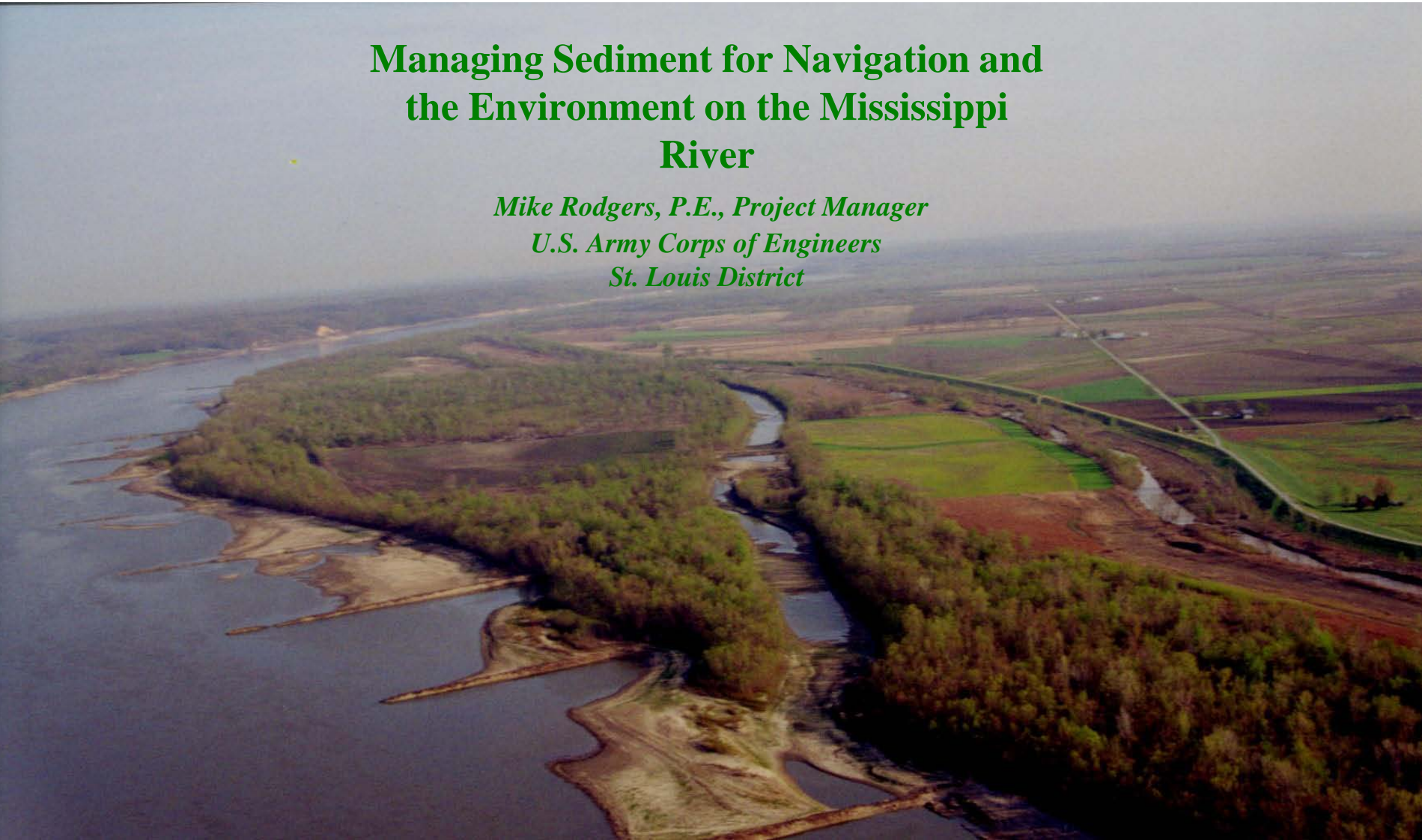




Managing Sediment for Navigation and the Environment on the Mississippi River

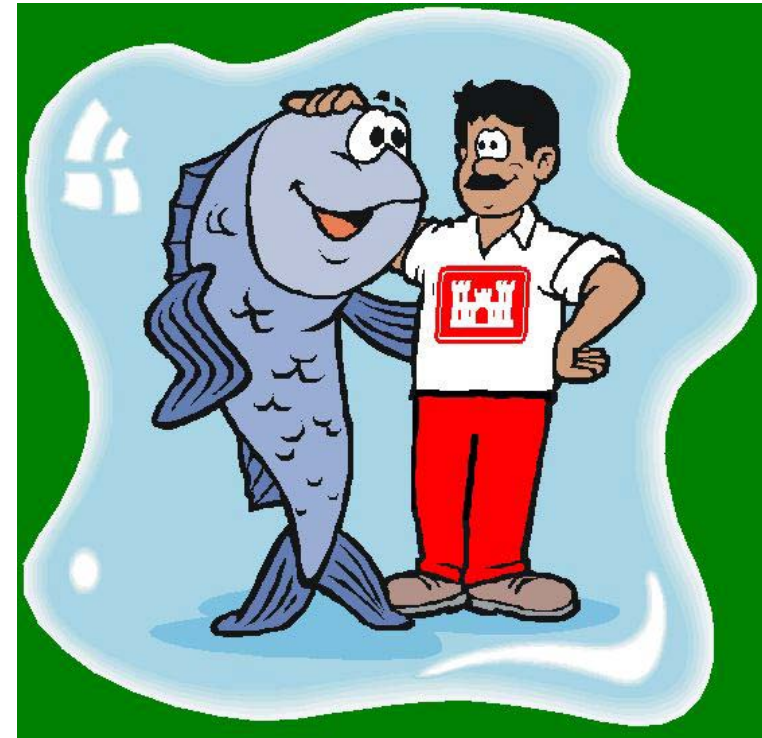
*Mike Rodgers, P.E., Project Manager
U.S. Army Corps of Engineers
St. Louis District*





