

**STATUS REPORT ON THE ACTIVITIES OF THE
INTERNATIONAL RED RIVER BOARD**

**Prepared for the International Joint Commission
Spring Semi-Annual Meeting,**

**April 29, 2014
Washington, D.C.**

April 29, 2014

Table of Contents

1.0 Introduction..... 2

2.0 Water Quality and Quantity Conditions..... 2

3.0 Initiatives and Activities8

4.0 Red River Basin – Activities and Issues..... 14

5.0 International Red River Board Membership.....27

6.0 Summary of Priorities28

1.0 Introduction

This status report provides highlights of current International Red River Board (IRRB) activities and basin issues. The report reflects the deliberations and decisions of the IRRB in implementing its work plan, and builds upon previous reports including the Board's fourteenth annual progress report dated October 2013 which covers the period October 1, 2012 to September 30, 2013. The water quantity information presented below highlights flow and level conditions for the spring 2014. For information on spring 2013 water quantity refer to the April 2013 status report. The water quality data, for the five IJC objectives, covers the period 2010-2013 to show any variations over that time span.

2.0 Water Quality and Quantity Conditions

Water Quantity

The risk in 2014 for substantial spring flooding in the United States portion of the Red River basin is low. According to the US National Weather Service (NWS) hydrologic outlook on March 6, 2014 there exists a 50% or greater chance of moderate flooding at Fargo, Oslo, Drayton and Pembina. The potential for minor flooding exists at Wahpeton, Halstad, and Grand Forks. A minor to moderate spring flood potential is indicated for most MN and ND tributaries of the Red River. Soils and streams are a bit "wet" in the far southern basin, otherwise, near normal. Snow water equivalent (SWE) is generally running below normal south of Grand Forks and near normal north of Grand Forks. The current climate pattern suggests below normal temperatures and near to somewhat below normal precipitation will persist from Mid-March into April.

At freeze-up in 2013 the Manitoba portion of the basin had slightly below normal soil moisture conditions, while the U.S. portion of the basin has normal to slightly above normal conditions. Precipitation over the 2013-2014 winter was slightly above normal in Manitoba and below normal in the U.S. portion of the basin. The flood outlook indicates minor flooding is to be expected along the Manitoba portion of the main stem of the Red River with normal weather conditions. With unfavorable weather conditions, moderate flooding similar to the levels experienced in 2010 can be expected from Emerson to Winnipeg. With unfavorable weather, minor to moderate flooding is expected to occur in small tributaries such as the La Salle, Rat and Morris Rivers.

The potential for spring flooding is minor in the Pembina River. With unfavorable weather, levels would be similar to levels experienced in 2010.

Water Quality

The IJC recommended the establishment of water quality objectives for a limited number of variables at the International Boundary on April 11, 1968, and the recommendation was approved by governments on May 4, 1969. These variables include: dissolved oxygen, total dissolved solids, chloride, sulphate, and Fecal coliform bacteria. E. coli replaced Fecal coliform as a water quality objective October 1, 2010. The IRRB is responsible for monitoring and reporting on compliance with these objectives. Several exceedances were observed during the 2012-2013

water year, as summarized in Table 1, below. Additional detail on each parameter is provided in the following sections.

Table 1 International Red River Board Water Quality Objectives Summary of Exceedances Red River at the International Border 2012-2013 Water Year					
Parameter	Objective	Exceedances		Exceedance Value	
		Number (total # samples)	% samples exceeding	Minimum	Maximum
Dissolved Oxygen	>5 mg/L	0 (41)	0%	-	-
Total Dissolved Solids	<500 mg/L	31 (44)	70.5%	525.2	1248.1
Chloride	<100 mg/L	10 (44)	22.7%	117	186
Sulphate	<250 mg/L	15 (44)	34.1%	288	461
E. coli	<200 colonies /100 ml	0 (14)	0%	-	-

Dissolved Oxygen

Figure 1 shows the variability in *dissolved oxygen* levels in the Red River at Emerson over a three-year period. Observed levels did not fall below the objective of 5 mg/L in 2012-2013. The lowest concentrations tend to occur in the summer when flows are reduced and temperatures are highest.

Total Dissolved Solids

Total Dissolved Solids (*TDS*) remained at or above the objective of 500 mg/L for most of the reporting period, with the exception of during the flood stage (Figure 2). Exceedances were observed in 70.5% of the samples collected in the 2012-2013 water year. The highest observed value of 1248 mg/L occurred in November 2012 when there were higher and sustained releases from Devils Lake coupled with low flow / drought conditions for the majority of the basin.

Chloride

The *chloride* objective (100 mg/L) was exceeded in 22.7% of the samples collected during this reporting period. Monthly values ranged from a minimum of 8 mg/L in May 2013 to a maximum of 186 mg/L in October 2012 (Figure 3).

Sulphate

The *sulphate* objective (250 mg/L) was exceeded in 34 % of the sampled collected 2012-2013 water year. Like the TDS objective, the main reason for such a high increase in sulphate concentrations was likely due to the releases from Devils Lake through much of the reporting period. Sulphate concentrations ranged from a low of 41 mg/L in May 2013 to a high of 461 mg/L in December 2012 (Figure 4).

E. coli

Observed *E. coli* bacteria as shown in Figure 5 were not exceeded during the reporting period. Only one exceedance has been observed over the last three years.

