Annual Weather Station Maintenance Report

2018

Newfoundland Labrador

Government of Newfoundland & Labrador
Department of Municipal Affairs and Environment
Water Resources Management Division

Prepared by:

Leona Hyde
Environmental Monitoring Specialist
Water Resources Management Division
Department of Municipal Affairs and Environment
4th Floor, Confederation Building, West Block
PO Box 8700, St. John's NL A1B 4J6
Ph. No.: (709) 729 - 3597
Fax No.: (709) 729 - 0320
leonahyde@gov.nl.ca

Overview

The Department of Municipal Affairs and Environment's 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 Environmental Scientists within WRMD.

Automated Weather Stations in Operation (2018)

	Camera	Snow Monitoring	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	✓	✓	✓
Churchill River at End of Mud Lake Road	✓		✓
Muskrat Falls MET	✓		✓
Metchin River near TLH		✓	✓
TLH between Churchill Falls and Lab City		✓	✓
Waterford River at Kilbride	✓		
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	✓		

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 downloaded three times daily:
    - Air Temperature
    - Relative Humidity
    - Precipitation
    - Wind Speed
    - Wind Direction
- Site Selection Rationale: Pilot weather station test site, verified that this particular 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: Summer 2018
- Location: N 47° 35’ 16.7” W 52° 44’ 1.3”
- Elevation: 332 ft

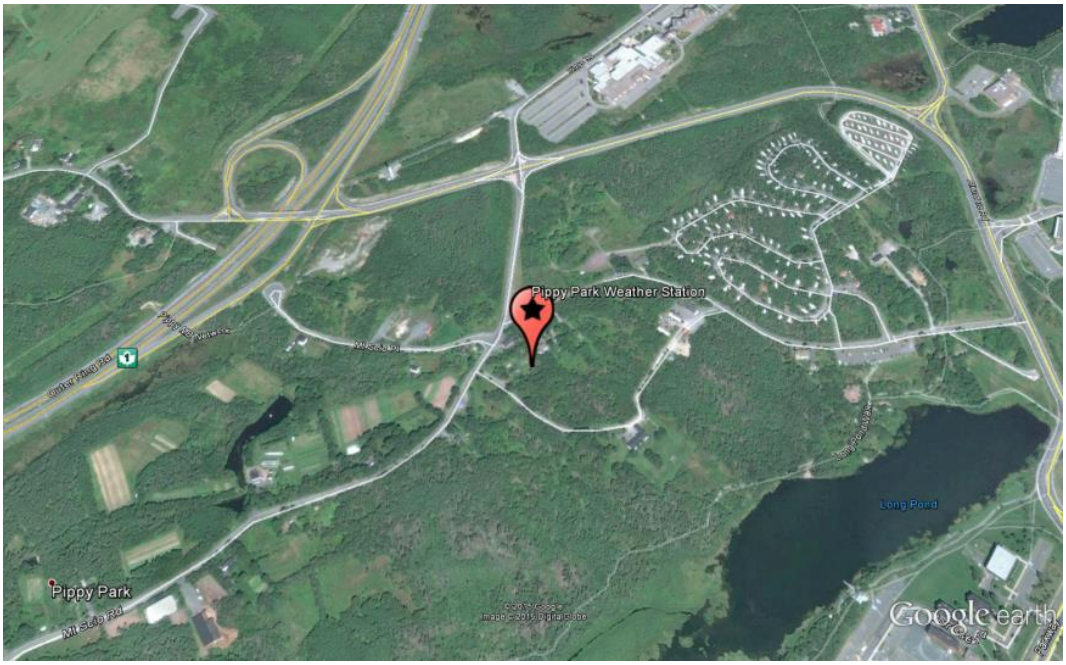

Figure 1: Pippy Park Weather Station Location

Tasks accomplished:

- Installed 10m tower

Follow-up tasks required:

- Install sensors and datalogger

Exploits River at Badger East of Stadium

Station Details:

- Station Identification: NLENCL0002
- Station Installed: September 2008
- Image taken and transmitted every hour
- Parameters measured every fifteen minutes and downloaded three times daily:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Solar Radiation
    - Sunshine Hours
- Site Selection Rationale: WRMD provides flood forecasting services, in which snow monitoring has been integrated, for the community of Badger in the Exploits River Basin.
- Date Visited: June 11, 2018
- Location: N 48° 58' 29.83" W 56° 2' 4.43"
- Elevation: 289 ft

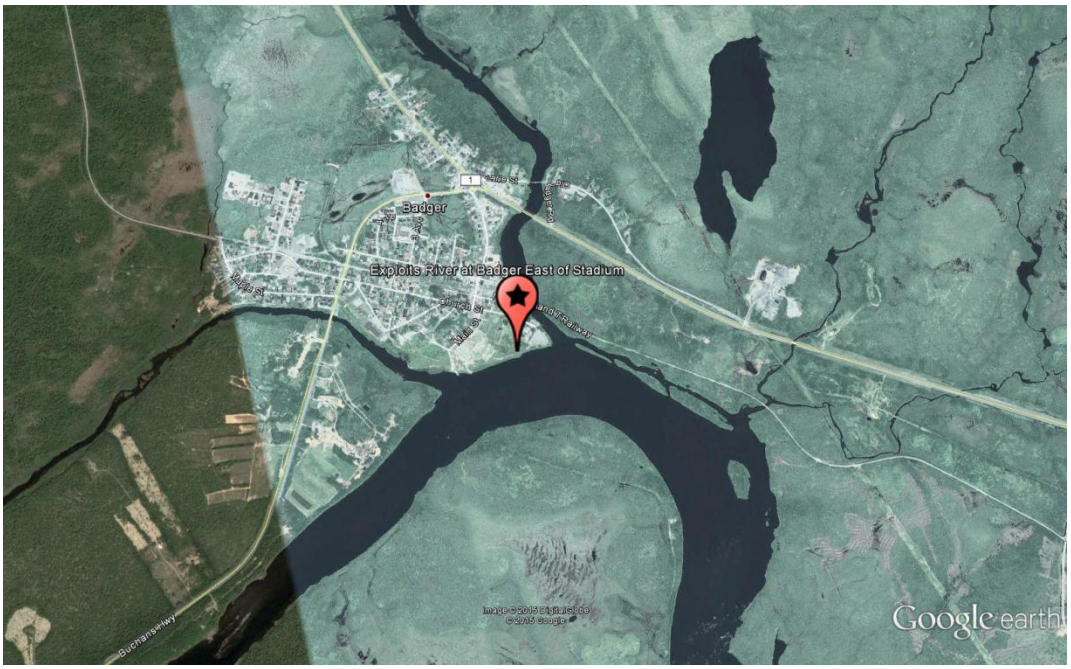

Figure 2: Exploits River at Badger Weather Station Location

Tasks accomplished:

