Final

Environmental Impact Statement

Enhanced Evaluation of Cumulative Effects Associated With US Army Corps of Engineers Permitting Activity For Large-Scale Development in Coastal Mississippi

Appendices for the EIS

August 2005

VOLUME II

Prepared for

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Mobile District

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COOPERATING AGENCIES

Environmental Protection Agency—Region 4 • U.S. Fish and Wildlife Service • National Marine Fisheries Service
National Aeronautics and Space Administration—John C. Stennis Space Center • National Oceanic and Atmospheric Administration
Federal Highway Administration • Mississippi Department of Environmental Quality • Mississippi Department of Marine Resources
Mississippi Department of Transportation • Mississippi Secretary of State • Mississippi Department of Archives and History
Mississippi Department of Wildlife, Fisheries & Parks • Gulf Regional Planning Commission • Hancock County Port and Harbor Commission
Jackson County Board of Supervisors • Hancock County Board of Supervisors • Harrison County Economic Development Commission
Mississippi Gulf Coast Chamber of Commerce

Appendix A

Public Comments and Responses

Comments and Responses
Environmental Impact Statement for Coastal Mississippi

No.	Location and Comment	Response
Written Comments		
John Stevens, President, PDQ, Inc		
1	Therefore may we bring to your attention one of your own reports entitled, "Gaming Facilities Development in Coastal Mississippi," issued October 18th, 1996 by the U.S. Corp[s] of Engineers and the U.S. Environmental Agency. The map showing the areas of minimum, moderate and most concerned based on the contents of the E.I.S. would dumb the facts down to where the public could understand the areas of the coast and the endangerment thereof.	We believe the commenter is referring to a map created by EPA and the Corps in the mid-1990's, prior to development of this EIS, depicting environmentally sensitive areas along the Harrison and Hancock Counties, MS, coastline. The mapping result differed only very slightly from the MS Coastal Management Plan; as a result both Federal agencies believed it appropriate to rely on the coastal management plan and scrapped the map initiative.
Charles H. Chisolm, Executive Director, MS DEQ		
2	We believe that some of the comments contained in the EIS do not seem to characterize adequately the unique groundwater resources along the Mississippi Gulf Coast.	Comment noted. The DEIS used the best data available to characterize the region's groundwater. Comment is too generalized to implement requested changes.
3	MDEQ has groundwater data and various publications pertaining to the water resources along the Gulf Coast that may not have been taken into account by the Corps prior to making the projections contained in the EIS related to saltwater intrusion issues and depletion of ground water resources in the study area.	The Corps believes the current draft sufficiently characterizes the existing groundwater resources in the Gulf Coast and has adequately addressed environmental degradation issues such as saltwater intrusion.
Thomas Waggener, MSDAH		
4	For your information, one of the reviewers noted regarding Table 4.11-1 that the time periods do not match descriptions (e.g. 22Hr64) Fort Mass. Listed as prehistoric.	The time periods in Table 4.11-1 will be compared to the descriptions and revised where necessary.

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Written Comments		
Bill Walker, MS DMR		
5	Our staff has reviewed Barry A. Vittor & Associates, Inc. February 11, 2004 comments regarding the draft Coastal EIS, and feels a more thorough understanding of temporal and spatial land use change could be achieved by utilizing all available land classifications. For example, the draft EIS has pine savannah, which is a prominent wetland type in the southeast, grouped with pine forest, which could be either an upland or a wetland forest. By saying this, the draft is stating pine savannah and pine forest are the same land classification. This could overestimate or underestimate the acreage of wetlands. A more accurate approach would be to look at other wetland classes (swamp, bottomland hardwood, and pine savannah) other than just emergent wetlands (marsh).	The Corps recognizes the limitations of its land cover characterization of the Coastal Study Area. However, the land cover time series data, which formed the basis of the trends analysis were not of sufficient high resolution to better delineate among the different land cover types.
Jim Foster, Gulfport-Biloxi International Airport		
6	*Page 4-65, line 35* No space is currently available for new airlines. A major $28 million terminal expansion is planned for 2004-2005. This expansion will increase the terminal from 92,000 sq. ft. to 165,000 sq. ft. and provide space for two new airlines, expanded baggage claim, new gates and expanded security functions post 9-11.	Text has been edited to reflect comment.
7	*Page 4-66, figure 4.4-1* It appears that the Chartered and Scheduled Passengers column colors are reversed. For instance in 2000 the table indicates 82,599 Charter Passenger and 866,630 Scheduled Passengers, but the columns in the chart show the exact opposite. The table is correct, the chart is miscolored.	Figure has been edited to reflect comment.

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8	*Page 4-67, line 7* It should be noted that, based on surveys, 45 percent of the new passengers at the Gulfport-Biloxi International Airport are classified as casino gamblers.	Text has been edited to reflect comment.
9	*Page 4-69, line 5*	Text has been edited to reflect comment.
10	*Page 4-69, line 18* The facility can accommodate domestic and international air cargo in Foreign Trade Zone No. 92 and is a joint venture of the Airport, Harrison County and the state of Mississippi.	Text has been edited to reflect comment.
11	*Page 4-69, line 22* The airport has its firs [t] major freight forwarder in place and cargo activity is expected to grow significantly over the next 5 years.	Text has been edited to reflect comment.
12	General aviation activity is operated by AvPort's FBO AvCenter and is a major contributor to the airport's aviation service resources.	Text has been edited to reflect comment.
13	A new 50-acre general aviation area is being developed [w]hich will allow general aviation to be relocated from the east ramp (Hewes Avenue area) to the new southwest general aviation area during the period 2004 to 2006.	Text has been edited to reflect comment.
14	In any event, the Airport is operating at 30 percent of capacity; and with the extension of runway 18-36 to 7,000 feet, capacity will increase by a factor of 1.75.	Text has been edited to reflect comment.

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15	The only passenger airport in the ROI is the Gulfport-Biloxi International Airport.	Text has been edited to reflect comment.
16	Gulfport-Biloxi International Airport. The Gulfport-Biloxi International Airport is the only passenger airport in the study area.	Text has been edited to reflect comment.
17	Gulfport-Biloxi airport official assert that the introduction of quieter commercial aircraft has allowed for increase in operations without a commensurate increase in noise. Moreover, the greater source of noise is from high performance military aircraft and these operations have not increased substantially over the last 10 years.	Text has been edited to reflect comment.
18	Also located in the subwatershed are the Gulfport-Biloxi International Airport, Gulfport Naval Reservation, and Keesler Air Force Base.	Text has been edited to reflect comment.
Miles M. Croom, Asst. Reg. Admin, Habitat Cons. Div., NOAA		
19	For the special-purpose methodology to be successful in regard to meeting the goals and objective of the Magnuson-Stevens Act, the RCPs should include adequate measures to be incorporated into projects that will encourage the restoration and maintenance of suitable marine fishery habitat quality and quantity and not result in adverse individual and cumulative impacts to EFH. Also, the special-purpose methodology and RCPs should be applicable to all federal projects in coastal Mississippi including those of the COE.	The Corps agrees that RCPs should encourage the restoration and maintenance of suitable marine fishery habitat and not result in adverse impacts, either individual or cumulative in nature. The Corps believes that the RCPs developed by the Gulf of Mexico Fishery Management Council if implemented, would accomplish that goal.
20	Accordingly, in assessing cumulative adverse effects to water quality and fishery resources from coastal development activities, this practice of open water disposal of maintenance dredged material should be addressed in the trend analysis for consideration in the RCPs and utilization by the special-purpose methodology.	Comment noted. The Corps has included RCPs in the document to indicate the types of measures that could be implemented to mitigate environmental impacts for development projects. The list is not intended to be exhaustive and cover all potential future activities such as disposal of dredge material.

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Written Comments		
Lindsey Stewart and Jo F. Everett, RPG		
21	*Page4-113, Paragraph 2: "Because the aquifers' downgradient is to the south, drawdown would be expected to occur first along the coast, possibly indicating future drawdown problems inland in the future."* This statement appears to be attributed to MDEQ 2000. This statement was not included in the MDEQ report. There are many water-bearing sands along the coast, and pumpage from one has no effect on the others. The inland areas use different aquifers from those being used along the coast, so water level declines along the coast would not cause future drawdown problems inland.	Comment noted. Text removed from document.
22	*Page 4-114, Paragraph 2: "This report did state the actual positions of the interfaces were unknown (MDEQ, 2002)."* This statement is wrongly referenced as MDEQ 2002. It actually came from Sumner's report (USGS, 1989). The MDEQ 2002 report is not included in the EIS bibliography.	Text edited to reflect comment. Reference changed from MDEQ, 2002 to USGS, 1989.
23	*Page 5-67, Paragraph 4: "However, data from isolated areas in the CSA and in adjacent metropolitan areas in Louisiana suggest that the potential for significant deterioration of the groundwater aquifer resource in the long term exists in certain areas (Stewart, personal communication, 2002), particularly under the High-Growth Scenario."* This statement is not true and was not made by Stewart through personal communication or otherwise. There is no danger of deterioration of ground water due to pumpage from the confined aquifers anywhere along the Mississippi coast.	Comment noted. Text removed from document.

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Cynthia Sarthou, Gulf Restoration Network		
24	Although the Corps discusses the need for RCPs to reduce future impacts – they assign most of the burden for development and implementation of RCPs to state and local governments. This is troubling for two reasons	The Corps does not have the authority to implement or enforce RCPs, however, the Corps does provide a list of RCPs for each resource area in the FEIS, to serve as a guide for implementing agencies.
25	First, it suggests that the Corps will continue its current failure to acknowledge its duty, under the Clean Water Act, to protect wetlands from unnecessary destruction or degradation.	The Corps disagrees with the assertion that the Corps "will continue its current failure to acknowledge its duty, under the Clean Water Act, to protect wetlands from unnecessary destruction or degradation." The Corps' responsibility is to balance the environmental stewardship with economic growth and is committed to environmental stewardship to the fullest extent of its authority and this applies to the protection of wetlands. Reference to Section 1344(c) of the Clean Water Act specifically states the authority of EPA's Administrator and not the authority of the Corps. The Corps only provides consultation as cited in the comment.
26	Yet, nowhere in the DEIS does the Corps indicate that as one of the RCPs it will increase the stringency of its review and approval of 404 permit applications, particularly applications for non-water dependent projects.	Comment noted. The Corps applies all review and approval measures under its authority for each 404 permit application. However, on January 9, 2001, the U.S. Supreme Court determined that the Corps' authority under the CWA did not extend to isolated wetlands if they are not "adjacent" to navigable waters (The Supreme Court's SWANCC Decision). Wetlands are considered to be isolated if there is no apparent surface water connection to perennial streams, estuaries, or the ocean (i.e., wetlands with no surface water outlet).
27	Second, we find it disconcerting that, within the DEIS' discussion of the effects of implementation of the proposed action, the Corps seems to presume that RCPs will be implemented.	Comment noted. RCP implementation is outside the Corps' regulatory authority. The Corps can influence local and state government to implement smart growth policies, and best management measures to ensure that the environment is protected. However, the Corps cannot compel state and local governments to follow this course.

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28	Additionally, many of the RCPs discussed by the Corps should be considered as possible future permit conditions.	Comment noted. On page 5-1, the EIS states that the RCPs could be implemented in two ways. The first was mentioned is as follows: Formulate site-specific permit conditions under the regulatory authority of the Corps for large-scale development projects. Upon the review of proposed large-scale development projects, the Corps of Engineers might formulate site-specific permit conditions based in part on RCPs (as identified within in each individual resource area that follows) to reduce environmental and/or socioeconomic effects.
29	If the Corps wishes to discuss the potential impact of RCPs, it should do so in a separate section of the DEIS.	Comment noted. Assuming that the RCPs would not be implemented is the No Action Alternative. Assuming implementation of the RCPs is a part of the proposed action and must be included in this section. The purpose of this EIS is to evaluate the efficacy of a new methodology for evaluating cumulative impacts from large-scale development projects
30	However, the DEIS does not discuss whether required mitigation has been successful in offsetting development impacts. The Final EIS should discuss the success of mitigation measures imposed under permits issued in or before 2000.	Comment noted. The purpose of the EIS is not to discuss whether mitigation offsets development impacts. In fact, it is likely that not all impacts can be offset. Rather, the purpose of the EIS is to evaluate the efficacy of an alternative methodology for cumulative impacts analysis.
31	Furthermore, the DEIS should incorporate recommendations of the National Research Council in the 2001 report "Compensating for Wetlands Losses Under the Clean Water Act."	Comment noted. The DEIS included RCPs as examples of the type of appropriate BMPs that could be employed to mitigate environmental impacts from development. The list was not designed to be exhaustive or definitive in listing all of the possible measures that might be implemented to mitigate or compensate for wetland losses.

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32	The environmental justice section does not consider any substantial issues except housing and flooding. Where is the data that demonstrates the presence or absence of disproportionate impacts? Additionally, although Turkey Creek is mentioned throughout the EIS in referenced to already existing impairments and probable future problems, there is no mention of the claims of disproportionate impact and environmental justice raised by the African America community within this watershed. Finally, we believe that the projections within this section soft-pedal the negative cumulative impacts and overstate the economic benefits of projected development to these communities and the coast as a whole.	Comment noted. The document describes economic impacts of development in an objective manner and places no undue emphasis on the benefits of projected development. The trends analyses did not identify any other resource areas in which significant adverse impacts would be potentially borne by minority or low income communities, because no significant adverse impacts were identified. It must be emphasized that potential EJ impacts would be evaluated in all future environmental assessments.
33	Within the EIS, the Corps refers to 303(d) listed waters. Members of public are not generally familiar with the statutory requirements of the Clean Water Act. Therefore, it is doubtful that a member of the public would understand the import Section 303(d) listed waters. To facilitate understanding by the general public we would ask that the Corps clarify such terminology, either by describing what is required under Section 303(d) of the Clean Water Act, or more simply, by referring to these lists as the state's list of polluted waters.	Comment noted. Use of "303(d)" was replaced with 'state impaired' or 'state polluted' waters.

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34	The DEIS does not contain any graphics which assist in the understanding of the potential impact of the various growth scenarios. We would request that the Final EIS should include maps or other illustrations indicating (i) the cumulative loss of wetlands in each watershed over the past 20-30 years; (ii) remaining medium to high functioning ecosystems; and (iii) those portions of each watershed that the Corps predicts will be affected by projected growth under each scenario. If possible, these maps should also incorporate the Mississippi Coastal Program's use classifications for shorelines. Even if the Corps is unable to provide such information on maps, other graphical depictions such as pie charts, graphs, etc. would assist the reader in comprehending and comparing effects associated with various scenarios. In general, these illustrations would facilitate a greater understanding of the DEIS findings. Moreover, they would provide useful guides to the public, agencies, and developers when seeking to determine the effects of proposed development.	Comment noted. The EIS does not evaluate any specific development project; rather it evaluates the efficacy of an alternative methodology for determining cumulative impacts. Therefore, there is no impact or resulting cumulative loss of wetlands to map.
35	The Corps must also consider the continuing illegal fill of wetlands in its analysis of cumulative effects. Illegal wetlands destruction is a problem in coastal Mississippi and the failure to consider its impacts will result in inappropriate conclusions regarding cumulative effects. Therefore, the Corps should thoroughly investigate this issue and include the acreage loss associated with this loss in its analysis. Additionally, the Corps should propose actions to prevent illegal fills, such as improved monitoring of wetland areas, and compensate for those that do occur, including ensuring severe punishment for offenders.	It is not the purpose of this EIS is to investigate or evaluate illegal filling of wetlands.

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36	The Corps must also establish a tracking mechanism that allows it to verify the accuracy of its growth/development predictions.	Comment noted. The growth data can be updated with time to allow future projects to be determined with accuracy to assist in the evaluation of cumulative impact analysis for large-scale development projects. However, it should be noted that the DEIS included a range of growth scenarios to capture reasonable alternative growth patterns.
37	Reliance on untested growth and impact projections as the basis of cumulative impacts analyses is not sufficient in the long-term to satisfy NEPA requirements.	The Corps disagrees with the commenter. This EIS is evaluates the efficacy of an alternative methodology for determining cumulative impacts. Cumulative impacts analysis is conducted in addition to the analysis of direct and indirect, short- and long-term direct and indirect effects on the resources by an action. It is not the only evaluation that would occur under NEPA. The purpose of this EIS is to evaluate an alternative method of determining cumulative impacts of a large-scale development project.
Fred Wagner, Beveridge & Diamond, P.C.		
38	Specifically, the addition of Appendix A to the Draft CEIS gives an excellent framework by which future applicants can understand how the Corps might consider cumulative and indirect effects for the 6 hypothetical projects set forth therein. We do suggest, however, that these examples be expanded to 10, including a review of the permits historically granted by the Corps to provide more detailed information concerning the types of projects typically addressed by this District. In short, any additional steps that can be taken to make the CEIS even more "user-friendly" will be valuable.	Comment noted. The Appendix A contains a reasonable number of hypothetical projects to aid the reader on how to use the special purpose tool. The Corps believes these examples capture the range of likely categories of projects that would occur in the region during the 20-year study period.

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39	The Final CEIS must provide additional detail, we propose through some sort of a summary chart, to describe each and every one of the permits for "large-scale" (military, transportation, entertainment, other?) development issued by the Corps. This information should track the applicant (public or private?), the type of project involved, the quantity of wetlands or "waters of the United States" affected, the mitigation measures imposed and related data. This information should be readily available to the Corps and would provide an extremely valuable perspective on the Corps' permitting decisions during the study periods.	Comment noted. The Corps does not agree with the assertion that providing a summary chart on each of the permits issued during the historical period would add a valuable perspective to the document. The narrative in the affected environmental sections sufficiently describes the major development projects, particularly gaming projects that were permitted and built during the 1990s. These specific projects engendered much of the economic changes that took place during this period. The economic and demographic data clearly support this assertion.
40	The reality, however, is that there will be an approximate five-year gap between the baseline year 2000 and when this CEIS is finalized. Consequently, there is the likelihood that much of the data used in this analysis will be stale by the time an applicant approaches the Corps for a permit in 2005.	The purpose of the EIS is to evaluate the efficacy of an alternative cumulative impacts analysis methodology. The EIS used the best and most recent available data at the outset. It may be necessary to bring the database current as permits are issued and resource conditions are evaluated. However, it must be emphasized that the trends analysis encompassed a range of growth scenarios so as to capture the spectrum of alternative growth paths that could take place over the 20-year planning period.
41	The CEIS would be enhanced, we believe, by including a summary of proposed RCPs in an appendix to the document.	A summary of the resource-specific RCPs previously discussed in this section is presented in Table 5.15–2.
42	We have read during the CEIS process criticism of the Corps' reliance on local governmental conservation and/or land use planning efforts. This criticism is not well-found.	Comment noted. The Corps agrees with the commenter that the local and regional agencies have been, and will continue to be valuable partners for ensuring environmental stewardship, and implementing and enforcing of RCPs.
43	In sum, the Corps and the affected public can be confident that the local governments will continue to address growth issues in the future.	Comment noted.

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44	We had commented that the many positive economic benefits of recent development in this region should be described more fully in the CEIS.	The economic analysis describes in detail increases in employment, income, government revenue and demographic changes that can be attributed to large-scale development. The Corps believes that the socioeconomic impacts, both positive and negative are sufficiently discussed in the document.
Barry Vittor, Barry Vittor & Associates		
45	However, I do have serious concerns about the data used to describe historic rates of wetland loss due to development, and about the application of those loss rates in the trends analysis. The DEIS does not address the most common types of historic wetland loss, but instead relies on emergent wetland, which is rarely permitted to be altered by development.	The use of emergent wetlands to assess wetland loss due to development is clearly not optimal. The Corps acknowledges this in the EIS. Unfortunately, the land cover data that were available do not separate out any other type of wetlands from other nonwetland land covers. Using pine savanna or another land cover type that is not exclusively wetlands would not be more accurate than using emergent wetlands, but would result in a similar argument about the lack of accuracy in the approach. The Corps, therefore, stands by the analysis as it was performed while recognizing the limitations to its conclusions.
46	However, the DEIS identifies no correlation between emergent wetland loss and population growth, or regulatory actions by the Corps of Engineers.	The Corps has based the estimate of emergent wetland loss on Corps-issued permits and analysis of the land cover data. Losses due to permitted takings are direct losses. Losses discernible from land cover analysis are from an unknown cause, and, as mentioned in the EIS, could be related to population growth and development. The Corps does not claim that the changes in quantities of emergent wetlands or any other land cover type are necessarily due to population growth or any other single factor. The analysis in the EIS is one of trends and correlations, and the Corps notes a definite correlation between development, population growth, and wetland loss.

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47	It would have been necessary to do side-by-side comparisons of the detailed 1992 and 2000 data sets, versus the lumped terrestrial cover type data, to demonstrate the appropriateness of using emergent wetland data to predict future coastal development impacts. I hope that these data comparisons will be incorporated in the FEIS, to show whether the focus on emergent wetland is appropriate.	The focus on emergent wetlands was necessary because of data limitations. As the commenter notes, terrestrial land cover data was lumped together and it was not possible to estimate wetland loss trends using it. Emergent wetland data, therefore, were the only relevant data available for estimating trends in wetland loss associated with development and population growth. The drawbacks of the methodology are fully discussed in the EIS.
48	Another concern is with the anticipated implementation of the trends analysis protocol described in Appendix A. While the method is sound (and applicable in most cases), the data used do not support the numerical scales used to predict future wetland impacts.	The purpose of the trends analysis is not to attempt to determine with high accuracy the quantity of emergent wetlands, other type of wetlands, or other land cover type that could be lost by 2010 or 2020, but to aid the Corps in assessing how its permitting actions, and development and population growth in general, cumulatively affect land cover change and natural resources in the Mississippi coastal region. Using this information will provide the Corps a better tool with which to consider the qualitatively cumulative impacts of its permitting decisions in the future. Vagaries of economics performance and political decision-making renders accurate quantitative prediction of future land cover changes unrealistic. The data analysis performed and the methodology used in the EIS are the best that could be realized with imperfect data and adequately serve the purpose.
Reilly Morse, Attorney		
49	The Corps should include more discussion of the role of past decision-making, including permitting, on resource losses.	The document provides a detail discussion of large-scale development that occurred during the 1990s, including Corps permitted development.
50	The Corps can reasonably impose restrictions on the siting of nonwater dependent uses in wetlands. This is not a “taking.” It is unclear why this [is] not included within the RCPs discussed by the Corps. The Draft EIS also should address the uncertainty over whether it is exclusively the Corps of Engineers’ responsibility to consider cumulative impacts.	The purpose of the EIS is to unambiguously demonstrate the importance of assessing cumulative impacts as part of the EIS process. The methodology is designed to improve the quality of the cumulative impacts analyses whether conducted by the Corp or by permit applicants.

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Written Comments		
51	The Draft EIS should make clear that federal and state agencies each have responsibility to consider cumulative impacts in their analysis, and address whether or not the Draft EIS may be used by state agencies to the extent the content is relevant to the subject matter regulated by state agencies.	It is outside the authority of the Corps and the scope of this EIS to dictate policy to local and regional governmental agencies; however, the Corps has no objection, and in fact welcomes the use of this alternative cumulative impact analysis methodology by local and regional resource agencies.
52	The Draft EIS should reject efforts by Harrison County Development Commission to disavow any link between the adverse cumulative impacts experienced during the 1990s and the advent of legalized dockside casinos.	The Corps stands behind the findings and conclusions described in the DEIS.
53	The cumulative impacts analysis therefore must take into account reasonably foreseeable induced growth from casinos and similar large-scale developments in its cumulative impacts analysis.	The DEIS explicitly takes into account induced growth from casinos and similar large-scale developments. The socioeconomics section of the trends analysis evaluated induced impacts from low, medium, and high growth scenarios.
54	The Draft EIS needs to have a mechanism to verify whether or not this assumption proves to be correct in the case of each individual permit as well as in general. The Draft EIS also needs to have some set of dependable economic indicators to periodically determine if and when the Corps needs to shift its predictions from the most likely growth scenario to another growth scenario.	Enforcement and implementation of RCPs are beyond the authority of the Corps.
55	The Corps of Engineers should not permit an individual applicant to replace a project specific analysis with a generic use of the conclusions in the hypothetical contained in the Appendices. The Corps should reject the Harrison County Development Commission's plea to enlarge the number of these hypotheticals and make clear that they are illustrative only and are not a substitute for an actual project specific analysis.	The hypothetical examples contained in the Appendices are for illustrative purposes only and are not a substitute for project specific analysis.

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Written Comments		
56	The Corps of Engineers should reject the Harrison County Development Commission's plea to remove the regional conservation practices from the body of the Draft EIS and relegate them to an appendix.	The RCPs are a part of the proposed action and therefore must remain in the discussion of the environmental consequences.
57	The Corps of Engineers should include in the final EIS a series of side-by-side maps that illustrate the problem of cumulative resource loss and habitat fragmentation. This is an important tool for several reasons. The Corps also should produce similar maps that illustrate the impacts in the major watersheds of the three coastal counties.	The Corps does not believe this could be done with the available data. Such a task would require substantial time and funding resources. This type of product would be more appropriately created by the CRMP (MSDMR).
58	The final EIS should include a map that indicates what portions of the affected watersheds are, generally speaking, medium to high function ecosystems, and should also indicate which have suffered the greatest cumulative losses over the past 30 years. Another important overlay that should be made available is a future land use map drawn from municipal and county planners showing the geographic future growth paths.	The Corps does not believe this could be done with the available data. Such a task would require substantial time and funding resources. This type of product would be more appropriately created by the CRMP (MSDMR).
59	The Corps of Engineers may be able to obtain better data about the extent of wet pine savannah than it currently has from existing sources.	The Corps believes that the data used in the DEIS are sufficiently detailed to estimate cumulative impacts based on the trends analysis and other data generated for the specific project being evaluated.
60	The Corps of Engineers should completely rewrite its environmental justice section. The map and data used to characterize the neighborhoods that would be susceptible to environmental justice analysis are grossly inadequate-the lines have been drawn far too broadly and do not accurately depict the location of predominantly African American communities within the study area.	The EJ section has been prepared in accordance with CEQ and EPA guidance. The Corps disagrees with the commenter's assertion that this section needs to be rewritten.

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61	The Draft EIS in general overstates the likelihood and necessity of its economic development land use needs and understates the likelihood and severity of adverse environmental impacts and conservation measures.	The Corps disagrees with the commenter's assertions. The trends analysis simply provides alternative growth scenarios based on historical growth patterns.
62	The Draft EIS appears to be focused upon altering the angle of downward trajectory but not upon leveling off or (even more desirable) establishing an upward trajectory to the size and health of our natural resources.	The DEIS was prepared in order to develop a better methodology for capturing cumulative effects of large-scale development. The objective of the methodology is to better protect natural resources not degrade them.
63	The CEIS should discuss more fully the track record of mitigation measures imposed under permits issued in or before 2000.	The inclusion of RCPs is to provide guidance to local governments in the types of mitigation measures that might be implemented. Because the Corp has no authority to enforce the RCPs, adding a discussion of past performance would not provide useful information.
64	There is insufficient data on the illegal filling and dredging of wetlands in the study area.	Illegal filling and dredging would not be addressed by RCPs but by better reporting and referral for investigation and potential prosecution.
65	The only scenario under which the Draft EIS projects there would be substantial adverse cumulative impacts is under a high growth/no regional conservation practices scenario. Is one basis for this projection the experience of the 1990s? If so, then it needs to be explicitly stated. It is yet another instance where the Draft EIS fails to highlight an important argument to induce state and local officials to cooperate in implementing regional conservation practices.	The high-growth scenario is based on the economic growth patterns of the 1990s. The narrative is quite clear about this assumption.
66	The Final EIS should include a citizen friendly summary that synopsizes numeric and narrative findings on the past environmental impacts, that contains a series of maps illustrating cumulative impacts loss and habitat fragmentation, and that identifies the geographic areas where future resource loss is at greatest risk.	The current format provides summary tables and narratives to make the document user friendly.

No.	Location and Comment	Response
Written Comments		
William Walker, Executive Director, MS Dept. of Marine Resources		
67	*Section 4.10.2.4 Specific Wetland Losses (from Corps Permitting Records, 1992-2000), page 4-176, line 3: "All wetlands affected under Mobile Corps individual permits were in pine flatwoods, pine savannah, and forested areas."* It should be noted that the Corps did not distinguish stream impacts from wetland impacts for the time period cited. Some forested wetlands were likely small drains and streams.	This analysis was performed at a landscape level using land cover data. It is entirely possible that forested wetlands were in fact small drains, but this is not apparent from the land cover data. A case-by-case study of each of the permits would be required to determine such and is beyond the scope of this EIS.
68	*Section 5.2 Land Use and Land Cover, page 5-22.* This section goes into a detailed analysis of projected land use under the different growth scenarios. Notably the fate of emergent marsh is discussed in great detail. Has the effect of the DMR's Coastal Preserves Program and establishment of mitigation banks been considered in the figures for the wetlands that are available to be impacted? In both cases, the wetlands are placed in conservation easements or are preserved in a natural state and are not available to be impacted. The Coastal Preserves Program has title to 27,847 acres, which includes emergent marshes and associated uplands and represents a significant amount compared to the current total of 55,7000 acres cited on Table 4.10-10.	The quantity of emergent marsh in MR's Coastal Preserves Program or any other protection program was not incorporated into the analysis. The analysis is a gross, regional-level analysis of trends, not a prediction of how specific lands will be consummed by specific uses. The Corps was interested in knowing how various levels of future development might affect land use throughout the region, and using all land use and land cover types without regard to ownership was the methodology used. In fact, it would be very difficult to incorporate lands removed from potential development into the analysis without making large and perhaps unbased assumptions. On the one hand, protection could mean that less land of the land cover type would be developed, while on the other hand, it could indicate increased pressure to develop what is left unprotected.
69	Table 4.10-8 on page 4-177 should perhaps be explicitly labeled so that it is clear to the reader that they refer only to individual permit actions.	Table 4.10-8 was edited as suggested.

No.	Location and Comment	Response
Written Comments		
70	*Section 1.3.3 Large-Scale Development, page 1-7.* It should be noted that a portion of western Hancock County is within the jurisdiction of the Vicksburg District of the USACE. Their numbers should be included, or the paragraph should state that a portion of Hancock County is not included in this study.	A footnote was added to the text of Section 1.3.1 to reflect the content of the comment.
71	*Section 3.3 Deferral to State/Local Agencies, page 3-1.* In 1979, coastal program legislation mandated that one-stop permitting be developed to coordinate the processing and issuing of permits, licenses, and other such instruments in the coastal area. The use of the joint application form is a step towards this. This form is first submitted to the DMR. The DMR, in turn, forwards this application to the Corps.	Commenter is correct that a Joint Application Notification Form is first submitted to the DMR and, if necessary for the activity being permitted, the DMR forwards the Joint Application to the appropriate Federal agency. The text has been corrected. (REF: http://www.dmr.state.ms.us/Coastal-Ecology/permitting/wetlands-permitting.htm)
72	*Section 5.5.2.1.1 Technical Approach for Wetlands, page 5-77, line 18: "Available wetland permit data, suggests that less than 10 percent of the recent emergent wetland losses in the region were due to direct filling of wetlands from building activities (USACE, 2001)."* Does this include permit data from the Corps' Vicksburg District?	No the statement does not include permit data from the Vicksburg District.
73	*Section 4.1.2 Employment, page 4-4, Table 4.1-3 "Total Full-Time and Part-Time Employment by Industry."* Does this table refer to the number of persons employed? There are no units associated with the table.	The units are people.

No.	Location and Comment	Response
Written Comments		
74	*Section 4.1.5 Quality of Life, page 4-9, line 10: "For purposes of this study, the quality of life affected environmental includes, public schools, law enforcement, medical facilities, and fire protection services."* This sentence is still unclear	Text has been edited for clarification as follows: For purposes of this study, the affected environment for quality of life, includes public schools, law enforcement, medical facilities, and fire protection services.
75	*Appendix A, Implementation Methods for Permitting Actions in the Coastal Study Area.* The first page of Appendix A lists six project examples that are used to illustrate the application of the trends analysis presented in this EIS. Another project example that would require a Section 10 permit not included in the first six examples would be a marina facility.	The Corps believes that the six examples included in Appendix A adequately illustrate how the trends analysis could be applied, and that separate examples for every possible project that would require a Section 10 permit are not necessary.
Gregory Hogue, Regional Environmental Officer, USDOI, Office of the Secretary, Office of Environmental Policy and Compliance. – include USFWS and USGS		
76	One overarching issue that needs more consideration is the topic of cumulative effects, specially the relationship between Corps of Engineers Civil Works Projects found on the Mississippi Gulf Coast and the activity-impacts that are considered in the DEIS.	The issue of focus in the EIS *is* cumulative effects, specifically the cumulative effects of Corps permit issuance on development and natural resources along the Mississippi coast. The Corps believes that the issue of focus is complex enough, and that the EIS would not be improved by introducing separate consideration of the impacts of Corps Civil Works Projects.
77	*Executive Summary, Table ES-1* The Service recommend that loss of recreational and commercial fisheries be added to the summary of impacts that are affected by the large-scale development considered in the DEIS, which may benefit from the proposed action.	The Corps agrees that impacts to recreational and commercial fisheries should be added to the summary of impacts. The addition would be in keeping with the conclusion that water quality and aquatic habitat and life would be affected and that, in turn, would have an economic impact on fisheries.

No.	Location and Comment	Response
Written Comments		
78	*Sub-section 2.2.3* When reviewing the document, we found no specific section or discussion that addressed the potential impacts to living natural resources, including fish and wildlife resources and their habitats. A section addressing these potential impacts should be added into the DEIS.	Potential impacts to biological resources are discussed under Section 5.0 *Environmental And Socioeconomic Consequences*, Subsection 5.5 Biological Resources, which includes terrestrial life; wetlands; marine aquatic life; and rare, threatened and endangered species.
79	*Section 4.2.4 - Land Use Controls* In the penultimate sentence of this subsection, reference is made to land use in the unincorporated areas being controlled by city zoning. In view of the differing levels of government, an explanation of how city zoning could apply to all unincorporated areas is recommended.	The text has been corrected to state that land use in the unincorporated areas being controlled by county zoning.
80	*Table 4.3-7* The Service recommends an explanation be provided to explain the difference between "average capacity" and "peak capacity." This is especially important if differing levels of treatment are associated with these two terms.	The Corps has clarified the distinction by changing the column headings to read (beginning with Column 3) "Annual Average Monthly Inflow (MGD)," "Annual Peak Monthly Inflow (MGD)," "Sustainable Daily Inflow (MGD)," and "Peak Capacity (MGD)."

No.	Location and Comment	Response
Written Comments		
81	*4.3.2.1.3 - Jackson County Wastewater Treatment Facilities* This section and in other parts of the description of county wastewater facilities (see sub-section 4.3.2.2.2) there is a discussion about past and recent planning activities. However, there is no information provided to indicate whether the facilities were actually constructed and put in operation. A brief discussion on the operational status of existing county wastewater facilities should be included into the DEIS, so a baseline can be established for future analysis. As a general point related to the DEIS presentation of wastewater facilities, some detailed descriptions of certain facilities are provided. However, there is no information provided concerning the performance of these facilities. A discussion of the effectiveness and performance of these facilities (e.g. the record of violations) should be incorporated into the DEIS.	The Corps believes that a baseline with respect to wastewater treatment and collection facilities has been adequately established in the EIS. The discussion of each county's facilities begins with a statement of what existed at baseline, followed by a discussion of each county's planning activities to give the reader general information on how and a general impression that these facilities would be modified to accommodate future growth. The existing discussion adequately serves the purpose of the EIS.
82	*4.4.4 - Ports* After reading this section, the Service noticed that a discussion of the recent development that has taken place in association with the Harrison County Industrial Seaway and the Harrison County Development Commission was not included. A description of the Harrison County Industrial Seaway and the Harrison County Development Commission and its relationship to the Corps' navigation channel should be included into the DEIS to ensure that cumulative and secondary impacts resulting from the Harrison County projects are adequately assessed.	The Corps does not believe that specific inclusions of the Harrison County Industrial Seaway and Harrison County Development Commission would benefit the EIS. The EIS by default includes all development that has occurred in the three-county Coastal Study Area by analyzing changes in population, land use, and land cover over a period of time. Analysis of these broad factors serves the purpose of the EIS, which is to improve the Corps's consideration of cumulative effects in its permitting analyses and decisions, and makes it unnecessary to analyze the changes in natural and demographic factors that have occurred over the last 3 decades in the region on a project-specific level. Such an analysis would also have been prohibitively complex and costly, and most likely not feasible.

No.	Location and Comment	Response
Written Comments		
83	*4.8.2.5.1.2 - DeLisle* The Service noticed a discrepancy in the discussion of the soil limitation issue in this section, when compared to subsequent sub-sections relating to lower Wolf River, Rotten Bayou, Upper Jordan River, etc. In some sections the soil limitation issue is adequately discussed, but in others it is not. Due to the importance of soil limitation with development, the DEIS should cover this issue equally for all areas.	There is no soil limitation information in the discussions of the DeLisle, Rotten Bayou, and Upper Wolf River watersheds. The Corps suggests that the following information be added for those watersheds. De Lisle: "The soils in this subwatershed are rated between fair and poor for proper functioning of septic systems. The area immediately within the city of De Lisle is primarily on septic systems (Wicker et al., 1992)." Rotten Bayou: "The soils in this subwatershed are rated between fair for proper functioning of septic systems. The urbanized areas in the subwatershed are sewered (Wicker et al., 1992)." Upper Wolf River: "The soils in this subwatershed are rated between poor and fair to good for proper functioning of septic systems. There are no recorded sewage collection systems in the subwatershed (Wicker et al., 1992)."
84	*4.10.4.3.2 - The Period of 972 through 1992* This section switches to the use of words to describe numbers instead of using numerals as found in other parts of the document. The sole use of numerals to describe numbers is recommended.	Text has been edited to change so that text such as "150 thousand" to be consistent with the way other numbers in the text are presented.

No.	Location and Comment	Response
Written Comments		
85	*5.1.3 - Environmental Justice* In this section and in subsequent related sections, consideration should be given to the issue of watershed flooding. Watershed-related flooding can be exacerbated by development activities through increases in impermeable surfaces. The impacts of such increased flooding on communities and ecosystems located in downstream areas can be devastating, and should be discussed in the DEIS.	The Corps does not see watershed-related flooding as an appropriate topic to be discussed under Environmental Justice. When a tributary or river floods, it does so without regard to the economic or social status of the communities in its path. Watershed-related flooding is an issue of concern and could appropriately be included under Water Resources. The Corps, however, decided to concentrate on four groups of water quality parameters— pathogens, sediment, nutrients, and metals—as *indicators* of the effects of the growth scenarios on water resources. The percent of imperviousness within watersheds was a factor used in calculating the effects of the growth scenarios on these water quality parameters. The Corps stresses that the EIS does not attempt to provide details on all changes that would occur under the growth scenarios, but only to determine the magnitude of changes under the scenarios and how adoption of the special methodology might help the Corps address cumulative effects. A detailed discussion of the direct and indirect effects of development on watershed-related flooding is a topic for another document.
86	*5.3.2 - Coastal Processes* There are currently no water quality stations established to measure trends in the open waters of the Mississippi Sound and other embayments. This fact should be mentioned in this section. The Service believe the establishment of such data collection stations would help give some indication of current conditions, as well as serving as a means of warning about developing trends for water quality that may affect human uses of these water bodies.	The section on Coastal Processes discusses shore currents, wind, sedimentation, and changes to the coastline and coastal processes due to human interventions. The comment refers to the inclusion of a statement about water quality monitoring stations in Mississippi Sound. Water quality was discussed in the Surface Water section, and focused on water quality within watersheds and subwatersheds. The Corps stresses, again, that the EIS takes an *indicator* approach to attempt to determine the magnitude of changes under different growth scenarios, and the EIS is not an attempt to exhaustively discuss all issues that affect the Mississippi coast. Water quality monitoring stations positioned in the Sound could be of benefit for trend monitoring, but such recommendations would not serve the purpose of the document.

No.	Location and Comment	Response
Written Comments		
87	*5.5.1.3.1 - Regional Conservation Practices* Consideration should be given to a Special General Permit for stormwater discharges in the planning area or in certain parts of the drainage area where sensitive species and water quality conditions of concern may likely be found.	Stormwater discharge permits are issued by EPA or authorized state and not by the Corps.
88	*5.5.2.2 - No Action Alternative* The Service has some concern about characterizations of additional wetland losses beyond those that have historically occurred up to year 2000 as being of a minor nature. They are also concerned about categorizations of overall wetland losses of 30-40 percent as being not significant, whereas losses of 40-45 percent as being significant. The losses that have taken place up to year 2000 are significant, by Service standards. Additional wetland losses of any measure may be significant and result in resource conflicts and projected continuing degradation of water quality. The text within this section should be revised to reflect these concerns.	The Corps agrees that any loss of wetlands, particularly given the losses incurred before 2000, is significant in the Mississippi coastal area. The projected losses in wetlands over the period 2005 to 2020 under the alternative growth scenarios were considered in both absolute and relative terms and the descriptions provided in the text are reasonable.
89	*5.5.2.3.1 - Regional Conservation Practices* Consideration should be given to working with the Environmental Protection Agency to carry out an advanced identification of wetlands in the three county area. This tool has been successfully used in other Gulf Coast states and has served to help conserve wetland resources.	The Corps will consider working with EPA to carry out an advanced identification of wetlands in the 3 county area. However, that activity falls outside the scope of this EIS.

No.	Location and Comment	Response
Written Comments		
90	*5.5.3.2 – No Action Alternative* The Service noticed this section lacks an analysis of the impacts of the no action alternative on fishery resources. In addition, no analysis of the impacts of continuing water quality degradation are discussed in terms of the effect of such conditions on fisheries productivity, commercial and recreational fishing, and other related uses presented in other parts of the DEIS. The Service recommends that a discussion of this issue be included in the DEIS.	Section 5.5.3.2 does contain a discussion of impacts to fisheries under the No Action Alternative (please see the second bold subheading—***Fish***). Impacts to fisheries are discussed in the context of water quality degradation in Section 5.3 and in terms of habitat loss and general impacts due to development in this section.
91	*5.5.3.1.1 – Technical Approach for Marine Aquatic Life* In addition to the actions considered in other sections, the Service believes consideration should be given to impacts that might arise from expansion of existing navigation channels. Also, the impacts from placing dredged material in open waters of Mississippi Sound and embayments, as well as projects like the proposed dredged material disposal area at Pascagoula, should be analyzed. The impacts of such actions on Essential Fish Habitat should be specifically analyzed.	The Corps does not believe that specific inclusions of the Harrison County Industrial Seaway and Harrison County Development Commission would benefit the EIS. The EIS by default includes all development that has occurred in the three-county Coastal Study Area by analyzing changes in population, land use, and land cover over a period of time. Analysis of these broad factors serves the purpose of the EIS, which is to improve the Corps's consideration of cumulative effects in its permitting analyses and decisions, and makes it unnecessary to analyze the changes in natural and demographic factors that have occurred over the last 3 decades in the region on a project-specific level. Such an analysis would also have been prohibitively complex and costly, and most likely not feasible.

No.	Location and Comment	Response
Written Comments		
92	*5.5.3.3.1 – Regional Conservation Practices* Regional conservation practices (RCPs) are conservation measures that eliminate or reduce adverse environmental impacts resulting from development projects. Corps 404-authorized projects usually contain RCPs; whereas Corps-authorized Civil Works Projects do not. The DEIS should include recommendations that any future large-scale development projects in coastal Mississippi, either Corps 404 or Corps Civil Works, include RCPs that involve elimination of filling of water bottoms for spoil disposal, fully mitigating for unavoidable loss of marine fish habitat, mitigating for losses within the same basin where the impact occurs, and similar measures.	It is the Corps' intention that the special methodology to address cumulative impacts be applied to any future large-scale development project. The Corps has developed the methodology to help it address the issue of development impacts in general in the Mississippi coastal region, regardless of the project source of the impacts, where the Corps has a permitting role in the project.
93	*5.5.4.1.2 – Growth Scenarios* The Service suggests that any section or discussion related to the impacts to terrestrial species should include a discussion of the relationship between development actions, including infrastructure needs, and the spread of exotic vegetation, such as cogon grass, and the effects of this invasive species on wildlife habitat. This discussion should include concerns for potential impacts to the threatened gopher tortoise. Marginal water quality conditions found in many coastal embayments present indirect impacts to listed species, such as the gulf sturgeon and marine mammals, such as the Atlantic bottlenose dolphin. Population growth and subsequent increases in drainage structures will affect these already stressed aquatic areas and will lead to further degradation of aquatic conditions for these species. The Service notes that neither the medium or high growth analyses present any consideration of effects to aquatic species. Any section or discussion involving medium or high growth scenarios should include a discussion of potential effects to aquatic species.	The discussion does mention impacts on species such as brown pelicans, the gulf sturgeon, and sea turtles. While every aquatic species in peril could have been mentioned, please remember that the document is not an exhaustive review of literature on the impacts of development in the coastal Mississippi region on every species, physical process, and natural resource in the region. The Corps has developed a methodology to assist in its consideration of cumulative effects, and has included discussions of a variety of resources to reflect the breadth of the methodology and to characterize how the methodology would assist the Corps. Further discussions of specific species or resources or how the spread of exotic species is related to development would not improve the EIS nor further its purpose.

No.	Location and Comment	Response
Written Comments		
94	*5.5.4.3.1 – Regional Conservation Practices* A prohibition on dredging or filling in Alabama red-bellied turtle habitat should be added.	The second RCP provided in the section is "Prohibit dredging in areas supported by the Alabama red-bellied turtle."
95	*5.9.1.2 – Growth Scenarios* The Service recommends a discussion of the impacts that additional pollutants, carried by increased storm water discharges, would have on the receiving waters. Specific analysis of the ability of receiving estuaries to assimilate additional wastes and maintaining designed uses should be provided.	The topic of the comment is discussed in Section 5.3, Water Resources. A discussion of water quality impacts would not be appropriate in Section 5.9, Utilities.
96	*5.10.3.2 – Effects of Implementing the Proposed Action* A number of actions presented in this section would cause substantial impacts to fish and wildlife resources, including listed endangered and threatened species such as the gopher tortoise, Louisiana, quillwort, and others. These impacts should be thoroughly discussed in this section	The comment concerns impacts on fish and wildlife resources, while the comment is on Section 5.10.3.2, Effects of Implementing the Proposed Action on Transportation. Impacts on fish and wildlife resources, regardless of whether they are from storm water increases, transportation projects, or any other project source, are discussed in Section 5.5.
97	The Service recommends that additional analysis be performed before the next iteration of this document is released, specifically in the areas of cumulative effects and the relationship between Corps of Engineers Civil Works Projects found on the Mississippi Gulf Coast and the activity-impacts that are considered in the DEIS; large scale development's direct and secondary/cumulative impact on fish and wildlife resources and federally listed species; and potential water quality issues.	The comment—that the Corps perform additional analysis in the areas of cumulative effects and activity-impacts considered in the EIS—appears to miss the point that the EIS is a consideration and analysis of the relationship between large-scale development in the coastal Mississippi region—regardless of its source—and its associated impacts, and the EIS is a specific attempt to gain new perspective on the cumulative effects associated with such development. The EIS specifically addresses impacts on fish and wildlife resources, federally listed species, and water quality in many places.

No.	Location and Comment	Response
Written Comments		
98	The document should include some information about specific periodic reevaluation, such as how and when the predictions of this comprehensive study will be updated based on comparisons with measured data. Note that the beneficial effects to water resources only occur if the numerous well-designed regional conservation practices (RCPs) identified in the document are implemented.	The Corps has not reached the point in the process yet where it will consider the frequency with which the predictions of the study will be reevaluated. The Corps will consider the issue at a later time.
99	*Page 4-112, Chapter 4 Affected Environment; Section 7, Geology and Soils; Subsection 4, Hydrogeology; Subsection 2, Water Use and Supply, lines 24-26.* The method of dividing all ground water used in the study area by total population to arrive at a per capita use rate is valid for the time period during which use was measured. However, a change in water use depends on more factors than simply changes in population. Because this method includes all use (including agricultural and industrial) it cannot reliably be used to predict future usage based on population trends alone. Rather, predictions of future use should also account for predicted changes in non-domestic use sectors, such as commercial, industrial, and agricultural use. For example, if land use is changed from agricultural to residential/light commercial to accommodate a large influx of population, and the light commercial land use did not require as much water as the previous agricultural use, the total use incorporated into the per capita use calculation would also change. The USGS recommends that a more accurate method of predicting water use (including changes based on land-use changes) be incorporated, or the limitations and inaccuracies of the present method be more clearly stated.	The Corps acknowledges that the methodology used in the EIS has its flaws and cannot necessarily be used to accurately estimate ground water consumption in the future. The uncertainties introduced by attempting to predict future use based on estimates of use by sector (commercial, agricultural, industrial, and domestic) would render such a new analysis equally flawed. The Corps agrees that the limitations of the methodology used should be clearly stated in the EIS, and will, where appropriate, clarify the current text.

No.	Location and Comment	Response
Written Comments		
100	*Page 4-113, Chapter 4 Affected Environment; Section 7, Geology and Soils; Subsection 4, Hydrogeology; Subsection 3, Saltwater Intrusion, lines 14-16.* The effects of large-scale pumping will first be felt near the areas where wells are pumped, regardless of ground-water flow direction. Drawdown is first seen along the coast because the coast is the location of greatest pumpage, not because the coast is at the downgradient portion of the aquifer. Nor is direction of flow alone sufficient to determine where future drawdowns will occur. The last sentence in the paragraph should be deleted because it is inaccurate.	The text referred to does not claim that the effects of large-scale withdrawals will be greatest depending on flow direction. The text states "Because Coastal Mississippi is on the edge of the same aquifer system, if pumping rates in Coastal Mississippi were allowed to reach the levels in southern Louisiana, similar problems may occur." This is simply stating that pumping in Mississippi similar to that which has occurred in Louisiana *from the same aquifer* could produce similar results.
101	*Page 4-113, Chapter 4 Affected Environment; Section 7, Geology and Soils; Subsection 4, Hydrogeology; Subsection 3, Saltwater Intrusion, lines 20-23.* The value given for the U.S. Environmental Protection Agency definition of "freshwater" are inaccurate. The values of 500 mg/L total dissolved solids and 250 mg/L chloride are secondary drinking water standards (Driscoll, 1986, p. 110). The definition should be corrected.	Text has been edited to reflect comment.

No.	Location and Comment	Response
Written Comments		
102	*Page 4-113, Chapter 4 Affected Environment; Section 7, Geology and Soils; Subsection 4, Hydrogeology; Subsection 3, Saltwater Intrusion, lines 28-29.* The report references Figure 4.7-2 as if that figure is in the 1989 Sumner report but the figures in Sumner's report are simply numbered 1 through 50; the 4.7-2 numbering is that of the DEIS document. Sumner's (1989) figures 23 through 26 indicate chloride concentrations in layer 3 through 6, respectively, while the DEIS statement refers to layers 3 through 7. The USGS recommends the nomenclature be made consistent with that in Sumner's document to facilitate comparison.	The text has been revised to read "in subsurface hydrologic layers 3 through 6 (see Figure 4.7-2 of this document)."
103	*Page 4-113, Chapter 4 Affected Environment; Section 7, Geology and Soils; Subsection 4, Hydrogeology; Subsection 3, Saltwater Intrusion, lines 39-42.* Saltwater intrusion can only be indicated by an increasing trend in seawater constituents (generally chloride is used as an indicator), not by chloride concentrations exceeding a specific threshold as indicated in the text. The authors should verify that there are no increasing trends in the wells that could be indicative of saltwater intrusion.	The Corps agrees that saltwater intrusion is best indicated by a trend in seawater constituents, but the text to which the comment refers discusses the conclusions of other studies and is not a conclusion of the EIS based on original research. The text accurately states the conclusions and methods of the study cited.
104	*Page 4-114, Chapter 4 Affected Environment; Section 7, Geology and Soils; Subsection 4, Hydrogeology; Subsection 3, Saltwater Intrusion, lines 16-18.* Many factors in addition to lithology, including flow rates, saturated thickness, flow paths, and recharge rates, can affect potential for saltwater intrusion. The USGS recommends that either the sentence be deleted because it is overly simplistic, or that the section be expanded to discuss the additional factors.	The Corps agrees that many factors affect the potential for saltwater intrusion, but also does not believe that the comparison drawn in the document is therefore invalid. The text has been revised to read, "While many factors can contribute to the potential for saltwater intrusion, because Coastal Mississippi is on the edge of the same aquifer system...."

No.	Location and Comment	Response
Written Comments		
105	*Page 4-114, Chapter 4 Affected Environment; Section 7, Geology and Soils; Subsection 4, Hydrogeology; Subsection 4, Aquifer Recharge, lines 34-36.* The USGS recommends that a measure of reliability be provided to establish the significance of this trend, because the slope of the fitted trend line is very small compared to the annual noise in the data.	The Corps agrees that the data have a lot of noise and the statement should be qualified. The text has been edited to "and precipitation at this station indicates that there might have been an increasing trend between 1955 and 1995...."
106	*Page 4-114, Chapter 4 Affected Environment; Section 7, Geology and Soils; Subsection 4, Hydrogeology; Subsection 4, Aquifer Recharge, line 43.* Figure 4.7-3 does not show any streamflow data, as indicated in the text. The flow data should be provided in this or another figure.	Text has been edited to text to read: "...trend of increasing runoff during the period between 1953 and 2000."
107	*Page 4-115, Chapter 4 Affected Environment; Section 7, Geology and Soils; Subsection 4, Hydrogeology; Subsection 4, Aquifer Recharge, lines 12-14.* Increased impervious areas generally, but not necessarily, decrease recharge. Practices that could change the pattern, but not the total quantity, of recharge include the use of paved areas that drain into recharge basins. In addition, not all impervious areas are effective at diverting precipitation from recharging ground water, such as roofs that drain to grassy areas where the precipitation can then infiltrate. The USGS recommends that changes in river flows coupled with changes in impervious areas is suggestive, but not completely conclusive, without an understanding of the ultimate fate of the runoff, and that the statement in lines 12-14 be modified accordingly.	Text has been edited: "An increase in impervious surfaces such as paved surfaces and rooftops can increase the amount of runoff and decrease infiltration to the aquifer system, and aquifer recharge could decrease with continued development."

No.	Location and Comment	Response
Written Comments		
108	*Page 4-128, Chapter 4, Affected Environment; Section 8, Water Resources; Subsection 3, Pollutant Loads, lines 19-27.* The bullet list mixes sources with transport mechanisms. The USGS recommends that the mechanisms be deleted from the list, or the title of the section be modified. "Sources" include human and natural land uses, such as agricultural, industrial, wildlife (for nutrients and coliform). "Mechanisms" include sewers, streams, ground-water discharge, and overland runoff. For example, it would not matter to the water quality of the Sound whether pollutants arrived via stormwater runoff or overland runoff.	Text has been edited to : "Pollutant loads enter the coastal Mississippi watershed by various mechanisms, including the following: ▪ Watershed runoff entering the surface waterbodies directly and draining to the Mississippi Sound. These loads are reflective of the land uses in the various subwatersheds. ▪ Storm water runoff carrying pulsed pollutant loadings. ▪ Flows from combined sewer overflows (CSO) and sanitary sewer overflows (SSO). These point sources are common sources of the pathogens that cause beach and shellfish bed closures following storms. ▪ Permitted point sources discharging to surface waterbodies. ▪ Runoff from areas with failing septic systems."
109	*Page 4-130, Chapter 4, Affected Environment; Section 8, Water Resources; Subsection 3, Pollutant Loads, Subsection 1, Watershed Leads, lines 8-10.* No rationale is provided for normalizing unit load contributions to the land use that provides the largest contribution, rather than presenting unit load contribution in a more explicit form such as lbs/acre. The data should be presented in a more accessible format or the rationale for normalizing be provided.	Calculations were made to identify the potential for changes in existing water quality not just violations of water quality standards. Data were normalized to the largest pollutant contributor to supply a tool for identifying the source or major contributor of a specific pollutant, which in turn may be used to identify sensitive watersheds where best management practices could be implemented to protect those waters from further degradation. Normalized data is more robust, than actual loads, for identifying changes in potential for pollutant loading since the calculations are not directly influenced by the error, which is inherent in approximating loading rates. The relationship between the various land use loading rates remain regardless where the loading rates are under or over predicted by a few pounds per acre.

No.	Location and Comment	Response
Written Comments		
110	*Page 4-146, Chapter 4, Affected Environment; Section 8, Water Resources; Subsection 4, Mississippi Coastal Study Area Watersheds - Historical Analysis, Subsection 1, Historical Conditions, lines 18-19.* The report should describe what was done in the analysis to address the concern about "suspect" historical analytical data, to assure that reported trends are real and not an artifact of changes or inaccuracies in analytical methods.	The Corps believes that that current narrative sufficiently caveats the limitations of the data used in the analyses. The Corps used the best data available, and believes that despite inherent limitations to the historical data series used, the trends analyses accurately captures changes in the various resource areas that occurred during the past 30 years.
111	*Page 5-50 to 5-53, Chapter 5 Environmental Consequences; Section 3, Water Resources, Subsection 1, Surface Water; Subsection 1, Trends Analysis for Surface Water Resources, Subsection 2, Growth Scenarios.* The data in the figures should be presented in absolute numbers and related to the appropriate State water-quality standard, rather than as a percentage of the prediction based on the year 2000 land use, so the reader can determine which potential changes reach a level of concern in evaluating a potential project/scenario. Even a fast rate of growth in a parameter that remains well below a threshold may not be cause for concern.	The method of showing a percent change from current conditions was acceptable to US EPA reviewers and will remain. The analysis looked at the potential for pollutant loads. Using absolute numbers is inappropriate since actual loads were not calculated.
Sara Foster		
112	As you mentioned in your comments, Col. Keyser, Enforcement is profoundly important.	Comment noted. The Corps agrees that enforcement is important.
113	Please conserve our limited wetlands in every way your authority allows.	Comment noted. The Corps will continue to fully carry out its mission, which includes protection of the nation's wetlands to the extent such authority has been provided by Congress.

No.	Location and Comment	Response
Written Comments		
Vevva (?) and John Sears		
114	This is a request to ask the Corps of Engineers to do everything in their power to protect our wetlands and thus our clean water as shown on their own environment impact study showing cumulative effects on the wetlands.	Comment noted. The Corps will continue to fully carry out its mission, which includes protection of the nation's wetlands to the extent such authority has been provided by Congress.
Donald Bonnecarrrere		
115	The Corps and Cooperating Agencies should be applauded for the development of this Draft EIS. The ambitious scope of this document seems to have been fully achieved. Obvious use of some of the vast amount of marine-related, scientific knowledge, is most encouraging. Though much cooperation will be required between the various governmental agencies and other parties to successfully execute this program, long-term results should prove immensely beneficial to all interested parties. Moreover, these actions should ensure that at least a microcosm of the once myriad of marine life, including plants, birds, and aquatics, that existed some 50 years ago, may be allowed to survive long-term. If so, my grandchildren's grandchildren shall have the magnificent opportunity to directly interact with these natural wonders – thus making them better stewards.	Comment noted.
Leonard Carruba		
116	In as far as the mitigation to compensate for filling in wetlands, I believe that the created wetland should be within one mile of the filled site and make it contagious with the water, this would allow the misplaced wildlife a place to feed and spawn.	Comment noted. Placement of wetlands for mitigation purposes will occur in accordance to Corps policy and site- or project-specific basis.

No.	Location and Comment	Response
Written Comments		
EPA		
117	However, there was some concern expressed during the process development coordination about how long these data would remain relevant. We suggest that the efficacy of the TA could easily be prolonged beyond 2020 with recurrent updates as the growth situation in the project area warrants. Revamping the information would also serve as a means to "ground-truth" the effects of continuing real estate development in the project effects' area and gauge the on-going value of this analytical tool. If used as designed, the proposed matrix analysis should provide all stakeholders [to include the general public] in coastal Mississippi with a much clearer picture of both the short- and long-term ramifications of large-scale development projects.	The Corps agrees that the efficacy if the TA could be prolonged with recurrent updates on resource growth.
118	As a result, EPA has no significant environmental objections to the use of the proposed permitting methodologies cited in the DEIS and supports the TA approach as a means to improve overall decision-making. Thus a rating of LO [Lack of Objections] was assigned.	Comment noted.

No.	Location and Comment	Response
Written Comments		
Carolyn Sapio		
119	They as well as myself are concerned that Diamondhead will be devastated and changed due to large developments like a casino. We are concerned that traffic would become grid-lock and emergency vehicles would have a terrible time getting to them when they needed them most. The casino will use our water and sewer facility; this would have a great impact upon that facility and this community. Eleven years ago our population was about 2500, it is now near 6 to 7000. To add more vehicles and demand on our community is a big concern. In addition there has been no miraculous change in the water level in the Bay; it is still below the required water depth to accommodate a casino.	Comment noted. The development of any specific project would undergo a separate environmental analysis of the potential impacts associated with that project. This would include water supply, transportation, utilities and other infrastructure that would have the potential to be affected by the project.
Samuel P. Sapio		
120	The Bay of St. Louis has for a long time been classified as an "Impaired waterbody" yet all the coastal permitting agencies have disregarded the ranking by the MS Dept. of Environmental Quality and have given their permits strictly on economic concerns.	The Bay of Saint Louis has been listed "impaired" for pathogens but a TMDL was approved on 7/2/2001 which means the state has developed a plan to bring the water quality into compliance with the state standard. A waterbody may be classified as "impaired" for one specific pollutant yet meeting all other water quality standards therefore permitting agencies may issue permits if the proposed action does not contribute to the impairment. For example if the Bay of Saint Louis is "impaired" for pathogens and a plant wants to discharge cooling water, which would not have pathogens in the effluent, the permitting agency can issue a permit to discharge because it would not be adding any additional pathogens to the receiving stream.

No.	Location and Comment	Response
Written Comments		
121	As a resident of Diamondhead I have concerns about the numerous extension of permits to Casino World (Diamondhead Casino) even though the location on the north side of the Bay doesn't meet water depth criteria.	According to the Mississippi Gaming Commission Regulations under Licensing Qualifications section 2-location, there should be "sufficient depth and width at least 30 days of a calendar year to accommodate a vessel of at least 150' in length and proposed width of the applicant vessel." Although the water depth may appear not to be meeting the criterion if the casino is a float 2.5 days a month or only a float during the month of January the criterion is being met.
Brierley Acker		
122	The study, while complete and comprehensive leaves all enforcement and regulation to local politicians, who have proven incapable of resisting big development and the promise of jobs and tax revenue. I implore you, give it some teeth before we have no wetlands left.	Congress strictly limits the Corps regulatory authority. The Corps has no authority over local political decision-making.
Samuel Sapio		
123	When mitigation is required on a project, it should be done as close to the project, not in another county.	Comment noted. The location for mitigation measures is determined on a case-by-case basis.
124	When wetlands are disturbed before an EIS is completed, these people, businesses should be prosecuted.	Comment noted. An EIS is not necessarily required prior to disturbing a wetland, however, a permit is required. When an individual has illegally filled a wetland, either unintentionally or intentionally, they may apply for an after-the-fact permit, which is within the law for them to do. The Corps then conducts a critical evaluation of the circumstances under which the filling of the wetland has occurred and determines the appropriate regulatory action to be taken, ranging from approval of an after -the-fact permit to referral of criminal prosecution.

No.	Location and Comment	Response
Written Comments		
Tom Mann		
125	Notwithstanding implementation of well-conceived RCPs, there is no magic mitigation plan which will allow co-existence of many of the listed species in the coastal counties with an indefinitely expanding population (with road, sewerage, and other infrastructure needs)	The Corps agrees that there is no magic mitigation plan, however, with the implementation of well-conceived RCPs and coordination with local agencies, the U.S. Fish and Wildlife Service, and National Marine Fisheries, measures can be implemented to minimize adverse affects on listed species. The Corps will use the methodology described in the EIS to help assess permit actions as they come in and make a determination on the cumulative impacts of those individual projects.
126	The original draft asserted that 82% of the land cover in the coastal counties is natural. The natural cover figure was adjusted to 78% in the current draft, by I believe that my argument still stands.	The land cover data, generated from satellite imagery, did not consistently distinguish between first (if any) and second growth pine forest and pine plantations. Hence in order to compare land cover datasets from different years the pine subcategories were lumped together into a pine forest/savanna category, and all were called natural land cover types.
127	I was struck by the negativity of most of the comments by County Supervisors, Port and Harbor Authorities, and Development Commissions, and do not believe for a moment that left to their own devices and to oversight by local pro-development entities, that individual developers (in general) would occupy the landscape in a fashion compatible with the greater public interest in conservation of animals and plants, clean water, clean air, adequate groundwater supplies, healthy fisheries, minimization of stream sedimentation, minimization of flash-flooding, etc.	Comment noted. It is outside the Corps' authority to enforce these measures. The enforcement of is the responsibility of local agencies.
128	Finally, the term sustainable growth is often used by proponents of development. There is no such thing, at least not such that can be continued indefinitely.	Comment noted.

No.	Location and Comment	Response
Written Comments		
Helen (Sandy) Johnson		
129	The bottom line for permitting is sustainability. This word needs to occur early and often throughout the document.	Comment noted.
130	The emphasis on the effect of large-scale development may obscure the cumulative impact of smaller-scale development. Please note these dangers and emphasize that smaller-scale permitting should keep an eye on patterns.	The Corps is committed to environmental stewardship to the fullest extent of its authority and this applies to the permitting process for both large and small projects.
131	The CEIS is based primarily on projections from data beginning in 1992. The data base is incomplete and far from pristine, and the methodology itself is experimental.	The commenter is incorrect. Depending on the resource area, historical data used in the trend analysis extended back to 1970. The period 1992 to 2000 period was used to characterize a high growth scenario. The Corps recognizes the limitations to the data sets used in the DEIS, but believes that they are sufficiently complete to support the trend analysis.
132	We need to track very closely the result of current experiments with mitigation, and to recognize its limits in even best-case scenarios.	The Corps agrees that monitoring is a valuable tool for determining the efficacy of various mitigation measures following implementation.
133	We know what we mean locally by ³quality of life,² but we cannot effectively sustain that quality under pressure from powerful business interests -- unless the CEIS mandates enforceable RCPs.	Enforcement of RCPs is the responsibility of local agencies and is beyond the authority and the scope of the Corps of Engineers.
Elaine Wilkinson		
134	The use of Personal Communication as a reference, however, is bothersome.	The use of *Personal Communication* is commonplace method for citing a reference from a source based on a conversation. A statement based on Personal Communication can be fact, rather than a viewpoint, based on unpublished data.

No.	Location and Comment	Response
Written Comments		
135	The long term success of the project will depend on how effectively the COE continues to encourage the interaction among the stakeholders and interested parties.	Comment noted.
136	The objective of the EIS, to measure cumulative impacts, has long been discussed as a valuable tool to assist in the evaluation of development projects; it comes down to the reliability of the model and the information used to generate it. The point of negative, thus unacceptable, impacts must be understood and uniformly adopted to become a standard measure of project feasibility	The potential for adverse impacts would be determined during the NEPA analysis and documentation that would occur prior to the permitting of a project.
Edward Tippin		
137	To this end I beg that no permits will be issued to locate Casinos on the North shore of Bay St. Louis.	The location or citing of a casino on the north shore of Bay St. Louis is a local zoning consideration and the Corps of Engineers does not have the authority to impose Federal restrictions on local land use. The Corps can regulate the wetlands, but if the permittee complies with all the requirements of the resource agencies, the Corps cannot deny the permit.
138	One wonders why these Casinos are not constructed on dry land of which there is plenty along I-10, unless it is a cheap, illegal way of eliminating their sewerage and thus further destruction of marine habitat.	Gambling is not permitted in the State of Mississippi and therefore, casinos cannot be built on the land (except on Native American Reservations) Navigational waters fall under the jurisdiction of the federal government, which does not categorically prohibit gambling on lands it controls (e xcept in special areas such as national parks). All wastewater discharges are required to have a National Pollutant Discharge Elimination System (NPDES) discharge permit and must meet strict water quality standards.
Carolyn Sapio		
139	We need stronger, enforceable guidelines, to be sure that the findings would be upheld for now as well as for future developments.	The EIS presents a methodology for evaluating the cumulative impacts of large-scale development projects and does not evaluate any specific project. Enforcing RCPs or guidelines beyond permit requirements is beyond the Corps authority.

No.	Location and Comment	Response
Written Comments		
140	The information the Corps has put out is not easy to decipher. If a map showing the findings could be presented to the public then they could see where the areas of most concern are.	The Document contains an executive summary as well as summary tables of the projected impacts of different growth scenarios on each resource area.
Becky Gillette		
141	As long as it is easy to get away with filling in wetlands without a permit, and all people have to do when caught is apply for an after-the-fact permit, there is not great discouragement from doing the illegal fills.	Comment noted. When an individual has illegally filled a wetland, either unintentionally or intentionally, they may apply for an after-the-fact permit, which is within the law for them to do. The Corps conducts a critical evaluation of the circumstances under in which the wetland has been filled and determines the appropriate regulatory action to be implemented ranging from approval of an after -the-fact permit to referral of criminal prosecution.
142	This is a major concern considering the number of unlined landfills and toxic waste contamination sites under industry in Coastal Mississippi. For example, there is a lead plume underneath DuPont Delisle. They claim it is not spreading laterally except towards the Bay of St. Louis. But if the contamination is also being drawn downward, it could impact drinking water supplies. This reversal of groundwater flow could mean the toxics flow downward into out drinking water supply from site across the Coast. Certainly this is a very important issue that deserves more attention when considering large-scale projects that would hasten this trend.	The Corps agrees that it is important to maintain clean sources of groundwater. Impacts to groundwater are evaluated during the analysis that would occur prior to permitting a large-scale project. State and federal resource agencies (i.e., EPA) are responsible for monitoring and enforcing groundwater regulations - the Corps does not have such authority.

No.	Location and Comment	Response
Written Comments		
Robert F. Bozeman, Jr.		
143	The Coastal EIS should recommend to the states, counties and local bodies how 21st Century growth (A Fat Linear Corridor) combined with best management practices could enable these three states to exceed today's growth expectations and have less environmental consequences than random unprepared for growth.	Comment noted
Edna Boone		
144	The worrisome news is that while the Corps' study details the significant damage that we have already done to our natural resources and suggests how we might begin to turn things around by implementing sustainable development practices, it does not mandate that regional, state and local governments embrace and enforce these critically important practices.	It is not within the Corps authority to mandate that regional, state and local governments embrace and enforce the practices outlined in the EIS. However, the Corps continues to coordinate and cooperate with the various resource agencies to improve the environment.
Dean R. Wilson		
145	For reasons stated below, I strongly object to the need for this EIS and with content in the EIS. First, this EIS represents a clear departure from the statutory and regulatory process and from the constitutional authority of the Corps of Engineers.	The Corps has statutory and regulatory authority to issue permits for large-scale development projects and to evaluate the potential environmental impact of those projects, including the potential cumulative impacts of those projects. This EIS presents a methodology for performing the cumulative impact analysis.
146	Second, it represents efforts by the Corps to assert itself into the constitutional authority and duties of state and local agencies and planning commissions.	The Corps disagrees with the commenter's statement that the Corps is asserting itself into the constitutional authority and duties of state and local agencies and planning commissions. The Corps has the authority to issue permits for large-scale development projects and to ensure that there is a balance between environmental stewardship and economic growth. In doing so, the Corps evaluates the potential impacts associated with these projects. The Corps makes no assertions that it has authority over local or zoning decisions.

No.	Location and Comment	Response
Written Comments		
147	Third, as the Corps of Engineers has had its jurisdiction under the Clean Water Act narrowed significantly in recent decisions of the United States Supreme Court and the Fifth Circuit Court of Appeals, most of the land and therefore the impacts identified in the EIS are beyond the Corps jurisdiction. As such, the need for the Corps to conduct such a broad, unprecedented EIS therefore eliminated.	The Corps is required to conduct cumulative impact analysis as part of the environmental resource impact analysis associated with the permitting process. Impacts to a variety of resources must be considered including land.
148	Fourth, the scope of the EIS calls for large expenditures by the State of Mississippi and the local cities and counties to create the regional agency or organization that could carry out the mandates of the EIS.	The DEIS provides guidance on the types of RCPs that might be implemented to mitigate the impacts of future development. The DEIS does not mandate any new expenditures nor does it compel, encourage, or even mention the formation of a new agency organization to carry out the mandates of the EIS, especially since the EIS imposes no new mandates.
149	Finally, and most importantly, the Corps has exceeded and continues to exceed its authority under the laws and the Constitution of the United States and should regulate only that which it has authority to regulate and leave the land use management and water rights to the local governmental bodies.	The Corps disagrees with the commenter's statement that the Corps is asserting itself into the constitutional authority and duties of state and local agencies and planning commissions. The Corps has the authority to issue permits for large-scale development projects and to ensure that there is a balance between environmental stewardship and economic growth. In doing so, the Corps evaluates the potential impacts associated with these projects. The Corps makes no assertions that it has authority over local or zoning decisions.
150	Does the Corps Mobile have the authority, either constitutional, statutory, or regulatory, to conduct such and EIS? If so, what is that authority and on what basis can such authority be relegated or restricted to such a narrow area? Does the preparation of this EIS amount to an unconstitutional usurpation of the rights and responsibilities of local and state governments over land management (i.e., zoning) and water rights?	The purpose of the EIS is to provide methodology for evaluating cumulative impacts. Neither the preparation of the EIS nor use of the methodology impinge on the authority of local and state governments regarding any jurisdictional issue including zoning nor water rights.

No.	Location and Comment	Response
Written Comments		
151	Effect of the CWA case law on the subject EIS. As can be seen, the Corps of Engineers has had its CWA jurisdiction severely restricted by the United States Supreme Court as well as by the Fifth Circuit Court of Appeals. How does this limitation of jurisdiction affect the Corps' ability to conduct such an EIS as the one in question?	The Court ruling referred to by the commenter has no bearing on the scope of this EIS.
152	To continue to assert jurisdiction over wetlands having no direct connection to navigable waters or otherwise connected to interstate or foreign commerce results in the federal agencies intruding on state land use and water use matters.	The EIS does not in any manner suggest Corps authority over isolated wetlands as defined by the SWANCC decision.
153	To allow the Corps to continue the EIS process and, more importantly, to use it as the basis for future permits represents a change in the fundamental basis for the federal system. As much of the land within the EIS study area are no longer jurisdictional to the Corps, either under the River and Harbors Act or the Clean Water Act, such a broad EIS is not necessary and is a waste of taxpayers money. To undertake such an EIS process without a specific project being considered undermines the very nature and structure of our federal system.	The Corps disagrees with the assertion that the EIS undermines the nature and structure of our federal system. This EIS simply describes and evaluates a methodology that was developed for evaluating cumulative impacts for the permitting process. Cumulative impacts analysis are standard evaluations conducted prior to the issuance of any permit. This EIS presents an alternative methodology to traditional cumulative impact analysis.
154	This is not only a hybrid document. It is a document that has no legal basis and that will lead to landowners and developers having to submit to a permit process when no such permit is required.	The EIS does nothing to alter the threshold conditions that trigger the 404 permit process.

No.	Location and Comment	Response
Written Comments		
155	The EIS enumerates several possible adverse impacts on minority and low-income communities in Section 5.1.3.1. The EIS, however, fails to consider two factors that already make these adverse impacts a reality under the Corps, as well as the DMR's and DEQ's, present regulatory methods. First, housing prices are already rising in no small part due to regulation of wetlands by the Corps. Despite a major reduction in the jurisdiction of the Corps over wetlands, the Corps continues to exert jurisdiction over all wetlands in total disregard of the rule of law.	The Corps is Congressionally mandated to regulate actions that affect wetlands.
156	Under the most likely growth scenario identified in the EIS, the EIS posits that "further development could case disproportionate adverse impacts on minority and low-income populations if residents are compelled to relocate, or because of short-term construction related impacts, long-term traffic impacts, or visual impacts. . ." §5.1.3.1 at p. 5.20. What the EIS fails to give proper consideration to is that development brings economic opportunities to the people in the minority and low-income communities.	The DEIS fully documents the increases in employment, income, government revenue, and other economic benefits of robust economic development. It singly acknowledges that such development could be potentially accompanied by higher costs in rental housing, which by nature disproportionately affects low income populations. The DEIS in no way suggests that these potential effects outweigh the benefits of economic growth.
157	The key complaint to this EIS is that it is being conducted at all. No constitutional, statutory or regulatory basis exists for the EIS.	Comment noted. As noted in previous comment responses, the Corps disagrees with the assertion the DEIS was prepared in the absence of statutory authority.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
Mayor Rusty Quave		
158	For the environmental impact study coastal wide, I'd like to hope that the Corps, which you mentioned earlier, to recognize the zoning that the cities along the Gulf Coast already have in effect. Also, at one time, there was a map that came out along with the EIS, which would designate certain areas for industrial, in this instance as far as casino development or any type of waterfront development type activities. I feel quite comfortable that the Corps is not going to overstep its boundaries by enforcing zoning in these local municipalities and counties along the Gulf Coast.	Comment noted. The authority to enforce zoning laws falls within the jurisdiction of local and regional governments not the Corps.
159	So I ask you, again, to look at these maps that probably will come out, and recognize the zoning that the cities already have in place, and recognize coastal consistently that was already put in place by such agencies as the Department of Marine Resources in our local cities.	Comment noted.
Reilly Morse		
160	I went to the trouble of picking out the maps 12 from 1972 and 2000 and then putting them side-by-side in the Bay of St. Louis, Biloxi Bay and the Pascagoula River mouth areas. It's a stunning site. I think it's something that the regulatory people need to take a good close look at, because you see, in a way that no amount of worries can ever express to you, the level of penetration and urbanization of our area. So I would encourage the final EIS, in some form or fashion, to include some side-by-side comparisons to bring this image -- just to bring it home, graphically.	Comment noted. Pixel-by-pixel comparison was not conducted because the two datasets were generated using two entirely different methods, and comparing the two pixel-by-pixel would not yield accurate results. Rather, total acreages for each land cover type were calculated for each year than then compared.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
161	The second point related to that, is that if I'm not mistaken, a great deal of that data is digital, and it would appear possible to me to take the three sets of data from 1970 through 1992 and 2000 and create some kind of change analysis, data point by data point, or pixel by pixel, or unit by unit, or region by region -- something fairly specific. If that is done, and you are able to detect, at a fairly careful level of resolution, the geographic trend or change, then it would seem to be very possible for you to be able to tell where it has been this conversion of wetlands into urban or other less valuable properties as far as the natural aspects that we are concerned of.	A change analysis was conducted only for the purposes of estimating percentage of each natural land cover type converted to urban areas and to use these percentages to numerically estimate how much urban conversion would occur in the future. Pixel-by-pixel comparison, discussion, and display (i.e. on a map) were not done for the reasons described in the response to comment #160. The methodology incorporated the amount of natural land cover present that could actually be converted. The results of this are presented in the land use section.
162	And so, this development that we have allowed to happen under whatever old-school regional conservational practices hasn't worked, and it must change. The only prospect we have of reducing the trend of decline or the percentage of decline is convincing the local leaders to buy into 100 percent and cooperate 100 percent with the Corps on these regional conservation practices.	Comment noted.
Sherry Webster		
163	But I know people that have waterfront property that have been stopped from putting bulkheads in for a boat dock or a pier because there were three little pieces of wetlands grass, and yet we allow things like this to occur.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
Cynthia Sartou		
164	The first is that, in reading it, I really became concerned that the Corps continues to ignore its authority to deny these permits as they are presented. Nowhere in that EIS does it ever discuss, as a regional conservation practice or otherwise, increase the stringency of review of permits in consideration, in particular in the terms of nondependent, water-dependent uses. We can argue all day about whether a casino is a water-dependent use, but I can tell you that a baseball field is not a water-dependent use. A parking lot is not a water-dependent use.	Comment noted. It is not within the Corps authority to enforce the RCPs. If an applicant meets all of the requirements established under the Clean Water Act, the Corps has no authority to deny the permit application.
165	We have seen in this area the consistent waiving of conservation practices, the consistent ignoring of zoning and changing of zoning. And yet, when I read the EIS, I really see this implication that there is a reality that these things will come out. And I think that that's totally untrue. The reality is that unless something really strange happens, and I'm hoping it will, there will be no conservation planning in this area. I hate to say that, but that's what I have seen. I have seen it over and over and over, again. They have lost all of those battles. Even in the circumstances of mitigation, as much as the Corps may try, Federal reports and internal reports show that mitigation requirements have not been met. Those that have been met are often not successful. So to presume within the EIS that those kinds of conservation practices are going to mitigate or reduce the impact seems to be totally unfounded. I think if you want to discuss those, and I think it's important to discuss those, then they should be discussed in a totally separate section of the EIS. They should not be built into and create implications that that is what you are expecting to happen and that that could reduce the impact, because, as I said, it's highly unlikely to happen.	The RCPs are presented by resource area to indicate the specific types of mitigation measures that could be implemented to mitigate project impacts to that particular resource. The document clearly states that such mitigation measures would be within the purview of local and regional governments and not the Corps.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
Oscar Echoff		
166	We need some Marine Reserves out here in the Mississippi Sound and the Gulf to make it so that nobody can fish, and nobody can disturb the bottom. But, we cannot get them, because, well, it might offend certain people. In other words, they won't vote for me.	Comment noted.
167	The idea that this study goes to the year 2020, well, I think it's a little silly. I'm a genealogist, and I think in terms of millions of years, so 20 years is insignificant. I think we should be thinking in terms of hundreds of years, at least.	Comment noted.
168	I read the regional conservation practices. I got the impression that everybody had their say-so in there, and yet we have the assumption that the -- that as long as we can put these things into practice, that everything is fine. The biggest speaker up there says that that's going to be impossible. Nobody, especially politicians, is going to tolerate any of those resource regional conservation practices. And zoning -- those politicians will continue to do everything they can to say zoning by definition, by our definition means we've got to have more growth, but they won't do it.	Comment noted.
169	I consider this EIS -- you have so many things that are in there that allow whoever is in charge to do anything he wants whenever he wants to. So you can't pin him down and say, well, this thing allows me to do it, because it doesn't.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
Janet Densmore		
170	Your own Environmental Impact Statement draft indicates that there is a specific area under your permitting process, which is currently a waste site in Delisle. It's next to the DuPont plant. Now there is a suggestion or a permit application to extend that waste pit. Now, we know some of the things that are there, but my question to you is, in your study, since you have already indicated that even a minimal category two hurricane -- we know that there are five categories, and that two is the one that we don't take necessarily real seriously here. We'll flood here. The proposed site will flood on the expanded toxic waste dump that's under consideration for permitting. And if we already know that there are substances in the current site, such as mercury, lead, benzene, and for me, personally, and especially terrifying, dioxin, which in its strongest form you may recognize as Agent Orange, if this is already there and we know that the proposed site will be inundated in a category two storm, then why would the Corps consider permitting the additional 24 acres where more toxic waste can collect? You know nobody can scoop it up once the hurricane spreads it around. I especially want the cumulative effects of that issue addressed.	This particular document does not address specific project impacts, but rather the cumulative impacts of large-scale development over time. The issues raised by the commenter would be addressed in the environmental assessment of the associated with that project's permit application.
Steve Shepard		
171	Of course, I understand that this proposal is considering that we might actually consider giving more power to local politicians.	Comment noted.
172	And so, the last thing we need to do is give any politician any leeway on any permit, or on any ability to fill any wetland.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
Lee Emory		
173	Our biggest concern about that line of demarcation is that once you let one casino in on the water and don't have a line of demarcation, that becomes the precedent to set. Where are you going to stop? If the casino is going to be on the water, where are you going to stop?	Comment noted.
Becky Gillette		
174	But, one of the things in there that we are concerned about is more along the lines of the local government. You have to realize that in these most heated wetlands battles that we've had in the last couple of years, the government like Ocean Springs, my town, they wanted to fill in a hundred acres of wetlands for a soccer field complex. In Gulfport, we had the administration and the mayor pushing really hard to do a 300-acre wetland, fill in a flood plain in a low-income minority neighborhood. So if you rely more on them, then we are going have wetland filled in faster and faster.	Regulation of wetlands remains within the purview of the Corps. Proposals to fill wetlands must be submitted to the the Corps permitting process. Each application is judged on the basis of whether or not the proposed action meets the regulatory requirements promulgated under the Clean Water Act.
175	We believe that you do have the authority and the mandate under the no net loss policy of the U.S. to control these losses to prevent them with dependent uses. I feel that several sections in your comments are not complete enough, and it doesn't really discuss how these lower income minority communities can receive a disproportionate burden from these wetlands impact without receiving the economic gain.	The Environmental Justice section discusses potential disproportionate impacts on minority and low-income populations under the different growth scenarios. No EJ issues were identified specifically related to wetlands impacts.
176	Also, in the interest of time I would like to just mention one other thing that -- the big issue with me is illegal wetlands fills, particularly in Jackson County.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
177	I can tell you that I can ride around Bull Park Estates, St. Andrews, even on Highway 90, and I'm constantly seeing illegal wetlands fills. When people do get caught, what do they do? They apply for an after-the-fact permit. That's really not very much punishment for that. So I'd really like you to look a lot more strongly at the illegal wetlands fills.	Comment noted.
178	We have this kind of technology, and I would suggest that it needs to be used. We need to aggressively pursue people who illegally fill wetlands so there are – so it's not that it's sort of like a wild west mentality that it's easier to just fill it and then later maybe they will catch it and you'll have to fill it in.	Comment noted.
John McCovich		
179	As I've looked at the EIS summary document on Page 2, beginning on line number 11 going through line number 25, where it talks about document development and several Federal, state and local agencies that are in support of that, I fail to see where my own county, Harrison County, the biggest county in this three-county area that you are looking at -- our own county supervisors failed to participate. So I do not understand how the Corps can even begin to believe that local governments would step up and effectively and efficiently pursue regional conservation practices. I think their absence in participating -- as I look around tonight, I still don't see a single representative from the Harrison County Board of Supervisors. I think that should tell the Corps exactly what local government's position is on this issue about regional conservation is.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
180	I would like to just refer to a couple of specific issues in the executive summary, and that's on Page Number 9 where you are referring -- where your report refers to the water resources. The third bullet point, second line on the third bullet point says, many water bayous in this region are included in the state's 303-deed list. That's the bad list. I would submit that the Corps needs to change the language. It's not many water bayous. It's most water bayous.	Comment noted. The Corps believes that the current language sufficiently captures the status of water quality impairment in the study area.
181	On the right-hand side of that, same issue of where he talks about water resources under the proposed action plan, there is a study on about the seventh or eighth line down where he refers to requiring the latest technology for new septic tank installations to improve the situation. If I remember my World History, I believe that it was back in the dark ages when water-based sanitation systems began to be implemented. So I don't think that a consideration of new septic tank installations as the latest technology needs to be in your document. If we are going to talk about the latest in technology, my concern would be why are we not talking about the incinerators that hide temperature degree at waste disposal incinerators that they install site by site. No septic tanks, no plumbing, no sewage, no water base, have cost them less than $2000 per unit. These systems are in place in Norway, Japan, in Canada, and in other parts of the United States. I think that we need this, particularly in this area, where we know that septic tanks keep repeating the same mistakes of thinking that a are doomed to fail. Why would we septic tank is going to work at this time? I think the Corps needs to consider other alternatives in the water resources management area.	The Corps does not have the regulatory authority to specify the technology requirements regarding treatment of sanitary waste from residential sources.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
182	Another comment that I would make -- looking at tables that are identified in the executive summary about -- it discusses the major areas. The word map -- a matter of adverse effect, amount of effect – I think that some of these things are actually major effects, and they should be considered as such in the, hopefully, revised document. They are more than just matter of effects.	Comment noted.
183	The last thing that I would say, and this is really located on EIS-14, line number 37, where it talks about ground water resources, and the comment is made that ultimately that this area is going to use up our marine water resources, and we need to consider building another dam. Well, I appreciate the fact that the Corps of Engineers -- that's what the history of the Corps has deemed. But I believe that this community should be looking not to the past, but to the future in other parts of the world, we just brought in the new pipe companies. The man from eastern or the Middle East -- I've heard that at the regional Chamber of Commerce meeting the other night they talked about he was an international expert on the desalination process. I cannot understand why in this type of a document talking about the future of our coast, that the Corps would even considering implementing a program that destroys the limited natural resources. And basically, I would assume that the only reasonable place would be the Desoto National Forrest. We can go 300 yards to the south and have unlimited source of water during the modern salinazation process.	Comment noted.
Doty Fournier		
184	There are no ifs, no ands, and no buts. You need to keep everything out of the pristine areas.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
Piji White		
185	And I ask you now, the Mississippi Gulf Coast is going to suffer the same thing if we pave wetlands. We are going to have floods, and our citizens are going to suffer the same thing.	Comment noted.
Paula Vassey		
186	You talk about limiting. The EIS should not be limited to just large-scale developments. What does the term large-scale development mean? I see it as a term to make it more streamline for developers to fill in wetlands. It's not fair. We are tired of fighting. You have the rights. You have the rules. You have the authority, and you don't use it.	The DEIS focuses on large-scale projects requiring 404 permits and which were responsible for most of the induced impacts of economic growth that occurred during the 1990s. The purpose of the document is to present a methodology that better captures these induced impacts.
187	I disagree with people saying these aren't political issues. All of the new development in wetlands in the state of Mississippi is a political issue. If you don't play by your rules then the Corps of Engineers doesn't get funded. At the local level, if they try to argue and stay some conservation, but put in some crap -- whatever you call them, RCMP's, then they don't get reelected because they stop development. We've got to find some happy ground where we can get together.	Comment noted.
188	There are some issues that need to be investigated where we can give the Corps the authority, which it already has. It has the authority to do what it needs to do, it just never does it. We pay for it in the end with tax dollars for poor Infrastructure, loss of our fishing industry, loss of habitat.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
189	The Corps continues to ignore the comments of the interior department of Fish and Wildlife, NOLA, and the State of Mississippi on habitat issues, on submerged vegetation, and on essential fish habitat. That needs to stop. If it's consistency reports, then why do people not listen when the comments are presented? Instead, they go behind closed doors and renegotiate issues or take permits off the board and come back with them later. That's not the way it's supposed to be. The Corps has rules. All they need to do is be enforced. It's the cost benefit.	The Corps works cooperatively with these other agencies as required by law.
190	The State of Mississippi benefits by not having to go back and repair things that have been permitted by the Corps. We are trying desperately to save the heritage of Mississippi for our fishing, our wetlands, our waters. We need some other things besides huge industries that continue to fill in wetlands.	Comment noted.
191	There are ways to do things and ways not to. Mitigation trades something good for something that somebody is going to make that doesn't work. There is no enforcement on the project. Jackson County I'm not sure has ever fulfilled some of the mitigations that they we required. Mitigation, by definition, is to be traded for unavoidable loss of wetlands. When there is an alternative that exists, it's not unavoidable; therefore, there should be no mitigation. Mitigation banks are great, but all they have done is allowed people to continue to destroy needed habitat, wetlands, marshlands, tidal marsh, and merchant marshland, in order for some stinking developer to make some money or make a politician to get reelected so they can say that they provided jobs.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
192	The EIS is good, and it's on the way to be a document that's usable. But stoop to allow the local politicians who control the resources when you only have to look to the project that they do and they don't permit by digging ditches, to drain water from developments into the Gulf of Mexico, is proof of point that they are not the ones that need to be in charge. To base the future trends on depending on somebody else to do something that y'all think they might would like to do is ridiculous.	Comment noted.
Charles Spam		
193	So do you want more sewage or less sewage? Fresh water or sewer water? I mean, let's all be honest and enforce the laws that we have. Let's let the Corps of Engineers put that study out there and be honest with what they are saying.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
Steve Oivanki		
194	One, I didn't see much mention of discrimination between high value and medium low value wetlands with regard to urban density where the wetlands occur on the coast, and which wetalnds were being lost in high density urban areas as opposed to what we call pristine or undeveloped areas. I think the study should look carefully at that and look at the trend with perspective of where these losses occur.	The Corps is not certain what "high value and medium low value wetlands with regard to urban density" (emphasis added) is meant to convey. Based on the subsequent sentence, the Corps assumes that the commenter means that wetlands in high-density urban areas are of lesser value, whereas those in "pristine or undeveloped areas" are of greater value. The Corps disagrees. The value of wetlands in high-density urban areas, whether "pristine" or degraded, can be extremely high with regards to flood control, recreational value, and aesthetic value (i.e., social values), while wetlands in undeveloped areas, while perhaps of great value to the critters that live there (i.e., biological value), may offer none of these social benefits. Because of the subjective nature of the "value" of wetlands and given a lack of a functional value determination and a scientifically and socially accepted societal valuation of the wetlands in the Coastal Mississippi area, the Corps decided not to base its trends analysis on such factors. The analysis does not attempt to determine which acres of any land use or land cover type will be consumed by development within the next 20 years, but only to make a gross prediction of the quantity that will be converted or consumed.
195	I think the study should look at the data as development as a means to avoid individual EIS for individual projects in the future. A number of the casinos have had to do it in reference to the EIS, and it's caused a long delay. They came up with the same data that the company's and EIS have come out with, and I think the study should promote the use of this data to increase the use and enhance the environmental assessments as opposed to EIS on individual projects. It's a waste of taxpayers' money to develop these if the data is already here.	The purpose of this document is to help provide a baseline of data for future documents. However, individual projects will still need to prepare an EIS. To the extent possible those project EIS's could use existing data where appropriate and applicable.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
196	So I think that the study is going in the right direction. There are efforts in one way on the coast, in particular, the CRV effort with the DMR to promote smart growth. I think the study is going in the right direction, but I just would like to see some consideration given to discrimination to the good -- I say good -- and bad wetlands, the wetlands already impacted, and a promotion of the use of this data to prevent problems in the future.	Comment noted.
Terrese Collins		
197	The things that we're concerned about, besides the fact that our local rules and regulations aren't in force and you can't trust local officials to do that, is that the Corps realizes authority and use that authority.	Comment noted.
198	Casinos may be water dependent by law, but hotels, parking garages, and things like that are not water dependent by law and should not be built over the water. The wetlands should not be filled to allow for those buildings. There should be retention ponds for the runoff from those facilities. This is not just for casinos, it's for any barge or even a small development. Once we realize the fact that we as individuals have more impact than large development -- yes, we as individuals, our homes have runoff and sewage problems. We put things on our lawns that could pollute the water. We build our houses out of things that they shouldn't be built out of. We pave over our parking -- our driveways with things, those impervious surfaces, that's true. However those impacts on an individual basis are, by far, much smaller than one city development that has a thousand toilets or paves over a water bottom and has no retention for that runoff.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
199	I'm very concerned about water quality in the Back Bay of Biloxi. We have beach closings on the front beach, but have you ever checked the quality of the water in the bay? If you did we wouldn't be swimming in that water, or would you have to put warning signs up in the Back Bay saying keep out.	Comment noted.
200	The stringent alternative to the analysis to be considered is mitigation is not the answer. We need to avoid the impact or solve the problem on the site, not mitigate 40 miles away. That's a health problem.	Comment noted.
201	If the regional conservation planning thing doesn't work, then what are you going to do? What's your plan? Does the EIS direct that issue? The Corps does need to assert its authority over permitting and not give it to local agencies.	The Corps continues to assert it s authority over wetlands issues. However, it does not have the authority to regulate local zoning.
202	So we applaud the Corps for doing the EIS to begin with, and we hope that you continue to improve it. We hope that you do have another public hearing when you come out with a final EIS, show us these map overlays, and show us where the growth is occurring.	Comment noted.
203	I'm concerned that if we look at only where good wetlands are, not where bad wetlands are, where the impacts are, then we're going to have a serious problem because we are going to lose much, much more. We are very concerned in the Back Bay and in Bay St. Louis and in Jackson County, that where growth has occurred we've lost a major amount of wetlands, but that doesn't mean that's where it should continue to occur. We need to preserve those areas so that it can filter for pollution that occurs on the, you know, whatever you want to call it -- the impacts that are occurring in those areas.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
Mayor Rusty Quave		
204	The casino development that's going on right now on the Gulf Coast -- you've got a point there. Any place that cannot take proper care of their sewage, their water, their streets, their financial capability should not be allowed to do major developments.	Comment noted.
Unidentified Speaker		
205	Yeah, I just wanted to comment on the person who is advocating low-grade wetlands. He mentioned population density on the East Coast. We need to remember that the northern Gulf of Mexico and generally the Gulf of Mexico cannot take the same level of development density as the East Coast or the West Coast. Because if you go over there and you find out that they have a six-foot tide twice a day on average, we have one tide once a day of two feet. So you need to have a much lower population density to have the same level of negative impact on the water. So I hope that's, you know, remembered by the Army Corps. I hope they realize that.	Comment noted.
Oral Comments 1/29/04 – Public Meeting, Bay St. Louis, Mississippi		
Reilly Morse		
206	I think you need to and you owe to the process to be as forceful on your environmental adverse effect projections and your language as you seem to be capable of doing on the economic side.	Comment noted.
207	I did mention at the last instance that I thought maps that compare, blends one into the other, would be useful for people to understand this fragmentation issue.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/27/04 – Public Meeting, Biloxi, Mississippi		
Nonnie Debardeleben		
208	Mitigation has been a problem. We have been many numerous times where people are allowed to buy acreage in mitigation banks, or they go and they can replace a wetlands. How can you replace a wetlands? Most of the time you go in and you put in these wetlands vegetation and they die. They don't grow. You cannot go in and plant a wetlands like you plant a garden. The key is to protect the wetlands that we now have.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/29/04 – Public Meeting, Bay St. Louis, Mississippi		
209	And I guess the main thing is that we have to look at when things are being permitted, the infrastructure that goes with this particular project. People come in and they present a project, and it's going to take up X amount of land and wetlands are going to be filled. But nobody looks at the roads, the connector roads, the schools, the adjacent housing that goes in. That's the cumulative impacts, which have been ignored. And we have been trying and trying now for ten years to say, look at these cumulative impacts. And the EIS needs to address these more directly, how the cumulative impacts effect existing resources.	The purpose of the DEIS is to present a methodology that would better capture cumulative effects from future large-scale development projects in the Mississippi Coastal Region.
210	Ground water and water quality are paramount, and the quality of our water in the last ten years has really gone down. And the ground water situation is Deplorable. And these issues are not being addressed and need to.	Comment noted.
Chris Salisbury		
211	We have a seriously faulty sewer system in Hancock County. And the wetlands. We are destroying the wetlands with this improperly installed sewer system. And I would like to provide you with documentation and proof of this. And we hope that you take this in consideration before you pass out anymore permits.	Comment noted.
Randall Abrams		
212	I would urge the Corps to be more stringent, as far as the allowing of substitution of degraded wetlands for fairly undisturbed or pristine wetlands.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/29/04 – Public Meeting, Bay St. Louis, Mississippi		
213	And I think that what I've seen is that in permit applications, and also Environmental Impact Statements developed by the large scale developers, is that there is not an adequate cost benefit analysis, and the permit applicants are far too often accentuate or give a detailed description of the benefits of a specific project, without an adequate accounting of the economic cost of the project to other commercial industries, government facilities and local biotic and human communities.	Comment noted. Cost benefit analyses are beyond the scope of NEPA documents.
214	And the other thing I just wanted to mention is, and as you pointed out, in the region of influence that you mention, as far as the study of the Coast, as far as the water shed, you know, we've got a much larger region of influence, and when we look at cumulative impacts over time we -- we probably need to go a little further than looking at the Coast as far as the influence to the Coast from non-point source pollutants and other sources of pollution further north than the Coastal communities.	The Corps believes that the ROI's identified for each resource area effective captures these impacts. That is one reason why the geographical reaches for resource areas are not the same.

No.	Location and Comment	Response
Oral Comments 1/29/04 – Public Meeting, Bay St. Louis, Mississippi		
Howard Page		
215	The key projection of minimal future cumulative impacts under the most likely growth scenario relies too heavily on local government implementation of most of the regional conservation practices. Many of these practices are things that the Corps can and should continue include in its permits. They are not outside the Corps' jurisdiction. Passing the responsibility on to the locals is unwise. Over the past 30 years, State and local governments have failed to adequately implement existing conservation practices. This is why we've had such a large loss of wetlands and unnecessary flooding and unnecessary loss of some of our water quality. It's because we haven't had the wisest resource use up until now. And for the Corps to assume that local governments will suddenly start doing a lot of best management practices and that the Corps can step out to the largest degree possible, I don't think it reasonable, and I think the Corps should stay as involved in it as they have been up to this point.	Regulating local zoning laws is beyond the scope of the Corps regulatory authority.

No.	Location and Comment	Response
Oral Comments 1/29/04 – Public Meeting, Bay St. Louis, Mississippi		
216	The second point that I noticed was, the environmental justice section does not consider any substantial issues except for housing and flooding. Turkey Creek is mentioned in the EIS and references already existing impairments and probable future problems, but there's no mention of the environmental justice issues in this watershed. And you know they've been many. We've had other cumulative impacts, such as spills at the airport. A sand pit that's proposed. There's been a lot of disproportionate share of wetlands fill impacts have fallen on at risk communities and lower income communities. And looking at environmental justice, to me, is just not thorough enough in this EIS. I think we could do a better job at looking at it and at really stating the impacts that are there. Because it's required to be looked at, and I think that anyone who looked at, for example Gulfport is what I know the best, and there's just clear and consistent behavior that shows that there are some environment justices issues here. And I think this ought to be quantified and discussed in this EIS.	The EIS identified accelerated increases in the cost of housing as the primary potential EJ issue. No other significant adverse impacts were identified, including disproportionate impacts borne by minority or low-income populations. Because no specific projects are assessed it would not be possible to assess flooding and environmental degradation impacts on specific populations. Such considerations would be evaluated in specific assessments performed in the future and which are tied to specific proposed actions.
217	Everything is about mitigation. We discussed the success of mitigation measures imposed under permits before 2000. If the impact of various gross scenarios is based on success of mitigation requirements, the Corps must institute a comprehensive system for monitoring mitigation. For example, in the Big Sun case in Mississippi in Vicksburg, it was learned that although mitigation had been required to compensate for wetland loss, the Vicksburg Corps had not done 30 percent of the required mitigation over the past decade. My question is, for our local area and this EIS, how vigilant has the Mobile Corps been following up on mitigation, and how can we be assured of vigilance in the future.	The RCPs provided in the EIS are intended as guidance and are not mandatory. The Corps has no authority to enforce the RCPs; they must be monitored and enforced by local governments.

No.	Location and Comment	Response
Oral Comments 1/29/04 – Public Meeting, Bay St. Louis, Mississippi		
218	And so, I think the Corps should embrace and not divorce themselves from the responsibility of storm water management. Because at the very basic discussion that we have here is going to be loss of wetlands. And so they -- the Corps in this EIS should include that issue, also.	Storm water management is not within the purview of the Corps.
Jerry Gilmore		
219	I notice in your table of the groundwater usage, you mention and list some municipal sources, but I don't recall any industrial uses of ground water. I've got an industry in my neighborhood up around the north end of the Bay that puts six million gallons a day of water into the Bay. And I believe that all comes out of the aquifer. And six million gallons a day, if my math is right, is like 33,000 people's worth of water. So I think you need to bring the industrial uses of the ground water in here.	The best available data was used at the time the EIS was written. In 2002, the state began developing a comprehensive statewide management plan, which is to characterize and quantify existing groundwater resources and identify existing uses of those resources. The plan has not been completed therefore the data are not available for inclusion.
220	And then, I'd like you to, in some form, try to consider the expected rises in sea level, and that as a cumulative impact to be added into all the man made things that are going on locally as far as wetlands destruction here, and consider the snowball effect of both of these together.	Sea level rises are not expected within the 20-year period covered by the EIS.
Lawrence Deese		
221	So I think that it's important and it has to be part of the Corps', you know, authority to determine whether or not wetlands get filled in as it effects the existing function of, for example, drainage canals.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/29/04 – Public Meeting, Bay St. Louis, Mississippi		
222	And the second question that I have is the issue or the practice of the Corps to give after-the-fact permits for filling in of these watersheds -- I mean, of these wetlands. And, you know, it's my understanding that that is not an unusual practice to the Corps. And there is a particular situation where the Corps has every authority to exercise some sort of oversight with regard to these wetlands in a more regulated fashion. And there should be something that is different for the application process than for someone to go and illegally fill in wetlands, apply for the -- apply for the permit after the fact, and submit his engineer's no impact statement. It's -- it doesn't make any sense. There's no -- there's no protection to the rest of us for those kinds of illegal actions. And you're the authority on that.	Comment noted. An EIS is not necessarily required prior to disturbing a wetland, however, a permit is required. When an individual has illegally filled a wetland, either unintentionally or intentionally, they may apply for an after-the-fact permit, which is within the law for them to do. The Corps then conducts a critical evaluation of the circumstances under which the filling of the wetland has occurred and determines the appropriate regulatory action to be taken, ranging from approval of an after -the-fact permit to referral of criminal prosecution.
Jim Maness		
223	What I would like to add to the program, and ask you all to please consider, is we have been hearing the generic term "wetlands" used consistently. I would like to present that one of the basic freedoms guaranteed to us by our Constitution is the freedom of seizure of private property. I would say that the generic term "wetlands" is inappropriate, as somebody owns that property, somebody pays taxes on that property, and this should be a consideration when we are dealing with different regulations. Albeit, we do have groups that would like to seize our private property, I think we do deserve, at least, a consideration that it is a basic freedom of America to own private property.	Comment noted.
Doty Fournier		
224	You want to accommodate D'Iberville. They need growth. They want a casino. They have at least three sites east of I-110. They do not need the one west of I-110. Save our pristine area, please.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/29/04 – Public Meeting, Bay St. Louis, Mississippi		
Teri Wyly		
225	Another thing that we also agree with is the fact that you have made the document more user friendly by including the six hypothetical projects that you have in Appendix A that makes it easier for developers and economic development personnel involved in these decisions and these permit applications to assess the cumulative impacts. We would suggest, though, that maybe you expand that to ten hypothetical projects and use as a basis for the additional ones some of the previously permitted historical projects that this district has had to face so that we can see examples of the cumulative impact analysis under the DEIS.	The Corps believes that the 6 hypothetical examples sufficiently capture the range of large-scale projects that would potentially require permits in the Coastal Mississippi Region.
226	Things that we respectfully disagree include the fact that the basic premise for the DEIS was the perception that the casino hotel developments had a cumulative indirect impact had not been adequately addressed or considered by the Corps.	Comment noted.
227	To adequately and fairly represent development impact, the final DEIS should include historical permit description. Specifically, the type project that was permitted, who held the permit, was it a military installation expansion, was it a public entity or private.	Comment noted. The Corps disagrees with the commenter that such information would add clarity or context to the EIS.
228	Secondly, we understand that the Corps had to use some cutoff date. You had to come up with something as a baseline. You all have used 2000. Respectfully, we would request that you would include some mechanism to update your data, which is tremendous in both its value and also its volume. Because if we're going to use 2000 data, by the time this document is ready for final use in 2005, it's already five years old data. That data is stale. Any assumptions made based on that stale data could, in fact, be fatally flawed as a result.	Comment noted. The analysis used the best data available. The trends analysis uses multiple growth scenarios to capture a range of different growth rates that are reasonably foreseeable. Clearly it makes sense to update information as appropriate for future projects.

No.	Location and Comment	Response
Oral Comments 1/29/04 – Public Meeting, Bay St. Louis, Mississippi		
229	In addition to that, the resource conservation practices, there's much discussion on those. We would request that instead of it being so repetitive in the text, that you incorporate and consolidate this as an appendix.	The Corps believes that the current presentation makes sense because the RCPs are tied to specific resource areas.
230	We've heard testimony earlier tonight and the other night that there really is no faith in our government entities in adopting these RCPs. That criticism is both unfair and unfounded. There are already ongoing conservation efforts, numerous conservation efforts, being completed and implemented by our local authorities. They include expansion of sewer systems across the entire coastal study area that are removing septic tanks from low lying areas, benefiting in a positive way the water quality of our Coastal areas. In addition to that, there are many, many smart growth initiatives being incorporated and adopted by our communities. In addition to that, CF funds have been used to, again, embrace some of those RCPs. Those RCPs are today being implemented by many of our communities. And I think that you will see in the future that will continue. Not only our public entities, but we have private groups that are very involved in these efforts. The Chamber, your welfare and conservation people, your land trusts. Conservation and preservation are very upper most in the minds of both of public sector and the private sector. I would like to have that noted in the DEIS.	Comment noted.

No.	Location and Comment	Response
Oral Comments 1/29/04 – Public Meeting, Bay St. Louis, Mississippi		
231	Finally, the additional positive economic benefits of large- scale developments must be noted under a NEPA review. You've got to look at your socioeconomic causes and results, but we would ask that the positive ones be included in there. That is including the infrastructure, improvements to our schools, to our communities, along with the enhanced employment opportunities that we experience through the study period that no longer our children have to leave this area to get good employment and sustainable employment. So what I'm getting to is that if we're going to deal with smart growth ideas, we need to consider the situation about the water resources available to us, fresh water and so forth.	Comment noted.
Jim Thriffiley		
232	My concern has to do with the water tables as we're talking about smart growth and so forth into the future. So I wanted to get this into record, so that anybody that is concerned about the smart growth that we're talking about today, I think y'all have a lot of open ears, but we have a -- but we also have to be real certain that we understand that the fresh water situation is going to be taken care of. And, also, how is it going to effect what's underneath us, including the sands and any other hard materials we may have underneath there.	Comment noted.

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Appendix B

Implementation Methods for Permitting Actions in the Coastal Study Area

Implementation Methods for Individual Permitting Actions in the Coastal Study Area

Background. As part of the special-purpose methodology, the Corps will require an enhanced analysis and understanding of the induced regional cumulative effects associated with large-scale development projects when making permit decisions within the Coastal Study Area. For consistency, this methodology may also be applied to all permits under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act of 1972 within this geographical area. To streamline the permitting process, the Corps has developed implementation methods for permit specialists and applicants utilizing the results of the trends analysis presented in this EIS. Using these methods, analysts may more quickly provide the necessary level of analysis for documenting the regional cumulative impacts for their NEPA documents. The analytical approach for implementing this method is presented below. For each step, examples are provided to illustrate the application of these methods. Each example involves projects requiring Section 10 and/or Section 404 permits within the Coastal Study Area, as presented below:

1. Project #1 involves a retail shopping plaza that would require a Section 404 permit and that would ultimately employ 200 permanent workers and serve customers primarily within the multi-county area along the coast.

2. Project #2 involves a residential development complex that would require a Section 404 permit and that would include 500 single-family homes.

3. Project #3 involves a gaming resort and hotel complex that would require both Section 10 and Section 404 permits and that would employ 1,000 new permanent employees and attract tourists from around the nation.

4. Project #4 involves a resort/hotel complex that would require Section 404 permits and that would employ 100 new permanent employees and attract tourists from around the nation.

5. Project #5 involves a new industrial facility that would require Section 10 and Section 404 permits and that would employ 2,000 new employees. This facility would sell goods and services to markets throughout the nation.

6. Project #6 involves a large residential development complex involving 12,000 housing units to be constructed over a 20-year period. The development of the 5,000-acre tract calls for the construction of supporting retail shopping plazas, churches, golf courses, office space, schools, health care facilities, commercial businesses, and light industrial complexes over the next 20 years. Half of the housing units would consist of retirement homes and would be marketed to retirees from throughout the nation. Market analysis shows that two-thirds of the retirees would immigrate to the coastal area from other regions in the nation, while one-third of the units would be purchased by retirees who already live on the Mississippi coast at the time of their retirement. Half of the units would consist of single-family homes and multi-family units that would be purchased or leased from residents of the multi-county area. Given the size of the 5,000-acre complex, Section 404 permits would be required for the construction, including the filling of 100 acres of wetlands over the next 20 years.

To assess long-term cumulative effects, an econometric model was used to project economic conditions to the year 2020. These results, along with a GIS-based land conversion analysis,

were used to characterize regional cumulative effects from current and projected economic growth. Four growth scenarios were analyzed: Most-Likely Growth, Low-Growth, Medium-Growth, and High-Growth. These growth scenarios were developed to capture the range of reasonably foreseeable long-term cumulative effects under varying economic conditions. The key element of this methodology is to select the most appropriate growth scenario for characterizing long-term cumulative effects based on economic conditions and permitting actions, as discussed in more detail below.

The Most-Likely Growth Scenario serves as the baseline forecast, and was based on an econometric model using 30 years of economic data for the region. The "most-likely" forecast was found to be virtually identical to the Low-Growth Scenario (as shown in Table 1), when comparing employment and population forecasts. The Low-Growth Scenario assumed that the sectors of the economy that experienced very high growth through the 1990s (i.e., entertainment, recreation, amusement, and resorts [which includes casino and hotel resort complexes]; referred to as the "resort" sector in this discussion) would remain at current levels, while the remaining sectors of the economy would continue to experience internal growth. The High-Growth Scenario assumed that the economy would grow at rates experienced during the 1990s, while the Medium-Growth Scenario assumed that the growth rate would be half of this level.

The EIS contains an in-depth cumulative effects analysis for each of the growth scenarios under a range of resource management conditions. Two resource management conditions were assessed: (1) the status quo relative to conservation methods and conditions prior to 2000; and (2) enhanced conservation relative to conservation methods and conditions prior to 2000. As discussed in detail in the EIS, the "enhanced conservation" measures, referred to as Regional Conservation Practices (RCPs), include both voluntary measures that state, local, and/or private entities may adopt to further protect the environment, as well as some permit-specific measures that the Corps of Engineers may require as permit conditions for certain development projects. The two resource management conditions (i.e., status quo and enhanced conservation) were assessed in order to address the range of possible conditions that might occur in 2020 under different growth scenarios to more accurately capture the long-term cumulative effects of all permitting actions, as well as induced effects of such actions. At present, local agencies and private developers are already using some of the RCPs.

Table 1
Employment and Population Growth Scenarios for the ROI

Area/Year	Employment (thousands)				Population (thousands)			
	Most-Likely Growth	Low-Growth	Medium-Growth	High-Growth	Most-Likely Growth	Low-Growth	Medium-Growth	High-Growth
2000	223	223	223	223	367	367	367	367
2001	229	228	233	236	372	372	374	375
2002	231	230	237	242	377	377	380	382
2003	233	233	241	248	381	381	386	391
2004	235	234	245	254	385	385	393	399
2005	236	235	248	259	389	388	399	408
2006	238	237	252	264	393	392	406	417
2007	239	238	255	269	396	395	413	427
2008	240	239	258	274	400	398	419	436
2009	240	239	261	278	403	401	426	446
2010	241	240	264	283	406	404	433	457
2011	243	242	267	289	409	407	440	467
2012	244	243	271	294	412	410	447	478
2013	245	244	274	299	415	413	454	489
2014	246	245	277	305	417	415	461	500
2015	247	247	281	310	420	418	468	510
2016	248	248	284	315	422	421	475	521
2017	249	249	288	321	425	423	482	532
2018	251	250	291	326	427	425	489	543
2019	251	251	294	332	429	428	495	554
2020	252	252	297	337	431	430	502	565

Analytical Approach. To evaluate the cumulative effects associated with a specific project in the Coastal Study Area, it is necessary to assess all activities in the region, not just those directly associated with a given project. To minimize the burden on permit applicants who must consider such a complex array of issues and effects, the results of the EIS can be used directly to address cumulative effects. The approach involves both qualitative and quantitative measures depending on the size and scale of the project under consideration. As previously discussed, the EIS assessed cumulative effects for past and present conditions, as well as four future growth conditions. For past and present conditions, the EIS can be cited by reference in the cumulative effects section of a NEPA document in order to address these issues at a regional level. Also, the site-specific NEPA document should include an "Affected Environment" section that addresses current baseline conditions. For future long-term cumulative effects, the results of the EIS can be used directly to assess these impacts. First, the permit analyst needs to select the appropriate growth scenario based on an assessment of current conditions, pending permitting actions, and projects that have received permits but have yet to be constructed. The Corps of Engineers would make a determination of which growth scenario should be emphasized in the site-specific NEPA document based on this assessment of current conditions and pending permitting actions, which are tracked by the Corps. The Corps would then provide the NEPA analyst with the appropriate growth scenario(s) to include in the cumulative effects discussion. The NEPA analyst may then adopt elements of the regional cumulative effects discussion from the EIS, some of which has been provided as part of this appendix.

Selecting a Growth Scenario. Tracking and identifying the growth scenario that is most appropriate for the region at any given time involves consideration of current conditions,

permitting actions that are pending before the Corps of Engineers, and approved permits for large-scale developments yet to be constructed. An overview of the methods to be used by the Corps for tracking and identifying the most appropriate growth scenario is presented below.

1. ***Consideration of Current Conditions.*** With respect to monitoring current conditions, population and employment data should be tracked at the ROI level, using readily available demographic and economic data sources to determine whether economic trends continue in accordance with those predicted for the Most-Likely/Low-Growth Scenarios (for population census data, go to www.census.gov; for employment data, go to www.bea.gov/regional/reis [1]). Table 1 can be used to identify the most appropriate growth scenario using the current population demographic data obtained from the sources mentioned above. At present, the regional economy is predicted to maintain levels commensurate with the most-likely and Low-Growth Scenarios, unless factors discussed below for items #2 and #3 should increase economic growth above baseline conditions.

2. ***Consideration of Permitting Actions Pending Before the Corps of Engineers.*** The results of this EIS have shown that Corps permitting actions for certain types of large-scale developments in the Coastal Study Area have induced growth and cumulative effects within the entire region beyond historical levels. When evaluating permits pending before the Corps of Engineers, a determination must be made as to whether or not issuing the permit or permits could shift economic and population growth beyond levels predicted for the Most-Likely Growth Scenario. This first step in this determination is to evaluate the nature of the project and determine to what extent the project depends on the local economy (i.e., multi-county coastal area or smaller) versus the regional, state, national, and/or global economy. In the case of Project #1, a shopping plaza depends on customers from the local economy. For Project #2, a typical housing complex is inhabited primarily by residents already residing in the ROI. The growth associated with these types of projects has already been factored into the Most-Likely and Low-Growth Scenarios. Therefore, permitting such activities would not shift the economy from Most-Likely to Medium- or Higher-Growth. However, Projects #3, #4, #5, and #6 would be driven by economic demand derived primarily from outside the ROI. Each of these projects, to varying degrees, depends on attracting customers and commerce from beyond the local economy. Although the Most-Likely and Low-Growth Scenarios assume some level of interdependence of the local economy in relation to the national economy, the economic activity generated from adding new projects that attract additional customers and revenue from the regional, national, and/or global economy could to some degree increase growth above levels assumed for the Most-Likely and Low-Growth Scenarios. Thus, permitting these types of establishments, to varying degrees, may spawn incremental economic growth beyond that which was predicted for the Most-Likely Growth Scenario.

   When one or several permits are before the Corps of Engineers for review, a determination must be made as to whether or not actions on these permits would shift the economy from Most-Likely/Low-Growth to Medium- or even High-Growth conditions. This is done by estimating and tracking incremental changes in

[1] It should be noted that employment forecasts are based on Bureau of Economic Analysis estimates which are based on "place of work" employment not "place of residence" employment as used by the U.S. Census Bureau.

population and employment levels in the ROI. For businesses, it is necessary to convert the number of new employees for the project to potential increases in regional population levels. Based on the results of the economic study conducted for the coastal area, it is estimated that increasing employment by 1 would translate into an increase of 2.2 residents from direct and induced economic growth, assuming that unemployment rates are relatively low.

To be conservative, it is assumed that for employment that depends on economic forces outside the local economy (e.g., Projects #3 and #4), each additional employee would result in a potential increase in population within the ROI, so long as unemployment rates have not increased significantly. However, to the extent that a sector has reached a saturation level, this assumption could overestimate the economic impact of the project. For example, Project #3 may take business from other resorts in the area, rather than attracting additional customers and commerce to the ROI, resulting in little or no net increase in economic growth. Furthermore, if unemployment increases in the area, issuing a permit for Project #3 may not result in a net increase in population, but rather a slight decrease in the unemployment rate. To address the "market saturation" and "unemployment" issues discussed above, it is recommended that population and employment levels in the ROI be monitored on an annual basis in order to determine how the economy is responding to permitting decisions over time.

In the event that employment levels remain below those projected for the Most-Likely and Low-Growth Scenarios (see Table 1), permitting Projects #3, #4, and #5 may not result in increases in population or economic growth above levels assumed for the Most-Likely Growth Scenario. Current employment levels should be compared with predicted levels to determine whether the ROI can supply the labor for Projects #3, #4, and #5 without increasing overall population levels. For example, if actual employment levels in 2005 are 10,000 below those estimated for the Most-Likely Growth Scenario, issuing a permit for Project #3, which would employ 1,000 workers, would not shift overall employment for the ROI above the levels assumed for the Most-Likely Growth Scenario. Therefore, the Most-Likely Growth Scenario should be used for the cumulative effects section.

Assuming unemployment levels are commensurate with estimates presented in Table 1, incremental *potential* change in population levels associated with Projects #3 through #6 can be estimated as presented below:

Project #3: 2,200 residents (2.2 residents/employee x 1,000 employees = 2,000 new residents)

Project #4: 220 residents (2.2 residents/employee x 100 employees = 220 new residents)

Project #5: 4,400 residents (2.2 residents/employee x 2000 employees = 4,400 residents)

Project #6: 340 residents/year (Project #6 does not represent a business activity, but rather housing that may attract additional retirees to the coast from outside the ROI. In this case, it is only necessary to estimate the additional retirees who come to the coastal area from outside the ROI. As with Project #2, housing units

that primarily serve the local economy are already considered part of the Most-Likely Growth Scenario. As discussed above, there were 12,000 units to be built over 20 years, half of which were set aside for retirees, and two-thirds of that amount were estimated to be filled by retirees from outside the ROI; therefore, the annual number of units to be filled would be 200 units/year (e.g., 12,000 units/20 years x ½ x ? = 200 units/year). Market analysis reveals that 1.7 individuals would occupy one retiree unit; therefore a total of 340 new residents would locate to the area annually (200 units/year x 1.7 residents/unit = 340 residents.)

The appropriate growth scenario can be identified by adding the estimated potential increase in population associated with the new project to the estimated population level in the year in which the business would open, and then comparing that with those levels assumed for the growth scenarios as presented in Table 1. For example, if the population within the ROI in 2005 is projected to be 387,000 (based on the latest census projection) and Project #3 may increase that level by 2,000, the new total could be as high as 389,000. As shown in Table 1, the estimated population in 2005 is commensurate with those assumed for the Most-Likely/Low-Growth Scenarios; therefore, the Most-Likely Growth Scenario would be the most appropriate scenario for characterizing future cumulative effects. If Projects #3, #4, and #5 are being considered together, then the potential increase in population may be as high as 394,000 (387,000 + 6,800 = 394k). In this case, the coastal area may experience growth between levels estimated for the Most-Likely and Medium-Growth Scenarios. It would be recommended that the analyst include cumulative effects information on both scenarios and qualitatively discuss the degree to which Medium-Growth impacts may occur.

3. ***Consideration of Recently Approved Permits for Large-Scale Developments Awaiting Completion.*** In selecting an appropriate growth scenario, it is important to continue to track permits that have been approved but are still under construction. Population and employment projections should be included with other pending permit estimates when assessing the effect of future permit impacts on growth. For example, if the Corps of Engineers has already approved three projects similar to Project #3, and Projects #3, #4, and #5 come before the Corps for consideration for the year 2005, the potential cumulative population levels would be 400,000 (387,000 + 6,800 + 6,600 = 400k), assuming the area has relatively low unemployment. This growth in economic activity would be commensurate with a Medium-Growth Scenario (as shown in Table 1).

Documenting Long-Term Cumulative Effects. Once the appropriate growth scenario is identified as detailed above, the NEPA analyst may choose to incorporate the appropriate long-term cumulative effects summary table into the NEPA document (see Tables 2, 3, and 4). These tables may be augmented to include more localized effects, as appropriate. For example, it may be appropriate to highlight cumulative impacts for the specific subwatershed where the project is going to be located. This information can be found in the Water Resources section of the EIS for the selected growth scenario. Consideration should also be given to the extent to which RCPs have been applied to reduce long-term cumulative effects, particularly for those resource areas that may be considered significant. The benefits associated with RCP implementation may be documented using the results of the EIS (as provided in Section 5.0 for each resource) and/or augmented using qualitative analyses, as appropriate.

Table 2
Summary of Regional Cumulative Effects in 2020
Under Most-Likely Growth Conditions

Resource	Long-Term Regional Cumulative Effects in 2020	Description of Principal Cumulative Effects
Socioeconomics: Economics	Population: 431k (+64k) Employment: 252k (+30k) GRP: $14.5B (+$4.6B)	• Percent growth relative to 2000: Population: 17%; Employment: 14%; and GRP: 46% • Hancock and Jackson Counties projected to have robust growth (~25%) unrelated to casino/tourism activities, while only 10% growth is projected for Harrison County to 2020. • 8% of casino/tourism growth in Harrison and Hancock Counties would spill into Jackson County. This would result in less than 1% growth in Jackson County, under the most-likely scenario.
Socioeconomics: Public Services and Safety	Minor Adverse Effects	• Public services should be able to respond to growing population levels within the ROI, although short-term minor adverse effects may occur. • Minor adverse effects on public safety may occur based on past trends in crime rates.
Socioeconomics: Environmental Justice	Minor Adverse and Beneficial Effects	• Adverse effects include increased potential for encroachment and displacement of minority and low-income neighborhoods due to land acquisition for roads and other development projects. • Beneficial effects may include increased employment opportunities and wage increases.
Socioeconomics: Protection of Children	Minor Adverse Effects	• Increases in development, traffic, and potentially minor increases in gaming may result in minor increases in risk to children. As cited in the *National Gambling Impact Study Commission Report*, gaming may pose increased risk to children. Development and increased traffic may pose safety risks to children.
Land Use/Land Cover	No land use conflicts, with minor cover changes expected by 2020 (11k acres of new developed land in the three-county area)	Coastal Counties in 2020: • Developed: 9% (8% in 2000) • Impervious: 3% (2.6% in 2000) • High-Density Development: 3% (2% in 2000) • Loss of Natural Areas: 8k acres (<1% of available habitat) Coastal Study Area in 2020: • Developed: 22% (20% in 2000) • Impervious: 5% (4% in 2000) • High-Density Development: 8% (5% in 2000) • Loss of Natural Areas: 3k acres (1.7% of available habitat)
Water Resources	Minor to Moderate Adverse Effects	• Primary impacts due to increased pathogen, nutrient, and BOD_5 loadings, particularly during storm events. Inadequate storm water control (due to serious wetlands loss and increased impervious surface) and septic tank failures would continue to be the major causes of water quality impairments along the coast. • Many waterbodies in the region are included on the state's 303(d) list, primarily as a result of pathogens, nutrients, and BOD_5 loadings. Subwatersheds that would likely experience the most significant decline in water quality relative to current conditions due to increased loadings of these parameters are De Lisle, Lower Wolf River, Rotten Bayou, Tuxachanie Creek, and (to a lesser extent) Biloxi River. • Turkey Creek–Old Fort Bayou is already significantly impaired and would not experience dramatic changes in loadings.

Table 2
Summary of Regional Cumulative Effects in 2020
Under Most-Likely Growth Conditions (continued)

Resource	Long-Term Regional Cumulative Effects in 2020	Description of Principal Cumulative Effects
Geology, Soils, and Groundwater	Negligible to Minor Adverse Effects	• Soil loss might be reduced in some subwatersheds due to loss of agricultural land cover, whereas soil loss might increase to a very minor extent in other subwatersheds. • Improper installation or maintenance of septic tanks located in hydric soils has caused septic tank failures, which have resulted in adverse impacts on water quality. The predicted 17% increase in population by 2020 may cause a measurable increase the number of septic tank failures unless corrective measures are put in place. • There are insufficient data to quantify the carrying capacity of groundwater aquifers in the region. Lowering of the groundwater table and saltwater intrusion might occur in the future. It is unclear, however, whether the carrying capacity of these aquifers would be reached in 20 years. Data suggest the infrastructure is sufficient to address future needs.
Biological Resources: Terrestrial Life	Negligible to Minor Adverse Effects	• Loss of 8k acres of natural area cover within the three-county area, or <1% of available natural habitat (nearly 2% of available natural habitat in the Coastal Study Area). Loss of 1k acres of wet pine savanna habitat would be expected as would the loss of nearly 1.3k acres of emergent wetlands (principally due to lack of replenishment of sediments to coastal wetland habitat and storm events). Other habitat loss includes upland deciduous forest, bottomland forests/swamp, upland coniferous forest, and scrub-shrub habitat. • One-third of habitat loss expected within the Coastal Study Area. Negligible adverse effects are expected north of I-10.
Biological Resources: Emergent Wetlands	Minor Adverse Effects	• Loss of nearly 1,300 acres (6%) of emergent wetlands in the Coastal Study Area. Cumulative loss of 1/3 of available emergent wetlands from early 1970s to 2020.
Biological Resources: Aquatic Life	Minor Adverse Effects	• Significant cumulative adverse effects on aquatic life from human activities and natural causes have occurred, particularly in seagrass beds, over the past several decades. • Significant deterioration of aquatic life habitat has occurred, including adverse fluctuations in salinity levels, erosion due to severe weather events, nutrient loadings, and direct loss due to development and shoreline protection measures. • Continued incremental degradation and loss of aquatic habitat from development; recovery of habitats and species made more difficult. • Loss of 6% of emergent wetlands, a critical aquatic habitat. • Continued losses of aquatic plants and EFH; shrimp and blue crab populations decline.
Biological Resources: Rare, Threatened, and Endangered Species	Minor to Significant Adverse Effects (depending on the species)	• Federally listed species would not be expected to reach recovery goals with continuation of historical growth and current management approaches. • Of particular note is the possible extinction of the Mississippi gopher frog in the absence of significant intervention. • Loss of 1% of wildlife habitat from land use conversion. • Wetland loss of 6% reduces habitat for marine mammals, marine turtles, seabirds. • Loss of shoreline nesting habitat for marine turtles. • Losses of habitat and declines in species from mining, timber harvesting, land use conversion, intensive recreational use of the coast.

Table 2
Summary of Regional Cumulative Effects in 2020
Under Most-Likely Growth Conditions (continued)

Resource	Long-Term Regional Cumulative Effects in 2020	Description of Principal Cumulative Effects
Cultural Resources	Minor Adverse Effects	• Increased potential for development to encroach on historic districts or increase pressure to modify historic structures. • Increased potential to disturb yet-undiscovered archaeological sites.
Air Quality	Negligible to Minor Adverse Effects	• Increase in population would result in increased car transportation and mobile emissions, but technological advances could keep air quality from deteriorating or cause it to improve slightly.
Noise	Negligible to Minor Adverse Effects	• An overall minor increase in noise levels. • Increases in levels of noise along transportation corridors. • Background noise levels increase by 10 to 20 dB compared with current conditions, from transportation, construction, general urban expansion.
Utilities	Minor to Moderate Adverse Effects	• Overall, levels of service should be maintained through adaptive management even with a 17.5% increase in population. • Adverse effects include increased potential for flooding in the Turkey Creek–Old Fort Bayou watershed from increases in impervious surface, and increased septic tank failures.
Transportation	Negligible to Minor Adverse Effects	• Air and public transportation systems would be sufficient and relatively unaffected. • Public safety risks would continue to increase at railroad crossings. • Minor effects on road transportation as traffic congestion increases.
Visual and Aesthetic Resources	Negligible to Minor Adverse Effects	• Development encroaching on historic structures and natural areas could adversely affect visual and aesthetic vistas in the region; light pollution increases in urban areas.

Table 3
Summary of Regional Cumulative Effects in 2020
Assuming Medium-Growth Conditions (2X the Most-Likely Growth Rate)

Resource	Long-Term Regional Cumulative Effects in 2020	Description of Principal Cumulative Effects
Socioeconomics: Economics	Population: 502k (+134k) Employment: 297k (+73k) GRP: $16.8B (+6.9B)	• Percent growth relative to 2000: Population: 37%; employment: 32%; and GRP: 70% • Harrison and Hancock Counties would grow by more than 40%, with over 70% of this growth directly attributed to the casino/tourism sector. Jackson County projected to have robust growth (~28%). • 8% of casino/tourism growth in Harrison and Hancock Counties would spill into Jackson County. This would result in an 18% increase in growth in Jackson County, under the medium-growth scenario.
Socioeconomics: Public Services and Safety	Minor to Significant Adverse Effects	• Public services should be able to respond to growing population levels within the ROI, although short-term minor adverse effects may occur. • Minor adverse effects on public safety may occur based on past trends in crime rates.
Socioeconomics: Environmental Justice	Minor Adverse and Beneficial Effects	• Adverse effects include increased potential for encroachment and displacement of minority and low-income neighborhoods due to land acquisition for roads and other development projects. • Beneficial effects may include increased employment opportunities and wage increases.
Socioeconomics: Protection of Children	Minor to Significant Adverse Effects	• Moderate increases in development, traffic, and potentially gaming may result in minor to significant increased risk to children. Development and increased traffic may pose safety risks to children. As cited in the *National Gambling Impact Study Commission Report*, gaming may pose increased risk to children. Possible effects on children associated with gaming as cited in the report include family disintegration, substance abuse, and increases in criminal activity.
Land Use/Land Cover	No land use conflicts, with moderate cover changes expected by 2020 (23k acres of new developed land in the three-county area)	Coastal Counties in 2020: • Developed: 10% (8% in 2000) • Impervious: 3.5% (2.6% in 2000) • High-Density Development: 3.6% (2% in 2000) • Loss of Natural Areas: 18k acres (2% of available habitat) Coastal Study Area in 2020: • Developed: 24% (20% in 2000) • Impervious: 6% (4% in 2000) • High-Density Development: 11% (5% in 2000) • Loss of Natural Areas: 8k acres (4% of available habitat)

Table 3
Summary of Regional Cumulative Effects in 2020
Assuming Medium-Growth Conditions (2X the Most-Likely Growth Rate) (continued)

Resource	Long-Term Regional Cumulative Effects in 2020	Description of Principal Cumulative Effects
Water Resources	Minor to Significant Adverse Effects	• Primary impacts due to increased pathogen, nutrient, and BOD_5 loadings, particularly during storm events. Inadequate storm water control (due to serious wetlands loss and increased impervious surface) and septic tank failures would continue to be the major causes of water quality impairments along the coast. • Many waterbodies in the region are included on the state's 303(d) list, primarily as a result of pathogens, nutrients, and BOD_5 loadings. Subwatersheds that would likely experience the most significant decline in water quality relative to current conditions due to increased loadings of these parameters are De Lisle, Lower Wolf River, Rotten Bayou, Tuxachanie Creek, and (to a lesser extent) Biloxi River. • Turkey Creek–Old Fort Bayou is already significantly impaired and would not experience dramatic changes in loadings. However, additional increases in impervious surface, along with minor increases in loadings, would result in additional impairments in Turkey Creek–Old Fort Bayou.
Geology, Soils, and Groundwater	Negligible to Minor Adverse Effects on Geology and Soils. Groundwater effects are uncertain.	• Soil loss might be reduced in some subwatersheds due to loss of agricultural land cover, whereas soil loss might increase to a minor extent in other subwatersheds. • Improper installation or maintenance of septic tanks located in hydric soils has caused septic tank failures, which have resulted in significant adverse impacts on water quality. The predicted 37% jump in population by 2020 may increase the number of septic tank failures unless corrective measures are put in place. • There are insufficient data to quantify the carrying capacity of groundwater aquifers in the region. Lowering of the groundwater table and saltwater intrusion might occur in the future. It is unclear, however, whether the carrying capacity of these aquifers would be reached in 20 years. Nonetheless, there is the potential for serious deterioration of the groundwater aquifer resource in the long-term under the medium-growth scenario. Therefore, additional study is needed.
Biological Resources: Terrestrial Life	Negligible to Minor Adverse Effects	• Loss of 18k acres of natural area cover within the three county area, or 2% of available natural habitat (4% of available natural habitat in the Coastal Study Area). Loss of nearly 3k acres of wet pine savanna habitat would be expected as would the loss of 3.2k acres of emergent wetlands (principally due to a lack of replenishment of sediments to coastal wetland habitat and storm events). Other habitat loss includes upland deciduous forest, bottomland forests/swamp, upland coniferous forest, and scrub-shrub habitat. • Nearly half of the habitat loss would be expected from within the Coastal Study Area. Negligible adverse effects are expected north of I-10.
Biological Resources: Emergent Wetlands	Significant Adverse Effects	• Loss of 3,200 acres (14%) of emergent wetlands in the Coastal Study Area. Cumulative loss of 40% of available emergent wetlands from early 1970s to 2020.

Table 3
Summary of Regional Cumulative Effects in 2020
Assuming Medium-Growth Conditions (2X the Most-Likely Growth Rate) (continued)

Resource	Long-Term Regional Cumulative Effects in 2020	Description of Principal Cumulative Effects
Biological Resources: Aquatic Life	Minor to Moderate Adverse Effects	• Significant cumulative adverse effects on aquatic life from human activities and natural causes have occurred, particularly on seagrass beds, over the past several decades. • Significant deterioration of aquatic life habitat has occurred, including adverse fluctuations in salinity levels, erosion due to severe weather events, nutrient loadings, and direct loss due to development and shoreline protection measures. • Continued incremental degradation and loss of aquatic habitat from development; recovery of habitats and species made more difficult. • Loss of 14% of emergent wetlands, a critical aquatic habitat. • Continued losses of aquatic plants and EFH; shrimp and blue crab populations decline.
Biological Resources: Rare, Threatened, and Endangered Species	Minor to Significant Adverse Effects	• Federally listed species would not be expected to reach recovery goals with continuation of historical growth and current management approaches. • Of particular note is the possible extinction of the Mississippi gopher frog in the absence of significant intervention. • Loss of 2% of wildlife habitat from land use conversion. • Wetland loss of 14% reduces habitat for marine mammals, marine turtles, seabirds. • Loss of shoreline nesting habitat for marine turtles. • Losses of habitat and declines in species from mining, timber harvesting, land use conversion, intensive recreational use of the coast.
Cultural Resources	Minor to Moderate Adverse Effects	• Increased potential for development to encroach on historic districts or increase pressure to modify historic structures. • Increased potential to disturb yet-undiscovered archaeological sites.
Air Quality	Minor to Moderate Adverse Effects	• Growth could result in a 36% population increase, with associated mobile source emission increases, and the area could be designated in nonattainment for ozone.
Noise	Minor to Moderate Adverse Effects	• An overall minor to moderate increase in noise levels. • Increases in levels of noise along transportation corridors and increased construction noise, with a larger overall area being affected than under the most-likely growth scenario. • Background noise levels increase up to 20 dB compared with current conditions, from transportation, construction, general urban expansion.
Utilities	Minor to Moderate Adverse Effects	• Overall, levels of service should be maintained through adaptive management even with a 36% increase in population. • Adverse effects include increased potential for flooding in the Turkey Creek–Old Fort Bayou watershed from increases in impervious surface and increased septic tank failures.
Transportation	Negligible to Minor Adverse Effects and Significant Adverse Impacts	• Delays in air transportation could increase with increased passenger volume and airport expansion construction. • Public transportation systems would have minor delays as the system reaches and temporarily exceeds capacity. • Public safety risks would continue to increase at railroad crossings. • Moderate effects on road transportation as traffic congestion increases.
Visual and Aesthetic Resources	Minor to Moderate Adverse Effects	• High-density development might encroach on historic structures and natural areas, which could adversely affect visual and aesthetic vistas in the region.

Table 4
Summary of Regional Cumulative Effects in 2020
Assuming High-Growth Conditions (3X the Most-Likely Growth Rate)

Resource	Long-Term Regional Cumulative Effects in 2020	Description of Principal Cumulative Effects
Socioeconomics: Economics	Population: 565k (+197k) Employment: 337k (+111k) GRP: $18.7B (+8.8B)	• Percent growth relative to 2000: Population: 54%; Employment: 50%; and GRP: 89% • Harrison and Hancock Counties would grow by more than 60%, with 80% of this growth directly attributed to the casino/tourism sector. Jackson County projected to have robust growth (~32%). • 8% of casino/tourism growth in Harrison and Hancock Counties would spill into Jackson County. This would result in a 25% increase in growth in Jackson County, under the high-growth scenario.
Socioeconomics: Public Services and Safety	Minor to Significant Adverse Effects	• Public services should be able to respond to growing population levels within the ROI, although short-term minor adverse effects may occur. • Minor to significant adverse effects on public safety may occur based on past trends in crime rates.
Socioeconomics: Environmental Justice	Minor Adverse and Beneficial Effects	• Adverse effects include increased potential for encroachment and displacement of minority and low-income neighborhoods due to land acquisition for roads and other development projects. • Beneficial effects may include increased employment opportunities and wage increases.
Socioeconomics: Protection of Children	Minor to Significant Adverse Effects	• High increases in development, traffic, and possibly gaming may result in minor to significant increased risk to children. Development and increased traffic may pose safety risks to children. As cited in the *National Gambling Impact Study Commission Report*, gaming may pose increased risk to children. Possible effects on children associated with gaming as cited in the report include family disintegration, substance abuse, and increases in criminal activity.
Land Use/Land Cover	No land use conflicts, although major cover changes expected by 2020 (34k acres of new developed land in the three-county area)	Coastal Counties in 2020: • Developed: 11% (8% in 2000) • Impervious: 4% (2.6% in 2000) • High-Density Development: 4.2% (2% in 2000) • Loss of Natural Areas: 26k acres (3% of available habitat) Coastal Study Area in 2020: • Developed: 26% (20% in 2000) • Impervious: 7% (4% in 2000) • High-Density Development: 14% (5% in 2000) • Loss of Natural Areas: 12k acres (6% of available habitat)
Water Resources	Minor to Significant Adverse Effects	• Primary impacts due to increased pathogen, nutrient, and BOD_5 loadings, particularly during storm events. Inadequate storm water control (due to serious wetlands loss and increased impervious surface) and septic tank failures would continue to be the major causes of water quality impairments along the coast. • Many waterbodies in the region are included on the state's 303(d) list, primarily as a result of pathogens, nutrients, and BOD_5 loadings. Subwatersheds that would likely experience the most significant decline in water quality relative to current conditions due to increased loadings of these parameters are De Lisle, Lower Wolf River, Rotten Bayou, Tuxachanie Creek, and (to a lesser extent) Biloxi River. • Turkey Creek–Old Fort Bayou is already significantly impaired and would not experience dramatic changes in loadings. However, significant increases in impervious surface under the high-growth scenario, along with minor increases in loadings, would result in additional impairments in Turkey Creek–Old Fort Bayou.

Table 4
Summary of Regional Cumulative Effects in 2020
Assuming High-Growth Conditions (3X the Most-Likely Growth Rate) (continued)

Resource	Long-Term Regional Cumulative Effects in 2020	Description of Principal Cumulative Effects
Geology, Soils, and Groundwater	Negligible to Minor Adverse Effects on Geology and Soils. Groundwater effects are uncertain.	• Soil loss might be reduced in some subwatersheds due to loss of agricultural land cover, whereas soil loss might increase to a minor extent in other subwatersheds. • Improper installation or maintenance of septic tanks located in hydric soils has caused septic tank failures, which have resulted in significant adverse impacts on water quality. The predicted 54% jump in population by 2020 may increase the number of septic tank failures unless corrective measures are put in place. • There are insufficient data to quantify the carrying capacity of groundwater aquifers in the region. Lowering of the groundwater table and saltwater intrusion might occur in the future. It is unclear, however, whether the carrying capacity of these aquifers would be reached in 20 years. Nonetheless, there is the potential for serious deterioration of the groundwater aquifer resource in the long-term under the-high growth scenario. Therefore, additional study is needed.
Biological Resources: Terrestrial Life	Negligible to Minor Adverse Effects	• Loss of 26k acres of natural area cover within the three-county area, or 3% of available natural habitat (6% of available natural habitat in the Coastal Study Area). Loss of nearly 4k acres of wet pine savanna habitat would be expected and over 5k acres of emergent wetlands (principally due to lack of replenishment of sediments to coastal wetland habitat and storm events). Other habitat loss includes upland deciduous forest, bottomland forests/swamp, upland coniferous forest, and scrub-shrub habitat. • Nearly half of the habitat loss would be expected from within the Coastal Study Area. Negligible adverse effects are expected north of I-10.
Biological Resources: Emergent Wetlands	Significant Adverse Effects	• Loss of emergent wetlands in the Coastal Study Area could reach 5,000 acres (21%). • Cumulative losses of emergent wetlands in the Coastal Study Area of 45%.
Biological Resources: Aquatic Life	Minor Adverse Effects	• Significant cumulative adverse effects on aquatic life from human activities and natural causes have occurred, particularly in seagrass beds, over the past several decades. • Significant deterioration of aquatic life habitat has occurred, including adverse fluctuations in salinity levels, erosion due to severe weather events, nutrient loadings, and direct loss due to development and shoreline protection measures. • Continued incremental degradation and loss of aquatic habitat from development; recovery of habitats and species made more difficult. • Loss of 21% of emergent wetlands, a critical aquatic habitat. • Continued losses of aquatic plants and EFH; shrimp and blue crab populations decline.
Biological Resources: Rare, Threatened, and Endangered Species	Minor to Significant Adverse Effects	• Federally listed species would not be expected to reach recovery goals with continuation of historical growth and current management approaches. • Of particular note is the possible extinction of the Mississippi gopher frog in the absence of significant intervention. • Loss of 3% of wildlife habitat from land use conversion. • Wetland loss of 21% reduces habitat for marine mammals, marine turtles, seabirds. • Loss of shoreline nesting habitat for marine turtles. • Losses of habitat and declines in species from mining, timber harvesting, land use conversion, intensive recreational use of the coast.

Table 4
Summary of Regional Cumulative Effects in 2020
Assuming High-Growth Conditions (3X the Most-Likely Growth Rate) (continued)

Resource	Long-Term Regional Cumulative Effects in 2020	Description of Principal Cumulative Effects
Cultural Resources	Minor Adverse Effects	• Increased potential for high-intensity development to encroach on historic structures. • Increased potential to disturb yet-undiscovered archaeological sites.
Air Quality	Minor to Significant Adverse Effects	• Population growth of 54% would result in increased mobile emissions, some increased industrial emissions, and the area possibly being designated in nonattainment for ozone.
Noise	Moderate Adverse Effects	• An overall moderate increase in noise levels. • Increases in levels of noise along transportation corridors and increased construction noise, with a larger overall area being affected than under the medium-growth scenario. • Background noise levels increase up to or more than 20 dB compared with current conditions, from transportation, construction, general urban expansion.
Utilities	Moderate Adverse Effects	• Most utility levels of service should be maintained through adaptive management even with a 54% increase in population; water supply could become limited; may need to add wastewater treatment facilities and landfills or expand existing ones. • Adverse effects include increased potential for flooding in five watersheds from increases in impervious surface, and increased septic tank failures.
Transportation	Moderate to Major Adverse Effects	• Airport delays could result with increased annual passenger volume and necessary expansion construction. • Public transportation systems could have major delays as the system exceeds capacity and expansion is necessary in routes and equipment. • Public safety risks would continue to increase at railroad crossings. • Major effects on road transportation as traffic congestion increases and major system expansion and construction are necessary.
Visual and Aesthetic Resources	Minor to Significant Adverse Effects	• High-density development would encroach on historic structures and natural areas, adversely affecting visual and aesthetic vistas in the region.

Appendix C

Point Source Discharge Locations

Table 1
Point Source Discharge Locations

Identification Number	Facility Name	City	County	Receiving Water	Major Or Minor	Average Design Flow (Million Gallons/Day)
			Bayou La Croix			
MS0023337*	Waveland Reg. Bay St.Louis Lag	Bay Saint Louis	Hancock	Watts Bayou Tributary	Major	1.260
MS0027847	Srwmd/Waveland POTW	Waveland	Hancock	Edwards Bayou	Major	4.900
MS0031020	Stennis Air Industrial Park	Bay Saint Louis	Hancock	Bayou Marone	Minor	0.080
MS0046078	Diamondhead Water/Sewer District	Bay Saint Louis	Hancock	Jourdan River	Major	2.500
MS0055981	Williams Express Inc	Bay Saint Louis	Hancock	Unnamed Tributary into St Louis Bay	Minor	0.025
			Biloxi River			
MS0002925	Mississippi Power Company	Gulfport	Harrison	Biloxi Back Bay	Major	336.900
MS0027154	Riverline Hills Sub Division	Gulfport	Harrison	Little Biloxi River	Minor	0.100
MS0044351	Cavenham Forest Industries	Lyman	Harrison	Little Biloxi River	Minor	0.031
MS0044369	Cavenham Forest Industries	Lyman	Harrison	Little Biloxi River	Minor	0.031
MS0055298	Speedway Super America LLC	Gulfport	Harrison	Unnamed Tributary Thence Biloxi River	Minor	0.014
			De Lisle			
MS0003115	Mississippi Phosphates Corporation	Pascagoula	Jackson	Bayou Casotte	Major	17.000
			Rotten Bayou			
MS0043231	Pecan Grove Sanitary Landfill	Pass Christian	Harrison	Delisle Creek	Minor	0.025
MS0056774	Ladners Grocery	Gulfport	Harrison	Lasalle Bayou	Minor	0.007
			Turkey Creek – Old Fort Bayou			
MS0001520	Reichhold Chemicals Inc.	Gulfport	Harrison	Big Lake	Minor	0.025
MS0001562	R. Fournier and Sons Seafood Inc.	D'Iberville	Harrison	Back Bay of Biloxi	Minor	0.010
MS0001589	R.A. Fayard Seafood Company Inc.	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.099
MS0001759	Weems Brothers Seafood	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.001
MS0002020	Ashco Division Bactolac Pharma	Gulfport	Harrison	Brickyard Bayou	Major	0.050
MS0002682*	Hygiene Crab Company Inc.	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.008
MS0002852	Taber Metals Gulfport LP	Gulfport	Harrison	Brickyard Bayou	Minor	0.400
MS0002861	C.F. Gollott and Son Seafood Co.	D'Iberville	Harrison	Back Bay of Biloxi	Minor	0.083
MS0003298*	Chemfax Incorporated-Gulfport	Gulfport	Harrison	Bayou Bernard	Minor	0.010
MS0020907*	Harrison County Long Beach Plant	Long Beach	Harrison	Johnson Bayou	Major	2.000
MS0022373	Long Beach Industrial Park	Gulfport	Harrison	Johnson Bayou	Minor	0.600
MS0023159	HC/East Biloxi POTW	Gulfport	Harrison	Keegan Bayou and Back Bay of Biloxi	Major	10.000
MS0023345	HC/Gulfport POTW	Gulfport	Harrison	Bernard Bayou (Segment 168)	Major	16.000
MS0023523	Windance Subdivision	Gulfport	Harrison	Bayou Bernard	Minor	0.080
MS0024082*	Gulf Coast Regional-Ocean Springs	Ocean Springs	Jackson	Tidewater Bayou	Major	2.200
MS0027537	Bernard Bayou Industrial Park	Gulfport	Harrison	Bernard Bayou	Minor	0.600
MS0030333	HC/West Biloxi POTW	Biloxi	Harrison	Back Bay of Biloxi	Major	9.000

Table 1
Point Source Discharge Locations

Identification Number	Facility Name	City	County	Receiving Water	Major Or Minor	Average Design Flow (Million Gallons/Day)
MS0034410	U-Wash-M Carwash	D'Iberville	Harrison	St Martin Bayou	Minor	0.002
MS0034436	HC/Eagle Point POTW	Gulfport	Harrison	Biloxi River	Minor	0.182
MS0034878	Channel Chemical Corporation	Gulfport	Harrison	Bernard Bayou	Minor	0.005
MS0034924	Spee-D-Wash Carwash	Gulfport	Harrison	Brickyard Bayou	Minor	0.001
MS0036315	Seymour and Sons Seafood Inc.	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.042
MS0036650	Moore and Munger Inc.	Pass Christian	Harrison	Bayou Portage	Minor	0.040
MS0037001	Ocean Springs Seafood Company Inc.	Ocean Springs	Jackson	Back Bay of Biloxi	Minor	0.042
MS0037656	R.A. Lesso Seafood Company Inc.	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.007
MS0040142	Golden Gulf Coast Packing Co.	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.198
MS0043028*	Sunbelt Chemical	Gulfport	Harrison	Bernard Bayou	Minor	
MS0043141	HC/Long Beach-Pass Christian	Gulfport	Harrison	Bayou Portage	Major	7.000
MS0043249*	MS Air National Guard	Gulfport	Harrison	NA	Minor	NA
MS0044466	M and M Shrimp Company Inc.	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.044
MS0044580	Cavenham Forest Industries Inc.	Gulfport	Harrison	Bernard Bayou	Minor	0.049
MS0045004	Custom Pack Inc.	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.060
MS0045012	J and W Seafood	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.040
MS0045519	Gulf Coast Pre-Stressed Co.	Pass Christian	Harrison	Bayou Portage	Minor	0.006
MS0045772	Munro Petroleum and Terminal	Biloxi	Harrison	Back Bay of Biloxi	Minor	
MS0045926	Custom Pack Inc.	Ocean Springs	Jackson	Simmons Bayou	Minor	1.008
MS0046493	G and R Seafood L.L.C.	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.060
MS0047252*	Cvitanovich Packing Company	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.014
MS0052400	David Gollot Seafood, Inc.	Biloxi	Harrison	Back Bay of Biloxi	Minor	0.081
			Tuxachanie Creek			
MS0037028	C.J. Davis Slaughterhouse Inc.	Biloxi	Harrison	Howard Creek	Minor	0.002
MS0042269	Finicky Pet Food Company Inc.	Pascagoula	Jackson	Pascagoula River East	Minor	0.004
MS0042340	HC/D'Iberville POTW	Gulfport	Harrison	Back Bay of Biloxi	Major	1.156
MS0045446	GC/West Jackson County POTW	Pascagoula	Jackson	Costapia Bayou	Major	5.000
			Upper Jourdan River			
MS0022870	Tesi/Jourdan River Shores	Bay Saint Louis	Hancock	Jourdan River	Minor	0.050
			Upper Wolf River			
MS0055875	Pearl River Chip Mill	Poplarville	Pearl River	Unnamed Tributary/Poplar Springs	Minor	0.360
MS0056456*	MS Carbamate Company, Inc.	Poplarville	Pearl River	NA	Major	NA

* Inactive facilities, NA - Data not available

Source: USEPA, 2001b.

