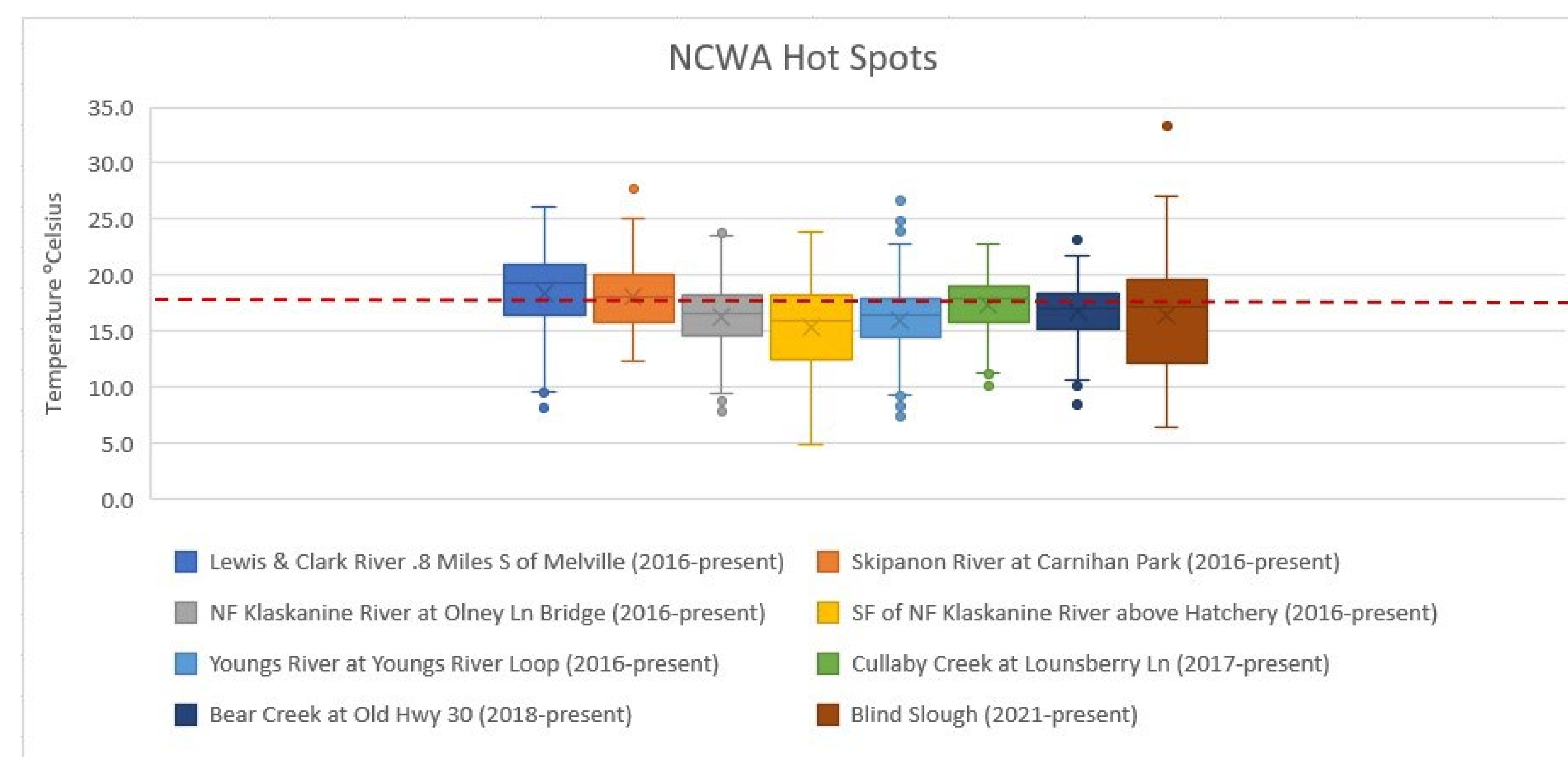
