



***INTERNATIONAL RAINY-LAKE OF THE WOODS
WATERSHED BOARD***

TENTH ANNUAL REPORT - 2022

**JANUARY 1, 2022
to
DECEMBER 31, 2022**

TABLE OF CONTENTS

1	SUMMARY.....	3
1.1	Overview of Key Watershed Issues.....	3
1.2	Highlights of Board Activities	5
1.3	International Rainy-Lake of the Woods Watershed Board Work Plan and Annual Reporting (2022).....	5
2	INTRODUCTION.....	6
2.1	International Rainy Lake of the Woods Watershed Board	6
2.2	Basin Description	7
3	BOARD MEMBERSHIP	7
4	INTERNATIONAL RAINY-LAKE OF THE WOODS BOARD ACTIVITIES	11
4.1	Water Levels Committee	11
4.2	Adaptive Management Committee.....	14
4.3	Aquatic Ecosystem Health Committee.....	14
4.4	Engagement Committee	15
4.5	Board Meetings.....	16
4.6	International Watershed Initiative (IWI) Projects.....	16
4.6.1	Spring 2022 Climate Change Public Engagement Workshop	16
4.6.2	Compiling Data and Information to Assess the Vulnerability of Rainy River and Lake of the Woods Watershed to Mining	17
4.6.3	Wild Rice Mapping.....	17
4.6.4	Erosional Study Proposal	17
5	ADVISORY GROUP ACTIVITIES.....	18
5.1	Community Advisory Group (CAG)	18
5.2	Industry Advisory Group (IAG).....	18
6	WATER LEVEL CONDITIONS	19
7	WATER QUALITY CONDITIONS	23
7.1	State of the Basin Report (SOBR) 3 rd Edition	23
7.2	Exploring an Updated Approach to Exceedance Reporting.....	24
7.3	International Rainy-Lake of the Woods Watershed Forum.....	24
7.4	Binational Approach to Address Nutrients and Harmful Algal Blooms in the Lake of the Woods.....	25
7.5	Nuclear Waste Management Site	26
8	APPENDICES	26
8.1	Appendix 1 – Board Work Plan 2022.....	26

1 SUMMARY

1.1 Overview of Key Watershed Issues

The Rainy-Lake of the Woods Watershed experienced an extreme flood condition throughout the spring and summer of 2022. Rainy Lake reached record-breaking water levels, Lake of the Woods reached its second highest level since 1925 and Namakan Lake experienced the third highest levels on record. The flood lasted many weeks and losses were widespread with severe damage to homes, docks, boathouses, infrastructure, and roads. Significant shoreline erosion and tree loss was also experienced throughout the basin. Thousands of hours were spent by citizens and emergency response agencies on flood protection and mitigation such as sandbagging, building berms, water pumping, and recovery and remediation efforts once water levels began to return to normal ranges. Many recreational tourism operators across the region lost business or had to close due to flooding. In total, the economic, financial, and emotional toll on the entire community, and the entire downstream watershed, was significant. The Board's Water Levels Committee was active during this time coordinating with the U.S. National Weather Service and Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry on releasing emergency information updates, doing media interviews, visiting the basin, and participating in public outreach sessions.

Based on the 2022 flood event and observations during basin visits and public outreach sessions, it became apparent that the title of the 'high flood risk rule curve,' which is used by the WLC to set water levels targets for the watershed, was misleading and the actual amount of flood protection provided by the high flood risk rule curve was less than what the public expected. Whereas implementation of the 'high flood risk rule curve' could mitigate minor to moderate spring flood risk, it would not be able to prevent or mitigate extreme events like the flood in 2022. As such, the WLC requested an amendment to the 2018 Supplementary Order to eliminate the distinction between the 'regular' and 'high flood risk rule curves' for Rainy Lake, creating just one rule curve through the spring period (including removal of all references to a high flood risk rule curve from the Order).

The WLC also requested the IJC update the language of the Supplementary Order such that the WLC be required to establish a 'Spring Regulation Plan' by March 10 and not, as in previous years, a 'rule curve decision.' Whereas a 'rule curve decision' suggests there is singular water level regulation decision on March 10, after which the WLC takes no further action, a 'Spring Regulation Plan' implies that the WLC has the flexibility to adjust water level targets to meet any changes in hydrologic conditions after the March 10 decision. In March 2023, the IJC issued a

temporary supplementary order to implement these changes and will consider a permanent change after the 2023 freshet.

Other actions taken by the Board and WLC during and after the 2022 flood event include:

- Two basin visits during the 2022 flood event to assess damages and meet with emergency management personnel, First Nations, resort and property owners, and local media.
- Coordinated with the National Weather Service to host a webpage specific to the Rainy River Basin with resources for river and lake levels across the Basin and on both sides of the border.
- WLC coordination with the North Central River Forecasting Center (NCRFC) for additional forecasting support for the full Rainy River basin and additional modeling capacity to accurately quantify snow observations within the basin.
- The WLC began development of the Post Flood Report to be finalized in 2023. The report covers basin conditions before and during the flood, WLC actions before and during the flood, summary of public engagement, what-if scenario analysis if the high flood risk rule curve was implemented in 2022, and a summary of resources and sources of information.

Persistent harmful algal blooms, caused by excess phosphorus loadings in Lake of the Woods, continued to be the priority water quality issue in 2022. The blooms, which have been a problem for the last several decades, affect how American and Canadian citizens work, live, and enjoy the Lake, and represent a major public concern on both sides of the US-Canadian border. After a later-than-normal start, the 2022 harmful algal bloom peaked on October 13 at 2598 km² (~67.3% of the lake's surface area), with the highest concentrations occurring in the southeast portion of the lake.

In response to the Board's letter to the IJC on October 18, 2021, the IJC sent a letter on January 24, 2022 to the U.S. and Canadian governments recommending next steps for the development of joint Canada-U.S. binational phosphorus reduction targets. The Board continues to monitor the progress of Governments in responding to this issue and notes that the U.S. Environmental Protection Agency approved Minnesota's domestic Total Maximum Daily Load (TMDL) for Lake of the Woods on June 17, 2021, and that engagement for the development of Canada's Lake Ecosystem Objectives and Phosphorus Reduction Targets is ongoing.

Throughout 2022, the Board continued to monitor advancements in the CN Rail Bridge Replacement project between Rainier, MN and Fort Frances, ON. The bridge replacement has concerned the public owing to the potential to change the flow of the Rainy River. Though CN

has a design criterion to not affect the net outflow, this project could trigger IJC review under the 1909 *Boundary Waters Treaty* should the governments agree.

1.2 Highlights of Board Activities

Whereas the extensive and extreme nature of flooding in 2022 was the focus of much of the Board's activities in 2022, the Board was able to achieve the following additional items during 2022.

- Completed committee review of the third edition of the Rainy-Lake of the Woods State of the Basin Report - a collaborative project with the Lake of the Woods Water Sustainability Foundation, the IJC, Grand Council Treaty #3 (GCT#3), Northwestern Ontario Métis Community, US Tribes, and 15 agencies.
- Reviewed the Aquatic Ecosystem Health Committee's (AEHC's) Terms of Reference.
- Drafted a revised approach to exceedance reporting to align with the Directive.
- Delivered a Climate Change workshop with climate and lake experts to support the IJC Climate Change Guidance Framework implementation.
- Secured International Watershed Initiative funding to assess the vulnerability of waters in the Rainy-Lake of the Woods watershed to mining.
- Hosted public listening sessions in Fort Frances and International Falls on August 10 and 11, 2022 with attendance by members of the public and Board members or others affiliated with the work of the Board.
- Approved a USGS project to map bathymetry of Rainy Lake, Namakan Reservoir, and Rainy River.

The Board, its Committees and its Advisory Groups continued to benefit from the involvement of diverse and knowledgeable members from both Canada and the United States. Ongoing leadership was provided by Canadian Board Co-Chair Michael Goffin of Environment and Climate Change Canada, and U.S. Co-Chair Colonel Eric Swenson of the U.S. Army Corps of Engineers who assumed Co-chair responsibilities for the Board from the outgoing U.S. Co-chair Col. Karl Jansen effective November 1, 2022.

1.3 International Rainy-Lake of the Woods Watershed Board Work Plan and Annual Reporting (2022)

Each year, the Board develops a work plan that aligns with the mandate that it is provided by the International Joint Commission. The work plan guides Board activities and is designed to

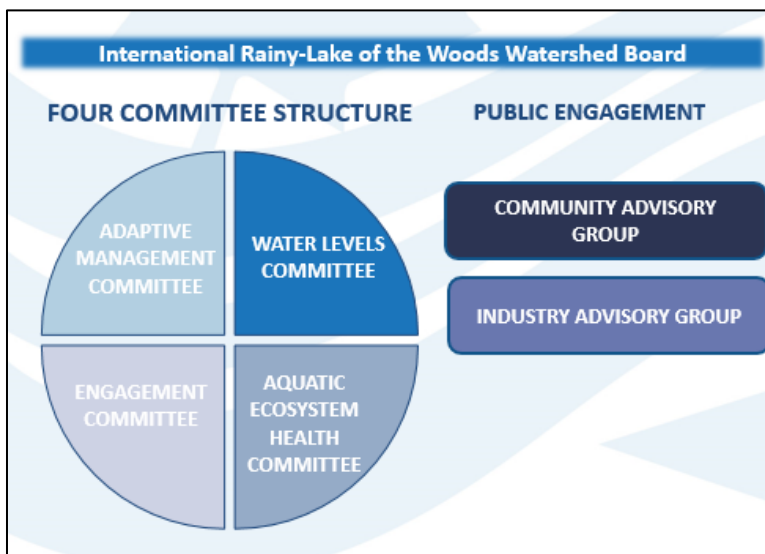
monitor progress of Board actions related to assigned roles and responsibilities. A copy of the Board’s 2022 work plan can be found in Appendix 1 of this report.

2 INTRODUCTION

2.1 International Rainy Lake of the Woods Watershed Board

Per the Directive issued by the IJC, the Board’s mandate is to review and report on the ecological health of the Lake of the Woods and Rainy River boundary waters aquatic ecosystem, including water quality, and to assist the IJC in preventing and resolving disputes regarding the boundary waters of the Rainy-Lake of the Woods watershed. With respect to water regulation, the Board’s mandate is to coordinate the management of water levels and flows on Rainy and Namakan Lakes. The Water Levels Committee has the authority to act independently of the Board to regulate water levels of the Rainy and Namakan chain of lakes within the rule curves for those lakes.

The Board’s work is supported by four standing committees. The four committees monitor issues and coordinate activities relevant to binational management of the international waters in the basin so that the Board can provide information and recommendations to the International Joint Commission.



