FY15 RSM-EWN IPR

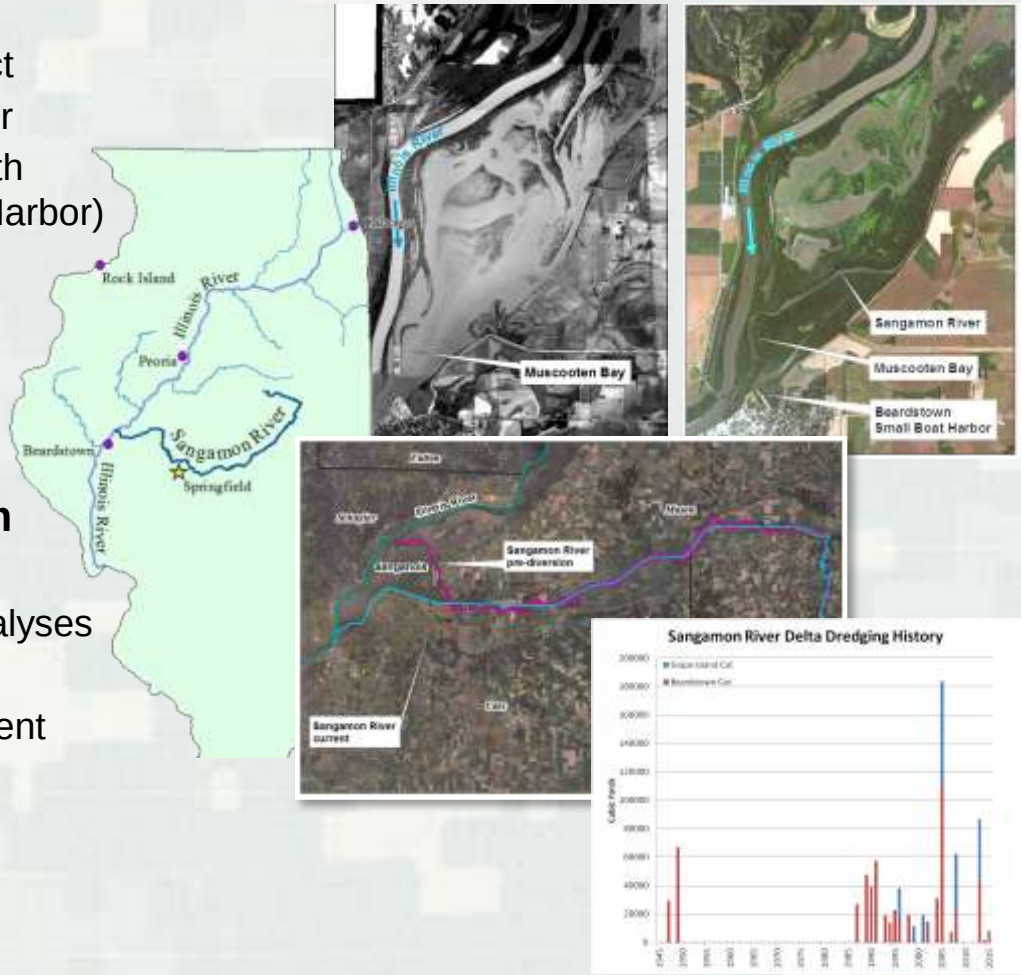
Rock Island District, Sedimentation Impacts at the Confluence of the Sangamon and Illinois Rivers

Heather Bishop, Elizabeth Bruns, Nicole Manasco, Tom Kirkeeng

BLUF: This effort achieves greater understanding of the consequences of channelization and other land use activities in the Sangamon River watershed and explores opportunities for addressing sediment delivery to the Illinois River.

