

Scaling the Geomorphic and Ecological Consequences of Contemporary Climate Change in the Salmon River Watershed, Central Idaho: A View from Taylor Ranch Field Station



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site description and project motivation

Taylor Ranch Field Station:

- Located Central Idaho, in the Frank Church Wilderness of No Return,
- Along Big Creek, a 1,445 km² tributary to the Middle Fork of the Salmon River
- Center for terrestrial and aquatic ecological studies for almost 40 years
- Basin favors studies of feedbacks between the physical and biological systems
- Increasing temporal and spatial resolution sensors of environmental conditions
- Current demand to study the stability of the basin as a water source for Snake and Columbia Rivers and as ideal habitat for threatened native fish

some key questions

Consequences for different hydrologic regimes:

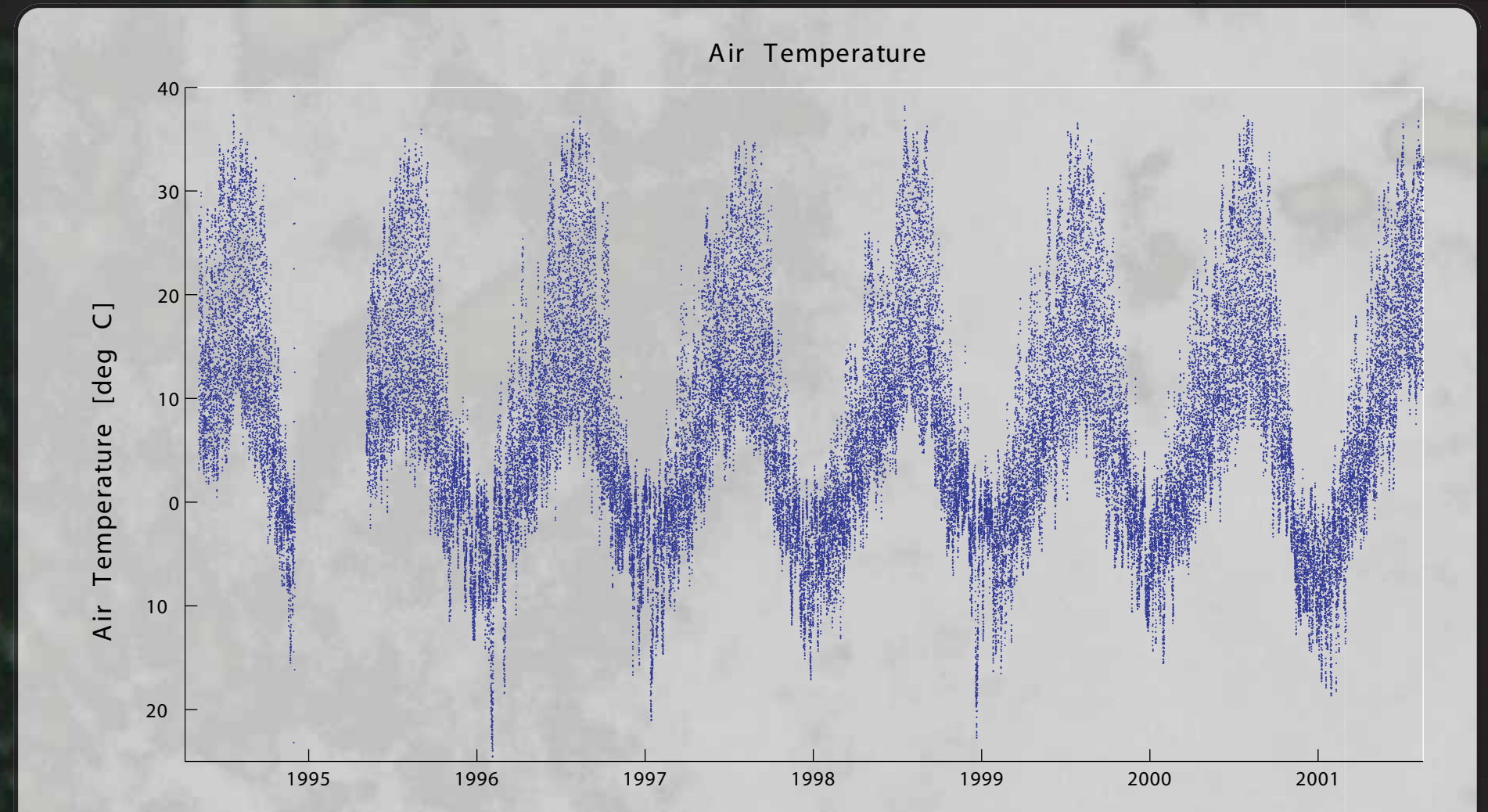
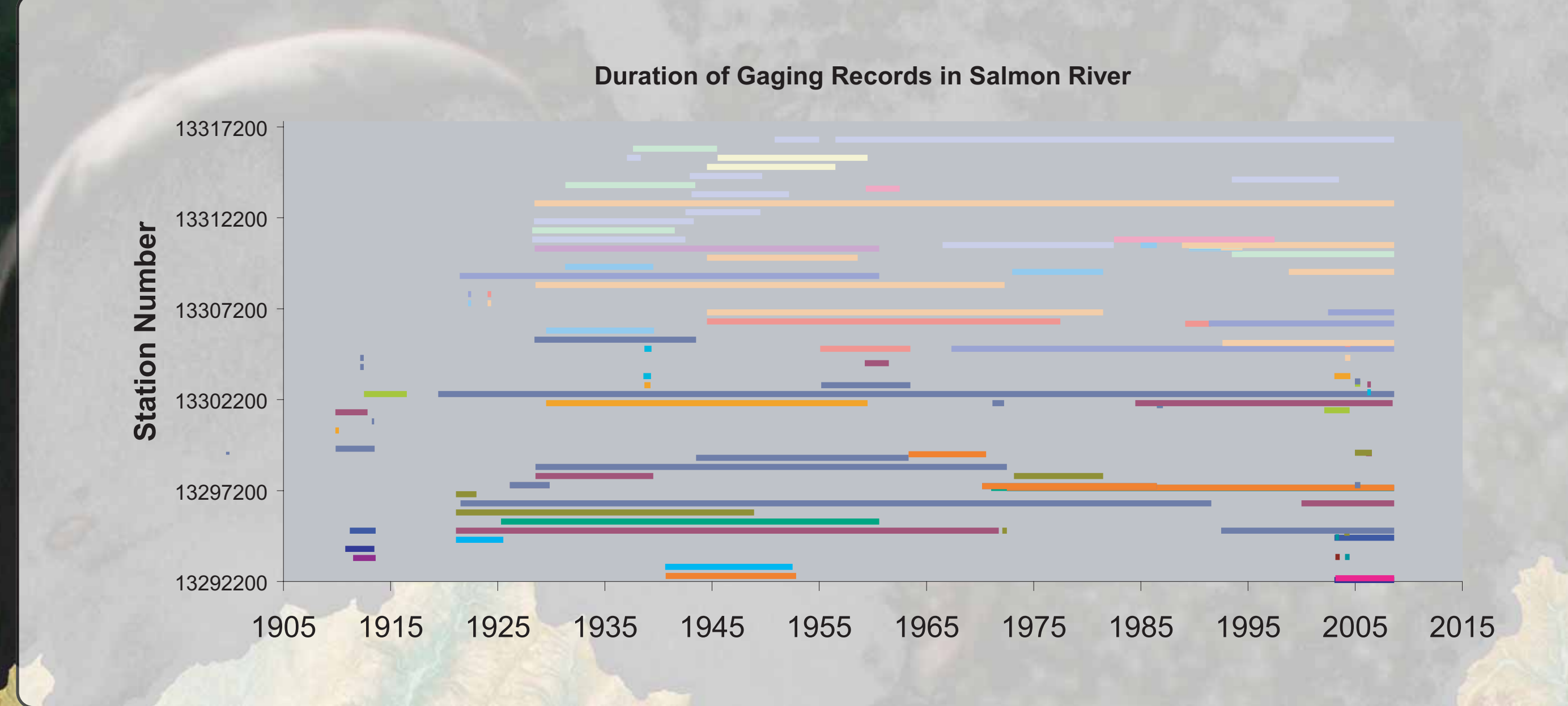
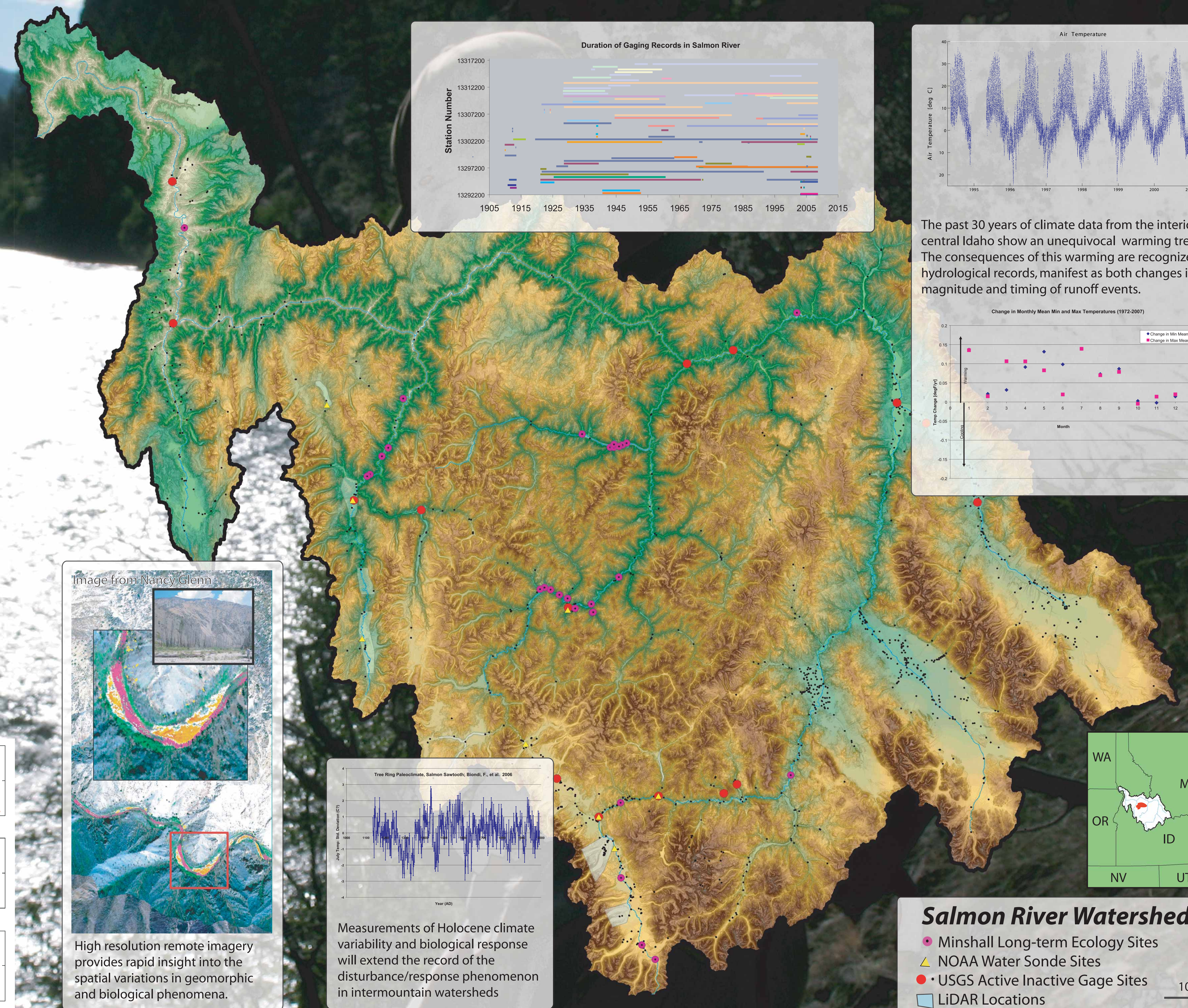
- Basin spans rain, rain on snow and snow dominated regions
- How is channel form/process different in regimes and how sensitive to change?
- How have biological systems adapted to different flow timing and magnitude?
- How much of the basin would be affected by anticipated changes in snow line?

