

The effect of abnormal heat events on the availability of cold water refugia to juvenile Coho Salmon (*Oncorhynchus kisutch*) on the Central Oregon Coast.

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Introduction

- Juvenile Coho Salmon (*Oncorhynchus Kisutch*) experience inhibited growth at water temperatures above 17°C, and experience die off at 22°C (Richter and Kolmes 2005).
- Historically relied on deep pools in connected tributaries to shelter during warmer days.
- Fish passage barriers, streambed simplification, and climate change reduce accessibility to Juvenile Coho.
- Over the Summer of 2021, the Central coast of Oregon experienced a prolonged period of higher-than-average temperatures (Figure 1 and 2).

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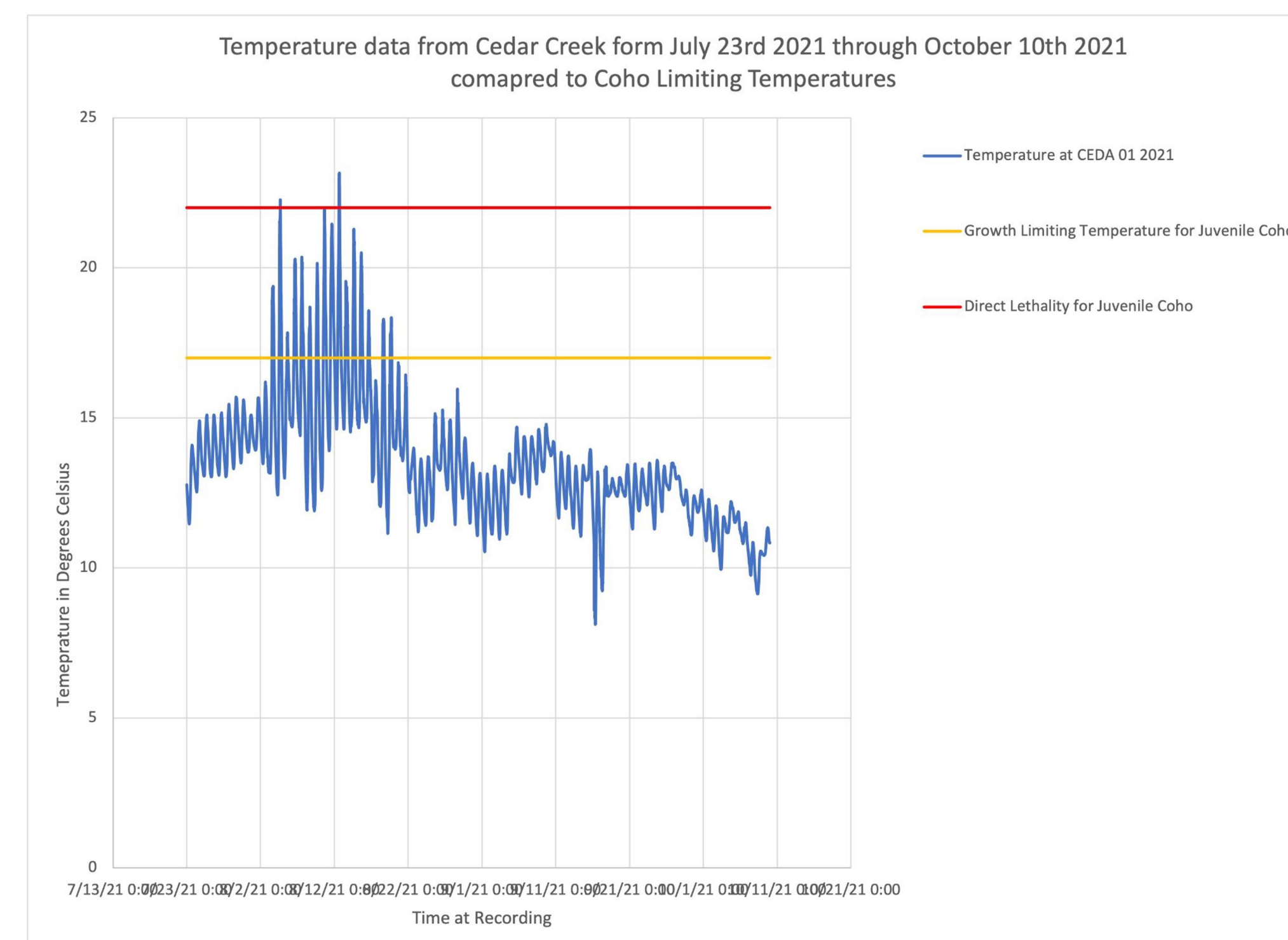


