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High frequency monitoring system to assess water quality constituent loading

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Abstract Text:

A large variety of Best Management Practices, storm water management systems, and point source controls have been developed and implemented to address water quality impairments in surface waters. Due to the large number of streams, lakes, and reservoirs that are still impaired after 35 years of the Clean Water Act, it is clear that improvements are needed to both the controls and the assessment of their impacts. The future will likely bring more proactive management of constituent loadings through the implementation of real-time monitoring systems and active controls, such as offline equalization systems or sedimentation ponds, to protect water resources from short-term insults. As part of our USDA CEAP program and with funding from other agencies based on this work, we have developed a telemetered network of flow and water quality sensors in the Little Bear River Watershed (Utah) that, along with field observations of water quality constituents, allow us to correlate constituents of concern (e.g. nutrients) with real-time measurements of flow, turbidity, specific conductance, pH, dissolved oxygen, and other parameters, to obtain estimates of constituent loadings to two reservoirs. This talk will present an overview of the network design and implementation, and the results obtained so far for the assessment of total phosphorus loading in the Little Bear River.

Impact Statement:

We have implemented the water quality network at six locations in the watershed and have identified a number of loading events and previously unobserved diurnal cycles of turbidity that we are currently associating with near-stream water users. These observations have already changed our view of how constituent loadings should be monitored and assessed.