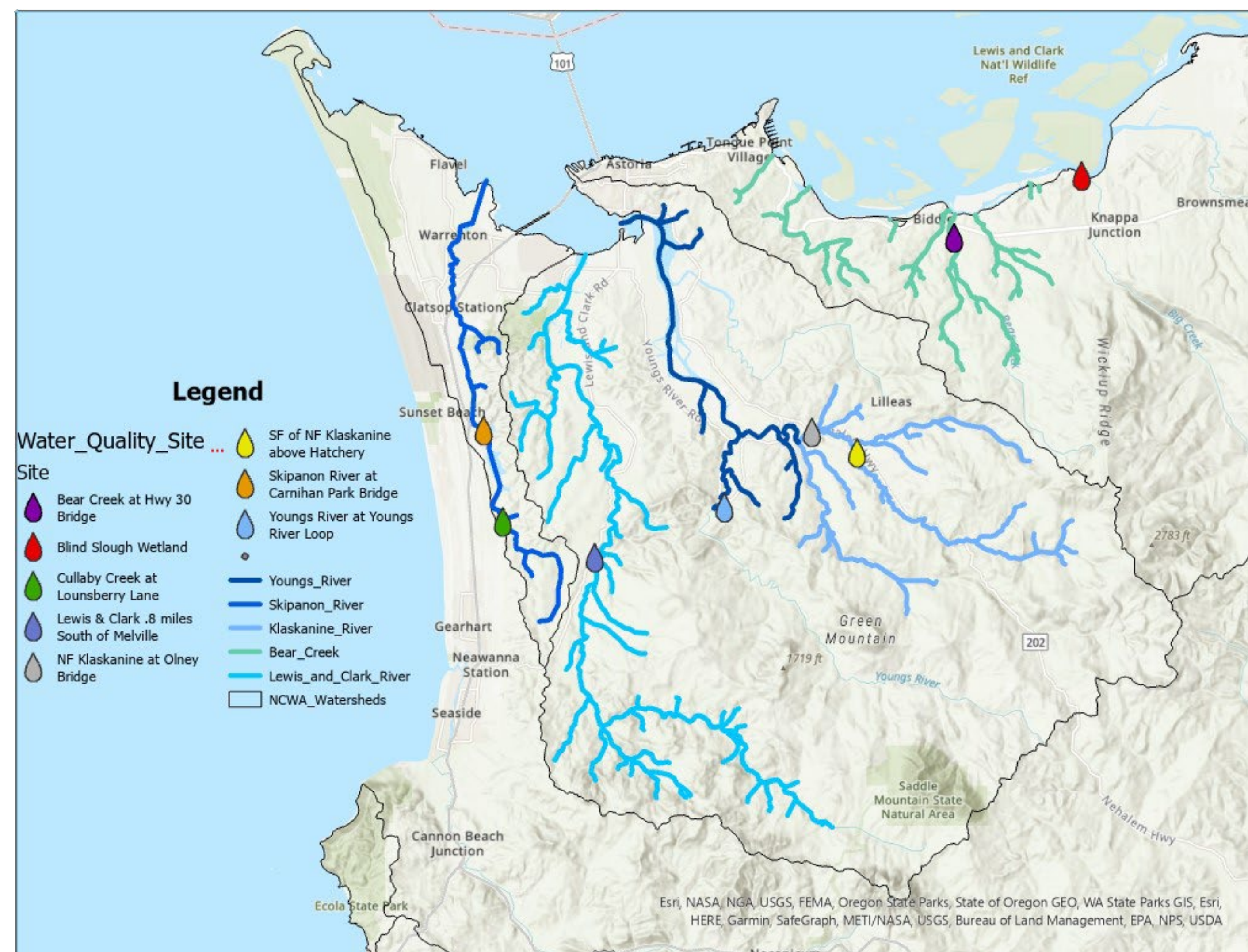


