

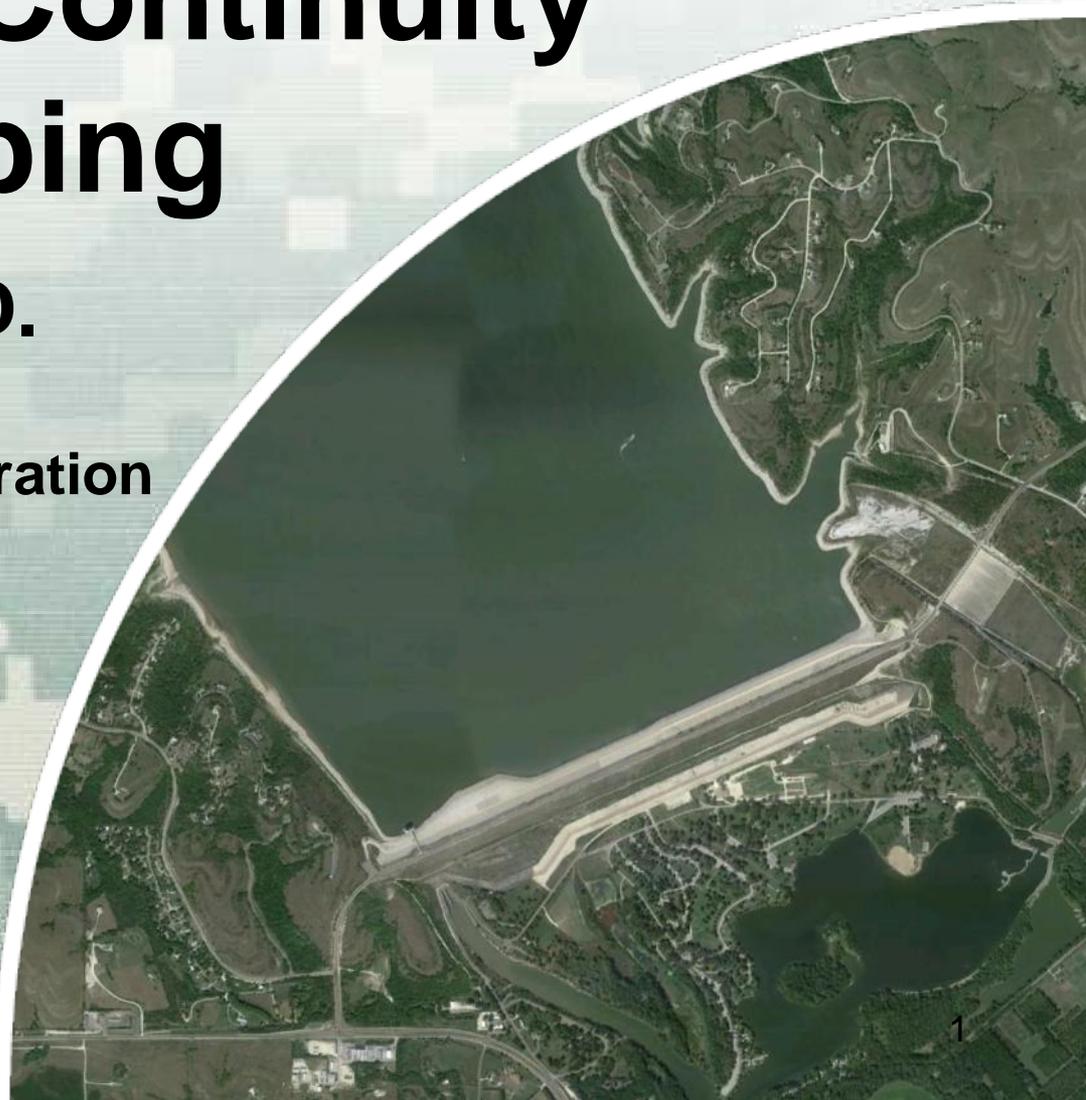
Reservoir Sustainability/ Sediment Continuity Scoping

John Shelley, Ph.D.