The Objective

Develop a Reliable, Safe and Environmentally Sustainable Navigation Channel





The Design

9 feet (3m) deep, 300 feet (100m) wide,
with additional width in bends as required





2 football fields long

9 feet deep

'94 5 11



Primary Authority Maintain Navigation Channel





While Minimizing the Impact to the Environment

Least Tern



Pallid Sturgeon





Historical River Training Methodology





Traditional Far Field Sediment Management





Modern Far Field Sediment Management



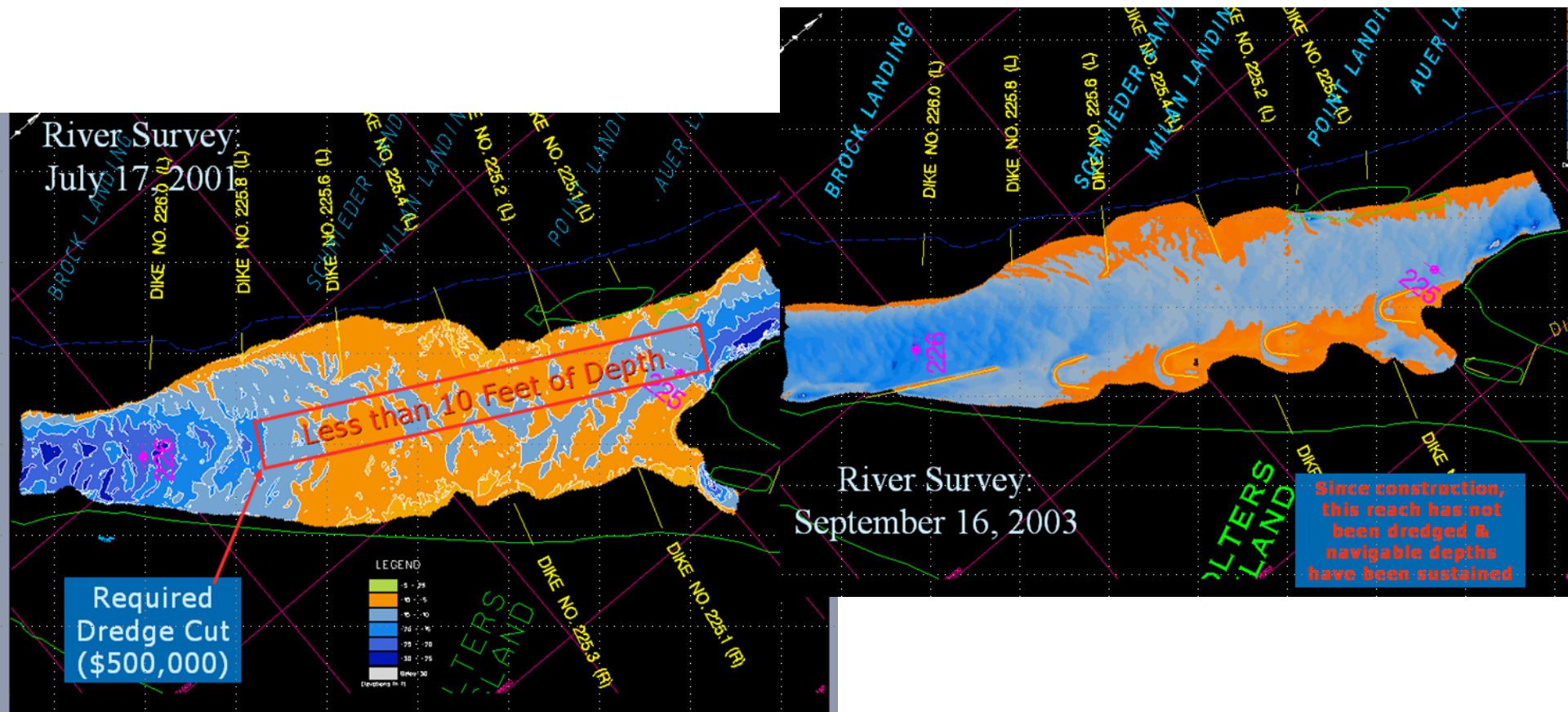


Bolter's Bar RM 225

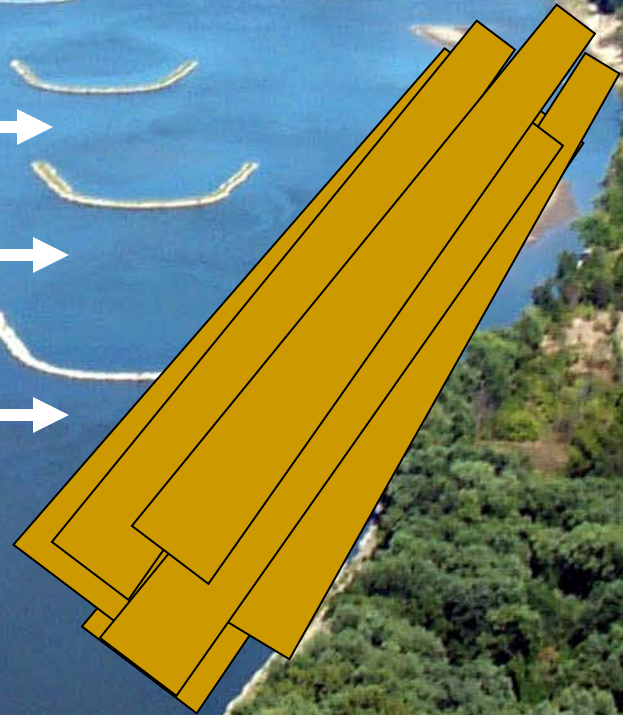
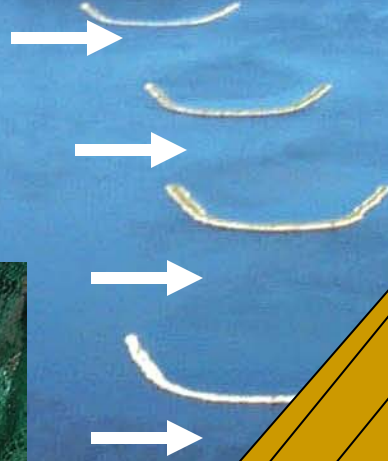
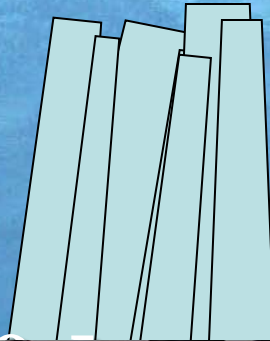




Pre and Post Construction Surveys Bolter's Bar



2002 Construction - \$1.5 mil





US Army Corps of Engineers



St. Louis Harbor Chevrons



Building Strong



U.S. ARMY

US Army Corps of Engineers



