



Dams and Sediment in the Hudson

Overview

Hundreds of dams built on tributaries of the Hudson River estuary currently hold substantial volumes of sediment and have altered the way that sediment moves through the system. Natural resource managers are now interested in removing some of these dams to improve connectivity of aquatic habitats, restore fish spawning habitat, and reduce risks of dam failure. A high-priority management need of the Hudson River National Estuarine Research Reserve is to improve the scientific understanding of potential impacts that dam removals have on sediment transport in the estuary and deposition in downstream tidal wetlands, including how these dam-derived sediments might help offset future sea level rise impacts.

This project will address needs identified by managers and regulators to assess the immediate impacts of sediment that is released when a dam is removed, as well as the longer-term implications. The approach combines field observations with analysis of sediment transport using a proven hydrodynamic model. The project will develop watershed assessment tools for permitting dam removals and establish an improved scientific basis for considering the potential downstream benefits in regulatory decision-making.

Project Location

Hudson River National Estuarine Research Reserve

Project Duration

November 2016 to October 2019

Project Lead

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Project Type

Collaborative Research – generating science that informs decisions

Project Partners

- Consensus Building Institute
- Hudson River National Estuarine Research Reserve
- University of Massachusetts–Amherst
- Woods Hole Oceanographic Institution

Photo Credit

Andrew Meyer, New York State Department of Environmental Conservation, Hudson River Estuary Program

Anticipated Benefits

- Scientists, dam removal specialists, marsh managers, and restoration practitioners will work collaboratively.
- Project findings will fill an important gap in the scientific understanding of dam removal impacts.
- Natural resource managers will be able to better characterize the impacts of dam removal and will make better informed restoration decisions.
- Dam removal regulations and permitting processes will be based on an improved scientific understanding of the impacts of dam removal in the Hudson River estuary.

Project Approach

Using input from key end users, including staff members from the Hudson River Reserve and state regulatory agencies, the project team will select representative study sites to develop model case studies for dam removal. The project team will combine field observations, numerical modeling, and observational data analyses to evaluate sediment yield from the watershed, sediment storage behind dams, and sediment fate in the estuary. The project team will also evaluate the impacts of sea level rise and major storm events on sediment transport in the estuary in the context of dam removal effects. The project will examine long-term data collected under the National Estuarine Research Reserve System Wide Monitoring Program to see how different parts of the estuary respond to natural variability in sediment discharge after storm events. A project advisory committee with members representing diverse end-user groups and disciplines will convene regularly. Discussions among advisory committee and project members will foster collaboration and co-learning, and their input will inform the project approach and implementation. The project will culminate with a training event that brings together the advisory committee and other end users to learn about the project findings, products, and tools.

Targeted End Users and Anticipated Products

- Regulators will have access to new watershed assessment tools to help them evaluate the downstream impacts of dam removal.
- Landowners, marsh managers, and federal and state restoration planners will receive training, project reports, and analysis tools to assess how dam removal will affect sediment conditions downstream.
- Project findings and tools will be shared with resource and estuarine managers in similar systems.

About the Science Collaborative

The National Estuarine Research Reserve System's Science Collaborative supports collaborative research that addresses coastal management problems important to the reserves. The Science Collaborative is managed by the University of Michigan's Water Center through a cooperative agreement with the National Oceanic and Atmospheric Administration (NOAA). Funding for the research reserves and this program comes from NOAA. Learn more at coast.noaa.gov/nerrs or graham.umich.edu/water/nerrs.