

2nd Annual Climate Change Adaptation Workshop: Turning Research Into Action

Thursday, January 23rd, 2014
Sackville Royal Canadian Legion
Lorne St. Sackville

Hosted and Organized by EOS Eco-Energy Inc.
In Partnership with the Tantramar Climate Change Adaptation Working Group

Funded By
The New Brunswick Environmental Trust Fund



Workshop Report By
Amanda Marlin
Executive Director, EOS Eco-Energy
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Contents

Welcome and Round Table.....	2
Presentations.....	3
Atlantic Region Tide Gauge System – Phillip MacAulay, DFO and Terry Murphy, Port Elgin EMO	3
Nova Scotia Flood Strategy – John Cooper, NS Environment.....	3
Flood Modeling – James Bornemann, RSC 7.....	3
Mapping Vulnerability – David Lieske, Mt Allison University	4
Salt Marsh Restoration Project –Nic McLellan, Ducks Unlimited Canada and Jeff Ollerhead, Mount Allison	4
Dyke Maintenance – Mike Green, NB Dept. of Agriculture.....	4
Extreme Weather – Claude Côté, Warning Preparedness Meteorologist, Environment Canada.....	5
Emergency Measures Panel Discussion	5
World Café Discussions – Issues and Priorities.....	7
EMO.....	8
Education and Outreach.....	9
Infrastructure and Dykes.....	9
Policy and Planning.....	10
Evaluations and Ideas for Next Year.....	11
Appendix 1 – 2014 Workshop Participants	12

Welcome and Round Table

The second annual Tantramar climate change adaptation workshop was hosted by EOS Eco-Energy Inc. and the workshop working group along with funding from the New Brunswick Environmental Trust Fund. It took place on Thursday, January 23rd, 2014 at the Sackville Legion, appropriately located within the flood plain. Despite a snowstorm the night before, the workshop began on time with participants arriving and enjoying a light breakfast.

New executive director for EOS Eco-Energy, Amanda Marlin, welcomed participants and thanked the Tantramar Climate Change Adaptation Working Group (formed during the 2013 workshop) for their efforts in planning the content and logistics of the workshop. The working group meets monthly via tele-conference to help move Tantramar Climate Change Adaptation Action Plan (developed during the 2013 workshop) forward and maintain communication and collaboration between the various stakeholder groups that make up the the Tantramar Climate Change Collaborative. Members of the working group include:

Amanda Marlin, EOS Eco-Energy
Jason McDonald, Amherst
Margaret Tusz-King, Sackville Town Council
Craig Bowser, Sackville EMO Coordinator
Andrew Fisher, Amherst
Steve Ferguson, Cumberland County
Laurie Collette, NB Environment
Georgia Klein, Mount Allison University
Jim Hannon, Cumberland County EMO Coordinator
Julie Dupuis, Transport Canada
Colette Lemieux, NB Climate Change Secretariat
Lori Ann Roness, Lori Ann Roness Consulting & Mount Allison University
David Lieske, Mount Allison University
Tracey Wade, Regional Service Commission 7
Terry Murphy, Port Elgin EMO Coordinator
Sabine Dietz, EOS Board of Directors
Val MacDermid, Port Elgin Village Council
Will Green, NS Environment
Jana Cheverie, Ducks Unlimited Canada
Mike Green, NB Dept. of Agriculture

Participants introduced themselves and their affiliation during a quick round table. Participants include representatives Dept. of Fisheries and Oceans, Environment Canada, provincial departments of environment and agriculture, NGOs such as Ducks Unlimited, planners from both the Tantramar region and across the border in Amherst and Cumberland County, EMO coordinators, researchers, and municipal

staff and councilors from across Tantramar including Nova Scotia. The full list of 2014 workshop participants is provided at the end of this report.

Presentations

The morning of the workshop saw participants enjoy seven very informative presentations. Below is a summary of some of the key points made by presenters. Copies of the full presentation slides are available in an online Drop Box. Please contact EOS at eos@nb.aibn.com to gain access.

