Tributary Monitoring

ALEX MOODY - WRV MTAC MARCH 3, 2022
Tributary Presence/Absence
Creek Cameras

- Deployed Fall 2018 in Eagle Creek, Lake Creek, Adams Gulch, and Greenhorn Gulch
- Two cameras stolen
- Glitchy images after cameras covered in snow
- Removed Fall 2021
Temperature Loggers

Analyze temperature patterns to determine streamflow frequency and duration in ephemeral streams

- Dry streambeds generally have larger diurnal temperature fluctuation than flowing

**ONSET HOBO Tidbit MX Temperature Logger**

- Deployed in Lake Creek, Eagle Creek, and Adams Gulch
- IDWR also using in Raft River Basin
Thermograph Examples


Figure 1. Hypothetical streambed surface thermograph during a sequence of hydrological surface conditions.
Logger Installs

Eagle Creek

Lake Creek

Adams Gulch
Groundwater Flux Monitoring

University of Idaho Center for Ecohydraulics Research

Daniele Tonina, Andrew Tranmer, Andrea Bertagnoli, Charlie Luce (USFS)
Method Description

Passive thermal monitoring using an array of temperature sensors 15 cm apart to determine vertical fluxes between stream and shallow aquifer (Luce et al. 2013)

- Stream temperature fluctuations used as a tracer to detect vertical pore water velocity

- Report here
Performance

Local vertical fluxes are integrated along stream to get total gain/loss.

Lack of oscillations or small temperature gradients prohibit flux estimation (Occurs often in winter).

Results match USGS seepage surveys well.

Warm Springs

USGS 10/30/2019

UI 10/31/2019
Performance

- Results agree with seepage estimated by USGS gages when diversions are limited
- Gages account for all losses/gains (diversions, tributary inflows, ET, groundwater exchange)
- Probes quantify only groundwater exchange
- Difference is net surface water extractions
  - May – August in Trail Creek
Seepage “Fingerprint”

Provides high resolution spatial and temporal seepage values

Figure 10: Daily reach seepage discharge, $Q_{mech}(x,t)$ (ft$^3$/s) along Warm Springs Creek (horizontal axis from upstream, 0 to downstream, 1.48 mi (2,392 m)) for each day (vertical axis). Diamonds and square indicate location of probes (red vermilion data available and black data not available) and installation or replacement of a probe, respectively.