

Sediment-Management Decision Making

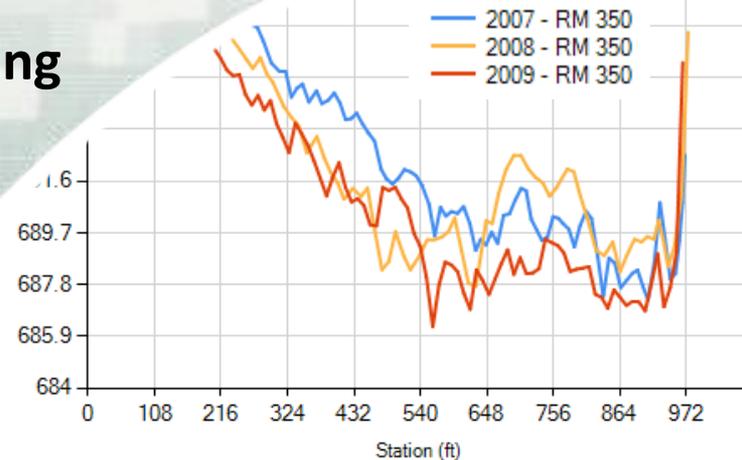
Cross-Section Viewer/Analysis Tool

Inland RSM Meeting
May 2014

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Kansas City District USACE



®

US Army Corps of Engineers

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Outline

- Empirical analysis for decision support
- XS Viewer



Sediment Management Decision Making

Sediment Measurements +
Empirical relationships and
trends

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Sediment Measurements +
Regional Process-Based
Models

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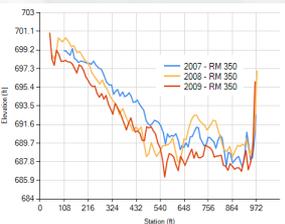
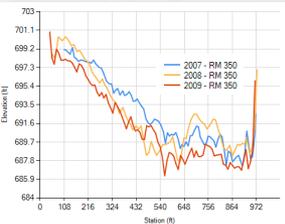
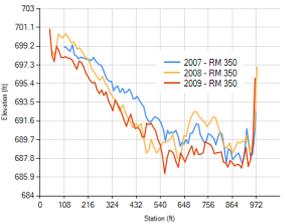


