GREAT LAKES AND ST. LAWRENCE
CITIES INITIATIVE
L'ALLIANCE DES VILLES
DES GRANDS LACS ET DU SAINT-LAURENT

Final Recommendations for Improving Municipal Coastal Resilience Across the Great Lakes and St. Lawrence River Basin

MAYORS ADVISORY COUNCIL
ON COASTAL RESILIENCE
April 2022

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GREAT LAKES AND ST. LAWRENCE CITIES INITIATIVE
L'ALLIANCE DES VILLES DES GRANDS LACS ET DU SAINT-LAURENT

Message from Advisory Council Co-Chairs

Dear Great Lakes and St. Lawrence Coastal Leaders and Stakeholders,

As coastal mayors, we understand the critical importance of freshwater resources to the social, environmental and economic vitality of our communities. Our shorelines are a part of our community's DNA and define who we are. Unfortunately, these important spaces are increasingly under threat from climate change and other forces.

In recent years, our communities have struggled to respond to increasingly hazardous coastal conditions, including flooding and erosion from high water levels and severe storm events. These experiences are driving us to seek out better solutions to address coastal resilience that are collaborative, comprehensive and actionable. We need solutions that are developed to compliment and work with natural coastal processes, rather than against them. As frontline leaders, this is our call to action to enhance coastal resilience across the basin so that our communities can ensure the future stability of these important spaces that connect our communities with the Great Lakes and St. Lawrence River.

In February 2021, we convened as a binational Mayors Advisory Council on Coastal Resilience. The aim of the Advisory Council was to better understand the most pressing coastal resilience needs facing the basin's shoreline communities and develop an informed and cohesive long-term response to coastal challenges. Over the past year, mayors, elected officials, academics and other coastal leaders from across the basin have explored the impacts of shoreline erosion, coastal flooding and lake-level variability to identify and prioritize actions that will help improve our collective coastal resilience. The culmination of this hard work is a suite of recommendations, as outlined in this report, that will guide us toward greater resilience to the threats posed by changing coastal conditions.

In developing these recommendations, our group benefitted from a great deal of learning, relationship building and momentum that will carry this important work forward into the next year. We want to thank each of the Advisory Council members, contributors, presenters, and Cities Initiative staff for their dedication and support throughout this process. Without their input and insights, the Advisory Council could not have generated the body of work that it has over the past year. Looking ahead, as we pass the roles of Co-Chairs to our successors, we know Advisory Council members are eager to continue working to advance these recommendations and building relationships with other stakeholders and thought leaders in this space.

Sincerely,

Brian Saunderson
Mayor, Collingwood, Ontario
Canadian Co-Chair, Mayors Advisory Council on Coastal Resilience

Jim Carruthers
Former Mayor, Traverse City, Michigan
U.S. Co-Chair, Mayors Advisory Council on Coastal Resilience

Advisory Council Recommendations – Executive Summary

The following recommendations are an abridged version of those developed by the Mayors Advisory Council on Coastal Resilience in 2021. Please see the following detailed report for the full recommendations and more background on the Advisory Council.

Binational Recommendations

1. Maintain the Mayors Advisory Council on Coastal Resilience through continued meetings and a clear outline of priorities for the next year.
2. Leverage high-visibility web platforms to promote existing collections of resources and expert networks that offer support around nature-based solutions.
3. Conduct an annual survey to track coastal resilience trends and contribute to an ongoing study of municipal needs to address this issue.
4. Continue exploring opportunities for public-private collaboration around coastal resilience solutions to identify specific actions that can be taken to advance more united and comprehensive strategies.

Canadian Recommendations

1. Make coastal resilience a core priority for federal government actions on climate adaptation, infrastructure funding and science and research.
2. Invest $1 billion in federal funding to accelerate the development of regional shoreline adaptation plans and support the creation of a joint Office of Shoreline Climate Change Adaptation and Resilience, in partnership with Ontario and Quebec governments.
3. Advance a green infrastructure Centre of Excellence at Infrastructure Canada to improve access to practical advice and best practices around nature-based and hybrid solutions.
4. Carefully identify current data and information gaps that could help municipalities address coastal resilience issues with support from the federal and provincial governments.
5. Identify knowledge gaps for municipalities, Indigenous communities and other key actors that act as barriers to better integrating social, environmental and economic considerations in decision-making around coastal resilience issues.

U.S. Recommendations

1. Improve coastal coordination and cohesion through the organization or enhancement of formal coastal resilience hubs deployed at a sub-regional scale to ensure appropriate resources, technical support, and networks are accessible to municipalities.
2. Guide municipal engagement in the U.S. Army Corps of Engineers' (USACE) Great Lakes Coastal Resiliency Study, utilizing the Great Lakes and St. Lawrence Cities Initiative member network to ensure that study results are scalable to local solutions, fill data gaps, and respond effectively to needs facing coastal municipalities.
3. Advocate for the removal of barriers within existing federal funding programs to ensure municipalities can access critical funds for shoreline resilience efforts.
4. Expand capacity for municipalities to apply for federal funds and boost the competitiveness of Great Lakes and St. Lawrence municipalities in selection processes.
5. Help municipalities grow diverse and innovative financing portfolios to advance coastal resilience efforts.