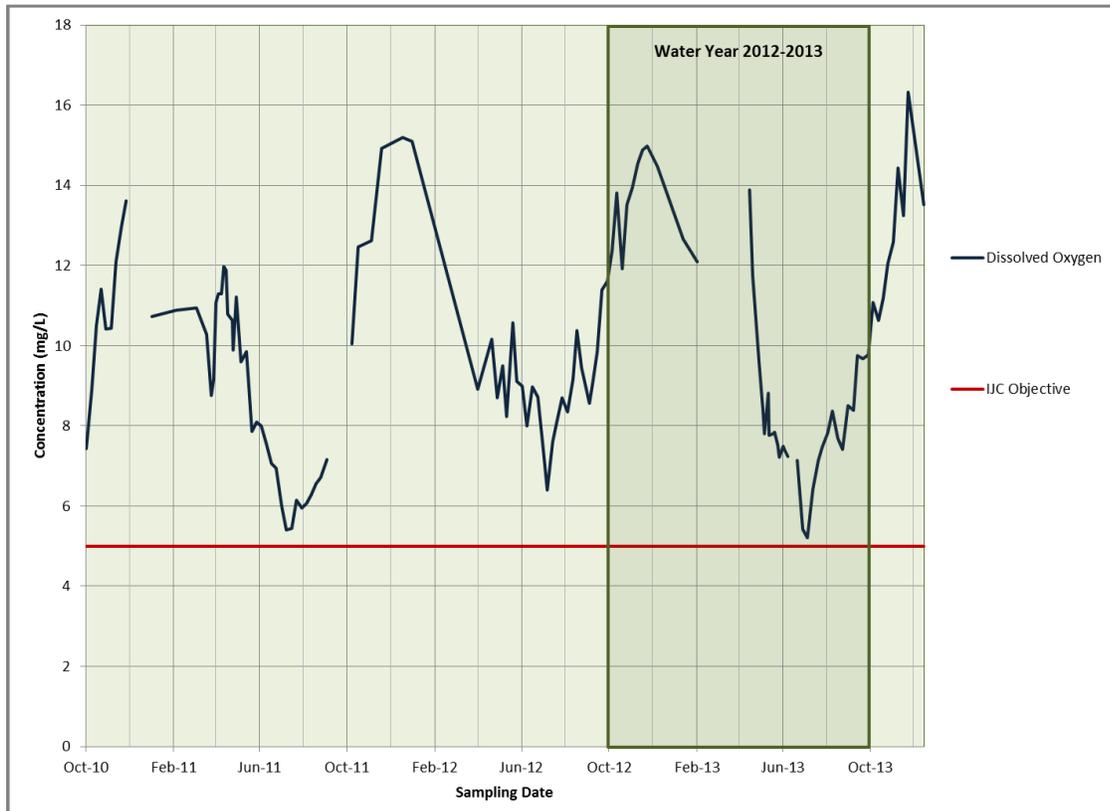


Figure 1 Dissolved Oxygen Levels – Red River at the International Boundary

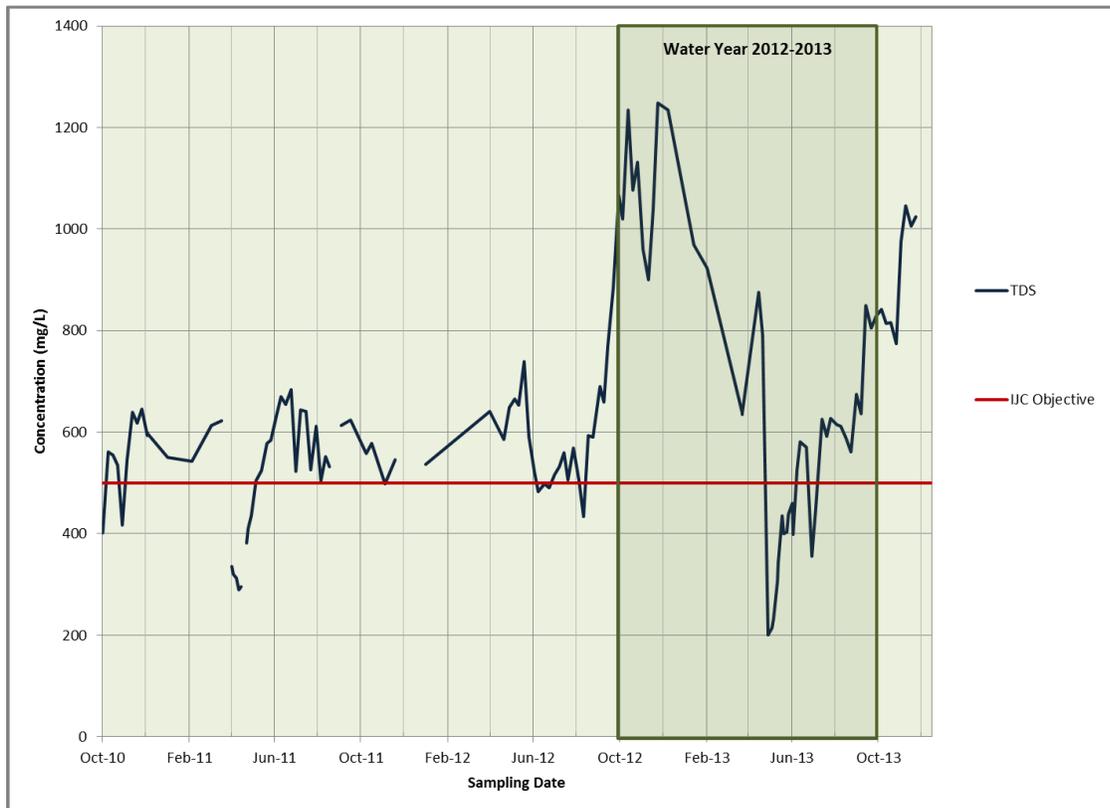


Figure 2 Total Dissolved Solids (TDS) - Red River at the International Boundary

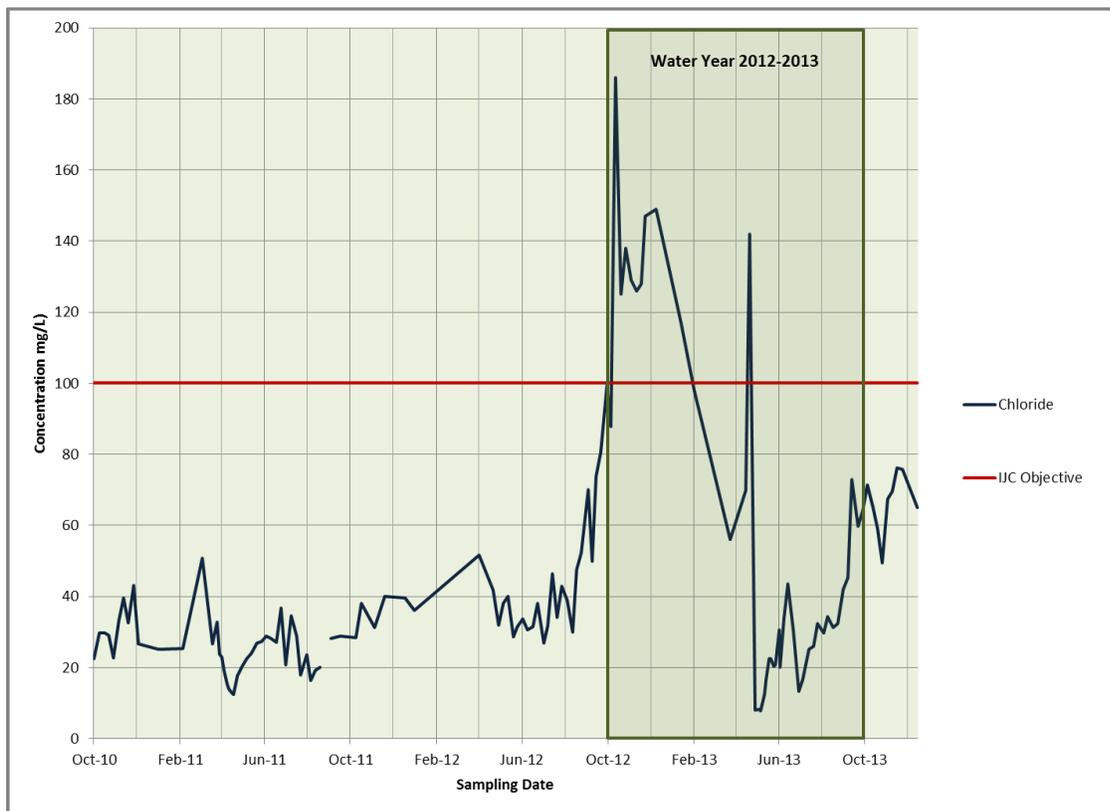


Figure 3 Chloride Levels – Red River at the International Boundary

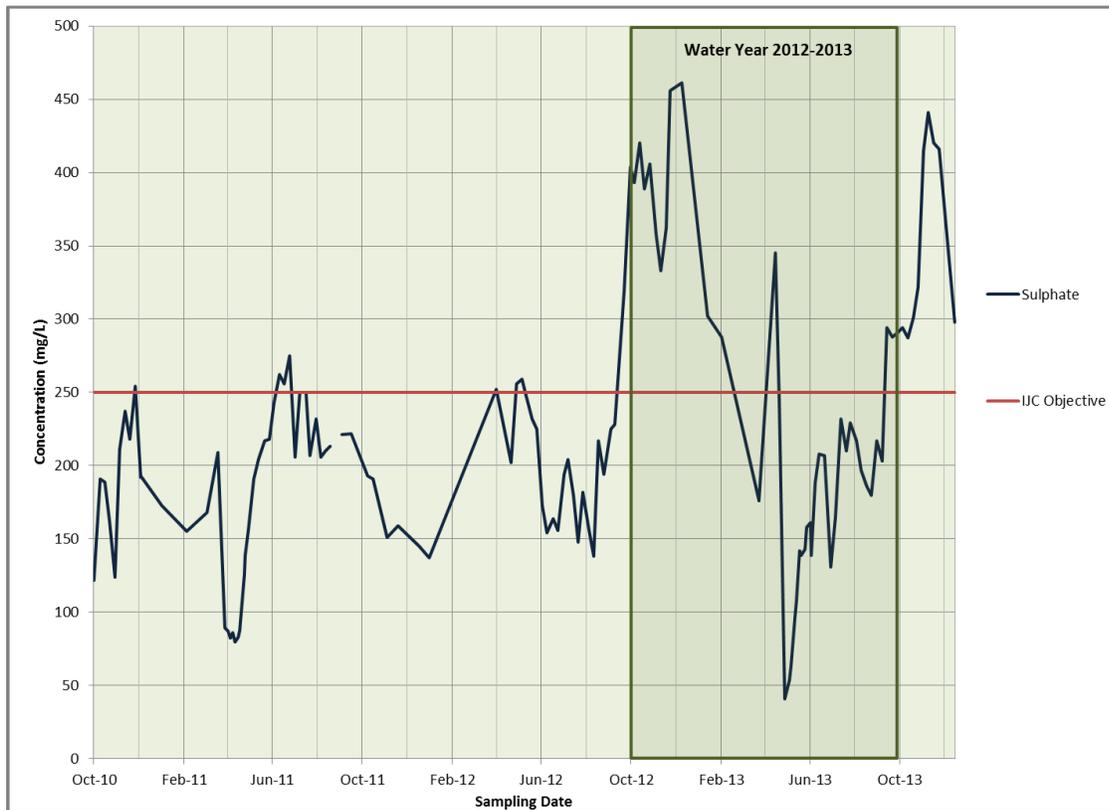


Figure 4 Sulphate Levels – Red River at the International Boundary

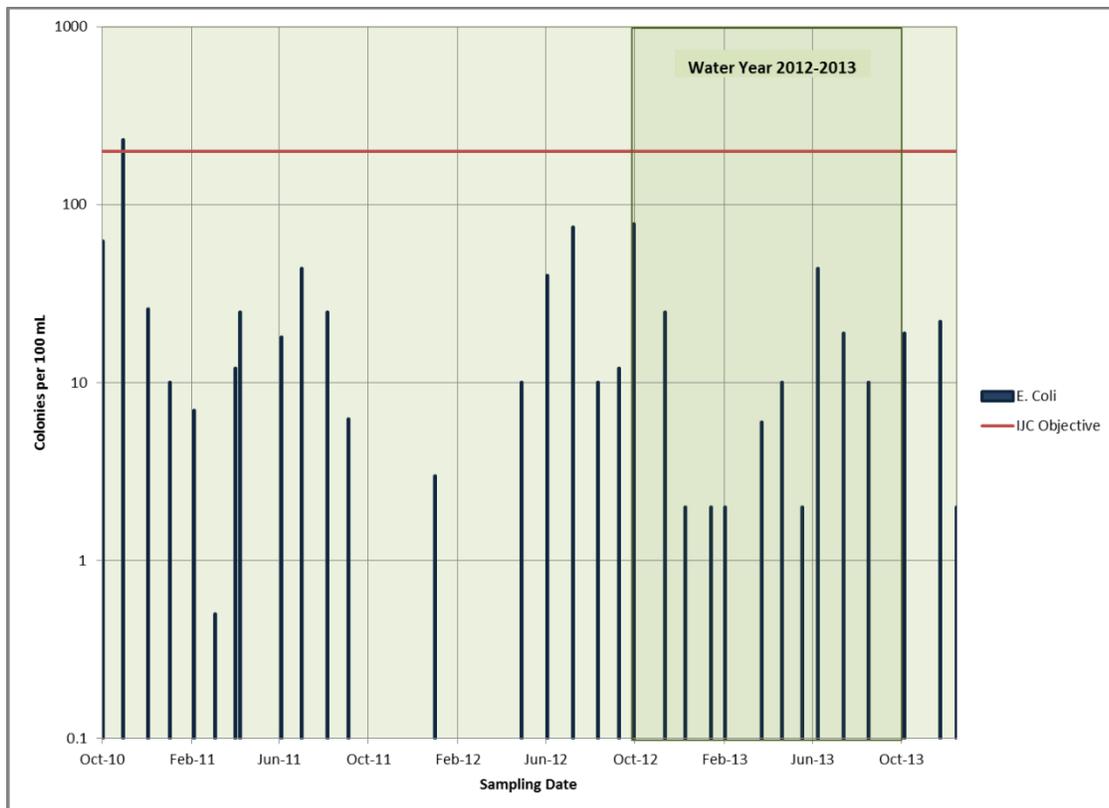


Figure 5 E. coli Count - Red River at the International Boundary

Alert Levels

Ten of the suites of pesticides and herbicides and five of the metals and toxic substances for which alert levels were established by the former International Red River Pollution Board were detected by Environment Canada (Water Quality Monitoring and Surveillance Division) during the reporting period.

Pesticides and Herbicides

Based on a total of up to 12 water samples, 9 pesticides and/or herbicides and one metabolite (Desethyl Atrazine) a total aggregate of 98 alerts (greater than detection concentration) were recorded during the October 1, 2012 - September 30, 2013 reporting period. Five compounds (2, 4-D, MCPA, Mecoprop, Atrazine and Desethyl Atrazine) were detected in all samples analyzed; however the detection levels were all below the Canadian Guidelines for the Protection of Aquatic Life. Given that the Red River basin is an agriculturally dominated region, the presence of pesticides and herbicides is expected. The detection of banned pesticides (legacy contaminants) is not unusual given the slow bio-degradation rate of these chemicals.

The IRRB recognizes that there is very little scientific information available to assess the implications of long-term exposure to low concentrations of pesticides and herbicides by aquatic organisms and humans. The IRRB continues to closely monitor trends in these concentrations and their frequency of detection with the intention to update its assessment as new scientific information becomes available.

Metals

A total of 44 water samples were collected and analyzed for metals and toxic substances during the reporting period. The highest numbers of exceedances were detected for iron, manganese and cadmium, with exceedance rates of 95%, 97% and 100%, respectively. Iron is an abundant component in the soil within the basin; however, the detection of higher levels of cadmium indicates anthropogenic sources. Exceedances of zinc and arsenic were also detected. However, these occurrences were less frequent, with exceedances in 7% and 11% of the samples, respectively.

Water Quality Monitoring at Emerson in 2013

Following North Dakota's decision to increase releases from Devils Lake, Environment Canada increased the frequency of water quality monitoring on the Red River at Emerson. During the spring freshet, a minimum of 2 samples per week were collected. Weekly samples were collected for the remainder of the open water season. Monthly sampling resumed during the winter (Table 2).

Table 2 Summary of the results of the Monitoring Program from May to October 2013.

Table 2 Water Quality for the Red River at the International Boundary May 2013 to October 2013								
Parameter	IJC Objective	Canadian Drinking Water Guideline (aesthetic mg/L)	Mean Concentration 2013 (mg/L)					Change in % Nov. vs. May-June
			May – June (N=14)	July – Aug (N=9)	Sept (N=4)	Oct (N=5)	Nov (N=4)	
Total Dissolved Solids	<500 mg/L	500	393	559	741	814	1013	157.8
Sulphate	<250 mg/L	500	132	194	251	299	423	220.5
Chloride	<100 mg/L	250	21	27	55	62	72	242.9
Sodium	n/a	200	31	55	112	128	137	341.9

Current Water Quality Status at the Red River at Emerson

Water quality at the International Boundary has improved somewhat since fall 2013. Key water quality parameters remained above established objectives throughout the month of November but have been decreasing since then. On January 14, 2014, TDS at the international boundary was 651 mg/L, well above the International Joint Commission (IJC) water quality objective of 500 mg/L. However, the January 2014 Sulphate and Chloride concentrations were recorded as 190 mg/L and 51 mg/L respectively, both below the IJC objectives. Environment Canada will continue to provide monthly updates on these key parameters.