Atlantic Region Tide Gauge System – Phillip MacAulay, DFO and Terry Murphy, Port Elgin EMO

Phillip MacAulay, with DFO, stated that the Port Elgin tide gauge is part of the Atlantic tide gauge system, which warns about tsunamis and tidal surges and provides information to emergency measures organizations in the region. The sensors in the gauges record water levels, sea level rise, pressure and are linked to GPS. Data are also presented on the Canadian Hydrographic Service website. The data collected are compared to storm surge statistics with Environment Canada.

Phillip explained that the Gulf of St. Lawrence is a sediment-filled estuary. The “hole” at the bottom goes up and down and depends on the dynamics of currents. He said that the Gulf Stream acts like a speed bump and affects local sea level rise. In effect, global sea level rise is different from local sea level rise. Phillip also mentioned that the Gulf Stream is slowing down.

Nova Scotia Flood Strategy – John Cooper, NS Environment

John Cooper, a policy analyst with the Climate Change Unit of NS Environment, was not able to attend the workshop due to the wintery weather but presented via Skype. He explained that Nova Scotia is developing a flood mitigation framework to help plan for the future impacts of flooding. They also have a flood assessment fund to help support vulnerable communities with their planning, policy and infrastructure. Communities have to apply and explain why they are vulnerable to flooding. Vulnerability is assessed against geography, population, transportation, social and environmental assets. The flood strategy is a result of the fact that NS municipalities do not have uniform flood risk data. Flood management issues also came to light as a result of mandatory climate change action plans in the province.

Flood Modeling – James Bornemann, RSC 7

James Bornemann, geomatics analyst with the Regional Service Commission 7 in Sackville, NB, presented on lidar mapping plans for 2014. In particular lidar data will be collected for the Northumberland Coast of southeast New Brunswick. The

Bay of Fundy as well as the Baie Verte coasts are proposed for lidar mapping with anticipated NB Environmental Trust Fund funding.

Mapping Vulnerability – David Lieske, Mt Allison University

David Lieske, professor in Mount Allison's Department of Geography and Environment, provided an overview of his involvement with climate change research and action over the past few years including Regional Adaptation Collaborative research projects on dyke elevations, economic implications and visualizations, and EOS Eco-Energy's Climate Change Week 2013. David is currently working on a "Tantramar Community Viewer" which is an interactive GIS tool which maps flood extents and vulnerable locations. It harnesses personal knowledge of local residents and experts. The aim is for it to feed locally specific adaptation strategies. The mapping tool also includes the cost of damages by flood level. There are many applications for local planners. And there are huge potentials to design this tool for use in other communities such as Alma, NB where there is great flood risk but no local knowledge or data.

Salt Marsh Restoration Project –Nic McLellan, Ducks Unlimited Canada and Jeff Ollerhead, Mount Allison

Nic McLellan, conservation programs specialist, with DUC and Jeff Ollerhead, dean of science at Mount Allison, provided an update on their Aulac salt marsh restoration project on the Bay of Fundy. A new, stronger dyke was built further inland from an aging and failing stretch of dyke by Fort Beausejour. This situation allowed researchers the opportunity to conduct an engineered breach of the old dyke and study the processes of salt marsh restoration at the head of the Bay of Fundy. The dyke was breached in two locations in 2010. Monitoring of animals, plants, geomorphology and hydrology continues to take place but is dependent on further funding. Conclusions thus far indicate that there is enough sediment in the Bay of Fundy to support salt marsh restoration but sufficient time is critical. In addition, social and economic factors present constraints on salt marsh restoration as an adaptation to climate change and sea level rise.

Dyke Maintenance – Mike Green, NB Dept. of Agriculture

Mike Green with the NB Department of Agriculture, offered an update on the dykes and maintenance issues for the region. The department has a budget of \$400,000 for all of their work including roads, aboiteaus and dykes, but this is not nearly enough. It costs \$15,000 to raise one kilometer of dyke by one meter. Mike explained that the Department of Agriculture is actually only mandated to protect agricultural infrastructure (farm fields) but the dykes are now protecting much more, including the community of Sackville. He urged workshop participants to start lobbying the government for more money for dyke maintenance in order that community assets behind the dykes are properly protected. It is also important to note that the dykes, due to their design, can only be raised to a certain height. Thus the dykes are not a

long-term solution but will afford communities like Sackville the time needed to adapt to sea level rise in other ways such as managed retreating. Mike also explained that a new Marshlands Act is coming into affect in New Brunswick and will allow the department access and rights in order to do much needed work on the dykes. For example, the Department has been stalled in the past by landowners who will not provide them access across private property to stretches of dykes.

