

Missouri River Bed Degradation

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**River Engineering and Restoration
Section**

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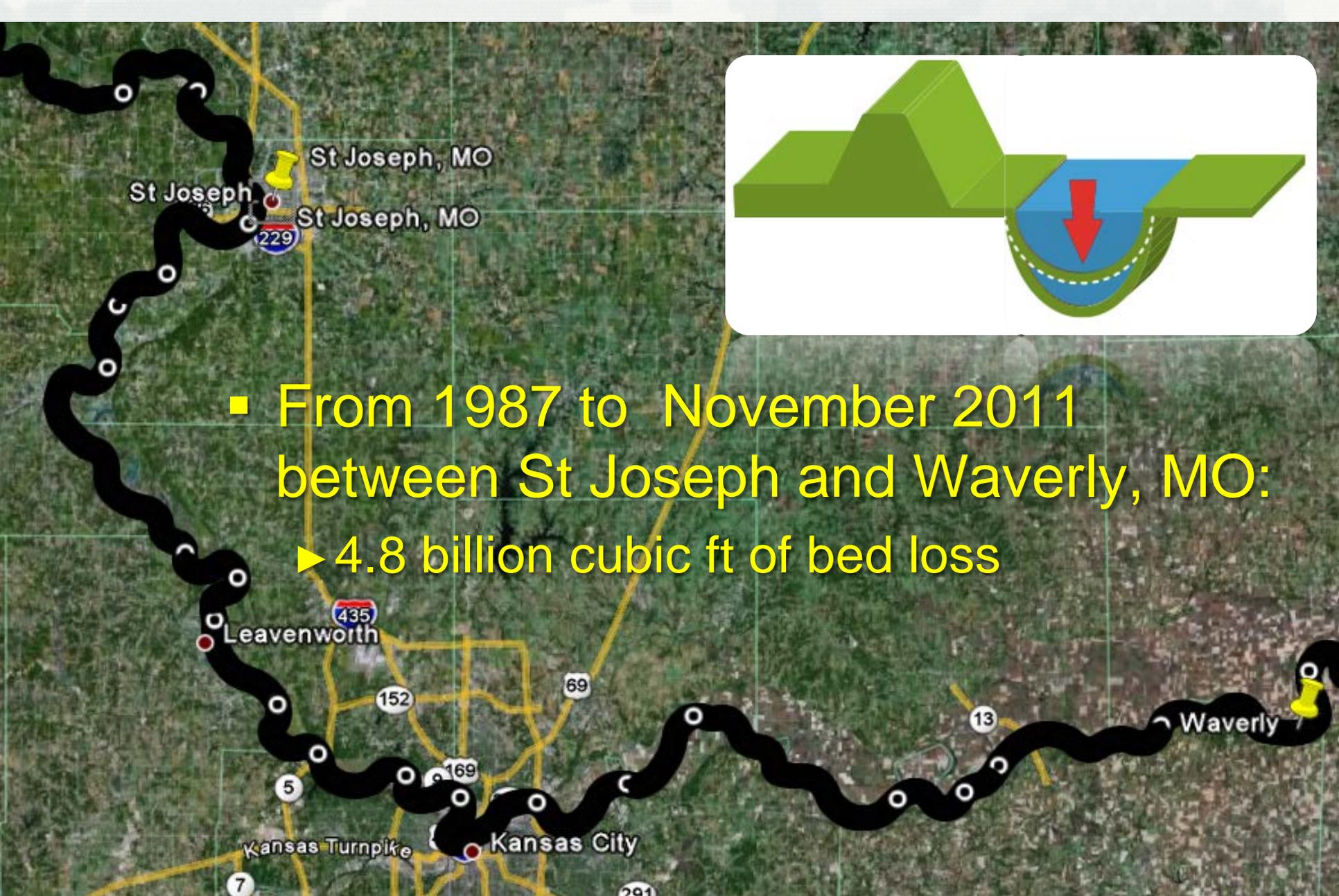
®

**US Army Corps of Engineers
BUILDING STRONG®**

Missouri River Bed Degradation

- Magnitude
- Impacts
- Causes
- Modeling
- Alternatives
- Results





How much material has left?

49 x



How much material has left?

