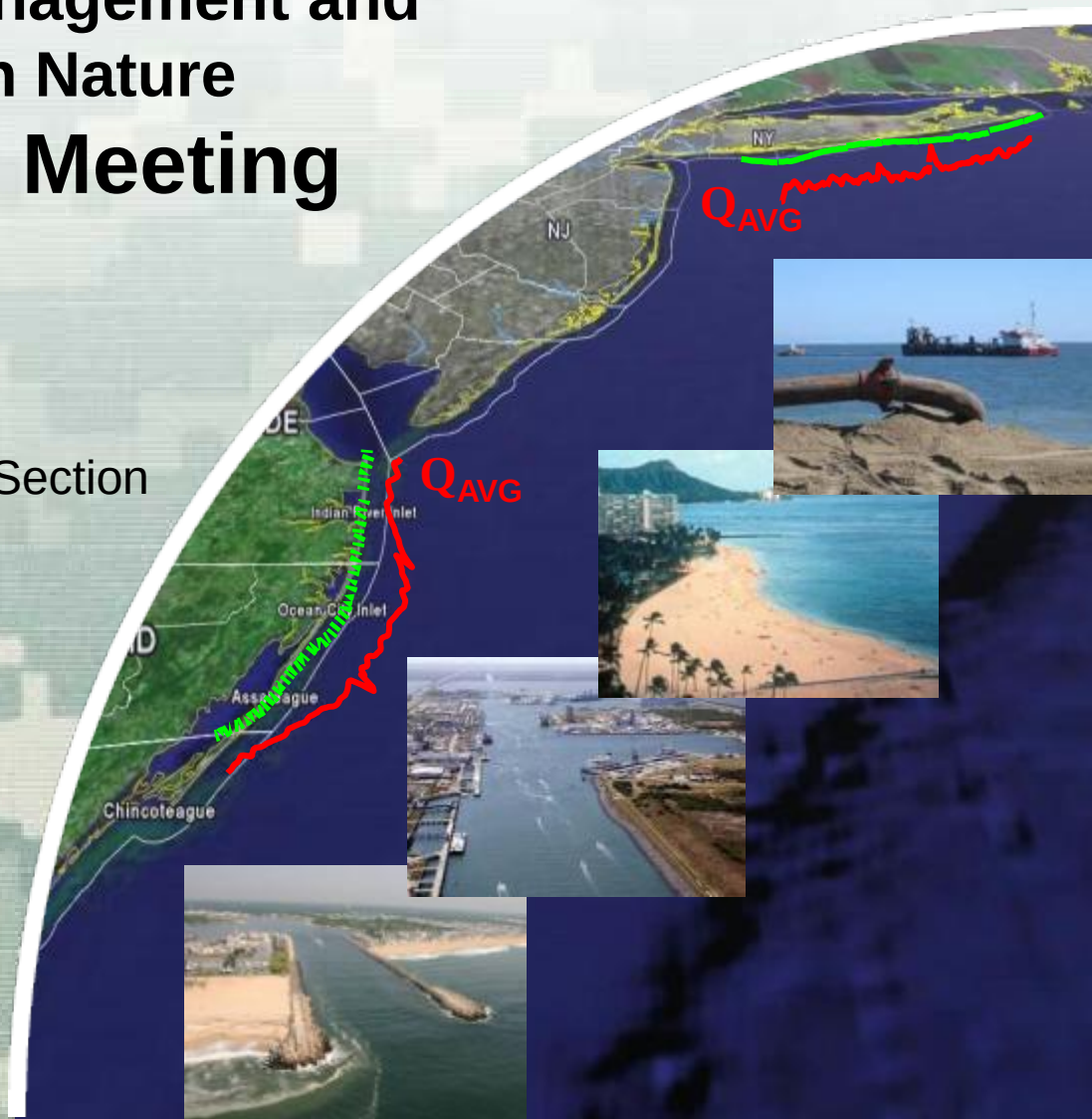
Regional Sediment Management and Engineering With Nature

Inland Working Meeting

John Shelley, Ph.D., P.E.
Hydraulic Engineer
River Engineering and Restoration Section
Kansas City District



