

Long-Term Community-Based Monitoring in Sambaa K'e

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Background

Sambaa K'e is a small Dene community located on the shores of Trout Lake, Northwest Territories which is a large lake of 513 square kilometers with depths up to 90 feet. The lake is home to an abundance of fish that includes lake trout, lake whitefish, grayling, Yellow walleye, burbot, northern pike and longnose suckers - all of which are an important part of the community's diet.



Figure 1. Community of Sambaa K'e

The community has a long running community-based monitoring program that shows the effect of climate on the characteristics of the lake and how those can impact important fish stocks, specifically lake trout. The program first started in 2001 as an itinerant angler survey to monitor fly-in fishing. At that time, a 19 foot harbour craft with a 150 HP Honda outboard was purchased for the community and

outfitted with all the necessary safety gear. Two individuals were then hired to patrol the entire lake. Initially the Guardians (monitors) were trained in surveying techniques to interview anglers. In 2011, the Guardians began collecting water quality information on local tributaries and monitoring the temperature profile of the lake (i.e., temperature from top to bottom at the deepest place).

Methods and Results

To monitor the water quality, community Guardians were outfitted with YSI Pro Plus hand held meters that could measure pH, conductivity, dissolved oxygen, temperature and oxidation-reduction potential. They also received training on the maintenance and use of YSI Sondes which passively measure multiple parameters every 2 hours for the entire summer. The YSI Pro Plus meters were used at all the tributaries flowing into and out of the lake for the entire summer every year, producing trend data that can show seasonal changes or long term effects due to climate change.

