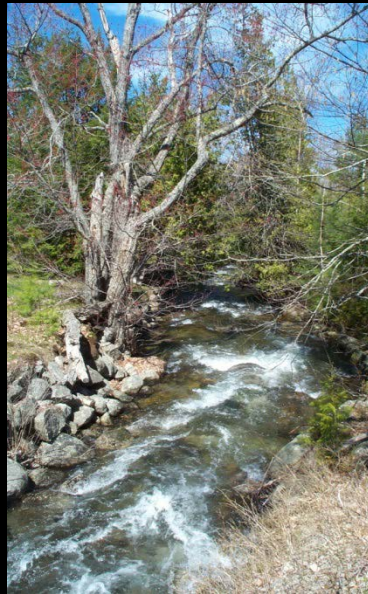


Water Temperature Monitoring and Modeling



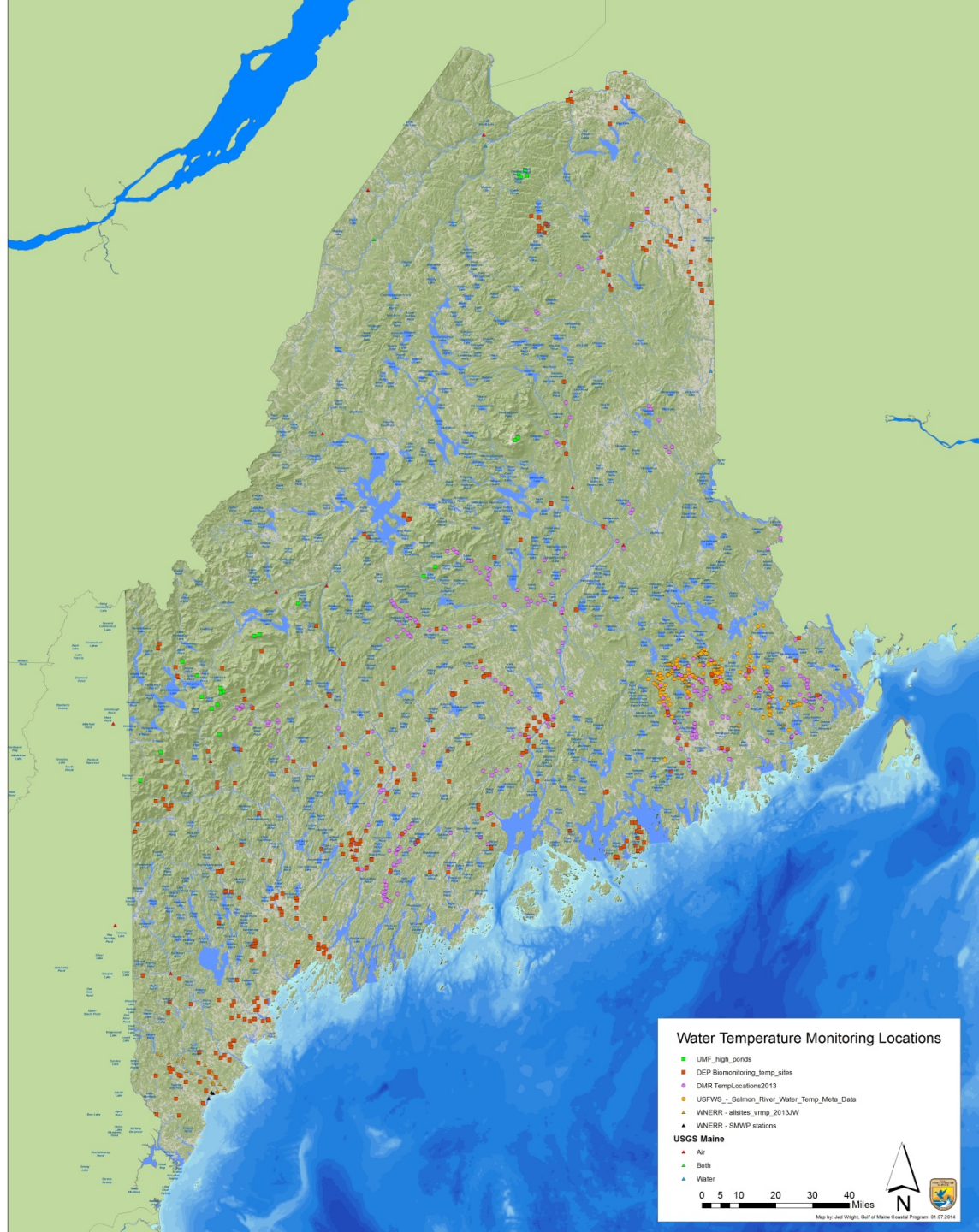
Fisheries Improvement Network

Jed Wright
Gulf of Maine Coastal Program
U.S. Fish and Wildlife Service
November 6, 2014