Workshop participants asked about the best strategies to control erosion on the dykes. Mike said that the Bay of Fundy is very strong and waves and tides pound away at certain stretches of dyke at the head of the Bay. His best tools are vegetation and rocking. He also noted that originally during Acadian times, there would have been much more salt marsh in front of the dykes, which would have absorbed the impact of waves before reaching the dykes. The dykes and other human-made control structures affect the distribution of sediment and sand in front of them in coastal environments.

Extreme Weather – Claude Côté, Warning Preparedness Meteorologist, Environment Canada

Claude Côté is a warning preparedness meteorologist with Environment Canada based in Fredericton. He explained the tools and models that weather warning experts use to make their predictions. He said that there are really no new climate normals anymore because the climate is changing so fast. He also mentioned that the jet stream is getting weaker and because of this colder temperatures can be felt further south than before. He said that summers are not really getting warmer but that winters are. Claude also explained how weather warnings play into emergency measures planning.

Emergency Measures Panel Discussion

After a lunch made by the ladies of the Sackville Royal Canadian Legion and a chance for workshop participants to network, emergency measures organization (EMO) coordinators and Red Cross officials from both sides of the border in Tantramar joined together in an informative panel discussion. Participants in the panel included:

- Mike LeBlanc, NB Regional EMO Coordinator Region 6&7
- Craig Bowser, Sackville EMO Coordinator
- Terry Murphy, Port Elgin EMO Coordinator
- Jim Hannon, Cumberland County EMO Coordinator
- Marc Belliveau, Disaster Management Associate, Red Cross Moncton
- Penny Henneberry, Volunteer, Red Cross Amherst

Terry Murphy began the panel with a slide show from the Port Elgin 2010 winter storm which required emergency response as waters of the Northumberland Strait flooded the streets of his small village.



Mike LeBlanc made the point that he is a coordinator and not an expert. He uses the extensive networks of the EMO and ensures the right people are on site and responding to the emergency (eg. Transport Canada, CN, Agriculture, etc). His role as regional coordinator includes reviewing municipal EMO plans and ensuring the municipal leaders know what their plans entail so

they are ready when disasters strike. Mike also noted that Sackville is a leader in EMO municipal planning. Their plan is progressive due to the efforts of Craig Bowser (EMO) and Phil Handrahan (CAO). Port Elgin's plan has also been described as excellent.

Craig Bowser explained that Jim Feeny with CN will be meeting with him and the Sackville EMO as well as town council regarding CN emergency response. Craig also highlighted Sackville's new Sentinel System and the need for all residents to register (go to www.sackville.com). It's free of charge and allows people to know what is going on whether it's a boil order or flood event.

Jim Hannon is the EMO coordinator for all of Cumberland County, NS including Springhill, Oxford and Amherst. He said he works with all agencies including Hazmat, fire, special care, hospitals, transportation, Red Cross, Department of Environment, etc. He said that all networking pays off in times of emergency. He also noted that he needs to get together with New Brunswick more and that he has set up a communication network now so that New Brunswick transport and Nova Scotia Transport can communicate directly with the use of a TMR (trunked mobile radio) network. Jim also offers his training opportunities to EMO officials on the New Brunswick side of the border.

Marc Belliveau and Penny Henneberry with Red Cross in Moncton and Amherst explained how the Red Cross responds to emergencies. Marc said that the Red Cross uses climate change models and predictions to prepare their responses. For example, they are beginning to pre-position supplies in Sackville because of the threat of a major hurricane and flood event. They have 300 cots stored at the

Tantramar Veterans Civic Centre and more are coming soon. The Red Cross is assuming the community could be cut off, requiring response materials to be housed within the town. He also stated that the Red Cross is the last to leave after a disaster. They have committed to 7 more years in New York City.

Panelists took many questions from the audience. One workshop participant asked how the Red Cross helps the most vulnerable to prepare. Marc said that they have a direct link with social services and that the Red Cross does not want to duplicate services.

