

# Assessing and Enhancing the Resilience of Great Lakes Coastal Wetlands

Information Sharing Meeting #2

Black Creek Village, Toronto  
March 12, 2020



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

*In support of the Great Lakes Protection Initiative*

*In partnership with:*



# Why Focus on Coastal Wetland Vulnerability and Resilience?

- Ecological, social, spiritual and economic importance
- Unprecedented climate change impacts and biodiversity loss
- Vulnerability, resilience, adaptation has not been a focus
- Engineering and infrastructure solutions are costly and possibly maladaptive
- Wetland management and biodiversity can be improved via resilience and adaptation



Zuzek Inc. 2019



Zuzek Inc. 2019



Zuzek Inc. 2019

# Coastal wetlands are among the most vulnerable ecosystem types in the Great Lakes



## Low Water Level Blues

Georgian Bay Wetland Stranding

## High Water Level Impacts

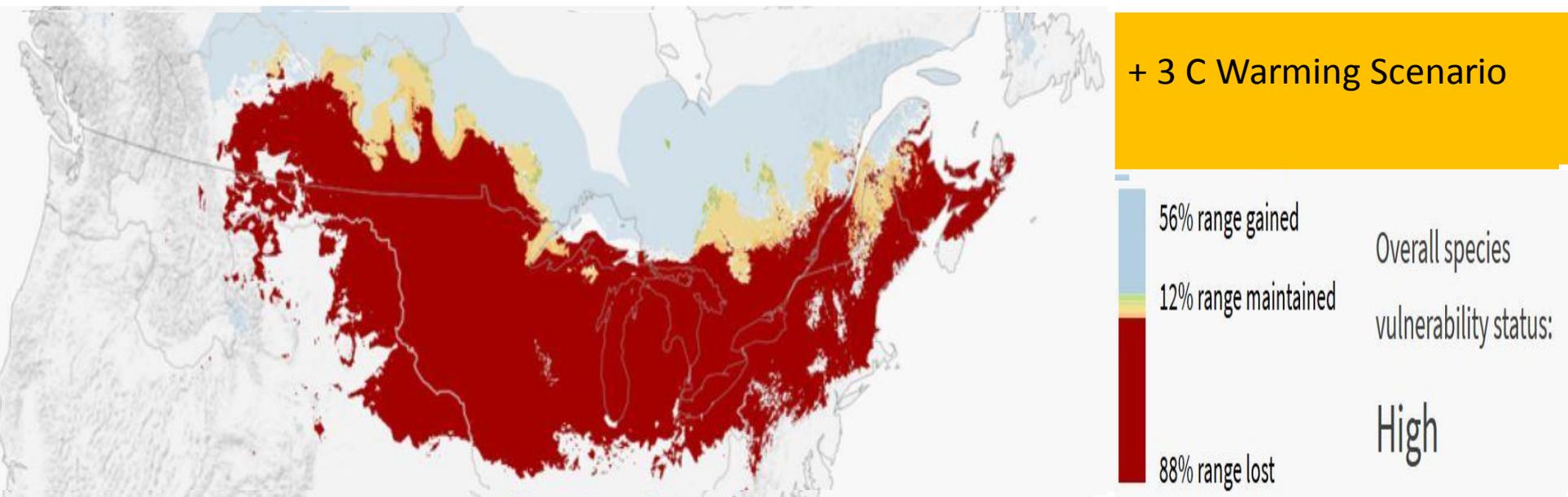


Hillman Marsh Breach- Zuzek Inc. 2019



Point Pelee Wetland Breach - Zuzek Inc. 2019

# Two-thirds of North American birds are at increasing risk of extinction from global temperature rise

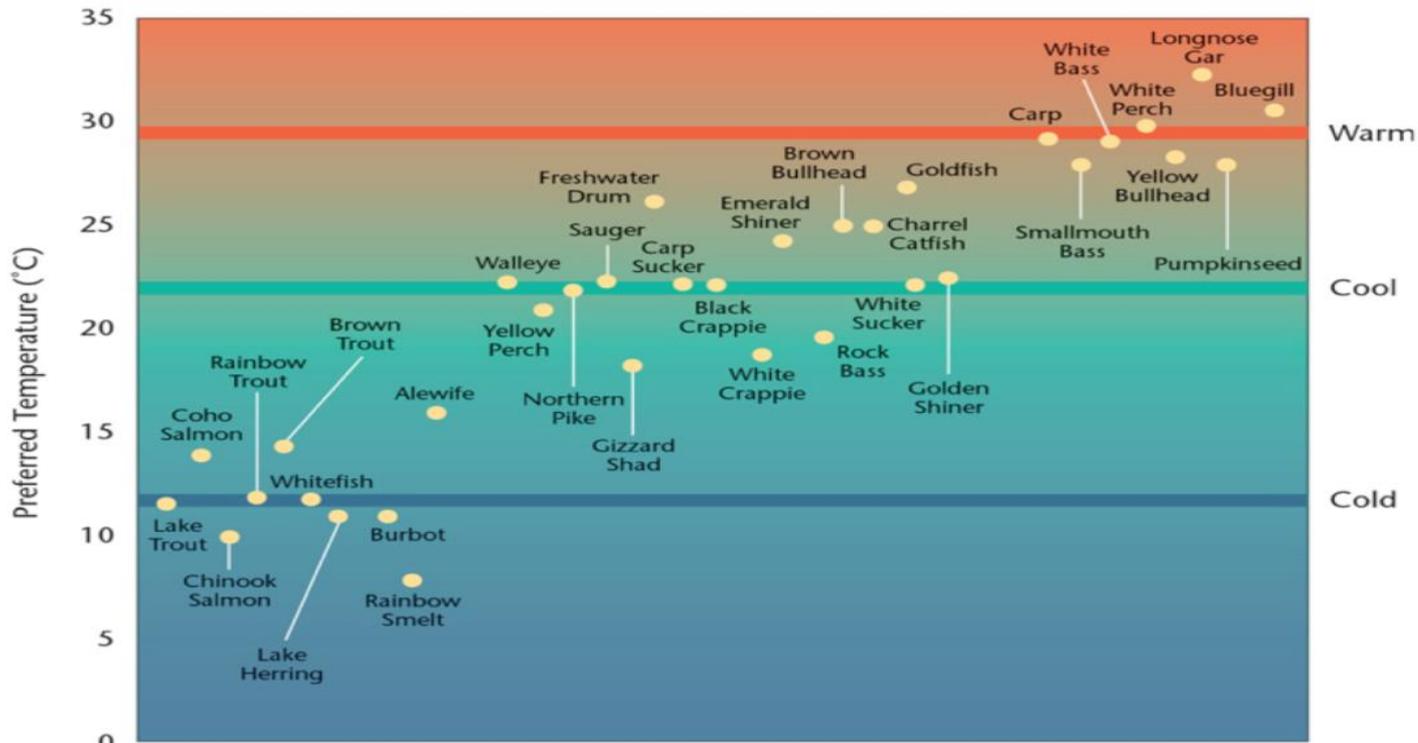


**Survival by Degrees:  
389 Bird Species on the Brink**

# Climate change is transforming where fish live in the Great Lakes

FIGURE 23  
**Temperature Groupings of Common Great Lakes Fish**

from page 53



Source: Based on information provided by Brian Shuter  
Credit: Amanda Wait/DG Communications