Defining Coastal Resilience in the Great Lakes and St. Lawrence River Basin

Water levels across the Great Lakes and St. Lawrence River Basin are naturally variable, with cyclical highs and lows. However, climate change is exacerbating these fluctuations, leading to record high water levels in recent years. When paired with severe storm events and wave action, high water levels are leading to greater erosion and flooding events along the coasts. These challenges threaten public and private properties, critical infrastructure, and recreation and tourism assets and opportunities. Importantly, municipalities are on the frontlines of addressing these urgent issues and becoming more resilient to coastal changes.

In the context of this report, coastal resilience refers to impacts from varying water levels and storm events across the Great Lakes and St. Lawrence River basin, including associated damages to retention walls, city facilities, public recreation areas and park land, docks, public boating facilities, water and sewage facilities located on the coastline, harbors, beaches, and other assets and resources in shoreline areas.

Mayoral Response to Municipal Coastal Resilience Challenges

In response to a growing need by coastal municipalities to plan for and respond to high water levels and associated hazards, the Great Lakes and St. Lawrence Cities Initiative (Cities Initiative) formed the Mayors Advisory Council on Coastal Resilience (Advisory Council) in February 2021. The initial purpose of the Advisory Council was to explore and recommend actions to respond to coastal needs, while also strengthening the ability of municipal governments to address current damages and future risks. Led by mayors, and in partnership with a number of public, private, nonprofit and academic partners, the Advisory Council met monthly over the first year to learn about a range of associated issues from experts in the field, document coastal needs from the perspective of municipalities, and ultimately organized these into a summary of the greatest needs facing shoreline municipalities (See Appendix I).

Understanding Municipal Coastal Resilience Needs

2021 Coastal Resilience Needs Assessment Survey

In tandem with the Advisory Council, the Cities Initiative conducted a Coastal Resilience Needs Assessment Survey in partnership with the University of Illinois Applied Research Institute in spring 2021. The survey received nearly 300 responses from approximately 250 jurisdictions across all eight U.S. states and the two Canadian provinces that border the Great Lakes and St. Lawrence River. The intent of the survey was to better understand the context in which local communities are experiencing, responding to, and planning for coastal resilience challenges.

Preliminary analysis of the survey results revealed that most (95%) respondents were highly or moderately concerned about coastal issues facing their community with erosion, flooding and high water levels of greatest concern (See Appendix II). However, the survey found that very few respondents (27%) had a high knowledge of coastal issues, and even fewer (11%) had the capacity to actually respond to coastal challenges.

With this in mind, only half of respondents indicated that their jurisdiction is incorporating strategies to anticipate, accommodate and adapt to changing coastal conditions in their planning efforts. Respondents noted that funding and government support was highly important to their efforts, although it was clear that current support and funding are not fully meeting the needs of coastal communities. Finally, respondents across the U.S. and Canada projected a combined investment of $2.8 billion (CAD)/$2.2 billion (USD) over the next five years to address coastal resilience challenges. This likely represents a fraction of the true need as not all shoreline jurisdictions are reflected in this figure.

Summarizing Municipal Coastal Resilience Needs

Building off of the Coastal Resilience Needs Assessment Survey, the Mayors Advisory Council on Coastal Resilience produced a high-level summary of coastal needs facing municipalities (See Appendix III). Expanding on survey findings, the Advisory Council identified four thematic categories surrounding municipal coastal resilience needs:

- Coordinated planning and comprehensive solutions – Coastal planning and response needs to be more coordinated across larger stretches of shoreline and more collaborative between different public and private entities. Additionally, solutions need to prioritize nature-based approaches and place a greater emphasis on planning for long-term resilience to changing coastal conditions.
- Broad engagement and strategic education – Frontline responders, including both municipalities and private property owners, need greater access to and awareness of coastal resources and support, including strategic education around nature-based solutions.
- Operational tools and complete data – Relevant data and tools need to be accessible to municipalities and should fill critical data gaps that inform coastal decision-making. Guidance for best practices for coastal resilience in the basin also needs to be further developed.
- Supportive and accessible funding – Funding needs to better serve coastal municipalities by reducing barriers and improving accessibility to critical funding sources, including minimizing cost-share requirements. Funding sources also need to be expanded to provide support for different phases of work and collaboration.

Developing Recommendations for Coastal Resilience

In fall 2021, the Advisory Council began developing a suite of binational, U.S. and Canadian recommendations for strengthening coastal resilience that leveraged findings from the 2021 Coastal Resilience Needs Assessment Survey and reflected coastal resilience needs and lessons learned from the Advisory Council's monthly meetings. This process would ensure that recommendations responded directly to needs identified by coastal municipalities. Recommendation development was driven by U.S. and Canadian subcommittees and underwent a rigorous process of feedback and refinement multiple times before being approved by the Cities Initiative Board of Directors in March 2022. The Advisory Council also worked with a number of trusted state, provincial and federal partners on both sides of the border to ensure final recommendations would be feasible and have the most impact.