Problem Statement/Issue

- Most expensive dredging location in the District
- Historic USACE project changed outlet of River
- Backwater areas of the Illinois have filled in with sediment (also affecting Federal Small Boart Harbor)
- Lack of data
- Lack of regional/political will



Approach to Address Problem
(non-technical)

- Continue sediment data acquisition and analyses
- Expand collaboration efforts
- Develop beneficial use strategies for sediment
  - IDOT use of sand for new bridge
  - Partnership for soil manufacturing
  - Increase topographic diversity

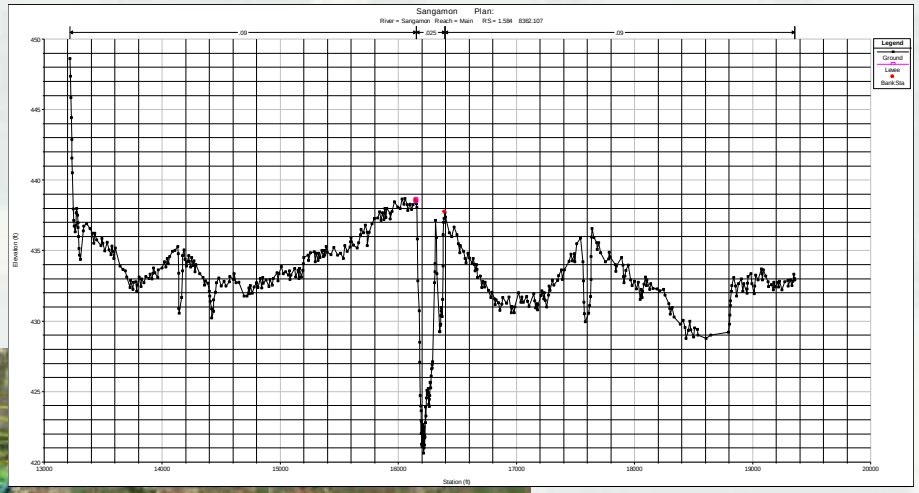
FY15 RSM-EWN IPR

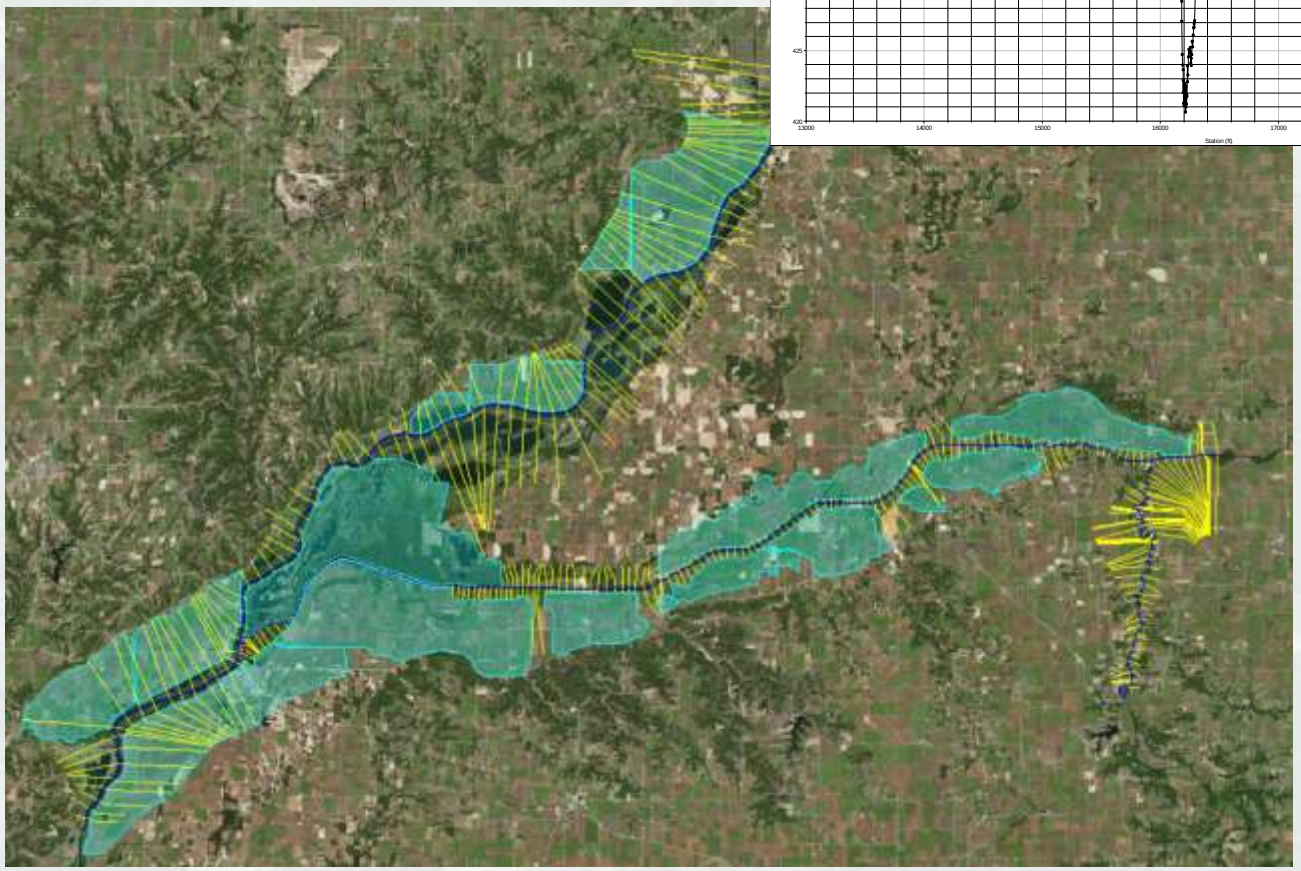
Rock Island District, Sedimentation Impacts at the Confluence of the Sangamon and Illinois Rivers

