AVAILABILITY AND COMPILATION OF SELECTED STREAMFLOW DATA FOR THE MOBILE RIVER AND ITS DISTRIBUTARIES INCLUDING THE LOWER ALABAMA RIVER AND THE LOWER TOMBIGBEE RIVER

By William L. Psinakis

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ILLUSTRATIONS

TABLES

CONVERSION FACTORS

For use of readers who prefer to use metric units, conversion factors for terms used in this report are listed below:

Multiply	By	To obtain
	Length	
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	2.590	square kilometer (km^2)
	Flow	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)

National Geodetic Vertical of 1929 (NGVD of 1929): A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, called NGVD of 1929, formerly called mean sea level.

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ABSTRACT

The U.S. Army Corps of Engineers and the U.S. Geological Survey have collected streamflow data in and near the Mobile Estuary, in southwestern Alabama since 1940. These data include stage, stream velocity, and water-quality information, which were collected from 12 gaging stations and at miscellaneous sites in the area. From 1978 to 1983 over 100 discharge measurements were made along the U.S. Highway 90 Causeway, for the Tensaw, Apalachee, and Blakeley Rivers. Flood profiles for the Mobile River study area have been compiled and are on file with the U.S. Army Corps of Engineers, Mobile District.

This report summarizes and categorizes the data collected in southwestern Alabama and lists the availability of the data and the location where the data are on file.

INTRODUCTION

The Mobile River, together with its lakes, shallow swamps, tributaries, and distributaries, is an abundant water resource in Mobile and Baldwin Counties in southwestern Alabama. The uses of this water resource are varied. Industry uses the Mobile River as a water highway to transport goods, utilities use the water supply for power plants, recreational uses are enjoyed by many, and this water system serves as an environmental habitat for a variety of fish and wildlife.

Some or all of these uses, as well as the river system itself, may be affected by man-made and natural changes. Questions, including how the construction of a bridge may affect the flow of a river, how much damage may be done to the ecology of the area, and how the quality of the water would change if a hurricane should strike, may be answered through the use of streamflow models. However, effective use of these models requires adequate streamflow data.

Streamflow data have been collected in the area since 1940, and some of these data are published in various reports. Gaging stations have been established to collect continuous stage data and discharge, velocity, specific conductance, and water temperature measurements have also been made. These data will be helpful in future studies. Compilation of these data will provide a much needed source for future studies.

Purpose and Scope

The purpose of this report is to describe the type of streamflow data that have been collected along the Mobile River and its distributaries, list its availability and identify where it may be obtained. Data collected for the lower reaches of the Alabama and Tombigbee Rivers are also included. For this report, the lower reaches of the Alabama and Tombigbee Rivers are defined as south of Dead River on the Alabama River and south of Bates Lake on the Tombigbee River.

The technical scope of the report includes the identification and compilation of available discharge, water temperature, and velocity data collected in the study area. Stream gaging stations were established in 1978 to record water quality and velocity data along the U.S. Highway 90 Causeway for the Apalachee, Blakeley, and Tensaw Rivers, and other gaging stations were established in other locations in the study area to record stage data.

Acknowledgments

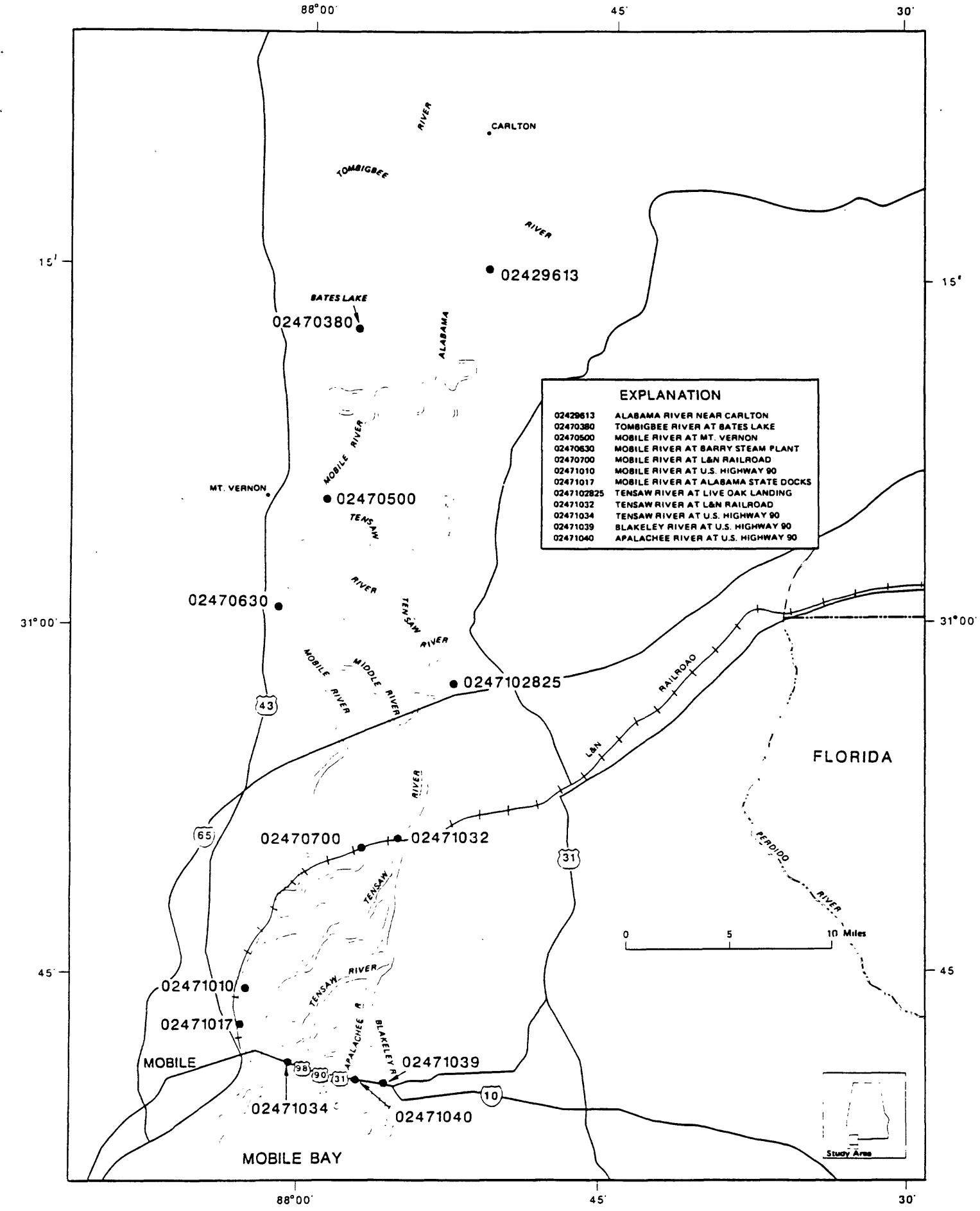
Appreciation is expressed to the U.S. Army Corps of Engineers, Mobile District, for their cooperation and assistance.

STUDY AREA

The study area includes the lower reaches of the Alabama and Tombigbee Rivers, and the Mobile Estuary which includes the Apalachee, Blakeley, Mobile, and Tensaw Rivers above U.S. Highway 90. For this report, the lower reaches of the Alabama and Tombigbee Rivers are defined as south of Dead River on the Alabama River and south of Bates Lake on the Tombigbee River (fig. 1).

Description of Area

The lower reaches of the Alabama and Tombigbee Rivers flow through a primarily flat and wooded terrain. The confluence of these rivers, approximately 30 miles north of the city of Mobile, forms the Mobile River which flows in a single channel for about five miles before entering the Mobile Estuary which consists of a maze of small channels, lakes, and bayous. As it enters this swampy estuary, the Mobile River diverges into two distinct channels; the Mobile River which flows along the western section of the estuary, and the Tensaw River which flows along the eastern section of the estuary. The Mobile River discharges into Mobile Bay at the city of Mobile. The area of the Mobile River and its estuary is 520 mi^2 of which approximately 85 percent is marshland. The Tensaw River divides into several channels enroute to Mobile Bay, and discharges into the bay through the Apalachee, Blakeley, and Tensaw Rivers.


88°00'
45'
30'
15'
31°00'
CARLTON
TOMBIGBEE RIVER
02429613
BATES LAKE
02470380
ALABAMA
MOBILE RIVER
MT. VERNON
02470500
TENSAW RIVER
02470630
MIDDLE RIVER
0247102825
RAILROAD
L&N
FLORIDA
PERDIDO RIVER
02470700
02471032
02471010
02471017
MOBILE
02471039
02471034
02471040
APALACHEE R.
BLAKELEY R.
MOBILE BAY
43
65
31
98
90
10
0 5 10 Miles
Study Area
EXPLANATION
02429613 ALABAMA RIVER NEAR CARLTON
02470380 TOMBIGBEE RIVER AT BATES LAKE
02470500 MOBILE RIVER AT MT. VERNON
02470630 MOBILE RIVER AT BARRY STEAM PLANT
02470700 MOBILE RIVER AT L&N RAILROAD
02471010 MOBILE RIVER AT U.S. HIGHWAY 90
02471017 MOBILE RIVER AT ALABAMA STATE DOCKS
0247102825 TENSAW RIVER AT LIVE OAK LANDING
02471032 TENSAW RIVER AT L&N RAILROAD
02471034 TENSAW RIVER AT U.S. HIGHWAY 90
02471039 BLAKELEY RIVER AT U.S. HIGHWAY 90
02471040 APALACHEE RIVER AT U.S. HIGHWAY 90

02429613 ALABAMA RIVER NEAR CARLTON

LOCATION.-- Lat 31°15'14", long 87°50'31", in SE1/4 sec. 2, T. 3 N., R. 2 E., Clarke County, on right bank, about 9 miles south of Carlton, at river mile 19.2.

DRAINAGE AREA.-- 22,580 mi^2, approximately.

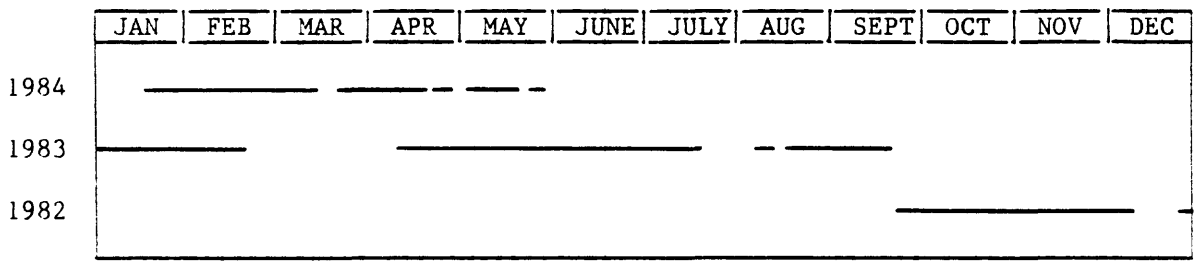
PERIOD OF RECORD.-- September 22, 1982 to June 26, 1984.

COOPERATOR.-- U.S. Army Corps of Engineers.

GAGE.-- Automatic digital recorder connected to a bubble gage manometer and standard outside staff gage. Datum of gage is 2.33 feet NGVD of 1929 (Corps of Engineers Benchmark).

REMARKS.-- The river has one channel at all stages and bankfull stage along the steep right bank is about 26 feet and along the sloping left bank about 12 feet. Some fluctuations of flow occur due to the operation of power plants upstream.

STAGE DATA.-- Stage data were collected during the period of record. Graph below shows the periods for which stage data are available. These data are on file at the U.S. Geological Survey, Montgomery.



02470380 TOMBIGBEE RIVER AT BATES LAKE NEAR MALCOLM

LOCATION.-- Lat°31 12'45", long 87°56'49", in NE1/4 of SE1/4 sec 38, T. 3 N., R. 1 E., Washington County, about 4.4 miles east of Malcolm, at river mile 9.00.

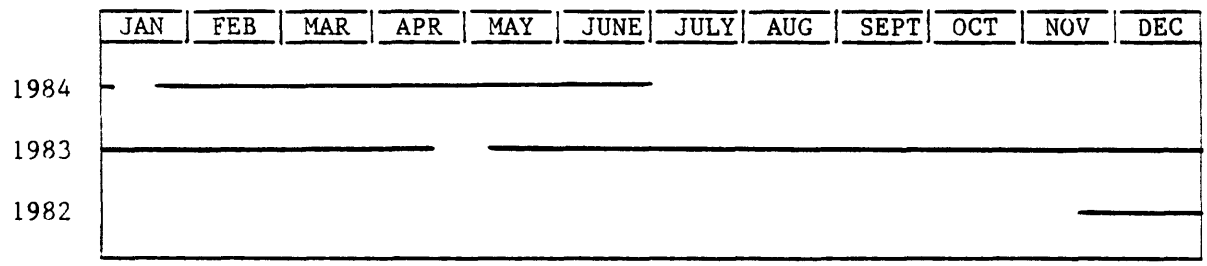
DRAINAGE AREA.-- 20,032 mi^2.

PERIOD OF RECORD.-- September 14, 1982 to June 27, 1984.

COOPERATOR.-- U.S. Army Corps of Engineers.

GAGE.-- Automatic digital recorder and standard outside gage. Datum of gage is 0.52 foot NGVD of 1929.

STAGE DATA.-- Stage data were collected at this station during the period of record. Graph below shows the periods for which stage data are available. These data are on file at the U.S. Geological Survey, Montgomery.



