Linking landscape characteristics to stream temperature in the coastal temperate rainforest of southeast Alaska.

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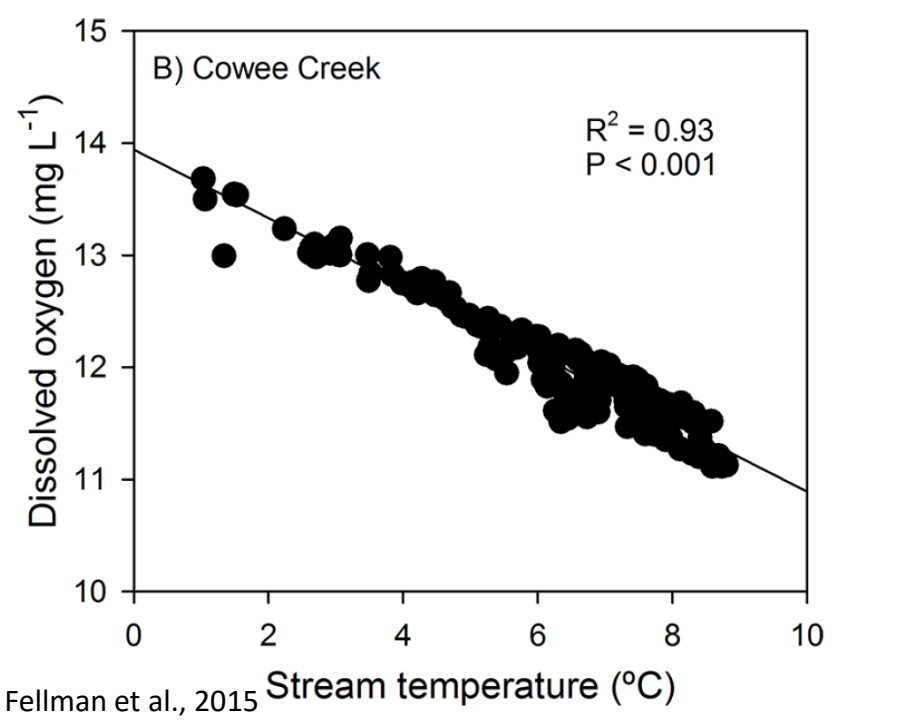
Stream Temperature

Stream temperature is a master hydrologic variable, influencing physical and biological processes of aquatic ecosystems as well as distribution and abundance of aquatic organisms