49 x

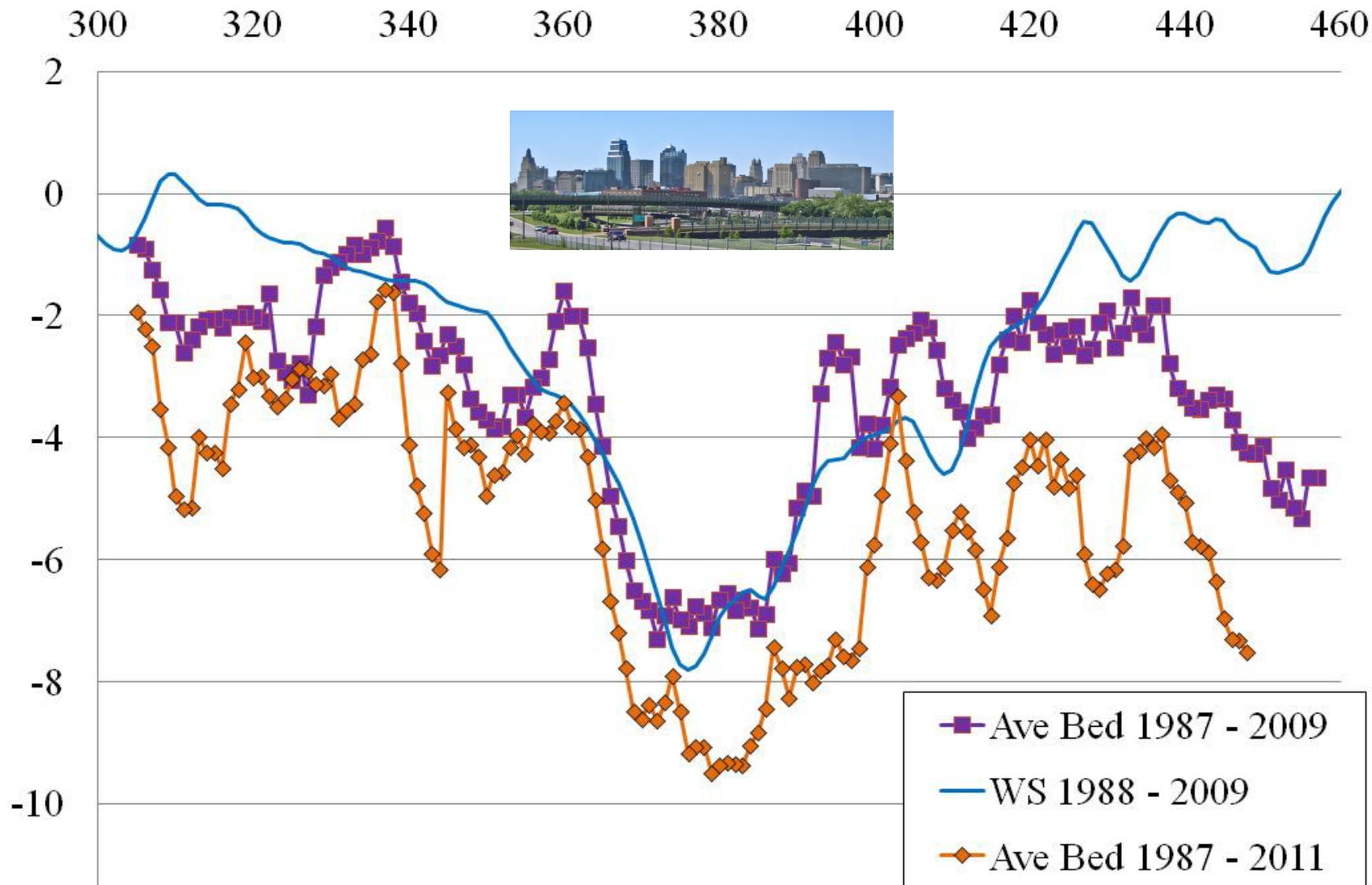


x



Rolling 5-mi Average of Bed Changes , ft

River Mile



KCMO Raw Water Intake



Emergency Rock Placement

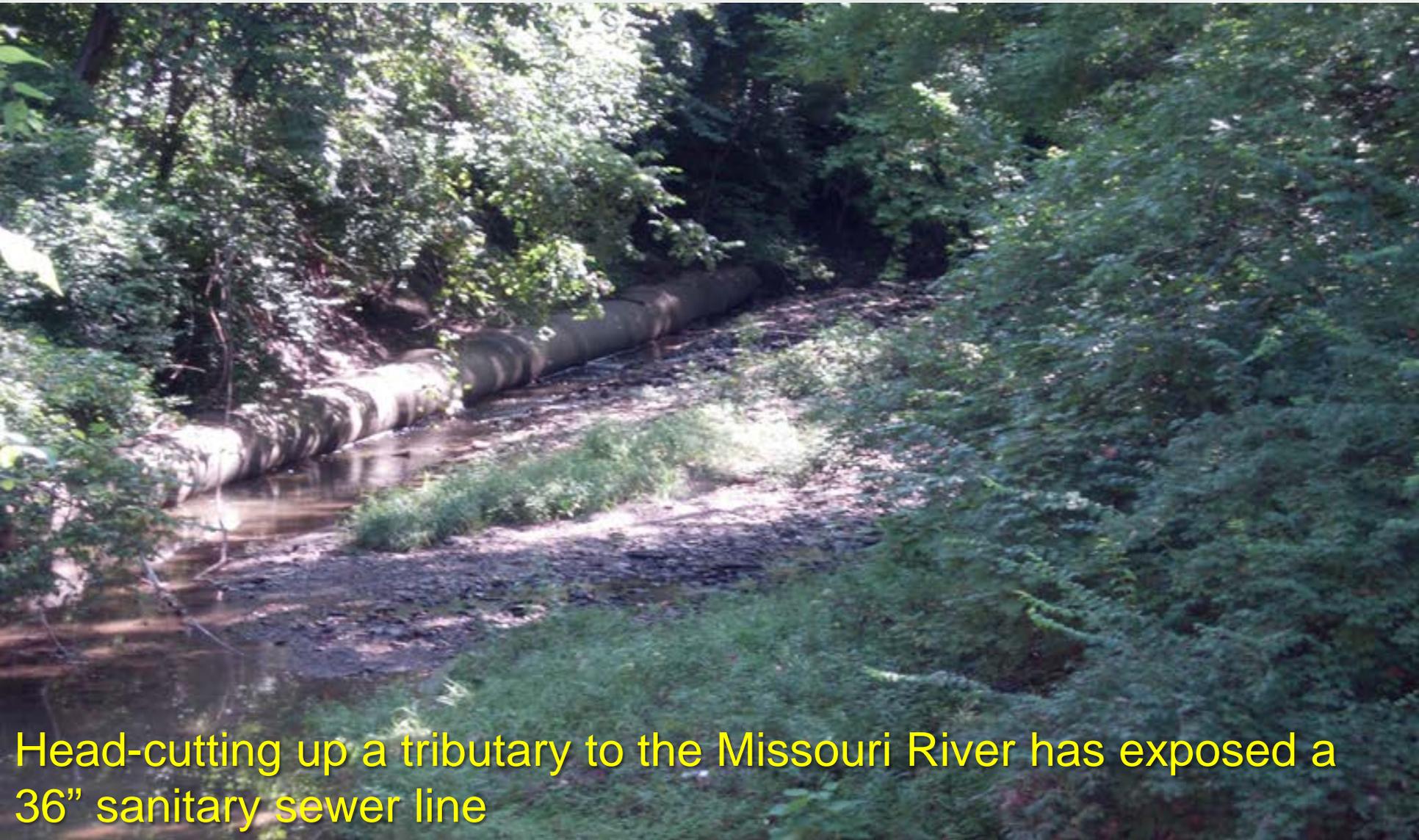




43
42
41
740
39
38
37
36
735
34
33
32
31
730
29

01/01/2007

Argosy Road on Line Creek: Tributary to the Missouri River



Head-cutting up a tributary to the Missouri River has exposed a 36" sanitary sewer line

Impacts of Bed Degradation?

- More than \$100 million has been spent since 1990 in response to degradation
- Preliminary estimates show that additional \$360 million will be spent over next 50 years if degradation is not addressed

