



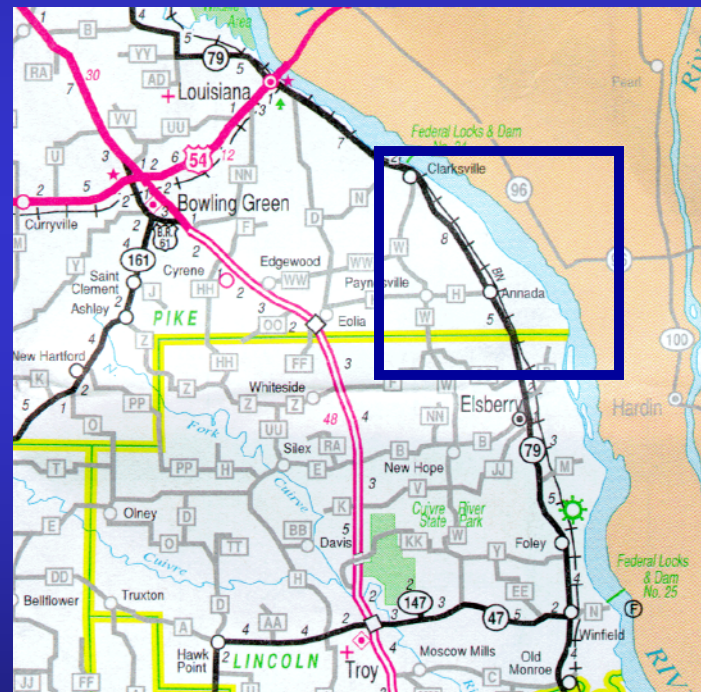
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# CARROLL ISLAND

# MICROMODEL STUDY

## River Miles 273.0-263.0



Sponsored by the  
Avoid and Minimize Program

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# Purpose of the Study



The primary goal of this micromodel study is to reduce or eliminate the need for repetitive dredging adjacent to the upstream and downstream ends of Carroll Island, while maintaining or improving current environmental conditions.



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# Study Reach Characteristics

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Multiple Round Point Structure



Chevron Structures



Flow Distribution



Notched Off-Bank Revetment

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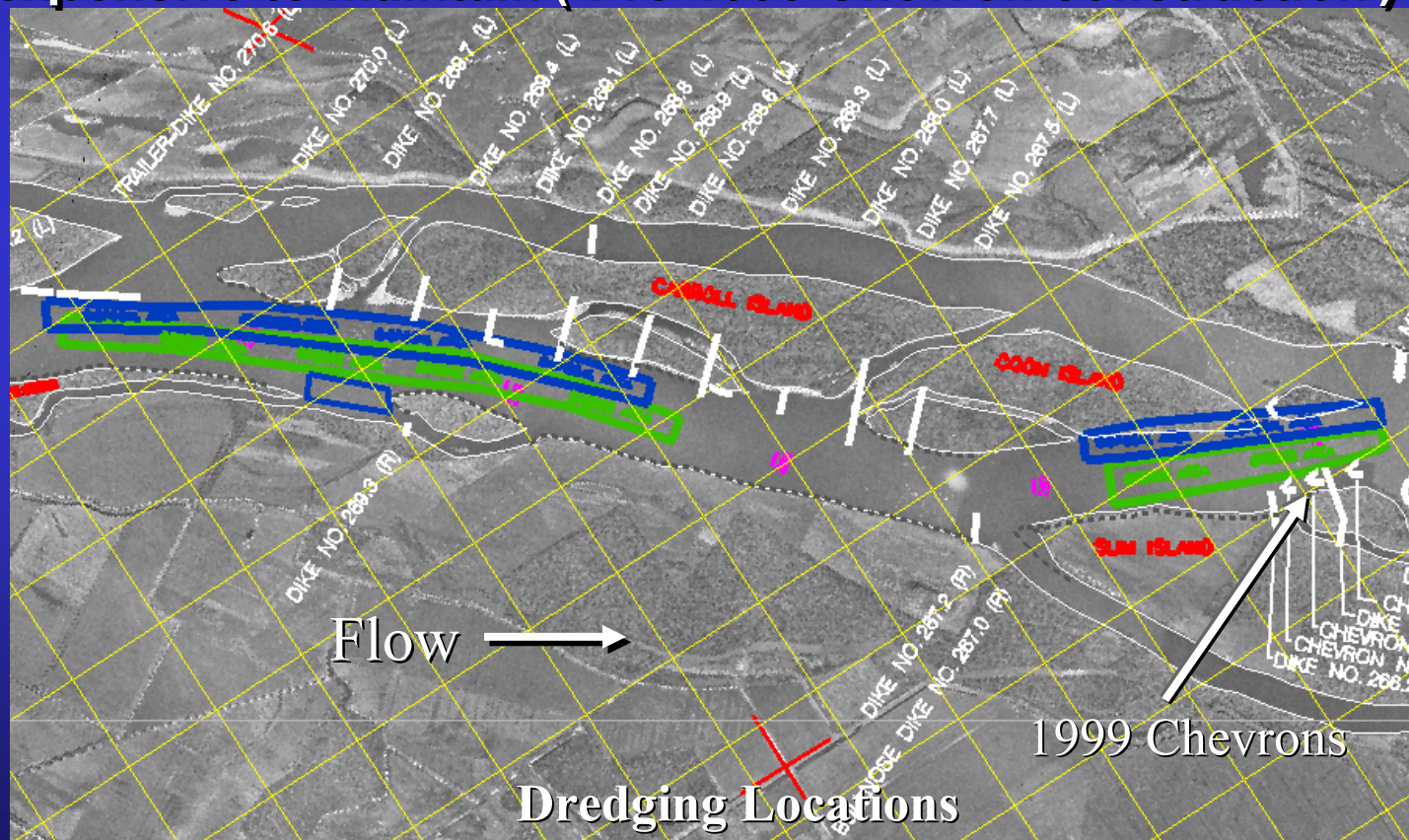


