

# COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

## TASK FORCE MEETING

May 28, 1992

### MINUTES

#### I. INTRODUCTION

Colonel Michael Diffley, representing the Secretary of the Army, convened the ~~fourth~~<sup>seventh</sup> meeting of the Louisiana Coastal Wetlands Conservation and Restoration Task Force at 9:45 a.m., May 28, 1992, in the District Assembly Room of the New Orleans District, U.S. Army Corps of Engineers. The Agenda is attached as Enclosure 1. The Task Force was created by the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) which was signed into law (PL 101-646, Title III) by President Bush on November 29, 1990.

#### II. ATTENDEES

The Attendance Records for the Task Force meeting are attached as Enclosure 2. Listed below are the six Task Force members. With the exception of Dr. Lewsey and Mr. Sewell, who were represented by Mr. Ric Ruebsamen and Mr. David Fruge respectively, all were in attendance.

Dr. Len Bahr, State of Louisiana  
Mr. Russell Rhoades, Environmental Protection Agency  
Mr. S. Scott Sewell, U.S. Department of the Interior  
Mr. Horace Austin, U.S. Department of Agriculture  
Dr. Clement Lewsey, U.S. Department of Commerce  
Col. Michael Diffley, U.S. Department of the Army, Chairman

#### III. APPROVAL OF MINUTES FROM PREVIOUS MEETING

The minutes from the ~~fourth~~<sup>sixth</sup> Task Force meeting, held on February 20, 1992, (Enclosure 3) were unanimously approved by the Task Force members. [1/180] \*

#### **IV. TASK FORCE DECISIONS**

The Task Force voted and passed the following motions:

- A. Adopt the recommendations of the Technical Committee as to the "Amendment of the Fiscal Year 1992 Budget" (Enclosure 4) for the reallocation of fiscal 1992 funds. The reallocation was made to account for increases in planning and engineering support. It was agreed that \$100,000 in contingency funds would be left in the budget for possible action by the Task Force at their next meeting. The Task Force members unanimously approved this amendment. [2/125]
- B. Mr. Mielke presented two versions of the "Task Force Vision Statement" (Enclosure 5) reviewed by the Citizens Participation Group. After some discussion of the merits of each version, and their possible amendment, Mr. Fruge' moved that the 2nd version be adopted without change. Mr. Bahr seconded, and the Task Force unanimously approved the motion. [5/495]

#### **V. TASKS REQUIRING FURTHER ACTION**

- A. Colonel Diffley requested that Dr. Stewart and the Monitoring Work Group coordinate with the Lead Agencies to verify and ensure monitoring plans for the 1st Priority List projects. [1/254]
- B. Mr. Ruebsamen requested that Mr. Elguezabal supply him with a completed copy of the model Cost Sharing Agreement. [1/346]
- C. Mr. Elguezabal discussed a plan for the Corps of Engineers to handle the accounting of in-kind services provided by the state, as verified by the lead federal agency, and the funding of this service. Following this discussion of "Funding for the Management of Inter-Agency Disbursement of CWPPRA Funds", Col. Diffley requested that Mr. Elguezabal compile a scope of administrative services for submittal to the Task Force agencies. It was also requested that this topic be an agenda item at the next Task Force meeting. [2/470]
- D. Col. Diffley tasked his staff with the development of a method for the updating and continuing involvement of the congressional delegation and their staffs. This methodology will be an agenda item for discussion at the next Task Force meeting. [5/540]

## **VI. STATUS OF FISCAL MATTERS**

- A. Mr. Rowe alerted the Task Force to the need to begin preparing budget requests for the fiscal 1993 budget. This will be an agenda item for the next Task Force meeting. [2/472]
- B. Mr. Rowe also reviewed the procedure for the carryover of fiscal 1992 funds. Those funds will be available for the reimbursement of fiscal 1992 expenditures into fiscal 1993. Haste in presenting bills after the end of the fiscal year was advised. The disposition of unobligated fiscal 1992 funds was also discussed. There is some question as to whether these funds would be available for obligation in the fiscal 1993 budget. Mr. Rowe supplied a letter from Corps of Engineers headquarters that seemed to indicate that unobligated funds could be carried over for use in the next fiscal year. Col. Diffley requested that this be verified with the Corps headquarters finance and accounting staff before the next Task Force meeting. [2/556, 631]