Approach to Address Problem

(Tools, Models, Technologies)

- Development of Unsteady HEC-RAS Sediment Model
- Purpose: Model that can be used to evaluate sediment management alternatives





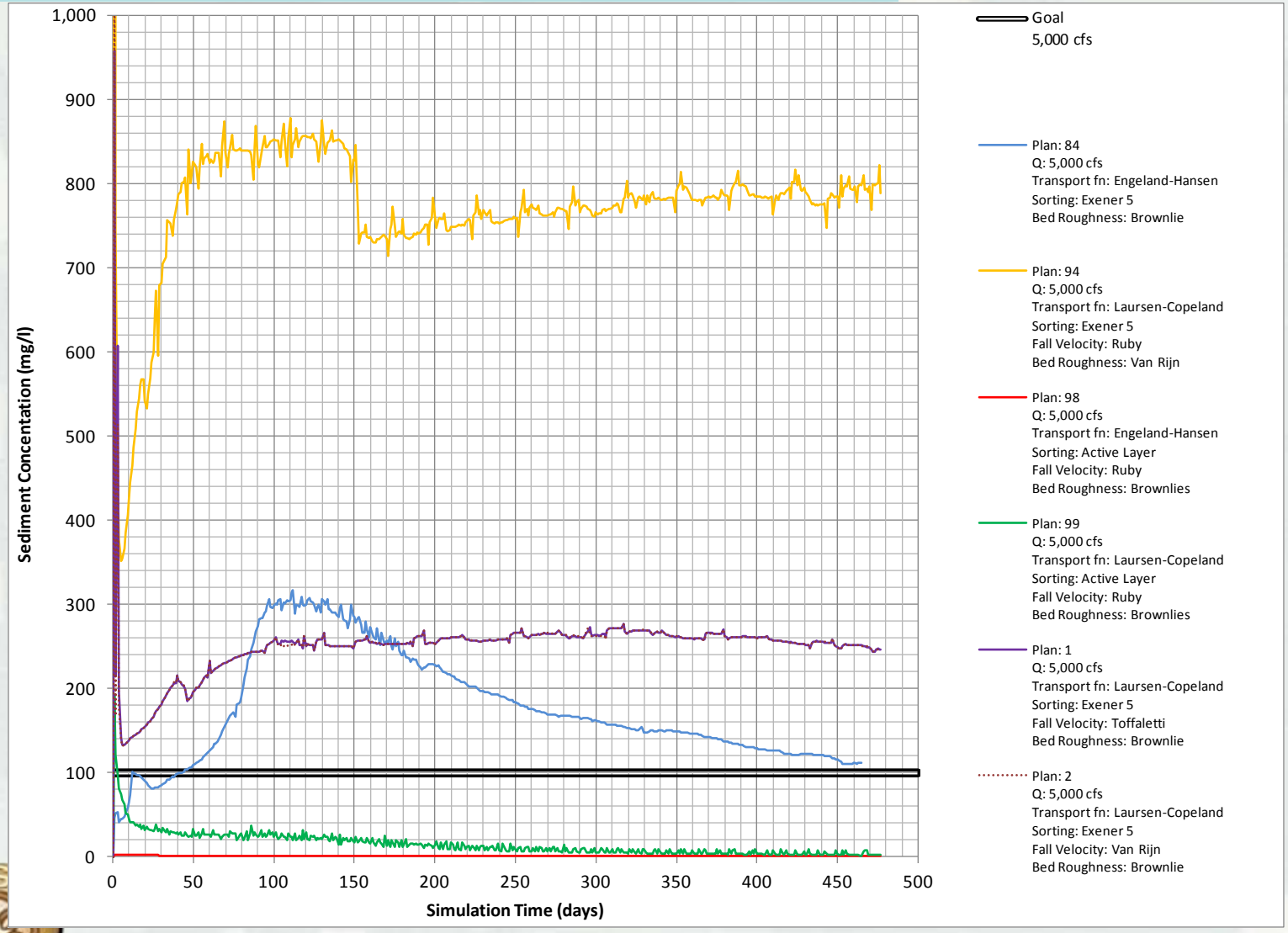
Development of Sediment Model

- Inputs
  - Bed material gradation
  - Sediment Transport Function
  - Sorting Method
  - Fall Velocity
  - Bed Roughness
  - Boundary conditions
    - Inflow – Equilibrium
- Calibration
  - Seven years of Sediment Data Collection at the Oakford Gage
- Future
  - BSTEM
  - Sediment delivered to storage areas
    - Levee overtopping
    - Sanganois Conservation Area
  - Re-meandering
  - Grade control

FY15 RSM-EWN IPR

Rock Island District, Sedimentation Impacts at the Confluence of the Sangamon and Illinois Rivers

Calibration of Sediment Parameter Selection



FY15 RSM-EWN IPR

Rock Island District, Sedimentation Impacts at the Confluence of the Sangamon and Illinois Rivers

Approach to Address Problem

(Tools, Models, Technologies)

- Conceptual Modeling Workshop – July 2015
- Public Meeting – August 2015

The opportunities identified most often were:

•enhance topographic diversity using dredged material
•Re-meander Sangamon
•strengthen levees with dredged material
•watershed tax

The longer list of opportunities identified in two groups includes:

•beneficial use on roads
•beneficial use
