

INTERNATIONAL RAINY LAKE BOARD OF CONTROL
INTERNATIONAL RAINY RIVER WATER POLLUTION BOARD

Fall 2011 REPORT

Submitted to

The International Joint Commission

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BOARD MEMBERS AND STAFF

	Canada	USA
IRLBC Members	Gail Faveri, P.Eng Vacant	Michael Price, COL Leland Grim
IRRWPB Members	Vacant Gregory Chapman Kelli Saunders (Alternate)	Jeffrey Stoner, PG Nolan Baratono
IRLBC Engineering Advisors	Rick Cousins, P.Eng Matt DeWolfe, P. Eng	Edward Eaton, PE
Joint Board Secretary	Tana McDaniel	

1 INTRODUCTION

The International Rainy Lake Board of Control (IRLBC) and the International Rainy River Water Pollution Board (IRRWPB) report jointly to the International Joint Commission (IJC) in the fall and spring of each year. Both reports address activities and basin issues of interest occurring since the previous report and may include sections on specific topics under review by the Boards. The fall reports focus on environmental quality and related issues, while the spring reports provide more detail on the regulation of Namakan and Rainy lakes over the previous calendar year.

The business of the two Boards continues to be conducted cooperatively, with joint conference calls throughout the year. Joint meetings were held in International Falls, Minnesota in August. These included a public meeting held on August 16th, a meeting with the dam operators (H2O Power LP / AbitibiBowater and Boise Inc.), a meeting with resource agencies and a tour of the Steep Rock Mine Site. In attendance from the IJC were Canadian Chair Joseph Comuzzi and US Chair Lana Pollack, Commissioner Pierre Trépanier, Commissioner Richard Moy, Commissioner Dereth Glance, acting IJC Secretary Paul Pilon and engineering advisors Nick Heisler and Mark Colosimo. The meeting of the IRLBC and IRRWPB coincided with the IJC's public hearings on the recommendations of the International Lake of the Woods and Rainy River Watershed Task Force.

2 AMBIENT ENVIRONMENTAL MONITORING IN 2010

2.1 Water Quality Monitoring – Minnesota Pollution Control Agency (MPCA)

The MPCA recently completed an assessment of the Milestones Monitoring Program and how it fits into its Intensive Watershed Approach (described below). Management decided to eliminate the Milestone Monitoring Program effective November 1, 2010.

While the Milestones network has for decades provided a mechanism for tracking long-term trends in stream water quality, the new watershed monitoring systems the MPCA has instituted are providing a much more complete picture of water quality conditions and trends. This new monitoring requires a significant investment to achieve the goals set forth by the agency and the Legislature, and the agency continues to look for opportunities to increase efficiency to meet that staffing challenge.

MPCA's future plans:

- Complete the trends analysis of this last decade of Milestones data and include it in the long-term trend information for these monitoring locations. This database will continue to provide information on stream water quality trends in the last half of the 20th century and the early 21st century.
- Our Major Watershed Load Monitoring Program (described below) provides extensive baseflow and storm event information for all major watersheds of the state. Baseline data from the first years of monitoring will be reported out this winter. The MPCA will continue to build the perpetual record at these sites over time. Advantages of the load monitoring network over Milestones include watershed geographic coverage, annual year-round sampling, and the ability to calculate loads.
- The rotating 10-year cycle Intensive Watershed Monitoring approach includes chemistry monitoring and biological monitoring at many sites per watershed. Monitoring is conducted in each watershed on a decadal frequency, and subsequent decades will start to indicate trends.

The amount and type of monitoring performed is significantly more extensive than of the discontinued Milestones Program.

Intensive Watershed Monitoring:

In order to effectively sample streams throughout the state, the MPCA instituted the Intensive Watershed Monitoring Plan (IWM) in 2006. The IWM is designed to assess the aquatic health of an entire major watershed through intensive biological and water chemistry sampling.

The IWM utilizes a 'pour point' method of sampling; this systematic sampling near the mouth of watersheds of different size scales is used to measure the condition of the upstream watershed in an unbiased way. The intensive approach allows assessment of the watershed for aquatic life, aquatic recreation, and aquatic consumption use support of the state's streams in each of the state's 84 major watersheds on a rotating 10 year cycle. These uses are assessed to make sure that the goals of the Clean Water Act are being met; having "fishable, swimmable" waters.

The main objectives of the IWM Strategy are to determine the condition of all watersheds throughout the state for a variety of indicators, to locate watersheds with impairments, to provide information for the stressor identification/Total Maximum Daily Load process, and to monitor conditions over time.

Little Fork River Watershed:

The lower reach of the Little Fork mainstem was added to the United States Federal Impaired Waters List [303(d) Report to Congress] for turbidity in 2006. The Total Maximum Daily Load study and report development is scheduled to begin in 2012.

In 2006, the MPCA began the Little Fork/Big Fork Paired Watershed Study designed to provide resource managers with information that will explain why the Little Fork has high sediment concentrations causing the turbidity. 2006 field work included a sediment-loading study during spring runoff and gathering additional morphologic data from both watersheds. 2007 field work included a continuation of the spring runoff sediment loading study, as well as an on-the-ground reconnaissance and characterization of a 12-mile section of the river (with assistance from the Minnesota Department of Natural Resources (MDNR)).

In 2008-09 the MPCA also conducted the first phase of intensive watershed monitoring of the Little Fork River and tributaries. Sites were to be sampled to assess fish community structure, physical habitat, and water chemistry during the months of June - August. Invertebrate sampling at these sites was conducted in the month of September. A detailed assessment report is in draft form and is expected to be posted on the MPCA's website in 2011. For more information on the MPCA's biological monitoring go to:

<http://www.pca.state.mn.us/water/biomonitoring/bio-about.html>

For a PDF map of monitoring locations on the Little Fork go to:

<http://www.pca.state.mn.us/publications/maps/biomonitoring-littleforkphase1.pdf>

Stressor identification and watershed modeling started in 2011 with completion expected in 2012.

Big Fork River Watershed:

In 2010, the MPCA initiated the first phase of intensive watershed monitoring of the Big Fork River and tributaries. The first phase will be completed in 2011, with stressor identification and watershed modeling to follow in 2012.

Rainy River Headwaters Watershed:

The White Iron Chain of Lakes Association (WICOLA), in cooperation with stakeholders and numerous state and federal agencies, is leading a volunteer-based, long term, condition monitoring project for the Kawishiwi River Watershed. The Kawishiwi is a sub-watershed of the Rainy River Headwaters Watershed. This project was initiated in 2005.

In 2008, WICOLA initiated a protection project for the Kawishiwi Watershed. In 2011, the three year Kawishiwi Watershed Protection Project formally commenced with the support of Lake County and the MPCA. A coordinator was hired and the ongoing monitoring effort was expanded to include additional lake and stream sites. The outcome of this project will be development of a watershed management plan for the Kawishiwi.

Major Watershed Load Monitoring Program:

Tied to the goals of the 1972 Clean Water Act (CWA) for restoring and protecting the multiple beneficial uses and ecological integrity of America's waters, the MPCA's Major Watershed Load Monitoring Program (MWLMP) is designed to measure and compare regional differences and long-term trends in water quality from Minnesota's major rivers and the outlets of major tributaries draining to these rivers. Data will also be used to aid in the development of "Total Maximum Daily Load" (TMDL) studies and implementation plans, assist watershed modeling efforts, and provide information to watershed research projects.

Initiated in 2007 and funded with appropriations from Minnesota's Clean Water Fund, the MWLMP's multi-agency monitoring approach combines site specific stream flow data from United States Geological Survey (USGS) and MDNR flow gauging stations with water quality data collected by the MPCA, Metropolitan Council Environmental Services (MCES), and local monitoring organizations to compute annual nutrient and sediment pollutant loads. When fully implemented, the MWLMP will monitor and compute pollutant loads at 82 stream sites across the State.

