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## *NVCA Climate Change Strategy and Action Plan*

### *Stakeholder Advisory Group Meeting 1, February 15, 2017 – Summary Document*

*March 13, 2017*

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*Prepared for the Nottawasaga Valley Conservation Authority  
by Georgian College, Environmental Technology Students  
as part of their ENVR 3015 Stakeholder Engagement and Management Course  
(Winter 2017)*

# Report Contents

- 1.0 Introduction and Background ..... 1
- 2.0 Meeting Details and Objectives ..... 1
- 3.0 Meeting Participants..... 2
- 4.0 Meeting Overview..... 3
  - 4.1 Welcome and Introductions..... 3
  - 4.2 Activity One: Identifying current climate change impacts on NVCA programs ..... 6
  - 4.3 Activity Two: Identifying elements of a successful climate change program for NVCA ..... 7
- 5.0 Wrap-up and Next Steps..... 7
  
- Appendix A: Stakeholder Advisory Group Summary Notes from Activity 1..... 8
- Appendix B: Stakeholder Advisory Group Summary Notes from Activity 2 ..... 14
- Appendix C: Additional Comments..... 21

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## 1.0 Introduction and Background

The Nottawasaga Valley Conservation Authority (NVCA) is developing a Climate Change Strategy and Action Plan. The plan is intended to help the watershed adapt to anticipated climate changes and assist in minimizing the severity of resulting impacts within the local watershed. The NVCA has adopted the Local Government for Sustainability (ICLEI) Framework to complete this climate change work. The Framework includes five milestones that provide a structured approach to adaptation planning. The NVCA has now completed *Milestone 1 – Initiating the Process* and *Milestone 2 – Researching Climate Change* and is now preparing for *Milestone 3 – Planning the Climate Change Strategy*.

The NVCA has partnered with Georgian College and students from the ENVR3015 Stakeholder Engagement and Management course to help in the preparation and facilitation of a Stakeholder Advisory Group (SAG). The SAG has been formed to provide the NVCA with a broader, sector-specific range of perspectives in shaping the strategy. Specifically, the role of the SAG is to provide an ongoing forum for advice, feedback and guidance to the NVCA at key points during Milestone 3 of the project. This document is a summary of the first meeting of the SAG.

## 2.0 Meeting Details and Objectives

**Date:** February 15, 2017

**Time:** 3:00 pm – 6:00 pm

**Location:** Room M122 of Sadlon Centre for Health and Wellness, Georgian College

The **objectives** of the first meeting with key stakeholders were to:

- Provide information and scientific research on climate change;
- Identify and discuss climate change impacts on the Nottawasaga Valley watershed;
- Encourage stakeholder feedback and opinions on real and potential climate change impacts;
- Foster opportunities for collaboration between stakeholders;
- Allow students an opportunity to grow and learn from stakeholder engagement; and
- Present and discuss next steps for completion of the NVCA Climate Change Strategy and Action Plan.

### 3.0 Meeting Participants

Table 1 summarizes meeting participants. Where an invitee was unable to attend the February 15, 2017, meeting, the notation (*invited*) is included next to the stakeholder name.

**Table 1** – NVCA Climate Change Action Group Stakeholder Meeting Participants (Feb 15, 2017)

Agency	Name
Aware Simcoe	Stephanie MacLellan ( <i>invited</i> )
BILD GTA	Carmina Tupe ( <i>invited</i> ) Nicole MacInnis
City of Barrie	Katie Thompson
CounterPoint Engineering	Patrick Turner
Free Spirit Tours	Jennie Elmslie ( <i>invited</i> )
Lakehead University (Orillia)	Dr. Sreekumari Kurissery ( <i>invited</i> )
Lake Simcoe Region Conservation Authority	Ben Longstaff
Ministry of the Environment & Climate Change	Chris Hyde
Ministry of Natural Resources & Forestry	Kate Gee
NVCA Agricultural Advisory Committee	Colin Elliott Jim Partridge ( <i>invited</i> ) Hugh Simpson
Simcoe Muskoka District Health Unit	Morgan Levison
Simcoe Muskoka Catholic District School Board	Glenn Clarke
Simcoe County District School Board	Jessica Kukac
Tourism Simcoe	Brendan Matheson
Town of Mono, NVCA Board of Directors	Councillor Fred Nix
Town of New Tecumseth	Rick Vatri
Nottawasaga Valley Conservation Authority	Gayle Wood Laurie Baron Fred Dobbs Chris Hibberd Heather Kepran Glenn Switzer Byron Wesson Lyle Wood
Georgian College, Environmental Technology Program	Nicole Barbato (faculty) <u>STUDENTS</u> : Samuel Adams, Victor Azubuike, Jordon Bloye, Joshua Cronk, Ryan Deforge, Brooklyn Dill, Christy Doolittle, Simon Fortin, Trevor Gelaznikas, Chelsea Hutchinson, David Khorsand, Avery Konda, Jessica Lawrynnowicz, Michael LeClair, Justine Lunt, Danielle Marcoux, Gregory Mcgrath, Tyler Meadows, Stephanie Oddie, Marvin Patani, Nikole Priestman, Kristopher Robinson, Kyle Rossignol, Derek Switzer, Brittney Thompsen, Nathan Vajda, Tayte Van de Laar, Julie Waddell, Shaun Wakefield, Cheryl Weber, Ashley York