Sediment Measurements +
Site-specific models

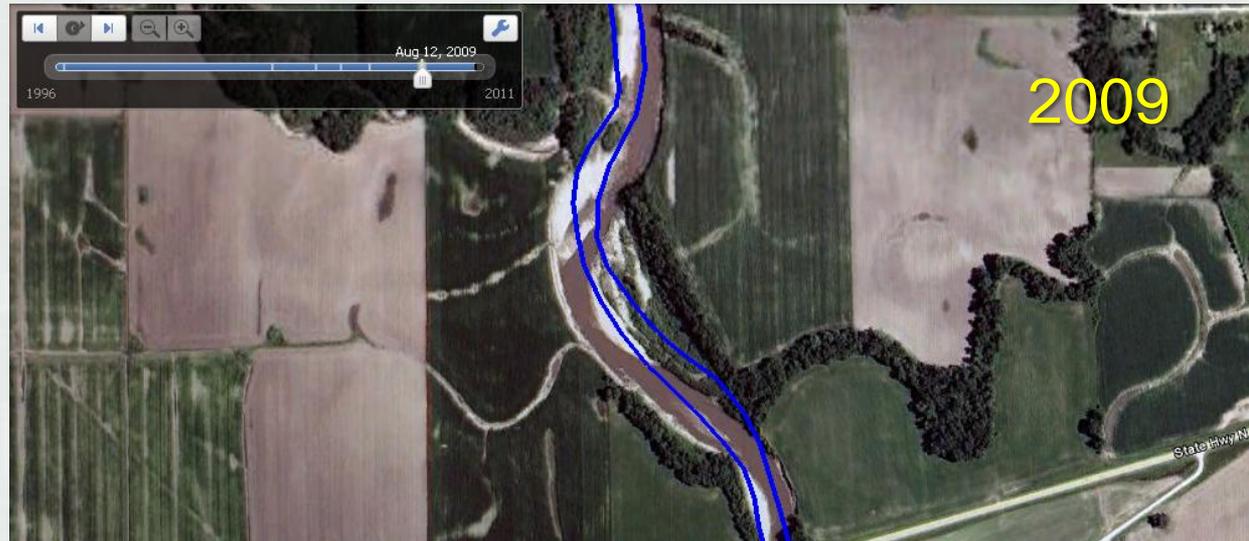
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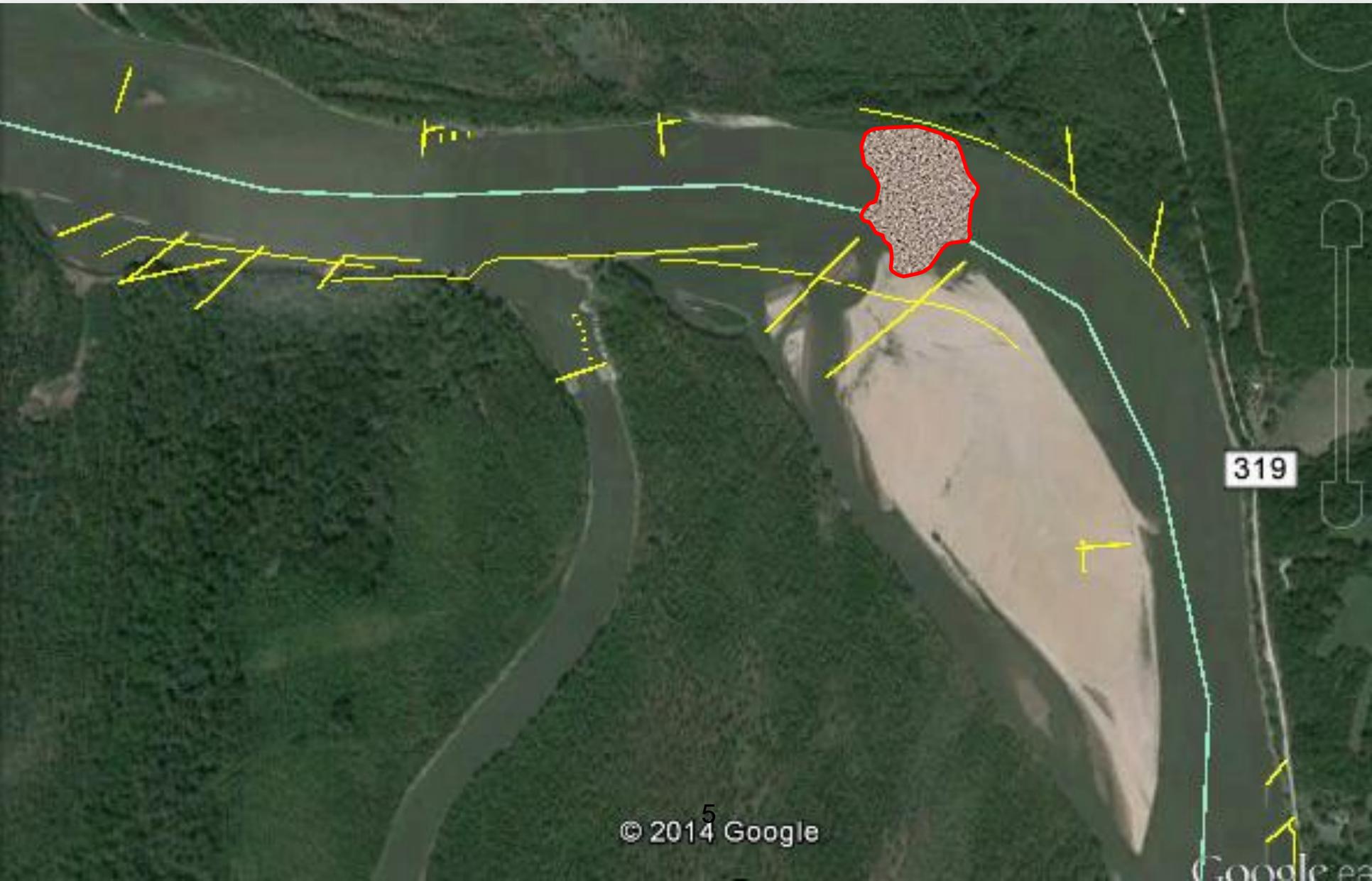


Empirical Relationships Example



Thompson River,
Kansas

Empirical Evidence Example



Reconnaissance Study 905(b) Analysis

- “Existing, readily-available data should be used during the Reconnaissance Study. Sponsor, other agency, State, and local government sources of available data will be used to the maximum extent possible.”
- “Sound judgment and limited analytical approaches should be employed during the Reconnaissance Study”

The most commonly used,
readily-available data for
analyzing sediment in rivers is...

