

Water Classification – Southwest Miramichi

Year 1 Report

2010-2011



Your Environmental Trust Fund at Work

ACKNOWLEDGMENTS

This year has been a busy year for Water Classification as we began the field work component of the project and started planning for capacity building. We would like to thank JD Irving for helping us with the collection of the upper river water samples. NB DENV staff have been very helpful and supportive during the whole process. We would also like to thank the NB Environment Laboratory staff for processing the water chemistry results. And finally the land owners for allowing us access on their properties.

TABLE OF CONTENTS

Acknowledgments	i
Table of Contents	ii
List of Figures	v
List of Tables	v
1.0. About the Miramichi River Environmental Assessment Committee	1
2.0. Introduction to Water Classification	3
2.1. Water Classification Regulation	3
2.2. Water Classification Steps	4
2.3. Evaluation for the Miramichi River	4
3.0. Overview of the Southwest Miramichi River Study Area	6
3.1. Watershed boundary	6
3.2. Land use	7
3.3. Climate	8
3.4. Geology	9
3.5. Water Quality	9
4.0. Southwest Miramichi Accomplishments	11
4.1. Stakeholders	11
4.2. Communication	12
4.3. Mapping	12
4.4. Water Quality Monitoring	12
5.0. Water Quality Monitoring Results	15
5.1. Taxis River	15
General Description	15
Sample Results	15

Water Classification – Southwest Miramichi, Year 1 Report, 2010-2011

5.2.	Cains River	15
	General Description	15
	Sample Results.....	15
5.3.	Bartholomew River	16
	General Description	16
	Sample Results.....	16
5.4.	Renous River	16
	General Description	16
	Sample Results.....	16
5.5.	Dungarvon River.....	17
	General Description	17
	Sample Results.....	17
5.6.	Barnaby River	17
	General Description	17
	Sample Results.....	17
5.7.	Rocky Brook.....	18
	General Description	18
	Sample Results.....	18
5.8.	Sister Brook	18
	General Description	18
	Sample Results.....	18
5.9.	Clearwater Brook	18
	General Description	18
	Sample Results.....	18
5.10.	Burnthill Brook	19
	General Description	19
	Sample Results.....	19

Water Classification – Southwest Miramichi, Year 1 Report, 2010-2011

5.11. North Branch of the Southwest Miramichi River @ Juniper Station19

 General Description19

 Sample Results.....19

6.0. Next Steps.....20

References21

Appendix 1 New Brunswick Map Outlining the Miramichi River Watershed22

LIST OF FIGURES

Figure 1 - MREAC organizational structure.....	1
Figure 2 – Maps of the Ecological Regions and watersheds of New Brunswick (Biodiversity Strategy of New Brunswick, 2009)	2
Figure 3 - Flow chart demonstrating MREAC’s work plan for Water Classification of the Miramichi River	5
Figure 4 - Map of the Miramichi River watershed with Southwest Miramichi highlighted	6
Figure 5 - Map of Miramichi River watershed land cover with Southwest Miramichi highlighted (NBDENV).....	8
Figure 6 - Geological map of the Maritime Provinces (NBDENV)	9
Figure 7 - Sector chart indicating possible members of community stakeholder groups for Southwest Miramichi ..	11
Figure 8 - Miramichi River Water Classification map with focus on Southwest Miramichi and illustrating sample sites.....	14

LIST OF TABLES

Table 1 – Detailed description of the classes for the Water Classification Program (Water Classification Guidebook)	3
Table 2 - Southwest Miramichi 14 water quality sites (* indicates sites sampled by JD Irving) and seven bio-monitoring sites	13
Table 3 - DENV's Southwest Miramichi monitoring stations.....	13

1.0. ABOUT THE MIRAMICHI RIVER ENVIRONMENTAL ASSESSMENT COMMITTEE

The Miramichi River Environmental Assessment Committee (MREAC) is a non-profit, multi-stakeholder organization dedicated to the continual improvement of environmental quality of the Miramichi River ecosystem, with emphasis on the Miramichi River watershed. MREAC was created in 1989 as a response to a community concern around a local pulp and paper mill expansion. The committee remained intact following its initial phase to address other environmental issues on the Miramichi River watershed. When joined with the Atlantic Coastal Action Program (ACAP) in 1993, MREAC was then able to hire full-time staff. The committee has grown (approximately 40 members) and directs the volunteer and staff activity through guidance during monthly meetings.



Figure 1 - MREAC organizational structure

MREAC focuses on science based research and environmental projects in order to protect and manage the Miramichi River watershed. The watershed is found in the Atlantic Maritime Ecozone and lies within the Highlands, Northern Uplands, Central Uplands, Valley Lowlands and Eastern Lowlands Ecoregions (See Figure 2). This watershed is the largest watershed entirely within the province of New Brunswick and encompasses approximately 23% of the province's land mass (about 13,465 km²). MREAC interests include freshwater, estuarine, and coastal zone habitats. The Miramichi River is world renowned for its Atlantic salmon (*Salmo salar*) recreational fly-fishing. It is also the only known spawning habitat of Striped bass (*Morone saxatilis*) in the isolated stock of the Gulf of St. Lawrence. Other Species at Risk (SAR) are home on the Miramichi such as the Piping Plover (*Charadrius melodus*), Brook Floater (*Alasmidonta varicosa*) and the Wood Turtle (*Glyptemys insculpta*). There are many reasons why Miramichi River is deemed an important river system by MREAC members who are committed to the long term management and stewardship of this river.