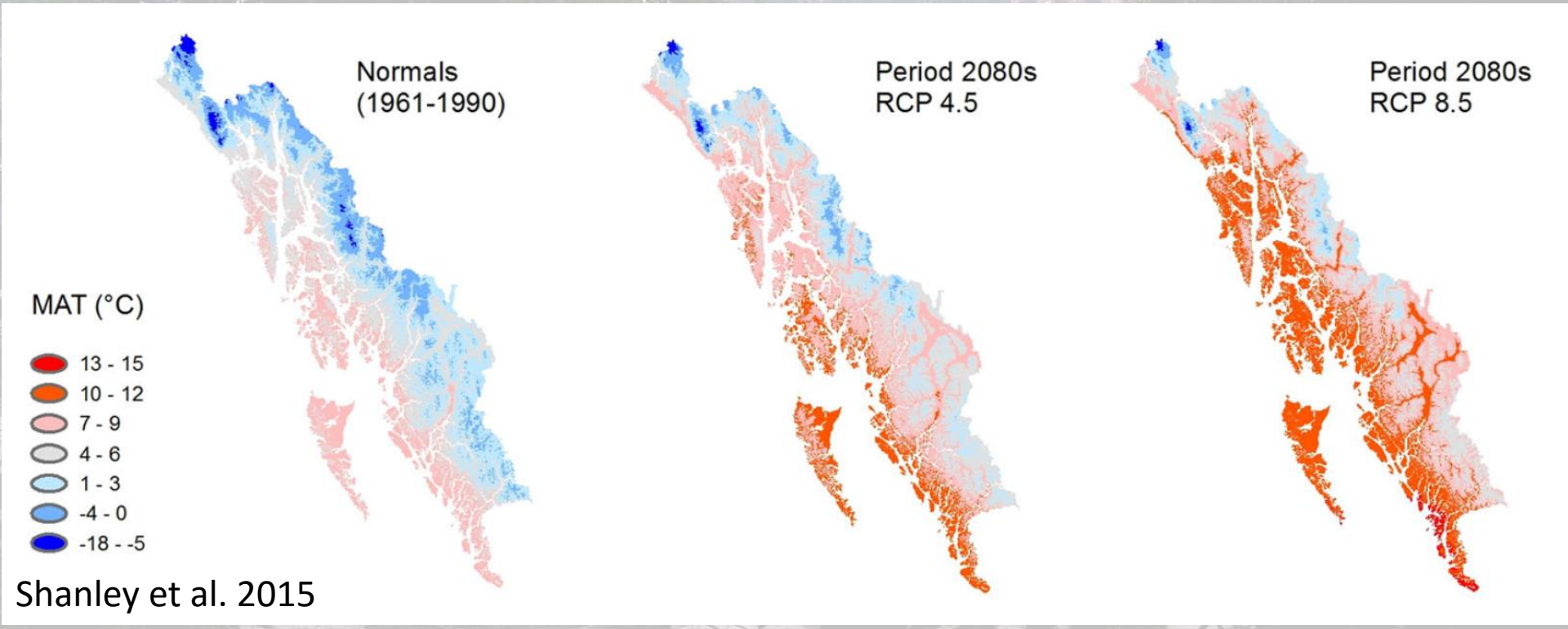


Fellman et al., 2015

Photo credit: Mark Lisac

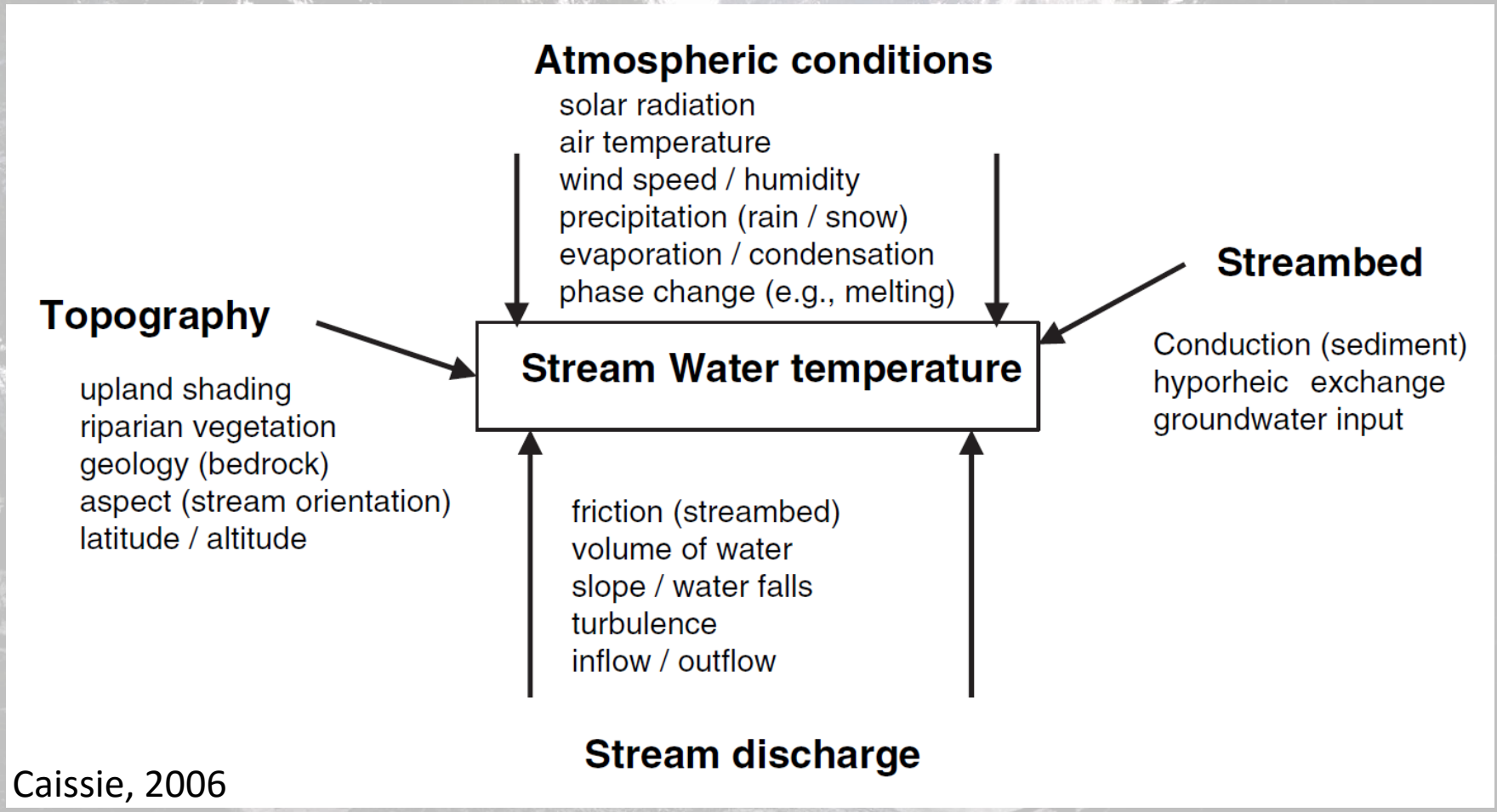
Streamwater thermal regimes are a fundamental concern among scientists and land managers

Climate Change in Southeast Alaska



Shanley et al. 2015

What controls stream temperature?

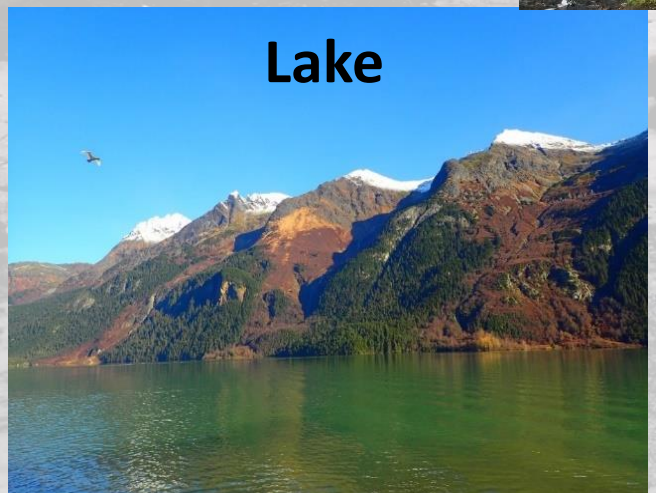


Caissie, 2006

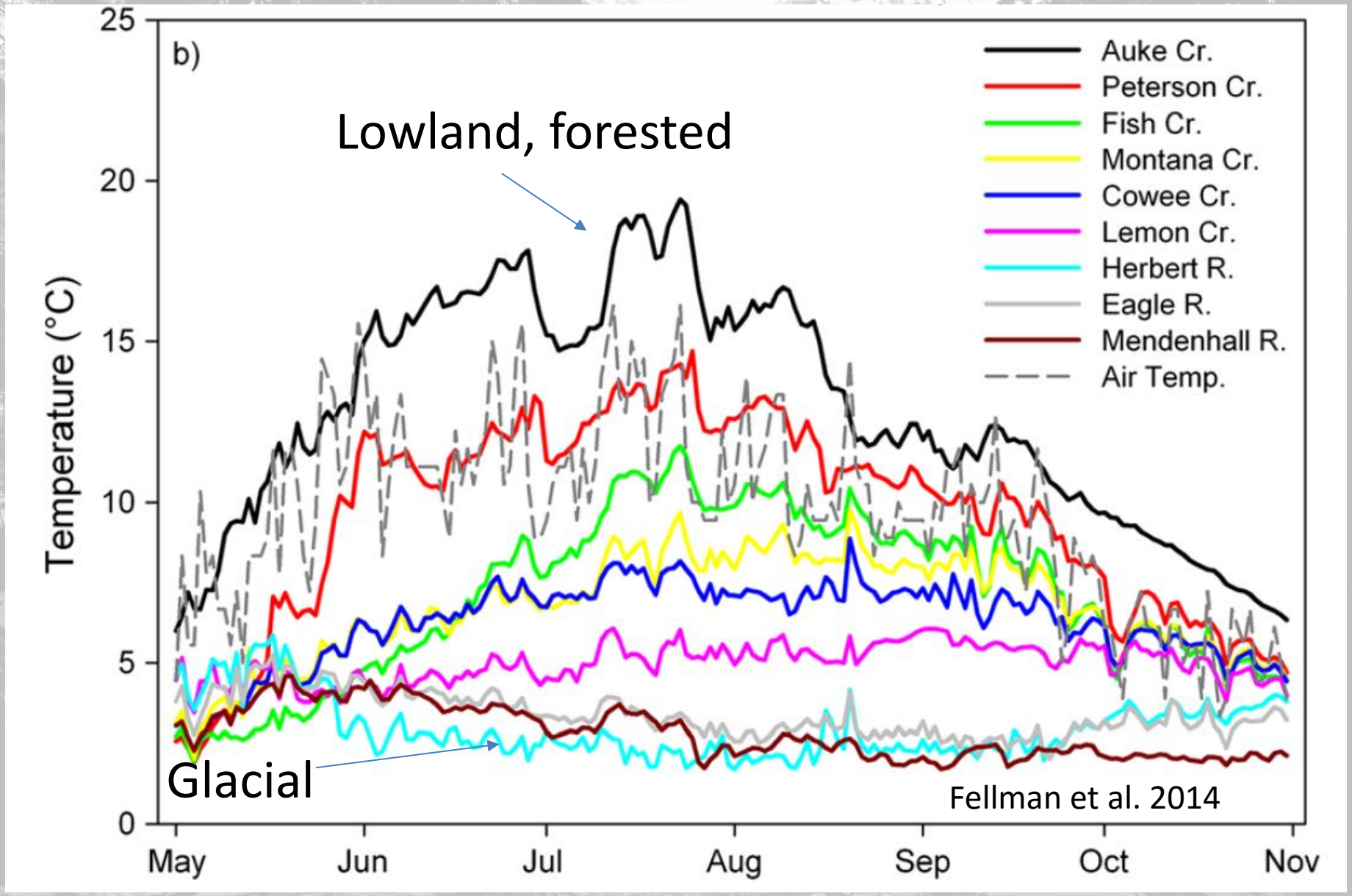
Landcover as a proxy for stream temperature controls