- Datalogger:
    - Model: CR1000
    - Replaced desiccant
- Camera:

    - Model: CC640
    - Cleaned enclosure and replaced desiccant
- Anemometer:
    - Model: RM Young
    - Serial: Young 05178 Rev D
    - Replaced the bearings and O-rings
- Temperature/Relative Humidity:
    - Model: HMP45C
    - Sensor chip was in good working order - no need to be replaced
    - Added redundant air temperature sensor (109L thermistor) for calibration and verification of Temp/RH sensor
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50
    - Serial: C8767
    - Transducer model: C2258
    - Replaced SR50 transducer due to pitting and peeling
- Barometric Pressure:
    - Model: Young 61205V
    - Serial: BP05005
    - Model 61205V barometer requires no regular maintenance
- Precipitation
    - Model: Texas Electronics TE525WS
    - Cleared funnel and bucket portion of the unit for debris
- Solar Radiation
    - Model: Kipp & Zonen SP LITE Pyranometer
    - Serial: 080135
    - Cleaned lens
- Soil Moisture
    - Installed Hydraprobe sensor at depth 10”
    - Serial:
- Compound
    - Measurements and drawings for Metadata

Follow-up tasks required:

- Monitor the precipitation platform as it is deteriorating
- Area where SR50 is measured needs to be landscaped
- Possibility of installing a heated rain gauge, power approx. 60ft to hut
- Regular scheduled maintenance

Sandy Lake near Birchy Narrows (Camp 55)

Station Details:

- Station Identification: NLENCL0005
- Station Installed: November 2010
- Image taken and transmitted once a day at 12pm NST
- Parameters measured every fifteen minutes and downloaded three times daily:
    - 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: Snow monitoring involves determining the extent of snow cover (SE) and its snow water equivalent (SWE). SWE is a measurement of both the depth of snow and its density. It represents the depth of water that would result if the entire snow cover melted at once. 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 communities of Deer Lake and Steady Brook in the Humber River Basin.
- Date Visited: June 12, 2018
- Location: N 49° 16' 28.30" W 56° 51' 5.80"
- Elevation: 393 ft

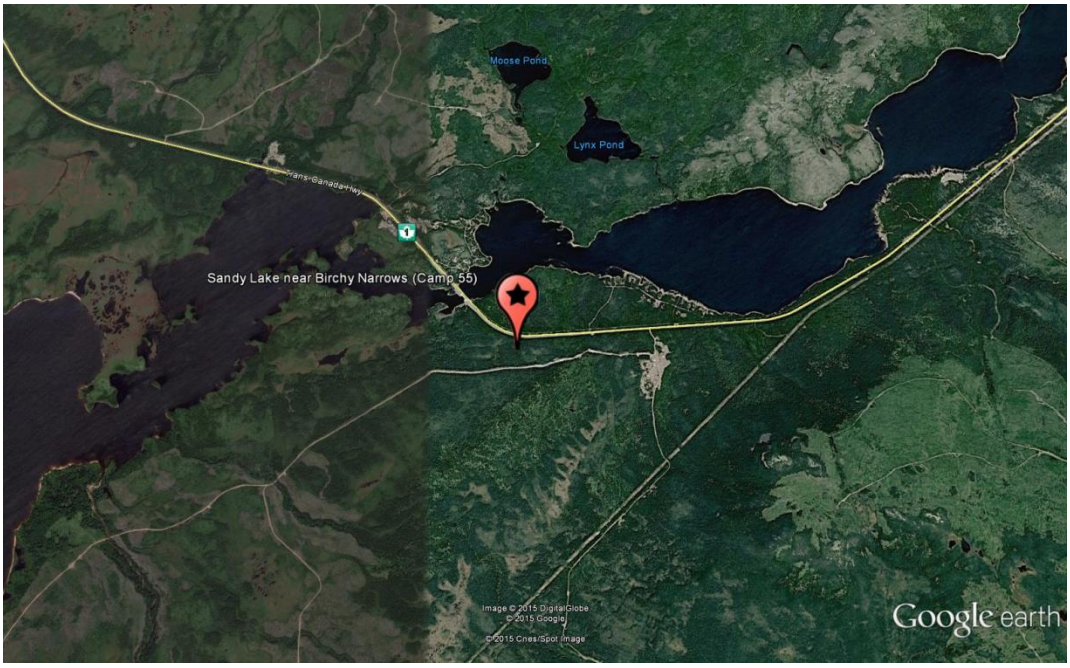

Figure 3: Sandy Lake near Birchy Narrows (Camp 55) Snow Monitoring Station Location

Tasks accomplished:

- Datalogger:
    - Model: CR1000
    - Replaced desiccant
    - 3.236V on internal battery
- Camera:
    - Model: CC640
    - Serial: 01654
    - Cleaned enclosure and replaced desiccant
- Anemometer:
    - Model: RM Young 05103-10
    - Serial: Young 05178A Rev D
    - Replaced the potentiometer; replaced the bearings, O-rings and calibrated the sensor
- Temperature/Relative Humidity:
    - Model: HC-S3
    - Cleaned sensor - note: this is an old sensor that is no longer manufactured
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: 2999
    - Replaced SR50 transducer due to pitting and peeling serial C11773
- Barometric Pressure:
    - Model: Young 61302V
    - Serial: BPA1405
    - Checked the QDP Hydro Vent hydrophobic filter. The 61302V is not field serviceable nor can it be field calibrated
- Precipitation
    - Model: Texas Electronics TE525WS
    - Serial: 42377-1009
    - Cleared funnel and bucket portion of the unit for debris and balanced sensor
- Solar Radiation
    - Model: Kipp & Zonen SP LITE Pyranometer
    - Serial: 091169
    - Cleaned lens
- Compound
    - Landscaped snow depth pad and compound
    - Split gate entry required if money available
    - Measurements and drawings for Metadata
    - Completed Solar Panel Upgrade
- Snow Water Equivalent:
    - Model: CS725
    - The CS725 is not field serviceable

Follow-up tasks required:

- Landscape trees outside of compound for better solar in the winter
- Regular scheduled maintenance

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 three times daily:
    - Air Temperature
    - Relative Humidity
    - Atmospheric Pressure
    - Dew Point Temperature
    - Precipitation
    - Wind Speed
    - Wind Direction
    - Snow Depth
    - Solar Radiation
    - Sunshine Hours
- 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: July 19, 2017
- Location: N 48° 58' 58.21" W 57° 45' 38.04"
- Elevation: 25 ft

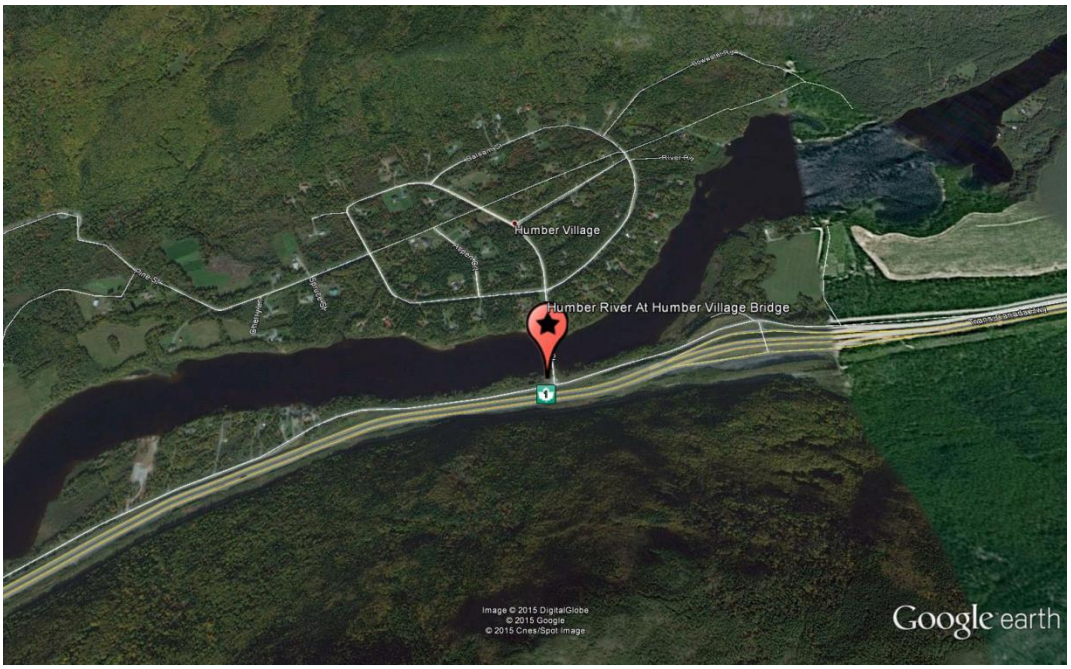

Figure 5: Humber River At Humber Village Bridge Weather Station Location

Tasks accomplished:

- Datalogger:
    - Model: CR1000

    - Replaced desiccant
- Camera:
    - Model: CC640
    - Serial: 01511
    - Cleaned enclosure and replaced desiccant
- Anemometer:
    - Model: RM Young Alpine
    - Serial: Young 05178A Rev D
    - Replaced the potentiometer; replaced the bearings, O-rings and calibrated the sensor
- Temperature/Relative Humidity:
    - Model: HMP45C
    - Sensor chip replaced on July 21st due to precipitation on July 20th
    - Calibrated Temperature/Relative Humidity chip
    - LiCl: 11.36 K2SO4: 97.47 Temperature 25.5
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: 5808
    - Replaced SR50 transducer due to pitting and peeling
- Barometric Pressure:
    - Model: 65205V
    - Serial: BP05888
    - Model 65205V barometer requires no regular maintenance
- Precipitation
    - Model: Texas Electronics TR-525USW
    - Serial: 49063-109
    - Cleared funnel and bucket portion of the unit for debris
    - Needs replacement in 2018 due to wear
- Solar Radiation
    - Model: Kipp & Zonen SP LITE Pyranometer
    - Serial: 080395
    - Cleaned lens
    - Replaced mounting arm (See Figure 6)
- Compound
    - Door is skewed
    - Cross piece on the fence needs replacement
    - Landscaped (See Figure 7)

Follow-up tasks required:

- Enclosure door is broken and must be replaced
- Order and replace precipitation sensor
- Regular scheduled maintenance

Figure 6: Replaced Solar Radiation mounting arm due to corrosion at Humber River at Humber Village Bridge Station

Figure 7: Landscaped compound

Upper Humber River above Black Brook

Station Details:

- Station Identification: NLENCL0007
- Station Installed: September 30th 2015
- Image taken and transmitted once a day at 12pm NST
- 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: Snow monitoring involves determining the extent of snow cover (SE) and its snow water equivalent (SWE). SWE is a measurement of both the depth of snow and its density. It represents the depth of water that would result if the entire snow cover melted at once. 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: July 20, 2017
- Location: N 49° 37' 6.24" W 57° 17' 41.20"
- Elevation: 992 ft

Figure 8: Upper Humber River above Black Brook Snow Monitoring Station Location

Tasks accomplished:

- Datalogger:
    - Model: CR1000

    - Replaced desiccant
    - Lithium Battery: 1.7 V needs replacement
- Camera:
    - Model: CC640
    - Serial: 01511
    - Removed due to transmission issues
- Anemometer:
    - Model: RM Young Alpine
    - Serial: Young 05178A Rev D
    - Replaced the potentiometer; replaced the bearings, O-rings and calibrated the sensor
- Temperature/Relative Humidity:
    - Model: HC-S3
    - Cleaned sensor - note: this is an old sensor that is no longer manufactured
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: 1670
    - Replaced SR50 transducer due to pitting and peeling
- Barometric Pressure:
    - Model: 61302V
    - Serial: BPA140
    - Checked the QDP Hydro Vent hydrophobic filter. The 61302V is not field serviceable nor can it be field calibrated
- Precipitation
    - Model: Texas Electronics TR-525USW
    - Serial: 43230-210
    - Cleared funnel and bucket portion of the unit for debris
- Solar Radiation
    - Model: Kipp & Zonen SP LITE Pyranometer
    - Serial: 091168
    - Cleaned lens
- Snow Water Equivalent:
    - Model: CS725
    - No maintenance needed
- Compound
    - Battery Box requires sanding and Tremclad paint to prevent the enclosure from rusting (See Figure 9)

Follow-up tasks required:

- Order new lithium battery
- Solar Panel Upgrade
- Regular scheduled maintenance

Figure 9: Battery Box Enclosure Rust conditions at Upper Humber at Black Brook

Churchill River at End of Mud Lake Road

Station Details:

- Station Identification: NLENCL0004
- Station Installed: July 2010
- Image taken and transmitted every hour during winter months (October to May) and once a day at 12pm NST during the summer (June to September)
- 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: Snow monitoring provides essential information for flood forecasting, hydropower generation, ice monitoring, wildlife studies, and for climate change adaptation in the province. Captures image of the ice road. Provides weather data to better understand water quality data for the Churchill River.
- Date Visited: August 22, 2017
- Location: N 53° 20' 15.95" W 60° 11' 21.44"
- Elevation: 4 ft

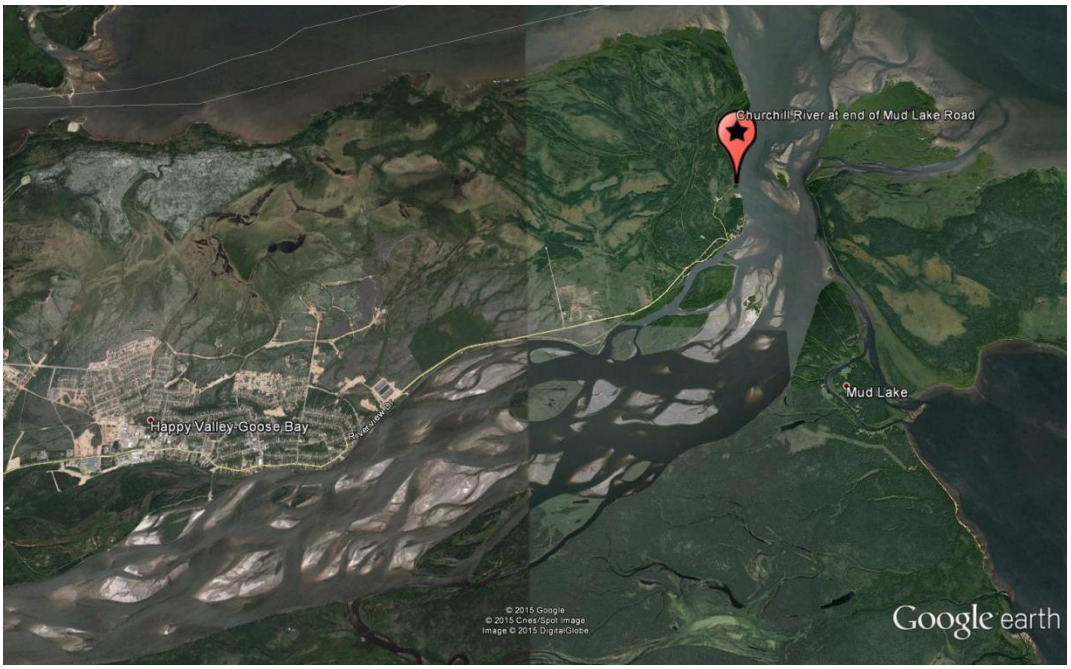

Figure 10: Churchill River at end of Mud Lake Road Weather Station Location

Tasks accomplished:

- Datalogger:
    - Model: CR1000
    - Replaced desiccant
- Camera:
    - Model: CC640
    - Serial: AAW-TZ49
    - Cleaned enclosure and replaced desiccant
- Anemometer:
    - Model: RM Young Alpine Version
    - Serial: Young 05178A Rev A 46-07
    - Replaced the potentiometer, replaced the bearings and O-rings and calibrated the sensor
- Temperature/Relative Humidity:
    - Model: HMP45C
    - Cleaned and calibrated Temperature/Relative Humidity chip
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: 3000
    - Replaced SR50 transducer due to pitting and peeling
- Barometric Pressure:
    - Model: 61302V
    - Serial: BPA1406
    - Checked the QDP Hydro Vent hydrophobic filter. The 61302V is not field serviceable nor can it be field calibrated
- Precipitation
    - Model: Texas Electronics TE-525WS
    - Serial: 58146-113
    - Uninstalled snow fall adapter, cleaned funnel and bucket
- Solar Radiation
    - Model: Kipp & Zonen SP LITE Pyranometer
    - Cleaned lens
- Compound
    - Vegetation upkeep
    - Corner of compound needs ground work repair
    - Tower is compromised due to spring thaw and freeze during flood and needs to be replaced

Follow-up tasks required:

- Replace Tower
- Upgrade camera
- Landscape
- Regular scheduled maintenance

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 construction 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: August 23, 2017
- Location: N 53° 14' 43.64" W 60° 46' 42.15"
- Elevation: 39 ft

Figure 11: Muskrat Falls Weather Station Location

Tasks accomplished:

- Datalogger:
    - Model: CR1000

    - Replaced desiccant
    - Lithium Battery: 3.46 V
- Cameras:
    - Model: CC5MPX
    - Serial: 01317, 01314
    - Verified working properly
- Anemometer:
    - Model: RM Young Alpine
    - Serial: Young 05178A Rev D
    - Bearings replaced
- Temperature/Relative Humidity:
    - Model: HC2-S3-L
    - Cleaned sensor
- Snow Depth Sensor:
    - Model: Sonic Ranger SR50A
    - Serial: 1670
    - Replaced transducer due to pitting and peeling
- Barometric Pressure:
    - Model: Vaisala PTB110
    - Serial: J1660083
    - Checked the QDP Hydro Vent hydrophobic filter. This sensor is not field serviceable nor can it be field calibrated
- Precipitation
    - Model: Texas Electronics TE-525WS
    - Serial: 53322-1012
    - Cleared funnel and bucket portion of the unit for debris
- Solar Radiation
    - Model: Kipp & Zonen SP LITE2 Pyranometer
    - Cleaned lens

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: Snow monitoring involves determining the extent of snow cover (SE) and its snow water equivalent (SWE). SWE is a measurement of both the depth of snow and its density. It represents the depth of water that would result if the entire snow cover melted at once. WRMD provides flood forecasting services, in which snow monitoring has been integrated, for the Churchill River Basin.
- Date Visited: October 16-23 2017
- Location: N 53° 26' 10.12" W 63° 14' 1.38"
- Elevation: 1082 ft

Figure 12: Metchin River near TLH Snow Monitoring Station Location

Tasks accomplished: Installation occurred Oct 16-23rd 2017.

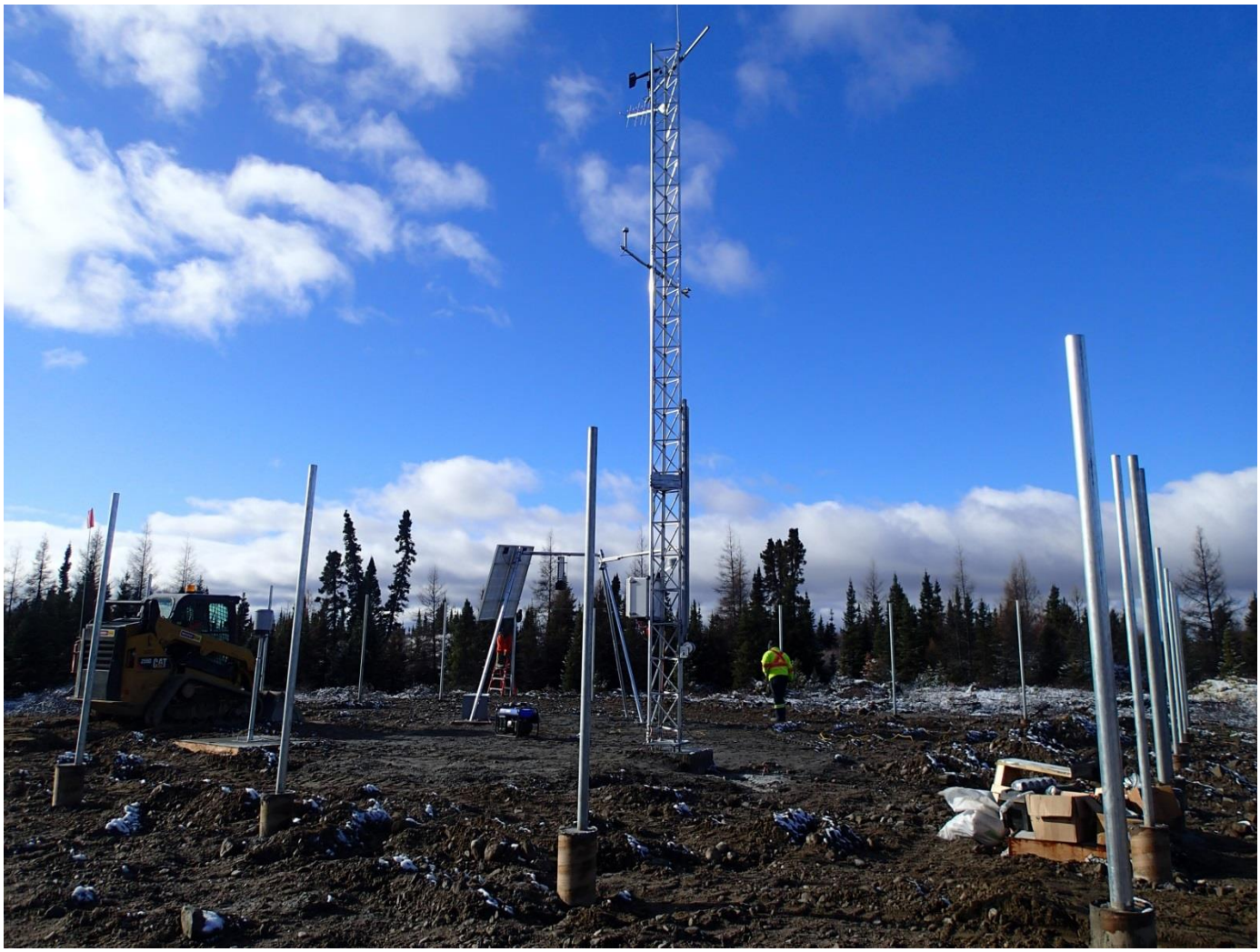

Figure 13: Metchin River near TLH Snow Monitoring Station Installation

Follow-up tasks required:

- Resolve Wind Gust Programming
- Annual Maintenance

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: Snow monitoring involves determining the extent of snow cover (SE) and its snow water equivalent (SWE). SWE is a measurement of both the depth of snow and its density. It represents the depth of water that would result if the entire snow cover melted at once. WRMD provides flood forecasting services, in which snow monitoring has been integrated, for the Churchill River Basin.
- Date Visited: October 16-23 2017
- Location: N 53° 21' 35.23" W 65° 33' 41.27"
- Elevation: 1781 ft

