# Lower Sangamon River Regional Sediment Management (RSM) Program

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Background

The Illinois River has chronic sediment management problems at the mouth of the Sangamon River, Beardstown, Illinois. The tributary confluence includes: the 9-ft navigation project, an important conservation area, levee districts, and a small city with a municipal harbor. Straightening of the Sangamon occurred between 1905 and 1909, and the lower six miles were diverted south through Muscooten Bay in 1949. Aquatic habitat in the lake was significantly degraded by sediment and the marina is only accessible at flood stage. USACE Rock Island District began studying the problem in 2012 using funding from the Regional Sediment Management (RSM) Program. Investigations have included: a report of the history of the watershed and known studies to date, sediment sampling and characterization, a cross-sectional survey of 50 miles of the project area, a HEC-RAS unsteady flow model including sediment transport, a conceptual modeling workshop and follow-on town hall, and collaboration building among various stakeholder groups. The project team is hopeful that interest in the issues generated through the course of this project will aid in successful regional sediment management.
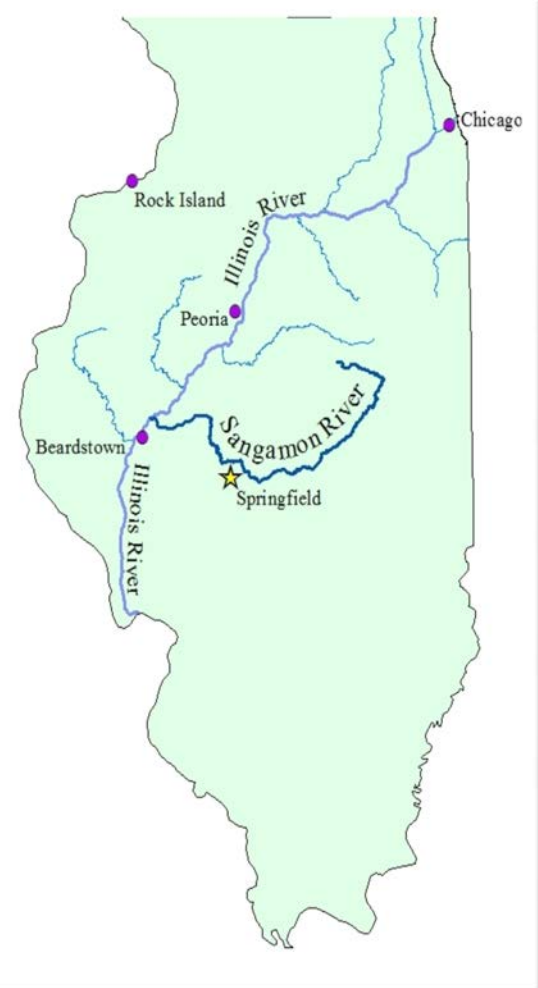
The Sangamon River has a 5,410 square mile watershed and flows for approximately 250 miles through central Illinois and is the largest tributary to the Illinois River.
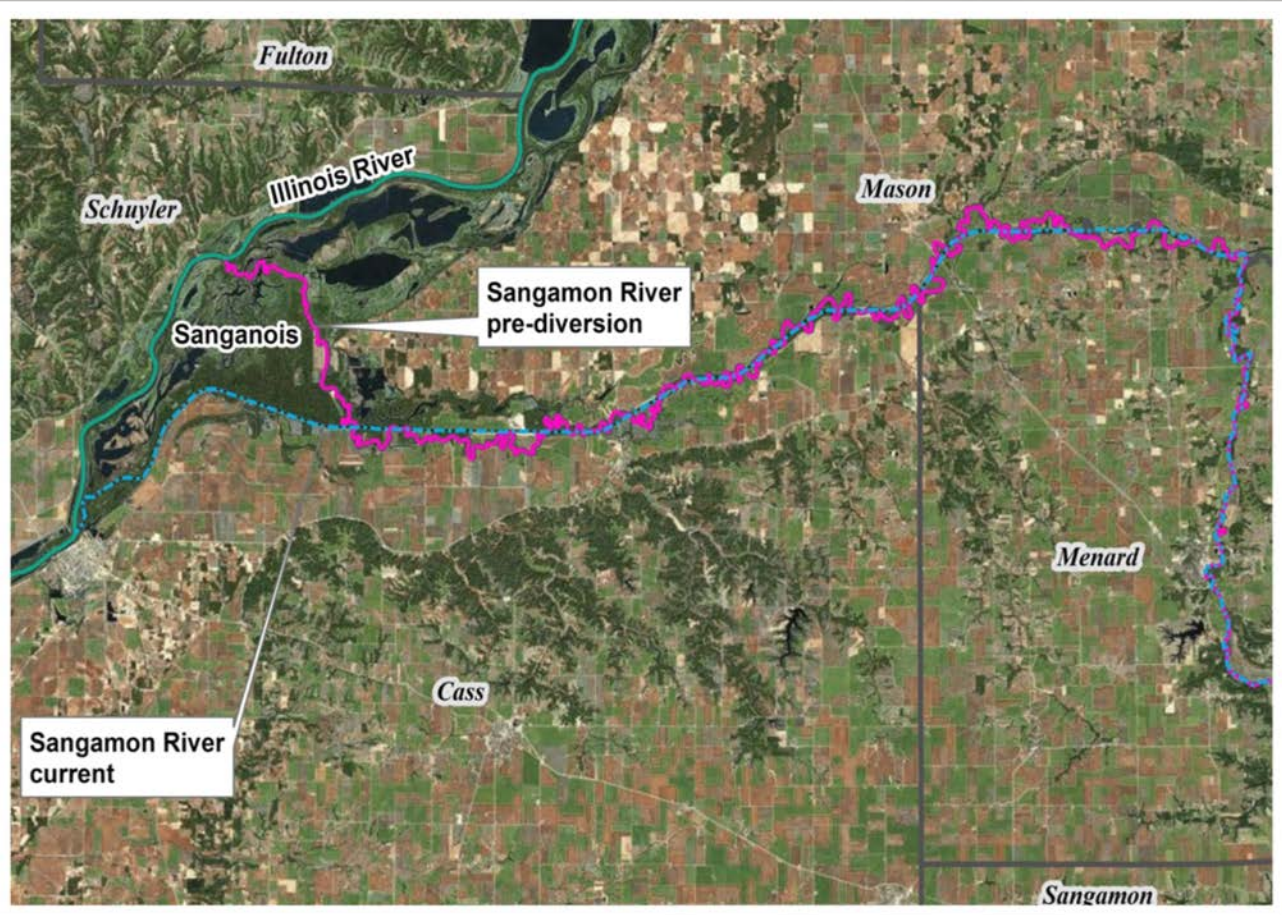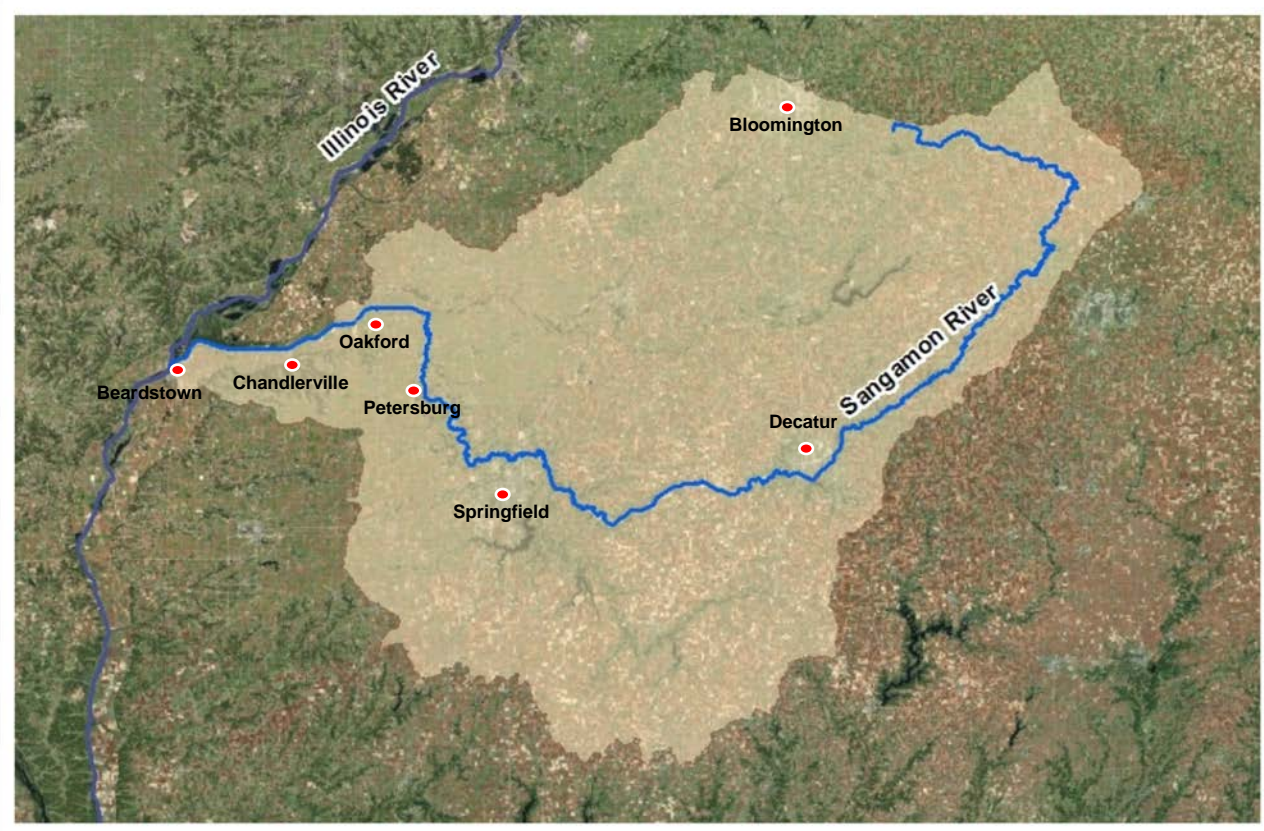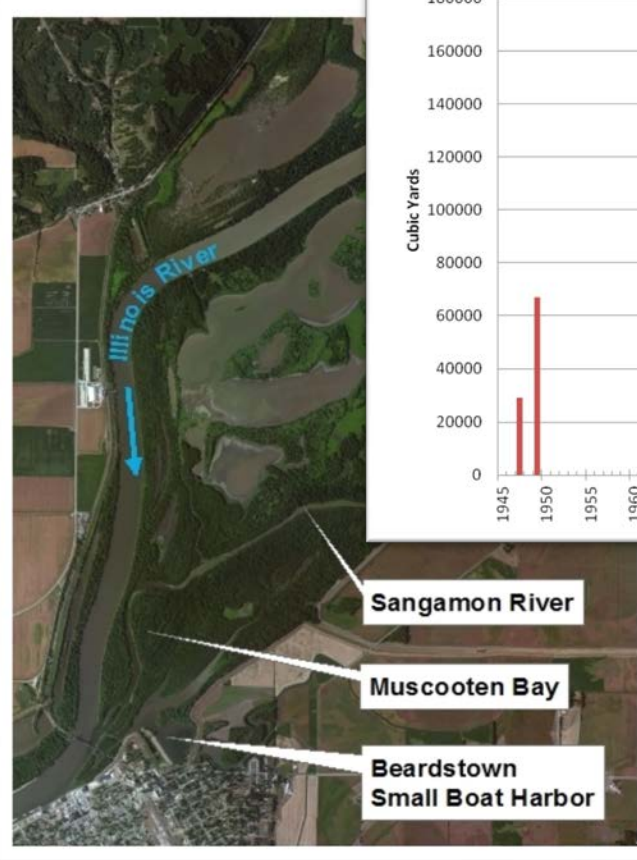
Historical and Current Sangamon River Centerlines

