

AD-A155 353

REPORT OF THE FLOOD OF JUNE 1973 BLACK AND POCOTALIGG
RIVERS SOUTH CAROLINA(U) CORPS OF ENGINEERS CHARLESTON
SC CHARLESTON DISTRICT JUN 75

1/1

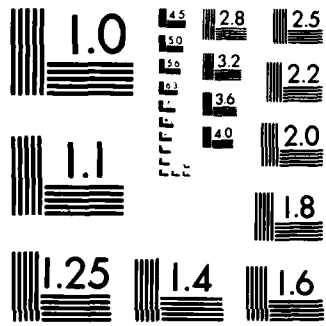
UNCLASSIFIED

F/G 8/8

NL

							END								
							FILED								
							DEC								





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963 A

SECTION

SECTION

REPORT OF THE FLOOD



OF

SECTION

JUNE 1973

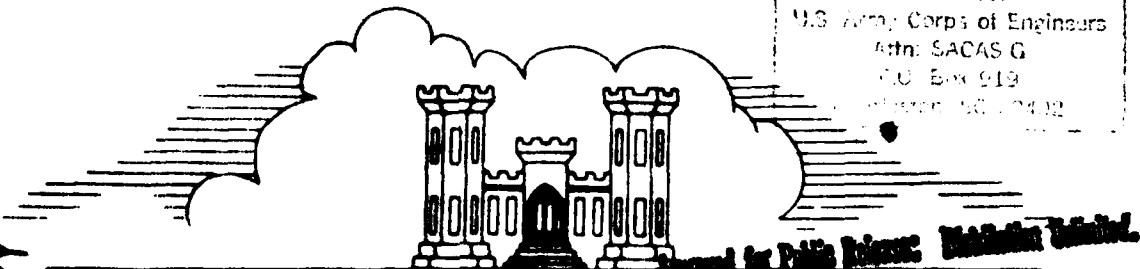
AD-A155 353

BLACK AND POCOTALIGO RIVERS

SOUTH CAROLINA

Property of the U.S. Government

Return To:
U.S. Army Corps of Engineers
Attn: SACAS G
D.O. Box 919
Charleston, SC 29402