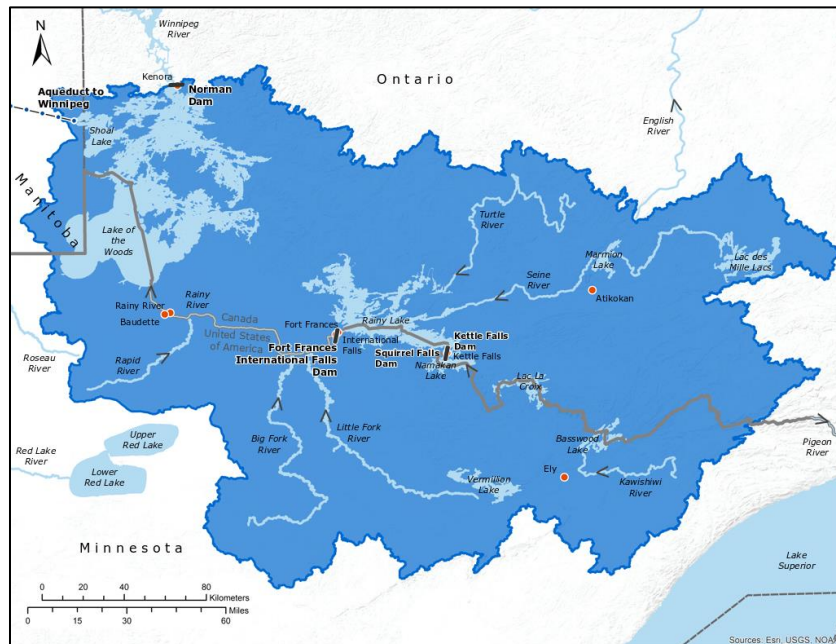
Structure of the IRLWWB, Committees and Advisory Groups.

The Board receives local insight and advice to accomplish its mandate through a diverse membership including representation from First Nations, Métis and Tribal communities, and a variety of non-government and government members. The Board aims to encourage the

development of local and regional capacity and promotes public engagement through public meetings and through regular consultation with both a Community Advisory Group and Industry Advisory Group.

2.2 Basin Description

The Rainy-Lake of the Woods watershed covers an area of 27,000 mi² or 70,000 km². This boundary watershed is situated within the Canadian provinces of Ontario and Manitoba and the U.S. State of Minnesota. See map on next page.



Map of the Rainy-Lake of the Woods watershed. Image courtesy of the International Joint Commission.

3 BOARD MEMBERSHIP

The Board is comprised of ten members from Canada and ten members from the United States representing government agencies at all levels, Indigenous communities, and local community interests. During 2022, Board membership continued to evolve and appointment of new members is ongoing. Of note, outgoing U.S. Co-chair Col. Karl Jansen continued to support Board activities throughout the spring and summer of 2022 due to the historic flooding. The new U.S. Co-chair, Col Eric Swenson, assumed the responsibilities of the position effective November 1, 2022.

Following years of dedicated volunteer service, Canadian public Board and Water Level Committee member Kiley Shebagegit resigned from her position on May 20, 2022. Her position was vacant through the 2022 reporting period.

A second position, which was previously filled by Trina Rawn of the Ontario Ministry of Environment, Conservation and Parks (MECP) since the inception of the Board, remained vacant in 2022. MECP declined to nominate a replacement for Trina. Given MECP’s clear and unique mandate to protect water quality at the provincial level, the Board felt the absence of a member from MECP would inhibit its ability to fulfill elements of its mandate.

The following table lists current Board members as of December 31, 2022.

CANADIAN MEMBERS (10)	UNITED STATES MEMBERS (10)
<p>Michael Goffin <i>(Board Co-Chair, Aquatic Ecosystem Health Committee Member)</i> Environment and Climate Change Canada</p>	<p>COL Eric Swenson <i>(Board Co-Chair, Water Levels Committee Co-Chair)</i> St. Paul District, United States Army Corps of Engineers</p>
<p>Karen Cederwall <i>(Board Member, Engagement Committee Co-Chair, CAG Member)</i> Metis Nation of Ontario, Region 1 Kenora, ON</p>	<p>Matthew Guoin <i>(Public Board Member, Engagement Committee Member, CAG Member)</i> Rainy Lake, International Falls, MN</p>
<p>Greg Chapman <i>(Board Member, IAG Co-Chair)</i> Ontario Ministry of Natural Resources and Forestry Fort Frances, ON</p>	<p>Theresa Haugen <i>(Board Member, Aquatic Ecosystem Health Committee Member)</i> Minnesota Pollution Control Agency</p> <p>Alternate: Amy Adrihan Minnesota Pollution Control Agency</p>

CANADIAN MEMBERS (10)	UNITED STATES MEMBERS (10)
<p>Megan Garner <i>(Water Levels Committee Co-Chair)</i> Environment and Climate Change Canada</p>	<p>Mike Hirst <i>(Board Member, IAG Co-Chair, Aquatic Ecosystem Health Committee Co-Chair)</i> Lake of the Woods Soil and Water Conservation District</p>
<p>Mark Lee <i>(Board Member, Aquatic Ecosystem Health Committee Member)</i> Manitoba Conservation and Water Stewardship</p>	<p>Doug Franchot <i>(Public Board Member, CAG Co-chair, Engagement Committee)</i> International Falls, MN</p>
<p>Chief Brian Perrault <i>(Board Member, Engagement Committee Member, CAG Member)</i> Chief, Couchiching First Nation Fort Frances, ON</p> <p>Alternate: Lucas King Territorial Planning Unit Grand Council Treaty #3</p>	<p>Al Pemberton <i>(Board Member, Aquatic Ecosystem Health Committee Member, Engagement Committee Member, CAG Member)</i> Red Lake Department of Natural Resources Red Lake, MN</p> <p>Alternate: Joshua Jones Red Lake Department of Natural Resources</p>
<p>Todd Sellers <i>(Public Board Member, Aquatic Ecosystem Health Committee Co-Chair, Engagement Committee Member, CAG Member)</i> Minaki, ON / Winnipeg MB</p>	<p>Kelly Sjerven <i>(Public Board Member, Engagement Committee Co-Chair)</i> International Falls, MN</p>

CANADIAN MEMBERS (10)	UNITED STATES MEMBERS (10)
<p>Matt Myers <i>(Public Board Member, CAG Co-Chair, Aquatic Ecosystem Health Committee Member)</i> Fort Frances, ON</p>	<p>Shelly Patten <i>(Board Member)</i> Minnesota Department of Natural Resources Grand Rapids, MN</p>
<p>[Vacant]</p>	<p>Jim Stark <i>(Board Member, Aquatic Ecosystem Health Committee Member)</i> Minnesota State Legislature</p>
<p>[Vacant]</p>	<p>Pam Tomevi <i>(Public Board Member, Water Levels Committee Member, CAG Member).</i> Koochiching Soil and Water Conservation District</p>
ENGINEERS	
<p>Matt DeWolfe Lake of the Woods Control Board Secretariat</p>	<p>Scott Jutila St. Paul District Army Corps of Engineers</p>
	<p>Abigail Moore St. Paul District Army Corps of Engineers</p>
SECRETARIES	
<p>Wellsley Hamilton Environment and Climate Change Canada</p>	<p>Scott Jutila St. Paul District Army Corps of Engineers</p>
	<p>Abigail Moore</p>

CANADIAN MEMBERS (10)	UNITED STATES MEMBERS (10)
	St. Paul District Army Corps of Engineers
	Rebecca Seal-Soileau St. Paul District Army Corps of Engineers

4 INTERNATIONAL RAINY-LAKE OF THE WOODS BOARD ACTIVITIES

4.1 Water Levels Committee

The mandate of the Water Levels Committee (WLC) is to monitor the water levels of Rainy and Namakan Lakes to ensure that the terms of the IJC Orders are followed. The WLC communicates with the Lake of the Woods Control Board, who manages water levels on Lake of the Woods, and International Lake of the Woods Control Board who approves regulation decisions on Lake of the Woods at extremely high and low water levels. The WLC is Co-chaired by COL Eric Swensen, who replaced COL Karl Jansen November 1, 2022, and Megan Garner.

The WLC hosted a pre-spring engagement webinar where the Engineering Advisors provided a summary of basin conditions and seasonal forecast information to approximately 37 participants. Webinar participants were encouraged to provide their knowledge, subject-matter expertise, and share any concerns or additional information for consideration in advance of the freshet season.

Under the 2018 Order for Rainy and Namakan Lakes, the WLC is required to make an annual decision by March 10 of each year whether to implement the High Flood Risk Rule Curve (HFRRC) for Rainy Lake. In March 2022, after consulting with stakeholder representatives, the WLC elected not to implement the HFRRC in the spring of 2022. The basin drought category ranged from abnormally dry in portions of Canada to moderate to severe drought in portions of the U.S. Forecasted conditions at the time of the decision also did not support the use of the HFRRC. To balance the needs of the fisheries in the lakes, the lake levels were to be held in the middle range (25 to 75 percent) of the band. For Namakan Lake, the March 31 target range was between 339.65 m (1,114.3 ft) and 339.8 m (1,114.8 ft). The Rainy Lake March 31 target range was 336.90 m (1,105.3 ft) and 337.0 m (1,105.6 ft), and within the upper range of the HFRRC.

Refer to the [Water Level Decisions & Data](#) page on the Board's website for all WLC decisions and sources for water levels data.

In response to the extreme precipitation which occurred April 22-23, the Namakan Lake outflow was increased to approximately 280 m³/s (9,888 cfs), and the Rainy Lake outflow increased to approximately 740 m³/s (26,133 cfs) on April 25. All logs were pulled from sluices at Namakan dams on April 26 and gates at the International Falls-Fort Frances Dam were opened to maximize outflow as lake levels rose, with all gates open on May 5.

Once all sluices and gates were open at Namakan and Rainy Lake dams, there were no additional actions that the dam operators or the WLC could take to pass additional water. The rate of water released from both lakes steadily rose as the water levels of the lakes increased but remained well below the inflow rates as week after week of above-average precipitation continued to fall. The WLC Engineering Advisors worked closely with Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry and the U.S. National Weather Service to provide guidance three days a week on forecasts for the levels of both lakes.

At the end of May, the U.S. Co-Chair of the WLC and the public U.S. WLC member met with local officials and community members from around the International Falls. During the week of June 6, 2022, the WLC and IJC representatives, including a Lead Commissioner, traveled through the larger basin to meet with the affected residents and community officials. Local WLC members have been consistently communicating with affected residents, providing information, and answering questions.

The Rainy Lake Property Owners Association (RLPOA) sent a request to WLC on June 30, 2022. The request detailed that when Namakan Lake water level recedes to 1,118.8 feet (top of 1970 Rule Curve) operations on the lake should follow the 1970 rule curve temporarily to speed up the decline of the Rainy Lake in the hope that residents have access to damages and start on restoration activities. Following a discussion amongst the WLC and Namakan Lake residents, the WLC requested a Temporary Order from the IJC to hold the lake at the upper limit of the 1970 Rule Curve. On July 5, the WLC received the Temporary Order from the IJC. Refer to the [Water Levels Decision & Data](#) webpage for additional information.

On July 26, as Rainy Lake fell below the IJC All-Gates Open lake level, the WLC advised operators to set outflows from Namakan and Rainy lakes to target the middle 50 percent of their rule curve bands. The Namakan and Rainy Lakes returned to their standard rule curves on August 3, 2022.

During the IRLWWB annual basin meeting the second week of August, the IRLWWB and WLC hosted two Public Listening Sessions: one in Fort Frances, Ontario, and the other in International Falls, Minnesota. The goal for each session was to provide an opportunity for the community members to share their views and concerns with the Board and its Committees. Participants were asked to register in advance and submit questions. The WLC developed a video presentation about the 2022 flood. The video played at the beginning of each listening session and is available on the IRLWWB website. The video followed a facilitated session for participants to ask questions and express concerns.

