

Recovery of Sediment from the Conowingo Reservoir

A Circular Model of Research, Policy, Dredging, and Reuse Technology



BATTELLE

Innovations in Climate Resilience Conference
March 30, 2022



northgate
environmental management, inc.

SESSION AGENDA

1

Context

2

Sediment Characterization

3

The Circular Model

4

Lessons Learned

CONOWINGO RESERVOIR



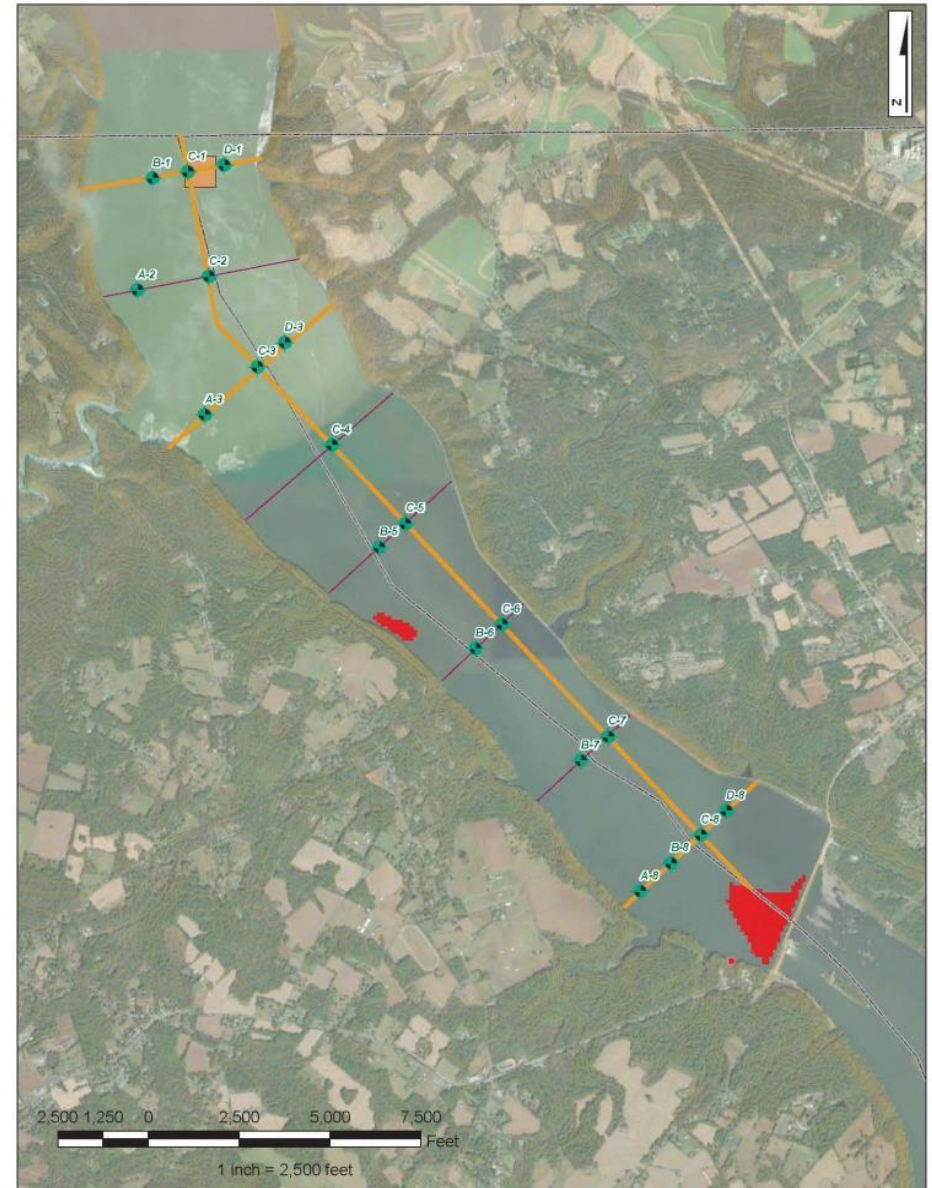
- Dam built from 1926-1928
- Reached capacity in ~2010
- Sediment overflow now compromising water quality
- Decades of studies have failed to identify cost-effective solutions at scale



CONOWINGO RESERVOIR



In 2019 the State of Maryland launched a sediment characterization study to help evaluate whether possible large-scale dredging and could address the environmental concerns.



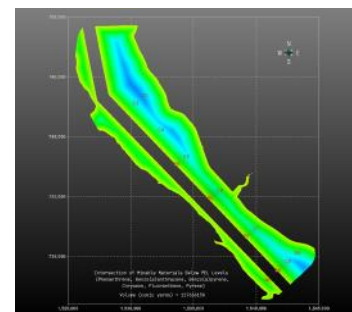
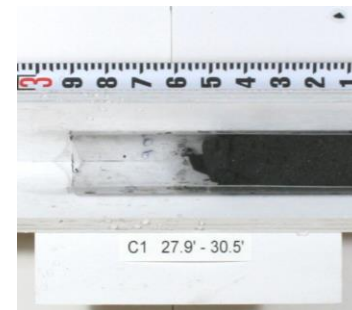
PROJECT COMPONENTS