Detection limits for contemporary climate change:

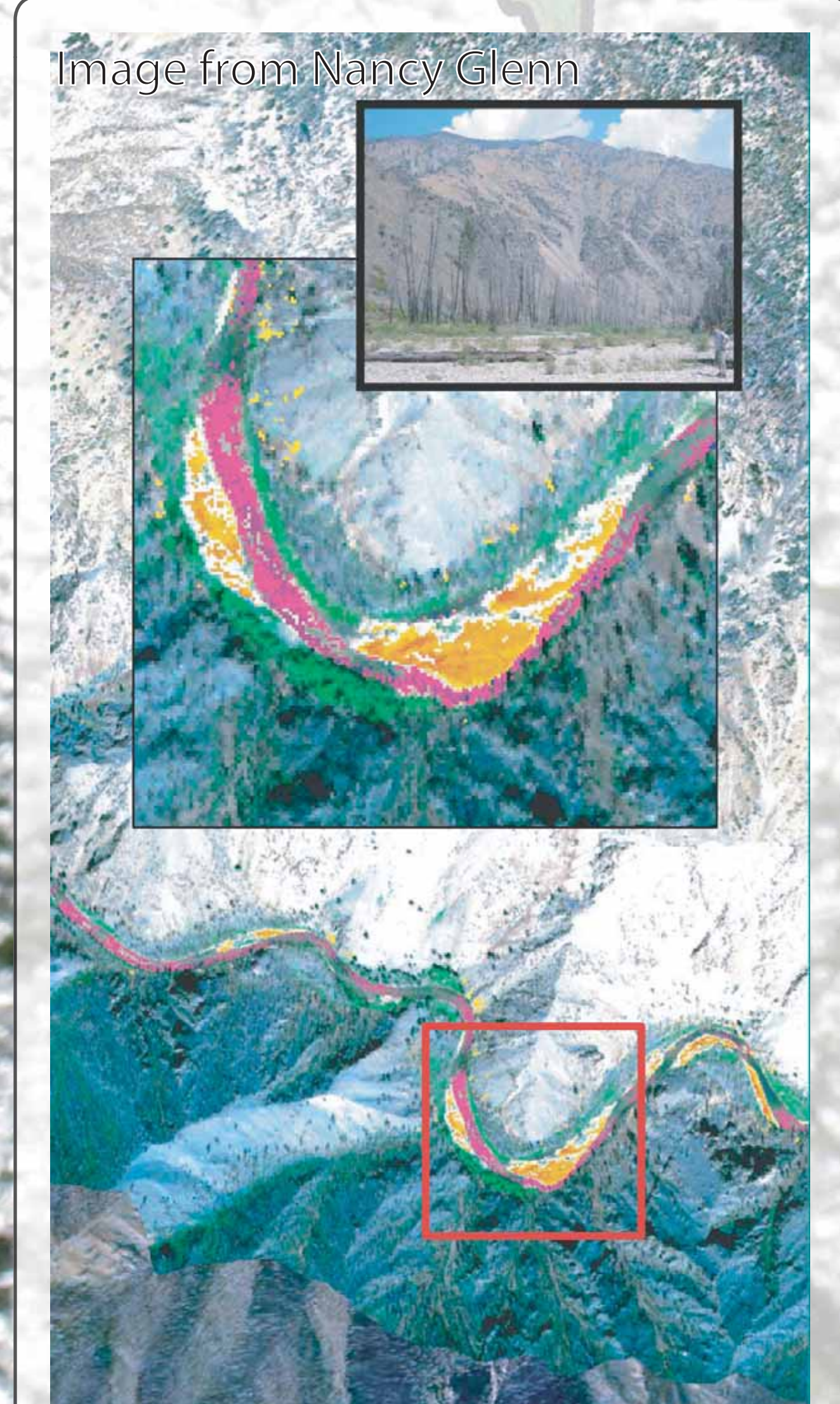