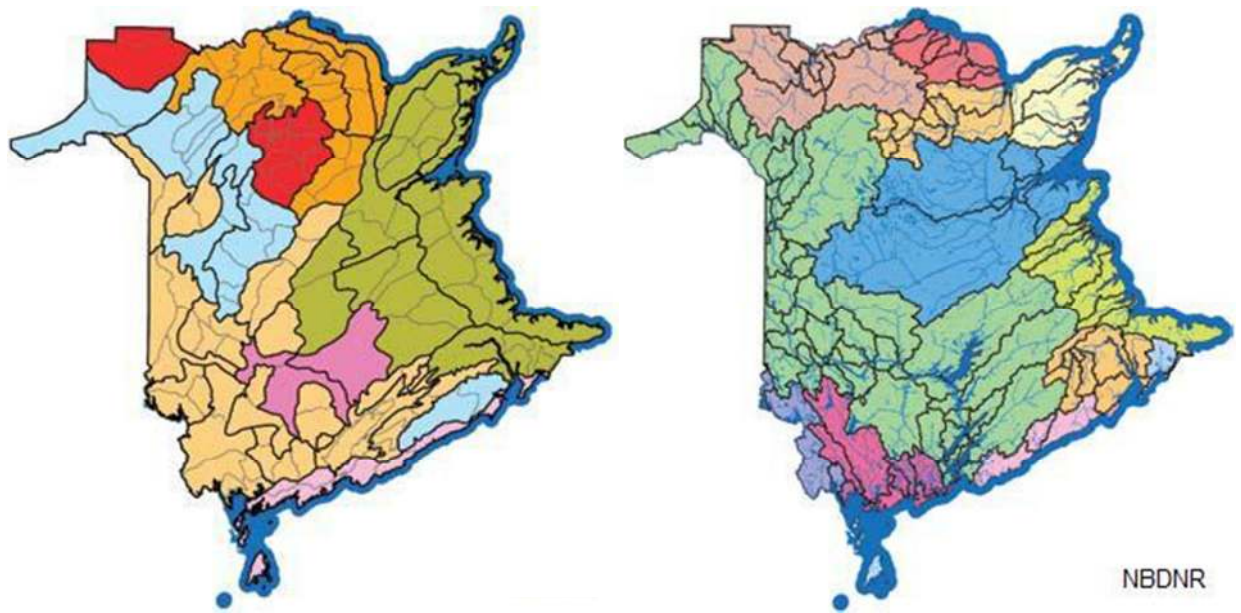


Figure 2 – Maps of the Ecological Regions and watersheds of New Brunswick (Biodiversity Strategy of New Brunswick, 2009)

2.0. INTRODUCTION TO WATER CLASSIFICATION

2.1. WATER CLASSIFICATION REGULATION

Water Classification is a community-based, water management program implemented by New Brunswick Department of the Environment (NB DENV). The objective of this program is to set goals for water quality and harmonize the use and protection of watercourses within a watershed to achieve those goals. These goals are determined by involved stakeholders through a consensus based consultation process. Based on the desired water quality goals and use of these rivers, as well as water quality results, watercourses will be assigned a class. These classes include:

- O – outstanding natural waters
- AP – designated drinking water supply
- AL – all other lakes not classified as O or AP
- A – excellent water quality
- B – good water quality
- C – acceptable water quality

Table 1 – Detailed description of the classes for the Water Classification Program (Water Classification Guidebook)

Class	Characteristics
O	Outstanding Natural Waters <ul style="list-style-type: none"> • Water quality and quantity should be at it naturally occurs • Aquatic community should be as it naturally occurs • Should be no existing industrial or commercial discharges • Should be no or minimal discharges from land-use activities • Water levels should not be artificially altered • Water should provide a representative or unique example of a natural ecosystem or it may posses outstanding recreational, aesthetic, historical or other important qualities
AP	Designated Drinking Water <ul style="list-style-type: none"> • Includes surface water used for designated municipal drinking water supplies • Water quality and benthic invertebrate community are essential as they naturally occur
AL	All Lakes <ul style="list-style-type: none"> • All lakes, ponds and impoundments not classified as Outstanding natural water or AP • Water quality and benthic community are essentially as they naturally occur • Some impoundments and lakes in peat bogs may be excluded
A	Excellent Water Quality <ul style="list-style-type: none"> • Water quality and benthic community are essentially as they naturally occur
B	Good Water Quality <ul style="list-style-type: none"> • Water may show minimum alteration from the natural water quality • Water quality will support all indigenous aquatic species, with no detrimental changes on resident biological community
C	Acceptable Water Quality <ul style="list-style-type: none"> • Water may show some alteration from natural water quality • Water quality will support indigenous fish species and will maintain the structure and the function of the resident biological community

2.2. WATER CLASSIFICATION STEPS

According to the *Water Classification Guidebook*, there are five steps to undergo Water Classification:

- Identify and involve stakeholders
- Gather water quality information
- Assemble land and water use information
- Set goals for water quality
- Prepare and implement action plans

Stakeholders include anyone who has an interest in the management of water quality and quantity within a given watershed. Stakeholder will help classify the river segments by indicating what future uses of the river are acceptable and indicate their desired outcomes for water quality.

Water quality data is collected in order to understand the chemical, physical and biological properties of the river system. This includes both the physical data derived from water samples, and bio-monitoring samples that involve the study of aquatic insects.

Land use data, past and present, will help identify point source discharges or impacted areas that may have an effect on the water quality. It also helps determine influences that naturally occur. Future uses of water and land in the watershed are also incorporated in order to set water quality and management goals. Input from stakeholders becomes important at this stage to provide insight into future land use activities. With water quality data and input from stakeholders, classes for the various rivers can then be set in order to achieve the desired outcomes. Action plans are then established to achieve or maintain the desired water quality goals.

2.3. EVALUATION FOR THE MIRAMICHI RIVER

During a targeted ten year time frame (2008-2018), the Miramichi River will undergo Water Classification lead by MREAC and in partnership with DENV. Due to the large size of the Miramichi River watershed (over 13,400 km²), it has been divided into three sections for better management of this project. The sections are Southwest Miramichi, Northwest Miramichi and the Estuary Drainage. As according to the *Water Classification Strategic Plan for the Miramichi River, 2008-2018 – Revised*, the process has been broken into five parts, each with a dedicated two year time frame.

The first objective, carried out during the years of 2008-2010, began project planning and creation of a Strategic Plan. Also past environmental data for the Miramichi River watershed was compiled and shared between project partners. A pilot project was then launched in 2009, beginning capacity building with the Renous River sub-watershed.

The second objective of the project is to study each of the three watershed sections by collecting present water quality data of the river systems and capacity building with stakeholders. Two years will be given to each of the three sections, during the time frame of 2010-2016.

