

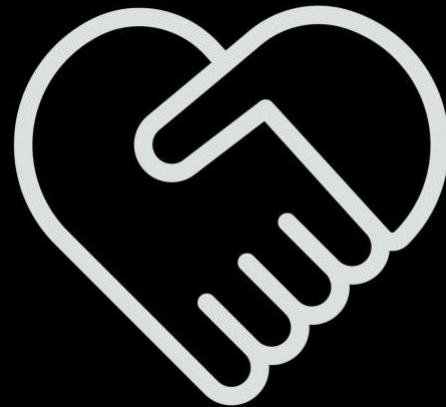


Development of a Coastal Resilience Framework, Lake Erie North Shore Pilot

Pete Zuzek, Linda Mortsch, Larry Hildebrand
December 15, 2022



I – WELCOME



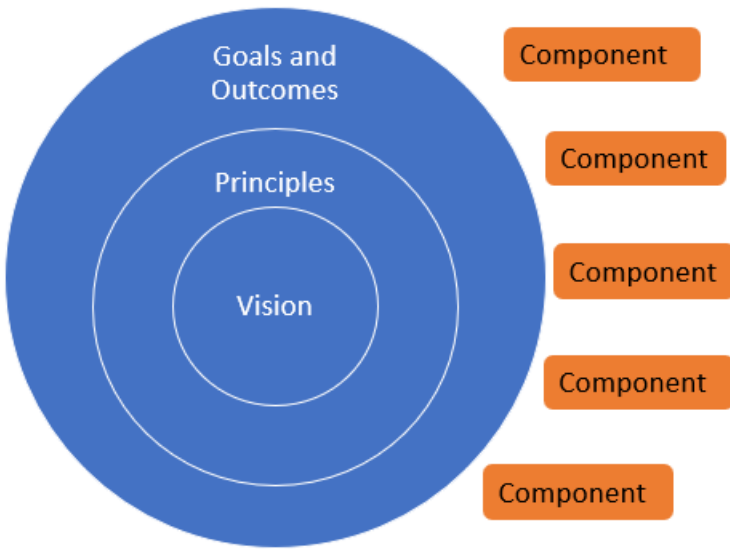


Agenda Review

- I. Welcome
- II. Recap of Previous Meeting Highlights
- III. NRCan Update on National Adaptation Strategy
- IV. Why We Need a Coastal Resilience Framework – Chatham-Kent example
- V. International Best Practice Review
Break
- VI. Vision, Goals, and Outcomes Breakout Discussion
- VII. Next Steps

Meeting 1: Common Understanding and Shared Vision

*What is coastal resilience?
What are the narrative, goals and outcomes?
What are we aspiring to achieve?
Why do we Need It?*



All of Society Approach
Equity in Collective

November 2022

Meeting 2: Who Needs to Be Involved & What Others are Doing?
*Who is actively working on coastal resiliency (stakeholder mapping)?
What is happening internationally?*

December 2022

Meeting 3 & 4 Mutually Re-enforcing Activities

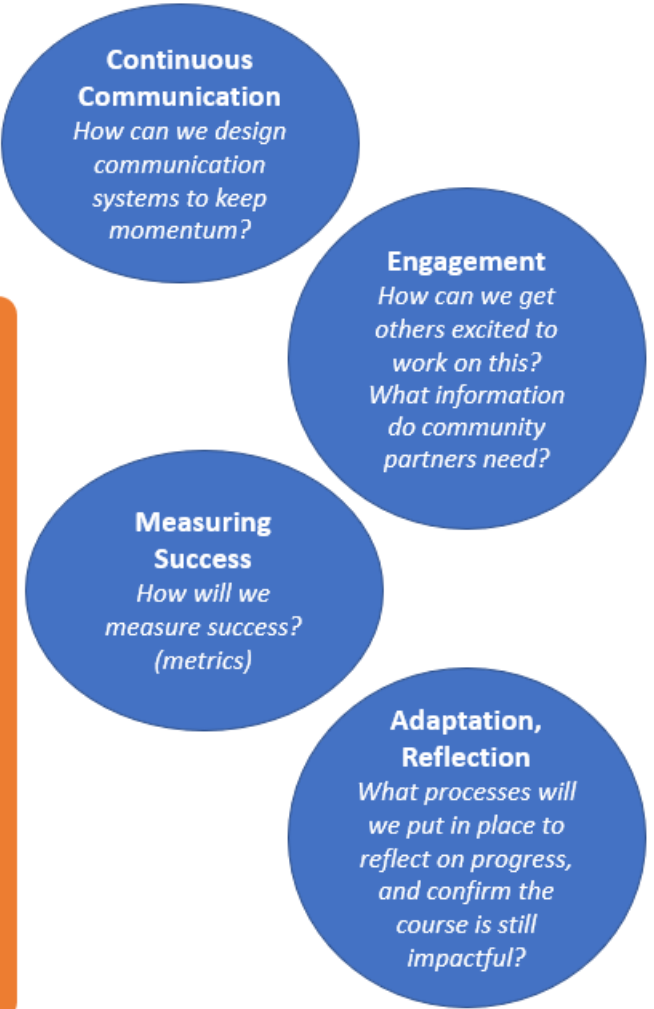
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January-February 2023

**Governance Model/
Backbone Support**

Meeting 5: Draft Framework and Measuring Success

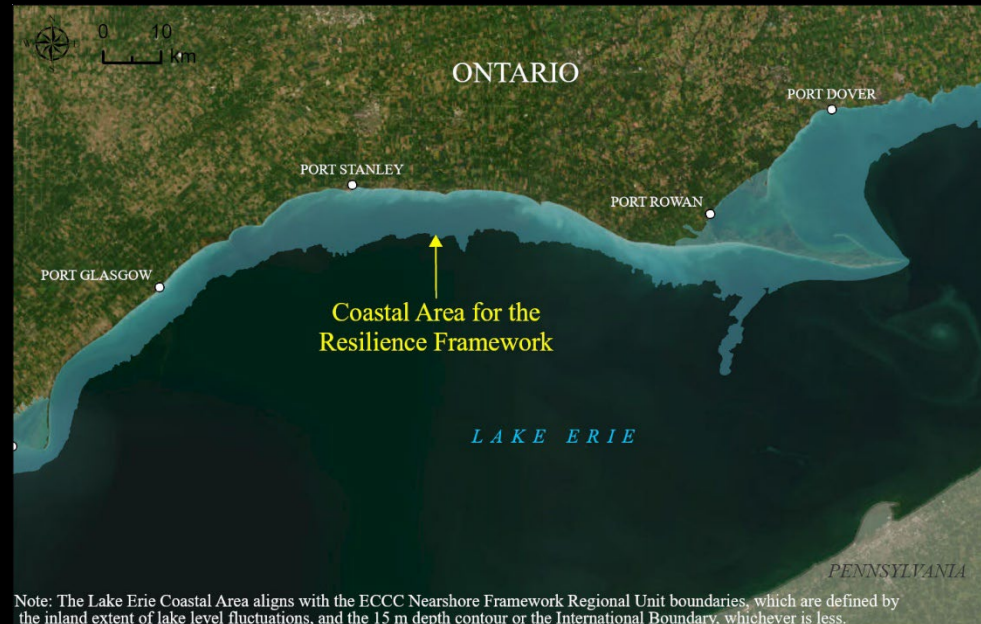


March 2023

*What governance models have worked?
What do we need to do (differently) to achieve the vision, goals, objectives? What kind of support and/or endorsement is needed?*