Full Recommendations

The following includes detailed recommendations developed by the Mayors Advisory Council on Coastal Resilience, including background context for each. Recommendations are organized in three categories: binational, U.S and Canada.

Binational Recommendations

1. Maintain the Mayors Advisory Council on Coastal Resilience through continued meetings and with an outline of clear priorities for the next year. The Advisory Council's upcoming work should be dedicated to developing action plans for the recommendations outlined in this report and assigning leadership around next steps.

   The Mayors Advisory Council on Coastal Resilience concluded its first year of operation in February 2022 with the presentation of its recommendations to the Cities Initiative's Board of Directors for approval. After a year of developing relationships, exploring coastal needs and developing solutions, the Advisory Council is in a position to advance action and outcomes on its recommendations and other associated activities.

2. Leverage high-visibility web platforms to promote existing collections of resources and expert networks around nature-based solutions.

   Coastal leaders are often overwhelmed by the range of information available to support their decision-making around nature-based solutions, with resources being housed under multiple organizations and in different locations. Some efforts exist to compile resources in one location, but none have become the 'go-to' source for information. The Cities Initiative and other boundary organizations can better advertise existing resources and information libraries while focusing on information that targets a municipal audience and their local partners. The Cities Initiative can also leverage ongoing research conducted by graduate students at the University of Michigan to propose next steps for improving resource sharing and navigation around nature-based solutions.

3. Conduct an annual survey to track coastal resilience trends and contribute to ongoing study of municipal needs.

   In spring 2021, the Cities Initiative disseminated a Coastal Resilience Needs Assessment Survey in partnership with the University of Illinois Applied Research Institute to better understand resiliency challenges facing coastal municipalities across the Great Lakes and St. Lawrence River basin. Results from the survey allowed the organization, and others in the field, to guide policy and programming that directly support the needs of municipalities. The Cities Initiative should continue to conduct an annual survey aimed at tracking trends and identifying emerging needs and challenges related to coastal resilience and associated issues. Additionally, assessing financial needs for coastal response efforts has proven to be useful in advocating for greater investment and financial support around coastal and climate resilience challenges.

   Survey dissemination could continue to include municipal partners (e.g. Conservation Authorities in Ontario and municipal leagues in the states) and could be expanded to include other organizations working in this field to further refine the community's understanding of coastal resilience needs in the Great Lakes and St. Lawrence River basin.

4. Continue exploring opportunities for public-private collaboration around coastal resilience solutions to identify specific actions that can be taken to advance more united and comprehensive coastal resilience strategies. Formal exploration includes forming a subcommittee within the Mayors Advisory Council on Coastal Resilience and researching case studies of successful public-private programs.

Historically, public and private entities have not typically worked together to resolve coastal resilience issues, with many efforts occurring in a disjointed and uncoordinated fashion. With a large portion of the Great Lakes and St. Lawrence River shorelines being privately owned, municipalities can no longer dismiss the potential for public-private partnerships or the need to engage with private landowners. They should instead aim to advance a common agenda along the coasts.

Failure to collaborate effectively could result in reduced effectiveness of intervention measures and greater costs to mitigate shoreline hazards. However, there are limited resources available to help guide public-private collaboration around coastal solutions and few examples exist. To combat these issues, it will be critical for municipalities on both sides of the border to identify successful examples and work with senior levels of government and binational organizations to establish programs and resources to improve and guide collaboration and coordination with private entities and landowners.

Canadian Recommendations

1. Make coastal resilience a core priority for federal government actions on climate adaptation, infrastructure funding and science and research. Coastal resilience should be included in the mandate of the new Canada Water Agency, be a key focus of the National Adaptation Strategy and be included in the scope of Environment and Climate Change Canada's upcoming climate data strategy development.

Given the significant environmental and economic risks associated with increased water level variability and significant erosion and flooding, the federal government must play a leadership role in the development of science and data tools, policies and programs to address climate resiliency issues faced by coastal communities across Canada, with a particular focus on the Great Lakes and St. Lawrence River basin. Numerous federal commitments made in the mandate letters provided to Cabinet ministers in December 2021 outline priorities that could directly support coastal communities in the Great Lakes and St. Lawrence River basin in adapting their shorelines to the impacts of climate change. Increased funding for coastal infrastructure will also be critical to address given that Great Lakes and St. Lawrence River basin are planning investments in the magnitude of $2.8 billion (CAD)/$2.2 billion (USD) in the next five years, based on the Cities Initiative 2021 Coastal Needs Assessment Survey.

