

CHOCTAW COUNTY, MISSISSIPPI AND INCORPORATED AREAS

COMMUNITY NAME COMMUNITY NUMBER

ACKERMAN, TOWN OF 280032 **CHOCTAW COUNTY** (UNINCORPORATED AREAS) 280069 FRENCH CAMP, TOWN OF 280084 WEIR, TOWN OF 280085





Federal Emergency Management Agency FLOOD INSURANCE STUDY NUMBER

28019CV000A

NOTICE TO FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Countywide FIS Effective Date:

Revised Countywide FIS Date:

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FLOOD INSURANCE STUDY CHOCTAW COUNTY, MISSISSIPPI AND INCORPORATED AREAS

1.0 <u>INTRODUCTION</u>

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and supersedes the Flood Insurance Rate Maps (FIRMs) in the geographic area of Choctaw County, Mississippi, including the Towns of Ackerman, French Camp, Mathiston, and Weir, and unincorporated areas of Choctaw County (hereinafter referred to collectively as Choctaw County). The Town of Mathiston is located in Choctaw and Webster Counties. The Town of Mathiston portion within Choctaw County is shown as Area not Included (ANI).

This FIS aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates. This information will also be used by Choctaw County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some States or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS report are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this countywide FIS were performed by the State of Mississippi for the Federal Emergency Management Agency (FEMA), under Contract No. EMA-2004-CA-5028. This study was completed in August 2006.

The digital base map information files were provided by the U.S. Department of Agriculture Aerial Photography Field Office, 2222 West 2300 South, Salt Lake City, Utah 84119-2020, phone number (801) 975-3500. This data included digital orthophotography flown in November 2004, with the data having a 1-meter pixel resolution.

The digital FIRM was produced using the State Plane Coordinate System, Mississippi East, FIPSZONE 2301. The horizontal datum was the North American Datum of 1983, GRS 80 spheroid. Distance units were measured in U.S. feet.

1.3 Coordination

An initial Consultation Coordination Officer's (CCO) meeting is held with representatives from FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied by detailed methods. A final CCO meeting is held with representatives from FEMA, the community, and the study contractor to review the results of the study.

For this countywide FIS, a Project Scoping Meeting was held on July 28, 2004, followed by a Post-Scoping Meeting on September 23, 2004. Attendees for these meetings included representatives from the Mississippi Department of Environmental Quality, Mississippi Emergency Management Agency, FEMA National Service Provider, Choctaw County, the Golden Triangle PDD, and the State Study Contractor. Coordination with county officials and Federal, State, and regional agencies produced a variety of information pertaining to floodplain regulations, available community maps, flood history, and other hydrologic data. All problems raised in the meetings have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Choctaw County, Mississippi.

Several flooding sources within the county were studied by approximate methods. Approximate analyses are used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and the State of Mississippi.

For this countywide FIS, detailed streams were studied by limited detailed methods. This study type entails collecting basic field measurements of hydraulic structures and channel geometry. Vertical control for the measurements is established using Real Time Kinematics Global Positioning System instrumentation. Generalized roughness values are estimated from land-use data, aerial photography, and photographs collected during survey. Channel and overbank reach lengths are computed using GIS methods. Model results are calibrated to known stage values, as they are available and deemed reliable. The following table lists the flooding sources, which were newly studied by detailed methods:

TABLE 1 - FLOODING SOURCES STUDIED BY DETAILED METHODS

<u>Stream Name</u> <u>Limits of Detailed Study</u>

Yockanookany River From the Choctaw County boundary with Attala

County to a point approximately 500 feet

upstream of South Union Road

Yockanookany River Tributary 2 From the confluence with Yockanookany River

to a point approximately 0.6 mile upstream of

McKnight Road.

Yockanookany River Tributary 3 From the confluence with Yockanookany River

Tributary 2 to a point approximately 0.3 mile

upstream of State Highway 12

Yockanookany River Tributary 4 From the confluence with Yockanookany River

Tributary 3 to a point approximately 1,100 feet

upstream of College Street

Limits of detailed study are also indicated on the Flood Profiles (Exhibit 1) and/or on the FIRM (Exhibit 2).

No Letters of Map Revisions were incorporated in this FIS.

2.2 Community Description

Choctaw County is located in central Mississippi and is bordered by Webster County on the north; Attala County and Montgomery County on the west; Winston County on the south; and Oktibbeha County on the east. The county covers approximately 419 square miles, and has 4 municipalities. The county is served by the Natchez Trace Parkway and State Highways 9, 12, 15, 407, 413, 415, and 790. The county is also served by the Kansas City Southern Railroad.

The 2005 population of Choctaw County was reported to be 9,572 (U.S. Census Bureau, 2006).