Figure 2. Graph of Temperatures at Cedar Creek over Summer of 2021

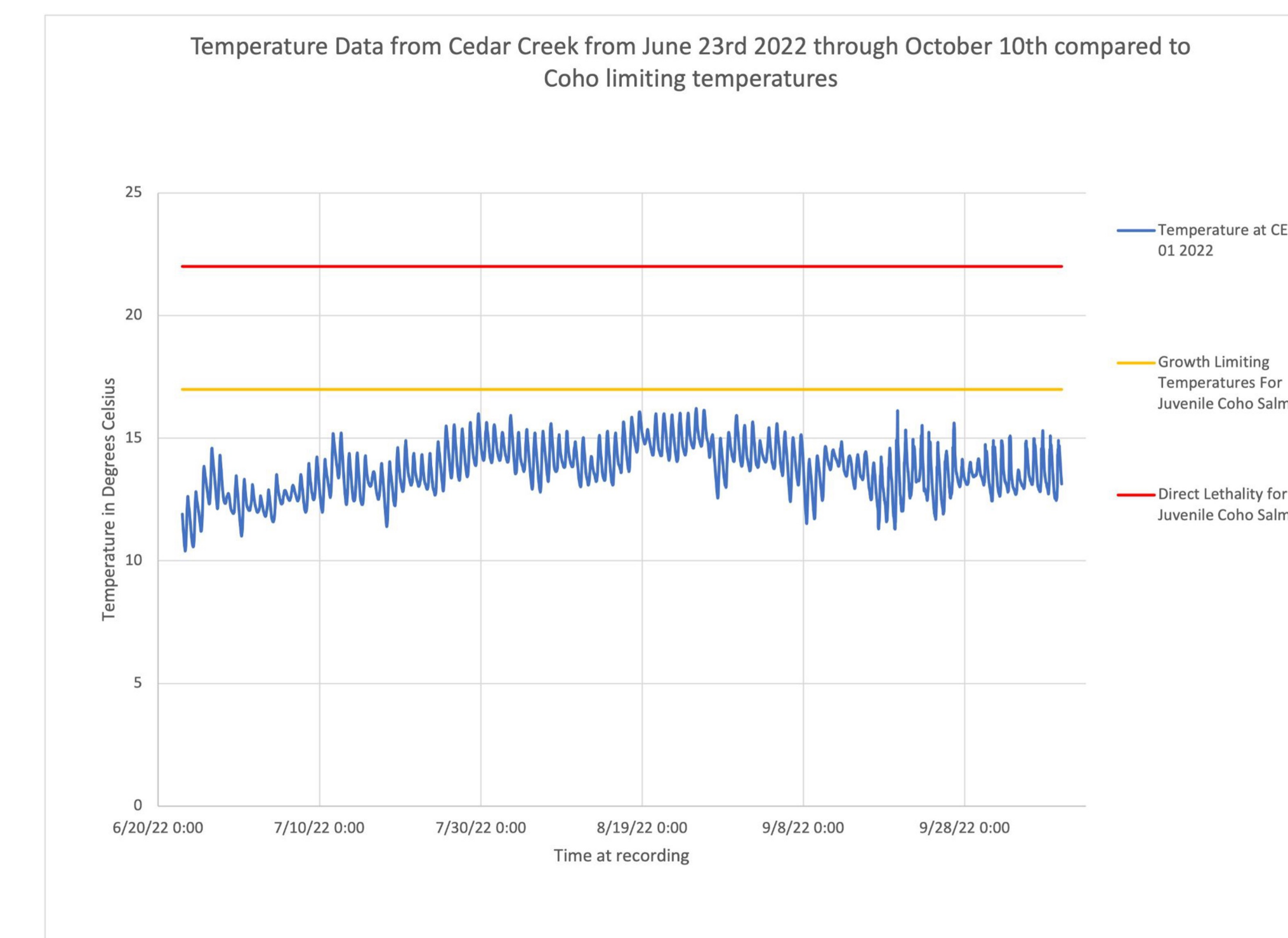


Figure 3. Graph of Temperatures at Cedar Creek over Summer of 2022

Acknowledgments

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References

Basemap: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed April, 2023.

Data from MidCoast Watersheds Council and Bureau of Land Management Temperature Monitoring Program Alsea, Oregon.