Water Quality Monitoring In Tributaries of the Lower Columbia River Estuary



Kelli Daffron¹, Chris Farrar¹, York Johnson², Graham Klag¹

1. North Coast Watershed Association 2. Oregon Department of Environmental Quality

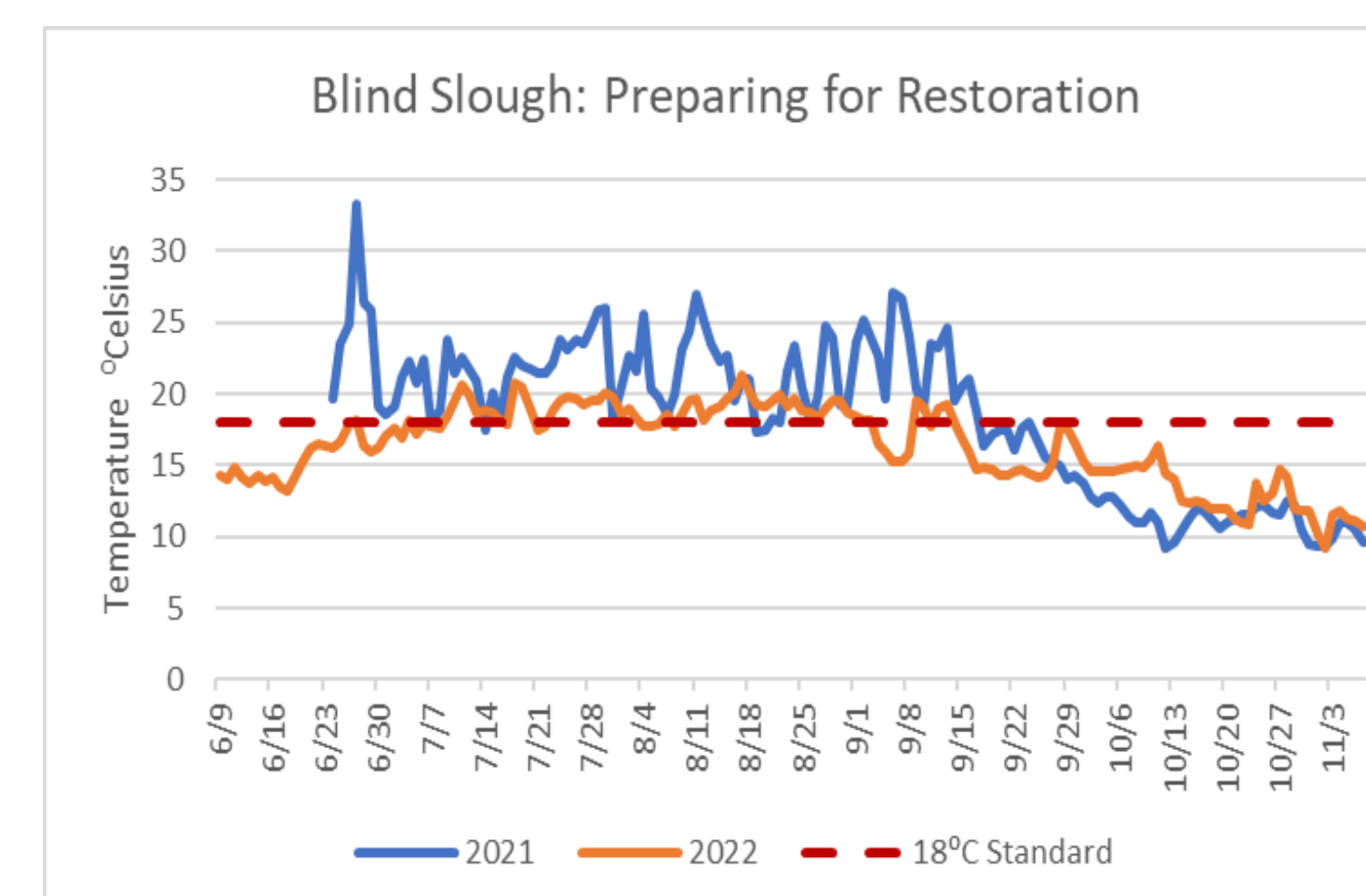
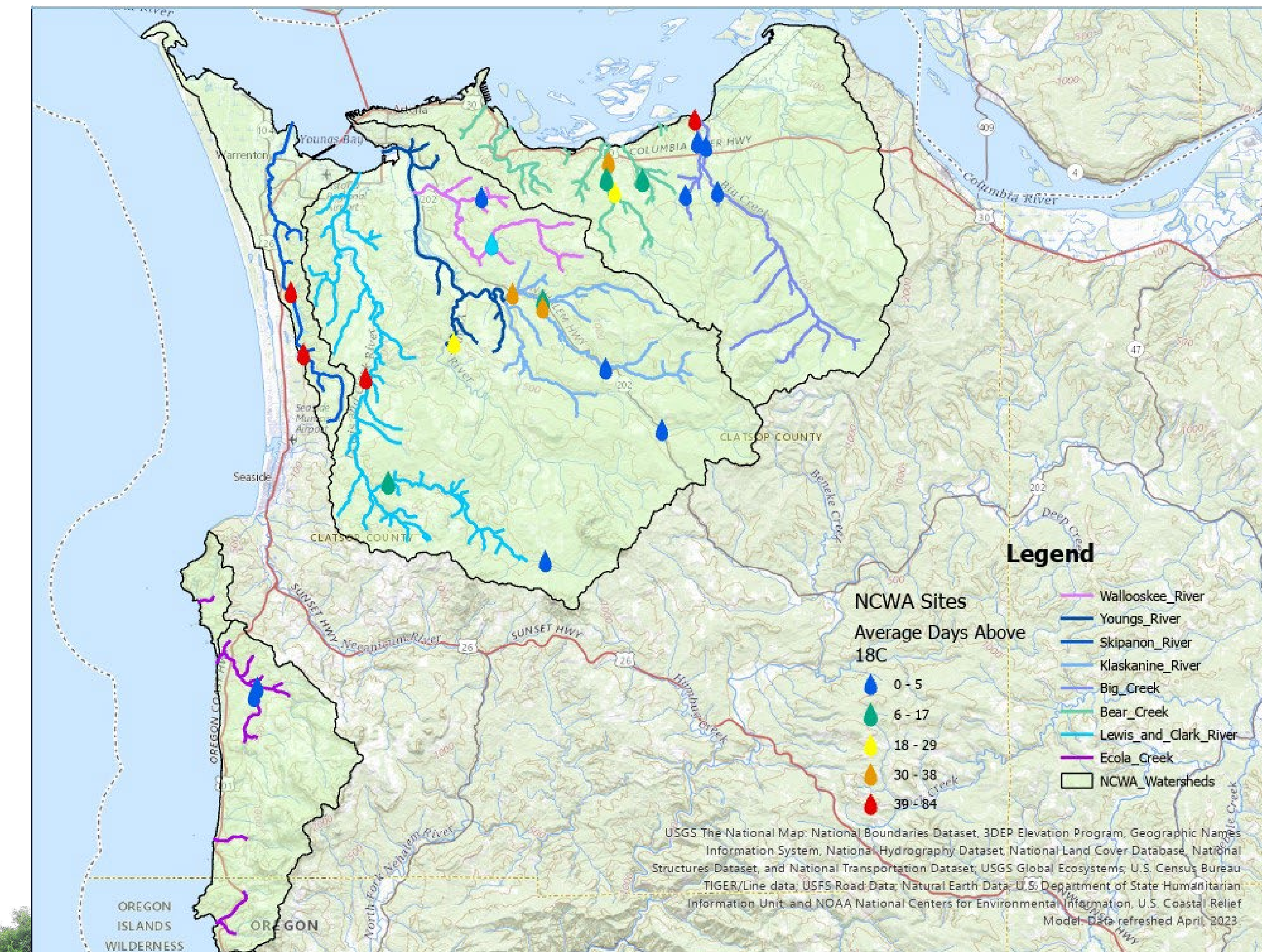