Appendix D

Detailed Coastal Mississippi Land Uses

Table 1
Bay St. Louis Distribution by Subwatershed

Land Use	Bayou La Croix 03170009130	DeLisle 03170009120	Lower Wolf River/Cane Creek 03170009090	Rotten Bayou 03170009110	Upper Jourdan River 03170009100	Upper Wolf River 03170009080	Total Land Use Area
Surface Water/Other	43,194	6,092	934	341	1,442	864	52,867
Upland Pine Forest	6,999	2,621	17,123	6,538	23,188	24,603	81,072
Upland Mixed Forest	2,425	719	6,939	3,226	11,028	19,747	44,084
Upland Deciduous Forest	2,168	310	5,244	2,143	8,847	11,799	30,511
Upland/Wet Cutover Land/Burned Area	3,317	528	5,497	1,886	6,472	7,784	25,484
Upland/Wet Sand/Barren Land	937	298	1,989	627	1,829	1,381	7,061
Wet Pine Forest/Pine Savanna	19,495	1,450	6,768	3,774	17,689	6,463	55,639
Upland/Wet Scrub/Shrub	14,533	1,346	19,397	8,221	29,185	31,864	104,546
Bottomland Hardwood Forest/Swamp	13,310	978	12,712	2,664	16,251	13,874	59,789
Emergent Wetland	9,927	3,327	1,337	275	457	9	15,332
Cropland/Pasture/Grassland	2,075	1,297	15,715	5,642	26,293	14,847	65,869
High Density Urban	1,303	402	604	225	374	113	3,021
Medium Density Urban	5,722	759	1,663	1,826	1,225	393	11,588
Transportation	2,002	613	231	101	65	362	3,374
Total Acreage	127,408	20,740	96,154	37,491	144,347	134,103	560,243

Table 2
Biloxi Bay and The Islands Land Use Distribution by Subwatershed

Land Use	Biloxi River 03170009140	Turkey Creek/Old Fort Bayou 03170009160	Tuxachanie Creek 03170009150	Biloxi Bay Land Use Total	Percent of Total	The Islands 03170009170	The Islands Land Use Total	Percent of Total
Surface Water/Other	1,083	15,956	1,168	18,207	3.74	85,665	85,665	96.76
Upland Pine Forest	52,073	10,612	44,318	107,003	22.01	415	415	0.47
Upland Mixed Forest	14,819	5,998	10,964	31,781	6.53	0	0	0
Upland Deciduous Forest	4,346	4,961	3,191	12,498	2.57	0	0	0
Upland/Wet Cutover Land/Burned Area	10,004	3,863	7,427	21,294	4.38	0	0	0
Upland/Wet Sand/Barren Land	2,339	3,351	1,472	7,162	1.47	1,053	1,053	1.19
Wet Pine Forest/Pine Savanna	20,887	24,129	33,960	78,976	16.24	284	284	0.32
Upland/Wet Scrub/Shrub	26,042	15,740	18,113	59,895	12.32	295	295	0.33
Bottomland Hardwood Forest/Swamp	19,557	16,935	20,321	56,813	11.69	0	0	0
Emergent Wetland	750	5,852	996	7,598	1.56	823	823	0.93
Cropland/Pasture/Grassland	15,608	13,976	9,354	38,938	8.01	0	0	0
High Density Urban	1,282	11,110	1,219	13,611	2.80	0	0	0
Medium Density Urban	2,867	19,815	2,903	25,585	5.26	0	0	0
Transportation	905	5,368	566	6,839	1.41	0	0	0
Total Acreage	172,562	157,667	155,973	486,202		88,535	88,535	

Appendix E

Water Quality Data Tables

Table 1a
1998-2000 Water Quality Statistics for Station 02481667 (Bayou La Croix)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	6	5.67	7.46	6.77	6.73	6.11	7.28
Specific Conductance	µmhos/cm at 25 °C	6	79.00	27,620.00	16,290.33	3,583.72	4,109.75	27,167.50
Water Temperature	°C	4	17.00	30.70	23.70	22.75	17.08	30.18
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	4	5.00	23.00	11.50	9.70	6.50	14.00
Residue, Total Dissolved	mg/L	5	0.06	16.40	11.57	4.73	9.50	16.30
Turbidity	NTU	4	3.00	13.00	9.50	8.27	8.25	12.25
EUTROPHICATION								
NO_2/NO_3	mg/L as N	3	0.02	0.07	0.05	0.04	0.04	0.07
Total NH_3/NH_4+	mg/L as N	4	0.10	0.22	0.15	0.14	0.10	0.20
TKN	mg/L	4	0.36	0.56	0.50	0.49	0.47	0.55
Dissolved Oxygen	mg/L	4	4.14	8.50	7.25	6.97	7.10	8.34
Total Phosphorus	mg/L	4	0.01	0.08	0.05	0.03	0.03	0.07
Transparency, Secchi disc	m	2	0.38	0.65	0.52	0.50	0.45	0.58

Table 1b
1972-1974 Water Quality Statistics for Station 02481667 (Bayou La Croix)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Water Temperature	°C	16	12.00	18.50	14.59	14.30	12.00	17.75
EUTROPHICATION								
BOD 5	mg/L	2	1.20	1.40	1.30	1.30	1.25	1.35
Total NH_3/NH_4+	mg/L as N	2	0.34	0.39	0.37	0.36	0.35	0.38
TKN	mg/L	2	1.12	1.40	1.26	1.25	1.19	1.33
Dissolved Oxygen	mg/L	32	8.39	9.50	9.07	9.07	8.88	9.42

Table 2a
1998-2000 Water Quality Statistics for Station 02481675 (Bayou La Croix)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	5	7.82	7.94	7.89	7.89	7.87	7.92
Specific Conductance	µmhos/cm at 25 °C	7	133.80	39,750.00	31,420.40	16,393.47	33,765.00	39,105.00
Water Temperature	°C	5	18.88	30.10	23.36	22.76	18.89	29.90
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	3	8.00	27.00	17.67	15.72	13.00	22.50
Residue, Total Dissolved	mg/L	7	23.20	34,027.00	5,817.01	464.53	23.45	2,222.00
Turbidity	NTU	3	2.00	6.00	3.67	3.30	2.50	4.50
EUTROPHICATION								
NO_2/NO_3	mg/L as N	3	0.02	0.03	0.02	0.02	0.02	0.03
Total NH_3/NH_4+	mg/L as N	3	0.10	0.14	0.12	0.12	0.11	0.13
TKN	mg/L	3	0.10	0.19	0.13	0.12	0.10	0.15
Dissolved Oxygen	mg/L	3	6.71	12.32	8.65	8.30	6.81	9.62
Total Phosphorus	mg/L	3	0.05	0.07	0.06	0.06	0.06	0.07
Transparency, Secchi disc	m	2	0.71	1.79	1.25	1.13	0.98	1.52
METALS								
Arsenic, total	µg/L as As	2	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	2	1.00	1.00	1.00	1.00	1.00	1.00
Copper, total	µg/L as Cu	2	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	2	5.00	8.00	6.50	6.32	5.75	7.25
Mercury, total	µg/L as Hg	2	0.05	0.50	0.28	0.16	0.16	0.39
Zinc, total	µg/L as Zn	2	10.00	13.00	11.50	11.40	10.75	12.25

Table 2b
1972-1974 Water Quality Statistics for Station 02481675 (Bayou La Croix)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	1	9,000.00	9,000.00	9,000.00	9,000.00		
pH	SU	2	7.40	7.50	7.45	7.45	7.43	7.48
Water Temperature	°C	7	10.00	26.00	15.43	14.64	12.50	17.00
PATHOGENS								
Fecal Coliform	CFU/100ml	3	4.00	223.00	89.00	32.92	22.00	131.50
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	1	44.00	44.00	44.00	44.00		
EUTROPHICATION								
NO_2/NO_3	mg/L as N	4	0.01	0.10	0.08	0.06	0.08	0.10
Total NH_3/NH_4+	mg/L as N	4	0.01	0.06	0.03	0.02	0.01	0.04
TKN	mg/L	4	0.35	0.54	0.47	0.46	0.43	0.53
Dissolved Oxygen	mg/L	14	5.74	11.40	9.01	8.77	7.42	10.11
Total Phosphorus	mg/L	4	0.04	0.08	0.06	0.05	0.04	0.07
METALS								
Arsenic, total	µg/L as As	1	1.00	1.00	1.00	1.00		
Cadmium, total	µg/L as Cd	1	2.00	2.00	2.00	2.00		
Copper, total	µg/L as Cu	1	28.00	28.00	28.00	28.00		
Lead, total	µg/L as Pb	1	6.00	6.00	6.00	6.00		
Mercury, total	µg/L as Hg	1	0.50	0.50	0.50	0.50		
Zinc, total	µg/L as Zn	1	30.00	30.00	30.00	30.00		

Table 3
1998-2000 Water Quality Statistics for Station 639SLB01 (Bayou La Croix)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	26	6.10	8.08	7.58	7.56	7.55	7.89
Specific Conductance	µmhos/cm at 25 °C	30	76.00	36910.00	19844.00	10629.23	9557.75	29392.25
Water Temperature	°C	24	10.80	31.75	21.74	20.78	18.92	25.81
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	14	5.00	53.00	21.29	16.82	11.00	34.00
Residue, Total Dissolved	mg/L	32	0.07	23200.00	9241.45	511.00	12.12	18082.50
Turbidity	NTU	12	2.90	28.00	11.66	8.06	3.00	20.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	12	0.02	0.34	0.06	0.03	0.02	0.04
Total NH_3/NH_4+	mg/L as N	12	0.10	0.77	0.22	0.18	0.13	0.21
TKN	mg/L	13	0.30	0.94	0.54	0.51	0.38	0.63
Dissolved Oxygen	mg/L	16	7.39	11.54	9.50	9.40	8.54	10.55
Total Phosphorus	mg/L	13	0.02	0.11	0.06	0.06	0.05	0.08
'Transparency, Secchi disc	m	9	0.36	1.58	0.91	0.84	0.72	1.05
METALS								
Arsenic, total	µg/L as As	12	0.00	5.00	4.58	4.37	5.00	5.00
Cadmium, total	µg/L as Cd	11	0.10	1.00	0.92	0.81	1.00	1.00
Copper, total	µg/L as Cu	12	0.00	5.00	4.58	4.37	5.00	5.00
Lead, total	µg/L as Pb	12	0.00	5.00	4.58	4.37	5.00	5.00
Mercury, total	µg/L as Hg	11	0.05	0.50	0.46	0.41	0.50	0.50
Zinc, total	µg/L as Zn	11	10.00	10.00	10.00	10.00	10.00	10.00
ORGANICS								
Phenols	µg/L	10	0.05	0.05	0.05	0.05	0.05	0.05

Table 4a
1998-2000 Water Quality Statistics for Station 02480990 (Biloxi River)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	29	2.00	93.00	7.61	4.67	3.90	4.70
pH	SU	31	5.14	7.23	6.18	6.15	5.66	6.56
Specific Conductance	µmhos/cm at 25 °C	31	14.00	71.00	34.23	31.45	23.50	41.00
Water Temperature	°C	31	8.19	29.70	20.08	18.77	14.31	26.05
PATHOGENS								
Fecal Coliform	CFU/100ml	30	3.00	5,800.00	275.73	43.36	18.50	80.00
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	31	1.00	366.00	20.77	5.22	1.50	13.50
Residue, Total Dissolved	mg/L	32	0.00	290.00	23.33	1.42	0.02	25.25
Turbidity	NTU	27	2.54	136.00	11.54	6.51	4.00	7.50
EUTROPHICATION								
NO_2/NO_3	mg/L as N	31	0.02	1.31	0.08	0.03	0.02	0.03
Total NH_3/NH_4+	mg/L as N	31	0.10	0.66	0.17	0.14	0.10	0.16
TKN	mg/L	32	0.10	1.01	0.33	0.28	0.18	0.42
Dissolved Oxygen	mg/L	31	0.00	13.41	8.65	6.66	7.62	9.73
Total Phosphorus	mg/L	31	0.01	0.19	0.04	0.03	0.01	0.06
METALS								
Arsenic, total	µg/L as As	13	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	13	1.00	1.00	1.00	1.00	1.00	1.00
Chromium, total	µg/L as Cr	13	1.00	6.00	1.38	1.15	1.00	1.00
Copper, total	µg/L as Cu	13	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	13	5.00	5.00	5.00	5.00	5.00	5.00
Mercury, total	µg/L as Hg	13	0.50	0.50	0.50	0.50	0.50	0.50
Zinc, total	µg/L as Zn	13	10.00	10.00	10.00	10.00	10.00	10.00
ORGANICS								
Phenols	µg/L	12	0.05	0.08	0.05	0.05	0.05	0.05

Table 4b
1992-1994 Water Quality Statistics for Station 02480990 (Biloxi River)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	22	4.83	6.06	5.38	5.37	5.11	5.63
Specific Conductance	µmhos/cm at 25 °C	22	20.00	35.00	26.32	25.98	23.00	27.75
Water Temperature	°C	22	8.20	27.90	20.24	19.23	14.98	24.78
PATHOGENS								
Fecal Coliform	CFU/100ml	3	56.00	830.00	355.33	203.01	118.00	505.00
SEDIMENT								
Residue, Total Dissolved	mg/L	22	3.60	22.70	16.35	15.61	14.40	17.78
EUTROPHICATION								
BOD 5	mg/L	2	1.00	1.00	1.00	1.00	1.00	1.00
NO_2/NO_3	mg/L as N	15	0.04	0.12	0.05	0.05	0.04	0.06
Total NH_3/NH_4+	mg/L as N	14	0.10	0.24	0.13	0.12	0.10	0.14
TKN	mg/L	15	0.10	0.80	0.37	0.31	0.22	0.48
Dissolved Oxygen	mg/L	22	6.48	11.23	8.43	8.34	7.54	9.49
Total Phosphorus	mg/L	15	0.01	0.28	0.06	0.04	0.02	0.06

Table 5a
1998-2000 Water Quality Statistics for Station 02481050 (Biloxi River)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	2	3.00	4.00	3.50	3.46	3.25	3.75
pH	SU	2	5.07	7.53	6.30	6.18	5.69	6.92
Specific Conductance	µmhos/cm at 25 °C	2	34.00	133.00	83.50	67.25	58.75	108.25
Water Temperature	°C	2	13.40	27.80	20.60	19.30	17.00	24.20
PATHOGENS								
Fecal Coliform	CFU/100ml	2	40.00	60.00	50.00	48.99	45.00	55.00
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	2	1.00	11.00	6.00	3.32	3.50	8.50
Residue, Total Dissolved	mg/L	2	0.02	0.09	0.06	0.04	0.04	0.07
Turbidity	NTU	2	3.00	16.00	9.50	6.93	6.25	12.75
EUTROPHICATION								
NO_2/NO_3	mg/L as N	2	0.02	0.02	0.02	0.02	0.02	0.02
Total NH_3/NH_4+	mg/L as N	2	0.10	0.11	0.11	0.10	0.10	0.11
TKN	mg/L	2	0.26	0.33	0.30	0.29	0.28	0.31
Dissolved Oxygen	mg/L	2	8.84	9.89	9.36	9.35	9.10	9.63
Total Phosphorus	mg/L	2	0.03	0.03	0.03	0.03	0.03	0.03

Table 5b
1992-1994 Water Quality Statistics for Station 02481050 (Biloxi River)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	22	5.10	6.15	5.62	5.61	5.41	5.90
Specific Conductance	µmhos/cm at 25 °C	22	19.00	34.00	27.95	27.72	26.25	30.00
Water Temperature	°C	22	8.60	29.10	20.25	19.16	15.10	24.53
PATHOGENS								
Fecal Coliform	CFU/100ml	3	20.00	190.00	91.67	62.74	42.50	127.50
SEDIMENT								
Residue, Total Dissolved	mg/L	22	12.40	21.50	17.80	17.66	16.60	19.15
EUTROPHICATION								
BOD 5	mg/L	2	1.00	1.00	1.00	1.00	1.00	1.00
NO_2/NO_3	mg/L as N	15	0.04	0.11	0.06	0.05	0.04	0.07
Total NH_3/NH_4+	mg/L as N	14	0.10	0.50	0.16	0.14	0.10	0.19
TKN	mg/L	15	0.10	1.37	0.40	0.32	0.18	0.46
Dissolved Oxygen	mg/L	22	7.09	11.17	8.79	8.71	7.85	9.76
Total Phophorus	mg/L	15	0.01	0.17	0.05	0.03	0.01	0.08

Table 6a
1998-2000 Water Quality Statistics for Station 02481100 (Biloxi River)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	2	4.00	4.00	4.00	4.00	4.00	4.00
pH	SU	2	5.49	6.16	5.83	5.82	5.66	5.99
Specific Conductance	µmhos/cm at 25 °C	2	18.00	24.00	21.00	20.78	19.50	22.50
Water Temperature	°C	2	9.10	25.70	17.40	15.29	13.25	21.55
PATHOGENS								
Fecal Coliform	CFU/100ml	2	37.00	110.00	73.50	63.80	55.25	91.75
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	2	1.00	1.00	1.00	1.00	1.00	1.00
Residue, Total Dissolved	mg/L	2	0.02	0.02	0.02	0.02	0.02	0.02
Turbidity	NTU	2	4.00	8.00	6.00	5.66	5.00	7.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	2	0.03	0.03	0.03	0.03	0.03	0.03
Total NH_3/NH_4+	mg/L as N	2	0.10	0.18	0.14	0.13	0.12	0.16
TKN	mg/L	2	0.37	0.57	0.47	0.46	0.42	0.52
Dissolved Oxygen	mg/L	2	7.16	10.66	8.91	8.74	8.04	9.78
Total Phosphorus	mg/L	2	0.03	0.03	0.03	0.03	0.03	0.03

Table 6b
1992-1994 Water Quality Statistics for Station 02481100 (Biloxi River)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	20	4.50	5.70	5.06	5.05	4.65	5.35
Specific Conductance	µmhos/cm at 25 °C	20	18.00	29.00	24.25	24.02	21.75	27.00
Water Temperature	°C	20	8.60	26.00	19.40	18.50	15.05	23.55
PATHOGENS								
Fecal Coliform	CFU/100ml	1	77.00	77.00	77.00	77.00		
SEDIMENT								
Residue, Total Dissolved	mg/L	20	11.50	18.40	15.44	15.29	13.60	17.13
EUTROPHICATION								
NO_2/NO_3	mg/L as N	13	0.04	0.10	0.05	0.05	0.04	0.05
Total NH_3/NH_4+	mg/L as N	13	0.10	0.25	0.14	0.13	0.10	0.18
TKN	mg/L	13	0.10	1.82	0.48	0.36	0.26	0.55
Dissolved Oxygen	mg/L	20	6.53	10.91	8.04	7.95	7.18	8.93
Total Phosphorus	mg/L	13	0.01	0.25	0.06	0.03	0.01	0.06

Table 7
1998-2000 Water Quality Statistics for Station 02481527 (De Lisle)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	4	6.92	7.61	7.43	7.42	7.42	7.60
Specific Conductance	µmhos/cm at 25 °C	4	65.00	32,200.00	20,766.25	6,061.85	18,946.25	27,220.00
Water Temperature	°C	2	13.10	30.20	21.65	19.89	17.38	25.93
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	2	7.00	14.00	10.50	9.90	8.75	12.25
Residue, Total Dissolved	mg/L	4	0.06	18.90	12.29	4.01	11.27	16.13
Turbidity	NTU	2	5.00	13.00	9.00	8.06	7.00	11.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	2	0.02	0.03	0.03	0.02	0.02	0.03
Total NH_3/NH_4+	mg/L as N	2	0.21	0.27	0.24	0.24	0.23	0.26
TKN	mg/L	2	0.31	0.41	0.36	0.36	0.34	0.39
Dissolved Oxygen	mg/L	2	9.82	10.68	10.25	10.24	10.03	10.47
Total Phosphorus	mg/L	2	0.03	0.06	0.05	0.04	0.04	0.05
METALS								
Arsenic, total	µg/L as As	1	5.00	5.00	5.00	5.00		
Cadmium, total	µg/L as Cd	2	0.00	0.60	0.30	0.77	0.15	0.45
Copper, total	µg/L as Cu	1	8.00	8.00	8.00	8.00		
Lead, total	µg/L as Pb	1	5.00	5.00	5.00	5.00		
Mercury, total	µg/L as Hg	2	0.00	0.05	0.03	0.22	0.01	0.04
Zinc, total	µg/L as Zn	1	20.00	20.00	20.00	20.00		

Table 8a
1998-2000 Water Quality Statistics for Station 02481510 (Lower Wolf River-Cane Creek)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	27	0.00	5.30	4.27	4.13	4.15	5.00
pH	SU	29	5.24	7.62	6.52	6.49	6.13	6.98
Specific Conductance	µmhos/cm at 25 °C	29	13.00	66.00	33.97	31.92	27.00	40.00
Water Temperature	°C	29	5.37	30.41	20.54	18.82	14.48	27.73
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	30	1.00	470.00	24.00	5.23	2.00	7.75
Residue, Total Dissolved	mg/L	30	0.00	44.00	14.31	1.23	0.02	23.00
Turbidity	NTU	27	2.00	192.00	14.59	6.37	3.21	7.50
EUTROPHICATION								
BOD 5 Day	mg/L	0			NA			
NO_2/NO_3	mg/L as N	29	0.02	0.24	0.06	0.04	0.02	0.08
Total NH_3/NH_4+	mg/L as N	29	0.02	0.63	0.18	0.14	0.10	0.19
TKN	mg/L	30	0.10	1.04	0.33	0.29	0.22	0.38
Dissolved Oxygen	mg/L	29	6.77	14.20	9.37	9.25	8.38	10.49
Total Phosphorus	mg/L	30	0.01	0.59	0.06	0.03	0.01	0.06
METALS								
Arsenic, total	µg/L as As	13	5.00	21.00	6.23	5.58	5.00	5.00
Cadmium, total	µg/L as Cd	14	0.00	1.00	0.93	1.00	1.00	1.00
Chromium, total	µg/L as Cr	14	0.00	12.00	1.71	1.19	1.00	1.00
Copper, total	µg/L as Cu	13	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	13	5.00	5.00	5.00	5.00	5.00	5.00
Mercury, total	µg/L as Hg	14	0.00	0.50	0.46	0.53	0.50	0.50
Zinc, total	µg/L as Zn	13	10.00	10.00	10.00	10.00	10.00	10.00
ORGANICS								
Phenols	µg/L	12	0.00	0.05	0.05	0.06	0.05	0.05

Table 8b
1992-1994 Water Quality Statistics for Station 02481510 (Lower Wolf River-Cane Creek)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	18	5.70	7.90	6.61	6.58	6.13	6.90
Specific Conductance	µmhos/cm at 25 °C	17	12.00	64.00	30.00	27.76	20.00	34.00
Water Temperature	°C	18	7.70	29.00	19.66	18.76	17.00	24.00
PATHOGENS								
Fecal Coliform	CFU/100ml	1	130.00	130.00	130.00	130.00		
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	18	1.00	80.00	15.33	7.11	3.50	14.75
Turbidity	NTU	18	4.00	61.70	18.44	12.95	6.13	22.50
EUTROPHICATION								
NO_2/NO_3	mg/L as N	18	0.04	0.19	0.08	0.07	0.05	0.10
TKN	mg/L	18	0.10	1.21	0.52	0.43	0.37	0.66
Dissolved Oxygen	mg/L	18	6.14	11.93	8.74	8.61	7.47	9.80
Total Phosphorus	mg/L	18	0.01	0.28	0.05	0.03	0.01	0.06
METALS								
Arsenic, total	µg/L as As	6	3.00	5.00	3.33	3.27	3.00	3.00
Cadmium, total	µg/L as Cd	7	0.00	1.00	0.76	0.88	0.65	1.00
Chromium, total	µg/L as Cr	7	0.00	1.00	0.86	1.00	1.00	1.00
Copper, total	µg/L as Cu	6	1.00	35.00	9.33	5.29	5.00	5.00
Lead, total	µg/L as Pb	6	3.00	5.00	3.33	3.27	3.00	3.00
Mercury, total	µg/L as Hg	7	0.00	1.00	0.64	0.74	0.50	1.00
Zinc, total	µg/L as Zn	7	0.00	24.00	12.14	8.25	6.50	19.00

Table 9a
1998-2000 Water Quality Statistics for Station 024812665 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	8	5.69	7.90	7.13	7.09	6.92	7.83
Specific Conductance	µmhos/cm at 25 °C	8	373.00	25,635.00	19,830.75	13,495.44	21,276.00	22,699.50
Water Temperature	°C	6	13.30	32.40	20.49	19.77	18.27	20.02
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	4	7.00	23.00	12.50	11.24	8.50	14.00
Residue, Total Dissolved	mg/L	8	0.30	16,670.00	7,564.90	275.71	12.48	14,650.00
Turbidity	NTU	4	4.00	16.00	8.50	7.48	6.25	9.25
EUTROPHICATION								
NO_2/NO_3	mg/L as N	3	0.04	0.23	0.16	0.12	0.13	0.22
Total NH_3/NH_4+	mg/L as N	3	0.22	0.29	0.26	0.26	0.25	0.28
TKN	mg/L	3	0.76	1.19	0.93	0.92	0.81	1.02
Dissolved Oxygen	mg/L	4	4.73	9.17	6.74	6.56	5.83	7.45
Total Phosphorus	mg/L	3	0.07	0.26	0.19	0.16	0.16	0.25
Transparency, Secchi disc	m	1	1.30	1.30	1.30	1.30		
METALS								
Arsenic, total	µg/L as As	3	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	3	0.10	1.00	0.70	0.46	0.55	1.00
Copper, total	µg/L as Cu	3	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	3	5.00	5.00	5.00	5.00	5.00	5.00
Mercury, total	µg/L as Hg	3	0.05	0.50	0.35	0.23	0.28	0.50
Zinc, total	µg/L as Zn	3	10.00	16.00	12.00	11.70	10.00	13.00
ORGANICS								
Phenols	µg/L	1	0.05	0.05	0.05	0.05		

Table 9b
1992-1994 Water Quality Statistics for Station 024812665 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	6	7.20	8.70	7.77	7.74	7.40	8.23
Specific Conductance	µmhos/cm at 25 °C	6	900.00	15,000.00	9,900.00	7,562.80	10,125.00	11,750.00
Water Temperature	°C	6	15.00	31.00	23.17	22.45	19.00	27.75
PATHOGENS								
Fecal Coliform	CFU/100ml	1	170.00	170.00	170.00	170.00		
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	6	6.00	27.00	16.50	13.97	8.25	24.75
Turbidity	NTU	6	2.00	16.00	10.20	8.10	5.90	13.85
EUTROPHICATION								
NO_2/NO_3	mg/L as N	6	0.04	0.21	0.08	0.06	0.04	0.07
TKN	mg/L	6	0.73	1.73	1.14	1.08	0.83	1.38
Dissolved Oxygen	mg/L	6	5.74	15.82	8.80	8.13	6.28	10.58
Total Phosphorus	mg/L	6	0.09	0.43	0.23	0.20	0.13	0.28
Transparency, Secchi disc	m	6	0.09	0.95	0.70	0.56	0.71	0.88
METALS								
Arsenic, total	µg/L as As	2	3.00	3.00	3.00	3.00	3.00	3.00
Cadmium, total	µg/L as Cd	2	31.00	38.00	34.50	34.32	32.75	36.25
Copper, total	µg/L as Cu	2	15.00	26.00	20.50	19.75	17.75	23.25
Lead, total	µg/L as Pb	2	3.00	37.00	20.00	10.54	11.50	28.50
Mercury, total	µg/L as Hg	2	1.00	1.00	1.00	1.00	1.00	1.00
Zinc, total	µg/L as Zn	2	10.00	12.00	11.00	10.95	10.50	11.50

Table 10a
1998-2000 Water Quality Statistics for Station 02481270 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	6	0.00	0.00	0.00	1.00	0.00	0.00
pH	SU	130	5.99	8.31	7.32	7.30	7.09	7.64
Specific Conductance	µmhos/cm at 25 °C	142	22.00	35,720.00	16,586.60	11,462.26	9,051.00	24,633.25
Water Temperature	°C	125	10.68	32.90	22.12	21.11	16.60	27.30
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	61	5.00	160.00	25.33	19.14	12.00	27.00
Residue, Total Dissolved	mg/L	161	0.09	23,720.00	7,165.34	677.66	13.40	14,350.00
Turbidity	NTU	57	4.00	86.00	14.27	10.95	7.00	18.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	52	0.02	0.24	0.05	0.04	0.02	0.06
Total NH_3/NH_4+	mg/L as N	58	0.10	1.19	0.26	0.20	0.13	0.25
TKN	mg/L	62	0.16	1.42	0.67	0.61	0.45	0.87
Dissolved Oxygen	mg/L	67	0.76	15.09	7.18	6.57	5.73	9.04
Total Phosphorus	mg/L	58	0.01	3.19	0.23	0.11	0.06	0.15
Transparency, Secchi disc	m	28	0.23	4.77	0.92	0.78	0.65	0.97
METALS								
Arsenic, total	µg/L as As	13	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	14	0.50	1.00	0.96	0.95	1.00	1.00
Copper, total	µg/L as Cu	13	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	15	5.00	72.00	9.47	5.97	5.00	5.00
Mercury, total	µg/L as Hg	15	0.05	0.50	0.47	0.43	0.50	0.50
Zinc, total	µg/L as Zn	16	5.00	13.00	9.94	9.79	10.00	10.00
ORGANICS								
Phenols	µg/L	11	0.05	0.05	0.05	0.05	0.05	0.05

Table 10b
1992-1994 Water Quality Statistics for Station 02481270 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	6	6.30	8.10	7.28	7.26	7.15	7.53
Specific Conductance	µmhos/cm at 25 °C	6	2,700.00	20,000.00	13,330.00	11,377.03	12,320.00	17,000.00
Water Temperature	°C	6	15.00	31.00	23.50	22.88	21.25	27.50
PATHOGENS								
Fecal Coliform	CFU/100ml	1	40.00	40.00	40.00	40.00		
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	6	10.00	27.00	17.83	17.08	15.50	19.50
Turbidity	NTU	6	3.90	13.40	8.35	7.77	6.43	9.83
EUTROPHICATION								
NO_2/NO_3	mg/L as N	6	0.04	0.12	0.06	0.05	0.04	0.05
TKN	mg/L	6	0.45	2.16	1.00	0.86	0.60	1.10
Dissolved Oxygen	mg/L	6	4.26	11.67	7.80	7.48	7.16	8.05
Total Phosphorus	mg/L	5	0.07	0.22	0.14	0.13	0.11	0.17
Transparency, Secchi disc	m	6	0.20	0.90	0.63	0.57	0.54	0.78
METALS								
Arsenic, total	µg/L as As	2	3.00	4.00	3.50	3.46	3.25	3.75
Cadmium, total	µg/L as Cd	2	37.00	65.00	51.00	49.04	44.00	58.00
Copper, total	µg/L as Cu	2	16.00	36.00	26.00	24.00	21.00	31.00
Lead, total	µg/L as Pb	2	38.00	59.00	48.50	47.35	43.25	53.75
Mercury, total	µg/L as Hg	2	1.00	1.00	1.00	1.00	1.00	1.00
Zinc, total	µg/L as Zn	2	10.00	13.00	11.50	11.40	10.75	12.25

Table 10c
1972-1974 Water Quality Statistics for Station 02481270 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	1	5,000.00	5,000.00	5,000.00	5,000.00		
pH	SU	3	5.90	7.10	6.33	6.31	5.95	6.55
Water Temperature	°C	32	13.00	31.00	28.39	28.01	29.00	30.00
PATHOGENS								
Fecal Coliform	CFU/100ml	3	99.00	1,040.00	418.00	227.92	107.00	577.50
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	1	10.00	10.00	10.00	10.00		
EUTROPHICATION								
NO_2/NO_3	mg/L as N	4	0.02	0.10	0.06	0.05	0.04	0.07
Total NH_3/NH_4+	mg/L as N	4	0.01	0.22	0.11	0.07	0.07	0.15
TKN	mg/L	4	0.32	0.74	0.56	0.53	0.49	0.64
Dissolved Oxygen	mg/L	64	4.24	9.10	5.45	5.39	5.02	5.51
Total Phosphorus	mg/L	4	0.05	0.10	0.07	0.06	0.05	0.08
METALS								
Arsenic, total	µg/L as As	1	2.00	2.00	2.00	2.00		
Cadmium, total	µg/L as Cd	1	2.00	2.00	2.00	2.00		
Copper, total	µg/L as Cu	1	20.00	20.00	20.00	20.00		
Lead, total	µg/L as Pb	1	4.00	4.00	4.00	4.00		
Mercury, total	µg/L as Hg	1	0.50	0.50	0.50	0.50		
Zinc, total	µg/L as Zn	1	20.00	20.00	20.00	20.00		
ORGANICS								
4, 4 DDT	µg/L	1	Below detection	Below detection	N/A	N/A		
Aldrin	µg/L	1	Below detection	Below detection	N/A	N/A		
Chlordane	µg/L	1	Below detection	Below detection	N/A	N/A		
Endrin	µg/L	1	Below detection	Below detection	N/A	N/A		
Heptachlor	µg/L	1	Below detection	Below detection	N/A	N/A		
Total PCBs	µg/L	1	Below detection	Below detection	N/A	N/A		
Toxaphene	µg/L	1	Below detection	Below detection	N/A	N/A		

Table 11
1998-2000 Water Quality Statistics for Station 02481287 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Specific Conductance	µmhos/cm at 25 °C	12	2,894.00	31,725.00	19,759.42	17,053.46	15,525.25	26,691.00
Water Temperature	°C	11	13.00	32.35	23.47	22.48	18.77	29.74
PATHOGENS								
Fecal Coliform	CFU/100ml	12	61.00	2,700.00	780.08	323.55	92.25	1,675.00
SEDIMENT								
Residue, Total Dissolved	mg/L	1	15.10	15.10	15.10	15.10		

Table 12
1998-2000 Water Quality Statistics for Station 02481289 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Specific Conductance	µmhos/cm at 25 °C	24	2,960.00	52,515.00	22,478.58	18,982.25	16,319.00	31,212.25
Water Temperature	°C	24	13.60	130.00	28.93	25.28	17.79	30.85
PATHOGENS								
Fecal Coliform	CFU/100ml	22	2.00	2,700.00	331.59	53.14	10.25	217.50
SEDIMENT								
Residue, Total Dissolved	mg/L	1	12.52	12.52	12.52	12.52		

Table 13
1998-2000 Water Quality Statistics for Station 024812975 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	31	4.81	7.69	6.22	6.17	5.75	6.82
Specific Conductance	µmhos/cm at 25 °C	31	18.00	22,787.00	5,371.55	1,244.27	130.00	7,304.50
Water Temperature	°C	27	12.40	31.11	22.33	21.54	17.83	27.28
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	15	2.00	88.00	19.00	8.77	4.00	13.00
Residue, Total Dissolved	mg/L	28	0.01	86,610.00	9,093.54	166.53	1.90	4,635.25
Turbidity	NTU	12	3.00	59.20	19.57	11.23	4.60	32.50
EUTROPHICATION								
NO_2/NO_3	mg/L as N	14	0.02	1.01	0.10	0.04	0.02	0.05
Total NH_3/NH_4+	mg/L as N	15	0.10	0.68	0.20	0.16	0.11	0.22
TKN	mg/L	16	0.13	0.85	0.50	0.44	0.27	0.70
Dissolved Oxygen	mg/L	18	3.00	9.61	6.29	5.95	4.76	8.01
Total Phosphorus	mg/L	16	0.01	0.75	0.12	0.06	0.04	0.08
'Transparency, Secchi disc	m	8	0.20	1.26	0.81	0.69	0.69	0.99
METALS								
Arsenic, total	µg/L as As	11	5.00	8.00	5.27	5.22	5.00	5.00
Cadmium, total	µg/L as Cd	11	1.00	2.00	1.09	1.07	1.00	1.00
Chromium, total	µg/L as Cr	12	1.00	83.00	10.67	2.67	1.00	8.75
Copper, total	µg/L as Cu	13	0.00	8.00	4.85	4.58	5.00	5.00
Lead, total	µg/L as Pb	11	5.00	5.00	5.00	5.00	5.00	5.00
Mercury, total	µg/L as Hg	11	0.50	0.50	0.50	0.50	0.50	0.50
Zinc, total	µg/L as Zn	11	10.00	10.00	10.00	10.00	10.00	10.00
ORGANICS								
Phenols	µg/L	11	0.05	0.14	0.06	0.05	0.05	0.05

Table 14a
1998-2000 Water Quality Statistics for Station 02481300 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	9	7.57	8.01	7.79	7.78	7.65	7.97
Specific Conductance	µmhos/cm at 25 °C	11	27,180.00	39,840.00	33,921.18	33,692.06	32,215.00	35,603.00
Water Temperature	°C	6	14.90	31.30	22.94	22.16	20.13	28.23
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	4	14.00	47.00	25.25	22.29	14.75	30.50
Residue, Total Dissolved	mg/L	11	15.90	23,290.00	10,424.22	481.00	18.90	22,960.00
Turbidity	NTU	3	8.00	16.00	12.67	12.15	11.00	15.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	3	0.02	0.09	0.05	0.04	0.04	0.07
Total NH_3/NH_4+	mg/L as N	4	0.10	1.77	0.57	0.27	0.10	0.66
TKN	mg/L	4	0.55	1.77	0.93	0.83	0.57	1.07
Dissolved Oxygen	mg/L	4	3.56	8.91	7.13	6.72	6.88	8.27
Total Phosphorus	mg/L	4	0.07	0.17	0.13	0.13	0.12	0.16
Transparency, Secchi disc	m	3	0.67	1.01	0.79	0.77	0.68	0.85
METALS								
Arsenic, total	µg/L as As	1	5.00	5.00	5.00	5.00		
Cadmium, total	µg/L as Cd	1	1.00	1.00	1.00	1.00		
Copper, total	µg/L as Cu	1	5.00	5.00	5.00	5.00		
Lead, total	µg/L as Pb	1	5.00	5.00	5.00	5.00		
Mercury, total	µg/L as Hg	1	0.50	0.50	0.50	0.50		
Zinc, total	µg/L as Zn	1	10.00	10.00	10.00	10.00		
ORGANICS								
Phenols	µg/L	1	0.05	0.05	0.05	0.05		

Table 14b
1972-1974 Water Quality Statistics for Station 02481300 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	1	9,400.00	9,400.00	9,400.00	9,400.00		
pH	SU	3	5.60	7.80	6.73	6.67	6.20	7.30
Water Temperature	°C	24	12.00	29.00	26.83	26.29	28.00	29.00
PATHOGENS								
Fecal Coliform	CFU/100ml	3	129.00	380.00	217.33	191.38	136.00	261.50
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	1	10.00	10.00	10.00	10.00		
EUTROPHICATION								
NO_2/NO_3	mg/L as N	4	0.03	0.10	0.07	0.06	0.04	0.10
Total NH_3/NH_4+	mg/L as N	4	0.03	0.09	0.06	0.05	0.03	0.08
TKN	mg/L	4	0.48	0.62	0.53	0.52	0.50	0.54
Dissolved Oxygen	mg/L	48	3.15	10.00	5.10	4.92	4.16	5.48
Total Phosphorus	mg/L	4	0.07	0.08	0.07	0.07	0.07	0.07
METALS								
Arsenic, total	µg/L as As	1	1.00	1.00	1.00	1.00		
Cadmium, total	µg/L as Cd	1	0.00	0.00	0.00	1.00		
Copper, total	µg/L as Cu	1	17.00	17.00	17.00	17.00		
Lead, total	µg/L as Pb	1	4.00	4.00	4.00	4.00		
Mercury, total	µg/L as Hg	1	0.50	0.50	0.50	0.50		
Zinc, total	µg/L as Zn	1	30.00	30.00	30.00	30.00		
ORGANICS								
4, 4 DDT	µg/L	1	Below detection	Below detection	N/A	N/A		
Aldrin	µg/L	1	Below detection	Below detection	N/A	N/A		
Chlordane	µg/L	1	Below detection	Below detection	N/A	N/A		
Endrin	µg/L	1	Below detection	Below detection	N/A	N/A		
Heptachlor	µg/L	1	Below detection	Below detection	N/A	N/A		
Total PCBs	µg/L	1	Below detection	Below detection	N/A	N/A		
Toxaphene	µg/L	1	Below detection	Below detection	N/A	N/A		

Table 15
1998-2000 Water Quality Statistics for Station 02481310 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	4	6.45	7.31	6.81	6.80	6.54	7.01
Specific Conductance	µmhos/cm at 25 °C	4	90.00	13,590.00	7,531.75	2,857.02	3,470.25	12,285.00
Water Temperature	°C	2	16.70	28.20	22.45	21.70	19.58	25.33
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	2	8.00	18.00	13.00	12.00	10.50	15.50
Residue, Total Dissolved	mg/L	4	0.07	8.10	4.54	1.84	2.12	7.43
Turbidity	NTU	2	7.10	21.00	14.05	12.21	10.58	17.53
EUTROPHICATION								
NO_2/NO_3	mg/L as N	2	0.02	0.06	0.04	0.03	0.03	0.05
Total NH_3/NH_4+	mg/L as N	2	0.16	0.26	0.21	0.20	0.19	0.24
TKN	mg/L	2	0.56	0.57	0.57	0.56	0.56	0.57
Dissolved Oxygen	mg/L	2	3.39	8.32	5.85	5.31	4.62	7.08
Total Phosphorus	mg/L	2	0.04	0.17	0.11	0.08	0.07	0.14
METALS								
Arsenic, total	µg/L as As	1	5.00	5.00	5.00	5.00		
Cadmium, total	µg/L as Cd	1	1.00	1.00	1.00	1.00		
Copper, total	µg/L as Cu	1	5.00	5.00	5.00	5.00		
Lead, total	µg/L as Pb	1	5.00	5.00	5.00	5.00		
Mercury, total	µg/L as Hg	1	0.50	0.50	0.50	0.50		
Zinc, total	µg/L as Zn	1	10.00	10.00	10.00	10.00		

Table 16a
1998-2000 Water Quality Statistics for Station 02481325 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	4	6.58	8.00	7.49	7.47	7.26	7.93
Specific Conductance	µmhos/cm at 25 °C	4	371.00	41,870.00	26,297.75	11,135.72	23,042.75	34,730.00
Water Temperature	°C	2	14.70	30.70	22.70	21.24	18.70	26.70
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	2	4.00	30.00	17.00	10.95	10.50	23.50
Residue, Total Dissolved	mg/L	4	0.30	24.30	15.38	7.06	13.50	20.33
Turbidity	NTU	2	21.00	276.00	148.50	76.13	84.75	212.25
EUTROPHICATION								
NO_2/NO_3	mg/L as N	2	0.08	0.12	0.10	0.10	0.09	0.11
Total NH_3/NH_4+	mg/L as N	2	0.10	0.65	0.38	0.25	0.24	0.51
TKN	mg/L	2	0.40	1.02	0.71	0.64	0.56	0.87
Dissolved Oxygen	mg/L	2	9.32	9.38	9.35	9.35	9.33	9.36
Total Phosphorus	mg/L	2	0.06	0.69	0.38	0.20	0.22	0.53
METALS								
Arsenic, total	µg/L as As	2	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	2	1.00	1.00	1.00	1.00	1.00	1.00
Copper, total	µg/L as Cu	2	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	2	5.00	5.00	5.00	5.00	5.00	5.00
Mercury, total	µg/L as Hg	2	0.05	0.50	0.28	0.16	0.16	0.39
Zinc, total	µg/L as Zn	2	10.00	17.00	13.50	13.04	11.75	15.25

Table 16b
1992-1994 Water Quality Statistics for Station 02481325 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	12	6.00	7.40	6.92	6.90	6.68	7.30
Specific Conductance	µmhos/cm at 25 °C	11	4,000.00	37,200.00	14,317.27	11,807.25	8,210.00	15,900.00
Water Temperature	°C	12	13.00	31.00	22.66	22.02	19.75	28.03
PATHOGENS								
Fecal Coliform	CFU/100ml	1	20.00	20.00	20.00	20.00		
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	12	11.00	29.00	17.92	17.29	14.50	18.75
Turbidity	NTU	12	1.60	23.60	11.82	9.97	9.03	14.25
EUTROPHICATION								
NO_2/NO_3	mg/L as N	12	0.04	0.18	0.06	0.06	0.04	0.07
TKN	mg/L	12	0.21	1.29	0.62	0.55	0.36	0.77
Dissolved Oxygen	mg/L	12	5.62	10.94	8.37	8.27	7.84	8.72
Total Phosphorus	mg/L	12	0.03	0.42	0.13	0.10	0.06	0.14
Transparency, Secchi disc	m	12	0.28	10.00	1.49	0.85	0.64	0.85
METALS								
Arsenic, total	µg/L as As	4	3.00	3.00	3.00	3.00	3.00	3.00
Cadmium, total	µg/L as Cd	4	0.50	54.00	25.63	10.06	7.63	42.00
Copper, total	µg/L as Cu	4	20.00	67.00	37.50	33.70	24.50	44.50
Lead, total	µg/L as Pb	4	3.00	146.00	50.75	16.09	3.00	74.75
Mercury, total	µg/L as Hg	4	0.50	1.00	0.88	0.84	0.88	1.00
Zinc, total	µg/L as Zn	4	10.00	40.00	21.50	17.96	10.00	29.50

Table 16c
1972-1974 Water Quality Statistics for Station 02481325 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Water Temperature	°C	7	13.00	15.00	13.93	13.90	13.00	14.75
EUTROPHICATION								
BOD 5	mg/L	2	1.20	1.80	1.50	1.47	1.35	1.65
Total NH_3/NH_4+	mg/L as N	2	0.44	0.51	0.48	0.47	0.46	0.49
TKN	mg/L	2	1.45	1.90	1.68	1.66	1.56	1.79
Dissolved Oxygen	mg/L	14	9.44	9.80	9.60	9.59	9.50	9.70

Table 17
1998-2000 Water Quality Statistics for Station 302540088511000 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Specific Conductance	µmhos/cm at 25 °C	35	3,330.00	35,976.00	21,825.54	19,125.16	16,873.50	30,602.00
Water Temperature	°C	34	14.20	32.86	23.90	22.97	16.98	29.57
PATHOGENS								
Fecal Coliform	CFU/100ml	29	2.00	560.00	71.07	16.61	3.00	42.00
SEDIMENT								
Residue, Total Dissolved	mg/L	1	14.22	14.22	14.22	14.22		

Table 18
1998-2000 Water Quality Statistics for Station 639SLB02 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	30	6.31	8.03	7.48	7.46	7.53	7.78
Specific Conductance	µmhos/cm at 25 °C	34	50.00	39,680.00	19,819.32	7,366.80	7,316.75	31,508.75
Water Temperature	°C	30	9.60	31.75	21.40	20.52	20.02	25.92
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	10	8.00	43.00	16.60	14.48	10.50	17.00
Residue, Total Dissolved	mg/L	29	0.05	23,380.00	9,178.47	372.13	13.92	17,400.00
Turbidity	NTU	9	3.00	22.00	9.52	7.53	4.00	14.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	10	0.02	0.05	0.03	0.03	0.02	0.04
Total NH_3/NH_4+	mg/L as N	9	0.10	0.51	0.23	0.19	0.10	0.29
TKN	mg/L	10	0.26	0.69	0.43	0.41	0.34	0.49
Dissolved Oxygen	mg/L	17	7.29	11.58	9.56	9.43	7.67	10.85
Total Phosphorus	mg/L	10	0.01	0.13	0.06	0.05	0.04	0.06
Transparency, Secchi disc	m	8	0.42	4.80	1.44	1.08	0.73	1.46
METALS								
Arsenic, total	µg/L as As	10	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	11	1.00	1.00	1.00	1.00	1.00	1.00
Copper, total	µg/L as Cu	10	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	10	5.00	5.00	5.00	5.00	5.00	5.00
Mercury, total	µg/L as Hg	11	0.05	0.50	0.46	0.41	0.50	0.50
Zinc, total	µg/L as Zn	11	10.00	27.00	11.73	11.13	10.00	10.00
ORGANICS								
Phenols	µg/L	9	0.05	0.05	0.05	0.05	0.05	0.05

Table 19
1998-2000 Water Quality Statistics for Station 640BBYB01 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	30	6.31	8.03	7.48	7.46	7.53	7.78
Specific Conductance	µmhos/cm at 25 °C	34	50.00	39,680.00	19,819.32	7,366.80	7,316.75	31,508.75
Water Temperature	°C	30	9.60	31.75	21.40	20.52	20.02	25.92
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	10	8.00	43.00	16.60	14.48	10.50	17.00
Residue, Total Dissolved	mg/L	29	0.05	23,380.00	9,178.47	372.13	13.92	17,400.00
Turbidity	NTU	9	3.00	22.00	9.52	7.53	4.00	14.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	10	0.02	0.05	0.03	0.03	0.02	0.04
Total NH_3/NH_4+	mg/L as N	9	0.10	0.51	0.23	0.19	0.10	0.29
TKN	mg/L	10	0.26	0.69	0.43	0.41	0.34	0.49
Dissolved Oxygen	mg/L	17	7.29	11.58	9.56	9.43	7.67	10.85
Total Phosphorus	mg/L	10	0.01	0.13	0.06	0.05	0.04	0.06
Transparency, Secchi disc	m	8	0.42	4.80	1.44	1.08	0.73	1.46
METALS								
Arsenic, total	µg/L as As	10	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	11	1.00	1.00	1.00	1.00	1.00	1.00
Copper, total	µg/L as Cu	10	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	10	5.00	5.00	5.00	5.00	5.00	5.00
Mercury, total	µg/L as Hg	11	0.05	0.50	0.46	0.41	0.50	0.50
Zinc, total	µg/L as Zn	11	10.00	27.00	11.73	11.13	10.00	10.00
ORGANICS								
Phenols	µg/L	9	0.05	0.05	0.05	0.05	0.05	0.05

Table 20
1998-2000 Water Quality Statistics for Station 640BBYB02 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	29	6.56	8.16	7.66	7.65	7.45	7.94
Specific Conductance	µmhos/cm at 25 °C	1	25.00	25.00	25.00	25.00		
Water Temperature	°C	29	9.30	33.10	23.15	22.07	18.00	29.22
SEDIMENT								
Turbidity	NTU	17	4.90	68.20	22.69	17.76	11.60	26.20
EUTROPHICATION								
NO_2/NO_3	mg/L as N	27	0.02	0.07	0.03	0.03	0.02	0.03
Total NH_3/NH_4+	mg/L as N	27	0.10	0.80	0.30	0.25	0.18	0.34
TKN	mg/L	26	0.10	1.50	0.68	0.60	0.47	0.81
Dissolved Oxygen	mg/L	11	5.23	11.24	7.87	7.69	7.04	8.44
Total Phosphorus	mg/L	26	0.01	1.41	0.18	0.12	0.08	0.16
Transparency, Secchi disc	m	23	0.61	2.10	1.29	1.21	1.00	2.00

Table 21
1998-2000 Water Quality Statistics for Station 646BBB04 (Turkey Creek-Old Fort Bayou)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	27	6.39	8.25	7.69	7.68	7.52	7.95
Specific Conductance	µmhos/cm at 25 °C	34	69.00	37,742.00	24,956.62	17,747.86	19,384.50	33,307.00
Water Temperature	°C	27	10.99	30.80	20.69	19.90	15.78	25.65
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	18	4.00	149.00	31.33	23.76	17.00	34.25
Residue, Total Dissolved	mg/L	35	0.06	24,590.00	10,568.30	623.02	15.70	19,955.00
Turbidity	NTU	15	4.68	58.00	16.86	13.14	8.50	19.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	15	0.02	0.17	0.04	0.03	0.02	0.04
Total NH_3/NH_4+	mg/L as N	16	0.10	1.21	0.33	0.21	0.11	0.35
TKN	mg/L	16	0.10	1.21	0.57	0.49	0.37	0.73
Dissolved Oxygen	mg/L	19	2.93	12.97	8.89	8.45	7.43	9.70
Total Phosphorus	mg/L	15	0.03	1.92	0.36	0.16	0.08	0.18
Transparency, Secchi disc	m	11	0.46	1.80	0.87	0.80	0.53	1.02
METALS								
Arsenic, total	µg/L as As	12	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	13	0.20	1.00	0.94	0.88	1.00	1.00
Copper, total	µg/L as Cu	12	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	12	5.00	5.00	5.00	5.00	5.00	5.00
Mercury, total	µg/L as Hg	13	0.05	0.50	0.47	0.42	0.50	0.50
Zinc, total	µg/L as Zn	14	10.00	20.00	11.64	11.27	10.00	10.00
ORGANICS								
Phenols	µg/L	10	0.05	0.05	0.05	0.05	0.05	0.05

Table 22a
1998-2000 Water Quality Statistics for Station 02480350 (Tuxachanie Creek)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	32	2.00	6.00	3.87	3.77	3.58	4.30
pH	SU	33	4.48	7.90	6.06	5.96	5.22	7.02
Specific Conductance	µmhos/cm at 25 °C	33	13.00	58.00	31.06	29.02	22.00	36.00
Water Temperature	°C	33	6.75	31.00	19.79	18.60	14.61	24.40
PATHOGENS								
Fecal Coliform	CFU/100ml	32	2.00	700.00	93.28	27.43	6.00	99.00
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	33	1.00	120.00	14.21	5.14	3.00	8.00
Residue, Total Dissolved	mg/L	33	0.01	37.00	15.55	2.01	0.02	23.00
Turbidity	NTU	32	2.00	58.00	12.22	7.45	3.80	13.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	33	0.02	0.06	0.02	0.02	0.02	0.02
Total NH_3/NH_4+	mg/L as N	33	0.10	0.73	0.19	0.16	0.10	0.18
TKN	mg/L	33	0.13	0.82	0.34	0.29	0.19	0.44
Dissolved Oxygen	mg/L	32	0.00	12.69	8.89	8.45	7.86	10.25
Total Phosphorus	mg/L	33	0.01	0.3	0.06	0.04	0.02	0.09
METALS								
Arsenic, total	µg/L as As	13	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	13	1.00	1.00	1.00	1.00	1.00	1.00
Chromium, total	µg/L as Cr	13	1.00	1.00	1.00	1.00	1.00	1.00
Copper, total	µg/L as Cu	13	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	13	5.00	5.00	5.00	5.00	5.00	5.00
Mercury, total	µg/L as Hg	13	0.50	0.50	0.50	0.50	0.50	0.50
Zinc, total	µg/L as Zn	13	10.00	10.00	10.00	10.00	10.00	10.00
ORGANICS								
Phenols	µg/L	10	0.05	0.05	0.05	0.05	0.05	0.05

Table 22b
1992-1994 Water Quality Statistics for Station 02480350 (Tuxachanie Creek)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	22	4.38	5.88	5.10	5.07	4.49	5.60
Specific Conductance	µmhos/cm at 25 °C	22	21.00	29.00	25.14	25.03	24.00	27.00
Water Temperature	°C	22	9.40	31.80	21.50	20.45	16.75	25.65
PATHOGENS								
Fecal Coliform	CFU/100ml	3	24.00	240.00	104.67	66.04	37.00	145.00
SEDIMENT								
Residue, Total Dissolved	mg/L	22	13.30	18.40	16.04	15.97	15.23	17.08
EUTROPHICATION								
BOD 5	mg/L	2	1.00	1.00	1.00	1.00	1.00	1.00
NO_2/NO_3	mg/L as N	15	0.04	0.11	0.05	0.05	0.04	0.05
Total NH_3/NH_4+	mg/L as N	14	0.10	0.51	0.18	0.15	0.10	0.20
TKN	mg/L	15	0.10	0.75	0.44	0.39	0.29	0.60
Dissolved Oxygen	mg/L	22	7.21	11.12	8.61	8.54	7.87	9.51
Total Phosphorus	mg/L	15	0.01	0.17	0.05	0.03	0.01	0.09

Table 23a
1998-2000 Water Quality Statistics for Station 02480500 (Tuxachanie Creek)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	34	1.00	6.00	4.09	3.90	3.80	4.80
pH	SU	33	4.14	23.39	5.95	5.59	4.59	5.98
Specific Conductance	µmhos/cm at 25 °C	33	16.00	68.00	34.26	31.73	24.00	39.00
Water Temperature	°C	33	7.32	29.20	20.04	18.94	14.51	25.40
PATHOGENS								
Fecal Coliform	CFU/100ml	33	2.00	1,000.00	112.97	32.73	10.00	94.00
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	33	1.00	17.00	3.97	2.75	1.00	4.00
Residue, Total Dissolved	mg/L	33	0.01	39.00	15.95	2.22	0.02	23.00
Turbidity	NTU	33	1.00	19.00	5.44	4.04	2.48	6.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	33	0.02	0.60	0.07	0.03	0.02	0.02
Total NH_3/NH_4+	mg/L as N	33	0.10	0.81	0.19	0.15	0.10	0.18
TKN	mg/L	34	0.10	1.06	0.36	0.30	0.24	0.42
Dissolved Oxygen	mg/L	33	0.00	11.66	8.31	7.91	7.44	9.70
Total Phosphorus	mg/L	34	0.01	0.48	0.06	0.04	0.02	0.07
METALS								
Arsenic, total	µg/L as As	13	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	13	1.00	1.00	1.00	1.00	1.00	1.00
Chromium, total	µg/L as Cr	13	1.00	1.00	1.00	1.00	1.00	1.00
Copper, total	µg/L as Cu	13	5.00	5.00	5.00	5.00	5.00	5.00
Lead, total	µg/L as Pb	13	5.00	5.00	5.00	5.00	5.00	5.00
Mercury, total	µg/L as Hg	13	0.50	0.50	0.50	0.50	0.50	0.50
Zinc, total	µg/L as Zn	13	10.00	10.00	10.00	10.00	10.00	10.00
ORGANICS								
Phenols	µg/L	11	0.05	0.05	0.05	0.05	0.05	0.05

Table 23b
1992-1994 Water Quality Statistics for Station 02480500 (Tuxachanie Creek)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	22	4.15	5.29	4.70	4.69	4.48	4.93
Specific Conductance	µmhos/cm at 25 °C	22	20.00	31.00	25.23	25.01	24.00	27.75
Water Temperature	°C	22	8.50	29.60	21.11	20.04	16.38	25.13
PATHOGENS								
Fecal Coliform	CFU/100ml	3	103.00	500.00	244.33	188.47	116.50	315.00
SEDIMENT								
Residue, Total Dissolved	mg/L	22	12.70	19.70	16.10	15.96	15.05	17.50
EUTROPHICATION								
BOD 5	mg/L	2	1.00	1.00	1.00	1.00	1.00	1.00
NO_2/NO_3	mg/L as N	15	0.04	0.10	0.05	0.05	0.04	0.05
Total NH_3/NH_4+	mg/L as N	14	0.10	0.45	0.16	0.13	0.10	0.17
TKN	mg/L	15	0.18	1.11	0.49	0.43	0.30	0.67
Dissolved Oxygen	mg/L	22	6.60	11.17	8.22	8.14	7.43	9.24
Total Phosphorus	mg/L	15	0.01	0.12	0.04	0.03	0.02	0.05

Table 24a
1998-2000 Water Quality Statistics for Station 02481660 (Upper Jourdan River)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	5	0.00	6.00	1.20	1.43	0.00	0.00
pH	SU	78	4.78	7.28	6.23	6.20	5.98	6.71
Specific Conductance	µmhos/cm at 25 °C	68	24.00	21,190.00	5,072.74	847.34	72.75	8,518.25
Water Temperature	°C	65	7.00	32.10	22.14	20.77	16.20	28.23
PATHOGENS								
Fecal Coliform	CFU/100ml	1	11.00	11.00	11.00	11.00		
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	24	1.00	68.00	7.67	4.97	4.00	6.25
Residue, Total Dissolved	mg/L	67	0.00	13,130.00	2,115.12	44.61	1.92	3,630.00
Turbidity	NTU	23	1.00	77.10	10.94	7.08	4.20	12.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	24	0.02	0.34	0.07	0.05	0.04	0.07
Total NH_3/NH_4+	mg/L as N	24	0.10	0.72	0.19	0.16	0.10	0.20
TKN	mg/L	24	0.10	0.93	0.50	0.45	0.32	0.67
Dissolved Oxygen	mg/L	34	2.97	10.79	6.28	6.01	4.95	7.00
Total Phosphorus	mg/L	24	0.01	0.72	0.10	0.06	0.03	0.10
Transparency, Secchi disc	m	1	1.90	1.90	1.90	1.90		
METALS								
Arsenic, total	µg/L as As	11	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium, total	µg/L as Cd	11	1.00	40.00	4.55	1.40	1.00	1.00
Chromium, total	µg/L as Cr	11	1.00	11.00	1.91	1.24	1.00	1.00
Copper, total	µg/L as Cu	11	5.00	6.40	5.13	5.11	5.00	5.00
Lead, total	µg/L as Pb	10	5.00	27.00	7.20	5.92	5.00	5.00
Mercury, total	µg/L as Hg	11	0.50	0.50	0.50	0.50	0.50	0.50
Zinc, total	µg/L as Zn	11	10.00	40.00	12.73	11.34	10.00	10.00
ORGANICS								
Phenols	µg/L	11	0.05	0.05	0.05	0.05	0.05	0.05

Table 24b
1992-1994 Water Quality Statistics for Station 02481660 (Upper Jourdan River)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
pH	SU	18	4.90	7.50	6.34	6.31	6.03	6.68
Specific Conductance	µmhos/cm at 25 °C	18	20.00	13000.00	1239.67	153.38	37.75	507.50
Water Temperature	°C	18	10.30	29.00	20.95	20.12	16.50	24.98
PATHOGENS								
Fecal Coliform	CFU/100ml	1	110.00	110.00	110.00	110.00		
SEDIMENT								
Residue, Total Nonfiltrable	mg/L	18	2.00	28.00	8.11	6.63	5.00	9.00
Turbidity	NTU	17	4.00	38.60	15.97	13.65	10.60	18.00
EUTROPHICATION								
NO_2/NO_3	mg/L as N	18	0.04	0.10	0.07	0.06	0.04	0.08
TKN	mg/L	18	0.10	2.52	0.70	0.58	0.44	0.76
Dissolved Oxygen	mg/L	18	4.73	9.92	7.25	7.09	5.96	8.34
Total Phosphorus	mg/L	18	0.01	0.27	0.05	0.03	0.01	0.06
Transparency, Secchi disc	m	1	0.75	0.75	0.75	0.75		
METALS								
Arsenic, total	µg/L as As	6	3.00	5.00	3.33	3.27	3.00	3.00
Cadmium, total	µg/L as Cd	6	0.50	1.00	0.83	0.79	0.63	1.00
Chromium, total	µg/L as Cr	6	1.00	1.00	1.00	1.00	1.00	1.00
Copper, total	µg/L as Cu	6	1.00	34.00	9.17	5.26	5.00	5.00
Lead, total	µg/L as Pb	6	3.00	13.00	5.00	4.17	3.00	4.50
Mercury, total	µg/L as Hg	6	0.50	1.00	0.75	0.71	0.50	1.00
Zinc, total	µg/L as Zn	6	3.00	28.00	15.33	12.34	10.00	20.75

Table 24c
1972-1974 Water Quality Statistics for Station 02481660 (Upper Jourdan River)

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
PHYSICAL								
Total Chloride in water	mg/l	2	16.00	650.00	333.00	101.98	174.50	491.50
pH	SU	3	6.30	6.70	6.50	6.50	6.40	6.60
Water Temperature	°C	1	11.50	11.50	11.50	11.50		
EUTROPHICATION								
BOD 5	mg/L	2	1.60	2.40	2.00	1.96	1.80	2.20
Dissolved Oxygen	mg/L	4	5.10	11.10	8.43	7.99	6.23	10.95

Appendix F

Mississippi Beach Monitoring Provisional Data 2000-2002

Table 1
2000 – 2002 Fecal Coliform Monitoring Data
Station 2

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/8/00	10:00	19			
3/13/00	8:00	24			
3/20/00	9:50	55			
3/29/00	9:50	33	30.2	0	0
4/10/00	10:09	3			
4/19/00	8:41	12			
4/25/00	10:15	3	4.8	0	0
5/3/00	10:13	7			
5/11/00	9:56	17			
5/16/00	8:35	7			
5/22/00	8:40	96	16.8	0	0
6/5/00	9:28	8			
6/13/00	8:38	80			
6/20/00	8:00	24			
6/30/00	8:00	410	50.1	1	25%
7/5/00	14:09	14			
7/10/00	6:41	9			
7/18/00	10:36	5			
7/20/00	8:41	23	11.0	0	0
8/8/00	9:31	9			
8/15/00	8:00	52			
8/24/00	8:20	19			
8/29/00	9:50	2	11.5	0	0
9/14/00	8:30	2			
9/21/00	9:00	2			
9/25/00	10:00	100	7.4	0	0
10/11/00	9:01	30			
10/17/00	9:00	670			
10/19/00	9:41	14			
10/30/00	9:40	2	27.4	1	25%
3/2/01	6:40	60			
3/15/01	9:50	2,000			
3/16/01	10:17	300			
3/26/01	9:41	51	207.0	1	25%
4/4/01	10:03	37			
4/9/01	9:41	77			
4/18/01	8:51	5			
4/24/01	9:13	21	23.4	0	0
5/2/01	7:41	100			
5/7/01	9:11	52			
5/14/01	9:18	70	71.4	0	0
6/5/01	7:51	1,200			
6/15/01	8:52	440			
6/29/01	7:30	870	771.6	3	66%
7/10/01	7:13	200			
7/17/01	9:16	97			
7/18/01	8:13	680			
7/23/01	8:47	180	220.7	1	25%

Table 1
2000 – 2002 Fecal Coliform Monitoring Data
Station 2

8/7/01	9:00	160			
8/14/01	7:00	360	240.0	0	0
9/5/01	7:30	67			
9/17/01	9:30	180			
9/24/01	9:20	370	164.6	0	0
10/1/01	8:00	26			
10/8/01	8:30	7			
10/10/01	8:30	280			
10/30/01	8:12	5	22.5	0	0
3/5/02	8:01	140			
3/19/02	8:20	130			
3/21/02	9:51	510	210.2	1	33%
4/8/02	4:20	19			
4/10/02	8:10	120			
4/16/02	9:30	56	50.4	0	0

Source: USM COMS, 2002a

Table 2
2000 – 2002 Fecal Coliform Monitoring Data
Station 3

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/8/00	10:06	18			
3/13/00	8:20	27			
3/20/00	10:02	18			
3/29/00	9:56	370	42.4	0	0
4/10/00	10:18	3			
4/19/00	8:52	20			
4/25/00	10:00	27	11.7	0	0
5/3/00	10:06	65			
5/11/00	9:45	20			
5/16/00	8:46	54			
5/22/00	9:00	143	56.3	0	0
6/5/00	9:35	3			
6/13/00	8:30	3			
6/20/00	8:30	82			
6/30/00	8:15	400	23.3	0	0
7/5/00	14:22	26			
7/10/00	7:10	21			
7/18/00	10:46	120			
7/20/00	8:26	33	38.3	0	0
8/8/00	9:45	14			
8/15/00	8:15	28			
8/24/00	8:29	40			
8/29/00	9:58	2	13.3	0	0
9/14/00	8:41	5			
9/21/00	9:11	2			
9/25/00	10:27	24	6.2	0	0
10/11/00	9:10	16			
10/17/00	9:15	5			
10/19/00	9:57	19			
10/30/00	10:03	77	18.5	0	0
3/2/01	6:52	80			
3/15/01	9:59	2,000			
3/16/01	10:00	260			
3/19/01	10:21	470			
3/26/01	9:58	1,600	500.1	3	60%
4/4/01	10:15	19			
4/9/01	9:30	44			
4/18/01	9:15	14			
4/24/01	9:20	12	19.4	0	0
5/2/01	9:50	93			
5/7/01	9:15	90			
5/14/01	9:30	73	52.0	0	0
6/5/01	8:03	1,200			
6/15/01	8:58	320			
6/29/01	7:38	530	349.1	2	66%
7/10/01	7:36	160			
7/17/01	9:22	130			
7/18/01	8:18	350	249.2	1	25%

Table 2
2000 – 2002 Fecal Coliform Monitoring Data
Station 3

7/23/01	8:52	140			
8/7/01	9:13	160			
8/14/01	7:10	420	259.2	1	33%
9/5/01	7:38	490			
9/17/01	9:40	65			
9/24/01	9:27	97	145.6	1	33%
10/1/01	8:16	19			
10/8/01	8:35	12			
10/10/01	8:40	200			
10/30/01	8:22	2	17.4	0	0
3/5/02	8:21	67			
3/19/02	8:25	30			
3/21/02	9:56	390	92.2	0	0
4/8/02	9:26	23			
4/10/02	8:00	570			
4/16/02	9:36	33	75.6	1	33%

Source: USM COMS, 2002a

Table 3
2000 – 2002 Fecal Coliform Monitoring Data
Station 4

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
1/6/00	9:15	3			
1/10/00	8:21	9			
1/12/00	8:34	67			
1/18/00	9:00	19			
1/19/00	9:05	22			
1/21/00	8:02	10			
1/25/00	9:30	3			
1/27/00	10:41	3			
1/29/00	9:30	9			
1/31/00	8:30	3	8.4	0	0
2/8/00	9:10	3			
2/9/00	10:06	3			
2/10/00	9:12	3			
2/15/00	10:30	3			
2/16/00	10:21	3			
2/22/00	10:00	7			
2/23/00	10:15	3			
2/24/00	9:00	39			
2/28/00	10:25	14			
2/29/00	8:41	13	5.7	0	0
3/1/00	8:41	13			
3/3/00	8:48	22			
3/9/00	10:00	40			
3/10/00	9:20	22			
3/16/00	11:30	180			
3/23/00	10:23	420			
3/25/00	7:30	32			
3/28/00	10:48	310			
3/29/00	10:05	30			
3/30/00	11:33	3			
3/31/00	9:45	10	36.8	1	9%
4/4/00	12:15	70			
4/5/00	10:51	3			
4/5/00	10:51	3			
4/11/00	9:00	3			
4/12/00	10:36	3			
4/13/00	8:55	17			
4/19/00	9:16	83			
4/20/00	8:41	67			
4/26/00	9:50	3			
4/27/00	10:14	8			
4/30/00	8:26	12	10.4	0	0
5/4/00	10:00	190			
5/9/00	7:15	65			
5/10/00	9:73	3			
5/15/00	8:06	140			
5/16/00	8:55	240			
5/17/00	8:35	7			

Table 3
2000 – 2002 Fecal Coliform Monitoring Data
Station 4

5/22/00	9:03	3			
5/25/00	8:30	3			
5/30/00	8:20	3			
5/31/00	90:00	29	19.2	0	0
6/7/00	10:55	3			
6/8/00	8:55	3			
6/12/00	8:00	3			
6/15/00	11:45	140			
6/19/00	9:10	20			
6/23/00	8:30	3			
6/27/00	9:45	40			
6/28/00	9:30	9	9.7	0	0
7/5/00	14:39	12			
7/11/00	9:20	87			
7/12/00	10:40	140			
7/14/00	8:57	140			
7/17/00	9:15	200			
7/20/00	8:56	77			
7/24/00	10:44	46			
7/25/00	9:30	340			
7/27/00	9:04	830			
7/28/00	9:40	540	136.3	2	20%
8/3/00	11:00	130			
8/7/00	10:00	5			
8/9/00	8:40	7			
8/14/00	7:21	16			
8/16/00	8:30	2			
8/22/00	8:20	330			
8/23/00	7:30	560			
8/28/00	9:48	23			
8/29/00	10:08	100	34.1	1	10%
9/6/00	9:28	220			
9/7/00	10:47	1,200			
9/11/00	8:00	80			
9/14/00	8:53	7			
9/19/00	10:00	26			
9/25/00	10:33	830			
9/28/00	9:12	7			
9/29/00	12:28	49	75.8	2	20%
10/3/00	11:00	7			
10/6/00	7:15	2			
10/9/00	8:30	320			
10/18/00	9:30	2			
10/20/00	11:34	5			
10/23/00	9:30	180			
10/24/00	10:16	2			
10/27/00	10:30	2			
10/30/00	10:15	2			
10/31/00	8:30	16	8.0	0	0%
11/6/00	10:29	450			
11/8/00	9:08	240			
11/9/00	10:00	770			

Table 3
2000 – 2002 Fecal Coliform Monitoring Data
Station 4

11/14/00	10:30	14			
11/16/00	10:03	200			
11/21/00	9:50	7			
11/27/00	9:42	14			
11/28/00	11:00	12			
11/29/00	10:25	14			
11/30/00	10:06	44	52.8	2	20%
12/4/00	9:30	37			
12/5/00	10:53	9			
12/6/00	9:39	2			
12/7/00	10:10	2			
12/8/00	10:05	40			
12/12/00	10:00	2			
12/13/00	7:31	140			
12/14/00	8:26	21			
12/18/00	6:30	19	12.2	0	0%
1/24/00	9:30	2			
1/8/01	10:05	2			
1/10/01	10:09	9			
1/17/01	9:50	12			
1/22/01	9:07	2			
1/23/01	10:39	2			
1/25/01	10:00	2			
1/29/01	9:26	110			
1/31/01	9:31	7	5.2	0	0%
2/6/01	9:49	7			
2/7/01	10:30	9			
2/14/01	10:01	5			
2/15/01	10:35	14			
2/19/01	10:46	33			
2/20/01	9:25	73			
2/21/01	9:15	90			
2/23/01	9:01	23			
2/26/01	8:11	30			
2/28/01	10:12	2,000	32.5	1	10%
3/2/01	6:14	210			
3/6/01	10:00	73			
3/8/01	9:74	110			
3/9/01	9:18	490			
3/15/01	10:09	260			
3/19/01	10:30	100			
3/20/01	9:00	7			
3/21/01	9:31	12			
3/27/01	11:16	1,100			
3/28/01	9:50	330			
3/29/01	8:30	33	107.3	2	20%
4/3/01	9:42	44			
4/10/01	9:15	2,000			
4/11/01	10:14	1,700			
4/12/01	9:38	330			
4/13/01	9:08	330			
4/14/01	8:33	680			

Table 3
2000 – 2002 Fecal Coliform Monitoring Data
Station 4

4/16/01	9:30	280			
4/17/01	9:14	170			
4/19/01	9:30	28			
4/23/01	9:31	330			
4/25/01	9:12	1,300			
4/27/01	9:51	100			
4/30/01	10:11	180	292.4	4	40%
5/1/01	9:30	51			
5/3/01	9:47	100			
5/9/01	9:26	440			
5/15/01	9:03	51			
5/18/01	10:15	16			
5/21/01	10:06	900			
5/29/01	6:45	1,800			
5/30/01	9:32	5			
5/30/01	9:30	2	67.6	3	30%
6/7/01	10:10	670			
6/8/01	9:46	730			
6/12/01	9:43	2,000			
6/13/01	9:56	800			
6/14/01	10:49	520			
6/14/01	10:33	570			
6/21/01	11:20	400			
6/22/01	11:25	1,000			
6/25/01	8:38	90			
6/26/01	9:10	14	404.4	7	70%
7/9/01	7:03	440			
7/11/01	7:46	220			
7/12/01	9:38	480			
7/16/01	10:37	1,000			
7/19/01	8:26	1,900			
7/24/01	8:05	220			
7/27/01	8:31	360			
7/30/01	8:30	220			
7/31/01	10:04	630	462.5	5	50%
8/9/01	8:41	270			
8/15/01	9:10	270			
8/16/01	9:30	2,000			
8/17/01	7:01	57			
8/20/01	8:31	35			
8/21/01	8:40	73			
8/22/01	8:05	87			
8/23/01	9:50	2			
8/27/01	9:56	70			
8/31/01	9:13	630	105.0	2	20%
9/6/01	10:50	390			
9/7/01	9:16	1,300			
9/10/01	10:17	51			
9/11/01	10:16	28			
9/12/01	9:48	120			
9/18/01	9:36	86			
9/20/01	9:53	73			

Table 3
2000 – 2002 Fecal Coliform Monitoring Data
Station 4

9/25/01	8:40	140			
9/26/01	9:00	69			
9/27/01	9:32	2	79.8	1	10%
10/1/01	8:21	2			
10/3/01	8:41	47			
10/9/01	9:00	67			
10/11/01	9:15	2,000			
10/12/01	15:11	320			
10/15/01	8:29	290			
10/17/01	7:38	56			
10/18/01	8:30	130			
10/22/01	9:17	83			
10/23/01	9:41	51			
10/24/01	8:48	580			
10/29/01	8:38	7			
10/31/01	8:23	5	68.5	2	20%
11/6/01	8:20	2			
11/7/01	8:11	42			
11/8/01	9:43	330			
11/13/01	9:43	44			
11/14/01	9:10	2			
11/15/01	8:27	9			
11/21/01	8:00	2			
11/26/01	9:30	58	15.0	0	0%
12/4/01	9:32	26			
12/5/01	9:38	9			
12/6/01	9:05	49			
12/7/01	9:12	110			
12/11/01	10:00	190			
12/12/01	10:05	77			
12/18/01	11:31	220	63.3	0	0%
1/7/02	8:20	220			
1/9/02	8:20	60			
1/10/02	9:32	21			
1/16/02	8:36	87			
1/17/02	9:32	2			
1/22/02	8:28	830			
1/23/02	10:10	5			
1/24/02	7:30	33			
1/29/02	7:58	90	43.8	1	10%
2/4/02	9:30	14			
2/11/02	9:38	26			
2/14/02	10:09	210			
2/18/02	11:22	7			
2/19/02	8:39	26			
2/21/02	10:27	9			
2/22/02	9:16	9			
2/25/02	8:21	2			
2/27/02	8:20	7			
2/28/02	9:52	87	16.4	0	0%
3/6/02	8:52	70			
3/12/02	10:38	40			

Table 3
2000 – 2002 Fecal Coliform Monitoring Data
Station 4

3/14/02	10:10	70			
3/18/02	9:51	47			
3/20/02	8:55	65			
3/21/02	10:03	97			
3/22/02	7:38	9			
3/25/02	8:00	19	42.1	0	0%
4/10/02	8:23	90			
4/11/02	9:23	2			
4/15/02	9:12	70			
4/17/02	10:20	42			
4/18/02	9:45	40	29.2	0	0%

Source: USM COMS, 2002a

Table 4
2000 – 2002 Fecal Coliform Monitoring Data
Station 5

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/8/00	10:24	27			
3/13/00	8:39	130			
3/20/00	10:19	10			
3/28/00	11:03	97	43.0	0	0
4/10/00	10:37	20			
4/19/00	9:31	3			
4/25/00	10:46	7	7.5	0	0
5/3/00	10:35	430			
5/11/00	10:17	3			
5/16/00	9:25	70			
5/22/00	9:30	8.7	29.8	1	25%
6/5/00	9:52	17			
6/13/00	9:01	9			
6/20/00	8:45	64			
6/30/00	8:30	970	55.5	1	25%
7/5/00	15:10	5			
7/10/00	7:19	190			
7/18/00	10:58	12	22.5	0	0
8/8/00	10:00	26			
8/15/00	8:36	14			
8/24/00	8:43	100			
8/29/00	10:20	70	40.0	0	0
9/14/00	9:01	2			
9/21/00	9:26	12			
9/25/00	10:46	14	7.0	0	0
10/11/00	9:22	21			
10/17/00	9:26	9			
10/19/00	10:13	51			
10/23/00	9:46	16			
10/30/00	10:30	2	12.5	0	0
3/5/01	9:30	340			
3/15/01	10:16	190			
3/19/01	10:46	140			
3/26/01	10:21	770	288.9	1	25%
4/4/01	10:28	83			
4/9/01	10:11	110			
4/18/01	9:26	120			
4/24/01	9:39	160	115.1	0	0
5/2/01	10:05	100			
5/7/01	9:29	1,000			
5/11/01	10:04	190	266.8	1	33%
5/12/01	7:02	43			
5/14/01	10:00	67	81.8	0	0%
6/5/01	8:17	1,700			
6/15/01	9:26	250			
6/28/01	10:10	420	563.0	2	67%
7/10/01	7:51	23			
7/17/01	9:35	290			

Table 4
2000 – 2002 Fecal Coliform Monitoring Data
Station 5

7/18/01	8:30	440			
7/23/01	9:15	120	137.0	1	25%
8/7/01	9:20	240			
8/14/01	7:20	390	305.9	0	0
9/5/01	7:48	120			
9/17/01	10:00	23			
9/24/01	96:39	330	96.9	0	0
10/1/01	8:36	5			
10/8/01	9:00	37			
10/10/01	8:56	53			
10/30/01	8:35	2	29.1	0	0
3/5/02	8:32	21			
3/19/02	8:30	19			
3/21/02	10:13	410	54.7	1	33%
4/8/02	10:45	28			
4/10/02	8:30	5			
4/16/02	9:48	1,500	59.4	1	33%

Source: USM COMS, 2002a

Table 5
2000 – 2002 Fecal Coliform Monitoring Data
Station 6

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/8/00	10:32	150			
3/13/00	8:53	30			
3/20/00	10:24	3			
3/28/00	11:11	210	41.0	0	0
4/10/00	10:45	3			
4/19/00	9:46	3			
4/25/00	10:52	22	5.8	0	0
5/3/00	10:43	160			
5/11/00	10:26	3			
5/16/00	9:35	28			
5/24/00	8:57	3	14.2	0	0%
6/5/00	9:59	10			
6/13/00	9:15	9			
6/20/00	9:00	1,700			
6/22/00	14:15	9			
6/30/00	8:38	430	56.8	2	20%
7/5/00	15:05	2			
7/10/00	7:27	12			
7/18/00	11:17	930			
7/19/00	11:00	140	42.0	1	25%
8/8/00	10:13	12			
8/15/00	8:42	23			
8/24/00	8:50	240			
8/29/00	10:36	2	19.1	0	0%
9/14/00	9:13	2			
9/21/00	9:33	21			
9/25/00	10:55	58	13.5	0	0
10/11/00	9:43	9			
10/17/00	9:40	40			
10/19/00	10:26	80			
10/23/00	9:55	21			
10/30/00	10:40	7	21.2	0	0
3/5/01	9:36	220			
3/15/01	10:25	160			
3/19/01	10:54	360			
3/26/01	10:36	1,400	365.0	1	25%
4/4/01	10:36	560			
4/9/01	10:23	330			
4/18/01	9:38	420			
4/24/01	10:00	53			
5/2/01	10:11	330			
5/7/01	9:50	2,000			
5/8/01	8:23	2,000			
5/9/01	9:46	2,500			
5/11/01	10:09	730			
5/12/01	7:07	10			
5/13/01	8:30	14			
5/14/01	10:21	9	219.5	6	50%

Table 5
2000 – 2002 Fecal Coliform Monitoring Data
Station 6

6/5/01	8:27	770			
6/15/01	9:36	350			
6/28/01	10:21	640	556.6	2	50%
7/10/01	8:02	130			
7/17/01	9:39	380			
7/18/01	8:38	390			
7/23/01	9:26	320	280.2	0	0
8/7/01	9:38	310			
8/14/01	7:38	450			
9/5/01	7:54	12			
9/17/01	10:13	26			
9/24/01	9:45	51	74.0	1	20%
10/1/01	8:42	2			
10/8/01	9:13	28			
10/10/01	9:05	270			
10/30/01	8:47	2	13.2	0	0
3/5/02	8:37	14			
3/19/02	8:34	70			
3/21/02	10:18	200	58.1	0	0
4/8/02	11:00	28			
4/10/02	8:35	40			
4/16/02	9:52	730	93.5	1	33%

Source: USM COMS, 2002a

Table 6
2000 – 2002 Fecal Coliform Monitoring Data
Station 7

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
1/6/00	9:39	3			
1/10/00	8:46	12			
1/12/00	9:01	3			
1/18/00	9:20	3			
1/19/00	9:46	3			
1/21/00	8:39	3			
1/25/00	9:37	3			
1/27/00	11:00	13			
1/29/00	9:41	30			
1/31/00	8:50	13	5.8	0	0
2/8/00	9:25	3			
2/9/00	10:17	3			
2/10/00	9:31	3			
2/15/00	10:45	8			
2/16/00	10:30	10			
2/22/00	10:20	3			
2/23/00	10:45	3			
2/24/00	9:21	10			
2/28/00	10:45	7			
2/29/00	8:57	8	5.1	0	0
3/1/00	8:57	8			
3/3/00	9:00	77			
3/9/00	10:20	12			
3/10/00	9:45	10			
3/16/00	11:48	360			
3/23/00	10:44	12			
3/28/00	11:15	74			
3/29/00	10:15	35			
3/30/00	11:53	23			
3/31/00	10:10	3	21.5	0	0%
4/4/00	12:40	3			
4/5/00	11:15	3			
4/5/00	11:15	3			
4/11/00	9:30	3			
4/12/00	10:50	3			
4/13/00	9:15	67			
4/19/00	10:03	3			
4/20/00	8:50	43			
4/26/00	10:15	3			
4/27/00	10:37	7			
4/30/00	8:50	18	6.4	0	0
5/4/00	10:30	200			
5/9/00	7:30	51			
5/10/00	10:15	3			
5/15/00	8:30	8			
5/17/00	9:03	3			
5/22/00	9:47	150			
5/23/00	7:55	7			

Table 6
2000 – 2002 Fecal Coliform Monitoring Data
Station 7

5/25/00	8:59	3			
5/30/00	8:50	3			
5/31/00	10:30	47	14.2	0	0
6/7/00	11:13	3			
6/8/00	9:10	3			
6/12/00	8:31	3			
6/15/00	12:10	600			
6/19/00	9:36	39			
6/23/00	8:49	3			
6/27/00	10:15	58			
6/28/00	9:50	600			
6/29/00	10:50	3	18.0	2	22%
7/5/00	15:10	7			
7/11/00	9:30	110			
7/12/00	11:03	5			
7/14/00	9:19	2			
7/17/00	9:29	140			
7/20/00	9:16	9			
7/24/00	11:00	2			
7/25/00	9:51	19			
7/27/00	9:17	16			
7/28/00	9:58	7	11.5	0	0%
8/3/00	11:20	63			
8/7/00	10:30	23			
8/9/00	9:00	23			
8/14/00	7:50	1,300			
8/16/00	8:47	2			
8/22/00	8:52	31			
8/23/00	8:11	110			
8/28/00	10:01	87			
8/31/00	9:06	77	50.1	1	11%
9/6/00	9:49	120			
9/7/00	11:05	270			
9/11/00	8:23	260			
9/14/00	9:32	2			
9/19/00	10:21	2			
9/25/00	11:03	70			
9/28/00	9:55	2			
9/29/00	12:45	49	26.3	0	0%
10/3/00	11:41	19			
10/6/00	7:31	56			
10/9/00	8:52	140			
10/18/00	9:44	26			
10/20/00	11:41	26			
10/23/00	10:13	32			
10/24/00	10:30	9			
10/27/00	10:49	2			
10/30/00	10:45	2			
10/31/00	8:50	2	13.7	0	0%
11/6/00	10:55	450			
11/8/00	9:19	180			
11/9/00	11:07	1,900			

Table 6
2000 – 2002 Fecal Coliform Monitoring Data
Station 7

11/14/00	10:46	12			
11/16/00	10:24	23			
11/21/00	10:10	110			
11/27/00	10:00	7			
11/28/00	11:17	7			
11/29/00	10:50	2			
11/30/00	10:27	23	40.0	2	20%
12/4/00	9:45	120			
12/5/00	11:17	19			
12/6/00	9:49	2			
12/7/00	10:25	2			
12/8/00	10:28	2			
12/12/00	10:13	2			
12/13/00	7:41	90			
12/14/00	8:42	58			
12/18/00	6:39	14	11.2	0	0%
1/8/01	10:21	7			
1/10/01	20:01	2			
1/17/01	10:15	2			
1/22/01	9:19	2			
1/23/01	10:49	2			
1/24/01	9:51	2			
1/25/01	10:15	2			
1/29/01	9:46	220			
1/31/01	9:48	35	5.3	0	0%
2/14/01	10:17	40			
2/15/01	10:20	390			
2/19/01	11:07	70			
2/20/01	9:39	120			
2/21/01	9:35	23			
2/23/01	9:26	5			
2/26/01	8:29	5			
2/28/01	10:38	200	44.4	0	0%
5/9/01	10:06	2,000			
5/11/01	10:31	86			
5/12/01	7:26	200			
5/13/01	8:38	1,000			
5/15/01	9:30	80			
5/16/01	15:48	410			
5/17/01	8:09	73			
5/21/01	10:30	350			
5/22/01	9:50	150			
5/24/01	10:00	130			
5/29/01	7:10	67	211.4	3	27%
6/7/01	10:30	510			
6/8/01	10:01	2,000			
6/12/01	10:06	210			
6/13/01	10:15	300			
6/21/01	11:50	100			
6/22/01	11:51	2,000			
6/23/01	8:50	2,100			
6/24/01	19:10	530			

Table 6
2000 – 2002 Fecal Coliform Monitoring Data
Station 7

6/25/01	8:51	60			
6/26/01	9:23	28			
6/28/01	10:38	380			
6/29/01	7:58	100			
6/30/01	9:46	190	302.0	5	38%
7/1/01	11:00	7			
7/9/01	7:28	140			
7/11/01	8:02	1,400			
7/12/01	10:06	140			
7/16/01	10:58	480			
7/19/01	8:41	670			
7/24/01	8:21	110			
7/27/01	8:46	380			
7/31/01	10:32	67	177.3	3	33%
8/9/01	8:58	210			
8/14/01	7:49	490			
8/15/01	9:27	600			
8/16/01	9:41	2,000			
8/17/01	7:28	47			
8/20/01	9:48	830			
8/21/01	8:58	28			
8/22/01	8:26	550			
8/23/01	10:09	7			
8/27/01	10:13	73			
8/29/01	9:30	1,200			
8/31/01	9:35	420	227.4	7	58%
9/7/01	9:25	660			
9/10/01	10:30	21			
9/11/01	10:32	40			
9/12/01	9:59	1,900			
9/13/01	14:00	120			
9/18/01	9:45	1,200			
9/20/01	10:09	320			
9/25/01	9:07	23			
9/26/01	9:26	730			
9/27/01	10:02	5	144.9	4	40%
10/3/01	9:15	2			
10/9/01	9:17	62			
10/11/01	7:38	77			
10/15/01	8:39	370			
10/17/01	7:52	58			
10/18/01	8:40	140			
10/22/01	9:30	63			
10/23/01	9:58	130			
10/24/01	9:12	600			
10/29/01	9:47	14			
10/31/01	8:40	5	53.3	1	9%
11/6/01	8:32	23			
11/7/01	8:19	9			
11/8/01	9:55	2			
11/13/01	10:00	37			
11/14/01	9:23	2			

Table 6
2000 – 2002 Fecal Coliform Monitoring Data
Station 7

11/15/01	8:42	23			
11/21/01	8:16	19			
11/26/01	9:51	23	11.5	0	0%
12/4/01	9:51	37			
12/5/01	9:50	12			
12/6/01	9:35	49			
12/7/01	9:40	51			
12/11/01	10:11	23			
12/12/01	10:15	90			
12/18/01	11:50	85	41.0	0	0%
1/7/02	8:39	100			
1/9/02	8:43	35			
1/10/02	8:48	130			
1/16/02	8:49	56			
1/17/02	9:43	2			
1/22/02	8:33	900			
1/23/02	10:23	16			
1/24/02	7:50	30			
1/29/02	8:09	67	48.5	1	11%
2/4/02	9:45	470			
2/11/02	9:47	550			
2/14/02	10:21	16			
2/18/02	11:39	21			
2/19/02	8:47	520			
2/21/02	10:46	500			
2/22/02	9:25	27			
2/25/02	8:39	5			
2/27/02	8:37	2			
2/28/02	10:04	2	40.6	4	40%
3/6/02	9:14	16			
3/8/02	9:10	49			
3/12/02	10:54	47			
3/14/02	10:26	7			
3/18/02	10:08	240			
3/20/02	9:25	14			
3/22/02	9:45	48			
3/25/02	8:11	2			
3/27/02	11:04	7			
3/28/02	10:17	2	16.1	0	0%
4/10/02	8:43	23			
4/11/02	9:39	9			
4/15/02	9:34	110			
4/18/02	9:59	77	36.4	0	0%

Source: USM COMS, 2002a

Table 7
2000 – 2002 Fecal Coliform Monitoring Data
Station 7A

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/8/00	10:44	70			
3/13/00	9:15	20			
3/20/00	10:35	70			
3/31/00	10:15	3	23.3	0	0
4/19/00	10:19	3			
4/20/00	9:00	140			
4/25/00	11:05	83	32.7	0	0
5/3/00	10:53	340			
5/11/00	10:35	27			
5/16/00	9:49	100			
5/24/00	9:13	120	102.4	0	0
6/5/00	10:14	13			
6/13/00	9:23	240			
6/20/00	9:10	130			
6/30/00	8:50	2,000	168.8	1	20%
7/1/00	18:15	10			
7/10/00	7:41	380			
7/18/00	11:36	7			
7/22/00	12:00	1,300			
7/24/00	11:10	67	74.6	1	20%
8/8/00	10:24	12			
8/15/00	8:56	44			
8/24/00	8:59	63			
8/31/00	9:17	33	32.4	0	0
9/14/00	9:41	2			
9/21/00	9:45	23			
9/25/00	11:10	140	18.6	0	0
10/11/00	9:56	300			
10/17/00	9:56	120			
10/19/00	10:43	150			
10/31/00	9:15	2	57.3	0	0
3/5/01	9:49	120			
3/15/01	10:39	2,000			
3/19/01	11:15	550	509.2	2	67%
4/4/01	10:52	450	450.0	1	100%
5/7/01	10:30	2,000			
5/8/01	9:16	1,400			
5/12/01	7:30	120			
5/29/01	7:15	100			
5/30/01	10:05	420	426.5	3	60%
6/5/01	8:38	1,500			
6/15/01	9:42	87			
6/28/01	10:47	670	443.8	2	67%
7/10/01	8:15	70			
7/17/01	9:46	180			
7/18/01	8:51	800			
7/23/01	9:49	1,100	324.5	2	50%
8/7/01	9:57	2,000			

Table 7
2000 – 2002 Fecal Coliform Monitoring Data
Station 7A

8/9/01	9:15	210			
8/14/01	8:00	830	703.8	2	67%
9/5/01	8:17	600			
9/17/01	10:25	1,100			
9/24/01	9:56	170	482.3	2	67%
10/3/01	9:28	340			
10/10/01	9:17	70			
10/30/01	8:59	300	192.6	0	0
3/5/02	8:42	53			
3/19/02	8:41	90			
3/21/02	10:24	270	108.8	0	0
4/8/02	11:10	300			
4/10/02	8:48	380			
4/16/02	10:09	930	473.3	1	33%

Source: USM COMS, 2002a

Table 8
2000 – 2002 Fecal Coliform Monitoring Data
Station 8

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
1/6/00	9:51	3			
1/10/00	9:05	30			
1/12/00	9:15	3			
1/18/00	9:31	29			
1/19/00	10:00	18			
1/21/00	9:28	33			
1/25/00	10:01	7			
1/27/00	11:10	15			
1/29/00	9:57	15			
1/31/00	8:56	3	10.8	0	0
2/8/00	9:30	13			
2/9/00	10:23	3			
2/10/00	9:40	3			
2/15/00	11:30	3			
2/16/00	10:40	3			
2/22/00	10:55	3			
2/23/00	11:07	3			
2/24/00	9:30	10			
2/28/00	11:06	13			
2/29/00	9:22	3	4.5	0	0
3/1/00	9:22	3			
3/3/00	9:15	37			
3/9/00	10:34	10			
3/10/00	10:15	22			
3/16/00	12:00	50			
3/23/00	11:30	320			
3/25/00	8:20	20			
3/29/00	10:25	37			
3/30/00	12:05	3			
3/31/00	10:30	19	17.6	0	0%
4/4/00	12:50	3			
4/5/00	11:30	3			
4/5/00	11:30	3			
4/11/00	9:50	33			
4/12/00	11:01	3			
4/13/00	9:30	20			
4/19/00	10:27	220			
4/20/00	9:11	45			
4/26/00	10:23	17			
4/27/00	10:51	20			
4/30/00	9:03	3	11.7	0	0
5/4/00	11:01	140			
5/4/00	10:46	30			
5/9/00	7:38	3			
5/10/00	10:36	3			
5/15/00	8:45	56			
5/17/00	9:30	130			
5/22/00	10:05	321			

Table 8
2000 – 2002 Fecal Coliform Monitoring Data
Station 8

5/23/00	8:15	100			
5/25/00	9:15	57			
5/30/00	9:15	3			
5/31/00	10:50	7	28.6	0	0
6/7/00	11:21	3			
6/8/00	9:15	6			
6/12/00	8:47	27			
6/15/00	12:18	170			
6/19/00	10:21	83			
6/23/00	9:15	3			
6/27/00	10:27	260			
6/28/00	10:32	2,000			
6/29/00	10:59	800	58.9	2	22%
7/5/00	15:24	2			
7/11/00	9:39	90			
7/12/00	11:15	100			
7/14/00	9:31	220			
7/17/00	9:46	310			
7/20/00	9:28	30			
7/24/00	11:21	30			
7/25/00	10:10	400			
7/27/00	9:21	9			
7/28/00	10:05	30	51.0	0	0%
8/3/00	11:35	37			
8/7/00	10:40	9			
8/9/00	9:15	26			
8/14/00	8:17	240			
8/16/00	9:07	56			
8/22/00	9:20	67			
8/23/00	8:30	500			
8/28/00	10:11	35			
8/31/00	9:31	80	60.5	1	11%
9/6/00	10:00	130			
9/7/00	11:19	270			
9/11/00	9:37	160			
9/14/00	9:53	5			
9/19/00	10:33	2			
9/25/00	11:17	100			
9/28/00	10:13	5			
9/29/00	12:54	5	28.8	0	0%
10/3/00	12:14	35			
10/6/00	7:41	47			
10/9/00	9:11	430			
10/18/00	95:63	73			
10/20/00	11:47	16			
10/23/00	10:30	100			
10/24/00	10:41	97			
10/27/00	10:59	2			
10/30/00	10:55	2			
10/31/00	9:05	2	24.0	1	10%
11/6/00	11:09	870			
11/8/00	9:25	100			

Table 8
2000 – 2002 Fecal Coliform Monitoring Data
Station 8

11/9/00	11:35	210			
11/14/00	10:52	2			
11/16/00	10:41	340			
11/21/00	10:15	14			
11/27/00	10:15	7			
11/28/00	11:30	340			
11/29/00	11:00	2			
11/30/00	10:46	2	33.3	1	0%
12/4/00	10:06	12			
12/5/00	11:26	2			
12/6/00	10:00	120			
12/7/00	10:31	2			
12/8/00	10:47	2			
12/12/00	10:17	5			
12/13/00	8:00	2			
12/14/00	9:09	200			
12/18/00	6:52	73	10.6	0	0%
1/8/01	10:46	2			
1/10/01	10:30	2			
1/17/01	10:33	5			
1/23/01	11:09	2			
1/24/01	10:18	9			
1/25/01	10:37	2			
1/29/01	10:11	120			
1/31/01	9:57	1,400	10.2	1	13%
2/6/01	10:14	2			
2/7/01	11:00	9			
2/14/01	10:23	12			
2/15/01	10:04	7			
2/19/01	11:14	12			
2/21/01	9:40	870			
2/26/01	8:37	140	21.6	1	14%
4/10/01	9:54	150			
4/11/01	10:37	800			
4/12/01	10:02	40			
4/16/01	9:41	97			
4/17/01	9:42	120			
4/19/01	9:41	90			
4/23/01	9:58	210			
4/25/01	10:42	570			
4/27/01	10:22	350			
4/30/01	11:04	700	207.4	3	30%
5/1/01	10:29	430			
5/3/01	10:15	2,000			
5/4/01	10:14	1,800			
5/7/01	10:38	450			
5/9/01	10:18	2,000			
5/15/01	9:48	230			
5/17/01	8:20	9			
5/21/01	10:40	1,700			
5/22/01	10:05	56			
5/30/01	10:17	5	259.3	6	60%

Table 8
2000 – 2002 Fecal Coliform Monitoring Data
Station 8

6/7/01	10:46	630			
6/8/01	10:17	2,000			
6/9/01	10:15	1,800			
6/12/01	10:00	2,000			
6/13/01	10:29	500			
6/14/01	11:00	1,100			
6/21/01	12:03	100			
6/22/01	12:05	900			
6/25/01	9:26	80			
6/26/01	9:36	35	478.5	7	70%
7/5/01	9:52	280			
7/9/01	7:52	570			
7/11/01	8:12	2,000			
7/12/01	10:15	410			
7/16/01	11:12	310			
7/19/01	9:03	260			
7/24/01	8:33	16			
7/27/01	9:00	330			
7/31/01	10:49	26	224.5	3	33%
8/7/01	10:22	2,000			
8/9/01	9:27	200			
8/15/01	9:40	200			
8/16/01	9:50	1,300			
8/20/01	10:09	330			
8/21/01	9:10	62			
8/22/01	9:00	73			
8/23/01	10:15	7			
8/27/01	10:24	26			
8/29/01	9:41	1,400			
8/31/01	10:01	2,000	226.2	4	36%
9/1/01	7:01	6,000			
9/2/01	12:30	530			
9/3/01	7:25	330			
9/4/01	12:30	350			
9/7/01	9:33	830			
9/10/01	10:38	37			
9/11/01	10:40	28			
9/12/01	10:15	530			
9/18/01	10:00	170			
9/20/01	11:40	150			
9/25/01	9:19	80			
9/26/01	9:39	67			
9/27/01	10:21	7	176.4	4	31%
10/3/01	9:30	80			
10/9/01	9:30	120			
10/10/01	9:43	130			
10/15/01	8:45	570			
10/17/01	8:10	500			
10/18/01	9:00	120			
10/22/01	9:48	53			
10/23/01	12:15	5			
10/24/01	9:26	26			

Table 8
2000 – 2002 Fecal Coliform Monitoring Data
Station 8

10/29/01	10:00	53			
10/31/01	9:00	2	59.2	2	18%
11/6/01	8:42	33			
11/7/01	8:26	7			
11/8/01	10:10	2			
11/13/01	10:06	28			
11/14/01	9:42	2			
11/15/01	8:59	2			
11/21/01	8:29	5			
11/26/01	9:58	15	5.3	0	0%
12/4/01	9:59	640			
12/5/01	10:05	35			
12/6/01	9:52	140			
12/7/01	9:59	2			
12/11/01	10:22	26			
12/12/01	10:29	150			
12/18/01	12:01	28	49.1	1	14%
1/22/07	9:41	2			
1/7/02	9:02	19			
1/9/02	8:52	290			
1/10/02	10:06	150			
1/16/02	9:05	2			
1/17/02	9:45	12			
1/22/02	8:45	87			
1/23/02	10:35	42			
1/24/02	8:21	170			
1/29/02	8:15	100			
1/30/02	13:12	47	35.6	0	0%
2/4/02	9:58	5			
2/11/02	10:02	34			
2/14/02	10:46	7			
2/18/02	11:45	570			
2/19/02	8:59	33			
2/21/02	10:54	40			
2/22/02	9:35	19			
2/25/02	8:47	5			
2/27/02	8:50	2			
2/28/02	10:15	73	20.4	1	10%
3/6/02	9:32	2			
3/8/02	9:25	2			
3/12/02	11:03	200			
3/14/02	10:38	190			
3/18/02	10:28	170			
3/20/02	9:37	30			
3/22/02	9:52	63			
3/25/02	8:19	19			
3/27/02	11:15	26			
3/28/02	10:28	2	23.4	0	0%
4/10/02	8:58	170			
4/11/02	9:48	130			
4/15/02	9:46	220			
4/17/02	11:37	67			

Table 8
2000 – 2002 Fecal Coliform Monitoring Data
Station 8

4/18/02	10:11	180	142.4	0	0%

Source: USM COMS, 2002a

Table 9
2000 – 2002 Fecal Coliform Monitoring Data
Station 9

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
1/6/00	10:01	3			
1/10/00	9:26	9			
1/12/00	9:25	7			
1/18/00	9:42	23			
1/19/00	10:07	10			
1/21/00	9:35	7			
1/25/00	10:13	3			
1/27/00	11:18	3			
1/29/00	10:19	19			
1/31/00	9:15	3	6.6	0	0
2/8/00	9:40	3			
2/9/00	10:36	10			
2/10/00	9:49	3			
2/15/00	11:45	10			
2/16/00	10:46	9			
2/22/00	10:45	3			
2/23/00	11:12	3			
2/24/00	9:41	10			
2/28/00	11:15	3			
2/29/00	9:39	20	5.8	0	0
3/1/00	9:39	20			
3/3/00	9:29	18			
3/9/00	10:41	150			
3/10/00	10:31	200			
3/16/00	12:08	67			
3/23/00	11:40	440			
3/25/00	8:32	7			
3/28/00	11:30	250			
3/29/00	10:30	630			
3/30/00	12:13	44			
3/31/00	10:40	42	78.0	2	18%
4/4/00	13:06	3			
4/5/00	11:40	43			
4/5/00	11:40	43			
4/11/00	9:56	3			
4/12/00	11:07	10			
4/13/00	9:41	87			
4/19/00	10:36	560			
4/20/00	9:16	820			
4/26/00	10:33	33			
4/27/00	11:00	3			
4/30/00	9:10	3	24.6	2	18%
5/9/00	7:42	27			
5/10/00	10:46	3			
5/15/00	9:11	37			
5/17/00	9:45	160			
5/22/00	10:20	175			
5/23/00	8:25	22			

Table 9
2000 – 2002 Fecal Coliform Monitoring Data
Station 9

5/25/00	9:20	3			
5/30/00	9:30	3			
5/31/00	10:55	3	15.4	0	0
6/7/00	12:11	86			
6/8/00	9:22	3			
6/12/00	9:03	7			
6/15/00	12:25	560			
6/19/00	10:31	200			
6/23/00	9:36	13			
6/27/00	10:37	2,000			
6/28/00	10:39	300			
6/29/00	11:09	100	80.9	2	22%
7/5/00	15:32	53			
7/11/00	9:45	280			
7/12/00	11:26	250			
7/14/00	9:42	330			
7/17/00	9:55	2,000			
7/18/00	19:11	29			
7/20/00	9	14			
7/24/00	11:26	35			
7/25/00	10:21	19			
7/27/00	9:46	160			
7/28/00	10:15	380	113.5	1	10%
8/3/00	11:44	400			
8/7/00	10:51	154			
8/9/00	9:26	110			
8/14/00	8:25	350			
8/16/00	9:15	160			
8/22/00	9:35	600			
8/23/00	8:39	160			
8/28/00	10:19	390			
8/31/00	9:39	73	216.3	1	11%
9/6/00	10:10	106			
9/7/00	11:30	320			
9/11/00	8:45	200			
9/14/00	10:00	2			
9/19/00	10:43	2			
9/25/00	11:23	580			
9/28/00	10:21	73			
9/29/00	13:03	2,000			
9/30/00	16:00	20	71.0	2	22%
10/3/00	12:23	44			
10/6/00	7:48	900			
10/9/00	9:26	100			
10/18/00	10:10	90			
10/20/00	11:59	9			
10/23/00	10:36	130			
10/24/00	10:47	210			
10/27/00	11:06	2			
10/30/00	11:05	47			
10/31/00	9:25	9	48.6	1	10%
11/6/00	11:17	1,000			

Table 9
2000 – 2002 Fecal Coliform Monitoring Data
Station 9

11/8/00	9:37	330			
11/9/00	11:51	510			
11/14/00	11:06	9			
11/16/00	10:49	42			
11/21/00	10:21	37			
11/27/00	10:21	2			
11/28/00	11:45	280			
11/29/00	11:10	2			
11/30/00	10:51	9	43.4	2	20%
12/4/00	10:17	12			
12/5/00	11:36	2			
12/6/00	10:11	19			
12/7/00	10:43	53			
12/8/00	10:57	140			
12/12/00	10:29	210			
12/13/00	8:15	80			
12/14/00	9:21	37			
12/18/00	7:11	7	29.0	0	0%
1/8/01	10:50	35			
1/10/01	10:36	23			
1/17/01	10:43	2			
1/22/01	9:57	33			
1/23/01	11:18	2			
1/24/01	10:34	5			
1/25/01	10:58	2			
1/29/01	10:27	18			
1/31/01	10:11	2,000	7.3	0	0%
2/6/01	10:23	2			
2/7/01	11:15	2			
2/14/01	10:36	170			
2/15/01	9:55	2			
2/19/01	11:23	7			
2/20/01	9:52	7			
2/21/01	9:44	190			
2/23/01	9:41	16			
2/26/01	8:49	5			
2/28/01	10:55	930	24.5	1	10%
3/6/01	10:26	16			
3/8/01	10:26	12			
3/8/01	10:00	630			
3/9/01	9:39	2,000			
3/10/01	13:28	21			
3/15/01	10:43	450			
3/20/01	9:16	23			
3/21/01	9:59	5			
3/27/01	11:52	1,900			
3/28/01	10:30	2,000			
3/29/01	9:05	100	123.3	5	45%
4/3/01	10:01	1,900			
4/16/01	9:56	700			
4/17/01	9:52	110			
4/23/01	10:09	390			

Table 9
2000 – 2002 Fecal Coliform Monitoring Data
Station 9

4/25/01	11:05	530			
4/27/01	10:48	200			
4/30/01	11:14	450	430.1	4	57%
5/1/01	10:36	1,400			
5/3/01	10:19	400			
5/9/01	12:27	2,000			
5/15/01	9:57	290			
5/17/01	8:30	120			
5/21/01	10:49	930			
5/22/01	10:14	39			
5/24/01	10:23	400	392.7	3	38%
6/7/01	11:03	970			
6/8/01	10:27	2,000			
6/9/01	10:27	1,900			
6/12/01	10:32	32			
6/13/01	10:41	220	329.0	4	40%
6/14/01	11:08	930			
6/21/01	12:13	1,800			
6/22/01	12:17	2,000			
6/23/01	9:11	2,500			
6/24/01	19:26	390			
6/25/01	9:38	110			
6/26/01	9:41	42			
6/28/01	11:15	3,000			
6/29/01	8:13	1,400			
6/30/01	10:12	240	593.0	9	60%
7/1/01	11:21	500			
7/2/01	9:00	1,600			
7/3/01	10:00	1,800			
7/4/01	6:39	350			
7/5/01	10:10	2,000			
7/6/01	9:50	1,500			
7/7/01	7:20	260			
7/8/01	77:16	340			
7/9/01	8:07	120			
7/11/01	8:22	2,000			
7/12/01	10:23	630			
7/19/01	9:17	1,700			
7/24/01	8:41	100			
7/27/01	9:10	1,100			
7/30/01	8:55	350			
7/31/01	10:58	900	525.0	5	50%
8/10/01	7:58	130			
8/15/01	9:49	2,000			
8/16/01	9:57	700			
8/20/01	10:30	240			
8/21/01	9:30	80			
8/22/01	9:05	130			
8/23/01	10:21	30			
8/27/01	10:32	40			
8/29/01	9:53	500			
8/31/01	10:12	1,600			

Table 9
2000 – 2002 Fecal Coliform Monitoring Data
Station 9

9/7/01	9:45	380			
9/10/01	10:45	53			
9/11/01	10:45	35			
9/12/01	10:21	2,000			
9/13/01	14:15	58			
9/18/01	10:08	1,600			
9/20/01	11:49	52			
9/25/01	11:49	91			
9/26/01	9:48	1,100			
9/27/01	10:27	110	193.8	3	30%
10/3/01	9:46	12			
10/9/01	9:36	7			
10/10/01	9:49	460			
10/15/01	8:52	47			
10/17/01	8:19	56			
10/18/01	9:10	92			
10/22/01	10:03	1,800			
10/23/01	12:21	77			
10/24/01	9:42	250			
10/29/01	10:05	5			
10/31/01	9:11	14	45.9	1	9%
11/6/01	8:55	19			
11/7/01	8:40	12			
11/8/01	10:05	33			
11/13/01	10:19	30			
11/14/01	9:58	12			
11/15/01	9:10	42			
11/21/01	8:46	2			
11/26/01	10:07	210	22.6	0	0%
12/4/01	10:06	280			
12/5/01	10:13	14			
12/6/01	10:00	28			
12/7/01	10:09	12			
12/11/01	10:26	21			
12/12/01	10:35	100			
12/18/01	12:11	12	31.8	0	0%
1/7/02	9:10	1,400			
1/9/02	8:59	56			
1/10/02	10:17	190			
1/16/02	9:17	5			
1/22/02	8:55	26			
1/23/02	10:47	40			
1/24/02	8:33	28			
1/29/02	9:00	47			
1/30/02	13:26	42	54.6	1	11%
2/4/02	10:15	12			
2/11/02	10:17	28			
2/14/02	10:53	5			
2/18/02	11:50	500			
2/19/02	9:04	40			
2/21/02	11:01	100			
2/22/02	9:41	28			

Table 9
2000 – 2002 Fecal Coliform Monitoring Data
Station 9

2/25/02	8:55	2			
2/27/02	8:57	5			
2/28/02	10:21	110	25.2	1	10%
3/6/02	9:44	2			
3/8/02	9:39	2			
3/12/02	11:11	100			
3/14/02	10:42	2			
3/18/02	10:35	370			
3/20/02	9:53	270			
3/22/02	10:03	33			
3/25/02	8:25	2			
3/27/02	11:20	12			
3/28/02	10:38	2	12.9	0	0%
4/10/02	9:10	210			
4/11/02	10:00	26			
4/15/02	9:57	160			
4/17/02	11:46	700			
4/18/02	10:38	33	115.1	1	20%

Source: USM COMS, 2002a

Table 10
2000 – 2002 Fecal Coliform Monitoring Data
Station 10

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
1/6/00	10:13	3			
1/10/00	9:33	15			
1/12/00	9:39	3			
1/18/00	9:48	22			
1/19/00	10:15	19			
1/21/00	9:42	3			
1/25/00	10:24	3			
1/27/00	11:27	13			
1/29/00	10:22	27			
1/31/00	9:20	3	7.5	0	0
2/8/00	9:53	10			
2/9/00	10:46	3			
2/10/00	9:55	3			
2/15/00	11:51	20			
2/16/00	10:53	3			
2/22/00	10:50	33			
2/23/00	11:20	87			
2/24/00	9:55	20			
2/28/00	11:21	8			
2/29/00	9:57	3	9.7	0	0
3/1/00	9:57	3			
3/3/00	9:37	13			
3/9/00	10:53	20			
3/10/00	10:46	220			
3/16/00	12:15	59			
3/23/00	11:43	380			
3/25/00	8:39	22			
3/28/00	11:38	660			
3/29/00	10:38	80			
3/30/00	12:23	160			
3/31/00	10:45	15	53.7	1	18%
4/4/00	13:13	22			
4/5/00	11:50	3			
4/5/00	11:50	3			
4/11/00	10:15	7			
4/12/00	11:18	20			
4/13/00	9:52	13			
4/19/00	10:42	270			
4/20/00	9:22	1,000			
4/26/00	10:46	3			
4/27/00	11:07	7			
4/30/00	9:20	3	14.5	1	9%
5/4/00	11:22	110			
5/9/00	7:51	34			
5/10/00	10:85	13			
5/15/00	9:17	51			
5/17/00	9:54	15			
5/22/00	10:38	192			

Table 10
2000 – 2002 Fecal Coliform Monitoring Data
Station 10

5/23/00	8:49	7			
5/25/00	9:43	3			
5/30/00	9:38	3			
5/31/00	10:59	3	16.3	0	0
6/7/00	12:17	3			
6/8/00	9:30	40			
6/12/00	9:15	3			
6/15/00	12:36	1,800			
6/19/00	10:43	120			
6/23/00	9:47	230			
6/27/00	10:43	6,000			
6/28/00	10:46	110			
6/29/00	11:16	550	123.1	3	33%
7/5/00	15:41	360			
7/11/00	9:58	120			
7/12/00	11:36	49			
7/14/00	10:01	380			
7/17/00	10:10	2,000			
7/18/00	19:17	110			
7/20/00	9:47	670			
7/24/00	11:35	120			
7/25/00	10:36	830			
7/28/00	10:13	73			
8/3/00	11:50	800	275.3	4	36%
8/7/00	11:04	39			
8/9/00	9:39	160			
8/14/00	8:39	2,000			
8/15/00	9:05	830			
8/16/00	9:25	110			
8/22/00	9:41	290			
8/23/00	8:21	290			
8/28/00	10:25	150			
8/31/00	9:47	63	213.1	2	22%
9/6/00	10:15	930			
9/7/00	11:38	210			
9/11/00	8:59	470			
9/14/00	10:10	2			
9/19/00	10:59	5			
9/25/00	11:30	340			
9/28/00	10:27	16			
9/29/00	13:08	580	82.8	3	33%
10/3/00	12:30	9			
10/6/00	7:58	97			
10/9/00	9:37	500			
10/18/00	10:15	33			
10/20/00	12:10	290			
10/23/00	10:43	150			
10/24/00	10:53	550			
10/27/00	11:18	2			
10/30/00	11:15	2			
10/31/00	9:30	2	35.0	2	20%
11/6/00	11:25	180			

Table 10
2000 – 2002 Fecal Coliform Monitoring Data
Station 10

11/8/00	9:46	570			
11/9/00	12:00	2,000			
11/10/00	16:10	21			
11/14/00	11:11	7			
11/16/00	10:51	330			
11/21/00	10:32	21			
11/27/00	10:29	270			
11/28/00	11:54	180			
11/29/00	11:15	2			
11/30/00	10:57	5	65.9	2	18%
12/4/00	10:30	580			
12/5/00	11:44	5			
12/6/00	10:19	14			
12/7/00	10:46	140			
12/8/00	11:10	7			
12/12/00	10:35	330			
12/13/00	8:29	2,220			
12/14/00	9:36	490			
12/18/00	7:26	19	86.5	3	33%
1/8/01	11:09	2			
1/10/01	10:47	2			
1/17/01	10:50	5			
1/22/01	10:17	5			
1/23/01	11:26	2			
1/24/01	10:46	47			
1/25/01	11:10	2	4.1	0	0%
2/14/01	10:44	37			
2/15/01	9:46	19			
2/19/01	11:31	30			
2/20/01	10:02	2			
2/21/01	9:56	34			
2/23/01	9:53	97			
2/26/01	9:15	9			
2/28/01	11:03	1,700	34.8	1	10%
3/6/01	10:24	5			
3/8/01	10:10	9			
3/9/01	9:56	570			
3/15/01	10:51	230			
3/26/01	10:58	1,800			
3/27/01	11:58	1,200			
3/28/01	10:38	1,300			
3/29/01	9:15	180	203.8	4	50%
4/3/01	10:07	120			
4/10/01	10:15	2,000			
4/11/01	10:48	710			
4/12/01	10:12	480			
4/16/01	10:09	450			
4/17/01	10:01	180			
4/19/01	10:01	1,400			
4/23/01	10:13	590			
4/25/01	11:15	120			
4/27/01	11:03	170			

Table 10
2000 – 2002 Fecal Coliform Monitoring Data
Station 10

4/30/01	11:21	2,000	465.7	7	64%
5/1/01	10:43	1,000			
5/3/01	10:25	230			
5/9/01	10:33	830			
5/15/01	10:09	160			
5/17/01	8:41	120			
5/21/01	10:58	1,100			
5/22/01	10:22	100			
5/24/01	10:29	320	326.5	3	38%
6/7/01	11:15	270			
6/8/01	10:41	2,000			
6/9/01	10:33	4,900			
6/12/01	10:39	670			
6/13/01	10:49	2,000			
6/14/01	11:23	3,600			
6/15/01	9:55	39			
6/16/01	8:01	210			
6/21/01	12:19	1,900			
6/22/01	12:28	2,000			
6/23/01	12:55	93			
6/25/01	9:47	130			
6/26/01	9:52	37	514.7	7	54%
7/9/01	8:15	97			
7/11/01	8:27	930			
7/12/01	10:32	970			
7/18/01	9:15	1,000			
7/19/01	9:26	92			
7/24/01	9:00	21			
7/27/01	9:20	490			
7/30/01	9:07	170			
7/31/01	11:05	340	256.4	4	44%
8/2/01	9:20	2,000			
8/3/01	12:35	1,800			
8/7/01	10:32	2,000			
8/9/01	9:40	700			
8/15/01	9:55	1,600			
8/16/01	10:03	1,100			
8/20/01	10:36	1,600			
8/21/01	9:41	1,600			
8/22/01	9:11	560			
8/27/01	10:38	60			
8/29/01	10:15	1,200			
8/31/01	10:19	2,000	1,051.7	11	92%
9/1/01	7:20	1,100			
9/7/01	9:58	37			
9/10/01	10:49	83			
9/11/01	10:55	51			
9/12/01	10:27	51			
9/18/01	10:17	930			
9/20/01	11:57	310			
9/25/01	11:57	83			
9/26/01	9:55	2,000			

Table 10
2000 – 2002 Fecal Coliform Monitoring Data
Station 10

9/27/01	10:33	92	225.7	4	36%
10/9/01	8:48	37			
10/10/01	9:56	200			
10/15/01	9:06	1,200			
10/17/01	8:26	350			
10/18/01	9:20	67			
10/22/01	10:15	1,300			
10/23/01	12:28	32			
10/24/01	9:50	430			
10/29/01	10:13	2			
10/31/01	9:17	5	90.6	3	30%
11/6/01	9:10	7			
11/7/01	8:50	19			
11/8/01	12:03	2			
11/13/01	12:00	42			
11/14/01	10:13	2			
11/15/01	12:05	14			
11/21/01	8:52	2			
11/26/01	10:13	340	11.0	0	0%
12/4/01	10:20	340			
12/5/01	10:18	51			
12/6/01	10:20	70			
12/7/01	10:20	7			
12/11/01	10:32	23			
12/12/01	10:42	90			
12/18/01	12:18	20	44.6	0	0%
1/7/02	9:23	12			
1/9/02	9:15	630			
1/10/02	10:23	49			
1/16/02	9:28	12			
1/22/02	9:07	73			
1/23/02	10:56	93			
1/24/02	8:48	160			
1/29/02	9:15	120			
1/30/02	13:32	460	86.3	2	22%
2/4/02	10:23	2			
2/11/02	10:31	2			
2/14/02	10:59	2			
2/18/02	12:02	380			
2/19/02	9:10	440			
2/21/02	11:07	44			
2/22/02	9:48	21			
2/25/02	9:00	2			
2/27/02	9:06	1,600			
2/28/02	10:23	7	22.1	2	20%
3/6/02	9:55	5			
3/8/02	9:45	140			
3/12/02	11:17	17			
3/14/02	10:48	130			
3/18/02	10:42	900			
3/20/02	10:03	600			
3/22/02	10:10	110			

Table 10
2000 – 2002 Fecal Coliform Monitoring Data
Station 10

3/25/02	8:32	9			
3/27/02	11:34	9			
3/28/02	10:45	2	41.4	2	20%
4/10/02	9:15	90			
4/11/02	10:10	340			
4/15/02	10:03	220			
4/17/02	11:52	630			
4/18/02	10:47	63	192.9	1	20%

Source: USM COMS, 2002a

Table 11
2000 – 2002 Fecal Coliform Monitoring Data
Station 11

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
1/6/00	10:20	3			
1/10/00	9:45	1,100			
1/12/00	9:45	67			
1/18/00	9:56	190			
1/19/00	10:25	50			
1/21/00	10:00	3			
1/25/00	10:30	9			
1/27/00	11:38	10			
1/29/00	10:29	17			
1/31/00	9:28	10	25.0	1	10%
2/8/00	9:59	7			
2/9/00	10:50	3			
2/10/00	9:59	3			
2/15/00	12:06	39			
2/16/00	11:00	3			
2/22/00	11:00	10			
2/23/00	11:28	15			
2/24/00	10:04	13			
2/28/00	11:27	3			
2/29/00	10:29	63	8.8	0	0
3/1/00	10:29	63			
3/3/00	9:50	80			
3/9/00	11:02	70			
3/10/00	10:55	40			
3/16/00	12:23	220			
3/23/00	11:51	370			
3/25/00	8:46	260			
3/28/00	11:47	470			
3/29/00	10:47	70			
3/30/00	12:29	18			
3/31/00	11:00	12	86.9	1	9%
4/4/00	13:22	49			
4/5/00	12:03	3			
4/5/00	12:03	3			
4/11/00	10:26	3			
4/12/00	11:24	7			
4/13/00	10:00	10			
4/19/00	11:00	13			
4/20/00	9:27	10			
4/26/00	10:55	6			
4/27/00	11:20	48			
4/30/00	9:32	20	9.7	0	0%
5/4/00	11:30	87			
5/9/00	8:01	83			
5/10/00	10:58	37			
5/15/00	9:28	42			
5/17/00	10:03	40			
5/22/00	10:51	409			

Table 11
2000 – 2002 Fecal Coliform Monitoring Data
Station 11

5/23/00	8:59	110			
5/25/00	9:52	3			
5/30/00	9:56	9			
5/31/00	11:06	3	33.2	1	10%
6/7/00	12:23	20			
6/8/00	9:43	66			
6/12/00	9:36	300			
6/15/00	12:42	2,000			
6/16/00	9:30	2,000			
6/17/00	21:05	970			
6/19/00	10:50	2,000			
6/20/00	10:01	370			
6/21/00	8:00	220			
6/22/00	14:49	230			
6/23/00	10:00	2,000			
6/24/00	18:08	6,000			
6/25/00	14:30	6,000			
6/26/00	9:31	1,400			
6/27/00	10:50	6,000			
6/28/00	10:55	2,300			
6/29/00	11:23	500			
6/30/00	9:20	6,000	923.8	12	67%
7/1/00	19:00	81			
7/2/00	16:45	1,200			
7/3/00	17:20	3,100			
7/4/00	14:00	4,100			
7/5/00	15:55	1,800			
7/6/00	6:30	950			
7/7/00	15:25	160			
7/8/00	15:25	7			
7/10/00	7:50	200			
7/11/00	10:10	1700			
7/12/00	11:40	730			
7/14/00	10:14	150			
7/15/00	18:00	6,000			
7/16/00	19:06	5,700			
7/17/00	10:20	6,000			
7/18/00	12:00	6,000			
7/19/00	11:26	6,000			
7/20/00	9:58	14			
7/22/00	12:35	540			
7/23/00	15:29	1,400			
7/24/00	11:40	230			
7/25/00	10:53	77			
7/26/00	11:00	250			
7/27/00	10:21	1,800			
7/28/00	10:50	270			
7/29/00	10:45	450			
7/30/00	9:60	450			
7/31/00	11:20	170	596.0	17	61%
8/1/00	15:21	230			
8/2/00	14:38	21			

Table 11
2000 – 2002 Fecal Coliform Monitoring Data
Station 11

8/3/00	11:59	190			
8/7/00	11:13	2			
8/9/00	9:49	97			
8/14/00	8:46	600			
8/16/00	9:50	100			
8/22/00	10:09	500			
8/23/00	9:20	26			
8/28/00	10:32	220			
8/31/00	9:56	460	103.1	3	27%
9/6/00	10:21	110			
9/7/00	11:47	200			
9/11/00	9:12	620			
9/14/00	10:19	100			
9/19/00	11:09	2			
9/25/00	11:42	270			
9/28/00	10:35	2			
9/29/00	13:15	47	53.7	1	13%
10/3/00	12:35	7			
10/6/00	8:15	100			
10/9/00	9:56	90			
10/18/00	10:26	19			
10/20/00	12:16	320			
10/23/00	10:56	160			
10/24/00	10:59	800			
10/24/00	11:30	2			
10/27/00	11:26	14			
10/30/00	11:20	5			
10/31/00	9:35	12	35.3	1	9%
11/6/00	11:39	2,000			
11/8/00	9:57	330			
11/9/00	12:13	2,000			
11/10/00	16:00	7			
11/14/00	11:16	74			
11/16/00	11:00	200			
11/21/00	10:40	28			
11/27/00	10:41	12			
11/28/00	11:59	140			
11/29/00	11:30	73			
11/30/00	11:06	2	80.7	2	18%
12/4/00	10:47	81			
12/5/00	12:15	33			
12/6/00	10:25	200			
12/7/00	10:53	2			
12/8/00	11:17	2			
12/12/00	10:41	360			
12/13/00	8:46	2			
12/14/00	9:50	26			
12/18/00	7:41	70	24.2	0	0%
1/8/01	11:17	70			
1/10/01	11:01	77			
1/17/01	10:56	2			
1/22/01	10:28	2	12.1	0	0%

Table 11
2000 – 2002 Fecal Coliform Monitoring Data
Station 11

2/6/01	10:33	190			
2/7/01	11:31	2			
2/14/01	10:51	160			
2/15/01	9:35	14			
2/19/01	11:38	12			
2/20/01	10:11	130			
2/21/01	10:06	1,700			
2/23/01	10:11	73			
2/26/01	9:30	520			
2/28/01	11:11	1,500	102.5	3	30%
3/6/01	10:41	1,100			
3/8/01	10:23	200			
3/9/01	10:07	2,000			
3/10/01	13:30	210			
3/14/01	9:15	200			
3/15/01	11:06	1,100			
3/20/01	9:45	93			
3/21/01	10:15	400			
3/27/01	12:08	250			
3/28/01	10:51	520			
3/29/01	9:21	310	388.6	4	36%
4/3/01	10:15	87			
4/10/01	10:31	2,000			
4/11/01	10:54	1,200			
4/12/01	10:19	2,000			
4/13/01	9:40	6,000			
4/14/01	9:04	1,300			
4/15/01	8:07	1,700			
4/16/01	10:17	220			
4/17/01	10:09	180			
4/19/01	10:17	93			
4/23/01	10:23	140			
4/25/01	11:26	5			
4/27/01	11:17	1,300			
4/30/01	11:29	430	432.4	8	57%
5/1/01	10:50	200			
5/3/01	10:30	180			
5/9/01	10:39	340			
5/15/01	10:15	490			
5/17/01	8:58	530			
5/21/01	11:04	530			
5/22/01	10:28	190			
5/24/01	10:39	370			
5/30/01	10:30	900	361.9	4	44%
6/7/01	11:21	410			
6/8/01	10:52	2,000			
6/9/01	10:41	3,600			
6/12/01	10:47	2,000			
6/13/01	11:02	2,000			
6/14/01	11:30	4,000			
6/15/01	10:03	2,200			
6/16/01	8:15	78			

Table 11
2000 – 2002 Fecal Coliform Monitoring Data
Station 11

6/17/01	10:05	37			
6/18/01	10:20	2,000			
6/21/01	12:26	2,000			
6/22/01	12:40	830			
6/25/01	9:51	60			
6/26/01	10:15	56	665.5	10	71%
7/9/01	8:25	430			
7/11/01	8:34	2,000			
7/16/01	12:12	530			
7/19/01	10:01	1,400			
7/24/01	9:15	430			
7/27/01	9:31	3,700			
7/29/01	7:30	300			
7/30/01	9:20	47			
7/31/01	11:14	150	505.3	6	60%
8/9/01	10:00	120			
8/15/01	10:03	2,000			
8/16/01	10:10	1,400			
8/20/01	10:48	290			
8/21/01	10:00	93			
8/22/01	9:16	100			
8/23/01	10:30	21			
8/27/01	10:55	47			
8/29/01	10:26	1,900			
8/31/01	10:26	700	255.6	4	40%
9/6/01	12:15	530			
9/7/01	10:20	600			
9/10/01	10:57	83			
9/11/01	11:16	350			
9/12/01	10:39	2,000			
9/13/01	14:26	67			
9/18/01	11:50	1,400			
9/20/01	12:03	1,200			
9/25/01	12:04	28			
9/26/01	10:10	23			
9/27/01	11:38	310	262.9	5	45%
10/3/01	10:09	44			
10/9/01	10:16	9			
10/11/01	10:00	93			
10/15/01	9:17	1,300			
10/17/01	8:32	56			
10/18/01	9:32	26			
10/22/01	10:22	53			
10/23/01	12:37	110			
10/24/01	10:01	160			
10/29/01	10:22	5			
10/31/01	9:23	7	46.6	1	9%
11/6/01	9:25	2			
11/7/01	9:15	7			
11/8/01	12:08	35			
11/13/01	12:12	53			
11/14/01	10:20	2			

Table 11
2000 – 2002 Fecal Coliform Monitoring Data
Station 11

11/15/01	12:11	2			
11/21/01	9:01	2			
11/26/01	10:17	100	8.2	0	0%
12/4/01	12:30	28			
12/5/01	10:25	2			
12/6/01	10:33	550			
12/7/01	10:26	7			
12/11/01	10:38	180			
12/12/01	10:51	77			
12/18/01	12:30	240	49.4	1	14%
1/7/02	9:34	33			
1/9/02	9:33	44			
1/10/02	10:32	100			
1/16/02	9:35	5			
1/22/02	9:17	100			
1/23/02	11:05	120			
1/24/02	9:00	140			
1/29/02	9:22	73			
1/30/02	13:48	430	69.6	1	11%
2/4/02	10:29	28			
2/11/02	10:50	150			
2/14/02	11:05	9			
2/18/02	12:10	320			
2/19/02	9:17	26			
2/21/02	11:15	40			
2/22/02	9:52	44			
2/25/02	9:10	2			
2/27/02	9:15	1,100			
2/28/02	10:28	19	43.3	1	10%
3/6/02	10:04	2			
3/8/02	9:51	2			
3/12/02	11:23	150			
3/14/02	10:55	9			
3/18/02	10:49	1,100			
3/20/02	10:12	430			
3/22/02	10:16	380			
3/25/02	8:49	7			
3/27/02	11:43	12			
3/28/02	10:53	2	26.4	2	20%
4/10/02	9:20	40			
4/11/02	10:23	12			
4/15/02	10:10	330			
4/17/02	12:03	110			
4/18/02	11:00	190	80.2	0	0%

Source: USM COMS, 2002a

Table 12
2000 – 2002 Fecal Coliform Monitoring Data
Station 12

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/2/00	8:00	33			
3/5/00	6:30	3			
3/8/00	10:56	40			
3/13/00	9:35	30			
3/20/00	10:54	140			
3/21/00	8:20	80	33.2	0	0
4/6/00	9:00	2,000			
4/7/00	10:00	1,200			
4/10/00	11:13	42			
4/18/00	9:00	160			
4/25/00	11:26	13	183.8	2	40%
5/3/00	11:14	290			
5/11/00	10:58	3			
5/16/00	10:13	37			
5/24/00	9:38	20			
6/5/00	10:39	3			
6/13/00	9:41	23			
6/20/00	8:41	27			
6/30/00	10:20	260	27.3	0	0
7/10/00	8:02	210			
7/24/00	12:00	2			
7/25/00	10:59	33			
7/26/00	11:38	77			
7/31/00	11:50	19			
8/8/00	10:40	2			
8/9/00	9:55	12			
8/15/00	9:12	30			
8/24/00	9:26	21			
8/31/00	10:10	170	23.5	0	0%
9/6/00	10:30	76			
9/13/00	7:01	79			
9/20/00	9:39	2			
9/26/00	9:27	5	15.7	0	0%
10/17/00	10:11	160			
10/19/00	11:00	7			
10/27/00	11:35	12			
10/31/00	9:45	2	12.8	0	0%
3/5/01	10:23	180			
3/14/01	9:31	320			
3/19/01	11:30	83	168.5	0	0%
4/4/01	11:20	120			
4/9/01	10:36	2,000			
4/10/01	15:30	3,700			
4/11/01	11:01	3,100			
4/12/01	10:27	550			
4/13/01	9:48	590			
4/14/01	9:21	190			
4/15/01	8:30	420	718.8	6	75%

Table 12
2000 – 2002 Fecal Coliform Monitoring Data
Station 12

5/2/01	11:01	230			
5/8/01	9:41	490			
5/18/01	10:38	51	179.1	1	33%
6/5/01	9:06	620			
6/15/01	10:11	350			
6/18/01	10:49	1,400			
6/29/01	8:26	110	427.6	2	50%
7/10/01	8:44	12			
7/17/01	10:06	220			
7/18/01	9:25	140			
7/23/01	10:28	460	114.2	1	25%
8/9/01	10:13	1,300			
8/14/01	8:49	830	1,038.7	2	100%
9/5/01	8:50	350			
9/17/01	10:46	200			
9/24/01	10:38	100	191.3	0	0%
10/1/01	9:44	9			
10/8/01	9:53	210			
10/10/01	10:20	83			
10/30/01	12:15	360	86.7	0	0%
3/5/02	9:17	16			
3/19/02	9:21	900			
3/21/02	10:50	40	83.2	1	33%
4/8/02	11:25	110			
4/10/02	9:30	40			
4/16/02	10:30	1,800	124.9	1	33%

Source: USM COMS, 2002a

Table 13
2000 – 2002 Fecal Coliform Monitoring Data
Station 12A

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
4/25/00	11:36	3	3.0	0	0
5/4/00	11:45	180			
5/9/00	8:15	530			
5/10/00	11:05	22			
5/15/00	9:47	27			
5/17/00	10:18	410			
5/22/00	11:10	317			
5/23/00	9:17	37			
5/25/00	10:14	22			
5/30/00	10:11	20	79.0	2	22%
6/7/00	12:37	3			
6/8/00	10:00	3			
6/12/00	9:52	3			
6/15/00	12:48	170			
6/19/00	11:01	133			
6/23/00	10:20	3			
6/27/00	11:06	1,000			
6/28/00	11:10	67			
6/29/00	11:37	1,500	38.5	2	22%
7/5/00	16:05	67			
7/11/00	10:26	53			
7/12/00	12:03	130			
7/14/00	10:31	80			
7/17/00	10:36	1,200			
7/18/00	18:48	7			
7/24/00	12:12	77			
7/25/00	11:11	120			
7/26/00	11:41	65			
7/27/00	11:00	160	88.6	1	10%
8/3/00	12:26	9			
8/8/00	10:55	93			
8/9/00	10:03	16			
8/14/00	9:09	35			
8/16/00	10:20	2			
8/22/00	10:26	73			
8/23/00	10:01	42			
8/28/00	11:00	2	16.6	0	0%
9/6/00	10:38	80			
9/7/00	12:09	190			
9/11/00	9:39	47			
9/13/00	7:11	130			
9/19/00	11:30	2			
9/20/00	9:48	2			
9/26/00	9:39	16			
9/28/00	10:49	9			
9/29/00	13:47	77	25.2	0	0%
10/3/00	12:48	5			
10/6/00	8:36	290			

Table 13
2000 – 2002 Fecal Coliform Monitoring Data
Station 12A

10/9/00	10:05	200			
10/18/00	10:42	9			
10/20/00	12:29	7			
10/23/00	11:15	150			
10/24/00	11:11	330			
10/27/00	11:44	2			
10/30/00	11:40	44			
10/31/00	9:55	37	35.2	0	0%
11/6/00	12:24	2,000			
11/8/00	10:11	1,400			
11/9/00	12:30	1,600			
11/14/00	11:29	28			
11/16/00	11:20	16			
11/21/00	10:50	37			
11/27/00	10:58	23			
11/28/00	12:25	2,000			
11/29/00	11:40	170			
11/30/00	11:30	48	17.6	4	40%
1/17/01	11:12	90			
1/22/01	10:50	2			
1/23/01	11:38	2			
1/24/01	11:00	23			
1/25/01	11:26	2			
1/29/01	10:41	28			
1/31/01	10:30	49	11.2	0	0%
2/6/01	10:49	2			
2/7/01	12:07	5			
2/14/01	11:10	77			
2/15/01	9:28	56			
2/19/01	11:51	83			
2/20/01	10:25	7			
2/21/01	10:20	2			
2/23/01	10:27	19			
2/26/01	10:00	150			
2/28/01	11:29	430	31.5	1	11%
3/6/01	10:51	7			
3/8/01	10:48	67			
3/9/01	10:27	1,700			
3/14/01	9:56	770			
3/15/01	11:17	510			
3/16/01	11:11	330			
3/20/01	10:10	240			
3/21/01	10:25	51			
3/26/01	11:07	420			
3/27/01	12:26	900			
3/28/01	11:22	5			
3/29/01	9:51	410	177.5	6	50%
4/3/01	11:29	310			
4/10/01	10:42	2,000			
4/11/01	11:15	3,600			
4/12/01	10:35	2,900			
4/13/01	9:57	460			

Table 13
2000 – 2002 Fecal Coliform Monitoring Data
Station 12A

4/14/01	9:30	400			
4/15/01	8:39	300			
4/16/01	10:30	1,500			
4/17/01	10:40	290			
4/23/01	10:48	1,100			
4/25/01	11:54	490			
4/27/01	11:49	73			
4/30/01	11:37	1,200	685.2	8	62%
5/1/01	11:18	110			
5/3/01	10:48	300			
5/9/01	10:46	2,000			
5/11/01	11:40	1,200			
5/12/01	7:03	490			
5/13/01	9:11	930			
5/15/01	10:38	100			
5/16/01	16:23	79			
5/17/01	10:11	870			
5/18/01	10:50	160			
5/21/01	11:13	290			
5/22/01	10:41	77			
5/24/01	11:06	230	305.7	5	38%
6/7/01	11:39	2,000			
6/8/01	11:07	2,000			
6/9/01	11:28	1,000			
6/12/01	11:08	2,000			
6/13/01	11:20	2,000			
6/14/01	11:43	1,400			
6/15/01	10:20	560			
6/16/01	8:36	57			
6/17/01	10:26	1,200			
6/20/01	10:50	560			
6/21/01	12:40	1,900			
6/22/01	12:57	1,700			
6/23/01	9:32	1,200			
6/24/01	9:20	1,800			
6/25/01	10:16	90			
6/26/01	10:38	2,000			
6/28/01	11:38	770			
6/29/01	8:33	1,000			
6/30/01	10:48	2,600	1010.0	17	89%
7/1/01	11:43	71			
7/2/01	9:25	580			
7/3/01	10:15	1,800			
7/4/01	7:05	270			
7/6/01	8:40	930			
7/7/01	6:50	260			
7/8/01	7:00	220			
7/9/01	8:46	130			
7/11/01	8:45	1,100			
7/12/01	11:00	190			
7/16/01	12:27	670			
7/19/01	10:27	2,000			

Table 13
2000 – 2002 Fecal Coliform Monitoring Data
Station 12A

7/20/01	14:50	21			
7/24/01	9:46	26			
7/27/01	9:43	500			
7/31/01	11:33	670	309.5	8	50%
8/7/01	10:48	470			
8/15/01	10:16	1,000			
8/16/01	10:25	1,200			
8/20/01	11:00	100			
8/21/01	12:12	44			
8/22/01	9:30	180			
8/27/01	11:10	35			
8/29/01	10:43	2,000			
8/30/01	15:30	6,000			
8/31/01	10:47	1,900	452.1	6	60%
9/1/01	7:43	500			
9/2/01	12:46	770			
9/3/01	7:00	900			
9/4/01	12:47	200			
9/7/01	10:48	1,500			
9/10/01	11:14	100			
9/11/01	11:30	87			
9/12/01	10:46	1,600			
9/18/01	12:00	74			
9/20/01	12:20	2,000			
9/21/01	15:30	930			
9/25/01	12:16	490			
9/26/01	10:46	150			
9/27/01	10:52	16	336.0	8	57%
10/3/01	10:17	9			
10/9/01	12:30	380			
10/10/01	10:39	40			
10/15/01	9:23	2,000			
10/17/01	9:00	120			
10/18/01	12:15	42			
10/22/01	10:39	14			
10/24/01	10:23	100			
10/29/01	10:39	5			
10/31/01	9:38	5	46.6	1	10%
11/6/01	12:20	2			
11/7/01	9:50	26			
11/8/01	12:30	160			
11/13/01	12:38	630			
11/14/01	10:39	21			
11/15/01	12:25	5			
11/21/01	9:30	14			
11/26/01	10:22	93	30.3	1	13%
12/4/01	12:55	370			
12/5/01	10:38	70			
12/6/01	10:50	2			
12/7/01	10:43	23			
12/11/01	10:56	14			
12/12/01	11:15	93			

Table 13
2000 – 2002 Fecal Coliform Monitoring Data
Station 12A

12/18/01	12:49	44	35.3	0	0%
1/7/02	10:00	1,800			
1/9/02	10:00	40			
1/10/02	10:49	19			
1/16/02	9:50	16			
1/22/02	9:41	510			
1/23/02	11:20	140			
1/24/02	9:15	83			
1/29/02	9:46	110			
1/30/02	13:59	40	94.0	2	22%
2/4/02	10:40	14			
2/11/02	10:59	110			
2/14/02	11:19	12			
2/18/02	12:22	380			
2/19/02	9:38	23			
2/21/02	11:22	300			
2/22/02	10:12	51			
2/25/02	9:17	2			
2/27/02	9:31	2			
2/28/02	10:40	9	24.8	0	0%
3/6/02	10:19	2			
3/8/02	10:03	2			
3/12/02	11:37	21			
3/14/02	11:13	2,000			
3/18/02	11:02	200			
3/20/02	10:26	530			
3/22/02	10:30	310			
3/25/02	9:20	2			
3/27/02	11:57	16			
3/28/02	11:08	2	28.5	2	20%
4/10/02	10:00	16			
4/11/02	11:00	410			
4/15/02	10:26	250			
4/17/02	12:19	430			
4/18/02	11:15	1,400	250.5	3	60%

Source: USM COMS, 2002a

Table 14
2000 – 2002 Fecal Coliform Monitoring Data
Station 13

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/2/00	820	37			
3/14/00	721	3			
3/21/00	833	100	22.3	0	0%
4/6/00	909	770			
4/18/00	920	17			
4/25/00	1149	17	60.6	1	33%
5/3/00	1125	150			
5/11/00	1106	15			
5/16/00	1034	33			
5/23/00	932	19	34.5	0	0%
6/15/00	1300	120			
6/20/00	912	92			
6/30/00	1015	380	161.3	0	0%
7/10/00	815	23			
7/25/00	1126	47			
7/26/00	1152	49			
7/31/00	1216	390	67.4	0	0%
8/9/00	1010	77			
8/15/00	921	240			
8/24/00	938	73			
8/30/00	830	2	40.5	0	0%
9/13/00	723	49			
9/20/00	1000	5			
9/26/00	945	14	15.1	0	0%
10/12/00	1100	7			
10/17/00	1026	47			
10/27/00	1156	9			
10/31/00	1005	5	11.0	0	0%
3/5/01	1031	310			
3/6/01	1103	2			
3/9/01	1038	120			
3/14/01	1006	230			
3/19/01	1147	51	61.4	0	0%
4/4/01	1113	160			
4/9/01	1049	2,000			
4/10/01	1538	6,000			
4/11/01	1125	1,500			
4/12/01	1041	410			
4/13/01	1003	830			
4/14/01	938	57			
4/15/01	900	210			
4/18/01	1020	100	472.5	5	56%
5/2/01	1115	140			
5/8/01	1001	78			
5/18/01	1041	150	117.9	0	0%
6/1/01	900	2,000			
6/2/01	1041	1,800			
6/5/01	913	230			

Table 14
2000 – 2002 Fecal Coliform Monitoring Data
Station 13

6/15/01	1026	1,300			
6/28/01	1151	2,000			
6/29/01	845	470			
6/30/01	1052	250	821.7	5	71%
7/1/01	1200	21			
7/2/01	938	700			
7/10/01	916	28			
7/17/01	1014	140			
7/18/01	938	100			
7/23/01	1038	100			
7/24/01	953	40	81.1	1	14%
8/7/01	1103	470			
8/9/01	1026	280			
8/14/01	915	970			
8/24/01	820	33	254.8	2	50%
9/5/01	915	47			
9/17/01	1053	310			
9/24/01	1046	67	99.2	0	0%
10/1/01	951	23			
10/8/01	1010	23			
10/11/01	1120	46			
10/30/01	1240	370	54.8	0	0%
3/5/02	938	23			
3/19/02	926	130			
3/21/02	1059	35	47.1	0	0%
4/8/02	1135	220			
4/10/02	1015	5			
4/16/02	1039	1,700	123.2	1	33%

Source: USM COMS, 2002a

Table 15
2000 – 2002 Fecal Coliform Monitoring Data
Station 13A

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/2/00	8:58	3			
3/5/00	6:47	3			
3/14/00	7:34	3			
3/21/00	8:41	27	5.2	0	0%
4/6/00	9:17	44			
4/18/00	9:31	3			
4/25/00	12:05	260	32.5	0	0%
5/3/00	11:37	180			
5/11/00	11:13	20			
5/16/00	10:46	260			
5/23/00	9:45	3	40.9	0	0%
6/5/00	10:55	27			
6/13/00	10:04	20			
6/20/00	9:20	23			
6/30/00	10:22	160	37.5	0	0%
7/10/00	8:21	2			
7/26/00	12:02	67			
7/27/00	11:15	100			
7/31/00	12:41	39	26.9	0	0%
8/15/00	9:37	340			
8/24/00	9:55	5			
8/30/00	8:41	73	49.9	0	0%
9/13/00	7:37	19			
9/20/00	10:15	2			
9/26/00	10:00	5	5.7	0	0%
10/12/00	11:11	2			
10/17/00	10:49	2			
10/27/00	12:00	7			
10/31/00	10:13	7	3.7	0	0%
3/5/01	10:49	930			
3/9/01	10:41	440			
3/14/01	10:19	1,900			
3/19/01	11:55	51	446.2	3	75%
4/4/01	11:41	350			
4/9/01	11:00	93			
4/18/01	10:36	47	115.2	0	0%
5/8/01	10:13	51			
5/18/01	10:45	26	36.4	0	0%
6/1/01	9:14	370			
6/1/01	9:10	440			
6/5/01	9:24	2,000			
6/15/01	10:38	370			
6/29/01	8:50	26	315.6	2	40%
7/17/01	10:21	47			
7/19/01	10:41	180			
7/23/01	10:43	19	54.4	0	0%
8/7/01	11:20	390			
8/14/01	9:32	380			

Table 15
2000 – 2002 Fecal Coliform Monitoring Data
Station 13A

8/24/01	8:30	30	164.4	0	0%
9/5/01	9:20	30			
9/17/01	11:05	380			
9/24/01	10:58	73	94.1	0	0%
10/1/01	9:59	12			
10/8/01	10:20	14			
10/11/01	11:32	360			
10/30/01	12:50	16	31.4	0	0%
3/5/02	9:49	26			
3/19/02	9:39	1,500			
3/21/02	11:09	63	134.9	1	33%
4/8/02	11:42	460			
4/10/02	10:28	16			
4/16/02	10:47	1,800	236.6	2	67%

Source: USM COMS, 2002a

Table 16
2000 – 2002 Fecal Coliform Monitoring Data
Station 14

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/2/00	9:20	3			
3/5/00	7:15	12			
3/14/00	7:00	60			
3/21/00	8:51	60	19.0	0	0%
4/6/00	9:36	10			
4/18/00	9:46	3			
4/27/00	11:54	10	6.7	0	0%
5/3/00	11:47	3			
5/11/00	11:41	3			
5/18/00	8:59	30			
5/24/00	10:10	70	11.7	0	0%
6/5/00	11:05	3			
6/16/00	10:00	70			
6/20/00	9:36	67			
6/30/00	10:35	140	37.5	0	0%
7/10/00	8:30	5			
7/26/00	12:12	5			
7/27/00	11:26	87			
7/31/00	12:56	21	14.6	0	0%
8/9/00	10:16	2			
8/14/00	9:29	5			
8/22/00	10:48	7			
8/24/00	10:20	60			
8/30/00	8:59	490	18.3	1	20%
9/13/00	8:00	2			
9/20/00	10:19	58			
9/26/00	10:42	29	15.0	0	0%
10/12/00	11:29	2			
10/17/00	10:56	5			
10/30/00	12:00	2	2.7	0	0%
3/5/01	11:05	90			
3/6/01	11:13	87			
3/14/01	10:36	530			
3/19/01	12:06	73	131.9	1	25%
4/4/01	12:00	73			
4/9/01	11:15	120			
4/18/01	10:48	1,800			
4/24/01	11:17	97	197.8	1	25%
5/2/01	11:36	40			
5/8/01	10:27	42			
5/18/01	10:55	260	75.9	0	0%
6/1/01	9:25	2,000			
6/2/01	10:59	290			
6/5/01	9:32	2,000			
6/14/01	11:58	1,400			
6/28/01	12:30	1,500	1194.9	4	80%
7/10/01	9:50	44			
7/18/01	11:00	140			

Table 16
2000 – 2002 Fecal Coliform Monitoring Data
Station 14

7/23/01	10:51	150	97.4	0	0%
8/7/01	11:40	460			
8/14/01	10:00	1,200			
8/16/01	10:38	230	502.6	2	67%
9/5/01	9:40	150			
9/17/01	11:15	5			
9/24/01	11:20	65	36.5	0	0%
10/1/01	10:27	16			
10/8/01	10:31	12			
10/11/01	12:00	26			
10/30/01	13:00	380	37.1	0	0%
3/5/02	10:10	67			
3/19/02	9:52	770			
3/21/02	11:30	65	149.7	1	33%
4/8/02	12:00	200			
4/10/02	10:49	170			
4/16/02	11:11	51	120.1	0	0%

Source: USM COMS, 2002a

Table 17
2000 – 2002 Fecal Coliform Monitoring Data
Station 15

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
1/6/00	10:48	3			
1/10/00	10:09	77			
1/12/00	10:21	23			
1/18/00	10:30	130			
1/19/00	16:49	15			
1/21/00	10:15	3			
1/25/00	11:31	18			
1/27/00	11:56	3			
1/29/00	11:31	3			
1/31/00	10:00	3	10.4	0	0%
2/8/00	10:20	32			
2/9/00	9:00	3			
2/10/00	10:25	10			
2/15/00	12:30	160			
2/16/00	11:30	17			
2/22/00	11:20	3			
2/23/00	12:07	3			
2/24/00	10:30	3			
2/28/00	11:47	3			
2/29/00	11:15	3	7.6	0	0%
3/1/00	11:15	3			
3/3/00	10:10	3			
3/9/00	11:30	3			
3/10/00	11:10	3			
3/16/00	13:00	20			
3/21/00	9:15	3			
3/23/00	12:23	3			
3/28/00	12:30	160			
3/29/00	11:15	8			
3/30/00	13:00	7			
3/31/00	11:30	10	6.7	0	0%
4/4/00	13:55	19			
4/5/00	12:37	3			
4/5/00	12:37	3			
4/11/00	10:55	3			
4/12/00	11:51	3			
4/13/00	8:05	3			
4/19/00	11:30	22			
4/20/00	9:45	20			
4/25/00	6:45	130			
4/27/00	12:10	3			
4/30/00	10:15	3	7.1	0	0%
5/4/00	12:06	17			
5/9/00	8:41	3			
5/10/00	11:25	3			
5/15/00	10:12	3			
5/17/00	10:42	3			
5/23/00	10:04	3			

