Beaver Creek Hydrology [DRAFT]

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# Preface

In Spring 2022, the United States Geological Survey (USGS) initiated a partnership with Kenai Watershed Forum (KWF) with support from the [Alaska Climate Action Science Center](https://akcasc.org/) (AK CASC). The project will investigate hydrological conditions in the Beaver Creek watershed, a lowland tributary of the Kenai River. The project will use present-day data on water temperature, discharge, and landscape characteristics to model future conditions under future scenarios of climate conditions and groundwater usage.

This document is a draft in progress and is for use only in disseminating information among the research team. All data is preliminary and has not been approved for use in publications by USGS or any other entity, as of r Sys.Date().

For more details visit <https://www.kenaiwatershed.org/water-research-news/usgs-beaver-creek/>.

# 1. Methods

## 1.1 Water Temperature Loggers

### 1.1.1 Locations

Our project includes water temperature data from a total of fifteen locations throughout the Beaver Creek watershed. In summer 2022 we established thirteen new sites to monitor water temperature with HOBO TempPro v2 loggers, in addition to the one site previously established by Kenai Watershed Forum. The USGS Alaska Science Center also established a real-time gauging station in the lower reach, which records water temperature in addition to discharge (station # 15266500). These data are available online at <https://waterdata.usgs.gov/monitoring-location/15266500/>.

Site locations and other metadata are available for download in the link below.

An ArcGIS Online map of site locations is displayed below. The map may also be accessed at <https://arcg.is/0ySarv1>.

View larger map

### 1.1.2 Water Temperature Logger QA/QC Checks

#### 1.1.2.1 Pre-deployment

Prior to deployment, all water temperature loggers undergo a QA/QC check using ice-water and room temperature water as described in (Mauger et al. 2015).

#### 1.1.2.2 Site Checks

Content TBD here.

#### 1.1.2.3 Post-deployment

##### 1.1.2.3.1 Fall 2022 Site Visits

We downloaded data from all loggers in September/October 2022, and reviewed it in Spring 2023. Each logger’s time series was visually inspected in an R Shiny plot for data that is non-representative of stream channel conditions, such as exposure to air or burial in sand.

Segments of each time series that were identified as non-representative were flagged in a separate csv file, then applied in order to remove these segments.

An example plot for one logger is shown below, with flagged data in red and retained data in black.

Records for time periods flagged for individual loggers are recorded and available to view at the download below.

##### 1.1.2.3.2 Spring / Summer 2023 Site Visits

All water temperature logger sites were visited in Spring / Summer 2023, and log files were downloaded from each logger. The process QA/QC described from Fall 2022 was applied in an identical fashion.

(source csv files from diff folder and take through same process. remove dates from prior to earliest previous round of visits, join two dfs, then exclude redundant rows. hide code chunks since we already showed it once)

### 1.1.3 Preliminary Water Temperature Data

Water temperature will be applied as part of ongoing watershed-scale modeling efforts. At a later stage, it will be housed in a public repository such as AKTEMP (<https://aktemp.uaa.alaska.edu>) and others.

Preliminary water temperature files are available for download at the link below.

# 2. Summary

Content TBD

# References

Mauger, Sue, Rebecca Shaftel, E Jamie Trammell, Marcus Geist, and Dan Bogan. 2015. “Stream Temperature Data Collection Standards for Alaska: Minimum Standards to Generate Data Useful for Regional-Scale Analyses.” *Journal of Hydrology: Regional Studies* 4, Part B (September): 431–38. <https://doi.org/10.1016/j.ejrh.2015.07.008>.