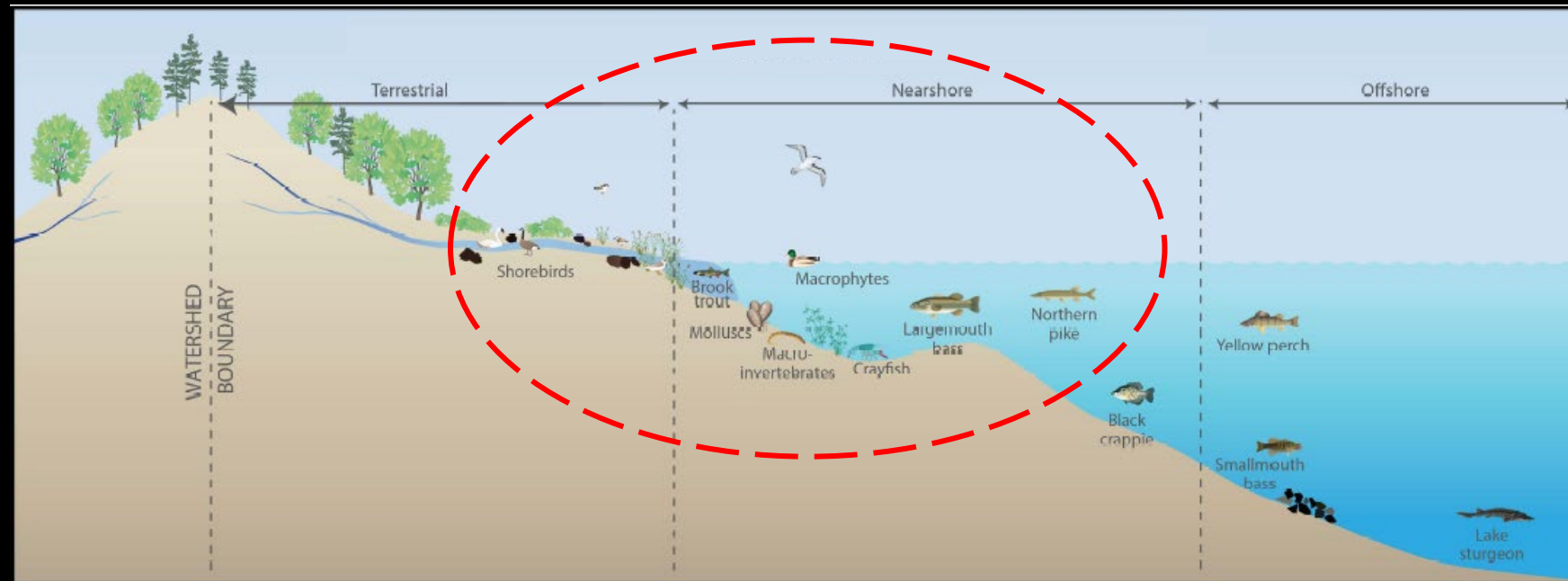
II – RECAP OF PREVIOUS MEETING HIGHLIGHTS





GEOGRAPHIC FOCUS OF COASTAL FRAMEWORK

- Areas impacted by lake level fluctuations and coastal hazards
- Sediment sources (sand and gravel), transport pathways, and depositional environments defined by littoral cells also define the geographic focus
- Not upper watershed or offshore





Coastal Area for the Framework

(corresponds to the Nearshore Framework Regional Units)





Project Website

- <https://zuzekinc.ca/ResilienceFramework/>
- Think Tank members are listed – can we make this live on the site?



Think Tank Members

Bev Rose, DFO	Neil Fisher, DFO	Lisa Fowler, DFO
Luca Cargnelli, ECCC	Jody McKenna, ECCC	Jocelyn Sherwood, ECCC
Heather Braun, ECCC	Greg Mayne, ECCC	Mary Bellissimo, ECCC
Julia KohHatchAyyoub, ECCC	Mary-Ann Wilson, NRCan	Kelsea Walker, NRCan
Lindsay Rodger, PC	Scott Parker, PC	Steve Marklevitz, MNRF
Mitch Baldwin, MNRF	Ngan Diep, MECP	Pamala Lamba, MECP
Greg Wilson, MECP	Bonnie Fox, CO	BMark Peacock, Lower Thames Valley CA
Bridget Brown, GLSLC	Phillipe Murphy-Rheaume, GLSLC	Joanna Eyquem, Intact
Tracy Eso, Intact	Larry Hildebrand, CZCA	Linda Mortsch, CZCA
Pete Zuzek, CZCA	Susan Hall, LURA	James Knott, LURA
Janette Anderson, Citizen		

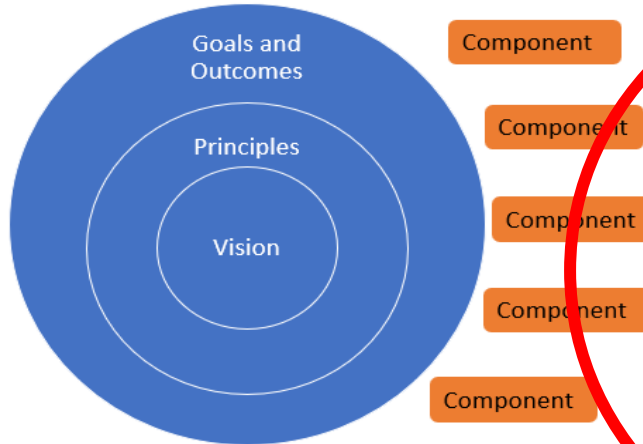


Legislation and Policy Scan – Why?



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January-February 2023

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Continuous Communication

How can we design communication systems to keep momentum?

Engagement

*How can we get others excited to work on this?
What information do community partners need?*

Measuring Success

How will we measure success? (metrics)

Adaptation, Reflection

What processes will we put in place to reflect on progress, and confirm the course is still impactful?

