

# the estuary compact

a public-private promise to  
work together to save the  
Barataria and Terrebonne basins



**The Barataria-Terrebonne  
National Estuary Program**

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# foreword

Almost five years ago, representatives from industry and business, fisheries, farming, oil and gas, and government agencies, individual citizens, land owners, civic organizations, hunters, scientists, engineers, environmentalists, economists, and urban planners began a journey. But this was to be no ordinary journey, for it marked the first time that groups with differing points of view agreed to work together to protect and preserve the fragile resources of Louisiana's Barataria and Terrebonne basins.

Under the umbrella of the Barataria-Terrebonne National Estuary Program (BTNEP), these individuals, collectively known as the "Management Conference," have volunteered tens of thousands of hours determining the directions the journey must take to safeguard the estuary for future generations. *The Estuary Compact* is a product of their efforts, a road map if you will, to ensure the most direct route to this coveted destination.

The journey is still young, and we invite you to join us as we travel toward a new understanding of the estuary ecosystem, an appreciation of its resources, and a more profound recognition of and respect for its extreme importance and relationship to our lives.

Donna Smith



and so the journey began...

# the vision

We the people of Louisiana and the Barataria Terrebonne estuarine basins believe that the Barataria-Terrebonne ecosystem is a national treasure which represents a unique multi-cultural heritage.

Furthermore, we recognize that our ongoing stewardship is critical to its preservation, restoration, and enhancement. This stewardship can only be maintained by active support of those who live in the basin, and those who use its abundant resources locally, statewide, and throughout the nation.

Acknowledging the importance of this estuary to our environmental, cultural, and economic well being, the people living and working in these two basins believe that we should have a balanced ecosystem that includes:

- Public education and informed citizen participation.
- Local, state, and national recognition and support.
- Maintained multi-cultural heritage.
- Sustained and restored wetlands that support viable fish and wildlife resources.
- Pollution abatement to protect the health of plants, animals, and people.
- Environmentally-responsible economic activity.
- Environmentally-compatible infrastructure (roads, bridges, levees, rail roads, etc.)
- Comprehensive, integrated watershed planning among all users.
- Harmonious use of the resources by many interests and resolution of user conflicts.

We pledge to work together to implement a plan to re establish a chemical, physical and biological balance in the Barataria-Terrebonne estuary so that diverse plant and animal communities and human health and welfare can improved and sustained for present and future generations.

*The Management Conference  
November 13, 1992*

# the estuary compact

*The Estuary Compact* is just that, a promise by many individuals, organizations, government entities, and interest groups to work together to halt destructive land-loss trends, to reduce pollution, and to create economic opportunities for estuary residents and businesses alike.

Contained in this report are brief descriptions for 51 individual plans designed to address complex scientific and technical issues such as hydrologic modification, sediment transport, and habitat loss. Equally important, plans also deal explicitly with economic growth, citizen education, and program coordination and implementation. Full accounts of all of these plans can be found in *The Technical Supplement* which contains detailed information on each plan including: objectives, project justification, implementors, schedules for implementation, and specific recommended activities.

Make no mistake, *The Estuary Compact* does not describe just another series of plans created by government. It does not outline plans developed by and for only select interests. It does not list plans produced only by residents or landowners of the basins. *The Estuary Compact* is a document that reflects plans that were written and embraced by residents and landowners, government officials, environmentalists, and business and industry representatives alike. All of the work that has resulted in the production of plans contained in this document is a direct product of the Barataria-Terrebonne National Estuary Program (BTNEP).

## ***Why Should You Support BTNEP and the CCMP?***

If you live or work in the Barataria-Terrebonne estuary or use its resources, you have a vested interest in the success of this program. Scientific evidence suggests that the resources of the basins are in danger. If programs are not undertaken to protect the resources, they may be lost forever. And these changes could take place during your lifetime. This is not just radical environmental fiction, it is fact.

It is difficult to predict the full effects of pollution, continued land loss and the alteration of habitats that are now taking place due to natural and human-induced processes. But we can look at existing trends and try to imagine how your life might be impacted. To some extent, everyone in the Barataria and Terrebonne basins will pay the price in the long-run if projects to control existing environmental problems are not started now.

The potential impacts on your life could be many. With accelerated land loss along the coastal region, land could be replaced by water, forcing families to relocate further inland. As more land is lost, the types of wildlife that the new habitat would sustain could change significantly. The process could also cause the introduction of salt water into freshwater systems which could alter or kill vegetation and cause fish, birds, and mammals to find new places to live. With continued dumping of sewage into water bodies, more oyster grounds could be closed due to the likelihood of serious illness should you eat a raw oyster. Moreover, it could be unsafe to swim in the water due to the presence of bacteria. With continued runoff from urban and agricultural areas, water bodies could be depleted of oxygen, and fish could die. With continued release of toxic materials into the basins, fish could be contaminated to the point that they could be unfit for human consumption. Further, the toxics could affect a fish's ability to reproduce, meaning less fish to catch. When tainted fish are eaten by predators such as birds and mammals, certain contaminants in the fish could affect the predator's ability to reproduce as well. Crabs and crawfish could become diseased and inedible as they sift through polluted mud on the bottom of lakes, streams, and bayous.

### The Barataria-Terrebonne National Estuary Program

In 1990, the U.S. Environmental Protection Agency (EPA) and the State of Louisiana formed a novel partnership. Their goal was to not only protect the Barataria-Terrebonne estuary from further degradation but to undertake programs that would begin to check human-induced or natural damage that had already occurred to habitats throughout the estuary. The partnership is called the Barataria-Terrebonne National Estuary Program (BTNEP).

BTNEP was established under the authority of Section 320 of the Clean Water Act. It is administered and funded by the EPA and the State of Louisiana. Under this program, a set of plans and implementation schedules must be developed within five years after an estuary's nomination and acceptance into the program. Thus far, 28 estuaries of national significance have been selected to participate in the National Estuary Program and are in various stages of plan development or implementation.

You may argue that this is unnecessarily alarmist. If you do, then talk to some of the old-timers in Barataria-Terrebonne. They can show you vast expanses of water which used to be land where they hunted as children. They can bring you to water bodies where fish kills have occurred, they have seen toxic chemical spills, and oyster fishing has been periodically halted. They can tell you how their catches of fish and crabs have changed over the years and how, in some areas, they can no longer make a living.

The problems are real, and they are happening now. They are, however, limited in scope at this point in time, but they will continue to impact larger and larger areas of the Barataria and Terrebonne basins if we don't take action. If this is the case, your quality of life, and that of your neighbors, will suffer.

One other impact bears mentioning. The money that the state and local governments collect from businesses in the basins will decline as resources decline. Ultimately, this will mean fewer dollars to fund roads, schools, police, and other public services required to run your community.

To prevent these possible problems, hundreds of people have already come together and made the commitment to take action through BTNEP. They have

met regularly over the last several years to discuss how the Barataria and Terrebonne basins could be preserved. But before they attempted to reach consensus on recommendations they needed a vision.

### ***The BTNEP Vision: The Programs Foundation***

The creation of the BTNEP Vision in 1992 (Page 5) was a benchmark achievement in many ways. Unlike many government sponsored programs in which public input is not considered critical to program success, the BTNEP Management Conference refused to proceed without it. Further, they sought to include suggestions of Barataria-Terrebonne residents, not at the end of the planning process, when decisions have all but been finalized, but at the very beginning. The BTNEP Vision is thus an expression of hope for the future by and for the people who reside in the region.



*Citizens developing action plans*

Yet another departure from traditional planning practice has been the scope of involvement of people from throughout the Barataria and Terrebonne basins. Individual landowners, organizations, and government representatives have been encouraged to participate in every aspect of the planning process, from the initial problem identification to writing plans to resolve the problems. In response to the unique opportunity, literally hun-

dreds of people representing a growing list of interests have come forward. They have volunteered their time to help develop plans to reduce pollution, promote economic development, restore habitats, and improve government permitting processes, as well as other areas. Their commitment and enthusiasm have proven to be the hallmark of BTNEP's success to date.

Possibly the most significant breakthrough in the program, though, has been seen in the new spirit of cooperation. Special interest groups, normally at irreconcilable odds, have worked in good faith to resolve differences and to find a common ground upon which they could base their new working relationships. Their determination to find this common ground is testimony to the widely held belief that without a cooperative effort, the resources of the Barataria and Terrebonne basins will continue to be negatively impacted, in some cases permanently.

### ***Barataria and Terrebonne Explored***

The map on the facing page will give you a good idea of how large an area the Barataria and Terrebonne basins cover. Spanning over 4.1 million acres, the system is flanked by the Mississippi River on the east and the Atchafalaya basin on the west. It extends from the towns of Morganza in the north, to Grand Isle in the south.



## Land Use in the BTES

Classification	Acres	% of Total
Urban	111,818	2.69
Extractive	8,673	0.21
Agricultural	501,951	12.07
Forest Land	287,314	6.91
Water	1,186,224	28.52
Wetland	2,054,786	49.41
Barren Land	8,173	0.20
Total	4,158,939	100.00

Source: LDEQ, 1993.

For the most part, elevations throughout the system are at or just a few feet above sea level and are generally categorized as "wetlands." Only in the very northern portion of Barataria Terrebonne do land elevations on natural ridges reach up to 30 feet. Throughout much of the system, however, levees are the most prominent land feature.

More than three-quarters of the Barataria-Terrebonne area, or 3.2 million acres, is classified as open water or wetlands, leaving approximately one million acres for urban and agricultural uses. The southern half of the sys-

tem contains estuaries which exchange water with the Gulf of Mexico, while the northern end contains freshwater wetlands and backswamps. The northern end is also referred to as the "upper watershed" because it collects the rainwater and feeds the bayous that drain into the estuarine system. While references throughout this report may refer to "Barataria-Terrebonne", "the system", "the basins" or the "estuary," they naturally refer to the entire drainage area of both basins shown on the map.