02470500 MOBILE RIVER NEAR MOUNT VERNON

LOCATION.-- Lat°31 06'50", long°87 58'05" in SE1/4 sec. 41, T. 2 N., R. 1 E., Mobile County, at boat pier on west bank of David Lake, 0.5 mile upstream of outlet to Mobile River, 2.5 miles northeast of Mount Vernon, at river mile 41.35.

DRAINAGE AREA.-- 1/

PERIOD OF RECORD.-- July 29, 1953 to September 30, 1954
June 7, 1972 to June 25, 1973
October 1, 1974 to March 28, 1975
September 15, 1982 to present.

COOPERATORS.-- U.S. Army Corps of Engineers and Geological Survey of Alabama.

GAGE.-- July 1953 to September 1954; water stage recorder with a thermograph attachment and standard outside staff gage. Datum of gage about 2 feet NGVD of 1929, based on comparative readings. June 1972 to June 1973, continuous water stage strip chart recorder and standard outside staff gage. Gage datum about 1.3 feet below NGVD of 1929. October 1974 to March 1975, continuous water stage strip chart recorder and standard outside staff gage. Gage datum about 4 feet below NGVD of 1929. September 1982 to present; digital recorder and standard outside staff gage. Gage datum about 3.7 feet above NGVD of 1929.

REMARKS.-- David Lake is subject to tidal fluctuations at low and medium stages. At high stages the tidal effect is drowned out and the river spreads out over a large swampy area extending eastward of David Lake for about 6.5 miles. The west bank of David Lake is high and is not inundated.

STAGE DATA.-- Data collected from October 1953 to September 1954 and October 1972 to July 1973 are available, and information regarding these data may be obtained from the U.S. Geological Survey, Alabama District. The data collected from October 1974 to March 1975 are on file at the U.S. Army Corps of Engineers, Mobile. The data collected since September 1982 are on file at the U.S. Geological Survey, Montgomery.

DISCHARGE DATA.-- Daily discharge data for October 1953-September 1954 are published in U.S. Geological Survey Circular 373 (Robinson and others, 1956). Discharge measurements made during this period are on file at the U.S. Geological Survey, Montgomery. Daily discharge data for October 1972-July 1973 are on file at the U.S. Geological Survey, Montgomery. Summary data from discharge measurements made March 15, 1979 and March 17, 1980 are tabulated in tables 1 and 2.

WATER-QUALITY DATA.-- Water-quality data including temperature and dissolved solids concentrations were collected during October 1953-September 1954 and are published in Geological Survey Circular 373 (Robinson and others, 1956).

MISCELLANEOUS DATA.-- A dye study was conducted in the vicinity of the station during November 17-22, 1972. Information pertaining to this study is on file at the U.S. Geological Survey, Tuscaloosa.

1/ Drainage area in Estuary not determined. See Appendix for drainage area of tributaries.

Table 1.--Summary of data from moving boat discharge measurements made March 15, 1979

Run number	Discharge ft^3/s
1	139,100
2	129,700
3	153,700
4	129,600
5	155,800
6	131,100
Average	139,800

Table 2.--Summary of data obtained from discharge measurements made March 17, 1980

Measurement number	Width (ft)	Area (ft^2)	Discharge (ft^3/s)	Remarks
55A	980	38,100	153,000	Measurement made on Mobile River at Mount Vernon (above divide)
55B	545	16,300	70,900	Measurement made on Tensaw River (below divide)
56A	590	20,500	68,500	Measurement made on Mobile River (below divide)

02470630 MOBILE RIVER AT BARRY POWER PLANT AT BUCKS

LOCATION.-- Lat 31°00'10", long 88°01'40", in NW1/2 sec. 31, T. 1 N., R. 1 E., Mobile County, on right bank at Barry Power Plant, 0.4 mile east of Bucks, at river mile 30.5.

DRAINAGE AREA.-- 1/

PERIOD OF RECORD.-- October 30, 1951 to present.

OPERATOR.-- U.S. Army Corps of Engineers.

GAGE.-- October 1951 - August 1963, a weekly graphic recorder. At present, a continuous water-stage recorder and telemark (stage available via telephone). The outside gage is a metal staff gage. Datum of gage is 1.91 feet below NGVD of 1929.

REMARKS.-- The east bank is low and was overflows occur the river spreads over the entire estuary. The estuary extends eastward about 6 miles over wide, flat, wooded swamplands interlaced with smaller channels and distributaries. The west bank in the vicinity of the gage is high and is not likely to be inundated. Some fluctuations in stage occur due to operation of the steam plant and due to tidal effects at low and medium stages.

STAGE DATA.-- Stage data have been collected since October 1951. These available data are on file at the U.S. Army Corps of Engineers. A list of annual peak stages was published in the U.S. Geological Survey "Water Resources Data for Alabama, 1983." A revised list of annual peak stages was published in the 1984 version of this publication.

DISCHARGE DATA.-- Daily mean discharge was computed above the tide effected stage of 5.0 feet, except for storm surges, for the period of record. These data are on file at the U.S. Army Corps of Engineers, Mobile. A list of annual peak discharges was published in the U.S. Geological Survey "Water Resources Data for Alabama, 1983." A revised list of annual peak discharges was published in the 1984 version of this publication. Discharge measurements were made downstream of the gage at river mile 21 and at the L&N Railroad bridge (river mile 13.3).

1/ Drainage area in Estuary not determined. See Appendix for drainage area of tributaries.

02470700 MOBILE RIVER AT L&N RAILROAD BRIDGE NEAR HURRICANE

LOCATION.-- Lat 30°50'13" long 87°56'41" in S1/2 sec 26, T. 2 S., R. 1 E., Mobile County, at L&N Railroad bridge, about 1 mile southwest of Hurricane, at river mile 13.3.

DRAINAGE AREA.--1/

PERIOD OF RECORD.-- August 26, 1952 to October 15, 1955.
September 4, 1981 to January 16, 1984.

OPERATORS.-- August 1952 - October 1955, U.S. Army Corps of Engineers.
September 1981 - January 1984, U.S. Geological Survey.

COOPERATOR.-- September 1981 - January 1984, U.S. Army Corps of Engineers.

GAGE.-- August 1952 - October 1955, a graphic water stage recorder with standard outside staff gage. Gage datum 0.83 foot below NGVD of 1929. September 1981 - January 1984; automatic digital recorder connected to an electromagnetic velocity meter.

REMARKS.-- Both banks are relatively low and are heavily wooded and covered with brush. Because of the low banks, overflow occurs frequently. The low and medium stage controls are the channel and tide. The high stage control is the channel and stuary.

STAGE DATA.-- Stage data collected during August 1952 to October 1955 on file at the U.S. Army Corps of Engineers, Mobile.

VELOCITY DATA.-- Velocity data were collected during September 1981 to January 1984. The following graph shows the periods for which velocity data are available. These data are on file at the U.S. Geological Survey, Montgomery.

DISCHARGE DATA.-- A discharge measurement was made on January 22, 1982. Table 3 lists the data from that measurement.

1/ Drainage area in Estuary not determined. See Appendix for drainage area of tributaries.

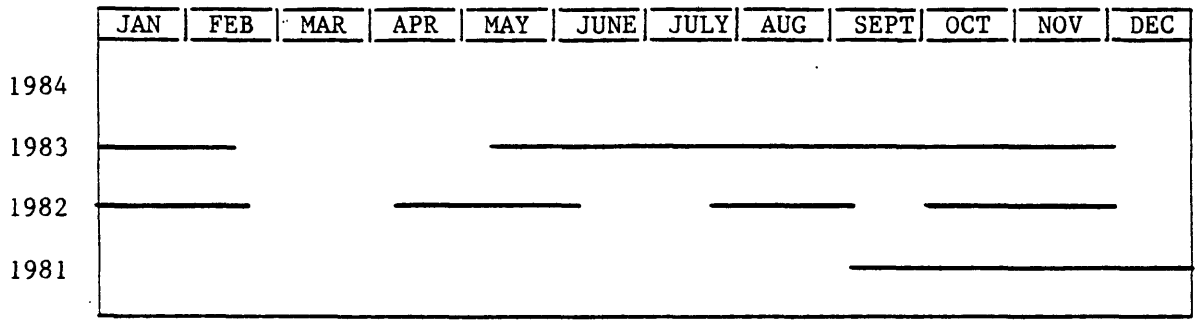


Table 3.--Summary of data obtained from discharge measurement made January 22, 1982, on Mobile River at L&N Railroad bridge near Hurricane

Width (ft)	Area (ft^2)	Discharge (ft^3/s)	Mean velocity (ft/s)	Velocity meter reading (ft/s)
845	10,500	25,300	2.41	2.36

02471010 MOBILE RIVER AT U.S. HIGHWAY 90 NEAR PRICHARD

LOCATION.-- Lat 30°43'59", long 88°02'33", T. 4 S., R. 1 W., Mobile County, left of draw span at the U.S. Highway 90 bridge, near Prichard at river mile 2.89.

DRAINAGE AREA.--1/

PERIOD OF RECORD.-- May 18, 1978 to January 25, 1983.

COOPERATOR.-- U.S. Army Corps of Engineers.

GAGE.-- Two automatic digital recorders: one attached to an electromagnetic velocity meter; the other connected to a water-quality mini-monitor. A second velocity meter was installed immediately upstream of the original meter on June 24, 1980.

VELOCITY DATA.-- Velocity data were collected during the period of record. The following graph shows the periods for which velocity data are available, based on the data collected from the velocity meter installed in May 1978.

The second graph shows the periods for which velocity data are available, based on data collected from the velocity meter that was installed in June 1980. The data collected from this velocity meter were processed under station number 304400088023502.

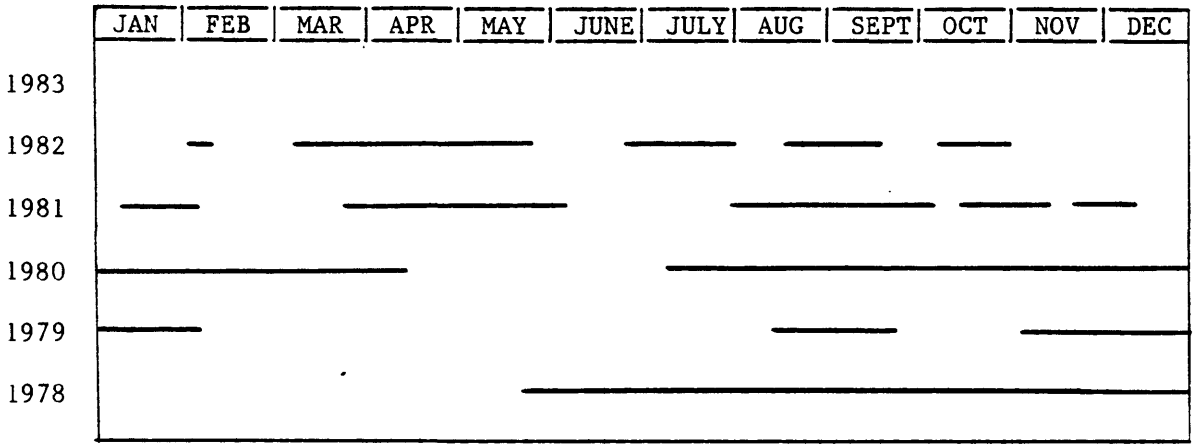
A velocity study was conducted July 16-17, 1978 to calibrate the point velocity meter. The data were collected at selected sites shown in figure 2. The data collected from this study are shown in tables 4, 5 and 6. The negative signs in the data indicate the negative (upstream) directional component. Velocity studies were conducted by the U.S. Army Corps of Engineers in May 1972, April and June 1973, April 1975, March, April, and August 1980, and August 1982. The data from these studies are on file at the U.S. Army Corps of Engineers, Mobile.

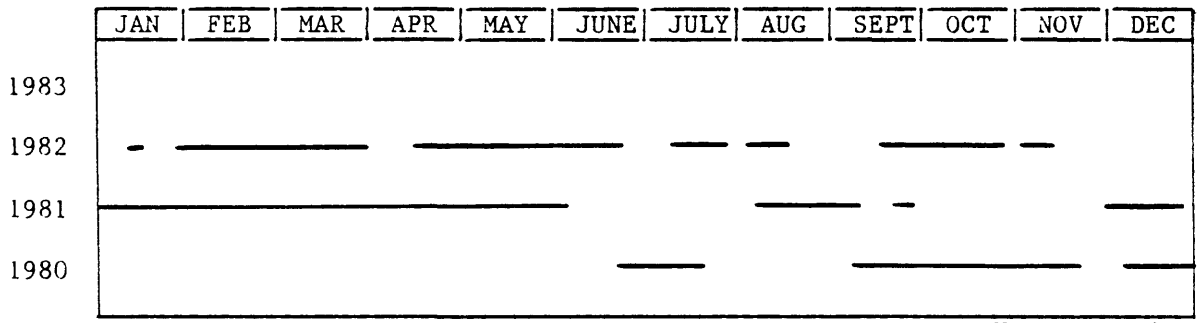
DISCHARGE DATA.-- Discharge measurements made by the moving boat method are on file at the U.S. Geological Survey, Montgomery. Discharge measurements made by the U.S. Army Corps of Engineers, including a measurement made during the flood of March 1961, are on file at the U.S. Army Corps of Engineers, Mobile.