During the IRLWWB Appearance with IJC Commissioners in October, the WLC presented on the historic flooding in the basin and shared key observations, implications, recommendations, and next steps. There was public misperception that the flood could have been prevented, as well as misunderstanding of the roles and responsibilities of the IJC, IRLWWB, and WLC. The WLC and IRLWWB noted that the “High Flood Risk Rule Curve” is a misleading term and fueled much of the public distrust in the WLC and IJC during the flood event. To improve public engagement and information sharing, the WLC also proposed that the IJC assist in establishing an email subscription service for any updates on the WLC’s Data and Decisions webpage, support the WLC in engagement with local media outlets, and consider establishing a WLC YouTube channel on a trial basis to enable sharing of regulation information and related public education content videos that could be embedded on the WLC web page.

After the IRLWWB Appearance, the WLC began work on the Post Flood Report with content that would cover the following questions and topics:

- The roles and responsibilities shared by the IJC, IRLWWB, and WLC within the watershed;
- Hydrologic conditions that led to the extreme flooding;
- Activities and decisions of the WLC in 2022;
- The role of rule curves during flood events and what would have happened if the HFRRC on Rainy Lake was implemented in 2022; and
- A summary of public engagement and what the WLC heard throughout the flood event and August 2022 Public Listening Sessions in Fort Frances, Ontario and International Falls, Minnesota.

Along with writing the 2022 Post Flood Report, on October 31, the WLC sent a letter to the North Central River Forecasting Center (NCRFC) requesting additional forecasting support for the full Rainy River basin and building modeling capacity and support from NOHRSC for snow

water equivalent measurements to accurately quantify snow observations within the basin. Since the request, NCRFC has been actively working on forecast modeling efforts and will be adding the Rainy-Lake of the Woods watershed flight paths for aerial snow surveys. These efforts would help support water level target decisions for spring and address public concerns that modeled snow data was not accurately depicting what was observed on the ground.

4.2 Adaptive Management Committee

The Adaptive Management Committee (AMC) applies an adaptive management approach to monitor and understand how the rules governing dam operation (rule curves) affect Namakan Reservoir, Rainy Lake, and Rainy River. This work will support an objective review of the rule curves on Rainy and Namakan lakes in the future.

In the summer of 2022, the AMC (through an IJC-funded USGS project) was able to complete nearshore bathymetric data collection on Rainy Lake and Namakan Reservoir lakes. This work enhanced the reliability of the base Digital Elevation Model on which the rule curve performance indicator modelling was run.

The AMC was also able to initiate a project with the USGS to develop a web-based data visualization tool for Rainy Lake, Namakan Reservoir, and Rainy River in support of adaptive management of lake levels. The tool, which is now in development, will assist the IRLWWB and its committees in assessing lake level management scenario modeling output showing performance of existing and alternate rule curves.

In addition to monitoring and understanding rule curves within the basin, the AMC is also responsible for guiding the board's climate adaptation activities. On August 11, the AMC hosted a public climate adaptation workshop, to identify values in the basin that are at risk due to climate change. Flooding emerged as a major concern among all workshop participants. 2022's extreme flooding demonstrated that historical approaches to water levels management that rely solely on rule curve adjustments are inadequate to meet the magnitude of water levels fluctuations wrought by climate change. The workshop report identified several steps the board and AMC could follow to develop more robust management objectives and practices to reduce flood risk and climate change harms.

4.3 Aquatic Ecosystem Health Committee

The AEHC provides advice and makes recommendations to the Board about water quality and aquatic ecosystem health monitoring, reporting, objectives and alerts, and other activities assigned to them by the Board.

Active IWI projects and proposals include:

- Submission of the Lake of the Woods - South Shore Barrier Island Erosional Study for IWI funding consideration
- Initiation of a project funded by the International Watershed Initiative to assess the vulnerability of waters to mining in the Rainy Lake of the Woods watershed, in partnership with the IJC's Health Professionals Advisory Board.
- The completion of the State of the Basin Report in collaboration with the Lake of the Woods Watershed Sustainability Foundation, International Joint Commission, Grand Treaty Council #3, member agencies of the International Multi-Agency Arrangement (IMA) and relevant academic researchers.
- Plans to develop a proposal in 2023 for Phase II of a project to develop recommendations for international water quality objectives for phosphorus, identify alert levels for other issues of concern and to design-scope a core monitoring program to support related reporting on objectives and alerts.

4.4 Engagement Committee

The Engagement Committee (EC) continues its work to seek opportunities to further engage the public on issues of water quality and quantity in the basin.

The Board had ongoing correspondence and collaboration with residents, stakeholders and agency representatives throughout 2022, including the following targeted engagement activities:

- February
 - WLC Pre-Spring Engagement
- March
 - WLC Meeting with Operators
 - Presentation to the public at the March Forum
 - CAG and IAG Meeting with the Board
- May
 - U.S. WLC tour of basin during flooding
- June
 - WLC and Commissioner tour of basin during flooding, and on-the-ground with residents, including First Nations communities (coordinated with the International Lake of the Woods Control Board (ILWCB) and the Lake of the Woods Control Board (LWCB))

- August
 - In-person public meeting in Fort Frances
 - In-person public meeting in International Falls
 - Resource Management Agency meeting
 - CAG Meeting with the Board
 - Climate Change Stakeholder Workshop
- September
 - Participation in LWCB public engagement session

The Board and WLC also engaged in extensive community outreach in support of flood and post flood situations, details of which are provided in the Post Flood Report.

4.5 Board Meetings

The Board met 6 times in 2022, including twice at the IJC Semi-Annuals, one meeting in person within the basin, and three times virtually.

4.6 International Watershed Initiative (IWI) Projects

The Board endorsed and led the implementation of the following International Watershed Initiative-funded projects to advance delivery of our mandate:

4.6.1 Spring 2022 Climate Change Public Engagement Workshop

On August 11, with IWI support, the AMC hosted a half-day Public Climate Change Adaptation Workshop. The workshop aimed to 1) Summarize the climate related planning done under the rule curve study; 2) Share recent insights into the regional climate change studies; 3) Report on whether the implementation of the IJC’s climate change guidance framework’s (CCGF’s) adaptive management (AM) program is working as hoped; 4) Brainstorm and prioritize a list of climate influenced management concerns (flooding, hydropower production, water quality, etc.); and 5) Formulate a group consensus on next steps, including public findings, changes in the IJC’s CCGF’s AM program, additional IWI studies, or broader actions. The goal of the workshop was to increase public and stakeholder confidence that the Board would be prepared for climate change impacts.

The workshop built on preliminary public feedback and insights about local climate change impacts gathered through a smaller Lake Association meeting that took place in November 2021.

Conversations at the workshop were wide-ranging and explorative, with participants attempting to understand committee and Board business in the larger context of the basin. The basin flood

drove much of the discussion, including the speculation that management of the lakes caused the flooding, which expert analysis has invalidated, and that the Board should do more to address flooding while staying within their mandate.

4.6.2 Compiling Data and Information to Assess the Vulnerability of Rainy River and Lake of the Woods Watershed to Mining

The watershed's vulnerability to adverse water quality and aquatic-health impacts, from current and potential mining activities, has been a topic of interest to the Board since 2014. Based on similar concerns, the IJC Commissioners advised the Board and the Health Professionals Advisory Board (HPAB) to develop a proposal focused on the vulnerability of the watershed to the cumulative effects of mining.

Work commenced to draft and refine the scope of the project and engage with the CAG, IAG and the AEHC in 2021 and continued into 2022. The proposal was approved in 2022 with the initial phase of the work involving the compilation of data and information. Funding agreements were formalized with partners in both countries-the U.S. Geological Survey and the Geological Survey of Canada. Work on the U.S. side began in 2022 and will commence, in Canada, in 2023.

4.6.3 Wild Rice Mapping

In partnership with GCT#3, in 2021 the IJC's in-house geospatial team prepared a map of control structures and water ways. This was a first step towards informing better protection and management of wild rice in the basin. The Board received a presentation on the outcomes of this project in 2022 including how the mapping will support the development of a wild rice protocol.

4.6.4 Erosional Study Proposal

The Board is proposing a Lake of the Woods Southern Shore Barrier Island Erosion Investigation to develop a lake-wide circulation model, wave model and shore evolution model to assess causes of island and shoreline degradation of Pine, and Curry and Sable Islands. These islands, located on the southern shore, provide significant historical, habitat and economic benefits. Local and state partners are seeking to better understand erosional processes which are occurring, and how they tie into resiliency, recovery, and climactic factors.

The proposal was reviewed by the Board at the October 5 meeting and there was discussion on how an erosion study relates to the Board's mandate and if recommendations would be related to aquatic ecosystem health and/or water level management mandates. Revisions were made to the proposal based on Board member input, most significantly the inclusion of Sable Island on the Canadian side of the border. The project has support from the MN DNR and OMECP to

ensure the project was binational. The Board approved the IWI proposal and will follow up with the IWI Committee in 2023 about next steps for getting the project approved and developing a Statement of Work. This project represents action the Board is taking in response to the 2022 flood event.

5 ADVISORY GROUP ACTIVITIES

5.1 Community Advisory Group (CAG)

The CAG is made up of Board and public members from across the basin who provide advice, insight and support to the Board on issues related to its mandate and activities.

The CAG met twice to discuss the following key topics:

- observations and recommendations related to the 2022 flooding;
- defining roles to improve Board communications and public engagement;
- assessing the cumulative effects of mining within the basin, the basis of an approved IWI-funded project sponsored by the committee chairs;
- concerns related to the Nuclear Waste Management Organization's (NWMO) consideration of a potential deep repository nuclear waste site in Ignace, ON, just outside of the boundary of the watershed; and
- improving binational coordination of international emergency events

The Board met with the CAG twice to receive advice and respond to questions regarding their concerns.

CAG members benefitted from IJC funding to participate in the Forum, which allows them to stay informed and fulfil their role.

5.2 Industry Advisory Group (IAG)

The purpose of the IAG is to make the Board aware of industry perspectives on both sides of the border. Current membership reflects a wide range of industrial interests in the watershed and includes hydroelectric power, paper production, agriculture, forestry, fisheries, mining, recreation and tourism. Membership is being strengthened and is open to any industry operating in the watershed.