### *Estuary Benefits - Tangible and Intangible*

Of all the places on earth, none overflows with more life than an estuary. Defined as a coastal area where salt water from the ocean mixes with fresh waters from rivers, rainfall and upland runoff an estuary is made up of many types of habitats. This is nowhere more true than in the Barataria and Terrebonne basins where one can find bottomland hardwoods, barrier islands, salt marshes, and freshwater marshes, among other habitats. With each habitat comes an assortment of wildlife and plant life that are in delicate balance with their environment.

In some cases, animal life may move from one habitat to another during its life-cycle, while others may spend their entire life in a single habitat. What is clear is that each habitat plays a critical role in maintaining the abundance of fish, shellfish, birds and other animals found throughout Barataria-Terrebonne and, indeed, throughout the nation. For example, studies indicate that about 95 percent of the finfish and shellfish harvested in the coastal areas of Louisiana were dependent on the estuarine habitats of the Barataria-Terrebonne system.



One of the nation's most important fishing grounds extends through Louisiana, Texas, Mississippi, and Alabama. Most species of aquatic life found in these grounds were born and raised in the Barataria Terrebonne system. Shrimp, oysters, blue crab, and more than 60 species of fish live in the estuary. Overall, these wetlands support almost one-fifth of the estuarine-dependent fisheries of the United States.

Agriculture also plays an important economic role in the estuary. Sugarcane remains a dominant crop, with over 200,000 acres in cultivation within the basins, which will account for approximately \$200 million in sales in 1995. In 1993, feed grains were planted on 32,000 acres in the estuary with a gross farm value of \$75 million. Commercial vegetable production by farmers is also worth noting. In 1993, 80 farmers in Terrebonne Parish produced over one-half million dollars worth of vegetables, while 60 farmers in Lafourche Parish produced \$1.2 million.



Minerals in the estuary include crude oil, natural gas, sulphur, and salts. Besides the jobs created by these industries and the sale of products, these resources produce severance taxes and royalties which are paid to the state. In 1992, such royalties amounted to over \$379 million.

The Houma Navigation Canal, Barataria Bay Waterway, Mississippi River, Empire Canal, Gulf Intracoastal Waterway, and the Bayous Chene, Boeuf and Black Project are all integral parts of the nation's shipping system. In addition, the ports of Baton Rouge, South Louisiana, and New Orleans are among the ten highest volume ports in America. Together, they make up one of the world's largest international port systems. The Port of South Louisiana alone, which encompasses St. James, St. John, and St. Charles Parishes, led the nation in 1992 with 90 million tons of cargo.

Benefits of the estuary also come in less tangible forms, although no less important. Studies have concluded that every mile of the estuary's vegetated wetlands can reduce up to seven inches of storm flood water by holding large amounts of water that would otherwise move inland to populated areas. In 1985, estimates placed the value of wetlands along the coast of Terrebonne Parish between \$1,064 and \$1,712 per acre, just in terms of the hurricane protection benefits that they offer.

The wetlands of an estuary also act as giant filters, screening out and capturing harmful pollutants thereby limiting their widespread distribution. After the substances have been trapped in the marshlands, micro organisms begin the task of breaking some of the pollutants down into more basic elements, reducing the



harm to plants, animals and humans. It is estimated that replacing 30 million acres of wetlands with equivalent water pollution control devices would cost a minimum of \$100 billion.

Sightseeing, offshore fishing, and picnicking on Fourchon or Grand Isle beaches are just a few of the recreational opportunities that the estuary offers. Such excursions bring substantial economic benefits.

One study estimates that 180,000 licensed saltwater sports fishermen in Louisiana spend \$181 million on fishing and have nearly \$1 billion invested in boats, gear, camps, and other equipment.

The Barataria-Terrebonne swamps and marshes contain nine of Louisiana's scenic streams and are among the top three areas in the United States for bird watching. Swamp tours and bed and breakfasts are also expanding industries that provide visitors with an introduction to the region's natural beauty and local residents with opportunities to capitalize on the natural and cultural resources of the area.

### ***Our Challenge***

The wildlife and habitats in the estuary are being threatened. Artificial levees along the Mississippi River, which were constructed for flood protection, prevent needed sediment from reaching and replenishing the estuary marshes. Along with the natural process of marshes sinking and sea level rise, land is slowly converting to open water, creating a domino effect where adjacent habitats are being negatively affected. Discharges from septic tanks and leaking sewer lines are contaminating oysters, making them unfit for human consumption. High fecal coliform levels caused by this human waste is thus forcing periodic closures of oyster fishing grounds

<b>Historic Wetland Loss in the BTES (in acres)</b>			
<b>Years</b>	<b>BTES</b>	<b>Barataria Basin</b>	<b>Terrebonne Basin</b>
1932-1958	85,208	52,020	33,188
1958-1974	183,763	85,830	98,383
1974-1983	108,435	63,910	44,525
1983-1990	69,565	43,860	25,705
<b>Total Wetland Loss</b>	<b>446,971</b>	<b>245,170</b>	<b>201,801</b>

Source: CWPPRA Report, 1993.

which are often recreational areas where families in the Barataria and Terrebonne basins have traditionally fished and swam. Non-point source runoff containing fertilizers causes excessive algal growth, depletes oxygen in the water, and ultimately can result in fish kills. Toxic substances from urban runoff and industrial emissions are magnified as they progress through the food chain, making consumption by people dangerous and in some cases, fatal.

Without intervention, the problems will only worsen with time. The challenge, therefore, is to develop plans which will benefit the people and the resources of Barataria-Terrebonne. At the same time, our recommendations must acknowledge everyone's right to a productive existence, the right to earn a living, the right to conduct business with minimal interference, the right to live in a pollution-free environment, the right to access and enjoy recreational activities unique to the basins, and the right to an improving quality of life.

Ultimately, a plan for a "sustainable environment" in Barataria-Terrebonne must be created: one in which renewable resources are maintained, the health of estuary residents is protected, and continued economic growth is ensured.

### ***The Comprehensive Conservation and Management Plan***

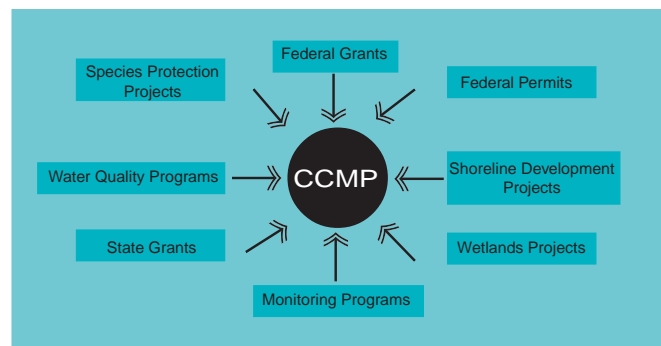
The Estuary Compact is one of four reports which make up *The Comprehensive Conservation and Management Plan (CCMP)* for the Barataria and Terrebonne basins. The CCMP is our plan for facing the challenges head on, promoting practices that will result in a truly sustainable future.

But successfully reaching this goal will require new modes of operation, novel ways of thinking, and active public and private partnerships grounded in trust. Plans developed by the Management Conference over the last five years strive to create just that. The CCMP thus introduces concepts which will move beyond traditional engineering approaches to the problems encountered in the estuary. Accordingly, recommended plans deal not only with the technical aspects of the problems evident in the basins, but also consider the economic and cultural impacts.

The CCMP will serve yet another critical function: to help ensure a high level of coordination among agencies engaged in activities that impact the Barataria-Terrebonne resources. It will thus

help guarantee that projects support each other and have as their basis BTNEP goals and objectives. It should be noted, however, that the CCMP is an advisory document only, one which is meant to serve as guidance for the preservation and restoration efforts throughout the Barataria-Terrebonne estuary over the next 25 years. Acceptance of the

CCMP and the Action Plans contained in it by any agencies or other entities that constitute the BTNEP Management Conference does not commit any agency or entity to implement the CCMP or any of its action plans.



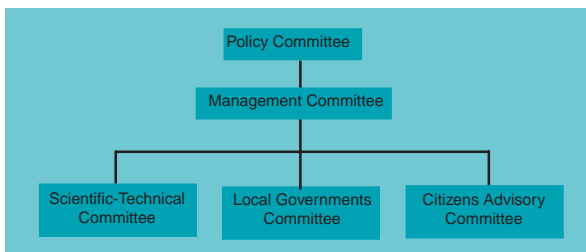
In the past, diversions, drainage, and other coastal restoration or marsh management projects in the estuary might have been the result of separate plans by different government agencies. Plans outlined in the CCMP serve to establish mech-

anisms to support, focus and coordinate projects recommended under the Louisiana Coastal Wetlands Restoration Plan and the Coastal Wetlands Conservation and Restoration Plan as well as others being undertaken by the U.S. Army Corps of Engineers, U.S. Natural Resource Conservation Service, and Louisiana Department of Natural Resources, among others. It is important to note that the CCMP is thus not another level of regulation, but a process which will function to make existing programs, policies, and regulations run better, thereby saving limited financial resources. It will also guarantee that an estuary wide perspective is engaged when selecting and prioritizing engineering and construction projects for the Barataria-Terrebonne system.

Members of both state and federal agencies such as the Louisiana Department of Environmental Quality the U.S. Fish and Wildlife Service, the U.S. Natural Resource Conservation Service, the Louisiana Department of Natural Resources, the U.S. Environmental Protection Agency, the Louisiana Department of Wildlife and Fisheries, and the U.S. Army Corps of Engineers, have been members of the Management Conference from the very beginning of the program. They have, in tandem with residents and interest groups, participated in determining the vision for the estuary and for developing plans as well. They have each weighed the benefits of plans contained in the CCMP, their potential impact on agency operations, and the merits of committing agency funds to the implementation of the plans contained in the CCMP. Several agencies have already indicated their willingness to incorporate appropriate CCMP plans into their normal operations, seeing the CCMP as an important vehicle for successful restoration and preservation of the basins.

