

Development of A Great Lakes  
*Coordinated Science Initiative*

# BEC Assignment to Planning Group

*(October 25-26, 2006)*

- ...to explore the need, value and objective for binational coordination of monitoring and research (science),
- ..to identify what exists and the value of a more structured approach, and
- ..explore what this joint work-planning would look like if it was to focus on our obligations under GLWQA and other Great Lakes frameworks

# Why is this needed?

- Currently there are many groups claiming to coordinate science; GLWQA identifies that the **Parties** are responsible for coordinating science and BEC is assuming leadership:
  - Article V 2(b): *“The Parties shall use their best efforts to ensure that mechanisms be developed for appropriate cost-effective international cooperation”*.
- The goal is to gain efficiencies and to develop binational consensus on science assessments

# Objective

An integrated, demand-driven Great Lakes Coordinated Science Initiative based on the knowledge needs of federal departments, provinces, states, First Nations, Tribes, Municipalities, and other stakeholders.

# WHY A Great Lakes Coordinated Science Initiative?

A GL Coordinated Science Initiative will set the direction for future freshwater science by:

1. aligning freshwater science with policy results
2. establishing a focus for governance and management of freshwater science, based on horizontality, integration and capacity
3. identifying priorities for an integrated and collaborative science program based on the knowledge needs
4. ensuring alignment of science to support policy and operational needs, legal mandates and national and international commitments for water now and in the future

# What specific issues must be addressed if this initiative is going to succeed?

- Mission critical science must continue
- The coordinated science program needs to address priority common issues (eg. source water quality) and support outcomes (eg. human and ecosystem health)
- Need management structure to set priorities and manage resources for coordinated science
- Need participation of partners/stakeholders in identifying priorities
- Need to identify role for existing coordination groups (CGLRM, GLFC, GLRRIN, GLOS, CMI...)

# A PROPOSED GREAT LAKES WATER SCIENCE FRAMEWORK\*

Clean, safe and secure water for people and ecosystems in the Great Lakes Basin

## Human Health

Citizens have access to safe drinking water, and human health is protected from water quality-related threats

## Ecosystem Health

Aquatic ecosystems and biodiversity are conserved and protected

## Sustainable Use and Economy

Economic, social and environmental benefits accrue to citizens through sustainable and productive use of water resources

## Hazards and Environmental Prediction

Health, safety and socio-economic impacts from floods, droughts and other water-related hazards are minimized

\* Adopted from the Canadian Federal Water Framework

# 4 Themes

## 18 Science Areas

### Human Health

Source Water Protection

Chemical Threats

Microbiological Threats

Water System Security

Climate Change and Weather Impacts

### Ecosystem Health

Chemical Pollutant and Nutrient Impacts

Impacts of Development

Technology, Decision Tools & Information

Biological Threats

Climate Change Impacts

### Sustainable Use

Quantitative Resource Inventories

Water Cycle Models / Forecasting

Aquatic Organisms and Aquatic Habitat

Climate Change Impacts

Socio-Economics

Water Use & Efficiency

### Hazards and Environmental Prediction

Understanding and Predicting Water Events

Protection from Water Events

# Human Health

| Proposed Priorities                | Ocean Science Priorities  | COA  | GLWQA  | GLRC                    | DFO                 | Others              |
|------------------------------------|---|--|--|-------------------------|---------------------|---------------------|
| <u>Human Health</u>                | <u>Human Health</u>   | <u>Human Health</u>  | <u>Human Health</u>  | <u>Human Health</u>     | <u>Human Health</u> | <u>Human Health</u> |
| Source Water Protection            | Sources and Processes contributing to Human Health Risk (Introduction, cycling, fate and effects) | Human health risks from harmful pollutants are understood and addressed  | Population-based studies to determine effects of toxics                            | Source Water Protection | N/A                 | ?                   |
| Chemical Threats                   | Exposure assessment of water based human risk vectors   | Understand the impacts of climate change on the Great Lakes Basin Ecosystem in support of the development of adaptation strategies   | Establishment of action levels to protect human health                             | Recreational exposure   |                     |                     |
| Microbiological Threats            | Socio-economic, human activities introducing risk   | Make significant progress towards the development and implementation of locally-created, science-based source water protection plans to identify and mitigate risks to drinking water sources in the Great Lakes Basin | Contribution of various exposure media to overall human intake of toxic substances |                         |                     |                     |
| Water System Security              | Ocean By-products   |  |  |                         |                     |                     |
| Climate Change and Weather Impacts |   |  |  |                         |                     |                     |