The IAG met twice to discuss the following key topics:

- agricultural production in the basin;

- Minnesota’s One Watershed, One Plan program;
- the status and progress of various Board projects and studies (e.g., aquatic invasive species risk assessment, the core monitoring program, objectives and alerts development and the flood risk mapping tool, etc.); and
- flooding and fire risks related to weather forecasts

6 WATER LEVEL CONDITIONS

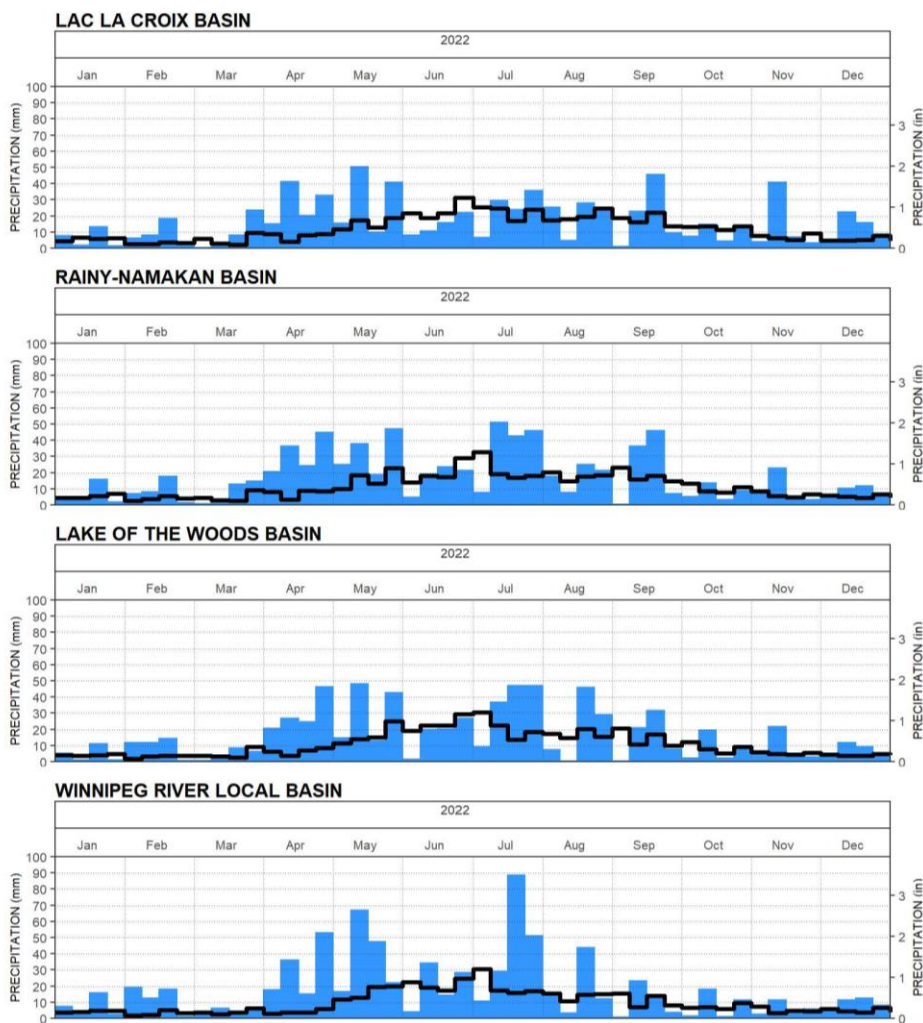
Flows and water levels of Namakan Lake and Rainy Lake were extreme. At the beginning of the year, the basin was recovering from extreme drought status and still categorized as a severe drought well into March. Snowpack and snow water equivalent was above normal in the winter, and unseasonably cold temperatures in April delayed the melt. A series of Colorado Low systems crossed the basin in April. Although air temperatures in the first few days were above freezing, an additional 10 cm (4 in) of snow fell over the Rainy River watershed by the end of the first week of April. Conditions in the second week of April did not improve; air temperatures continued plummeting and the Colorado Low brought widespread, heavy snowfall to the basin. Snowfall totals ranged from 30 to 70 cm (12 to 28 in). The highest amounts of snow accumulated directly over the Namakan sub-basin. In the third week of April, the next Colorado Low struck, causing a rain-on-snow event that resulted in an almost instant depletion of the snowpack.

From April 1 to the end of May, the Rainy River basin had an average of 257 mm (10.1 in) of rainfall. This equated to more than twice the average for April and May. The intensity and longevity of the spring precipitation caused flows in the tributaries of the Rainy River watershed to remain at high or close to peak levels from late April to mid-June. The average inflow to Namakan and Rainy Lakes was the highest on record for April and May combined. The long duration of these high flows fed the inflows to the lakes and ultimately became the driving force behind the flooding. The water level of Namakan Lake rose to a maximum level of 342.18 m (1,122.69 ft), the third highest on record, and only 7 cm (2.8 in) lower than the record level set in 1916. The water level of Rainy Lake rose to 339.31 m (1,113.28 ft) and set a record 8 cm (3.1 in) higher than the previous level record set in 1950. The Namakan and Rainy Lakes returned to their standard rule curves on August 3, 2022, where they remained for the rest of the year. Above-average precipitation raised water levels to the upper portion of both lakes’ rule curves in December and were within the middle of bands in January 2023.

The Post Flood Report details the hydrological and meteorological conditions which contributed to the flood in the Rainy River basin in 2022.

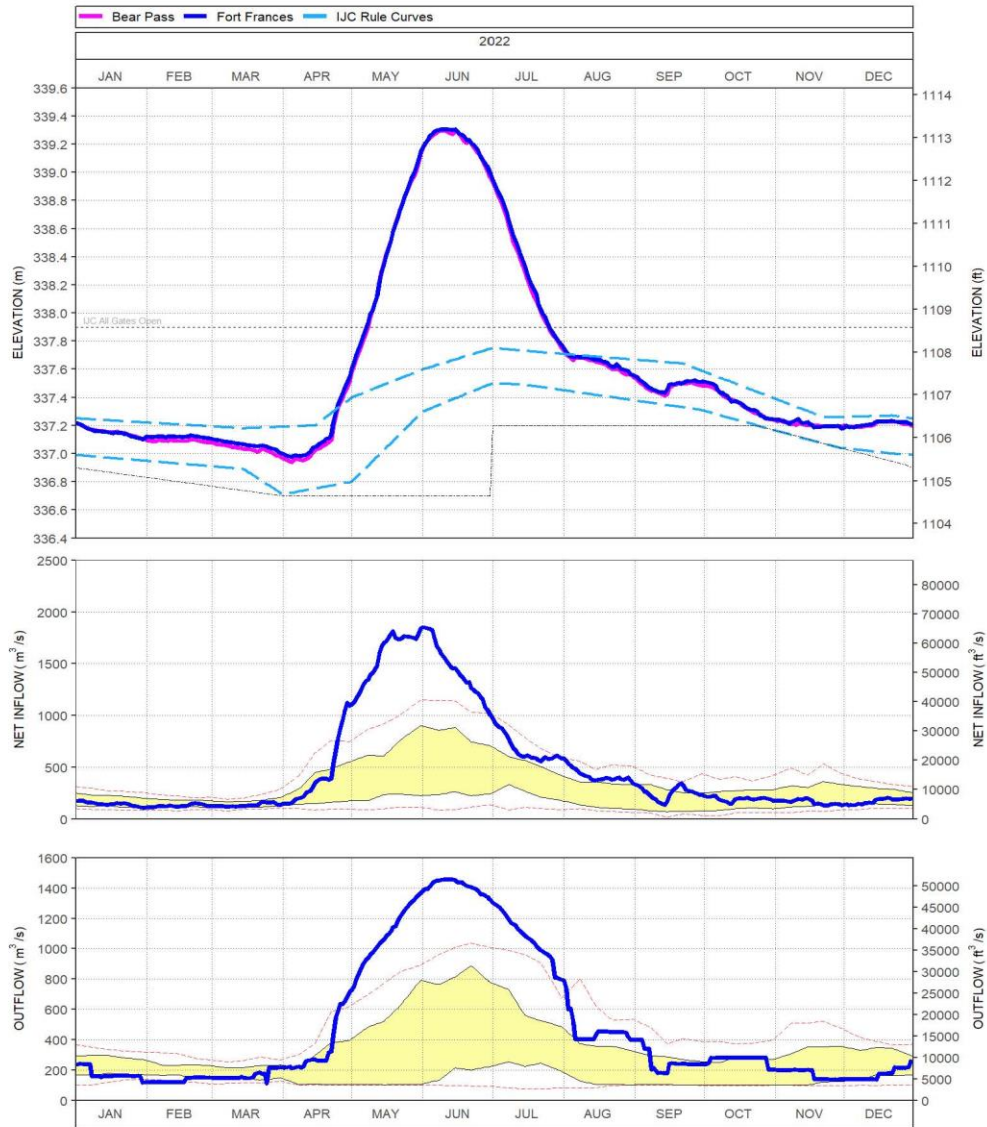
The following figures show precipitation totals for the Winnipeg System, including the Rainy-Namakan and Lake of the Woods basins, as well as water levels and inflow and outflow conditions in the Rainy and Namakan Lakes during 2022.

WINNIPEG SYSTEM PRECIPITATION

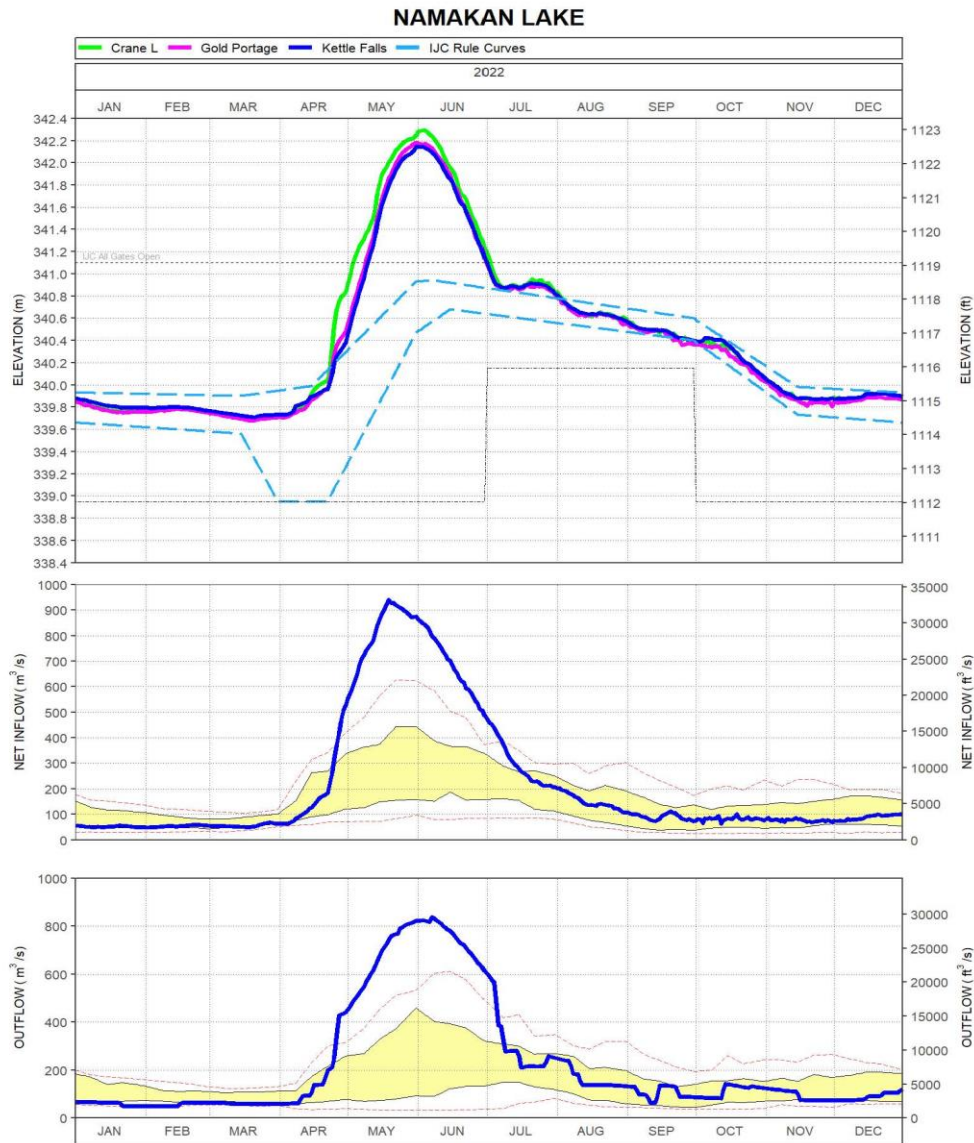


Quarter-monthly precipitation totals for Winnipeg System in 2002. Blue bars represent the actual data for a given quarter month and the black line represents the median from 1986-2015.

