

# Measuring the eco-hydrological performance of the Lower Bear River Basin through experiential learning – the Bear River Fellows Program

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## Abstract

Measuring and evaluating the performance of river systems necessarily requires understanding the variety of environmental and ecological variables driving the decision-making process in managing river basins. Such variables are best understood with field measurements, data analysis and computational modeling. The Department of Civil and Environmental Engineering at Utah State University (USU), through a National Science Foundation project, has partnered with the Outdoor Recreation, and Parks and Recreation programs at USU to offer the Bear River Fellows Program - a new, unique river-based experiential learning opportunity for 5 freshmen Fellows to receive first-hand experience in collecting, synthesizing and analyzing environmental and ecological metrics. We collected field measurements and examined environmental and ecological variables from three different sites along the Lower Bear River between the Idaho-Utah state line and Cutler dam on a river trip Aug. 14-18, 2012 and on Nov. 3 and 17, 2012. Data collected includes flow measurements, channel cross section topology, riparian vegetation, beaver activity, and human-caused inflows and diversions. This poster presents the findings of the data analysis for one site at the confluence of the Bear and Cub Rivers. We provide insights related to our hydrological and ecological observations.

## Objectives

- Undertake water and environmental research on a nearby river
- Experience the river first hand on a multi-day trip
- Meet other incoming freshmen
- Interact with faculty and graduate students
- Develop data collection, analysis, boating, and leadership skills
- Get paid to work with collected field data through Fall and Spring semesters

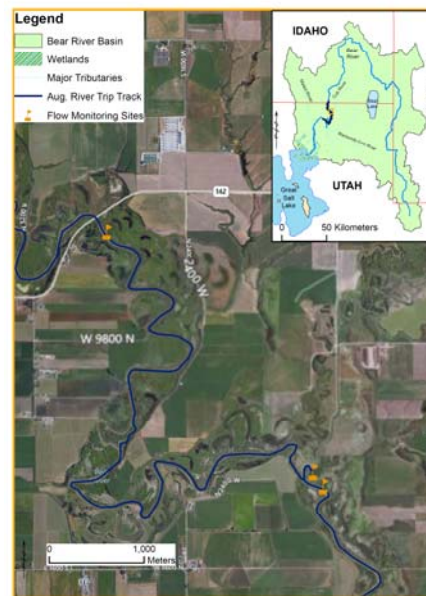


## Methods



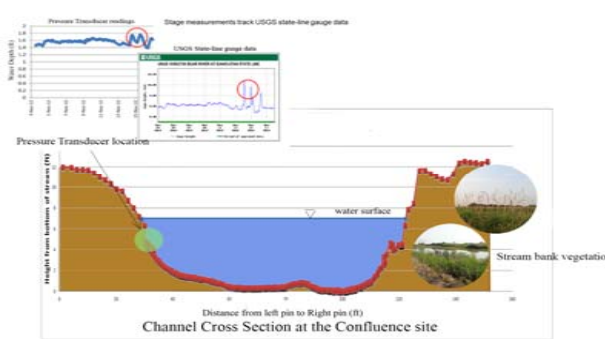
## Study sites

Bear River Flow Monitoring Sites



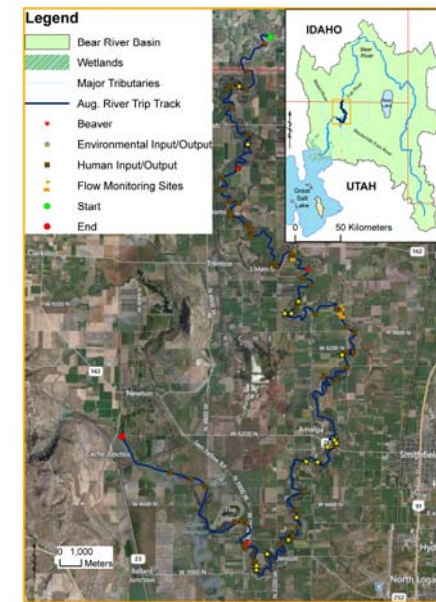
A map showing the three sites where the group monitored the river flow and took measurements of flow, channel cross section, and reported observations of vegetation cover. Data from geology.utah.gov and from our trip

## Results



## Inflows and outflows

Bear River Input/Output



We canoed 68.2 Km out of the total Bear River length of 790 Km. We passed numerous locations where we observed human activities (e.g. water diversions and return flows) and environmental inputs and outputs to the River. We also observed three beaver activity sites. Data from geology.utah.gov and from our trip.

## Conclusions & Next Steps

- Set up three monitoring sites for use in future years.
- Observed most beaver activity in Beaver Bottoms area.
- Observed numerous human water diversions and return flows along the river
- Collect more flow measurements to build stage-flow relationships at each site.
- Compare the observations of human withdrawals to the Utah State water rights database.
- Identify remaining vegetation.
- Share our results with the river commission and managers.