WATER-QUALITY DATA.-- Specific conductance and water temperature data were also collected July 16-17, 1978. Hourly specific conductance and water temperature data were collected from the water-quality mini-monitor during the stations period of operation. These data are on file at the U.S. Geological Survey, Montgomery.

Analyses of sediment samples that have been collected at this station are on file at the U.S. Army Corps of Engineers, Mobile.

1/ Drainage area in Estuary not determined. See Appendix for drainage area of tributaries.





Station 304400088023502 Upstream site

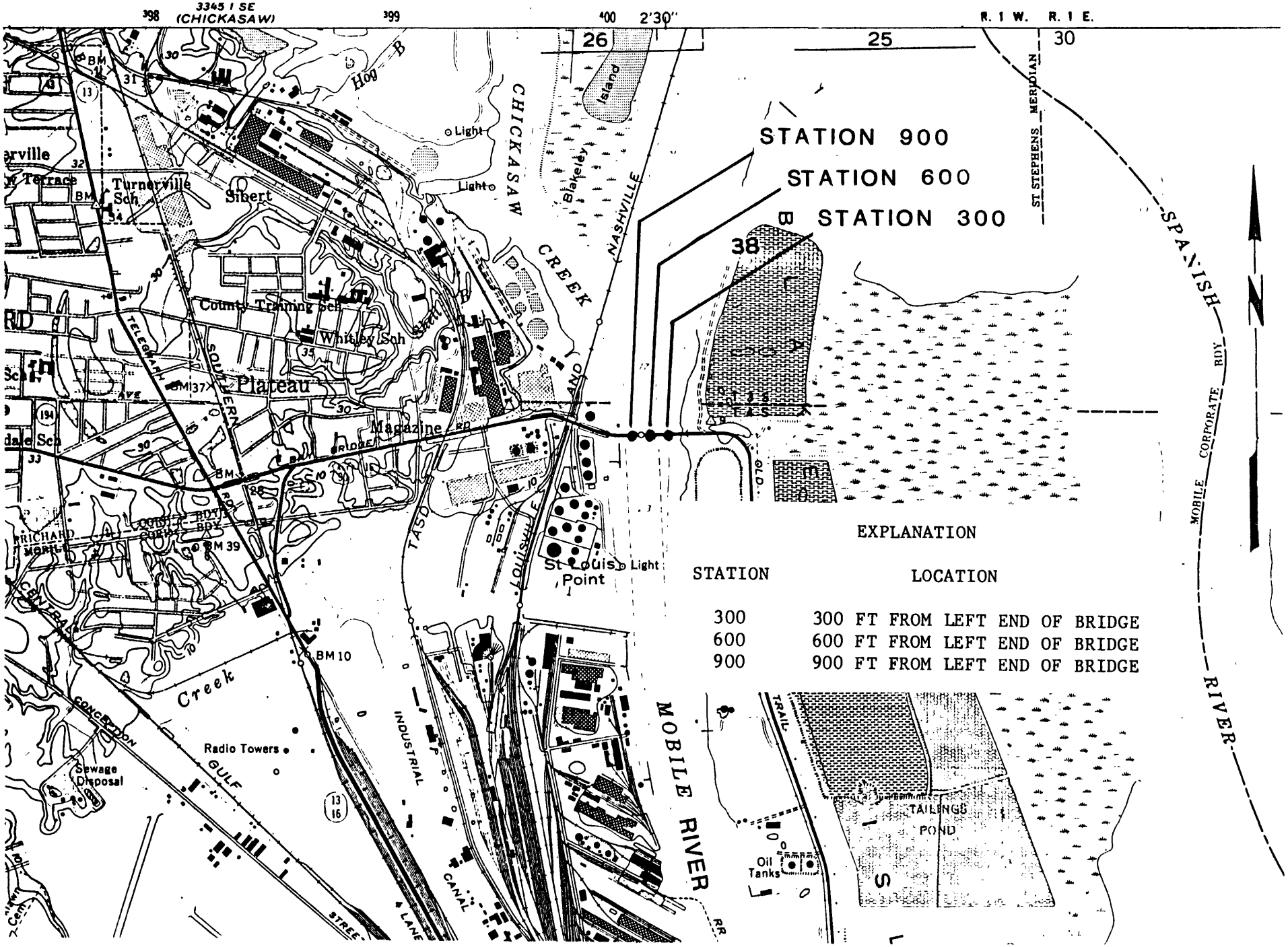


Figure 2—Location of vertical velocity profile study for Mobile River at U.S. Highway 90 near Prichard

Table 4.--Data obtained during velocity study at station 300 for Mobile River at U.S. Highway 90 near Prichard

Date	July 16, 1978													July 17, 1978											
Time	1100	1215	1310	1512	1651	1820	1925	2039	0313	0415	0523	0558	1242	1355	1520	1534	1612	1623	1653	1715	1809	1835	1912	1932	2126
Total depth (ft)	35.9	34.7	33.9	33.3	32.3	31.9	32.3	31.2	33.2	33.2	33.5	33.5	34.1	34.3	32.9	33.1	33.4	33.0	32.9	32.8	32.4	32.5	32.3	32.9	32.6
Percent of total depth	Velocity (ft/s)																								
10	0.84	0.91		1.84			1.29			0.26				1.20		1.58		0.42			1.70				0.84
20	.84		1.23	1.84	1.62	1.26	1.11	0.75	-0.25	-.05	-0.18	-0.40	0.59	1.08	1.23	1.41	1.29	.53	0.69	1.11	1.47	1.20	1.51	1.47	.78
30	.53			1.62			.88			-.23				.78		1.16		.69			1.23				.93
40	.36			1.80			1.08			-.88				.23		1.38		1.29			1.20				.60
50	.27			1.65			.63			-.75				.48		1.58		1.62			1.54				.73
60	.53	1.11		1.80			.63			-.63				.89		1.92		2.05			1.29				.52
70	.95			1.62			.21			-.53				1.35		2.05		2.68			1.62				.44
80	1.11	1.51	1.41	1.62	.95	.84	.16	.56	-.56	-.47	-.76	-.64	.52	1.35	2.08	2.24	2.05	2.68	1.92	1.84	1.67	1.18	1.20	1.23	.48
90	1.08			1.84			.19			-.42				1.35		2.15		2.00			1.23				.29

Table 5.--Data obtained during velocity study at station 600 for Mobile River at U.S. Highway 90 near Prichard

Date	July 16, 1978								July 17, 1978				
Time	1150	1230	1323	1623	1717	1829	2004	2115	0330	0439	0531	0606	1307
Total depth (ft)	30.4	35.8	42.0	28.8	30.6	29.0	28.5	28.6	29.6	29.1	29.3	29.0	30.0
Percent of total depth	Velocity (ft/s)												
10		1.29			2.10			1.26			0.11		
20	0.99	1.20	1.35	1.92	2.05	1.76	1.38	1.11	-0.30	0.16	.20	-0.22	0.72
30		1.18			1.96			1.01			-.54		
40		1.25			1.96			1.06			-1.35		
50		1.41			1.62			.55			-1.65		
60	.70	1.44			1.51		.86	.20			-1.54		
70		.88			1.47			-.25			-1.44		
80	1.38	.75	.25	1.16	.75	.72	.20	-.18	-.75	-.89	-1.08	-1.18	.35
90		--			.25			-.20			-.60		

Table 6.--Data obtained during velocity study at station 900 for Mobile River at U.S. Highway 90 near Prichard

Date	July 16, 1978									July 17, 1978														
Time	1205	1250	1342	1451	1644	1730	1834	2015	2108	0350	0451	0550	1613	1314	1526	1555	1617	1648	1658	1720	1828	1840	1925	1940	2208
Total depth (ft)	20.7	20.6	19.1	20.9	19.9	19.6	19.9	19.3	19.5	20.3	20.0	20.1	21.7	20.3	20.9	20.3	20.5	19.9	20.0	20.0	20.1	19.7	20.2	19.6	18.4
Percent of total depth	Velocity (ft/s)																								
10			1.70	1.58			1.65			0.35				1.18						1.84				1.73	
20	1.20	1.38	1.58	1.47	1.76	1.84	1.41	0.99	1.03	.36	0.38	-0.24	0.18	.95	1.54	1.73	1.84	1.92	2.10	1.70	1.67	1.80	1.23	1.67	0.53
30			1.47	1.20			1.26			.35				.75						1.47				1.73	
40			1.41	1.20			1.11			-.46				.62						1.44				1.65	
50			1.41	1.11			1.13			-.62				.23						1.16				1.41	
60			1.26	1.01			1.06			-.93				.27						.91				.89	
70			1.20	1.06			.77			-1.13				-.13						.75				1.01	
80	1.01	.47	.99	.67	.82	1.32	.87	.67	.47	-1.03	-1.06	-.97	-1.11	.16	1.03	.83	.93	.60	.86	.76	.46	.99	.81	.61	.26
90			.83	.56			.76			-.99				.12						.44				.46	

02471017 MOBILE RIVER AT ALABAMA STATE DOCKS NEAR MOBILE

LOCATION.-- Lat 30°42'20", long 88°02'30", Mobile County, at the Alabama State Docks, near Mobile at river mile 0.93.

DRAINAGE AREA.-- 1/

PERIOD OF RECORD.-- August 1940 to present.

OPERATOR.-- U.S. Army Corps of Engineers.

GAGE.-- August 1940 to September 1966, weekly stage recorder. Since September 1966, continuous stage recorder. The outside gage is a staff gage. Gage datum is 0.90 foot below NGVD of 1929 (1971 adj).

REMARKS.-- The channel is straight for about 2 miles upstream and downstream of the gage. Both banks are lined with piers and docks servicing the Port of Mobile. The control is the channel which empties into Mobile Bay which is tidal.

STAGE DATA.-- The stage data are on file at the U.S. Corps of Engineers, Mobile.

0247102825 TENSAW RIVER AT LIVE OAK LANDING

LOCATION.-- Lat 30°57'25", long 87°52'28", Baldwin County, at the Live Oak Landing, at river mile 23.2.

DRAINAGE AREA.-- 1/

PERIOD OF RECORD.-- August 21, 1981 to present.

OPERATOR.-- U.S. Army Corps of Engineers.

GAGE.-- A continuous stage recorder. Gage datum is 0.30 foot above NGVD of 1929 (1976 adj).

REMARKS.-- The channel is straight for about 1 mile upstream and downstream of the gage. The channel is the control up to bankfull stage and the heavily wooded flood plain is the control at higher stages. The flow is affected by the tidal influences of Mobile Bay and the Gulf of Mexico.

STAGE DATA.-- The stage data are on file at the U.S. Corps of Engineers, Mobile. Figure 3 shows a comparison of stage data between the Mobile River at the Barry Steam Plant and the Tensaw River at Live Oak Landing.

1/ Drainage area in Estuary not determined. See Appendix for drainage area of tributaries.

