Project Website

Temperature Patterns in Central New York Streams

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TROUT UNLIMITED MOHAWK VALLEY



Project Website: https://emilyabaker.weebly.com/stream-temperature-monitoring.html

Stream Temperatures & Trout

Stream temperatures control habitat suitability

Varies by life stage

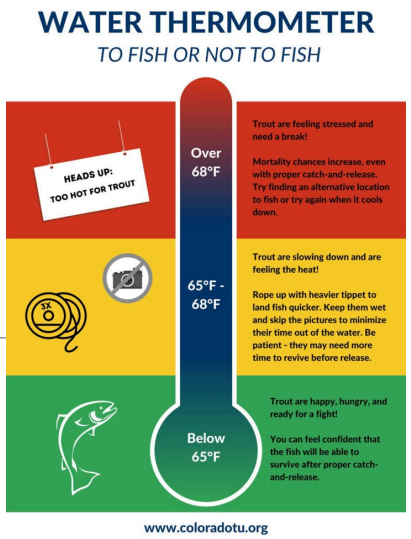
Native brook trout are slightly more temperature sensitive than brown trout (non-native)*

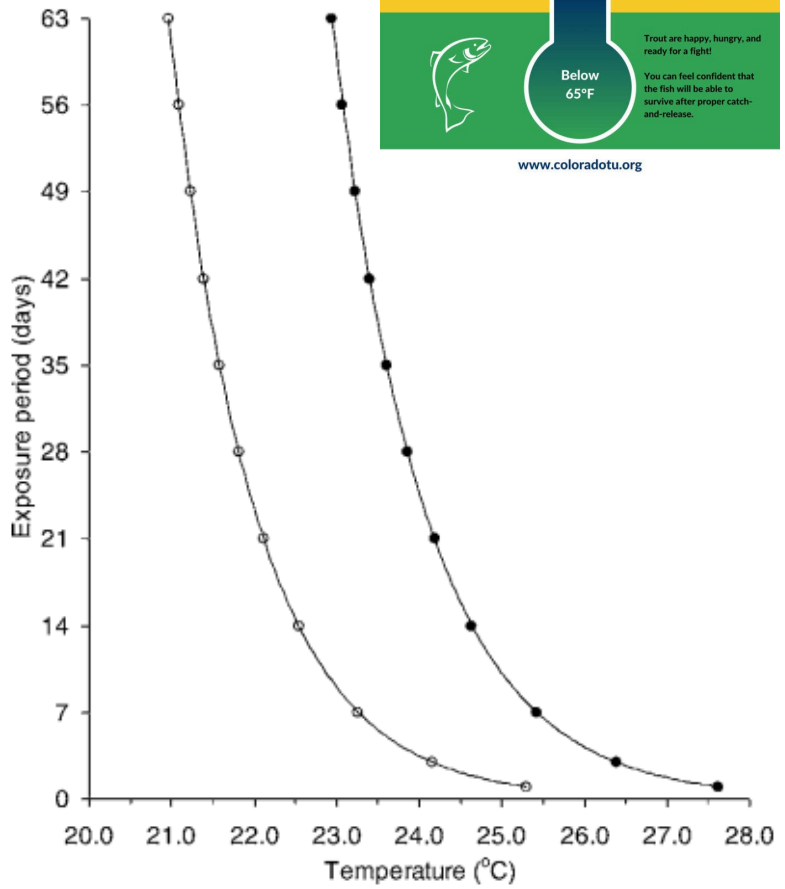
The optimal temperature range for brook trout (feeding and growth) is between about 12.8 – 18.3°C (55-65°F)

Trout begin to experience declines in growth rate above 16°C/60.8°F and acute heat stress above 20°C/68°F (Wehrly et al., 2007; Waraniak et al., 2025)

Field studies indicate brook trout are not present in waters above a 30-day maximum daily max temperature of ~24°C/75°F (Wehrly et al., 2007)

Trout will move to stretches of river, tributaries that have more suitable temperatures or congregate in cold-water patches (e.g. from groundwater)





(Wehrly et al., 2007)

Thermal Sensitivity & Streams

Slope (linear regression) between air temperature and water temperature

Higher values indicate a stronger coupling with the atmosphere, while lower values mean the stream resists changes in air temperature

Impacted by riparian shading/exposure, streamflow, urbanization (heated runoff), weather, groundwater contributions, dams (Kelleher et al., 2012)

Sites below dams often have very low thermal sensitivities relative to stream size (Kelleher et al., 2012)

Higher groundwater contributions result in lower thermal sensitivities, as groundwater is cooler during the summer than surface water, particularly in small streams (Kelleher et al., 2012)

Larger streams often have higher sensitivities due to heat accumulation along the stream (Kelleher et al., 2012)

Project Goals

Monitor water temperatures along streams

Assess temperatures for habitat suitability

Establish a baseline dataset

Test and troubleshoot setup

Develop long term monitoring network

Understand controls (groundwater, air temp)