•build lakes/reservoirs
•detention basins/WASCOBs
•divert Sangamon to main channel
•pump/move silt uphill with thin layer placement
•reservoir plan
•sediment collector
•stabilize grade/weirs
•stop head cuts
•tax levee districts for Sangamon River maintenance
•watershed buffer
•watershed plan

FY15 RSM-EWN IPR

Rock Island District, Sedimentation Impacts at the Confluence of the Sangamon and Illinois Rivers

District PDT Members

- Nicole Manasco, Operations
- Tom Kirkeeng, Engineering
- Toby Hunemueller, Engineering
- Heather Bishop, Engineering
- Elizabeth Bruns, Engineering
- Eric Mortensen, Engineering
- Chuck Theiling, Planning

Stakeholders and Partners

- Illinois State Water Survey, Sediment Budget
- Illinois Department of Natural Resources
- USGS – Illinois Water Science Center
- Local Communities

FY 15 Leveraging

- Cross section survey of the Sangamon River
  - State of Illinois provided
- Enhanced HEC-RAS Model
  - Extra GI funds
- Conceptual Modeling workshop
  - Participation with IL, NRCS, FWS, TNC, DU
- Public Meeting

Leveraging/Collaborative Opportunities

- Navigation (Operations Division)
- Illinois River Basin Restoration Program
- Environmental Management Program
- Navigation and Ecosystem Sustainability Program (NESP)
- Levee Safety Program
- Beneficial use of Illinois River Sediment
- Mud to Parks Program
- Chamber of Commerce