Table 17
2000 – 2002 Fecal Coliform Monitoring Data
Station 15

5/24/00	10:25	3			
5/25/00	11:00	3			
5/30/00	10:35	3			
5/31/00	11:40	3	3.6	0	0%
6/7/00	12:58	3			
6/8/00	10:21	3			
6/12/00	10:09	10			
6/15/00	13:20	3			
6/19/00	11:23	18			
6/23/00	10:45	20			
6/27/00	11:29	73			
6/29/00	11:45	27	10.8	0	0%
7/5/00	16:15	5			
7/11/00	10:50	5			
7/12/00	12:18	140			
7/17/00	11:30	93			
7/20/00	11:21	490			
7/24/00	12:30	2			
7/25/00	11:39	37			
7/26/00	12:15	2			
7/31/00	13:01	35	21.1	1	11%
8/3/00	12:40	2			
8/8/00	11:20	2			
8/9/00	10:29	2			
8/14/00	9:41	16			
8/16/00	11:00	2			
8/22/00	10:55	7			
8/28/00	11:20	2			
8/30/00	8:16	2	3.0	0	0%
9/6/00	10:59	10			
9/7/00	12:30	93			
9/11/00	10:10	83			
9/13/00	8:21	12			
9/19/00	11:41	2			
9/20/00	10:37	9			
9/26/00	10:51	9			
9/28/00	11:15	200			
9/29/00	14:15	800	30.7	1	11%
10/3/00	13:17	2			
10/6/00	9:40	23			
10/9/00	10:15	2			
10/12/00	11:45	2			
10/18/00	11:00	2			
10/20/00	12:40	5			
10/23/00	11:39	2			
10/24/00	11:37	2			
10/30/00	13:00	2			
10/31/00	11:28	7	3.2	0	0%
11/6/00	12:43	2,000			
11/8/00	10:29	240			
11/9/00	12:41	1,100			
11/14/00	11:47	21			

Table 17
2000 – 2002 Fecal Coliform Monitoring Data
Station 15

11/21/00	11:09	21			
11/27/00	11:09	9			
11/28/00	13:00	70			
11/28/00	12:51	70			
11/29/00	12:00	7			
11/30/00	11:58	170	81.0	2	20%
12/4/00	11:15	2			
12/5/00	12:50	5			
12/6/00	10:48	1,700			
12/7/00	11:10	7			
12/8/00	11:50	2			
12/12/00	11:00	170			
12/13/00	9:15	12			
12/14/00	10:09	21			
12/18/00	8:00	21	18.2	1	11%
1/8/01	11:41	21			
1/10/01	11:26	2			
1/17/01	11:36	2			
1/22/01	11:15	2			
1/23/01	11:51	2			
1/24/01	11:26	5			
1/25/01	11:43	2			
1/29/01	11:06	130			
1/31/01	11:06	5	5.1	0	0%
2/6/01	11:15	2			
2/7/01	12:30	2			
2/14/01	11:30	30			
2/15/01	11:06	2			
2/19/01	12:13	2			
2/20/01	10:53	12			
2/21/01	10:49	2			
2/23/01	10:49	14			
2/26/01	10:15	5			
2/28/01	13:12	40	5.6	0	0%
3/6/01	11:26	2,000			
3/8/01	11:00	23			
3/9/01	11:00	110			
3/15/01	11:31	740			
3/20/01	10:40	230			
3/21/01	10:39	16			
3/27/01	13:00	2			
3/28/01	11:41	7			
3/29/01	10:10	67	61.7	2	22%
4/3/01	11:48	2			
4/10/01	11:18	19			
4/11/01	11:51	26			
4/12/01	10:50	2			
4/16/01	10:44	19			
4/17/01	10:51	47			
4/23/01	11:24	19			
4/25/01	12:02	2			
4/30/01	12:21	37	11.1	0	0%

Table 17
2000 – 2002 Fecal Coliform Monitoring Data
Station 15

5/1/01	11:26	110			
5/3/01	11:09	12			
5/9/01	11:14	900			
5/15/01	11:01	2			
5/18/01	11:10	180			
5/21/01	11:48	28			
5/22/01	10:59	2			
5/29/01	9:20	700	45.0	2	25%
6/1/01	9:35	2,000			
6/2/01	11:06	620			
6/8/01	11:13	340			
6/12/01	11:40	2,000			
6/13/01	11:46	2,000			
6/14/01	12:07	2,600			
6/15/01	10:46	700			
6/16/01	9:07	210			
6/17/01	9:30	140			
6/18/01	9:15	130			
6/19/01	N/A	2,000			
6/20/01	13:10	830			
6/21/01	13:05	2,000			
6/22/01	13:24	2,000			
6/23/01	9:53	290			
6/25/01	11:30	40			
6/26/01	11:15	51	555.8	10	59%
7/9/01	9:16	30			
7/11/01	9:02	74			
7/12/01	11:17	77			
7/16/01	12:45	33			
7/19/01	10:51	100			
7/24/01	10:30	15			
7/27/01	13:30	19			
7/30/01	10:00	90	44.2	0	0%
8/10/01	8:30	73			
8/14/01	10:20	1,200			
8/15/01	10:35	590			
8/16/01	10:45	330			
8/20/01	11:50	46			
8/21/01	12:38	44			
8/22/01	9:46	120			
8/27/01	11:16	31			
8/31/01	11:30	770	166.6	3	33%
9/6/01	13:00	2			
9/7/01	11:10	16			
9/10/01	11:30	53			
9/11/01	11:46	30			
9/12/01	11:15	170			
9/18/01	12:15	53			
9/20/01	13:04	280			
9/26/01	10:58	12			
9/27/01	7:00	2	24.4	0	0%
10/3/01	10:37	9			

Table 17
2000 – 2002 Fecal Coliform Monitoring Data
Station 15

10/9/01	12:50	93			
10/11/01	12:10	830			
10/15/01	9:55	100			
10/17/01	9:20	130			
10/18/01	12:38	210			
10/22/01	10:49	2			
10/23/01	13:15	67			
10/24/01	10:45	93			
10/29/01	10:52	9			
10/31/01	10:12	2	40.1	1	9%
11/6/01	13:00	2			
11/7/01	10:13	12			
11/8/01	12:56	26			
11/13/01	12:52	830			
11/14/01	11:00	14			
11/15/01	12:53	14			
11/21/01	9:48	23			
11/26/01	10:39	1,500	37.0	2	25%
12/4/01	13:59	330			
12/5/01	11:01	51			
12/6/01	11:15	300			
12/11/01	11:15	180			
12/12/01	11:30	97			
12/18/01	13:12	33	119.5	0	0%
1/7/02	10:15	280			
1/9/02	10:50	42			
1/10/02	11:15	60			
1/16/02	10:10	5			
1/22/02	10:15	97			
1/23/02	11:35	390			
1/24/02	9:39	100			
1/29/02	10:02	30			
1/30/02	14:10	30	61.2	0	0%
2/4/02	10:59	310			
2/11/02	11:25	600			
2/14/02	11:37	9			
2/18/02	12:51	7			
2/19/02	9:59	47			
2/21/02	11:46	140			
2/22/02	10:39	16			
2/25/02	11:15	7			
2/27/02	11:00	1,000			
2/28/02	10:53	77	60.6	2	20%
3/6/02	10:42	2			
3/8/02	10:25	2			
3/12/02	11:54	93			
3/14/02	11:38	150			
3/18/02	11:26	14			
3/20/02	12:00	42			
3/22/02	10:45	42			
3/25/02	10:00	7			
3/27/02	12:19	2			

Table 17
2000 – 2002 Fecal Coliform Monitoring Data
Station 15

3/28/02	11:30	2	11.4	0	0%
4/10/02	6:40	97			
4/11/02	11:30	310			
4/15/02	10:58	5			
4/17/02	12:28	30			
4/18/02	11:30	16	37.3	0	0%

Source: USM COMS, 2002a

Table 18
2000 – 2002 Fecal Coliform Monitoring Data
Station 15A

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/5/00	7:50	3			
3/14/00	7:50	3			
3/21/00	9:45	17	5.3	0	0%
4/6/00	9:55	3			
4/18/00	10:00	3			
4/25/00	7:00	23	5.9	0	0%
5/3/00	8:00	10			
5/11/00	7:30	17			
5/18/00	11:18	77			
5/24/00	10:52	3	14.1	0	0%
6/6/00	8:55	3			
6/16/00	10:34	93			
6/21/00	10:00	3			
6/30/00	10:58	16	10.8	0	0%
7/10/00	8:50	2	2	0	0%
8/9/00	10:46	2			
8/15/00	9:57	5			
8/24/00	12:09	2			
8/30/00	9:40	21	4.5	0	0%
9/13/00	8:43	2			
9/20/00	11:01	2			
9/26/00	11:05	14	3.8	0	0%
10/12/00	12:00	54			
10/17/00	11:17	40			
10/27/00	12:15	5			
10/31/00	11:07	19	21.3	0	0%
3/20/01	11:00	21			
3/21/01	11:00	23			
3/26/01	11:30	5	13.4	0	0%
4/3/01	12:06	2			
4/10/01	11:55	360			
4/18/01	11:15	2			
4/23/01	11:06	12	11.5	0	0%
5/2/01	13:27	5			
5/8/01	11:30	87			
5/18/01	11:39	1			
5/30/01	10:50	33	10.9	0	0%
6/15/01	12:58	42			
6/21/01	9:00	120			
6/29/01	9:17	45	61.0	0	0%
7/17/01	10:49	8			
7/18/01	11:43	77			
7/23/01	11:15	430			
7/27/01	10:25	83	68.5	1	33%
8/9/01	10:38	12			
8/24/01	9:00	26	17.7	0	0%
9/17/01	11:30	14			
9/24/01	13:30	2			

Table 18
2000 – 2002 Fecal Coliform Monitoring Data
Station 15A

9/26/01	11:15	9	6.3	0	0%
10/1/01	10:20	7			
10/8/01	10:48	2			
10/10/01	11:15	69			
10/30/01	14:16	54	15.1	0	0%
3/6/02	11:03	9			
3/19/02	10:19	5			
3/21/02	11:48	19	9.5	0	0%
4/8/02	12:36	44			
4/10/02	11:20	5			
4/16/02	11:30	500	47.9	1	33%

Source: USM COMS, 2002a

Table 19
2000 – 2002 Fecal Coliform Monitoring Data
Station 17

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/2/00	10:00	3			
3/5/00	7:33	3			
3/14/00	8:05	3			
3/21/00	10:10	33	5.5	0	0%
4/6/00	10:15	58			
4/27/00	8:00	13			
4/30/00	10:45	3	13.1	0	0%
5/3/00	8:17	200			
5/11/00	7:45	3			
5/18/00	9:31	12			
5/24/00	11:18	3	12.1	0	0%
6/5/00	11:29	3			
6/6/00	9:15	3			
6/16/00	10:50	310			
6/21/00	10:15	7			
6/30/00	11:15	23	13.5	0	0%
7/10/00	9:29	2	2.0	0	0%
8/9/00	11:00	2			
8/15/00	10:17	30			
8/24/00	12:31	2			
8/30/00	10:00	2	3.9	0	0%
9/13/00	9:00	2			
9/20/00	11:30	2			
9/26/00	11:14	2	2.0	0	0%
10/20/00	9:41	16			
10/27/00	12:30	2			
10/30/00	12:25	2			
10/31/00	10:48	2	3.4	0	0%
3/20/01	11:25	35			
3/21/01	11:27	23	28.4	0	0%
4/12/01	11:20	19			
4/18/01	11:38	5			
4/24/01	11:47	56	17.5	0	0%
5/2/01	13:41	21	21.0	0	0%
6/15/01	13:31	730			
6/21/01	9:22	60			
6/29/01	9:50	80	151.9	1	33%
7/17/01	11:05	7			
7/18/01	12:16	87			
7/23/01	11:33	1,000			
7/27/01	10:40	26	63.1	1	33%
8/9/01	11:20	80			
8/24/01	9:22	56	66.9	0	0%
9/17/01	11:46	5			
9/24/01	13:50	5			
9/26/01	11:40	19	7.8	0	0%
10/1/01	11:16	2			
10/8/01	11:15	16			

Table 19
2000 – 2002 Fecal Coliform Monitoring Data
Station 17

10/10/01	11:42	77			
10/30/01	14:38	150	24.7	0	0%
3/5/02	10:22	37			
3/19/02	10:38	320			
3/21/02	12:15	14	54.9	0	0%
4/8/02	10:59	33			
4/10/02	11:48	2			
4/16/02	11:58	37	13.5	0	0%

Source: USM COMS, 2002a

Table 20
2000 – 2002 Fecal Coliform Monitoring Data
Station 19

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
1/6/00	7:00	3			
1/10/00	7:09	57			
1/12/00	7:00	10			
1/18/00	8:01	110			
1/19/00	7:30	21			
1/21/00	10:45	3			
1/25/00	8:30	15			
1/27/00	9:23	17			
1/29/00	8:00	3	10.6	0	0%
2/8/00	8:00	70			
2/9/00	8:30	3			
2/10/00	8:00	3			
2/15/00	8:00	9			
2/16/00	8:00	7			
2/22/00	8:00	7			
2/23/00	8:00	14			
2/24/00	2:00	3			
2/28/00	9:15	3			
2/29/00	7:30	3	6.3	0	0%
3/1/00	7:30	3			
3/3/00	7:30	3			
3/9/00	8:20	3			
3/10/00	8:00	7			
3/16/00	8:57	97			
3/21/00	10:49	20			
3/23/00	8:58	19			
3/28/00	8:00	13			
3/29/00	9:00	20			
3/30/00	9:00	17			
3/31/00	7:40	7	10.7	0	0%
4/4/00	10:30	3			
4/5/00	9:08	3			
4/5/00	9:08	3			
4/11/00	8:00	7			
4/12/00	9:29	3			
4/13/00	7:30	20			
4/19/00	7:20	35			
4/20/00	7:30	12			
4/25/00	8:24	3			
4/27/00	8:46	10	6.5	0	0%
5/4/00	8:30	3			
5/9/00	6:15	7			
5/10/00	8:38	3			
5/15/00	10:48	3			
5/18/00	10:23	13			
5/23/00	10:43	3			
5/24/00	11:59	10			
5/25/00	11:43	10			

Table 20
2000 – 2002 Fecal Coliform Monitoring Data
Station 19

5/30/00	11:13	3			
5/31/00	8:30	33	6.1	0	0%
6/6/00	9:49	3			
6/7/00	9:27	3			
6/12/00	6:45	10			
6/15/00	10:30	7			
6/19/00	7:36	97			
6/23/00	7:22	13			
6/27/00	8:32	640			
6/28/00	12:45	5			
6/29/00	9:00	530	22.3	2	22%
7/5/00	13:00	2			
7/11/00	8:10	5			
7/12/00	9:03	5			
7/14/00	7:30	9			
7/17/00	7:45	480	11.7	1	20%
11/6/00	9:09	110			
11/8/00	8:30	170			
11/14/00	9:00	51			
11/16/00	9:10	9			
11/21/00	9:00	170			
11/27/00	8:40	7			
11/28/00	10:00	1,700			
11/29/00	8:20	23			
11/30/00	9:06	5			
11/30/00	8:59	19	45.5	1	10%
12/4/00	8:00	5			
12/5/00	9:30	2			
12/6/00	8:40	5			
12/7/00	9:10	2			
12/8/00	7:53	87			
12/12/00	9:00	210			
12/14/00	7:39	58			
12/14/00	7:30	80			
12/18/00	5:45	7	15.7	0	0%
1/8/01	9:00	56			
1/10/01	7:01	21			
1/17/01	8:58	210			
1/22/01	8:20	2			
1/23/01	9:15	7			
1/24/01	7:09	2			
1/25/01	8:45	2			
1/29/01	8:31	160			
1/31/01	7:51	35	16.2	0	0%
2/6/01	9:10	2			
2/7/01	9:15	5			
2/14/01	9:31	44			
2/15/01	9:01	110			
2/19/01	9:07	30			
2/20/01	7:17	120			
2/21/01	7:10	2,000			
2/23/01	7:15	180			

Table 20
2000 – 2002 Fecal Coliform Monitoring Data
Station 19

2/26/01	7:15	120			
2/28/01	7:20	49	57.1	1	10%
3/8/01	8:40	110			
3/9/01	7:41	2,000			
3/10/01	12:15	21			
3/14/01	7:15	1,800			
3/15/01	8:00	830			
3/20/01	8:07	160			
3/21/01	7:09	21			
3/27/01	9:21	54			
3/28/01	8:30	37			
3/29/01	7:09	170	154.8	3	30%
4/3/01	6:27	28			
4/10/01	8:00	1,300			
4/11/01	7:21	670			
4/12/01	7:00	510			
4/16/01	7:30	130			
4/17/01	7:00	7			
4/19/01	8:31	2			
4/23/01	8:40	33			
4/25/01	7:21	40			
4/27/01	8:50	16			
4/30/01	8:20	340	68.8	3	27%
5/1/01	8:30	2			
5/3/01	8:41	23			
5/9/01	8:30	210			
5/15/01	8:00	93			
5/18/01	9:00	18			
5/21/01	9:00	30			
5/22/01	8:30	180			
5/24/01	9:00	75			
5/29/01	5:20	310	50.2	0	0%
6/7/01	9:00	53			
6/8/01	8:45	19			
6/12/01	8:25	1,100			
6/13/01	8:23	1,400			
6/14/01	8:59	260			
6/21/01	10:00	500			
6/22/01	9:14	770			
6/25/01	7:30	80			
6/26/01	8:21	350	253.7	4	44%
7/5/01	8:30	190			
7/9/01	6:38	90			
7/11/01	7:00	200			
7/12/01	8:30	80			
7/16/01	9:11	140			
7/19/01	7:30	590			
7/24/01	7:01	73			
7/27/01	7:20	19	115.4	1	13%
8/9/01	7:22	42			
8/15/01	7:48	270			
8/16/01	8:48	1,300			

Table 20
2000 – 2002 Fecal Coliform Monitoring Data
Station 19

8/21/01	7:17	930			
8/22/01	7:00	87			
8/23/01	8:56	2			
8/27/01	8:00	620			
8/31/01	7:30	330	162.6	3	38%
9/6/01	9:50	200			
9/7/01	8:00	96			
9/10/01	9:08	80			
9/11/01	9:00	360			
9/12/01	8:50	450			
9/18/01	8:00	450			
9/20/01	9:11	930			
9/25/01	7:48	37			
9/26/01	7:30	150			
9/27/01	8:10	9	148.5	3	30%
10/3/01	7:38	9			
10/9/01	8:16	92			
10/11/01	8:29	570			
10/15/01	7:01	93			
10/17/01	6:45	290			
10/18/01	7:30	44			
10/22/01	8:00	33			
10/23/01	8:40	14			
10/24/01	8:05	14			
10/29/01	7:30	7			
10/31/01	7:30	2	33.0	1	9%
11/6/01	7:03	18			
11/7/01	7:00	25			
11/8/01	8:20	410			
11/13/01	8:45	7			
11/14/01	8:00	19			
11/15/01	7:30	5			
11/21/01	7:00	2			
11/26/01	8:41	16	15.8	1	13%
12/4/01	8:38	19			
12/5/01	8:45	7			
12/6/01	7:58	2			
12/7/01	7:50	83			
12/11/01	8:59	9			
12/12/01	9:00	53			
12/18/01	9:36	51	17.7	0	0%
1/7/02	7:13	2,000			
1/8/02	7:50	9			
1/9/02	7:15	19			
1/10/02	8:15	33			
1/16/02	7:20	12			
1/17/02	8:36	9			
1/22/02	7:30	170			
1/23/02	9:00	9			
1/24/02	6:30	150			
1/29/02	7:05	49	41.1	1	10%
2/4/02	8:30	5			

Table 20
2000 – 2002 Fecal Coliform Monitoring Data
Station 19

2/11/02	8:25	930			
2/14/02	8:31	12			
2/18/02	10:05	110			
2/19/02	7:51	97			
2/21/02	9:12	21			
2/22/02	8:00	51			
2/25/02	7:15	5			
2/27/02	7:15	12			
2/28/02	9:00	7	27.7	1	10%
3/6/02	11:40	2			
3/8/02	8:00	2			
3/12/02	9:18	30			
3/14/02	9:21	2,000			
3/18/02	8:24	9			
3/20/02	11:15	21			
3/22/02	8:47	130			
3/25/02	7:13	12			
3/27/02	9:44	2			
3/28/02	9:07	2	14.0	1	10%
4/10/02	7:00	40			
4/11/02	8:15	7			
4/15/02	8:31	110			
4/17/02	9:08	5			
4/18/02	8:40	540	38.4	1	20%

Source: USM COMS, 2002a

Table 21
2000 – 2002 Fecal Coliform Monitoring Data
Station 20

Date	Time	Fecal Coliform (Count/100 ml)	Monthly Geometric Mean	Number of Exceedances Per Month	Percent Exceedances Per Month
3/9/00	8:00	14			
3/16/00	8:56	220			
3/21/00	10:51	3			
3/31/00	7:50	10	17.4	0	0%
4/5/00	8:50	3			
4/5/00	8:50	3			
4/11/00	8:15	3			
4/25/00	8:18	44			
4/27/00	8:53	13	6.9	0	0%
5/3/00	8:46	20			
5/11/00	8:30	3			
5/18/00	10:13	3			
5/23/00	10:52	70	10.6	0	0%
6/6/00	9:52	3			
6/7/00	9:32	3			
6/16/00	12:00	10			
6/21/00	10:45	10			
6/29/00	9:10	110	10.0	0	0%
7/5/00	13:05	7			
7/10/00	10:00	2			
7/18/00	9:30	14	5.8	0	0%
9/19/00	9:09	2	2.0	0	0%
10/3/00	8:00	5			
10/12/00	10:07	2			
10/18/00	8:30	2			
10/24/00	9:00	9	3.7	0	0%
3/8/01	8:46	210			
3/14/01	7:26	1,900			
3/20/01	8:16	590			
3/27/01	9:25	21	265.2	2	50%
4/19/01	8:36	5			
4/25/01	7:32	26			
4/27/01	8:58	5			
4/30/01	8:28	73	14.8	0	0%
5/2/01	8:50	14			
5/7/01	8:00	560			
5/14/01	11:46	3			
5/24/01	9:06	40	31.1	1	25%
6/8/01	8:51	23			
6/13/01	8:30	1,600			
6/29/01	7:00	42	115.6	1	33%
7/17/01	8:20	5			
7/18/01	7:20	190			
7/23/01	7:38	450	75.3	1	33%
8/9/01	7:28	40			
8/14/01	6:15	230	95.9	0	0%
9/5/01	6:46	170			
9/17/01	12:15	2			

Table 21
2000 – 2002 Fecal Coliform Monitoring Data
Station 20

9/24/01	8:17	2	8.8	0	0%
10/3/01	7:32	5			
10/8/01	12:00	14			
10/11/01	8:20	90			
10/24/01	8:00	200	33.5	0	0%
3/5/02	10:45	26			
3/19/02	7:41	150			
3/21/02	8:59	37	52.5	0	0%
4/8/02	8:31	140			
4/10/02	7:05	97			
4/16/02	8:29	1,200	253.5	1	33%

Source: USM COMS, 2002a

Appendix G

Sediment Quality Data Tables

Table 1
1972-1977 Sediment Quality Statistics for Bayou La Croix

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
METALS								
Arsenic	mg/Kg	4	0.00	7.00	3.50	2.65	0.00	7.00
Cadmium	mg/Kg	8	0.03	10.00	5.63	1.65	1.88	10.00
Chromium, total	mg/Kg	8	4.41	10.00	8.60	8.15	8.60	10.00
Copper	mg/Kg	8	4.41	10.00	8.60	8.15	8.60	10.00
Lead	mg/Kg	8	8.82	50.00	19.71	14.49	9.71	20.00
Mercury	mg/Kg	8	0.00	0.20	0.08	0.38	0.00	0.13
Nickel	mg/Kg	4	0.15	15.00	7.58	1.50	0.15	15.00
Zinc, total	mg/Kg	8	2.00	20.00	9.54	7.05	5.13	12.50
ORGANICS								
DDT, total	µg/Kg	6	0.00	0.40	0.27	0.54	0.10	0.40
PCB, total	µg/Kg	6	0.00	16.00	5.67	2.52	0.25	12.25

Table 2
1972-1977 Sediment Quality Statistics for Lower Wolf River-Cane Creek

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
METALS								
Arsenic	mg/Kg	2	5.00	5.00	5.00	5.00	5.00	5.00
Cadmium	mg/Kg	6	0.03	10.00	4.18	0.91	0.65	8.13
Chromium, total	mg/Kg	6	3.01	50.00	21.00	11.46	4.76	40.00
Copper	mg/Kg	6	0.09	10.00	6.70	2.08	2.57	10.00
Lead	mg/Kg	6	6.02	90.00	48.67	30.03	17.02	80.00
Mercury	mg/Kg	6	0.08	0.20	0.13	0.12	0.09	0.18
Nickel	mg/Kg	4	6.02	15.00	10.51	9.50	6.02	15.00
Zinc, total	mg/Kg	6	1.80	10.00	4.60	3.30	1.85	8.00
ORGANICS								
DDT, total	µg/Kg	6	0.00	0.55	0.32	0.60	0.10	0.51
PCB, total	µg/Kg	6	0.00	1.00	0.67	1.00	0.25	1.00

Table 3
1972-1977 Sediment Quality Statistics for Upper Jourdan River

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
METALS								
Cadmium	mg/Kg	4	0.03	2.50	1.27	0.27	0.03	2.50
Chromium, total	mg/Kg	4	3.56	10.00	6.78	5.97	3.56	10.00
Copper	mg/Kg	4	0.09	10.00	5.05	0.95	0.09	10.00
Lead	mg/Kg	4	21.37	50.00	35.69	32.69	21.37	50.00
Mercury	mg/Kg	4	0.10	0.20	0.15	0.14	0.10	0.20
Nickel	mg/Kg	4	14.24	15.00	14.62	14.62	14.24	15.00
Zinc, total	mg/Kg	4	2.00	11.39	6.70	4.77	2.00	11.39
ORGANICS								
DDT, total	µg/Kg	4	0.40	1.70	1.05	0.82	0.40	1.70
PCB, total	µg/Kg	4	1.00	1.00	1.00	1.00	1.00	1.00

Table 4
1972-1977 Sediment Quality Statistics for Turkey Creek-Old Fort Bayou

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
METALS								
Arsenic	mg/Kg	26	0.00	15.00	4.60	3.09	2.00	6.50
Cadmium	mg/Kg	38	0.03	10.00	3.87	1.63	2.00	8.13
Chromium, total	mg/Kg	38	2.52	34.50	11.77	9.43	5.20	18.20
Copper	mg/Kg	38	0.09	14.00	6.00	3.20	1.00	10.00
Lead	mg/Kg	38	4.00	52.55	21.91	16.09	10.00	32.40
Mercury	mg/Kg	22	0.00	0.90	0.18	0.22	0.10	0.20
Nickel	mg/Kg	28	0.15	15.00	7.29	3.94	2.00	11.95
Zinc, total	mg/Kg	38	2.00	65.40	19.74	13.40	6.60	34.65
ORGANICS								
DDT, total	µg/Kg	20	0.00	0.40	0.24	0.58	0.00	0.40
PCB, total	µg/Kg	20	0.00	16.00	3.70	1.99	1.00	6.00

Table 5
1990-1993 Sediment Quality Statistics for Bayou La Croix

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
METALS								
Arsenic	mg/Kg	4	5.39	8.40	6.92	6.82	6.11	7.76
Cadmium	mg/Kg	4	0.13	0.16	0.15	0.15	0.15	0.16
Chromium, total	mg/Kg	4	37.69	54.10	44.57	44.16	40.34	47.47
Copper	mg/Kg	4	7.50	10.40	9.10	9.01	8.03	10.33
Lead	mg/Kg	4	12.20	15.00	13.40	13.35	12.43	14.18
Mercury	mg/Kg	4	0.04	0.06	0.05	0.05	0.05	0.06
Nickel	mg/Kg	4	12.47	20.41	16.62	16.26	13.68	19.73
Silver	mg/Kg	4	0.12	0.14	0.13	0.13	0.13	0.13
Zinc, total	mg/Kg	4	50.10	71.30	60.50	59.74	51.45	69.35
ORGANICS								
DDT, total	µg/Kg	4	0.28	0.40	0.32	0.32	0.28	0.34
PAH, total	mg/Kg	4	0.03	0.10	0.08	0.07	0.07	0.10
PCB, total	µg/Kg	4	0.68	0.90	0.80	0.80	0.78	0.83

Table 6
1990-1993 Sediment Quality Statistics for De Lisle

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
METALS								
Arsenic	mg/Kg	1	9.00	9.00	9.00	9.00		
Cadmium	mg/Kg	1	0.15	0.15	0.15	0.15		
Chromium, total	mg/Kg	1	51.00	51.00	51.00	51.00		
Copper	mg/Kg	1	10.70	10.70	10.70	10.70		
Lead	mg/Kg	1	23.60	23.60	23.60	23.60		
Mercury	mg/Kg	1	0.07	0.07	0.07	0.07		
Nickel	mg/Kg	1	15.40	15.40	15.40	15.40		
Silver	mg/Kg	1	0.11	0.11	0.11	0.11		
Zinc, total	mg/Kg	1	73.00	73.00	73.00	73.00		
ORGANICS								
DDT, total	µg/Kg	1	0.28	0.28	0.28	0.28		
PAH, total	mg/Kg	1	0.14	0.14	0.14	0.14		
PCB, total	µg/Kg	1	0.78	0.78	0.78	0.78		

Table 7
1990-1993 Sediment Quality Statistics for Turkey Creek-Old Fort Bayou

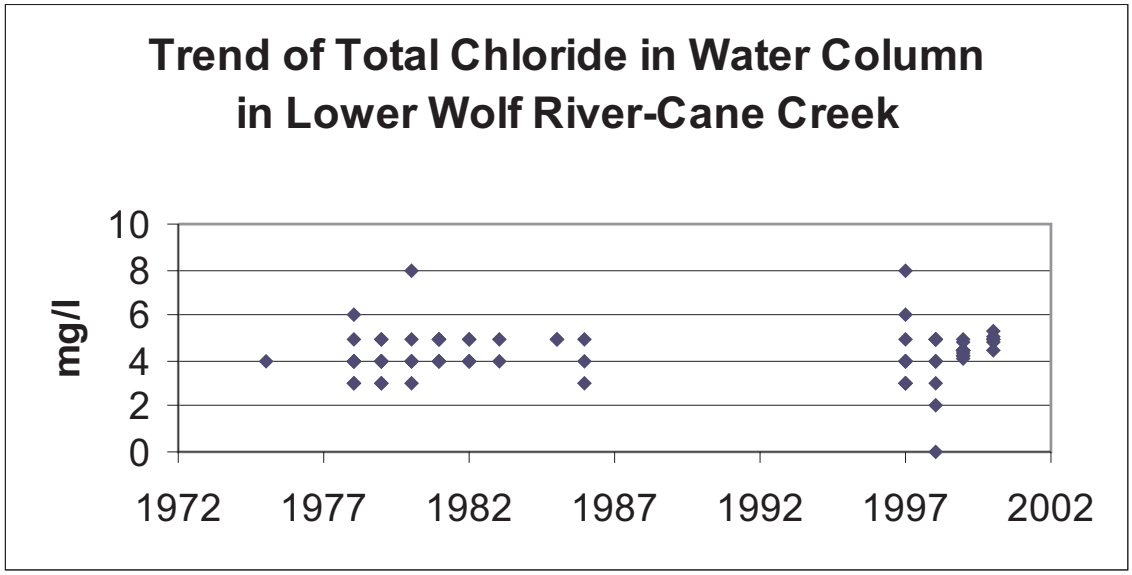
Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
METALS								
Arsenic	mg/Kg	5	1.20	3.30	2.08	1.96	1.48	2.30
Cadmium	mg/Kg	5	0.07	0.21	0.11	0.10	0.09	0.10
Chromium, total	mg/Kg	5	13.70	30.00	19.43	18.53	14.60	23.00
Copper	mg/Kg	5	3.50	7.20	4.44	4.26	3.60	4.20
Lead	mg/Kg	5	5.90	16.10	8.76	8.13	6.00	8.20
Mercury	mg/Kg	5	0.02	0.03	0.02	0.02	0.02	0.02
Nickel	mg/Kg	5	1.60	15.05	6.04	4.38	2.90	7.60
Silver	mg/Kg	5	0.07	0.29	0.13	0.11	0.09	0.11
Zinc, total	mg/Kg	5	22.10	155.00	50.52	35.23	23.90	27.40
ORGANICS								
DDT, total	µg/Kg	5	0.21	0.73	0.40	0.37	0.29	0.42
PAH, total	mg/Kg	5	0.05	0.16	0.10	0.09	0.07	0.14
PCB, total	µg/Kg	5	0.78	6.54	2.25	1.51	0.81	2.30

Table 8
1990-1993 Sediment Quality Statistics for The Islands and Mississippi Sound

Parameter	Units	No. Obs.	Minimum Value	Maximum Value	Arithmetic Mean	Geometric Mean	25th Percentile	75th Percentile
METALS								
Arsenic	mg/Kg	14	0.33	82.50	12.72	6.47	5.61	10.90
Cadmium	mg/Kg	14	0.01	0.56	0.08	0.04	0.03	0.08
Chromium, total	mg/Kg	14	2.60	90.00	52.98	37.66	33.03	69.93
Copper	mg/Kg	14	0.70	25.20	10.22	7.39	6.93	12.73
Lead	mg/Kg	14	0.33	82.50	12.72	6.47	5.61	10.90
Mercury	mg/Kg	14	0.01	0.56	0.08	0.04	0.03	0.08
Nickel	mg/Kg	14	2.60	90.00	52.98	37.66	33.03	69.93
Silver	mg/Kg	13	0.04	0.16	0.08	0.08	0.06	0.10
Zinc, total	mg/Kg	14	7.90	139.00	70.70	55.36	48.43	91.05
ORGANICS								
DDT, total	µg/Kg	13	0.25	1.02	0.41	0.37	0.25	0.48
PAH, total	mg/Kg	13	0.00	0.11	0.05	0.03	0.02	0.08
PCB, total	µg/Kg	13	0.78	1.56	0.94	0.90	0.78	0.81

Appendix H

Water Quality
Historical Trend Analysis Graphs



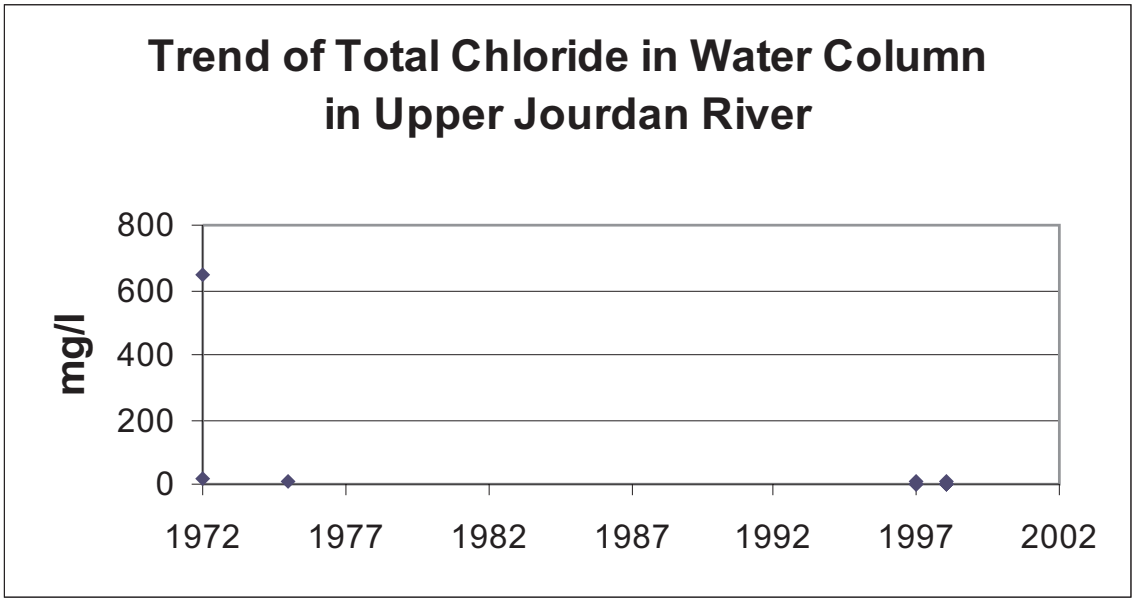
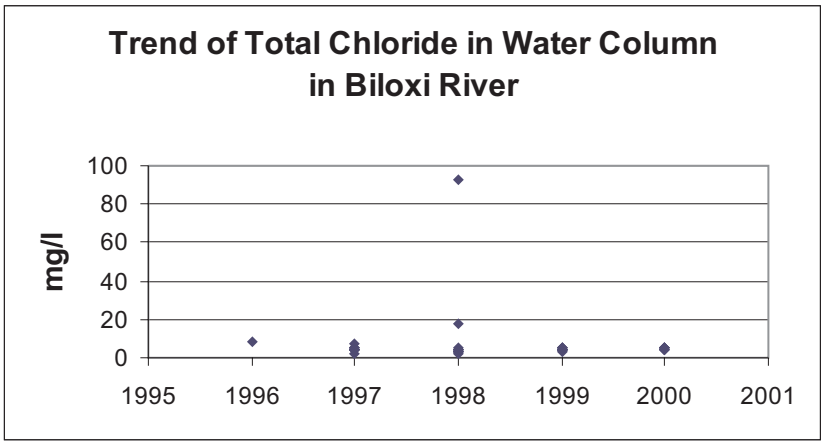
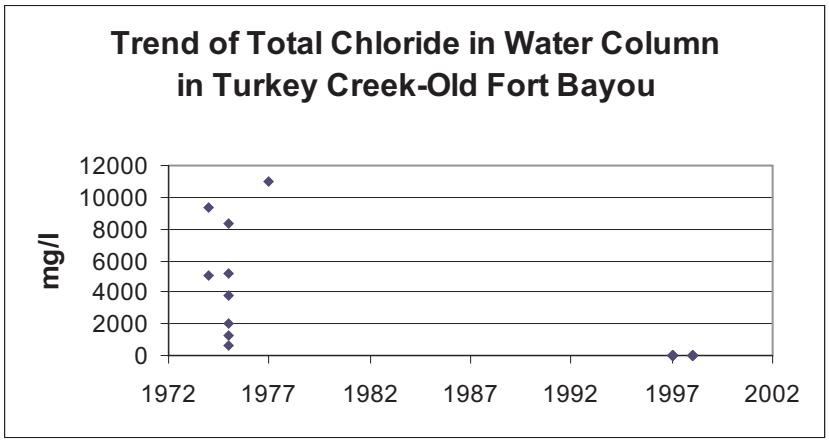


Figure 1a.
Historical trends in total chloride in Bay St. Louis subwatersheds





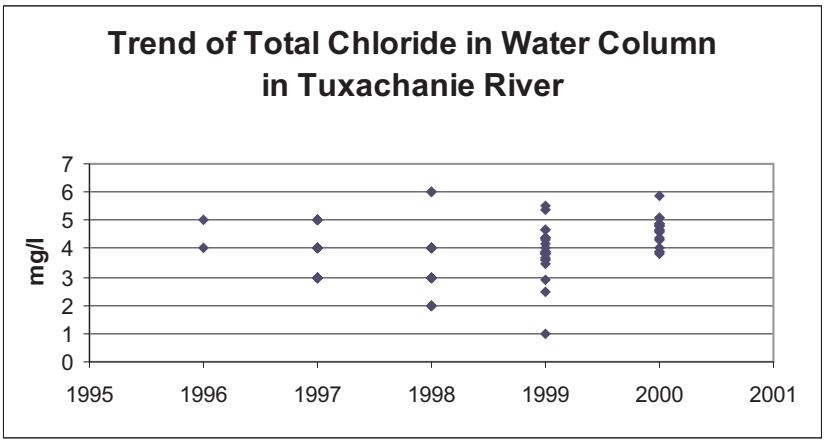
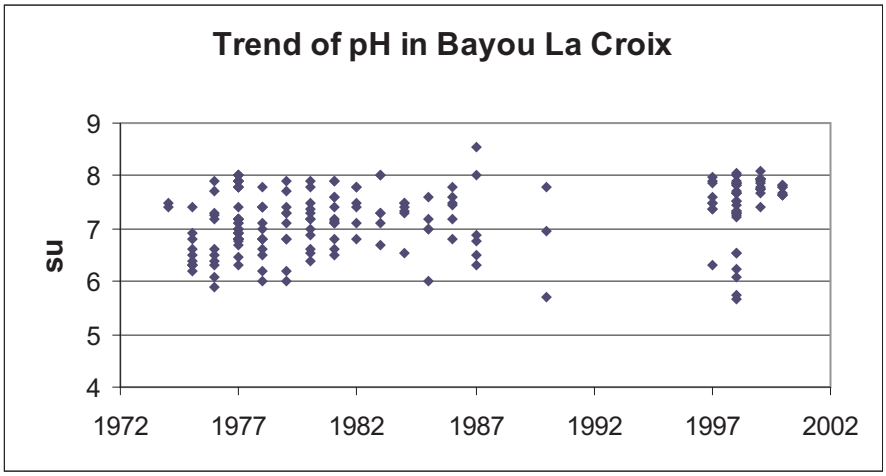
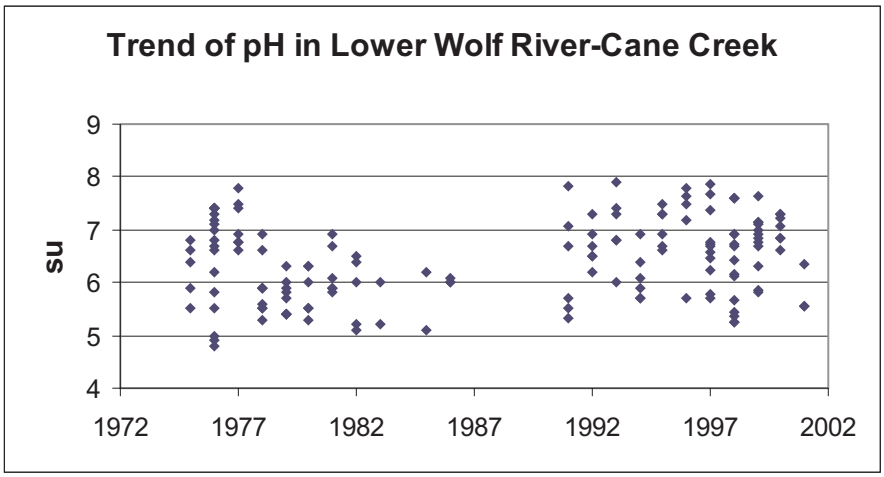


Figure 1b.
Historical trends in total chloride in Biloxi Bay subwatersheds





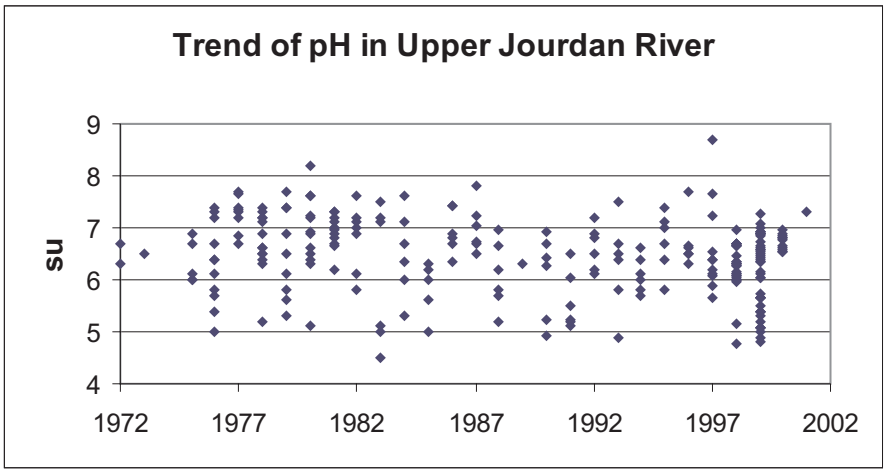
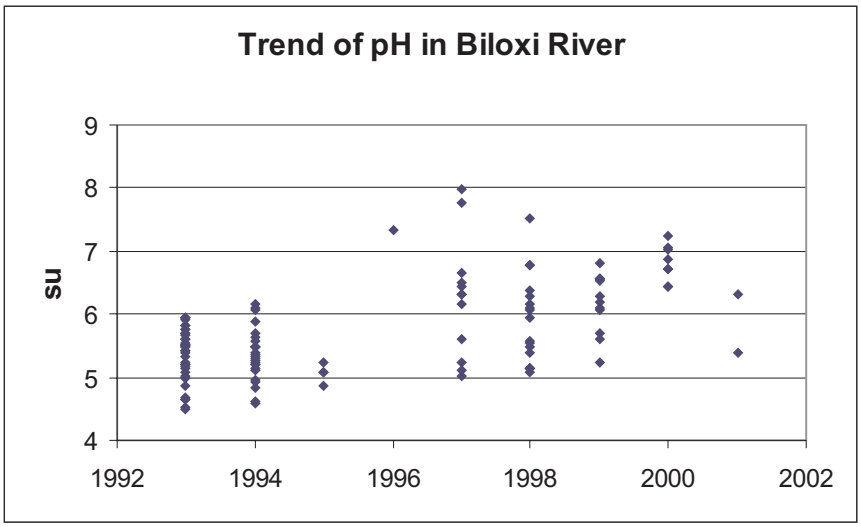
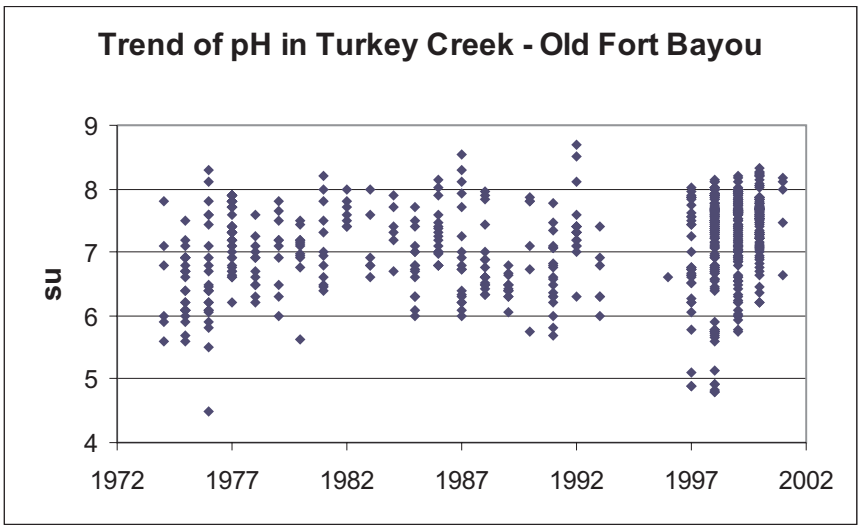


Figure 2a. Historical trends in pH in Bay St. Louis subwatersheds





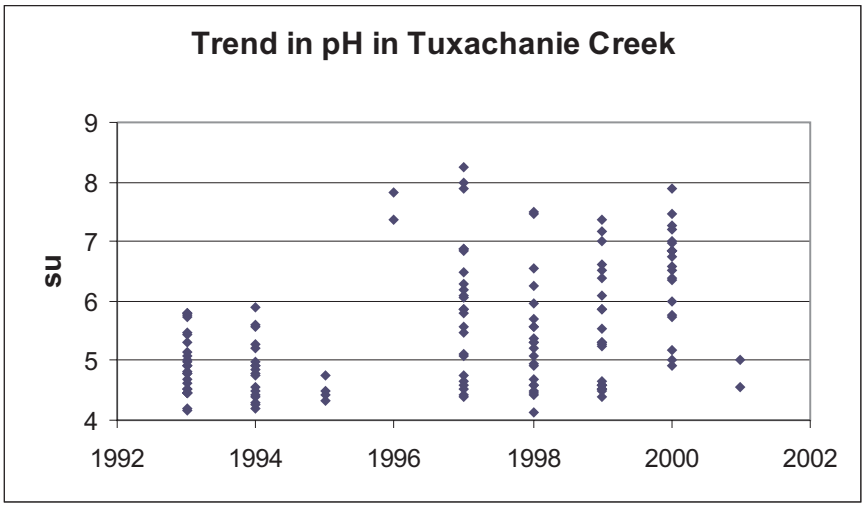
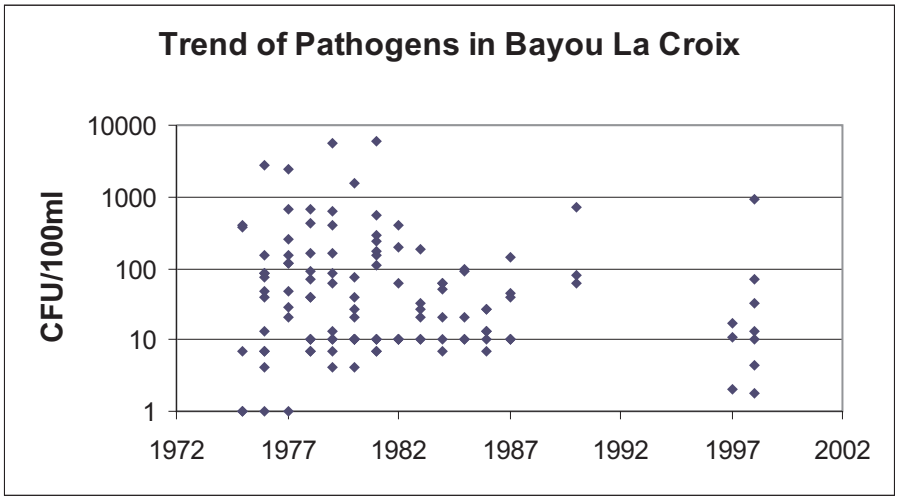
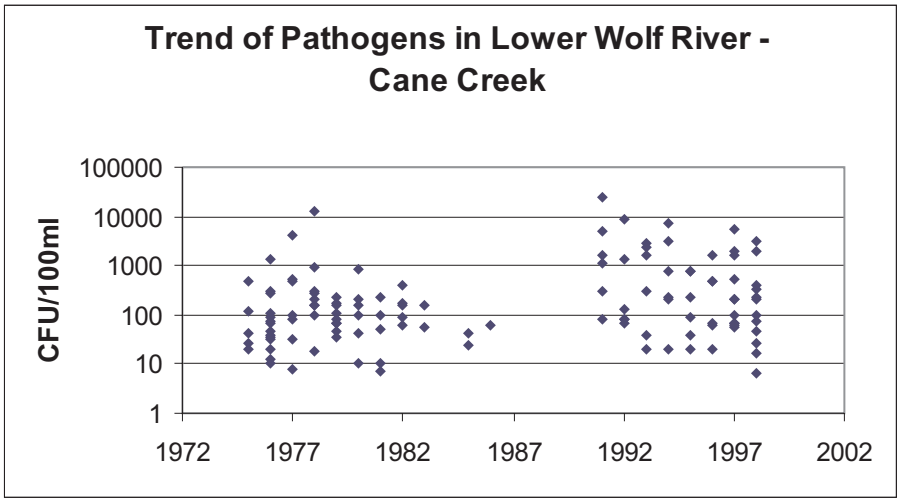


Figure 2b. Historical trends in pH in Biloxi Bay subwatersheds





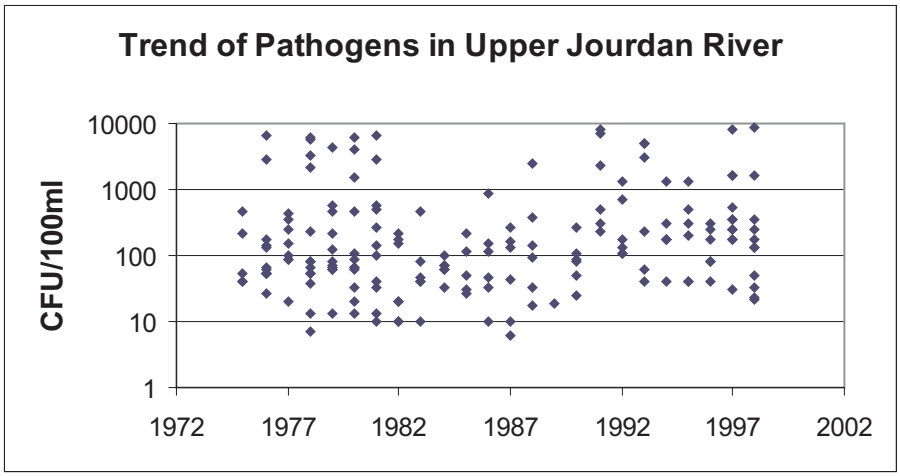
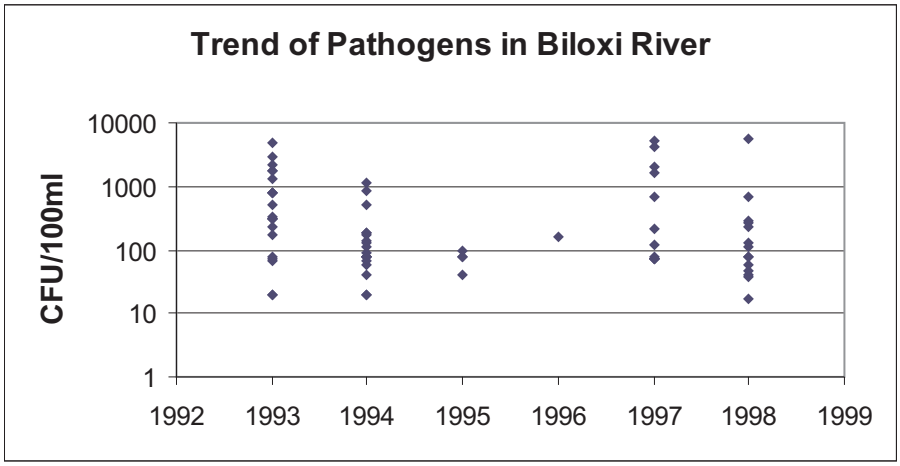
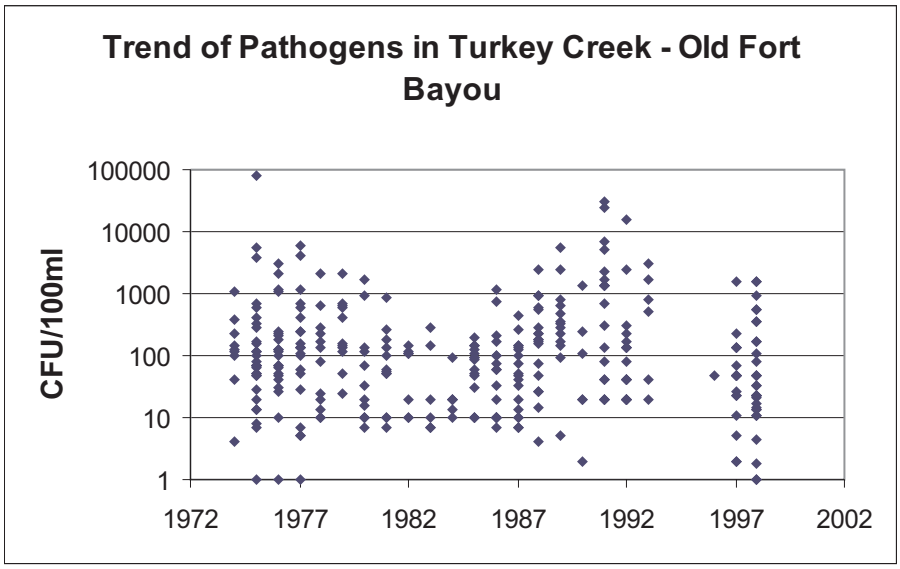


Figure 3a. Historical trends in pathogens in Bay St. Louis subwatersheds





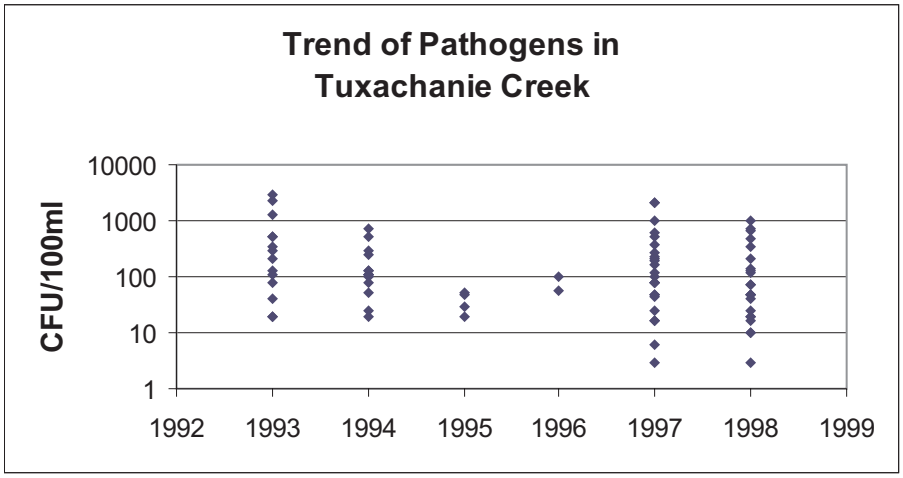
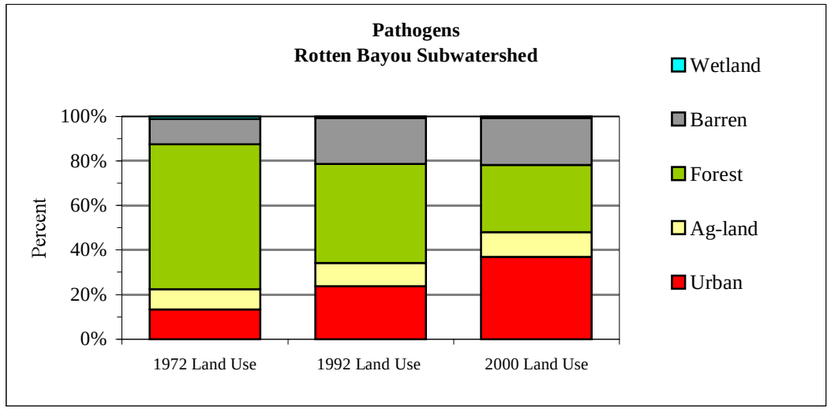
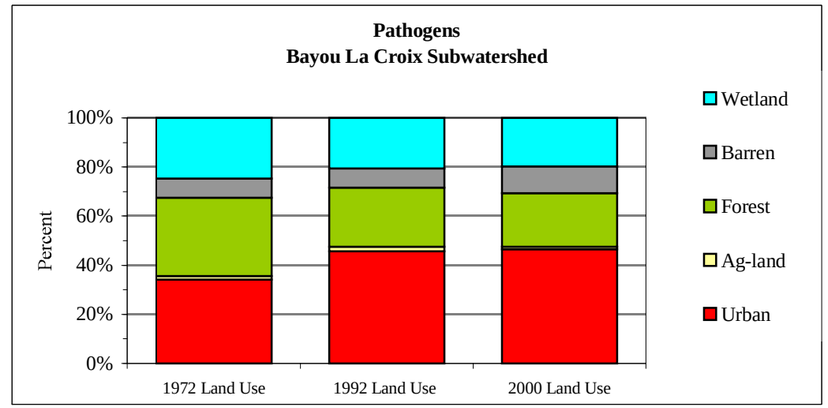
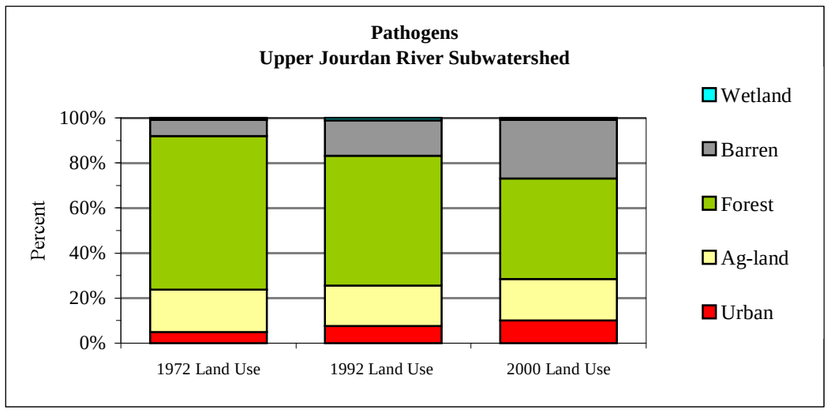
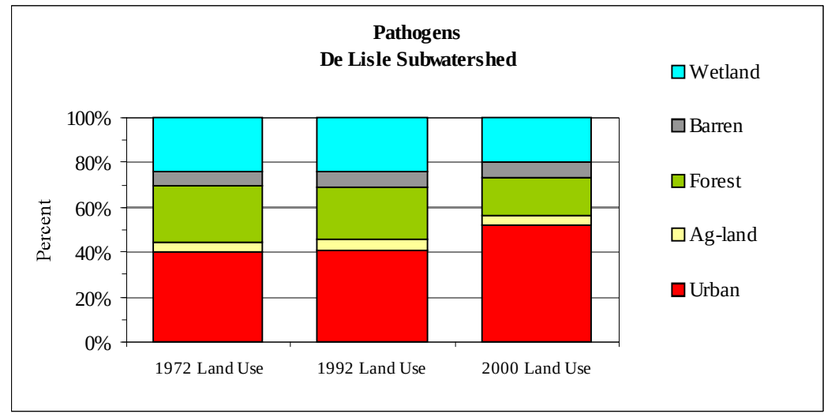


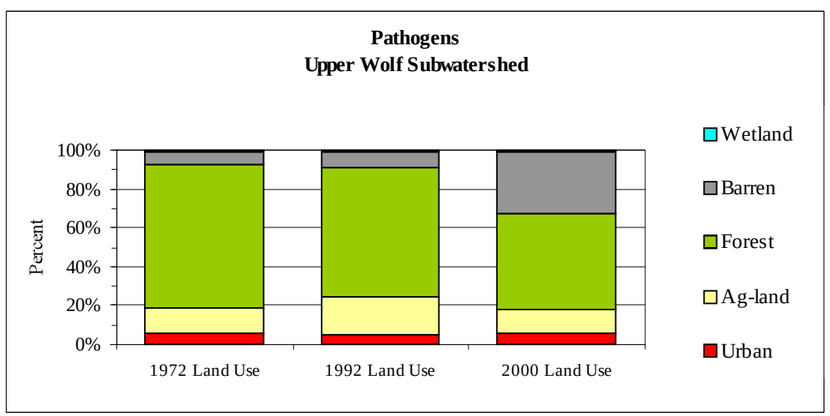
Figure 3b. Historical trends in pathogens in Biloxi Bay subwatersheds











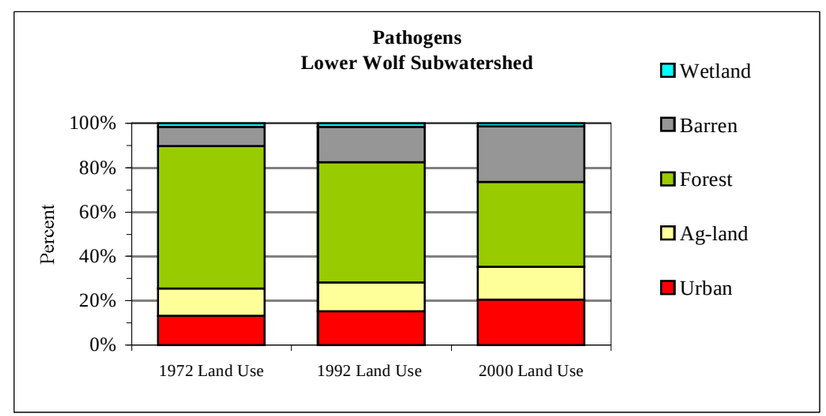
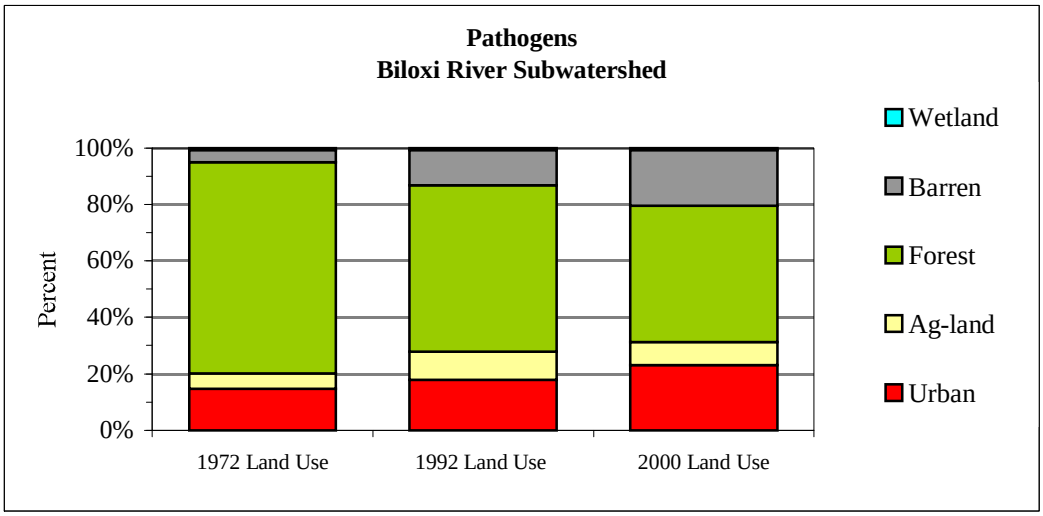
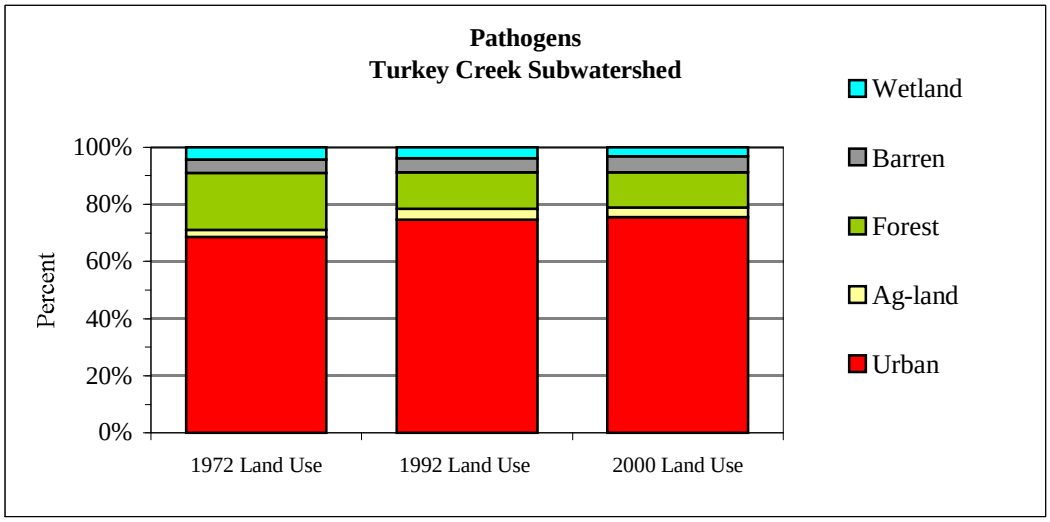


Figure 4a. Historic change in percent of pathogen contribution per land use for Bay St. Louis subwatersheds





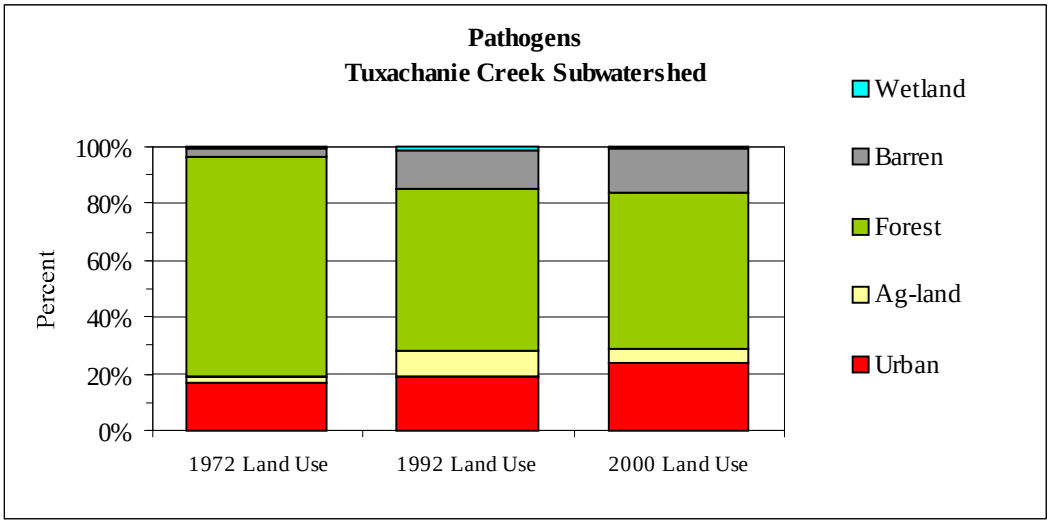


Figure 4b. Historic change in percent of pathogen contribution per land use for Biloxi Bay subwatersheds

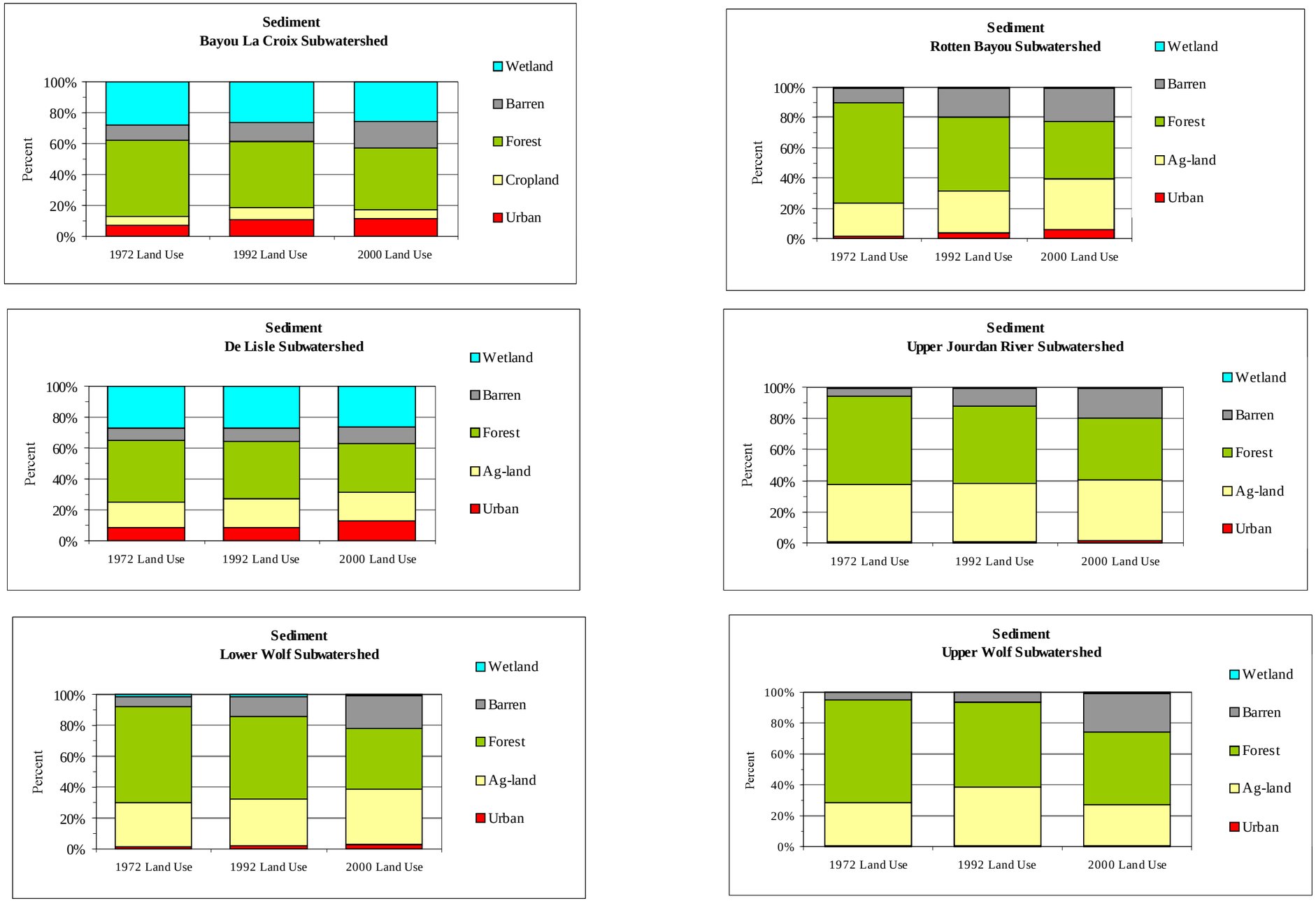
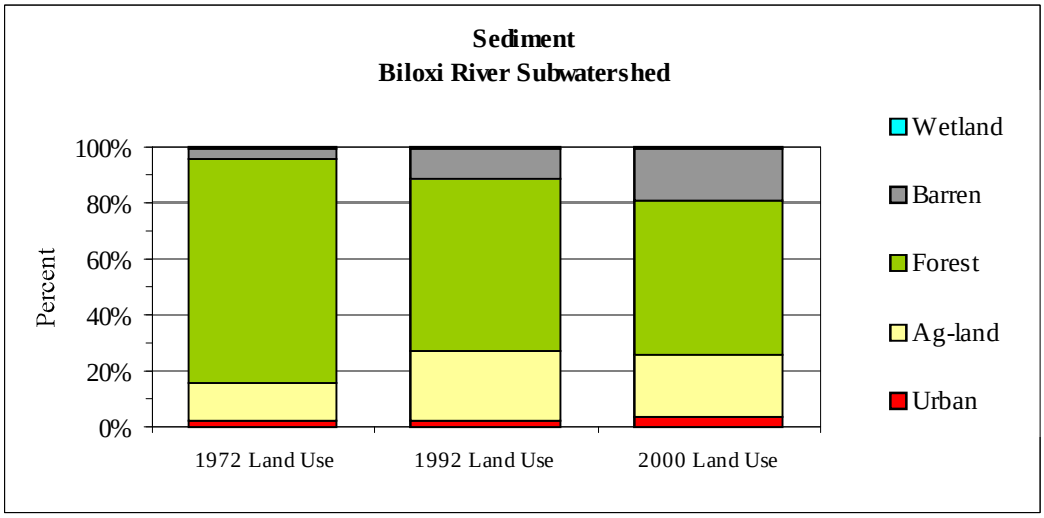
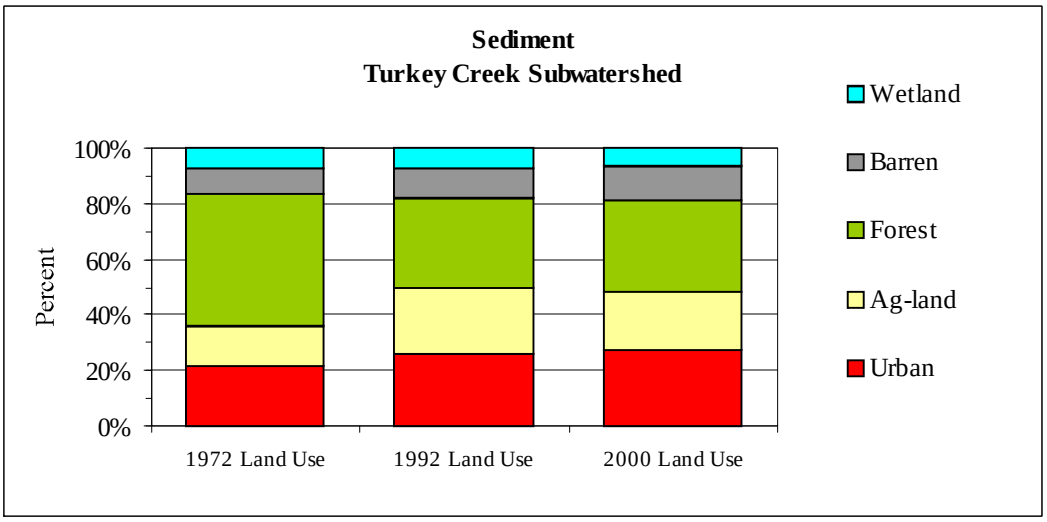


Figure 5a. Historic change in percent of sediment contribution per land use for Bay St. Louis subwatersheds





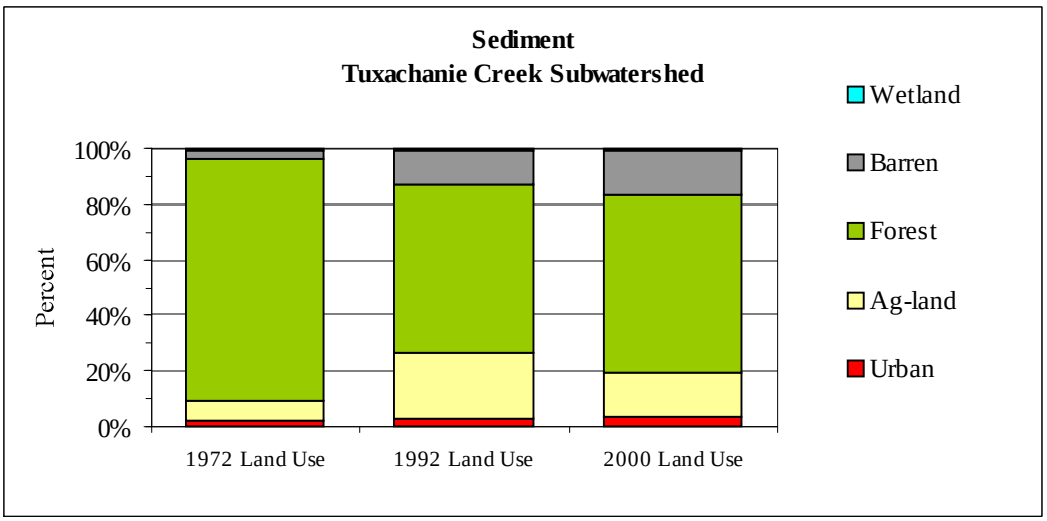
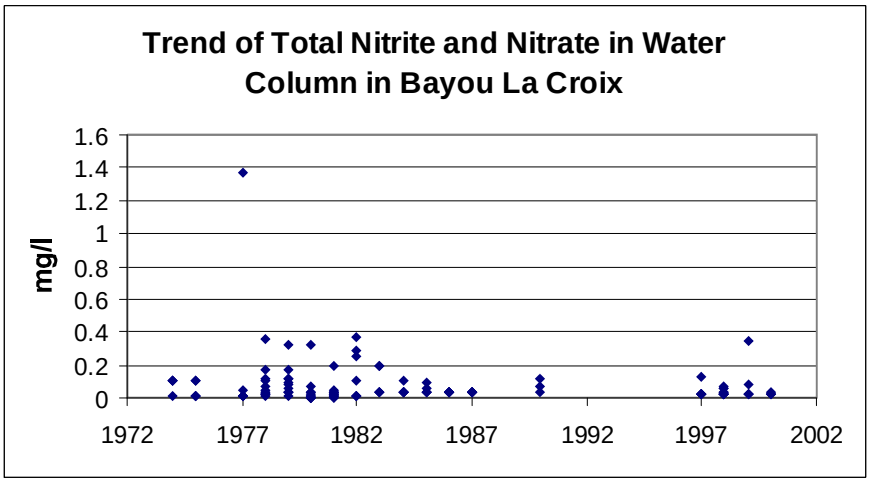
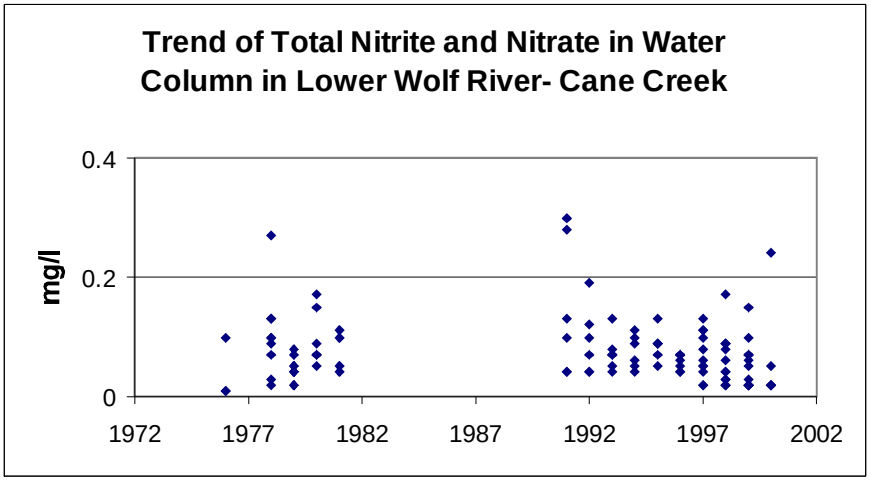


Figure 5b. Historic change in percent of sediment contribution per land use for Biloxi Bay subwatersheds





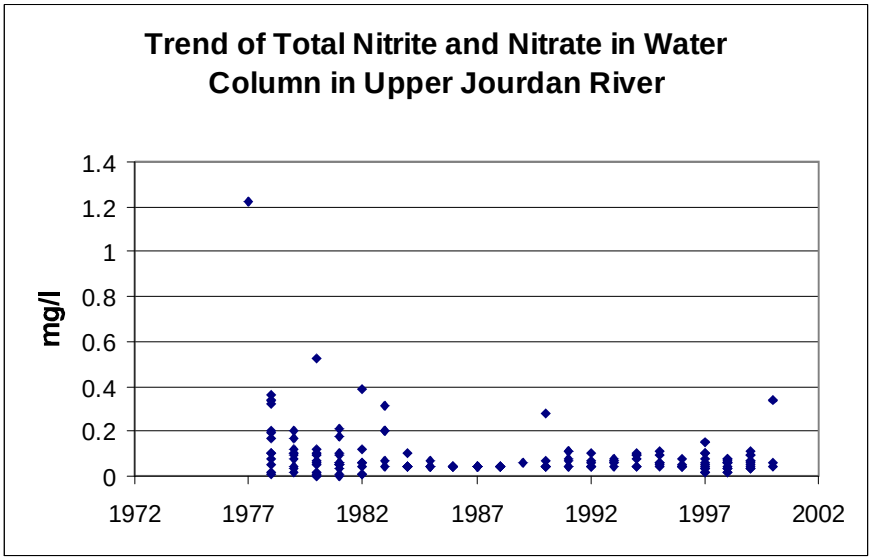
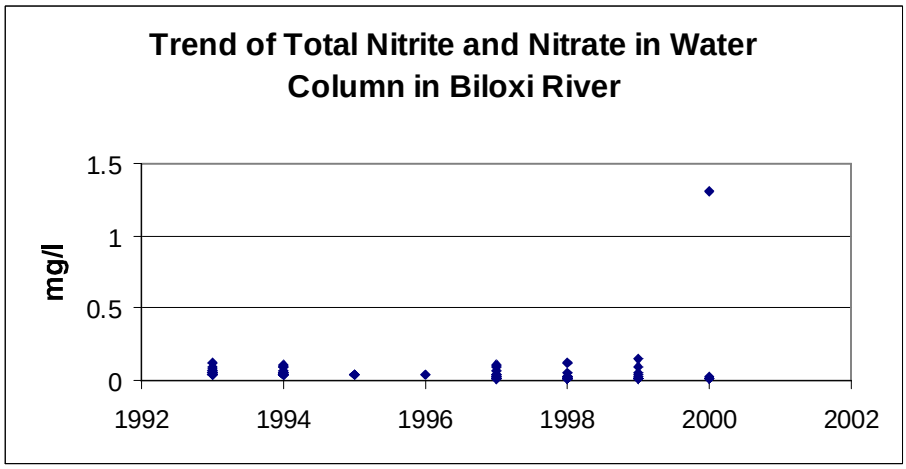
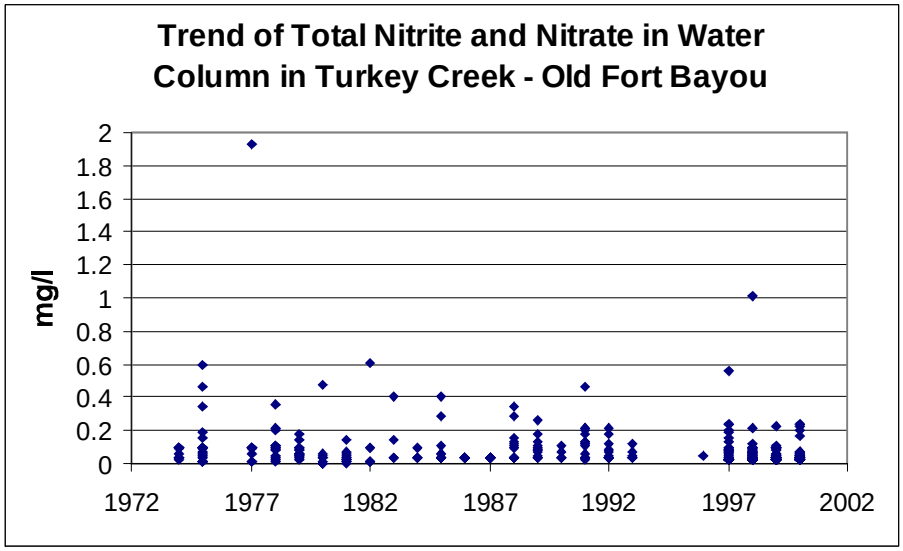


Figure 6a. Historical trends in total nitrate and nitrate in water column in Bay St. Louis subwatersheds





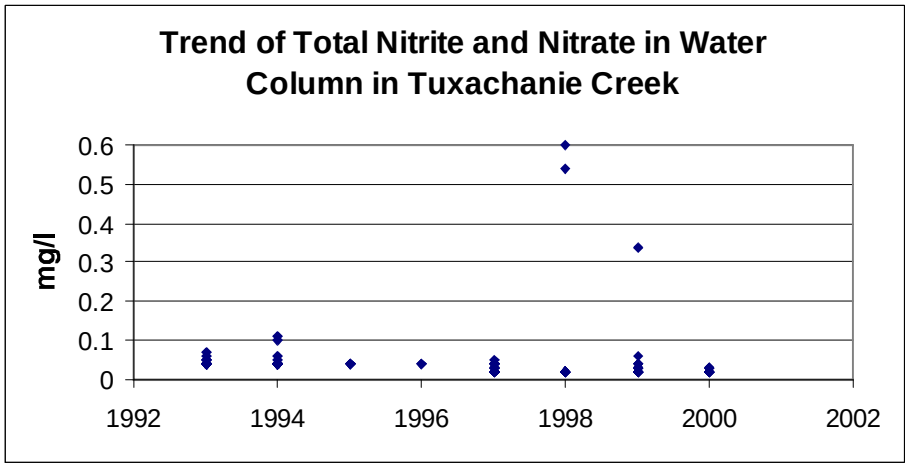
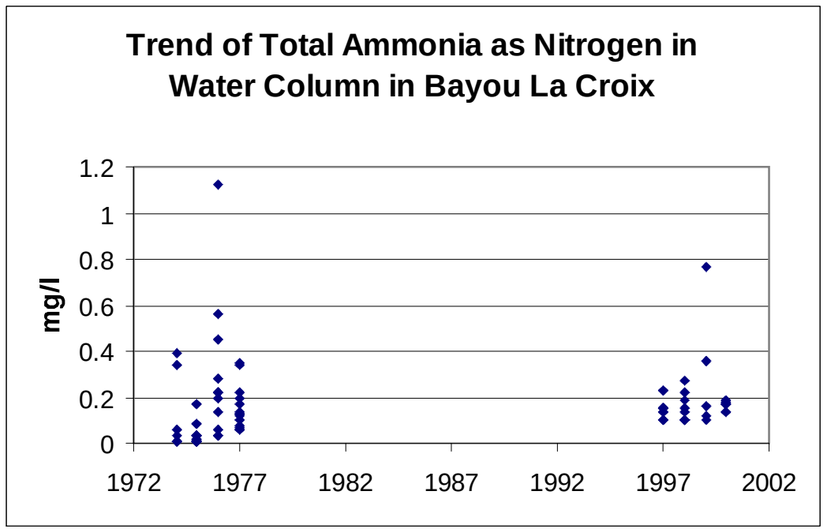
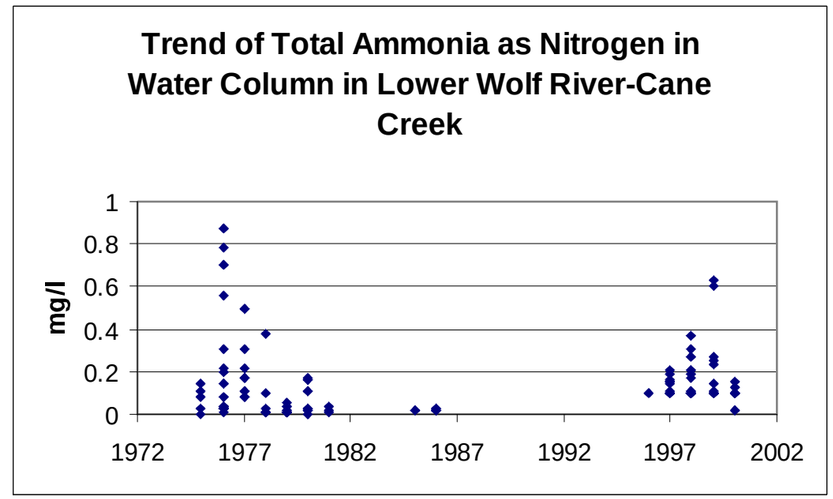
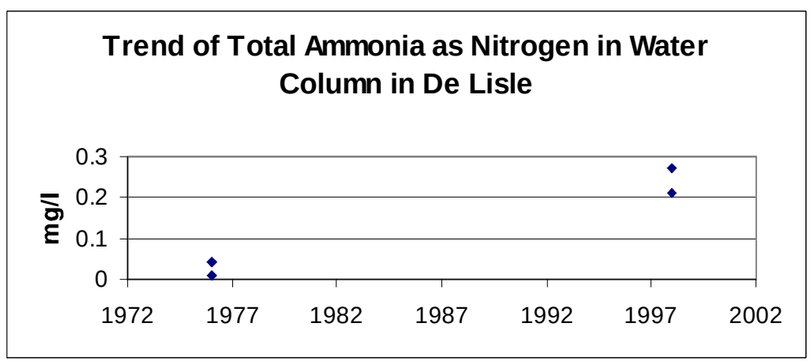


Figure 6b. Historical trends in total nitrate and nitrate in water column in Biloxi Bay subwatersheds







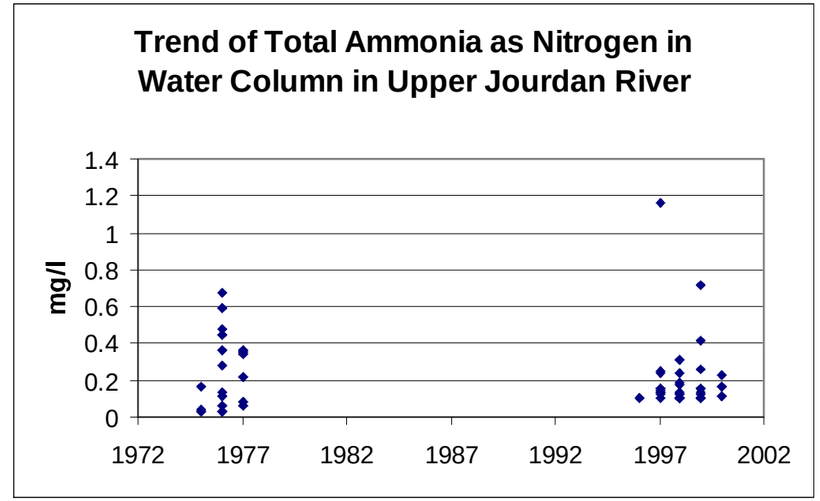
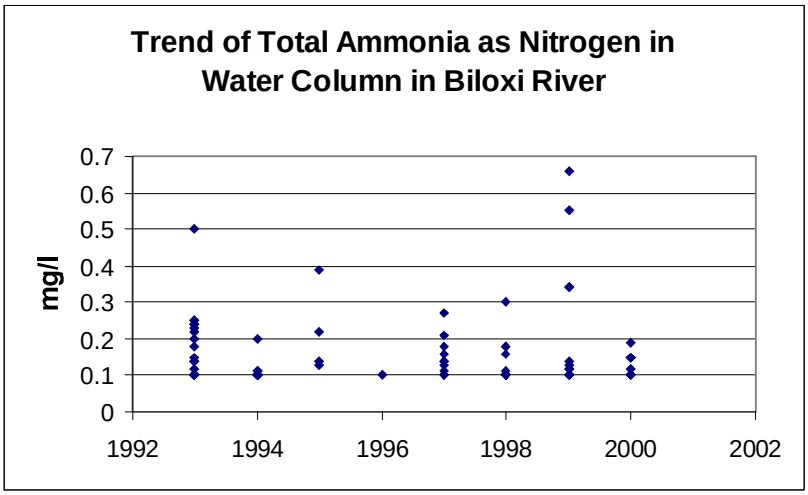
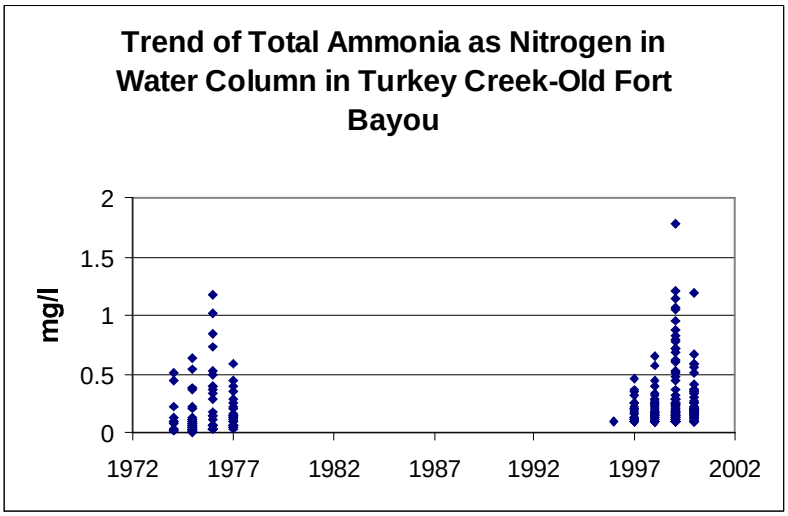


Figure 7a. Trends in total ammonia as nitrogen in water column in Bay St. Louis subwatersheds





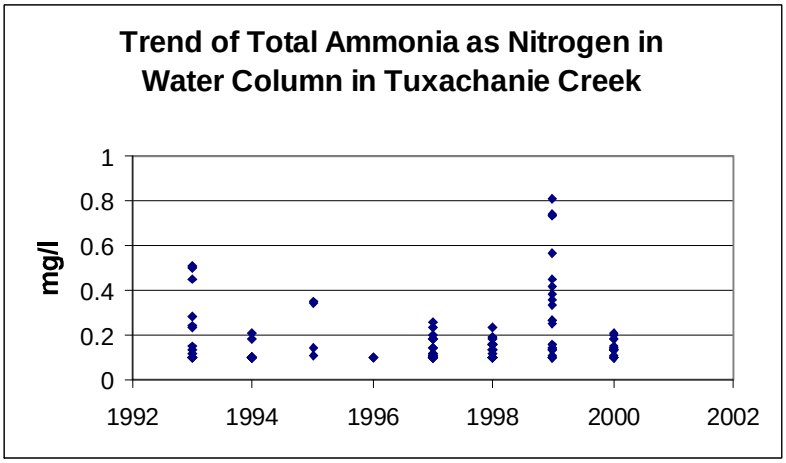
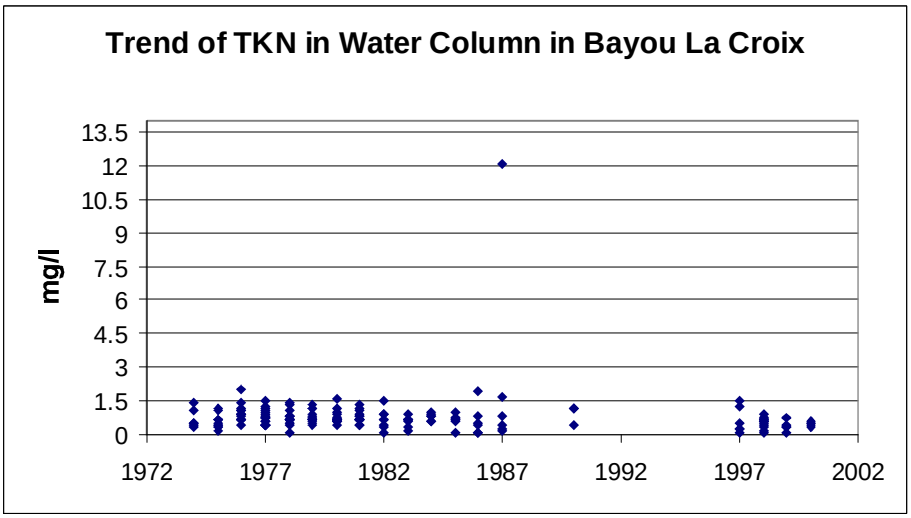
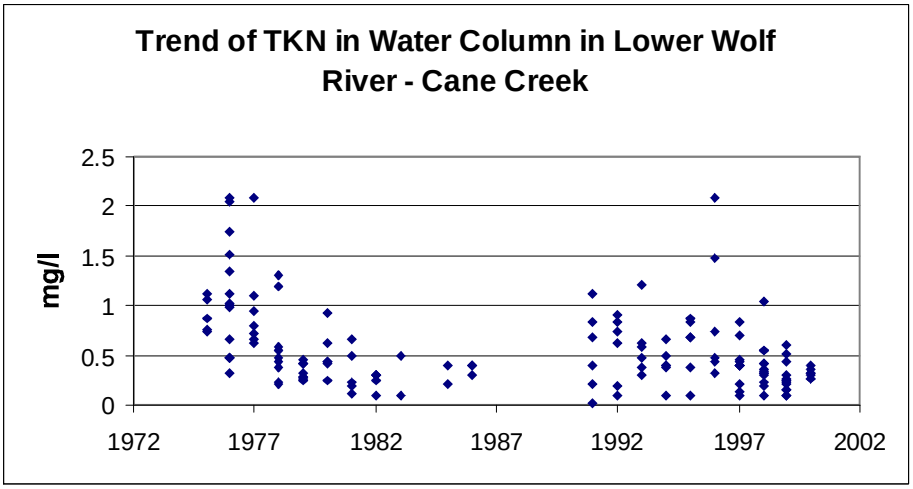


Figure 7b. Trends in total ammonia as nitrogen in water column in Biloxi Bay subwatersheds





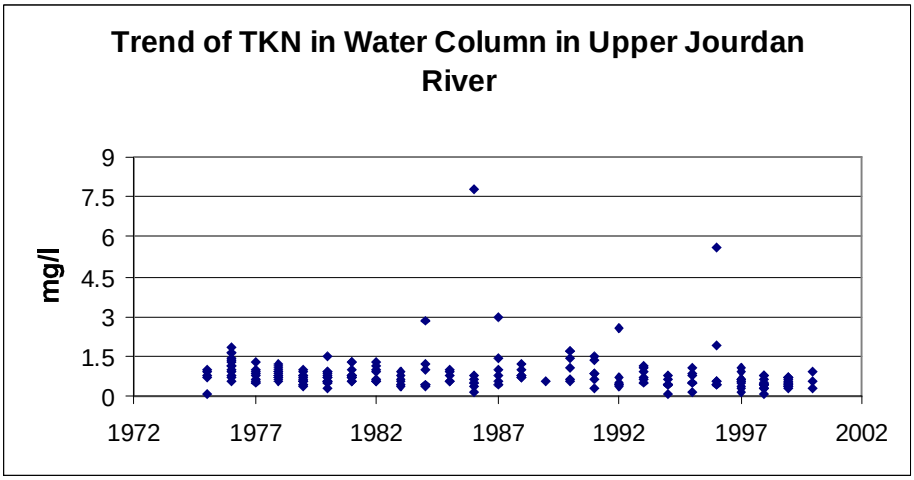
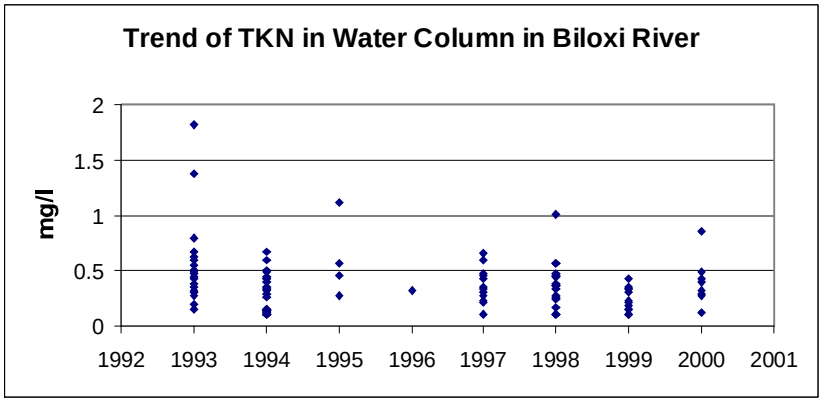
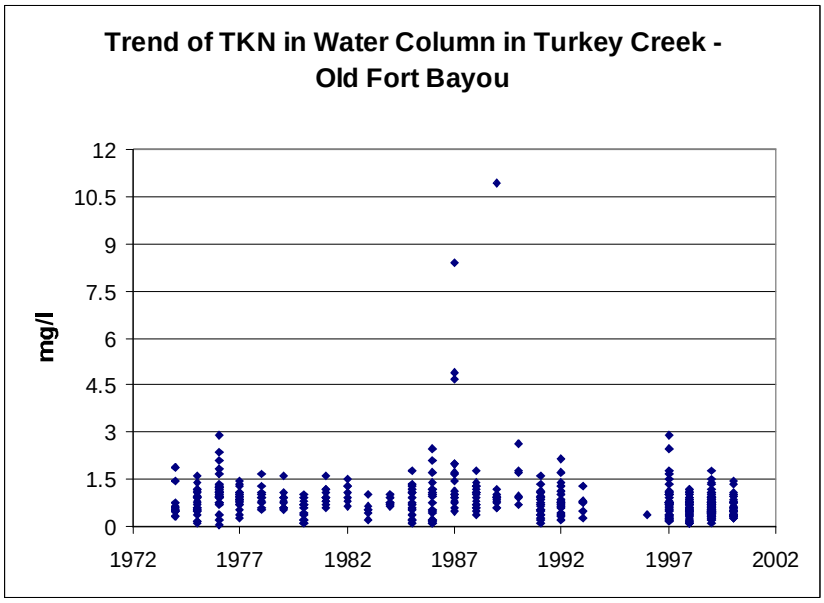


Figure 8a. Trends in total kjeldahl nitrogen in water column in Bay St. Louis subwatersheds





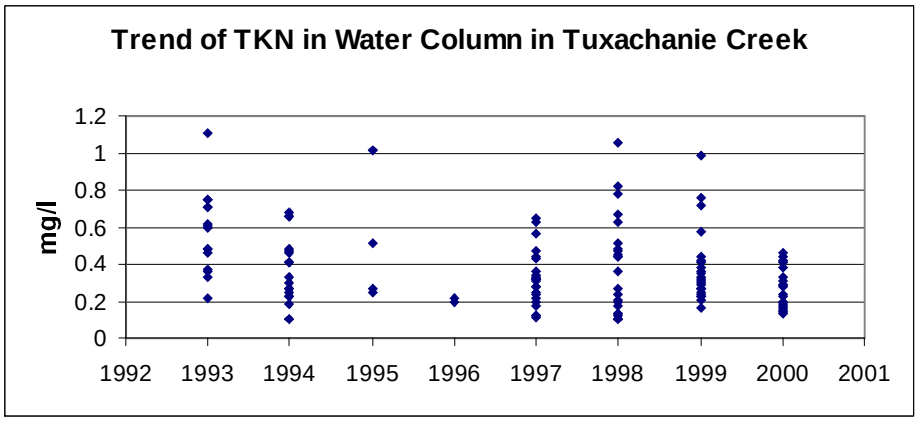


Figure 8b. Trends in total kjeldahl nitrogen in water column in Biloxi Bay subwatersheds

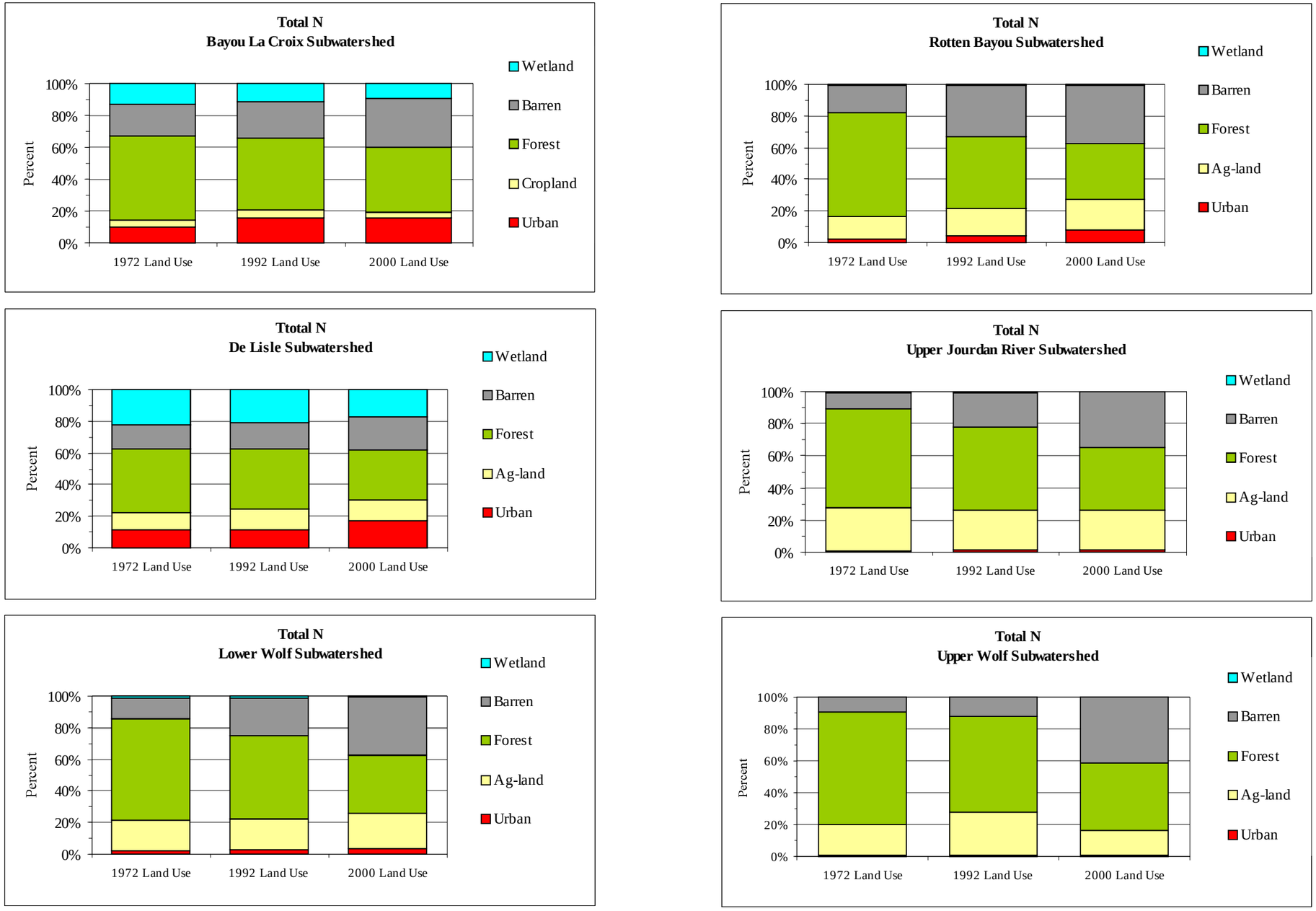
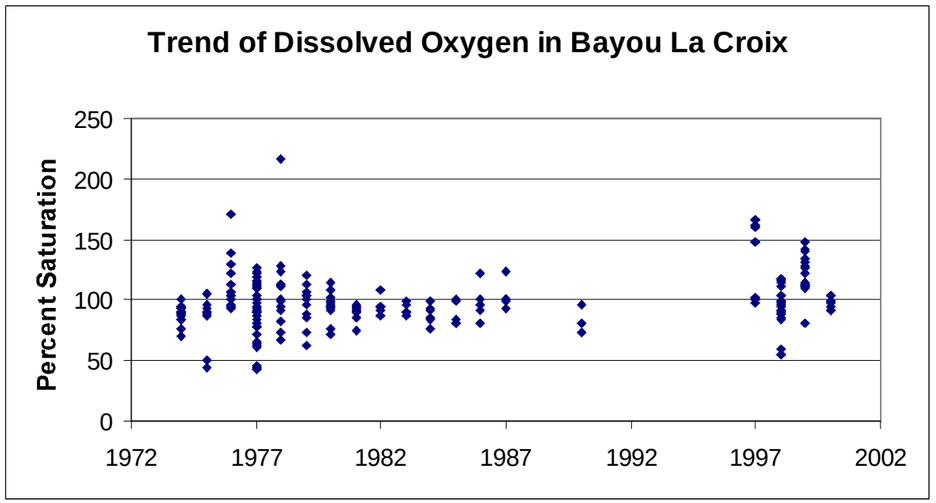
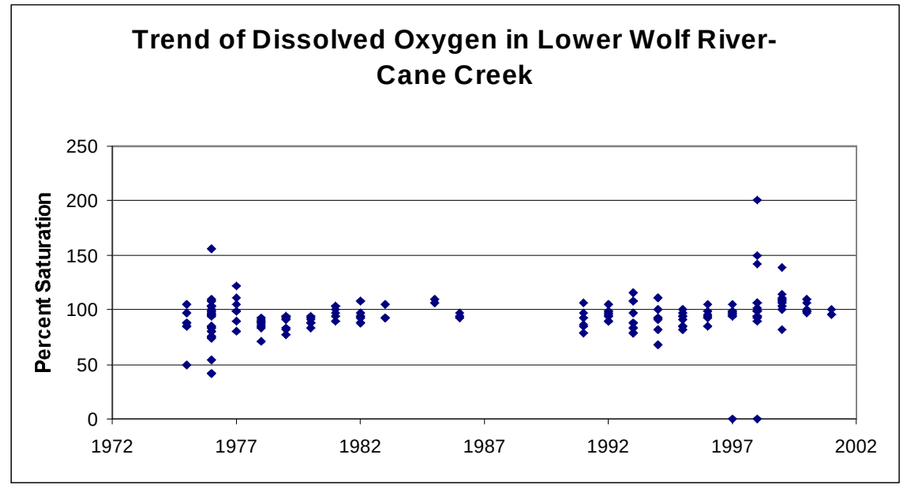
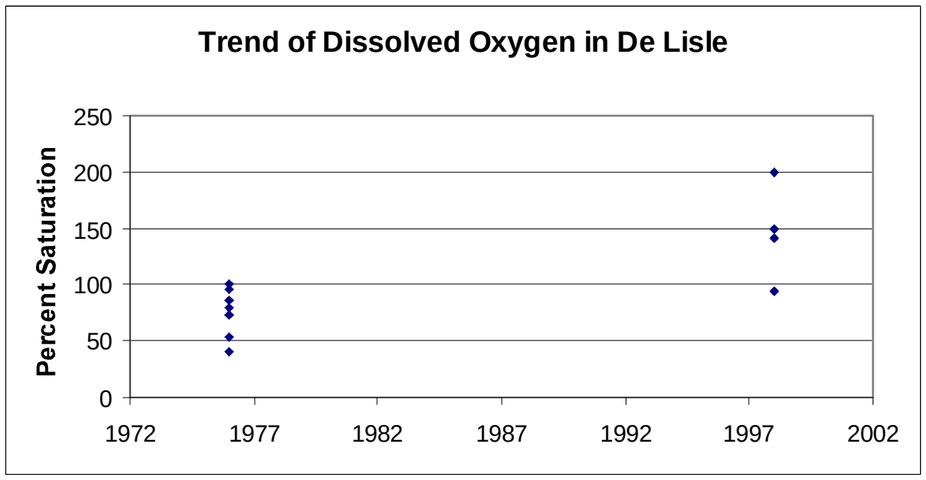


Figure 9a. Historic change in percent of total nitrogen contribution per land use for Bay St. Louis subwatersheds

Figure 9b. Historic change in percent of total nitrogen contribution per land use for Biloxi Bay subwatersheds







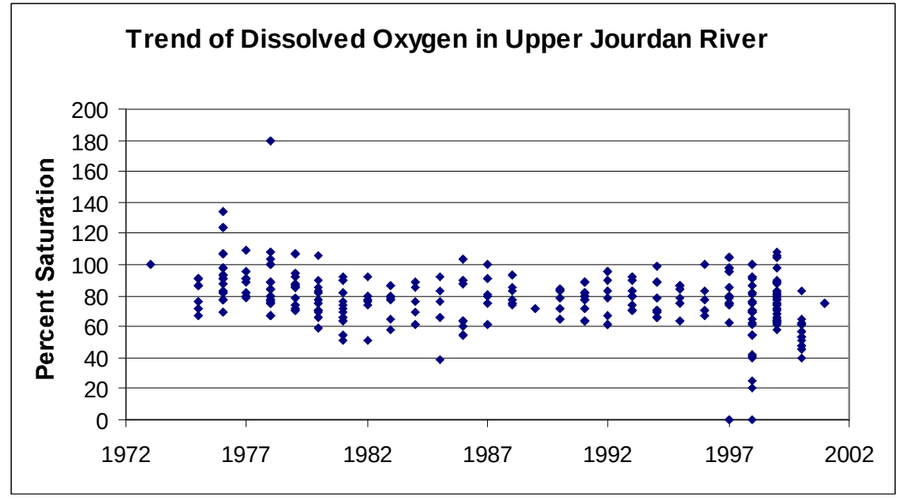
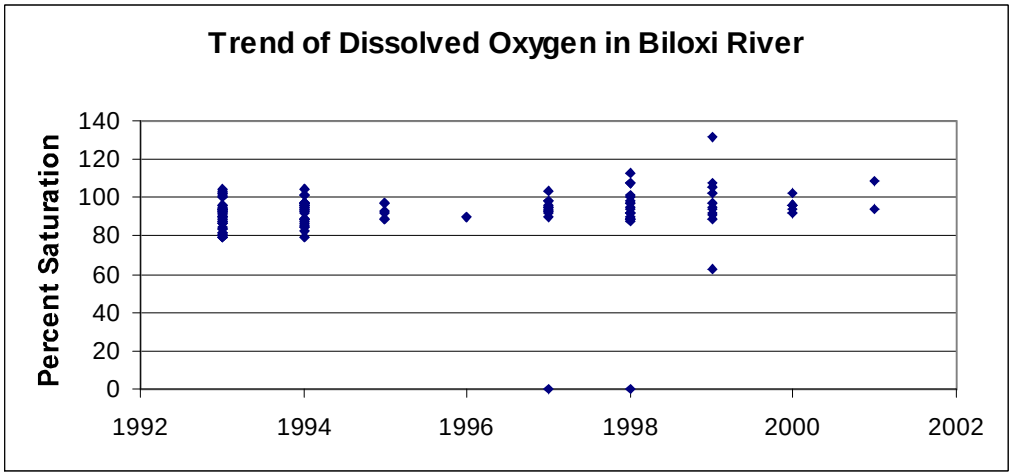
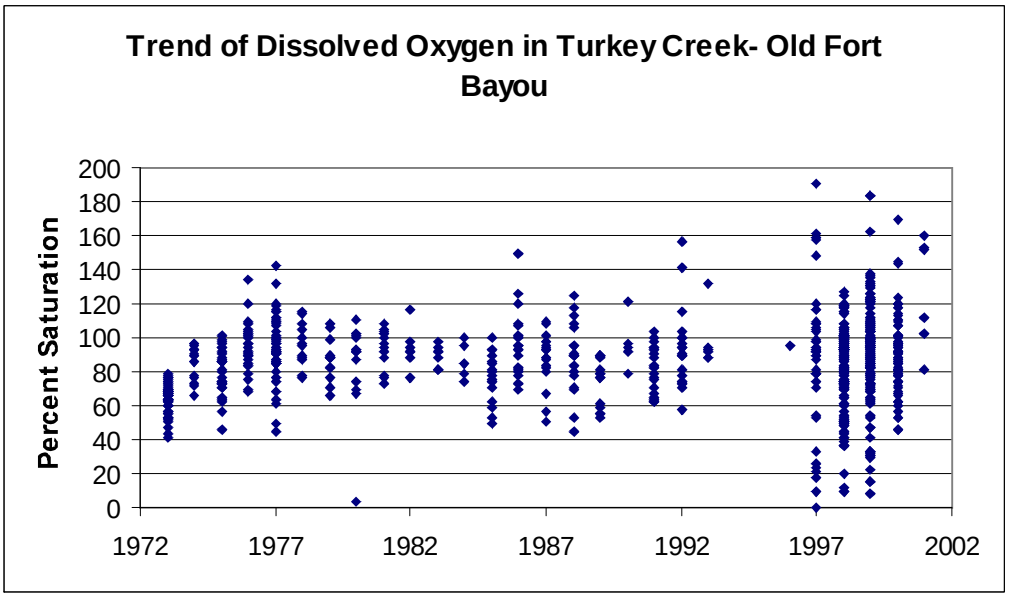


Figure 10a. Trends in dissolved oxygen in Bay St. Louis subwatersheds





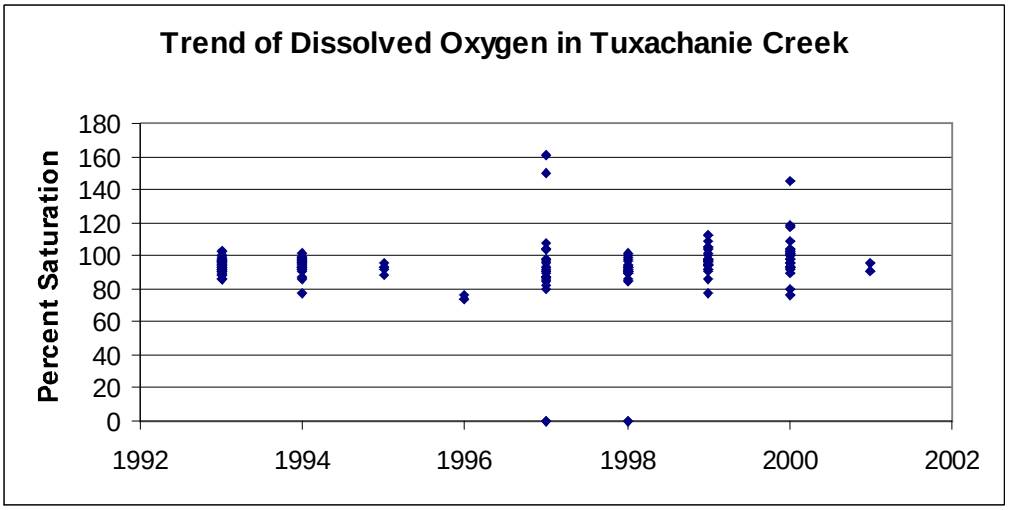
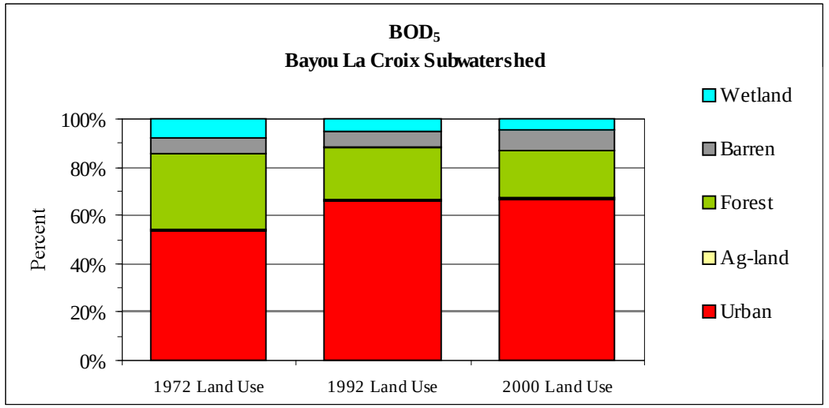
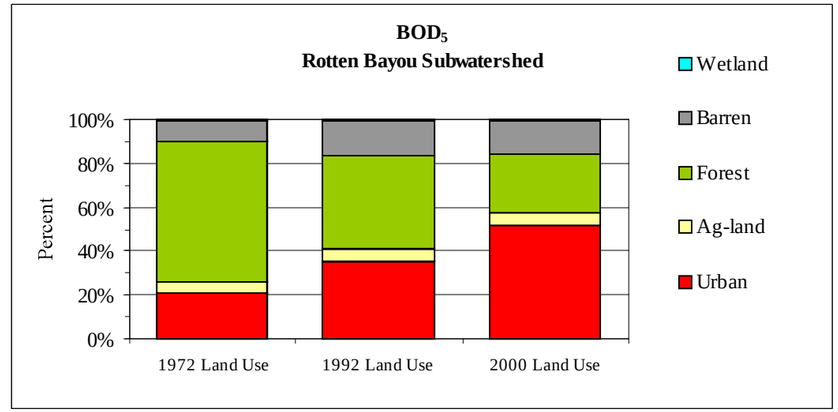
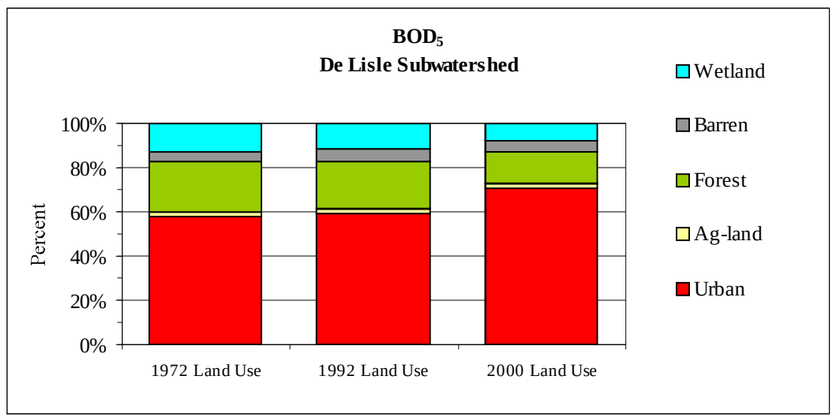
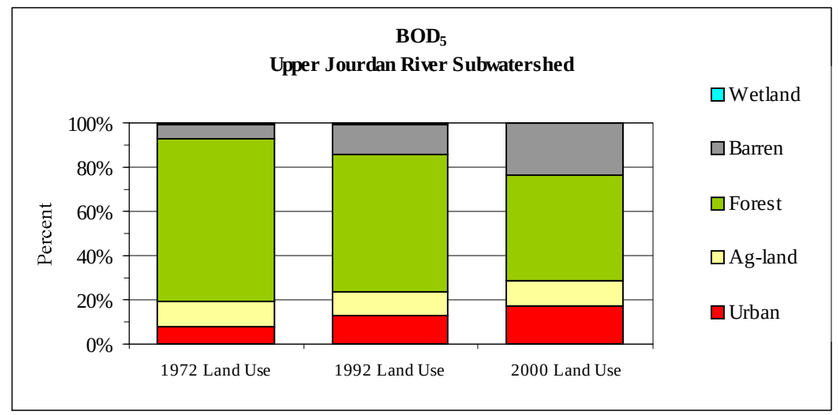


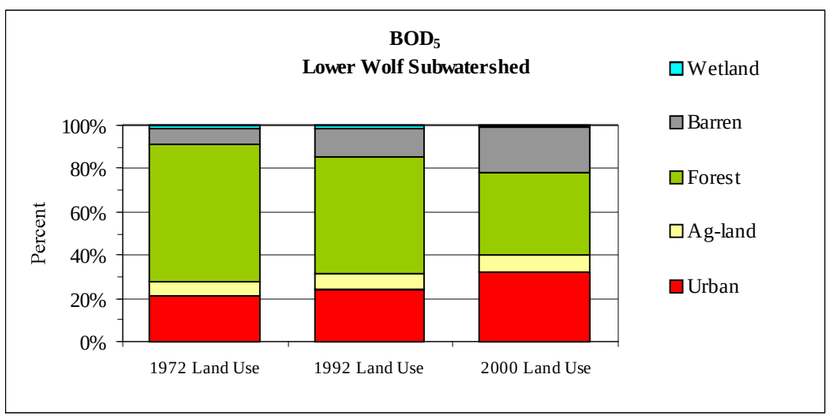
Figure 10b. Trends in dissolved oxygen in Biloxi Bay subwatersheds











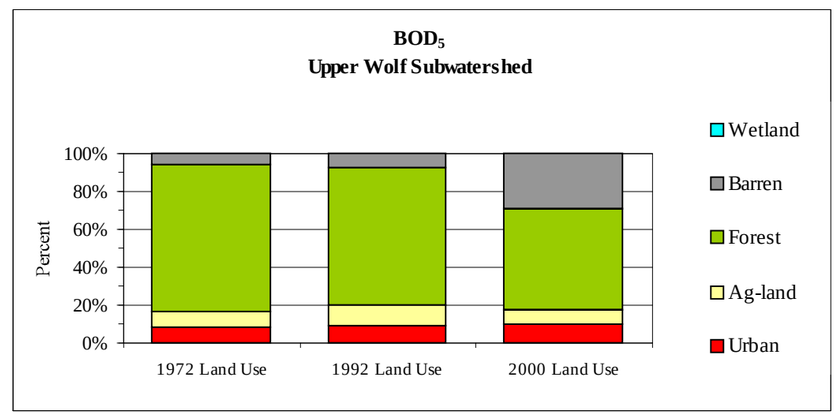
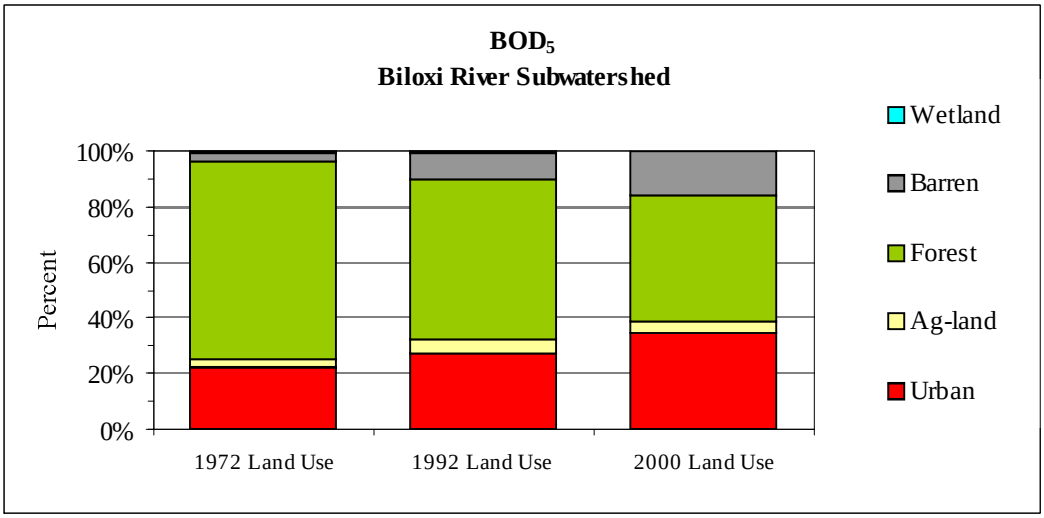
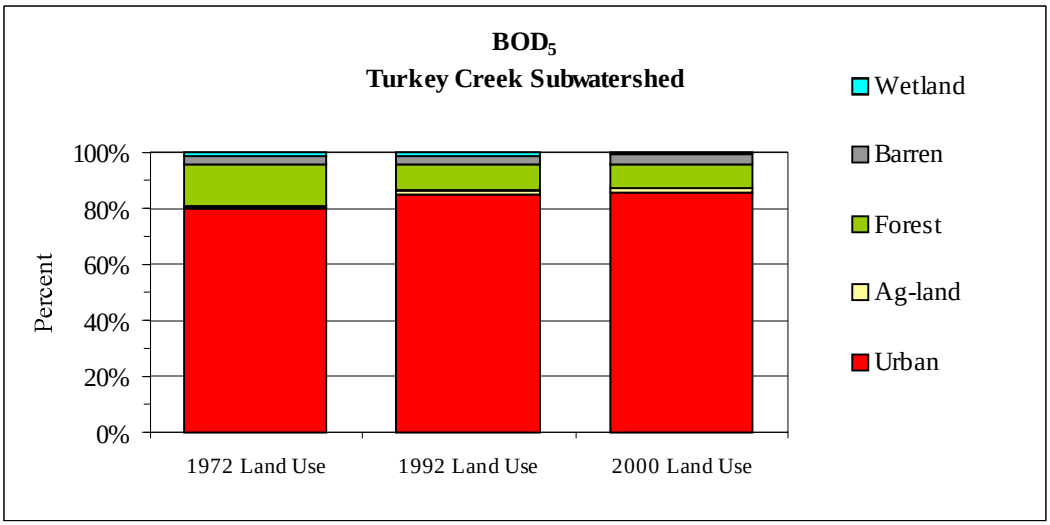


Figure 11a. Historic change in percent of BOD_5 per land use for Bay St. Louis subwatersheds





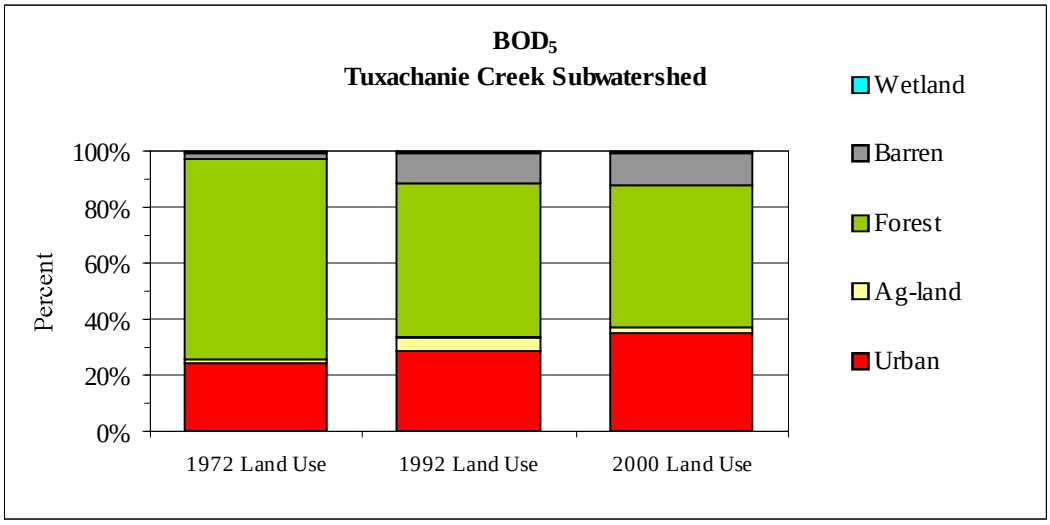
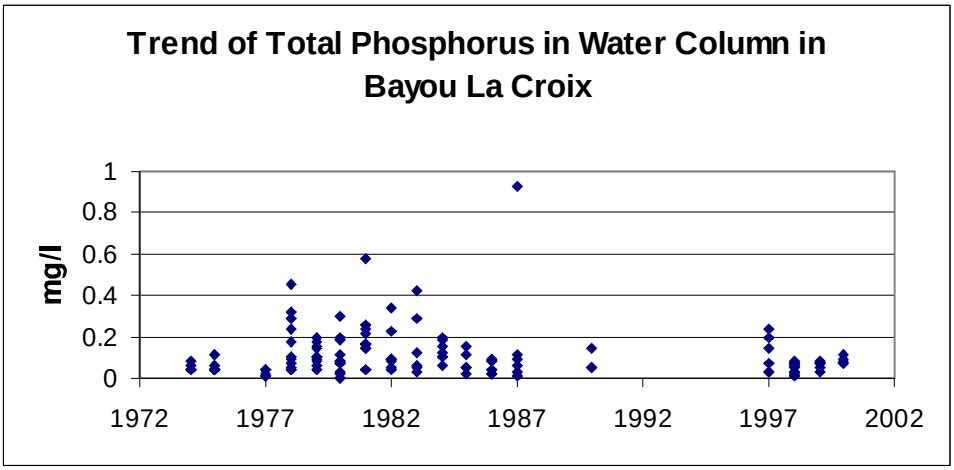
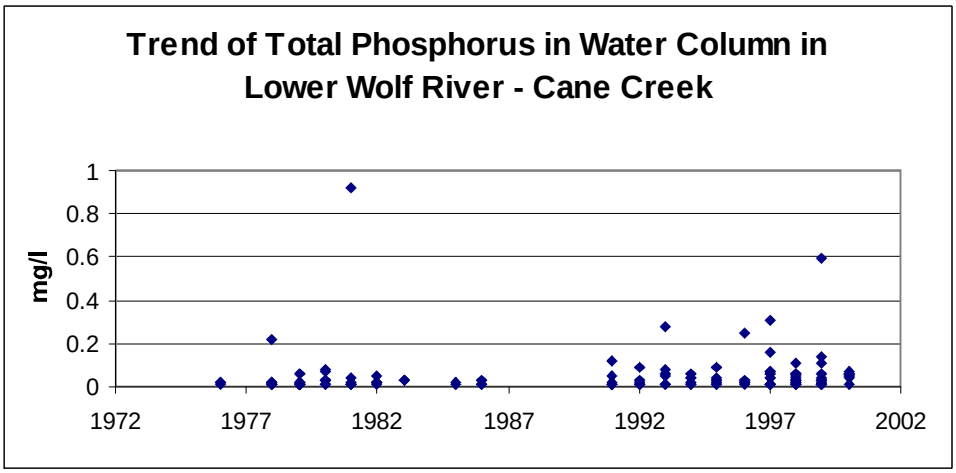


Figure 11b. Historic change in percent of BOD_5 contribution per land use for Biloxi Bay subwatersheds





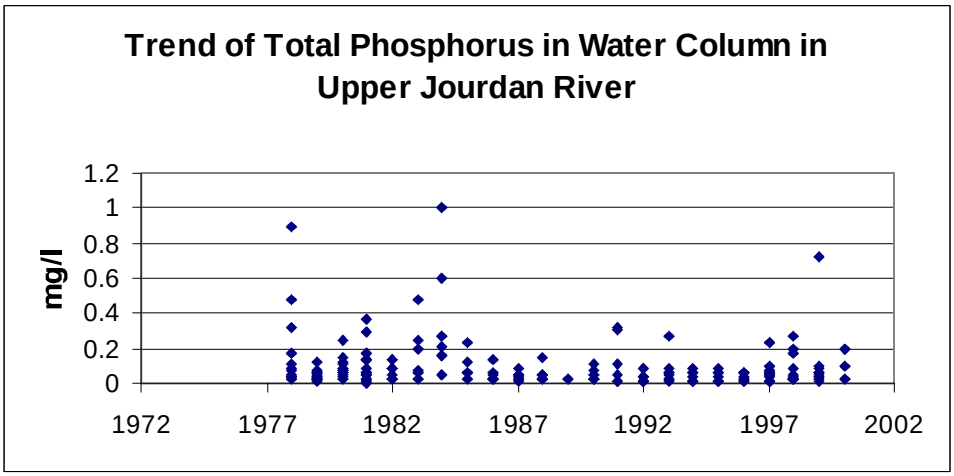
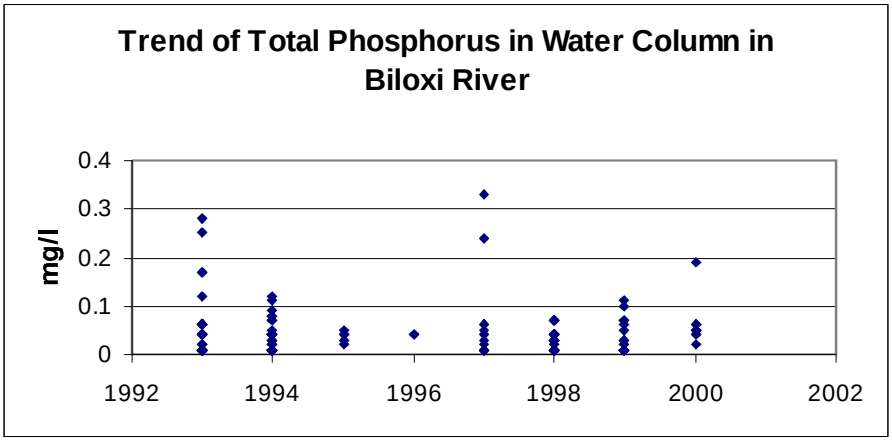
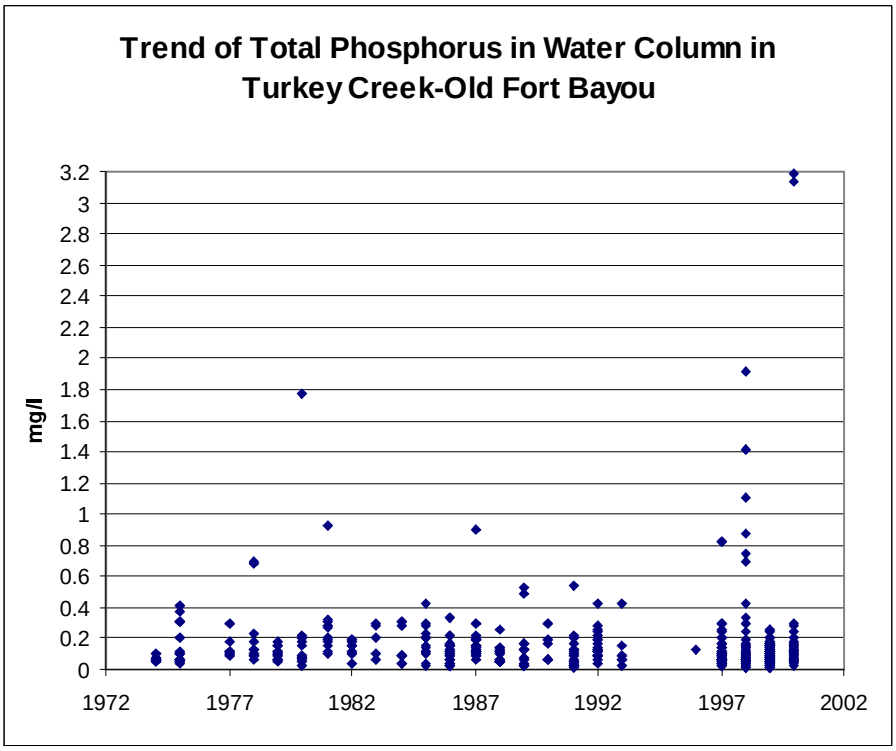


Figure 12a. Trends in phosphorus in Bay St. Louis subwatersheds





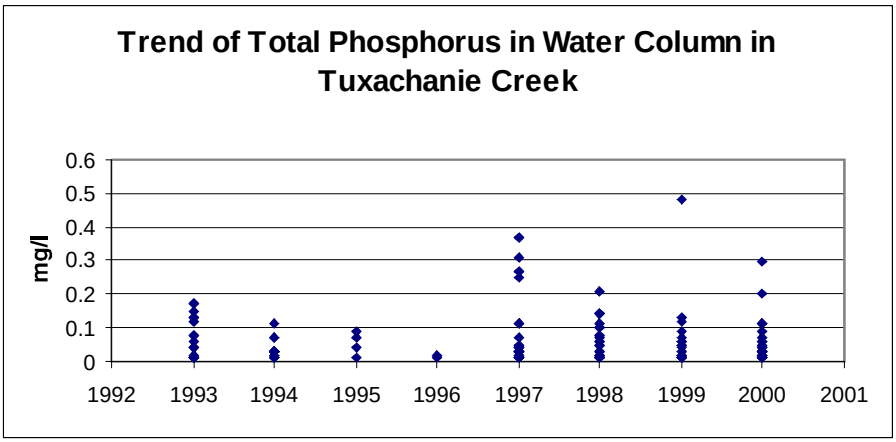
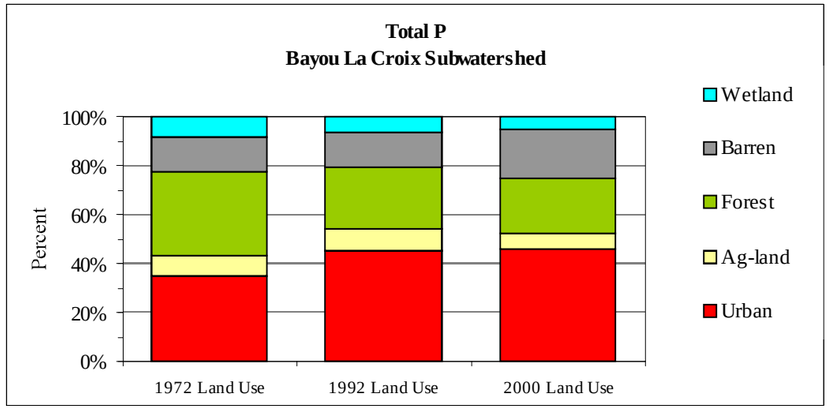
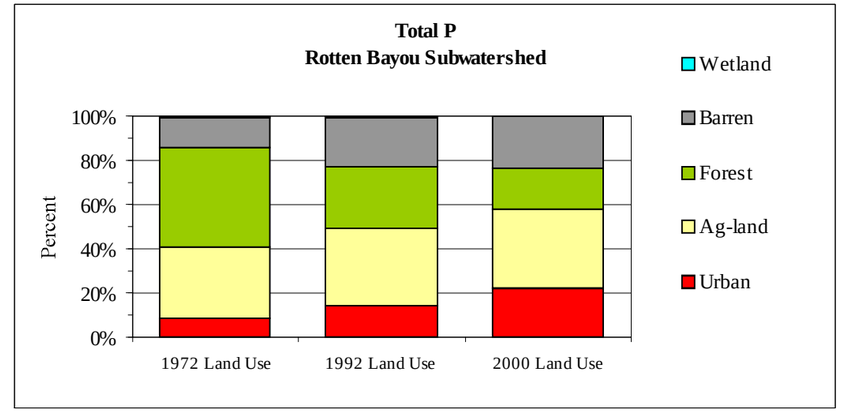
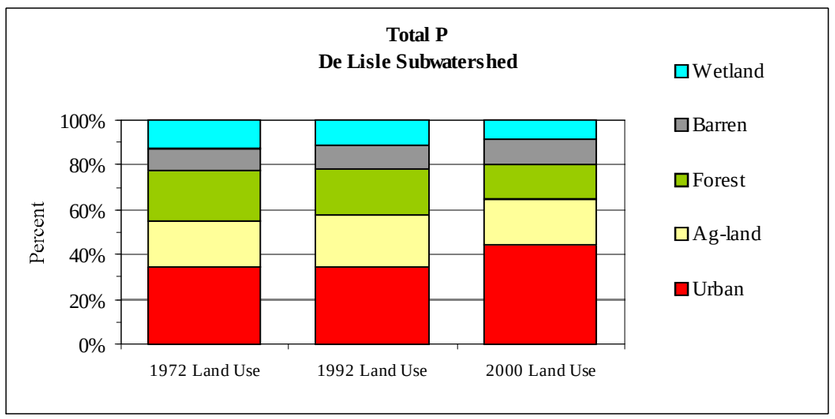
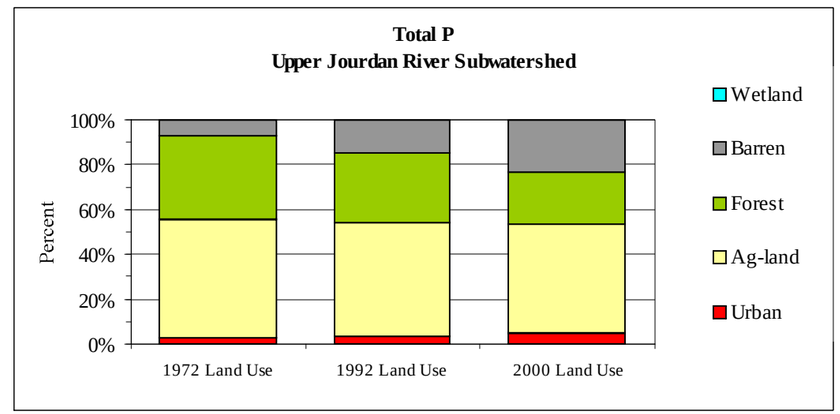


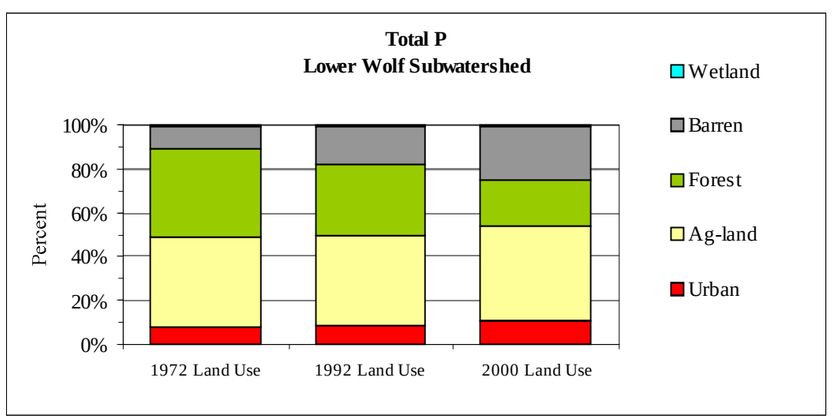
Figure 12b. Trends in phosphorus in Biloxi Bay subwatersheds











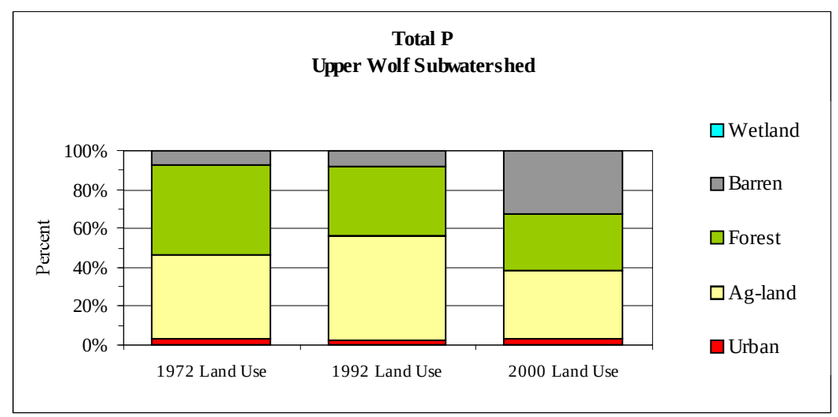
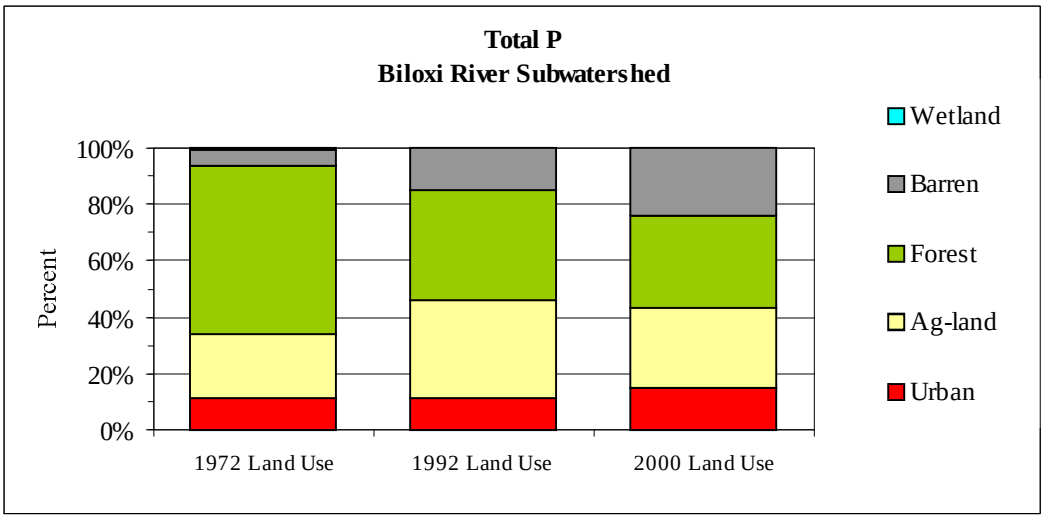
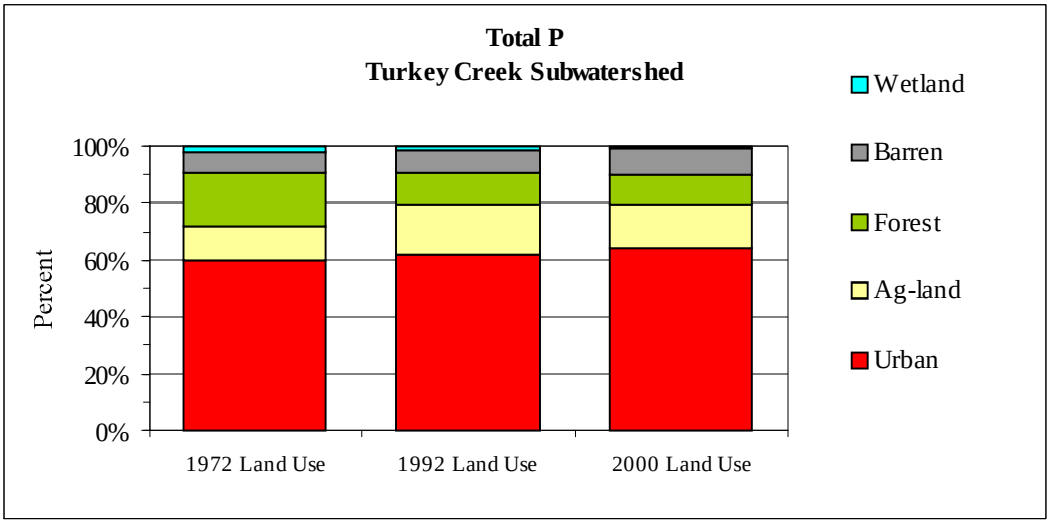


Figure 13a. Historic change in percent of total phosphorus contribution per land use for Bay St. Louis subwatersheds





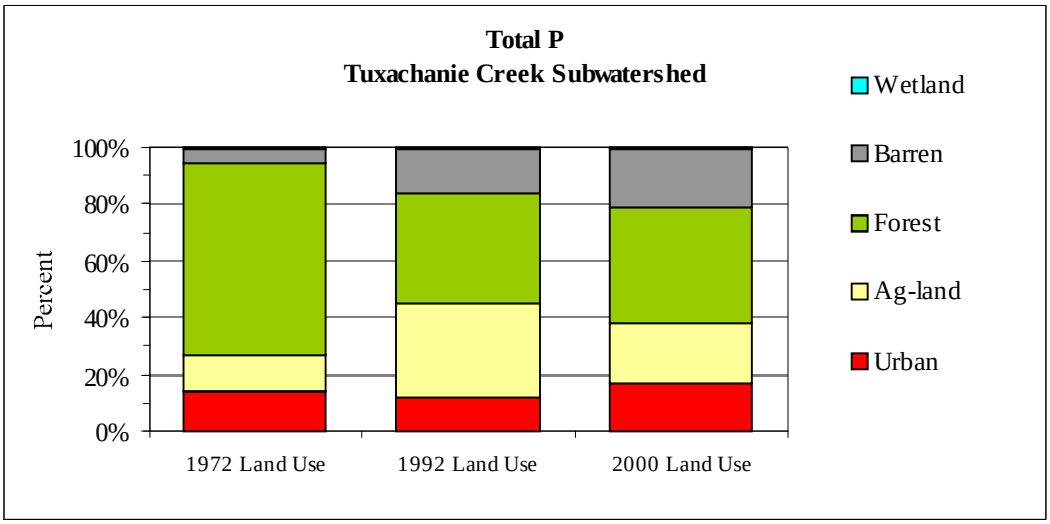
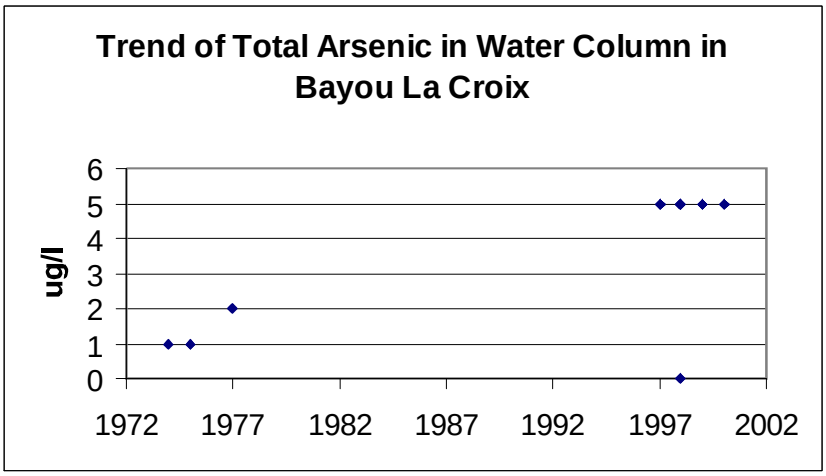
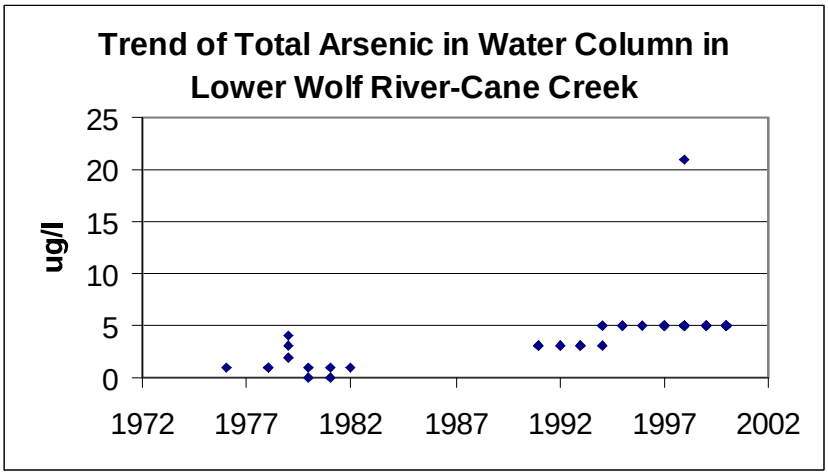