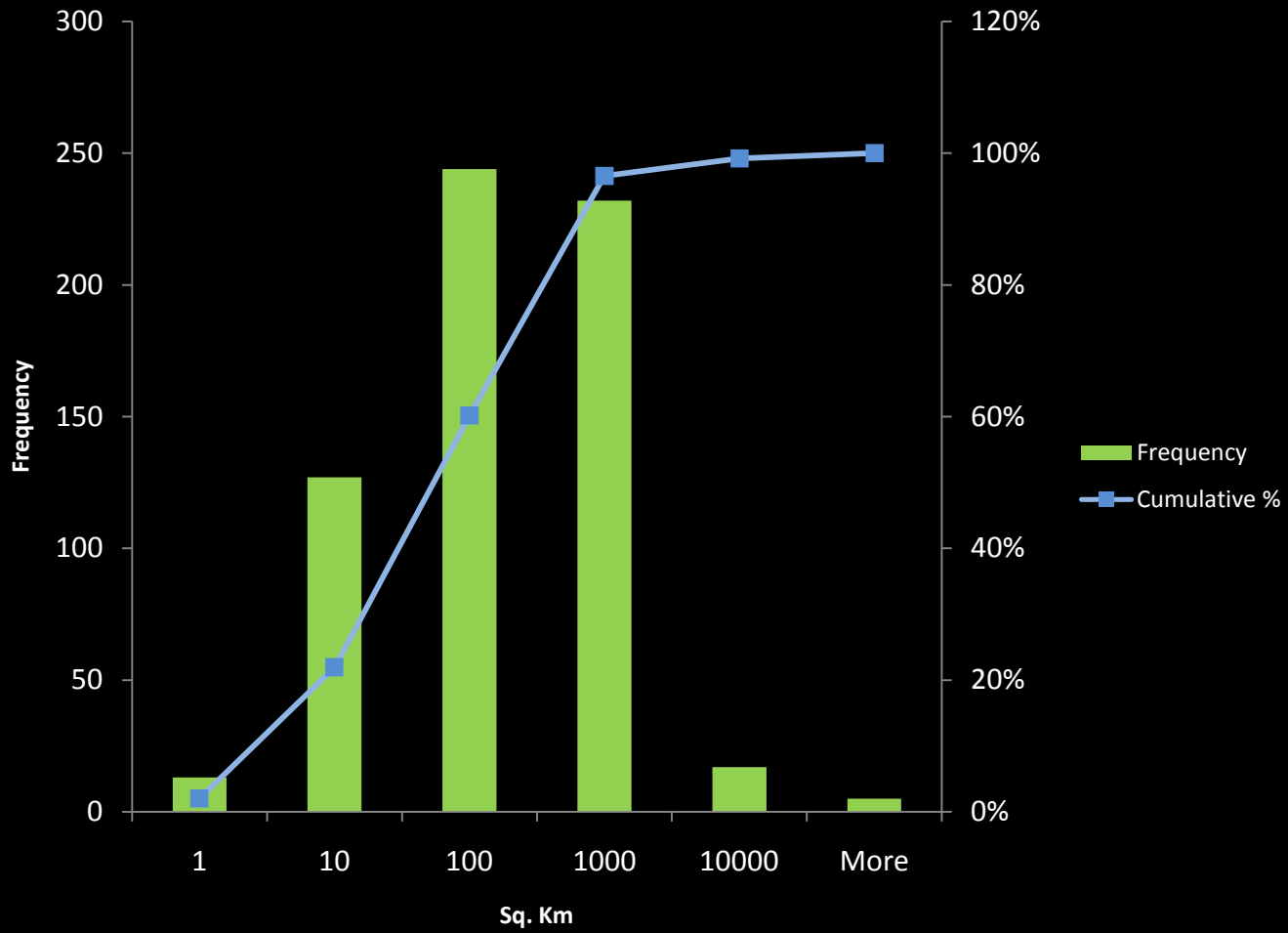


Objectives

- Develop stream temperature monitoring network
- Collect standardized year-round stream temperature data
- Provide easy storage, access and analysis of stream temperature datasets
- Identify areas that are more resilient to temperature increases

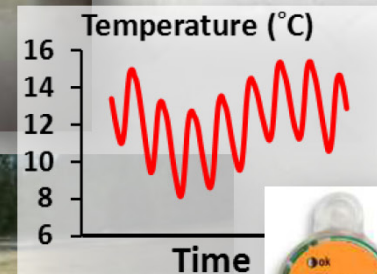
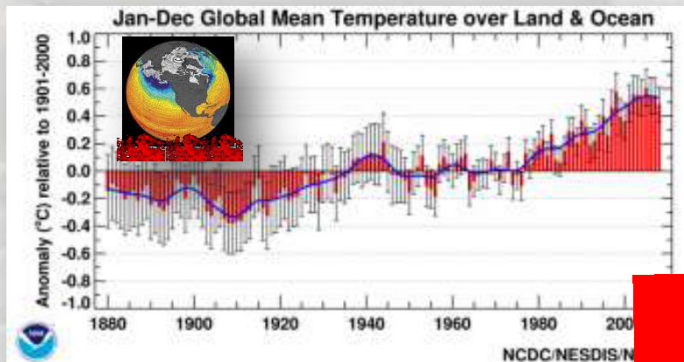
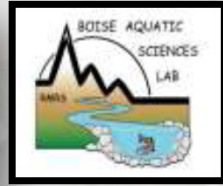


Monitoring Sites and Watershed Size



Monitoring & Modeling Stream Temperatures: Lessons Learned in the Rocky Mountains with Utility for Maine?

Dan Isaak, US Forest Service
Rocky Mountain Research Station



More Longterm, Annual Monitoring Needed

Inexpensive, reliable “epoxy protocol”