Approved for Public Release: Unlimited Release

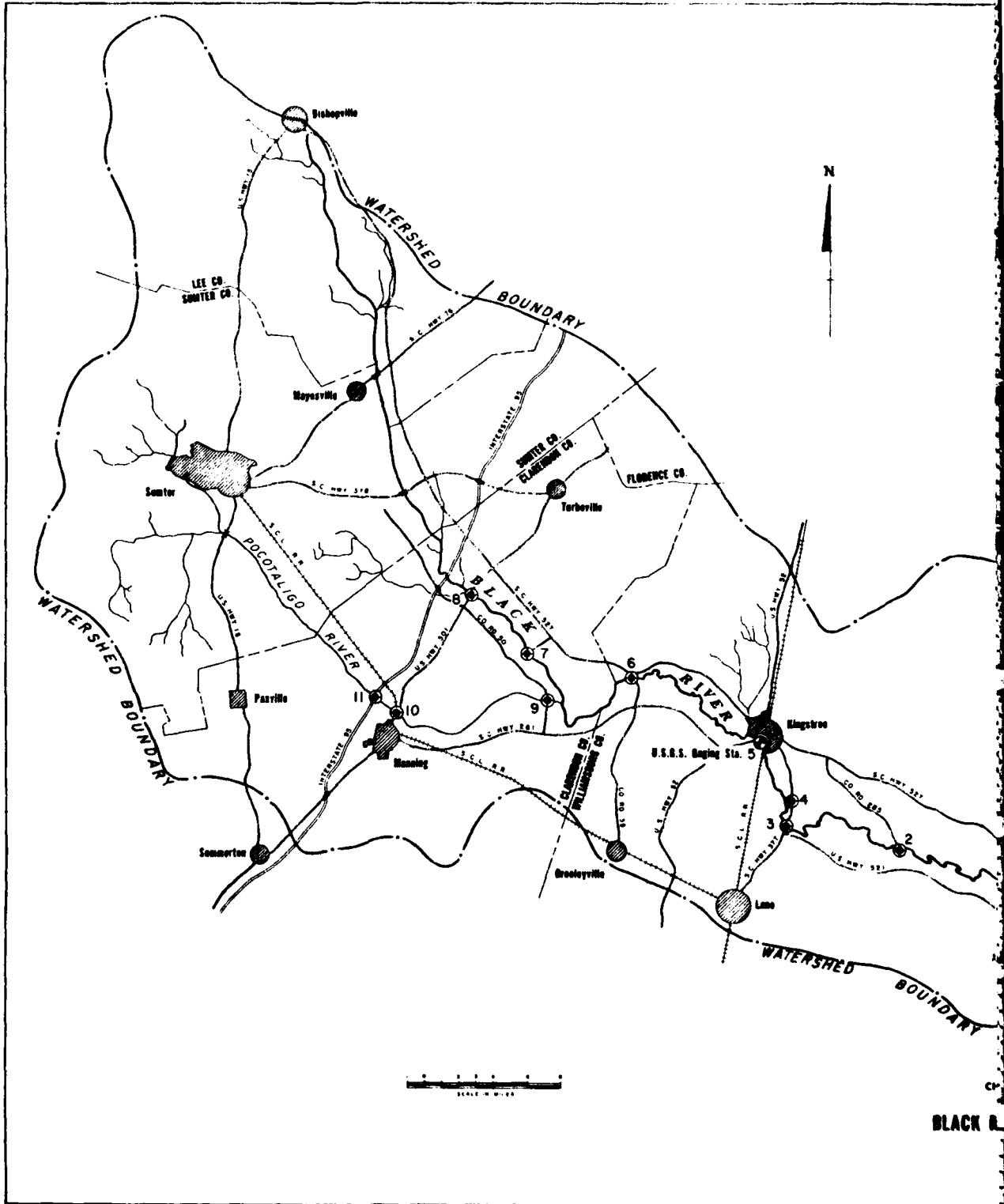
DTIC FILE COPY

U. S. ARMY ENGINEER DISTRICT, CHARLESTON
CORPS OF ENGINEERS

CHARLESTON, SOUTH CAROLINA

DTIC
ELECTE
FEB 07 1985

SERIAL NO. 05



BLACK R

16A 7

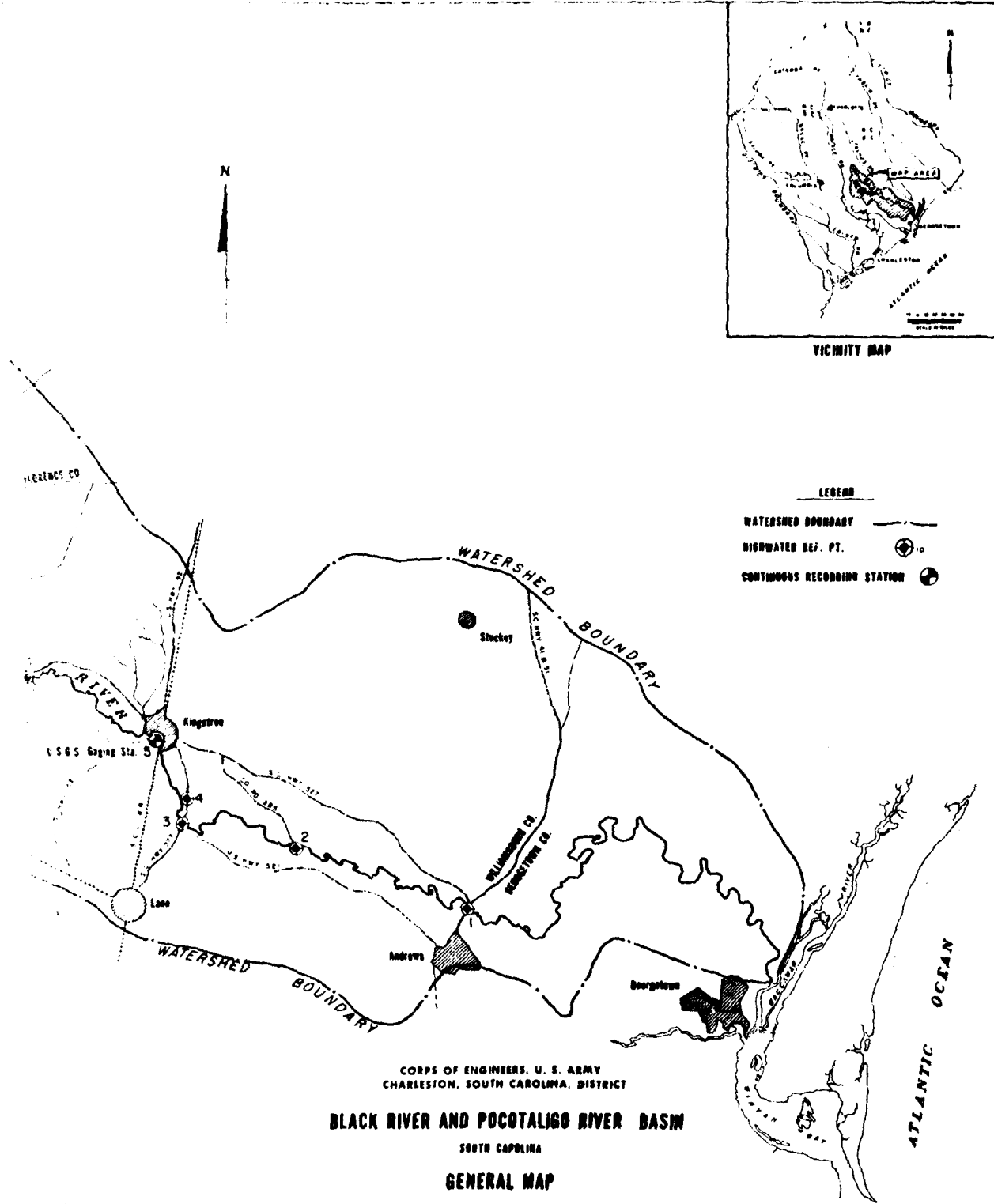


FIGURE 1

2 of 2



DEPARTMENT OF THE ARMY

CHARLESTON DISTRICT, CORPS OF ENGINEERS
P O BOX 919
CHARLESTON, S.C. 29402



Accession For

NTIS GRA&I
DTIC TAB

June 1975 needed location

SANGP-I

SUBJECT: Final Report on the Flood of June 1973, Black and Pocotaligo Rivers, South Carolina

Chief of Engineers
ATTN: DAEN-CWO-E

Distribution/
Availability Codes

Form 10/1 and/or
Special

A-1

1. Authority. This report was prepared under provisions contained in PL-99, which delegates authority to District Engineers to prepare post-disaster reports.

2. Purpose. The purpose of this report is to present the basic data collected on the storm of June 1973 and the subsequent flooding which occurred along the Black and Pocotaligo Rivers, South Carolina since this was the flood of record. A general basin map is shown on Figure 1.

3. Scope of report. This report summarized hydrologic, economic and other data which were considered of significance and were readily available. A reconnaissance of affected areas was made after the flood waters subsided for the purpose of conducting a flood damage survey. Subsequent office studies included an evaluation of flood damages and a brief hydrologic analysis.

4. Included is an evaluation of the effectiveness of the Corps' authorized Kingstree Branch channelization project had it been operational at the time the flood occurred.

STORM DATA

5. General. A weak subtropical low moved northward into southern South Carolina on the 9th-15th, followed by a period of unusually heavy showers as it slowly dissipated.

Excessive rains on the 7th-15th over portions of southern and central South Carolina caused major flooding of roads, with crop damage especially heavy to tobacco and truck crops, as well as requiring considerable evacuation of low-lying areas. Record daily and monthly rainfall records were set at Charleston, as well as a new flood record established on the Black River at Kingstree. Major flooding occurred on the Black River from Kingstree to the coast.



6. This is a relatively small system on which only one gage at Kingstree, S. C., is used as a river stage reporting point. There are four rainfall reporting locations in the area of concern: Bishopville, Sumter, Manning and Kingstree. Rainfall totals for April, May and June for these four stations are indicative of rainfall on the Black and Pocotaligo River Basins. Daily totals are listed in Table 1. At Bishopville, in the headwater area, rainfall was somewhat heavy during the second week of the month but not exceptionally heavy. From Sumter, S. C., to Manning, S. C., 20 miles southeast of Sumter and out to about 10 miles on either side of Manning, rainfall was torrential. A subtropical disturbance, or area of low pressure, remained over southeast South Carolina for almost a week from June 9 - 15. Repeated heavy showers and thunderstorms occurred. At Sumter, for 24 hours up to 7 a.m. of the 10th, .72 inch of rainfall occurred. During the next four hours rainfall of 3.85 inches occurred with the total the next morning 4.12 inches. By 7 a.m. on the 12th another 6.63 inches of rainfall had fallen. Streets, roads, and highways in Sumter County were flooded at dozens of locations. A few miles south of Sumter, S. C., a Greyhound Bus was swept from the road by flood waters. In Clarendon County, bordering Sumter County on the southeast, Mr. G. H. Hardy, County Supervisor, measured $17\frac{1}{2}$ inches of rainfall Tuesday, June 12, at a point about seven miles east of Manning. From runoff and flooding, indications are that this much rainfall or more occurred due west of Manning on that day. At Shaw Air Force Base, a few miles west of Sumter, rainfall of 7.51 inches was recorded on the 10th, .67 inch on the 11th, and 1.54 inches on the 12th for a three day calendar total of 9.72 inches. By noon, Tuesday, June 12, all roads out of Manning were impassable except for U. S. 301 South. Every road crossing of Pocotaligo River from U. S. Highway 15 at Paxville, S. C. downstream to Manning was washed out. About 75 locations in Clarendon County had water running across the road or had roads or bridges washed out. At I-95 Highway, a few miles north of Manning, water three feet deep was running across south bound lanes. Home Branch community was isolated with all roads washed out or impassable. Water also crossed U. S. Highway 301 N. two miles north of Manning at least six feet deep and flooded the northern edge of Manning.

