June 24, 2015

HPAB Recommendations for the IJC Triennial Assessment of Progress Report

Under Article 7.1 (k) of the Great Lakes Water Quality Agreement, the International Joint Commission has a responsibility for "providing to the Parties, in consultation with the Boards established under Article 8, a triennial "Assessment of Progress Report."

In support of its efforts to develop this Triennial Assessment of Progress (TAP) Report, the Commission has issued a call for advice from its advisory boards working in the Great Lakes to address the following questions:

- How can [the Commission] provide a measureable account of progress relative to the Agreement objectives? What methodologies or approaches would this accounting entail? How would the Commission apply its indicators to the assessment?
- How would this account be different from what is expected in the State of the Lakes reporting?
- How can the account of progress be related to programs and measures?

Human Health Indicators and Agreement Objectives

The Commission has also requested advice on which, if any, of the Agreement Objectives should be identified as requiring in-depth assessment and/or topics for "other advice" to be included in the report. The Health Professionals Advisory Board has considered the question of indicators and Agreement Objectives, and has developed the following topic areas with recommendations for consideration.

In 2014, the HPAB recommended five human health hazard and exposure indicators in its report to the IJC, "Recommended Human Health Indicators for Assessment of Progress on the Great Lakes Water Quality Agreement." The indicators were selected due to their alignment with pathways of risk for human users of the Great Lakes resources and general objectives of the Great Lakes Water Quality Agreement.

While the HPAB report was forwarded to the Parties in 2014, the State of the Lakes Ecosystem Conference also announced Great Lakes Indicators of human health for use in the next State of the Great Lakes report. This report will inform the Progress Report of the Parties (due 2016), which the IJC will review as part of its Triennial Assessment of Progress. The HPAB notes that the Great Lakes Indicators are not equivalent to the human health indicators recommended by the HPAB, as summarized in Table 1 below.

There are differences both between the indicators measured and the approach recommended to address the objectives of the Great Lakes Water Quality Agreement. For instance, SOLEC will report on incidence of contaminants in treated drinking water, while the HPAB recommends reporting on source water quality to enable the IJC to assess the status and vulnerability of the bi-national resource.

Table 1. Indicators of human health proposed by the HPAB compared with expected human health indicators reporting by SOLEC in 2017.

GLWQA General Objectives	SOLEC/Great Lakes Indicators	HPAB Recommended Human Health Indicators
Objective 1: Be a source of safe, high-quality drinking water	**Treated Drinking Water**	**Source of Drinking Water** (Chemical - Atrazine, Estrogenicity, Cyanotoxins; Biological - E. coli, Nitrate, Turbidity)
Objective 2: Allow for swimming and other recreational use, unrestricted by environmental quality concerns	**Beach Advisories**	**Recreational Water Contact** (E. Coli; Pollution via Beach Sanitary or Environmental Health & Safety Surveys)
Objective 3: Allow for human consumption of fish and wildlife unrestricted by concerns due to harmful pollutants	**Contaminants in Edible Fish** (Whole Fish)	**Contaminant Levels in Great Lakes Edible Fish Species** (Edible Portions of Fish)

Recommendations:

1) That the SOLEC/Great Lakes Indicators team include the HPAB Recommended Human Health Indicators in their 2016 Report, Assessment of Progress on the Great Lakes Water Quality Agreement.
2) That the SOLEC/Great Lakes Indicators team review all HPAB Recommended Human Health Indicators, identify issues with the indicators (e.g., validation, feasibility), and initiate dialog with HPAB for resolution as soon as possible.
3) Technology forcing is a strategy that mandates currently unachievable and uneconomic performance standards should be met at some future point in time as part of a regulatory or monitoring framework. The HPAB recommends that for indicators without data, technology forcing be implemented for inclusion of Human Health Indicators as part of Great Lakes monitoring within a 5 – 10 year time frame.
4) The HPAB acknowledges that the importance of the integration of ecosystem and human health in determining well-being. In addition to examining the existing indicators, the HPAB recommends that the SOLEC/Great Lakes Indicators team engage in a ongoing dialog with the HPAB on the adoption of an Ecohealth perspective to connect the health of the Great Lakes ecosystem and its human population.

Other Advice and Recommendations

In addition to the General Objectives of the GLWQA, the HPAB examined the question of how programs and other measures are achieving GLWQA objectives, and has identified recommendations in the following focus areas.

Health Advisory Harmonization

Public Health Advisories that warn for health risks associated with human use of Great Lakes resources should be harmonized for both sides of the border, with attention paid to the needs of First Nation communities.

Recommendations:

1) Health issues of First Nations and tribes whose traditional territories spread across both countries should be specifically addressed. Monitoring approaches and issues of public health advisory need to be coordinated to support their needs and avoid confusion.
2) Indicators and Public Health Advisories should be harmonized, so that the public can understand the health effects of a given indicator (such as PCB contaminants in edible fish portions).