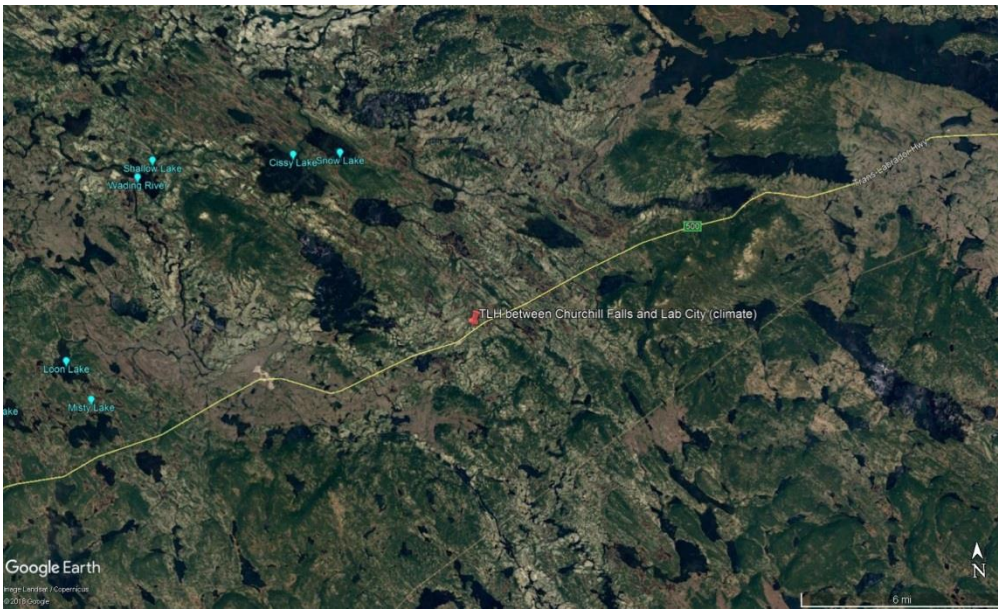

Figure 14: TLH between Churchill Falls and Lab City Snow Monitoring Station Location

Tasks accomplished: Installation occurred Oct 16-23rd 2017.

Figure 15: TLH between Churchill Falls and Lab City Snow Monitoring Station Installation

Follow-up tasks required:

- Resolve Wind Gust Programming
- Annual Maintenance

Waterford River at Kilbride

Station Details:

- Station Identification: NF02ZM0009
- Station Installed: July 21st 2015
- Image taken and transmitted every hour
- Site Selection Rationale: Provides essential information for visual image of changing water levels in this urban stream.
- Date Visited: May 24, 2017
- Location: N 47° 31' 44.44" W 52° 44' 41.04"
- Elevation: 108 ft

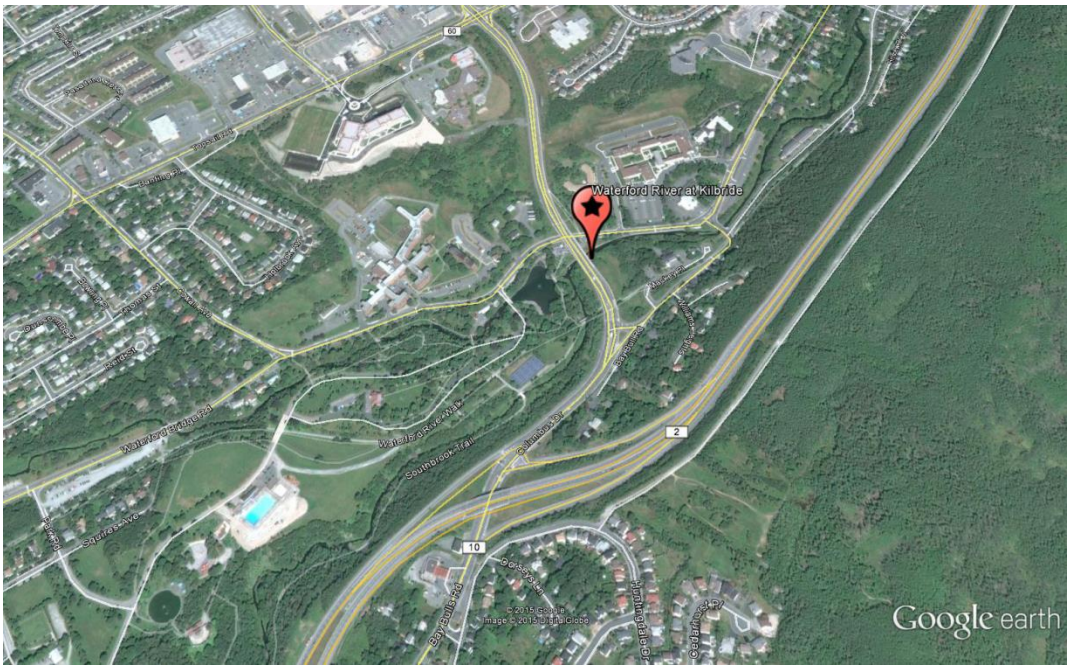

Figure 16: Waterford River at Kilbride Camera Station Location

Tasks accomplished:

- Datalogger:
  - Model: CR800
  - Replaced desiccant, battery tender and battery
- Camera:
  - Cleaned lens
- Site:
  - NL Power needs to be called to trim trees from powerline.