RAINY LAKE



Water level conditions in Rainy Lake in 2022



Water level conditions in Namakan Lake in 2022

The preceding two figures illustrate water levels (top); net inflows (middle) and outflows (bottom) in separate panes. The blue lines represent the actual data; the black dotted lines on the top panes represent the drought and all gates open levels; the blue dashed lines represent the upper and lower limits of the rule curves; and the red dotted lines in the lower two panes

represent the 10% and 90% percentiles¹ and the yellow band represents the normal range (between 25% and 75% percentiles).

7 WATER QUALITY CONDITIONS

The Board is charged with reviewing and reporting on the ecological health of the basin’s aquatic ecosystem, including water quality. Over the past year, the Board has kept informed on the development of the following initiatives.

7.1 State of the Basin Report (SOBR) 3rd Edition

The 3rd Edition of the Rainy-Lake of the Woods State of the Basin Report (SOBR) was released jointly by the Lake of the Woods Water Sustainability Foundation and the Board on March 25.

The SOBR provides the Board, partners in the project, and the public with a current understanding of priority issues in the basin. It includes an assessment of progress since the previous report in 2014, focusing on the primary areas of concern in the watershed: nutrients and algae, contaminants, climate change, aquatic invasive species, and erosion/water levels. Further, the report includes gap analysis, and recommendations to enhance work-planning, public communication tools, and relationship building with Indigenous peoples going forward.

Key topics within the 3rd edition include:

- an analysis of declining walleye biomass and fishing quality caused by over-harvest in the north end of Lake of the Woods;
- addition of a new chapter on human health which examines work to end long-term boil water advisories for First Nations’ drinking water, the negative health impacts of mercury contamination, adverse health effects associated with exposure to cyanobacterial toxins, and concerns related to blastomycosis, a diseases caused by a

¹ — In statistics, percentile denotes the relative position of a value in a set of ranked values. For example, a 75th percentile lake level or river flow is greater than 75 % of all other values recorded at the same time of year but is less than the remaining 25 %. A 25th percentile lake level or river flow is greater than 25% percent of all other values recorded at the same time of year, but less than the remaining 75%.

soil-born fungus that has higher incidence and hospitalization rates in the basin than elsewhere in both Ontario and Minnesota.

The 2022 SOBR took the first steps towards “two eyed seeing,” by bringing together views of priority concerns and solutions through both an Indigenous knowledge lens (first eye) and a Western science lens (second eye).

7.2 Exploring an Updated Approach to Exceedance Reporting

In 2018, as directed by the Board, the AEHC initiated a project aimed at fulfilling the Board’s Directive related to objectives and alerts.

Phase I was completed in October 2019. The Phase I Report identified phosphorus as the only parameter significant enough to warrant an internationally agreed-upon objective, and recommended developing a set of total phosphorus objectives for various segments of the Lake of the Woods and the Rainy River. Phase II, which is priority for 2023, will involve identifying specific boundary water segments that require phosphorus Water Quality Objectives and assign P concentration or load targets to achieve desired results in each segment.

The Phase I Report noted that the existing 1965 Water Quality Objectives for the Rainy River are obsolete and should be replaced in order to satisfy reporting requirements under the Board Directive.

Given there are no contemporary objectives for the watershed, the AEHC is developing an interim approach to report on phosphorus exceedances.

7.3 International Rainy-Lake of the Woods Watershed Forum

Since 2004, the annual Forum has been a strategic incubator for cross-border research, management collaboration, networking and communication. Led by the Lake of the Woods Water Sustainability Foundation, the Forum is attended each year by upwards of 144 research and resource managers.

The 2022 Forum took place on March 9-10. Themes covered included: Water Governance, State of the Basin, Nutrients, and Emerging Issues and Technologies. Information about the research presented and proceedings for each year’s Forum are available at: lowwsf.com/watershed-forum.

7.4 Binational Approach to Address Nutrients and Harmful Algal Blooms in the Lake of the Woods

Persistent and significant harmful algal blooms have been a key water quality concern in the basin for some time. For the last decade, blooms in the summer and fall have covered up to 70% of Lake of the Woods, though it is uncertain if blooms are changing over time. The southern U.S. portion of Lake of the Woods is considered impaired for aquatic recreational use due to eutrophication. Algal blooms have been observed in other lakes upstream of the Rainy River.

Based on a recommendation from the Board, Commissioners wrote to Governments on January 24, to reiterate recommendations made in their May 3, 2018 letter for the development of a Canadian and/or binational Canada-United States phosphorus reduction target(s). The January letter from IJC to Governments included the following recommendations:

- the Governments of Canada, Ontario and Manitoba develop a Canadian phosphorus reduction target based on the science and input from stakeholders and Indigenous peoples (recognizing that engagement with Indigenous peoples has yet to be completed);
- the Governments of Canada and the United States take action to achieve phosphorus load reduction targets and regularly report progress publicly;
- the Governments of Canada the United States work together to establish a shared binational phosphorus substance objective and load reduction targets for this important shared binational waterbody; and
- the Governments of Canada and the United States commit to regularly reviewing and revising this shared binational objective and targets as further science becomes available.

Progress towards meeting the IJC recommendations is ongoing. After completing 4-year nutrient and algae research program in 2020, and public engagement in winter and spring 2020-2021, Environment and Climate Change Canada (ECCC) developed proposed Lake Ecosystem Objectives and Phosphorus Reduction Scenarios for Lake of the Woods. Engagement with First Nations and the Métis on the proposed ecosystem objectives and phosphorus reduction scenarios remains to be completed.

In the U.S., the Environmental Protection Agency approved Minnesota's Total Maximum Daily Load (TMDL) on June 17, 2021 for Lake of the Woods. Minnesota set a target of an annual P reduction of 141.0 metric tons (t) to the Lake of the Woods, which corresponds to a 17.3% load reduction. Sources of phosphorus reduction were identified and the implementation plan recognized the importance of transboundary collaboration.

7.5 Nuclear Waste Management Site

The Canadian NWMO is studying the feasibility of siting a national ‘deep geological repository’ for nuclear waste in Ontario. The NWMO site selection process is still under way and two remaining sites are currently being considered: the Township of Ignace and the Municipality of South Bruce.

The Board has identified the NWMO project as a watch item and the CAG and the Board received presentations from the NWMO. The NWMO confirmed that the Town of Ignace site is not within the Board’s watershed. The Board recognizes community concern about potential groundwater impacts and increased risk associated with increased transportation of nuclear waste through the basin.

8 APPENDICES

8.1 Appendix 1 – Board Work Plan 2022



International Rainy-Lake of the Woods Watershed Board (IRLWWB)

WORK PLAN 2022

[for period January 1, 2022 to December 31, 2022]

BASED ON: April 1, 2013 Directive to International Rainy-Lake of the Woods Watershed Board.

MANDATE OVERVIEW: The Board’s mandate is to ensure compliance with the Commission’s Order pursuant to the Rainy Lake Convention, to monitor and report on the ecological health of the Lake of the Woods and Rainy Lake boundary waters aquatic ecosystem, including water quality, and to assist the Commission in preventing and resolving disputes regarding the boundary waters of the Lake of the Woods and Rainy River watershed. The Board shall accomplish its mandate by exploring and encouraging the development of local and regional capacity to prevent and solve problems locally, applying the best available science and knowledge, and maintaining an awareness of the needs, expectations and capabilities of residents of the Lake of the Woods and Rainy River watershed.

DIRECTIVE	WHAT WE HAVE BEEN DIRECTED TO DO	LEAD	WHAT WE ARE GOING TO DO TO CARRY OUT THIS DIRECTION	ACTIONS TO DATE	STATUS
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<p>2</p>	<p>Maintain an awareness of the needs, expectations and capabilities of residents of the Lake of the Woods and Rainy River watershed.</p>	<p>EC</p>	<ol style="list-style-type: none"> 1. Hold public meetings in August during Basin Week. 2. Meet with the public, associations and interest groups on various issues, as requested or needed. 	<ol style="list-style-type: none"> 1. In-person Community Listening Sessions focussed on the 2022 flooding took place on August 10 and 11, 2022 in Fort Frances, ON and International Falls, MN respectively. 2. In addition to meetings with the CAG and the IAG, the Board attended and provided a presentation at the 2022 International Rainy Lake of the Woods Watershed Forum on March 9, 2022. IJC funding support CAG attendance at the Forum. 3. There was a significant number of meetings and correspondence with the public, associations and interest groups in 2022 as a result of the historical flooding. (Additional engagement activities to fulfill this work plan objective are detailed below under 4.c. and General.) 	<p>Ongoing in 2022.</p>
<p>4.a</p>	<p>Recommend, as appropriate, water quality and/or aquatic ecosystem health objectives for the boundary waters of the Lake of the Woods and Rainy River watershed.</p> <p>Maintain continuous surveillance over the quality of</p>	<p>AEHC</p>	<ol style="list-style-type: none"> 1. Request relevant agencies to provide recent water quality and ecosystem health monitoring information: <ul style="list-style-type: none"> • analyze in relation to water quality objectives and trends • focus on priority issues • assess and report to the IJC 	<ol style="list-style-type: none"> 1. Updated State of the Basin Report was released in March 2022. It provided an overview of issues affecting aquatic conditions. The Board identified exceedance reporting as a key priority for 2022. 	<ol style="list-style-type: none"> 1. SOBR completed. Exceedance reporting revised request specification in progress 2. AEHC reporting template pending completion of Objectives Alerts P2.

	<p>water and health of the Lake of the Woods and Rainy River boundary waters aquatic ecosystem (with particular focus on priority issues within the basin such as water quality, alien aquatic invasive species, climate change indicator and adaptation, and ground and surface water contamination, as identified by the International Lake of the Woods and Rainy River Watershed Task Force’s Study).</p>		<ol style="list-style-type: none"> 2. Review mandate to ensure aquatic ecosystem health reporting requirements are understood and can be met. In cooperation with partner agencies develop a template for the annual aquatic ecosystem health reporting, submit to Board for review, revision, and approval. 3. In 2022, submit Draft Aquatic Ecosystem Health Report to Board for review, revision, acceptance, and submission to the IJC. 4. In cooperation with the Lake of the Woods Water Sustainability Foundation, development of an online, annual “water quality report card” workshop. 5. In collaboration with the Lake of the Woods Water Sustainability Foundation, provide oversight for the next State of the Basin Report (SOBR 3.0). 	<ol style="list-style-type: none"> 2. The Board’s mandate relative to aquatic ecosystem health reporting has been reviewed. New template to be developed with guidance from Objectives-Alerts P2. 3. Prioritized for 2022. 4. Pending outcomes of Objectives-Alerts Project and SOBR. 5. AEHC provided oversight and review of SOBR 	<ol style="list-style-type: none"> 3. Per revised Terms of Reference, report refocused on Exceedance reporting and delivery of report deferred to 2023 4. Oh hold, no action in 2022 5. Completed
<p>4.a</p>	<p>International Watershed Initiative Projects addressing Directive 4.a</p>	<p>AEHC</p>	<p>AIS Coarse Filter Risk Assessment</p>	<ol style="list-style-type: none"> 1. International Multi-Agency Arrangement evaluation of report information to determine next steps ongoing in 2022. 	<ol style="list-style-type: none"> 1. Ongoing

		AEHC	Wild Rice Mapping	<p>IJC's in-house Geospatial Team prepared a map of control structures and water ways.</p> <p>Map is available for Grand Council Treaty 3 to use in wild rice protocol development.</p> <p>Board update requested for 2022</p>	<p>The Board and IJC's role in this project is complete for the time being.</p> <p>Update for Board scheduled for 2023 first meeting.</p>
4.a.i	Continue to carry out evaluations and assessments from time to time as the Board considers necessary or desirable to ascertain the extent to which existing water quality objectives, such as approved by the Governments for the Rainy River in 1965, are being met.	AEHC	<ol style="list-style-type: none"> Where significant exceedances of relevant objectives identified, request relevant jurisdictions to indicate action taken: <ul style="list-style-type: none"> Assess adequacy of actions taken Upon completion of IJC's Water Quality Objectives Review, develop a strategy for the development of new Objectives and Alert Levels appropriate to the Rainy-Lake of the Woods basin. 	<ol style="list-style-type: none"> Originally prioritized for 2022 but deferred. Currently there are no contemporarily relevant objectives agreed to by governments. Objectives-Alerts Phase 2 project prioritized for 2023, to identify recommendations for Objectives and to establish Alert Levels. 	<ol style="list-style-type: none"> On hold. Action pending completion of Objectives-Alerts Phase 2 and potential approval of objectives. Objective-Alerts Phase 2 proposal in development for spring submission to IWI
4.a.ii	Notify the Commission of instances where existing water quality objectives are not being met and of actions being taken by those responsible for sources of pollution and by the regulatory agencies to meet these water quality objectives.				