***The Program's Strength: Its Organization and Volunteers***

Over the last five years, literally hundreds of individuals have helped in creating the program that exists today. Volunteers, some representing the agricultural interests in the north, some representing fisheries in the south, and citizens from across both basins have dedicated their valuable time to this critical effort. The



reason for their devotion to the program is clear: they too recognize the problems throughout the estuary. Every day they come face-to-face with the detrimental effects of pollution and the difficulties in working with confusing government regulations as they try to make a living.

Volunteers from business and industry have also committed to arresting the trends that are threatening the estuary, for they recognize that a healthy environment yields increased profits. Joining in the program are a number of state and federal agencies as well, all of whom are dedicated to working together with other program participants.

While there are numerous sub-committees and alliances that are key to plan development, there are five committees that have been the heart of BTNEP. Each has distinct responsibilities relative to project administration or plan formulation.

The "Policy Committee" directs all Management Conference activities which entails setting program goals and activities. It also establishes priorities and direction for the Barataria-Terrebonne program. Committee members include government officials who are in a position to ensure the resources and funding needed to support BTNEP.

The "Management Committee" communicates and collaborates among its members to build consensus for recommended actions and is responsible for day-to-day decisions and activities. Advised by staff, work groups, and other committees, the Management Committee produces scientific reports, develops management strategies, and designs the master plan, the "*Comprehensive Conservation and Management Plan (CCMP)*." One of the primary roles of the Management Committee is to approve resource and funding allocations.

The "Scientific and Technical Committee" provides direction from a scientific perspective, identifying and defining the estuary's environmental problems. It also recommends technical studies, investigations, and sampling and monitoring programs that are necessary to determine the causes of environmental problems. The committee also conducts peer reviews of studies, reports on the status and trends in the estuary and alerts the Management Committee to emerging environmental problems.

The "Citizens Advisory Committee" guarantees representation of the public voice during all program phases. Its primary role is to help the Management Committee and staff include the public in the decision-making process and integrate public opinion and expertise into each program phase. To that end, the committee recommends the most effective ways to inform the public and encourage its participation. It also identifies key people and organizations that can help bring basin-related issues to the public's attention and build support for program activities.

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## BTNEP Participants

Members of the committees and working groups involved in BTNEP come from all walks of life. The following is a partial listing of those who are currently working to make the CCMP an implementable plan.

Louisiana Cooperative Extension Service, Louisiana Wildlife Federation, Louisiana Mid-Continent Oil and Gas Association, Texaco Exploration and Production Inc., Jefferson Parish League of Women Voters, Louisiana Mariculture, Inc., Coalition to Restore Coastal Louisiana, Terrebonne Parish, Orleans Audubon Society, Terrebonne Fishermen Organization, Louisiana Farm Bureau Federation, Inc., Louisiana Nature Conservancy, Gulf Intra-coastal Canal Association, Terrebonne Port Commission, Greater Lafourche Parish Port Commission, Sierra Club, Southeastern State University, Nicholls State University, Louisiana Fishermen for Fair Laws, Louisiana Forestry Association, United Houma Nation, Inc., Houma Indian Tribal Council, Louisiana Cattle-men's Association, Louisiana Association of Coastal Anglers, Terrebonne Cooperative Extension Service, Lafourche Parish Coastal Zone Management, St. Charles Parish - Coastal Zone Administrator, Assumption Parish Police Jury, Louisiana Association of Levee Boards, South Central Planning and Development Commission, St. Mary Parish - Chief Administrative Officer, Director of Economic Development - St. John the Baptist Parish, Terrebonne Parish - Public Works Director, Louisiana Association of Conservation Districts, Parish President - Plaquemines Parish, Orleans Parish - Office of Environmental Affairs, U.S. Fish and Wildlife Service, Natural Resources Conservation Service, U.S. Geological Survey, U.S. Coast Guard, Louisiana Department of Natural Resources, Governor's Office of Coastal Activities, Louisiana Department of Environmental Quality, Louisiana Department of Health and Hospitals, U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration, U.S. Army Corps of Engineers, Louisiana Department of Agriculture, Louisiana Department of Wildlife and Fisheries, Louisiana Independent Oil and Gas Association, American Sugar Cane League, Louisiana Seafood Management Council, Offshore Marine Service Association, Chamber of Commerce - New Orleans and the River Region, Bayou Lafourche Freshwater District, Louisiana State University - Coastal Ecology Institute, LSU Agricultural Center, Louisiana Department of Culture, Recreation and Tourism, National Park Service, Louisiana Universities Marine Consortium and private citizens too numerous to mention.

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The 'Local Governments Committee' ensures that local governments and various agencies in the Barataria Terrebonne region are part of the decision-making process. The committee provides practical advice on sewage treatment, development issues, zoning ordinances, health concerns, and other local planning needs, issues, and existing projects.

During 1994, four additional special working groups were created: the Ecological Management Alliance, the Coordinated Planning Alliance, the Sustained Recognition and Citizen Involvement Alliance, and the Planned, Balanced Economic Growth Alliance. Each of the groups were tasked with developing action plans that related to their area of expertise. One of the key reasons for the success of these groups has been the ongoing effort to seek new members who possess expertise in the specific fields of interest and in ensuring representation by stakeholders.

### ***Early Accomplishments of the Program***

Early on in the Barataria-Terrebonne National Estuary Program, the Management Conference began identifying gaps in scientific data that would be needed for a complete picture of the state of the estuary. Scientists from throughout the state then assembled to participate in projects that would focus on the priority problems of the Barataria-Terrebonne estuary system.

Research and demonstration projects were undertaken with each effort designed to provide data critical to a thorough understanding of the estuary ecosystem. With the completion of these activities has come the most detailed, integrated description of the flow of water through the estuary, biological communities, and water quality ever presented for this region.



In many cases, intense studies of specific areas were initiated. For example, to understand the location shifts of oyster beds, scientists at Nicholls State University conducted a study to locate and map oyster growing areas and rank the productivity of existing and potential oyster grounds. In another study in an attempt to measure the impact of non-native species on estuary habitat, the Louisiana Department of Wildlife and Fisheries embarked on a study of overgrazing by nutria. To determine the impact of non-point source pollution on the estuary, storm drain pump stations throughout the estuary were located, mapped, and evaluated by researchers from the University of Southwestern Louisiana.

In order to showcase and study innovative techniques, technologies, or management approaches, BTNEP sponsored numerous 'Action Plan Demonstration Projects. The projects were scaled-down versions of potential CCMP action plans. The purpose of these projects was to test the cost effectiveness of solutions to priority problems prior to their large scale implementation.

In 1993, a project to reduce the amount of soil and fertilizer washed from sugar cane fields was initiated. The project involved coordinated efforts with local farmers, the Lower Delta Soil and Water Conservation District, and the U.S. Natural Resource Conservation Service. Yet another project involved conversion of abandoned, dead-end canals to floating marshlands through the placement of recycled Christmas trees and the cultivation of aquatic vegetation. The success of the Christmas tree project can be traced to the hundreds of volunteers who helped bundle trees and place them in specially designed retaining structures in the marshes. One project looked at methods to treat protein-rich effluents from shrimp-processing plants. Goals were to find ways to lessen the impact of the effluents which reduce oxygen levels in water.

One of the most important series of studies conducted, called "Status and Trends", investigates in detail how the estuary has changed over time. The four reports also provide a complete description of the current state of the estuary and identify problems that the estuary will face in the future, with and without intervention. The studies were coordinated by the LSU Center for Coastal Energy and Environmental Resources and completed by scientists, planners, engineers and others from the Louisiana Universities Marine Consortium, Louisiana State University, Nicholls State University, the University of Southwestern Louisiana, the National Biological Service, and Societal and Institutional Interactions, Inc.



*Christmas trees in cribs*

The four reports: 1) *Status and Trends of Hydrologic Modification, Reduction in Sediment Availability, and Habitat Loss/Modification in the Barataria-Terrebonne Estuarine System*; 2) *Status and Trends of Eutrophication, Pathogen Contamination, and Toxic Substances in the Barataria-Terrebonne Estuarine System*; 3) *Status, Trends, and Probable Causes of Change in Living Resources in the Barataria-Terrebonne Estuarine System*; and 4) *Status and Trends of Land Use and Socio-Economics in the Barataria-Terrebonne Estuarine System*, provide the scientific basis for problems evident in the basins. More importantly they recommend programs needed to halt destructive trends that are impacting habitats and wildlife.

The primary findings of the Status and Trends reports, as well as recommendations, are summarized in a user-friendly report called *Saving Our Good Earth: A Call to Action, Barataria-Terrebonne National Estuary Program Characterization Report*. If you would like to obtain a free copy, contact BTNEP at the address on the inside front cover.

# the state of the estuary

Management Conference members have identified seven priority problems in the estuary that are contributing to the decline in certain animal populations, contamination of both fish and shellfish, land loss, habitat modification, and contamination of sediment in the marshes. Each of the priority problems, in some way, impacts the next, making the resolution of each of the problems that much more pressing and complex.

Today, approximately 602,000 people, or 14 percent of the state's total population, call Barataria Terrebonne home. Forecasts indicate that by the year 2000 the number of residents in the parishes that cut across the basins will increase by over 12 percent. As more people crowd into urban areas, demand for land, water, and other natural resources will naturally increase. With that increase will come additional demands for drinking water, sewer services, flood protection, and forced drainage. Infrastructure (roads, bridges, etc.) to support the growth will begin to encroach on already scarce developable land. As this urbanization occurs, urban runoff will accelerate, dumping pollutants into surrounding water systems. Additionally sensitive habitats will see greater use as people boat, hunt, fish, and enjoy the out-of-doors.