Notched Dikes



Building Strong



US Army Corps of Engineers



Rootless Dikes





US Army Corps of Engineers



Bullnose Revetments





Alternating Hardpoints





US Army Corps of Engineers



Offbank Revetments



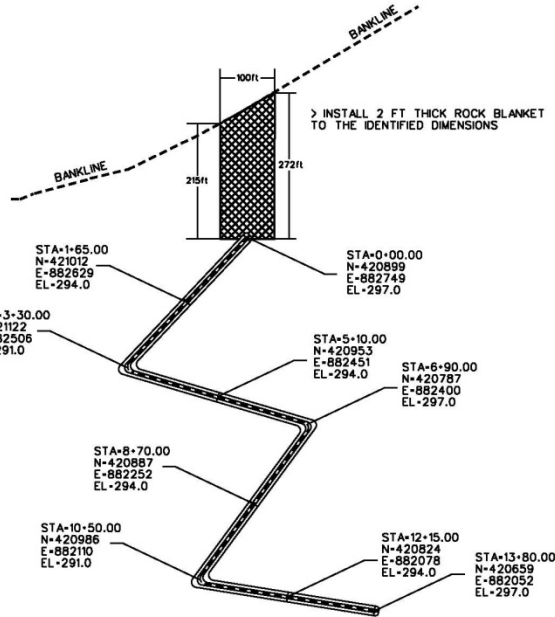


“W” Dikes

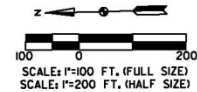




US Army Corps of Engineers



W-DIKE 4.2 L



US Army Corps of Engineers
 St. Louis District

REVISION BLOCK

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS DISTRICT UPPER MISSISSIPPI RIVER BASIN RIVER MILES 26.8 - 6.0	Designed By M. WOODS, P.E.	Reviewed By J. BROWN, P.E.	Survey Date Old Job New Job
Checked By M. WOODS, P.E.	Drawn By M. WOODS, P.E.	Approved By R. LAWNEY, P.E.	Project Name RIVER MILES 26.8 - 6.0

ELIZA PT. / GREENFIELD BEND
 RIVER MILES 26.0 - 0.0
 MISSISSIPPI RIVER
 STONE DIKE CONSTRUCTION AND MODIFICATION
 CONSTRUCTION YEAR: 4, 5, 11
 PLAN VIEW