March 2023

Governance Model/
Backbone Support



Legislation and Policy Scan

- Found in Downloads at: <https://zuzekinc.ca/ResilienceFramework/>
- Excel file: Draft_SCAN_Legislation_Policy_Programs_Priorities Ver6 Review & Discussion 22.12.15 FINAL
- The Asks:
 - Provide Agency content – POPULATE



Legislation and Policy Scan – The File Content

Draft_SCAN_Legislation_Policy_Programs_Priorities Ver6 Review & Discussion 22.12.15 FINAL

	A	B
1	Background on the content of each sheet and guidance for your input/review (colour-coded to match cells)	Review question(s)
2		
3	Review guidance:	
4	Sheet: REVIEW_Draft Scan Framework	Describes organization and rational of content in the Excel sheet that will guide the scan
5	Row 1: Headings represent content solicitation for scan and inform resilience framework	Do columns themes identify all necessary content? (Additional columns?) Can we omit some columns to streamline request? Is the information request clear?
6	Row 2: Notes and questions for feedback on column information request	Provide responses to questions
7	Row 3: Notes on form, purpose of data and how might be analysed	Comments on framing
8	Row 5+ and list: List of draft content for column and question on heading	Review list, does the draft content reflect the information we want to extract for column? Add or delete words. Answer question(s) on column headings
9		
10	Sheet: EXAMPLES_input	Allows you to review how information/content can be co
11	Row 4+: We have added some content based on the DFO report and added other input to test content and ease of input; provides you with level of detail	Any feedback on content?
12		
13	Sheet: INPUT by AGENCY	Where each agency member inputs relevant information
14	Once template is finalized, Agencies input their relevant information HERE for the scan	
15	Sheet: Dropdown	Content for dropdowns
16	FYI. No input required	
17		



Legislation and Policy Scan – Example of Input

A Agency providing input of content	B Component in Integrated coastal planning and management (Dropdown,)	C Component detail	D Scale Who (Binational, Federal, Provincial, Conservation Authority, Regional, Municipal)	E Agency (lead unit(s))	F Mandate(s)	G Key Legislation (One input per row with links)	H Role in shoreline planning and management (Short description)	I Key activity in shoreline planning and management (Dropdown, Key word one per cell)
1 DFO - Jurisdictional scan report	Species and Habitats	Aquatic species (Fish)	Federal	DFO administers SARA for all aquatic species at risk (SAR), except areas administered by the Parks Canada Agency (National Parks, Historic Canals, etc.)	DFO responsible for protecting and conserving all aquatic SAR listed under the Species at Risk Act (37 aquatic SAR (fishes and mussels) on SARA public registry in the Lake Erie Basin);	Species at Risk Act (SARA);	review of any proposed projects: protection of SAR, compliance with the prohibitions of SARA (sections 32, 33 and 58) or of section 80 Emergency Orders	Review OR Regulate
3	<ul style="list-style-type: none"> Coastal stewardship Coastal processes and geodiversity Coastal hazards Species and habitats Biodiversity Invasive species Nearshore water quality and sediments Land use planning and regulation Economics and livelihoods Social justice, equity and mental health Infrastructure, Public Infrastructure, Private Recreation and tourism Navigation Climate change 		<ul style="list-style-type: none"> Binational First Nation Federal Provincial Conservation Authority Regional Municipal Site Other 				<ul style="list-style-type: none"> Regulating Planning Assessment Monitoring Research Outreach and communication Policy development Review Coordinating Funding Securing land Engineering 	



Legislation and Policy Scan – Example of Input

	J	K	L	M	N	O	P
	Priorities OR Issues relevant to coastal resilience (Descriptive text)	Programs relevant to components in integrated coastal planning and management for coastal resilience Priorities OR Issues (with links) (One per cell)	Tools/Instruments	Program outcome(s)	Key partners	Additional information	
1							
3	Prevent wildlife species from becoming extirpated or extinct. Requires recovery of endangered and threatened species at risk due to human activity, manage species of special concern to prevent becoming endangered or threatened. The Act covers all wildlife species at risk nationally, their residences and critical habitats, and applies throughout Canada	Species at Risk (SAR) Program	<p>Data Collection. SARA public registry https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html</p> <p>Regulations Orders Permits and agreements Policies and guidelines Round table reports and Minister's response Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada Species at Risk Program: Results-Based Management and Accountability Framework and Risk-Based Audit Framework</p>		MECP		

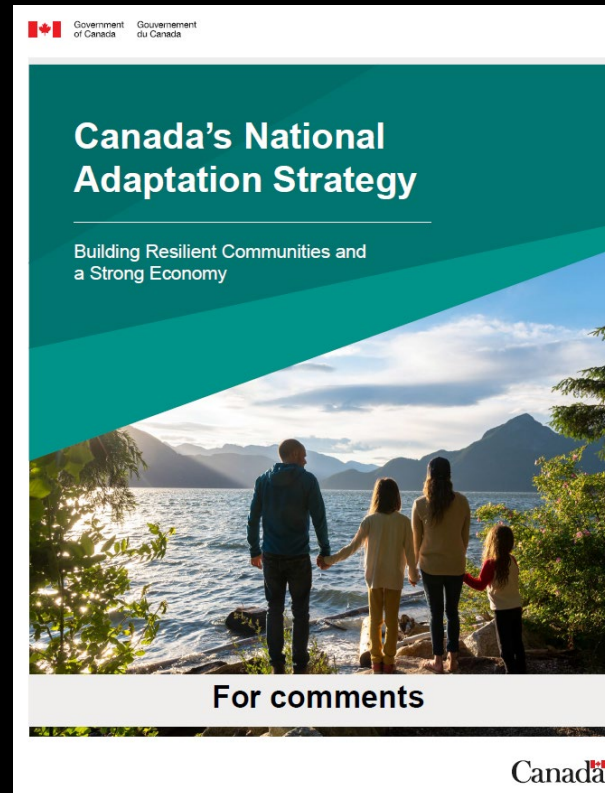


Legislation and Policy Scan – Next Steps

- Think Tank members populate Excel file
 - Input January 13, 2023
- Discuss at Project meetings
 - January 2023 and February 2023