The Canada Water Agency can and should play a role in helping communities better understand

the processes underpinning the impacts on coastal infrastructure, as erosion and flooding can have significant impacts on water quality. The government's National Adaptation Strategy and impending development of a climate data strategy can further support communities' ability to plan their coastlines in a sound, science-based way to protect their shorelines for the long term and invest in the right solutions. That is why the federal government should consult with Great Lakes and St. Lawrence River basin communities, including the Cities Initiative, to further understand and address the challenges highlighted by the Advisory Council. Moreover, the Advisory Council's recommendation for greater federal leadership also reflect recommendations put forward by the Great Lakes and St. Lawrence Collaborative in their *Action Plan to Protect the Great Lakes and St. Lawrence 2020-2030 (Action Plan 2020-2030).*

2. Invest $1 billion to create a joint Office of Shoreline Climate Change Adaptation and Resilience between the federal, Ontario and Quebec governments, in consultation with municipalities, municipal partners and Indigenous communities. This Office would support the development of, and funding for regional shoreline and adaptation action plans and projects, as well providing professional services and expertise to regional and local governments and Indigenous communities.

Municipalities and municipal partners (e.g., Conservation Authorities) are tasked with sorting through a range of programs in different departments and at various levels of government in order to fund coastal resilience plans and implementation projects, where funding for such activities is even available (i.e., there is little funding available to assist municipalities in project planning). Moreover, there is currently little to no coordination to proactively remediate an issue that will cost Canadian communities billions of dollars to address, with no dedicated funding or programs for coastal communities along the Great Lakes and St. Lawrence River. Differing priorities among jurisdictions could also potentially slow the roll-out of funding to support coastal resilience projects.

Dedicated funding to support shoreline management planning will allow communities and senior levels of government to better assess a range of options to address coastal resilience issues. A call for greater federal and provincial coordination was included in Action Plan 2020-2030 recommendations, including the establishment of the joint Office of Shoreline Climate Change Adaptation and Resilience and the development of regional coastal resiliency plans. A fully-funded Office could facilitate coordination to fund and develop these regional plans along with other relevant projects, such as updating technical guidelines to inform municipal development planning and associated funding needs for recommended infrastructure solutions.

3. Advance a green infrastructure Centre of Excellence at Infrastructure Canada for municipalities and other stakeholders to access practical advice, updated technical guidelines and best practices around nature-based and hybrid solutions that help address shoreline resilience.

The federal government is promoting the enhanced use of nature-based solutions in infrastructure projects, such as the new Natural Infrastructure Fund announced in Canada's 2021 Budget. Funding for these types of solutions is welcomed by

municipalities. However, existing resources related to best practices for resilient shoreline management, specifically around nature-based solutions, are limited and lack the nuance to support decision-making at a municipal or regional scale. Additionally, these resources don't consider how to assess if, and when, a nature-based solution should be implemented, with even greater concern around zones with hardened shoreline, hazardous areas (e.g., bluffs) and dense development. Furthermore, smaller municipalities generally do not have access to the same level of technical knowledge or financial resources to cost-share projects, particularly those that are considered "risky" because they employ novel solutions or technologies.

A range of organizations and resources, such as Conservation Authorities and the Coastal Zone Canada Association's Community of Practice on Living Shorelines and Nature-based Solutions, do provide important resources for knowledge-building and should be consulted by municipalities. Despite those tools, the federal government must play a leadership role in developing stakeholder knowledge to boost the uptake of these types of solutions. A Centre of Excellence housed within Infrastructure Canada and developed in consultation with Environment and Climate Change Canada and Natural Resources Canada, along with nongovernmental experts in the field and the private sector, could help make Canada a global leader in green infrastructure, while supporting local needs for technical knowledge.

4. Identify current data and information gaps that could help municipalities address coastal resilience issues and provide targeted timelines for completion through a federal-provincial audit of currently available data and information products.

Critical data sets lay the foundation for developing resources to help municipalities and other stakeholders address coastal resilience issues. Therefore, it is important that the quality and availability of data be up-to-date and made available to municipalities to use in their decision-making. Municipalities and municipal partners (e.g., Conservation Authorities) have access to a range of data to assist in decision-making which is being used, yet persistent data gaps have been identified by Advisory Council members.

A whole range of government ministries and agencies among all three levels of government, along with para- and non-governmental actors (e.g., Conservation Authorities, universities, insurers, etc.) collect data and produce information, such as mapping and erosion rates, that could assist decision-makers. Persistent issues around that information's discoverability (i.e., where to find it) and accessibility (i.e., how to access it electronically), however, have been frequently raised by Advisory Council members.

A coordinated assessment of the data and information needs that would help municipalities address coastal resilience issues, led by the federal government, along with the gaps in finding or accessing that data, would assist stakeholders in taking the necessary steps to appropriately plan for the future and ensure adequate adaptation

measures are taken. The mandate commitment to develop a climate data strategy presents a great opportunity to address this issue. The Canada Water Agency could also play a key role in this respect. Municipalities and provincial governments likewise have a role to play by ensuring that they are adequately funding their operations and partners, like Conservation Authorities, to complete their work.