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
- 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: June 11, 2018
- Location: N 48°56'25.86" W 55°58'42.98"
- Elevation: 330 ft

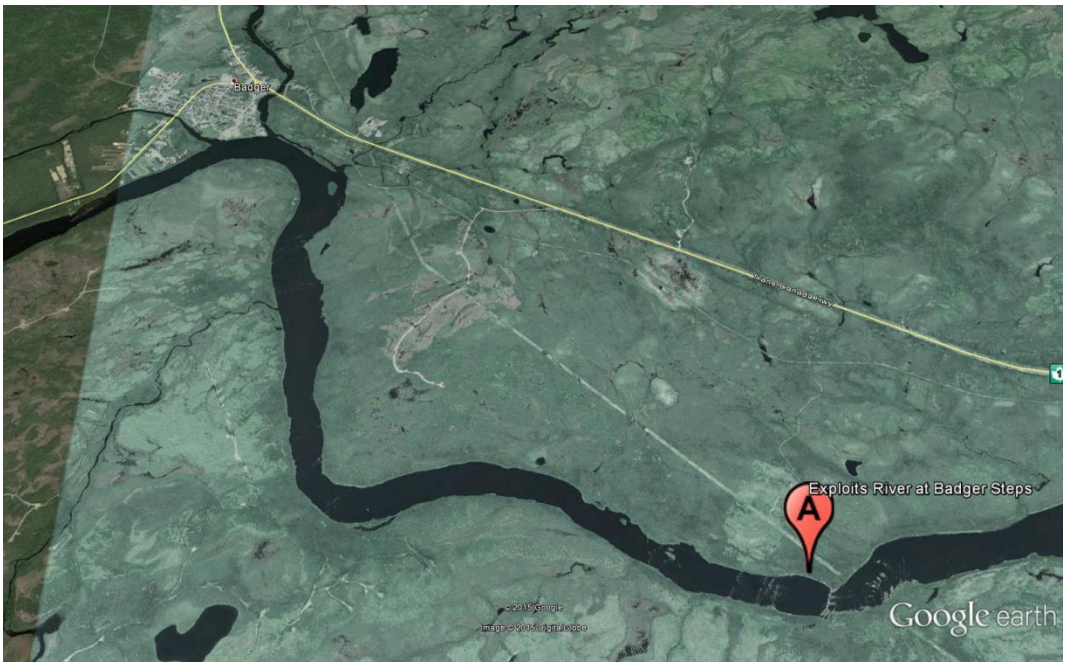

Figure 17: Exploits River at Badger Steps Camera Station Location

Tasks accomplished:

- Datalogger:
  - Model: CR1000
  - Replaced desiccant
- Camera:
  - Model: CC640
  - Replaced desiccant
- Site:

- Site is still landscaped – keep monitoring for growth
- Dirt road to site needs to be pruned – bring axe or chainsaw in the future

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
- Image taken and transmitted every hour
- 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: July 19, 2017
- Location: N 48° 57' 11.59" W 57° 49' 40.02"
- Elevation: 24 ft

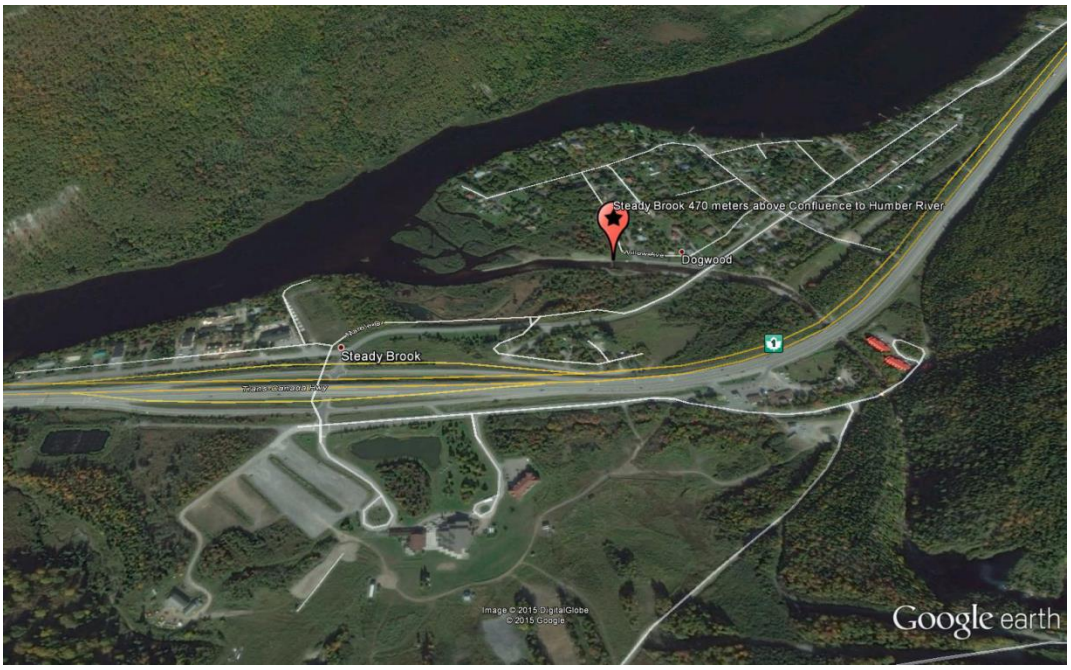

Figure 18: Steady Brook 470 meters above Confluence to Humber River Camera Station Location

Tasks accomplished:

- Datalogger:
  - Model: CR800
  - Replaced desiccant
- Camera:
  - Model: CC5MPX
  - Serial: 1862
  - Fixed the time to NST

Follow-up tasks required:

- Regular scheduled maintenance

Churchill River at end of Mud Lake Road - Level

Station Details:

- Station Identification: 03OE018
- Station Installed: Oct 24, 2018
- Image taken and transmitted every hour
- Site Selection Rationale: ????
- Date Visited: Oct 24, 2018
- Location: N 53°20'5.24" W 60°11'18.18”
- Elevation: 4 ft