FY15 RSM-EWN IPR

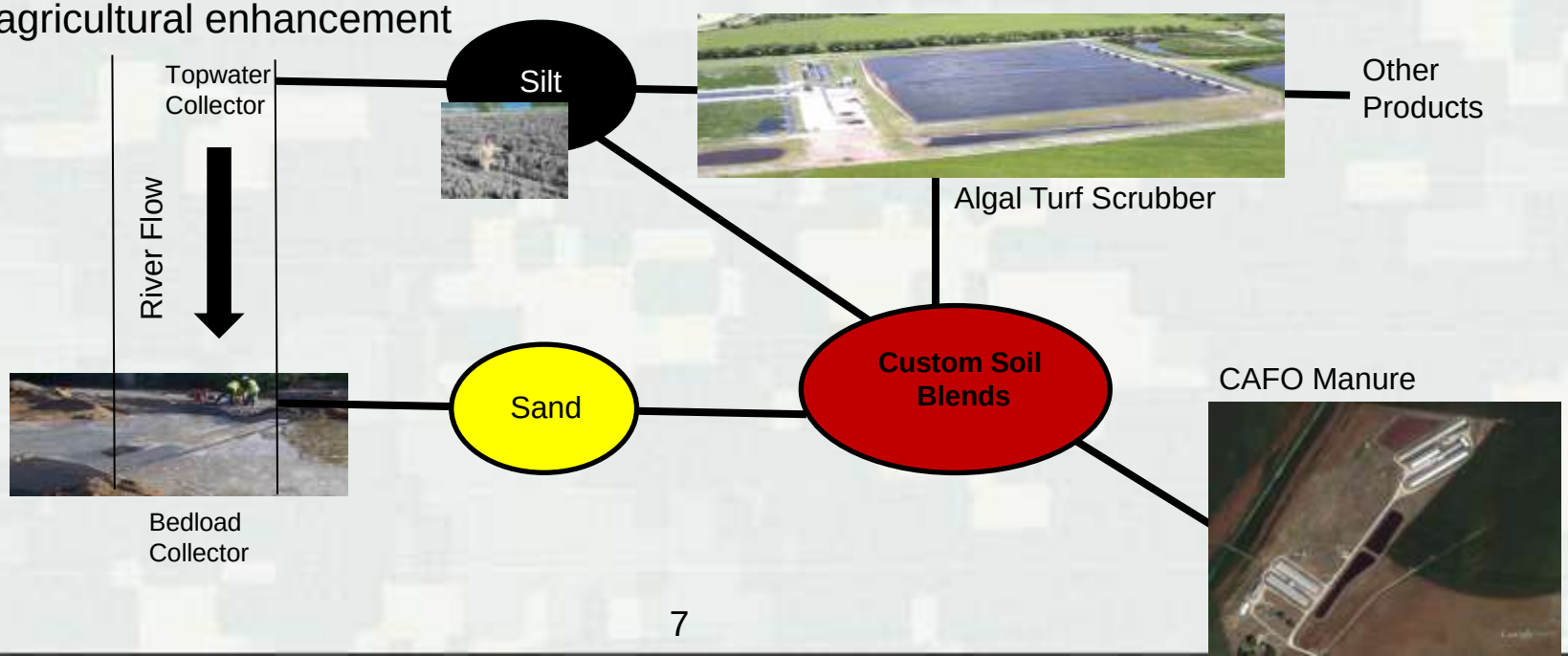
Rock Island District, Sedimentation Impacts at the Confluence of the Sangamon and Illinois Rivers

UPs – 3 Positives from effort

- Collection of intensive channel survey (50 miles of sections spaced 1,000' apart) and development of calibrated hydraulic model including storage areas; ability to quantitatively analyze the problem

- Partners are forming a collaborative network: sharing of data/resources; offers to buy strategic property; an understanding that we all need to move past "no"; City has $ they can spend on dredging

- Partners are understanding that the sediment is a resource. Discussions of using material for ecosystem restoration, flood risk management, and agricultural enhancement



DOWNs – 3 Negatives from effort

- State of Illinois is not a viable partner at this time and most authorized partnerships require participation with the non-Federal sponsor (65/35); much of the land is in private ownership
- Past USACE activities have created strong local animosity which makes moving forward difficult
- Significant log jam a few miles upstream is changing the system…and may have significant impacts whether removed or left in place.

Value to the Nation

- Value added – improved soils, decreased costs to new bridge, environmental benefits
- Increased recreation (sustainable marina/preserve-restore Sanganois) = improved local economy
- Leveraging resources – Navigation, FRM, state natural resources, agriculture, recreation
- $/habitat credits
- Improved partnerships – restore relationships with the city
- Cost savings – through Capacity of placement site saved and therefore $ saved on coordination, surveys, modeling, etc to designate a new placement site

Questions

Nicole Manasco – CEMVR-OD-T
nicole.m.manasco@usace.army.mil

Tom Kirkeeng – CEMVR-EC-HQ
thomas.a.kirkeeng@usace.army.mil