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of Engineers**

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**ANALYSIS AND TECHNICAL REPORT OF
REMOTE SENSING DATA FOR THE *USS KINSMAN***

Final Report

January 2000

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13. ABSTRACT (Maximum 200 words)

This report details the results of research and analysis of remote sensing data for an area of approximately 25 acres south of Morgan City along the south bank of Bayou Boeuf at a point where it enters Berwick Bay in St. Mary Parish, Louisiana. Earth Search, Inc. (ESI), was contracted by the New Orleans District, U.S. Army Corps of Engineers (NODCOE), to conduct background research and analyze side-scan sonar, magnetometer, bathymetry, multi-beam swath sonar data for the study area, which is near to the NODCOE's maintenance dredging area in Bayou Boeuf where it enters Berwick Bay. The dredging, which has been ongoing since 1973, now appears to be very close to a possible historic shipwreck, possibly that of the *USS Kinsman*. Analyses revealed a total of 17 anomalies, seven of which may be associated with the *Kinsman*. It is recommended that Phase II investigations be undertaken on these seven anomalies to determine their nature, age, significance, and National Register eligibility.

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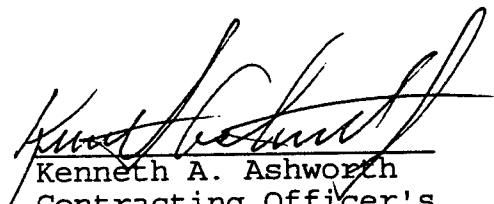
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To The Reader:

This cultural resource effort was designed and guided by the U.S. Army Corps of Engineers, New Orleans District, as part of our cultural resource management program. The report documents the results of a U.S. Army, Corps of Engineers, New Orleans District (NOD) remote sensing investigation and analysis of the reported location of the USS Kinsman.

We concur with the authors' recommendations to physically inspect the seven anomalies noted in the report. These efforts will hopefully determine the presence and/or absence of the USS Kinsman. The Louisiana State Historic Preservation Officer also concurs with authors' recommendations.


Kenneth A. Ashworth
Contracting Officer's
Representative

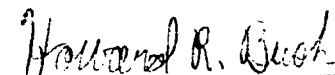

Howard Bush
Acting Chief, Environmental
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Branch

TABLE OF CONTENTS

CHAPTER 1	
INTRODUCTION.....	1
Summary of Previous Investigations	1
Definition of the Study Area.....	2
Report Organization.....	2
CHAPTER 2	
GEOMORPHIC SETTING AND HISTORY OF THE	
MORGAN CITY/BERWICK AREA	5
Geographic and Physiographic Setting.....	5
Previous Investigations and Information Sources	6
Geologic Framework.....	6
Subsidence and Sea Level Rise.....	8
Landforms and Depositional Environments.....	9
Geomorphic History and Chronology.....	12
Bankline and Channel Changes in the Project Area, 1842 to Present	15
CHAPTER 3	
HISTORIC BACKGROUND.....	22
Prehistory	22
The Colonial Period to 1803.....	22
The Antebellum Period, 1804-1861	24
The Civil War, 1861-1865	26
The Late-Nineteenth Century.....	33
The Twentieth Century	37
CHAPTER 4	
POTENTIAL CULTURAL RESOURCES AND THE SIDEWHEEL	
STEAMBOAT <i>GRAY CLOUD</i> OR <i>U.S.S. COL. KINSMAN</i>	43
The Sidewheel Steamboat <i>Grey Cloud</i> or <i>U.S.S. Colonel Kinsman</i>	44
Private Service, Upper Mississippi Trade, 1854-1855.....	44
Federal Government Service, Sioux Expedition, 1855-1856	45
Federal Government Service, Coast of Florida and Third Seminole War, 1856-1859	45
Private Service, Gulf Coast and Mobile to New Orleans Trade, 1859-1861.....	46
Confederate Service on the Gulf Coast, 1861-1862	46
Union Service, Pontchartrain and Atchafalaya River Basins, 1862-1863.....	47
Loss of the <i>Kinsman</i> , February 23, 1863	48
Description of the <i>U.S. Colonel Kinsman</i>	50
CHAPTER 5	
PREVIOUS INVESTIGATIONS	54
Jackson (n.d.)	54
Gagliano et al. (1975).....	54

Gagliano (1976).....	54
Neuman and Servello (1976)	54
Rivet	55
Gibson (1978a).....	55
Gibson (1978b).....	56
Weinstein et al. (1978)	56
Giardino and Davis (1981).....	57
Gibson (1982)	57
Floyd (1982).....	58
Goodwin and Selby (1984).....	58
DeFrance (1985)	58
Goodwin et al. (1985)	59
Deshotels (1987).....	59
Kelley (1988).....	59
Pearson and Saltus (1989).....	59
Pearson and Saltus (1991).....	60
Weinstein and Kelley (1992)	61
 CHAPTER 6	
THEORETICAL OVERVIEW OF METHODOLOGY FOR REMOTE	
SENSING AND SURVEY	62
Global Positioning System (GPS): Trimble Navigation Model 4000 RL	62
Fathometer: Innerspace Model 448.....	62
Side Scan Sonar: Geo Acoustical Side Scan Sonar Model SS941 Transceiver	
And model SS942 Side Scan Sonar Tow Fish	63
Multi-Beam Sonar	63
Magnetometer: Geometrics Model G-806A.....	63
 CHAPTER 7	
RESULTS OF REMOTE SENSING SURVEY.....	66
Analysis of Magnetic Anomalies.....	77
 CHAPTER 8	
CONCLUSIONS AND RECOMMENDATIONS	87
Summary of Anomalies	87
Bank Anomalies	87
Anomalies Possibly Associated With the <i>Col. Kinsman</i>	88
Other Anomaly Sources	90
Recommendations	90
 REFERENCES CITED	 92

LIST OF FIGURES

Figure 1. Excerpt from the Morgan City, LA 7.5' quadrangle (1994) showing the study area	3
Figure 2. Excerpt and enlargement from the Morgan City, LA 7.5' quadrangle (1994) showing the dredge area defined and provided by Captain Mistrot.	4
Figure 3. Survey of Berwick Bay by the U.S. Army Engineer Department, 1842 (Morgan City Archives)	15
Figure 4. <i>Diagram Showing the Position Of Our Works At And About Brashear City</i> by the U.S. Army Engineer Department, 1863 (Morgan City Archives).....	16
Figure 5. Excerpt from <i>Atchafalaya Bay, Louisiana</i> by the U.S. Coast and Geodetic Survey, 1890	16
Figure 6. USCGS 1890 survey overlaid on Abbot 1963 survey.....	17
Figure 7. Abbot 1863 survey overlaid on excerpt from the Morgan City, LA 7.5' quadrangle (1994)	18
Figure 8. USCGS 1890 survey overlaid on excerpt from the Morgan City, LA 7.5' quadrangle (1994)	19
Figure 9. Depth soundings (1987) from the 1986-1988 <i>Hydrographic Survey of the Atchafalaya River</i>	20
Figure 10. Excerpt from <i>Plan of Field Works At Brashear City</i> by the U.S. Army Engineer Department, 1865 (Morgan City Archives)	32
Figure 11. The approximate route of the <i>Kinsman's</i> last voyage	51
Figure 12. <i>The Fight at Corney's Bridge, Bayou Teche, Louisiana, and the Destruction of the Rebel gun-boat 'Cotton,' January 14, 1863</i> from Harper's Weekly, February 14, 1863 depicting The <i>Kinsman</i> in the foreground.....	52
Figure 13. <i>Brashear City, Berwick's Bay, LA, Base of General Banks's Operations</i> from Harper's Weekly, May 9, 1863 possibly depicting the <i>Kinsman</i> in the center	53
Figure 14. Excerpt and enlargement from the Morgan City, LA 7.5' quadrangle (1994) showing 1990 post plot survey lines	60

Figure 15. Excerpt and enlargement of the Morgan City, LA 7.5' quadrangle showing the 1990 bathymetric contours in 10 foot intervals.....	67
Figure 16. Excerpt and enlargement of the Morgan City, LA 7.5' quadrangle showing magnetic contour lines from 1990 survey.....	68
Figure 17. Post plot points (1998) in the study area.....	70
Figure 18. Bathymetric contour map (1998) of the study area in smooth 5 foot intervals ...	71
Figure 19. Magnetic contour map (1998) of the study area in 10 gamma intervals.....	72
Figure 20. Magnetic contour map (1998) of the study area in 10 gamma intervals showing the seventeen magnetic areas or anomalies	73
Figure 21. Side scan sonar, Line 24, Section A, showing Anomaly Areas 1 and 6	74
Figure 22. Side scan sonar, Line 24, Section B, showing Anomaly Areas 3 and 4.....	75
Figure 23. Side scan sonar, Line 46, showing Anomaly Areas 6 and 7	76
Figure 24. Multibeam image showing overview of project area and locations of area A . and B insets.....	78
Figure 25. Multibeam image of project area from the northwest to the southeast	79
Figure 26. Multibeam image showing insert area A and Anomalies 1, 2, 3, 4, and 7	80
Figure 27. Multibeam image showing insert area B and Anomalies 11 and 12.....	81
Figure 28. Side scan sonar in area of Anomaly #7 at 600 kz	84
Figure 29. Excerpt from Morgan City, LA 7.5' quadrangle (1994) showing shoal location.....	88
Figure 30. Multibeam image in the area of Anomaly #7	89
Figure 31. Multibeam image in the area of Anomaly #7 with overlay of <i>Kinsman</i> outline in the same scale.....	89

LIST OF TABLES

Table 1. Oysters Shipped from Morgan City and Berwick, 1908-1909 (from Southern Pacific Rail Road 1910:7)	39
Figure 2. Excerpt from the Morgan City, LA 7.5' quadrangle (1994) showing the study area as defined in the scope of services	43
Table 3. Selected Magnetic Signatures of Known Objects	65

CHAPTER 1 INTRODUCTION

This report details the results of research and analysis of remote sensing data for an area south of Morgan City along the south bank of Bayou Boeuf at a point where it enters Berwick Bay. Earth Search, Inc. (ESI), was contracted by the New Orleans District, U.S. Army Corps of Engineers (NODCOE), to conduct background research and analyze side-scan sonar, magnetometer, bathymetry, multibeam swath sonar data for the study area, which is near to the NODCOE's maintenance dredging area in Bayou Boeuf where it enters Berwick Bay. The dredging, which has been on-going since 1973, now appears to be very close to a possible historic shipwreck.

Summary of Previous Investigations

In 1990, Mike Davis, a local sport diver, discovered shipwreck remains approximately 150 feet north of a navigational light on the south bank of Bayou Boeuf. Mr. Davis reported his discovery to members of the Young-Sanders Center, an organization for the study of the War between the States in Louisiana. Personnel from Coastal Environments, Inc. (CEI), were performing underwater resource investigations in the vicinity at that time, and they examined the area where Mr. Davis had found Civil War artifacts from what he believed to be the *Col. Kinsman*, a Federal steamer which ran aground in 1863. Magnetic and bathymetric anomalies were recorded during CEI's exploratory survey along the bank above and below the navigational light.

In 1998, the Young-Sanders Center began the search for this vessel to confirm Mr. Davis' discovery, to investigate the resource's research potential, and to investigate its potential for tourist development. A consortium was organized by Mr. Roland Stansbury of the Young-Sanders Center to implement these goals, with Mr. Allen Saltus as Principal Investigator. Study of an expanded area was planned utilizing improved positioning technology and additional geophysical equipment. This more comprehensive survey included a portion of the Atchafalaya River from the railroad bridge to approximately 2,000 feet below the navigation light at Twenty Grand Point (the confluence of the Atchafalaya River and Bayou Boeuf), and a portion of Bayou Boeuf. Performed by Mr. Dan McDonald of T. Baker Smith in Thibodaux, Louisiana, with Mr. Saltus, the survey yielded several dozen magnetic anomalies.

Mr. Stansbury had arranged for Mr. Jack Couch, dive manager of Oceaneering International, to provide two days of diving to confirm the *Kinsman's* location. Prior to any dive attempt, Mr. Couch enlisted the cooperation of Mr. Shawn Johnson, manager-multibeam projects, Frugro-West, Inc., of Ventura, California. The purpose of the multibeam study was to maximize dive efficiency determining which magnetic anomaly most likely represented the shipwreck. The multibeam study was performed across the river bottom in an area with a radius of approximately 1,200 feet from the navigational light.

Subsequent to these surveys, during the early fall of 1998, Roland Stansbury observed dredge activity in the Bayou Boeuf and Berwick Bay area. Acting on behalf of the Young-Sanders Center, Mr. Stansbury notified the NODCOE regarding the center's study and concern for the *Kinsman*. Thereafter, Mr. Saltus, Captain Al Mistrot with USCOE, Dr. Kenneth Ashworth and Ms. Joan Exnicios, archeologists with NODCOE, visited the site to compare the dredge area, the area of potential disturbance, and the area of magnetics. It was apparent that these areas overlapped and that cultural material of unknown nature, age, and significance was present. Therefore, Dr. Jack Irion and Dr. Richard Anuskiewicz of the Department of Interior, Mineral Management Service, Gulf of Mexico OCS Regional Office, along with Dr. Ashworth, performed a digital, 600 Khz side-scan sonar investigation around the Berwick Bay navigational light to acquire additional information prior to award of this delivery order.

Definition of the Study Area

The project area (Figure 1) utilized for this report incorporates the dredge area defined and provided by Captain Mistrot (Figure 2) and the area where Mike Davis reported finding the remains of the *Kinsman*. The study area also includes the area of spud deployment by the dredge, anchor impact of support vessels and dredge pipes, and also possible future dredge pipe storage.

Report Organization

Chapter 2 provides an overview of project area geomorphology. Chapter 3 presents a discussion on the history of St. Mary Parish. Chapter 4 provides a history of the *Kinsman*, and Chapter 5 summarizes the previous archeological investigations in the vicinity of the project area. Chapter 6 provides a theoretical overview of the remote sensing methodology, while Chapter 7 provides the analysis of the remote sensing data. Conclusions and recommendations for further investigations are presented in Chapter 8.

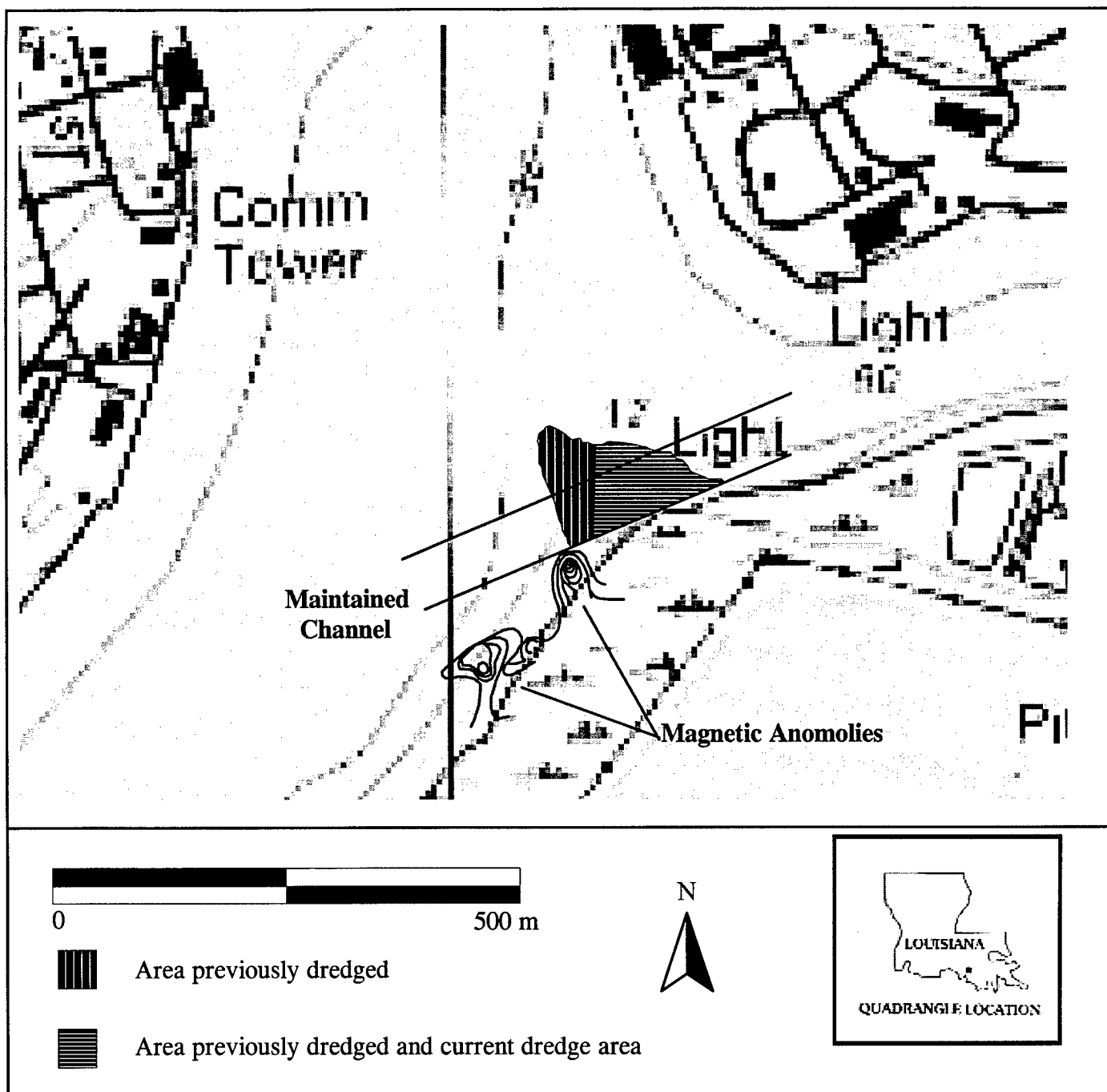


Figure 2. Excerpt and enlargement from the Morgan City, LA 7.5' quadrangle (1994) showing the dredge area defined and provided by Captain Mistrot.

CHAPTER 2 GEOMORPHIC SETTING AND HISTORY OF THE MORGAN CITY/BERWICK PROJECT AREA

Geographic and Physiographic Setting

The project area is located in St. Mary Parish in south-central coastal Louisiana. The study area lies within a radius of 900' (274.32 m) of the navigation light located on Bateman Island south of Morgan City and across Berwick Bay from Berwick. The cities of Morgan City and Berwick lie astride the north-south trending and southward flowing Lower Atchafalaya River called Berwick Bay at its confluence with the east-west trending Bayou Boeuf, about 27 km north of Atchafalaya Bay. In turn, the bay is directly connected with the Gulf of Mexico.

Physiographically, the entire project vicinity lies within the Mississippi River deltaic plain, a subdivision of the Gulf Coastal Plain province. It is a landscape characterized by low elevations, low relief, broad alluvial ridges, extensive tracts of intratidal wetlands, winding streams, and shallow lakes. All surface and nearsurface landforms and deposits were directly or indirectly created by the Mississippi River and, to a much lesser extent, the Red River. In project area along the bankline of Bateman Island, natural elevations generally lie between about 0 to 1.5 m above sea level (NGVD). Elsewhere in the project vicinity, elevations are in a similar range.

In contrast to most deltaic plain streams that are quite shallow, the Lower Atchafalaya River and Bayou Boeuf are unusually deep. Maximum depths in the former approach 30 m, while they are over 8 m in the western portion of Bayou Boeuf in that segment wherein flow from the Lower Atchafalaya River is directed into Bayou Shaffer. The Lower Atchafalaya River depths reflect the fact that it is the principal distributary of the Mississippi River and annually carries approximately 25 to 30% of the total discharge of the river. This amounts to an average annual freshwater flow of about 3220 cms (115,500 cfs) (Shlemon 1975). Nevertheless, the river at Morgan City responds to tides in the Gulf of Mexico which average 0.39 m.

Seasonal flooding on the Lower Atchafalaya River is severe enough that urbanized and industrial areas in the project vicinity must be protected by artificial levees or floodwalls. In addition, the study area is prone to flooding from tides and tidal surges caused by tropical storms and hurricanes, especially south of the Teche Ridge. The magnitude of stream flooding has increased in historic times because of upstream drainage changes, while tidal flooding has been present throughout much of prehistoric times.

Three major physiographic units of the deltaic plain are represented in the project vicinity. The portion of the project vicinity along the Intracoastal Waterway lies within but at the extreme southern limit of the Atchafalaya Basin, an immense area of freshwater swamp and lacustrine environments of nearly 9,800 sq km in extent. The Basin lies at the junction of the deltaic plain and the Mississippi alluvial valley (or plain) and is a depression bordered by the present and past meander belt ridges of the Mississippi River. Within the limits of Morgan City and Berwick and along Bayou Boeuf, the project vicinity is situated within the east-west trending Teche Ridge, a 2- to 3-km-wide abandoned meander belt of the Mississippi River. Bayou Boeuf marks the location of the actual abandoned Mississippi River channel. The portion of the project corridor south of the ridge lies within fresh- to brackish-water intratidal wetlands bordering the Gulf of Mexico.

As will be discussed more fully in the section on geomorphic history, the Lower Atchafalaya River, the principal drainage feature of the Atchafalaya Basin, postdates the formation of the Teche Ridge. The river represents a natural breach through the ridge formed to provide a drainage outlet for the Basin when the Basin's former outlet to the Gulf (farther to the east) was blocked by deltaic sedimentation.

Previous Investigations and Information Sources

Because of an extraordinary set of circumstances involving a possible major diversion of the Mississippi River and its potential severe human impacts, the Atchafalaya Basin has been the focus of detailed geological investigations, beginning with the classic study by Fisk (1952). This work describes the geomorphic processes at work and presents a huge amount of detailed geological and hydrological data on the area, including the project vicinity. The unique character of the basin and the dynamic deltaic processes at work has prompted subsequent studies such as those by Coleman (1966), Krinitzsky and Smith (1969), and Shlemon (1975). These focused on identifying depositional environments and ecological changes and involved the study of large numbers of sediment samples taken in extensive subsurface investigations. About the same time, geosciences data from a variety of sources was brought together (Gagliano and van Beek 1975), prompted by the need to employ careful environmental management in this ecologically critical area.

Despite earlier geological studies, the first large-scale systematic mapping of alluvial deposits (1:62,500-scale) did not take place until the work of May et al. (1984). This mapping, accomplished by and for the U.S. Corps of Engineers, involved both geomorphic interpretations and subsurface interpretations and correlations using a large number of borings by various agencies. Shortly thereafter, even larger-scale (1:24,000-scale) mapping on a quadrangle basis was accomplished in the region to provide a background for the evaluation of cultural resources by this same agency (Smith, Dunbar, and Britsch 1986). Results of both of these mapping effort were used in the present investigation.

The chronology of the development of the deltaic plain has evolved over several decades as a result of numerous investigations and involves alternative models and interpretations; however, the work of Frazier (1967) is regarded by many as authoritative and is referred to heavily in this study. Results of some more recent studies, as summarized by Saucier (1994) in a recent comprehensive synthesis, have been factored into the chronological scenario presented in this report.

It should be noted that the Atchafalaya Basin *per se* north of the project area has been the focus of attention for reasons cited above, and that the Atchafalaya Bay south of the project area more recently has been extensively investigated because of the development of a new delta lobe. However, the actual project area, lying between these two unusually heavily studied areas, has received relatively little attention except as part of the quadrangle-scale mapping mentioned above. Consequently, the project area has been marginal to areas in which, for example, bankline changes due to accretion or erosion have been documented in repeated surveys. Changes in the project area have not been of the magnitude as to attract critical evaluation as they have been elsewhere.

Geologic Framework

The Mississippi alluvial valley, of which the Atchafalaya Basin is the southernmost portion, and the adjacent and gradational deltaic plain have been affected for millions of years by downwarping within the broad, north-south trending Mississippi Embayment and the east-west trending Gulf Coast Syncline with which it merges (Saucier 1994). This has resulted in the deposition during the Tertiary and Quaternary periods of tens of thousands of feet of sediments in alternating fluvial, deltaic, estuarine, and shallow marine environments. Accompanying the downwarping and sedimentation have been the formation of zones of east-west trending growth faults and the intrusion of diapiric salt domes (Murray 1961). Both geologic processes have largely determined the nature and extent of petroleum resources that are so abundant in south Louisiana. No major producing oil or gas fields occur in the immediate project vicinity, although some wells are present along with several major pipelines.

Within this structural geologic framework, events relevant to this report are those that occurred during the Pleistocene and Holocene epochs of the Quaternary period. Constituting the

last 2.5 million years of geological time, these epochs were dominated by the cyclical advance and retreat of continental glaciers and the rise and fall of sea level. Glaciers did not directly affect the Lower Mississippi Valley area, but on several occasions the alluvial valley served as a giant sluiceway for the transport of vast volumes of meltwater and glacial outwash to the Gulf of Mexico. Glacial stages were episodes marked by a Mississippi River braided stream regime, the transport and deposition largely of sands and gravels, and relatively low sea level stands (Autin et al., 1991). In contrast, interglacial stages were times of stream meandering and meander belt formation, predominantly fine-grained sediment loads (silts and clays), and relatively high sea level stands. Near the Gulf Coast, glacial stages were characterized by stream entrenchment with shorelines well south of their present location. Interglacial stages were times of entrenched valley filling, transgressing shorelines, and eventually deltaic plain formation by delta lobe growth and decay.

The Mississippi alluvial valley and deltaic plain in the project area are the cumulative product of multiple episodes of entrenchment and planation during the Pleistocene during which time Tertiary and early Quaternary formations were scoured to depths of as much as 120 m. At the surface, the floodplain of the alluvial valley and the inland margin of the deltaic plain are flanked by Pleistocene terraces dating to the Sangamon and Mid-Wisconsin stages. However, all deposits to a depth of several tens of meters in the project area are of Holocene age.

Alluvial deposits that fill the entrenchment beneath the floodplain and the western and central part of the deltaic plain consist of a coarse-grained substratum and a fine-grained topstratum (May et al. 1984). Substratum deposits are predominantly sands that grade downward into sands and gravels (glacial outwash) of Wisconsin-stage age that extend from the base of the entrenchment (30 to 100 m) to within 30 to 35 m of the surface. The age of the basal portion of the substratum probably exceeds 20,000 yrs while the uppermost deposits have been dated to about 10,000 to 12,000 yrs B.P. (Saucier 1994; Smith, Dunbar & Britsch 1986). Sea level was at least 30 m lower than at present while the deposits were being laid down.

Within the Atchafalaya Basin area, the fine-grained topstratum, 30 to 35 m thick, represents overbank deposition by the Mississippi and Red Rivers while they have flowed in meandering or anastomosing regimes during the last 10,000 to 12,000 yrs. Several discrete environments of deposition are represented. Along the flanks of the basin in the areas of the Teche and the modern Mississippi River meander belts, the sediments were laid down primarily in natural levee, point bar, and abandoned channel environments. However, across the broad expanse of the central and southern portions of the basin, some natural levee and abandoned course environments are represented, but the vast majority of the sediments were laid down in intertributary wetlands consisting of backswamp, lacustrine, and lacustrine delta environments. Because of shifts in the balance between base level changes from the south (discussed below) and the input of fluvial sediments from the north, landscapes of the basin have varied during the Holocene from shallow swamps through deep swamps to shallow lakes (Coleman 1966; Krinitzky and Smith 1969).

Beneath the deltaic plain south of the Teche Ridge in the project vicinity, the lower two-thirds or so of the 30- to 35-m-thick Holocene topstratum sedimentary sequence is also composed largely of fine-grained fluvial sediments similar to those of the Atchafalaya Basin. However, they alternate with thin beds of marine sediments that represent periodic, cyclic incursions of the Gulf that occurred prior to about 6,000 to 7,000 yrs ago (Roberts et al. 1991).

The upper one-third or so of the topstratum south of the Teche Ridge is a more typical deltaic plain sedimentary sequence, reflecting the processes and environments that occur in the zone of interaction between the river and the ocean. The mostly fine-grained deposits represent a series of distinctive onlapping sedimentary cycles initiated by upstream diversions of river flow, each cycle being the correlative of a discrete delta complex. Typically, each cycle involves sediments laid down in multiple environments ranging from fresh water to saline in the dynamic zone of interaction where the river emptied into the Gulf. Considering the deltaic plain as a whole, the

cumulative result of multiple cycles has been the net buildup and seaward buildout of the deltaic plain. Each delta complex in turn involves a series of delta lobes, a lobe being defined as that portion of a complex that formed during a relatively short period of time and that can be attributed to a single or discrete set of delta distributaries (Saucier 1994). Because of the prevailing influence of subsidence and sea level rise (discussed below), each lobe typically has experienced a constructional or progradational phase in which fluvial processes dominate, and a subsequent destructional or transgressive phase in which marine processes become progressively more dominant.

The surface expression of each delta complex is a trunk course and a series of radiating and branching distributaries that form a skeletal framework. The trunk course and each distributary is flanked by a low, narrow natural levee ridge that gradually narrows and lowers in elevation toward the Gulf. The distributaries are separated by broad, flat interdistributary basins characterized by intratidal wetlands (swamps and marshes). The project area, being small in size, is situated on a trunk course (Teche Ridge) and while intratidal (interdistributary) wetlands are present, there are no major distributaries in the project vicinity. Therefore, while deltaic environments are present, the project area does not display the broad range of deltaic plain landscape types.

Subsidence and Sea Level Rise

Subsidence and sea level rise are two related basic geologic controls whose influence on the Mississippi River deltaic plain are omnipresent. Well back into the past century, it was observed that deltaic plain landforms, as well as the structures built on them, were sinking at a rapid rate not only in geological time frames but human time frames as well. Geologically, the process has come to be known as subsidence and involves five basic factors or natural processes (Kolb and Van Lopik 1958). Subsidence can be simply defined as the relative lowering of the land surface with respect to sea level and may involve a) true or actual sea level rise, b) sinking of the basement (Paleozoic) rocks due to crustal processes, c) consolidation of the thousands of meters of sediments in the Gulf Basin, d) local consolidation of nearsurface deposits due to desiccation and compaction, and e) tectonic activity such as faulting. All five processes have been active in the project area during the Quaternary period.

Until the early 1960s, most Gulf Coast geologists believed that the rapid rate of post-glacial sea level rise (the Holocene transgression) slowed abruptly about 5,000 yrs ago when sea level had attained essentially its present level. Since that time, the rate of rise has been relatively slow and not a major component of subsidence. Within the last several decades, most geologists have come to realize that sea level did not attain its essentially present level (± 1 m) until about 3,500 yrs ago, and about 5,000 yrs ago, the level was perhaps several meters lower than at present. Still more recently, many geologists support the hypothesis that the rate of sea level rise during the Holocene has been episodic rather than steady, producing a step shape to a sea level rise curve (Penland, Suter and McBride 1987). Periods with essentially no rise alternated with ones in which sea level rose at rates between 5 and 20 mm/yr: the higher rates being characteristic of the early Holocene.

Calculations of subsidence rates have been made in several portions of the deltaic plain using radiocarbon dates and observations of structures (Kolb and Van Lopik 1958). These illustrate that primarily because of consolidation within the Gulfward-thickening prism of Holocene deltaic deposits, rates increase sharply from north to south and west to east and reach their maximum in the modern delta southeast of New Orleans, LA. Extrapolating and interpreting from the calculations, it is suggested that subsidence rates along the Teche Ridge for at least the last few centuries probably vary from about 1.0 to 1.1 mm/yr but increase sharply to the south and probably exceed 1.5 mm/yr near the coast. Because of rising sea level, total subsidence rates were probably an order of magnitude higher at various times in the early Holocene.

Short-term subsidence rates (i.e. measured in terms of years and decades) are often controlled by deltaic sedimentation rates to a greater degree than other processes. For example, in the

Atchafalaya Basin where sedimentation during the last several decades has been extremely high, aggradation almost always prevails over subsidence. This is certainly also the case in Atchafalaya Bay where a new delta lobe is forming. However, despite the very large sediment load of the Lower Atchafalaya River (estimated to be 36 million cu yds [27 million cu m] in 1964), the affect has not extended beyond the confines of the channel. Because of subsidence and human impacts, the intertributary wetlands immediate south of the Teche Ridge and adjacent to the Lower Atchafalaya River has been experiencing significant land loss during the past several decades (May and Britsch 1987).

Landforms and Depositional Environments

Following a tradition in geologic mapping in the Lower Mississippi Valley established several decades ago (Kolb et al. 1968), alluvial deposits of the project vicinity have been classified and mapped according to the inferred environments in which they were laid down. However, this includes more than the basic environments such as natural levee, abandoned channel, and point bar. To make the classification sensitive and responsive to the needs of cultural resources investigations, the basic units have been subdivided based on a more detailed consideration of formational processes and topography. As described below, 10 units are recognized in the project vicinity.

Alluvium overlying Intertributary Wetlands. Within the Atchafalaya Basin where sedimentation has been extremely heavy in the last several decades, lacustrine environments have been transformed into lacustrine deltas and areas of backswamp and other intertributary wetlands (IW) have been heavily veneered with overbank deposits. In the project vicinity, forested tracts such as Drews Island, Middle Island, and Long Island, are underlain by soft, organic clays and silty clays, but have recently been veneered with up to a meter of silts deposited during periods of basinwide flooding by turbid waters. The siltation has resulted in some vegetation changes, but basically the areas are still characterized by a backswamp or swamp forest assemblage composed of cypress, tupelo-gum, swamp maple, willow, sycamore, and cottonwood. The areas experience deep seasonal inundation during periods of basinwide flooding.

Abandoned Courses. In the project vicinity, abandoned courses vary in size from shallow, linear sloughs a few meters wide and a few kilometers long up to the Bayou Teche/Bayou Boeuf/Bayou Black system which is several hundred meters wide and can be traced through the alluvial valley and deltaic plain for hundreds of kilometers. The former mark small abandoned distributaries while the latter marks an abandoned course of the Mississippi River.

When either distributaries or a trunk channel are abandoned slowly, flanking natural levees may develop inward toward the progressively narrowing stream channel, leaving no discernible topographic break or discernible sediment type. Delineation of the former active channels becomes difficult and subjective in these cases. However, when courses are abandoned abruptly, the channels become filled with relatively soft deposits and support a distinctive swamp forest vegetation assemblage. The outer limits of the former full-flow channel are usually marked by slight by distinctive topographic rises. Such is the case with Bayou Boeuf. The width and configuration of the former full-flow or nearly full-flow Mississippi River channel in the Teche meander belt are evident and the channel filling represents materials laid down in a slack-water environment or by the Red River during a subsequent period of occupation of the Mississippi River course.

Channel-filling deposits of the Mississippi River course are mostly layered clays and silts with a small amount of sand. They are probably slightly oxidized, mottled gray and brown in color, and firm in consistency within the upper meter or two, but grade downward in gray, soft deposits that extend to a depth of about 45 m (May et al. 1984). At the surface, the deposits may be poorly drained and moderately organic and are characterized by Buxin-Portland-Perry soils of the nearly level to gently sloping phases (Lytle et al. 1959).

Narrow bands up to 200 m wide of abandoned course filling flank the Lower Atchafalaya River channel west of Berwick Bay and along Bayou Boeuf. These bands are low-lying and mostly undeveloped tracts less than 2 m in elevation and often are forested. Along and west of the Bayou Boeuf Lock, the deposits have been either severely impacted by construction activities or have been removed by artificial channel widening. Along the shores of Berwick Bay between Morgan City and Berwick, most of the deposits have been removed as a result of channel widening by natural bank erosion; however, two small areas may remain. Their identity and limits are somewhat questionable because of problems in mapping imposed by urbanization in these areas. Through Berwick Bay, the probable position of the Mississippi River abandoned course is shown by short dashed lines.

Channel Filling. At several locations along the Lower Atchafalaya River, the stream channel has shifted laterally or narrowed in size: the resulting areas of accretion are designated as channel filling and lithologically the deposits probably resemble closely the abandoned course deposits described above. However, because they have formed within the historic period, their consistencies are probably weaker, involving very soft and watery gray clays and silts. Buxin-Portland-Perry soils of the level, overflow phase have been mapped in these areas (Lytle et al. 1959) and they are essentially undeveloped tracts.

The largest areas of channel filling occur at and just south of the mouth of Stouts Pass and are directly attributable to the increased volume of fluvial sediments moving through the area from the Atchafalaya Basin into the Gulf. Based on historic survey data contained in Latimer and Schweizer (1951; Plate B27), it is apparent that much of the accretion took place between 1837 and 1916-17.

Trunk Channel Natural Levees. In a general sense, natural levees are low, gently sloping alluvial ridges that flank streams that carry high suspended loads and that periodically overtop their banks. The ridges are highest near the stream channels and slope outward (distally) toward the adjacent floodbasins (backswamps). By far the largest, best developed, and most extensive natural levees in the project vicinity are those of the Teche Ridge which formed along the Mississippi River trunk channel. They constitute essentially all of the deltaic plain landscape that is suitable for habitation, transportation corridors, and commercial and industrial development without artificial filling.

Natural levee deposits have the highest consistencies of any in the project area, consisting of medium to stiff, well-oxidized, mottled brown and gray clays and silty clays. Deposits with these characteristics are thickest immediately adjacent to the trunk channel and thin distally toward the levee margins. Even though the levee crests have maximum elevations of only 2 to 3 m, the deposits extend to maximum depths of about 5 to 6 m below ground surface because of the influences of local and regional subsidence.

Soils developed on natural levee deposits have been mapped as those of the Baldwin silt loam, Baldwin silty clay loam, Baldwin silty clay, and Iberia clay series. The silt loam deposits occur nearest the levee crests while the finer clayey deposits occur near the levee margins. Natural levees originally supported a mixed, deciduous, hardwood forest composed of species such as live oak, water oak, red oak, sweetgum, and hackberry.

Distal Portions of Trunk Channel Natural Levees. Along the distal margins of the natural levees, there are narrow, flat, and low-lying zones up to a kilometer wide that are transitional in terms of topography, soils, and vegetation between natural levees and the adjacent interdistributary wetlands. The zones represent either the distal levees *per se* or formerly higher areas that have been affected by subsidence and that now experience occasional inundation. Vegetation consists of a mixture of swamp forest and bottomland hardwood forest species and soils have been mapped as those of the Sharkey-Alligator series or simply as swamp clays and mucky clays.

Boundaries between the natural levee units and the adjacent wetlands are gradational and difficult to define. It has been found through experience that, in the deltaic plain, natural levee limits closely coincide with the extent of agriculture and urbanization as of early this century. However, with wetlands drainage and flood control structures, within the last several decades, agriculture and urbanization have expanded into distal natural levee areas and even wetlands areas where reclamation has taken place. Such is definitely the case in the Morgan City area.

Lower Atchafalaya River Natural Levees. Natural levees such as those along the Teche Ridge or a major deltaic distributary form over a period of centuries to millennia through slow overbank deposition, mostly by sheet flooding. Their size is therefore in part a function of age. Along the Lower Atchafalaya River south of Morgan City/Berwick, conditions for natural levee development exist (heavy stream sediment load and occasional overbank flooding), but they have occurred for only a few decades. Therefore, natural levees are low, thin, and very narrow. Lithologically, they should resemble those along the Teche Ridge, but they will be less well oxidized and desiccated and therefore weaker in consistency. This being the case, they are difficult to delineate and their limits as shown in the mapping are largely arbitrary.

Point Bar. This depositional environment includes the narrow zones in which the Mississippi River channel, while active, meandered laterally, scoured away older alluvial and deltaic deposits, and laid down relatively coarse-grained channel deposits. As a river channel migrates laterally, it erodes on its outer (cutbank) side while depositing mostly silts and sands on point bars on its inner banks. These silty and sandy deposits extend to the maximum depth of the migrating channel (about 45 m) and constitute a part of the substratum, but are capped with finer-grained topstratum deposits near the surface.

As a migrating channel moves away from a given point, point bar deposits often become progressively veneered with overbank sediments that eventually form a true capping of natural levee deposits. Newly formed point bar areas typically exhibit an alternating ridge and swale topography, but these features become progressively obscured as the natural levee veneer grows, and may eventually lose all surface expression. This is the case with the point bar area in the city of Morgan City where the presence and extent of the deposits were determined solely on the basis of borings (May et al. 1984).

Crevasse Natural Levees. Natural levees accrete vertically by sediments laid down by sheet flow during periods of overbank flooding, but also by the coalescence of numerous small crevasse splays where overbank flow becomes temporarily concentrated and forms a fan-like deposit. Occasionally, some crevasses will persist through multiple flood events and may form small distributary-like channels that trend for several kilometers away from the parent channel across the natural levee. Where the crevasses are unusually well developed, the channels become flanked with small natural levee ridges that lower and narrow outward toward the distal ends of the crevasse systems.