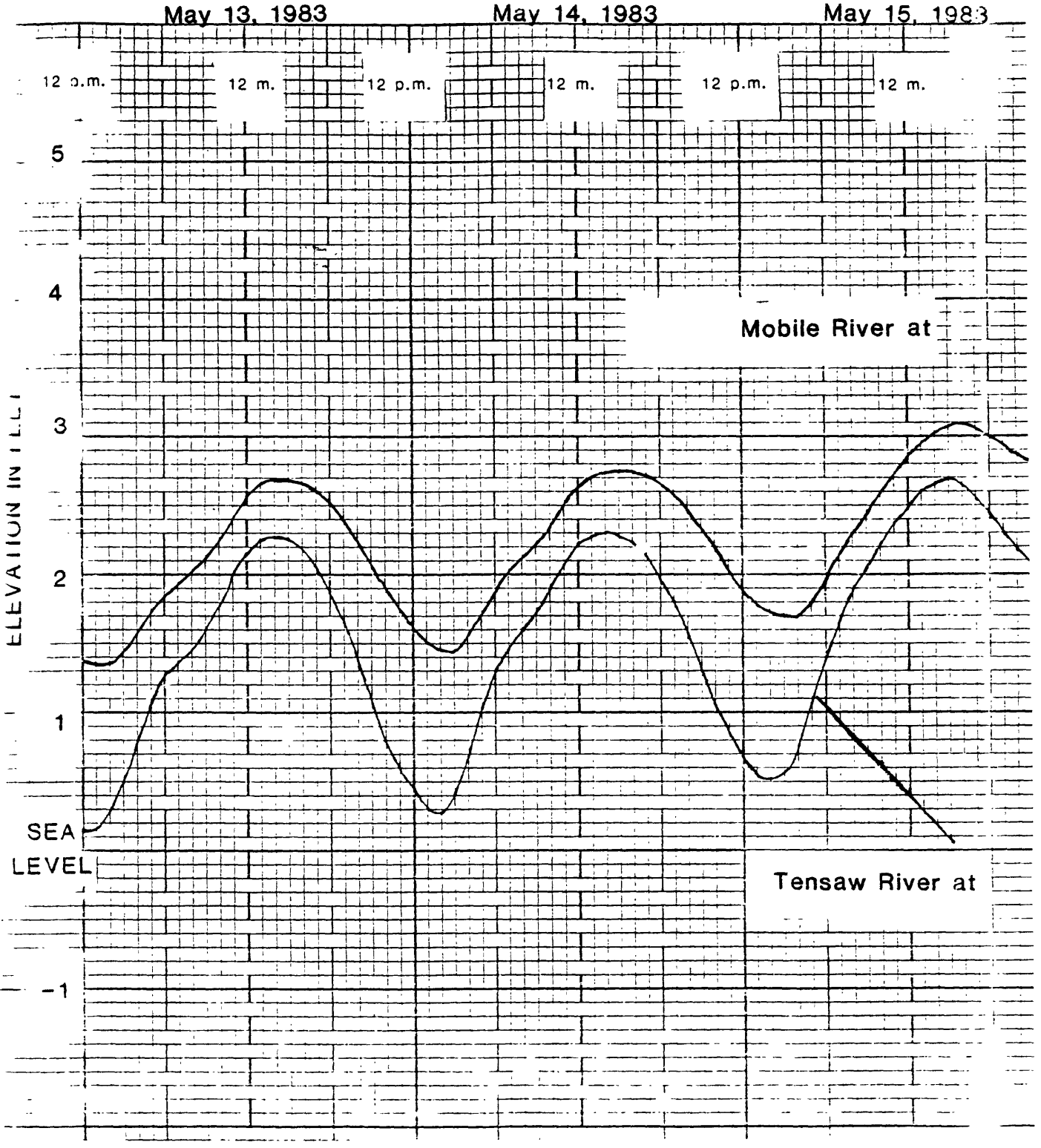
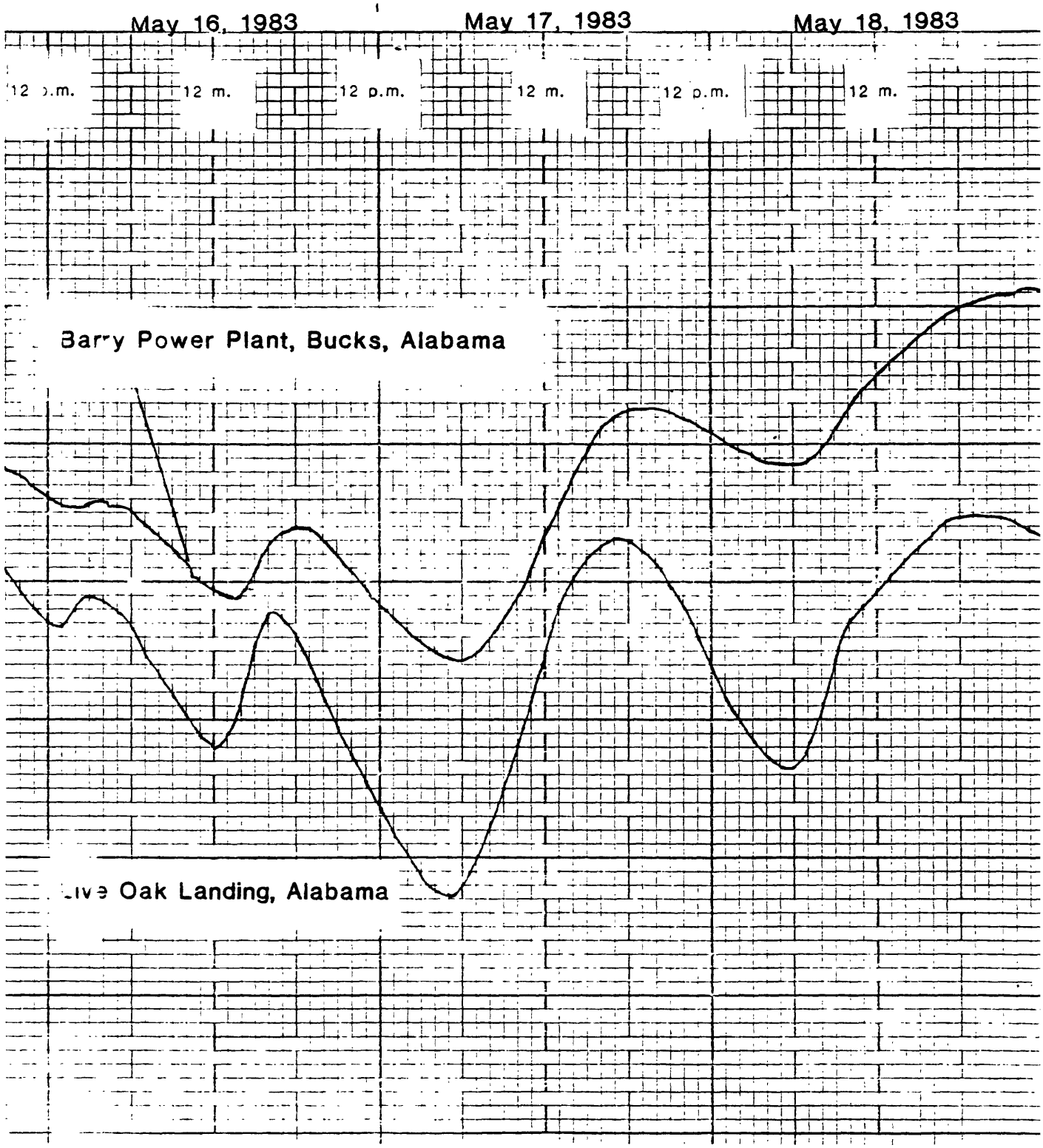


Figure 3--Comparison of stage data between Mobile River



at Barry Power Plant and Tensaw River at Live Oak Landing

02471032 TENSAW RIVER AT L&N RAILROAD NEAR HURRICANE

LOCATION.-- Lat 30°50'43" long 87°54'48", in W1/2 sec. 30, T. 2 S., R. 2 E., Baldwin County, at L&N Railroad bridge, about 0.7 miles southwest of Hurricane, and 7.5 miles downstream of the Interstate 65 crossing at river mile 12.75.

DRAINAGE AREA.--1/

PERIOD OF RECORD.-- September 4, 1981 to May 31, 1984.

COOPERATOR.-- U.S. Army Corps of Engineers.

GAGE.-- A digital water-stage recorder, and a separately housed electromagnetic flow meter. The outside gage was a staff gage. Gage datum is 5.00 feet below NGVD of 1929.

REMARKS.-- The channel differentiates based on stage due to the topographic features of the delta basin. Bankful stage is about 6.5 feet. The low and medium stage controls are the channel and tide. The high stage controls are the flood plain and tide.

STAGE DATA.-- Stage data were collected during the period of record. The following graph shows the periods for which stage data are available. These data are on file at the U.S. Geological Survey, Tuscaloosa.

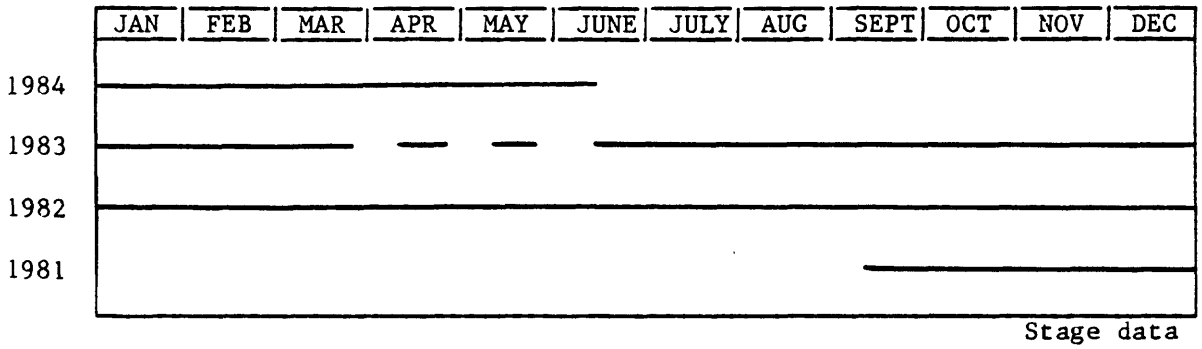
VELOCITY DATA.-- Velocity data were collected at this station during the period of record. The second graph shows the periods for which velocity data are available. These data are on file at the U.S. Geological Survey, Tuscaloosa.

DISCHARGE DATA.-- A discharge measurement was made on January 22, 1982. Table 7 lists the data from that measurement.

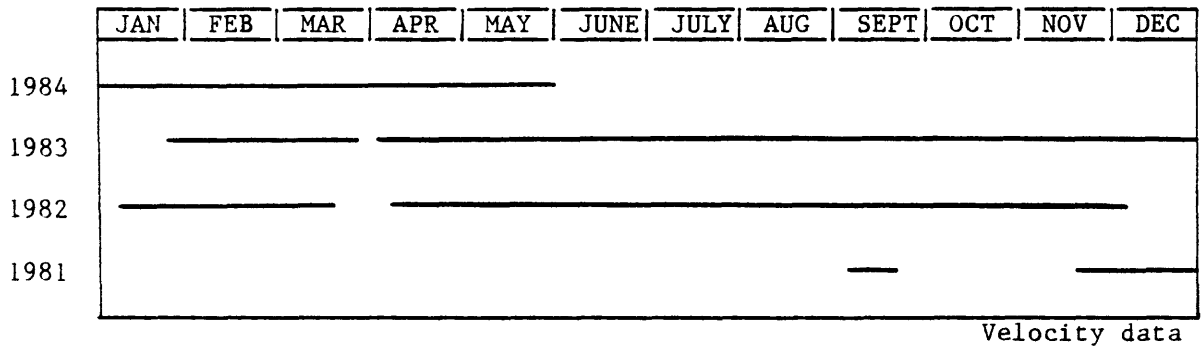
Table 7.--Summary of data obtained during discharge measurement made January 22, 1982, for Tensaw River at L&N Railroad bridge near Hurricane

Width (ft)	Area (ft^2)	Mean velocity (ft/s)	Stage (ft)	Discharge (ft^3/s)
2,035	38,200	1.31	5.32	49,900

1/ Drainage area in Estuary not determined. See Appendix for drainage area of tributaries.



Stage data



Velocity data

02471034 TENSAW RIVER AT U.S. HIGHWAY 90 NEAR MOBILE

LOCATION.-- Lat 30°41'01", long 88°00'32", T. 4 S., R. 1 E., at Mobile-Baldwin County line, at U.S. Highway 90 bridge, near Mobile at river mile 0.00.

DRAINAGE AREA.-- 1/

PERIOD OF RECORD.-- May 18, 1978 to January 25, 1983.

COOPERATOR.-- U.S. Army Corps of Engineers.

GAGE.-- A digital water stage recorder. The outside gage was a staff gage. Gage datum is 5.90 feet below NGVD of 1929 (1971 adj). The station was also equipped with two additional digital recorders: one connected to an electromagnetic velocity meter; the other connected to a water-quality mini-monitor. A second velocity meter was installed upstream of the meter on July 24, 1980.

STAGE DATA.-- Stage data were collected at this station during the period of record. The following graph shows the periods for which the data are available. These data are on file at the U.S. Geological Survey, Tuscaloosa.

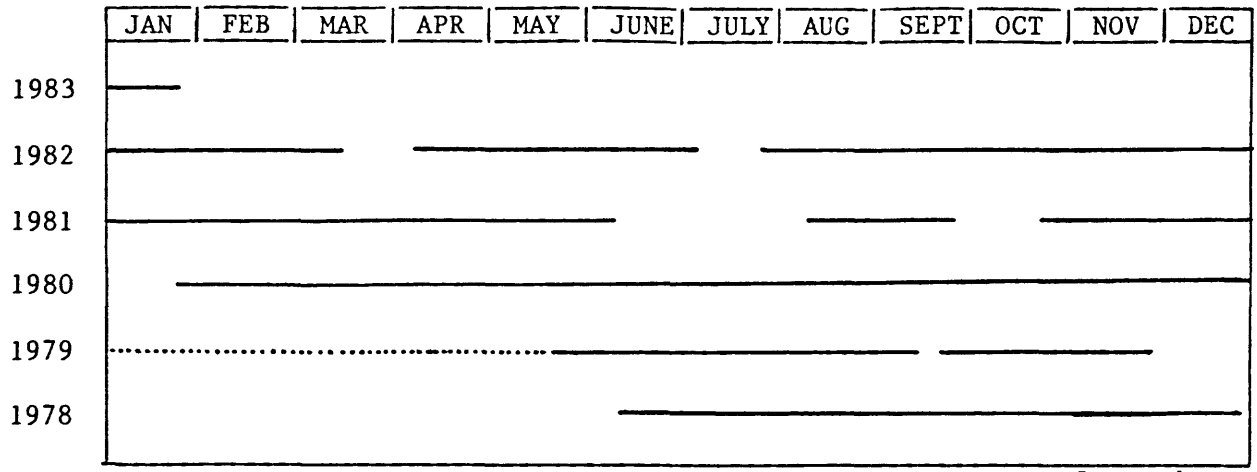
VELOCITY DATA.-- Velocity data were collected at this station during the period of record. The second graph shows the periods for which velocity data are available from the original velocity meter installed in May 1978.

Graph 3 shows the periods of available velocity data from the velocity meter that was installed in July 1980. These data were processed under station number 304101088003202.

A velocity study was conducted July 16-18, 1978, to calibrate the point velocity meter. The study was made at sites shown in figure 4. The data collected are shown in tables 8, 9, and 10. The negative signs in the data indicate the negative (upstream) directional component. Velocity studies were conducted by the U.S. Army Corps of Engineers in May 1972, April and June 1973, April 1975, and August 1982. Data from these studies are on file at the U.S. Army Corps of Engineers, Mobile.