In general, the overall health of the Barataria and Terrebonne basins show signs of years of abuse and neglect. The following discussion provides a snapshot of the problems that must be overcome to prevent further degradation of the habitats, ecosystems, and cultural heritage that are so unique to the system.

## ***Hydrologic Modification***

Hydrologic modification is considered the "linchpin" problem of the basins, indicating that all other problems revolve around, and are often affected by it. When we build levees, dredge canals, or cut through natural ridges, the natural flow of water is changed. In some cases, such changes accelerate erosion. In other cases, it can result in changed salin-

## **Hydrologic Modification**

### **Probable Causes**

- Diking and leveeing of wetlands.
- Maintenance dredging; spoil banks.
- Excavation of channels and canals for navigation and/or oil, gas and mineral exploitation; particularly those excavations deeper than surrounding waters.
- Diversion of freshwater flows and sediment loads for navigation, flood control or water supply purposes.

### **Probable Impacts**

- Reduced sediment flows.
- Habitat loss/modification.
- Changes in living resources.
- Eutrophication.
- Pathogen contamination.
- Toxic substances.

ity of water bodies. As a result, fresh marsh can be changed to a more “salt tolerant” type. In more extreme cases, marsh can be converted to open water.

Because of flood protection measures instituted by Congress following the 1927 flood, in conjunction with those of private landowners and the State of Louisiana prior to the flood, artificial levees now line much of the Mississippi River. The levees coincidentally prevent sediment and water from being dispersed into the surrounding wetlands through periodic flooding and levee breaks. Concrete mattresses placed along the channel bank have prevented the natural tendency of the river to change course. In fact, the length of the river has been shortened by approximately 150 miles by cutoffs in the central portion of the lower Mississippi River. Both shortening of the river and placement of concrete mats on the banks have reduced the river area exposed to erosion. In the past, soil from the river’s edges was the primary source of sediment that fed the marshes.



*Levees line the Mississippi River*



Aerial views of the estuary also reveal another type of hydrologic modification: canals for navigation and oil and gas exploration and production. When canals are constructed, the excavated material is placed alongside the canal, creating banks. The impact of this type of activity can be threefold. First, the canal itself creates paths for waters of higher salinity to mix, forcing animals to either adapt or relocate. Native plants have little choice but to either adapt to their new environment or die.

Second, erosion can occur along the canal banks with the passing of each vessel, converting more land to open water. Third, the dredged material alters the natural flow of water across the estuary landscape, sometimes creating lakes and in other cases, depriving large areas of water, nutrients, and sediments.

Impacts of canals are not, however, all necessarily negative. Canal banks do provide some diversity of habitat, especially in intercoastal areas. Canals provide significant recreational opportunities and aquatic production potential as well.

### ***Sediment Reduction***

Yet another critical problem is sediment reduction. Louisiana marshes need a source of sediment to survive. Historically, the Mississippi River provided the sediment. Now, however, levees confine the sediment to the river thus bypassing the marshes, ultimately depositing it on the continental shelf in the Gulf. Our coastal

## Reduced Sediment Flows

### Probable Causes

- Navigation and oil/gas extraction canals.
- Levees.
- Diking and leveeing of wetlands.
- Spoil banks from dredging activities.
- Upstream diversions of the Mississippi River into other basins. Less water and sediments available for the estuarine complex.
- Locks and dams on the Missouri, Ohio and upper Mississippi rivers.

### Probable Impacts

- Sedimentation rate becomes less than the rate of apparent water level rise (subsidence and sea level rise).
- Submergence and mortality of wetlands vegetation.
- Internal fragmentation of wetlands.
- Lowered productivity of wetlands vegetation.

marshes constantly undergo a natural process called "subsidence" which results in the land slowly sinking. In the past, the rate of sediment building equalled or surpassed the rate of sinking and the level of the marsh remained above the level of the sea.

Today, the river carries up to 80 percent less sediment than it did a century ago. Dams, reduction in land clearing and tilling, and implementation of conservation measures that reduce erosion upriver are the major causes of the reduction. Thus, even if all of the levees along the Mississippi River were removed today, the marshes would still receive significantly less sediment than they did in the 1800s.

Still, some sediment does move into coastal marshes during hurricanes and winter cold fronts when winds stir mud on the bottom of shallow bays. The volume of this sediment however, is usually inadequate to counter the effects of subsidence. The existence of levees, canal banks, roadbeds, railroad embankments and changes upriver all contribute to the problem of inadequate sediment distribution in our coastal marshes.

### *Habitat Loss*

What is known about the rate of habitat conversion, and ultimately land loss in the coastal areas of the Barataria Terrebonne basins, is that it is alarmingly high. Studies through 1978 showed that over 11,500 acres of land a year were being lost as it slowly converted to open water due to subsidence or other factors. The rate in 1990 was estimated at almost 13,500 acres per year. Scientists have calculated that over 294,000 acres of marsh converted to open water between 1956 and 1978.

The rate of land loss currently shows a decline. With over 33 percent of the coastal area of the state, the Barataria and Terrebonne basins are experiencing between 50 and 61 percent of the land loss for the entire state. At the current rate, it is predicted that residents of coastal communities throughout Louisiana will be forced to move within the next 15 years as land under their homes is replaced by water. Conservative estimates are that an additional 163,000 acres of land will be lost by the year 2010.

## Habitat Loss/Modification

### Probable Causes

- Hydrologic modification and wetland subsidence; salt water intrusion.
- Spoil banks and diking/leveeing of wetlands; isolation, submergence and mortality of wetlands; wetland erosion and internal fragmentation.
- Shoreline erosion by commercial and recreational boat wakes.
- Filling of wetlands for agriculture and other development.

### Probable Impacts

- Decreases in sport and commercial fish and shellfish populations.
- Changes in furbearing and waterfowl populations with sport and commercial value.
- Reduced recreation and commercial value of wetlands and estuaries.
- Decreased acreage available to treat pollution inputs; increased levels of eutrophication, pathogen contamination and toxic substances.
- Decreased capacity to buffer storm energy.
- Decreased habitat for neotropical migratory birds and other species such as the black bear.

Land loss is not evenly distributed across Barataria-Terrebonne. Hot spots of land loss can be seen at the southernmost tip of the basins near the mouth of the Mississippi River in the Barataria basin, moving northward in a narrow band following the river and extending westward to Bayou Perot and Rigolettes. A second hot spot occurs along western Barataria Bay to the Gulf. In Terrebonne, the area of greatest marsh loss occurs in the marshes north of Terrebonne Bay, extending south along the western edge of Terrebonne Bay.



Habitat loss can occur due to many activities. As noted earlier, sediment loss, in conjunction with the natural sinking of marsh, is by far the most significant problem in the estuary. Sea level rise and erosion also contribute to the problem as can human activities such as canal dredging and construction of navigation channels. Additionally, overgrazing by mammals, such as nutria, destroys plant communities that hold soil in place. Studies have indicated that hurricane damage is increased in marshes that have been heavily grazed by nutria.

Storm surges and winds associated with severe tropical storms and winter fronts are additional natural forces that account for significant habitat alteration and



land loss in the estuary. During storms or periods of floods, habitats are subjected to changes in water chemistry and extended periods in which they are totally submerged. When a wetland plant experiences sustained and deep flooding, growth suffers. If the flooding stress is sufficient, the plant dies. In the case of saltwater intrusion from the Gulf, some plant species have adapted and exclude salt from their tissues, but their tolerance of salt varies widely. Most fresh marsh

species, however, are unable to survive exposure to high salinity waters. When fresh marsh plants die quickly from salt water exposure, their roots can no longer hold the soil, and massive soil loss can occur before the area can be colonized by salt tolerant plants.

### ***Eutrophication***

When too many nutrients, such as phosphorus and nitrogen, are in the water, a condition known as eutrophication occurs. The process begins with an accelerated growth of algae with the end result being that oxygen in the water is depleted as plant matter decays, killing fish and shellfish. Sources of excess nutrients

## Eutrophication

### Probable Causes

- Sewage treatment plants.
- Septic tanks.
- Urban runoff.
- Agricultural runoff.
- Mississippi River diversions.
- Channelization of runoff directly into the estuary.
- Channel dredging/loss of wetlands; reduced capacity of the estuary to filter out nutrients.

### Probable Impacts

- Algal blooms; floating masses of algae; noxious odors.
- Reduced recreational value of beaches and waterbodies.
- Anoxic conditions; fishkills.
- Changes in species composition and population.
- Decreases in wildlife populations with sport and commercial value.
- Reduced recreational and commercial value of wetlands and the estuaries.

include urban and agricultural runoff, often called “non-point source” pollution. Nutrient levels have remained constant over the last 15 year period, while other indicators of eutrophication have increased. Chlorophyll levels, which indicate how much algae is growing, are high in the northern part of the Barataria basin and have increased substantially in past decades. Similar increases were observed in Terrebonne and Barataria Bays.

Beyond the algal blooms, eutrophic waters are characterized by a dominance of fish like gar and shad and have a potential for noxious and toxic phytoplankton blooms. At present, toxic and noxious phytoplankton have been observed in Bayou Little Calliou, in the Terrebonne Bay estuary and in Fourleague Bay. To date, these tiny plants have not caused harm to hu-

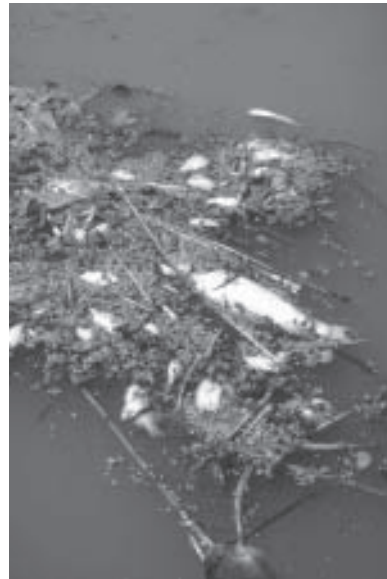
man health, but they have discolored the water and caused some fish kills.