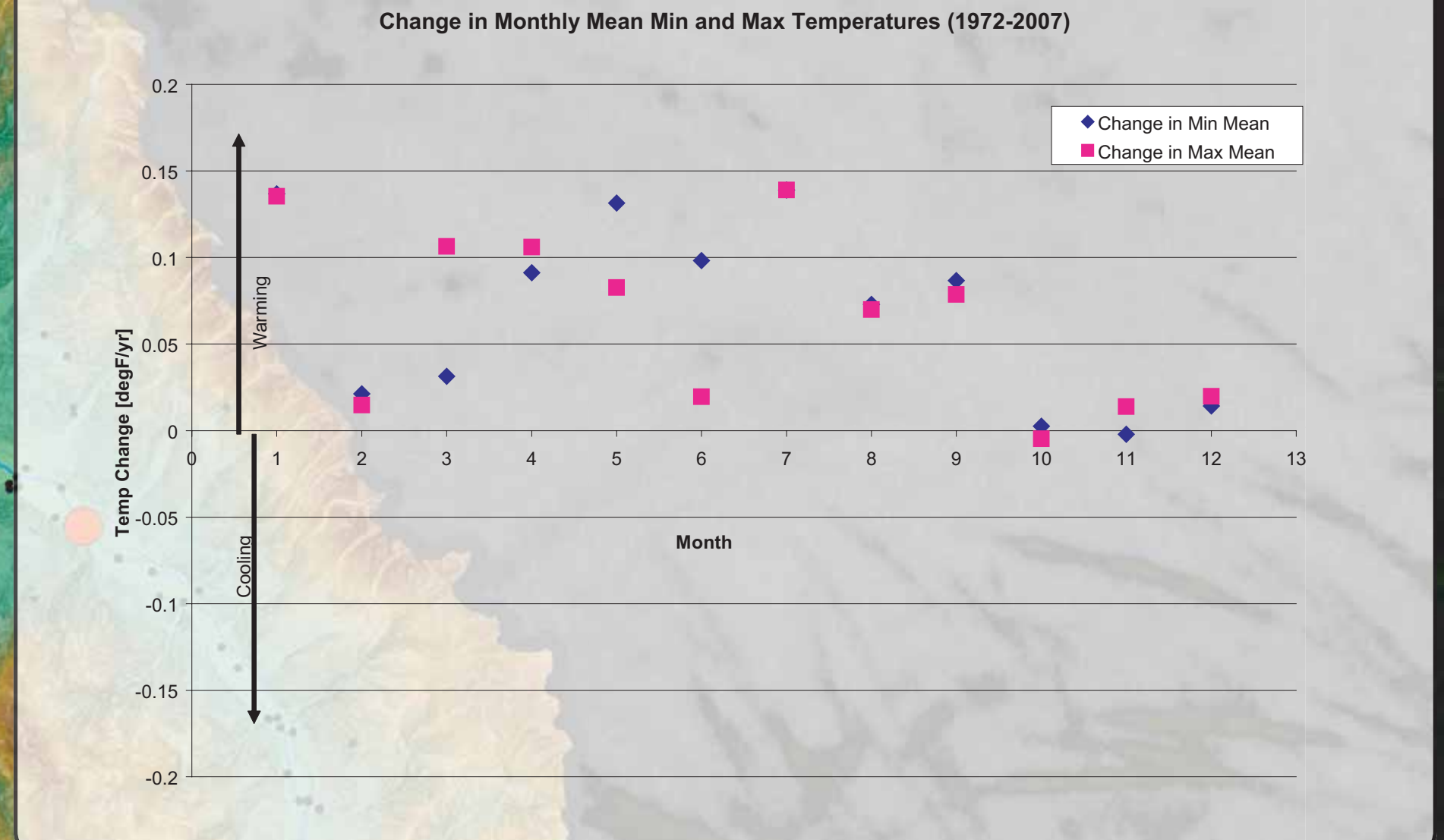
- can responses to climate be recognized against anthropogenic disturbance