7. In Williamsburg County, next county downstream from Clarendon County, the Black River at Kingstree rose on the 13th from a stage of 10.7 feet at 7 a.m. on the 13th to 16 feet, four feet above flood stage, by 7:15 p.m. that same day and crested at 19.77 feet at 11 p.m. on the 14th. That is the highest stage recorded there since the gage was installed in 1894. It exceeds the previous highest flood of 18.0 feet in September 1928 by 1.77 feet.

8. Near normal rainfall occurred over the northwestern third of the Columbia River District (State of South Carolina). Monthly totals show near 10 inches over South Carolina mountains ranging down to $3\frac{1}{2}$ inches in much of the Piedmont. Over headwaters of the Catawba and Yadkin Basins in North Carolina the average was about $4\frac{1}{2}$ inches. The average over the Pee Dee Basin below Highrock Lake, N. C., to the coast was $5\frac{1}{2}$ to 6 inches of rainfall. Precipitation over the Lumber Basin averaged $4\frac{1}{2}$ inches.

TABLE 1
 Recorded Rainfall For Selected Stations
 Influencing Black River Basin

Day	April 1973			May 1973			June 1973		
	Bishop-ville	Sumter	Kings-tree	Bishop-ville	Sumter	Kings-tree	Bishop-ville	Sumter	Kings-tree
1	2.08	1.92	1.20	-	-	-	-	-	-
2	.08	.06	.14	-	-	.08	-	-	-
3	-	-	.55	-	-	-	-	-	-
4	.10	.07	.28	.11	.06	.85	-	-	-
5	.03	.05	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-
7	-	-	.03	-	-	-	1.05	.91	.27
8	1.64	2.12	2.60	-	-	-	.22	-	-
9	-	-	1.60	.62	1.68	.61	-	.06	.29
10	-	-	-	-	-	.30	.90	.72	.53
11	-	-	-	-	-	-	1.78	4.12	2.40
12	-	-	-	.31	.77	.49	1.36	6.63	1.50
13	-	-	-	-	-	-	.34	.23	.60
14	-	-	-	-	-	-	-	-	.10
15	-	-	-	-	-	.18	-	.03	.10
16	-	-	-	-	-	-	.21	.48	.85
17	-	-	-	-	-	-	.06	.07	.01
18	-	-	-	-	-	-	-	-	.10
19	-	-	-	-	-	-	-	-	-
20	-	-	-	.13	.18	.07	.11	.02	.44
21	-	-	-	.02	-	-	.68	2.00	-
22	-	-	-	-	-	-	.78	.15	.05
23	-	-	-	-	-	-	-	.49	.20
24	-	-	-	.16	.32	-	-	-	.33
25	.19	.64	.22	.35	.05	.56	.35	-	-
26	.01	.65	.03	-	-	-	.03	-	-
27	.51	.27	.32	.98	-	-	-	-	-
28	-	-	-	-	-	-	.09	-	.03
29	-	-	-	.13	.11	.04	.22	.45	.50
30	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-
Total	4.64	5.13	4.67	2.81	3.17	2.88	8.18	14.33	9.75
Normal			4.67			1.55			8.63

*Only Established Normal

9. For the southeastern third of Columbia River District it was astoundingly different. The monthly total of 27.24 inches at Charleston, S. C., airport is the highest monthly total recorded since the settlers started keeping records in the year 1738. Near 18 inches of rainfall occurred from southern shores of Lake Marion to Shaw Air Force Base near Sumter, S. C. Locally over 17 inches of rainfall occurred over headwaters of the Edisto Basin. A subtropical low moved inland from over the Atlantic on the 19th and remained over southeastern South Carolina for a week. Bands of showers and thunder-showers kept developing and remained stationary or moved only very slowly. Day after day excessive rainfall and flash flooding would develop first in one locality and then another.

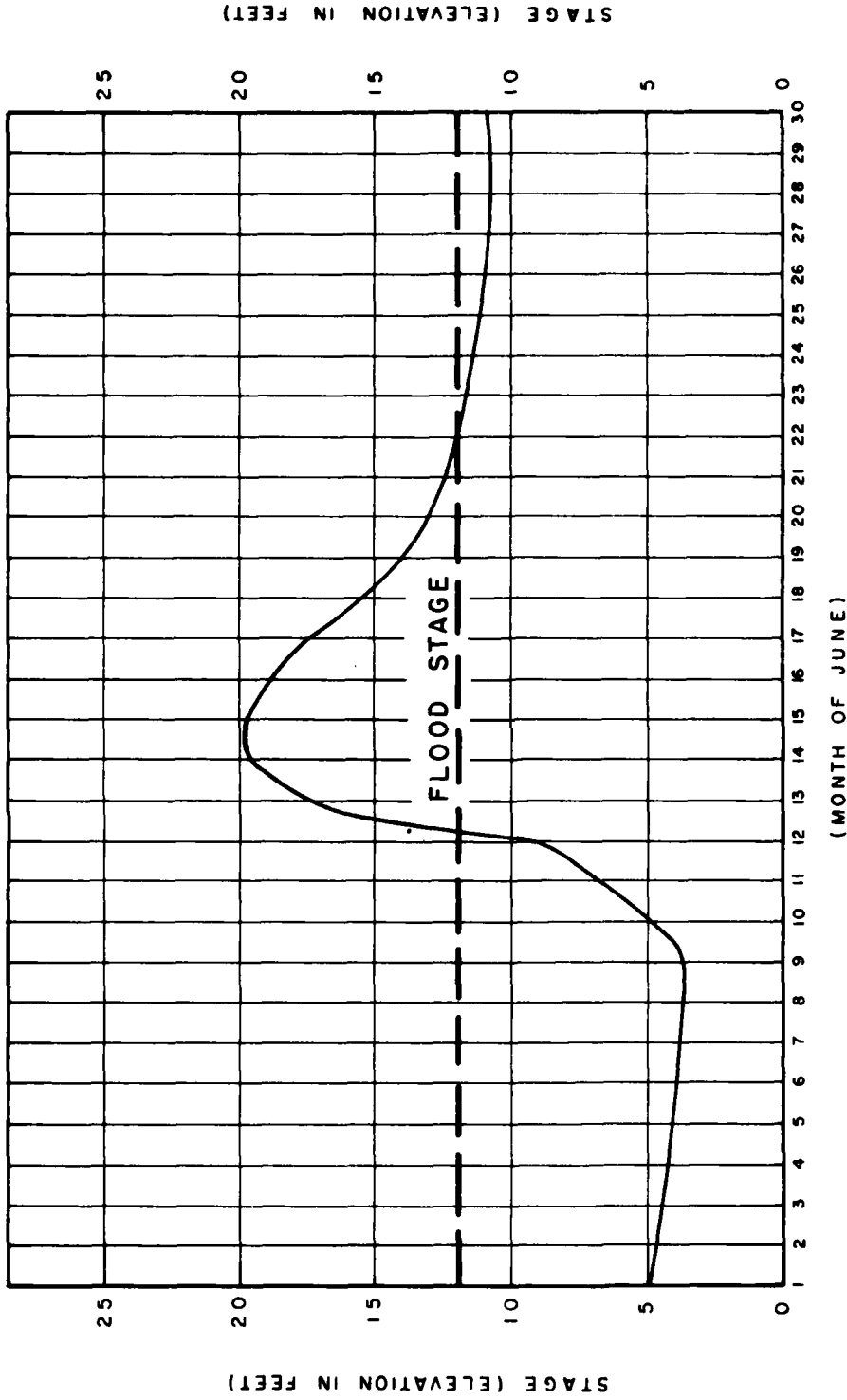
10. Counties receiving most rainfall were Charleston, Dorchester, portions of Orangeburg and Bamberg counties, Clarendon, and Williamsburg. In three days, 10th - 12th, Shaw Air Force Base, west of Sumter six or seven miles, received 9.72 inches of rainfall with most of it the first day. Sumter Waterworks Department reported 11.47 inches of rainfall from 7 a.m. on the 9th to 7 a.m. on the 12th. Rainfall came in periods of four to six hours in "cloudburst" manner. On Tuesday, June 12, a center of very heavy rainfall developed over the adjoining Clarendon County. Unofficial rainfall measurements by responsible citizens gave $17\frac{1}{2}$ inches in one 24 hour period, June 12, at a point seven miles east of Manning, S. C. Another citizen reported over $15\frac{1}{2}$ inches of rainfall about $3\frac{1}{2}$ miles northwest of Manning.

