Annual Weather Station Maintenance Report

2024

Government of Newfoundland & Labrador
Department of Environment and Climate Change
Water Resources Management Division

Prepared by:

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Overview

The Department of Environment and Climate Change – Water Resources Management Division (WRMD) operates and maintains a network of automated weather stations across the province. Reliable weather data is needed to support water resources management decisions and policy development. This network (see table below) is maintained by staff within the WRMD.

Automated Weather/Camera Stations in Operation (2024)

	Camera	Snow Water Equivalent (SWE)	Meteorological
Pippy Park in St. John's		✓	✓
Exploits River at Badger East of Stadium	✓		✓
Sandy Lake near Birchy Narrows (Camp 55)	✓	✓	✓
Humber River At Humber Village Bridge	✓		✓
Upper Humber River above Black Brook		✓	✓
Muskrat Falls MET	✓		✓
Metchin River near TLH		✓	✓
TLH between Churchill Falls and Lab City		✓	✓
Mud Lake Road MET			✓
Exploits below Noel Paul's Brook MET	✓		✓
Vale LH1 MET			✓
Vale LH2 MET			✓
Marathon-Gold MET		✓	✓
Conception Bay South MET			✓
Waterford River at Kilbride	✓		
Learys Brook at Prince Philip Drive	✓		
Exploits River at Badger Steps	✓		
Steady Brook 470 meters above Confluence to Humber River	✓		
Churchill River at end of Mud Lake Road - Level	✓		
Churchill River below Traverspine River	✓		
Goose River at Bridge	✓		
Mud Lake Outlet Tributary at Mud Lake	✓		
Churchill River above Grizzle Rapids	✓		
Exploits River at Bishop's Falls Trestle	✓		
Humber River at Nicholsville at Bridge	✓		

Purpose

Annual maintenance and accuracy checks are necessary to ensure not only the longevity of the equipment, but more importantly, to ensure the accuracy and validity of the data that is being reported by the stations. This is necessary to ensure ongoing program reliability, effectiveness, and delivery of high-quality results for the existing automated weather station network.

Pippy Park Weather Station

Station Details:

- Station Identification: NLENCL0001
- Station Installed: August 2004
- Parameters measured every fifteen minutes and updated every hour:
  - Air Temperature
  - Relative Humidity
  - Atmospheric Pressure
  - Dew Point Temperature
  - Precipitation
  - Wind Speed
  - Wind Direction
  - Solar Radiation
  - Sunshine Hours
  - Snow Water Equivalent
- Site Selection Rationale: Pilot weather station test site, verified that this technology can be integrated without issues within our existing infrastructure. A microclimate exists at this site due to the height of surrounding trees and development in close proximity to the weather station.
- Date Visited: Throughout 2024
- Location: N 47° 35’ 16.7” W 52° 44’ 1.3”
- Elevation: 101.2 m

Figure 1: Pippy Park Weather Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Model: CR1000X
  - Serial: 14253
  - Changed desiccant and humidity indicator card
- Anemometer:
  - Model: 05103-10 RM Young
  - Serial: 57031
  - Replaced speed bearings
- Temperature/Relative Humidity:
  - Model: HygroVUE10
  - Serial: E1337
  - Replaced temp/RH chip
- Barometric Pressure:
  - Model: CS106
  - Serial: BP06403
- Snow Water Equivalent:
  - Model: Fluidless Snow Pillow 5
- Heated Precipitation:
  - Model: H3 rain[e] Heated Tipping Bucket
  - Cleaned funnel and bucket of debris
- Solar Radiation:
  - Model: SPLite 2
  - Serial: 194492
  - Wiped lens
- Soil Moisture:
  - Model: STEVENS HydraProbe
- Precipitation (Weighing):
  - Model: OTT Pluvio^2 – Weighing Rain Gauge
  - Newly installed
- Site:
  - Area cleared of vegetation
  - Sized up potential locations for installing BC Standpipe

Follow-up tasks required:

- Regular scheduled maintenance
- Perform manual snow surveys for check on Fluidless Snow Pillow 5 measurements
- Install other precipitation methods
  - BC Standpipe

Exploits River at Badger East of Stadium

Station Details:

- Station Identification: NLENCL0002
- Station Installed: September 2008
- Camera image taken and transmitted every hour during the daytime
- Parameters measured every fifteen minutes and updated every hour:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Solar Radiation
    - Sunshine Hours
- Site Selection Rationale: Weather information collected at this site feeds into a flood forecast modelling system for the community of Badger.
- Date Visited: July 10th, July 26th, August 29th - 30th, September 4th, November 18th – 20th 2024
- Location: N 48° 58' 29.83" W 56° 2' 4.43"
- Elevation: 88.1 m

Figure 2: Exploits River at Badger Weather Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
    - Model: CR1000
    - Serial: 13443
    - Changed desiccant and humidity indicator card
    - Updated datalogger programming to accommodate newly installed TX325 transmitter due to GOES CS2 required upgrade
- Camera:
    - Model: CC5MPX
    - Cleaned camera lens
    - Replaced o-ring to keep moisture out
- Anemometer:
    - Model: RM Young 05103-10-L
    - Serial: 58072
    - Replaced speed bearings
- Temperature/Relative Humidity:
    - Model: HygroVUE10
    - Serial: E3899
    - Replaced temp/RH chip
- Snow Depth Sensor:
    - Model: SR50A Sonic Ranger
    - Serial: 31665
    - Replaced transducer with grill-less model due to pitting and peeling of surface foil
- Barometric Pressure:
    - Model: Young 61205V
    - Serial: BP05005
- Precipitation:
    - Model: Texas Electronics TE525WS
    - Serial: 44701-1007
    - Cleared bucket and funnel of any debris
- Solar Radiation:
    - Model: Kipp & Zonen SP LITE Pyranometer
    - Serial: 080135
    - Cleaned lens
- Solar Panel:
    - Model: 100W Enerwatt EWS-100P
    - Replaced 50W solar panel with 100W

Follow-up tasks required:

- Regular scheduled maintenance
- Installation of 52202 heated tipping bucket

Humber River at Humber Village Bridge

Station Details:

- Station Identification: NLENCL0003
- Station Installed: September 2009
- Image taken hourly and transmitted three times daily
- Parameters measured every fifteen minutes and downloaded hourly:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Solar Radiation
    - Sunshine Hours
- Site Selection Rationale: Weather information collected at this site is used for flood forecast monitoring of communities along the Humber River.
- Date Visited: August 6th 2024
- Location: N 48° 58' 58.21" W 57° 45' 38.04"
- Elevation: 7.6 m

