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

Planning Unit 2

Lake Pontchartrain Basin Foundation Coalition to Restore Coastal Louisiana

Workshop Presentation
November 16, 2007
Requirements for Implementation of the Multiple Lines of Defense Strategy to Rebuild Louisiana’s Coast and Hurricane Protection

Technical Workshops

Sponsored by the Lake Pontchartrain Basin Foundation and the Coalition to Restore Coastal Louisiana

Planning Units 3b and 4 - November 6, 2007
McNeese University (room announced later), Lake Charles, La.

Planning Units 3a and 3b - November 16, 2007
Houma Civic Center, Houma La.

Planning Units 1 and 2 - November 16, 2007
Bayou Segnette State Park

The workshops will start at 8:00 am and end at approximately 3:00 pm
Workshop Objective
Three workshops will be held to discuss and identify the essential recommendations to restore the coast, levee improvement, elevating homes and all other “Lines of Defense” as described by the Multiple Lines of Defense Strategy. Focus will be on not just the individual components of a plan but their relation to each other. Integration means components should mutually support and not conflict with their contribution to the overriding goals of improving flood protection while sustaining the coastal estuary. Notes from the meeting and other related documents will be posted on the MLODS website (www.mlods.org) after the workshop. The overall goal is to facilitate convergence on the best projects to keep our coast healthy while providing adequate flood protection from storm surges.
Multiple Lines of Defense (MLOD) are definable geographic areas in which certain natural or manmade features or activities are promoted or implemented, resulting in the reduction of impacts by tropical weather systems to the Louisiana coast.

The order of LOD’s derived from the physical location of the LOD’s moving from the Gulf of Mexico inland. The order is not intended to indicate a relative significance, just relative physical position.

<table>
<thead>
<tr>
<th>Period</th>
<th>Square Miles lost or predicted to be lost</th>
<th>Restoration cost at Historical CWPPRA cost ($13,000 / ac), includes 25% Cost share &amp; 10% Administrative cost</th>
<th>Restoration cost with Post-Katrina, Marsh Creation cost ($26,000/ acre), includes inflation, energy costs, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003- 2050</td>
<td>186</td>
<td>$1.5B</td>
<td>Cost to maintain $3.0B</td>
</tr>
<tr>
<td>1978 -2050</td>
<td>(186+213)= 399</td>
<td>$3.3B</td>
<td>Cost to restore to 1978 $6.6B</td>
</tr>
<tr>
<td>1932 - 2050</td>
<td>(186+213+238)= 637</td>
<td>$5.3B</td>
<td>Cost to Restore to 1932 $10.6B</td>
</tr>
</tbody>
</table>
Hurricane Katrina surge, Note: 5-foot reduction across 14 miles = 1'/2.8 miles

Interagency Evaluation Performance Task Force, March 2006
100-Year Surge Frequency Contours

Legend
- Primary Roads
- Yellow: Planning Unit Boundary
- Gray: Leveed Area

Contours (feet)
- 3
  Notes:
  All levees are assumed to be at authorized grades.
- 4
- 5
- 6
  Contours shown are for outside existing levee systems only.
- 7
- 8
  Contours reflect still water elevations only.
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 18.5

Outer perimeter of contour map does not reflect limits of flooding.

March 20, 2007

DRAFT
Figure 16. Donaldsonville to the Gulf Alignment: #1 - Swamp.
Figure 18. Donaldsonville to the Gulf Alignment: #3-GlWW.
<table>
<thead>
<tr>
<th>Save Points</th>
<th>Surge (ft)</th>
<th>Wave Height (ft)</th>
<th>Wave Period (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 10  Orleans Land bridge</td>
<td>33</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>11 – 26 St. Bernard &amp; Plaq east bank</td>
<td>36</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>27 – 33 Plaquemines west Bank</td>
<td>33</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>34 – 44 Plaquemines west Bank &amp; GWW</td>
<td>30</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>45 – 51 East Bayou Lafourche</td>
<td>33</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>52 – 53 Golden Meadow</td>
<td>36</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>54 – 104 Golden Meadow to Franklin</td>
<td>40</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>105 – 126 Franklin to Grande Lake</td>
<td>36</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>127 – 134 Grand Lake to Hwy 27</td>
<td>33</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>135 – 142 Hwy 27 to Sabine R.</td>
<td>30</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>200 – 214 Lake Pontchartrain South</td>
<td>13 - 20</td>
<td>9 - 12</td>
<td>8</td>
</tr>
</tbody>
</table>
Conceptual Design of Surge Transfer Spillway
Bayou Lafourche
Conceptual Design of Surge Transfer Spillway
Mississippi River
Draft Non-Structural Measures