<p>4.a.iii</p>	<p>Review boundary waters water quality and aquatic ecosystem health from time to time and recommend to the Commission such amendments and additions to water quality or aquatic ecosystem health objectives as might be appropriate.</p> <p>At minimum, within one year after completion of, or updates to, major water studies and plans, review existing objectives and present a report to the Commission recommending whether or not to establish new or adjusted objectives, and any such objectives and their levels, so the Commission can consider bringing them forward to Governments for approval. (One example of a major water study or plan is a binational comprehensive basin water management plan for Lake of the Woods and Rainy River watershed, which could have subsequent major updates, anticipated each decade.</p>	<p>AEHC</p>	<p>1. Upon completion of IJC’s Water Quality Objectives Review, develop a strategy for the development of new Objectives and Alert Levels appropriate to the Rainy-Lake of the Woods basin.</p>	<p>1. IWI Objectives / Alerts Project</p> <p>Phase 1: completed Phase 2: Statement of Work to be revised. On hold in 2021.</p> <p>Phase 2 revision to statement of work and IWI submission prioritized for spring 2023</p>	<p>1. Phase 2 on hold but prioritized for 2023 IWI submission</p>
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<p>4.b</p>	<p>Select, determine, establish, and report on water quality and/or aquatic ecosystem health alert levels within the waters of the Lake of the Woods and Rainy River watershed in order to identify potential problems for boundary waters for which water quality objectives have not been established with particular focus on priority issues within the basin such as water quality (including nutrients, sediment and metals), alien aquatic invasive species, climate change indicators and adaptation, and ground and surface water contamination.</p>	<p>AEHC</p>	<p>1. Upon completion of the IJC’s Water Quality Objectives Review, develop a strategy for the development of new Water Quality Objectives and Alert Levels, as appropriate, for the Rainy-Lake of the Woods basin:</p> <ul style="list-style-type: none"> • Current IRLWWB Alert levels are tied to the most stringent jurisdictional standard/objective • Develop a subset of key parameters of practical relevance to use on an interim basis and continue to report on them against existing Alert Levels until completion of the IJC review 	<p>1. IWI Objectives / Alerts Project</p> <p>Phase 1: completed Phase 2: Statement of Work to be revised. On hold in 2022.</p> <p>Phase 2 revision to statement of work and IWI submission prioritized for spring 2023</p>	<p>1. On hold in 2022, deferred and prioritized for 2023</p>
<p>4.b.i</p>	<p>Continue to identify water quality problems on the Rainy River through a process based on comparisons of monitoring data with alert levels selected by the Board as the most stringent water quality guidelines being used by local, state, provincial or federal agencies for such pollutants.</p>				
<p>4.b.ii</p>	<p>Establish alert levels for biological, physical and chemical</p>				

	<p>constituents the Board deems important within the Lake of the Woods and Rainy River watershed.</p>				
4.b.iii	<p>Thereafter, report annually to the Commission on alert levels, exceedances and implications, actions being taken by those responsible for drivers of exceedances, if any, and actions being taken by regulatory agencies, if appropriate.</p>				
4.b.iv	<p>Review alert levels from time to time and make such amendments and additions as might be appropriate.</p>				

<p>4.d</p>	<p>Keep the Commission informed of boundary waters aquatic conditions and plans, policies, and developments, actual or anticipated which have the potential to affect the quantity and quality of the water and the health of the Lake of the Woods and Rainy River watershed boundary waters aquatic ecosystem.</p>	<p>Board CAG IAG</p>	<p>1. Board, IAG and CAG to bring forward relevant information standing item on all agenda:</p> <ul style="list-style-type: none"> • Watershed Coordinator to assist with advising the Board of developments in the watershed • Board to identify items which require further investigation • Board to develop recommendations as appropriate for communication to the IJC 	<p>1. Board meeting agendas include standing items for Roundtable and Update from Watershed Coordinator. A new standing item related to watershed issues of concern was added to Board agendas. Draft agendas were shared with Board members, including CAG and IAG co-chairs, for input and review prior to each meeting.</p>	
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<p>4.e</p>	<p>Maintain awareness of basin-wide developments and conditions which might affect water quantity and quality and ecosystem health, and the people living within the Lake of the Woods and Rainy River watershed, and recommend appropriate strategies to the Commission, if appropriate.</p>	<p>AEHC EC</p>	<ol style="list-style-type: none"> 1. Assure dialogue with advisory groups re issues identified by their members. 2. Periodically conduct basin tours, agency resource meetings, and other education events for IRLWWB members. 	<ol style="list-style-type: none"> 1. AEHC member attendance at CAG and IAG meetings. 2. Resource Management Agency Meeting took place on August 9, 2022 	<ol style="list-style-type: none"> 1. Ongoing. 2. 2022 Basin Tour complete.
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<p>4.f</p>	<p>Coordinate activities with appropriate agencies and institutions as may be needed or desirable, including inter-agency working groups and other research groups conducting sound science within the watershed, and consider designating specific Board members to liaise with specific groups where useful.</p>	<p>EC IWC</p>	<ol style="list-style-type: none"> 1. With the assistance of the International Watershed Coordinator, Board Secretariat to liaise with agencies and institutions, and provide regular updates to Board. 2. Hold meeting with resource agencies in August during Basin Week to exchange information as appropriate. 	<ol style="list-style-type: none"> 2. The Board met with Resource Agencies on August 9, 2022. 	<ol style="list-style-type: none"> 1. Ongoing 2. Board plans to meet with Resource Agencies at the August 2023 basin meeting.
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<p>4.g</p>	<p>Establish and maintain a Community Advisory Group (CAG) for the purpose of keeping the Board aware of any water resource management issues that may arise in the basin and providing feedback and input to the Board’s products and processes, such as the Board’s work plan.</p>	<p>CAG</p>	<ol style="list-style-type: none"> 1. Continue to maintain an active and vibrant CAG. 2. Seek CAG assistance in identifying resource management issues. 3. Consult with CAG on Board products and processes. 4. Meet quarterly, with face-to-face meeting during Basin Week. 5. Have programs that educate its members about significant issues in the watershed. 6. Raise important issues of concern. 7. Maintain a list of issues and status and update at each meeting. 	<ol style="list-style-type: none"> 1. Ongoing with focus on attracting five new members to replace retiring members and to ensure basin-wide representation. The CAG is developing a prioritized list of issues with member leads to stay ahead of existing and emerging issues. Additionally, the CAG will continue to arrange presentations on issues to inform and educate its members. 2. On September 19, 2022 the CAG sent a letter to the Board regarding the flood and provided recommendations based on what the CAG heard during and after the flood. 	<ol style="list-style-type: none"> 6. The IRLWWB tasked the WLC with categorizing the CAG recommendations by what recommendations are within the mandate of the IJC, Board, and its committees. Recommendations number 4 and 6 are being actioned by the WLC already. Remaining recommendations continue to be discussed and the Board level.
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<p>4.h</p>	<p>Establish and maintain an Industry Advisory Group (IAG) for the purpose of making the Board aware of industries' perspectives.</p>	<p>IAG</p>	<ol style="list-style-type: none"> 1. Seek IAG input on industries' perspectives. 2. Consult IAG on Board products and processes. 3. IAG to meet as appropriate. 	<p>IAG Meeting - May 3, 2022 IAG Meeting - November 23, 2022</p>	<ol style="list-style-type: none"> 1. Ongoing. 2. Ongoing. 3. Ongoing.
<p>4.j</p>	<p>The Board shall organize a joint meeting of the Board with the CAG and IAG once a year.</p>	<p>SEC</p>	<ol style="list-style-type: none"> 1. At the Advisory Committees' request, the Board will meet in-person once a year with the IAG in March (during the Forum week) and with the CAG in August. 	<p>Board-CAG-IAG meeting took place on March 24, 2022. Board-CAG meeting took place on August 10, 2022.</p>	<ol style="list-style-type: none"> 1. Ongoing. 2. Ongoing.

<p>4.k</p>	<p>Involve the public in the work of the Board; facilitate provision of timely and pertinent information on Board activities within the watershed in the most appropriate manner [...].</p>	<p>EC</p>	<ol style="list-style-type: none"> 1. Conduct interactive presentations with public groups as requested. 2. Respond to public, agency, and IJC information requests or letters and conduct on-line surveys as opportunities arise. 3. Provide educational opportunities for students to learn about water quality and water quantity issues. 4. Continue to provide pertinent information for dissemination to be posted on Board website and SharePoint site. 5. Working with IJC staff, develop media releases and/or IJC newsletter articles for new members of the Board and to announce Water Board accomplishments, actions, reports, and other information, as needed. 6. Communicate the research conducted by IWI projects in ways that are understood by researchers and the public. 	<ol style="list-style-type: none"> 1. 2022 Public Meeting anticipated to be held in person. 2. Ongoing. Resource Management Agency meeting also anticipated in person in 2022. 3. Work to be renewed in 2022. 4. Office365 and SharePoint access to be expanded in 2022 with appropriate training and support from the IJC. 5. The Secretariat and WLC worked with IJC Communications to put out news releases throughout the year. 	<p>2 public meetings were held in-person on August 10 (Fort Frances, ON) and 11 (International Falls, MN).</p> <p>SharePoint access expanded to WLC members to collaborate on 2022 Post Flood Report</p> <p>IRLWWB website updated with relevant news releases regarding high water levels and public meeting notices .</p>
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<p>4.k</p>	<p>Meet publicly at least once a year with invitations to First Nations, Métis, and Native Americans and all water users' groups and stakeholders to seek advice and hear concerns, such as on a binational comprehensive basin water management plan or other issues. (Locations of such meetings shall be moved around the basin, generally alternating between locations in Canada and the United States.)</p>	<p>SEC EC</p>	<p>1. Arrange, as appropriate, a meeting or meetings with First Nation, Métis and/or Native Americans.</p>	<p>1. Renewed and concerted efforts to meet with Indigenous peoples and groups should resume in 2022 with the improving public health environment</p>	<p>1. The WLC met with First Nations on Rainy Lake and the Bois Forte Band of Chippewa in northern Minnesota during the 2022 flood event.</p>
<p>4.k</p>	<p>International Watershed Initiative Projects Addressing Directive 4k.</p>	<p>EC</p>	<p>1. Project WET – support educators in the basin by providing training and curriculum materials on water quality and quantity issues.</p>	<p>1. In 2022 work on curriculum for the remaining grade levels will resume..</p>	<p>1</p>

