

# Skeena Summer Climate Conditions

August 1, 2023

## Summary

It's hot in the Skeena! Like much of the province, we are seeing unusually high temperatures and low water levels throughout the region... and it's only the start of August. A combination of warming ocean temperatures, early snowpack melt, and drought conditions that started in June have set the stage for what could be a challenging year for Skeena salmon and steelhead. The Skeena and many of its tributaries are currently at water levels well below historic averages, in many cases below historic minimums, with water temperatures well above average. These conditions add stress to migrating salmon and could influence spawning habitat availability and success if similar conditions continue into the fall as expected. Salmon are resilient and will adapt, but it's important for us to understand environmental conditions and challenges our salmon will be facing this year.

## Sea Surface Temperature

After three years of La Niña (cooler) conditions in the Northeast Pacific Ocean, June 2023 saw the start of El Niño conditions, and above average sea surface temperatures, which are expected to continue warming throughout the year. In late July, sea surface temperature (SST) anomalies of up to 4°C above long-term averages were present across the Northeast Pacific, with this trend extending into nearshore north coast waters and the Skeena and Nass estuaries (Figure 1). El Niño events typically see lower survival of Pacific salmon populations. Warmer surface temperatures influence ocean currents and decrease productivity, affecting both the food availability for salmon and the predators they face. Decreases in large, lipid-rich zooplankton and increases in smaller, less fatty zooplankton from the south mean less nutritious food for salmon while at-sea.

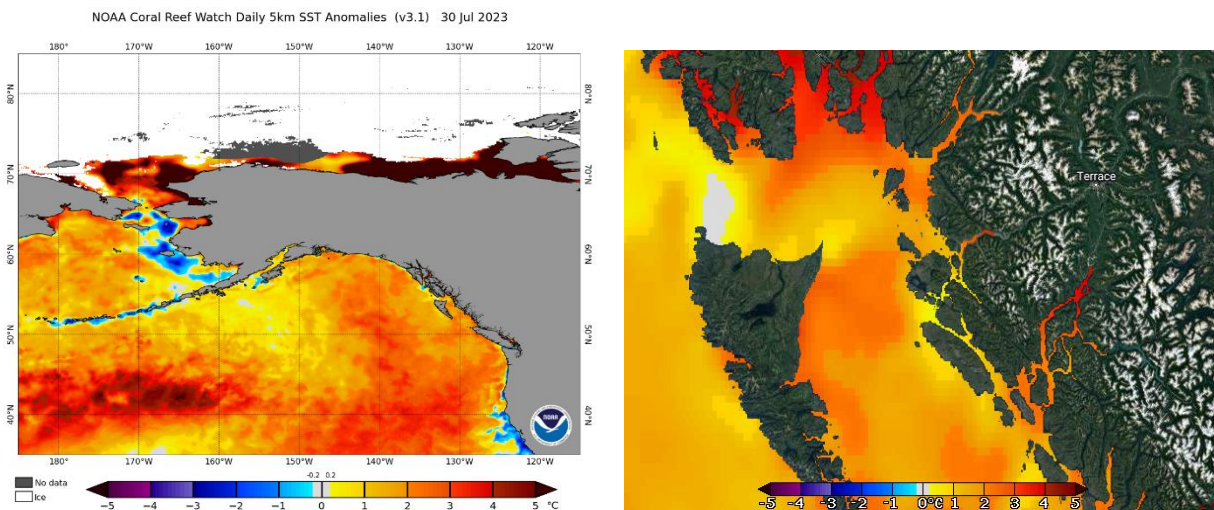


Figure 1. Sea surface temperature (SST) anomalies (difference from the long-term average, in degrees Celsius) in the Northeast Pacific (left) and B.C. north coastal waters (right) on July 30, 2023. [Source: NOAA Coral Reef Watch]

## Snowpack

Warm spring temperatures this year also contributed to faster and earlier snowpack melt than usual. On [June 15<sup>th</sup>](#), the Skeena-Nass snow pack was well below average at 18% of its normal for that time of year, which is very different from the conditions we saw in 2022. Similar conditions were observed across the province, with many regions already snow free at that time (Figure 2).

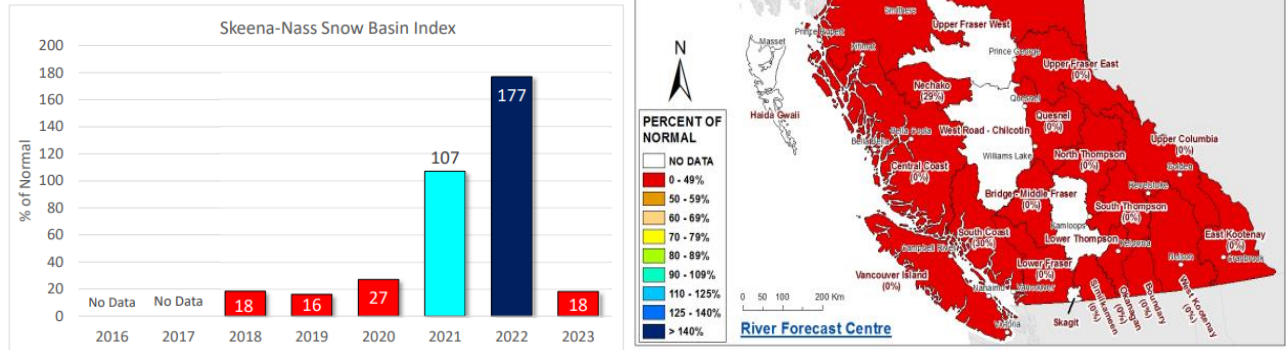
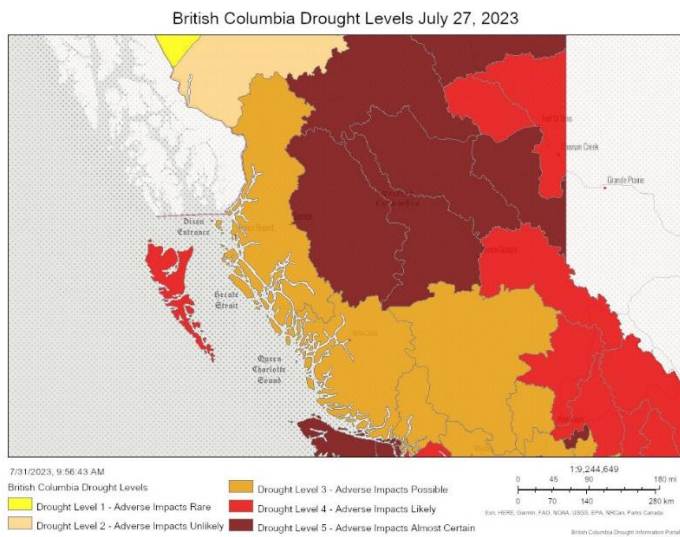


Figure 2. Skeena-Nass snow basin index (percent of long-term average) on June 15, 2023, compared to the previous five years (left) and other regions in B.C. (right). [Source: British Columbia River Forecast Centre]

## Drought Levels



In June, the B.C. government forecasted a high risk of province-wide drought this summer, due to a combination of climate conditions including the early season snowmelt and unusually warm and dry temperatures over the winter and spring. As of late July, the coastal Skeena-Nass region is at Drought Level 3, with possible adverse impacts to communities and ecosystems, while the interior Bulkley-Lakes region is already at Drought Level 5, with adverse impacts almost certain (Figure 3).

