Climate Change Adaptation Planning within The Chippewas of Georgina Island First Nation

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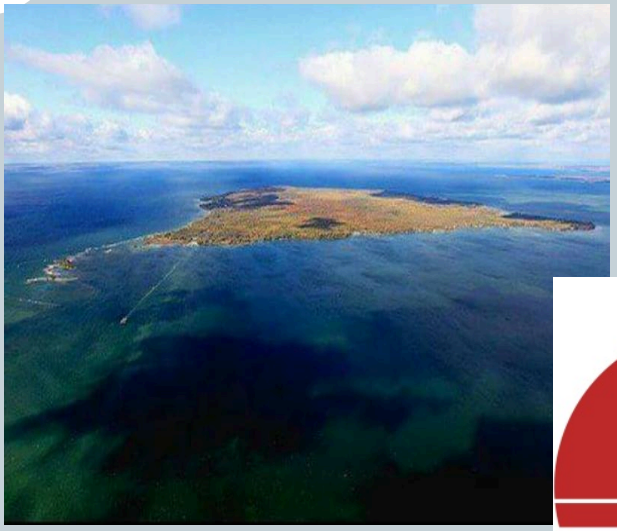


CAMBIUM ABORIGINAL

Our Partners

- INAC
- OCCIAR
- CEC
- US EPA
- MOECC
- MNRF
- Georgian College
- Turtle Island Conservation
- Lake Simcoe Region Conservation Authority

The Chippewas of Georgina Island First Nation At A Glimpse

- Located approximately100 km north of the Greater Toronto Area (GTA).
- Consisting of 3 separate Islands, Georgina, Snake and Fox with 2 mainland access points, Virginia Beach and Island Grove.
- Georgina is the largest of the Islands with a land mass of approximately 15 km^2 which is 4.5 km long and 3.2 km wide, an area of 1,416 ha/4,399 acres.
- Infrastructure consists of an Administration building, Health Centre, Police Station, Fire Hall, Landfill site, Sewage lagoon, Water Treatment Facility, Community Centre, Church, Trails System, an Outdoor Rink, Childcare facility for infants and toddlers and a two-classroom school that accommodates the children of the First Nation until Grade 5.
- There are a few Member operated businesses on the First Nation which include but are not limited to Bed and Breakfasts, Cabin and Cottage Rentals, Restaurants and a Campground.
- The second largest Island is Snake covering an area of approximately 135ha/333acres and has 227 cottages. Fox Island is the smallest at 20ha/49acres with 52 cottages. Neither Snake Island or Fox Island have year round member residents or major Infrastructure.
- The forest on Georgina Island is one of the largest remaining in the GTA, covering 70% of the island. It includes 39 species of mixed wood, hardwood and conifer supporting over 400 species of flora, including several locally, regionally and provincially rare species, and approximately 180 species of birds. Rabbits, beaver, racoon, grouse, wood frogs, salamanders, foxes, wolf , wild turkey and deer also make their home in the forest and in the four adjacent wetlands.

Background and Link to Climate Change

- Georgina Island First Nation is progressive on environmental issues and often leaders in the implementation of such with the premise that all of the work that is being undertaken is all linked in one way or another.
  - Species at Risk Mapping
  - Ash Tree Monitoring and Management
  - Invasive Species Management
  - Shoreline and wetland restoration/rehabilitation
  - Climate Change Adaptation

- Since Initiation of the Climate Change Project in 2011 with funding through INAC the First Nation has been incorporating the Climate Change Lens to all of our Projects.

Framework

- Step 1: Let's get started
- Step 2: Gather data
- Step 3: Current vulnerability
- Step 4: Prioritize future risk
- Step 5: Identify adaptation options
- Step 6: Implement adaptation actions
- *Step 7: Monitor progress*

Community Engagement Critical

Community Engagement was a critical component of this project and continues to be.

