Lake Panache Spring Sampling 2023

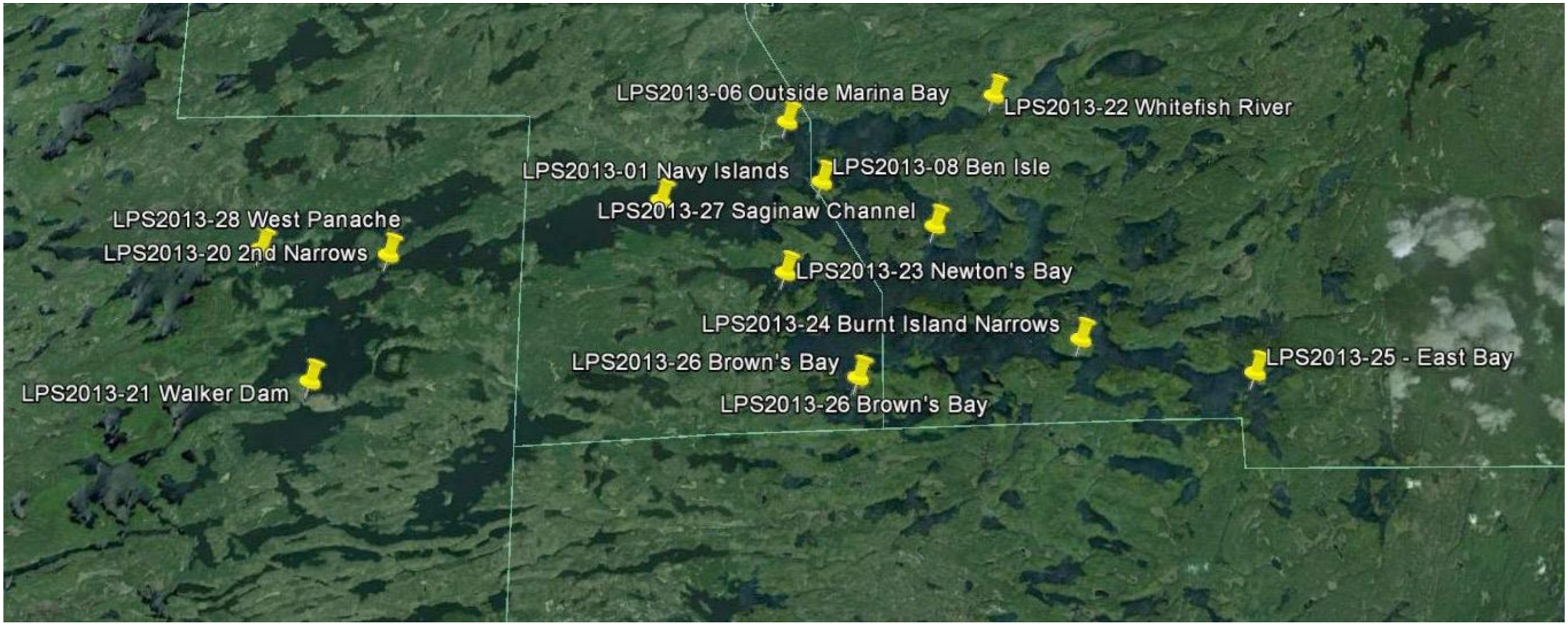
Sampling Information

- In the summer of 2013, 12 Sites were selected by the Stewardship Committee for sampling, based upon location and proximity to water inputs. These same sites have been sampled every second year in the summer:
- 2013/2015/2017/2019/2021/2023
- 2023 was our 6th water sampling study

Sampling Information

- All samples used standard sampling protocols from City of Sudbury

Sampling Locations



Sampling Method

- All water samples were taken at Secchi Depths as determined by Secchi disc measurements (average Secchi depth ~5 m)
- All water samples were taken using Van Dorn Beta Sampler recently purchased by LPCA
- Water samples were kept cool and delivered to Testmark Labs on the day after sampling

Sampling Method

Measurements Requested

- The stewardship committee requested total metals testing (including Arsenic) as well as total Phosphorus as per the advice received from the City of Sudbury (Total of **46 metals** were tested)
- Coliform (i.e. E. Coli) samples were not taken – also under the advice of the city

Provincial Standards (PWQO)

The Province of Ontario has set guidelines for the presence of metals in water (PWQO)

Testmark Labs generates a document that highlights any metals number that exceeds these standards

In some cases these standards are interim numbers that will be discussed later.

