

International Joint Commission

International Watersheds Initiative (IWI) Multi-board Workshop Summary Report

**April 20, 2016
Washington, DC**

Executive Summary

About sixty people, including IJC Commissioners, members from all the IJC Boards, and Commission staff participated in the workshop to: (1) develop a limited number of suggested “action items” to address impacts from climate change on water quantity and quality in transboundary basins; and (2) clarify the approach to engage IJC Boards in developing the 5th IWI Report to Governments and addressing other Commission priorities. This workshop builds upon findings from the 2015 IWI Workshop and provides further input and advice from IJC Boards.

Even though there were two distinct breakout groups (water quantity and water quality) their findings and approach to addressing climate change impacts were remarkably similar. This resulted in development of a consistent approach that integrates water quality and quantity. The following climate change framework was put forth:

- Build upon work conducted at the last two IWI workshops and complete a baseline review of the existing climate change activities of all IJC boards;
- Identify and synthesize the social, economic, and ecological impacts triggered by climate change on water quality and/or quantity in the transboundary basins where the IJC has a mandate, particularly any emerging impacts not yet identified by IJC Boards;
- Prioritize the social, economic, and ecological impacts relative to the mandates of IJC Boards and the use of risk analysis and/or other appropriate methods;
- Identify needed action items by completing a gap analysis – in other words, compare the priorities relative to existing IJC Board activities;
- Develop an adaptive management plan to monitor progress, document and share lessons, and adjust activities and strategies as appropriate.

The participants recommended that an ad-hoc climate change working group be established to further develop and implement this climate change framework.

In terms of the second workshop objective -- to clarify the approach to engage IJC Boards -- the participants were in agreement with an approach presented by the Commission to engage IJC Boards. The participants also concluded that half-day, face-to-face workshops could be sufficient assuming that supporting material was provided in advance of the workshop. They were also supportive of having webinars between face-to-face workshops that focused on addressing topics related the IWI 5th Report to Governments, as well as Commission and Board priorities. They proposed the idea of creating a small steering committee to help in the selection of topics to be covered.

The workshop participants tested a new technology (Poll Everywhere) in addressing a couple of questions put forward to this large group. The general consensus was that it was an effective way of polling a large group in an anonymous, useful and entertaining manner. A number of participants expressed interest in knowing more about applying this technology for Board purposes.

The participants provided a tremendous amount of feedback on the workshop. The general consensus was that the workshop was focused, efficient, productive, and well-facilitated. It also was clear from the Boards that they find these workshops to be very beneficial. Participants noted they benefit from learning from other boards' activities and collaborating with them on multi-board issues.

Participants also offered a number of suggestions on how to improve future workshops: (1) participants indicated that the preparatory materials for the workshop were useful and they would like workshop materials to be distributed earlier to allow participants more time to review and prepare (materials for this meeting were sent out 2.5 business days in advance); (2) while some participants thought the preparatory materials were good, others requested that future requests for input from the boards before the workshop be clearly aligned with the purpose, scope, and agenda of the workshop; (3) participants would like a meeting space that is more comfortable and conducive to dialogue and deliberation (some comments suggested that the meeting space was sub-par, the room arrangement was marginally functional, and there were some audio-visual issues including loss of call-in function for those on teleconference); and (4) although many participants thought there had been sufficient time, some would have preferred more time being allocated to address such a broad topic.

The next steps are to:

1. Distribute the workshop report to participants for review, comment and to affirm the workshop report reflects the discussions that had taken place.
2. Produce a penultimate draft report of the workshop that incorporates the Boards' feedback and share that draft with Commissioners at the upcoming June Executive. The Commissioners will provide their advice and guidance on establishing (a) the ad-hoc climate change working group; (b) further development of the climate change framework; and (c) the steering committee for Board engagement and the proposed

webinar/workshop topics.

3. Advise the Boards in July on the Commission's decisions and next steps.
4. Continue building upon the list of climate change activities of the Boards.
5. Maintain an ongoing list of webinar/workshop topics for both IWI and other Commission and Board priorities.

Introductory Comments

About sixty people, including IJC Commissioners, members from all the IJC Boards, and Commission staff participated in the workshop to: (1) develop a limited number of suggested “action items” to address impacts from climate change on water quantity and quality in transboundary basins; and (2) clarify the approach to engage IJC Boards in developing the 5th IWI Report to Governments and addressing other Commission priorities.

The agenda for the workshop is presented in Appendix 1. A complete list of attendees is presented in Appendix 2, which also shows which breakout group they participated in at the workshop.

Commissioners Morgan (CAN) and Moy (USA) welcomed the participants to the workshop and provided a brief overview of the history, purpose, and operating principles of the IWI. They emphasized that the over-arching objective of IWI is to create the necessary conditions at the watershed scale to help prevent or resolve water-related international disputes. The premise being that local people and institutions are often the best placed to anticipate, prevent, and resolve problems related to water resources, the environment, and sustainable development.

The Commissioners also emphasized that one of the goals presented in the 4th IWI Report to Governments is to regularly convene all of the IJC boards to exchange information, learn from each other, and work together on issues of common concern. Building on the 2015 IWI Workshop, they explained that their expectation of this workshop is to identify and develop a limited number of action items to address the impacts of climate change on water quantity and water quality in the transboundary basins.