5. Identify knowledge gaps among municipal staff, municipal partners (e.g., Conservation Authorities), Indigenous communities and other key actors (e.g., public works contractors) around coastal resilience issues to better integrate engineering, water sciences, conservation, urban planning and equity considerations, among others. Once gaps have been identified, develop, offer and promote multidisciplinary programs that offer rapid skills training programs (e.g., micro-credentialing) for current employees and curricula to train current and future post-secondary students to develop the coastal planning and water workforce of the future.

   Municipalities are on the front lines of addressing coastal resilience challenges. However, staff are often not equipped with the knowledge and skills to handle such complex and dynamic shoreline issues. As science and community needs evolve, it is critical that post-secondary institutions embrace specialized and continuing education programs to boost municipal workforce knowledge and skills.

   There are also opportunities to train the municipal workforce of the future by equipping post-secondary students with skills around coastal resilience preparation and climate change adaptation in an integrated manner. Given the significant public and private sector investments and technical knowledge that will be necessary over the coming decades to implement climate adaptive solutions, post-secondary and research institutions will have a key role to play to ensure that municipalities have a workforce to address coastal resilience issues. Better integrating workers and students from marginalized communities into this field will also be important to help include a more diverse array of perspectives into coastal resilience work and bolster inclusion and equity.

U.S. Recommendations

1. Improve coastal coordination and cohesion through the organization or enhancement of formal coastal resilience hubs deployed at a sub-regional scale to ensure appropriate resources, technical support, and networks are accessible to municipalities. Hubs will include collaboration between state, sub-regional, and local partners. Where coastal leadership is already gaining traction, existing efforts will be amplified and communicated to municipalities. Where efforts are unclear, key coastal partners will be identified and engaged to explore leadership possibilities. With increased funding and capacity, hubs could be led by Sea Grant programs or state Coastal Management Programs, and in collaboration with Councils of Government., regional commissions, and similar bodies.

   Across the basin, coastal resilience coordination varies with some locations having established formal networks to coordinate coastal strategies and actions. Current efforts to prepare for and respond

to coastal resilience challenges are often fragmented and localized to individual properties, with cities and private property owners on the front lines confronting repercussions from current structures. In addition, the level of preparedness and ability to respond to coastal resilience challenges likely varies between communities. Communities will benefit from greater coordination on a sub-regional scale to advance cohesive and effective solutions that span greater stretches of coastline, in some cases crossing municipal/county boundaries, and result in long-term resilience to coastal hazards. Local communities also will benefit from greater collaboration across varying levels of government (i.e., local, state, federal) that are responsible for administering resources and technical support to municipalities. Sub-regional coastal resilience hubs will allow for multi-scale action and collective impact that ensure local governments are responding to, planning and preparing for current and future coastal challenges (e.g., resilience planning, accessing funds, project development and implementation, etc.). Stronger leadership structures and network connectivity will enhance capacity and facilitate greater collective action and strategic direction for coastal resilience activities. It is also apparent that funding is typically project-oriented and this recommendation may require advocacy for funding for leadership structures that help sustain cohesion around coastal resilience efforts.

2. Guide municipal engagement in the U.S. Army Corps of Engineers' (USACE) Great Lakes Coastal Resiliency Study, utilizing the Great Lakes and St. Lawrence Cities Initiative member network to ensure that study results are scalable to local solutions, fill data gaps, and respond effectively to needs facing coastal municipalities.

   The Great Lakes Coastal Resiliency Study has had a slow start, but new movement provides promise for accelerated progress. USACE does plan to engage coastal stakeholders, including municipalities, in their study; however, there is opportunity to recommend best approaches for engaging local stakeholders in this process. The Great Lakes Coastal Resiliency Study is a prime opportunity to fill critical data gaps that can be utilized by municipalities to advance more comprehensive solutions to coastal resilience challenges. Additionally, there may be opportunities to encourage the release of interim products as the study progresses while also encouraging results that are easy for municipal staff to comprehend and interact with. Thorough engagement with municipalities will ensure that study results are relevant and utilized, making the most out of federal funding dedicated to the study.

3. Advocate for the removal of barriers within existing federal funding programs to ensure municipalities can access critical funds for shoreline resilience efforts. Specific barriers to address include cost-share requirements; equity considerations; expanding the types of funding available; and identifying and advocating for best routes and structures for distributing major upcoming federal funding opportunities.

   Existing federal funding sources, including key resilience programs through FEMA, still hold a wide range of barriers that limit access for municipalities.

It is critical that federal agencies remove barriers to accessing their programs through a number of methods. First, agencies should increase technical assistance for critical programs such as the STORM Act and BRIC programs, with an emphasis on supporting communities with limited resources and capacity to address coastal risks and vulnerabilities. It will be critical for funding programs to limit the burden of cost-share requirements that prohibit some municipalities from accessing funds. Additionally, agencies must continue to expand funding opportunities to support long-term planning and mitigation efforts, which require greater up-front investment, over short-term solutions. With additional funding being allocated to federal agencies for resilience efforts, it is critical that new programs consider these existing barriers while also developing equitable selection criteria that prioritize communities with the greatest need.

