

The Great Lakes Futures Project

Synthesis Paper Guidelines

Climate Change

For climate drivers, it is important to look at both regional (and finer scale if possible) changes in seasonal as well as annual temperature and precipitation. It is also important to explore historical and projected changes in extreme in both. The paper should also look at some of the proximate, physical effects of those historical and projected changes; for example, in ice cover, lake temperatures, lake levels, and water/sediment/chemical deliver loss from land.

Energy

For energy drivers, it is important to look not only at the overall demand for energy in the Great Lakes region, but also in the historic and projected changes in the mix of energy sources. It will be important to review energy mixes with the most potential impact on the Great Lakes (need for cooling water, on-shore vs. off-shore wind, water demand/quality impacts of biofuels, etc.).

Water as a Resource

For the water as a resource driver, the influence of anthropogenic and natural processes on the quantity of water within the Great Lakes-St. Lawrence Basin should be identified. A review of the types of anthropogenic (e.g., population, jurisdiction, water use types: industrial & domestic, and privatization) and natural (climate change: increased storms, precipitation, dry periods) inputs and withdrawals should be outlined, and the effect of these withdrawals on the Basin identified. The past and present legislation that regulates water withdrawals from the Basin should also be highlighted and the role of changes in water level on the provision of water should be described in light of the proposed future water availability.

Biological and Chemical Contaminants

For contaminant drivers, biological refers to microbes, pathogens, and related taxa, and not to invasive species such as invertebrates, plants and fish. Chemical contaminants include nutrients as well as organic and inorganic pollutants. It is important to explore historical and projected pathways of entry (i.e., land use changes such as urbanization and agriculture), including technological and regulatory changes. The paper should examine effects of substances on receiving water biota and human health. The paper should project trends based on technological pathways in chemical manufacture, management, and regulation, and evolving microbial threats and projected management actions.

Alien Invasive Species

For invasive species drivers, it is important to look at a regional scale and separate the analysis by vectors of entry. It is also important to explore historical and projected regulatory changes for all vectors. The paper should also look at some of the biological, chemical and physical effects of invasive species on ecosystem processes, economically important aquatic and terrestrial communities, and projected movement of invasive species across the basin under future conditions associated with climate change predictions.

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Governance and Geopolitics

For the governance and geopolitics drivers, the relationship between Canada-US and how it relates to the Great Lakes should be described. Points covered should include: How do Canada and the United States organize and act to establish a vision on Great Lakes policy? How do these countries allocate resources when it comes to the Great Lakes? How are goals set and achieved? How are tradeoffs negotiated? It is important to examine actors at the federal, state-provincial and regional/local scales. In addition, the global geopolitical picture should be examined – for example, have the Great Lakes played a role in global geopolitical concerns? If so, how? If not, will access to the Great Lakes become increasingly important to the global community in the future? For example, how will growing consumer demand and access to fresh water in countries like China and India impact the Great Lakes? How will continued migration from these countries impact the Great Lakes – a region that has experienced severe demographic declines over the past 40 years, but, one that also has the infrastructure to accommodate population increases? What factors (disputes, terrorism, etc.) would jeopardize the water availability?

Demographic Change and Societal Values

For the demographic change and societal values drivers, various aspects of demographic and societal value changes within the Basin should be examined. For example, how will bi-national population growth at the national, state-provincial and regional scales impact the Great Lakes region? Where will population growth be distributed – nationally, but also at the regional Great Lakes scale? What will be the composition of that population (e.g., immigrant versus non-immigrant to discern emerging changes in societal values)? What about age trends in the Great Lakes region? In addition, the future of the “smart growth” and sustainability movements may have an impact on the Great Lakes. What policy initiatives are in place that check sprawl? What are the land use patterns around the Great Lakes? What legal issues surround land development in Great Lakes metro regions?

The Economy

For the economy driver, it should be illustrated how changes in global, continental and regional economies impact the Great Lakes. This synthesis paper should summarize economic indicators and trends, and offer reasonable projections into the future in areas such as sector-specific (manufacturing, agriculture, services) economic growth (GDP, GMP); export intensity and supply chains between Canada and the US; infrastructure investment and transportation (road, sea, rail) system trends; sectors attracting private capital (e.g., clean economy); sector evolution in dominant regional markets; employment; wages; occupational change; energy prices; and industrial production, among other possibilities.