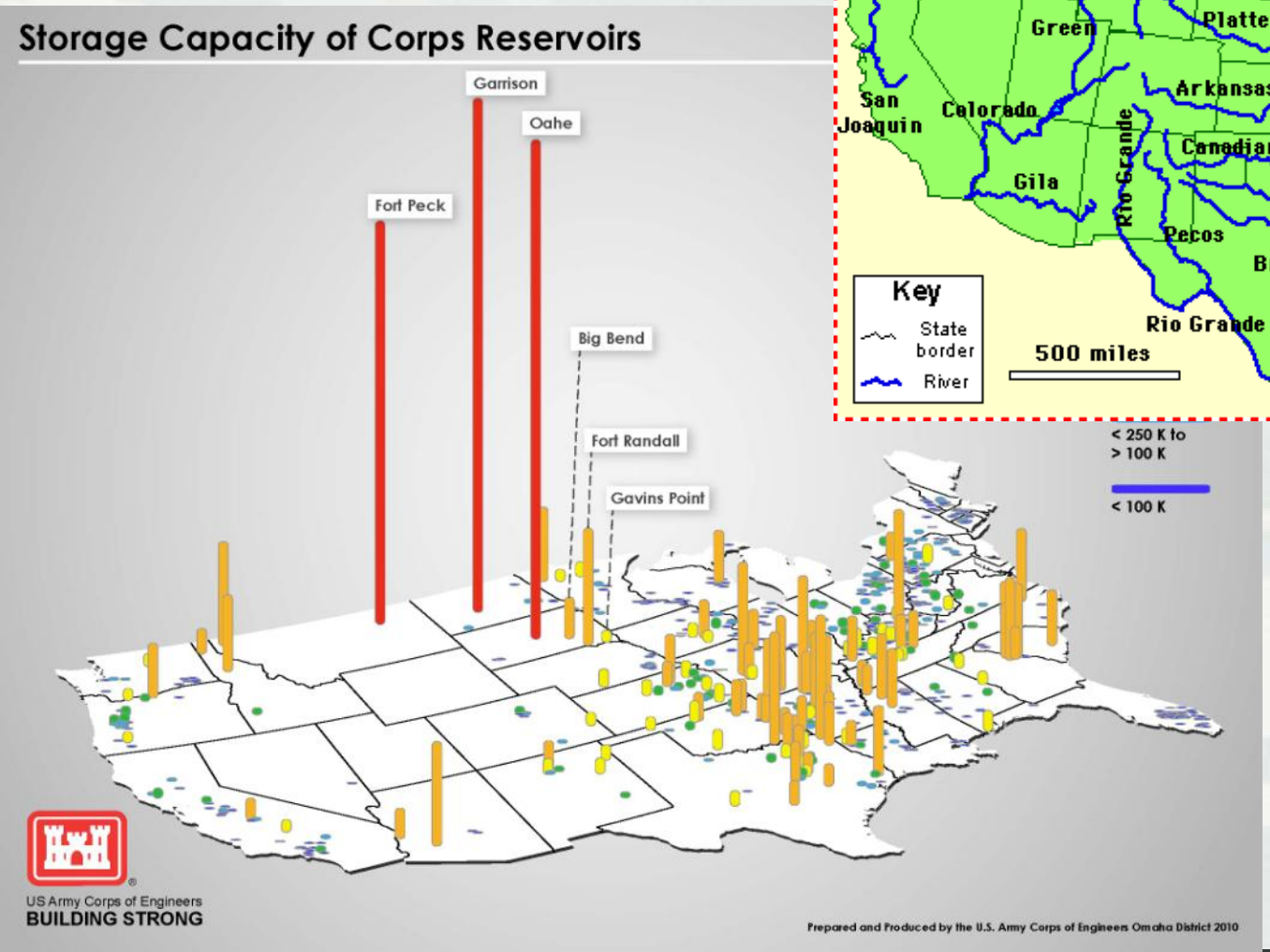
US Army Corps of Engineers
BUILDING STRONG®

Outline

- Relevance of RSM/EWN to Inland Districts
- Working Meeting
- Presentations and Examples
  - Missouri River
  - Decision Making and Level of Detail
- RSM/EWN Challenges and Opportunities
- Field Trip