Figure 13b. Historic change in percent of total phosphorus contribution per land use for Biloxi Bay subwatersheds





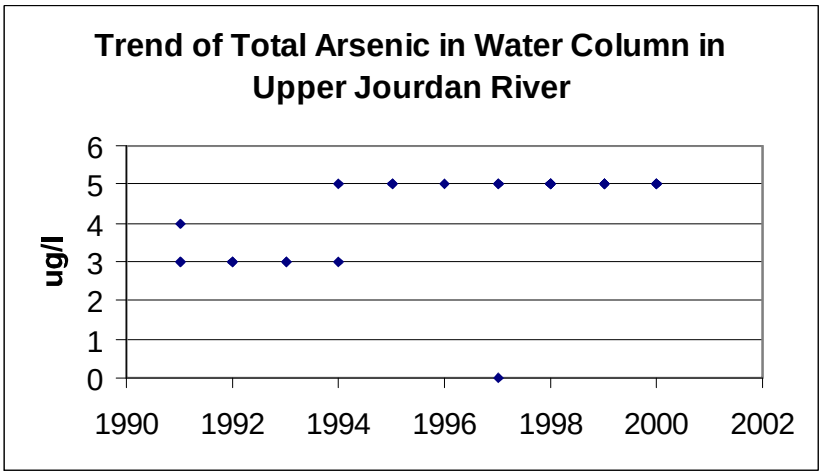
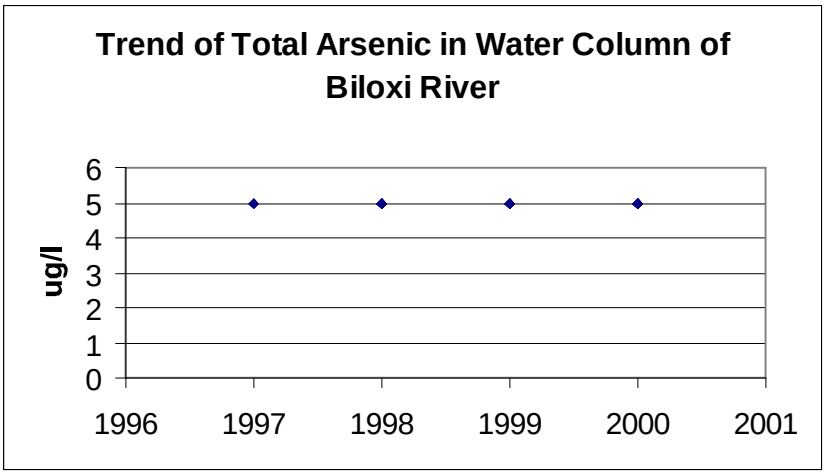
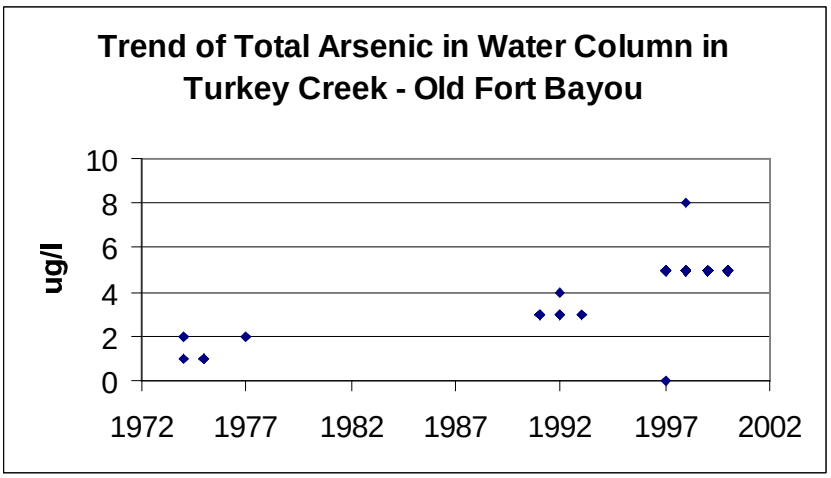


Figure 14a. Trends in total arsenic in Bay St. Louis subwatersheds





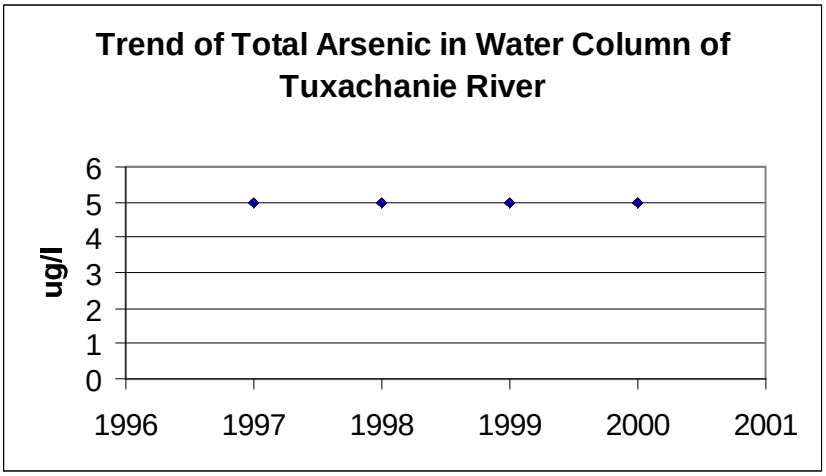
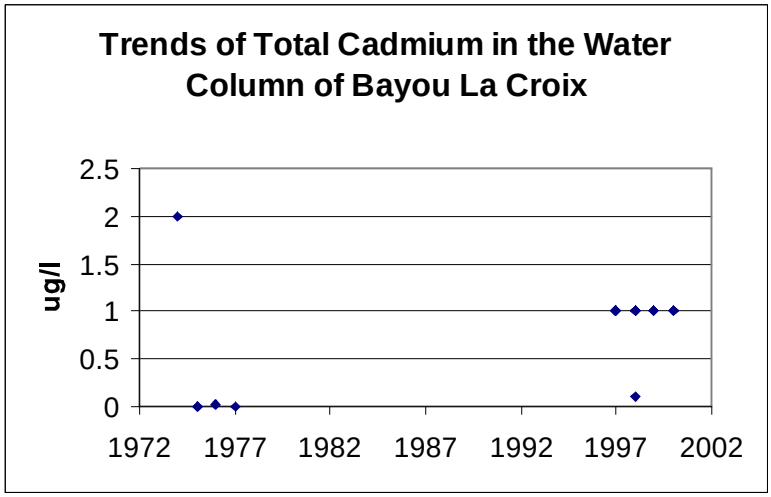
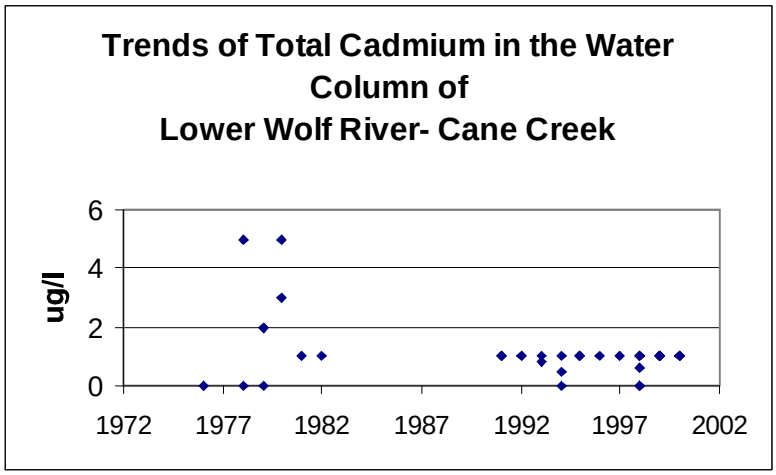


Figure 14b. Trends in total arsenic in Biloxi Bay subwatersheds





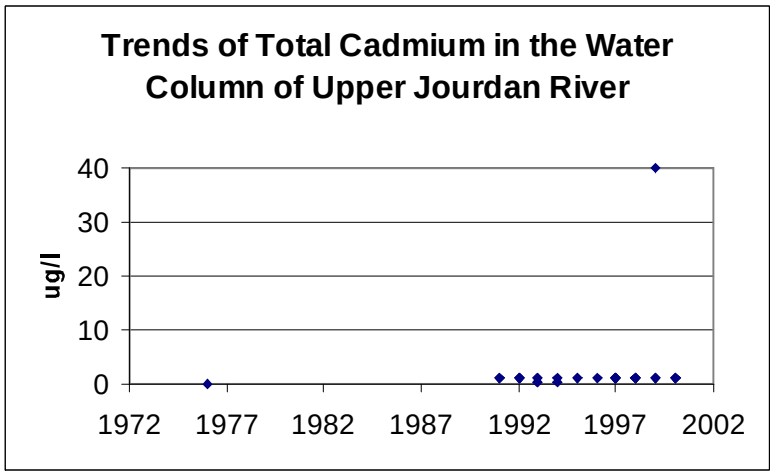
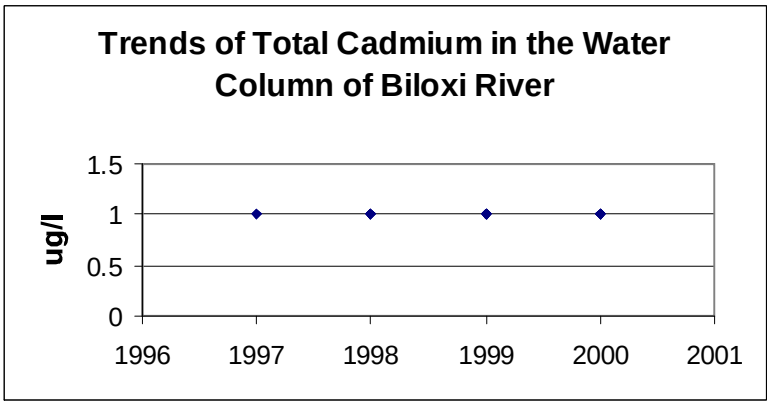
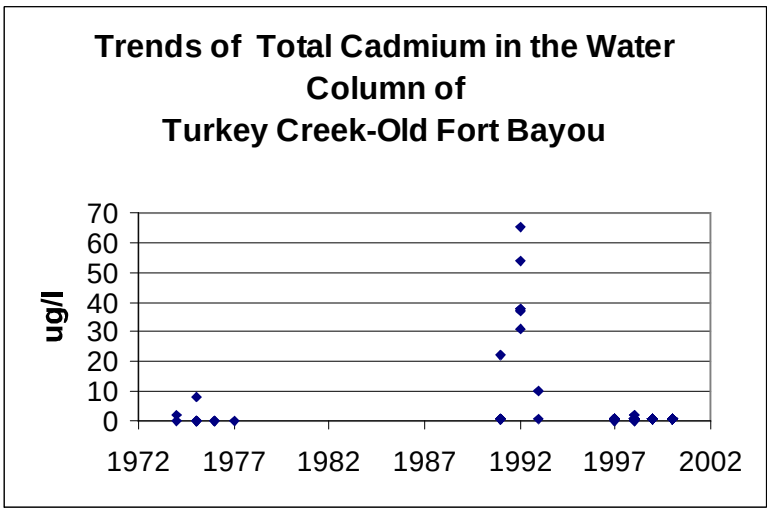


Figure 15a. Trends in cadmium in Bay St. Louis subwatersheds





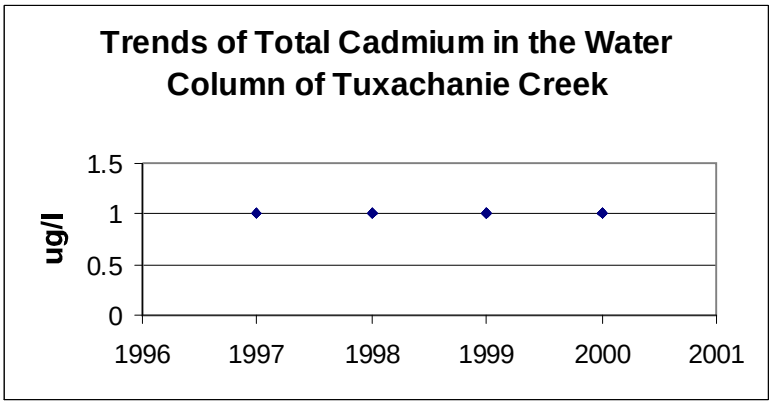
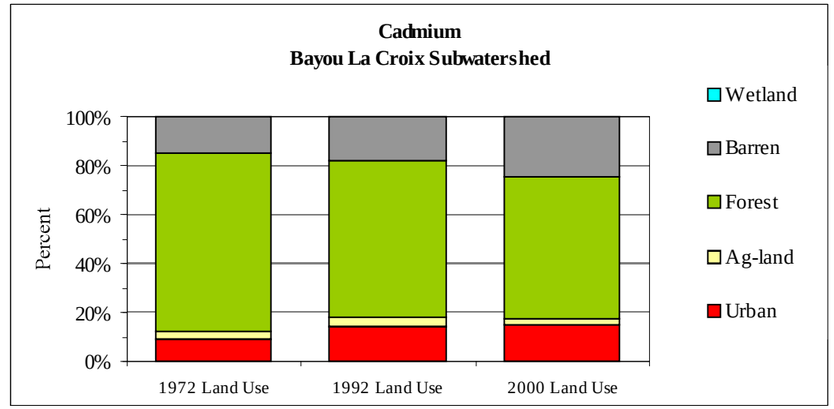
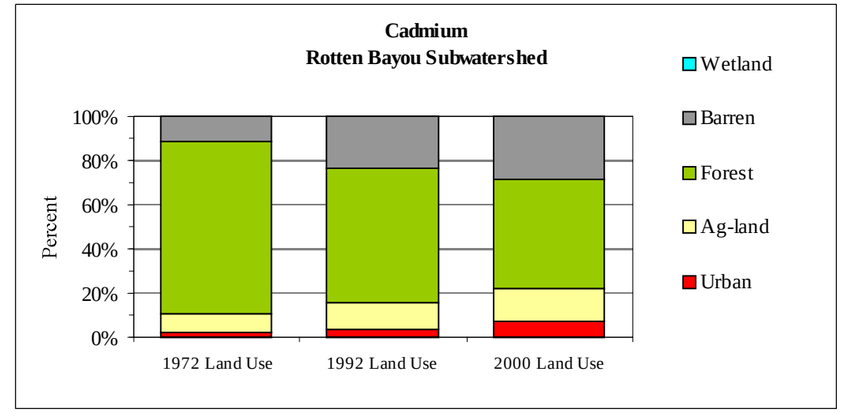
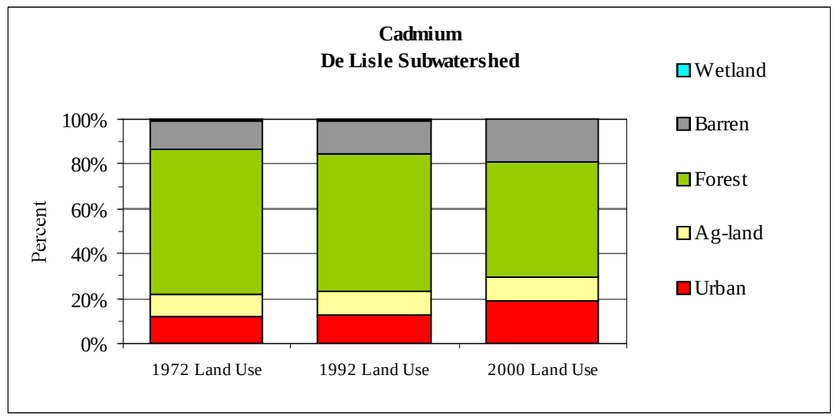
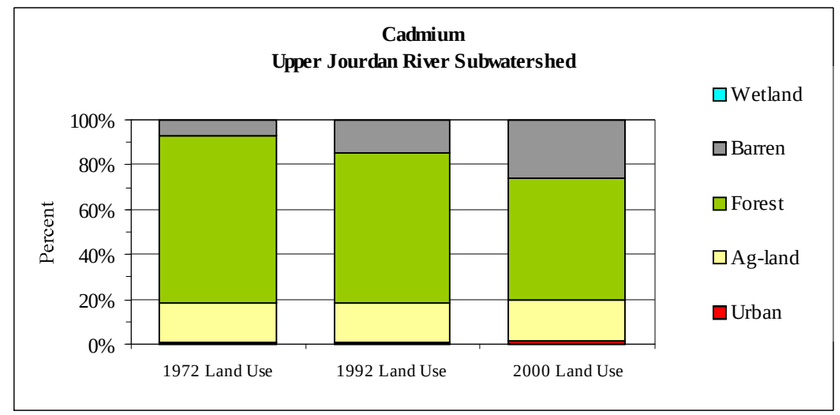


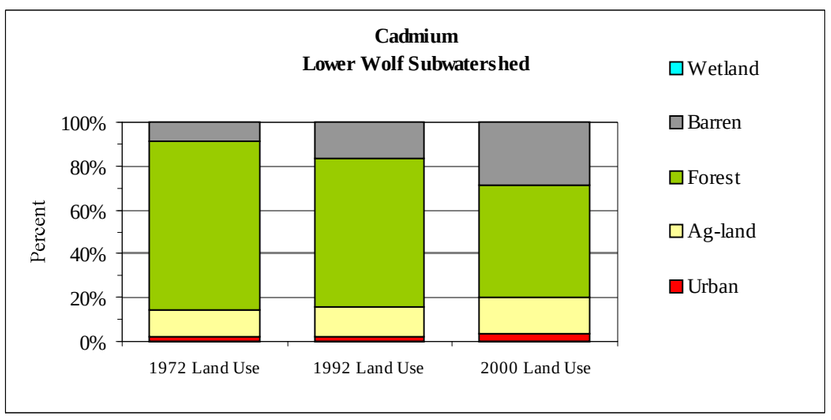
Figure 15b. Trends in cadmium in Biloxi Bay subwatersheds











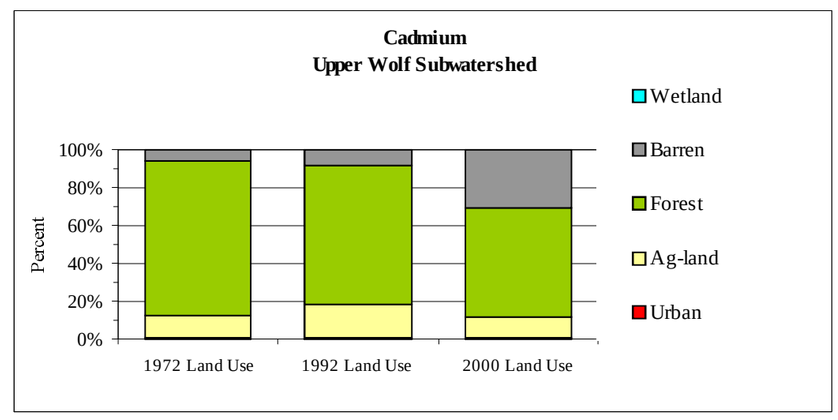
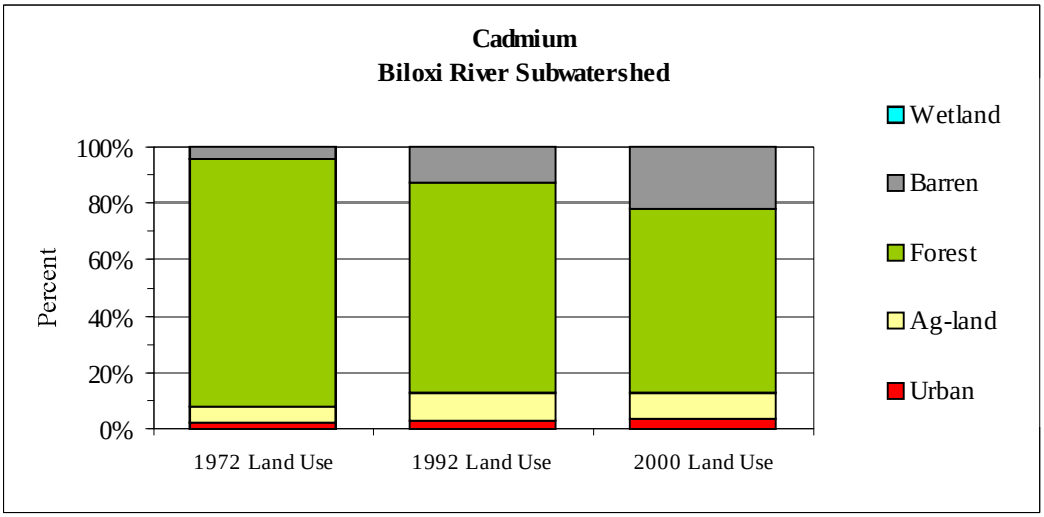
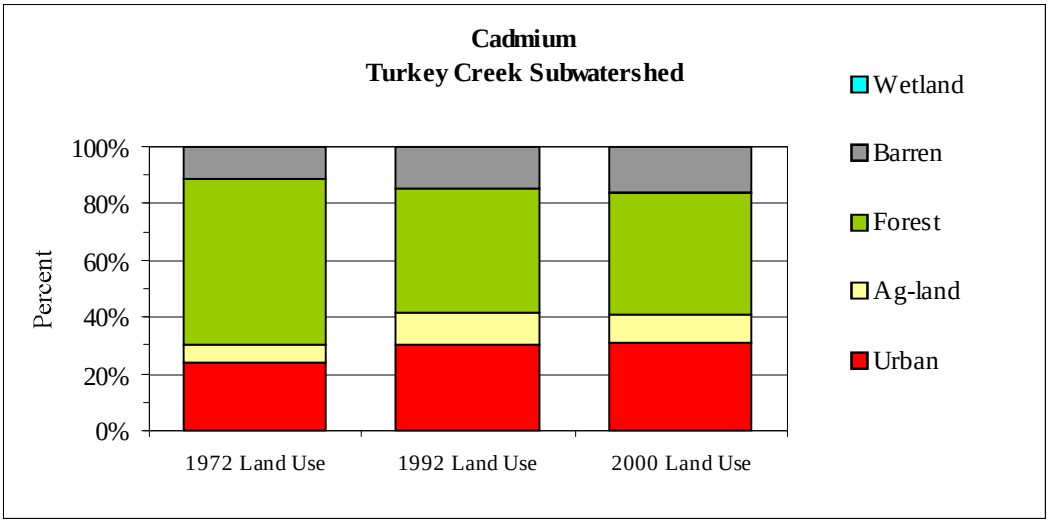


Figure 16a. Historic change in percent of total cadmium contribution per land use for Bay St. Louis subwatersheds





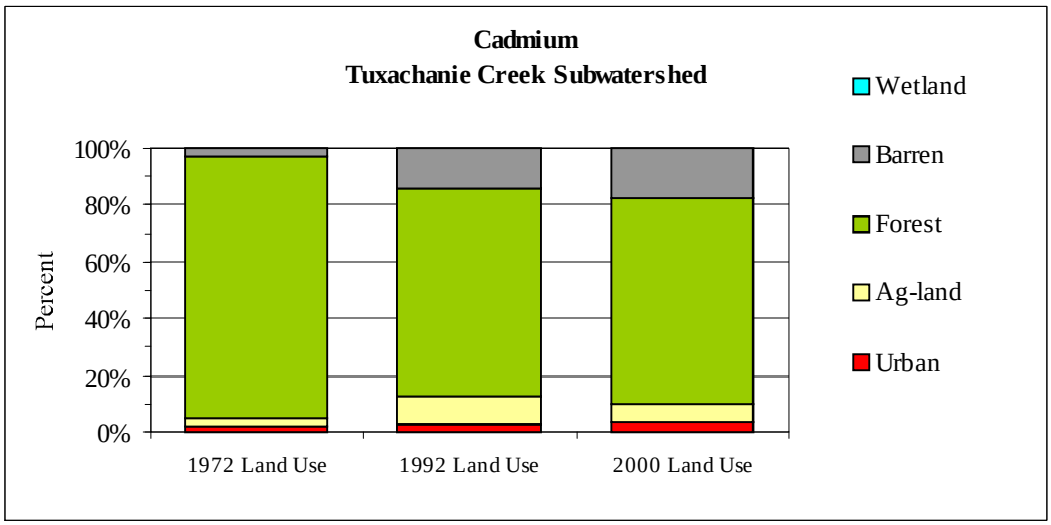
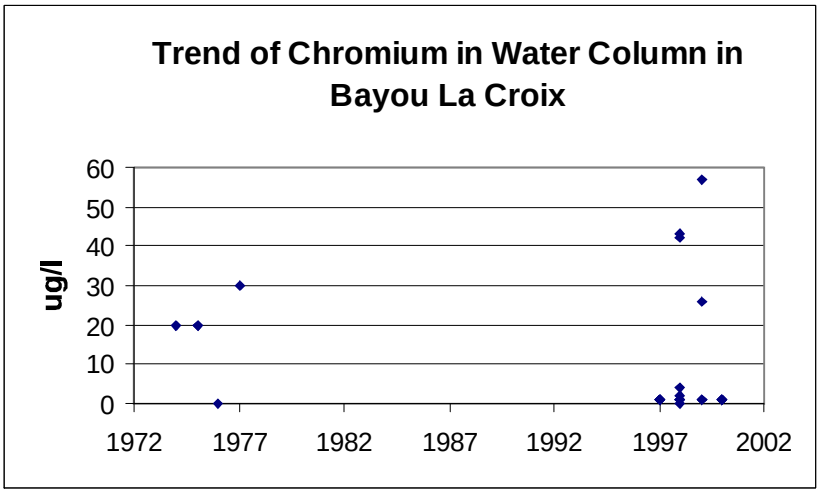
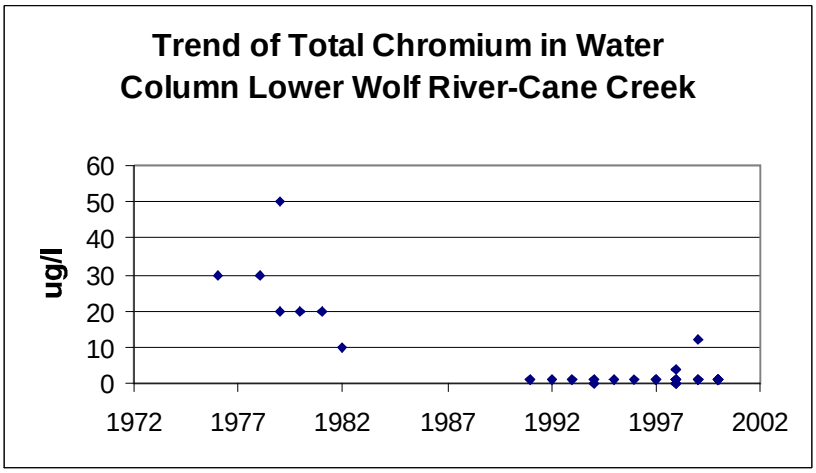


Figure 16b. Historic change in percent of cadmium contribution per land use for Biloxi Bay subwatersheds





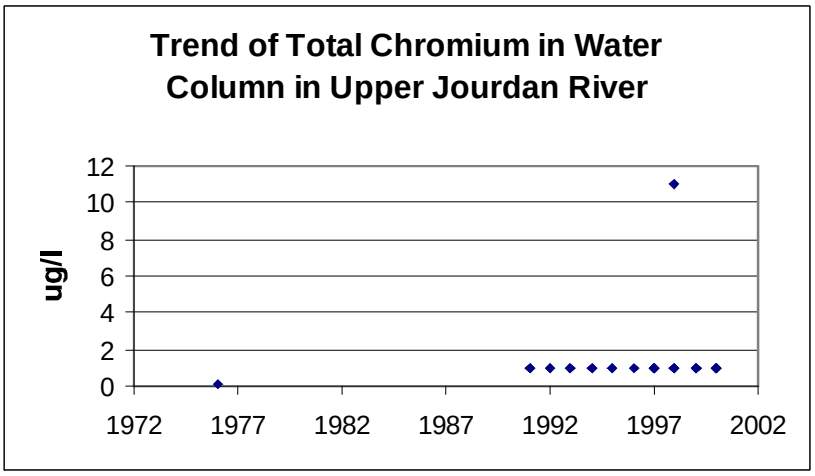
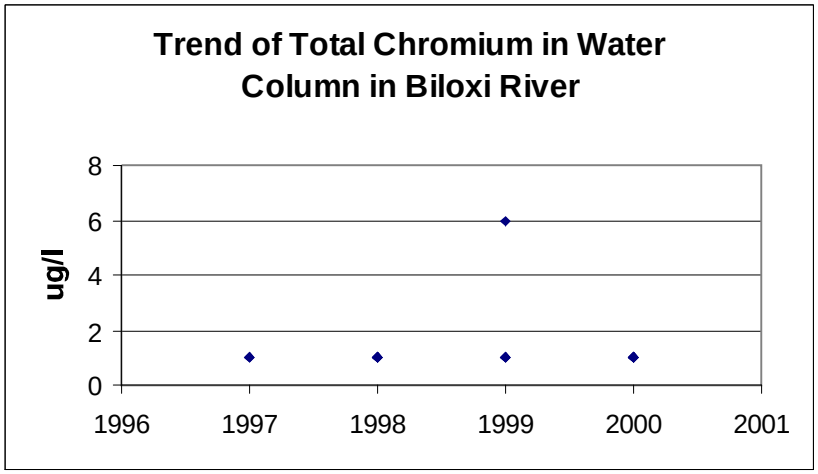
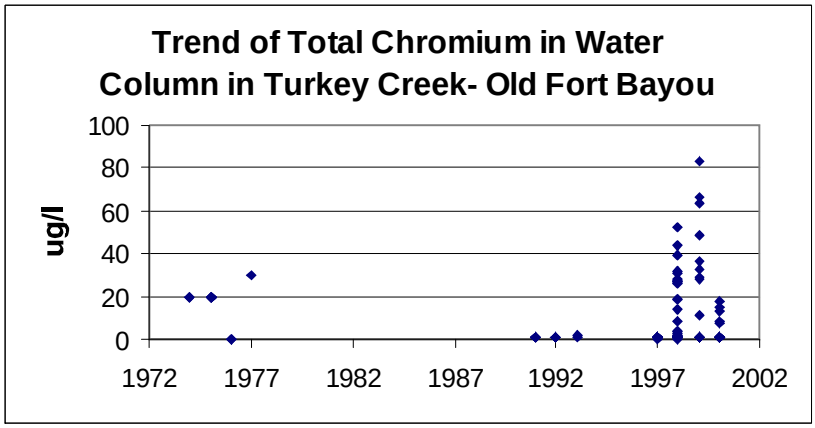


Figure 17a. Trends in chromium in Bay St. Louis subwatersheds





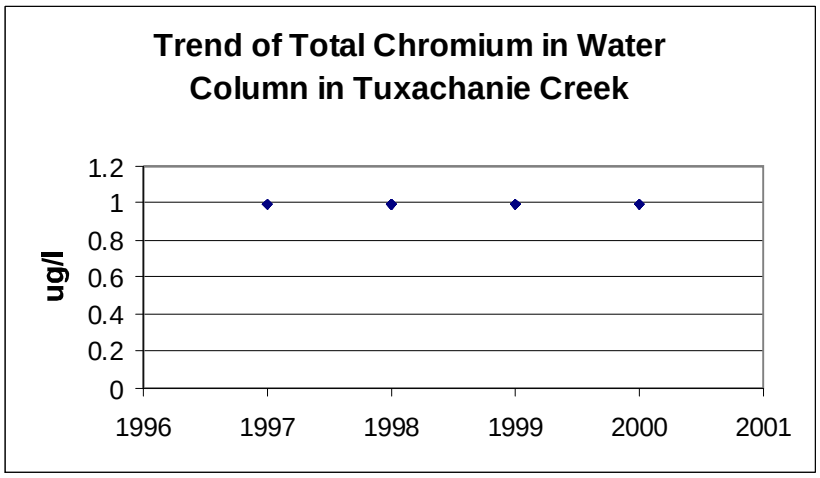


Figure 17b. Trends in chromium in Biloxi Bay subwatersheds

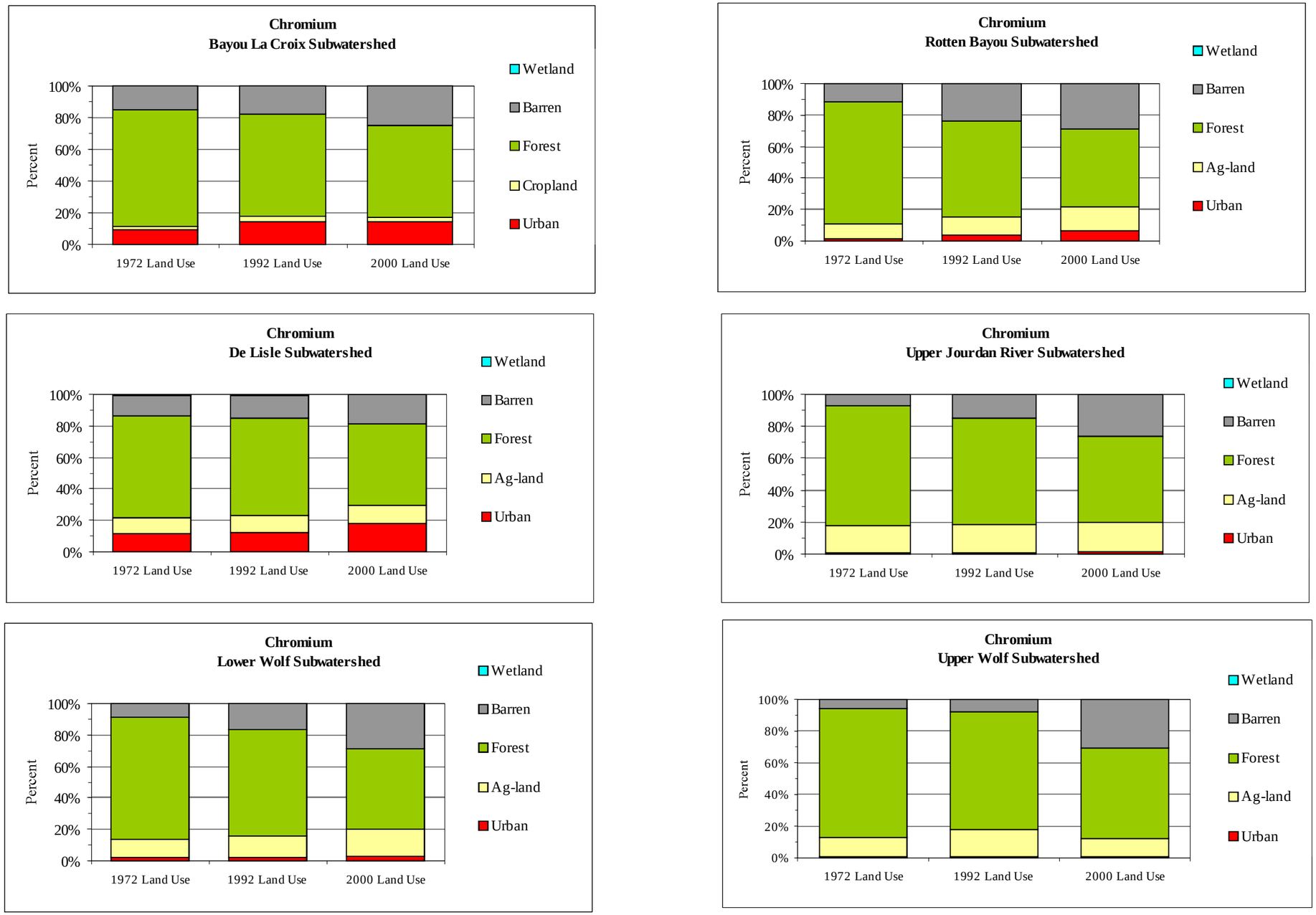
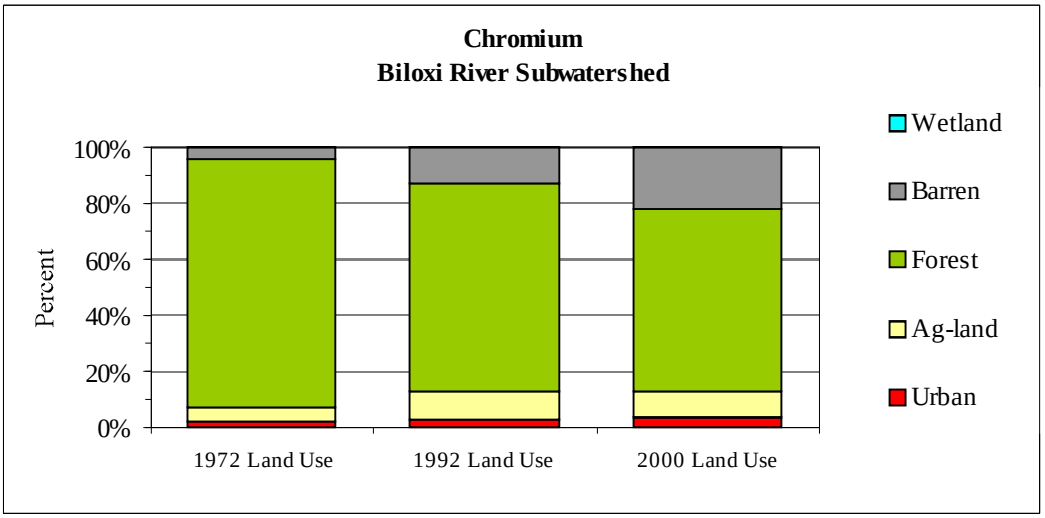
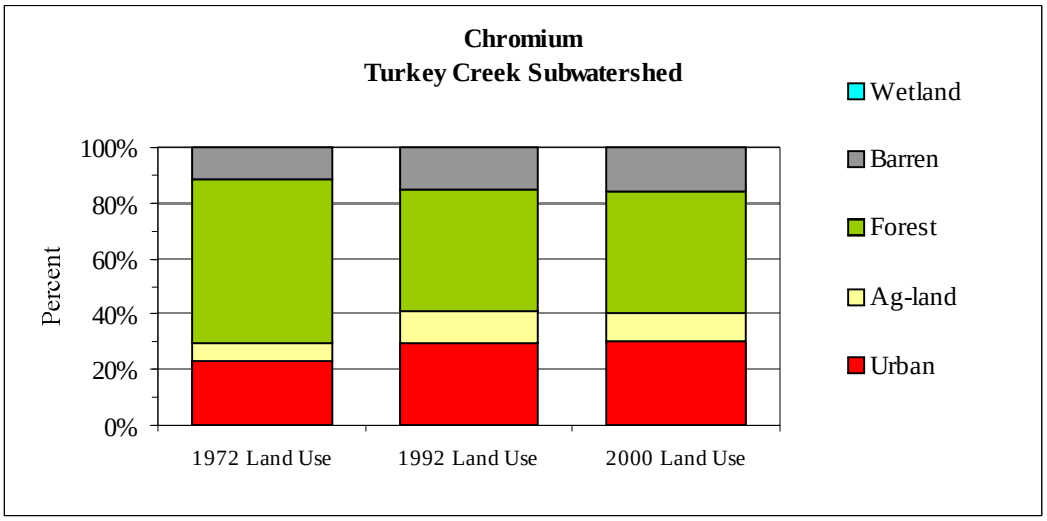


Figure 18a. Historic change in percent of chromium contribution per land use for Bay St. Louis subwatersheds





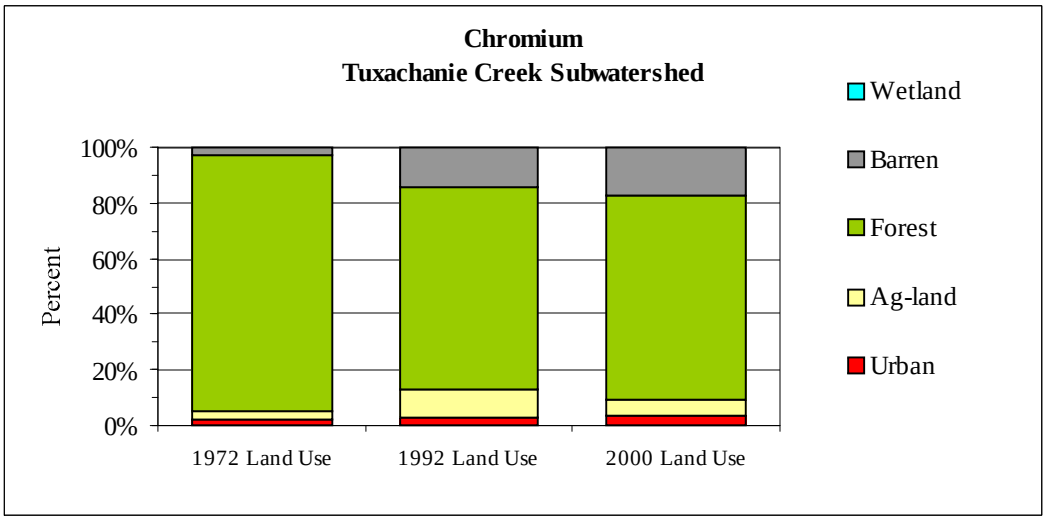
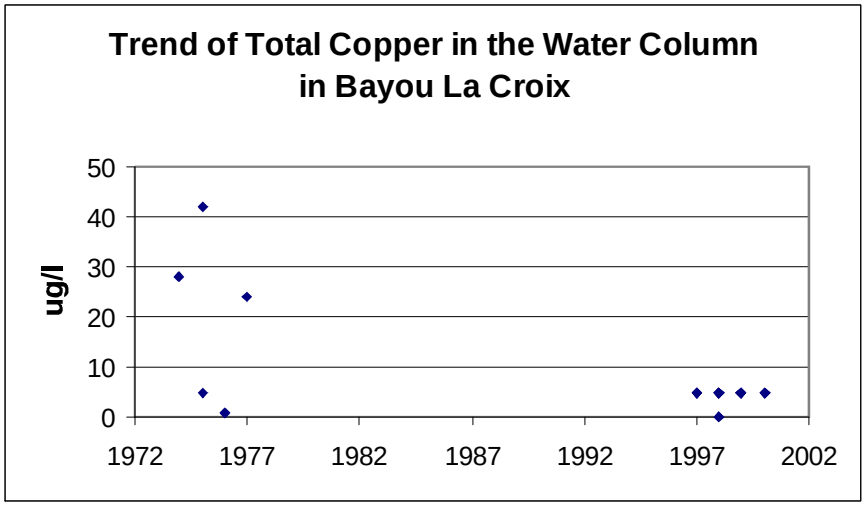
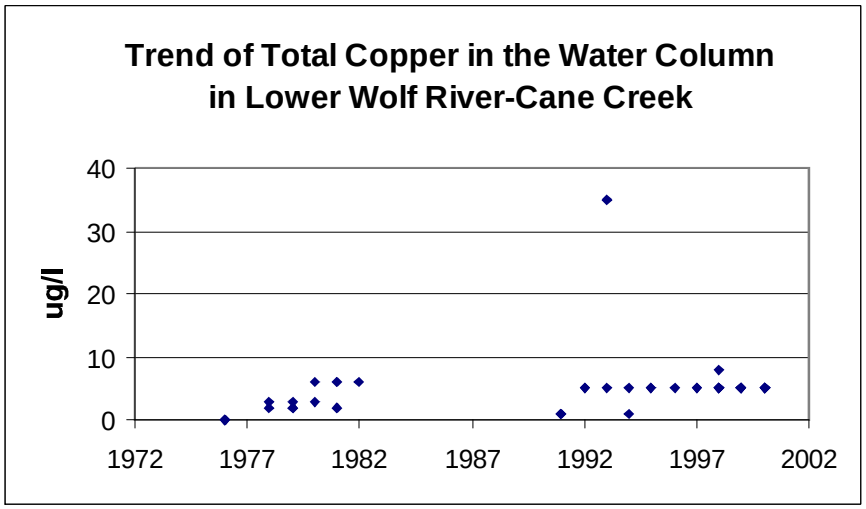


Figure 18b. Historic change in percent of chromium contribution per land use for Biloxi Bay subwatersheds





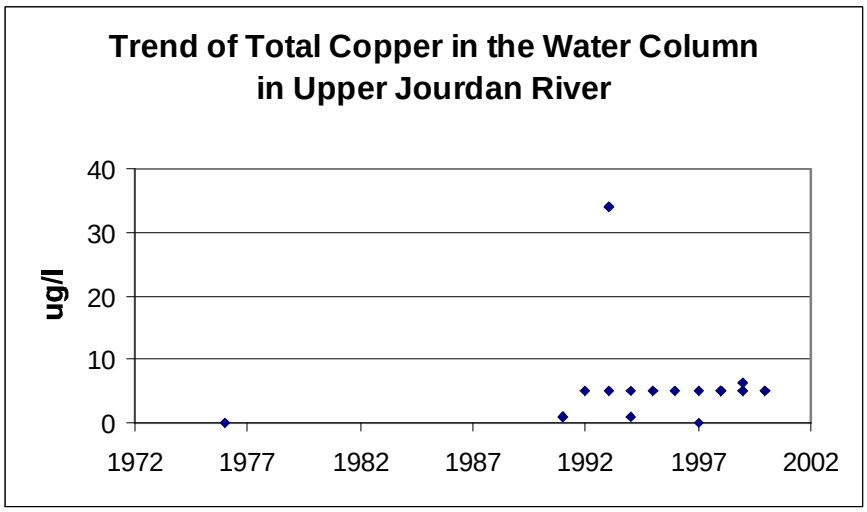
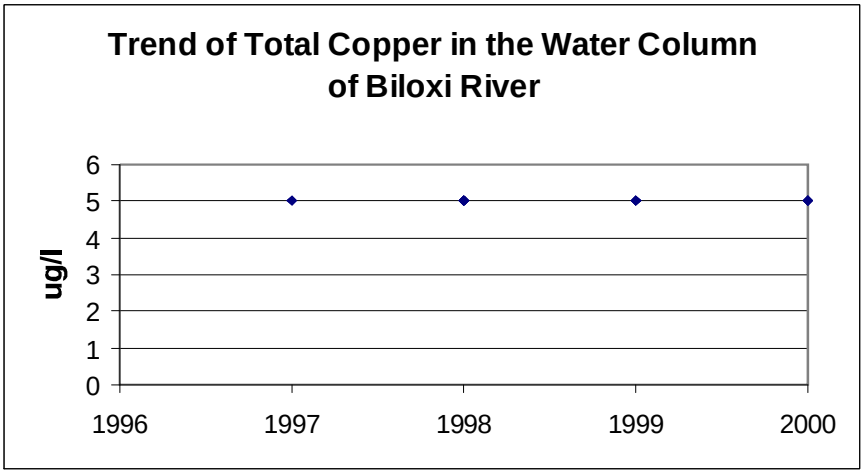
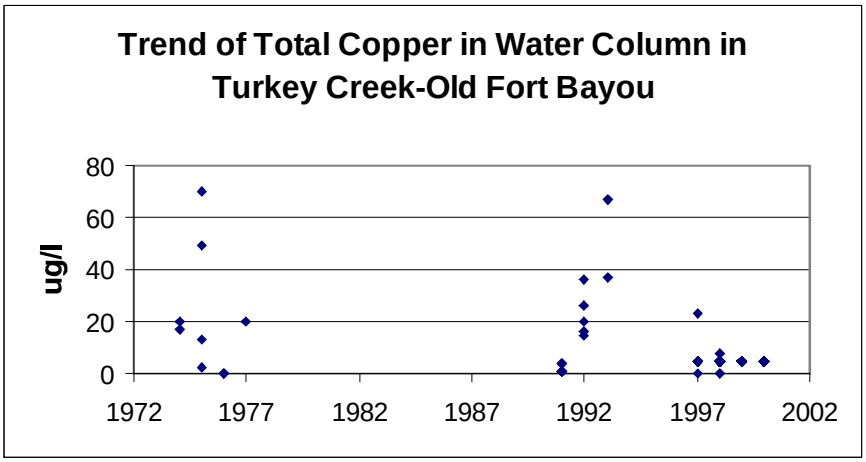


Figure 19a. Trends in copper in Bay St. Louis subwatersheds





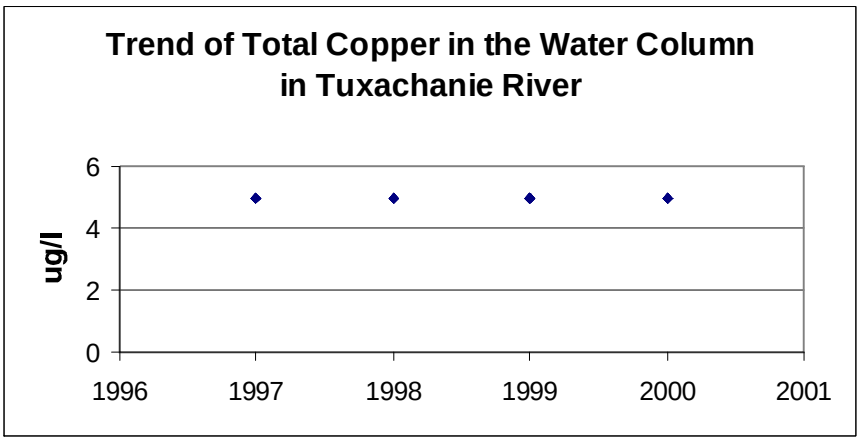
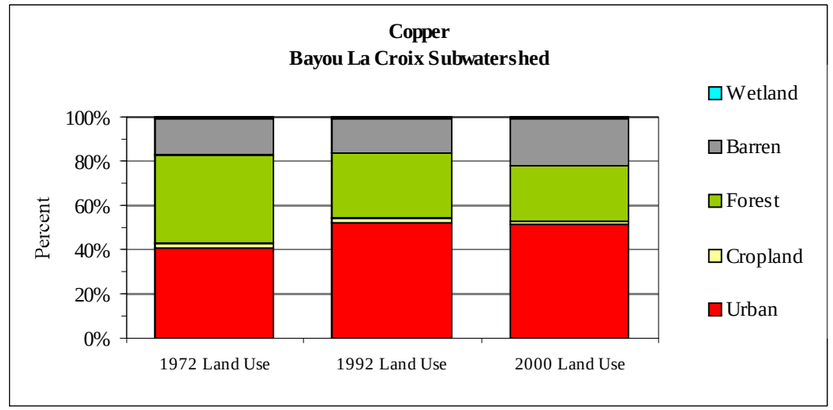
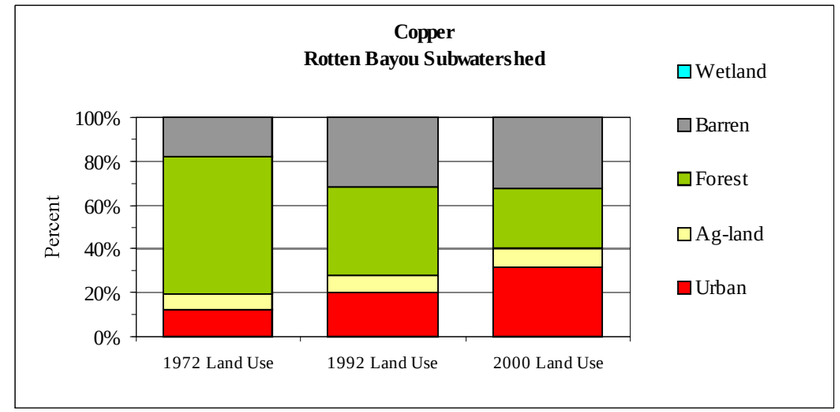
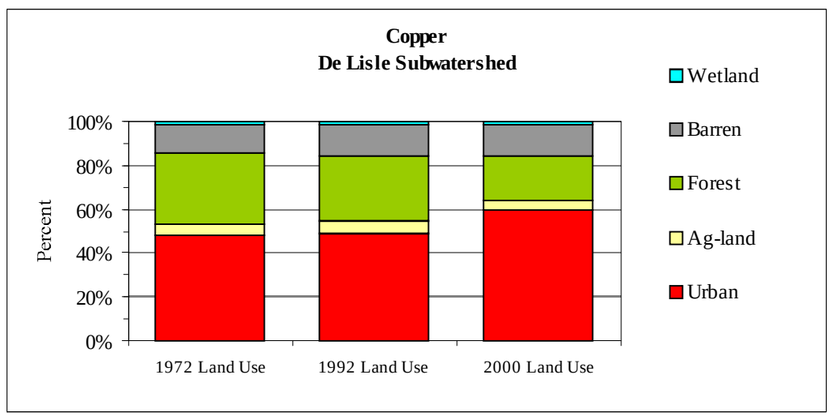
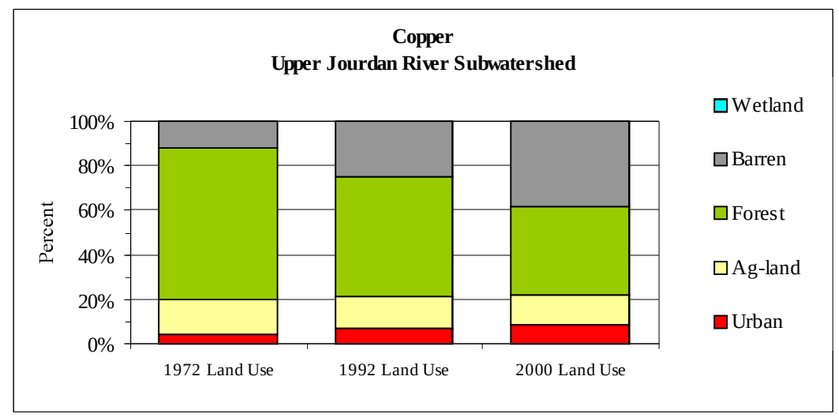


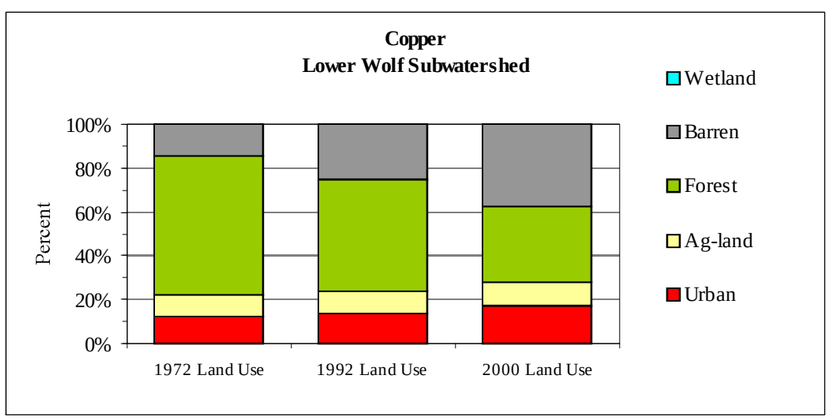
Figure 19b. Trends in copper in Biloxi Bay subwatersheds











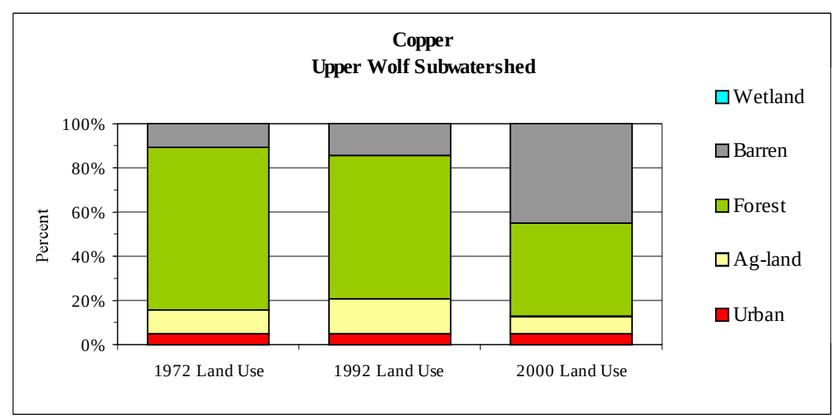
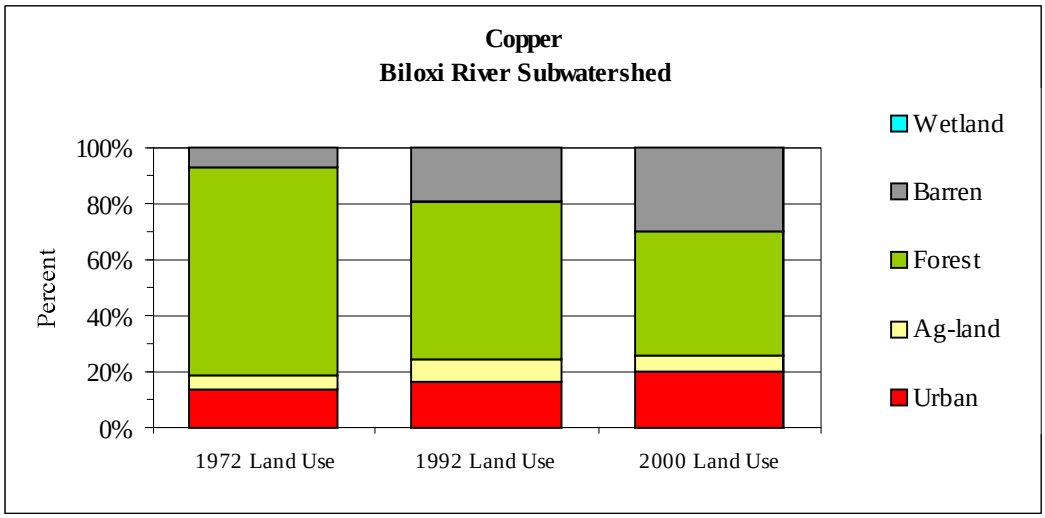
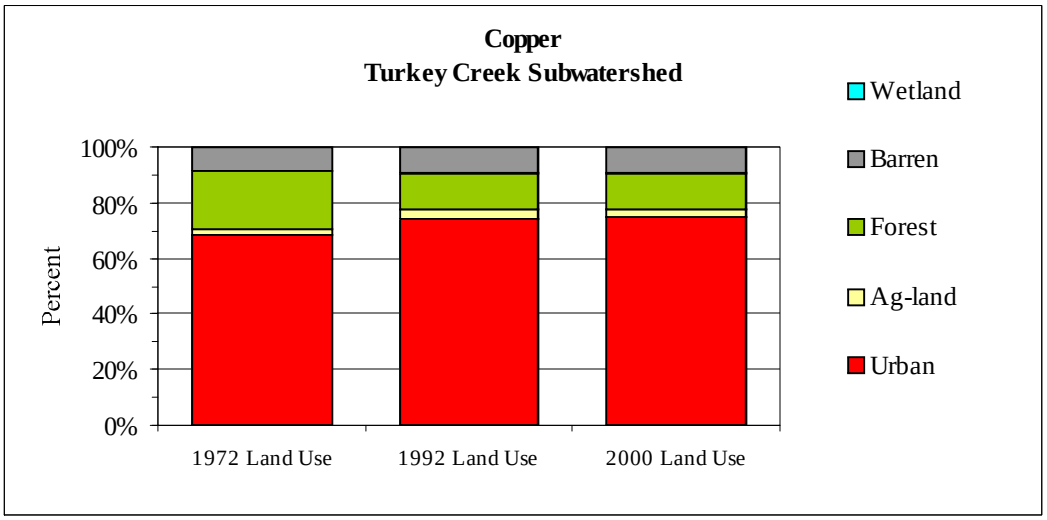


Figure 20a. Historic change in percent of copper contribution per land use for Bay St. Louis subwatersheds





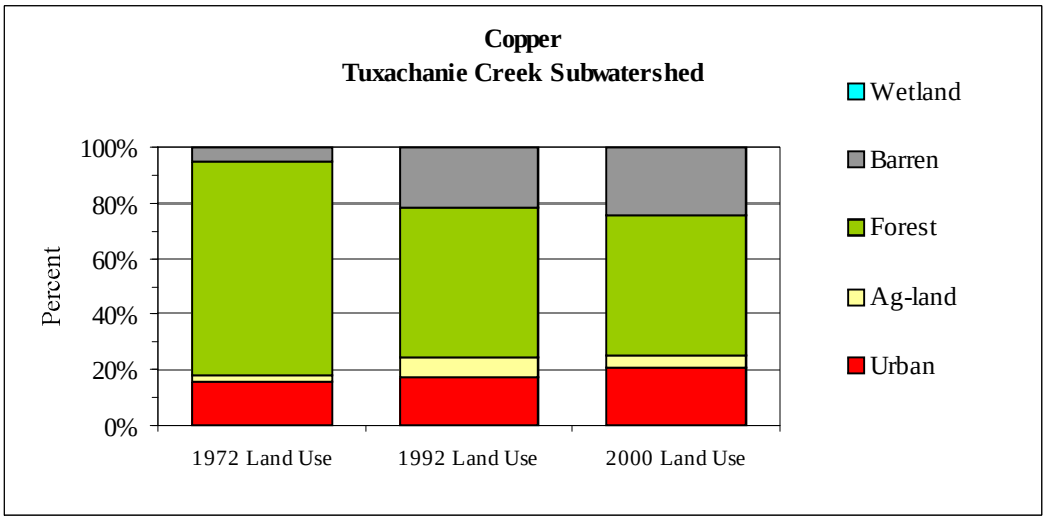
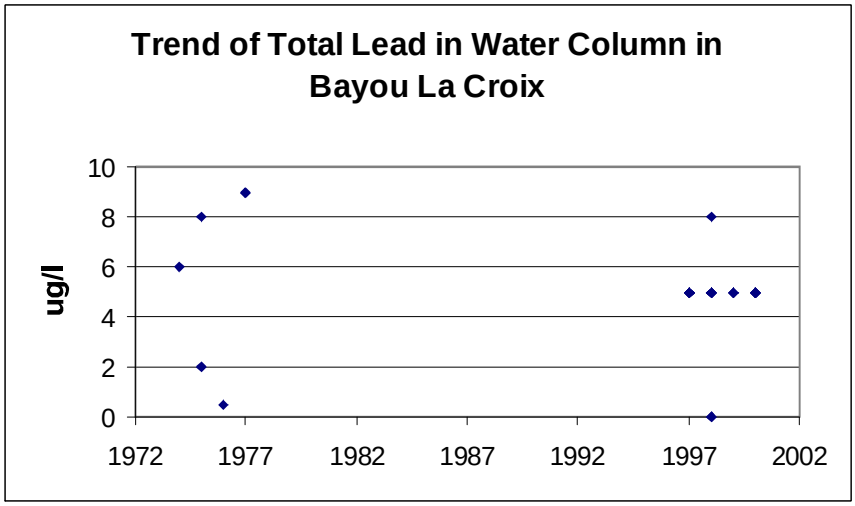
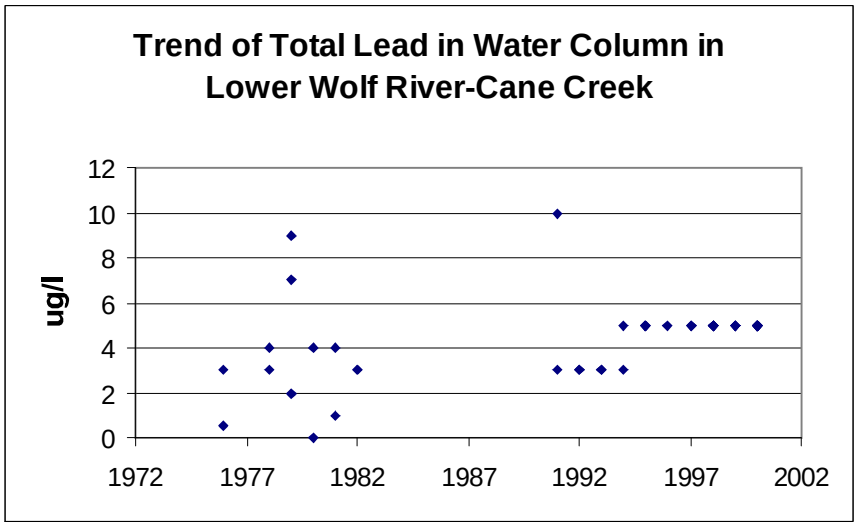


Figure 20b. Historic change in percent of copper contribution per land use for Biloxi Bay subwatersheds





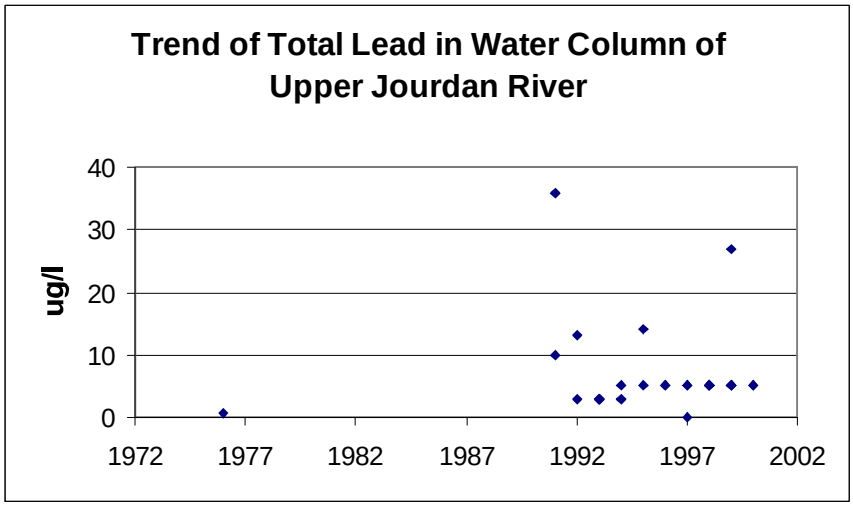
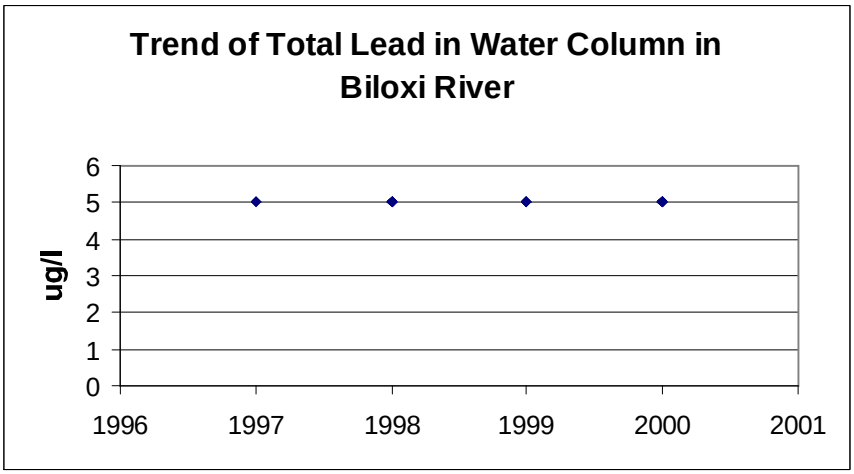
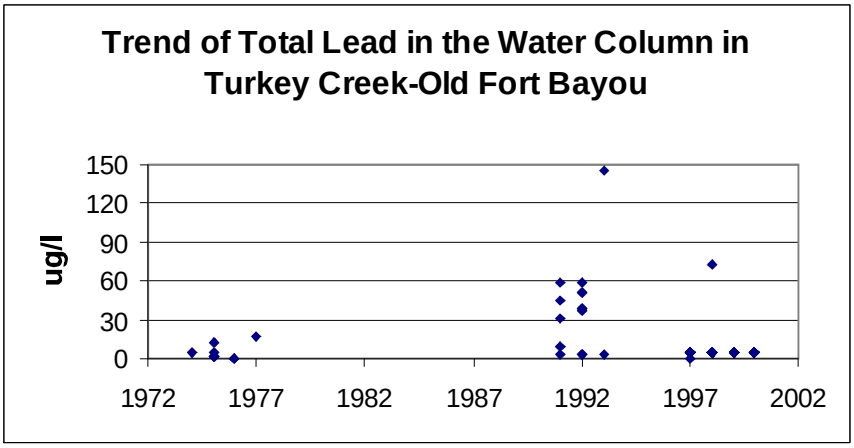


Figure 21a. Historical trends in lead in Bay St. Louis subwatersheds





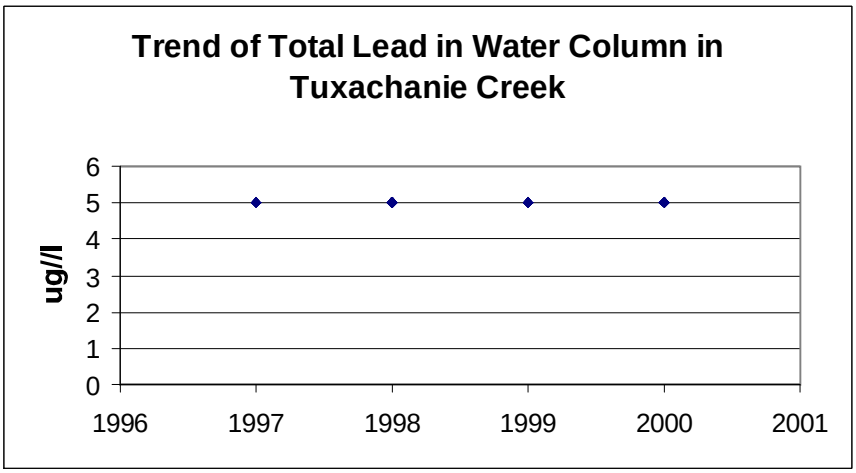
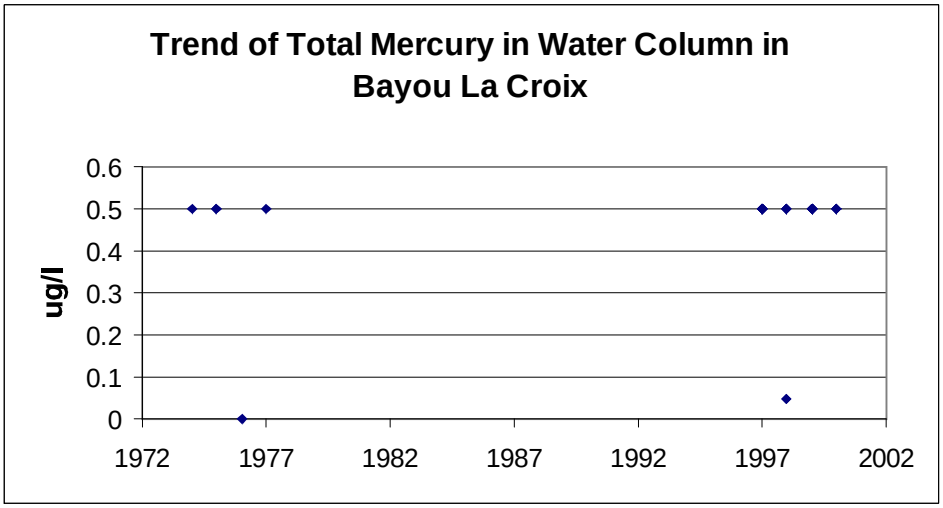
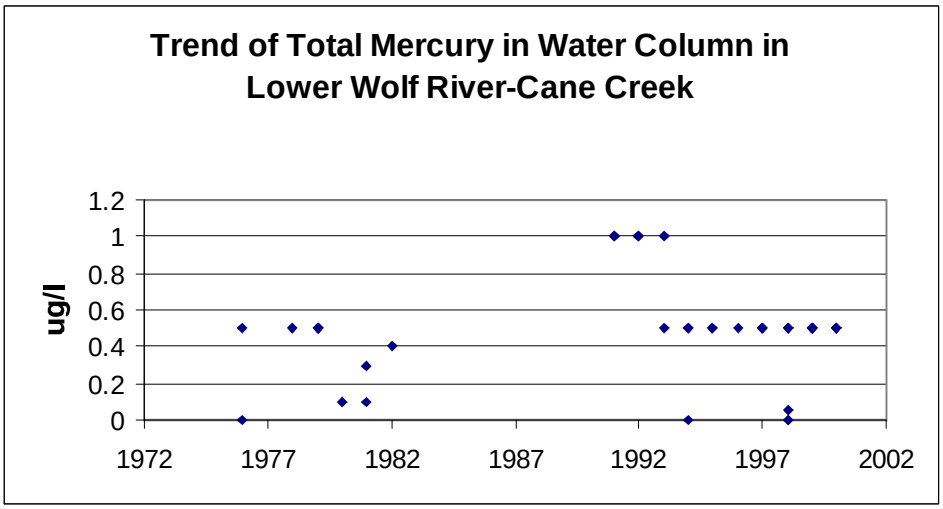


Figure 21b. Historical trends in lead in Biloxi Bay subwatersheds





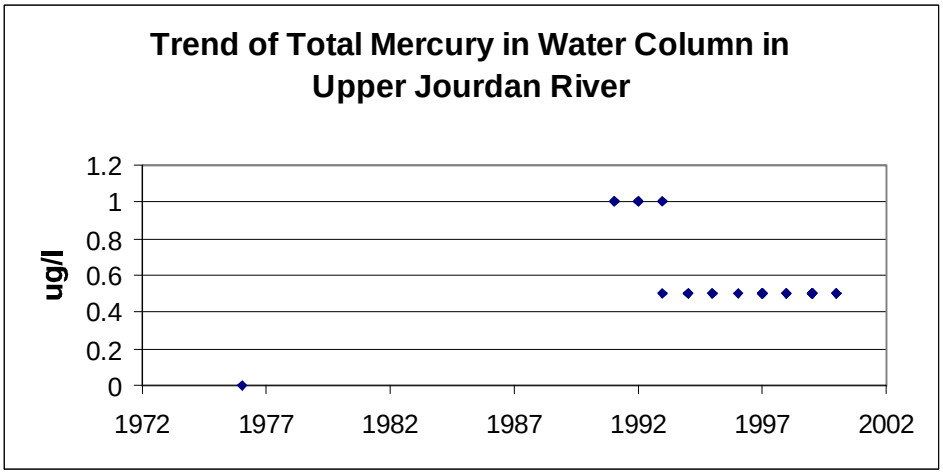
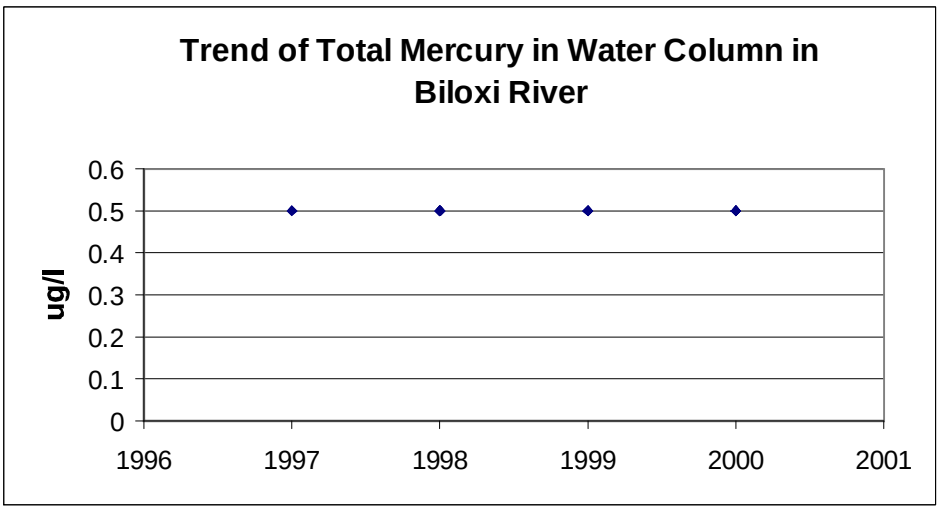
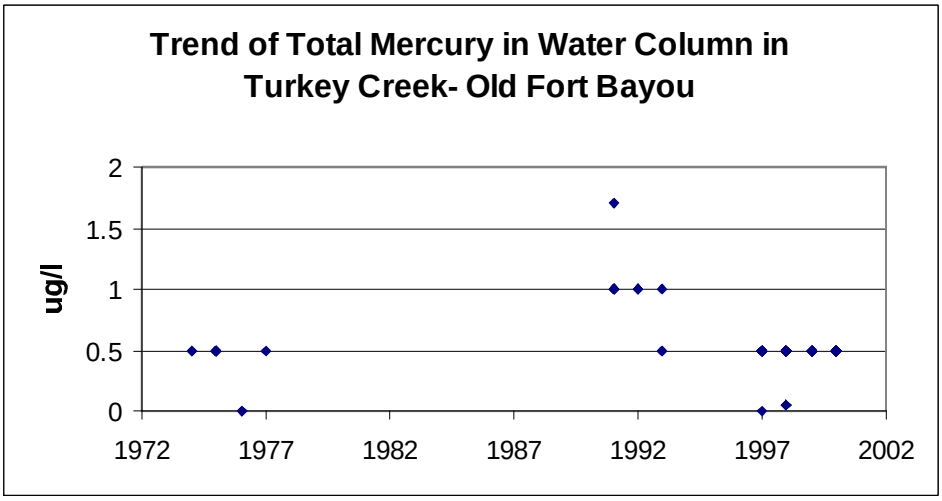


Figure 22a. Historical trends in mercury in Bay St. Louis subwatersheds





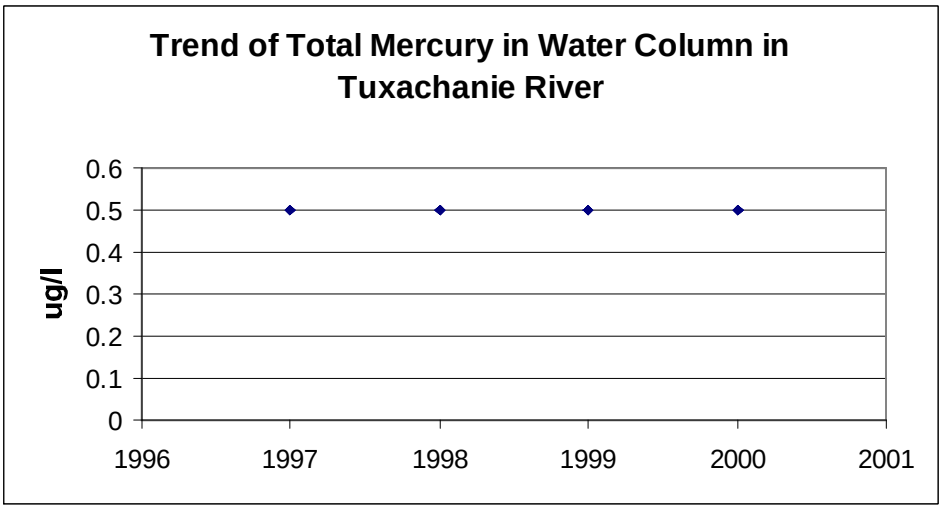
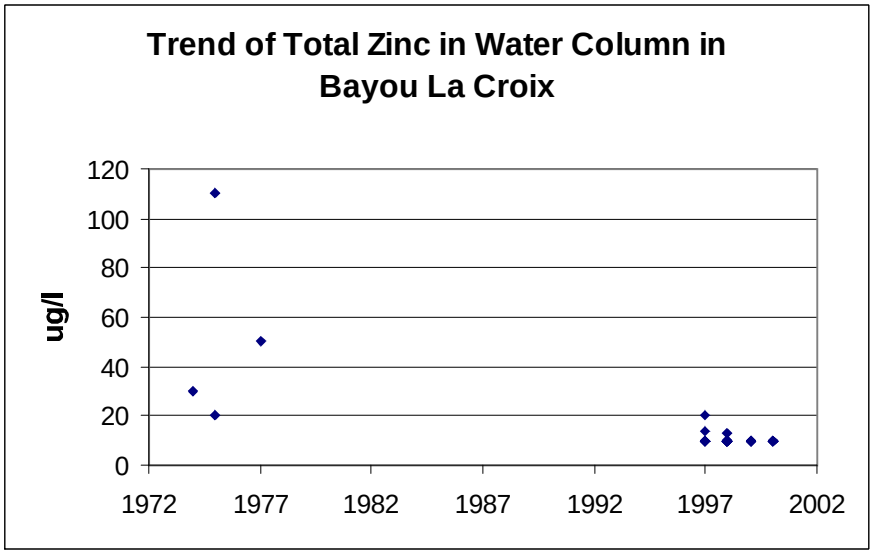
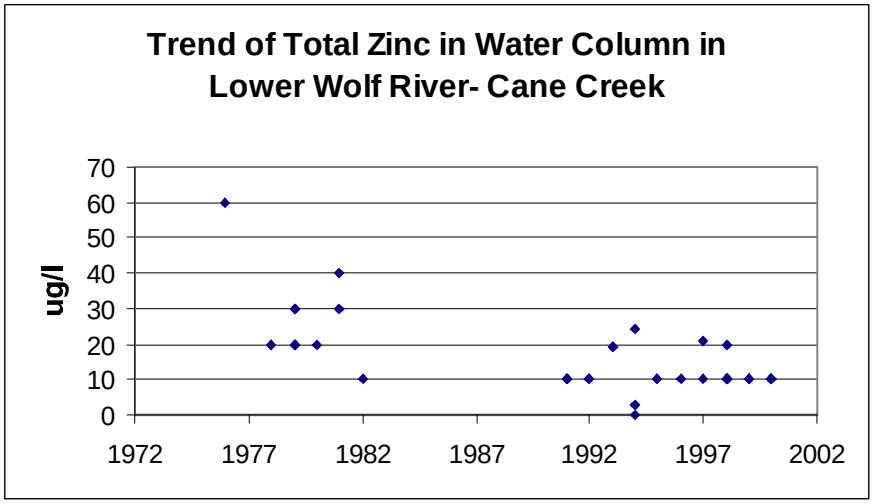


Figure 22b. Historical trends in mercury in Biloxi Bay subwatersheds





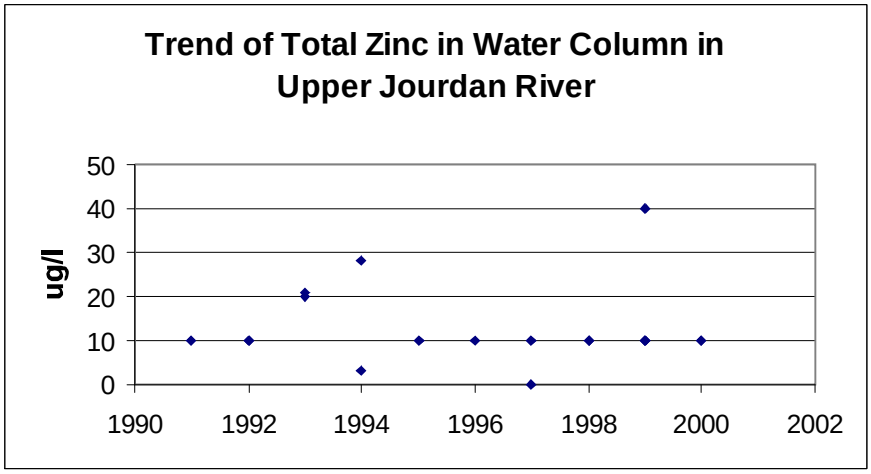
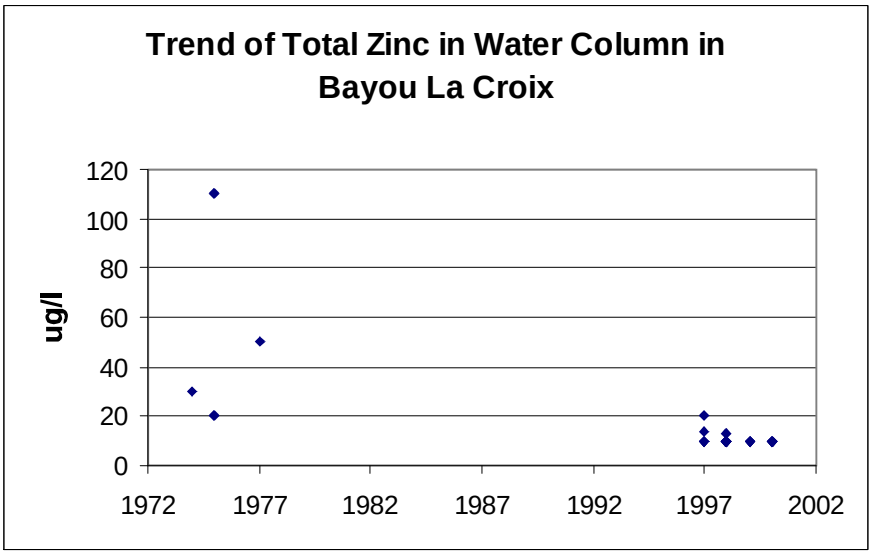
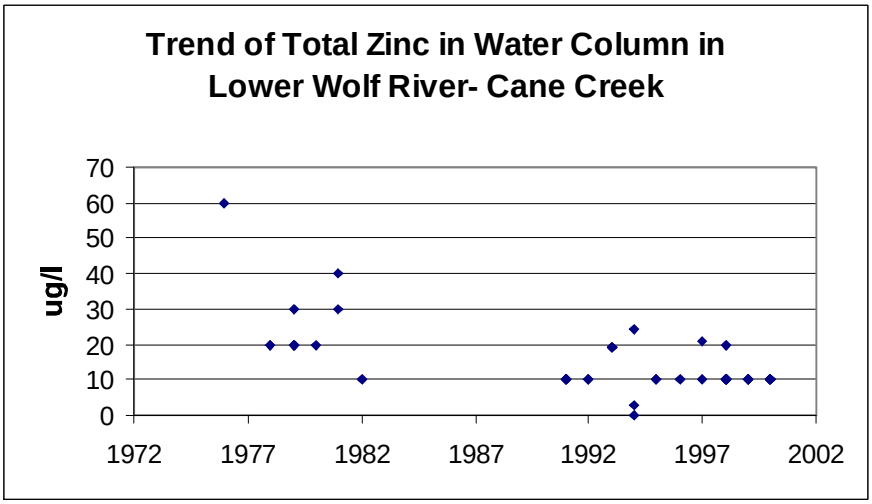


Figure 23a. Historical trends in lead in Bay St Louis subwatersheds





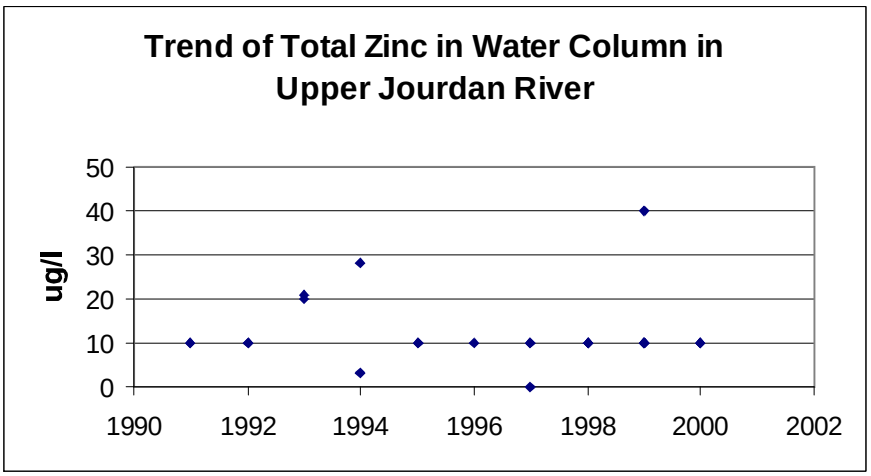


Figure 23b. Historical trends in zinc in Biloxi Bay subwatersheds

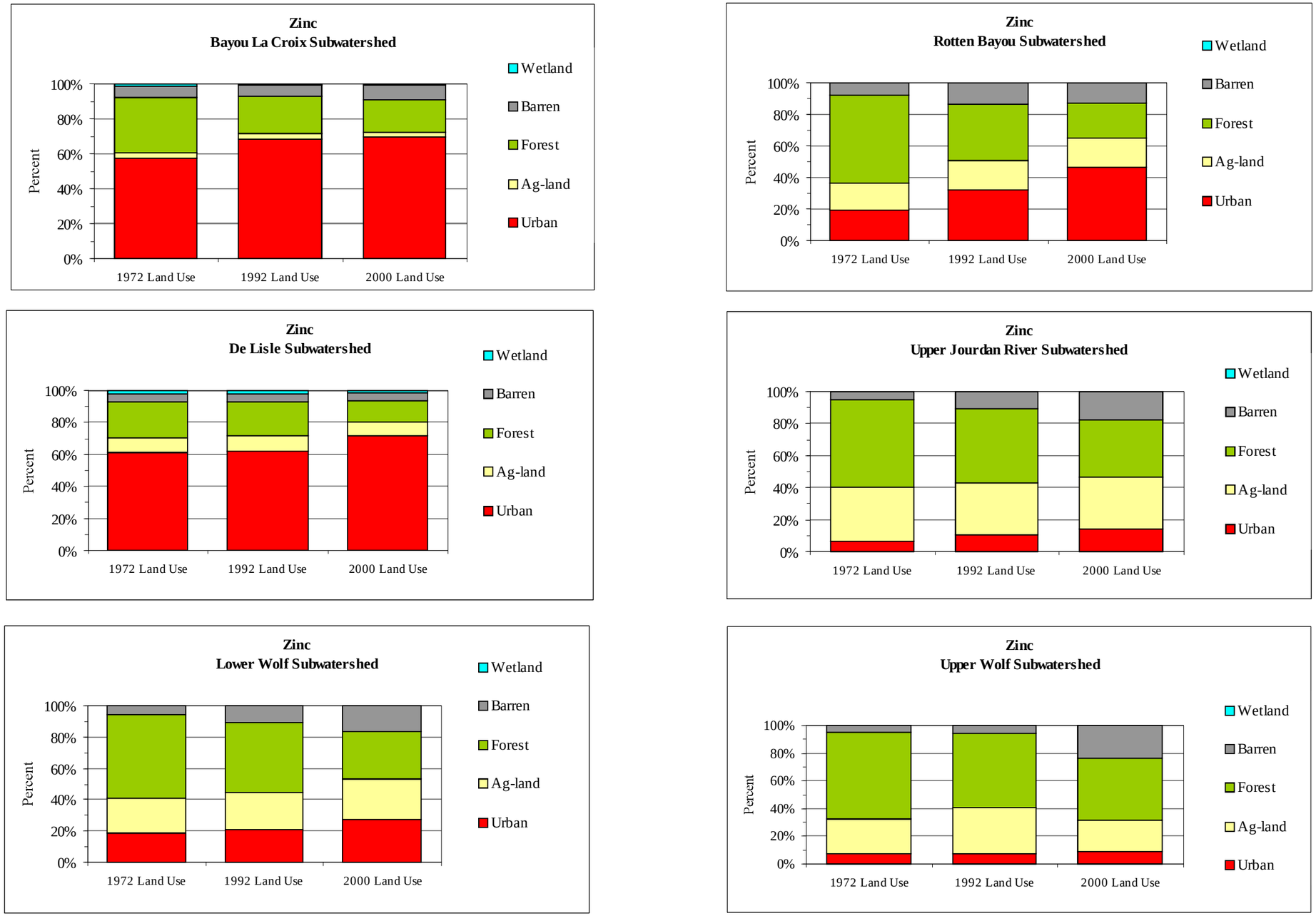
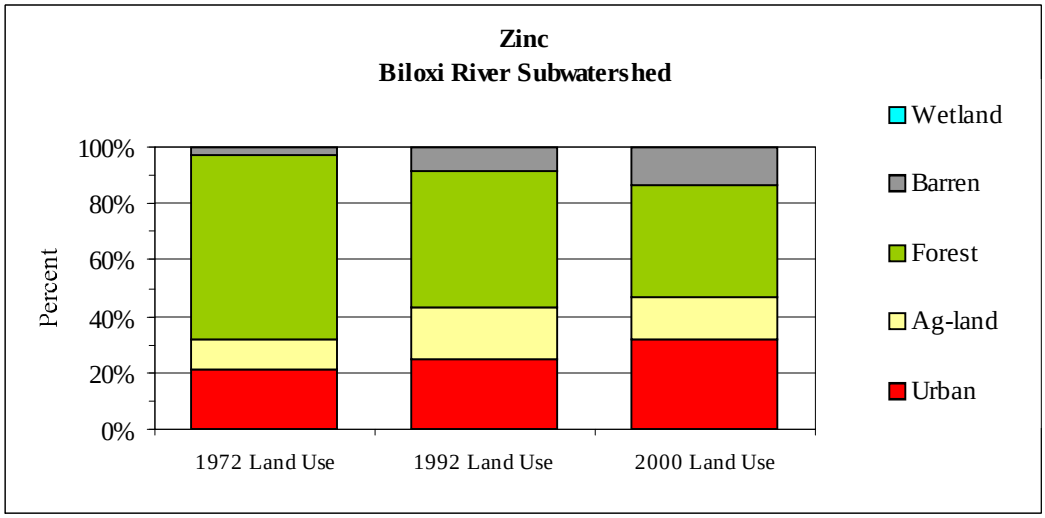
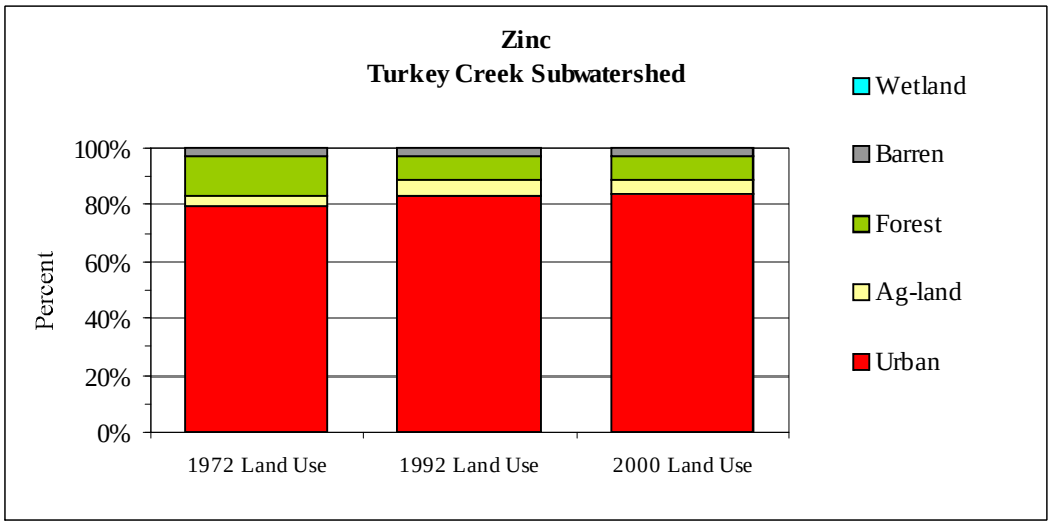


Figure 24a. Historic change in percent of zinc contribution per land use for Bay St. Louis subwatersheds





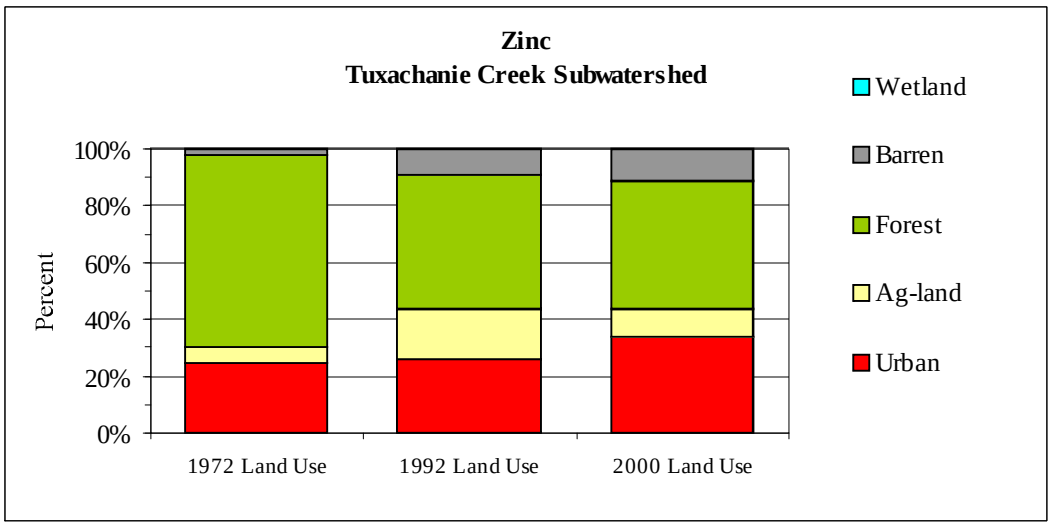
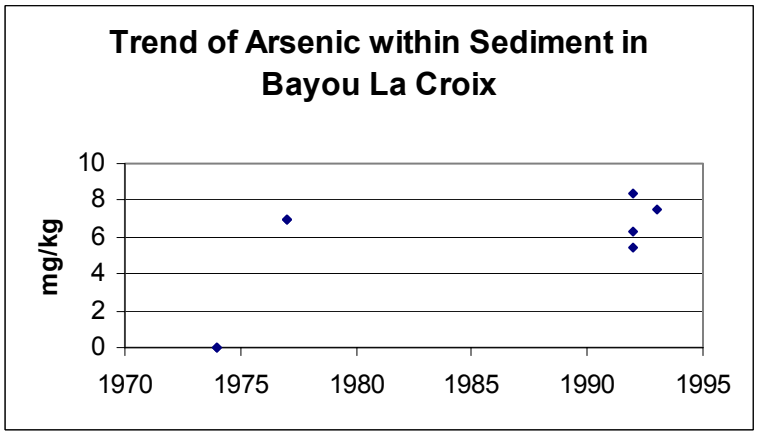
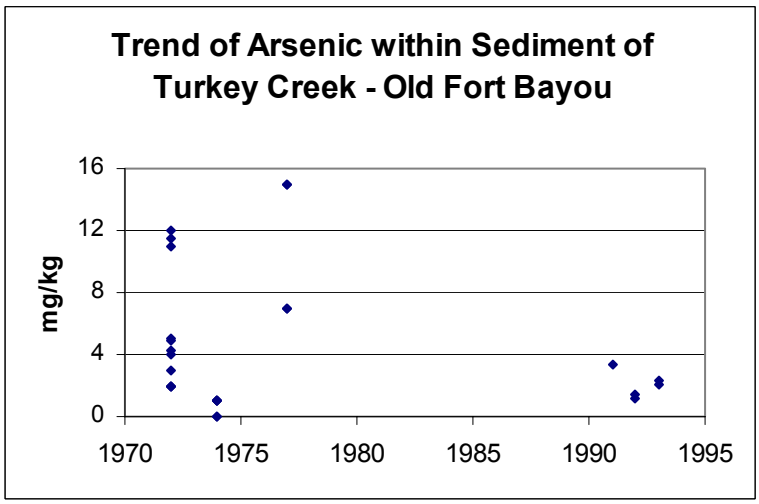


Figure 24b. Historic change in percent of zinc contribution per land use for Biloxi Bay subwatersheds

Appendix I

Sediment Quality
Historical Trend Analysis Graphs





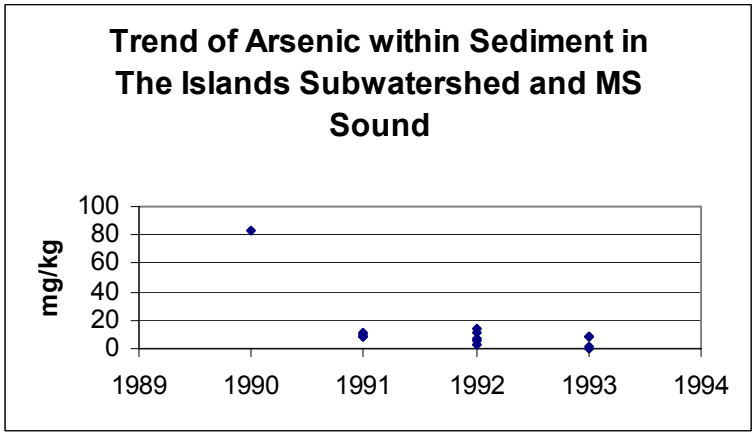
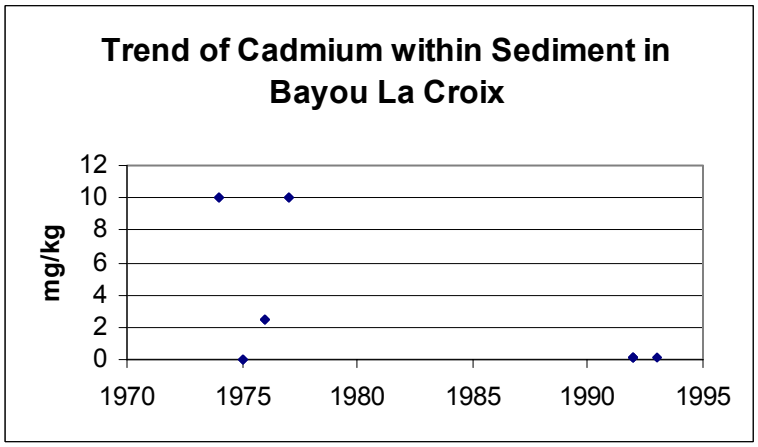
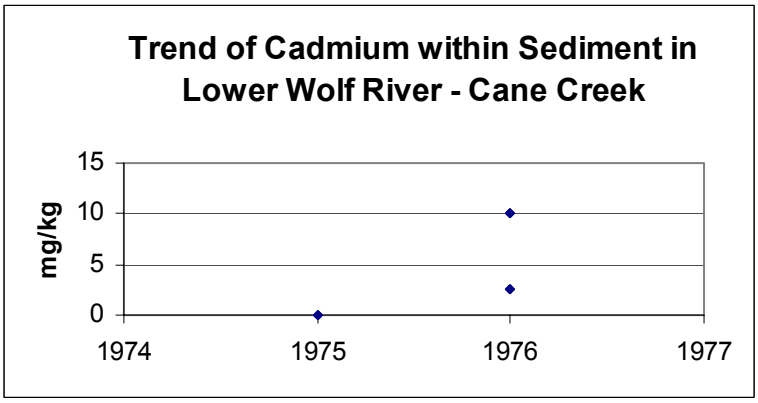


Figure 1. Trend in arsenic concentrations in coastal Mississippi sediments.





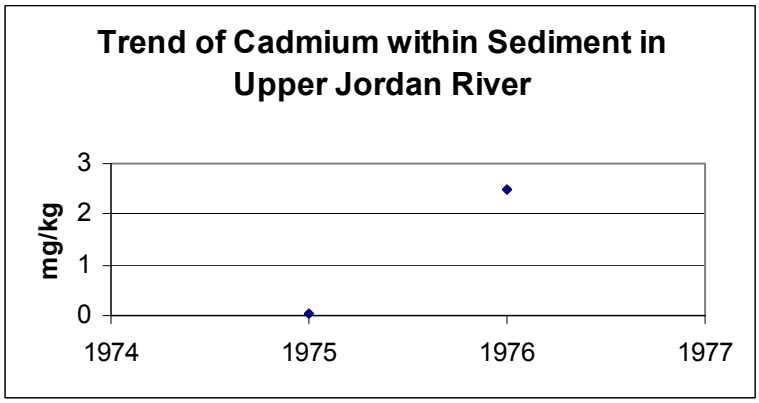
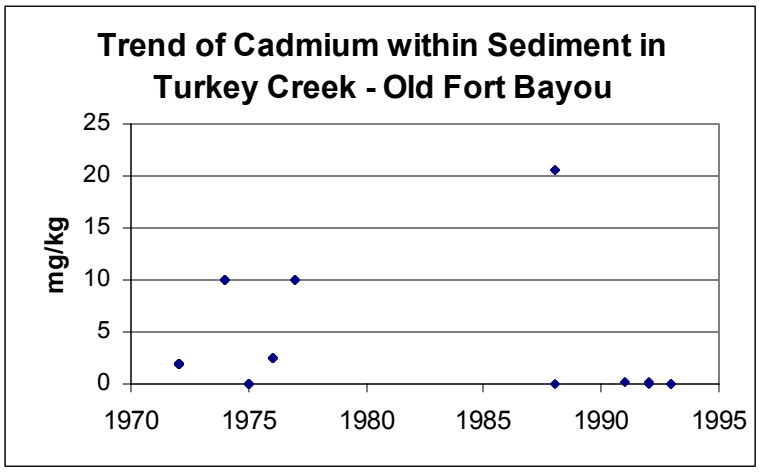


Figure 2. Trend in cadmium concentrations in coastal Mississippi sediments.



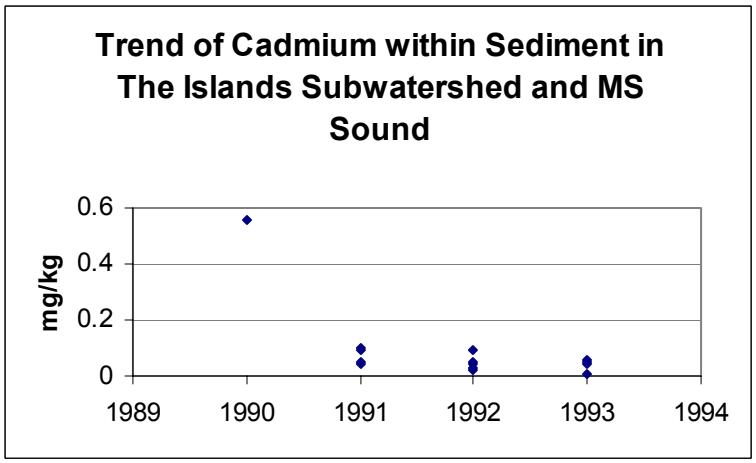


Figure 2. Trend in cadmium concentrations in coastal Mississippi sediments. (continued)

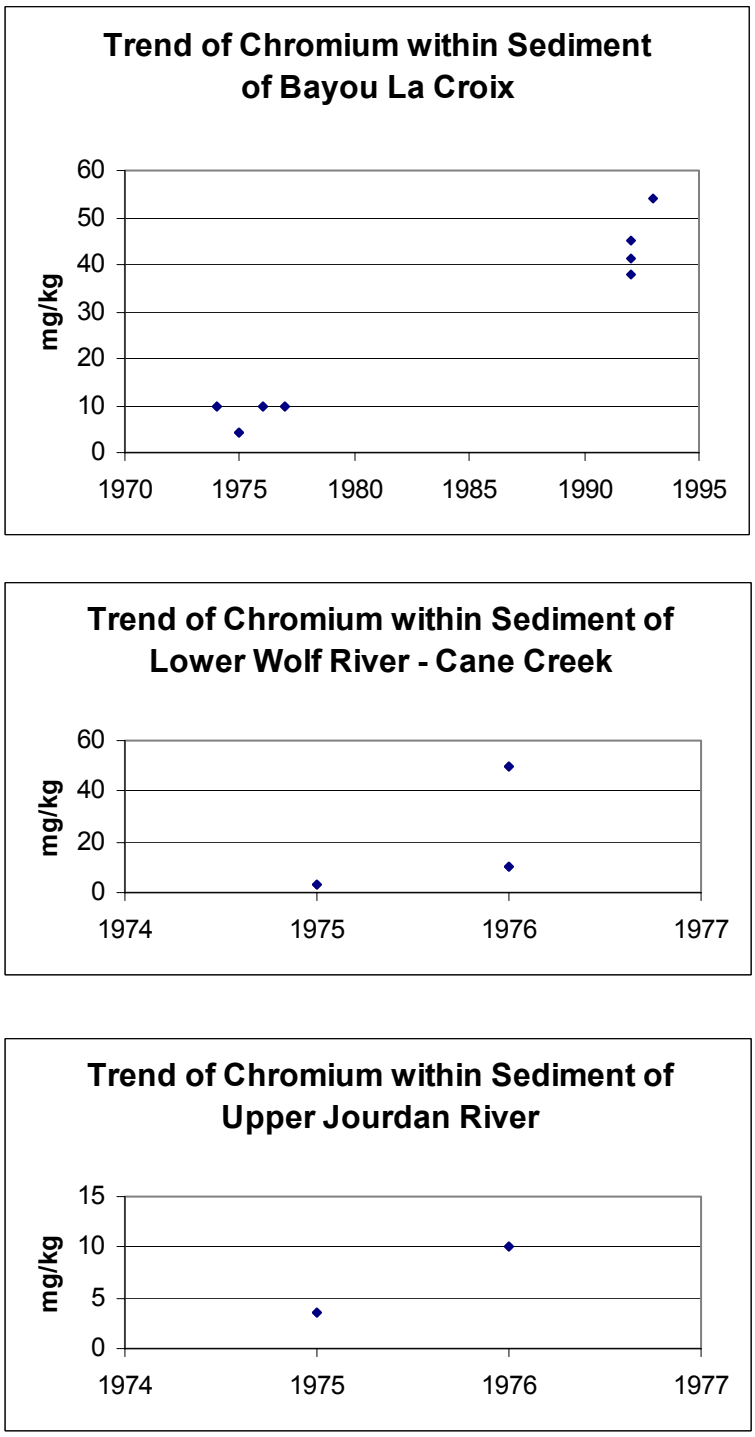


Figure 3. Trend in chromium concentrations in coastal Mississippi sediments.

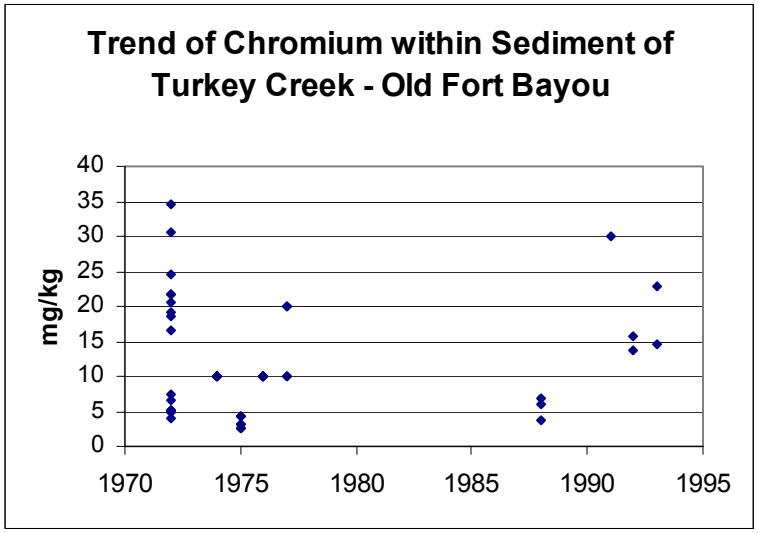


Figure 3. Trend in chromium concentrations in coastal Mississippi sediments. (continued)

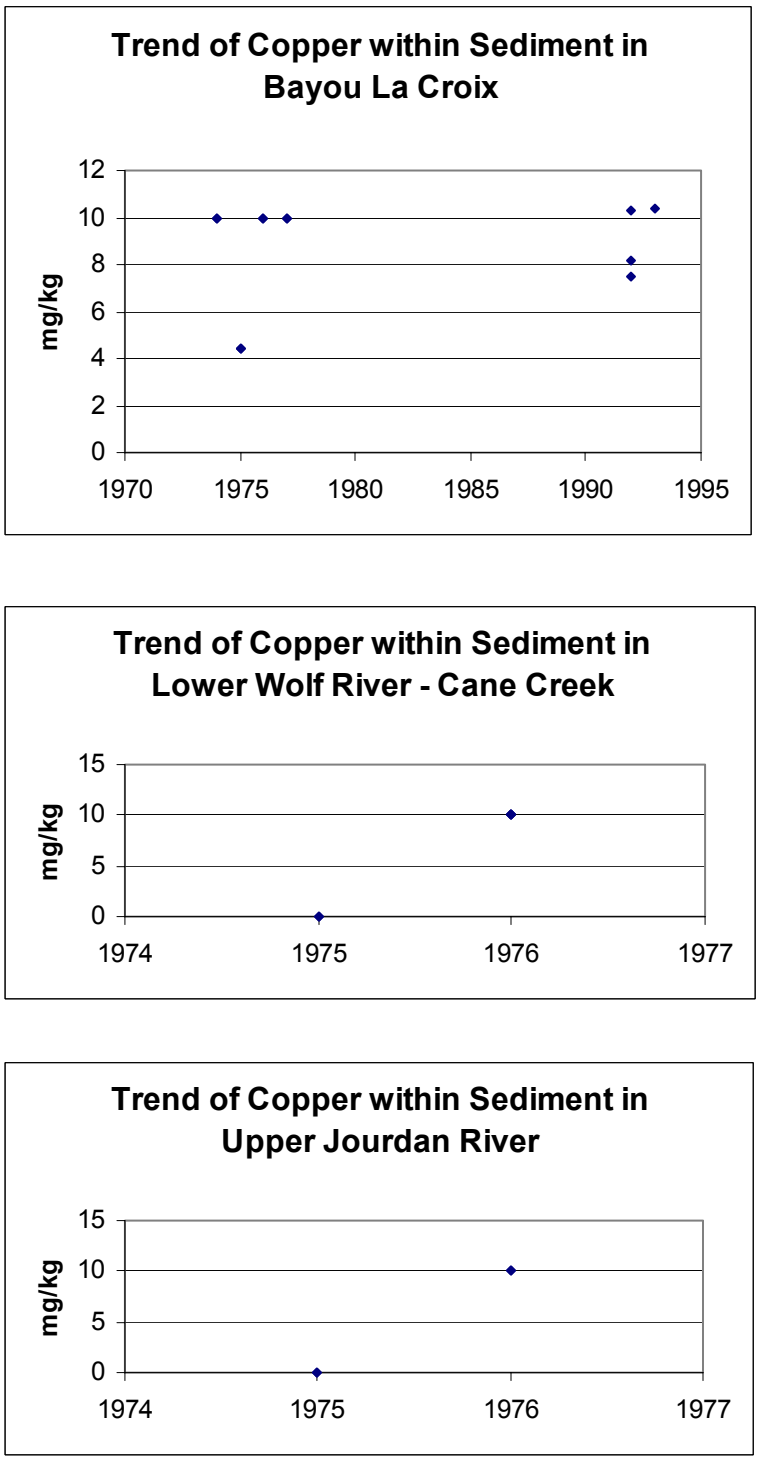
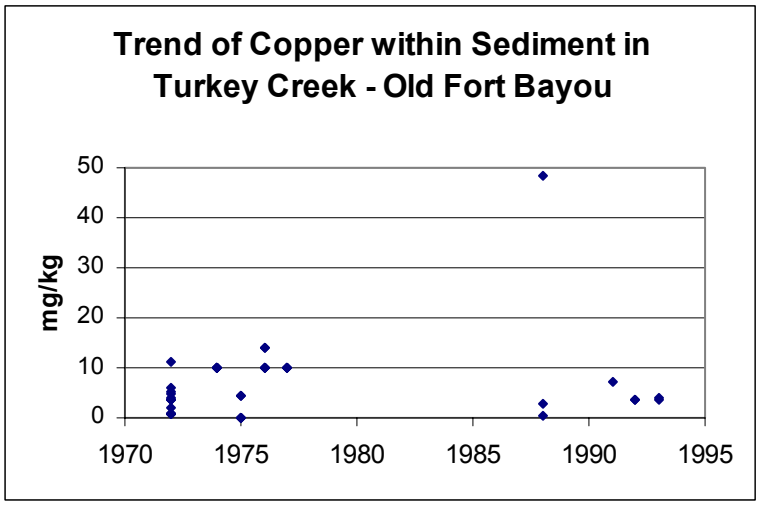


Figure 4. Trend in copper concentrations in coastal Mississippi sediments.



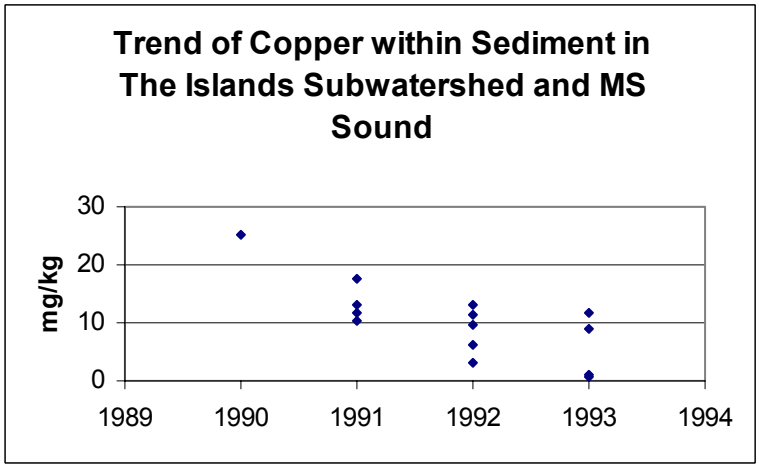
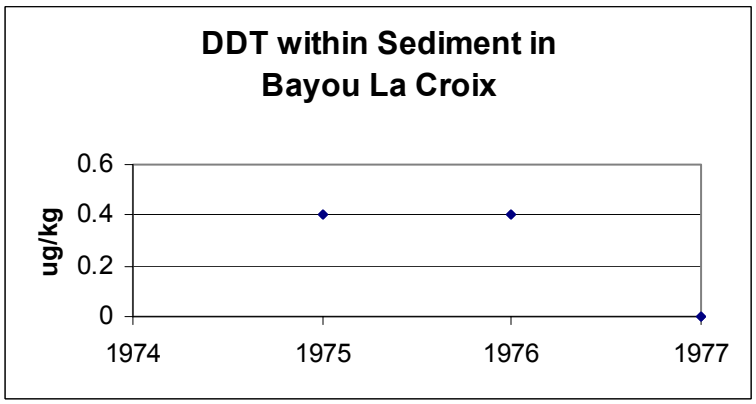
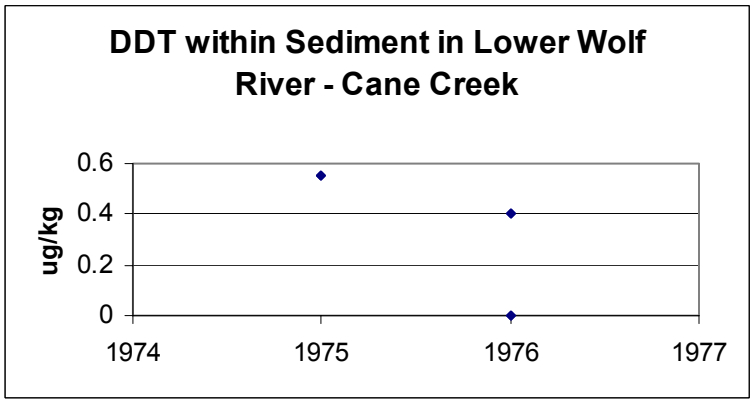


Figure 4. Trend in copper concentrations in coastal Mississippi sediments. (continued)





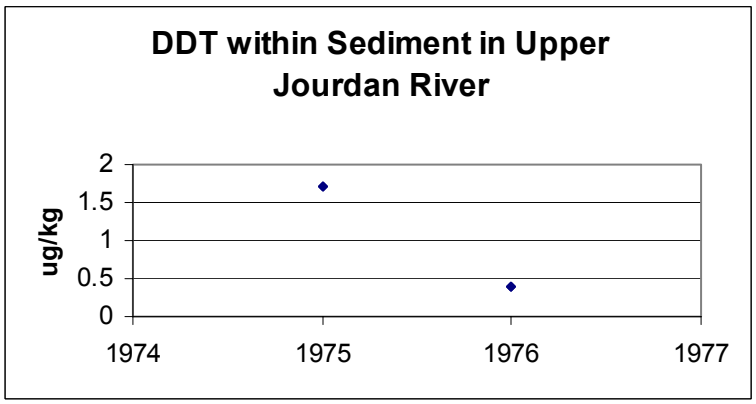


Figure 5. Trend in DDT concentrations in coastal Mississippi sediments.

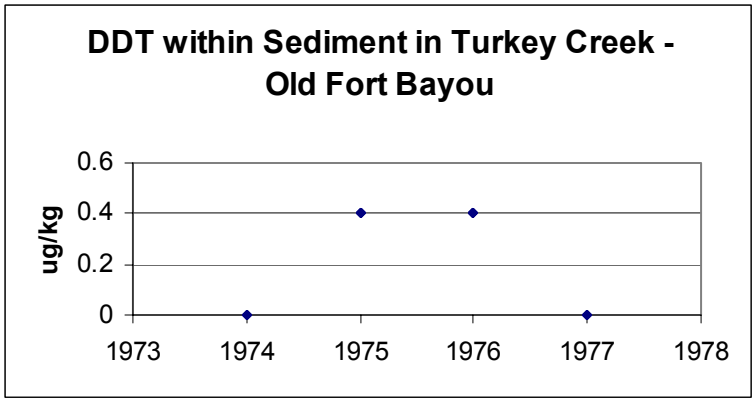
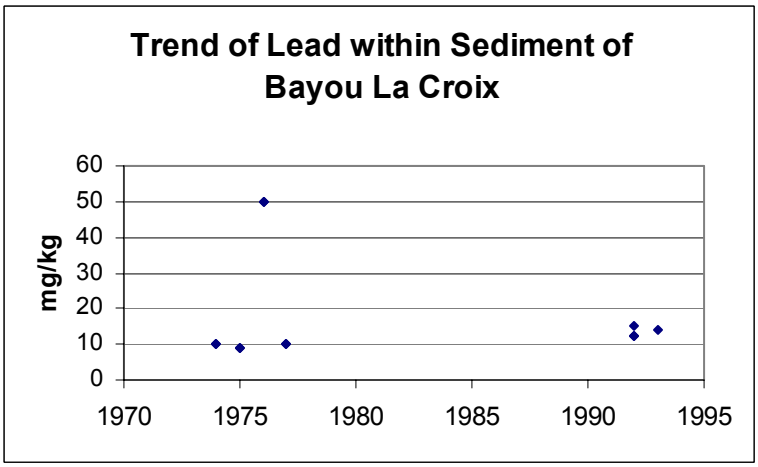
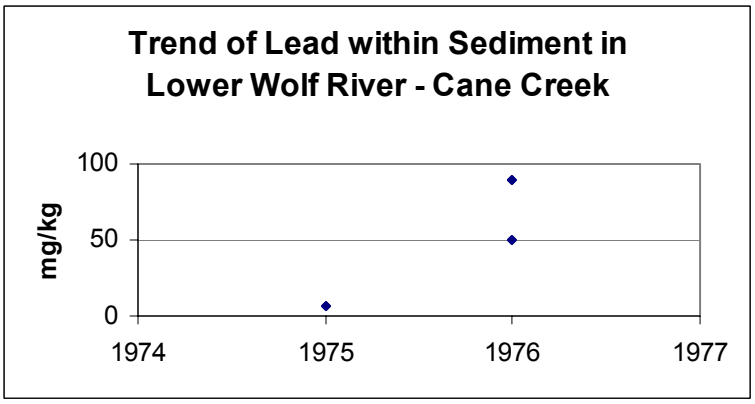


Figure 5. Trend in DDT concentrations in coastal Mississippi sediments. (continued)





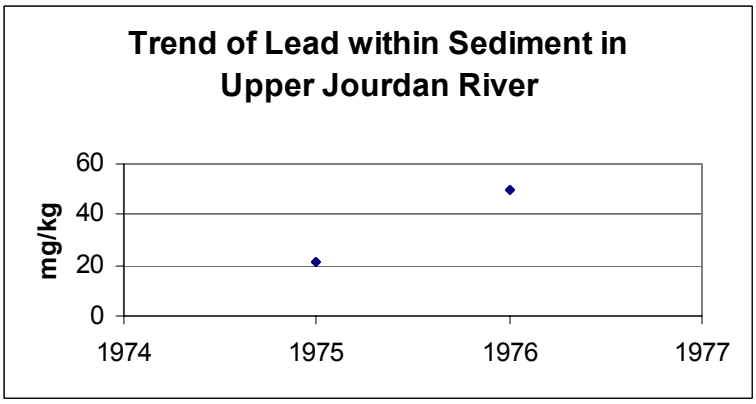


Figure 6. Trend in lead concentrations in coastal Mississippi sediments.

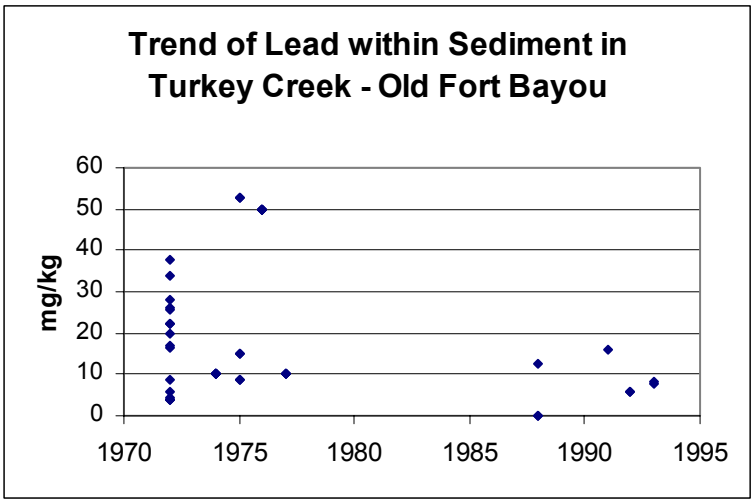
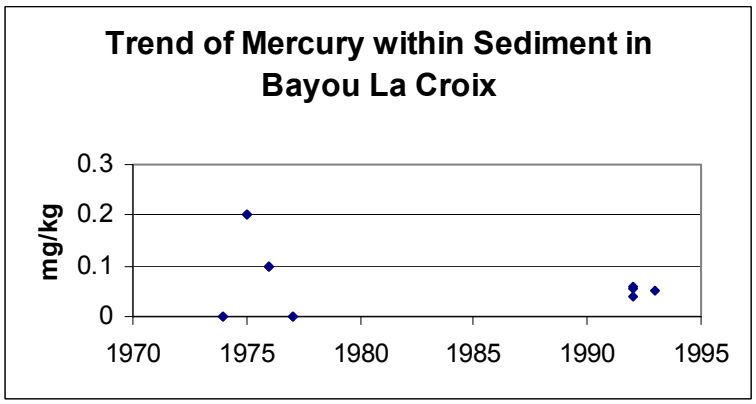
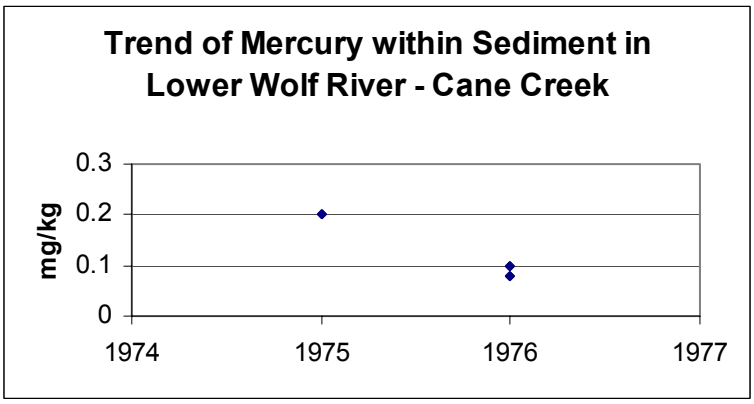


Figure 6. Trend in lead concentrations in coastal Mississippi sediments. (continued)





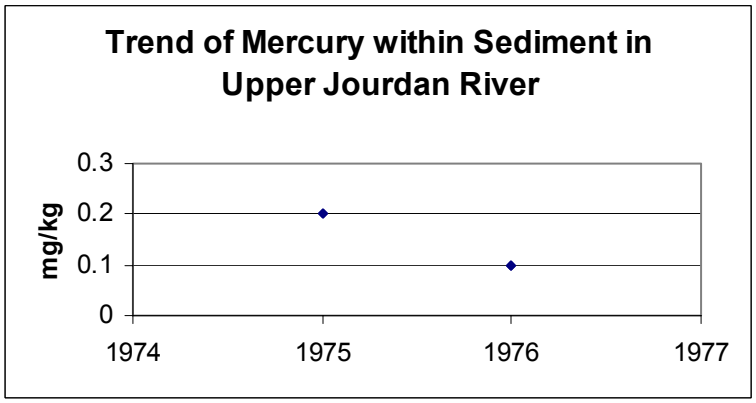
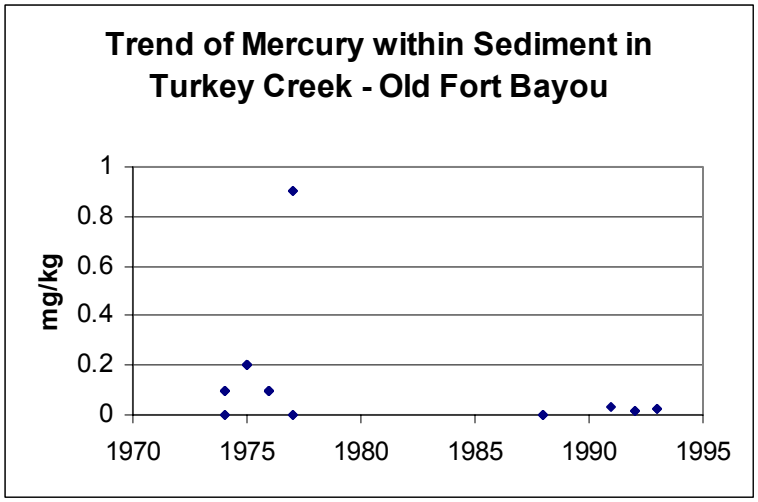


Figure 7. Trend in mercury concentrations in coastal Mississippi sediments.



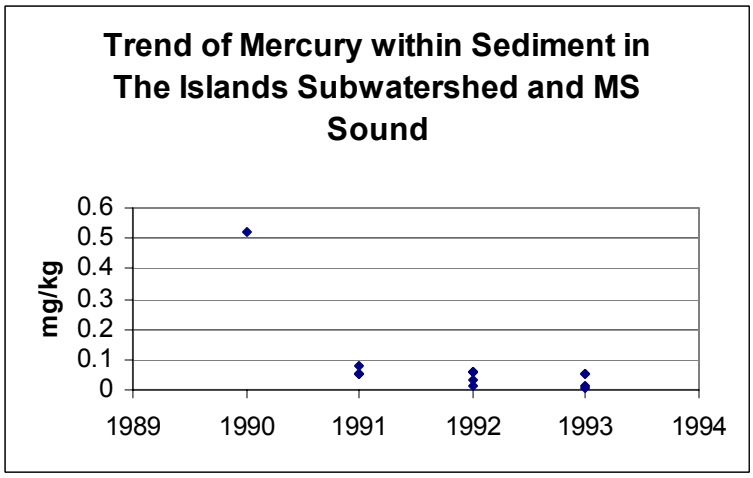
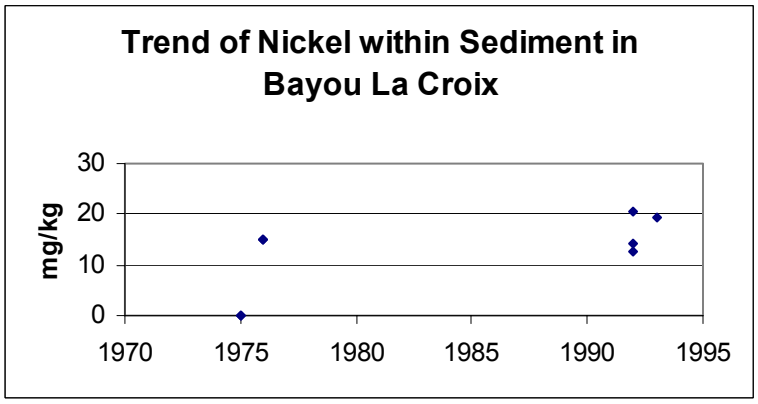
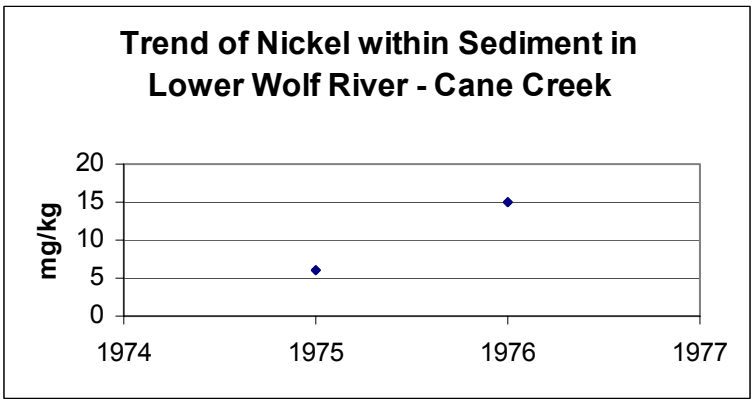


Figure 7. Trend in mercury concentrations in coastal Mississippi sediments. (continued)





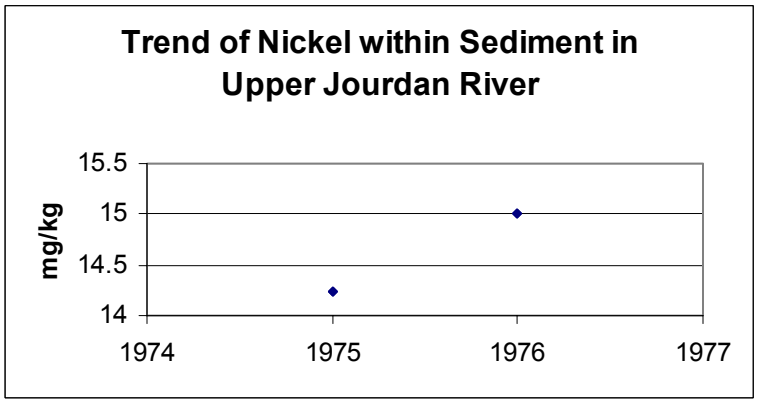
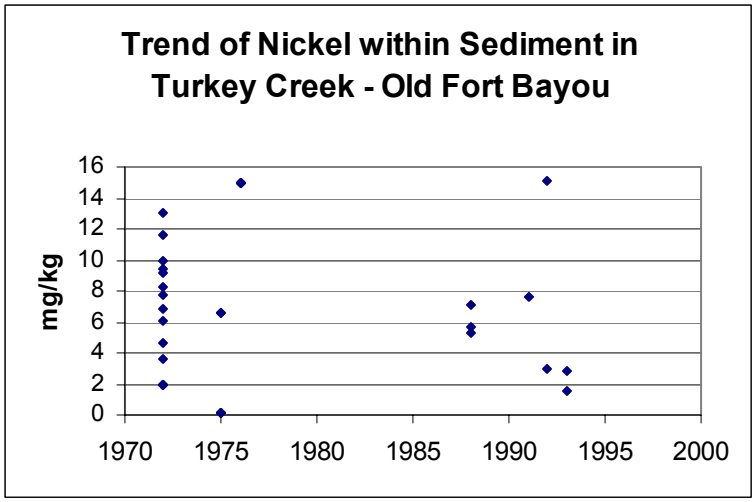


Figure 8. Trend in nickel concentrations in coastal Mississippi sediments.



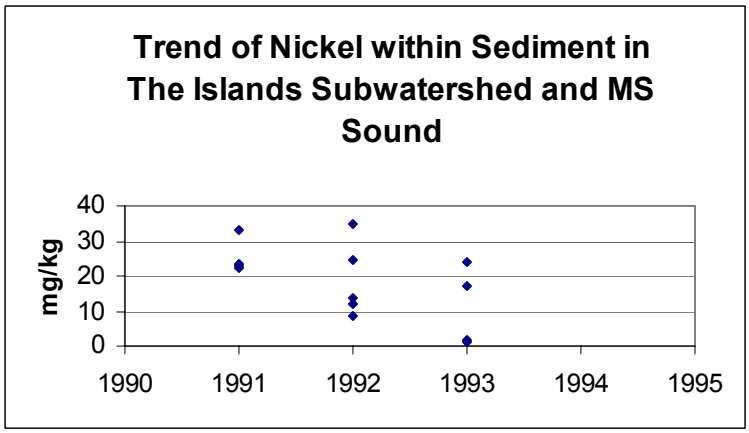
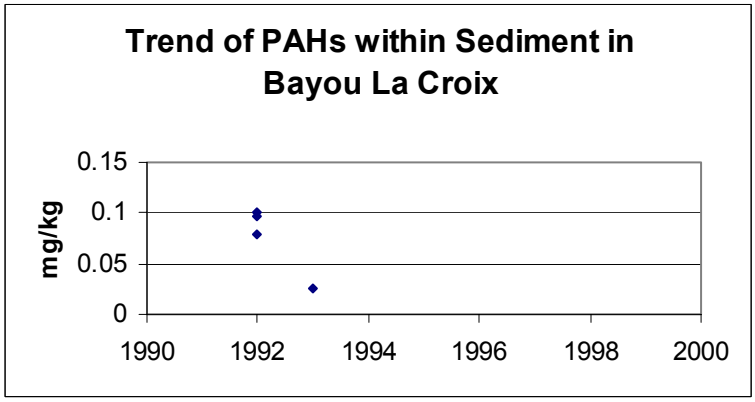
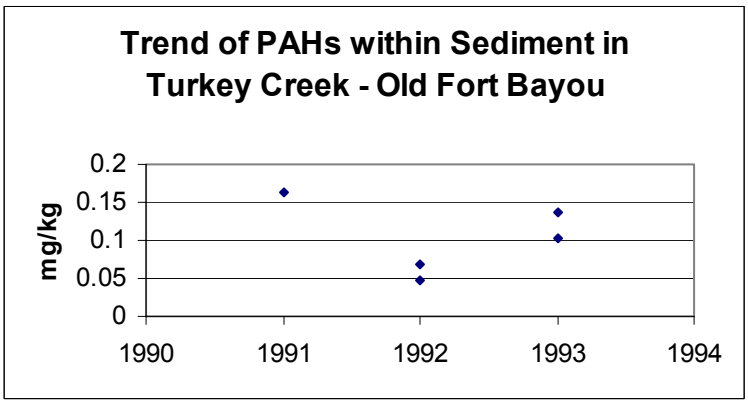


Figure 8. Trend in nickel concentrations in coastal Mississippi sediments. (continued)





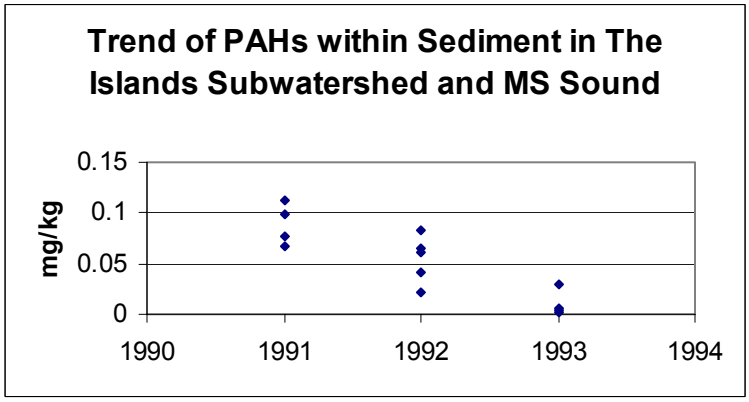
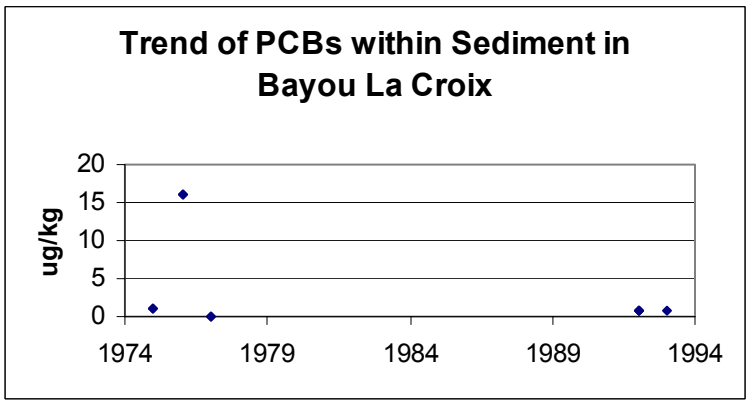
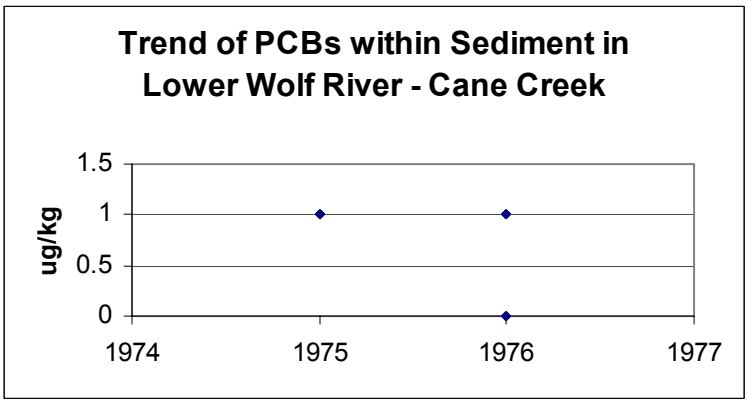


Figure 9. Trend in PAH concentrations in coastal Mississippi sediments.





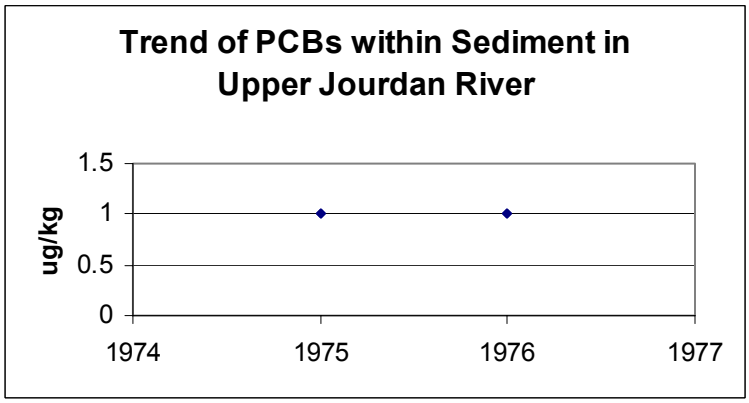
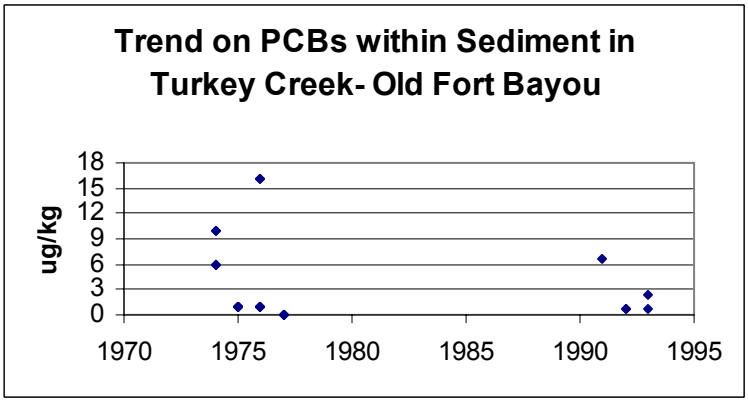


Figure 10. Trend in PCB concentrations in coastal Mississippi sediments.



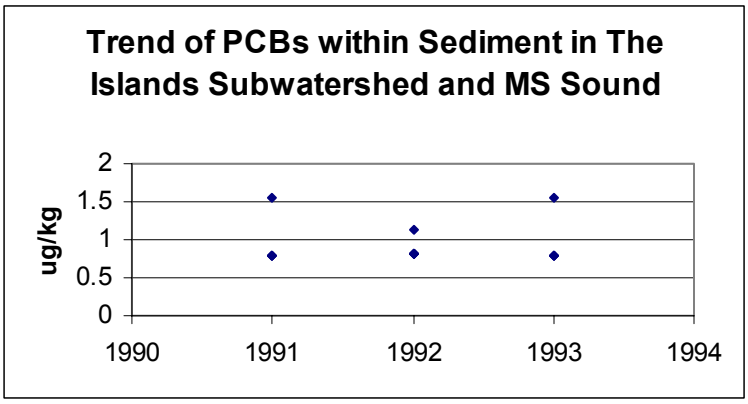
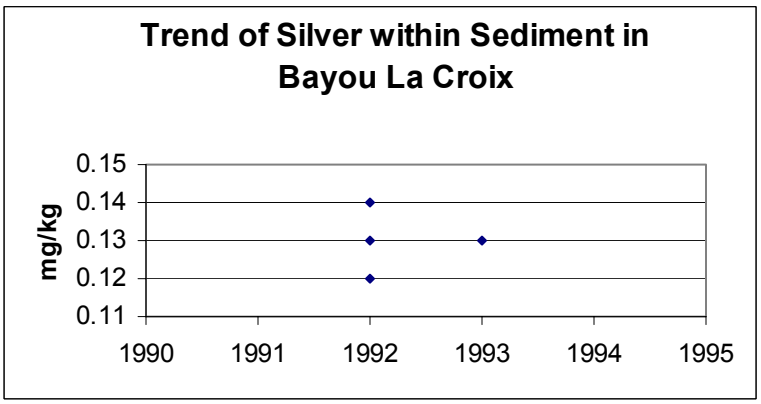
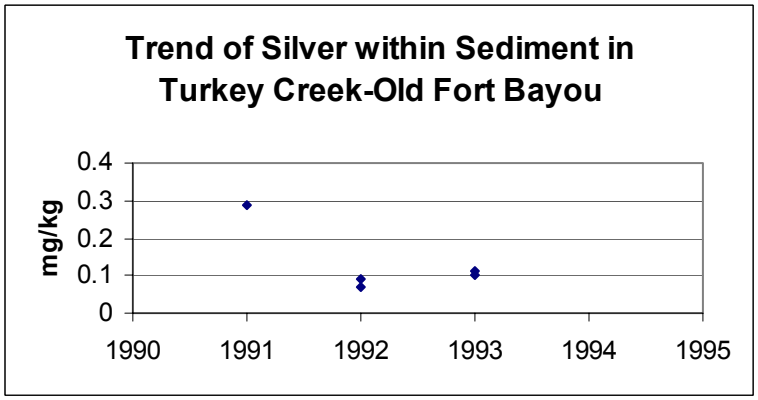


Figure 10. Trend in PCB concentrations in coastal Mississippi sediments. (continued)





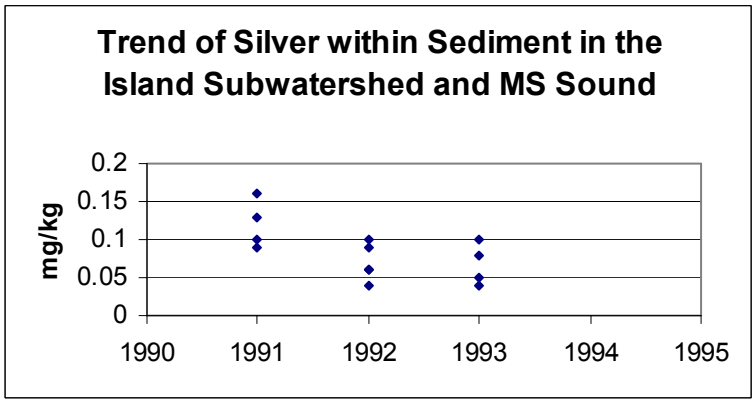
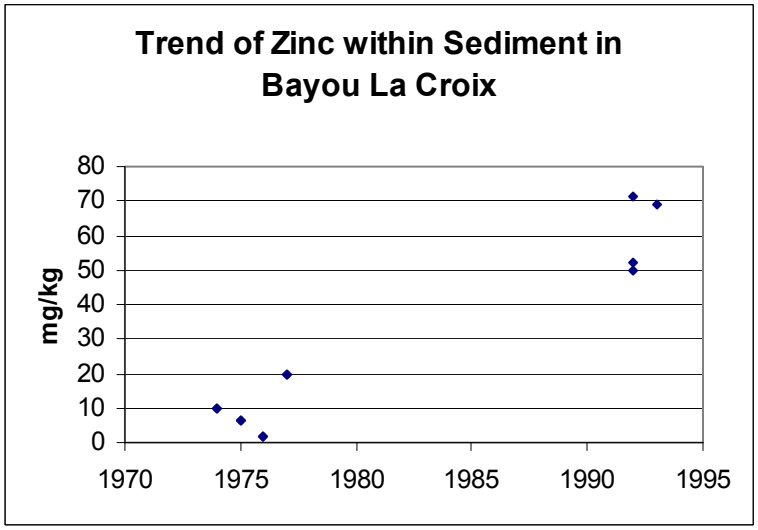
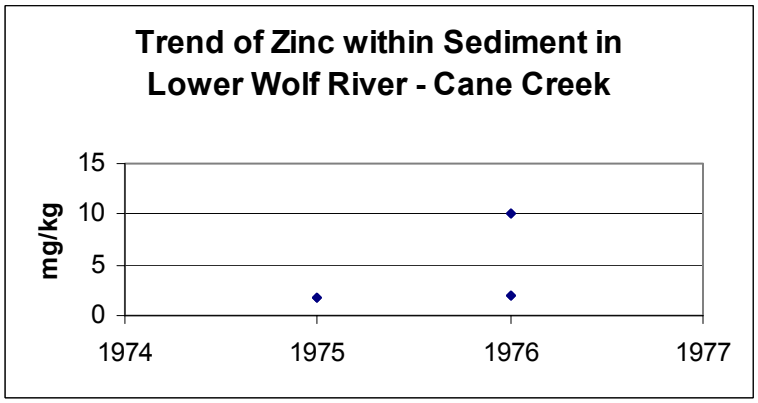


Figure 11. Trend in silver concentrations in coastal Mississippi sediments.





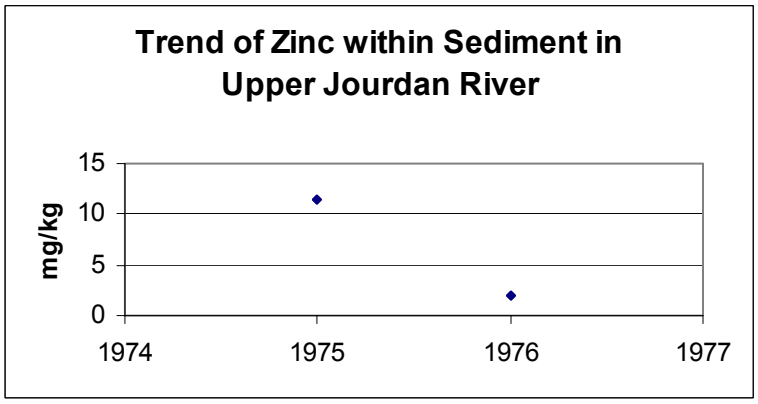
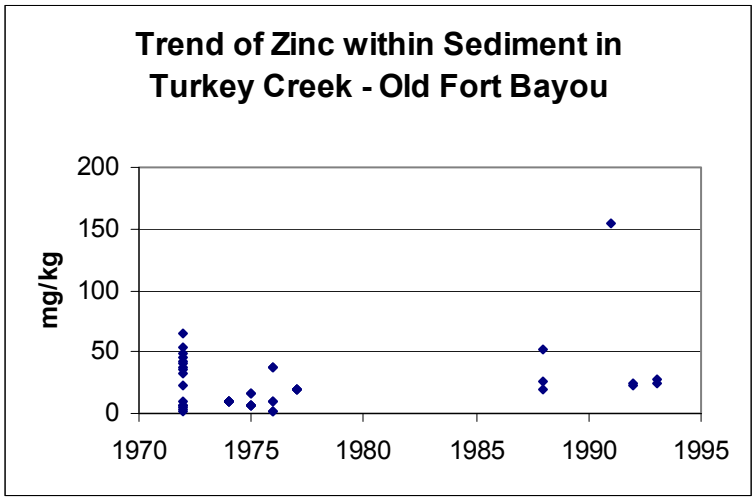


Figure 12. Trend in zinc concentrations in coastal Mississippi sediments.



