


2010 AGU Fall Meeting

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Location: Poster Hall (Moscone South)

Time of Presentation: Dec 17 8:00 AM - 12:20 PM

Assessing stream temperature response to environmental change

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Stream temperature controls aquatic ecosystem function by directly influencing water quality, ecosystem productivity, and the physiological functioning of aquatic organisms. To date, there are limited studies of the impacts of environmental disturbance on stream temperature, particularly on the eastern slopes of the Rocky Mountains. This region provides key habitat for native salmonid species such as westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) and bull trout (*Salvelinus confluentus*), which are listed as 'threatened' and 'species of special concern', respectively. Increases in stream temperature could limit habitat availability, reduce competitive advantage, and potentially increase mortality rates for these native species. This study uses field data collected at high spatiotemporal resolution to develop a spatial stream temperature model that simulates the mass and energy balance of the stream system. Preliminary field results demonstrate the high spatial and temporal variability in processes governing stream temperature in three study stream reaches. Groundwater/surface water interactions, topographic setting, and local meteorological conditions all contribute in determining stream thermal regimes. This work discusses how these primary drivers of stream temperature can be incorporated into a physically based spatial model, and demonstrates how depending on the scale of interest, the temperature of a stream can be governed by very different contributing factors.

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