

Citizen Science and Dam Removal: Opportunities for Harnessing and Deepening Public Engagement in Watersheds

Christopher Jadallah¹, Ryan Meyer¹, Heidi Ballard¹, Christine Brissette², Deb Fassnacht³, and Aissa Wise³

1. Center for Community and Citizen Science, UC Davis School of Education, Davis, CA 2. Trout Unlimited, Missoula, MT 3. Watershed Education Network, Missoula, MT

Community-Based Monitoring of Dam Removal

Thousands of dams in the United States impede the natural ecosystem processes that constitute healthy watersheds. Dam removal is gaining traction as a compelling strategy to restore unregulated flow regimes in rivers and streams, revitalize threatened fisheries, and promote the social and ecological resilience of these complex systems.

Environmental monitoring is critical for scientists and managers to assess and respond to the biophysical impacts dam removal.

Community-based monitoring, a form of citizen science, is one approach to overcome insufficient monitoring while sustaining public engagement and connecting communities with both science and their local environment. To this end, the UC Davis Center for Community and Citizen Science developed a manual for local groups considering community-based approaches to monitoring before and after dam removal.

This poster draws from the manual to present considerations for how local groups can plan for and implement community-based monitoring in the unique context of dam removal to achieve goals such as:

- Fostering interaction and trust among stakeholders
- Providing formal and informal learning opportunities
- Supporting community development
- Addressing public priorities and concerns
- Honoring local or traditional knowledge
- Improving cost-effectiveness of monitoring

Case Study: Collaborative Monitoring on Rattlesnake Creek, Missoula, MT



The obsolete Rattlesnake Creek Dam blocks the migration of the threatened bull trout and Western cutthroat trout and poses a safety risk for downstream communities in Missoula, MT. Slated for removal in 2020, **Trout Unlimited (TU)**, **Watershed Education Network (WEN)**, and numerous other collaborators are engaging in comprehensive environmental monitoring to understand the impacts of the dam's removal.



The monitoring plan and the UC Davis manual have been developed in dialogue, each informing the other through an iterative process that is described on this poster.

1. Building a Team

- Determine your stakeholders, collaborators, and participants paying special attention to whose voices you may not be hearing.
- Develop clear and effective communication and decision-making strategies predicated on building trust.
- Lay out high-level goals that can guide your project.

Case Study: Goal-Setting and Establishing Partnerships

Project lead TU identified two overarching goals:

1. Understand the impact of dam removal on natural resources and stream processes.
2. Engage the public through citizen science and outreach.

Collaborating with WEN, whose Stream Teams had already been actively monitoring Rattlesnake Creek, offered the chance to meet these goals. Each organization saw mutual benefit in working together and began the process of developing a shared understanding of each others' needs and opportunities.



2. Building a Process

- Choose appropriate indicators for monitoring in consultation with scientific and community experts.
- Leverage appropriate expertise in designing sampling schemes and methods to ensure data quality and credibility.
- Encourage and sustain participation by creating meaningful opportunities for volunteers to contribute to project in diverse ways.

Case Study: Developing a Monitoring Plan

Through ongoing conversations and meetings, both organizations collectively decided that WEN would assume responsibility over several field methods associated with TU's monitoring questions.

To fulfill this new role, WEN needed to adapt and update their monitoring protocols to provide high quality data. Iterative revising and field testing with volunteers provided a foundation for developing new protocols that were both in line with volunteer capacities and of adequate rigor for drawing scientific conclusions.



3. Program Implementation

- Think creatively about training volunteers – take the opportunity to establish project culture, address broader learning goals, and integrate feedback from participants.
- Balance project needs with needs of participants to ensure they are well-supported before, during, and after participation.

Case Study: Working with Volunteers in the Field

New volunteers start out collecting data alongside WEN staff, who host a series of orientations to recruit volunteers.

By framing data collection as for the purpose of answering specific questions related to dam removal, WEN has seen success in retaining volunteers who embrace the higher level of commitment and rigor. These volunteers have taken on informal leadership roles, helping train and mentor other volunteers while in the field.



4. Follow-Through and Sustainability

- Bring in outside experts as well as participants into data analysis and interpretation to improve the process.
- Celebrate participants by reporting back findings, centering their perspectives, and offering them concrete benefits.
- Expand fundraising potential through "win-win" collaborations with diverse groups.

Case Study: Capacity-Building for the Future

A well-supported collaborative process can have program-wide benefits for partner organizations. In the case of WEN, for instance, participation has led to:

- Improved protocols as a result of working with science advisors and TU
- Higher interest and commitment from volunteers
- Opportunities for expanding Stream Team to additional sites
- Increased funding for Stream Team activities
- Stronger partnerships with local organizations



Iterative Collaboration between University and Community-Based Partners