## 4.0 Meeting Overview

### 4.1 Welcome and Introductions

Gayle Wood, Chief Administrative Officer for the NVCA, welcomed participants to the first stakeholder advisory group meeting for the NVCA Climate Change Strategy and Action Plan. She thanked everyone for their support and provided an opportunity for stakeholders to introduce themselves and provide their perspectives on climate change collaboration. The following is a summary of stakeholder comments related to their interest in stakeholder collaboration on climate change:

- Interested in partnerships and successful collective strategies.
- Experienced in climate change strategy development/at similar stage in climate change strategy development as the NVCA.
- Interest based on climate change strategy development in the GTA.
- Interested in climate change and developing land use efficiencies.
- Concern in how to change mindset of municipalities.
- Concern about impact of climate change on natural resources.
- Interested in provincial scale versus local scale climate change mitigation/adaptation activities.
- Educational interests for school boards and potential impacts on school board activities (e.g. inclement weather and transportation, increased utility costs, extreme weather and health impacts).
- Interest in health impacts due to climate change, particularly as they will affect vulnerable populations.
- Integration of multiple perspectives (e.g., agriculture sector sees benefits from increased carbon dioxide and temperatures extending the growing season).

Nicole Barbato, Georgian College, introduced the students of her Stakeholder Engagement and Management course that participated in the SAG meeting. She thanked NVCA and the stakeholders present for having her students involved in this project. The SAG is an excellent opportunity for students to experience firsthand a multi-stakeholder meeting.

Gayle Wood presented the goals of the NVCA in regards to climate change and their objectives in creating a Climate Change Strategy and Action Plan. Lyle Wood, GIS Analyst with NVCA, presented the scientific information behind climate change research conducted by NVCA, including historical rain gauge and temperature data, model projections for near-future temperature and precipitation change. Lyle also outlined the potential impacts that climate change could have on the environment and society within the Nottawasaga Valley watershed. Table 2 summarizes the results of the science of climate change for the Nottawasaga Valley Watershed.

**Table 2** – Anticipated Climate Change Outcomes in the Nottawasaga Valley Watershed.

Climate Indicator	Anticipated Outcome
Temperature	<ul style="list-style-type: none"> <li>• average annual temperature projected to climb between 1.3 to 1.5°C in the near future (2020s)</li> </ul>
Precipitation	<ul style="list-style-type: none"> <li>• average annual precipitation projected to increase to between 19 and 32 mm by 2020s</li> <li>• increase in annual precipitation will likely occur primarily in the spring and winter seasons</li> <li>• summers are expected to become drier</li> </ul>
Streams	<ul style="list-style-type: none"> <li>• stream temperatures can be expected to increase between 0.8 and 1.5°C by 2020s</li> <li>• this response will not be uniform</li> </ul>
Extreme Events	<ul style="list-style-type: none"> <li>• trend toward higher intensity and frequency of extreme storm events</li> </ul>

The SAG was given an opportunity to ask questions. The following is a summary of questions and answers.

**Q: *If temperatures continue to rise, what can be done to slow down or even out the damage that has already been done?***

*A: Mitigation is difficult to address for NVCA, so adaptation is key. NVCA can do their part by understanding global change and looking at the local watershed to do their part. By focusing at a local level, NVCA can accomplish their piece of the puzzle, and if other communities do the same hopefully we can make a difference at the global level.*

**Q: *The risks of climate change are recognized, however with the positive changes for agriculture (e.g. more CO<sub>2</sub>, higher temperatures, longer growing season), why should we do anything differently?***

*A: Communicating the wide array of projected impacts that climate change may have is critical. Incentives for changes also have to be supported to ensure change.*

**Q: *Were the data results found by the NVCA comparable to other local areas?***

*A: Historical data was collected from two points in Barrie and one point in Midhurst. Climate model projections were compared with other local communities. Differences between model projections between local communities were not significant. All surrounding communities foresee similar impacts – e.g. hotter, drier, summers and warmer, wetter winters.*

**Q: Do the climate change results presented by NVCA match the outcomes of surrounding watersheds (i.e. other conservation authorities)?**

*A: Yes they do. The Lake Simcoe Region Conservation Authority representative indicated that the data LSRCA acquired was quite similar to the NVCA's climate change assessment. The areas sampled in the NVCA watershed had small differences but the differences were not enough to show notably different potential impacts.*

**Q: Can you discuss which emissions scenario NVCA used to complete their assessment?**

*A: AR4 emissions scenarios A1B, A2 and B1 were used for comparisons of results to estimate the magnitude of climate change impacts. (AR4 scenarios are the standard used in the fourth Assessment Report of the Intergovernmental Panel on Climate Change.)*

**Q: There were three data points used to determine temperatures in the Nottawasaga Valley watershed. Did you consider using other locations such as other nearby watersheds to compare?**

*A: Projections were compared for four locations spanning the Nottawasaga Valley watershed and all four locations had identical climate change projection values; hotter, drier summers, and warmer, wetter winters.*