The third and final objective of the program during 2016-2018, is when the Miramichi River will be assessed and rivers will be given a class according to the six categories of the NB Water Classification Program. Once this is

completed and with the community recommendations incorporated, a Water Classification template will be presented to the Minister of Environment for approval.

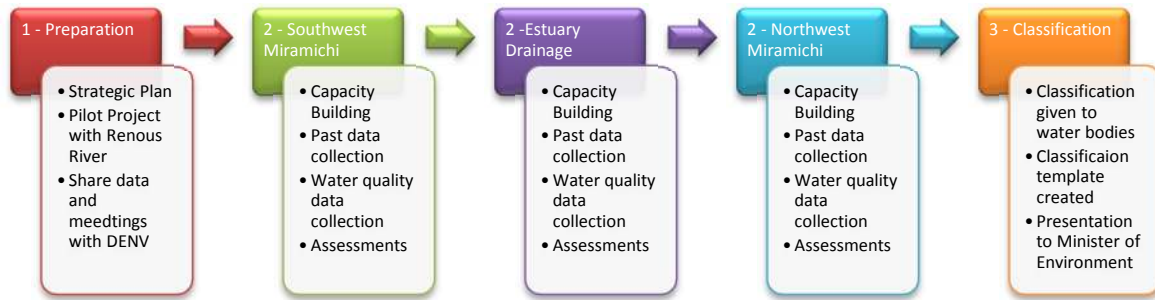


Figure 3 - Flow chart demonstrating MREAC's work plan for Water Classification of the Miramichi River

3.0. OVERVIEW OF THE SOUTHWEST MIRAMICHI RIVER STUDY AREA

The Southwest Miramichi River is the focus study area for Water Classification during 2010-2011, the first of three study areas for the Miramichi River watershed.

3.1. WATERSHED BOUNDARY

The Southwest Miramichi River is the largest of the three drainage areas for this project, covering an area of 7,700 km². The Southwest Miramichi drainage extends from the headwater divide that separates the Miramichi from the St. John River drainage. The meander length of the main branch Southwest Miramichi is 250 km to where it joins with the Northwest Miramichi. This area includes the villages of Blackville, Doaktown, Boiestown, Renous, Juniper, Rogersville and many other smaller hamlets and communities, all having a combined population of over 8,200 (Stats Canada, 2006). Highway 8 is the main travel corridor that extends along much of the Southwest Miramichi from the City of Miramichi to Fredericton. Most of this watershed lies within Northumberland County with some tributaries extending into the York, Carleton, Victoria, Sunbury and Kent Counties. This project includes the following branches of the Southwest Miramichi:

- Barnaby River – 490 km²
- Cains River – 1,399 km²
- Renous River – 1,429 km²
- Bartholomew River – 396 km²
- Taxis River – 510 km²
- Southwest Miramichi River (remainder) – 3,930 km²

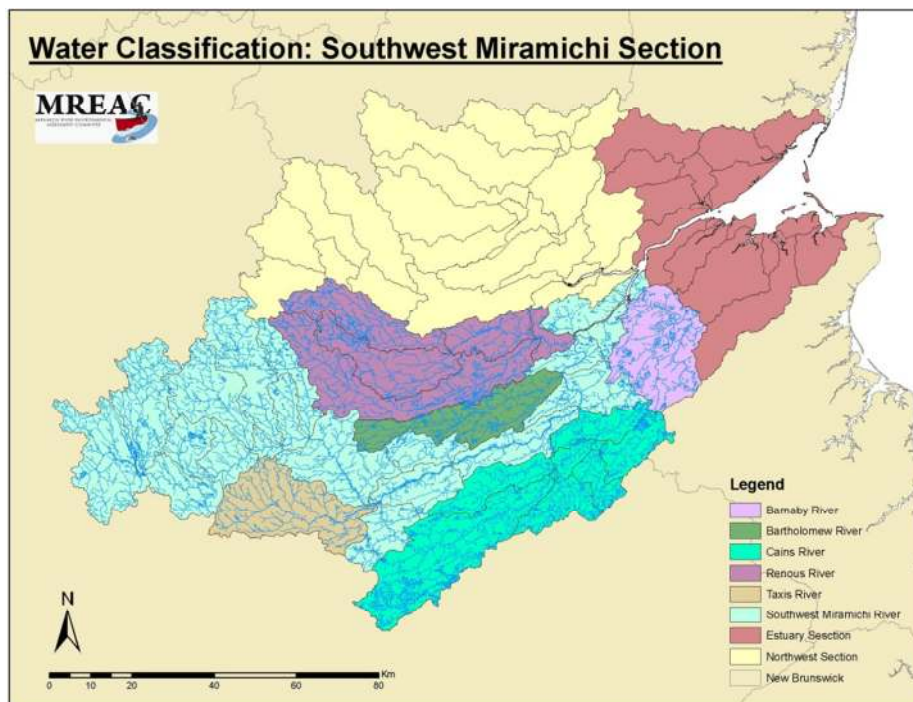


Figure 4 - Map of the Miramichi River watershed with Southwest Miramichi highlighted

3.2. LAND USE

The villages and hamlets in this area encompass small portion of this large drainage area. The forest industry remains the most significant economic sector despite the closure of most lumber mills. The demand for wood products remains strong and most of it is trucked out of the region. Tourism, especially which associated with recreational sport fishing, is still a significant sector. Small scale agriculture is common on the Barnaby and Southwest Miramichi especially around Rogersville and Doakown respectively. Family farms with beef cattle and pasture lands are most common. Cranberry and blueberry harvesting have become more popular and Oceans Spray Ltd. is now developing a very large cranberry farm near Rogersville. There is a longer history of peat harvesting which is considered to be in the mining sector rather than in agriculture.

Most of the Southwest Miramichi is forested with scattered wetlands, shrub and barren lands. Much of the property along the Southwest Miramichi River corridor and the Barnaby River corridor is private land. The remaining branches flow mostly over crown land, which are mostly large lease hold properties in the hands of a few large forest sector industries. Many outfitters have constructed lodges and offer some of the world's best fly-fishing opportunities for Atlantic Salmon and Brook Trout (*Salvelinus fontinalis*). Canoeing, swimming, fishing and more recently, river tubing are other popular recreational activities. Most of these activities require good water quality for the safety of not only the ecosystem, but also for human health.