Nutrients

Nutrient loading and cyanobacterial harmful blooms: progress to date has been inadequate, given 2014 bloom activity in the Western Erie Basin, Lake St. Clair and Green Bay of Lake Michigan resulting in economic disruption and health anxiety. Moreover, risks of cyanobacteria blooms and cyanotoxin exposure are likely to rise with climate change.

Recommendations:

1) Reductions in nutrient pollution must continue to be a priority;
2) Identify leading cyanotoxins in Great Lakes, along with increased information on the toxicity of these cyanotoxins.
3) Establish No Observable Effect Levels for cyanotoxins;
4) Conduct research on cyanotoxin removal from drinking water.

Recommendation 2 will be further examined by the HPAB upon receipt of its contracted report, "Cyanobacterial Harmful Algal Blooms and Human Health in the Great Lakes Region." In a related effort, a work plan to examine human health cases attributable to cyanotoxins in data from Poison Control center data will be submitted for Commission approval.

Climate Change, Sustainability and Drinking Water Source Quality

Efforts to reduce carbon emissions have not been sufficient to meaningfully slow anthropogenic climate change. Possible effects of climate change in the Great Lakes Basin Ecosystem effects include increased precipitation and stronger storm events, earlier snow-melt & ice-out, lake warming, and increases in nutrient loading, harmful algal blooms, turbidity and suspended organic matter.

These effects will place additional stress on both potable & waste water treatment and distribution infrastructure. These stresses on water resources are critical to human health in the basin since consuming Great Lakes water is not safe without drinking water treatment. Investments in potable and waste-water treatment infrastructure is not keeping pace with baseline depreciation, much less than for increased stress/demands, and source and finished water quality and quantity may suffer as a result.

In addition to the above impacts of climate change, unsustainable use of ground water resources may also increase demand for basin surface water. For example, the anticipated first request for diversion of water outside the watershed for suburbs of Milwaukee, WI under the Great Lakes Compact was necessitated by unsustainable drawdown of aquifers and subsequent radium contamination of

remaining groundwater. Both consumption and contamination of groundwater for Concentrated Agricultural Feed Operations (CAFOs) may accelerate this demand.

Recommendations:

1) Include focus on waste and drinking water infrastructure in adaptation plans and increase infrastructure investments.
2) Give increased attention to the consequences of unsustainable ground water use on future demand for Great Lakes water and consequences to the ecosystem.

Recreational Water Safety

Climate change, nutrient loading and cyanobacterial blooms may adversely affect safety of swimming water. In most Great Lakes jurisdictions, beach water safety is an elective local program with widely divergent testing schedules, methodologies and advisory practices. Local and state health departments have experienced major budget and staff reductions since 2008. Most current methods of beach testing are labor intensive, typically delayed by days, and may not detect the most significant indicators of human health hazards (e.g., viruses)

Recommendations:

1) Implement faster, less expensive, more sensitive and specific testing methods;
2) Perform uniform testing programs across jurisdictions.
3) Make testing data accessible to researchers.

Human Health and Environmental Data

Human environmental health research is impeded by the lack of comparable and superimposable datasets on human health and environmental exposures around the Great Lakes. Data sets lack sufficient subjects to power smaller area studies, sufficient and comparable geographic, temporal, and demographic detail, and comparability on both sides of border. Health data that represents state or provincial incidence and prevalence is not granular enough for analysis of the Great Lakes Basin.

Recommendations:

1) Greater attention to creating and accessing integrated, granular bi-national health and environmental data;
2) Research novel ways to obtain richer data (e.g. propensity-weighted internet panel surveys; participatory environmental and health monitoring);
3) Network basin local health departments and academics for data gathering and research.

Note that the HPAB expects to submit a work plan related to Recommendation 3 for IJC consideration.

June 24, 2015

Emerging Environmental Contaminants

Toxicity testing of new environmental contaminants is not keeping pace with their introduction. Pharmaceutical and personal care products are becoming significant environmental contaminants in the basin with insufficient knowledge regarding their effects and their environmental fates. Physical characteristics (e.g. nano-particles, microplastics), as opposed to chemical composition, is an increasingly relevant but poorly understood area of concern.

Recommendations:

1) Establish a robust system of research that includes the entire product lifecycle (production, use, disposal, environmental fates);
2) Develop a regulatory framework for toxicity related to physical size.
3) Better coordinate between the environmental monitoring programs on fish and wildlife and human monitoring programs on the choice of target chemicals, e.g. emerging flame retardants and compatibility of data.
4) Conduct integrated spatial and temporal surveys and analysis of levels of legacy persistent organic pollutants such as PCBs by sharing databases on levels in the environment and human tissues.
5) As both countries are signees of the Minamata Convention, there is a need to develop a harmonized approach for biomonitoring of fish/wildlife and human exposure to mercury, under the umbella of the Global Environment Facility of UNEP/WHO.