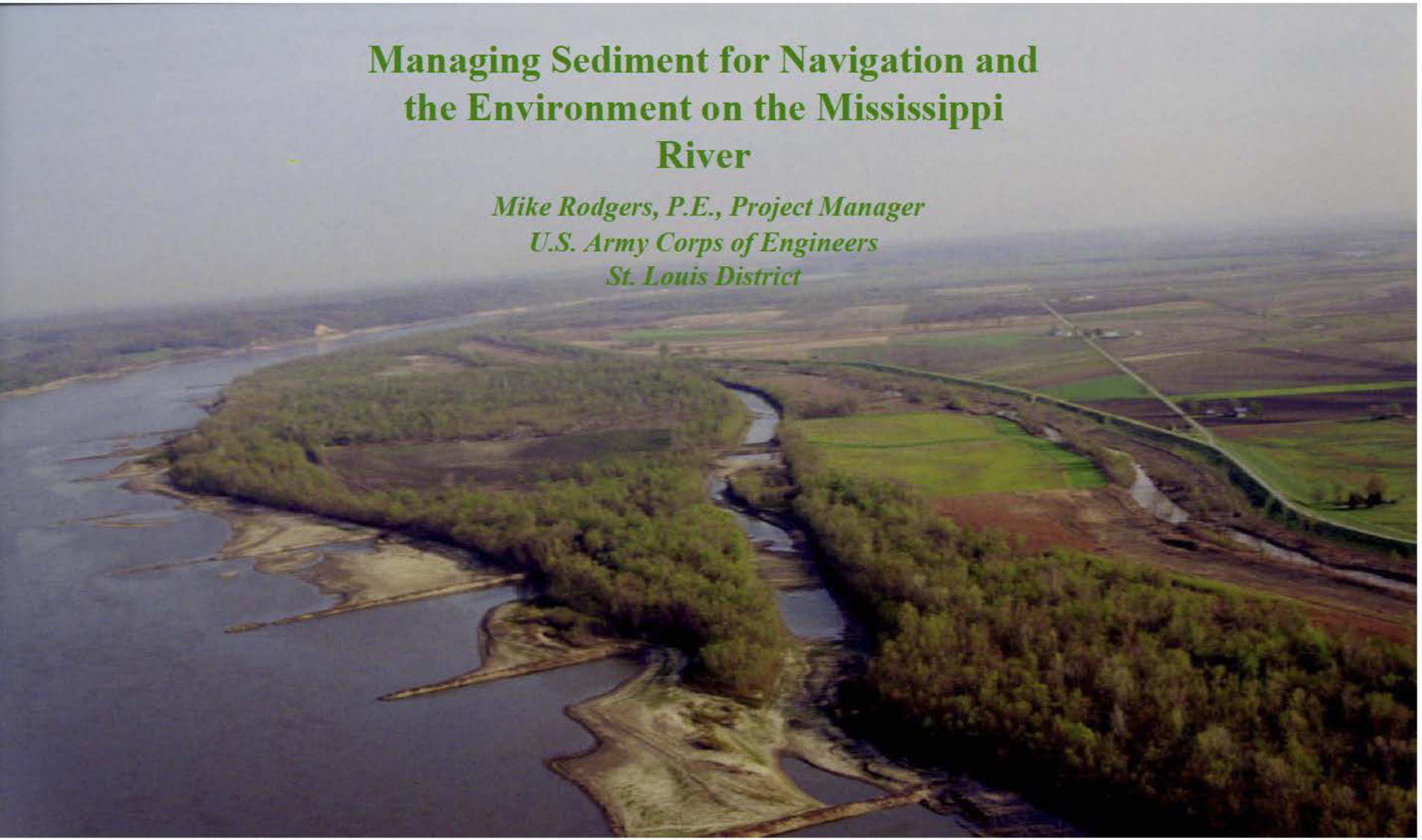
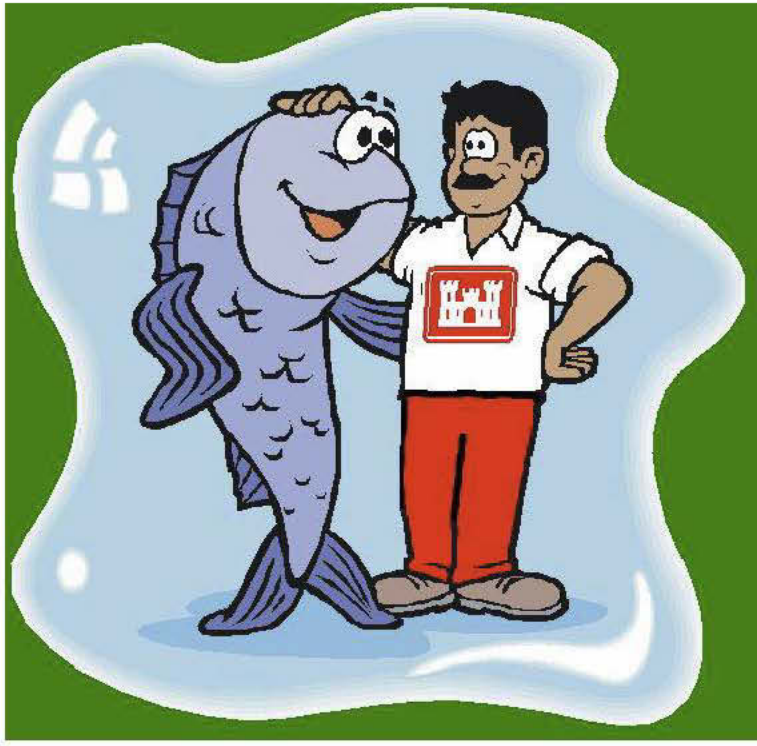
Managing Sediment for Navigation and the Environment on the Mississippi River