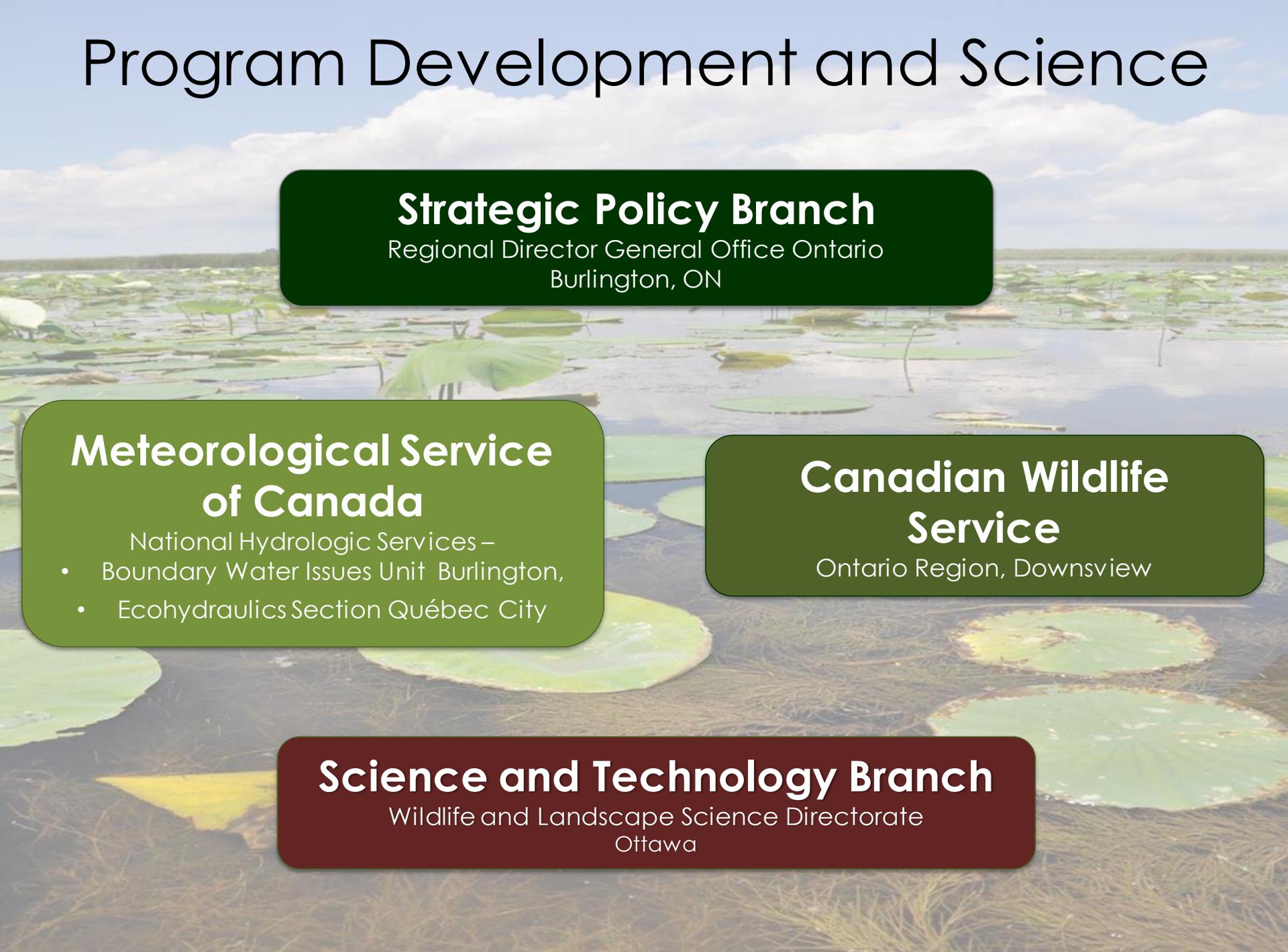
**Warming temperatures in the Great Lakes are causing population shifts among cold water and warm water fish**

# Study Objectives

- **Assess coastal wetland vulnerability to climate change** and how wetlands are likely to respond;
- **Develop guidance to enhance resilience and adaptation** of coastal wetlands to climate change impacts; and,
- **Engagement, information sharing, building consensus and collaboration** on resilience and adaptation priorities with rights holders and stakeholders