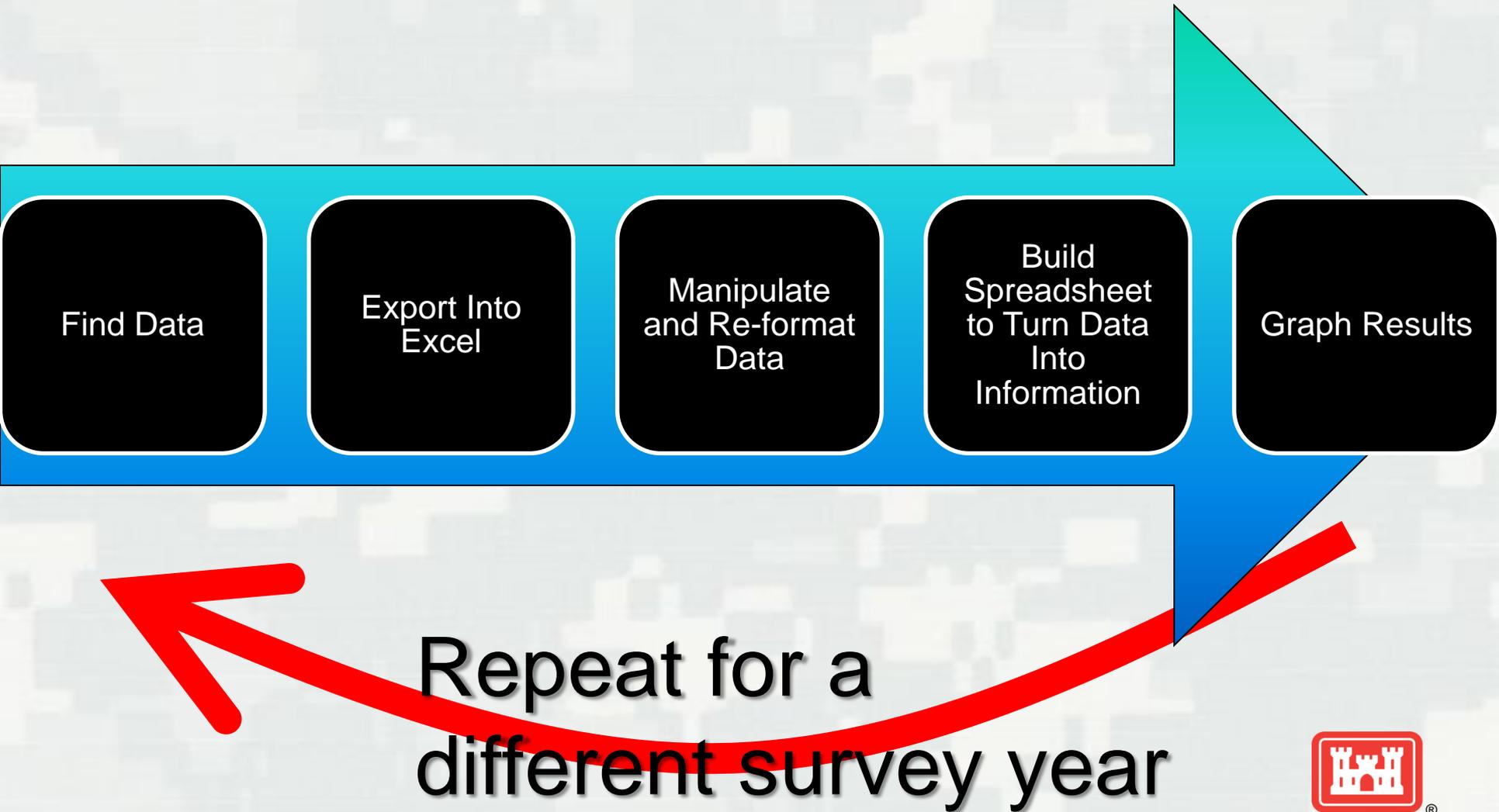


Over 32,000 data requests from
USGS website in Nebraska in
April 2014

By about 2,000 people



XS analysis typical workflow



Missouri River XS Data

- Repeated single-beam sonar surveys at defined transect locations in 2007, 2008, 2009, 2011, 2012, 2013
- 35,165 cross-sectional bathymetric measurements
- Spans 500 miles