PLATE NUMBER
 H-UH-26/R-15

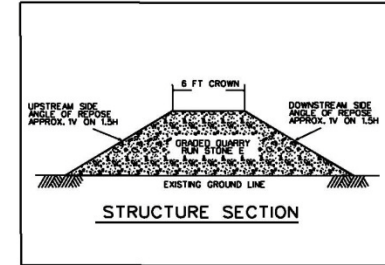


US Army Corps of Engineers

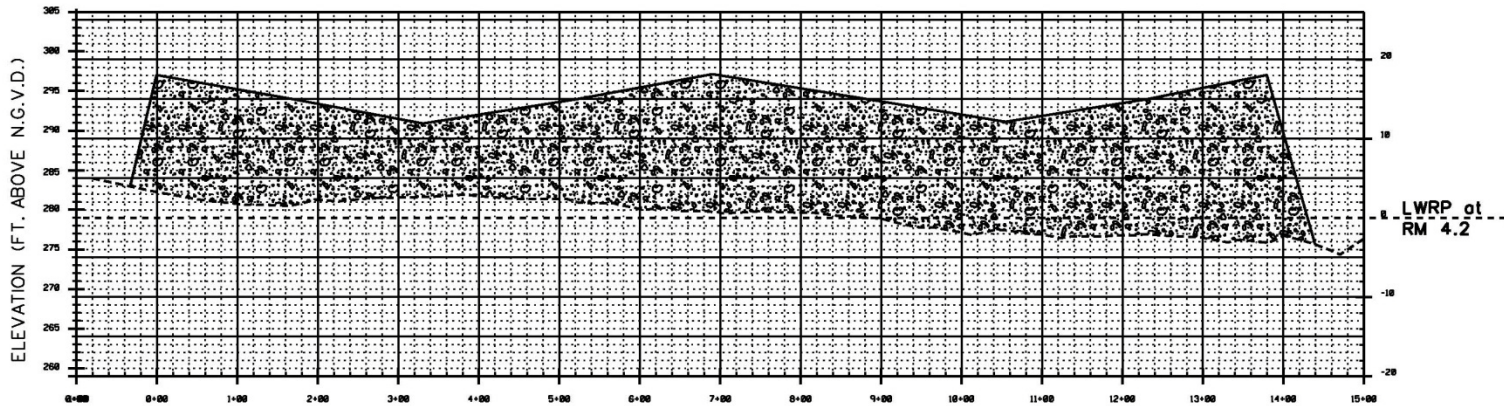


GAGE RECORD			
	WATER SURFACE	THOMPSON	BIRDS PT
ZERO N.G.V.D.		280.0	274.5
MILE		20.2	2.0
L. W. R. P.		289.0	277.9

ELEVATIONS ARE REFERRED TO N.G.V.D. - CONTOURS ARE BELOW 1956-57 LOW WATER REFERENCE PLANE (L.W.R.P.) (54,000 C.F.S.)



W-DIKE 4.2 L LOOKING DOWNSTREAM



US Army Corps of Engineers
St. Louis District

REVISION BLOCK

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI
UPPER MISSISSIPPI RIVER BASIN
RY BR BRANDED
RIVER MILES 20.1E-4.8

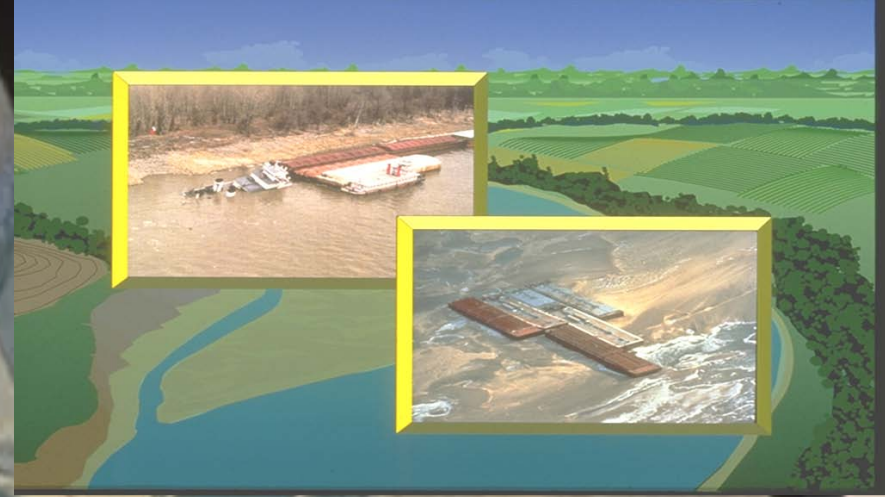
Drawn by: M. WOODS, P.E.
Checked by: M. WOODS, P.E.
Project Engineer: M. WOODS, P.E.