Kansas City District

**River Engineering and Restoration
Section**

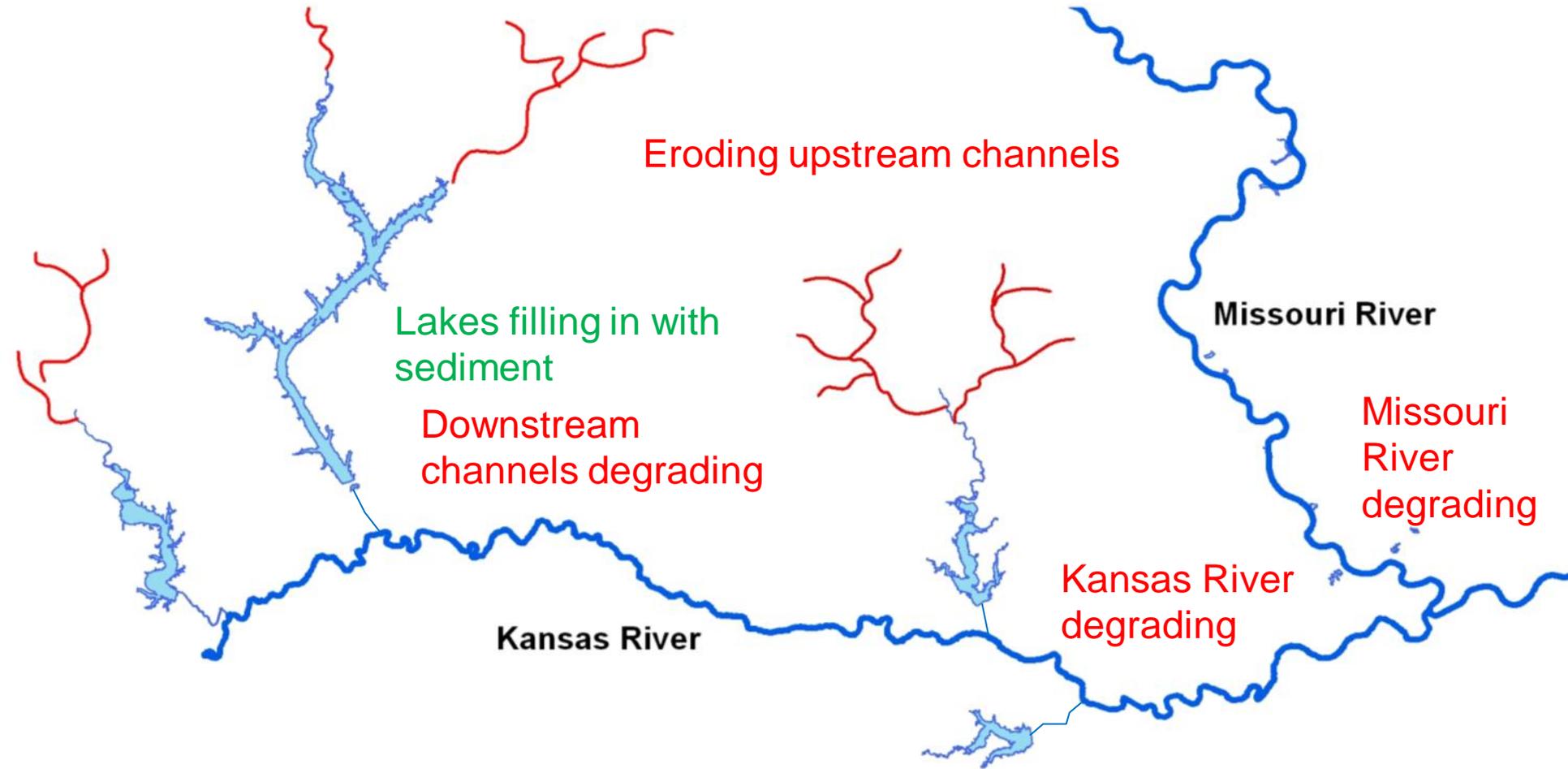
Aug 2013



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Sediment Imbalances



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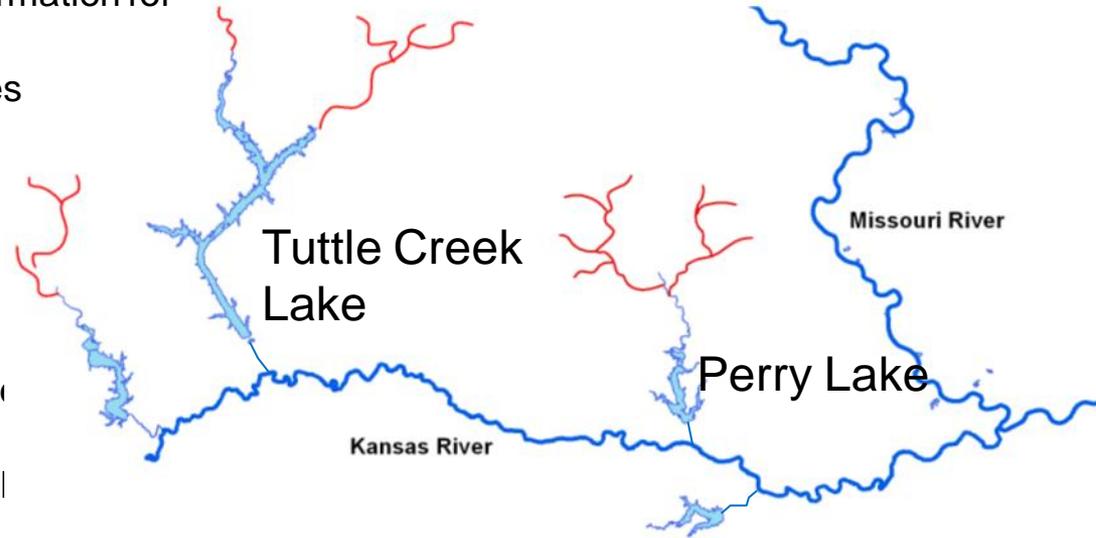
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Description/Challenges

- Hold a workshop on reservoir sediment management options
- Provide enough technical background information for productive, specific discussions
- Engage the right state and federal agencies

Objectives

- Generate a list of potential reservoir sediment management ideas
- Select 2 – 3 “most promising ideas” for Tuttle Creek Lake and Perry Lake
- Understand potential funding/implementation strategies and regulatory considerations.



BLUF: Hold a workshop with pertinent State of Kansas and COE personnel to lay the groundwork for a pilot implementation project for sediment bypass, hydrosuction, or other “low-energy” management alternative at a Corps of Engineer reservoir in Kansas.

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District PDT Members

- John Shelley
- Lamar McKissack
- Christy Ostrander

Leveraging/Collaborative Opportunities

- Section 204 Program
- State of Kansas Reservoir Sustainability Initiative

Stakeholders and Partners

- USACE (KC):
 - River Engineering
 - Hydrologic Engineering Branch Chief
 - Planning
 - Water Control
 - Regulatory
 - Tuttle Creek Lake Manager
 - Perry Lake Manager
 - Water Quality
- Other USACE: ERDC, HEC, Omaha, Tulsa
- HNTB, The Watershed Institute
- Rollin H. Hotchkiss
- George Annandale
- Kansas Biological Survey
- Kansas Water Office
- USGS
- University of Kansas
- Delaware River Watershed
- Kansas Department of Health and Environment
- Kansas Department of Agriculture-DWR
- Kansas Department of Wildlife, Parks, and Tourism

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Approach

(including Tools/Models/Data Used)

- Build comprehensive “data-book” for each lake. Send to participants in advance.
- Invite international experts with experience in reservoir sediment management: Drs. George Annandale and Rollin Hotchkiss.
- Chris Gnau of Kansas Water Office to invite state technical, planning, and regulatory agencies.
- John Shelley to invite other interested COE districts.