Several major crevasse systems with flanking natural levees are present in the project vicinity, the best developed being along Bayou Shaffer. It is apparent that a crevasse and associated natural levees also existed along the Lower Atchafalaya River south of Morgan City; however, they have been eroded away by enlargement of the river channel in this area due to increased discharges during historic times. Only the distal portions of the crevasse natural levees (see below) still remain along this stretch of river.

Several very small crevasse systems, only a few hundred meters long, occur along and are generically associated with the Lower Atchafalaya River Natural Levees (LARNL). These are mappable units, but are too small to have been of consequence to humans in either prehistoric or historic times.

Deposits of crevasse natural levees are similar to those along trunk channel natural levees, but slightly finer grained and not as thick. Soils of the Baldwin silt loam and Baldwin silty clay loam series are present, but also soils of the finer-grained Sharkey-Alligator clay series (Lytle et al. 1959). Vegetation of the crevasse natural levees was also very similar to those of the trunk channel.

It is certain that the crevasse systems mentioned above formed while the Mississippi River was actively flowing in the Teche meander belt. They became inactive and were probably marked only by narrow streams or sloughs when the meander belt was abandoned. Most investigators working in the area (e.g., Smith, Dunbar and Britsch 1986) have presumed that a crevasse was the small drainage feature or topographic low that facilitated the breaching of the Teche Ridge by the Atchafalaya River when a new outlet for the Atchafalaya Basin became necessary to provide a drainage outlet.

Distal Portions of Crevasse Natural Levees. These zones are analogous in essentially all respects to the distal portions of levees along the trunk channel, only smaller in size. They are best developed along the crevasse system along the Lower Atchafalaya River south of Morgan City where they are characterized by tracts of freshwater swamp vegetation.

Interdistributary Wetlands. This environment is characterized by freshwater swamp north of the Teche Ridge and freshwater swamp and fresh- to brackish-water marshes south of the ridge. The plant species composition of the wetland communities has been described in detail in several publications (e.g., Lytle et al. 1959; O'Neil 1949) and is not repeated herein.

Deposits underlying wetland vegetation communities consist of gray, extremely soft, watery, organic clays and peats. They represent the finest-grained sediments that precipitate from overbank floodwaters. The deposits vary in thickness from a few centimeters where they onlap distal natural levees to several meters well removed from natural levee ridges. Soils developed in interdistributary wetlands are described as clays and mucky soils of either swamp, freshwater, or brackish marsh.

Geomorphic History and Chronology

The time of the maximum extent of the last Pleistocene continental glaciation (Late Wisconsin Stage) about 18,000 yrs ago is a convenient time to begin a scenario of events leading to the development of the present landscape. At that time, with the Laurentide ice sheet covering much of the mid-continent area of North America, sea level was more than 100 m lower than at present. The Mississippi alluvial valley was entrenched with the floodplain surface about 30 to 35 m lower than at present and characterized by a broad, sandy, outwash plain where the Mississippi River flowed in a braided regime (Saucier 1994). The entrenched alluvial valley merged with the Gulf well south of the present coastline and southeast of the project area.

Between about 18,000 and 11,000 yrs ago, continental glaciation waned and sea level rose rapidly, driving the Gulf coastline steadily inland across the continental shelf and into the lower end of the Mississippi entrenched valley. However, huge volumes of glacial meltwater and outwash continued flowing through the valley and the landscape and river regime did not change.

About 11,000 yrs ago, the Lower Mississippi Valley ceased serving as an outlet for glacial meltwater and outwash, the sediment load of the Mississippi River rapidly became finer-grained, discharges declined sharply, and the river regime changed from braided to meandering. This marked the beginning of deposition of topstratum deposits in the entrenched Mississippi alluvial valley, but because sea level was still tens of meters lower than at present, any deltas the river may have formed between about 11,000 and 9,000 yrs ago were well south of the present coastline. Environments in the project area probably alternated between swamp and shallow estuarine conditions with the floodplain surface at least 10 m lower than at present.

About 9,000 yrs ago, the first Mississippi River delta complex—the Outer Shoal complex—formed well offshore from central coastal Louisiana when sea level was perhaps about 15 m lower than at present (Penland et al. 1988). Apparently this complex was inundated and largely destroyed within 1000 yrs by rising sea level but was followed by a second one—the Maringouin complex—that formed about 7,000 yrs ago slightly farther inland and at a higher elevation (about 5 m lower than at present). Geological studies in the Atchafalaya Basin area indicate that the trunk course of the Mississippi River that was associated with both delta complexes was located along the western side of the alluvial valley along the route of the later Teche meander belt (Saucier 1994), but it is likely that the river was flowing in an anastomosing regime rather than a well-developed meandering one (Aslan and Autin 1996). Deposits associated with this trunk course are presumed to underlie the Teche Ridge in the project vicinity, but they have not been specifically identified as such. At that time, the Atchafalaya Basin already was a broad lowland characterized by swamp and lacustrine environments.

With sea level still slightly lower than at present, the Mississippi River began constructing the Teche meander belt and Teche delta complex about 6,000 yrs ago (Saucier 1994). By 5,000 yrs ago, the meander belt was probably fully developed with large natural levees, zones of point bar accretion, crevasses, and bordering interdistributary wetlands. During the following 1,000 to 1,500 yrs, the Teche delta continued to develop distributaries and expanded to the south and southeast (Frazier 1967) while the meander belt remained active, although probably not with the full discharge of the Mississippi River. About 4,800 yrs ago, because of a major upstream diversion, the river began creating a new meander belt along the eastern side of its valley and constructing a delta complex (the St. Bernard complex) eastward into and beyond the New Orleans area.

Even with the Mississippi River constructing meander belts along the western and eastern margins of the alluvial valley, the Atchafalaya Basin remained marginal to active sedimentation with no more than a few distributaries directly affecting the area. Local runoff from the broad basin area had to find an outlet to the Gulf to the southeast between the two meander belts, probably no farther west than the longitude of Houma, LA. Without question, the Teche Ridge was an unbreached feature still in an active, constructional mode.

When the Mississippi River was flowing in the Teche meander belt, the Red River was a major western tributary to that system and the flows combined. However, when the Mississippi River finally diverted all of its discharge to the meander belt along the eastern side of the valley about 3,000 yrs ago, the Red River could have and apparently did occupy the abandoned Mississippi River channel. The question is when and for how long did this occur? Russell (1940) established that small Red River natural levees exist within the confines of the Mississippi River abandoned course with the smaller stream unable to overtop the much larger confining Mississippi River natural levees. Various workers (e.g., Fisk 1944; Russ 1975; Saucier 1974) have attempted to develop a chronology of Red River courses, but definitive evidence is almost nonexistent. McIntire (1958) investigated an archeological site (Gibson Site) along the Teche meander belt (Bayou Black segment east of the project area) which he found to be stratified with Red River sediments. On this basis, he interpreted that the Red River was actively flowing in the Teche meander belt during Marksville times or about 2,000 to 1,600 yrs ago.

Exactly when the southeastern outlet for drainage from the Atchafalaya Basin was closed due to deltaic sedimentation is not known because of uncertainties in the age of certain distributaries and consequently the presence of alternate chronological models. Frazier (1967) has proposed that an early phase of the Lafourche delta complex (Bayou Terrebonne lobe) began forming as early as about 3,500 yrs ago. According to his interpretation, which is a modification of the work of Fisk (1952), this lobe would have intersected the Teche Ridge, formed an alluvial barrier, and forced drainage in the Atchafalaya Basin to find a new outlet to the Gulf. At that time, Mississippi River discharge through the Lafourche complex actually backed up into the distal end

of the Teche course (Bayou Black segment) and flowed westward as far as Morgan City (Russell 1940).

The closing of the lower end of the Atchafalaya Basin would have marked the breaching of the Teche Ridge at Morgan City and formation of the Lower Atchafalaya River 3,000 yrs ago or slightly earlier. It is speculated that during severe floods, overflow entered and scoured a preexisting crevasse channel until an effective outlet was achieved. Smith, Dunbar and Britsch (1986) have speculated that initially basin overflow followed the abandoned Teche course eastward through the Bayou Black segment to near Houma where it entered channels of the Lafourche delta complex. However, both geomorphological and archeological evidence argue against this. It is much more probable that flow quickly breached the ridge at Morgan City and flowed directly south into Atchafalaya Bay rather than into Bayou Black.

In a recent geological investigation, Törnqvist et al. (1996) failed to find direct evidence for an early phase of the Lafourche complex. They concluded that a major distributary (an alluvial barrier) was absent from the area until about 1,500 yrs ago when the late phase of the Lafourche complex formed. Based on their scenario, it is *possible* (but not necessarily mandatory) that the Lower Atchafalaya River through the Teche Ridge did not form until at least that time.

It can only be said with reasonably certainty that the Lower Atchafalaya River formed *only* after the Teche meander belt was abandoned by the Mississippi River and that date is estimated at about 3,000 yrs ago (Saucier 1994). However, the work of McIntire (1958) seems to support a date of 1,500 yrs ago for the breaching of the ridge since it is reasonable that it occurred after the Teche meander belt had also been abandoned by the Red River as well as the Mississippi River. It is not reasonable to believe that Red River flow and sediment would have moved east of the Morgan City area into the Bayou Black segment of the Teche meander belt if the Lower Atchafalaya River breach was present. The latter stream surely would have diverted all of the Red River flow directly to the Gulf. Finally, based on interpretations of Red River diversions upstream in the alluvial valley, Weinstein and Kelley (1992) believe that the Red River abandoned the Teche meander belt by about 1,900 to 1,800 yrs ago. Thus, there is disagreement on the order of 2,000 yrs as to when the Lower Atchafalaya River may have formed.

Prior to the intersection of the Lafourche lobe (early or late phase) with the Teche Ridge, the lower end of the Atchafalaya Basin was subject to sufficient tidal influence to cause at least occasional brackish water conditions. After the Lower Atchafalaya River channel formed, this basin outlet also allowed brackish water to occasionally enter the lower end of the basin as attested to by the large *Rangia* shell middens that occur along the margins of Grand Lake and other lacustrine bodies (McIntire 1958). These conditions existed until the 19th century because the Atchafalaya River had only a modest discharge.

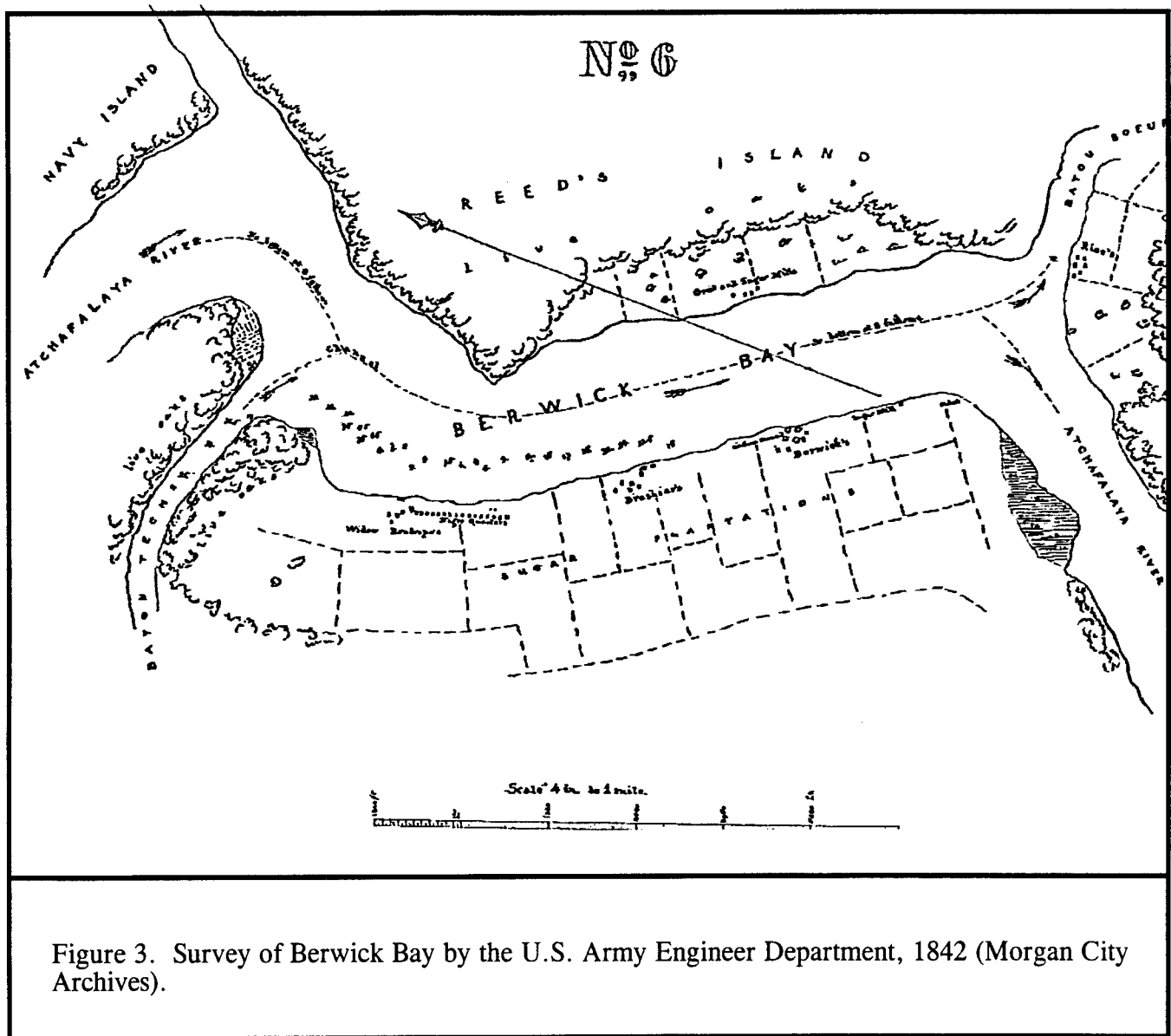
Freshwater discharge through the Atchafalaya Basin began increasing significantly and steadily in about 1881 when an extensive log raft was removed from the Atchafalaya River channel and Mississippi River flow began increasing (Fisk 1952). Since that time, the lower end of the basin has been a totally freshwater environment. The discharge continued increasing until the early 1960s when the flow became artificially regulated by the Old River Control Structure near the northern end of the basin. However, the discharge through the Lower Atchafalaya River probably peaked in 1942 at which time the Wax Lake Outlet was artificially dredged to provide a secondary outlet through the Teche Ridge for basin discharge. This outlet reduced the Lower Atchafalaya River discharge by about 20%.

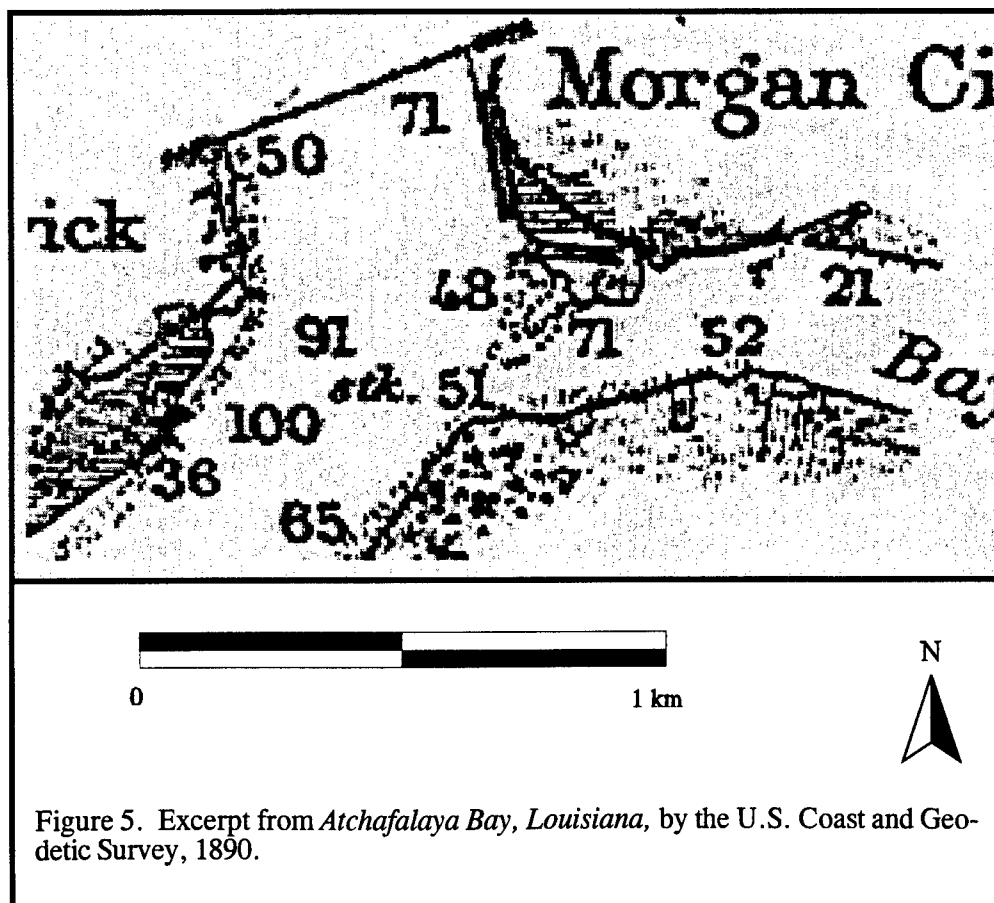
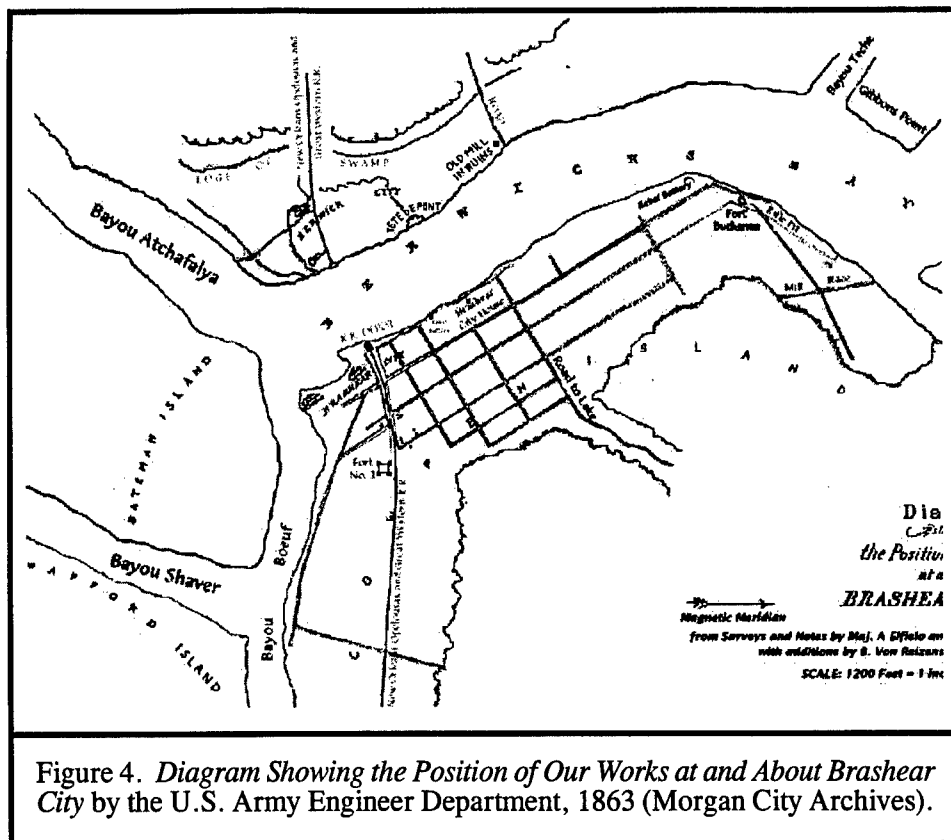
Since the early part of the 20th century, the Grand and Six Mile Lakes lacustrine complex in the lower part of the Atchafalaya Basin has served as a settling basin for much of the increased sedimentation through the basin (Gagliano and van Beek 1975). By the 1970s, the basin was

effectively filled with the lacustrine environment evolving into a riverine environment. However, since the early 1950s, enough sediment was being transported through the entire system to allow a marine delta to begin forming in Atchafalaya Bay (Shlemon 1975).

Bankline and Channel Changes in the Project Area, 1842 to Present

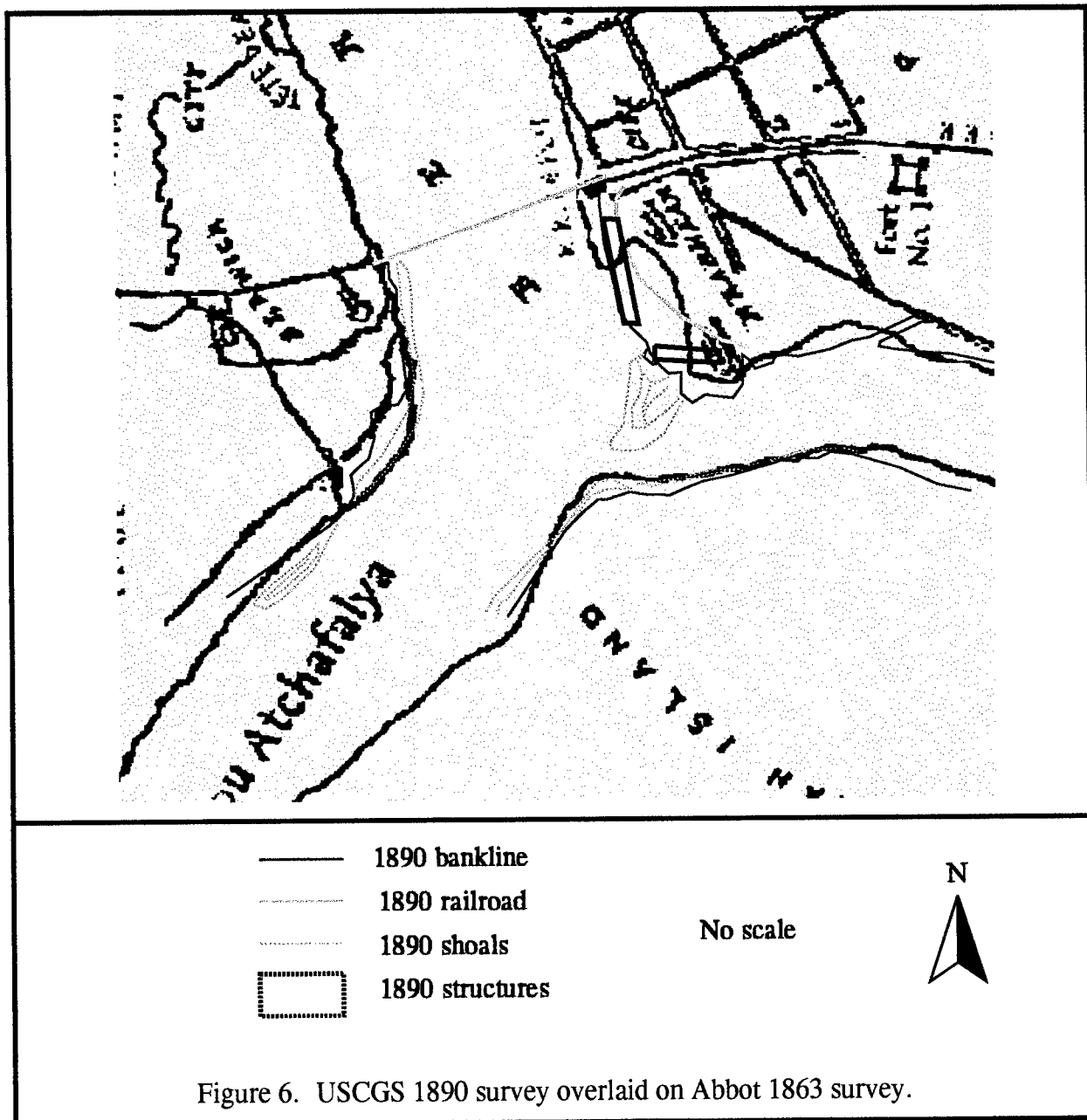
Historic data on bankline change in the project vicinity has been derived from surveys of the Berwick Bay area conducted in 1842 (Figure 3), 1863 (Figure 4), and 1890 (Figure 5); USGS quadrangle map editions of 1935 (15'), 1955 (15'), 1966 (7.5'), 1967 (15'), 1966 (7.5', photorevised 1981), and 1994 (Figure 1); Atchafalaya River Hydrographic Survey (1986-1988); Navigation Maps of Atchafalaya River System (1993); and aerial photographs (1935, 1951, 1963).





Since the antebellum period, the banklines at the confluence of Bayou Boeuf and Berwick Bay have changed dramatically on the northern or Morgan City side, and very little on the southern or Bateman Island side. This is because the natural levee on the northern end of Bateman Island is relatively high for the vicinity, reaching nearly 1.6 m (5.2') above NGVD at the navigation light (the western end of the natural levee in this area). The bankline east of the navigation light very closely parallels the 5-foot elevation line, and the natural levee rises to over 2.25 m (7.4') above NGVD on the southern shore of Bayou Boeuf before the natural levee turns south along Bayou Schaffer. Bateman Island has remained without a modern artificial levee. At some time since 1986, widespread borrow excavations on the northern end of Bateman Island have resulted in large pit areas, as shown on the 1994 USGS quadrangle map (Figure 1).

Overlays of historic maps on the contemporary quadrangle map (Figures 6-8) reinforce the suggestion that bankline changes have been small on the northern end of Bateman Island. However, shoal conditions in the project area have changed very substantially from the nineteenth



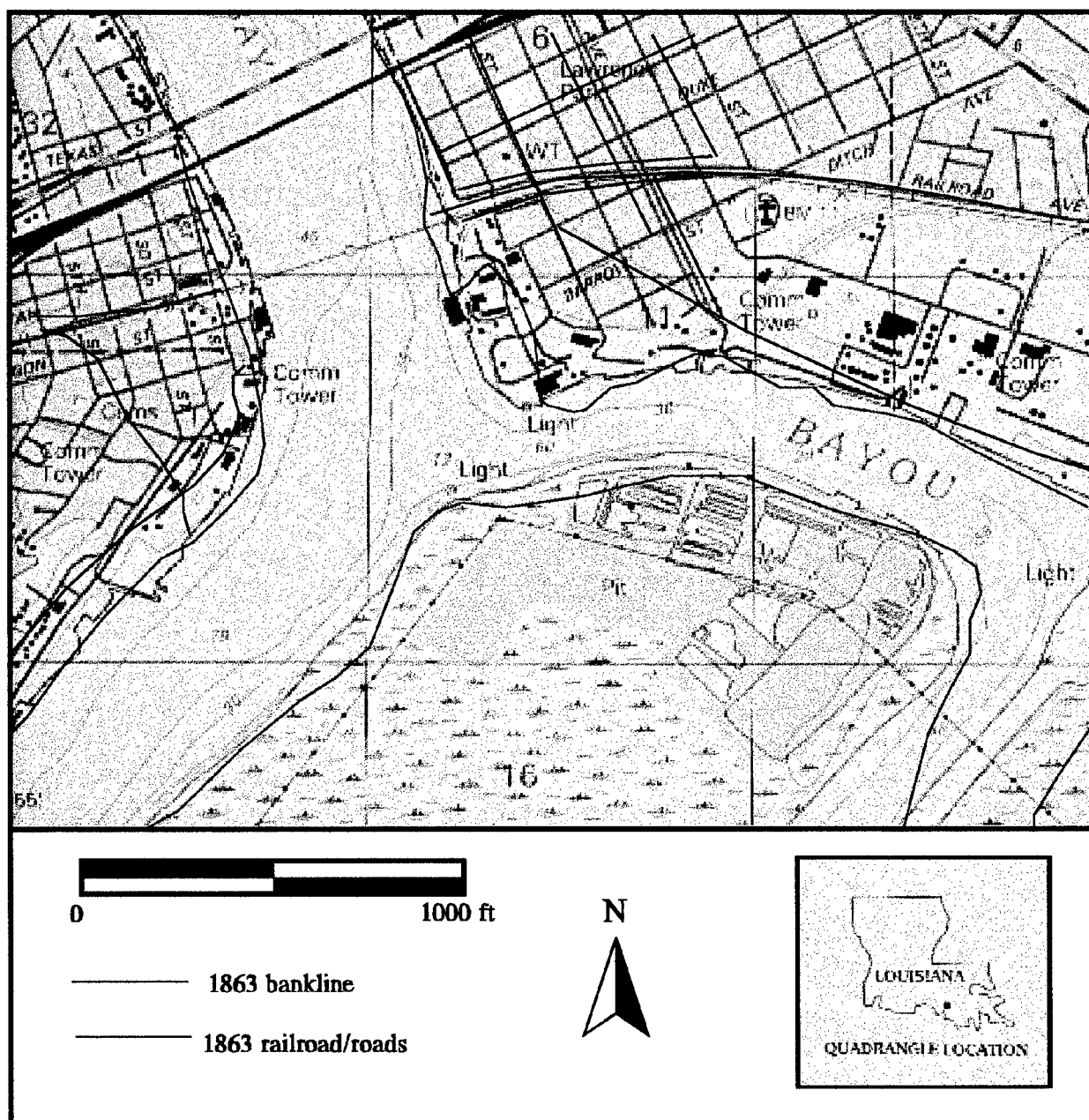


Figure 7. Abbot 1863 survey overlaid on excerpt from the Morgan City, LA, 7.5' quadrangle (1994).

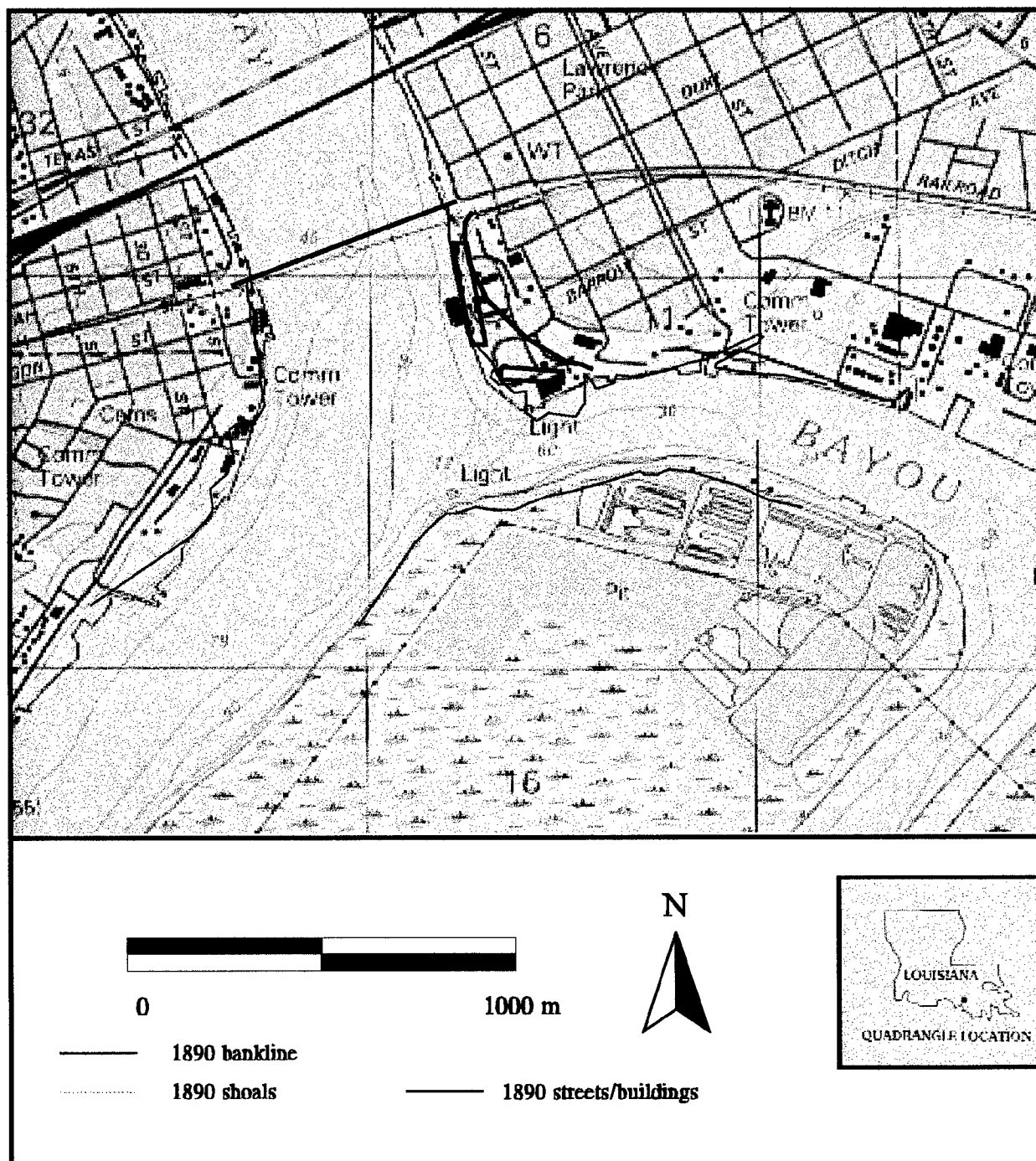
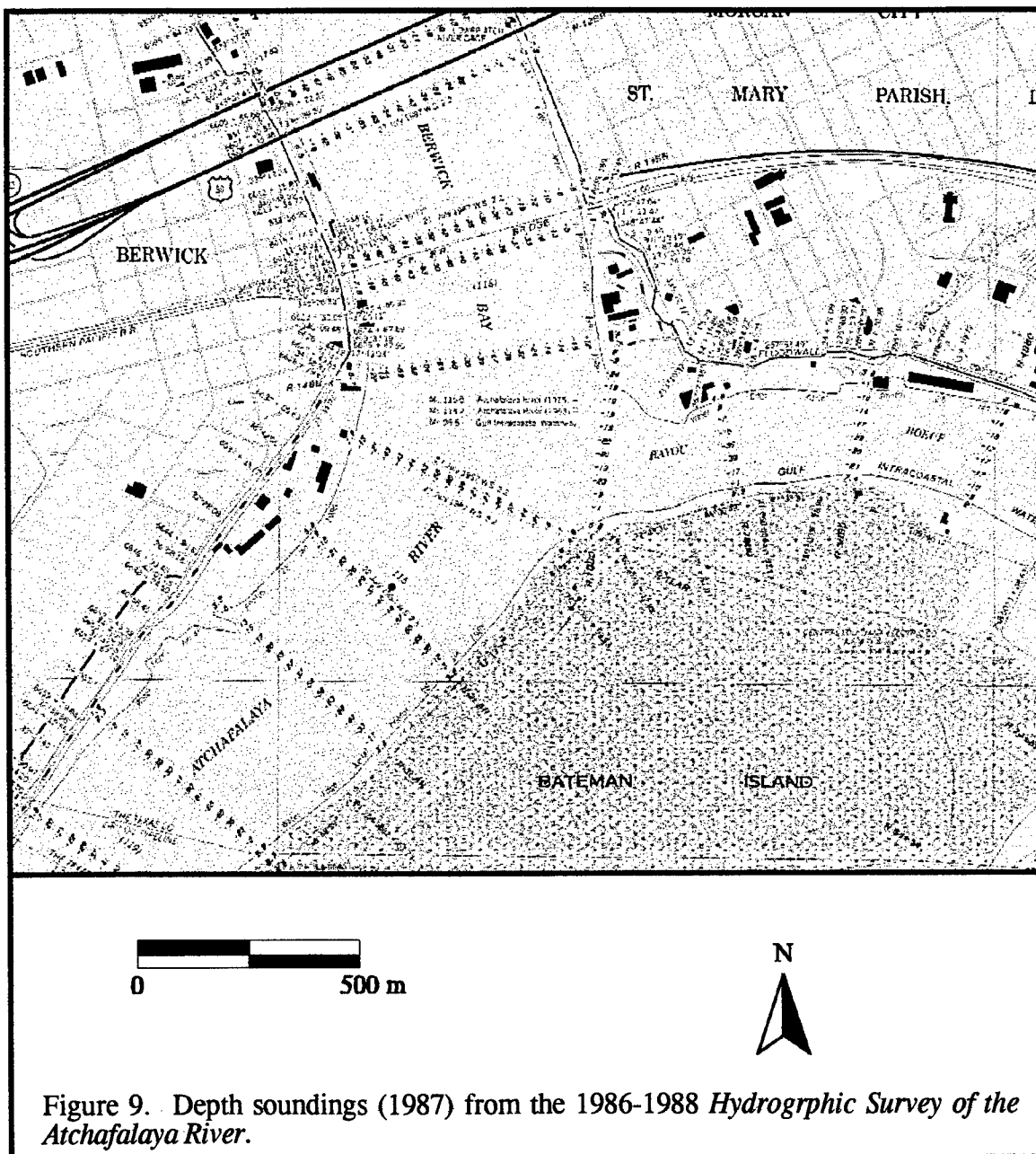


Figure 8. USCGS 1890 survey overlaid on excerpt from the Morgan City, LA, 7.5' quadrangle (1994).

century to the present. The first available detailed map with soundings for the project area dates to 1890 (Figure 5), and shows shoals extending from the bank on the Morgan City side; a depth of 481 (14.6 m) on the Berwick Bay side of the shoals; a depth of 721 (22 m) on the Bayou Boeuf side of the shoals; and a depth of channel of 511 (15.6 m) in the approximate navigation light location. By the mid-twentieth century, the shoal had shifted to the southern or Bateman Island side of the confluence. It is possible that construction of the Intracoastal Waterway (ca. 1942) and Bayou Boeuf Lock (between 1947 and 1955) had an effect on the hydrology in this area sufficient to produce a shift in the shoals in a fairly brief interval of time. In 1955, the channel of Bayou Boeuf east of the former shoal location was 471 (14.3 m) where it had been 721 (22 m) in 1890; in 1966, there was a depth of 601 (18.3 m) at this location. By 1966, the shoal had clearly shifted to the southern side of the confluence, and immediately north-northeast from the navigation light a depth of 121 (3.7 m) is shown in the location that had been 511 (15.6 m) in depth in 1890. The 1987 depth soundings (from the 1986-1988 *Hydrographic Survey of the Atchafalaya River*, Figure 9)



indicate an increase in depth west-northwest of the navigation light to a maximum mid-channel depth of 58' (17.7 m), while the bar at the head of Bayou Boeuf has a maximum mid-channel depth of only 22' (6.7 m). It is not known the degree to which channel dredging may have affected water flow in the area.

The bank of Berwick Bay below the railroad bridge in Morgan City is technically outside of the project area, but the bankline location figures in the sinking of the *U.S.S. Col. Kinsman* in 1863 (see Chapter 4). The *Diagram Showing The Position Of Our Works At And About Brashear City* (Figure 4) by the U.S. Army Engineer Department (1863), probably illustrates banklines during high water. It shows a large inundated area south of the railroad bridge. This area was partially raised with fill in the post Civil War era, when Morgan's Louisiana and Texas Railroad undertook improvements of the railroad and port facilities, and a railroad loop was constructed (shown in the 1890 survey map, Figure 5). Subsequent filling and leveeing have further altered the elevation of the bayside area below the railroad bridge; between 1963 and 1966, wharf bulkheads were constructed stretching approximately 800' (244 m) north and 1250' (380 m) east of the navigation light on the northern bank of the Berwick Bay - Bayou Boeuf confluence. In the past thirty years, these bulkheads have been extended up the Berwick Bay frontage and Bayou Boeuf frontage of Morgan City and, for the most part, represent the current bankline.

In summary, the bankline of the current project area has changed very little since the antebellum period as a result of the well-developed trunk channel natural levee deposits on Bateman Island. However, the point bar on the northern bank of the Bayou Boeuf/Berwick Bay confluence is no longer extant. Furthermore, there has been a substantial change in shoal conditions between 1890 and the mid-twentieth century. The shift of the shoal southward into the channel area is possibly related to construction of the Intracoastal Waterway and/or the Bayou Boeuf Lock. Thus, there is a high potential for cultural resources within this area.

CHAPTER 3 HISTORIC BACKGROUND

Prehistory

The study area is composed of natural levee deposits related to the Maringouin and Teche delta complexes. Prior to being buried by the Teche complex, the Maringouin complex distributaries were exposed for hundreds of years and could have accumulated archeological deposits during Archaic times. However, any cultural deposits on the Maringouin natural levee surface in the project vicinity would be deeply buried (>2.4 m). Consequently, the earliest cultural deposits within the project area vicinity date to the Tchula period (500 B.C.-A.D. 1) or later and are associated with the Teche complex. By approximately A.D. 1500 during the Mississippi period (A.D. 1200-1700), the material culture of aboriginal groups in the area appeared similar to that encountered by the early French explorers. For a detailed discussion on the prehistory of the study area, see Lee et al. (1999).

The Colonial Period to 1803

The area of St. Mary Parish was little explored or settled during the early decades of the French colonial administration of Louisiana. The region was part of the Attakapas district, named for an Indian tribe in southwestern Louisiana. The early historic occupation of the Attakapas District was by the Atakapas (or Attakapas) at its western extremity and the Chitimacha tribe to the east.

