut Creek near Reels ville, Ind. ___ 69 Biloxi, Miss........................... __ .. 83 Biloxi River basin.. ______ . ___ ...... 84 Bird Creek.... L __ . _____ . _______ 40 at Avant, Okla _______ . ________ 37 Bixby, Okla.-l. ____________ . __ .. 38 Black Bear Craek at Pawnee, Okla ______ 29 Blackfoot, Idaho . __ . ___________ 49 Blackfoot River ___ . _ .. __________ 49 Blackfoot River basin... __ . ________ 50 Blue Island, 111 _ ... ______________ 74 Boise River basin... -.....-..-. ________ 15 Bowling Green, Ind ______________ 69 Brazos River basin ____ . ... ______ 21 Brush Creek at Pacific, Mo. __________ 56 Bucket survey __________________ 26,27 Bully Creek uear Vale, Oreg--- ________ 18 Burlington, Wyo _______ ...... __ 52

Cadron Creek
Cagles Mill Reservoir, Ind
Cahokia Creek basin
Calumet-Sag Channel, 111..

. ... 81
69
.... 57
74

Canadian River at Bridgeport, Okla.. . 40,41 Canadian River basin___________ Canaseraga Creek._________.__.
Caney River.._______________ Caseyville, 111_.__.________....
Castle Rock, Colo______________
Castor River at Aquilla, Mo. .... Cedar Bluff Reservoir, Kans..._____.

Page
Chattanooga, Term______________ Cll Cherry Creek, floods of July 26, 30______ 76 near Franktown, Colo.___________ 76 Chicago Transit Authority.__________ 74 Chickasaw Creek____.__ . ... _. 39 Chikaskia River_______._____-__ 45 Chittenango Creek near Chittenango, N.Y... 78
Cimarron River.... . . 27
Cimarron River basin_.____....... 37
Clearwater River..__.. __.. 51
at Spalding, Idaho. ... .. 49 Clearwater River basin ____...__..... 48,50
Clinch River. . . 10
Clingmans Dam, N.C~_.__.... 6
Clinton, Ark.. . 79
Coffeeville, Miss.... ... 72
floods of July 1... 69
Colorado, snowmelt floods of June and July 63 Colorado River at Ballinger, Tex 85,86
Colorado River basin. 21
Texas, floods of October 13-15 85
Colton, S. Dak . 60
Commerce, Okla... 40
Cowaselon Creek._ 79
Coyle, Okla_ - 37
Crab Creek basin_.-. . 14
Creighton area, Nebr 57
Crystal River... 65
Cumberland River basin.... 8,91
Cypress Creek - 72

D

Damage, Arkansas.. 27,37
Colorado..... 65
Denver, Colo 44
Florida 53
Idaho.... 16,50
Illinois.. - 55,69,74
Indiana__ 69
Iowa.... 62

Kentucky and adjacent areas 9
Missouri..... 55
New Mexico.. 81
New York 78
Oklahoma... 37
Oregon 16
South Dakota.._ ---- -- 62
Tennessee.. 10

Texas and adjacent areas 24
total estimated, United Sates 1
Virginia., ._. - - 1°
Washington___... 16
Deer Creek 41
Dell Rapids, S. Dak. 61
Denver, Colo., floods of May 9... 43
Dougals Creek basin.. 14
C95

C96 INDEX

Page
Dover, Okla __......._ C37 Drought, Great Plains.....__________ 24 Drummond, Okla..___________. 37 Dry Creek near Eagle, Idaho_________ 13 Duck River at Columbia, Tenn.____... 10

E

Eagle Creek_________________. 65
East Cache Creek..______________ 39 East Fork Pond River near Apex, Ky____ 89 Elk River..__....._...................... 40 at Fayetteville.___._..__________ 10 Ellis, Kans- __......_... 58 Elm Creek_ __________________ 85,86 Enid Dam, Miss. ________________ 69 Explanation of data.........________ 4