Information sessions (with bingo) and interactive workshops were hosted within the community to:

- Inform the community of the project
- Encourage participation
- Ensure feedback

Building the Georgina Island Team

Advisory Committee

- a group of ten consisting of community members including youth, adults and elders.

Community Adaptation Liaison

- to foster relationships with the Georgina Island First Nation community

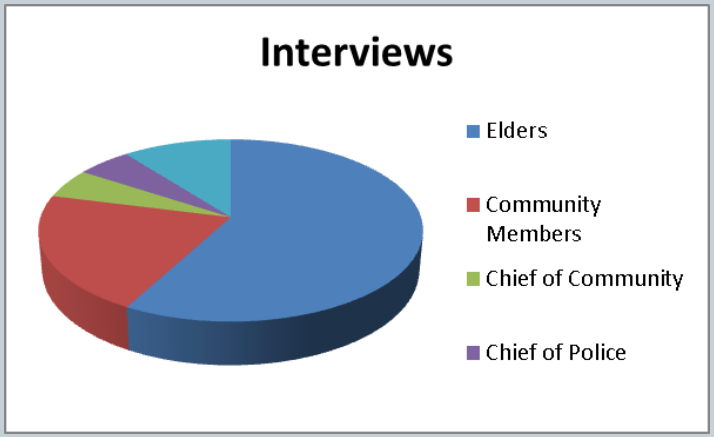
Tasks of Advisory Committee:

- Helped customize Traditional Ecological Knowledge survey specifically towards Climate Impacts/Changes within Georgina Island
- Also suggested a list of potential interviewees

TEK Gathering

Inspired by Dr. Dave Pearson's Survey "Adaptation Planning in the Far North" modified to reflect Georgina Island living:

- Changes in the "bush"
- Changes in wet areas
- Changes in fish
- Changes in birds, animals and insects
- Weather changes in the different seasons, Changes in air/clouds
- Changes in Winter Weather
- Effects of Climate Change on Community Infrastructure
- Weather Emergencies and Health