# Program Development and Science



## Strategic Policy Branch

Regional Director General Office Ontario  
Burlington, ON

## Meteorological Service of Canada

National Hydrologic Services –

- Boundary Water Issues Unit Burlington,
- Ecohydraulics Section Québec City

## Canadian Wildlife Service

Ontario Region, Downsview

## Science and Technology Branch

Wildlife and Landscape Science Directorate  
Ottawa

# PHASE I VULNERABILITY ASSESSMENT

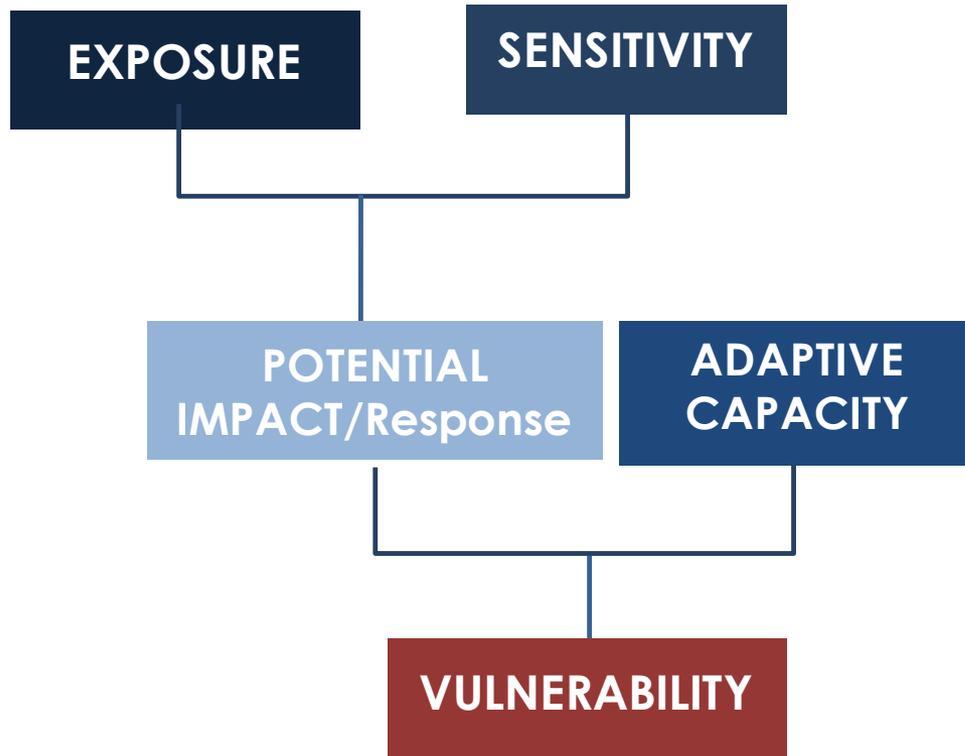
- Site selection, access, local involvement
- Physical and biological data collection
  - Climate and water level projections
- Wetland response model development & validation
- Wetland sensitivity and adaptive capacity
  - Spatial analysis and interpretation
    - Expert input and review

# 26 Study Sites



Variety of hydrogeomorphic types, disturbance gradients, ecological significance and local interest. Involves First Nation communities, national & provincial parks, businesses, land owners.

# Components of Vulnerability



**Exposure:** Amount and rate of climate change to which wetlands are likely to be exposed.

**Sensitivity:** The degree to which wetlands are likely to be affected by or responsive to climate change.

**Adaptive capacity:** Ability of wetlands to cope and persist under changing climate conditions.

Glick et. al., 2011. Scanning the Conservation Horizon: A Guide to Climate change Vulnerability Assessment

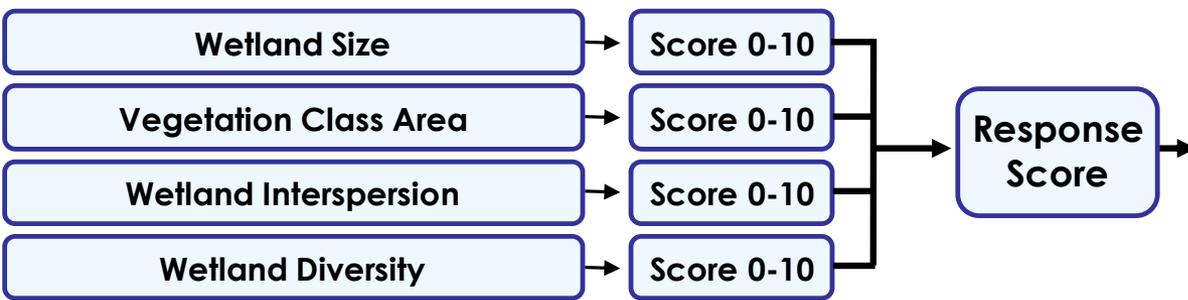
Vulnerability is a function of the sensitivity of a wetland, its exposure to climate change and its capacity to adapt.

