

International Joint Commission
Canada and United States



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IJC Science Advisory Board

The Metcalfe Hotel (Edwards Room)
123 Metcalfe Street, Ottawa
October 25, 2017 – 12:30pm – 4:00pm

U.S. Members	Canadian Members	Commission Staff
Carol Miller (SPC Co-Chair)	Jeff Ridal (SPC Co-Chair)	Matthew Child (SPC Secretary)
Norm Grannemann (retired RCC Co-Chair)	Gavin Christie (RCC Co-Chair)	Li Wang (RCC Secretary)
Dave Allan	Andrea Kirkwood	Victor Serveiss (U.S. Liaison)
Mike Murray	Christina Semeniuk	Glenn Benoy (Canadian Liaison)
Scott Sowa	Clare Robinson (by phone)	Mark Burrows
Dale Phenicie	Henry Lickers	Raj Bejankiwar
Lucinda Johnson	John Livernois	Trish Morris
Val Klump (by phone)	Patricia Chambers	
Kyle McCune	Yves Michaud	
Chris Winslow (by phone)	Ian Campbell	
Michael Twiss	Kathy McKague	
Sandra Eberts		
Eric Emery (by phone)		

Regrets: Debbie Lee (RCC Co-Chair), Thomas Speth, Yingming Zhao, Christine Mayer, Joe DePinto, Bob Hecky

1. Welcome and Approval of Draft Agenda

The Co-Chairs welcomed everyone to the meeting. The draft agenda was approved by consensus.

Norm Grannemann was recognized for his outstanding contributions to the RCC, and the Council of Great Lakes Research Managers before that. Board members wished Norm the best in his retirement, and look forward to continuing to interact with him as a work group member.

Debbie Lee has been confirmed as the new U.S. Co-Chair of the RCC.

2. Work Group Updates

Brief updates on each of the ongoing SAB projects were provided:

Research Coordination Committee

- i. Research Inventory – This project provides a meta-database of completed or ongoing Great Lakes research projects. The research inventory website is undergoing some improvements, and RCC members will be invited to ‘test drive’ the website soon. In response to a question about the research inventory project’s spatial and temporal extent, it was clarified that the inventory could include any completed or ongoing research or monitoring project in the Great Lakes basin.
- ii. Surface Water-Groundwater Model Integration - This project will develop an integrated modeling platform for combined representation of surface and subsurface hydrological processes. A contractor has been selected and project completion is expected in fall, 2018.
- iii. Great Lakes Nutrient Adaptive Management - This project will develop an inventory and comparative assessment of nutrient-related models, identify gaps and sources of uncertainty, and determine how well management actions can be incorporated in the models. A contractor has been selected and work has recently started.

Science Priority Committee

- i. Information Coordination and Flow – This project assesses the status, challenges and opportunities associated with the flow of data and information to decision-makers. The project report has been submitted to the Commission for approval, and the Work Group co-chairs hosted a webinar earlier in October to present the report to Commissioners, board members and staff.
- ii. Fertilizer Application – This project assesses the relative influence of different sources of agricultural phosphorus to the western basin of Lake Erie, and related factors that influence the flux of phosphorus to the lake (e.g., management practices, legacy P, etc.). The project report has been submitted to the Commission for approval.
- iii. Energy Transport & Water Quality – This project is assessing the potential impacts of unrefined liquid hydrocarbon transport on Great Lakes water quality and ecological processes. A draft technical report has been reviewed by the work group, and a revised final draft report is currently being prepared by the contractor.
- iv. Declining Lake Productivity – This project is investigating the influence of nearshore retention of nutrients and implications for offshore productivity including fisheries. The contractor has completed a literature review and is presently updating data on fish biomass and yield and total phosphorus concentrations, and reviewing ecosystem models. Project reporting will be completed in spring, 2018.

Science Advisory Board

- i. Great Lakes Early Warning System (GLEWS) - GLEWS is a full SAB project to develop and apply analytical and decision processes to identify emerging environmental stressors and threats in the Great Lakes basin. On October 3, 2017 three contractor proposals were reviewed, and a contract with the preferred bidder will be finalized imminently.

3. Proposed Work Plans

Brief updates on work plans that have (or will) be submitted to Commissioners for approval were provided.