After the introductory comments by the Commissioners, the facilitator reviewed the objectives and agenda for the workshop, and provided instructions for the breakout sessions.

Breakout Session on Impacts from Climate Change on Water Quantity

The session started with a short, focused presentation by Dr. Alain Pietroniro on the current state of knowledge on the global impacts on temperature and precipitation from climate change and the capability of Regional Climate Models (RCMs) to predict impacts on the regional hydrology (see Appendix 3).

The group reviewed the list of proposed projects identified to date (Appendix 4) and discussed the utility from their Board’s perspective. Many of the projects submitted by the Boards to capture their climate change-related activities were Board specific, so the group shifted gears and started contributing to a new list of work that was broader in nature and would have utility for multiple Boards.

The group identified the work they thought was important for addressing climate change impacts on water quantity. This work was then prioritized by participants using a dot-voting exercise where each participant was given three sticky-dots and were asked to place one or more dots next to each suggested action item. Prioritized items are identified in bold:

- Implications of climate change on droughts and floods.
- **Baseline of current climate change activities undertaken by Boards, gap analysis, next steps.**
- Climate change impacts on precipitation patterns and timing (snowfall, rainfall, flood parameters).
- Application of Regional Climate Model to all transboundary watersheds.
- **Broad framework that focuses on climate change impacts, and how this relates to Boards' mandate.**
- **Systematic monitoring of water temperature and other pertinent parameters (temperature, ice, wind) for assessing impacts from climate change.**
- **Risk analysis framework to assess implications of changing climate (United States Army Corps of Engineers has such a framework that could serve as a model).**
- **Coordination with key agencies to ensure standards and usability of important data in transboundary basins.**
- Tracking socio-economic and environmental changes due to climate change.
- Assess how systems are adapting to climate change.
- Cross-reference issues of concern with existing IJC mandate (Review of Orders, References).

After further discussions, the group determined that the work items could be structured sequentially as they were interrelated. This resulted in the following order and refinement of the proposed work.

1. Perform a baseline review of climate change impacts and related Board activities.
2. Assess hydroclimate shifts that will trigger ecological and socio-economic changes in the basin.

3. Perform risk analyses of the impacts to address the implications of these climate change-related triggers with respect to Board priorities and mandates.
4. Develop an IJC/Board list of action items for addressing the prioritized impacts associated with a changing climate relative to water quantity.

Breakout Session on Impacts from Climate Change on Water Quality

After a short presentation from Dr. Glenn Benoy on the impacts from climate change on water quality (see Appendix 5), the participants reviewed, discussed, and clarified the preliminary menu of action items as presented in the distributed working paper (see Appendix 6). During this process, the participants were able to combine some suggested action items and articulated some new action items as well.

After a lively discussion, the participants completed a dot-voting exercise where each participant was given three sticky-dots and were asked to place one or more dots next to each suggested action item that they thought was most important. The highest priorities are as follows:

- 1) Facilitate an exchange of information across Boards to share scientific and technical knowledge, pilot projects, and lessons learned in order to identify tools that are currently available to address the impacts of climate change on water quality, as well as tools that need to be developed to better address these issues.
- 2) Complete a binational baseline study of the impacts from climate change on water quality. This study should integrate indigenous knowledge and should be performed basin-by-basin when appropriate in light of the Board's mandate (see Text Box on Elements of a Baseline Study).
- 3) Document, as part of the baseline study, socio-economic impacts to communities, particularly indigenous communities (including impacts to culture, human health, and traditional livelihoods).
- 4) Capture and share best practices for adaptive management in responding to the impacts from climate change on water quality. Some, if not most, of this information could be generated through the exchange of information mentioned above.

The participants consistently referred to a number of key concepts to inform and shape a comprehensive, practical climate change strategy. They were:

- Employ a "Research to Action" approach to develop and implement a comprehensive IJC/IWI climate change strategy that can be appropriately adapted to individual watersheds.

- Complete an inventory of “what we know” and “what we do not know” as the foundation of any baseline study; this exercise will shed light on “what we need to know” to move forward.
- Harvest lessons from recently completed, ongoing, and future pilot/demonstration projects within selected basins to share knowledge, lessons, technology, and so on with other boards.
- Invest in “action items” that are consistent with the IJC’s mandate and are genuinely bi-national in purpose and scope.
- Integrate the objectives and methods of adaptive management (learning!) in everything IJC does.

Elements of a Baseline Study

The participants identified a number of elements or components to help design a baseline study, including:

1. Recognize that change is a natural part of ecosystem dynamics over the long-term, clarify how climate change may amplify these natural cycles, and identify what can/cannot be done to mitigate and/or adapt to inevitable changes;
2. Review historical records of temperature change and its impacts, including indigenous knowledge;
3. Clarify the elements and dynamics that influence precipitation, including temperature, CO₂, and NO₂;
4. Focus on ecosystem stressors, eutrophication issues and trends, nutrients and the dynamics of nutrient loading, the influence of groundwater on the temperature of streams, and the influence/impact of changing demographics;
5. Include some type of risk and certainty analysis;
6. Capture and share lessons learned from recently completed and ongoing pilot/demonstration projects on adaptive management in the face of climate change;
7. Continually review and update the baseline study and use it to predict and forecast issues, problems, and solutions; and
8. The participants also identified some of the constraints associated with creating a binational baseline study, including how best to manage large datasets and the need for a common protocol for baseline studies of a bi-national nature.

