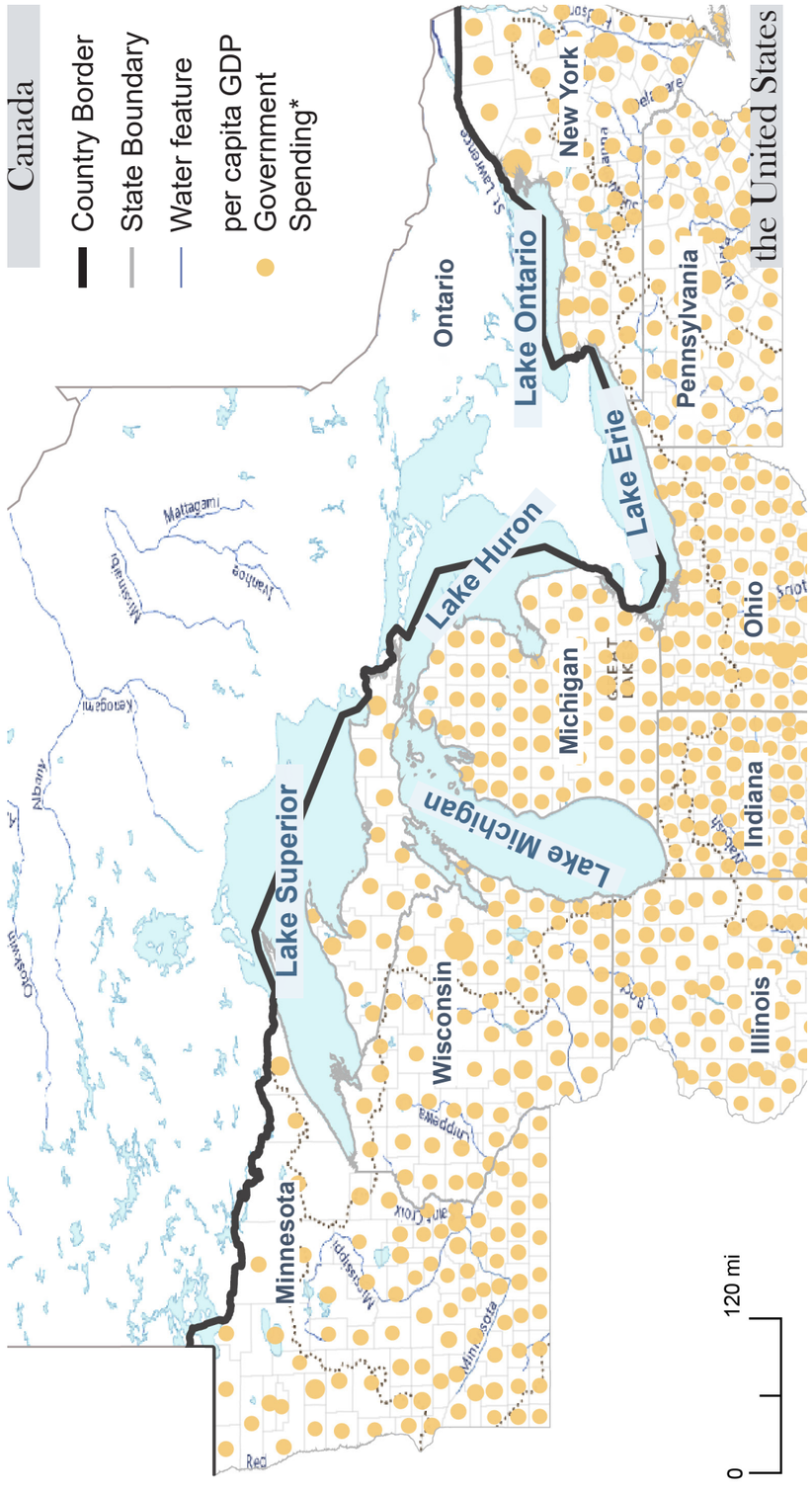
Political and Hydrological Map of the Great Lakes Region



*Note: The graduated symbols show U.S. per capita current dollar GDP from government spending by County in 2015, as a source of political feature signalling local governments' potential interest in investing in flood inundation and planning

To: Elected Officials in the Great Lakes Region

Policy Brief

Creation of a Flood Inundation Modeling and Planning Center in the Great Lakes Region

Climate change is expected to affect water levels of not only coastal but also inland waters, as changing precipitation and outdated infrastructure have already led to alarming cases in the Great Lakes Region. However, research on riverine and lake flooding are not as prevalent as research on coastal flooding, especially at the regional and local level. Establishing a regional Flood Inundation Modeling & Planning Center (FIMPC) will be a necessary way to strengthen flood resiliency of all communities in the region, which include the Canadian province of Ontario and U.S. states of Michigan, Wisconsin, Minnesota, Illinois, Indiana, Ohio, Pennsylvania, and New York.

Scientific Research

All of the Great Lakes have hit record high levels in the past three years. Facing challenges as such, the center will have scientists and professionals working with communities to mitigate flood challenges and manage water resources. To predict disasters, scientists will develop carefully calibrated flood inundation models which utilize tools and data to estimate the extent of flood events and identify at-risk areas. These data are hydraulic and topographic, including updated locations of streams, detailed ground-surface elevation, water level, weather condition, in addition to the conventional past events. Most of these datasets or tools, such as piezometer to measure water level, are already in place or easy to access. After multiple rounds of testing and improvements, the model will deliver more accurate outcomes and a wider range of flooding scenarios.

Professional Planning

Meanwhile, professionals will help communities prepare resources in advance, through planning efforts such as establishing floodplain zones, building rules, and flood insurance. These will be done with assistance of shared data on emergency shelters, existing infrastructure, and sociodemographic profile throughout the region. They are also tasked to assist local officials in understanding the flood maps and assuming the costs associated with plan implementation. On a cloud server, technical resources will be shared to local experts, while digestible results such as interactive maps and explanatory videos will be made available to the public.

Political Context

Although the Great Lakes influence some communities more than others, the water should be managed as a system because any engineered intervention will have myriad ecological impacts and unintended consequences. To prevent shortsightedness, it is important for the local communities to have FIMPC as a bridge for resource and data sharing, even though there are political barriers standing in the way. This may cause confusion in responsibilities, create dispute in revenue and spending, or challenge those benefitting from the status quo, for different government bodies of the two countries. As shown on the map, counties have different patterns in government spending and thus different willingness to support FIMPC. Local authorities are usually reluctant to designate risk zones as they may hurt development and property values. Sometimes, there might be derailed or even mis-adaption of policies under economic, social, and political pressures. Fortunately, a lot of these issues could be alleviated with FIMPC being an intergovernmental regional center. Motivated by public rather than political interest, scientists and professionals will work with local authorities to avoid externalities and ensure that policies are efficiently executed.

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