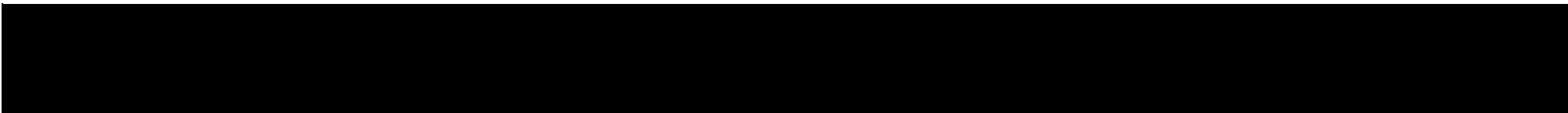
4.l	Collaborate or carry out such other studies or activities as the Commission may, from time to time, request, including undertaking or facilitating the development of plans or studies [...]	EC WLC/ AM Task Team	1. Participate in the IJC's Climate Change Guidance Framework 4-step process pilot project.	1. IWI project to undertake local engagement in 2022.	1. Climate Change Workshop held in Fort Frances, ON on August 11, 2022 to discuss climate impacts and adaption planning for the basin.
4.m	Submit a report covering Board activities annually to the Commission, at least three weeks in advance of the Commission's spring semi-annual meetings, and submit such other reports as the Commission may request or the Board may desire.	SEC	1. Coordinate development of annual report.	1. The IRLWWB's annual reports will reflect the calendar year to ensure achievement of this requirement.	1. The 2022 Annual report covers the 2022 calendar year (January 1 to December 31, 2022)
General	Inform the Commission in advance of plans for any meetings, or other means of involving the public in Board outreach.	SEC EC	1. Place appropriate IJC staff on Board and Committee mailing lists. 2. Invite IJC staff and Commissioners to meetings and teleconferences.	1. Ongoing inclusion on e-mail lists and communication with IJC staff throughout the year. 2. Invitations for all meeting shared throughout the year.	Ongoing.

General	Report to the Commission, in a timely manner, on these plans [for meetings] and any other presentations or representations made to the Watershed Board.	SEC EC	1. Develop a database to track public engagement activities.	1. Board Secretariat tracking engagement activities.	Ongoing.
General	Provide support for Board members.	SEC EC	<ol style="list-style-type: none"> 1. Provide orientation for new members of the Board. 2. Maintain and upgrade as appropriate Board web site. 3. Produce and maintain materials for Board members and others to use for presentations. 4. Provide for well-run meetings and timely meeting notes. 	<ol style="list-style-type: none"> 1. 2. 3. 4. Online meetings using various virtual platforms used throughout the year to facilitate well-run meetings. The Secretariat produced comprehensive meeting packages for Board members to refer to during meetings. Meeting notes and action item lists provided in advance of subsequent meetings. Meeting notes were posted on website following approval. 	Ongoing.



WATER LEVELS COMMITTEE WORK PLAN 2021

[for period January to December 2022]



MANDATE OVERVIEW: The Water Level Committee is a committee of the IRLWWB. The Water Levels Committee is delegated by the Board with the task of ensuring compliance with the terms of the 2001 Consolidated Order and the 2018 Supplementary Order in the matter of regulation of Rainy Lake and other boundary waters in the Rainy Lake watershed. The Board, through the Water Levels Committee, acts as a technical advisor to the Commission on the matter of water levels regulation in the Rainy Lake watershed.

DIRECTIVE	WHAT WE HAVE BEEN DIRECTED TO DO	LEAD	WHAT WE ARE GOING TO DO TO CARRY OUT THIS DIRECTION	ACTIONS TO DATE	STATUS
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<p>4.c</p>	<p>Ensure compliance with the terms of the Order in the matter of emergency regulation of Rainy Lake and other boundary waters in the Rainy Lake watershed and act as technical advisor to the Commission on this matter.</p>	<p>WLC</p>	<ol style="list-style-type: none"> 1. The Water Levels Committee’s Engineering Advisors will regularly monitor water levels and flows in the basin and evaluate compliance with the terms of the Order for the levels of Rainy Lake and Namakan Lake. The Committee and its advisors will provide technical advice to the Commission as requested, and as needed to keep the Commission apprised of any current or potential non-compliance with the terms of the Order. 2. Obtain hydrologic/hydraulic data as necessary to monitor water levels and flows. 3. Support the proper functioning of the gauge network. 4. Support the identification/resolution of equipment and data errors. 5. Analyze data, maintain communications with the dam owners, and provide advice/direction to dam owners as required. 6. Support studies to inform the assessment of the impact of the 2000 rule curve change on Rainy/Namakan Lakes. 	<p>The Water Levels Committee monitored basin conditions throughout the 2022.</p> <p>Communications were maintained with the dam owners and instructions provided as necessary.</p> <p>Due to flood conditions in the basin in 2022 the water levels of both Rainy and Namakan lakes rose above the respective rule curves during the spring/summer period.</p> <p>During this time the WLC met regularly to assess conditions and make decisions on outflow modifications.</p> <p>Communications with the IJC, dam owners and the public were maintained throughout this time. The WLC toured the basin during the flood event to observe flood conditions and answer questions from resort owners and local media. The IRLWWB/WLC hosted 2 Public Listening Sessions in August (one in Fort Frances and the other in International Falls) as an opportunity for community members to share their views and concerns with the Board and its Committees. This information would help inform</p>	<p>This is an ongoing requirement and will be carried forward to the next work plan.</p>
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				<p>analyses and content that will be included in the post 2022 flood report.</p> <p>The WLC coordinated with the NWS to develop a basin specific public website that provided a “one-stop shop” for current observed and forecasted hydrologic conditions in the basin.</p>	
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4.c.i	Whenever, in the opinion of the Water Levels Committee, the terms of the Order are not being complied with, the Water Levels Committee shall so inform dam owners and operators and make such recommendations as it considers appropriate.	WLC	<ol style="list-style-type: none"> 1. The Water Levels Committee’s Engineering Advisors will notify the Committee and dam owners and operators of any potential or existing non-compliance with the 2001 Consolidated Order and the 2018 Supplementary Order. 2. In keeping with the directive, “At the earliest opportunity, the Water Levels Committee shall report to the Commission directly such apparent lack of compliance with the Order, the circumstances under which it occurred, the action taken by the Board, and the action, if any, taken by or on behalf of the dam owners and operators and inform the Board through the Board Co-chairs.” 	<p>The Water Levels Committee monitored conditions throughout the year.</p> <p>No non-compliance situations occurred.</p>	This is an ongoing requirement and will be carried forward to the next work plan.
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<p>4.c.ii</p>	<p>The Water Levels Committee may, on behalf of the Commission:</p> <ol style="list-style-type: none"> 1. authorize the reduction of the outflow from Rainy Lake for periods of up to ten days if necessary to raise the head pond level at International Falls-Fort Frances to ensure an adequate water supply for plant fire protection purposes or to permit the passage of watercraft from the head pond to Rainy Lake, provided the outflow shall not be less than the flows prescribed in paragraph numbered 2(c) of the Order, and 2. authorize the reduction of the outflow from Rainy Lake and/or Namakan Lake for periods of up to ten days if necessary to meet emergency conditions such as machinery breakdowns at the Kettle Falls or International Falls-Fort Frances dams, fires or other 	<p>WLC</p>	<ol style="list-style-type: none"> 1. The Water Levels Committee’s Engineering Advisors will monitor basin conditions on a regular basis, and advise the Water Levels Committee on recommendations to reduce outflows consistent with this directive. 2. The Water Levels Committee will evaluate conditions and direct the Companies as appropriate, advising the Board of any actions it takes. The Committee Co-chairs shall inform the Commission forthwith and as soon as practicable thereafter shall forward a written report to the Commission, describing the circumstances in which such action was taken. The report shall be posted on the IJC website following Commission approval. 	<p>No action required in 2022.</p>	<p>This is an ongoing requirement and will be carried forward to the next work plan.</p>
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	<p>accidents, provided the outflow shall not be less than the flows prescribed respectively in paragraphs numbered 1(c) and 2(c) of the Order.</p>				
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<p>4.c.iv</p>	<p>When, in the opinion of the Water Levels Committee, conditions either exist or are likely to occur which make it advisable to deviate temporarily from the strict application of the Order, the Board Co-chairs shall refer the matter to the Commission by the fastest practicable means, together with the Water Levels Committee’s recommendation; the Commission will inform the Water Levels Committee of its decision as expeditiously as possible.</p>	<p>WLC</p>	<ol style="list-style-type: none"> 1. The Water Levels Committee’s Engineering Advisors will monitor basin conditions on a regular basis, and advise the Water Levels Committee on recommendations to deviate from the strict application of the Order. 2. If, based on a review of basin conditions, the Water Levels Committee determines that a deviation from the strict application of the Order is advisable; it will notify the Commission by the fastest practicable means. 3. Lead the coordination of participants in the Rainy River sturgeon spawning assessment protocol each spring as conditions warrant. 	<p>The WLC requested a Temporary Order from the IJC to hold Namakan at the upper limit of the 1970 Rule Curves after receiving a request from property owners on Rainy Lake to speed up the decline of Rainy Lake and provide relief to residence by allowing them to assess damages and begin restoration activities. On July 5, the WLC received the Temporary Order and directed the dam operators to make the minor adjustment from the standard Namakan Lake level target to temporarily target the range 340.90 m to 341.0 m, a 10 cm (4 in) range centered on the upper level of the 1970 Rule Curves, 340.95 m (1118.6 ft).</p>	<p>This is an ongoing requirement and will be carried forward to the next work plan.</p>
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<p>4.c.vi</p>	<p>The Water Levels Committee shall meet face-to-face with the operators of the dam at International Falls-Fort Frances annually to discuss water level issues that have occurred during the previous year and keep the Board informed of important issues discussed at the meeting.</p>	<p>WLC</p>	<p>1. The Water Levels Committee will carry out the annual meeting as described in the Directive.</p>	<p>Due to limitations on travel, virtual meeting with the dam operators was held in March 2022.</p>	<p>This is an ongoing requirement and will be carried forward to the next work plan.</p>
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<p>General</p>	<p>The Board shall conduct its public outreach activities in accordance with the Commission’s public information policies.</p>	<p>WLC EC</p>	<ol style="list-style-type: none"> 1. Maintain communications as appropriate with the media and public, especially regarding water level and flow regulation. Issue public news releases and web site advisories, as needed, in keeping with the Commission’s public information policies. 2. Meet with the public, associations and interest groups on various issues, as required. 3. Maintain the Board’s web-based data on lake levels and basin flows for use by the public. 4. Respond to public, agency, and IJC information requests or letters of complaint. 5. Periodically conduct basin tours. 6. Appear before the IJC at its semi-annual meetings, as requested. 7. Annually update the Water Levels Committee Work Plan. 	<p>During 2022 several email communications were sent to the WLC distribution list advising of low water conditions and outflow decisions made by the WLC.</p> <p>The WLC held a Pre-Spring Engagement Webinar, hosted on March 3, 2022.</p> <p>Updates and decisions were also posted to the IJC website on the following dates:</p> <ul style="list-style-type: none"> • March 10, 2022 • April 13, 25, and 27, 2022 • May 3-4, 11, 13, 17, and 22, 2022 • June 16, 2022 • July 5 and 26, 2022 <p>A News Releases were issued on March 10, 2022 announcing the decision not to implement the HFRRC, May 5, 2022 advising on high water and flows in the basin, and August 4, 2022 announcing the Community Listening Sessions held August 10-11 in Fort Frances and International Falls.</p>	<p>This is an ongoing requirement that will be carried forward to the next workplan.</p> <p>A Pre-Spring Engagement will be held by the WLC prior to 10 March 2023 and a second virtual engagement will be held in April 2023 as spring freshet develops.</p> <p>EC will help WLC with any and all of these items as requested.</p>
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				<p>A representative from the Water Levels Committee presented at both IJC appearances during 2022. The Fall IJC Appearances included recommendations on changes to the 2018 Supplementary Orders and public engagement/ communications.</p> <p>Basin tours were conducted in late May and early June by the WLC.</p> <p>The work plan was updated and provided to the Secretariat.</p>	
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<p>2018 Supplementary Directive 1)</p>	<p>The WLC will endeavour to follow the procedures outlined in the Operational Guidelines, weighing the advantages and disadvantages to be accrued by stakeholders.</p>	<p>WLC</p>	<ol style="list-style-type: none"> 1. The WLC will develop and maintain Operational Guidelines to include current best practices for maintaining water levels throughout the year within the established rule curves, to maximize the benefits to stakeholders. 2. The WLC will develop and maintain Operational Guidelines with input from resource agencies, the public, stakeholders, and indigenous communities, and is to be made public. 3. The WLC shall record a summary of any operational decisions made by the WLC, along with a rationale for the decisions, to the IJC as part of the International Rainy-Lake of the Woods Watershed Board’s annual report. 	<p>Records of Water Level Committee Activities were maintained as required.</p> <p>Development of Operational Guidelines will be carried forward to the 2023 workplan.</p>	<p>Ongoing.</p>
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<p>2018 Supplementary Directive 2)</p>	<p>At a minimum the WLC will appoint two technical advisory groups: an Engineering Advisory Group to provide engineering support and a Flood Forecasting Advisory Group to provide climate, dam operations weather and flood forecasting information support.</p>	<p>WLC</p>	<ol style="list-style-type: none"> 1. The WLC will engage with the dam operators and agencies responsible for flood forecasting in both the U.S. and Canada to establish the membership of the Flood Forecasting Advisory Group. 2. The WLC will notify the IJC of any new technical advisory groups or membership changes of existing groups, and the WLC will post the details of the technical advisory groups on the IJC website. 	<p>The WLC held a meeting with newly established Flood Forecast and Communications Subcommittee (FFCS) on February 24, 2022 to discuss basin conditions.</p> <p>During the 2022 flood, the WLC worked with the NWS to develop a specific website for the Rainy River basin that published current conditions, forecasts, and relevant emergency information.</p> <p>A draft Terms of Reference for the FFCS has been formulated and is continuing to undergo revision by the WLC.</p>	<p>Ongoing.</p>
<p>2018 Supplementary Directive 3)</p>	<p>Within one month prior to March 10, the WLC will hold at least one in-person Pre-Spring Engagement Meeting.</p>	<p>WLC</p>	<p>The WLC will host a Pre-Spring Engagement meeting during the week of the Rainy-Lake of the Woods Watershed Forum to take note of stakeholder observations and concerns.</p>	<p>A virtual Pre-Spring Engagement meeting was held on March 3, 2022.</p>	<p>This is an ongoing requirement that will be carried forward to the next work plan.</p>