**Q: Will there be a noticeable change after climate change policies are implemented?**

*A: Various organizations are beginning to develop strategies to make the change noticeable. They are beginning to work together which increases the power of the overall climate change strategies. Adaptation by sectors may need to be made when it comes to type of crop, tilling methods, etc.*

**Q: It was said that municipalities were going to be heavily involved in climate change mitigation efforts. How will they be involved in efforts by the Province?**

*A: MOECC representative indicated that one example is Low Impact Development. A larger amount of small projects will be put into effect to gradually reduce climate change impacts. Provincial policies are being created but the release date of this is still to be determined. There will be implementation requirements for low impact development (LID) policies based on updates to the Lake Simcoe Protection Act which will hopefully address stormwater quantity and quality impacts. This may also be implemented into the Great Lakes Protection Act. There will likely be additional requirements in the future.*

**Q: Will new policies identified by the Provincial Government be legislated or just best management practices?**

*A: The MOECC representative indicated that it will likely be mostly through legislation with some inclusion of best management practices. For example, more technology is required to reduce nutrient loading.*

A comment also was made that that mitigation and adaptation can be considered as more than a dollar value, but also as future potential savings.

## **4.2 Activity One:**

### **Identifying current climate change impacts on NVCA programs**

The SAG members were divided into six groups based on different focus areas as followings:

1. Rivers and Streams – High and Low Water
2. Groundwater and Extreme Weather
3. Terrestrial and Aquatic Habitats, Shorelines, and Stewardship
4. Development Review and Flood Planning Mapping
5. Education and Communication
6. Recreation and Tourism

The SAG worked within their table to discuss their opinions of climate change impacts. SAG worked within their tables to discuss the following questions:

- 1. *What past impacts have resulted from climate change on the watershed resources and NVCA programs and activities?***
- 2. *What do you see as future impacts on these resources and activities?***

Table rules for conduct and respect were explained, and one Georgian College student was assigned the lead role to capture all table ideas in order to present back to the larger group. **A summary of the thoughts and ideas from each table based on Activity One is provided in Appendix A.**

During the portion of the meeting one stakeholder asked, “*How do we ensure that there is a future buy in from key stakeholders, and ensure that there will be a monetary investment to keep our waters safe? What would those future plans look like (e.g., legislation, policies, recommendations, etc.)?*” This question is expected to be addressed in future stakeholder sessions.

### 4.3 Activity Two:

#### Identifying elements of a successful climate change program for NVCA

The SAG again worked among their tables (as listed above) to brainstorm ideas on what a successful Climate Change NVCA program would look like. The following question was asked during the second activity and feedback was collected:

1. *What does successful climate change adaptation and preparedness look like for the NVCA?*

A Georgian College student was selected to record breakout table ideas and to present to the larger group. **A summary of the thoughts and ideas from each table based on Activity Two is provided in Appendix B.**

### 5.0 Wrap-up and Next Steps

Georgian College student leads presented their table's ideas for both activities to the room. Stakeholders at each table were given an opportunity to present further information if desired.

Gayle Wood noted that the outcome of the meeting will be used to determine what programs/policies can be implemented to ensure that NVCA is targeting its climate change challenges as efficiently and effectively as possible. NVCA also asked if there were any other key stakeholders that could be brought to the table to ensure the best climate change adaptation actions or those that could have an effect (positively/negatively) on the climate change were included in the discussions.

All participants were thanked for their time and efforts in attending the first SAG meeting. A summary of the meeting was promised, as well as a second SAG meeting. The second meeting is scheduled for Wednesday March 22, 2017, from 3:00 pm to 6:00 pm at Georgian College.

## Appendix A: Stakeholder Advisory Group Summary Notes from Activity 1

### ACTIVITY 1: IDENTIFICATION OF CLIMATE CHANGE IMPACTS ON NVCA PROGRAMS (Rivers and Streams)

#### What are some past impacts that have resulted from climate change?

##### **Contaminant loading**

- More salt loading to streams (trucks out more because temperatures more often hovering around freezing mark); impact fish reproduction and wildlife; Stormwater management saltier than Dead Sea, pink bacteria seen that only grow at high saline environments has been seen in local stormwater ponds.
- Increased pesticides with increased precipitation in lakes (runoff)

##### **Changes in water levels**

- Variable precipitation resulting less baseflow; Groundwater levels have been fluctuating
- 2001-2004: drought conditions more prevalent resulting in the need to notify farmers to reduce reversed stream flows, promote reservoir building and irrigating at night, and pump at night over winter; Huge financial loss to farmers
- Great river flooding due to higher intensity storms as well as snowmelt events; Flooding in rivers impacting infrastructure and buildings; Heavy river flow cause bridge and culvert washouts.

##### **Infrastructure impacts**

- Design changes in infrastructure are required
- Developments in flood plains impacted by high water levels/flooding.

#### What are some future impacts that may result due to climate change?

##### **Contaminant loading**

- Increased salt loadings – salt trucks are going to need to be out more frequently
- Algal blooms in lakes and rivers leading to dissolved oxygen reduction and impact on coldwater fisheries.
- Warmer climate patterns will see an increased migration of tourists – Wasaga Beach is biggest freshwater beach. This can result in loading on septic systems of long term residents that used to be seasonal.