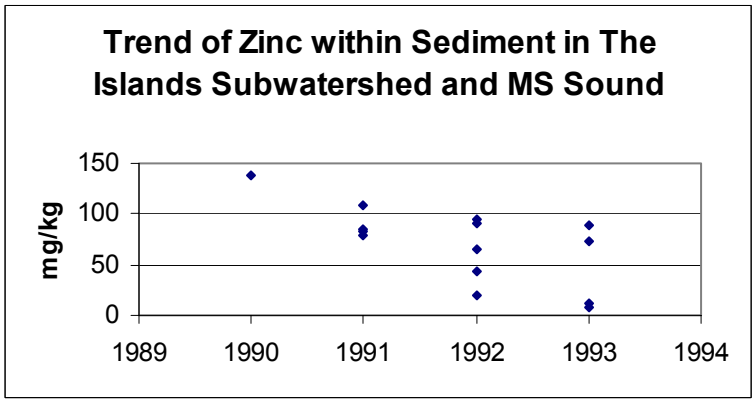
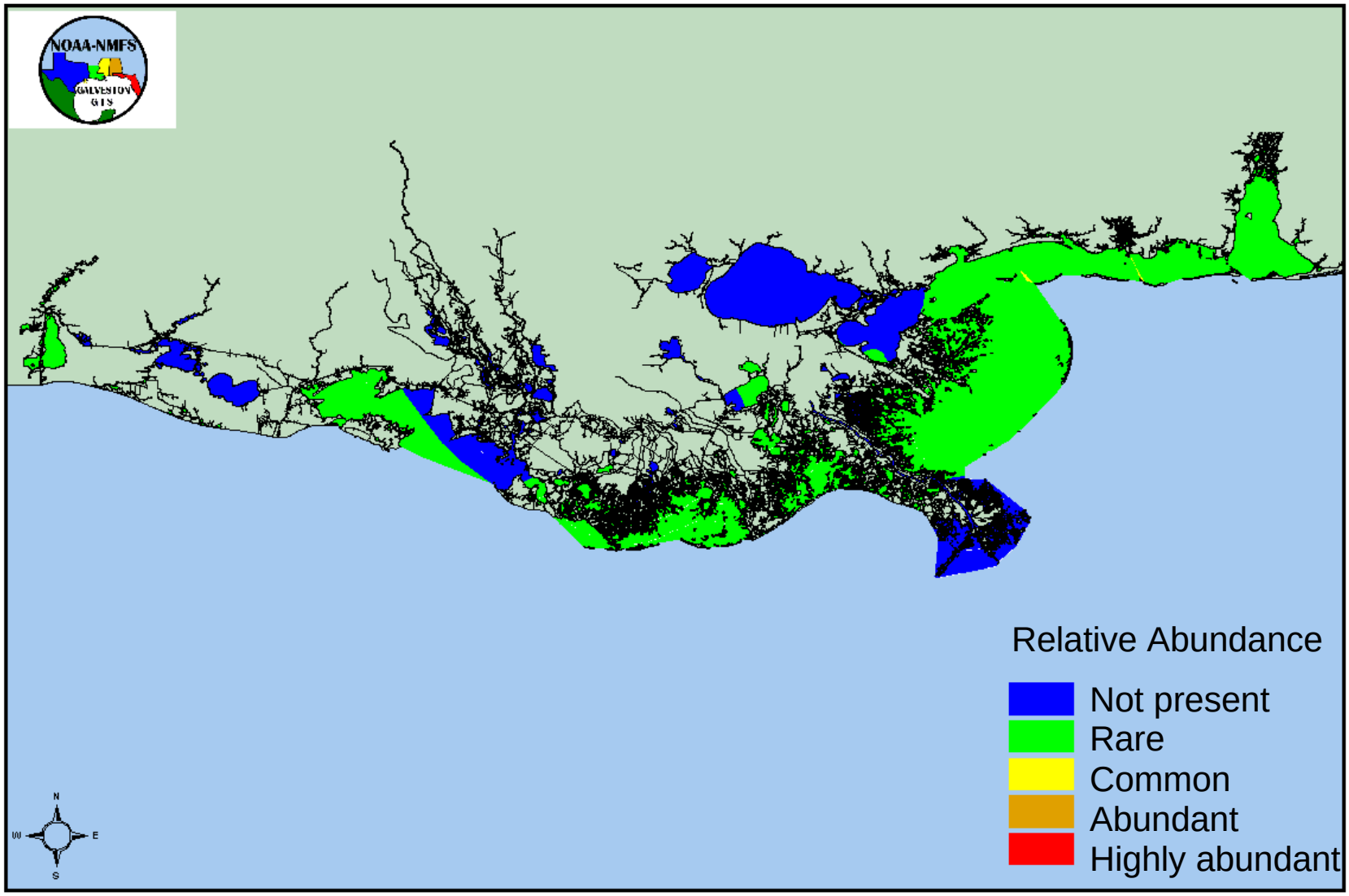
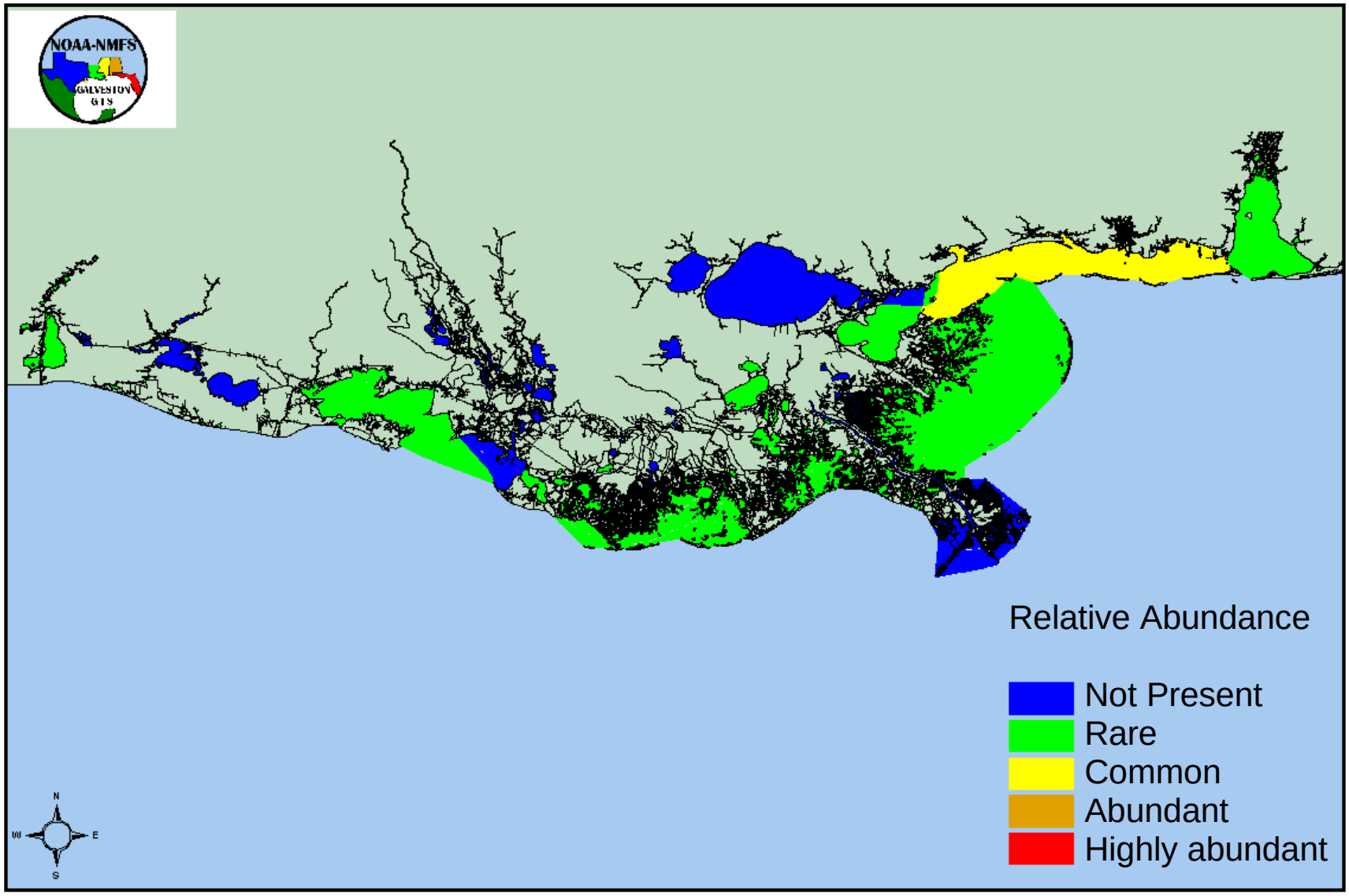


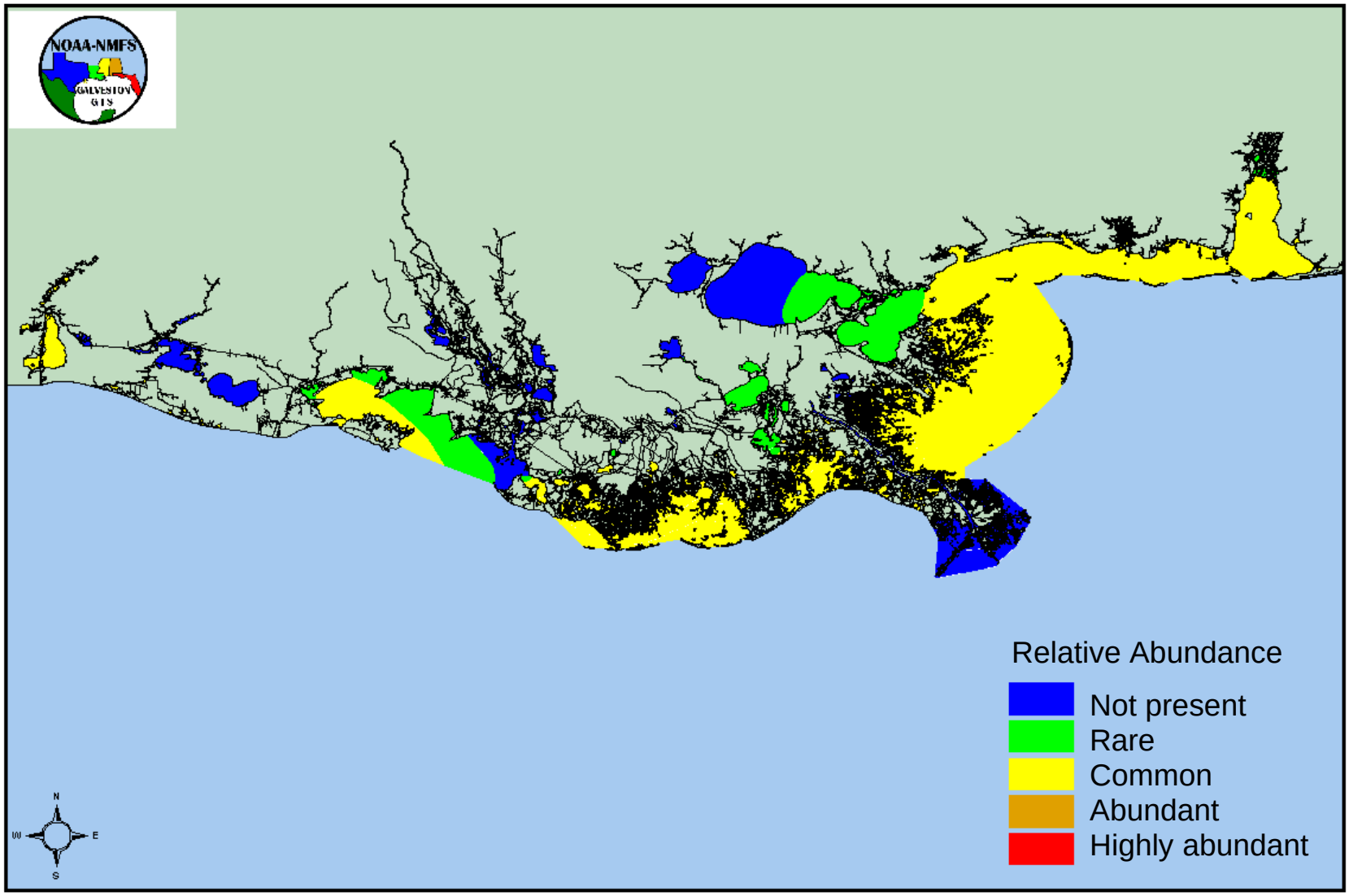
Figure 12. Trend in zinc concentrations in coastal Mississippi sediments. (continued)

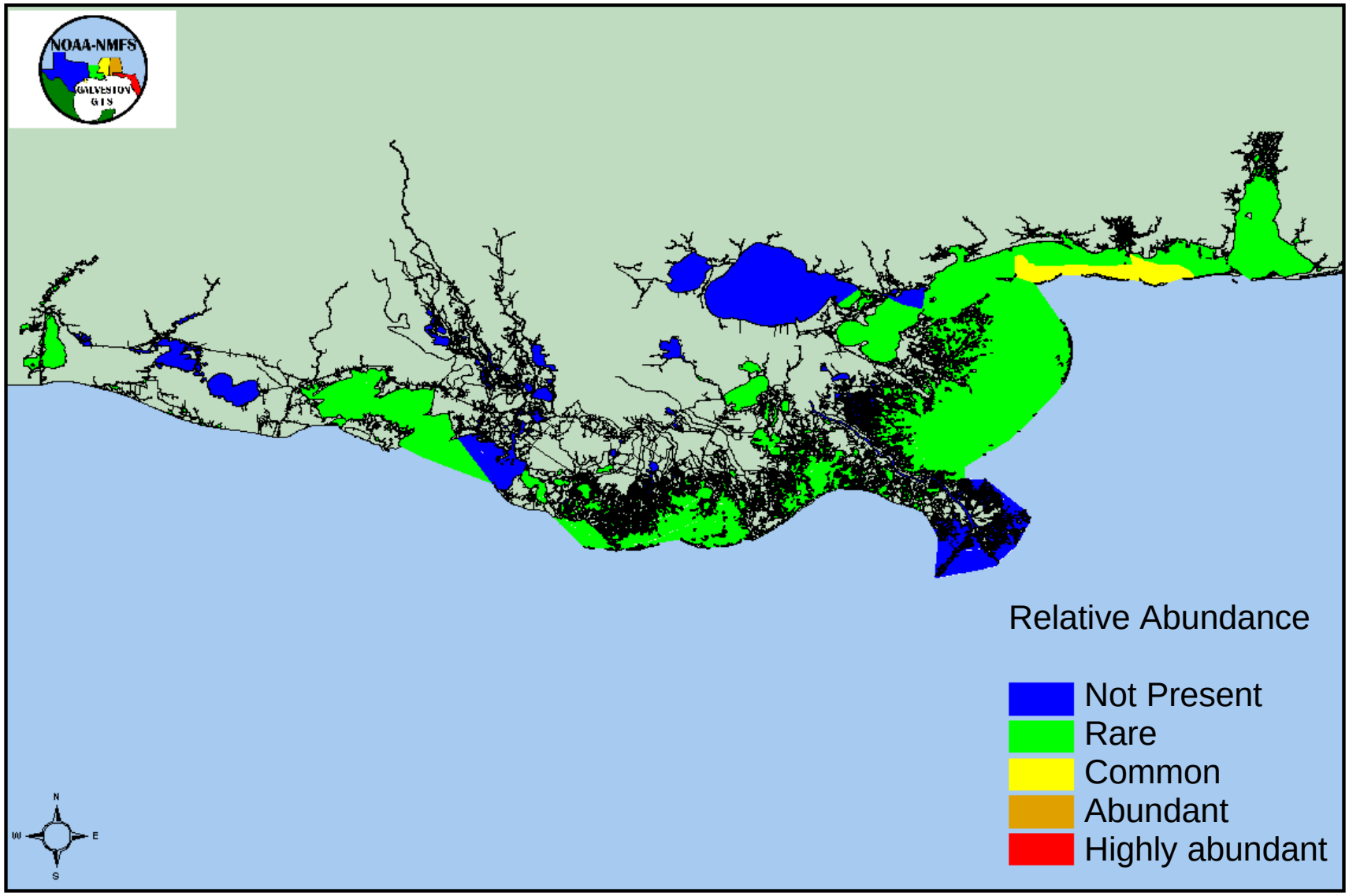
Appendix J

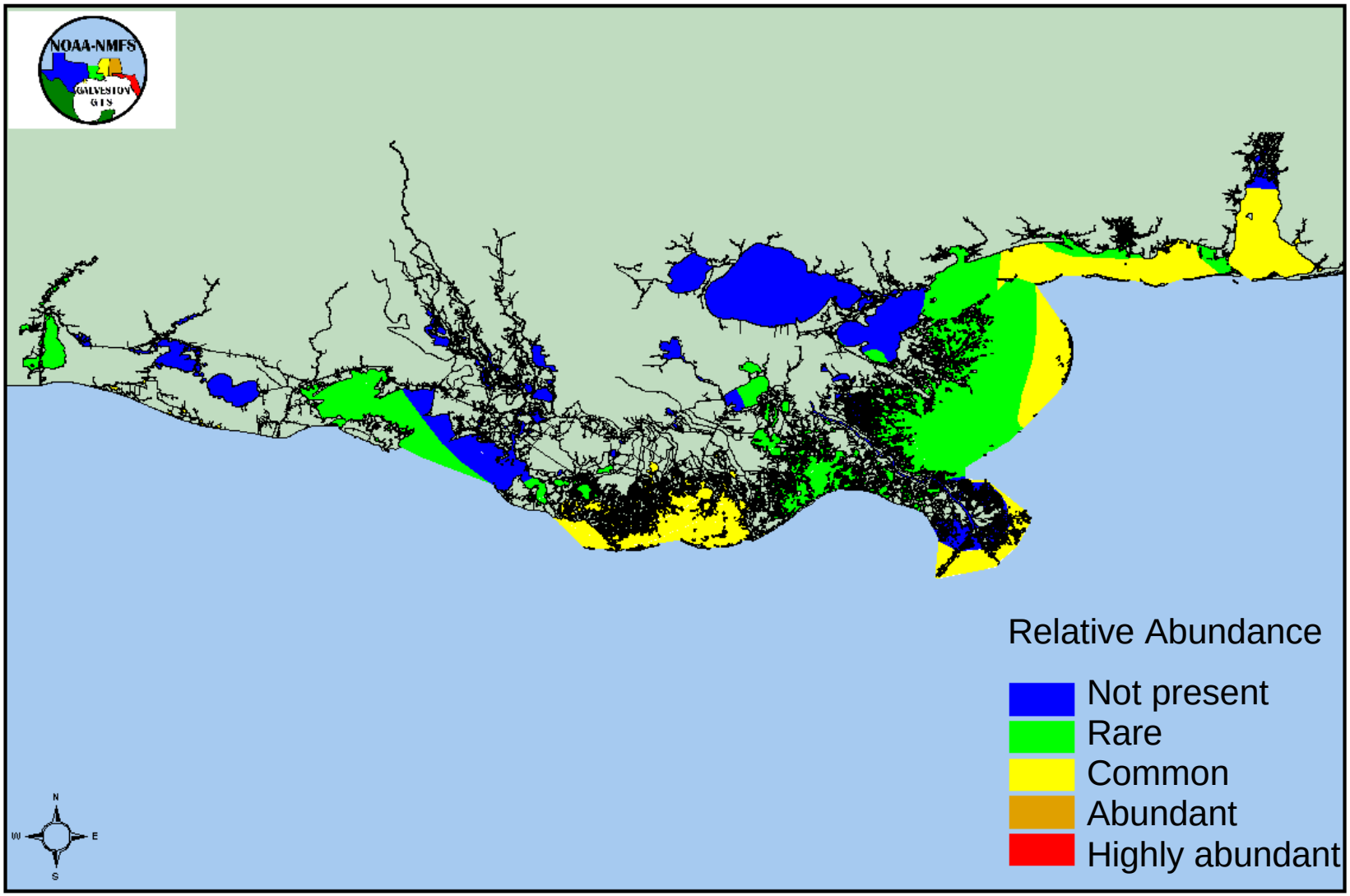
Distribution and Relative Abundance of the Managed Species within Essential Fish Habitat of the Mississippi Sound and Back Bay Region


NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not present
Rare
Common
Abundant
Highly abundant
N
W
E
S


NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not Present
Rare
Common
Abundant
Highly abundant
N
W
E
S


NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not present
Rare
Common
Abundant
Highly abundant
N
W
E
S


NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not Present
Rare
Common
Abundant
Highly abundant
N
W
E
S


NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not present
Rare
Common
Abundant
Highly abundant
N
W
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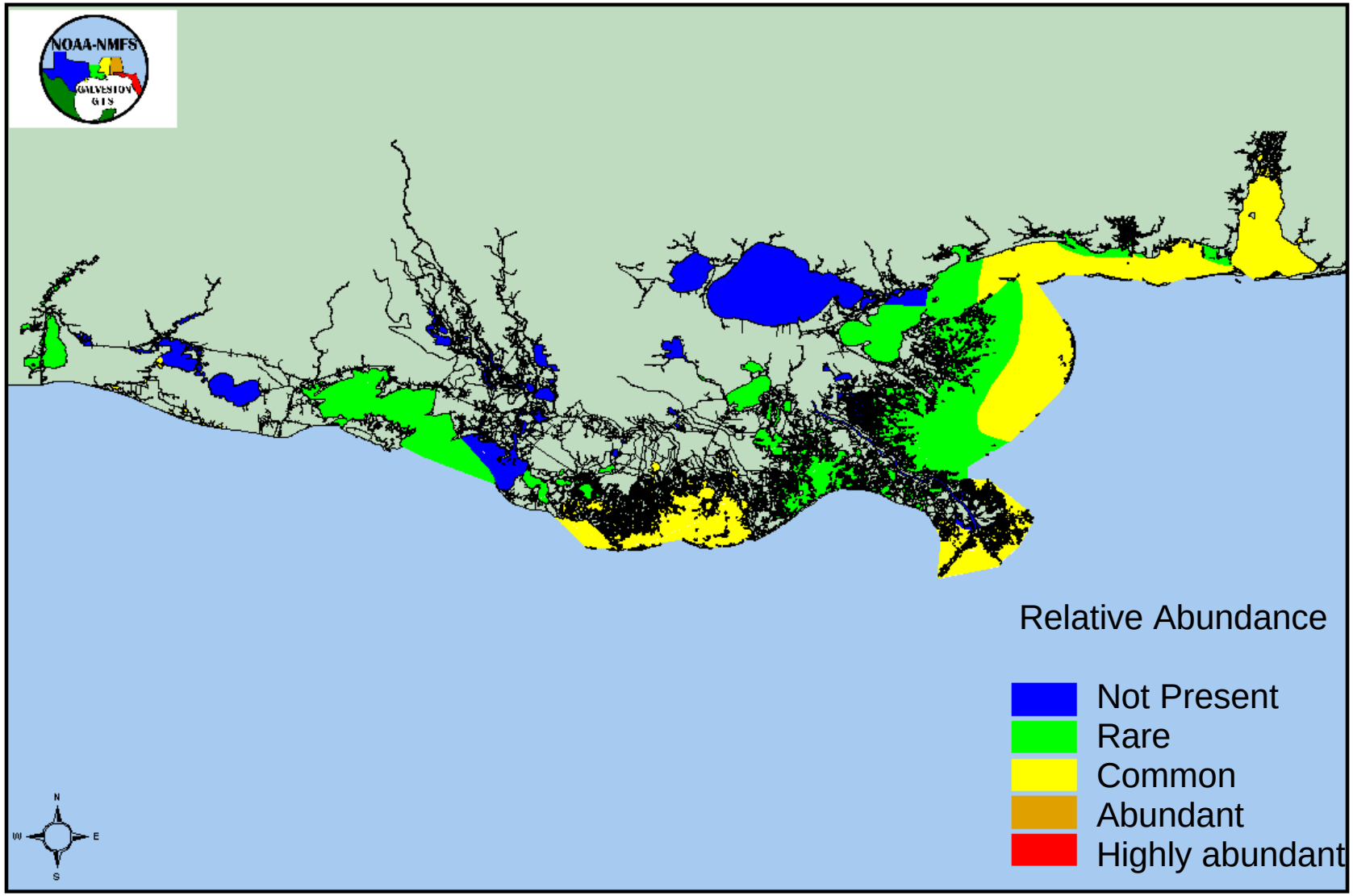
S


NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not Present
Rare
Common
Abundant
Highly abundant
N
W
E
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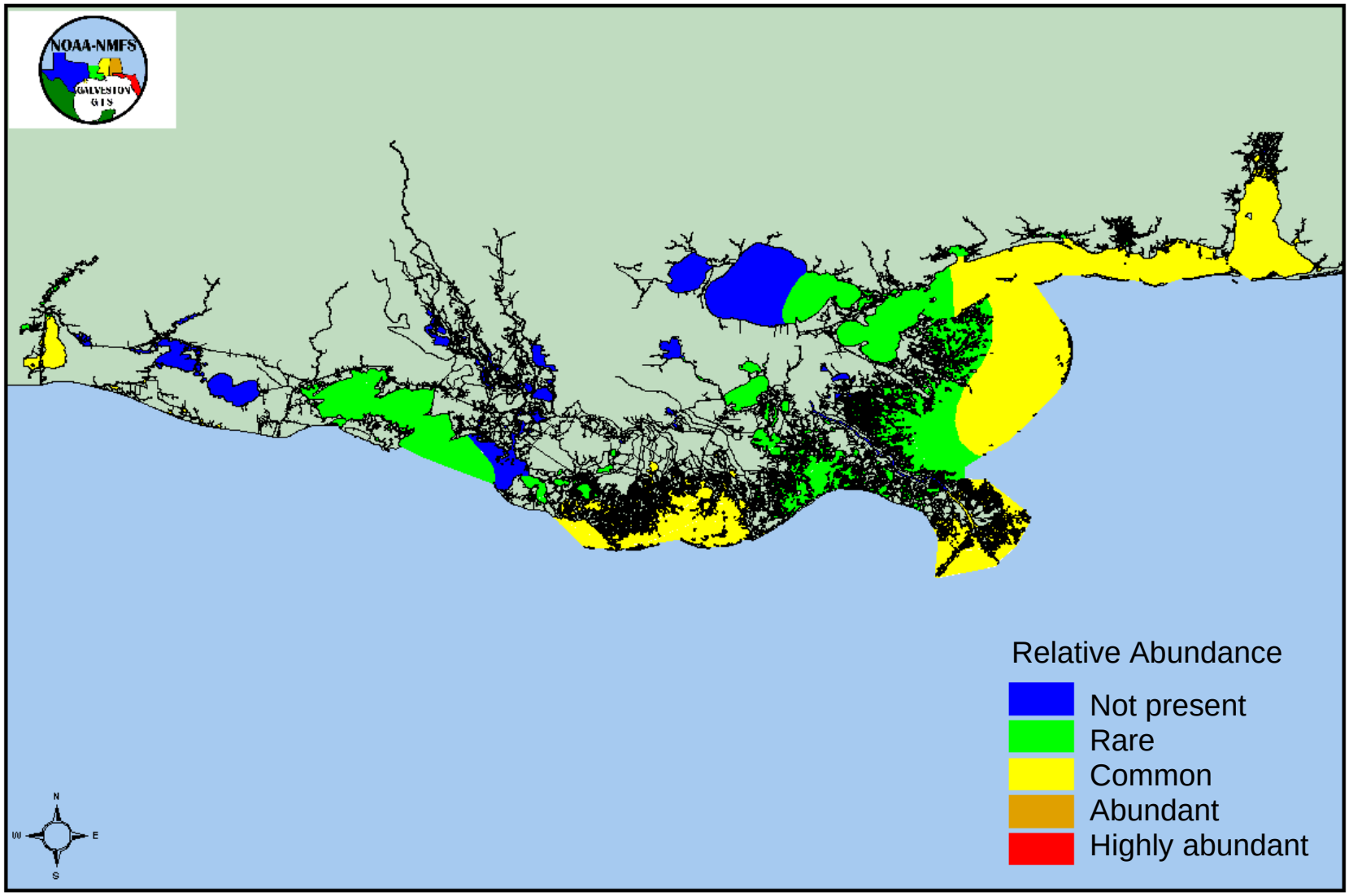
NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not present
Rare
Common
Abundant
Highly abundant
N
W
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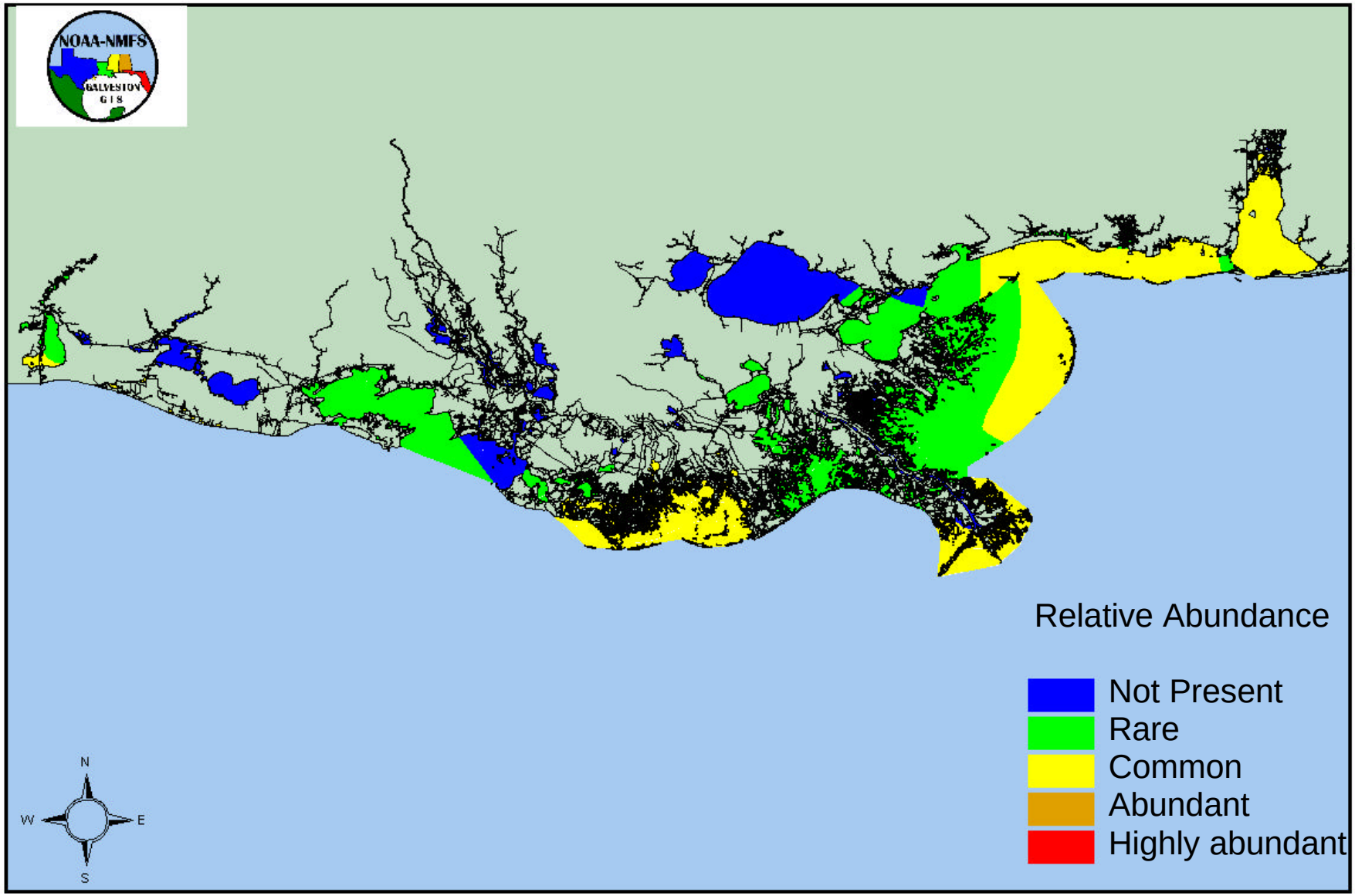
NOAA-NMFS
GALVESTON
GIS
Relative Abundance
Not Present
Rare
Common
Abundant
Highly abundant
N
W
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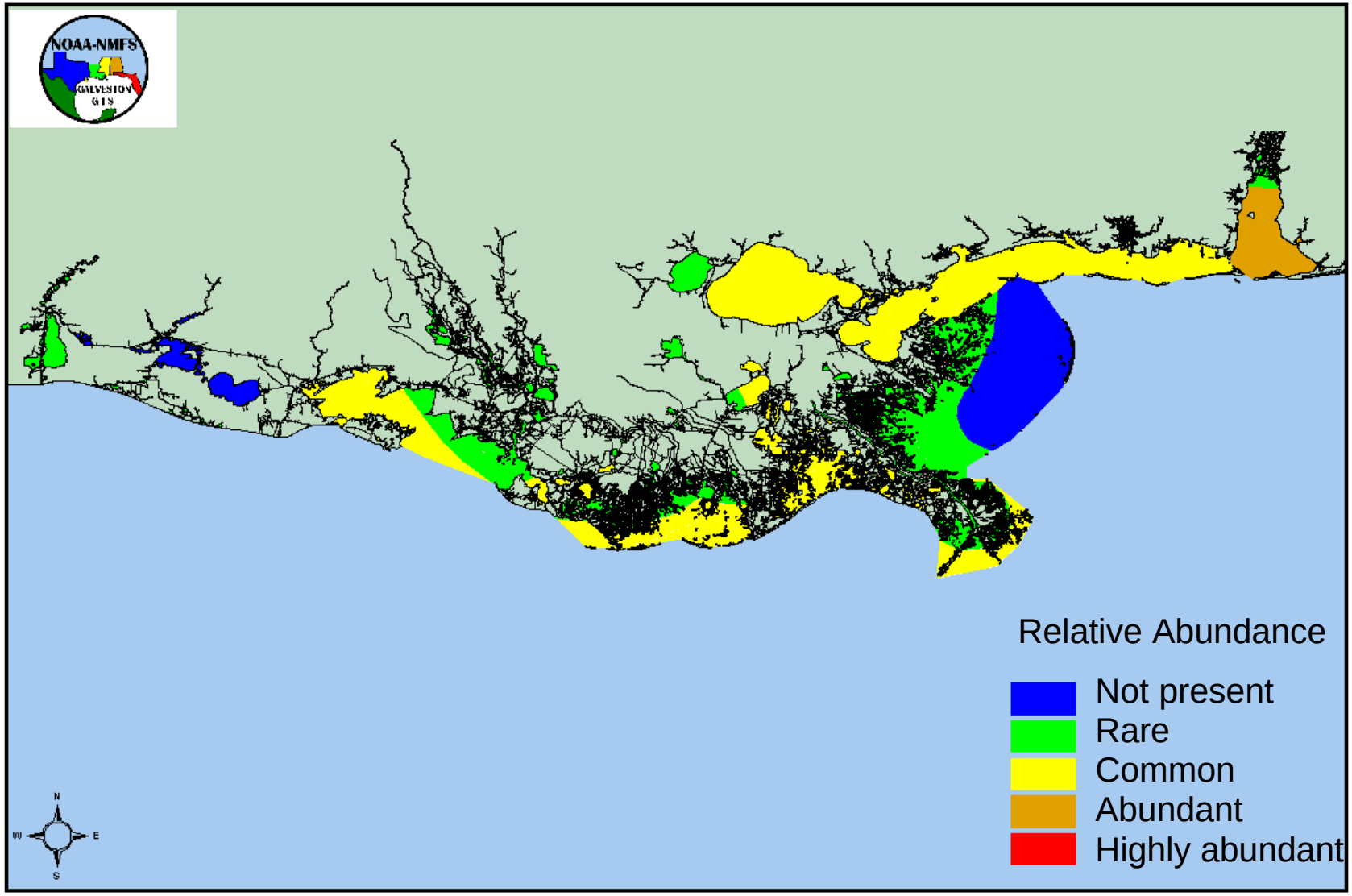
NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not present
Rare
Common
Abundant
Highly abundant
N
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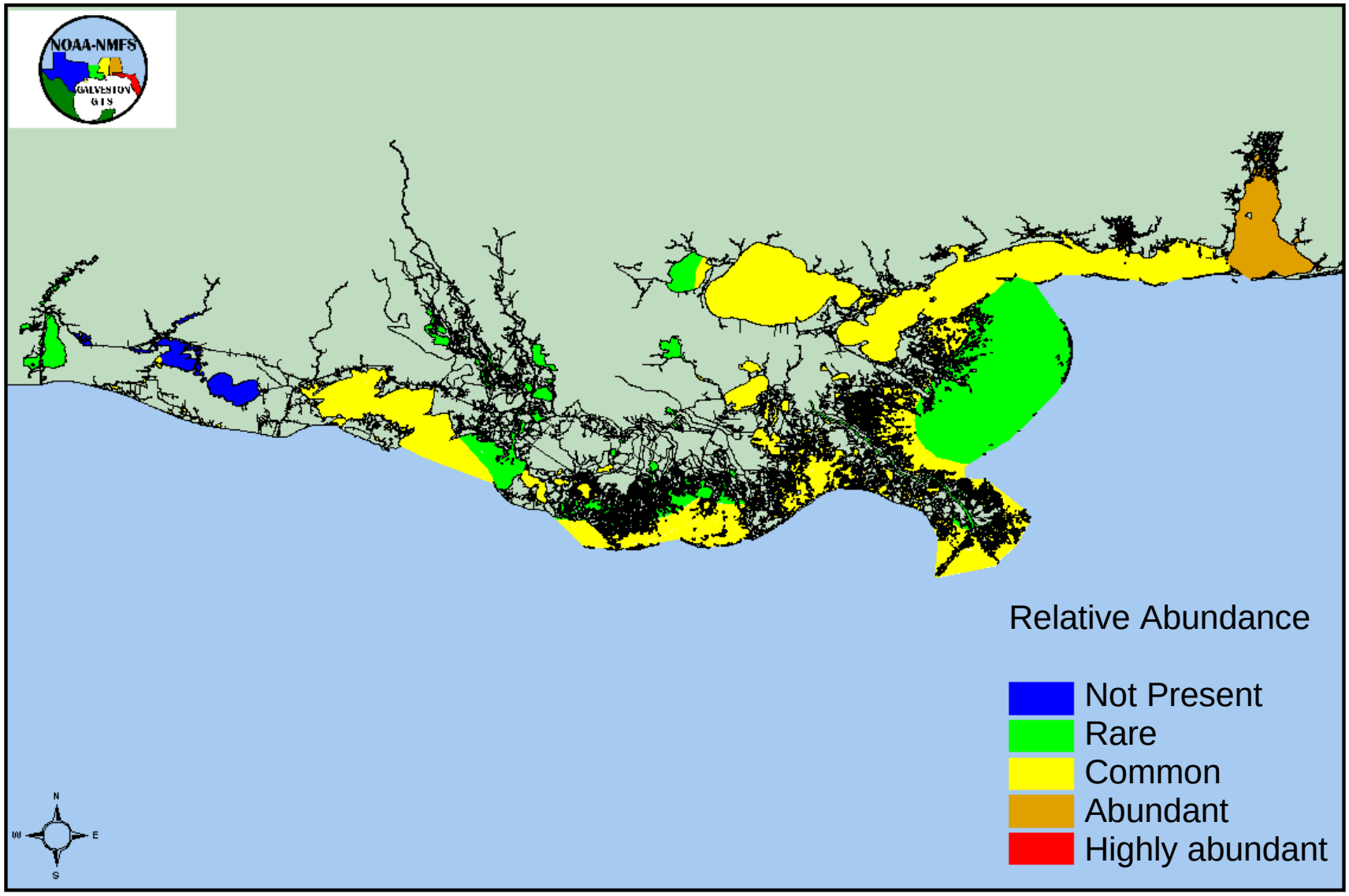
NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not Present
Rare
Common
Abundant
Highly abundant
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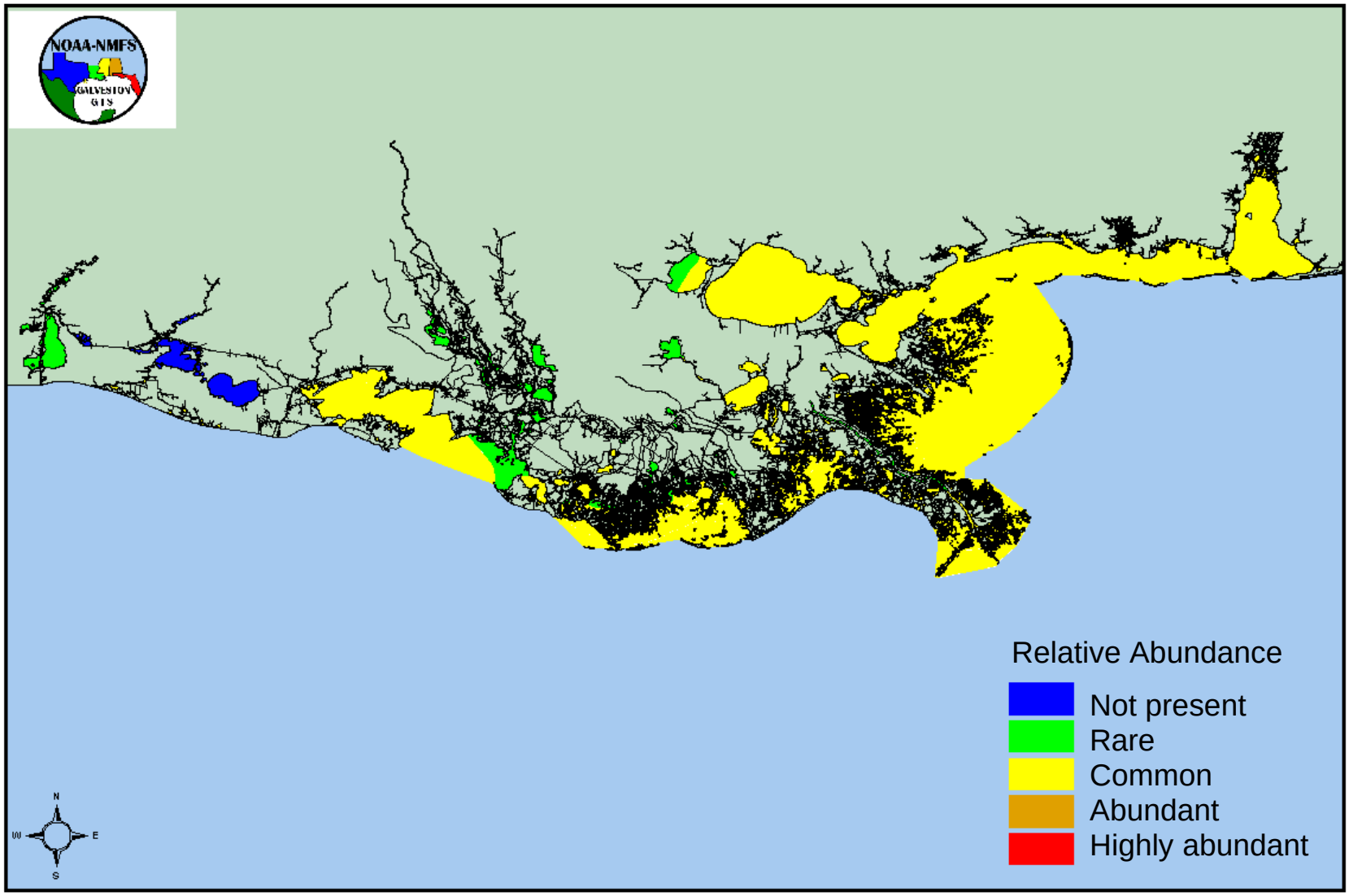
NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not present
Rare
Common
Abundant
Highly abundant
N
W
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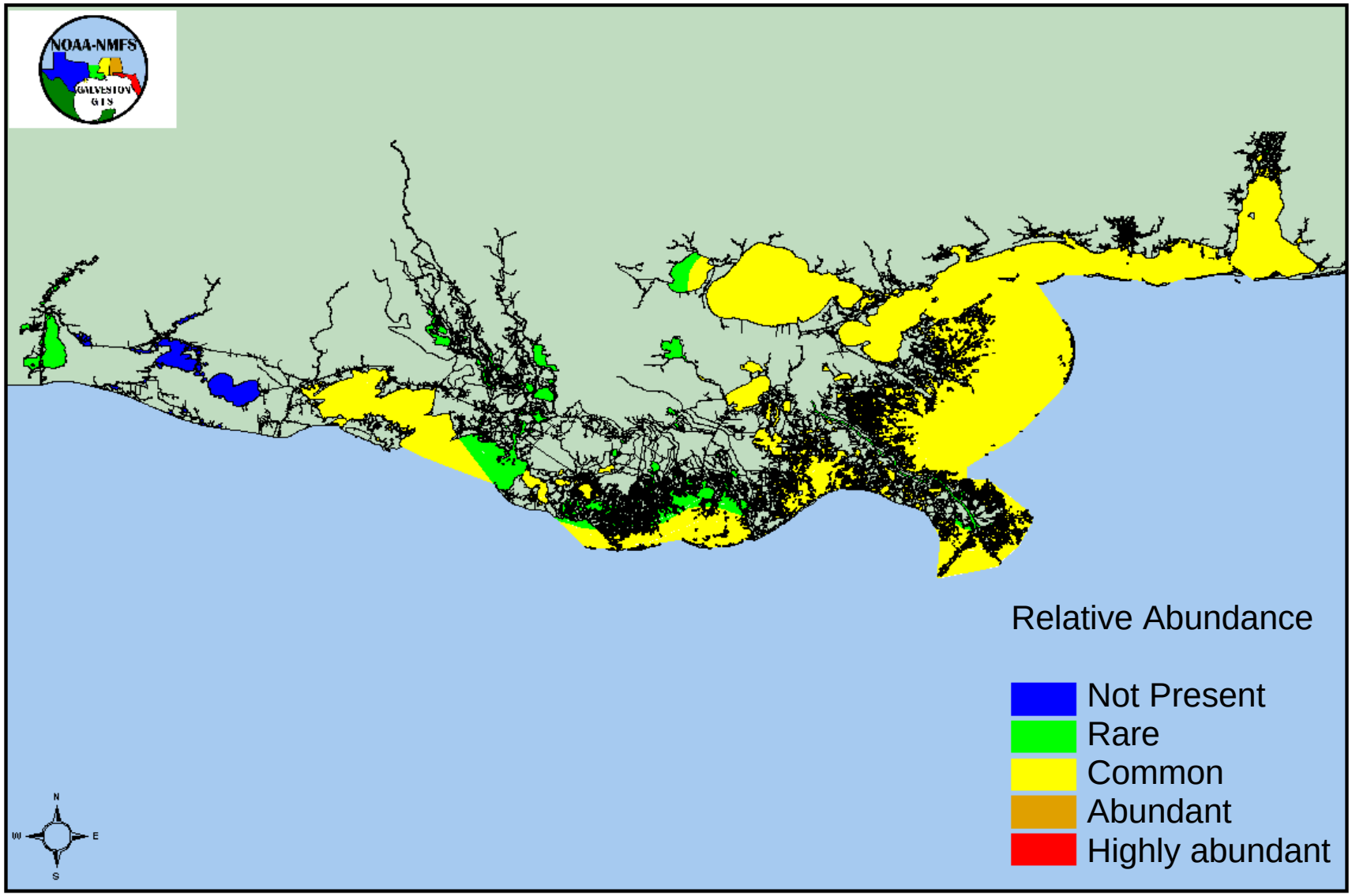
NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not Present
Rare
Common
Abundant
Highly abundant
N
W
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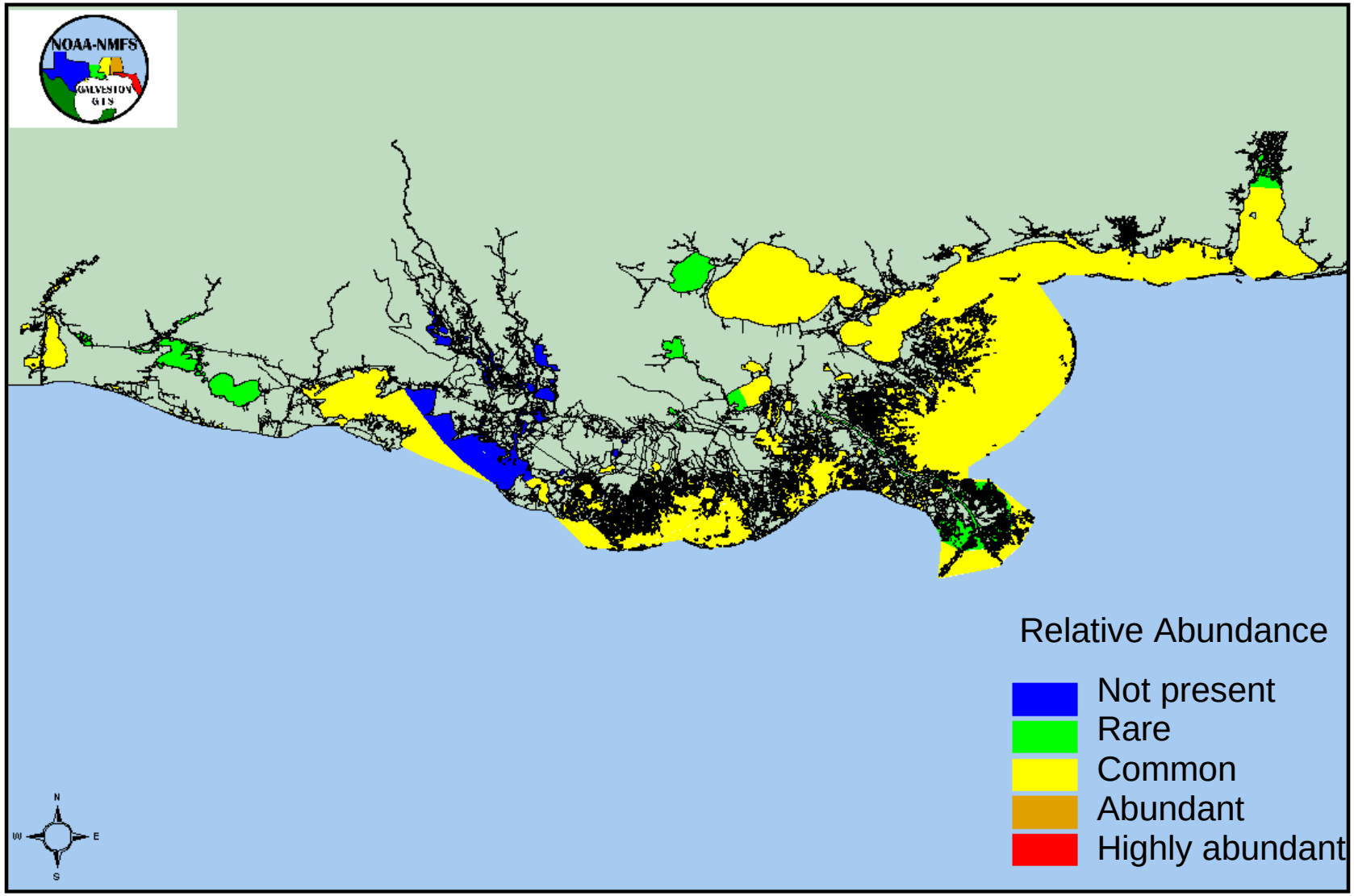
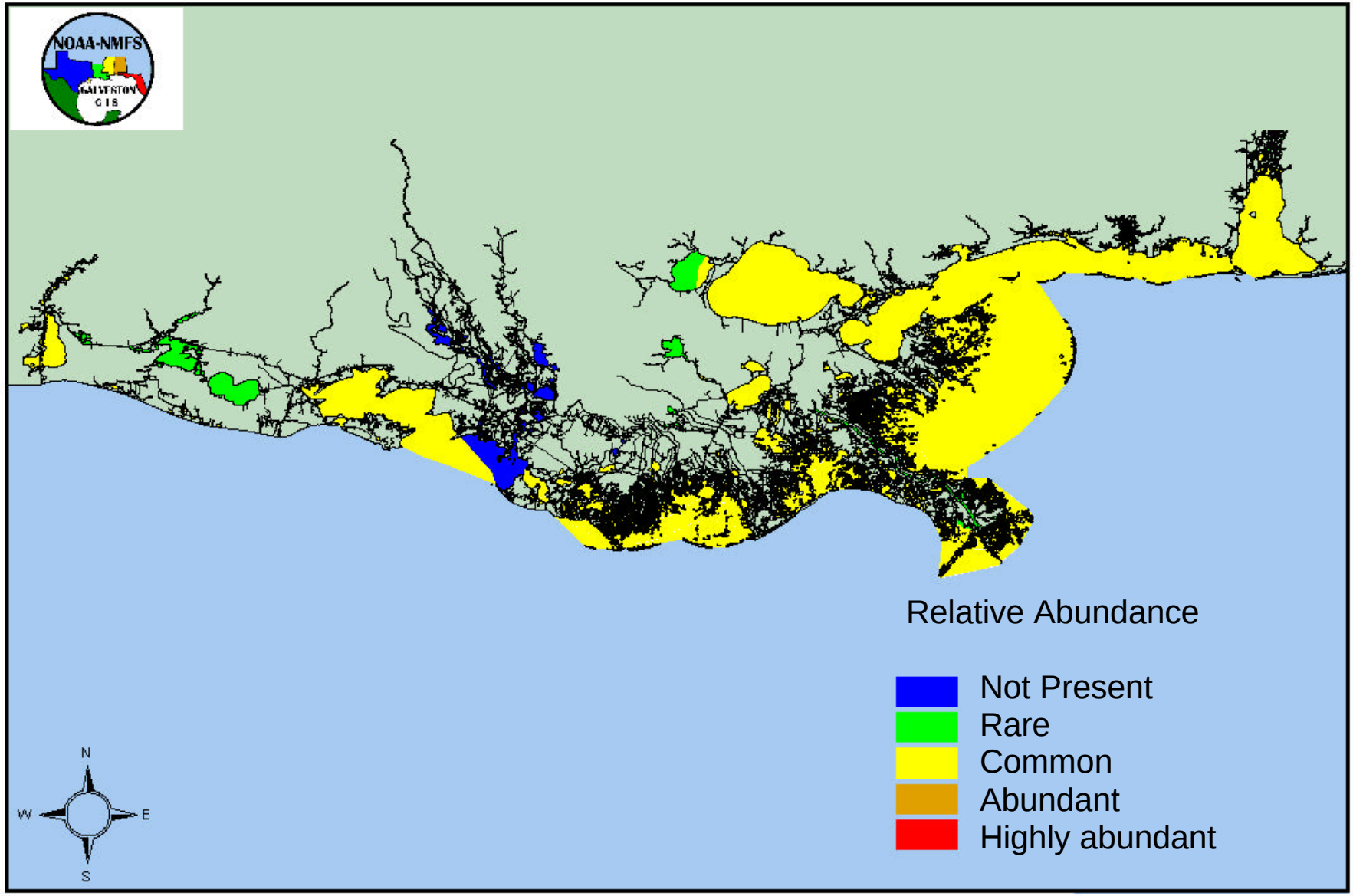

NOAA-NMFS
GALVESTON GIS
Relative Abundance
Not present
Rare
Common
Abundant
Highly abundant
N
W
E
S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GALVESTON
GIS
Relative Abundance
Not Present
Rare
Common
Abundant
Highly abundant
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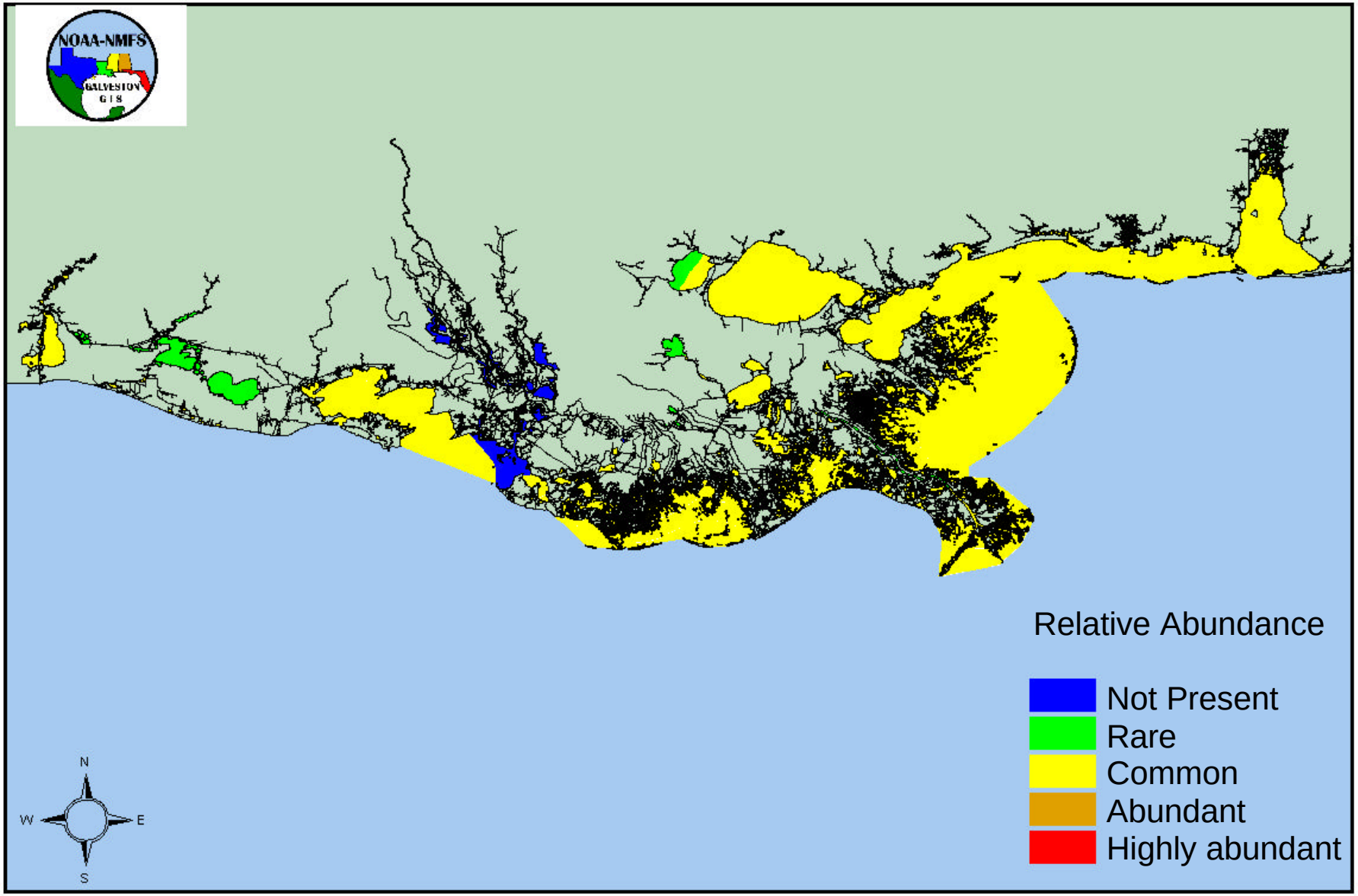
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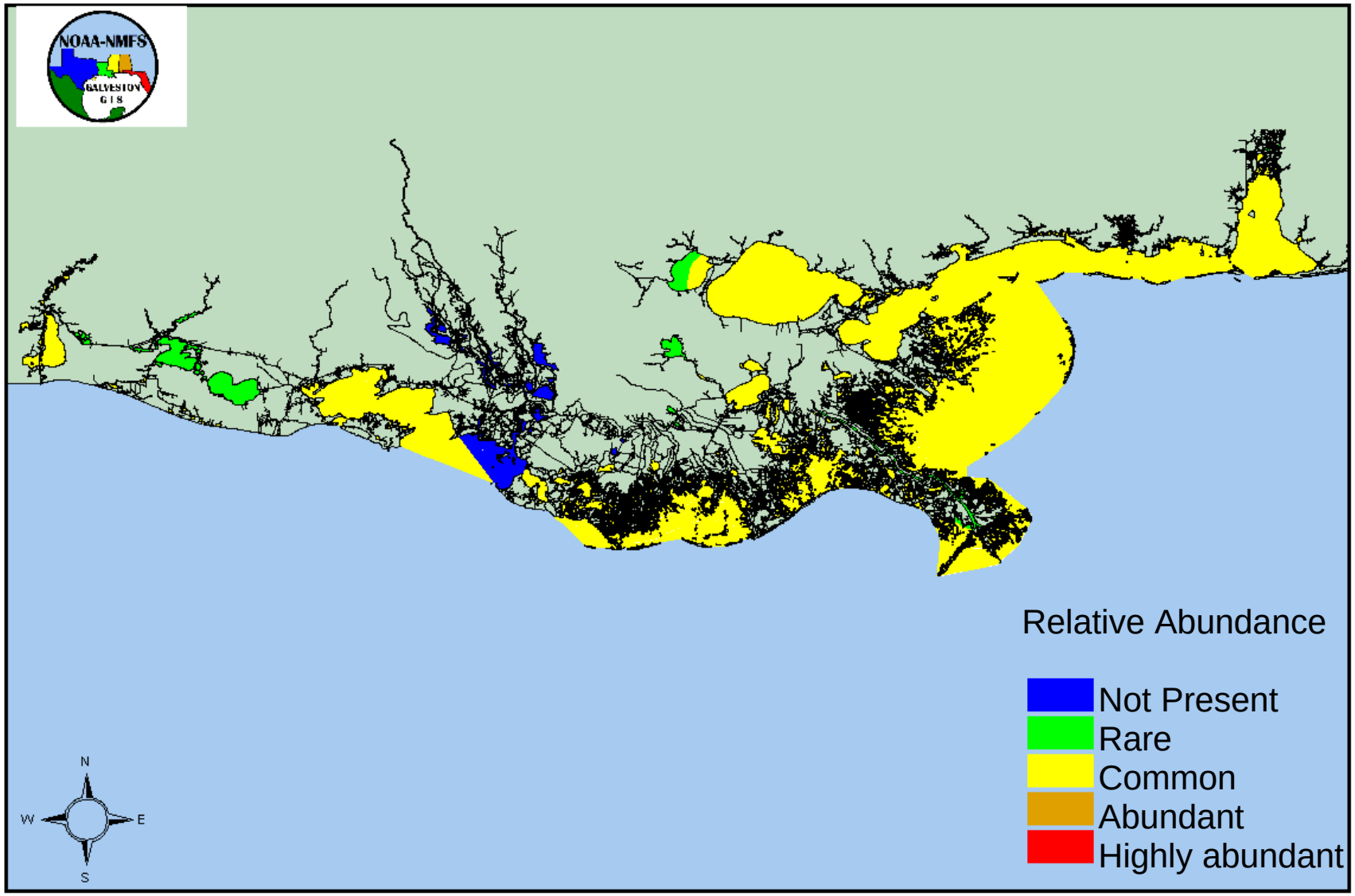
NOAA-NMFS
GALVESTON
G I S
Relative Abundance
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Rare
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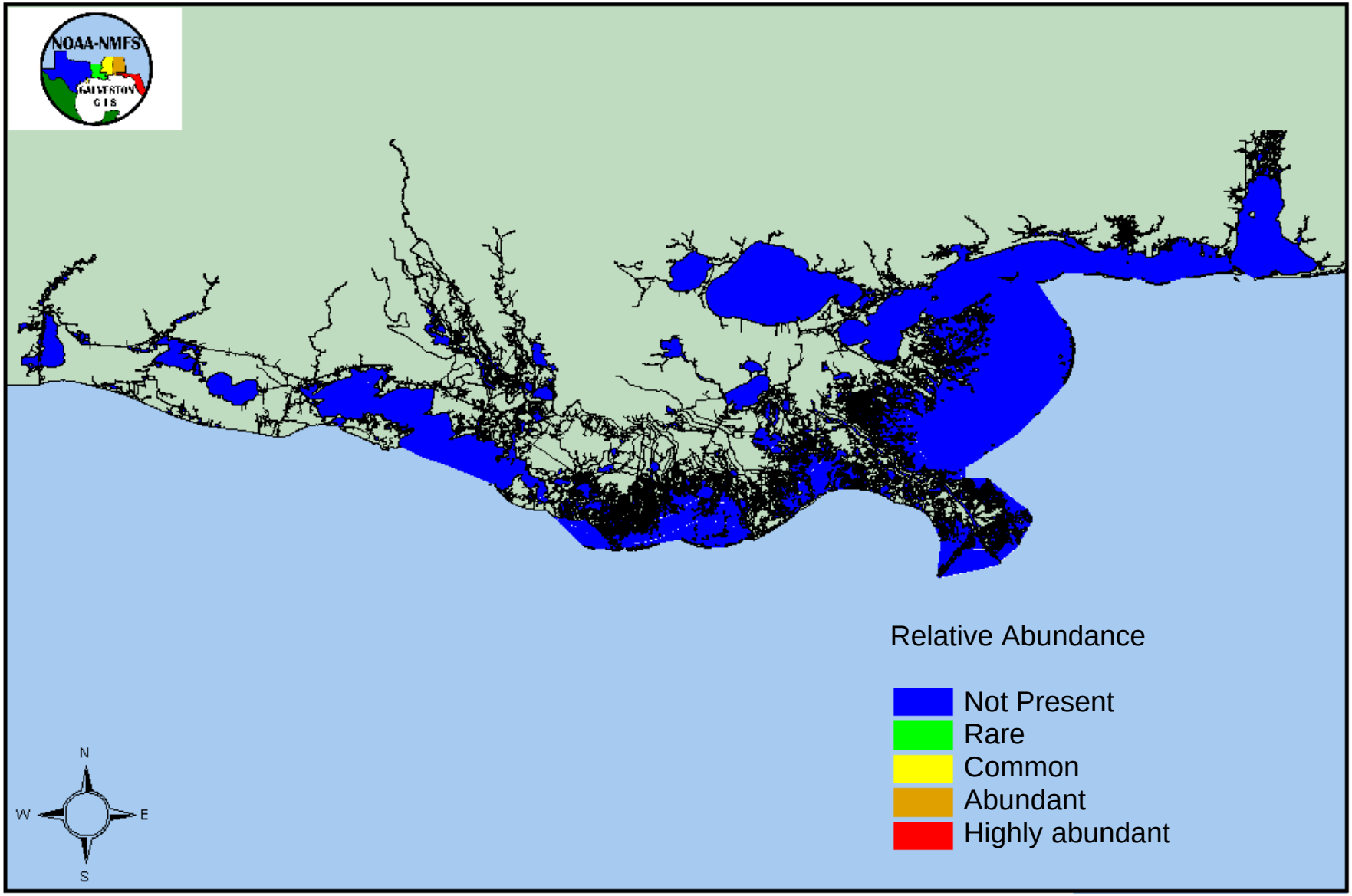
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GALVESTON
GIS
Relative Abundance
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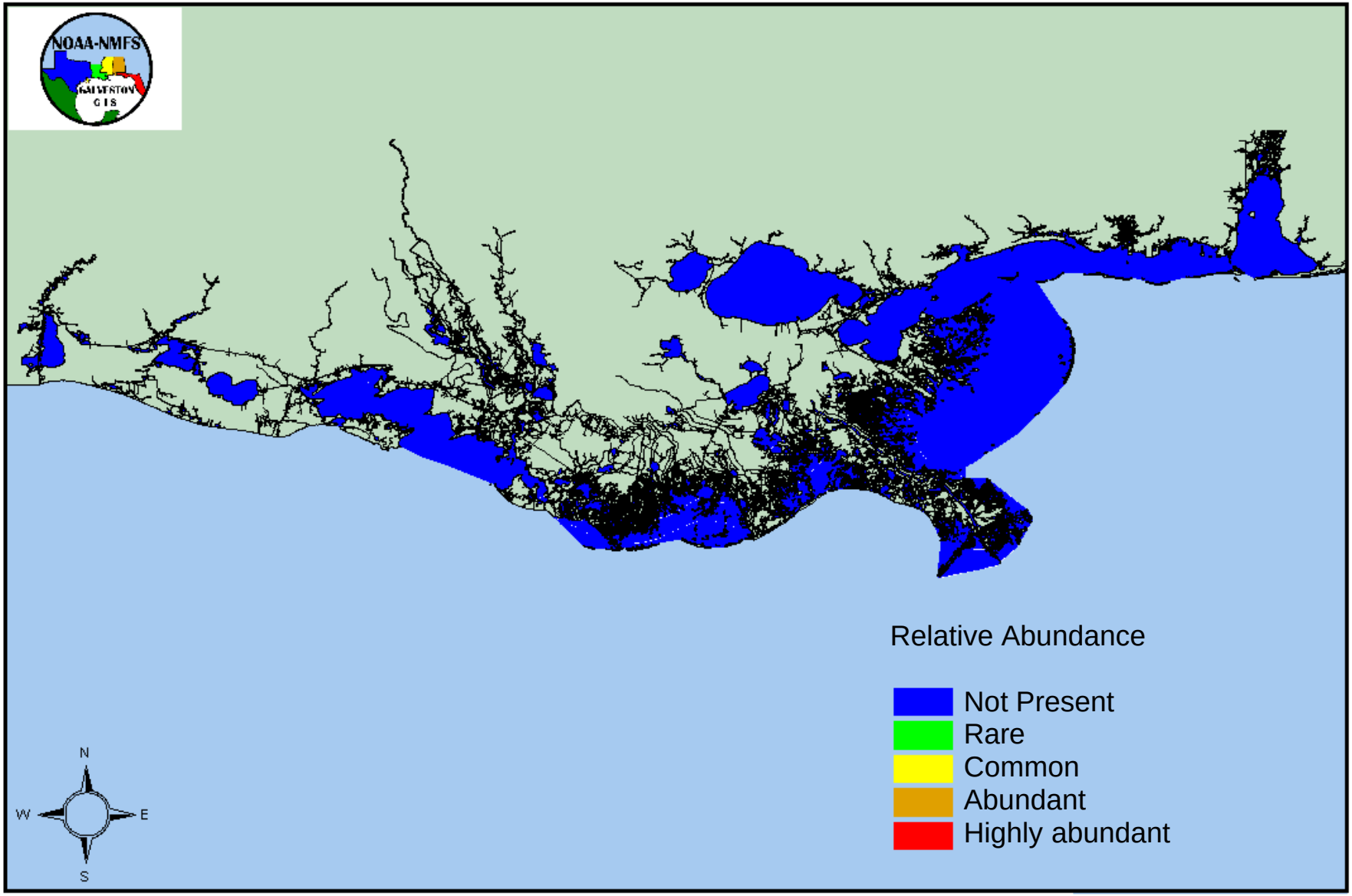
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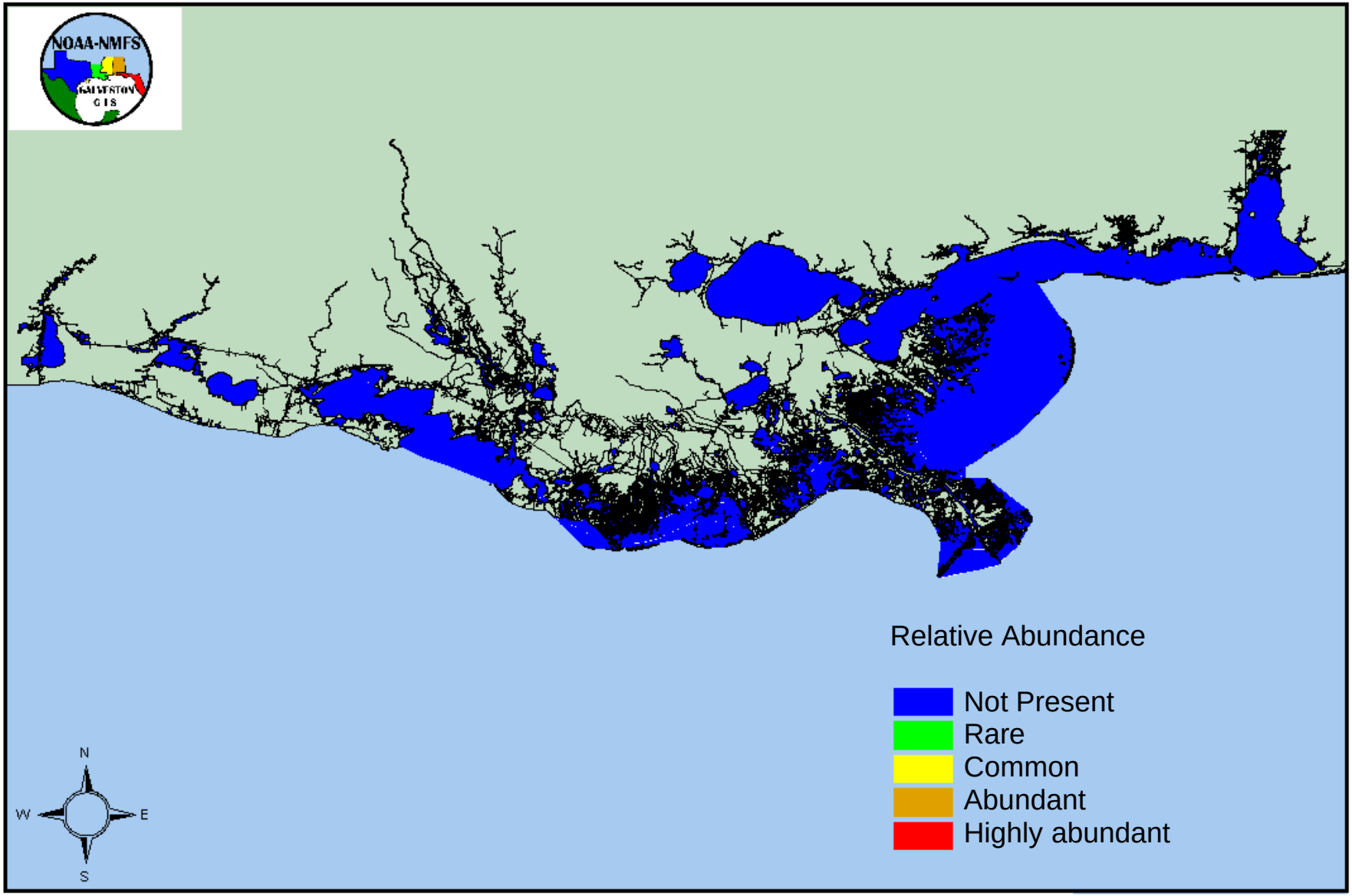
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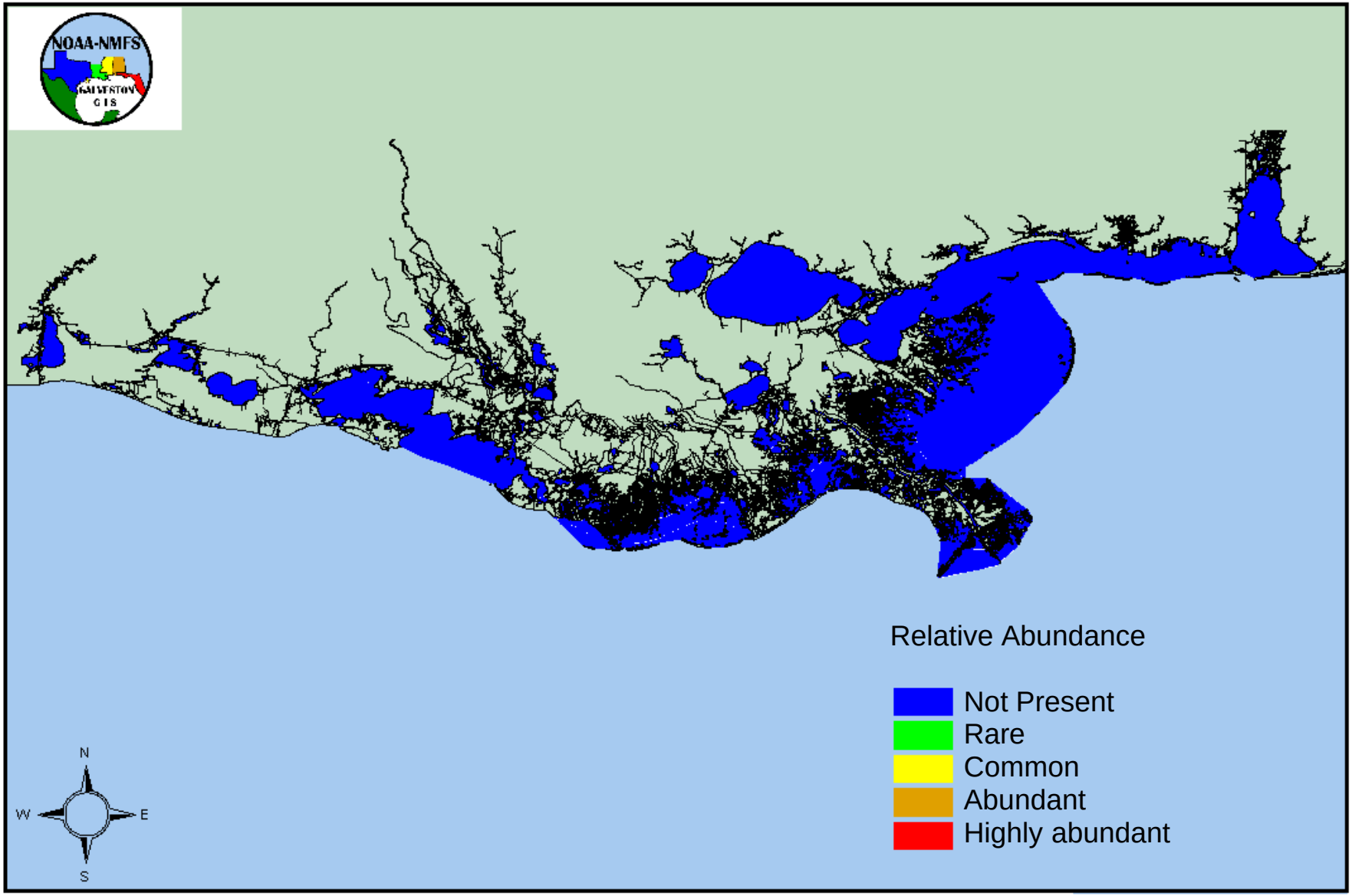
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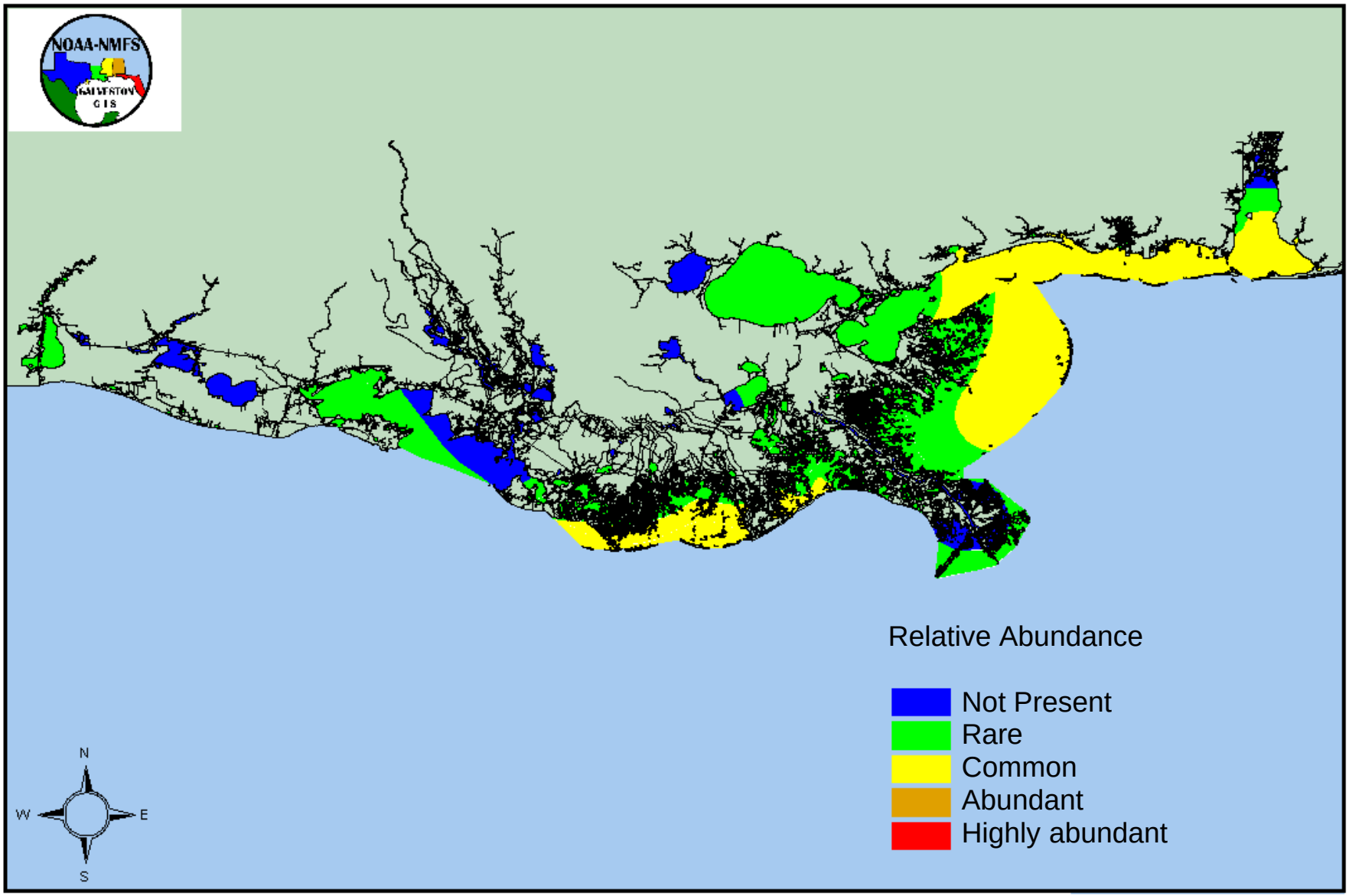
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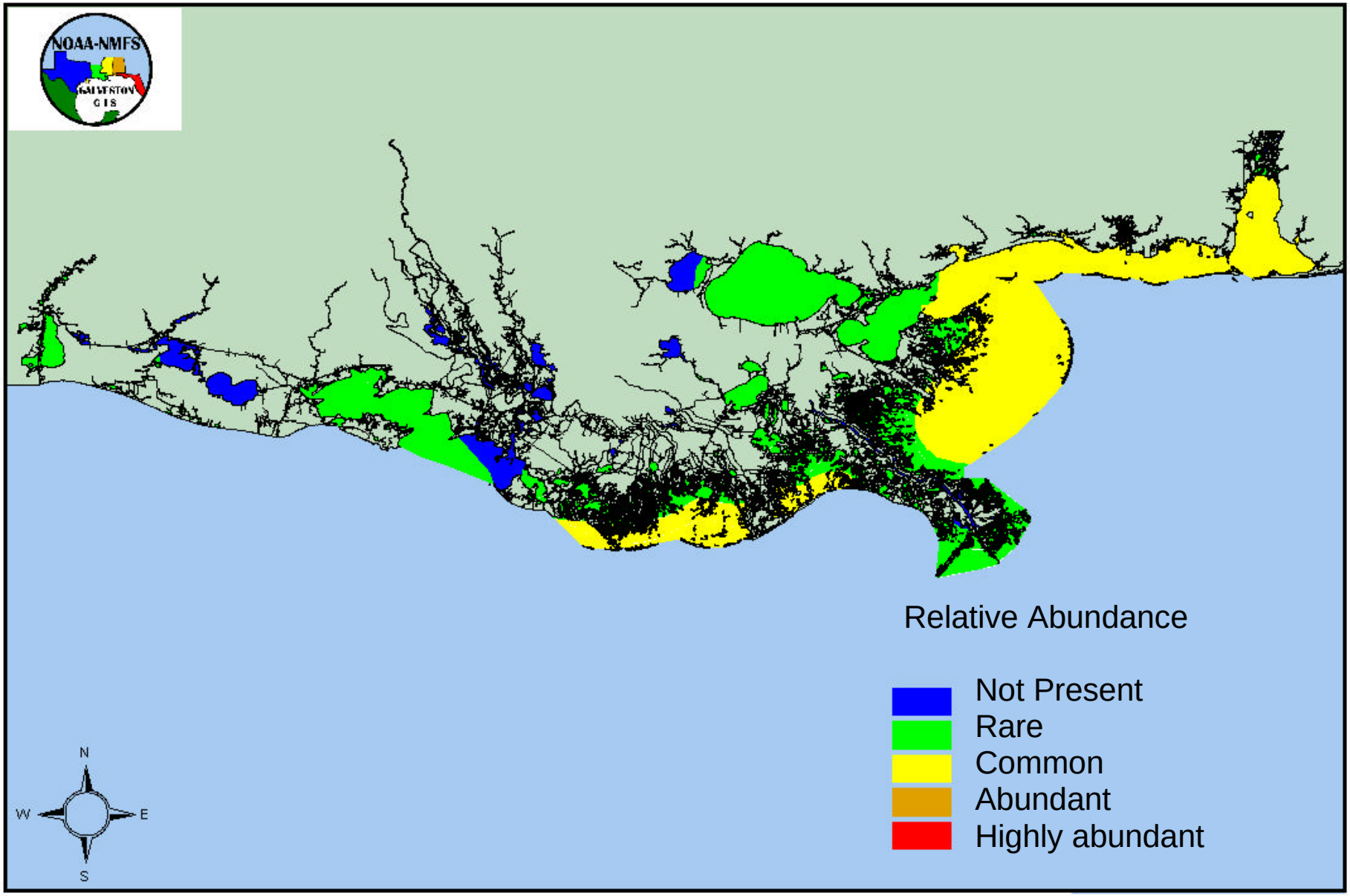
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GIS
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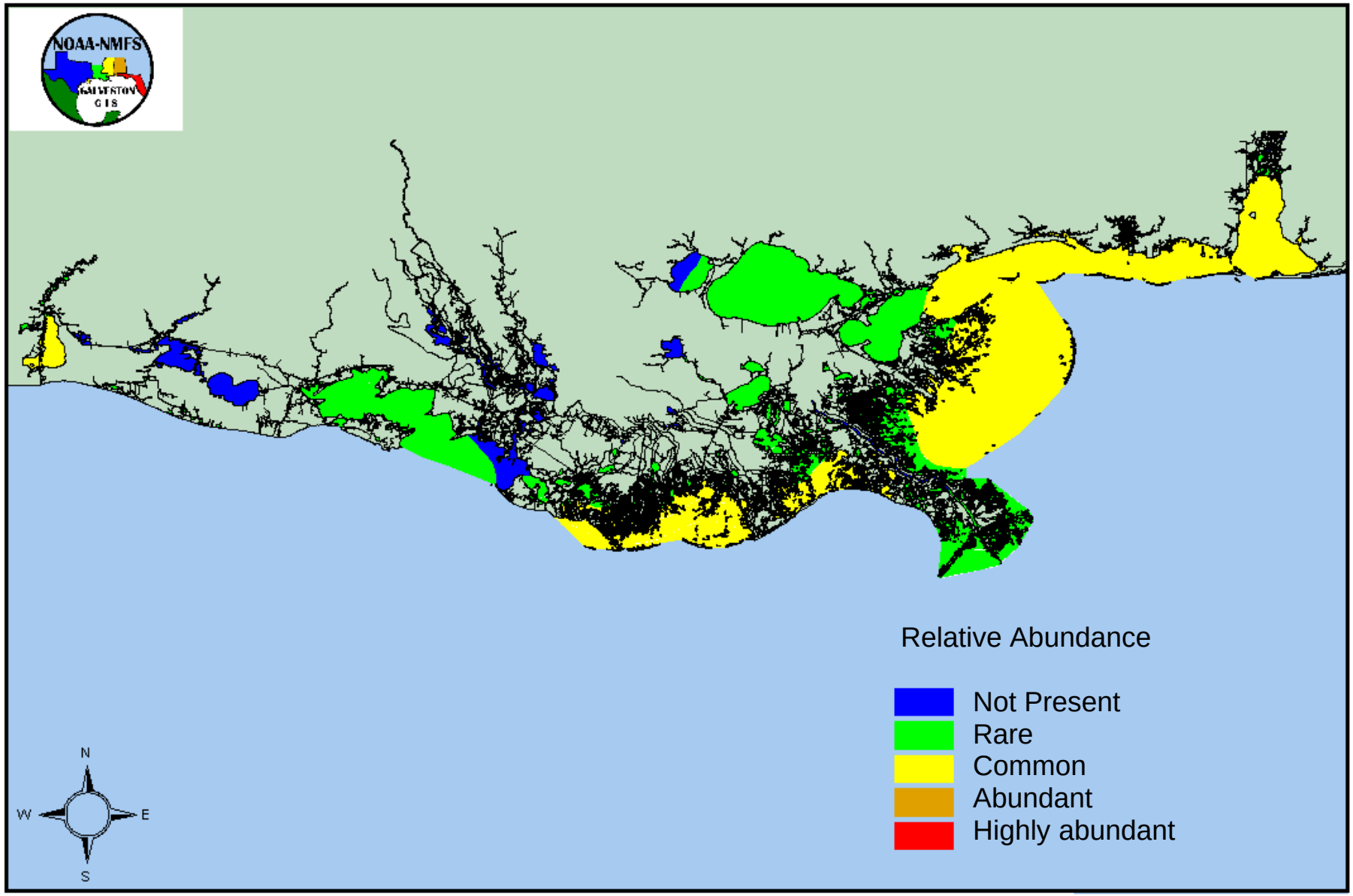
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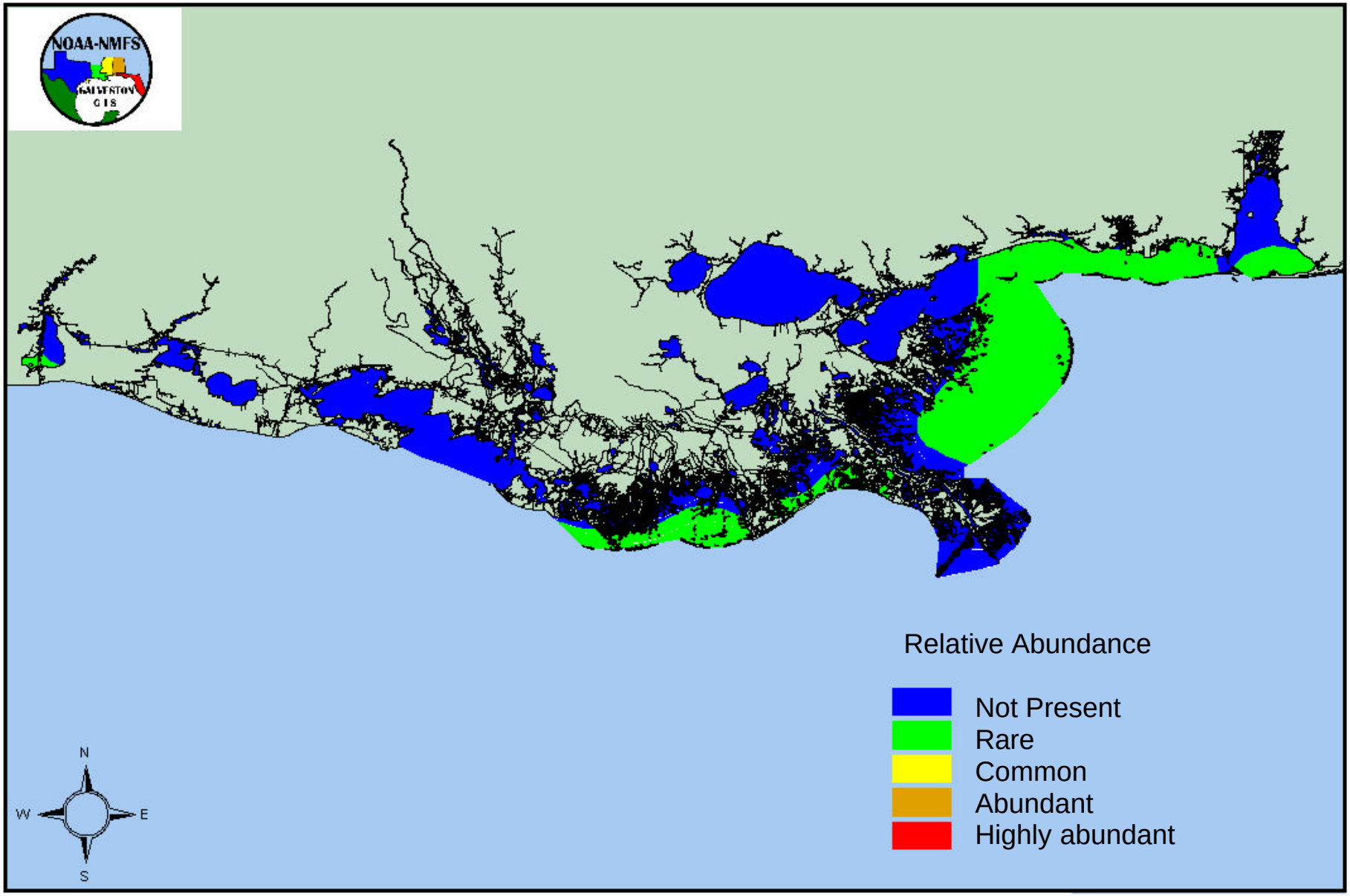
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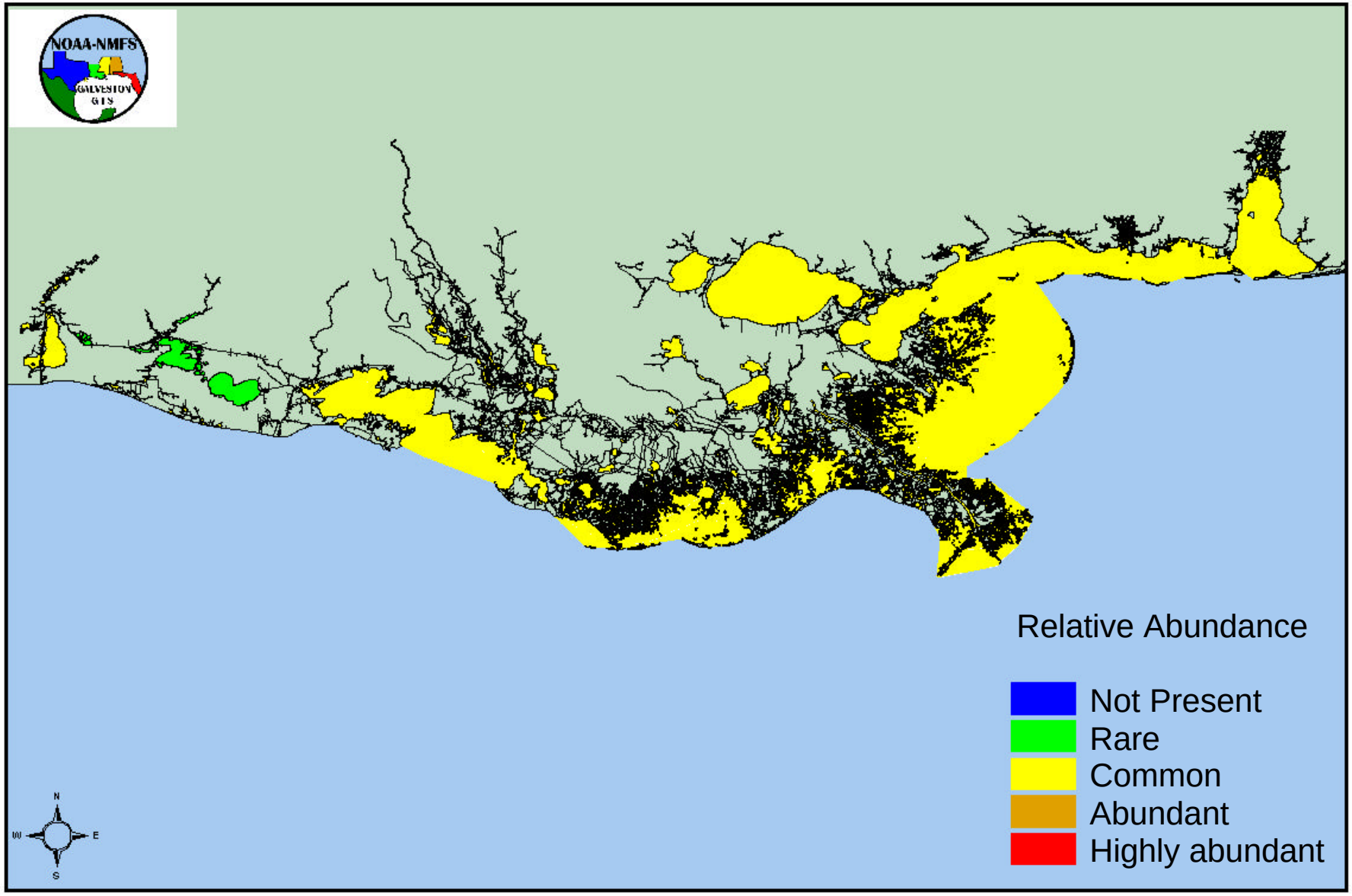
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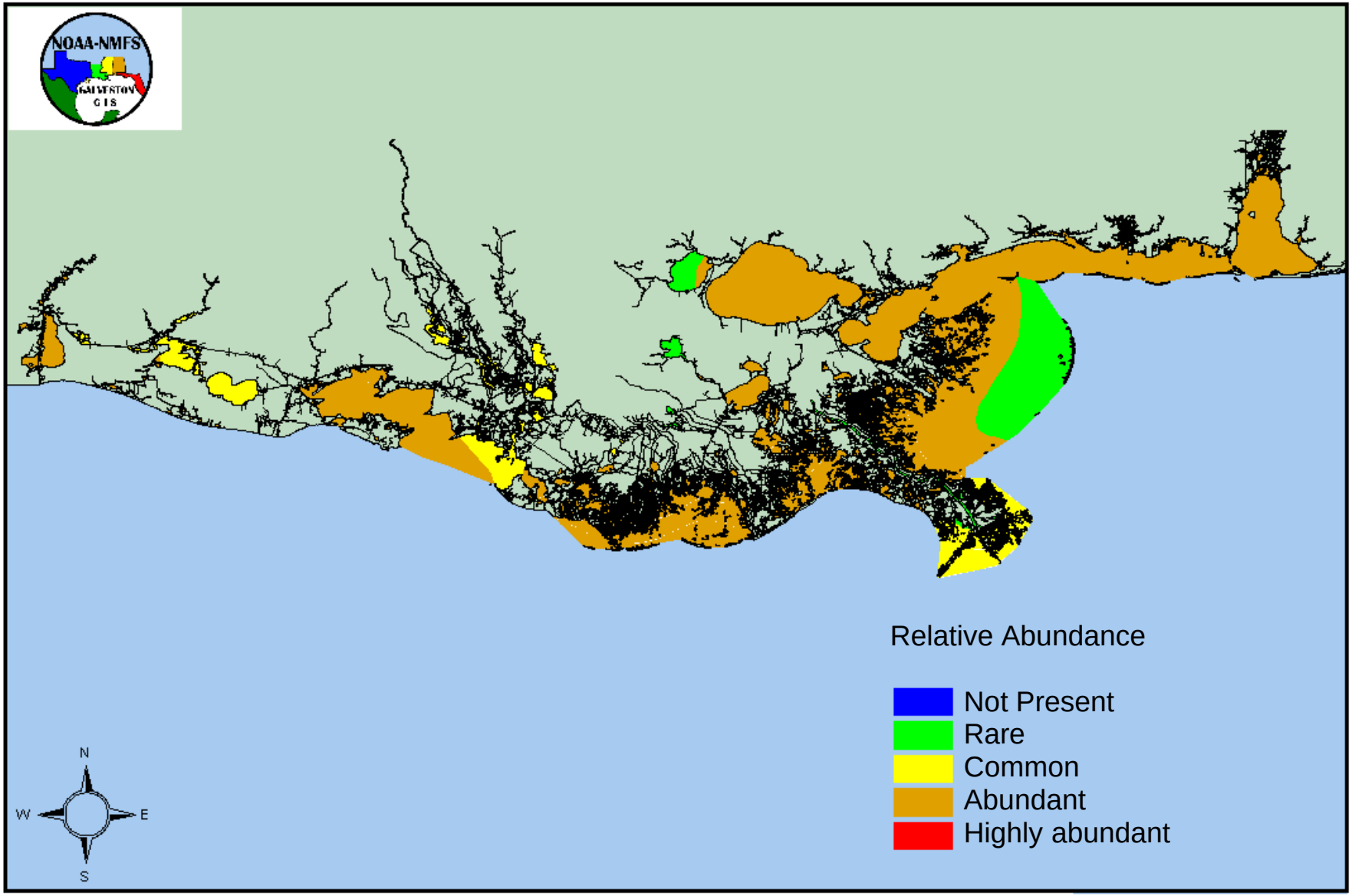
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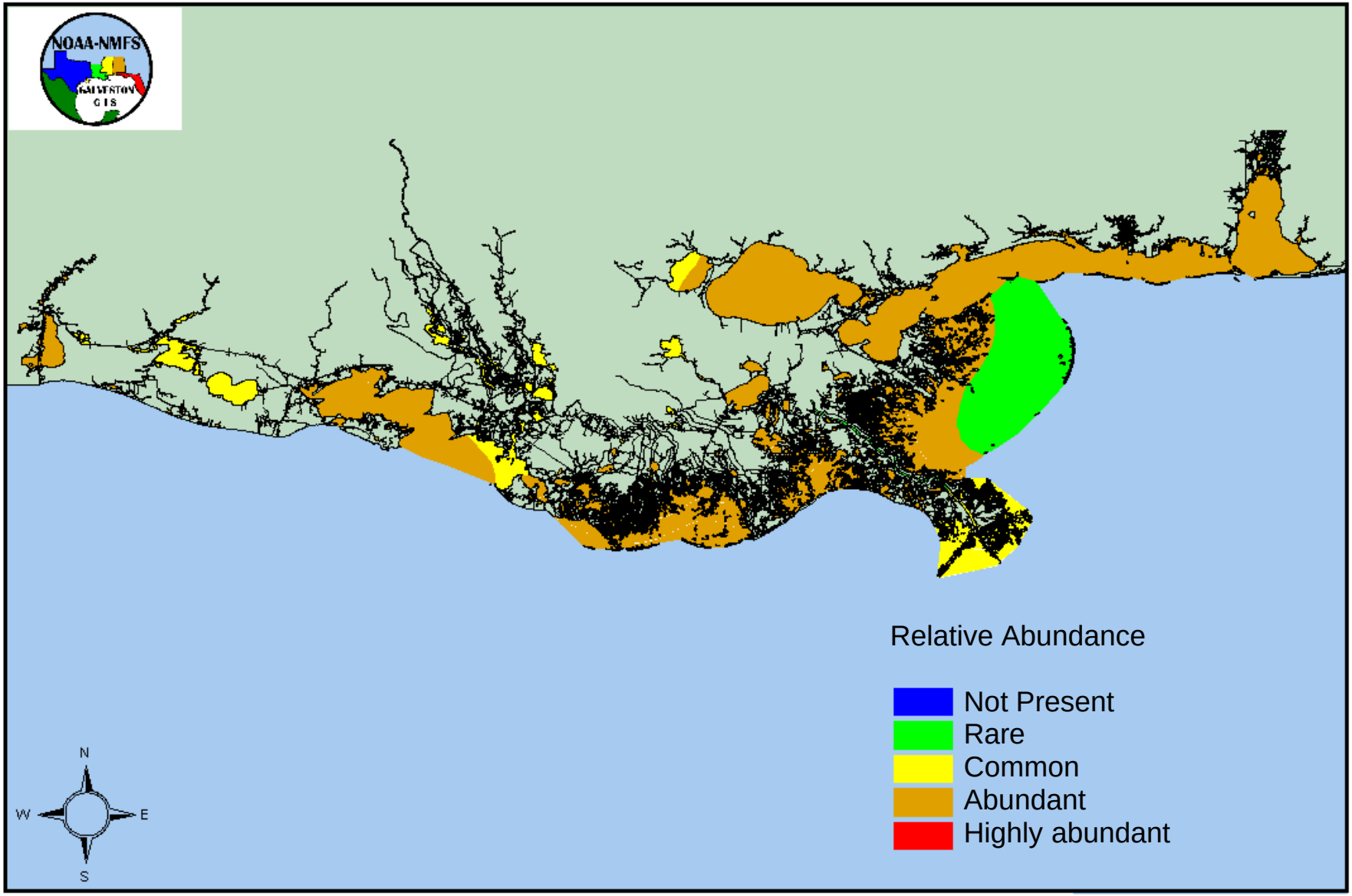
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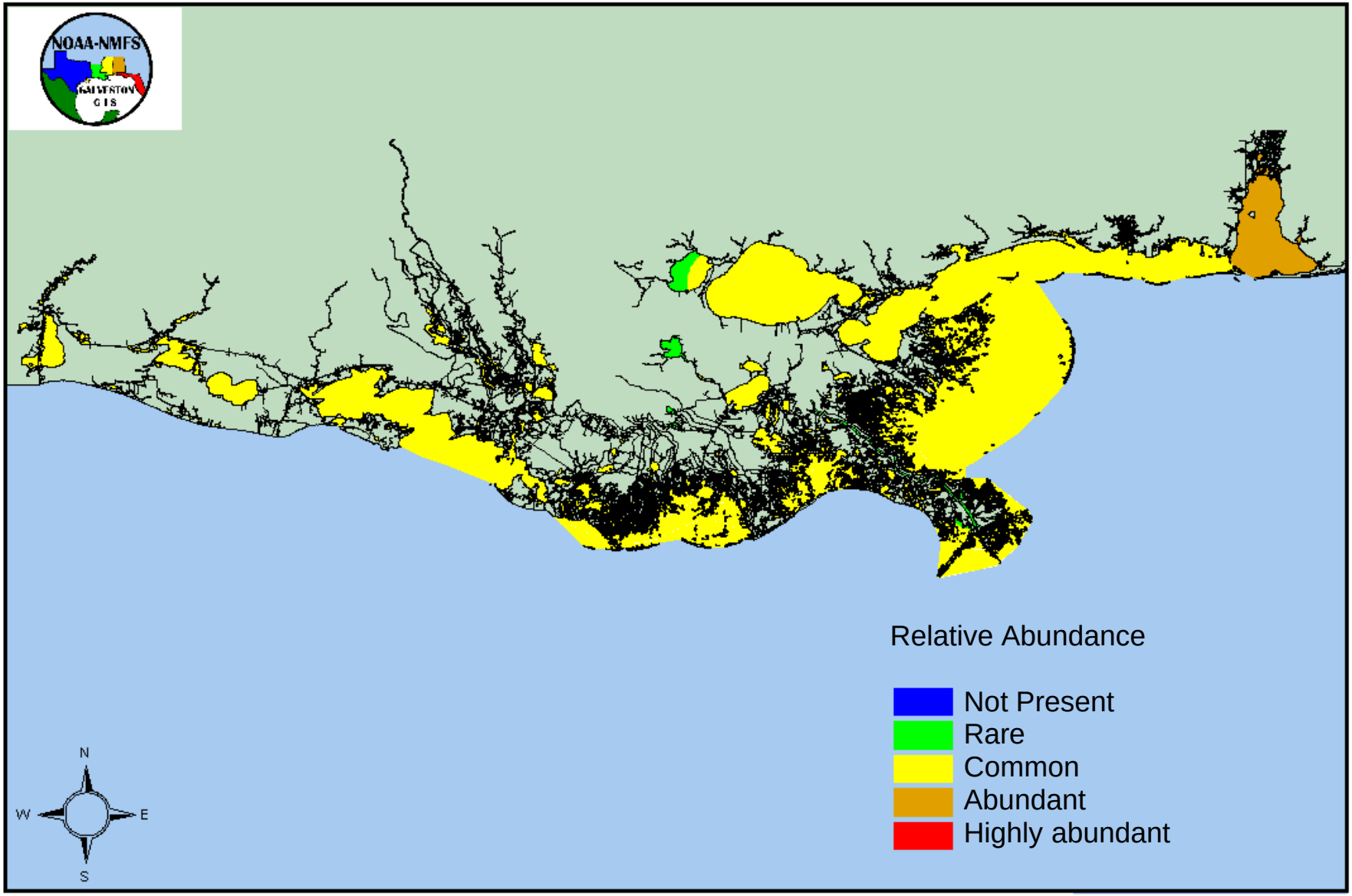
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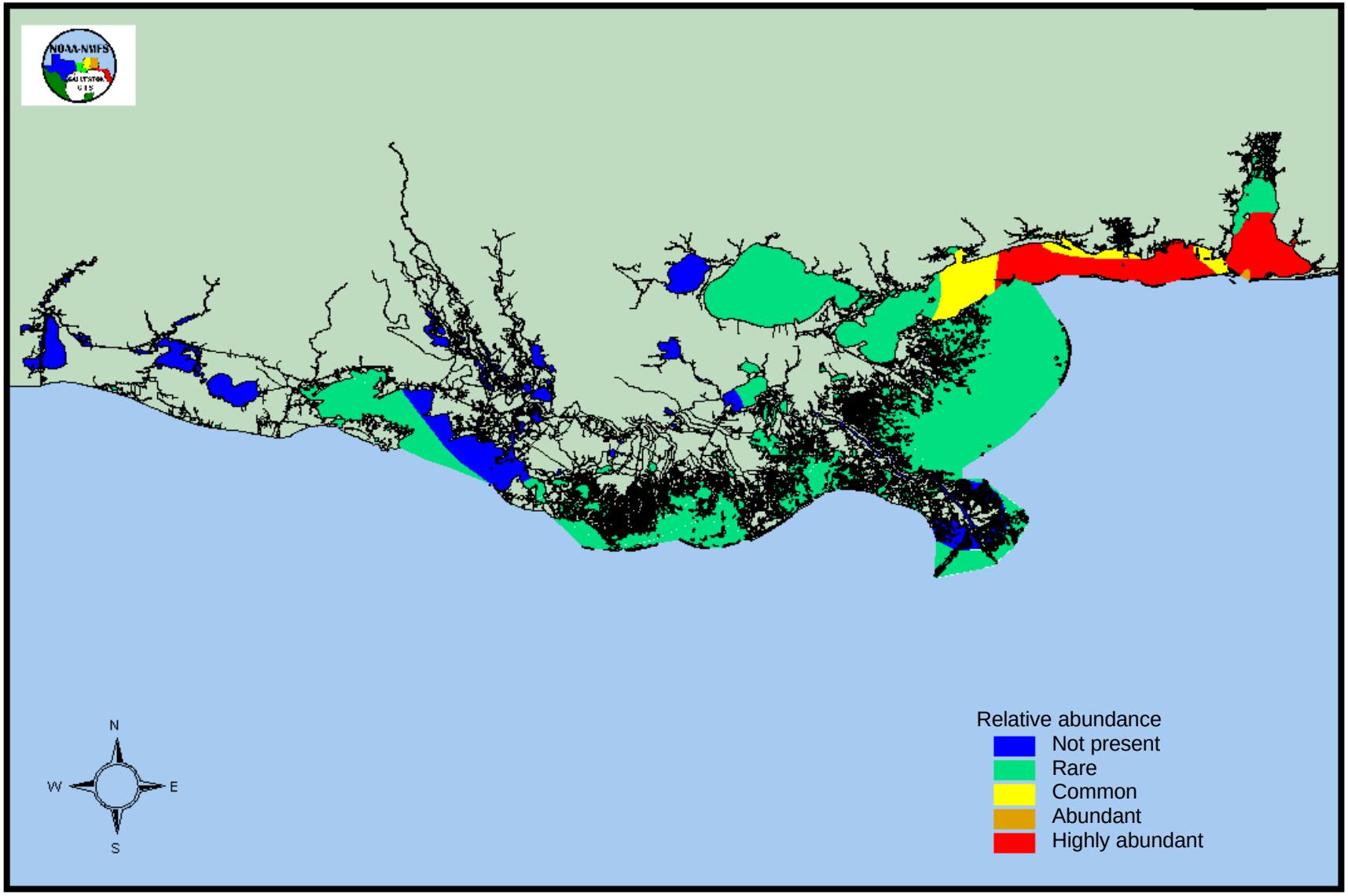
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Relative abundance
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Abundant
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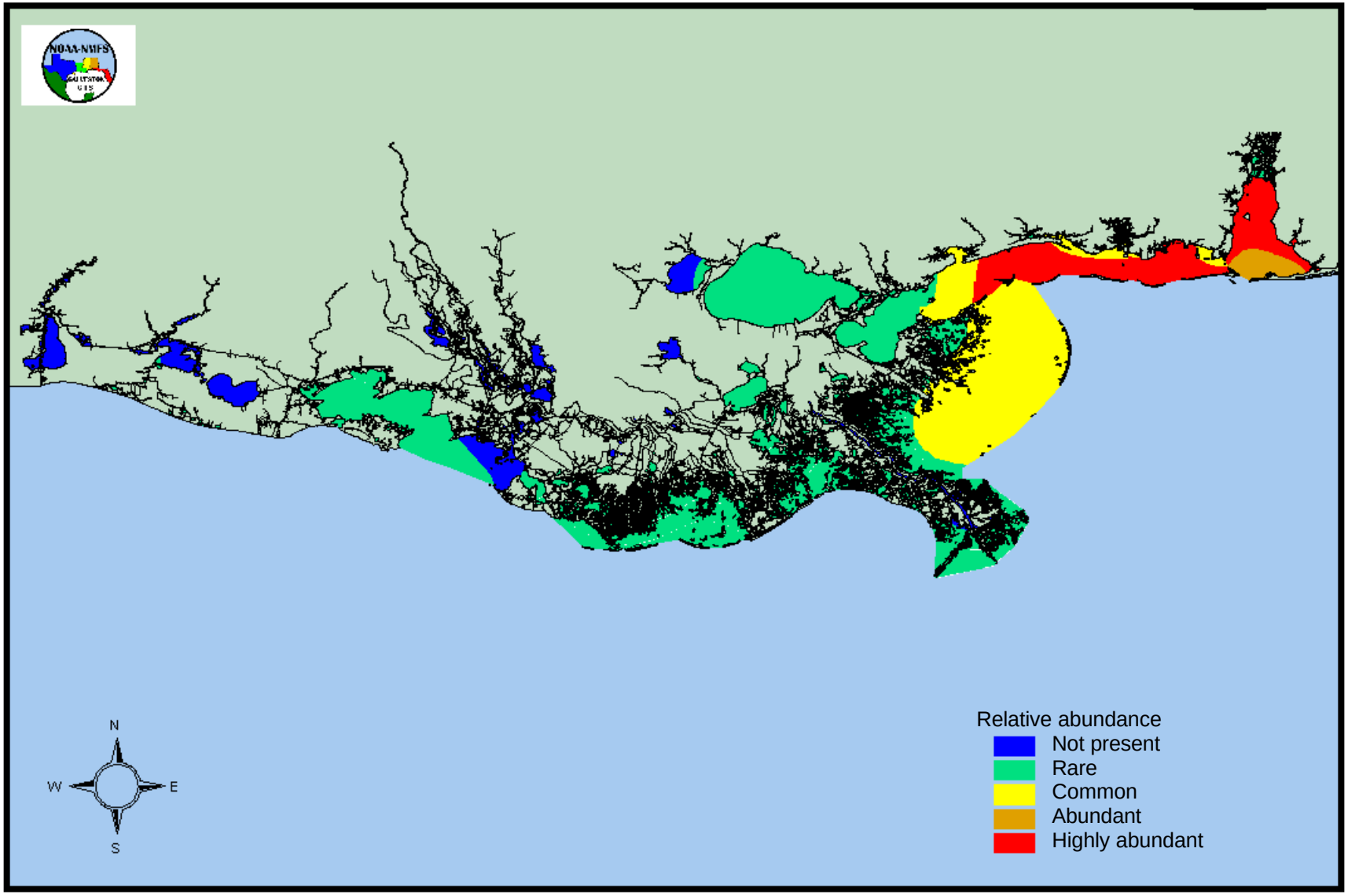
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Relative abundance
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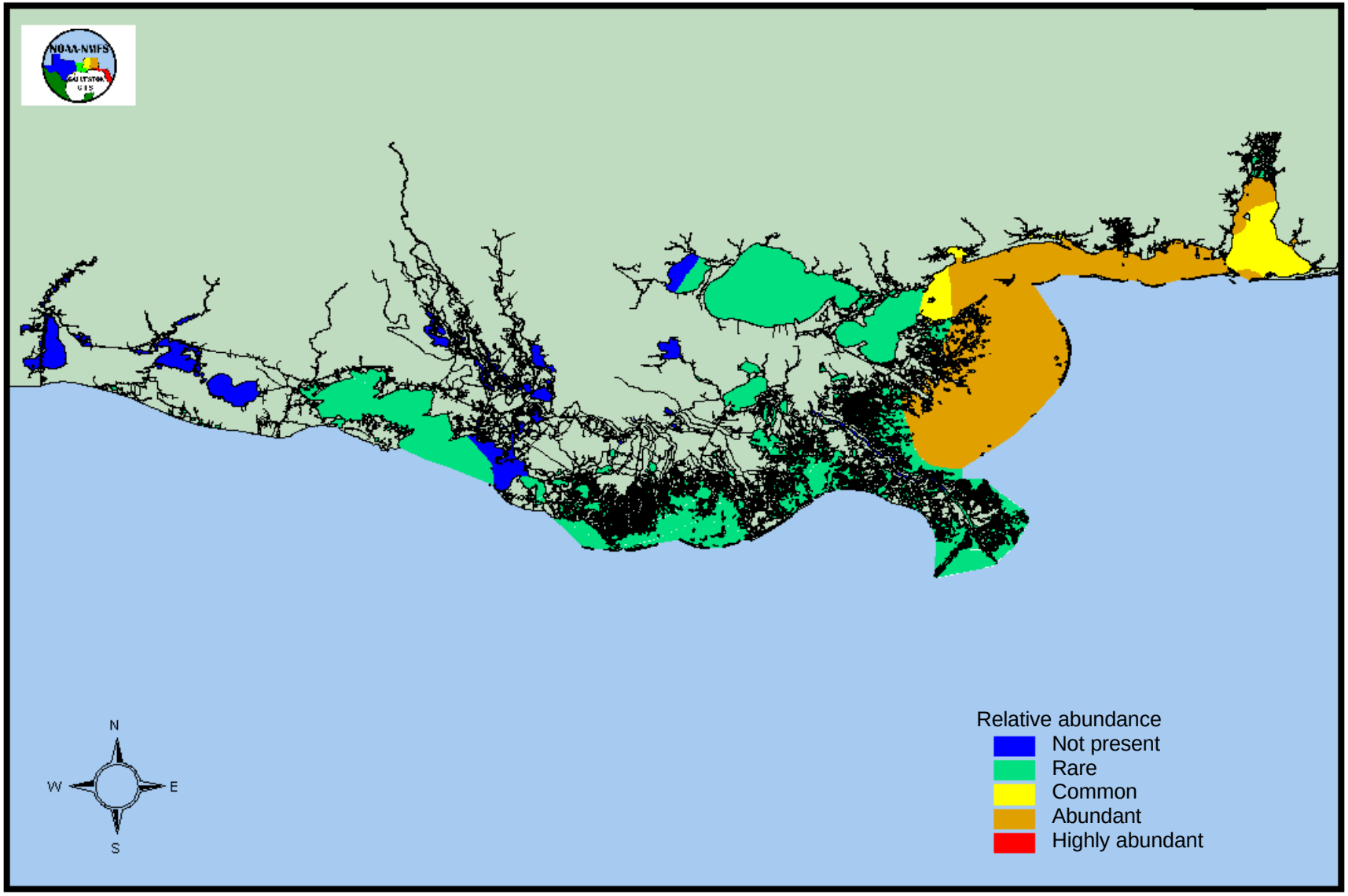
Abundant
Highly abundant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Relative abundance
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Rare
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Abundant
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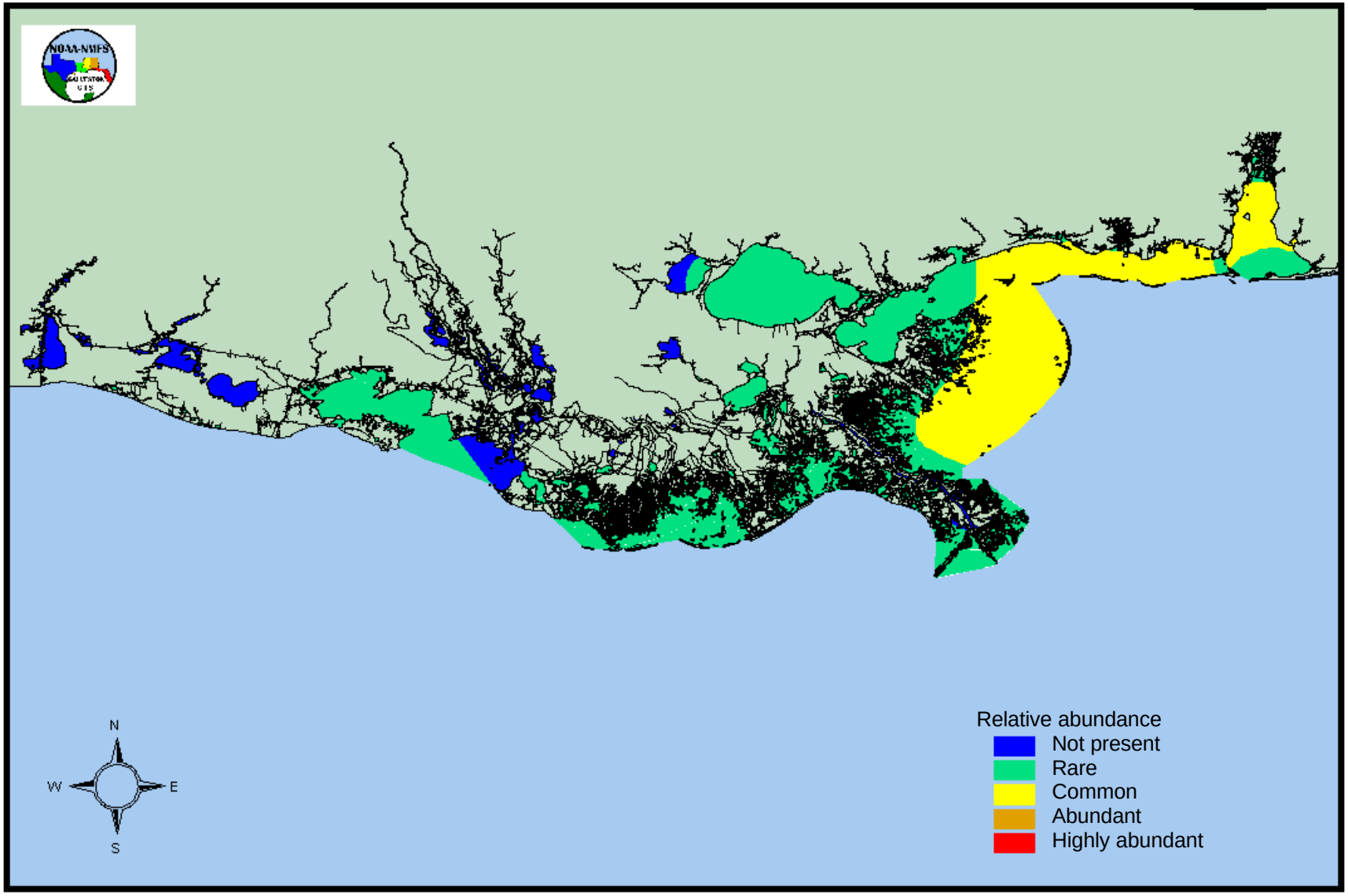
NOAA-NMFS
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Relative abundance
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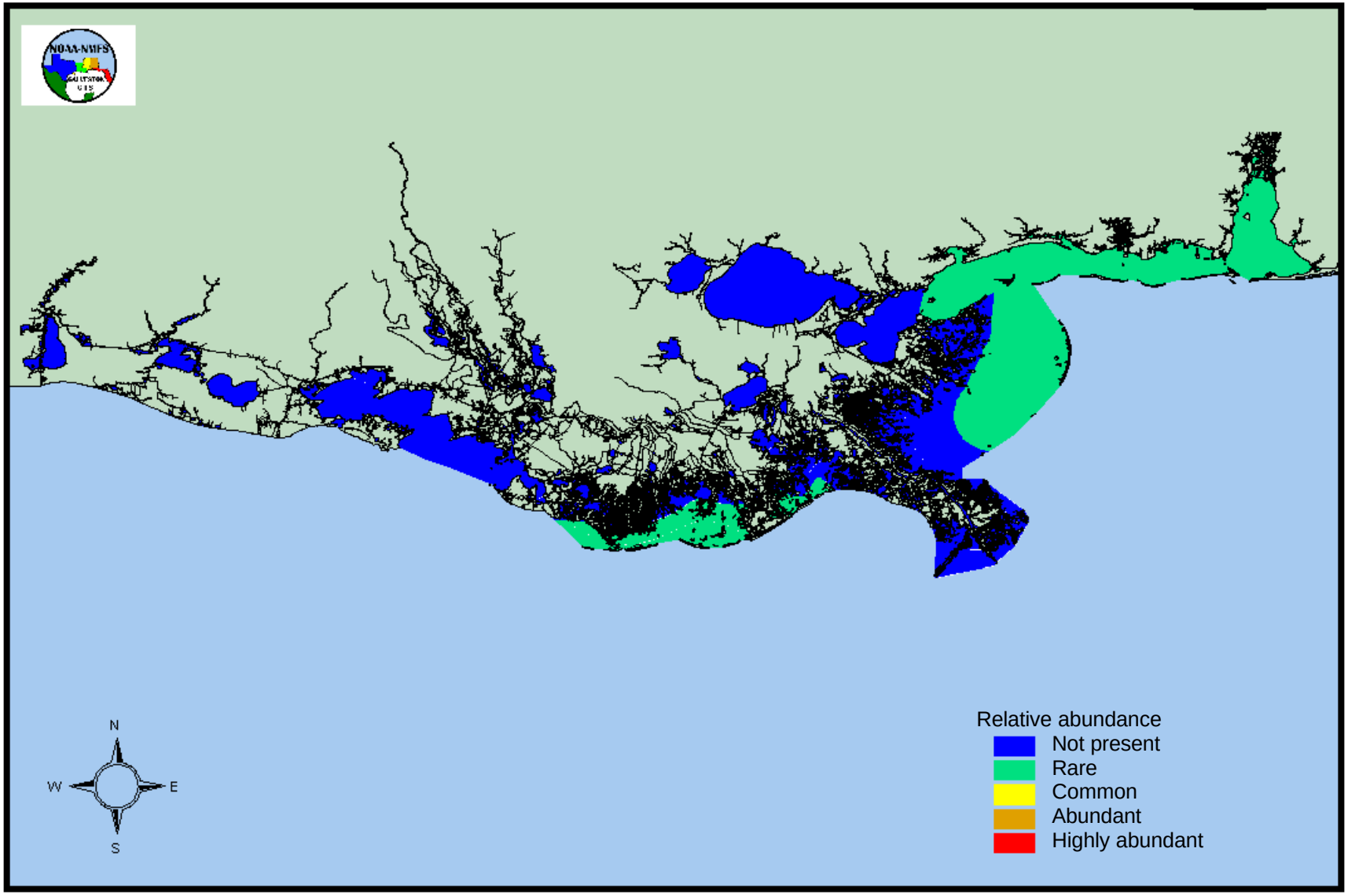
NOAA-NMFS
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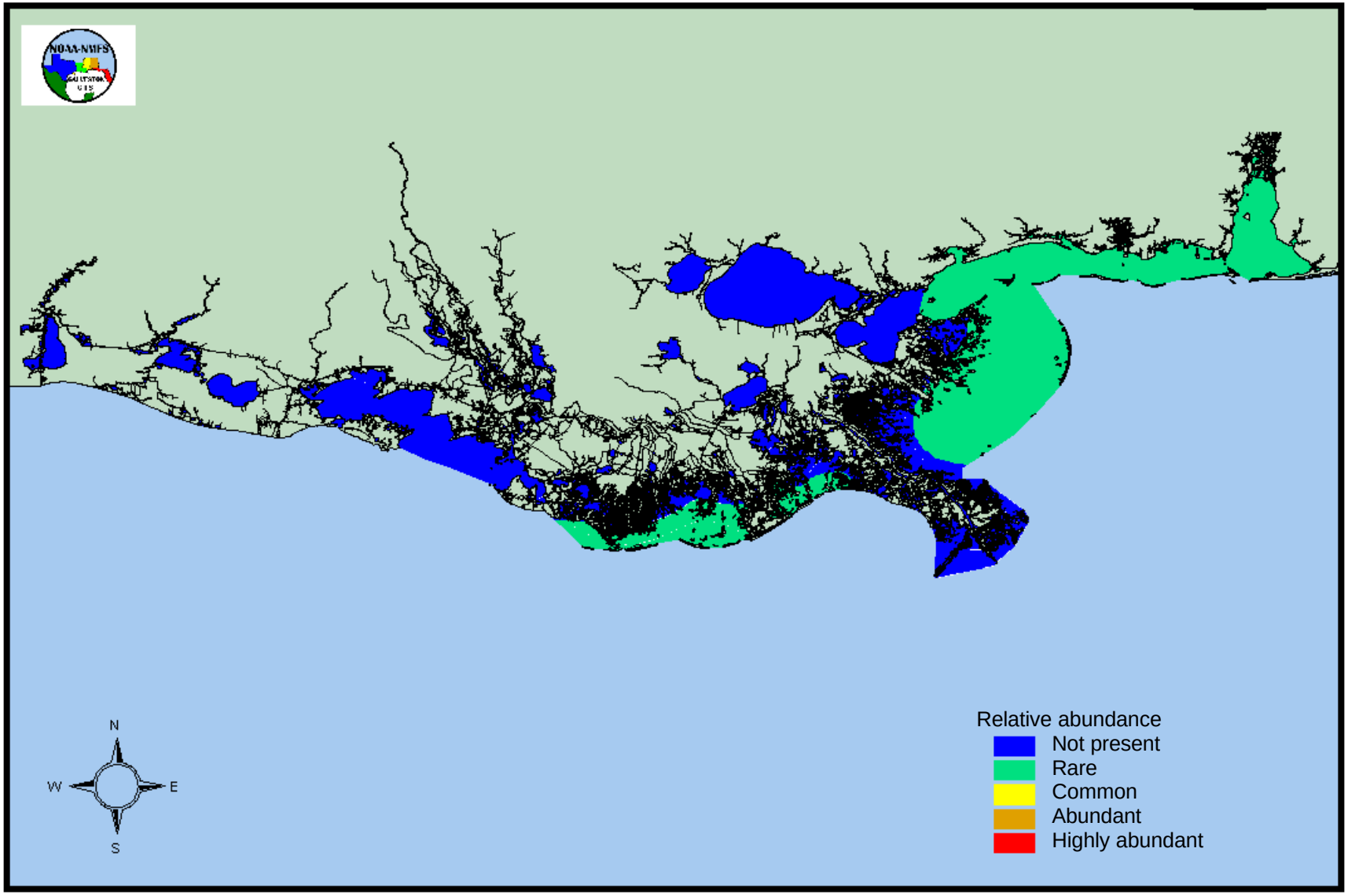
NOAA-NMFS
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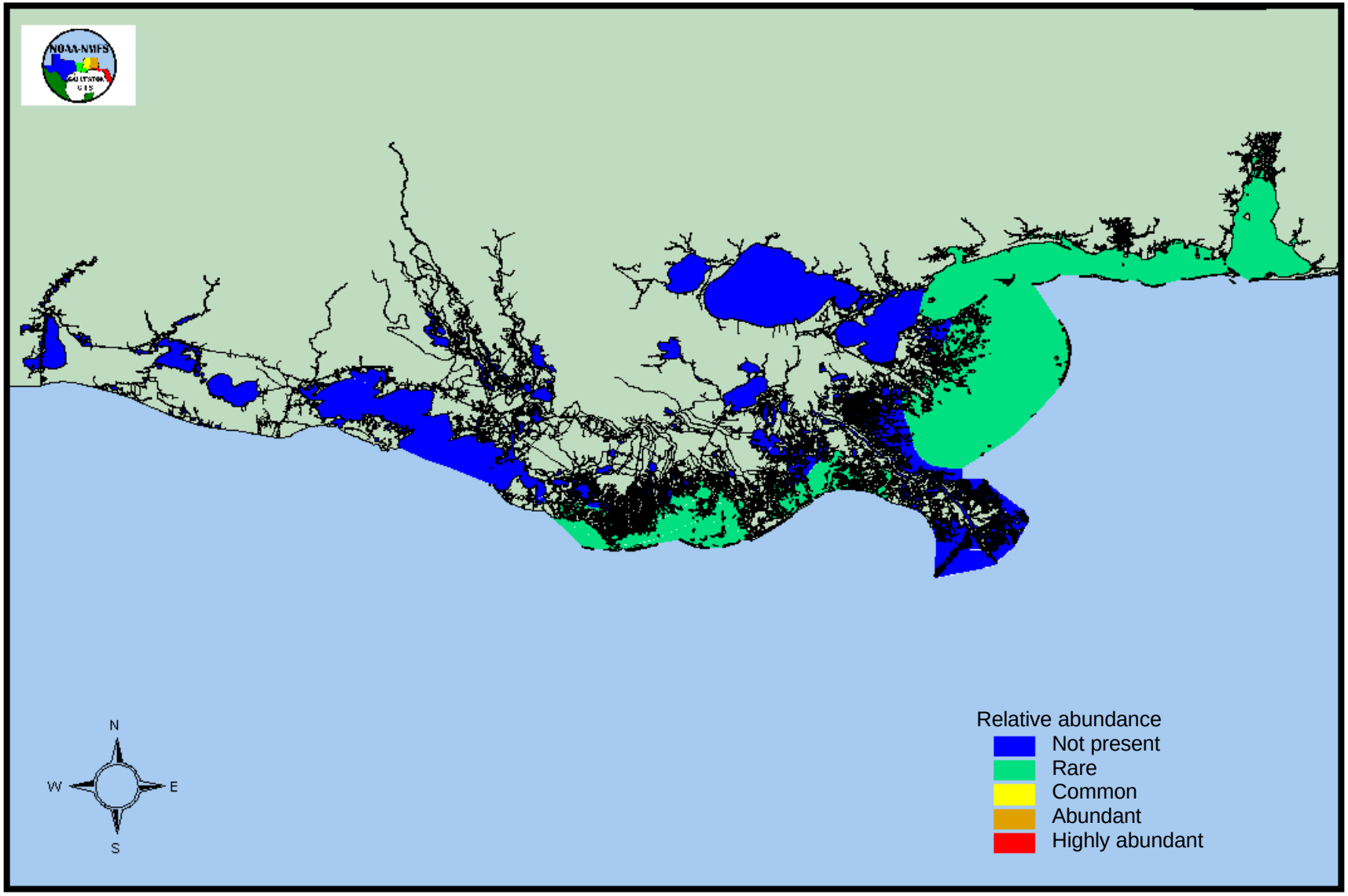
NOAA-NMFS
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Relative abundance
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Rare
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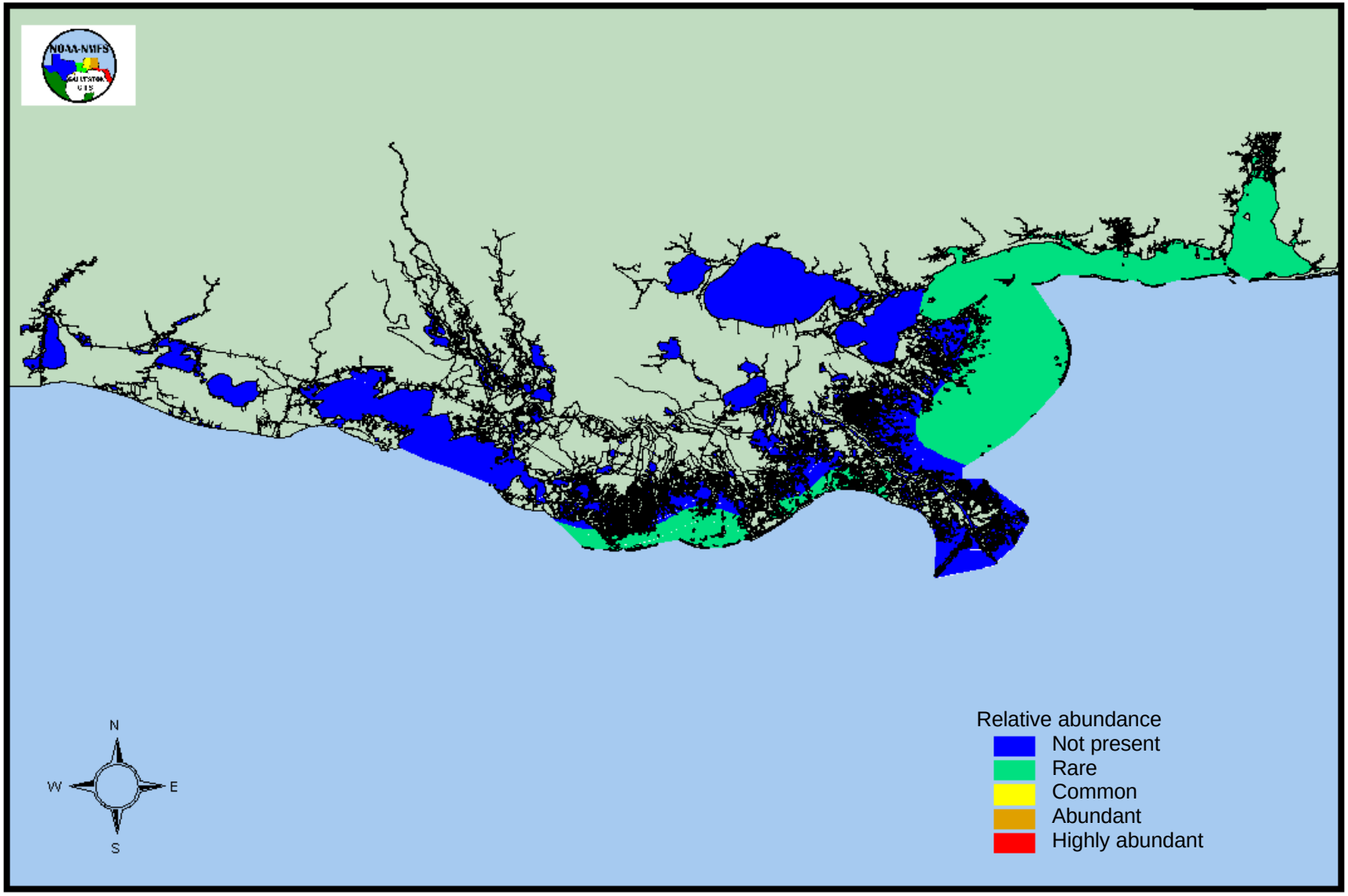
Abundant
Highly abundant


NOAA-NMFS
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Relative abundance
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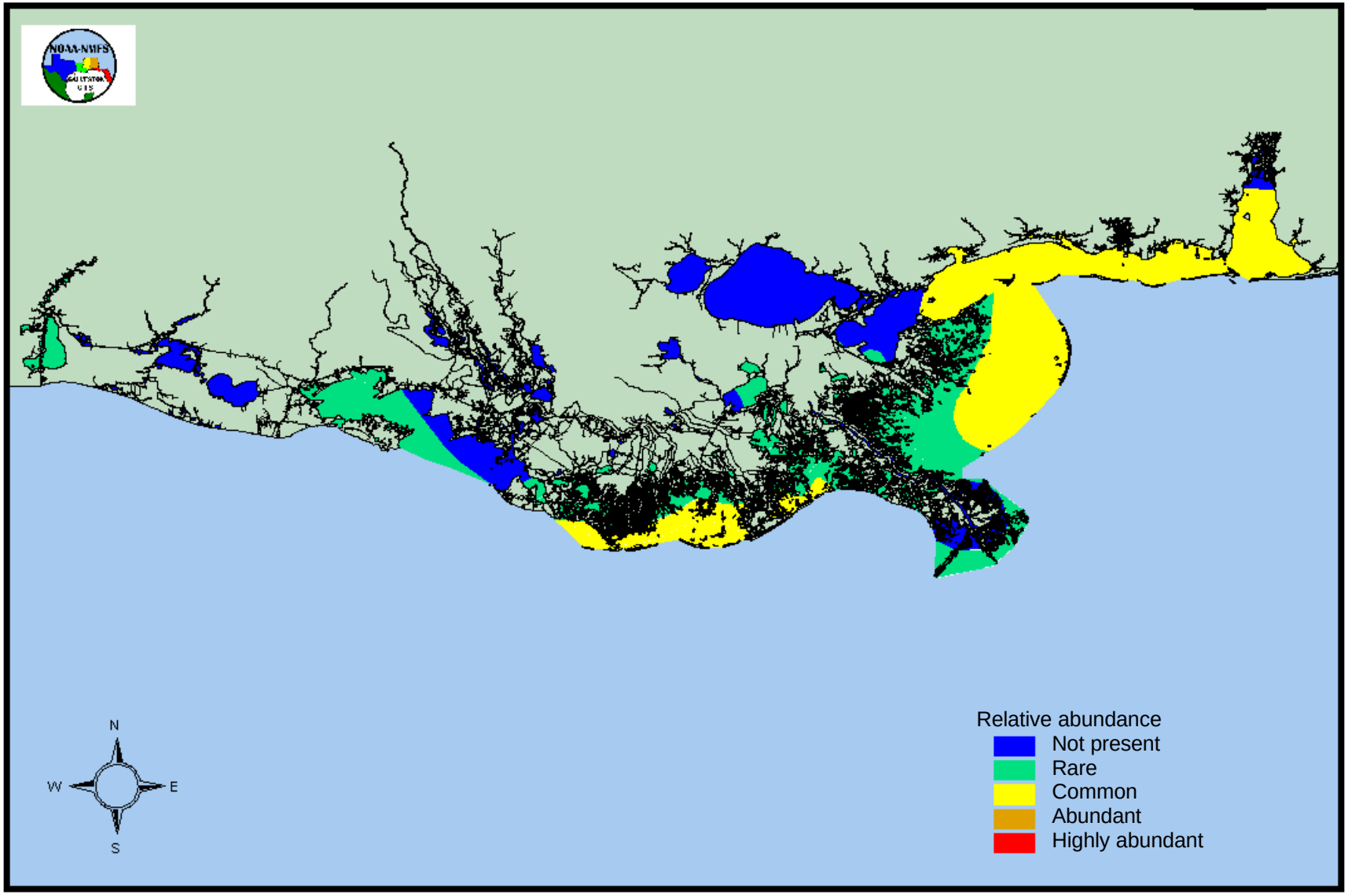
Common
Abundant
Highly abundant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Relative abundance
Not present
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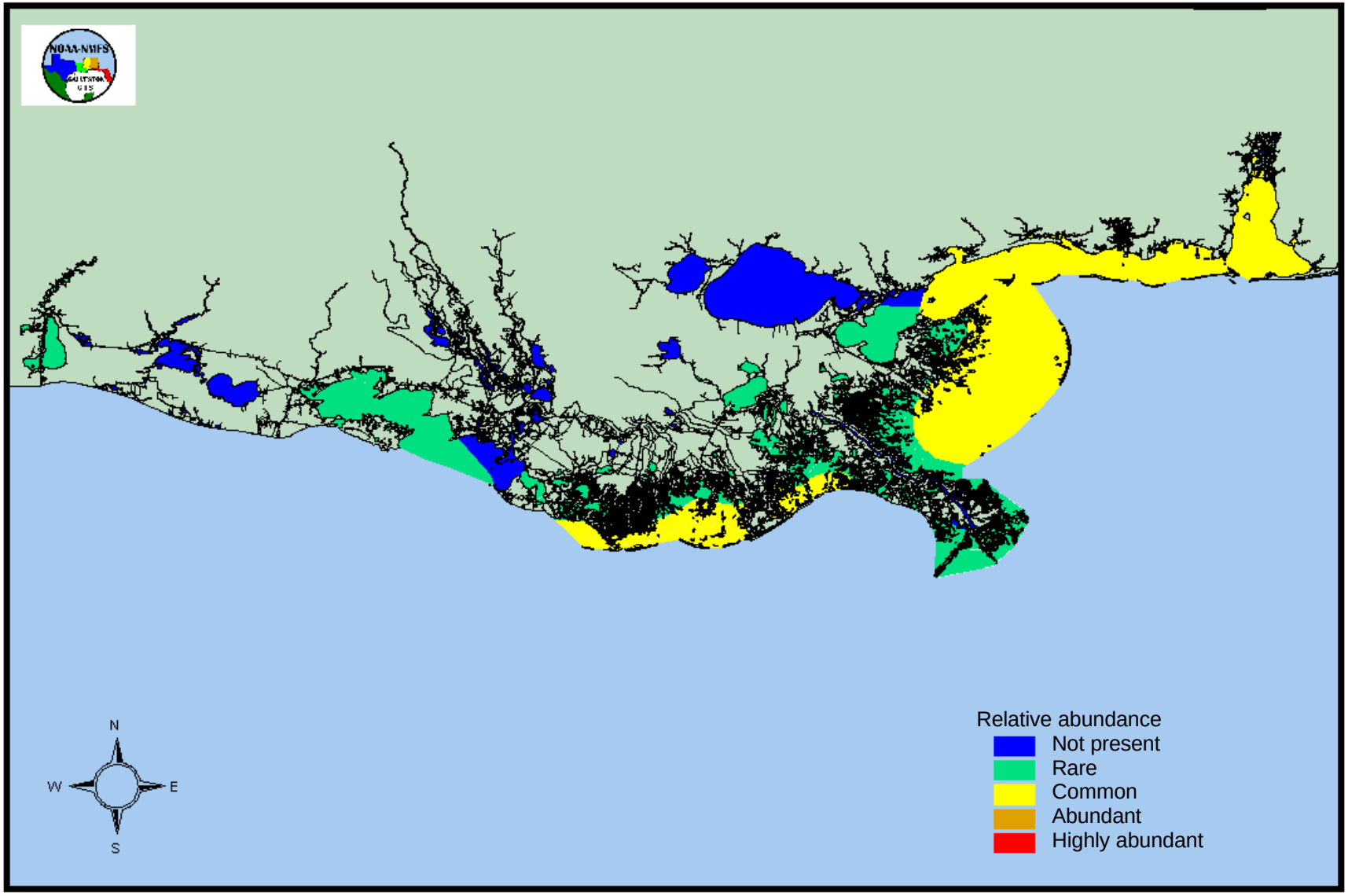
Common
Abundant
Highly abundant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Relative abundance
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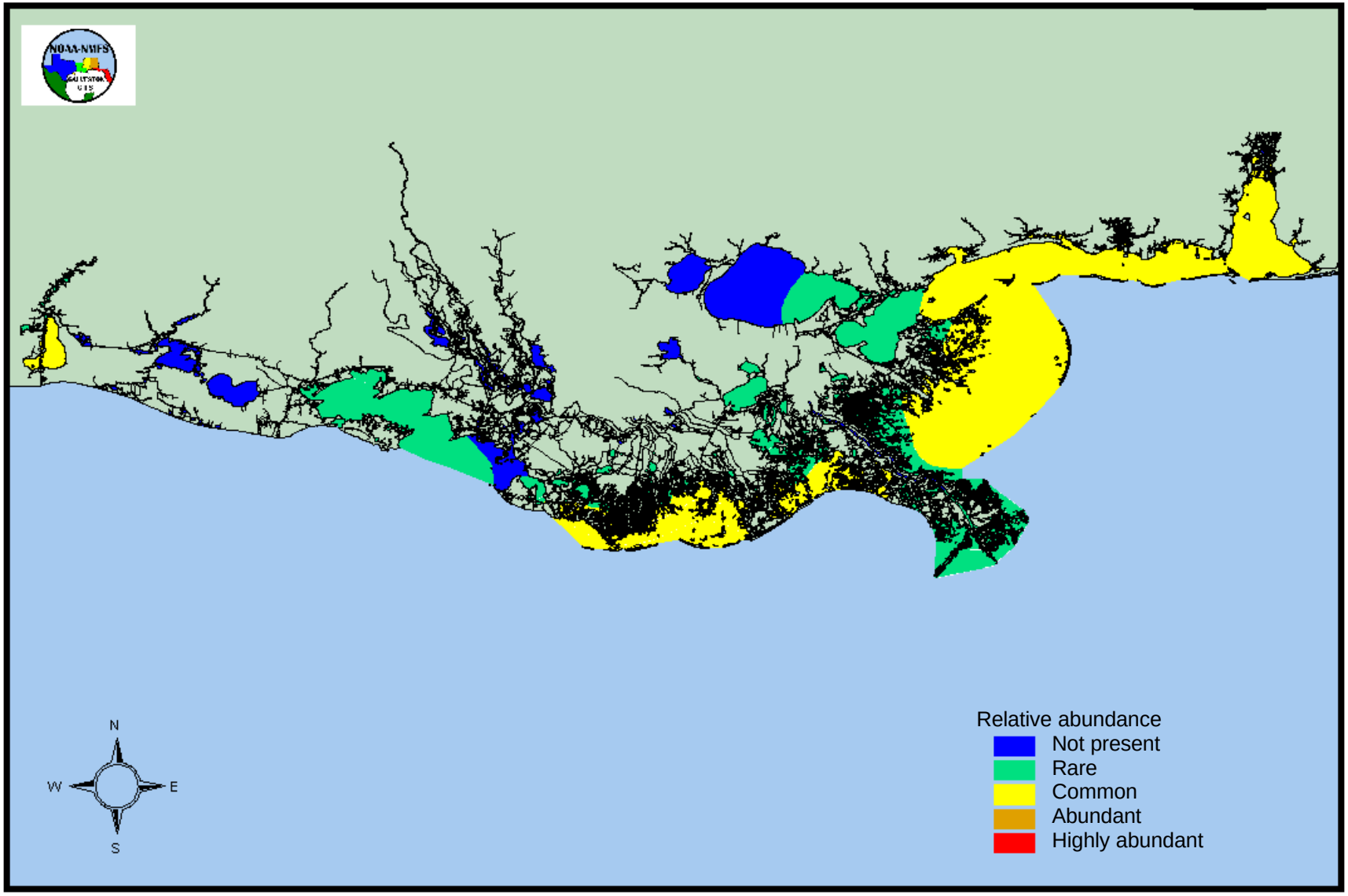
Rare
Common
Abundant
Highly abundant


