

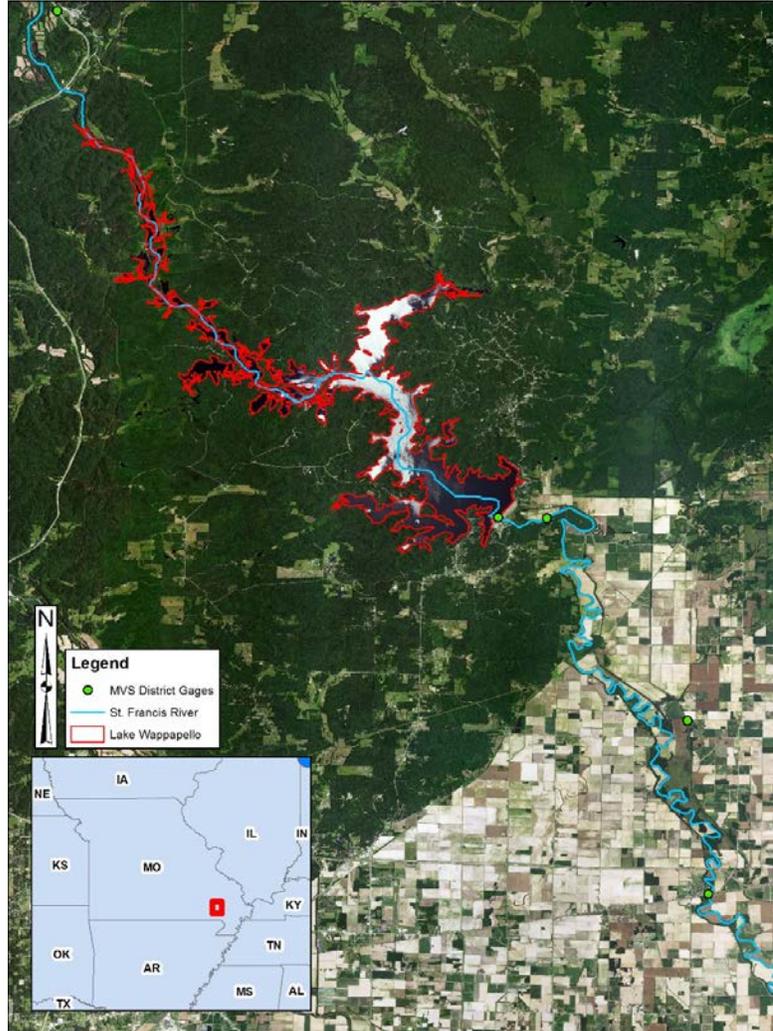


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National Regional Sediment Management Program St. Louis District (MVS): Wappapello Lake Downstream Bank Erosion



Description (MVS will monitor, via cameras and erosion pins, bankline mass wasting downstream of Wappapello Lake under multiple release conditions in an attempt to improve drawdown schedules. Successful schedule modification could possibly decrease downstream sediment loads, reducing impacts to downstream lands and projects and improving stakeholder relations.



Wappapello Lake and Downstream Channel

Issue/Challenge To Address

By their very definition, Corps flood control reservoirs store water and release them at a more convenient time in such a manner to reduce the risk of downstream flooding. Due to limits on releases to keep flows within banks, downstream banklines are loaded significantly longer than if a flood wave were allowed to pass. These saturated banks can then be prone to mass wasting if unloaded too quickly by a rapid drawdown in flow releases necessitated by meeting rule curve targets for the reservoir pool. Reservoir Water Control Manuals (WCMs) typically prescribe a maximum daily drawdown, but these values were often developed at the beginning of the project without much site-specific data, or developed through anecdotal evidence and associated trial-and-error practice.



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Imprecise maximum daily drawdown targets contribute to continuing bank material loss and increased threat of lost land and property.

Successes Lessons Learned

Lessons learned will be compiled during the duration of this study, with the goal of improving drawdown schedules for Wappapello Lake if possible.

Expected Products

- Technical Note on data collection efforts
- Changes, as possible, to Wappapello Lake drawdown schedules

Stakeholders/Users

Stakeholders include the property owners downstream of Wappapello Lake.

Projected Benefits Value Added

Potential value added can be found across multiple business lines. A potential reduction in downstream bank mass wasting has long-term benefit to any location where the Corps maintains a series of flood risk management reservoirs (e.g. MVS's Lake Shelbyville – Carlyle Lake). By reducing the sediment load mobilized downstream of the upstream reservoir, the useful life is extended of the downstream reservoir that would capture it, or additional dredging costs to maintain capacity are avoided. The situation is similar for navigation projects downstream of reservoirs (e.g. MVS's Carlyle Lake – Kaskaskia Navigation Project) – a reduction in sediment load coming into the navigation project reduces the cost of maintaining a channel via long-term repetitive maintenance dredging.

As a short-term benefit, if a reduction in lost land via bankline collapse were to occur, it would lead to better relationships and communication between water control managers and downstream stakeholders.

Leveraging Opportunities

Bankline mass wasting and data collection at Lake Wappapello could not only improve St. Louis District operations, but could tie into ongoing efforts of the Memphis District. Memphis is looking at deposition further downstream on the St. Francis, of which bank material loss downstream of Wappapello is one source. Furthermore, Memphis has numerical modeling tools already developed downstream of Wappapello that could be modified as part of future efforts to look at the banks in more detail (such as taking Memphis existing RAS models and adding sediment with B-STEM modeling).

Points of Contact

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Participating Partners

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Wappapello Lake Project Staff
Wappapello Lake downstream land owners