- Studies have linked physical characteristics of watersheds controls stream temperature

Photo credit:
Eran Hood



Landcover and Stream temperature



A Stream Temperature Network for SEAK

Methods and study design

- Watershed selection criteria
  - < 150 km ^{2}, anadromous streams, varying landcover, accessibility

Research Approach

- Monitoring site selection criterion
  - Representative cross section
  - Siting considerations: above tidal influence, active channel, shaded areas

Photo Credit: Peter McKay

Data Collection

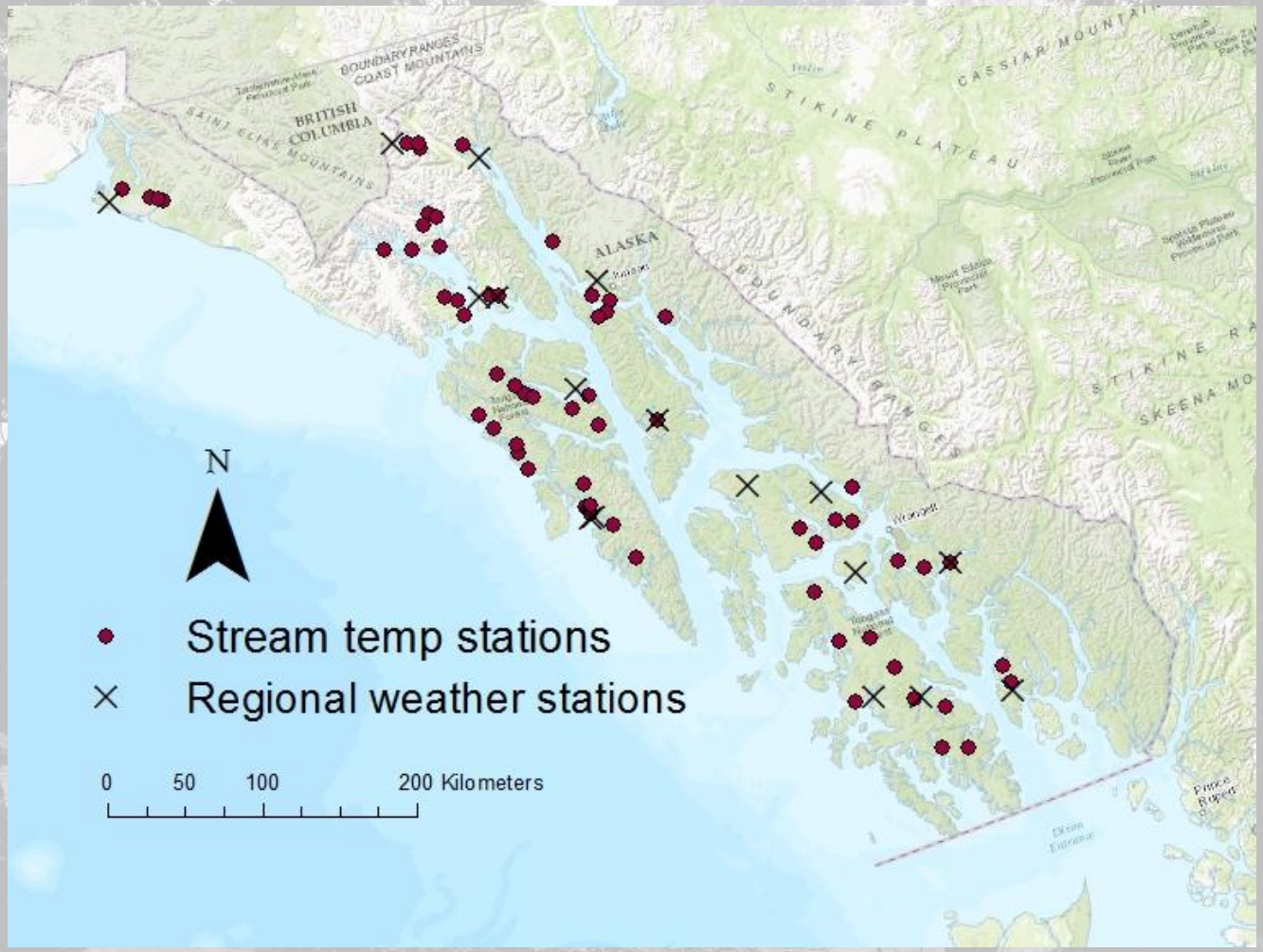
- Hobo pro V2 – precision ±0.2°C
- Data collected at hourly to sub-hourly interval