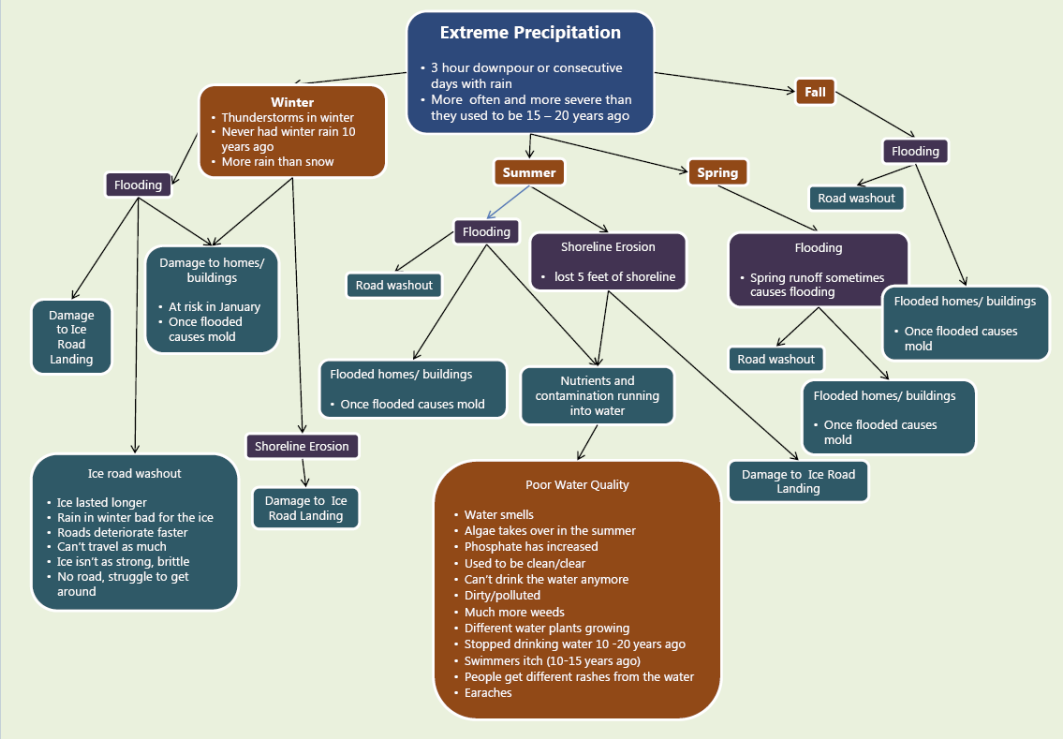


Weather changes in the different seasons, Changes in air/clouds: early spring, long hot summers

Changes in Winter Weather: winters are warmer, ice quality, less snow

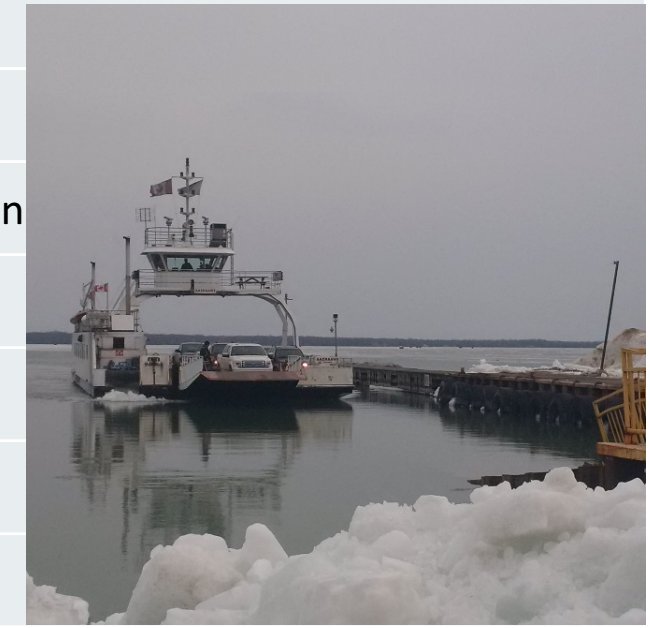
Current Vulnerabilities

Impact trees help visualize how changes in weather and climate impacted the community



Prioritized Impacts

Climate Hazard	Impacted Areas	Impact (taken directly from TEK survey responses)
Changes in Winter	Transportation	Road deteriorates faster
		Can't travel as much
		No road, struggle to get aroun
		Ice pile-up
		Damage to ice road landings
		Pressure cracks
		Using the Scoots more
		Stress on ferry due to breaking through the ice



Historical and Projected Climate

Historical climate for Shanty Bay

Historical Temperature

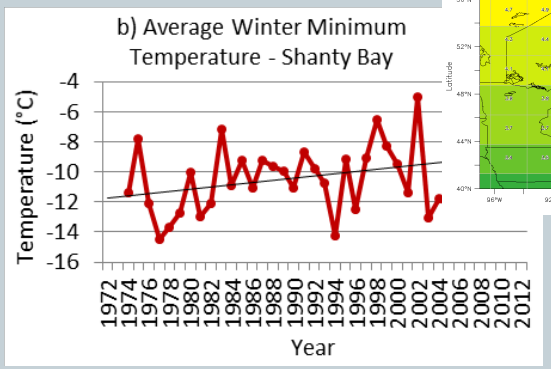
- Warming observed in all seasons
- More warming observed in winter than other seasons
- Winter minimum temperature warmed more than maximum temperature

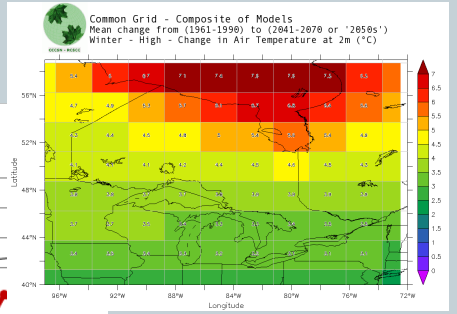
Historical Precipitation

- Increases in precipitation observed in all seasons
- Environment Canada's Canadian Climate Change Scenarios Network Ensemble Projections