##### **Changes in water levels**

- Increased flooding – less ice cover on waterbodies resulting in more lake effect snow.
- Flooding events will be primarily snowmelt driven; cause less ice cover on lakes which will in turn produce more precipitation

##### **Changes in program delivery**

- Outreach and education is vital to ensure buy-in and understanding by all parties involved - so that residents and locals are aware of the severity of the impacts of climate change.
- Designing for future impact; e.g. Low impact development will become more important to combat climate changes
- Problems caused by illegal connections to sewer systems will cause even more impact with increased precipitation. Over capacity of the sewer system will occur, which will overload the Wastewater Treatment Plants.
- Erosion and sediment protection (ground not frozen) will become more important to deal with heightened precipitation events
- More careful documentation of land use for determining new flood plains

## ACTIVITY 1: IDENTIFICATION OF CLIMATE CHANGE IMPACTS ON NVCA PROGRAMS (Groundwater and Extreme Weather)

### What are some past impacts that have resulted from climate change?

#### **Flood management**

- There has been more intense and localized flooding, this means we need to put into perspective other stressors such as urbanization and the potential for adaptation through such things as low impact development (LID).

#### **Delineated flood issues**

- New storm patterns are difficult to predict. CAs need to figure out how to mitigate the chance of flood damage happening as well as how to advise municipalities. Barrie itself has a large problem with stormwater and these issues directly relate to it.

### What are some future impacts that may result due to climate change?

- **Flood management** → potential implications of issues identified above include:
  - Will CAs need to regulate larger areas?
  - What is impact on habitats? Potential for additional erosion.
  - Will there be an increase in erosion?
  - Planning now for future flooding is needed to minimize damage from larger/more frequent storms.
- **Temperature**: as there is an increase in temperature we see more frequent freeze/thaw cycles. This can mean that there will be times when less salt is need but also times when much more will have to be used. Need better salt use practices.
- **Impacts on Agriculture**: this sector is more vulnerable to drought due to climate change which could lead to crop loss and an increase in erosion
- **Law/Policy Implications**: there may be times in the future where there is potential for a water ban. This was brought up from discussing drought in the agriculture sector.
- **Conservation Authority Duties**: With increased storms as well as drought we discussed how the duties for conservation authorities have to be ever changing and adaptable. CAs need to know where they will be regulating issues. Flooding mapping will be needed for future predicting and warning.
- Restoration will be changing, not only in what vegetation species are needed, but as also where you will source the species seeds from.
- **Changes in species** – Changing climate may increase the number of invasive species occurring in sensitive areas.
- In general it was discussed that monitoring is needed. We need better and more efficient early warning and rapid response systems.

## ACTIVITY 1: IDENTIFICATION OF CLIMATE CHANGE IMPACTS ON NVCA PROGRAMS (Terrestrial/Aquatic Habitat, Shorelines & Stewardship)

### What are some past impacts that have resulted from climate change?

**NOTE – group first discussed definition of stewardship and prioritization of fish species.**

#### **What is stewardship?**

- Stewardship in relation to the NVCA means helping to restore the environment and ecosystem. When doing restoration, species need to be considered. Will they be able to adapt to the changes?
- When working on stewardship projects it is important to pick vegetation species that are able to thrive in the changing climate.

#### **How does the NVCA decide on which fish species?**

- Historic population data
- Restore populations based on which already inhabit area
- Look at climate change projections

#### **Negative Effect Observed in Watershed**

- Coldwater Fish species are affected during the always changing seasons, the warming streams lowers the ability for reproduction.
- Biodiversity of terrestrial species may be lowered.
- Wetland marshes are currently changing drastically; more drought periods are erasing ponds.
- Due to the increase in temperature, the oxygen level within various streams is going down as warm water holds less oxygen.
- The ability for various smaller ecosystems within the NVCA region to maintain historical populations is a more difficult task than in previous years.
- Aphids are arriving earlier in the growing season which limits the ability of agriculture to utilize the longer growing season, depending on which crop is being grown.
- Many farmers spread fertilizer during the winter season. This leads to nutrient leaking in to bodies of water. It was agreed that this is an issue that the *Great Lakes Protection Act* should take into consideration and prohibit this action.

### What are some future impacts that may result due to climate change?

#### **Negative Effect that could occur in the Watershed**

- Invasive species from more southern (warmer) climates can produce at a much higher rate. This leads to invasive species expanding their habitat which can affect cropland, growth rates and crop quality.

#### **Positive Effects that could occur in the Watershed**

- OFA Member indicated that warming climate is positively effecting crop growth. Longer seasons allow for farmers to plant crops that normally would not survive in this area. (I.e. plants with higher hardiness index moving north).