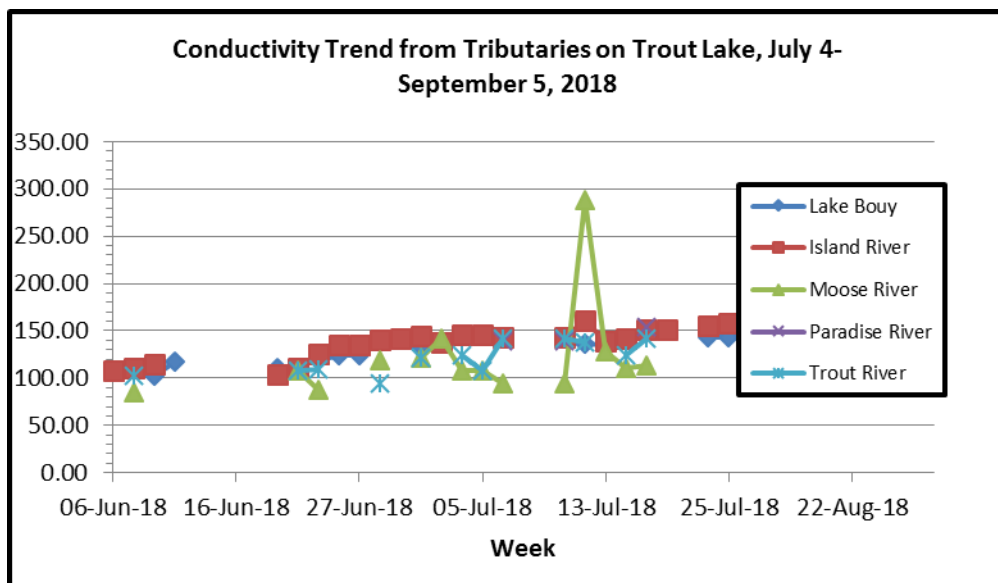


Figure 2. Chart showing the conductivity trend for all tributaries

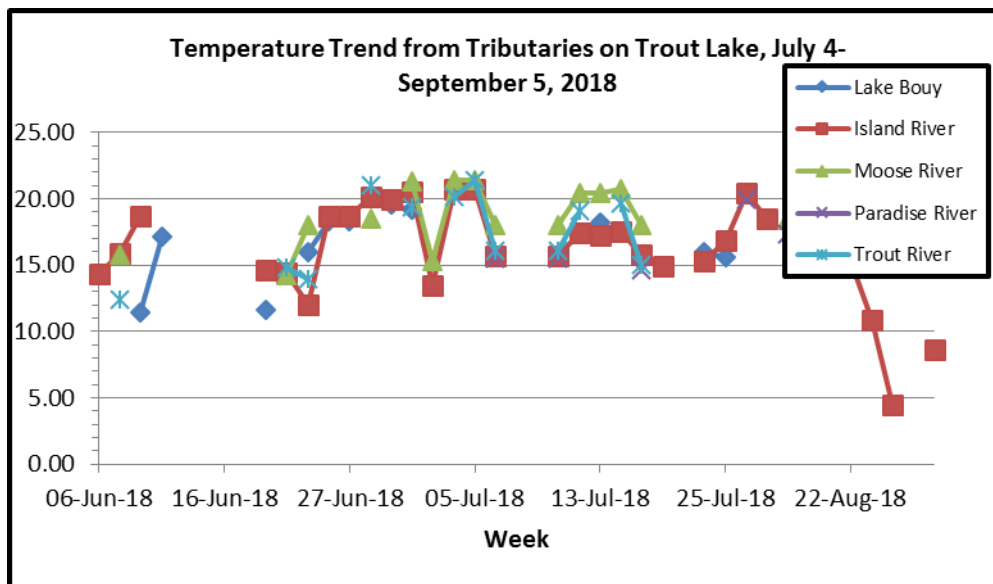


Figure 3. Chart showing the temperature trend for all tributaries of Trout Lake, NWT.

In addition to the water quality monitoring, community guardians deployed a temperature buoy in the deepest part of the lake. The buoy is made up of a red marine buoy tied with Samson braid rope to a chain and anchor and equipped with HOBO data loggers affixed every meter. The HOBO meters are programed with a computer to record temperature levels every hour for the entire open water season. This data is very useful as it shows the depth at which the water suddenly becomes cooler and denser (thermocline). This habitat is critical for lake trout in the summer as it has a high concentration of oxygen. Over time, the depth of the thermocline can be tracked as well as any potential effects from climate change.

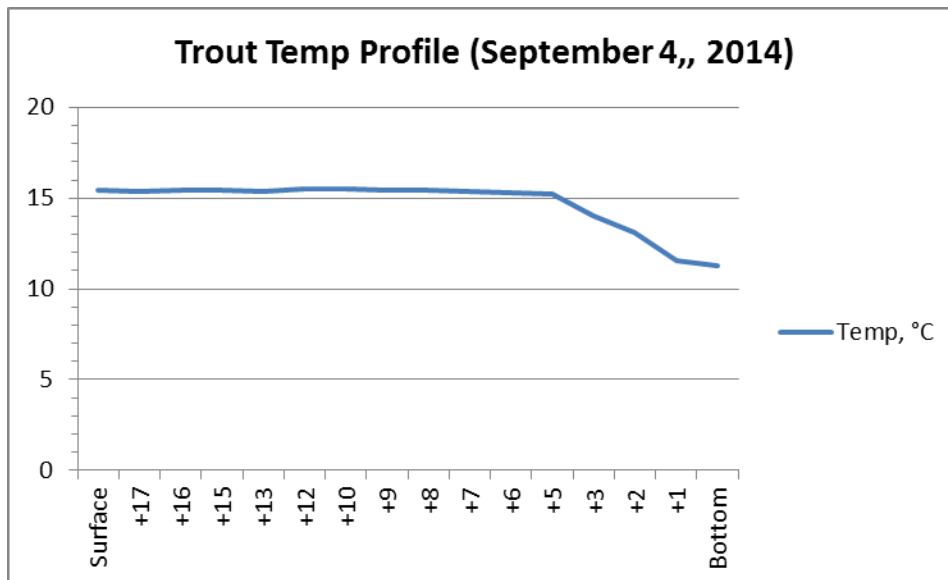


Figure 4. Graph showing the temperature of the water from the top to the bottom; the sharp drop corresponds to the thermocline.

Success Factors and Benefits

This community guardian program continues to run, collecting the same data. This type of long-term monitoring is crucial to actually show changes that are occurring. There are several reasons this program is successful and provides the community with so many direct and indirect benefits. An important requirement for the success of the program is continuous funding to provide wages to hire the same Guardians on a yearly basis which contributes to the community buy-in. Secondly, a suitable boat and outboard was purchased for the community with funding being provided for yearly maintenance. These boats become important for other uses in the communities including hunting, providing travel to gatherings, search and rescue and use during youth, culture, and ecology camps, also contributing to community buy-in. Other factors that have contributed to the success of this program include the stipulation that the same community Guardians are chosen and hired by the First Nation each year with provided funding and receive all available training as well as continued assistance (if requested) from outside organizations, well-maintained equipment, uniforms, and logos.

There are other key outcomes that come from successful community-based programs like this one. For example, there are many socio-economic benefits, increased time on the land, ability to practice culture and tradition, knowing what's happening on the land, resource management, and employment.