MWLMP sites in the Rainy River Basin are located on the following rivers:

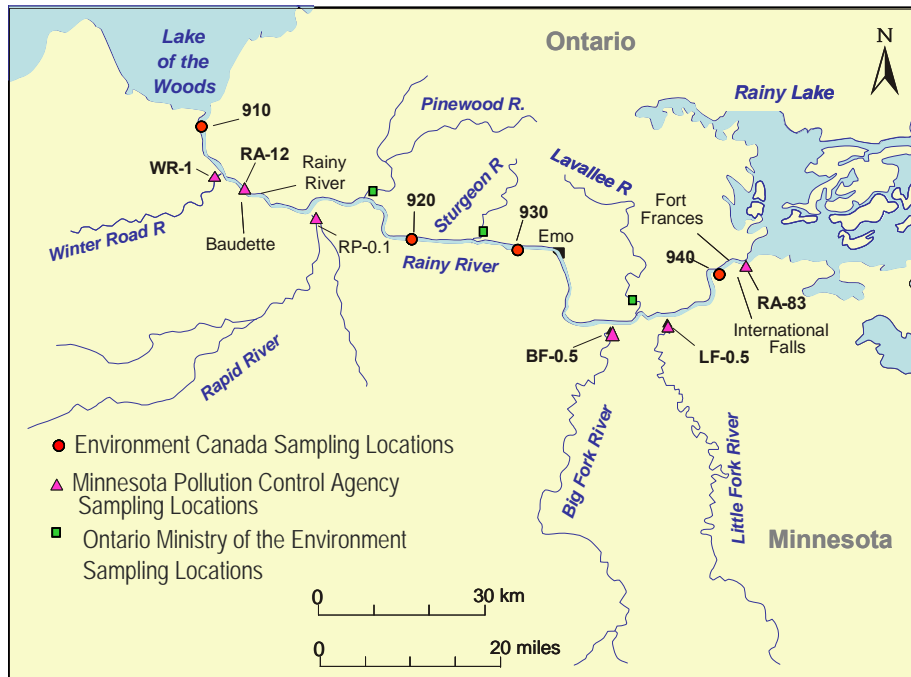
- Vermilion River
- Little Fork River
- Big Fork River
- Rainy River
- Rapid River

Loading data are currently not available on line, but data will be provided on request (Contact is Pat Baskfield at Pat.Baskfield@state.mn.us.)

Lake of the Woods Study:

In 2009, the MPCA implemented a loading study of tributaries to Lake of the Woods. This study included most of the U.S. direct tributaries to Lake of the Woods, including a Rainy River site at Manitou Rapids (currently an MWLMP site as described above). 2010 data are available at www.pca.state.mn.us. In 2010, the MPCA contracted with the USGS to establish a flow and stage gage and conduct a two year loading study at Wheeler's Point, the terminus of the Rainy River. The Wheeler's Point site captures all of the Rainy River flow. Following completion of the two year study, the MPCA extended the operation of the gage for a third year. Following completion of the study, data will be available on the MPCA website.

Figure 1 Rainy River Sampling Locations for MPCA, OMOE, and Environment Canada



2.2 Water Quality Monitoring –Environment Canada (EC)

In 2009, Environment Canada (EC) initiated a program to monitor water quality at four sampling sites on the Rainy River in order to improve estimates of nutrient loadings to Lake of the Woods, and to measure mercury levels in the River for comparison to water quality guidelines. In cooperation with Rainy River First Nation, water samples are collected from four transects on the Rainy River (Figure 1) on a bi-weekly basis to monitor nutrients, physical properties and mercury concentrations. Each transect consists of five equidistant stations running from the Canadian to the American shore. Water is sampled at each station at a depth of one meter and analyzed individually for nutrients (total and dissolved phosphorus, nitrates/nitrites, ammonia, total nitrogen) and physical chemistry (anions, cations, sulphates, reactive silicate). A dip sample for mercury is taken from the central station of each transect. At sites 920, 930 and 940, sampling takes place from May to October, while at station 910 at the mouth of Rainy River sampling takes place year round. During early spring, samples are also collected at the Fort Frances water treatment plant from their water intake pipe. Data from this study will contribute towards nutrient loading estimates for the Lake of the Woods and will also be published as part of an Environment Canada report on Lake of the Woods.

In 2010, average total phosphorus concentrations ranged from 23.0 ug/L upstream at Fort Frances (station 940) to 27.4 ug/L at the mouth of the Rainy River (station 910). These average concentrations are below the Rainy River Alert Level for total phosphorus of 30 ug/L. Similarly, average concentrations of total mercury ranged from 0.0011 ug/L at Fort Frances to 0.0029 ug/L at Manitou Rapids (Station 930), well below the Rainy River Alert Level of 0.0069 ug/L. Data from this study will contribute towards nutrient loading estimates for Lake of the Woods.

2.3 Water Quality Monitoring –United States Geological Survey (USGS)

Beginning in April 2010, the USGS sampled the Rainy River as part of an assessment to better understand nutrient loads near the mouth of the river—specifically the Rainy River near the boat landing at Wheeler's Point, MN. Emphasis of this sampling was to better understand nutrient conditions during snowmelt runoff in April and May, 2011. The data were collected to support the development of a water-quality model being developed by the MPCA.

Sediment, total suspended sediment, and turbidity were monitored at the Little Fork River at Little Fork, MN, in cooperation with the MPCA. The Little Fork River is a major tributary to the Rainy River and important to understand the overall nutrient loads to the Rainy River. These basic data can be found in the USGS National Water Information System data base.

In cooperation with the National Park Service, water quality, sediment quality, and streamflow data were collected from 22 sites affecting Kabetogama Lake in Voyageurs National Park in 2008 and 2009 in order to assess internal and external nutrient loading and algal community characteristics. The final USGS report (citation below) was published in 2011.

Christensen, V.G., Maki, R.P., and Kiesling, R.L., 2011, Relation of nutrient concentrations, nutrient loading, and algal production to changes in water levels in Kabetogama Lake, Voyageurs National Park, northern Minnesota, 2008–09: U.S. Geological Survey Scientific Investigations Report 2011–5096, 50 p. This report is available [at http://pubs.usgs.gov/sir/2011/5096/](http://pubs.usgs.gov/sir/2011/5096/). The abstract is reproduced hereinafter.

Nutrient enrichment has led to excessive algal growth in Kabetogama Lake, Voyageurs National Park, in northern Minnesota. Water- and sediment-quality data were collected during 2008–09 to assess internal and external nutrient loading. Data collection was focused in Kabetogama Lake and its inflows, the area of greatest concern for eutrophication among the lakes of Voyageurs National Park. Nutrient and algal data were used to determine trophic status and were evaluated in relation to changes in Kabetogama Lake water levels following changes to dam operation starting in 2000. Analyses were used to estimate external nutrient loading at inflows and assess the potential contribution of internal phosphorus loading. Kabetogama Lake often was mixed vertically, except for a few occasionally stratified areas, including Lost Bay in the northeastern part of Kabetogama Lake. Stratification, combined with larger bottom-water nutrient concentrations, larger sediment phosphorus concentrations, and estimated phosphorus release rates from sediment cores indicate that Lost Bay may be one of several areas that may be contributing substantially to internal loading. Internal loading is a concern because nutrients may cause excessive algal growth including potentially toxic cyanobacteria. The cyanobacterial hepatotoxin, microcystin, was detected in 7 of 14 cyanobacterial bloom samples, with total concentrations exceeding 1.0 microgram per liter, the World Health Organization's guideline for finished drinking water for the congener, microcystin-LR. Comparisons of the results of this study to previous studies indicate that chlorophyll-*a* concentrations and trophic state indices have improved since 2000,

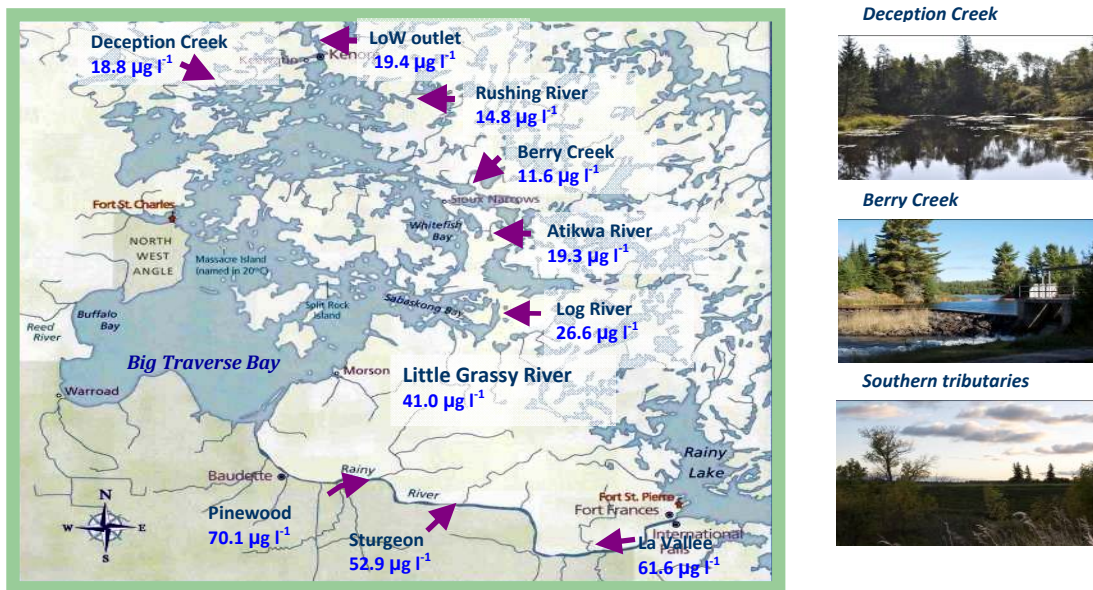
when the rules governing dam operation changed. However, total-phosphorus concentrations have not changed significantly since 2000.