Program Summary

The North Coast Watershed Association (NCWA) began monitoring summer stream temperatures at 9 sites in the Youngs Bay and Skipanon watersheds in 2016. The following year 5 sites were added and expanded the program into the Ecola Creek watershed; and in 2018 coverage extended into the Nicolai-Wikiup watershed with an additional 8 sites. In 2021 NCWA began monitoring temperatures at Blind Slough to gather data prior to a project reconnecting its wetlands; and in 2022 a site was added on Hillcrest Creek. We report our data to the Oregon Department of Environmental Quality (DEQ) to help establish Total Maximum Daily Loads (TMDLs). In the fall of 2021 NCWA began taking grab turbidity data at the time of launching and retrieving the loggers—Clatsop County is likely to have some of the worst issues with turbidity in the state according to US Geological Service (USGS) models based on soil types, land use, and weather. The NCWA's Water Quality monitoring informs our projects and helps fill data gaps within our service area.



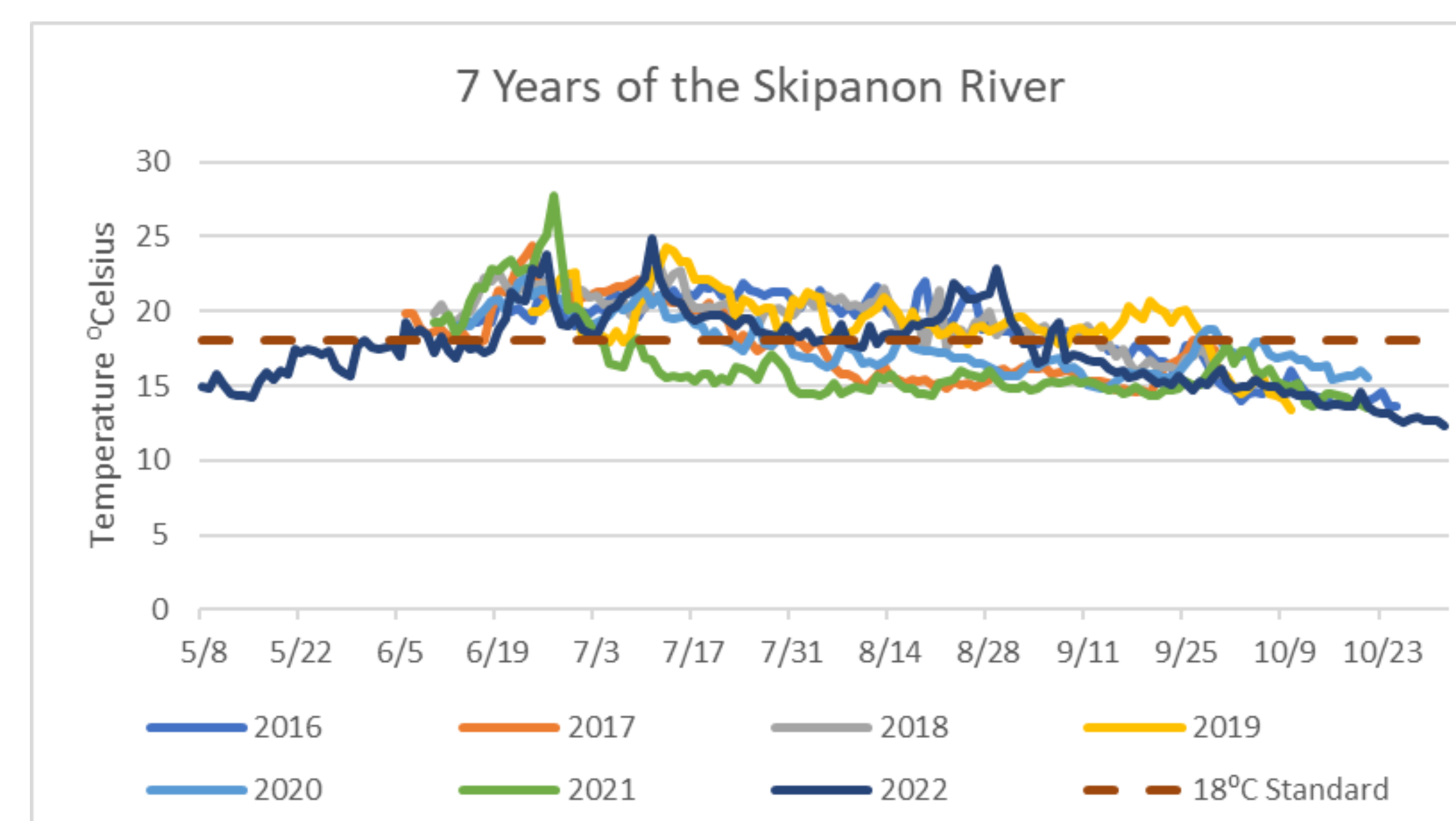
Above: Project Manager Kelli Daffron retrieves a logger from the West Fork Ecola Creek. Ecola Creek is considered to be a cold water refuge.