Photo credit: Marianna Carpeneti

Photo credit: Marianna Carpeneti

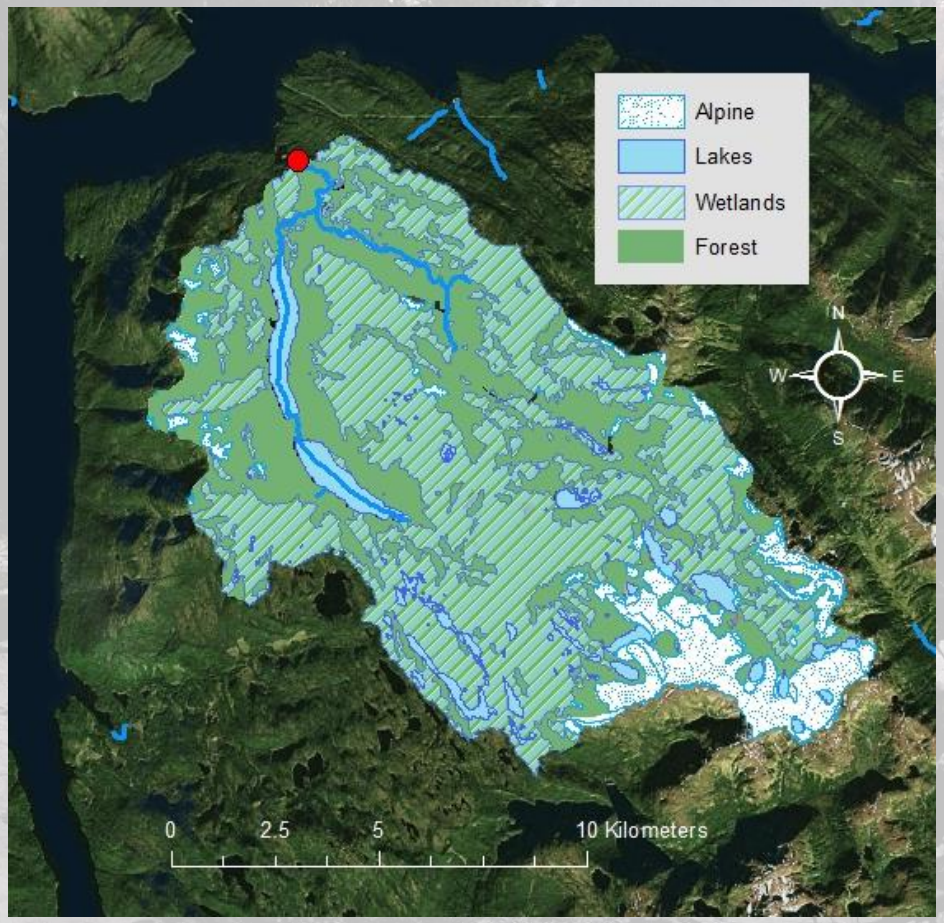
Photo credit: Scott Harris

Study Area



59 watersheds total, 40 sites installed for this study

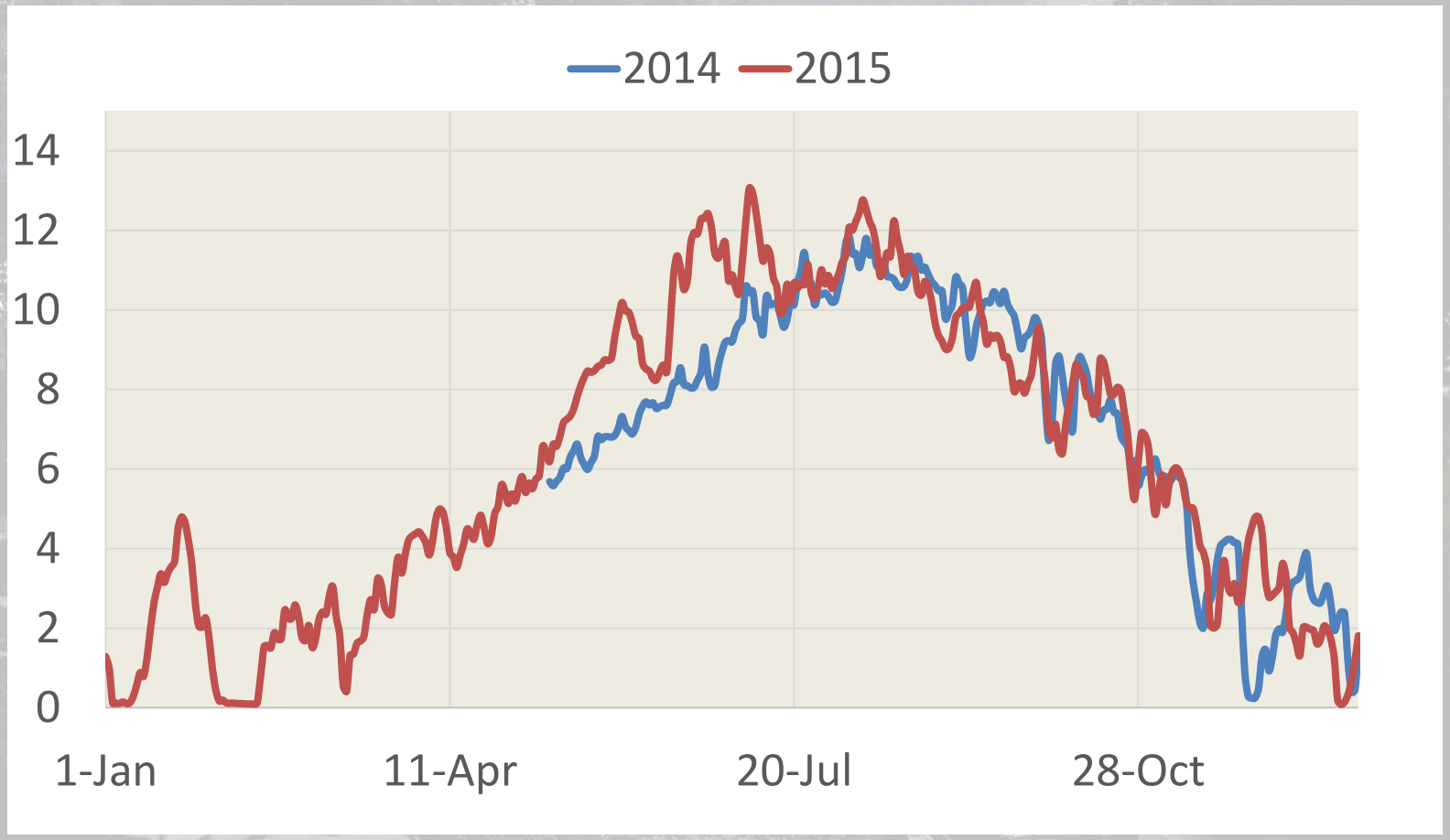