Total Phosphorus Results

Phosphorus in Our Water

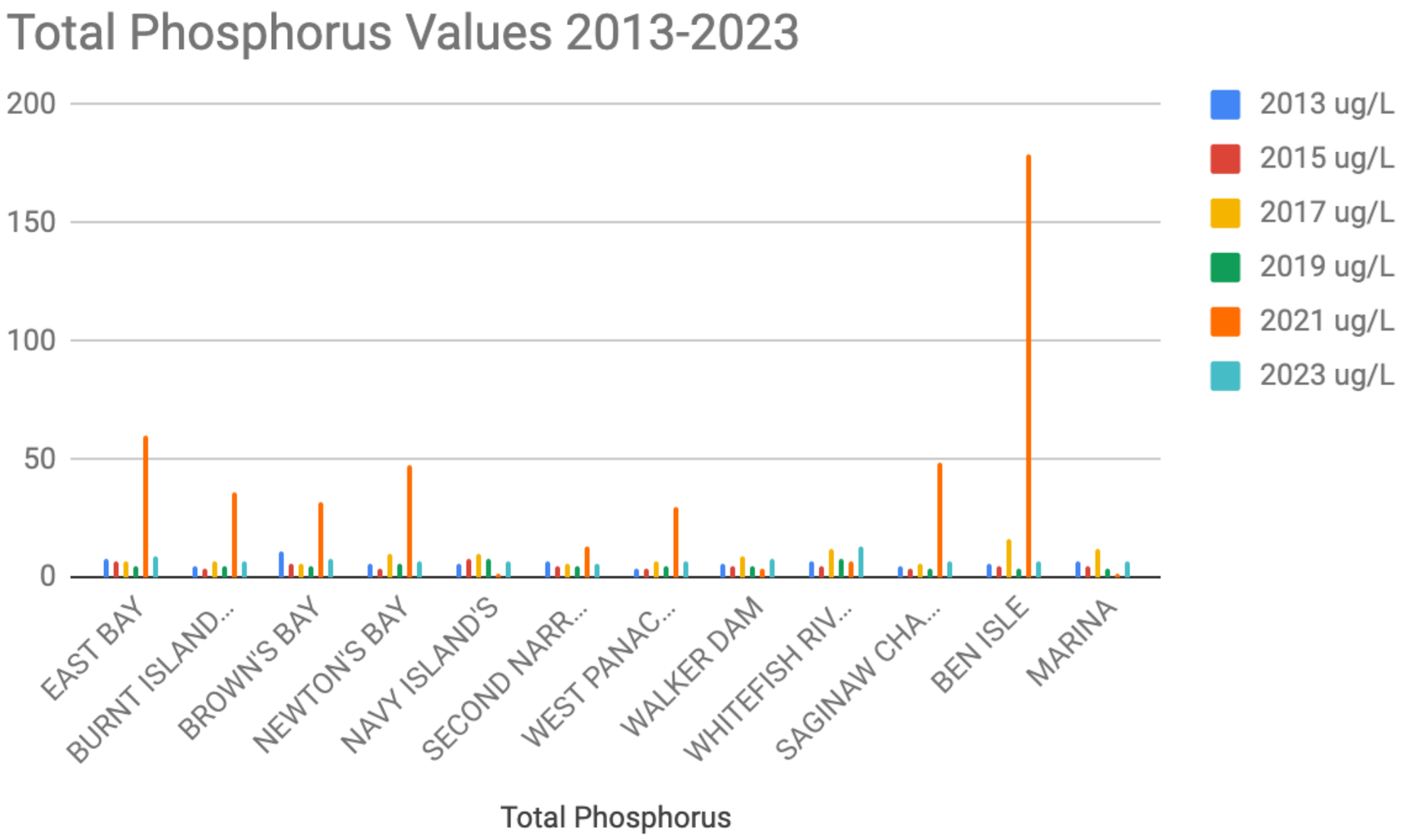
Total phosphorus is sampled in order to assess the effects of human impact on a lake. Phosphorus is the principle limiting nutrient (fertilizer) controlling the extent of algae blooms.