At the beginning of the historic period, the Atakapas comprised several bands. Their territory ranged from the Vermilion River in the east, stretching westward past the Mermentau River to the Calcasieu and lower Sabine Rivers. "Atakapas" ("man eaters") was a name given them by Mobilian or Choctaw speakers because of purported cannibalistic practices, but they referred to themselves as many tribes did, as "the People" (*Ishak*). Two eastern bands of the Atakapas, the *Hikiike Ishak* or "Sunrise People," at various times lived at the western edge of modern St. Mary Parish. They occupied locations on upper Bayou Teche, lower Vermilion River, near Plaquemine Brule, near lake Arthur on the Mermentau River, on western Grand Lake, on Lower Bayou Nezpique, on Bayou Queue de Tortue, and on Lacassine Island. The total Atakapas population may have totaled about 2,000 to 2,500 in the second half of the seventeenth century (Swanton 1952:198-199; Kniffen et al. 1987:46; Goins and Caldwell 1995:21).

The Atakapas were initially isolated from French settlement in southeastern Louisiana because of the obstacle the Atchafalaya Basin provided to migration and trade. In the 1720s, Bienville estimated the Atakapas at about 200 warriors. In the late 1730s, the Atakapas made entreaties to the French to trade pelts, bear oil, and horses for European goods, and the French were happy to comply (Usner 1992:1100-101). Increased contact with the French negatively affected the Atakapas with disease, and substantial European settlement in their territory began in the mid-eighteenth century. After 1760, European settlement within the Atakapas district accelerated, and the Atakapas began to withdraw westward. The Atakapas sold land between Bayou Teche and the Vermilion River to French settlers. In 1779, the eastern Atakapas bands at the Vermilion River and the Mermentau River had a total of about 180 warriors, and furnished warriors to Galvez' expedition against the British. By 1805, only about 80 warriors remained in the single surviving Atakapas town on the Vermilion River, and of these, about 30 were Houma and Tunica that had joined the Atakapas. A handful of eastern Atakapas may have resided on the Mermentau River into the 1830s, but otherwise, they were absent from their former eastern range by this date (Swanton 1952:198-199; Kniffen et al. 1987:75; Goins and Caldwell 1995:21).

The Chitimacha tribe in the early historic period were centered in two groups, one along Grand Lake and its environs, including lower Bayou Teche, and one on the upper reaches of Bayou

Lafourche. The Chitimacha may have derived their appellation from their own name for Grand River (*Sheti*). They were a powerful tribe in the region, numbering approximately 3,000 or 4,000 individuals in 1650. John R. Swanton (1952) identified several Chitimacha village sites within modern St. Mary Parish. These included: *Ama'tpan na'mu*, a village located three miles east of Charenton on Bayou Teche, and then later on the east side of Grand Lake opposite Charenton; *Hi'pinimsh na'mu*, at Fausse Pointe; *Ne'kun tsi'snis*, opposite Isle aux Oiseaux in Lake False Pointe; *Ne Pinu'nsh*, two miles west of Charenton on Bayou Teche; *Oku'nkiskin*, somewhere on Bayou Teche; *Shatshnish*, at Jeanerette; *Sho'ktangi ha' ne hetci'nsh*, on the south side of Graine à Volée Inlet, Grand Lake; *Tca'ti kuti'ngi na'mu*, at the junction of Bayou Teche with Atchafalaya Bayou (probably north of Berwick); *Tcat kasi'tunshki*, at Charenton; and *Waitinimsh*, at Irish Bend (Swanton 1952:202-203; Kniffen et al. 1987:53; Castille et al. 1990:21-22).

At the beginning of the eighteenth century, the French found Chitimacha villages on Bayou Lafourche and Bayou Teche; the latter settlements were possibly recently established. The Chitimacha allied themselves with Iberville and the French, and they had an estimated 700 to 800 warriors in 1699. Relations between the French and the Chitimacha soon deteriorated. War erupted between the Chitimacha and the Taensa, who had formerly been allies, in 1706. A Chitimacha war party returning from an unsuccessful raid on the Taensa killed a party of Frenchmen (including Father de St. Cosmé, missionary to the Natchez). A war ensued which lasted more than a decade, and which was disastrous to the Chitimacha. In 1707, the French and their Indian allies destroyed one of the Chitimacha villages, and the Chitimacha began a retreat to more inaccessible regions of the Atchafalaya Basin. Many Chitimacha were enslaved by the French before a peace between them was concluded in 1718. Some of the Chitimacha moved to the Mississippi River, but some remained in the southwest part of the Atchafalaya Basin. In 1784, there were two Chitimacha villages reported on the Teche. By the later-nineteenth century, only a small band of Chitimacha remained at Charenton, with a handful of Chitimacha descendants remaining in the Atchafalaya Basin. The Federally-recognized Chitimacha tribe is unique in Louisiana in that their reservation today at Charenton is located where they had a settlement in 1700 (Swanton 1952:202-203; Kniffen et al. 1987:308-309; Castille et al. 1990:21-22; Goins and Caldwell 1995:21).

It is possible that European settlers had established themselves in the vicinity of Morgan City in the early Spanish colonial period. Acadians and others ascending Bayou Teche to the Poste des Attakapas may have stopped in the area of Berwick Bay and Bayou Boeuf in the second half of the 1760s. Descendants of Irishman Christopher O'Brien claimed that he was resident on Tiger Island for a short time before 1770, and after 1801, O'Brien received a Spanish grant of a 640-acre tract that eventually became the site of Morgan City. However, the earliest documented European settler in the Morgan City area was Thomas Berwick, who moved to Tiger Island from Opelousas after 1784. On July 3, 1797, Berwick's wife, Eleanor Wallace Berwick, and his son, Joseph, received a Spanish land grant for a 70-arpent front tract on Tiger Island, fronting on "the river Teche" [Lower Atchafalaya River and Berwick Bay] (Peltier and Lehmann 1960:11).

The early European settlers found the portion of modern St. Mary Parish along Bayou Teche to be the most desirable land for settlement. Along the Teche, cultivable land extended one to three miles on either bank. Along Bayou Salé, Bayou Cypremort, Bayou Boeuf, Bayou Shaffer, and the shores of Berwick Bay, the land suitable for cultivation was less extensive and seldom exceeded an area one-half mile from the water (de Grummond 1949:18). In 1762, there were about 400 persons residing in the Attakapas district. Some of these settlers were Creoles who had come from Fort Toulouse and Mobile.

Louisiana was transferred to Spain under the terms of the Treaty of Paris in 1763, and the Spanish encouraged settlement in the Attakapas district. In 1765, Acadian settlers began to arrive in Louisiana in large numbers. Some were settled along the Mississippi River by the colonial administration, but many of them located in Attakapas. The Acadian settlers received Spanish land grants in an area stretching from La Manque, near modern Breaux Bridge, to Fausse Pointe (present-day Loreauville).

The settlement of the St. Mary Parish region was predominantly Acadian only at the upper and lower extremities of Bayou Teche within the modern Parish boundaries. Between the vicinities of Baldwin and Morgan City, many settlers were Creoles from elsewhere in the colony, and after 1804, Americans of British or other European background (Goins and Caldwell 1995:97). The Franklin and Morgan City regions thus developed a diversified population of Acadian, Creole, British-American, and African-American heritage (Kuttruff et al. 1993:36; Harris 1881:217).

The Antebellum Period, 1804-1861

In 1805, the Legislative Council of the Territory of Orleans renamed the Attakapas District the County of Attacapas (*sic*), comprising the modern parishes of Vermilion, Iberia, Lafayette, St. Martin, and St. Mary. The first territorial legislature redivided Louisiana into nineteen parishes in 1807. The former Attakapas district became the parish of St. Martin, with a total population of 7,369 persons in 1810. In 1811, St. Mary Parish was created out of St. Martin Parish. Franklin was established as the seat of St. Mary Parish in 1820. In the following decades, the boundaries of St. Mary Parish were defined and altered and did not become permanent in their contemporary locations until the Reconstruction period. Notably, Iberia Parish was created from portions of St. Mary and St. Martin parishes in 1868 (Broussard 1977:12; Goins and Caldwell 1995:41-44).

More European-American settlers arrived in the Berwick Bay area during the early American period. By 1805, Lt. Enoch Humphrey of the U.S. Army reported six families in the area of Berwick Bay, two families above the mouth of Bayou Teche and four families below it. When James Leander Cathcart traveled through the area making a timber survey for the U.S. Navy in 1819, he mentioned numerous settlers on Tiger Island, Rice Island (now Bateman Island), Lafourche Island, and tracts on Cowpen Island (Avoca Island). Tracts were subdivided and sold on Berwick Island by 1812. Around this time, Dr. Walter Brashear was resident on a plantation established by Thomas Berwick, which Brashear acquired between 1809 and 1817. Brashear was a major landowner in the area, eventually owning tracts at Cote Blanche, Petite Anse, and Orange Island as well as on both sides of Berwick Bay and on Bayou Boeuf (Peltier and Lehmann 1960:9-13; Goodwin et al. 1985:36, 40; Pearson and Saltus 1991:28).

Sugar was grown in St. Mary Parish from early in the nineteenth century. Thomas Ashe, traveling in Attakapas in 1806, noted that stock raising was important in the district, but also that sugar cane was "very abundant and profitable" (quoted de Grummond 1949:21). Cathcart noted in 1819 that sugar cane was being grown on the natural levees on the south side of Tiger Island, and other planters in the Berwick Bay area had turned to sugar growing by this date (Peltier and Lehmann 1960:9-13; Goodwin et al. 1985:36, 40). The excellent alluvial soil along Bayou Teche and Bayou Sale also led to the re-consolidation of tracts along these waterways and their use for commercial agriculture. Land was relatively cheaper in the Berwick Bay area than it was along the Mississippi River, with first quality unimproved lands costing about \$10 per acre in 1819 (Goodwin et al. 1985:37). Many of those consolidating larger tracts were American planters, encouraged by the sugar tariffs of 1816. Cotton prices were also low in the 1820s, which further encouraged sugar growing. By 1824, there were over 1500 acres planted in sugar cane in St. Mary Parish. The tariff was revised in 1828, and within a year, the number of sugar plantations nearly doubled. By 1835, sugar had clearly become the dominant commercial crop in the area (de Grummond 1949:21; Goodwin et al. 1985:41).

Sugar was the dominant agricultural product of the Berwick Bay area in the antebellum period, but the soil and climate were suitable for many other crops. Travelers in the early antebellum era noted that Tiger Island residents also grew corn, oranges, pears, plums and other fruits, sweet potatoes, beans, garlic, and cabbages (Peltier and Lehmann 1960:77).

The availability of water transportation in the Parish was important to its agricultural development. Bayou Teche remained the main transportation route within St. Mary Parish throughout

the antebellum period. Regular steamboat service between New Orleans and New Iberia began in 1819. By 1825, ships were carrying St. Mary Parish sugar directly to markets in the northern states and regular steamship service soon developed out of Franklin (de Grummond 1949:22; Pearson and Saltus 1991:27-35).

The area of Franklin was laid out in lots by Hugh Latiolais in 1808. At first called Carlin Settlement, the Post Office was named Franklin in 1817. In 1819, Franklin was described as a village of 15 or 20 houses, and the neighboring area had 15 or 20 plantations. Many of the early settlers of Franklin were of British descent (Kuttruff et al. 1993:36), in contrast to the heavily Creole and French population of the countryside. Named the St. Mary Parish seat in 1820, Franklin was not incorporated until 1830 (Broussard 1977:12). By 1838, a visitor to Franklin described the town as a "beautiful village" with a population of about 800 persons. The community had a church, court house, public school, female seminary, two hotels, two banks, two printing offices, a post office, an ice house, and even had some macadamized streets. By 1850, the population had reached almost 900 persons and continued to grow during the remainder of the antebellum period. The port of Franklin was also increasingly busy; sugar, molasses, and timber were exported and manufactured goods imported for distribution up the Teche and along the shores of Berwick Bay. Franklin had a U.S. custom house for some time in this period. Centerville also had a post office and stores by 1838, and the population had grown to 200 persons by 1853. The town had several stores, a sawmill, an icehouse, and several hotels (de Grummond:22-23, 53-54; Broussard 1977:13; Pearson and Saltus 1991:27-35).

The town of Brashear, later called Morgan City, was at least sometimes called the town of St. Mary prior to its incorporation. Walter Brashear bought a parcel of land on Berwick Bay in 1832 and another in 1835. These two tracts, Tiger Island and Golden Farm sugar plantations, were on opposite sides of Berwick Bay. Brashear evidently usually resided at Golden Farm on the western side of Berwick Bay. A U.S. survey of Berwick Bay in 1842 (Figure 3) indicates Brashear's plantation complex west of Berwick Bay, located about halfway between the plantations of Widow Rentrope and Joseph Berwick. Berwicks' plantation complex was located at the Berwick Indian mounds, north of the later railroad line. Widow Rentropes's plantation had the largest number of buildings shown in the 1842 survey, including 16 quarters cabins extending in a single row parallel to the Bay front. On Tiger Island, Brashear also had grist and sugar mills.

Brashear's holdings were subdivided by his descendants after his death in 1842, and the descendants evidently began to sell parcels of the two plantations before 1849. Berwick Bay became an entrepôt for shipping from the Gulf of Mexico to the port of Franklin. Sugar, molasses, and large numbers of cattle were shipped from the area. The greatest stimulus to the area was the construction of the New Orleans, Opelousas, and Great Western railway line from Algiers to Berwick Bay, which began in 1852. The owners of Tiger Island sugar plantation, Robert B. and Thomas T. Brashear, granted a right of way across the plantation to the railroad and also sold them a lot for a depot. The Brashears further subdivided their tract in an 1853 plan, and population growth was rapid enough that by 1855 (before the railroad reached the area), the town of Brashear had a United States Post Office. According to an 1855 advertisement in the New Orleans *Picayune*, the Brashears intended to donate 50 to 100 town lots to "homesteading mechanics, shopkeepers, artisans, etc." (quoted in Goodwin et al. 1985:58). On August 20, 1856, the Brashears conveyed to the N.O.O. & G.W.R.R. rights to construct and maintain wharves, sheds and other buildings on the margin of Berwick Bay for a distance of 130 feet above and 200 feet below the centerline of the railroad line. Another contract dated February 14, 1857, allowed construction of a coal yard wharf and cattle landing on the bay front and a track extending down Front Street (Tourist Division 1938:234; Peltier and Lehmann 1960:14-16; Goodwin et al. 1985:52-53,58; Kuttruff et al. 1993:36; Goins and Caldwell 1995:68).

The railroad was completed as far as Bayou Boeuf on February 24, 1856, and through to Brashear by April 1857. In the same month, the remaining town lots bounded by Berwick Bay,

Sixth Street, Brashear Avenue, and Bayou Boeuf were sold at public auction. The subdivision plan for this sale is preserved at the Morgan City Public Library. The Bay side of Front St. appears to have been excepted from this subdivision plan. On November 13, 1856, the N.O.O. & G.W.R.R. made an agreement with Cornelius Vanderbilt for steamer service between Brashear and Galveston, Texas. The first sidewheel steamboat between Brashear and Galveston entered service in April 1857, and the second in May of that year. Daily trains ran from Algiers, and Brashear became a hub for east-west traffic and shipping on the Teche. The town grew rapidly around the rail terminus, and by 1859, 40 homes had been constructed at Brashear. Brashear was formally incorporated on March 8, 1860. Its population was about 300 persons at this time (Tourist Division 1938:234; Peltier and Lehmann 1960:14-16; Goodwin et al. 1985:58; Kuttruff et al. 1993:36; Goins and Caldwell 1995:68).

The rise of commercial sugar agriculture in St. Mary Parish was accompanied by an increasing proportion of enslaved African-Americans in the population. By 1830, slaves made up more than half the parish population, and by 1840, over 70% of the parish's total population of nearly 9,000 was enslaved. Between 1850 and 1860, the white population of St. Mary Parish increased by 100 persons, while the slave population increased by 3,200 persons. On the eve of the Civil War, about 77% of the Parish's total population of 16,816 persons were slaves. Relatively speaking, slaveholdings were large in St. Mary Parish. In 1860, the average number of slaves per slaveholding was over 20 slaves, and fewer than 10% of slaves were held in units of 9 slaves or fewer. However, about 42% of slaveholders in St. Mary Parish owned fewer than 10 slaves in 1860. This means that while many slaveowners had only a few slaves, most slaves were held by owners with 10 or more slaves. Fewer than 6% of slaveholders, about 90 persons total, owned 50 slaves or more; but about 73% of slaves in the Parish were held by these 90 slaveowners. In addition, a smaller percentage of the white population owned slaves in 1860 than had done so ten years before (de Grummond 1949:26-27; Hilliard 1984:29-38; Kuttruff et al. 1993:37).

Farms were also relatively large in St. Mary Parish. In 1853, there were 175 farms producing sugar in St. James Parish, 67 with steam mills and 115 with horse-powered mills; they had an average of 37 working hands per farm. The average sugar production of these farms and plantations in 1853 was 226 hogsheads of sugar (Broussard 1977:26). Over 10% of all farms in St. Mary Parish in 1860 were 500 acres and larger; the average farm size was over 800 acres and average farm was valued at over \$10,000. These statistics indicate that a significant number of plantations were very large indeed. Alluvial lands in St. Mary Parish were valued from \$10,000 to \$20,000 per square mile, among the highest in the sugar region, surpassed only by lands in Ascension and Iberville parishes (Hilliard 1984:41-44).

The heavy investments made by St. Mary Parish planters in slave labor and sugar-processing equipment contributed to St. Mary Parish being the leading sugar-producing parish in the state for eight of the years between 1850 and 1860 (de Grummond 1949:43). In the banner crop year of 1861-1862, St. Mary Parish plantations produced 48,779 hogsheads of sugar (Champomier 1862).

The Civil War, 1861-1865

St. Mary Parish saw its share of military activity during the Civil War. In spring 1861, the Parish of St. Mary was more concerned with local defense than providing troops for out-of-state Confederate service. Brashear City, located at the junction of Bayou Teche, the Atchafalaya River, and the only railway line in southern Louisiana, was a strategic point that was bound to be involved in military action. A battalion of militia was quickly raised and equipped in St. Mary Parish after secession, but initially, only three companies of troops were sent to the regular Confederate Army (Winters 1963:74), with free transportation courtesy of the N.O.O. & G.W.R.R. The railroad provided nearly \$18,000 worth of free transportation of troops and materiel for the Confederate military during the first year of the war (Peltier and Lehman 1960:17). The St. Mary Parish militia

was called into active duty in June 1861 and deployed at the mouth of the Red River. The St. Mary's Cannoneers, made up of planters, distinguished itself the following year. This unit was the only one to remain steadfastly at its post during the mutiny of Confederate troops at Fort Jackson, below New Orleans, in April 1862 (Winters 1963:100, 150, 314).

A substantial minority of the free residents of St. Mary Parish were not secessionists, and probably a larger number were indifferent to the Confederacy. The majority of the Parish population were slaves, a fact sometimes overlooked by local historians when considering the popularity of the Confederate "Cause." An unknown number of African-Americans from St. Mary Parish, at least many hundreds, were recruited into the Union Army in the last three years of the war, contributing to the over 24,000 African-Americans from Louisiana who served in the United States armed forces during the Civil War (Winters 1963:100, 150, 314).

The Confederates built three forts and several smaller works in the vicinity of Brashear in 1861. The largest were Fort Berwick, Fort Chene, and Fort Bisland. Fort Berwick was located across the bay and about four miles from Brashear at the outlet of Wax Bayou onto the Atchafalaya. The site of this fort was mostly destroyed by construction and widening of the Intracoastal Waterway after 1933. Fort Chene was located eight miles south of Brashear. Fort Bisland was located outside of Patterson. These forts were all relatively small earthen works, short on ordnance. Each was manned by a company of infantry or engineers, with no trained artillerymen available. Five smaller Confederate battery emplacements were constructed on the Brashear side of the Bay and one on the Berwick side (Figure 4). On the Brashear side, one battery position faced the mouth of the Atchafalaya across the Bay; one was located approximately at the intersection of Front Street and Levee Road; one was near the foot of modern Greenwood Avenue; one faced the lower confluence of Berwick Bay and the Atchafalaya River (now inland, near the intersection of modern First and Barrow streets); and the last was west of the foot of modern First Street, facing Bayou Boeuf. It is uncertain that any guns were ever positioned in these emplacements. Other defensive measures taken by the Confederates included removing all navigational aids in the Atchafalaya channel and filling it with an abatis of live oak trees, except for an eighty-foot passage. Barges were prepared with additional trees to fill the gap when required. However, with the fall of New Orleans on April 25, 1862, the Confederates abandoned the fortifications in and around Brashear (and other Gulf Coast points). The works around Brashear were dismantled and the heavy artillery dumped into the bodies of water the cannon had been intended to guard (Peltier and Lehmann 1960:19; Goodwin et al. 1985:61).

On May 1, 1862, the N.O.O. & G.W.R.R. was taken over by Union troops. A few days later, a company of Confederate Rangers captured the train at Bayou Boeuf, and then proceeded to Avondale aboard the captured train. After destroying track there, the Rangers returned to Brashear, destroying the Des Allemands, Lafourche, and Boeuf bridges behind them before abandoning the train. The Union Army took complete control of the line in November 1862, and after repairs, the line was operated by Federal authorities exclusively for military use (Peltier and Lehmann 1960:17).

The war came to St. Mary Parish in earnest in 1862. Almost 1400 Confederate troops under General Alfred Mouton passed through Brashear on October 28 or 29, retreating toward Fort Bisland and pursued by General Godfrey Weitzel's Union troops. The Federal gunboats *Kinsman*, *Estrella*, *Calhoun*, and *Diana* reached Brashear City on October 30, too late to impede Mouton, and Weitzel arrived at the town on November 2 (Winters 1963:162; Peltier and Lehmann 1960:20-21; Pearson and Saltus 1991:36; Goins and Caldwell 1995:38). An inconclusive running naval battle between the Confederate gunboat *J.A Cotton* and the *Kinsman*, *Estrella*, *Calhoun*, and *Diana* occurred from November 1 to November 4 on Berwick Bay, the lower Atchafalaya, and Bayou Teche. These actions concluded with the Federal gunboats withdrawing to Brashear City and the *Cotton* moving up the Teche (Winters 1963:162-163).

Brashear City was to be a springboard for successive Federal troop movements throughout the Bayou Teche and Atchafalaya River basins. The Federal base at Brashear City included two sizable earthwork forts, constructed at the end of 1862. Fort Brashear (also referred to as Fort Star and Fort No. 1) was constructed at what were then the southern limits of the town. Positioned to protect the railhead from the land side, Fort Brashear was on the south side of the railroad tracks and near the modern intersection of Third Street and S. Railroad Avenue (Figure 4). It was a four-sided work with bastions at the corners, mounting 11 pieces of artillery and intended for a complement of 450 soldiers. Fort Buchanan was a mile north of Fort Brashear, opposite the mouth of Bayou Teche. It was smaller than Fort Brashear, occupying a space of about half an acre (Peltier and Lehmann 1960:19-20). Numerous smaller outposts and fortified points were located in the area of Brashear City. Some of the former Confederate fortifications were probably occupied, and a large redoubt was apparently built at this time on the Berwick side of the Bay. Located in the 3700 block of modern Belleview Front Street, this earthwork was dubbed the *tête du pont* or bridgehead, although there was no bridge at this time (Figure 4). Several redans of this fortification are clearly visible in the 1931 Corps of Engineers aerial photographs of Berwick.

The Federals hoped to encourage sugar and cotton production in the region, and the sale of these products to northern brokers. St. Mary Parish was one of the Louisiana parishes expressly exempted from the Emancipation Proclamation (Brown 1867:121), and slaves there were technically not emancipated until June 1865. They were thus supposed to remain on their plantations, producing the valuable commodities the Federals were so anxious to obtain. However, large numbers of slaves deserted their plantations and flocked to the Federal forces at Brashear, becoming a substantial logistical problem. The Federals tried to discourage the "contrabands" from coming to Brashear and encouraged slaves to stay on their plantations. The Federals had only a limited effect in this regard, and the planters in the region were mostly paralyzed for lack of reliable labor. Furthermore, the Federal troops displayed poor discipline, and much plundering of farms and plantations went on in the vicinity. Many "loyal" planters complained loudly to the Union command, and in some cases, Federal troops were stationed on "loyal" plantations to protect them from depredations of crops and livestock (Winters 1963:162-163).

Brashear City remained an important Federal base in 1863. Reconnaissance expeditions were regularly sent up the Teche and Atchafalaya from Brashear. As a result of one of these expeditions, the Union gunboat *Diana* was captured by the Confederates in an ambush on Bayou Teche in early 1863. Also in winter 1863, Union General Nathaniel P. Banks made plans to move towards the strategic Confederate strongpoint at Port Hudson from the west, rather than ascending the Mississippi. Forces from New Orleans and Baton Rouge, numbering 4,500 men, were assembled at Brashear City in March 1863, and began advancing north on April 11. Their objectives were to clear the Teche of Confederates, take Fort Burton at Butte La Rose on the Atchafalaya River, and cut Port Hudson off from supply from the west. The Federals clashed with Confederate forces at Bisland (or Bethel's Place) between Pattersonville and Centerville on April 13. The *Diana* was damaged in this action supporting the Confederate infantry and withdrew to Franklin for repairs. The Confederate infantry also withdrew from their positions. The Confederate and Union forces met again on April 14 upstream at Nerson's Woods (Irish Bend) near Franklin. The Confederates retreated from the larger Union force, abandoning Franklin and escaping north. Also on April 14, Union naval forces defeated the Confederates on Grand Lake in St. Martin Parish. These actions were relatively small by Civil War standards, but loomed quite large to the participants and St. Mary Parish inhabitants who witnessed them or their aftermath of dead and wounded. Skirmishing continually, the Union Army pushed the exhausted Confederate forces out of St. Mary Parish, past Jeanerette to New Iberia, and on to Vermilionville. Opelousas was captured by Banks' forces on April 20. Banks' troops rested and then advanced on Alexandria, which was occupied by David Farragut's U.S. naval force on May 7 (Winters 1963:214, 221-233; Goins and Caldwell 1995:39).

Banks sought to secure his supply lines from Brashear City to Opelousas. Additional expeditions were sent into the Atchafalaya Basin, and for a time Franklin was occupied by Federal troops. The town and the surrounding countryside suffered from foraging expeditions and outright pillaging. A New York soldier observed between Bisland and Franklin:

The men soon learned the pernicious habit of slily leaving their places in the ranks, when opposite a planter's house, to "appropriate" a chicken, or "confiscate" a pig, or "gobble" a few turnips and radishes. Oftentimes a soldier can be found with such an enormous development of the organ of destructiveness, that the most severe punishment cannot deter him from indulging in the breaking of mirrors, and pianos, and the most costly furniture. Men of such reckless dispositions are frequently guilty of the most horrible desecrations...[quoted in Winters 1963:236]

The soldiers following Banks' army in its advance observed widespread destruction of fences, houses ransacked, crops trampled, and the carcasses of butchered cattle. Some inhabitants flew British or French flags over their homes, hoping to escape molestation. Instead, the soldiers held the flying of a foreign flag in particular contempt and showed these inhabitants "very little mercy" (quoted in Winters 1963:236). Pillaging and looting became bad enough for guards to be stationed at every house with two or more chimneys along the army's route to prevent theft; the more modest homes of the lesser inhabitants did not receive such protection. By April 15th, some 300 soldiers had been arrested for theft, and approximately 500 stragglers were at large behind Banks' army, plundering the countryside. Some inhabitants fled their homes and hid in the woods. The depredations of straggling soldiers were perhaps most serious, but slaves no longer concerned with plantation discipline and vagabond civilians appropriated livestock and other items for their own use. Matters were bad enough from wanton looting, but Banks' army also tried to supply itself from the countryside as much as possible. Cotton, sugar, molasses, rum, corn, sweet potatoes, horses, mules, cattle, and livestock harness were seized by foraging parties operating from Franklin and other posts. Requisitions of private property went beyond the immediate needs of the forces in the area, but some "loyal" planters managed to sell their plantation products to the Federals. Thousands of bales of cotton, tens of thousands of head of livestock, and vast amounts of other commodities were sent to Brashear City from the surrounding countryside (Winters 1963:237).

In a report on May 11, 1863, Banks enthusiastically described shipping traffic at Brashear City:

...Almost hourly vessels are to be seen coming down the bay freighted with mountain loads of the precious materials of the regions just regained by our arms—cotton, hogsheads of sugar, and countless herds of mules and cattle.

The treasures already discharged upon the landing of Brashear City up to this date would amount to many hundreds of thousands of dollars; while this is but an installment of what remains behind, and which can only be counted by millions of dollars... the planters in the newly-overrun regions had not the amount of "patriotism" which the rebel leaders either supposed or pretended they had... [they] did not quite see the necessity of consigning to flames all the wealth they possessed in the world, merely for the sake of proving their devotion to the cause of Jeff Davis & Co....

Wherever our armies have penetrated they have found cotton and sugar carefully concealed in all sorts of remote corners; and as they seize these costly products a receipt is given to the owners, upon a fair valuation, in case they should hereafter be able to prove themselves of loyal antecedents, the *onus probandi* being entirely on the planter [quoted in Peltier and Lehmann 1960:23]

The presence of Federal troops on Bayou Teche played havoc with the sugar plantations of the area. The initial reaction on the part of many slaves to the arrival of Union troops in their district was a great excitement and exuberance. Some slaves simply rejoiced in thanks, and some took more material advantage of the situation; large numbers of slaves left their plantations to follow the Union troops. The slaves were sometimes encouraged by the soldiers to take what they wanted of their master's foodstuffs, clothing, furniture, or livestock; other stragglers sometimes interfered with the slaves on the plantations, disrupting all work. Civil order was threatened, and Federal provost troops were required to suppress "insurrections" of slaves who had left their plantations below Franklin and formed into disruptive bands. The retraction of Federal forces from the Teche towards Port Hudson in May 1863 actually contributed to a decline in slave disorders in some areas, as slave owners clamped down on slave discipline. But through the same month, St. Mary Parish also suffered from widespread disturbances by jayhawkers and runaway slaves. A white jayhawker was believed to be fomenting slave rebellion in St. Mary Parish, and the frightened white citizenry formed a vigilance committee. Assisted by 35 Confederate soldiers, the nascent insurrection was quashed without compunction; the white "ringleader" and some 50 slaves were hanged (Winters 1963:237-238, 307).

Among the many dramatic changes for the African-Americans of St. Mary Parish resulting from occupation of the area by Federal troops was the raising of "Colored Regiments" for United States service. Banks, though initially reluctant to use "colored" troops, had five regiments of African-American soldiers by May 1863, and was planning at least two more. By September 1863, Banks was more enthusiastic about the "colored" regiments. He began to conscript able-bodied African-American men into the Corps D'Afrique, eventually creating 20 regiments. There were many problems with these early regiments, but their discipline and training improved markedly over time. They were frequently used for garrison duty (as at Brashear City) and engineering labor, but some units eventually established good combat records (Winters 1963:238, 312-314).

With Port Hudson lost to the Confederates, General Richard Taylor decided in June 1863 to strike back at the Federals with what forces he had. Confederate troops under Alfred Mouton moved back down the Teche, while Colonel J.P. Major took a cavalry force toward Thibodeaux. The Union base at Brashear was a tempting target. It was manned by a large number of convalescents and poorly disciplined troops. Colonel Albert Stickney was placed in command of Brashear City in early June, and tried a crackdown on discipline with a heavy regimen of drill, scouting expeditions, and artillery target practice on the abandoned hamlet of Berwick. Half of his force quickly ended up on the sick list and morale plummeted. Meanwhile, Major's cavalry surprised a Federal force at Thibodeaux on June 20. The Union troops retreated in disorder to Lafourche crossing, where Stickney awaited. The Confederates, after a drunken binge at Thibodeaux, advanced through a heavy rainstorm and attacked on June 21. They were repulsed and retreated toward Thibodeaux (Winters 1963:284-286).

Additional Union troops arrived at Brashear City the day after the battle of Lafourche Crossing and Stickney returned to Brashear City. Union forces at Brashear then numbered some 700 men, of whom about 300 were convalescents. On the night of June 22, 250 of Mouton's men under Major Sherrod Hunter rowed down the Teche and the Atchafalaya in a "mosquito fleet" of skiffs, bateaux, and pirogues, landing in the backswamp at the rear of Brashear City. Two artillery batteries and three battalions of calvary and mounted infantry under Brigadier Thomas Green were simultaneously positioned in the ruins of Berwick and in the woods south of the town. On June 23, the surprised Union garrison was awakened by artillery fire from Green's troops across the Bay. Unnoticed by the distracted Federals, Hunter's Louisiana and Texas men formed into line of battle. One column was to attack Fort Brashear and the Union camp south of the rail depot, and the another column was to attack Fort Buchanan and a sugarhouse north of the rail depot. The columns were then to converge at the railway depot.

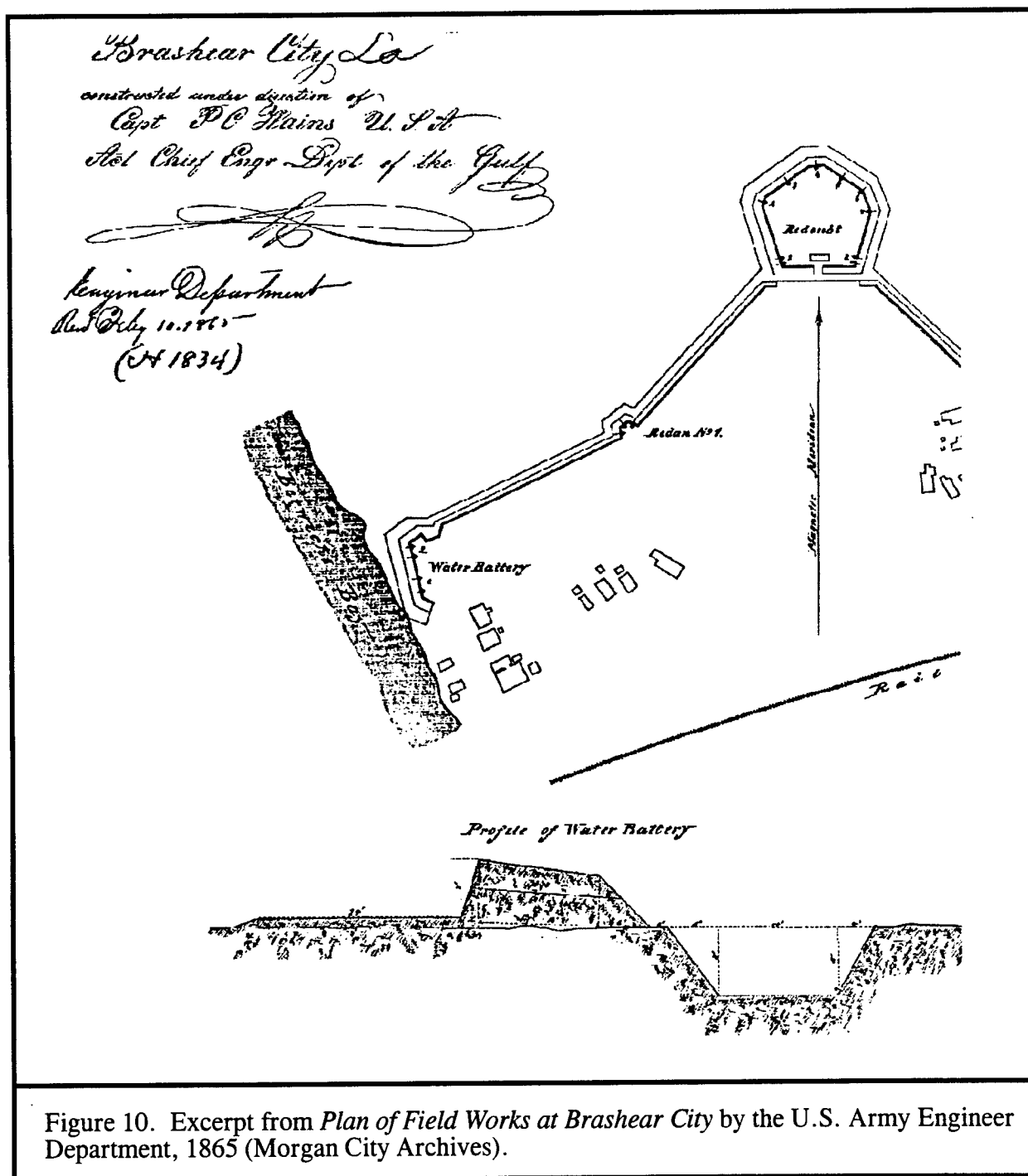
The Federals soon realized that Green's artillery was little danger and his troops had no means to cross Berwick Bay, but remained oblivious to Hunter's troops poised on the backswamp side of the town. Many of the Union soldiers left the forts and drifted back to camp. Hunter's men then struck, sweeping through the Union camp, and in the confusion, many unarmed convalescents were killed as they sought shelter. A train, consisting of three engines and several carriages, managed to roll out of the depot steaming east, but was later captured by the Confederates at the Bayou Boeuf bridge. Some of the Federal troops at Brashear managed to rally at the rail depot, but by 10:00 a.m., the Union garrison had surrendered to Hunter (Peltier and Lehmann 1960:24-25; Winters 1963:287-288).

Confederate losses were very light in the capture of Brashear; 3 soldiers were killed and 18 wounded. The Confederates claimed 46 Federals killed, 40 wounded, and 1,300 military prisoners (possibly an exaggeration); eleven guns, 2,500 rifles, 2,000 Negroes (presumably contrabands), over 200 wagons, hundreds of tents, and a huge amount of other materiel and ordnance were captured. The Confederate soldiers gorged themselves on captured food and drink, and supplied themselves with parts of Federal uniforms and other captured items. The rolling stock of the railroad was burned and the locomotives run into Berwick Bay. The captured Union enlisted men were given parole and marched off toward Algiers, while the officers were kept at Brashear. No African-American soldiers were captured; they had evidently all run away during the battle (Peltier and Lehmann 1960:26; Winters 1963:288-289).

There are several reasons why the African-American troops at Brashear abandoned their posts, including poor training, low morale, and lack of previous combat experience. Following the battles of Milliken's Bend and Port Hudson, persistent rumors circulated in June and July 1863 that the Confederates had a policy of "no quarter" for African-American troops. Many feared that summary execution by the Confederates awaited if they were captured or wounded. In fact, the Confederate Congress stipulated that white officers of black troops could be executed, while Negro enlisted men could expect reenslavement. However, Richard Taylor's personal preference was for "no prisoners" and Kirby Smith, commander of Confederate forces in the Trans-Mississippi Department, went beyond the wishes of the Confederate Congress and ordered no quarter for Negro troops and their officers (Cornish 1956:163-164, 168). With the collapse of resistance by Federal troops at Brashear, the inexperienced African-American soldiers understandably panicked and fled the scene.

Colonel Major's troop continued up Bayou Boeuf, and one day after the Brashear battle (June 24) a Federal contingent of 435 officers and men at Boeuf Crossing surrendered to Major's Confederates without firing a shot. The re-combined Confederate troops under Mouton then failed to take Donaldsonville on June 27-28. After prevailing against the Federals at Cox's Plantation on July 13, this Confederate force withdrew to Brashear City. During July, the Confederates constructed an earthwork redoubt on Young's Plantation at Bayou Boeuf, facing the mouth of Bayou Shaffer (Figure 4). However, learning that Union gunboats were enroute to Brashear City, Mouton abandoned Brashear and pulled back to Franklin. Federal troops transferred by Weitzel from Donaldsonville reoccupied Brashear City in force on July 25 (Peltier and Lehmann 1960:25; Winters 1963:289; Pearson and Saltus 1991:39; Goins and Caldwell 1995:39).

After the capture of Brashear by the Confederates and its re-occupation by Federal troops in July 1863, a ring of fortifications around the railhead and back of the town was constructed by Union engineers. The line of fortifications was built running roughly northwest from Fort Brashear to a strong hexagonal redoubt at approximately the intersection of modern Federal and Freret Street; then the fortifications ran west to the Bay, where they were joined to the revamped Confederate water battery at the foot of Greenwood Avenue. Figure 10 shows a plan and profile of the water battery.



Banks was preoccupied with the Texas campaign during the rest of the summer of 1863, but after General Franklin's Sabine Pass debacle, Banks' attention returned to the Teche. In September 1863, the Federals were routed at Sterling's plantation near Morganza. Banks decided on an overland move against Texas, and to secure the Teche, in October 1863, another Union expedition under General Franklin moved up the bayou from Brashear City. Beyond Opelousas, it was stopped by low water levels. Franklin's dawdling caused the overland approach to Texas to be abandoned. The Federals began a slow withdrawal down the Teche, and were attacked by the Confederates at Grand Coteau on November 3. The Federals made out badly in the contest, with

716 killed, wounded, or captured. The Union troops continued down the Bayou and reached New Iberia on November 17 (Peltier and Lehmann 1960:25; Winters 1963:289; Pearson and Saltus 1991:39; Goins and Caldwell 1995:39). These movements concluded major operations in the area for the year.