## **VII. INFORMATIONAL AGENDA ITEMS**

- A. Mr. T. J. Brown of the New Orleans District's Real Estate Division, updated the Task Force on the status of procedures for compliance with section 303e. Mr. Brown stated that in the case of the BA-2 project, the Soil Conservation Service would acquire real estate easements only in areas of actual construction. Compliance with section 303e for wetlands protected by this project would be achieved through federal and state permitting programs. He indicated that SCS use of this procedure for the BA-2 project met with the approval of NOD's real estate expertise. He also indicated that other lead agencies were interested in using this procedure. [1/727]
- B. Dr. S. M. Gagliano presented to the Task Force a conceptual overview of the problems of the Louisiana coast and the probable solutions to be dealt with in the Restoration Plan. A transcript of his presentation (Enclosure 6) has been included in these minutes. [2/631-3/500]
- C. The Basin Captains reported on the conceptual plans and their status in each of the coastal basins. [4-105]

## **VIII. ADDITIONAL AGENDA ITEMS**

- A. Dr. Bahr suggested that status reports on Priority List projects be included as a regular agenda item. Col. Diffley noted that a reasonable compromise might be to have each Lead Agency submit a one page status report for inclusion as a binder tab for each Task Force meeting. Dr. Bahr stated that he was agreeable with that idea and Mr. Schroeder agreed to develop a format for the reports. [5/526]
- B. Col. Diffley stated that he had been contacted by Senator Johnstons' staff concerning some form of regular involvement. The Task Force was in agreement that a method to more closely involve the Congressional delegation and their staffs, both in and out of state, is needed. The disposition of this item is addressed in section V., paragraph D. of these minutes. [5/540]

## **IX. DATE/LOCATION OF THE NEXT TASK FORCE MEETING**

The date for the next Task Force meeting is August 26th 1992. The site of the meeting will be the U.S. Army Corps of Engineers New Orleans District. The meeting will be held in the New Orleans District Assembly Room. [5/638]

## **X. Questions from the Public**

No written questions or comments were received from the public. [5/655]

## **XI. Adjournment**

The Task Force meeting was adjourned at 2:20 p.m. [5/658]

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\* The Task Force meeting was recorded on audio tape. These bracketed figures represent the Tape#/Counter# for the discussion of this item.

COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT

TASK FORCE MEETING  
May 28, 1992

ENCLOSURE 1

AGENDA

# COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT

## TASK FORCE MEETING

May 28, 1992

### Agenda

#### I. Introductions

- A. Task Force Members or Alternates.
- B. Other Attendees.
- C. Opening Remarks by Task Force Members.

#### II. Adoption of Minutes from the February 20, 1992 Meeting

#### III. Status of Tasks from February 1992 Meeting Requiring Further Action

- A. Draft report on Monitoring Program--Dr. Stewart or Mr. Steyer
- B. Formation of a CSA Work Group charged with development of standard language for a model Cost Sharing Agreement--Mr. Elguezabal
- C. Revision of schedule for completion of 2<sup>nd</sup> Priority Project List and Restoration Plan, including NEPA requirements, to meet November 1993 deadline--Ms. Hawes
- D. Delegation to Technical Committee of authority to review scope of work for support services to be provided by Lee Wilson, Inc., and Dr. James Gosselink--Mr. Thomas
- E. Nomination and selection of Basin Captains--Mr. Rowe

#### IV. Resolution of Real Estate Issues Related to Section 303 of the CWPPRA--Mr. Brown

#### V. Amendment of Budget for Fiscal Year 1992

- A. Funding for Basin Captains--Mr. Rowe
- B. COE Engineering support for preparation of 2<sup>nd</sup> Priority Project List and Restoration Plan--Mr. Rowe
- C. Funding for management by COE of disbursement of CWPPRA funds--Mr. Elguezabal
- D. Discussion and action by Task Force