NOAA-NMFS
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Relative abundance
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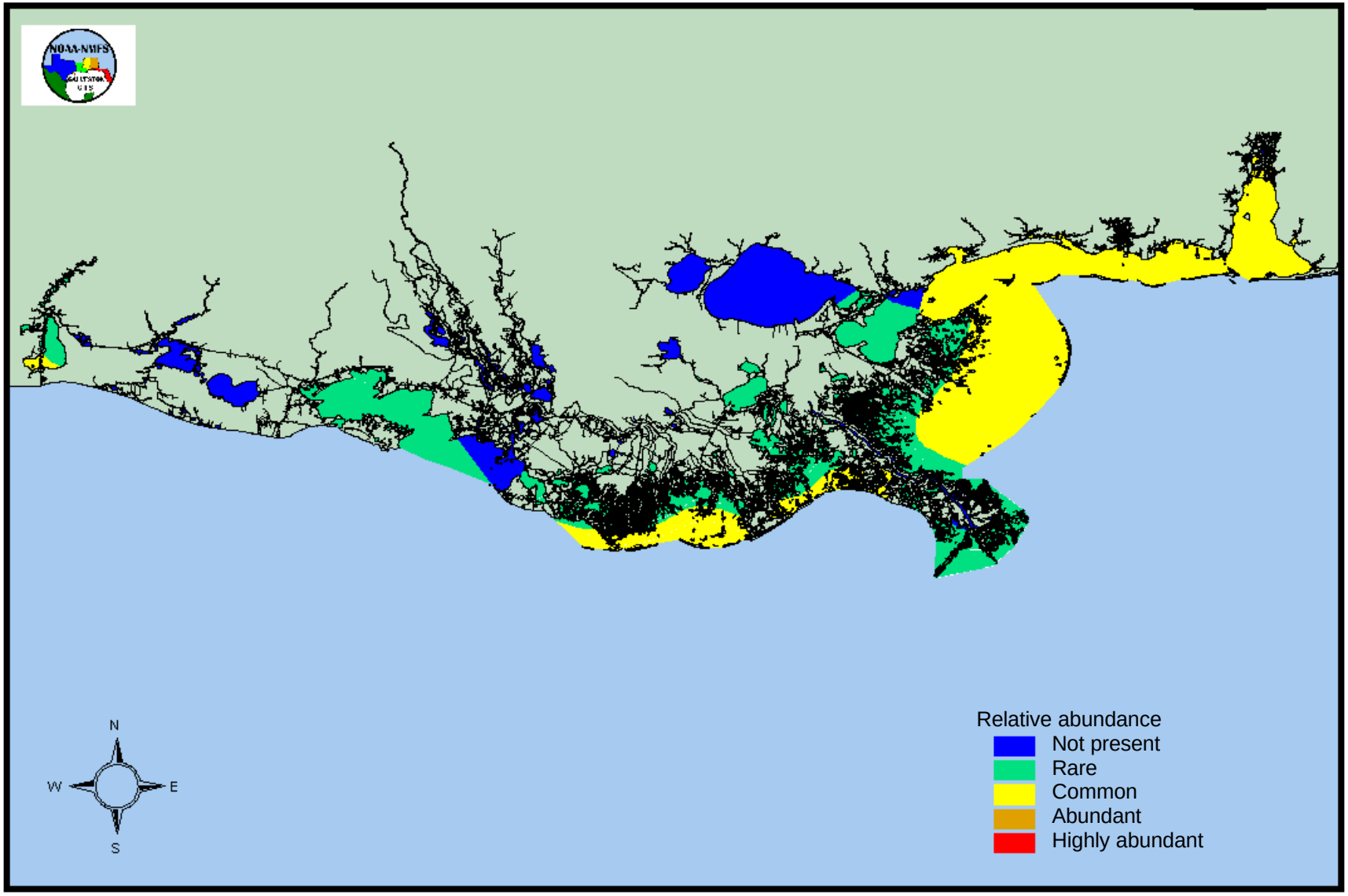
Rare
Common
Abundant
Highly abundant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Relative abundance
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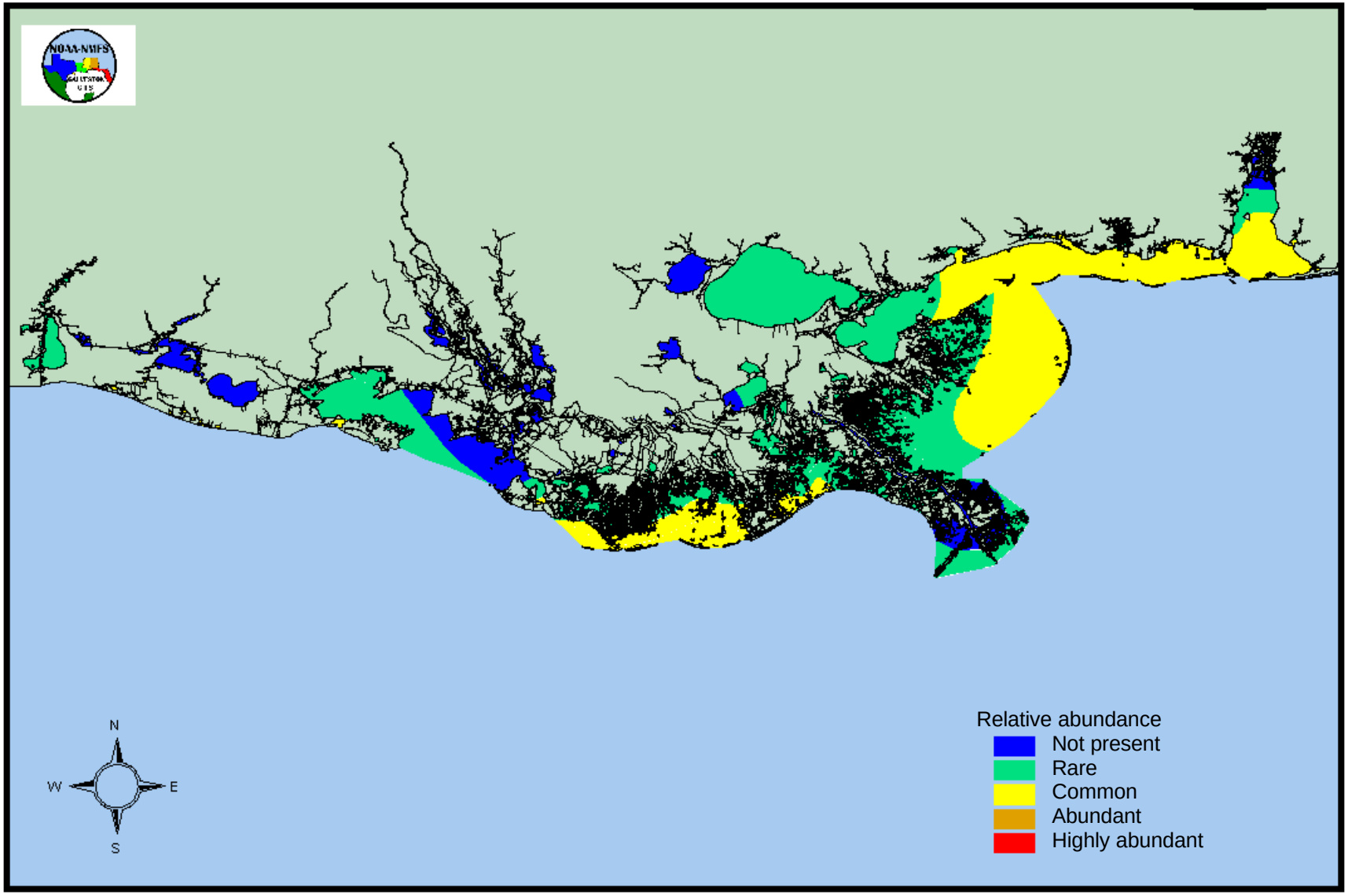
Common
Abundant
Highly abundant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Relative abundance
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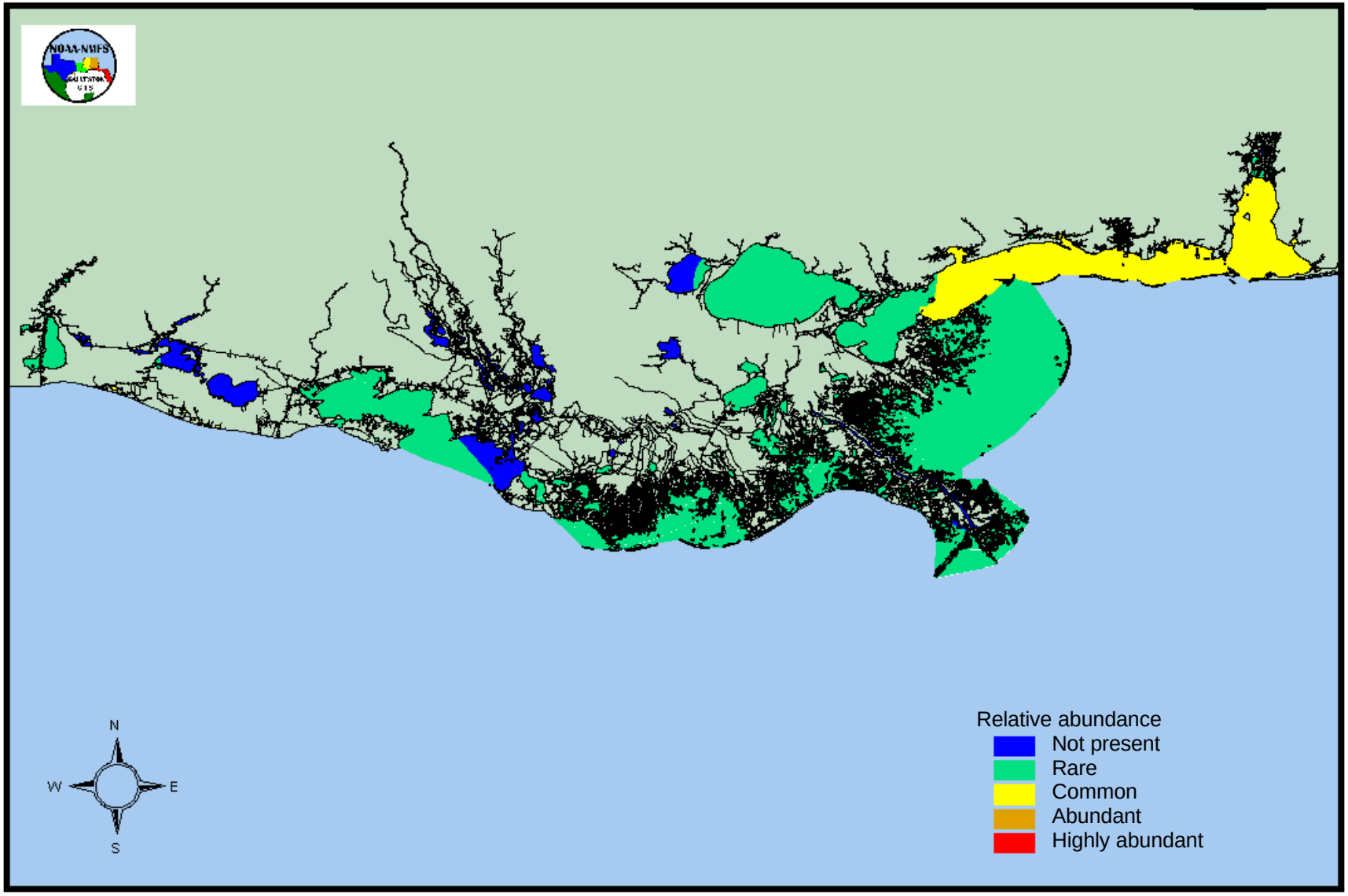
Rare
Common
Abundant
Highly abundant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Relative abundance
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Common
Abundant
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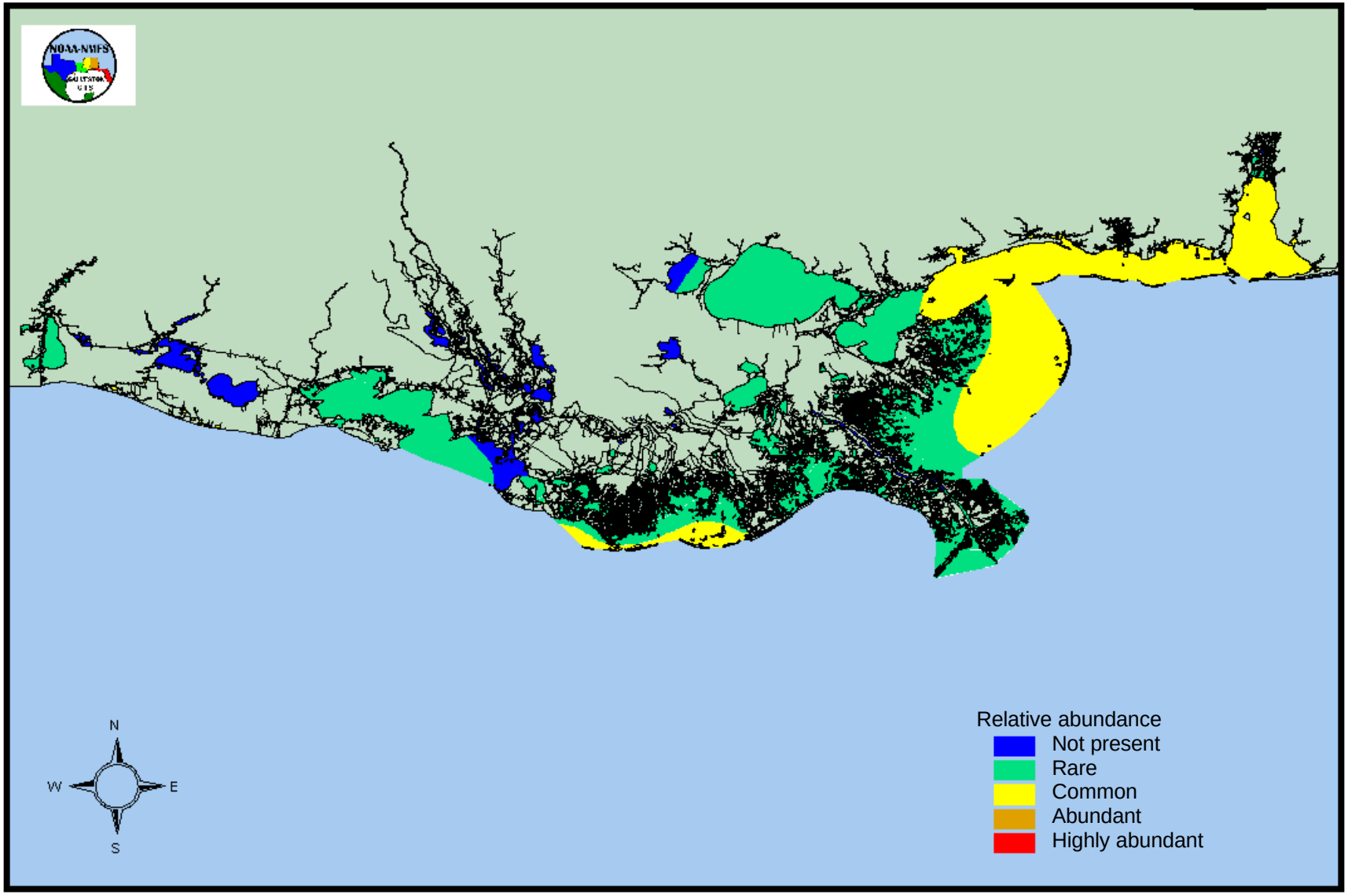
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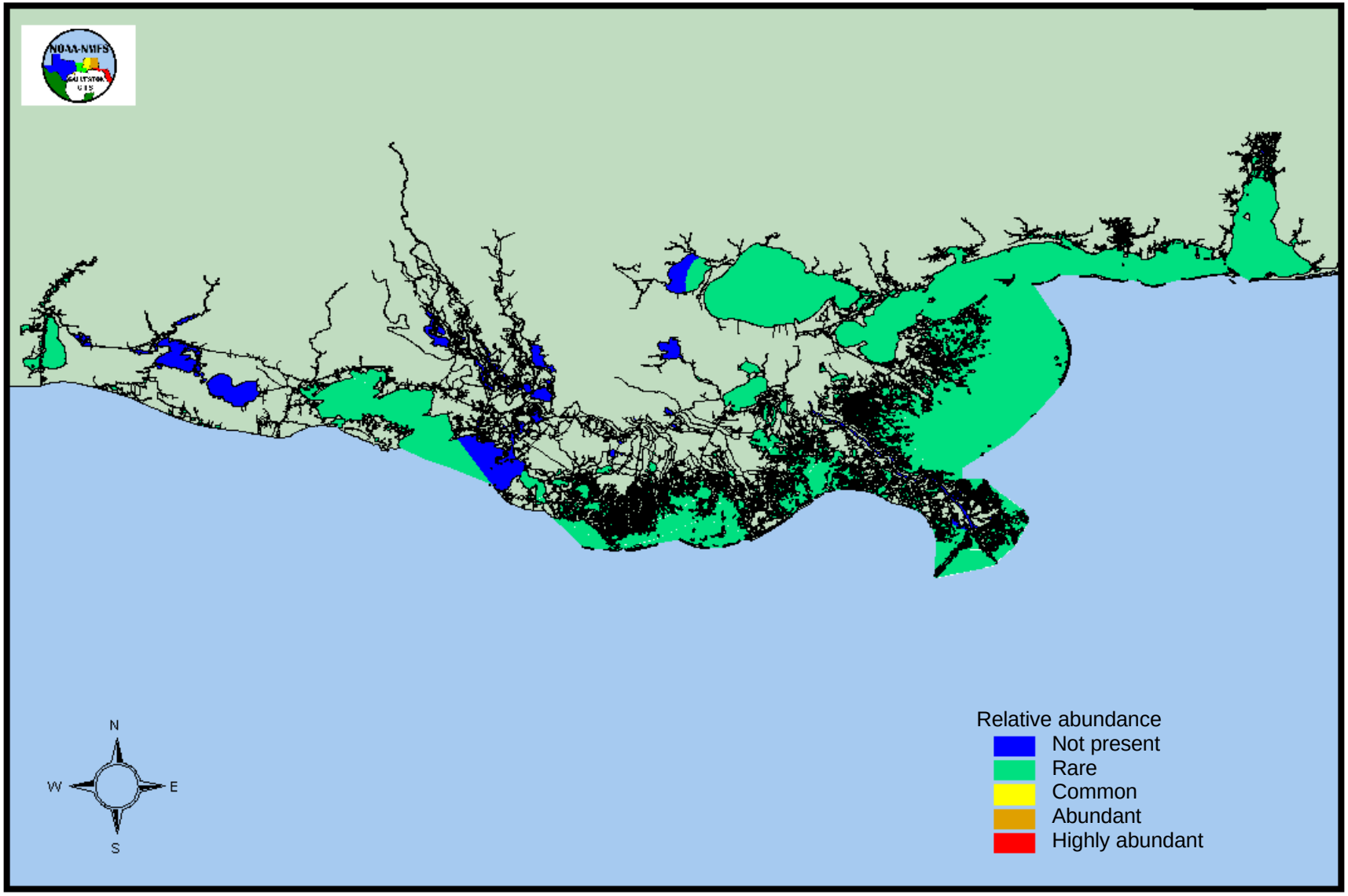
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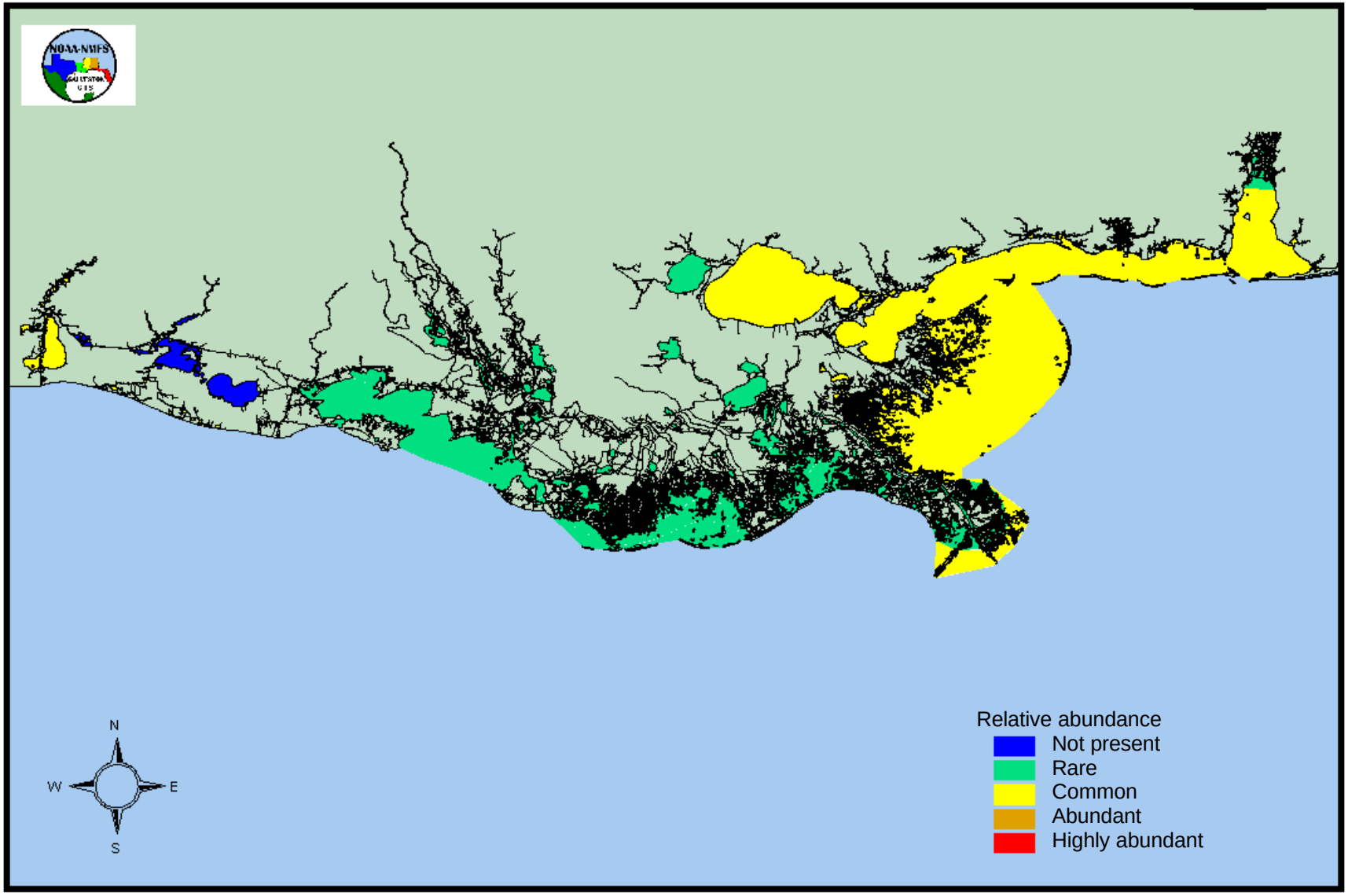
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Relative abundance
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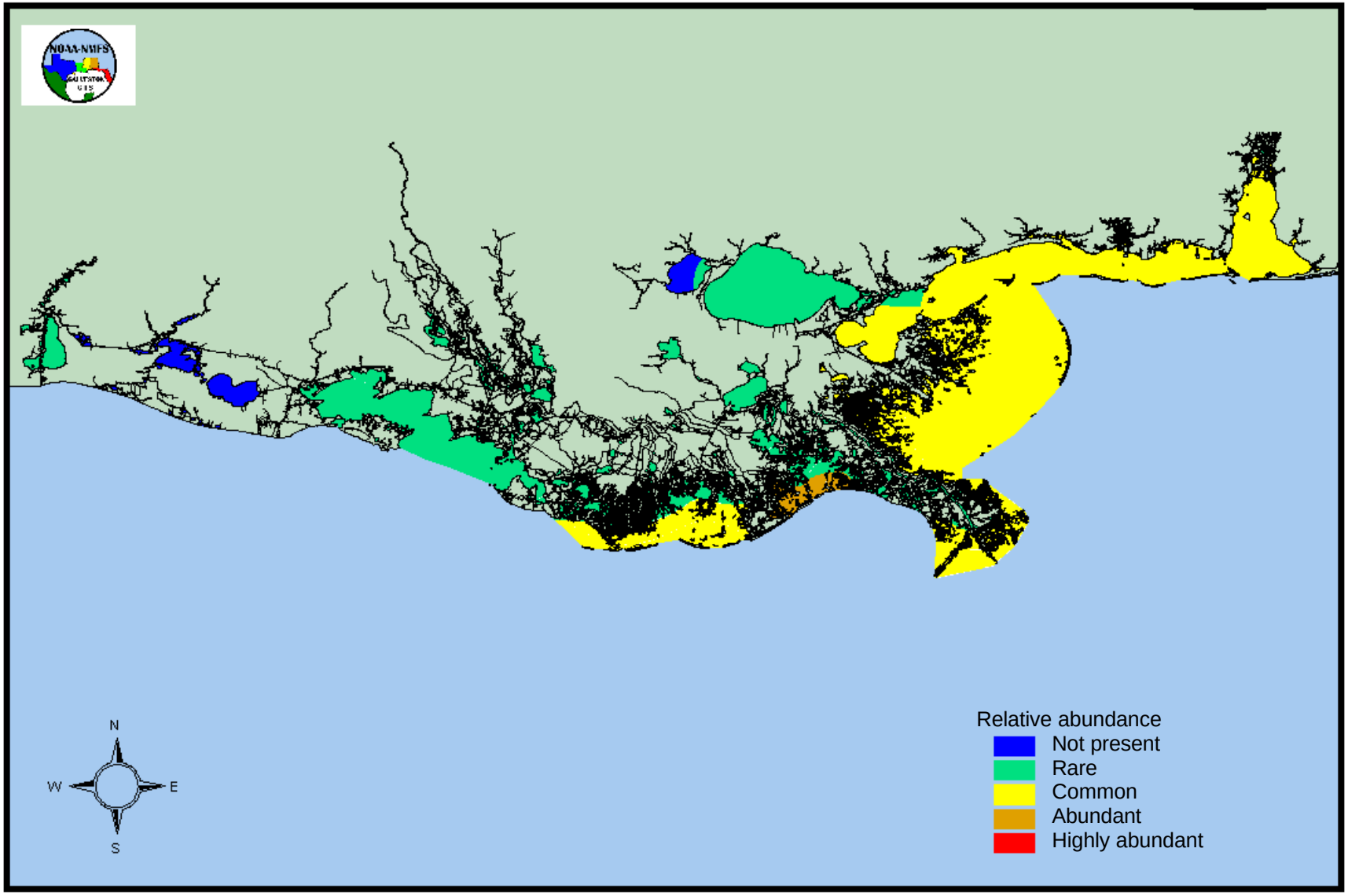
Rare
Common
Abundant
Highly abundant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Relative abundance
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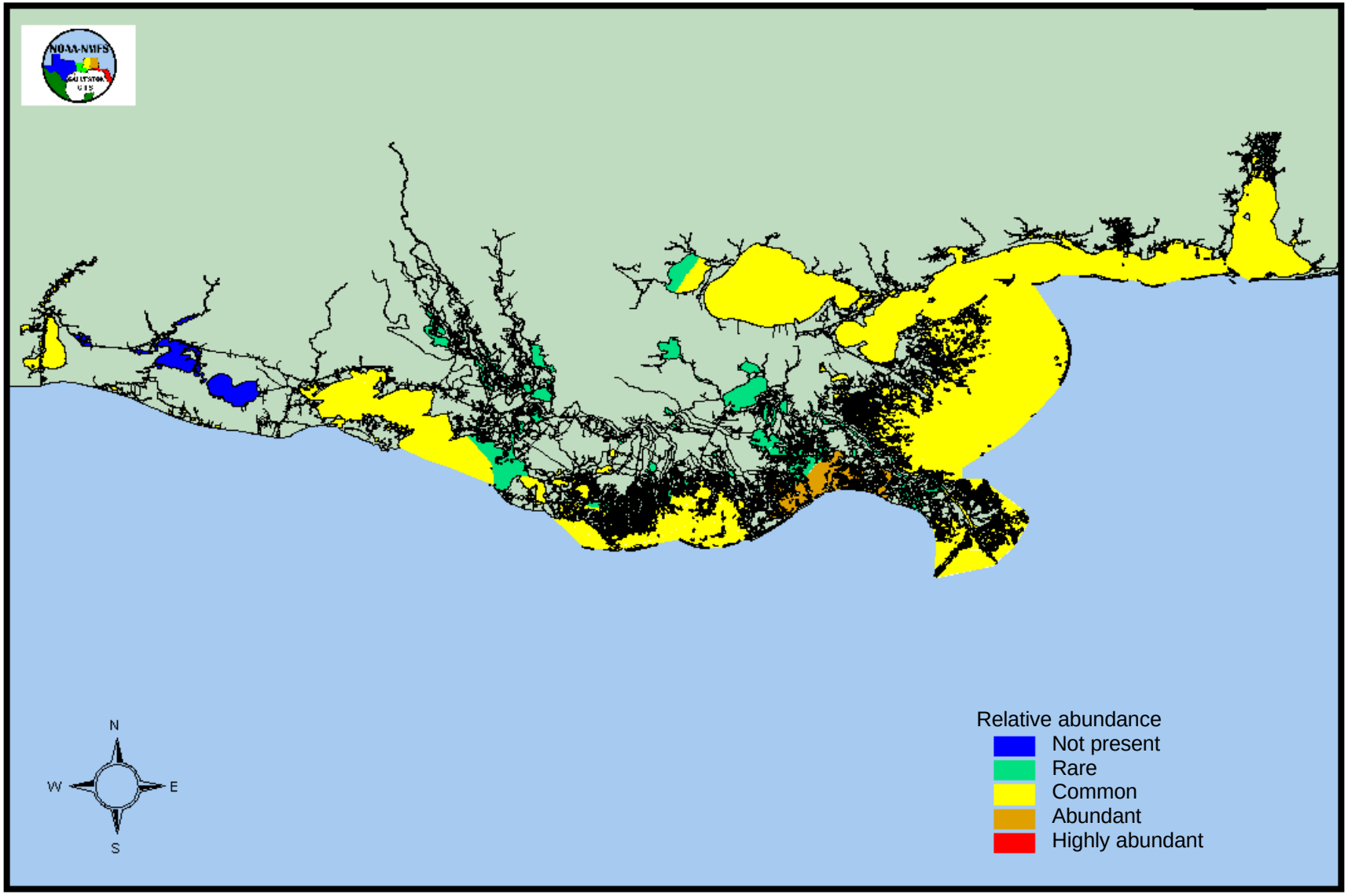
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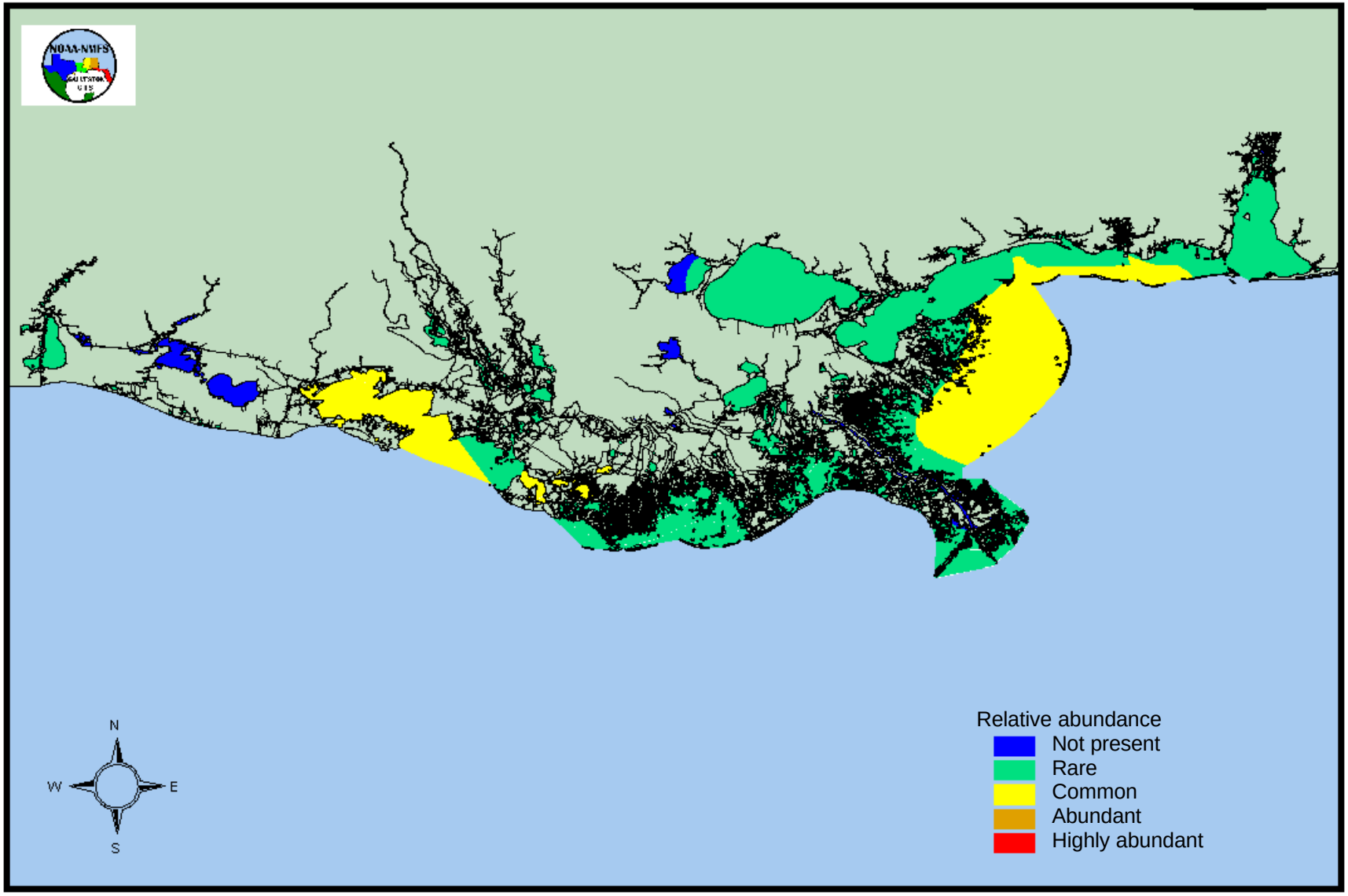
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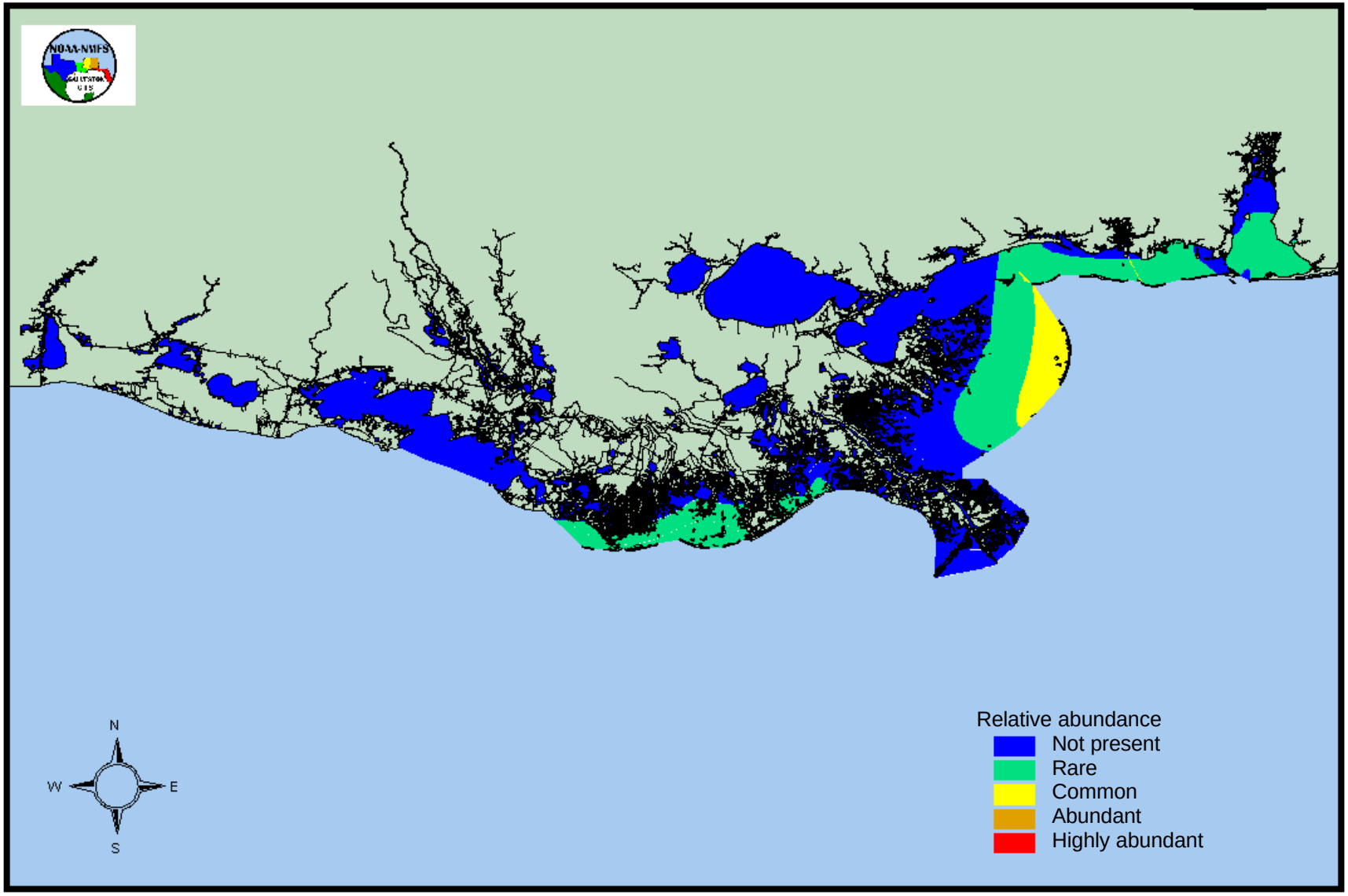
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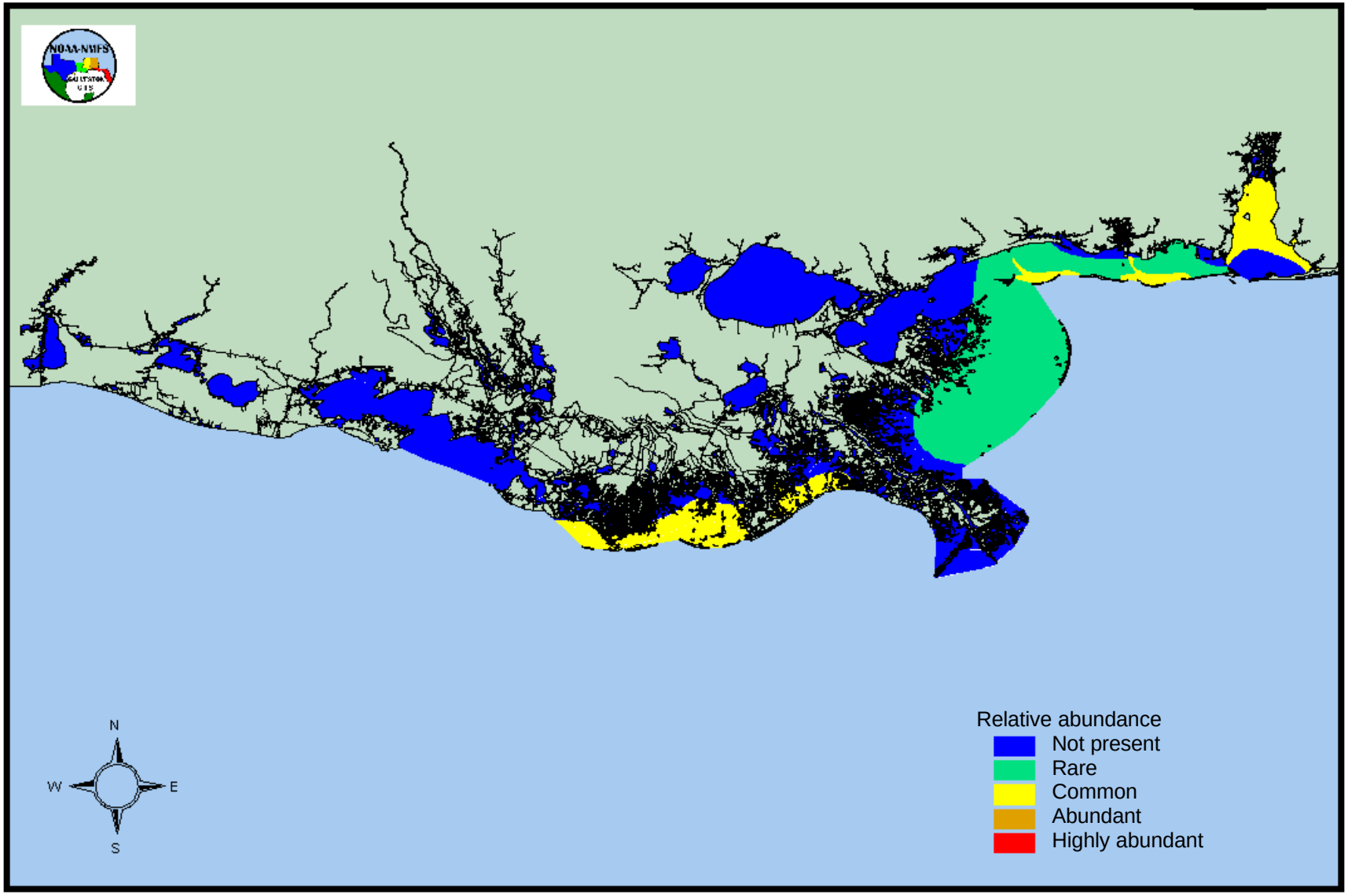
Highly abundant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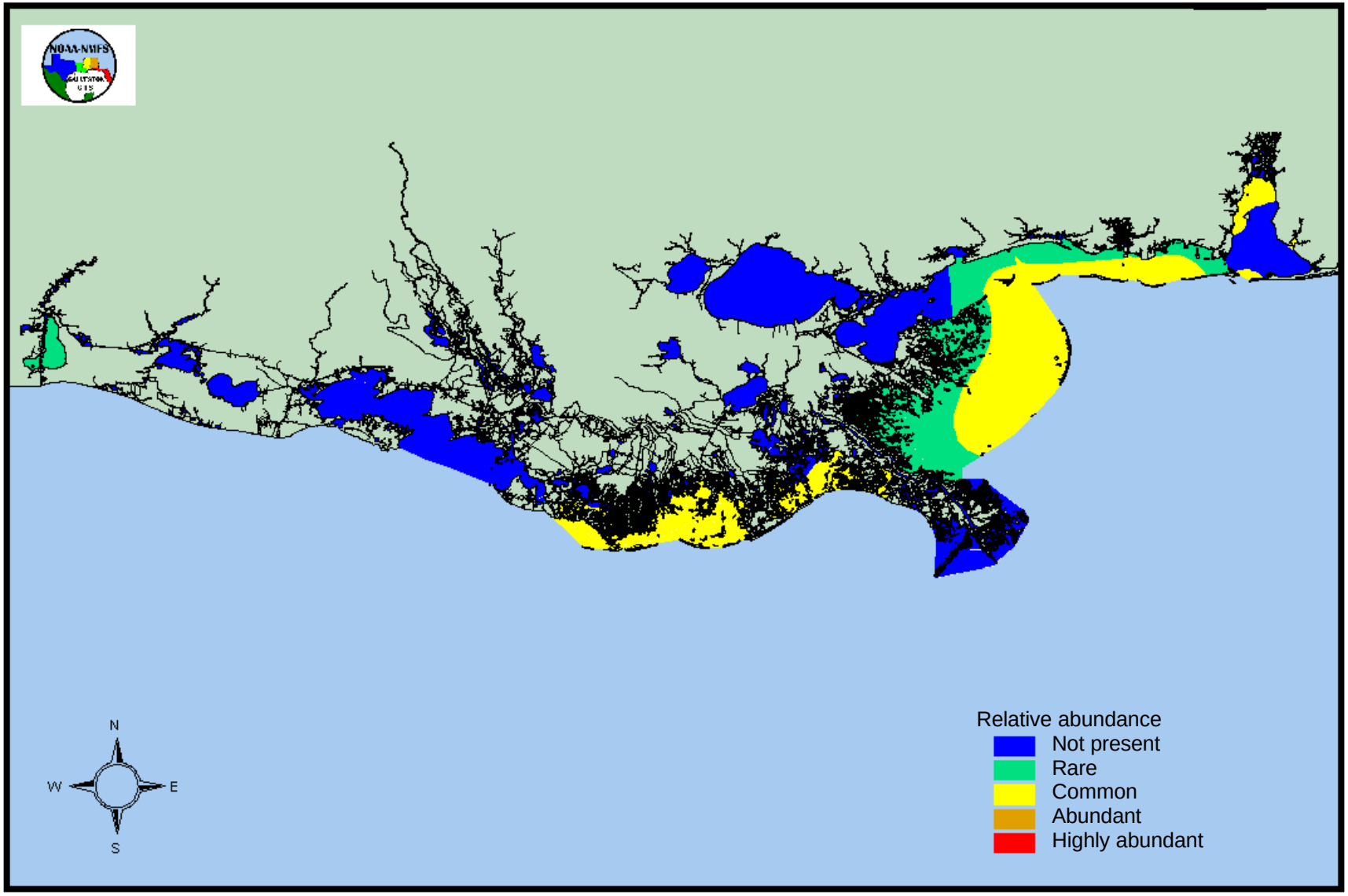
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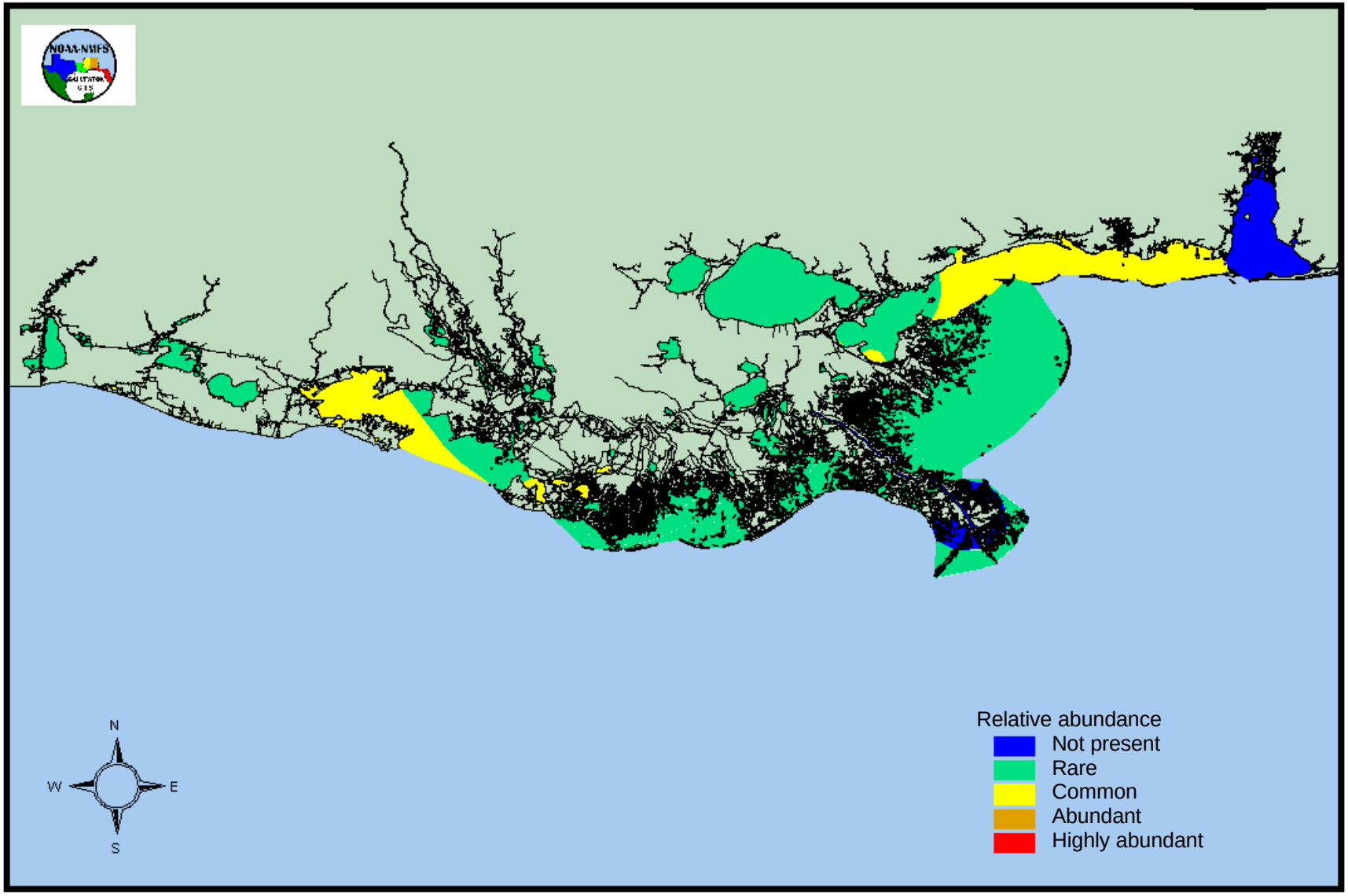
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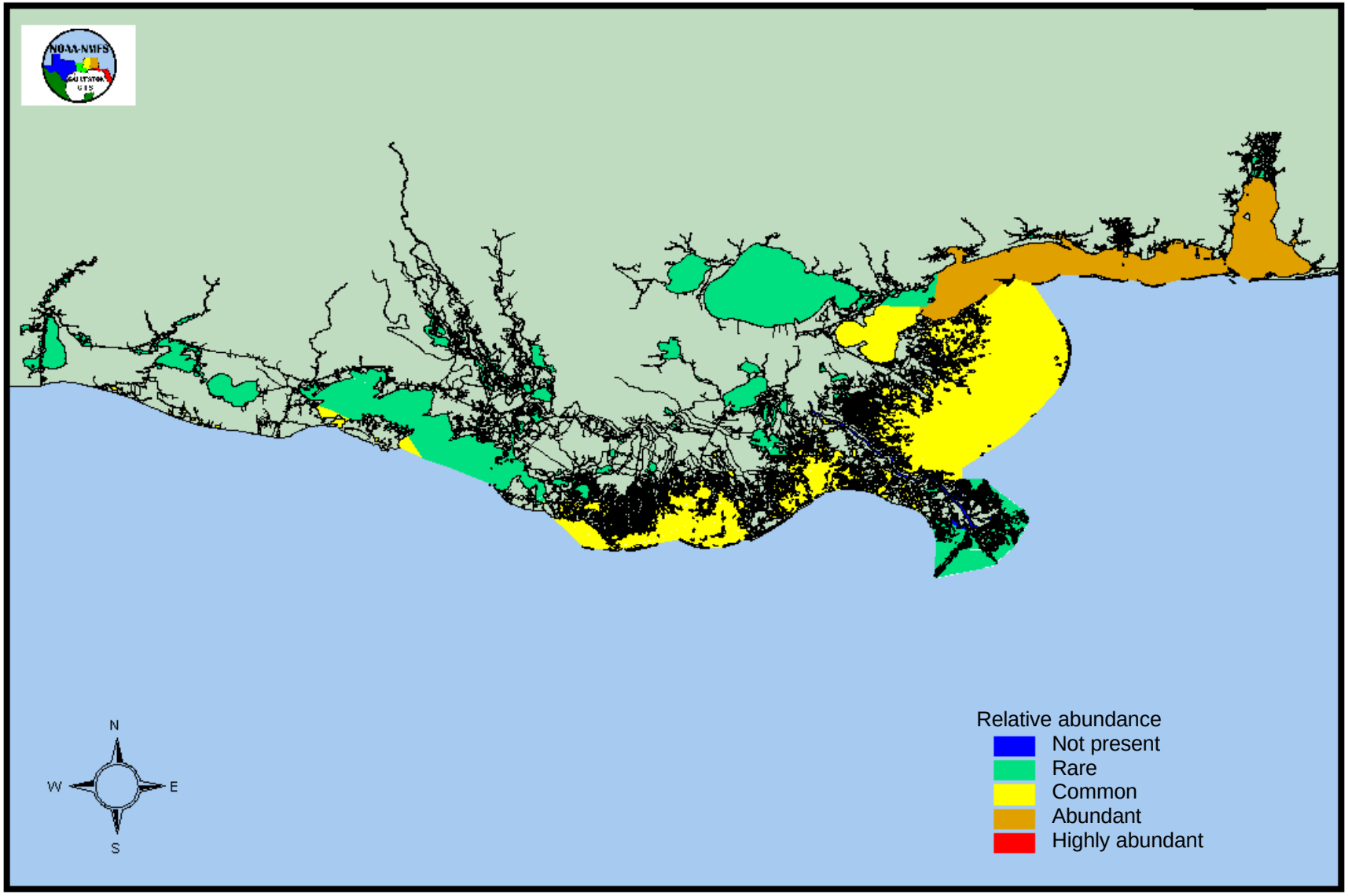
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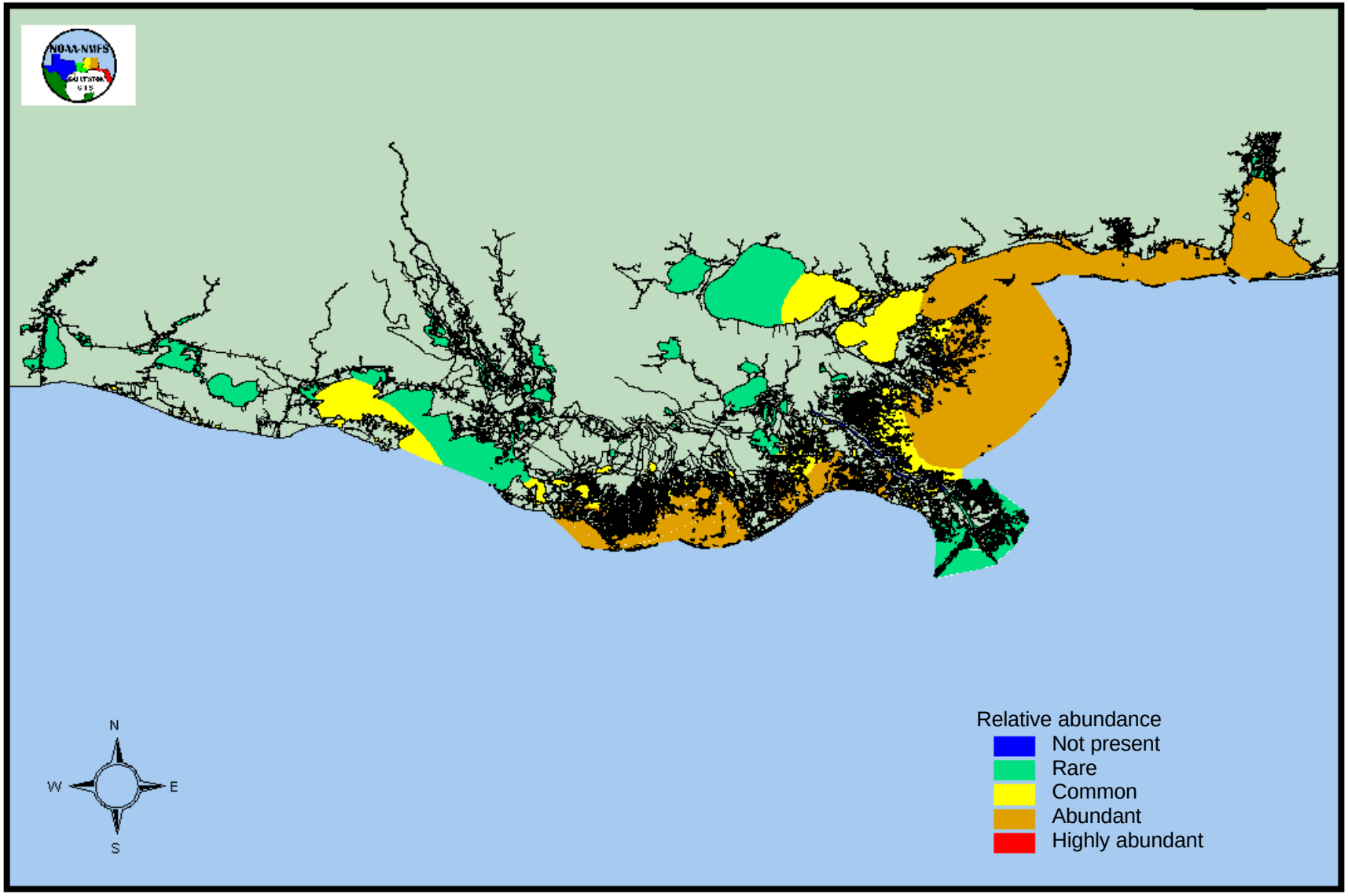
NOAA-NMFS
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Relative abundance
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Abundant
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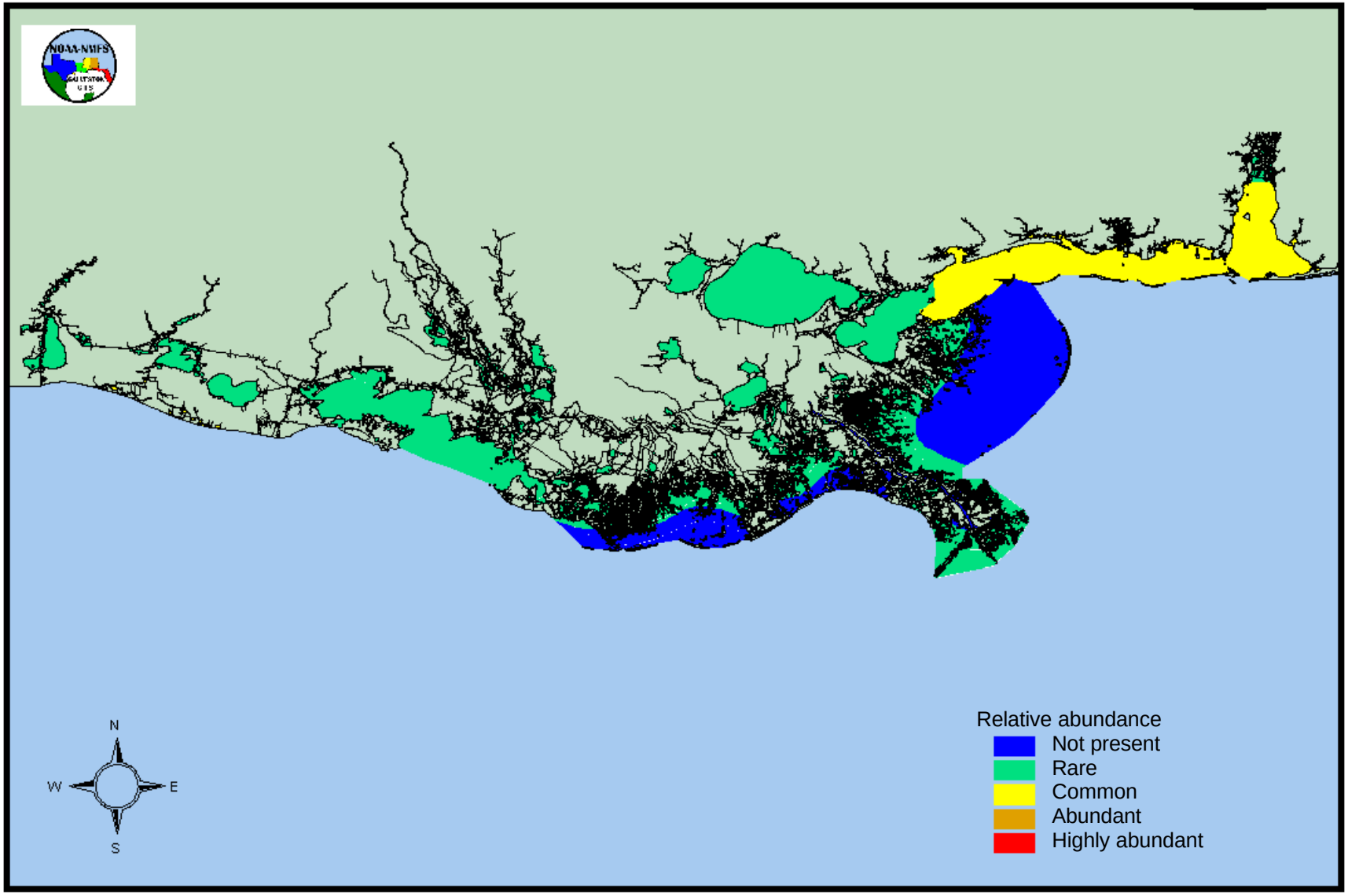
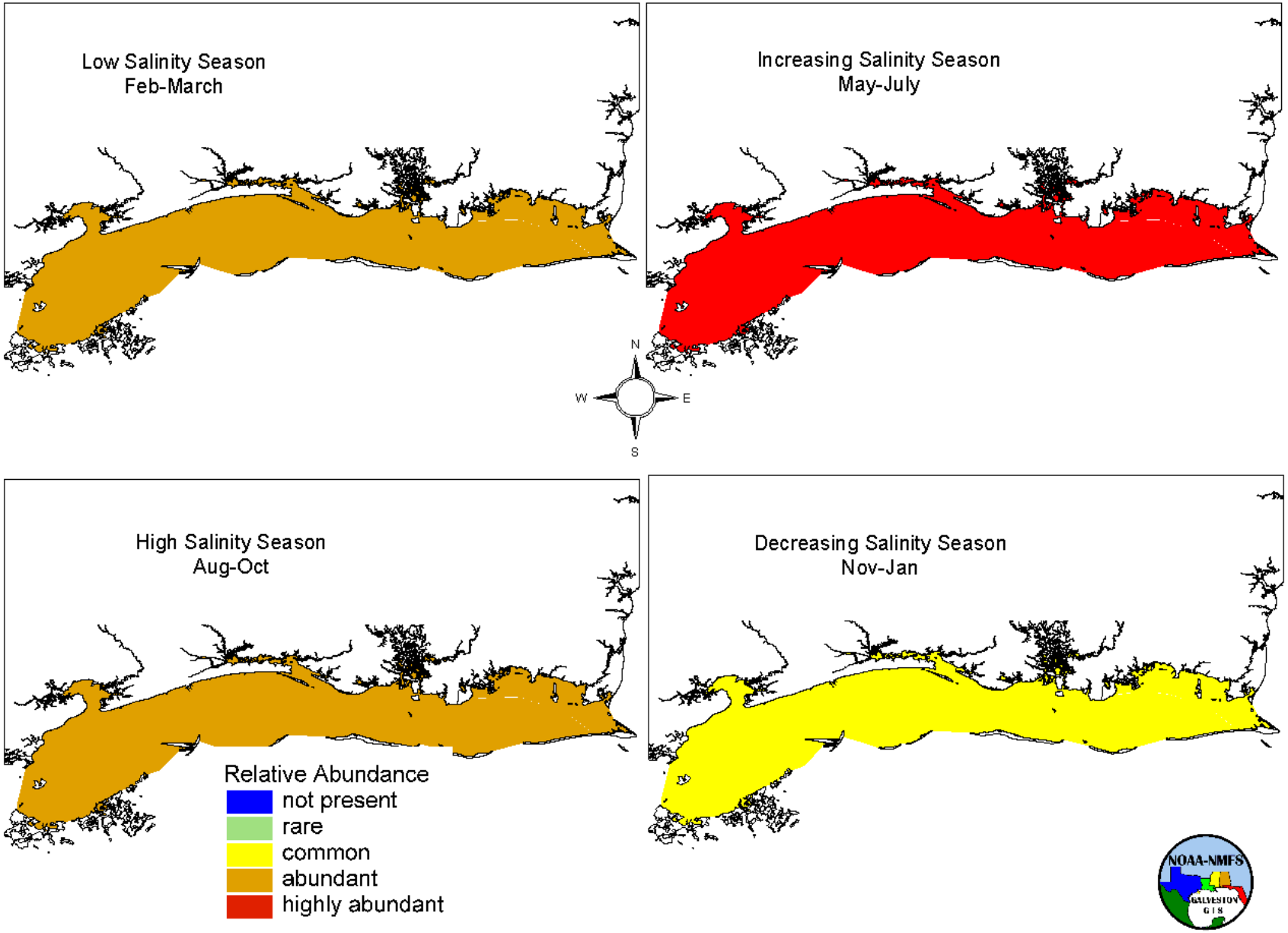
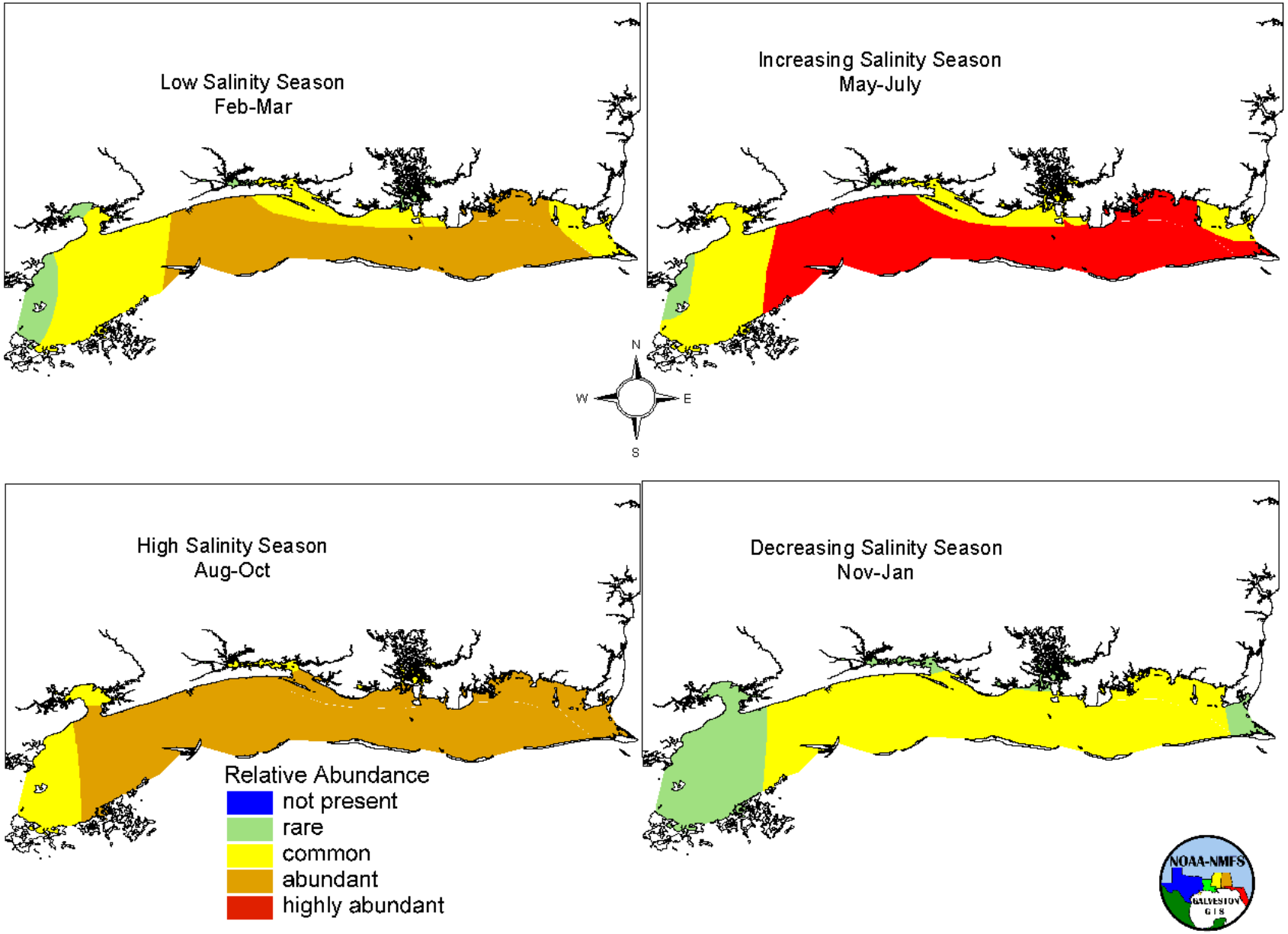
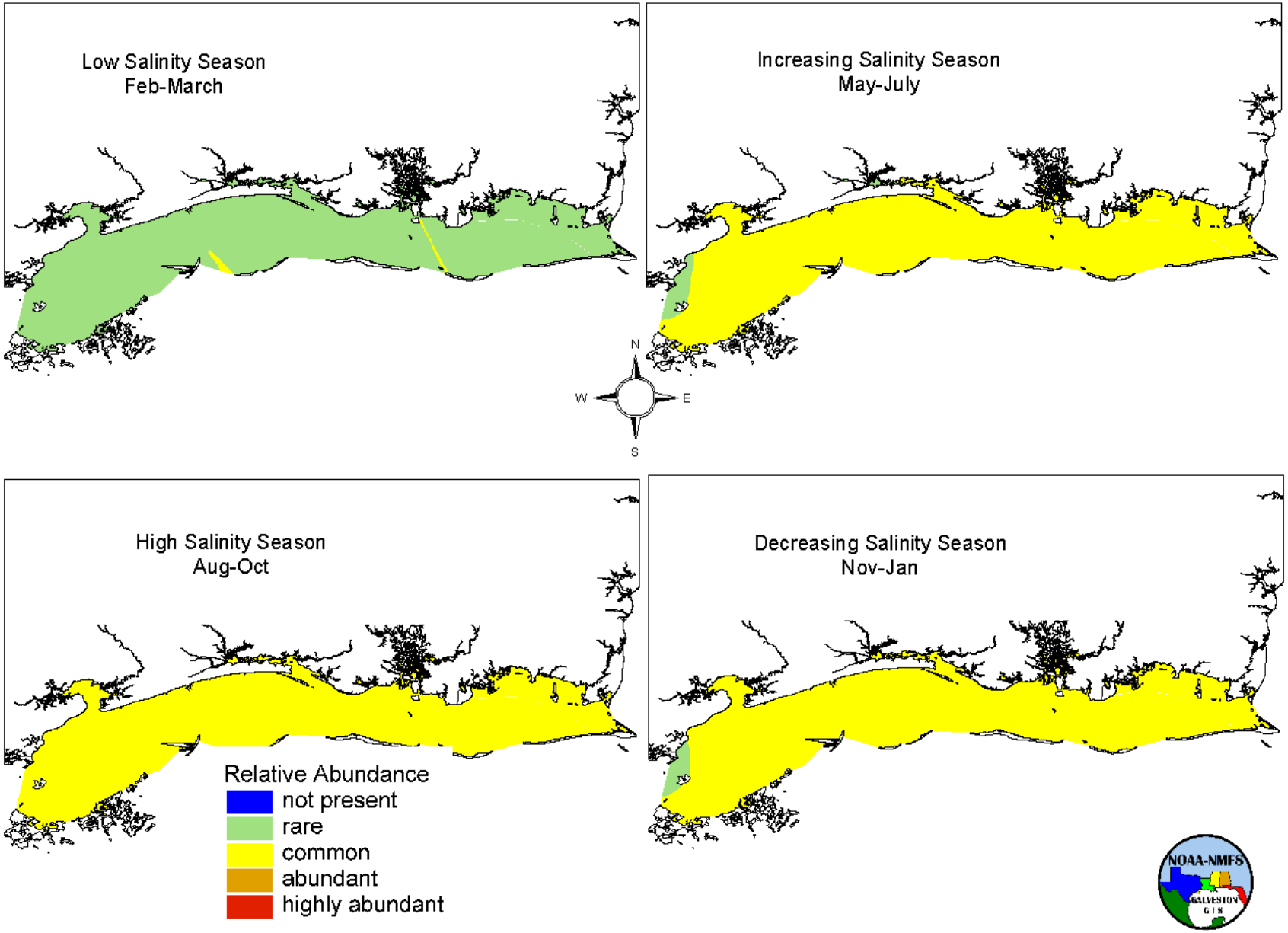

NOAA-NMFS
N
W
E
S
Relative abundance
Not present
Rare
Common
Abundant
Highly abundant

Mississippi Sound, MS | Brown Shrimp, *Penaeus aztecus* | Juveniles

EFH Mapping, NMFS Galveston Lab | http://galveston.ssp.nmfs.gov/efh | July, 1998

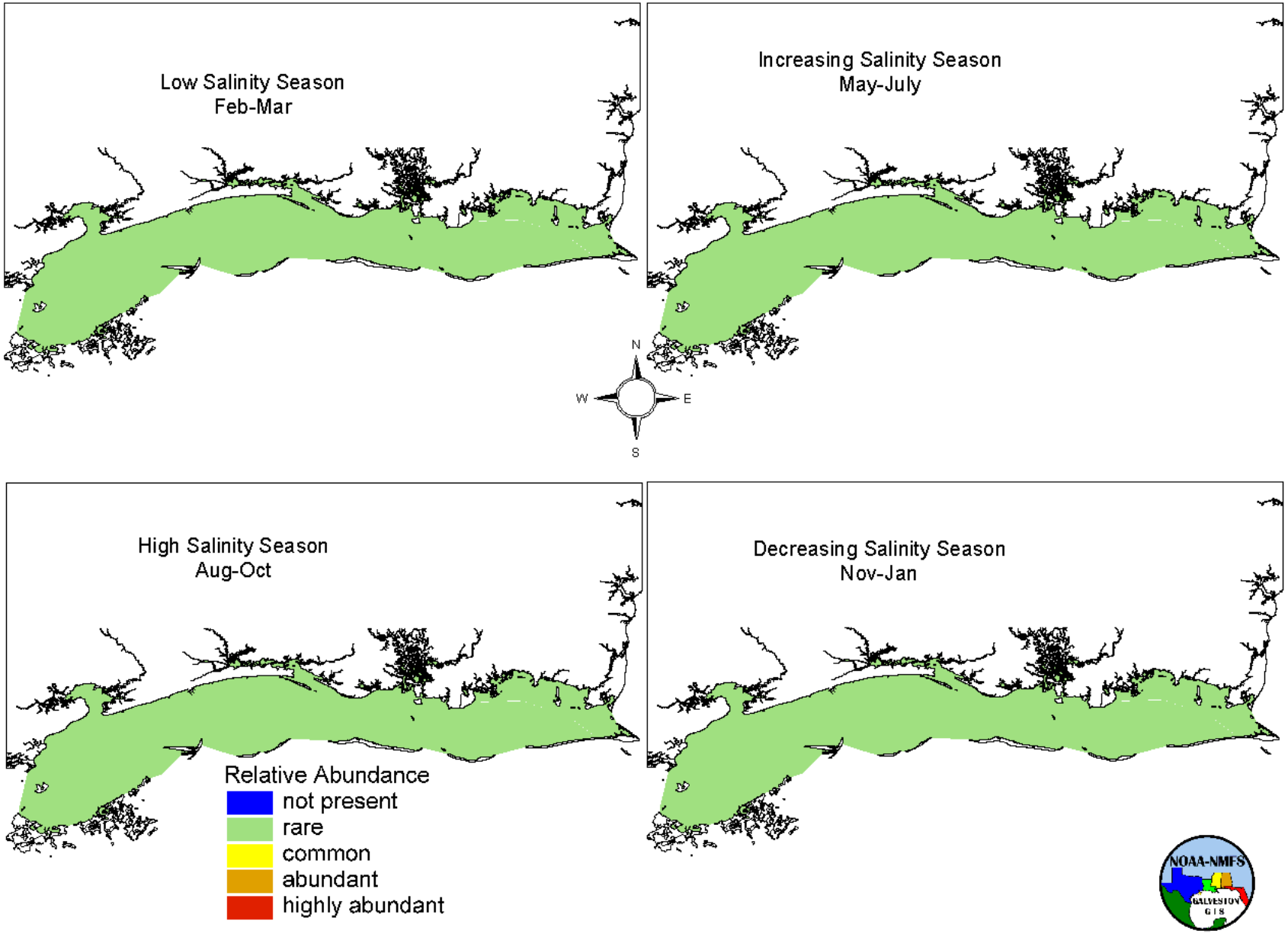



Low Salinity Season
Feb-Mar
Increasing Salinity Season
May-July
High Salinity Season
Aug-Oct
Decreasing Salinity Season
Nov-Jan
N
W
E
S
Relative Abundance
not present
rare
common
abundant
highly abundant
NOAA-NMFS
GALVESTON
GIS


Low Salinity Season
Feb-March
Increasing Salinity Season
May-July
N
W
E
S
High Salinity Season
Aug-Oct
Decreasing Salinity Season
Nov-Jan
Relative Abundance
not present
rare
common
abundant
highly abundant
NOAA-NMFS
GALVESTON
GIS

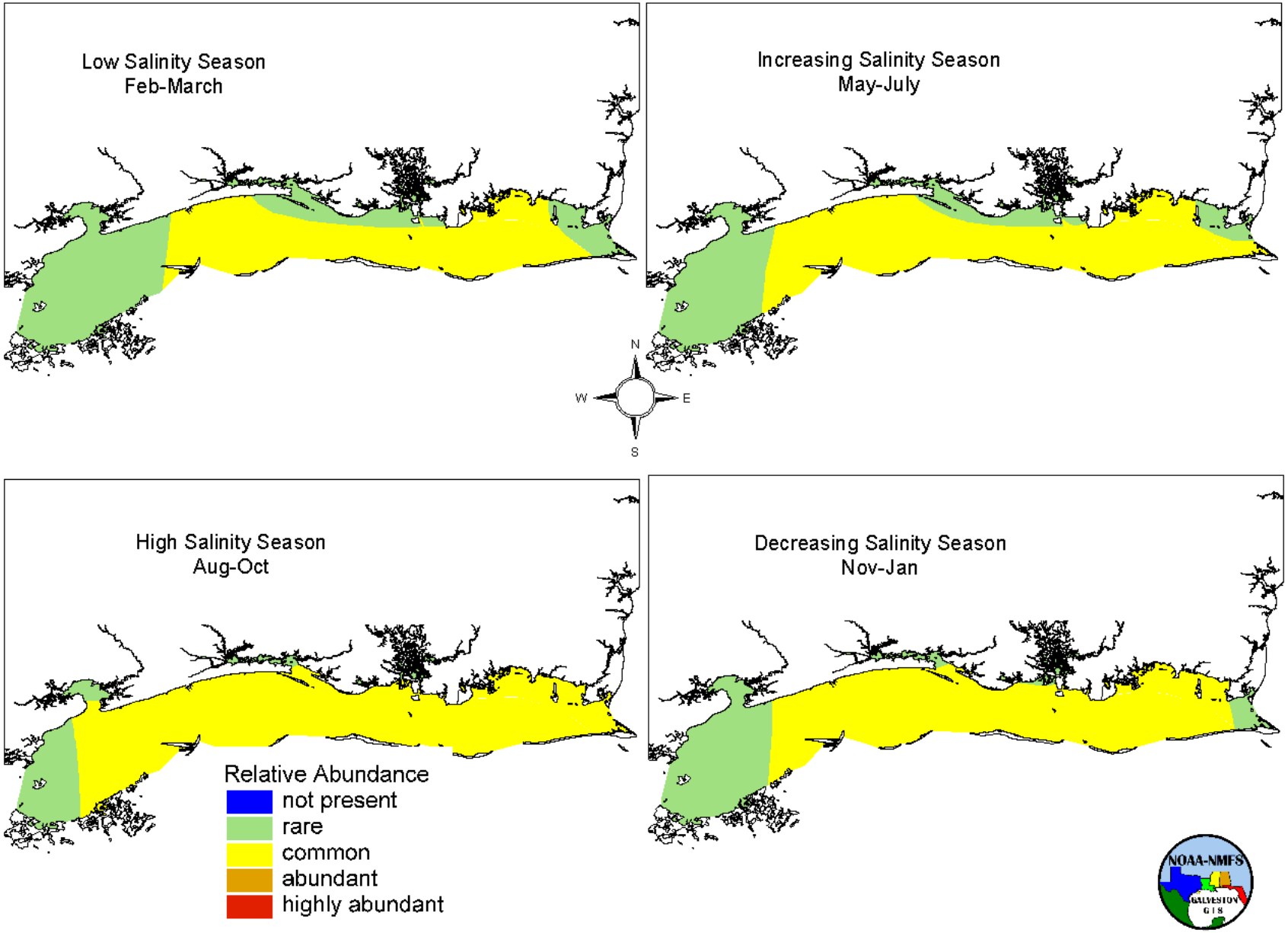
Mississippi Sound, MS | Gray Snapper, *Lutjanus griseus* | Adults

EFH Mapping, NMFS Galveston Lab | http://galveston.ssp.nmfs.gov/efh | July, 1998



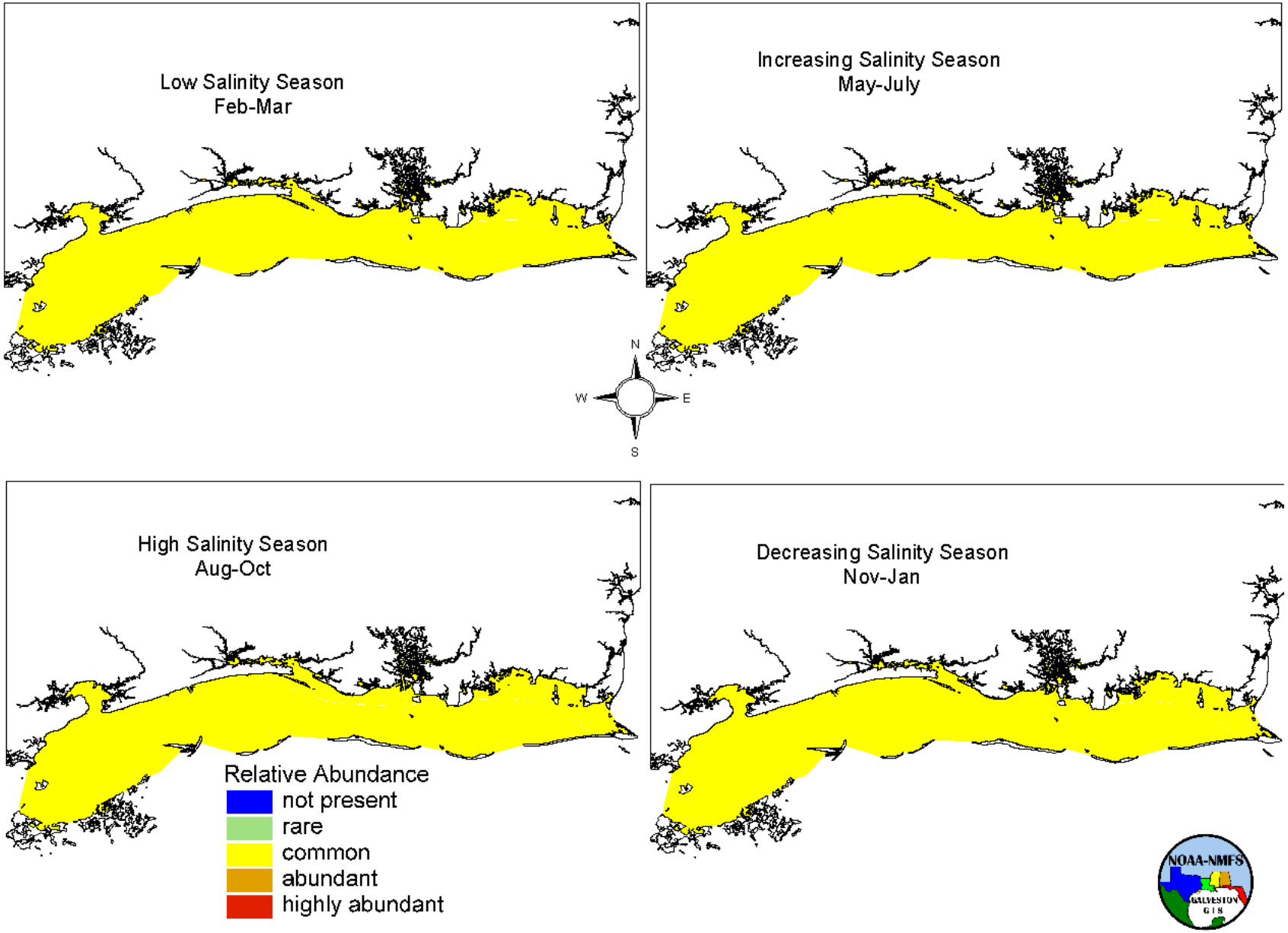
Mississippi Sound, MS | Gulf Stone Crab, *Menippe adina* | Juveniles

EFH Mapping, NMFS Galveston Lab | http://galveston.ssp.nmfs.gov/efh | July, 1998



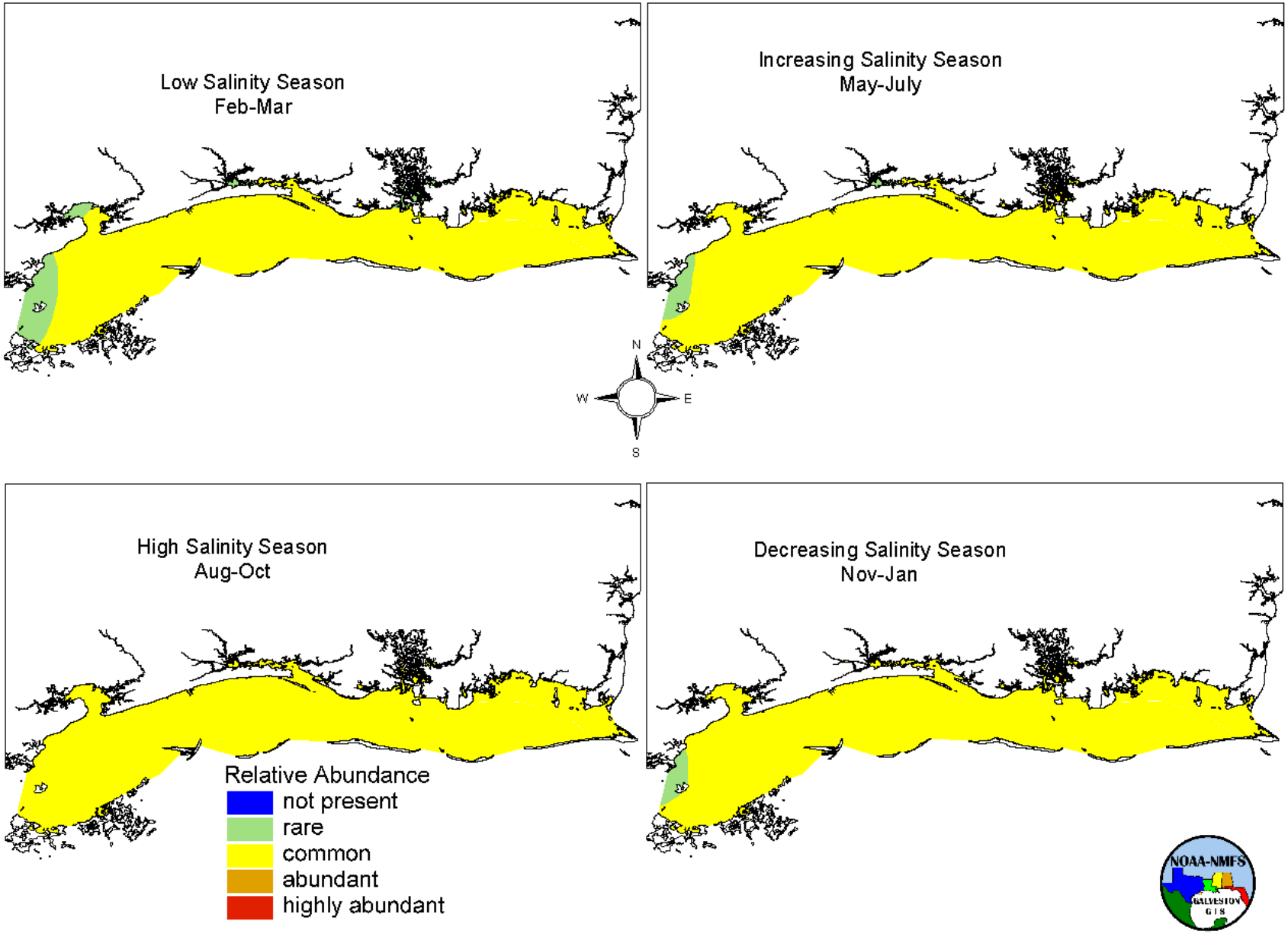
Mississippi Sound, MS | Gulf Stone Crab, *Menippe adina* | Adults

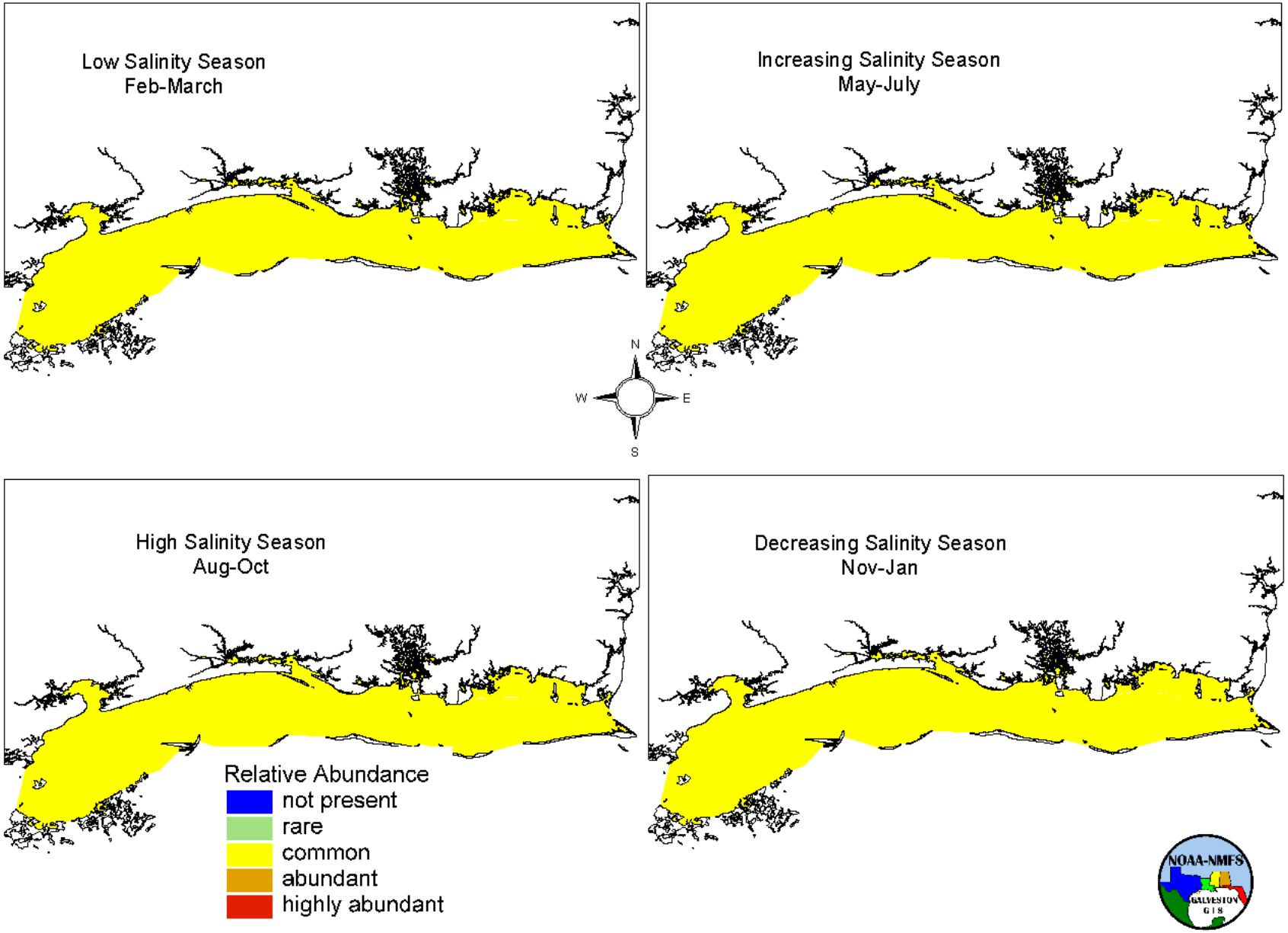
EFH Mapping, NMFS Galveston Lab | http://galveston.ssp.nmfs.gov/efh | July, 1998

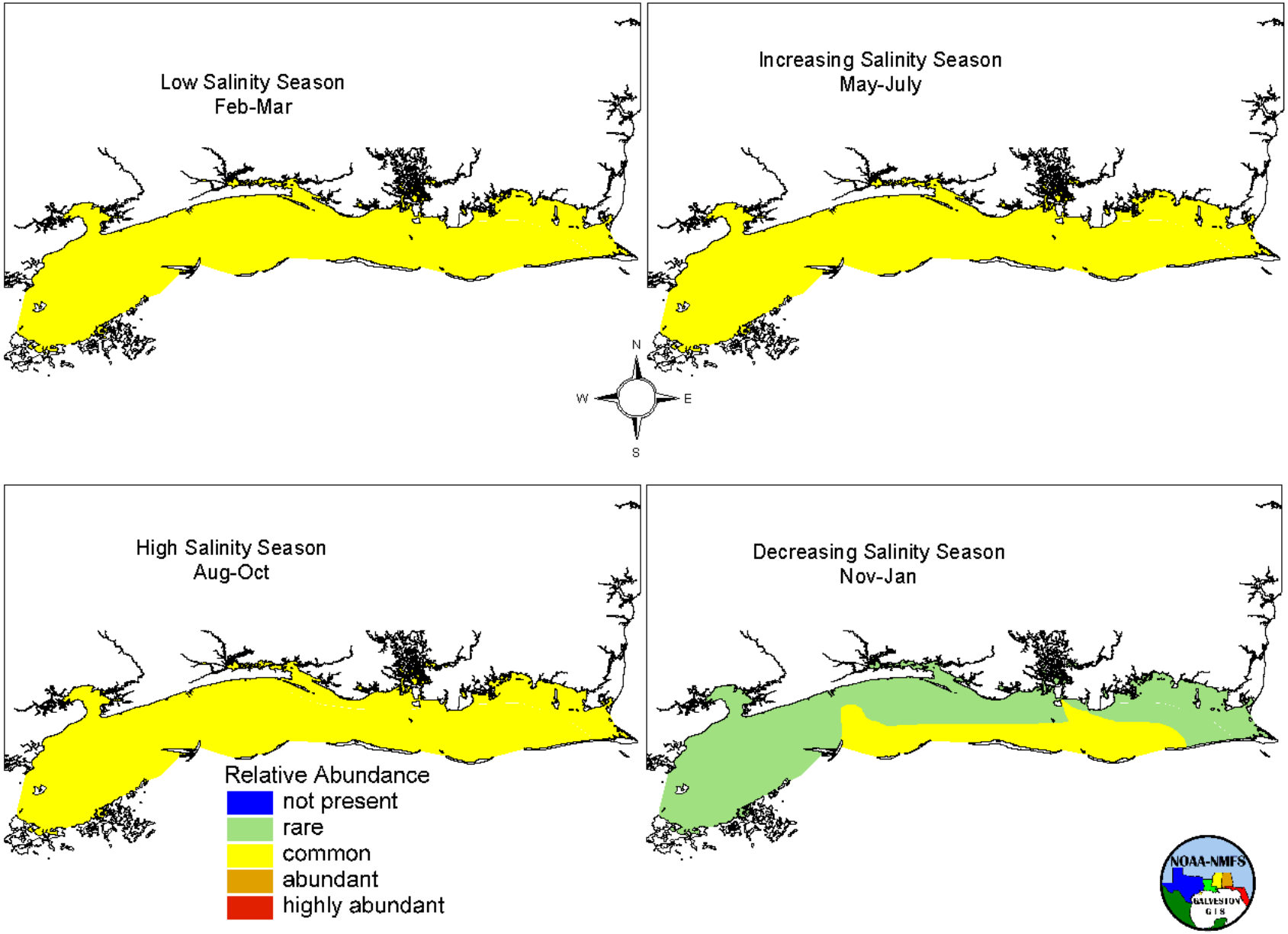


Mississippi Sound, MS | Pink Shrimp, *Penaeus duorarum* | Adults

EFH Mapping, NMFS Galveston Lab | http://galveston.ssp.nmfs.gov/efh | July, 1998




Low Salinity Season
Feb-March
Increasing Salinity Season
May-July
N
W
E
S
High Salinity Season
Aug-Oct
Decreasing Salinity Season
Nov-Jan
Relative Abundance
not present
rare
common
abundant
highly abundant
NOAA-NMFS
GALVESTON
GIS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Relative Abundance
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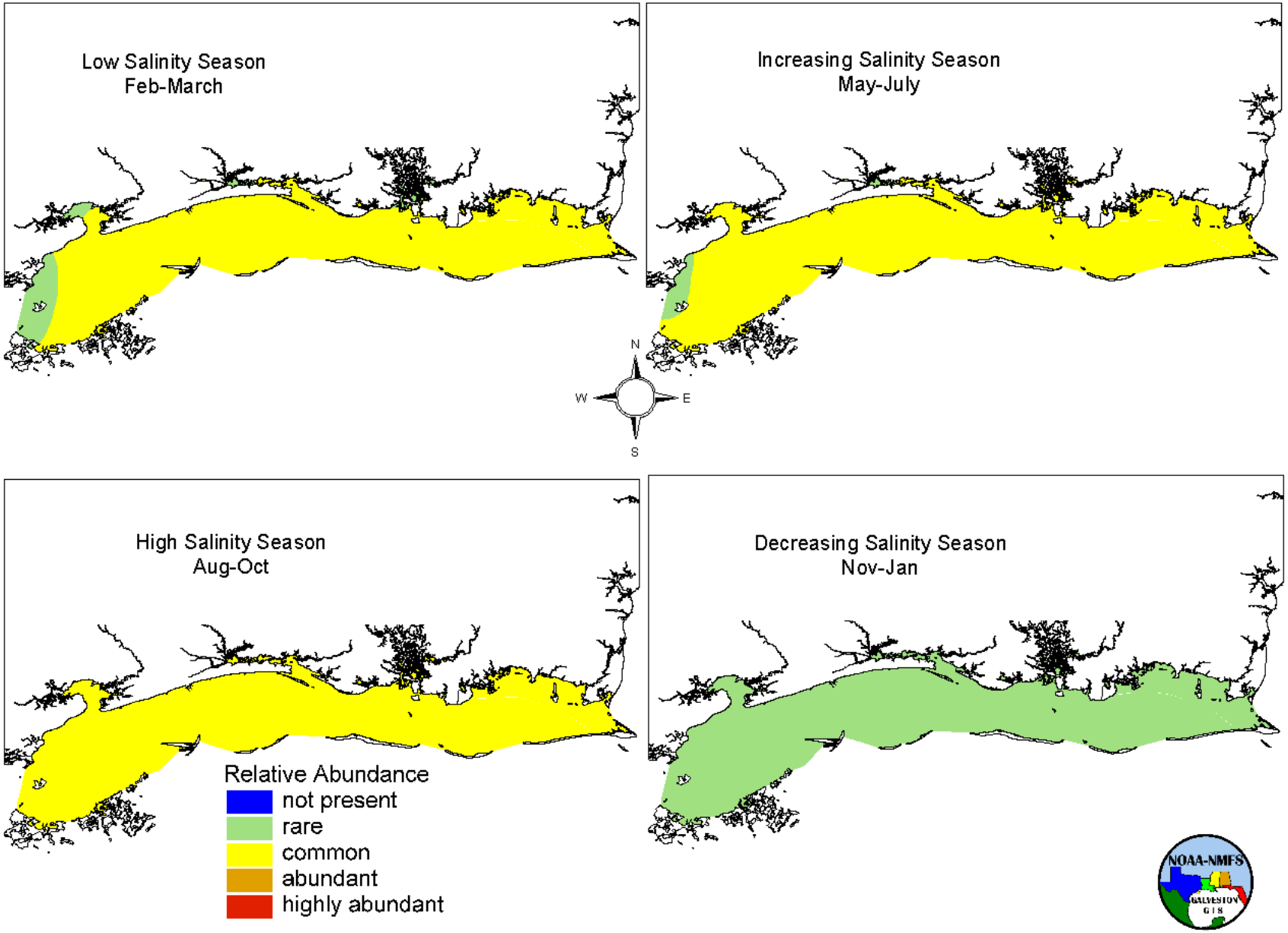
GALVESTON
GIS

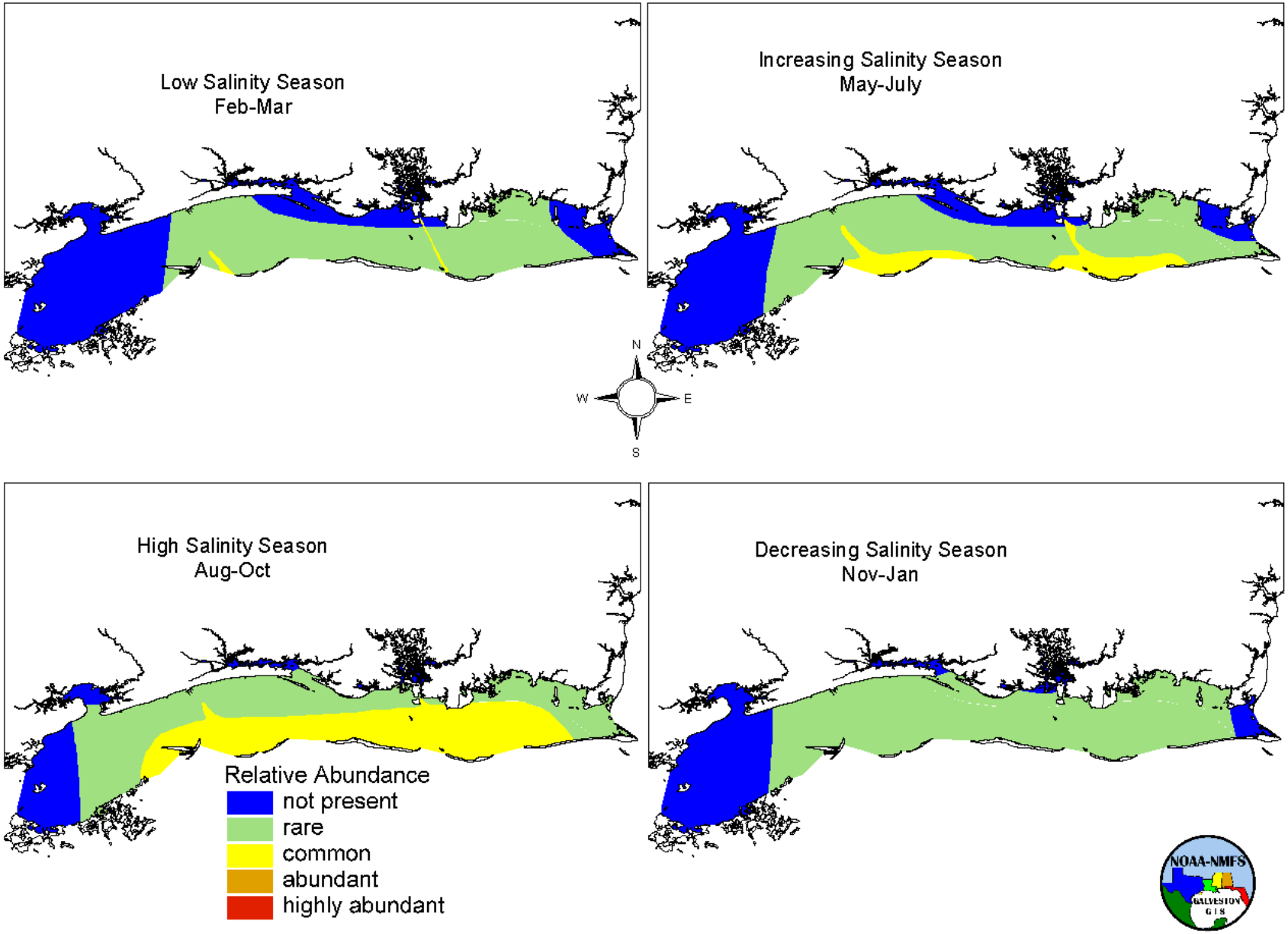
Mississippi Sound, MS | Spanish Mackerel, *Scomberomorus maculatus* | Juveniles

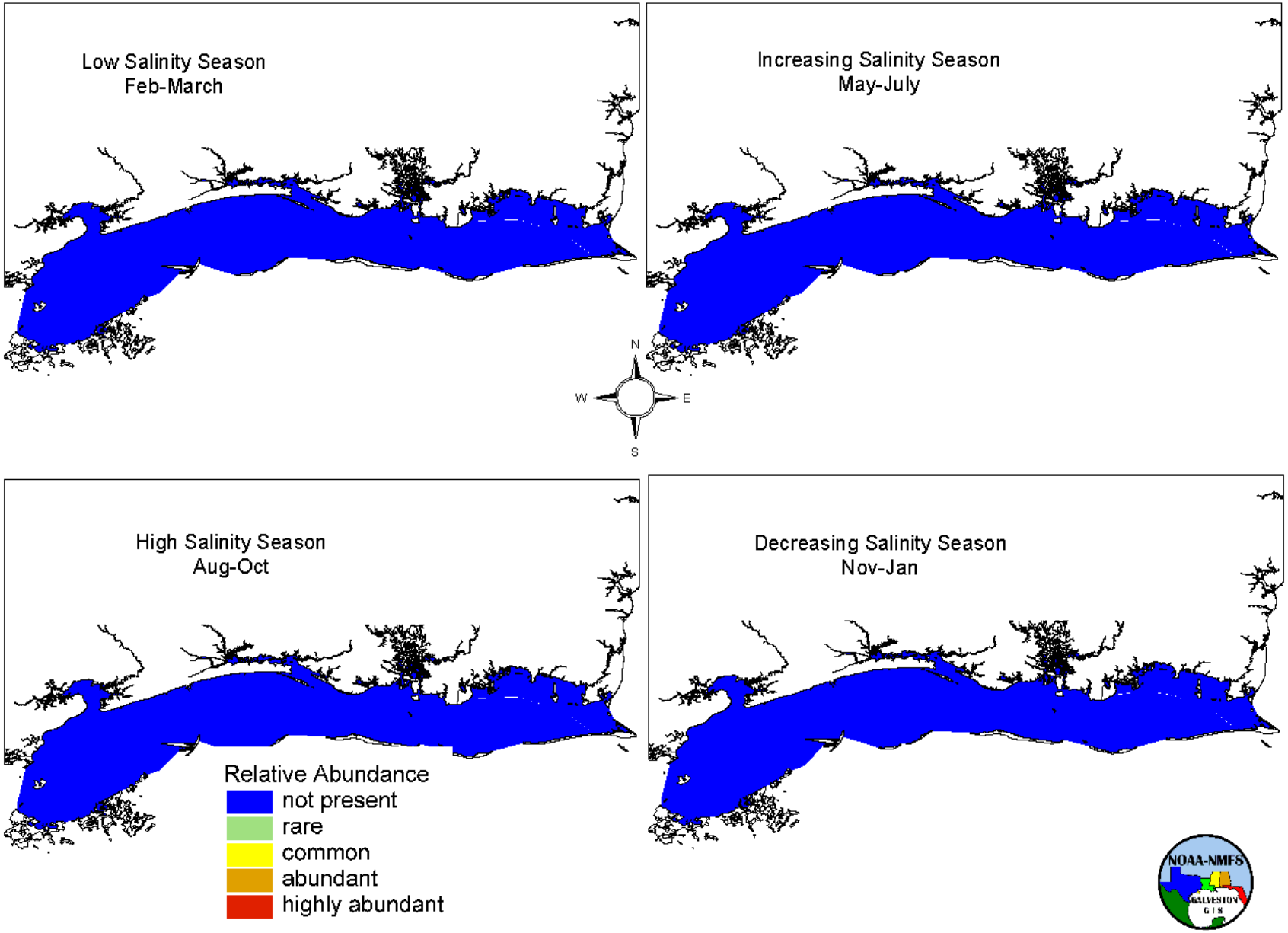
EFH Mapping, NMFS Galveston Lab | http://galveston.ssp.nmfs.gov/efh | July, 1998



Mississippi Sound, MS | Spanish Mackerel, *Scomberomorus maculatus* | Adults

EFH Mapping, NMFS Galveston Lab | http://galveston.ssp.nmfs.gov/efh | July, 1998




Low Salinity Season
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Decreasing Salinity Season
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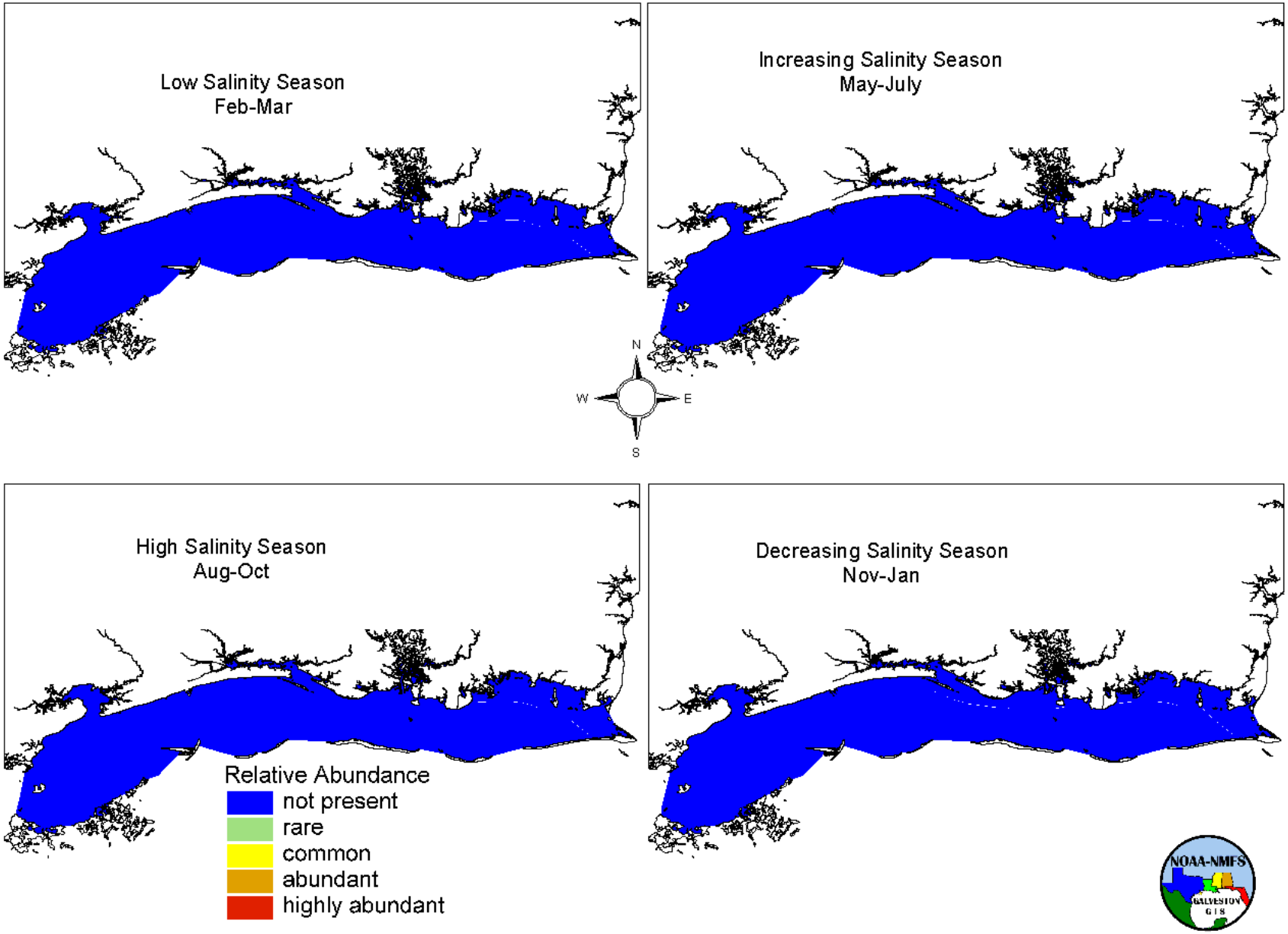
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Relative Abundance
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abundant
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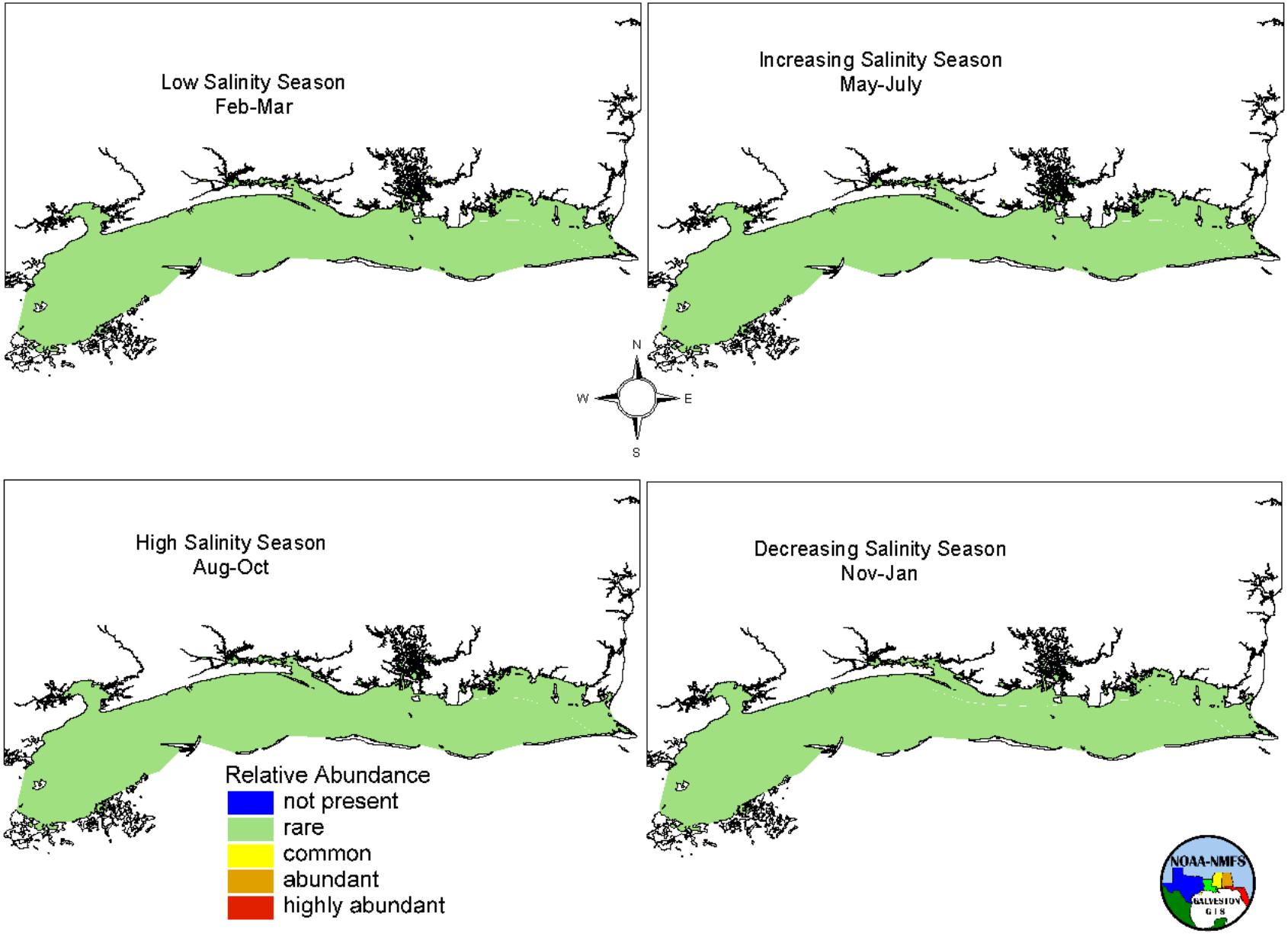
NOAA-NMFS
GALVESTON
GIS

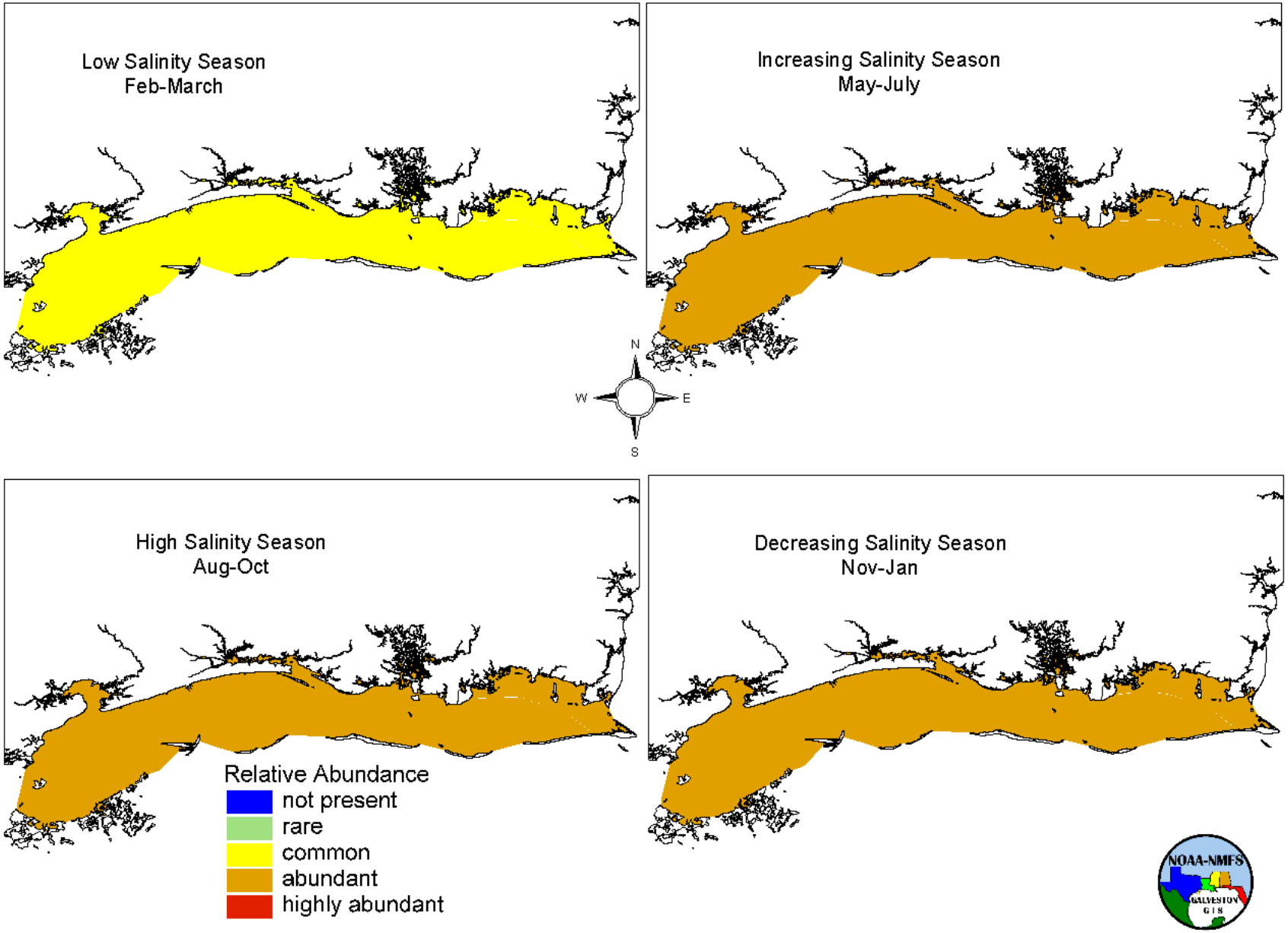
Mississippi Sound, MS | Stone Crab, *Menippe mercenaria* | Adults

EFH Mapping, NMFS Galveston Lab | http://galveston.ssp.nmfs.gov/efh | July, 1998



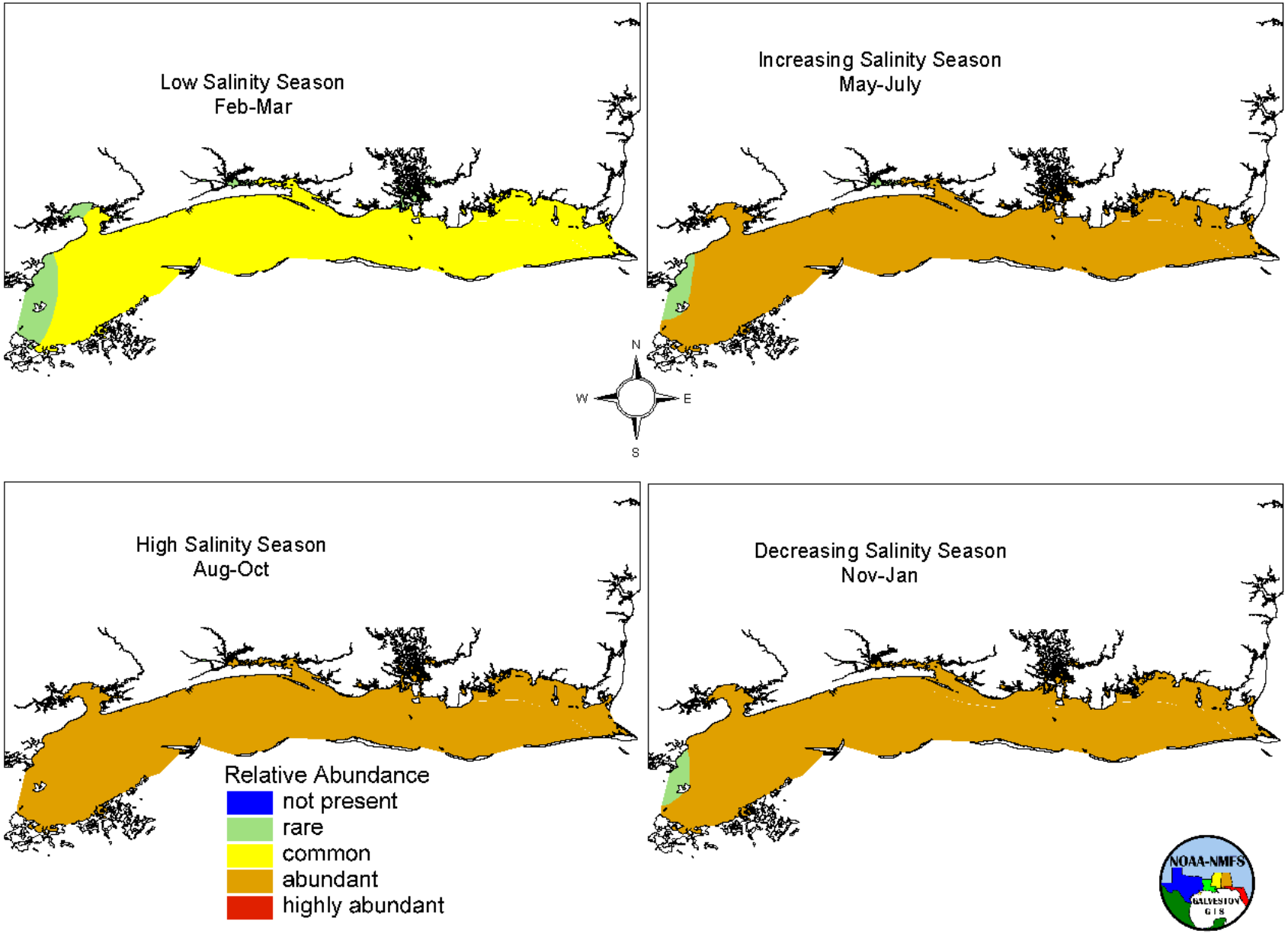
Mississippi Sound, MS | White Shrimp, *Penaeus setiferus* | Juveniles

EFH Mapping, NMFS Galveston Lab | http://galveston.ssp.nmfs.gov/efh | July, 1998



Mississippi Sound, MS | White Shrimp, *Penaeus setiferus* | Adults

EFH Mapping, NMFS Galveston Lab | http://galveston.ssp.nmfs.gov/efh | July, 1998



Appendix K

Agency Correspondences

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Principal Chief Perry Beaver
Muscogee (Creek) Nation of Oklahoma
Post Office Box 580
Okmulgee, Oklahoma 74447

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

The USACE, with support from Tetra Tech, Inc. is preparing an Environmental Impact Statement (EIS) for a proposal to implement a trends analysis methodology to evaluate large-scale development permit applications in coastal Mississippi.

This is a U.S. Army Corps of Engineers (USACE) EIS undertaken in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), *Council of Environmental Quality Regulations Implementing Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508), and USACE regulations for implementing NEPA (33 CFR Parts 230 and 325). It is being prepared to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with permit applications for large-scale development projects in coastal Mississippi. During the past eight years, acting under its regulatory program authorities, the USACE has evaluated applications and issued several permits for gaming casinos and other large-scale development projects. In the permitting process, consideration of potential environmental effects has traditionally focused on the direct and indirect effects of individual projects. More recently, because of a growing concern over the secondary effects of induced growth and the incremental loss of sensitive resources such as wetlands and other coastal habitats, there has been a growing call for an improved understanding and consideration of the cumulative effects of all permits issued, as well as those of other, unrelated regional development activities.

The scope of this EIS is twofold: (1). to produce a comprehensive analysis of recent and reasonably foreseeable development trends and environmental conditions, and (2). to consider

environmental impact evaluations associated with future permit applications for large-scale developments in coastal Mississippi.

The EIS will evaluate a proposed action, i.e., development and implementation of a special-purpose permit evaluation methodology that the Corps would be authorized to implement, acting within its statutory authority under Section 10 of the Rivers and Harbors Act of 1899 or Section 404 of the Clean Water Act of 1972. The EIS will evaluate a range of growth scenarios (e.g., smart growth) that are likely to occur in the future as a result of implementing the special-purpose methodology. A no action alternative will also be evaluated. Under the no action alternative, the USACE would not develop and implement the proposed methodology using the trends analysis. USACE would instead continue to perform cumulative effects analysis for permits on an ad hoc basis.

In addition to the EIS, a trends analysis is being conducted. The trends analysis is a critical component of the special-purpose methodology being evaluated as part of the proposed action. The analysis will evaluate regional cumulative effects associated with historical (1992 to present) and potential future growth (present to 2020) in the region. The results of the trends analysis will be used as the basis for assessing the environmental consequences of each alternative and growth scenario evaluated in the EIS.

In accordance with the National Environmental Policy Act and Section 106 of the National Historic Preservation Act of 1966, as amended, Tetra Tech, Inc., is assessing the potential effects that implementation of the proposed action might have on cultural resources. The EIS will identify, evaluate, and document the environmental, cultural, and socioeconomic effects of implementing the proposed action, including a discussion of cultural resources within the project area and an evaluation of the potential effects to cultural resources within the project area.

The project area includes portions of three counties, Hancock, Harrison, and Jackson. The southern limit of the study area is the state boundary between Mississippi and Louisiana, and includes the Mississippi Sound, as well as Cat, Ship, Horn, and Deer Islands. A map (Figure 1) is attached that shows the project area.

The purpose of this correspondence is to formally request a list of any Native American properties or sacred sites, or other issues of concern that are known to occur, or could potentially occur within the project area.

I would also like to know whether there are any other sensitive natural resources that should be considered during the development of the EIS.

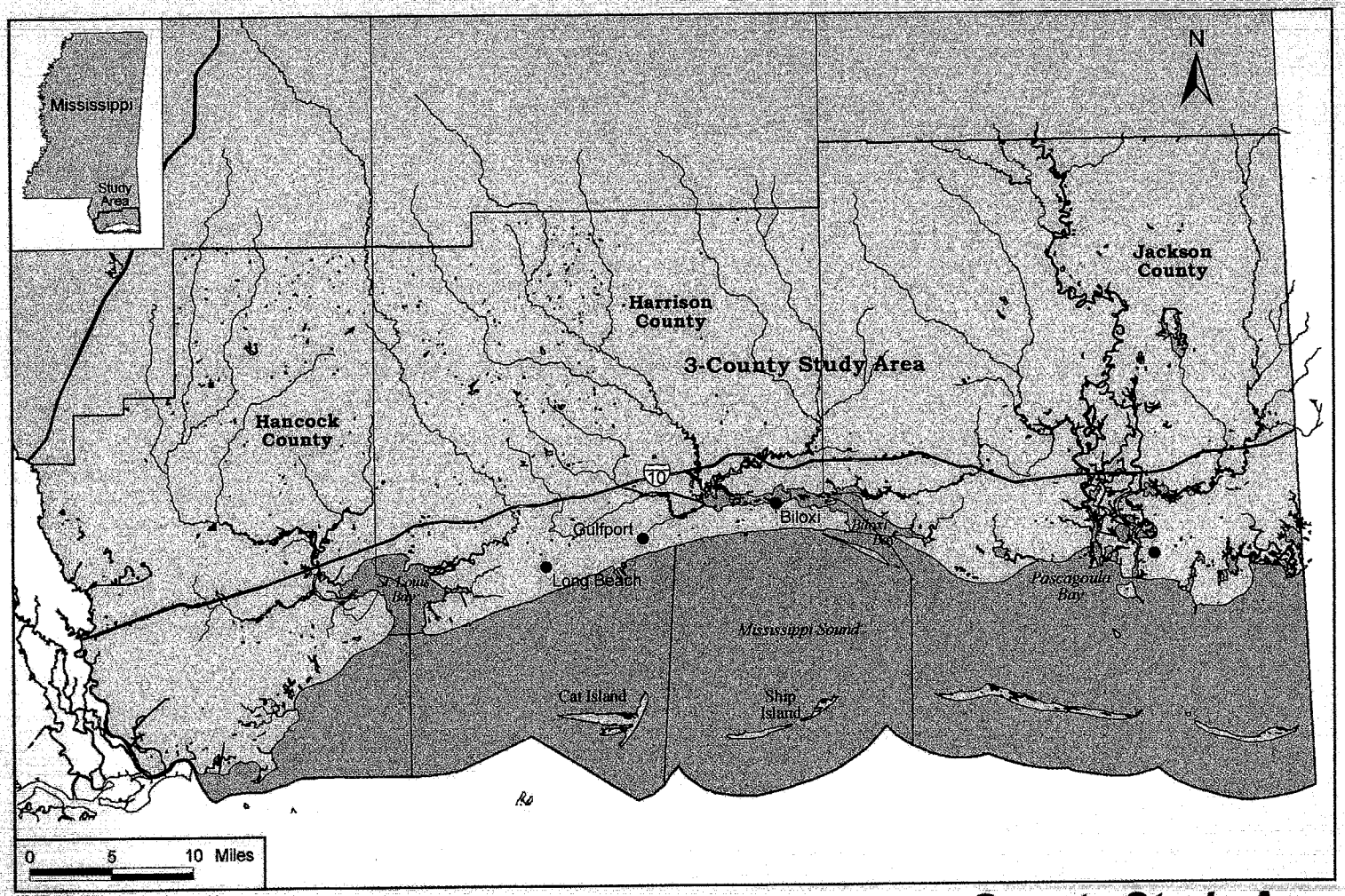
If you have any questions or require additional information, please call (251) 694-4141 or e-mail me at Susan I. Rees@sam.usace.army.mil.

Sincerely,

Susan Ivester Rees, Ph.D
EIS Program Manager

encl.

PD-EC/Rees/cb/4141
PD-EC/Rees
PD-E/McClellan



LEGEND

- 3-County Study Area
- County Boundary

Source: DMR, 2000.

County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Principal Chief Leon Jones
Eastern Band of the Cherokee Nation
Post Office Box 455
Cherokee, North Carolina 28719

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

The USACE, with support from Tetra Tech, Inc. is preparing an Environmental Impact Statement (EIS) for a proposal to implement a trends analysis methodology to evaluate large-scale development permit applications in coastal Mississippi.

This is a U.S. Army Corps of Engineers (USACE) EIS undertaken in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), *Council of Environmental Quality Regulations Implementing Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508), and USACE regulations for implementing NEPA (33 CFR Parts 230 and 325). It is being prepared to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with permit applications for large-scale development projects in coastal Mississippi. During the past eight years, acting under its regulatory program authorities, the USACE has evaluated applications and issued several permits for gaming casinos and other large-scale development projects. In the permitting process, consideration of potential environmental effects has traditionally focused on the direct and indirect effects of individual projects. More recently, because of a growing concern over the secondary effects of induced growth and the incremental loss of sensitive resources such as wetlands and other coastal habitats, there has been a growing call for an improved understanding and consideration of the cumulative effects of all permits issued, as well as those of other, unrelated regional development activities.

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Sincerely,

Susan Ivester Rees, Ph.D
EIS Program Manager

encl.

PD-EC/Rees/cb/4141
PD-EC/Rees
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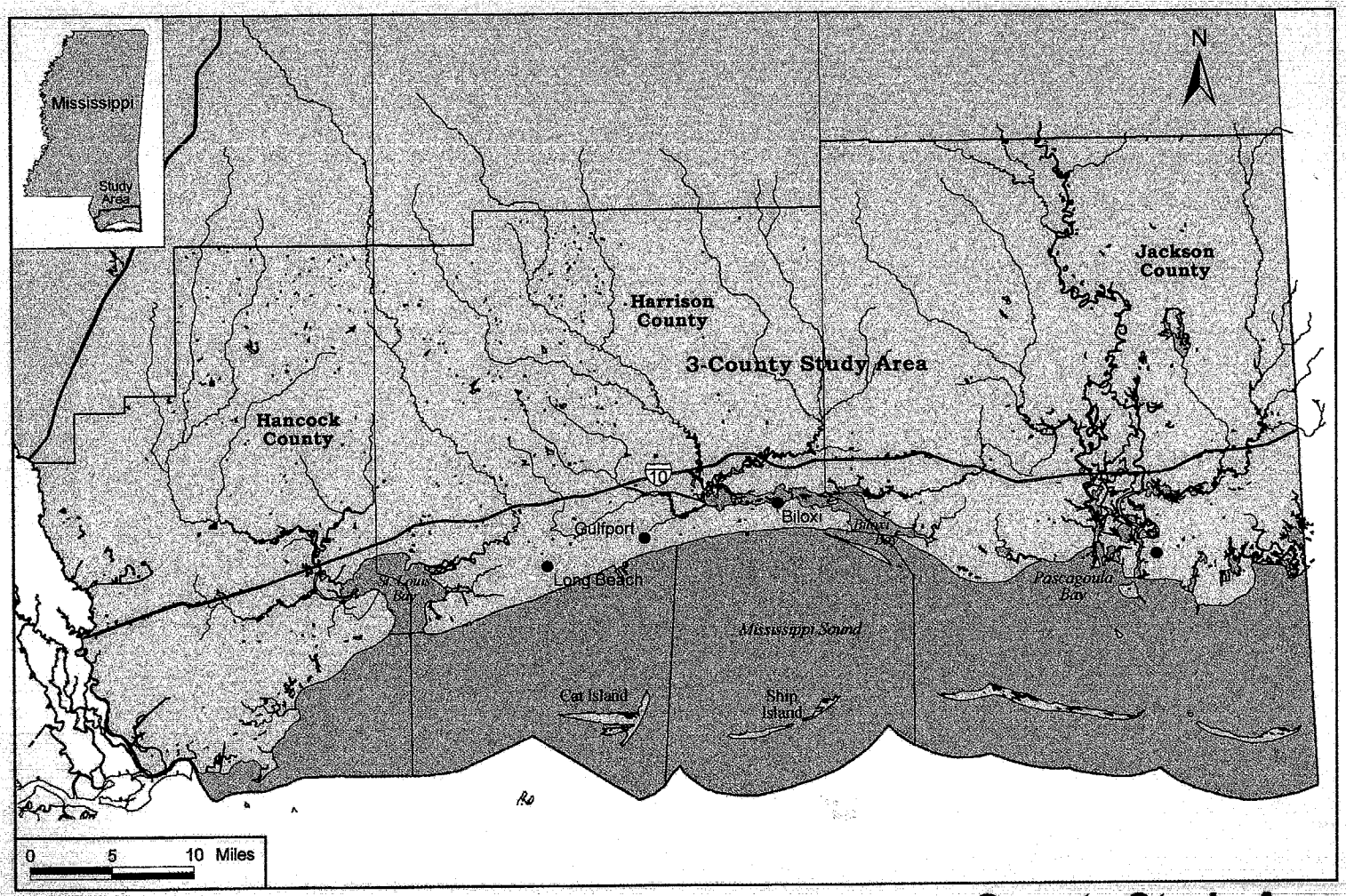

LEGEND

- 3-County Study Area
- County Boundary

Source: DMR, 2000.

County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Chief Gregory E. Pyle
Choctaw Nation of Oklahoma
Post Office Drawer 1210
Durant, Oklahoma 74702

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

The USACE, with support from Tetra Tech, Inc. is preparing an Environmental Impact Statement (EIS) for a proposal to implement a trends analysis methodology to evaluate large-scale development permit applications in coastal Mississippi.

This is a U.S. Army Corps of Engineers (USACE) EIS undertaken in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), *Council of Environmental Quality Regulations Implementing Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508), and USACE regulations for implementing NEPA (33 CFR Parts 230 and 325). It is being prepared to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with permit applications for large-scale development projects in coastal Mississippi. During the past eight years, acting under its regulatory program authorities, the USACE has evaluated applications and issued several permits for gaming casinos and other large-scale development projects. In the permitting process, consideration of potential environmental effects has traditionally focused on the direct and indirect effects of individual projects. More recently, because of a growing concern over the secondary effects of induced growth and the incremental loss of sensitive resources such as wetlands and other coastal habitats, there has been a growing call for an improved understanding and consideration of the cumulative effects of all permits issued, as well as those of other, unrelated regional development activities.

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EIS Program Manager

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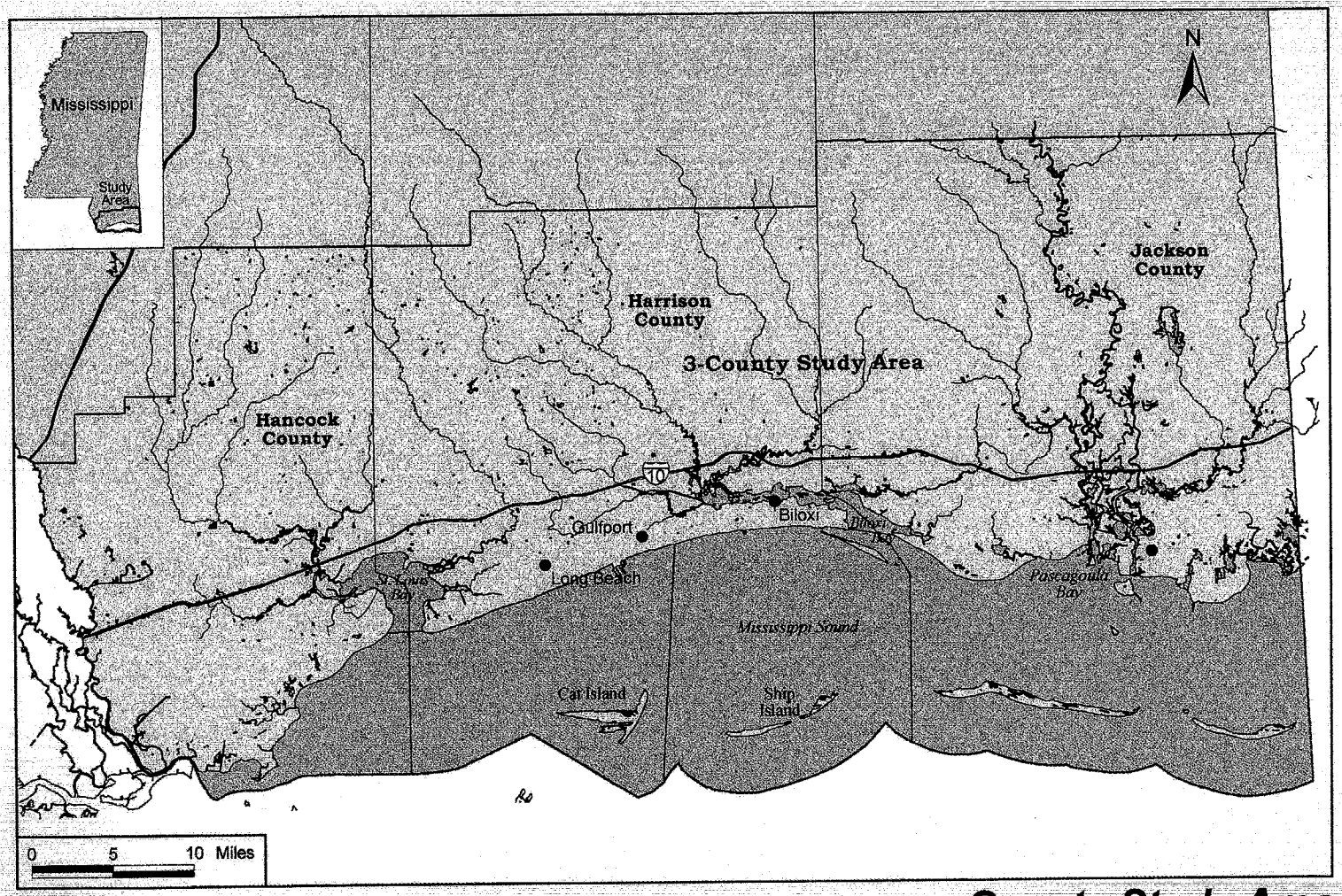
PD-EC/Rees/cb/4141
PD-EC/Rees
PD-E/McClellan



LEGEND

- 3-County Study Area
- County Boundary

Source: DMR, 2000.

County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Chairman Earl J. Barby, Sr
Tunica-Biloxi Tribe of Louisiana
Post Office Box 331
Marksville, LA 71351

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

The USACE, with support from Tetra Tech, Inc. is preparing an Environmental Impact Statement (EIS) for a proposal to implement a trends analysis methodology to evaluate large-scale development permit applications in coastal Mississippi.

This is a U.S. Army Corps of Engineers (USACE) EIS undertaken in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), *Council of Environmental Quality Regulations Implementing Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508), and USACE regulations for implementing NEPA (33 CFR Parts 230 and 325). It is being prepared to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with permit applications for large-scale development projects in coastal Mississippi. During the past eight years, acting under its regulatory program authorities, the USACE has evaluated applications and issued several permits for gaming casinos and other large-scale development projects. In the permitting process, consideration of potential environmental effects has traditionally focused on the direct and indirect effects of individual projects. More recently, because of a growing concern over the secondary effects of induced growth and the incremental loss of sensitive resources such as wetlands and other coastal habitats, there has been a growing call for an improved understanding and consideration of the cumulative effects of all permits issued, as well as those of other, unrelated regional development activities.

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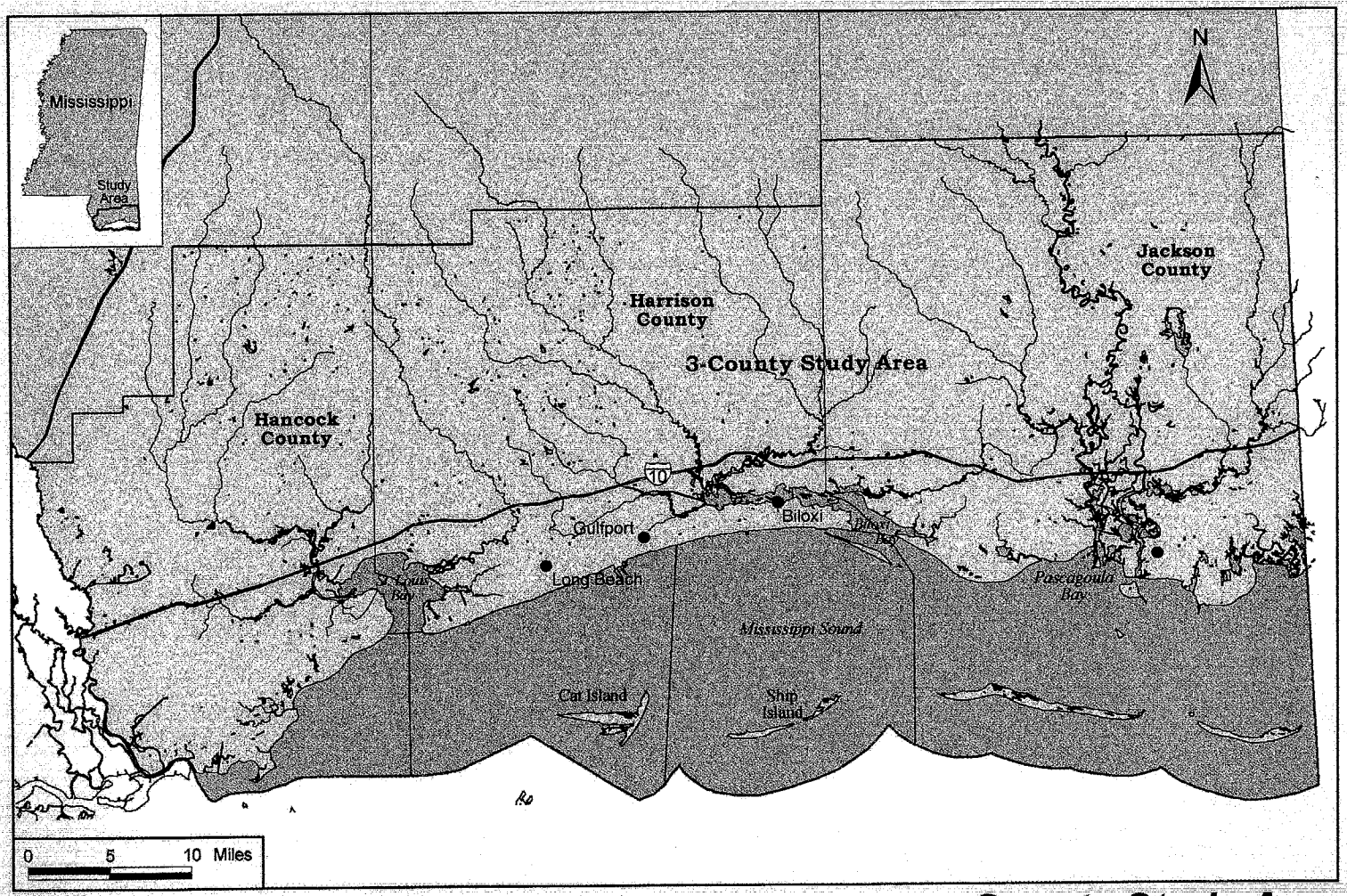
Sincerely,

Susan Ivester Rees, Ph.D
EIS Program Manager

encl.

PD-EC/Rees/cb/4141
PD-EC/Rees
PD-E/McClellan



LEGEND

- 3-County Study Area
- County Boundary

Source: DMR, 2000.

County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Principal Chief Chadwick Smith
Cherokee Nation of Oklahoma
Post Office Box 948
Tahlequah, Oklahoma 74465

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

The USACE, with support from Tetra Tech, Inc. is preparing an Environmental Impact Statement (EIS) for a proposal to implement a trends analysis methodology to evaluate large-scale development permit applications in coastal Mississippi.

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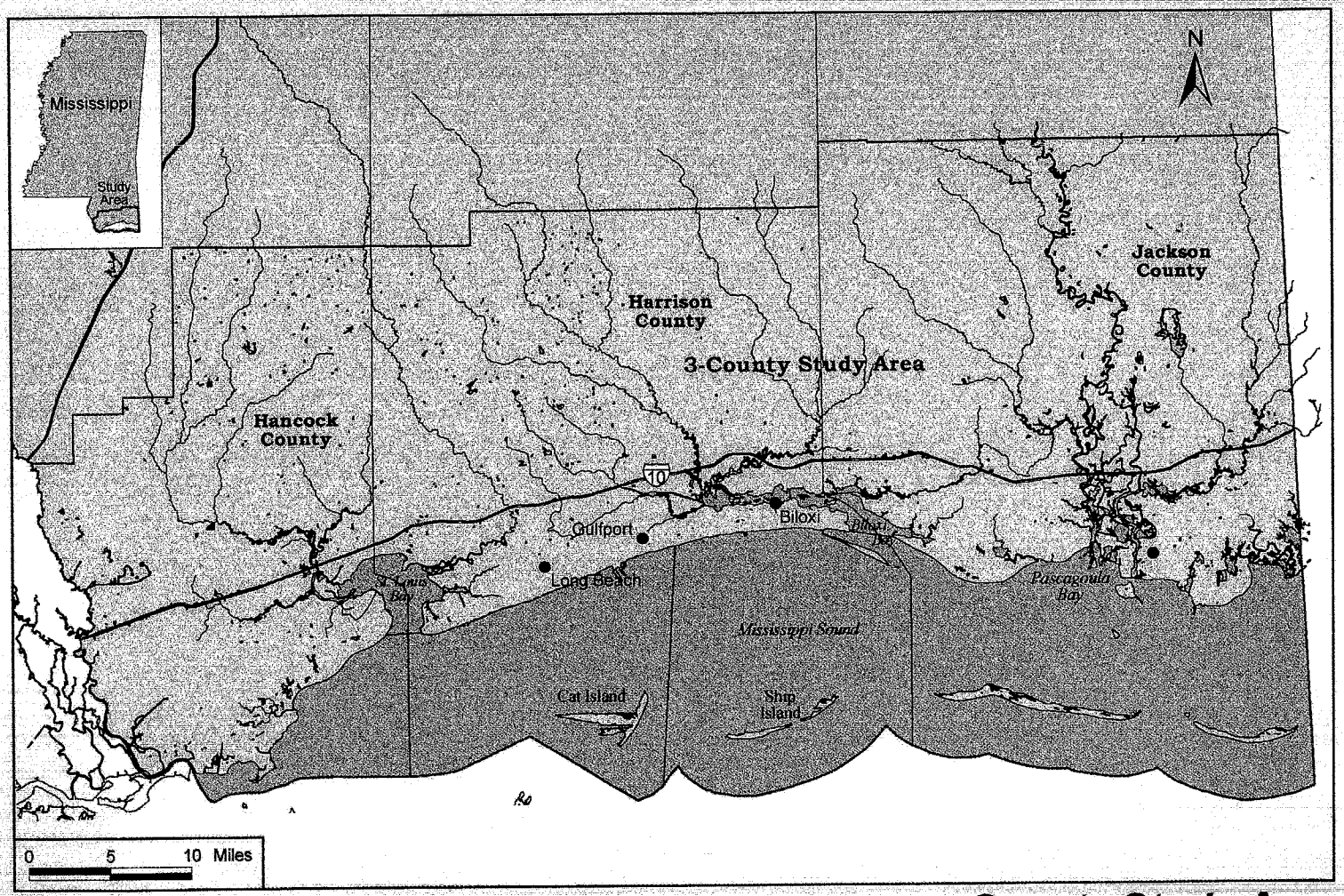
Sincerely,

Susan Ivester Rees, Ph.D
EIS Program Manager

encl.

PD-EC/Rees/cb/4141
PD-EC/Rees
PD-E/McClellan



LEGEND

- 3-County Study Area
- County Boundary

Source: DMR, 2000.

County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Chairman Lovelin Poncho
Coushatta Tribe of Louisiana
Post Office Box 818
Elton, Louisiana 70532

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

The USACE, with support from Tetra Tech, Inc. is preparing an Environmental Impact Statement (EIS) for a proposal to implement a trends analysis methodology to evaluate large-scale development permit applications in coastal Mississippi.

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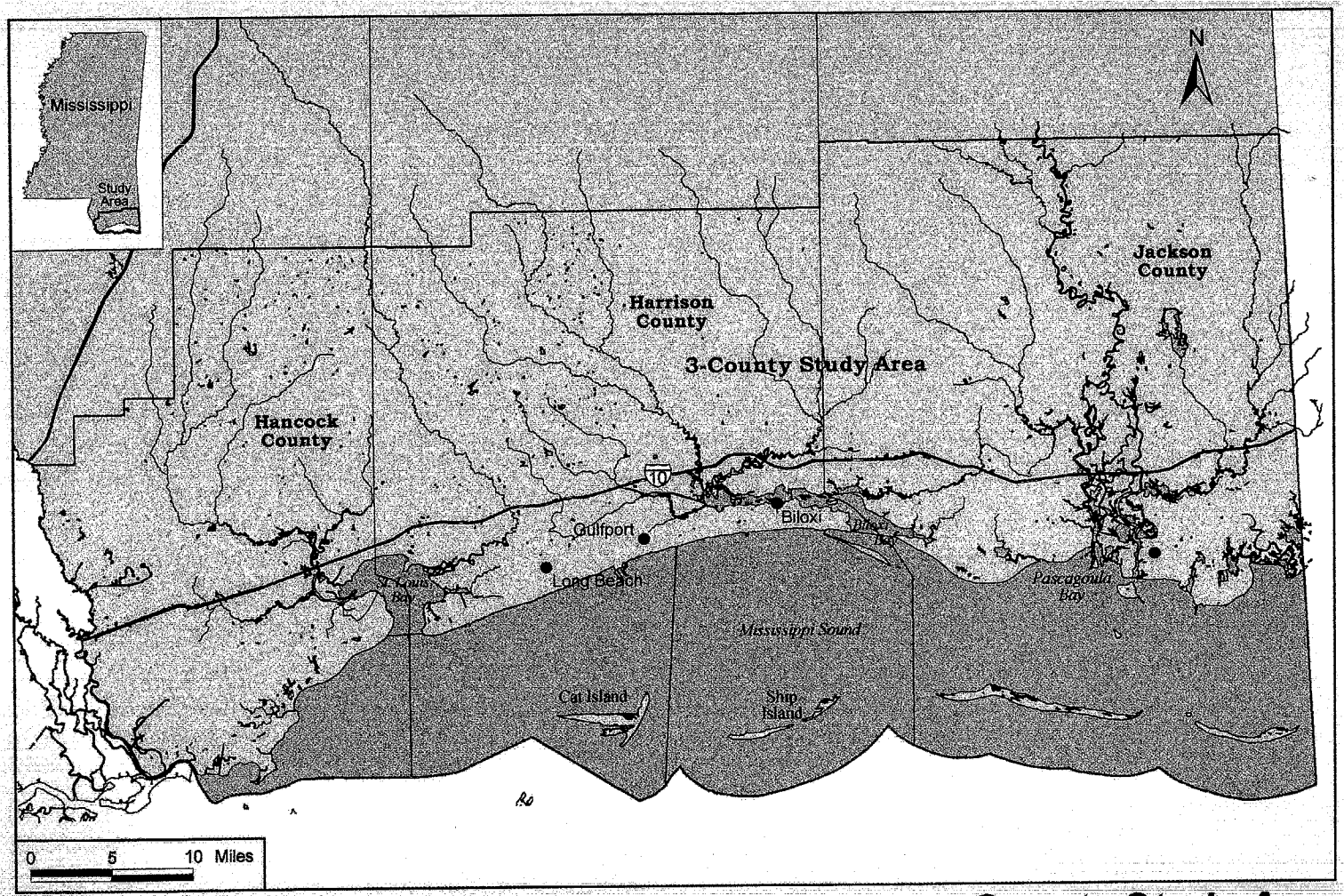

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County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Chief Phillip Martin
Tribal Council of the Mississippi Band
Of Choctaw Indians
Box 6010, Choctaw Branch
Choctaw, Mississippi 39350

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

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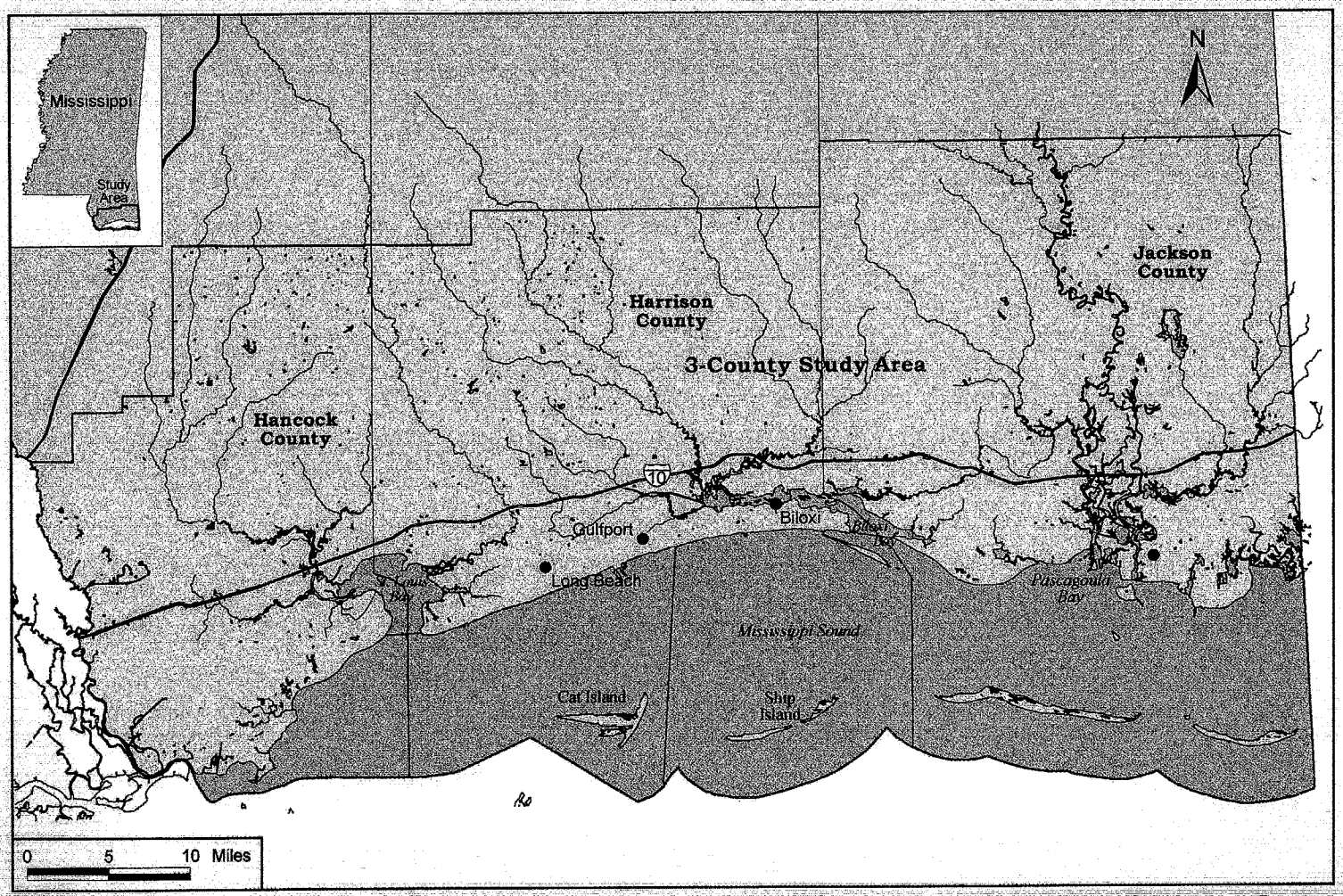

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Mississippi Coastal EIS

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DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Chairman Billy Cypress
Miccosukee Tribe of Indians of Florida
Post Office Box 440021, Tamiami Station
Miami, Florida 33144

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

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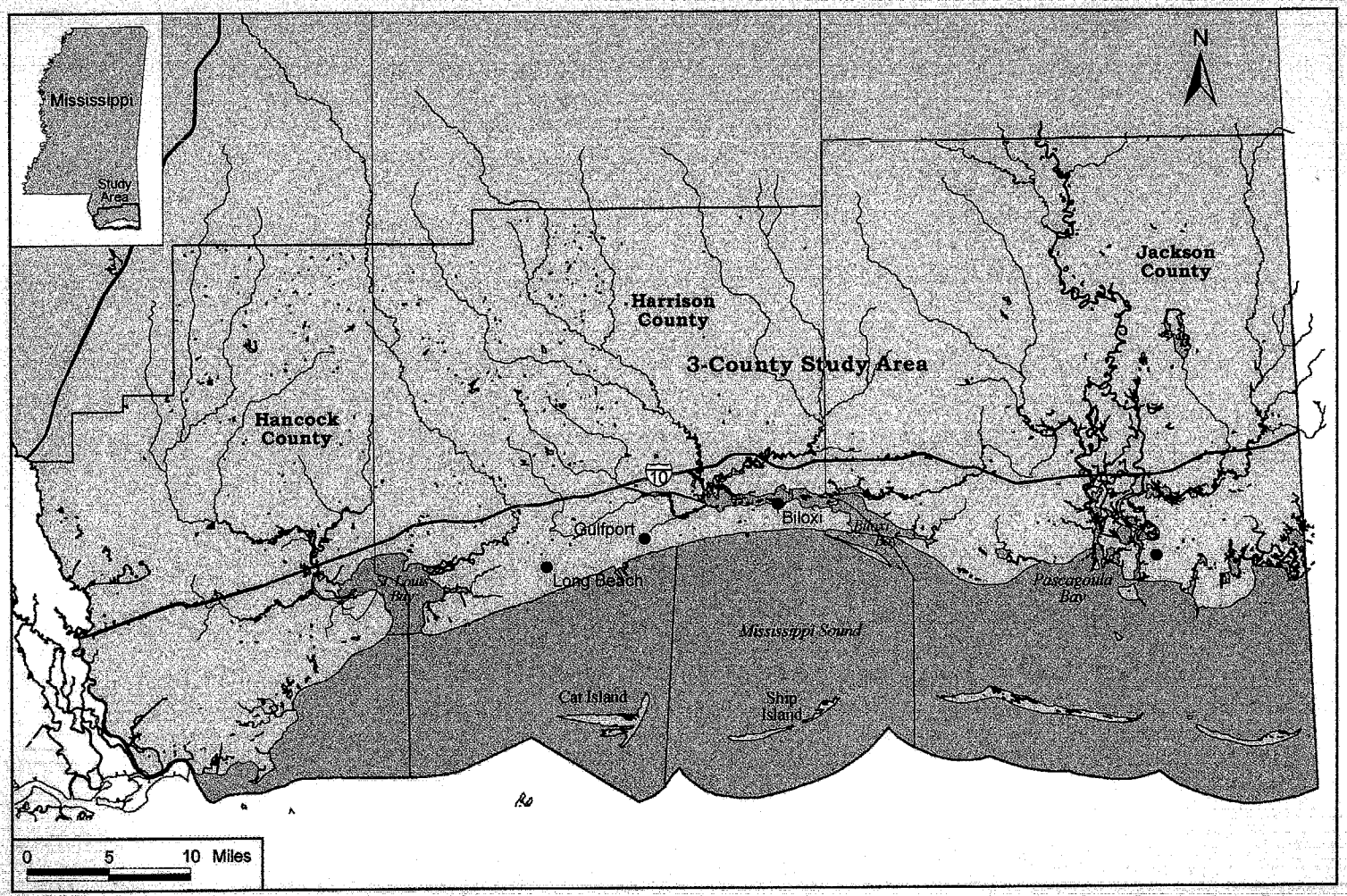

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Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Principal Chief Kenneth Edward Chambers
Seminole Nation of Oklahoma
Post Office Box 1498
Wewoka, Oklahoma 74884

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

The USACE, with support from Tetra Tech, Inc. is preparing an Environmental Impact Statement (EIS) for a proposal to implement a trends analysis methodology to evaluate large-scale development permit applications in coastal Mississippi.