How coupled are biological and physical systems?

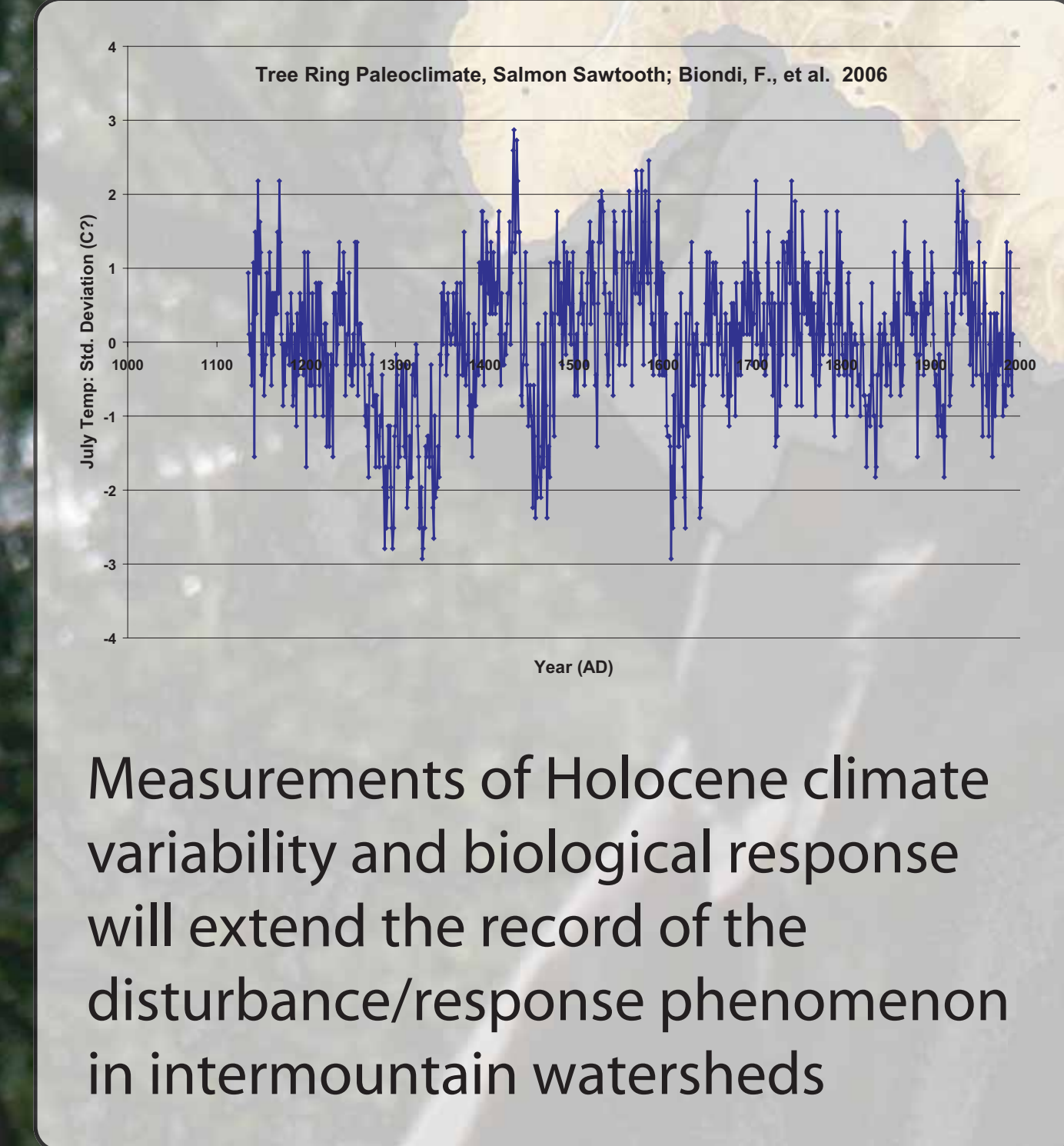
- is life detectably responsive to progressive change or only extreme events?