Annual Flooding

Concerns



Underwater epoxy cement



\$130 = 5 years of data

Data retrieved
from underwater

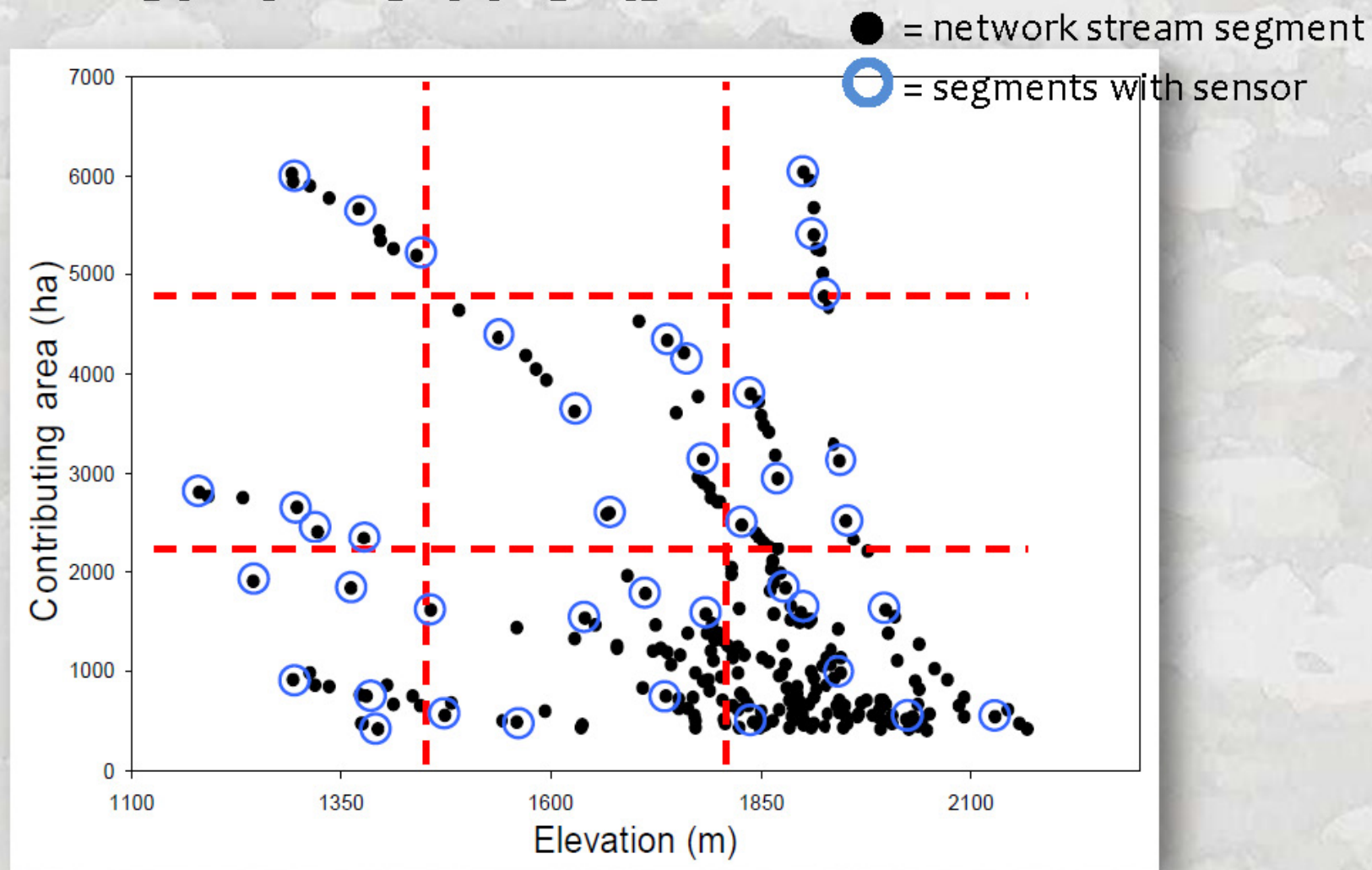


Sensors glued to large
