

**Mactaquac Aquatic Ecosystem Study
Report Series 2015-022**



**METHODS REPORT:
Total Suspended Solids (TSS)
Sampling – Longitudinal Profile for
the Saint John River**

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DISCLAIMER

Intended use and technical limitations of the report, “Methods Paper: Total Suspended Solids (TSS) Sampling – Longitudinal Profile for the Saint John River”. This report describes the methods for the TSS sampling to create a longitudinal profile for the Saint John River. The CRI does not assume liability for any use of the included information outside the stated scope.

Introduction

As part of the Mactaquac Aquatic Ecosystem Study (MAES), Total Suspended Solids (TSS) and Turbidity sampling and analyses were completed to characterize the sediment loads suspended by the main-stem Saint John River (N.B.) and its major tributaries. Results from the TSS samples will also be used to calibrate hydrodynamic models of TSS in support of MAES. The surveyed area was the Saint John River between Hartland and Saint John, NB. Initial TSS sampling was completed during the spring freshet between April 29 and May 1, 2015 (Table 1). Future TSS sampling will seek to characterize sediment loading patterns during other periods (i.e. low water periods).

Methods

In all, 23 sites were sampled along the Saint John River and its major tributaries and bays. Sampling was staggered over three (3) days, working in a downstream direction in order to sample from the same bulk flow and minimize a possible temporal bias (Table 1, Figure 1). All samples were collected using a 2.2L Van Dorn Beta horizontal water sampler (www.wildco.com) and consisted of a 1L surface water sample (top 1m). Samples were analyzed in the Civil Engineering Environmental Lab, Department of Civil Engineering, University of New Brunswick, Fredericton.

Water samples were collected from Hartland to Saint John from the Saint John River during the 2015 spring freshet (Table 1). Some samples were taken from a boat, some from a bridge, and some from the shoreline. Sample bottles were kept chilled.

Total Suspended Solids analysis was conducted using a vacuum filtration method following the Standard Method 2540 D Total Suspended Solids Dried at 103 - 105C1 procedure. Turbidity was measured with a Hach 2100N Turbidimeter in the lab.

Results: 2015 Spring Freshet

During the height of the freshet (23-25 April 2015), the average TSS values in the Saint John River were approximately 31 mg/L with corresponding turbidity values of approximately 22 NTU (Fredericton Station 01AK003, 6.4 to 6.7m – minimum and maximum during period). After the spring water level dropped (29 April – 1 May 2015: Fredericton Level = 5.8 to 5.9m), TSS average values dropped to approximately 8 mg/L and turbidity dropped to approximately 7 NTU.

References

Standard Methods for the Examination of Water and Wastewater, 21st edition (2005), APHA, AWWA, WEF, edited by Andrew D. Eaton et al. p 2-58

Table 1. Locations where Total Suspended Solids were sampled on the Saint John River and major tributaries and bays as part of the Mactaquac Aquatic Ecosystem Study (coordinates are in WGS 1984 datum).

ID	Site	Latitude	Longitude	Day	Date	Time	Method
1	Becaguimac	46.30223	-67.52873	1	29-Apr-15	09:19	Bridge
2	Hartland	46.29674	-67.52990	1	29-Apr-15	09:34	Bridge
3	Woodstock	46.16566	-67.56966	1	29-Apr-15	11:00	Bridge
4	Meduxnekaeg	46.14902	-67.57433	1	29-Apr-15	11:25	Bridge
5	Eel River	45.99585	-67.49277	1	29-Apr-15	11:53	Bridge
6	Pokiok Stream	45.95829	-67.24590	1	29-Apr-15	12:13	Bridge
7	Nackawic	45.96119	-67.24789	1	29-Apr-15	12:18	Bridge
8	Nackawic Stream	46.00394	-67.24212	1	29-Apr-15	12:36	Bridge
9	Mactaquac Causeway	45.97593	-66.88591	2	30-Apr-15	08:42	Bridge
10	Mactaquac Dam	45.95509	-66.87138	2	30-Apr-15	08:54	Bridge
11	Keswick Stream	45.99417	-66.83200	2	30-Apr-15	09:07	Bridge
12	Nashwaaksis Stream	45.98434	-66.66463	2	30-Apr-15	09:25	Bridge
13	Fredericton	45.95698	-66.62952	2	30-Apr-15	09:47	Bridge
14	Nashwaak River	45.95694	-66.61958	2	30-Apr-15	10:01	Bridge
15	Oromocto River	45.85005	-66.51586	2	30-Apr-15	11:20	Bridge
16	Jemseg River	45.82923	-66.11572	2	30-Apr-15	12:05	Bridge
17	Gagetown	45.76642	-66.13734	2	30-Apr-15	13:01	Boat
18	Washademoak	45.82980	-65.95184	3	1-May-15	08:49	Bridge
19	Belleisle Creek	45.67475	-65.80965	3	1-May-15	09:15	Bridge
20	Grand Bay	45.35035	-66.22004	3	1-May-15	10:40	Ferry Landing
21	Nerepis	45.36612	-66.23745	3	1-May-15	10:50	Bridge
22	Millidgeville	45.28722	-66.13049	3	1-May-15	11:50	Boat
23	Kennebaccasis	45.47637	-65.94061	3	1-May-15	13:00	Boat

Figure 1. Locations where Total Suspended Solids were sampled on the Saint John River and major tributaries and bays as part of the Mactaquac Aquatic Ecosystem Study. See also Table 1.