Future projections

- Mean temperature projected to increase into the 2050s for all seasons
- Greatest warming projected to occur in the winter
- Projected change in precipitation is variable





RISK ASSESSMET

Risk is defined by the likelihood and consequences of impacts associated with climate change on vulnerable systems

Risk Assessment

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Climate Event: Changes in winter (warmer, shorter, more rain, less snow)
Risk Scenario: Transportation - damage to ice road landings
Time Horizon (planning period): 2050s

	Social						Economic						Environmental						Cultural					
Consequence	Health & Safety	Displacement	Loss of Livelihood	Property Damage	Financial Impact	Impact on Community Finances	Air	Water	Land	Ecosystem	Traditional Food	Traditional Medicine	Traditional Lifestyle											
Very Low (1)							✓	✓		✓	✓	✓												
Low (2)									✓															
Moderate (3)	✓					✓																		
High (4)			✓	✓	✓																			
Very High (5)		✓																						

Consequence = Moderate (3)
Likelihood = Virtually certain to occur (5)

Risk Assessment

Table 28: Estimate of likelihood of vulnerabilities related to changes in extreme precipitation happening in the specified time horizon

Climate Event: Extreme Precipitation (3 hour downpour or consecutive days with rain; more often and more severe than 15-20 years ago)

Time Horizon (planning period): 2050s

Risk Scenario		Very Unlikely to happen (1)	Occasional Occurrence (2)	Moderately Frequent (3)	Occurs Often (4)	Virtually Certain to Occur (5)
Poor Water Quality	○ Water smells ○ Used to be clean and clear ○ Dirty/polluted				✓	
	○ Algae takes over in the summer				✓	
	○ Drinking water ✓ Stopped drinking water 10-20 years ago ✓ Can't drink the water anymore				✓	
	○ Much more weeds			✓		
	○ Different water plants growing			✓		
	○ Health Issues ✓ Swimmers Itch (10-15 years ago) ✓ People get different rashes from the water ✓ Earaches					✓
Flooding	○ Spring runoff sometimes causes flooding			✓		
	○ Road washout		✓			
	○ Flooded homes/buildings – once flooded causes mold			✓		

Very unlikely to happen: not likely to occur during the planning period

Occasional occurrence: may or may not occur during the planning period

Moderately frequent: likely to occur at least once during the planning period

Occurs often: likely to occur several times during the planning period

Virtually certain to occur: happens often and will happen again during the planning period

Risk Matrix

Consequence						
	Very High					
	High					
	Mod-erate				Transportation: • Pressure cracks • Stress on ferry due to break through ice	Transportation: • Road deteriorating faster • Damage to ice road landings
	Low				Ice Quality: • Freeze-up getting later and breaking up earlier	
	Very Low					
		Very Unlikely to happen	Occasional Occurrence	Moderately Frequent	Occurs Often	Virtually Uncertain to Occur
		Likelihood				