Above: the overgrown relic road that was decommissioned at Blind Slough. Right: post decommissioning; road fill was removed allowing water to flow freely from one side to the other.

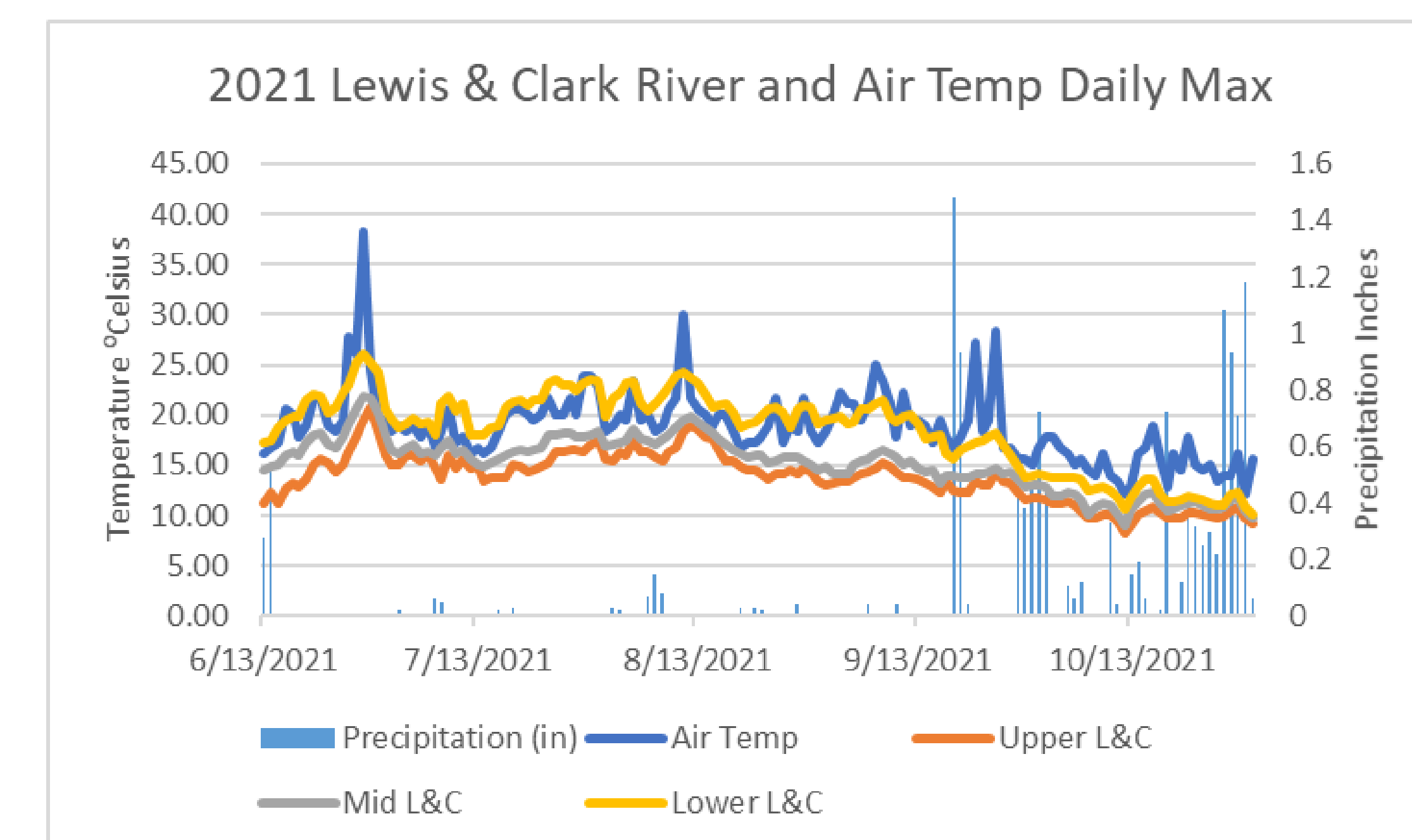
Effectiveness Monitoring

The Blind Slough Wetland Reconnection project was completed in 2022 to enhance connectivity in this Sitka Spruce swamp habitat, which is globally rare and provides valuable refuge and forage for listed salmonid species, including Chinook, Coho, and Steelhead. While many factors affect the temperature of the water, we anticipate that increasing connectivity and tidal influence in this area will help to decrease and stabilize temperatures. Time will tell.



The Lewis & Clark River

The Lewis & Clark River is our most monitored system; during the Heat Dome over the Pacific northwest of 2021 the air temperatures observed at the Astoria Airport were often on-par, or even cooler than, stream temperatures in the lower L&C River.