Methods

Deployed temperature loggers from June through October, 2026

Recorded water temperature every 15 minutes

Issues with data loss

Stations were most untampered with







Monitoring Locations

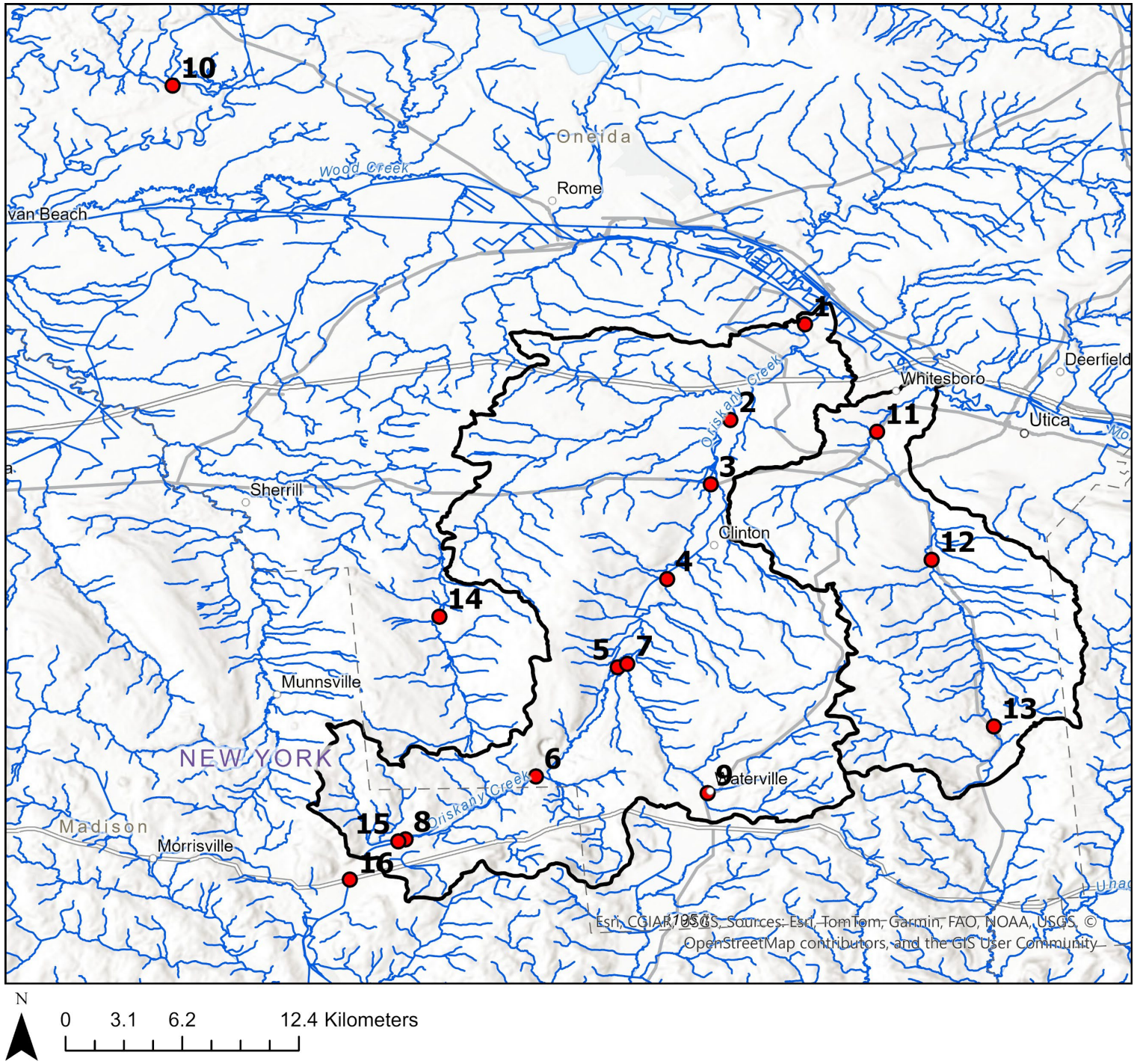
16 sites

Concentrated in Oriskany Creek (7) and Sauquoit Creek (3) watersheds, including Big Creek (2)

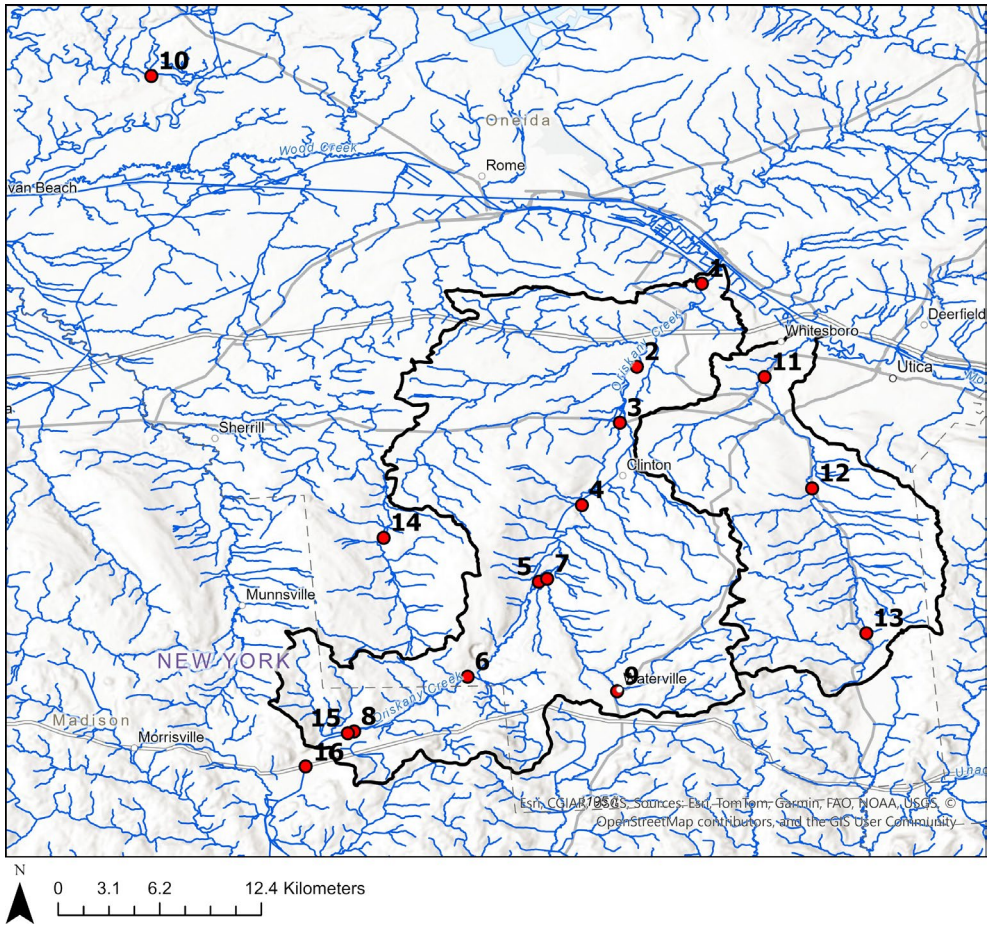
West Branch Fish Creek (1)

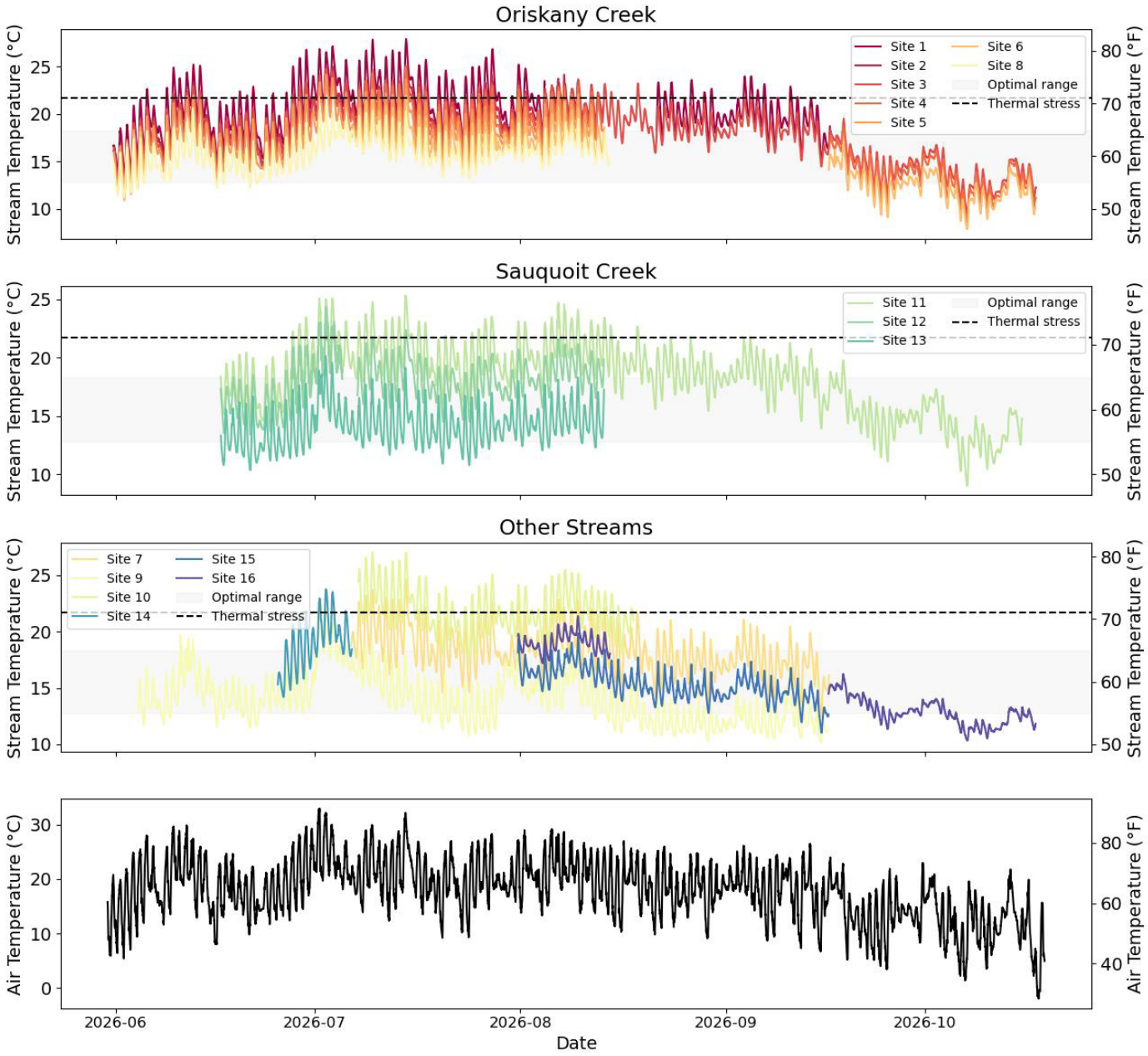
Sconondoa Creek (1)