III – NRCan Update on the National Adaptation Strategy





IV – WHY WE NEED A COASTAL RESILIENCE FRAMEWORK

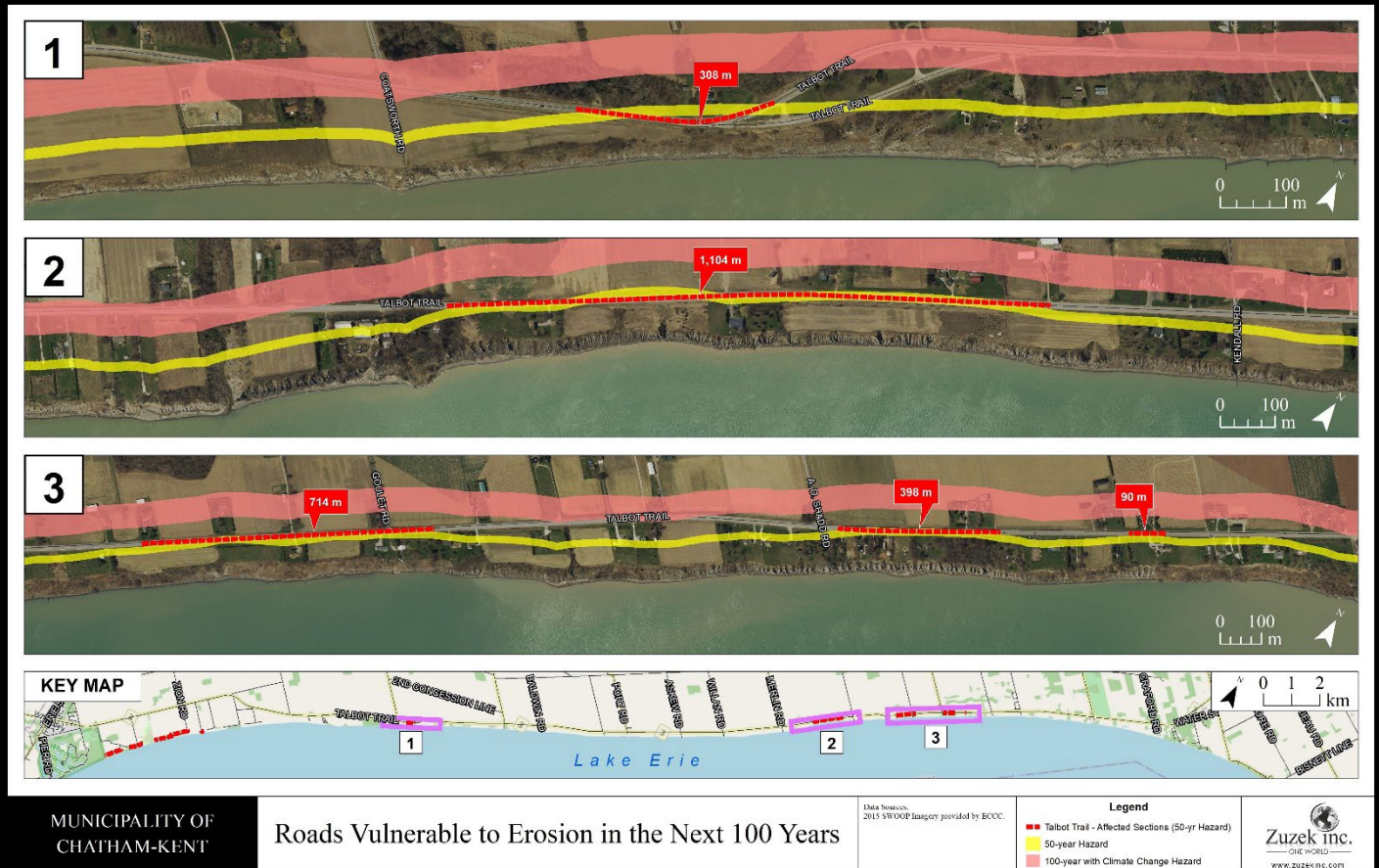
Chatham-Kent Lake Erie Shoreline Study

Prepared for:
The Municipality of Chatham-Kent
May 25, 2020



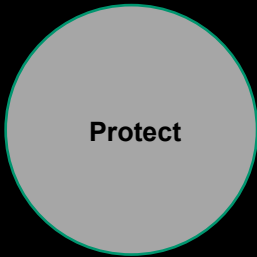
Prepared by:

Contact the Author:
Peter J. Zuzek
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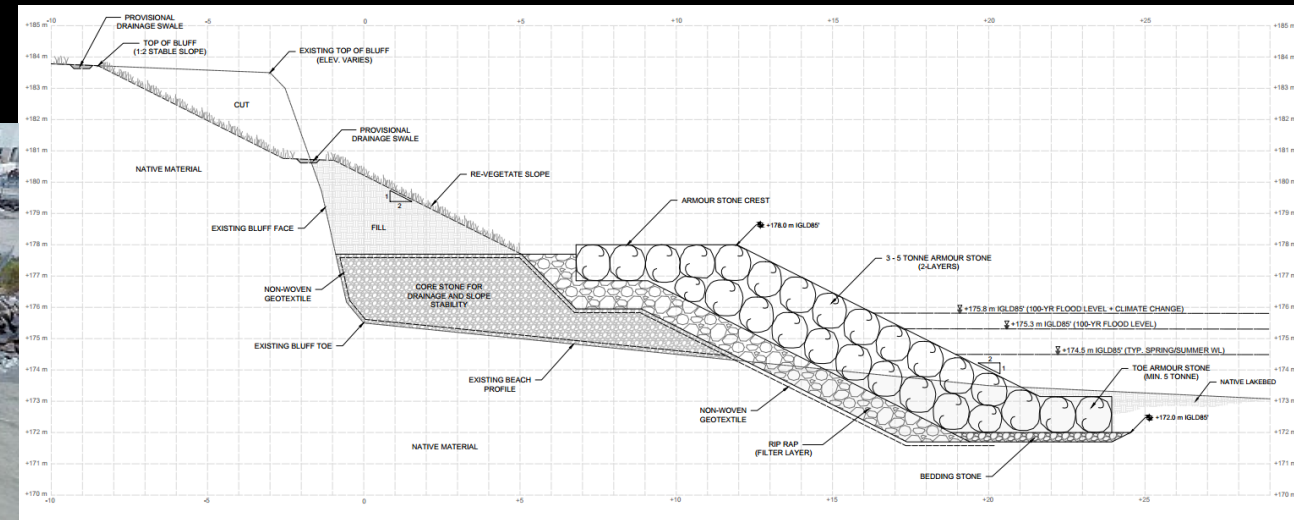
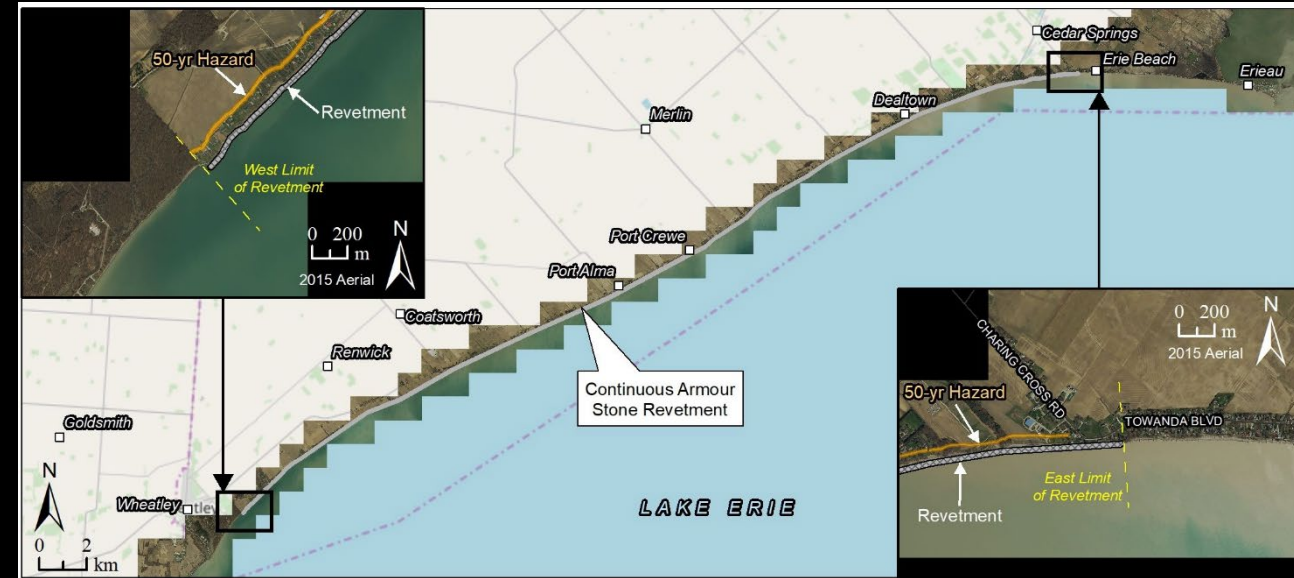