There currently are five Protected Natural Areas (PNA) within the Southwest Miramichi. The Kennedy Lakes is the largest PNA within the Miramichi River watershed covering an area of 207 km². All of the PNAs are Class II which permits public access to these areas (*Protected Natural Areas of New Brunswick.*). The PNAs that can be found in the Southwest Miramichi area are:

- Kennedy Lakes
- Big Rocky Brook
- Dungarvon Whopper Spring Woodlot
- Cains River
- Shinnickburn

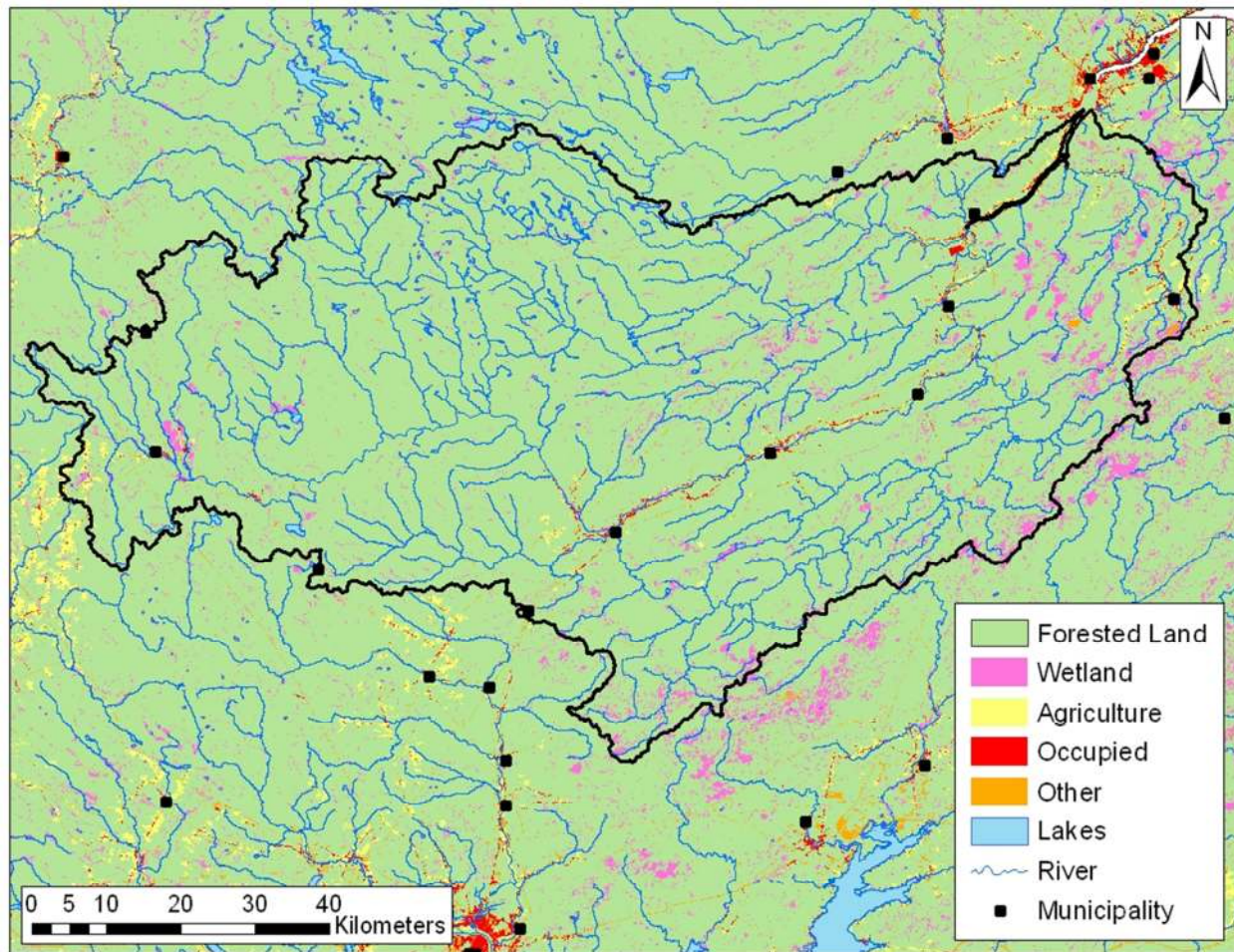


Figure 5 - Map of Miramichi River watershed land cover with Southwest Miramichi highlighted (NBDENV)

3.3. CLIMATE

The Miramichi area, as with the rest of New Brunswick, has a maritime influenced continental climate. Doaktown has the only weather monitoring station in the Southwest Miramichi area. According to Environment Canada's Climate data for 1971-2000, the daily average temperature in Doaktown is 4.8°C, with an annual maximum and minimum of 10.7°C and -1.3°C respectively. The average annual rainfall is 863.4 mm and snowfall is 286.7 cm, giving an annual precipitation of 1150.1 mm at Doaktown. The average number of days with rainfall is 198.1 days and snowfall is 71.6 days (*Canadian Climate Normals 1971-2000, Doaktown, New Brunswick*).

3.4. GEOLOGY

Much of the Southwest Miramichi is on the low lying New Brunswick Maritime Plain and underlain by Late Carboniferous Pennsylvanian aged sandstone of the Pictou Group. Further west, the Southwest Miramichi has a rise in elevation, and the Ordovician and Cambrian bedrock types begin to be the dominate geological type (*Geological Map of Canada, NRCan*).