Historic channel was 63 miles long with a slope of ½ft/mile. Current channel is only 36 miles long with a slope of 1ft/mile likely resulting in higher velocities and more sediment.
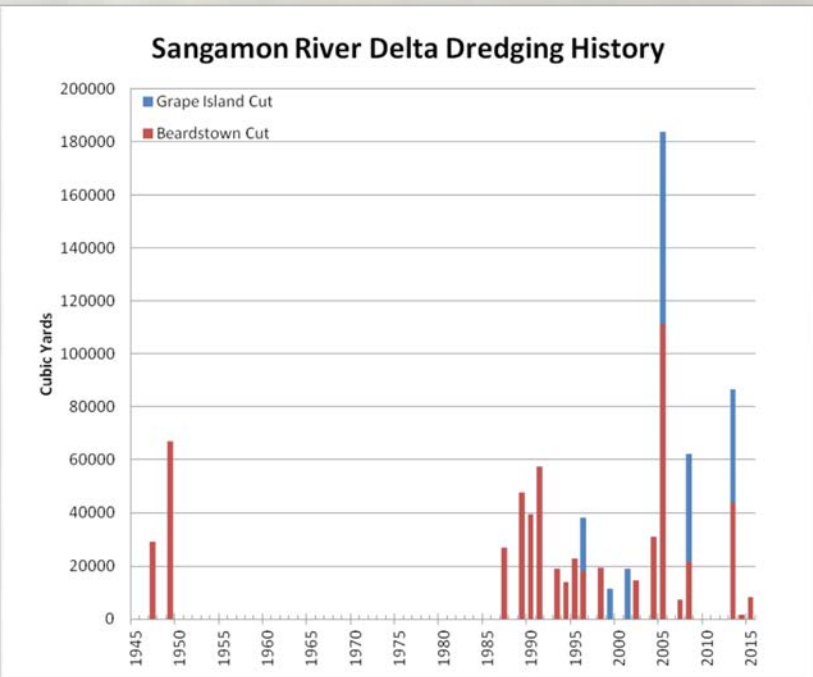
Navigation Dredging History

Navigation channel maintenance dredging is typically required annually, except for a 35-yr period after the Sangamon River was diverted into Muscooten Bay.

Sangamon River Delta Dredging History

Beardstown and Grape Island Dredge Cuts

Muscooten Bay Pre-Diversion (circa 1939)

Muscooten Bay Post-Diversion (circa 2011)

Regional Sediment Management

"Managing sediment to benefit a region potentially saves money, allows use of natural processes to solve engineering problems, and improves the environment." – https://rsm.usace.army.mil

RSM Program Goals
- Management of sediments on a regional scale
- Implement adaptive management strategies across multiple projects which support sustainable navigation and dredging, flood and storm damage reduction, and environmental practices
- Increase benefits while reducing costs
- Involve stakeholders to leverage resource

RSM Lower Sangamon Goals
- Understand sediment quality, input, and transport
- Establish a coordinated stakeholder group
- Identify sediment management opportunities and beneficial uses
- Reduce navigation costs and provide other benefits

Hydraulic Modeling

Unsteady HEC-RAS model

Data used for cross-sections:
- 2014 IDNR/MVR bank to bank survey data,
- 1-m LiDAR and 10-m NED