Banks' Red River Campaign began in late winter 1863. In March, a large force was assembled at Brashear. On March 13, Union troops began to move from Brashear City up the Teche and westward from Vicksburg, converging on Alexandria, which was taken on March 16 (Goins and Caldwell 1995:40). The Federal troops subsequently retreated down the Red River, and Bayou Teche was largely spared further military activity for the rest of the War.

In the spring of 1864 the Louisiana government sought to solve the problem of low recruitment and jayhawking with a single measure. Men of St. Landry, Calcasieu, Vermilion, Lafayette, St. Martin, and St. Mary Parishes liable for military service were ordered "to come forward and join the Louisiana Infantry regiments on duty in the state on or before the 1st day of June, 1864; otherwise they [would] be considered and treated as jayhawkers and shot down on sight" (quoted in Winters 1963:383). The impression of desperation conveyed by this order suggests the low ebb of Confederate fortunes in the region. Nevertheless, recruits of the Fourth Louisiana Regiment were trained at Franklin, and in spring 1864 they raided the Union garrison at Brashear City. After this attack, the Federals became afraid to forage far from their Brashear City base, to the relief of the Teche planters (Winters 1963:383). Expeditions of gunboats and troop transports into the Atchafalaya Basin continued until the early summer of 1865 (Maygarden et al. 1997:43-47). For the remainder of the War, jayhawkers were a greater problem for the residents of St. Mary Parish than was Federal military activity. The last Confederate forces in Louisiana surrendered on May 26, 1865, and on June 3, a Federal order abolished slavery in the state of Louisiana.

The Late-Nineteenth Century

St. Mary Parish, as a commercial sugar-growing region, was heavily affected by the Civil War. Physical destruction had been suffered along Bayou Teche, at Brashear City, and in other areas of military activity. More importantly, the loss of huge amounts of capital invested in slaves (about 50% of total wealth in the Parish in 1860), the collapse of land values, and the disruption of agricultural labor systems spelled economic disaster for the Parish as a whole, and particularly for the planter class. A painful period of adjustment was required, and political Reconstruction added a context of social tension and civil unrest to efforts to re-develop the economy.

Political and social unrest were already at a high pitch when the first of the Military Reconstruction Acts designated Louisiana part of the Fifth U.S. Military District in early 1867. This Act disenfranchised most of the electorate that had been Confederate sympathizers, antagonizing the white population. Symptomatic of the social and political tension in St. Mary Parish was the formation of Knights of the White Camellia in Franklin on May 22, 1867, one day before its formal organization in New Orleans, in response to the Reconstruction Acts. Chairman Alcibiades de Blanc described the Knights of the White Camellia as a "strictly peaceful, law-abiding and loyal order; as much so as Freemasons or Oddfellows" (quoted in Goodwin et al. 1985:65). However, the real intent of the organization was to insure that Freedmen voted Democratic or did not vote at all, by violence if necessary. The Knights of the White Camellia, like the Ku Klux Klan at the same time, identified "carpetbaggers" as interlopers and trouble-makers who had incited the Freedmen and were responsible for the political and social tension in the area. By autumn 1868, there were 800 knights of the White Camellia in St. Mary Parish, a very large percentage of the adult white males of the Parish. St. Mary Parish Sheriff H.H. Pope (a native of New York) and a judge named Chase were shot in October 1868 at O'Neill's Hotel in Franklin, in the presence of Pope's family. The perpetrators were suspected to be members of the Knights of the White Camellia, but no legal action was ever brought in the case. The activity of this organization

declined after the national elections of 1868, but not before it was implicated in the assassination of 23 African-American office-holders across the state (Broussard 1977:70-72; Goodwin et al. 1985:66).

Among the effects of war and Reconstruction was a change in the demographic structure of the parish population. Total population declined between 1860 and 1880 because of the detachment of Iberia Parish from St. Mary Parish in 1868. In 1880, the St. Mary Parish population total was 16,470, about 98% of the 1860 total. However, the white population had increased from about 3900 persons in 1860 to about 5400 in 1880, a 72% increase in a much smaller area over a period of only twenty years. In the same two decades, the African-American population decreased from about 13,000 persons in 1860 to about 11,000 in 1880, or to 67% of the Parish total. The African-American population of St. Mary Parish thus experienced an absolute population decline of about 8.5% during the war and Reconstruction years. Much or all of this decline can be attributed to the creation of Iberia Parish, since in the state as a whole, the years 1860 to 1880 saw a strong increase in African-Americans as a percentage of total population. After 1880, St. Mary Parish reflected particularly strong overall population growth. By 1900, total parish population had reached 34,145 persons (Goins and Caldwell 1995:52), more than double the 1880 total.

Brashear City was in a sorry state at the conclusion of the Civil War. Moveable property of the residents and livestock had been confiscated or plundered, and real property and capital investments in buildings and machinery damaged and destroyed. The agricultural economy of the hinterland, upon which the commerce of Brashear depended, was in disarray. The once-thriving port was reduced to "five stores, two coffee houses, one tailor and one shoemaker" (quoted in Peltier and Lehmann 1960:27) and serious flooding in 1865 further damaged the town. In March 1866, the Brashear City Council gave Mayor J.P. Walters \$25 expense money to go to New Orleans and ask the military authorities that "houses built for the troops and other buildings now in use by soldiers be turned over to Brashear as compensation" for the "destruction of public buildings and property during the military occupation" (quoted in Peltier and Lehmann 1960:26-27). There was another flood and a yellow fever epidemic in 1867, the latter probably brought in by steamship or train passengers. However, the railroad was eventually the savior of Brashear's fortunes. By 1869, the N.O.O. & G.W.R.R. went broke with the effort to repair its track and bridges and to extend the line westward. Shipping magnate Charles Morgan purchased the line, which became Morgan's Louisiana and Texas Rail Road. In July 1869, Morgan obtained permission to construct 650 feet of wharves, a double track or turntable for the railroad, storage sheds, cattle pens, and other improvements at Brashear City at the railroad's expense. The revival of commerce led to Brashear being made a U.S. port of entry in 1873. In 1871-1874, Morgan undertook dredging of the Atchafalaya and Berwick Bay so that his larger steamships could dock at Brashear (Peltier and Lehman 1960:29, 65; Pearson and Saltus 1991:40).

Despite another major flood in 1874, Brashear continued to grow. In that year, a U.S. Army Corps of Engineers survey of the Atchafalaya included a description of traffic in Berwick Bay:

The products of the Atchafalaya Country are cotton, sugar, molasses, moss, lumber, staves, and shingles... The lumber and staves are rafted down to Brashear and the Teche, seven small steamers being engaged in this trade... United States contractors for live-oak have a depot at the one hundred and thirty-fourth mile, on Berwick's Bay, where they collect large supplies of this valuable material from points as far above as Bayou Chene, and ship by schooner... [quoted in Pearson et al. 1991:40].

In recognition of the railroad's impact upon the community, the City Council changed the name of Brashear to Morgan City in 1876. Morgan City was already larger than Franklin by this date, with about 3000 residents and 800 houses. By the late 1870s, Morgan City had two newspapers; two fire companies; Presbyterian, Catholic, Episcopal, Methodist, Baptist, and Jewish congregations; five schools; two white and two African-American fraternal lodges; one moss

factory; one sash, door, and blind factory; four steam sawmills; one ice house; three drug stores; 50 wholesale or retail stores; fifteen coffee shops; five billiard rooms; three bakeries; and a public park with menagerie. Morgan City had become a major regional transportation center, with 17 vessels in regularly-scheduled operation between Morgan City and Texas, New York, Havana, and Mexican and Central American ports, as well as regular traffic by Teche and Atchafalaya packets. The yellow fever epidemic of 1878 caused over 100 deaths in Morgan City (about 3% of total population) but only temporarily checked its increasing population (Peltier and Lehmann 1960:31-32, 36-37; Goins and Caldwell 1995:68).

Opposite Morgan City, Berwick also grew strongly in this period. In 1880, Berwick had about 700 residents and two shipyards. In the same year, Franklin's population had reached about 1500 persons, and the town had six churches— three white and three black— a shipyard, an ice factory, and a sawmill. Ten years later, Franklin had three schools, a white school, a "colored" school, and a Catholic school; plus three hotels, two livery stables, and a newspaper. In 1880, St. Mary Parish overall had a total of 21 "colored" and 11 white public schools (Harris 1881:119, 218; Kuttruff et al. 1993:36).

Morgan's Louisiana and Texas Rail Road was sold prior to his death in 1878 to the Louisiana and Texas Rail Road and Steamship Co., which completed a steel swing-span bridge across the Atchafalaya at Morgan City in 1882. Deeper-draft ships were thus not prevented from docking north of the bridge, but competition with the railway eventually undercut steamer traffic to Morgan City. By 1885, 90% of the commerce between the Teche and New Orleans was carried by the railroad (Vertical Files, Morgan City Archive; Peltier and Lehmann 1960: 67-68; Pearson and Saltus 1991:41).

It is likely that by this period the inlet at the southern tip of the Morgan City (upon which a Confederate fortification had fronted) was filled, and a large loop in the railroad tracks was constructed. The earliest Sanborn Fire Insurance Co. maps of Morgan City (1885) indicate the southward curve of the tracks below the depot. This loop allowed industry to develop fronting on Bayou Boeuf, alleviating the need for vessels to dock north of the railway bridge yet with convenient access to the rail trunk line. Unfortunately, the Atchafalaya channel from Berwick Bay to the Gulf was allowed to silt up, and by 1888, the U.S. Army Corps of Engineers noted a serious decline in shipping traffic at Morgan City. However, in 1887, the Atchafalaya and Plaquemine Improvement Association had been formed with the help of lumbermen E.A. Pharr and F.B. Williams. The Association had two goals: establishing a channel 30 feet deep from the mouth of the Atchafalaya River to the Gulf of Mexico, and opening a route to the Mississippi River through Bayou Plaquemine with locks. Further action on this plan was delayed, but the channel was eventually dredged to 15', and the Plaquemine Lock was begun in 1895 and completed in 1907 (Vertical Files, Morgan City Archive; Peltier and Lehmann 1960: 67-68; Pearson and Saltus 1991:41).

Sugar-growing remained one of the principal economic factors in St. Mary Parish after the Civil War, and the problem of developing a wage labor system to replace slavery was one among many difficulties facing the sugar plantations. African-American women largely withdrew from full-time field labor after emancipation, and shortages of sugar cane labor were periodically acute for the rest of the century. Despite various experiments with share tenancy, immigrant workers, and other measures over the last three decades of the nineteenth century, male African-American wage-laborers eventually became the predominant workers on the sugar plantations. Sugar cane plantation workers usually received housing and also a food ration to supplement their wages, which were frequently paid in credit at the plantation store. Because of the centralized nature of the sugar estates, the workers oftentimes resided in the old antebellum quarters. The number of residents per house, however, was typically about half of the antebellum complement. Once the post-Reconstruction economic, social, and political regime stabilized, the living standards of cane plantation workers were not otherwise dramatically better than they were before emancipation (Braud et al. 1997).

There were a variety of reasons why plantation workers did not share in the general rise in living standards for agricultural labor that occurred in the North, Mid-West, and West of the United States. The provision of non-wage compensation to plantation workers, and use of seasonal labor, may have limited upward pressure on wages. In addition, technological advances in cane husbandry also dramatically reduced full-time labor requirements during the late-nineteenth century, a process that continued into the twentieth century. Between 1860 and the mid-1890s, mechanization nearly halved the labor requirements of cane growing, and the costs of labor for cane-growers by over one-third (Slichen Van Bath 1960:18). Overall, the cost of producing sugar cane decreased by about 50% between 1855 and 1890. This dramatic reduction in the cost of producing cane was not totally due to new technologies. However, it matched the decrease in the cost of producing corn, one of the crops heavily mechanized by the 1890s, and was significantly greater than the median decrease in the cost of production for all major U.S. crops. By the end of the 1890s, mechanization saved cane-growers some \$5.25 million per year over what it would have cost to produce the U.S. sugar crop by antebellum methods (Quaintance 1904:11, 14, 25-26).

The planters of St. Mary Parish and elsewhere were dead set against labor organization on their plantations, while sometimes effectively combining themselves to prevent wages from rising. In St. Mary Parish, a strike by the Knights of Labor in 1887 occurred while other parishes were in great turmoil. Violence erupted, and the St. Mary Parish strike resulted in the death of four African-American workers at the hands of Sheriff's deputies (Wade 1995:181). The sugar strike of 1887 seems to have been the last large-scale labor organizing activity in St. Mary Parish until the twentieth century (Ferleger 1982:32).

The plantation labor market operated with relative freedom from the effects of planter combinations or labor organization for much of the late-nineteenth century. While chronic shortages of seasonal cane labor did occur, African-Americans also had relatively limited opportunities to pursue other employment in the late-nineteenth century. Plantation wage rates, including non-wage compensation, compared favorably with other employments available to large numbers of African-Americans. At the end of the nineteenth century, use of immigrant labor on the cane plantations also increased, although African-Americans remained the predominant ethnic group among cane workers in St. Mary Parish. In 1890, there were 207 Italian immigrants resident in St. Mary Parish, and by 1900, there were 1039 Italians in the Parish (Wade 1995:181-182). These immigrant workers were exploited in semi-indenture arrangements, and most left the plantations at the earliest opportunity. Immigrant labor probably also depressed wages for plantation workers. However, despite the many factors identified, the stasis in cane plantation laborer's wages and living standards has yet to be fully explained (Braud et al. 1997).

While some sugar cane plantations remained large productive units, others were subdivided under the economic pressures of the Reconstruction era. The lack of capital to rebuild or modernize sugar house equipment was solved by the introduction of the central factory system, in which large refineries processed cane from several surrounding plantations and farms. Whereas nearly every antebellum planter sought to build his own sugar house, the central factory system allowed smaller and under-capitalized planters to produce remunerative crops without the expense of building a sugar house. By the early 1880s, the central factory system was an established fact in St. Mary Parish, although 115 sugar houses were still in operation in the Parish. The logic of economies of scale in sugar growing and processing was relentless. When narrow-gauge railroads came into prevalent use on cane plantations in the 1890s, individual sugarhouses could process thousands of acres of cane; the size of plantations grew rapidly while the number of sugarhouses declined precipitously (Braud et al. 1997).

On the other hand, the rise of central factories meant that smaller farmers could concentrate on growing cane and selling their crop to a central processor. These small farmers were mostly white. Relatively few African-Americans were among the small farmers growing cane for sale to the large central factory concerns late in the nineteenth century. However, there were 248

sugar cane farms owned and operated by African-American farmers in St. Mary Parish in 1900, representing more than one-quarter of black-owned sugar farms in the state (Scott 1994:80-81).

Other crops beside sugar cane were grown in commercial quantities in St. Mary Parish after the Civil War. On alluvial tracts, oranges, plums, muscadine grapes, blackberries, and dewberries were grown in addition to sugar cane and corn. The Land Reclamation Company of Louisiana reclaimed tracts of sea marsh in St. Mary Parish for rice raising. Sweet potatoes, Irish potatoes, pumpkins, peas, hay, cabbages, tobacco, beans, castor oil beans, ramie, indigo, and sea island cotton were also raised on reclaimed marsh tracts (Harris 1881:217-218). Other minor products of the St. Mary Parish area shipped from Morgan City included honey, beeswax, wool, and onions. Wild products shipped from Morgan City included moss (approximately 300 tons in 1876, a year of short production), otter and coon skins, alligator hides (over 4100 in 1876), live wild birds, pelican oil, lake shell, and oysters. Jacques Lehmann, a French immigrant, began buying oysters from local oystermen in 1879 and the business expanded rapidly. Lehmann soon had to bring in oyster shuckers from Galveston, Biloxi, and Baltimore to handle demand and was shipping oysters as far as California. From an early production rate of 300,000 oysters a week, Lehmann was shipping 2 to 3 million oysters weekly from his Front Street plant by 1886. Over 13½ million oysters were shipped by rail from Morgan City between September 1, 1886 and May 1, 1887. Saltwater and freshwater fish were also shipped from Morgan City by rail from the 1870s, sometimes by companies that also sold oysters and furs. Among these early fish exporters were Louis Smyly, John Dalton Co. Ltd. (established 1882), Edgar Bass Fish Depot, and the Berwick Bay Fish and Oyster Co. (before 1887), all located on Front Street. Crucial to the success of the oyster and fish trades was the availability of cheap manufactured ice. An ice plant opened in Morgan City by 1875, and not only supplied ice for seafood shipping but also served the lucrative Texas wholesale ice market (Vertical Files, Morgan City Archive; Peltier and Lehmann 1960:32, 77-79).

St. Mary Parish, like many parts of southern Louisiana, was a potentially rich source of timber resources. Cypress, oak, ash, elm, sweetgum, black walnut, hickory, and magnolia were all present in St. Mary Parish in marketable qualities (Harris 1881:218), and almost one third of the Parish was covered with marketable timber. The pre-industrial float logging methods of the "swamper" and logger made little dent in the vast reserves of virgin cypress timber in wetland locales, until the invention of the overhead railway cable skidder in 1889 and the pullboat in 1892 made it possible to harvest timber in almost any environment. But even before these technological developments, timber was a major product of the region, and the Berwick Lumber Co. was in operation soon after the Civil War. The pullboat and skidder were developed in a period of surging national demand for lumber and a lumber boom resulted in Louisiana (Mancil 1972:76-77). Whereas alluvial lands in St. Mary Parish cost from \$6 to \$30 per acre in the early 1880s, public lands, where much of the virgin cypress timber in particular was located, could be purchased from the government at \$.25 to \$1.25 per acre (Harris 1881:118). Huge tracts of public land were purchased by timber companies, who often simply ceased to pay property taxes on the properties once the marketable timber was removed. New sawmills were established on Berwick Bay to process the immense rafts of timber floated down the Atchafalaya, and some grew into huge operations. Among the first of these industrial sawmills was built by the Brownell-Moore Lumber Co., established in 1886. This mill became the Berwick Lumber Co. in 1889. The Brownell-Drews Lumber Co. constructed a huge new sawmill on Morgan City's Front Street in 1899 (Vertical Files, Morgan City Archive; Southern Pacific Rail Road 1910:27; Peltier and Lehmann 1960:81-82).

The Twentieth Century

The twentieth-century population of St. Mary Parish has ridden a roller-coaster. Between 1900 and 1910, the populations of Morgan City, Berwick, and St. Mary Parish as a whole grew strongly. In 1900, Morgan City had 2,332 residents and Berwick 713 residents. In 1910, Morgan

City's population had more than doubled to 5,477 persons, while Berwick's population had tripled to 2,183 residents. However, between 1910 and 1920, St. Mary Parish lost almost 22% of its total population, declining from 39,368 persons to a total of 30,754. In 1920, St. Mary Parish had fewer residents than at the turn of the century. Throughout the sugar-producing parishes population decline was comparable, as large numbers of African-Americans migrated to urban centers and other areas in Louisiana and beyond its borders, but the exodus from St. Mary Parish was particularly heavy. Even Morgan City ceased to grow in this period; its official census count of population in 1920 was 5,429 persons, a decline of 38 persons since the 1910 census. The total Parish population declined further by 1930 and recovered slowly during the Depression, only reaching 31,458 persons in 1940. Morgan City and Berwick, however, began to grow again, a trend that continued into the post-World War II era. At the height of the modern oil boom, in 1980, total Parish population had doubled since 1940, reaching 64,253 persons. During the following decade, with the oil bust, the population of St. Mary Parish plunged 10% to a 1990 total of 58,068 persons. Morgan City declined even more acutely. From a 1970 high of 16,586, the Morgan City population declined over 12% by 1990, sinking to a total population of 14,531 persons (Peltier and Lehmann 1960; Yakubik et al. 1994:69; Goins and Caldwell 1995:54; *Louisiana Almanac* 1997).

Railroad transportation remained important in St. Mary Parish in the early twentieth century. The Southern Pacific system acquired Morgan's Louisiana and Texas Rail Road and by 1908, had built a new swing-span bridge at Morgan City at a cost of \$1 million. By 1915, the S.P.R.R. had built two spur lines from the trunk line between Morgan City and New Iberia, one roughly paralleling Bayou Sale to East Cote Blanche Bay and another from Baldwin to Vermilion Bay. Although the importance of Morgan City as a railway terminus and connecting point declined, particularly in the second half of the twentieth century, yet another swing-span bridge replacing the 1908 bridge was constructed. This third railway bridge across the Atchafalaya was completed in 1970 (Vertical Files, Morgan City Archives; Goins and Caldwell 1995:69).

The early twentieth century also saw dramatic change in water transportation in the Morgan City area. In 1906, the Atchafalaya Bay Ship Channel Company was organized, and with private and public funds the Atchafalaya ship channel was dredged to 14 feet by 1909. At this date, Berwick Bay had a maximum channel depth of 90 feet, and the Berwick and Morgan City harbors at the docks had a depth of 40 to 70 feet. Marine traffic increased so dramatically that the Federal Government assumed authority from the Company and began dredging the channel to a width of 200' and a depth of 20'. The 1915 hurricane nearly eliminated the shipping channel. The profitability of offshore shrimp harvesting led to increased traffic in the 1930s, and the channel was fully redredged to a 10-foot depth in 1939-1940. By 1960, the channel was maintained at a depth of 16 feet. At this time, more than 21 million tons of cargo passed through Morgan City annually, representing \$6 million worth of exported and \$2 million of imported goods and commodities (Peltier and Lehman 1960:68-70).

An important alteration to the waterways in the Morgan City region was the construction of the Intracoastal Waterway. Construction of the western Gulf portions of the modern Waterway route had begun soon after 1905. However, regular Federal funding of Intracoastal Waterway construction did not begin until the passage of the U.S. River and Harbor Acts of 1925. The section of the ICWW through St. Mary Parish had been constructed between 1933 and 1935. The strategic value of the ICWW was recognized at the outbreak of World War II, and in early 1942, Congress authorized an extension of the Waterway from the Louisiana Gulf Coast to Florida. Beginning at this time, existing sections of the ICWW were enlarged and new portions constructed to a depth of 12' and a width of 125' (Vertical Files, Morgan City Archive). The 1931, 1947, and 1955 Corps of Engineers aerial photographs of Morgan City indicate the development of the frontage of Bayou Boeuf with petroleum-related facilities after World War II.

The twentieth century has also witnessed major improvements in road transportation in the Morgan City area. The Old Spanish Trail, now U.S. Highway 90, was developed through St. Mary Parish in the early decades of the twentieth century. The Old Spanish Trail was to be a major improved automobile highway running from California to Florida along historic routes. In the Morgan City vicinity, the Old Spanish Trail ran along the southern side of Bayou Boeuf on Avoca Island and crossed Bayou Boeuf by ferry. From Berwick, the route headed northwest toward Bayou Teche. Parts of the Old Spanish Trail were coursed with gravel in the early 1920s. During Louisiana Highway Commission road improvements begun during the Huey Long administration and continued under Governor O.K. Allen, Old Spanish Trail was designated U.S. Highway 90 and was paved. The Berwick Bay Highway Bridge (now the Hwy. 182 Bridge) was constructed 1931-1933. The current U.S. Hwy 90 bridge was constructed ca. 1973. As part of the construction of the Atchafalaya Basin protection levees, Hwy. 70 was constructed on the outside of the east protection levee in 1936-1937. The large borrow pit created by the construction of the protection levee south of Drew's Pass became a locus for houseboats and camps (Vertical Files, Morgan City Archive). Scores of camps and houseboats are visible along this borrow pit in 1947, 1955, and 1960 Corps of Engineers aerial photographs.

Natural resources were important to the Morgan City area economy in the early decades of the twentieth century, as they were in the nineteenth century. This was particularly true of seafood and timber. The number of Berwick Bay fish and oyster dealers grew, particularly after about 1907, when gasoline-powered internal combustion boat motors were introduced. Among the seafood dealers during this period were pioneer firms like the John Dalton Co., Bass Fish Depot, the Berwick Bay Fish and Oyster Co., and Louisiana Oyster and Fish Co. The Louisiana Oyster and Fish Co., incorporated in 1904 by W.J. Lowrance, revolutionized the oyster industry. They developed the method of planting oysters in deep water and harvesting them by dredge rather than by hand tongs. The Company rapidly grew into one of the largest in the oyster business (Table 1). By the early twentieth century, Dalton, Bass, the Louisiana Oyster and Fish Co., and other dealers were shipping oysters and fish to New Orleans, Denver, St. Louis, Kansas City, Omaha, and other markets in the Indian Territory (Oklahoma), Texas, Montana, Idaho, and California. The largest of all the oyster shippers was the firm of Dunbar, Lopez, and Dukate, whose huge cannery complex was located south of Morgan City, adjacent to Bayou Boeuf and between the bayou and the Southern Pacific Rail Road track loop. Other seafood firms begun in the twentieth century included that of Manuel Cogenheim, who took over the Berwick Bay Fish and Oyster Co., and his successor, T.H. Bergeron; the Ozio, Casso, and Emery firms; St. Mary Seafood, Riverside Seafoods, Drackett Fisheries, and Monarch Packing Co.; and independent operators like Victor Guarisco, Jack Pharr, Ernest "Honey" Casso, H.W. Logan, Sidney Prestenbach, D. Egle and Sons, A.J. Breaux, and Alfred Mead. (Southern Pacific Rail Road 1910:7; Vertical Files, Morgan City Archive; Peltier and Lehmann 1960:79-81).

Table 1. Oysters Shipped from Morgan City and Berwick, 1908-1909 (from Southern Pacific Rail Road 1910:7).

Company	Barrels
Dunbar, Lopez, and Dukate	47,279
Berwick Bay Fish and Oyster Co.	16,865
Louisiana Oyster and Fish Co.	13,924
John Dalton Co.	12,567
Inspector's Collections	6,402
Total	97,037

Ice production at Morgan City expanded with the growth of the fish and oyster shipping industries. The John Dalton Co. owned the largest ice plant in the area in 1909, producing 30 tons of ice a day, while the old Berwick Ice and Fuel Co., Ltd., plant produced 10 tons a day (Vertical Files, Morgan City Archives).

The oyster industry in Morgan City declined by World War II, and by 1960, most oyster packing at Morgan City was of oysters harvested from beds out of proximity to St. Mary Parish. In the 1920s, crabmeat packing began in the Morgan City area, and by the 1930s, shipments from Morgan City topped one-half million pounds annually. From the mid-1930s, deep-sea shrimp fishing also rose to importance, following the migration of white and brown shrimp into the waters off south Louisiana. East-coast and Texas fishermen followed the shrimp population, and Morgan City became a major packing and shipping point, touted as "the Shrimp Capital of the World," until Brown shrimp began to be caught in larger numbers in Texas waters. In 1960, as many as 175 seagoing shrimp trawlers still made Morgan City their home port. The freshwater fish industry also grew in the twentieth century, based on urban markets for rail-shipped catfish, buffalofish, and gaspergou. The Morgan City fish docks were supplied by independent fisherman of the Atchafalaya Basin, and this industry enjoyed a heyday through the 1940s. Freshwater fish still remained important after the war; in 1959, the Morgan City area shipped over 2 million pounds of freshwater fish, 90% of total Louisiana freshwater fish production (Peltier and Lehmann 1960:79-81).

By the 1980s, the Morgan City area had become less important in the Louisiana fishing industries. In the second half of the decade, St. Mary Parish marine fisheries produced only 4% of the Louisiana total, and freshwater fisheries, a mere 3% of total Louisiana production (Goins and Caldwell 1995:83).

The Louisiana fur industry is also based on natural resources and has experienced vagaries of fortune over the course of the twentieth century. This occurred largely because of tastes in fashion, but also because of habitat change in the region and other environmental factors. The Bass Fish Depot was among the dealers who purchased furs trapped by Atchafalaya Basin trappers from the early twentieth century, and by 1909, was shipping mink, coon, otter, muskrat, and 'possum furs to the New Orleans and St. Louis fur markets. Fur receipts at Morgan City were valued at over \$100,000 in 1909, and in 1917, \$150,000 worth of furs were shipped from Morgan City. This climbed to half a million dollars in sales by the end of 1919. Fur prices rose with demand; muskrat pelt prices rose from 10¢ apiece to 80¢; 'possum skins brought \$1.00, 'coons \$4.50, minks \$5.50, and otters from \$10 to \$15 in 1919. Many Atchafalaya Basin residents added significantly to their annual incomes with the proceeds of trapping during this period of fur coat popularity. The market for furs stood at \$15 million in 1946, but had dwindled to less than \$1 million annually by the late 1950s (Vertical Files, Morgan City Archive; Southern Pacific Rail Road 1910:13; Peltier and Lehmann 1960:84-85; c.f. Comeaux 1972; Maygarden et al. 1997).

Morgan City reached its peak as a lumbering center in the early twentieth century. By 1909, the Brownell-Drews sawmill on Front Street was at its largest and produced 50,000 board feet of lumber and 80,000 shingles per day (18 million board feet and 29 million shingles per year). At this same date, the Menefee Cypress Co. (formerly Berwick Lumber Co., later Norgress-Menefee Lumber Co.), had an annual production of 17 million feet of cypress lumber and 90 million shingles, while the Cotten Bros. Cypress Co. sawmill had an annual production of 15 million board feet of cypress lumber. The George Vinson Shingle and Manufacturing Co., established in 1905, was by 1909 producing 140,000 shingles per day (51 million shingles per year). Another very large concern in the Morgan City area was the Wadell-Williams Co. (after 1922, the Norman-Breaux Co.), located on Bayou Boeuf. Other lumber companies in Morgan City or Berwick in the early-twentieth century were the Baldwin Lumber Co., Hanson Lumber Co., F.B. Williams Cypress Lumber Co., Ramos Lumber Co., Riggs Cypress Lumber Co., Kyle Lumber Co., Chapman-Storm Lumber Co., Wadell-Jones Lumber Co., Rhoda Lumber Veneer Co., and the Texas Co. Shook (stave) Mill. These lumber companies usually had their own logging pullboats as well as towboats and tugs to convey the rafts of timber to the mills. Stands of virgin cypress quickly declined under intense logging pressure, and by 1925, the cypress lumber business went into decline, although milling of other hardwoods continued on a large scale for some time. The Norman-Breaux mill was the last large industrial sawmill in operation in Morgan

City. It became a planing mill and survived until 1957 (Southern Pacific Rail Road 1910:27; Vertical Files, Morgan City Archive; Peltier and Lehmann 1960:81-82; Mancil 1972).

The early-twentieth century economy of the Berwick Bay area was remarkably diversified for a relatively small city. There were four banks in Morgan City by 1908, and several facilities developed serving the important agricultural and transportation industries of the region by 1910. These included the Morgan City Boiler and Sheet Iron Works, established by J.P. Hogan in 1902, and other machine shops producing tanks, structural iron and steel, castings, and other metal products. The marine industries included the Morgan City Shipyard and Docking Co. on Berwick Bay; the Charles Watkins & Bro. Co. marine repair yard, established before 1900; and Hanson & Carpenter shipbuilders. By 1910, Morgan City was already producing gasoline engines and installing them in boats. The Howard Co. of Berwick produced mechanical cane-loaders and other sugar-processing and cane-harvesting machinery, while sugar and molasses were produced at the Riverside Plantation Co. and John N. Pharr Sons' Sugar Refinery. Other agricultural products such as hot pepper sauce, catsup, canned fruits and vegetables, and flavorings were manufactured by the J.O. Grevemberg Co. The Myles Salt Co. was a major producer of this basic commodity. Berwick Bay had long been an important livestock transshipment point, and between September 1907 and June 1908, 100,000 head of cattle passed through the Morgan City transit stockyards (Vertical Files, Morgan City Archive; Southern Pacific Rail Road 1910).

Petroleum has been the single most important factor affecting St. Mary Parish's economic fortunes in the twentieth century. Interest in the potential extraction of natural gas and oil in St. Mary Parish dated to the turn of the twentieth century. As early as 1901, three oil production companies were organized in St. Mary Parish; the Franklin Oil Co., the Attakapas Oil Co., and the Chitimacha Oil Co. Chitimacha drilled unsuccessfully at Charenton Beach in 1902, but exploratory ventures continued. Meanwhile, Morgan City became a center not only for early extraction efforts, but also for the distribution of petroleum. The Higgins Oil and Fuel Co. was established on Berwick Bay before 1908 and had a fleet of ocean-going oilers and tug boats handling petroleum barges in the region. Higgins had also established a pipeline for distribution within Morgan City by this date. By 1910, other oil distributors had located on Berwick Bay, but extraction efforts in the region remained a focus of oil companies. Two exploratory wells were drilled on Avoca Island in 1918-1919, but without success. The Land and Exploration Co. of Houma drilled another dry hole at Charenton in 1926 and conducted extensive seismic testing on Avoca Island in 1928. However, no successful fields were developed in the area until the Jeanerette field in 1935. The Horseshoe Bayou and Bateman Lake fields were developed by Texaco in 1937, and Sun Oil first successfully drilled in the Belle Isle field in 1940-1941. The Deer Island Field was discovered in 1942, the Bayou Carlin Field in 1945, and the Duck Lake Field (eventually the most productive) in 1948 (Vertical Files, Morgan City Archive; Southern Pacific Rail Road 1910; Peltier and Lehmann 1960:71-75).

Among the most important developments in the economic history of St. Mary Parish was the rise of offshore petroleum production. The first producing offshore well had been drilled about 1937, and extensive experimentation by Magnolia Petroleum Co. (later Mobil) in 1944-1946 showed the practicality of deep-water offshore production. However, the first large-scale offshore drilling success, the Ship Shoal Field, Block 32, was drilled by Kerr-McGee in 1947. The Kerr-McGee success led to an eventual burgeoning of the south Louisiana offshore petroleum extraction industry. The next major field off St. Mary Parish was the Eugene Island Block 32 Field, discovered in 1949. By 1951, St. Mary Parish had 12 onshore and offshore fields with 300 oil wells, 31 gas wells, and an annual production topping 11 million barrels of oil. In 1954, the first offshore field discovered since 1949 was found, the Eugene Island Block 18 Field. In 1959, St. Mary Parish had 1159 oil wells and 231 gas wells. It ranked fourth among Louisiana parishes in crude oil production (almost 19 million barrels), fourth in mcf casinghead gas (almost 27 million mcf), sixth in mcf natural gas, and tenth in condensate (Peltier and Lehmann 1960:71-76).

By the end of the 1950s, Shell, Humble, Mobil, Gulf, Phillips, Sun, Kerr-McGee, Sinclair, Continental, Pure, Superior, California, Atlantic, United Gas, Union Producing, and many other petroleum companies had been or were currently active in St. Mary Parish. The strong petroleum extraction sector in St. Mary Parish produced carbon black plants, fabricators, and other oilfield support industries in the Parish. At least 21 Morgan City supply firms, eight tool rental companies, six oil sale firms, five mud companies, five repair companies, four truck lines, and four shipyards were dependent on the petroleum business in 1960 (Peltier and Lehmann 1960:71-76; Broussard 1977:98-100). The dominance of the petroleum industry in the Parish economy has caused St. Mary Parish and Morgan City to experience economic swings over the decades, particularly the petroleum boom years of the 1970s and the bust of the mid-1980s.

Despite the importance of lumbering and then the petroleum industry, agriculture has remained important in St. Mary Parish in the twentieth century. Cotton, sugar cane, rice, corn, potatoes, soybeans, cowpeas, velvet beans, lespedeza and clover, figs, oranges, peaches, and pears have all been commercially grown in the Parish (Tourist Division 1938:179). Late-nineteenth-century trends in the sugar industry continued in the twentieth century. The growth of central factories and the plantation railroads provided new opportunities for small, independent cane farmers and for cane-growing tenants. By 1916, the average sugar factory was grinding over 25,000 tons of cane in a season, representing the output of about 1,700 acres under normal yields. It was difficult for a single firm to efficiently organize this much acreage. By 1916, the majority of tonnage ground at Louisiana cane factories was purchased by the mills, and 85% of Louisiana sugar factories purchased at least some of the cane they ground. Typically, the larger the factory, the greater reliance on outside sources of cane, and the trend was for the factories to purchase more cane as time went on and rely less on the production of their own plantations. Only nine of the over 150 mills in Louisiana in 1916 purchased all of their cane, and the largest of these purchased cane from as many as 700 farmers in a 20-mile radius (Schmitz 1979:276-277). Sugar remains a major agricultural product of St. Mary Parish today. In the second half of the 1980s, St. Mary Parish was in the top three sugar-producing parishes of the state, annually producing about 13% of total Louisiana sugar production (Goins and Caldwell 1995:74-92).

In economic aspects other than the petroleum industry and agriculture, St. Mary trails behind larger and more diversified parishes. However, Morgan City makes St. Mary Parish a regional center of the transportation, communications, utilities, and construction industries (Goins and Caldwell 1995:74-92). Conversely, the contraction of the Louisiana petroleum business in the 1980s produced relatively high unemployment rates in St. Mary Parish and was a disaster for Morgan City. The revival of the offshore petroleum industry in the mid-1990s begins another chapter of St. Mary- Morgan City history.

Major economic and environmental challenges continue to confront Morgan City, as they have in the past. Morgan City has benefited from a series of growth industries— sugar cane in the antebellum period; railroad expansion and shipping after the Civil War; and timber, fishing, and petroleum in the twentieth century— yet still seeks a diversified, stable economy that can withstand the buffets of business cycles and depletion of natural resources. Similarly, Morgan City's geographic location has been its most strategic economic feature, yet the Atchafalaya River is also the community's greatest challenge. It is not surprising that the Morgan City bayfront will remain the focus of the city's plans for the next century.

CHAPTER 4

POTENTIAL CULTURAL RESOURCES AND THE SIDEWHEEL STEAMBOAT GRAY CLOUD OR U.S.S. COL. KINSMAN

Potential cultural resources within the project area could include remains from submerged landing facilities, abandoned watercraft and/or shipwrecks. Watercraft could be in the current study area as a result of the abandonment of vessels that were left in place at a landing. Alternatively, vessels could have been disposed of out of the way of waterborne traffic.

Abandoned watercraft tend to cluster at landings. For example, abandoned historic craft in the project vicinity include three vessels (a skiff, barge and sailing craft) at 16SMY61 on Bayou Shaffer; and ten watercraft (including a pirogue, skiffs, flats, Lafitte skiff, motorized lugger and dredge) found at 16SMY55, on the Bayou Shaffer bank of Bateman Island. Also adjacent to Bateman Island is 16SMY58, the remains of an abandoned wooden WWII mine sweeper which had been modified for use as a fishing vessel.

On the northern end of Bateman's Island within the current project study area was Rice's Plantation, shown on the 1842 U.S. Coast Survey of Berwick Bay (Figure 3). Rice's plantation undoubtedly had a landing; although its location is not known, it could have been within the current project area at the confluence of Berwick Bay and Bayou Boeuf. Samuel R. Rice established his plantation in the Spanish colonial period, before 1803 (Weinstein and Kelley 1992:51). The plantation buildings shown on the 1842 chart were likely to the east of the current project study area, perhaps centered 350 to 425 m east of the modern navigation light, but field improvements in the plantation era extended well to the southwest of the modern navigation light.

Shipwrecks are another category of potential underwater cultural resource site within the study area. Wrecked and sunken vessels can pose hazards to navigation, but the U.S. Coast Guard Hazards to Navigation computerized database contains no references to specific shipwrecks in the study area. The database does report wrecks outside the study area in Bayou Boeuf, in the Atchafalaya River above the Hwy. 90 and Hwy. 70 bridges between Morgan City and Berwick, and in the Atchafalaya River over a half mile below the current study area. However, the study area appears as a shoal on the U.S. Coast Guard's obstruction data base, and a review of shipwreck records and historical documentation reflects 13 shipwrecks reported lost in the lower portion of Berwick Bay, including the *U.S.S. Colonel Kinsman*, an armed steamboat in U.S. Naval service which sank in Berwick Bay in February 1863. The thirteen vessels which could have been lost in our study area are listed on Table 2 (Pearson et al. 1989).

Table 2. Vessels Reported Lost in the Lower Portion of Berwick Bay (US Coast Guard Hazards to Navigation Database).