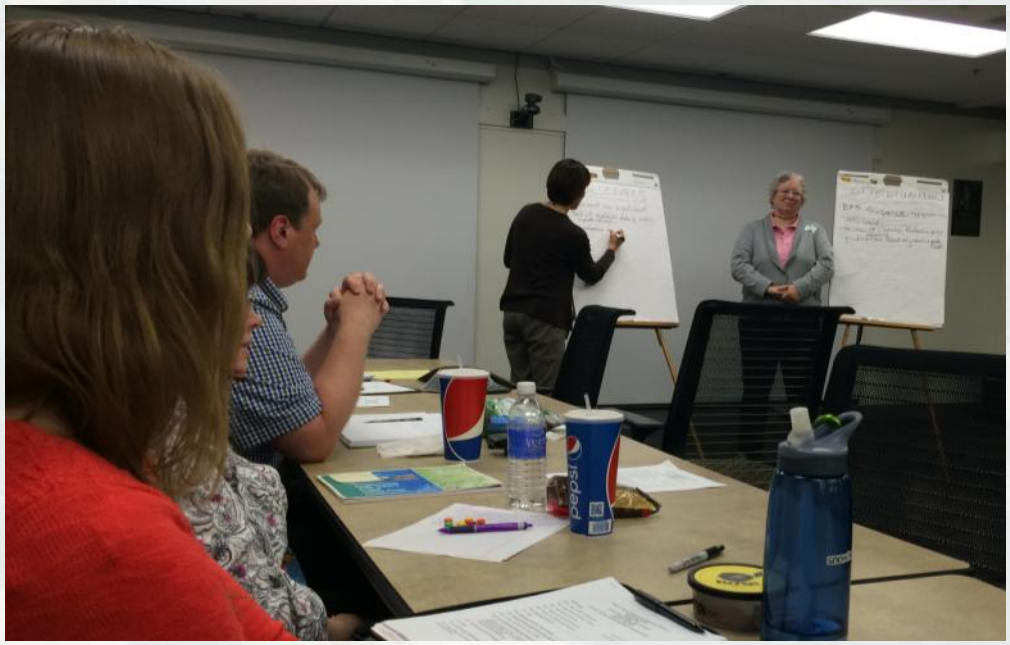
Poll

Relevance to Inland Districts



Regional Sediment Management and Engineering With Nature
Inland Working Meeting: 29 April – 1 May 2014

Linda Lillycrop	ERDC
Todd Bridges	ERDC
Dinah McComas	ERDC
Steve Tapp	MVP
Brian Ball	LRH
Meg Jonas	ERDC
Todd Davis	LRL
Craig Fischenich	ERDC
Chuck Downer	ERDC
John Shelley	NWK
Stanford Gibson	HEC
Paul Boyd	NWO
Aaron Byrd	ERDC
Katherine Touzinsky	ERDC
Elizabeth Bruns	MVR
Heather Bishop	MVR
Kevin Landwehr	MVR
David Gordon	MVS



