

Snake River Watershed Task Force Core Team Meeting
Keystone Policy Center, 1628 Sts John Road, Keystone, CO
August 25, 2016
Meeting Summary

Participants

Patrick Byrne (Liverpool University), Jeff Graves (CDRMS), Brian Lorch (Summit County Open Space & Trails), Paul Peronard (Environmental Protection Agency), Tom Probert (U.S. Forest Service), Rob Runkel (U.S. Geological Survey), Elizabeth Russel (Trout Unlimited) (phone), Paul Semmer (U.S. Forest Service), Tim Steele (TDS Consulting), Andrew Todd (U.S. Geological Survey), Lane Wyatt (Northwest Colorado Council of Governments), Julie Shapiro (Keystone), Rebecca Casabonne (Keystone)

Action Items and Next Steps

- 1) All: Let Rob Runkel know if there are sites you would like to see added to October sampling.
- 2) Paul Peronard will work with EPA (Kerry Guy) to ensure that Andrew Todd and USGS have the funds and agreements needed to move forward with the proposed 1-year conductivity-based monitoring plan for.
- 3) Patrick Byrnes and Andrew Todd will connect regarding piloting new electro-magnetic monitoring technology being developed at Liverpool University.
- 4) Paul Semmer and Tom Probert will determine past macroinvertebrate sampling methodology used by USFS, the appropriate timing of a next sampling event, and whether/when there is USFS capacity to sample again.
- 5) Jeff Graves will work with Paul Peronard to develop a wishlist of stockpile materials and ideal locations; Paul Peronard will work with Paul Semmer and Tom Probert to discuss appropriate locations for stockpiles; Paul will add these to an upcoming EPA budget.
- 6) Next core group meeting to occur in early November, to review monitoring updates, check in on action items, and identify any new action items; Julie Shapiro will send a scheduling poll.

Discussion Notes

Julie Shapiro opened the meeting and reviewed the agenda, reflecting on the field tour that had occurred that morning, which had a great turnout of approximately 50 people and benefitted from the expertise of all of the Core Group members that participated.

October 2015 monitoring results; October 2016 monitoring plans

Rob Runkel provided an update on 2015 monitoring results. Rob noted that monitoring showed water quality improvements following the closure of the first bulkhead in 2014. The 2015 results reflect monitoring after the closure of the second bulkhead. The results have not been fully analyzed yet, and loading analysis has not been completed. pH shows improvement below the bulkhead but then worsens at other sites downstream. 2015 results do not show as much reduction in copper concentrations as the 2014 results. Zinc similarly did not show significant change between 2014 and 2015. However, load analysis for 2015 may shift these numbers if it is a matter of having lower flow in 2015. Rob also described the sampling plans for this October. He will sample at the same sites and may add some additional sites, including sampling more of the watershed. Please let Rob know if there are specific sites that should be added.

Conductivity-based monitoring plan

Andrew Todd provided an overview of the conductivity-based monitoring proposal that USGS developed based on previous core group meetings and that had been submitted to EPA (attached at the end of this summary). The plan would involve monthly site visits for a year and would utilize low-cost conductivity loggers that are continuously in the stream and require periodic cleaning. Core Group members are comfortable with the proposed plan. Paul Peronard confirmed that EPA can provide the funding for the site visits and lab analysis and, over the course of the meeting, also ensured that interagency agreement documents were sent over to USGS. If this approach works, it could provide a low-cost, technology-based solution for long-term monitoring. Volunteers could potentially be utilized to help with site visits in the future.

Patrick Byrne also offered to work with Andrew Todd to investigate the possibility to test on Peru Creek a new electromagnetic sensor technology with remote data reporting capability that is being developed by a PhD student at Liverpool University. The student is looking for test sites and Patrick will share a paper on the technology to Andrew.

Macroinvertebrate sampling

Concerns and questions are often about the fishery downstream, and people want to know what the benefits of clean-up are to the biology. The U.S. Forest Service has conducted macroinvertebrate monitoring in the past and it would be good to have them continue this for continuity of methodology. The study was last performed in 2011; seasonality impacts results. Paul Semmer and Tom Probert will look into what methodology was used in 2011, when the monitoring occurred in the season, when the next appropriate monitoring would occur and whether USFS can do this.

Snake River Foundation

This idea is not being pursued by the group due to concerns about layers of decision-making and complexity that would not be needed to accomplish monitoring objectives.

Stockpiling

The group discussed the opportunity to stockpile equipment and materials before funding goes away. Jeff Graves will work with Paul Peronard to develop a wishlist of stockpile materials and ideal locations; Paul will work with Paul Semmer and Tom Probert to discuss appropriate locations for stockpiles. This could be added to the proposed budget for Jumbo Mine work.

EPA/USGS proposal for examining metal/conductivity correlations in the Snake River Watershed

Thomas Chapin, Andrew Todd and Ben McGee (U.S. Geological Survey, Denver, CO)

Background:

The Pennsylvania (Penn) Mine is recognized as a major source of toxic metals to the Snake River Watershed. Bulkheads were installed at the Penn Mine in 2014 & 2015 to flood open mine tunnels, reduce the risk of mine blowout, and reduce the flow of toxic water out of the mine workings. Monitoring the Snake River watershed and effect of the Penn bulkheads on toxic water inputs would ideally include a long-term, year-round water quality monitoring program. However, traditional water sampling programs are expensive, typically provide only a few samples during the accessible summer period, and would likely miss important flow events such as snow-melt runoff and heavy rainstorms. The Snake River Watershed task force has requested the USGS to evaluate the potential of developing low-cost monitoring alternatives to traditional water sampling within the Snake River watershed.