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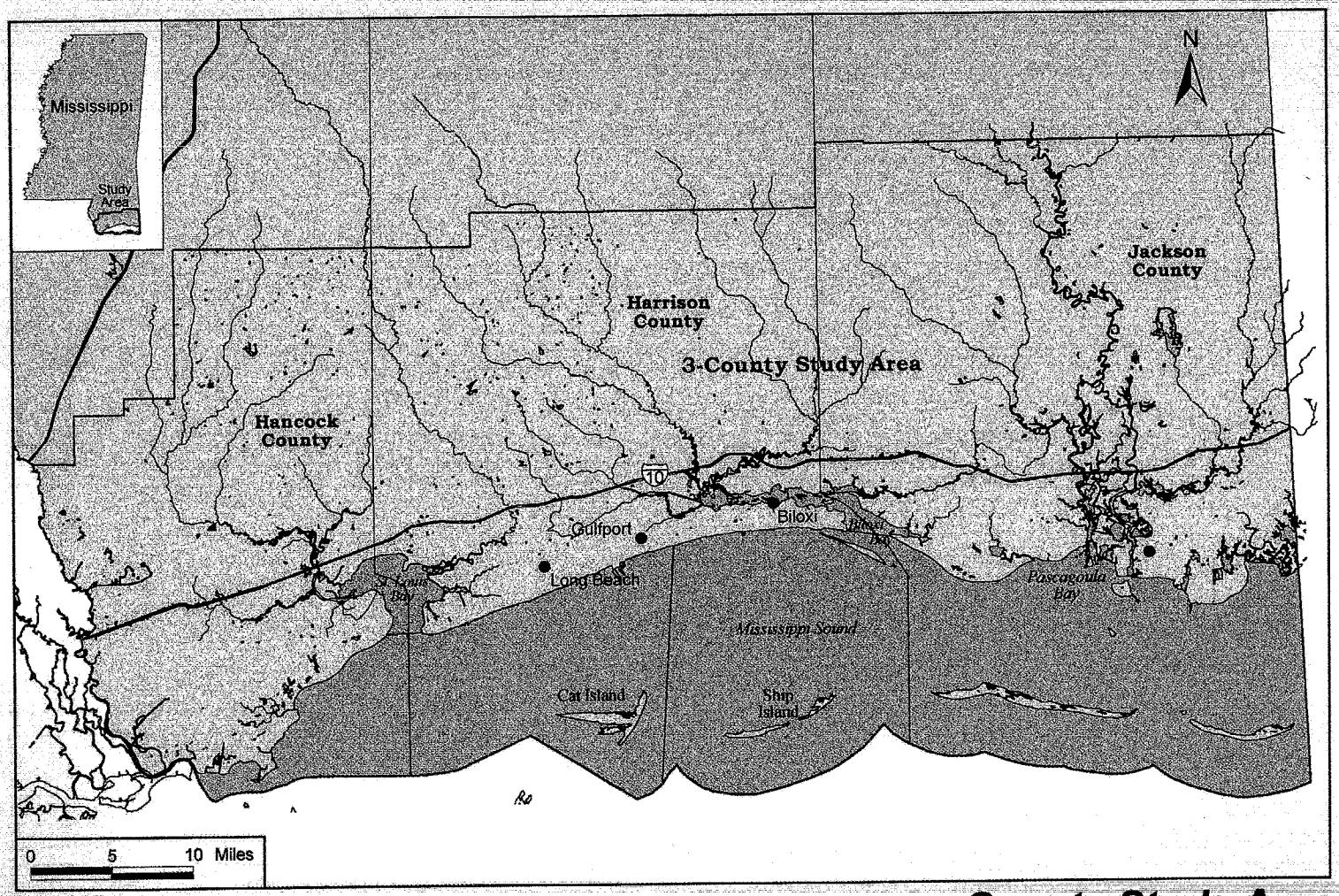

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DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Acting Chairman/President Mitchell Cypress
Seminole Traibe of Florida
6300 Stirling Road
Hollywood, Florida 33024

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

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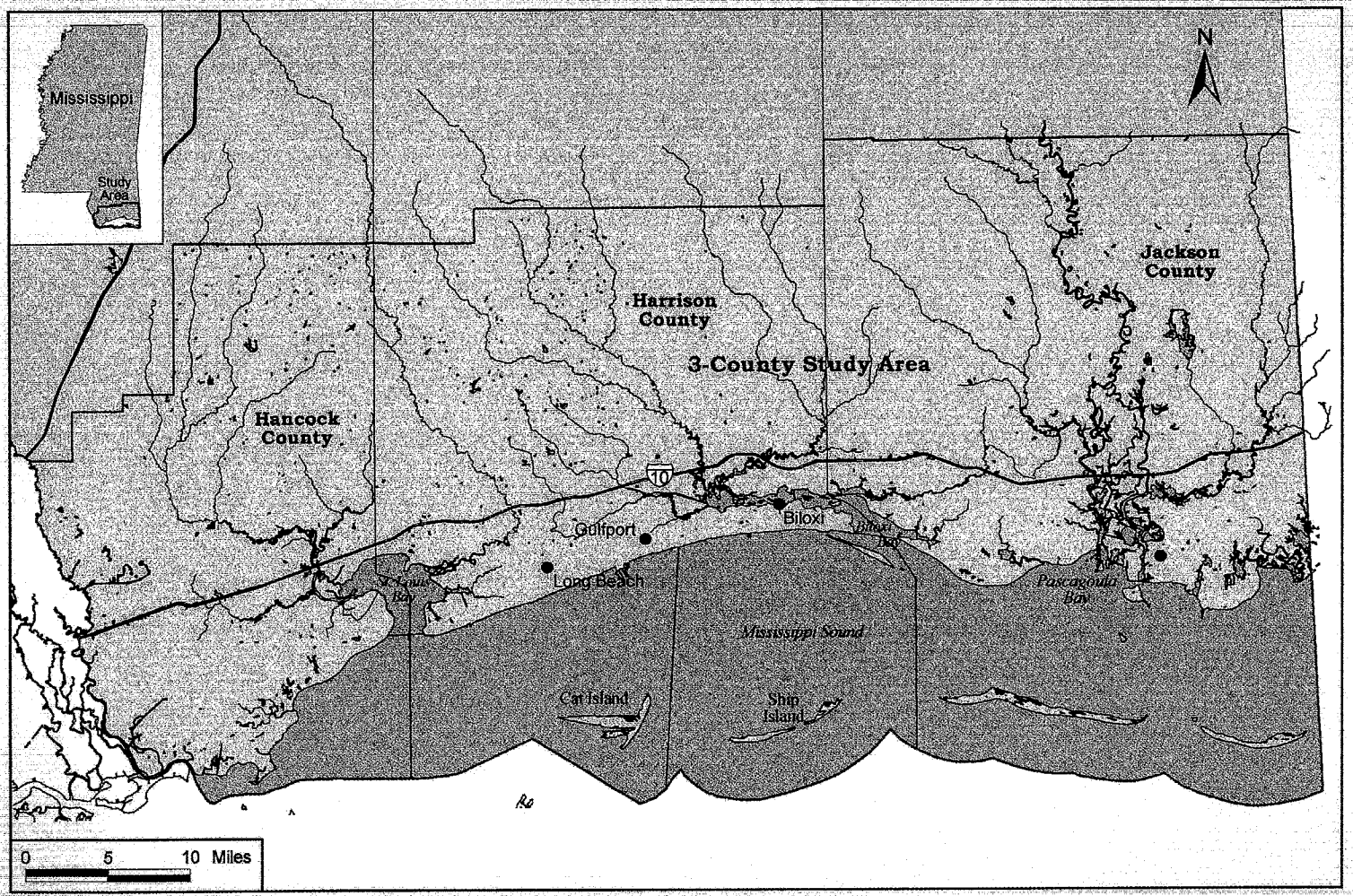

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County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO ATTENTION OF

Coastal Environment Team
Planning and Environmental Division

Chairman Eddie Tullis
Poarch Band of Creek Indians
HCR 69A, Post Office Box 85B
Atmore, Alabama 36502

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

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In accordance with the National Environmental Policy Act and Section 106 of the National Historic Preservation Act of 1966, as amended, Tetra Tech, Inc., is assessing the potential effects that implementation of the proposed action might have on cultural resources. The EIS will identify, evaluate, and document the environmental, cultural, and socioeconomic effects of implementing the proposed action, including a discussion of cultural resources within the project area and an evaluation of the potential effects to cultural resources within the project area.

The project area includes portions of three counties, Hancock, Harrison, and Jackson. The southern limit of the study area is the state boundary between Mississippi and Louisiana, and includes the Mississippi Sound, as well as Cat, Ship, Horn, and Deer Islands. A map (Figure 1) is attached that shows the project area.

The purpose of this correspondence is to formally request a list of any Native American properties or sacred sites, or other issues of concern that are known to occur, or could potentially occur within the project area.

I would also like to know whether there are any other sensitive natural resources that should be considered during the development of the EIS.

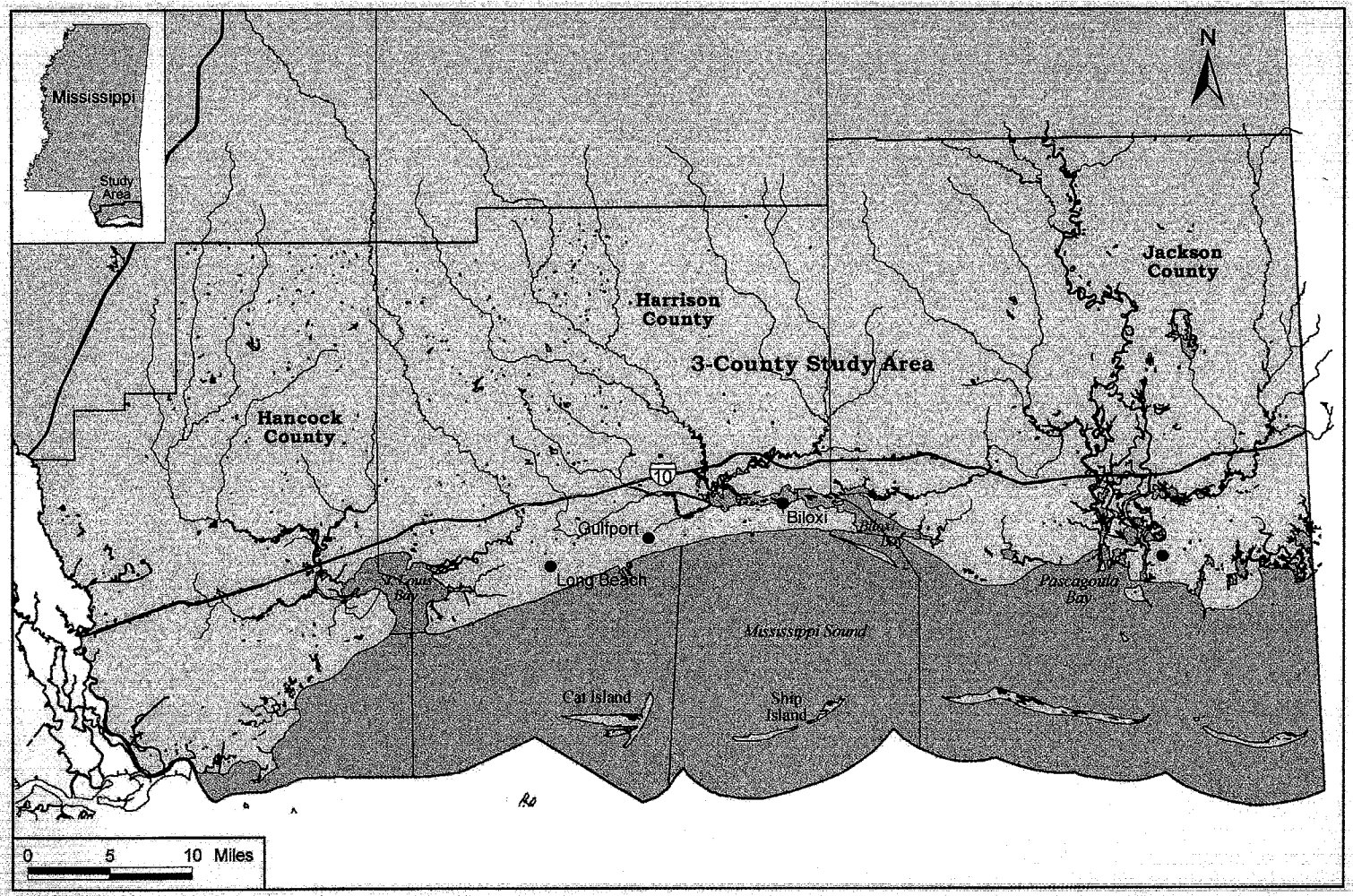
If you have any questions or require additional information, please call (251) 694-4141 or e-mail me at Susan I. Rees@sam.usace.army.mil.

Sincerely,

Susan Ivester Rees, Ph.D
EIS Program Manager

encl.

PD-EC/Rees/cb/4141
PD-EC/Rees
PD-E/McClellan



LEGEND

- 3-County Study Area
- County Boundary

Source: DMR, 2000.

County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Governor Bill Anoatubby
The Chickasaw Nation
Post Office Box 1548
Ada, Oklahoma 74821-1548

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

The USACE, with support from Tetra Tech, Inc. is preparing an Environmental Impact Statement (EIS) for a proposal to implement a trends analysis methodology to evaluate large-scale development permit applications in coastal Mississippi.

This is a U.S. Army Corps of Engineers (USACE) EIS undertaken in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), *Council of Environmental Quality Regulations Implementing Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508), and USACE regulations for implementing NEPA (33 CFR Parts 230 and 325). It is being prepared to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with permit applications for large-scale development projects in coastal Mississippi. During the past eight years, acting under its regulatory program authorities, the USACE has evaluated applications and issued several permits for gaming casinos and other large-scale development projects. In the permitting process, consideration of potential environmental effects has traditionally focused on the direct and indirect effects of individual projects. More recently, because of a growing concern over the secondary effects of induced growth and the incremental loss of sensitive resources such as wetlands and other coastal habitats, there has been a growing call for an improved understanding and consideration of the cumulative effects of all permits issued, as well as those of other, unrelated regional development activities.

The scope of this EIS is twofold: (1). to produce a comprehensive analysis of recent and reasonably foreseeable development trends and environmental conditions, and (2). to consider

environmental impact evaluations associated with future permit applications for large-scale developments in coastal Mississippi.

The EIS will evaluate a proposed action, i.e., development and implementation of a special-purpose permit evaluation methodology that the Corps would be authorized to implement, acting within its statutory authority under Section 10 of the Rivers and Harbors Act of 1899 or Section 404 of the Clean Water Act of 1972. The EIS will evaluate a range of growth scenarios (e.g., smart growth) that are likely to occur in the future as a result of implementing the special-purpose methodology. A no action alternative will also be evaluated. Under the no action alternative, the USACE would not develop and implement the proposed methodology using the trends analysis. USACE would instead continue to perform cumulative effects analysis for permits on an ad hoc basis.

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In accordance with the National Environmental Policy Act and Section 106 of the National Historic Preservation Act of 1966, as amended, Tetra Tech, Inc., is assessing the potential effects that implementation of the proposed action might have on cultural resources. The EIS will identify, evaluate, and document the environmental, cultural, and socioeconomic effects of implementing the proposed action, including a discussion of cultural resources within the project area and an evaluation of the potential effects to cultural resources within the project area.

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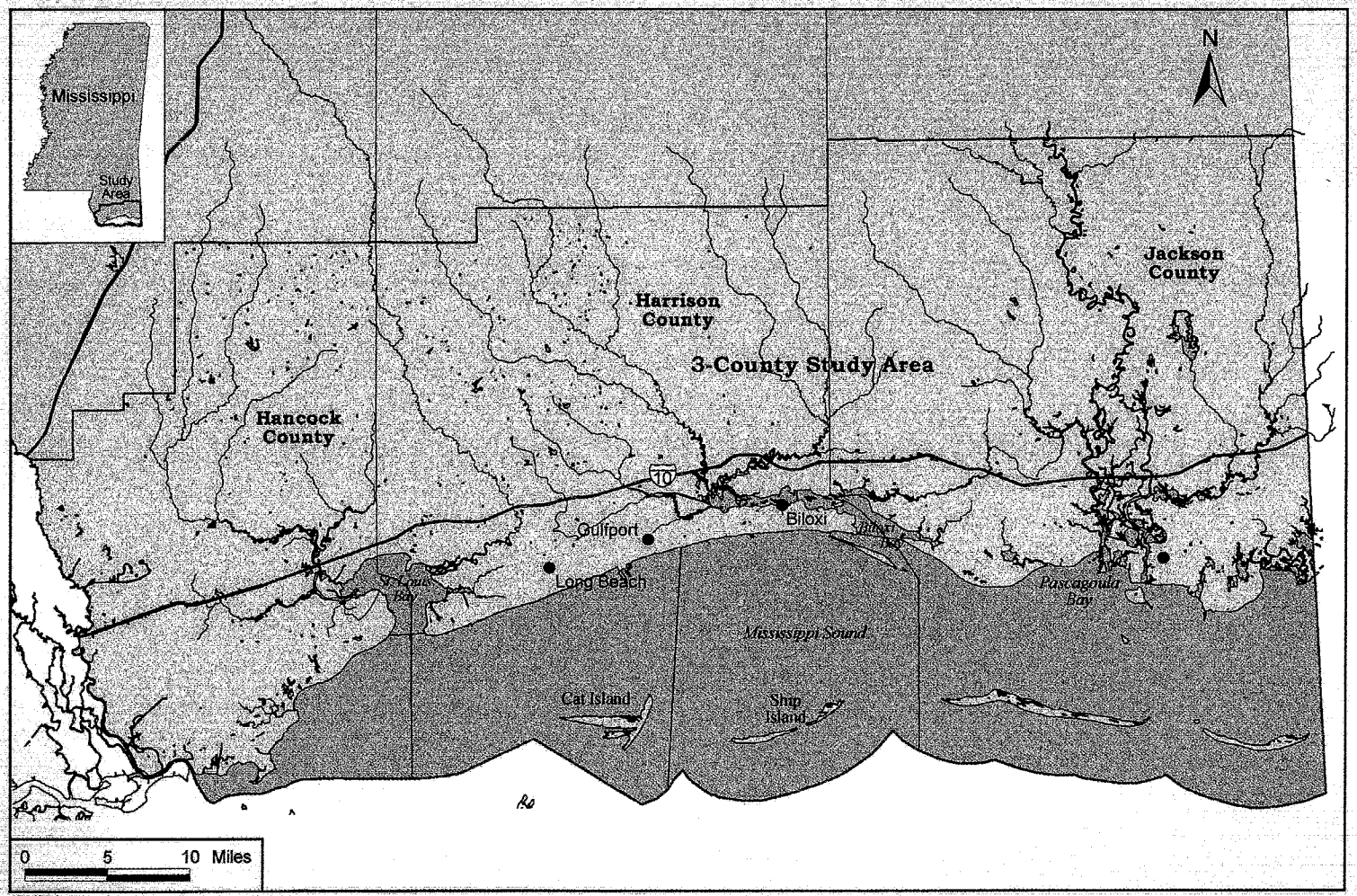
Sincerely,

Susan Ivester Rees, Ph.D
EIS Program Manager

encl.

PD-EC/Rees/cb/4141
PD-EC/Rees
PD-E/McClellan



LEGEND

- 3-County Study Area
- County Boundary

Source: DMR, 2000.

County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 15, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Mr. Mark Thompson
National Marine Fisheries Service
3500 Delwood Beach Rd.
Panama City FL 32408

Dear Mr. Thompson:

We are currently preparing an Environmental Impact Statement (EIS) to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special-purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with U.S. Army Corps of Engineers (Corps) permit applications for large-scale development projects in wetlands and waterways in coastal Mississippi. The trends analysis associated with the EIS identifies relevant documents, and projects coastal Mississippi development trends and their cumulative effects spanning the period 1992 to 2020.

In recent years, coastal Mississippi has experienced significant growth and development. This has been due, in large part, to the state's authorization of dockside gaming casinos in 1992. During the past 8 years, acting under its regulatory program authorities, the Corps has evaluated applications and issued several permits for gaming casinos and other large-scale development projects. In the permitting process, consideration of potential environmental effects has traditionally focused on the direct and indirect effects of individual projects. More recently, because of growing concerns over the secondary effects of induced growth and the incremental loss of sensitive resources such as wetlands and other coastal habitats, there has been a growing call for an improved understanding and consideration of the cumulative effects of all permits issued, as well as those of other, unrelated regional development activities.

In accordance with the National Environmental Policy Act, Endangered Species Act, and Fish and Wildlife Coordination Act, an evaluation of the potential impacts (both positive and negative) associated with implementing this action is required. We are requesting your input concerning any biological concerns regarding this action, such as threatened, endangered or candidate species or habitat on the Mississippi gulf coast. For quick reference, the project area can be found on the attached location map of Hancock, Harrison and Jackson Counties.

I would like to thank you in advance for your cooperation with this matter. Your prompt consideration and response is greatly appreciated. If there is anything that I can do to help expedite this process please feel free to contact me at (251) 694-4141 or e-mail me at Susan.I.Rees@sam.usace.mil.

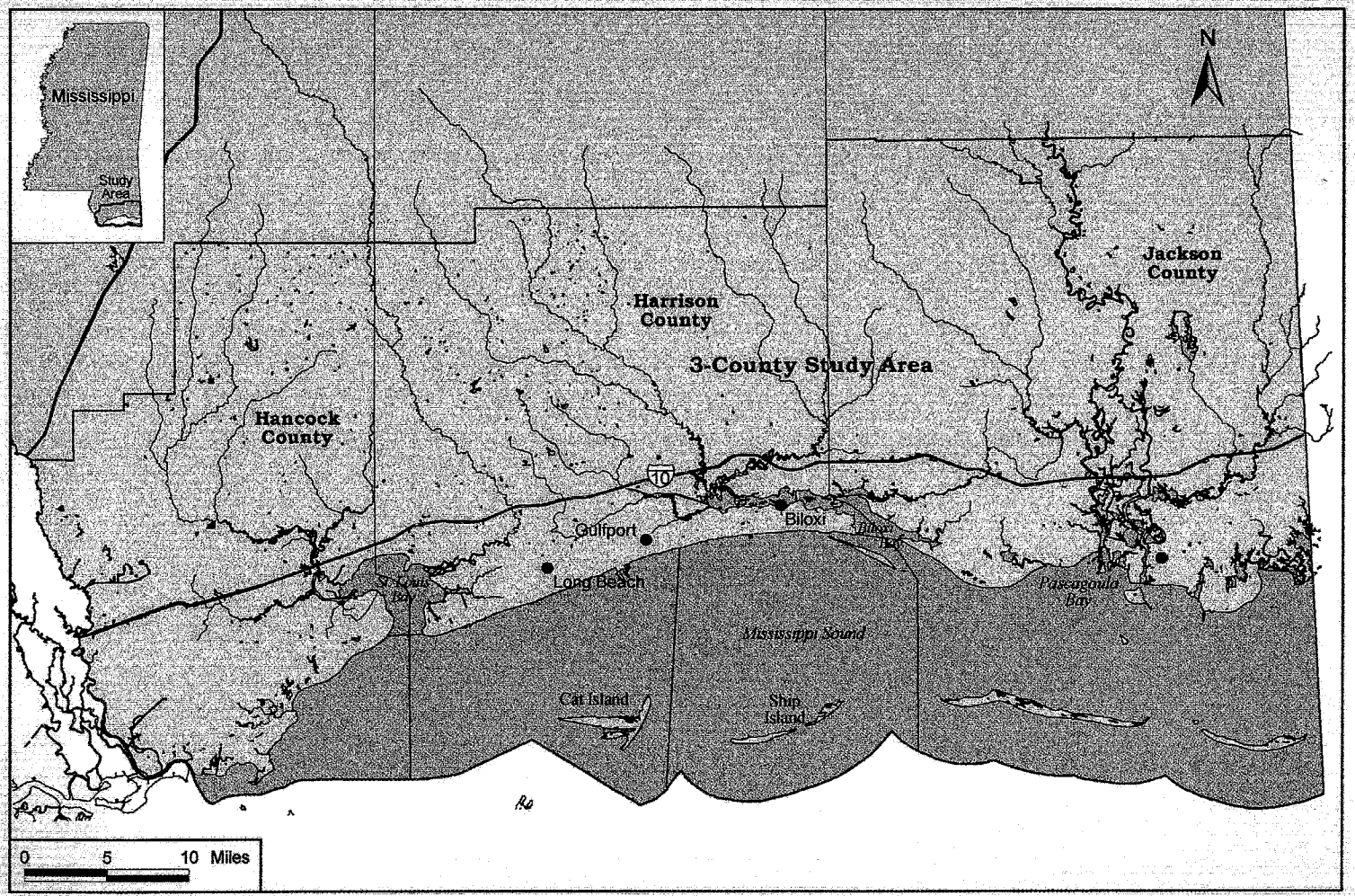
Sincerely,

Susan Ivester Rees,Ph.D
EIS Program Manager

Enclosure

SIR

PD-EC/Rees/cb/4141
PD-E/McClellan
OP-S/Krizman



LEGEND

- 3-County Study Area
- County Boundary

Source: DMR, 2000.

County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 15, 2001

REPLY TO
ATTENTION OF:

Ms. Cynthia Rickis-Gordon
Mississippi Natural Heritage Program
Mississippi Museum of Natural Science
Department of Wildlife, Fisheries and Parks
2148 Riverside Drive
Jackson, MS 39202

Dear Ms. Rickis-Gordon:

We are currently preparing an Environmental Impact Statement (EIS) to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special-purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with U.S. Army Corps of Engineers (Corps) permit applications for large-scale development projects in wetlands and waterways in coastal Mississippi. The trends analysis associated with the EIS identifies relevant documents, and projects coastal Mississippi development trends and their cumulative effects spanning the period 1992 to 2020.

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In accordance with the National Environmental Policy Act, Endangered Species Act, and Fish and Wildlife Coordination Act, an evaluation of the potential impacts (both positive and negative) associated with implementing this action is required. **We are requesting all available Heritage data for state or federally listed rare, threatened, or endangered species, and rare natural communities occurring in Hancock, Harrison and Jackson Counties.** Names and locations of heritage elements, along with information concerning when the element was last observed, potential threats, and population size will be essential to analysis of cumulative effects. Delivery of this data in electronic format would be preferable. For quick reference, the project area can be found on the attached location map of Hancock, Harrison and Jackson Counties. A list of topographic quad map names covering the study area is also provided to help you process this request.

I would like to thank you in advance for your cooperation with this matter. Your prompt consideration and response is greatly appreciated. If there is anything that I can do to help expedite this process please feel free to contact me at (251) 694-4141 or e-mail me at Susan.I.Rees@sam.usace.army.mil.

Sincerely,

Susan Ivester Rees, Ph.D
EIS Program Manager

Enclosure

PD-EC/Rees/cb/4141 SIR
PD-E/McClellan
OP-S/Krizman

EAST ID	NAME	STATE
17332	Airey	MS
17369	Bay Saint Louis	MS
17392	Beatrice	MS
17414	Big Point	MS
17416	Biloxi	MS
17455	Caesar	MS
17531	Dead Tiger Creek	MS
17535	Deer Island	MS
17558	Easen Hill	MS
11948	English Lookout	LA
17611	Gautier North	MS
17612	Gautier South	MS
17625	Grand Bay SW	AL
17633	Gulfport North	MS
17634	Gulfport NW	MS
17635	Gulfport South	MS
12044	Haaswood	LA
17641	Harleston	MS
17687	Hurley	MS
17712	Kiln	MS
17725	Kreole	MS
17739	Latimer	MS
11743	Logtown	MS
17808	McHenry	MS
17828	Millard	MS
17858	Necaise	MS
12312	Nicholson	MS
17881	Ocean Springs	MS
17902	Pascagoula North	MS
17903	Pascagoula South	MS
17904	Pass Christian	MS
12349	Picayune	MS
12029	Saint Joe Pass	MS
18001	Savannah	MS
18008	Sellers	MS
18031	Silver Run	MS
18063	Success	MS
18082	Three Rivers	MS
18118	Vancleave	MS

18125	Vestry	MS
18128	Vidalia	MS
18141	Waveland	MS
18155	White Plains	MS
18171	Wortham	MS

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 15, 2001

REPLY TO
ATTENTION OF:

Mr. Larry Goldman, Director
U.S. Fish and Wildlife Service
Daphne Field Office
PO Box Drawer 1190
Daphne, AL 36526

Dear Mr. Goldman:

We are currently preparing an Environmental Impact Statement (EIS) to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special-purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with U.S. Army Corps of Engineers (Corps) permit applications for large-scale development projects in wetlands and waterways in coastal Mississippi. The trends analysis associated with the EIS identifies relevant documents, and projects coastal Mississippi development trends and their cumulative effects spanning the period 1992 to 2020.

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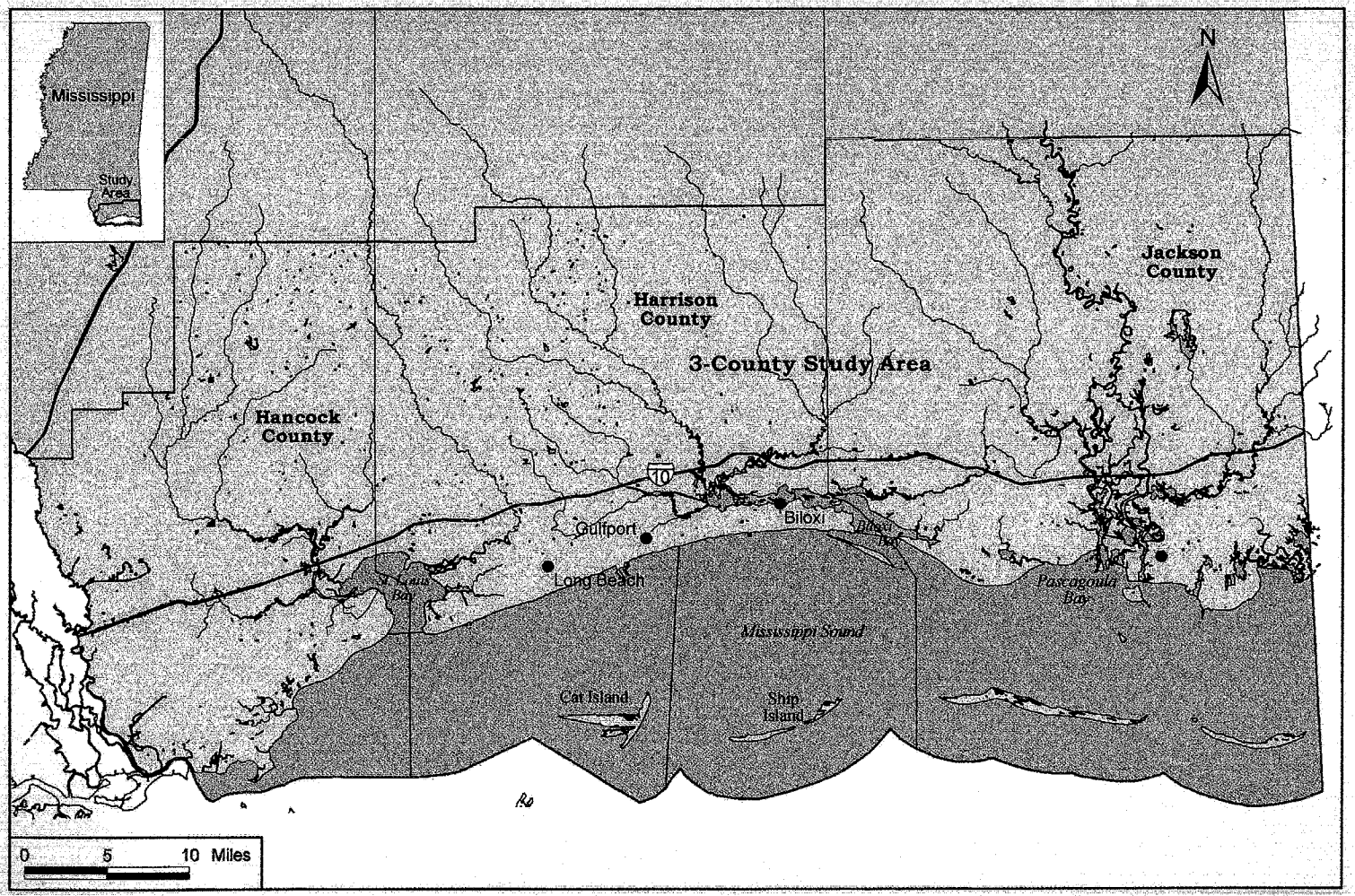
I would like to thank you in advance for your cooperation with this matter. Your prompt consideration and response is greatly appreciated. If there is anything that I can do to help expedite this process please feel free to contact me at (251) 694-4141 or e-mail me at Susan.I.Rees@sam.usace.army.mil.

Sincerely,

Susan Ivester Rees, Ph.D
EIS Program Manager

Enclosure

PD-EC/Rees/cb/4141
PD-E/McClellan
OP-S/Krizman



LEGEND

- 3-County Study Area
- County Boundary

Source: DMR, 2000.

County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 15, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Christopher S. Alonzo, Environmental Director
Mississippi Department of Wildlife, Fisheries, and Parks
Mississippi Museum of Natural Science
2148 Riverside Drive
Jackson, Mississippi 39202-1353

Dear Mr. Alonzo:

We are currently preparing an Environmental Impact Statement (EIS) to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special-purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with U.S. Army Corps of Engineers (Corps) permit applications for large-scale development projects in wetlands and waterways in coastal Mississippi. The trends analysis associated with the EIS identifies relevant documents, and projects coastal Mississippi development trends and their cumulative effects spanning the period 1992 to 2020.

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Sincerely,

Susan Ivester Rees, Ph.D
EIS Program Manager

Enclosure

PD-EC/Rees/cb/4141 SIR
PD-E/McClellan
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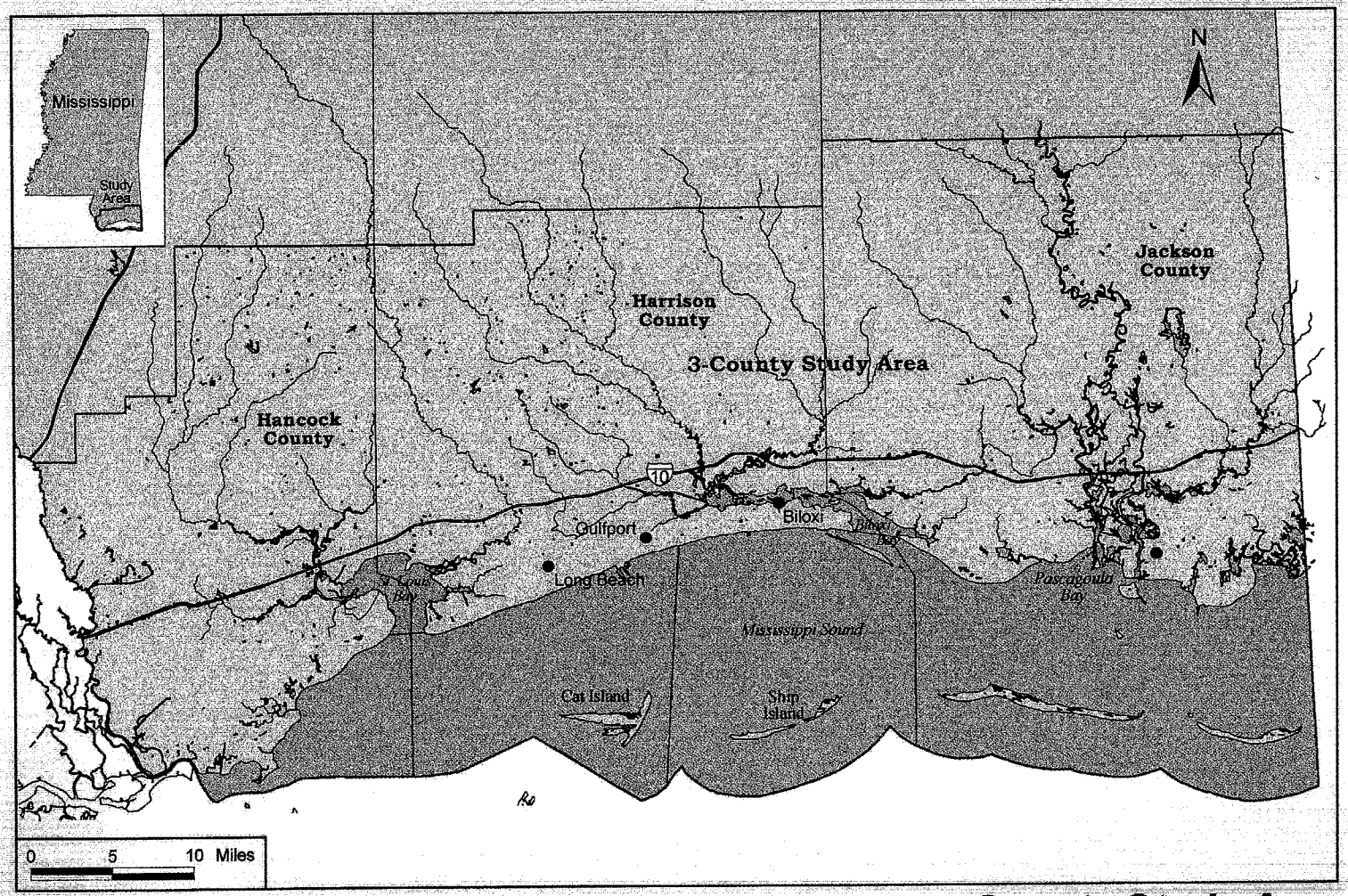

LEGEND

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County Study Area

Mississippi Coastal EIS

Figure 1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 19, 2001

REPLY TO
ATTENTION OF:

Coastal Environment Team
Planning and Environmental Division

Thomas Waggener
Review and Compliance Officer
Historic Preservation Division
Department of Archives and History
P.O. Box 571
Jackson, Mississippi 39205-0571

REFERENCE: Preparation of an Environmental Impact Statement for Large-Scale Development of Coastal Mississippi

Dear Mr. Tullis:

The USACE, with support from Tetra Tech, Inc. is preparing an Environmental Impact Statement (EIS) for a proposal to implement a trends analysis methodology to evaluate large-scale development permit applications in coastal Mississippi.

This is a U.S. Army Corps of Engineers (USACE) EIS undertaken in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), *Council of Environmental Quality Regulations Implementing Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508), and USACE regulations for implementing NEPA (33 CFR Parts 230 and 325). It is being prepared to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with permit applications for large-scale development projects in coastal Mississippi. During the past eight years, acting under its regulatory program authorities, the USACE has evaluated applications and issued several permits for gaming casinos and other large-scale development projects. In the permitting process, consideration of potential environmental effects has traditionally focused on the direct and indirect effects of individual projects. More recently, because of a growing concern over the secondary effects of induced growth and the incremental loss of sensitive resources such as wetlands and other coastal habitats, there has been a growing call for an improved understanding and consideration of the cumulative effects of all permits issued, as well as those of other, unrelated regional development activities.

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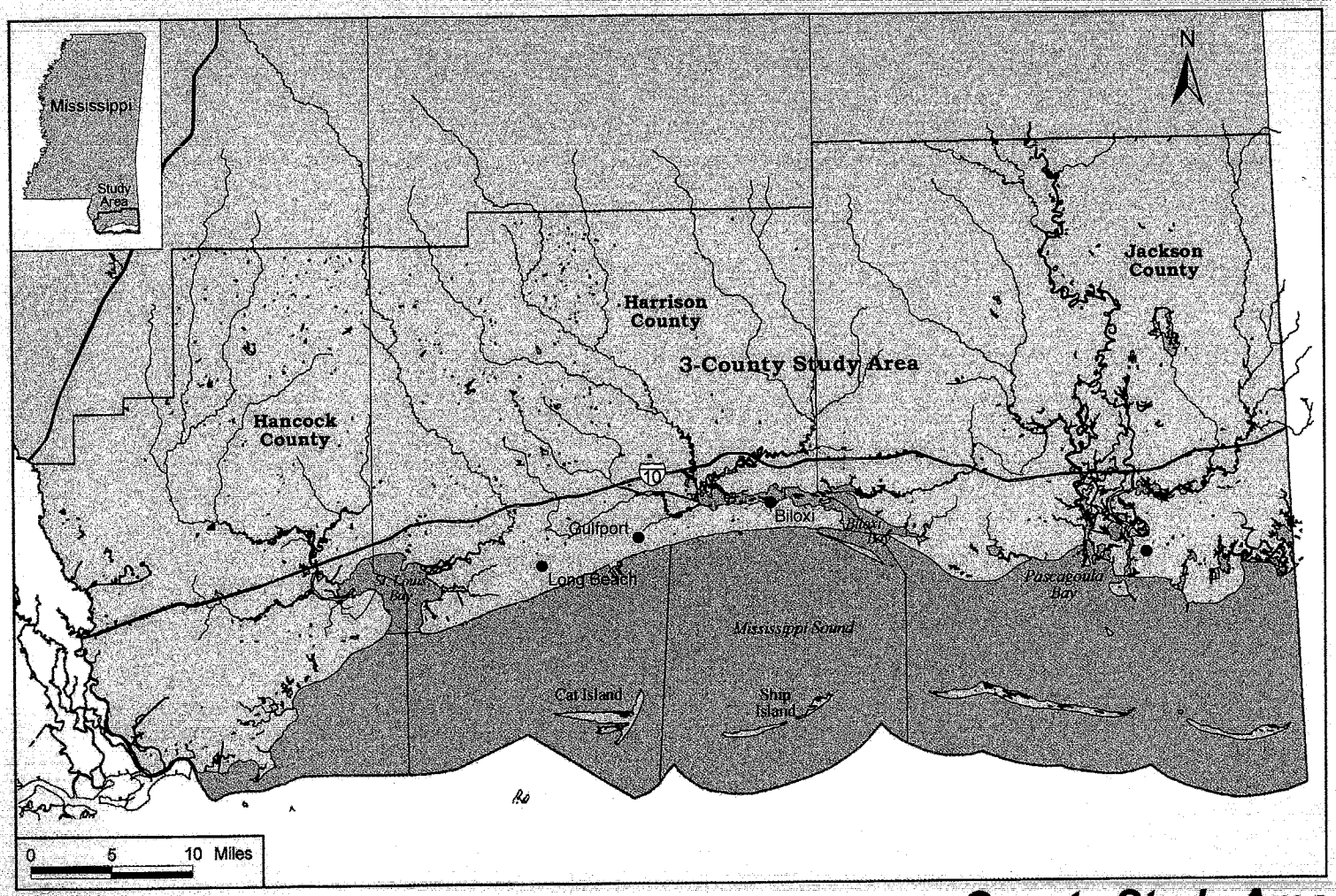
Sincerely,

Susan Ivester Rees, Ph.D
EIS Program Manager

encl.

PD-EC/Rees/cb/4141
PD-EC/Rees
PD-E/McClellan



LEGEND

- 3-County Study Area
- County Boundary

Source: DMR, 2000.

County Study Area

Mississippi Coastal EIS

Figure 1

***Preparer's Note**: To date the only agency to respond is the Mississippi Natural Heritage program; their letter follows.*

13 April 2002

Dr. Susan Ivester Rees
EIS Program Manager
Department of the Army
Mobile District, Corps of Engineers
P.O. Box 2288
Mobile, AL 36628-0001

Dear Dr. Rees:

On 15 November 2001 you contacted our office regarding preparation by the Mobile District of the U.S. Army Corps of Engineers (COE) of an Environmental Impact Statement "to address the environmental and socioeconomic consequences of developing and implementing a trends analysis-based "special-purpose methodology" to improve consistency and objectivity in the consideration of cumulative effects in environmental impact analyses associated with U.S. Army Corps of Engineers (Corps) permit application for large-scale development projects in wetlands and waterways in coastal Mississippi." You requested input from our agency regarding biological concerns relevant to this action. As related during our phone conservation last December, you are particularly interested in documented trends in listed species and their habitats since 1992.

Within the past decade the COE has, through its 404 permitting authority, reviewed, with input of various state agencies in Mississippi (Dept. of Environmental Quality; Dept. of Marine Resources; Dept. of Wildlife, Fisheries, and Parks) many projects in coastal Mississippi, the great preponderance of which have been subsequently implemented without substantive modification. Herein I will highlight the consequences of four such projects on population and habitat trends of one very high profile species-the federally endangered Mississippi gopher frog (Rana sevosa, also known as *Rana areolata sevosa*, the dusky gopher frog). The frog was listed as endangered by the State of Mississippi in 1992, and was listed by the U.S. Fish and Wildlife Service in January of 2002. It was listed as a Candidate 1 species by the FWS in 1991; it was removed from candidate status by the FWS in 1996; it was re-elevated to candidate status by the FWS in 1999; and was proposed for listing by the FWS in 2000. The frog is probably the most endangered terrestrial vertebrate in Mississippi, but the problems of habitat loss which threaten it as described below also threaten and/or curtail recovery prospects for other state and/or federally listed species found in the coastal counties: the one toed amphiuma (state endangered), During the past five or six years, in particular, state and federal agencies have had several opportunities to adjust various development plans to accommodate listed species interests, typically as a consequence of wetlands destruction accompanying development which necessitates formal COE involvement.

The gopher frog was formerly common in the coastal counties of Mississippi (Allen, 1932). During the non-breeding season it was frequently seen in the burrows of gopher tortoises, and during the breeding season it used intermittent upland ponds. The latter were particularly widespread in Jackson, Harrison, and Hancock Counties. With coastal

development many of the latter have been destroyed, and many have been unfavorably altered because of fire suppression, and uplands adjacent to many of the ponds have been converted to habitat unsuitable for tortoises and gopher frogs. There remains only one known pond supporting the frog, but as recently as 1987 there were at least 3 or 4. What has to be understood is this-it is very unlikely that a frog population can be indefinitely conserved at one breeding site. What is required is a functional metapopulation, a loose association of subpopulations, each centered about a discrete breeding pond with a unique hydrology. No individual pond probably produced emerging froglets in each year, depending on rainfall patterns, and local extirpations doubtless occurred. However, historically recolonizations could have occurred via movements from individuals associated with other ponds nearby. Because of the proliferation of roads and inappropriate habitat alterations on the coast such recolonization is no longer feasible.

Four major developments with a COE nexus have negatively affected future prospects of this frog, and I will enclose copies of previously submitted comments on each of these:

1. Tradition Development;
2. Tradition Parkway;
3. Highway 67 Four-laning and re-route; and
4. Cowan-Lorraine Rd.

There is of course much overlap in the comments made regarding these respective projects, which will also negatively affect the federally threatened, state-endangered gopher tortoise (Gopherus polyphemus), and the state endangered, federal candidate black pinesnake (Pituophis melanoleucus lodingi). These are all highly vagile herptiles whose ranges may extend for several miles. With the recent proliferation of casino related road building (new location and expansion of old rows via four-laning) on the coast, the odds of intersecting such a roadway, with its obvious implications for elevated mortality rates, are greater.

An additional very rare special concern species, the river frog (*Rana hecksheri*) is reported from only 5 locations, all in coastal MS counties, and only one site is known to have supported the species within the past two decades. The latter population was at Cypress Creek, a tributary of the Tchoutacabouffa River, an area now completely hemmed in by development permitted with the past decade. I drove by this site on 12 April 2002 on Hwy 15/Hwy 67 (just north of I-10). Recently deposited fill is pushed into the wetland perimeter bordering the Tchoutacabouffa River just downstream of the mouth of Cypress Creek (just east of 15/67). I saw no silt fencing. This site has been hammered by poorly regulated development. One developer even attempted to secure permits to build on a wet site previously offered as mitigation in an earlier round of development. I think the MS Dept. of Environmental Quality detected this sleight-of-hand, but it is evident even to the casual observer that the area bordering the Tchoutacabouffa has been completely sacrificed to development. Uplands in the area also once supported the state-endangered southern hognose snake (*Heterodon simus*), now thought to be extirpated from the state, at least in part due to usurpation of coastal upland habitats by development). The COE has no regulatory authority over uplands per se, but most development sites are large enough that wetlands are included, particularly on the coast, so there is usually a COE nexus.

Last, the federally and state endangered Alabama red-bellied cooter (*Pseudemys alabamensis*) is restricted to the lower Mobile River in Alabama and to the lower Pascagoula River (and its tributaries) and to the lower reaches of tributaries to Back Bay of Biloxi in Mississippi. Marshes flanking these systems are the primary foraging habitat of this species, and nearby uplands are used for nesting. As you know, development in this area has increased dramatically since the arrival of casinos on the MS gulf coast. Marshes are negatively affected by dredging projects which can directly destroy submerged macrophytic vegetation beds upon which this species feeds, and may also be indirectly affected by salinity changes accompanying dredging, as salt wedges penetrate farther upstream. Bulkheading of channel borders often accompanies development of uplands adjoing streams and bayous, and bulkheading blocks access of female red-bellied cooters to upland nesting areas, resulting in local concentrations of nesting near more limited egress points, leaving nests more vulnerable to predation. In addition, the increase in boat traffic from an expanding coastal population directly threatens the turtles with injury from collisions with boat hulls and props, and I have seen many animals so injured. Turtles are also vulnerable to incidental capture by recreational fishermen; again, an activity which is increasing due to the expanding population on the coast. The MS Dept. of Transportation has recently decided to span the Tchoutacabouffa River with a new bridge at the worst possible spot with respect to the marshes inhabited by the red-bellied turtle. Many alternatives were available, and others were cheaper. Wetlands damage will be much greater at this site than at alternatives. But transportation concerns trump everything else as the process has been conducted to date.

Individuals of the federally and state endangered manatee (*Trichechus manatus*) have also been seen along the coast in most recent years in the same general areas used by the red-bellied cooter, and these two are threatened by boat propellors and entanglement in fishing gear, which have proved significant threats to the species in Florida.

Your consideration of these issues with respect to the cumulative effects analysis is appreciated.

Tom Mann, Zoologist
MS Natural Heritage Program
MS Dept. of Wildlife, Fisheries, and Parks

Appendix L

The REMI Policy Insight Model

What is REMI

REMI was established in 1980. The REMI Policy Insight Model has been evaluated by MIT and other peer reviewers, and has been used by the U.S. Environmental Protection Agency, the Federal Highway Administration, twenty-six state governments, city governments, universities, non-profit organizations, public utilities, and private consulting firms throughout the country. REMI Policy Insight integrates key aspects of three types of economic models: Input/Output (I/O) models; Computer Generated Equilibrium (CGE) models; and econometric models. The Policy Insight Model is a dynamic model that forecasts how changes in the economy and adjustments to those changes will occur on a year-by-year basis. The dynamic aspect of REMI provides insight into the long-term impact considerations of a policy change to an economic region.

The REMI model is a structural model, meaning that it clearly includes cause-and-effect relationships. The model shares two key underlying assumptions with mainstream economic theory: *households maximize utility*, and *producers maximize profits.* In the model, businesses produce goods to sell to other firms, consumers, investors, governments, and purchasers outside the region. The output is produced using labor, capital, fuel and intermediate inputs. The demand for labor, capital, and fuel per unit of output depends on their relative costs, since an increase in the price of any one of these inputs leads to substitution away from that input to other inputs. The supply of labor in the model depends on the number of people in the population and the proportion of those people who participate in the labor force. Economic migration affects the population size. More people will move into an area if the real after-tax wage rates or the likelihood of being employed increases in a region.

Supply and demand for labor in the model determines the wage rates. These wage rates, along with other prices and productivity, determine the cost of doing business for every industry in the model. An increase in the cost of doing business causes either an increase in price or a cut in profits, depending on the market for the product. In either case, an increase in cost would decrease the share of the local and U.S. market supplied by local firms. This market share combined with the demand described above determines the amount of local output. Of course, the model has many other feedbacks. For example, changes in wages and employment impact income and consumption, while economic expansion changes investment, and population growth impacts government spending.

The REMI Policy Insight Model has been customized for the ROI defined in this EIS. For this study, the 53-sector Policy Insight Model is used. In the 53-sector model, industries are defined at their 2-digit Standard Industrial Classification (SIC) code level, which provides sufficient industry detail for the policy questions analyzed in this EIS. The model has a complete economic history of the ROI from 1969 to the present. Data for the model is obtained from the Bureau of Economic Analysis, the Bureau of Labor Statistics, the Department of Energy, the Census Bureau, and other public sources. Based on this data, a control, or baseline, forecast was generated for the ROI to the year 2035[1]. This baseline forecast simulates the expected long-term growth of the ROI based on past and current trends and conditions. An alternative forecast is then developed for each alternative scenario in the trends analysis (i.e., high-, moderate-, and no growth scenarios). Alternative forecasts are created by altering the value of policy variables in the model from their value in the baseline forecast. The deviation of the alternative forecast from the baseline forecast is the effect of the policy on the regional economy.

[1] The economic impact analysis for this study is limited to the period 2000 to 2020.

Appendix M

Population Projection Comparison Between the REMI Model and Other Forecasts

Population Projection Comparison Between the REMI Model and Other Forecasts

The ability of the REMI model to accurately project ROI demographic and economic conditions 20 years into the future obviously cannot be assured, because validating data are available for only one of the forecast years (Census data are available for the year 2000). While the REMI model has a good track record, past performance does not guarantee future accuracy. To better assess REMI's ability to forecast demographic and economic conditions for the Mississippi Coastal Region, two independent demographic projections were obtained for comparison purposes and to identify possible limitations in the REMI model to capture local trends. Specifically, the REMI baseline forecast was compared to demographic projections developed by the Mississippi Institutions of Higher Learning (IHL) and by Woods and Poole, Inc. These particular alternative forecasts were selected for comparison based on their broad acceptance and use by public and private entities. The IHL projections are used extensively by Mississippi State and County agencies to support planning analyses. Demographic projections prepared by Woods and Poole, Inc. have also been used by planning agencies in Mississippi.

REMI projections compare quite well with forecasts generated by IHL and Woods and Poole, although the IHL population estimates are projected only to the year 2015. As seen in Table K-1, REMI baseline population projections for the ROI are slightly lower than projections generated by IHL. For the region as whole, REMI's population estimates are about 3.5 percent lower than that projected by IHL for the last year of IHL's projections (2015). In contrast, REMI projections for the ROI are slightly higher than the Woods and Poole projections for most of the forecast period. The largest discrepancies in projections are for Hancock County, the smallest and most rural of the three counties. For the year 2015, IHL projects Hancock County population to exceed 59,000, while REMI forecasts a population of about 51,500, almost a 10 percent difference.

In contrast, REMI and IHL population projections for the much larger Counties of Jackson and Harrison differ by only about 0.8 percent and 2.8 percent, respectively. Finally, for the year 2020, the Woods and Poole and REMI projections for the ROI differ by only 0.7 percent.

Given the relatively small numerical and percentage differences in population projections (except for Hancock County) among the three independent forecasts, the analysis assumes that the REMI forecasts are reasonably accurate and provide a solid basis for performing impact analyses using different growth scenarios. Potential ramifications of baseline under- or over-estimates of population and economic characteristics for the forecast period are described at the end of the economic analysis section.

Table 1
Comparison of REMI Regional Baseline Population Projections with IHL and Woods and Poole Projections (in thousands)

	2000	2005	2010	2015	2020
Hancock County					
REMI	42.356	46.041	49.070	51.509	53.376
IHL	42.967	49.955	55.117	59.082	NA
W&P	42.460	47.120	51.710	56.310	60.930
Harrison County					
REMI	189.397	195.451	201.062	205.692	209.515
IHL	189.601	196.175	204.164	211.609	NA
W&P	180.350	189.450	198.380	207.500	216.770
Jackson County					
REMI	135.507	147.614	155.745	162.672	168.541
IHL	131.420	147.894	156.628	164.123	NA
W&P	134.240	139.940	145.510	151.250	157.110
ROI					
REMI	367.259	389.106	405.878	419.873	431.432
IHL	363.988	394.024	415.909	434.814	NA
W&P	357.049	376.507	395.603	415.052	434.811

NA: not available

Appendix N

Square Footage Demand Calculations and Assumptions

Square Footage Demand Calculations and Assumptions.

While projections of the future demand for developed land are inherently uncertain, the employment change projections generated by the REMI general equilibrium regional input-output model (discussed in detail in Section 5.1) can be used to estimate the demand for square feet of commercial, office, retail, manufacturing, warehouse and other kinds of industrial, commercial, and government sector space, and thus the demand for land by employment sector.

These projections can provide county and local government policy officials estimates of the amount of land needed in the future based on forecasts of economic growth. The usual approach taken in estimating the demand for land is to apply estimates of the square footage per employee to the projected employment growth by sector, and multiply this by employment density information, typically measured by local floor-to-area ratios or FARs. Thus, employment forecasts can be converted into a demand forecast for land need with the following equation:

Land Demand = (Employment Growth) * (square feet/employee) * (1/FAR)

The amount of land needed (or demanded) for future employment-related growth can be determined by the following factors: forecast of regional economic (employment) growth; the allocation of the regional growth into sub-areas; employment density information (building densities and FARs); and, vacancy rates. Combining these factors can provide a projection of land demand or need by different land types (industrial, retail, office, etc.), and for different types of locations (regional center, town center, employment area, corridor, main street, industrial, and farming/mining area).

The following tables provide the projected demand for square footage of space by location, type, and sector for the years 2000, 2005, 2010, 2015 and 2010 for the region of influence (ROI), Hancock, Harrison, and Jackson counties, for the No Action, and Low, Moderate, and High Growth Alternatives.

Table 1. Coastal Counties: Most-Likely Growth Scenario
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	976,060	1,030,358	1,038,498	1,037,850	1,028,045
Retail Trade	4,232,468	4,500,838	4,555,123	4,522,340	4,470,758
Wholesale	1,930,631	1,785,290	1,655,686	1,611,250	1,559,409
Services	9,106,440	9,777,460	10,283,280	10,785,320	11,240,040
Ag/For/Fish S	523,076	569,510	595,058	642,424	694,079
Sub-Total	16,768,675	17,663,455	18,127,644	18,599,184	18,992,330
TOWN CTR.					
Fin/Ins/RE	976,060	1,030,358	1,038,498	1,037,850	1,028,045
Retail Trade	4,232,468	4,500,838	4,555,123	4,522,340	4,470,758
Services	9,106,440	9,777,460	10,283,280	10,785,320	11,240,040
Government	12,702,775	14,178,295	14,843,710	15,165,420	15,327,335
Sub-Total	27,017,743	29,486,950	30,720,610	31,510,930	32,066,178
EMPLOY AREA					
Construction	4,847,735	4,724,720	4,435,325	4,271,305	4,178,380
Tran/Pub Ut.	7,651,875	7,642,500	7,602,188	7,722,188	7,722,188
Wholesale	1,930,631	1,785,290	1,655,686	1,611,250	1,559,409
Ag/For/Fish S	523,076	569,510	595,058	642,424	694,079
Sub-Total	14,953,317	14,722,020	14,288,256	14,247,167	14,154,055
CORRIDOR					
Fin/Ins/RE	976,060	1,030,358	1,038,498	1,037,850	1,028,045
Retail Trade	4,232,468	4,500,838	4,555,123	4,522,340	4,470,758
Wholesale	1,930,631	1,785,290	1,655,686	1,611,250	1,559,409
Services	9,106,440	9,777,460	10,283,280	10,785,320	11,240,040
Ag/For/Fish S	523,076	569,510	595,058	642,424	694,079
Sub-Total	16,768,675	17,663,455	18,127,644	18,599,184	18,992,330
MAIN ST.					
Fin/Ins/RE	976,060	1,030,358	1,038,498	1,037,850	1,028,045
Retail Trade	4,232,468	4,500,838	4,555,123	4,522,340	4,470,758
Services	9,106,440	9,777,460	10,283,280	10,785,320	11,240,040
Government	12,702,775	14,178,295	14,843,710	15,165,420	15,327,335
Sub-Total	27,017,743	29,486,950	30,720,610	31,510,930	32,066,178
INDUSTRIAL					
Manufact.	20,854,400	21,411,432	21,234,444	22,336,160	23,612,120
Construction	4,847,735	4,724,720	4,435,325	4,271,305	4,178,380
Tran/Pub Ut.	7,651,875	7,642,500	7,602,188	7,722,188	7,805,625
Sub-Total	33,354,010	33,778,652	33,271,957	34,329,653	35,596,125
FARM-MINE					
Mining	83,780	82,010	80,830	83,780	89,090
Farming	659,620	595,310	543,980	517,430	492,060
Sub-Total	743,400	677,320	624,810	601,210	581,150
TOTAL	136,623,562	143,478,801	145,881,530	149,398,257	152,531,783

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 2. Hancock County, MS: Most-Likely Growth Scenario
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	85,193	92,038	94,535	95,553	95,183
Retail Trade	325,945	352,148	359,785	357,670	352,265
Wholesale	80,539	78,225	74,985	73,596	71,745
Services	1,030,540	1,167,740	1,271,340	1,368,500	1,457,260
Ag/For/Fish S	52,028	59,860	65,082	71,422	77,576
Sub-Total	1,574,245	1,750,010	1,865,726	1,966,741	2,054,028
TOWN CTR.					
Fin/Ins/RE	85,193	92,038	94,535	95,553	95,183
Retail Trade	325,945	352,148	359,785	357,670	352,265
Services	1,030,540	1,167,740	1,271,340	1,368,500	1,457,260
Government	1,140,560	1,243,910	1,299,295	1,335,070	1,351,235
Sub-Total	2,582,238	2,855,835	3,024,955	3,156,793	3,255,943
EMPLOY AREA					
Construction	437,485	433,650	417,425	405,920	398,840
Tran/Pub Ut.	517,500	529,688	537,188	555,938	555,938
Wholesale	80,539	78,225	74,985	73,596	71,745
Ag/For/Fish S	52,028	59,860	65,082	71,422	77,576
Sub-Total	1,087,552	1,101,423	1,094,679	1,106,876	1,104,098
CORRIDOR					
Fin/Ins/RE	85,193	92,038	94,535	95,553	95,183
Retail Trade	325,945	352,148	359,785	357,670	352,265
Wholesale	80,539	78,225	74,985	73,596	71,745
Services	1,030,540	1,167,740	1,271,340	1,368,500	1,457,260
Ag/For/Fish S	52,028	59,860	65,082	71,422	77,576
Sub-Total	1,574,245	1,750,010	1,865,726	1,966,741	2,054,028
MAIN ST.					
Fin/Ins/RE	85,193	92,038	94,535	95,553	95,183
Retail Trade	325,945	352,148	359,785	357,670	352,265
Services	1,030,540	1,167,740	1,271,340	1,368,500	1,457,260
Government	1,140,560	1,243,910	1,299,295	1,335,070	1,351,235
Sub-Total	2,582,238	2,855,835	3,024,955	3,156,793	3,255,943
INDUSTRIAL					
Manufact.	1,071,532	959,028	921,298	986,468	1,062,614
Construction	437,485	433,650	417,425	405,920	398,840
Tran/Pub Ut.	517,500	529,688	537,188	555,938	570,938
Sub-Total	2,026,517	1,922,366	1,875,911	1,948,326	2,032,392
FARM-MINE					
Mining	10,030	8,260	7,670	7,670	8,260
Farming	177,590	160,480	146,910	139,240	132,750
Sub-Total	187,620	168,740	154,580	146,910	141,010
TOTAL	11,614,654	12,404,218	12,906,532	13,449,178	13,912,441

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 3. Harrison County, MS: Most-Likely Growth Scenario
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	630,573	659,618	661,838	656,935	647,408
Retail Trade	2,636,583	2,767,948	2,784,398	2,742,568	2,698,388
Wholesale	1,426,565	1,318,717	1,224,754	1,186,336	1,144,215
Services	6,279,140	6,621,580	6,892,200	7,161,000	7,409,920
Ag/For/Fish S	314,778	340,140	353,566	380,419	409,883
Sub-Total	11,287,639	11,708,001	11,916,755	12,127,258	12,309,813
TOWN CTR.					
Fin/Ins/RE	630,573	659,618	661,838	656,935	647,408
Retail Trade	2,636,583	2,767,948	2,784,398	2,742,568	2,698,388
Services	6,279,140	6,621,580	6,892,200	7,161,000	7,409,920
Government	8,179,490	9,091,885	9,481,435	9,647,590	9,722,850
Sub-Total	17,725,785	19,141,030	19,819,870	20,208,093	20,478,565
EMPLOY AREA					
Construction	2,585,380	2,425,490	2,255,570	2,143,470	2,081,815
Tran/Pub Ut.	5,801,250	5,730,938	5,665,313	5,709,375	5,709,375
Wholesale	1,426,565	1,318,717	1,224,754	1,186,336	1,144,215
Ag/For/Fish S	314,778	340,140	353,566	380,419	409,883
Sub-Total	10,127,974	9,815,284	9,499,203	9,419,600	9,345,288
CORRIDOR					
Fin/Ins/RE	630,573	659,618	661,838	656,935	647,408
Retail Trade	2,636,583	2,767,948	2,784,398	2,742,568	2,698,388
Wholesale	1,426,565	1,318,717	1,224,754	1,186,336	1,144,215
Services	6,279,140	6,621,580	6,892,200	7,161,000	7,409,920
Ag/For/Fish S	314,778	340,140	353,566	380,419	409,883
Sub-Total	11,287,639	11,708,001	11,916,755	12,127,258	12,309,813
MAIN ST.					
Fin/Ins/RE	630,573	659,618	661,838	656,935	647,408
Retail Trade	2,636,583	2,767,948	2,784,398	2,742,568	2,698,388
Services	6,279,140	6,621,580	6,892,200	7,161,000	7,409,920
Government	8,179,490	9,091,885	9,481,435	9,647,590	9,722,850
Sub-Total	17,725,785	19,141,030	19,819,870	20,208,093	20,478,565
INDUSTRIAL					
Manufact.	4,170,194	4,039,854	3,994,578	4,268,292	4,620,896
Construction	2,585,380	2,425,490	2,255,570	2,143,470	2,081,815
Tran/Pub Ut.	5,801,250	5,730,938	5,665,313	5,709,375	5,729,063
Sub-Total	12,556,824	12,196,282	11,915,461	12,121,137	12,431,774
FARM-MINE					
Mining	53,100	51,920	51,330	53,100	56,050
Farming	210,630	189,980	174,050	165,200	157,530
Sub-Total	263,730	241,900	225,380	218,300	213,580
TOTAL	80,975,375	83,951,527	85,113,293	86,429,737	87,587,084

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 4. Jackson County, MS: Most-Likely Growth Scenario
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	260,295	278,703	282,125	285,363	285,455
Retail Trade	1,269,823	1,380,743	1,410,940	1,422,103	1,420,105
Wholesale	423,063	388,348	355,947	351,318	343,450
Services	1,796,760	1,988,140	2,119,740	2,255,960	2,372,860
Ag/For/Fish S	156,457	169,697	176,224	190,583	206,433
Sub-Total	3,906,397	4,205,630	4,344,976	4,505,326	4,628,303
TOWN CTR.					
Fin/Ins/RE	260,295	278,703	282,125	285,363	285,455
Retail Trade	1,269,823	1,380,743	1,410,940	1,422,103	1,420,105
Services	1,796,760	1,988,140	2,119,740	2,255,960	2,372,860
Government	3,382,460	3,842,500	4,062,980	4,182,760	4,253,515
Sub-Total	6,709,338	7,490,085	7,875,785	8,146,185	8,331,935
EMPLOY AREA					
Construction	1,824,870	1,865,580	1,762,330	1,721,915	1,697,725
Tran/Pub Ut.	1,334,063	1,381,875	1,400,625	1,456,875	1,456,875
Wholesale	423,063	388,348	355,947	351,318	343,450
Ag/For/Fish S	156,457	169,697	176,224	190,583	206,433
Sub-Total	3,738,452	3,805,500	3,695,126	3,720,691	3,704,483
CORRIDOR					
Fin/Ins/RE	260,295	278,703	282,125	285,363	285,455
Retail Trade	1,269,823	1,380,743	1,410,940	1,422,103	1,420,105
Wholesale	423,063	388,348	355,947	351,318	343,450
Services	1,796,760	1,988,140	2,119,740	2,255,960	2,372,860
Ag/For/Fish S	156,457	169,697	176,224	190,583	206,433
Sub-Total	3,906,397	4,205,630	4,344,976	4,505,326	4,628,303
MAIN ST.					
Fin/Ins/RE	260,295	278,703	282,125	285,363	285,455
Retail Trade	1,269,823	1,380,743	1,410,940	1,422,103	1,420,105
Services	1,796,760	1,988,140	2,119,740	2,255,960	2,372,860
Government	3,382,460	3,842,500	4,062,980	4,182,760	4,253,515
Sub-Total	6,709,338	7,490,085	7,875,785	8,146,185	8,331,935
INDUSTRIAL					
Manufact.	15,612,674	16,412,550	16,318,568	17,082,086	17,928,610
Construction	1,824,870	1,865,580	1,762,330	1,721,915	1,697,725
Tran/Pub Ut.	1,334,063	1,381,875	1,400,625	1,456,875	1,505,625
Sub-Total	18,771,607	19,660,005	19,481,523	20,260,876	21,131,960
FARM-MINE					
Mining	21,240	21,240	21,240	22,420	24,780
Farming	270,810	244,850	223,610	212,400	202,370
Sub-Total	292,050	266,090	244,850	234,820	227,150
TOTAL	44,033,579	47,123,024	47,863,020	49,519,409	51,032,819

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 5. Coastal Counties: Low Growth Scenario				
Projected Demand for Square Footage by Location Type and Sector				
	2005	**2010**	**2015**	**2020**
REGIONAL				
Fin/Ins/RE	1,030,080	1,038,220	1,037,573	1,027,860
Retail Trade	4,499,663	4,553,948	4,521,635	4,470,640
Wholesale	1,785,290	1,655,686	1,611,250	1,558,946
Services	9,671,340	10,150,000	10,699,360	11,201,120
Ag/For/Fish S	569,510	595,058	642,610	694,079
Sub-Total	17,555,882	17,992,911	18,512,428	18,952,645
TOWN CTR.				
Fin/Ins/RE	1,030,080	1,038,220	1,037,573	1,027,860
Retail Trade	4,499,663	4,553,948	4,521,635	4,470,640
Services	9,671,340	10,150,000	10,699,360	11,201,120
Government	14,176,705	14,841,060	15,163,300	15,326,540
Sub-Total	29,377,788	30,583,228	31,421,868	32,026,160
EMPLOY AREA				
Construction	4,722,360	4,433,260	4,271,305	4,178,970
Tran/Pub Ut.	7,640,625	7,601,250	7,722,188	7,722,188
Wholesale	1,785,290	1,655,686	1,611,250	1,558,946
Ag/For/Fish S	569,510	595,058	642,610	694,079
Sub-Total	14,717,785	14,285,254	14,247,353	14,154,182
CORRIDOR				
Fin/Ins/RE	1,030,080	1,038,220	1,037,573	1,027,860
Retail Trade	4,499,663	4,553,948	4,521,635	4,470,640
Wholesale	1,785,290	1,655,686	1,611,250	1,558,946
Services	9,671,340	10,150,000	10,699,360	11,201,120
Ag/For/Fish S	569,510	595,058	642,610	694,079
Sub-Total	17,555,882	17,992,911	18,512,428	18,952,645
MAIN ST.				
Fin/Ins/RE	1,030,080	1,038,220	1,037,573	1,027,860
Retail Trade	4,499,663	4,553,948	4,521,635	4,470,640
Services	9,671,340	10,150,000	10,699,360	11,201,120
Government	14,176,705	14,841,060	15,163,300	15,326,540
Sub-Total	29,377,788	30,583,228	31,421,868	32,026,160
INDUSTRIAL				
Manufact.	21,414,862	21,240,618	22,337,532	23,607,318
Construction	4,722,360	4,433,260	4,271,305	4,178,970
Tran/Pub Ut.	7,640,625	7,601,250	7,722,188	7,803,750
Sub-Total	33,777,847	33,275,128	34,331,025	35,590,038
FARM-MINING				
Mining	82,010	80,240	83,780	89,090
Farming	594,720	544,570	517,430	492,650
Sub-Total	676,730	624,810	601,210	581,740
TOTAL	143,039,701	145,337,469	149,048,179	152,365,132

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 6. Hancock County, MS: Low Growth Alternative
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	85,193	91,945	94,535	95,553	95,183
Retail Trade	325,828	351,795	359,550	357,553	352,265
Wholesale	80,539	78,225	74,985	73,596	71,745
Services	1,029,840	1,166,060	1,269,240	1,367,100	1,456,700
Ag/For/Fish S	51,841	59,674	64,895	71,422	77,576
Sub-Total	1,573,241	1,747,699	1,863,205	1,965,223	2,053,468
TOWN CTR.					
Fin/Ins/RE	85,193	91,945	94,535	95,553	95,183
Retail Trade	325,828	351,795	359,550	357,553	352,265
Services	1,029,840	1,166,060	1,269,240	1,367,100	1,456,700
Government	1,140,560	1,243,380	1,298,235	1,334,275	1,350,705
Sub-Total	2,581,420	2,853,180	3,021,560	3,154,480	3,254,853
EMPLOY AREA					
Construction	437,190	433,060	416,835	405,920	398,840
Tran/Pub Ut.	516,563	529,688	536,250	555,938	555,938
Wholesale	80,539	78,225	74,985	73,596	71,745
Ag/For/Fish S	51,841	59,674	64,895	71,422	77,576
Sub-Total	1,086,133	1,100,646	1,092,965	1,106,876	1,104,098
CORRIDOR					
Fin/Ins/RE	85,193	91,945	94,535	95,553	95,183
Retail Trade	325,828	351,795	359,550	357,553	352,265
Wholesale	80,539	78,225	74,985	73,596	71,745
Services	1,029,840	1,166,060	1,269,240	1,367,100	1,456,700
Ag/For/Fish S	51,841	59,674	64,895	71,422	77,576
Sub-Total	1,573,241	1,747,699	1,863,205	1,965,223	2,053,468
MAIN ST.					
Fin/Ins/RE	85,193	91,945	94,535	95,553	95,183
Retail Trade	325,828	351,795	359,550	357,553	352,265
Services	1,029,840	1,166,060	1,269,240	1,367,100	1,456,700
Government	1,140,560	1,243,380	1,298,235	1,334,275	1,350,705
Sub-Total	2,581,420	2,853,180	3,021,560	3,154,480	3,254,853
INDUSTRIAL					
Manufact.	1,071,532	959,714	921,298	986,468	1,062,614
Construction	437,190	433,060	416,835	405,920	398,840
Tran/Pub Ut.	516,563	529,688	536,250	555,938	570,938
Sub-Total	2,025,285	1,922,462	1,874,383	1,948,326	2,032,392
FARM-MINE					
Mining	10,030	8,260	7,670	7,670	8,260
Farming	177,590	160,480	146,910	139,240	132,750
Sub-Total	187,620	168,740	154,580	146,910	141,010
TOTAL	11,608,359	12,393,605	12,891,458	13,441,518	13,909,141

Source: REMI model output, square foot/employee, and regional allocation assumptions

Table 7. Harrison County, MS: Low Growth Scenario				
Projected Demand for Square Footage by Location Type and Sector				
	2005	**2010**	**2015**	**2020**
REGIONAL				
Fin/Ins/RE	659,525	661,745	656,843	647,130
Retail Trade	2,767,948	2,784,398	2,742,450	2,698,388
Wholesale	1,318,717	1,224,754	1,186,336	1,144,215
Services	6,517,700	6,761,720	7,076,720	7,371,980
Ag/For/Fish S	340,140	353,939	380,419	409,883
Sub-Total	11,604,029	11,786,556	12,042,768	12,271,595
TOWN CTR.				
Fin/Ins/RE	659,525	661,745	656,843	647,130
Retail Trade	2,767,948	2,784,398	2,742,450	2,698,388
Services	6,517,700	6,761,720	7,076,720	7,371,980
Government	9,092,415	9,482,230	9,648,120	9,723,380
Sub-Total	19,037,588	19,690,093	20,124,133	20,440,878
EMPLOY AREA				
Construction	2,425,490	2,255,570	2,143,470	2,081,815
Tran/Pub Ut.	5,730,000	5,664,375	5,709,375	5,709,375
Wholesale	1,318,717	1,224,754	1,186,336	1,144,215
Ag/For/Fish S	340,140	353,939	380,419	409,883
Sub-Total	9,814,346	9,498,638	9,419,600	9,345,288
CORRIDOR				
Fin/Ins/RE	659,525	661,745	656,843	647,130
Retail Trade	2,767,948	2,784,398	2,742,450	2,698,388
Wholesale	1,318,717	1,224,754	1,186,336	1,144,215
Services	6,517,700	6,761,720	7,076,720	7,371,980
Ag/For/Fish S	340,140	353,939	380,419	409,883
Sub-Total	11,604,029	11,786,556	12,042,768	12,271,595
MAIN ST.				
Fin/Ins/RE	659,525	661,745	656,843	647,130
Retail Trade	2,767,948	2,784,398	2,742,450	2,698,388
Services	6,517,700	6,761,720	7,076,720	7,371,980
Government	9,092,415	9,482,230	9,648,120	9,723,380
Sub-Total	19,037,588	19,690,093	20,124,133	20,440,878
INDUSTRIAL				
Manufact.	4,038,482	3,993,892	4,268,292	4,619,524
Construction	2,425,490	2,255,570	2,143,470	2,081,815
Tran/Pub Ut.	5,730,000	5,664,375	5,709,375	5,728,125
Sub-Total	12,193,972	11,913,837	12,121,137	12,429,464
FARM-MINING				
Mining	51,920	51,330	53,100	56,050
Farming	189,980	174,050	165,200	157,530
Sub-Total	241,900	225,380	218,300	213,580
TOTAL	83,533,450	84,591,151	86,092,837	87,432,027

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 8. Jackson County, MS: Low Growth Scenario				
Projected Demand for Square Footage by Location Type and Sector				
	2005	**2010**	**2015**	**2020**
REGIONAL				
Fin/Ins/RE	278,518	281,940	285,270	285,363
Retail Trade	1,379,920	1,410,000	1,421,633	1,419,988
Wholesale	388,348	355,947	351,318	343,450
Services	1,987,580	2,119,180	2,255,540	2,372,440
Ag/For/Fish S	169,697	176,224	190,583	206,433
Sub-Total	4,204,062	4,343,291	4,504,343	4,627,673
TOWN CTR.				
Fin/Ins/RE	278,518	281,940	285,270	285,363
Retail Trade	1,379,920	1,410,000	1,421,633	1,419,988
Services	1,987,580	2,119,180	2,255,540	2,372,440
Government	3,840,910	4,060,330	4,180,640	4,252,455
Sub-Total	7,486,928	7,871,450	8,143,083	8,330,245
EMPLOY AREA				
Construction	1,863,810	1,761,150	1,721,915	1,698,315
Tran/Pub Ut.	1,381,875	1,400,625	1,456,875	1,456,875
Wholesale	388,348	355,947	351,318	343,450
Ag/For/Fish S	169,697	176,224	190,583	206,433
Sub-Total	3,803,730	3,693,946	3,720,691	3,705,073
CORRIDOR				
Fin/Ins/RE	278,518	281,940	285,270	285,363
Retail Trade	1,379,920	1,410,000	1,421,633	1,419,988
Wholesale	388,348	355,947	351,318	343,450
Services	1,987,580	2,119,180	2,255,540	2,372,440
Ag/For/Fish S	169,697	176,224	190,583	206,433
Sub-Total	4,204,062	4,343,291	4,504,343	4,627,673
MAIN ST.				
Fin/Ins/RE	278,518	281,940	285,270	285,363
Retail Trade	1,379,920	1,410,000	1,421,633	1,419,988
Services	1,987,580	2,119,180	2,255,540	2,372,440
Government	3,840,910	4,060,330	4,180,640	4,252,455
Sub-Total	7,486,928	7,871,450	8,143,083	8,330,245
INDUSTRIAL				
Manufact.	16,416,666	16,324,742	17,082,772	17,925,180
Construction	1,863,810	1,761,150	1,721,915	1,698,315
Tran/Pub Ut.	1,381,875	1,400,625	1,456,875	1,505,625
Sub-Total	19,662,351	19,486,517	20,261,562	21,129,120
FARM-MINING				
Mining	21,240	21,240	22,420	24,780
Farming	244,850	223,610	212,400	202,370
Sub-Total	266,090	244,850	234,820	227,150
TOTAL	47,114,150	47,854,794	49,511,925	51,025,929

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 9: Coastal Counties, MS. Moderate Growth Alternative
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	980,778	1,059,310	1,092,148	1,116,383	1,132,200
Retail Trade	4,252,678	4,613,638	4,756,753	4,816,090	4,862,855
Wholesale	1,937,574	1,821,856	1,716,785	1,697,344	1,670,498
Services	9,331,140	11,091,080	12,689,740	14,327,320	15,970,220
Ag/For/Fish S	524,755	578,834	614,079	675,804	746,479
Sub-Total	17,026,924	19,164,718	20,869,503	22,632,940	24,382,252
TOWN CTR.					
Fin/Ins/RE	980,778	1,059,310	1,092,148	1,116,383	1,132,200
Retail Trade	4,252,678	4,613,638	4,756,753	4,816,090	4,862,855
Services	9,331,140	11,091,080	12,689,740	14,327,320	15,970,220
Government	12,710,195	14,352,930	15,313,820	15,987,980	16,516,125
Sub-Total	27,274,790	31,116,958	33,852,460	36,247,773	38,481,400
EMPLOY AREA					
Construction	4,882,840	4,918,240	4,756,875	4,704,660	4,716,165
Tran/Pub Ut.	7,671,563	7,738,125	7,771,875	7,984,688	7,984,688
Wholesale	1,937,574	1,821,856	1,716,785	1,697,344	1,670,498
Ag/For/Fish S	524,755	578,834	614,079	675,804	746,479
Sub-Total	15,016,731	15,057,055	14,859,613	15,062,495	15,117,830
CORRIDOR					
Fin/Ins/RE	980,778	1,059,310	1,092,148	1,116,383	1,132,200
Retail Trade	4,252,678	4,613,638	4,756,753	4,816,090	4,862,855
Wholesale	1,937,574	1,821,856	1,716,785	1,697,344	1,670,498
Services	9,331,140	11,091,080	12,689,740	14,327,320	15,970,220
Ag/For/Fish S	524,755	578,834	614,079	675,804	746,479
Sub-Total	17,026,924	19,164,718	20,869,503	22,632,940	24,382,252
MAIN ST.					
Fin/Ins/RE	980,778	1,059,310	1,092,148	1,116,383	1,132,200
Retail Trade	4,252,678	4,613,638	4,756,753	4,816,090	4,862,855
Services	9,331,140	11,091,080	12,689,740	14,327,320	15,970,220
Government	12,710,195	14,352,930	15,313,820	15,987,980	16,516,125
Sub-Total	27,274,790	31,116,958	33,852,460	36,247,773	38,481,400
INDUSTRIAL					
Manufact.	20,852,342	21,322,252	21,044,422	22,092,630	23,365,846
Construction	4,882,840	4,918,240	4,756,875	4,704,660	4,716,165
Tran/Pub Ut.	7,671,563	7,738,125	7,771,875	7,984,688	8,179,688
Sub-Total	33,406,745	33,978,617	33,573,172	34,781,978	36,261,699
FARM-MINE					
Mining	83,780	82,010	80,830	83,780	89,090
Farming	659,620	595,310	543,980	517,430	492,060
Sub-Total	743,400	677,320	624,810	601,210	581,150
TOTAL	137,770,303	150,276,343	158,501,522	168,207,108	177,882,983

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 10. Hancock County, MS: Moderate Growth Alternative
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	85,563	94,535	99,253	102,490	104,525
Retail Trade	327,238	359,080	372,123	375,413	375,883
Wholesale	81,002	79,614	77,299	77,299	75,911
Services	1,048,460	1,275,680	1,471,120	1,665,580	1,858,920
Ag/For/Fish S	52,401	62,098	69,930	79,627	89,883
Sub-Total	1,594,663	1,871,006	2,089,724	2,300,409	2,505,122
TOWN CTR.					
Fin/Ins/RE	85,563	94,535	99,253	102,490	104,525
Retail Trade	327,238	359,080	372,123	375,413	375,883
Services	1,048,460	1,275,680	1,471,120	1,665,580	1,858,920
Government	1,141,090	1,256,630	1,335,335	1,399,995	1,446,635
Sub-Total	2,602,350	2,985,925	3,277,830	3,543,478	3,785,963
EMPLOY AREA					
Construction	440,140	450,170	445,450	444,860	448,105
Tran/Pub Ut.	518,438	536,250	548,438	573,750	573,750
Wholesale	81,002	79,614	77,299	77,299	75,911
Ag/For/Fish S	52,401	62,098	69,930	79,627	89,883
Sub-Total	1,091,981	1,128,131	1,141,117	1,175,536	1,187,649
CORRIDOR					
Fin/Ins/RE	85,563	94,535	99,253	102,490	104,525
Retail Trade	327,238	359,080	372,123	375,413	375,883
Wholesale	81,002	79,614	77,299	77,299	75,911
Services	1,048,460	1,275,680	1,471,120	1,665,580	1,858,920
Ag/For/Fish S	52,401	62,098	69,930	79,627	89,883
Sub-Total	1,594,663	1,871,006	2,089,724	2,300,409	2,505,122
MAIN ST.					
Fin/Ins/RE	85,563	94,535	99,253	102,490	104,525
Retail Trade	327,238	359,080	372,123	375,413	375,883
Services	1,048,460	1,275,680	1,471,120	1,665,580	1,858,920
Government	1,141,090	1,256,630	1,335,335	1,399,995	1,446,635
Sub-Total	2,602,350	2,985,925	3,277,830	3,543,478	3,785,963
INDUSTRIAL					
Manufact.	1,070,846	953,540	908,950	967,946	1,040,662
Construction	440,140	450,170	445,450	444,860	448,105
Tran/Pub Ut.	518,438	536,250	548,438	573,750	594,375
Sub-Total	2,029,424	1,939,960	1,902,838	1,986,556	2,083,142
FARM-MINE					
Mining	10,030	8,260	7,670	7,670	8,260
Farming	177,590	160,480	146,910	139,240	132,750
Sub-Total	187,620	168,740	154,580	146,910	141,010
TOTAL	11,703,050	12,950,694	13,933,643	14,996,775	16,014,594

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 11. Harrison County, MS: Moderate Growth Alternative
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	634,550	683,575	706,423	722,518	734,635
Retail Trade	2,653,150	2,859,715	2,949,720	2,985,558	3,024,685
Wholesale	1,433,508	1,352,969	1,281,687	1,266,412	1,247,898
Services	6,484,100	7,817,740	9,082,780	10,381,700	11,704,700
Ag/For/Fish S	316,084	346,853	367,925	405,408	449,417
Sub-Total	11,521,392	13,060,852	14,388,535	15,761,595	17,161,334
TOWN CTR.					
Fin/Ins/RE	634,550	683,575	706,423	722,518	734,635
Retail Trade	2,653,150	2,859,715	2,949,720	2,985,558	3,024,685
Services	6,484,100	7,817,740	9,082,780	10,381,700	11,704,700
Government	8,185,585	9,234,720	9,869,395	10,331,290	10,717,395
Sub-Total	17,957,385	20,595,750	22,608,318	24,421,065	26,181,415
EMPLOY AREA					
Construction	2,612,225	2,576,530	2,510,450	2,489,800	2,514,580
Tran/Pub Ut.	5,819,063	5,818,125	5,817,188	5,947,500	5,947,500
Wholesale	1,433,508	1,352,969	1,281,687	1,266,412	1,247,898
Ag/For/Fish S	316,084	346,853	367,925	405,408	449,417
Sub-Total	10,180,879	10,094,477	9,977,250	10,109,120	10,159,394
CORRIDOR					
Fin/Ins/RE	634,550	683,575	706,423	722,518	734,635
Retail Trade	2,653,150	2,859,715	2,949,720	2,985,558	3,024,685
Wholesale	1,433,508	1,352,969	1,281,687	1,266,412	1,247,898
Services	6,484,100	7,817,740	9,082,780	10,381,700	11,704,700
Ag/For/Fish S	316,084	346,853	367,925	405,408	449,417
Sub-Total	11,521,392	13,060,852	14,388,535	15,761,595	17,161,334
MAIN ST.					
Fin/Ins/RE	634,550	683,575	706,423	722,518	734,635
Retail Trade	2,653,150	2,859,715	2,949,720	2,985,558	3,024,685
Services	6,484,100	7,817,740	9,082,780	10,381,700	11,704,700
Government	8,185,585	9,234,720	9,869,395	10,331,290	10,717,395
Sub-Total	17,957,385	20,595,750	22,608,318	24,421,065	26,181,415
INDUSTRIAL					
Manufact.	4,170,194	4,011,042	3,933,524	4,194,204	4,558,470
Construction	2,612,225	2,576,530	2,510,450	2,489,800	2,514,580
Tran/Pub Ut.	5,819,063	5,818,125	5,817,188	5,947,500	6,067,500
Sub-Total	12,601,482	12,405,697	12,261,162	12,631,504	13,140,550
FARM-MINE					
Mining	53,100	51,920	51,920	53,100	56,640
Farming	210,630	189,980	174,050	165,200	157,530
Sub-Total	263,730	241,900	225,970	218,300	214,170
TOTAL	82,003,645	90,055,277	96,458,085	103,324,244	110,319,613

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 12. Jackson County, MS: Moderate Growth Alternative
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	260,665	281,200	286,473	291,375	293,133
Retail Trade	1,272,408	1,394,843	1,434,910	1,455,120	1,462,288
Wholesale	423,526	389,737	357,799	353,633	346,690
Services	1,798,720	1,997,520	2,135,840	2,280,040	2,406,600
Ag/For/Fish S	156,457	169,697	176,224	190,956	206,993
Sub-Total	3,911,775	4,232,996	4,391,245	4,571,123	4,715,702
TOWN CTR.					
Fin/Ins/RE	260,665	281,200	286,473	291,375	293,133
Retail Trade	1,272,408	1,394,843	1,434,910	1,455,120	1,462,288
Services	1,798,720	1,997,520	2,135,840	2,280,040	2,406,600
Government	3,383,520	3,861,315	4,109,090	4,256,695	4,352,360
Sub-Total	6,715,313	7,534,878	7,966,313	8,283,230	8,514,380
EMPLOY AREA					
Construction	1,830,475	1,891,540	1,800,975	1,770,000	1,753,480
Tran/Pub Ut.	1,334,063	1,385,625	1,406,250	1,465,313	1,465,313
Wholesale	423,526	389,737	357,799	353,633	346,690
Ag/For/Fish S	156,457	169,697	176,224	190,956	206,993
Sub-Total	3,744,520	3,836,598	3,741,247	3,779,901	3,772,475
CORRIDOR					
Fin/Ins/RE	260,665	281,200	286,473	291,375	293,133
Retail Trade	1,272,408	1,394,843	1,434,910	1,455,120	1,462,288
Wholesale	423,526	389,737	357,799	353,633	346,690
Services	1,798,720	1,997,520	2,135,840	2,280,040	2,406,600
Ag/For/Fish S	156,457	169,697	176,224	190,956	206,993
Sub-Total	3,911,775	4,232,996	4,391,245	4,571,123	4,715,702
MAIN ST.					
Fin/Ins/RE	260,665	281,200	286,473	291,375	293,133
Retail Trade	1,272,408	1,394,843	1,434,910	1,455,120	1,462,288
Services	1,798,720	1,997,520	2,135,840	2,280,040	2,406,600
Government	3,383,520	3,861,315	4,109,090	4,256,695	4,352,360
Sub-Total	6,715,313	7,534,878	7,966,313	8,283,230	8,514,380
INDUSTRIAL					
Manufact.	15,611,988	16,357,670	16,202,634	16,930,480	17,766,028
Construction	1,830,475	1,891,540	1,800,975	1,770,000	1,753,480
Tran/Pub Ut.	1,334,063	1,385,625	1,406,250	1,465,313	1,516,875
Sub-Total	18,776,526	19,634,835	19,409,859	20,165,793	21,036,383
FARM-MINE					
Mining	21,240	21,240	21,240	22,420	24,780
Farming	270,810	244,850	223,610	212,400	202,370
Sub-Total	292,050	266,090	244,850	234,820	227,150
TOTAL	44,067,271	47,273,270	48,111,070	49,889,220	51,547,735

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 13. Coastal Counties, MS: High Growth Alternative
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	984,848	1,084,470	1,139,045	1,185,573	1,224,145
Retail Trade	4,270,185	4,713,043	4,936,763	5,081,288	5,218,763
Wholesale	1,944,054	1,853,794	1,770,478	1,773,255	1,769,089
Services	9,524,340	12,222,980	14,770,560	17,397,940	20,075,580
Ag/For/Fish S	526,247	587,039	631,421	706,573	794,405
Sub-Total	17,249,673	20,461,326	23,248,267	26,144,628	29,081,981
TOWN CTR.					
Fin/Ins/RE	984,848	1,084,470	1,139,045	1,185,573	1,224,145
Retail Trade	4,270,185	4,713,043	4,936,763	5,081,288	5,218,763
Services	9,524,340	12,222,980	14,770,560	17,397,940	20,075,580
Government	12,716,555	14,501,330	15,719,800	16,709,840	17,571,355
Sub-Total	27,495,928	32,521,823	36,566,168	40,374,640	44,089,843
EMPLOY AREA					
Construction	4,913,225	5,086,095	5,037,125	5,084,030	5,188,460
Tran/Pub Ut.	7,688,438	7,821,563	7,923,750	8,221,875	8,221,875
Wholesale	1,944,054	1,853,794	1,770,478	1,773,255	1,769,089
Ag/For/Fish S	526,247	587,039	631,421	706,573	794,405
Sub-Total	15,071,963	15,348,491	15,362,774	15,785,733	15,973,829
CORRIDOR					
Fin/Ins/RE	984,848	1,084,470	1,139,045	1,185,573	1,224,145
Retail Trade	4,270,185	4,713,043	4,936,763	5,081,288	5,218,763
Wholesale	1,944,054	1,853,794	1,770,478	1,773,255	1,769,089
Services	9,524,340	12,222,980	14,770,560	17,397,940	20,075,580
Ag/For/Fish S	526,247	587,039	631,421	706,573	794,405
Sub-Total	17,249,673	20,461,326	23,248,267	26,144,628	29,081,981
MAIN ST.					
Fin/Ins/RE	984,848	1,084,470	1,139,045	1,185,573	1,224,145
Retail Trade	4,270,185	4,713,043	4,936,763	5,081,288	5,218,763
Services	9,524,340	12,222,980	14,770,560	17,397,940	20,075,580
Government	12,716,555	14,501,330	15,719,800	16,709,840	17,571,355
Sub-Total	27,495,928	32,521,823	36,566,168	40,374,640	44,089,843
INDUSTRIAL					
Manufact.	20,850,284	21,246,106	20,884,584	21,889,574	23,160,732
Construction	4,913,225	5,086,095	5,037,125	5,084,030	5,188,460
Tran/Pub Ut.	7,688,438	7,821,563	7,923,750	8,221,875	8,517,188
Sub-Total	33,451,947	34,153,764	33,845,459	35,195,479	36,866,380
FARM-MINE					
Mining	83,780	82,010	80,830	83,780	89,680
Farming	659,620	595,310	543,980	517,430	492,060
Sub-Total	743,400	677,320	624,810	601,210	581,740
TOTAL	138,758,511	156,145,871	169,461,911	184,620,957	200,060,909

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 14. Hancock County, MS: High Growth Alternative
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	85,933	96,848	103,693	109,058	113,220
Retail Trade	328,295	36,543	383,520	392,215	398,325
Wholesale	81,002	81,002	79,614	80,077	80,077
Services	1,065,820	1,380,120	1,664,320	1,953,280	2,247,420
Ag/For/Fish S	52,774	64,522	74,592	87,646	101,818
Sub-Total	1,613,824	1,659,034	2,305,738	2,622,275	2,940,860
TOWN CTR.					
Fin/Ins/RE	85,933	96,848	103,693	109,058	113,220
Retail Trade	328,295	36,543	383,520	392,215	398,325
Services	1,065,820	1,380,120	1,664,320	1,953,280	2,247,420
Government	1,141,620	1,268,555	1,369,255	1,461,740	1,538,060
Sub-Total	2,621,668	2,782,065	3,520,788	3,916,293	4,297,025
EMPLOY AREA					
Construction	442,795	464,920	471,115	480,850	494,420
Tran/Pub Ut.	519,375	542,813	559,688	589,688	589,688
Wholesale	81,002	81,002	79,614	80,077	80,077
Ag/For/Fish S	52,774	64,522	74,592	87,646	101,818
Sub-Total	1,095,946	1,153,257	1,185,008	1,238,260	1,266,002
CORRIDOR					
Fin/Ins/RE	85,933	96,848	103,693	109,058	113,220
Retail Trade	328,295	36,543	383,520	392,215	398,325
Wholesale	81,002	81,002	79,614	80,077	80,077
Services	1,065,820	1,380,120	1,664,320	1,953,280	2,247,420
Ag/For/Fish S	52,774	64,522	74,592	87,646	101,818
Sub-Total	1,613,824	1,659,034	2,305,738	2,622,275	2,940,860
MAIN ST.					
Fin/Ins/RE	85,933	96,848	103,693	109,058	113,220
Retail Trade	328,295	36,543	383,520	392,215	398,325
Services	1,065,820	1,380,120	1,664,320	1,953,280	2,247,420
Government	1,141,620	1,268,555	1,369,255	1,461,740	1,538,060
Sub-Total	2,621,668	2,782,065	3,520,788	3,916,293	4,297,025
INDUSTRIAL					
Manufact.	1,070,846	950,110	897,288	952,168	1,022,826
Construction	442,795	464,920	471,115	480,850	494,420
Tran/Pub Ut.	519,375	542,813	559,688	589,688	616,875
Sub-Total	2,033,016	1,957,843	1,928,091	2,022,706	2,134,121
FARM-MINE					
Mining	10,030	8,260	7,670	7,670	7,670
Farming	177,590	160,480	146,910	139,240	132,750
Sub-Total	187,620	168,740	154,580	146,910	140,420
TOTAL	11,787,564	12,162,038	14,920,730	16,485,009	18,043,500

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 15. Harrison County, MS: High Growth Alternative
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	637,880	704,295	744,995	779,590	810,763
Retail Trade	2,667,250	2,940,203	3,096,830	3,203,990	3,319,845
Wholesale	1,439,526	1,382,130	1,331,214	1,337,231	1,339,546
Services	6,658,260	8,837,080	10,956,120	13,142,640	15,390,480
Ag/For/Fish S	317,016	352,820	380,606	427,785	484,848
Sub-Total	11,719,932	14,216,527	16,509,765	18,891,237	21,345,481
TOWN CTR.					
Fin/Ins/RE	637,880	704,295	744,995	779,590	810,763
Retail Trade	2,667,250	2,940,203	3,096,830	3,203,990	3,319,845
Services	6,658,260	8,837,080	10,956,120	13,142,640	15,390,480
Government	8,190,620	9,355,030	10,200,645	10,925,420	11,592,425
Sub-Total	18,154,010	21,836,608	24,998,590	28,051,640	31,113,513
EMPLOY AREA					
Construction	2,635,530	2,706,625	2,730,225	2,789,815	2,890,115
Tran/Pub Ut.	5,834,063	5,890,313	5,952,188	6,158,438	6,158,438
Wholesale	1,439,526	1,382,130	1,331,214	1,337,231	1,339,546
Ag/For/Fish S	317,016	352,820	380,606	427,785	484,848
Sub-Total	10,226,134	10,331,887	10,394,232	10,713,269	10,872,946
CORRIDOR					
Fin/Ins/RE	637,880	704,295	744,995	779,590	810,763
Retail Trade	2,667,250	2,940,203	3,096,830	3,203,990	3,319,845
Wholesale	1,439,526	1,382,130	1,331,214	1,337,231	1,339,546
Services	6,658,260	8,837,080	10,956,120	13,142,640	15,390,480
Ag/For/Fish S	317,016	352,820	380,606	427,785	484,848
Sub-Total	11,719,932	14,216,527	16,509,765	18,891,237	21,345,481
MAIN ST.					
Fin/Ins/RE	637,880	704,295	744,995	779,590	810,763
Retail Trade	2,667,250	2,940,203	3,096,830	3,203,990	3,319,845
Services	6,658,260	8,837,080	10,956,120	13,142,640	15,390,480
Government	8,190,620	9,355,030	10,200,645	10,925,420	11,592,425
Sub-Total	18,154,010	21,836,608	24,998,590	28,051,640	31,113,513
INDUSTRIAL					
Manufact.	4,170,194	3,987,718	3,884,818	4,137,952	4,511,136
Construction	2,635,530	2,706,625	2,730,225	2,789,815	2,890,115
Tran/Pub Ut.	5,834,063	5,890,313	5,952,188	6,158,438	6,372,188
Sub-Total	12,639,787	12,584,656	12,567,231	13,086,205	13,773,439
FARM-MINE					
Mining	53,100	52,510	51,920	53,690	57,230
Farming	210,630	189,980	174,050	165,200	157,530
Sub-Total	263,730	242,490	225,970	218,890	214,760
TOTAL	82,877,534	95,265,303	106,204,142	117,904,117	129,992,882

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Table 16. Jackson County, MS: High Growth Alternative
Projected Demand for Square Footage by Location Type and Sector

	2000	2005	2010	2015	2020
REGIONAL					
Fin/Ins/RE	261,035	283,420	290,265	296,833	300,070
Retail Trade	1,274,640	1,407,298	1,456,295	1,484,965	1,500,593
Wholesale	423,526	390,662	359,650	355,947	349,467
Services	1,800,260	2,005,920	2,150,400	2,302,020	2,437,540
Ag/For/Fish S	156,457	186,480	186,480	186,480	207,739
Sub-Total	3,915,918	4,273,780	4,443,090	4,626,245	4,795,408
TOWN CTR.					
Fin/Ins/RE	261,035	283,420	290,265	296,833	300,070
Retail Trade	1,274,640	1,407,298	1,456,295	1,484,965	1,500,593
Services	1,800,260	2,005,920	2,150,400	2,302,020	2,437,540
Government	3,384,315	3,877,480	4,149,635	4,322,415	4,440,870
Sub-Total	6,720,250	7,574,118	8,046,595	8,406,233	8,679,073
EMPLOY AREA					
Construction	1,834,900	1,914,550	1,835,785	1,813,365	1,803,925
Tran/Pub Ut.	1,335,000	1,388,438	1,411,875	1,472,813	1,472,813
Wholesale	423,526	390,662	359,650	355,947	349,467
Ag/For/Fish S	156,457	186,480	186,480	186,480	207,739
Sub-Total	3,749,883	3,880,130	3,793,790	3,828,605	3,833,943
CORRIDOR					
Fin/Ins/RE	261,035	283,420	290,265	296,833	300,070
Retail Trade	1,274,640	1,407,298	1,456,295	1,484,965	1,500,593
Wholesale	423,526	390,662	359,650	355,947	349,467
Services	1,800,260	2,005,920	2,150,400	2,302,020	2,437,540
Ag/For/Fish S	156,457	186,480	186,480	186,480	207,739
Sub-Total	3,915,918	4,273,780	4,443,090	4,626,245	4,795,408
MAIN ST.					
Fin/Ins/RE	261,035	283,420	290,265	296,833	300,070
Retail Trade	1,274,640	1,407,298	1,456,295	1,484,965	1,500,593
Services	1,800,260	2,005,920	2,150,400	2,302,020	2,437,540
Government	3,384,315	3,877,480	4,149,635	4,322,415	4,440,870
Sub-Total	6,720,250	7,574,118	8,046,595	8,406,233	8,679,073
INDUSTRIAL					
Manufact.	15,609,244	16,310,336	16,101,792	16,800,140	17,626,084
Construction	1,834,900	1,914,550	1,835,785	1,813,365	1,803,925
Tran/Pub Ut.	1,335,000	1,388,438	1,411,875	1,472,813	1,528,125
Sub-Total	18,779,144	19,613,324	19,349,452	20,086,318	20,958,134
FARM-MINE					
Mining	21,240	21,240	21,240	23,010	24,780
Farming	270,810	244,850	223,610	212,400	202,370
Sub-Total	292,050	266,090	244,850	235,410	227,150
TOTAL	44,093,412	47,455,338	48,367,462	50,215,286	52,023,501

Source: REMI model output, square foot/employee, and regional allocation assumptions.

Appendix O

Projected Land Use

Coastal Mississippi EIS Land Use Analysis Methodology

To perform a trend analysis in land use patterns to the year 2020, current and historical land use data were acquired and analyzed for the years 1972, 1992, and 2000. Economic models and land use trends information were used to simulate land use cover changes to the year 2020.

2000 Land Use Data

Data Sources. The most current land use dataset was utilized to represent baseline land use for the EIS. Land use coverages classified from satellite imagery taken during 1999 (although the data are commonly referred to as "2000 land use data") were provided by Mississippi DMR (MARIS, 2000). The data were produced under contract for DMR by the Mississippi Automated Resource Information System (MARIS) Technical Center, a state GIS agency. The datasets were provided in ArcView shapefiles, which were then converted to Arc/Info grids with a 30-meter pixel resolution for ease in processing (a pixel is a square 0.22 acres in size). The land use classification categories are shown in Table 1. In order to facilitate use of the data for the EIS and compare it with land use datasets from previous years, the categories were "consolidated" together to create the following classification used throughout the EIS. A full text description of each 2000 MARIS land use type (as provided by MARIS [Belokon, 2001]) is provided in Attachment 1 at the end of this appendix.

Data Consolidation/Modification. After reviewing acreages of raw data values for the 2000, 1992, and 1972 data, the following modifications were made to the 2000 data to make it more comparable with the previous years' datasets:

- A transportation class was created for the 2000 land use dataset by extracting the Transportation class from the MARIS 1992 land use dataset, which included 4-lane roads and airport runways. Further review of the 1992 Transportation class determined that no new major 4-lane roads and airport runways have been added since 1992.

- A separate inland water class was desired, and the 2000 land use dataset did not separate out surface water types. The Fresh Water class from the 1992 dataset was included in the land use tables for 2000 and 1972 in the EIS. For the purposes of the land use tables only, the Surface Water/Other class is the total acreage of the study area minus all other classes listed above. This was done because of differences in the extents or boundaries of the datasets, and some of the missing data were determined to be surface water areas.

- Large discrepancies between the acreage for the upland coniferous forest and wet coniferous forest/savanna categories between the 2000 and the 1992 datasets were found, most likely the result of different methods of classifying the satellite imagery. Furthermore, a pine savanna category was not present in the 1972 dataset. It is assumed that the older satellite imagery was not able to distinguish between upland and wet coniferous forest as well. To account for this, the upland coniferous forest and wet coniferous forest/savanna categories were combined to create a single coniferous forest/savanna category.

Table 1
2000 MARIS Detailed Land Use Classes Converted to 2000 MARIS Consolidated Classes

2000 MARIS Class	Equivalent 2000 Consolidated MARIS Class
Upland Pine	Coniferous Forest/Savanna
Upland Mixed Forest	Deciduous/Mixed/Bottomland Forest/Swamp
Upland Deciduous Forest	Deciduous/Mixed/Bottomland Forest/Swamp
Bottomland Hardwood Forest	Deciduous/Mixed/Bottomland Forest/Swamp
Swamp	Deciduous/Mixed/Bottomland Forest/Swamp
Wet Pine Forest/Pine Savanna	Coniferous Forest/Savanna
Upland Scrub/Shrub Land	Scrub-Shrub/Cutover/Barren
Wet Scrub/Shrub Land	Scrub-Shrub/Cutover/Barren
Tidal Marsh	Emergent Wetland
Non-Tidal Marsh	Emergent Wetland
Surface Water	Surface Water/Other
Upland Cutover Land	Scrub-Shrub/Cutover/Barren
Wet Cutover Land	Scrub-Shrub/Cutover/Barren
Upland Sand/Barren Land	Scrub-Shrub/Cutover/Barren
Wet Sand/Barren Land	Scrub-Shrub/Cutover/Barren
Cropland/Pasture/Grassland	Cropland/Pasture/Grassland
Burned Area	Scrub-Shrub/Cutover/Barren
High-Density Urban	High Density Urban
Medium-Density Urban	Medium Density Urban

1992 Land Use Data

Data Sources. A dataset for pre-casino development (circa 1990) in coastal Mississippi was desired to compare with historical and current land use datasets. Two sets were located – a 1992 land use coverage developed by MARIS and provided by DMR (MARIS, 1992), and 1992 data produced as part of the nationwide National Land Cover Dataset (NLCD) developed in a joint effort by USGS and EPA (USGS and EPA, 1992). Both datasets were provided in Arc/Info grid format at a 30-meter pixel resolution. The MARIS dataset was chosen because of its similarities with the 2000 land use data, thus comparisons between the two datasets would be more accurate. The 1992 MARIS land use classification categories are shown in Table 2. It should be noted that the available MARIS data covered the three coastal counties (Hancock, Harrison, and Jackson), so the NLCD data were used to fill in the missing data areas not originally covered by the MARIS dataset for conducting the watershed analysis (e.g., parts of the Bay Saint Louis and Biloxi Bay watersheds that fall in Pearl River, Stone, and Lamar counties). Full text descriptions of the land use types in the 1992 MARIS and 1992 NLCD datasets are provided in Attachments 2 and 3, respectively.

Consolidation/Modification. The 1992 MARIS land use classification was similar to the 2000 classification, with slight differences:

- A Transportation class was included;
- A slightly different classification scheme was used for classifying urban density between 1992 and 2000. In 1992, a “Low” and “High” Density Urban class were used rather than “Medium” “and “High” as found in the 2000 data. MARIS confirmed that the Low and Medium classifications were similar (Belokon, 2001);

Table 2
1992 MARIS Land Use Classes Converted to 2000 MARIS Consolidated Classes

1992 MARIS Class	Equivalent 2000 Consolidated MARIS Class
High Density Urban	High Density Urban
Low Density Urban	Medium Density Urban
Transportation	Transportation
Pine Forest	Coniferous Forest/Savanna
Mixed Forest	Deciduous/Mixed/Bottomland Forest/Swamp
Deciduous Forest	Deciduous/Mixed/Bottomland Forest/Swamp
Cropland	Cropland/Pasture/Grassland
Pasture/Grassland	Cropland/Pasture/Grassland
Upland Scrub/Shrub	Scrub-Shrub/Cutover/Barren
Barren Land	Scrub-Shrub/Cutover/Barren
Other Land	Scrub-Shrub/Cutover/Barren
Fresh Water	Inland Fresh Water
Aquacultural Water	Surface Water/Other
Estuarine Water	Surface Water/Other
Marine Water	Surface Water/Other
Estuarine Emergent	Emergent Wetland
Estuarine Woody	Deciduous/Mixed/Bottomland Forest/Swamp
Palustrine Emergent	Emergent Wetland
Bottomland Hardwood Forest	Deciduous/Mixed/Bottomland Forest/Swamp
Riverine Swamp	Deciduous/Mixed/Bottomland Forest/Swamp
Pine Savanna/Wet Pine Flatwoods	Coniferous Forest/Savanna
Freshwater Scrub/Shrub	Scrub-Shrub/Cutover/Barren
Palustrine Non-Vegetated	Emergent Wetland
Clouds	Applied to other categories based on NCLD data
N/A	Surface Water/Other
Background	Surface Water/Other

Table 3
1992 NLCD Land Use Classes Converted to 2000 MARIS Consolidated Classes

1992 NLCD Class	Equivalent 2000 Consolidated MARIS Class
Open Water	Surface Water/Other
Low Intensity Residential	Medium Density Urban
High Intensity Residential	High Density Urban
Commercial/Industrial/ Transportation	High Density Urban
Bare Rock/Sand/Clay	Scrub-Shrub/Cutover/Barren
Quarries/Strip Mines/Gravel Pits	Scrub-Shrub/Cutover/Barren
Transitional	Scrub-Shrub/Cutover/Barren
Deciduous Forest	Deciduous/Mixed/Bottomland Forest/Swamp
Evergreen Forest	Upland Coniferous Forest
Mixed Forest	Deciduous/Mixed/Bottomland Forest/Swamp
Pasture/Hay	Cropland/Pasture/Grassland
Row Crops	Cropland/Pasture/Grassland
Urban/Recreational Grasses	Medium Density Urban
Woody Wetlands	Deciduous/Mixed/Bottomland Forest/Swamp
Emergent/Herbaceous Wetlands	Emergent Wetland

- There were 4 water categories used in 1992, rather than one as found in the 2000 data;
- A “Clouds” category was present in 1992.

For the Transportation class, the missing 4-lane roads (i.e., Interstate 110 and two highways not included in the NLCD dataset in Pearl River and Stone Counties, Interstate 59 and U.S. Route 49) were added to the 1992 dataset. The water classes were lumped together into 2 classes, as presented above. For the clouds, the NLCD land use within the MARIS cloud areas were incorporated into the final dataset.

In order to facilitate comparison with the 2000 land use data, similar land use classes in the 1992 MARIS and NLCD datasets were lumped together to match the 2000 "consolidated" classification discussed previously, as shown in Tables 2 and 3.

Preliminary comparison between the 1992 and 2000 MARIS datasets revealed that the resolution at which the data was classified was lower for 1992, resulting in less urban land use fragmentation in the 1992 MARIS data as compared with the 2000 land use dataset. In addition, the 2000 dataset appeared to pick up isolated urban "pockets" (areas containing less than five acres) in the less developed areas of the counties. The 1992 data appears to have overestimated urban areas in municipalities and along the coast, and few urban pixels were found in rural areas. To make the datasets more comparable, the following corrections were applied. To account for the lack of urban fragmentation, land uses that were not expected to change from 1992 to 2000 were extracted from the 2000 dataset and applied to urban areas in the 1992 data to "replicate" the fragmentation. To add urban "pockets" to the 1992 dataset to make it more comparable with the 2000 data, medium and high intensity urban pixels outside of 1992 urban areas were separately extracted from the 2000 dataset and applied to the 1992 data based on the expected urban acreage calculated for 1992 using the population data at the subwatershed level. Subwatersheds were used because it was a small enough functional geographic area that provided end-to-end coverage over the entire Mississippi coastal region and would also provide a more accurate level of analysis than the county or watershed level.

Table 4 shows which 2000 land uses were retroactively applied. Other corrections that were made are presented below.

- There was a high amount of discrepancy between the deciduous forest acreage values for the years 1992 and 2000 beyond what could be explained by deforestation. Upon further review it was determined that borderline deciduous forest stands were classified as scrub-shrub in the 1992 data. To account for this discrepancy, the 1992 NLCD deciduous and mixed forest areas that fell within the 1992 MARIS scrub/shrub areas were subtracted from the scrub/shrub acreage and applied to the deciduous and mixed forest acreage.

- Large discrepancies between the acreage for the upland coniferous forest and wet coniferous forest/savanna categories between the 2000 and the 1992 datasets were found, most likely the result of different methods of classifying the satellite imagery. A pine savanna category was not present in the 1972 dataset. It is assumed that the older satellite imagery was not able to distinguish between upland and wet coniferous forest as well. To account for this, the upland coniferous forest and wet coniferous forest/savanna categories were combined to create a single coniferous forest/savanna category. However, wet coniferous forest/savanna areas were considered a separate category when calculating the potential future conversion of natural land cover types to developed areas by determining the percentage of all coniferous forest areas that were wet coniferous forest/savanna.

- Not all emergent wetland areas in 2000 were wetlands in 1992. Although wetland mitigation for development projects has occurred since 1992, it is unlikely that the 2000 image classification could have picked up mitigated wetlands in early stages of development. Therefore, wetlands present in the 2000 dataset but not in the 1992 data were applied to the 1992 dataset.

Table 4
Land Uses Applied Retroactively

Land Use Applied from Previous Year's Dataset	**Applied to Urban Areas (1992 and 1972)**	**Applied to Agricultural Areas (1972 only)**	**Applied to Mixed Forest Areas (1972 only)**
Deciduous/Mixed/Bottomland Forest/Swamp	X	X	
Upland Coniferous Forest	X	X	X
Wet Coniferous Forest/Savanna	X	X	X
Cropland/Pasture/Grassland	X		
Scrub-Shrub/Cutover/Barren	X		
Emergent Wetland	X	X	X

1972 Land Use Data

Data Sources and Modifications. The 1972 Geographic Information Retrieval and Analysis System (GIRAS) land use dataset produced by USGS was used as the older historical land use data for the EIS (USGS, 1972). The land use classification categories for this dataset are shown in Table 5. However, this coverage was originally digitized using 10 acres as the smallest unit (i.e. no polygon was less than 10 acres) in urban areas and 40 acres as the smallest unit in rural areas, resulting in generalized polygons that overestimated the amount of area covered by that land use type. No land use fragmentation occurs as seen in the 2000 dataset. To account for this, land uses from 2000 were applied to the 1972 "generalized" urban, agricultural, and mixed forest areas data in instances where the land use was most likely not to have changed as shown in Table 4. Procedures used to apply 2000 natural land uses to 1992 urban areas, were also used to correct the 1972 data.

2020 Land Use Projections

Calculation of New Urban Acreages. The increase in medium- and high-intensity urban land use from 2000 to 2020 were estimated by: 1) calculating the difference between the projected population levels for 2020 for each of the growth scenarios (most-likely, medium, and high) calculated using the REMI model (REMI, 2001) and the current (2000) population levels; 2) calculating the difference in per capita land consumption rates between 1992 and 2000; and then 3) multiplying the results from 1) and 2) to estimate the growth in urban acreage values for each growth scenario and watershed to the year 2020. The REMI model provided projected population numbers at the county level. The four regions evaluated in this analysis and their per capita land consumption rates are shown in Table 6. To calculate conversion of other land uses to urban, the increases in urban acreages for the four regions were then allocated at the subwatershed level, weighted towards those subwatersheds in each region where more land conversion took place (see Table 7 for a list of the subwatersheds). Estimates of the specific types of natural areas that were converted to urban land use types were based on land conversion trends within each of the four regions.

Table 5
1972 GIRAS Land Use Classes Converted to 2000 MARIS Consolidated Classes

1972 GIRAS Class	Equivalent 2000 Consolidated MARIS Class
Water	Surface Water/Other
Residential	Medium Density Urban
Commercial and Services	High Density Urban
Industrial	High Density Urban
Transportation, Communications, Utilities	High Density Urban
Mixed Urban or Built-up	Medium Density Urban
Other Urban or Built-up	Medium Density Urban
Cropland and Pasture	Cropland/Pasture/Grassland
Orchards, Groves, Vineyards, Nurseries, and Ornamentals	Cropland/Pasture/Grassland
Confined Feeding Operations	Cropland/Pasture/Grassland
Other Agricultural Land	Cropland/Pasture/Grassland
Deciduous Forest Land	Deciduous/Mixed/Bottomland Forest/Swamp
Evergreen Forest Land	Upland Coniferous Forest
Mixed Forest Land	Deciduous/Mixed/Bottomland Forest/Swamp
Streams and Canals	Surface Water/Other
Lakes	Surface Water/Other
Reservoirs	Surface Water/Other
Bays and Estuaries	Surface Water/Other
Forested Wetland	Deciduous/Mixed/Bottomland Forest/Swamp
Nonforested Wetlands	Emergent Wetland
Beaches	Scrub-Shrub/Cutover/Barren
Strip Mines	Scrub-Shrub/Cutover/Barren
Transitional Areas	Scrub-Shrub/Cutover/Barren

Calculation of Conversion of Other Land Uses to Urban Areas. Once the expected increases in medium- and high-intensity urban acreages from 2000 to 2020 were calculated at the CSA/WSA level, acres of other land use types (agriculture, deciduous, coniferous, scrub/shrub, wetland, and for high intensity urban-only, medium intensity urban) that would be converted to urban areas were calculated and subtracted from the 2000 acreages for each of these land use types on a subwatershed level (Table 7). The acres of each natural land cover type that would be lost under each scenario were determined by applying the percentage of each natural land cover type lost to medium and high-intensity urban areas from 1992 to 2000. Because wet coniferous forest/savanna acreages were only available in the 2000 dataset, conversion from this category to developed areas was calculated using the percentage of all coniferous forest areas that were wet coniferous forest/savanna in 2000. The total acreage converted from coniferous forest to developed areas was split between upland coniferous forest and wet coniferous forest/savanna using this percentage.

Assumptions. Several assumptions were made while calculating 2020 projected land uses. The change in per capita land consumption (shown in Table 6) was assumed to remain constant through 2020. The change in other land use types is assumed to remain stagnant, other than for those land uses converted to urban areas.

Table 6
Change in Per Capita Land Consumption Rates Between 1992 and 2000

Scale	Change in Per Capita Medium Intensity Urban Land Consumption (Acres) 1992-2000	Change in Per Capita High Intensity Urban Land Consumption (Acres) 1992-2000
Region of Watershed Study Area		
Upper Bay Saint Louis Watershed (Outside Coastal Study Area)	0.19 acres	0.05 acres
Upper Biloxi Bay Watershed (Outside Coastal Study Area)	0.17 acres	0.07 acres
Lower Bay Saint Louis Watershed (Inside Coastal Study Area)	0.06 acres	0.13 acres
Lower Biloxi Bay Watershed (Inside Coastal Study Area)	-0.07 acres	0.16 acres
County		
Hancock County	0.08 acres	0.09 acres
Harrison County	0.07 acres	0.11 acres
Jackson County	-0.02 acres	0.16 acres

Table 7
Acres of Land Use Converted to Urban Areas at the
Subwatershed Level From 1992 to 2000

	Acres to Medium-Intensity Urban		**Acres to High-Intensity Urban**	
Subwatershed	Baseline Growth	High Growth	Baseline Growth	High Growth
Upper Wolf River (outside Coastal Study Area (CSA))	75	240	30	97
Upper Jourdan River (outside CSA)	251	800	64	205
Upper Jourdan River (in CSA)	9	30	8	25
Lower Wolf River-Cane Creek (outside CSA)	347	1,105	95	302
Lower Wolf River-Cane Creek (in CSA)	137	482	76	26
Rotten Bayou (outside CSA)	210	669	41	130
Rotten Bayou (in CSA)	682	2,390	81	285
De Lisle (outside CSA)	1	4	1	1
De Lisle (in CSA)	580	2,033	103	363
Bayou La Croix (outside CSA)	23	74	8	26
Bayou La Croix (in CSA)	-690	-2,421	873	3,063
Biloxi River (outside CSA)	368	1,785	163	791
Biloxi River (in CSA)	-58	-25	111	427
Tuxachanie Creek (outside CSA)	248	1,205	86	419
Tuxachanie Creek (in CSA)	913	3,531	259	1,003
Turkey Creek-Old Fort Bayou (outside CSA)	191	924	83	401
Turkey Creek-Old Fort Bayou (in CSA)	-3,043	-11,637	4,206	15,943
Offshore Areas (in CSA)	142	549	10	37
TOTAL	385	1,537	6,298	23,786

Attachment 1: 2000 MARIS Land Use Dataset

PROJECTION PARAMETERS

MISSISSIPPI TRANSVERSE MERCATOR PROJECTION (MSTM)
==========

TYPE: TRANSVERSE MERCATOR
SPHEROID: GRS1980
DATUM: NAD83
SCALE FACTOR: 0.9998335
LONGITUDE OF CENTRAL MERIDIAN: -89 45 00 (89.75)
LATITUDE OF ORIGIN OF PROJECTION: 32 30 00 (32.50)
FALSE EASTING: 500,000.00
FALSE NORTHING: 1,300,000.00
UNITS: METERS

Draft Copy

CRMP LAND USE/COVER CATEGORY DESCRIPTIONS
==========

Class

1 Upland Pine Forest - Forested land located on a non-hydric soil type in which more than 75% of the overstory canopy consists of various species of pine (Pinus spp.).

2 Upland Mixed Forest - Forested land located on a non-hydric soil type in which pine and non-pine tree species occur but neither comprises 75% or more of a given forest stand.

3 Upland Deciduous Forest - Forested land located on a non-hydric soil type in which more than 75% of the overstory canopy consists of hardwood tree species.

4 Bottomland Hardwood Forest - Stands of deciduous and some mixed forest types that predominantly occur on the floodplains of streams and rivers on non-swamp areas based on hydric soil and National Wetlands Inventory (NWI) data.

5 Swamp - Stands of deciduous and some mixed forest types that predominantly occur on the floodplains of streams and rivers on swamp areas based on hydric soil and National Wetlands Inventory (NWI) data.

6 Wet Pine Forest/Pine Savanna - Mixed areas of grass, pine scrub, and pine forest occurring on hydric soil types.

7 Upland Scrub/Shrub Land - A vegetated area located on a non-hydric soil where the stage of management precludes it from being classified as forest or pasture/grassland. Examples of this category include:

(a) older cut forest areas that have not been replanted;
(b) recently replanted forest tracts; and
(c) brush areas with the presence of woody vegetation that consists of bushes or small trees.

8 Wet Scrub/Shrub Land - A vegetated area located on a hydric soil where the stage of management precludes it from being classified as forest or pasture/grassland. Examples of this category include:
(a) older cut forest areas that have not been replanted;
(b) recently replanted forest tracts; and
(c) brush areas with the presence of woody vegetation that consists of bushes or small trees.

9 Tidal Marsh - Marsh areas located on tidal hydric soil types.

10 Non-Tidal Marsh - Marsh areas located on non-tidal hydric soil types.

11 Surface Water - water areas detectable from the Landsat imagery on the date of acquisition.

12 Upland Cutover Land - Recently harvested forest area located on a non-hydric soil type.

13 Wet Cutover Land - Recently harvested forest area located on a hydric soil type.

14 Upland Sand/Barren Land - Land located on a non-hydric soil type that has recently been cleared of vegetation for clearcuts, urban development, or other miscellaneous activities. It also includes areas such as sand bars, beaches, gravel pits, spoil areas, active landfills, and salt flats, etc.

15 Wet Sand/Barren Land - Land located on a hydric soil type that has recently been cleared of vegetation for clearcuts, urban development, or other miscellaneous activities. It also includes areas such as sand bars, beaches, gravel pits, spoil areas, active landfills, and salt flats, etc.

16 Cropland/Pasture/Grassland - Includes these cover types a variety of others including prairies, fallow fields, golf courses, cemeteries, parks, picnic groves, rights-of-way, and other miscellaneous areas.

17 Burned Area - A land area that has recently been burned.

18 High-Density Urban - Pavement and/or structures cover more than 50% of the respective area classified.

19 Medium-Density Urban - Pavement and structures cover 50% Or less of the area classified.

Attachment 2: 1992 MARIS Land Use Dataset

MISSISSIPPI LAND USE/LAND COVER PROJECT
METADATA

Introduction
==========
The objective of this project was to develop an up-to-date set of land use/land cover data for the state of Mississippi. This project began in the Spring of 1994 with the selection and puchase of imagery and reached initial completion in December 1996. Partial funding for this project was provided by US EPA Region IV that was matched by in-kind contributions and a limited amount of funds from the state of Mississippi.

Questions concerning the land cover data set and the project in general can be directed to Walter Belokon with the Mississippi Automated Resource Information System (MARIS) at 601-432-6353, or by email to wally@supernova.ihl.state.ms.us.

Data Sources
==========
Land cover was classified from a set of ten Landsat Thematic Mapper digital images acquired under leaf-on conditions. Data for coastal Mississippi was acquired in October 1992.

Additional scenes of older Landsat TM leaf-off imagery were used when needed.

PROJECTION PARAMETERS

MISSISSIPPI TRANSVERSE MERCATOR PROJECTION (MSTM)
==========

TYPE: TRANSVERSE MERCATOR
SPHEROID: GRS1980
DATUM: NAD83
SCALE FACTOR: 0.9998335
LONGITUDE OF CENTRAL MERIDIAN: -89 45 00 (89.75)
LATITUDE OF ORIGIN OF PROJECTION: 32 30 00 (32.50)
FALSE EASTING: 500,000.00
FALSE NORTHING: 1,300,000.00
UNITS: METERS

EPA STATE WETLANDS PROTECTION DEVELOPMENT PROGRAM
MISSISSIPPI LAND USE/COVER CATEGORY DESCRIPTIONS

The following categories have been developed for the Landsat Thematic Mapper (TM) -based update of statewide land use. Decisions concerning categories to include were made in a meeting of those state agencies participating in this project. Input was also considered from representatives of interested local and federal entities who attended.

This land use classification scheme is organized in a hierarchal structure in which general categories are sub-divided into more specific sub-categories as needed. Some final categories will require only a first level classification while others are as detailed as a third level classification. Please note that category descriptions preceded by an arabic numeral, ranging in value from 1 through 26 and enclosed by parentheses, are categories proposed to be included in the classification scheme.

I. Level I - Urban Land: Land that has been altered by human activity where the surface is largely covered by inert material - ie., concrete, asphalt, structure, etc.

Level II
========

(1) High-Density Urban - Pavement and/or structures cover more than 50% of the respective area classified.

(2) Low-Density Urban - Pavement and structures cover 50% or less of the area classified.

(3) Transportation - Wide highways (4 or more lanes) and airport facilities.

II. Level I - Forestland

Level II
========

(4) Pine Forest - Forested land on which more than 75% of the overstory canopy consists of any of the various species of 'Pinus' that occur in Mississippi, exclusive of those pine forest areas that occur on very wet soil areas near the Gulf Coast.

(5) Mixed Forest - Forested area in which pine and non pine tree species occur but neither comprises 75% or more of a given forest stand.

(6) Deciduous Forest - Forested land on which more than 75% of the overstory canopy consists of hardwood tree species primarily occurring on upland, sloping, and drier low lying sites.

III. Level I - Agriculture/Grassland

Level II
========

(7) Cropland - Land dedicated to the production of agricultural row crops.

(8) Pasture/Grassland - Includes a variety of lands covered by non-wetland grasses including improved and unimproved pasture, natural prairies, and fallow fields. This category will also include a number of other grassy areas such as golf courses, cemeteries, parks, picnic groves, rights-of-way, and other miscellaneous areas.

IV. Level I - Disturbed Area/Barren Land/Sand

Level II
========

(9) Upland Scrub/Shrub Land - A vegetated non-wetland area where the stage of management precludes it from being classified as forest or pasture/grassland. Examples of this category include:
   (a) cut forest areas that have not been replanted;
   (b) recently replanted forest tracts; and
   (c) brush areas with the presence of woody vegetation that consists of bushes or small trees.

(10) Barren Land - Land that has recently been cleared of vegetation for clearcuts, urban development, etc.

(11) Other land - Miscellaneous lands that cannot be classified elsewhere such as sand bars, beaches, gravel pits, spoil areas, active landfills, salt flats, etc.

V. Level I - Water

Level II
========

(12) Fresh Water - Inland non-saline surface waters including ponds, lakes, reservoirs, and lagoons, exclusive of impoundments used for aquacultural practices. This category will also include rivers and streams wide enough to be detected by Landsat's thematic mapper (30 meters).

(13) Aquacultural Water - Catfish ponds and other impoundents dedicated to the production of aquaculture products.

(14) Estuarine Water - Surface waters of the Mississippi Sound and associated bays and inlets subject to tidal influences. This category will represent water that varies greatly in salinity level.

(15) Marine Water - Surface waters of the Gulf of Mexico defined as being outside the barrier islands of Mississippi.

VI. Level I - Wetlands

Level II
========

(16) Farmed Wetlands - Land areas currently used as cropland which were developed on land that previously would have been considered wetland. This information will be retrieved from a data set developed for the USDA Soil Conservation Service (since renamed the Natural Resources Conservation Service).

(17) Estuarine Emergent - Salt Marsh; Areas of marsh grasses, primarily spartina spp. and juncus spp;

further breakdown based on salinity level may be possible if ancillary data (NWI maps) are used.

(18) Estuarine Woody - Coastal Scrub-Shrub; Areas of woody vegetation that occur on somewhat drier areas along the edges of, and within, salt marsh areas (TiTi-for example).

(19) Palustrine Emergent - Freshwater Marsh; Areas of non-woody water-related vegetation that occur away from the coastal zone (ie tidal influences).

(--) Palustrine Woody

Level III
=========

(20) Bottomland Hardwood Forest - Stands of hardwood tree species that predominantly occur on the floodplains of streams and rivers.

(21) Swamp - Forest stands occurring in very wet areas that are subject to frequent long term or permanent inundation. They may occur in backwater areas, wet flats, and river oxbows. Commonly occurring tree species include cypress, tupelo, and gum.

(22) Pine Savannah/Wet Pine Flatwoods - Mixed areas of grass and longleaf pine (Pinus palustris) occurring on very wet sites only in the vicinity of the Gulf Coast. This category will not be easy to discern from other pine forests solely on the basis of thematic mapper imagery. It may require that hydric soil data be used to define this cover type.

(23) Freshwater Scrub-Shrub - Woody vegetation found in wetland areas consisting of bushes, shrubs, and small trees.

(24) Cutover Wetland - Clearcuts located in a wetland area.

VII. Level I - Other phenomena

(25) Clouds/cloud shadows - May be unavoidable in some cases.

(26) Palustrine Non-Vegetated - Mud Flats; Areas that are adjacent to a water body and are innundated frequently enough to cause little, if any vegetation to be present.

When this project is completed, the land data will be available from the MARIS Technical Center (MTC). The final data product will be aggregated to a minimum mapping unit of five acres. MTC will be able to distribute the data in a variety of formats including ARC polygon coverages, ARC grid coverages, ArcView shape files, and ERDAS Imagine files.

Attachment 3: 1992 NLCD Land Use Dataset

National Land Cover Data
Mississippi

Version 06-01-99
(Updated: July, 1998; June 1999)

Introduction

This land cover data set was produced as part of a cooperative project between the U.S. Geological Survey (USGS) and the U.S. Environmental Protection Agency (USEPA) to produce a consistent, land cover data layer for the conterminous U.S. based on 30-meter Landsat thematic mapper (TM) data. National Land Cover Data (NLCD) was developed from TM data acquired by the Multi-resoultion Land Characterization (MRLC) Consortium. The MRLC Consortium is a partnership of federal agencies that produce or use land cover data. Partners include the USGS (National Mapping, Biological Resources, and Water Resources Divisions), USEPA, the U.S. Forest Service, and the National Oceanic and Atmospheric Administration.

Projection Information:

The initial Landsat TM mosaics, all ancillary data sets, and the land cover
product are all map-registered to an Albers Conical Equal Area projection. The following represents projection information for the final land cover product for the state of Mississippi.

```
      Projection: Albers Conical Equal Area
           Datum: NAD83
           Spheroid: GRS80
           Standard Parallels: 29.5 degrees North Latitude
                               45.5 degrees North Latitude
      Central Meridian:  96 degrees  West Longitude
      Origin of the Projection: 23 degrees North Latitude
      False Easting:   0 meters
      False Northing:  0 meters
```

Number of Lines (rows): 18639
Number of Samples (columns): 11058
Number of Bands: 1 Pixel size: 30 X 30 meters
Projection Coordinates (center of pixel, projection meters)

```
     Upper Left Corner:   407970 meters(X),
                         1361550 meters(Y)
     Lower Right Corner:  739680 meters(X),
                          802410 meters(Y)
```

Data Sources:

The base data set for this project was leaves-off/on Landsat TM data,

nominal-1992 acquisitions. Other ancillary data layers included leaves-on/off TM, USGS 3-arc second Digital Terrain Elevation Data (DTED) and derived slope, aspect and shaded relief, Bureau of the Census population and housing density data, USGS land use and land cover (LUDA), and National Wetlands Inventory (NWI) data if available. Other additional data sets included STATSGO soils information and a land cover data set for the state of Mississippi.

NLCD Land Cover Classification System Land Cover Class Definitions

Water - All areas of open water or permanent ice/snow cover.

11. Open Water - All areas of open water; typically 25 percent or greater cover of water (per pixel).

12. Perennial Ice/Snow - All areas characterized by year-long cover of ice and/or snow.

Developed - Areas characterized by a high percentage (30 percent or greater) of constructed materials (e.g. asphalt, concrete, buildings, etc).

21. Low Intensity Residential - Includes areas with a mixture of constructed materials and vegetation. Constructed materials account for 30-80 percent of the cover. Vegetation may account for 20 to 70 percent of the cover. These areas most commonly include single-family housing units. Population densities will be lower than in high intensity residential areas.

22. High Intensity Residential - Includes highly developed areas where people reside in high numbers. Examples include apartment complexes and row houses. Vegetation accounts for less than 20 percent of the cover. Constructed materials account for 80 to100 percent of the cover.

23. Commercial/Industrial/Transportation - Includes infrastructure (e.g. roads, railroads, etc.) and all highly developed areas not classified as High Intensity Residential.

Barren - Areas characterized by bare rock, gravel, sand, silt, clay, or other earthen material, with little or no "green" vegetation present regardless of its inherent ability to support life. Vegetation, if present, is more widely spaced and scrubby than that in the "green" vegetated categories; lichen cover may be extensive.

31. Bare Rock/Sand/Clay - Prennially barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, beaches, and other accumulations of earthen material.

32. Quarries/Strip Mines/Gravel Pits - Areas of extractive mining activities with significant surface expression.

33. Transitional - Areas of sparse vegetative cover (less than 25 percent of cover) that are dynamically changing from one land cover to another, often because of land use activities. Examples include forest clearcuts, a transition phase between forest and agricultural land, the temporary clearing of vegetation, and changes due to natural causes (e.g. fire, flood, etc.).

Forested Upland - Areas characterized by tree cover (natural or semi-natural woody vegetation, generally greater than 6 meters tall); tree canopy accounts for 25-100 percent of the cover.

41. Deciduous Forest - Areas dominated by trees where 75 percent or more of the tree species shed foliage simultaneously in response to seasonal change.

42. Evergreen Forest - Areas dominated by trees where 75 percent or more of the tree species maintain their leaves all year. Canopy is never without green foliage.

43. Mixed Forest - Areas dominated by trees where neither deciduous nor evergreen species represent more than 75 percent of the cover present.

Shrubland - Areas characterized by natural or semi-natural woody vegetation with aerial stems, generally less than 6 meters tall, with individuals or clumps not touching to interlocking. Both evergreen and deciduous species of true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions are included.

51. Shrubland - Areas dominated by shrubs; shrub canopy accounts for 25-100 percent of the cover. Shrub cover is generally greater than 25 percent when tree cover is less than 25 percent. Shrub cover may be less than 25 percent in cases when the cover of other life forms (e.g. herbaceous or tree) is less than 25 percent and shrubs cover exceeds the cover of the other life forms.

Non-natural Woody - Areas dominated by non-natural woody vegetation; non-natural woody vegetative canopy accounts for 25-100 percent of the cover. The non-natural woody classification is subject to the availability of sufficient ancillary data to differentiate non-natural woody vegetation from natural woody vegetation.

61. Orchards/Vineyards/Other - Orchards, vineyards, and other areas planted or maintained for the production of fruits, nuts, berries, or ornamentals.

Herbaceous Upland - Upland areas characterized by natural or semi-natural herbaceous vegetation; herbaceous vegetation accounts for 75-100 percent of the cover.

71. Grasslands/Herbaceous - Areas dominated by upland grasses and forbs. In rare cases, herbaceous cover is less than 25 percent, but exceeds the combined cover of the woody species present. These areas are not subject to intensive management, but they are often utilized for grazing.

Planted/Cultivated - Areas characterized by herbaceous vegetation that has been planted or is intensively managed for the production of food, feed, or fiber; or is maintained in developed settings for specific purposes. Herbaceous vegetation accounts for 75-100 percent of the cover.

81. Pasture/Hay - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops.

82. Row Crops - Areas used for the production of crops, such as corn,

soybeans, vegetables, tobacco, and cotton.

83. Small Grains - Areas used for the production of graminoid crops such as wheat, barley, oats, and rice.

84. Fallow - Areas used for the production of crops that are temporarily barren or with sparse vegetative cover as a result of being tilled in a management practice that incorporates prescribed alternation between cropping and tillage.

85. Urban/Recreational Grasses - Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Examples include parks, lawns, golf courses, airport grasses, and industrial site grasses.

Wetlands - Areas where the soil or substrate is periodically saturated with or covered with water as defined by Cowardin et al.

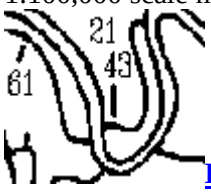
91. Woody Wetlands - Areas where forest or shrubland vegetation accounts for 25-100 percent of the cover and the soil or substrate is periodically saturated with or covered with water.

92. Emergent Herbaceous Wetlands - Areas where perennial herbaceous vegetation accounts for 75-100 percent of the cover and the soil or substrate is periodically saturated with or covered with water.

Attachment 4: 1972 USGS Land Use Dataset

Background

The Land Use and Land Cover (LULC) data files describe the vegetation, water, natural surface, and cultural features on the land surface. The United States Geological Survey (USGS) provides these data sets and associated maps as a part of its National Mapping Program. The LULC mapping program is designed so that standard topographic maps of a scale of 1:250,000 can be used for compilation and organization of the land use and land cover data. In some cases, such as Hawaii, 1:100,000 scale maps are also used.



Land Use and Land Cover Example (6.8 kb)

Compilation is based upon a classification scheme identified in the Appendix.

Extent of Coverage

Land Use and Land Cover (LULC) data are available for most of the contiguous United States and Hawaii.

Spatial Resolution

The minimum area representing the man made features of the LULC polygons are 10 acres (4 hectares) that have a minimum width of 660 feet (200 meters). This minimum width precludes the existence of very narrow or long tracts of data classification. Non-urban and non-man made features may be mapped with polygons with a minimal area of 40 acres (16 hectares) that have a minimum width of 1320 feet (400 meters).

