PEAK DISCHARGES ON BULL CREEK AND TRIBUTARIES

SCURRY AND BORDEN COUNTIES, TEXAS

FLOOD OF APRIL 12, 13, 1954

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COLORADO RIVER BASIN

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by

L. L. McDaniels

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Prepared in cooperation with the Texas
State Board of Water Engineers

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FLOOD OF APRIL 12, 13, 1954

INTRODUCTION

This report contains a description of the rainfall pattern producing the flood of April 12, 13, 1954, in the Bull Creek watershed, the results of indirect determinations of peak discharges and estimates of flows at several points in that watershed, and a comparison of the peak stage at the discontinued gaging station on Bull Creek near Ira, Tex., with other floods on record. Field work consisted of transit-stadia surveys at five locations to develop high-water profiles and cross-sections, performed within two weeks after flood occurred.

ACKNOWLEDGMENTS

Discharge data contained herein were obtained in cooperation with the Texas State Board of Water Engineers. Rainfall data includes recorded precipitation at one official station operated by the Weather Bureau and supplemental records furnished by the Colorado River Municipal Water District of Big Spring, Tex.

RAINFALL

Rainfall across the Bull Creek watershed in the upper part of Borden County during the period April 10-13 ranged as high as 5.1 inches. The storm period followed an extended drought -- only 0.22 inches of precipitation had been recorded at the Weather Bureau station in Gail during the preceding six months. Rainfall at the Gail station from 8 a.m., April 11, to 8 a.m., April 14, amounted to 2.78

inches. Of that amount, 2.48 inches fell April 11. Supplemental records furnished by the Colorado River Municipal Water District of Big Spring show that the flood-producing rains fell to the north, east and west of Gail. Total amounts of rainfall recorded during the period April 11-14, at various sites in and adjacent to the Bull Creek watershed, are plotted on the accompanying map. Rains varied from 2.5 inches 4 miles west of Gail, to 5.1 inches 10 miles northwest, to 4 inches in the upper Bull Creek area in Lynn, Garza and Borden Counties. Precipitation to the east and northeast of Gail ranged from 3.4 inches about 8 miles east, to 4.5 inches about 15 miles northeast across the head of Gavett Creek. The highest rainfall reported east of Gail was 4.8 inches across head of Silver Creek, with a slightly smaller total of 4.75 inches reported in the middle Gavett Creek area. The period of greatest intensity of rainfall over the area was reported to be from 4 to 5:30 a.m., April 12.

BULL CREEK ABOVE GAVETT CREEK

Data obtained in a survey of the flood peak of April 12 on Bull Creek above Gavett Creek in Borden County, at State F. M. Road 1957 crossing (drainage area, 266 sq mi), and observations of indicated complexities of flow within the reach surveyed, were such that the resulting peak discharge computed by the slope-area method is considered not sufficiently reliable for publication. The peak discharge of 19,600 cfs computed on basis of the data obtained is considered no better than an estimate.

GAVETT CREEK

A field survey was made of Gavett Creek at bridge on U. S. Highway 180 east of Gail, Borden County (drainage area, 66 sq mi). Evidence of high water was insufficient to provide data for reliable

computation of the peak discharge at this site. The data obtained indicated that the flood on Gavett Creek was not of great magnitude. On basis of the data obtained, the peak discharge of Gavett Creek combined with the peak discharge through a culvert to the left of main channel has been estimated to be about 4,200 cfs. This estimate is not sufficiently reliable for publication and is only an indication of the (probable) peak discharge.

MOORE CREEK

A survey was made of high-water marks at the bridge on U. S. Highway 180 across Moore Creek west of Snyder in Scurry County (drainage area, 26 sq mi). Available data were insufficient for reliable computation of the peak discharge of the flood of April 12 at this site. An estimate, not satisfactory for publication, of about 2,000 cfs was made for the peak rate of flow on basis of the data obtained.

