

REPORT ON NIAGARA REGION
HAZARD IDENTIFICATION RISK ASSESSMENT
WORKSHOP
FEBRUARY 7TH, 2014



An agency of the Government of Ontario.
Un organisme du gouvernement de l'Ontario.

**Report on ACER and Greening Niagara's
Hazard Identification Risk Assessment (HIRA) workshop
Heartland Forest Outdoor Education Centre
Friday, February 7th, 2014**

BACKGROUND

On February 7, 2014, about 50 individuals, representatives of environmental non-governmental organizations (ENGOS), agencies, municipalities and others, assembled at Heartland Forest Outdoor Education Centre for the first HIRA workshop. The co-sponsors of the event were ACER (Association for Canadian Educational Resources) and Greening Niagara. The workshop is one of a series of events designed to bring together the players on the environmental front in the Niagara Region, with ACER acting as the facilitator, Greening Niagara hosting with funding for the initiative provided by the Ontario Trillium Foundation.

The timing of the workshop turned out to be highly relevant in view of the recent ice storm of December, 2013 and the blizzard conditions the participants had driven through to attend the workshop. The focus of the event was top-of-mind for the participants, as evidenced by the enthusiastic participation in and large number of recommendations resulting from the breakout sessions in the afternoon.

PURPOSE

The purpose of the gathering was to update participants on the most recent scientific understanding of the impacts of climate change for southern Ontario and to allow for discussion, exchange and recommendations to be made on two areas affecting the Niagara Region – Biodiversity and Community Preparedness.

MORNING PRESENTATIONS

The morning consisted of presentations of the most recent data from the climate change models, along with information on adaptation and resilience for southern Ontario municipalities by three of Canada's foremost scientists in the area, Heather Auld, Neil Comer from Risk Sciences International and Nobel Laureate Don MacIver, the Mayor of Amaranth.

Don MacIver, Heather Auld and Neil Comer are former Environment Canada employees, recently retired from government, whose contributions to climate change modelling, and the practical aspects of infrastructure adaptation and ecosystem resilience have formed a vital part of the IPCC's reports (International Panel and Climate Change). The latest report from the IPCC

is due to be released in April, 2014. The HIRA workshop information was an advanced window into some of the findings that will be in the report.

The following will provide some highlights of what the participants heard.

Don MacIver reviewed the Top 10 things that cities can do to increase their resilience in the face of climate change. These included:

1. Put in place organization and coordination to understand and reduce disaster risk, based on participation of citizen groups and civil society. Build local alliances. Ensure that all departments understand their role in disaster risk reduction and preparedness.
2. Assign a budget for disaster risk reduction and provide incentives for homeowners, low-income families, communities, businesses and the public sector to invest in reducing the risks they face.
3. Maintain up-to-date data on hazards and vulnerabilities, prepare risk assessments and use these as the basis for urban development plans and decisions. Ensure that this information and the plans for your city's resilience are readily available to the public and fully discussed with them.
4. Invest in and maintain critical infrastructure that reduces risk, such as flood drainage, adjusted, where needed, to cope with climate change.
5. Assess the safety of all schools and health facilities and upgrade these as necessary.
6. Apply and enforce realistic, risk-compliant building regulations and land use planning principles, Identify safe land for low-income citizens and upgrade informal settlements, wherever feasible.
7. Ensure that education programmes and training on disaster risk reduction are in place in schools and local communities.
8. Protect ecosystems and natural buffers to mitigate floods, storm surges and other hazards to which your city may be vulnerable. Adapt to climate change by building on good risk reduction practices.
9. Install early warning systems and emergency management capacities in your city and hold regular public preparedness drills.
10. After any disaster, ensure that the needs of the affected population are placed at the centre of reconstruction, with support for them and their community organizations to design and help implement responses, including rebuilding homes and livelihoods.

Don MacIver also spoke about monitoring for biodiversity in the past as having focused on species at risk, population trends, status of habitat and forest biodiversity. Now there is a need for long-term monitoring with a focus on the response of species and ecosystems to warming trends. He pointed to the Smithsonian Biodiversity Observation Network and the work of ACER in setting up and monitoring plots over the past up to 12 years. ACER has the only biodiversity plot (Humber Arboretum) to monitor the effects of warming of various tree species.

Heather Auld presented economic data to show how, on a global basis, catastrophic weather-related losses are now moving into the 100's of billions of dollars in costs annually. For Canada, the frequency of weather-related losses is growing exponentially. She explained that the

degradation of natural buffers is usually the result of poor planning and that our economic prosperity is declining in areas such as food production, erosion, disaster risk and losses.