4. Expand capacity for municipalities to apply for federal funds and boost the competitiveness of Great Lakes and St. Lawrence municipalities in selection processes. Develop support resources to improve the ability for municipalities to navigate federal funding programs and apply for funds.

When applying for federal funding, municipalities often lack the resources and capacity to navigate demanding application processes. Additionally, many municipalities are not prepared to apply for programs and do not meet certain requirements to remain competitive. For example, municipalities must have updated hazard mitigation plans to be eligible for BRIC funds, but updates are costly and time intensive. It is crucial to advance greater engagement with and support for municipalities in their funding efforts, potentially through targeted workshops developed in partnership with federal agencies.

5. Help municipalities grow diverse financing portfolios to advance coastal resilience efforts. Portfolios should include innovative and sustainable financing mechanisms that provide long-term security, while also continuing to pursue other one-time funding awards (i.e., federal, philanthropic, etc.).

Municipalities often rely on intermittent funding sources from the federal government and philanthropic organizations. While helpful when received, these sources do not provide a long-term, sustainable and reliable source of funding for high-cost resilience needs that will persist over long periods of time. Innovative financing mechanisms could include establishing a Great Lakes revolving loan fund or exploring a coastal utility, similar to stormwater utilities. Establishing a wider portfolio of funding and financing mechanisms to sustain coastal resilience efforts will enable Great Lakes communities to better manage long-term coastal resilience challenges.

Next Steps for Developing Action Plans

The Advisory Council will continue to meet through 2022 to develop action plans to advance progress on the recommendations outlined in this report. More specifically, the Advisory Council will launch working groups to develop action plans around specific elements identified in the recommendations (e.g., funding challenges).

In addition, Advisory Council members will continue to invite participation by regional partners to further refine next steps and continue to identify viable solutions to complex problems. Advisory Council members will also participate in meetings with officials from senior levels of government to present the recommendations outlined and garner support for action where federal and provincial/state actors are called upon to respond.

A progress report will be presented in 2023 to update the Cities Initiative's members and other interested stakeholders on the steps taken by the Advisory Council in 2022 to implement recommendations and related successes.

For more information on the Great Lakes and St. Lawrence Cities Initiative please visit glslcities.org.

Contributors

We'd like to thank and recognize all those who made this work possible.

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Great Lakes Commission

Michigan Department of Environment, Great Lakes, and Energy – *Coastal Management Program*

National Oceanic and Atmospheric Administration Sea Grant Program

National Oceanic and Atmospheric Administration Office for Coastal Management

Ontario Ministry of Environment, Conservation and Parks

Quebec Ministry of Environment and the Fight Against Climate Change

The Nature Conservancy

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APPENDIX I:

Timeline of Meetings and Development of Recommendations by the Mayors Advisory Council on Coastal Resilience

February 9, 2021 – Inaugural Meeting

Introductions by Advisory Council Co-Chairs and Cities Initiative staff

Approval of the Advisory Council mandate and review of schedule and anticipated outcomes

March 24, 2021 – Community and Geoscience Perspectives on Coastal Erosion and Climate Change Impacts

Presentations by:

Dr. John W. Johnston, Professor, University of Waterloo, Earth and Environmental Sciences

Dr. Liette Vasseur, Professor, Brock University, Department of Biological Sciences

April 28, 2021 – Perspectives on Regional Policy Development and Collaboration for Coastal Resilience

Presentations by:

Pierre Béland, Canadian Chair and Commissioner, International Joint Commission

Nick Zager, Chief of Planning, Detroit District, U.S. Army Corps of Engineers

Bonnie Fox, Policy and Planning Director, Conservation Ontario

Breakout discussions on programs and policies influencing coastal resilience

May 19, 2021 – Future Impacts of Climate Change on the Great Lakes Over the Next 30 Years

Presentations by:

Dr. Donald J. Wuebbles, Professor of Atmospheric Science, University of Illinois

Shanna Draheim, Director, Policy Research Labs, Michigan Municipal League

Evaluation of coastal needs – Focus group
Facilitated by: Dr. Ann Witmer, Professor, University of Illinois

June 30, 2021 – Coastal Needs and Priorities

Presentations by:

Heather Stirratt, Great Lakes Regional Lead, Office for Coastal Management, NOAA

Alex Timmons, University of Illinois

Breakout discussions on coastal needs assessment survey and results

July 28, 2021 – Coastal Needs and Priorities

Finalized the summary of coastal needs and priorities

Discussion held on private property approaches to coastal impacts to private property (resolution put forward by the Village of Sodus Point, NY)

continued

August 25, 2021 – Interim Report at the Cities Initiative Virtual Annual Meeting

Presentations by:

Brian Saunderson (Co-Chair), Mayor, Town of Collingwood, ON & Board Member, Great Lakes and St. Lawrence Cities Initiative

Jim Carruthers (Co-Chair), Former Mayor, Traverse City, MI

Clare Latimer, Councillor, Municipality of Chatham-Kent, ON & Board Member (Representative), Great Lakes and St. Lawrence Cities Initiative

Shaun Collier, Mayor, Ajax, ON & Board Member, Great Lakes and St. Lawrence Cities Initiative

Gino Moretti, Mayor, Saint-Anicet, QC & Board Member, Great Lakes and St. Lawrence Cities Initiative

Dr. Ann Witmer, Lecturer / Research Scientist, University of Illinois

Alex Timmons, Research Engineer,University of Illinois

September 30, 2021 – Understanding Nature-Based Solutions

Presentations by:

Peter Zuzek, President, Zuzek Inc.