2.4 Tributary Monitoring Program- Ontario Ministry of Environment (MOE)

In spring 2011, the Ontario Ministry of the Environment, with the assistance of a Confederation College student, continued their annual tributary monitoring program of 9 streams that flow into the Rainy River and/or Lake of the Woods as well as the outlet of Lake of the Woods at the Winnipeg River. The main objective of this work is to continue to monitor nutrient loads into the lake and river to observe seasonal and spatial trends and to have data available for refining the nutrient budget done for the lake in 2010. This work will also help to identify those tributaries with the highest nutrient loadings, and help focus possible reduction strategies in the future. Sampling is occurring on three tributaries of the Rainy River: the Lavallee River, the Sturgeon River and the Pinewood River in addition to six other tributaries to Lake of the Woods and the outlet at the Winnipeg River.

Flows have been highly variable this year, from high spring levels to very little to no flow (LaVallee) this fall. As of September, 13 sampling events have been completed for the 2011 season on all of the tributaries and one additional event completed on the Rainy River tributaries. Samples have been analyzed for nutrients (phosphorus, nitrogen) and general chemistry parameters (pH, alkalinity, specific conductance, total & dissolved solids, dissolved organic & inorganic carbon, plus reactive silicate). Although this report is primarily concerned with water quality in the Rainy River and its tributaries, data from other tributaries in the Lake of the Woods watershed are shown for comparison. Data are being compiled into a data base; results to date have shown that concentrations are significantly higher in the tributaries to the Rainy River as compared to the other locations (see Figure 2). The tributary sampling program has run since 2009 and is expected to continue in 2012 in order that the nutrient loadings into the Rainy River and Lake of the Woods can be further understood, and ultimately any management decisions made on the best information available.

Figure 2. Mean total phosphorus concentrations from 2009 tributary monitoring program.



From Hargan 2010.

2.5 Fish Consumption Advisories

Fish consumption advisories are issued based on fish tissue monitoring carried out by provincial and state agencies in Ontario and Minnesota. In Minnesota, it is a shared program between the MDNR and the Minnesota Department of Health (MDH), while in Ontario it is a shared program with the Ontario Ministry of Natural Resources (MNR) and the MOE.

Minnesota

Each year, the MDNR collects fish from lakes and rivers for testing. Fish fillets are tested for mercury and in some cases polychlorinated biphenyls (PCBs). The MDNR, the MPCA, and the MDH collaborate to select sites where fish are tested. The MPCA also screens fish for other chemical contaminants that may be of concern. The MDH issues fish consumption advice based on the concentrations of chemicals measured in fish fillets. The concentrations that trigger fish consumption advice are listed in Appendix A.

Currently MDH issues consumption advisories based on mercury for Rainy Lake, Rainy River, Little Fork River, Big Fork River, Vermilion River and Lake of the Woods. Detailed information can be found at <http://www.health.state.mn.us/divs/eh/fish/index.html>.

Ontario

The *Guide to Eating Ontario Sport Fish* is published every other year by the MOE in cooperation with the MNR. Skinless boneless dorsal fillets are analyzed for a variety of contaminants that may include mercury and other metals, DDT, PCBs, PCB congeners, mirex/photomirex, pesticides, chlorinated phenols, chlorinated benzenes, polycyclic aromatic hydrocarbons (PAHs), dioxins/furans and dioxin-like PCBs. Results are used to develop tables in the *Guide*, which give size-specific consumption advice for each species tested at each location. For Rainy River and Lake of the Woods where contaminant burdens vary within the water body, consumption advice is given for each area. The number of recommended meals per month ranges from 8, for fish with low contaminant concentrations, to zero, for fish with high contaminant concentrations. Consumption advice is based on health protection guidelines developed by Health Canada. The 2011-2012 *Guide* contains important information on consumption of sport fish for both the general population and the sensitive population of women of child-bearing age and children under 15. The concentrations that trigger fish consumption advice are listed in Appendix A.

Advisories restricting fish consumption remain in effect for Rainy Lake, Rainy River, and Lake of the Woods. Consumption guidelines also vary within these water bodies with consumption of northern pike and walleye being more restricted in Rainy Lake in fish from Redgut Bay compared to fish from the North and South arm of the lake. For all of these water bodies, advisories are mainly a result of mercury concentrations in fish tissue. Fish consumers should consult the “2011-2012 *Guide to Eating Ontario Sport Fish*” for more detailed information. The Guide can be accessed at <http://www.ontario.ca/fishguide>.

2.6 Environmental Effects Monitoring

Through federal legislation, the Environmental Effects Monitoring (EEM) program requires pulp and paper mills in Canada to monitor the effects of pulp and paper mill discharges in receiving waters. Study components include an adult fish survey, a benthic invertebrate survey, and toxicological testing of final effluent. The EEM program consists of a series of monitoring and interpretation cycles that build on the findings from previous cycles. Since the regulations came into effect, the Fort Frances mill has completed 5 cycles of the program.

The Cycle 5 study for Abitibi-Consolidated included a fish survey, benthic invertebrate survey and sub-lethal toxicity testing of mill process effluent. The field investigations for Cycle 5 were conducted from September 29 to October 1, 2009. The report was submitted on March 30, 2010 to Environment Canada.

During the field survey the water levels were high and thus all fish exposure locations and all benthic stations were exposed to <1% effluent. The fish survey was conducted using young of the year Johnny darter as the sentinel species. The only significant difference seen was that the exposed fish were 2.5 % heavier than the reference fish (Reference 1).

The Cycle 5 benthic invertebrate survey utilized a gradient design with 30 stations from the effluent diffuser downstream for 10.5 km. The only key differences seen were a significant decrease in abundance and changes in benthic community structure with distance from the outfall.

Sub-lethal toxicity testing of final effluent was undertaken for three different tests: Fathead minnow (*Pimephales promelas*) survival and growth test, water flea (*Ceriodaphnia dubia*) survival and reproduction and the algal (*Pseudokirchneriella subcapitata*) growth inhibition test. Growth inhibition (IC25) for fathead minnow was observed in three out of six tests and ranged from 68.2% to 82.6%. Reproduction inhibition (IC25) for *C. dubia* was observed for five out of six tests and ranged from 2.0 % to 89.9 %. Growth inhibition (IC25) for *P. subcapitata* was observed in three test samples and ranged from 6.8% to 32.9%. The geometric means of the IC25 were 87.7% for fathead minnow, 33.8% for *C. dubia* and 42.1% for *P. subcapitata*. Using the Cycle 5 estimated 1% effluent plume length of ~100 m, the potential zone of effect was estimated as 1.14 m downstream for fathead minnow growth, 2.96 m downstream for *C. dubia* reproduction and 2.38 m for *P. subcapitata* growth.

3 POINT SOURCE DISCHARGES

As indicated in the recent Board reports, point source discharges to the Rainy River from municipal and industrial sources have remained relatively constant from a loadings perspective and will probably remain fairly steady at current levels in the foreseeable future. The dramatic decreases in loading for conventional parameters, such as biological oxygen demand (BOD) and total suspended solids (TSS), from the 1960's to the early 1980's are the direct result of remedial measures undertaken by industry and municipalities. Figure 3 documents this historical downtrend of BOD from municipal and industrial sources. Given the nuisance algal bloom and elevated nutrient issues faced in water bodies downstream of Rainy River (Lake of the Woods, Lake Winnipeg), the Boards have decided to include information on point sources loadings of total phosphorus (where available) in this report. Figure 4 documents temporal trends in total phosphorus loads in the Rainy River from point and non-point sources from Hargan's phosphorus budget for Lake of the Woods:

Hargan, K.E. 2010. A total phosphorus budget for the Lake of the Woods. M.Sc. Thesis, Environmental and Life Sciences, Trent University, Peterborough, O.N.

Similar to BOD, although more variable, phosphorus loads in the Rainy River have generally declined significantly since the early 1970s, likely due to reductions from industrial and municipal point sources.

Figure 3. Total BOD Load from Continuous Discharges 1968-2010.