She referenced an approach that may be taken by municipalities to enhance their ability to adapt to climate change starting with the prioritization of hazards/risks and disaster risk reduction planning, including:

- Better and new building and engineering codes, standards, practices
- Larger “safety factors” and more redundancy in infrastructure design
- Expensive retrofits of the most vulnerable or “at risk” structures
- Phased adaptation structures – berms built for additional height/safety
- Maintain the services provided by ecosystems – maintain ecosystems
- Merging of soft (green) and hard infrastructure solutions

Ms. Auld gave examples of the economic benefits of ecosystem services including an estimate that Canada’s wetlands provide 2.7 billion dollars in flood control annually. She pointed out that we have ‘after the fact’ data on which to base the value of ecosystem services. For example, in British Columbia, after the destruction of the forest cover following the invasion of the Pine Beetle, a thirteen-year heavy rain event has the equivalent impact of a 50 year rainfall event before the loss of the forest.

She spoke about community climate resilience as requiring:

- Robust infrastructure: reasonable safety margins, redundancy
- Good maintenance of critical infrastructure
- Healthy ecosystems
- Ecosystems that protect and provide services for communities
- People capable of coping with impacts from climate hazards
- Development away from high risk areas
- Planning using up-to-date analyses on changing climate

Ms. Auld demonstrated the risk assessment grid that may be used to assess local risks.

Finally, both presenters referred to the climate change models illustrated in the power point by Neil Comer who was unable to attend. The conclusion from the models is that we are on the trajectory for this century of what had been considered the most extreme model. This is the new norm with temperatures expected to increase between 2 and 2.7 Celsius degrees by 2050 in southern Ontario. The consequences of this increase in temperature which will become the “new normal” for human health, agriculture, construction, energy supply etc. must be factored into future plans for communities.

It was pointed out that:

- Climate change is already happening
- It will continue even if we stop emitting pollutants today

- Climate models show agreement in the direction of change, although the amount varies.
- In spite of ‘climate change deniers’, there is near-consensus in the scientific community
- Media likes conflict – so deniers get ‘*better airplay*’

Notably: “Only Two Percent of Canadians Deny Climate Change”

Editorial Note: Regrettably, Canadians are having difficulty in obtaining up-to-date information on the scientific facts of climate change and the opportunity to prepare within their communities. One of the reasons is that our expert knowledge that resides in federal scientists cannot be accessed. These scientists have either been ‘retired’ from Environment Canada, or they are being ‘muzzled’ as to what they can discuss in public based on their knowledge of climate change which may not be in agreement with the federal government’s agenda.

AFTERNOON

After lunch, the participants were divided into two topic areas, Biodiversity and Community Preparedness with a facilitator/note taker for each group.

FINDINGS AND RECOMMENDATIONS:

Workshop participants developed a list of Niagara’s top ten risks to biodiversity and preventative actions as well as hazards likely to affect the Niagara region. They were then asked to rank the top ten priorities and recommend preventative actions that should be taken.

Biodiversity:

This group prepared detailed notes on actions to be taken to protect various ecosystems and enhance green infrastructure in the region.

QUESTION: WHAT ARE THE THREATS TO BIODIVERSITY IN THE NIAGARA REGION AND WHAT ACTIONS CAN BE TAKEN TO MITIGATE THESE THREATS?

TOP TEN THREATS:

1. Development and urban sprawl
2. Agriculture and intensive land use/management
3. Invasive species
4. Climate change
5. Pollution and pesticides
6. Increasing forest cover/tree planting
7. Lack of information and analysis on biodiversity
8. (Lack of) education, public awareness and engagement
9. Lack of understanding of biodiversity benefits – e.g. goods and services
10. Lack of enforcement and interpretation of public policy

The recommendations for each of these priorities may be found in the attachment “Notes from breakout groups”.

Community Preparedness:

With the ice storm being ‘top of mind’, participants immediately began to develop their list of risk and hazards around their recent experience, emphasizing how their community could have been better prepared.

QUESTION: WHAT ARE THE THREATS FOR COMMUNITIES FACING A CHANGING CLIMATE IN THE NIAGARA REGION AND WHAT ACTIONS CAN BE TAKEN TO MITIGATE THESE THREATS?