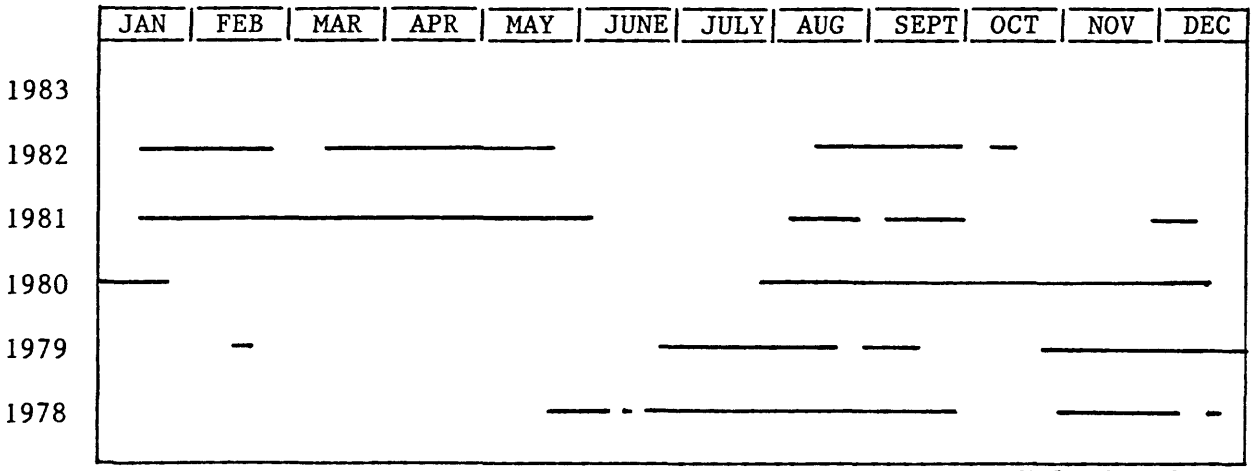
DISCHARGE DATA.-- Several discharge measurements were made from the upstream side of the westbound bridge. Table 11 lists the results of the discharge measurements made at this station by the U.S. Geological Survey. Additional discharge measurements made by the U.S. Army Corps of Engineers, including a measurement made during the flood of March, 1961, are on file at the U.S. Corps of Engineers, Mobile.

1/ Drainage area in Estuary not determined. See Appendix for drainage area of tributaries.

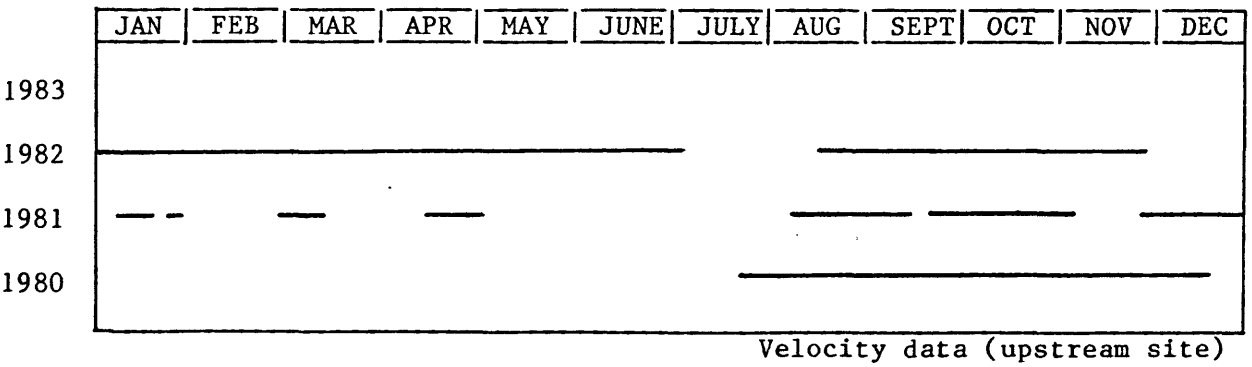


Stage data

·····Estimated



Velocity data



Velocity data (upstream site)

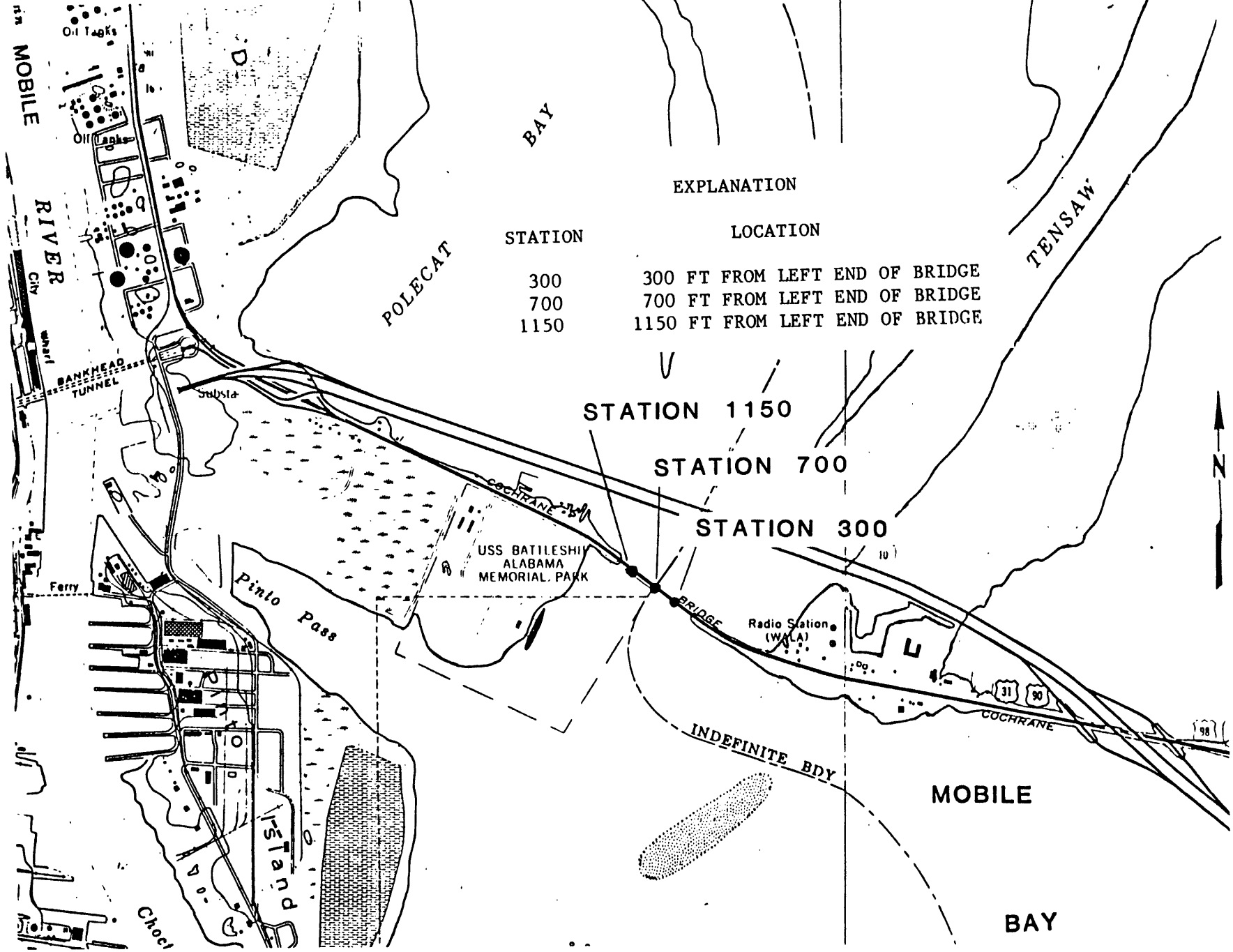


Figure 4.--Location of vertical velocity profile study for Tensaw River at U.S. Highway 90 near Mobile

Table 8.--Data obtained during velocity study at station 300 for Tensaw River at U.S. Highway 90 near Mobile

Date	July 16, 1978									July 17, 1978				July 18, 1978		
Time	1230	1315	1343	1615	1702	1807	1927	2152	2236	0349	0433	0520	0629	1017	1100	1128
Total depth (ft)	25.6	25.4	25.3	25.7	25.0	24.3	24.2	24.3	23.8	26.0	26.5	26.8	25.0	25.6	26.2	26.0
Percent of total depth	Velocity (ft/s)															
10			1.80			1.44			0.69			-0.72				
20	1.76	1.95	1.76	1.28	1.18	1.41	1.10	0.85	0.67	-0.85	-0.52	-.86	-0.83	-0.97	-0.55	0.18
30			1.91			1.41			.52			-.89		-1.16		
40			1.87			1.37			.48			-.58		-1.20		
50			1.80			1.37			.48			-.40		-1.02		
60			1.69			1.34			-.30			-.41		-.55		
70			.48			1.34			-.28			-.27		.23		
80	.36	.29	-.48	1.53	1.57	1.13	-.30	.38	-.29	-.80	.45	-.30	-.59	.27	.46	.31
90			-.52			.41			-.34			-.34		.16		

Table 9.--Data obtained during velocity study at station 700 for Tensaw River at U.S. Highway 90 near Mobile

Date	July 16, 1978									July 17, 1978				July 18, 1978		
Time	1220	1255	1333	1606	1641	1800	1917	2130	2228	0339	0413	0512	0622	1012	1051	1112
Total depth (ft)	30.5	30.5	30.8	30.0	30.0	29.3	29.5	29.2	29.0	29.9	29.6	30.0	30.2	30.7	30.6	30.5
Percent of total depth	Velocity (ft/s)															
10		2.04			1.91			0.97			0.42					0.39
20	1.99	1.99	2.04	1.69	1.87	1.50	1.25	0.85	0.78	-0.91	-0.59	-0.95	-1.01	-1.26	-0.86	-0.48
30		1.99			1.99			.83			-.85					-.80
40		1.91			1.91			.63			-.66					-.50
50		2.04			1.57			-.30			.41					-.33
60		1.50			1.57			-.36			.34					.27
70		.85			1.53			-.39			-.48					.24
80	.36	.49	.34	1.76	1.15	.85	-.27	-.43	-.48	-.63	-.30	-.38	-.63	-.22		.52
90		.30			-.40			-.38			-.46					.25

Table 10.--Data obtained during velocity study at station 1150 for Tensaw River at U.S. Highway 90 near Mobile

Date	July 16, 1978									July 17, 1978				July 18, 1978		
Time	1150	1243	1324	1507	1629	1752	1857	2119	2218	0314	0404	0504	0603	1000	1036	1105
Total depth (ft)	29.5	30.0	30.5	29.5	29.0	28.5	28.5	28.3	28.0	28.5	29.1	29.0	29.5	29.5	29.3	29.1
Percent of total depth	Velocity (ft/s)															
10	1.95			2.08			1.41			-1.03			0.91			
20	1.91	1.99	1.95	2.13	1.80	1.53	1.41	1.01	0.69	-1.05	-0.66	-0.64	-.91	-1.03	-0.88	-0.58
30	1.87			2.24			1.57			-1.03			-.80		-.82	
40	1.95			2.19			1.47			-.97			-.86		-.65	
50	1.83			1.95			1.37			-.83			-.72		-.34	
60	1.37			1.57			.89			-.70			-.85		-.42	
70	.41			1.08			-.49			-.62			-.76		-.55	
80	-.47	-.38	-.30	.54	.37	-.52	-.69	-.85	-.56	-.63	-.49	-.58	-.80	-.76	-.66	-.46
90	-.69			-.63			-.50			-.53			-.72		-.52	

Table 11.--Summary of discharge measurement data for Tensaw River at U.S. Highway 90 near Mobile

Measurement number	Date	Number of sections	Width (ft)	Area (ft^2)	Mean velocity (ft/s)	Discharge (ft^3/s)
1	7/19/78	24	1,330	34,300	-0.88	-30,100
2	7/19/78	24	1,330	35,000	-.66	-23,000
3	7/19/78	24	1,340	34,300	.89	30,500
4	7/19/78	24	1,330	35,300	1.14	40,200
5	7/19/78	24	1,340	33,700	1.45	48,800
6	7/19/78	24	1,330	33,600	1.67	56,200
7	7/19/78	24	1,340	31,900	1.03	33,000
8	7/19/78	24	1,340	31,700	1.12	35,500
9	10/28/78	24	1,330	33,400	.28	9,480
10	10/28/78	24	1,330	33,400	.45	15,100
11	10/28/78	24	1,330	33,300	.49	16,400
12	3/17/79	23	1,400	34,500	3.24	112,000
13	3/23/79	24	1,330	34,300	2.42	82,900
14	4/27/79	25	1,330	36,000	4.58	165,000

02471039 BLAKELEY RIVER AT U.S. HIGHWAY 90 NEAR MOBILE

LOCATION.-- Lat 30°40'04", long 87°55'31", Baldwin County, at the U.S. Highway 90 bridge near Mobile, at river mile 0.00.

DRAINAGE AREA.-- 1/

PERIOD OF RECORD.-- July 12, 1978 to January 24, 1983.

COOPERATOR.-- U.S. Army Corps of Engineers.

GAGE.-- Two digital recorders: one was connected to an electromagnetic velocity meter; the other connected to a water-quality mini-monitor. On June 18, 1980, a velocity meter was installed upstream of the original velocity meter.

VELOCITY DATA.-- Velocity data were collected during the period of record. The following graph shows the periods for which velocity data are available from the original velocity meter installed in May 1978.

