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

Climate Change in Muskoka: A Workshop on Extreme Weather and Emergency Management

October 21st 2016

This presentation delivered by:

Kerry-Ann Charles
Chippewas of Georgina Island First Nation Environment Co-ordinator
Our Partners

- OCCIAR
- CEC
- US EPA
- Indigenous and Northern Affairs Canada
- MOECC
- Georgian College
- MNRF
- Turtle Island Conservation
- Lake Simcoe Region Conservation Authority
The Chippewas of Georgina Island
First Nation At A Glimpse

• Located approximately 100 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 km² 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/333 acres and has 227 cottages. Fox Island is the smallest at 20ha/49 acres 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.
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 the First Nation has been incorporating the Climate Change Lens to all of our Projects including our Emergency Management Plan.
The sensitivity of the natural environment to changes in weather and climate affect the ecosystems and socioeconomic aspects of every community, especially Indigenous communities.
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 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

Community Adaptation Liaison
- to foster relationships with the Georgina Island First Nation community

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

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
Traditional Ecological Knowledge (TEK)

Indigenous knowledge presents a rich fabric of knowledge and wisdom that relates directly to environmental stewardship, preservation, and the enhancement of biological diversity by the First Peoples of Turtle Island (North America).

(Bell, Wheatley, & Johnson, 2012)
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
Impact trees help visualize how changes in weather and climate impacted the community.
### Prioritized Impacts

<table>
<thead>
<tr>
<th>Climate Hazard</th>
<th>Impacted Areas</th>
<th>Impact (taken directly from TEK survey responses)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Changes in Winter</strong></td>
<td>Transportation</td>
<td>Road deteriorates faster</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can’t travel as much</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No road, struggle to get around</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ice pile-up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Damage to ice road landings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure cracks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Using the Scoots more</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stress on ferry due to breaking through the ice</td>
</tr>
</tbody>
</table>
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 is defined by the likelihood and consequences of impacts associated with climate change on vulnerable systems.
## Climate Event
Changes in winter (warmer, shorter, more rain, less snow)

## Risk Scenario
Transportation - damage to ice road landings

### Time Horizon (planning period)
2050s

<table>
<thead>
<tr>
<th>Consequence</th>
<th>Social</th>
<th>Economic</th>
<th>Environmental</th>
<th>Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health &amp; Safety</td>
<td>Displacement</td>
<td>Loss of Livelihood</td>
<td>Property Damage</td>
</tr>
<tr>
<td>Very Low (1)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Low (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate (3)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very High (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Consequence</th>
<th>Very High</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
<th>Very Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Unlikely to happen</td>
<td>Occasional Occurrence</td>
<td>Moderately Frequent</td>
<td>Occurs Often</td>
<td>Virtually Uncertain to Occur</td>
<td></td>
</tr>
</tbody>
</table>

#### 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

**Transportation**:
- Pressure cracks
- Stress on ferry due to break through ice

**Ice Quality**:
- Freeze-up getting later and breaking up earlier

16
• Changes in Winter
• Changes in Summer
• Extreme Precipitation
• Wind
• Drought
- 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.
### Recommended Adaptation Measures

<table>
<thead>
<tr>
<th>Risk Scenario</th>
<th>Adaptation Action</th>
</tr>
</thead>
</table>
| **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 recommendations to respond to risks associated with current and future climate change
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 policies 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
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.

<table>
<thead>
<tr>
<th>Title</th>
<th>Emergency Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>01/01/2005</td>
</tr>
<tr>
<td>Purpose</td>
<td>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)</td>
</tr>
<tr>
<td>Who does it apply to?</td>
<td>Band Administration, Health Centre, Fire Department, Emergency Response Volunteers and GI Police</td>
</tr>
<tr>
<td>Policy type</td>
<td>Plan</td>
</tr>
<tr>
<td>Location (URL)</td>
<td>Emergency Plan sits with the Georgina Island First Nation</td>
</tr>
<tr>
<td>Author Organization</td>
<td>Chippewas of Georgina Island First Nation</td>
</tr>
</tbody>
</table>
Hazard Mapping

- Translating identified Climate Impacts into GIS Maps
- (Geographic Information System)
WORKING TOGETHER AND SHARING KNOWLEDGE

Participating Communities

Moose Deer Point First Nation

Beausoleil First Nation

Williams Treaty Territory
Thank you!

Kerry-Ann Charles
Chippewas of Georgina Island First Nation
Environment Co-ordinator
kerry.charles@georginaisland.com