Plenary Session to Synthesize

The participants were pleasantly surprised by the convergence of ideas and suggested action items that emerged from the two breakout sessions. They agreed that with some modifications the findings from the Water Quantity and Water Quality groups could be integrated into one consistent climate change framework. The following climate change framework evolved from these discussions:

- Build upon work conducted at the last two IWI workshops and complete a baseline review of the existing climate change-related activities of all IJC boards;
- Identify and synthesize the social, economic, and ecological impacts triggered by climate change across the transboundary basins where the IJC has an appropriate mandate, particularly any emerging impacts not currently addressed by IJC Boards;
- Prioritize the social, economic, and ecological impacts relative to the mandates of IJC Boards, based on the use of risk analysis and/or other appropriate methods;
- Identify needed action items by completing a gap analysis – in other words, compare the priorities relative to existing IJC Board activities;
- Develop an adaptive management plan to monitor progress, document and share lessons, and adjust activities and strategies as appropriate.

The participants agreed that it would be valuable to create an ad-hoc working group to further develop and refine this emerging framework. It was suggested by participants that since the ad-hoc working group will discuss a climate change framework that addresses both water quality and water quantity issues, each IJC Board may want to consider putting forward a representative from their Board to participate in the working group (realizing that some Boards may have limited capacity or may not wish to participate).

A number of participants expressed an interest and willingness to serve on the ad-hoc climate change working group and put their names forward:

- Bruno Tassone (Osoyoos, Kootenay, Columbia Boards, Canadian Co-chair)
- Gail Faveri (Lake of the Wood Control Board Co-chair, Rainy-Lake of the Woods Watershed Canadian Board member, St. Lawrence River Board of Control Secretary)
- Nolan Baratono (Rainy-Lake of the Woods Watershed US Board member)
- Wendy Leger (Great Lakes Adaptive Management Committee Canadian Co-chair)
- Marc Hudon (St. Lawrence Board of Control Canadian member)

- Aaron Thompson (Niagara Board of Control Canadian Co-chair)
- Bill Appleby (St. Croix River Watershed Board Canadian Co-chair)
- Laurie Chan (Health Professionals Advisory Canadian Board member)

In addition to including representation from each IJC board, some participants suggested that the ad-hoc climate change working group might also include outside experts and Commission staff.

Discussion on Strategy to Engage Board Members

The participants agreed that using a combination of face-to-face workshops and online webinars to engage Boards throughout the year seems to be efficient and effective (see the draft strategy to engage Boards in Appendix 7). They were supportive of the idea of creating a small steering committee to help in the selection of topics to be covered. They concluded that half-day, face-to-face workshops could be sufficient assuming that supporting material was provided in advance of the workshop. They also supported having webinars between face-to-face workshops that focused on topics related to the IWI 5th Report to Governments, as well as other Commission and Board priorities.

Using the Poll Everywhere Technology, participants were polled as to what topics they were most interested in seeing covered in the webinar series. The prioritized list is as follows:

- 1) Information Management and Geospatial data in the IJC (20 votes)
- 2) Using IJC's harmonized datasets (15 votes)
- 3) Application of hydraulic models (1D-2D Models), hydrological or regional climate models (10 votes)
- 4) Apportionment of flow in transboundary basins (5 votes)
- 5) Application of water quality models (SPARROW model) (4 votes)
- 6) Undecided (1 vote)

It is clear that "information management and geospatial data in the IJC" is of the highest interest for the Boards and should be the first topic covered in the webinar series. It is important to note that most of these topics were identified in the 2015 IWI Workshop and further supported in the breakout groups at this workshop.

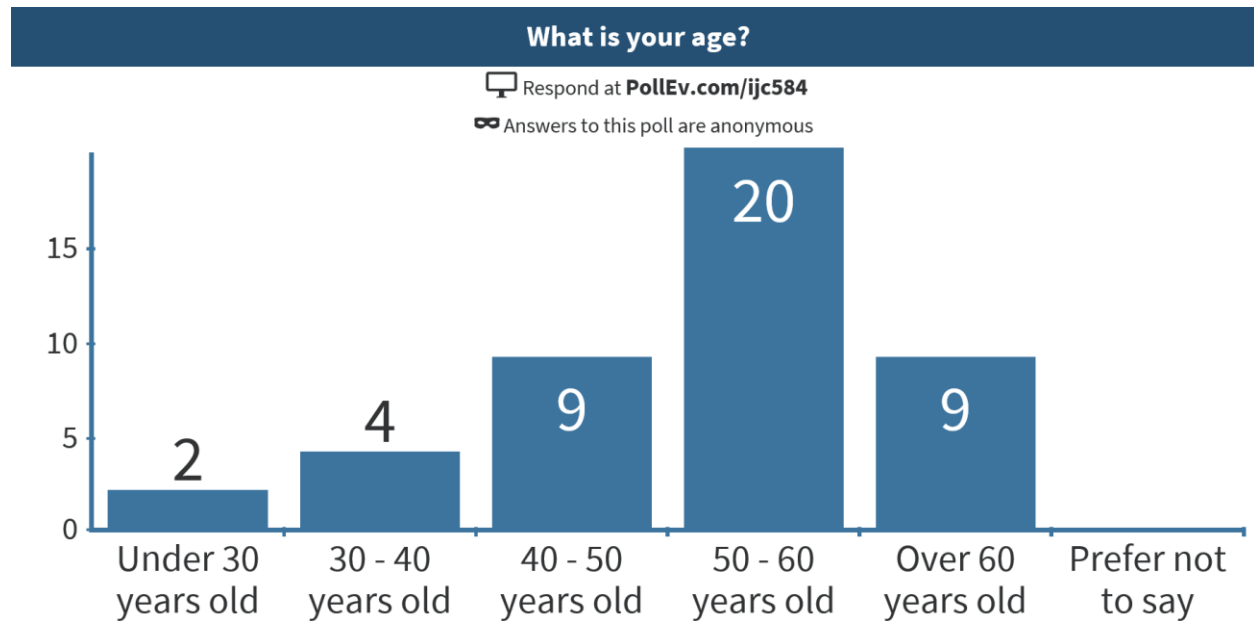
The participants also identified a number of other topics to address via webinars: communications/outreach/engagement, water and health, and information exchange and lessons learned by Boards that were not part of the above list. Except for water and health, the webinars on communications/outreach/engagement as well as information exchange had already been identified at the 2015 IWI Workshop.