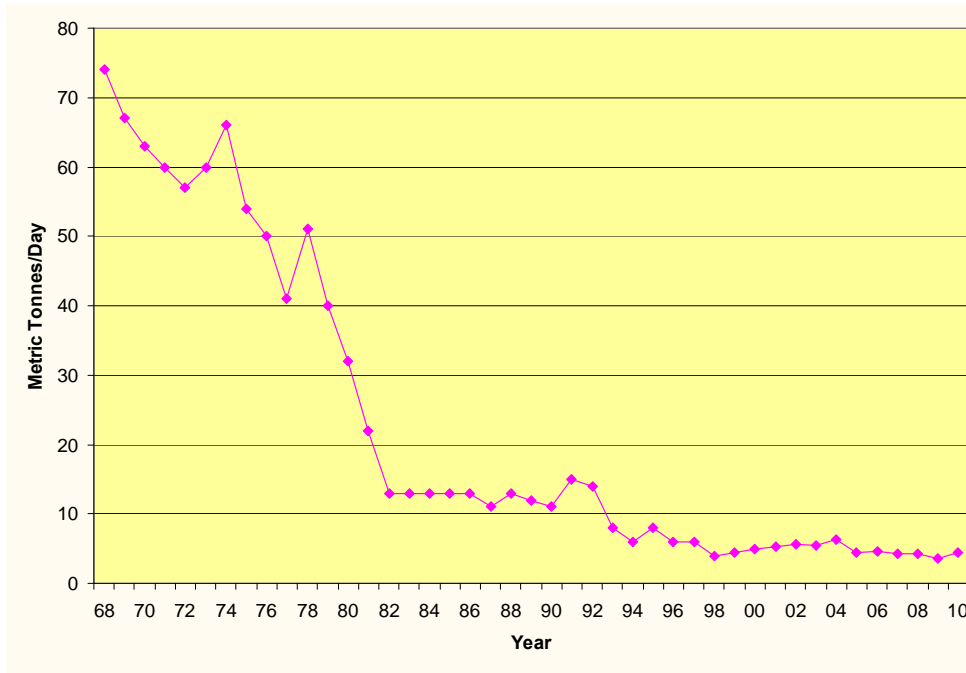
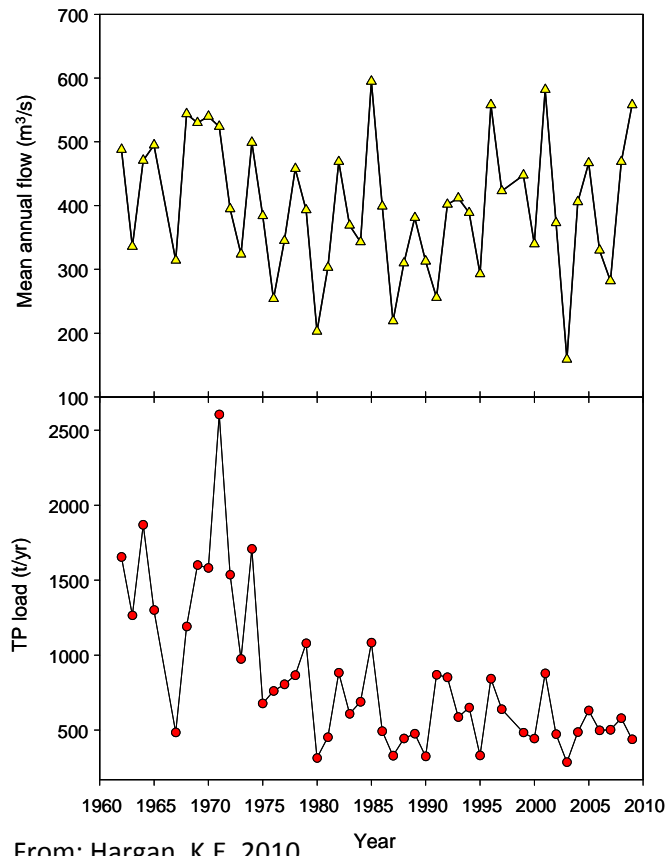


Figure 4. Total phosphorus Load in the Rainy River



From: Hargan, K.E. 2010.

3.1 Minnesota Municipal Sources

North Koochiching Sanitary Sewer District:

The District, which includes International Falls, discharges to the Rainy River downstream of International Falls. The current National Pollutant Discharge Elimination System (NPDES) Permit for the District expires in 2012. The District reported two technical violations to its discharge permit for the calendar year 2010. During the month of July 2010, the District failed to achieve the required 85% reductions for BOD (5% exceedence) and TSS (6% exceedence), but the total monthly discharges were well below the permit limits. The permit limits BOD discharge to 217 kg/d and the daily average discharge for July 2010 was 53.9 kg/d. The TSS limit is 261 kg/d and the daily average for July 2010 was 71.5 kg/d. Discharge data from this facility are shown in Table 1 for the years 1996 through 2010. The NPDES Permit for the District does not have a limit for total phosphorus.

The District is actively pursuing a permit and funding to replace its secondary unit and add an enhanced solids removal module, which will further reduce BOD and TSS discharges and provide for significant effluent reductions in phosphorus and mercury.

Table 1. North Koochiching Sanitary Sewer Average Annual Discharge Summary

Year	Flow (m ³ /d)	BOD (kg/d)	TSS (kg/d)	TP (kg/d)
1996	6813	89.7	50.4	-
1997	4921	77.4	38.6	-
1998	5349	77.1	32.4	-
1999	5149	70.0	35.0	-
2000	4245	54.6	26.7	-
2001	4920	64.3	35.4	-
2002	4538	71.0	35.2	11.4
2003	3191	47.1	20.2	10.2
2004	4397	43.4	19.0	10.6
2005	4781	51.6	24.6	12.0
2006	3794	46.2	18.6	12.5
2007	3780	41.1	24.6	11.7
2008	4391	39.1	35.7	10.8
2009	4634	52.3	34.1	10.5
2010	4474	41.3	29.9	9.6

“-” = Data unavailable at the time this report was generated

Baudette

The Baudette wastewater treatment facility has a lagoon system that discharges seasonally to the Rainy River. The facility discharged during May, October and November of 2010. The total discharge during that period was 201,912 m³. Calculated monthly discharge volumes are shown below in Table 2. During discharge periods, BOD levels were well within the NPDES Permit limits of 25 mg/l and TSS levels were below the 45 mg/l limit. Average BOD and TSS concentrations during discharge were 2.0 mg/l and 5.83 mg/l respectively. Average total phosphorus concentration during discharge was 1.89 mg/l. The NPDES Permit limits phosphorus discharge for the Baudette facility to 367 kg/year. The Baudette facility discharged 381.7 kg of phosphorus in 2010, a four percent exceedence. The NPDES Permit for the

Baudette facility was issued in November of 2010. The current Baudette permit is being modified to include a schedule of compliance to allow the facility to obtain the equipment to provide phosphorus treatment and attain compliance with the 1.0 mg/l phosphorus limit by September 1, 2012. This modification to the permit is on public notice through September 24th.

Table 2. Baudette Waste Water Treatment Facility Monthly Discharge in m³

Year	April	May	June	July	Aug	Sept	Oct	Nov
2004	none	144,235	28,847	none	none	96,157	67,310	38,463
2005	57,690	none	96,150	none	none	38,460	57,690	67,305
2006	none	69,150	67,305	none	none	none	48,075	none
2007	none	76,920	none	none	none	none	96,149	38,460
2008	none	96,149	none	none	none	none	67,305	67,305
2009	none	67,304	67,304	none	none	none	None	67,304
2010	none	67,304	none	none	none	none	67,304	67,304

3.2 Ontario Municipal Sources

Fort Frances

A rebuild and upgrade of the Fort Frances wastewater treatment plant was completed in January 1998 to include secondary treatment and phosphorus removal. The result of improved treatment is indicated in the 1998 discharge data in Table 3 which includes two years of pre-secondary treatment and eleven years of secondary treatment. The plant operated throughout 2010 within MOE guidelines of 25mg/l for BOD and TSS. Average concentrations in 2010 were 2.3 mg/l BOD and 5.1 mg/l TSS. The average total phosphorus (TP) concentration in the discharge was 0.2 mg/l, resulting in an annual loading of 697 kg of TP. There were three bypass events in 2010, all caused by heavy precipitation. Two of these events took place in early July and one took place in late September releasing a total of 9,634 m³ of storm water run-off mixed with effluent resulting in approximately an additional 9.9 kg of TP entering the river.