FLOOD DATA

11. General. The flood stage of 12.0 feet msl was exceeded on 13 June 1973 at Kingstree, and the river remained above this stage until 22 June 1973. The peak stage of 19.77 occurred on 14 June 1973 and was 1.77 feet above the known high water mark of 18.0 feet, which occurred 21 September 1928. Figure 2 shows the stage hydrograph at the Highway 52 Bridge over the Black River at Kingstree, South Carolina.

FLOOD DAMAGES

12. Flood damage survey. Representatives of the Charleston District conducted a field survey of the flooding along the Black and Pocotaligo Rivers from state Highway 41, north of Georgetown, to Interstate 95 above Manning to determine the extent of flooding and to establish high water marks. The field surveys indicated that the extent of damage was not severe. However, it was considered that a post-flood report should be made since this was the flood of record. The major damage was to roads, railroads, and urban damage at Kingstree from back water up Kingstree Branch.



CORPS OF ENGINEERS, U.S. ARMY
 CHARLESTON, SOUTH CAROLINA, DISTRICT
STAGE HYDROGRAPH
 U S HWY 52 BRIDGE
 KINGSTREE, S. C.
 USGS GAGE

NOTE:
 25.533 FT. M.S.L. = 0 FT. GAGE

FIGURE 2

13. Categorization and classification of damages. Flood losses were grouped into two major categories: physical damage to property and emergency costs. Physical damage to property was estimated by evaluating the cost of replacing, repairing, or rehabilitating the affected property and emergency losses were estimated as the costs of evacuation and reoccupation of flooded areas, relief, care or rehabilitation of flood victims, and increased cost of doing business during the flood. For this report, damages were classified as rural non-agricultural, non-crop agricultural, crops, and urban. A brief description of each type of damage classification is included in the succeeding paragraphs.

14. Rural non-agricultural. Numerous damages of this type were found between Manning and Andrews and consisted mainly of damage to farm roads, drainage ditches, and embankment erosion to the Seaboard Coastline Railroad.

15. Non-crop agricultural. The damages noted in this classification consisted of damages to equipment, buildings, pastures, and emergency losses associated with the isolation of buildings, equipment, and animals.

16. Crops. Crop losses consisted of losses to planted crops and losses due to late planting where river stages caused backwaters in drainage ditches, thereby saturating soils which delayed field preparation and planting.

17. Urban. Urban damages experienced were subdivided into physical damages and emergency losses.

ESTIMATED DAMAGES

18. The estimated damages by classification, stream and location are summarized in the following paragraphs and in Table 2.

19. Rural non-agricultural losses. The following summarizes the rural non-agricultural losses:

a. Roads. All roads from Highway 41 at Andrews to Highway 15 above Manning with the exception of Highway 377 were closed at one time or another. The locations of the major roads are shown on Figure 1, the General Basin Map, and are tabulated in Table 3. Most roads were closed due to inundation or washout around the bridge abutment. No estimate was made of the loss of wages due to people being unable to get to work for several days because the normally 19 mile trip became a 70 mile trip for the people who live in Manning and work in Sumter nor was an estimate made of the loss due to additional travel for through traffic. For instance, north bound traffic was rerouted up 601 at Orangeburg to 378 through Sumter to 301 near Turbeville.

TABLE 3
MAJOR ROADS CLOSED BY WASHOUT OR INUNDATION

<u>Road</u>	<u>Location</u>	<u>Closure Time</u>
HWY 41	North of Georgetown	16-23 June
HWY 30	Southeast of Kingstree Northwest of Andrews	15-21 June
HWY 52	West of Kingstree	14-16 June
HWY 35	Just South of HWY 527 from Kingstree	14-18 June
HWY 50	East of Manning on the Pocotaligo River	11-19 June
HWY 40	Located Northeast of Manning	11-12 June
HWY 301	Located just North of Manning on the Pocotaligo River	12-14 June
I-95	Located Northwest of Manning on the Pocotaligo River	12-14 June
HWY 15	Just South of Sumter on the Pocotaligo River	12-13 June

b. Railroads. The Seaboard Coast Line Railroad suffered extensive damage at Manning. There were 32 washouts along the embankment. Also, the roadbed received some damage. Mr. Watson, SCL Division Engineer estimated the total loss, including emergency costs, cost of rerouting traffic, and repair costs at \$150,000.

c. Utilities. There were no reports of utility damage although additional time was spent disconnecting powerlines where buildings were in danger of being flooded.

d. Other. There were a few cabins on Black River that were flooded; a sand operation and a sawmill below Highway 41 were flooded. It was estimated that \$34,000 in damages occurred in the vicinity of Highway 41.