# CONCEPTUAL FRAMEWORK FOR WETLAND VULNERABILITY

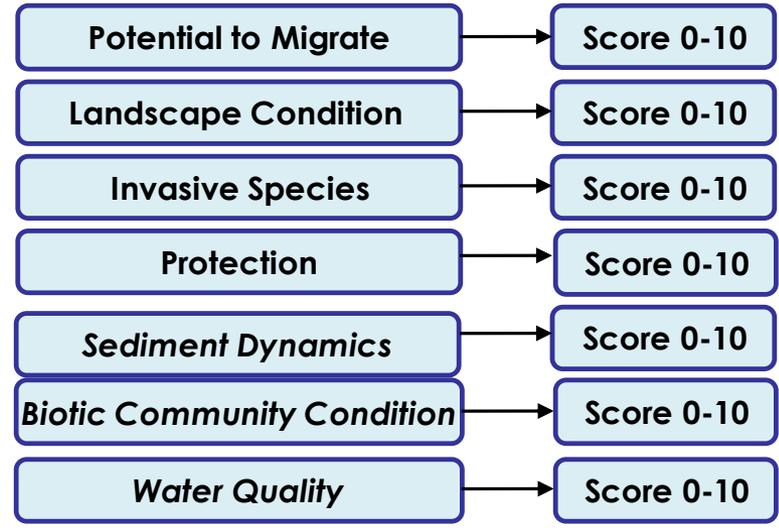
## Climate Exposure



## Sensitivity



## Adaptive Capacity



Adaptive Capacity Score

*Adaptive Capacity*

	→ Adaptive Capacity		
↑ Response	HL	HM	HH
	ML	MM	MH
	LL	LM	LH

**Vulnerability** - Very High; High; Moderate; Low

# Phase II: Enhancing Wetland Resilience

- Outreach & engagement
  - Literature reviews
- Interviews / questionnaires
- Focus group discussions and meetings
- Synthesis, priority setting and guidance
  - Reporting

*The ability of a wetland to absorb a disturbance while retaining the same basic structure and function*

# Resilience/Adaptation Goals

- GLWQA: conserve, protect, restore and **enhance the resilience of native species and their habitat** and support essential ecosystem services
- Engagement, knowledge transfer, foster dialogue and promote collaborative problem solving
- Understand climate change concerns, needs and opportunities
- Jointly develop strategies and measures to enhance resilience
- Share results to improve understanding and build capacity to respond to climate change impacts