Deliverables

- Databooks: July 29th, 2013
- Workshop: Aug 2nd and 3rd, Lawrence, KS
- Workshop notes and recommended actions: End of Aug, 2013

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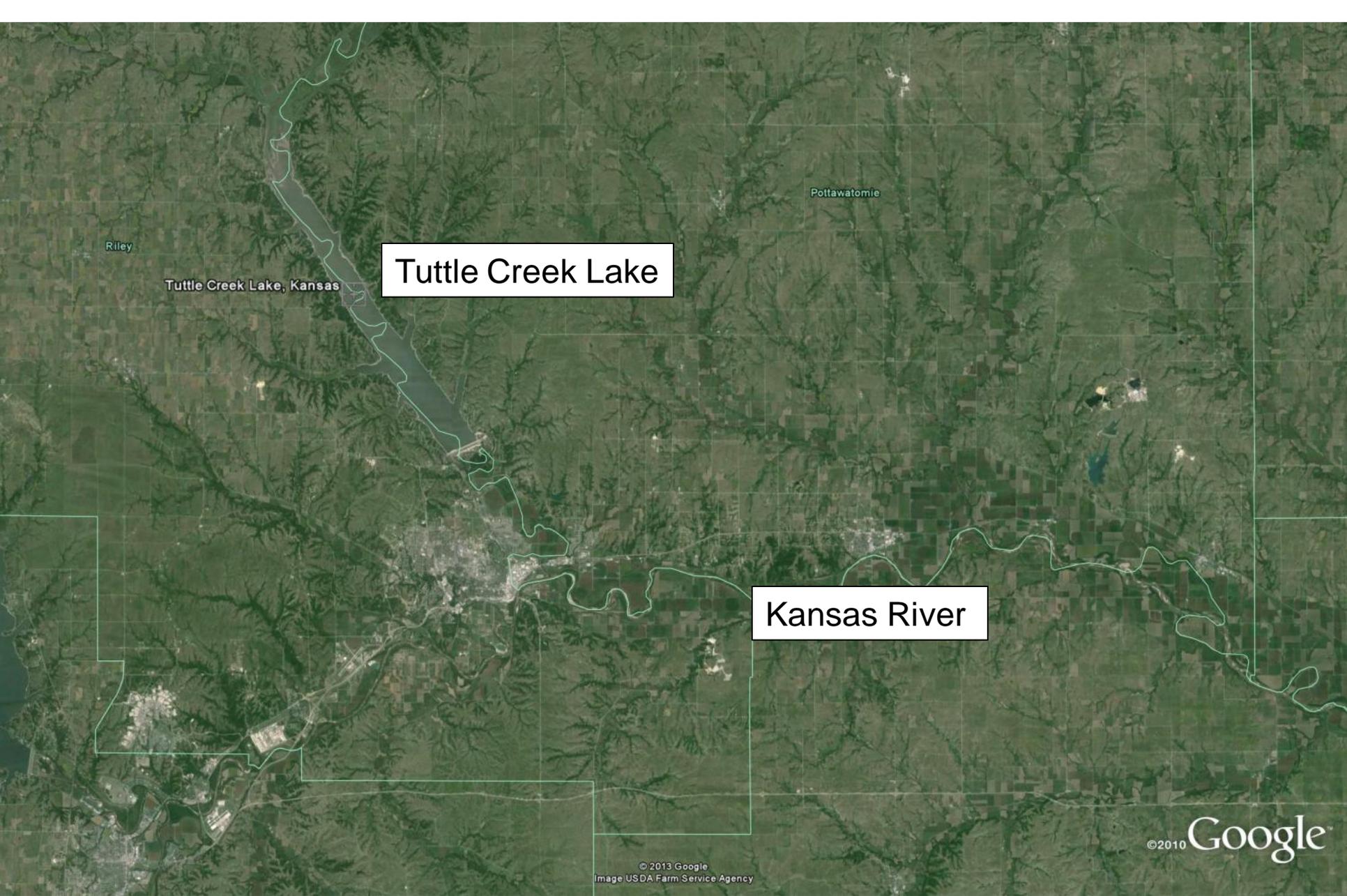
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Accomplishments/Benefits/Lessons Learned

- Data book was essential
- The right mix of people was essential

Opportunities to take action

- Sediment sluicing model
- “Spider inlet”
- Water transfer from Tuttle to Milford (nearby reservoir)