The panel explained that EMO takes an “all hazards approach”, meaning that they plan for disasters in general, not by specific possible events. It is impossible to predict everything so instead they look at who would need to be involved for different reasons and how to connect them. At the provincial level in New Brunswick EMO officials do have two specific emergency response plans for the two largest threats – a nuclear disaster at Point LePreau and a hurricane coming up the Bay of Fundy. They look at how to feed and house Nova Scotians if transportation to the province was to be cut off due to a hurricane.

A final comment made by a workshop participant was that a multi-faceted approach is needed to adapt to climate change: EMO services such as Sentinel which respond to immediate disasters, dyke maintenance which give people more time to adapt, and municipal zoning and long-term planning for the future.

World Café Discussions – Issues and Priorities

Julia Feltham, a trained “Art of Hosting” facilitator, facilitated the afternoon’s break out discussions around four topic areas:

- EMO
- Education and Outreach
- Infrastructure and Dykes
- Policy and Planning

These discussion topics are similar to those of the first (2013) workshop, with the addition of EMO issues, which have now become a critical part of adapting (or responding) to climate change in Tantramar.

Julia described that a “World Café” style would be used where participants move from table to table (as if in a café) to discuss different topics. This allowed participants to discuss more than one topic area if they wished. The principals of a world café are:

- **Focus** on what matters
- **Contribute** your thinking

- **Speak** your mind and your heart
- **Listen** to understand
- **Link and connect** ideas
- **Listen together** for insights and deeper questions
- Play, doodle, draw your answers

The discussion questions were:

1. What was learned today that we need to address as EMO, educators, planners, or those working on dykes/infrastructure?
2. What can we do about it?
3. What are our goals next steps for this year?



Emergency Measures

1. What was learned today that we need to address as EMO?

- The benefits of full time emergency planners
- The need for more PR with planning
- Awareness of priorities
- Insurance issues
- Need to keep issues topical

2. What can we do about it?

- Identify vulnerability and risk hazards
- How to keep issues topical, a year later?
 - TV ads
 - Annual risk analysis
 - Planning cycles (like changing smoke detector batteries when time changes)
 - Identify key players (fire, DNR, etc)
 - Preparedness Week
 - Exercises (mock disasters)
- Communication tools
 - At government level and citizens

- Social networking versus sentinel
- Conferences
- Issues of complacency and timing

3. What are our goals next steps for this year?

- More cross border (NS/NB) communication
- Promote climate change adaptation, flood risks, Sentinel, etc. during Preparedness Week
- Include Sentinel in RCE neighbourhood vulnerability planning project
- Create an education/information kit regarding Sentinel (Sackville EMO, EOS, RCE)
- Include EMO information and sentinel promotion during climate change week 2014 (EOS)

Education and Outreach

1. What was learned today that we need to address as educators?

- This is a special form of outreach.
- Need to educate policy makers and the public.
- The visualization tool will help get the message across.

2. What can we do about it?

- Offer training, use the visualization tool for the public as a way to build awareness (with good facilitators)
- Link knowledge (eg. videos stimulate exercise)
- How to reach out? Use summer students (get people to sign up for Sentinel)
- Keep issues in mind year round (eg. rain gardens in summer)

3. What are our goals next steps for this year?

- Continue climate change week (EOS)
- Plant rain gardens (EOS)
- Get a tidal gauge for Sackville (show tide heights and dyke heights in a public space, for public viewing)
- Maintain public awareness

Infrastructure and Dykes

1. What was learned today that we need to address as those working on dykes/infrastructure?

- The condition and costs regarding the dykes.
- Nova Scotia has a much larger budget (\$2 million!), than NB.

- Flooding from inside, requiring pumping, is an issue.
- The issue of how much can we rely on the dykes?
- We need the dykes to buy us time.
- There are legal issues with the dykes – need for informed consent, waivers, insurance, and education.

2. What can we do about it?

- We need an adaptable design.
- We may need to raise roads up.
- We need “tough love decisions” – don’t let people move to flood plains.
- Have moving incentives
- Education about living in a flood plain and the state of the dykes.