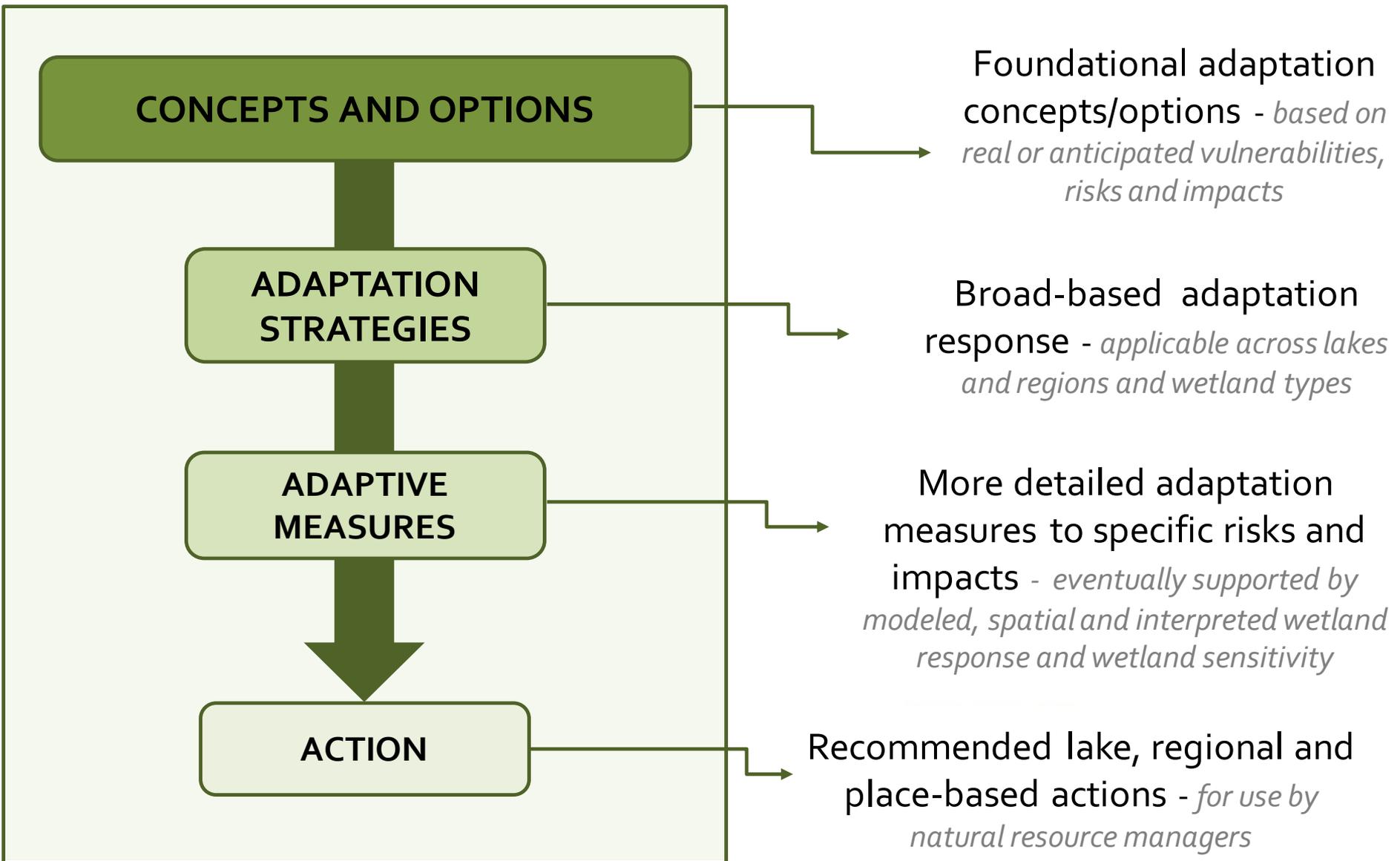


# Recommended Adaptation Strategies, Measures and Actions

- A spectrum of approaches to help :
  - Sustain GLs coastal wetlands and achieve management goals in the face of climate change;
  - Provide a framework of strategies from which managers select options best suited to their needs;
  - Potentially used to implement projects or pilots



# Conceptual Adaptation Framework



# Positive Signs on the Horizon

- UN Nature-based Solutions to Climate Coalition and the Post-2020 Convention on Biological Diversity negotiations
- Federal programs:
  - Nature Legacy/Fund: Protect 30% by 2030;
  - Nature-based Climate Solution Fund;
  - Green Infrastructure Fund;
  - Disaster and Mitigation and Adaptation Fund;
  - Climate Change Adaptation Platform (NRCAN);
  - North American Waterfowl Management Plan Fund;
  - and
  - Community funding programs – e.g., Eco-Action and others

# Today's Guidance

- Think Big! Don't let cost limit creativity!
- Rely on your experience and observations!
- Focus on cross scale connections – watershed influences, natural processes
- Level of detail:
  - Focus on implementable strategies and specific implementable measures
  - If possible, identify place-based actions