Figure 3. British Columbia regional drought levels as of July 27, 2023. [Source: British Columbia Drought Information Portal]

## Current Water Levels & Temperatures

This combination of climate conditions has already led to below average water levels and above average water temperatures throughout the Skeena and many of its tributaries, as well as the Nass, throughout July. In many cases, including the Skeena, water levels are currently below historic minimums ([see figures](#)). Low water levels in the rivers at this time of year can pose additional barriers to migration and, if these conditions continue throughout the late summer and fall, spawning habitats may be affected or limited as well. Warm water temperatures also impact migrating and spawning salmon, with negative effects observed at temperatures above 18°C and high pre-spawn mortality observed above 20°C (Figure 4). The Babine has seen temperatures of 18-19°C for much of the month of July, well above its historical average. The Bulkley River also observed temperatures above 20°C for the first half of July, but has cooled somewhat since then. On the bright side, cool inputs into headwater streams from glacial melt in the late summer can act as a reprieve for spawning salmon.

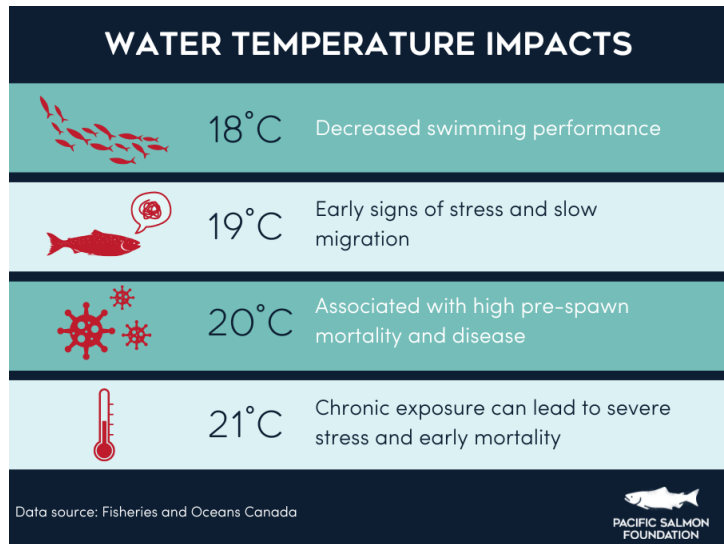


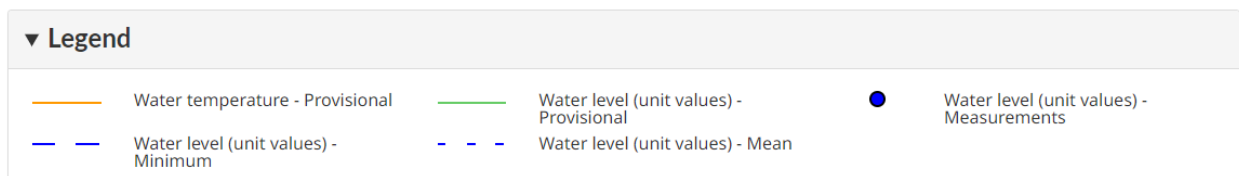
Figure 4. Water temperature impacts on migrating Pacific salmon. [Source: Pacific Salmon Foundation]

### What can you do to help salmon?

Given the drought forecast and low water levels we are seeing throughout the Skeena, you can do your part by conserving water at home. Be sure to follow your local watering restrictions and be water conscious by taking shorter showers and turning taps off when not in use.

### Water Levels & Temperatures by River

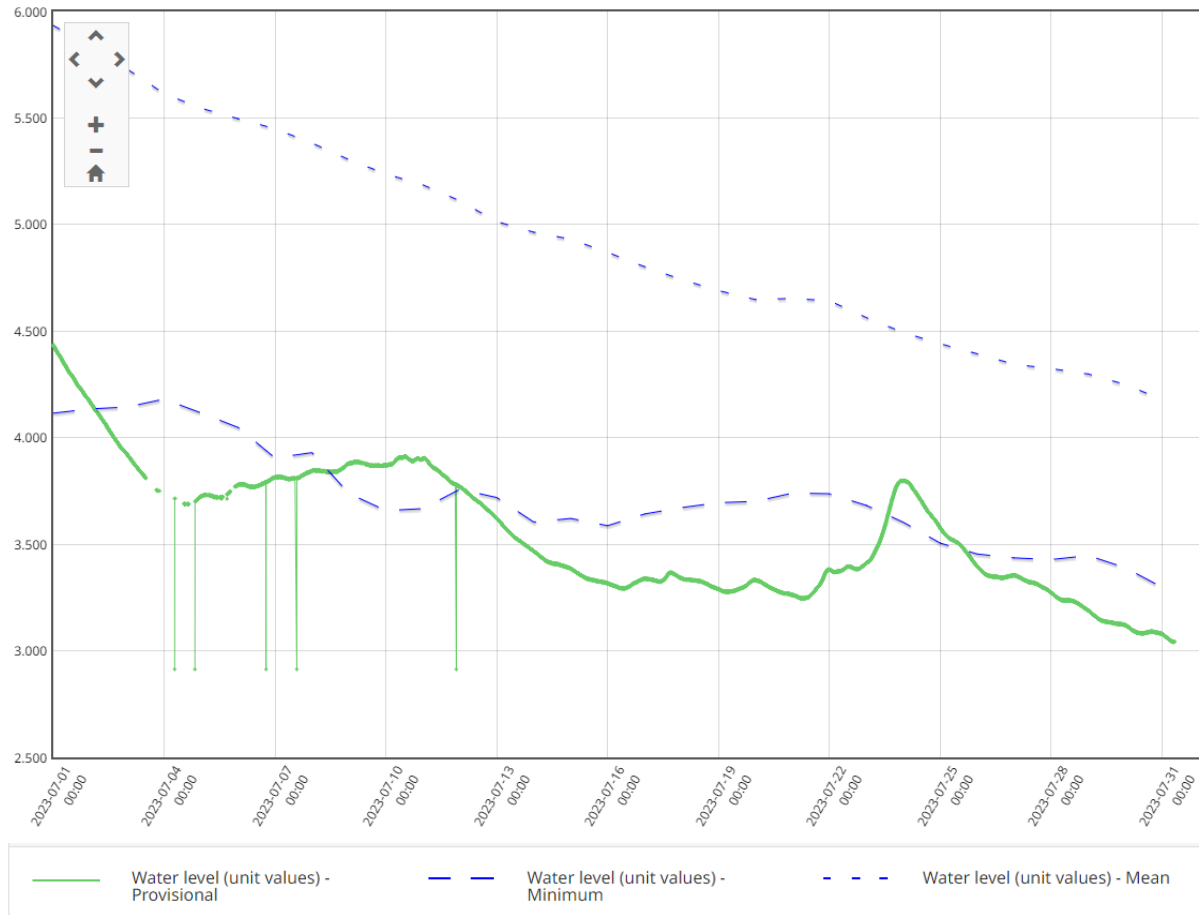
Current and historic water level and current temperature (where available) data is shown in the following pages for the [lower](#), [middle](#), and [upper](#) Skeena main stem, and [Kitsumkalum](#), [Zymoetz](#), [Kitwanga](#), [Kispiox](#), [Babine](#), [Bulkley](#), [Telkwa](#), [Morice](#), [Nanika](#), and [Upper Bulkley](#) Rivers. Water levels are shown on the left axis, with July 2023 in green and the historic mean (short dash) and minimum (long dash) in blue. If available, July 2023 water temperatures are shown in yellow on the right-side axis.