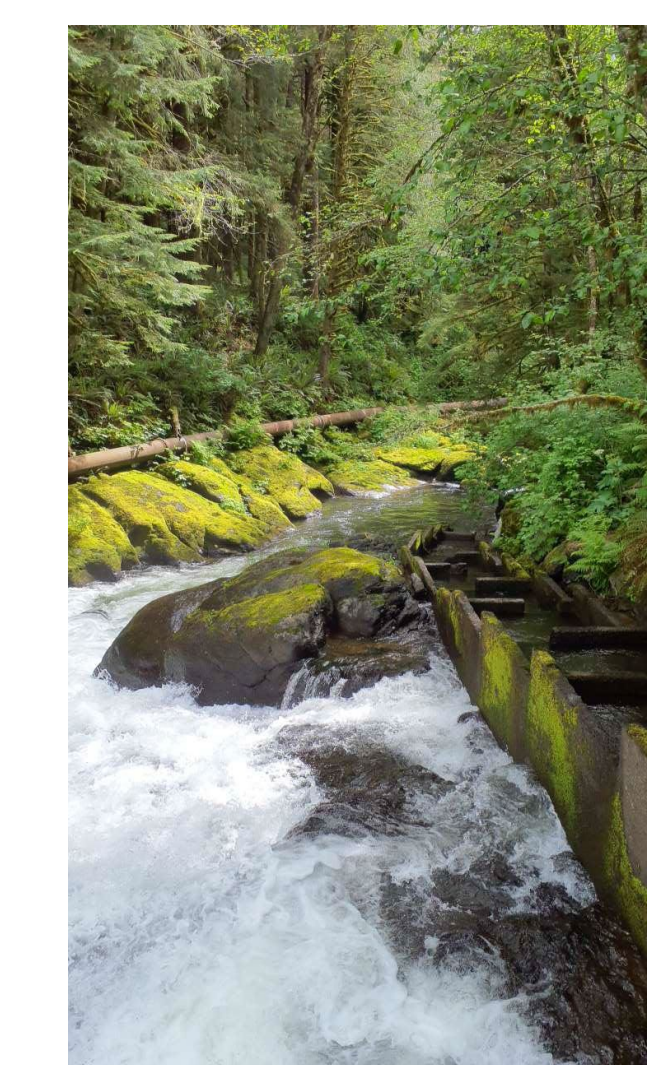


The Skipanon River

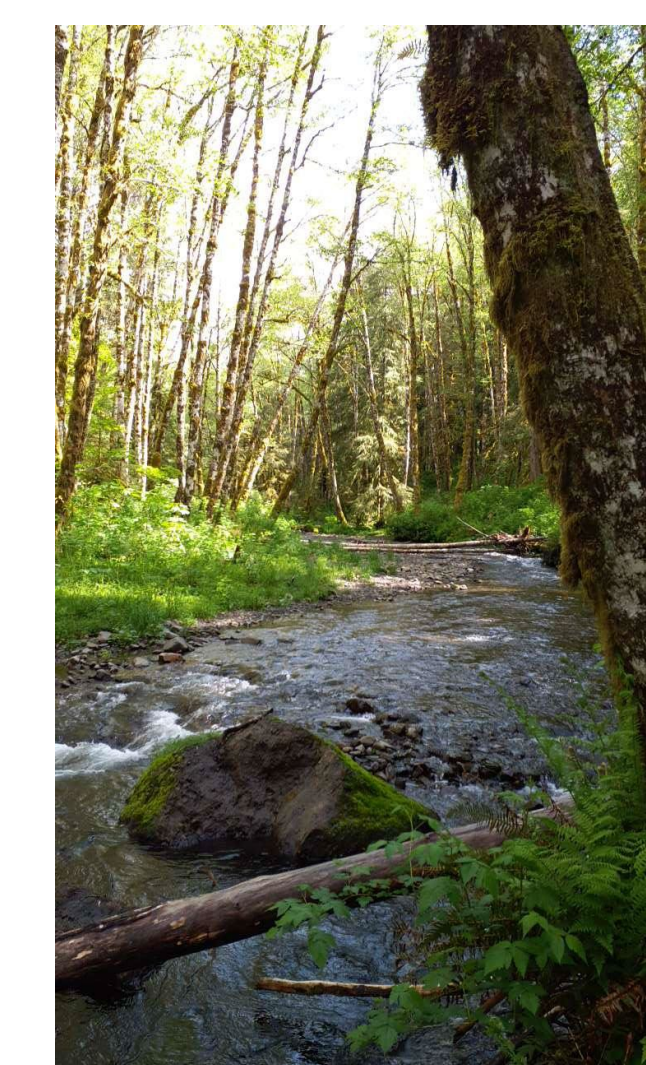
The Skipanon River is one of our hottest sites. This system has changed dramatically with the influence of human development. It is by far the most turbid site we monitor, with an average turbidity reading of 14 NTUs in 2022. Its temperature peaks tend to be in late June/early July. Although this system is impaired it still holds great potential to continue to foster wildlife.



Lower Lewis & Clark River



Mid Lewis & Clark River



Upper Lewis & Clark River



The Hottest Sites

In the 7 years we've been monitoring, the above 8 sites have consistently shown temperatures at or above the established 18 degrees Celsius (about 64 degrees Fahrenheit) standard at which salmonid health is adversely affected. These sites are mostly in less vegetated reaches of the watersheds we serve and would likely benefit from restoration projects such as riparian plantings.

Community Engagement

NCWA has partnered with Astoria High School and Warrenton High School whose students rear and release salmonids into Youngs Bay and the Skipanon River, respectively, to engage students within their watersheds. Students have assisted with placing, auditing, and retrieving loggers over the years.

Left: Warrenton High School students help retrieve a temperature logger from the Skipanon River.