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

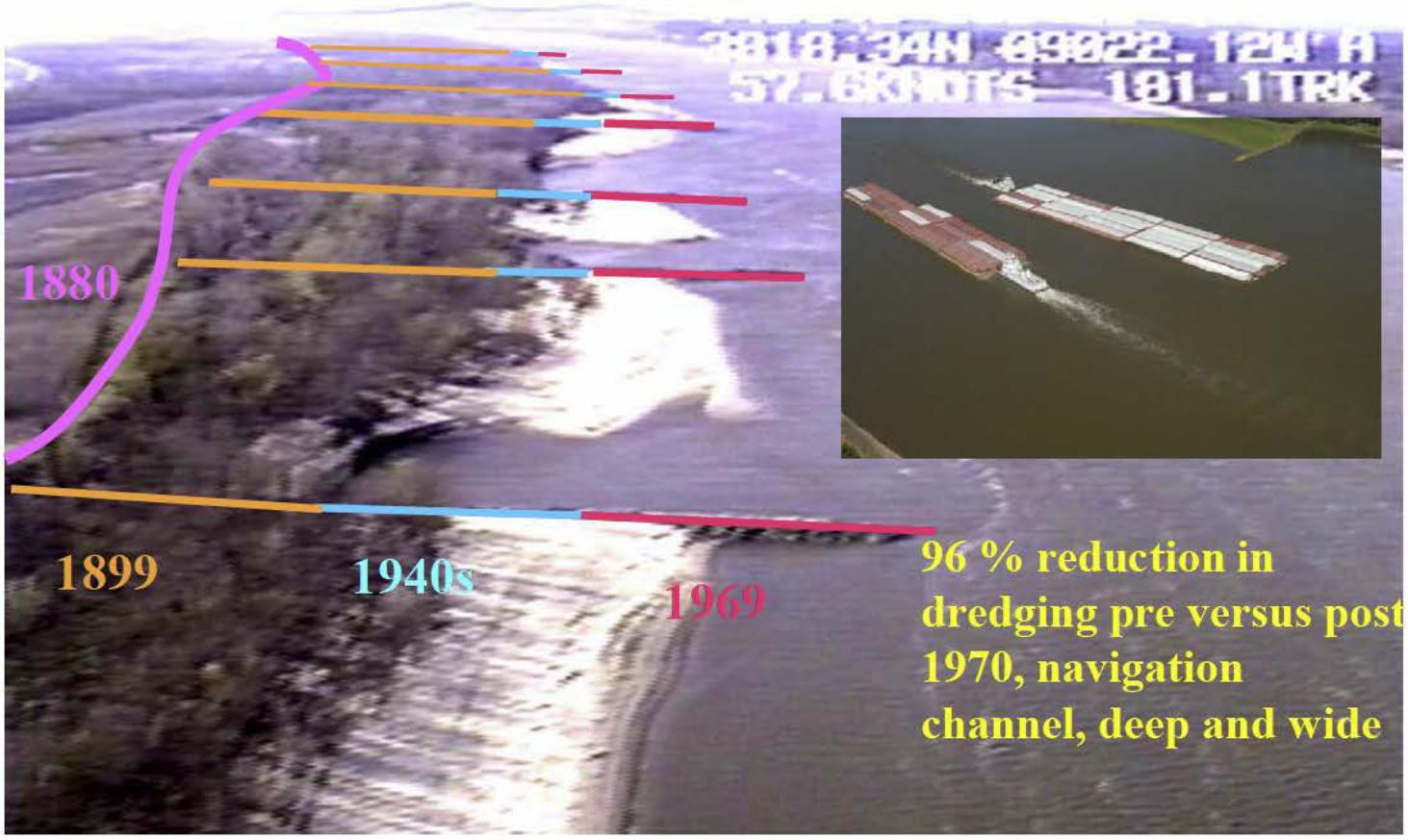
9 feet (3m) deep, 300 feet (100m) wide, with additional width in bends as required

2 football fields long
9 feet deep
'94 5 11

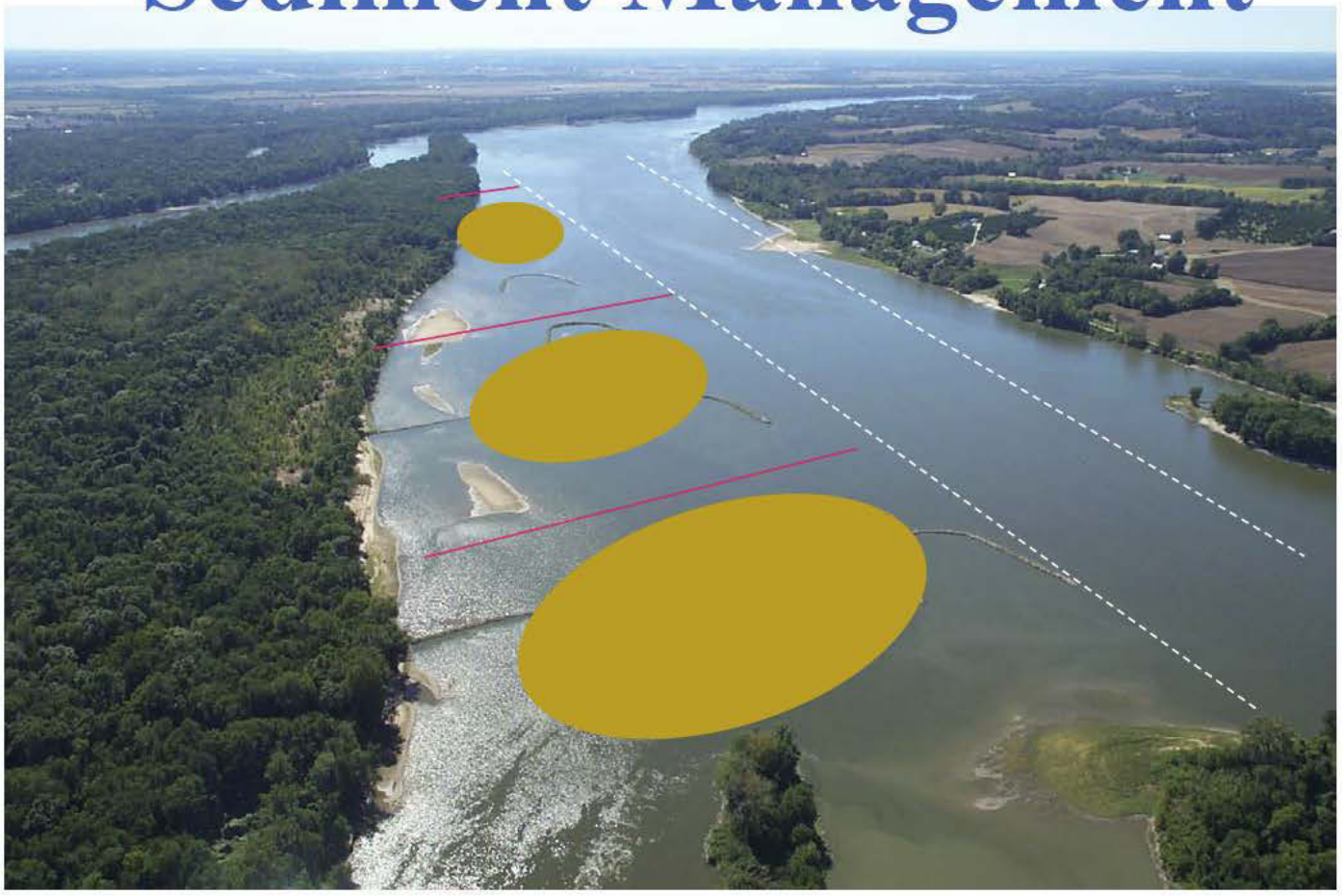
Primary Authority
Maintain Navigation Channel