All information was extracted from the [Environment and Climate Change Canada Real-time Hydrometric Data web site](#) on July 31, 2023.

# Lower Skeena River

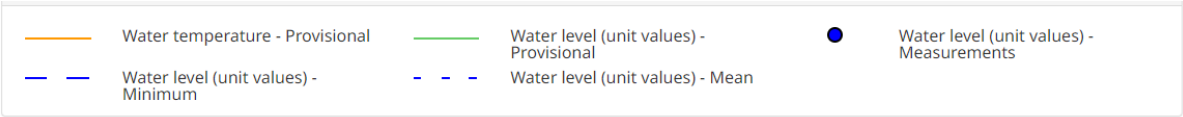
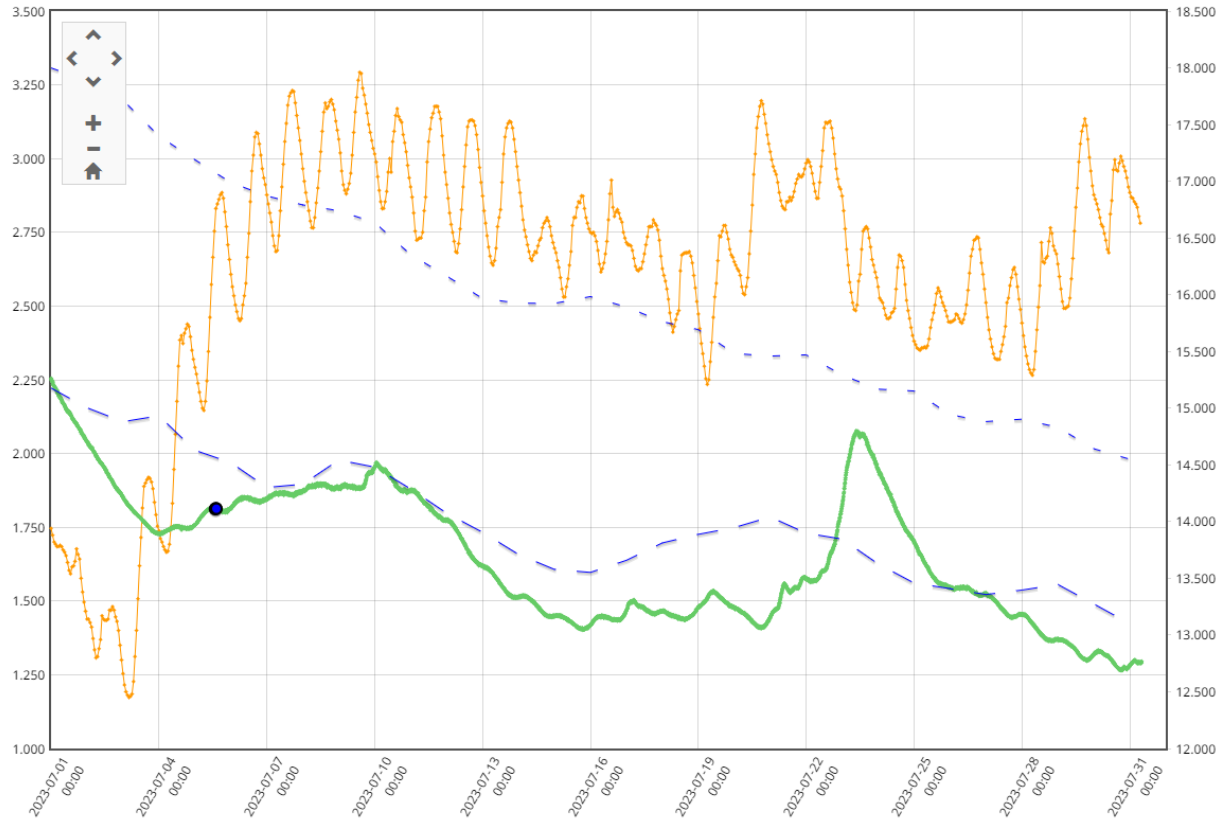
Water level (unit values) (m)



# Middle Skeena River

Water level (unit values) (m)

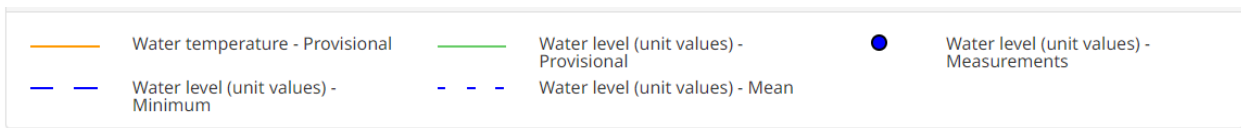
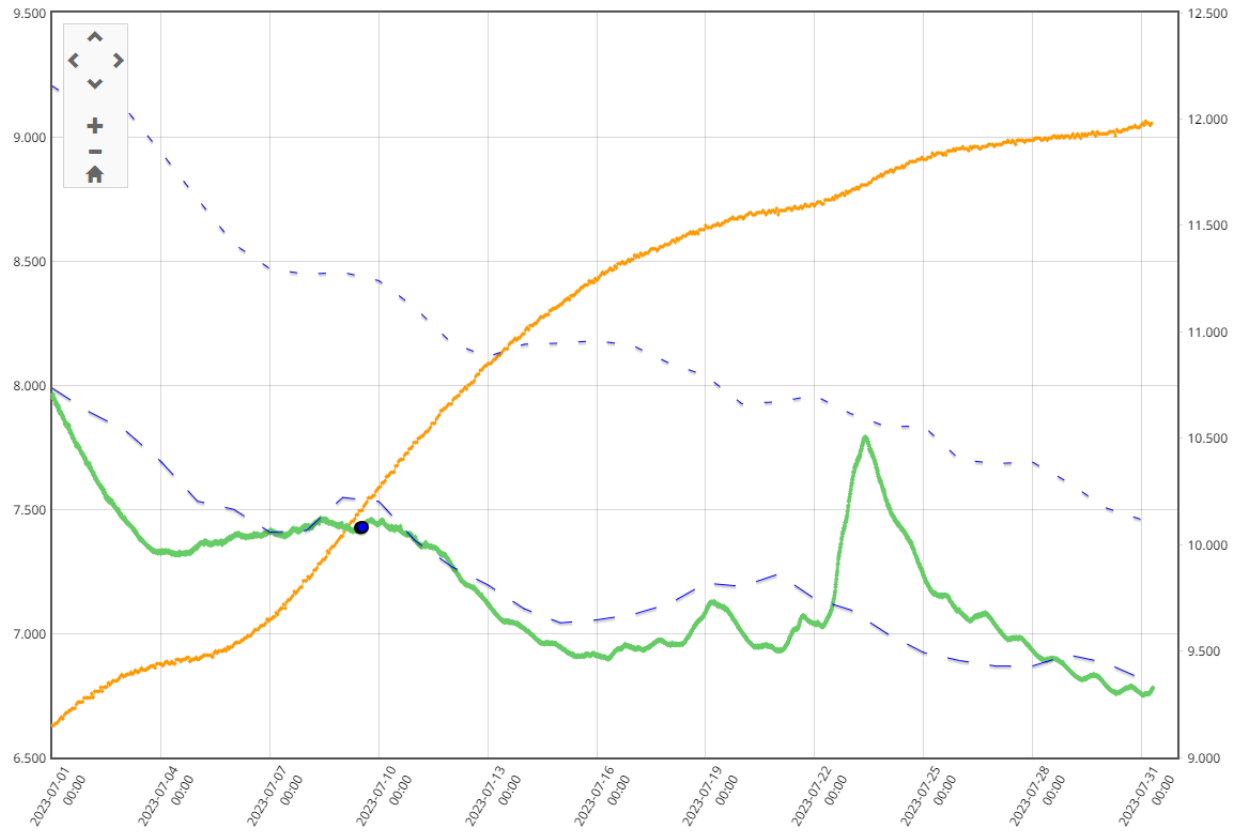
Water temperature (°C)



