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28-1 - CHARACTERIZING LAND USE HISTORY AND ASSESSING POTENTIAL GEOCHEMICAL CONTAMINANTS FROM LEGACY SEDIMENTS AND IMPOUNDED WATER IN ROCKBRIDGE COUNTY, VA



Sunday, October 10, 2021



9:00 AM - 1:00 PM



Oregon Convention Center - Exhibit Hall A

Booth No. 94

Abstract

Dams have been used historically in Virginia to create hydroelectric power, for navigation, and to power mills. Although most have been removed in recent decades, in 1860 there were at least thirty operating mills and ten navigation dam structures along major waterways in Rockbridge County, VA. Emplacement of dams causes a decrease in stream velocity and buildup of legacy sediments behind the structure. These legacy sediments archive land use activities such as agriculture, timbering, and development since colonial times. As a result of the formation of anoxic water behind the dams, contaminants can accumulate. By analyzing the legacy sediments and impounded waters, we aim to learn about the land use history of the region and interpret the possible hazards associated with sediment remobilization and contamination of drinking water.

We present sedimentological and water data from seven dam sites in the James and Maury River watersheds, which contribute to the greater Chesapeake Bay watershed. Maps and historical data were used to construct GIS visualizations of past and present land use, and create estimates of floodplain and water levels throughout the history of the watershed. XRD analyses of legacy sediment from multiple locations show that quartz is the prominent mineralogy, with minor hematite in some samples. We note a higher percentage of organic carbon by loss on ignition (LOI) behind dams that are in place today (avg. 9.5%) compared to floodplain deposits behind breached dams (avg. 6.0%),

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At most sites, water showed a trend of increasing conductivity and alkalinity, and decreasing oxygen and temperature with depth. Further lab analyses using EA-IRMS, pXRF, IC, ICP-MS, and ICP-OES complete acid digestion, sequential extractions, and particle size analysis will help us determine the elements present and their relative mobilities. Assessing the interactions between legacy sediments and water in this region can help us understand the impacts humans have had on the environment, and highlight how some of those impacts might pose problems for people today.

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Session

28: D27. Recent Advances in Sediments, Clastic (Posters)



Sunday, October 10, 2021



9:00 AM - 1:00 PM



Oregon Convention Center - Exhibit Hall A

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THE USE OF MULTI-SCALE GEOCHEMICAL TECHNIQUES IN THE ASSESSMENT OF LEGACY MINE LAND REMEDIATION

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HEAVY METAL CONTAMINATION IN SEDIMENTS AND LAND USE/LAND COVER CHANGE IN THE GUÁNICA WATERSHED, PUERTO RICO FROM 1936-2016

MOCZULSKI, Michelle M., GOLDSMITH, Steven T., RODRIGUES, Lisa J., CLEARY, Niki E., GANDY, Michele L. and CHASE, Tory J., Department of Geography and the Environment, Villanova University, 800 E. Lancaster Avenue, Villanova, PA 19085