	Title	Min River Mile	Max River Mile	Count XS
▶	2007	0.00	498.41	11,782
	2008	0.00	461.00	7,326
	2009	0.00	498.70	10,550
	2011 August	293.09	451.09	185
	2011 August 31	364.86	370.53	121
	2011 July 07	363.96	373.70	68
	2011 July 14	363.96	373.84	79
	2011 June	293.09	451.09	406
	2011 June 28	362.94	370.53	74
	2011 November	293.09	451.09	367
	2011 September ...	362.94	373.84	131
	2012	0.00	498.12	1,310
	2013 Survey Fro...	368.46	498.70	2,766

Basic Framework

XS Viewer Tool

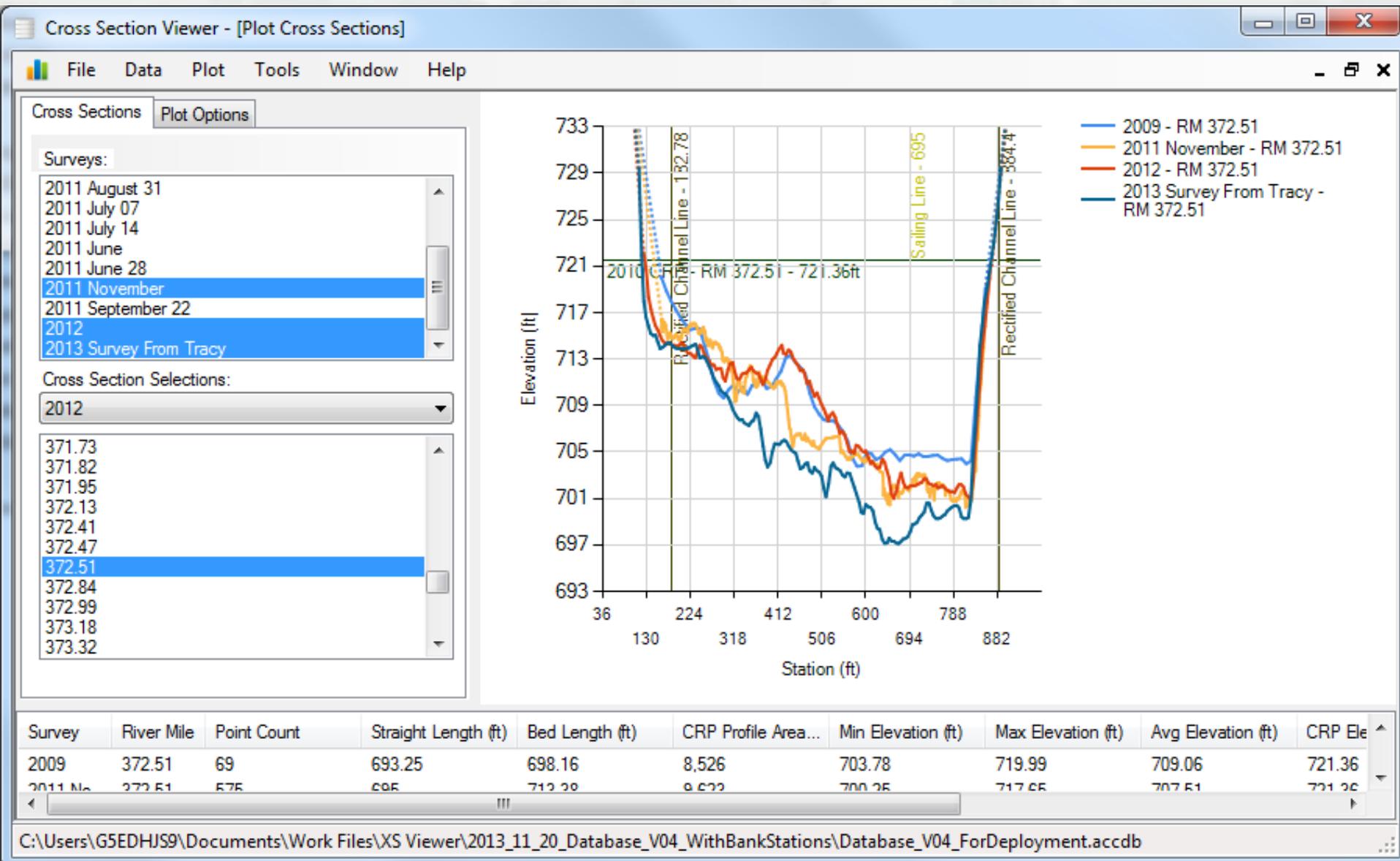
Nimble tool for displaying and exporting data and for automating common geomorphic analyses