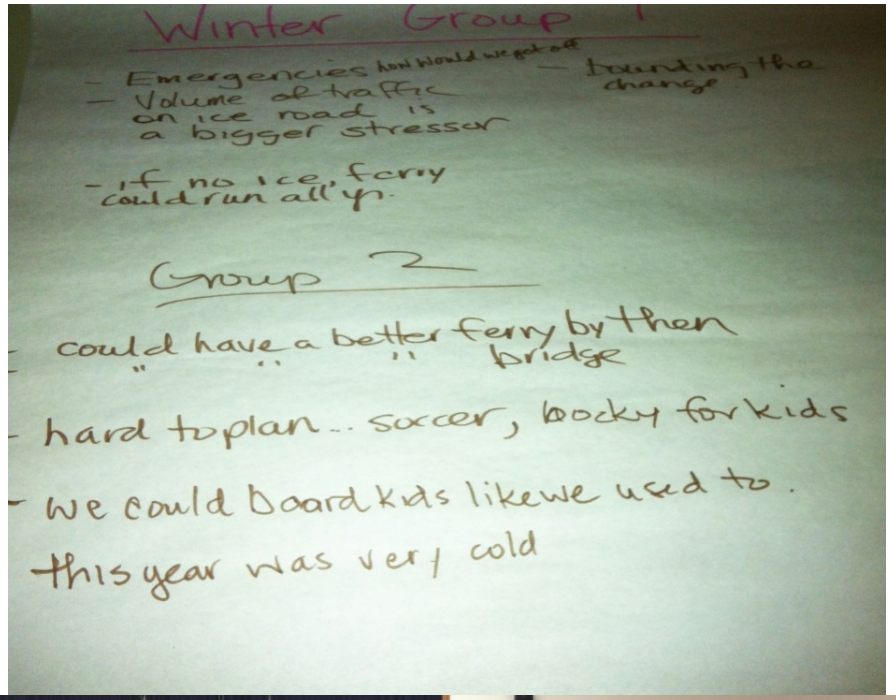
	Very high risk: immediate controls required
	High risk: high priority control measure required
	Moderate risk: some controls required to reduce risk to lower levels
	Low risk: controls not likely
	Very low risk: does not require further consideration

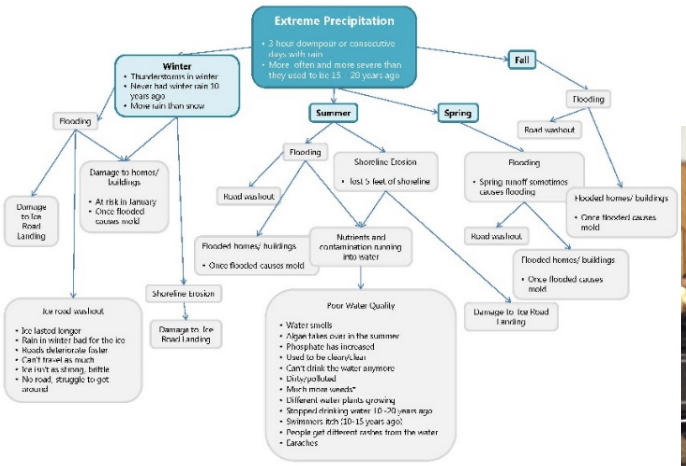
GEORGINA ISLAND

OCCIAR
Ontario Centre for Climate Impacts and Adaptation Resources

Interactive Workshop

- Changes in Winter
- Changes in Summer
- Extreme Precipitation
- Wind
- Drought





Prioritized Risks

- Ended up with a table of prioritized risks which was a combination of the results of the project team estimating risk, the advisory committee comments, and the community estimating consequence.
- Highest priority risks (very high and high) were moved into Year Three of the project.