If the phosphorus in lakes is greater than **20 micrograms/litre (µg/L)**, the lake is considered to be nutrient enriched or eutrophic.

Human sources of phosphorus are detergents, wastewater, sewage discharge, septic tank seepage and runoff, as well as runoff from lawn fertilizers.

All Phosphorus levels this year were below the 20 micrograms/litre (µg/L) standard

Total Phosphorus 2013-23



Metals Results

Provincial Standards (PWQO)

The Province of Ontario has set guidelines for the presence of metals in water (PWQO)

Testmark Labs generates a document that highlights any metals number that exceeds these standards

Arsenic Toxicity

- Arsenic toxicity is a concern due to the proximity to Long Lake *(historic gold mine remediation)*

- Proposed Adoption of the Canadian Water Quality Guideline for Arsenic as the Provincial Water Quality Objective
- Decision posted **July 17, 2020**

  The recommended PWQO for total arsenic in water samples is **5 ug/L.** (**PWQO for Arsenic is currently listed as 100 ug/L**)
- ***All locations on the lake were below the 5 ug/L of Arsenic recommendation.***

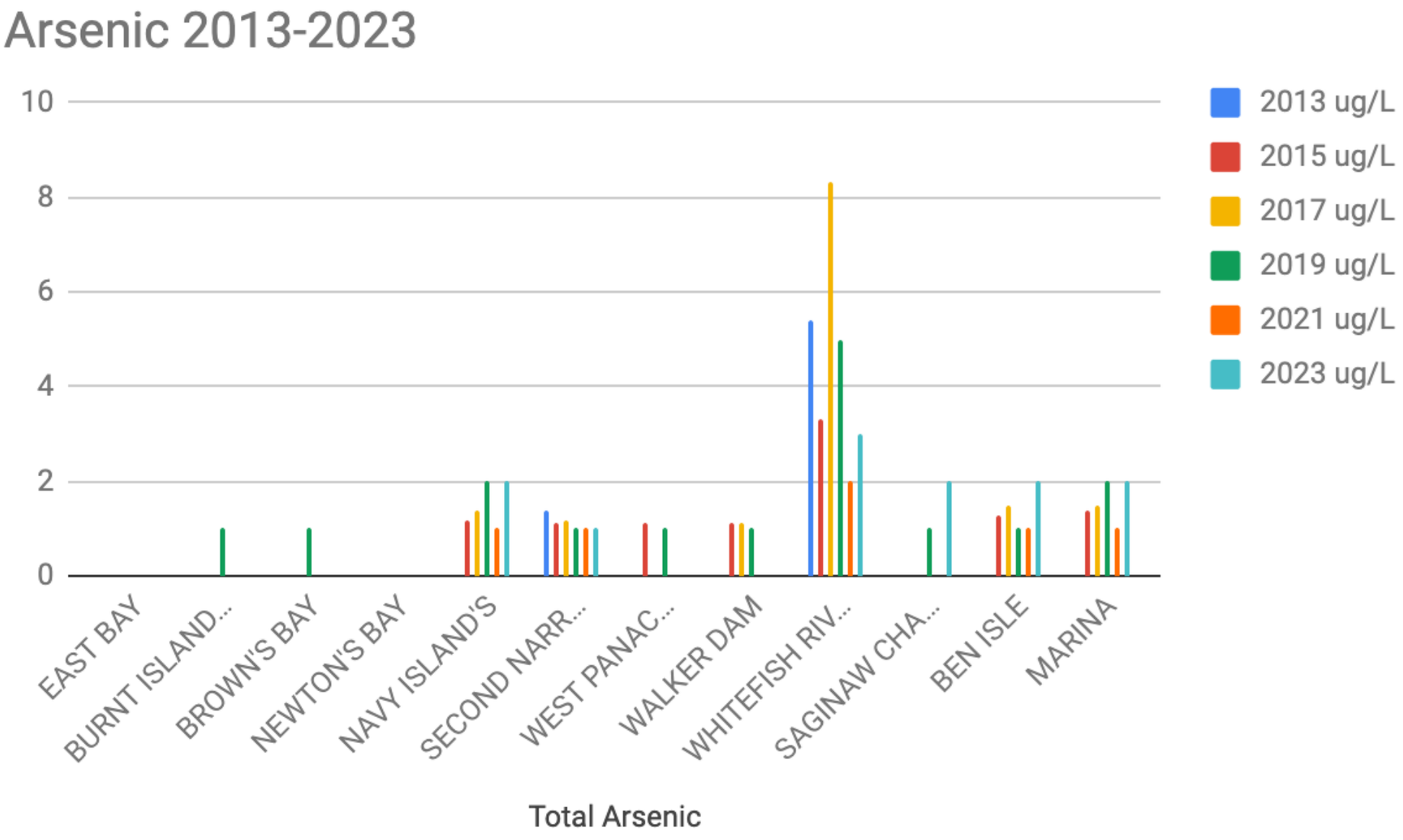
Arsenic Toxicity (Additional Information)