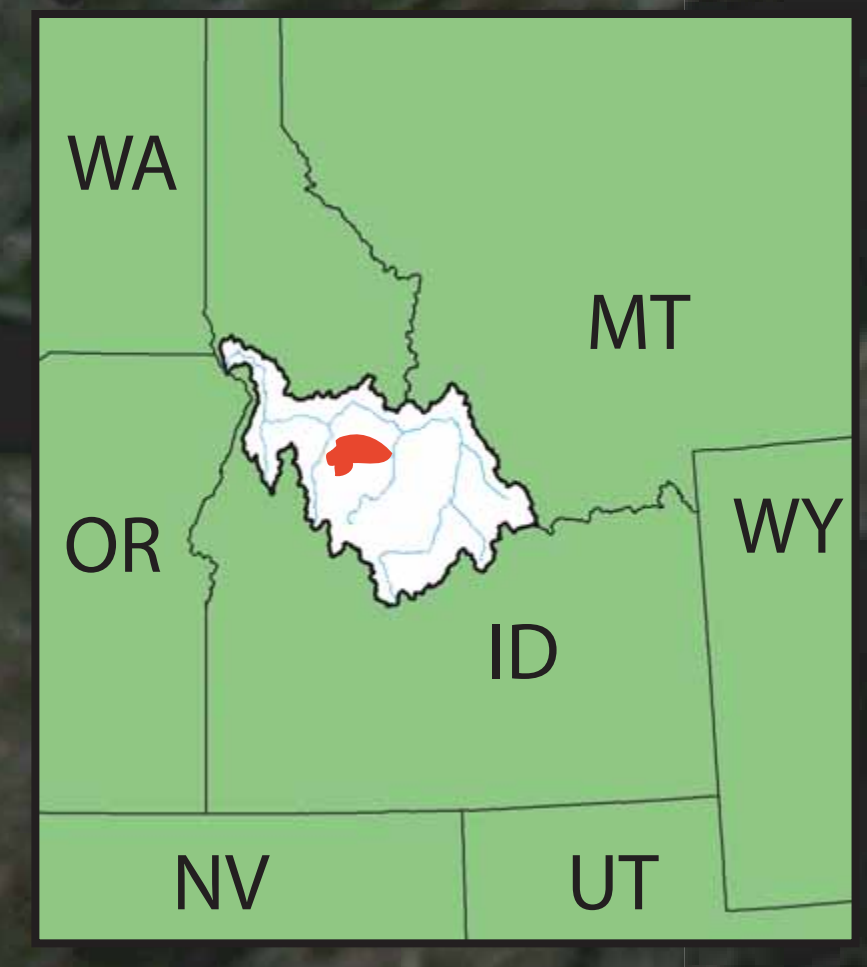
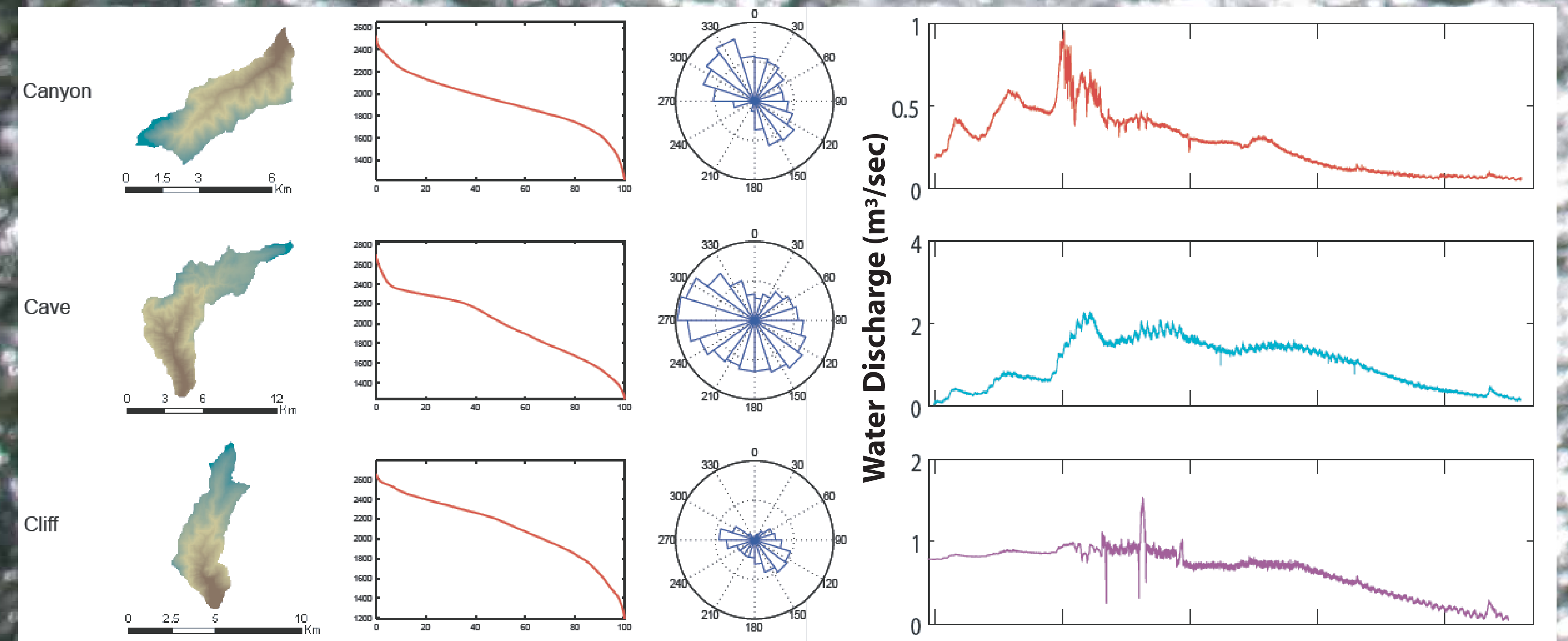
The past 30 years of climate data from the interior of central Idaho show an unequivocal warming trend. The consequences of this warming are recognized in hydrological records, manifest as both changes in the magnitude and timing of runoff events.



High resolution remote imagery provides rapid insight into the spatial variations in geomorphic and biological phenomena.



Measurements of Holocene climate variability and biological response will extend the record of the disturbance/response phenomenon in intermountain watersheds



Salmon River Watershed:

- Minshall Long-term Ecology Sites
- ▲ NOAA Water Sonde Sites
- USGS Active Inactive Gage Sites
- LiDAR Locations

10 km