Chenango Canal (2)

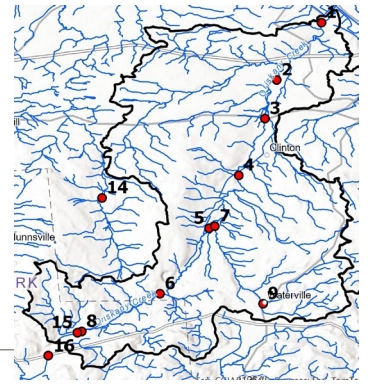


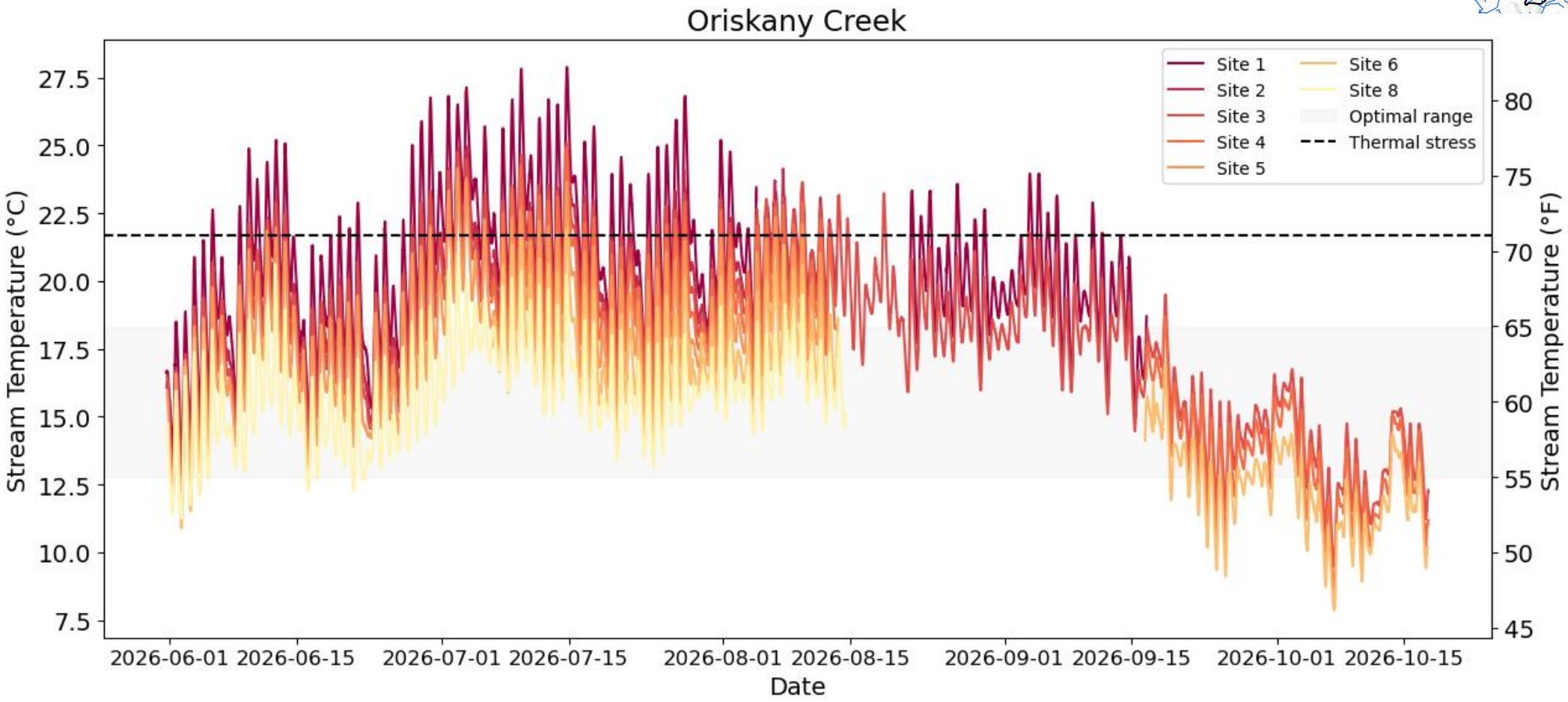
Data 2026


10
Oneida
Wood Creek
Rome
van Beach
Whitesboro
Deerfield
Utica
Sherrill
Clinton
Munnsville
NEW YORK
Madison
Morrisville
Waterville
1
2
3
4
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6
7
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11
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14
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16
Esri, CGIAR, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
N
0 3.1 6.2 12.4 Kilometers

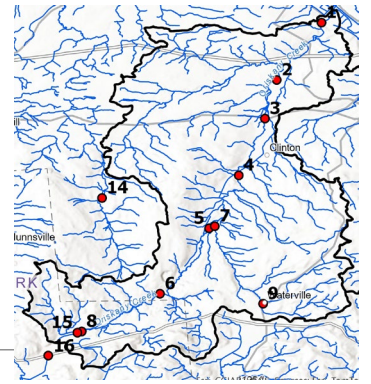

Oriskany Creek
Stream Temperature (°C)
Stream Temperature (°F)
Site 1
Site 2
Site 3
Site 4
Site 5
Site 6
Site 8
Optimal range
Thermal stress
Sauquoit Creek
Site 11
Site 12
Site 13
Optimal range
Thermal stress
Other Streams
Site 7
Site 9
Site 10
Site 14
Site 15
Site 16
Optimal range
Thermal stress
Air Temperature (°C)
Air Temperature (°F)
2026-06
2026-07
2026-08
2026-09
2026-10
Date