Watersheds and Landcover



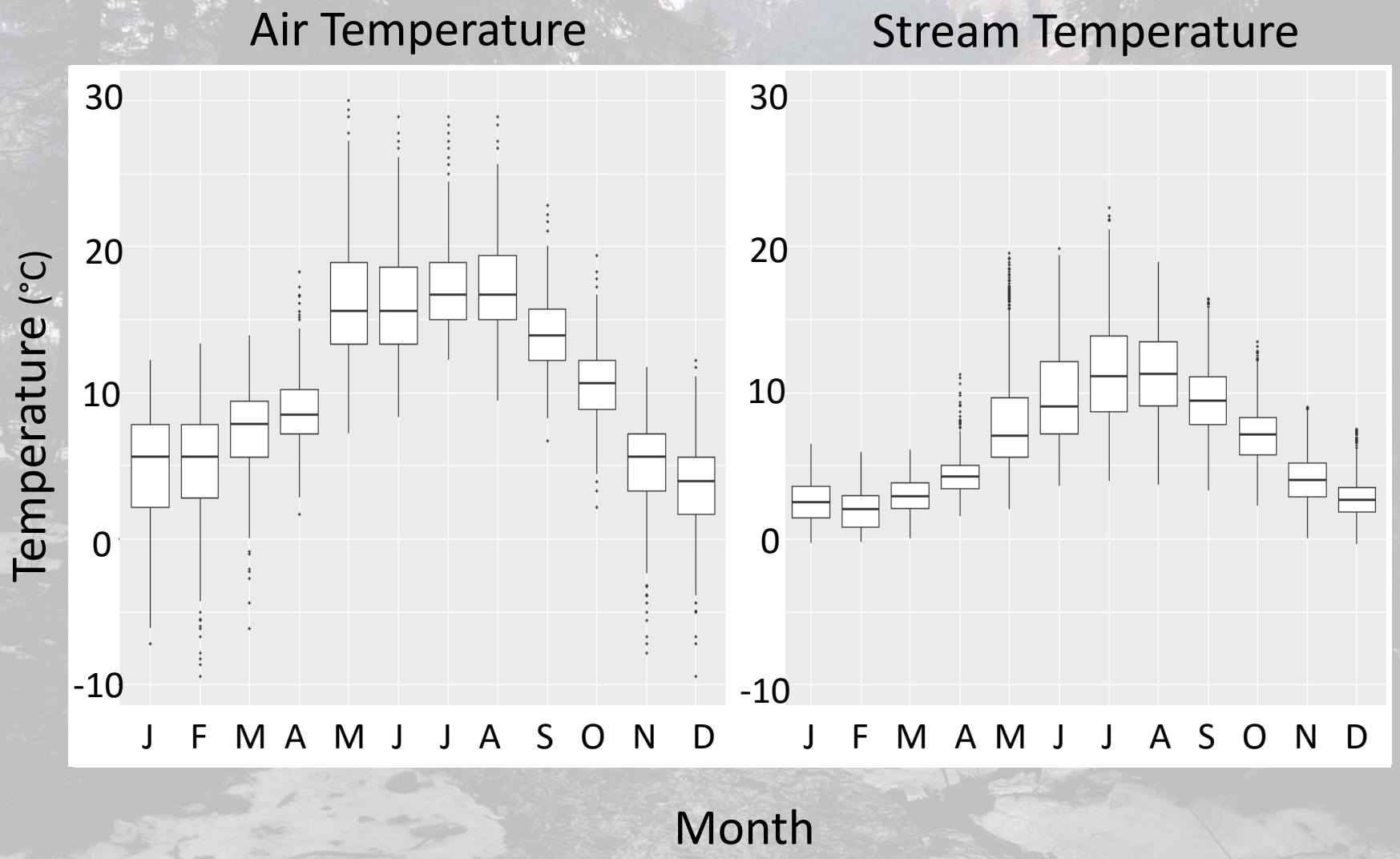
Variables

Slope
Aspect
Elevation
Area
Glacier
Alpine
Lake
Wetland
Forest
Harvest

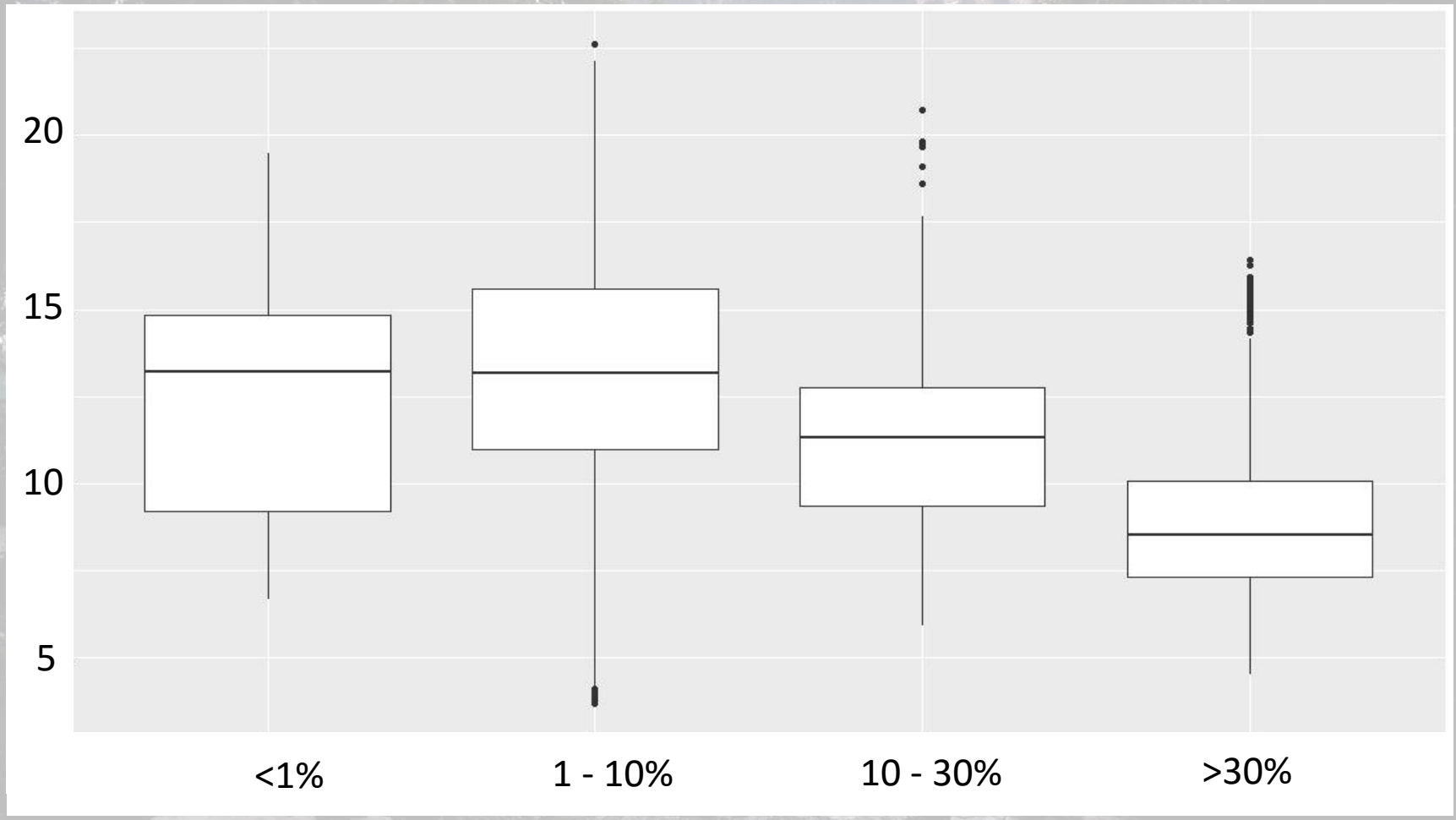
Peterson Creek