Table 3 Fort Frances Wastewater Treatment Plant Average Annual Discharge Summary

Year	Flow (m ³ /d)	BOD (kg/d)	TSS (kg/d)	TP (kg/d)
1996	8940	211	449	-
1997	7240	323	447	-
1998	6500	52	76	-
1999	8280	48	56	-
2000	6973	48	55	-
2001	8144	46	90	-
2002	7549	52	88	-
2003	6281	44	71	-
2004	7791	59	89	-
2005	8684	30	80	2.37
2006	7249	27	74	1.86
2007	6724	21	67	1.75
2008	7355	27	74	2.00
2009	7540	23	46	1.55
2010	7658	17	40	1.90

Emo

The Town of Emo has a seasonal discharge from its sewage lagoon to the Rainy River. During 2010, a total of 166,719 m³ was discharged to the river in the spring and fall. BOD and TSS were within the provincial discharge guidelines of 40 mg/l and 30 mg/l, respectively, during discharge periods. Average BOD and TSS concentrations during discharge were 4.03 mg/l and 6.3 mg/l, resulting in a total loading of 671.5 kg BOD and 1049 kg TSS. Total phosphorus concentrations averaged 0.69 mg/l resulting in a total loading of 115.5 kg of TP. There were no bypass events at the Emo sewage lagoon in 2010.

Manitou Rapids

The sewage lagoon operated by Rainy River First Nations at Manitou Rapids is monitored by Health Canada. In May of 2010, the sewage lagoon was tested but it was found that concentrations of phosphorus, BOD and TSS were too high to allow for a release. When the lagoon was tested again in July, concentrations of parameters were within acceptable concentrations for release to the Rainy River. Total phosphorus was 1 mg/l, BOD was 4.5 mg/l, phenols were 0.0021 mg/l, TSS was 5.9 mg/l, pH was 8.07 and E coli was 2 mg/l. Effluent volume at this facility cannot be measured currently.

Barwick

The lagoon in Barwick discharged 10,791 m³ effluent to the Rainy River in July of 2010. During this discharge period, BOD averaged 2.9 mg/l and TSS averaged 3.5 mg/L for a total of 31.3 kg and 37.8 kg, respectively. There were no bypasses or lagoon/ lift station overflows at this facility in 2010.

Rainy River

The Town of Rainy River discharged a total of 154,309 m³ from its lagoon to the Rainy River during the spring and fall of 2010. During the discharge period, BOD averaged 16.5 mg/l and TSS averaged 12.4 mg/l, both below the provincial guidelines of 40 mg/l and 30 mg/l, respectively with total loadings of 2,546 kg of BOD and 1,913.3 kg of TSS. Total phosphorus concentrations averaged 0.58 mg/l in the discharge for a total loading of 89.5 kg during the year. There were two lift station by-pass events from the Town of Rainy River, one in May of 2010 caused by heavy rain and one in July caused by insufficient temporary pump capacity. The total amount of effluent released to the Rainy River was 1,820 m³.

3.3 Minnesota Industrial Sources

Boise Inc. - International Falls

Discharge data from 1996 to 2010, including effluent flow, BOD, TSS, absorbable organic halogens (AOX), and TP for the Boise mill in International Falls is provided in Table 4. There was one NPDES Permit exceedence in 2010. In January, the 14,933 kg/d averaged daily TSS limit was exceeded by 4% (15,188 kg/d). Dioxins and furans in bleach plant effluent samples were below the regulatory threshold (pursuant to 40 CFR Sec. 430.01) of 10 parts per quadrillion (ppq) in 2010. The NPDES Permit for the Boise facility expired in August 2009 and was renewed in 2010. The current permit will expire in 2015.

Table 4. Boise Annual Average Discharge Data

	Flow (m ³ /d)	BOD (kg/d)	TSS (kg/d)	AOX (kg/d)	TP (kg/d)
Permit Limit	N/A	4,720	7,935	567	N/A
1996	120,363	1,500	3,750	762	-
1997	114,686	1,150	2,230	615	-
1998	158,242	1,129	2,156	611	-
1999	149,368	1,537	2,105	506	-
2000	158,837	789	1,183	805	125.5
2001	135,768	645	1,079	N/A	72.0
2002	160,484	747	1,584	N/A	133.2
2003	143,164	956	2,094	N/A	153.2
2004	150,496	1,884	3,978	N/A	102.3
2005	150,325	1,134	1,810	267	78.2
2006	151,358	561	1,161	232	221.0
2007	148,076	695	1,191	225	131.8
2008	147,536	526	785	224	124.4
2009	151,897	744	1,219	273	108.9
2010	160,042	751.2	1,220	263	68.2

“-” = Data unavailable at the time this report was generated, “N/A” = Not analyzed

3.4 Ontario Industrial Sources

AbitibiBowater -Fort Frances

Data on flow, BOD, TSS, AOX and TP are provided in Table 5 for the years 1996 through 2010 for the Abitibi-Bowater mill at Fort Frances. The average annual daily loads for BOD, TSS and AOX in 2010 continue to be well below compliance levels.

Table 5 AbitibiBowater Average Annual Discharge Data

Year	Flow (m ³ /d)	BOD (kg/d)	TSS (kg/d)	AOX (kg/d)	TP (kg/d)
Compliance Limit	N/A	5990	9420	956	
1996	84800	3330	4790	271	-
1997	84900	3350	5320	284	-
1998	59700	2290	3150	140	-
1999	86469	2700	5300	272	-
2000	91129	4139	6563	274	-
2001	88184	4484	6216	234	-
2002	87954	4701	6635	233	-
2003	88899	4429	5362	212	-
2004	80068	4279	5152	221	-
2005	79966	3199	4204	187	116.3
2006	78470	3936	4435	179	136.4
2007	78098	3492	4311	164	140.9
2008	67063	3107	4686	152	123.4
2009	63885	2839	3845	176	78.67
2010	65610	3698	5546	187	106.2

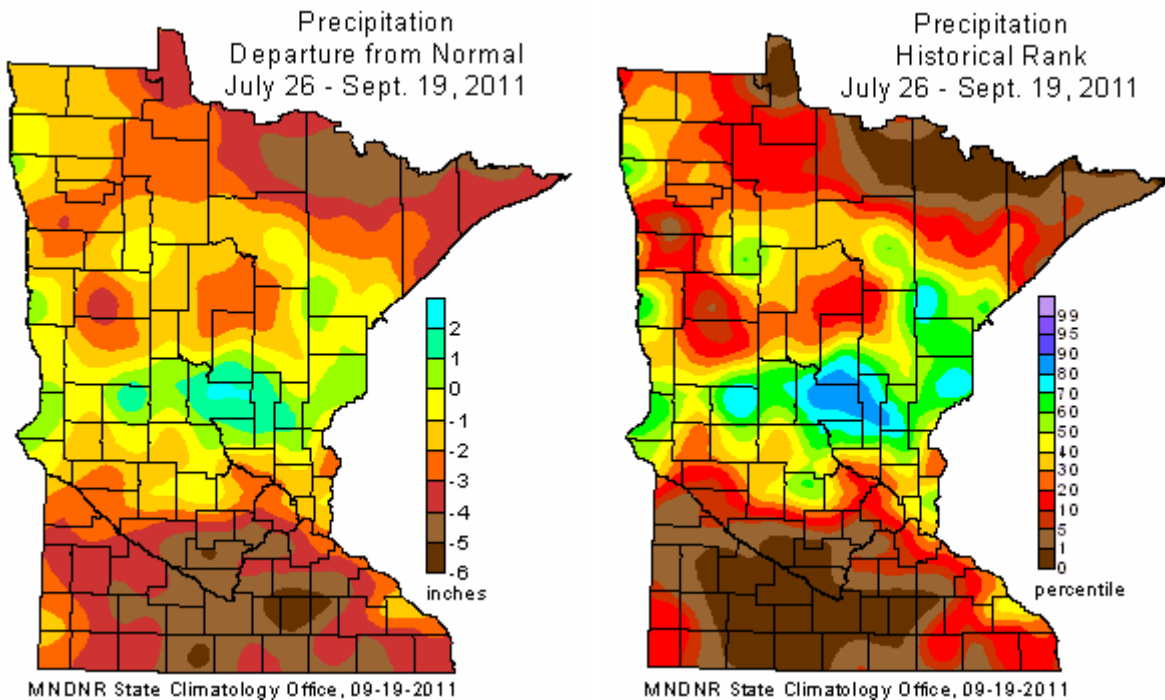
“-” = Data unavailable at the time this report was generated

4 BASIN ISSUES

4.1 **Namakan and Rainy Lakes Regulation:**

Current conditions in the Rainy River basin are dry. Basin inflow and precipitation in the third quarter of 2011 were below normal for the first time since 2007 (Figure 5). The MDNR reported that much of the basin had near-record lows for precipitation in the latter half of the summer. The United States Department of Agriculture (USDA) Drought Monitor described conditions in September across the Minnesota portion of the basin as ranging from abnormally dry to severe drought.