# Ecosystem Health

| Proposed Priorities                      | Ocean Science Priorities   | COA  | GLWQA  | GLRC   | DFO   | Others                  |
|--|--|--|--|--|---|-------------------------|
| <u>Ecosystem Health</u>                  | <u>Ecosystem Health</u>  | <u>Ecosystem Health</u>  | <u>Ecosystem Health</u>  | <u>Ecosystem Health</u>  | <u>Ecosystem Health</u>   | <u>Ecosystem Health</u> |
| Chemical Pollutant and Nutrient Impacts  | Ecosystem Structure and Function to understand natural and anthropogenic stressors | Continue progress toward virtual elimination of PTS<br><br>Reduce other harmful pollutants and initiate a program for managing chemical substances for the Great Lakes Basin | Manage Toxic Pollutants<br><br>Phosphorus control                          | Restoration of Areas of Concern<br><br>Manage Toxic Pollutants                 | Science to support ecosystem based management                           | ?                       |
| Impacts of Development                   | Development of socio-economic assessments  | Enhance knowledge regarding harmful pollutants   | Fate and effects of nutrients and contaminants of dredged materials        | Manage non-point source contributions  | Conservation and protection of fish habitat                             |                         |
| Technology, Decision Tools & Information | Development of Indicators and Metrics  | Understand the impacts of climate change on the Great Lakes Basin Ecosystem in support of the development of adaptation strategies   | Pathways, fate and effects of toxic substances                             | Information and integration tools to support scientifically informed decisions | Tool development for Ecosystem Assessment and prediction.               |                         |
| Biological Threats                       |  | Complete priority actions for delisting and make significant progress towards recovery and restoration   | Impact of non-native species on fish and wildlife populations and habitats |  | Monitoring programs to determine status of food webs and impact of AIS. |                         |
| Climate Change Impacts                   |  | Coordination of monitoring, science and information to facilitate sound decision-making and for reporting progress   |  |  | Prevention, control monitoring and risk assessment of AIS               |                         |

# Hazards and Environmental Prediction

| Proposed<br>Priorities                      | Ocean<br>Science<br>Priorities                          | COA  | GLWQA  | GLRC  | DFO   | Others                                      |
|---|---|--|--|---|---|---|
| <u>Hazards and Environmental Prediction</u> | <u>Hazards and Environmental Prediction</u>             | <u>Hazards and Environmental Prediction</u>  | <u>Hazards and Environmental Prediction</u>  | <u>Hazards and Environmental Prediction</u> | <u>Hazards and Environmental Prediction</u>                                   | <u>Hazards and Environmental Prediction</u> |
| Understanding / Predicting Water Events     | Understanding hazards and Improving forecasts           | Understand the impacts of climate change on the Great Lakes Basin Ecosystem in support of the development of adaptation strategies (provide information on atmospheric hazards and regional atmospheric change impact studies to decision makers and the public) | Effects of varying water levels on pollutant sources, and conservation of wetlands |   | Assessing the impact of climate variability for safe and accessible waterways | ?   |
| Protection from Water Events                | Understanding the response in the environment to events |  |  |   |   |   |
|   | Resilience and resistance to hazards                    |  |  |   |   |   |

# Sustainable Use

| Proposed Priorities                   | Ocean Science Priorities                                 | COA  | GLWQA   | GLRC  | DFO   | Others                 |
|---------------------------------------|--|--|---|---|---|------------------------|
| <u>Sustainable Use</u>                | <u>Sustainable Use</u>                                   | <u>Sustainable Use</u>   | <u>Sustainable Use</u>  | <u>Sustainable Use</u>  | <u>Sustainable Use</u>  | <u>Sustainable Use</u> |
| Quantitative Resource Inventories     | Status and trends of resource abundance and distribution | Encourage and enhance Great Lakes sustainability to achieve social, economic and aquatic ecosystem well-being      | Impacts of water quality and AIS on fish and wildlife populations and habitat     | Aquatic habitat and species management                                | Support for integrated management in the Great Lakes                              | ?                      |
| Water Cycle Models / Forecasting      | Cumulative Impact of Human Activities                    | Conserve and protect aquatic ecosystems, species and genetic diversity of the Great Lakes Basin                    | Control technologies for treatment of effluents, emissions and disposal of wastes | Stop AIS Introductions  | Assess impacts of developments on fish habitat.                                   |                        |
| Aquatic Organisms and Aquatic Habitat | Socio-economic human behaviours                          | Reduce the threat of aquatic invasive species to Great Lakes aquatic ecosystems and species                        |   | Indicators and Information to facilitate sustainable living decisions | Understand and predict the impact of climate variability on fish and fish habitat |                        |
| Climate Change Impacts                | Technology for effective resource management             | Understand the impacts of climate change on the Great Lakes Basin  |   | Sustainable Planning and Management of resources                      | Promote the development of sustainable Aquaculture                                |                        |
| Socio-Economics                       | Ocean/Climate interactions                               | Ecosystem in support of the development of adaptation strategies   |   |   |   |                        |
| Water Use & Efficiency                | Impact of Climate on biogeochemical processes            | Coordination of monitoring, science and information to facilitate sound decision-making and for reporting progress |   |   |   |                        |
|                                       | Climate change Predictions and adaptation                |  |   |   |   |                        |

# BEC Endorsement of Framework

- The Binational Executive Committee endorsed the approach being taken by the binational planning group for the Coordinated Science Initiative, and the draft coordination framework at its meeting in Chicago, April 25-26, 2007.

# Required Action – Framework Completion

- BEC member and observer agencies requested to provide input to Framework, particularly slides 9-12, by May 31.
- BEC members and observers should feel free to share this draft Framework with other partners, and request input as appropriate.

# Required Action - CSI Workshop

- A workshop will be organized for September, targeting science managers as invitees, to complete the Framework and select potential areas for collaborative science. **BEC members and observers are requested to nominate attendees for this workshop.**

# Planning Group Members

- EC: John Carey, John Lawrence, Melanie Neilson, Vi Richardson
- DFO: Scott Millard
- EPA: Paul Horvatin, Carl Richards, Glenn Warren
- NOAA: Steve Brandt, Doran Mason, Hank VanDerploeg
- USGS: Norm Granneman, Leon Carl