NAME	DATE LOST	CAUSE OF LOSS	DATE BUILT	REMARKS
<i>Active</i>	1/29/1877	Unknown	1867	Way Reports Tonnage as 95
<i>Alton</i>	9/23/1914	Burned	Unknown	At Morgan City Wharf, Head of Bayou Bouef
<i>Any One</i>	8/20/1869	Foundered	1864	Way Reports Body as Bayou Teche
<i>Lizzie E.</i>	9/27/1888	Stranded & Swamped	Unknown	Hull Leak after Pulling Over Flat Mud
<i>Sugarland</i>	9/29/1915	Foundered	1908	Foundered in Tropical Hurricane
<i>Fidget</i>	4/10/1884	Collision	Unknown	Collided with Tug <i>Restless</i> , Struck Piling of Railroad Bridge
<i>Helen Lane</i>	6/30/1919	Foundered	1915	
<i>Jennie Louise</i>	10/29/1913	Burned	1890	
<i>Jim</i>	9/1/1879	Beached	Unknown	Laid up at Morgan City, Stout's Point
<i>Major Aubrey</i>	11/0/1858	Snagged	1853	
<i>Opelousas</i>	11/15/1857	Collision	1857	18 Killed, Collided with the <i>Galveston</i>
<i>Restless</i>	4/10/1884	Collision	Unknown	Rammed by the Tug <i>Fidget</i> ; Struck the Railroad Bridge and Sank
<i>Kinsman, U.S.S.</i>	2/23/1863	Snagged	1854	6 Killed, Previously Named the <i>Gray Cloud</i>

The Sidewheel Steamboat *Gray Cloud* or U.S.S. *Colonel Kinsman*

Synopsis. The side-wheel steamboat *Gray Cloud* (or frequently, *Grey Cloud*) was built in 1854, likely for commerce on the upper Mississippi River. The vessel saw a wide variety of duties in other settings and was rebuilt on a number of occasions. The boat saw service as a U.S. Army transport in the extremely shallow waters of the Missouri River Basin during the Sioux Expedition of 1855-1856. During the winter of 1855-1856, the *Gray Cloud* was iced in at l'Eau Qui Court (South Dakota), and her hull subsequently required extensive repairs. After further rebuilding, the *Gray Cloud* was also used in the open waters of the Gulf of Mexico during the Third Seminole War, and was used in private commerce in the Mobile to New Orleans Gulf Coast trade. The *Gray Cloud* was a Confederate military transport vessel early in the Civil War and was captured at Biloxi by Union forces in July 1862. The *Gray Cloud* was commissioned into U.S. Navy service, and rebuilt as the armed steamer U.S.S. *Colonel Kinsman* (or frequently, *Kinsman*). The *Kinsman* saw significant service in Atchafalaya Basin operations, where it was damaged by cannon fire and a torpedo. Finally, on the night of February 23, 1863, the *Kinsman* struck a snag in Berwick Bay, and at a few minutes past midnight on the 24th, sank in the Bay just below Morgan City.

Repair and refitting of vessels was commonplace as a result of damage and deterioration, and therefore the *Kinsman* of 1863 was a substantially different craft from that christened the *Gray Cloud* in 1854. The following is a compilation of the historical data related to the physical characteristics of the vessel and a discussion of its potential historical significance.

Private Service, Upper Mississippi River Trade, 1854-1855

The *Gray Cloud* was a side-wheel steamboat (Holdcamper 1952; Merrick 1909; Gibbons 1989; Way 1994) originally intended for use in upper Mississippi River commerce. Enrollment #28 issued at the Port of Pittsburgh, March 17, 1854, described the vessel as being built at Elizabeth, Pennsylvania (Lytle 1952; Way 1994), on the Monongahela River, but Merrick (1909) says she was built at Elizabeth, Kentucky. The Pittsburgh enrollment states the following details:

vessel type	steamboat
length	170 feet
width	28 feet
depth	6 feet 5 inches
tonnage	245 81/95 tons
mast	none
head	plain
stern	transom
decks	one
cabin	on deck

Unfortunately, this and later descriptions fail to give details of the boiler(s) and engine(s) of the vessel. Civil War newspaper illustrations (discussed below) suggest that the *Gray Cloud* had a single stack and no walking-beam, and therefore, may have had a single horizontal fire-tube return-flue boiler and one single-expansion inclined engine (*c.f.* Gosnell 1949:6-8; Pearson et al. 1989:130-139), although this is far from certain.

Pliney A. Alford of St Louis was the first master of the *Gray Cloud*. Alford L. Swarnes of Illinois, and the partnership of J.V. and F.B. Roads, also of Illinois, each owned one-fourth of the vessel. E.C. Heasell and P.A. Mulford of Pittsburgh each owned a one-eighth interest. During the 1854 season and part of the 1855 season, the *Gray Cloud* was used in the St. Louis to St. Paul trade (Merrick 1909).

Federal Government Service, Sioux Expedition, 1855-1856

In the latter part of 1855, the vessel was acquired by the U.S. Government for use as a transport vessel in the Sioux Expedition. It was assigned to the Quartermaster's Headquarters in St. Louis and operated between Council Bluff, Iowa, and Ft. Pierre, South Dakota. This environment was not at all suited for the *Gray Cloud* or for another vessel used by the Quartermaster at the same time, the stern wheel steamboat *William Baird*. The draft of both boats was too deep for the shallow water environment of the area, and periodic high winds made the single stern paddlewheel *William Baird* unwieldy (Turnley 1855a, OQMGVP, National Archives). Capt. P.T. Turnley, on November 1, 1855, requested of Capt. J.D. Radford (master of the *Gray Cloud*) that the vessel transport a saw mill and grist mill, with all their fixtures, and deliver them 20 to 25 miles by water above l'Eau Qui Court, South Dakota (Turnley 1855a, OQMGVP, National Archives). After the *Gray Cloud* delivered her cargo of mill machinery, the boat was to transport corn, and later conveyed potatoes and tarpaulins to Fort Pierre (Turnley 1855b, 1855c). On December 14, 1855, Dr. John K. Cook reported to Maj. D.H. Vinton, Quartermaster Dept., St. Louis, that the *Gray Cloud* was frozen in on the l'Eau Qui Court River about 90 miles above Sioux City (Cook 1855, OQMGVP, National Archives). Special Orders No. 78, dated December 17, 1855, stated that the steamer *Grey Cloud* (*sic*) would remain for the winter at l'Eau Qui Court, in consequence of the closing of the river by ice, before returning to St. Louis (Harney 1855, OQMGVP, National Archives). Apparently the vessel sustained damage by being frozen in, as on July 1, 1856, Major G.H. Crosman reported from St. Louis that the *Gray Cloud* was half repaired, with the "keel straightened" and draft reduced (Crosman 1856, OQMGVP, National Archives), evidently at a cost of \$8,000 (Tompkins 1856a, OQMGVP, National Archives). The \$8,000 worth of repairs to the *Gray Cloud* undertaken in St. Louis cost close to the contemporary price of a new steamboat hull built by the Howard Brothers (Fishbaugh 1970). Crosman also recommended that the vessel "be sent back to the upper Mississippi" (Crosman 1856, OQMGVP, National Archives).

Federal Government Service, Coast of Florida and Third Seminole War, 1856-1859

Instead of returning to service on the upper Mississippi, the *Gray Cloud* was transferred to New Orleans in late-1856 with the intention of converting her for Gulf Coast service. Further repairs were discussed in a letter of November 24, 1856, from Asst. Adj. General Francis N. Page, Fort Brook, Florida, to Lt. Col. D.D. Tompkins in New Orleans. The letter stated that the *Gray Cloud* was "to be sent over without cutting the guards" (Page 1856, OQMGVP, National Archives). Lt. Col. Tompkins stated on December 5, 1856, that the vessel had \$8,000 in repairs done in St. Louis and ordered the vessel to New Orleans for alterations for service on the "Coast of Florida" (Tompkins 1856a, OQMGVP, National Archives). A telegraph message from Lt. Col. Tompkins on December 17, 1856, stated "the Steamer *Gray Cloud* can not be put in dry dock for twenty days. Fifteen to eighteen days thereafter will be required to complete her alterations and repairs" (Tompkins 1856b, OQMGVP, National Archives). With these repairs the *Gray Cloud* was converted from an upper western river packet to a vessel capable of coastal, open water service. This likely reflected in the change from a square stern in 1854 to a pink stern, which the vessel had at the time of admeasurement in New Orleans in 1859 (discussed below). The *Gray Cloud* was also lengthened from 170 feet at her first enrollment in 1854 to 177 feet, probably as a result of the conversion from a transom to a pink stern. The rudder was probably also modified in the 1856 rebuilding to allow open water use of the vessel.

The *Gray Cloud* was in the "Coast of Florida" service from 1856 until the summer of 1859, during which time it was used as a transport in the Third Seminole War. Two notable events occurred during this period. Sometime in 1857, a civilian pilot or steersman on the "*Grey Cloud*" (referred to variously as Rufina Farlis, Ruffino Fales, Rofino Farlis, Raffino Felly and Rufins Fales) claimed he was very seriously wounded by the accidental discharge of a piece of ordnance aboard the boat, and deserved a pension. The result of several filings and petitionings is inconclusive in the surviving documentation (OQMGVP, National Archives). A letter dated May 25, 1858, from

a Capt. Montgomery to Maj. J. McKinstrey, stated that the boilers of the *Gray Cloud* had been leaking for six weeks, causing "insufficient steam power to outrun a gale" during the Tampa to New Orleans run. The captain of the vessel was accused of not knowing of the problem, but as of the letter's date, the boilers had been repaired (Montgomery 1858, OQMGVP, National Archives).

Private Service, Gulf Coast and Mobile to New Orleans Trade, 1859-1861

In 1859, the *Gray Cloud* was back in New Orleans. An admeasurement of the "*Grey Cloud*" of New Orleans was performed by the District of New Orleans on April 2, 1859. The admeasurement form states "said vessel... has one deck, no masts, pink B stern, has upper cabin and plain head; that she is in length 177 feet, in breadth 27 feet 4 inches and in depth average 6 feet and she measures 275 19/95 ton." Also noted is "forward hatch 6.6 feet, main hatch 5.6, Zwc 6. fts" (WPA of LA 1942).

The U.S. Government sold the "*Grey Cloud*" in New Orleans to Henry E. Spearing of New Orleans, with W.C. Flanders as master, and the vessel received Enrollment No. 44, Port of New Orleans. John J. Woodfine was named master in Registration No. 62, June 2, 1859 (WPA of LA 1942). On February 7, 1860 the *Gray Cloud* again changed ownership and enrolled at the Port of Mobile with F. James and H. Sternes as owners, and G.A. Mupey as master. James owned a 2/3 interest in the boat and Sternes a 1/3 interest. The New Orleans and Mobile documents fail to note the location or date of the *Gray Cloud*'s construction, but describe the vessel as follows:

vessel type	steamboat
length	177 feet
width	27 4/12 feet
depth	6 feet
tonnage	275 19/95 ton
masts	none
head	plain
stern	pink
decks	one
cabin	on deck

As mentioned above, the change in the length of the vessel is probably due to the conversion from a transom to a pink stern, intended to make the boat serviceable in the open, deep water environment of the Gulf of Mexico.

Confederate Service on the Gulf Coast, 1861-1862

The *Gray Cloud* was evidently taken into the service of the Confederate States early in the War. She may have been among the vessels pressed into service in the summer of 1861, as a letter from Confederate Secretary of the Navy Stephen R. Mallory to Secretary of War L.P. Walker stated in July:

Your note this morning is received, inquiring whether this Department would fit for service the steamers Arrow, Creole and Oregon. Captain Rousseau was yesterday instructed to accept and equip for service such steamers as Governor Moore be willing to turn over to him... He is also instructed to turn over to General Twiggs, if he desires them, all the large guns made for this department by the Tredegar Works here and in the Iron Works in New Orleans [Davis et al. 1898:708, *sic* throughout].

However, there is no specific documentation that the *Gray Cloud* was armed while in Confederate service. On July 10, 1861 the "*Grey Cloud*" and the low-pressure side-wheel coastal steamer *Oregon* were at Ship Island when the fortified garrison there engaged the U.S.S. *Massachusetts*, a two masted steam-propeller Union naval vessel (Davis et al. 1898:709-710). There is no mention in the documentation that the *Gray Cloud* fired on the *Massachusetts*. The *Gray Cloud* made several other trips to Ship Island in 1861, carrying provisions and messages, including on August 14-15, August 21-24, and on September 6, 1861. The vessel was also among those used to evacuate Ship Island on September 15-16, 1861 (Davis et al. 1898:741). After the fall of New Orleans in the spring of 1862, the *Gray Cloud* was in the Biloxi area, where it was captured by the Union in July 1862 (Groene 1985).

Union Service, Pontchartrain and Atchafalaya River Basins, 1862-1863

The Union Navy eventually changed the official name of the *Gray Cloud* to the U.S.S. *Colonel Kinsman*, but documents (including official Union reports and vessel rosters) use *Colonel Kinsman* and *Kinsman* fairly indiscriminately. During the period from the beginning of the War to September 1862, Union and Confederate reports mentioning the vessel use the civilian name *Gray Cloud* or *Grey Cloud* (sometimes spelled both ways in the same document), suggesting that the boat was rechristened sometime after alteration to an armored steamer and transfer from the Quartermaster Corps to the Navy. After September 1862, the vessel was perhaps most commonly referred to as the *Kinsman*, but in reporting its sinking in February 1863 Admiral Farragut referred to the vessel with its official name, the U.S.S. *Colonel Kinsman*. While in Federal service, the *Kinsman* saw action against Confederate naval vessels on at least five occasions, once in the Lake Pontchartrain Basin, and the others in the Atchafalaya Basin. The *Kinsman* also actively participated in combined operations with infantry during Basin actions.

In the latter part of July, 1862, the "*Grey Cloud*" was under the command of Major Frank H. Peck and undertook an expedition in the Lake Pontchartrain Basin (Scott 1885:124-126). Peck's report made reference to the vessel's armament, including that on the morning of July 26, the vessel was at Pass Manchac when Captain P.E. Holcomb "sent forward a shell from his Sawyer gun." Peck also noted that while at Madisonville the "*Grey Cloud*" "responded with a shot from one of the 32-pounders of the boat....". Evidently, the vessel was armed with two cannon, at least one of them a Sawyer gun. Sylvanus Sawyer developed an cast-steel rifled cannon in the 1850s. His weapons were among the first rifled cannon purchased by the U.S. military, although few actually entered service. The "32-pounder" designation likely meant that the bore diameter was 6.4", the diameter of one standard smooth-bore naval cannon of the era, although the actual weight of the distinctive Sawyer projectile for this gun was probably greater than 32 pounds (Hazlett 1983:161).

The *Colonel Kinsman* was fitted out by General Butler for river service with her boilers and machinery protected by iron (Stewart 1905: 623) sometime between July and September 30, 1862, when the U.S. Army Quartermaster's Department transferred the vessel to the Navy (Way 1992). Details of the armor plating are not documented, but the wartime illustrations discussed below indicate that the iron-plated "casemate" enclosed the main deck, was sloped at the bow, and vertical (or close to it) on the sides. At the beginning of October, the Union Navy sent the vessel to Brashear City (now Morgan City) for use in the Atchafalaya Basin.

The *Kinsman* saw battle on three different occasions with the Confederate *A.J. Cotton*, a 549-ton side-wheel steamer. The first engagement with the Confederate gunboat occurred on November 4, 1862. Lieutenant Thomas McKean Buchanan reported to Maj. Gen. Benjamin F. Butler on November 5 that the *Kinsman* bore the brunt of the battle, but that "we can make all repairs here, and I will have the *Kinsman* ready for service to-morrow." He went on to state that "the iron casing on the *Kinsman* and *Diana* turned the shot beautifully" (Scott 1885:184). On November 9, Buchanan reported to Rear-Admiral David G. Farragut that the *Kinsman* in the same

battle sustained "54 shots through her hull and upper works and had three through his [sic] flag." One shot was under the port bow, and one shot through the shell room and magazine. The same source noted the *Kinsman* "kept up fire with his rifled gun" (Scott 1885:184-187).

The *Kinsman* met the *Cotton* for the second time on November 13, 1862. The *Kinsman* and the U.S. gunboat *Estrella* engaged the *Cotton* on this occasion for two and one-quarter hours. Lieutenant Buchanan stated "Her [the *Cotton*'s] tactics to-day were to back up the bayou and get us to follow, then rush at us and discharge her four guns (32-smooth) at us; we, on the contrary, tried to keep out of range and pepper her with our rifles" (Stewart 1905:342).

The *Kinsman*, *Calhoun*, *Diana* and *Estrella* engaged the Confederate steamer *Cotton* for the last time on January 14, 1863. The *Cotton*, supported by Confederate land batteries in the vicinity of Corney's (or Cornay's) Bridge, was protecting the mouth of Bayou Teche from incursions by the Union forces. During this engagement, the *Kinsman* was commanded by Lieutenant George Wiggins. The *New York Times* reported that during this battle "the *Kinsman* felt something explode under her: but fortunately with no damage, as was afterward found" (*New York Times*, January 31, 1863). However, the engineer on the *Calhoun* stated that "a torpedo exploded under the stern of the *Kinsman*, unshipping her rudder" (Stewart 1905 Ser.1 Vol.19). The *Cotton* was destroyed during this engagement.

In February 1863, the *Kinsman* was used in a reconnaissance-in-force to the Confederate stronghold at Butte-à-la-Rose in the central Atchafalaya Basin. The *Diana* and the *Kinsman* ascended the Atchafalaya River from Brashear City to within one mile of Fort Burton. The *Kinsman* then ascended the Little Atchafalaya toward Fort Burton until Confederate sharpshooters forced it to turn around. Attempting to steam down Upper Grand River to Indian Village on Bayou Plaquemine, the *Diana* and the *Kinsman* had to turn back because of impenetrable rafts of driftwood, and returned to Brashear the way they came (Scott 1886: 240-243, 248; Stewart 1905a:394, 611-612, 618).

Loss of the *Kinsman*, February 23, 1863

The U.S.S. *Colonel Kinsman*, was lost on February 23, 1863, in Berwick Bay while transporting troops for picket duty. Below appears Rear-Admiral Farragut's report of February 26, 1863, and two reports regarding the incident. The first is by Acting Volunteer Lt. George Wiggins, U.S. Navy, who commanded the vessel at the time of the loss, and the second report is by J.G. Oltmanns, Assistant, U.S.S. Coast Survey.

Report of Rear-Admiral Farragut, U.S. Navy, transmitting additional information.

Flagship Hartford,
New Orleans, February 26, 1863

Sir: I regret to have to report the loss of the gunboat *Colonel Kinsman*, which struck a snag in Berwick Bay, and although run ashore, slid off and sank in 50 feet of water at or near Brashear City. I herewith enclose the reports of Lieutenant-Commander A.P. Cooke and Acting Volunteer Lieutenant George Wiggin.

The *Colonel Kinsman* was one of the boats fitted out by General Butler for river service, with her boilers and machinery protected by iron.

Very respectfully, your obedient servant,

D.G. Farragut,
Rear-Admiral.

Hon. Gideon Welles,
Secretary of the Navy.

[Lt.-Cmdr. Cooke's report notes submission of Wiggin's report and mentions re-assignment of personnel from the *Kinsman*.]

Report of Acting Volunteer Lieutenant Wiggin, U.S. Navy, commanding U.S.S. Colonel Kinsman.

Berwick Bay, February 24, 1863.

Sir: I herewith submit to you my report about the loss of the U.S.S. *Kinsman*, under my command.

I received last night a detachment of the One hundred and fourteenth New York Volunteers on board, to accompany me on picket duty, and started for the fort at about 9:30 p.m. When within 100 yards of the fort, about 60 feet from shore, the engines being stopped, the steamer struck a snag, apparently floating, on her starboard bow, about 15 feet from the stem. The snag then passed on and struck the starboard wheel very heavily. We went ahead as usual, and made fast to shore, when it was reported to me by the watch below that the vessel was filling. I went below immediately and examined the leak; found the water rushing in very rapidly, the floor being covered some six inches in depth. I then ordered the engineer to start the bilge pumps and get up the greatest amount of steam that could be carried with safety. I had the line cut, backed out, and steamed down the bay for the flat below the wharf, in order to save my men and battery, if the water should rise too fast. When opposite the wharf, the water was reported to be rising very fast, and I hailed the steamers *Diana*, *Estrella*, and *Calhoun*, requesting boats and men to be sent to our assistance.

In the meantime I had organized my crew into pumping and bailing parties, and they were all steadily at work. Heading inshore, we ran aground with a full head of steam, thereby raising her bows about 2 feet out of the water. The carpenter and his gang tried in vain to stop the leak. I ordered the powder kegs and magazine to be brought on deck in order to keep them dry. Then I let go my anchors and ran a line from her quarters to the shore, at the same time sending troops on shore. In a few minutes afterwards her stern began to settle, causing her to slide down the steep bank, where she finally sank, and at twenty minutes past midnight every vestige of her had disappeared.

The officers and crew were picked up by the boats of the *Estrella*, *Calhoun*, and *Diana*, neither officers nor men having the least chance to save any of their effects. I am sorry to have to report the following of my men missing:

John Berry, ship's cook; Patk. McGoun, fireman; John Kirby, fireman; Isaac Deer, coal heaver, colored; William Parker, coal heaver, colored.

I also enclose the surgeon's report to me. Early this morning I went in a small boat to examine the bayou and recover what property I might, and succeeded in picking up 6 barrels of powder, with a few pieces of sailor's clothing and bedding.

Very respectfully, your obedient servant,

George Wiggin,
Acting Volunteer Lieutenant, U.S. Navy.

Lieutenant-Commander A.P. Cooke,
U.S.S. Estrella.

Report of Assistant Olmanns, U.S. Coast Survey

Berwick Bay, February 24, 1863.

Sir: According to your request, I herewith give to you the details of the loss of the gunboat *Kinsman* last night, as far as they came under my personal observation:

Between 7 and 8 o'clock p.m. a detail of the One hundred and fourteenth New York Volunteers came on board the steamer to accompany us on picket during the night. The soldiers were stationed on the quarter and hurricane decks. At about 9:30 p.m. the steamer started up the river under, as far as I could learn, about 50 pounds of steam. When nearly up to our station, 1½ miles from this place, just below the fort and about 20 yards from shore, while sitting in Captain Wiggin's cabin, I felt a log or snag striking the steamer on her starboard side, forward of the wheelhouse, and immediately afterwards I heard and felt the wheel striking very hard against this log. Going forward, I heard it reported that the vessel was fast filling. Captain Wiggin gave his orders very coolly and deliberately, no idea of danger entering our minds. Upon his request I went forward and found from 7 to 8 inches of water in the hold. The steam pumps had been started before this time, and all hands not engaged elsewhere were bailing the vessel with buckets. At this time, about fifteen minutes after the vessel struck, it was reported two or three times that we were gaining on the water. Captain Wiggin then turned the

steamer, and we started back down the river, under the greatest possible pressure of steam, in order to reach the flat below the wharves here, run the steamer ashore, and thus save the lives of all our crew, and also the heavy guns on board. The magazine was ordered to be opened and the powder to be put on deck, if the water should rise to it. When we passed the wharves the water was reported to gain fast and the vessel sinking. Captain Wiggin hailed the *Calhoun* and the *Estrella*, requesting boats to be sent to our assistance. In the meantime he ran the *Kinsman*, with full steam, head on shore till her bows grounded in three feet of water and no bottom with a 15-foot pole under her stern. A line was ordered to be brought out from her starboard quarter to haul her broadside to the bank, but before this could be accomplished, the steamer filled and slid backward from the bank and sunk in about 18 [*sic*, likely a mistake for eight] fathoms of water at twenty-five minutes past midnight. The steamer *Calhoun*, as soon as she could get up steam, came up and rendered, with the boats of the *Estrella*, *Diana*, and *Calhoun*, all the assistance possible in saving the crew and soldiers, who otherwise must have perished.

Very respectfully, your obedient servant,

J.G. Oltmanns,
Assistant, U.S. Coast Survey.

Lieutenant-Commander A.P. Cooke,
U.S.S. *Estrella*.

[Stewart 1905:623-626].

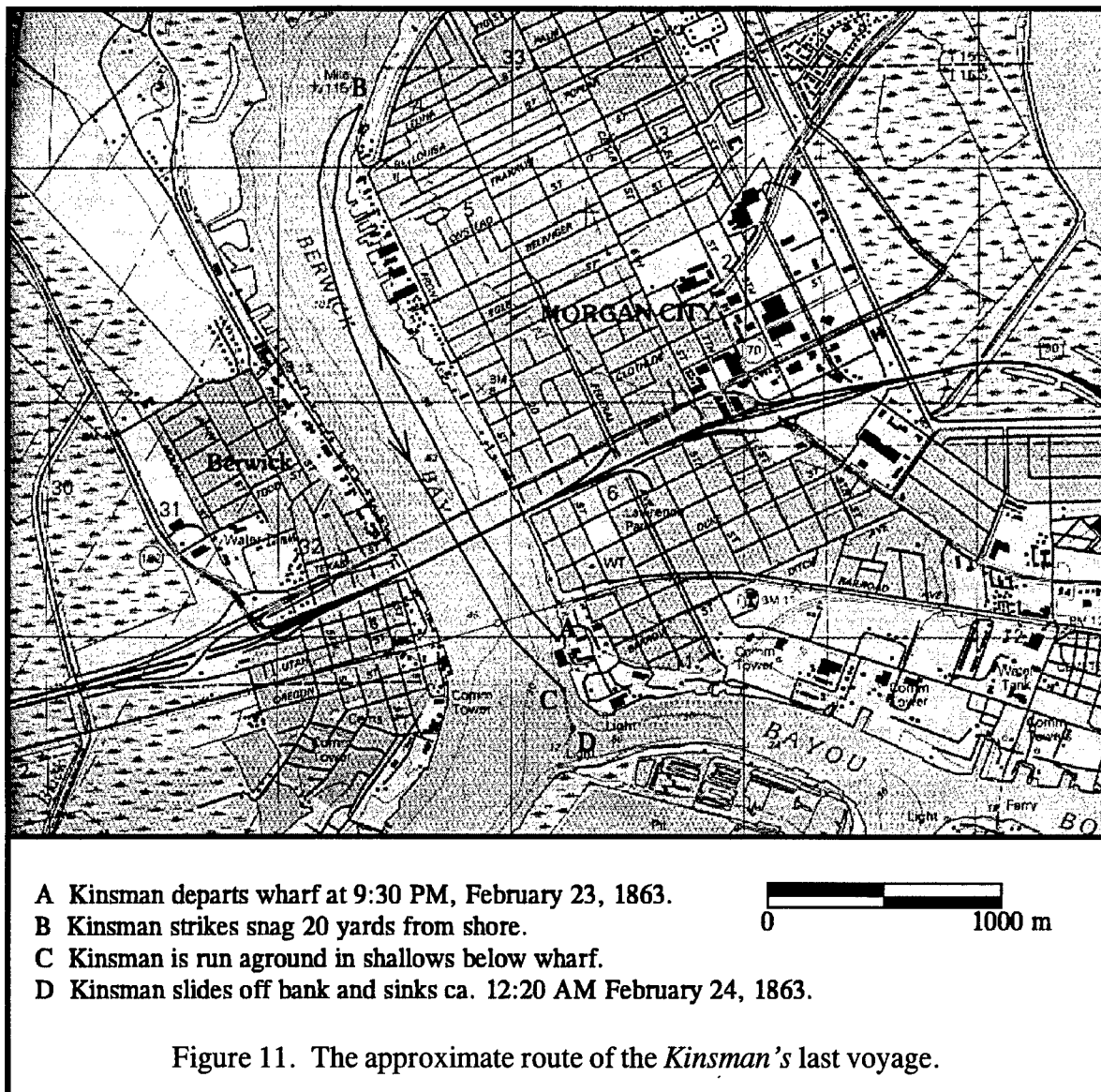
The loss of the *Kinsman* was considered a serious blow to Federal strength in the Atchafalaya Basin. General Nathaniel P. Banks had few shallow-draft gunboats capable of operating in Basin waters, and he was anxiously awaiting the arrival of more. Banks reported to Major-General H.W. Halleck in Washington on February 28, 1863, with his usual touch of hyperbole: "My dispatch... will have informed you of the embarrassing loss of the gunboat *Kinsman*, equal in effect to the destruction of two battalions" (O.R. v. 21:1106). Figure 11 indicates the approximate route of the *Kinsman's* last voyage.

Description of the U.S. Colonel *Kinsman*

The western river steamer *Gray Cloud* underwent many modifications and repairs during her nine years of existence. The final, and possibly the most drastic change, would have been the modifications for military use. The remains of the *Col. Kinsman* on the bottom of Berwick Bay or the Atchafalaya River should reflect these changes. The vessel can be described as follows:

vessel type:	sidewheel steamboat
length:	177 feet
width:	27 4/12 feet
depth:	6 feet (relative to hull cargo capacity)
draft:	4 feet (amount of water needed to float and not snag)
tonnage:	275 19/95 ton
masts:	none
head:	plain
stern:	pink
decks:	one
cabin:	on deck
armament:	two 32-pounder cannons, one a Sawyer rifled gun, the other possibly rifled also
armor:	iron plate casemate protecting boilers and machinery
hatches:	two, shot locker

No plans or photographs of the *Gray Cloud* or the *Kinsman*, in her armed steamer phase, are known to exist. However, one image of the *Kinsman* appeared in *Harper's Weekly* on February



14, 1863 in an illustration entitled "The Fight at Corney's Bridge, Bayou Teche Louisiana, and Destruction of the Rebel gun-boat 'Cotton,' January 14, 1863" (Figure 12). The illustration shows the *C.S.S. Cotton*, the *U.S.S. Calhoun*, the *U.S.S. Estrella* and the *U.S.S. Col. Kinsman*. The vessels appear in that order from background to foreground. The *C.S.S. Cotton* is in the upper portion of the sketch, in the background, flying the stars and bars of the Confederacy. Closest to the *Cotton* is the two-decked, 508-ton New England coastal steamer *U.S.S. Calhoun*, followed by the 438-ton iron-hulled *U.S.S. Estrella*. Finally, in the foreground is the *U.S.S. Col. Kinsman* after she fell below the others, her rudder having been unshipped by a torpedo. The sketch has several inaccuracies; it shows the smokestack of the *U.S.S. Calhoun* at the wrong end of its cabin, and the same vessel is lacking its wooden hog bracing and walking beam. The depiction of the *Kinsman* is short on detail, but does illustrate her general appearance after she was modified for use as an armed steamer. The two 32-pounder guns were placed bow and stern, and probably were both rifles mounted on naval barbette carriages that allowed them to be rotated through a wide field of fire, perhaps as much as 300° (Gosnell 1949:12). The casemate of iron plates surrounding the boilers and other machinery is suggested beneath the hurricane deck (or cabin roof). The lack of protection for the gun crews from small arms fire partly explains why the *Kinsman* was ineffective in the December 1862 reconnaissance to Fort Burton. In that engage-

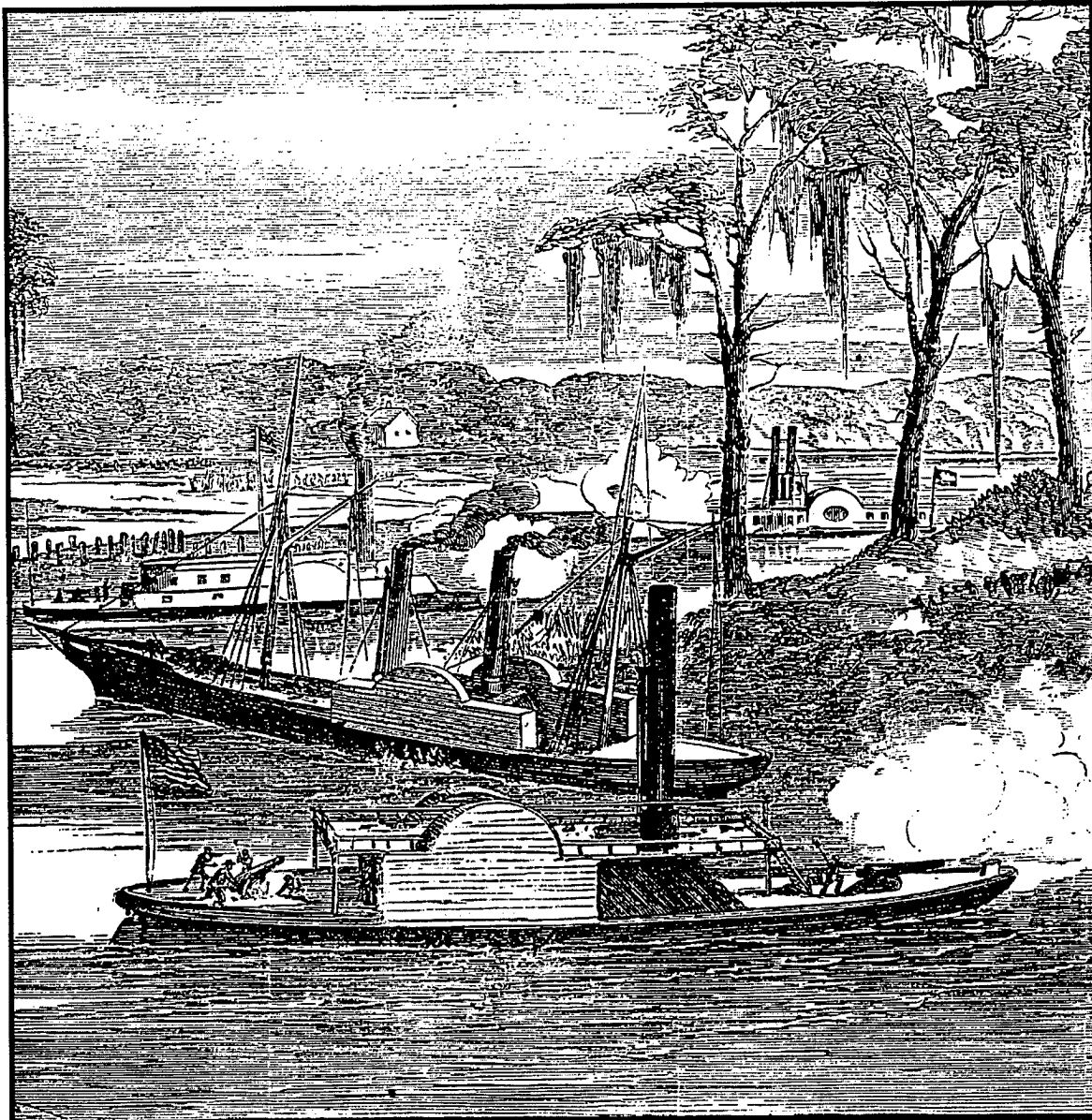


Figure 12. *The Fight at Corney's Bridge, Bayou Teche, Louisiana, and Destruction of the Rebel gun-boat 'Cotton,' January 14, 1863, from Harper's Weekly, February 14, 1863, depicting The Kinsman in the foreground.*

ment the narrow waterway and heavy vegetation on the banks meant Confederate sharpshooters could make handling the guns suicidal for their crews. The single smokestack is shown projecting from the hurricane deck forward of the paddlewheels. The image suggests that the pilot house was relocated within the casemate, although from photographs and engravings of other armored river steamers this would appear to be unusual.

Another image of the *Kinsman* may exist, an illustration from *Harper's Weekly* dated May 9, 1863, entitled "Brashear City, Berwick's Bay, LA., Base of General Banks's Operations" (Figure 13). Although the illustration was published some months after the *Kinsman* sank, it does not refer to any specific event and may have been published by the paper a considerable length of time after it was drawn in the field. The viewpoint of the illustration is from the Berwick side of Berwick Bay, and prominent in the background is the terminal of the New Orleans, Opelousas,

and Great Western Railroad at the Brashear City waterfront. A small civilian sailing craft is shown in the foreground, while three Federal gunboats are also depicted. To the left is a Federal steamer (name unknown) with a walking beam. At the right is probably the iron-hulled *Estrella*, appearing very similar to her depiction in the Corney's Bridge illustration. In the center is a single-smokestack sidewheel steamer, possibly the *Kinsman*, closely resembling the image in the Corney's Bridge illustration and also possibly without a wheelhouse. Unfortunately, the image is not sufficiently detailed to provide any additional technical details of the vessel.

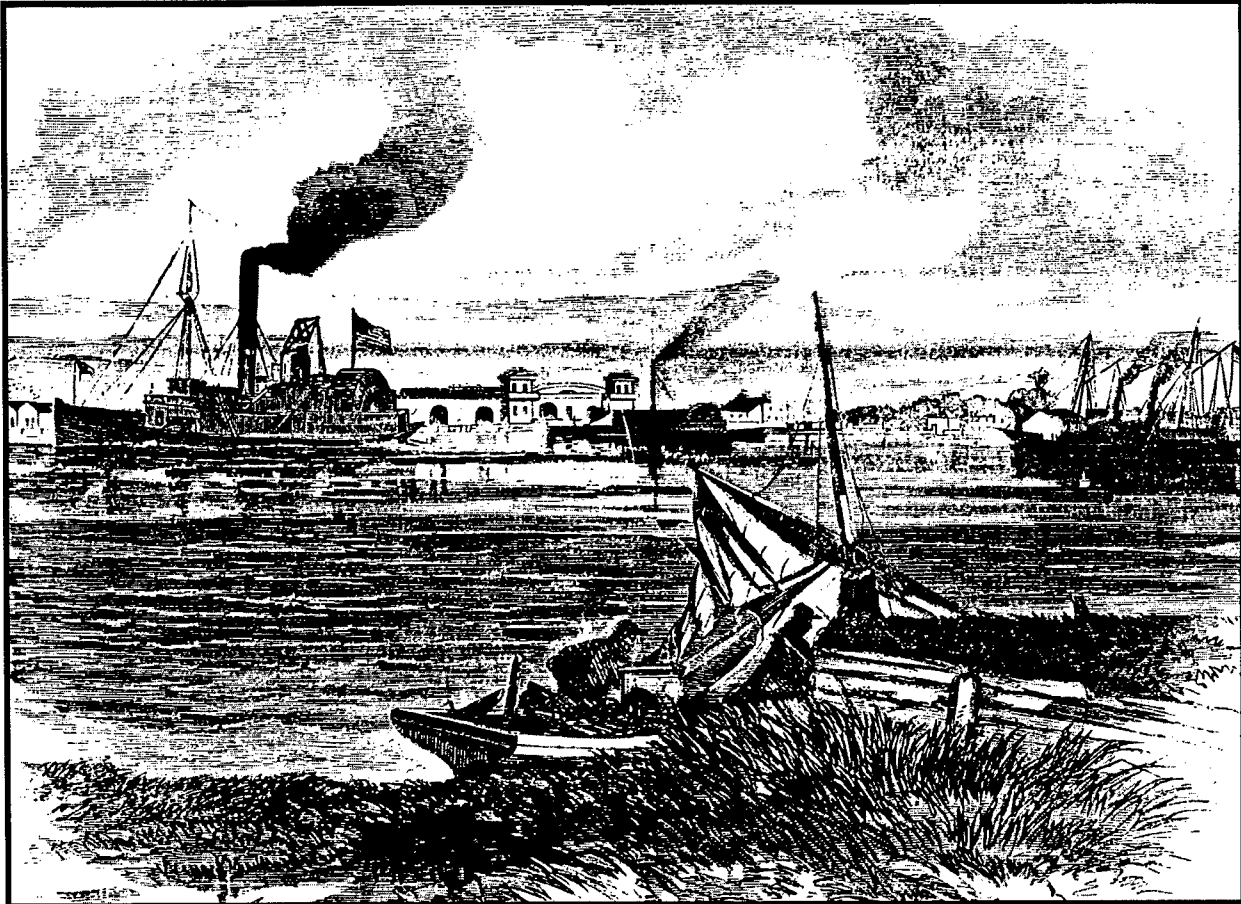


Figure 13. *Brashear City, Berwick's Bay, LA., Base of General Banks's Operations*, from Harper's Weekly, May 9, 1863, possibly depicting the *Kinsman* in the center.

CHAPTER 5

PREVIOUS INVESTIGATIONS

Jackson (n.d.)

The proposed locations of two oxidation ponds and new sewer lines in the vicinity of Stephenville and Belle River, Louisiana, were the subject of an archeological survey. The oxidation pond location for Stephenville was located in an inundated cypress swamp, but pedestrian survey was conducted at the proposed location for the Belle River oxidation pond. The sewer lines were all to be placed within an existing road right-of-way. No previously recorded sites were noted in the area; and no new sites were recorded as a result of the survey.

Gagliano et al. (1975)

This survey, which included 315.1 miles along the Intracoastal Waterway and associated spurs, was conducted by Coastal Environments, Inc., in 1975. The waterways, adjacent spoil, and their immediate vicinity were surveyed (Gagliano et al. 1975:1). The intent of the survey was to assess high-probability areas based on landforms and sediment dispersal. Geographic regions within the project area were discussed. The Amelia-Morgan City area was identified as being archeologically important. Gagliano et al. (1975:59) noted that numerous sites are located in the vicinity of Bayou Boeuf, but that very little is known of the archeology of the region.