Figure 5. Annual precipitation amounts for Minnesota for 2011 showing departures from normal and historic ranking.



Despite the dry conditions and new minimum-of-record 7-day Rainy Lake inflow being recorded for several days in the middle of the September, the levels of Rainy Lake and Namakan Lake have remained within the rule curve band (as of September 23). Due to the dry conditions, Rainy Lake outflow was lowered to the minimum specified flow of 100 m³/s under the IJC 2001 Consolidated Order for all of September (as of September 23). Both Rainy Lake and Namakan Lake levels reached 2% of band on September 19, but rainfall that week helped to avoid lake levels below the respective lower rule curves.

During the first quarter of the year both Namakan Lake and Rainy Lake levels declined normally near mid-band. A strong freshet in April led to both lakes rising quickly, but corresponding outflow increases prevented any significant deviation above the respective upper rule curves. Rainy Lake levels exceeded the IJC upper rule curve by only about 1 cm (1/2 in) for 3 days in April. Levels in the main body of Namakan/Kabetogama Lakes did not exceed the upper rule curve. However, during the freshet, the level of Crane Lake, which is part of the Namakan chain of 5 lakes, rose sharply due to the “pinch points” between Crane and Namakan lakes restricting the downstream passage of the high inflows. Crane Lake levels exceeded the upper rule curve for 15 days in April, rising to a maximum of 42 cm (16.5 in) above

the upper rule curve on April 15. (This level was still well below summer water levels.) Another concern occurred downstream with flooding on the Little Fork River during the freshet in April caused by a combination of high flows and ice jamming.

A detailed review of basin regulation for 2011 will be provided in the 2012 Spring Report.

4.2 IJC International Watershed Initiative Projects:

The International Watersheds Initiative (IWI) promotes an integrated, ecosystem approach to issues arising in transboundary waters through enhanced local participation and strengthened local capacity. Since the Rainy basin was identified by the IJC as a potential IWI watershed, the Boards have been involved in a number of IWI-related activities. The public can read more about the IWI at:

http://www.ijc.org/en/activities/bassins_watersheds.htm

4.2.1 Seine River Temperature Project

The Seine River First Nation, in conjunction with the MNR, monitored water temperatures and levels at two locations downstream of the Crilly dam and inserted transmitters in 12 sturgeon as part of this initial pilot project of a five year IWI study. Although only the milt of one spawning male sturgeon was noted this year, the study objectives have been set with the assistance of fisheries consultant Ryan Haines, as submitted in the report to the Boards. As well as the Boards' interest in determining how peaking and ponding influences on water levels and flows may affect the sturgeon spawn, and how the timing of the spawn may be determined by temperature and other surrogate parameters, the Seine River First Nation hopes to determine the effects of backwater from Rainy Lake on the Seine River by their community from the water level gauges. The Boards consider that next year more progress will occur.

4.2.2 Hydrographic Surveys of Four Pinch Points in the Namakan Reservoir System

A USGS team conducted bathymetric surveys of the Namakan, Harrison, King Williams, and Little Vermilion Narrows in the Namakan Chain of Lakes in August 2011. An expert in numeric modeling from Environment Canada joined the crew at the beginning of the field work. In addition to surveying, continuous water-stage sensors (non-telemetered) were installed in several locations and tied to the same datum, so that elevation comparisons can be made between key locations during open-water conditions. Bathymetric data will be post-processed by USGS staff in Nebraska. The data collected will be used to model the pinch points and better understand the movement of water through the Namakan Reservoir System.

4.2.3 Rainy Lake North Arm Water Level Gauge

WSC will install a water level gauge at the Government Landing in the NW arm of the lake this year with funding from the IWI. This gauge will allow the Boards to monitor higher levels at this location from inflows from Pipestone Creek, responding to a resident who noted at the 2010 public meeting that water levels at his location were higher than the Rainy Lake mean noted on the website. The operating costs of the gauge will be covered by WSC since they no longer operate three gauges at the dam on Rainy River.

4.2.4 Rainy River Water Level and Flow Gauges

The WSC will also install two gauges between Rainy Lake and the dam on Rainy River this year with funding from IWI to assist in the calibration of the hydraulic model of the upper Rainy River. Again, the operating costs of the gauges will be covered by WSC since they no longer operate three gauges at the dam on Rainy River.

The USGS received IJC funding to install a new gauge in the Rainy River below the dams at International Falls (and Fort Frances). The gauge installation is awaiting approval from the MDNR for driving a structure in the streambed to attach the Acoustic Doppler Velocity Meter (ADVM). Because the wait is beyond USGS control, the USGS installed the stage-sensing instrumentation in September 2011, so that a record of river stage will begin, and discharge measurements will be made. The ADVM would be installed when approved by the MDNR, if prior to ice-in. Provisional stage-only data may be viewed through the USGS data portal using this station's name: USGS ID. 05129515 Rainy River at Boat Landing below International Falls.

4.3 Implementation of IJC 2000 Rule Curve Assessment Workgroup Recommended Studies

As reported in the Boards' spring 2011 report in March, the Commission has undertaken implementation of the studies recommended in the Plan of Study (POS) contained in the June 29, 2009 submission of the IJC's 2000 Rule Curve Assessment Workgroup to the Commission (available on the Boards' website). The Boards have continued to work closely with IJC staff, the project management team at Voyageurs National Park (VNP) and principal investigators on prioritization, budgeting, scheduling and management of these studies, which are being funded through the IJC's IWI.

Since March, the VNP project management team has worked with principal investigators to prepare and submit scopes of work (SOW's) for the Boards' review and approval for eight of the studies recommended in the POS. Seven of the SOW's were approved by the Boards and one additional SOW was commented on by the Boards. The recommended studies in the POS will provide valuable information to assist the Commission in its 2015 review of the IJC Order for Rainy and Namakan lakes. The project management team and the IJC are proceeding to put contracts in place to accomplish these studies. The seven SOW's approved to date by the Boards along with the expected completion year (in parenthesis) include:

1. *Assess effects of water-level fluctuation on bioindicators using analytical models (one year extension) (2012)*
2. *Map habitat for marsh nesting birds and herptiles in Rainy and Namakan Lakes, using GIS to assess the effects of the 2000 Rule Curve changes(2013)*
3. *Measure changes in Rainy Lake and Namakan Reservoir benthic macroinvertebrate communities in relation to the 2000 Rule Curve changes (2014)*
4. *Measure critical spawning habitat for walleye on selected lakes in the Namakan Reservoir and assess how this habitat has been affected by the IJC 2000 Rule Curves (2014)*
5. *Assessment of the impacts of the IJC 2000 Rule Curves for Rainy and Namakan lakes on property damages due to flooding and ice (2014)*
6. *Measure Upper Rainy River critical fish spawning and nursery habitats to determine how they have been affected by the 2000 Rule Curves (2014)*
7. *Determine if northern pike spawning and nursery habitat and reproductive success have changed due to the 2000 Rule Curves (2014)*

One additional draft SOW commented on by the Boards, but yet to be finalized, along with the expected completion year (in parenthesis) includes:

1. *Study of the relationship of Rainy River hydrology to distribution and abundance of freshwater mussels (2013)*

The VNP project management team has identified principal investigators for three other studies recommended by the 2009 POS and the scoping process has been initiated. A listing of these studies along with the expected completion year (in parenthesis) includes:

1. *Characterize the hydrology of the Rainy River in terms of levels and flows, tributary and local inflow, flow attenuation and alteration from pre-dam and pre-2000 Rule Curve hydrology (2012)*
2. *Develop detailed bathymetric maps of the littoral zone for selected locations to assist other monitoring studies designed to assess the effect of the 2000 Rule Curves on aquatic vegetation, benthos, northern pike, and walleye (reservoirs) (2013)*
3. *Develop reservoir hydrologic model and reservoir PHABSIM or other equivalent habitat model for Rainy Lake and the Namakan Reservoir.(2013)*

In August, the Boards received the first final report from the POS, "Changes in Wetland Vegetation Associated with Lake Level Management, Voyageurs National Park". This study was carried out to assess the possible changes in aquatic plant communities at VNP, since the initiation of the 2000 Rule Curves, and to relate any noted change with water-level regulation. To accomplish this, abundance and composition of nearshore aquatic plant communities were assessed at previously monitored sites to investigate how strongly any vegetative differences among water bodies are correlated with the effects of the 2000 Rule Curves and other environmental factors.

The project management portion of the budget for the implementation of the 2009 Plan of Study for the Evaluation of the IJC 2000 Order for Rainy and Namakan Lakes and Rainy River for fiscal year 2012 was approved by the Boards.