## ACTIVITY 1: IDENTIFICATION OF CLIMATE CHANGE IMPACTS ON NVCA PROGRAMS

### (Development Review and Floodplain Mapping)

#### What are some past impacts that have resulted from climate change?

##### **Unpredictable changes in precipitation:**

- Dramatic decrease in water levels in their area, ponds on fields are decreasing
- Increased flooding
- Drought/increased water

##### **Changing Climate:**

- Warmer winters, less precipitation, warmer cycles
- Frequent intense storms, increase temperatures
- Weather is much less predictable, different from historical weather

##### **Infrastructure:**

- Damaged drainage systems because of an influx in precipitation
- Damage to infrastructure, with flooding
- Positive impact: funding for alternative systems like gardens, rain barrels, water retention system and technology advancements because of climate change. Saving on infrastructure by building sustainably (E.g. Cisterns)

##### **General Environment:**

- Common changes in lake use (lake closure, lower fish populations) in other areas but not so much around great lakes
- Increased runoff to lakes and higher nutrient loading (pressures from many areas on one localized area)
- Reduction in soil quality and erosion. It was noted that we can only manage soil synthetically for so long.

#### What are some future impacts that may result due to climate change?

##### **Positive future impacts of climate change:**

- Significant move from traditional soil management to innovative soil management, cover crops, low till, no till, crop rotation (still high yield, and can be used on large farms), runoff management; It was noted that sustainable farming requires different practices (may be forced or by choice); This is already happening a little (slow to change) and is a financially good choice but it's a change which isn't necessarily liked.
- Changes in the look of farms from pristine to messy (more natural) and no tractors
- Increased buffers on creek
- Better use of marginal land, not all soil on all land is equal; Could also section off land for other uses (e.g. Pollinators)
- Willingness to work together on climate change → municipally, federally and provincially

##### **Negative future impacts of climate change:**

- Increased Bypass events with impacts on lands and rivers.
- Increased cost for municipal services to upgrade infrastructure.

## ACTIVITY 1: IDENTIFICATION OF CLIMATE CHANGE IMPACTS ON NVCA PROGRAMS (Education and Communication)

### What are some past impacts that have resulted from climate change?

#### **Property Damage/Impacts**

- Significant change in storm event intensities causing an increase in flooding resulting in large property and infrastructure damages and expenses.
- Wind damage from intense storms and tornadoes (impacting schools/other buildings & trees).
  - Need to design schools so that they can better withstand extreme weather and protect those inside
  - Tree maintenance
- Increase in invasive species and insects that can transmit disease

### What are some future impacts that may result due to climate change?

#### **Human Health Impacts**

- With increased temperature there will be an increase in vector borne diseases. There is concern for the impact on children - do not want to discourage them from going outside.
- Other potential health impacts related to extreme temperatures (heat and cold), extreme weather events (severe storms, drought, etc.) issues surrounding water quality and quantity, and issues surrounding air quality.
- Increase in food borne illnesses in warmer months.
- Increase in skin cancer cases due to strong UV radiation.
- Climate change is very much a health issue - this grabs people's attention because it affects them on a direct level.
  - Communicating the impacts of climate change on human health could help educate others on the severity of climate change as well as help engage others to rethink their lifestyle and become involved in making a difference

#### **Environmental Impacts**

- Increase in algae blooms

#### **Impacts on Services (e.g. interruptions)**

- Resulting from inconsistency in weather; Increasing intensity in weather
- Increase in school bus cancellation
- Food security issues

## ACTIVITY 1: IDENTIFICATION OF CLIMATE CHANGE IMPACTS ON NVCA PROGRAMS (Recreation and Tourism)

### What are some past impacts that have resulted from climate change?

- Cycling FAT bikes have had a longer season this year than usual because there have been favourable conditions.
- Snowshoeing and skating has been in decline. Skiing (cross-country and downhill), has started having late starting seasons, there has been much more need for manmade snow which means there is less return on costs associated with operating the facilities.
- Pond hockey and ice fishing has become less popular because there is no ice.
- NVCA has also seen less attendance at the Tiffin Center. Increased wind and more severe weather conditions have resulted in more maintenance costs and the Tiffin Center has even closed more than previously noted.
- Algae blooms in the summer making beaches inaccessible more often.
- The warmer weather also gives insects more time to thrive and acts as a catalyst for invasive species like the spruce beetle, mountain beetle and emerald ash borer.
- Some noted that there was a noticeable increase in Lyme disease and loss of trees.
- Storm water ponds seem to be lacking adequate flows for proper function ability and monitoring.
- The weather also makes people want to travel less which impacts tourism.

### What are some future impacts that may result due to climate change?

- There will be a decrease in cold water fish and cold water fisheries will suffer.
- There are more contaminants in the water and the water quality is expected to decrease. There should however be an increase in water quantity due to more rain events which in turn will create limitations on the trails additionally causing an increase in insurance.
- Hot summers will make it difficult for safety due to increased health concerns and potential for forest fires. People will become less active from the heat and humidity.
- There is more risk associated with cost when considering more intense weather conditions and the maintenance of buildings exposed to the elements as well as more maintenance to trails. Falling trees, hazards after storms, trail blowouts, rising and falling water levels affect operation of trails and canoeing.
- Mountain biking is expected to be less accessible
- Overall when considering winter sports, there will be an expected loss in revenues. Loss of ice means there will be no ice fishing or skiing, less snowmobiling, snowshoeing and winter camping less enticing as it will foresee more rain than snow.
- Events year round will be more difficult to plan for and it is expected there will be less overnight stays in the region affecting tourism. If a ski resort has a rain event in the middle of a weekend then people leave and the resort misses out on revenue from their concession and lodging sales as well as people who may have decided to come the following day might change their plans based on the weather.
- Perhaps the focus should change from negative to positive; certain conditions may favour for beginners, for skiing in particular hard-core skiers may prefer natural conditions but if manmade snow always had to be made then beginners wouldn't know the difference and it may boost participation overall. New sports may also emerge from the differences in climate.
- Private or government indoor facilities could be potentially lucrative if they offer sports that are no longer available outdoors in this region. Charge people a fee per person and generate lost revenue due to climate change. Sort of like what has been done with rock climbing.