The second graph shows the periods for which velocity data are available from the velocity meter installed in June 1980. These data were processed under station number 30400408755310.

A velocity study was conducted July 16-18, 1978 to calibrate the point velocity meter. The study was made at a selected point in the river shown in figure 5. The data collected from this study are shown in table 12. The negative signs in the data indicate the negative (upstream) directional component.

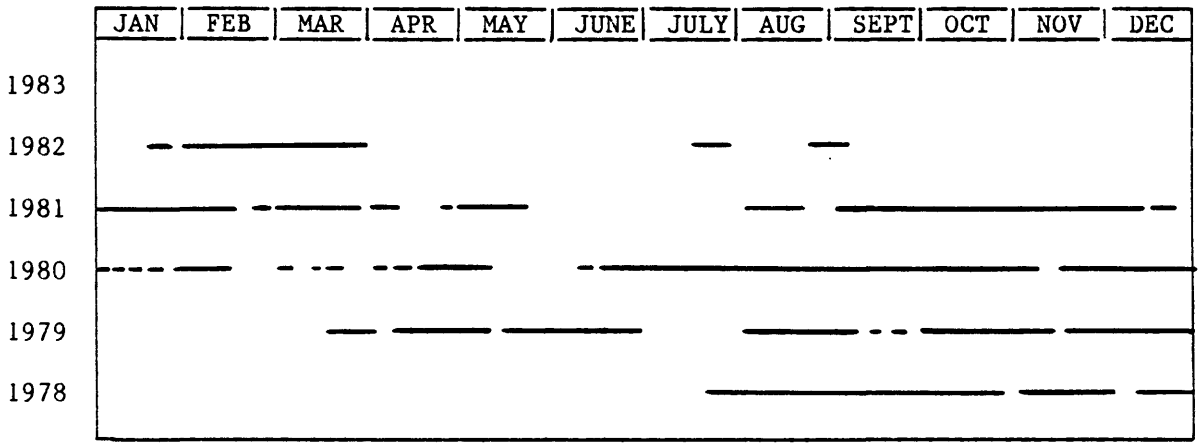
Velocity studies were conducted by the U.S. Army Corps of Engineers in May 1972, April and June 1973, April 1975, and August 1982. Data from these studies are on file at the U.S. Corps of Engineers, Mobile.

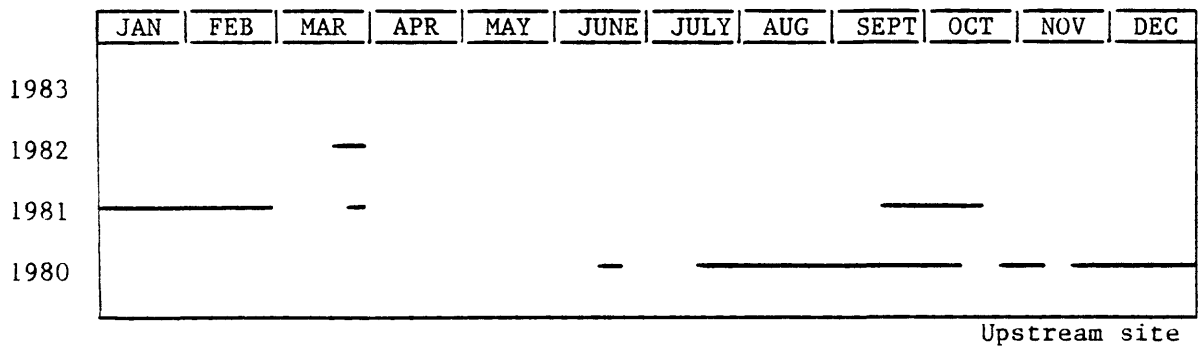
DISCHARGE DATA.-- Several discharge measurements were made from the upstream side of the westbound bridge. Table 13 shows the data from these measurements. Additional discharge measurements made by the U.S. Army Corps of Engineers, including a measurement made during the flood of March 1961, are on file at the U.S. Army Corps of Engineers, Mobile.

WATER-QUALITY DATA.-- During July 16-17, 1978 specific conductance and water temperature data were also collected. Hourly specific conductance and water temperature data were collected from the water-quality mini-monitor during the stations period of record. These data are on file at the U.S. Geological Survey, Montgomery.

Analyses of sediment samples collected at this station are on file at the U.S. Army Corps of Engineers, Mobile.

1/ Drainage area in Estuary not determined. See Appendix for drainage area of tributaries.





Upstream site

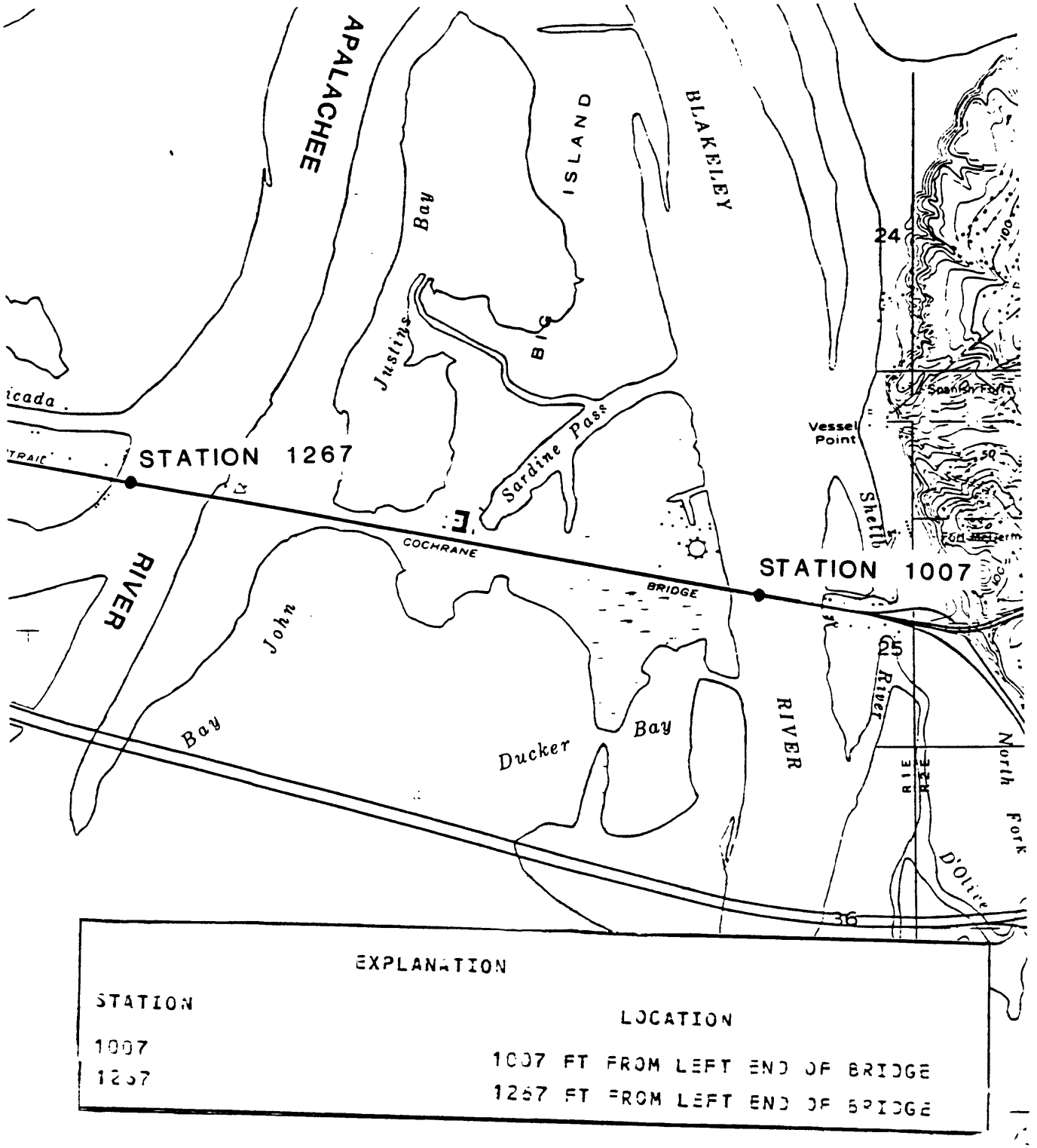


Figure 5.--Location of vertical velocity profile studies for Apalachee River and Blakeley River.

Table 12.--Data obtained during velocity study at station 1007 for Blakeley River at U.S. Highway 90 near Mobile

Date	July 16, 1978			July 17, 1978								July 18, 1978					
Time	1348	1904	2121	0336	0511	0624	1323	1452	1640	1921	2150	0822	1013	1131	1233	1406	1522
Total depth (ft)	31.4	29.4	30.2	31.2	31.4	31.6	32.0	31.6	30.8	30.4	30.2	32.5	32.5	32.6	32.6	32.0	31.8
Percent of total depth	Velocity (ft/s)																
10	1.44	1.00	0.52	-0.42	-0.45	-0.54	1.08	1.57	1.73	-1.15	-0.64	-0.85	-0.80	-0.05	0.08	1.41	1.69
20	1.41	.85	.47	-.40	-.46	-.54	.89	1.64	1.61	-1.13	-.63	-1.10	-.88	-.15	.15	1.18	1.61
30	1.34	.76	.47	-.52	-.44	-.53	.67	1.64	1.44	-1.10	-.65	-1.15	-.63	0	.15	1.10	1.25
40	1.28	.72	.43	-.48	-.40	-.53	.58	1.47	1.41	-1.10	-.76	-1.08	-.58	0	.12	.99	1.31
50	1.18	.66	.40	-.44	-.41	-.50	.44	1.38	1.28	-1.05	-.66	-1.08	-.74	-.08	.12	.95	1.41
60	1.13	.66	.27	-.48	-.47	-.52	.46	1.41	1.37	-1.03	-.59	-.97	-.76	-.05	0	.91	1.50
70	1.13	.65	.38	-.39	-.40	-.48	.65	1.31	1.37	-.91	-.56	-.99	-.72	-.05	0	.69	1.28
80	1.05	-.65	.33	-.30	-.39	-.48	.55	1.05	-1.34	-.97	-.49	-.85	-.64	-.13	0	.58	1.05
90	.78	-.53	.17	-.20	-.27	-.39	.41	.95	-1.20	-.73	-.41	-.76	-.50	-.10	0	.58	.91

Table 13.--Summary of discharge measurement data for Blakeley River at U.S. Highway 90 near Mobile

Measurement number	Date	Width (ft)	Area (ft^2)	Mean velocity (ft/s)	Stage (Tensaw River at US 90) (ft)	Discharge (ft^3/s)
1	7/16/78	1,270	26,200	1.22	6.04	32,000
2	7/16/78	1,230	24,600	1.02	5.55	25,200
3	7/16/78	1,230	25,000	.70	5.34	17,400
4	7/16/78	1,220	25,000	.36	5.29	9,470
5	7/17/78	1,270	26,600	-.29	6.36	-7,650
6	7/17/78	1,280	27,000	-.50	6.73	-13,400
7	7/17/78	1,270	27,100	1.11	6.68	30,000
8	7/17/78	1,260	26,000	1.36	5.96	35,400
9	7/17/78	1,260	24,500	1.02	5.47	25,900
10	7/17/78	1,240	25,300	.47	5.24	12,000
11	7/18/78	1,290	28,000	-.88	7.42	-24,500
12	7/18/78	1,290	28,100	-.48	7.58	-13,600
13	7/18/78	1,290	27,600	.11	7.52	2,920
14	7/18/78	1,280	28,400	1.15	6.94	32,700
15	7/18/78	1,270	27,500	1.24	6.43	34,200
16	10/27/78	1,270	26,200	.50	6.08	13,000
17	10/27/78	1,270	26,300	.37	6.14	9,630
18	10/27/78	1,280	26,600	.20	6.46	5,240
19	10/27/78	1,280	25,800	.14	6.53	3,730
20	10/28/78	1,270	26,100	.30	5.98	7,850
21	10/28/78	1,270	26,200	.24	6.15	6,380

Table 13.--Summary of discharge measurement data for Blakeley River at U.S. Highway 90 near Mobile--Continued

Measurement number	Date	Width (ft)	Area (ft^2)	Mean velocity (ft/s)	Stage (Tensaw River at US 90) (ft)	Discharge (ft^3/s)
22	10/29/78	1,280	27,000	-0.46	6.66	-12,400
23	10/29/78	1,280	27,000	-.15	6.74	-4,140
24	10/30/78	1,270	26,100	.30	6.00	7,830
25	3/17/79	1,190	27,500	2.78	7.44	76,200
26	3/23/79	1,260	27,100	2.03	7.08	55,000
27	4/27/79	1,300	28,700	3.55	--	102,000
28	7/10/80	1,220	30,900	-.30	6.81	-9,400
29	7/10/80	1,220	31,100	.87	7.15	27,000
30	7/10/80	1,220	30,700	1.00	6.70	30,600
31	7/11/80	1,220	30,600	-.51	6.51	-15,500
32	7/11/80	1,210	31,400	.62	7.36	19,400
33	7/11/80	1,210	30,600	.90	6.92	27,500
34	7/25/80	1,220	30,200	.93	6.42	28,100
35	7/26/80	1,220	30,500	-.40	6.45	-12,300
36	7/26/80	1,220	31,100	-.47	6.84	-14,600
37	7/26/80	1,220	31,500	.52	7.44	16,300
38	7/26/80	1,200	31,000	1.19	6.84	36,900
39	7/27/80	1,220	30,400	-.87	6.27	-26,400
40	7/27/80	1,220	31,000	-.60	6.84	-18,600
41	7/27/80	1,220	31,800	.48	7.31	15,200

Table 13.--Summary of discharge measurement data for Blakeley River at U.S. Highway 90 near Mobile--Continued

Measurement number	Date	Width (ft)	Area (ft^2)	Mean velocity (ft/s)	Stage (Tensaw River at US 90) (ft)	Discharge (ft^3/s)
42	9/ 5/80	1,210	31,400	0.27	7.32	8,330
43	9/ 5/80	1,220	31,600	.52	7.42	16,400
44	9/ 5/80	1,220	31,000	.90	7.18	27,800
45	9/ 5/80	1220	30,700	1.01	6.78	30,900
46	9/ 6/80	1220	31,100	.28	7.10	8,750
47	9/ 6/80	1220	30,900	.58	6.98	18,000
48	9/ 6/80	1220	30,500	.82	6.71	25,000
49	9/ 6/80	1220	30,200	.87	6.52	26,300

02471040 APALACHEE RIVER AT U.S. HIGHWAY 90 NEAR MOBILE

LOCATION.-- Lat°30 40'20", long 87°57'08", Baldwin County, at the U.S. Highway 90 bridge near Mobile, at river mile 0.00.