BULL CREEK DIVERSION CANAL

The peak discharge of the flood of April 12 carried by the Bull Creek Diversion Canal near Knapp, Scurry County, has been computed by the slope-area method to be 6,240 cfs. The base data for the computation were adequate and the result is considered reliable and will be published. The canal carries flood flow diverted from Bull Creek by an earthen dam to Lake J. B. Thomas on the Colorado River. The earthen dam was breached by flood waters in two places between 9 and 12 p.m., April 12. The maximum stage at diversion dam was at spillway level. The canal is about two miles long and probably carried the peak flow about the time the break in the dam started

releasing an appreciable amount of flow. Drainage area above the diversion dam is 363 sq mi.

BULL CREEK NEAR IRA

The United States Geological Survey, in cooperation with the Texas State Board of Water Engineers, operated and maintained a streamflow station on Bull Creek near Ira, Tex., from October 1947 to September 1953 (drainage area, 388 sq mi). This discontinued station is referred to herein as only a gage.

A field survey was made of floodmarks left by the flood during the morning of April 13 on Bull Creek at a reach about 3,500 ft downstream from the gage site. No appreciable inflow occurred between the two sites. Data were adequate and the peak discharge of 22,400 cfs computed by the slope-area method is considered reliable and will be published.

COMPARISON OF FLOOD STAGES

The peak stage of the flood of April 13, 1954, at site of discontinued gage on Bull Creek near Ira, Tex., was 21.1 ft. Datum of gage was 2,169 ft above mean sea level, as determined from USGS-Ira Quadrangle Texas, 7.5 Minute Series, 1951, which shows elevation of USGS-WR RM to be 2,185 ft above mean sea level, datum of 1929. The reference mark shown on the Ira quadrangle is apparently RM-3, elevation 15.586 ft gage datum.

The peak stage of the flood of Sept. 7, 1932, has been published as 22.1 ft at site of discontinued gage. The stage was determined by comparison of a 1932 floodmark cut on a sandstone boulder on left bank

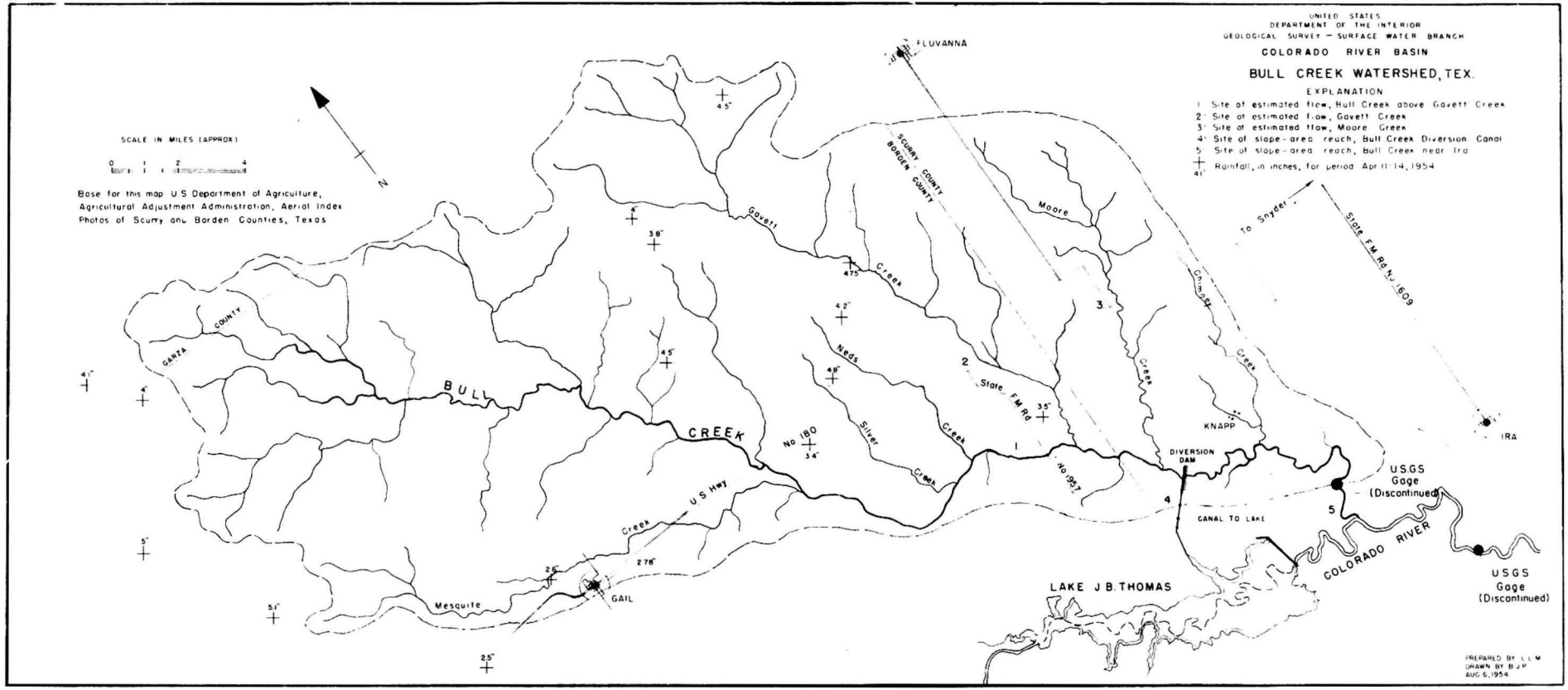
1,100 ft downstream from gage with the high water of May 1947 at the same site. The peak stage of the flood occurring in May 1947 was 15.72 ft gage datum. The flood peak of April 13, 1954, was compared with the above-described floodmarks and the peak stage of Sept. 7, 1932, is hereby revised to 23.0 ft at gage site on the basis of better correlation afforded by floods of more comparable magnitude. Previously published data will be revised in Part 8 for 1953, Western Gulf of Mexico basins, Water-Supply Paper 1282, of the yearly series entitled "Surface Water Supply of the United States."

