

****Dam It All! Using Remote Sensing Data to Track Persistence of Beaver Dams in Prairie Streams**

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Numerous studies highlight the critical role of beaver dams in providing important habitat for many species and mitigating the impacts of drought and floods. As climate change intensifies the frequency and severity of hydrological disturbances, beaver-based restoration efforts, such as translocations of beaver and construction of beaver dam analogs (BDAs), have become increasingly common. However, the longevity and effectiveness of restoration projects likely depend on their placement within a tributary, making identifying environmental factors that influence dam persistence essential for prioritizing restoration efforts and maximizing their benefits. To address this need, we used NAIP satellite imagery to identify, geolocate, and track beaver dams across 10 watersheds (~11,214 km²) in northeastern Montana, with observations taken every two years from 2017 to 2023. We identified 2,432 unique beaver dams (1,064 in 2017, 443 in 2019, 675 in 2021, and 250 in 2023), with only 146 (~6%) persisting from 2017 to 2023. Hazard rates, or the risk of failure for a dam during a specified period, were 62% in 2017–2019, 39% in 2019–2021, and 73% in 2021–2023. Future analysis will focus on the relative influence of flow-altering factors, including slope, catchment area, peak flow events, and upstream dam density, as well as availability of nearby woody vegetation on dam persistence. These findings will help refine expectations for long-term restoration success by improving predictions of dam persistence in these dynamic landscapes.