OPTION 1-2: Protect Talbot Trail and Buildings with an Armour Stone Revetment



- Continuous 40 km revetment
- \$600 to \$900 million plus annual maintenance (1%)
- Pros: Long-term Protection
- Cons: Cost, securing approvals, reduced sediment supply, and maintenance





OPTION 1-3: Re-locate Talbot Trail Inland

Planned
Retreat

- Re-align Talbot Trail inland with a combination of existing and new roads at a cost of \$31 to \$40 million
- Pros: 20x Cheaper than Protection Option 1-2
- Cons: Disruption to the local community





Municipality Strategic EA

- Following the study, a Strategic Environmental Assessment was completed
- Preferred alternative was re-aligning the road inland – planned retreat
- Municipal election results in new councillors. Lost ‘local champion’ councillor
- New Council may not endorse the study or send to for MECP approval
- Why should we care – how could the Resilience Framework help?
 - Canada needs positive adaptation success stories
 - Significant investment in finding a long-term sustainable solution will be lost
 - Further armouring of the shoreline will result in more habitat loss at Rondeau Bay
 - An “Integrated Littoral Cell Coastal Management Plan” would result in a continuous dialog among all levels of government, frame the issues, support solutions



V – INTERNATIONAL BEST PRACTICE REVIEW





International Coastal Resilience Best Practices Review

- Coastal resilience strategies/frameworks being developed around the world. ~20 extant examples to date
- The respective bodies of literature examined are integrated coastal zone management (ICZM), climate change adaptation (CCA), socio-technical and socio-ecological systems (STS/SES), disaster risk reduction (DRR), and ecosystem-based adaptation (EbA)
- Many strategies at the national/regional level (e.g., USA, England, Denmark, Australia, New Zealand, EU, Caribbean, China, East Asia, as well as Canada's National Adaptation Strategy), plus some sub-national (e.g., U.S. States, Tasmania, PEI)
- Primarily in response to growing climate change impacts; some more comprehensive, addressing all/most threats to socio-ecological coastal systems



Emerging International Guidance

- UN Sustainable Development Goals
- COP 27 Sharm-El Sheik Adaptation Agenda
- Post-2020 Biodiversity Framework (under development in Montreal this month)
- Decade of Ecosystem Restoration (2021-2030)
- Sendai Framework for Disaster-Risk Reduction
- Many others ...





Core Principles and Approaches

- A whole-of-government / whole-of-society approach
- Resilient society - Coastal areas as an integrated land-water, physical-social-ecological-economic system. Incorporate land-use planning
- ICZ'Governance' (vs. just 'management') - legislation, policy, institutions, investments, programs
- Meaningful stakeholder engagement (degree not specified)



Guidance for Great Lakes Coastal Resilience (1)

- The overall objective is to create 'resilient coastal societies'
- Build an inclusive team and establish an integrated planning & management body
- Strong leadership at a local level can mitigate the lack of structure and coherence of efforts at higher governance levels (if it materializes)
- Personal connections with citizens and communicating risks to them (local champion)



Guidance for Great Lakes Coastal Resilience (2)

- Take measures appropriate to local context
- Shift decision-making to nature-based solutions opportunities
- Technical assistance/capacity building necessary at local levels
- Preserving the health of coastal ecosystem services makes coastal areas more resilient to natural hazards, and should therefore be a point of focus within ICZM
- Underlying risk factors such as gender, ethnicity or land ownership also come into play and should be considered when taking adaptive measures



VI – VISION, GOALS, AND OUTCOMES BREAKOUT GROUPS

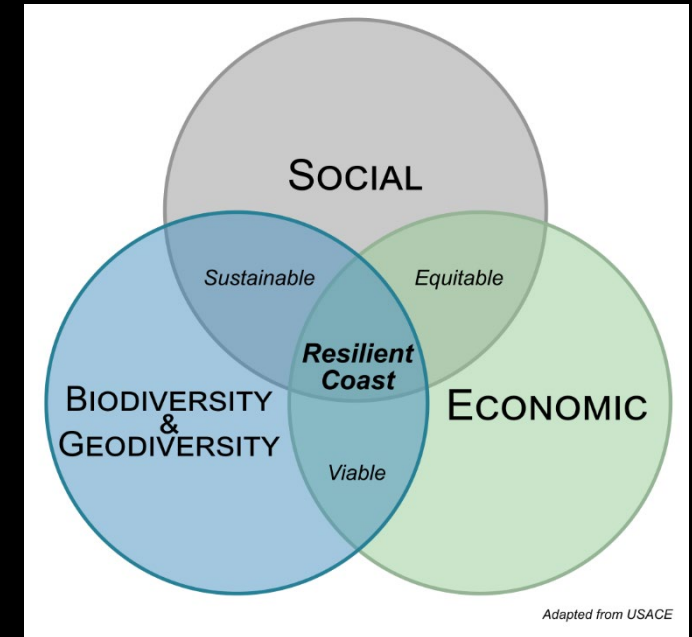




Resilience Definition for the Framework

- The capacity of social, economic, environmental, and physical systems in coastal areas to cope with a hazardous event, trend, or disturbance, responding and reorganizing in ways that maintain their essential function, identity, and structure, while also building capacity for learning, innovative and equitable adaptation, and transformation.