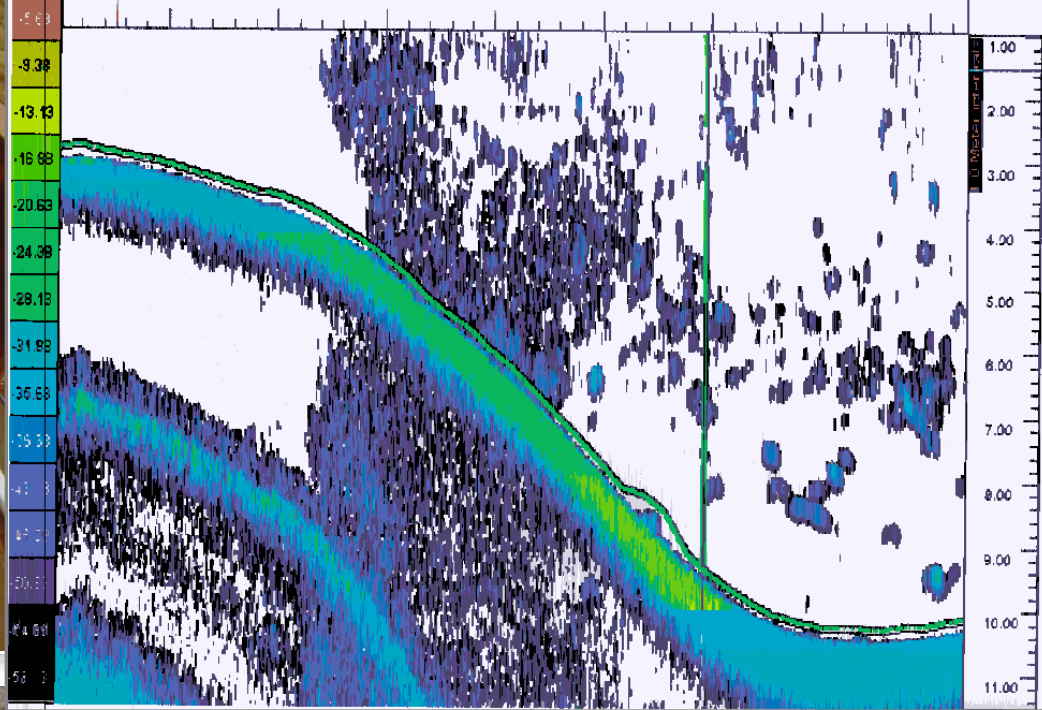
ELIZA PT / GREENFIELD BEND
RIVER MILES 20.0E-0.0
MISSISSIPPI RIVER
STONE DIKE CONSTRUCTION AND MODIFICATION
CONSTRUCTION OF DIKE 4.2 (L)
PROFILE VIEW

PLATE NUMBER
H-UM-28/R-16



Navigating Bends “Flanking”







US Army Corps of Engineers



Side Channel Enhancement Alternating Dikes





U.S. ARMY

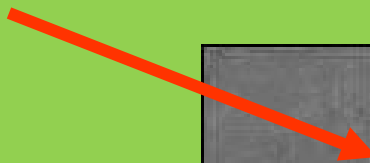
US Army Corps of Engineers



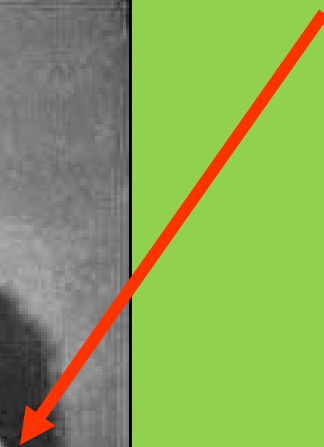
Building Strong

1950 to 1993 Environmental Plan Formulation on the Mississippi River “Title Bouts”