3.0 Initiatives and Activities

3.01 International Red River Board Work Plan

The Board currently operates under a three-year work plan it has developed for the period 2012-2015. The three-year work plan reflects the current status of the Board's activities that affirm consistency with the International Watersheds Initiative and the IJC Directive to the IRRB. The work plan priorities include a continued effort to expand the existing scientific knowledge of aquatic ecosystem dynamics and current conditions. The Board is currently exploring the possibility of extending the Pathogens and Parasites Study for the entire basin (Phase II). The Aquatic Ecosystems Committee is expected to come up with a proposed study plan. In addition, the IRRB work plan priorities include strategic goals that highlight flood preparedness and mitigation; participating in the new Lower Pembina Task Team established by governments, water quality, water quantity/apportionment, outreach and public engagement.

In 2013, IRRB requested the IJC to be designated as in IWI board. The Board discussed the merits and requirements of becoming an IWI board and to make the request at its summer 2013 meeting held in Steinbach, Manitoba. The IRRB became a pilot IWI board in 2005. The IRRB has two public members on the board. The board has also completed projects with IWI funding working with the Commission on strategic projects including:

- the Pathogens and Parasites Study,
- the Lower Pembina River Basin Hydrodynamic Modelling,
- the SPARROW Regional Water Quality Model, and
- the Harmonized Watershed Maps between Canada and the United States.

Once approved by Canada and the USA, the International Red River Board (IRRB) would be renamed the International Red River Watershed Board (IRRWB).

3.02 Water Quality Committee

The formation of the Water Quality Committee was approved at the September 2011 International Red River Board meeting. The Committee is developing a Nutrient Management Strategy as endorsed by the Board.

The Water Quality Committee currently consists of the following members:

Jim Ziegler, Minnesota Pollution Control Agency (co-chair)
Nicole Armstrong, Manitoba Conservation and Water Stewardship (co-chair)
Dennis Fewless, North Dakota State Department of Health
Mike Ell, North Dakota State Department of Health
Leah Thvedt, Red River Basin Commission
Rochelle Nustad, U.S. Geological Survey
Eric Steinhaus, U.S. Environmental Protection Agency
Sharon Reedyk, Agriculture and Agri-Food Canada
Lance Yohe, Red River Basin Commission
Mike Vavricka, Minnesota Pollution Control Agency
Iris Griffin, Environment Canada
Rob Sip, Minnesota Department of Agriculture
Keith Weston, United States Department of Agriculture
Justin Shead, Manitoba Conservation and Water Stewardship

The Committee's last report to the IRRB was January 16, 2014. The committee has not met since then.

Component One

Complete

Component Two - Develop a Shared Understanding of Jurisdictions' Nutrient Regulatory Frameworks and Identify Current Nutrient Reduction Actions, Activities and Plans for the Red River Watershed

Complete. The matrix and regulatory framework distributed previously will be updated as required.

Component Three - Recommend and Implement Nutrient Load Allocation and/or Water Quality Targets for Nutrients

International Watersheds Initiative Project – Review of Methods for Developing Water Quality Targets

The final report for this work was submitted by RESPEC in March, 2013 and approved by the Water Quality Committee in May, 2013. The report was distributed to and approved by the IRRB in July, 2013. It has been posted on the IRRB website at:

<http://ijc.org/boards/irrb/files/2012/06/Approaches-to-Setting-Nutrient-Targets-in-the-Red-River-of-the-North-FINAL.pdf>

Water Quality Modeling

No committee work has been done on this since the last report. Individual jurisdictions have the information they need to begin to utilize the SPARROW model.