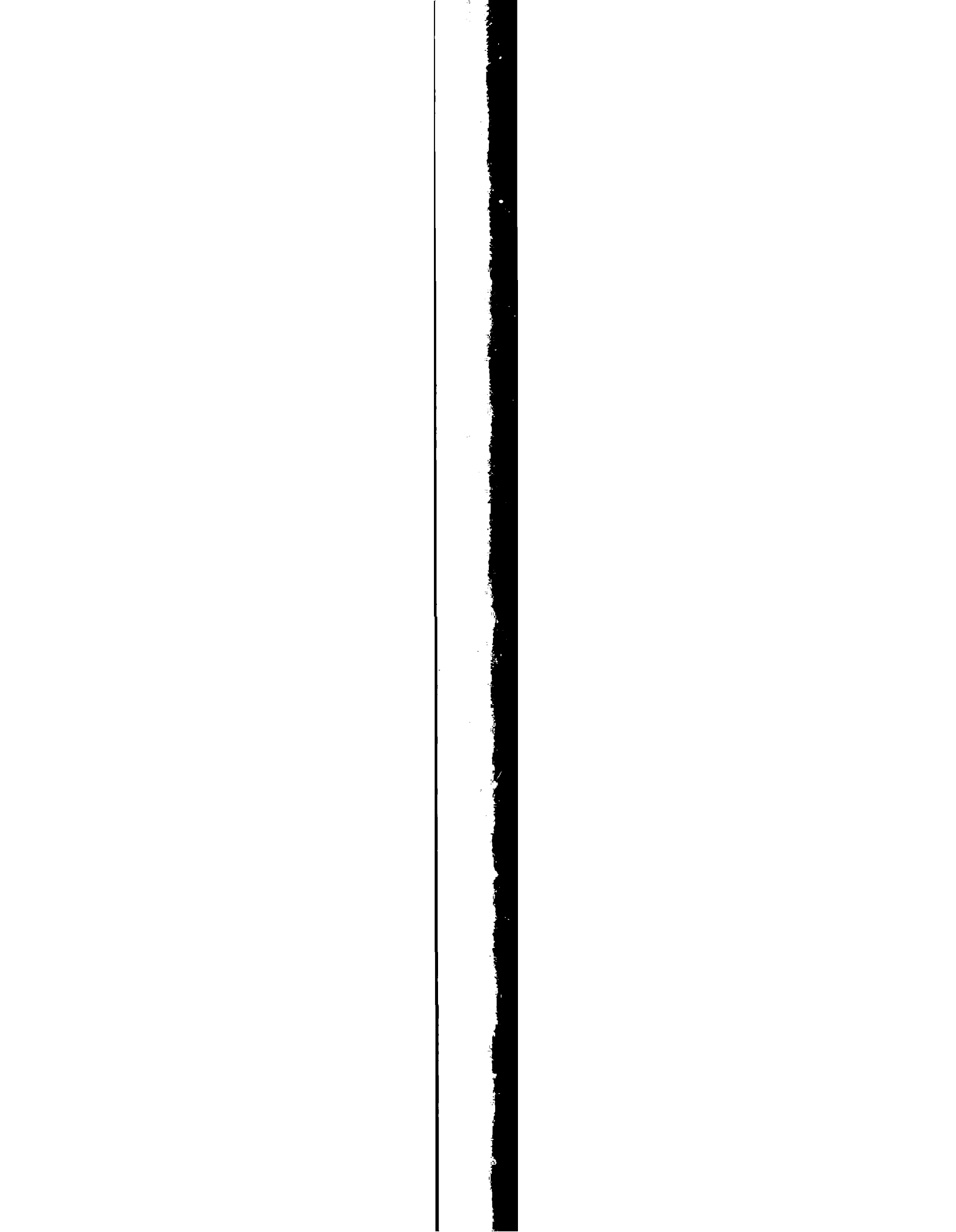
20. Crop losses. There were only three areas of substantial crop loss due to flooding although major losses resulted from poor lateral drainage and excess rain. There were scattered areas where the edge of fields were flooded, but these losses were minor. The three major damage areas were M. O. Parson's farm adjacent to Black River at Highway 41 - 50 acres of soybeans; farm below Highway 52 at Kingstree - 80 acres of soybeans; farm above and below U. S. 301 on Black River outside Manning, 1,100 acres of soybeans.

21. Urban losses. The main urban losses were at Kingstree, four houses on Scrivens and Scotts Cabin road had water at depths ranging from one foot to three feet and damage was extensive. Damage also occurred along Kingstree Branch due to backwater effect of Black River. Had the Corps' authorized Kingstree Branch channelization project been operational it would not have had any effect in reducing damages as they resulted from backwater from the Black River. Officials of Kingstree had estimated that commercial and residential damages amounted to \$300,000. Additionally, about \$4,400 was spent in emergency costs, such as cleanup, evacuation, stand-by, temporary housing, etc.

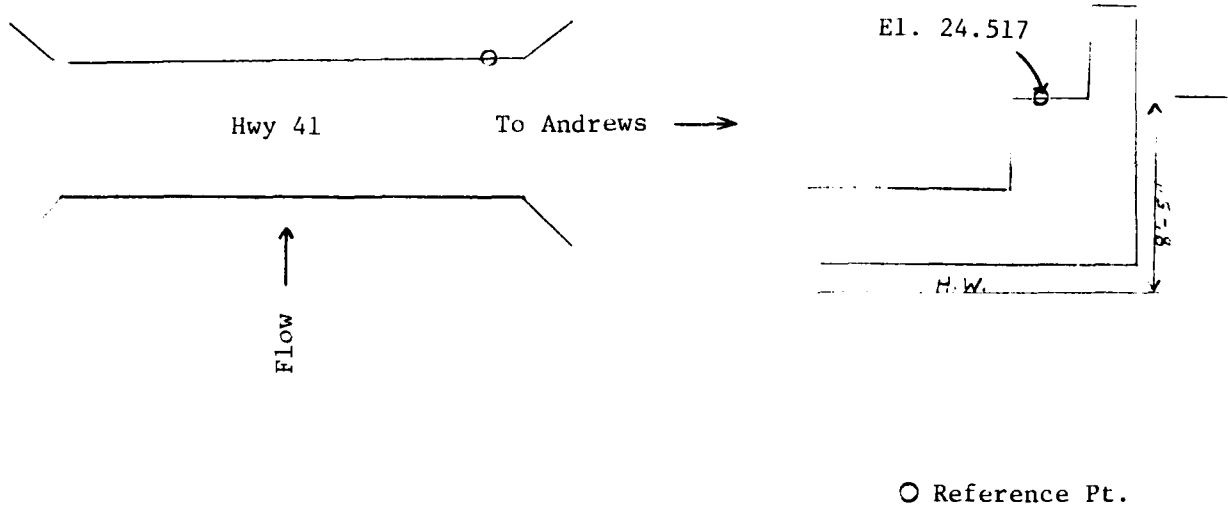
22. In Manning, the only urban losses were at the edge of the swamp on Highway 301. A Zippy Mart had water two shelves deep, two gas stations, a garage and 12 trailers had about two feet of water in them. The Civil Defense Director estimated \$30,000 damage in this area. Spot checks were made and this estimate seemed reasonable. Emergency costs at Manning were about \$1,000.