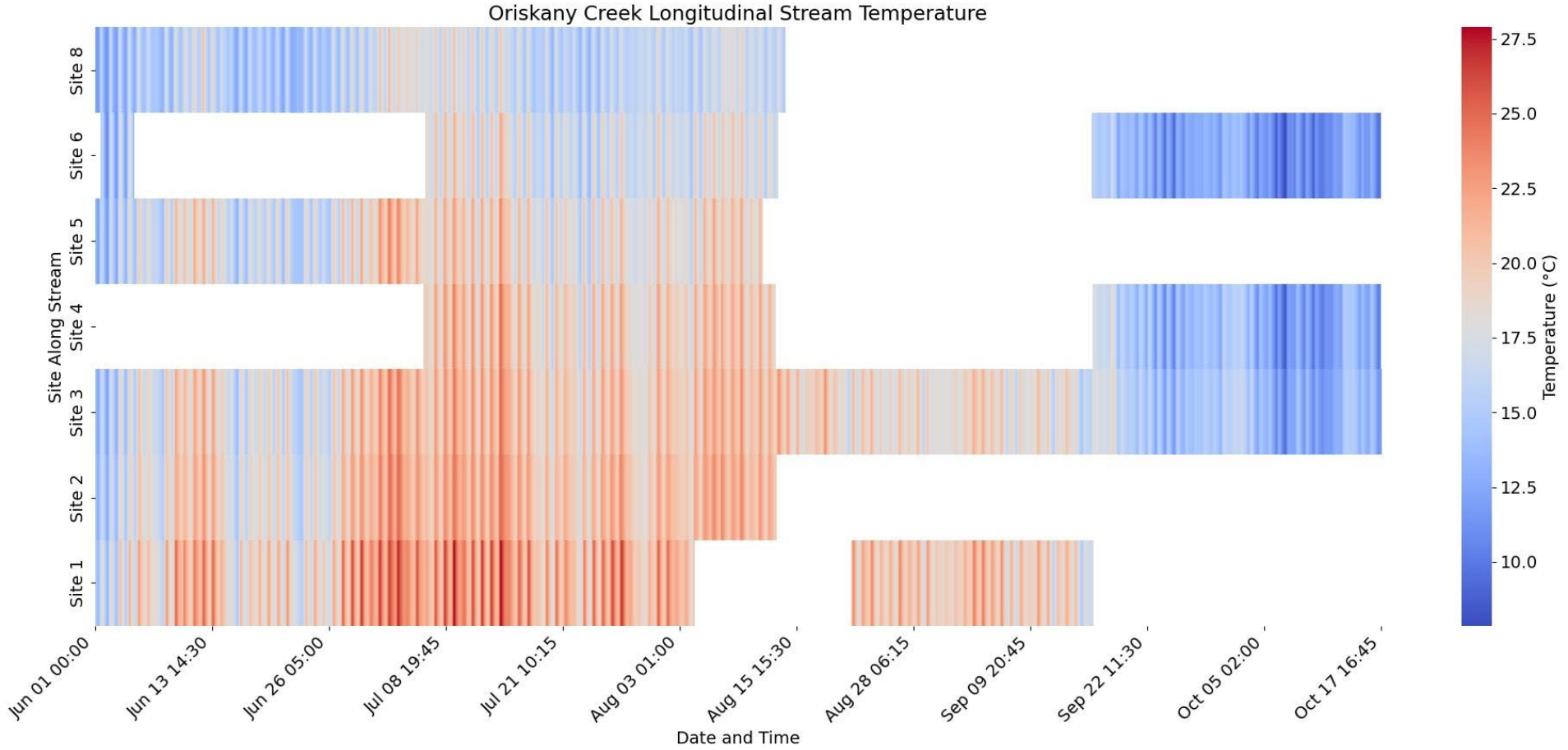
Oriskany Creek





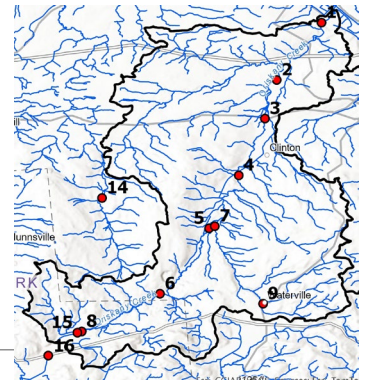
Oriskany Creek

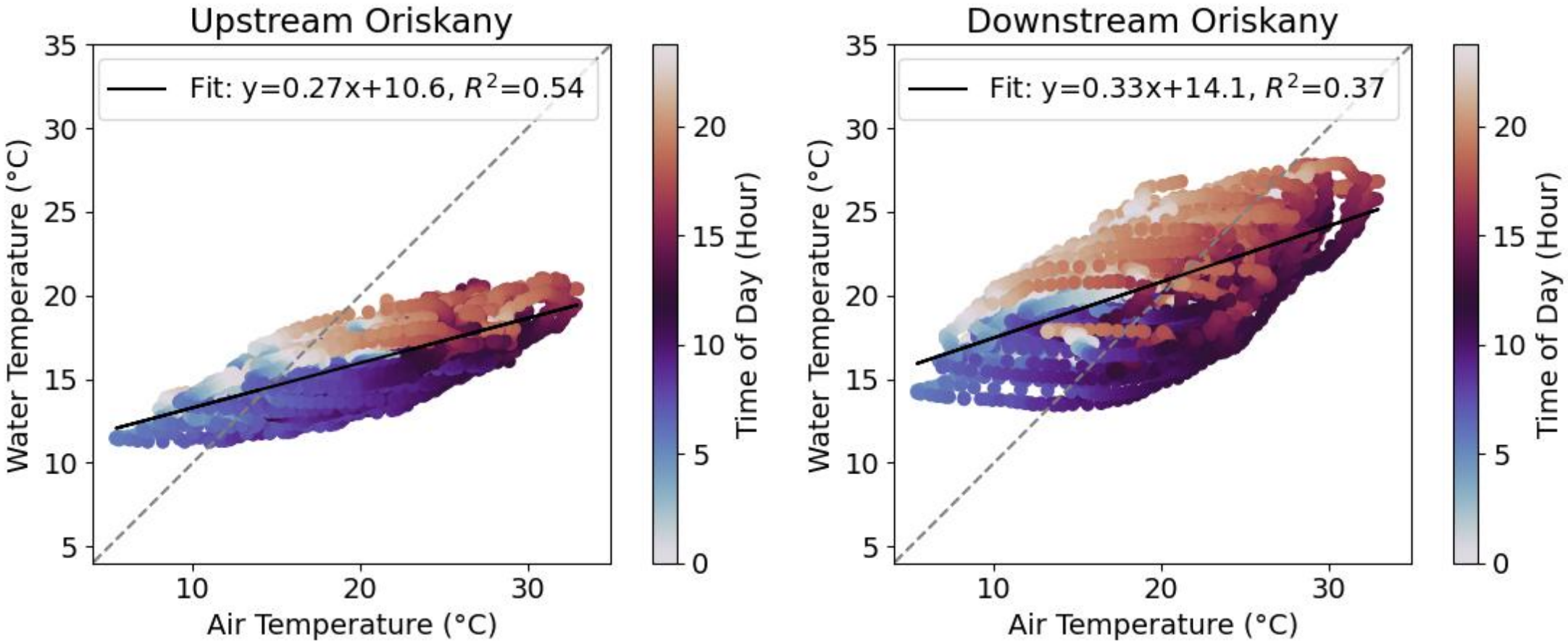




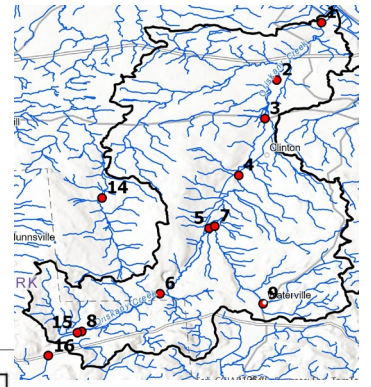
Oriskany Creek