Commission staff will create and maintain an ongoing list of topics for both IWI and other Commission and Board priorities – starting with the list presented in the draft strategy in Appendix 7. They will also be discussing with Commissioners the creation of a steering committee to help guide the board engagement.

Application of Poll Everywhere Technology

This technology (Poll Everywhere) was introduced to the Boards at this workshop to demonstrate one effective tool to engage citizens, stakeholders, and decision-makers and facilitate more participatory decision-making. Some basic information on this technology is provided in Appendix 8.

The participants were quickly introduced to this technology at the beginning the workshop when they were asked to provide information on their age, so as to provide an indication of the demographics of the participants. The results are captured below. Not all the participants submitted information, so this is not a complete picture.



The second question, presented toward the end of the workshop, asked participants to prioritize topics for webinars between face-to-face workshops. The results of this poll are presented above under “Discussion on Strategy to Engage Board Members.”

The general consensus from the Boards was that this was an effective way of polling a large group in an anonymous, useful and entertaining manner. A number of participants expressed interest in knowing more about applying this technology for Board purposes, suggesting another topic for a webinar.

Evaluation and Feedback from Participants

The participants provided a tremendous amount of feedback on the workshop (see Appendix 9 for a complete summary). The general consensus was that the workshop was *focused, efficient, well-organized, productive, and well-facilitated*.

It is clear from the Boards that they see numerous benefits by participating in these workshops, such as: (1) cross-pollination of ideas across the boards; (2) contributing to a better understanding of the Commission's role and mandate; and (3) effectively engaging the boards in the Commission's strategic planning.

Participants also offered a number of suggestions on how to improve future workshops: (1) participants indicated that the preparatory materials for the workshop were useful and they would like workshop materials to be distributed earlier to allow participants more time to review and prepare (materials for this meeting were sent out 2.5 business days in advance); (2) while some participants noted the preparatory materials were good others requested that future requests for input from the boards before the workshop be clearly aligned with the purpose, scope, and agenda of the workshop; (3) provide a meeting space that is more comfortable and conducive to dialogue and deliberation (some participants thought that the meeting space was sub-par, the room arrangement was marginally functional, and there were some audio-visual issues including loss of call-in function for those on teleconference); and (4) although many participants thought there had been sufficient time, some would have preferred more time being allocated to address such a broad topic.

Next Steps

The following action items are put forth in terms of next steps:

1. Distribute the workshop report to participants for review, comment and to affirm the workshop report reflects the discussions that had taken place.
2. Produce a penultimate draft report of the workshop that incorporates the Boards' feedback and share that draft with Commissioners at the upcoming June Executive. The Commissioners will provide their advice and guidance on establishing (a) the ad-hoc climate change working group; (b) further development of the climate change framework; and (c) the steering committee for Board engagement and the proposed webinar/workshop topics.
3. Advise the Boards in July on the Commission's decisions and next steps.
4. Continue building upon the list of climate change activities of the Boards.
5. Maintain an ongoing list of webinar/workshop topics for both IWI and other Commission and Board priorities.

Appendices

Appendix 1 - 2016 IWI Workshop Agenda

Appendix 2 - List of Workshop Participants

Appendix 3 - Presentation on Climate Change Impacts on Water Quantity

Appendix 4 - Input from Boards on Climate Change Impacts on Water Quantity

Appendix 5 - Presentation on Climate Change Impacts on Water Quality

Appendix 6 - Input from Boards on Climate Change Impacts on Water Quality

Appendix 7 - Commission Strategy for Broader Board Engagement

Appendix 8 - Poll Everywhere Technology Information

Appendix 9 - Workshop Evaluations

Appendix 1
2016 IWI Workshop Agenda

International Watersheds Initiative (IWI)
Multi-board Strategic Workshop

Date and time: April 20th, 2016 (8:00am -12:45 pm)

*Coffee and tea will be served throughout the meeting, starting at 8:00am

Location: Hilton Garden Inn
815 14th Street N.W
Washington DC

Participants:

- Commissioners
- Commission staff
- Representatives from the Boards
- Workshop facilitator
- Workshop report writer

Workshop objectives:

1. Focusing on the strategic priority, “Impacts on water quantity and quality in transboundary basins from climate change”, the workshop will:
 - Build consensus on the scope of this priority;
 - Clarify what work the Boards are currently engaged in that are consistent with the agreed-upon scope under water quantity and water quality (*i.e.*, nutrients and heavy metals);
 - Identify and assess broader projects that may assist numerous boards, as well as key work that may relate to only a specific board; and
 - Evaluate the proposed work/projects and undertake a prioritization for Commission consideration.
2. Clarify the approach for engaging the IJC Boards in development of the *5th IWI Report to Governments* and for addressing other Commission priorities.