Biologist

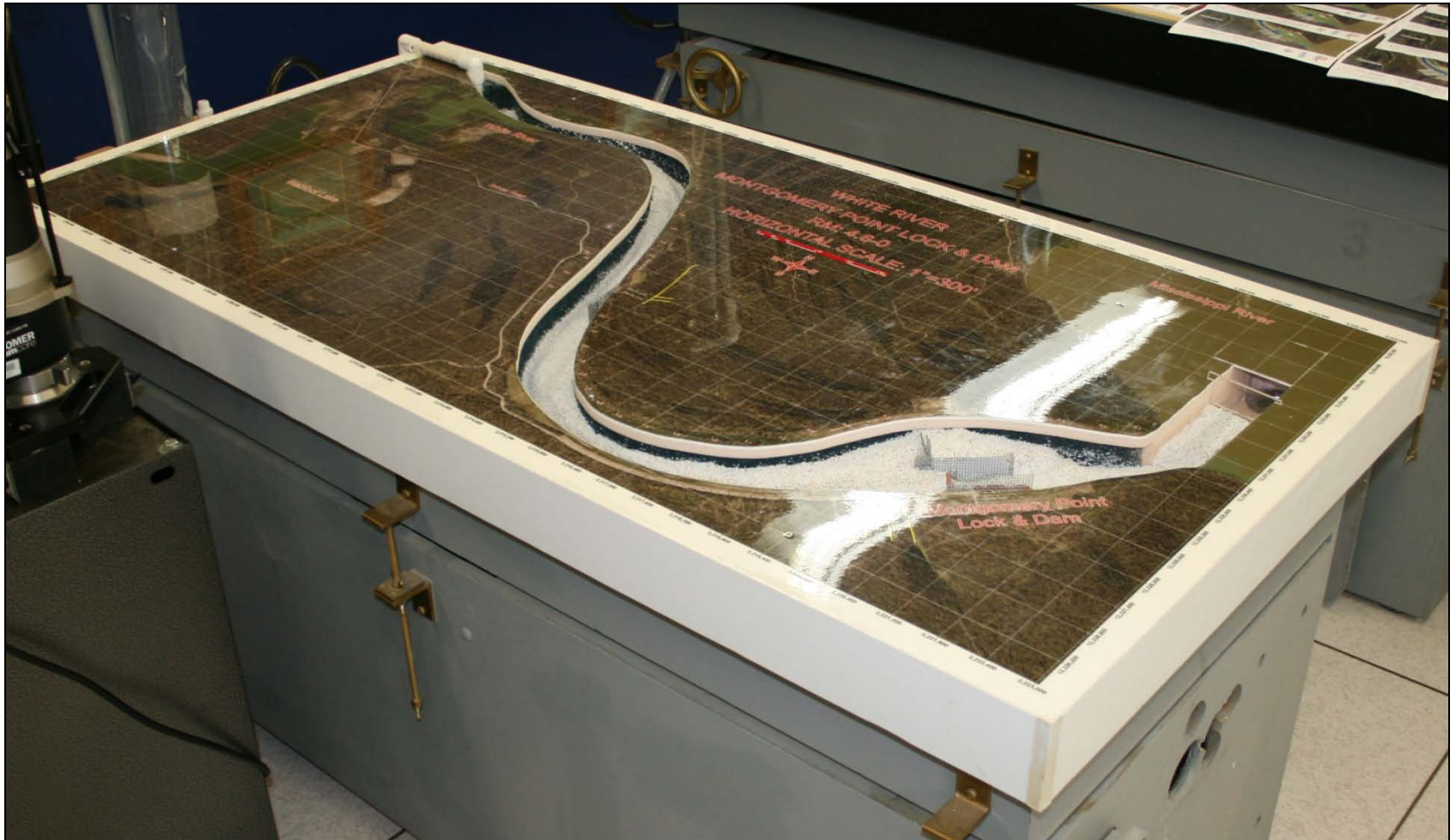


Engineer





HSR Modeling



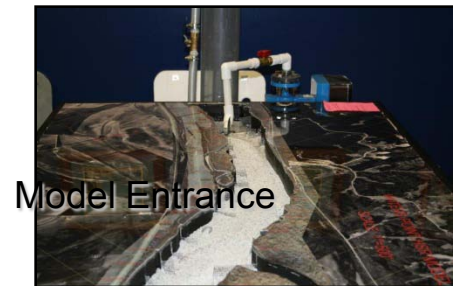
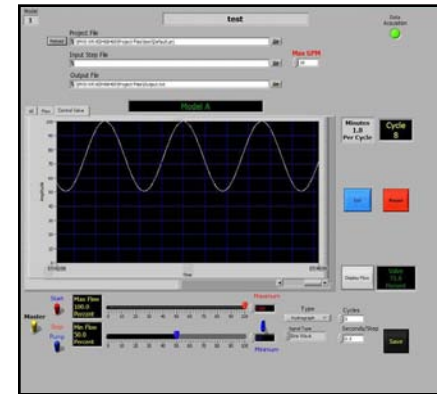
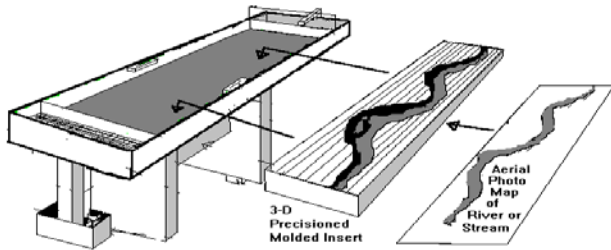


Incorporates Partners with Engineering Alternatives

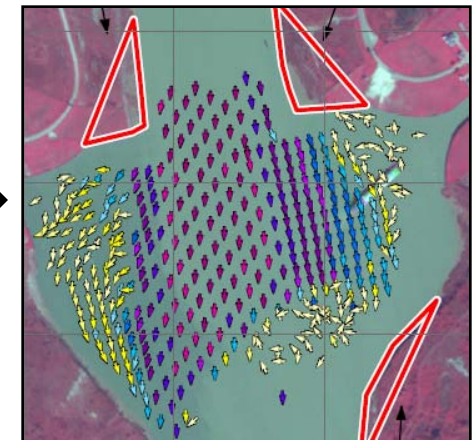
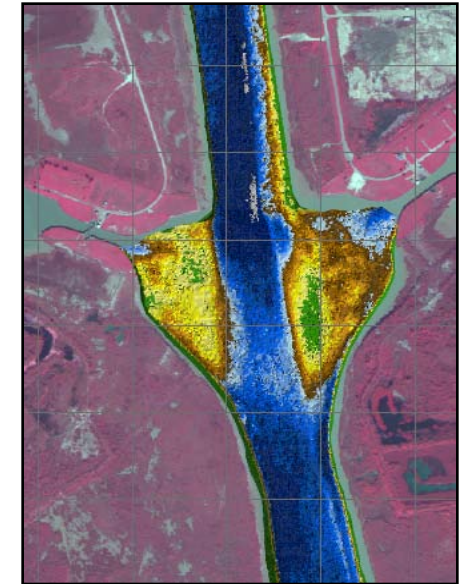