While Minimizing the Impact to the Environment

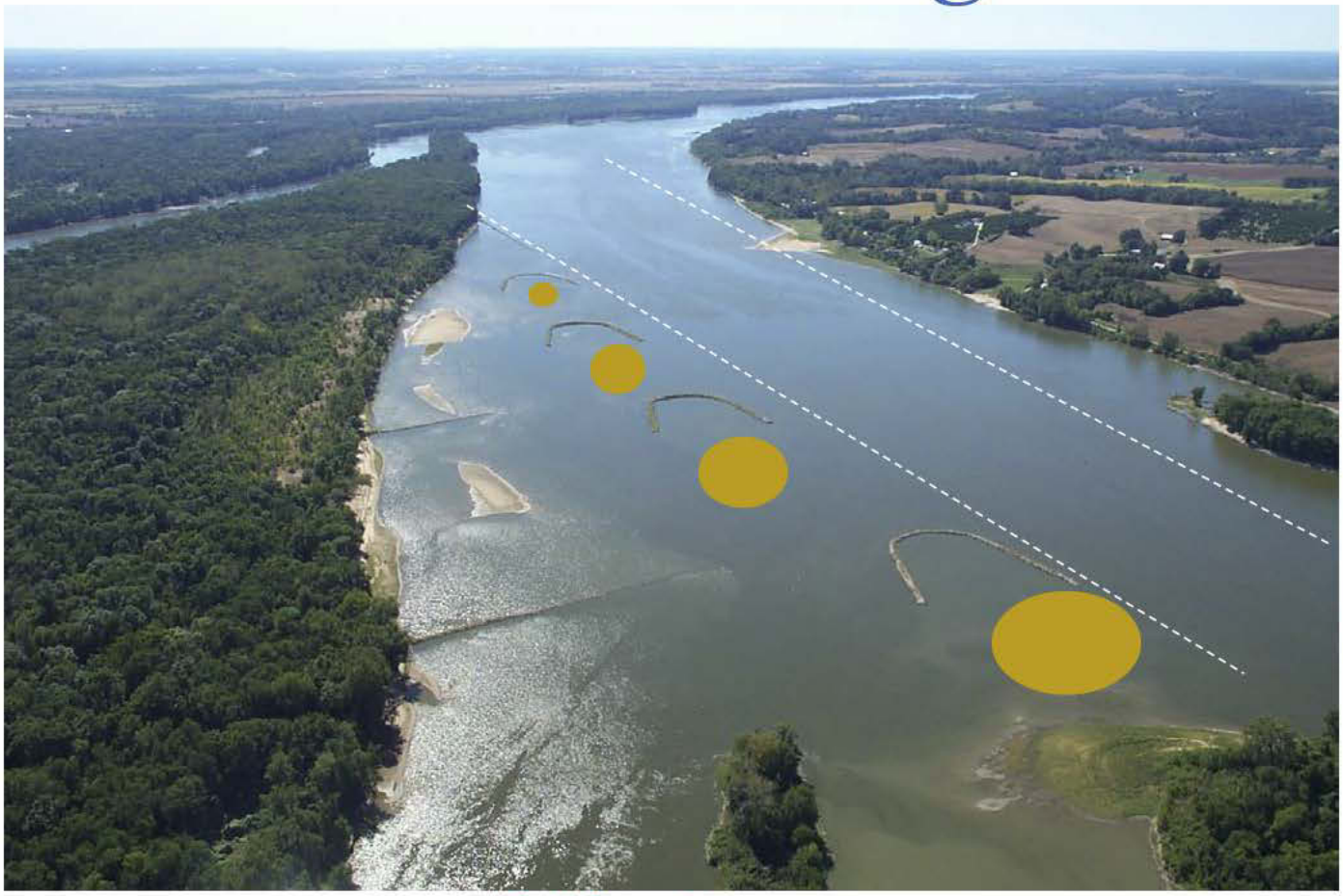
Historical River Training Methodology



Traditional Far Field Sediment Management

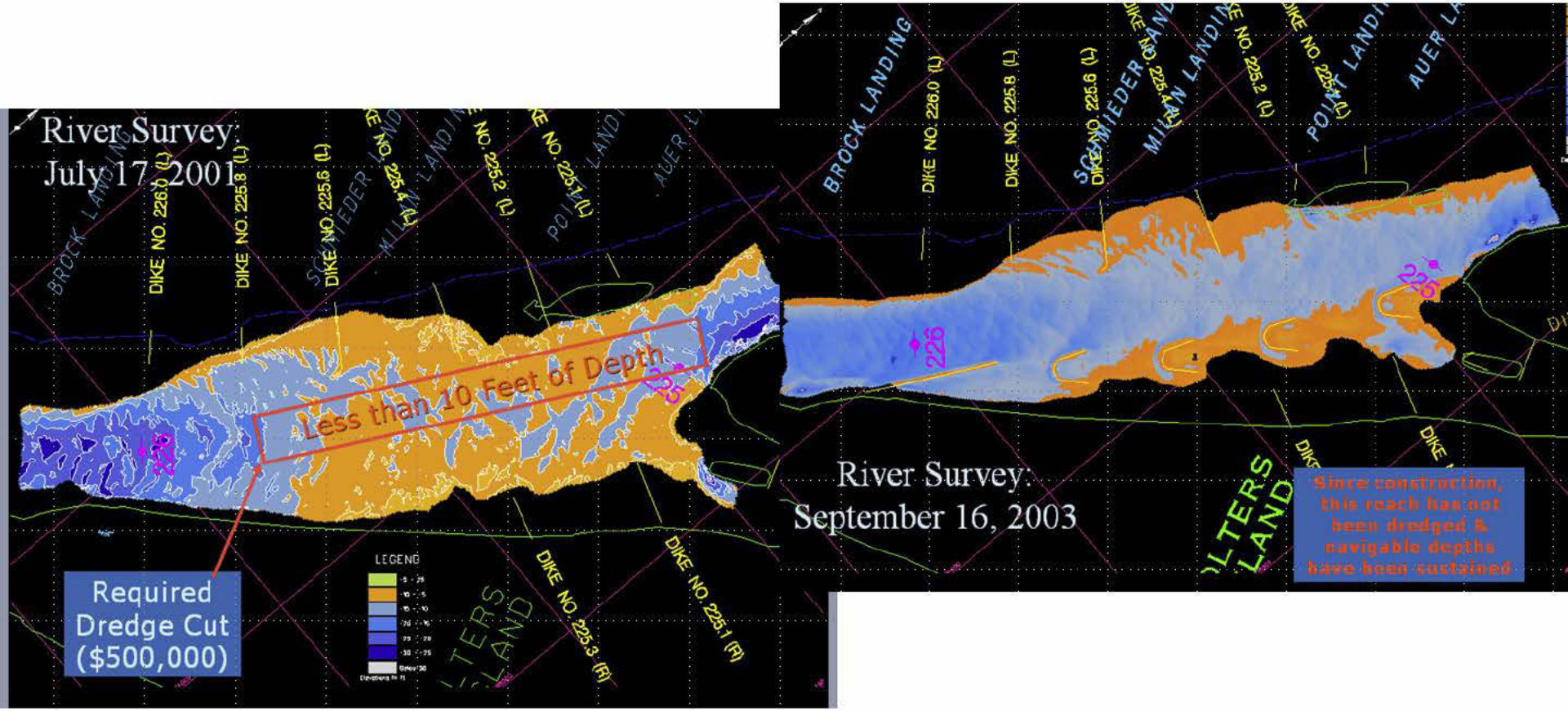


Modern Far Field Sediment Management



Bolter's Bar RM 225

Pre and Post Construction Surveys Bolter's Bar



2002 Construction - $1.5 mil

St. Louis Harbor Chevrons

Notched Dikes

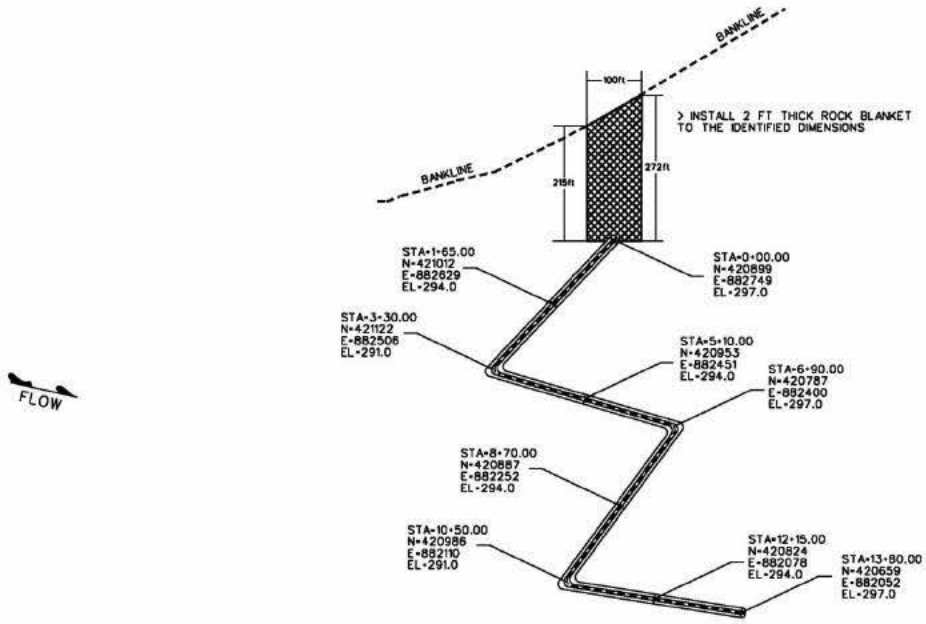
Rootless Dikes

Bullnose Revetments

Alternating Hardpoints

Offbank Revetments

"W" Dikes



W-DIKE 4.2 L

US Army Corps of Engineers St. Louis District

REVISIONS BLOCK

U.S. ARMY ENGINEER DIVISION CORPS OF ENGINEERS ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN FY 88 AWARD RIVER MILES 26.8 - 0.0