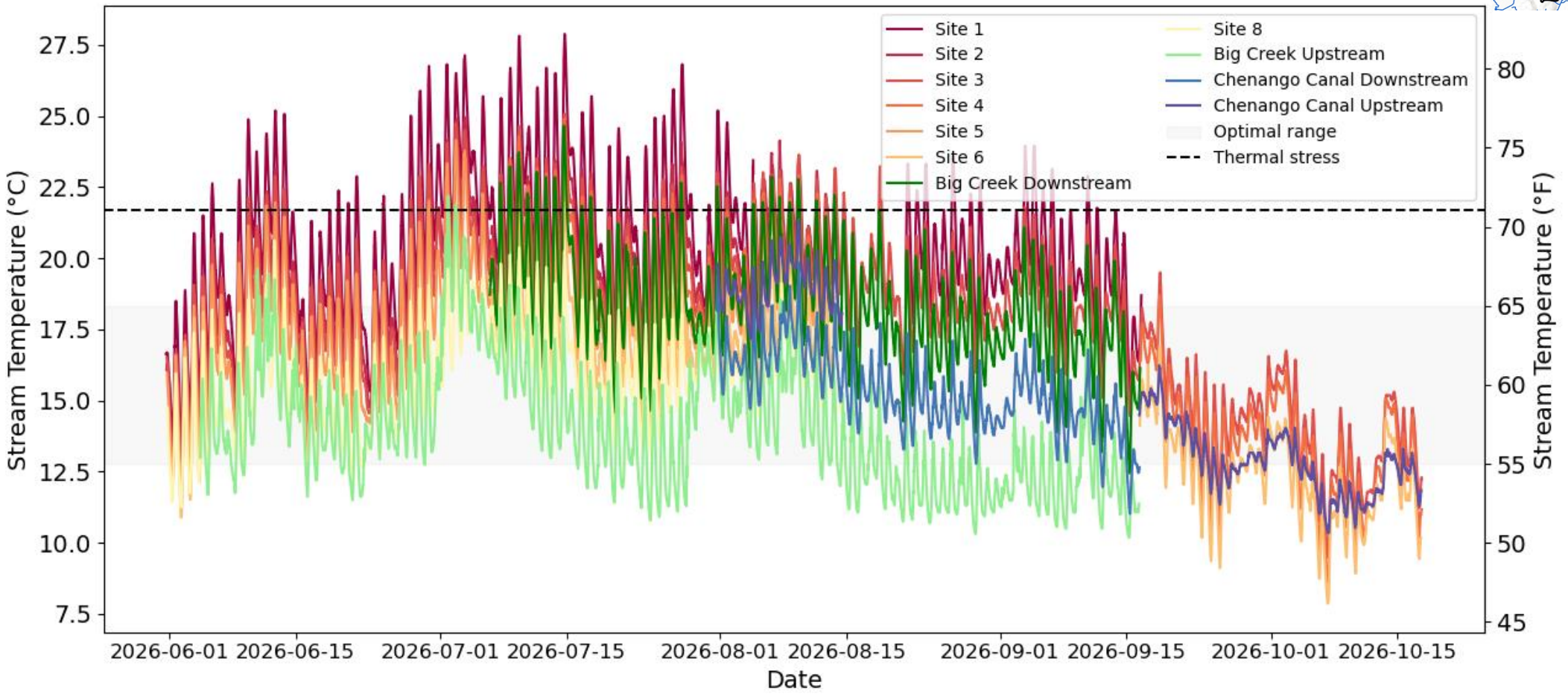
- The slope of the regression line represents the thermal sensitivity
- The coefficient of determination (r^2) tells you how strongly variations in air temp explain the fluctuations in water temp