# Upper Skeena River

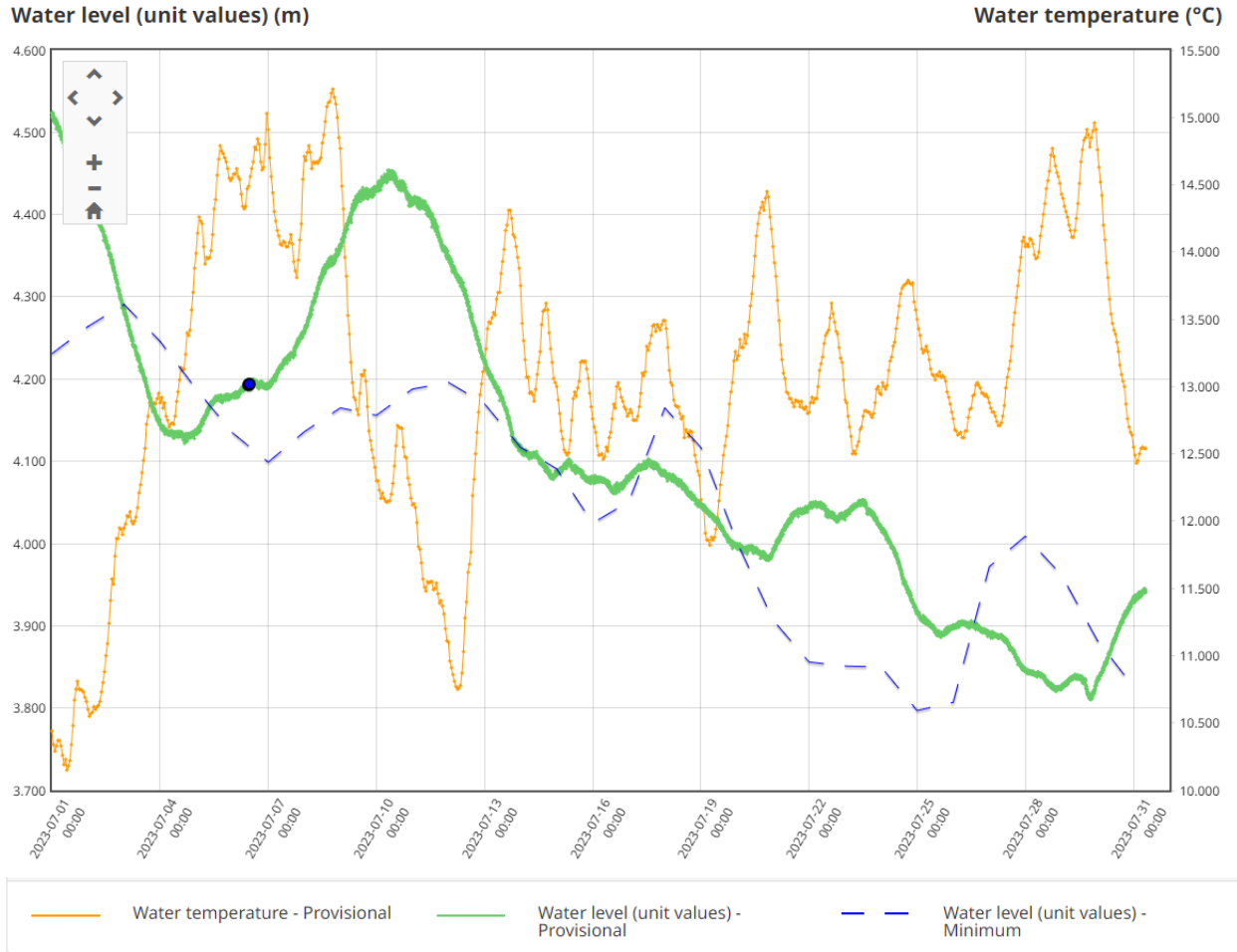
Water level (unit values) (m)

Water temperature (°C)



# Kitsumkalum River

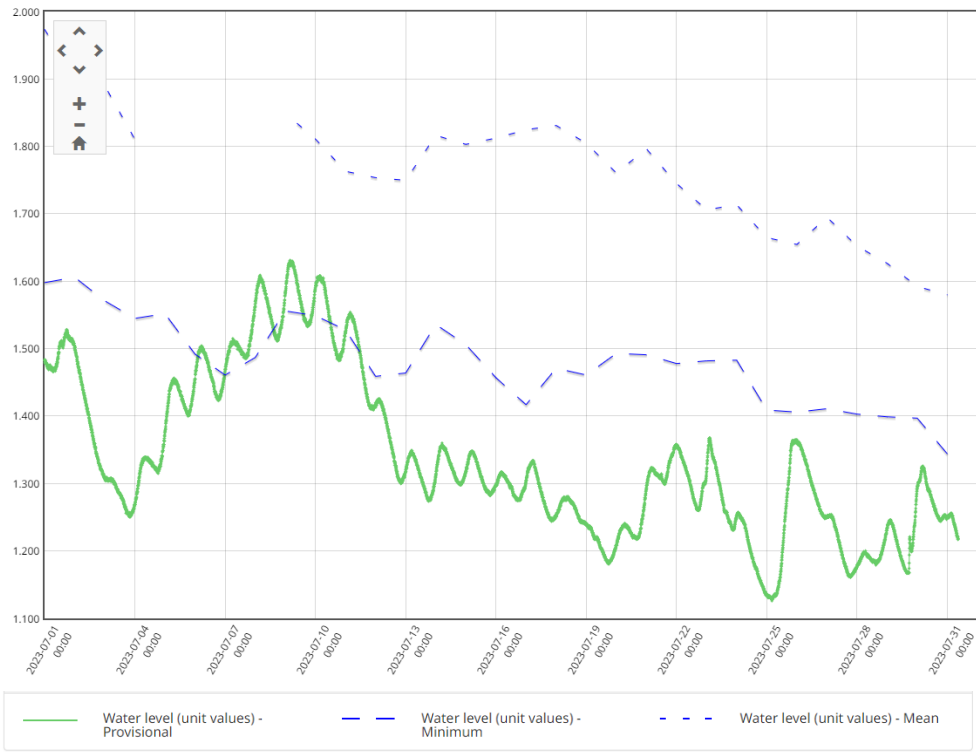
\*only 6 years of data (2018-2023)