## Appendix B: Stakeholder Advisory Group Summary Notes from Activity 2

### ACTIVITY 2: WHAT WOULD SUCCESSFUL CLIMATE CHANGE NVCA PROGRAMS LOOK LIKE? (Rivers and Streams)

#### **Better management and reporting**

- Improved flood forecasting/warning program - so that residents are notified beforehand of weather conditions and the possibility of flood conditions. Also, better flood plain mapping, so that it is known where to focus energy. The development of flood plain regulations, so that no one can build within a flood plain.
- Regulations → development out of flood plain
- Improved low water warning program - so that residents are aware of the water level and they can conserve where possible.
- Preparation and emergency preparedness for a wide variety of sectors such as key infrastructure development and maintenance, and species at risk → What maintenance is required? How to improve it resilience before an extreme event occurs?
- Increase riparian zones to reduce risk applied to rivers and streams → this involves the farmland that comes up to the water. Farmers don't want to give the allotted space for riparian zones since it takes away a large source of income from them; maybe incentives for farmers to sell the land back to the conservation authority to give them a monetary gain, but allow riparian zones to flourish
- No till farming, and the use of perennial plants instead of annual – Also, drought tolerant crops that can deal with hotter drier climates. Also, reservoirs for farmers that can fill at night and irrigate over night when absorption is the best.
- Low Impact Development is an important step towards reducing stress on the environment
- Recreation → permits to take water scaled back → where to take agriculture outreach

#### **Better data and communications**

- Improved outreach and education → Many people are not aware of the impacts of climate change and how severe they are. If people were aware of this, they might make it a priority to change. Education and outreach can also lead to better practices in many different sectors. Can focus on dollar amount, communication between municipalities, make available for public, leads to better practices in many different sectors
- Collaboration – the future will bring new challenges, and so collaboration will be important to reach solutions; By collaborating with local communities, challenges can be faced together and new solutions can be researched and implemented together
- Wide spread data collection; This could include watershed studies – what to do in extreme events; Hydraulic studies - see where water flows; Risk analysis – the severity/frequency of events occurring
- Mitigate impacts of development on watershed
- Complete inventory of natural assets
- Better flood plain mapping to understand “weak points” in infrastructure so we know where to focus more of our energy Provide weights to likelihood of events happening for general awareness

## ACTIVITY 2: WHAT WOULD SUCCESSFUL CLIMATE CHANGE NVCA PROGRAMS LOOK LIKE? (Groundwater and Extreme Weather)

- **Conservation Authority Duties:** climate change covers all areas of the NVCA operations and the watershed so an *encompassing strategy is necessary* and that *continued monitoring, evaluation and data management* is crucial. This is particularly important when it comes to floodplain mapping, restoration services, drought planning, and flood management and mitigation practices.
  - Providing continued knowledge and expertise to municipalities related to stormwater management.
  - Floodplain mapping will be essential
  - Training of municipalities so that when the next projects come around, new practices are used rather than traditional practices. This includes communicating that new practices have economical value.
  - Restoration services – need to consider climate change impacts when taking on a project. E.g. tree planting – consider using drought resistant trees. Could also consider possibility of scaling projects back in size but investing more in the follow-through to ensure higher success rates.
  - Management of conservation areas conservation plans (e.g. invasive species management)
  - Recreation on CA properties – issues with CA invasive species, signage to create awareness and protect patrons (e.g. from harmful plants like hogweed).
  - Extreme temperatures – impact on education programs. May need to consider making programs seasonal when weather is more temperate, moving programs indoors, installing climate control systems, changing to more outreach.
  - Flood management and mitigation – need more focus on training and education of the public (e.g., new building projects/development – create awareness and help create value that will justify the expense of installing systems such as low impact development.)
  - Alter planning of events – E.g. maple syrup festivals – may need to adjust date to reflect climate’s impact on syrup production.
  - CAs may need to assess how much to become involved in issues (e.g. low impact development -allow what is required or is there a need to push for more?)
- **Drought management:** with warmer temperatures and variability of water supply, management for drought response and being proactive in this approach will benefit all in the long run.
  - What role can NVCA play in permits to take water? CAs can take a proactive versus reactive approach and preform pre-planning or strategizing.
  - Adaptation plans and drought response during the summer.
- **Planning:** being proactive and assessing the future needs for floodplain mapping, floodplain management and floodplain mitigation is important. Planning also comes into play when speaking about restorative projects where plant species will become more important to the longevity of projects.
- **Monitoring** is needed and it is crucial to maintain a proactive monitoring program. Evaluate and assess monitoring frequency and location to determine if there is enough data. We need better and more efficient early warning and rapid response systems.