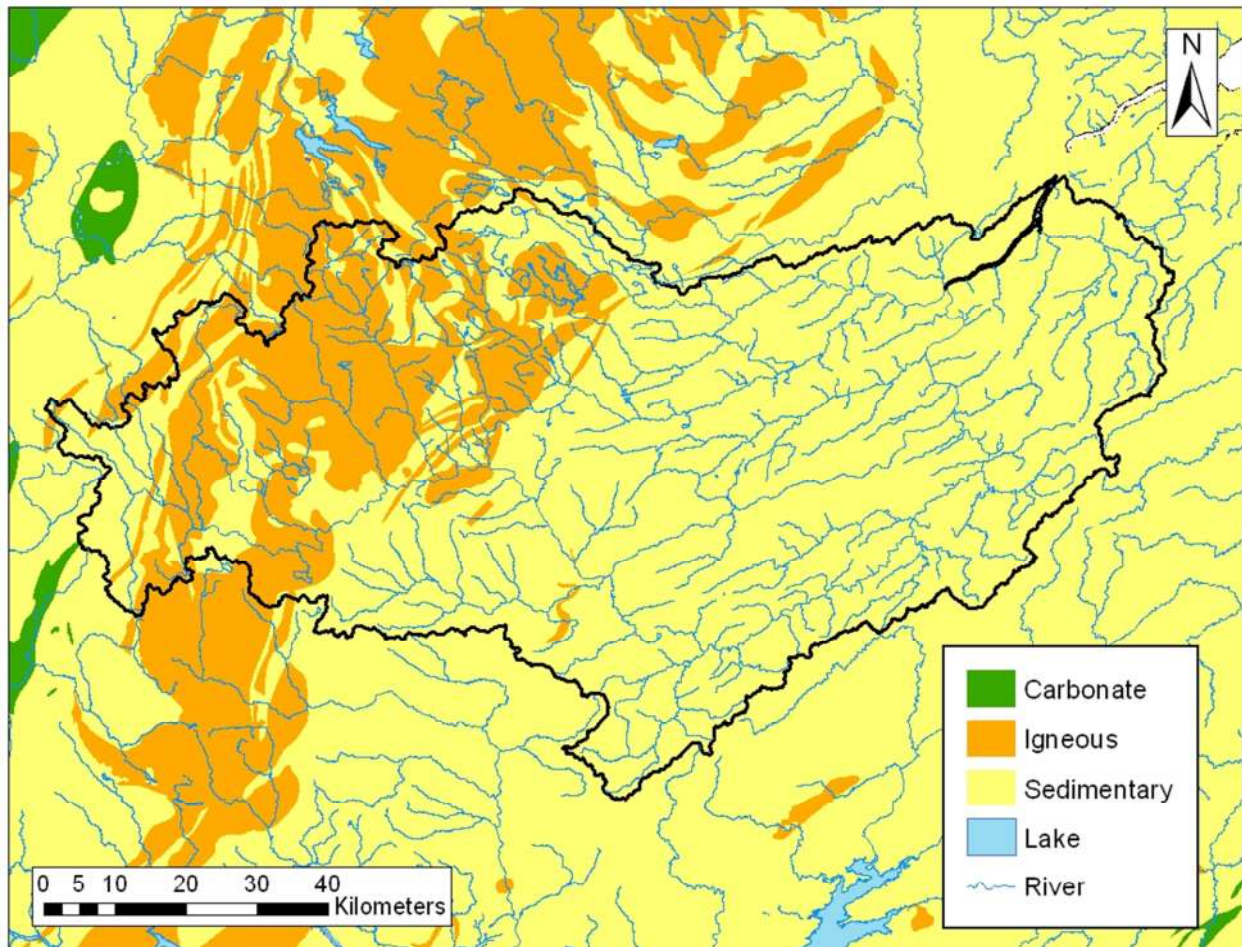


Figure 6 - Geological map of the Maritime Provinces (NBDENV)

3.5. WATER QUALITY

The current water quality in the Southwest Miramichi is general very good. Water quantity is sometimes a concern as it relates to fish habitat during hot dry summer periods. No clear picture of the impact of intensive long term forest harvesting is available. Catamaran Brook studies on the Northwest Miramichi since 1990 are generally supportive of the existing buffer zones being left along the river systems. Continuous water quality monitoring in this area has been ongoing since 1989 by MREAC through other monitoring programs such as Swim Watch, Freshwater Mussel Surveys and Sub-Watershed Monitoring Program. MREAC's On-Site Septic Remediation

Water Classification – Southwest Miramichi, Year 1 Report, 2010-2011

Program provided assistance for home septic system upgrades, which helped reduce the amount of untreated effluent from local homes into the river system. Support for this program through the ETF was discontinued in 2008.

There have been a number of community infrastructural improvements to sewage treatment over the past decade that may have an impact with improving the water quality in the Southwest Miramichi area. There have been upgrades to the Blackville Wastewater Treatment Plant in 2007 and Doaktown in 2010. Such upgrades reduce the amount of contaminated effluent from being released into the environment and improving the quality of the water.

Sawmills have been closing all over New Brunswick in recent years, with Juniper closing in 2006 and Blackville in 2007. While bad for the local economy and the livelihood of the people who worked at these mills, water quality impacts from these operations have been eliminated.

4.0. SOUTHWEST MIRAMICHI ACCOMPLISHMENTS

In the spring of 2011, MREAC will complete the first of two years of the Water Classification process focused on the Southwest Miramichi and her tributaries. This process involved the collection of environmental data, past and present, in order to establish the current state of water quality for the various tributaries and set a baseline for river categorization. Water quality sampling and bio-monitoring sampling were collected for the Southwest Miramichi area. Capacity building with stakeholders began as the program was announced by MREAC on the website, in the newsletter, and as a regular agenda item at MREAC monthly meetings. Some stakeholders were contacted directly and informed about Water Classification.

4.1. STAKEHOLDERS

The creation of a list of stakeholders within the Southwest Miramichi area began during this first year of Water Classification review. Some of these stakeholder groups were contacted by DENV (ie. JD Irving), and others by MREAC staff (ie. Miramichi Salmon Association). A contact list is continually being updated. Some of the stakeholders groups can be found in Figure 5 below. Individual stakeholders will not likely be contacted directly as there are over 8,000 people living in the Southwest Miramichi area, as well as non-resident camp owners from around the world. This issue will be addressed in the following Communication section.