Riley

Tuttle Creek Lake, Kansas

Tuttle Creek Lake

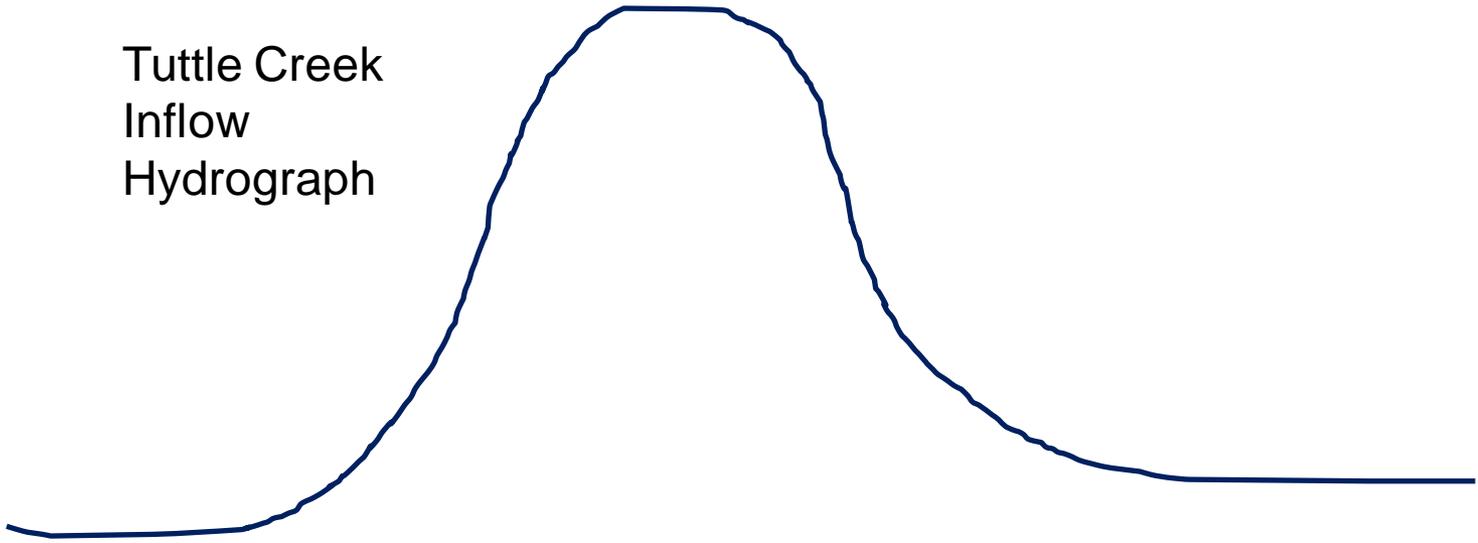
Pottawatomie

Kansas River

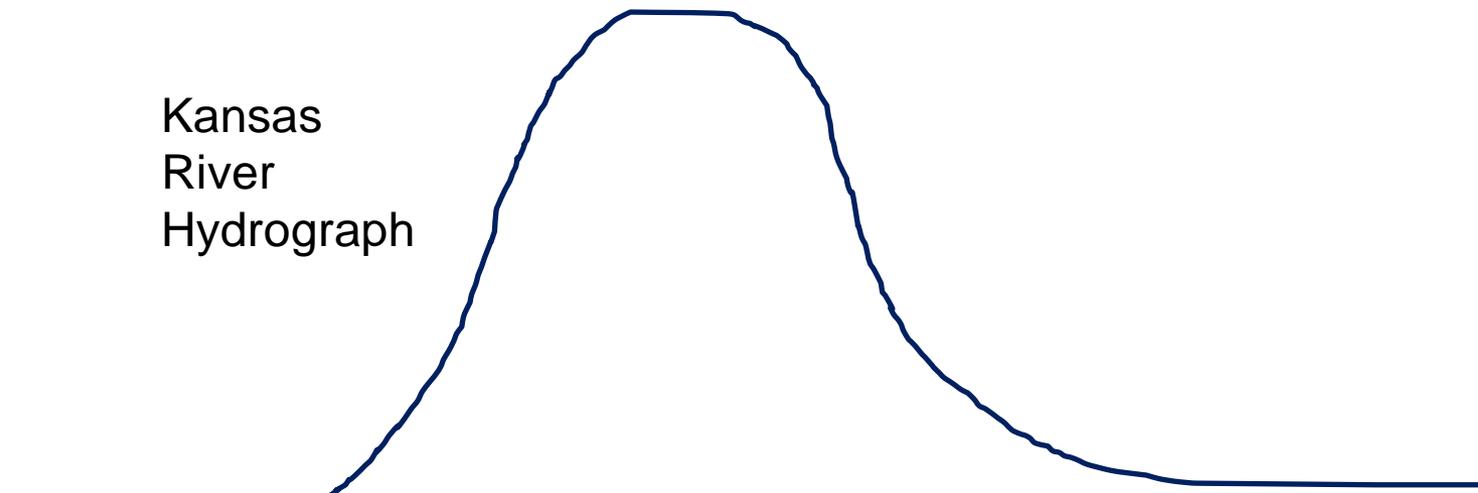
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Tuttle Creek
Inflow
Hydrograph