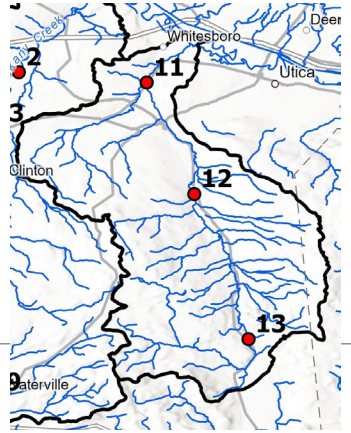


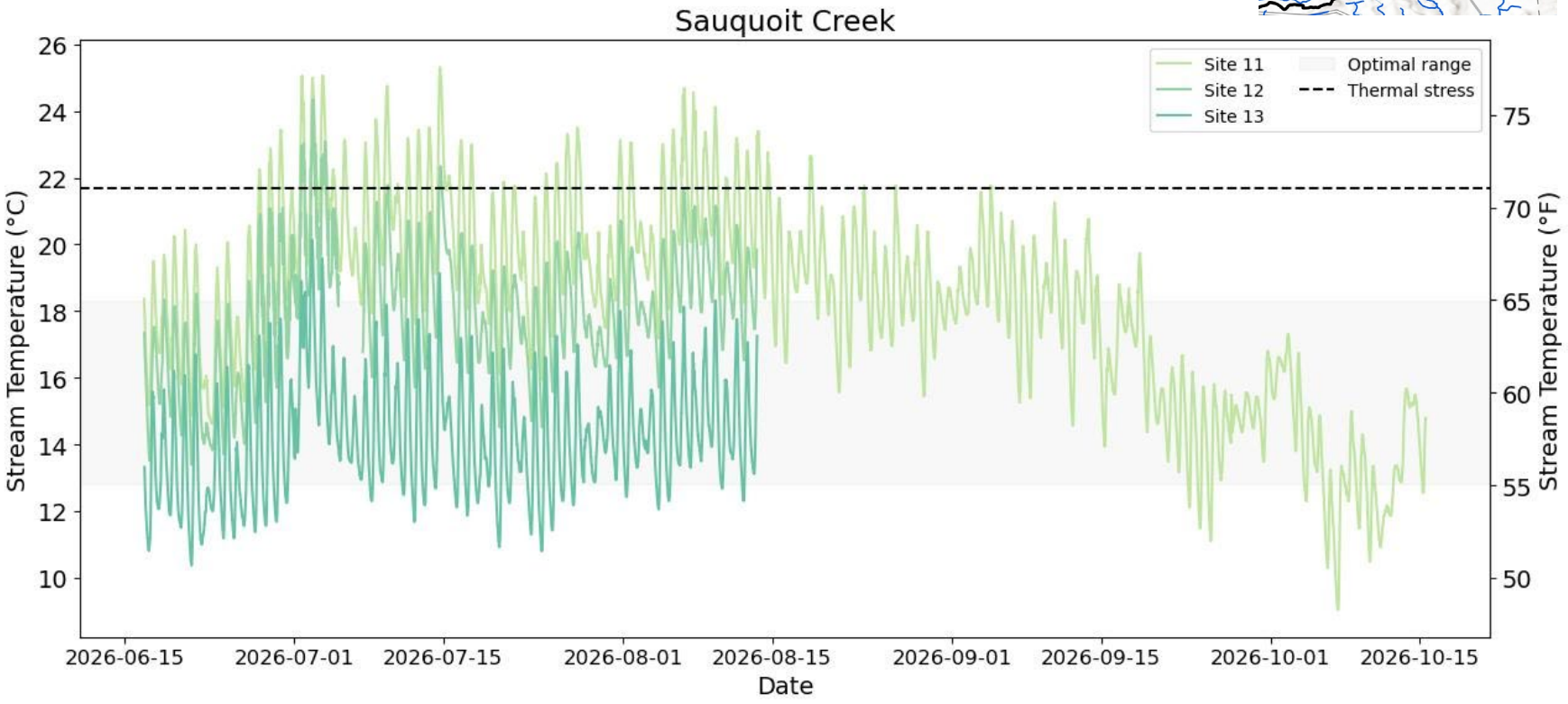
Chenango Canal & Big Creek

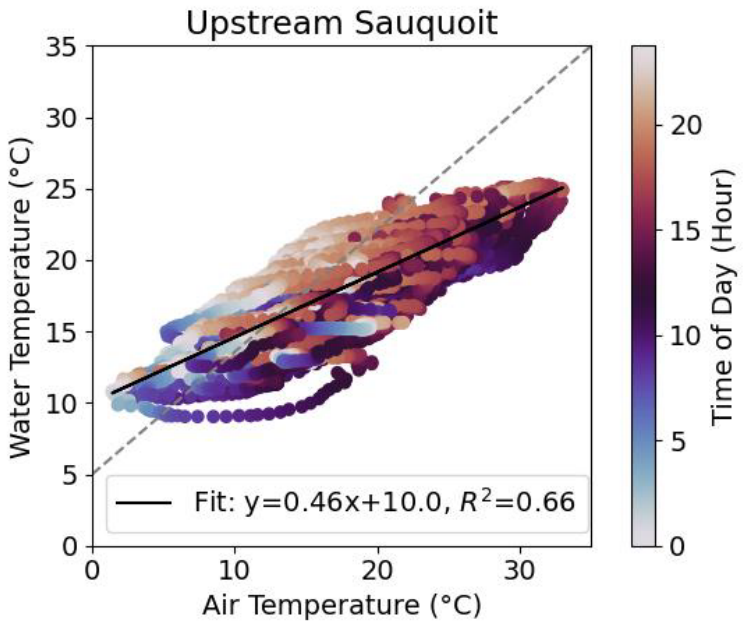


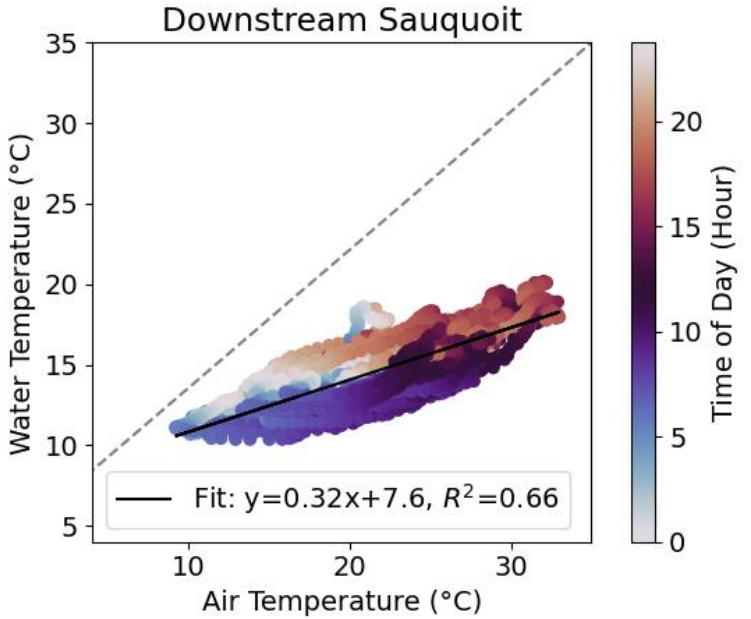


Sauquoit Creek



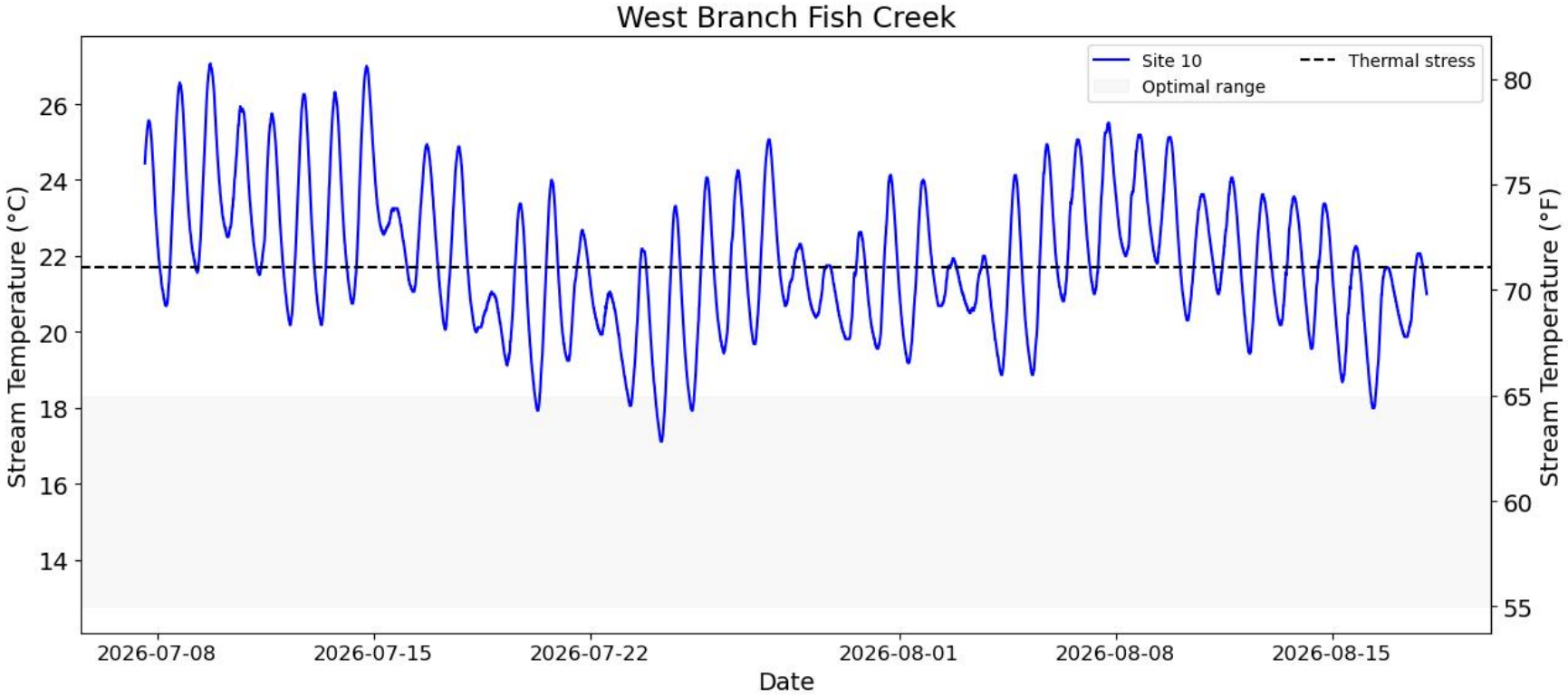


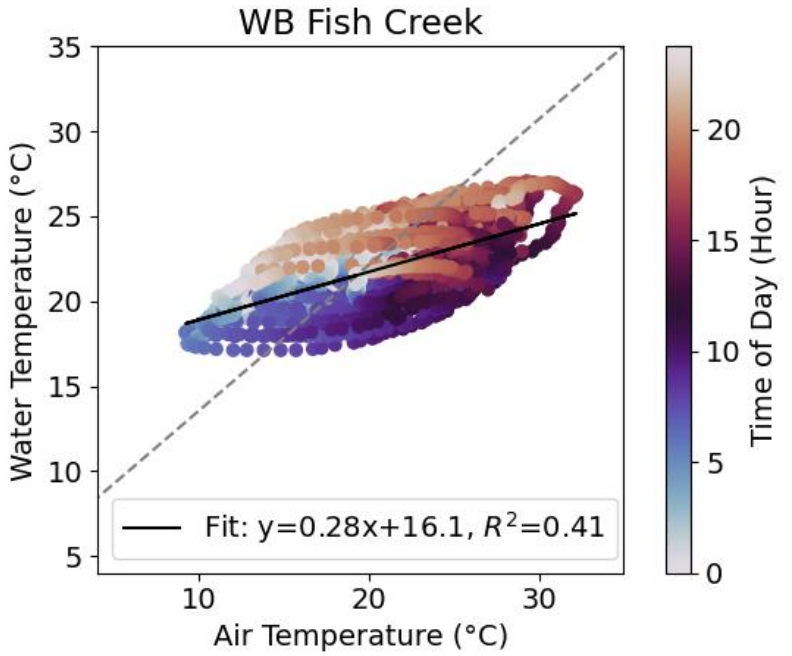




West Branch Fish Creek

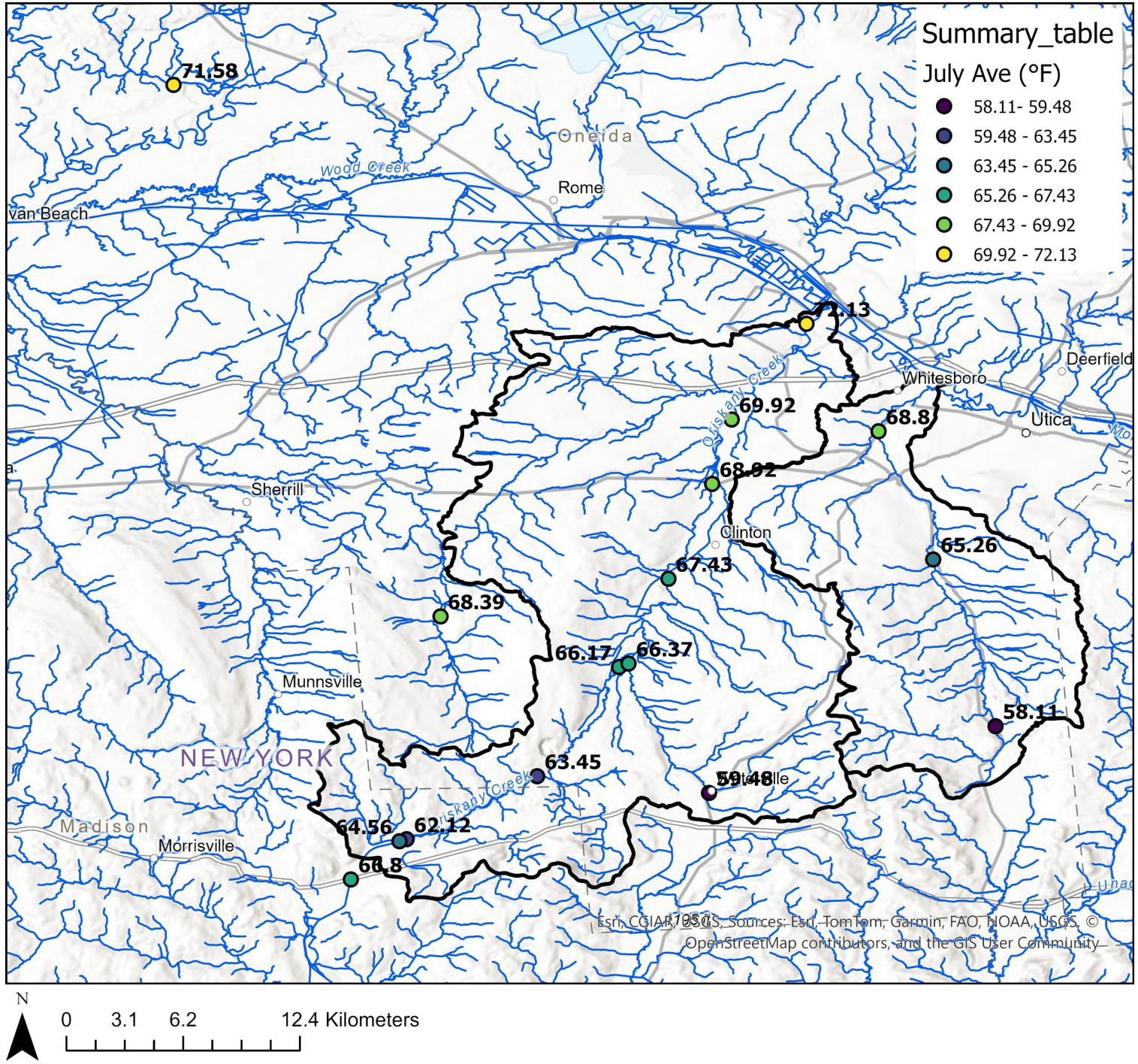






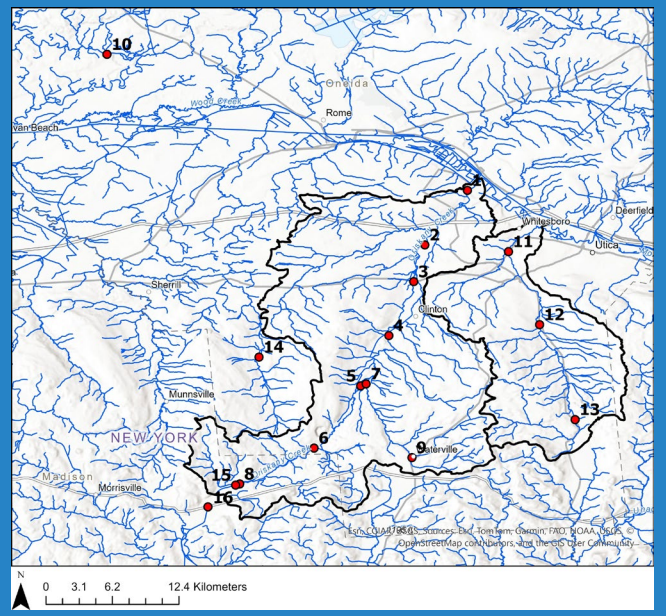
July Average Temperatures

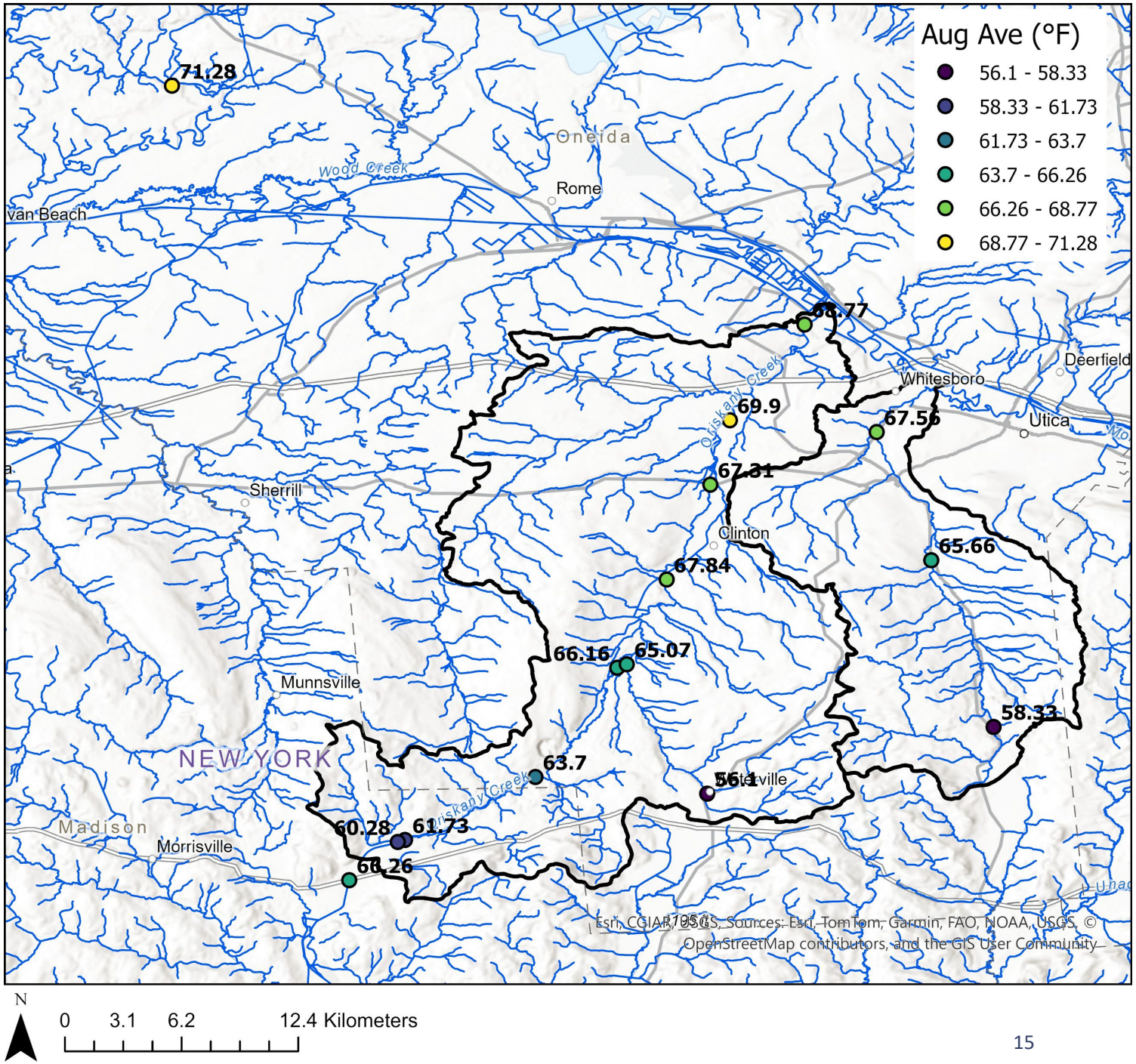