Leveed areas modeled as storage basins

Boundary Conditions – USGS gage data:
- Salt Creek at Greenview
- Sangamon River at Petersburg
- Illinois River at LaGrange
- Illinois River at Peoria
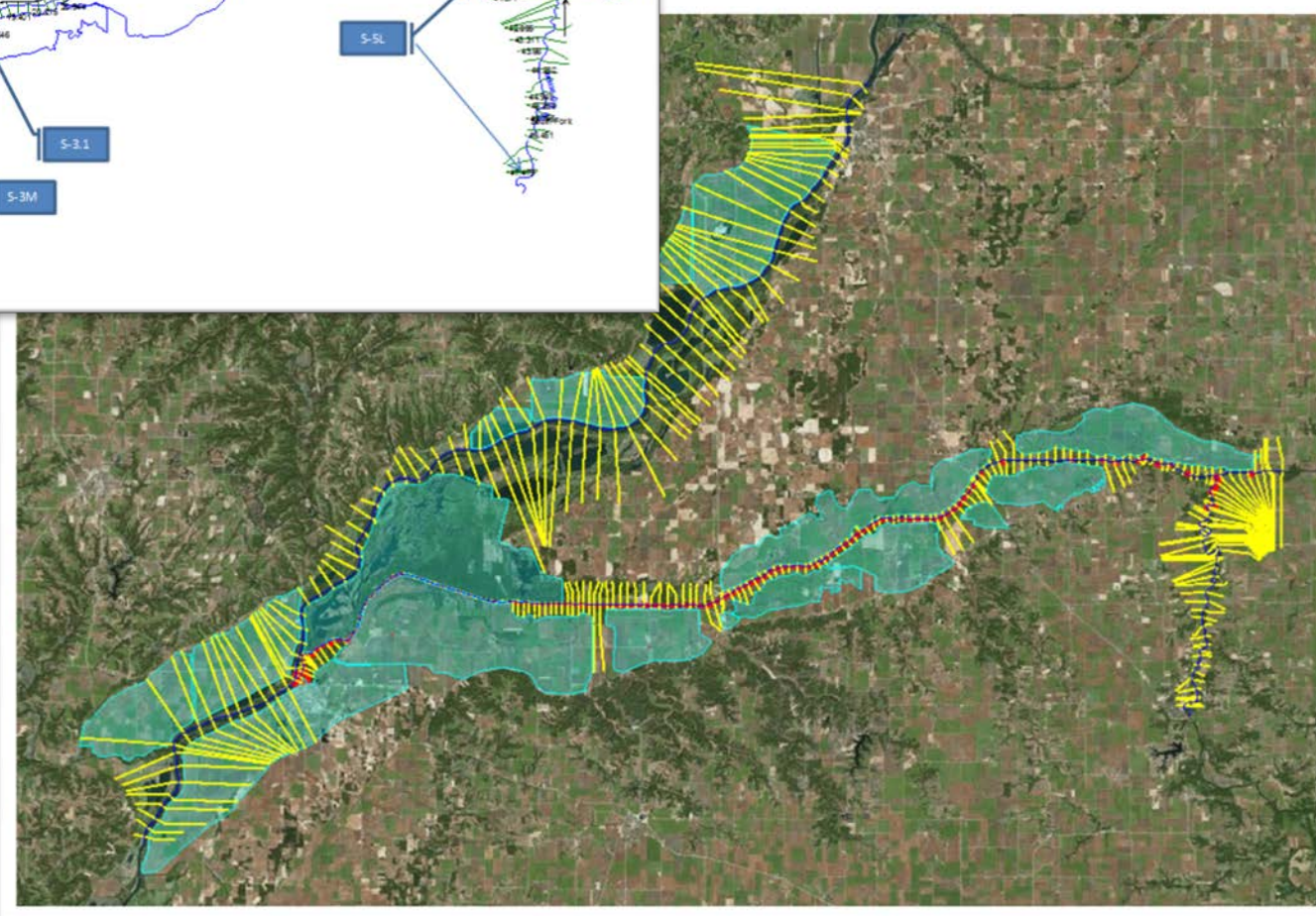
2013 sediment samples used for sediment transport

