

Comprehensive Recommendations Supporting the Use of the Multiple Lines of Defense Strategy to Sustain Coastal Louisiana

2008 Report (Version I)

This report recommends integrated coastal projects and levee alignments for the entire coast of Louisiana with the overriding goal of improving hurricane flood protection and sustaining the coastal estuaries.



Summary Map of Multiple Lines of Defense

“It may be hubris to think we could ever engineer our way out of this fix, when nature seems so aligned against us. It is certainly hubris to think we could do it without taking nature's assistance when it is offered.”

Quote from comments on the draft report by David Yeargin

Funding provided by the McKnight Foundation
Report is available at MLODS.org, SaveOurLake.org, or CRCL.org



Report Planning Process

The Lake Pontchartrain Basin Foundation (LPBF) and the Coalition to Restore Coastal Louisiana (CRCL) formulated an assessment team to develop and promote the application of the Multiple Lines of Defense Strategy (MLODS), applying the best science and engineering to coastal restoration and flood protection. The assessment team is composed of highly qualified coastal scientists and engineers. This group is supplemented with additional expertise through universities and professional services. In addition, three technical workshops were held in November 2007 to solicit input and critique the draft report. Public comments that were solicited from August 2007 until January 2008 are included in the current version of this report. Comments will continue to be solicited to acquire the best information available and public input.

LPBF and CRCL have made a long-term commitment to apply this strategy to their coastal programs. This report is released as the “2008 Report (Version I)” but subsequent addenda or modifications may develop in 2008 and into the future. Significant new and pertinent information will be developed or released, which may require additional data or sections in the report. In order to incorporate public input and the best available science and engineering in this document, the report will be revised on a yearly basis or more frequently if the information acquired makes it necessary.

Report Formulation Guidelines

Louisiana's Comprehensive Master Plan for a Sustainable Coast (2007) adopted the MLODS to achieve four stated objectives. These four objectives fall within the larger strategy objectives to provide adequate flood protection and restoration to sustain the ecology, economy, and culture of coastal Louisiana and is summarized in the State Master Plan as “to promote a sustainable coast that allows both human and natural communities to thrive over the long-term.” This report attempted to follow these objectives and developed specific guidelines of how this objective might be achieved in south Louisiana. The formulation guidelines, not absolute mandates, were utilized to integrate coastal restoration and protection within this report:

- 1) Utilize the MLODS by geographically and functionally integrating all eleven types of Lines of Defense in recommendations to sustain coastal Louisiana.
- 2) Establish Wetland Habitat Goals along the coast, which will most likely sustain the coastal extent and estuarine processes, utilizing historic habitat baselines (circa 1900) wherever appropriate.
- 3) Provide 400 year or better protection for the major population centers of New Orleans (east and west banks), Houma-Thibodaux, Morgan City, and Lake Charles through structural, non-structural, and natural measures.
- 4) Provide 100 year protection with a combination of structural, non-structural, and natural measures for lesser population centers outside of the major metropolitan areas with improved evacuation routes that are elevated where necessary.
- 5) Enhance existing levee alignments to satisfy the levee requirement needs of the region wherever existing alignments are appropriate (No assumption should be made regarding the geotechnical aspects of existing levee alignments. All foundations need to be checked for suitability with the existing or future designs.).
- 6) Utilize back levee or ring levee alignments that are located adjacent to natural ridges wherever appropriate.
- 7) Ring levees must be well-designed and constructed with efficient and adequate pumping capacities that are served by reliable evacuation routes (preferably elevated highways).
- 8) Hurricane protection structures facing open-water lakes and bays must be pile-supported or armored, or both to ensure reliability when overtopped by waves or surge. Wetland buffer strips or other measures should be used to reduce wave action on the structure. Reliability even when overtopped should possibly be given a greater priority for expenditure than a higher crest elevation.
- 9) Non-structural measures must be strongly encouraged everywhere in coastal Louisiana, and in many areas, a requirement if flood protection or mitigation is provided publicly (flood insurance, levees, etc.). Coastal residents must be informed of their risk from flooding as much as technically possible. It must be also recognized their choice of personal exposure may lead to non-recoverable losses. Relocating, elevating, and flood-proofing are measures that can be taken individually to mitigate personal choices made that create exposure to the loss of assets.

In other words, we should all consider non-structural measures even when they may not be required by regulations.

10) Maximize storage of surge by minimizing the extent of wetlands enclosed by levees.

11) Maximize the extent of wetlands outside of levees to attenuate surge and promote the health of the estuary.

12) Maximize the potential of the coast to disperse surge through avoidance of funnel geometry, use of surge spillways, maintaining or restoring the natural hydrology, and maximizing wetlands for surge attenuation.

13) Utilize mechanical restoration (i.e., marsh creation) on marsh land bridges identified as a Line of Defense.

14) Wherever possible, utilize land-sustaining diversions to maintain marsh land bridges identified as a Line of Defense by extensive overland flow of river water and to maintain the Wetland Habitat Goals.

15) Utilize land-building diversions where large scale restoration is needed for a recognized Line of Defense.

16) Freshwater diversions and spillways should be built with significant range in discharge capacity to allow a variety of discharge levels and adaptive management.

17) Normal freshwater introductions should include significant spring discharge to emulate the natural spring overbank cycle and maintain Wetland Habitat Goals.

18) Utilize occasional extreme pulsing freshwater discharge through diversions and spillways into wetlands to accelerate vertical accretion over larger extent than normal discharge cycle.

19) Incorporate measures to manage the sand budget of the Gulf shoreline.

20) MLODS Assessment Team will solicit reviews of coastal experts and consider these reviews before finalizing the report.

21) Public input will be solicited at any time. In order to incorporate public input and the best available science and engineering, the report will be revised on a yearly basis or more frequently if the new information makes it necessary.