<p>2018 Supplementary Directive 5)</p>	<p>The WLC will work with flood forecasting agencies, and other involved agencies active in the basin to assist in the development of communications protocols to effectively disseminate emergency information, leveraging those agencies' emergency alert and warning systems.</p>	<p>WLC</p>	<ol style="list-style-type: none"> 1. The WLC will work with dam operators, resource agencies and the public to develop material to effectively communicate current basin conditions and operation strategies. 2. The WLC may hold public meetings, either in-person or via video- or teleconference, at any time during the year when the WLC is faced with a decision regarding changing target water levels within the Rule Curves. 	<p>The WLC has drafted a Communications Plan. The plan is still undergoing revision. US IJC Communications Advisor is also developing a communications strategy for the WLC.</p> <p>The WLC and the IRLWWB hosted 2 public Listening Sessions August 10 and 11 in Fort Frances and International Falls. The purpose of these sessions was to provide an opportunity for community members to share their views and concerns with the Board and its Committees. This information would help inform analyses and content that will be included in the post 2022 flood report. The Committee also communicated externally via the Committee's email distribution list. This included the opportunity for the public/agencies/stakeholders to provide feedback regarding water level management decisions.</p>	<p>Ongoing.</p>
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ADAPTIVE MANAGEMENT COMMITTEE

2021-2022 WORK PLAN

[for the period of April 2021 to March 2022]

BASED ON: June 6, 2019 Directive to International Rainy-Lake of the Woods Watershed Board.

Directive requires a work plan within 8 months of committee appointment and typical work planning time frame for the Board.

MANDATE OVERVIEW: On March 1, 2018 the Commission signed a Supplementary Order in the Matter of Emergency Regulation of the Level of Rainy Lake and of other Boundary Waters in the Rainy Lake Watershed in which it endorsed the application of an adaptive management approach to i) monitor and objectively understand how the changes to the rule curves affect Namakan Lake, Rainy Lake and Rainy River; and ii) support an objective review of the rule curves in the future. The overall objective of the AMC is to consider information collected by resource agencies and others during the interim that may indicate the effect that changes to the 2018 rule curves have on water levels and flows and the impacts these have on the affected interests in the boundary waters of the Rainy River basin and make recommendations to the International Rainy - Lake of the Woods Watershed Board. This includes reviewing available information to assist in the evaluation of 2018 rule curves related to i) their effectiveness in preventing the occurrence of emergency conditions in the Rainy River watershed; ii) how the system may be changing over time and whether any modifications to the rule curves may be warranted to address what is learned over time including emerging issues and/or to address changing conditions; and iii) other questions asked by the Watershed Board and/or Commission that may affect the Watershed Board's water management decisions over the long-term.

WHAT WE HAVE BEEN DIRECTED TO DO	LEAD	WHAT WE ARE GOING TO DO TO CARRY OUT THIS DIRECTION	ACTIONS TO DATE	STATUS/TIMELINE
Consider the various monitoring programs, research projects and models needed to		Complete indicator prioritization exercise & data gap analysis:	<ul style="list-style-type: none"> Received advice from Bill Werick as to prioritization for 	<ul style="list-style-type: none"> To be considered further in 2022-2023 as modelling capacity is enhanced through agreements

<p>identify and assess the impacts of changes to Namakan Lake, Rainy Lake and Rainy River biological and aquatic communities associated with the implementation of 2018 rules curves</p>		<ul style="list-style-type: none"> • Gather input from modellers to evaluate the technical feasibility criteria for indicator prioritization and determine what new indicators are needed; we will use information gained from two prioritization workshops and Adaptive Management Task Team and AMC meetings in this process • Maintenance of core, existing models needs to be done; new data needs to be identified and prioritized • Identify and prioritize shortcomings or gaps in existing monitoring programs required to lead to a scientifically defensible review of monitoring information collected by natural resource management agencies and others that may indicate the effect of changes contained in the Supplementary Order of March 1, 2018 • Link in core monitoring inventory done by IMA-TAC in 2019 • Estimate the costs associated with overcoming each identified gap or shortcoming <ul style="list-style-type: none"> • Based on input from various monitoring agencies, identify 	<p>IWI proposal submission on this</p> <ul style="list-style-type: none"> • Now that modelling capacity has been improved, AMC will start to scope out modelling needs for this effort in support of IJC agreements with USACE and ECCC for performance indicator modeling. 	<p>between IJC and USACE and between IJC and ECCC.</p>
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		<p>the in-kind contribution that can currently be leveraged to support AM in the basin</p> <ul style="list-style-type: none"> consider linking monitoring needs for this to core monitoring being proposed by IMA for cost efficiency 		
		<p>Integrate the IJC’s Climate Change Guidance Framework with the adaptive management initiative</p> <ul style="list-style-type: none"> Liaise with the Water Levels Committee to complete the ‘Organize’ phase and build on the previous work, such as the self-assessment questionnaire Identify the models and datasets to be used in the ‘Analyze’ phase connect with other Boards to see what they are doing first/see what works 	<ul style="list-style-type: none"> Teika has reached out to other Boards and has prepared a report; approved by Board Met with Bill Werick to discuss priorities for next steps 	<ul style="list-style-type: none"> Submitted fall IWI proposal to host a climate impacts workshop in March 2022; Anticipate completing report following workshop.
		<p>Work with the Aquatic Ecosystems Health Committee’s Objectives and Alerts team leads to draft a 5-year strategy for the expansion of the AMC in support of water quality reporting within the Rainy-Lake of the Woods basin</p>	<ul style="list-style-type: none"> No actions to date 	<ul style="list-style-type: none"> Phase II of Objectives and Alerts is on hold.

		Assess the impact of water level regulation on medicinal plants	<ul style="list-style-type: none"> • Reviewing previous IWI proposal and research done to prepare for new IWI submission in future 	<ul style="list-style-type: none"> • Identified by AMC as top priority project in June 2020. • This project requires modelling capacity which is currently in development.
		Improve the Digital Elevation Model for Rainy and Namakan by collecting bathymetry for the nearshore	<ul style="list-style-type: none"> • Worked with ECCC and IJC to identify study area • Incorporated study area into SOW for project with USGS staff. IJC approved SOW. 	<ul style="list-style-type: none"> • Identified by AMC as top priority project in June 2020 • IJC incorporated approved SOW into agreement with USGS for this work. Project is underway and will be completed in 2022.
		Verify walleye spawning areas on Rainy Lake		<ul style="list-style-type: none"> • Identified by AMC as priority project in June 2020; has been identified as possible priority project to be considered for funding with US section funds.
		Enhance whitefish monitoring on the Canadian side of Rainy Lake and Namakan Reservoir		<ul style="list-style-type: none"> • Identified by AMC as priority project in June 2020; AMC was not able to move forward with this during fall/winter 2020, but hopes to when possible.
		Optimize aquatic vegetation monitoring to support development of a performance indicator for percent cover and/or biovolume of submerged aquatic plants	<ul style="list-style-type: none"> • VNP has acquired NPS funding • VNP worked with ECCC on plans for data collection and study area in support of improved performance indicator for submerged aquatic vegetation. 	<ul style="list-style-type: none"> • Data collection completed in 2021 although VNP may collect more data in-kind in 2022 • Will require ECCC or USACE modeling support to assess data and help VNP and/or AMC optimize submerged vegetation

				monitoring program in support of a performance indicator – timeline TBD.
Outreach and engagement strategy		<ul style="list-style-type: none"> • decision made in March 2020 that public outreach strategy not needed • regular updates to Board required 	<ul style="list-style-type: none"> • updates provided to Board at meetings on April 27, 2021; June 16, 2021; Sept. 9, 2021; public meeting Sept. 14, 2021 	<ul style="list-style-type: none"> • updates to Board will be prepared for all Board and public meetings in 2021 and 2022, as required.