DRAINAGE AREA.-- 1/

PERIOD OF RECORD.-- July 12, 1978 to January 24, 1983.

COOPERATOR.-- U.S. Army Corps of Engineers.

GAGE.-- Two digital recorders: one was connected to an electromagnetic velocity meter; the other connected to a water-quality mini-monitor.

VELOCITY DATA.-- Velocity data were collected at this station during the period of record. The following graph shows the periods for which velocity data are available.

A velocity study was conducted July 16-18, 1978 to calibrate the point velocity meter. The study was made at a selected point in the river shown in figure 5. The data collected from this study are shown in table 14. The negative signs in the data indicate the negative (upstream) directional component.

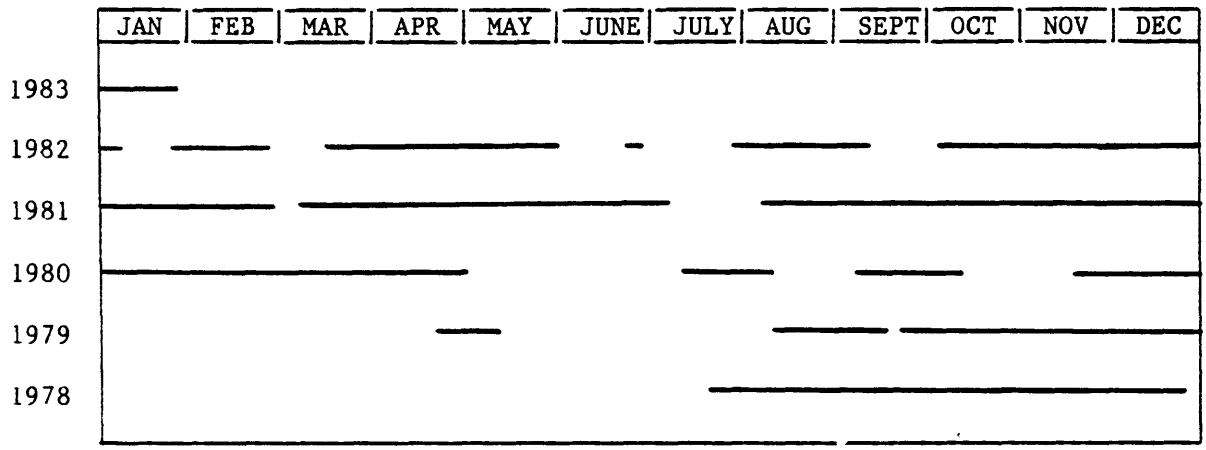
Velocity studies were conducted by the U.S. Army Corps of Engineers in May 1972, April and June 1973, April 1975, and August 1982. Data from these studies are on file at the U.S. Corps of Engineers, Mobile.

DISCHARGE DATA.-- Several discharge measurements were made from the upstream side of the westbound bridge. Table 15 shows the data from these measurements. Additional discharge measurements made by the U.S. Army Corps of Engineers, including a measurement made during the flood of March 1961, are on file at the U.S. Army Corps of Engineers, Mobile.

WATER-QUALITY DATA.-- During July 16-17, 1978 specific conductance and water temperature data were also collected. Hourly specific conductance and water temperature data were collected from the water-quality mini-monitor during the period of operation. These data are on file at the U.S. Geological Survey, Montgomery.

Analyses of sediment samples that have been collected at this station are on file at the U.S. Army Corps of Engineers, Mobile.

1/ Drainage area in Estuary not determined. See Appendix for drainage area of tributaries.


JAN
FEB
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DEC
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1980
1979
1978

Table 14.--Data obtained during velocity study at station 1267 for Apalachee River at U.S. Highway 90 near Mobile

Date	July 16, 1978					July 17, 1978										July 18, 1978				
Time	1300	1723	1813	2045	2200	0257	0415	0548	0741	1245	1409	1614	1756	1955	2112	0941	1055	1204	1445	1555
Total depth (ft)	27.7	26.7	26.4	25.6	25.3	26.4	27.0	27.8	27.7	27.7	28.2	25.9	27.2	26.0	26.3	28.4	27.1	28.3	28.4	28.0
Percent of total depth	Velocity (ft/s)																			
10	1.08	0.99	0.95	0.49	0.27	-0.58	-0.17	-0.48	-0.83	0.88	1.41	1.53	1.18	0.89	0.70	-0.78	-0.33	0.12	1.47	1.61
20	1.01	1.10	1.03	.54	.26	-.60	-.17	-.48	-.85	.76	1.34	1.50	1.25	.93	.63	-.76	-.44	0	1.20	1.41
30	1.34	1.13	1.08	.58	.15	-.49	-.18	-.49	-.78	.54	1.28	1.57	1.18	.85	.66	-.83	-.49	0	1.20	1.34
40	1.25	1.13	.89	.48	.27	-.47	-.23	-.61	-.64	.53	1.25	1.53	1.10	.93	.65	-.80	-.52	0	1.23	1.31
50	1.08	1.20	1.05	.50	.22	-.48	-.18	-.48	-.61	.49	1.25	1.53	1.31	.85	.65	-.60	-.45	.08	1.20	1.28
60	1.13	1.20	1.03	.47	.39	-.52	-.22	-.58	-.62	.54	1.20	1.41	1.20	.91	.64	-.48	-.42	.05	1.05	1.34
70	1.18	1.69	1.08	.54	.17	-.66	-.22	-.66	-.67	.45	1.20	1.37	1.34	.88	.66	-.52	-.34	0	1.01	1.41
80	1.03	1.01	1.10	-.38	.36	-.58	-.27	-.58	-.69	.45	1.18	1.15	1.23	.84	.64	-.50	-.33	0	.76	1.10
90	.86	-.85	.97	-.22	-.17	-.49	-.22	-.38	-.69	.40	1.25	1.11	1.03	.74	.60	.41	.34	0	.72	.85

Table 15.--Summary of discharge measurement data for Apalachee River at U.S. Highway 90 near Mobile

Measurement number	Date	Width (ft)	Area (ft^2)	Mean velocity (ft/s)	Stage (Tensaw River at US 90) (ft)	Discharge (ft^3/s)
1	7/16/78	1,400	22,700	0.67	6.94	15,300
2	7/16/78	1,390	20,900	.97	5.69	20,200
3	7/16/78	1,370	20,600	.79	5.41	16,200
4	7/16/78	1,370	19,700	.46	5.30	8,990
5	7/17/78	1,400	21,800	-.35	6.26	-7,640
6	7/17/78	1,400	23,300	-.25	6.58	-5,720
7	7/17/78	1,390	23,000	.71	7.15	16,300
8	7/17/78	1,390	21,800	1.25	6.23	27,300
9	7/17/78	1,380	20,700	1.03	5.68	21,400
10	7/17/78	1,370	20,500	.56	5.29	11,500
11	7/18/78	1,390	23,200	-.63	7.50	-14,700
12	7/18/78	1,390	23,600	-.53	7.56	-12,500
13	7/18/78	1,390	23,000	-.13	7.57	-3,000
14	7/18/78	1,390	21,400	.60	7.14	12,800
15	7/18/78	1,380	21,700	.88	6.70	19,100
16	10/27/78	1,400	21,600	.21	6.20	4,630
17	10/27/78	1,400	21,200	.32	6.20	6,740
18	10/27/78	1,400	20,800	.27	6.26	5,630
19	10/27/78	1,400	21,900	.26	6.30	5,400
20	10/27/78	1,400	21,500	.25	6.36	5,440
21	10/28/78	1,390	21,200	.40	5.87	8,470

Table 15.--Summary of discharge measurement data for Apalachee River at U.S. Highway 90 near Mobile--Continued

Measurement number	Date	Width (ft)	Area (ft^2)	Mean velocity (ft/s)	Stage (Tensaw River at US 90) (ft)	Discharge (ft^3/s)
22	10/29/78	1,400	22,000	-0.18	6.78	-3,900
23	10/29/78	1,400	22,200	-.18	6.80	-3,970
24	10/30/78	1,440	21,500	.32	5.94	6,880
25	3/17/79	1,380	21,700	2.35		51,100
26	3/23/79	1,410	21,600	2.02		43,700
27	4/27/79	1,410	23,400	3.10		72,600
28	11/06/79	1, 70	30,100	-.19	5.74	-5,760
29	11/06/79	1,370	30,800	-.35	6.07	-10,700
30	11/06/79	1,370	31,200	-.26	6.28	-8,140
31	11/07/79	1,380	30,100	.76	5.66	22,800
32	11/07/79	1,370	29,200	.63	4.99	18,300
33	11/07/79	1,370	28,900	.56	4.87	16,300
34	11/07/79	1,360	28,900	.43	4.88	12,400
35	11/07/79	1,360	29,100	.35	4.88	10,200
36	11/07/79	1,380	29,900	-.26	5.75	-7,650
37	11/07/79	1,380	30,300	-.29	5.90	-8,920
38	11/08/79	1,380	30,800	.85	6.19	26,200
39	11/08/79	1,360	29,900	.69	5.69	20,700
40	11/08/79	1,360	30,000	.54	5.57	16,100
41	11/08/79	1,360	30,000	.48	5.44	14,400
42	11/08/79	1,360	29,800	.42	5.35	12,600

Table 15.--Summary of discharge measurement data for Apalachee River at U.S. Highway 90 near Mobile--Continued

Measurement number	Date	Width (ft)	Area (ft^2)	Mean velocity (ft/s)	Stage (Tensaw River at US 90) (ft)	Discharge (ft^3/s)
43	1/23/80	1,410	24,300	0.86		20,900
44	7/10/80	1,370	31,700	-.21	7.10	-6,600
45	7/10/80	1,370	31,400	.76	6.96	23,900
46	7/10/80	1,360	31,100	.58	6.48	18,100
47	7/11/80	1,380	31,400	.16	6.58	5,180
48	7/11/80	1,360	31,700	.68	7.16	21,400
49	7/11/80	1,360	31,200	.59	6.70	18,400
50	7/26/80	1,390	31,600	-.27	6.64	-8,670
51	7/26/80	1,380	32,000	-.33	7.07	-10,700
52	7/26/80	1,380	32,400	.59	7.20	19,200
53	7/27/80	1,390	31,700	-.38	6.58	-12,000
54	7/27/80	1,390	32,000	-.15	6.98	-4,890
55	7/27/80	1,380	32,300	.71	7.02	22,900
56	9/ 5/80	1,370	32,300	.15	7.40	4,860
57	9/ 5/80	1,370	32,200	.50	7.38	16,000
58	9/ 5/80	1,370	31,500	.75	7.02	23,500
59	9/ 5/80	1,360	31,000	.56	6.64	17,500
60	9/ 6/80	1,370	31,700	.53	7.09	16,700
61	9/ 6/80	1,370	31,600	.66	6.86	21,000
62	9/ 6/80	1,360	31,000	.50	6.57	15,500
63	9/ 6/80	1,360	30,600	.46	6.26	14,100

MISCELLANEOUS SITES

The U.S. Army Corps of Engineers and the U.S. Geological Survey collected hydrologic data at miscellaneous locations near and within the study area. These data include stage, discharge, stream velocity, and water quality. Wind-velocity data were also collected from an anemometer located in Mobile Bay. The following sections of this report briefly describe these miscellaneous sites and the data that were collected.

Doctor Lake near Malcolm

The U.S. Army Corps of Engineers established a gaging station at Doctor Lake, approximately two miles east of Bates Lake, near Malcolm, Alabama on May 16, 1977. The station was operated until October 28, 1977. Stage data were collected at this station during its period of operation. Available data are on file at the U.S. Army Corps of Engineers, Mobile District.

Tensaw River at Sizemore Landing

The U.S. Army Corps of Engineers established a gaging station on the Tensaw River about 0.6 miles upstream of the L&N Railroad bridge crossing, at the Sizemore Landing on November 8, 1951. The station was operated until May 26, 1954. Stage data were collected at this station during its period of operation. Available data are on file at the U.S. Corps of Engineers, Mobile District.