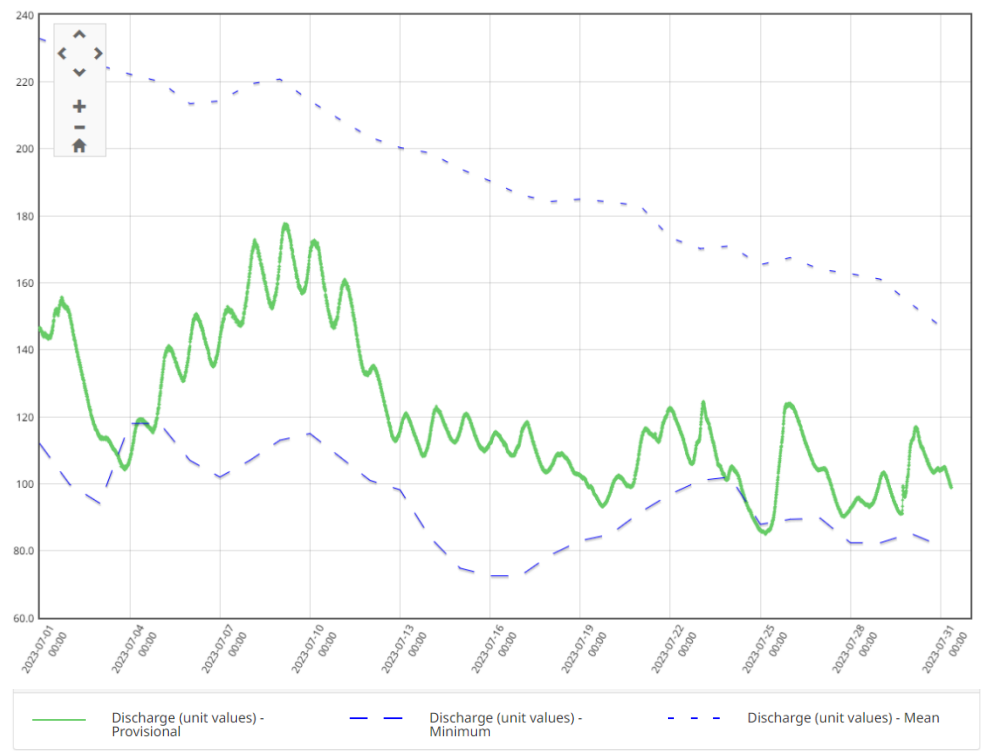
# Zymoetz River

\*Water level minimum and mean since 2011; discharge (below) minimum and mean since 1963

Water level (unit values) (m)



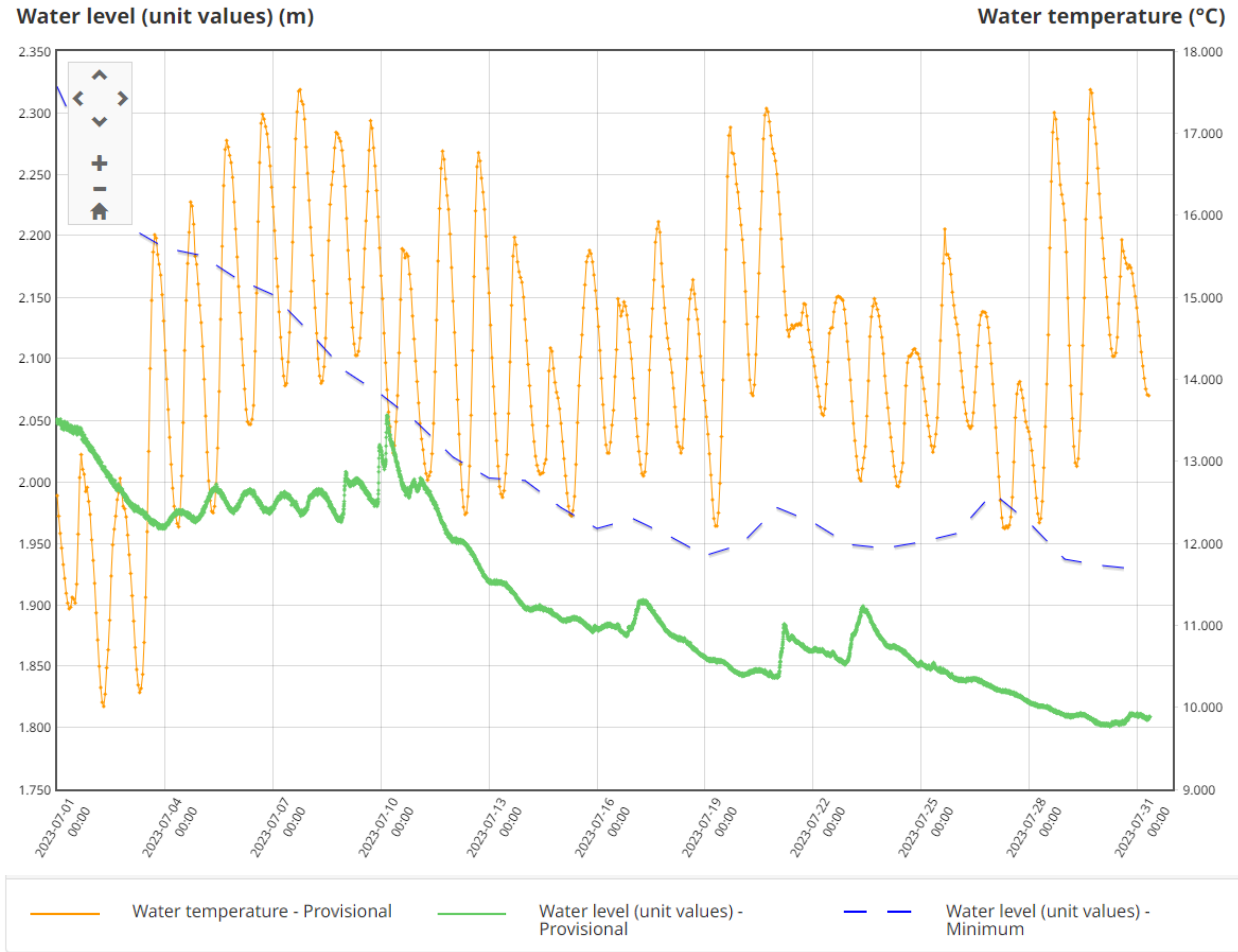
Discharge (unit values) (m³/s)