Investigations included archeological testing to define the presence and extent of prehistoric and historic archeological sites in the study area. Fieldwork was conducted by boat and consisted primarily of surface collection and examination of previously identified archeological sites. Previously unknown sites were identified by the presence of artifacts or shells associated with prehistoric middens (Gagliano et al. 1975:7-8). This survey resulted in the identification of 158 sites within their study area. Of these, 78 were exposed on the banks of the waterways or within their spoil areas. A total of 150 prehistoric and 42 historic components were discovered during the study.

Gagliano (1976)

A cultural resources survey was conducted for four proposed construction sites for drainage and flood control in the Wyandotte and Siracusaville subdivisions. No previously recorded sites were identified in the project area. No archeological remains or standing structures were recorded during the field survey.

Neuman and Servello (1976)

Between October 1974 and March 1976, Robert W. Neuman and A. Frank Servello conducted the first major systematic survey within the Atchafalaya Basin. This project was funded by the U.S. Army Corps of Engineers and included Avoyelles, Pointe Coupee, St. Landry, Lafayette, St. Martin, Iberville, Assumption, and St. Mary parishes.

Neuman and Servello (1976) performed archival research followed by an extensive field survey. Sites previously recorded by McIntire and Kniffen were not visited, but were recorded on the site map. Neuman and Servello stated that, "All recorded sites for which there was locational and other data, have been incorporated into the report" (Neuman and Servello 1976:8).

Of the 133 sites recorded in the Atchafalaya Basin and ancillary survey areas, 77 sites were newly discovered and 56 were previously recorded. Twenty-three of the previously recorded sites were revisited. Neuman and Servello classified all 133 sites into one of the following categories: shell midden, earthen midden, multiple mounds with associated middens, and isolated mounds (Neuman and Servello 1976:11-13).

Neuman and Servello's survey enhanced archeologists' understanding of the prehistory of the basin. A large number of previously unknown sites were recorded. Also, the survey provided a better basis for discussions of settlement patterns, site distribution patterns, and the chronological sequence within the basin. Some of the patterns noted as a result of their survey included: the location of tumuli versus shell middens, the earliest age and majority age of sites within the basin, the presence of Archaic and Tchefuncte sites on basin's periphery, site location on extant and relict bayou levees and lake shores, and finally, that no sites were located along the Atchafalaya River itself (Neuman and Servello 1976:72-73).

This and subsequent surveys that followed in the 1970s marked the beginning of a more scientific/systematic approach to understanding the archeological record within coastal Louisiana. This shift in archeological procedure can probably be related to the passing of the National Historic Preservation Act of 1974.

Rivet (1976)

This letter report detailed a cultural resources survey of the Lake Palourde by-pass roads, St. Mary Parish. Prior to field survey, the Louisiana Site Files were checked for previously recorded sites in the project area. While numerous sites were recorded along Bayou Boeuf to the south and west of the project area, no sites had been recorded in the immediate vicinity of the project area. During the surface survey, no archeological sites were encountered. Numerous shell deposits consisting of *Rangia*, *Crassostrea*, and *Thais* were observed, however, these were apparently natural deposits or the result of fill episodes.

Gibson (1978a)

From March through December of 1977, Jon L. Gibson conducted a survey southeast of Morgan City in St. Mary, Assumption, and Terrebonne parishes between U.S. Highway 90 and the Gulf of Mexico. Gibson posed a series of theoretical questions which dictated the approaches or goals for the systematic survey of the banks of Bayou Chene from its confluence with Bayou Black through Avoca Island Cutoff to the entrance of the Lower Atchafalaya River; Bayou Shaffer from its source at Bayou Boeuf to the Lower Atchafalaya River; Lower Atchafalaya River from its exit of Berwick Bay to the Atchafalaya Bay; and finally, an overland corridor bounded on the west by the Lower Atchafalaya River; on the east by the line corresponding to the eastern section line of conjoined sections 4, 9, and 16 in T18 S, R12 E; on the north by Avoca Island Cutoff, and on the south by the Atchafalaya Bay (Gibson 1978a:1). His stated goals for the systematic survey were to locate cultural resources in order to mitigate adverse project impacts and to analyze and explain the variability in prehistoric sites within the project area.

Gibson reported two sites in Assumption Parish, 29 in St. Mary Parish, and 12 in Terrebonne Parish. Of the 29 sites recorded in St. Mary Parish, 12 were evaluated as eligible for nomination to the National Register of Historic Places (Gibson 1978a:276-277, 283). Sites recorded within the general vicinity of the current project area include Shaffer Oak Ridge (16SMY50), Rip Rap (16SMY51), Bayou Shaffer Water Locks (16SMY52), 16SMY53, Lafitte Skiff (16SMY54), and Brick (16SMY130) along Bayou Shaffer; and Little Wax Bayou Cut-off (16SMY131) on the Atchafalaya River. The Shaffer Oak Ridge site (16SMY50) was the focus of a later report discussed below.

In conjunction with his systematic survey of the project area in the lower basin, Gibson also provided in-depth, theory-based discussions of the culture history of the Lower Atchafalaya Basin. The main focus was on chronological sequencing of prehistoric and historic populations (Gibson 1978a:30-65) and on the natural environment, geomorphic development, landforms, waterways, elevation and flooding potential, and relief and slope, since these could have influenced site location and use (Gibson 1978a:66-117). Finally, Gibson discussed the cores and the reconstruc-

tion of sedimentary environments for each site and performed a chi-square statistical analysis for site dispersal within different environmental zones (Gibson 1978a:183-260). The results of the tests suggested that aboriginal populations were choosing natural levees instead of swamps and marshes, and that there was a higher frequency of sites in the swamp-marsh ecotone rather than within the interior of either zone (Gibson 1978a:230-231).

Gibson (1978b)

The Shaffer Oak Ridge site (16SMY50) was recorded at the junction of Bayous Boeuf and Shaffer during the extensive survey discussed above. Shovel testing and examination of the ground surface indicated that the site consisted of *in situ* and redeposited shell and midden strata. Intact shell and earthen midden extended to a depth of 32 cmbs (below ground surface). Horizontally, the site extended 150 m west along the Bayou Boeuf waterfront and 350 m south along the Bayou Shaffer Waterfront. The extant width of the site was approximately 8 to 10 m; however, the presence of tree stumps in Bayou Boeuf indicated that bankline erosion had been fairly severe, destroying the northernmost 50 m of the site (Gibson 1978b:2).

Artifacts, consisting mostly of undecorated aboriginal sherds, were found in higher densities within shovel tests than on the ground surface. The only decorated ceramic type recovered was Pontchartrain Check Stamped. Faunal remains from fish, mammals, and shellfish, mostly *Rangia cuneata*, were also found at the site. Based on the presence of intact deposits, the Shaffer Oak Ridge site was considered eligible for nomination to the National Register of Historic Places (Gibson 1978b:2).

The property is leased by T & T Disposal Pits, Inc. Planned construction by the company included excavating two disposal pits 600 ft x 100 ft in the vicinity of the archeological site. Additional examination of the site was undertaken to determine the possible adverse impacts by the disposal pits. It was recommended that the easternmost boundary of the project be moved 80 m to the west, thereby completely avoiding the archeological site. Other planned construction, such as the stabilization of the bankline would be beneficial by protecting the site (Gibson 1978b:3).

Weinstein et al. (1978)

Coastal Environments, Inc., was contracted to perform a baseline environmental study of the proposed relocation of U.S. Hwy 90 (LA 3052 and interchanges) between Ellsworth and Morgan City, Louisiana (Weinstein et al. 1978:1). The project area crossed three parishes: Assumption, St. Mary, and Terrebonne. A total of 29 sites were recorded in the three parishes. The most sites (19) were recorded in St. Mary Parish.

There were eight sites which lay along Bayou Ramos between Lake Palourde and Bayou Boeuf in St. Mary Parish. Test excavations were performed at Bayou Ramos I (16SMY133) to evaluate its National Register eligibility. Bayou Ramos I included both prehistoric and historic components. Prehistoric artifacts recovered from the *Rangia* shell midden were ceramics and a few faunal remains. Ceramic types identified at the site are: Baytown Plain, Coles Creek Incised *vars.* *Coles Creek* and *Mott*, and Mazique Incised *vars.* *Bruly* and *Kings Point*. Shell samples yielded radiocarbon dates ranging from 735 A.D. to 980 A.D. (Weinstein et al. 1978:90 and 99).

The historic component at Bayou Ramos I includes the Bayou Ramos House constructed in the mid to late nineteenth century. At the time of the survey, the site was inhabited. Artifacts collected from the historic component included various ceramics, metal, glass, brick, and domestic animal bone. While the historic evidence indicates that the house was constructed in the mid-nineteenth century, and the area was occupied prior to this, the artifact assemblage represents mostly late nineteenth and early twentieth century activities (Weinstein et al. 1978:117). All of the other sites recorded along Bayou Ramos were small *Rangia* shell middens (Weinstein et al. 1978:120-130).

Giardino and Davis (1981)

In 1981, the Tulane Department of Anthropology conducted a survey of the 47.1 acre area of proposed construction for the U.S. Coast Guard's Marine Safety Office and Housing facilities (Giardino and Davis 1981:4). The objectives of the survey were to locate any archeological sites in the project area, to establish the locations of such sites in terms of the proposed construction, and to evaluate the significance of the sites and the need for mitigation (Giardino and Davis 1981:10). The only site located during the survey was the previously recorded Bergeron site (16SMY185). In the report, this site was incorrectly listed as 16SMY5.

The site is located approximately 340 m north of the Berwick Lock Facilities. It consists of *Rangia* shell midden. At the time of the 1981 survey, much of the site had already been lost due to erosion. Two localities were established at the site. Artifacts recovered from the site were aboriginal sherds and faunal material. The ceramic evidence indicated that the site was occupied during the Coles Creek/Plaquemine period (Giardino and Davis 1981:73). Only one locality exhibited apparently intact midden. This area was covered by 10-12 ft of spoil. Based on the general paucity of artifacts, the lack of diagnostic artifacts, the limited intact midden, and the amount of overburden at the site, 16SMY185 was considered a non-significant cultural resource which required no mitigation (Giardino and Davis 1981:2).

Gibson (1982)

This large-scale survey covered 295 kilometers in portions of Avoyelles, Pointe Coupee, St. Landry, St. Martin, Iberville, Assumption, and St. Mary parishes. The survey was necessitated because of proposed construction and maintenance of the East and West Atchafalaya Basin Protection Levees which demarcate the Atchafalaya Basin Floodway. The areas surveyed were long linear corridors from Moreauville to a southern terminus near the junction of the Avoca Island Cutoff and the Lower Atchafalaya River below Morgan City (Gibson 1982:31). The survey was conducted in five segments along the east and west protection levees as well as segments of levees west of the Berwick area, west and southwest of Morgan City (Gibson 1982:31-36).

Gibson's approach to this study was designed to provide data to address issues concerning "...certain broad settlement-related hypotheses dealing with lowland adaptation and relative site location" (Gibson 1982:325). An ethnographic survey of the area provided an excellent overview of the historic populations in and around the basin. The methodology for archeological survey was based on geographic parameters (settings) within the survey corridors. These corridors were 60 meters in width, centered on existing levee crests (Gibson 1982:336). Four different field techniques were utilized. Pedestrian coverage of one to three longitudinal transects following the corridors was undertaken. These transects were spaced 10 to 40 m intervals (Gibson 1982:337). In situations where the terrain precluded longitudinal transects, the corridor was covered by one to three irregular search paths beginning at points of disembarkation, which were systematically spaced at 200 meters (Gibson 1982:337-338). A third technique was applied for the southern extremities: the East Atchafalaya Basin Protection Levee south of Bayou Sorrel, the West Atchafalaya Basin Protection Levee south of Lake Fausse Point, and the levees west of Berwick. In these areas, probing was utilized in delimiting the extent of *Rangia* deposits. Finally, shovel tests were excavated in areas where geological information suggested near-surface sites were likely to be present. The shovel tests measured 50 x 50 cm. They were confined to geologically older but geomorphologically less active landforms found mostly north of U.S. Highway 190 (Gibson 1982:340).

Gibson's survey recorded two sites in Pointe Coupee Parish, one site in Iberville Parish, six sites in St. Martin Parish, fourteen sites in St. Mary Parish, two sites in Iberia Parish, five sites in St. Landry Parish, and two sites in Avoyelles Parish. Many of the sites located during the earlier survey (Gibson 1978a) were revisited during this survey. These included Shaffer Oak Ridge (16SMY50), Rip Rap (16SMY51), Bayou Shaffer Water Locks (16SMY52), 16SMY53, and Brick (16SMY130).

Floyd (1982)

A cultural resources survey of the Lake Palourde/Grassy Lake region was conducted by John E. Chance and Associates, Inc., under contract with Celeron Oil and Gas Company, Lafayette, Louisiana (Floyd 1982:2). A proposed pipeline route passed through an area where known archeological sites were located. One site (16SM23) in particular would be impacted by the pipeline. Both pedestrian and boat surveys were performed. Pedestrian surveys were conducted at all bayou banks and lake shore areas where proposed pipelines would cross. Subsurface testing was deemed unnecessary (Floyd 1982:21).

Four previously recorded sites (16SM23, 16SM24, 16SM25, and 16SM26) were relocated, and one new site (16AS43) was recorded. The sites were primarily *Rangia* shell midden with some *Unio* shells present. Artifacts recovered from the sites included Mississippi Plain, Baytown Plain, and Coles Creek Incised sherds, and faunal materials (Floyd 1982:24, 32, and 43). The pipeline was rerouted to avoid all archeological sites in the area (Floyd 1982:4).

Goodwin and Selby (1984)

In 1984, R. Christopher Goodwin and Associates, Inc., conducted investigations at the site of the Morgan City floodwall boat. The boat was located on the left descending bank of Berwick Bay at the floodwall on Front Street between Greenwood and Freret Streets. Prior to fieldwork, extensive archival and historic research, and oral interviews were done to establish the historical context of the boat (Goodwin and Selby 1984:8). The report also includes an extensive history of Morgan City (originally Brashear City) and its importance as a navigation center. No site number was ever assigned to the Morgan City floodwall boat (LA State Site Files).

Combining the historical context and the archeological evidence recovered at the site of the boat, two alternate hypotheses for its function were developed. The watercraft was a barge which may have been used as a ferry (Goodwin and Selby 1984:69). Flat-bottom barge ferries were an important mode of transportation across the Atchafalaya River. Alternatively, the vessel may have been used as an ice barge. Large amounts of sawdust were observed during excavations of the barge, and sawdust was used as an insulator for ice. In support of the latter hypothesis is the fact that the barge was wrecked in the location of a former wharf for an icehouse (Goodwin and Selby 1984:77).

deFrance (1985)

A cultural resources evaluation was made of an area to be impacted by the planned construction of a bulkhead on Bayou Boeuf, St. Mary Parish. The purpose of the survey was to determine if the proposed project would adversely impact the Greenwood Cemetery, site 16SMY19, a prehistoric site and historic cemetery (deFrance 1985:iv).

The site consists of a large prehistoric mounded shell midden with an intrusive historic cemetery (deFrance 1985:4). At the time of the survey, the prehistoric component of the site was fairly undisturbed; and the historic cemetery overgrown. A surface collection was made along the bayou bankline, where the prehistoric midden was being eroded. The types of aboriginal ceramics recovered suggest that the site was occupied during the late Marksville and early Coles Creek periods (de France 1985:4).

Intact *Rangia* shell midden was encountered at a depth of 36 cmbs in one shovel test. The vertical extent of the shell midden was not established (deFrance 1985:6-7). The proposed bulkhead would impact part of the intact midden; however, since erosion is the major destructive force at the site, the bulkhead would ultimately protect the remaining portions of the site. The historic cemetery would not be impacted by the proposed bulkhead. It was recommended that no further archeological investigations were necessary for the planned construction area (deFrance 1985:7).

Goodwin et al. (1985)

R. Christopher Goodwin and Associates, Inc., conducted a cultural resources survey in the vicinity of Morgan City. The survey was necessitated due to proposed expansion to the hurricane protection levees in the region (Goodwin et al. 1985:9). Fieldwork consisted of systematic shovel testing, mapping, and test excavations at the Goat Island site (16SMY1). No new prehistoric or historic sites were recorded during the survey. Excavations at the Goat Island site revealed that the *Rangia* shell midden at the site is discontinuous. Very few artifacts were recovered during the excavations (Goodwin et al. 1985:101). Based on the paucity of artifacts, the discontinuous nature of the midden, and the general disturbance of the site, 16SMY1 was considered ineligible for nomination to the National Register of Historic Places (Goodwin et al. 1985:112).

Deshotels (1987)

Rehabilitation of the existing bridge over Ramos Bayou, US 90, east of Morgan City, required examination of the Bayou Ramos I site (16SMY133), as well as the Ramos House, an historic habitation located on the north bank of Bayou Ramos. (Deshotels 1987:2). The Bayou Ramos I site, recorded by Weinstein et al. (1987), exhibited both prehistoric and historic components. The site is located on the south bank of Bayou Ramos, approximately 350 ft above the existing bridge. Bayou Ramos I was recommended as eligible for nomination to the National Register of Historic Places (Deshotels 1987:9). The Ramos House may have been constructed in the mid 1800s. At the time of the survey, the Ramos House was a well-kept residence.

Proposed construction work was limited to the existing roadway and right-of-way. Neither the Bayou Ramos I site nor the Ramos House would be adversely impacted by the planned construction. No further archeological investigations were deemed necessary prior to commencing construction.

Kelley (1988)

Coastal Environments, Inc., surveyed two proposed borrow areas and excavated a portion of Avoca Plantation (16SMY130) in St. Mary Parish, Louisiana. The survey was necessitated for planned improvements to the East Atchafalaya Basin protection levee (Kelley 1988:11). Fieldwork included systematic survey and test excavations at 16SMY130 to evaluate its National Register eligibility.

During the survey of one borrow area, five historic scatters were recorded. These were interpreted as the remains of workers' quarters on Avoca Plantation; and therefore were not assigned individual site numbers (Kelley 1988:81). Artifacts recovered from the locales included brick and other construction materials; historic ceramics consisting primarily of decorated whitewares; and glass. No intact archeological deposits were encountered at these locales. The workers' quarters were most likely constructed in the early-twentieth century (ca. 1910-1920) (Kelley 1988:91).

Additional excavations at 16SMY130 revealed intact prehistoric and historic deposits. There is some evidence for earlier occupations; however, the focus of the prehistoric occupations appears to have been during the Mississippi period (Kelley 1988:65). Historic deposits at the site date to the late-nineteenth and early-twentieth centuries. Based on intact archeological deposits for both the prehistoric and historic components, Avoca Plantation was recommended as eligible for nomination to the National Register of Historic Places.

Pearson and Saltus (1989)

Remote sensing survey and exploratory diving operations were undertaken by Coastal Environments, Inc., at two project areas (American Pass and Blue Point Chute) in the Atchafalaya

Basin. These were the sites of two proposed weirs, five and 14 miles upstream from Morgan City. The purpose of the survey was to locate and to evaluate the historic significance of submerged watercraft in these areas. The survey was conducted using a proton precession magnetometer. The use of this instrument limited the survey to fairly large historic boats with sufficient metal hardware to be detected by the magnetometer. Smaller craft with little or no iron work were not expected to be detected using this instrument (Pearson and Saltus 1989:5).

Until the latter half of this century, the project areas lay in the shallow waters of Grand Lake. Based on this and other information gleaned from the navigational histories of the two project areas, there was a low probability of locating shipwrecks in either area. However, given the intense use of south Louisiana waterways for commercial and private transportation and fishing, it was considered possible that small vessels may have been lost or abandoned in the vicinity of the project areas (Pearson and Saltus 1989:21).

Three magnetic anomalies recorded in the vicinity of the American Pass project area (five miles above Morgan City) were the subject of further investigations (Pearson and Saltus 1989:32, 35, and 38). At each magnetic anomaly, the river bottom was searched by hand and probed. The sources of the anomalies could not be located (Pearson and Saltus 1989:39-42).

This was the first reported use of remote sensing equipment for detecting submerged watercraft in the lower Atchafalaya Basin. While no wrecks were located during the survey, it provided invaluable data concerning the importance of remote sensing techniques in the region. This survey and the resulting interpretations form the basis for later investigations discussed below.

Pearson and Saltus (1991)

Remote-sensing surveys and diving operations were undertaken by Coastal Environments, Inc., in Sts. Martin and Mary parishes along the Atchafalaya River Main Channel and Bayou Shaffer (Pearson and Saltus 1991:11). The areas surveyed were the proposed locations of channel training projects. Survey was also conducted in the possible location of the wreck of the *U.S.S. Kinsman* (Pearson and Saltus 1991:73).

Survey was conducted using a proton precession magnetometer and a side-scan sonar to locate magnetic anomalies and submerged objects, and a fathometer to "map" the river bottom. Fieldwork was divided into the initial magnetometer survey of the entire projects areas, intensive side-scan sonar of possible shipwrecks, and actual investigation (diving operations and probing) of selected locales (Pearson and Saltus 1991:51).

Most of the anomalies investigated were modern debris from oil production and commercial fishing (Pearson and Saltus 1991:112-113). The project areas in Bayou Shaffer were the only locations to yield shipwrecks. At sites 16SMY55, 16SMY58, and 16SMY61, important submerged watercraft were recorded. The watercraft located at 16SMY55 was a small cypress skiff of the type which has had a long and important history in the region. Site 16SMY58 was a wooden vessel built as a mine sweeper and converted to a fishing vessel and abandoned. At 16SMY61, the remains of a large wooden barge were found. This was a coal barge, important to the sugar industry in the area. Another vessel found at 16SMY61 was a submerged sailing sloop or schooner. Numerous other vessels or sections of vessels were also recorded in the Bayou Shaffer areas (Pearson and Saltus 1991:113).

This survey, combined with the survey conducted in 1989 (Pearson and Saltus 1989), adds to the growing body of knowledge concerning the important navigational history of the Lower Atchafalaya Basin.

Weinstein and Kelley (1992)

This report provides possibly the best reviews and discussions of Terrebonne Marsh archaeological sites to date. Research for the report included field investigations and reviews of collections from 21 previously recorded sites within the area. The study area was bounded by Bayou du Large on the east, Bayou Shaffer and the Lower Atchafalaya River on the west, the proposed relocation of U.S. Hwy 90 on the north, and the Gulf of Mexico on the south. Fieldwork was undertaken for the U.S. Army Corps of Engineers to assess the impact of barrier construction related to the long term maintenance on the Atchafalaya Floodway.

Construction alternatives required assessment of previously recorded sites or survey in Assumption, St. Mary, and Terrebonne parishes. Information was gathered on 91 sites in the Atchafalaya Basin and Terrebonne Marsh. Seventy of these sites were visited during the field investigations. Of these sites, 13 were determined eligible for nomination to the NRHP, 30 were considered potentially eligible pending further investigations, 20 were regarded as non-significant cultural resources, four sites could not be relocated, and three were outside the sampling area.

Using data collected from the sites, Weinstein and Kelley developed a model of the reconstructed paleogeography for the area from 1,000 BC to AD 1940 (1992:331-361). The model shows changes in the physical landscape and concomitant human settlement patterns. They chose to divide the model into eight intervals: Poverty Point and Tchula, Marksville, Baytown, Coles Creek, Mississippi, Colonial, Antebellum and Civil War, and Postbellum and Modern (Weinstein and Kelley 1992:Plates 3-10). The south-central portion of the Terrebonne Marsh shows fairly continuous occupation from Poverty Point times through Mississippian (Weinstein and Kelley 1992:Plates 3-8). The colonial and later periods see few, if any, occupations (Weinstein and Kelley 1992:Plates 9-10).

Given the highly dynamic nature of the Terrebonne marsh in terms of both geology and human settlement, Weinstein and Kelley (1992:383) suggest that further research in the area should include an interdisciplinary approach that would involve archeologists and geomorphologists. Through such a study, we will gain invaluable information concerning the past lifeways of humans in the coastal zone.

CHAPTER 6

THEORETICAL OVERVIEW OF METHODOLOGY FOR REMOTE SENSING SURVEY

A portion of Berwick Bay, Louisiana, was investigated with an array of geophysical equipment including fathometer, side-scan sonar, multibeam sonar, and a magnetometer. Specifically, the equipment used included: (1) an Innerspace Model 448 Fathometer, (2) a GEO Acoustical Side-Scan Sonar Model SS941 Transceiver and Model SS942 Side-Scan Sonar Tow Fish, (3) a SeaBat 8100 Series New-Generation Multibeam Echo Sounder, and (4) a Geometrics Model G-806 a Magnetometer. These were used for relocation, delineation, and identification of submerged historic cultural resources south of Morgan City along the south bank of Bayou Boeuf where it enters Berwick Bay. A differential Global Positioning System (GPS) interfaced with the navigation computer was utilized to delineate and record where the data were generated. GPS is a satellite navigation system operated and maintained by the U.S. Department of Defense. The GPS utilized for this study was a Trimble Navigation Model 4000 RL.

Global Positioning System (GPS): Trimble Navigation Model 4000 RL

The GPS is the most accurate technology available for general marine navigation. By computing the distance to three or more GPS satellites orbiting the earth, a GPS receiver can calculate an accurate horizontal position, and a 3 dimensional position can be obtained by referencing four or more satellites. This process is called satellite ranging. GPS receivers can also provide precise speed and course measurements which are crucial for marine navigation. Differential GPS is the most accurate form of GPS navigation, providing position solutions with five meter or better accuracy.

Differential GPS relies on error corrections transmitted from a reference station placed at a known location. The reference station calculates the error correction in the satellite range data and broadcasts these corrections to the mobile receiver. A significant portion of the error in the GPS measurements can be eliminated by the GPS receivers incorporating these corrections. The errors caused by the ionosphere, the atmosphere and by selective availability can be eliminated with this method of using GPS navigation.

The GPS reference locator and mobile receiver utilized were manufactured by Trimble Navigation. The reference locator calculates and sends differential corrections: provides accurate differential GPS corrections, even during periods of Selective Availability; and utilizes carrier smoothing to provide highly accurate corrections. The mobile receiver receives differential corrections from the reference locator, receives GPS measurements from the GPS constellation, and provides the interface between the mobile receiver to the Sentinel Navigation computer used to provide survey navigation.

Fathometer: Innerspace Model 448

The Innerspace 448 thermic depth sounder recorder provides survey precision, high resolution depth readings using solid state thermal printing as well as digitized depth information for output to a data logger. The transducer operating frequency is 208Khz with an 8 degree beam width at 3 db. The fathometer uses a thermal printing technique which provides high resolution and accuracy required by such groups as the U.S. Army Corps of Engineers, dredge companies, survey companies, port administrations, etc. The depth is read directly from the printed scale, thereby avoiding the possible confusion encountered when examining outmoded, preprinted, multi-scaled charts. Time and event marks are numerically annotated, and the chart is automatically labeled feet or meters as determined by the mode switch. English measure was utilized for this project in order to permit integration with other survey data. Depth ranges for the device are 0 to 80 and 0 to 335, and the 0 to 80 range was utilized. Data accuracy is reported to be <0.1 foot timing and printing resolution.

The depth sounding data was integrated into the global information system (GIS), and the bathymetric projection plotted on the study maps. Bathymetric anomalies can suggest seafloor disturbances, such as cultural material, shipwrecks, pipelines, and well sites. Fathometer data is also helps elucidate magnetometer sensor to target distance for analytical purposes.

Side-Scan Sonar: Geo Acoustical Side-Scan Sonar Model SS941 Transceiver and Model SS942 Side-Scan Sonar Tow Fish

The Geo Acoustical Side-Scan Sonar Model SS941 Transceiver and Model SS942 Side-Scan Sonar Tow Fish can be used in either the "100" or "500" Khz configuration to yield a topographic seafloor presentation. The "500" Khz resolution was used to record the bottom of the bay in the project area. The side-scan sonar deck unit is used to control and condition fine signals from the side-scan sonar tow fish. The sonar transmits the "500" Khz bursts from both port and starboard transceivers upon receipt of a key pulse from the transceiver. The sonar returns are processed using time varied gain, and they are then converted to separate frequencies which are transmitted back up the tow cable to the SS941 transceiver. From the transceiver, the data is sent to an E.P.C. Model 1086 gray scale printer, which is utilized generate a hard copy of the data. This results in an "aerial sonar photograph" of the seafloor. Sediment variations and objects on or above the seafloor are then apparent.

Multibeam Sonar

Multibeam bathymetry provides increased detail of the seafloor. The swath coverage is from 90 to 150 degrees, sensing the seafloor every 1.5 degrees at updates 30 times per second. This simultaneous acoustic travel-time measurements with multiple paths provide data resolution where 2 meter objects are readily obvious. The resultant 100 percent data increases bathymetric detail with confidence that all features are mapped without voids or distortions. The system has the ability to map inaccessible areas, such as under jetties, vessels, or near breakwaters.

Multibeam data is equivalent to having a multi-fathometer source, with each of its one to three hundred readings corrected for the vessel's pitch, the vessel's roll, wave action, acoustic variability through the water column, and corrected side-scan sonar image. Differences between the side-scan sonar and the multibeam data are that the side-scan sonar produces shadowing when objects are off the bottom, and multibeam does not. This is because the multibeam projection of the data merges several survey lines with a total image of the bottom, while side-scan sonar can only provide, at best, a mosaic image of the bottom. Then too, what can be detected on any given pass by the side-scan sonar is dependent on the geometry of the sensor to the object on the seafloor. After several passes in different directions over a seafloor target, it is common that only a few useful data sets result, and on some lines, the target will go undetected.

Magnetometer: Geometrics Model G-806A

The Model G-806A is a proton-free precision magnetometer used for searching, mapping, and exploring bodies which produce anomalous magnetic fields. It allows the earth's magnetic field to be measured at repetition rates ranging from 2 times per second to once every second, depending on the configuration. The basic components of the proton-free precision magnetometer includes a sensing element and housing (tow fish or sensor), electronic console, recording device, and interconnecting cables. The sensing elements consist of three solenoidally wound coils with balancing trim turns to minimize noise pickup from remote sources. The sensing element is immersed in a hydrocarbon fluid, such as gasoline or kerosene.

The magnetometer measures the earth's magnetic field by determining the frequency at the protons precis in the hydrocarbon fluid. These preprocessing protons generate a A/C current in the solenoids, which is directly related to the magnetic field strength of the earth. The electronic

console includes the electronic circuitry required to process the precession signal for determining the value of the earth's magnetic field. These values were recorded on an analog recorder for assessment and interpretation.

Magnetic anomaly interpretation involves this measurement of the earth's magnetic field intensity, in gammas, using a magnetometer. The current study is concerned with the application of magnetometers in the search for shipwrecks; details on the physics and mechanics of magnetometers are discussed elsewhere (e.g., Aitken 1958; Breiner 1973; Saltus and Pearson 1990). A variety of objects and materials, including some buried archeological features, cause localized disturbances, or "anomalies," in the earth's magnetic field that can be detected with a magnetometer. Archeological objects typically located by magnetic survey can be divided into three categories: (1) iron or other ferrous materials; (2) burned features such as fire hearths, kilns, bricks, and daub; and (3) unfired features such as walls and wall trenches, ditches, storage pits, and wells. The first category is most easily detected, since ferrous objects cause substantial magnetic disturbances. The other two categories generally are detected less easily. They are caused by variations or disturbances within the clay substrata — pyrite concentrations, faults, and various other magnetic fluctuations. The current study was focused on locating large or numerous ferrous objects representing portions of submerged watercraft.

Magnetic signatures (anomalies) can be characterized by two nonexclusive factors, strength (intensity) and shape. Both factors are dependent upon a variety of anomaly source characteristics, including size, shape, number of objects, orientation, and mass; magnetic susceptibility; distance of the anomaly from the point of measurement; and magnetic properties of the surrounding matrix. Magnetic anomalies caused by a single-source ferrous object typically form a positive-negative anomaly pair known as a dipole. The dipole normally is oriented along the axis of magnetization, with the negative portion located nearer the north pole of the source object. The positive portion of the anomaly commonly is of greater intensity than the negative portion. Monopolar anomalies often are formed by non-ferrous geological features; linear objects such as pipe or long rods where only one end is detectable with the magnetometer; and dipolar anomalies in which only one of the poles is detected in the search pattern. Historic shipwrecks, which often contain numerous ferrous objects, usually produce complex magnetic signatures comprised of multiple dipole and/or monopole anomalies. This class of signature is particularly apparent when the wreck is scattered and dispersed.

Anomalies of archeological interest can vary from several hundred gammas or more, to less than one gamma, depending upon the characteristics and orientation of the source material and its distance from the point of measurement. As a rule, the strength of an anomaly is proportional to the inverse cube or square (depending on orientation) of the distance between the source and the point of measurement. Because of this rapid decline in anomaly strength, objects near the sensor are more likely to produce marked variation in magnetic intensity than are more distant objects. A variety of techniques have been developed to estimate distance of the anomaly from the sensor, all of which have varying degrees of error (Breiner 1973).

Even though a considerable body of magnetic signature data for shipwrecks is available, specific signatures cannot be positively associated with shipwrecks or other features or objects. The variation in iron content, condition, orientation, and distribution of a shipwreck all influence the intensity and configuration of the anomaly produced. In general, the magnetic signatures of moderate and large watercraft, or portions of watercraft, are large in area, minimally 24 to 27 m (80 to 90 ft) diameter across their smallest dimension. They range from moderate to high intensity (greater than approximately 30 gammas) at a distance of 6 m (20 ft), and they may or may not be complex in nature. Complexity of an anomaly is influenced largely by distance of the sensor from the source. For example, a magnetic anomaly recorded with the sensor located close to a shipwreck may exhibit a complex configuration, as the sensor records individual ferrous objects. At a greater distance, the signature may resemble a single dipolar anomaly, with the entire wreck

recorded as a single object. Riverine anomalies smaller than 9 x 18 m (30 x 60 ft) generally are considered non-significant, since they normally represent flotsam, or jettisoned material like paint cans, 55-gallon drums, camshafts, small anchors, small vessel parts, cable, chain, tires, and appliances. Steamboats are expected to produce an anomaly area in excess of 100 feet, even if the power plant and machinery had been removed. Examples of magnetic signatures of identified anomalies are presented in Table 3.

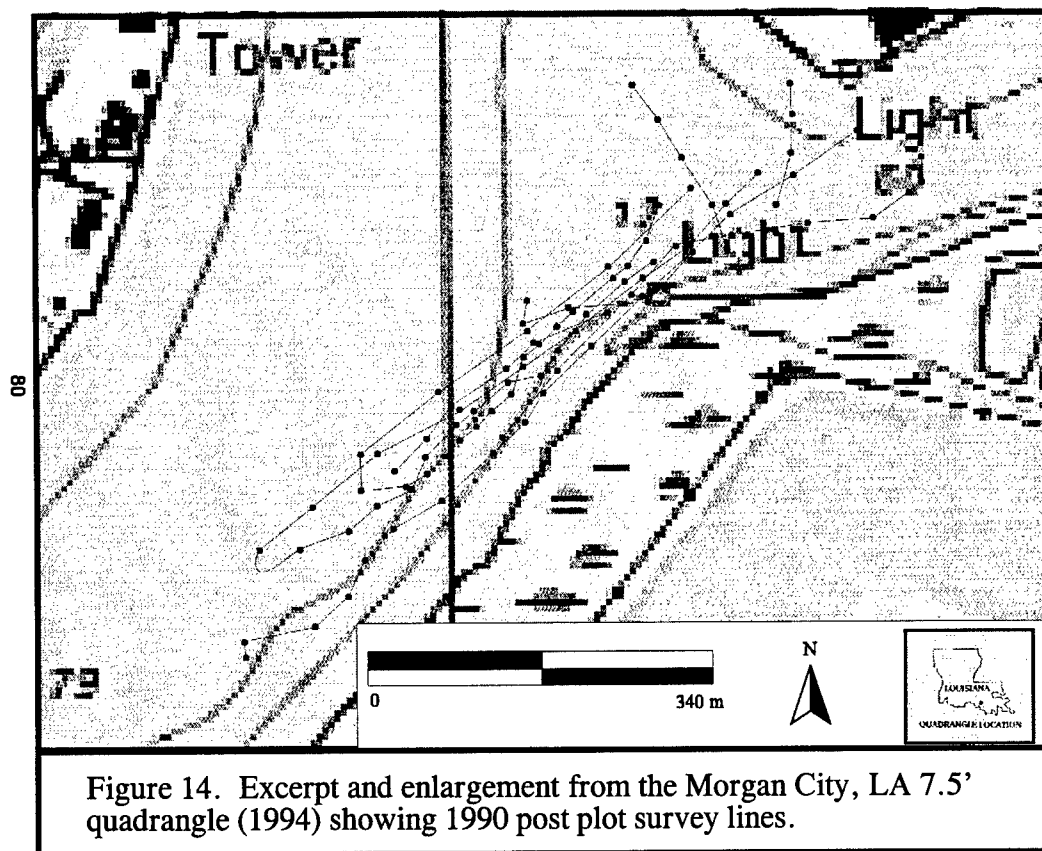
Table 3. Selected Magnetic Signatures of Known Objects.

OBJECT	SIZE OF OBJECT	MAGNETIC AREA (FEET)	MAGNETIC READINGS (GAMMAS)
Single objects:			
engine camshaft	20" x 2"	50 x 45	45
cast iron soil pipe	10' long	65 x 45	1407
iron anvil	150 lbs.	26 x 26	598
cable	120' GRC	200 x 200	75
iron kettle	22" dia.	23 x 23	200
iron anchor	6' shank	270 x 80	30
Multiple objects:			
pipe and bucket	8' pipe	60 x 50	250
2 pipes	10' and 3'	110 x 110	645
burn pile	8' dia. x 8"	40 x 30	20
Shipwrecks:			
coastal sailing craft - wood	90' x 20'	250 x 150	35
wooden steamer <i>Lotawanna</i>	180' x 47'	350 x 300	310
wooden steamer <i>Spray</i>	140' x 18'	210 x 160	520
schooner <i>James Stockton</i>	55' x 19'	130 x 90	80
Ocean Merchant <i>El Nuevo Constante</i>	126' x 26'	250 x 150	65
ironclad <i>CSS Tuscaloosa</i>	150' x 40'	300 x 200	4000
gasoline sternwheeler, machinery removed	50' x 10'	200 x 140	450
1840s towboat machinery removed	65' x 13'	110 x 60	110

CHAPTER 7 RESULTS OF REMOTE SENSING SURVEY

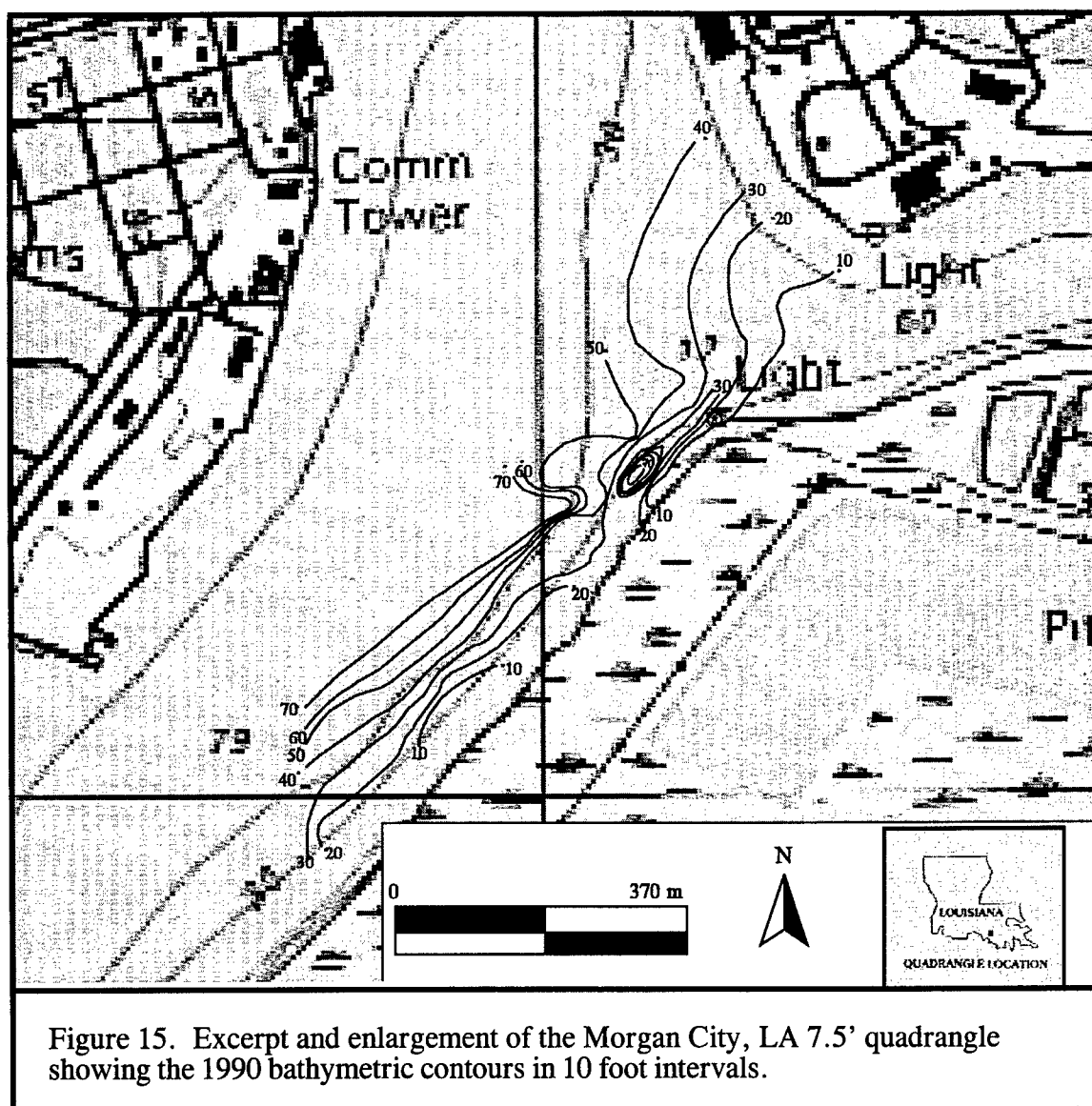
This chapter presents and analyses historical and physical data available for the current study area. These data derive from four surveys, one of which was performed in 1990 and the remaining three in 1998. These surveys were performed by Coastal Environments, Inc., by T. Baker Smith, by Fugro West, Inc., and by the Minerals Management Service (MMS), Gulf of Mexico. The latter three were all designed for the relocation of the *Col. Kinsman*.