* The Sconondoa Creek and Chenango Canal sites lack sufficient data



August Average Temperatures

* Sites 3, 7, 9, 11, and 15 have complete datasets



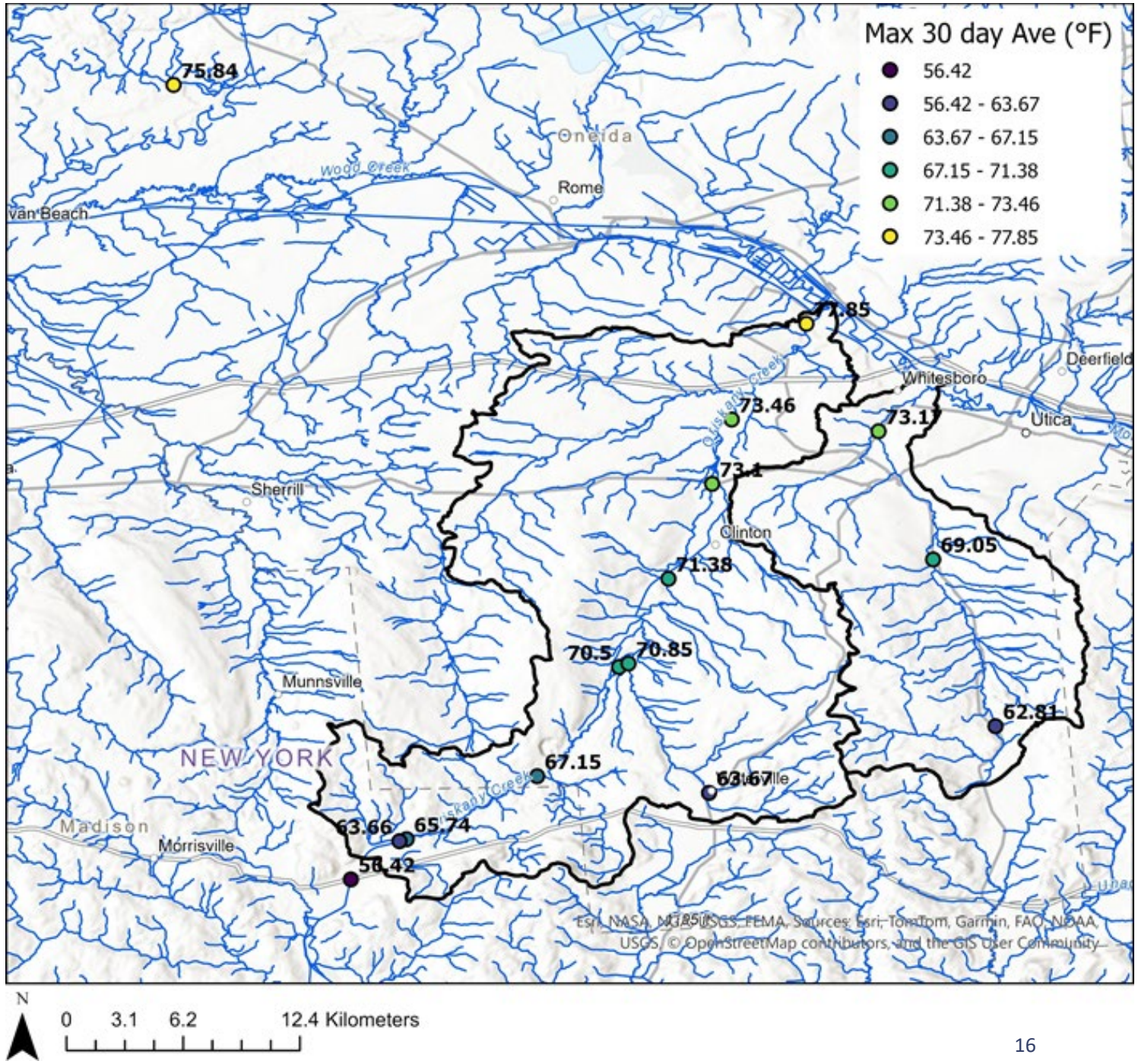


Maximum 30 Day Average

The maximum of the 30 day rolling average of maximum daily temperatures

Increased thermal stress onset when > 71°F

Field studies indicate brook trout are not present in waters above a 30-day maximum daily max temperature of ~24°C/75°F (Wehrly et al., 2007)



Future Work – We want your input!

Project Website

Invest in better temperature sensors

Collect more complete dataset

Year round sites to assess impacts of dams, etc.

Other streams?

Reaches of particular interest/concern?

Thermal infrared or fiber optic cables



Thank you to Stu Miller for all your help & support! Thanks to Emily Gutierrez and Amelia Hahn for field support and Paul Miller for site access on WB Fish Creek.

Project Website: https://emilyabaker.weebly.com/stream-temperature-monitoring.html