Dr. Jim Wasley, Professor, Department of Architecture, University of Wisconsin-Milwaukee

October 28, 2021 – Understanding Approaches to Coastal Planning and Zoning

Presentations by:

Perry Sisson, P.Eng., Director, Engineering and Field Operations, Central Lake Ontario Conservation Authority

Dr. Richard Norton, Professor of Urban and Regional Planning Program, Program in the Environment, University of Michigan

Breakout discussions and report out on strategies for coastal planning solutions

November 18, 2021 – Coastal Collaboration with Private Property Owners

Presentations by:

Allison Lukacsy-Love, Director of Planning and Development, City of Euclid

Erinn Lawrie, Executive Director, Lake Huron Centre for Coastal Conservation

Mary Austerman, Great Lakes Coastal Community Development Specialist & Roy Widrig, Great Lakes Coastal Processes and Hazards Specialist, New York Sea Grant

December 16, 2021 – Review of 1st Draft Recommendations

Review of binational recommendations

Breakout discussion – National recommendations (U.S. and Canada)

continued

January 13, 2022 – Review of 2nd Draft of Recommendations

Review of binational recommendations

Breakout discussion —
National recommendations (U.S. and Canada)

February 9, 2022 – Presentation of Recommendations by Advisory Council Members to the Board and Membership

Presentations by:

Brian Saunderson, Mayor, Town of Collingwood, ON & Board Member, Great Lakes and St. Lawrence Cities Initiative

Clare Latimer, Councillor, Municipality of Chatham-Kent, ON & Board Member (Representative), Great Lakes and St. Lawrence Cities Initiative

Sandra Easton, Mayor, Town of Lincoln, ON

Emily Larson, Mayor, City of Duluth, MN

Dave McDowell, Mayor, Sodus Point, NY

March 3, 2022 – Approval of the Advisory Council recommendations by the Great Lakes and St. Lawrence Cities Initiative Board of Directors

APPENDIX II:

Preliminary Analysis of Results From 2021 Coastal Resilience Needs Assessment Survey

Preliminary Findings from the Coastal Resilience Needs Assessment Survey of Great Lakes and St. Lawrence Municipal Governments

August 2021

The Coastal Resilience Needs Assessment Survey was completed in partnership with the University of Illinois and collected information from March through May 2021. The survey received nearly 300 responses from jurisdictions across all eight U.S. states and two Canadian provinces that border the Great Lakes and St. Lawrence River. The intent of the survey was to better understand the context in which local communities are responding to, and planning for, coastal resilience challenges. The following are preliminary findings and key takeaways from the survey.

Top Concerns and Priorities

- Over 95% of respondents were highly or moderately concerned about coastal issues facing their community.
- Shoreline/bluff erosion and flooding/high water levels were of greatest concern to communities, followed by infrastructure damage and storm frequency/severity.
- Jurisdictions are particularly concerned about the impact coastal issues have on their natural coastal features, public beaches, and local parks.
- Over 80% of respondents reported water level and flooding forecasts to be very important to their jurisdiction's work on coastal planning.

Resources and Support

- Over the past two years, respondents indicated spending $746 million USD to respond to coastal challenges, with privately owned shoreline property receiving over a quarter of these funds.
- U.S. and Canadian survey respondents indicated a combined financial need of $2.09 billion USD over the next five years to respond to coastal challenges. This represents a fraction of the true need as not all shoreline jurisdictions are reflected in this figure.
- Only 27% of jurisdictions rated their staff as being highly knowledgeable of coastal issues, and only 11% reported having a high level of capacity to respond to such issues.
- Funding for mitigation projects and planning is a high priority for communities; however, existing funding opportunities do not meet this need for most communities to respond to coastal issues.
- Communities noted support from state and federal agencies as very important to their efforts to respond to coastal issues; however, current support is not meeting the needs of coastal communities.

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Planning and Response

- Most communities are already taking action to complete comprehensive planning updates; collect data to inform their decision-making; update zoning codes and ordinances; and implement coastal resilience projects / practices.
- Only half of respondents are currently incorporating strategies to anticipate, accommodate, and adapt to changing coastal conditions in their planning efforts and noted a lack of technical expertise, low staff capacity, and a lack of funding as primary barriers to consideration.
- Of a range of coastal resilience planning activities, communities were severely behind in their efforts to develop climate action plans, with only 30% of respondents having started or completed progress. Of those who had not taken action, 25% indicated that developing a climate action plan was not a priority for their community.
- Only 27% of respondents indicated that they were highly likely to prioritize sustainable or environmentally friendly mitigation responses regardless of cost.
- Of activities that were not already taking place, communities rated vulnerability assessments and coastal resilience projects as the most important to act on.