Since 1980 there have been 188 reported fish kills in the estuary due to the presence of nutrients, toxics, and other contaminants. In September of 1994, an algal bloom resulted in a fish kill of almost 200,000 fish.

### Pathogens

Pathogens are disease-producing organisms such as bacteria and viruses. The sources of these organisms are human waste, pasture runoff, and waste products of marsh animals such as nutria and birds. Physical contact with natural marine pathogens while swimming or eating raw seafood can harm people who are predisposed to liver, blood, stomach, or immune system problems. Eating shellfish contaminated by human fecal pathogens can also cause illness such as gastroenteritis, salmonellosis, and hepatitis A, and, in more severe cases, could cause death for people suffering from certain immune system disorders.

To reduce the risk of illness associated with consumption of shellfish contaminated by pathogens, state agencies have been forced to close oyster beds where tests have indicated high fecal coliform levels in the water. The 1994 LDEQ Water Quality Inventory shows that fecal coliform is at least a suspected or potential problem in 33 out of 55 assessed waterbodies in the Terrebonne basin and in 18 out of 27 in the Barataria basin.



In spite of the development of plans for a parish-wide sewage treatment system in Terrebonne Parish and regional efforts to prevent direct dumping of sewage at camps, fecal coliform counts at four sites in the estuary have not declined in 15 years. It is known that 14 towns in Terrebonne Parish have septic tank problems that are contributing to this persistent problem.

Overall, there are no statistically significant trends of fecal coliform counts over the last 15 years in eight monitoring stations in Barataria-Terrebonne. Only one site in Plaquemine Parish shows a significant decrease in fecal coliform levels for the period 1980-1994.

## Pathogen Contamination

### Probable Causes

- Publicly owned treatment works. :
- Septic tanks.
- Hunting and fishing camps.
- Urban runoff.
- Agricultural runoff.
- Naturally occurring pathogens, particularly in warm water with high salinity.
- Illegal disposal of medical waste.

### Probable Impacts

- Food poisoning.
- Closure of oyster beds.
- Loss of revenue and employment.

## Toxic Substances

Water, animal tissue, and sediment testing have identified a variety of toxic substances in the basins. Some of the substances are known cancer-causing agents while others affect reproduction. When some animals consume contaminated food, the toxic concentration is magnified. Human consumption of highly contaminated seafood poses health risks. Toxics found throughout the system come from point sources, such as industry, and non-point sources, such as urban runoff.

Numerous potential sources of these toxicants exist within the basins: herbicides used in aquatic weed control; inputs from a variety of petrochemical and chemical industries along the Mississippi River; light industry and domestic inputs from population centers; storm and urban runoff; atmospheric deposition; recreational and commercial boats/ships; drilling fluids and produced waters from oil and gas production; runoff and leachate from hazardous waste sites; and pesticides and herbicides from agriculture. The greatest inputs of toxic substances into Barataria-Terrebonne are from discharges along the eastern margins of the basins because of heavy industries, large urban centers and agricultural areas along the river corridor.

The factors which determine a pollutant's risk to people and the ecosystem include toxicity.

## Toxic Substances

### Probable Causes

- Emission of toxic material from hazardous waste, recycling and disposal facilities.
- Drilling fluids and produced waters.
- Illegal dumping of toxic, industrial and commercial wastes.
- Agriculture runoff with pesticides and herbicides.
- Sewage plants.
- Aquatic weed control.
- Mississippi River diversions.
- Atmospheric deposition,
- Accidental spills.
- Leachates from hazardous waste in landfills and inactive hazardous waste dumps.
- Storm and urban runoff.
- Outfalls of industrial effluents containing heavy metals, PCBs and other toxins.
- PCBs from leakages of petrochemical pipelines and storage facilities.

### Probable Impacts

- Poisoning of wildlife and fish, and the reduction of reproduction.
- Decreases in wetland vegetation.
- Contamination of oyster beds.
- Decreases in submerged aquatic vegetation.
- Loss or reduction of commercial and sport fish and wildlife populations.
- Contaminations and closure of commercial and recreational fisheries.

concentration, bioavailability (the extent to which an organism can take up these pollutants), and persistence. Environmental contaminants may be very stable, toxic at low concentrations, and bioavailable. Moreover, several may have carcinogenic effects. These characteristics increase the likelihood of toxic effects in the environment itself, as well as effects on human health.



### ***Living Resources***

Approximately 735 species of birds, finfish, shellfish, reptiles, amphibians, and mammals spend all or part of their life cycle in the estuary. Several of the species

are either categorized as threatened or endangered. Many factors hold the potential for causing declines in animal populations. Changes in habitat is a significant factor for most of the living resources. Pollution can also have a negative impact on the health of species and their ability to reproduce. Additionally, over-harvesting by fishermen, hunters, and trappers can harm animal populations.

In spite of the threats that face animal species throughout the Barataria and Terrebonne basins, data indicates that most have not experienced continuous declines in population over the past thirty years. This is true for all estuarine dependent finfish and shellfish and for most of the wading birds and raptors. A significant number of species, such as the alligator, show an increasing trend that can be attributed to recovery from recent over harvesting. Birds, such as the American bald eagle and the brown pelican, also show signs of recovery fol-

lowing near extinction in this area due to reproductive failure caused by pesticides. Migratory waterfowl that winter in the region are also exhibiting increasing trends that track continental trends.

If you wish to obtain a fuller account of the state of the estuary, call the BTNEP office and request a free copy of *Saving Our Good Earth: A Call to Action Barataria-Terrebonne National Estuary Program Characterization Report* or one of the previously mentioned status and trends reports.



### **Changes in Living Resources**

#### **Probable Causes**

- Historic habitat loss/modification.
- Commercial fishing (overfishing).
- Historic wildlife hunting (overharvesting).
- Aquaculture.
- Water pollution (eutrophication, pathogens, toxins).
- Conflicts between recreational and commercial fisheries.
- Introduction of exotic species.

#### **Probable Impacts**

- Decreases in sport and commercial fish and shellfish populations.
- Decreases in furbearing and waterfowl populations of sport and commercial value.
- Decreased recreational and commercial value of wetlands and estuaries.
- Decreased populations or extinction of some native species.



# action plans

What follows is a series of plans developed by the Management Conference over a five-year period. While much effort was devoted to scientific endeavors to come to grips with the seven priority problems, an equal amount of time was spent grappling with issues of economics, planning, and citizen involvement. This active public participation and departure from a purely scientific approach is a distinguishing characteristic of the BTNEP CCMP.

One of the primary goals of the Barataria-Terrebonne National Estuary Program, as mandated by Section 320 of the Clean Water Act, is to:

“...develop a comprehensive conservation and management plan that recommends priority corrective actions and compliance schedules addressing point and non-point source pollution to restore and maintain the chemical, physical, and biological integrity of the [Barataria-Terrebonne] estuary, including restoration and maintenance of water quality, a balanced indigenous population of shellfish, fish and wildlife, and recreational activities in the estuary, and assure that the designated uses of the estuary are protected...”

In order to develop plans that were feasible and simultaneously met the needs of the community, special working groups called Alliances were created. Each alliance dealt with a particular topic such as economic development, citizen involvement, planning, or ecosystem management. As each idea surfaced, alliance members confirmed the need for the action and then set out to develop a plan that could be implemented under existing operational and budgetary constraints. The plan principles had to be approved not only by everyone on the alliance, but also by a majority of the Management Conference as well.

The recommended topics were then presented to local residents in a series of town meetings held by BTNEP staff. Comments from the residents helped refine both the objectives as well as the specific actions. Issues raised by residents resulted in the revision of several action plans dealing with oyster beds and backwater flooding and drainage.

From advancing the concepts of nature-based tourism, to transferring of environmentally-sensitive technology, to developing strategies on conflict management, to planning for kindergarten through-college education about the basins, the plans that follow strive to change the basic understanding of the importance of the estuary.

Some plans exceed 15 pages in length, so what is provided are only brief outlines of the plan objectives. If you would like to receive a free detailed version of any plan, note the reference number and plan name and contact the BTNEP office by calling or writing to the address below:

***The Barataria-Terrebonne National Estuary Program***

Nicholls State University Campus

P.O. Box 2663

Thibodaux, Louisiana 70310

985-447-0868

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985-447-0870 - fax

[www.btnep.org](http://www.btnep.org)

## I. COORDINATED PLANNING AND IMPLEMENTATION

### PROGRAM IMPLEMENTATION STRUCTURE

Once the CCMP is approved by the EPA and adopted by the State of Louisiana, a new organizational structure will begin the implementation of the program. Tasks will range from day-to-day activities, such as distributing information to the public to making policy decisions regarding the prioritization of major initiatives. The following action plans describe how these multiple tasks will be handled and how the other action plans will be completed.

#### PI-1 Barataria-Terrebonne Management Conference

The Management Conference will continue as a broadly based partnership which will direct CCMP implementation and revisions. The conference will consist of representatives of federal, state, and local governments, business and industry, environmental organizations, universities, and the general public. The diverse make-up of the conference will enable it to ensure the coordination and cooperation necessary for a balanced management of the estuaries.

#### PI-2 Establish Points of Contact for the State of Louisiana

The Governors Office will be designated as the point of contact for all policy-related issues and activities related to the implementation of the CCMP. This will include seeking funding and monitoring the activities of all involved State agencies. The Louisiana Department of Environmental Quality will also continue in its role as the responsible agency for fiscal and administrative support. Primarily, this includes the operation of the Program Office and the receipt of potential EPA grant funds.

#### PI-3 Barataria-Terrebonne Program Office

A Program Office will continue to provide administrative support to the Management Conference, day-to-day involvement in estuary activities, and a source of information to the public about the progress of CCMP implementation.