ELIZA PT / GREENFIELD BEND RIVER MILES 28.0 - 0.0 MISSISSIPPI RIVER

STONE DIKE CONSTRUCTION AND MODIFICATION CONSTRUCTION OF W-DIKE 4.2 (L) PLAN VIEW

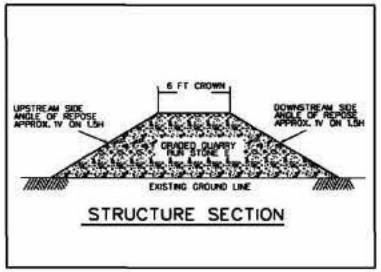
PLATE NUMBER M-LN-28/R-15

SCALE: 1"=100 FT. (FULL SIZE)
SCALE: 1"=200 FT. (HALF SIZE)

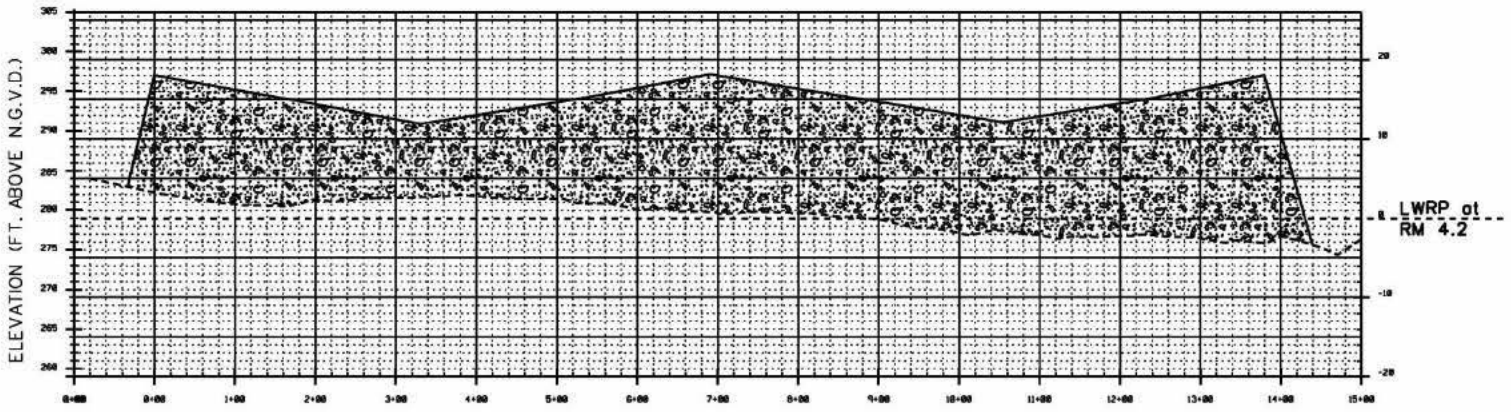
w_dike_4_2L.dgn 8/23/2007 11:09:15 AM

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

REVISIONS BLOCK

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

UPPER MISSISSIPPI RIVER BASIN
FY 08 AWARD
RIVER MILES 20.0-0.0

Designed by: E. BRAUER
Drawn by: M. ROGERS, P.E.
Reviewed by: J. BROWN
Survey Date
Chk'd by: E. BRAUER
Approved: R. DAVENPORT, P.E.
Chief, River Engineering
File name
Plot date