Chandlerville 2013 Hydrograph HEC-RAS Results

Oakford 2013 Hydrograph HEC-RAS Results
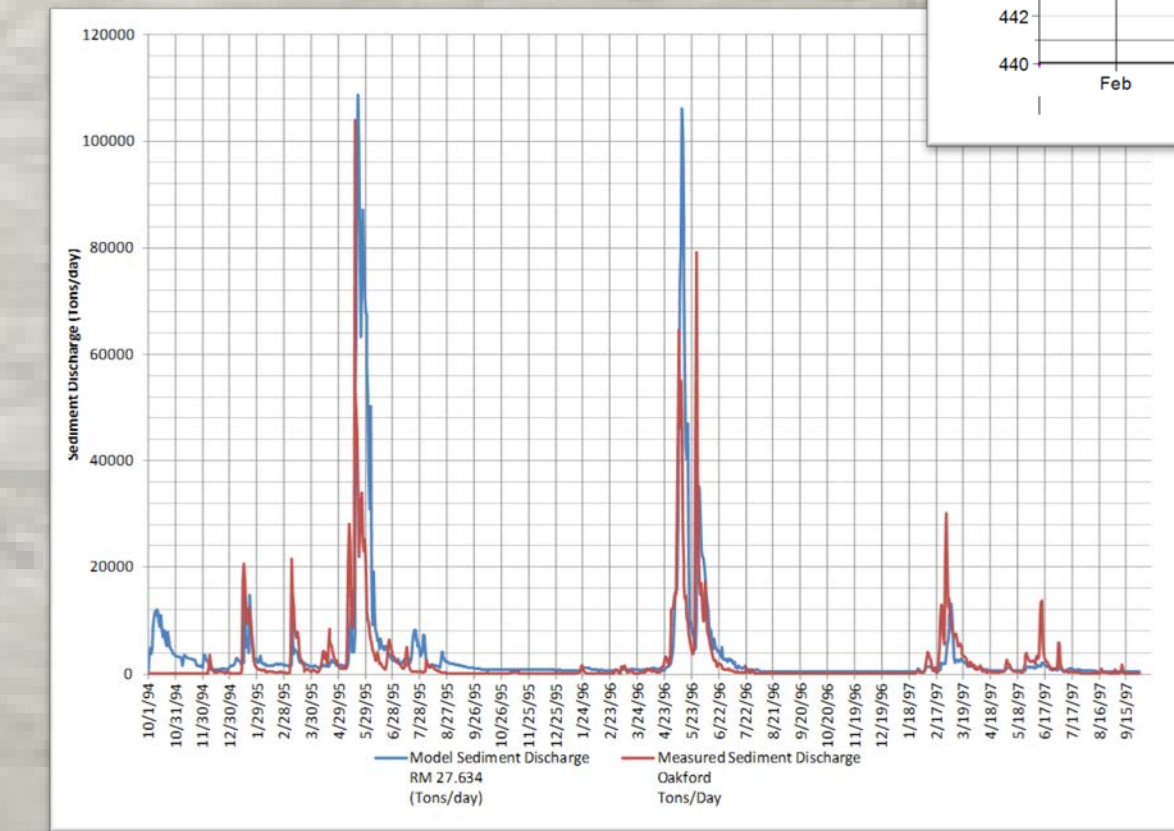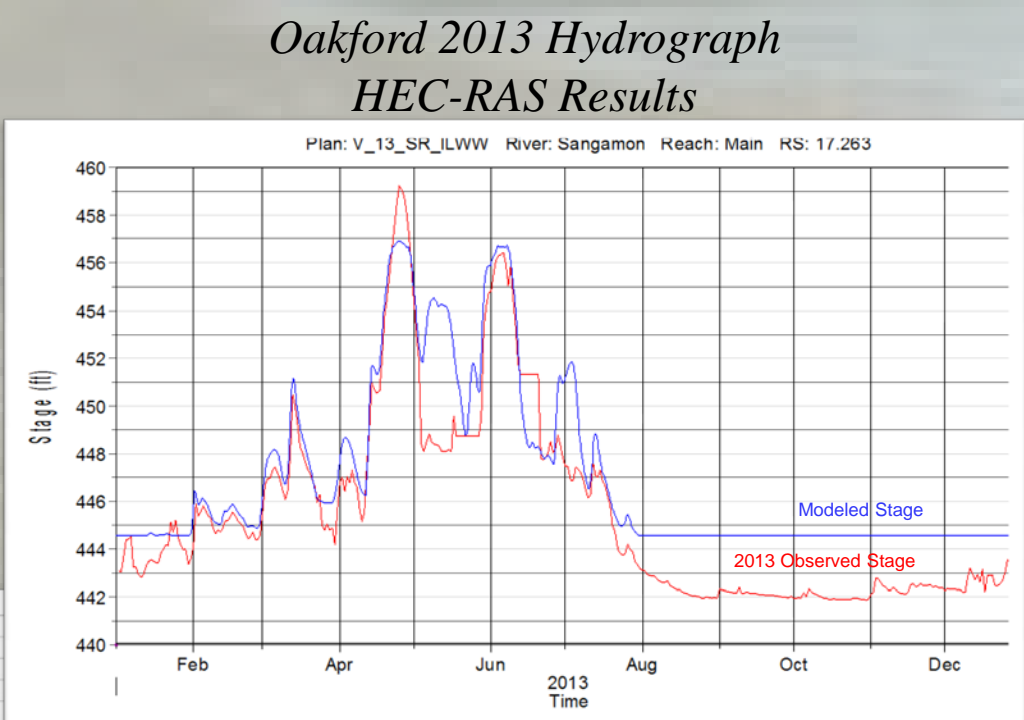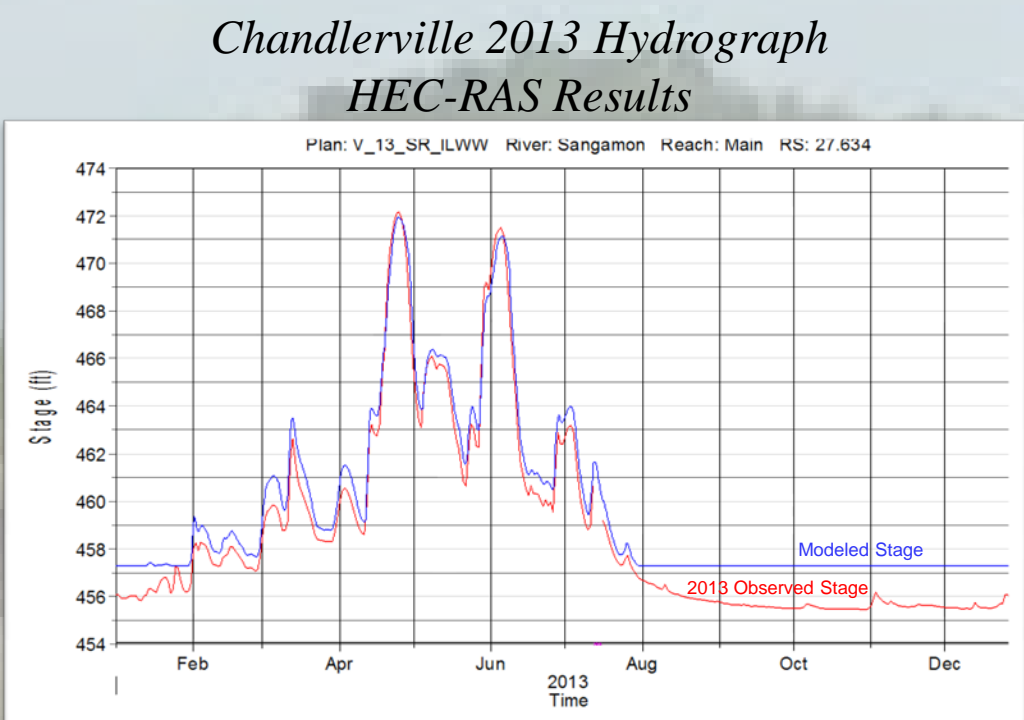
Sediment Transport Calibration Run 1994 to 1997
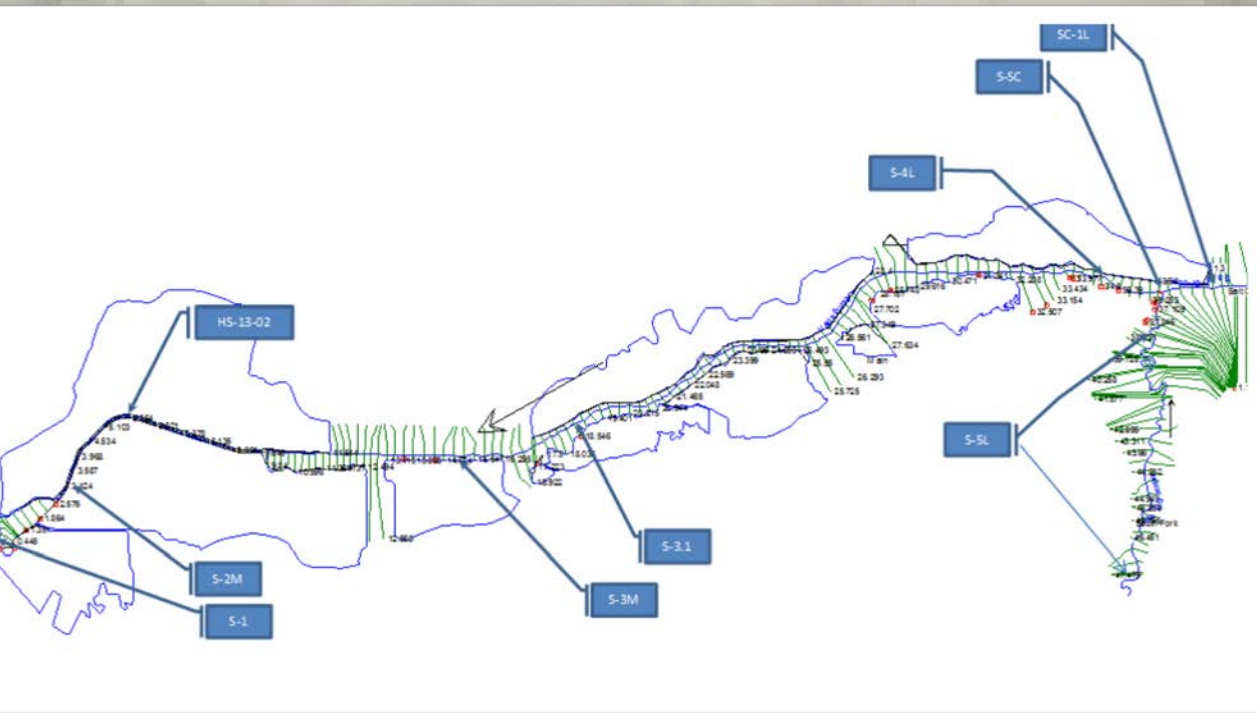
2013 Sediment Sampling Locations