## COORDINATED PLANNING

The action plans in this section are the broadest in scope, as they are meant to ensure a coordinated, comprehensive planning effort that works towards establishing a balance among the various needs and interests that exist in the estuary. The plans are organized under Common Ground Solutions actions which encourage decisions to be balanced and inclusive of the various interests involved; *Intergovernmental Coordination* - actions which attempt to coordinate the various government agencies involved in managing Barataria-Terrebonne resources; and *Infective Regulations* - actions which will serve to make environmental regulations more effective and equitable.

### COMMON GROUND SOLUTIONS

#### CP-1 Common Ground Solutions and Decision-Making

Guidelines will be established and used to ensure balanced decision making, impartial conflict resolution, and consensus among the various stakeholder groups. These practices will be used by the Management Conference in its administration of CCMP implementation.



### INTERGOVERNMENTAL COORDINATION

#### CP-2 Wetlands Permitting Information Centers

Work is currently underway to establish localized permitting information centers throughout the estuary to provide information to applicants concerning the application process for federal and State wetland permits. The centers will simplify the current permitting process by making information sources and permitting materials more accessible to applicants and to the public.

**CP-3 Sustainable Development  
Training for Public Officials**

Materials will be created and training provided to inform local public officials - planners, commissioners, elected officials, etc. - about the concept of "environmental sustainability" and ways in which parishes and communities can develop planning policies which are sensitive to the fragile environmental conditions in the basins.

**EFFECTIVE REGULATIONS**

**CP-4 Public Involvement in the  
Development of State Rules,  
Regulations and Guidelines**

New ways for citizens, land owners, and estuary users to become involved in the development of the State's environmental regulatory policies will be explored and developed. The goal of this action is to ensure that regulations which are developed by the State are more responsive to local community needs through early notification of residents and solicitation of comments for consideration during regulation development.

**CP-5 Agency Performance Review of  
the Wetlands Permitting Process**

A mechanism will be established by which agencies can monitor and evaluate the effectiveness of the manner in which current wetland permitting regulations are implemented and administered. Key points of interest will be the relationships between different agencies, additional data requirements, and ways in which the process can be streamlined.



**II. ECOLOGICAL MANAGEMENT**

The Ecological Management Action Plans directly address the "Priority Problems" identified for the estuary. As such, they are considered by many as the most important elements of the CCMP. The plans are listed under the following headings: *Habitat Management* - actions which address the issues of water and sediment flows, habitat loss, and marsh protection; *Water Quality* - actions which identify water quality problems and protect water resources; *Living Resources* - actions which address the problems associated with the plant and animal life of the estuary; and *Accessible and Compatible Data Sets* - actions which address the need for a centralized, accessible body of scientific information about the estuary and its problems.

**HABITAT MANAGEMENT**

**EM-1 Hydrologic Restoration**

A comprehensive effort will be implemented to use both human-made and natural devices to recreate a more natural water and sediment flow pattern to and across basin wetlands. This plan will help to overcome the various hydrologic modifications (levees, navigational canals, etc.) which have disrupted the estuary's natural hydrology.

**EM-2 Freshwater and Sediment  
Diversions**

Freshwater and sediment resources from the Mississippi and Atchafalaya Rivers can be used to preserve and create marshes by providing nourishment, controlling salinity levels, and offsetting the impacts of land subsidence. This action will help to create an integrated set of projects that will augment the existing limited system of freshwater and sediment flows into the marshes.

**EM-3 Evaluate the Effectiveness of  
Reactivation of Bayou  
Lafourche as a Distributary  
Channel of the Mississippi  
River**

Bayou Lafourche, a major waterway which separates the Barataria and Terrebonne basins, will be evaluated as a potential distributary of Mississippi

River freshwater and sediment By diverting river water at Donaldsonville, Bayou Lafourche's historic role as a source of nourishment for coastal wetlands might be restored.

#### **EM-4 Beneficial Use of Dredged and Noil-Indigenous Material**

Dredged materials, either from periodic dredging of waterways or from other specially designated actions, and other non-native materials can be used to assist in the preservation and creation of important habitat. These materials, which would otherwise be discarded, can be used to preserve and create marshes, rebuild barrier islands, and fill unused canals.

#### **EM-5 Preservation and Restoration of Barrier Islands**

A coordinated and comprehensive approach to the protection of the basins barrier islands will be encouraged and supported. Protection and restoration of the islands will preserve valuable habitat for the estuary's diverse wildlife, conserve extensive natural and commercial resources, and possibly contribute to the protection of coastal marshes.

#### **EM-6 Shoreline Stabilization and Induced Deposition**

Artificial structures can be used to reinforce the existing shorelines of the estuary's waterways, prevent erosion, and prevent the conversion of land to open water. In addition, devices can be utilized to trap sediments or to cause an increased level of sediment deposits. The resulting buildup of sediments will assist in the preservation and creation of marsh habitat.

#### **EM-7 Marsh Management**

Control structures can be used to preserve marshes through the manipulation of water levels. The manipulation of water levels can help to adjust salinity levels, water flow rates, and sediment loads, creating favorable conditions for marsh development.

## **WATER QUALITY**

### **EM-8 Nutrient, Bacteria and Toxic Contaminant Load Evaluation**

A computerized tool will be developed for estimating and evaluating existing and potential nutrient loads in estuary waters, and to forecast the impacts of proposed projects on eutrophication and contamination levels in the estuary.

### **EM-9 Oil and Produced Water Spill Prevention and Early Detection**

A system will be created to encourage the prevention and early detection of oil and produced water spills in the estuary. The ultimate aim of this action is to reduce the number of spills as well as the size and impact of each spill.

### **EM-10 Reduction of Sewage Pollution**

Educational activities, incentive programs, inspection and enforcement

mechanisms, and capital improvements are proposed to reduce both accidental and intentional releases of sewage into the estuary.



### **EM-11 Reduction of Agricultural Pollution**

The use of Best Management Practices" will be suggested and encouraged as a means to reduce the amount of related pollution while simultaneously enhancing continued agricultural production. These practices will help to ensure that the estuary maintains an ecological balance of nutrients and is free of harmful amounts of toxic contaminants.

### **EM-12 Storm Water Management**

Alternative storm water management practices will be developed to reduce the negative impacts on water quality that current practices may produce. Demonstration projects will be developed to encourage storm water treatment and marsh

enhancement efforts, educational activities, and more efficient usage of existing systems.

#### **EM-13 Contaminated Sediments Data Base**

A GIS data base will be created to identify the locations of known and probable sediment contamination. This will be used as a resource to prevent the inadvertent redistribution of sediment-borne contaminants to unimpacted areas of the estuary.

#### **EM-14 Assessment of Toxic and Noxious Phytoplankton Blooms**

Methods will be developed to determine whether toxic and noxious phytoplankton in the estuary pose a threat to human health and the economic well-being of the shellfish and finfish industries. If such a threat is found, the groundwork for a monitoring program will also be developed.

### **LIVING RESOURCES**

#### **EM 15 Protection of Habitat for Migratory and Resident Birds**



A framework will be established that encourages landowners to manage their land in a way that maximizes its suitability as habitat for resident and migratory birds. This action will identify important habitat areas, work to preserve and restore them, and establish means by which landowners and government agencies can work together to maintain them.

#### **EM-16 Reduction of Impacts from Exotic Vegetation**

Policies for addressing the increase of non-native species in the basins will be developed and coordi-

nated. This could include the formulation of new standards, public education about the adverse impacts of specific species, the development of a State noxious plant list, and encouragement to use environmentally sensitive means to control the species.

#### **EM-17 Zebra Mussel Monitoring and Control**

A strategy will be developed to monitor and explore ways of reducing the adverse impacts which could be caused by an influx of potentially destructive zebra mussels into the lower Mississippi River.

### **ACCESSIBLE AND COMPATIBLE DATA SETS**

#### **EM-18 Centralized Data Sets**

The development of a Data Information Management System for Barataria-Terrebonne will continue to ensure data preservation and accessibility. The project was begun by The Barataria-Terrebonne National Estuary Program as a way to centralize a data directory of information pertinent to the basins and data that will be collected to monitor the success of implemented CCMP action plans. In addition, a mechanism will be developed to provide public access to the information contained within the program's Data Information Management System. This will enable the public to obtain accurate, up-to-date information about both basins and the success of the action plans.

## **III. SUSTAINED RECOGNITION AND CITIZEN INVOLVEMENT**

The actions included in this section do more than any other plans to increase public awareness of the estuary's importance and problems, and encourage residents, users, and decision-makers to become more involved in the promotion and protection of the estuary as a national treasure. The plans are categorized by *Citizen Involvement and Participation* - actions which encourage the involvement of the general public in the estuary's protection; *Public Information and Education* - actions which educate the public about estuary issues; and *K-16 Curriculum* - actions which develop and support an estuary-based educational program to be used in the state's school system from kindergarten through college.

## **CITIZEN INVOLVEMENT AND PARTICIPATION**

### **SR-1 Community Sectors and Leader Teams**

Community groups will be organized as a way of encouraging citizen involvement in the program. Within each group, community leaders will be recruited to represent the program, allowing the program to operate on a more local level. This structure will provide a convenient way for residents to remain actively involved in the implementation of the CCMP.

### **SR-2 Participatory Meetings and Forums**

A series of public meetings and events will be held throughout the basins to provide citizens with information about the program and, more importantly, to allow citizens the opportunity to address any specific issues of concern they may have. Citizen input will play an important role in this program.

### **SR-3 Citizen Involvement Programs and Activities**

A series of programs will be initiated to encourage the participation of the basins' residents in the conservation of estuary resources. Activities such as educational field trips, vegetation planting campaigns, clean-up efforts, school contests, and citizen awards programs will be included in this effort.

### **SR-4 Citizen Monitoring Program**

A system could be established whereby the residents of the estuary can help monitor estuary conditions and alert government agencies to potential problems.