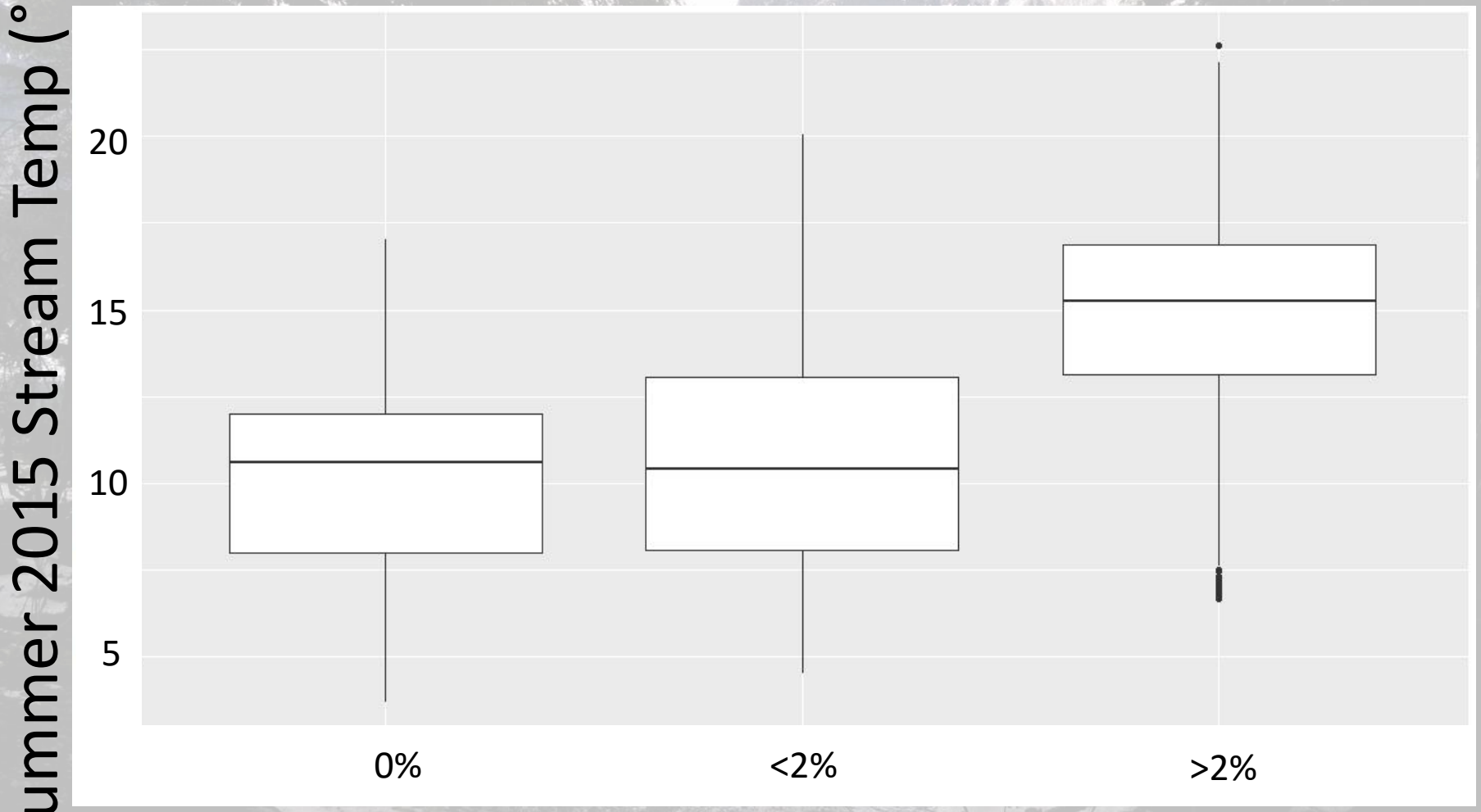
Results - preliminary



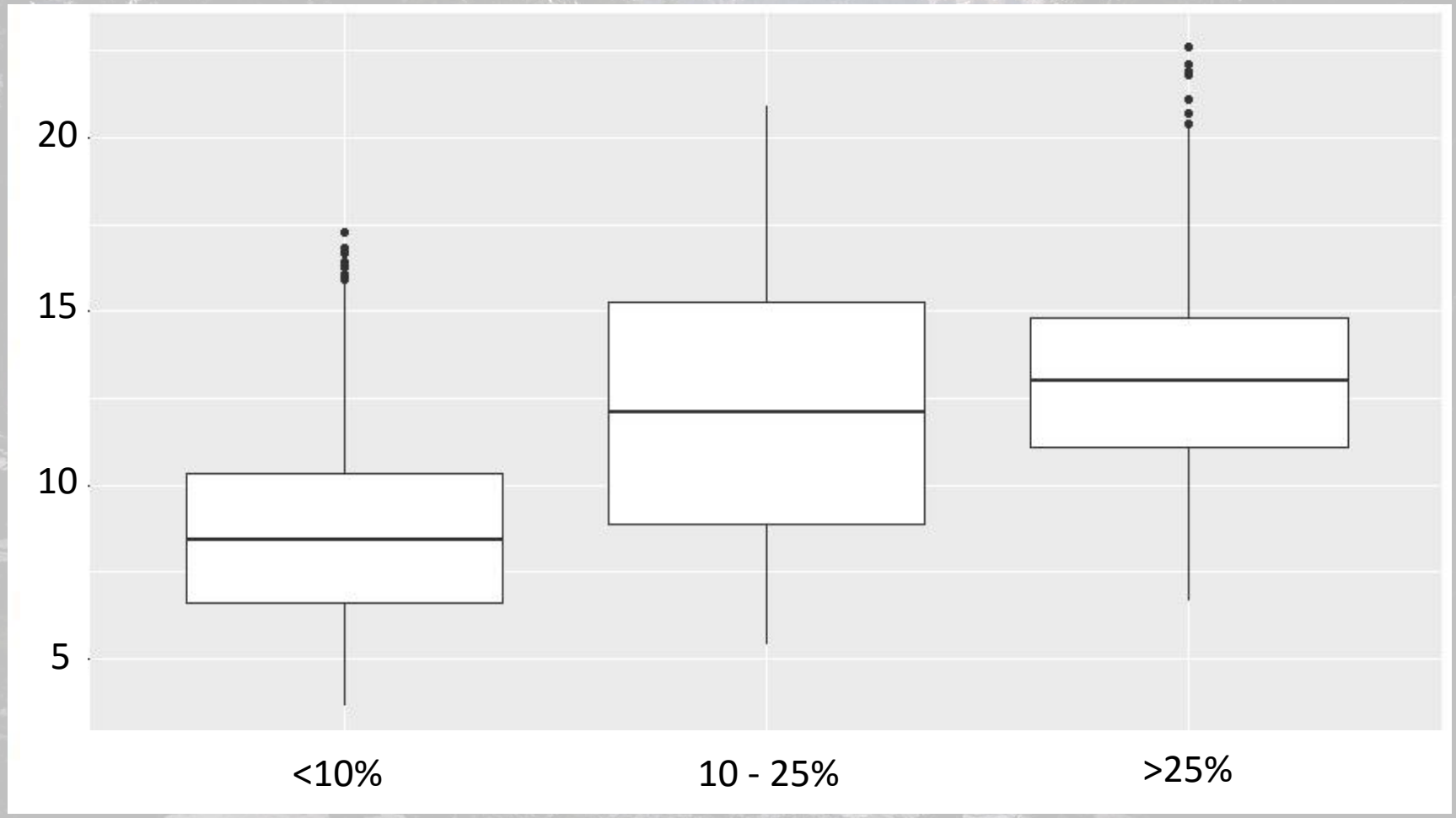
Alpine Area and Stream Temperature



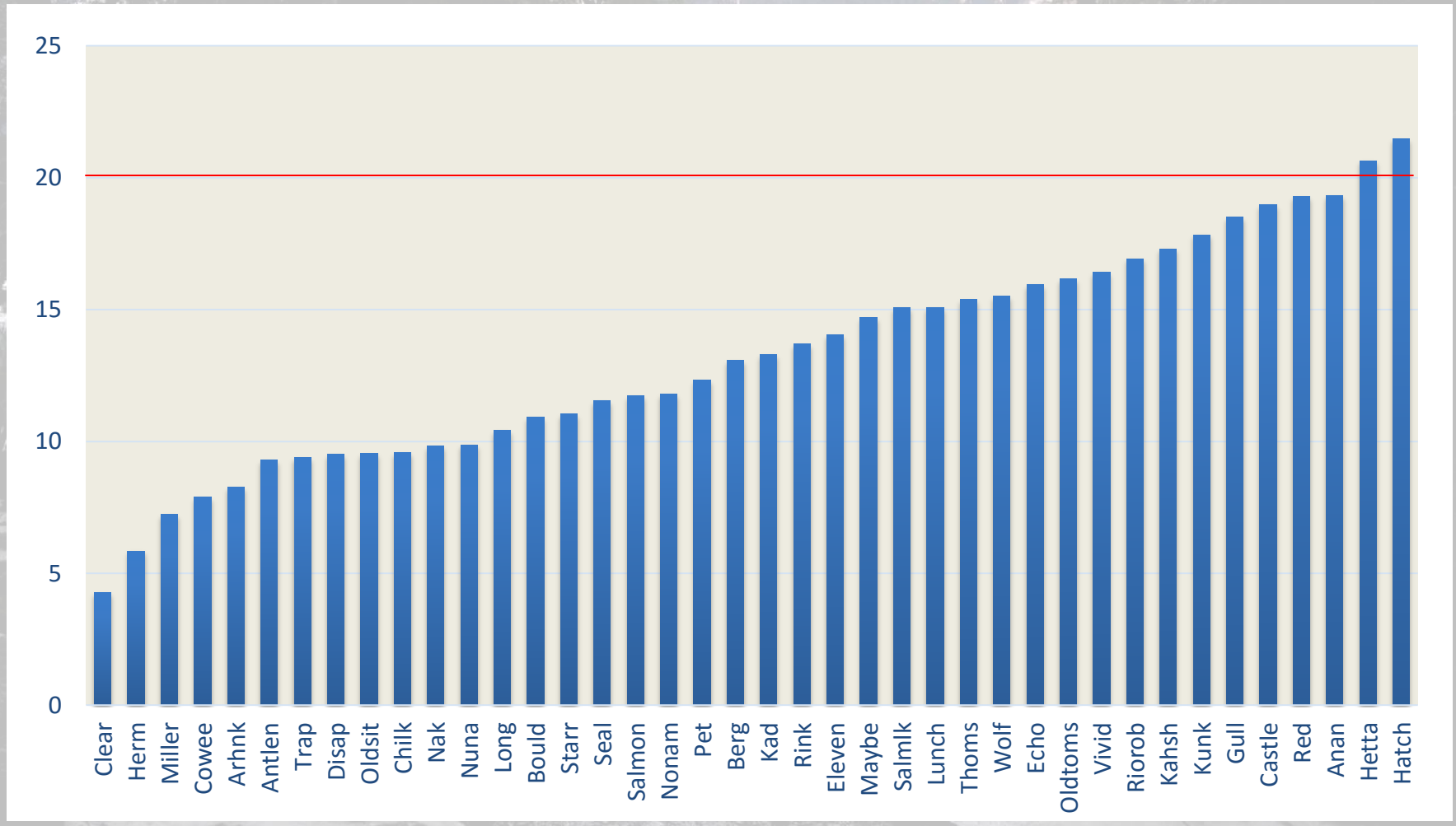
Lakes and Stream Temperature



