THE WATER INSTITUTE
OF THE GULF

FUTURE COSTS OF MARSH CREATION PROJECTS IN COASTAL LOUISIANA

SUMMARY FINDINGS

Fall 2016

Introduction and Approach

This study was conducted to provide the Coast Builders Coalition and the Restore the Mississippi River Delta Coalition with illustrative examples of how project costs can change over time and some of the factors that influence those cost changes. The study was based on previous analyses and estimates of controlling factors, and included no new data collection. The goal was to provide plausible estimates of how costs could escalate if marsh creation using dredged material is delayed for 10, 20, 30, 40, or 50 years. The approach included identifying the controlling factors, selecting example coastal sites, and estimating future changes in coastal condition and their influence on marsh creation project construction. This information was then used to estimate how project costs change and how either borrowing money or investing it could alter the timing of restoration and construction costs. Details of the methodology are described in a separate document. The work conducted by The Water Institute of the Gulf built on previous analysis for the 2017 Coastal Master Plan, which is already publicly available and used with permission of Louisiana Coastal Protection and Restoration Authority (CPRA).

Key Findings

Analysis was conducted for all seven sites, five scenarios, five future time periods, two fill depth criteria, and two inflation rates. The following points outline some of the key findings from the analyses:

- The depth criteria used to determine the areas to be filled has a major influence on cost that changes over time;
    - Filling only shallow areas to create marsh reduces the volume of material needed (and thus construction costs); yet as depths increase over time, less area within the footprint meets the shallow criteria. For some future scenarios, cost decreases in later years as less area meets the fill criteria.
    - Filling to greater depth to create marsh increases the volumes (and construction costs) but enables more land to be built in future years.
- Assumptions about future sea-level rise and subsidence dramatically influence the fill volumes of material needed (and construction costs);
    - Greater increases in construction costs were found at southwest Louisiana sites (lower subsidence areas).
    - Lower increases in total construction costs were found in southeast Louisiana (higher subsidence rates); however, less land was built leading to greater increases in cost per acre created.

- Cost per acre created for even the lowest scenario more than doubles in 20 years, and cost per acre continues to increase over time even for scenarios and fill criteria where less land is created over time;
    - For the medium scenario, cost per acre created increases at nearly 200% in 20 years and more than 600% in 40 years at 2% inflation.
- Finding ways to build projects sooner (e.g., selling bonds) decreases total construction costs, and land building benefits are realized sooner; and
    - For the medium scenario, savings can be as much as 30% versus waiting 10 years to build.
- Delays in construction make projects more expensive as water gets deeper and land degrades over time. The construction cost increase is not compensated for by interest earnings even in low subsidence areas where the increase in construction costs due to delay is least.

Further Analyses

The work summarized here has focused on the land built at the time of construction and the costs potentially incurred to build that land. It does not consider the fate of the created land once it has been built. Estimating how long the created marshes survives in the face of sea-level rise, subsidence, and other long-term factors contributing to land loss requires more complex analysis and additional assumptions about interactions among marsh creation projects and other restoration and protection activities.