boulders & bridges



Isaak et al. 2013. USFS Report;
Isaak & Horan 2011. **NAJFM** 31:134-137

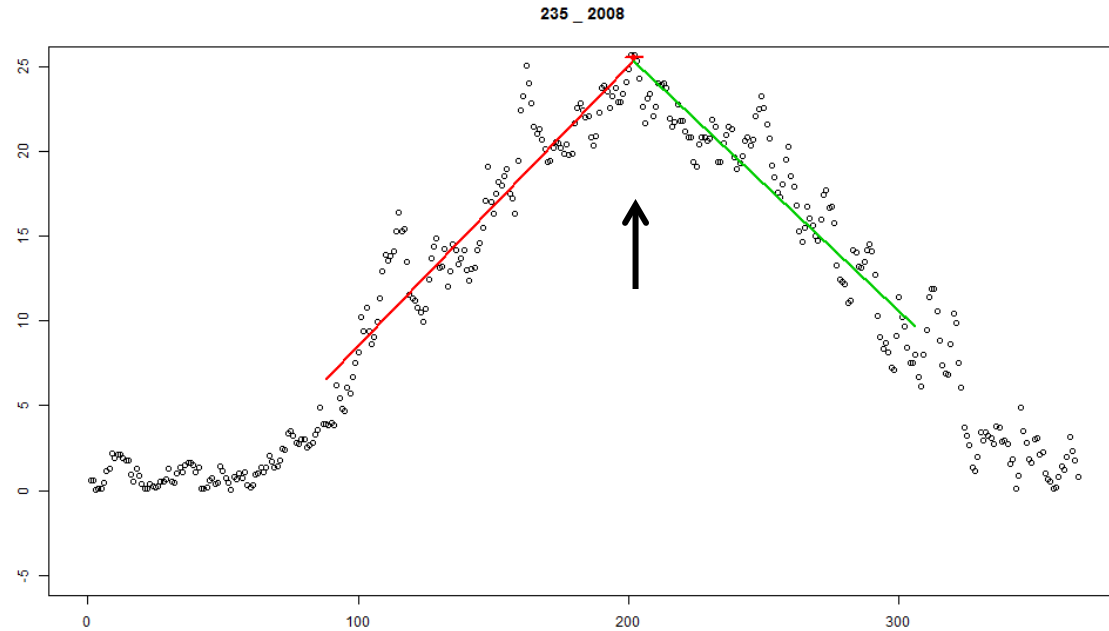
Sample Sites Representative of Full Network Gradients