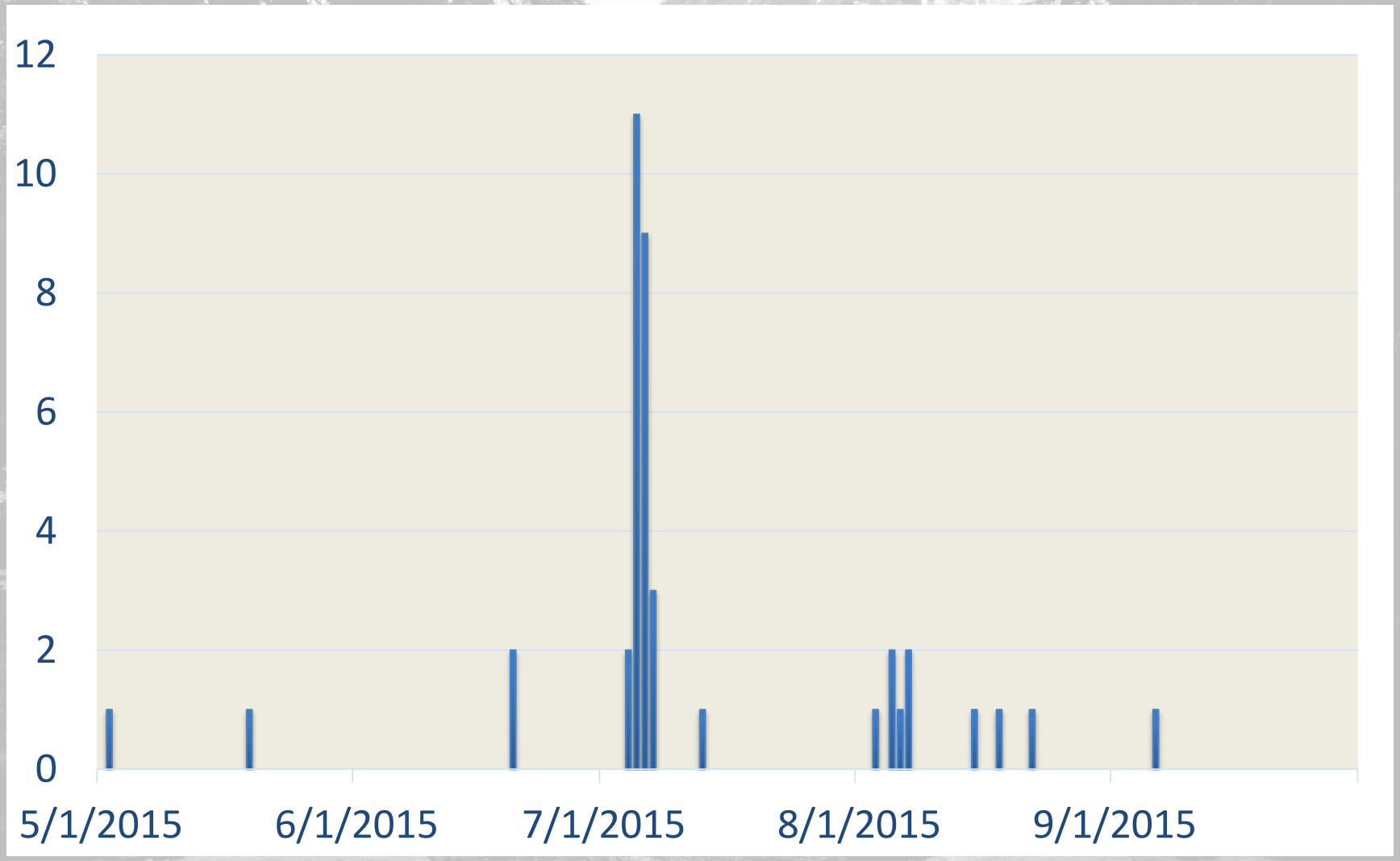
Wetlands and Stream Temperature



Range MWAT-2015



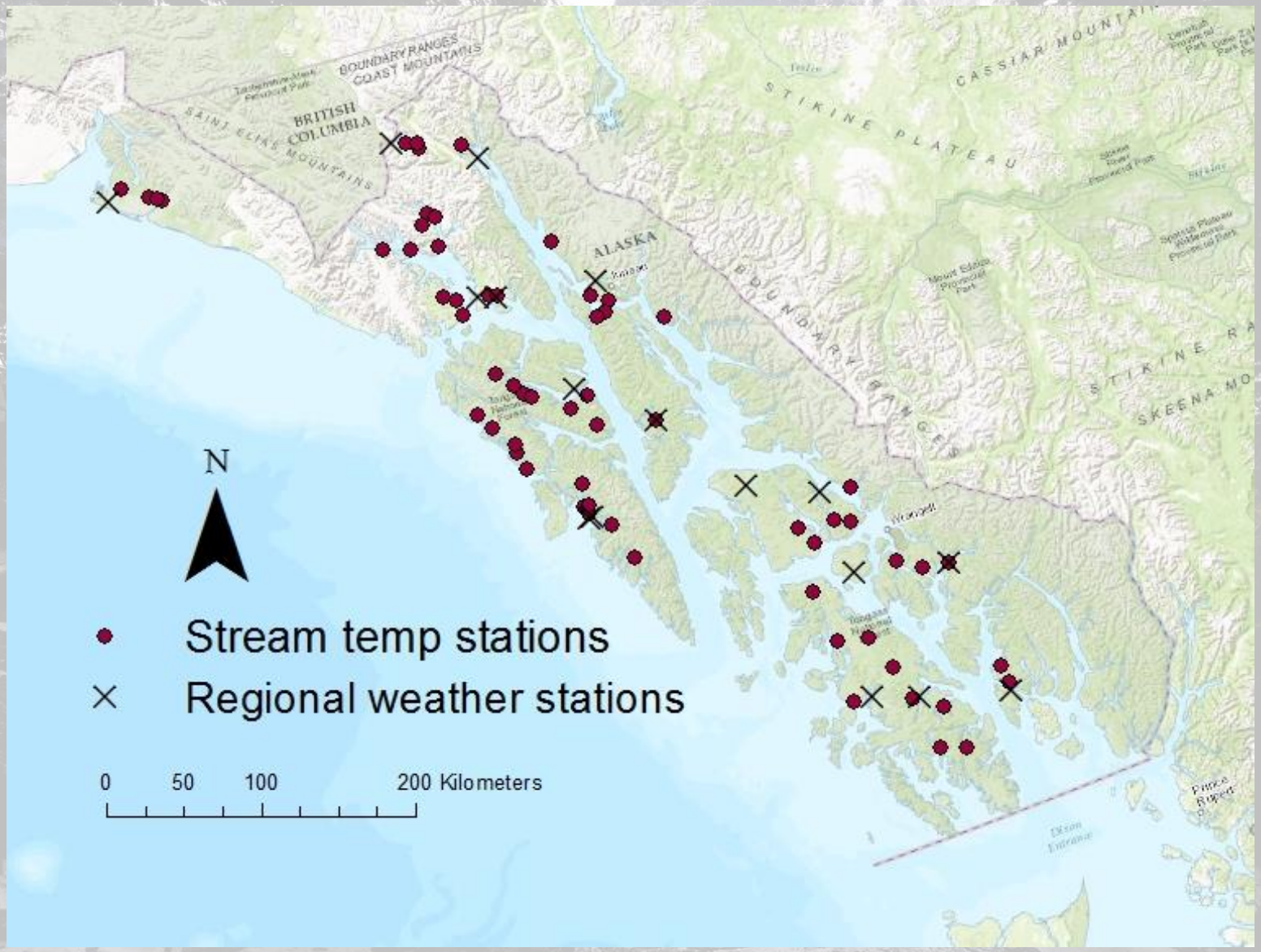
MWAT – date of occurrence



Future Work

Quantify relationship between watershed characteristics and stream temperature

Future SEAK Network



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USGS science for a changing world

AK CSC Alaska Climate Science Center

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Questions?