# Kitwanga River

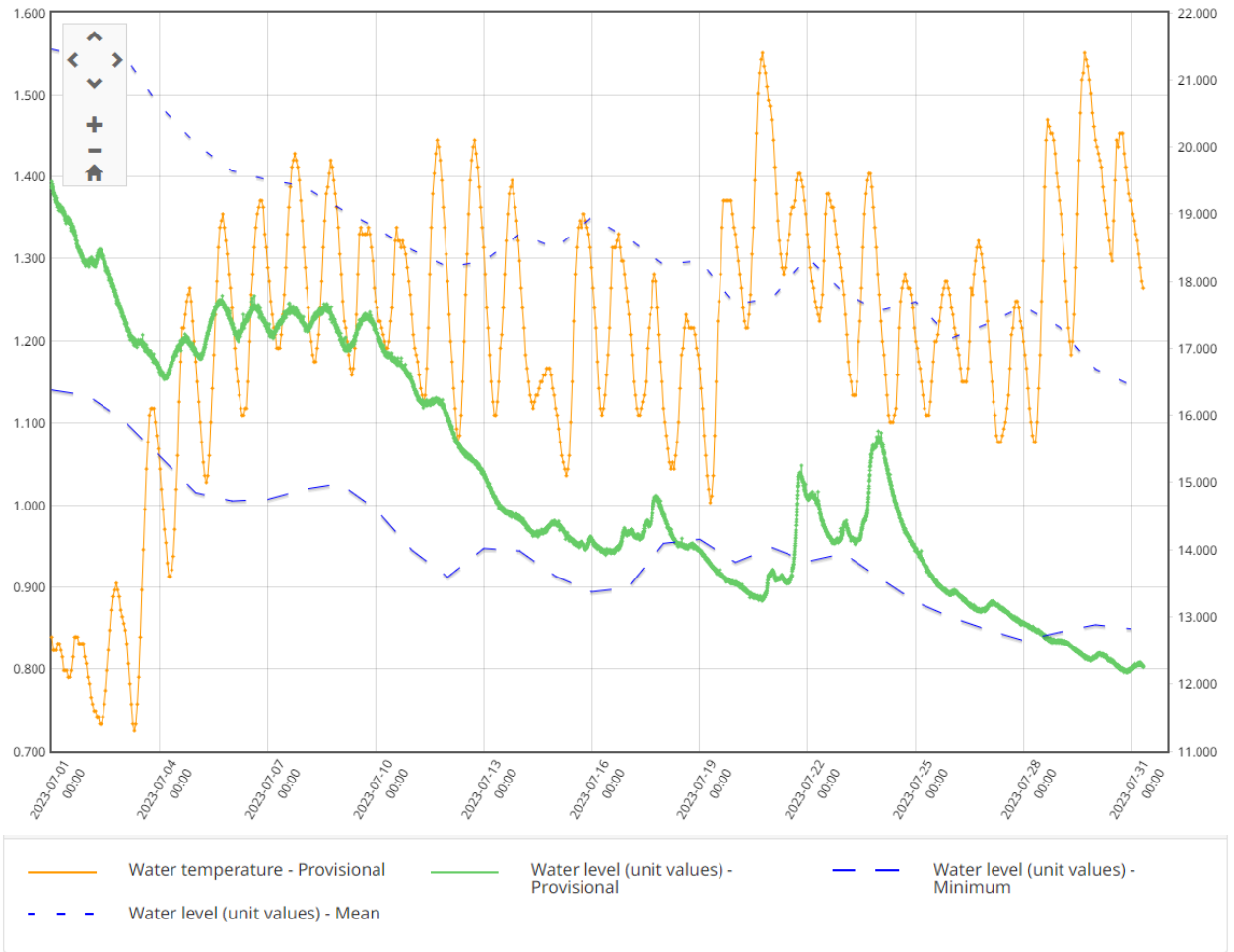
\*only 3 years of seasonal data is available (2021-2023); minimum water level since 2021 shown



# Kispiox River

Water level (unit values) (m)

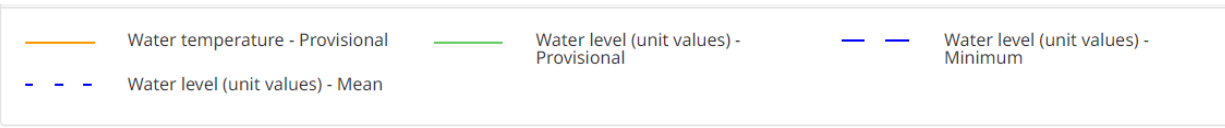
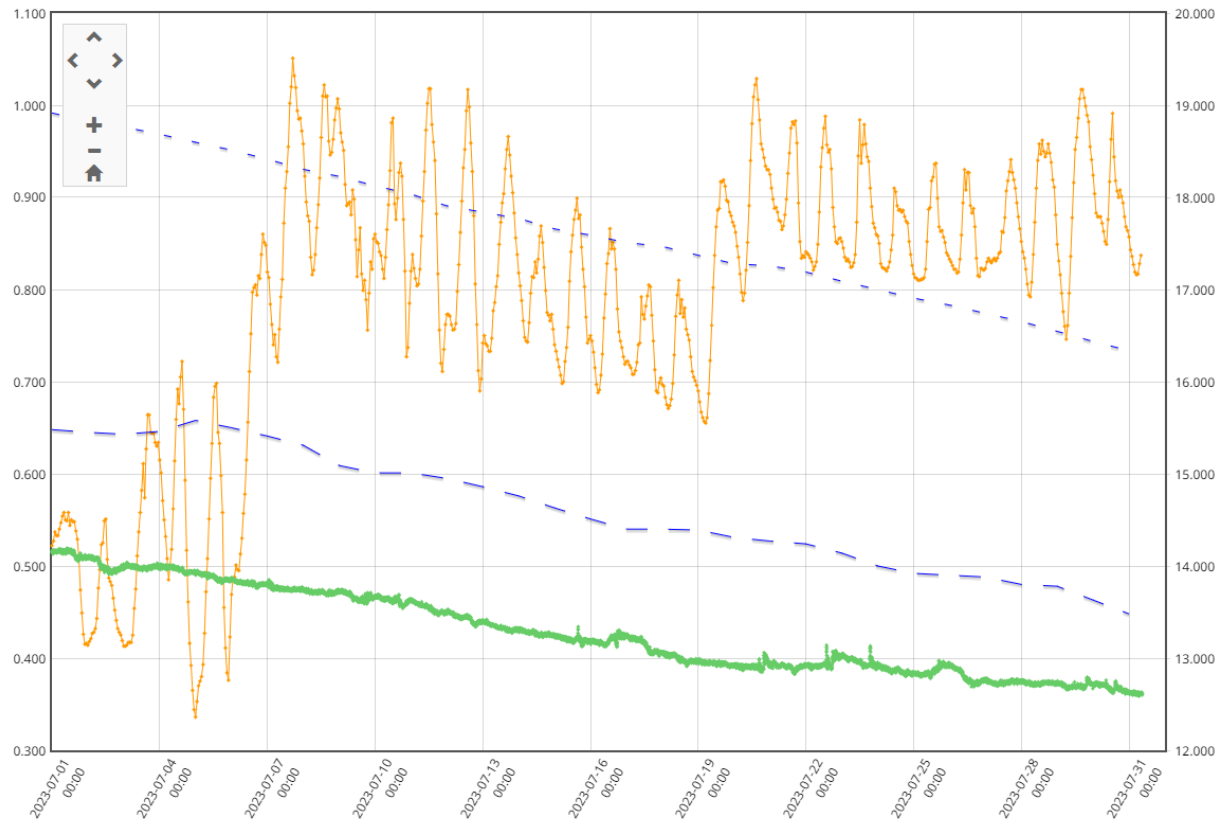
Water temperature (°C)



# Babine River

Water level (unit values) (m)

