What is being monitored and why is it being monitored?
Surface water is vital to the communities in the Southwestern Crown of the Continent. Those in the ranching and recreation industries depend on it for their livelihoods and it also provides essential habitat for native fish and other aquatic species. A changing climate will cause significantly higher stream temperatures in this part of Montana, which will influence the distribution of many aquatic species, such as native salmonids. In addition to water temperatures, climate changes will influence the amount and timing of flow in streams, with direct implications for human and natural communities. We are monitoring stream characteristics to gain a long-term perspective on changes in these systems. This work is complemented by a curriculum that meets State standards and provides a “real world” science experience for students and other citizen scientists to explore a range of topics in their local ecosystems.

How are we monitoring?
We have stream gages set-up on four streams (Elk Creek, Morrell Creek, East Warren Creek, and Poorman Creek) in four communities (Condon, Seeley Lake, Ovando, and Lincoln, respectively). Sites were chosen for sensitivity to change, importance to sensitive species (e.g. bull trout) and communities (e.g. irrigation), and ease of access. In addition, community volunteers are collecting water samples through spring runoff on several other streams in the Swan, Clearwater, and Blackfoot watersheds to measure turbidity.

What we measure:
- Streamflow (8-10 times per year)
- Temperature (through data-collecting instruments in the streams)
- Turbidity (water samples collected weekly in spring)
- Aquatic insects and fish species (optional)

Data uses and outputs:
- Annual streamflow and temperature curves for comparison across years and sites (see examples below).
- Annual data summary for stream.
- Grade-appropriate curriculum directly relating data to classroom exercises.

What is the value of the information and program?
It puts the power of monitoring in citizen’s hands, reduces the cost of high quality information, and engages the community in natural resource management issues. The data generated can help communities, and students, track changes in their streams through time and provides a connection to the ecosystems in which they live. It can provide valuable information for water stewards and fisheries biologists, help guide management actions, and emphasize the sensitivity of these systems.
to changes in climate and management. Incorporating the data into classroom exercises gives students hands-on experience in data management and analysis.

**Reports and Resources:**

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**Partners:**
Clearwater Resources Council
University of Montana
Blackfoot Challenge
Swan Valley Connections
Crown of the Continent Roundtable

Montana Department Natural Resources and Conservation
Seeley-Swan High School and Seeley Junior High
Lincoln High School
Helena NF Youth Forest Monitoring Program

Southwestern Crown of the Continent Collaborative
Trout Unlimited
Montana Fish, Wildlife and Parks
The Wilderness Society
Flathead, Helena, and Lolo National Forests

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**Figure 1.** Stream flow (cfs) at mid-day in Morrell, Poorman, and Elk creeks in 2014. The complete data include observations every two hours, but were subset here for ease of presentation.

**Figure 2.** Stream temperature (° F) at mid-day in Morrell, Poorman, and Elk creeks in 2014. The complete data include observations every two hours, but were subset here for ease of presentation.