HEC-RAS cross sections and storage areas as modeled

Conceptual Modeling Workshop

Goals of the Workshop
- Bring together stakeholders
- Identify Problems
- Identify Opportunities including Unconventional Ideas
- Identify what fits within RSM, other Corps programs, non-Corps programs
- Report all ideas
- Follow-up at Public Meeting

Workshop Attendees
- Cass County
- Ducks Unlimited
- IDNR
- Levee Commissioners & Local Landowners
- Natural Resources Conservation Service (NRCS)
- The Nature Conservancy
- USACE
- U.S. Fish & Wildlife Service
- University of Illinois

Opportunities Identified
- Enhance topographic diversity using dredged material
- Remeander Sangamon
- Strengthen levees with dredged material
- Watershed tax
- Beneficially use dredged material
- Build lakes/reservoirs
- Detention basins/WASCOBs
- Divert Sangamon to Illinois River
- Levee setbacks
- Pump/move silt uphill with thin layer placement
- Sediment collector
- Stabilize grade/weirs
- Stop head cuts
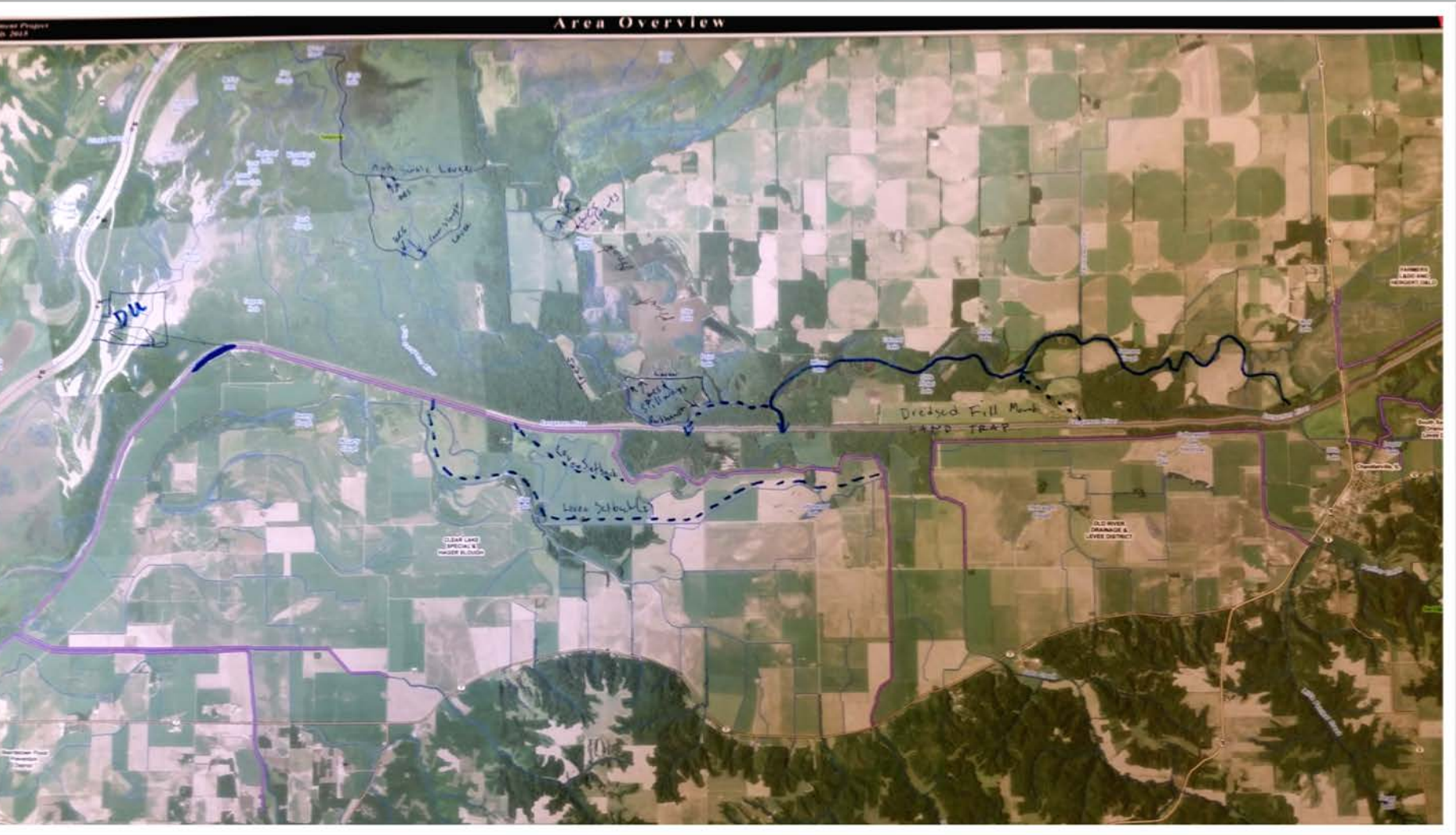- Watershed buffers
- Watershed plan

