Engineering With Nature Project Fact Sheet

Island Creation and Stabilization Review and AdH Modeling to Develop Best Practices, Design Criteria, and Recommendations for Large Navigable River Island and Secondary Channel Management

Background

Large navigable rivers have been modified in ways that channelize main channels and isolate off-channel aquatic areas to concentrate flow to create safe and efficient navigation channels. Channelization eliminates natural island forming processes and degrades existing island and secondary channel habitat. Concurrent levee building to reduce flood risks to agriculture and urban areas isolates seasonal floodplain habitats and ecological processes such as fish spawning and rearing, sediment and nutrient exchange, and terrestrial habitat forming processes. The outcome for many river reaches is uniform sand bed channels, armored banklines, numerous river training structures, swift currents, extreme stage variation over 50-ft in some reaches, and associated loss of historic aquatic and floodplain habitat that provided important ecosystem services.

Objectives

1. Evaluating the effectiveness of current island building approaches relative to various habitat and mission environments.
2. Developing hydro-geomorphic tools to aid in the implementation of island design based on natural reference sites, site constraints, and maintenance goals.
3. Create guidance on numerical model capabilities for the short and long-term morphologic analysis of artificial island creation using in-stream dredged sediment placement.

Approach

This research will:

1. Review island geomorphic, hydraulic and ecosystem function at prior USACE projects and high quality reference sites.
2. Evaluate standardized metrics at selected case study sites
3. Model a generic riverine island and apply it to case studies.
4. Develop island design guidance.

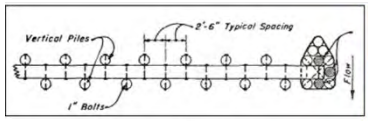
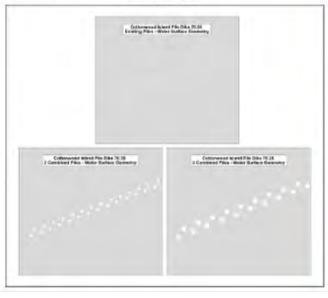
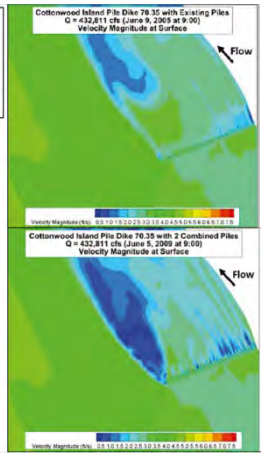


Figure 69. Water surface geometry of the different pile combinations.





Outcomes

This research will increase the environmental benefits of dredged sediment and ecosystem management in USACE inland waterways and river ecosystems.

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