Stakeholders are contacted in order to inform them about the project, how it affects them and what they can do to be part of the process. Maintaining the highest possible water quality standard is the ultimate goal as it is good for aquatic and human health. However, setting restrictions too high and preventing industrial or recreational use may conflict with economic growth and the prospect of new jobs. Finding a balance and setting classes accordingly is the challenge of Water Classification and the reason why stakeholder input is very important to this program.



Figure 7 - Sector chart indicating possible members of community stakeholder groups for Southwest Miramichi

4.2. COMMUNICATION

With over 8,000 people living in the Southwest Miramichi area, capacity building for this project becomes a challenge for such a large and spread out area. Direct contact with each individual stakeholder is not a feasible way to promote this project, nor is a mail-out like that done for the pilot project with the Renous River sub-watershed. Instead, open house community meetings will be held at four villages with planning started this year. These meetings will provide an opportunity for the public to come and inquire about Water Classification. These four villages will be Blackville, Doaktown, Boiestown and Rogersville. All meetings will be held in English with French provided at the Rogersville meeting. Brochures and other literature that explain Water Classification will be made available at the community meetings in both official languages.

Also this year, Water Classification was advertised on the MREAC website, and updates of the project were given in the organization's newsletters and at the monthly meetings. Any incoming calls of citizens were also directed to the MREAC office and handled appropriately.

4.3. MAPPING

Map creation during this first year of study was completed in house by MREAC staff or by DENV staff. Tools used were ArcMap with data from NBDNR for watershed boundaries and rivers layer. DENV provided the land use and geology maps. Also, two large maps illustrating four of the Southwest Miramichi villages and surrounding areas were created, using the GeoNB mapping tool online and printed by Taylor Digital Ltd. of Miramichi, which will be used during the community meetings.

4.4. WATER QUALITY MONITORING

This year, water quality samples were collected from 14 sites throughout the Southwest Miramichi area, targeting the major sub-watersheds. Samples were collected once a month for five months, starting in June and ending in October 2010. Nine sites were sampled by MREAC staff and five sites were sampled by JD Irving staff. Samples collected were sent to the New Brunswick Department of the Environment Analytical Laboratory where they were tested for nutrients, general chemistry, metals and bacteria. The *Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life* was used to compare the water sample results for metals and general chemistry. The bacteria guideline used to compare results was the *Canadian Water Quality Guideline for Recreational Use*, which is the standard that is used with a limit of 200 *Escherichia coli* CFU/100 ml.

Additional to these 14 sites, DENV has seven monitoring stations on different tributaries of the Southwest Miramichi where regular water quality information is collected every year. Tables 3, 4 and Figure 8 below indicate water quality sample site locations for Southwest Miramichi area.

Seven of the water quality monitoring sites were sampled for benthic invertebrates, two sites by DENV staff and five sites with MREAC staff assistance. One site for each of the Southwest Miramichi River tributaries were visited in September, 2010 for bio-monitoring. DENV standards were followed after onsite training from DENV staff. The sites sampled were:

Water Classification – Southwest Miramichi, Year 1 Report, 2010-2011

- Taxis River @ Hwy. 625
- Taxis River @ Mouth
- Cains River @ Hwy. 123
- Bartholomew @ Mouth
- Dungarvon @ Mouth
- North Branch of the Renous River @ Hwy. 108
- Barnaby @ Mouth

Table 2 - Southwest Miramichi 14 water quality sites (* indicates sites sampled by JD Irving) and seven bio-monitoring sites

Water Quality Sites	Bio-monitoring	N	W
Barnaby River @ mouth	B	46.89457	-65.61377
Barnaby River @ Hwy 126		46.86033	-65.44473
North Branch of Renous River @ Hwy 108	B	46.79527	-66.19687
Dungarvon River @ mouth	B	46.81425	-65.91667
Bartholomew @ mouth	B	46.71938	-65.87245
Bartholomew @ mid		46.67027	-66.03955
Cains River @ Hwy 123	B	46.43525	-66.01887
Taxis River @ mouth	B	46.45857	-66.42080
Taxis River @ Hwy 625	B	46.42608	-66.60403
Rocky Brook @ mouth*		46.60037	-66.63193
Sister Brook*		46.60155	-66.64552
Clearwater Brook*		46.65395	-66.76893
Burnthill Brook*		46.59972	-66.83893
N Branch SW Miramichi @ Juniper Station*		46.56227	-67.16618

Table 3 - DENV's Southwest Miramichi monitoring stations

Location
SW Miramichi @ Quarryville Bridge
SW Miramichi @ Renous River
SW Miramichi @ Blackville Bridge
SW Miramichi @ Cains River
SW Miramichi @ Doaktown
SW Miramichi @ Porters Brook Bridge
SW Miramichi @ Deersdale