REFERENCE ELEVATIONS

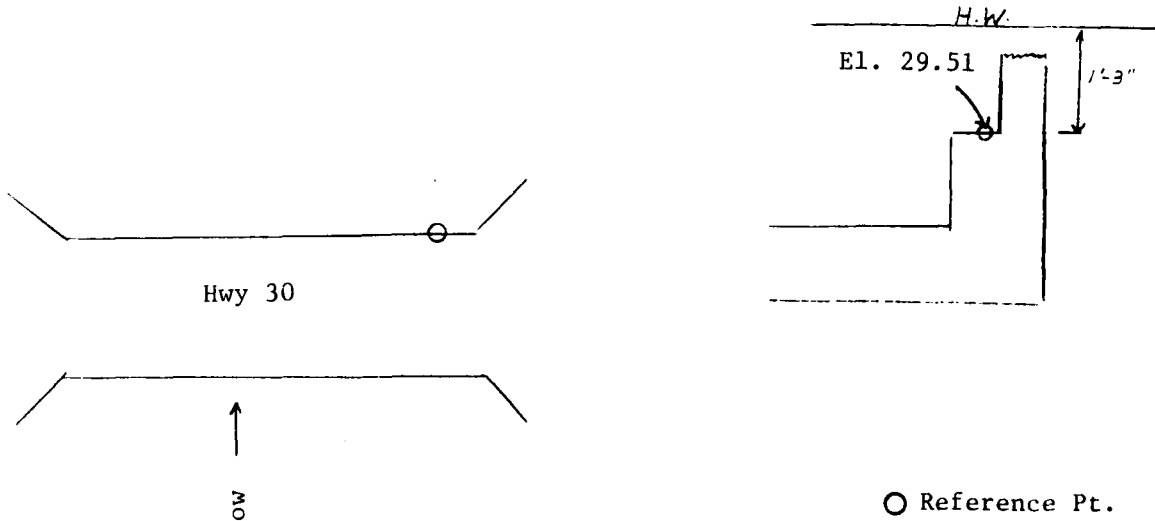
23. Eleven reference elevations establishing highwater marks were fixed in the field by the United States Geological Survey and District personnel. Levels were run to tie each highwater mark into a common datum. The highwater marks established are located on Figure 1, General Basin Map, and shown on Figures 3 through 7. A profile of the highwater marks is shown as Figure 8.