#### VI. Preparation of Agency Budgets for Fiscal Year 1993--Mr. Rowe

#### VII. Authorization of Carryover of Fiscal Year 1992 Funds

- A. Rationale for carryover--Mr. Rowe
- B. Discussion and Action by Task Force

**VIII. Responsibility for Tracking State's Share of Project Costs**

- A. Proposal by USFWS--Mr. Oberheu
- B. Discussion and Action by Task Force

**IX. Overview of Coastwide Conceptual Plan from Basin Integration Meeting--Dr. Gagliano**

**X. Goals and Strategies for Restoration Plan; Outline for Report--Mr. Rowe**

**XI. Report on Basin Captains Meeting--Ms. Hawes**

**XII. Status Reports by Basin Captains:**

- |                            |                |
|----------------------------|----------------|
| A. Pontchartrain           | Ms. Hawes      |
| B. Breton Sound            | Mr. Axtman     |
| C. Mississippi River Delta | Mr. Axtman     |
| D. Barataria               | Mr. Holder     |
| E. Terrebonne              | Mr. Thomas     |
| F. Atchafalaya             | Ms. Powell     |
| G. Teche/Vermilion         | Mr. Demcheck   |
| H. Mermentau               | Mr. Landreneau |
| I. Calcasieu/Sabine        | Mr. Hickey     |

**XIII. Task Force Vision Statement**

- A. Recommendations of Citizen Participation Group--Mr. Mielke
- B. Discussion and Action by Task Force

**XIV. Additional Agenda Items**

**XV. Date and Location of the Next Task Force Meeting**

**XVI. Request for Written Questions from the Public**

COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT

TASK FORCE MEETING  
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ENCLOSURE 2  
ATTENDANCE RECORDS





**ATTENDANCE RECORD**



<b>DATE(S)</b> 28 May 1992	<b>SPONSORING ORGANIZATION</b> Planning Division	<b>LOCATION</b> District Assembly Room
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**PURPOSE** - Louisiana Coastal Wetlands Planning, Protection and Restoration Act Task Force Meeting

**PARTICIPANT REGISTER \***

NAME	ORGANIZATION	TELEPHONE NUMBER
LEN PAHR	GOVERNOR'S OFFICE	504 922-3244
KAREN CAUREUX	Governor's office	504-922-3244
Peggy Jones	USDOC/NMFS	504 389-0508
Jim Smith	GOVERNOR OFFICE	972-3244
Ric Ruesamen	DOC/NMFS	504/389-0508
Chuk Pete Savage	St. Bernard Coastal Zone Comm.	504/271-2059
Chris Andrey	St. Bernard Parish Coastal Management	504/278-4303
Tim Axman	COE PD-FE	(504)862-1721
Janece Peckham	EPA	214-655-2265
Bill Savant	DNR/CRD	(504) 342-9420
Wance Edwards	DNR/CRD	11 342-7289
Red Pittman	COE Project	(504)862-2846
Dum ELGUEZABAI	COE - Proj. Mgr.	(504)862-2599
Tim Osborn	NOAA-NMFS-D.C.	(301)-713-0159
Cary Bodin	FWS - Lafayette	318-264-6630
David Frayé	USDI/FWS, Lafayette, La	318-264-6630
H. Austin	SDS - Alex L.	318-473-7751
BOB STEWART	FWS-NWRC, LA/AMTR	318-231-5811
Romy Landrean	USDA-SCS	318-473-7756
Greg Steyer	DNR/CRD	504-342-9435
Don Thomas	US EPA	(214) 655 2260
BRUCE LEHTO	USDA-SCS	318-783-1272
John C. Oberken	US Fish & Wildlife Serv., Atlanta	404-331-0830

\* If you wish to be furnished a copy of the attendance record, please indicate so next to your name.