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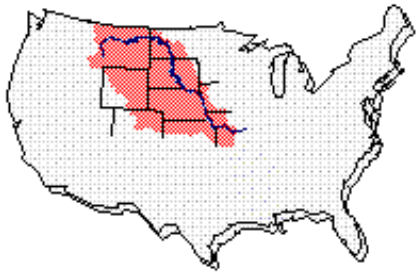
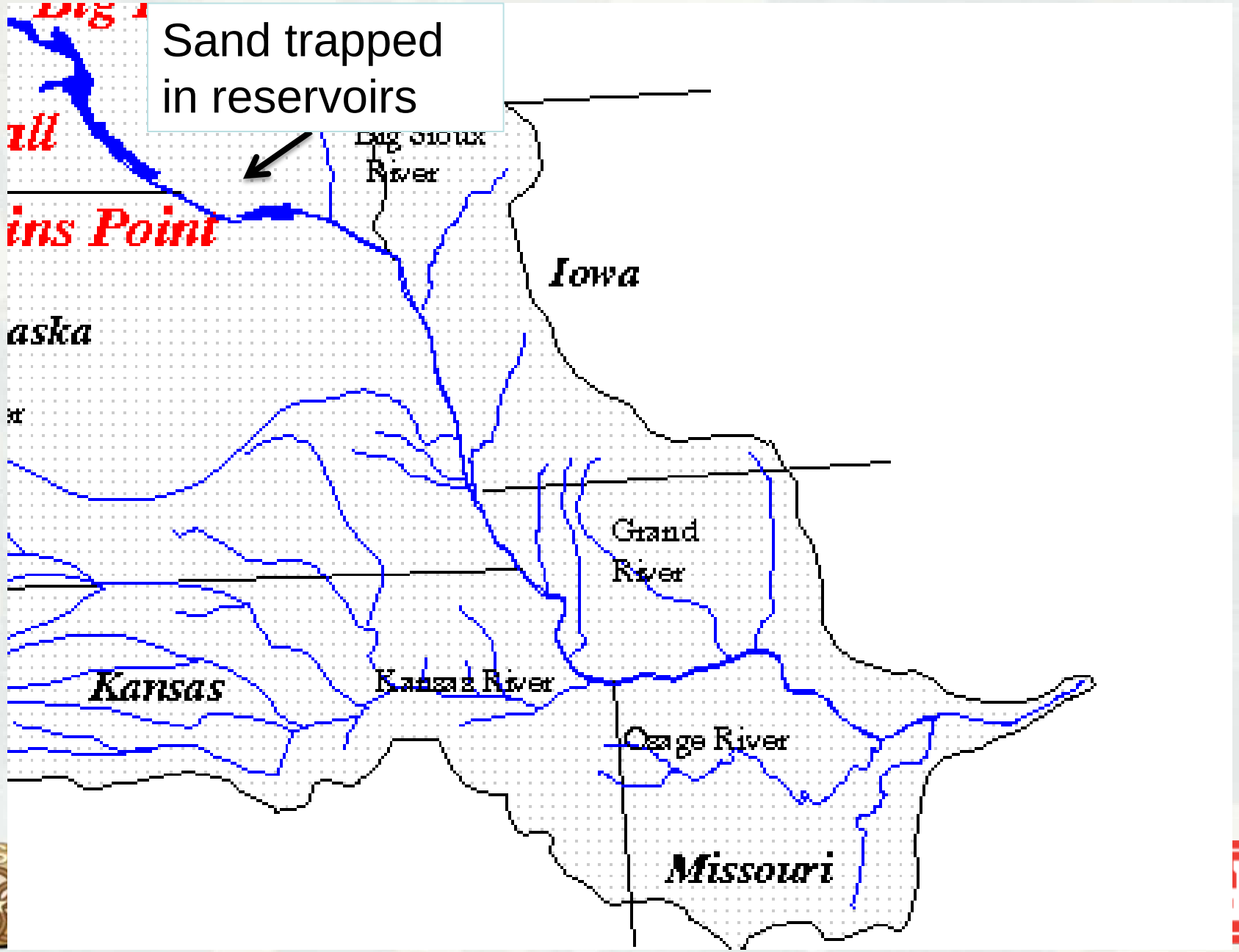
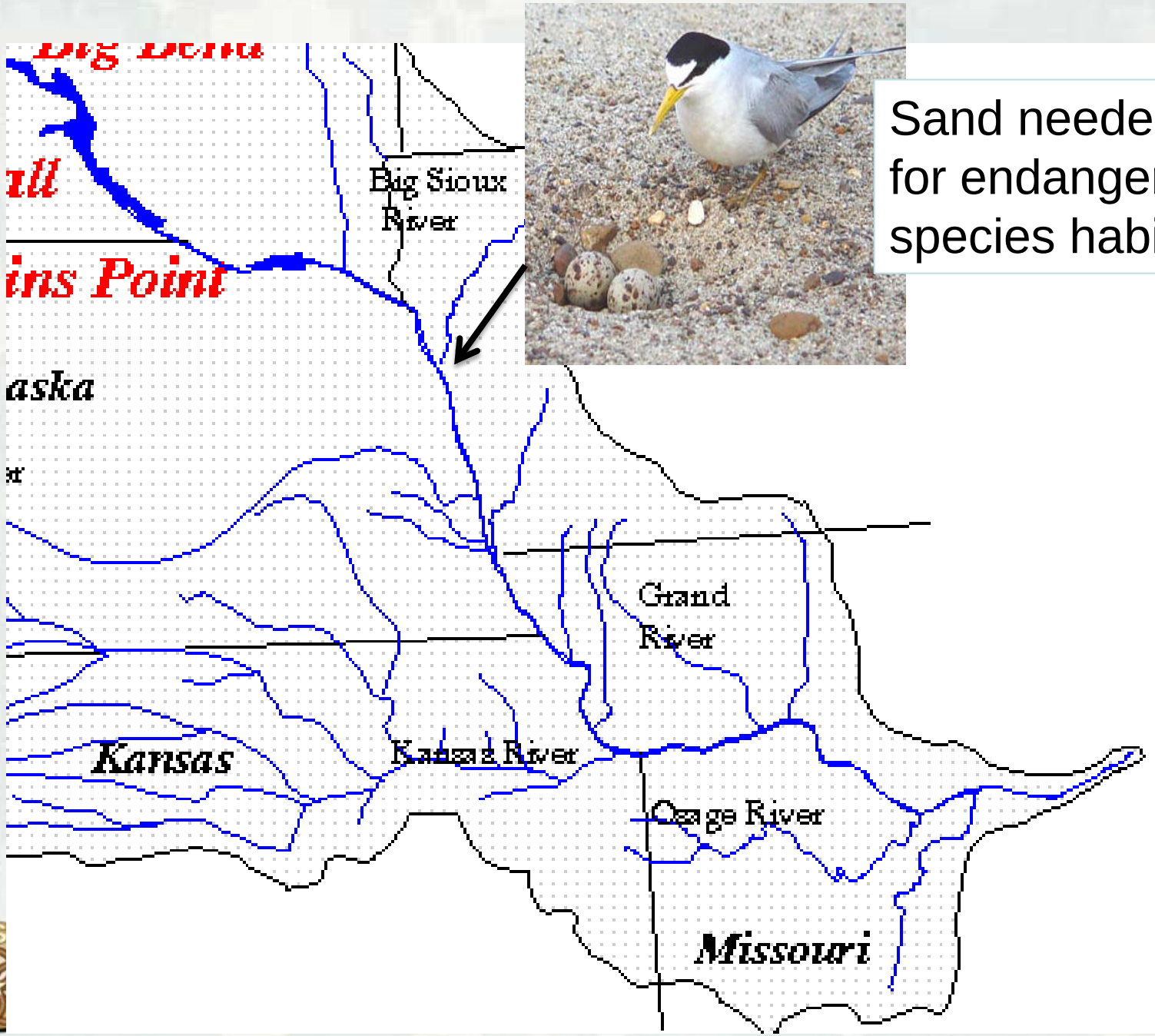
Missouri River Basin