# Carroll Island Dredging Costs



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- \$6.4 Million between 1979 and 2001
- Upstream and Downstream dredging locations are equally expensive to maintain ( Pre-1999 Chevron construction )



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# Study Reach Challenges



- **Lock and Dam 24 as a controlling factor**
- **Important Environmental habitat in multiple side channels**
- **Existence of numerous buried pile dike structures**
- **Miles of Revetment**
- **Repetitive Dredging and artificial channel placement**



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# Model Characteristics



- Horizontal scale of 1" : 800
- Vertical scale of 1" : 27
- Distortion of 29.6
- Volumetric flow rate is approximately 2.7 GPM
- Table slope is approximately 0.00625 in/in



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# Micromodel Setup



Model Insert



Standpipe



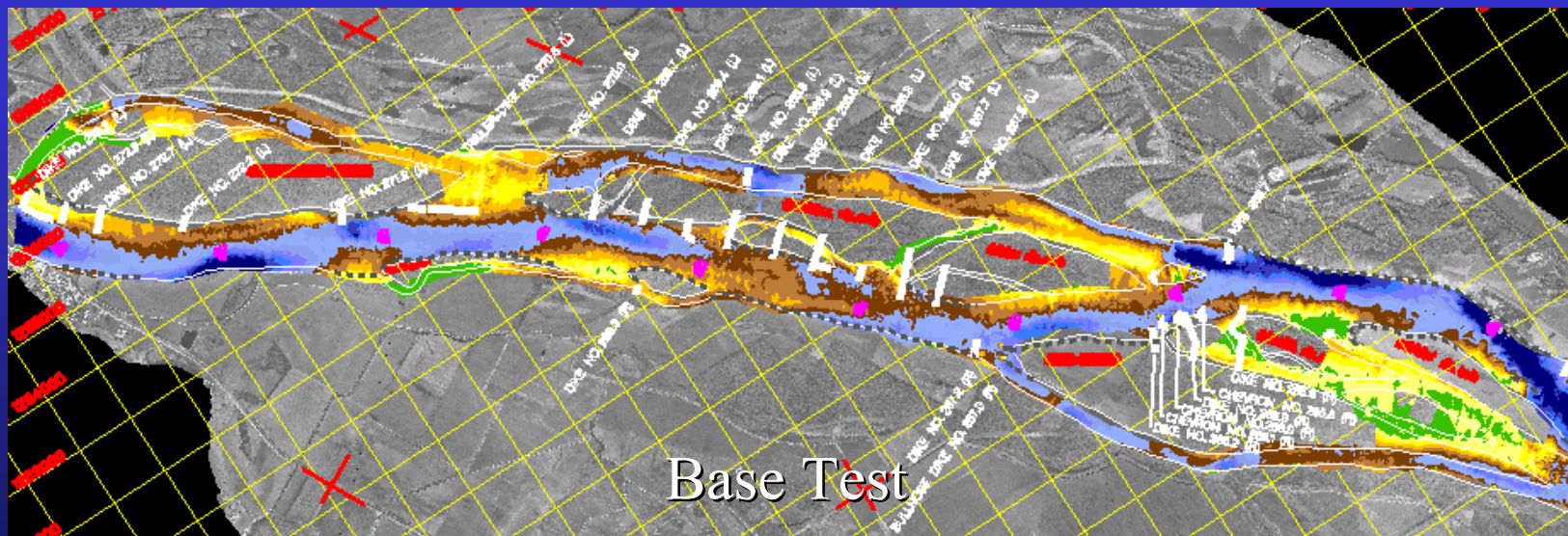
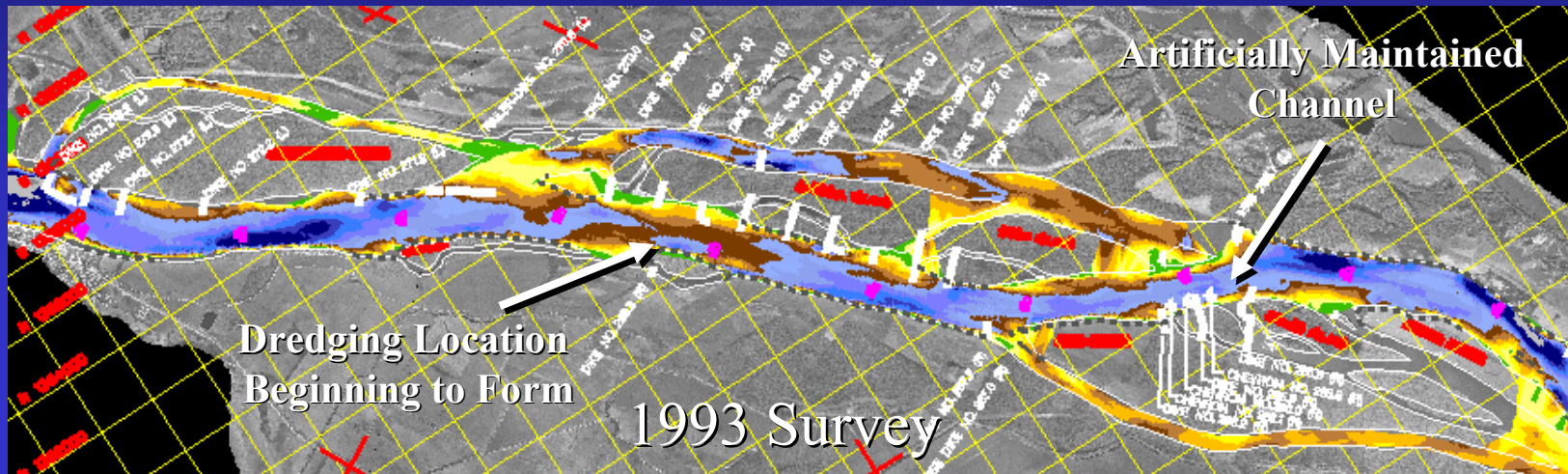
Storage Manifold