Communication and Engagement

- Nearly 99% of respondents indicated a consistent or increasing public interest in addressing coastal issues.
- Over 90% of respondents indicated an interest in participating in future training, capacity building, or partnership development opportunities related to coastal management.
- A majority of respondents expressed a preference for receiving information on coastal issues through websites or newsletters. This was followed by a lesser, but still notable, interest in receiving information through workshops and conferences, reports and studies, and virtual training.

APPENDIX III:

Summary of Coastal Needs Facing Great Lakes and St. Lawrence Coastal Communities

Coastal Resilience Needs for the Great Lakes and St. Lawrence River:
Themes for Interim Report from the Mayors Advisory Council on Coastal Resilience

August 2021

The following needs were identified through the Coastal Management Needs Assessment Survey and discussions with the Mayors Advisory Council on Coastal Resilience. They are organized in four thematic categories. This will guide the development of recommendations from the Council, beginning with an interim report at the Cities Initiative's Annual General Meeting in August 2021.

Coordinated Planning and Comprehensive Solutions

- Nature Based Solutions – Coastal planning needs to have a greater focus on nature-based solutions / hybrid approaches (i.e., a combination of nature-based solutions and traditional approaches), rather than armoring shorelines solely with hardened structures. This includes incorporating nature-based solutions in both new infrastructure and rehabilitation of existing, aging infrastructure.
- Regional Planning and Coordination – Coastal projects, mitigation efforts, and planning need to be more coordinated across spans of shoreline. Communities must coordinate on a regional scale to identify effective solutions that improve long-term resiliency while mitigating negative impacts on neighboring communities.
- Intergovernmental Collaboration – The region needs greater coordination and collaboration between federal agencies and across international borders.

Additionally, there is a need for greater partnerships between state / provincial and local governments and more extensive involvement with the new Canada Water Agency.

- Long-term Planning – Coastal planning needs to incorporate a greater focus on long-term solutions for a resilient future, including the consideration of climate change impacts on lake level variability and storm events. Communities must plan for both high and low lake level scenarios.
- Informed Decision-Making – Coastal planning and implementation needs to be advised by cost-benefit analysis.

Broad Engagement and Strategic Education

- Nature-Based Education – There is a need for strategic education around nature-based solutions to build a greater awareness within municipalities of the benefits and long-term cost savings from this approach. Additionally, there is a need to educate communities on their local role and impact within a greater system.
- Connection to Coastal Resources – There is a need to better connect local communities with available coastal management resources, including funding programs, ongoing initiatives, permitting guidance, and opportunities to collaborate and exchange information, experiences, and solutions.

continued

- Private Engagement – There is a need for broader engagement with coastal populations, specifically with private property owners and industry stakeholders, to educate on resilience strategies and develop partnerships around sustainable planning and solutions.
- Great Lakes Awareness – Coastal issues across the Great Lakes and St. Lawrence River basin need to be amplified at an international scale to highlight the region's equal value and importance to issues typically illustrated along the marine coasts.

Operational Tools and Complete Data

- Data Accessibility – Data and tools need to be accessible on a local scale, especially for smaller shoreline communities with limited capacity and resources.
- Data Gaps – Information gaps need to be identified with a subsequent strategy to obtain missing data, especially for critical datasets that inform local and regional response efforts. This includes a need for risk-informed spatial maps that illustrate existing and future risks across the entire basin (i.e., lake levels, sediment budgets, wave action, location of aging infrastructure).
- Decision Support Tools – There is a need to develop decision-support tools that can help communities prioritize and identify best actions to respond to coastal erosion and flooding with a priority on outcomes that are financially viable, environmentally sustainable, and protective of critical assets and development.
- Best Practices for Resilience – Coastal planners and leaders need more comprehensive guidance around best practices for shoreline resilience, including technical resources and updated management plans.

Supportive and Accessible Funding

- Funding Deficiencies – Existing funding resources need to be evaluated to understand where gaps in financial support exist, in addition to identifying barriers that are prohibiting communities from securing funding and expertise.
- Cost-Share Requirements – Cost-share requirements need to be revised to reduce barriers between levels of government to accessing common funding options, particularly for small or economically disadvantaged communities.
- Funding Guidance – Communities need greater communication and insight from resource providers (e.g., state, federal, provincial) on how to access and secure funding.

Topics for Further Consideration by the Council:

- Nature-based solutions
- Coastal planning and zoning
- *Private property impacts, solutions and support

**On July 28, 2021, the Mayors Advisory Council on Coastal Resilience voted in favor of further exploring and considering the topic of private property ownership in the Council's final report and recommendations.*