HIGH WATER REFERENCE POINT 1



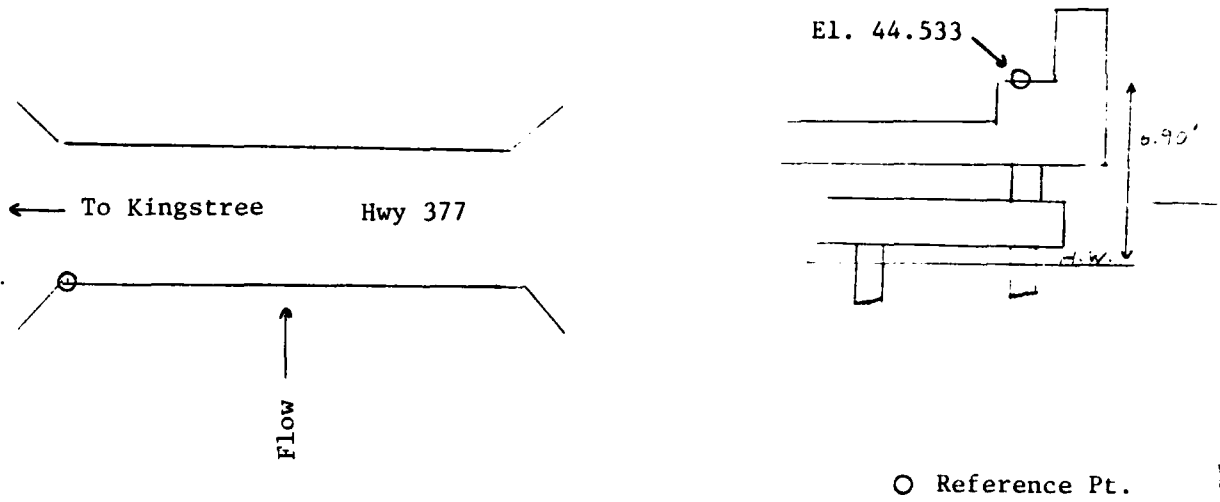
HIGH WATER REFERENCE POINT 2



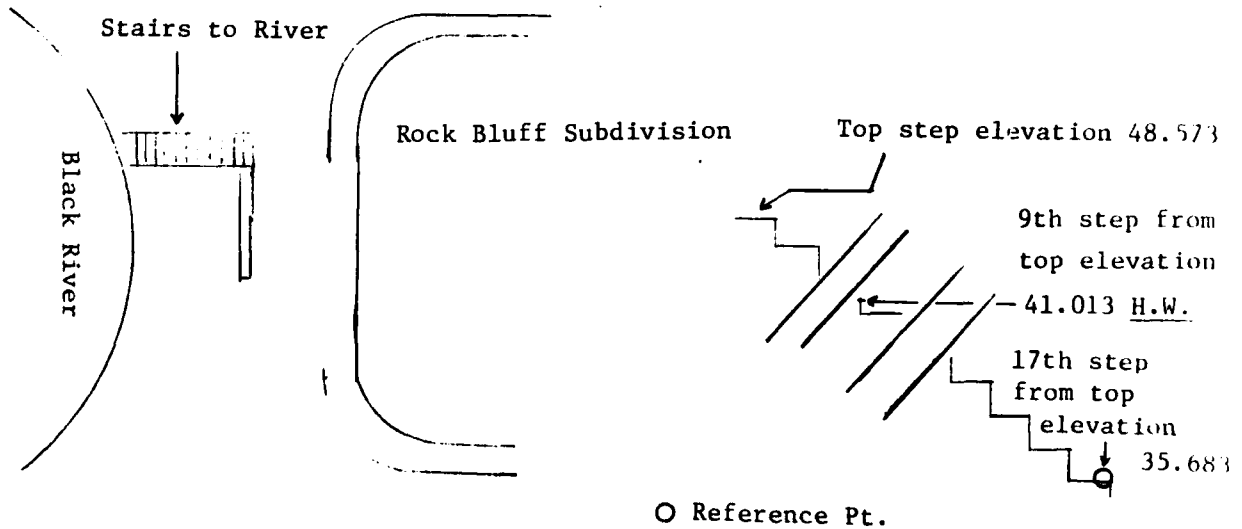
LOCATION & ELEVATION
HIGH WATER REFERENCE POINTS
BLACK & POCOTALIGO RIVERS

Fig. 3

HIGH WATER REFERENCE POINT 3



HIGH WATER REFERENCE POINT 4



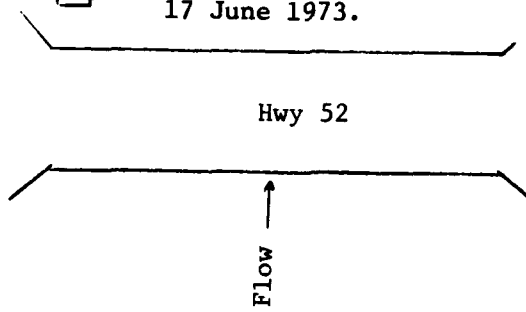
LOCATION & ELEVATION
HIGH WATER REFERENCE POINTS
BLACK & POCOTALIGO RIVERS

HIGH WATER REFERENCE POINT 5

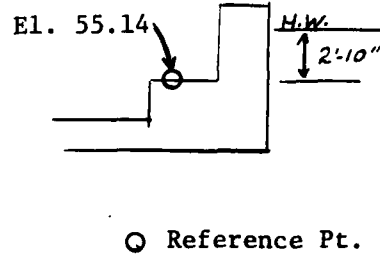
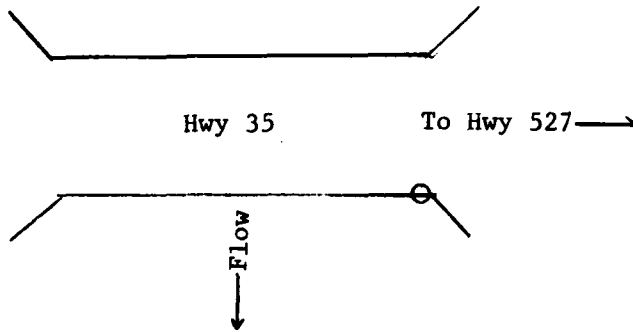
Staff and Discharge gauge



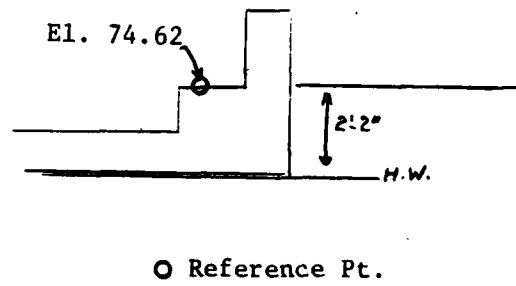
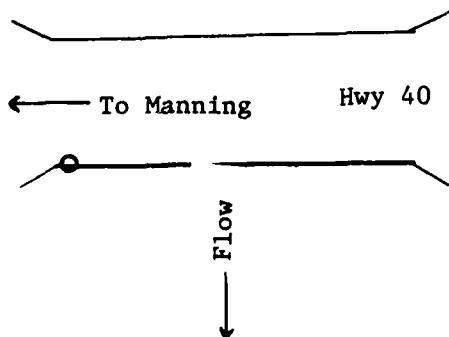
El. 25.533 = 0 ft. on gage
Peak stage of 19.77 ft read on gage
17 June 1973.



HIGH WATER REFERENCE POINT 6

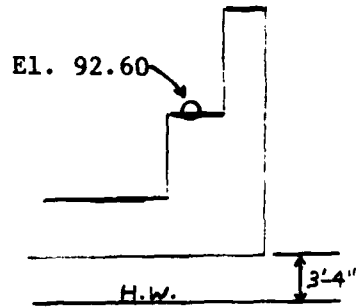
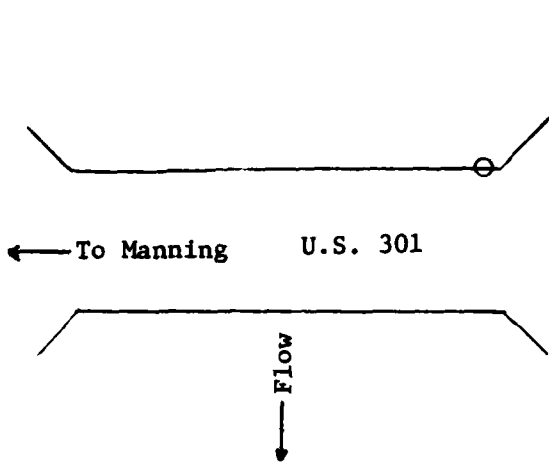


HIGH WATER REFERENCE POINT 7



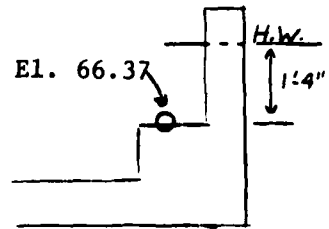
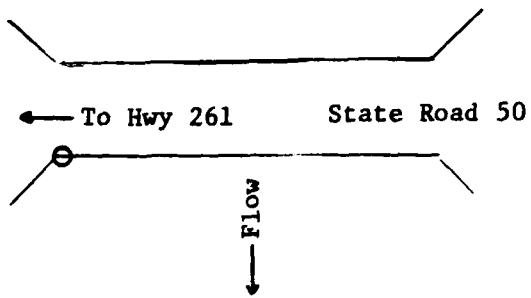
LOCATION & ELEVATION
HIGH WATER REFERENCE POINTS
BLACK & POCOTALIGO RIVERS

HIGH WATER REFERENCE POINT 8



○ Reference Pt.

HIGH WATER REFERENCE POINT 9

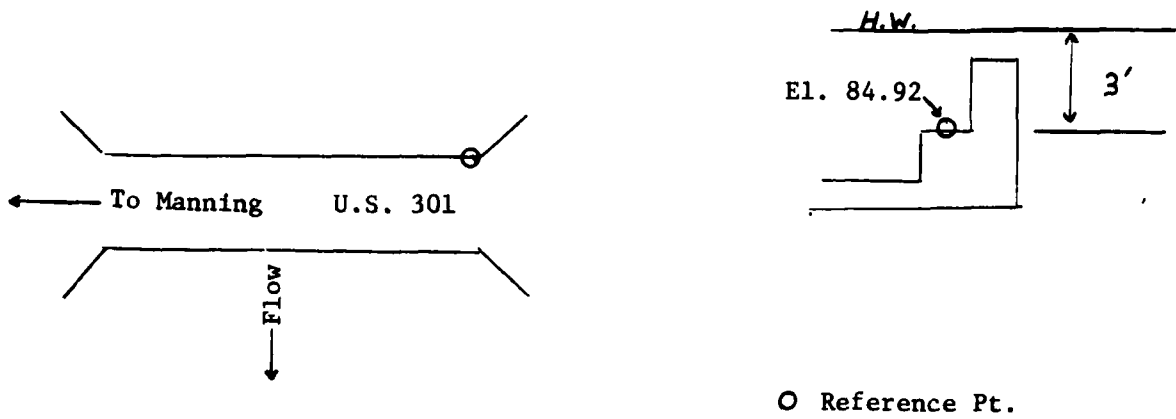


○ Reference Pt.