PARTICIPANT REGISTER (CONTINUED)

NAME	ORGANIZATION	TELEPHONE NUMBER
Richard Boe	Corps - Planning	504 862 1505
M. Gagliano	Coastal Environments Inc	504-383-7455
D. Klein Shultz	Corps - <del>Life Cycle</del> Proj Mgt	504-862-2783
Remond Demichiel	USGS/WTRD	504 389 0281
Stan Green	COE Piny Div	(504) 862-1486
Hauer	"	504-862-2518
Kemp	Coalition to Restore Coastal LA	504 760-0195
M. Clavon	GCRA - CAP	504/504-5416
M. Mielke	Coalition to Restore Coastal LA	504/764-8394
Paul Yakupack	USFWS - Field Representative <sup>Canada Prairie NWR</sup> Div. of Refuge	318-598-2216
James Proselink	LSU	504-388-6379
James E. Michulka	National Park Service	504-589-3882
Nancy Powell	Corps Engr Div	504 862-2449
R. H. Schroeder, Jr.	Corps Plan. Div	504-862-2244

COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT

TASK FORCE MEETING  
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**ENCLOSURE 4**

Amendment of Fiscal Year 1992 Budget

CWPPRA FY '92 BUDGET ALLOCATION

AGENCY	MIPR DATE	MIPR AMOUNT (\$)	BILLING DATE	BILLING AMOUNT (\$)	EXPENDITURES THRU APR 92 (\$)	PROJECTED MAY-SEP 92 (\$)	EXCESS FUNDS (\$)	ADDITIONAL FUNDS REQ. (\$)	REVISED FY 92 BUDGET (\$)
Department of the Army U.S. Army Corps of Engineers	2/24/92	932,000			491,800	911,100		470,900	1,402,900
Department of Agriculture Soil Conservation Service	1/28/92 2/24/92	556,000 243,000	4/21/92	402,704	402,700	396,300			799,000
Department of Commerce National Marine Fisheries National Oceanic Service	1/28/92 1/28/92	484,000 72,000	4/13/92	61,609	128,000 29,500	336,000 42,000	20,000 500		464,000 71,500
Department of Interior Minerals Management Services National Park Service U.S. Fish and Wildlife U.S. Geologic Survey (Baton Rouge) U.S. Geologic Survey (Reston)	1/30/92 1/28/92 1/28/92 1/28/92 1/28/92	2,900 12,100 619,100 131,400 47,500	3/23/92	2,900	5,000 1,600 177,000 36,400 27,500	20,500 4,000 398,300 121,800 20,000	6,500 43,800	22,600 26,800	25,500 5,600 575,300 158,200 47,500
Environmental Protection Agency Agency Contractor/Scientific Review	1/28/92 2/27/92	509,000 212,000			257,500	236,500 265,000	15,000	53,000	494,000 265,000
State of Louisiana Department of Natural Resources	1/28/92	767,400	2/25/92 4/14/92 5/20/92	49,639 27,529 13,505	188,900	287,300	291,200		476,200
Office of the Governor	1/28/92	155,600			17,700	96,100	41,800		113,800
<b>SUBTOTAL</b>		<b>4,744,000</b>		<b>557,886</b>	<b>1,763,600</b>	<b>3,134,900</b>	<b>418,800</b>	<b>573,300</b>	<b>4,898,500</b>
<b>CONTINGENCIES</b>		<b>256,000</b>							
<b>UNALLOCATED FUNDS</b>							<b>101,500</b>		<b>101,500</b>
<b>TOTAL</b>		<b>5,000,000</b>							<b>5,000,000</b>

COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

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**ENCLOSURE 5**

Task Force Vision Statement

# COASTAL WETLANDS ACT VISION STATEMENT

## Version 1

Our coastal wetlands are a unique and precious natural resource of international significance. Enormously productive, they provide life and livelihood for countless life forms, beauty, recreation, safety and fruitful bounty for humans to enjoy and consume. So prolific are these coastal wetlands that their yield in recreational opportunities and dockside values for several species is measured in tens of hundreds of millions of dollars each year. We want to continue to enjoy the beauty, safety, and production of these wetlands for ourselves and generations to come.

We understand that this system is dynamic and complex. It is essential that we "turn the tide" on loss of the Louisiana coastal wetlands and their associated functions and values. We must, as soon as is feasible, bring our wetlands gains to the level to meet or exceed our wetlands losses. Our vision is to prevent the loss of and restore the coastal wetlands in Louisiana through the planning and projects of the Coastal Wetlands Act. Our goal is to prevent the loss of and improve the functions and values of these wetlands.