## ACTIVITY 2: WHAT WOULD SUCCESSFUL CLIMATE CHANGE NVCA PROGRAMS LOOK LIKE?

### (Terrestrial/Aquatic Habitat, Shorelines & Stewardship)

#### **Better data and analysis**

- Need to have current/ future data for predictions when looking at floods and infrastructure impacts.
  - IDF Curves need to be updated to take into account the changes that could happen due to climate change.
- Have a better understanding of aquifers before moving forward on development.
  - Ensuring that areas with important aquifers are kept in mind when developing urban areas.
  - This goes along with working together with developing companies to ensure they have the proper education background before they cause irreversible damage.

#### **Communication and collaboration**

- It is essential that construction companies are educated with future IDF curves for construction projects
- Allow builders access to updated IDF curves. This updated information will keep housing projects in the best areas possible
- Ensure new development consider water quantity impacts.
- Work together with municipalities.
- Municipalities need to work more with developers. This could include:
  - More requirements to investigate what is going to happen with climate change.
  - Low impact development or building design.
  - Assess water availability - is there enough for the people in the area?
- Educate/Outreach
  - More about the importance of vegetation and its importance for a healthy watershed.
  - Letting the public know what is happening in the case of climate change.
  - Rain barrels programs

#### **Additional stewardship opportunities**

- Creating more infiltration opportunities to address water quantity concerns.
- Be more prepared when dealing with existing systems like storm water catchments
  - Need to be looked after.
  - Can be very costly of municipalities.
  - Increase groundwater recharge by increasing vegetation with a focus on headwater areas
- Buffer zones between agriculture areas and waterways.
  - Incentive for farmers who create buffers on their property.  
How would this affect cash crop farmers?
- OFA member acknowledge the fact that we need to keep in mind laws that are implemented need to be within reason so we are not adversely affecting livelihood.

## ACTIVITY 2: WHAT WOULD SUCCESSFUL CLIMATE CHANGE NVCA PROGRAMS LOOK LIKE?

### (Development Review and Floodplain Mapping)

#### **Infrastructure Considerations:**

- Creation of infrastructure to store water or allow water to flow out of areas that will flood that can meet the standards of higher precipitation events
- Infrastructure design that will help us adapt to changing climate
- Work to decrease erosion impacts on infrastructure
- Net zero infrastructure

#### **Protection of water supplies:**

- Less water being drawn from areas for bottling purposes and less water being taken out of the watershed
- Advocating to stop the transportation of water out of the watershed (cancel contracts or permits to take water)
- Better water supply monitoring
- Altering floodplain mapping to represent the existing increased flooding and projecting future flooding

#### **Communication/ Political Goals:**

- Direct connections to the importance of climate change, communicate the importance of change in society, and try to instill change in individuals before policy creation.
- Long term goals instead of short term goals for change.
- Possible stop in communication and just regulate to force change.
- Larger representation for climate change. NVCA needs to collaborate with others (e.g. federally and provincially, globally) for climate change policy to be effective.
- More third-party independent environmental consultants.

## ACTIVITY 2: WHAT WOULD SUCCESSFUL CLIMATE CHANGE NVCA PROGRAMS LOOK LIKE? (Education and Communication)

### **Consideration of target audience when communicating on climate change**

- People generally do not have a great understanding of climate change
- Educators are missing out on the opportunity to properly inform today's youth about climate change and its impact on the environment and human health.
- There is fear in how climate change is communicated to the general public - "world ending". How do we make issues relatable to the general public (e.g. "Save the man cave" from MOECC YouTube video - [www.youtube.com/watch?v=MstXGpxKO\\_A](http://www.youtube.com/watch?v=MstXGpxKO_A) )
- Level of language is key to getting message across Kids versus Adults
- Keeping things local is very important (teachers need more local examples of climate change)
- To be successful in the face of climate change is to understand who your vulnerable sector populations may be (e.g. Low income, newcomers who are not familiar with the language, people without insurance)
  - Success is to recognize these different levels of vulnerability and know how to communicate to them.
  - Map these vulnerable sector communities within your jurisdictions (e.g. Sudbury mapping exercise, Region of Peel)
  - Health Unit is working with a GIS analyst on a GIS application for their website to map these vulnerable sectors (who and where). Updating mapping is crucial.
- Develop more emergency preparedness drills for schools and the public (e.g. tornadoes)

### **Updated mapping**

- NVCA should update flood mapping to reflect current conditions, which will help for better planning and flood forecasting.