TOP TEN THREATS:

1. High winds
2. Wetter weather and extreme rain events/flooding
3. Loss of ‘Green Infrastructure’
4. Drought – effect on food security/agriculture
5. Soil erosion
6. Ice storms
7. Extreme heat
8. Water quality
9. Air quality
10. Power outages

The recommendations for each of these priorities may be found in the attachment “Notes from breakout groups”.

Next Steps:

This report will be shared with participants by email and posting on the ACER and Greening Niagara websites. The scientists have agreed to make their power point presentations available on our websites.

The format for the workshop will be refined and packaged so that it may be provided to other municipalities and interested groups. Among those who have expressed an interest in hosting a workshop include the municipalities of – Hamilton, Toronto and Markham. As well, the Toronto Zoo has expressed interest.

ACER and Greening Niagara wish to thank all those whose work made this workshop possible, including the scientists, Don McIver and Heather Auld, facilitators, ACER and Greening Niagara staff as well as the staff of the Heartland Forest Outdoor Education Centre. We gratefully acknowledge funding from the Ontario Trillium Foundation.

Final Note:

One indicator of the success of this first HIRA workshop on Climate Change in Niagara is the fact that about 50 participants arrived in blizzard-like conditions and stayed for the entire day participating with energy and experience. The second indicator is that participants came from a wide variety of organizations and locations around the Golden Horseshoe and expressed interest in hosting a similar workshop.

List of Attachments

1. Flyer
2. Workshop Agenda
3. List of Attendees
4. Notes from breakout groups' sessions on Biodiversity and Community Preparedness
5. Evaluation and Comments

1. Flyer

SAVE THE DATE: February 07, 2014 Hazard Identification Risk Assessment (HIRA) Workshop NIAGARA REGION



Become proactive! Learn how to identify, assess and prepare for hazards in your community as we face changes in climate.

Train with scientists from Risk Science International
Heather Auld, Neil Comber and Don MacIver climate change Nobel Laureate

Hosted by:



**GREENING
NIAGARA**

formerly
Climate Action Niagara

Our associate partners are:

- Land Care Niagara
- Niagara Restoration Council
- Niagara Peninsula Conservation Authority



Answer questions such as:
What hazards exist in my area?
How frequently do they occur and how will climate change increase the risks?
How severe can their impact be on the community, infrastructure, property, and the environment?
How do I prepare for emergency management?
Which hazards pose the greatest threat to your community?

Funded by



Take Exit 27 at
McLeod Rd
from QEW

Join us for this FREE event at
Heartland Forest
8215 Kalar Road,
Niagara Falls, ON L2H 0L5

Coffee and Registration 9:30am
Workshop 10am-4pm
Limited seating.
Please RSVP by Jan 29, 2014 at
info@climateactionniagara.ca



2. Workshop Agenda

Community Resilience: Hazard Identification Risk Assessment (HIRA) and Preparedness Free Workshop

Agenda

0900 - 0930 Registration

0930 - 0945 Welcome and Introductions

0945 - 1030 Atmospheric Threats and Risks – Heather Auld

1030 - 1045 Break

1045 - 1130 Biodiversity at Risk – Don MacIver

1130 - 1200 Climate Change Projections – Neil Comer

1200 - 1300 Lunch Break (lunch provided) /Outside Tour

1300 - 1330 Risk Analysis Tools

1330 - 1430 Two parallel Discussion Groups --- one focused on community preparedness actions and the other focused on Biodiversity Futures

1430-1500 Reporting and Discussion

1500 Closing Statements

Presenters

Don MacIver



Don is a climatologist with more than 45 years of experience. He was the Director of the Adaptation and Impacts Division, Environment Canada; and a Professor at York University. He is the Mayor in the Municipality of Amaranth and County Councilor in Dufferin. Don has often represented Canada at the UN Conventions on Climate Change, on Biodiversity, the UNESCO Man and the Biosphere Program. He was a research associate of the Smithsonian Institution. Don has received numerous awards including the Queen's Diamond Jubilee Medal and is a co-recipient of the IPCC Nobel Peace Prize.

Heather Auld



Heather works for Risk Sciences International as Principal Climate Scientist since 2012. She has more than 32 years of experience working in weather forecasting and operations, climate science and climate change adaptation. She has recognized national and international expertise in climate change impacts and adaptation, engineering climatology for national codes and standards, energy-climate research, extreme event and

forensic analyses, disaster risk reduction planning and science-policy linkages.