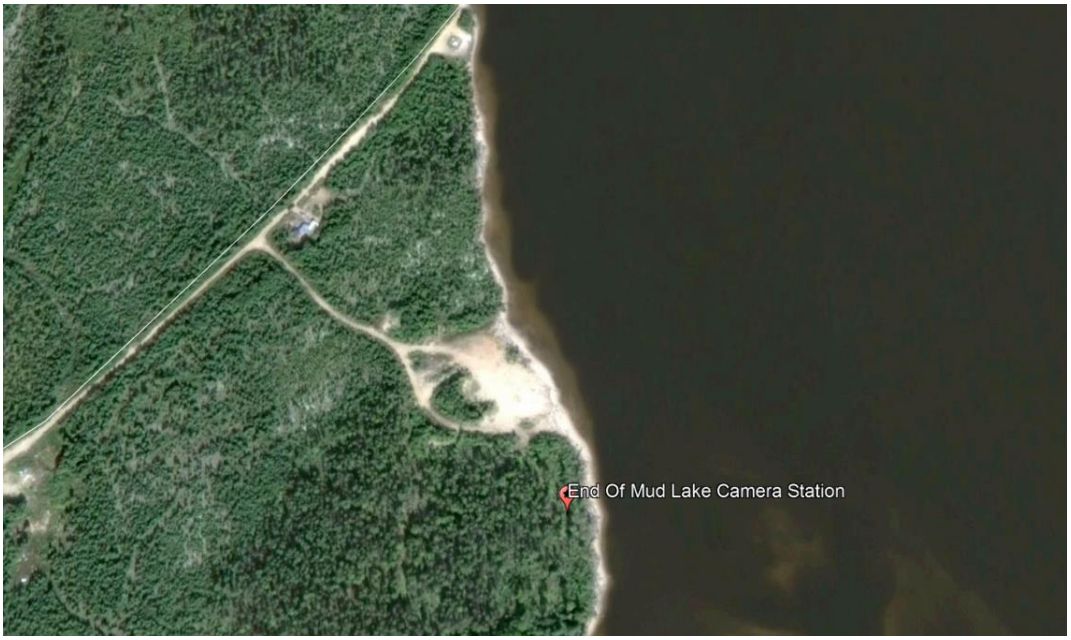

Figure 19: Churchill River at end of Mud Lake Road Camera Station Location

Tasks accomplished:

- Datalogger:
    - Model: CR800
    - Replaced desiccant
- Camera:
    - Model: CCFC
    - Serial:

Follow-up tasks required:

- Regular scheduled maintenance

Churchill River below Traverspine River

Station Details:

- Station Identification: 03OE019
- Station Installed: Sept 23, 2018
- Image taken and transmitted every hour
- Site Selection Rationale: ????
- Date Visited: Sept 23, 2018
- Location: N 53°17'28.20" W 60°13'16.49"
- Elevation: 4 ft

Figure 19: Churchill River below Traverspine River Camera Station Location

Tasks accomplished:

- Datalogger:
  - Model: CR800
  - Replaced desiccant
- Camera:

- Model: CCFC
- Serial:

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
- Site Selection Rationale: ????
- Date Visited: Sept 23, 2018
- Location: N 53°23'35.07" W 60°25'12.05"
- Elevation: 4 ft

Figure 19: Mud Lake at Mud Lake Camera Station Location

Tasks accomplished:

- Datalogger:
  - Model: CR800
  - Replaced desiccant
- Camera:
  - Model: CCFC
  - Serial:

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 every hour
- Site Selection Rationale: ????
- Date Visited: Sept 23, 2018
- Location: N 53°18'14.10" W 60°10'2.37"
- Elevation: 4 ft

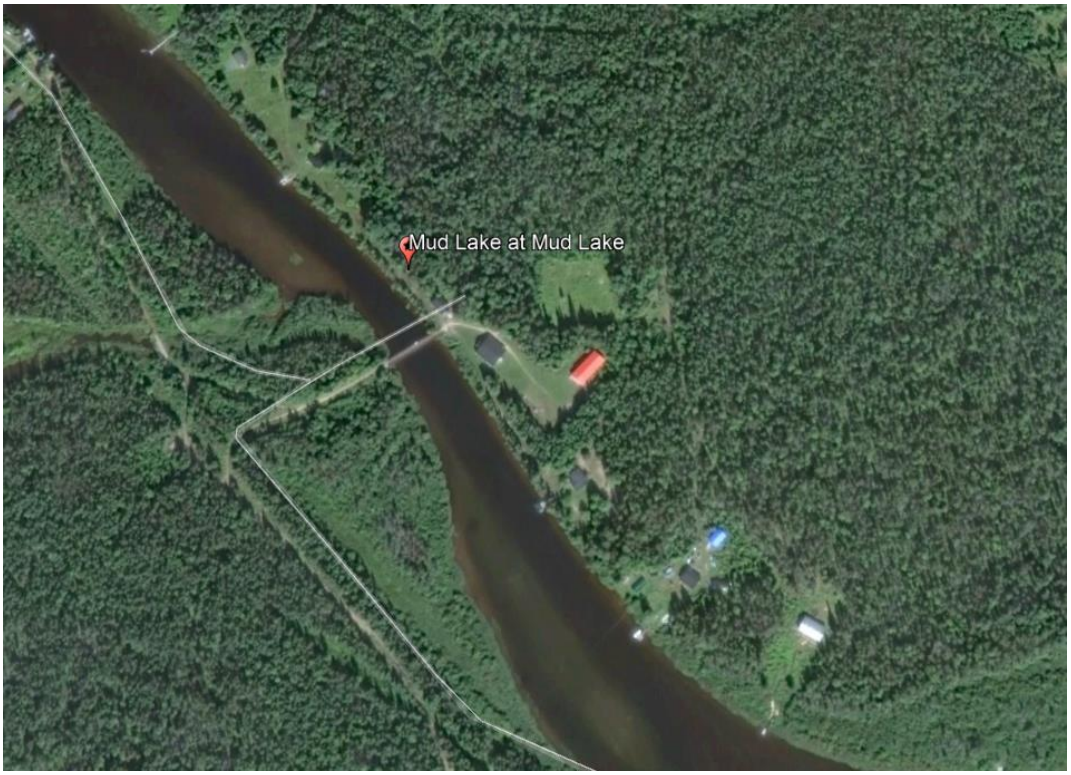

Figure 19: Mud Lake at Mud Lake Camera Station Location

Tasks accomplished:

- Datalogger:
  - Model: CR800
  - Replaced desiccant
- Camera:
  - Model: CCFC
  - Serial:

Follow-up tasks required:

Regular scheduled maintenance

The next scheduled annual maintenance trip will be completed by October 2018.