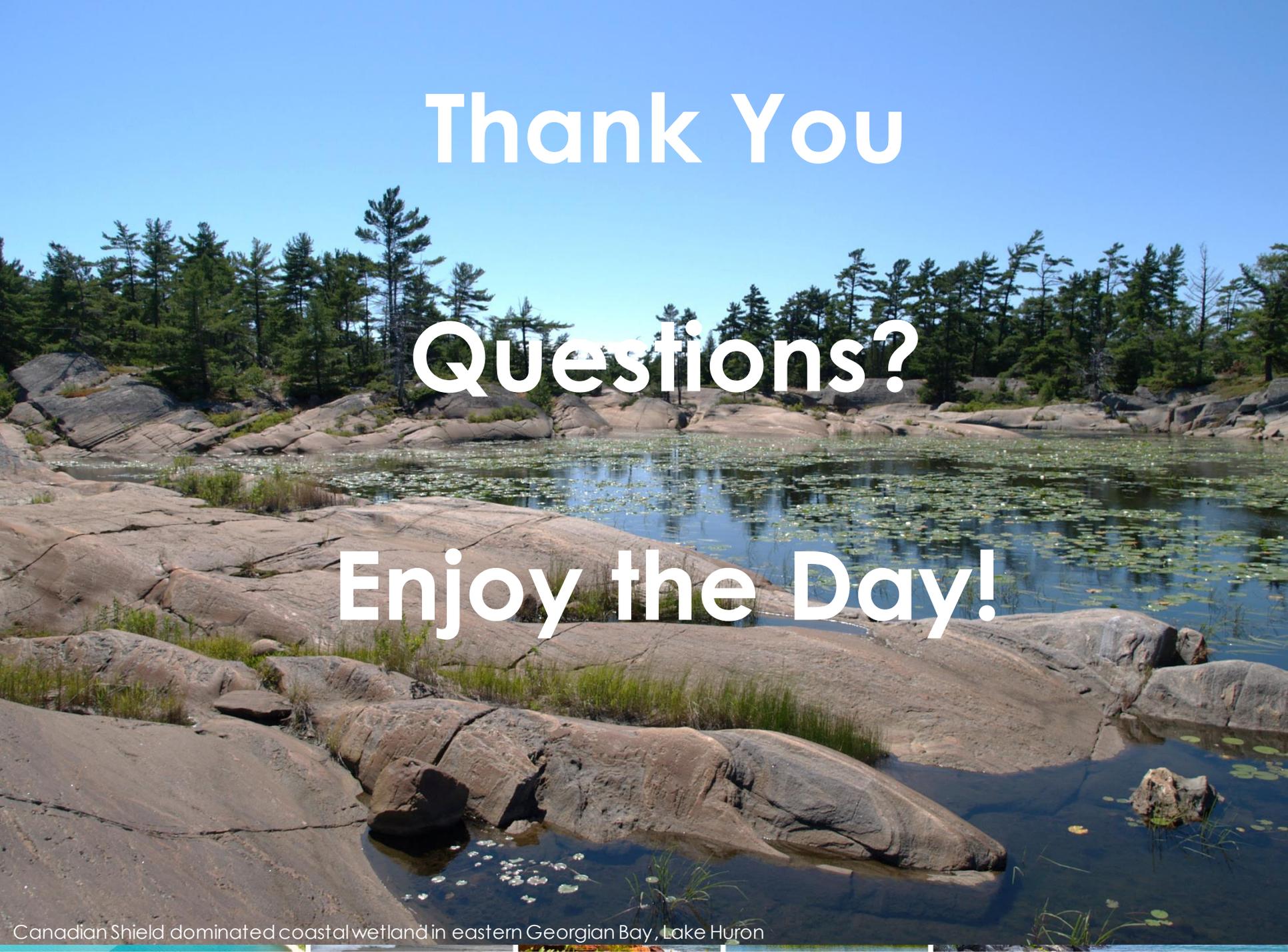
# Today's Guidance

- High level recommendations (science, monitoring, funding, governance, collaboration) have been obtained

Other considerations for today:

- Links with existing programs e.g., nature-based





Thank You

Questions?

Enjoy the Day!