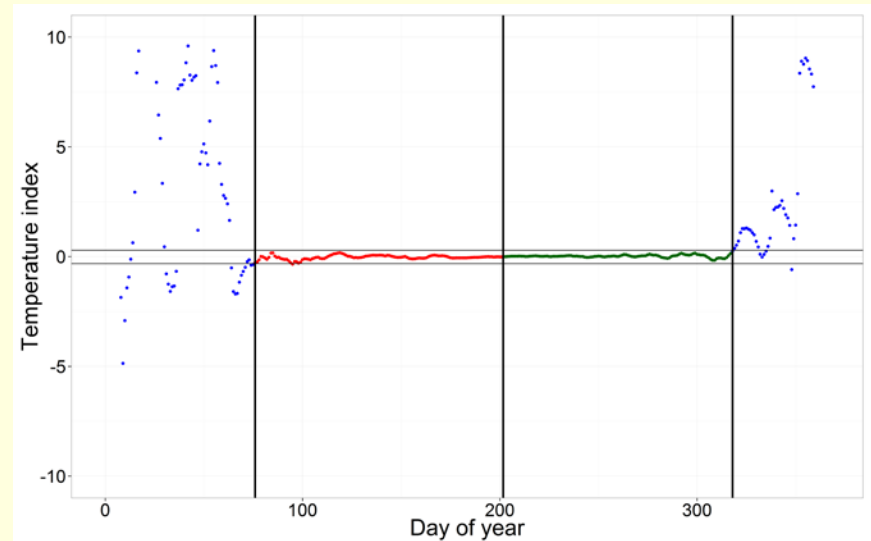
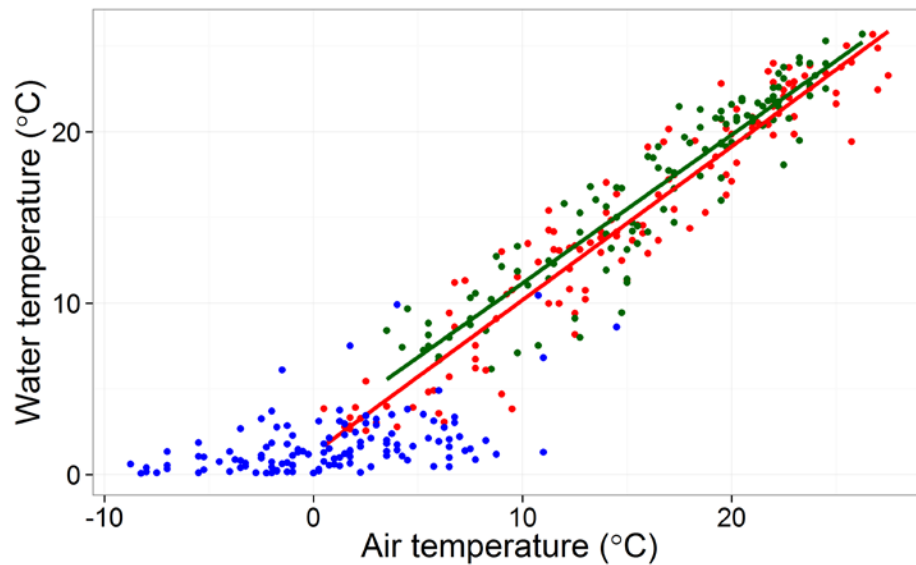
Plots easily developed from reach descriptors already linked to NHDPlus hydrography layer

When are
stream and air
temperature
synchronized?