"The arsenic Provincial Water Quality Objective (PWQO) has not changed. **Arsenic has a PWQO of 100 ug/L** *and an* **Interim PWQO of 5 ug/L.** *The more stringent Interim PWQO was based on draft scientific criteria under development when the PWQO's were published in 1994. Interim PWQO's were developed with intention of upgrading to PWQO status and to provide a greater level of protection. The* **2001 Canadian Water Quality Guideline for arsenic is 5 ug/L**, *the same value as the Interim PWQO. The* **Ontario Drinking Water Standard and the Canadian Drinking Water Quality Guideline are 10 ug/L arsenic.**

A source of arsenic in the Whitefish River watershed is the Long Lake Gold Mine tailings that have elevated arsenic concentrations in Long Lake; this site has been identified for remediation by the Ministry of Energy, Northern Development & Mines."

- **Ed Snucins, Surface Water Specialist, with the MECP**

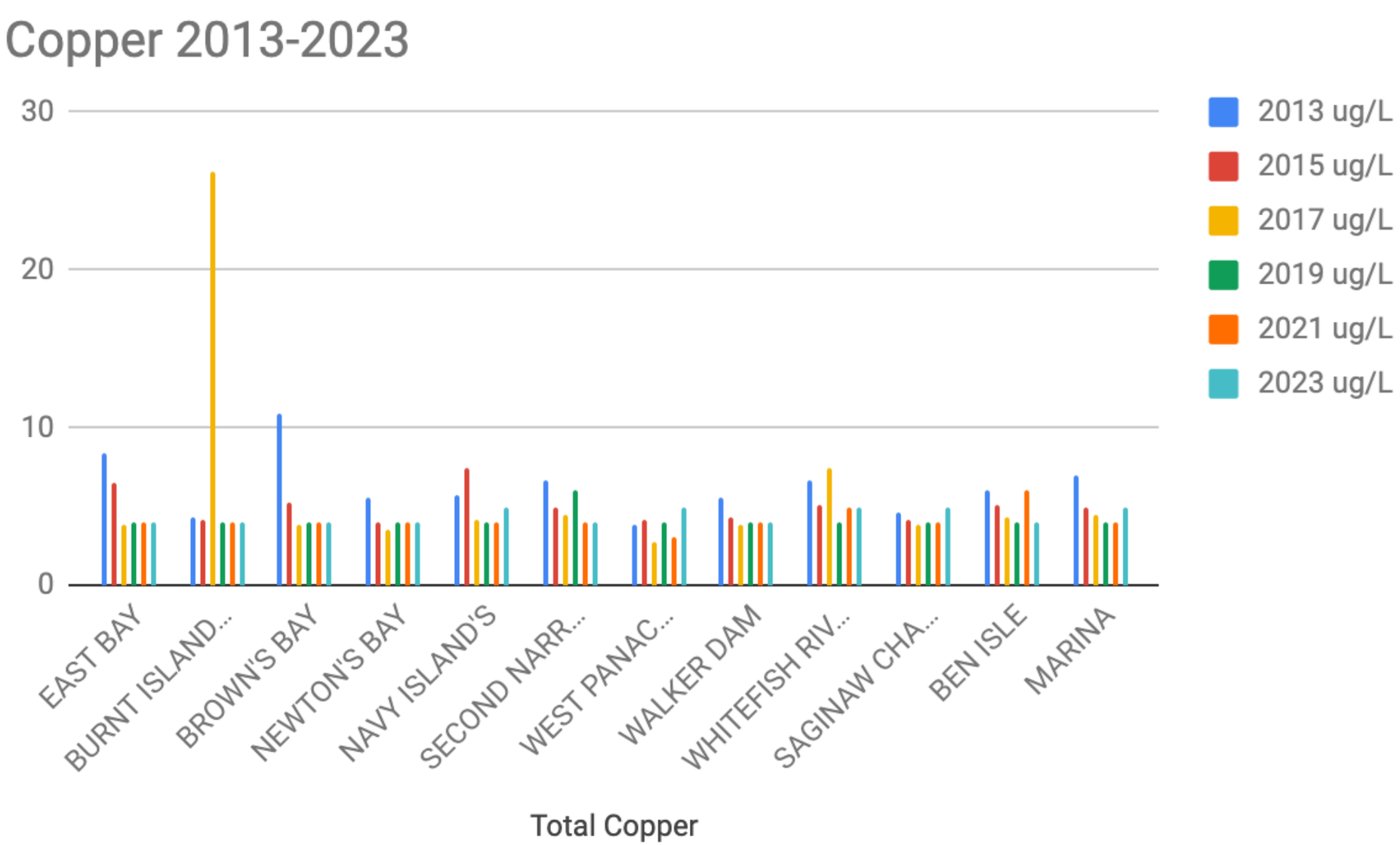
Total Arsenic 2013-23



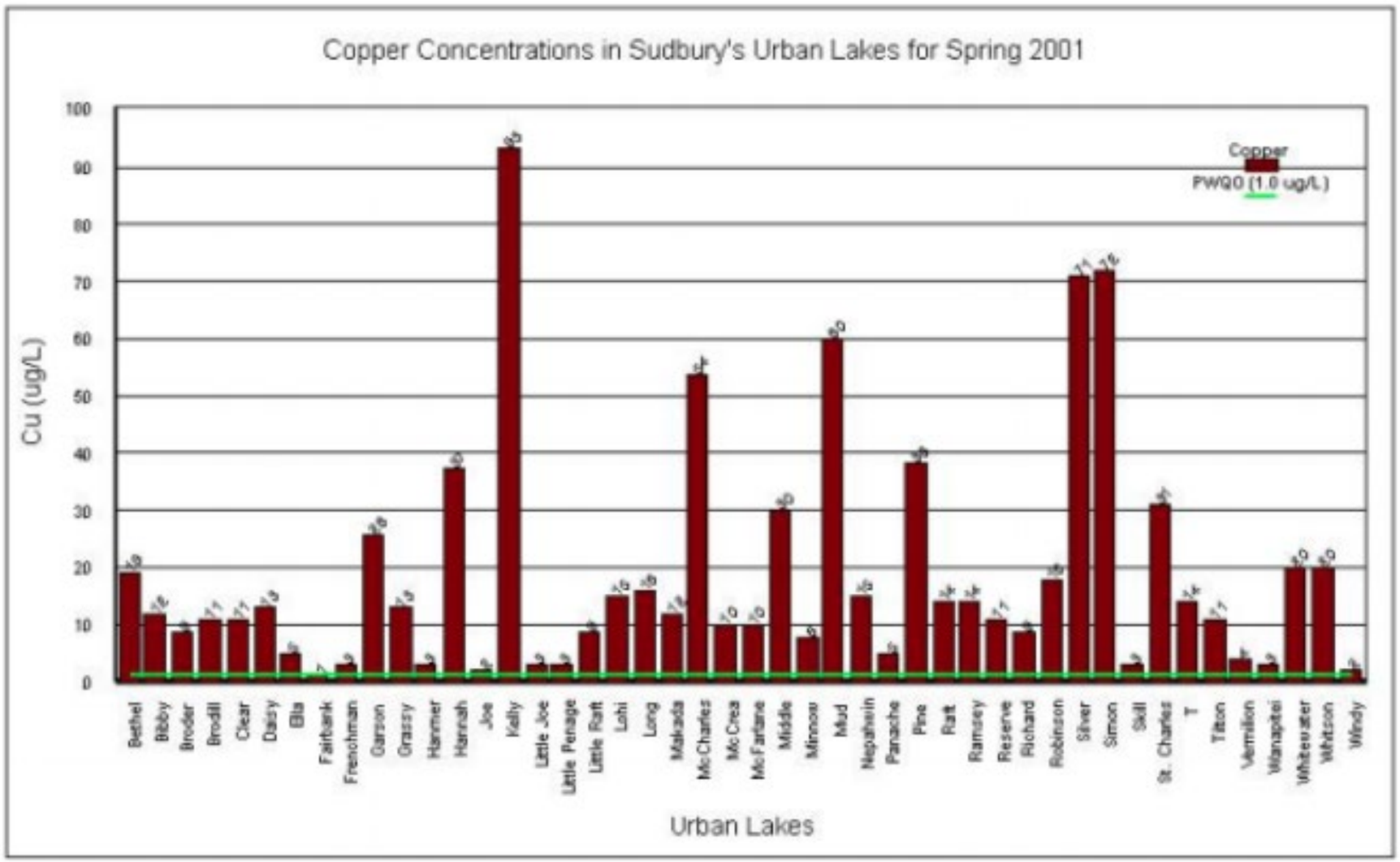
Copper 2023

- Copper is found in abundance in Sudbury Lakes and thus values can be found that exceed PWQO values.
- These levels of Copper do not represent any health risks