Sediment Characterization Study

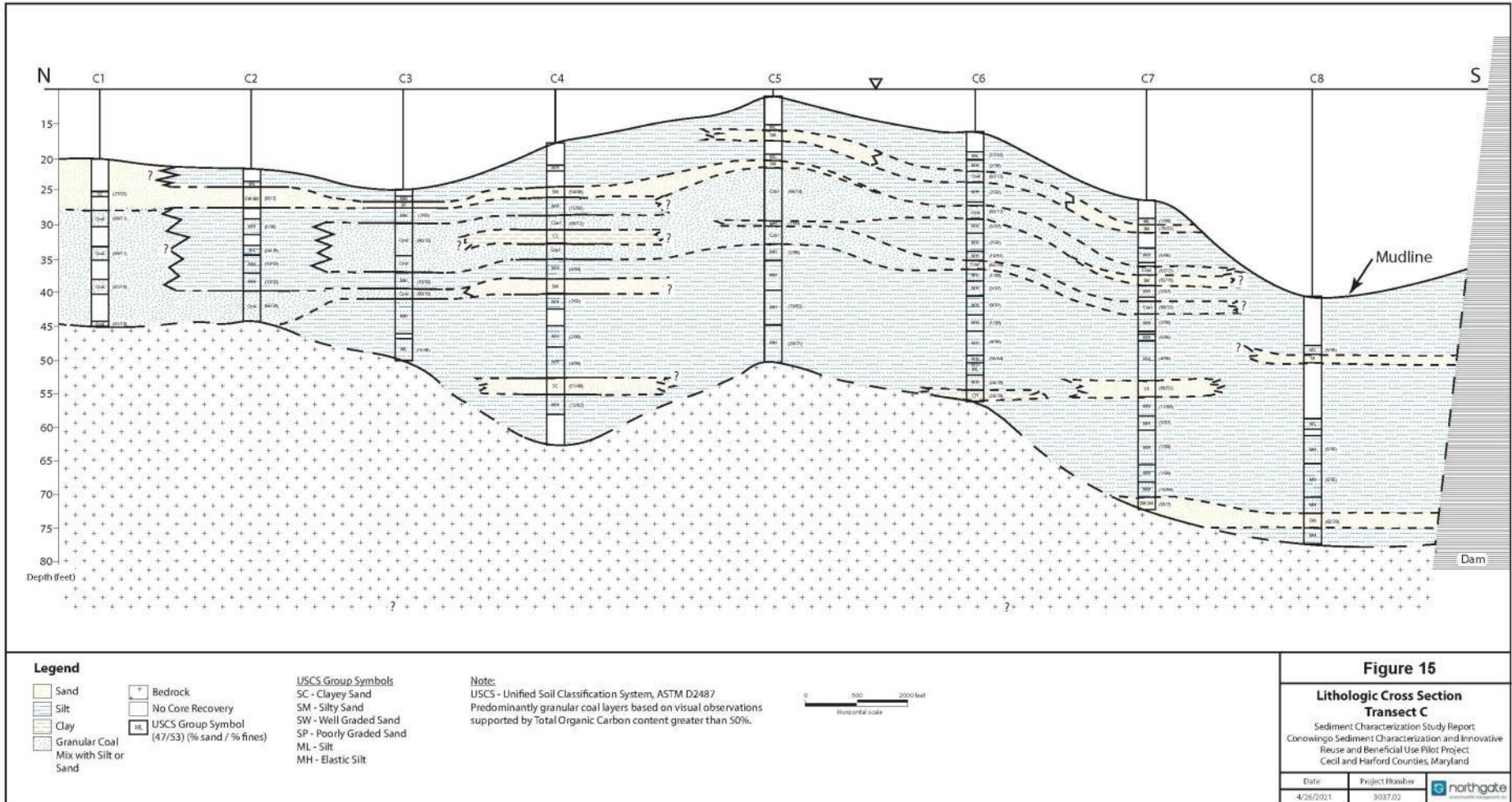
- Characterize thickness and volume of the sediment wedge, physical and chemical properties, and implications for reuse

Innovative Reuse Demonstration

- Dredge 1,000 CY from a designated area
- Conduct bench scale tests to assess suitability of material for potential end uses
- Conduct economic analysis of potential products and market absorption trends
- Evaluate changes in nutrient and sediment flux resulting from increase storage capacity



LITHOLOGIC CROSS SECTIONS



PROJECT SUMMARY

- There are approximately 250 million cy of sediment in the project area
- Over 150 core intervals were characterized:
 - Consist of predominantly interbedded silt and clay with sand lenses, coal, and coal dust throughout
 - Uses evaluated included concrete, asphalt, cement clinker, and in-water applications
 - In combination the uses could offset *some* costs of a dredging program but not all
 - Modeling showed that dredging at scale has the potential to dramatically improve water quality



Policy

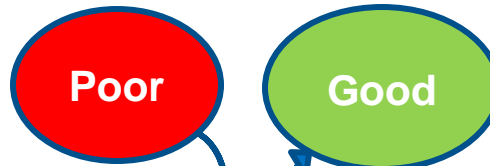
- WQ Credit Market
- BMP Designation
- Interstate Sales
- Credit Lifespan

Dredging

- 3 MCY/year over ten years
- Dewater
- Separate and process



Water Quality



Research

- Sediment characterization
- Nutrient flux modeling
- Economics of reuse options

Reuse Technology

- Concrete
- Activated carbon
- Habitat ... Others ...

LESSONS LEARNED

- For an environmental dilemma of this scale, policy innovation is required along with long term commitments to enhanced environmental and economic outcomes.
- Conventional risk-taking and debt-sharing roles between public and private sector groups can be revisited in support of a “partnership for public purpose” where it is understood that solutions large enough to address the problem are likely larger than any one sector can address alone.



QUESTIONS/DISCUSSION



northgate
environmental management, inc.

Presenter: Dr. Sam Merrill
207-615-7523, sam.merrill@ngem.com

[Conowingo Innovative and Beneficial Reuse Pilot Project \(maryland.gov\)](http://maryland.gov)