Water temperature

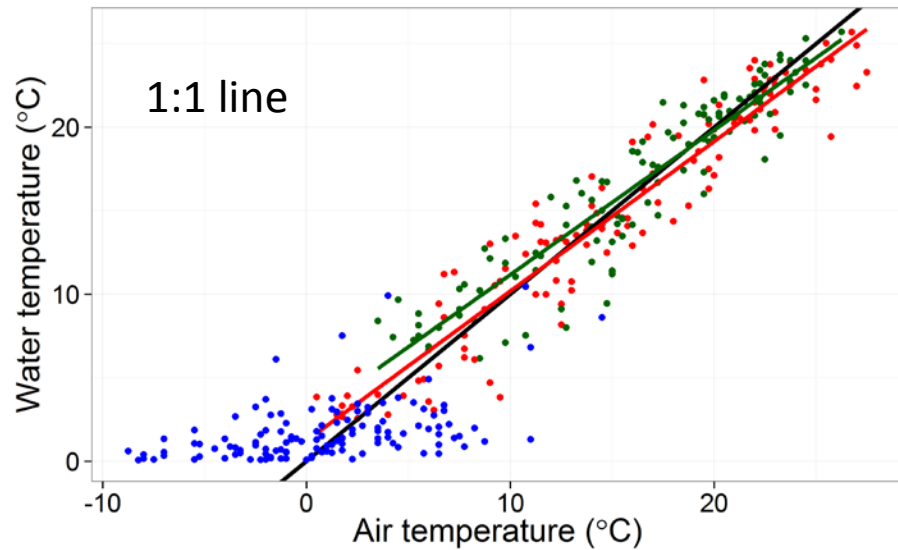


Day of year

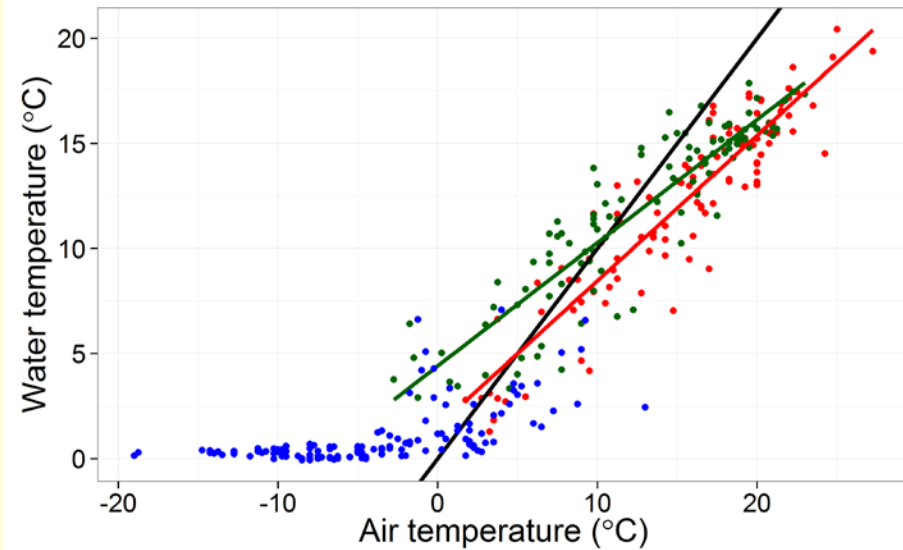


Metrics

Less resilient



More resilient



Slopes \sim resilience to air temperature change

NALCC/NECSC

[Basin Characteristics](#)[Stream Environment](#)[Fish](#)

Layer Control

Summer Max Temp

Opacity

100%

Previously Viewed ▾

- ☐ Show Flowlines
- ☐ Outline: Huc 4 Grey ▾
- ☒ Basemap: OpenStreetMaps ▾
- ☒ Legend

Legend

Summer Max Temperature



Latitude: 44.486397

Longitude: -66.101860

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- Conduct a comprehensive inventory of existing water temperature monitoring data.
- Identify a network of 'reference sites', intended to be maintained in "perpetuity".
- Develop minimum standards for data collection methods for a project to meet so that its water temperature observations can be usable in a regional network analysis.
- Develop databases and distribution network for Maine water temperature data.