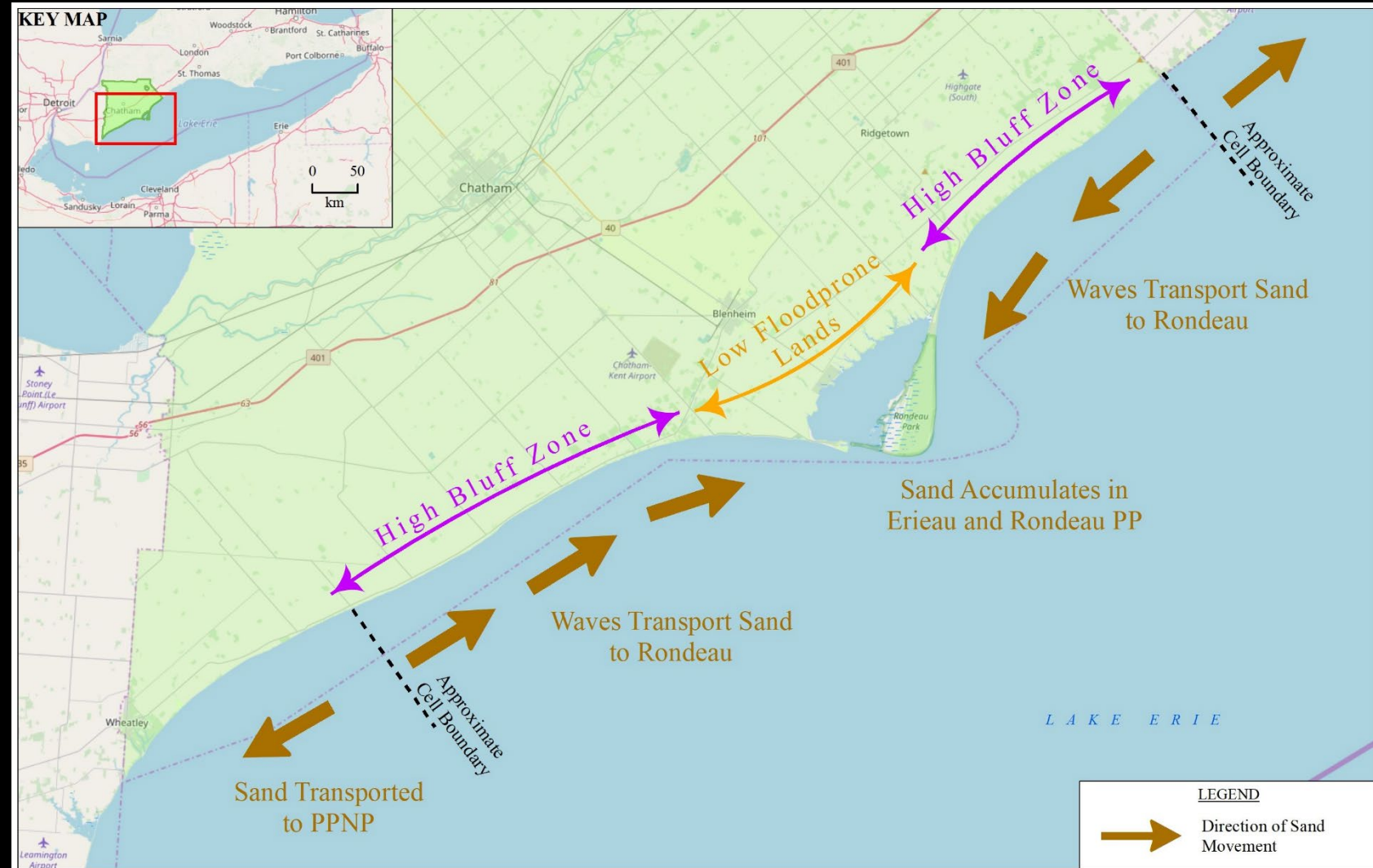
[Footnote: This definition builds on the one used by THE IPCC (2018) and the Arctic Council (2013).]





LITTORAL CELLS – Basic Spatial Unit

- ‘Scale’ is a critical component and organizing aspect of the framework
- Littoral Cells define sediment sources (sand and gravel), transport pathways, and depositional areas





Narrative – Business-as-Usual

- The north shore of Lake Erie faces growing challenges related to more severe coastal hazards, habitat and species loss, and development pressure. Climate change makes these problems worse. A warming atmosphere and lake have caused dramatic reductions in protective winter ice cover and by late century the lakes could be largely ice-free. The record-setting water levels of 2019 are a prelude, as future extremes are projected to increase. Bluff and beach erosion rates are accelerating, flooding events are more frequent and severe, ecosystems and species are threatened, infrastructure maintenance costs are increasing, and irreversible damage is occurring in our protected areas that provide public access to the lake. The health of coastal communities is negatively impacted by these events and threats, and in some cases, disproportionately distributed.
- To meet the mounting challenges, communities and governments need a coordinated and organized response. However, landowners continue to build close to the lake and when assets are threatened, shoreline armouring is the go-to solution, which exacerbates the already exhausted sediment supply needed to maintain healthy beaches and coastal areas. Most municipalities struggle with capacity to undertake land use planning incorporating the lens climate change. Tax-generating coastal development continues without sufficient consideration of current and emerging hazards. Government departments and ministries focus on core mandates, such as water quality or navigation, and lack the tools or framework for collaborative management at appropriate spatial scales in our coastal areas. Without a legislative framework (i.e., Act) or program that mandates/facilitates integration, sectoral management will continue.
- With the status quo, loss of critical habitat such as coastal wetlands will continue, and species will face extirpation. Recreational beaches will continue to degrade and eventually disappear. Infrastructure damages from coastal hazards will increase and costs to repair damages will reach unaffordable levels. Homes will continue to be destroyed by storms. Our current response strategy of shoreline armouring will continue to create negative feedback loops, resulting in further degradation of our coastal ecosystems and cause more negative downdrift impacts. Planned retreat for coastal communities won't be one of many adaptation options to consider, it will be the only option.