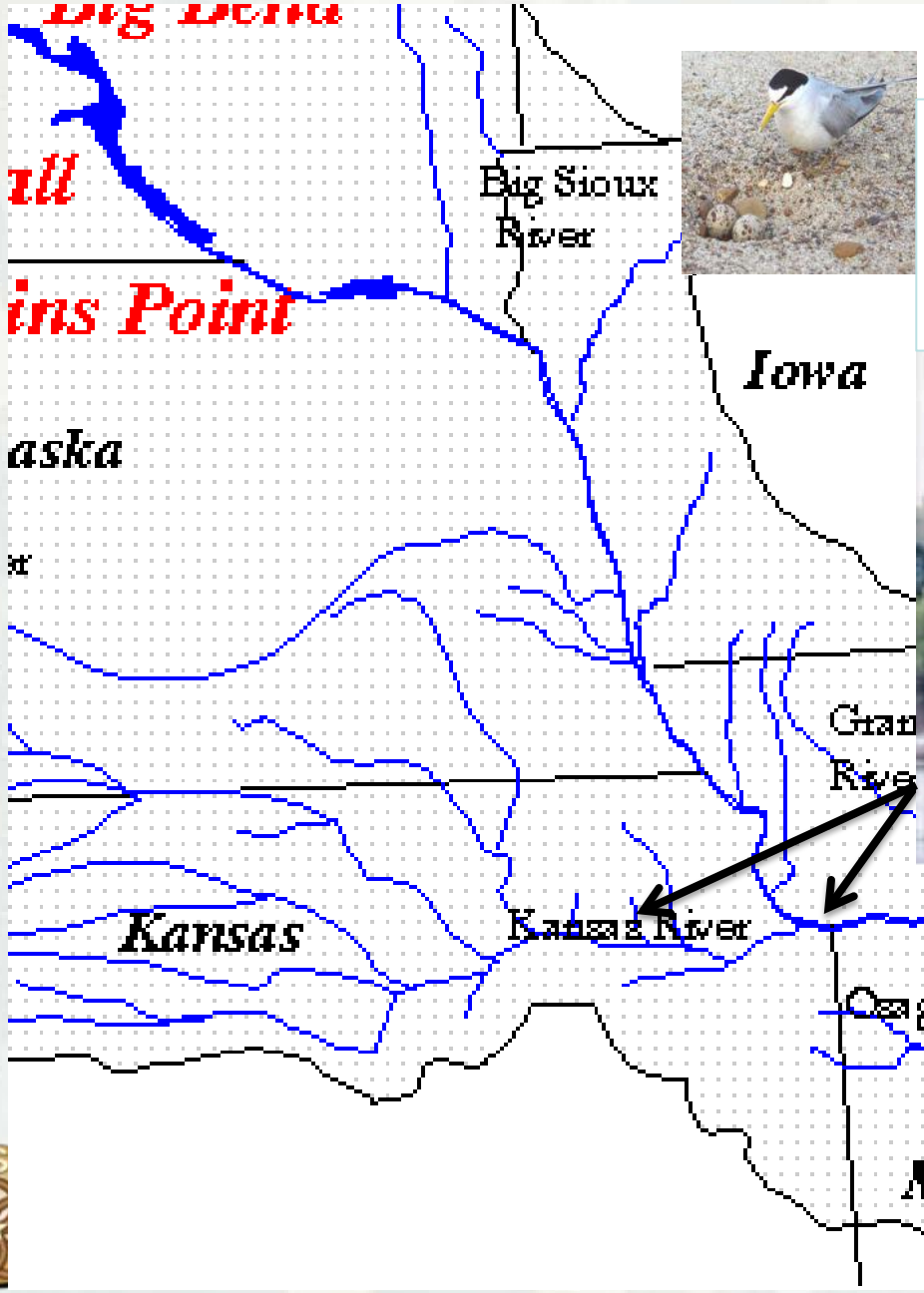


Fort Peck
Montana
Canyon Ferry
Yellowstone River
Tongue River
Big Horn River
Powder River
Yellowtail
Wyoming
Garrison
North Dakota
South Dakota
James River
Cheyenne River
Oahe
Big Bend
Fort Randall
Big Sioux River
Gavins Point
Iowa
Nebraska
Omaha District Boundary
Platte River
Colorado
Grand River
Kansas
Kansas River
Osage River
Missouri