Levee Protected >> Non-Structural Measures for Indirect Storm Surge
Non-levee Protected >> Non-Structural Measures for Direct Storm Surge
The wetland habitat goals are the desired future habitat distribution proposed in this plan. This habitat distribution was selected because they compliment other restoration proposals, and they represent potentially sustainable conditions for the coast. The wetland habitat distribution, in general, also corresponds to the historic distribution of habitats around 1900 before significant alteration by humans. One exception is in the area of Atchafalaya & Vermillion Bays where the habitat goals are fresher than historic 1900 conditions. The post-1900 freshening here is due to the increase in discharge through the Atchafalaya River. Since it is desirable to continue the land building of the active deltas which also contribute to the western shore’s mud stream, it is not considered desirable to re-establish the more saline conditions of 1900 in this area of the coast.
Bay Chene Fleur
Little Lake
2007 State oyster seed grounds
Barataria Bay
Caminada Bay
Bay Chene Fleur
2007 Active Oyster leases (pink outlines)
Location of oyster reefs prior to human alterations circa 1900
### Recommended Diversions

<table>
<thead>
<tr>
<th>No.</th>
<th>Location</th>
<th>Flow (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>“Lagan”</td>
<td>1,000 cfs</td>
</tr>
<tr>
<td>19</td>
<td>“Johnson”</td>
<td>1,000 cfs</td>
</tr>
<tr>
<td>20</td>
<td>Davis Pond</td>
<td>10,600 cfs</td>
</tr>
<tr>
<td>21</td>
<td>“Jesuit Bend”</td>
<td>10,000 cfs</td>
</tr>
<tr>
<td>22</td>
<td>Myrtle Grove</td>
<td>20,000 cfs</td>
</tr>
<tr>
<td>23</td>
<td>“Deer Range”</td>
<td>10,000 cfs</td>
</tr>
<tr>
<td>24</td>
<td>“Buras” (minimum)</td>
<td>150,000 cfs</td>
</tr>
<tr>
<td>25</td>
<td>West Bay</td>
<td>25,000 cfs</td>
</tr>
</tbody>
</table>

**TOTAL**: 227,600 cfs
Figure 19. Proposed hurricane protection in Plaquemines Parish.
The “Barataria Basin Landbridge”

Constructed or Planned CWPPRA Projects
10,000 cfs diversion at Jesuit Bend

Minimum area of overland flow

10,000 acres marsh creation & Canal Restoration

Constructed or Planned CWPPRA Projects
Recommended Diversions

18) “Lagan” 1,000 cfs
19) “Johnson” 1,000 cfs
20) Davis Pond 10,600 cfs
21) “Jesuit Bend” 10,000 cfs
22) Myrtle Grove 20,000 cfs
23) “Deer Range” 10,000 cfs
24) “Buras” (minimum) 150,000 cfs
25) West Bay 25,000 cfs

TOTAL 227,600 cfs
Approximate location of proposed diversion at Myrtle Grove

Approximate location of proposed diversion at Deer Range

Extensive wetland loss

Bayou Grand Chenier

Louisiana Department of Natural Resources
**Recommended Diversions**

18) “Lagan” 1,000 cfs
19) “Johnson” 1,000 cfs
20) Davis Pond 10,600 cfs
21) “Jesuit Bend” 10,000 cfs
22) Myrtle Grove 20,000 cfs
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24) “Buras” (minimum) 150,000 cfs
25) West Bay 25,000 cfs

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TOTAL 227,600 cfs
Example Area 2 X 2 miles: estimated cost to
restore 4 sq. miles by marsh creation is at least
$66 million
Postulated Active Geologic Faults

Legend
- Time 1 (1932 - 1958)
- Time 2 (1958 - 1974)
- Time 3 (1974 - 1983)
- Time 5 (1990 - 2001)
Image of Wax lake Delta superimposed over target area for land building diversion at ~ same scale.

Restore > half mile wide wetland buffer adjacent to Back levee.

Restore gulf shoreline.
Restore the Gulf Shoreline and manage the sand budget
Conceptual Design of Controlled Crevasse Levee

Controlled Crevasse

Levee

Levee