## Version 2

Our coastal wetlands are a unique and precious natural resource of international significance. Enormously productive, they provide habitat for countless life forms, beauty, recreation, safety and natural resources for humans to enjoy and consume. So prolific are these coastal wetlands that their yield in recreational opportunities and natural resources is measured in billions of dollars each year. We want to continue to enjoy the beauty, safety, and productivity of these wetlands for ourselves and generations to come.

We understand that this system is dynamic and complex. It is essential that we "turn the tide" on loss of the Louisiana coastal wetlands and their associated functions and values. We must, as soon as is feasible, bring our wetlands gains to the level to meet or exceed our wetlands losses. Our vision is to reverse the loss of and improve the functions and values of the coastal wetlands in Louisiana through the planning and projects of the Coastal Wetlands Act.

COASTAL WETLANDS PLANNING, PROTECTION AND RESTORATION ACT

TASK FORCE MEETING  
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**ENCLOSURE 6**

Transcript of the Coastal Overview  
presented by Dr Gagliano

TASK FORCE MEETING 5/28/92  
OVERVIEW OF COASTAL PLAN FORMULATION  
DR. S. M. GAGLIANO

It's good to be here again. I'd like to first express my thanks to the whole group who participated in the series of workshops that led up to what we have. . . characterizes the key elements of the Comprehensive Plan. It's a very enjoyable experience because of the caliber of the people who attended and because of the spirit of cooperation. I think everyone there was genuinely interested in making this overall program succeed and contributed freely of ideas and concepts and arguments and other things. But, it worked out very well.

What I'd like to do is to briefly, for the members of the Task Force who did not participate in the workshops, present a summary of what I believe was more or less a concensus. There may be some disagreement of minor points but we tried to capture the essence of the summaries of each basin workshop and to present them graphically on this map. It's important to recognize as a background that we waded through 4 long workshops across the coast and then a summary workshop before we really arrived at this. So, this is not something that we dreamed up in the middle of the night. It's something that is the result of a lot of discussion, a lot of background, a lot of hard work. I think a second important point is that the plan recognizes and addresses the natural and human constraints that is presented by the area. We will not go through the background material, but it is based on the distribution of the resource that is the wetlands and the coastal zone of Louisiana. And also, the summaries of the parameters that are affecting that resource, the sinking of the land, the erosion landward of the shoreline, the invasion of some areas that have been historically fresh by marine processes that have caused deterioration, and other factors that are contributing to deterioration.

The strategy that unfolded as the workshops progressed was really a twofold approach to the problem. One is a defensive approach where we try and get ahead of what happens. We recognize that this is a progressive disease that is attacking the wetlands of the coast. We have with the benefit of having mapped the symptoms of that disease the visual effects of that disease over a period of time. We know how it is progressing and where it is moving. So armed with that information a defense strategy was developed for each basin that would try and arrest the process and hold what we have and building on that, to that provide an opportunity for really optimizing what's left if you can



prevent further erosion. Then the next thing that you really want to do is to look at what is remaining and try and move towards managements so that conditions there are optimized for the resources that we are interested in working with.

The second part of the program is an offensive strategy, and what evolved there is a recognition that we are dealing with a big dynamic natural system, really two systems, the delta system from Atchafalaya to the Pearl River, and the Chenier Plain and bay systems to the west of that in order to maintain and to some extent restore and to work toward an equilibrium condition. The program had to try and recognize the dynamics of the system; that it was undergoing change and to allow for that dynamic condition to continue to exist to some extent, to give the system a little more latitude, a little more room to do what it did under natural conditions. So with that in mind then, I'll try to describe the elements of the plan starting with the defensive elements and maybe looking at some sample basins instead of trying to walk all the way across the state.