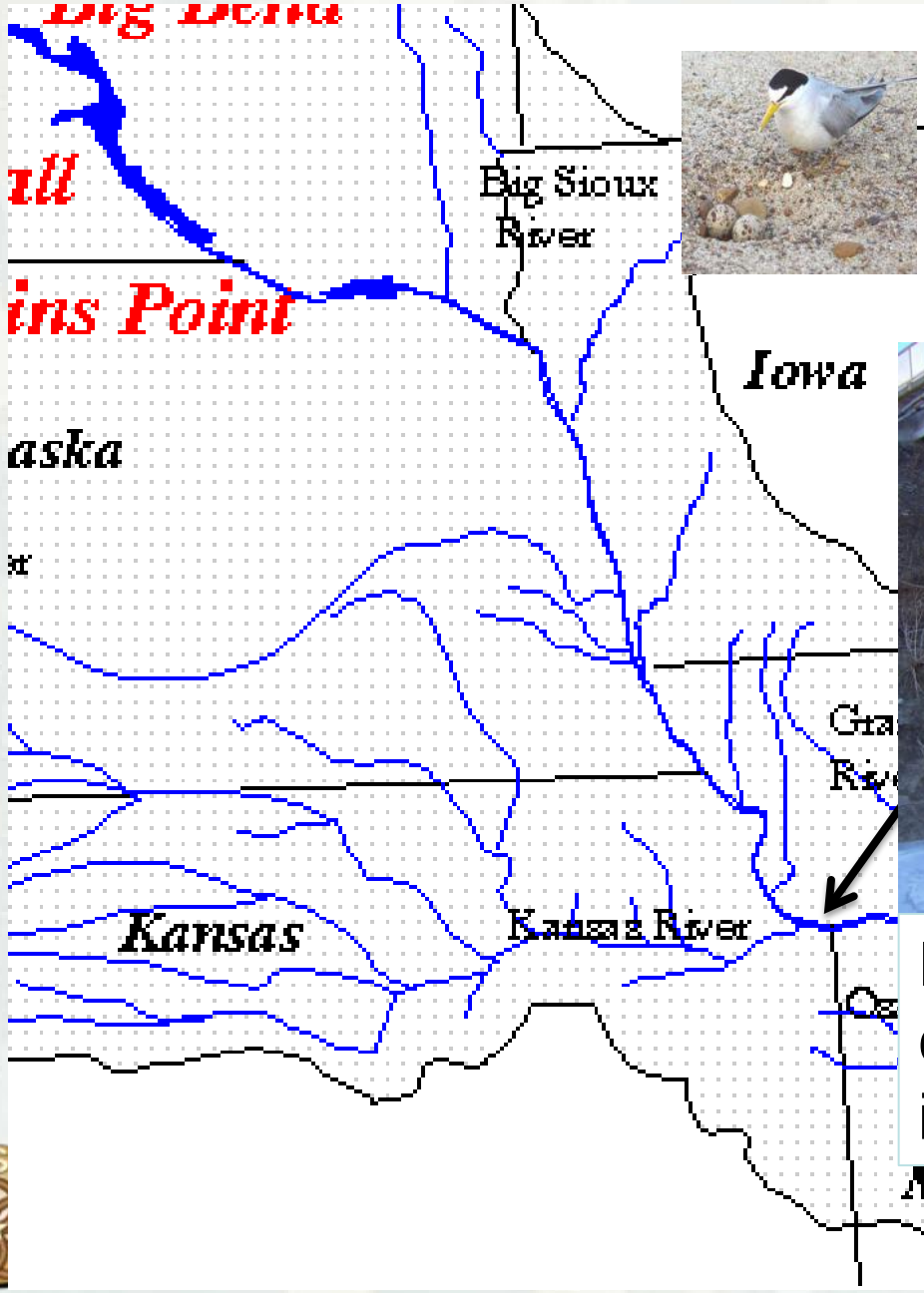

Sand trapped in reservoirs
Big Sioux River
Iowa
Grand River
Kansas
Kansas River
Osage River
Missouri



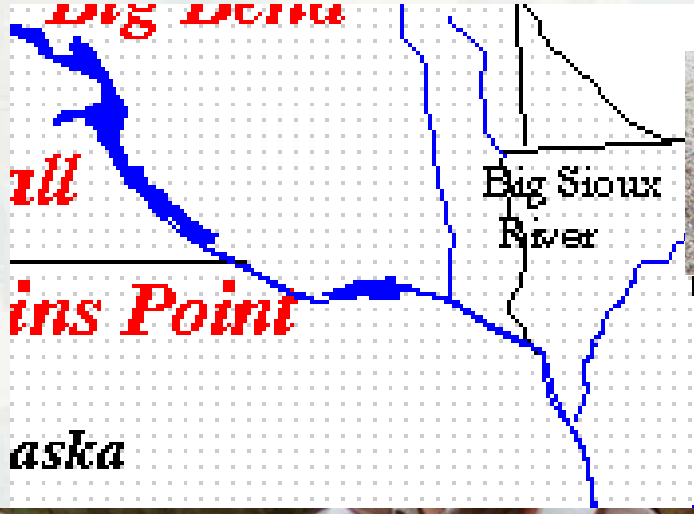
Sand needed for endangered species habitat



Kansas and Missouri Rivers are dredged (mined) for sand and gravel



Bed is degrading (dropping) causing a host of infrastructure problems



Corps wants to build habitat projects and to reintroduce sediment to the river

Missouri Clean Water Commission concerned about increasing sediment in the river-- “sediment is a pollutant” mind-set

Missouri River Flood of 2011

Mississippi River combats shoaling problems

Some Other Presentations

- Beneficial Use of Dredge Mat'l on the Ohio River
- Tuttle Creek Reservoir Sedimentation
- Sediment Management Needs at Huntington District Reservoirs
- Rio Grande Reservoirs and Sediment Problems