Classification Codes

Classification Codes-first and second level categories

1 Urban or Built-Up Land
- 11 Residential
- 12 Commercial Services
- 13 Industrial
- 14 Transportation, Communications
- 15 Industrial and Commercial
- 16 Mixed Urban or Built-Up Land
- 17 Other Urban or Built-Up Land

2 Agricultural Land
- 21 Cropland and Pasture
- 22 Orchards, Groves, Vineyards, Nurseries
- 23 Confined Feeding Operations
- 24 Other Agricultural Land

3 Rangeland
- 31 Herbaceous Rangeland
- 32 Shrub and Brush Rangeland
- 33 Mixed Rangeland

4 Forest Land
- 41 Deciduous Forest Land
- 42 Evergreen Forest Land
- 43 Mixed Forest Land

5 Water
- 51 Streams and Canals

- 52 Lakes
- 53 Reservoirs
- 54 Bays and Estuaries

6 Wetland

- 61 Forested Wetlands
- 62 Nonforested Wetlands

7 Barren Land

- 71 Dry Salt Flats
- 72 Beaches
- 73 Sandy Areas Other than Beaches
- 74 Bare Exposed Rock
- 75 Strip Mines, Quarries, and Gravel Pits
- 76 Transitional Areas
- 77 Mixed Barren Land

8 Tundra

- 81 Shrub and Brush Tundra
- 82 Herbaceous Tundra
- 83 Bare Ground
- 84 Wet Tundra
- 85 Mixed Tundra

9 Perennial Snow and Ice

- 91 Perennial Snowfields
- 92 Glaciers

Table 1. Hancock County Projected Land Use for the Year 2020 – Most-Likely Growth Scenario

	Existing Land Use		Most-Likely Growth		
	2000	Percent Total 2000	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General					
Developed	16,457	5.4%	18,218	5.9%	10.7%
- Impervious	7,550		8,443		11.8%
Natural	257,517	83.9%	256,112	83.5%	-0.5%
Agricultural	29,320	9.6%	28,963	9.4%	-1.2%
Inland Fresh Water	3,530	1.2%	3,530	1.2%	0.0%
Subtotals	306,824	100.0%	306,824	100.0%	
Surface Water/Other	46,800		46,800		
TOTAL Acres	353,623		353,623		
Land Use - Detailed					
Medium Density Urban Land	9,633	3.1%	10,462	3.4%	8.6%
High Density Urban Land	2,864	0.9%	3,796	1.2%	32.6%
Transportation	3,960	1.3%	3,960	1.3%	0.0%
Cropland/Pasture/Grassland	29,320	9.6%	28,963	9.4%	-1.2%
Deciduous/MixedBottomland Forest/Swamp	73,879	24.1%	73,670	24.0%	-0.3%
Upland Coniferous Forest	44,679	14.6%	44,330	14.4%	-0.8%
Wet Coniferous Forest/Savanna	45,400	14.8%	45,046	14.7%	-0.8%
Scrub-Shrub/Cutover/Barren	72,932	23.8%	72,653	23.7%	-0.4%
Emergent Wetland	20,626	6.7%	20,413	6.7%	-1.0%
Inland Fresh Water	3,530	1.2%	3,530	1.2%	0.0%
Subtotals	306,824	100.0%	306,824	100.0%	
Surface Water/Other	46,800		46,800		
TOTAL Acres	353,623		353,623		

Table 2. Harrison County Projected Land Use for the Year 2020 – Most-Likely Growth Scenario

	Existing Land Use		Most-Likely Growth		
	2000	Percent Total 2000	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General					
Developed	39,816	10.7%	43,398	11.7%	9.0%
- Impervious	18,971		20,999		10.7%
Natural	290,883	78.3%	288,278	77.6%	-0.9%
Agricultural	38,744	10.4%	37,768	10.2%	-2.5%
Inland Fresh Water	2,223	0.6%	2,223	0.6%	0.0%
Subtotals	371,667	100.0%	371,667	100.0%	
Surface Water/Other	255,241		255,241		
TOTAL Acres	626,907		626,907		
Land Use - Detailed					
Medium Density Urban Land	21,624	5.8%	23,017	6.2%	6.4%
High Density Urban Land	12,109	3.3%	14,298	3.8%	18.1%
Transportation	6,084	1.6%	6,084	1.6%	0.0%
Cropland/Pasture/Grassland	38,744	10.4%	37,768	10.2%	-2.5%
Deciduous/MixedBottomland Forest/Swamp	77,002	20.7%	76,335	20.5%	-0.9%
Upland Coniferous Forest	78,067	21.0%	77,584	20.9%	-0.6%
Wet Coniferous Forest/Savanna	51,613	13.9%	51,293	13.8%	-0.6%
Scrub-Shrub/Cutover/Barren	77,381	20.8%	76,358	20.5%	-1.3%
Emergent Wetland	6,820	1.8%	6,708	1.8%	-1.7%
Inland Fresh Water	2,223	0.6%	2,223	0.6%	0.0%
Subtotals	371,667	100.0%	371,667	100.0%	
Surface Water/Other	255,241		255,241		
TOTAL Acres	626,907		626,907		

Table 3. Jackson County Projected Land Use for the Year 2020 – Most-Likely Growth Scenario

	Existing Land Use		Most-Likely Growth		
	2000	Percent Total 2000	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General					
Developed	33,930	7.3%	39,121	8.4%	15.3%
- Impervious	15,846		20,800		31.3%
Natural	392,287	84.1%	387,983	83.1%	-1.1%
Agricultural	33,661	7.2%	32,774	7.0%	-2.6%
Inland Fresh Water	6,823	1.5%	6,823	1.5%	0.0%
Subtotals	466,701	100.0%	466,701	100.0%	
Surface Water/Other	207,792		207,792		
TOTAL Acres	674,493		674,493		
Land Use - Detailed					
Medium Density Urban Land	18,914	4.1%	18,172	3.9%	-3.9%
High Density Urban Land	9,600	2.1%	15,532	3.3%	61.8%
Transportation	5,417	1.2%	5,417	1.2%	0.0%
Cropland/Pasture/Grassland	33,661	7.2%	32,774	7.0%	-2.6%
Deciduous/MixedBottomland Forest/Swamp	144,721	31.0%	144,276	30.9%	-0.3%
Upland Coniferous Forest	69,163	14.8%	68,765	14.7%	-0.6%
Wet Coniferous Forest/Savanna	63,588	13.6%	63,223	13.6%	-0.6%
Scrub-Shrub/Cutover/Barren	86,535	18.5%	85,985	18.4%	-0.6%
Emergent Wetland	28,280	6.1%	25,733	5.5%	-9.0%
Inland Fresh Water	6,823	1.5%	6,823	1.5%	0.0%
Subtotals	466,701	100.0%	466,701	100.0%	
Surface Water/Other	207,792		207,792		
TOTAL Acres	674,493		674,493		

Table 4. Projected Subwatershed Imperviousness for the Year 2020 – Most-Likely Growth Scenario

	Urban Acres 2000 Land Use					Urban Acres 2020 Most Likely Growth		
Subwatershed Name	**Medium Density Urban**	**High Density Urban**	**Transportation**	**Total Area**	**Percent Impervious**	**Medium Density Urban**	**High Density Urban**	**Percent Impervious**
Upper Wolf River outside CSA	395	117	362	134,313	0.4%	470	147	0.4%
Upper Jourdan River outside CSA	1,215	359	25	143,776	0.3%	1,466	423	0.4%
Upper Jourdan River in CSA	8	15	40	594	9.1%	16	22	10.3%
Lower Wolf River-Cane Creek outside CSA	1,196	357	8	84,614	0.5%	1,543	452	0.7%
Lower Wolf River-Cane Creek in CSA	470	246	223	11,565	4.2%	607	323	4.9%
Rotten Bayou outside CSA	616	125	-	29,603	0.6%	826	166	0.8%
Rotten Bayou in CSA	1,206	97	99	7,890	4.1%	1,887	179	6.0%
De Lisle outside CSA	2	0	-	14	4.2%	3	1	7.3%
De Lisle in CSA	758	403	615	20,725	5.1%	1,338	506	5.8%
Bayou La Croix outside CSA	31	12	-	5,463	0.2%	54	20	0.4%
Bayou La Croix in CSA	5,693	1,292	2,002	78,911	4.8%	5,003	2,165	5.6%
Biloxi River outside CSA	2,257	1,002	761	165,984	1.1%	2,625	1,165	1.2%
Biloxi River in CSA	611	281	144	6,696	6.8%	553	392	8.1%
Tuxachanie Creek outside CSA	1,509	531	-	137,443	0.5%	1,758	617	0.5%
Tuxachanie Creek in CSA	1,392	687	562	18,701	7.0%	2,305	946	8.8%
Turkey Creek-Old Fort Bayou outside CSA	1,362	486	167	25,720	2.9%	1,552	568	3.3%
Turkey Creek-Old Fort Bayou in CSA	18,455	10,626	5,206	132,010	12.5%	15,443	14,739	14.8%
The Islands in CSA	-	-	-	88,554	0.0%	-	-	0.0%
Offshore Areas in CSA	30	10	-	158,139	0.0%	172	20	0.0%
TOTALS	37,204	16,645	10,213	983,516	2.9%	37,620	22,850	3.5%

Table 5. Bay Saint Louis Projected Land Use for the Year 2020 – Most-Likely Growth Scenario

	Existing Land Use		Most-Likely Growth		
	2000	Percent Total 2000	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General					
Developed	22,085	4.2%	25,183	4.8%	14.0%
- Impervious	8,762		10,303		17.6%
Natural	434,969	82.6%	432,554	82.1%	-0.6%
Agricultural	67,197	12.8%	66,514	12.6%	-1.0%
Inland Fresh Water	2,358	0.4%	2,358	0.4%	0.0%
Subtotals	526,609	100.0%	526,609	100.0%	
Surface Water/Other	100,204		100,204		
TOTAL Acres	626,812		626,812		
Land Use - Detailed					
Medium Density Urban Land	14,498	2.8%	15,993	3.0%	10.3%
High Density Urban Land	3,768	0.7%	5,370	1.0%	42.5%
Transportation	3,820	0.7%	3,820	0.7%	0.0%
Cropland/Pasture/Grassland	67,197	12.8%	66,514	12.6%	-1.0%
Deciduous/MixedBottomland Forest/Swamp	137,917	26.2%	137,477	26.1%	-0.3%
Upland Coniferous Forest	82,362	15.6%	81,713	15.5%	-0.8%
Wet Coniferous Forest/Savanna	58,993	11.2%	58,647	11.2%	-0.6%
Scrub-Shrub/Cutover/Barren	139,638	26.5%	139,005	26.4%	-0.5%
Emergent Wetland	16,059	3.0%	15,712	3.0%	-2.2%
Inland Fresh Water	2,358	0.4%	2,358	0.4%	0.0%
Subtotals	526,609	100.0%	526,609	100.0%	
Surface Water/Other	100,204		100,204		
TOTAL Acres	626,812		626,812		

Table 6. Biloxi Bay Projected Land Use for the Year 2020 – Most-Likely Growth Scenario

	Existing Land Use		Most-Likely Growth		
	2000	Percent Total 2000	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General					
Developed	41,917	9.2%	45,502	10.0%	8.6%
- Impervious	19,990		23,848		19.3%
Natural	375,139	82.1%	372,559	81.5%	-0.7%
Agricultural	37,920	8.3%	36,916	8.1%	-2.6%
Inland Fresh Water	1,932	0.4%	1,932	0.4%	0.0%
Subtotals	456,908	100.0%	456,908	100.0%	
Surface Water/Other	210,443		210,443		
TOTAL Acres	667,351		667,351		
Land Use - Detailed					
Medium Density Urban Land	22,738	5.0%	21,626	4.7%	-4.9%
High Density Urban Land	12,784	2.8%	17,480	3.8%	36.7%
Transportation	6,395	1.4%	6,395	1.4%	0.0%
Cropland/Pasture/Grassland	37,920	8.3%	36,916	8.1%	-2.6%
Deciduous/MixedBottomland Forest/Swamp	97,544	21.3%	97,110	21.3%	-0.4%
Upland Coniferous Forest	105,774	23.1%	105,416	23.1%	-0.3%
Wet Coniferous Forest/Savanna	76,643	16.8%	76,407	16.7%	-0.3%
Scrub-Shrub/Cutover/Barren	87,313	19.1%	86,718	19.0%	-0.7%
Emergent Wetland	7,866	1.7%	6,908	1.5%	-12.2%
Inland Fresh Water	1,932	0.4%	1,932	0.4%	0.0%
Subtotals	456,908	100.0%	456,908	100.0%	
Surface Water/Other	210,443		210,443		
TOTAL Acres	667,351		667,351		

Table 7. Hancock County Projected Land Use for the Year 2020 – Moderate Growth Scenario

	Most-Likely Growth			Moderate Growth		
	2020	Percent Total 2020	Percent Change 2000-2020	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General						
Developed	18,218	5.9%	10.7%	19,483	6.3%	18.4%
- Impervious	8,443		11.8%	9,083		20.3%
Natural	256,112	83.5%	-0.5%	255,104	83.1%	-0.9%
Agricultural	28,963	9.4%	-1.2%	28,707	9.4%	-2.1%
Inland Fresh Water	3,530	1.2%	0.0%	3,530	1.2%	0.0%
Subtotals	306,824	100.0%		306,824	100.0%	
Surface Water/Other	46,800			46,800		
TOTAL Acres	353,623			353,623		
Land Use - Detailed						
Medium Density Urban Land	10,462	3.4%	8.6%	11,057	3.6%	14.8%
High Density Urban Land	3,796	1.2%	32.6%	4,466	1.5%	55.9%
Transportation	3,960	1.3%	0.0%	3,960	1.3%	0.0%
Cropland/Pasture/Grassland	28,963	9.4%	-1.2%	28,707	9.4%	-2.1%
Deciduous/MixedBottomland Forest/Swamp	73,670	24.0%	-0.3%	73,520	24.0%	-0.5%
Upland Coniferous Forest	44,330	14.4%	-0.8%	44,080	14.4%	-1.4%
Wet Coniferous Forest/Savanna	45,046	14.7%	-0.8%	44,791	14.6%	-1.4%
Scrub-Shrub/Cutover/Barren	72,653	23.7%	-0.4%	72,453	23.6%	-0.7%
Emergent Wetland	20,413	6.7%	-1.0%	20,260	6.6%	-1.8%
Inland Fresh Water	3,530	1.2%	0.0%	3,530	1.2%	0.0%
Subtotals	306,824	100.0%		306,824	100.0%	
Surface Water/Other	46,800			46,800		
TOTAL Acres	353,623			353,623		

Table 8. Harrison County Projected Land Use for the Year 2020 – Moderate Growth Scenario

	Most-Likely Growth			Moderate Growth		
	2020	Percent Total 2020	Percent Change 2000-2020	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General						
Developed	43,398	11.7%	9.0%	53,824	14.5%	35.2%
- Impervious	20,999		10.7%	26,901		41.8%
Natural	288,278	77.6%	-0.9%	280,693	75.5%	-3.5%
Agricultural	37,768	10.2%	-2.5%	34,926	9.4%	-9.9%
Inland Fresh Water	2,223	0.6%	0.0%	2,223	0.6%	0.0%
Subtotals	371,667	100.0%		371,667	100.0%	
Surface Water/Other	255,241			255,241		
TOTAL Acres	626,907			626,907		
Land Use - Detailed						
Medium Density Urban Land	23,017	6.2%	6.4%	27,071	7.3%	25.2%
High Density Urban Land	14,298	3.8%	18.1%	20,669	5.6%	70.7%
Transportation	6,084	1.6%	0.0%	6,084	1.6%	0.0%
Cropland/Pasture/Grassland	37,768	10.2%	-2.5%	34,926	9.4%	-9.9%
Deciduous/MixedBottomland Forest/Swamp	76,335	20.5%	-0.9%	74,394	20.0%	-3.4%
Upland Coniferous Forest	77,584	20.9%	-0.6%	75,649	20.5%	-3.2%
Wet Coniferous Forest/Savanna	51,293	13.8%	-0.6%	50,363	13.5%	-2.5%
Scrub-Shrub/Cutover/Barren	76,358	20.5%	-1.3%	73,381	19.7%	-5.2%
Emergent Wetland	6,708	1.8%	-1.7%	6,379	1.7%	-6.5%
Inland Fresh Water	2,223	0.6%	0.0%	2,223	0.6%	0.0%
Subtotals	371,667	100.0%		371,667	100.0%	
Surface Water/Other	255,241			255,241		
TOTAL Acres	626,907			626,907		

Table 9. Jackson County Projected Land Use for the Year 2020 – Moderate Growth Scenario

	Most-Likely Growth			Moderate Growth		
	2020	Percent Total 2020	Percent Change 2000-2020	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General						
Developed	39,121	8.4%	15.3%	39,905	8.6%	17.6%
- Impervious	20,800		31.3%	21,548		36.0%
Natural	387,983	83.1%	-1.1%	387,333	83.0%	-1.3%
Agricultural	32,774	7.0%	-2.6%	32,640	7.0%	-3.0%
Inland Fresh Water	6,823	1.5%	0.0%	6,823	1.5%	0.0%
Subtotals	466,701	100.0%		466,701	100.0%	
Surface Water/Other	207,792			207,792		
TOTAL Acres	674,493			674,493		
Land Use - Detailed						
Medium Density Urban Land	18,172	3.9%	-3.9%	18,060	3.9%	-4.5%
High Density Urban Land	15,532	3.3%	61.8%	16,428	3.5%	71.1%
Transportation	5,417	1.2%	0.0%	5,417	1.2%	0.0%
Cropland/Pasture/Grassland	32,774	7.0%	-2.6%	32,640	7.0%	-3.0%
Deciduous/MixedBottomland Forest/Swamp	144,276	30.9%	-0.3%	144,209	30.9%	-0.4%
Upland Coniferous Forest	68,765	14.7%	-0.6%	68,706	14.7%	-0.7%
Wet Coniferous Forest/Savanna	63,223	13.6%	-0.6%	63,167	13.6%	-0.7%
Scrub-Shrub/Cutover/Barren	85,985	18.4%	-0.6%	85,902	18.4%	-0.7%
Emergent Wetland	25,733	5.5%	-9.0%	25,349	5.4%	-10.4%
Inland Fresh Water	6,823	1.5%	0.0%	6,823	1.5%	0.0%
Subtotals	466,701	100.0%		466,701	100.0%	
Surface Water/Other	207,792			207,792		
TOTAL Acres	674,493			674,493		

Table 10. Watershed Study Area Projected Subwatershed Imperviousness for the Year 2020 – Moderate Growth Scenario

	Existing Land Use	Urban Acres 2020 Most-Likely Growth			Urban Acres 2020 Moderate Growth		
Subwatershed Name	**Percent Impervious**	**Medium**	**High**	**Percent Impervious**	**Medium**	**High**	**Percent Impervious**
Upper Wolf River outside CSA	0.4%	470	147	0.4%	556	182	0.4%
Upper Jourdan River outside CSA	0.3%	1,466	423	0.4%	1,752	497	0.5%
Upper Jourdan River in CSA	9.1%	16	22	10.3%	27	31	11.8%
Lower Wolf River-Cane Creek outside CSA	0.5%	1,543	452	0.7%	1,938	560	0.8%
Lower Wolf River-Cane Creek in CSA	4.2%	607	323	4.9%	787	423	5.8%
Rotten Bayou outside CSA	0.6%	826	166	0.8%	1,065	212	1.0%
Rotten Bayou in CSA	4.1%	1,887	179	6.0%	2,782	285	8.6%
De Lisle outside CSA	4.2%	3	1	7.3%	5	1	10.9%
De Lisle in CSA	5.1%	1,338	506	5.8%	2,099	642	6.8%
Bayou La Croix outside CSA	0.2%	54	20	0.4%	80	29	0.6%
Bayou La Croix in CSA	4.8%	5,003	2,165	5.6%	4,096	3,312	6.7%
Biloxi River outside CSA	1.1%	2,625	1,165	1.2%	3,378	1,499	1.5%
Biloxi River in CSA	6.8%	553	392	8.1%	464	560	10.1%
Tuxachanie Creek outside CSA	0.5%	1,758	617	0.5%	2,266	794	0.7%
Tuxachanie Creek in CSA	7.0%	2,305	946	8.8%	3,697	1,342	11.5%
Turkey Creek-Old Fort Bayou outside CSA	2.9%	1,552	568	3.3%	1,942	738	4.0%
Turkey Creek-Old Fort Bayou in CSA	12.5%	15,443	14,739	14.8%	10,875	20,978	18.4%
The Islands in CSA	0.0%	-	-	0.0%	-	-	0.0%
Offshore Areas in CSA	0.0%	172	20	0.0%	388	34	0.0%
TOTALS	2.9%	37,620	22,850	3.5%	38,200	32,119	4.3%

Table 11. Bay Saint Louis Projected Land Use for the Year 2020 – Moderate Growth Scenario

	Most-Likely Growth			Moderate Growth		
	2020	Percent Total 2020	Percent Change 2000-2020	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General						
Developed	25,183	4.8%	14.0%	28,980	5.5%	31.2%
- Impervious	10,303		17.6%	12,201		39.2%
Natural	432,554	82.1%	-0.6%	429,594	81.6%	-1.2%
Agricultural	66,514	12.6%	-1.0%	65,677	12.5%	-2.3%
Inland Fresh Water	2,358	0.4%	0.0%	2,358	0.4%	0.0%
Subtotals	526,609	100.0%		526,609	100.0%	
Surface Water/Other	100,204			100,204		
TOTAL Acres	626,812			626,812		
Land Use - Detailed						
Medium Density Urban Land	15,993	3.0%	10.3%	17,815	3.4%	22.9%
High Density Urban Land	5,370	1.0%	42.5%	7,346	1.4%	94.9%
Transportation	3,820	0.7%	0.0%	3,820	0.7%	0.0%
Cropland/Pasture/Grassland	66,514	12.6%	-1.0%	65,677	12.5%	-2.3%
Deciduous/MixedBottomland Forest/Swamp	137,477	26.1%	-0.3%	136,959	26.0%	-0.7%
Upland Coniferous Forest	81,713	15.5%	-0.8%	80,933	15.4%	-1.8%
Wet Coniferous Forest/Savanna	58,647	11.2%	-0.6%	58,210	11.0%	-1.3%
Scrub-Shrub/Cutover/Barren	139,005	26.4%	-0.5%	138,255	26.3%	-1.0%
Emergent Wetland	15,712	3.0%	-2.2%	15,237	2.9%	-5.1%
Inland Fresh Water	2,358	0.4%	0.0%	2,358	0.4%	0.0%
Subtotals	526,609	100.0%		526,609	100.0%	
Surface Water/Other	100,204			100,204		
TOTAL Acres	626,812			626,812		

Table 12. Biloxi Bay Projected Land Use for the Year 2020 – Moderate Growth Scenario

	Most-Likely Growth			Moderate Growth		
	2020	Percent Total 2020	Percent Change 2000-2020	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General						
Developed	45,502	10.0%	8.6%	51,554	11.3%	23.0%
- Impervious	23,848		19.3%	29,899		49.6%
Natural	372,559	81.5%	-0.7%	368,228	80.6%	-1.8%
Agricultural	36,916	8.1%	-2.6%	35,195	7.7%	-7.2%
Inland Fresh Water	1,932	0.4%	0.0%	1,932	0.4%	0.0%
Subtotals	456,908	100.0%		456,908	100.0%	
Surface Water/Other	210,443			210,443		
TOTAL Acres	667,351			667,351		
Land Use - Detailed						
Medium Density Urban Land	21,627	4.7%	-4.9%	20,385	4.5%	-10.3%
High Density Urban Land	17,480	3.8%	36.7%	24,774	5.4%	93.8%
Transportation	6,395	1.4%	0.0%	6,395	1.4%	0.0%
Cropland/Pasture/Grassland	36,916	8.1%	-2.6%	35,195	7.7%	-7.2%
Deciduous/MixedBottomland Forest/Swamp	97,110	21.3%	-0.4%	96,341	21.1%	-1.2%
Upland Coniferous Forest	105,416	23.1%	-0.3%	104,776	23.0%	-1.0%
Wet Coniferous Forest/Savanna	76,407	16.7%	-0.3%	75,997	16.6%	-0.9%
Scrub-Shrub/Cutover/Barren	86,718	19.0%	-0.7%	85,663	18.7%	-1.9%
Emergent Wetland	6,908	1.5%	-12.2%	5,450	1.2%	-30.7%
Inland Fresh Water	1,932	0.4%	0.0%	1,932	0.4%	0.0%
Subtotals	456,908	100.0%		456,908	100.0%	
Surface Water/Other	210,443			210,443		
TOTAL Acres	667,351			667,351		

Table 13. Hancock County Projected Land Use for the Year 2020 – High Growth Scenario

	Most-Likely Growth			High Growth		
	2020	Percent Total 2020	Percent Change 2000-2020	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General						
Developed	18,218	5.9%	10.7%	20,688	6.7%	25.7%
- Impervious	8,443		11.8%	9,694		28.4%
Natural	256,112	83.5%	-0.5%	254,143	82.8%	-1.3%
Agricultural	28,963	9.4%	-1.2%	28,462	9.3%	-2.9%
Inland Fresh Water	3,530	1.2%	0.0%	3,530	1.2%	0.0%
Subtotals	306,824	100.0%		306,824	100.0%	
Surface Water/Other	46,800			46,800		
TOTAL Acres	353,623			353,623		
Land Use - Detailed						
Medium Density Urban Land	10,462	3.4%	8.6%	11,624	3.8%	20.7%
High Density Urban Land	3,796	1.2%	32.6%	5,104	1.7%	78.2%
Transportation	3,960	1.3%	0.0%	3,960	1.3%	0.0%
Cropland/Pasture/Grassland	28,963	9.4%	-1.2%	28,462	9.3%	-2.9%
Deciduous/MixedBottomland Forest/Swamp	73,670	24.0%	-0.3%	73,377	23.9%	-0.7%
Upland Coniferous Forest	44,330	14.4%	-0.8%	43,841	14.3%	-1.9%
Wet Coniferous Forest/Savanna	45,046	14.7%	-0.8%	44,548	14.5%	-1.9%
Scrub-Shrub/Cutover/Barren	72,653	23.7%	-0.4%	72,262	23.6%	-0.9%
Emergent Wetland	20,413	6.7%	-1.0%	20,115	6.6%	-2.5%
Inland Fresh Water	3,530	1.2%	0.0%	3,530	1.2%	0.0%
Subtotals	306,824	100.0%		306,824	100.0%	
Surface Water/Other	46,800			46,800		
TOTAL Acres	353,623			353,623		

Table 14. Harrison County Projected Land Use for the Year 2020 – High Growth Scenario

	Most-Likely Growth			High Growth		
	2020	Percent Total 2020	Percent Change 2000-2020	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General						
Developed	43,398	11.7%	9.0%	62,996	16.9%	58.2%
- Impervious	20,999		10.7%	32,093		69.2%
Natural	288,278	77.6%	-0.9%	274,022	73.7%	-5.8%
Agricultural	37,768	10.2%	-2.5%	32,426	8.7%	-16.3%
Inland Fresh Water	2,223	0.6%	0.0%	2,223	0.6%	0.0%
Subtotals	371,667	100.0%		371,667	100.0%	
Surface Water/Other	255,241			255,241		
TOTAL Acres	626,907			626,907		
Land Use - Detailed						
Medium Density Urban Land	23,017	6.2%	6.4%	30,638	8.2%	41.2%
High Density Urban Land	14,298	3.8%	18.1%	26,274	7.1%	117.0%
Transportation	6,084	1.6%	0.0%	6,084	1.6%	0.0%
Cropland/Pasture/Grassland	37,768	10.2%	-2.5%	32,426	8.7%	-16.3%
Deciduous/MixedBottomland Forest/Swamp	76,335	20.5%	-0.9%	72,686	19.6%	-5.6%
Upland Coniferous Forest	77,584	20.9%	-0.6%	74,939	20.2%	-4.0%
Wet Coniferous Forest/Savanna	51,293	13.8%	-0.6%	49,545	13.3%	-4.0%
Scrub-Shrub/Cutover/Barren	76,358	20.5%	-1.3%	70,762	19.0%	-8.6%
Emergent Wetland	6,708	1.8%	-1.7%	6,090	1.6%	-10.7%
Inland Fresh Water	2,223	0.6%	0.0%	2,223	0.6%	0.0%
Subtotals	371,667	100.0%		371,667	100.0%	
Surface Water/Other	255,241			255,241		
TOTAL Acres	626,907			626,907		

Table 15. Jackson County Projected Land Use for the Year 2020 – High Growth Scenario

	Most-Likely Growth			High Growth		
	2020	Percent Total 2020	Percent Change 2000-2020	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General						
Developed	39,121	8.4%	15.3%	40,603	8.7%	19.7%
- Impervious	20,800		31.3%	22,214		40.2%
Natural	387,983	83.1%	-1.1%	386,754	82.9%	-1.4%
Agricultural	32,774	7.0%	-2.6%	32,521	7.0%	-3.4%
Inland Fresh Water	6,823	1.5%	0.0%	6,823	1.5%	0.0%
Subtotals	466,701	100.0%		466,701	100.0%	
Surface Water/Other	207,792			207,792		
TOTAL Acres	674,493			674,493		
Land Use - Detailed						
Medium Density Urban Land	18,172	3.9%	-3.9%	17,961	3.8%	-5.0%
High Density Urban Land	15,532	3.3%	61.8%	17,226	3.7%	79.4%
Transportation	5,417	1.2%	0.0%	5,417	1.2%	0.0%
Cropland/Pasture/Grassland	32,774	7.0%	-2.6%	32,521	7.0%	-3.4%
Deciduous/MixedBottomland Forest/Swamp	144,276	30.9%	-0.3%	144,149	30.9%	-0.4%
Upland Coniferous Forest	68,765	14.7%	-0.6%	68,652	14.7%	-0.7%
Wet Coniferous Forest/Savanna	63,223	13.6%	-0.6%	63,188	13.5%	-0.6%
Scrub-Shrub/Cutover/Barren	85,985	18.4%	-0.6%	85,828	18.4%	-0.8%
Emergent Wetland	25,733	5.5%	-9.0%	25,006	5.4%	-11.6%
Inland Fresh Water	6,823	1.5%	0.0%	6,823	1.5%	0.0%
Subtotals	466,701	100.0%		466,701	100.0%	
Surface Water/Other	207,792			207,792		
TOTAL Acres	674,493			674,493		

Table 16. Watershed Study Area Projected Subwatershed Imperviousness for the Year 2020 – High Growth Alternative

	Existing Land Use	Urban Acres 2020 Most-Likely Growth			Urban Acres 2020 High Growth		
Subwatershed Name	**%Impervious**	**Medium**	**High**	**%Impervious**	**Medium**	**High**	**%Impervious**
Upper Wolf River outside CSA	0.4%	470	147	0.4%	635	214	0.5%
Upper Jourdan River outside CSA	0.3%	1,466	423	0.4%	2,015	564	0.5%
Upper Jourdan River in CSA	9.1%	16	22	10.3%	37	40	13.2%
Lower Wolf River-Cane Creek outside CSA	0.5%	1,543	452	0.7%	2,301	659	1.0%
Lower Wolf River-Cane Creek in CSA	4.2%	607	323	4.9%	951	514	6.7%
Rotten Bayou outside CSA	0.6%	826	166	0.8%	1,285	255	1.3%
Rotten Bayou in CSA	4.1%	1,887	179	6.0%	3,596	382	10.8%
De Lisle outside CSA	4.2%	3	1	7.3%	6	2	14.1%
De Lisle in CSA	5.1%	1,338	506	5.8%	2,791	766	7.7%
Bayou La Croix outside CSA	0.2%	54	20	0.4%	105	38	0.8%
Bayou La Croix in CSA	4.8%	5,003	2,165	5.6%	3,272	4,355	7.7%
Biloxi River outside CSA	1.1%	2,625	1,165	1.2%	4,041	1,793	1.7%
Biloxi River in CSA	6.8%	553	392	8.1%	386	708	11.8%
Tuxachanie Creek outside CSA	0.5%	1,758	617	0.5%	2,714	950	0.8%
Tuxachanie Creek in CSA	7.0%	2,305	946	8.8%	4,923	1,690	13.8%
Turkey Creek-Old Fort Bayou outside CSA	2.9%	1,552	568	3.3%	2,286	887	4.6%
Turkey Creek-Old Fort Bayou in CSA	12.5%	15,443	14,739	14.8%	6,849	26,475	21.6%
The Islands in CSA	0.0%	-	-	0.0%	-	-	0.0%
Offshore Areas in CSA	0.0%	172	20	0.0%	579	47	0.1%
TOTALS	2.9%	37,620	22,850	3.5%	38,772	40,338	5.0%

Table 17. Bay Saint Louis Projected Land Use for the Year 2020 – High Growth Scenario

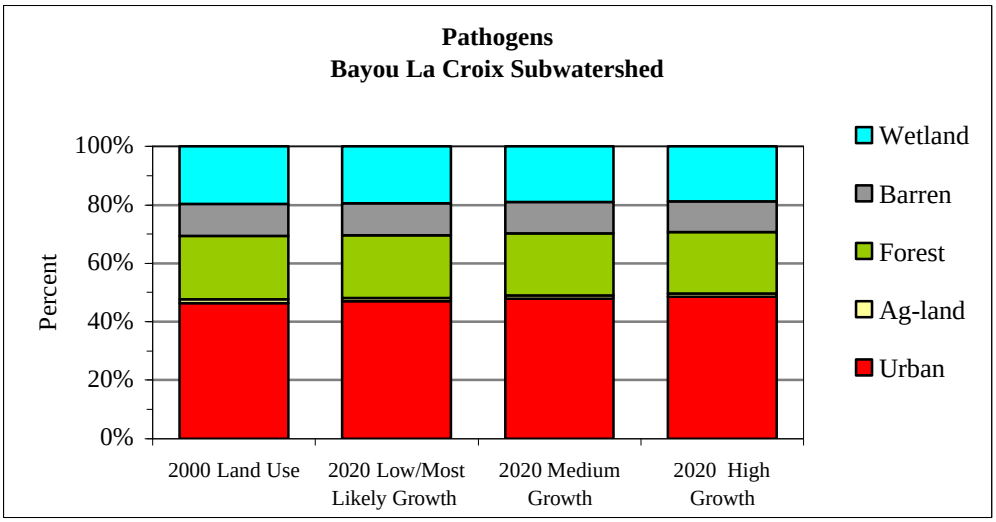
	Most-Likely Growth			High Growth		
	2020	Percent Total 2020	Percent Change 2000-2020	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General						
Developed	25,183	4.8%	14.0%	32,443	6.2%	46.9%
- Impervious	10,303		17.6%	13,929		59.0%
Natural	432,554	82.1%	-0.6%	426,895	81.1%	-1.9%
Agricultural	66,514	12.6%	-1.0%	64,913	12.3%	-3.4%
Inland Fresh Water	2,358	0.4%	0.0%	2,358	0.4%	0.0%
Subtotals	526,6099	100.0%		526,609	100.0%	
Surface Water/Other	100,204			100,204		
TOTAL Acres	626,812			626,812		
Land Use - Detailed						
Medium Density Urban Land	15,993	3.0%	10.3%	19,479	3.7%	34.4%
High Density Urban Land	5,370	1.0%	42.5%	9,144	1.7%	142.7%
Transportation	3,820	0.7%	0.0%	3,820	0.7%	0.0%
Cropland/Pasture/Grassland	66,514	12.6%	-1.0%	64,913	12.3%	-3.4%
Deciduous/MixedBottomland Forest/Swamp	137,477	26.1%	-0.3%	136,485	25.9%	-1.0%
Upland Coniferous Forest	81,713	15.5%	-0.8%	80,220	15.2%	-2.7%
Wet Coniferous Forest/Savanna	58,647	11.2%	-0.6%	57,812	11.0%	-2.0%
Scrub-Shrub/Cutover/Barren	139,005	26.4%	-0.5%	137,569	26.1%	-1.5%
Emergent Wetland	15,712	3.0%	-2.2%	14,810	2.8%	-7.8%
Inland Fresh Water	2,358	0.4%	0.0%	2,358	0.4%	0.0%
Subtotals	526,609	100.0%		526,609	100.0%	
Surface Water/Other	100,204			100,204		
TOTAL Acres	626,812			626,812		

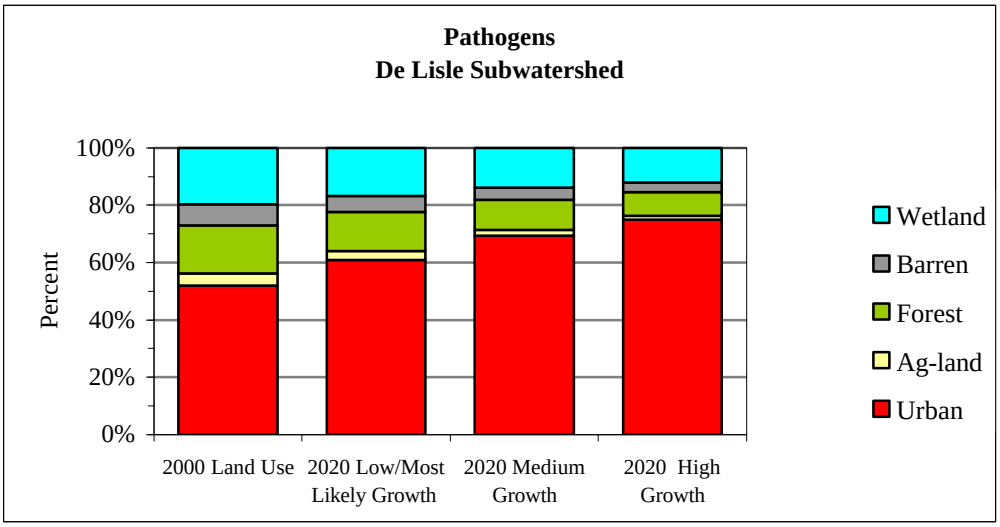
Table 18. Biloxi Bay Projected Land Use for the Year 2020 – High Growth Scenario

	Most-Likely Growth			High Growth		
	2020	Percent Total 2020	Percent Change 2000-2020	2020	Percent Total 2020	Percent Change 2000-2020
Land Use - General						
Developed	45,502	10.0%	8.6%	56,881	12.4%	35.7%
- Impervious	23,848		19.3%	35,225		76.2%
Natural	372,559	81.5%	-0.7%	364,415	79.8%	-2.9%
Agricultural	36,916	8.1%	-2.6%	33,681	7.4%	-11.2%
Inland Fresh Water	1,932	0.4%	0.0%	1,932	0.4%	0.0%
Subtotals	456,908	100.0%		456,908	100.0%	
Surface Water/Other	210,443			210,443		
TOTAL Acres	667,351			667,351		
Land Use - Detailed						
Medium Density Urban Land	21,626	4.7%	-4.9%	19,292	4.2%	-15.2%
High Density Urban Land	17,480	3.8%	36.7%	31,194	6.8%	144.0%
Transportation	6,395	1.4%	0.0%	6,395	1.4%	0.0%
Cropland/Pasture/Grassland	36,916	8.1%	-2.6%	33,681	7.4%	-11.2%
Deciduous/MixedBottomland Forest/Swamp	97,110	21.3%	-0.4%	95,665	20.9%	-1.9%
Upland Coniferous Forest	105,416	23.1%	-0.3%	104,213	22.8%	-1.5%
Wet Coniferous Forest/Savanna	76,407	16.7%	-0.3%	75,636	16.6%	-1.3%
Scrub-Shrub/Cutover/Barren	86,718	19.0%	-0.7%	84,735	18.5%	-3.0%
Emergent Wetland	6,908	1.5%	-12.2%	4,166	0.9%	-47.0%
Inland Fresh Water	1,932	0.4%	0.0%	1,932	0.4%	0.0%
Subtotals	456,908	100.0%		456,908	100.0%	
Surface Water/Other	210,443			210,443		
TOTAL Acres	667,351			667,351		

Appendix P

Trend Projections for Each Subwatershed





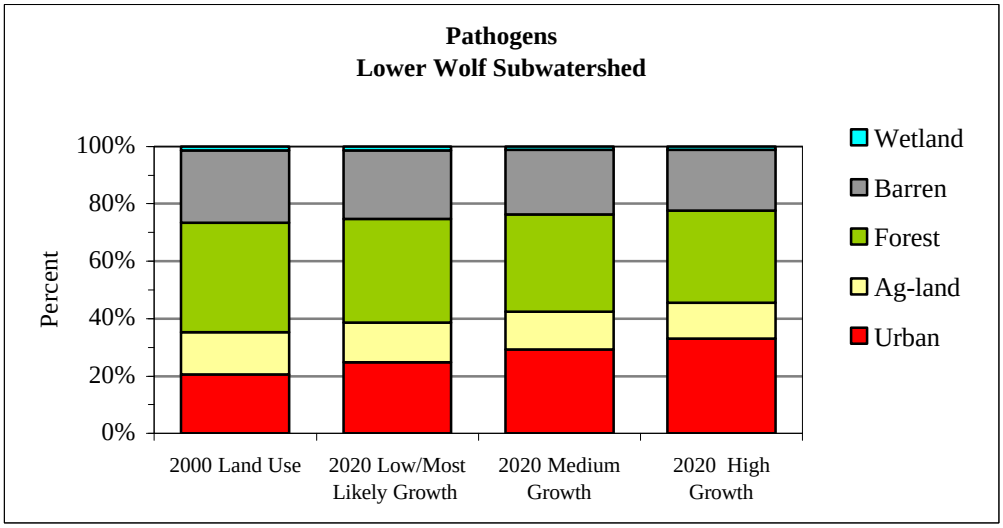
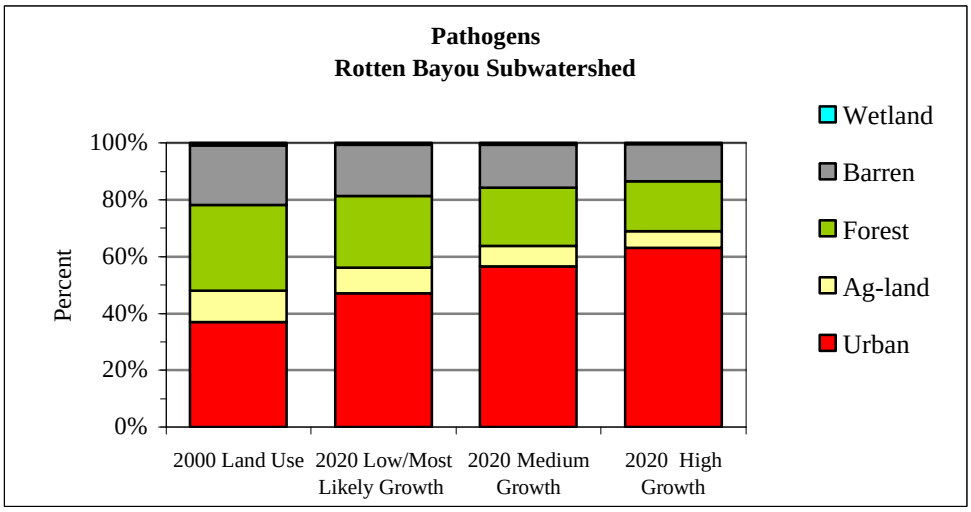
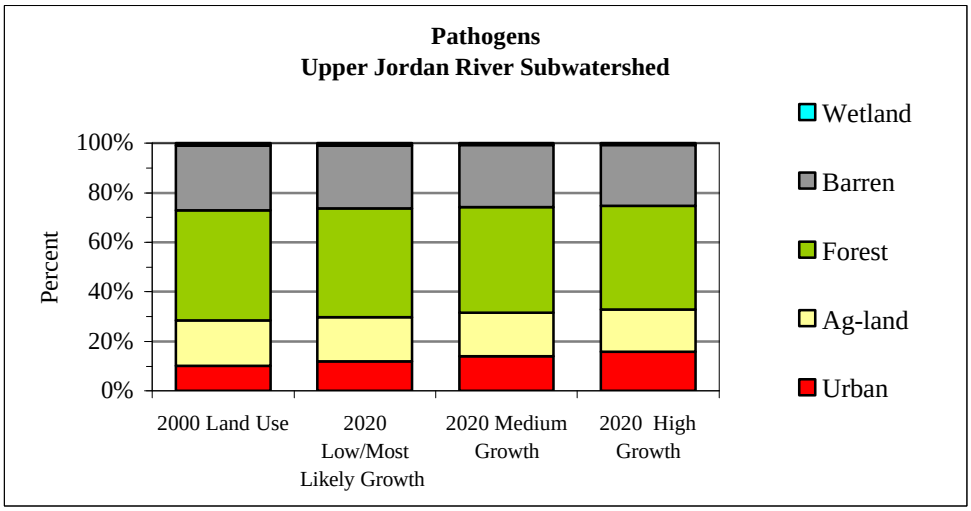


Figure 1a Change in percent of pathogen contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020.





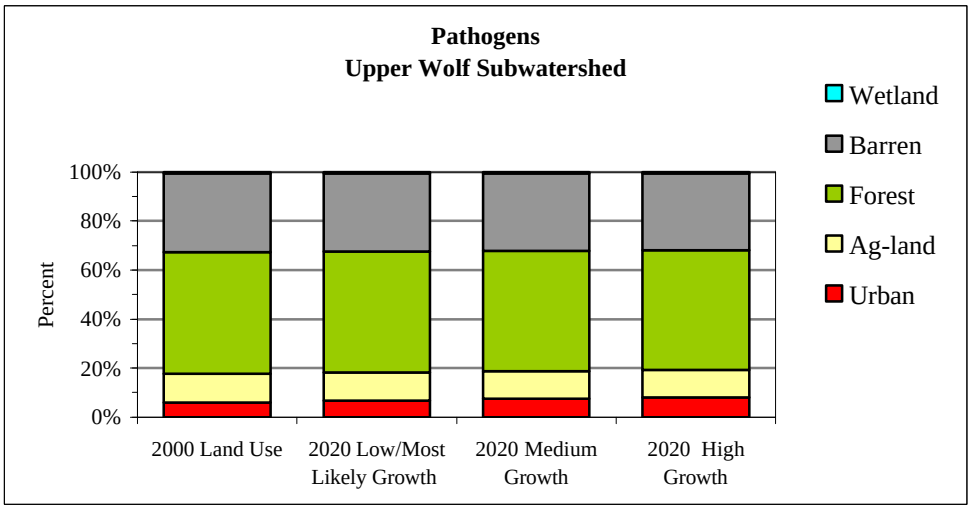
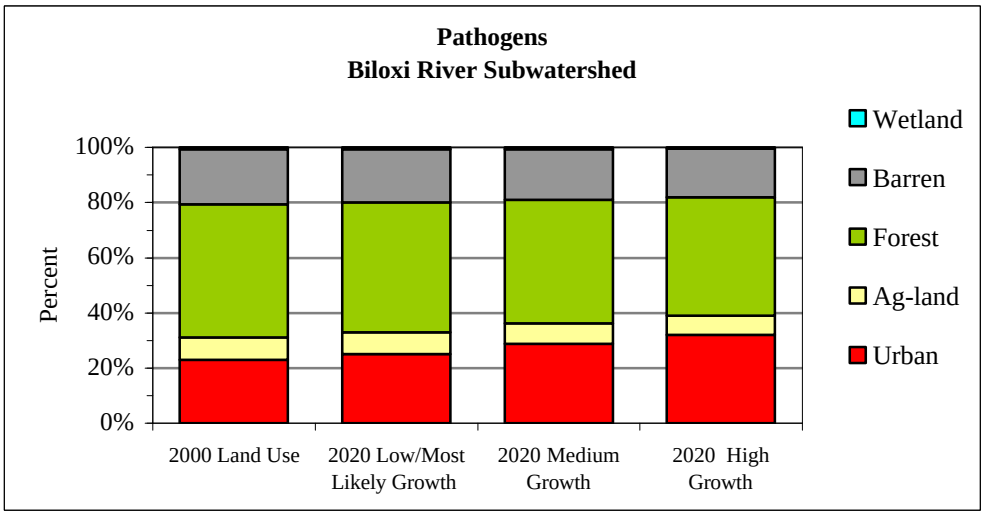
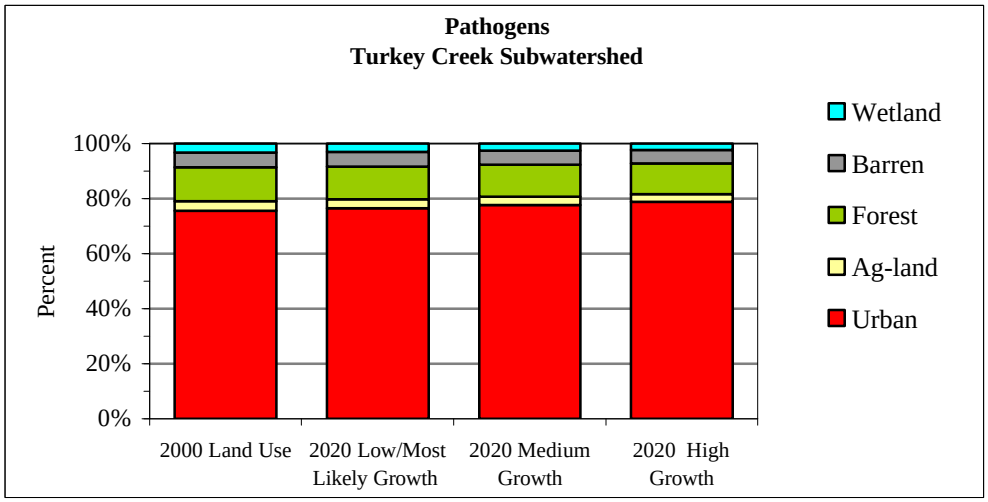


Figure 1a Change in percent of pathogen contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020. (contintued)





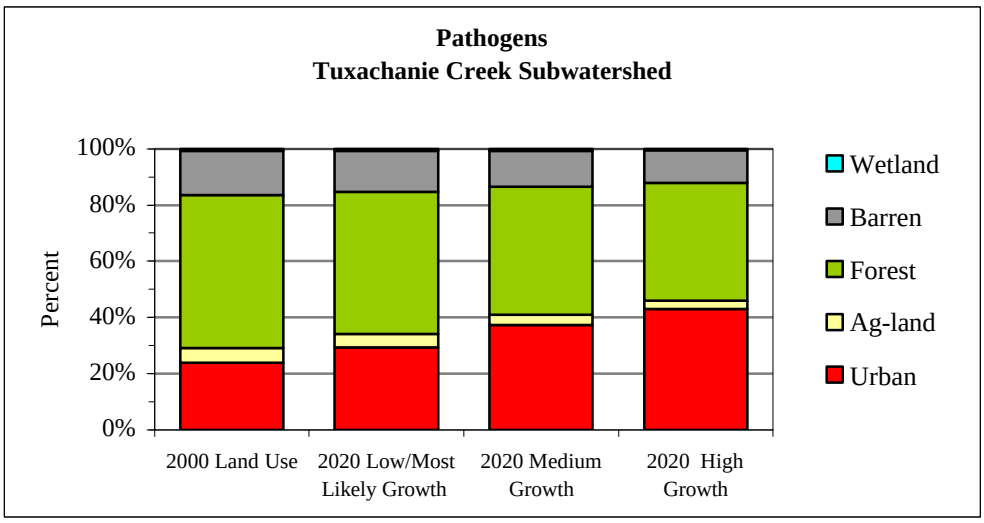
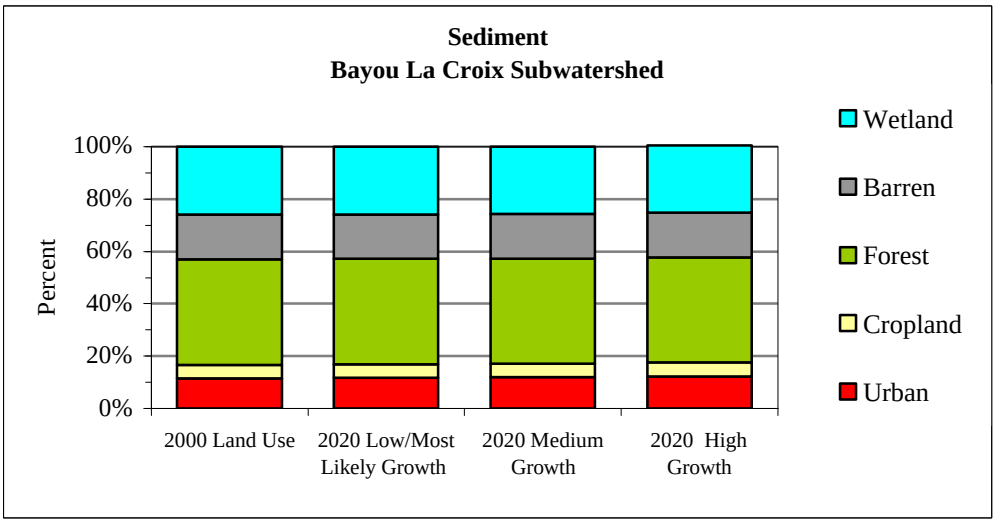
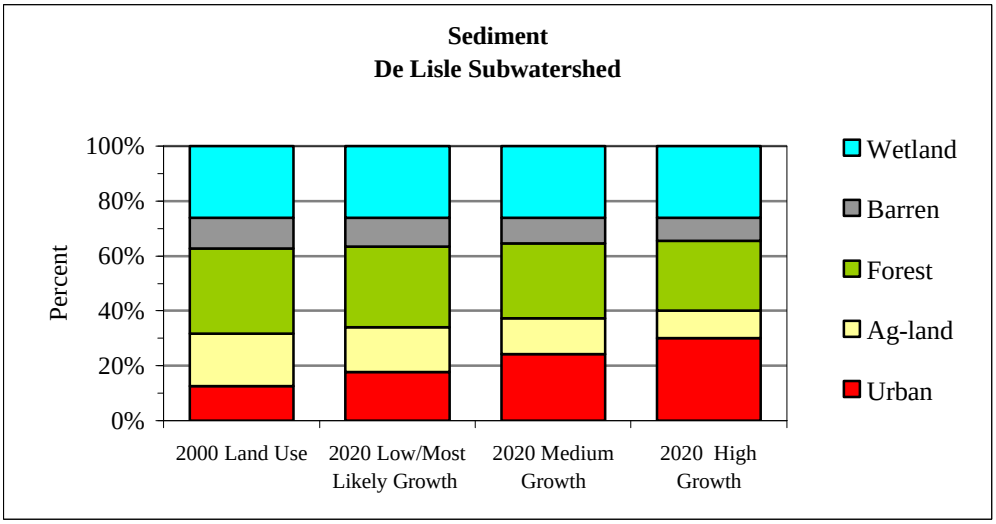


Figure 1b Change in percent of pathogen contribution attributable to predicted changes in land use for Biloxi Bay subwatersheds in 2020.





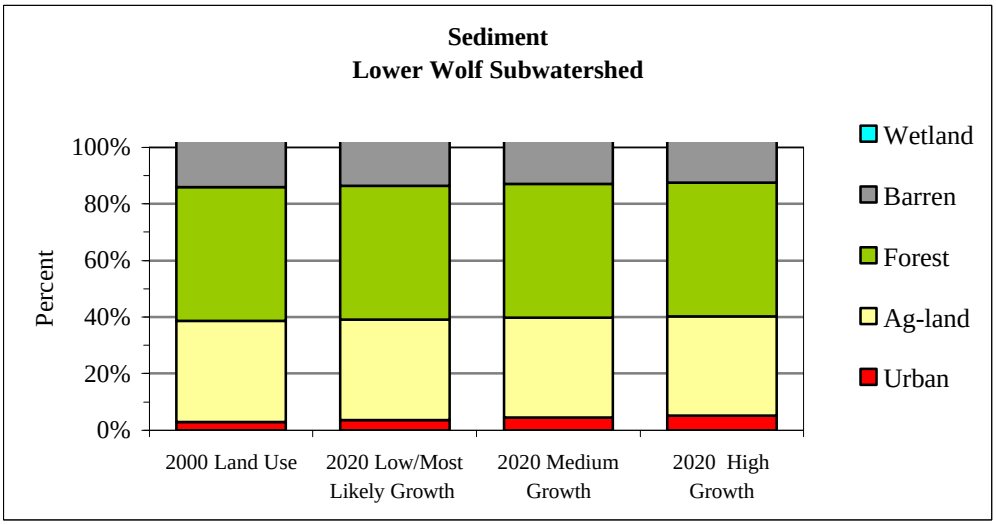
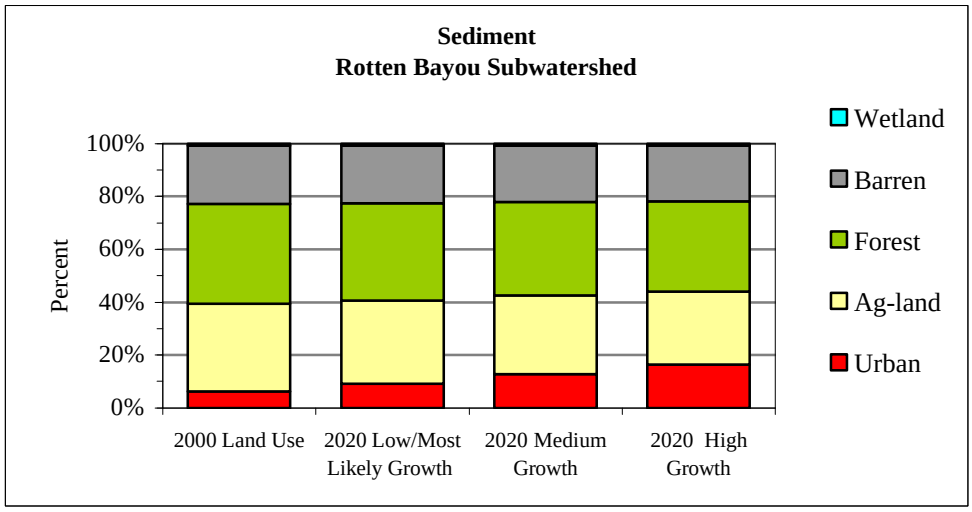
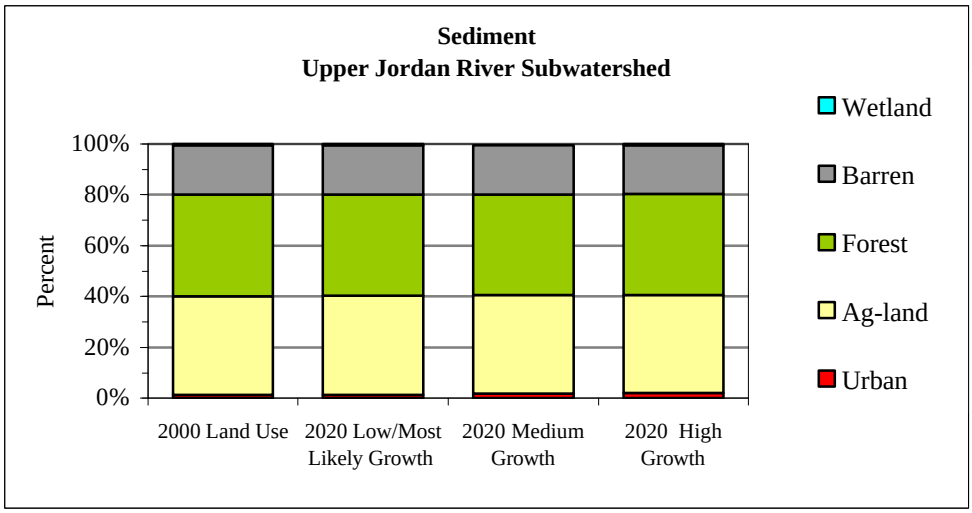


Figure 2a Change in percent of sediment contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020.





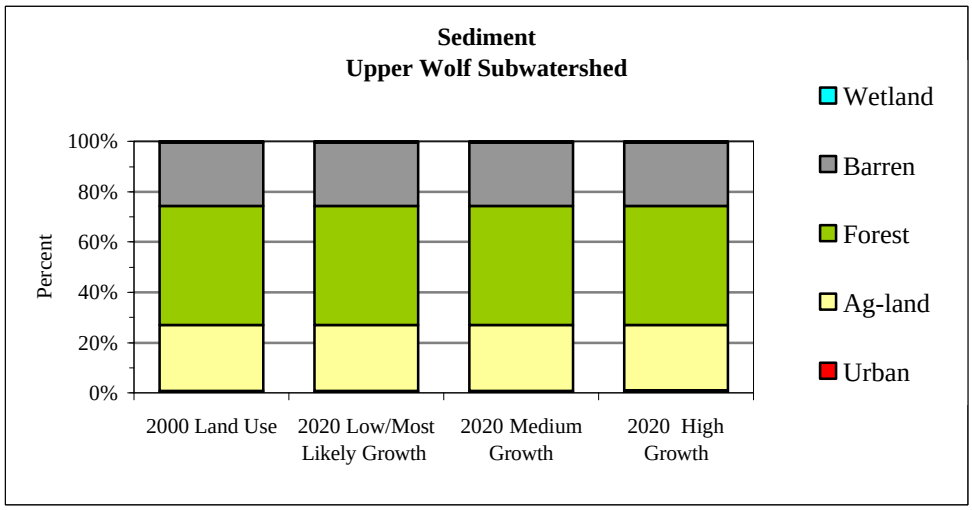
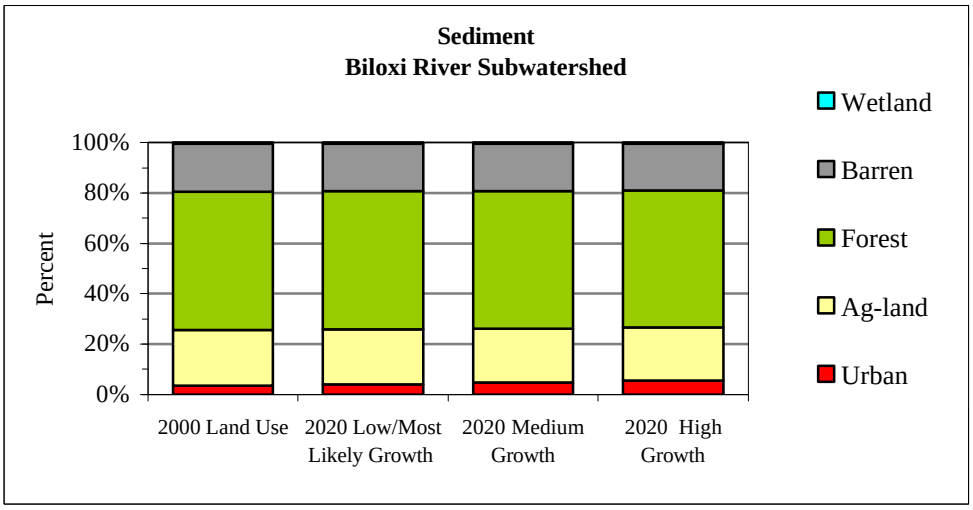
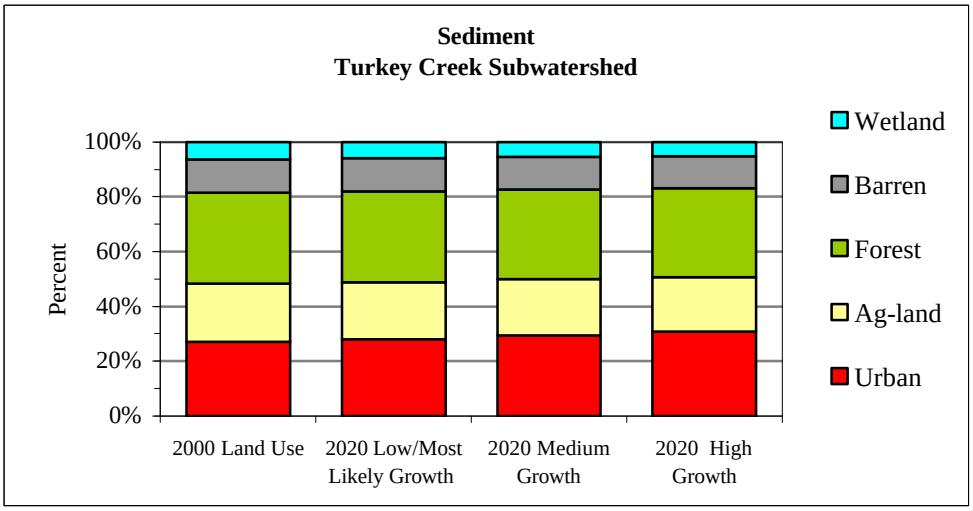


Figure 2a Change in percent of sediment contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020. (continued)





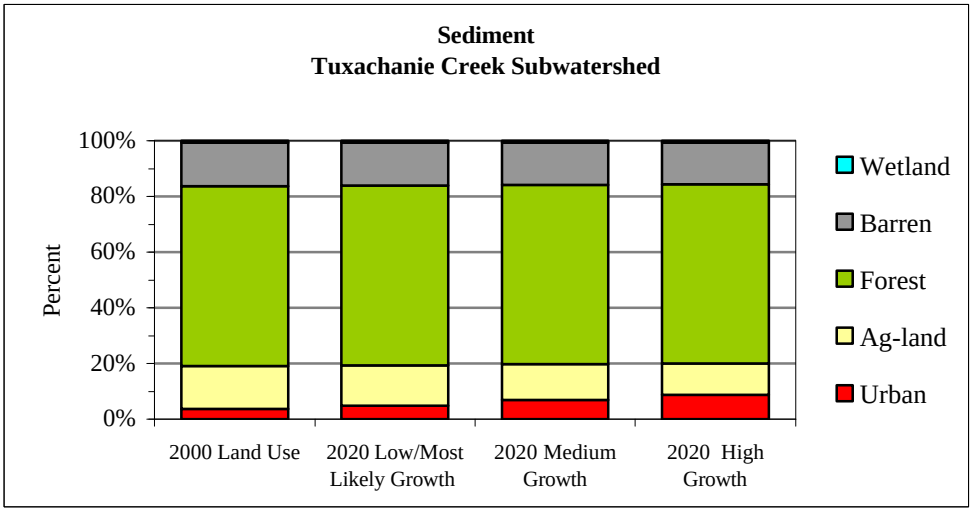
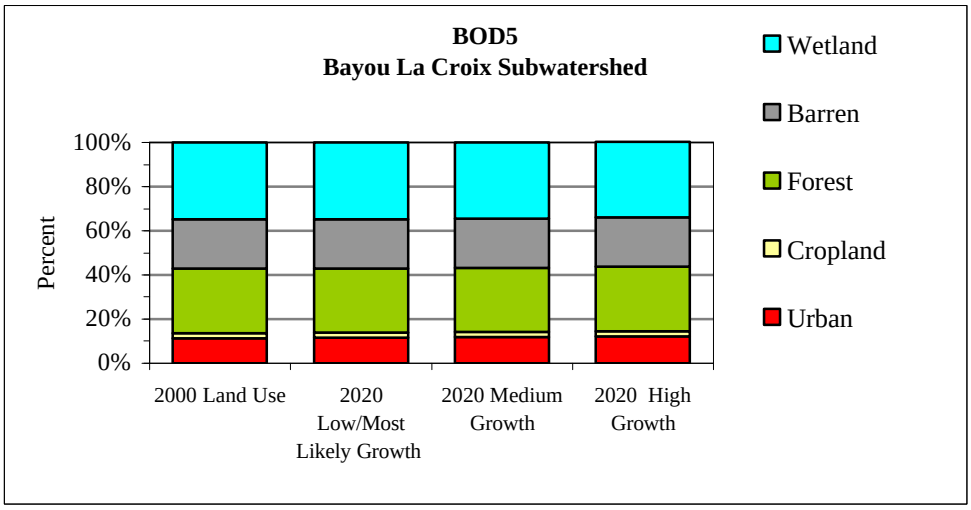
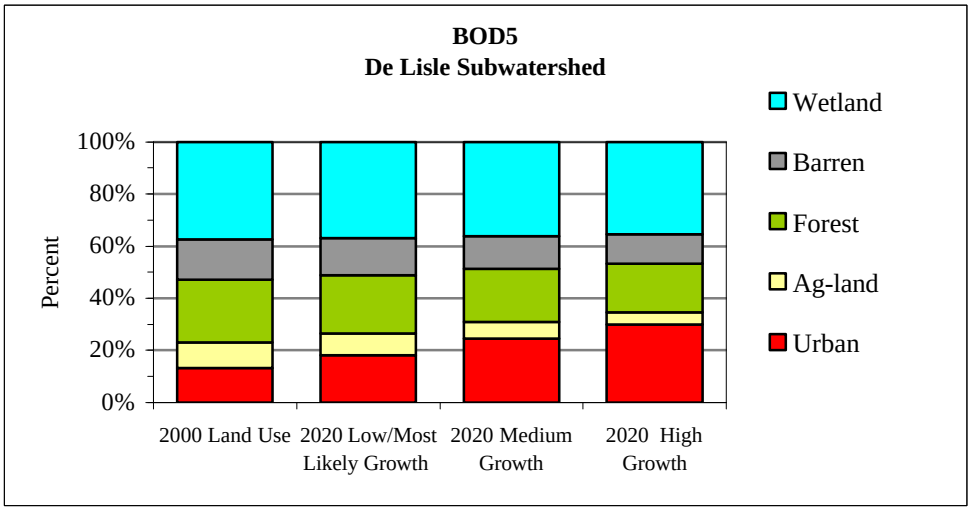


Figure 2b Change in percent of sediment contribution attributable to predicted changes in land use for Biloxi Bay subwatersheds in 2020.





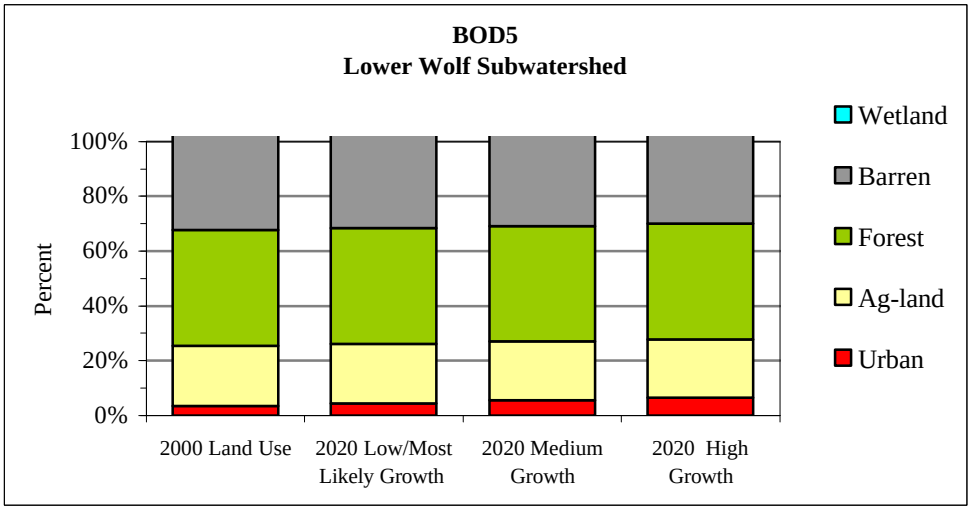
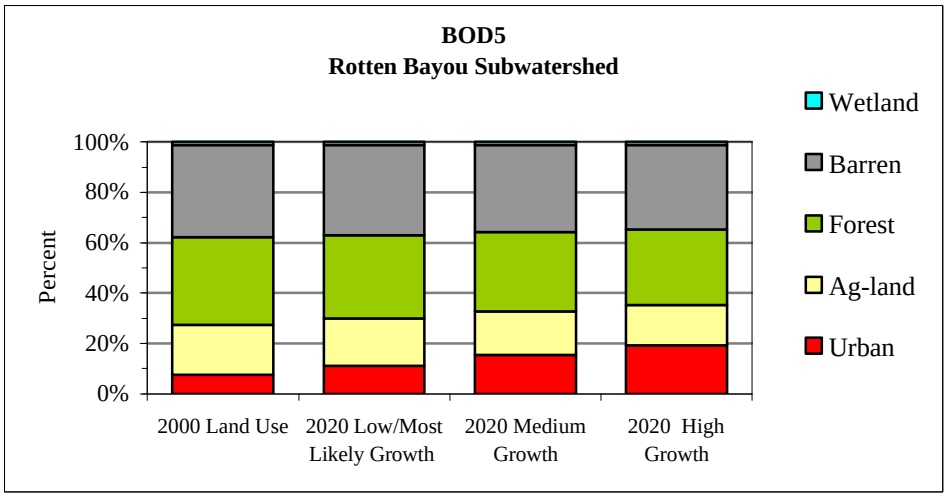
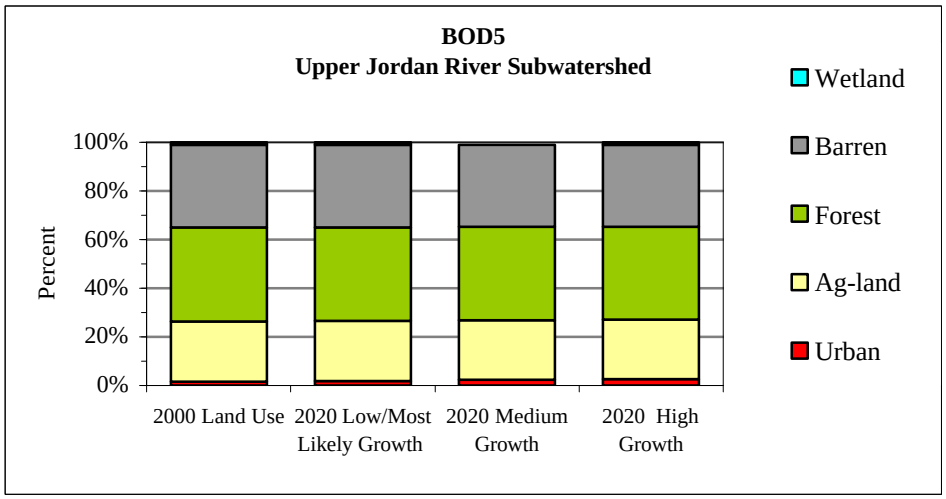


Figure 3a Change in percent of BOD5 contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020.





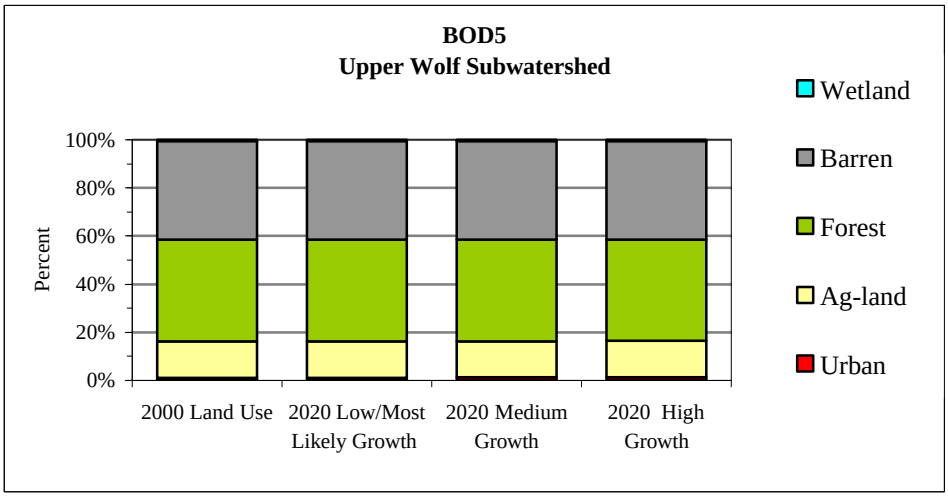
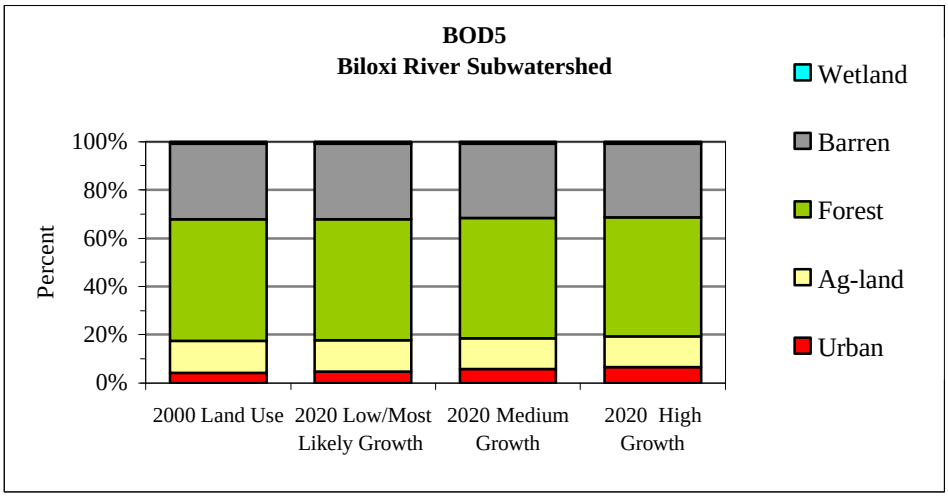
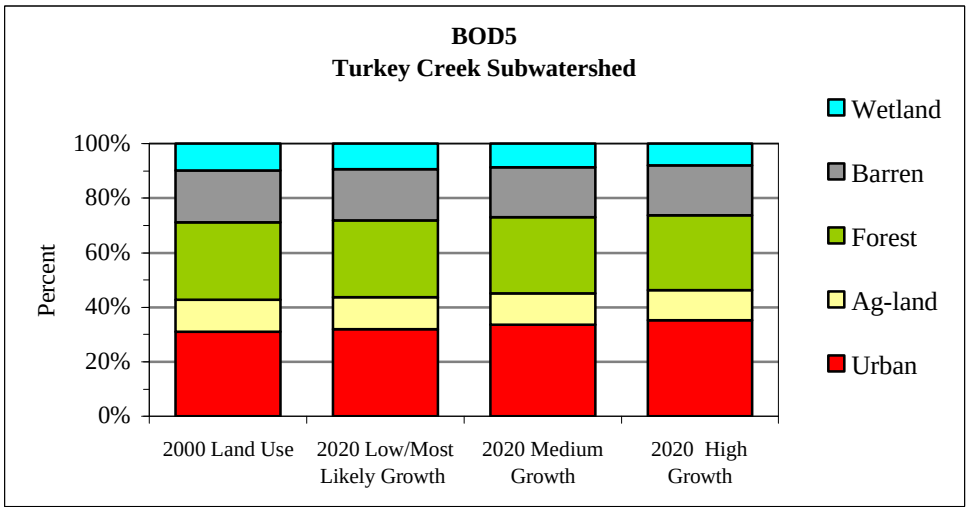


Figure 3a Change in percent of BOD5 contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020. (continued)





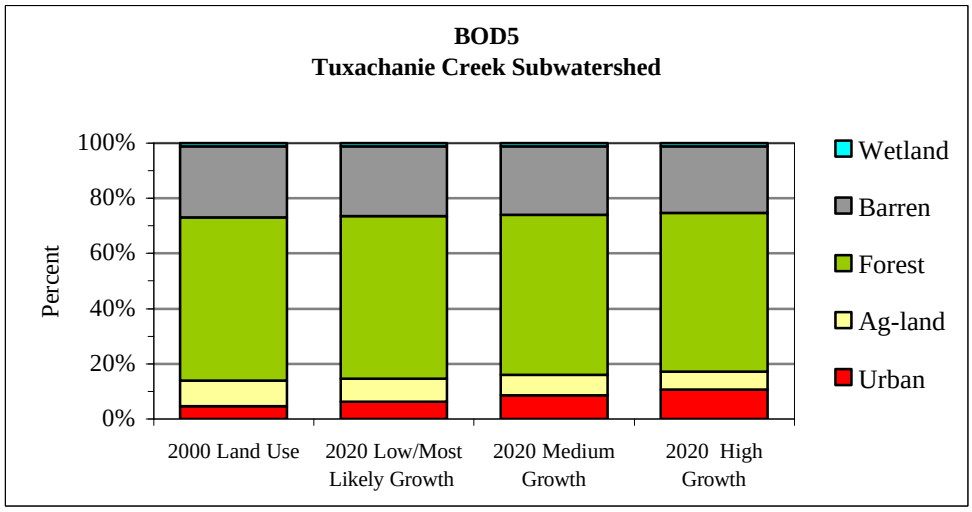
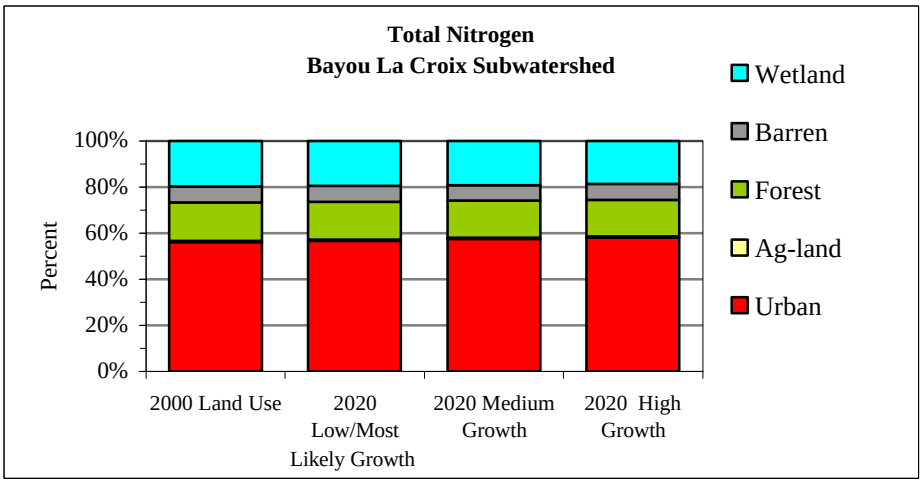
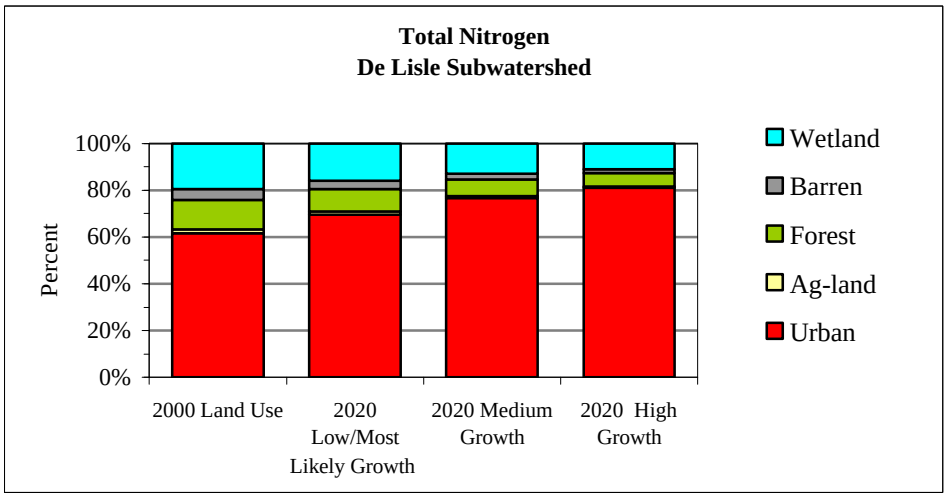


Figure 3b Change in percent of BOD5 contribution attributable to predicted changes in land use for Biloxi Bay subwatersheds in 2020.





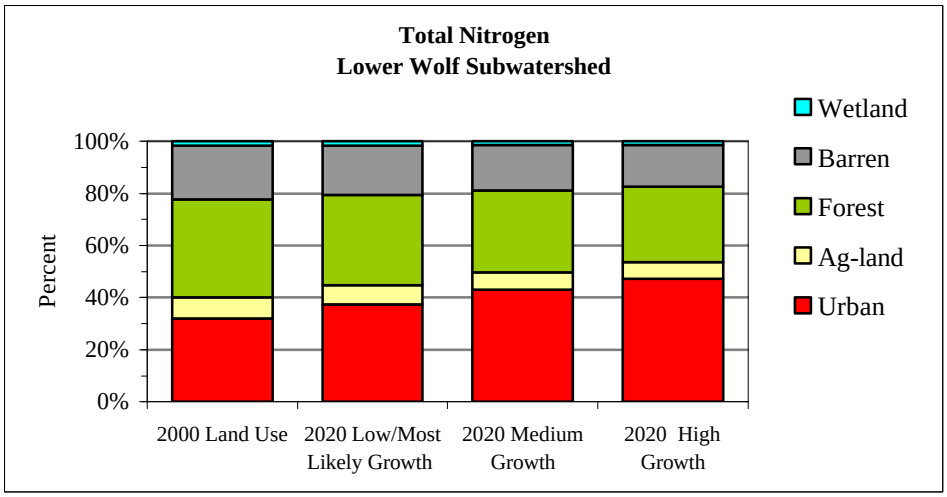
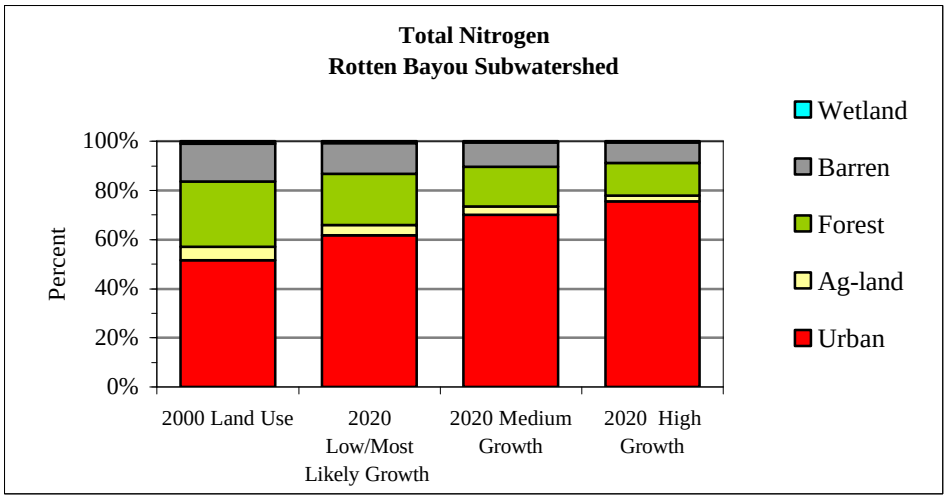
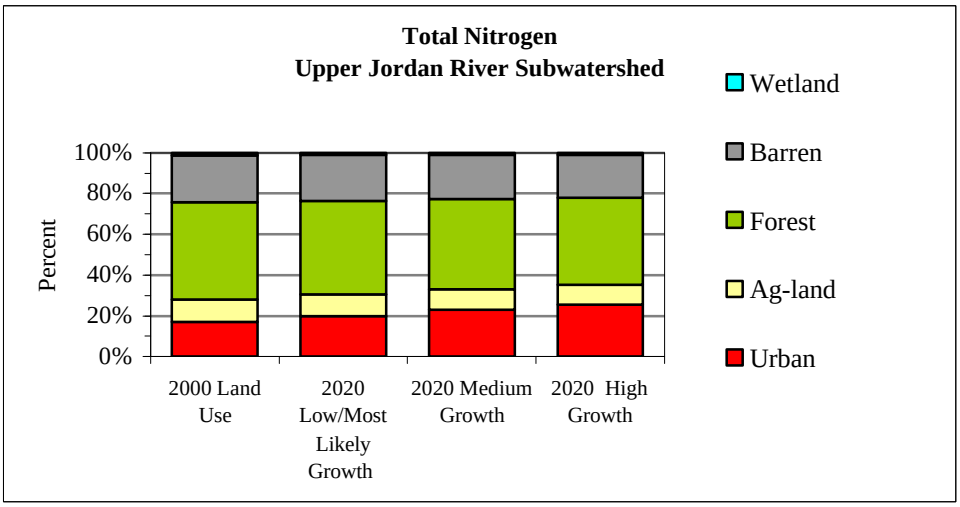


Figure 4a. Change in percent of Total Nitrogen contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020.





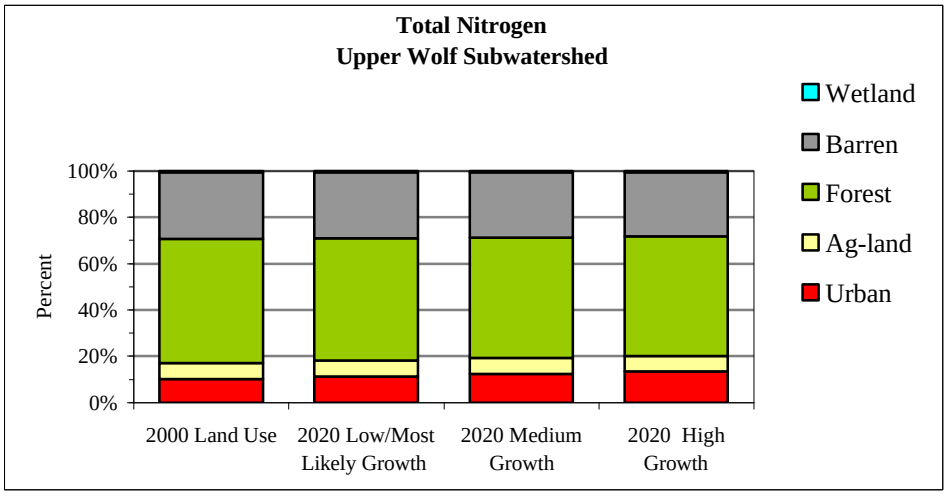
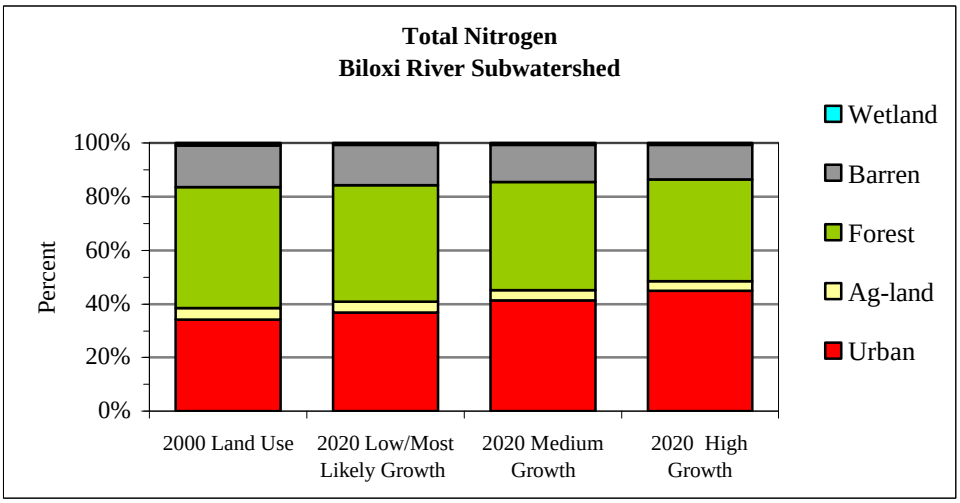
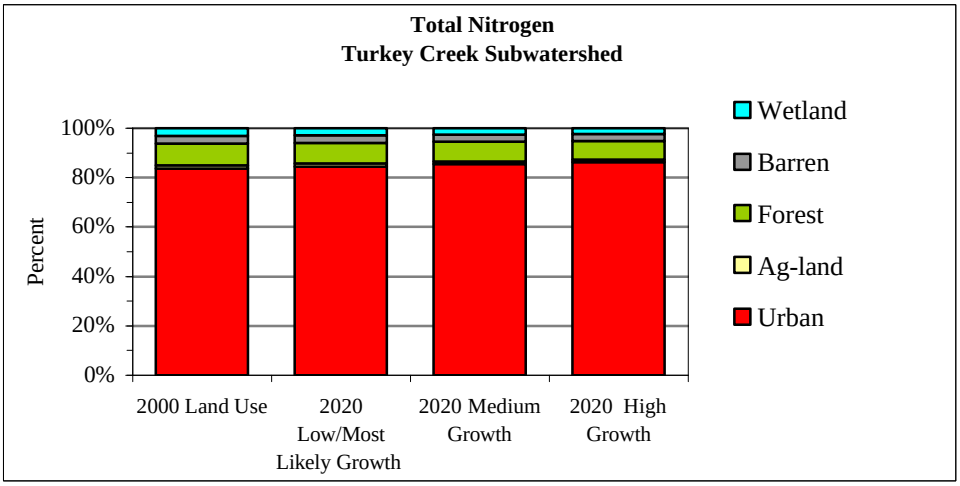


Figure 4a. Change in percent of Total Nitrogen contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020. (continued)





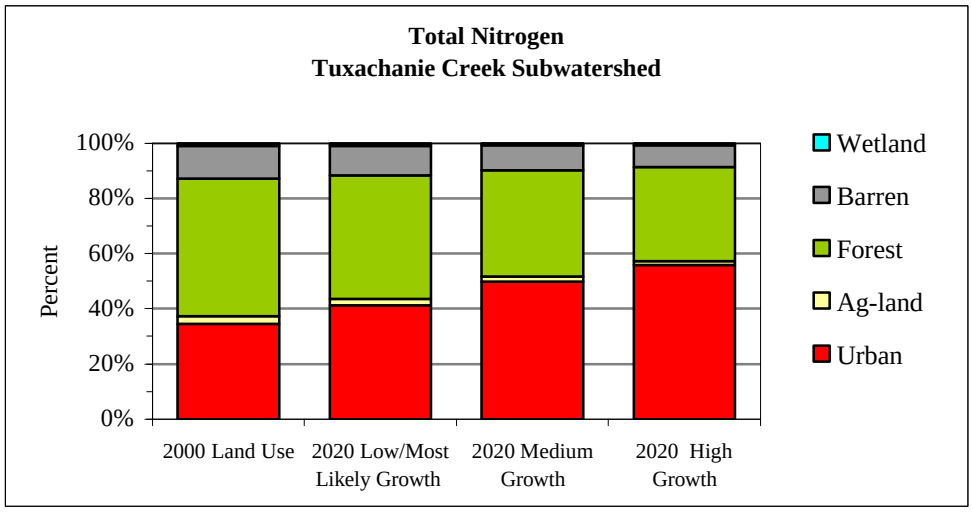
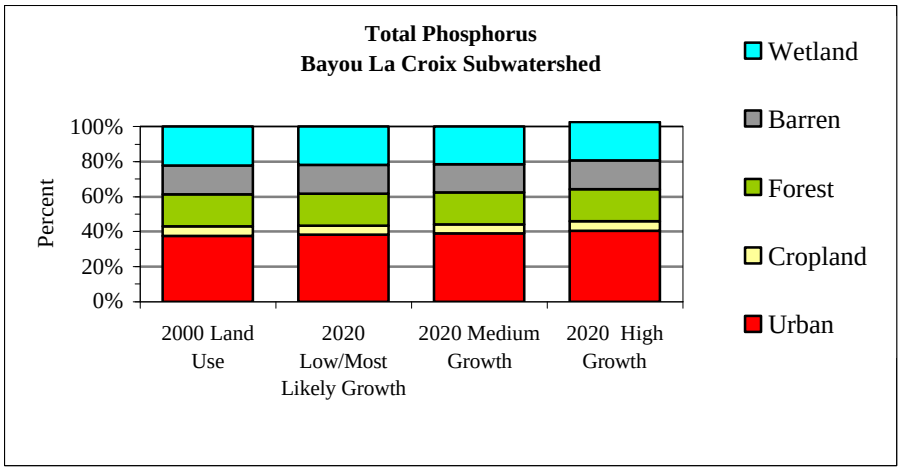
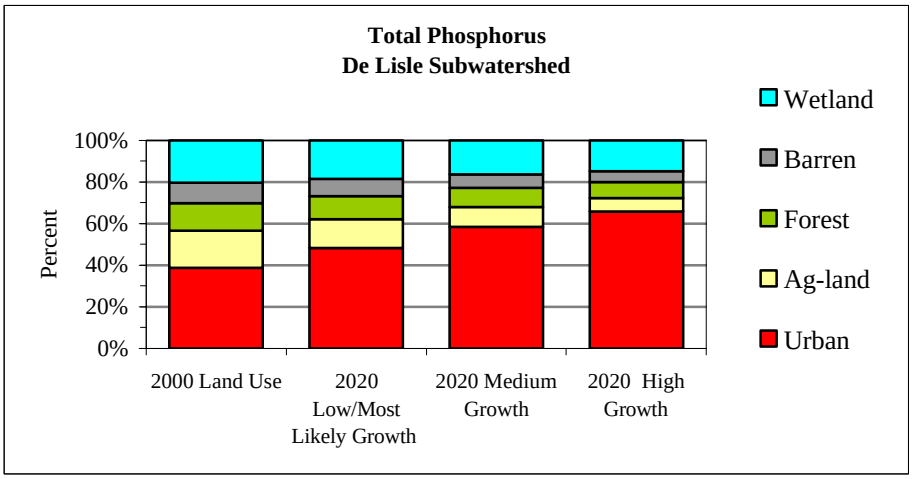


Figure 4b. Change in percent of Total Nitrogen contribution attributable to predicted changes in land use for Biloxi Bay subwatersheds in 2020.





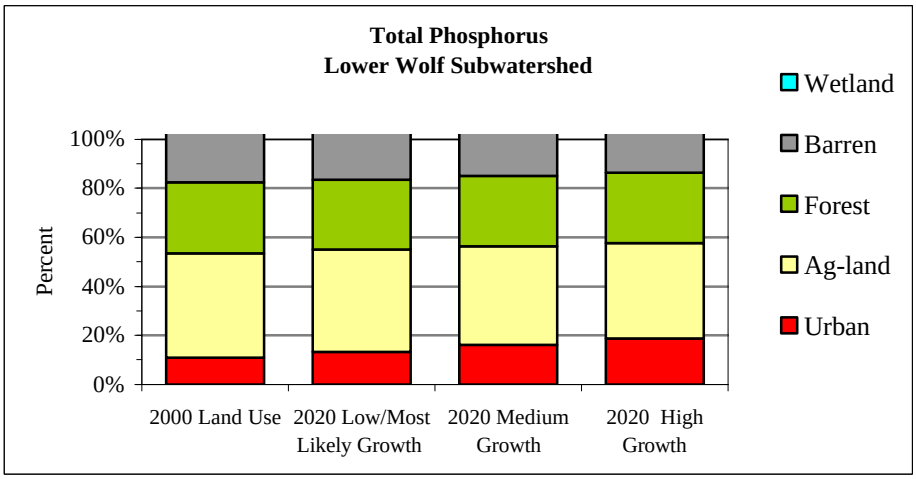
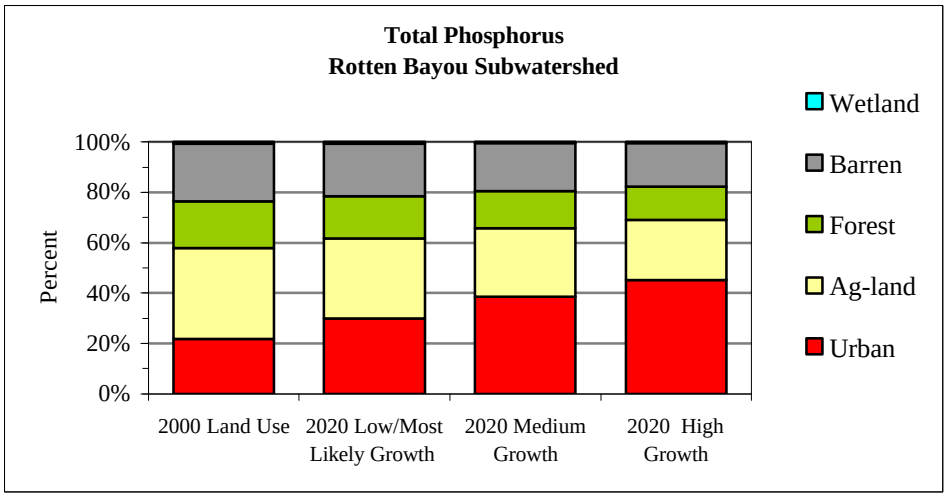
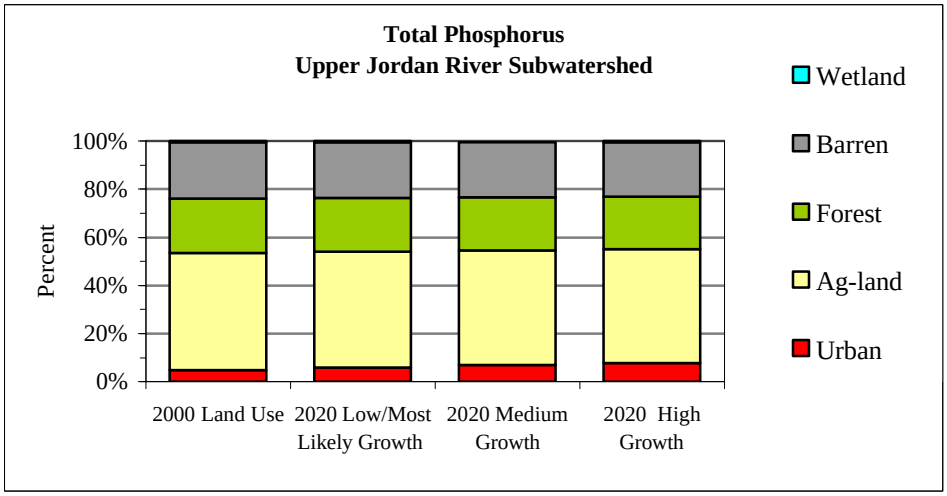


Figure 5a Change in percent of total phosphorus contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020.





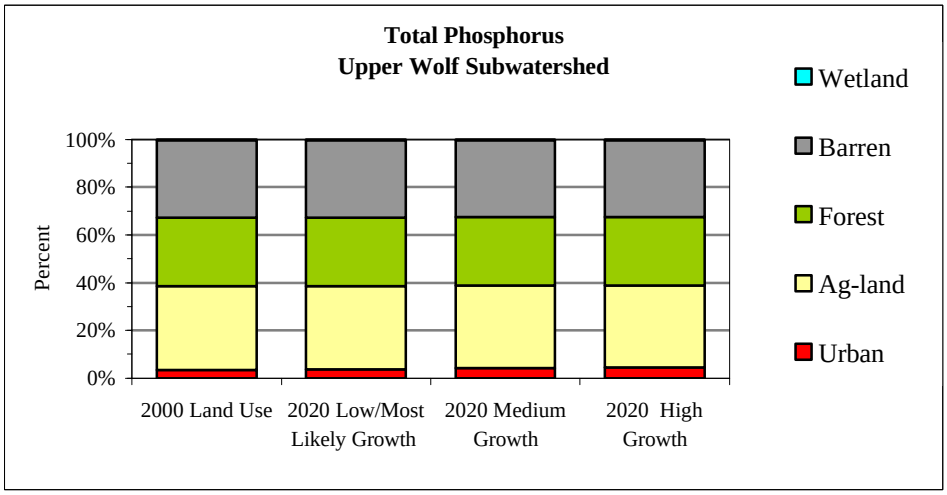
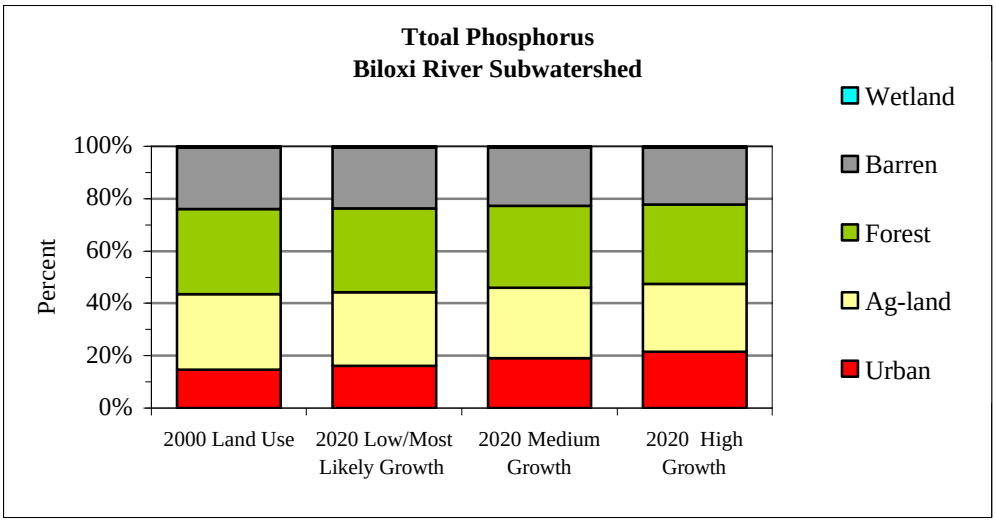
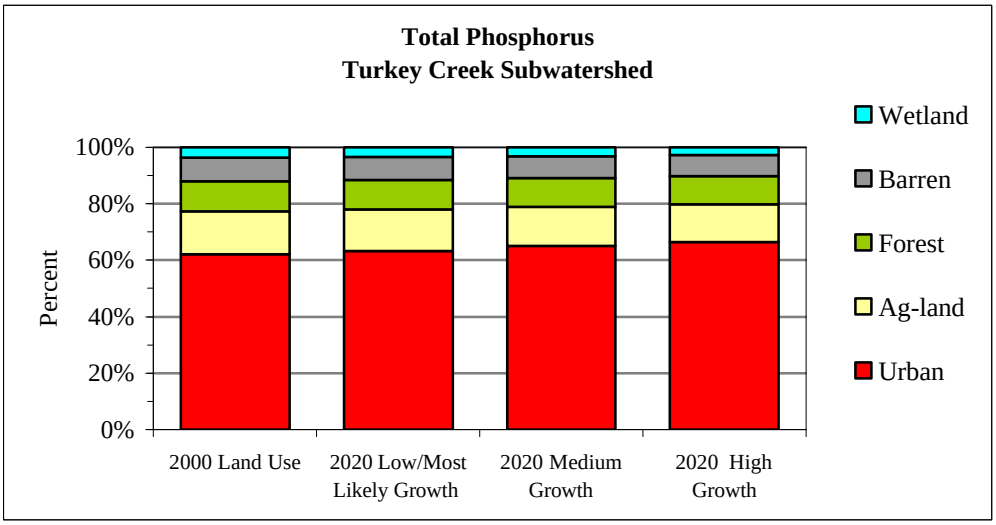


Figure 5a Change in percent of total phosphorus contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020. (continued)





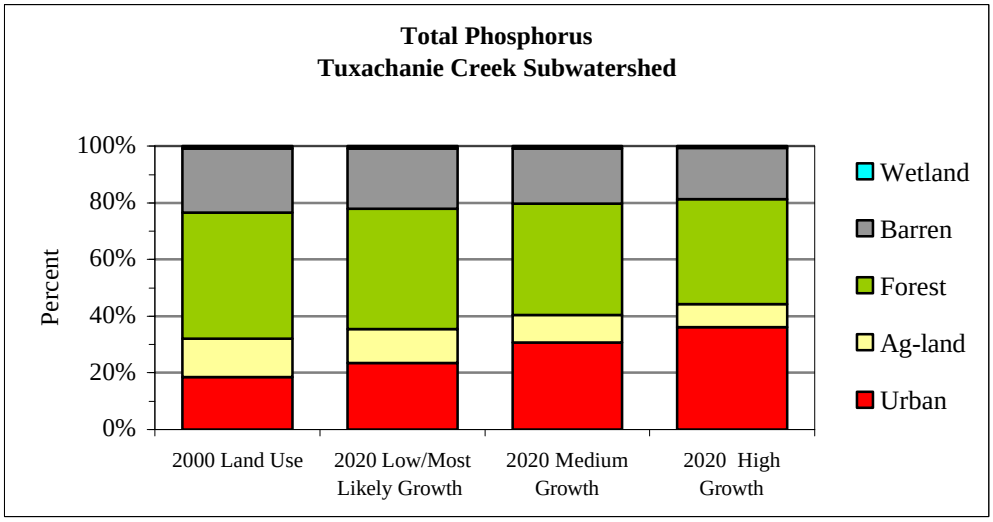
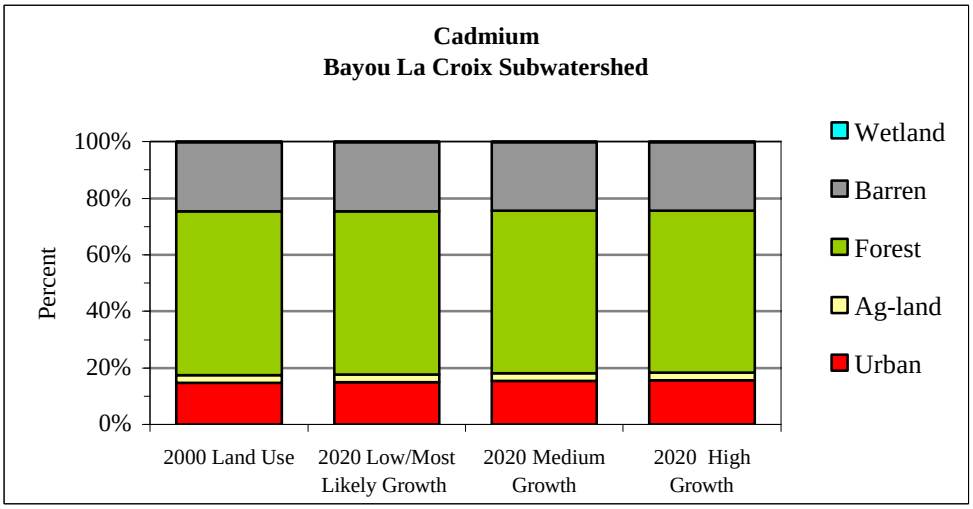
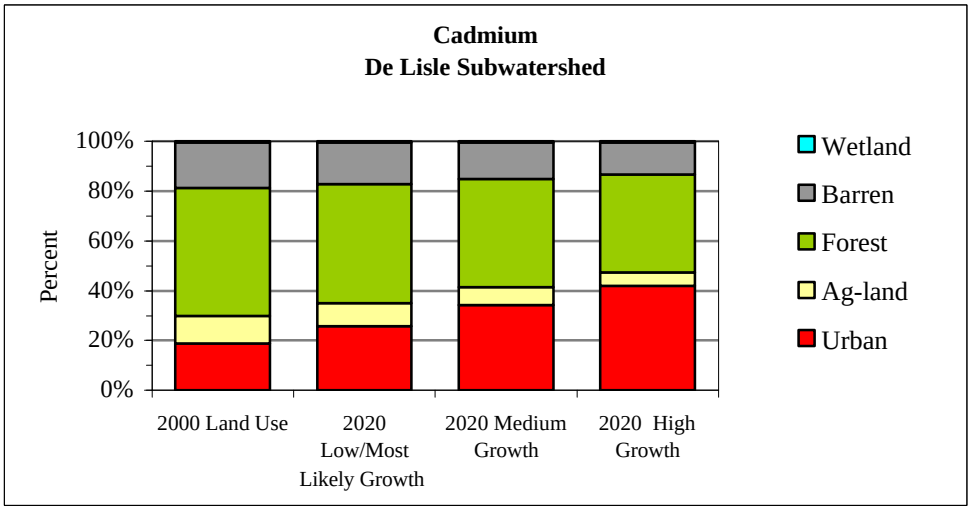


Figure 5b Change in percent of total phosphorus contribution attributable to predicted changes in land use for Biloxi Bay subwatersheds in 2020.





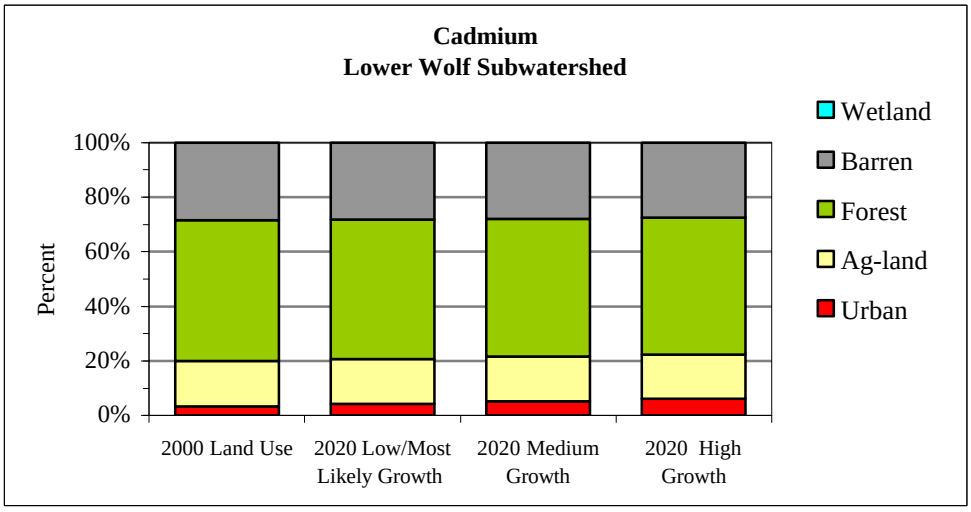
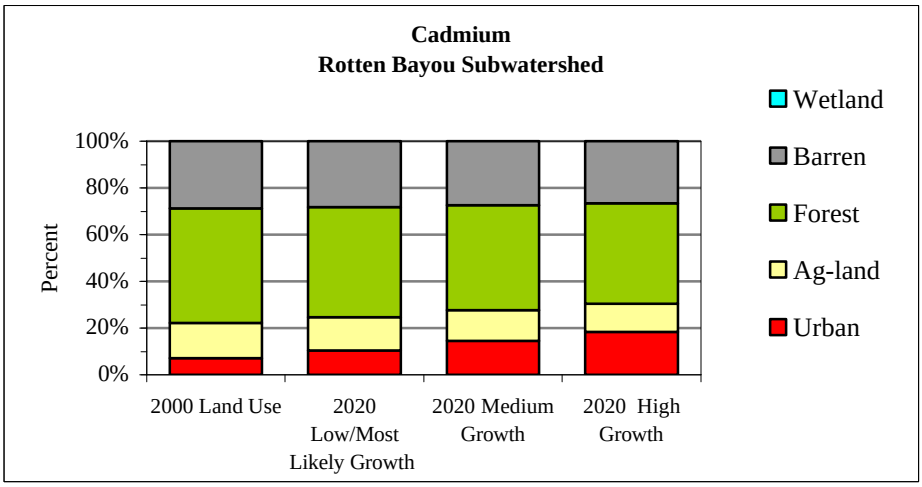
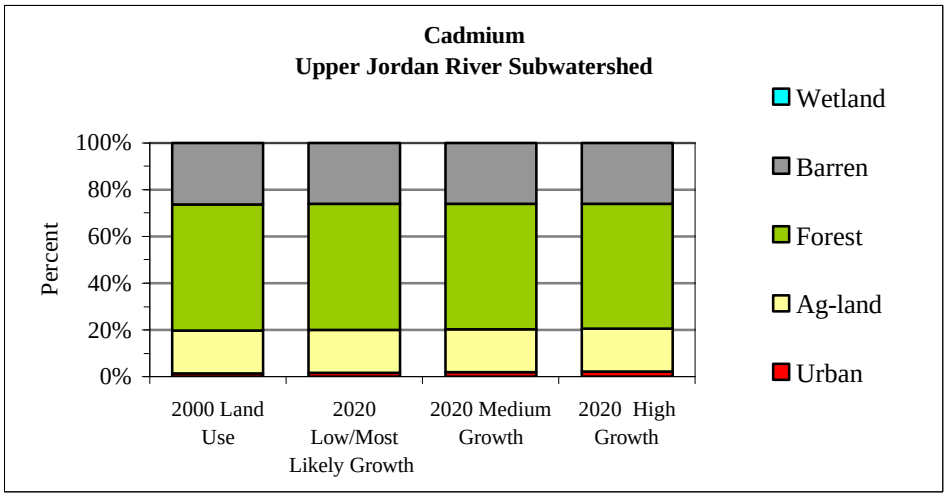


Figure 6a Change in percent of cadmium contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020.





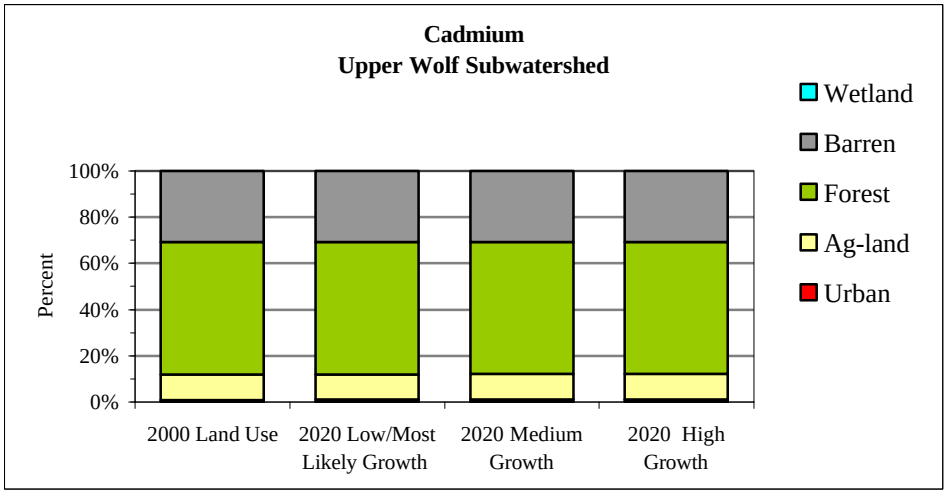
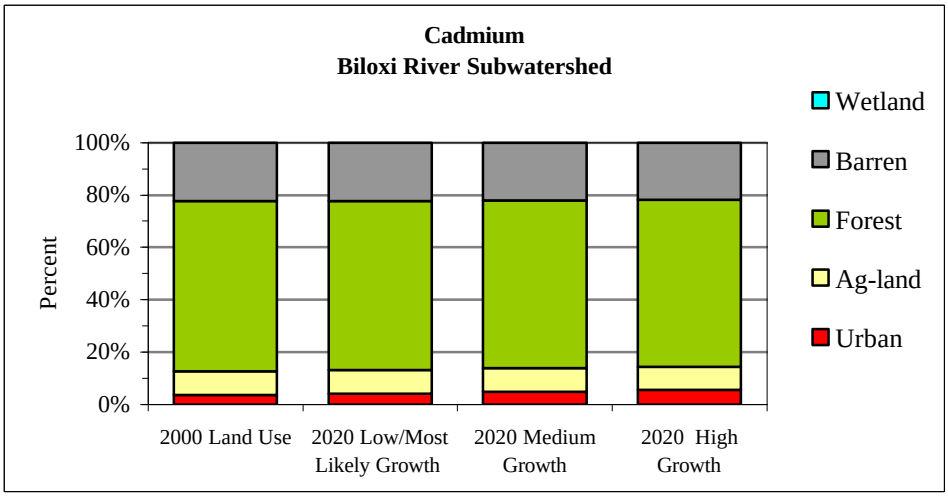
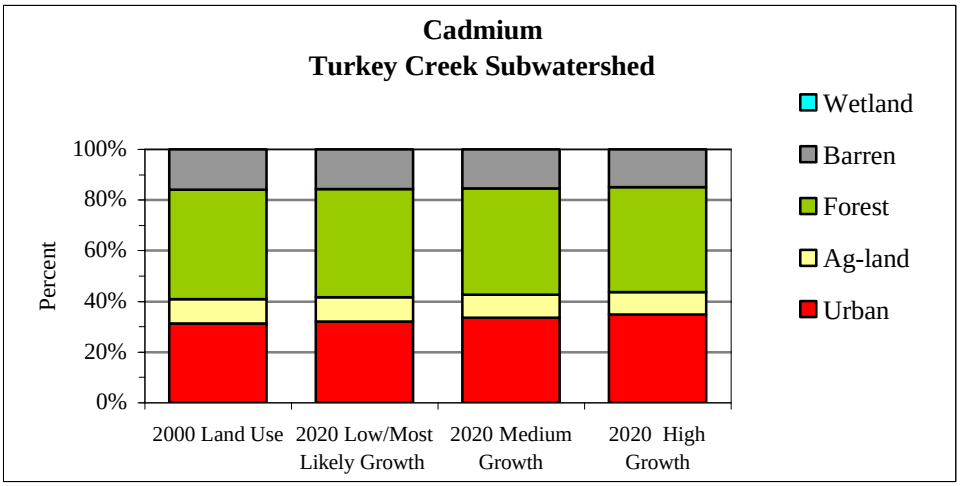


Figure 6a Change in percent of cadmium contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020. (continued)





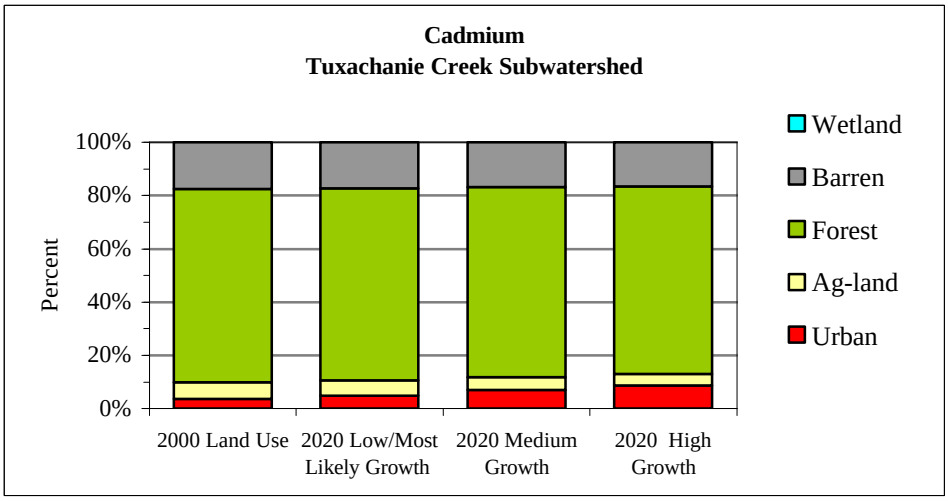
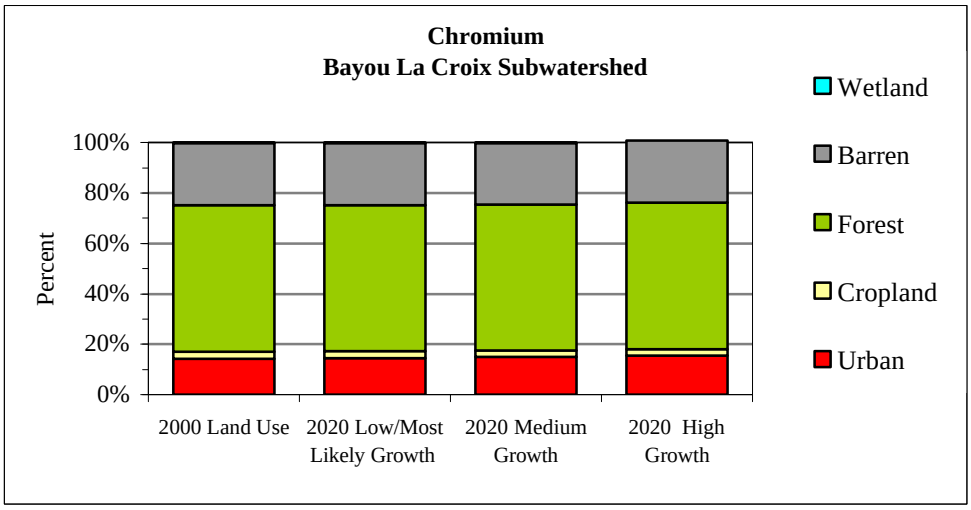
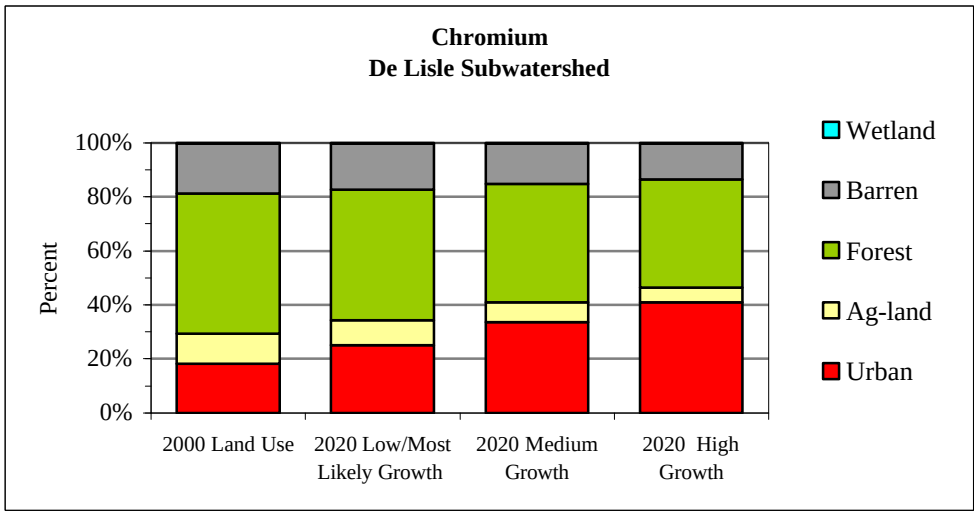


Figure 6b Change in percent of cadmium contribution attributable to predicted changes in land use for Biloxi Bay subwatersheds in 2020.





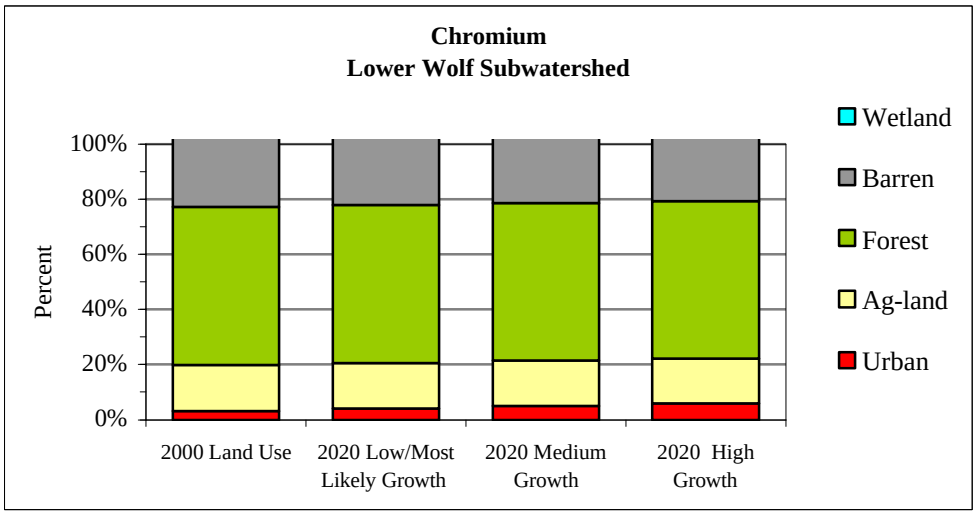
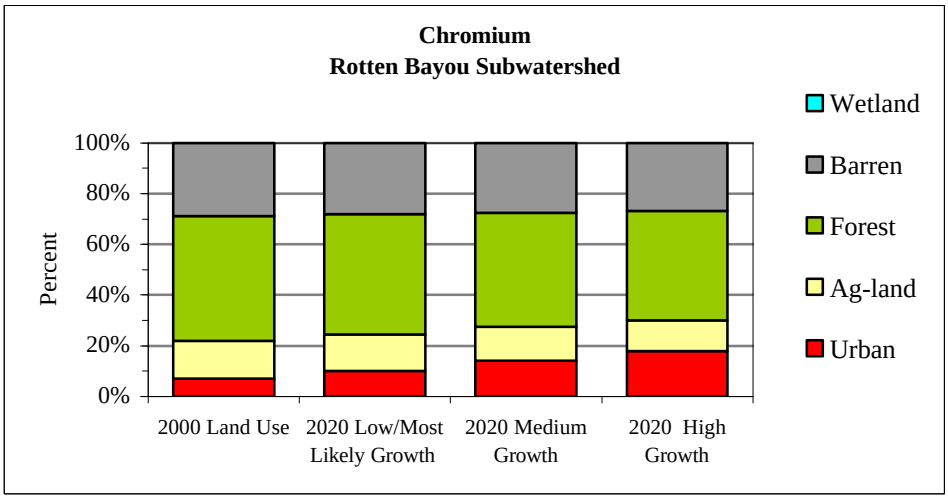
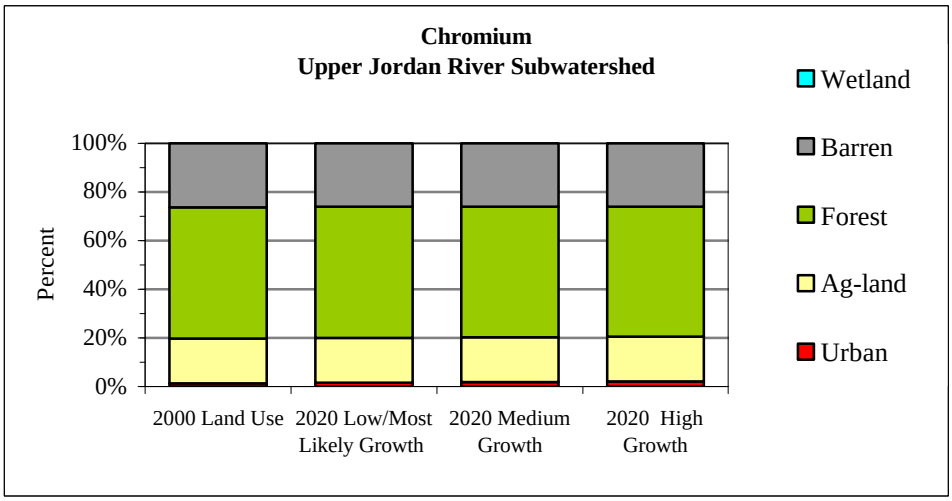


Figure 7a Change in percent of chromium contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020.





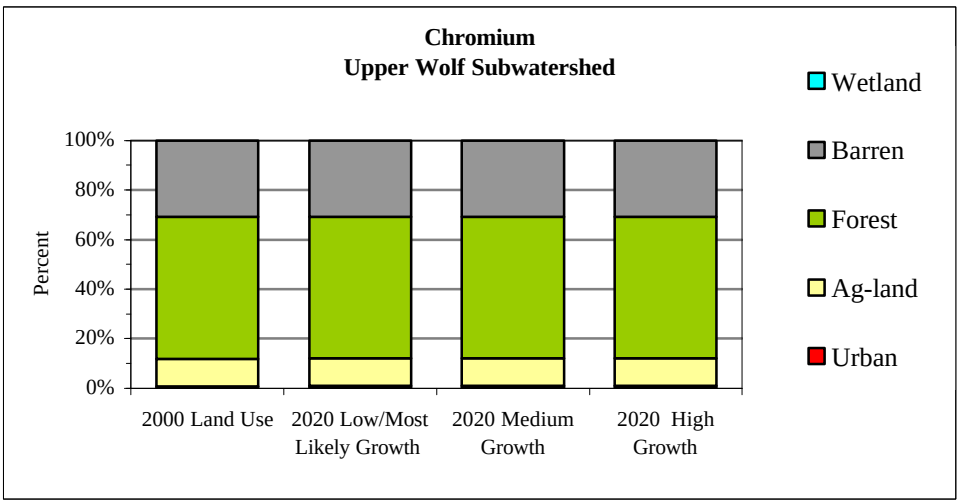
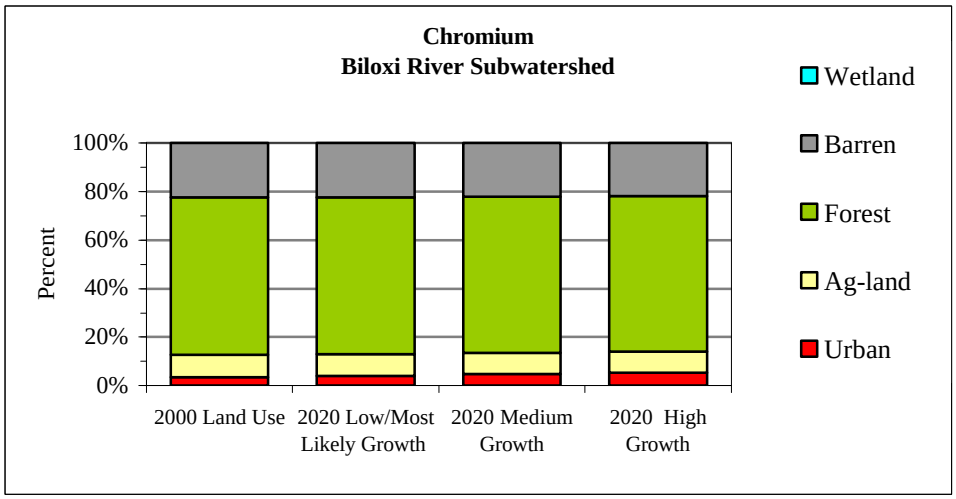
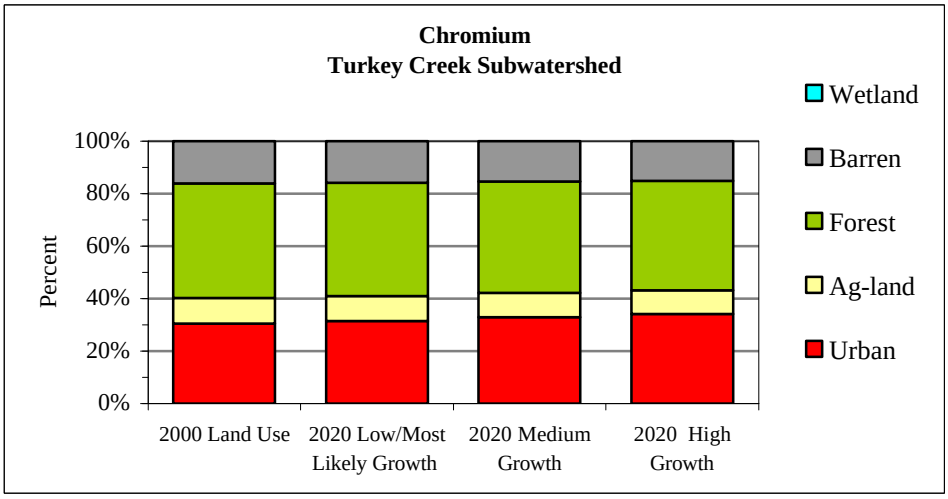


Figure 7a Change in percent of chromium contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020. (continued)





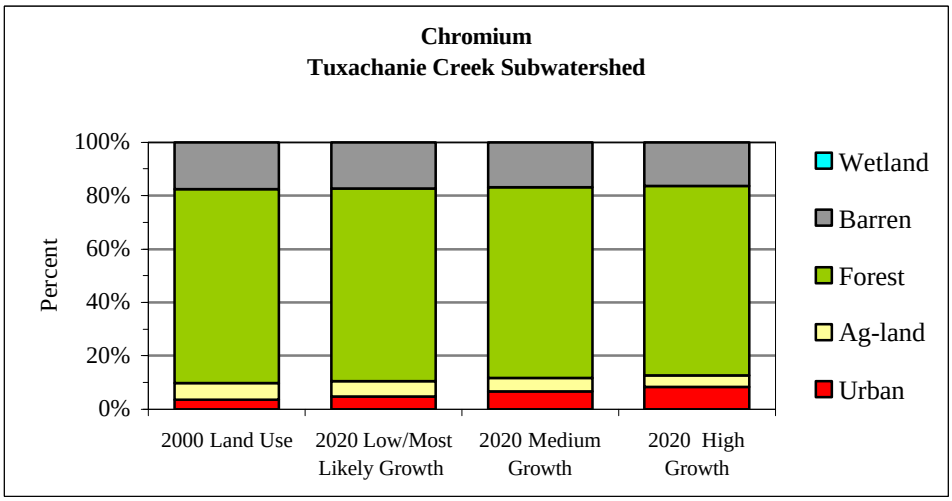
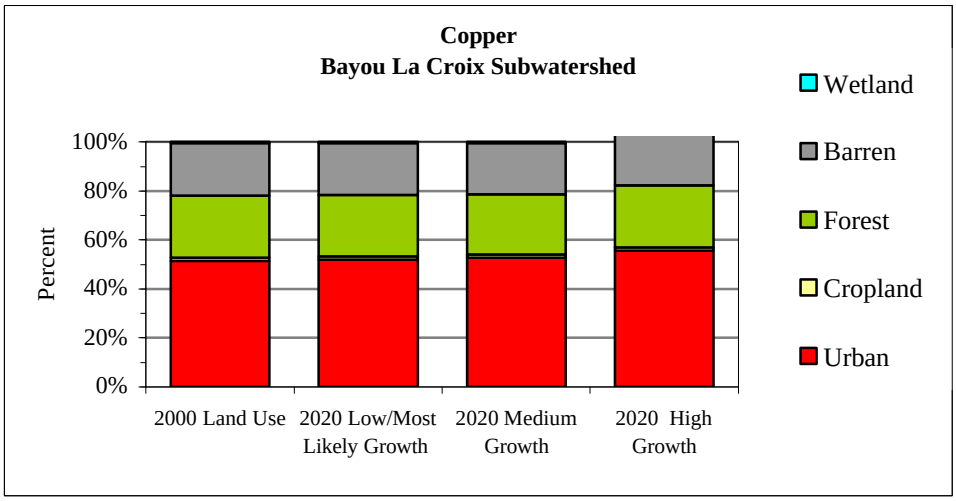
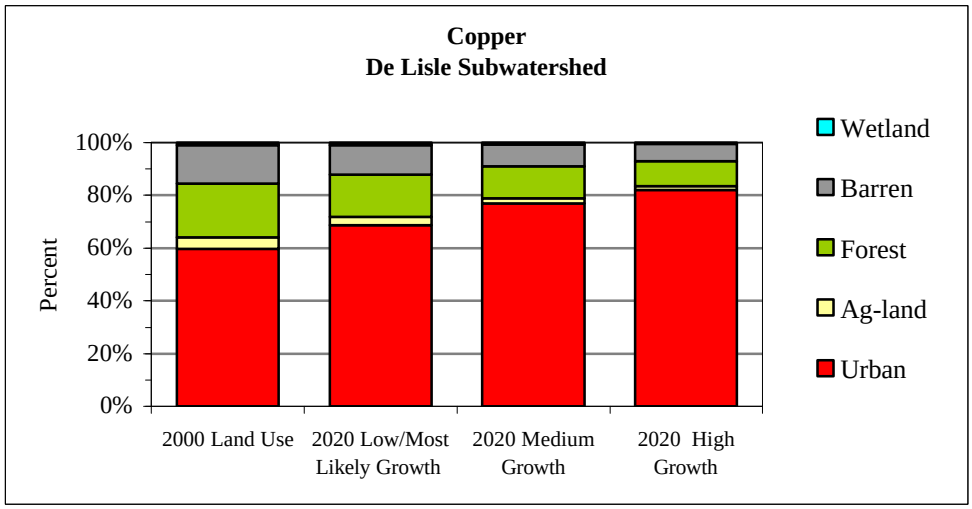


Figure 7b Change in percent of chromium contribution attributable to predicted changes in land use for Biloxi Bay subwatersheds in 2020.





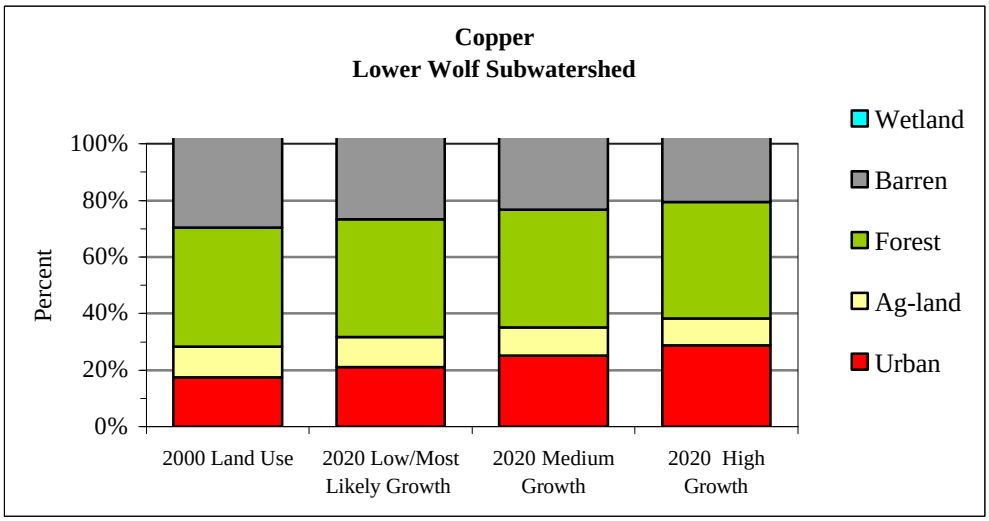
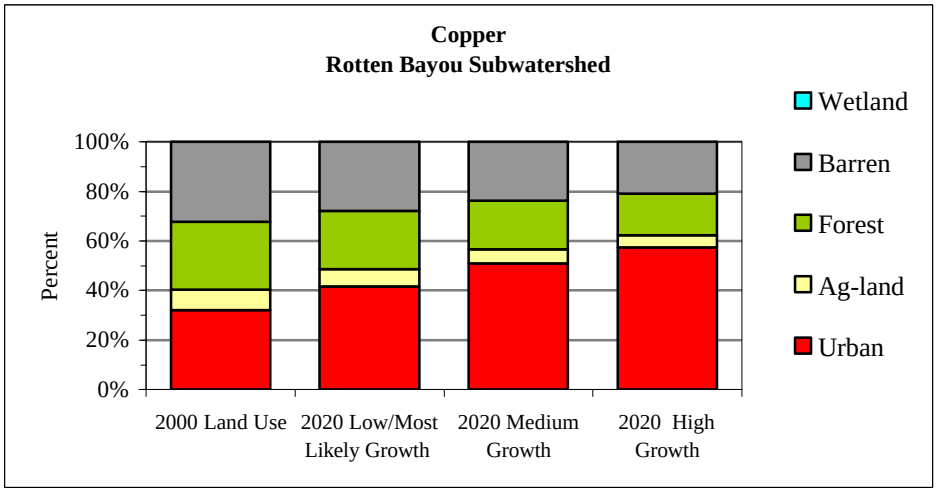
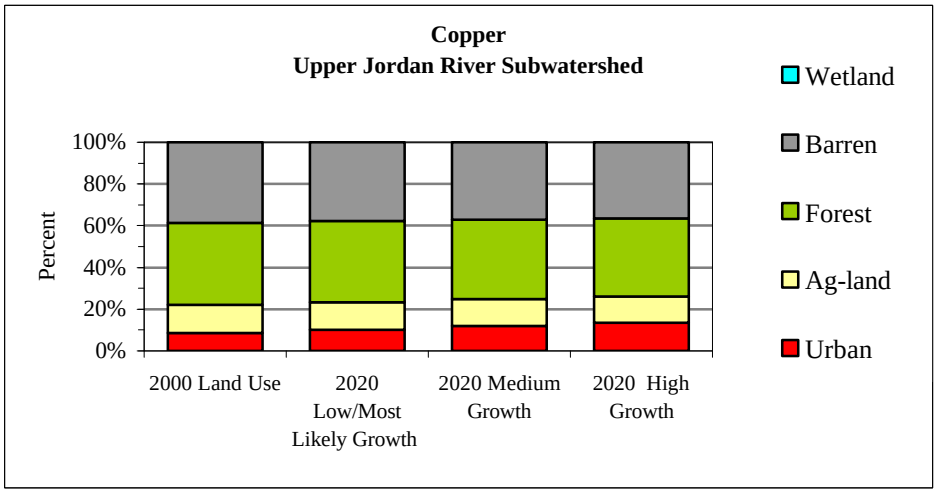


Figure 8a. Change in percent of copper contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020.





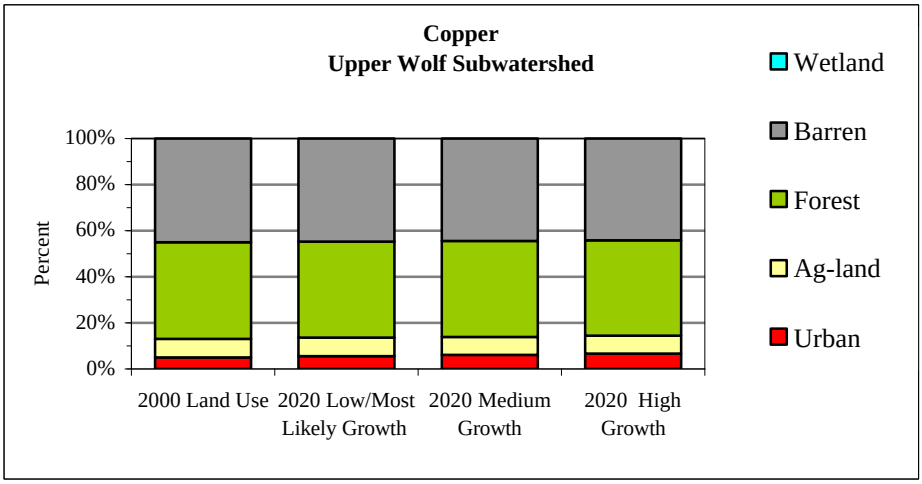
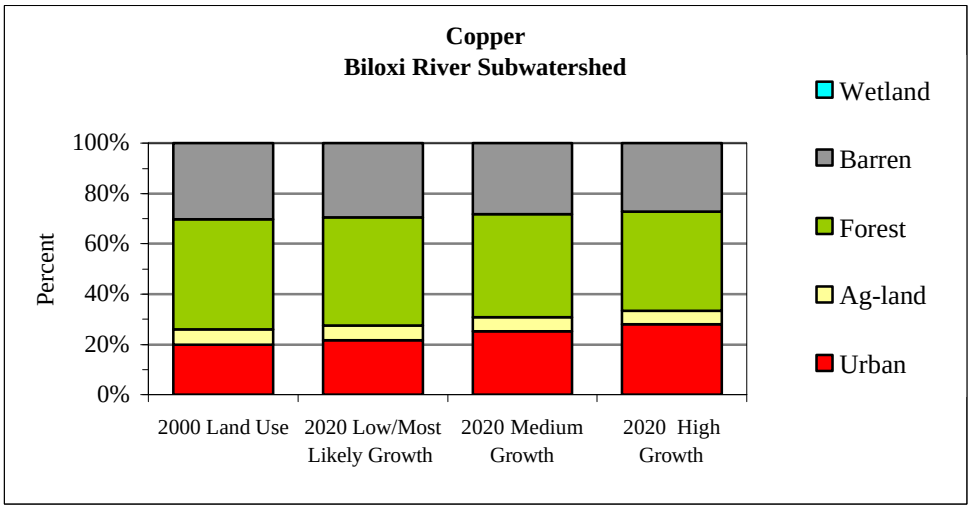
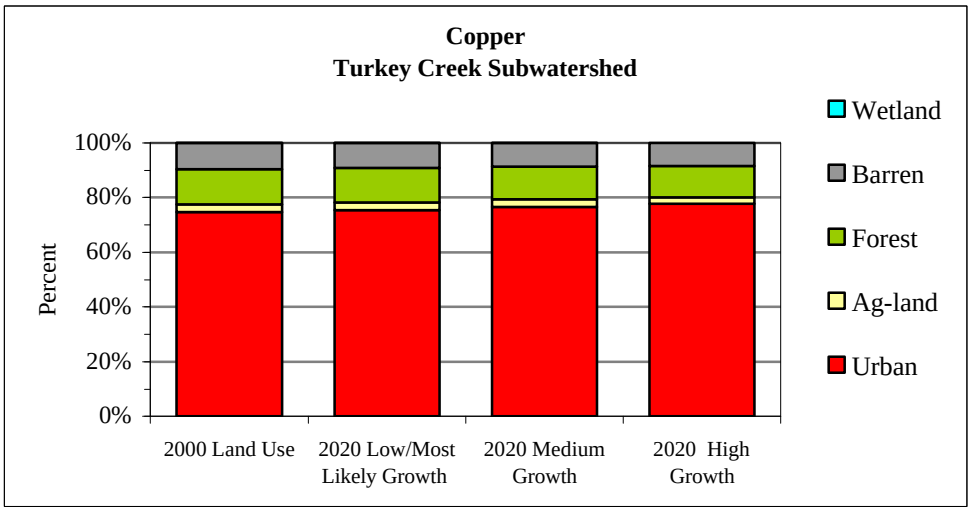


Figure 8a. Change in percent of copper contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020. (continued)





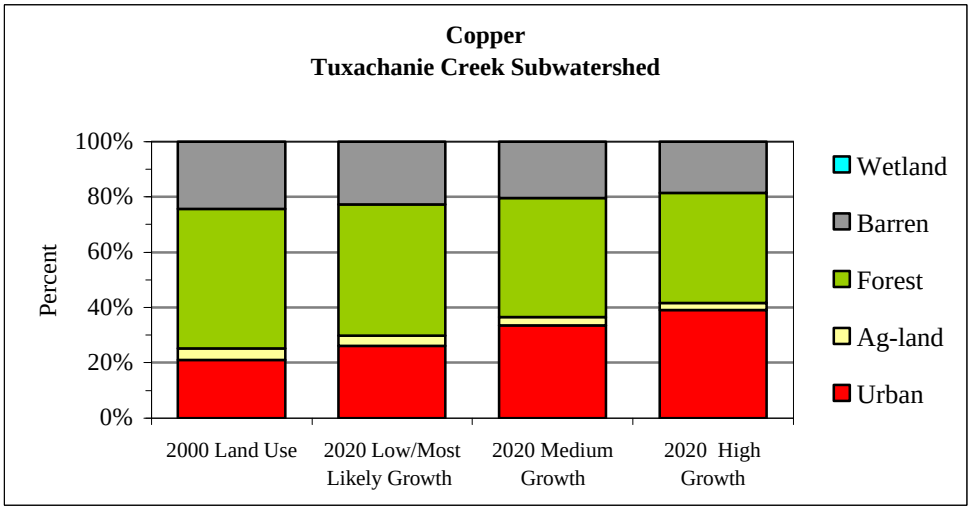
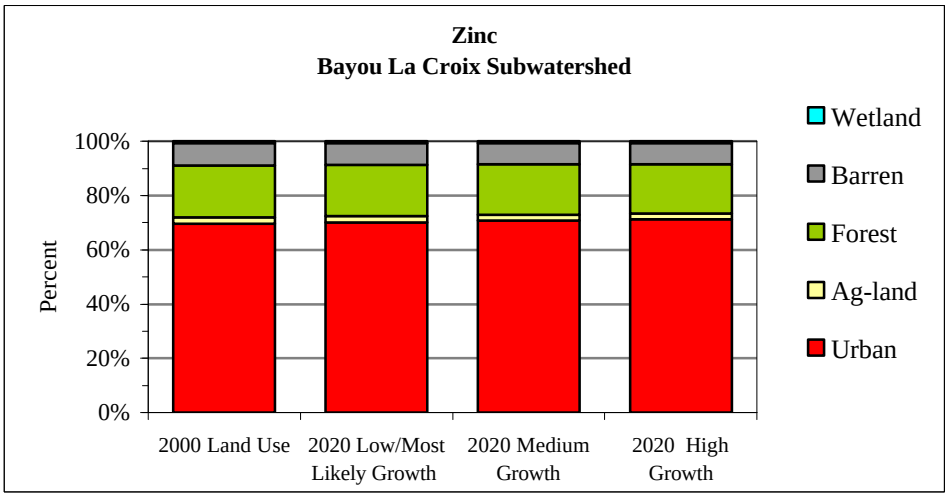
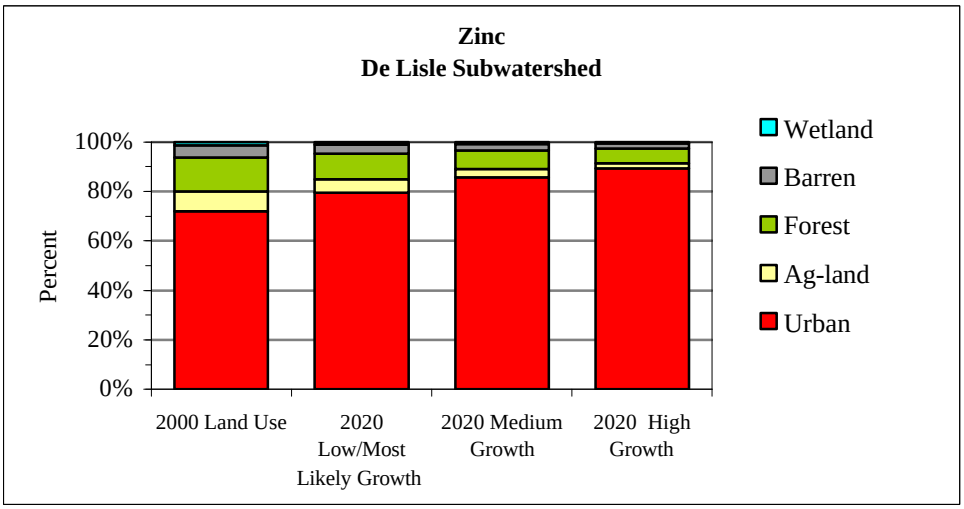


Figure 8b. Change in percent of copper contribution attributable to predicted changes in land use for Biloxi Bay subwatersheds in 2020.





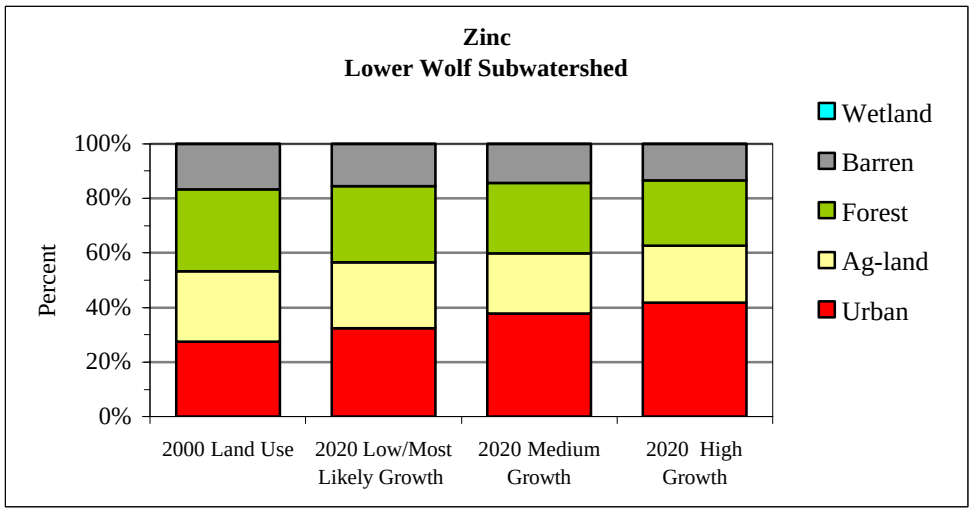
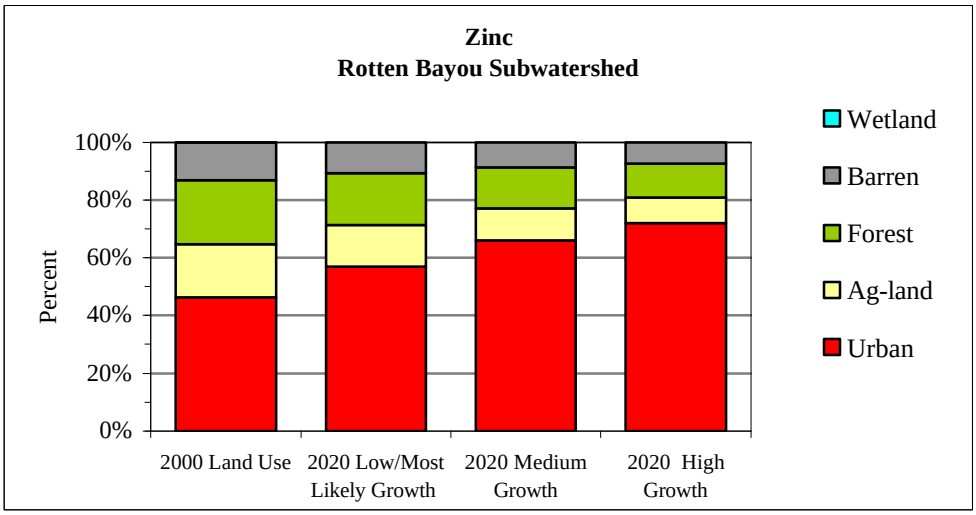
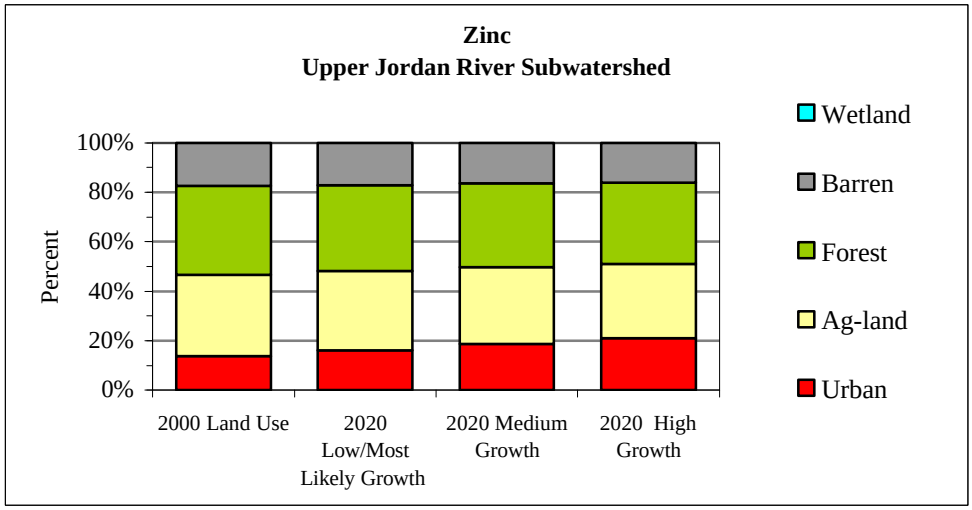


Figure 9a. Change in percent of zinc contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020.





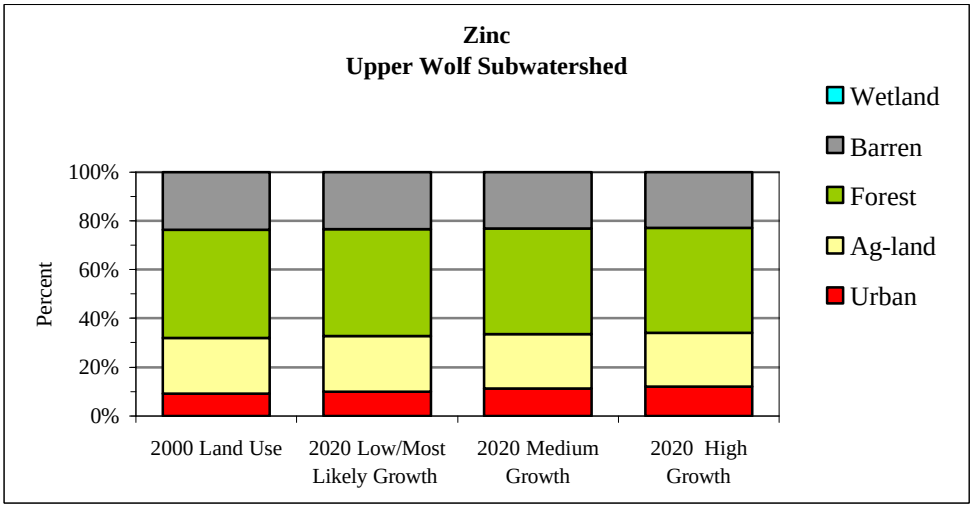
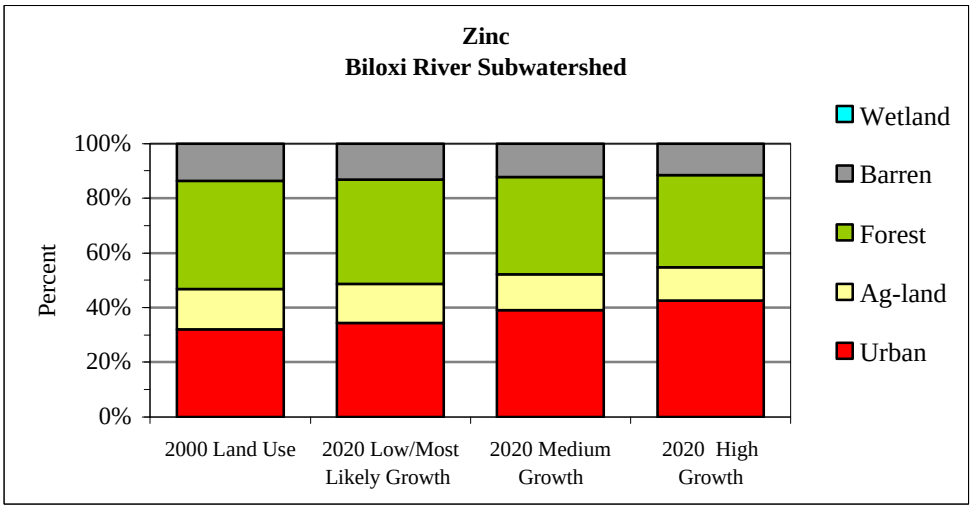
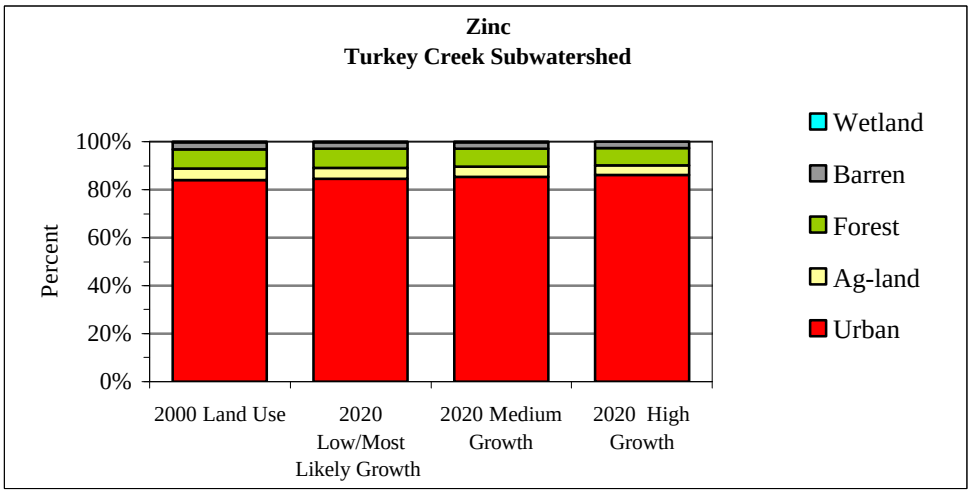


Figure 9a. Change in percent of zinc contribution attributable to predicted changes in land use for Bay St. Louis subwatersheds in 2020. (continued)





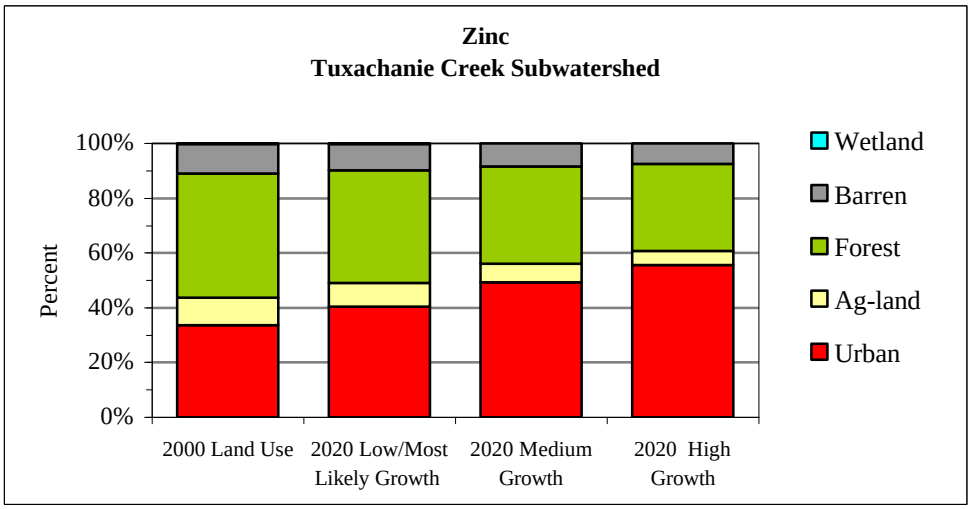


Figure 9b. Change in percent of zinc contribution attributable to predicted changes in land use for Biloxi Bay subwatersheds in 2020.