Narrative – Pathway to Resilience

- Lake Erie stakeholders, landowners, rights holders, and all levels of government recognize that the north shore coastal area is a dynamic integrated social, economic, environmental, and physical system. A “Great Lakes coastal resilience ethic”, which recognizes the value of and the need for integration, coordination, stewardship, and investment in the Great Lakes coastal system, would improve the quality of life for present and future generations.
- An integrated, regional perspective (e.g., littoral cell management linked to the land) to co-management/OR governance would be a new way to approach the coast and provide an effective mechanism to engage and involve all levels of government, expand expertise and innovation and build capacity with local stakeholders and communities to make informed decisions and to develop and implement effective actions to address current stressors and future threats. An “all of society” approach would develop a shared vision, use coordinated OR collaborative approaches and adopt a learning framework that includes performance measures to assess, adapt and improve. The Coastal Resilience Framework would be the mechanism to facilitate the implementation of the Great Lakes coastal resilience ethic and co-develop innovative and strategic solutions.
- Coastal Resilience Councils would lead and coordinate implementation of the Framework and develop specific goals, activities, outputs, and outcomes for each lake. The Framework focuses on five key pillars of action: data collection, funding, research, stewardship, and collaborative governance and planning. A key outcome for the Framework and Resilience Councils would be integrated littoral cell coastal management plans that leverage new ways of working together, establish coordinated priorities for action, and take collective action to increase coastal resilience.
- Success requires continuous participation, monitoring, and evaluation of progress on outputs and outcomes relative to the framework goals. An Adaptive management approach is followed to formalize this process.

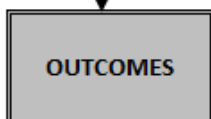
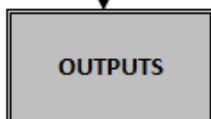
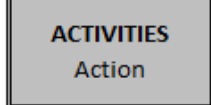
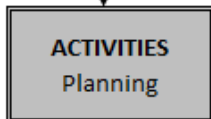
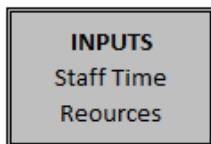


“VISION” and GOALS

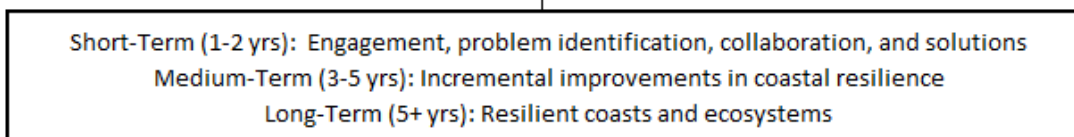
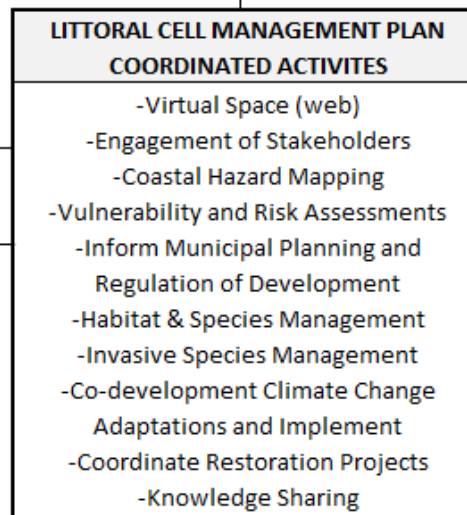
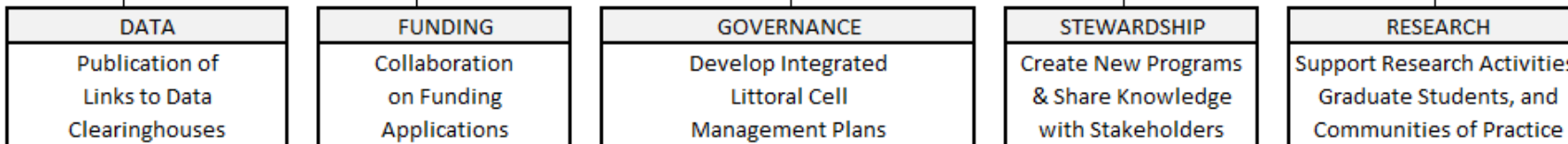
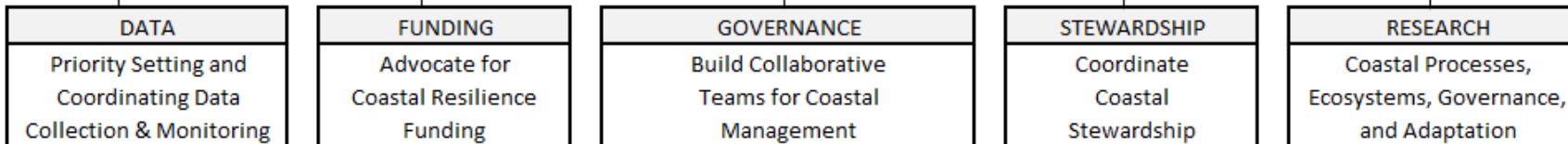
- “Bring partners together in coastal areas of the Great Lakes to work towards increasing coastal resilience, embrace the process, understand their role, and empower them to participate and create beneficial outcomes”
- Recognize the interconnected nature of our social, economic, environmental, and physical systems in Great Lakes coastal areas
- Advocate for and coordinate data collection for coastal resilience projects
- Pursue joint funding applications to plan and execute initiatives that increase coastal resilience
- Share knowledge with stakeholders and increase coastal stewardship
- Advance coastal research and train future professionals/leaders
- Develop integrated littoral cell management plans (assess, action, implement)

CANADIAN GREAT LAKES COASTAL RESILIENCE FRAMEWORK

LOGIC MODEL



BY LAKE



ADAPTIVE MANAGEMENT LOOP

Geospatial, Scientific and Biological Data

Resources to Plan and Complete Projects

Informed and Engaged Stakeholders

Training Future Leaders and Building Knowledge and Capacity

Data to Inform Action

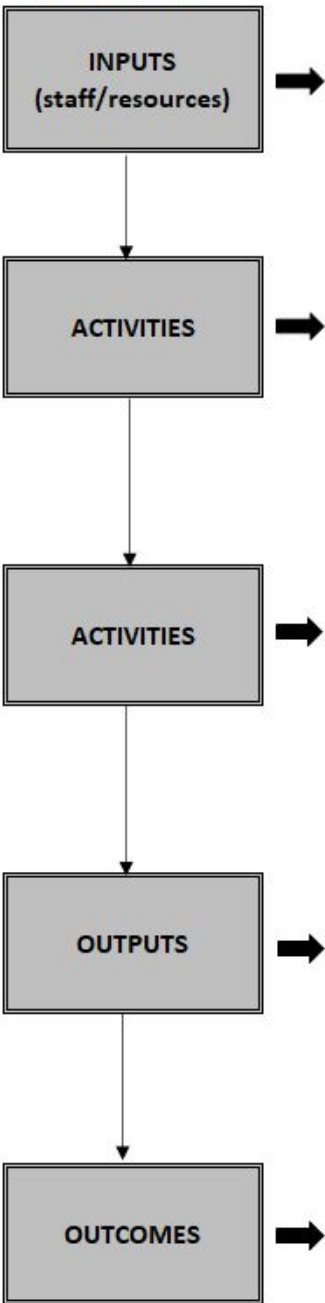
Options for Innovative Coastal Governance Considered