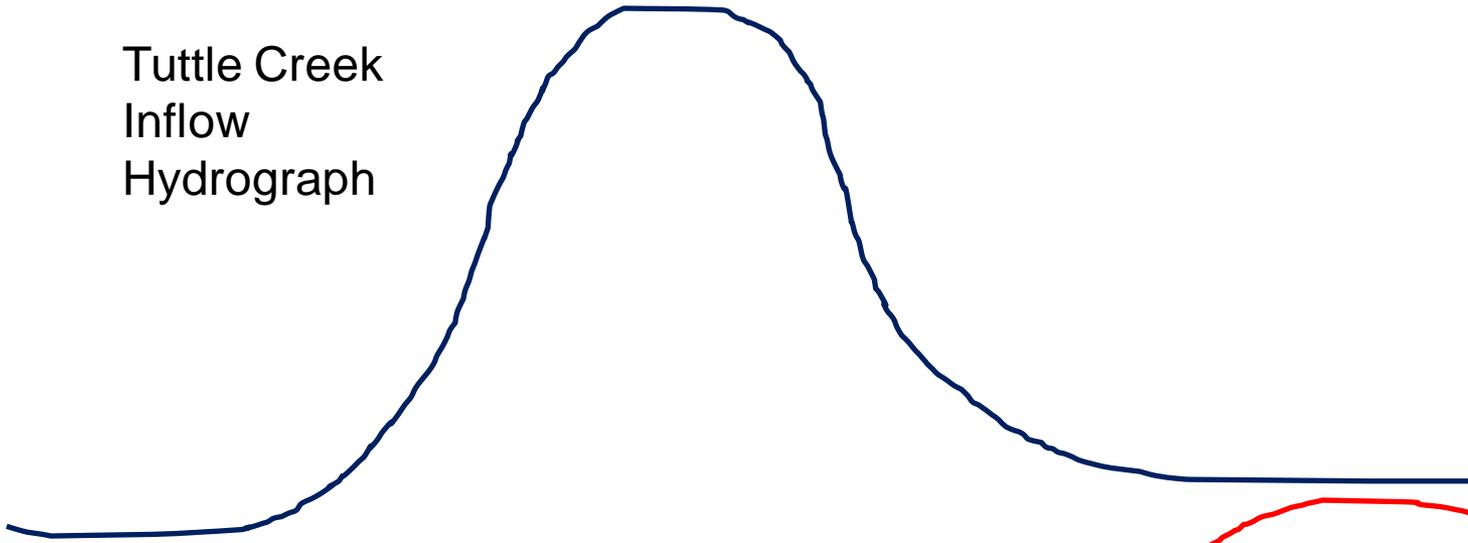


Kansas
River
Hydrograph



TIME

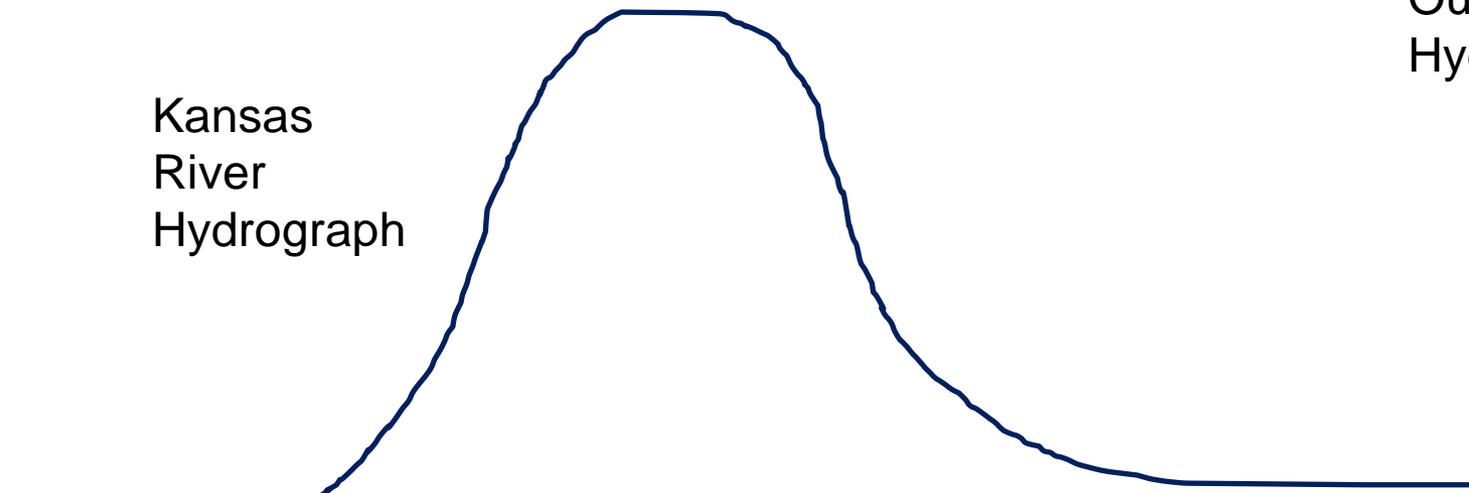
Tuttle Creek
Inflow
Hydrograph



Tuttle Creek
Outflow
Hydrograph

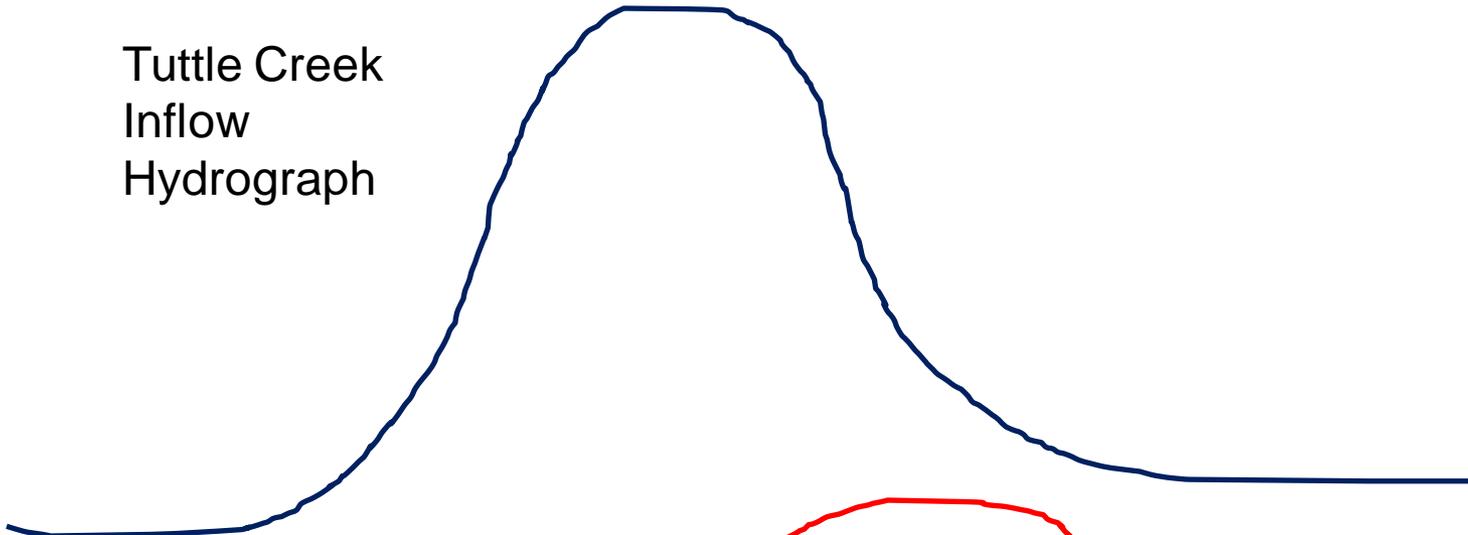


Kansas
River
Hydrograph



TIME