Flash floods..__________________ 89 Flood stages and discharges, Arkansas....__ 80 Cofleeville, Miss....___._______ 71 Colorado.__________________ 64 Colorado River basin, Texas.....__._ 87 Denver, Colo________________ 43
determination of.._____________. 3
Harrison County, Miss.._________ 84 Idaho... ...._.... 14,50 Illinois... ....__...... 57,67,75 Indiana....________________ 67 Iowa........ ._______________ 62 Kansas ...._________ 45,59 Kentucky and adajcent areas___ ___. 6,90 Missouri.......______________. 47,57 Nebraska__________________ 59 New York. ________________ 79 Oklahoma__________________ 31 Oregon.____________________ 14 Rio Grande basin..._________._ 82 South Dakota._.._____________ 62 Texas and adjacent States.________. 20,87 Washington______________. 14 Yellowstone River basin..-________ 52 Floods, previous.________________ 39 summary of......__________..... 4 Fork Gunnison River near Somerset, Colo_ 65 Fort Gibson Reservoir, Okla..________ 37 Fort Hall Indian Reservation, Idaho_____ 51 Fort Smith, Ark.....---....._.............. 38 Foster Creek basin.._____________ 14 Franktown, Colo_______________... 76 Frog Bayou..___________.__ 41

G

Gasconade River basin.___________. 47 Grand Glaize Creek_______________ 55 Grande Ronde River basin___________ 16 Green River basin___________.___ 8,90 Grenada Dam, Miss______________ 69, 71 Greybull River________________ 52 Wyo., floods of June 5-7__________ 52 Guadalupe River basin____________ 22 Gunnison River basin______________ 64
Guyandot River basin_...___._... . e

H
Pare

Harlan County Reservoir, Nebr.. C60
Harrison County, Miss., floods of September
18-19.. - - 82
Hawk Creek basin. ___ 14
Hays, Kans..... . -- . 58
Hazard, Ky.... 10
Heads Creek..... 55

Hennessey, Okla.... 26
Henrys Fork._____ . 50
Hickory Creeks.... 74
House Springs....... 55
Hulah, Okla-... -- 40
Hulah Reservoir, Okla...-- 37

Idaho, floods of February. 12
floods of May and June.. 48
Illinois, floods of June 14-17 55
floods of June-July__. 65
floods of July 12-13.. _ 72
Illinois River at Marseilles, 111__ 74
Illinois River basin______ ____ 57,67,75
Indian Creek at Wanda, 111...... 56
Indiana, floods of June-July.... 65
Introduction___..--.. -. 1

James River basin.. . . - 62
Joliet, 111.. 74

K
K-79 Reservoir, III..
Kanawha River basin..
Kankakee River near Wilmington, 111 . Kansas, floods of May 16-17-. -
Kansas River basin.....
Kansas and Nebraska, floods of June 16-18- Kaskaskia River basin.-.____----- 57,67 Kentucky and adjacent areas, floods of Jan-uary 29-February 6........ .
floods of November 18-21_____
Kentucky River basin..__ . - ...... Kermit, W. Va
Kiowa Creek, floods of July 26, 30..........

Lake Michigan, streams tributary to. 75
Lake Texoma.... .- 18
Langley, Okla_______________----- 40 Lavaca River basin___-
Levisa Fork..............
Licking River basin......
Little Beaver Creek...
Little Pigeon River.......
Little Red River basin...
Little Rock, Ala_____
Little Sandy River basin-
Little Washita River.....

M
McDonald Creek.
McGee Creek....

INDEX C97

Page
Malheur River__.._._.........__.__ CIS Malheur River basin.____ ________ 15 Mangum, Okla________________ 38 Marne Creek basin______________ 62 Mayfield Creek at Lovelaeeville, Ky_____. 89 Mayfleld Creek basin..____________ 92 Melvin, Colo___________________ 76 Meramec River basin....__________ 47,57 Middle Concho River_____________ 85 near Tankersly______________ 86 Midway Airport, 111.______________ 72 Mill Creek near Cataract, Ind_______.. 69 Mississippi Gulf Coast area________. 82 Missouri, floods of June 14-17_________ 55 floods of May 17, 21-23.................... 46 Mocane, Okla________________ 40
Moffett, Okla. 38
Mulberry Creek_________________ 41 Muskogee, Okla_______________ 39

N

Neches River basin_______.
Neosho River,...________.
New River.____.___._.
New York, floods of August 3-4.
Ninnescah River...__...__. Norris Lake._____.__..

. 21
.... 40
10
. 77
....__ 45
. 12

North Boggy Creek.______________ 39 North Concho River...____________ 85 North Fork Red River...........___...... 40 Nueces River basin__._.__._____ 22

O

Oak Creek Reservoir, Tex..........
Obion Creek basin.....____....
Oklahoma, floods of April-June.__
Oklihoma panhandle__.___..
Oneida Creek at Oneida, N.Y...... Onondaga Creek at Syracuse, N.Y. Oregon, floods of February____. Osage River basin____....... Otto, Wyo...-_ .-. _.........