Current Status and Assessment of GL Connecting Channels (Michael Twiss)

Connecting channels are an explicit focus of the Agreement (e.g., Annex 2 Lakewide Management) but have received less study than the open lakes for a variety of reasons including research vessel limitations, fewer researchers, etc. The proposed RCC Work Plan will assess and characterize existing connecting channel data sets, studies, initiatives etc. and identify gaps and research needs. The primary focus will be on the St. Marys, St. Clair, Detroit, Niagara and St. Lawrence rivers, although the Chicago and Erie canals will also be examined due to their potential as aquatic invasive species vectors.

Interacting Stressors (Dave Allan)

A large majority of existing research focuses on single stressors, and thus there is less knowledge on how stressors interact. A draft SPC Work Plan has been prepared for Commissioner consideration that will define terms and concepts, conduct a literature review, and through a workshop identify important stressor combinations. Through discussion, it was clarified that the primary focus will be on mechanisms of stressor interactions influencing ecological responses.

HPAB's Harmonized Fish Consumption Advisory Work Plan (Jeff Ridal)

A Work Plan is being prepared to work with Indigenous communities and other partners to develop fish consumption guidelines that consider the benefits of fish consumption, and the effects of harmful chemical mixtures, with a geographic focus on fishers and Indigenous communities on the upper St. Lawrence River. HPAB is the project lead, with the participation of SPC. The Work Plan will be submitted to the Commission in late 2017 or early 2018 and the project is expected to take two years to complete. Through discussion, it was clarified that MOECC is participating, and there have been related previous studies (e.g., IJC, Great Lakes Fishery Commission).

Effectiveness of Agricultural Beneficial Management Practices (Ian Campbell)

An RCC Work Plan is being considered for development in 2018. The proposed project will complete an inventory of current and recent BMP efficacy research from outside of the Great Lakes basin, that may have application within the basin.

4. Potential Collaborative Opportunities

Recommendations on Sustainable Restoration of Great Lakes (Val Klump)

The attachment distributed with the agenda was reviewed. A white paper building off of the attachment is being developed by the RCC. There was general agreement that the 'science futures' theme would be appropriate as an IAGLR 2018 session proposal. If Board members are interested in participating in that session they should contact the Secretaries and/or look for it in the upcoming IAGLR call for papers.

Aquaculture (Scott Sowa)

There is a growing demand for fish protein, which is expected to be met through aquaculture. Although at a global scale aquaculture now exceeds the mass of wild caught fish, aquaculture in the Great Lakes is relatively limited. The main systems being used in the Great Lakes include open net-

pens, flow-through systems and recirculating systems. The project could provide a science summary of each of the aquaculture systems to inform policy. Through discussion a number of items were discussed:

- Ontario's aquaculture legislation is still under consideration.
- Fisheries and Oceans Canada regulates net-pen systems, and provides science support on ecosystem effects of net-pen systems.
- Net-pen aquaculture is active on Lake Huron's North Channel in Ontario, although a net-pen review by Michigan's environmental agencies recommend against aquaculture.
- IJC's Water Quality Board prepared an aquaculture report in the late 1990s that should be considered.
- Great Lakes Fishery Commission is very engaged on this issue.
- Sea Grant's proposed budget includes substantial funding for aquaculture projects, although the details of that program are still under development.

Non-Agricultural Sources of Nutrients (Andrea Kirkwood)

The contribution of non-agricultural sources of nutrients in some watersheds can be significant. A project could be undertaken to examine the efficacy of non-agricultural BMPs, and other approaches to mitigating non-agricultural nutrient impacts.

Habitats of Species at Risk (Henry Lickers)

The Akwesasne Nation is interested in assessing the relationship of species at risk to protected areas. Through discussion, it was clarified that Natural Resources Canada has a funding program that may be suitable, and Canada's Species at Risk Act is currently being reviewed.