Learn from Outputs and Revise Activities As Required

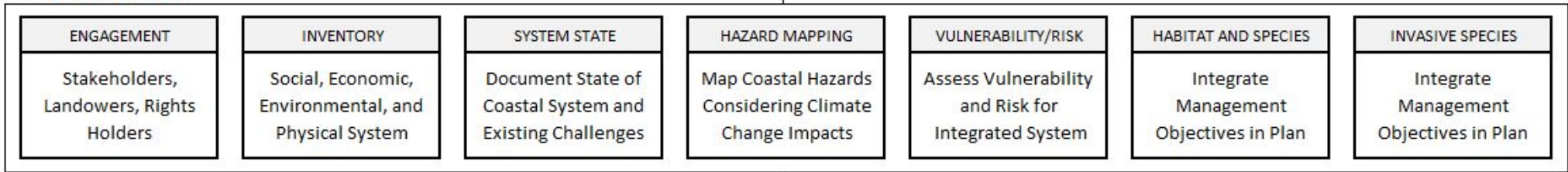
Evaluate Outcomes and Update Goals and Activities (as required)

LITTORAL CELL MANAGEMENT PLANS

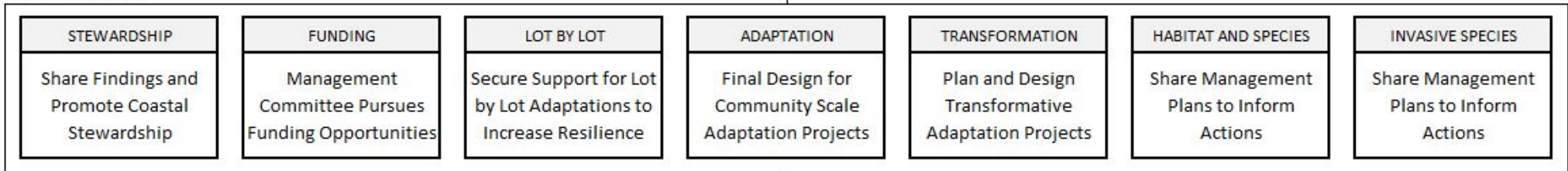
LOGIC MODEL



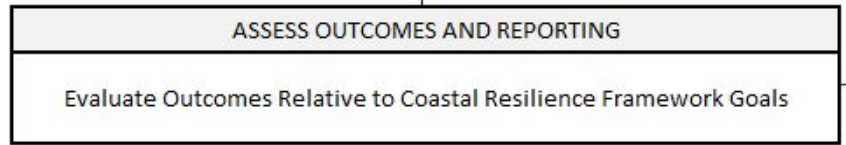
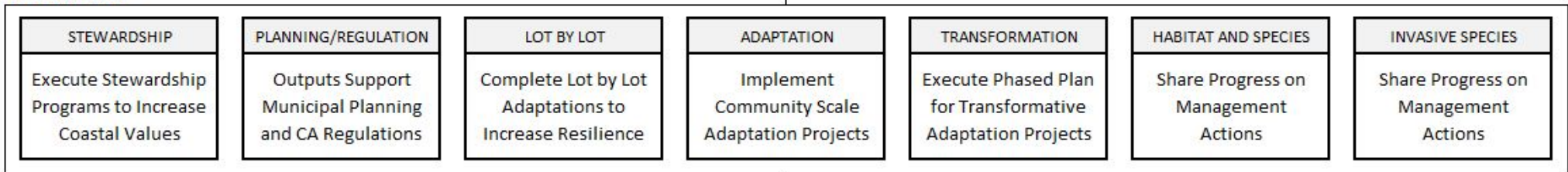
ASSESS AND PLAN



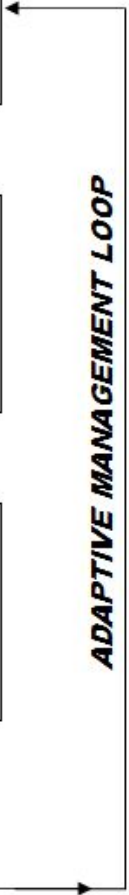
TAKE ACTION



IMPLEMENT



ADAPTIVE MANAGEMENT LOOP



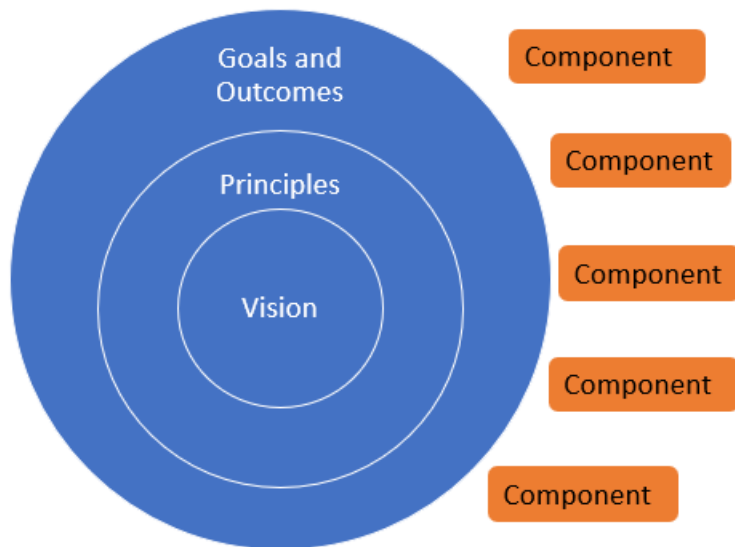


VII – NEXT STEPS



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**Governance Model/
Backbone Support**

March 2023



Discussion of Mutually Reinforcing Activities at Next Think Tank Meeting

- What activities are already occurring that align with the Resilience Framework?
- What do we have that can be leveraged (e.g., Canada-Ontario Agreement)?
- How can current government initiatives be more integrated?
- Do we have initiatives working at cross purposes?
- What gaps existing to advance the framework?
- What actions are needed and by whom?
- Presentations by other members?
- Other ideas and suggestions?



MEETING ADJOURNED