Coastal Environments' 1990 survey utilized a Geometrics 806 proton magnetometer with a King Fathometer and Loran C System. The Loran C system recorded data to the tenth of a minute or <60 feet (<18 meters). The survey was performed in a 21 foot aluminum survey vessel on March 14 by Allen Saltus, Jr., and Charles Pearson. An area measuring 3,000 by 600 feet (41 acres) was surveyed along the east bank of Berwick Bay extending from approximately 2,000 feet below the navigation light to 1,000 feet above the light. Figure 14 presents the survey post plot.



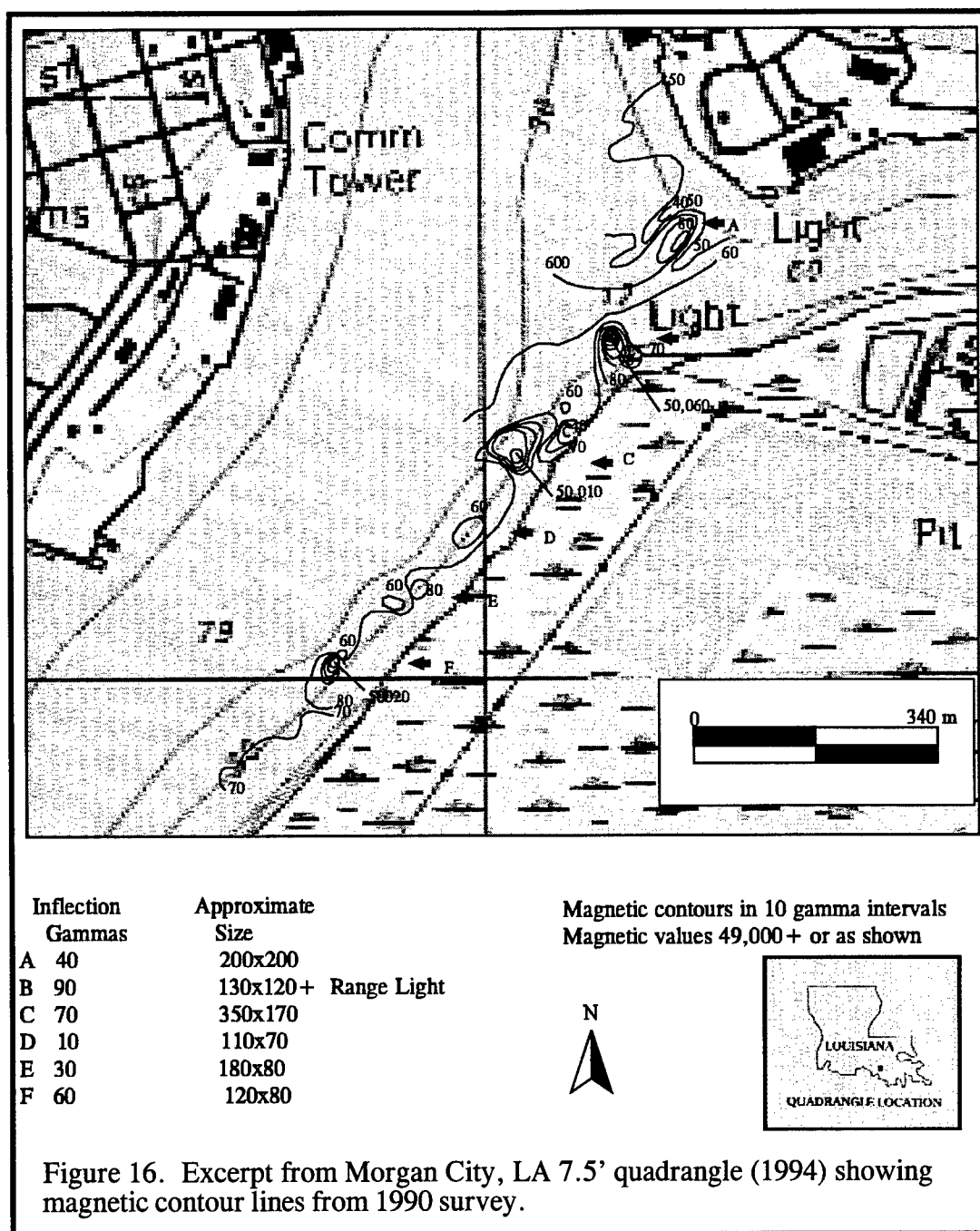
The bathymetric contours in 10 foot intervals are presented in Figure 15, while the magnetic contour in 10 gamma intervals are shown in Figure 16. Six magnetic anomalies were recorded (Figure 16) and are described as follows:

	Inflection (Gammas)	Approximate Size (Feet)	Comment
A	40 dipolar complex	200 x 200	
B	90 monopolar	130 x 120+	Range Light
C	70 dipolar	350 x 170	T. Baker Smith's anomaly 1
D	10 monopolar	110 x 70	T. Baker Smith's anomaly 2
E	30 dipolar	180 x 80	T. Baker Smith's anomaly 3
F	60 dipolar	120 x 80	T. Baker Smith's anomaly 4



Four of these six anomalies appear to have been relocated during the T. Baker Smith's 1998 survey. Anomaly A was not detected, and Anomaly B probably represents the range light. The latter was not identified by T. Baker Smith because lower river level precluded a survey pass close enough to detect the light.

Also in 1998, the Young-Saunders Center became interested in relocating the *Col. Kinsman*. The Center had obtained two days of voluntary diving from Oceaneering International, Inc., to confirm the location of the vessel. In order to make the most of this opportunity by maximizing dive efficiency, an expanded, more comprehensive survey was initiated utilizing the superior positioning capabilities of differential GPS. On August 29 and 30, T. Baker Smith performed the survey aboard the 23 foot survey vessel *M/V TBS*. The study area extended from just below the Rail Road Bridge to approximately 2,200 feet below the navigation light in the Atchafalaya River and approximately 1,000 feet into Bayou Boeuf. Crew members included Dan McDonald, Sr., Dan McDonald, Jr., and Allen Saltus, Jr. The survey included 53 survey lines spaced at 50 feet (16 meters) intervals over three irregular survey segments. These three segments provided overlap in the area where the *Col. Kinsman* was reported lost. Over 60 acres of river bottom was surveyed in the magnetometer, side-scan sonar and fathometer portion of this effort. An additional



20 acres of river bottom was surveyed using fathometer and side-scan sonar in the area between the Morgan City and Patterson bridges. The magnetometer was omitted in this area due to the massive ferrous effects from the bridges.

It should be noted that the line spacing utilized for this survey was less than the standard 165 feet (50 meters) used by the Minerals Management Service, Outer Continental Shelf, and the U.S. Army Corps of Engineers marine remote sensing surveys, as well as less than the 100 feet (30 meters) recommended by the National Park Service (Murphy and Saltus 1990). However, tighter lane spacing provides better bathymetric data of any exposed structure. Then too, closer lane intervals afford better coverage for magnetometer data, and would possibly elucidate the orientation of magnetic anomalies in the point bar/channel confluence environment. Thus, because

scheduling was not an issue, 50 feet (16 meters) intervals were used. Figure 17 is the post plot showing the survey lines as they were run.

Mr. Jack Couch, Diving Manager of Oceaneering International, Inc., facilitated the multibeam sonar survey provided by Fugro West, Inc. On December 8, 1998, the survey was performed by Shawn Johnson onboard one of Oceaneering's crew boats. An area measuring approximately 2,300 by 1,500 feet was surveyed, with the study area extending easterly from 1,000 feet below the navigational light. In addition, Drs. Jack Irion and Richard Anuskiewicz of the Department of Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, along with Dr. Kenneth Ashworth, archeologist with the New Orleans District, Corps of Engineers, performed a digital, 600 khz side-scan sonar investigation around the Berwick Bay navigational light. This side-scan sonar survey indicated that there was no apparent cultural material extending up off the river bottom.

The general data analysis by individual geophysical equipment source includes:

1. The **fathometer** data illustrates the complex river bottom, as displayed on the Bathymetry Map, Figure 18. This figure encompasses T. Baker Smith's study area using a five foot contour level.
2. The **magnetometer** data collected in the T. Baker Smith study area reflects a highly complex magnetic area both in the number of anomalies and gradient slope. The large ferrous sources include the bridges, bulk heads, floating dredge pipe, drilling rig, and numerous barges along the Morgan City bank below the rail road bridge. Seventeen magnetic anomalies have been defined within the current study area. Figure 19 is the magnetic contour map of the study area using a ten gamma contour interval. The seventeen magnetic areas or anomalies are delineated in Figure 20.
3. The **side-scan sonar** data within the current study area displays a rather featureless bottom other than sand waves and bathymetric features. There are no apparent objects extending sufficiently above the river bottom to cast an acoustical shadow. Five magnetic anomalies have corresponding sonar features. These sonar features appear to represent seafloor variations possibly caused by buried object(s) close enough to the surface to have a surface expression. Both the analog 500 khz side-scan sonar data used by the T. Baker Smith study and digital 600 khz side-scan sonar used by the MMS survey produced data with basically the same results.

Upon first examination, there were no apparent sonar features seen within the study area as seen in the side-scan sonar data collected by either T. Baker Smith or the MMS. Five sonar feature were identified after delineating the magnetometer data and reexamining the T. Baker Smith data. These sonar features or feature areas correspond to magnetic anomalies or anomaly areas #1, #3, # 4, #6 and #7 seen on Figures 21-23.

Drs. Jack Irion and Richard Anuskiewicz of the Department of Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, along with Dr. Kenneth Ashworth, archeologist with the New Orleans District, Corps of Engineers, performed another sonar survey using a digital, 600 khz Data Sonics Side-Scan Sonar. The investigation encompassed the vicinity of Berwick Bay several hundred yards around the navigational light. Dr. Irion analyzed the side-scan sonar data looking especially in the areas of the foci of the 17 magnetic anomalies. He stated that the data was indicative of a river environment void of any apparent cultural material extending up off the river bottom.

4. The **multibeam** data provided by Fugro West, Inc., and Oceaneering International, Inc., produced a remarkable view of the river bottom within the study area and the vicinity in

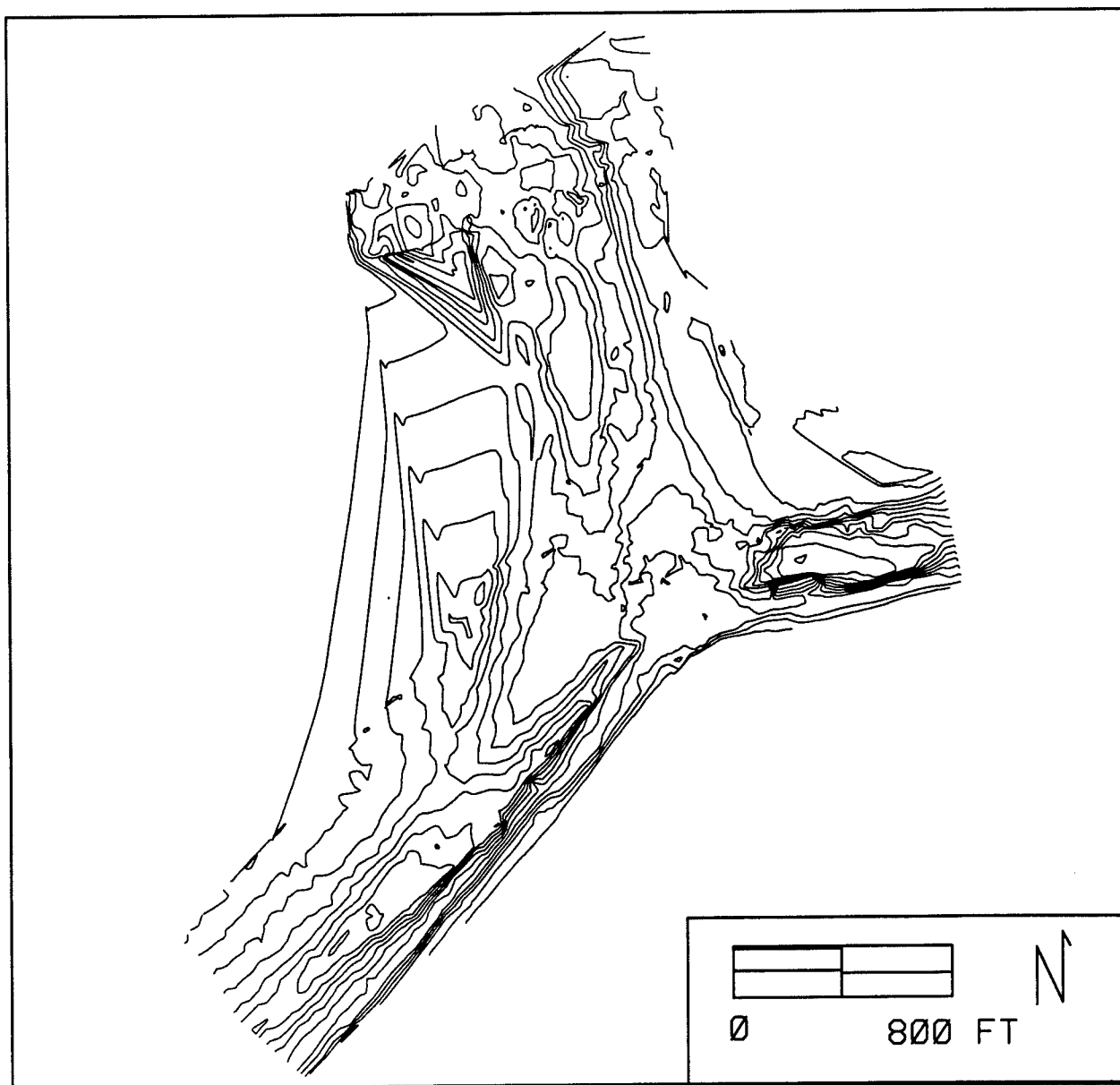


FIGURE 18. BATHYMETRIC CONTOUR MAP (1998) OF THE STUDY AREA IN SMOOTH 5 FOOT INTERVALS.

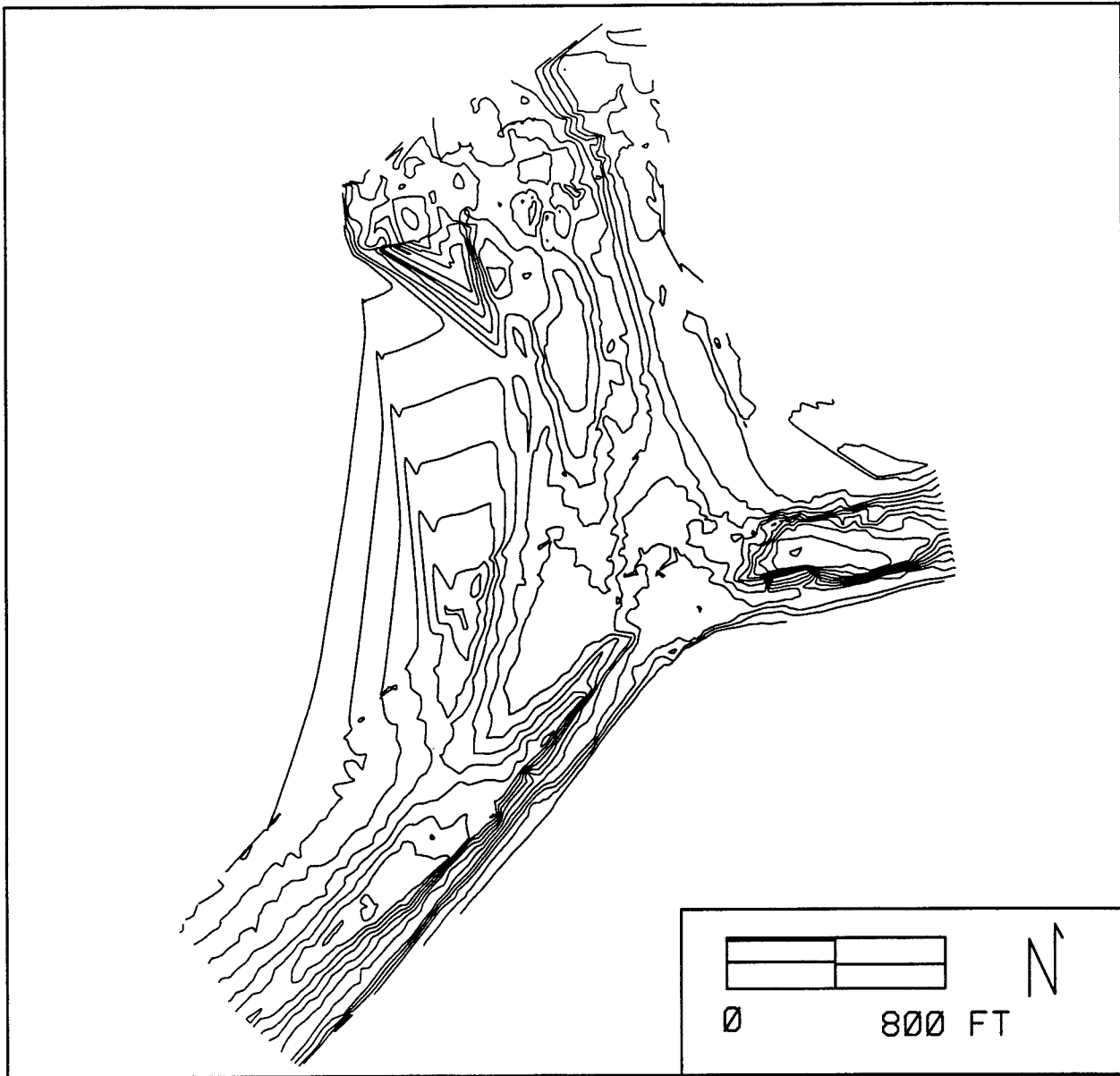


FIGURE 18. BATHYMETRIC CONTOUR MAP (1998) OF THE STUDY AREA IN SMOOTH 5 FOOT INTERVALS.

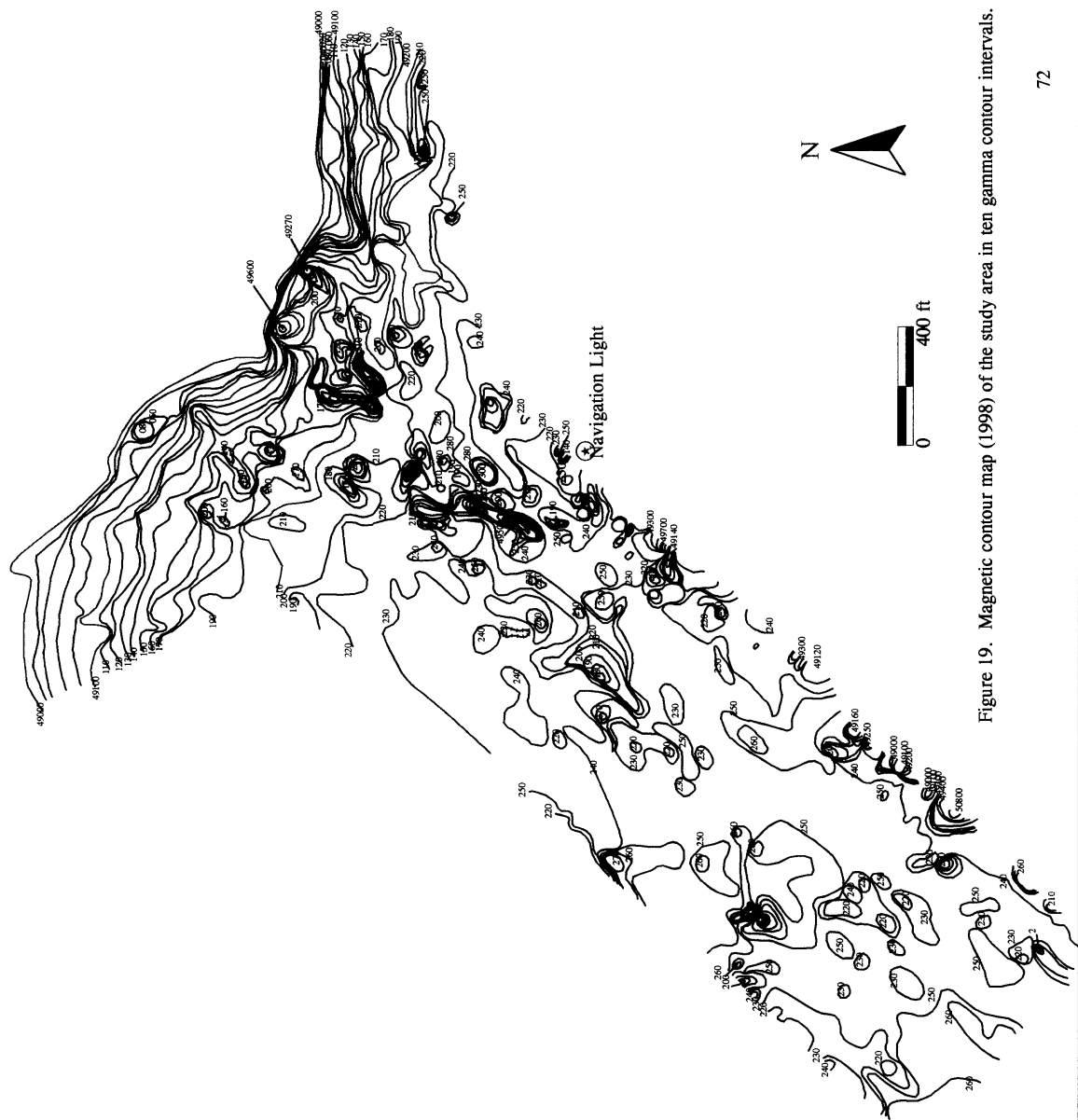


Figure 19. Magnetic contour map (1998) of the study area in ten gamma contour intervals.

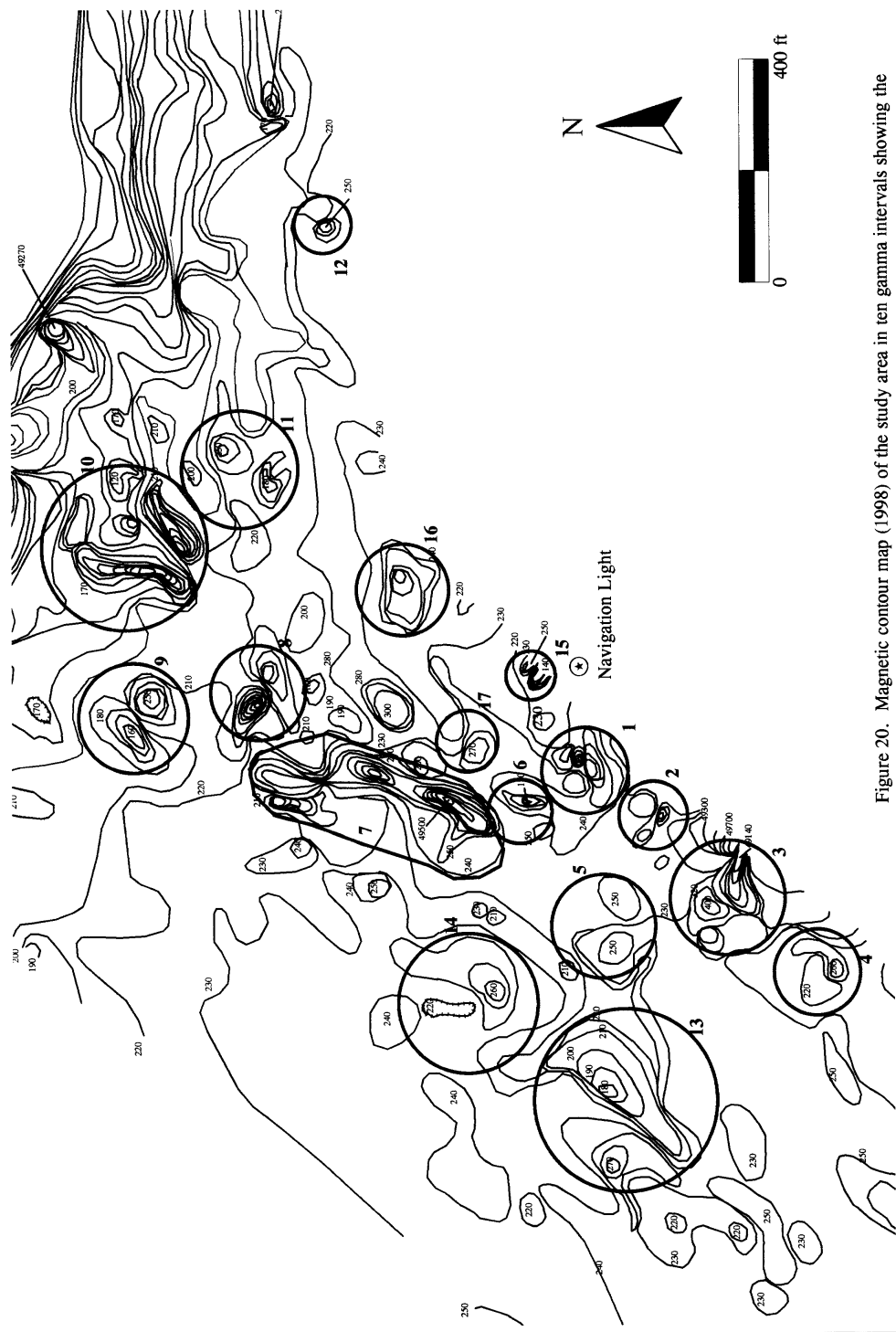


Figure 20. Magnetic contour map (1998) of the study area in ten gamma intervals showing the seventeen magnetic areas or anomalies.

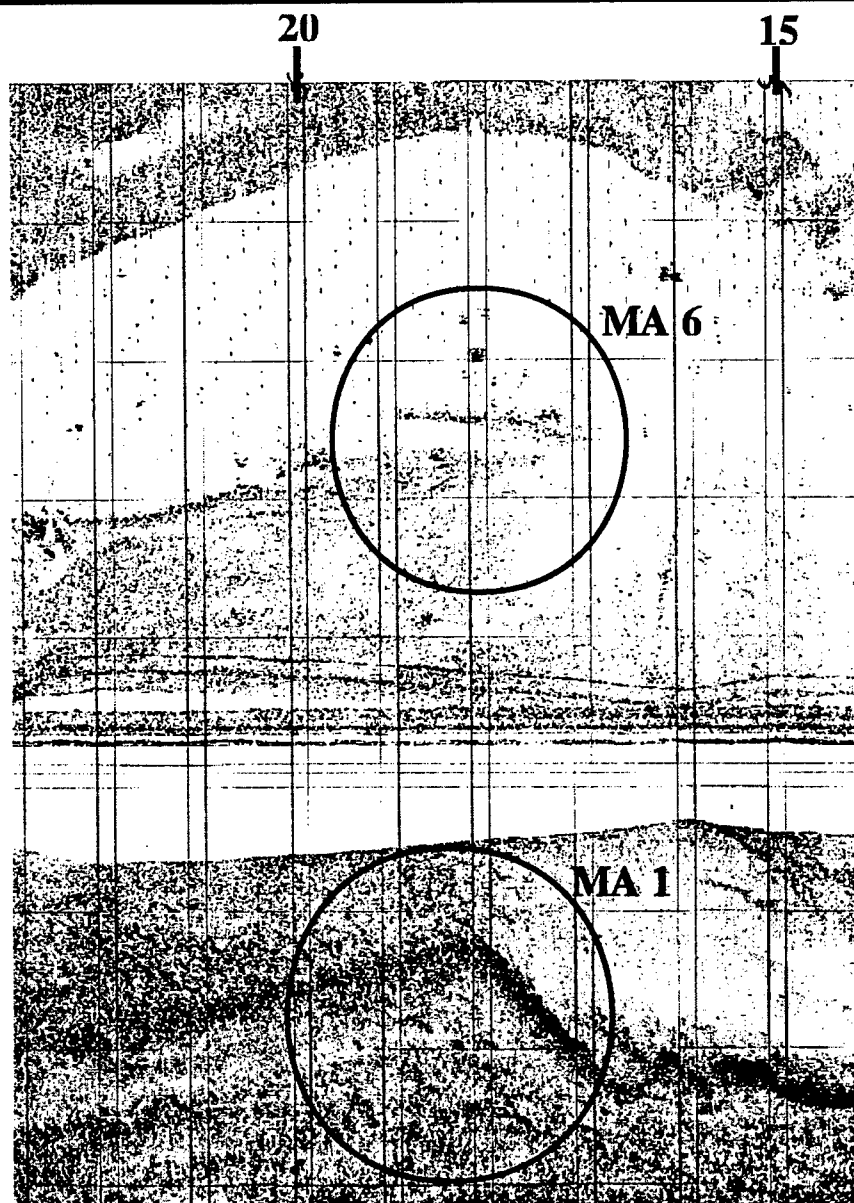
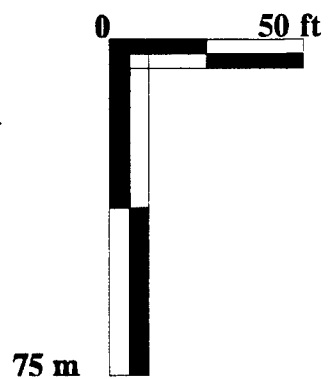


Figure 21. Side-scan sonar Line 24, Section A, showing Anomaly Areas 1 and 6.



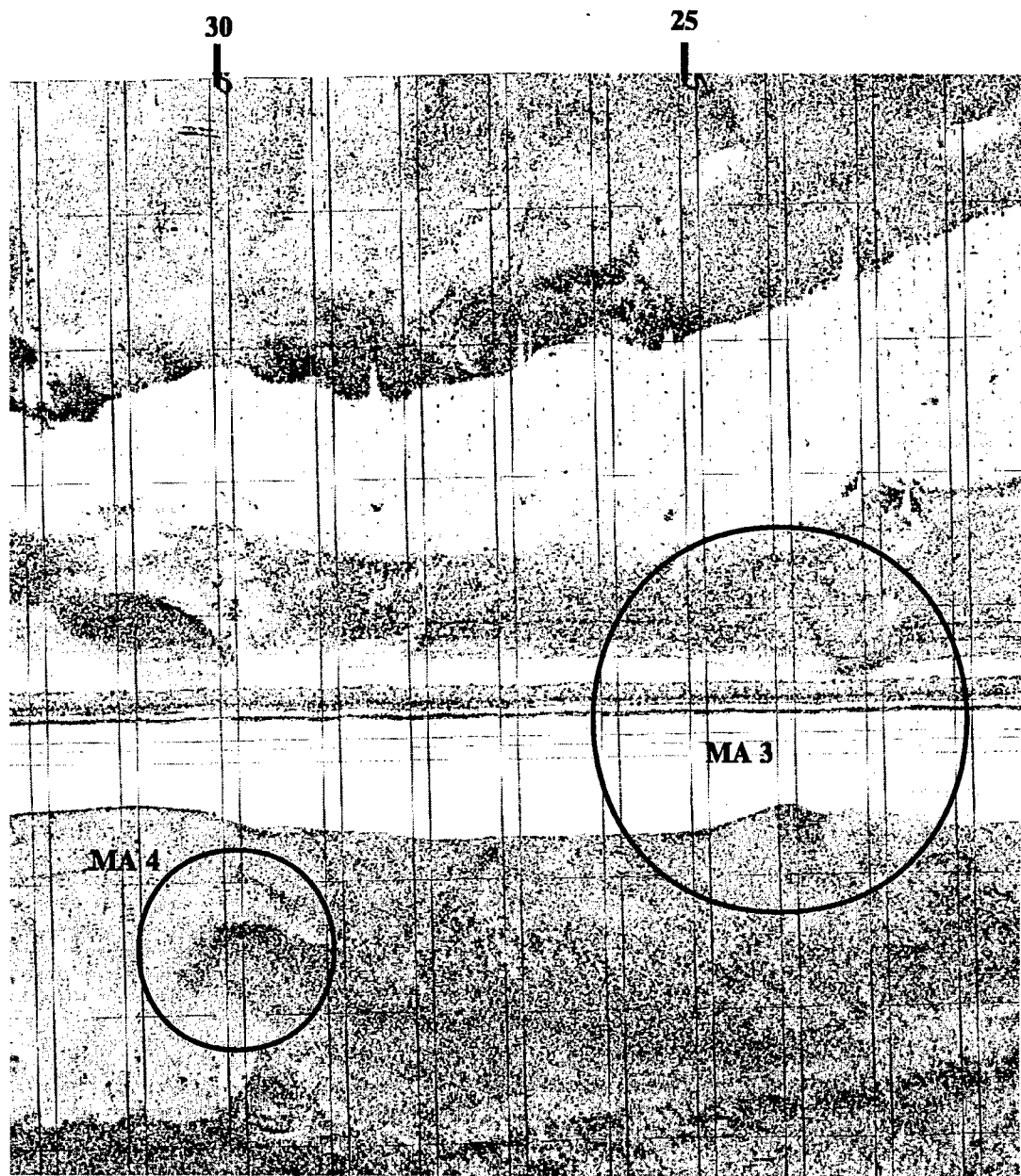
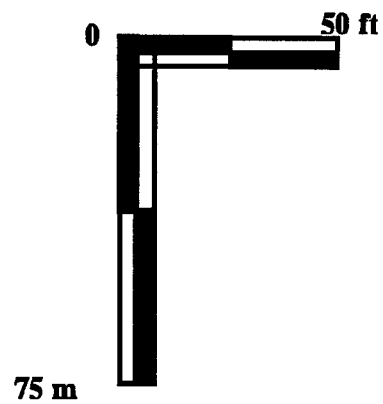


Figure 22. Side-scan sonar Line 24, Section B, showing Anomaly Areas 3 and 4.



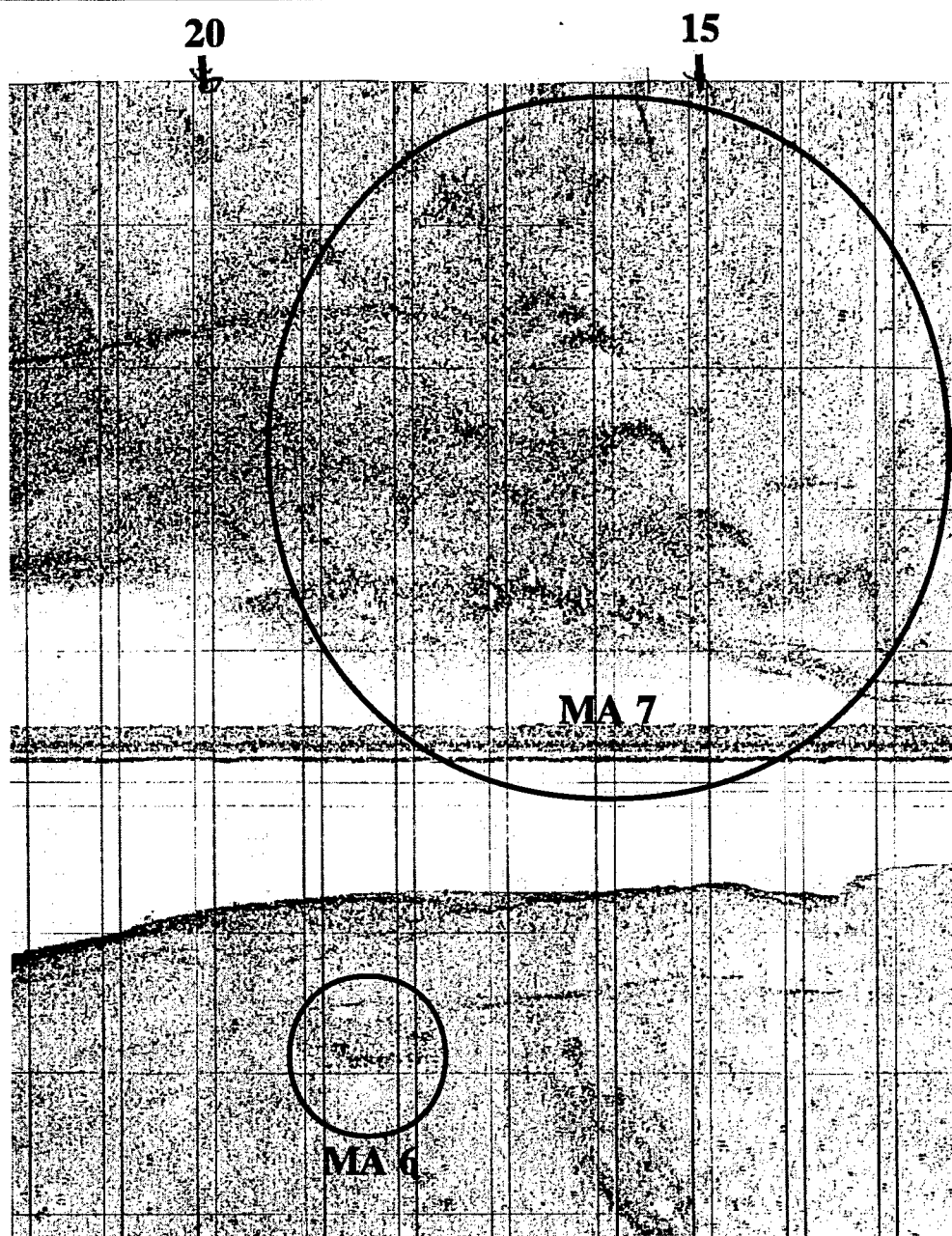
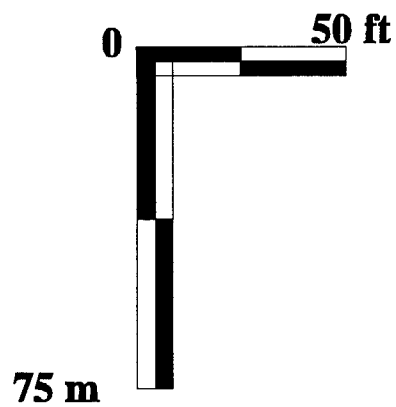


Figure 23. Side-scan sonar Line 26 showing Anomaly Areas 6 and 7.



the lower portion of Berwick Bay. Figure 24 shows the area surveyed by multibeam with bathymetry data contoured at five foot intervals. Figure 25 is a projected multibeam view of the study area looking from the northwest to the southeast. Striking features apparent in the data include the depth of the channels separated by the shallows of the study area and the two broad, 200 foot wide, 400 to 500 foot long zones of arching lines of different depths within the study area. These two broad zones could possibly be caused by dredge activity, since the dredge swept side to side in an arching pattern approximately 200 feet wide (Captain Al Mistrot, NOCOE, personal communication to Saltus 1999). Six multibeam sonar features or feature areas correspond to magnetic anomalies or anomaly areas #1, #3, #4, #7, #11 and #12 seen on Figures 26 and 27.

Analysis of Magnetic Anomalies

Seventeen magnetic anomalies have been delineated within the study area boundaries (Figure 20). Magnetic anomalies #1, #2, #3, #4, #6, #12, and #15 lie between the bank and above the toe of slope. Anomalies #8, #9, #10, and #11 lie in the river on the northern portion of the study area, and the monopolar Anomaly #16 appears to be a deeply buried magnetic source. Anomalies #5, #13, and #14 lie down current from the study area on the western side of the channel and well into the river. The complex Anomaly #7 may well represent the scattered remains of the Kinsman.