I think the starting point is that we have a skeletal framework that consists of uplands of old pleistocene terraces that border the delta and Chenier Plain that are ridged that will be there and that you might think of as the ultimate end of the process. If deterioration continued unabated, there's where the shoreline would end up. Other parts of that skeletal framework which hold the wetlands together literally consist of natural levee ridges related to the Mississippi River and former distributaries of the river and gulf beaches and gulf shorelines including the Chenier ridges and the gulf shoreline in Southwestern Louisiana. These can be thought of truly as the skeleton. These are rather ridged, they are not going to move much in time and they are a necessary framework for holding the natural system together. The wetlands that we are charged to deal with are the flesh of that system. They're part of almost . . . they have a lot of attributes, really, of living organisms in the way they function, but it's that skin that we are trying to manage and maintain. But, we have to recognize that the skeletal elements are absolutely essential to any type of maintenance and conservation and restoration. Now as you all recognize the part of the framework has been modified; the natural levee ridges have been extended by flood protection levees and drainage works so that what we have shown in brown here. As the skeletal elements really is a group of features including uplands, ridgeland, fastlands. This is not to imply that we are blowing off small patches of wetlands which may occur inside of our drainage districts but simply to allow us to look at the big picture. Now

within that framework we have a series of basins or hydrologic units. We have subbasins and subunits that are defined by the margins of those basins within the deltaic plain. Those basins have similar elements. They all have a large freshwater storage area or freshwater basin at the upper end and the consensus of the group was that these were all in reasonably good condition, but they were threatened. They are very fragile types of ecosystems, and if the trends of deterioration continue, it is predictable that they will break up and be altered and eventually be lost.

Moving seaward in each basin of course, we have a mixing zone and a marine zone. The basic defensive strategy, and it can be illustrated well in Pontchartrain, Barataria and East Terrebonne, is to really recognize that there are some critical areas that are under attack in each of these basins. Where there is a kind of leading edge of the deterioration process there are also some critical land bridges that break the basins into segments and control the inflow and outflow of water. The general hydrology of the basin in Pontchartrain for example. There are really two critical land bridges. One is between Lake Borgne and Lake Pontchartrain itself. The second is between Lake Pontchartrain and Lake Maurepas. So, it's fundamental then to recognize that those critical land bridges have to be maintained. If not, the whole character of the basin is altered and we will ultimately lose the freshwater ends of the basins that are again not only valuable in themselves but valuable to the whole hydrology and maintenance of the system. So these become critical elements.

We recognize in the Chenier Plain that the basins are oriented not north-south or to the coast or away from the coast, but rather in kind of an east-west direction because of the configuration of the gulf beaches. Nevertheless the general character is the same. We have central freshwater areas and those go into mixing zones and indirectly into the Gulf of Mexico. We find that we have critical land bridges there as well. For example, the . . . rather the Calcasieu Management area levees along the east side of Calcasieu are a kind of artificial boundary that has been constructed as part of an overall management project. But it is a rather fragile boundary if you really put it in perspective, and it is important that we recognize that we must maintain the integrity of that boundary if we have any hope at all of maintaining the marshes behind it.

This little boundary over here, near Holly Beach, is a critical boundary because there are no other ridges behind the highway. The Gulf of Mexico, the highway and all these marshes behind it. If that critical

land boundary is lost, this whole area will become a large embayment of the Gulf of Mexico. So that's part of the defensive strategy. Another part of the defensive strategy is to recognize that there's shoreline erosion occurring. Some around lake shores, some along the Gulf Intracoastal Waterway, particularly in places where it traverses the basins that are characterized by highly organic soils. And we recognize those as kind of a special problem that needed to be addressed all the way across the coastal zone.

Another part of the defensive strategy is recognizing that even beyond these ridgeland and fastlands that are important as corridor areas, and we'll certainly we will maintain those as part of the overall infrastructure of the state, but extending beyond those there are some other ridges like the Bayou La Loutre Ridge and the Bayou Lours Ridge over here. And some of the ridges in South Terrebonne that control the hydrology locally that support the wetlands and are important to maintain. We recognize that moving down the basin there are a couple other lines of defense that are important. Certainly the barrier islands in the gulf shore where they separate the gulf from the estuaries are absolutely the first line of defense. However, if you look at the barrier islands we really have three systems in Louisiana. The Chandeleur system, the system across the front of Fourchon including Grand Isle and Timberlier to the west of Isle Dernieres system. Their life expectancy and the ability to really restore them. . . maintain them varies.

So we recognize within the general need of trying to restore barrier islands, that we have at least two priority groups. One, those that are closest to the headlands including Grand Isle and the Fourchon headlands including these due south of the city of Houma that are the highest priority. This if we're going to invest money in restoring and maintaining barrier islands. This is where we get the most value for our investment. We have the highest degree of success. And then as we get more away from those more down drift, where the islands have a tendency to move and break up more rapidly that need to be addressed also. But it's a lower priority, a second priority.

