

Canal Backfilling to Achieve Hydrological Restoration in Coastal Wetlands in Louisiana

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The freshwater deltaic wetlands present in the Barataria Preserve of Jean Lafitte National Historical Park and Preserve are among the most biologically productive ecosystems in North America. Canals were dredged here starting in the mid-1800s, primarily to support natural resource extraction. The dredged material was deposited in spoil banks alongside the canals. The canal channels brought marine influence into freshwater wetlands and spoil banks blocked natural flow of water across the landscape, altering hydrology at the landscape scale. The changes in hydrology have ultimately resulted in impoundment, saltwater intrusion, soil compaction, habitat modification, invasive species introduction, and wetland loss. The National Park Service (NPS) is implementing a hydrological restoration effort where 12 miles of canals have been backfilled to reduce marine influence and to increase hydrologic exchange between the canal channels and adjacent wetlands, restoring more natural hydrological and biogeochemical processes at landscape scales. CDM Smith, in support of NPS, is executing a robust environmental and ecological monitoring plan to evaluate restoration outcomes. Monitoring includes observation of water levels and quality, soil properties, vegetative cover and species composition, invasive species presence, nekton presence and abundance, net primary productivity, accretion and/or erosion, and subsidence.

Excavation of canals in wetlands for development or natural resource extraction is a worldwide problem, and restoring wetland function can restore ecosystem services essential for sustaining human communities. Degrading remnant spoil banks into canals is an underutilized restoration method that is a cost-effective approach to address historic degradation of wetlands. In our presentation we will identify which environmental and ecological properties responded rapidly to hydrologic re-connection and evaluate how these shifts support park management goals of reducing marine influence from the Gulf of Mexico. During the presentation we will discuss lessons learned and construction tradeoffs to the restoration approach.

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