

# SEDIMENT TRAPPING BEHIND DAMS AND SEDIMENT SUPPLY TO THE HUDSON RIVER ESTUARY

Collectively sediment released by the removal of all the dams on the Lower Hudson would represent less than 2 years of average sediment inputs from the watershed

This document is part of a series that captures the outcomes of Dams and Sediment on the Hudson (DaSH), a research project to assess how sediment released by dam removals in the Lower Hudson River watershed would affect the estuary. For more information, visit [www.hrner.org/hrner-research/dams-and-sediment-in-the-hudson](http://www.hrner.org/hrner-research/dams-and-sediment-in-the-hudson).

## KEY POINTS

- Dams can be categorized into three types with respect to sediment trapping: 1. effective sediment trap; 2. run of river dam; 3. non-source of sediment.
- Less than 10% of the 1700 registered dams in the lower Hudson River watershed currently trap sediment, and in total, these 1700 dams have trapped less than 2-3 years of routine sediment delivery to the estuary
- Despite the large number of dams in this watershed, dam removals will have minimal impact on sediment supply to the estuary.

## BACKGROUND

Dams and Sediment on the Hudson (DaSH) was a research project funded by the National Estuarine Research Reserve System (NERRS) Science Collaborative designed to identify how future dam removals in the Lower Hudson River watershed will affect the estuary. Scientists from the Woods Hole Oceanographic Institution, University of Massachusetts Amherst, and Hudson River NERR led the research. Facilitators from the Consensus Building Institute convened a broad coalition of Hudson River stakeholders, including representatives from the New York State Department of Environmental Conservation, engineering firms, and multiple non-profits to advise the technical science.

## SEDIMENT TRAPPED BEHIND DAMS AND COMING FROM THE WATERSHED

Scientists surveyed the amount of sediment trapped behind dams at 17 representative sites in the lower Hudson River watershed. They measured water depths and sediment thicknesses and collected sediment cores. Sediment inventories calculated at study sites provided the basis for estimating the amount of sediment trapped in all 1700 registered dams on rivers that drain to the Hudson River Estuary. Dams fall into different categories of sediment trapping, with the vast majority being run-of-river or non-source dams that have relatively little sediment. Less than 10% of dams were classified as effective sediment traps. For comparison with the dam sediment inventory, the amount of sediment being input to the estuary from the watershed on an annual basis was calculated using data from multiple river gauges.



## HOW WOULD DAM REMOVALS AFFECT THE ESTUARY?

When a dam is removed, typically about half of the sediment trapped behind the dam is mobilized and moves downstream. Collectively, the sediment that could be released by removal of all of the approximately 1700 dams in the lower Hudson watershed is about 1.5 Mt. The average annual sediment input to the estuary is about 1 Mt, so the potential release from dam removals represents less than 2 years of the typical loading. By comparison, the sediment input from discharge due to Tropical Storms Irene and Lee was about 2.7 Mt, occurring over less than a month. After sediment from a dam removal in a tributary reaches the estuary, tidal currents disperse it along the estuary, and the river's downstream flow moves the sediment seaward. Deposition depends on grain size, with sand and coarse silt settling within a few miles of the tributary's mouth, and clay traveling farther downstream to deposit much farther from the source. The Hudson River Estuary is naturally muddy with relatively turbid water, so additional inputs from sediment stored behind old mill dams are insignificant. **Therefore, significant changes in overall sediment load to the estuary should not be a major concern when considering dam removal.**



## WANT TO LEARN MORE?

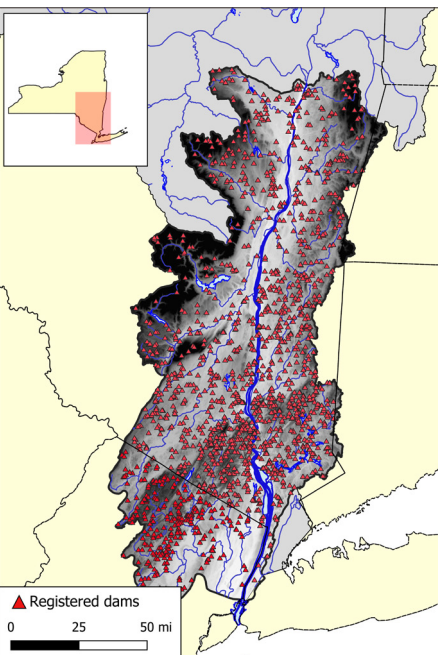
Visit the DaSH website (<https://www.hrner.org/hrner-research/dams-and-sediment-in-the-hudson>) There, you can find:

- All of the data collected with this project
- Links to journal articles
- A tool to help you estimate the amount of sediment behind your dam

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Registered dams in the Lower Hudson watershed.