Pahsimeroi River near May, Idaho. Peak Discharges, frequency of...... Perkins, Okla..._.....___..... Perry, Fla., floods of June 9........ Pikesville, Ky....______._..__.

49
41
37
52
10

Pimple Creek...__...._.__.... .. . 53,54 Pine Creek near Cambridge, Idaho______ 13 Platte River basin....._._______.__ 43 Point Remove Creek______________ 81 Portneuf River at Topaz, Idaho_______ 13 Portneuf River basin____________._ 15 Powder River__________________ 18 Powder River basin...________.. 16 Precipitation. See discussion under individual flood or area

R

Raccoon Creek at Mansfield. Ind. 65

Ralston, Okla.._..
Red Cloud, Nebr.............
Red River____...
Red River basin_
Redstone, Colo__..-..
Republican River_
Rio Grande basin....

Roaring Fork basin__
Rockville, Ind_.....
Rose Creek at Nebo, Ky...
Rough River near Madrid, Ky. Rough River Reservoir, Ky.... Rush Creek...___.......... Russell, Kans...

20

Page
041
60
24
34,38
65
60
22
64,65
65

Sabine River basin. 20
St. Francis River basin..... - 47,92
St. Vrain Creek. - - 43
Sallisaw, Okla... 37,38
Sallisaw Creek...... 41
Salmon River basin...... 50
Salt Fork Red River near Wellington, Tex... 38
Salt River basin.... 8,90
Salt Spring Creek basin..__.. 57
San Angelo Reservoir, Tex.. 86
Sand Creek.....____..... 43
Sante Fe, N. Mex., floods of August 24-..- 81
Saucier Experimental Forest, Miss 83
Sayre, Okla . 38
Sevierville, Term.._ ._ ... 10 Shelbyville, Tenn........... ... - 10
Sioux Falls, S. Dak 61
Skunk Creek . . 60

Smoky Hill River....... - 58,59
Smoky Hill Reservoir, Kans.-.-- ... 59
Soldiers Creek.... 74
South Dakota, floods of June 16-21...... 60
South Fork Little Red River... .. 79
South Fork Little River at Hopkinsville, Ky.. 89
South Fork Sangamon River 65
South Fork Solomon River.... 58
South Platte River....... - 43
Spring City, Term... . . - 89
Spring Creek.. 52,55
Spring Valley Creek . 13
Storage, Cagles Mill Reservoir, Ind 69
Cedar Bluff Reservoir, Kans. 59
K-79 Reservoir, Colo..... _ - 77
Lake Texoma, Tex_._. 18
Rough River Reservoir, Ky. 89
Smoky Hill Reservoir, Kans.. 59
Tennessee.-- --- U

Tchoutacabouffa River basin 84
Temperatures.... 13,49
Tennessee River basin_..... 6,9,92
Terral, Okla...--------- - 41
Terry Creek 75
Teton River basin.. - 49,50
Texas and adjacent States, floods of April-
June 18
Thorn Creek at Glenwood. 111-. ._ 75

C98 INDEX

Toll Gate Creek.............................. C43 Tradewater River basin___________.
Trinity River basin....___________.
Tug Fork_._________________.
Tulsa, Okla.. ...._.___.___..__ 37,41 Turkey Creek at Cofleeville, Miss____. Turkey Creek basin...........______. Twomile Reservoir, N. Mex________. Tygarts Creek basin____.________. Tyler, Minn__________________.

Vale, Oreg ... .-..--.-.________. Valley Park, Mo.._____________.
Van Buren, Ark_______._....__ 30,37,38,41 Verdigris River..__.______________ 40 near Inola.. . ...__. Vermillion River basin___________.

W

Wabash River.

?e
43
91
21
10
41
71

QA
01

7
fin

16
55
41
40
37
62

65

White River.... ____________

Wolf Creek

Y

Yankton, S. Dak.. ... ... Yazoo River basin.... ....

Page
... C65,67
... .. 12
. 27
41
_____ 41
.. 38
... 37,40
72
59
15
. 89
65
.. 47,65,80,93
... 65
- . 75
.... 14
..... 38

.... 71
60
..... 71

o