Environmental Monitoring for Future Rule Curve Evaluation

Recent Board reports to the Commission have provided some details of environmental research and monitoring projects being conducted by VNP, including a project that uses five "best bet" ecological indicators (benthic macro-invertebrates, wetland vegetation, fish, common loon and furbearers) to determine effects of implementation of the 2000 Rule Curves. These particular projects, as well as other ongoing agency research and monitoring projects were identified in the 2009 POS as providing an important body of scientific information for the Commission's 2015 review of its Order for Rainy and Namakan lakes.

As reported in the Boards' last four reports to the Commission, final reports have been generated and submitted to the Boards for two of the five "best bet" indicators, benthic macro-invertebrates and wetland vegetation. The fish indicator project final report has been under a lengthy review by the USGS since 2009 and is currently being revised by the principal investigator in response to comments. The common loon indicator project report is in its final stages and expected to be submitted for publication in a scientific journal, but a submission date has not been established. The furbearer indicator project is in development with no clear timeline.

4.4 Rainy River Peaking Work Group

As discussed in previous reports, hydropower peaking, the process of varying flow to coincide with peak times in electricity demand, on the Rainy River was an issue of major concern for MDNR and MNR fisheries managers. The Rainy Boards formed the Peaking Work Group in 2006 to deal with these issues.

The Peaking Work Group met by conference call on 1 April. Although they were unable to set a start date for the spring peaking window, due to cool temperatures, the members decided to meet in September to discuss the renewal of the agreement and review its success. By April 15th cool conditions meant that water temperatures were still too low to trigger walleye spawning and it was agreed that the spring peaking exclusion window would be initiated when water temperatures reached 5°C (41°F) at Rainy River and Manitou Rapids, as monitored by MDNR and the working group. The peaking exclusion window began on April 26th. Mid-peaking window meetings were held on the 27th of May and 24th of June to assess the end date for the peaking window. During the June 24th meeting the Work Group observed that the second sturgeon spawning event typically starts at 17 -18°C (63 - 64°F) and that these temperatures were reached on June 12th at Manitou Rapids. Given the seven to ten days for fry hatching and dispersal, the resource agencies representatives stated that the second sturgeon spawn had already occurred. Agreement was reached that the no-peaking window would end on 1 July 2011.

On August 16th the Work Group met to discuss changes and revisions to the Process document. The primary issue of concern was the dam operators' desire to see feedback as to the effectiveness of the Peaking Agreement. Resource agencies noted that there are several biological and logistical difficulties in trying to directly answer these questions, particularly as there is no pre-peaking data. However, many studies in the literature indicate that peaking operations are harmful to sturgeon spawning. Scientific literature was the basis to make adjustments to the 2000 Rule Curves to mitigate impacts to fish. The Rainy River provides critical walleye spawning habitat with flow acting as a strong cue for walleye spawning. An MDNR study in 2000 found peaking was causing exposure of spawning beds at Manitou rapids during spawning. The operators noted that river levels fluctuate naturally, sometimes to a larger magnitude than that caused by peaking.

The Work Group consensus was to adopt an iterative approach to determining the efficacy of the Peaking Process starting with the Lake Levels, Rainy River Habitat Study, proceeding to the Seine River Temperature Study, the DNR 2013 Sturgeon Study and the IWI Rainy River Temperature Study. If the data remain inconclusive as to efficacy of a peaking exclusion window, the Work Group can request that the Rainy Boards (or their successor body) propose an IWI initiative to determine data gaps and address them. Rainy Boards Process Facilitators suggested that any additional IWI peaking studies should be done in partnership with operators and resource agencies.

The Work Group agreed to meet in the fall to review the proposed studies and to include an MNR representative on the Work Group.

4.5 Mining

After the U.S. Environmental Protection Agency told PolyMet mining corporation in February 2010 that its proposal described in its draft EIS was unacceptable, PolyMet has returned to the drawing board. The company has been working on modifications to its mine plan and Environmental Impact Statement (EIS), and announced it will release a Supplement Draft EIS this fall. Fall is here and the draft has not yet been released. The company's current plans now call for putting the most-reactive waste rock back in the mine pits and allowing it to be covered with water. Twin Metals of Chile is currently preparing plans for

underground mining in the Ely area.

There is increased interest in prospecting for copper, nickel and other sulfide minerals on lands in northeastern Minnesota, including in the Superior National Forest (SNF) near the Boundary Waters. This spring, the Forest Service released a draft EIS regarding 32 applications for permits to conduct exploratory drilling and other activities on public land, much of it centered around the Birch Lake and South Kawishiwi River area in the watershed. The Notice of Availability for the Draft EIS was published in the Federal Register on April 1, 2011. Later, the comment period was extended to June 30, 2011.

When the Superior National Forest (SNF) revised its overall Forest Plan in 2004, it provided few guidelines on mineral exploration or development on the Forest. In this EIS, the SNF analyzed the impacts of the proposed exploration, and set guidelines for future such activities. The SNF is now reviewing public comments and preparing the Final EIS, which could be issued in 2012.

On September, 17, 2011, the northern Lake County three-member Stony River Township board of supervisors voted unanimously for a resolution that calls for the State of Minnesota to enact a metallic sulfide mining moratorium law, and, until such a moratorium is enacted, to deny all requests for permits to prospect or develop metallic sulfide mines in the township (Duluth News Tribune).

Township residents petitioned the board for the action. Supervisors believe the resolution recognizes the community's character as a rural lake district, not a mining district, and acknowledged the extreme negative impacts exploratory drilling and new sulfide ore mines could bring to the township. Some landowners are discovering that they don't own the mineral rights under their land, and that state and federal agencies are auctioning off those mineral rights to the highest bidder (Duluth News Tribune). Other range communities have passed resolutions of support for mining in the region.

The Hammond Reef gold deposit near Atikokan consists of the development of an open pit mine, an ore processing facility and a tailings management area. The project will also include the associated infrastructure at the mine site, upgrades to an existing road to the site, and a new electrical and communications transmission line. Options are currently being investigated to determine the preferred location for the tailings management area. All facilities will be co-located with the mine site. At this time, the proposed water usage requirements will be 82,000 m³/d, with 62,000 m³/d being reclaimed from the tailing facility and 20,000 m³/d coming from Marmion Lake. At this time the tailings facility expects to discharge approximately 5,000 m³/d. The Osisko Hammond Reef project has entered into a voluntary agreement with the MOE for an individual Environmental Assessment in late August of this year. The coordination of multiple provincial agencies will be the responsibility of the MOE.

The Rainy River Gold Project, a mining project of Rainy River Resources, is a gold exploration project situated in the southern half of Richardson Township, approximately fifty kilometres northwest of Fort Frances, ON. The company is currently carrying out an aggressive exploration plan, conducting metallurgical testing, and undertaking environmental baseline and geotechnical studies. Additionally, the company is currently completing a preliminary economic analysis for an open pit mine and, based on these results, may be starting the mine application process as early as the first quarter of 2012.

4.6 ILWRRW Task Force

The International Lake of the Woods and Rainy River Watershed (ILWRRW) Task Force (Task Force), appointed in July, 2010 to respond to the IJC Reference of June 2010 regarding binational management

of the Lake of the Woods and Rainy River watershed, submitted their final report to the IJC on July 15, 2011. The document outlines the scope of their mandate, the extensive consultation conducted by the Task Force, the priority issues of concern in the basin, observations made during discussions and a series of recommendations for improving binational governance in the watershed.

The IJC then conducted a series of public hearings in the basin from August 15-20, 2011 visiting Fort Frances, Rainy River First Nation and Kenora in Ontario and International Falls, Baudette and Cook in Minnesota. The Commissioners heard from numerous members of the public and were provided submissions for consideration in the preparation of their report to governments in December, 2011.

The Rainy Boards plan to prepare a letter to the IJC Engineering Advisors regarding summary comments on ILWRRW recommendations related to the function of the Rainy Boards.

5 OTHER BUSINESS

5.1 Meetings:

This section contains brief summaries of key meetings and tours attended by the Boards and their staff during the reporting period.

IJC Spring Semi-Annual Meeting- April 13, 2011

On April 13, the Boards appeared before the IJC at its semi-annual meeting in Washington to present the Boards' spring report. Ahead of the meeting, the Boards met to discuss a number of items, including proposed studies on the socio-economic and cultural implications of water level regulation on wild rice, updates on current projects funded through the IWI, the sale of ACH LP and its dam properties, budget planning for the IJC 2000 Rule Curve review, reporting of Rainy and Namakan Lake gate and sluice settings on the IRBLC website, and an update on the IWI Modeling Workshop. The Board also met with ILWRRW Task Force members to discuss their interim report and recommendations.