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# Model Calibration



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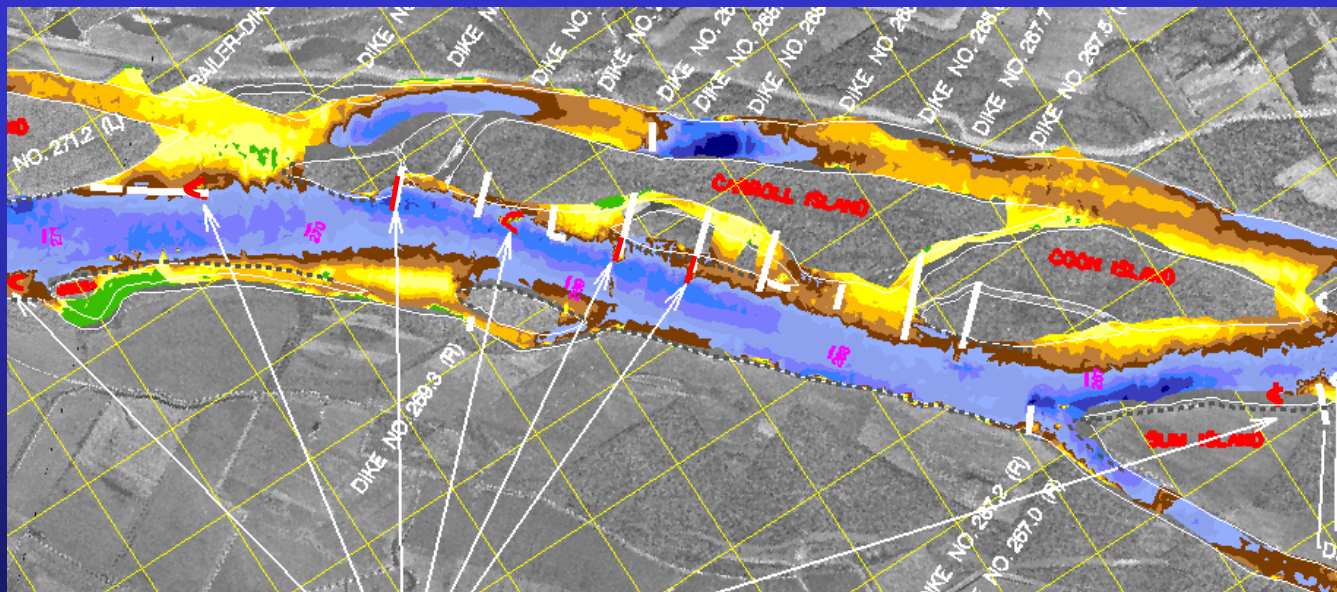


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# Alternative Testing



- 18 Alternatives Tested
- Dike Structures and Chevron Structures were tested in different combinations
- Alternatives 15 and 16 accomplished the study goals, although Alternative 16 added the additional benefit of an additional Chevron Structure, and one less Raised Dike Structure



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# Carroll Island Micromodel

## Summary



- **Model Study was initiated to alleviate repetitive dredging concerns**
- **Innovative structures already implemented in this reach, such as a Multiple Round Point Structure and a Chevron field.**
- **Important Environmental reach, with many side channels.**
- **Excellent Model Calibration**
- **18 Design Alternatives tested**
- **Design implementing 4 Chevrons and 3 Rock Dikes chosen as the best solution**



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Questions?

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