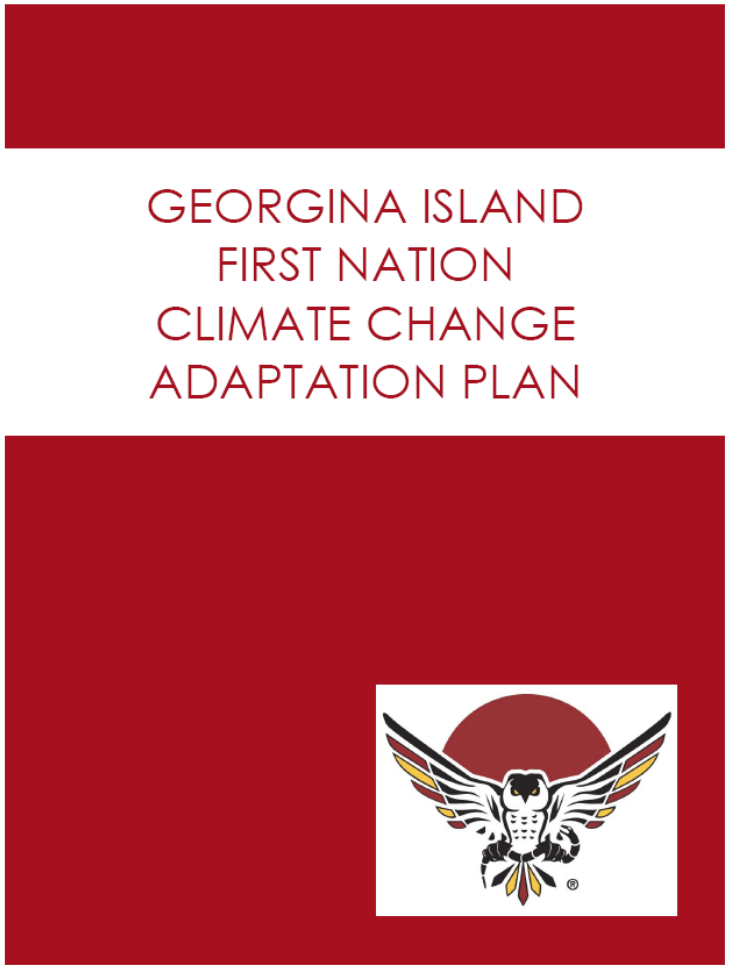
Level of Risk	Climate Hazard	Impacted Area	Impact
Very high risk	Changes in Winter	Transportation	Road deteriorating faster (can't travel as much; no road, struggle to get around; using scoots more)
			Damage to ice road landings
			Pressure cracks
			Stress on ferry due to breaking through ice
	Changes in Summer	Impacts to Water Quality	Health issues
			Water smells; used to be clean and clear; dirty/polluted
			Algae taking over in summer
			Drinking water (stopped drinking water 10-20 years ago; can't drink water anymore)
			Much more weeds
	Wind	Transportation	Stress on ferry due to breaking through the ice
High Risk	Changes in Winter	Ice Quality	Thinning
	Changes in Summer	Impacts to Water Quality	Different water plants growing
	Wind	Transportation	Using scoots less
			Ice pile-up
	Extreme Precipitation	Poor Water Quality	Health Issues
			Water smells; used to be clean and clear; dirty/polluted
		Flooding	Spring runoff sometimes causes flooding
			Road washouts
	Drought	Wildfire	Wildfire
		Changes in creeks	Creeks not draining properly
Moderate Risk	Changes in Winter	Ice Quality	Loss of community members through the ice
			Freeze-up getting later and breaking up earlier
	Changes in Summer	Changes in swamps	Swamps not draining properly
	Wind	Wildfire	Wildfire
		Transportation	Pressure cracks
			Damage to ice road landings
	Extreme Precipitation	Poor Water Quality	Algae taking over in summer
			Drinking water (stopped drinking water 10-20 years ago; can't drink water anymore)
		Flooding	Homes / buildings (mold)
Low Risk	Changes in Winter	Ice Quality	Ice lasted longer
	Changes in Summer	Changes in Swamps	Swamps behind island have dried up or shrunk
			Swamps draining faster
		Poor Water Quality	More weeds
			Different water plants growing
	Drought	Changes in creeks	Creeks drying up
Very Low			

Recommended Adaptation Measures and Implementation Plan

	Risk	Adaptation Action
	Very High Risk	**The following adaptation measures address the highest priority risks. The "very high risks" were associated with 3 of the 5 climate hazards:** · **Changes in Summer** · **Extreme Rainfall** · **Changes in Winter**

	Risk Scenario: Changes in winter – Transportation – Damage to ice road landings	Damage to ice road landings ranked as a "very high risk" due the changes in winter temperatures. In addition, damage to ice road landings ranked as a "moderate risk" due to wind. The following adaptations measures could be implemented to reduce the risks associated with ice road landings.
		Action: Amend or update Transportation Manual to ensure scheduled and documented monitoring and maintenance of ice road landings is occurring, and how it may need to be adjusted to correspond to milder winters
		Action: Develop a communication plan to notify community, on a regular basis, of ice conditions

Adaptation Plan



Adaptation recommendations to respond to risks associated with current and future climate change

Policy Review

BARRIERS AND DRIVERS

Barrier refers to elements of policies or plans that hinder, or act as a barrier to, climate change adaptation actions.