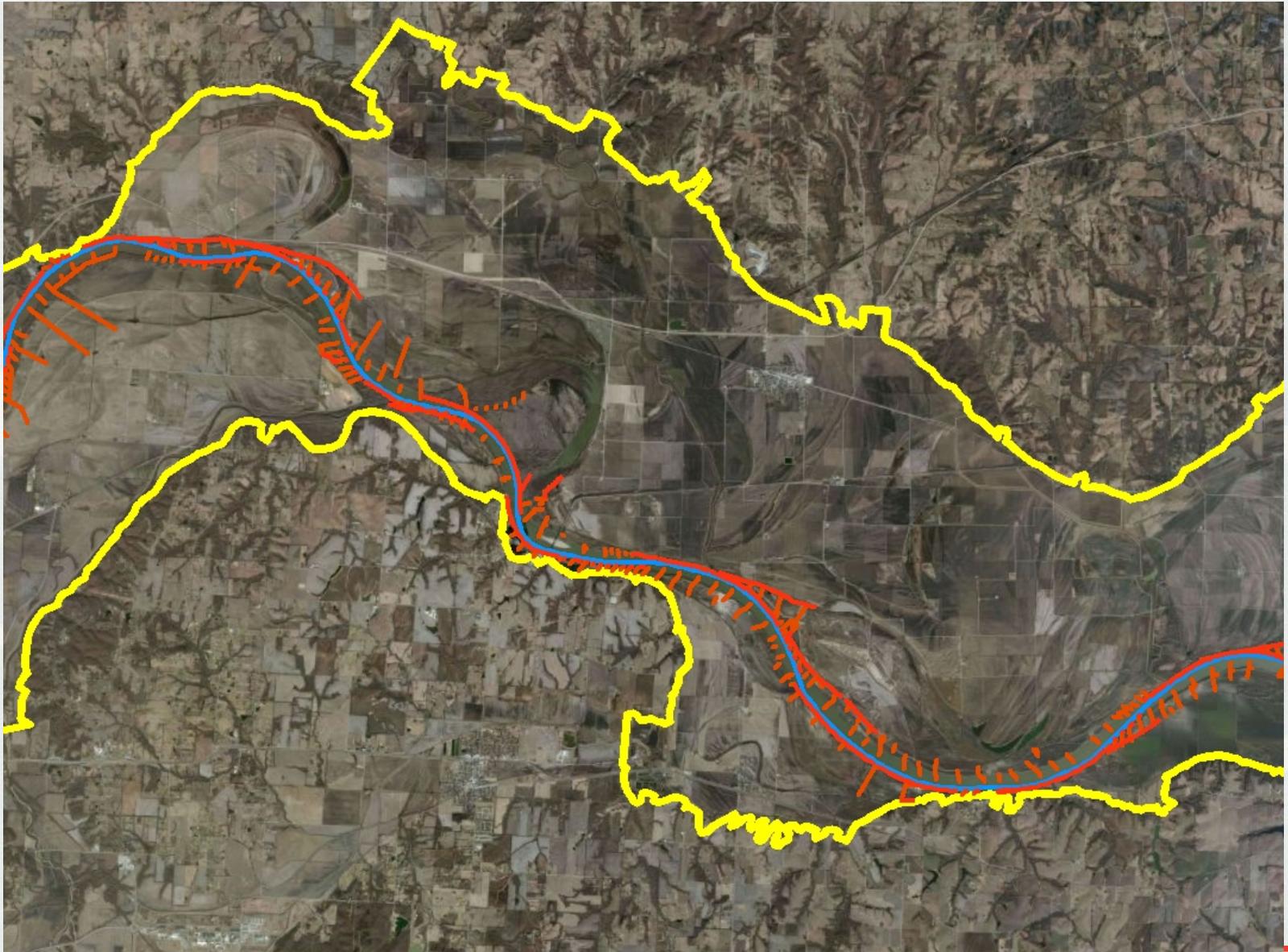


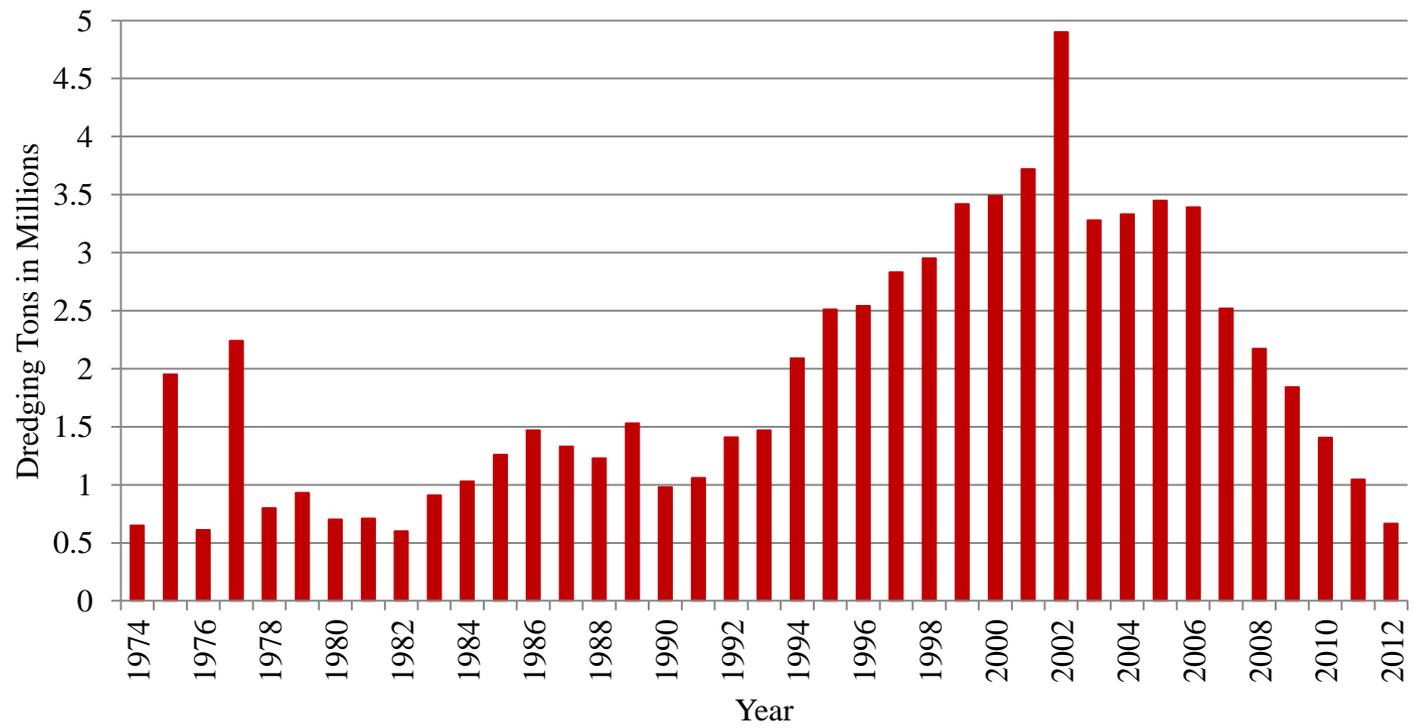
Bank Stabilization and Navigation Project



- Provides a 9-foot deep, 300-foot wide navigation channel
- Extends 735 miles
- Training structures
- Self scouring channel