### **Enhanced risk analysis, plan development and cost considerations**

- Complete an exercise to identify impacts on NVCA and analyse how the risk can be decreased (e.g. proactive pruning of old tree branches to minimize risk); this may help decrease potential risks.
- Complete internal costs analysis to give weight to adaptation. Complete a life-cost analysis of not completing the adaptive measure versus completing to adaptive measure to ensure adaptation is successful
- Thinking of health costs, internalizing dollar costs may help in preparedness planning
- More environmentally friendly design options (e.g. Johnson St. and 'Huron Rd. detention pond recreation areas)
- Include impact statements to planning documents from a health perspective (e.g. Official Plan)
- Preventative maintenance plan in place (e.g. Staff resources)
- Flood forecasting that the NVCA has developed is good and should be continued
- Monitoring of the Plan: NVCA should develop indicators and outline when the Climate Change Strategy and Action Plan will be updated

### **Infrastructure considerations**

- Stop preparing for the average and start preparing for the extreme; infrastructure is making storms look worse than they really are. Flood control needs improvement.
- Size infrastructure to population density within high density areas to be able to carry the necessary flow in light of climate change.
- Do more work at the NVCA on Low Impact Development
- Better urban design guidelines (especially for trees planted on boulevards which receive lots of salt)

## ACTIVITY 2: WHAT WOULD SUCCESSFUL CLIMATE CHANGE NVCA PROGRAMS LOOK LIKE? (Education and Communication)

### **Additional collaboration for implementation of climate change activities**

- More tree planting, specifically on school properties (NVCA has knowledge on which type of tree or plants are native and where they can be planted)
- Collaborate with all stakeholders across sectors that are also completing Climate Change Strategy and Action Plan so that individual plans become a cohesive unit (build relationship across sectors)

## ACTIVITY 2: WHAT WOULD SUCCESSFUL CLIMATE CHANGE NVCA PROGRAMS LOOK LIKE? (Recreation and Tourism)

### **Good understanding and communication of changing climate**

- Ensuring that the NVCA and Stakeholders have a good understanding of the landscape is the first step to anticipating extreme weather events such as flooding and forest fires and where it is most likely to occur. This anticipation will drive necessary preparations such as the relocation of trail networks out of areas that may experience flooding. Proactive approaches can be taken to ensure the safety of tourist by posting signage, notices, brochures and the reposting for new trails.
- Education on Climate Change is important to developing “reasons to care”. Information such as the reasons why trails or beaches are closed can enhance awareness to the general public. The NVCA and stakeholders should maintain updated literature to create a transparency of information on Climate Change issues and solutions.

### **Willingness to Undertake New Activities**

- Issues related to Climate Change will cause a shift in seasonal activities and may make some activities less popular or impossible to experience. With rising temperatures in the winter, less ice cover has and will continue to have an effect on ice related activities such as ice fishing. Ice fishing has seen shorter seasons and unsafe ice has made tourists and locals weary of conditions for performing other activities on and near the ice.
- Fishing both in the winter and summer have changed with Climate, cold water fish populations have declined and aquatic invasive species populations have increased. In order to adapt to these changes, the public could be promoted to adopt fishing for species that have adapted better or are more plentiful. This promotion could help to offset the negative impacts on cold water species and/or other sensitive aquatic species. The programs lead by conservations could incorporate a cold-water fish information session to educate and create awareness on these growing concerns for aquatic life.
- Winter recreational sports on a whole are anticipated to decline in popularity as wetter more unpredictable weather have made it less enjoyable to be outdoors. More focus on indoor recreational activities or a focus on increasing summer activities could offset some of the lost winter revenue.
- Recreational summer activities can be prolonged with the warming climate which will offer longer seasons to participate in activities such as emerging sports (e.g. Fat Biking). There may be a decrease in bird migration which presents the opportunities to promote bird watching. There was also discussion on possibilities for selective terrain for new trails that may entice activities on wheels.

The following is a summary of Actions/Activities that could be completed related to this topic.

- Paddling Map for emergency response
- Trail maintenance to prevent Hazards; Increase in Trail Head Signage – to increase awareness and to communicate potential hazards/problems
- Indoor recreation could become a rising field
- Creation of literature of changes to fishing areas (Location/Area/Time of year) – e.g. increases in warmwater fishing and decreasing in coldwater fishing.
- Adaption of recreation based on education and science.; Education and communication of climate change impacts will be paramount
- Enhancement of seasons - Capitalizing on shoulder seasons rather than just winter and summer; Summer adaptations of winter sports
- Adapting to new sports - Fat biking, and different sports for open water during the winter ext.
- Different ways of selection of trails based on - slope, run off, safely, and ease of use
- Increases of animal population could mean extended hunting seasons → Deer have more access to food in the colder seasons; Birding → Increases in migration bird watching; Less and less birds flying south for the winter

## Appendix C: Additional Comments

The comments below were received after the meeting.

**Communications Strategy** – There was a recommendation that the NVCA develop a communications strategy in parallel with the implementation of the climate change action plan. “Effective messaging on the subject of adaptation or mitigation as it relates to climate change will be the key to success with the disparate stakeholders. Two suggestions:

- 1) employ expert communication strategies and have them presented at meetings and at the strategy development table
- 2) when reporting out on adaptation or mitigation plans, recognize that the audiences perceive the issue of climate change through their own filter. Messaging and acceptance can be maximized if the plan is structured as ‘what does this mean to me and my future?’ ”

**Municipal Information Sharing** – There as a question about whether there is “any other information about mitigation that can be provided by municipalities (e.g., energy reduction, land use planning, etc.).”