International Watersheds Initiative Proposal – Development of a Stressor-Response model for the Red River

The RESPEC report mentioned above had a number of recommendations regarding development of appropriate water quality targets for the Red River. The Water Quality Committee developed an IWI proposal to do the first two of these recommendations. After discussion with IJC staff and the Board at the January meeting, the Committee revised the proposal. A revised proposal was submitted that included doing all of the work recommended in the RESPEC report with regard to the development of a stressor-response model for the Red River. The funding request was changed from \$30,000 for the earlier proposal to \$100,000 for the current proposal. The IJC responded to the proposal and identified several questions that are currently under review by the committee co-chairs.

Component Four – Monitor and Report on Progress towards Meeting Water Quality Targets and Nutrient Load Allocations

Work to assess the comparability of existing water quality monitoring programs and data throughout the watershed is underway and the committee is exploring options for web-based delivery of information on water quality monitoring programs.

This work is ongoing.

Component Five - Facilitate ongoing technical, scientific and methodological dialogue and information sharing

This work is ongoing.

Component Six - Adapt the nutrient management strategy based on progress and ongoing evaluation.

This work is ongoing.

3.03 Water Quantity Apportionment

As indicated by the historic streamflow records, water supply in the Red River basin is highly variable seasonally, annually, and over longer time periods. Recent forecasts of water demand based on population and economic growth projections further test the adequacy and reliability of these supplies. Scientific opinion with respect to climate change provides added caution regarding future hydrologic trends and the prospect of greater instability in water supply in the region. Projected increases in water use will likely cause larger departures from the natural regime to occur. The IRRB considers it prudent to consider establishment of flow targets at the international boundary before they are needed. The Board's Committee on Hydrology (COH) has been working on apportionment issues since 2006.

A literature review on apportionment for the Red River was completed by Dr. Rob de Loe, University of Guelph, with funding from the International Watersheds Initiative (IWI). Dr. de Loe's report titled, "Sharing the Waters of the Red River Basin: A Review of options for Transboundary Water Governance" was completed in 2009. The study recommends an apportionment model and approach to transboundary water governance in the Red River basin that includes the following major elements:

1. A prior appropriation to meet critical human and environmental needs,
2. Rules to apportion remaining natural flows between Canada and the United States based on the principle of equitable sharing, and
3. Rules regarding waters that originate in the respective countries' portion of the basin but do not cross the boundary. This model represents a balanced approach that takes account of local circumstances (e.g., the role of the *Boundary Waters Treaty of 1909*, existing management relationships, climatic conditions and the nature of water uses).

The second IJC funded report, by R. Halliday & Associates; entitled "Determination of Natural Flow for Apportionment of the Red River" was completed on May 30, 2010. This report established a process for the development and implementation of water quantity apportionment procedures. Various apportionment methodologies in the context of the Red River basin to assess natural flows were investigated and the Project Depletion Method is recommended. The report reviews the actual natural flow calculation and provides information on how the calculation can be accomplished. Gaps and concerns were discussed, particularly: hydrometric and meteorological networks, water allocation, water use, and instream flows. More detailed discussion on natural flow determination dealt with evaporation, minor projects, channel losses and travel times. Apportionment was addressed about location(s), period, make-up water and dispute resolution.

There is also a need for in-stream flow needs (IFN) studies to make recommendations for apportionment. IFN is a multi-disciplinary issue involving biology, geomorphology, connectivity, water quality, and hydrology. The Board's Aquatic Ecosystem Committee and its Committee on Hydrology are working together to address IFN questions as part of the Board's ongoing water quantity apportionment efforts. A joint proposal for IWI funding to hire a contractor to collect available bathymetric and hydrographic information for the Red River along with the following has been developed:

- Identification of representative fish species and life stages for the Red River,
- Data on distribution, habitat use and habitat availability of these representative fish species and life stages in the reference sites where bathymetric and flow data were recorded,
- Determination of biologically significant periods,
- Temperature preferences for the different fish species, and
- Any available reports on validating Habitat Suitability.

In January 2011, IRRB approved the joint IFN proposal and submitted it the IJC for IWI funding in the new fiscal year starting April 1, 2011. The project was conducted by Bill Franzin and completed in 2012.

3.04 Lower Pembina Flooding

The IRRB at its January 2008 meeting established the Lower Pembina River Flooding Task Team (LPRFTT). The mandate of this Task Team was to develop a science-based solution(s) to mitigate flooding in the lower Pembina River basin.

A significant milestone for the IRRB was the completion of the Lower Pembina River Flooding Task Team (LPRFTT) Report. The LPRFTT has overseen the completion of a three- phased International Watersheds Initiatives (IWI) study report entitled, “Simulation of Flood Scenarios on the Lower Pembina River Flood Plains with the Telemac 2D Hydrodynamic Model”. All three phases of the study were conducted by the National Hydraulic Centre (NRC). Based on the results of the modelling effort, the LPRFTT developed a document titled, “An exploratory analysis of mitigation measures for the lower Pembina River basin”. This LPRFTT reports from the three phases were then presented and subsequently accepted by the IJC. The reports, the model and animations have also been made public.

The National Research Council’s (NRC) Canadian Hydraulics Centre provided a March 1, 2013 webinar, showing how Blue Kenue can be used as an analysis and visualization tool for hydraulic models.

One of the recommendations provided by the IJC to Governments was to establish a Task Team to work towards a binational solution to help manage the flooding issues in the Pembina Basin. Based on this recommendation, the Governor of ND and the Premier of Manitoba have each assigned 5 members and have created the Pembina River Task Team. IRRB Co-chairs have also been included as members of the Task Team in addition to the 10 Task Team members. The first meeting was held on 15 October 2013 in Fargo, ND. The meeting was organized by the Red River Basin Commission. Lance Yohe, Executive Director of the RRBC, was the meeting facilitator.

- Topics of discussion included:
 - Summary of past reports/plans/studies, data, modelling, and transboundary committees;
 - Purpose and charge of the committee;
 - Role of participants;
 - Starting points that Manitoba and North Dakota agree on for what the committee will move forward on;
 - Presentation on the Telemac 2D model prepares under the leadership of the Lower Pembina River Basin Task Team from 2008-2012; and
 - Primary discussion of possible solutions.

The most recent meeting of the Task Force was held on March 24, 2014 in Fargo, ND.

3.05 Invasive Species - Zebra Mussels

Zebra mussels, an invasive species, were discovered in the Red River basin for the first time in September 2009. The mussels were found in Pelican Lake in Otter Tail County, Minnesota, which is on the Otter Tail River. Native to Eastern Europe and Western Russia, zebra mussels were first discovered in the Great Lakes in 1988. They entered the Upper Mississippi River system from Lake Michigan via the Illinois River (Chicago Sanitary and Shipping Canal) and spread upriver into Minnesota and Wisconsin via recreation and commercial boat traffic. Heavy

infestations can kill native mussels, impact fish populations, interfere with recreation, and increase costs for industry, including power and water supply facilities.

Zebra mussels are adapted to lentic (lakes/reservoir) habitat. They can survive in riverine habitat, but they require an upstream source of healthy zebra mussel populations to continually supply free floating larvae – typically from an upstream reservoir or lake. Zebra mussels are typically spread overland from infected lakes via transient recreational boat traffic and transfers of boat docks or lifts. It is probable that there is an established and reproducing population in Pelican Lake, as evidenced by small and large individuals observed. Based on previous experience on the Upper Mississippi River, it is likely that zebra mussels will colonize the reservoir immediately downstream (Orwell Reservoir) and larvae likely will drift down the Otter Tail River to the Red River. However, the higher energy and flashy nature of the Red River does not provide ideal zebra mussel habitat. Eventual Zebra mussel infestation of the Red River is possible, but surviving population levels are likely to be minimal.

The confluence of the Red River and the Otter Tail River is approximately 550 river miles from Lake Winnipeg. U.S. Army Corps of Engineers experience on the Upper Mississippi River indicates that larval drift ranges from approximately 75 to 125 miles before juveniles settle and attach to hard surfaces. It is highly unlikely that larval juveniles will drift from the Otter Tail to Lake Winnipeg. Infestation of Lake Winnipeg via the Red River would require the establishment of a viable population within closer proximity (a lake or a reservoir which is non-existent at this time). Over land transport by humans from infested waters appears to be a more likely vector for zebra mussels to become established in Lake Winnipeg.

There is little that can be done to address an existing infestation of zebra mussels. Natural resource agencies in the U.S. and Canada are focused on public awareness and education aimed at preventing transportation of mussels on boats, trailers, and docks. Actions include increased signage at infested lakes, watercraft inspections, and monitoring.