	<p>numerous boards that addresses the impacts from climate change on water quantity in transboundary basins. Review and assess the work that may be undertaken by individual boards that are also important contributions to this theme.</p> <p>b) Impacts from Climate Change on Water Quality Breakout - Identifying deliverables and prioritizing of work that is broader and pertinent to numerous boards that addresses the impacts from climate change on water quality from i) heavy metals (40 minutes) and ii) nutrients and eutrophication/harmful algal blooms (40 minutes) in transboundary basins. Review and assess the work that may be undertaken by individual boards that are also important contributions to this theme.</p>	
11:15-12:15	<p>Plenary - Reports from breakout groups and facilitated discussion on assessing synergies with projects that may be cross cutting including those projects integrating both water quantity and quality integration of water quantity and quality</p> <ul style="list-style-type: none"> • 20 minutes allocated for each topic <ul style="list-style-type: none"> ○ 5-10 minutes presentation of findings ○ Remainder of time for discussion • 20 minutes allocated to integration of quantity and quality analyses/projects 	<p>Matt McKinney (Facilitator)</p> <p>All</p>
12:15-12:30	Proposed Approach to Further Board Engagement over the next five years	Commissioners Moy and Morgan
12:30-12:45	<p>Wrap up</p> <ul style="list-style-type: none"> • Next steps in development of <i>5th IWI Report to Governments</i> • Workshop evaluation • Closing remarks 	Matt McKinney (Facilitator)
End of Day		

Appendix 2 IWI 2016 Workshop Participants

Breakout Group on Impacts from Climate Change on Water Quantity

Name	Attending on behalf of the:
Aaron Thompson	Niagara Board of Control
Al Pietroniro	Accredited Officers for the St. Mary-Milk Rivers
Barbara Blumeris	St. Croix Watershed Board
Benoit Bouchard, Commissioner	IJC Staff - Canadian Section
Bill Werick	Great Lakes Adaptive Management Committee
Brian Maloney	IJC Staff - US Section
Bruno Tassone	Osoyoos Lake , Columbia River and Kootenay Lake Board of Control
Cindi Barton	Osoyoos Lake and Columbia River Board of Control
Daniel Rokitnicki-Wojcik (REMOTE)	International Rainy-Lake of the Woods Watershed Board
David Fay	IJC Staff - Canadian Section
Dereth Glance, Commissioner (REMOTE)	IJC Staff - US Section
Gail Faveri	International Rainy-Lake of the Woods Watershed Board
Gordon Walker, Commissioner	IJC Staff - Canadian Section
Jeff Woodward	Souris River Board
John Allis	Lake Superior Board of Control
John Kilpatrick	Accredited Officers for the St. Mary-Milk Rivers
Kathryn Parlee (REMOTE)	St .Croix Watershed Board
Kyle McCune	Great Lakes Adaptive Management Committee
Lana Pollack, Commissioner	IJC Staff - US Section
Laurie Chan	Health Professionals Advisory Board
Marc Hudon	St. Lawrence Board
Mark Colosimo	IJC Staff - US Section
Michael Laitta	IJC Staff - US Section
Michael Toope	IJC Staff - Canadian Section
Mike Shantz (REMOTE)	Great Lakes Adaptive Management Committee
Nicholas Heisler	IJC Staff - Canadian Section
Norman Grannemann	Great Lakes Science Advisory Board - Research Coordination Committee
Paul Allen	IJC Staff - Canadian Section
Pierre-Yves Caux	IJC Staff - Canadian Section
Scott Jutila	Souris River Board
Shannon Runyon	IJC Staff - US Section
Susan Daniel	IJC Staff - US Section
Ted Yuzyk	Facilitator
Tim Takaro	Health Professionals Advisory Board
Wayne Jenkinson	IJC Staff - Canadian Section
Wendy Leger	Great Lakes Adaptive Management Committee

Breakout Group on Impacts from Climate Change on Water Quality

Name	Attending on behalf of the:
Arun Heer	Lake Superior Board of Control & Niagara Board of Control
Bill Appleby	St. Croix Watershed Board
Camille Mageau	IJC Staff - Canadian Section
Charlene Mason	International Rainy-Lake of the Woods Watershed Board
Frank Bevacqua	IJC Staff - US Section
Glenn Benoy	IJC Staff - Canadian Section
Kelli Saunders	International Rainy-Lake of the Woods Watershed Board
Marijke van Heeswijk	Osoyoos Lake and Columbia River Control Boards
Mark Gabriel	IJC Staff - US Section
Matt McKinney	Facilitator
Mike Goffin	International Rainy-Lake of the Woods Watershed Board
Mike Hirst	International Rainy-Lake of the Woods Watershed Board
Mike Renouf	Red River Board
Nolan Baratono	International Rainy-Lake of the Woods Watershed Board
Rich Moy, Commissioner	IJC Staff - US Section
Richard Morgan, Commissioner	IJC Staff - Canadian Section
Samantha Klaus	IJC Staff - Canadian Section
Jennifer Boehme	IJC Staff - GLRO Section
Seth Foldy	Health Professionals Advisory Board
Shane Zurbrigg	IJC Staff - Canadian Section
Tim McHale	Great Lakes Science Advisory Board - Research Coordination Committee
Trina Rawn	International Rainy-Lake of the Woods Watershed Board
Todd Sellers	International Rainy-Lake of the Woods Watershed Board
Tom Brown	St. Lawrence Board of Control