Dr. Neil Comer



Neil is a Senior Climatologist with Risk Sciences International. He has worked in the private sector as an applications engineer/instructor (Weather Services International), in the public sector with the Meteorological Service of Canada and the Adaptation and Impacts Research Section of Environment Canada (EC), and is an adjunct professor at UPEI and U of T. At EC, Dr. Comer shared responsibility for developing the Atmospheric Hazards network

and the Canadian Climate Change Scenarios Network (CCC5N). He has been a reviewer for the IPCC and currently serves as climate science advisor to the Ontario Regional Climate Change Consortium.



Ontario
Trillium Foundation



Fondation Trillium
de l'Ontario



4. Notes from breakout groups' sessions on Biodiversity and Community Preparedness

BIODIVERSITY:

QUESTION: WHAT ARE THE THREATS TO BIODIVERSITY IN THE NIAGARA REGION AND WHAT ACTIONS CAN BE TAKEN TO MITIGATE THESE THREATS?

LIST OF THREATS TO BIODIVERSITY "TOP TEN LIST"

1. Development and urban sprawl
2. Agriculture and intensive land use/management
3. Invasive species
4. Climate change
5. Pollution and pesticides
6. Lack of information and analysis on biodiversity
7. (Lack of) education, public awareness and engagement
8. Lack of understanding of biodiversity benefits – e.g. goods and services
9. Lack of enforcement and interpretation of public policy

THREATS TO BIODIVERSITY AND RECOMMENDED ACTIONS:

Threat: Development and urban sprawl

Actions:

- Regional and municipal planning
 - Public input
 - Community pressure
 - Increase forest/tree cover
- Recording incremental loss
- Enforcement and monitoring
- Increase regulation
- Protect what we have left
- Urban intensification-low impact development i.e. swales, rain barrels

Threat: Agriculture and intensive land use/management

Actions:

- Encourage 'Best Management Practices'
- Seedbank (non-GMO)
- Avoid pesticides, specifically neonicotinoids

Threat: Invasive species

Actions:

- Monitoring import and export
- Develop regional list
- Remove them
- Adapt plans to build resiliency
- Encourage studies, community action and citizen science
- Education and awareness
- Legislation – horticulture industry

Threat: Climate change

Actions:

- Vote wisely – elected government – list of questions for them
- More preventative measures
- Adaptation plans – to build resiliency –list of what can be planted
- Monitoring of GHG emissions
- Education and awareness at grassroots level
- Biodiversity as a stand-alone issue
- Backflow valve funding + other grants and initiatives
- Legislative reduction in emissions
- Financial penalties
- Increase forest cover/natural cover

Threat: Pollution and pesticides

Actions:

- Ban neonicotinoids
- Reduce review time from current 15 years to every 5 years
- Financial penalties
- Proper use of pesticides
- Adhere to 'Best Management Practices' e.g. buffer for wetlands

Threat: Lack of information and analysis on biodiversity

Actions: See recommendations for two following 'threats'.

Threat: (Lack of) Education, public awareness and engagement

Actions:

- Bioblitz-more citizen science training for monitoring birds, reptiles etc
- Share data and maps
- Hold public meetings

Threat: Lack of understanding of biodiversity benefits – e.g. goods and services

Actions:

- Data analysis – assess the value of biodiversity
- Awareness and education
- Utilize community groups
- Interpret data for public to understand

Threat: Lack of enforcement and interpretation of public policy

Actions:

- Attend Conservation Authority meetings
- Write letters to the Editor
- Grassroots mobilization
- Engage environmental writers for Niagara-at-large
- Use online news sites to get information out to the public

COMMUNITY PREPAREDNESS

QUESTION: WHAT ARE THE THREATS FOR COMMUNITIES FACING A CHANGING CLIMATE IN THE NIAGARA REGION AND WHAT ACTIONS CAN BE TAKEN TO MITIGATE THESE THREATS?

TOP TEN THREATS

1. High winds
2. Wetter weather and extreme rain events/flooding
3. Loss of 'Green Infrastructure'
4. Drought – effect on food security/agriculture
5. Soil erosion
6. Ice storms
7. Extreme heat
8. Water quality
9. Air quality
10. Power outages

THREATS TO COMMUNITIES AND RECOMMENDED ACTIONS:

Threat: High Winds

Actions:

- Upgrade building codes e.g. washers on bolts where house frame meets basement; hurricane clips on roofs

Threat: Severe rain events, wetter weather – flooding

Actions:

- Downspout disconnect
- Permeable surfaces
- Swales and green infrastructure

Threat: Loss of Green Infrastructure

Actions:

- Tree tender program e.g. Neighbourwoods
- Property tax incentives for tree planting and water retention e.g. Michigan
- Preserve and restore green Infrastructure e.g. Oakville's natural heritage system is a model – between 2000 and 2008, Oakville has protected 30% of a 7600 acre area under development
- Street tree plantings – planning rules and regs to facilitate
- Replace top 30" of topsoil
- Retain and buffer water courses/ enforce setbacks

Threat: Drought –impacts on food and agriculture

Action:

- Farmers should use organic principles, retain hedgerows, ponds and not use pesticides

Threat: Soil Erosion

Action:

- Retain and buffer water courses/ enforce setbacks

Threat: Ice Storms

Threat: Extreme Heat

Threat: Water Quality

Threat: Air Quality

Threat: Power Outages

Actions:

- Advance notice of emergency facilities
- Emergency frequency on radio
- Alternative to electric powered communications

Actions applicable to several of the above threats.

- Change criteria for measuring prosperity from GDP to Health and Happiness
- Gather data for making the best decisions

- Build capacity of Neighbourhood Watch groups e.g. In Sudbury – data on vulnerable individuals is being mapped
- Incentives for high efficiency furnaces

Actions to increase community resilience

- Community organization – increase local capacity around food, housing , energy and transportation e.g. City of Dundas
- Prepare resources for distribution to the community :
 - 72 hour preparedness information for Niagara Region
 - House kit (similar to emergency car kit)
 - Have a signal for alerting people to emergency situations
 - Provide advance notice of emergency facilities
 - Provide an emergency frequency on the radio
 - Set up clearing house for preparedness data at Brock U
 - Prepare layperson’s version of NPCA (Niagara Peninsula Conservation Authority) report and distribute it widely

5. Evaluation and Comments

EVALUATION FORM *HIRA WORKSHOP*

Niagara Region Friday February 7, 2014

Please complete and hand in before you leave

On a scale of 1-5, 1 being poor, 5 being excellent, please rate the various areas of the workshop by circling the relevant number.

1. Atmospheric Threats and Risks – Heather Auld
1 2 3 4 5

2. Comments:

3. Biodiversity at Risk – Don MacIver
1 2 3 4 5

4. Comments:

5. Climate Change Projections – Neil Comber
1 2 3 4 5

6. Comments:

7. Lunch and refreshments
1 2 3 4 5

8. Comments:

AFTERNOON – ALL

9. Risk Analysis Tools
1 2 3 4 5

10. Comments:

Workshop Groups: Answer for the workshop you attended:

11. Community Preparedness Action
1 2 3 4 5

12. Comments:

OR

13. Biodiversity Futures
1 2 3 4 5

14. Comments:

15. Reporting and Discussion
1 2 3 4 5

16. Comments

17. Closing Statements
1 2 3 4 5

18. Comments

Please use this space for any additional comments, suggestions or observations:

THANK YOU!

Evaluations Summarized

Question #	Question Category	# of Responses by Rating from Collated Evaluation Forms (11)					% Response Rated Excellent	Comments
		1	2	3	4	5		
	SESSIONS							
1	Atmospheric Risks	0	0	1	2	8	72.73%	excellent presentation, great depth info, Climate Change made > interesting
2								poor sound at first
3	Biodiversity	0	0	1	1	9	81.82%	excellent presentationx3, bluntness appreciated x2 -not candy coated!
4								
5	Climate Change Predictions (Heather)	0	0	1	5	4	36.36%	Neil was ill (Heather presented Neil's ppt.)
6								
7	Lunch	0	0	2	2	7	63.64%	Homemade x2 , variety, awesome, did not know it was offered
8								
9	Tools	0	1	0	2	7	70.00%	Excellent, great community exercise, what can citizens do?
10	DISCUSSIONS							How do we get to use it?
11	Community Preparedness Group	0	1	2	2	2	n/a	What can we do?, risks not assessed, group too big
12								
13	Biodiversity Group	0	0	0	5	3	n/a	Great ideas, Deanna great, Don, Jane helpful, organize better so all
14								have a chance to speak
15	Reporting/ Discussion	0	1	5	2	3	n/a	Great, ran out of time, good breakout session, new stuff e.g.

								72 hours list
16								
17	Closing	0	0	2	3	5	50.00%	Ran out of time, well said

Final Comments Added to Evaluation Pages
Very good informative, well organized
Thanks! (twice)
Pleased to be included
Will help with regional government
Thank you, very productive
Worthwhile, a positive experience.
Nice to spend time with people who share the same concerns but also have innovative solutions