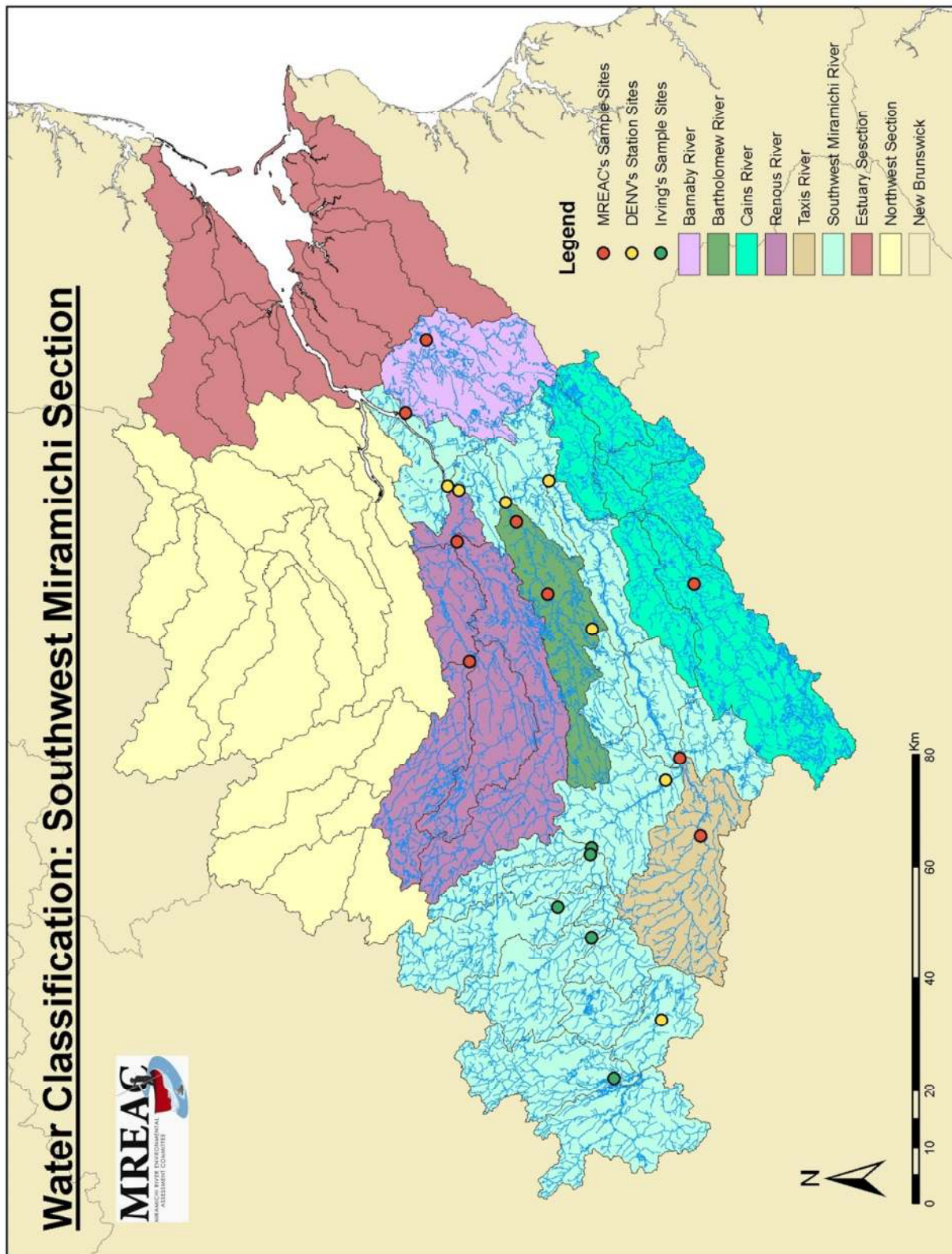


Figure 8 - Miramichi River Water Classification map with focus on Southwest Miramichi and illustrating sample sites

5.0. WATER QUALITY MONITORING RESULTS

Site descriptions, along with water quality results for the Southwest Miramichi sample sites can be found in the following sections. Bio-monitoring results were not completed in time to be included in this report.

5.1. TAXIS RIVER

GENERAL DESCRIPTION

This sub-watershed is mostly forested, crown land and Irving owned land, with some barren and shrub areas. A small number of rural residences are scattered throughout the sub-watershed.

Two water sampling sites were sampled by MREAC on the Taxis River, Taxis River @ Hwy. 625 which is approximate 18 km from the mouth of the river and upstream of Highway 625 Bridge, and Taxis River @ mouth which was directly at the mouth of the Taxis River where it empties into the Southwest Miramichi River, next to a privately owned fishing camp. Both Taxis River sites were also used for bio-monitoring sites on this river.

SAMPLE RESULTS

Both Taxis River sites had elevated bacterial counts in July but were still within an acceptable range. However, both sites greatly exceeded the guideline for bacteria during the September sampling (1300 CFU/100 ml). Heavy rain fall prior to sampling may be a contributing factor to this high count. Both sites exceeded the CWQG limits for cadmium in August, as well for aluminum in June and September. Chromium exceeded the CWQG limit in August at the Taxis River @ Hwy 625 site and in September at the Taxis River @ Mouth site. Iron was high at Taxis River @ Hwy 625 throughout the summer, and exceeded the CWQG in September for both Taxis River sites.

5.2. CAINS RIVER

GENERAL DESCRIPTION

Most of the land cover for the Cains River sub-watershed is forested with small pockets of shrub and barren land. This sub-watershed is almost entirely crown land, with some rural residents living throughout, and some cultivated land can also be found along the northern border. Highway 123 runs southward through this sub-watershed towards Minto, NB. The Cains River and Shinnickburn PNAs can also be found in this area.

Cains River @ Hwy. 123 was the only site sampled on this river and sampled by MREAC. This site was downstream of the Highway 123 bridge crossing. This same site was used for bio-monitoring.

SAMPLE RESULTS

Aluminum and iron at this site exceeded the CWQG limit for June, July, September and October.

5.3. BARTHOLOMEW RIVER

GENERAL DESCRIPTION

Most of the land cover for the Bartholomew River sub-watershed is forested with small pockets of shrub and barren land. The majority of this sub-watershed is crown land, with some rural residents living throughout. The mouth of this tributary empties into the main Southwest Miramichi River at the Village of Blackville. Blackville in 2007 upgraded their wastewater treatment plant which improved the water quality of the effluent released into the Bartholomew River.

This sub-watershed has two sample sites carried out by MREAC for water quality, Bartholomew @ Mid which can be found downstream of the Bartholomew Road Bridge that crosses the river approximately 20km from the mouth of the river, and Bartholomew @ Mouth which is approximately 5 km upstream from Blackville next to the Bartholomew Road where the old bridge crossed the Bartholomew River. This location was also used as a bio-monitoring site.

SAMPLE RESULTS

September samples for bacteria at both sites exceeded the CWQG (450 and 500 CFU/100ml respectfully). Also, aluminum for both sites during June exceeded the CWQG limit, and again in September for the Bartholomew @ Mid site. Iron was high during most of the summer, exceeding the CWQG limit for both sites in September.

5.4. RENOUS RIVER

GENERAL DESCRIPTION

The Renous River land cover is mostly forested with small pockets of shrub and barren land. The majority of this sub-watershed is crown land, with some rural residents living throughout. A major highway, Highway 108, runs through this sub-watershed which connects Miramichi to the Northwest of the province and is used as a route to Grand Falls or traffic leaving the province to Quebec. The Kennedy Lakes PNA can also be found along this highway in the Renous River sub-watershed.