I-65 Crossing of Mobile Estuary

The U.S. Army Corps of Engineers and the U.S. Geological Survey conducted hydrologic studies on the streams, rivers, and lakes in the vicinity of Interstate Highway 65 crossing of the Mobile Estuary. Table 16 lists the data that were obtained from discharge measurements made at these locations by the moving boat method. Sediment-sample data and water-quality data are on file at the U.S. Army Corps of Engineers, Mobile District. Velocity data obtained during a study conducted April 3 through 7, 1976 are on file at the U.S. Geological Survey Subdistrict Office, Montgomery, Alabama.

Meteorological Data at Mobile Bay

An anemometer was installed at Mobile Bay, approximately 0.4 mile south of McDuffie Island, and was used to collect wind-velocity data (fig. 6). Data collected from the anemometer are in the U.S. Geological Survey Subdistrict Office, Montgomery, Alabama.

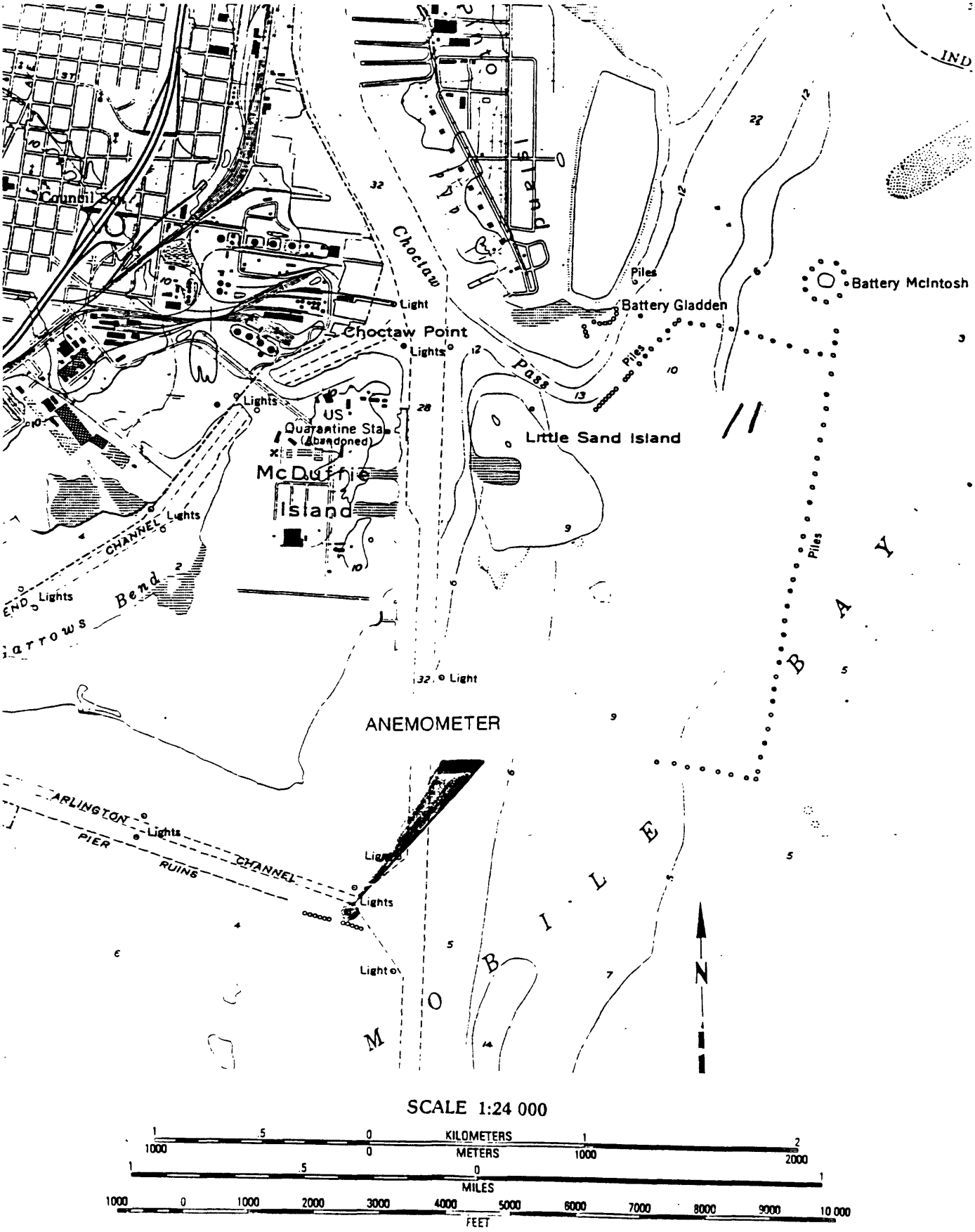

Figure 6--Location of anemometer at Mobile Bay.

Table 16.--Summary of discharge measurement data for the Mobile Estuary in the vicinity of the I-65 crossing

Date	Mobile River at Barry Steam Plant stage (gage datum) (ft)	Tensaw River discharge (ft^3/s)	Miffin Lake discharge (ft^3/s)	Middle River discharge (ft^3/s)	Mobile River discharge (ft^3/s)	Overflow sections discharge (ft^3/s)	Total discharge (ft^3/s)
3/11/61	17.74	67,600	26,600	95,200	138,000	188,000	515,000
4/7/76	14.90	69,300	29,600	89,900	116,000	109,000	414,000
4/19/77	11.83	70,900	22,500	63,800	93,600	43,900	295,000
3/16/79	14.30	55,600	24,800	81,100	115,000	85,900	362,000
3/18/79	13.26	69,400	24,200	80,700	117,000	65,000	356,000
3/22/79	8.85	68,500	21,900	51,100	74,300	0	216,000
4/25/79	17.62	70,300	27,700	97,900	118,000	148,000	462,000
4/26/79	17.70	70,700	29,200	106,000	131,000	162,000	499,000
6/ 4/80	6.51	25,600	5,420	32,000	45,900	—	109,000
2/24/81	5.81	26,800	4,300	34,400	50,900	—	116,000
3/ 6/81	4.29	16,200	3,500	28,200	57,100	—	105,000
3/10/81	5.1	16,200	4,600	34,900	42,700	—	98,400
4/14/81	3.59*	44,300	15,800	49,600	57,900	—	168,000
4/30/82		81,000	31,300	80,100	101,000	--	293,000

* Tensaw River at Live Oak Landing reading.

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REFERENCES

Geological Survey Circular 373, 1956, Water resources of the Mobile area, Alabama., p. 10-22.

U.S. Geological Survey, 1973, Water resources data, Alabama, part 1. surface water records, p. 128.

----- 1983, Water resources data, Alabama, p. 289.

----- 1984, Water resources data, Alabama, p. 226.

(p. 47 follows)

APPENDIX I

Drainage area for selected streams in Mobile River basin

Identification number	Stream name and location reference	Landline location	County and code number	Quadrangle maps and COE map number	Drainage area (mi2)
	Alabama River at Alabama River cutoff	SE 1/4 sec. 21, T. 3 N., R. 2 E.,	Clarke 025 Baldwin 003	Tensaw 121C	22,618
	Tombigbee River at mouth of and including Poll Bayou at but excluding Alabama cutoff	Sec. 26, T. 3 N., R. 1 E.	Washington 129 Clarke 025	Bilbo Island 121D	20,032
	Pine Log Creek at Alabama Highway 59	SE 1/4 sec. 7, T. 2 N., R. 3 E.	Baldwin 003	Tensaw 121C	27.7
02429650	Majors Creek at Alabama Highway 59 at USGS gaging station	SW 1/4 sec. 18, T. 2 N., R. 3 E.	Baldwin 003	Tensaw 121C	44.4
	Red Hill Creek at the eastern edge of the flood plain of the Mobile Estuary	Sec. 40, T. 2 N., R. 2 E.	Baldwin 003	Vaughn 121B	2.67
	Farris Creek at Nelson Landing	Sec. 53, T. 2 N., R. 2 E.	Baldwin 003	Vaughn 121B	4.08
	Halls Creek at mouth	Sec 15, T. 1 N., R. 2 E.	Baldwin 003	Vaughn 121B	22.0
	Watson Creek at mouth	Sec. 15, T. 1 N., R. 2 E.	Baldwin 003	Vaughn 121B	4.41
	Rice Creek at Rice Creek Landing	Sec. 28, T. 1 N., R. 2 E.	Baldwin 003	Stiggans Lake 121A	2.48
	Alkin Creek at Alabama Highway 59	Sec. 41, T. 1 S., R. 2 E.	Baldwin 003	Bay Minette North 94C	7.93
	Hastie Lake at Alabama Highway 225	Sec. 42, T. 1 S., R. 2 E.	Baldwin 003	Bay Minette North 94C	10.3
	Rains Creek at Alabama 225	Sec. 42, T. 1 S., R. 2 E.	Baldwin 003	Bay Minette North 94C	18.0

APPENDIX I

Drainage area for selected streams in Mobile River basin--Continued

Identification number	Stream name and location reference	Landline location	County and code number	Quadrangle maps and COE map number	Drainage area (mi2)
	Griffen Creek at Alabama 225	Sec. 44, T. 1 S., R. 2 E.	Baldwin 003	Bay Minette North 94C	2.91
	Dennis Creek at county road	Sec. 45, T. 1 S., R. 2 E.	Baldwin 003	Bay Minette North 94C	4.18
	Martin Branch at Alabama Highway 225	Sec. 5, T. 2 S., R. 2 E.	Baldwin 003	Bay Minette North 94C	6.23
	Red Hill Creek at Alabama Highway 225	On section line between sections 15 and 47, T. 2 S., T. 2 E.	Baldwin 003	Bay Minette North 94C	4.49
	Stony Hill Creek about 0.5 mile southeast of Sizemore Landing	Sec. 8, T. 2 S., R. 2 E.	Baldwin 003	Hurricane 94A	2.69
	Unnamed tributary to Byrnes Lake at unpaved road	Sec. 40, T. 3 S., R. 2 E.	Baldwin 003	Hurricane 94A	4.41
	Unnamed tributary to Byrnes Lake 0.1 mile upstream from mouth	Sec. 41, T. 3 S., R. 2 E.	Baldwin 003	Hurricane 94A	1.59
	Bluefield Branch at the eastern edge of the flood plain of the Mobile Estuary	Sec. 41, T. 3 S., R. 2 E.	Baldwin 003	Hurricane 94A	1.10
	Baptizing Branch at mouth of and including unnamed tributary	Sec. 44, T. 3 S., R. 2 E.	Baldwin 003	Hurricane 94A	1.65
	Bay Minette Creek at Alabama Highway 225	NW 1/4 sec. 17, T. 4 S., R. 2 E.	Baldwin 003	Bridgehead 68D	71.6
	Spanish Fort Branch at county road	Sec. 38, T. 4 S., R. 2 E.	Baldwin 003	Bridgehead 68D	0.90
	Unnamed tributary to Mobile River (Tombigbee River) at mouth	Sec. 6, T. 2 N., R. 1 E.	Mobile 097	Bilbo Island 121D	2.04

APPENDIX I

Drainage area for selected streams in Mobile River basin--Continued

Identification number	Stream name and location reference	Landline location	County and code number	Quadrangle maps and COE map number	Drainage area (mi2)
	Borrow Creek at Shephard Landing near Fort Stoddard	Sec. 28, T. 2 N., R. 1 E.	Mobile 097	Stiggans Lake 121A	17.2
	Cedar Creek at mouth	Sec. 8, T. 1 N., R. 1 E.	Mobile 097	Stiggans Lake 121A	89.9
	Conrad Creek at mouth	Sec. 42, T. 1 N., R. 1 E.	Mobile 097	Mt. Vernon 122B	3.43
	Grady Hall Creek at U.S. Highway 43	Sec. 41, T. 1 N., R. 1 W.	Mobile 097	Mt. Vernon 122B	2.22
	Sisters Creek at U.S. Highway 43	NE 1/4 sec. 1, R. 1 S., R. 1 W.	Mobile 097	Creola 95C	3.39
	Cold creek at U.S. Highway 43	E 1/2 sec. 12, T. 1 S., R. 1 W.	Mobile 097	Creola 95C	17.5
	Jim Bell Branch at county road	NE 1/4 sec. 6, T. 2 S., R. 1 E.	Mobile 097	Creola 95C	3.16
	Bayou Sara at U.S. Highway 43	Sec. 34, T. 2 S., R. 1 W.	Mobile 097	Chickasaw 95B	22.6
	Norton Creek at U.S. Highway 43	Sec. 3, T. 3 S., R. 1 W.	Mobile 097	Chickasaw 95B	4.51
	Gunnison Creek at Interstate Highway 65	On section line between sections 13 and 14, T. 2 S., R. 1 W.	Mobile 097	Creola 95C	32.3
	Harpers Creek at Interstate Highway 65	SE 1/4 sec. 12, T. 2 S., R. 1 W.	Mobile 097	Creola 95C	1.56
	Steele Creek at county road	Sec. 23, T. 2 S., R. 1 W.	Mobile 097	Chickasaw 95B	2.74
	Chickasaw Creek at Southern Railroad	Sec. 15, T. 3 S., R. 1 W.	Mobile 097	Chickasaw 95B	185
	Threemile Creek at mouth	Sec. 37, T. 4 S., R. 1 W.	Mobile 097	Mobile 69C	29.1
	Mobile River at the Mobile Estuary Causeway		Mobile 097 Baldwin 003	Mobile 69C Bridgehead 68D	43662