Proposed IJC Nutrients Workshop (Staff)

The workshop outline included in the agenda packet was reviewed. The attachment provided an overview of a proposed multi-Board workshop that Commissioners have requested to assess and synthesize the nutrients-related projects of the IJC's advisory boards, as well as the recent work of others e.g., various governments' Domestic Action Plans. There was general support for continuing to develop the workshop outline. Through discussion, several suggestions were offered for staff to consider when revising the workshop proposal:

- Need to consider how the proposed workshop will align with ongoing Annex 4 work, and add value to the Parties work.
- The Board's role to assess, advise and critique should be reflected in the workshop.
- It would be appropriate to develop a single voice on the IJC's existing and diverse recommendations; a focus of the workshop could be to develop fewer, pointed recommendations that have more force.
- Consider geographic scope – the lakes, or watersheds, or both? Shallow basins and bays, or the entirety of all the lakes?

5. Triennial Assessment of Progress

The final TAP report is expected to be transmitted to governments soon. IJC's Advisory Boards will be provided with an embargoed copy in advance of the public release.

6. Traditional Ecological Knowledge

Henry Lickers delivered an informational presentation on traditional ecological knowledge (slides attached). The Water Quality Board, Health Professionals Advisory Board and Great Lakes Adaptive Management Committee were invited to the presentation, and many members were in attendance.

Following the presentation, there was general agreement that TEK is an important issue for the advisory boards to consider in their work, and mechanisms to accomplish that should be the subject of further discussions.

7. Adjournment

The meeting adjourned at 4:05 p.m.

Ohenton Karithwatehkwen

The Words That Come Before All Else



The People
The Earth
The Waters
The Fish
The Plants
The 3 Sisters
The Medicinal Plants
The Animals
The Trees
The Birds
The Four Winds
The Thunderers
The Sun
The Grandmother Moon
The Stars
The Four Sacred Beings
The Enlightened Teachers
The Creator of All Things

Myths of Traditional Environment Knowledge

1. Only native people have TEK.
2. The TEK is being lost and needs to be saved.
3. The TEK can be stored or saved in books, databases and maps.
4. TEK is static and doesn't change.
5. TEK doesn't use or need science.
6. TEK is anecdotal.
7. TEK is not objective.
8. TEK is more spiritual and mystical than factual.
9. TEK is somehow the same all over the US and the World.

Kinds of Knowledge

Innate Knowledge:

knowledge that one is born with

Intuitive Knowledge

knowledge of how and why things are

Empirical Knowledge

knowledge gained from experience

Harmonious or Spiritual Knowledge is the realized when conflicts between empirical knowledge and intuitive knowledge is reconciled and a better understanding is achieved.

Naturalized Knowledge Systems

Naturalized : To adopt into the common use of a given area.

Knowledge: A Deep and extensive learning.
A product or result of knowing.

Systems: An orderly combination or arrangement of facts into whole.

Naturalized Knowledge Systems

Basic Themes or Principles:

1. The Earth is Our Mother.
2. Cooperation is the way to survive.
3. Knowledge is powerful, only if it is shared.
4. Responsibility is the best practice.
5. Everything is connected to everything.
6. Place is important.
7. The Spiritual World is not distant from the Earth.