One site was sampled by MREAC was the North Branch of the Renous River @ Hwy. 108. This site is downstream from the Highway 108 Bridge, approximately 2 km from where the Renous River branches into North and South Renous River. Just below the sample site is a commonly used recreational fishing site. This location was also used for the bio-monitoring site.

SAMPLE RESULTS

The bacteria result for the month of September exceeded the CWQG limit, with a result of 530 CFU/100ml. The aluminum parameter exceeded the CWQG limit for the month of September.

5.5. DUNGARVON RIVER

GENERAL DESCRIPTION

The Dungarvon River is a tributary of the Renous River, where most of the sub-watershed is forested land, with small pockets of shrub and barren land. This sub-watershed is almost entirely crown land, with some rural residents living throughout. The Dungarvon Whoopper Spring Woodlot and Big Rocky Brook PNA are located along this river.

One site was sampled by MREAC for this river, Dungarvon @ Mouth. This site is approximately 1.5 km from the Renous River and located behind a Scouts Canada camp ground. This site was also used as a bio-monitoring site.

SAMPLE RESULTS

Bacteria exceeded the CWQG limit in September with a result of 450 CFU/100ml. Aluminum exceeded the CWQG in September. Also fluoride exceeded the limit during the months of July, August and September.

5.6. BARNABY RIVER

GENERAL DESCRIPTION

The Barnaby River sub-watershed land cover is mostly forested with small pockets of shrub and barren land. The majority of this sub-watershed is crown land, with some rural residents living throughout. A major highway runs along this sub-watershed, Highway 126, connecting the Miramichi to Moncton. This highway runs through the village of Rogersville which lies within this sub-watershed. Peat harvesting and cranberry harvesting are active agriculture activities in this area.

Barnaby River @ Mouth and Barnaby River @ Hwy. 126 are the two sites MREAC sampled for this sub-watershed. Barnaby River @ Mouth is approximately 1.5 km from the main Southwest Miramichi River, accessed by a lane off of the South Barnaby River Road. This site was used as a bio-monitoring site. The Barnaby River @ Hwy. 126 is downstream of the Highway 126 Bridge, approximately 20 km from the mouth of the Barnaby River.

SAMPLE RESULTS

Both sites exceeded the CWQG for bacteria in September (740 and 270 CFU/100ml respectively), and Barnaby River @ Hwy. 126 in July with an E. coli count of 880 CFU/100ml. Both sites exceeded the CWQG for aluminum in June, September and October. The cadmium standard was exceeded in July for both sites, and again at Barnaby River @ Hwy 126 for July and August. Chromium exceeded the CWQG limit during July for both sites. Iron was above the standard during all five months for both sites.

5.7. ROCKY BROOK

GENERAL DESCRIPTION

This site can be found at the head waters of the Southwest Miramichi River, where much of the land is forested with pockets of shrub and barren land. The land is owned and operated by JD Irving for tree harvesting.

One site was sampled by JD Irving staff. This site can be found on the Rocky Brook Lodge properties at the mouth of Rocky Brook, where it empties into the Southwest Miramichi River.

SAMPLE RESULTS

Cadmium exceeded the CWQG limit in July and September. Fluoride also exceeded the standard for all five months at this site.

5.8. SISTER BROOK

GENERAL DESCRIPTION

This site can be found at the head waters of the Southwest Miramichi River, where much of the land is forested with pockets of shrub and barren land. The land is owned and operated by JD Irving for tree harvesting.

One site was sampled by JD Irving staff. This site is at the bridge that crosses Sister Brook near the mouth, about 1km upriver from the Rocky Brook site along the Southwest Miramichi.

SAMPLE RESULTS

Cadmium exceeded the CWQG limit in July, August and September. An unusual result with arsenic appeared (1.3 µg/L) in the July's sample, not exceeding the CWQG limit but being the only arsenic result for the entire summer.

5.9. CLEARWATER BROOK

GENERAL DESCRIPTION

This site can be found at the head waters of the Southwest Miramichi, where much of the land is forested with pockets of shrub and barren land. The land is owned and operated by JD Irving for tree harvesting.

One site was sampled by JD Irving staff. This site was next to the bridge that crosses over Clearwater Brook, almost 10km away from the Southwest Miramichi River.

SAMPLE RESULTS

Fluoride exceeded the CWQG in August with June, July and September approaching the limit.

5.10. BURNTHILL BROOK

GENERAL DESCRIPTION

This site can be found at the head waters of the Southwest Miramichi, where much of the land is forested with pockets of shrub and barren land. The land is owned and operated by JD Irving for tree harvesting.

One site was sampled by JD Irving staff. This site was next to the bridge that crosses over Burnthill Brook, over 3km away from the Southwest Miramichi River.

SAMPLE RESULTS

Fluoride exceeded the CWQG limit in June, July, August and September, with the November sample approaching the limit. Cadmium in August exceeded the CWQG limit, as well aluminum in November exceeded the limit.

5.11. NORTH BRANCH OF THE SOUTHWEST MIRAMICHI RIVER @ JUNIPER STATION

GENERAL DESCRIPTION

This site can be found at the head waters of the Southwest Miramichi, where much of the land is forested with pockets of shrub and barren land. The land is owned and operated by JD Irving for tree harvesting.

One site was sampled by JD Irving staff. This site is almost 10 km away from where the main Southwest Miramichi River branches into the North and South Branches, just north of Juniper Station and below an Irving fish barrier.

SAMPLE RESULTS

The only parameter that exceeded a CWQG limit for this site was aluminum in November.

6.0. NEXT STEPS

This completes year one for the Southwest Miramichi River to undergo Water Classification. Year 2, will continue with capacity building and informing stakeholders of the project. Community meetings will be arranged, along with direct contact to some stakeholder groups, either by phone or email. A second year of sampling is unlikely but will be undertaken if necessary. Uncertainty as to the legal status of Water Classification may result other adjustments to this partnership between MREAC and DENV as this process unfolds on the Miramichi River watershed.

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