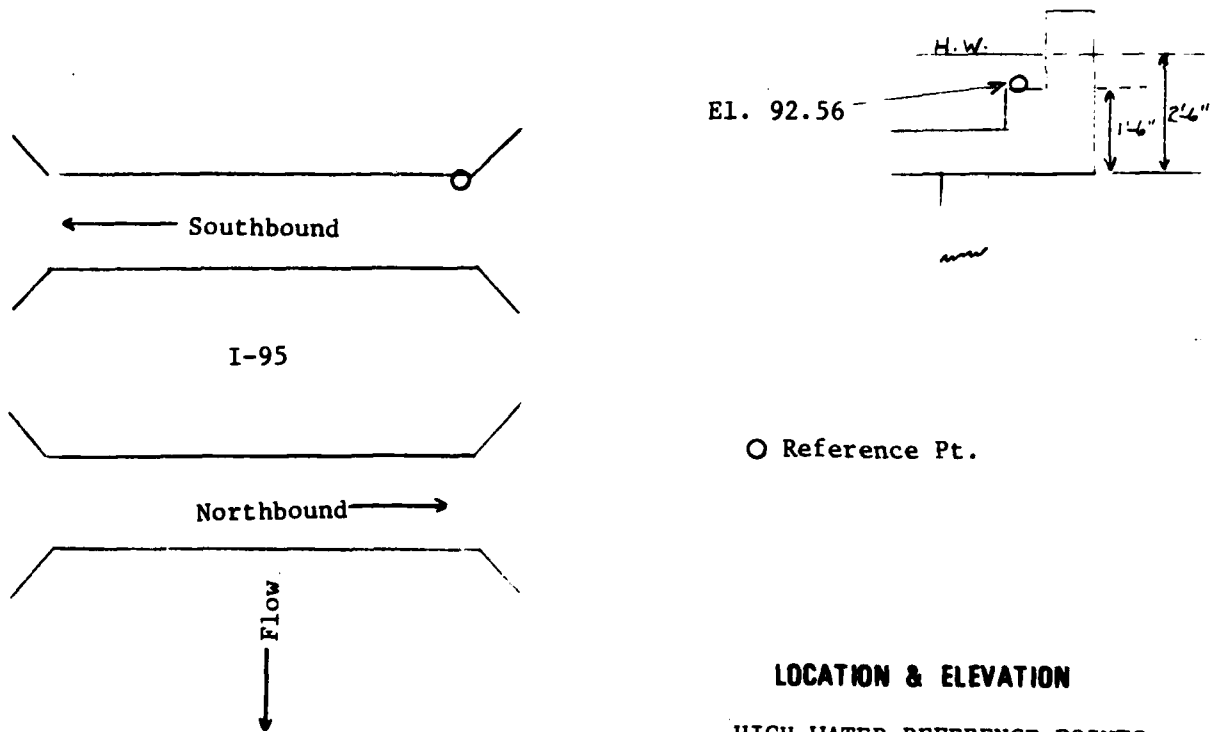
LOCATION & ELEVATION
HIGH WATER REFERENCE POINTS
BLACK & POCOTALIGO RIVERS

Fig. 6

HIGH WATER REFERENCE POINT 10



HIGH WATER REFERENCE POINT 11



LOCATION & ELEVATION
HIGH WATER REFERENCE POINTS
BLACK & POCOTALIGO RIVERS

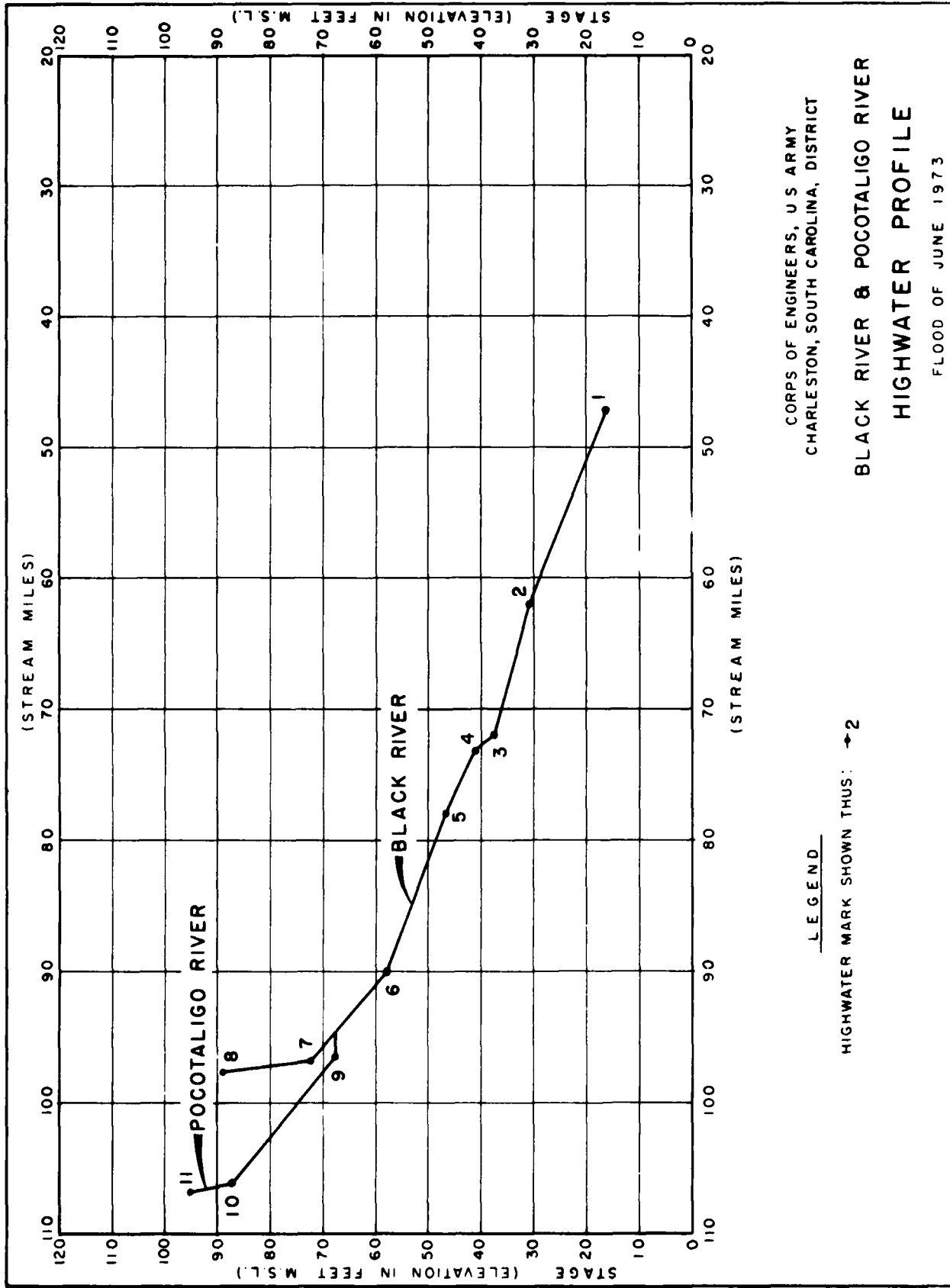


FIGURE 8

24. Loss of Life. There were two drownings during the flood. One occurred at Alcolu in Clarendon County when a small boy stepped into a deep hole. The other occurred when a boy jumped into the Black River at Highway 41 bridge, on a dare, and was swept away by the high water velocity.

25. Recommendations. The major damage was to roads, railroads, and the urban damage at Kingstree (mainly from backwater up Kingstree Branch). Other damage was scattered along many miles of river. There did not appear to be enough localized damage to warrant any study at this time.



HARRY S. WILSON, JR.
Colonel, Corps of Engineers
District Engineer

END

FILMED

8-85

DTIC