HSR Model Basics

MICRO MODEL INSERT



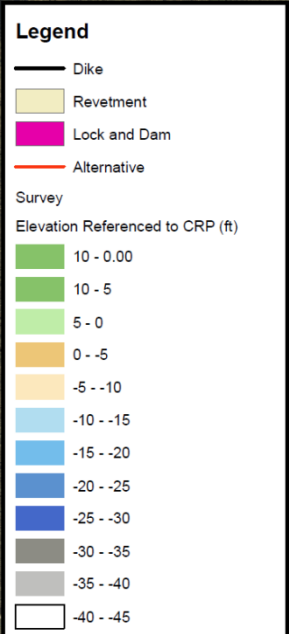
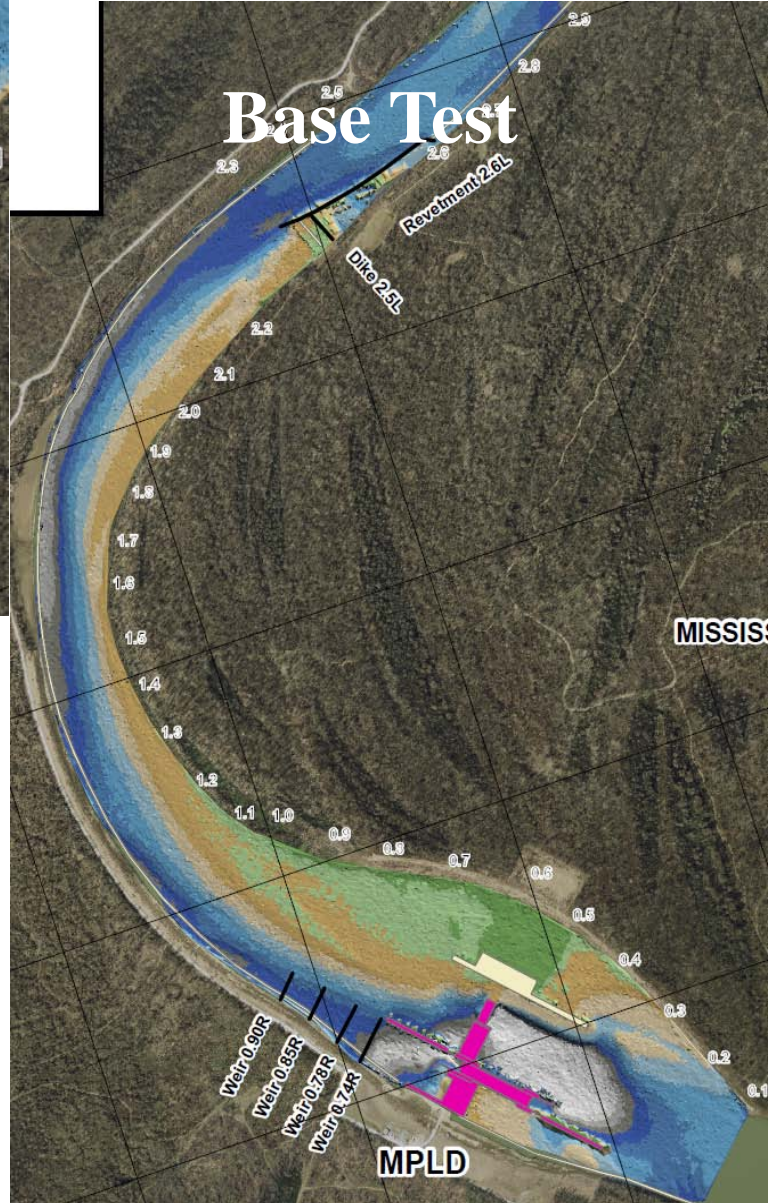
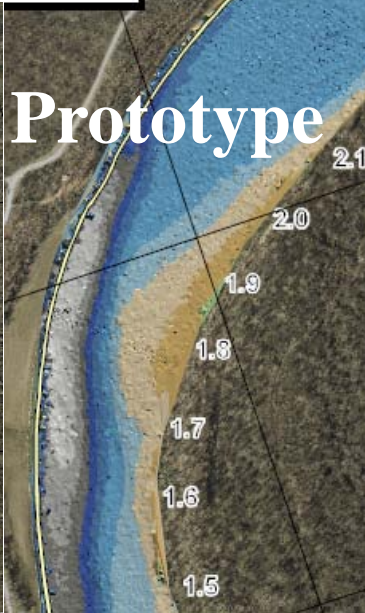
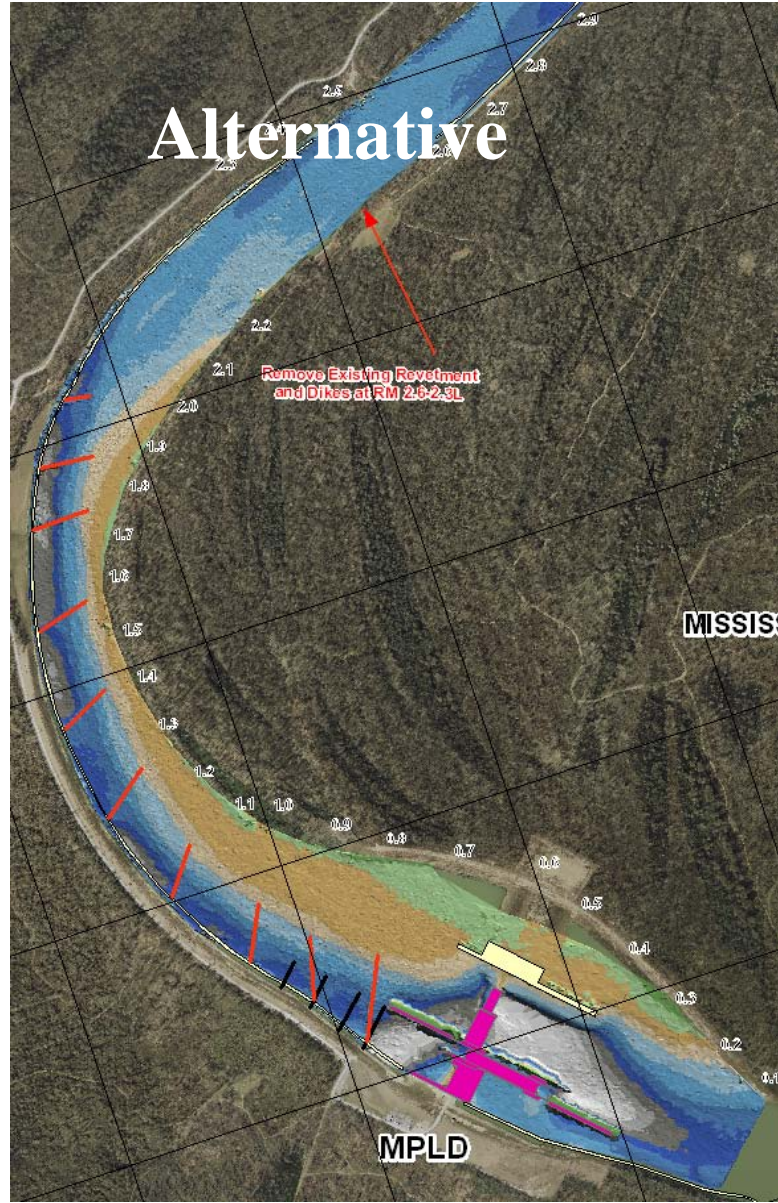
HSR Model Basics