3. What are our goals next steps for this year?

- Educate the public about the state of the dykes, and the mandate of the Department of Agriculture.
- The Collaborative and the public need to lobby the government of New Brunswick to spend more money on dyke maintenance. (Working Group)
- Continue to maintain the dykes. (Department of Agriculture)

Policy and Planning

1. What was learned today that we need to address as those working on plans and policies?

- Current EMO plans
- Vulnerability of population addressed
- Link with Sentinel
- Hierarchy of concern for response priorities
- Being proactive in regulations and policies. eg: NS climate change plans, and Sackville’s new flood risk map

2. What can we do about it?

- Find a way to make individuals take responsibility for changes
- Move new infrastructure to less risky areas
- Create the link between risks and emergencies
- Place restrictions for at risk areas
- Create a NB flood risk strategy
- Port Elgin flood risk map
- Improve information in Sackville
- Regional land use planning needed
- ESIC funding to identify vulnerable populations in Sackville

- Need “planning level” to be determined
- Implement risk maps based on flood risk capacity/forecasts to 10m (or other)

3. What are our goals next steps for this year?

- Not to make the problems worse!
- Follow a long-term vision with incentive programs
- Discourage (but not forbid) bad developments and encourage good ones
- Collect do-able things for the region (eg. rain gardens, bylaws, policy ideas)



Evaluations and Ideas for Next Year

Results of evaluation sheets filled in by workshop participants indicate that participants were happy with the day including the presentations, discussions and the venue. Some participants would have liked more time on an update on where the plan (developed at last year’s workshop) is at, and more information on what the working group has been up to. The evaluation forms will be used to help design the 2015 workshop (assuming that EOS is awarded further funding for this project).

Appendix 1 – 2014 Workshop Participants

Name	Organization	Contact Details
Amanda Marlin	EOS Eco-Energy	eos@nb.aibn.com
Andrew Fisher	Amherst	AFisher@amherst.ca
Bill Evens	Sackville Town Council	bevans@mta.ca
Claude Cote	Environment Canada	claudio.cote@ec.gc.ca
Colette Lemieux	NB Climate Change Secretariat	colette.lemieux@gnb.ca
Craig Bowser	Sackville EMO	c.bowser@sackville.com
David Lieske	MTA	dlieske@mta.ca
Emily Phillips	MTA/RCE	eaphillips@mta.ca
Georgia Klein	MTA	gklein@mta.ca
James Bornemann	Regional Service Comm. 7	James.Bornemann@csrrsc7.ca
Jana Cheverie	Ducks Unlimited Canada	j_cheverie@ducks.ca
Jeff Hoyt	NB Environment	Jeff.hoyt@gnb.ca
Jeff Ollerhead	MTA	jollerhead@mta.ca
Jim Hannon	Cumberland EMO	hannon@cumberlandcounty.ns.ca
John Cooper	NS Environment	COOPERJO@gov.ns.ca
Julia Feltham	Renaissance Sackville	renaissance@sackville.com
Kevin Bekkers	NS Agriculture	BEKKERKF@gov.ns.ca
Laurie Collette	NB Environment	laurie.collette@gnb.ca
Lisa Emery	Town of Amherst	emeryvine@gmail.com
Maggie Pitts	Cumberland County	mpitts@cumberlandcounty.ns.ca
Marc Belliveau	Red Cross, Moncton	Marc.Belliveau@redcross.ca
Margaret Tusz-King	Sackville Town Council	margarettuszking@gmail.com
Mike Green	NB Agriculture	michael.green@gnb.ca
Mike LeBlanc	NB Regional EMO Coordinator	Mike.LeBlanc2@gnb.ca
Nic McLellan	Ducks Unlimited Canada	n_mclellan@ducks.ca
Penny Henneberry	Cumberland County	phenneberry@cumberlandcounty.ns.ca
Phil Handrahan	Sackville CAO	Phil.handrahan@sackville.com
Phillip MacAulay	DFO	phillip.macaulay@dfo-mpo.gc.ca
Roland Chaisson	EOS/Aster Group	corvus@nbnet.nb.ca
Sabine Dietz	NBRAC/EOS/Aster Group	sabine.dietz@bellaliant.net
Steve Ferguson	Cumberland County	sferguson@cumberlandcounty.ns.ca
Terry Murphy	Port Elgin EMO	shamus@nbnet.nb.ca
Tracey Wade	Regional Service Comm. 7	Tracey.Wade@csrrsc7.ca