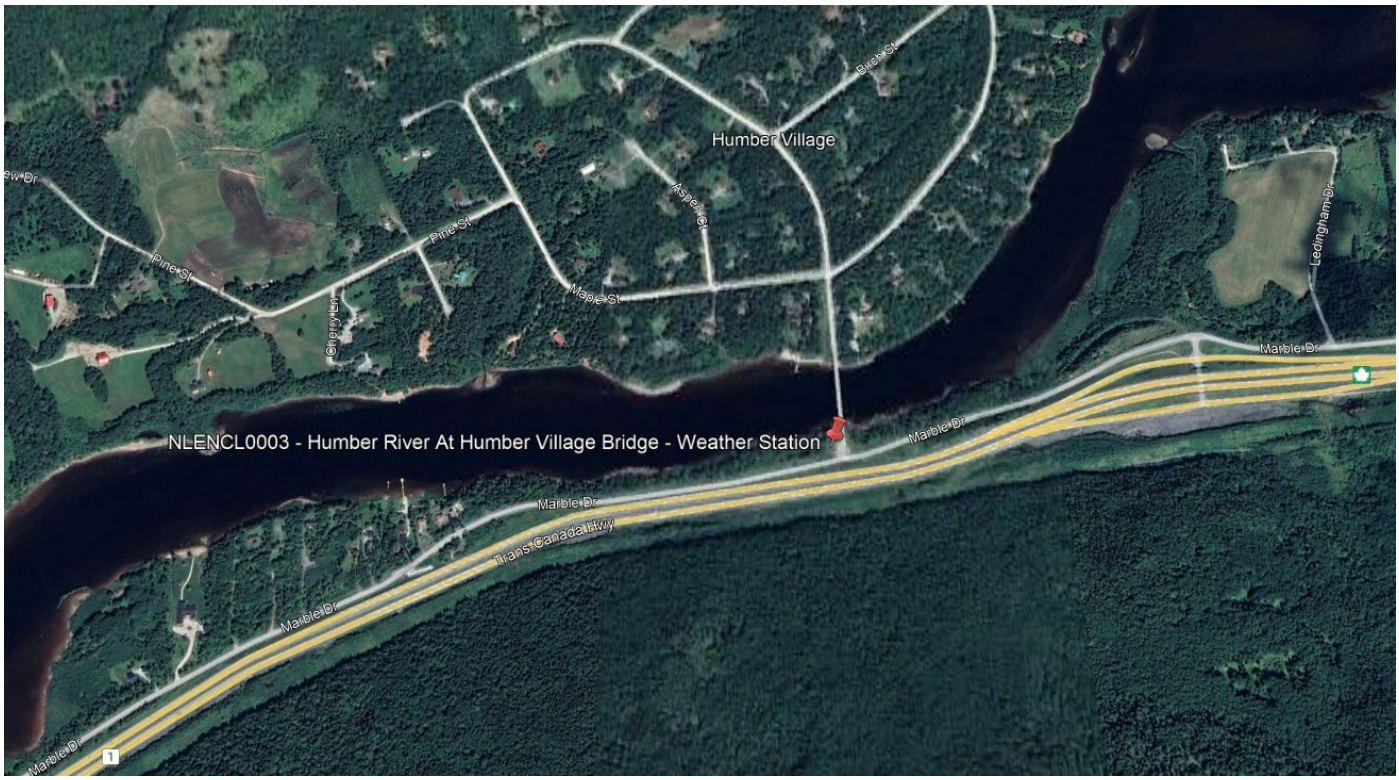

Figure 3: Humber River at Humber Village Bridge Weather Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
    - Model: CR1000
    - Serial: 22355
    - Changed desiccant and humidity indicator card
    - Data transmissions adjusted to use only dial up
- Camera:
    - Model: CC640
    - Serial: 01511
    - Cleaned enclosure window and lens, replaced desiccant
- Anemometer:
    - Model: RM Young 05103-10
    - Serial: 130198
    - Replaced speed bearings
- Temperature/Relative Humidity:
    - Model: HygroVUE10
    - Serial: E3852
    - Replaced temp/RH chip
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: C13213
    - Replaced transducer due to pitting and peeling of surface foil
- Barometric Pressure:
    - Model: 61205V
    - Serial: BP05888
- Precipitation:
    - Model: TE525WS Texas Electronics
    - Cleared bucket and funnel of any debris
- Solar Radiation:
    - Model: Kipp & Zonen SP LITE Pyranometer
    - Serial: 080395
    - Cleaned lens
- Compound:
    - Cleared vegetation

Follow-up tasks required:

- Regular scheduled maintenance
- Installation of 52202 heated tipping bucket
- Replace CC640 camera with updated model

Sandy Lake near Birchy Narrows (Camp 55)

Station Details:

- Station Identification: NLENCL0005
- Station Installed: November 2010
- Image taken and transmitted every hour during the daytime
- Parameters measured every fifteen minutes and updated hourly:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Snow Water Equivalent (TI)
    - Snow Water Equivalent (K)
    - Soil Moisture
    - Solar Radiation
    - Sunshine Hours
- Site Selection Rationale: Weather data collected at this site is used in flood forecasting operations for communities along the Humber River that are at risk of flooding during springtime snowmelt.
- Date Visited: August 8th 2024
- Location: N 49° 16' 28.30" W 56° 51' 5.80"
- Elevation: 119.8 m

Figure 4: Sandy Lake near Birchy Narrows (Camp 55) Snow Monitoring Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
    - Model: CR1000
    - Serial: 24833
    - Changed desiccant and humidity indicator card
- Camera:
    - Model: CC640
    - Serial: 01654
    - Cleaned enclosure window and lens, replaced desiccant
- Anemometer:
    - Model: 05103AP-10-L RM Young Wind Monitor Alpine Version
    - Serial: 83400
    - Replaced speed bearings
- Temperature/Relative Humidity:
    - Model: HygroVUE10
    - Replaced temp/RH chip
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: 2999
    - Replaced transducer due to pitting and peeling of surface foil
- Barometric Pressure:
    - Model: Young 61302V
    - Serial: BPA1405
- Precipitation:
    - Model: Texas Electronics TE525WS
    - Serial: 42377-1009
    - Cleared bucket and funnel of any debris
- Solar Radiation:
    - Model: Kipp & Zonen SP LITE Pyranometer
    - Serial: 091169
    - Cleaned lens
- Snow Water Equivalent:
    - Model: CS725
    - Serial: 1015

Follow-up tasks required:

- Regular scheduled maintenance
- Installation of TX325 CS2 GOES Transmitter to replace soon to be obsolete TX312 CS1 GOES Transmitter
- Replace CC640 camera with updated model

Muskrat Falls MET

Station Details:

- Station Identification: NLENCL0006
- Station Installed: July 2014
- Parameters measured every fifteen minutes and downloaded hourly:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Wind Chill
    - Humidex
    - Precipitation
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Solar Radiation
    - Sunshine Hours
- Site Selection Rationale: Provides essential meteorological information for site operations, water level analysis, flood forecasting, hydropower generation, wildlife studies, and climate change adaptation in the province. Provides weather data for accurate interpretation of water quality data and related events along the Churchill River
- Date Visited: October 8th 2024
- Location: N 53° 14' 43.64" W 60° 46' 42.15"
- Elevation: 11.9 m

Figure 5: Muskrat Falls Weather Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
    - Model: CR1000
    - Serial: 56808
    - Changed desiccant and humidity indicator card
- Cameras:
    - Model: CC5MPX
    - Serial: 01317, 01314
    - Cleaned both camera lens'
- Anemometer:
    - Model: 05130AP-10-L RM Young Alpine
    - Serial: 98398
    - Replaced speed bearings
- Temperature/Relative Humidity:
    - Model: HygroVUE10
    - Serial: 6013
    - Newly installed, replaced old HC2-S3
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: 6755
    - Replaced transducer due to pitting and peeling of surface foil
- Barometric Pressure:
    - Model: CS106
    - Serial: J1660083
- Precipitation:
    - Model: Texas Electronics TE-525WS
    - Serial: 53322-1012
    - Cleared bucket and funnel of any debris
- Solar Radiation:
    - Model: Kipp & Zonen SP LITE2 Pyranometer
    - Serial: 136646
    - Cleaned lens

Follow-up tasks required:

- Regular scheduled maintenance
- Separate power system so cameras and MET equipment use different battery banks
- Seeking permission to hook station up to powerline near tower

Upper Humber River above Black Brook

Station Details:

- Station Identification: NLENCL0007
- Station Installed: September 30th 2015
- Parameters measured every fifteen minutes and transmitted every hour:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Snow Water Equivalent (TI)
    - Snow Water Equivalent (K)
    - Solar Radiation
    - Sunshine Hours
- Site Selection Rationale: Weather data collected at this site is used in flood forecasting operations for communities along the Humber River that are at risk of flooding during springtime snowmelt.
- Date Visited: August 7th 2024
- Location: N 49° 37' 6.24" W 57° 17' 41.20"
- Elevation: 302.4 m

Figure 6: Upper Humber River above Black Brook Snow Monitoring Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
    - Model: CR1000
    - Replaced faulty datalogger
    - Changed desiccant and humidity indicator card
- Anemometer:
    - Model: 05103AP-10-L RM Young Wind Monitor Alpine Version
    - Serial: 98399
    - Replaced speed bearings
- Temperature/Relative Humidity:
    - Model: HygroVUE10
    - Replaced temp/RH chip
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: 1670
    - Replaced transducer due to pitting and peeling of surface foil
- Barometric Pressure:
    - Model: 61302V
    - Serial: BPA140
- Precipitation:
    - Model: Texas Electronics TE525WS
    - Serial: 432-30-210
    - Cleared bucket and funnel of any debris
- Precipitation (Weighing):
    - Model: OTT Pluvio^2 – Weighing Rain Gauge
    - Emptied catch basin
- Solar Radiation:
    - Model: Kipp & Zonen SP LITE Pyranometer
    - Serial: 091168
    - Cleaned lens
- Snow Water Equivalent:
    - Model: CS725
    - The CS725 is not field serviceable

Follow-up tasks required:

- Regular scheduled maintenance
- Installation of TX325 CS2 GOES Transmitter to replace soon to be obsolete TX312 CS1 GOES Transmitter

TLH between Churchill Falls and Lab City

Station Details:

- Station Identification: NLENCL0008
- Station Installed: October 2017
- Parameters measured every fifteen minutes and transmitted every hour:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Snow Water Equivalent (TI)
    - Snow Water Equivalent (K)
    - Solar Radiation
    - Sunshine Hours
- Site Selection Rationale: This station provides information for hydropower generation operations and flood forecast monitoring for the Churchill River
- Date Visited: October 10th 2024
- Location: N 53° 21' 35.23" W 65° 33' 41.27"
- Elevation: 542.8 m

Figure 7: TLH between Churchill Falls and Lab City Snow Monitoring Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
    - Model: CR1000
    - Changed desiccant and humidity indicator card
- Anemometer
    - Model: 05103AP-10-L RM Young Alpine Version
    - Serial: 113751
    - Replaced speed bearings
- Temperature/Relative Humidity:
    - Model: HygroVUE10
    - Serial: E3382
    - Replaced temp/RH chip
    - Added redundant secondary temperature probe
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: 9170
    - Replaced transducer due to pitting and peeling of surface foil
- Barometric Pressure:
    - Model: CS106
    - Serial: N2250425
- Precipitation:
    - Model: TB4-L
    - Cleared bucket and funnel of any debris
- Solar Radiation:
    - Model: Kipp & Zonen SP LITE2 Pyranometer
    - Serial: 173212
    - Cleaned lens
- Communication:
    - Model: TX321-G GOES Transmitter
    - Antenna: FTS EON2 GOES/Meteosat Antenna

Follow-up tasks required:

- Regular scheduled maintenance

Metchin River near TLH

Station Details:

- Station Identification: NLENCL0009
- Station Installed: October 2017
- Parameters measured every fifteen minutes and transmitted every hour:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Snow Water Equivalent (TI)
    - Snow Water Equivalent (K)
    - Solar Radiation
    - Sunshine Hours
- Site Selection Rationale: This station provides information for hydropower generation operations and flood forecast monitoring for the Lower Churchill River
- Date Visited: October 9th 2024
- Location: N 53° 26' 10.12" W 63° 14' 1.38"
- Elevation: 329.8 m

Figure 8: Metchin River near TLH Snow Monitoring Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
    - Model: CR1000
    - Changed desiccant and humidity indicator card
- Anemometer
    - Model: 05103AP-10-L RM Young Alpine Version
    - Serial: 152871
    - Replaced speed bearings
- Temperature/Relative Humidity:
    - Model: HygroVUE10
    - Serial: E3384
    - Replaced temp/RH chip
    - Added redundant secondary temperature probe
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: 9171
    - Replaced transducer due to pitting and peeling of surface foil
- Barometric Pressure:
    - Model: CS106
    - Serial: N2250424
- Precipitation:
    - Model: TB4-L
    - Cleared bucket and funnel of any debris
- Solar Radiation:
    - Model: Kipp & Zonen SP LITE2 Pyranometer
    - Serial: 173211
    - Cleaned lens

Follow-up tasks required:

- Regular scheduled maintenance

Exploits below Noel Paul's Brook MET

Station Details:

- Station Identification: NLENCL0010
- Station Installed: November 2020
- Image taken and transmitted once a day at 11:30 AM NST
- Parameters measured every fifteen minutes and transmitted every hour:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Snow Water Equivalent
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Solar Radiation
    - Sunshine Hours
- Site Selection Rationale: Selected with consultation from Environment Canada and for use in flood forecasting models.
- Date Visited: July 11th 2024
- Location: N 48° 50' 40.8" W 56° 16' 9.9"
- Elevation: 125.6 m

Figure 9: Exploits below Noel Paul's Brook MET Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Model: CR1000X
  - Serial: 7468
  - Changed desiccant and humidity indicator card
- Snow Depth Sensor:
  - Model: SR50A-EE Sonic Ranger
  - Serial: 11430
  - Replaced transducer due to pitting and peeling of surface foil
- Precipitation:
  - Model: TR-525-M-10-CA Texas Electronics
  - Serial: 77405-818
  - Cleared funnel and bucket of any debris
- Temperature/Relative Humidity:
  - Model: CS215
  - Serial: E21317
  - Replaced temp/RH chip
- Anemometer:
  - Model: 05103AP-10-L RM Young Alpine Version
  - Replaced speed bearings
- Barometric Pressure:
  - Mode: CS106 Barometric Pressure Sensor
  - This sensor is not field serviceable, nor can it be field calibrated
- Solar Radiation:
  - Model: SP Lite2 Pyranometer
  - Wiped lens
- GPS Antenna:
  - Model: Trimble GPS Antenna P/N 57861-20
  - Serial: 3480213
- Camera:
  - Model: NuPoint Fixed Sight Satellite Camera System
  - Serial: 13000464
- Snow Water Equivalent:
  - Model: Fluidless Snow Pillow 5
  - Newly installed

Follow-up tasks required:

- Regular scheduled maintenance
- Perform manual snow surveys for check on Fluidless Snow Pillow 5 measurements

Mud Lake Road MET

Station Details:

- Station Identification: NLENCL0011
- Station Installed: October 2020
- Parameters measured every fifteen minutes and transmitted every hour:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Soil Moisture
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Solar Radiation
    - Sunshine Hours
- Site Selection Rationale: NLENCL0004 needed to be moved as the coastline is deteriorating. This is a relocated site with mostly new equipment. Selected with consultation from Environment Canada and for use in flood forecasting models.
- Date Visited: October 7th 2024
- Location: N 53° 20' 6.9" W 60° 11' 23.5"
- Elevation: 0 m

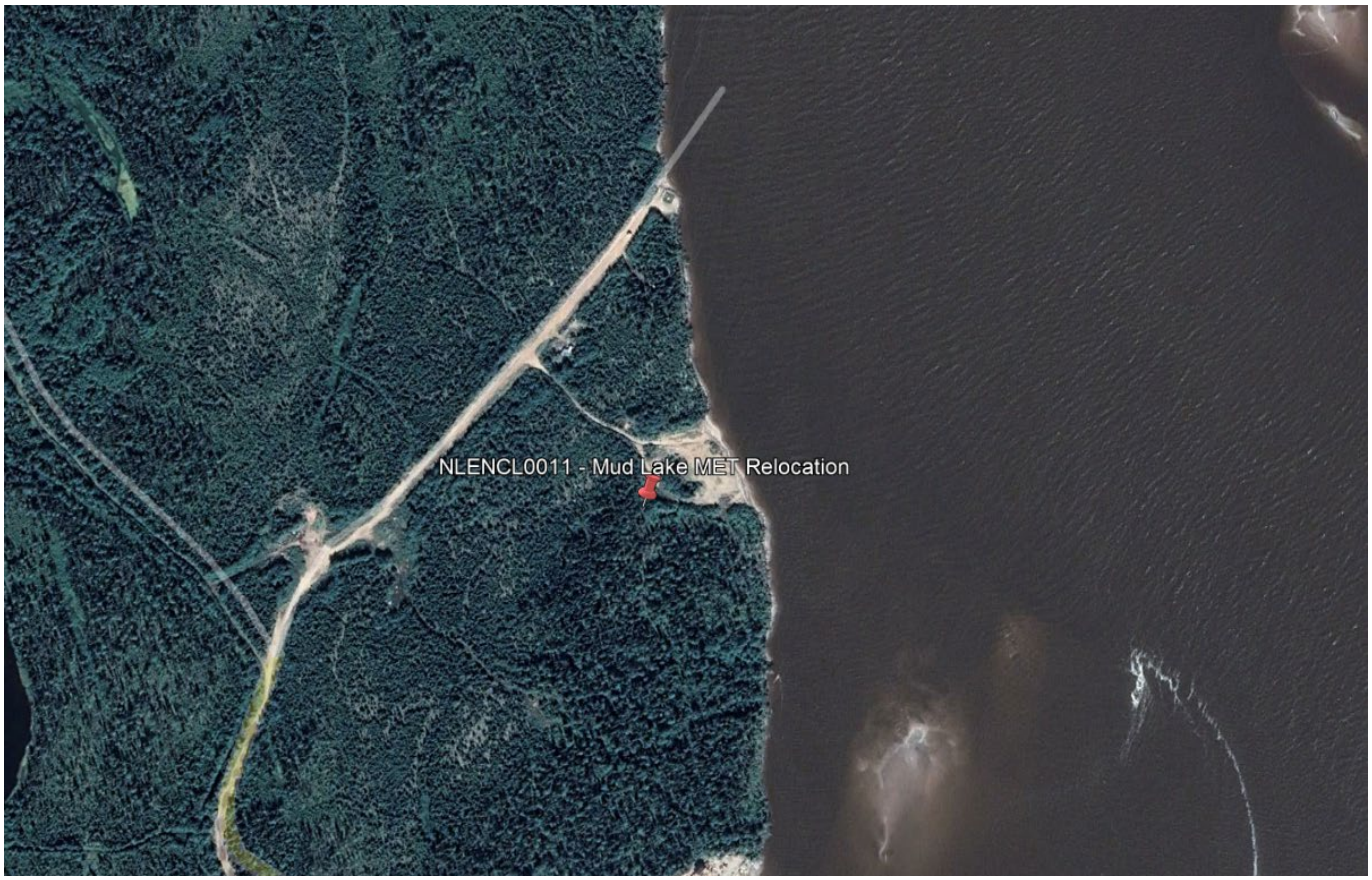

Figure 10: Mud Lake Road MET Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Model: CR1000X
  - Serial: 19389
  - Changed desiccant and humidity indicator card
- Snow Depth Sensor:
  - Model: SR50A-EE Sonic Ranger
  - Serial: 12504
  - Replaced transducer due to pitting and peeling of surface foil
- Precipitation:
  - Model: TE525WS Texas Electronics
  - Serial: 79341-319
  - Cleared funnel and bucket of any debris
- Temperature/Relative Humidity:
  - Model: HygroVUE10
  - Serial: E1342
  - Replaced temp/RH chip
- Anemometer:
  - Model: 05108-45-L40
  - Serial: 175874
  - Changed speed bearings
- Barometric Pressure:
  - Mode: CS106 Barometric Pressure Sensor
  - Serial: J4430010
- Solar Radiation:
  - Model: SP Lite2 Pyranometer
  - Serial: 205096
  - Wiped lens
- Soil Moisture:
  - Model: Stevens Hydra-Probe II
  - Serial: 253660
- Communication:
  - Model: Microhard 4GMini
- Antenna:
  - Model: C2444 9dB Yagi Antenna
- Solar Panel:
  - Model: SLP050-12C1D2 – 50 Watt 12 Volt with Mount & Regulator