Conference Calls

The Boards held a joint conference call on June 2 to discuss studies identified in the Plan of Study (POS) contained in the June 29, 2009 submission of the IJC's 2000 Rule Curve Assessment Workgroup to the Commission. Several studies were identified as candidates to commence in fiscal year 2011. In addition, the Boards discussed the potential for a study on the impacts of water level regulation on wild rice, perhaps in conjunction with a study by the Seine River First Nations. The Boards also held a joint conference call on August 29 to discuss the budgetary items for the POS studies in 2012 and the Boards response to the ILWRRW Task Force Recommendations.

IRLBC/IRRWPB Joint Annual Basin Meetings- August 16-18, 2011

The Boards met with IJC commissioners and staff at VNP headquarters in International Falls, Minnesota from August 16th to 18th for their eleventh annual joint meetings to discuss water issues in Rainy and Namakan lakes and Rainy River basin. The meetings consisted of joint Board meetings on the 16th and 18th, a meeting of the Peaking Work Group, a meeting with dam operators and paper companies, and a meeting with resource agencies. Items discussed at the Board meetings included updates on ongoing IWI and POS rule curve review projects and review of upcoming budgets for these projects. The Boards also agreed to support the designation of the Wheelers Point gauge as an international gauge.

As part of their basin meetings, the Rainy Boards, IJC Commissioners and staff toured the Steep Rock mine site near Atikokan, Ontario. The tour was provided by staff of the MNR and included a review of the history of the mining operation. In the early 1940s, the Seine River was diverted into the West Arm of Steep Rock Lake and portions of the East Arm were isolated to allow for mining in a portion of the now dry lake bed. At the time, the Seine River Diversion was the largest ever diversion project in Canada. Also discussed was the historic and potential future dire water quality impacts associated with the former mine site, as well as plans for future management to mitigate those impacts.

Meeting with Dam Operators and Paper Companies

The Boards met with dam operators and the paper companies on the afternoon of August 16th. Boise Inc. and H2O Power LP presented a summary of their regulation activities during the twelve preceding months as well as an update on dam maintenance and safety activities, public communication, and turnover in personnel. The Boards and Commissioners expressed their appreciation to the companies for keeping the lakes in the mid-band as much as possible.

The Boards and companies discussed the need to access to electronic data such as hourly flows and temperatures for use in the studies for the IJC 2000 rule curve review and for the companies to provide information on the economic impacts of the 2000 rule curves on hydro generation.

AbitibiBowater is planning to move its firewater intake this fall, installing a diesel powered fire pump upstream of the dam at International Falls/ Fort Frances so that in the spring when the head pond is low they can pass more water through the waste gates during the early phases of the spring run-off.

Boise Inc. had a release into the Rainy River on June 7th of 76,000 gallons of effluent. The total discharge on June 7th, for all pollutants remained below the mill's NPDES permit discharge limits. AbitibiBowater also experienced an effluent release this past summer. On July 18th an effluent line failure close to the pumping station resulted in 31m³ of effluent being released to the Rainy River. The effluent was diluted into the storm line and was not expected to pose a threat to the aquatic ecosystem.

Public Meeting

The Boards held their public meeting at Rainy River on the evening of August 16th at Rainy River Community College followed by IJC public hearings on the ILWRRW Task Force recommendations. The meetings were attended by members of the public and representatives of local resource agencies, media and industry. The Boards presented a review of its involvement in the basin in the past year, and a number of basin issues being monitored. This included effluent releases to the Rainy River, the Voyageurs Joint Powers Board Sewer project, and hydropower peaking on the Rainy River. Also reviewed were current and proposed projects under the IJC's IWI. Several of these projects concern improving the understanding of lake levels and hydraulics in the region. New gauges to monitor water levels are planned for the North Arm of Rainy Lake, as well as in the upper reaches of the Rainy River. The presentation also covered an IWI-funded project investigating sturgeon spawning and temperature changes near the Sturgeon Falls (Crilly) Dam on the Seine River. Following the presentation, the Boards solicited questions and comments from audience members.

Questions and concerns regarding invasive species such as Asian carp and zebra mussels and their impacts to local ecosystems dominated the discussions. Resource agency representatives described some of the programs they have put into place to monitor and prevent the spread of invasive species. The Boards were asked to recommend a phosphorus objective for the Rainy River and indicated that

they may consider this. Guidelines for sulfate were raised by residents upstream of Rainy River concerned about the impacts of mining on sulfate concentrations and wild rice. There were also questions regarding the number of communities who draw their drinking water from the Rainy River, and on the hydraulic models outlined in the Boards presentation.

The Boards were urged to fill their existing vacancies as soon as possible and to continue their public meetings, which provide a valuable forum for questions and the exchange of ideas.

Resource Agency Meeting

On August 18th the Boards met with representatives of resource agencies and other organizations with responsibility for water resources information and management within the Rainy River basin. In attendance were representatives from the IJC, VNP, MOE, Red Lake Band Department of Natural Resources, MNR, Rainy River First Nations, MDNR, Seine River First Nations, Canadian Environmental Assessment Agency (CEAA), MPCA and the Lake of the Woods Soil and Water Conservation District.

Amy Lui of the CCEAA presented an overview of the Canadian Federal Environmental Assessment process outlining the type of projects requiring a federal environmental assessment and the process involved. She used the example of the Hammond Reef Gold mine proposal to illustrate the various steps in a federal environmental assessment.

Joel Rohde, Red Lake Band DNR, provided an overview of their water quality monitoring program focusing on work in tributaries and waters of the Northwest Angle of Lake of the Woods. The nutrient and flow data collected is part of a Total Maximum Daily Load Study being conducted on Lake of the Woods.

Kelli Saunders presented an update on MOE's Lake of the Woods Watershed Stewardship Strategy. This has involved a multipronged approach including compliance promotion, through the inspection of communal sewage facilities on the lake; building partnerships with other agencies and NGOs; outreach and education; international cooperation; and scientific programs to address data gaps on water quality issues for the Lake of the Woods basin such as nutrient loading from tributaries and paleolimnological research on the impacts of climate change.

Tom Johnson (Seine River First Nation), Ryan Haines (consultant) and Amy Godwin (MNR) presented an update on the Seine River Sturgeon Monitoring project. See section 4.2.1 for details.

Mike Hirst of the Lake of the Woods Soil and Water Conservation District outlined the major projects and studies occurring in the District in 2011 including collaborative projects with the MPCA on the Rainy River basin major watershed assessment, and the Big Fork surface water assessment. He also discussed some of the land use changes occurring including an increase in tile drainage in agricultural fields and an increase in the number of invasive species.

5.2 Board Memberships:

Glenn Witherspoon completed his term as Canadian Member of the IRLBC on May 04. He was a key member of the Peaking Working Group and was an important liaison between local industry and the Boards.

Melanie Neilson, Canadian Co-Chair of the IRRWPB, retired from Environment Canada on July 15 and resigned from the Board effective that date. In addition to playing a strong leadership role on the IRRWPB since her appointment in 2007, she also served as the Canadian co-chair of the ILWRRW Task Force.

6 APPENDIX A. FISH CONSUMPTION ADVISORIES FOR MINNESOTA AND ONTARIO

Table A1. Consumption Advice – Mercury 2010

Meal Advice	Women not planning to become pregnant and men (ppm mercury)	Pregnant women, women who may become pregnant, and children under age 15 (ppm mercury)
Unlimited consumption	< = 0.16	< = 0.05
1 meal / week	> 0.16 - 0.65	> 0.05 - 0.2
1 meal / month	> 0.65 - 2.8	> 0.2 - 0.95
Do not eat	> 2.8	> 0.95

Table A2. Consumption Advice – PCBs 2010

Meal Advice	(ppm PCB)
Unlimited consumption	< = 0.05
1 meal / week	> 0.05 - 0.22
1 meal / month	> 0.22 - 0.95
1 meal / two months	> 0.95 - 1.89
Do not eat	> 1.89

Table A3. Examples of Ontario Consumption Advice Restrictions 2011/2012

Contaminant	Restrictions Begin	Total Restriction
Mercury (ug/g)	0.61	1.84
Mercury (ug/g) ¹	0.26	0.52
Total PCBs (ug/g)	0.105	0.844
Total PCBs (ug/g) ¹	0.105	0.211
Dioxins, Furans, Dioxin like PCBs (ng/g) TEQ ²	0.0027	0.0216
Dioxins, Furans, Dioxin like PCBs (ng/g) TEQ ¹	0.0027	0.0054

¹ Concentrations for women of child-bearing age and children under 15 years of age

² TEQ is the toxic equivalent of 2,3,7,8-TCDD