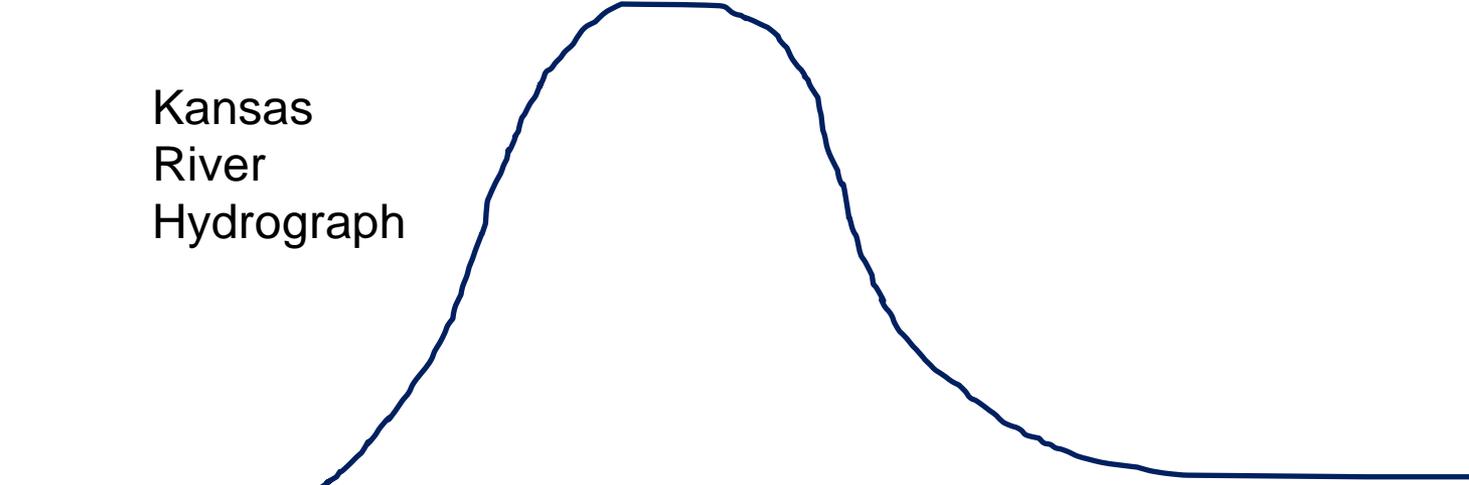
Tuttle Creek
Inflow
Hydrograph



Tuttle Creek
Outflow
Hydrograph



Kansas
River
Hydrograph

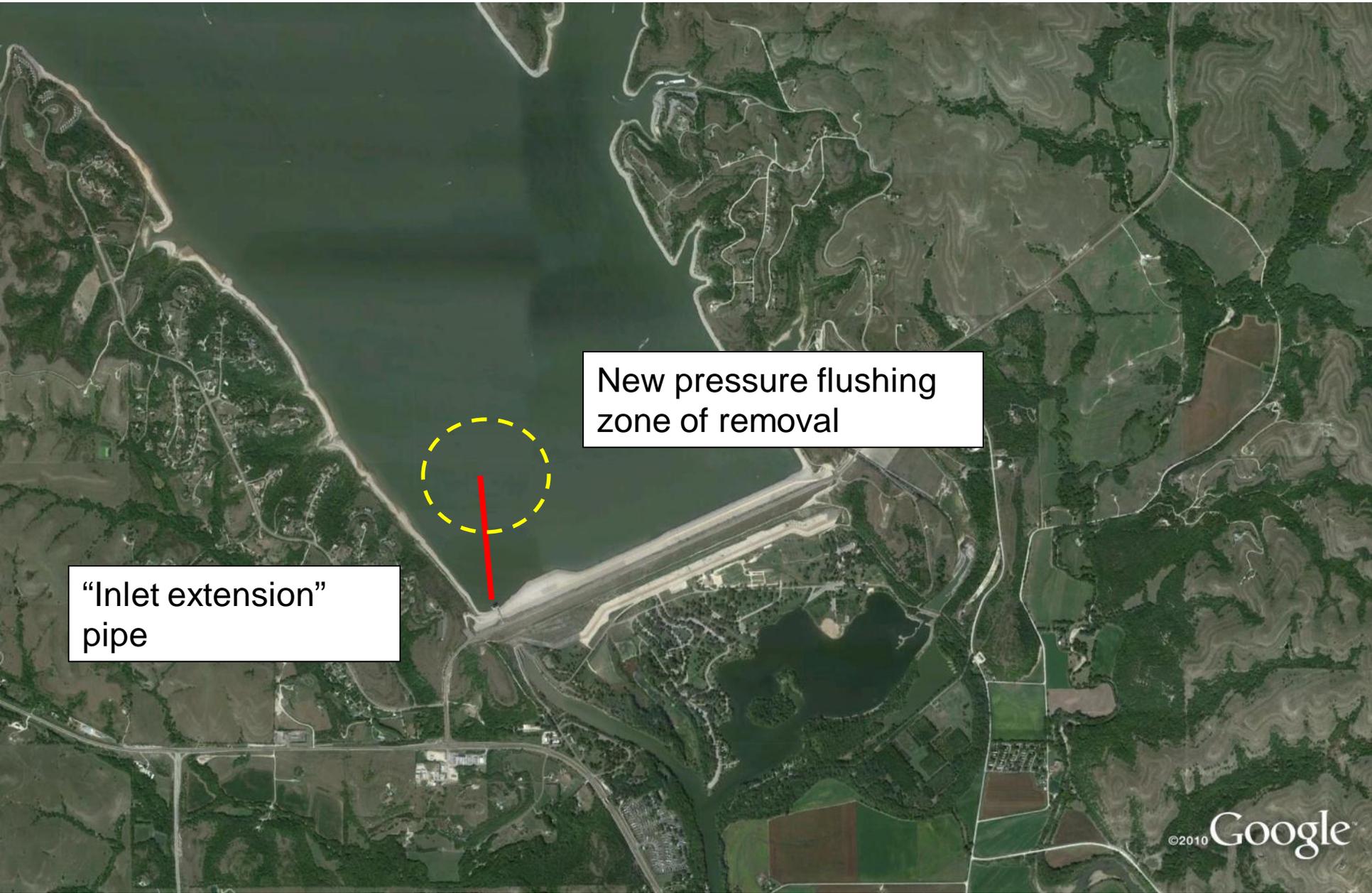


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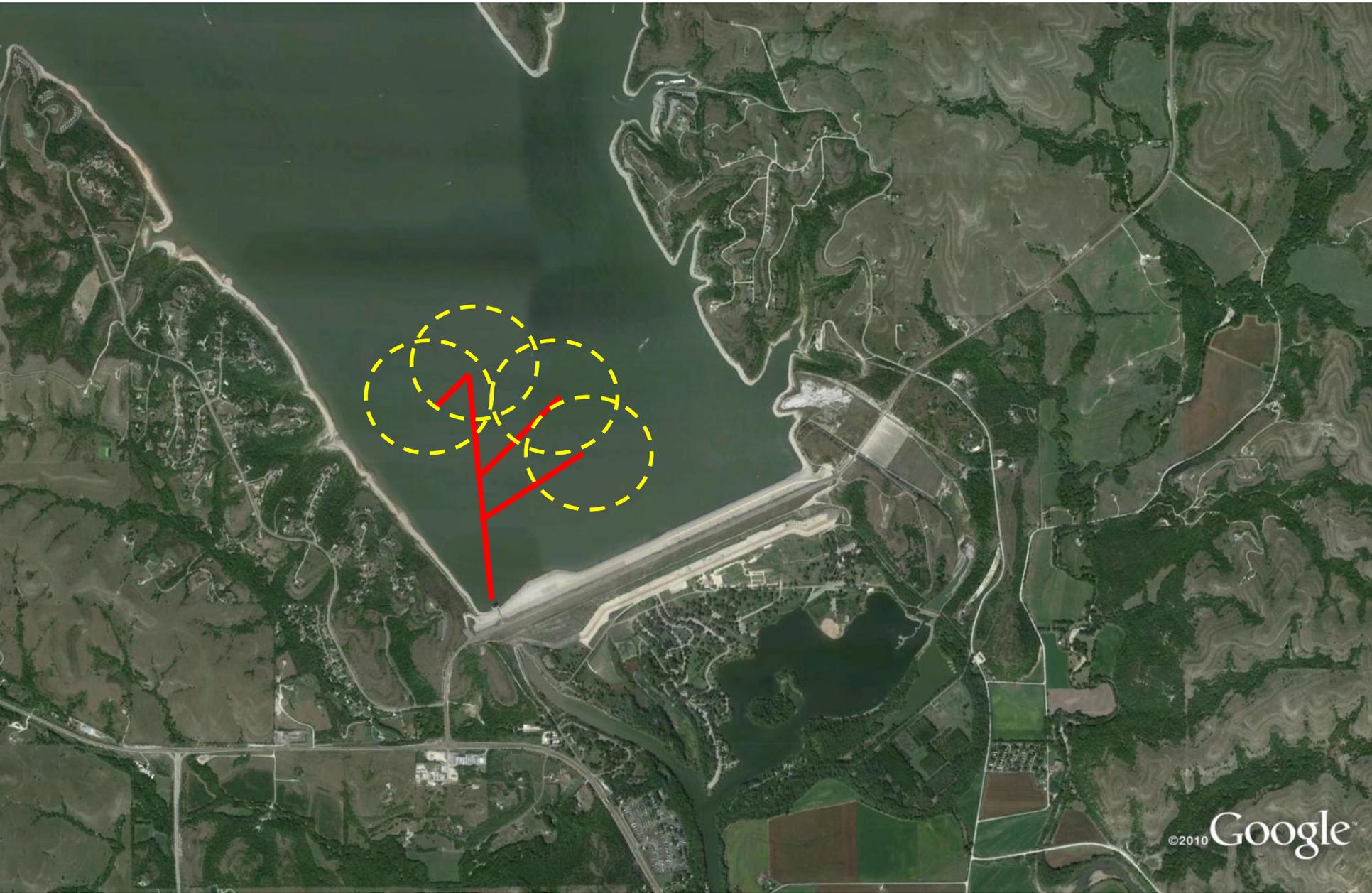
A satellite map showing a large dam and reservoir. A yellow dashed line outlines a specific area on the left side of the dam, labeled as the 'Pressure flushing zone of removal'. The surrounding landscape includes fields, roads, and some buildings. The reservoir is a large, dark body of water.

