

RESEARCH ARTICLE

Fracturing dams, fractured data: Empirical trends and characteristics of existing and removed dams in the United States

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Abstract

Dam removals in the United States continue to accelerate in pace and scope, but no national analyses have examined how removed dams compare with existing dam stock. Here, we review and analyse the best available national data on dams from the National Inventory of Dams (NID), dam removals from American Rivers, the U.S. Geological Survey, and the National River Restoration Science Synthesis databases to compare trends and characteristics of removed versus existing dams in the United States. If historical trends continue, by 2050 the United States can expect between 4,000 and 36,000 total removals, including 2,000–10,000 removals of NID dams. Best-fit regression models estimate total costs between \$50.5 million and \$25.1 billion (mean \$10.5 billion, median \$416.5 million) for all removals and \$29.6 million to \$18.9 billion (mean \$7.2 billion, median \$285 million) for NID removals, a significant cost savings over present stated dam rehabilitation needs. Structural characteristics and ages of documented removals are not representative of existing dams, with privately owned hydroelectric dams subject to public oversight and water supply dams the most disproportionately removed. We conclude that dam removal science would benefit from the creation of an interdisciplinary framework for studying dams as environmental, social, and technological interventions, facilitated by transparent datasets around dams and removals and reflexive research approaches that combine statistical approaches with place-based analyses.