Naturalized Knowledge Systems

Haudenosaunee Knowledge

Community Knowledge

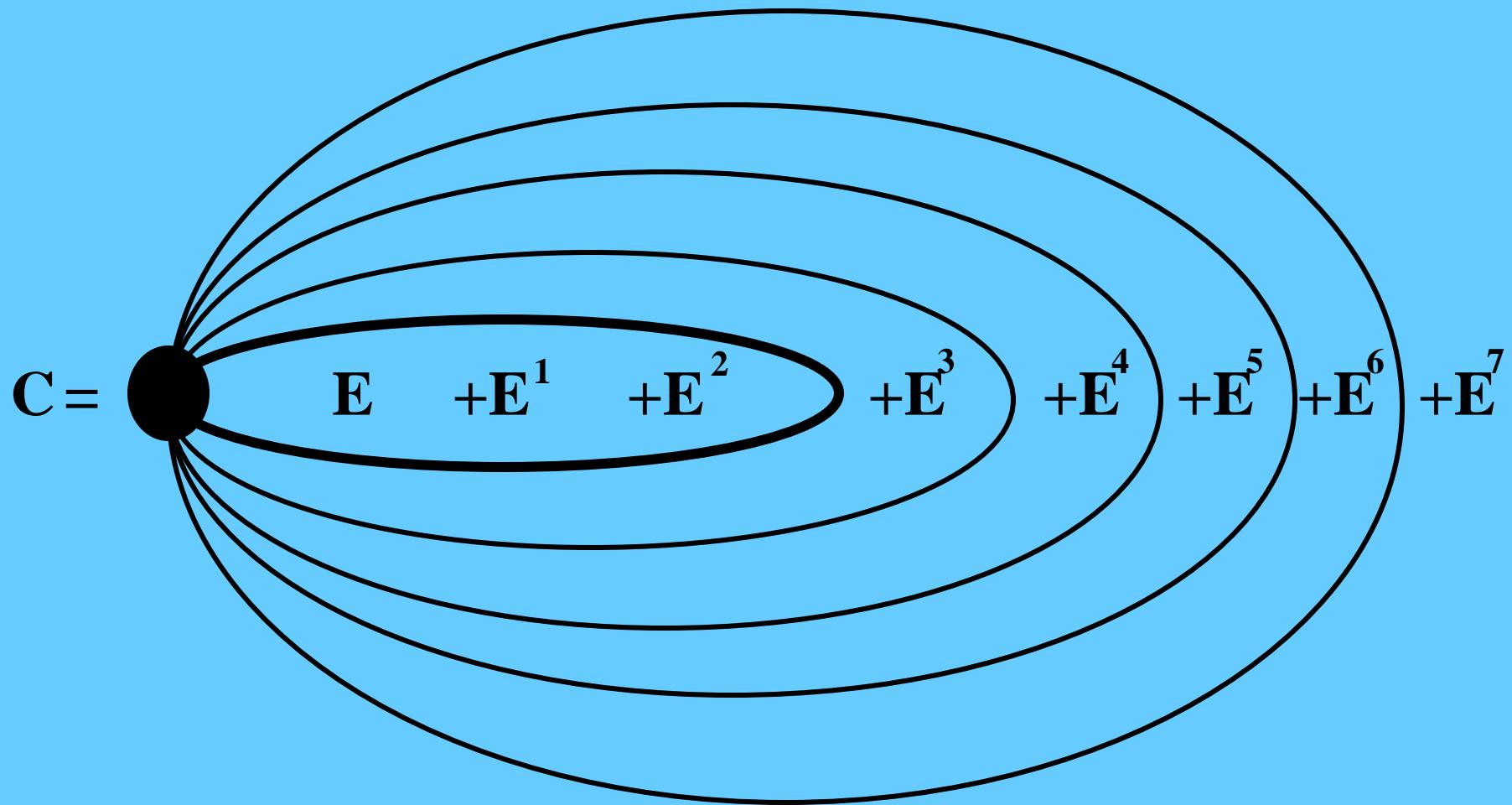
Environment

Lifestyle

Environment

Lifestyle

Conceptual Diagram of Cause and Effect Hierarchy



E = The sum of the effects in the hierarchy

Diagram of Model Hierarchy

Naturalized Knowledge System

Traditional Knowledge

<u>Scale</u>	<u>Our understanding:</u> <u>Who do you ask</u>			
Individual / Site:	85%	10%	5%	Kids
Group / Family	50%	30%	20%	Teens
Nation / Ecosystem	40%	40%	20%	Gathers
Confederacy	30%	30%	40%	Auntie & Uncles
Spiritual	10%	10%	80%	Elders

Naturalized Knowledge Systems

The Zeal to Deal

The “Zeal to Deal”
is generated by a balance of:

	RESPECT	EQUITY	EMPOWERMENT
TOOLS:	Understanding Communication Consensus Mediation Honour	Finances Knowledge Networks Personnel Social Power	Application Authorship Credibility Partnership Responsibility

Concept of Time

We must think about the seven generations to come.

Why?

Because we can know seven generations.

Great Grandmother - Grandmother - Mother

You

Child - Grandchild - Great Grand Child.

**The People
The Earth
The Waters
The Fish
The Plants
The 3 Sisters
The Medicinal Plants
The Animals
The Trees
The Birds
The Four Winds
The Thunderers
The Sun
The Grandmother Moon
The Stars
The Four Sacred Beings
The Enlightened Teachers
The Creator of All Things**



Now we come to the end, I ask only
two things of the Creator as we
leave this place that no impediment
is placed in your way as you proceed
home
and
that you see the happy smiling faces
of your families, knowing that no
misfortune has befallen them while
you've been here.