The following is an update from Fisheries Branch of Manitoba Conservation and Water Stewardship regarding Lake Winnipeg Zebra Mussel issue.

- The Science Advisory Committee has reviewed the data collected during the fall 2013 open water season to determine the spatial extent and density of the zebra mussel infestation.
- The data suggests a very early stage of infestation contained, for the most part, to five harbours within the south basin of Lake Winnipeg: Silver Harbour, Gimli Harbour, Boundary Creek/Winnipeg Beach Harbour, Willow Point (small man made harbour) and Balsam Bay Harbour.
- Nevertheless, there remains the risk that there is a much more established population outside of the harbours than MCWS has been able to determine to date.
- Initially it was thought the zebra mussels were likely year plus based on some of the lengths, however given these were removed from watercraft that are dry docked annually and/or from the underside of docks that freeze it is more likely they are this years' cohort.

- The Science Advisory Committee has looked at a number of management options and has recommended Manitoba consider eradication/control options at the harbours to apply downward pressure on the zebra mussel population and reduce the spread of zebra mussels from these harbours to other areas within Lake Winnipeg or other lakes during the upcoming open water season.
- Manitoba is currently investigating the feasibility of temporarily sealing off each harbour and applying liquid potash. The potassium in potash is lethal to mussels but not to finfish at the concentration it would be applied (100 ppm K+). Pending regulatory approvals, there are some site specific conditions which may make it difficult to implement during a very small window - between ice break up on the harbours and before water temperatures reach 10 degrees C.
- Fisheries Branch has also prepared for consideration a range of control and containment options including the “do nothing” approach. Within these options potential regulatory changes are being considered and include, for example: the requirement to remove the drain plug and drain all live wells and bilges; mandatory watercraft inspections; ability to stop watercraft; requirement for a mandatory AIS sticker; ban the bait industry within Lake Winnipeg and the Red River; restricting boat movement out of Lake Winnipeg).
- Monitoring would continue to determine the effectiveness of the eradication/control treatment and further assess the zebra mussel infestation within Lake Winnipeg.
- A reminder for anyone with water related equipment, please Clean, Drain and Dry when moving equipment between water bodies. Heat is the most effective means of killing both zebra mussels and other invasive species like spiny waterflea. Leave equipment out in the hot sun for a minimum of 5 days. One can also rinse using high pressure and extremely hot water (50 degrees C/120 degrees F). Drain all water from equipment.
- As the summer season approaches, all individuals who live along, maintain infrastructure, or boat in the Red River, Lake Winnipeg and Nelson River, or any Manitoba water body, are asked to watch for zebra mussels and report any findings, negative or positive, to the toll free line (1-877-867-2470).

4.0 Red River Basin – Activities and Issues

4.01 Devils Lake Sub-Basin

Devils Lake

Hydrology:

The water surface elevation on January 1, 2013 was 1451.4 msl. The level of Devils Lake continued to increase during the spring of 2013, with an apparent peak of 1453.96 msl on June 27. This is an increase of 2.6 feet from the beginning of 2013. This increase adds 28,852 acres to the size of the lake, and about 490,000 acre-feet of additional storage. This 2013 peak elevation is also only 0.3 feet lower than the modern period record high of 1454.30 established on June 27, 2011. Annual inflow for 2013 was about 420,000 acre-feet, the 4th highest recorded.

The lake elevation on January 1, 2014 was 1452.3 msl, about 0.9 feet higher than the beginning of 2013 (Table 3). The water elevation remained at 1452.3 msl near the end of March 2014

Table 3 Water Surface Elevations and Volumes Removed – Jan. 2010 - Jan. 2014

Date	Elevation (msl)	Area (acres)	Volume (acre-feet)
Jan. 16, 2010	1449.92	162,100	3.36 Million
June 27, 2010	1452.05	182,800	3.73 Million
Nov. 20, 2010	1451.26	175,000	3.59 Million
Jan. 16, 2011	1451.62	178,600	3.66 Million
June 27, 2011	1454.30	208,500	4.19 Million
January 21, 2012	1453.3	197,000	4.00 Million
May 7, 2012	1453.6	200,057	4.03 Million
Jan. 1, 2013	1451.4	176,000	3.62 million
June 27, 2013	1454.0	204,852	4.11 million
Jan. 1, 2014	1452.3	185,000	3.77 million

State Emergency Outlet Project Update:

Operation:

West Devils Lake Outlet:

Due to high flows on the Sheyenne River and other rivers further downstream, discharge from the west outlet started on July 1. It ran at full capacity, 250 cfs, until August 31. Discharge was then reduced to 200 cfs, while repairs were being done. The pumping rate remained at about 200 cfs until the pumps for this outlet were shut down for the year on October 17, due to problems with the West Outlet standpipe. Repair of two standpipes on the West End Outlet is expected to be completed by May 15, 2014.

East Devils Lake Outlet:

High downstream flow conditions also delayed the start of pumping from the east outlet. The pumps started to discharge at a reduced rate of between 125 cfs to 150 cfs on June 18. Pumps had to be shut down on June 20, due to heavy rain received further downstream. The pumps were again started at a rate around 125 cfs to 150 cfs on June 24, only to be shut down on June 25 due to heavy rains occurring further downstream. The pumps resumed operation on June 27. By July 1, the discharge was 250 cfs. On July 15, the outlet was increased to near the full capacity of 350 cfs and continued at this rate through November 9, with brief shutdowns to clear debris from the intake Tables 4 & 5). The pumps were shut down for the year, on November 9.

Table 4 Summary of the Extent of Discharge from the Outlets for 2013

Month	Days Discharge Occurred		Average Discharge (cfs)		Monthly Volume (acre-feet)	
	West	East	West	East	West	East
May	0	0	0	0	0	0
	0	9	0	39	0	2,328
July	30	31	229	321	14,110	19,722
August	31	31	253	366	15,566	22,509
Sept.	30	30	211	362	12,542	21,545
Oct.	17	31	199	338	6,694	20,783
Nov. 2013	0	9	0	335	0	5,984
TOTAL					48,912	92,871

Table 5 Summary of the Volume and inches of Water Removed from the Lake since Pumping was Started in 2005

Year	Volume Removed (acre-ft.)	Inches Removed (inches)
2005	38	0.0
2006	0	0.0
2007	298	0.02
2008	1,241	0.1
2009	27,653	2.0
2010	62,977	4.2
2011	46,911	2.7
2012	157,542	9.5
2013	141,783	10.0
TOTAL	438,443	28.52

Water Quality:

Water quality testing has been ongoing at several locations along the Sheyenne River and Red River. Little precipitation was received in the upper portion of the Sheyenne River watershed during July and August. While the high flow in the Sheyenne River prevented full operations of the pumps during the early part of the summer, the low flows in July and August caused an issue of water quality when mixing discharges from Devils Lake. Some fall rains helped to provide some natural flow in the Sheyenne River.

Sulfate concentrations above 750 mg/L were detected on the Sheyenne River near the Pekin monitoring station on October 3rd, October 29th, and November 6. The exceedance was also measured at the Cooperstown gage on November 6.

Devils Lake Outlet Committee:

The Devils Lake Outlets Management Advisory Committee met on December 16, 2013 in Carrington, ND. The committee includes a representative from Manitoba and Minnesota.

Tolna Coulee Control Structure:

The operating plan for the structure requires that prior to a natural overflow the stop log elevation remain between 1 foot and 2 feet below the water surface of the lake.

Emergency Gravity Water Transfer Channel:

The proposed gravity flow channel would provide an outlet from Stump Lake, extending south to Tolna Coulee. The control elevation at the bottom of the channel is proposed at 1452 msl. The channel would include stop logs to control releases based on downstream conditions. The channel would have a capacity of 100 cfs when Stump Lake is at an elevation of 1454 msl, if the stop logs were not in place. The channel would be operated to maintain downstream water quality uses. An operating committee is being proposed for the project.

The Devils Lake Joint Water Resource Board is the local sponsor for this project. They have indicated that they are withdrawing as the lead agency of the gravity outlet. The project is tabled at this time.

Upstream Storage:

The State Water Commission (SWC) is committed to a three-pronged approach to flooding in the Devils Lake basin, of which upper basin water management is an integral part. Several programs exist to store water, including the Extended Storage Acreage Program (ESAP), and projects by the ND Natural Resources Trust (Trust), and the U.S. Fish and Wildlife Service. The new Devils Lake Executive Committee action plan has reinforced and placed emphasis on the need to increase upper basin storage where possible.