The Snake River is a well-studied watershed with numerous academic and federal reports examining toxic metal concentrations over the last 30+ years. Using this dataset, the USGS conducted a rough evaluation of the relationship between field measurements of conductivity and dissolved concentrations of various toxic metals of ecological concern. For several of the conservatively transported toxic metals (e.g. Zn, Cd, Mn, and Ni), there appears to be a reasonable correlation between field conductivity and toxic metal concentration (Figure 1). If these relationships could be fine-tuned, it is possible that conductivity dataloggers could be deployed at key locations in the watershed to develop a semi-quantitative understanding of instream metal concentrations at a finer temporal resolution.

Scope of Work:

The USGS proposes to collect additional data within the Snake River to assess the effectiveness of employing low-cost conductivity loggers as a semi-quantitative surrogate for dissolved toxic metals concentrations. The proposed scope of work would entail a year of systematic monthly data collection.

Proposed Workplan:

1. The Snake River Watershed Task Force will choose 5-6 assessment sites. Since we have long-term data records, the following sites are recommended:
 - a. Snake River above Deer Creek (SW-044)
 - b. Snake River above Peru Creek (SW-047)
 - c. Peru Creek above the Snake River (SW-049)
 - d. Snake River below Peru Creek (SW-050)
 - e. Snake River below the North Fork (-at bridge not SW-082)
 - f. Snake River at Independence Road (SW-IND)

2. STICs (low-cost conductivity-temperature loggers) and Hobo U-24 Conductivity Loggers will be deployed in a number of key Snake River Watershed locations. The Hobo U-24 loggers are designed specifically to measure instream water conductivity at user-defined intervals. These loggers are fairly expensive (\$750 per unit), but are already owned by the USGS researcher. The STIC instruments are a research-grade tool that has great promise to provide low-cost (~\$70 per unit), high-resolution characterization of the temporal and spatial variability in Snake River watershed conductivity.
3. The USGS will make site visits to these site locations once a month for a year. At each visit and at each site, the USGS will:
 - a. Download the conductivity loggers
 - b. Clean each logger- Metal precipitation onto the logger may introduce a source of error
 - c. Measure and record field conductivity and pH
 - d. Collect filtered and unfiltered water samples. All water samples will be turned over to EPA for laboratory trace metal analysis
 - e. Measure stream flow
4. At the end of the year, the USGS will write a summary report.

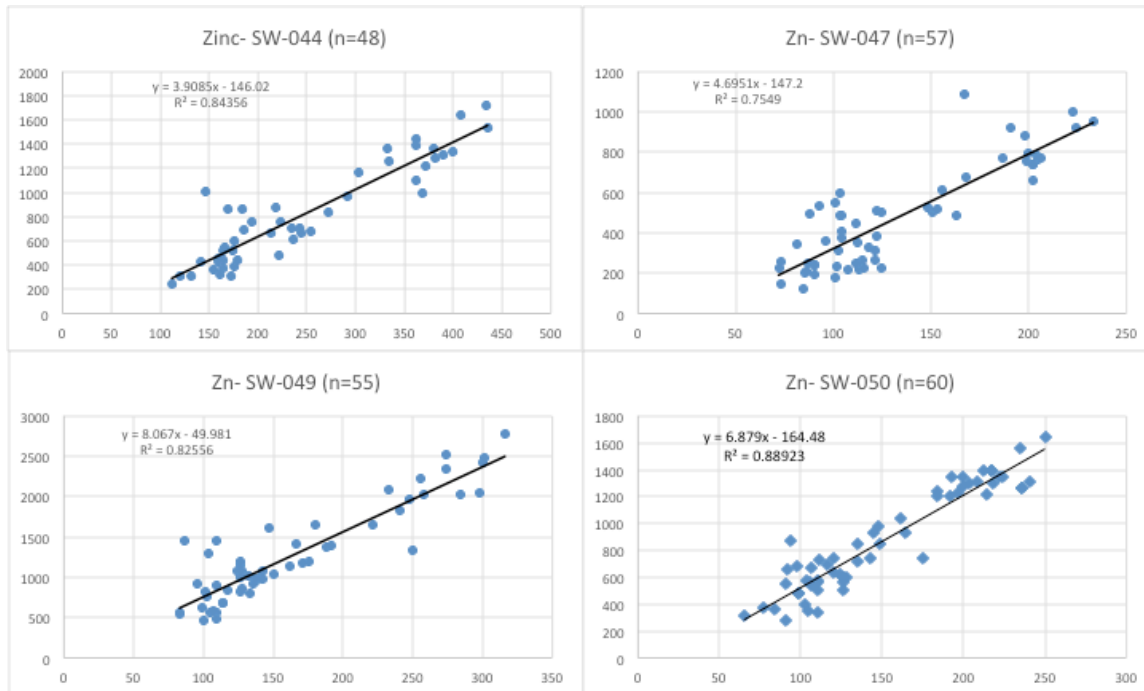


Figure 1: Relationships between field conductivity and dissolved Zn concentrations at 4 sites within the Snake River watershed, Summit County, Colorado.