Follow-up tasks required:

- Regular scheduled maintenance

Vale LH1 MET

Station Details:

- Station Identification: NLENCL0012
- Station Installed: November 2020
- Parameters measured every fifteen minutes and transmitted every hour:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Wind Speed
    - Wind Direction
- Site Selection Rationale: This station was installed in partnership with Vale Long Harbour. Vale required MET data from on site and we have the infrastructure in place already to host their data.
- Date Visited: May 1st 2024
- Location: N 47° 25' 27" W 53° 45' 57.7"
- Elevation: 163.1 m

Figure 11: Vale LH1 MET Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Model: CR1000X
  - Serial: 15039
- Precipitation:
  - Model: 52202-L RM Young Heated Rain and Snow Gauge
- Temperature/Relative Humidity:
  - Model: HygroVUE10
- Anemometer:
  - Model: RMY86000 Ultrasonic Anemometer
- Barometric Pressure:
  - Mode: CS106 Barometric Pressure Sensor
  - Serial: S1050162
- Communication:
  - Model: Microhard 4GMini
  - Serial: 012-1254949
- Compound:
  - Determined steps and equipment needed to get station running

Follow-up tasks required:

- Industry partner to determine if station will be repaired or decommissioned

Vale LH2 MET

Station Details:

- Station Identification: NLENCL0013
- Station Installed: May 2022
- Parameters measured every fifteen minutes and transmitted every hour:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Wind Speed
    - Wind Direction
- Site Selection Rationale: This station was installed in partnership with Vale Long Harbour. They required MET data from the community and we have the infrastructure in place already to host their data.
- Date Visited: January 29th 2025
- Location: N 47° 25' 49.23" W 53° 49' 14.36"
- Elevation: 5 m

Figure 12: Vale LH2 MET Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Model: CR1000X
  - Serial: 15038
  - Changed desiccant and humidity indicator card
- Precipitation:
  - Model: 52202-L RM Young Heated Rain and Snow Gauge
  - Cleared funnel and bucket of any debris
- Temperature/Relative Humidity:
  - Model: CS215
  - Replaced temp/RH chip
- Anemometer:
  - Model: 05108-45
  - Changed speed bearings, vertical shaft bearings and potentiometer
- Barometric Pressure:
  - Mode: CS106 Barometric Pressure Sensor
- Communication:
  - Model: Microhard 4GMini
- Compound:
  - T30 Fold-Over Tower has signs of structural stress from intense wind gusts on site and will need to be reinforced by guywires

Follow-up tasks required:

- Regular scheduled maintenance
- Replace CS215 with repaired HygroVUE10
- Install guywires in the Spring once purchased by industry partner

Marathon-Gold MET

Station Details:

- Station Identification: NLENCL0014
- Station Installed: June 2023
- Parameters measured every fifteen minutes and transmitted every hour:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Soil Moisture
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Solar Radiation
    - Sunshine Hours
    - Snow Water Equivalent
- Site Selection Rationale: Provides essential meteorological information for site operations, water level analysis, flood forecasting, and climate change adaptation in the province. Provides weather data for accurate interpretation of water quality data and related events in the work area.
- Date Visited: July 24th 2024
- Location: N 48° 20' 45.80" W 57° 9' 7.04"
- Elevation: 342 m

Figure 13: Marathon-Gold MET Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Model: CR1000X
  - Serial: 43543
  - Changed desiccant and humidity indicator card
- Snow Depth Sensor:
  - Model: SnowVUE10
  - Serial: 10293
  - Replaced transducer due to pitting and peeling of surface foil
- Precipitation:
  - Model: ARG314
  - Serial: 223812
  - Cleared funnel and bucket of any debris
- Temperature/Relative Humidity:
  - Model: HygroVUE10
  - Serial: E3851
  - Replace temp/RH chip
- Anemometer:
  - Model: 05108-45-L40
  - Serial: 195560
  - Changed speed bearings
- Barometric Pressure:
  - Mode: BaroVUE10
  - Serial: 1771
- Solar Radiation:
  - Model: SP Lite2 Pyranometer
  - Serial: 222279
  - Wiped lens
- Soil Moisture:
  - Model: Stevens Hydra-Probe II
  - Serial: 281213
- Snow Water Equivalent:
  - Model: Fluidless Snow Pillow 5
  - Newly installed but requires troubleshooting early in 2025
- Antenna:
  - Model: C2444 9dB Yagi Antenna

Follow-up tasks required:

- Regular scheduled maintenance
- Repair and troubleshoot Fluidless Snow Pillow
- Perform manual snow surveys for check on Fluidless Snow Pillow 5 measurements

Conception Bay South MET

Station Details:

- Station Identification: NLENCL0015
- Station Installed: October 2024
- Parameters measured every fifteen minutes and transmitted every hour:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Soil Moisture
    - Humidex
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Solar Radiation
    - Sunshine Hours
    - Snow Water Equivalent
    - Wind Chill
- Site Selection Rationale: This station was installed in partnership with the Town of Conception Bay South. They are looking to monitor the microclimate that exists in the town and we have agreed to host their data.
- Date Visited: October 28th 2024
- Location: N 47° 29' 2.14" W 53° 1' 0.63"
- Elevation: 60 m