ELIZA PT / GREENFIELD BEND
RIVER MILES 20.0-0.0
MISSISSIPPI RIVER

STONE DIKE CONSTRUCTION AND MODIFICATION
CONSTRUCTION OF DIKE 4.2 (L)
PROFILE VIEW

PLATE NUMBER
M-UM-20/R-16

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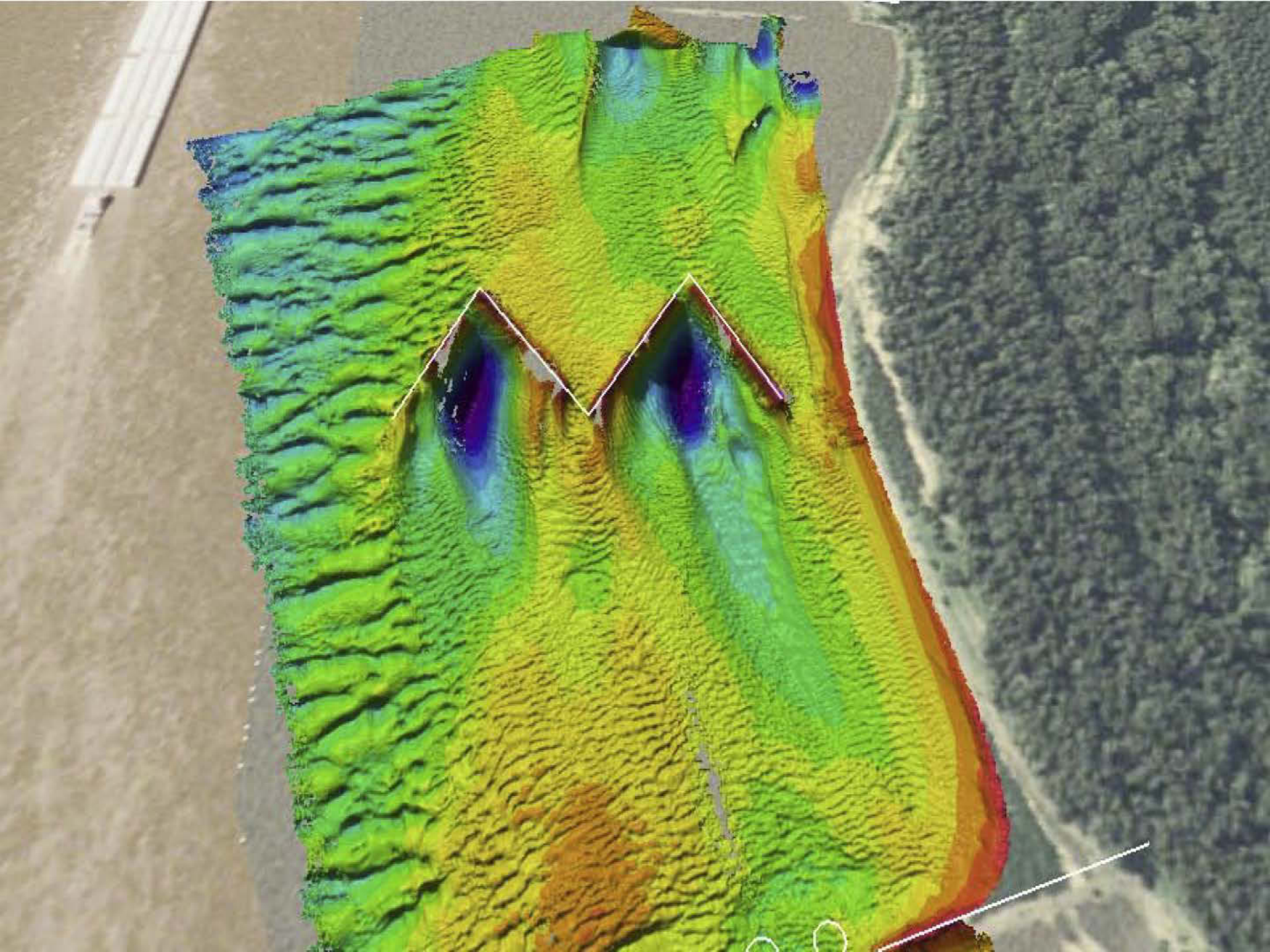
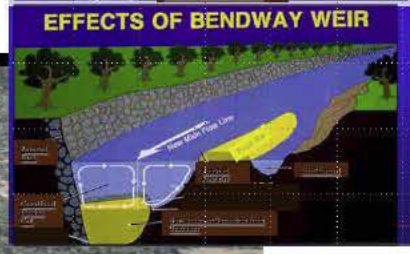
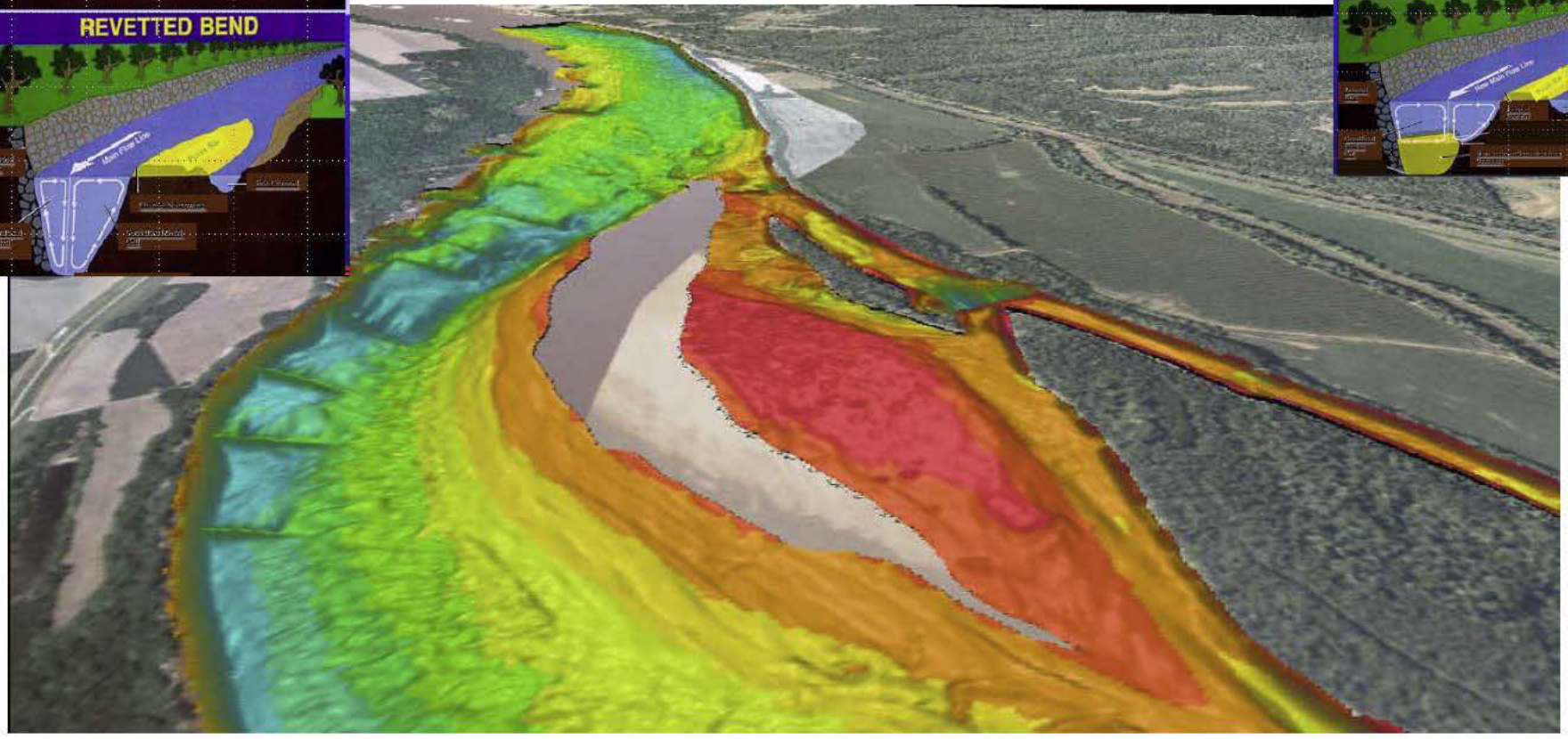
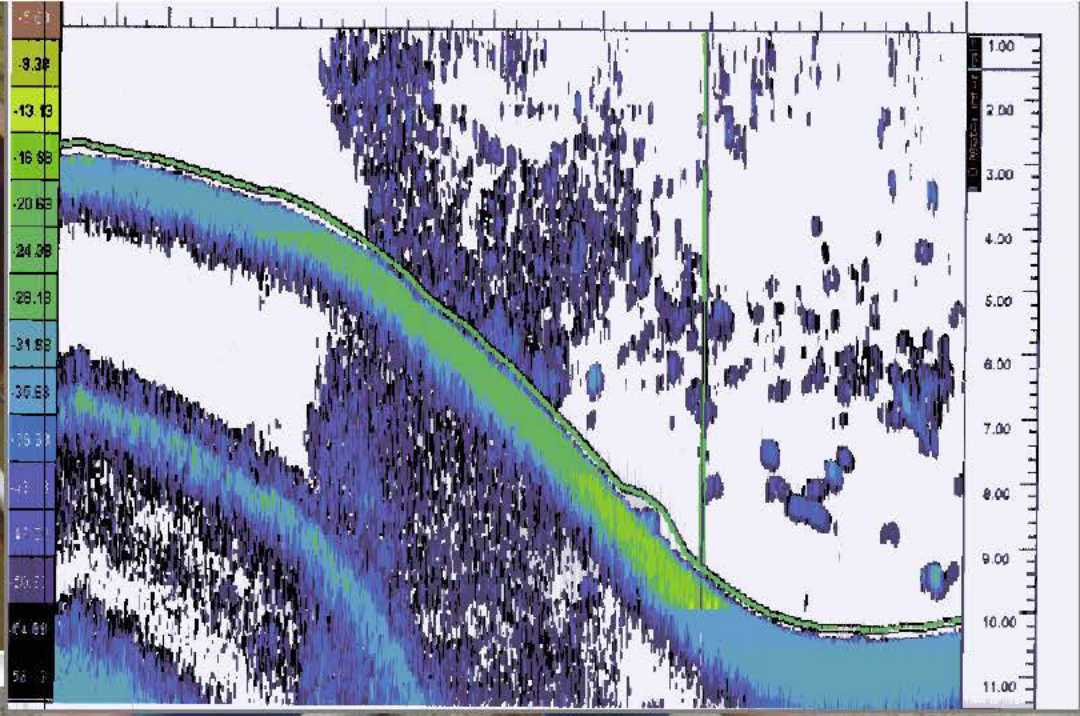