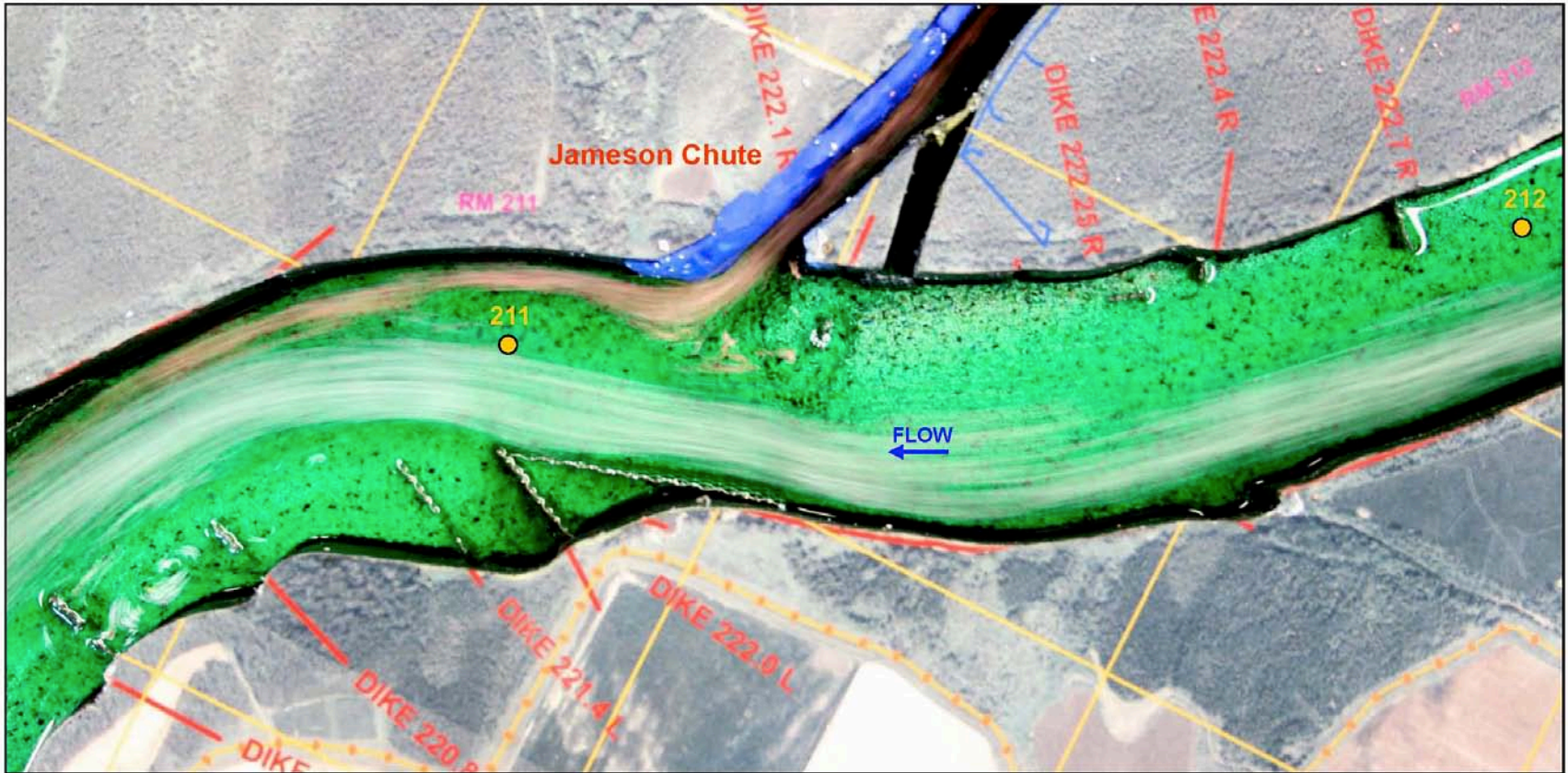
Alternative

Prototype

Base Test



Flow Visualization





Questions