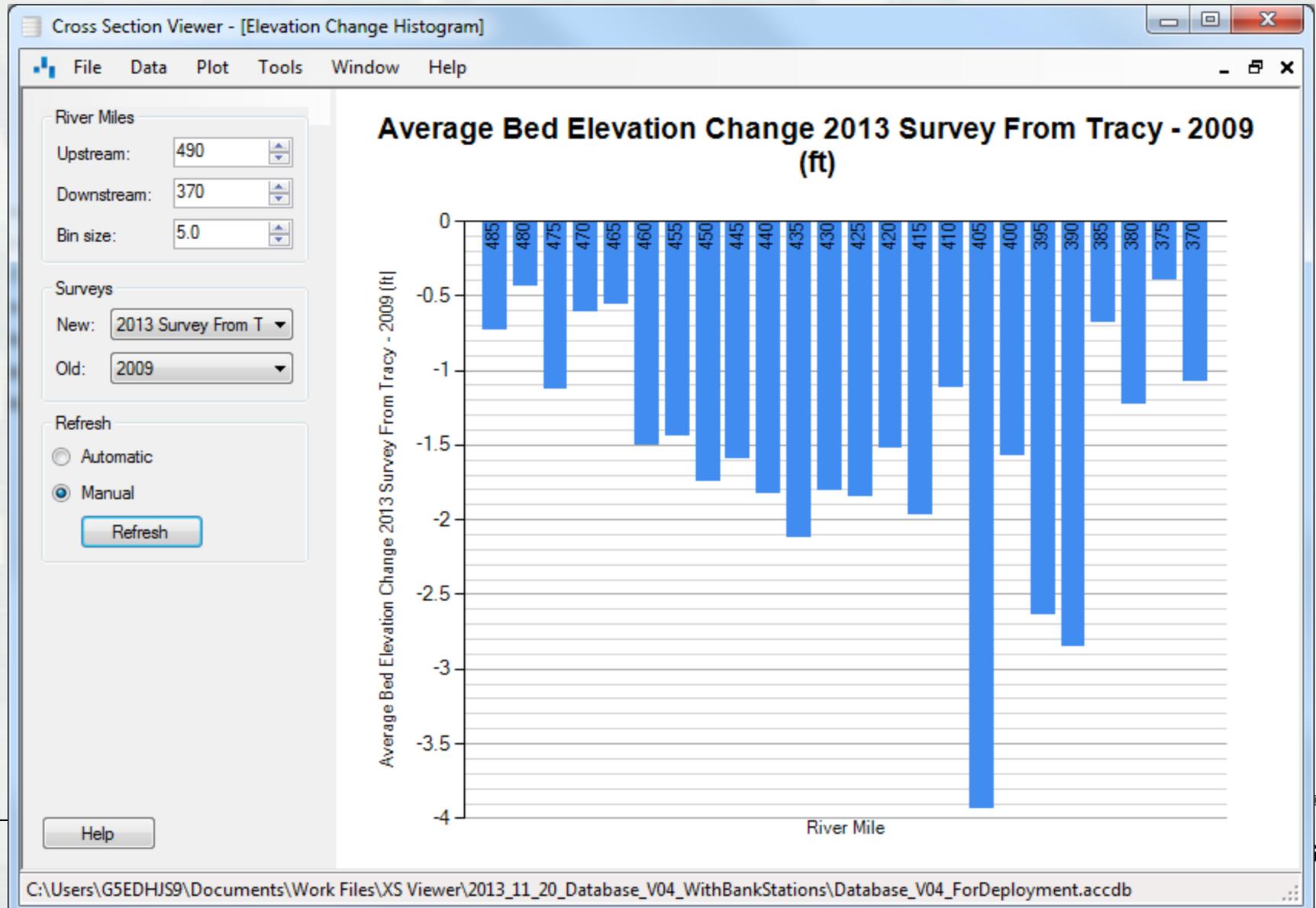
Access Database

x,y,z points, station, elevation points, transect line#
relational tables with river miles, river names, reach names, sailing line stations, rectified channel line stations, bank stations/elevations, and multiple CRP elevations