### **SR-5 Cultural Heritage**

Activities will be supported which highlight the unique relationship between our natural heritage and our cultural heritage. These activities will emphasize the historical connection between the estuary and those who live there. They will highlight the importance of the regions cultural practices in protecting the estuary and its resources.

### **SR-6 Urban Green Spaces**

A program will be developed to encourage land-owners to dedicate land in urban areas, particularly along the banks of bayous and other water bodies, for open space habitat and recreational use. The programs will also prove to be effective in broadening citizen participation in environmental activities.

### **SR-7 Storm Drain Stenciling**

An estuary-wide storm drain stenciling program will be continued to help reduce the amount of pollutants which are dumped into the estuary. Volunteers will mark storm drains throughout the estuary to alert potential polluters that the drains empty into estuary waters.

## **PUBLIC INFORMATION AND EDUCATION**

### **SR-8 Legislative Education**

Methods will be developed to provide legislators and other decision-makers with accurate and up-to-date information about the importance of the basins and the problems which threaten them. This will elevate the level of knowledge about the issues and concerns affecting the estuary, and encourage decision-makers to promote the estuary as a national treasure.

### **SR-9 Media Support**

A relationship will be developed with the various media groups to use this forum as a way to educate the public about the importance of the basins and the problems which threaten them. The ultimate goal is for the media to provide frequent, accurate, and balanced coverage of the Barataria-Terrebonne estuary.



#### **SR-10 Speakers Bureau**

A bureau of committed and knowledgeable speakers will be assembled and made available for public speaking engagements to organizations throughout Barataria-Terrebonne and the State. This group of experts will spread the word about the estuary and serve to recruit organizational support for the program.

#### **SR-11 Written, Audio and Visual Materials**

A series of informational materials will be prepared to inform the public about the estuary's importance and those items which threaten its resources. The materials will come in many forms and will be targeted to many different audiences schools, tourists, residents, elected officials, the media, businesses, and many others.

#### **SR-12 Distribution of Informational Materials**

A comprehensive network will be established through which informational materials about the basins can be distributed. The key objective is to ensure that those groups who want or could benefit from such information have a ready means to obtain it.

#### **SR-13 1-800 Number**

A toll free number will be maintained by the Program Office in order to provide the public with an easy means of obtaining information, voicing concerns, or alerting the office to potential problems.

### **KINDERGARTEN THROUGH COLLEGE CURRICULUM**

#### **SR-14 Estuarine Curriculum and Development**

Classroom materials will be developed to educate students about the basins and the problems facing them, as well as the unique culture of the region. The materials and programs developed through this action will ultimately be integrated into the State curriculum framework.

#### **SR-15 Continuing and Informal Education Programs**

Educational programs will be developed and offered for those estuary residents who may or may not be a part of a formal educational program, yet are still interested in learning about the estuary. These programs will be available for people of all ages and backgrounds.

#### **SR-16 Financial Support for Educational Initiatives**

This action will help to identify and obtain the financial resources to support the development, distribution, and teaching of educational programs focused on the basins. This effort will go beyond traditional sources of funding to encourage a widespread support of environmental education.

#### **SR-17 Educational Resources Network**

A network of educators, scientists, planners, and others interested in the conservation of the estuary will be assembled to provide their expertise and resources in support of the various educational programs developed for the estuary. In addition to providing a broad base of support for the programs, this network will ensure that the programs are factually sound, far-reaching, and up to date.

### **IV. ECONOMIC GROWTH**

The Economic Growth action plans were developed to encourage the growth of businesses which are more sensitive to the fragile environment. Industries such as nature based tourism, which has a tremendous potential in the estuary will benefit from the resources of the estuary. These plans are

organized under *Economic Development* - actions which support additional development of businesses; *Technology Transfer* - actions which promote ecologically sensitive technology; and *Cooperative Incentives* actions which encourage environmentally compatible practices through incentives and education.

## **ECONOMIC DEVELOPMENT**

### **EG-1 Funding Sources for New Businesses**

Sources of funding will be identified which can be used to encourage the development of new ecologically-sensitive businesses in the basins. Government funding sources, as well as private sources, will enable new businesses to find seed money for start-up and operating costs.

### **EG-2 Nature-Based Tourism and Recreation**

A plan will be developed and implemented to explore ways in which the emerging nature-based tourism industry can be supported in the basins. This plan will coordinate activities and agencies, ensure that basic tourism needs are met, and promote improvements that will promote the growth of tourism-based industries.



Cindy Skopp

### **EG-3 Nutria Market Development**

The development of a private corporation will be encouraged as a way to promote the nutria market in the U.S. and abroad. A more profitable market for nutria fur and meat will help reduce the overpopulation of this species and will also help minimize the damage to wetland vegetation caused by nutria.

## **TECHNOLOGY TRANSFER**

### **EG-4 Technology Exposition**

An annual exposition will be held to showcase and promote ecologically-sensitive technology. Technological advances which could help protect and restore marshes, or which could help minimize destructive industrial practices, will be featured. Technology which is developed within the basins will also be featured.

### **EG-5 Export of Resources, Products and Technology**

The promotion of ecologically-sensitive technologies will be expanded beyond the exposition to outside markets. A network will be developed to promote estuary based products to markets across the country and throughout the world.

### **EG-6 New Technology Research and Development**

Support will be provided to efforts which focus on developing new technology to address the management needs of the estuary. Special emphasis will be placed on new technology which can be used to protect estuary resources and facilitate the implementation of CCMP actions. Support will include the sponsoring of research to identify new possibilities, as well as financial and institutional support for their production and distribution.

## **COOPERATIVE INCENTIVES**

### **EG-7 Cooperative Incentives**

A listing of currently available environmentally based incentive programs will be compiled and publicized to local businesses and landowners as a way to encourage them to operate in more ecologically sensitive ways. In addition, businesses and landowners will be surveyed to develop more effective and appropriate incentive programs.

### **EG-8 Education about Regulatory Intent**

Educational materials and programs will be created to better explain the purpose of environmental regulations which exist in the basins. The goal of this program is to use education as a way to increase understanding of the reasons for certain regulations and thereby minimize potential conflicts.

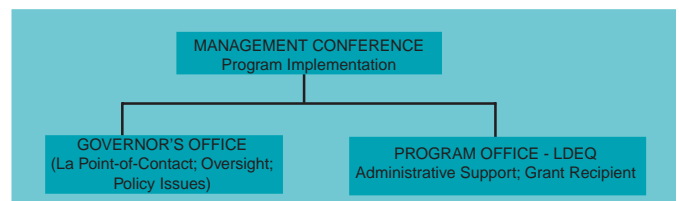
# implementing the plans

After the CCMP has the concurrence of the Governor of Louisiana and approval by the Administrator of the Environmental Protection Agency, implementation of the plans officially begins. After this approval process takes place, all local, State, and federal activities that are planned and carried out in the basins will be encouraged to recognize the goals of the various plans contained in the CCMP.

In reality however, implementation of several plans has already begun. As noted earlier, demonstration projects have been conducted to test the effectiveness of new technologies in habitat restoration and pollution reduction. A technology exposition is being planned to promote environmentally sensitive businesses and to bring new jobs to residents of the estuary. As an offshoot of BTNEP, interested citizens have formed a non-profit organization called the Barataria-Terrebonne Estuary Foundation which will act as an advocate of plans outlined in the CCMP and serve to educate the public about the value of the resources of the basins and the activities that threaten them.

One of the major factors that will determine how effectively the CCMP is implemented will be the management structure. Implementing the 51 plans listed here will require everyone's support. Some plans will have to be implemented by State and federal agencies. Some plans will require help from local governments. Yet others will necessitate the strong backing and volunteer efforts of residents of the basins. As a result, a unique organizational structure is required to ensure that all the plans are done, and done right.

When the program officially enters the implementation phase, it will be overseen by the Governor's Office. Specifically, this office will be responsible for the policy-related issues and activities related to the CCMP implementation, including securing funding and monitoring the activities of State agencies. In addition, the Louisiana Department of Environmental Quality will continue as the home of the Program Office and as the recipient of future grants from the EPA. These two offices will strive to promote active cooperation and coordination between those involved.



To a large degree, however, program management will be directed by the continuing existence of the Management Conference. It will consist of individuals representing the major stakeholders in the estuary as well as State and federal government agencies. The conference's primary responsibility will be to oversee implementation of the CCMP by coordinating and integrating the CCMP actions among agencies and stakeholders. Revising and updating the CCMP will also be the responsibility of this group.

As currently envisioned, the Management Conference will be supported by separate subcommittees, each with specific responsibilities. Although the final breakdown of subcommittees is not yet determined, it is likely that they will follow the existing Management Conference committee structure, or that of the four alliances. Such a structure will enable the Management Conference to provide more detailed oversight of the specific action plan categories which make up the CCMP. It is also likely that the members of the separate subcommittees and/or alliances will not be limited to Management Conference members. This will allow the existing broad base of inclusion to continue, and enable the Management Conference to take advantage of the input of experts, stakeholders and citizens who may not hold one of the limited Management Conference seats.

Funding for the implementation of the CCMP will be sought from a variety of sources. Initially, an application will be submitted to the EPA to provide resources to maintain a program office which will report both to the Governors Office and the Management Conference. As EPA grants require a 25 percent match, a request will simultaneously be made of the State of Louisiana to provide those financial resources.

Many action plan activities will be assumed by agencies and incorporated into their normal range of daily responsibilities. For example, projects involving economic development will be incorporated into work already being conducted by the Louisiana Department of Economic Development, construction projects will continue to be done by the U.S. Army Corps of Engineers and the Louisiana Department of Natural Resources, and marketing and promotion of the estuary will be done by the Louisiana Department of Culture, Recreation and Tourism. In other cases, action items contained in The Estuary Compact may not result in an increase in spending, but merely a reallocation of already existing resources. In cases where funding is not available, however, funds will be sought from the appropriate agency through existing grant programs or direct appropriations.