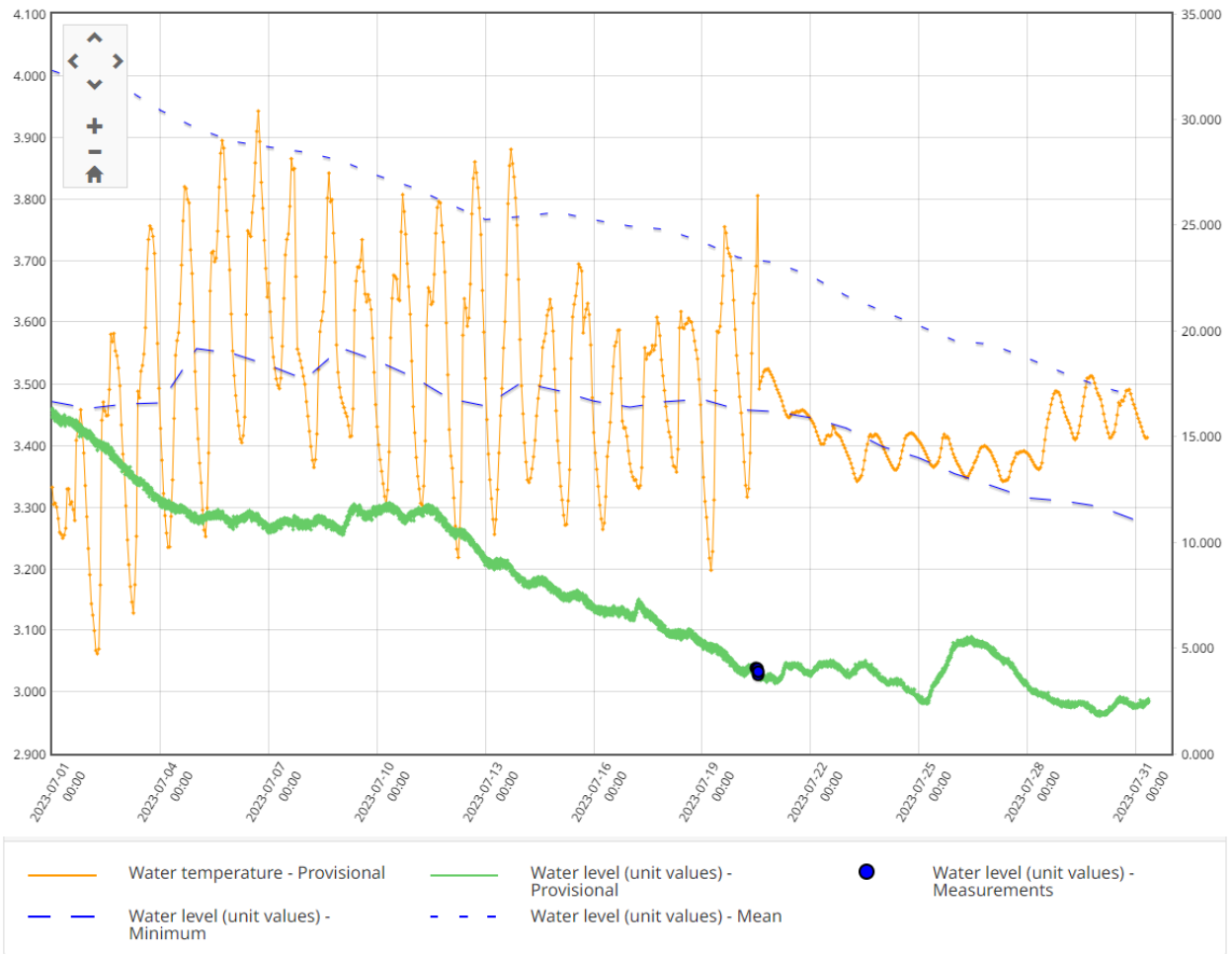
Water temperature (°C)



# Bulkley River (Smithers)

Water level (unit values) (m)

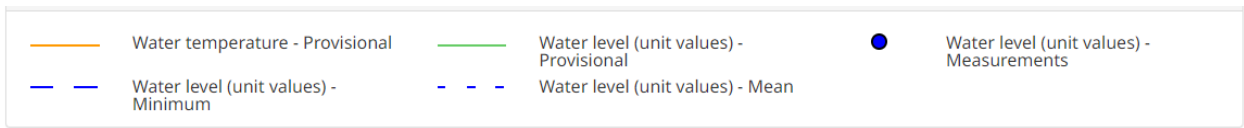
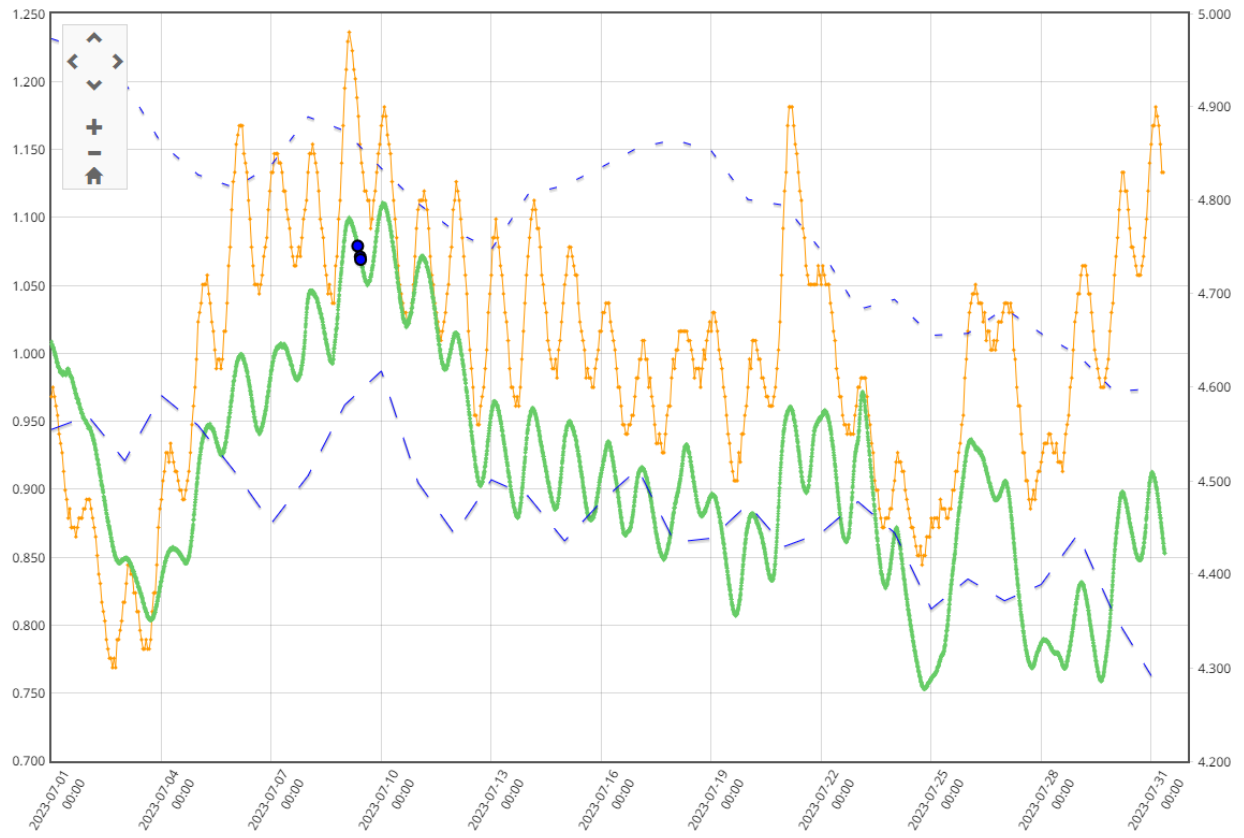
Water temperature (°C)



# Telkwa River

Water level (unit values) (m)