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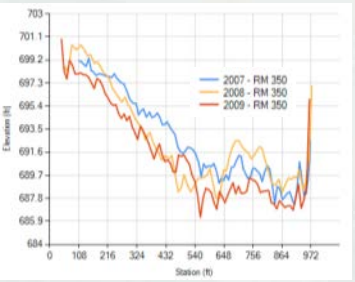
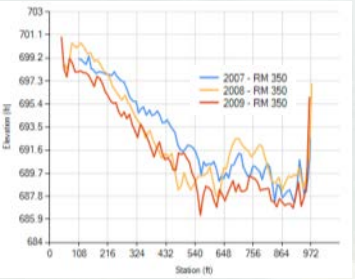
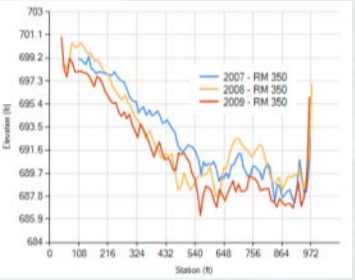
Decision Making and Level of Analysis



Empirical Data $



Empirical Data + Regional Process-Based Models $



Empirical Data + Site-specific models $

Decision Making and Level of Analysis

- Empirical Tools
  - XS Viewer
- HEC-RAS
  - SIAM sediment budgeting
  - Mobile-bed modeling
  - BSTEM bank erosion
  - Reservoir sedimentation
- AdH
  - Site-specific 2D and 3D sedimentation problems
- GEISHA
  - Full watershed sediment modeling (including watershed BMPs, reservoirs, and rivers)

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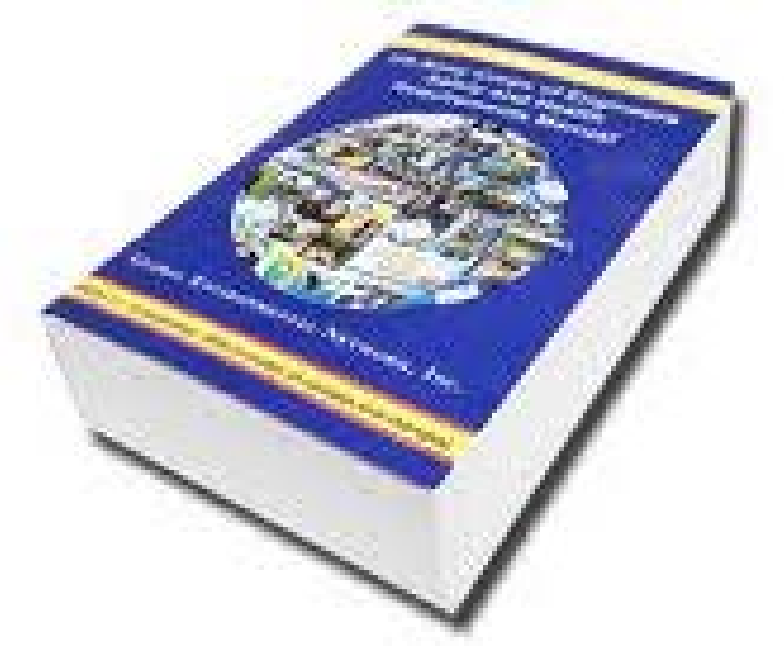
RSM-EWN Opportunities

Guidance/ Case Studies



Systematic review, lessons learned, and design guidance for river restoration, bendway weirs, and grade control projects

Method for quantifying costs and benefits of (1) recharging sediments trapped behind reservoirs to the downstream channel (2) beneficial use plans that keep sediment in the river

RSM-EWN Opportunities

Training

Create a “Planning Associates Program” for River Engineering

Cover River Engineering in PROSPECT courses (some material is scattered over several other courses, other essential skills are not taught in any)

Create a Reservoir Sedimentation PROSPECT course

RSM-EWN Opportunities

Other

Create sediment management plans in advance of flood events to intelligently inform post-flood recovery efforts

Sediment budgets that include fluxes to/from the floodplain

Tools for automating uncertainty analysis in sediment

RSM-EWN Challenges

"Sediment is a pollutant" mindset

Lack of data (baseline data, calibration data)

Large systems = very expensive projects (too big for RSM)

Lack of standard ways to quantify economic and environmental benefits to include in project justifications

RSM-EWN Challenges

Competing interests: Who does or does not want the sediment?

Permitting process ill-suited to looking at sediment as a resource

Corps lack of interest in water supply (dedicated programs, funding, research)

Field Trip – Deer Island Shallow Water Habitat Site

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