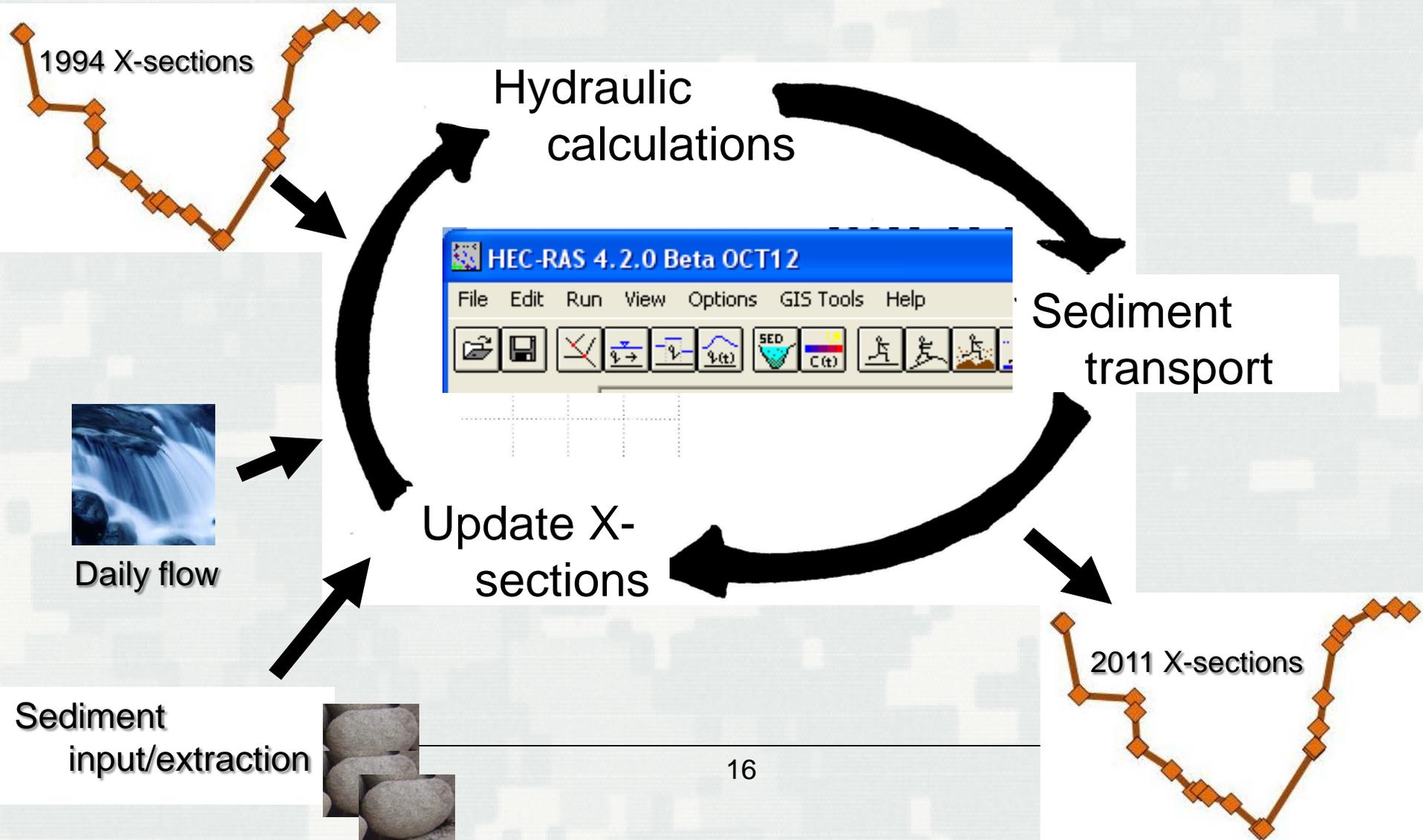
Missouri River Degradation Feasibility Study

What can
be done?

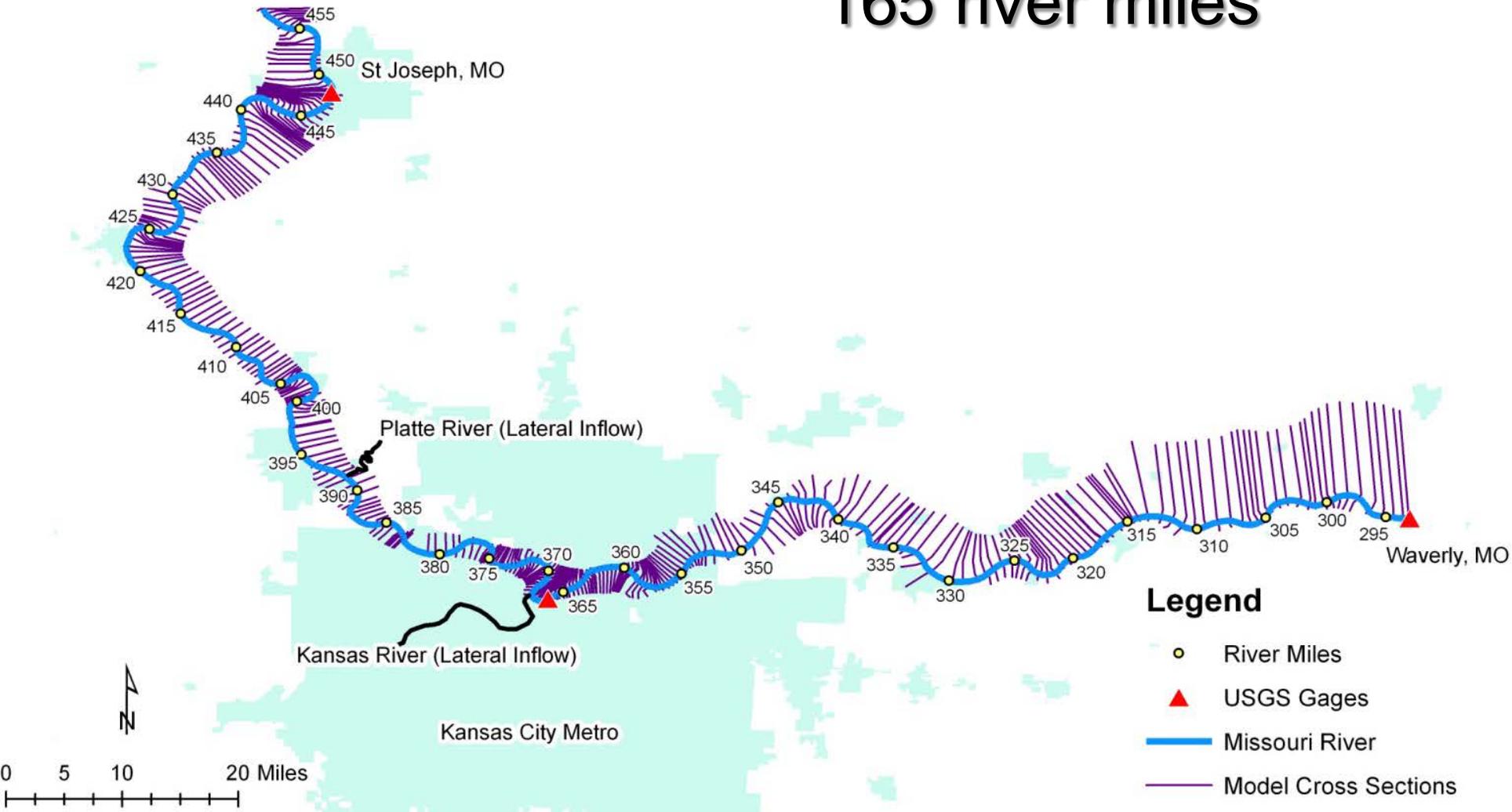
And is it worth
doing?