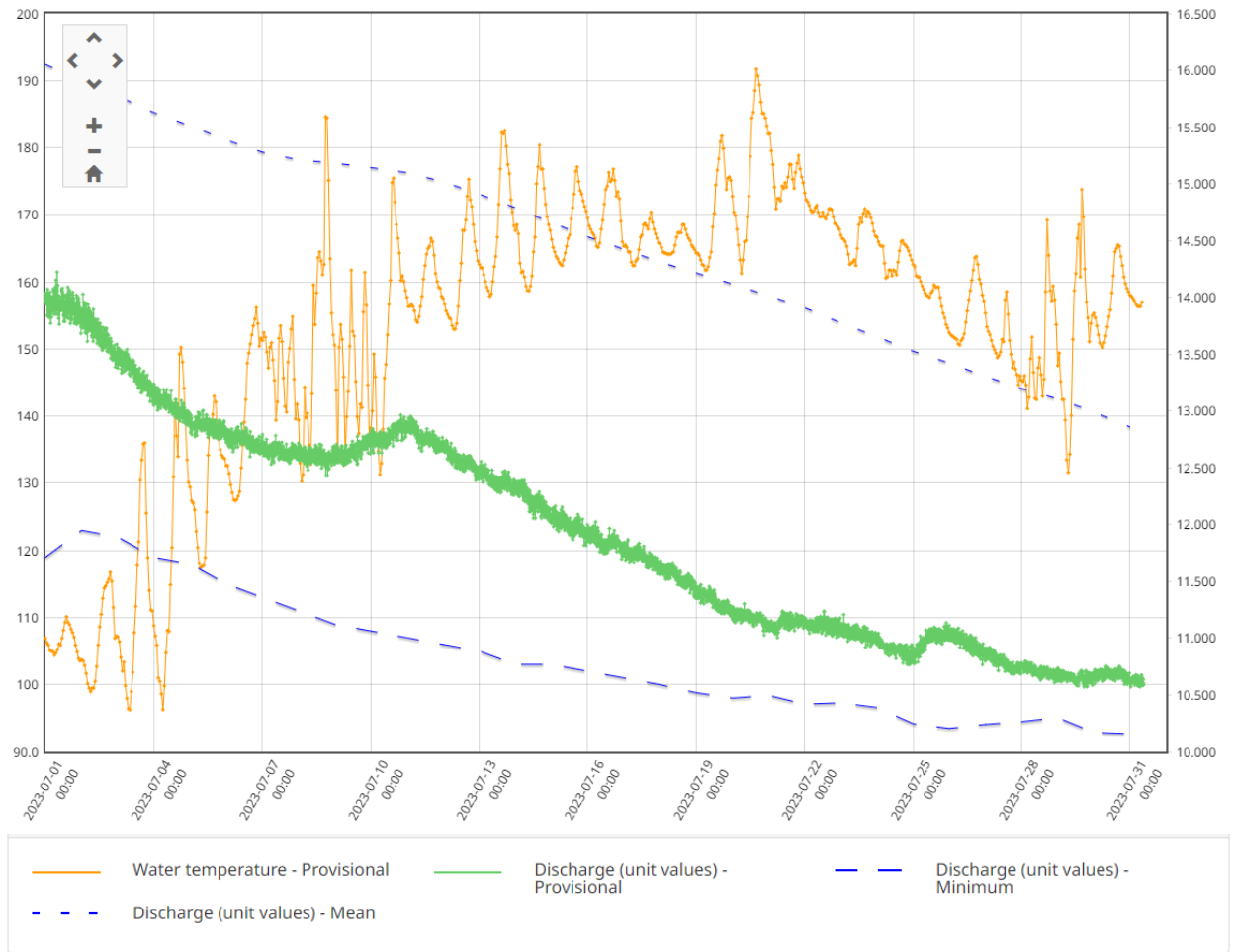
Water temperature (°C)



# Morice River

\*Note: discharge data shown instead of water level

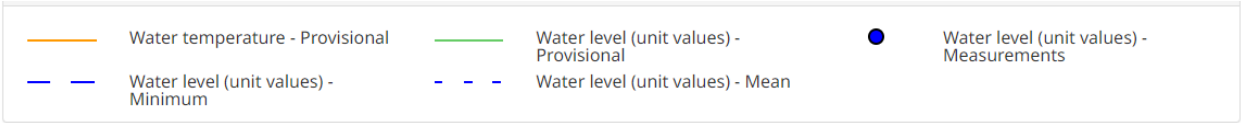
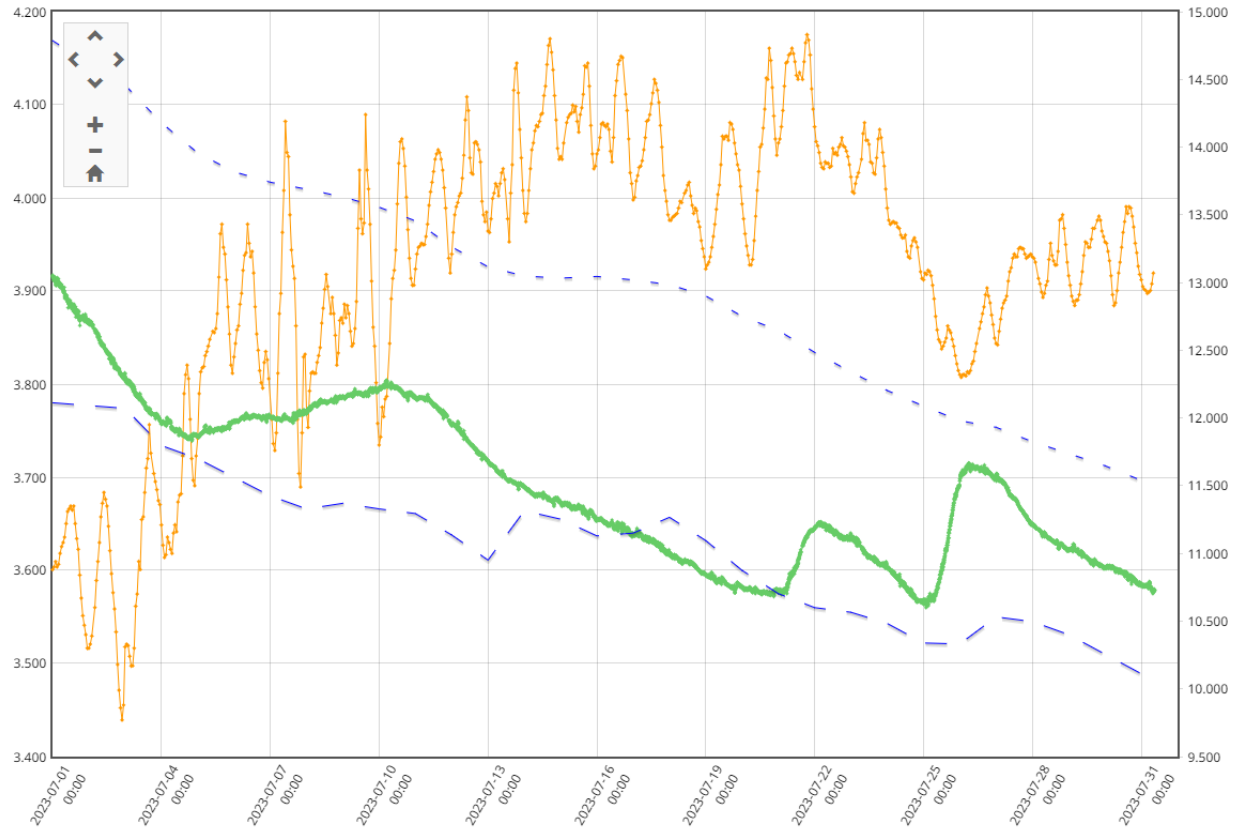
Discharge (unit values) (m<sup>3</sup>/s) Water temperature (°C)



# Nanika River

Water level (unit values) (m)

Water temperature (°C)



# Upper Bulkley

Water level (unit values) (m)

Water temperature (°C)