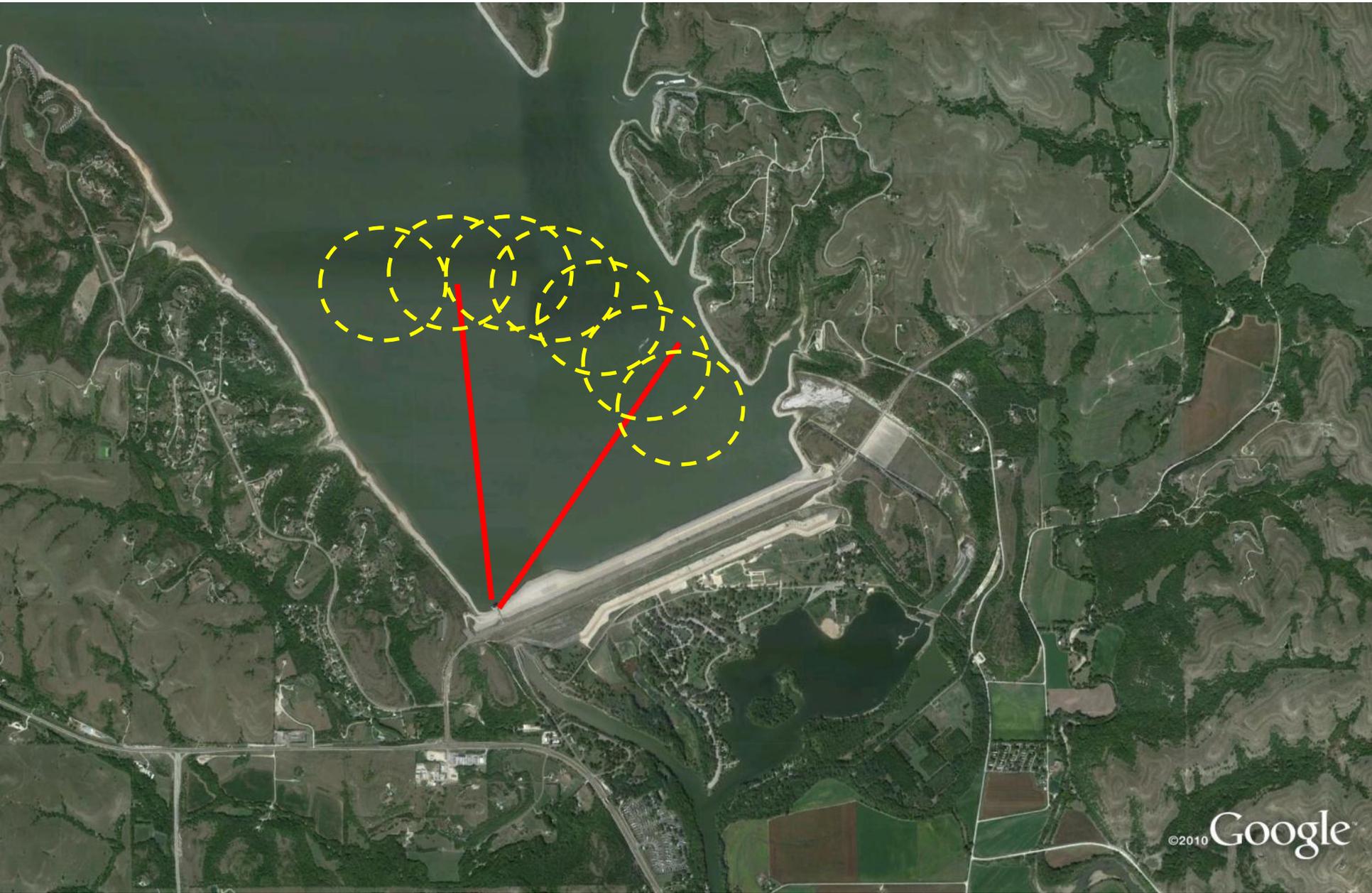
Pressure flushing
zone of removal

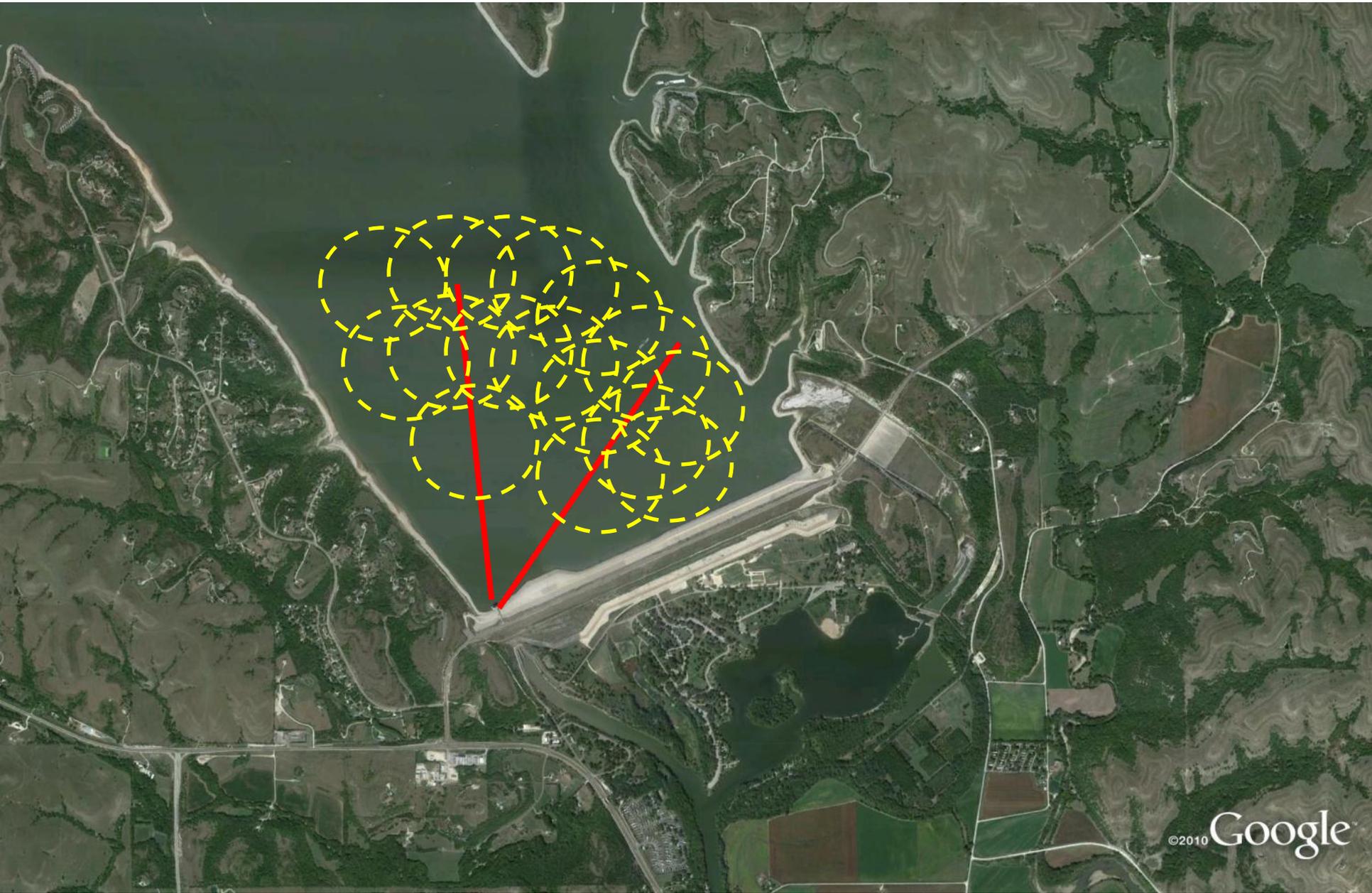


New pressure flushing zone of removal

“Inlet extension” pipe







Next Steps

- Workshop write-up
- Condensed white paper
- HEC-RAS sediment model
 - Sluicing model
 - Adaptable for a flushing model
- Initial evaluation of
 - “Spider inlet”
 - Water transfer