Another element of the defense of the basins would be to recognize that in all the shorelines inside of the barrier islands we're dealing with muddy shorelines. Louisiana has 30,000 miles of muddy land water interface and 350 miles of sandy shoreline. There's only a couple ways you can get granular material or coarse material on to those shorelines. One is by reworking of sand deposited in river systems, the way the

Barrier Islands that we now know formed. Another is to dredge from buried sand deposits and to move it to the beach artificially. Another might be to bring in riprap by barges, or some other rigid material. But another way that we have not utilized very much is to try and is the growth of shell materials in the bays themselves. When we look across the coast of Louisiana, there are a couple of places that stand out. One, over here in Plaquemines near Sandy Point, the gulf shoreline in that area was, it's deteriorating now, was composed almost entirely of shell material; mostly oyster shells. We find the same thing is true in the Cheniers. The Chenier ridges themselves, the composition ranges from 40% to over 90% shell material that's reworked from material that granular material that grew in place, and the front of Marsh Island, one of the areas that has the lowest erosion rates in the state, is protected by massive shell reefs that extend offshore and that contribute shell particles to the shorelines. This leads to a strategy of trying to establish a zone of oyster reefs in the upper ends of the bays and the lakes that would eventually grow into a second line of defense in the event that we lose our barrier islands. That there is something for the gulf energies to interact against at some time in the future. So that we don't leave the toes of our drainage and storm protection levees like the Golden Meadow Levee or the West Bank Jefferson Levee exposed to the direct energies of the Gulf of Mexico.

Another strategy, more of an offensive strategy I guess but related to maintenance of the basin and I'll cover these next, would be the whole idea of diversions. We certainly put a lot of emphasis on the importance of diversions of Caernarvon and Davis Pond. Of further consideration are Bonnet Carre' and the lesser diversions that are being developed south of New Orleans in Plaquemine Parish. Those all have important roles, and I think there was absolutely a consensus that one of the things that we had to move towards was getting sediment out into the basins, that the only way you can really efficiently build new marshes and counter the trend of deterioration is by doing that.

A unique approach in that direction is dedicated dredging. Not only dedicated dredging to use to nourish barrier islands, but dredging that might occur say in the Mississippi River with semi-permanent discharge pipes directing the material some distance from the river for the purpose of restoring and stabilizing marshes. The idea of using old pipelines as Len Bahr mentioned this morning has come up frequently in those discussions and is certainly a measure that should be considered and looks promising. That would, of course, work best in areas relatively close to the Mississippi or the Atchafalaya.

Another part of the defensive approach is really the management of wetlands. We did not attempt to depict every area where there is some form of management, but we did show in this green pattern those areas that are committed to some type of impounded management. Those include places like the Bayou Sauvage National Wildlife Refuge which lies inside of the hurricane protection levees in eastern Orleans Parish. The St. Charles marshes, the Rockefeller Refuge, Laccasine, Calcasieu and parts of Sabine Refuge over here. And there are others that are managed to a lesser extent.

Now finally we get to the offensive part of the program and that really involves looking at the use of the water resource available from the Mississippi and the Atchafalaya Rivers. And that's an area where there is a lot of additional discussion needed. We really find that we have several places. In fact, I have identified four places in purple on the map where there are two or more major hydrologic alternatives. And all of those involve possible diversions or some other use of changes in the pumping system. That would reallocate water, a major movement of water, in a way that would affect a large area and really affect the whole system.

Now I won't go into each alternative in detail but I will enumerate them. Bonnet Carre' for example, there is certainly the possibility still of a major diversion that would change the character of the lake and affect large areas of Lake Borgne and Mississippi Sound. There is the possibility of a smaller diversion and there has been suggestions that that might be routed through the adjacent Labranch wetlands. And finally, there's been the suggestion of operating the existing structure for limited diversion either every other year or part of the year or whatever.