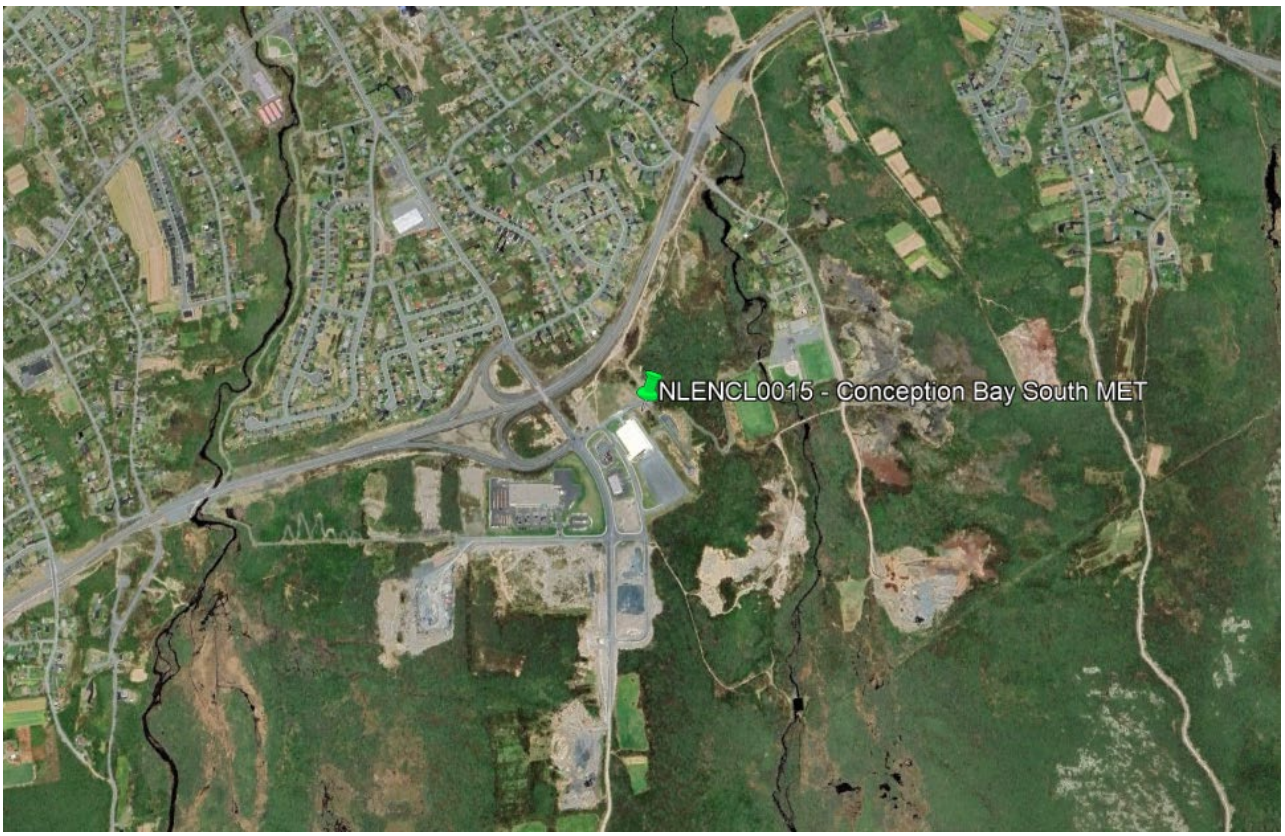

Figure 14: Conception Bay South MET Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Model: CR1000X
  - Serial: 59930
  - Newly installed
- Snow Depth Sensor:
  - Model: SnowVUE10
  - Serial: 12029
  - Newly installed
- Precipitation:
  - Model: 52202
  - Serial: TB 19387
  - Newly installed
- Temperature/Relative Humidity:
  - Model: HygroVUE10
  - Serial: E60960
  - Newly installed
- Anemometer:
  - Model: 05108-45-L40
  - Serial: WM190811
  - Newly installed
- Barometric Pressure:
  - Mode: BaroVUE10
  - Serial: 3480
  - Newly installed
- Solar Radiation:
  - Model: SP Lite2 Pyranometer
  - Serial: 244692
  - Newly installed
- Soil Moisture:
  - Model: TEROS12
  - Newly installed
- Humidex/Wind Chill:
  - Model: Black Globe
  - Newly installed
- Modem:
  - Model: Bulletplus-NA2
  - Serial: 012-1562582
  - Newly installed

Follow-up tasks required:

- Regular scheduled maintenance
- Install alter shield around tipping bucket to prevent erroneous precipitation measurements

Waterford River at Kilbride

Station Details:

- Station Identification: NF02ZM0009
- Station Installed: July 21st 2015
- Image taken and transmitted every half an hour during the daytime
- Site Selection Rationale: Provides essential information for visual image of changing water levels in this urban stream.
- Date Visited: Throughout 2024
- Location: N 47° 31' 44.44" W 52° 44' 41.04"
- Elevation: 32.9 m

Figure 15: Waterford River at Kilbride Camera Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Datalogger removed due to being unnecessary with new camera model
- Camera:
  - Model: Hikvision DS 2CD2012
  - Newly installed
- Modem:
  - Model: BULLETCAT4-GL 4G Mini
  - Serial: 5958202

Follow-up tasks required:

- Regular scheduled maintenance

Learys Brook at Prince Philip Drive

Station Details:

- Station Identification: NF02ZM0178
- Station Installed: July 21st 2015
- Image taken and transmitted every half an hour during the daytime
- Site Selection Rationale: Provides essential information for visual image of changing water levels in this urban stream.
- Date Visited: Throughout 2024
- Location: N 47° 33' 50.17" W 52° 44' 55.33"
- Elevation: 66.1 m

Figure 16: Learys Brook at Prince Philip Drive Camera Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Camera:
  - Model: Hikvision DS 2CD2012
  - Power cycled
  - Lens wiped
- Modem:
  - Model: BULLETCAT4-GL 4G Mini
  - Serial: 12-1559113

Follow-up tasks required:

Regular scheduled maintenance

Exploits River at Badger Steps

Station Details:

- Station Identification: NLENCM0001
- Station Installed: November 2009
- Image taken and transmitted every hour during the daytime
- Site Selection Rationale: Snow monitoring provides essential information for flood forecasting, hydropower generation and for climate change adaptation in the province. WRMD provides flood forecasting services, in which snow monitoring has been integrated, for the community of Badger in the Exploits River Basin.
- Date Visited: July 10th 2024
- Location: N 48°56'25.86" W 55°58'42.98"
- Elevation: 100.6 m

Figure 17: Exploits River at Badger Steps Camera Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Model: CR1000
  - Replaced desiccant and humidity indicator card
  - Cleared memory of USR drive
- Camera:
  - Model: CC5MPX
  - Wiped camera lens
- Compound:
  - Replaced battery
  - Placed second battery for extra battery bank over the winter months

Follow-up tasks required:

- Regular scheduled maintenance

Steady Brook 470 meters above Confluence to Humber River

Station Details:

- Station Identification: 02YL012
- Station Installed: June 23rd 2015
- Images taken up and down stream, transmitted every hour during the daytime
- Two cameras: one aimed upstream, one aimed downstream
- Site Selection Rationale: WRMD provides flood forecasting services, in which snow monitoring has been integrated, for the communities of Deer Lake and Steady Brook in the Humber River Basin.
- Date Visited: August 6th 2024
- Location: N 48° 57' 11.59" W 57° 49' 40.02"
- Elevation: 7.3 m