Remeander Lower Sangamon
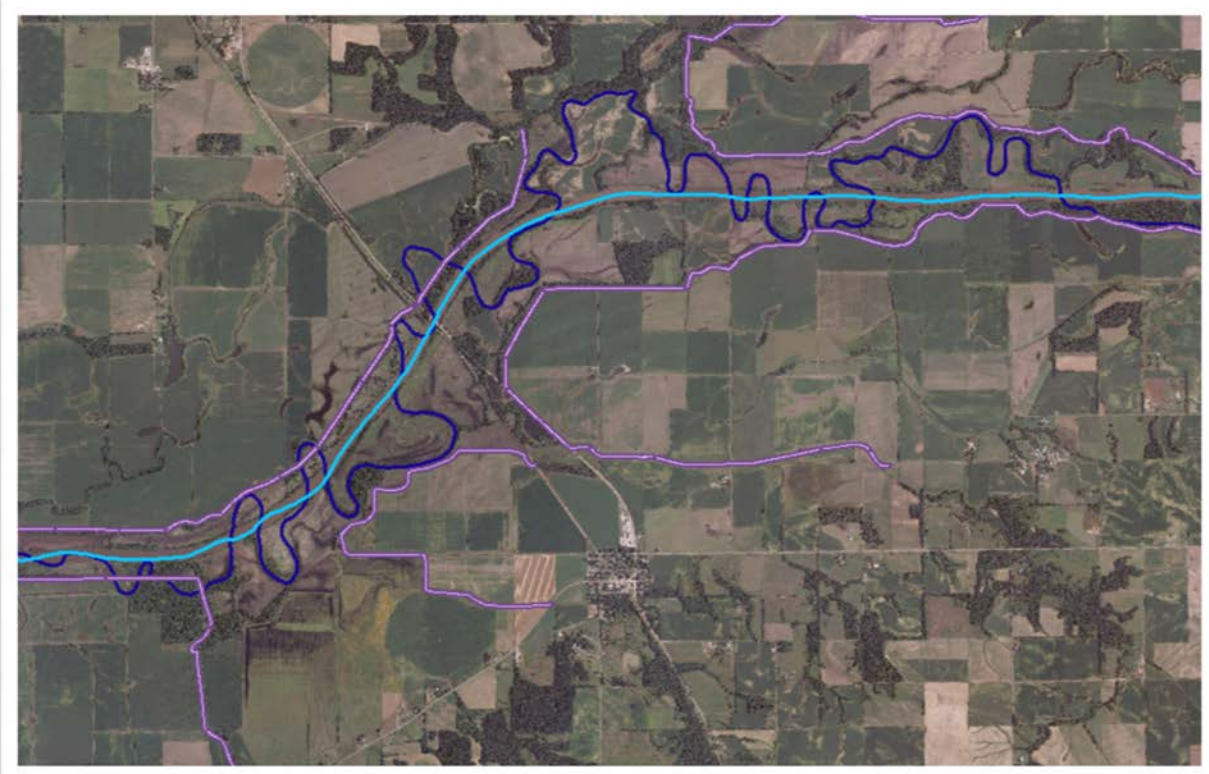
Thin Layer Placement
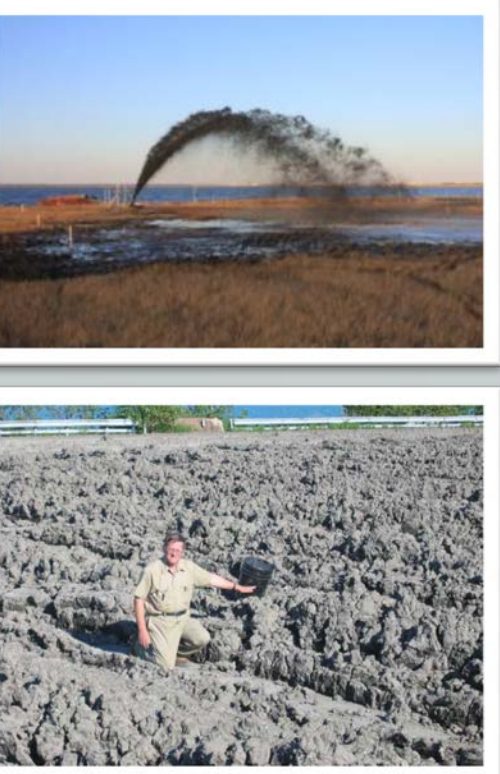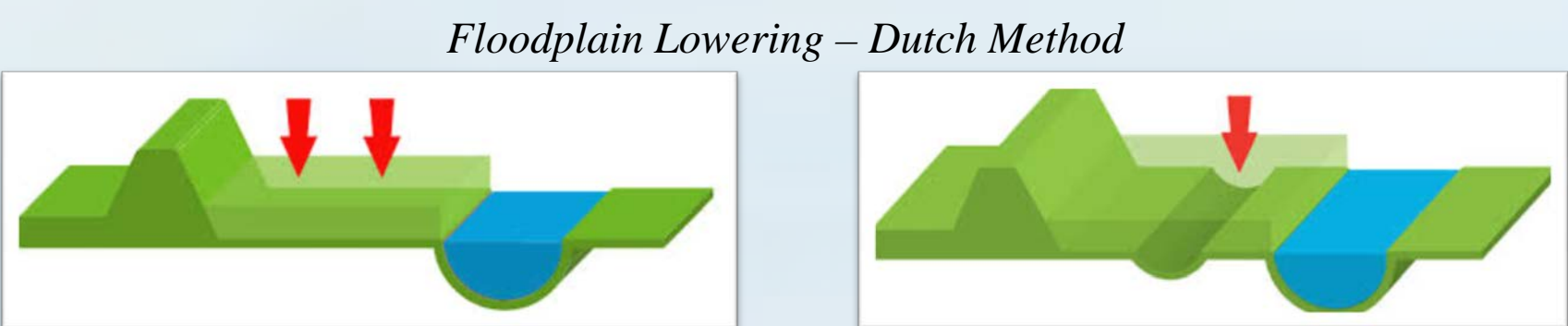
Multi-Featured Solution from Workshop
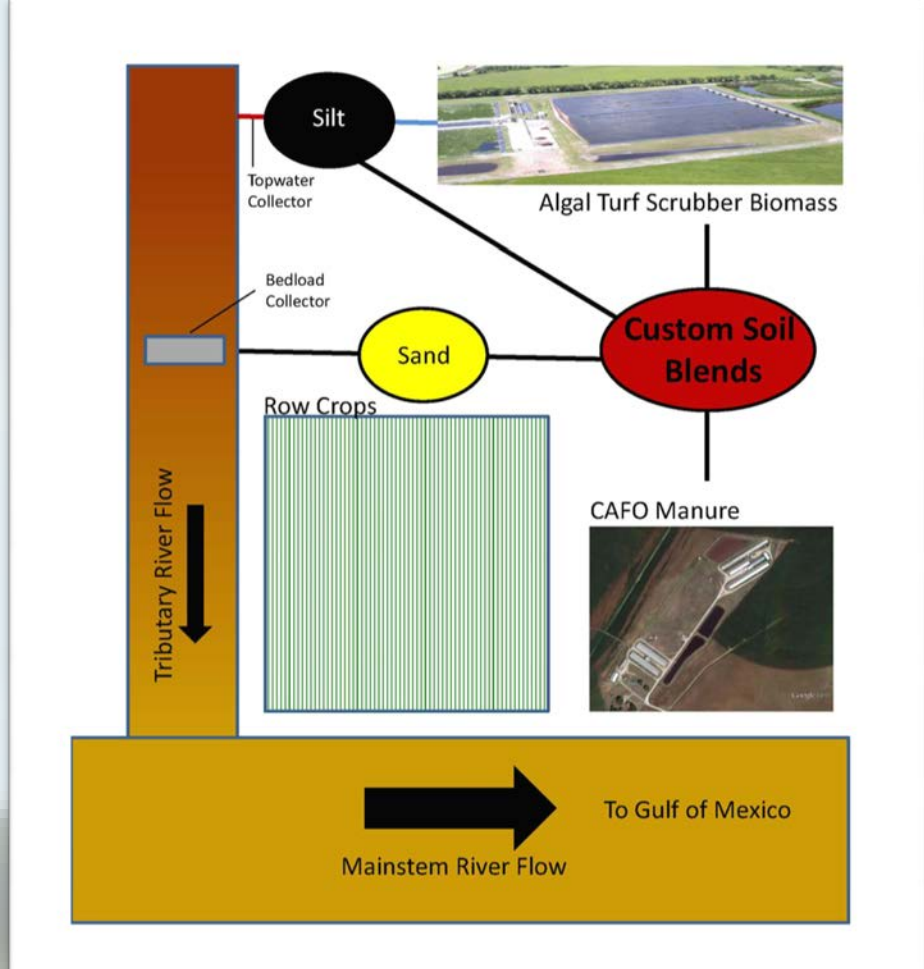
Topographic Diversity

