

# Losing a hectare of wetlands could cost upward of \$8,000 in flood damages

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A first-of-its-kind article coauthored by scholars at Resources for the Future (RFF) and Columbia University in the journal *American Economic Review* finds that the loss of a hectare of wetlands (roughly the size of two and a half football fields) costs society an average of \$1,900 in flood damages per year. In developed areas, that figure jumps to more than \$8,000.

The benefits of preserving wetlands are not well-documented while the costs, such as those incurred by complying with Clean Water Act regulations, are. The [paper](#) offers new evidence on the benefits of wetlands as the Supreme Court takes up a case that could limit the [federal government's](#) jurisdiction over wetland protection under the

Clean Water Act. The Environmental Protection Agency under the Biden administration is also in the process of redefining and updating federal waterway regulations.

"Wetlands provide important benefits to communities by soaking up excess water that might otherwise cause heavy flooding," RFF Fellow and paper coauthor Hannah Druckenmiller said. "The issue is that these benefits are rarely quantified. So, when policymakers are deciding what policies to institute, any benefit-cost analysis will likely be skewed to favor the costs. In this paper, we seek to highlight wetland benefits to help balance the scales."

Druckenmiller and her coauthor, Charles A. Taylor of Columbia University, assess how wetland loss is related to increases in flood damages by examining payouts from the National Flood Insurance Program (NFIP). Most Americans with flood insurance use the NFIP, so claims made under this program likely comprise a significant component of residential flood costs. The authors find that wetland loss significantly increases flood insurance claims made under the NFIP; on average, one hectare of wetland loss between 2001 and 2016 increased flood claims by \$1,900 per year. In developed areas, that average rises to more than \$8,000 per hectare.

Not all flood damages are captured by the NFIP, so the paper likely underestimates the value of wetlands for flood damage mitigation. The findings also do not consider benefits from recreation, habitat creation, [water filtration](#), or the [fishing industry](#).

The authors note several other key findings:

- The United States lost approximately 330,000 hectares of wetlands between 2001 and 2016. The authors estimate that this loss costs the country more than \$600 million per year in higher

damages from flooding.

- Wetlands are valuable to society at large. The flood mitigation value of wetlands to local property owners (those in the same [zip code](#) as the wetland) amounts to less than 30 percent of their full benefits to all users in the watershed.
- The annual benefits from reducing flooding outweigh the cost of conserving wetlands (based on [land values](#)) within 6 to 22 years, on average. However, these costs and benefits vary widely over space. To help land use planners and local policymakers understand the value of conservation in their area, the authors provide spatially resolved maps on wetland [benefits](#) and costs.
- Increases in wetland area do not appear to reduce damages from flooding, calling into question the extent to which wetland restoration can offset the negative impacts of wetland loss.

Notably, the paper's findings are at odds with the 2020 Navigable Waters Protection Rule interpretation that removed protections for wetlands not directly connected to streams or rivers. Rather, Druckenmiller and Taylor found that the most valuable wetlands for [flood](#) mitigation are those slightly removed from the nearest stream or river. The authors note that their findings are more in line with the 2015 interpretation of the rule, which was repealed in 2019.

"The Environmental Protection Agency and the Army Corps of Engineers cited a lack of credible estimates of the value of [wetlands](#) to justify the exclusion of many sites under the 2020 Navigable Waters rule," Taylor said. "Our findings present a new perspective—and hopefully can serve as a valuable asset as the regulations evolve."

**More information:** Charles A. Taylor et al, Wetlands, Flooding, and the Clean Water Act, *American Economic Review* (2022). [DOI: 10.1257/aer.20210497](https://doi.org/10.1257/aer.20210497)

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