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Membership of the Management Conference is diverse and ensures that all public and private interests are represented. Following is the preliminary membership list.

Louisiana Department of Environmental Quality  
Louisiana Department of Natural Resources  
Louisiana Department of Economic Development  
Louisiana Department of Culture, Recreation and Tourism  
Louisiana Department of Transportation and Development  
Louisiana Department of Wildlife and Fisheries  
Louisiana Cooperative Extension Service  
Louisiana Department of Health and Hospitals  
Louisiana Department of Education  
Louisiana Department of Agriculture & Forestry  
U.S. National Park Service  
U.S. Department of Agriculture  
U.S. National Oceanic and Atmospheric Administration  
U.S. Environmental Protection Agency  
U.S. Army Corps of Engineers  
U.S. Fish and Wildlife Service  
U.S. Natural Resource Conservation Service  
U.S. Coast Guard National Marine Fisheries Service  
Barataria-Terrebonne Estuary Foundation  
Business and Industry  
Local Government  
Environmental Organizations  
Citizen Representatives  
Academia  
Landowners  
Agricultural Representatives  
Fisheries Representatives

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what you can do to help

In the final analysis, support by individuals such as yourself will determine how effective the CCMP will be. You can directly impact the level of activity that threatens the living resources, what priority our public agencies will place on the numerous plans, and what type of construction projects the State will undertake.

There are a variety of things that citizen stakeholders can do individually and collectively to make a marked difference:

- Write or call local, state, and federal officials and voice your support for the CCMP.
- Join organizations and participate in programs that work to save the estuary.
- Provide input to local, state, and federal legislation that will improve programs designed to preserve and restore the BTES.
- Report observed pollution violations to the appropriate agency for enforcement action.
- Minimize the use of pesticides, herbicides, insecticides, and fertilizers that may contribute to pollution in the basins.
- Don't litter.
- Properly dispose of toxic materials.
- Regularly inspect and repair septic systems to prevent contamination of waterbodies.
- Observe fish and shellfish harvest limits and practice catch-and-release.
- Contribute to measures that protect the basins either in the form of cash donations or in-kind services.
- Recycle all you can and reduce your amount of waste by reusing.
- Adopt an area within the Barataria and Terrebonne basins and help keep it clean and beautiful.
- When boating in the estuary, don't dump waste overboard.
- Learn how to compost your grass clippings and leaves instead of sending to landfills.
- Teach your children about the basins and their role in the ecosystem.
- Above all, you can educate yourself about the Barataria-Terrebonne estuary and its resources, and cherish it as the national treasure that it is.

# conclusion

The future of the Barataria and Terrebonne basins habitats and wildlife, the economic prosperity and quality of life and the cultural heritage of the region lie in the balance. Only with your support can the basins be secured for your children and their children. They deserve the chance to paddle down a pristine bayou, to see a pelican in flight, to picnic on beaches of a barrier island, to remain on land where their families have lived for generations, and to experience the many other gifts that the estuary has to offer. Don't let these gifts of nature become only a memory.

Join in the journey which supports programs that will preserve and protect Barataria-Terrebonne.

...and with your help

# ...and with your help



*the journey will continue...*

# glossary

*Action Plan* - A collection of agreed upon goals and objectives and list of specific strategies or actions including who will be responsible for implementing the action, what will the action accomplish, where will the action be implemented, and how long will the action take to complete.

*Action Plan Demonstration Projects* - Small-scale projects designed to address one of the major problems in the estuary. Successful projects will be considered for large-scale implementation.

*Aquatic* - Taking place in or on water.

*Barataria -Terrebonne (BT)* - An area covering 4.1 million acres, flanked by the Mississippi River and the Atchafalaya basin, and extending from Morganza in the north, to the Gulf of Mexico (See map on Page 9).

*Barataria-Terrebonne National Estuary Program (BTNEP)* - A five year program tasked with identifying the most prominent environmental problems in the Barataria and Terrebonne basins and, through public-private consensus, developing a set of implementable plans to address those problems.

*Comprehensive Conservation and Management Plan (CCMP)* - The integrated master set of individual action plans designed to remedy environmental problems throughout the Barataria and Terrebonne basins.

*Drainage Basin* - The land area drained by a river or stream and its tributaries.

*Ecosystem* - A community of living organisms interacting with one another and their physical environment, such as salt marsh, an embayment, or an estuary.

*Estuary* - A semi-enclosed coastal body of water where fresh water and saltwater mix.

*Fecal Coliform* - An indicator used to determine the amount of fecal matter in the environment. Such matter can be from humans or wild and domesticated animals.

*Habitat* - The specific area or environment in which a particular type of plant or animal lives. An organism's habitat must provide all the basic requirements for survival.

*Management Conference* - The collection of individuals responsible for developing action plans for the CCMP.

*Marsh* - A wetland where the dominant vegetation is non-woody plants such as grasses and sedges, as opposed to a swamp where the dominant vegetation is woody plants and trees.

*National Estuary Program* - A voluntary program administered by the U.S. Environmental Protection Agency to assist states in developing comprehensive plans for protecting and restoring the productivity of estuaries while supporting economic and recreational activities.

*Nonpoint-Source Pollution* - Pollution that comes from sources such as runoff from cities, rather than from a single specific outlet.

*Point Source Pollution* - Pollution originating at a particular place, such as a sewage treatment plant or manufacturing facility.

*Renewable Resources* - A resource that potentially can last forever without reducing the available supply because it is replenished by natural processes. A fish is a renewable resource, while natural gas is a non-renewable resource.

*Stakeholder* - All individuals living, working, or recreating in the target region.

*Sustainable Environment* - An ecosystem approach to management of the resources of the environment that ensures no degradation in environmental quality.

*Urban Runoff* - A general term for the water runoff of impervious surfaces, such as pavement in an urban area. While most of the water runoff is from rain, other sources are from uses such as washing cars and watering lawns.

*Watershed* - A region or area that ultimately drains to a body of water.

*Wetland* - An area that is regularly saturated by surface or groundwater and subsequently is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions.

**SELECT BTNEP PROJECTS,  
PROGRAMS, AND STUDIES**

1. Landscape Simulation Model Upgrading: Spatial-Ecological Modeling of the Wetlands of Barataria-Terrebonne (BT).
2. Hydrologic Model of the BT Estuary.
3. Soil Survey of Terrebonne Parish Marshlands.
4. Elevation Data Acquisition.
5. Fecal Coliform Monitoring, Identification, and Assessment within the BTE Complex.
6. Owners Guide to Wetland Care Manual for the BT Complex.
7. Mapping of Oyster Producing Areas Within the B and T Estuaries.
8. Storm Water Drainage Stations: Location, Mapping, and Recommendations for Evaluation.
9. A survey of Vegetative Damage Caused by Nutria Herbivory in the BT basin.
10. Analysis of the Chabreck/Linscombe Vegetation Data Collected in the BTE.
11. Distribution of Salinity, Nutrients, and Suspended Sediments in the Western Terrebonne Marshes Associated with Winter Low Pressure Frontal Passages.
12. Development of Migratory Bird Management Plan for the BTE of Louisiana.
13. Distribution and Classification of Floating Marshes in the BT Coastal Region of Louisiana.
14. Analysis of Freshwater Drinking Resources in the BT basins.
15. Status and Trends Report on Hydrologic Modification, Reduction in Sediment Availability, and Habitat Loss/Modification.
16. Status and Trends Report on Eutrophication, Pathogen Contamination, and Toxic Substances.
17. Status and Trends of Living Resources.
18. Status and Trends on Socio-Economic Factors and Land Use Survey.
19. Characterization Report.
20. Feasibility and Implementation of a Data and Information Management System.
21. Development of a Comprehensive Monitoring Strategy for BTNEP.
22. Funding Source Inventory.
23. Action Plan Costing.
24. Estuarine Use and Economic Value Assessment.
25. CCMP Funding Strategy.
26. Federal Consistency Report.
27. Oil Canal Conversion Action Plan Demonstration Project (APDP).
28. Sugarcane BMP APDP.
29. Seafood Processing Plant Wastewater Improvement APDP.
30. Small-Flow Wastewater Treatment Action Plan APDP.
31. Alternative Dredging and Spoil Disposal Techniques APDP.
32. BTE Data Directory.
33. Management Conference Workshops.
34. Inventory of Programs and Projects and Base Programs Analysis.
35. Public Attitudes/Perceptions Survey.
36. Public Participation Action Plan.
37. Historical, Cultural, Ecological Video Production.
38. Teacher Estuarine Workshops.
39. Program Information Packages.
40. Storm Drain Stenciling Projects.
41. Speakers Bureau.
42. Owners Guide to Wetland Care: A Manual for the BTE complex.
43. Art and Essay Contests.
44. Environmental Technology Expo.
45. Estuary Recreational Handbook.
46. Citizens Action Handbook.
47. Habitat Loss Poster and Thematic Mapper Posters for the BTE complex.
48. Priority Problems Posters.
49. Marsh Maneuvers Program.
50. Residential Sewage Treatment Video.
51. Public Awareness and Education Program.
52. New Bulletins.
53. Citizens Monitoring Pilot Project.
54. Volunteer Vegetative Plantings Project.
55. Wetlands Education Program.

*For additional information on any of these plans, projects, and reports please call or write:*

**The Barataria-Terrebonne National  
Estuary Program**

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[www.btnep.org](http://www.btnep.org)

Communication is the key to the CCMP's future success and contacting the BTNEP program office about the CCMP couldn't be easier. You can call the program's 1-800 number and speak to a staff member directly, use E-mail, or write to the address noted on these business and rolodex cards. You can also find information on BTNEP on the world-wide-web at <http://www.epa.gov/nep/gulf/bt/>.

Copy and keep the attached cards handy and stay in touch with BTNEP.