Appendix 3
Presentation on Climate Change Impacts on Water Quantity

Climate Change and Adaptation

IMPACTS OF CLIMATE CHANGE ON WATER QUANTITY IN TRANSBOUNDARY BASINS

APRIL 20, 2016

DR. ALAIN PIETRONIRO
EXECUTIVE DIRECTOR – NATIONAL
HYDROLOGICAL SERVICE

THE
INTERNATIONAL
JOINT
COMMISSION
AND
THE
BOUNDARY
WATERS
TREATY
OF 1909

Environment Canada Environment Canada

Slide 1

Note: Double-click the image in order to view the embedded presentation.

Appendix 4

PROPOSED ACTION ITEMS IMPACTS OF CLIMATE CHANGE ON WATER QUANTITY IN TRANSBOUNDARY BASINS

Source IWI 4 th Report	Proposed Action
	Incorporate the most current climate science and climate scenarios from advanced regional climate models into its recent water regulation plan reviews to ensure the robustness of the revised plans to address a changing climate. The Commission will continue this practice as it proceeds to update the orders of approval for all the remaining water control structures (<i>i.e.</i> , dams) under its jurisdiction.
	Collaborate with key federal agencies and research institutions in the application of advanced regional climate models to transboundary basins to support its boards in understanding climate change impacts on key issues such as water apportionment, nutrient loading and aquatic ecosystem health.
2015 IWI Workshop	
1	Adopt a holistic approach to hydrology in the face of climate change.
2	Implement an adaptive management approach to climate change.
Feedback from Boards in 2016	
3	Monitor flood preparedness & mitigation actions identified in “Living with the Red” report (Red River Board).
4	Work on identifying in-stream flow needs and establishing minimum flow criteria (Red River Board).
5	Improve methods for estimating natural flows that take into account climate change (St. Mary and Milk Rivers Accredited Officers).
6	Simulate altered flows conditions due to climate change; build on existing routing models (St. Mary and Milk Rivers Accredited Officers).
7	Improved understanding of climate change impacts on flows and water levels and the implications on regulation (A study addressing climate change impacts was completed in 2011 as part of the Review of Orders) (Osoyoos Lake and Columbia River Boards).
8	Need a better understanding of how climate change will impact water levels in the system (Rainy-Lake of the Woods Watershed Board).
9	Develop a strategic plan to guide future climate change investments (Great Lakes-St. Lawrence River Adaptive Management Committee).
10	Need a better understanding of hydro-climatic conditions in the basin (Great Lakes-St. Lawrence River Adaptive Management Committee).


11	Improved understanding of socio-economic and environmental sensitivity to fluctuating water levels is changing in the system (Great Lakes-St. Lawrence River Adaptive Management Committee).
12	Maintain existing predictive tools and develop new ones regarding the impacts of fluctuating water levels (Great Lakes-St. Lawrence River Adaptive Management Committee).
13	Better understanding of how to improve decision making related to transboundary water management through adaptive management (Great Lakes-St. Lawrence River Adaptive Management Committee).
14	Climate Change and sea level rise. Analyzing water level data collected at the USGS tide gage would be extremely useful to document trends over time and capture real time storm surges at the mouth of the river (St. Croix Watershed Board).