Mobile-bed Modeling



St Joseph to Waverly: 165 river miles



I'm skipping technical details

Computing
sediment loads

Flows

Transport
formula

Bed sorting
algorithm

Fall velocity

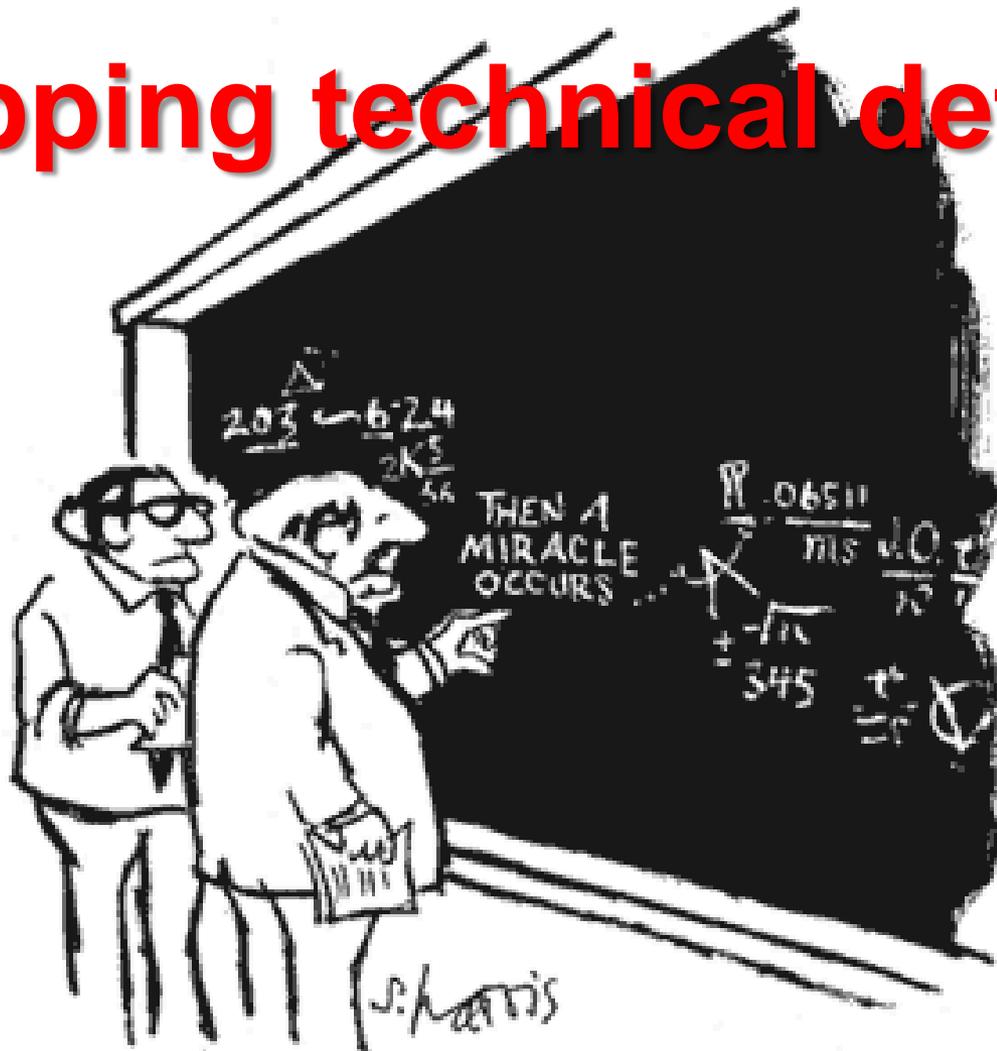
Computational
increment

Tributaries

Calibration
process

Channel
roughness

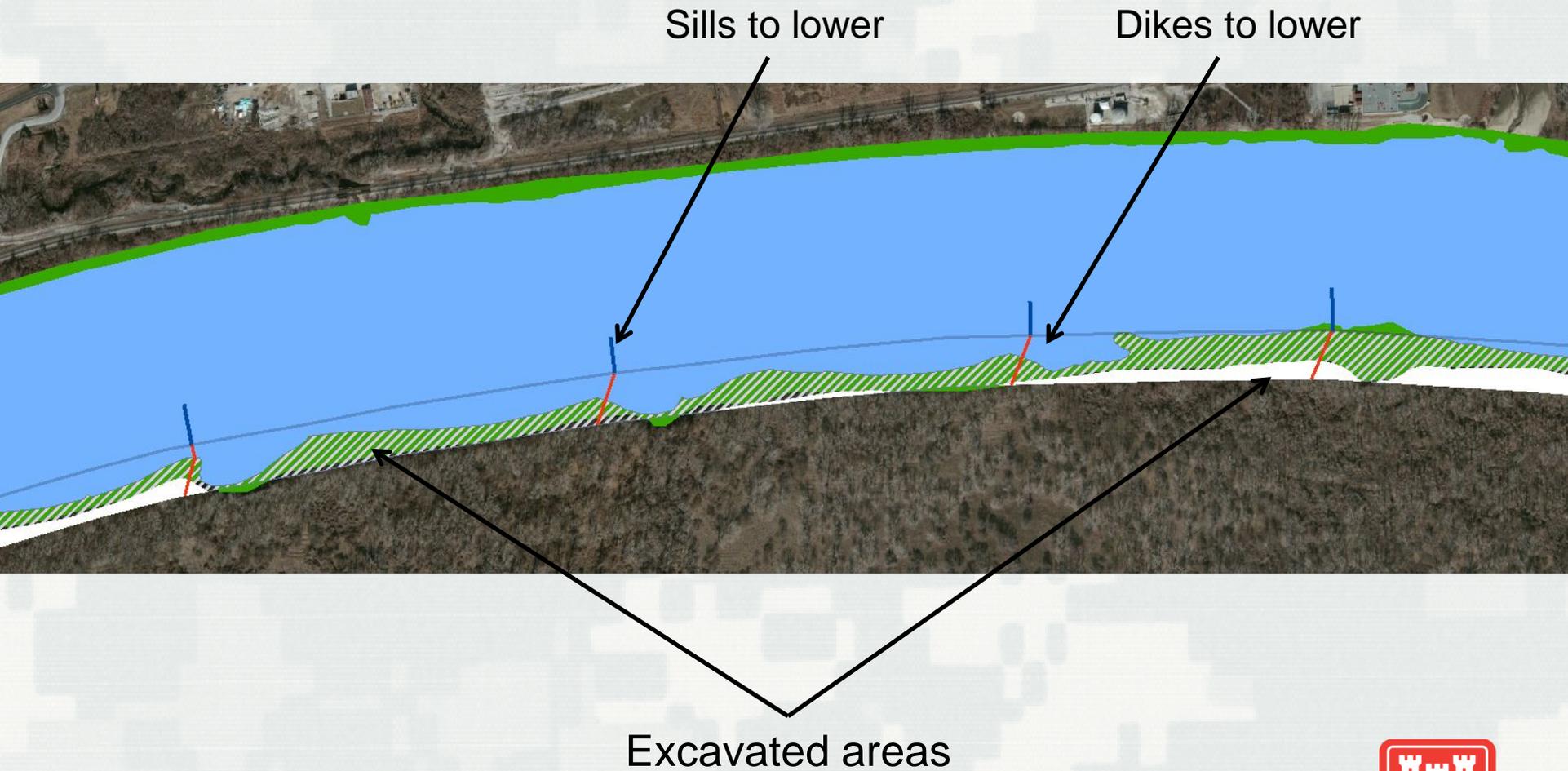
River structures



"I THINK YOU SHOULD BE MORE
EXPLICIT HERE IN STEP TWO."