The Trust is pursuing a plan to acquire privately held land for a multipurpose, multi-wetland restoration project in northeastern Ramsey County. SWC staff has estimated that this project will store approximately 631 acre-feet of additional water over existing conditions. The project requires commitments from multiple funding sources, including the Wetland Reserve Program (WRP), the North American Wetlands Conservation Act, ND Game and Fish, and the Trust. The project will put the land under a 30-year WRP easement with the ND Game and Fish taking title to the land for use as a public access wildlife conservation area. Total project cost is estimated at \$2,048,000, and would result in long term water storage on land available for public use. The Trust has requested water storage funding from the SWC in the amount of \$125,000. If approved, the SWC will develop a seven-year contract for water storage at the Johnson Farms site. Annual inspections will be conducted to ensure water storage at the site for the duration of the agreement. This expenditure equates to about \$30.00/acre-foot per year of storage for the duration of the contract, which is comparable to the rates paid for existing ESAP temporary storage easements. The acquisition plan developed by the Trust involves several partners and as a result has several contingencies.

Outlet Mitigation Plan:

Beginning in 1993, as Devils Lake began its historically unprecedented rise, the State Water Commission (SWC) has been at the forefront of efforts to combat flooding in the basin. The lake level has now risen 30 feet expanding from about 49,000 acres to over 200,000 acres. At its overflow elevation of 1458 feet msl, where it naturally spills into the Sheyenne River, Devils Lake will cover more than 261,000 acres. To combat the growing flooding problem, local, state, and federal authorities adopted a three-pronged approach in the mid-1990s: infrastructure protection for roads, levees, and relocations; upper basin water management, including water storage in the upper basin; and discharge of flood water through an emergency west-end outlet to the Sheyenne River. This approach was designed with the interests of both Devils Lake basin and downstream residents in mind. The principal concept has been to manage water and flood damage within the Devils Lake basin, while attempting to prevent a potentially catastrophic natural overflow through Tolna Coulee to the Sheyenne River.

The 2011 Devils Lake Outlet Mitigation plan developed by SWC staff with input from stakeholders, including the Devils Lake Outlet Advisory Committee, provides important direction in addressing problems that could arise downstream from emergency measures taken at Devils Lake to protect the safety and general welfare of both basin and downstream residents. The draft plan has two key components; construction of emergency outlets to remove floodwater from Devils Lake and a course of action to address downstream issues along the Sheyenne River that may result from operating the emergency outlet projects.

2014 Flood Outlook:

The National Weather Service Long Range Outlook for Devils Lake forecast elevations, including Stump Lake is shown below (Table 6). The values are valid from March 10, 2014 to September 30, 2014. Also, historic water surface elevations and elevations from 2010 – 2013 are shown in Figures 6 & 7.

Table 6 Chance of Exceeding Stages at Devils Lake and Stump Lake Locations

Location	Probability						
	95%	90%	75%	50%	25%	10%	05%
Creel Bay	1452.5	1452.6	1452.8	1453.1	1453.6	1454.0	1454.5
Stump Lake	1452.5	1452.6	1452.8	1453.1	1453.6	1454.0	1454.5

Period of Record Lake Elevations

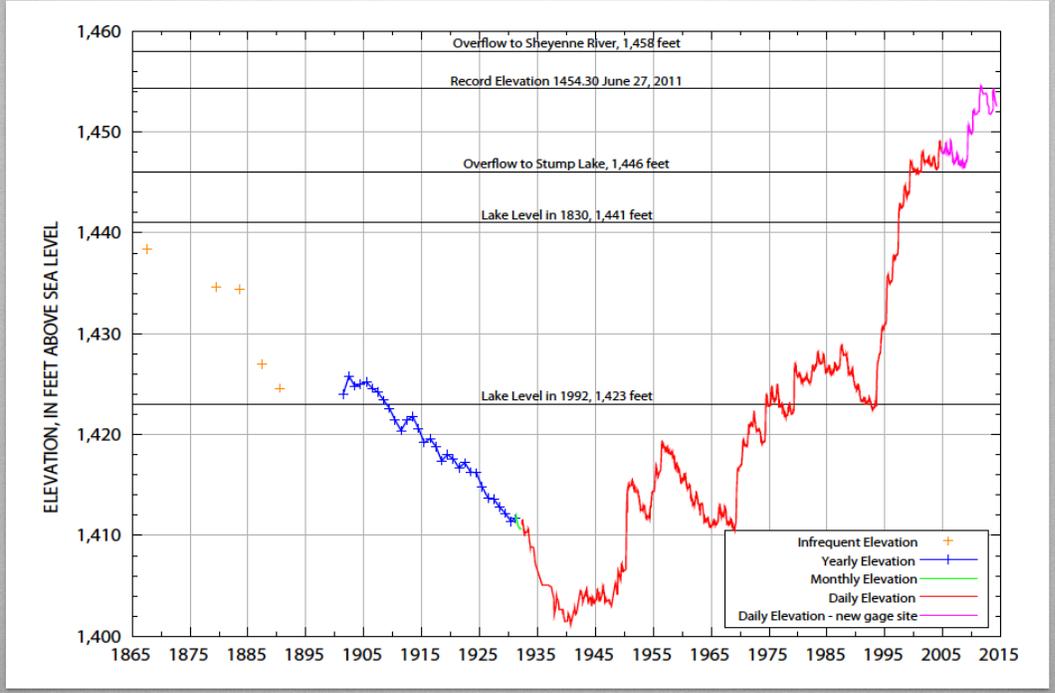


Figure 6 Devils Lake Historic Water Surface Elevations

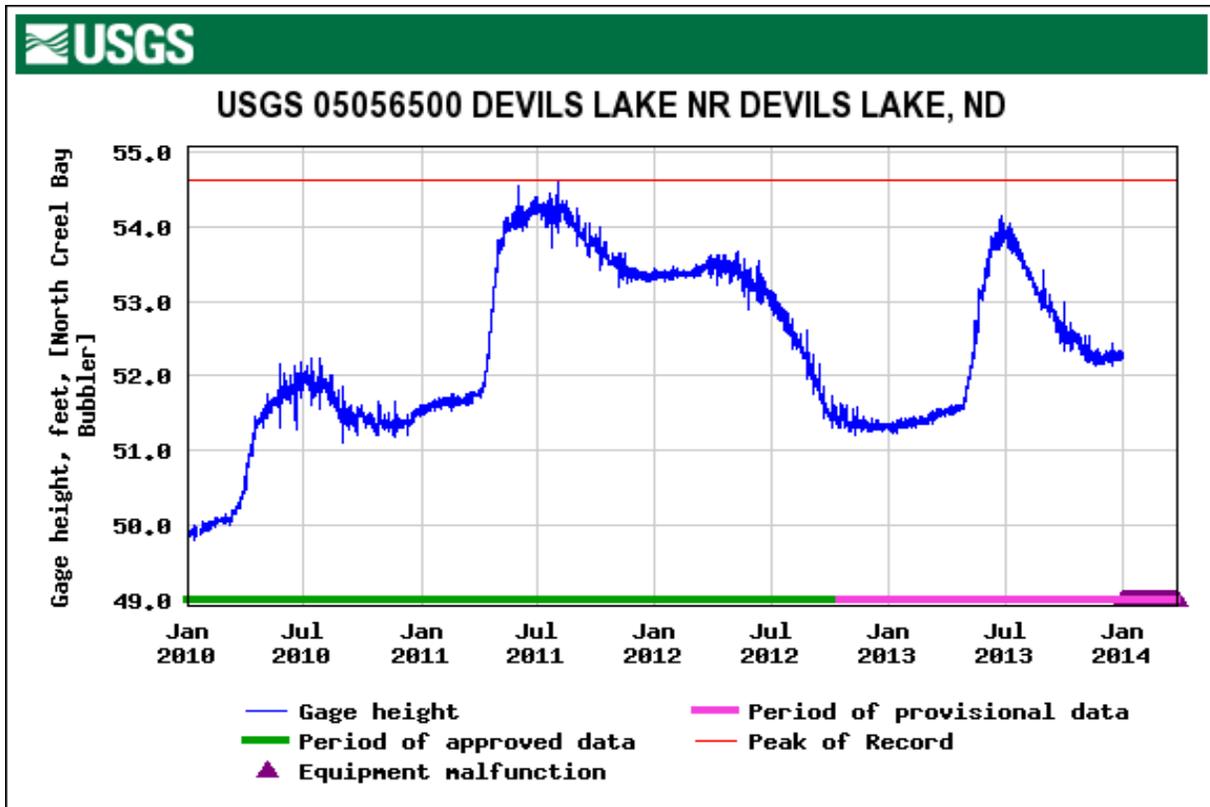


Figure 7 Devils Lake near Devils Lake Water Surface Elevations - 2010-2013

US Federal Government Initiatives to Reduce Flooding in the Devils Lake Basin

In June 2010, the United States government directed an intensive Federal interagency effort to assess the status of the efforts of each major Federal agency actively addressing the flooding in the area of Devils Lake and options for additional near-term actions within existing authorities. This U.S. Federal Interagency Task Force used data from previous analyses to re-examine what options might be feasible to address Devils Lake flooding.