Bedload Collector

Unconventional Ideas

Floodplain Lowering – Dutch Method

Floodway Bypass

Soil Manufacturing

Accomplishments to Date

- Ongoing - Collaboration between MVR, federal agencies, state agencies, local agencies, levee districts, non-governmental organizations, and other interested stakeholders
- 2012 - Report describing the background of the Sangamon River watershed and the sediment issues in the lower watershed.
- 2013 – Sediment sampling and characterization of the lower Sangamon River and Salt Creek bed and banks
- 2014 – MVR and Illinois DNR – 50 miles of cross-sectional and in-bed surveys of lower Sangamon River and Salt Creek
- 2015 – HEC-RAS hydraulic model of the lower Sangamon River
- 2015 - Conceptual Modeling Workshop to discuss sediment management opportunities for the region.
- 2015 - A Town Hall to present the results of the workshop

Acknowledgments

We would like to thank the following stakeholders for their participation in this project: USACE Regional Sediment Management Program, USACE DOTS, Cass County, Sanganois State Fish and Wildlife Area, Illinois Department of Natural Resources, Illinois State Water Survey, Illinois State History Survey, Illinois Sustainable Technology Center, Ducks Unlimited, The Nature Conservancy, Natural Resources Conservation Service, U.S. Fish and Wildlife Service, City of Beardstown, local levee districts, and interested citizens and landowners.

US Army Corps of Engineers
Rock Island District

ILLINOIS DEPARTMENT OF NATURAL RESOURCES