Navigating Bends
"Flanking"

Bendway Weirs






1.00
2.00
3.00
4.00
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7.00
8.00
9.00
10.00
11.00

MERCURY

Side Channel Enhancement Alternating Dikes

ILLINO

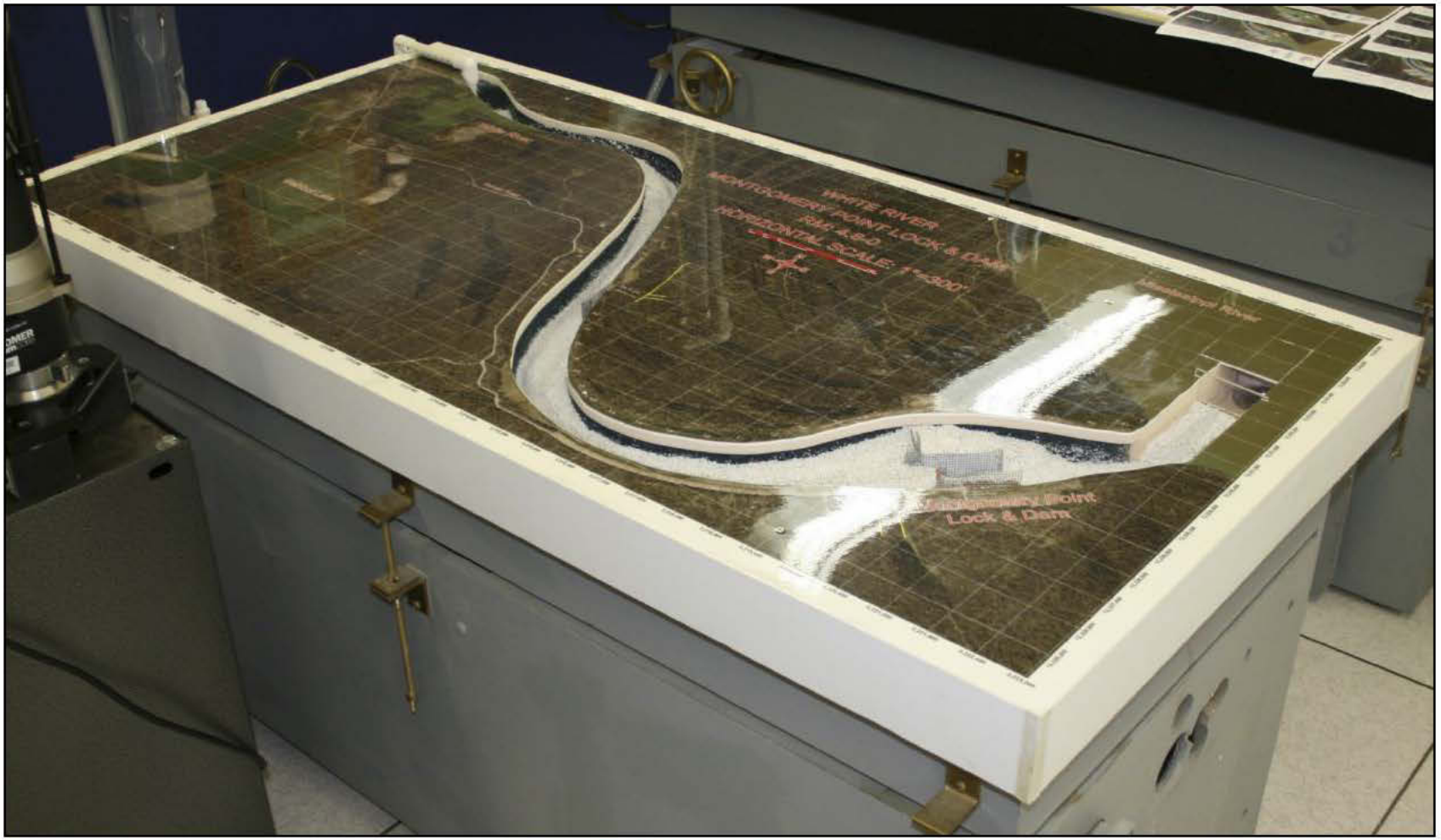
1950 to 1993 Environmental Plan Formulation on the Mississippi River

"Title Bouts"