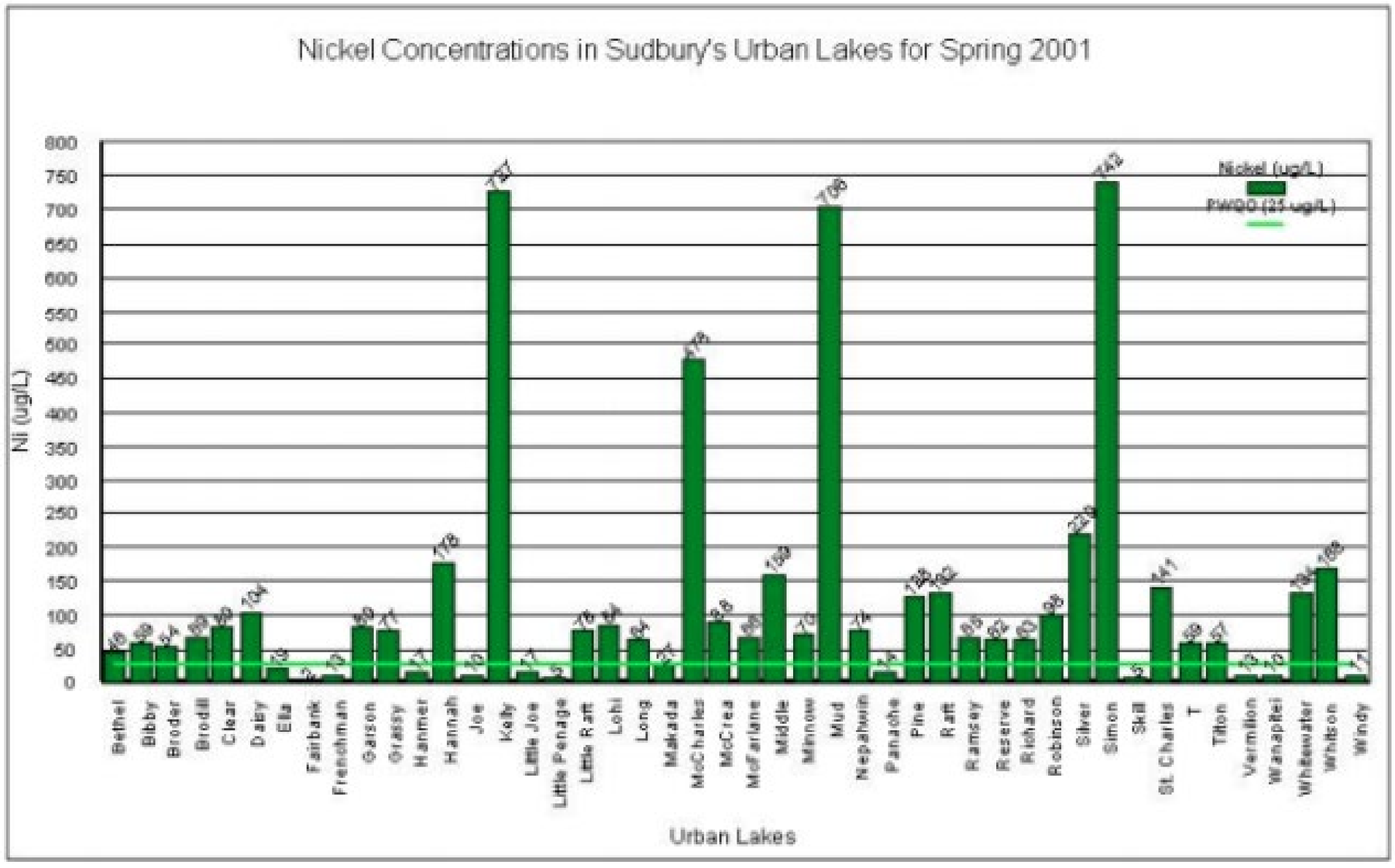
Total Copper 2013-23



Cu City of Sudbury Lakes 2001



Ni City of Sudbury Lakes 2001



Nickel 2023

- Nickel - No levels greater than PWQO

- Nickel is obviously a metal that is abundant in the local area

Cadmium 2023

- Cadmium -
  - Detectable Levels of Cadmium found at:
    - Burnt Island Narrows (**0.03** ug/L)
    - Whitefish River (**0.02** ug/L)

  - Measureable Cadmium in lake (<0.02 ug/L at all other sites) **- Ministry Standard 0.1 ug/L**

  - Cadmium may be released to water by **natural weathering processes**, discharge from industrial facilities or sewage treatment plants, atmospheric deposition, leaching from landfills or soil, or phosphate fertilizers

Cobalt 2023

- Cobalt
  - No detectable levels of Cobalt found in the lake this year
  - (<0.1 ug/L at all other sites) - **Ministry Standard 0.9 ug/L**

- Cobalt is commonly found in the environment at low levels
- Presence of Cobalt might be associated with mining activity

Lead 2023

- Lead
  - Detectable Levels of Lead found at:
    - Brown's Bay = 0.1ug/L
  - (<0.1 ug/L at all other sites) - **Ministry Standard 1 ug/L**

- Lead can get into drinking water by entering a drinking water supply or from lead containing piping, home plumbing or fixtures. Contamination of source water can occur due to discharge from industries that burn fossil fuels, mine, smelt, and manufacture.

Other Metals 2023

- Chromium, Mercury - No measurable levels
- All other Metals:

  There were no other metals present at any site in excess of the PWQO Standards for that Metal.