The flood of June 1939 at gage site was reported by a local resident to have been about one foot higher than that of Sept. 7, 1932. This person also stated that a large flood occurred at this site in 1913, stage unknown.

A rancher, residing immediately east of F. M. 1957 crossing on Bull Creek above Gavett Creek since 1940, stated that he had seen Bull Creek higher since 1940 than it was in April 1954.

A resident of Gail, Borden County, since 1892, stated that Bull Creek in the vicinity of the U. S. Highway 180 crossing east of Gail and above Mesquite Creek had been higher several times than in April 1954.

The sheriff of Borden County stated that Bull Creek above Mesquite Creek was probably the highest known in 1932; also, that Bull Creek was higher 6 or 7 years ago than in April 1954.


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY – SURFACE WATER BRANCH
COLORADO RIVER BASIN
BULL CREEK WATERSHED, TEX.
EXPLANATION
1 Site of estimated flow, Bull Creek above Gavett Creek
2 Site of estimated flow, Gavett Creek
3 Site of estimated flow, Moore Creek
4 Site of slope-area reach, Bull Creek Diversion Canal
5 Site of slope-area reach, Bull Creek near Ira
41 Rainfall, in inches, for period Apr 11-14, 1954
SCALE IN MILES (APPROX)
0 1 2 4
Base for this map U S Department of Agriculture, Agricultural Adjustment Administration, Aerial Index Photos of Scurry and Borden Counties, Texas
N
FLUVANNA
To Snyder
State F M Rd No 1609
SCURRY COUNTY
BORDEN COUNTY
GARZA COUNTY
Gavett Creek
Moore Creek
Chimney Creek
Neds Creek
Silver Creek
BULL CREEK
State F M Rd
No 180
No 1967
KNAPP
IRA
DIVERSION DAM
CANAL TO LAKE
USGS Gage (Discontinued)
USGS Gage (Discontinued)
COLORADO RIVER
LAKE J B THOMAS
U S Hwy
Mesquite Creek
GAIL
PREPARED BY J L M
DRAWN BY B J P
AUG 6, 1954