The following discussion of each magnetic anomaly includes the location of its magnetic foci, the area where the source of the anomaly can be found, its magnetic intensity, its magnetic area, the water depth of the foci, and whether it has a corresponding side-scan sonar and/or multibeam feature.

1. Foci Locations x = 2,038,910 x = 2,038,900
 y = 370,750 y = 370,735
 Magnetic Intensity 90 gammas, dipolar complex
 Magnetic Area 140 x 120 feet
 Water Depth 18 feet
 500 khz sonar
 feature yes, angular lines (Figure 21).
 600 khz sonar
 feature no.
 Multibeam feature yes, elliptical shape 65 feet by 10 feet (Figure 26).
 comments located along the bank slope just below the navigational light.

2. Foci Location x = 2,038,800
 y = 370,600
 Magnetic Intensity 50 gammas, dipolar complex
 Magnetic Area 100 x 80 feet
 Water Depth 18 feet
 500 khz sonar
 feature no.
 600 khz sonar
 feature no.
 Multibeam feature possible, pock mark near toe of slope close to being within magnetic
 area whose foci is up the slope closer to the bank (Figure 26).
 comments located along the bank slope approximately 250 feet below the navigational light.

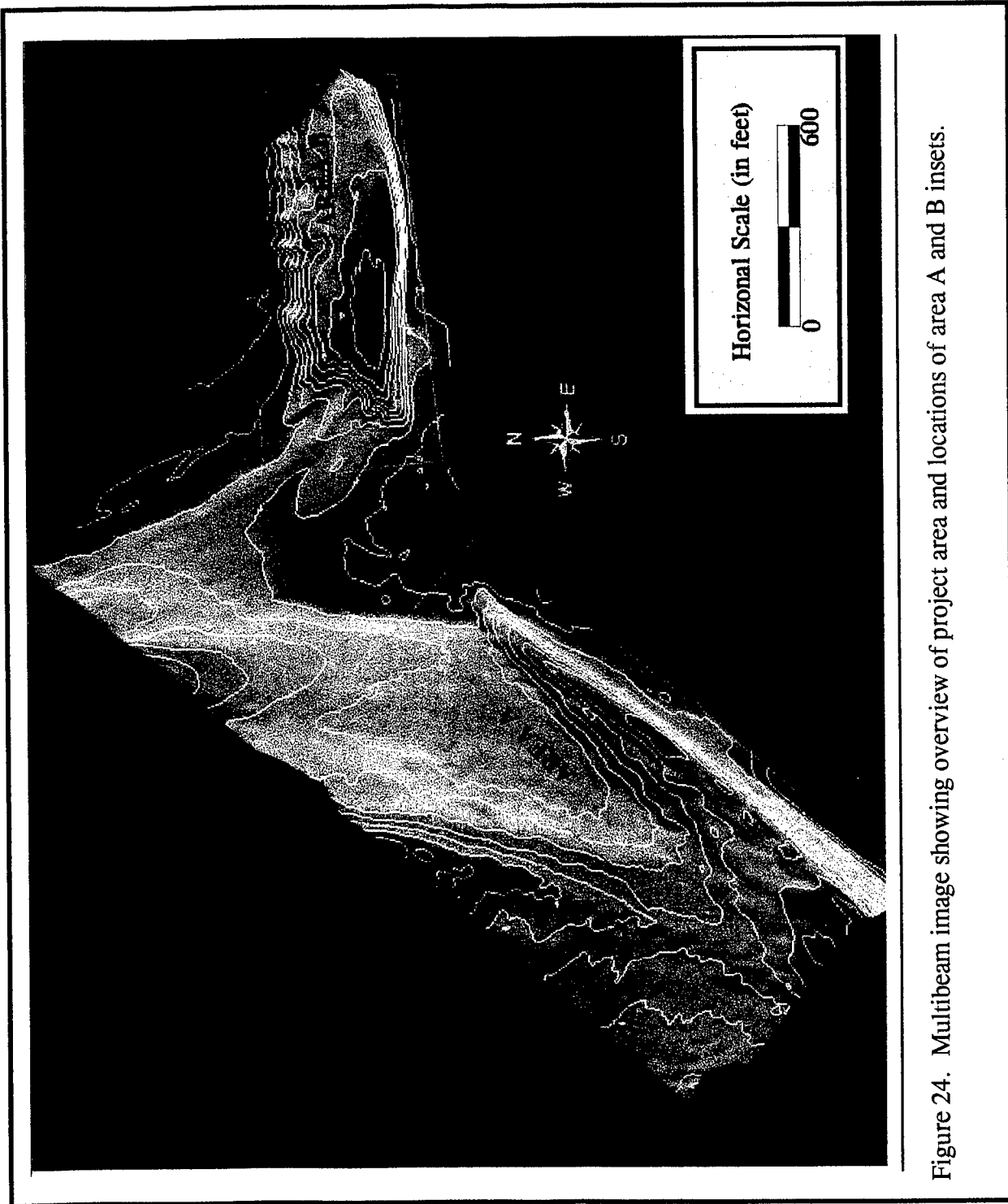


Figure 24. Multibeam image showing overview of project area and locations of area A and B insets.

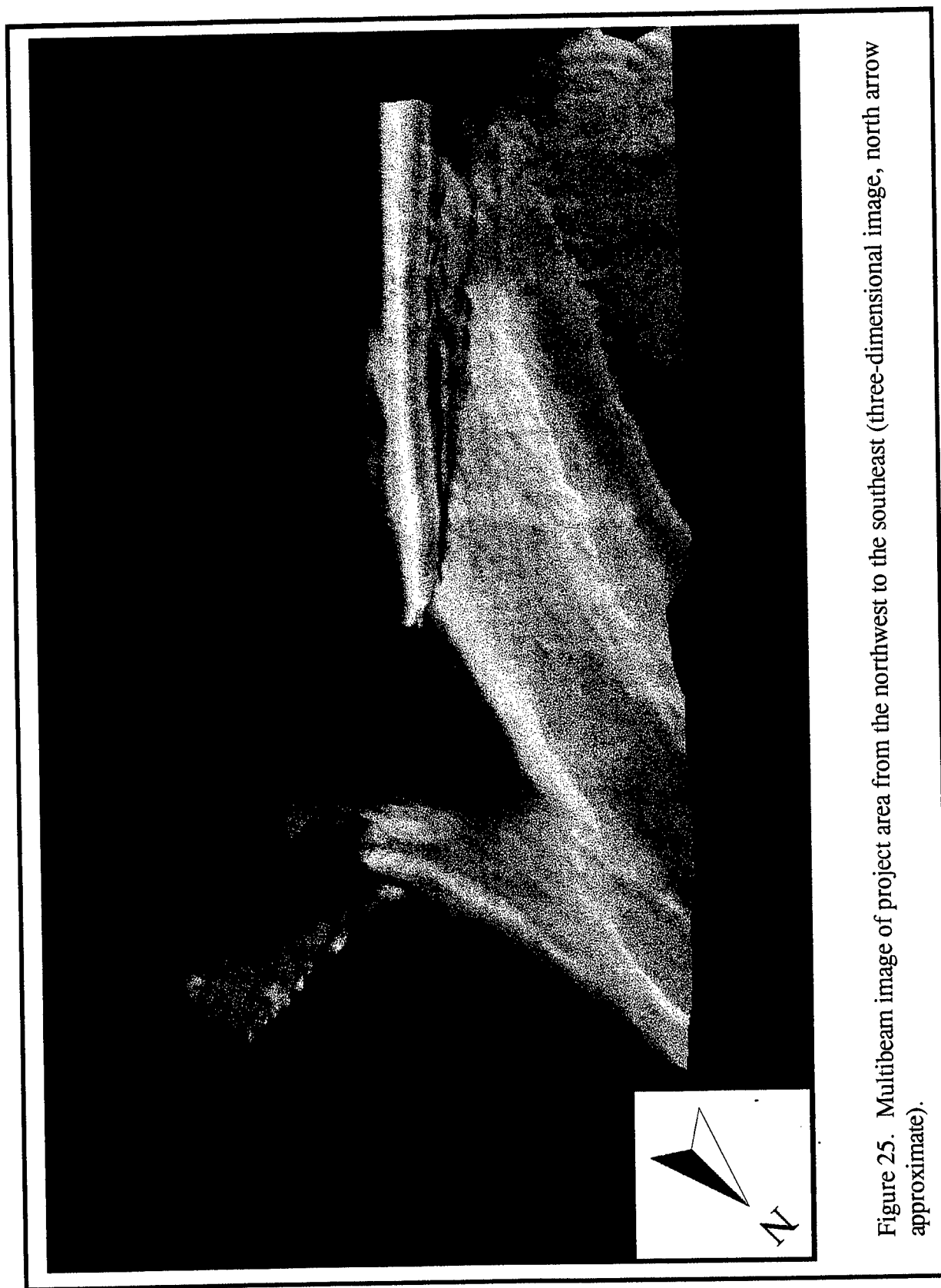


Figure 25. Multibeam image of project area from the northwest to the southeast (three-dimensional image, north arrow approximate).

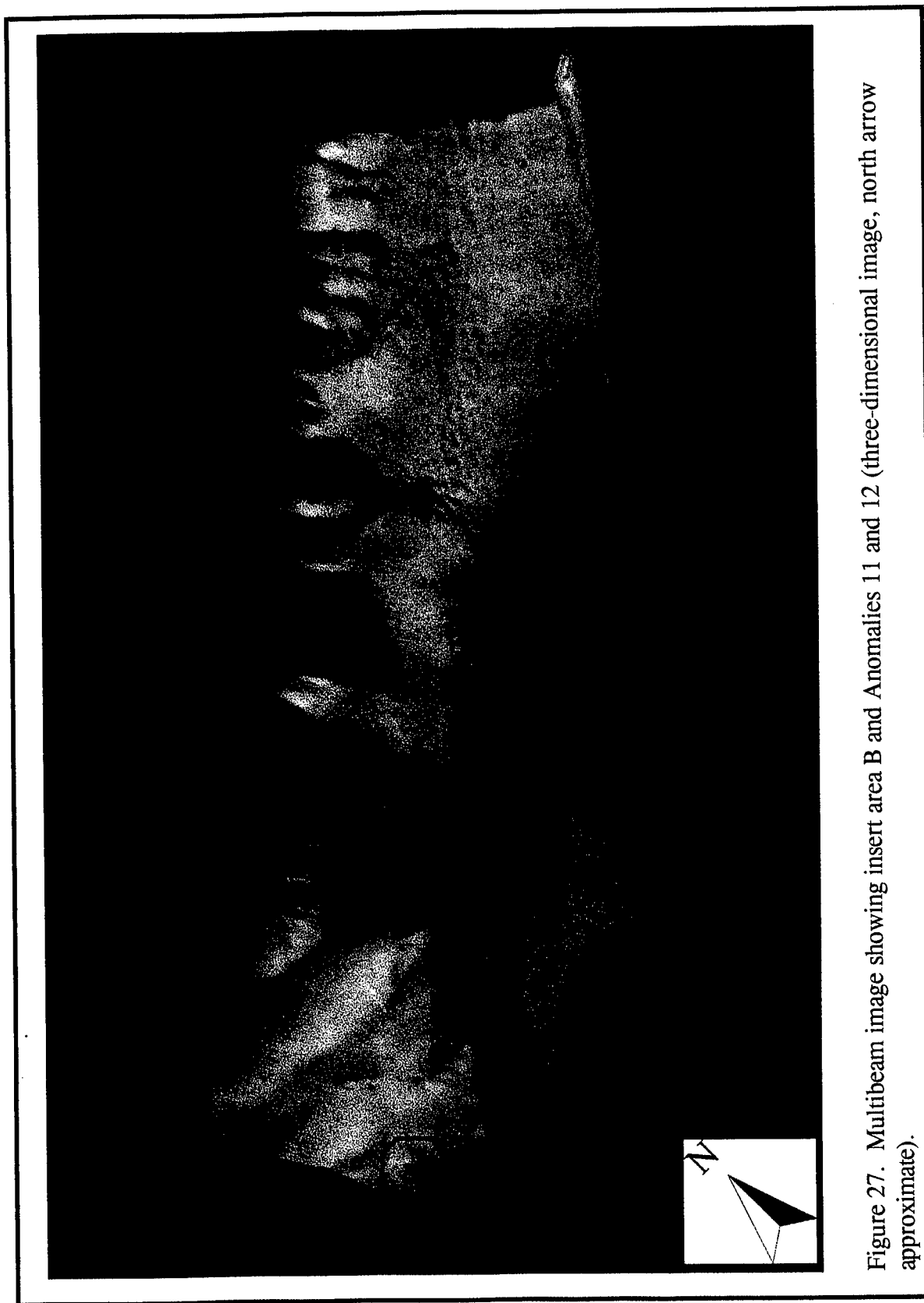


Figure 27. Multibeam image showing insert area B and Anomalies 11 and 12 (three-dimensional image, north arrow approximate).

3. Foci Location x=2,038,710
y=370,465
Magnetic Intensity 560 gammas, dipolar complex
Magnetic Area 200 x 200 feet
Water Depth 10 to 28 feet
500 khz sonar feature yes, appears as a mound (Figure 22).
600 khz sonar feature no.
Multibeam feature yes, elliptical shape feature approximately 115 feet long, 22 feet wide and five to seven feet high (Figure 26). Magnetic foci at lower or southern end and Magnetic Anomaly #2 at northern end.
comments located along the bank slope about 400 feet below the navigational light, complex magnetic area extends across the bank slope.
4. Foci Location(s) x=2,038,580 x=2,038,525
y=370,300 y=370,320
Magnetic Intensity 30 gammas, dipolar
Magnetic Area 120 x 120 feet
Water Depth 14 feet
500 khz sonar feature yes, curved feature approximately 75 feet long (Figure 22).
600 khz sonar feature no.
Multibeam feature yes, elliptical shape feature approximately 60 feet long and 12 feet wide creating a depression in the bank slope of approximately three to four feet (Figure 26).
comments located along the bank slope approximately 625 feet below the navigational light.
5. Foci Location x=2,038,670
y=370,670
Magnetic Intensity 40 gammas, dipolar
Magnetic Area 180 x 150 feet
Water Depth 54 feet
500 khz sonar feature no.
600 khz sonar feature no.
Multibeam feature no.
comments located across the channel.
6. Foci Location x=2,038,790
y=370,820
Magnetic Intensity 60 gammas, dipolar
Magnetic Area 150 x 90 feet
Water Depth 28 feet
500 khz sonar feature yes, appears as either a linear feature about 90 feet long and 20 feet wide, possibly boat shaped (Figures 21 and 23).
600 khz sonar feature no.
Multibeam feature no.
comments located at the toe of slope just off the navigation light.

- | | | | | |
|----|-----------------------|--|--|--------------------------|
| 7. | Foci Location(s) | x=2,038,860
y=371,000
x=2,038,745
y=371,200 | x=2,038,850
y=371,165
x=2,038,925
y=370,940 | x=2,038,900
y=371,100 |
| | Magnetic Intensity | 350 gammas, dipolar complex | | |
| | Magnetic Area | 450 x 350 feet | | |
| | Water Depth | 20 to 32 feet | | |
| | 500 khz sonar feature | yes, rippled bottom in general area, Figure 23. | | |
| | 600 khz sonar feature | yes, Figure 28 illustrates the sea floor variation over this complex magnetic anomaly area. The lateral sonar coverage would not have been sufficient to display the possible vessel form of the Kinsman, which is reported to be 177 feet long and apparently has no surface expression. | | |
| | Multibeam feature | yes, this complex magnetic anomaly has a depressed feature measuring approximately 20 x 80 feet within its area. Directly up stream at the northern channel area, there are two parallel lines converging at the eastern end. This boat-shaped feature is similar in shape and size of the <i>Col. Kinsman</i> , and has a break in the parallel lines and overburden build up conforming to where the side wheels could be (Figure 26). | | |
| | comments | a large complex magnetic area, possibly located at the head of the deep channel, with multibeam sonar feature located 240 feet to 400 feet from the navigation light | | |
| 8. | Foci Location | x=2,039,015
y=371,280 | | |
| | Magnetic Intensity | 120 gammas, dipolar | | |
| | Magnetic Area | 230 x 150 feet | | |
| | Water Depth | 21 feet | | |
| | 500 khz sonar feature | no. | | |
| | 600 khz sonar feature | no | | |
| | Multibeam feature | no. | | |
| | comments | located at the margins of the dredge area. | | |
| 9. | Foci Location | x=2,038,500
y=371,482 | | |
| | Magnetic Intensity | 70 gammas, dipolar | | |
| | Magnetic Area | 200 x 135 feet | | |
| | Water Depth | 21 feet | | |
| | 500 khz sonar feature | no. | | |
| | 600 khz sonar feature | no | | |
| | Multibeam feature | no. | | |
| | comments | located at the margins of the dredge area. | | |

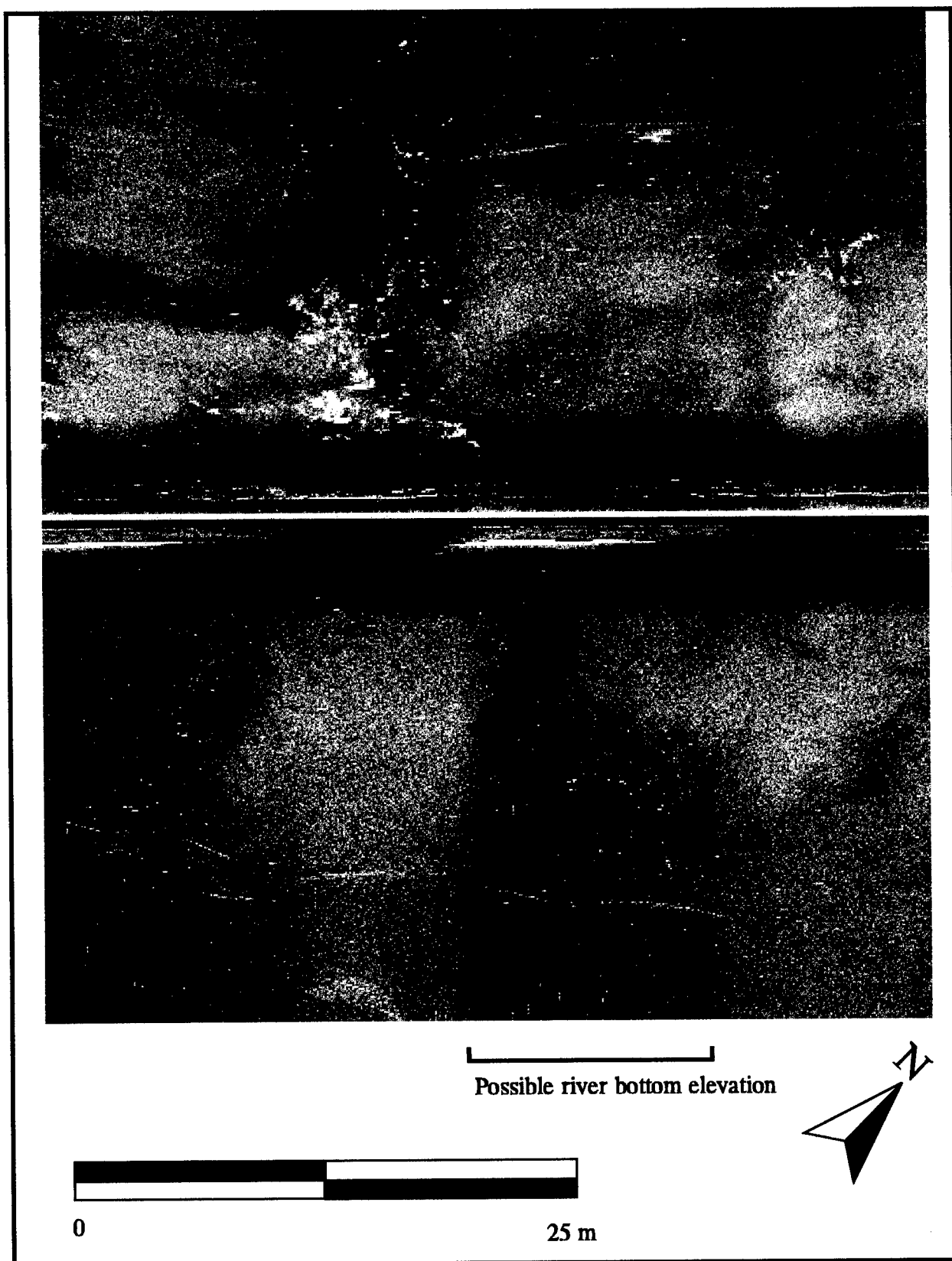


Figure 28. Side-scan sonar in area of Anomaly #7 at 600 kz.

- | | | |
|-----|-----------------------|--|
| 10. | Foci Location(s) | x=2,039,240 x=2,039,300
y=371,425 y=371,490 |
| | Magnetic Intensity | 200 gammas, dipolar complex |
| | Magnetic Area | 280 x 210 feet |
| | Water Depth | 18 to 24 feet |
| | 500 khz sonar feature | no. |
| | 600 khz sonar feature | no. |
| | Multibeam feature | no. |
| | comments | located at the margins of the dredge area. |
| | | |
| 11. | Foci Location | x=2,039,385
y=371,300 |
| | Magnetic Intensity | 70 gammas, dipolar |
| | Magnetic Area | 160 x 80 feet |
| | Water Depth | 23 feet |
| | 500 khz sonar feature | no. |
| | 600 khz sonar feature | no. |
| | Multibeam feature | no, but it does display a series of depressions in area (Figure 27). |
| | comments | located at the margins of the dredge area. |
| | | |
| 12. | Foci Location | x=2,039,800
y=371,180 |
| | Magnetic Intensity | 40 gammas, dipolar |
| | Magnetic Area | 80 x 50 feet |
| | Water Depth | 17 feet |
| | 500 khz sonar feature | no. |
| | 600 khz sonar feature | no. |
| | Multibeam feature | yes (Figure 27). |
| | comments | located along the Bayou Boeuf bank above the navigation light. |
| | | |
| 13. | Foci Location | x=2,038,290
y=370,700 |
| | Magnetic Intensity | 60 gammas, monopolar |
| | Magnetic Area | 220 x 200 feet |
| | Water Depth | 49 feet |
| | 500 khz sonar feature | no. |
| | 600 khz sonar feature | no. |
| | Multibeam feature | no. |
| | comments | located west of the deep channel |

- | | | |
|-----|--------------------------|---|
| 14. | Foci Location | x=2,038,480
y=370,910 |
| | Magnetic Intensity | 40 gammas, dipolar |
| | Magnetic Area | 220 x 130 feet |
| | Water Depth | 28 feet |
| | 500 khz sonar
feature | no. |
| | 600 khz sonar
feature | no. |
| | Multibeam feature | no. |
| | comments | located west of the deep channel. |
| | | |
| 15 | Foci Location | x=2,039,050
y=370,820 |
| | Magnetic Intensity | 90 gammas, dipolar |
| | Magnetic Area | 60 x 40 feet |
| | Water Depth | 4 feet |
| | 500 khz sonar
feature | no. |
| | 600 khz sonar
feature | no. |
| | Multibeam feature | no. |
| | comments | in area of bank not covered by multibeam, may be near or above
water line. |
| | | |
| 16 | Foci Location | x=2,039,200
y=370,040 |
| | Magnetic Intensity | 50 gammas, monopolar |
| | Magnetic Area | 160 x 120 feet |
| | Water Depth | 18 feet |
| | 500 khz sonar
feature | no. |
| | 600 khz sonar
feature | no. |
| | Multibeam feature | no. |
| | comments | magnetic expression makes it look as if it is deeply buried. |
| | | |
| 17 | Foci Location | x=2,038,905
y=370,940 |
| | Magnetic Intensity | 50 gammas, dipolar |
| | Magnetic Area | 150 x 60 feet |
| | Water Depth | 22 feet |
| | 500 khz sonar
feature | no. |
| | 600 khz sonar
feature | no. |
| | Multibeam feature | no. |
| | comments | located at the toe of slope at the upper end of the deep channel close
to anomaly area #7. If anomaly #7 represents the <i>Col. Kinsman</i> ,
then this area could represent debris from the wreck. |

CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

Summary of Anomalies

There is a high potential for locating significant cultural resources within the current study area. The river banks in the area appear to have been relatively stable throughout the historic period. The only apparent change in geomorphology is that the point bar at the northern portion of the Atchafalaya River and Bayou Boeuf confluence shown on the 1890 hydrographic map (Figure 7) is no longer extant. In addition, the channel area is now occupied by a shoal, as shown on the 1966 quadrangle map of the area (Figure 29). This shoal has necessitated dredging to maintain the 18 foot channel. The study area, with its proximity to Morgan City, is an active avenue for waterborne commerce, and 13 watercraft are reported lost in the general area (Table 2) and it has potential for docks and other features associated with a river landing. Therefore, this study area is the likely repository of shipwrecks, abandoned watercraft, and landing remains. In particular, the wreck of the *Col. Kinsman* appears to be located in the study area.

Within the Berwick Bay study area, which includes portions of the Atchafalaya River and Bayou Boeuf, 17 magnetic anomalies have been located (see Chapter 7). Anomalies #1, #3, #4, #6, #7, and #12 appear to have surface expressions, and they may lie on and flush with the bottom or just under the sediments. However, none of these magnetic anomalies appear to have exposed elements. Anomalies #1, #2, #3, #4, #12, #15 appear to represent material lying along the river's submerged bank slope either adjacent to the dredge area or an area where ancillary activity is expected. Of these, Anomalies #3, #12 and #15 may represent flotsam drifted up on the river bank at water's edge. Anomalies #6, #7, #8, and #17, as well as #9, 10, and #11 may represent scatter associated with the *Col. Kinsman* as she broke up while sinking into the channel from where she was beached by her captain. These anomalies lie adjacent to the dredge area. The monopolar anomaly, #16, is the only magnetic anomaly which lies within the dredge area. It appears to be deeply buried, or it represents an end of a linear object at or beneath the dredge cut. Anomalies #5, #13, and #14 lie riverward of the deep channel and probably would not be disturbed by the dredge activity or ancillary activity.

All 17 anomalies represent cultural material of unknown nature, age, and significance. Thirteen of these anomalies (#1, #2, #3, #4, #6, #7, #8, #9, #10, #11, #12, #15, and #17) are situated where they may be impacted by anchoring the dredge, anchoring the floating dredge pipe, storage of the floating dredge pipe, or anchoring ancillary vessels. These anomalies should be investigated to determine if they represent significant cultural material. However, because Anomaly #16 is deeply buried, and because Anomalies #5, #13, and #14 are situated where they are unlikely to be disturbed by dredging, these four anomalies do not require further investigation at the present.

Bank Anomalies

Anomalies #1, #2, #3, #4, #12, and #15 lie along the submerged bank slope of Bateman's Island. They are located in an area where they could represent the remains of a landing, including abandoned watercraft and bank structures (e.g., docks, wharves, dolphins). The bank of Bateman's (or Rice's) Island has not shown appreciable change since 1842, and activity along this portion of the island could date as early as the Spanish colonial period. In addition, there should have been a landing associated with Rice's plantation home, which was located on the northern end of the island. If processes at this potential landing area were similar to those in the areas of 16SMY55 and 16SMY58 (see Chapter 5), then numerous watercraft could be extant along the bank. Both 16SMY55 and 16SMY58 lie on the eastern side of Bateman's Island along Bayou Shaffer. However, one of these anomalies may be a section of floating dredge pipe that Captain Al Mistrot states that he encountered several times off the bank about 500 feet below the navigation light (personal

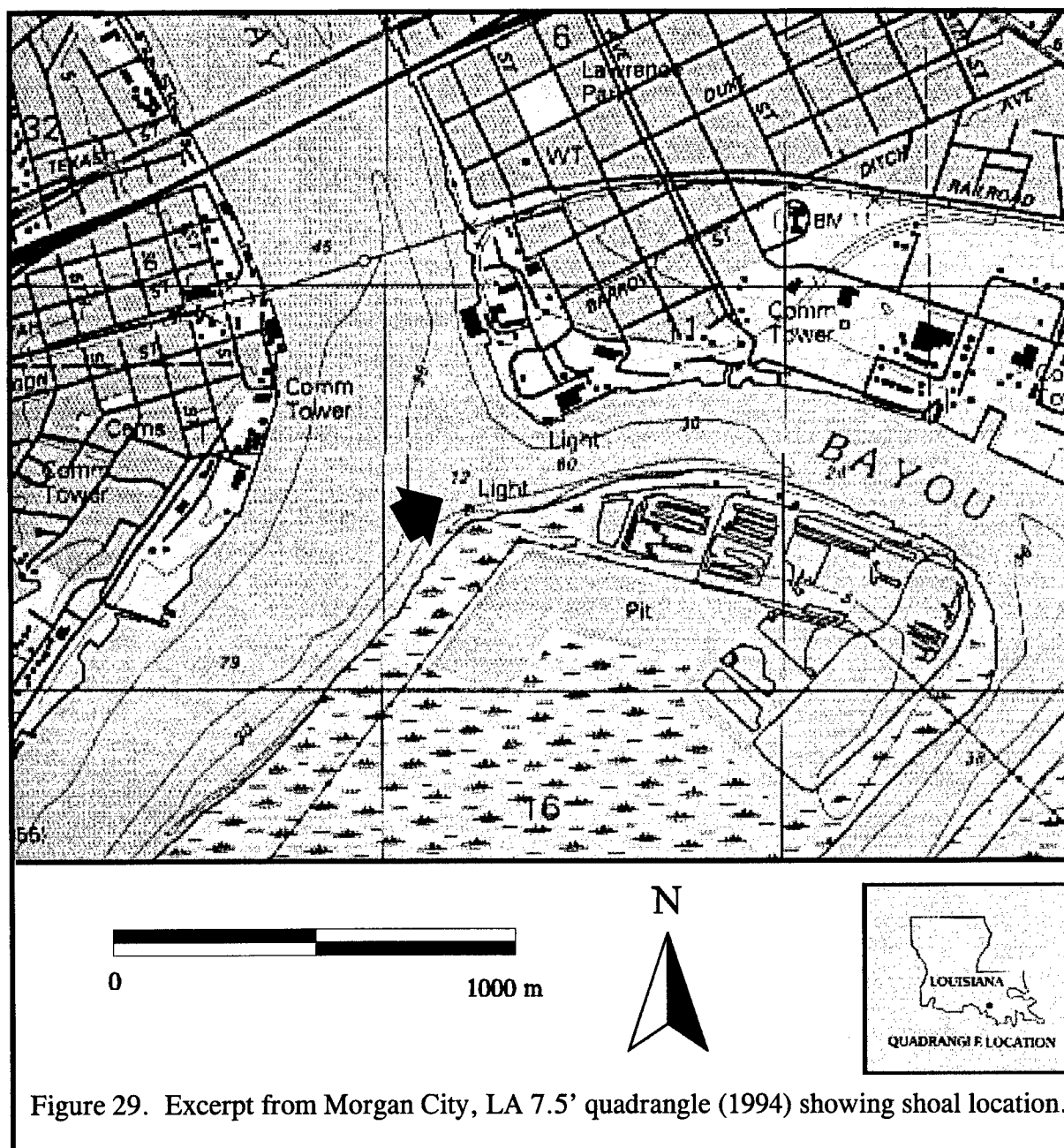


Figure 29. Excerpt from Morgan City, LA 7.5' quadrangle (1994) showing shoal location.

communication to Saltus 1999). The presence of the dredge pipe in this locale and the fact that Captain Mistrot encountered it several times indicates ancillary dredge activity along the bankline in the study area.

Anomalies Possibly Associated With the *Col. Kinsman*

As noted above, Anomalies #6, #7, #8, and #17, as well as #9, 10, and #11 may represent scatter associated with the *Col. Kinsman* as she broke up while sinking into the channel from where she was beached by her captain. They lie adjacent to the dredge area where the dredge places its spuds to anchor while digging. Anomaly #7 appears to be a complex magnetic area which appears to be associated with bottom topography and has a boat-shaped form. Figure 30 shows this area as seen on the multibeam data. Figure 31 shows the Anomaly #7 area with an outline of the *Col. Kinsman* at the same scale superimposed. The multibeam data suggests that the

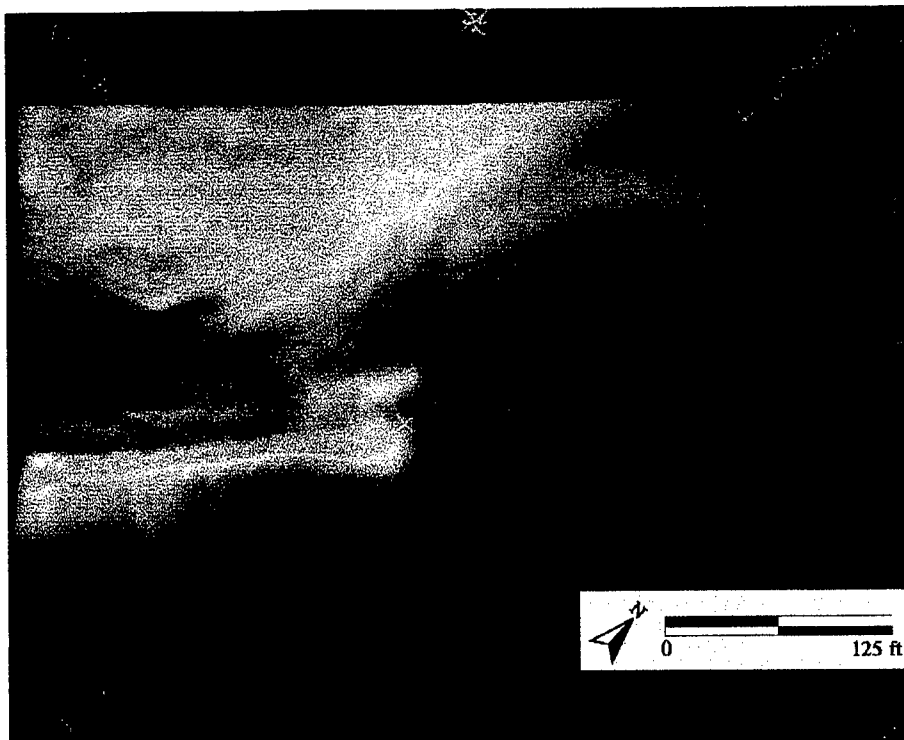


Figure 30. Multibeam image in the area of Anomaly #7.

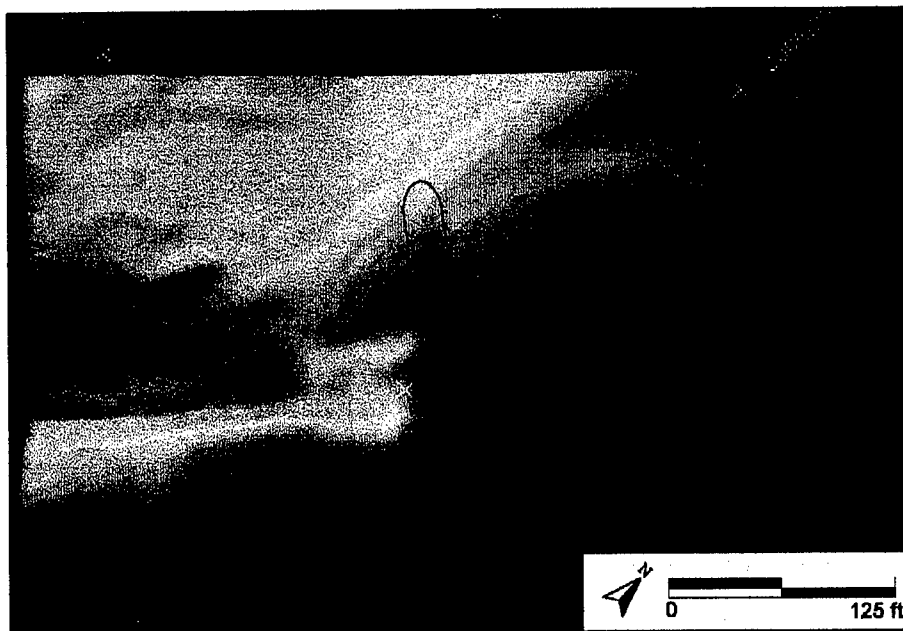


Figure 31. Multibeam image in the area of Anomaly #7 with overlay of *Kinsman* outline.

sonar feature is the length and width of the *Col. Kinsman*. The width does not include the area of the guards. This suggests that they may have been removed when she was transferred and refitted for open water service during the Third Seminole War. Alternatively, the sonar feature represents the hull of the vessel with the superstructure strewn across the river bottom. This latter alternative is supported by the nature of the magnetics.

The area of the multibeam sonar feature and Anomaly #7 appear to be approximately 200 to 400 feet from the navigation light. It should be noted that Mike Davis stated that the site was 150 feet from the navigation light. He also said that he the site was in about 35 feet of water and he swam through "fluff" to reach the bottom where "he followed the remains on a number of subsequent dives, scooping up artifacts in a kitchen colander strainer" (personal communication to Saltus 1990). This suggests that the remains of the *Col. Kinsman* were scattered during the shipwreck process, with possibly the lower hull coming to rest in the area of Anomaly #7. The area currently under consideration lies in some 20 feet of water, but is adjacent to the northern end of the natural channel, which extends downward rapidly to 30 to 40 feet.

Although this sonar feature has the size and shape of the *Col. Kinsman*, and although this interpretation is supported by the complex magnetics and Mike Davis' statements, identification is not certain. The two, broad 200 foot wide swaths of arched impressions end at the edge of the sonar feature, and these could be the remnants of last year's dredge activity. The only way to determine the nature, age, and significance of this area is through diving.

There is little doubt that *Col. Kinsman* is significant. National Register Bulletin 20 notes that a vessel's significance is "based on her representation of vessel type and her association with significant themes in American history and comparison with similar vessels" (National Park Service 1985:4). Additionally, significance requires that a shipwreck display sufficient integrity to address architectural, technological, and other research concerns. Underwater investigations are necessary not only to confirm the identification of the *Col. Kinsman* but to evaluate the integrity of the wreck. If, as the evidence indicates, the remains are those of a nineteenth-century upper Mississippi river/open water/coastal/naval river steamer, then it will be the only one reported as an archeological site in Louisiana. Further, if the wreck is that of the *Col. Kinsman*, it would be one of the few Civil War-period vessels known as an archeological site in the region. Finally, the *Col. Kinsman* is associated with significant events (the Civil War) and with an important individual (Captain George Wiggin). Thus, the wreck site has the potential to meet all four NRHP criteria. If the wreck possesses integrity, it will embody "the distinctive characteristic of a type" (Criterion C), and will yield important historical information (Criterion D). The remains of the *Col. Kinsman* satisfy Criterion A by their "association with events that have made a significant contribution to the broad patterns of our history," as well as Criterion B by their association "with the lives of persons significant in our past."

Other Anomaly Sources

If not associated with the *Col. Kinsman*, one of Anomalies #9, #10, or #11 could represent a multi-ton anchor lost during dredge operations in the area of Anomalies #10 and #11 (Captain Al Mistrot, personnel communication to Saltus 1999). These three anomalies lie within the dredge's spud area. Any of these three anomalies has a sufficient magnetic intensity and duration to represent either a shipwreck or a dredge pipe, anchor, cable, etc. The nature of these anomalies can only be ascertained through a diver's investigation.

Recommendations

Due to its potential significance, and because of the wealth of existing historical data, priority should be given to the seven anomalies (Anomalies 6, 7, 8, 9, 10, 11, and 17) that may be associated with the *Col. Kinsman*. First, the anomalies should be relocated with a intensive

bathymetric investigation. Concurrently, a gradiometer should be used to determine the foci location for diver investigation. Precise positioning better utilizes dive time and provides better results by limiting the search portion of the investigation. The dive time needs to be optimized, since these seven anomalies lie within the Bayou Boeuf navigational channel. River current and the waterborne traffic in this area pose special considerations.

Once the focus of the magnetic anomaly has been established, its location needs to be physically examined by a diver to determine the nature, age, and significance. If the source proves to be an historic watercraft, then it must be recorded in sufficient detail to make an initial assessment of significance. Subsurface examinations may be required, but these should be limited to the minimum necessary for collecting sufficient information to make the required assessment. Recordation in these instances should include the collection of important dimensions and characteristics of the watercraft. These would include overall length, width, and depth; dimensions and placement of important framing pieces, scantlings, and timbers; and general structure, characteristics, and design. The objective should be to determine the type, age, and condition of any watercraft discovered. Detailed drawings of the complete vessel or vessel remains are not necessary at this level of investigation, although particulars on critical components or sections of the vessel will eventually be required to evaluate it adequately. In the event that no surficial or near-surface cultural remains are encountered, then a probing regimen would be useful to determine horizontal and vertical extent of the material. Additional historical investigations to identify and assess the significance of recovered resources should then be undertaken, and the result of investigations should be synthesized into a technical report.

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