Choctaw County consists mainly of forested, undeveloped lands. The climate of the county is generally mild to humid, with abundant rainfall that averages 56.77 inches annually (National Weather Service, Ackerman, 2006). Temperatures range from monthly averages of 42 degrees Fahrenheit (°F) in January to 79 °F in July (National Weather Service, Louisville, 2006).

2.3 Principal Flood Problems

The Town of Weir and the Town of Ackerman have experienced flooding from the Yockanookany River. A section of State highway 12 northwest of Weir has also experienced flooding from the Yockanookany River.

2.4 Flood Protection Measures

There are four dams within and surrounding the Town of Ackerman. The four dams were built from 1974 to 1978. The USDA classifies all four dams as high hazard. Dam No. 1 is located on Yockanookany River Tributary 3 and has a drainage area of 0.72 square miles. The dam provides a lake area of 32.6 acres at the crest of the spillway. Dam No. 2 is located on Yockanookany River Tributary 4 and has a drainage area of 0.21 square miles. The dam provides a lake area of 15.8 acres at the crest of the spillway. Dam No. 3 is located on Yockanookany River Tributary 2 and has a drainage area of 0.16 square miles. The dam provides a lake area of 10.2 acres at the crest of the spillway. Dam No. 4

is located on an unnamed tributary of the Yockanookany River and has a drainage area of 0.32 square miles. The dam provides a lake area of 16.9 acres at the crest of the spillway (U.S. Department of Agriculture, 1974-1977).

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during a 100-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. This event, commonly termed the 100-year flood, has a 1-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent annual chance flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community. Peak discharges for the streams studied by detailed methods were calculated based on U.S. Geological Survey regional regression equations (U.S. Department of the Interior, 1991). For the discharges calculated based on regional regression equations, the rural regression values were modified to reflect stream gage weighting and/or urbanization as necessary. Flood control effects of the dams (Section 2.4) was estimated by using a simplified triangular hydrograph method, based on "as built" plans for the dams' construction.

A summary of the drainage area-peak discharge relationships for all the streams is shown in Table 2, "Summary of Discharges."

TABLE 2 - SUMMARY OF DISCHARGES

	DRAINAGE	PEAK DISCHARGES (cfs)			
FLOODING SOURCE AND LOCATION	AREA (sq. mi.)	10-percent	2-percent	1-percent	0.2-percent
YOCKANOOKANY RIVER					
At Choctaw/Attala County border	39.67	*	*	9,215	*
At confluence of Besa Chitto Creek	33.93	*	*	8,389	*

TABLE 2 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE	PEAK DISCHARGES (cfs)			fs)
	AREA (sq. mi.)	10-percent	2-percent	1-percent	0.2-percent
Approximately 1365 feet downstream of Fentress-Panhandle Road Approximately 2900 feet downstream of the confluence of Yockanookany River	21.27	*	*	6,600	*
Tributary 2 At confluence of Yockanookany River	12.87	*	*	4,783	*
Tributary 2	8.08	*	*	3,549	*
YOCKANOOKANY RIVER TRIBUTARY 2					
At confluence with Yockanookany River Approximately 560 feet upstream of the confluence of Yockanookany River	3.99	*	*	1,732	*
Tributary 3 Approximately 780 feet upstream of Dewey	1.91	*	*	1,057	*
Street bridge Approximately 0.5 mile upstream of	0.87	*	*	688	*
McKnight Road	0.24	*	*	102	*
YOCKANOOKANY RIVER TRIBUTARY 3 Approximately 450 feet upstream the confluence with Yockanookany River					
Tributary 2 Approximately 280 feet upstream of the confluence of Yockanookany River	1.70	*	*	803	*
Tributary 4 Approximately 350 feet downstream of State	1.09	*	*	441	*
Highway 12	0.73	*	*	114	*
YOCKANOOKANY RIVER TRIBUTARY 4					
Approximately 60 feet upstream of College Street culvert Approximately 300 feet upstream of the confluence with Yockanookany River	0.27	*	*	119	*
Tributary 3	0.43	*	*	311	*

^{*} Data not available

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data table in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating

purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

Countywide Analyses

Cross section geometries were obtained from a combination of terrain data and field surveys. Bridges and culverts located within the detailed study limits were field surveyed to obtain elevation data and structural geometry.

Downstream boundary conditions for the hydraulic models were set to normal depth using a starting slope calculated from values taken from topographic data, or where applicable, derived from the water-surface elevations. Water-surface profiles were computed through the use of the U.S. Army Corps of Engineers (USACE) HEC-RAS version 3.1.2 computer program (USACE, 2002). The model was run for the 1-percent annual chance storm for the detailed and approximate studies.

Channel roughness factors (Manning's "n") values used in the hydraulic computations for both channel and overbank areas were based on recent digital orthophotography and field investigations.

Table 3, "Summary of Roughness Coefficients," shows the ranges of the channel and overbank roughness factors used in the computations for all of the streams studied by the detailed method.