Appendix 5



Presentation on Climate Change Impacts on Water Quality

**IMPACTS OF CLIMATE CHANGE ON WATER
QUALITY IN TRANSBOUNDARY BASINS**

**IJC's International
Watersheds Initiative
(IWI)
Multi-board Strategic
Workshop**



Dr. Glenn Benoy, Senior Water Quality and Ecosystem Adviser



A century of cooperation protecting our shared waters www.ijc.org

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Appendix 6

PROPOSED ACTION ITEMS IMPACTS OF CLIMATE CHANGE ON WATER QUALITY IN TRANSBOUNDARY BASINS

Source	Suggested Action
<i>IWI 4th Report</i>	
	Collaborate with key federal agencies and research institutions in the application of advanced regional climate models to transboundary basins to support its boards in understanding climate change impacts on key issues such as water apportionment, nutrient loading and aquatic ecosystem health.
	Complete a broader binational modelling of nutrient loading and highlight creative approaches and best practices that are being undertaken by various jurisdictions to address this issue.
<i>2015 IWI Workshop</i>	
1	Adopt a holistic approach to hydrology in the face of climate change.
2	Implement an adaptive management approach to climate change.
3	Facilitate the exchange of information and coordination of expertise across boards (<i>relative to nutrient loading</i>).
4	Raise the profile of this issue and facilitate effective communication and understanding (<i>relative to nutrient loading</i>).
5	Improve the capacity to predict when and where algal toxins may occur (<i>relative to nutrient loading</i>).
6	Facilitate a workshop on the role of adaptive management to nutrient loading and algal blooms (<i>relative to nutrient loading</i>).
7	Clarify the purpose and scope of the third strategic priority – the impacts on quality of transboundary waters from heavy metals and associated contaminants.
8	Provide for a better understanding of the status and characteristics of heavy metals in transboundary basins.
9	Foster better understanding of ecosystem stressors (<i>relative to heavy metals</i>).
10	Incorporate climate change assessment into SPARROW (water quality) modelling.
<i>Feedback from Boards in 2016</i>	
11	Develop and implement a stressor response model for the Red River Basin (Red River Board).
12	Determine nutrient loading and establish international water quality targets for the Red River Basin (Red River Board).

13	Develop a better understanding of sources of nutrients and nutrient dynamics and their role in algal blooms (Rainy-Lake of the Woods Watershed Board).
14	Investigate the vulnerability of boundary waters to contamination from mining & petrochemical transport (Rainy-Lake of the Woods Watershed Board).
15	Support and complete the ongoing IWI study to define the existing aquatic food-web in the St. Croix River and identify the potential benefit of marine derived nutrient input with the return of large numbers of alewife (St. Croix Watershed Board).

Appendix 7

Proposed Approach to IJC Board Engagement over the Next Five Years

Context

Over the next five years, the International Joint Commission (IJC) plans to foster exchange of information, engage in dialogue, and seek input and advice from all IJC boards on a number of areas including:

- Address key governance, policy, or support needed to further increase Board efficiency and effectiveness;
- Contribute to the IJC International Watersheds Initiative's 5th Report to Governments; and other annual activities reports; and
- Advance other Commission priorities.

This document presents a proposed approach to facilitate board engagement through a series of face-to-face workshops and internet-based webinars. The workshops will coincide with the semi-annual meetings and two webinars will be convened each year between these workshops. The figure on the last page of this document illustrates the overall architecture and timeline of the proposed strategy.

Board Engagement

As explained above, this proposed approach provides a framework to foster board engagement over the next five years in a series of workshops to produce measurable outcomes, all of which work to further improve the efficiency and effectiveness of the IJC and its boards and address their more pressing needs. Some of these workshops will also contribute to the production of the 5th Report to Governments on the IWI and the annual reports to governments on overall Commission activities. A complimentary series of workshops will be convened to address other Commission priority issues, aimed at increasing the Commission and its boards' knowledge and/or effectiveness. These two series of workshops will be augmented by webinars to exchange information and promote dialogue on specific topics. The precise content for each workshop and webinar will emerge through consultations with the board co-chairs and secretaries as this approach is implemented. The overall approach will be adaptive to emerging priorities and based on lessons learned.

Proposed Topics and Outcomes

The proposed topics below were compiled from the 2015 IWI Workshop and internal Commission discussions; consequently, it is largely IWI focus. It should not be considered an exhaustive list and will need to be supplemented. There will be the need to prioritize and determine what topics are best delivered through a workshop format or can be adequately covered in a webinar. Input into the scheduling of topics will also be sought from the boards.

1. IWI Workshop Topics

1. Work planning for Commissions' three Strategic Priorities (spring 2016).
2. Review implementation of priority projects and address any challenges.
3. Assessing progress on the three IWI Strategic Priorities.
4. IWI Story Map Development.
5. Outline and messaging for the 5th IWI report and information to be compiled from boards on their other IWI projects.
6. Review draft of the 5th IWI report.
7. Updating and revising the International Water Quality Objectives.

2. Other Potential Workshop Topics

1. Aboriginal awareness and utilizing traditional environmental knowledge.
2. Improving IJC's communications, including working with the media.
3. Effective public and stakeholder engagement.
4. Adaptive management – lessons learned to date.

3. IJC Webinar Topics

1. Using IJC's harmonized data sets.
2. Application of water quality models (SPARROW Model).
3. Application of hydraulic models (1D-2D Models), hydrological or regional climate models.
4. Apportionment of flow in transboundary basins.
5. Information Management and Geospatial data in the IJC.

Other Considerations

- It may be possible to combine a couple topics into one workshop, depending on the level of board input and discussions that are required.
- Consideration might be given to alternating between a strategic Commission priority (*e.g.*, during the spring Semi-annual), and board priorities discussed on the margins of the Fall Semi-annual or they could alternate if that is considered to be more appropriate.

- The strategy will need to be reviewed every two years in order to finalize the topics to be discussed in the workshops and webinars and ensure it is delivering on the most pertinent topics at that time for the Commission and its boards.

Engagement Framework

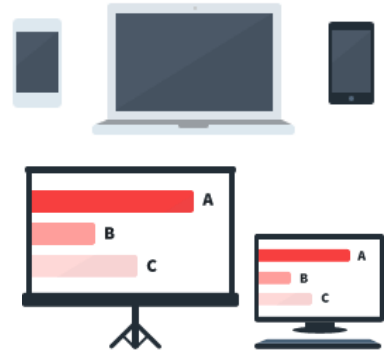


Appendix 8 Poll Everywhere Technology Information

Poll Everywhere lets you engage your audience in real time.