Another plumbing problem, and it really is kind of a mixed bag between the defensive and offensive strategy, involves the Mississippi River Gulf Outlet. The alternatives there . . . Intrusion resulting from tidal processes and salt water. That could be done by construction of a lock or sill or some type of structure that would either completely shut the movement down or reduce the movement. A likely candidate for such a structure would be the natural levee ridges at Bayou La Loutre that provide rather firm foundation conditions. Another alternative would be to completely isolate it and make it an arm of the sea by closing all the interconnecting waterways and really confining the channel from the Gulf of Mexico to the center port area.

The third suggestion would be to direct the freshwater flow, increase freshwater flow, into Mississippi River Gulf Outlet. Probably in the vicinity of the existing Violet siphon but through a major conduit of the river that would provide enough freshwater to offset saltwater intrusion and marine tidal processes. That would have additional benefits of moving freshwater eastward through the Gulf Intracoastal Waterway and really, probably affecting a considerable area.

The two big tough areas, of course, are the active delta and the Atchafalaya outlets. In the active delta, the alternatives include maintaining Southwest Pass, as we do now, as the major channel for navigation with some control subdeltas. The two that are highest on the list I think are West Bay, which seems to be a project that's moving forward, and a second subdelta in this area, in the vicinity of Port Sulphur. It would have substantial benefit in blocking off openings that are now occurring between Barataria Bay and the Gulf of Mexico. And really building kind of a land mass that would help confine the Barataria system. In addition, it would build a land mass of its own and would add to the overall wetland acreage of coastal Louisiana.

The second major alternative would be consideration of another navigation outlet, that is, abandon Southwest Pass-do not maintain it through dredging but as an alternative dredge. A navigation channel either to the west to about the 60-foot contour, or has been suggested in the past, to the east to Mississippi River Gulf Outlet and out to the gulf, in that direction. Such a navigation channel would probably work best if it had locks. This of course, is a technical challenge because of the poor foundation conditions in the lower delta. But the whole idea behind this alternative is that it's essential that we take a fresh look at how we allocate sediment in the Mississippi delta system.

Our priorities have been since 1890 to use substantial part of the discharge to maintain navigation channels through jetties. And the alternative, I think, the essence of this alternative is that we really take a fresh look at that concept. Because unless we are able to get substantial sediment out of the river and into the natural delta system, it will continue to deteriorate and there will continue to be a net loss. The only hope of ever restoring a balance is to use the flow and sediment that is being presently used for navigation maintenance for environmental enhancement and maintenance.

The same rationale carries over to the Atchafalaya delta. There are two alternatives there, one is to maintain the present, more or less, the present flow conditions with optimize delta building. That is, some channel training, additional training, adjacent in areas, adjacent to the lower Atchafalaya navigation channel and perhaps some more training in the Wax Lake Outlet.

The second major option would be reduce flow in the lower Atchafalaya itself by construction of a sill above Morgan City and removal of the existing sill above Wax Lake. It's recognized, of course, that that would have far reaching implications. That there may be some bridge replacements and other major structural elements that would be needed. But the benefits would be, that the navigation into Morgan City and into the shipyards to the east of Morgan City through Chene, Boeuf, Black could be maintained, more or less, in a slack water channel condition and that the major delta building would occur out of Wax Lake. And that would be, more or less, divorced from the navigation channel leading into the Morgan City area.

One of the downsides of that would be some reduction in freshwater flow that is presently getting into western Terrebonne. So that again, this is a fundamental plumbing decision that needs to be resolved and needs a lot further evaluation. But we address it in the plan by not saying we can't do anything else till we solve that. But rather isolate those as problems for further discussions.

I think I've covered most of the elements. Maybe a few pick up things here is that there is substantial mud flat development presently occurring in this area, west of Chenier Autege. That will continue undoubtedly, it has some possibilities of enhancing it.

Another little pet project of mine is the possibility of using maintenance dredged material to construct some new barrier islands that do not presently exist along the lower ends of these subbasins, along Mississippi River Gulf Outlet and St. Bernard Parish. This gets us to a scale of environmental sculpturing, if you will, estuarine sculpturing that is really within our present capabilities. . .time wise, space wise, dollar wise. It leads to the conclusion that our projects need to be bite size, we need to have an overall plan as we try visualize here. But we need to look at how our projects, as bite size projects, are building blocks of that plan.