This Working Group effort involved extensive analysis by all key Federal agencies engaged in responding to flooding at Devils Lake. Led by the U.S. Army Corps of Engineers, the Working Group also included the U.S. Environmental Protection Agency (EPA), the Office of Management and Budget (OMB), and the Departments of Agriculture (USDA), Commerce, Defense, Homeland Security, Interior, Transportation, and State. The Working Group was committed to gaining an understanding of the local perspectives on these issues, and held four focus group meetings in North Dakota (“the State”) – three in the City of Devils Lake and one in Valley City, North Dakota. The purposes of these meetings were to gather information and testimony from local and state officials and other subject matter experts, and to obtain recommendations on actions that the Federal government could undertake to assist with the problems caused by the rising lake.

The Working Group completed several specific tasks to assess the status of each agency’s ongoing activities to address the flooding in the area and identified the near-term actions that could be taken within existing authorities. These tasks included:

- Identifying past and current Federal activities/programs and spending
- identifying all available legal authorities to respond to the flooding, including those that have been used in the past and those that have not
- compiling existing analyses of near-term and longer-term actions, including evaluating the actions raised by the North Dakota congressional delegation
- re-examining possible solutions using data generated from its previous analyses

Federal agencies have been involved in a number of initiatives to assist the population affected by the flooding, including rebuilding and elevating roads and levees; constructing dams; reimbursing local governments for damaged infrastructures; purchasing easements; relocating and buying out homes; studying the cause and modeling potential future lake levels; providing area-specific weather, water and climate forecasts; and providing assistance to farmers and local businesses. Since 1992 (when the lake started rising from an elevation of 1423 feet), using at least 49 different Federal program authorities, Federal agencies have spent or committed about \$852 million of Federal funding to assist those affected by Devils Lake flooding. Many of the authorities Federal agencies operate under require a local sponsor and matching contribution. As such, State and local governments have also expended hundreds of millions of dollars.

In addition to these ongoing activities, the Working Group identified and developed twenty one specific actions that are underway or could be undertaken by Federal, State, and/or local agencies. Those items are identified in the table below with the Federal and local agency responsible for each (Table 7).

Table 7 Actions and Lead Agencies Responsible for Flood Mitigation Works

#	Action	Lead Agency	
		Federal	State/Tribal
1	Devils Lake Executive Committee (DLEC)	USACE (MVD)	NDSWC
2	Devils Lake Collaborative Working Group (DLCWG)	USACE (MVP)	NDSWC
3	Comprehensive Watershed Management Strategy	FEMA	NDSWC / NDDDES
4	Development of the Multi-Purpose “Pelican Bay Recreation and Wildlife Area”	USFWS	NDGF
5	Consider Options for Revising Water Quality Standards	EPA	NDDH
6	<i>Control Outflows from Tolna Coulee Outlet at Elevation 1458.0</i>	USACE (MVP)	NDSWC
7	East Devils Lake Outlet	USACE (NWO)	NDSWC
8	<i>Expansion of West End Outlet</i>	USACE (NWO)	NDSWC
9	<i>Flooded Land Compensation and Increase Upper Basin Storage</i>	NRCS	NDGF
10	Increase Sheyenne River Channel Capacity	USACE (MVP)	NDSWC
11	Construct Biota Filter for Devils Lake Outlets	USACE (MVP)	NDSWC
12	Control Structure on Jerusalem Channel between East Devils Lake and Stump Lake	USACE (MVP)	NDSWC
13	Construct Diversion from Edmore Coulee to Tributaries of the Red River of the North	USACE (MVP)	NDSWC
14	Non-Structural Hazard Reduction: Acquisition/Relocation of Imperiled Structures	FEMA	NDDDES
15	Fully Fund Roads Acting as Dams Project	BIA/FHWA	SLT
16	Road Raise Contracts to 1460/1465	FHWA	NDDOT
17	<i>Raise Township Roads</i>	FHWA	NDDOT
18	Utility Relocations	RD	NDDDES
19	Railroad Embankment Raises	FRA/FHWA	NDDOT
20	Prepare a Multi County Evacuation and Mass Care Annex to Existing Emergency Operations Plans	FEMA	NDDDES
21	Additional Observations for Emergency Preparedness	USGS	NDSWC
22	<i>Mental Health Assistance</i>	<i>FEMA</i>	<i>NDDDES</i>
23	<i>Digital Flood Insurance Rate Maps (DFIRMS)</i>	<i>FEMA</i>	<i>NDDDES</i>
24	<i>Local/ Tribal Hazard Mitigation Planning</i>	<i>FEMA/BIA</i>	<i>NDDDES</i>
25	<i>Business and Employment Preservation</i>	<i>Dept. Commerce</i>	<i>NDDC</i>

Since the release of the federal report, the U.S. Federal Government directed that action item 1, the Devils Lake Executive Committee, be established to oversee efforts and to ensure Federal actions are expedite to the greatest extent possible to address the flooding issues in and around Devils Lake. The DLEC was additionally directed to prepare an action plan and present it to the Office of Management and Budget in June 2011. Those actions are currently ongoing.

4.02 Garrison Diversion Projects

Dakota Water Resources Act

The Dakota Water Resources Act (DWRA) of December 2000 amended authorizing legislation for the Garrison Diversion Project. The legislation outlines a program to meet Indian and non-Indian water supply needs in North Dakota and authorizes water uses including municipal, rural and industrial, fish and wildlife, recreation, irrigation, flood control, stream flow augmentation, and ground water recharge.

Red River Valley Water Supply Project

The final version of the EIS underwent internal review within Reclamation and the Department of the Interior and was finalized on December 21, 2007 and published in the Federal Register on December 28, 2007. The “preferred option” is to bring water from the Missouri River Basin into the Hudson Bay Basin (inter-basin transfer). Reclamation consulted with the Environmental Protection Agency and State Department regarding the 1909 Boundary Waters Treaty between Canada and the United States; and the document has been submitted to Congress for further action. Many agencies, along with Canada, have expressed concern and opposition to inter-basin transfer of water from the Missouri River Basin into the Hudson Bay Basin.

CURRENT STATUS

ND Governor Dalrymple advised Manitoba Premier Selinger in the first week of January 2014 that the state intends to proceed with examining options to complete the Red River Valley Water Supply Project (RRVWSP). The RRVWSP would create a permanent transfer of water from the Missouri River basin, which drains into the Gulf of Mexico, to the Red River basin which drains into Hudson Bay in Canada. Currently, there is no timeline for construction; ND is only exploring options at this time. ND is concerned that the north east portion of the state will not have sufficient water to supply its urban and rural areas in the event of a drought condition or to meet increased demands for water due to rapid population and industrial growth. The original RRVWSP was a joint federal-state initiative that was submitted to the Secretary of the Interior for approval in January 2008. No Record of Decision was ever issued. ND is now prepared to complete the project using state funding without federal assistance. The estimated cost for the project could exceed \$1B.

Canada, through the Department of Foreign Affairs, Trade and Development (DFATD), has previously advocated its position to both ND and the United States, indicating that ND should pursue options that focus on accessing in-basin water supplies to minimize the potential environmental risks from invasive species. Treatment of the water to reduce the risk of transfer of alien species would be required to avoid violating the *Boundary Waters Treaty*.

In late December 2013, the ND Legislature approved \$9-\$11M to explore alternative water supply routes in order to complete the major inter-basin water transfer project that takes water from the Missouri River across the continental divide to the Red River Valley. On December 23, 2013, the ND State Water Commission issued a Request for Proposals (RFP) for a value engineering study to examine the various routes and identify the associated costs and permitting requirements for each.

On February 4, 2014, the ND Legislative Committee responsible for water management met with a number of backers of the project in Fargo, ND. The legislators indicated their strong support for the project to move forward quickly with state only funding and that, unlike the earlier joint federal-state effort, the decision to proceed would rest solely with the ND State Legislature. The legislators are aware of Canada and Manitoba's historical positions on the project and that treatment of the water prior to transfer across the continental divide would be required to respect the *Boundary Waters Treaty* (1909).

The proposed routes were originally developed as part of the federal *National Environmental Policy Act* (NEPA) process which required a formal review of any environmental impacts of the RRWSP. The Final Environmental Impact Statement (FEIS), which was published in December 2007, identifies a preferred route for the water diversion that includes a combination of canals and pipelines to bring the water to the Red River. Congressional approval and the signature of the Secretary of the Interior on a Record of Decision for the project have been pending since 2008.

4.03 Lake Winnipeg

Lake Winnipeg is the 10th largest freshwater lake in the world. The Lake's watershed spans an area of almost one million km², from the eastern slopes of the Rocky Mountains to the Winnipeg River system and Lake of the Woods. The watershed extends into four provinces and four U.S. states as illustrated in Figure 8.