Driver refers to elements of polices or plans that support, or 'drive', climate change adaptation action.

Emergency Plan

Health and Safety Manual/Policy

Forest Management Plan

Pandemic Influenza Contingency Plan

Transportation Manual

Operations and Maintenance Manual

EMERGENCY MANAGEMENT PLAN

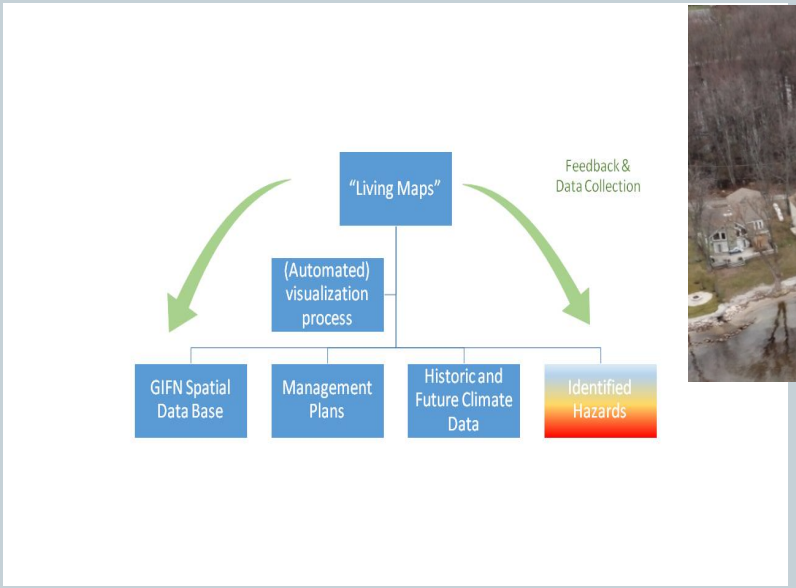
Title	Emergency Plan
Date	01/01/2005
Purpose	To lay down a plan of action for the most efficient employment of all services required in order that the following may be assured: a) The earliest possible response to an emergency… (see page 1 of plan)
Who does it apply to?	Band Administration, Health Centre, Fire Department, Emergency Response Volunteers and GI Police
Policy type	Plan
Location (URL)	Emergency Plan sits with the Georgina Island First Nation
Associated Policies	Influenza Pandemic Plan, Health and Safety Plan, Transportation Manual
Author Organization	Chippewas of Georgina Island First Nation

General recommendations:

- An emergency plan should be proactive, as much as possible when dealing with the impacts of climate change
- Update the plan to include a list of what would constitute an emergency (e.g. extreme or severe weather, flooding, drought, blow-down, wildfire, etc; all of which may become more frequent or intense with climate change).
- Update the plan to specify that adaptive measures such as debris clearing and removal from culverts and ditches should also be conducted before extreme weather is expected.
- In addition to providing information on rising flood waters, plan should be amended to include monitoring ice conditions, ice road (including landings), and ice jams/pile-up
- Encourage households to have a '72 hour' emergency preparedness kit

Hazard Mapping

- **Translating identified Climate Impacts into GIS Maps**
- **(Geographic Information System)**



ORKING TOGETHER AND SHARING KNOWLEDGE

Moose Deer Point First Nation

Beausoleil First Nation

Chippewas of RAMA First Nation

Curve Lake First Nation

Alderville First Nation

GEORGINA ISLAND

CHALLENGES

"The sensitivity of the natural environment to changes in weather and climate affect the ecosystems and socioeconomic aspects of every community, especially Indigenous communities"

Chi Miigwetch!

Kerry-Ann Charles
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Cambium Aboriginal Inc