Richter A, Kolmes SA. 2005. Maximum temperature limits for Chinook, coho, and chum salmon, and Steelhead trout in the pacific northwest. Rev Fish Sci. 13(1):23–49. doi:10.1080/10641260590885861. http://dx.doi.org/10.1080/10641260590885861.

Discussion

- Comparison between number of sites with growth inhibiting temperatures in 2021 versus 2022 indicates large decrease in available cold water refugia during abnormal heat event (Figure 1 and 4).
- Reductions in cold water refugia during heat wave could result in lower productivity in the 2021 Oregon Coast Coho Salmon year class (Figure 2 and 3).
- Temperature Monitoring highlights areas of cold water refugia where restoration of Coho Salmon habitat could mitigate impacts of heat waves.
- Future monitoring of temperature and landings data could provide information on impacts of heat wave on populations.

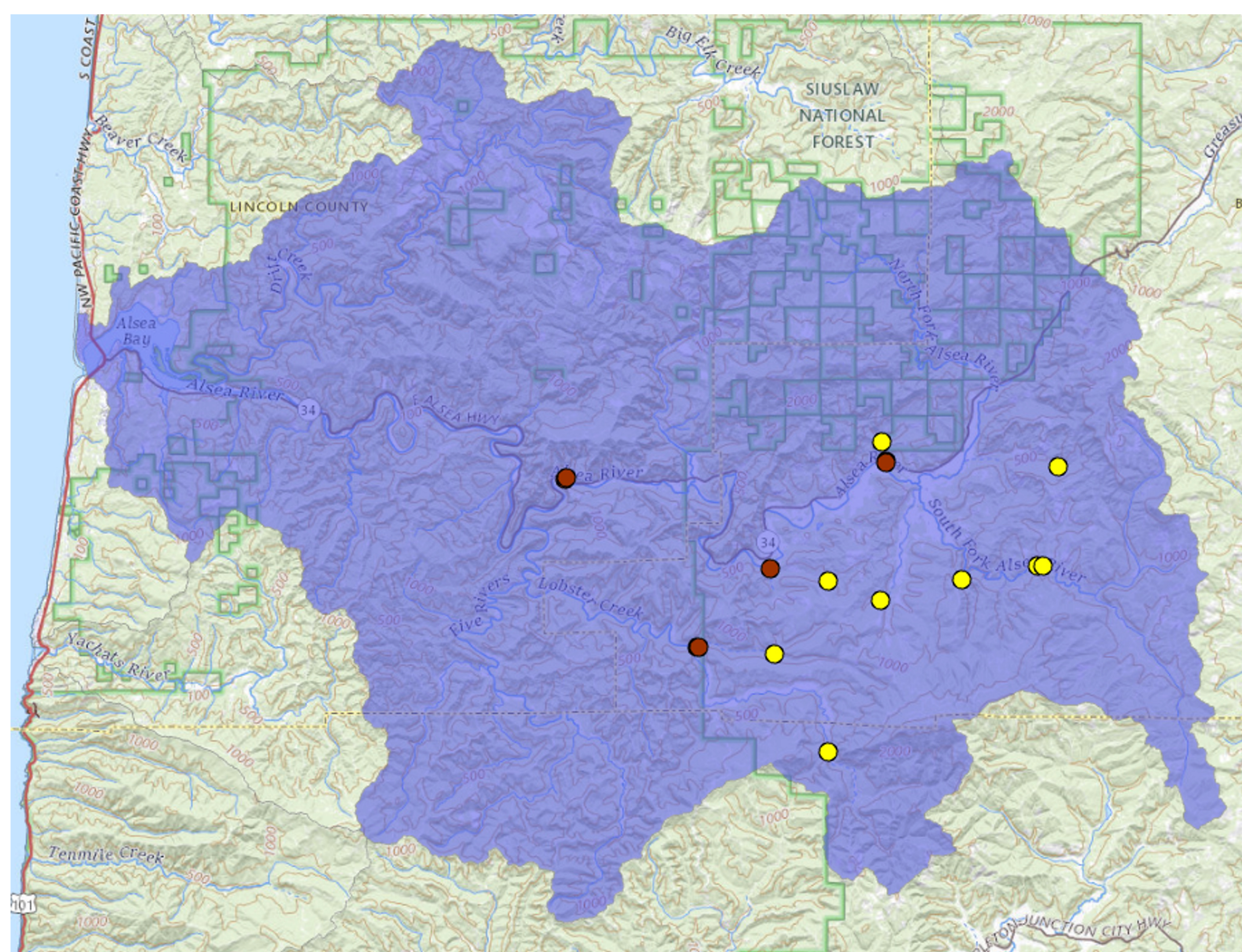


Figure 1. Alsea Basin Temperature monitoring sites during the 2021 season.