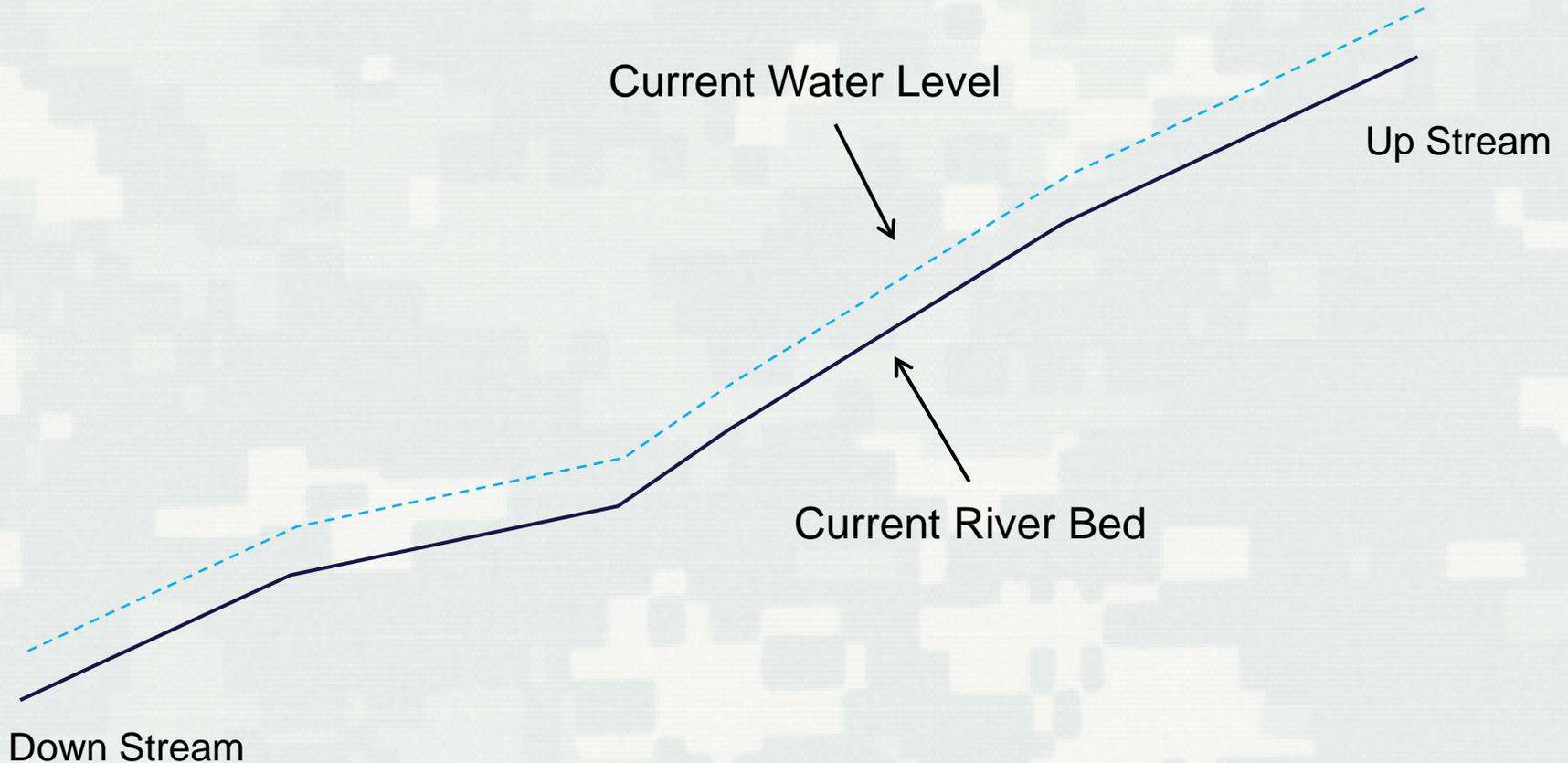
Lowering/Widening Scenarios



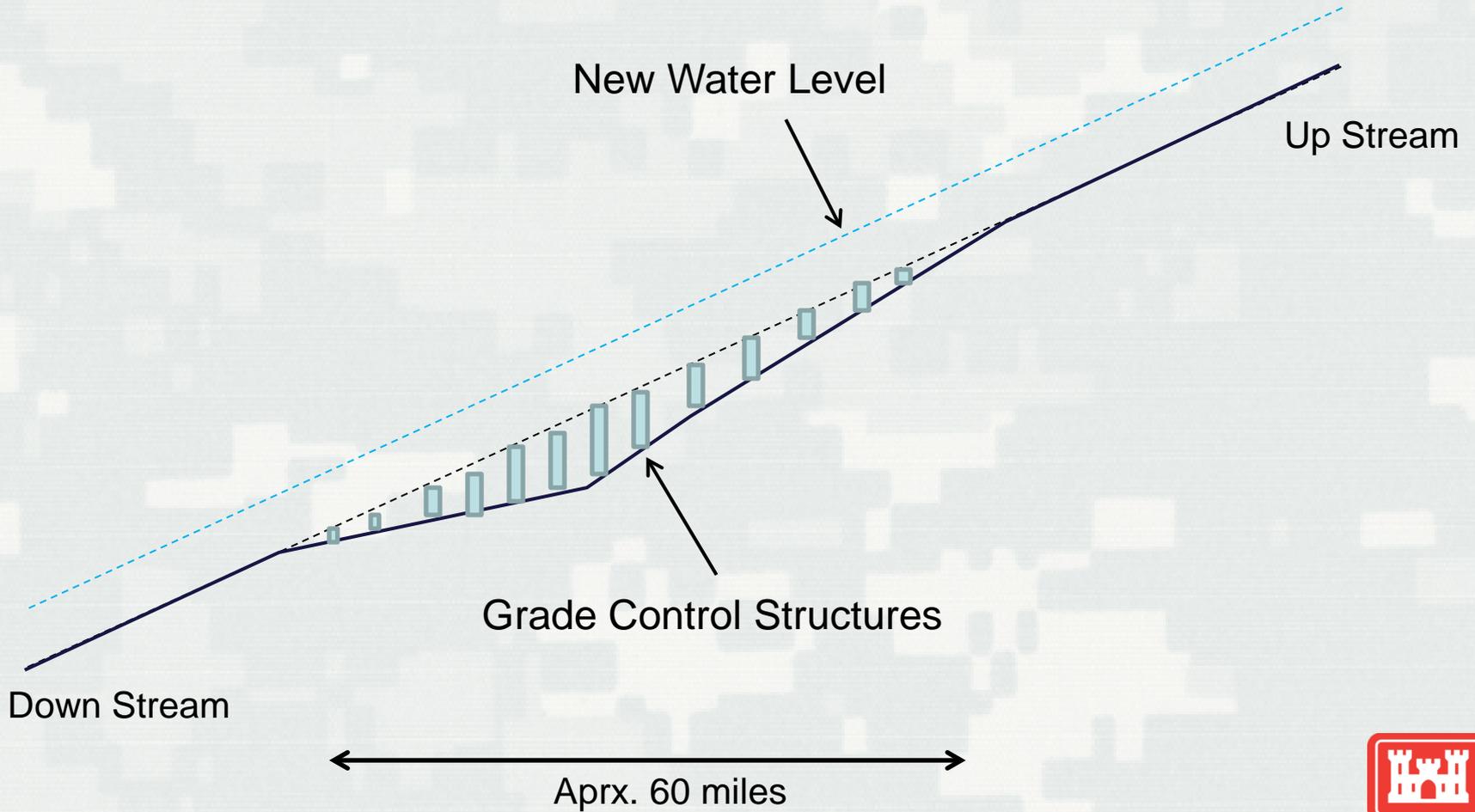
Excavated areas



Grade Control



Grade Control



Summary

- Magnitude
- Impacts
- Causes
- Modeling
- Alternatives
- Results



Questions?