Figure 18: Steady Brook 470 meters above Confluence to Humber River Camera Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Model: CR1000X
  - Serial: 43548
  - Changed desiccant and humidity indicator card
- Camera:
  - Model: 2 x CC5MPX
  - Serial: 2507/2508
- Compound:
  - Replaced solar panel with larger module to accommodate double camera setup
  - Replaced solar controller to accommodate larger module panel

Follow-up tasks required:

- Regular scheduled maintenance

Churchill River at end of Mud Lake Road – Water Level

Station Details:

- Station Identification: 03OE018
- Station Installed: Oct 24, 2018
- Image taken and transmitted every hour during the daytime
- Site Selection Rationale: Selected with consultation from Environment Canada and for use in flood forecasting models.
- Date Visited: October 7th 2024
- Location: N 53°20'5.24" W 60°11'18.18”
- Elevation: 1.2 m

Figure 19: Churchill River at end of Mud Lake Road Camera Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
  - Model: CR800
  - Serial: 28914
  - Changed desiccant and humidity indicator card
- Camera:
  - Model: CCFC
  - Wiped lens
- Modem:
  - Model: BulletCAT4-GL 4G Mini
  - Serial: 012-1557626
  - Replaced malfunctioning modem

Follow-up tasks required:

- Regular scheduled maintenance
- Monitor connectivity to station

Churchill River below Traverspine River

Station Details:

- Station Identification: 03OE019
- Station Installed: Sept 23, 2018
- Image taken and transmitted every hour during the daytime
- Site Selection Rationale: Selected with consultation from Environment Canada and for use in flood forecasting models.
- Date Visited: Not visited in 2024
- Location: N 53°17'28.20" W 60°13'16.49"
- Elevation: 1.2 m

Figure 20: Churchill River below Traverspine River Camera Station Location

Tasks accomplished:

- Site not visited

Follow-up tasks required:

- Regular scheduled maintenance

Goose River at Bridge

Station Details:

- Station Identification: NLENHM0001
- Station Installed: Sept 23, 2018
- Image taken and transmitted every hour during the daytime
- Site Selection Rationale: Selected for use in flood forecasting models.
- Date Visited: October 22nd 2024
- Location: N 53°23'35.07" W 60°25'12.05"
- Elevation: 1.2 m

Figure 21: Goose River at Bridge Camera Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
    - Model: CR800
    - Serial: 43340
    - Changed desiccant and humidity indicator card
- Camera:
    - Model: CCFC
    - Wiped lens

Follow-up tasks required:

- Regular scheduled maintenance

Mud Lake at Mud Lake

Station Details:

- Station Identification: 03OE017
- Station Installed: Sept 23, 2018
- Image taken and transmitted once a day at 10:30 AM NST
- Site Selection Rationale: Selected with consultation from Environment Canada and for use in flood forecasting models.
- Date Visited: Not visited in 2024
- Location: N 53°18'14.10" W 60°10'2.37"
- Elevation: 1.2 m

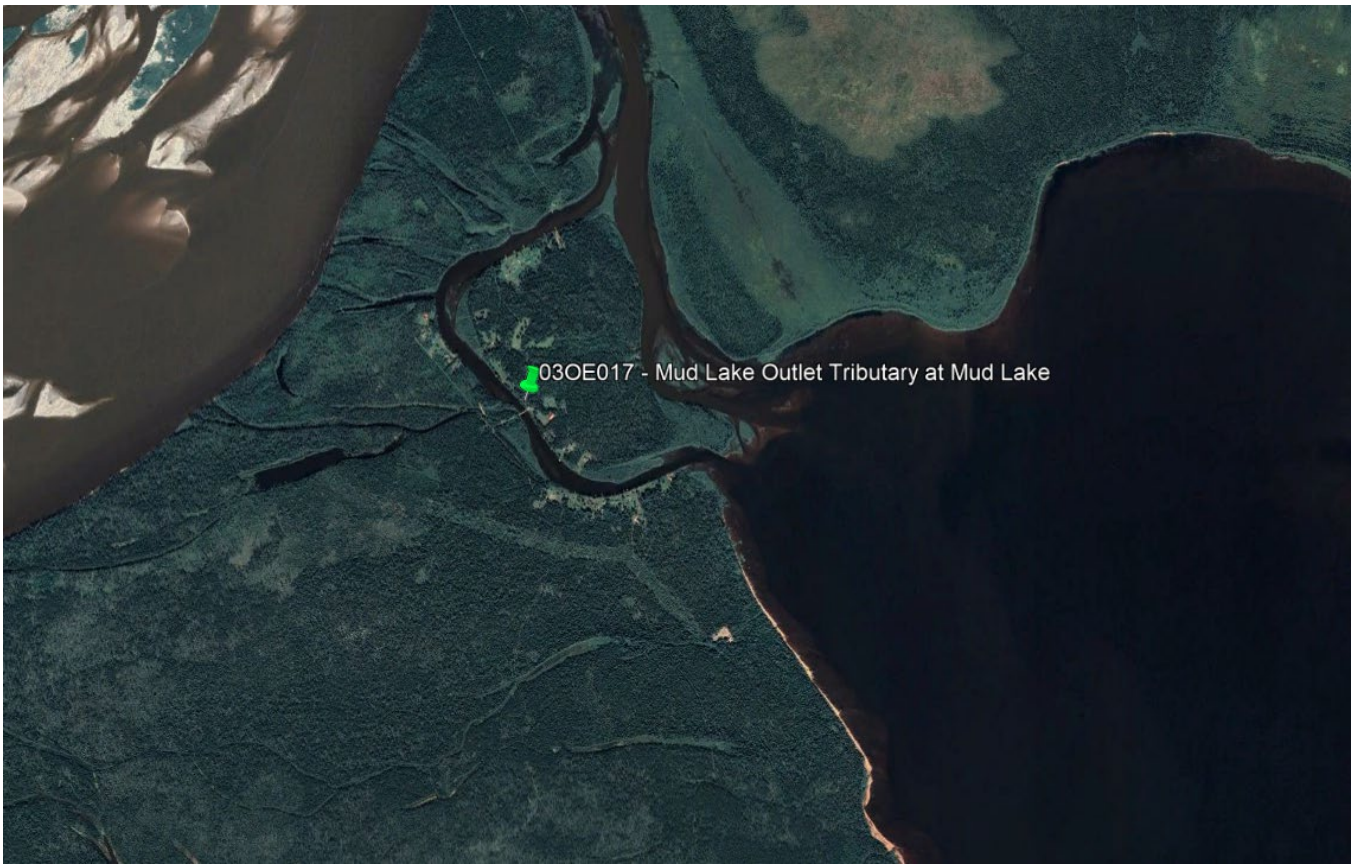

Figure 22: Mud Lake at Mud Lake Camera Station Location

Tasks accomplished:

- Camera:
  - Model: NuPoint Fixed Sight Satellite Camera System
  - Serial: 13000468

Follow-up tasks required:

- Regular scheduled maintenance

Churchill Falls above Grizzle Rapids

Station Details:

- Station Identification: 03OE013
- Station Installed: July 3rd 2019
- Image taken and transmitted once a day at 10:30 AM NST
- Site Selection Rationale: Selected with consultation from Environment Canada and for use in flood forecasting models.
- Date Visited: Not visited in 2024
- Location: N 52°58'12.22" W 61°26'43.48"
- Elevation: 62.5 m

Figure 23: Churchill River above Grizzle Rapids Camera Station Location

Tasks accomplished:

- Camera:
  - Model: NuPoint Fixed Sight Satellite Camera System
  - Serial: 14000078

Follow-up tasks required:

- Regular scheduled maintenance

Exploits River at Bishop's Falls Trestle

Station Details:

- Station Identification: NLENHM0003
- Station Installed: Sept 9 - 10, 2019
- Image taken and transmitted every hour during the daytime
- Parameters measured every fifteen minutes and transmitted every hour:
    - Distance from Bridge to Water
- Site Selection Rationale: Selected with consultation from Environment Canada and for use in flood forecasting models.
- Date Visited: July 9th, 2024
- Location: N 49° 0'29.50" W 55°29'23.80"
- Elevation: 36.0 m

Figure 24: Exploits River at Bishop's Falls Trestle Camera Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
    - Model: CR800
    - Serial: 44026
    - Changed desiccant and humidity indicator card
- Camera:
    - Model: CC5MPX
    - Serial: 01293
    - Lens wiped

Follow-up tasks required:

- Regular scheduled maintenance

Humber River at Nicholsville Bridge

Station Details:

- Station Identification: NLENHM0004
- Station Installed: Sept 10 - 11, 2019
- Image taken and transmitted every hour during the daytime
- Parameters measured every fifteen minutes and transmitted every hour:
    - Distance from Bridge to Water
- Site Selection Rationale: Selected with consultation from Environment Canada and for use in flood forecasting models.
- Date Visited: August 8th 2024
- Location: N 49°11'18.98" W 57°26'52.32"
- Elevation: 30.8 m

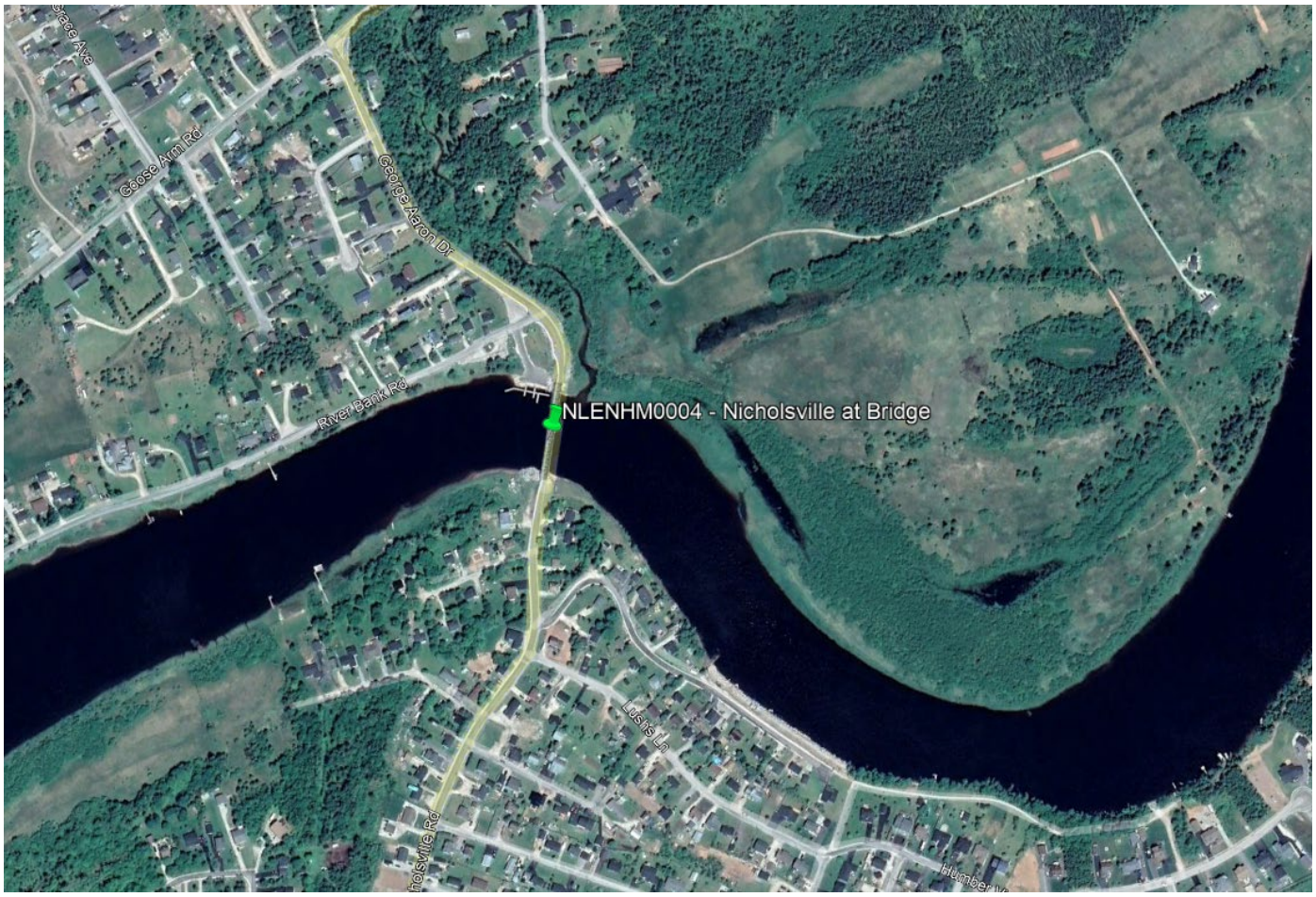

Figure 25: Humber River at Nicholsville Bridge Camera Station Location

Weather Station Annual Maintenance - 2024, Newfoundland and Labrador

Tasks accomplished:

- Datalogger:
    - Model: CR800
    - Serial: 44027
    - Changed desiccant and humidity indicator card
- Camera:
    - Model: CCFC
    - Lens wiped

Follow-up tasks required:

- Regular scheduled maintenance

The next scheduled annual maintenance trip will be completed by October 2025.