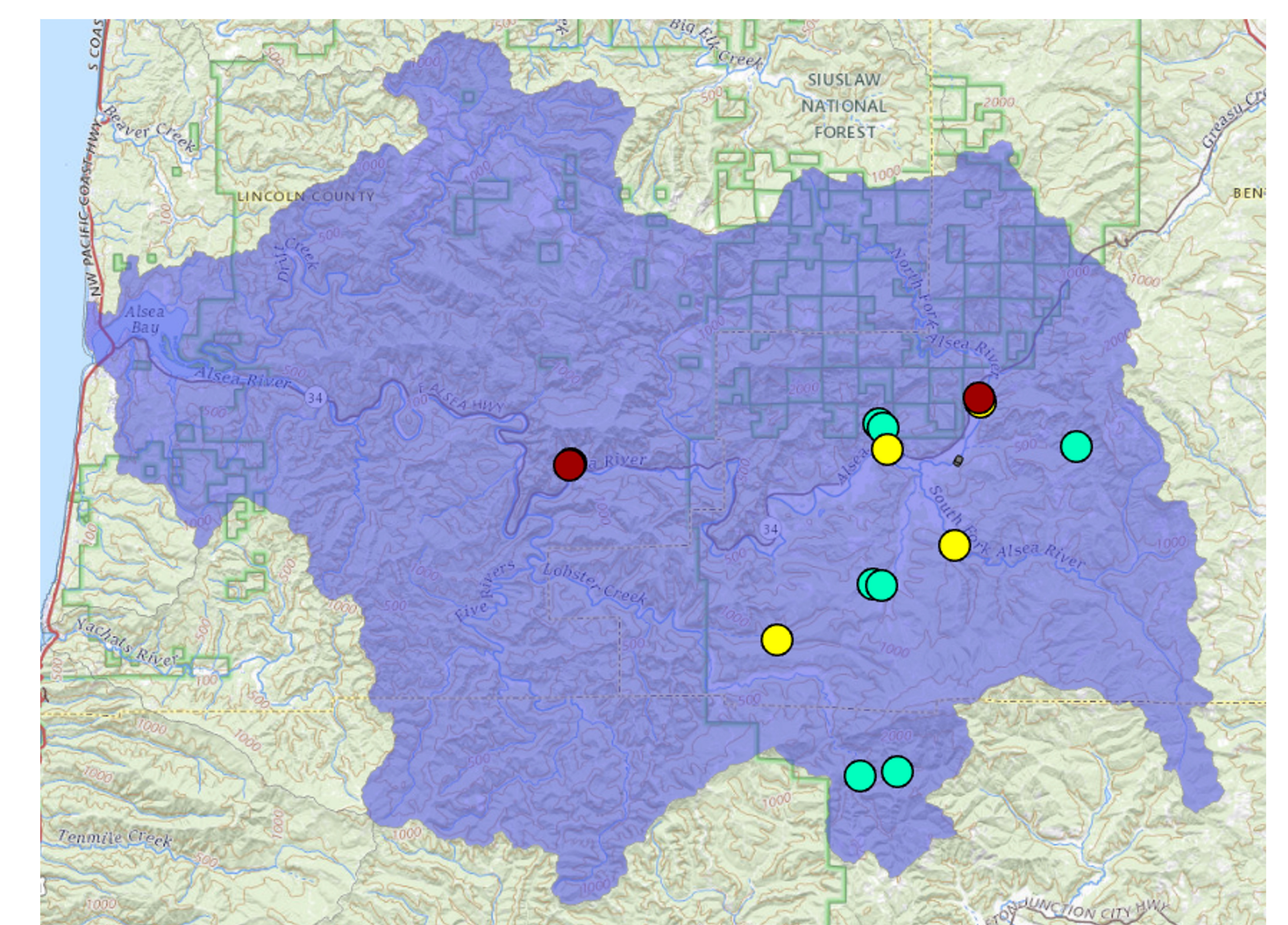


Figure 4. Alsea Basin Temperature monitoring sites during the 2022 season.