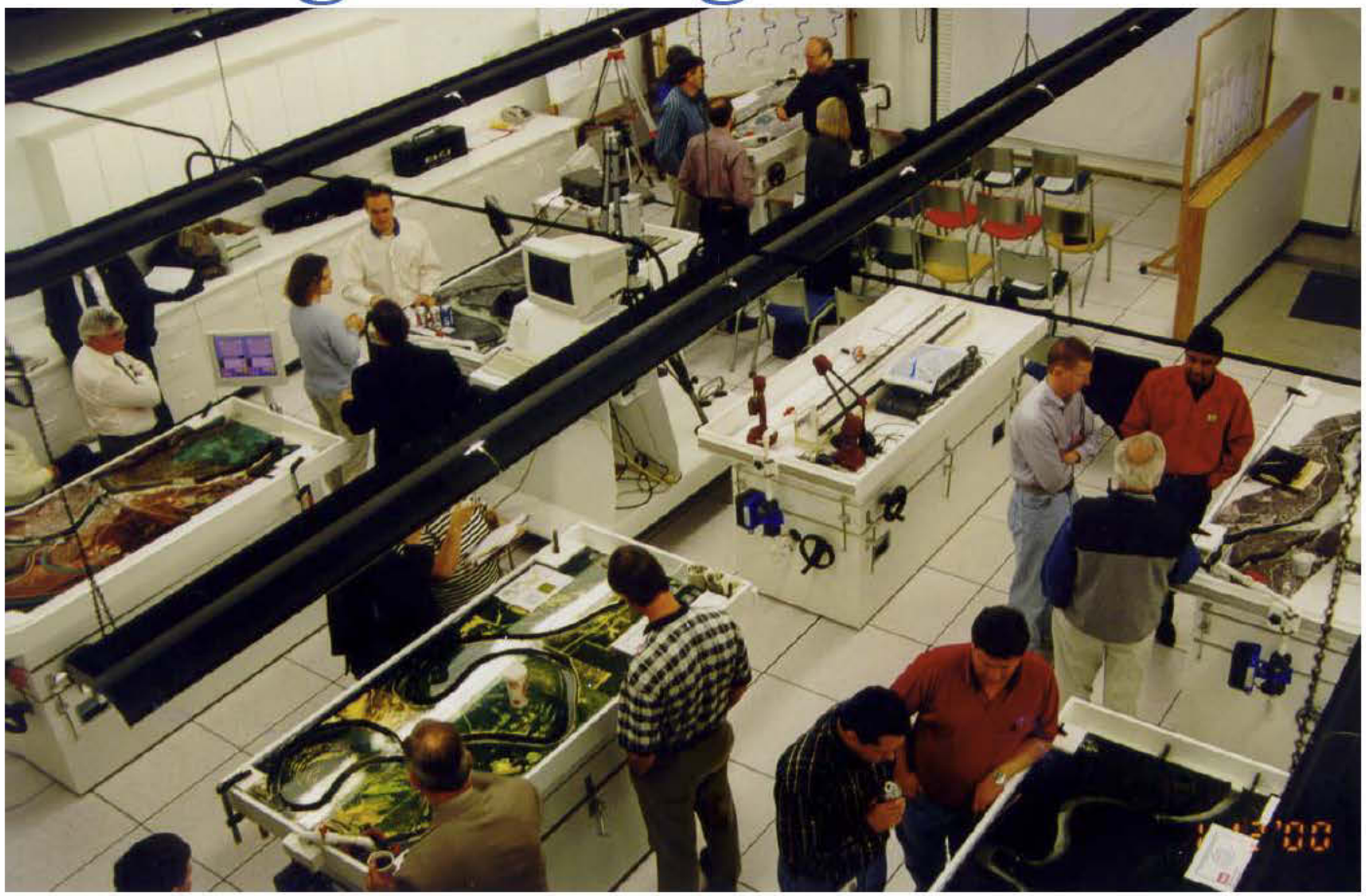
Biologist

Engineer

HSR Modeling

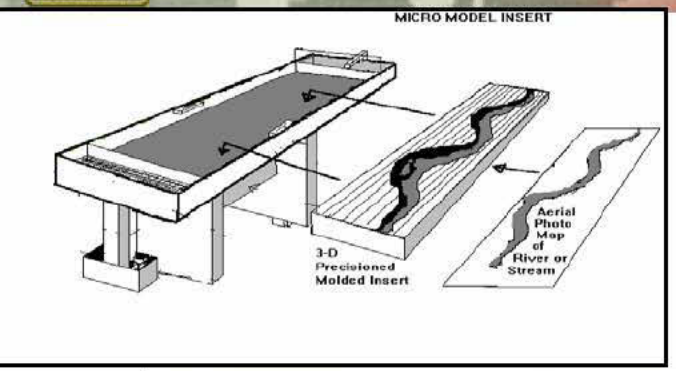


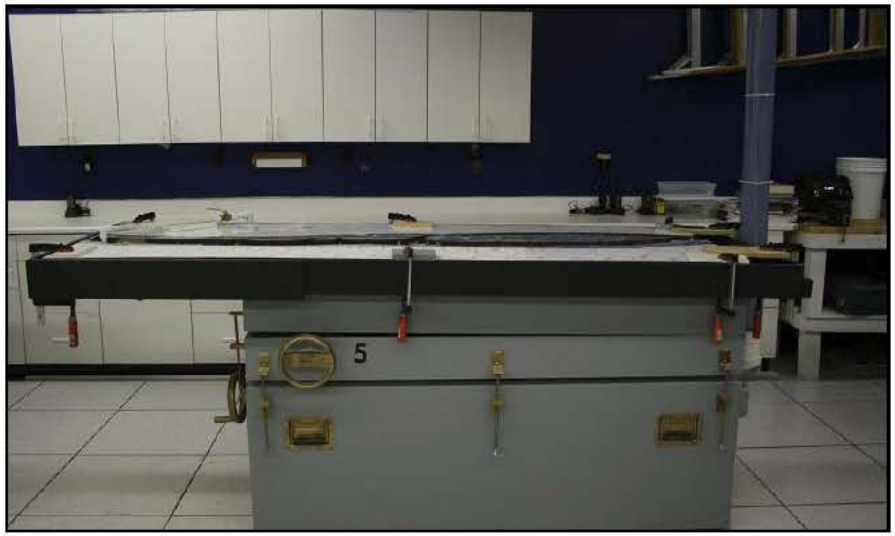
Incorporates Partners with Engineering Alternatives