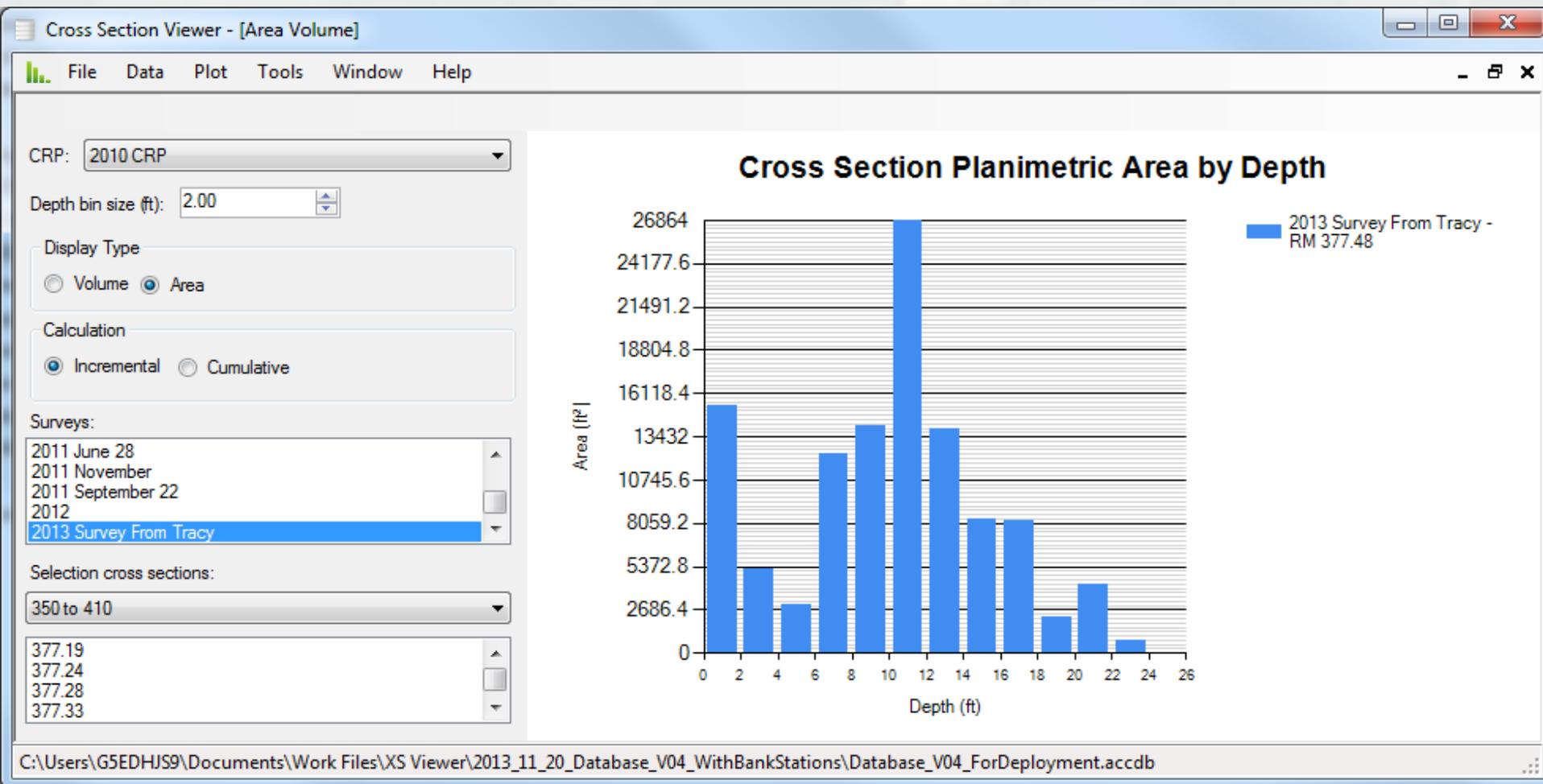
Plot Cross-sections



Average Bed Change



Depth Distributions



Export Data

Export Cross Sections

Cross Sections Surveys

Title	Description	CreatedBy
350 to 410		G5EDHJS9
DegradationXSList		G5EDHJS9
2012		G5EDHJS9
All		G5EDHJS9
358-358_7	For Greg Howick	J Shelley
For Tim O'Neil		G5EDHJS9

Export Format

Comma Separated Value (CSV)
 HEC file (survey XY)
 HEC file (snapped XY)

River:

Reach:

Open exported file when complete

OK Cancel



Current Development

- Fix volume computation tool
- Expand depth diversity reporting to reaches
- Additional input capabilities for adding new surveys, reference elevations, reference stations, etc.
- Flexibility to make tool portable to other rivers



Future Developments

- Web-hosting of data...?
- Other geomorphic analyses...?



Summary

- Empirical analysis for decision support
- Data utilization \propto availability and ease of use
- XS Viewer



Questions?