Figure 8 Lake Winnipeg Watershed (Map by Manitoba Conservation & Water Stewardship)

Lake Winnipeg Basin Initiative (LWBI)

Lake Winnipeg continues to experience poor water quality due to excess nutrient loading from multiple transboundary sources, including agriculture, industry, municipal wastewater, and surface runoff. More than half of the nutrient loading originates outside Manitoba’s borders, predominantly from the Red River.

Renewal of the Lake Winnipeg Basin Initiative (\$18M, 2012-2017) was introduced in Budget 2012 and formally announced by Prime Minister Harper on August 2, 2012. The LWBI focuses on three areas: transboundary partnerships to manage nutrients in the basin; scientific research, modelling and monitoring; and a stewardship fund for stakeholder-led projects that reduce nutrient loads into the lake and basin.

Phase II of the LWBI shifts emphasis from discovery to action, using the knowledge gained from 2008-12 to focus on on-the-ground action to reduce nutrient loads to Lake Winnipeg. Monitoring

of the watershed and research on impacts of land-based activities on nutrient loads will continue, but with decreased emphasis. An increased Lake Winnipeg Basin Stewardship Fund (LWBSF) will shift in focus from general “stewardship” programs in the basin to targeted key geographic areas (Red/Assiniboine and Winnipeg/Rainy sub-basins). Environment Canada will continue to ensure priority progress on nutrient issues through domestic and international water boards, working with partners toward the development of a broad bi-national nutrient management strategy across the basin.

Program priorities under the renewed LWBSF remain unchanged and will focus on:

- reducing nutrient inputs from rural and urban sources,
- controlling point and non-point sources of nutrients,
- rehabilitating priority aquatic ecosystems that support nutrient reduction & sequestration, and
- enhancing research and monitoring capacity to assist in decision-making.

LWBI activities since the last IJC update (September 30 2013):

- Staff from the Lake Winnipeg Basin Office (LWBO) attended a two day technology transfer and training meeting on SPARROW modelling hosted by the International Joint Commission and United States Geological Survey and held in Wpg on December 5-6, 2013. Once completed, the Red-Assiniboine River Basin SPARROW model will be the first such model developed for a Canadian river basin. Efforts are underway to include the Saskatchewan River Basin and the Winnipeg River Basin in the model which will then cover the entire Lake Winnipeg Basin.
- The Canada-Manitoba Lake Winnipeg MOU Steering Committee held its 7th meeting on Dec. 11, 2013. Bruce Gray, ADM for Manitoba Conservation and Water Stewardship, is replacing Dwight Williamson as the Manitoba co-chair and Cheryl Baraniecki, AsRDG W&N, is the new EC co-chair. Work is underway to conduct a management review of the MOU in anticipation of its renewal in September 2015. The MOU Committee’s next meeting will be May 2014.
- LWBO staff attended the third meeting of the provincially led Lake Friendly Accord and Stewards Alliance on December 12, 2013. LWBO staff are members at large on the Lake Friendly Stewards Alliance Steering Committee. EC staff from the LWBO participated in two of the six working groups formed to start gathering sector specific information and actions for implementing the goals and objectives of the Accord.
- A fourth meeting of the Lake Friendly Accord and Stewards Alliance is scheduled for March 21, 2014. At that meeting, Minister Aglukkaq, on behalf of the Government of Canada, will sign the Accord, which is a non-binding pledge to take actions and work collaboratively to reduce nutrients in waterways in the Lake Winnipeg Basin. Minister Aglukkaq will be the first signatory to the Lake Friendly Accord.
- Zebra Mussels Found in Lake Winnipeg - MCWS Fisheries Branch is the lead to coordinate the response to the discovery of zebra mussels in Lake Winnipeg with support from Department of Fisheries and Oceans (DFO) as the Federal lead. Environment Canada will monitor, provide science expertise on water quality implications for Lake Winnipeg, and engage with MCWS and DFO as appropriate.

- EC staff from the LWBO and the Freshwater Quality Monitoring and Surveillance Division attended North Dakota Department of Health's first Nutrient Reduction Strategy Stakeholder Meeting on December 19th in Bismarck, ND. The nutrient reduction strategies developed as a result of this process will impact nutrient levels in the Red River and its tributaries and ultimately Lake Winnipeg.
- The LWBSF Public Advisory Committee (PAC) met on January 8th and 9th to consider 32 proposals, requesting greater than \$3.5M in funding under Round 7. The PAC provided funding recommendations to the Minister and a decision about projects approved for funding is anticipated by March 31, 2014.

Contact: Les Rutherford, Manager, Lake Winnipeg Basin Initiative, Environment Canada, Winnipeg, MB, Phone: 204-983-5897 or e-mail Les.Rutherford@ec.gc.ca
Website: <http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=4E8DF48A-1>

5.0 International Red River Board Membership

Current membership is as follows – eight members on the Canadian side and eight members on the United States side. The full complement of membership is nine members from each country.

United States

Col. Daniel Koprowski – U.S. Co-Chair District Engineer, St. Paul District U.S. Army Corps of Engineers	Megan Estep U.S. Fish and Wildlife Service
James Ziegler Detroit Lakes Office Minnesota Pollution Control Agency	Bert Garcia Director of Ecosystems Protection Remediation U. S. Environmental Protection Agency (Region 8)
Dennis Fewless Director, Division of Water Quality North Dakota Department of Health	Daniel Wilkens Administrator, Sand Hill River Watershed District, Minnesota (Red River Basin Commission)
Randy Gjestvang Red River Water Resources Engineer North Dakota State Water Commission	Gregg Wiche Director, North Dakota U.S. Geological Survey, Water Science Center
Keith R. Mykleseth A/Regional Manager, Division of Ecological and Water Resources, Minnesota Department of Natural Resources	Scott Jutila- U.S. Co-Secretary Hydraulic Engineer St. Paul District U.S. Army Corps of Engineers

Canada

Mike Renouf – Canadian Chair Executive Director Transboundary Waters Unit Environment Canada	Herm Martens Red River Basin Commission
Nicole Armstrong Director, Water Science and Management Manitoba Conservation & Water Stewardship	Vacant
Steven Topping Executive Director, Infrastructure and Operations, Manitoba Water Stewardship	Dr. Brian Parker Director, Fisheries Branch Manitoba Conservation & Water Stewardship
Gordon Bell Senior Hydrologist, Ag Water Directorate Agri-Environment Services Branch Agriculture and Agri-Food Canada	Dr. Patricia Ramlal Manager, Environmental Science Division Fisheries and Oceans Canada
Dr. L. Gordon Goldsborough Delta Marsh Field Station and Department of Botany, University of Manitoba	Girma Sahlu - Canadian Co-Secretary Senior Engineering Advisor Transboundary Waters Unit Environment Canada

6.0 Summary of Priorities

The IRRB work plan identifies a suite of activities in response to the IJC Directive and in support of the International Watersheds Initiative. These activities are being undertaken as resources and capacity of the participating agencies allow. The work plan includes the following strategic goals and three-year outcomes:

- 1. FLOOD PREPAREDNESS AND MITIGATION: The human and economic impacts of flooding in the Red River Basin are minimized.
 - Monitor and Report progress by the governments (federal, state, provincial, municipal) in implementing the recommendations of the Commission's report on Red River basin flooding, and in maintaining and advancing the work of the Task Force's legacy projects.
 - IRRB is aware of the Basin runoff conditions.
 - Identify strategies to encourage governments to develop and implement long-term flood mitigation and emergency preparedness in the Basin.
 - Provide scientific support to address Pembina flooding issues.
 - Meet IJC's requirements for ongoing reporting.
- 2. WATER QUALITY: Water quality at the international boundary is at an acceptable level so that international disputes with respect to water quality in the Red River Basin are avoided and resolved.
 - Meet IJC's requirements for ongoing Monitoring and Reporting of Water Quality Objectives and Alert Levels at the International Boundary.
 - Develop and Recommend science-based nutrient objectives at the international boundary.
- 3. AQUATIC ECOSYSTEM HEALTH: Water resources of the Red River of the North Basin support and maintain a balanced community of organisms with species composition, diversity and functional organization comparable to the natural habitats within the Basin without regard to political boundaries so that disputes with respect to aquatic ecosystem health are avoided and resolved.
 - Complete Devils Lake Fish Pathogens and Parasites Survey.
 - Complete the risk analysis, peer review, and prepare final report.
 - The IRRB is aware of and takes appropriate action regarding the natural transfer of water between the Red River basin and other basins.
- 4. WATER QUANTITY: International disputes with respect to water quantity in the Red River Basin are avoided and resolved.
 - Long-term: Assess and recommend a process for the development and implementation of water quantity apportionment procedure for the Red River at the International Boundary.
 - Short-term: Compile information identified in the January 2008 approved multi-year "Proposed Flow Apportionment Conceptual Framework Plan".
- 5. OUTREACH AND ENGAGEMENT: The IRRB's work is enhanced by its relationships with key stakeholders and interested members of the public.