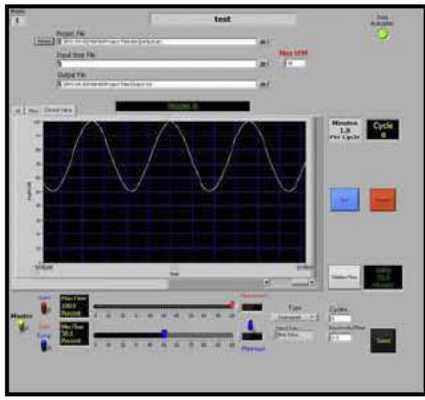


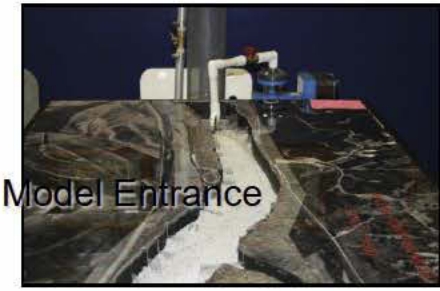
Moveable Bed Models

HSR Model Basics

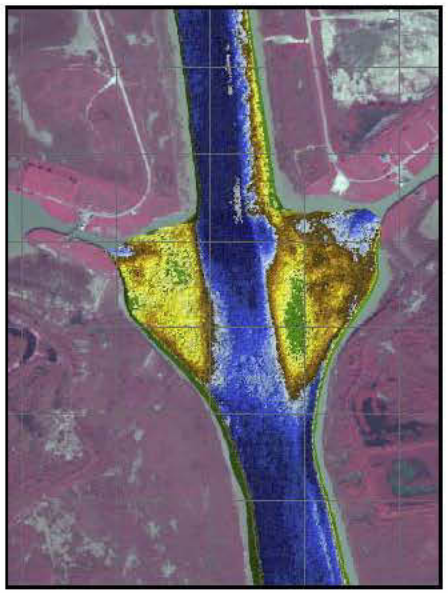


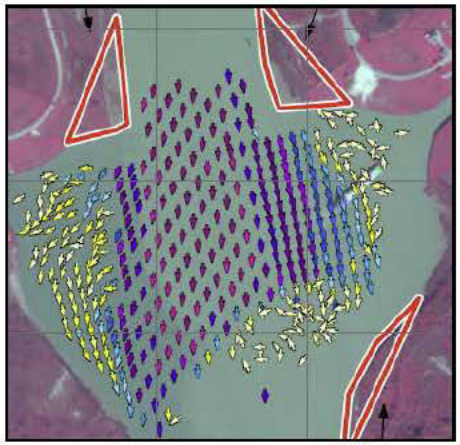


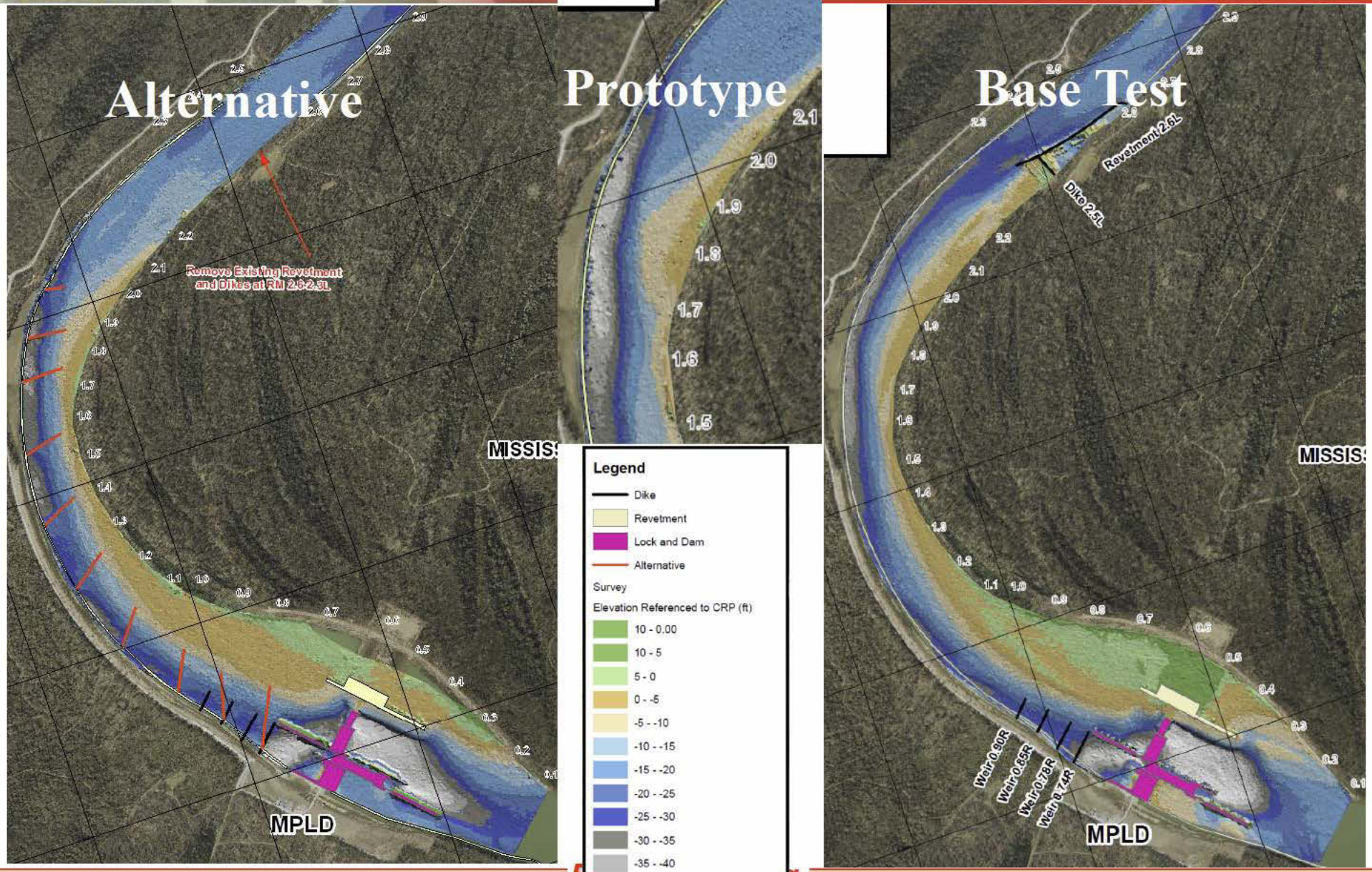




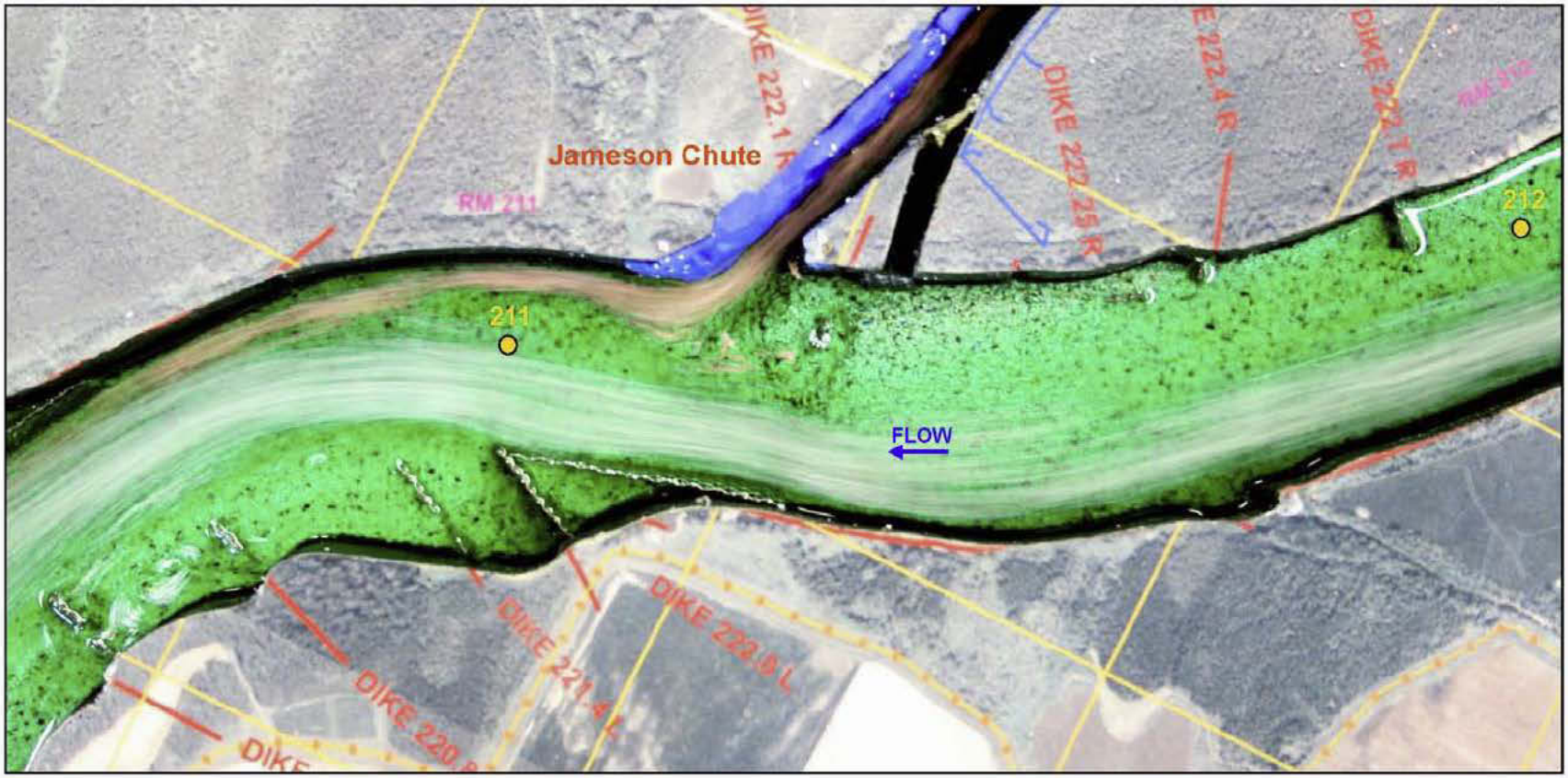
HSR Model Basics






Alternative
Remove Existing Revetment and Dikes at RM 2.6-2.3L
MISSIS
MPLD
Prototype
2.1
2.0
1.9
1.8
1.7
1.6
1.5
Legend
Dike
Revetment
Lock and Dam
Alternative
Survey
Elevation Referenced to CRP (ft)
10 - 0.00
10 - 5
5 - 0
0 - -5
-5 - -10
-10 - -15
-15 - -20
-20 - -25
-25 - -30
-30 - -35
-35 - -40
-40 - -45
Base Test
Revetment 2.6L
Dike 2.5L
MISSIS
Weir 0.90R
Weir 0.85R
Weir 0.78R
Weir 0.74R
MPLD

Flow Visualization



Questions