How it works:

- 1) Ask your audience a question by creating one on your Poll Everywhere account.
- 2) Audience answers in real time using mobile phones, Twitter, or web browsers
- 3) See your response live on the web or in a PowerPoint presentation



Try it for yourself:

You can create an account at <https://www.polleverywhere.com/> and test it out for free.

How much does it cost?

Poll Everywhere is a tool has monthly or annual subscription plans based on your needs. For a list of pricings please go to <https://www.polleverywhere.com/plans>

How do I explain Poll Everywhere to my audience?

The following embedded file is an example of a handout you can give to participants to help explain how to participate in the poll. Simply replace XXX with the address provided to you by Poll Everywhere!

How to respond to the Workshop Poll

From any web browser

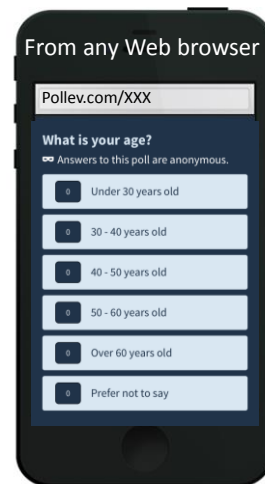
To participate, connect your phone to a wifi network.

Then open any browser (Google, Internet Explorer, FireFox) and visit

pollev.com/XXX

Wait for the poll to appear and then submit your response.

Your response will show up immediately on the workshop poll graph!



Who can I contact for more information?

Please feel free to contact Samantha Klaus, IJC's Environmental Officer, for more information at klauss@ottawa.ijc.org

Appendix 9 Workshop Evaluations

Toward the end of the workshop, the facilitator distributed one index card to each participant and asked them to write on one side of the card -- What worked well? What did you like? On the other side of the card, the facilitator asked people to suggest how the workshops and the IWI in general could be improved. The feedback received is as follows:

What Worked Well?

- **The workshop was focused, efficient, productive, and well-facilitated**
 - Good process overall – Work done prior to workshop to develop potential actions for discussion was especially helpful
 - Use of experienced and focused facilitators
 - Focused discussion, well facilitated
 - Allowed to have more than 2 people from each board
 - Class discussion among board
 - Focus provided by facilitators
 - Nice to have prep materials ahead of meeting
 - Good workshop
 - Preparation material was good
 - Good discussion. Good representation. Good focus
 - About the right amount of time to cover the topic
 - Workshop worked well. Made significant progress in short amount of time because of strong facilitation and especially thorough prep work by organizers
 - Good to have a facilitator
 - Breakout groups on focused question
 - Excellent facilitators
 - Brief introductions worked well
 - Length of time given for breakout sessions
 - Good facilitator
 - I find helpful to go with focus points
 - Covered a lot of ground quickly
 - Well organized workshop
 - Good that workshop was tied to Semi-Annual meeting. Reduced travel costs.
 - Very good, efficient
 - Good structure for generating discussion
 - IWI – Focus on harmonization / cross leveraging between two countries Ad-Hoc Committee – Yes!
 - Awesome commonality on Water Quality and Water Quantity priorities
 - Excellent follow up on next steps moving forward
 - Good focus
 - Focused breakout sessions that were well facilitated
 - Good participation
 - Good breakout topics and enthusiasm

- Good agreement on general next steps
 - Good discussion
 - The topics were very good – not too many and well explained
 - Interesting and encouraging that both groups came up with similar key concerns and a similar path forward
- **Bringing the boards together generates a variety of benefits**
- Good that we were able to get together
 - Chance to meet other boards
 - The right people were in the room
 - Ability to interact with multi-disciplinary experts on issues
 - Benefit of hearing about other Boards' activities

Suggestions on How to Improve IWI Workshops

- **Provide more time to read preparatory materials**
- Agenda and support info could be provided with more lead time
 - Reminder to review for workshop & need to resend resources (NOTE: Seem to want more time to prepare and a reminder to prepare for the workshop)
 - More lead time on homework and information sent out in advance of the meeting
- **Improve facility & audio**
- Can always improve conference call capabilities – there are always limitations
 - Did not seem to work too well over the phone
 - Poor audio-visual and room arrangement
 - Poor room (layout and audio)
 - The room was not the best set-up
 - Facility was cramped
- **Improve the Process**
- Request feedback from boards prior to the workshop. Did not seem to meet planner's objective?
 - When voting is done – equalize the voting capacity of each board
 - Need better way to get to know people from other boards
 - May need to break into small groups (<10 persons) (which may help address the issue of getting to know other boards)
 - A large topic! Hard to discuss in 4 hours
 - Need more time to develop action items – and difference approaches
 - Need time for sharing on particular subjects
 - Very ambitious list of activities to tackle
 - Continue to have confusion about IWI vs. Board mandate

Miscellaneous Feedback

- This is 40,000-foot level stuff!
- Include outside experts in any ad hoc working group that may be formed
- Webinars in between would be good
- Need mechanism for next steps; and roadmap or defined process for funding of IWI Projects from proposal to finding
- I think that instead of using flip charts to records points, you should use mind-mapping software that can easily support brainstorming and sharing electronically over the web (Freemind or Mindjet mind mapping remote participants can hear but not see).
- MOECC & ECCC are provincial and federal CDN agencies who have expanded their mandate to focus on climate change – we need to work with them.
- I would like to know this is not just “one and done” workshop