TABLE 3 - SUMMARY OF ROUGHNESS COEFFICIENTS

FLOODING SOURCE	CHANNEL "N"	OVERBANK "N"
Yockanookany River	0.035-0.060	0.035-0.180
Yockanookany River Tributary 2	0.035-0.060	0.035-0.180
Yockanookany River Tributary 3	0.045-0.070	0.035-0.180
Yockanookany River Tributary 4	0.050	0.045-0.180

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

The hydraulic analyses for this countywide FIS were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B, or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

Benchmarks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)

Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)

Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monuments below frost line)

Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS bench marks, the FIRM may also show vertical control monument established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

To obtain current elevation, description, and/or location information for benchmarks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM. Interested individuals may contact FEMA to access this data.

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD29. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities.

The elevations shown in the FIS report and on the FIRM for Choctaw County are referenced to NAVD88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD29 by applying a conversion factor. To convert elevations from

NAVD88 to NGVD29, subtract 0.13 feet to the NGVD29 elevation. The 0.13 feet value is an average for the entire county. The adjustment value was determined using the USACE Corpscon 6.0.1 computer program (USACE, 2004) and topographic maps. The BFEs shown on the FIRM represent whole-foot rounded values. For example, a BFE of 12.4 feet will appear as 12 feet on the FIRM, and 12.6 feet as 13 feet. Users who wish to convert the elevations in this FIS report to NGVD29 should apply the stated conversion factor to elevations shown on the Flood Profiles and supporting data tables in the FIS report, which are shown at a minimum to the nearest 0.1-foot.

For more information regarding conversion between the NGVD and the NAVD, see the FEMA publication entitled *Converting the National Flood Insurance Program to the North American Vertical Datum of* 1988 (FEMA, June 1992) or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (Internet address http://www.ngs.noaa.gov).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent annual chance flood elevations and delineation of the 1-percent annual chance floodplain boundary to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data Table and Summary of Stillwater Elevations Table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 1-percent annual chance floodplain boundary is shown on the FIRM (Exhibit 2. On this map, the 1-percent annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For this study, 10-meter Digital Elevation Model (DEM) data from the United States Geological Survey were used to delineate the floodplain boundaries for the detailed and approximate studies.

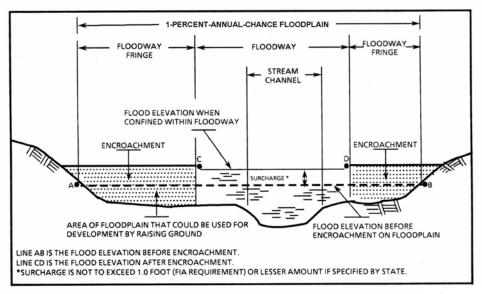
4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The

floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent annual chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

Encroachment into areas subject to inundation by floodwaters having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. In order to reduce the risk of property damage in areas where the stream velocities are high, the county may wish to restrict development in areas outside the floodway.

The area between the floodway and 1-percent annual chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent annual chance flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1 "Floodway Schematic."



FLOODWAY SCHEMATIC

Figure 1

No floodways were computed as part of this countywide FIS.

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance risk zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent annual chance) flood elevations (BFEs), or base flood depths are shown within this zone.

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent annual chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 1-percent annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within the zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 1-percent annual chance shallow flooding (usually sheet flow on sloping terrain) where the average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within the zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 1-percent floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 1-percent coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 1-percent coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent annual chance floodplain, areas within the 0.2-percent annual chance floodplain, areas of 1-percent annual chance flooding where average depths are less than 1 foot, areas of 1-percent annual chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the base flood by levees. No BFEs or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance risk zones as described in Section 5.0 and, in the 1-percent annual chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1-percent annual chance floodplain and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The countywide FIRM presents flooding information for the entire geographic area of Choctaw County. Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide FIRM also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community up to and including this countywide FIS, are presented in Table 4, "Community Map History."

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Ackerman, Town of	January 31, 1975		July 3, 1986	
Choctaw County (Unincorporated Areas)				
French Camp, Town of				
Weir, Town of				

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHOCTAW COUNTY, MS AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

This FIS report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting Federal Insurance and Mitigation Division, FEMA Region IV, Koger-Center — Rutgers Building, 3003 Chamblee Tucker Road, Atlanta, GA 30341.

9.0 BIBLIOGRAPHY AND REFERENCES

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- U.S. Army Corps of Engineers (November 2002). Hydrologic Engineering Center, <u>HEC-RAS</u> River Analysis System, User's Manual, version 3.1.2, Davis, California.
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- U.S. Department of the Interior (1991). Geological Survey, <u>Flood Characteristics of</u>
 Mississippi Streams, Water-Resources Investigations Report 91-4037, Jackson, MS.

