

# Increasing Capacity for Climate Change Adaptation: Home Flood Risk Assessments for Vulnerable Residents



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By

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- Workshop speakers – Dr. Georgia Klein (Dalhousie University) Dr. Sabine Dietz (ClimAtlantic), Ms. Cheryl Evan (Intact Centre).
- AET Group for training and assistance on the home flood risk assessment software.
- The Intact Centre for their guidance and assistance with setting up our home flood risk assessment program.
- Homeowners who participated in our new home flood risk assessment program.
- The Mount Allison University Faculty Association, Rainbarrel.ca, and various private EOS donors for contributing to our small flood risk reduction rebate program for local homeowners.
- The communities in Tantramar and Strait Shores for help promoting our webinars and the home flood risk assessment program.

## Summary

Due to its low-lying coastal location, the Memramcook-Tantramar-Strait Shores area is one of the most vulnerable areas to climate change in New Brunswick. In particular, the region is impacted by increasing storm frequency and severity leading to more coastal and inland flooding. The changing climate impacts our economy, infrastructure, livelihoods, safety, and homes. Many homes have and will be impacted by flooding due to changing precipitation patterns and extreme weather. Local communities, municipal governments and the rural region have adaptation plans which include flood risk maps and mention the need to provide education and reduce flood risk. This project aimed to support vulnerable homeowners to reduce their flood risk. Specifically, EOS Eco-Energy organized free public webinars to help raise awareness about flood risk and adaptation options, and coordinated the Chignecto Climate Change Collaborative (CCCC) and its annual event (a fall site tour of local flood risk reduction and adaptation projects). EOS staff obtained training and coordinated a free home flood risk assessment program across the Memramcook-Tantramar-Strait Shores region. EOS staff also coordinated a bulk order of rain barrels and fundraised to create a small rebate program to help homeowners with the costs of flood risk reduction upgrades.

## Introduction

Due to its low-lying coastal location, the Memramcook-Tantramar-Strait Shores area is one of the most vulnerable areas to climate change in New Brunswick. In particular, the region is impacted by increasing storm frequency and severity leading to more coastal and inland flooding. The changing climate impacts our economy, infrastructure, livelihoods, safety, and homes. Many homes have and will be impacted by flooding due to changing precipitation patterns and extreme weather. Local communities, municipal governments and the rural region have adaptation plans which include flood risk maps and mention the need to provide education and reduce flood risk. This project aimed to support vulnerable homeowners to reduce their flood risk. Specifically, EOS Eco-Energy organized free public webinars to help raise awareness about flood risk and adaptation options, and coordinated the Chignecto Climate Change Collaborative (CCCC) and its annual event (a fall site tour of local flood risk reduction and adaptation projects). EOS staff obtained training and coordinated a free home flood risk assessment program across the Memramcook-Tantramar-Strait Shores region. EOS staff also coordinated a bulk order of rain barrels and fundraised to create a small rebate program to help homeowners with the costs of flood risk reduction upgrades. This final report summarizes the project goals, methods, challenges, results, community impacts and recommendations.

## Goals

The goals and benefits of this project are to:

1. Reduce homeowners' flood risk;
2. Increase public awareness of flood risk and appropriate adaptation actions;
3. And increase resilience and adaptation capacity at the local level.

## Methodology

The project methodology included the following:

1. EOS coordinated the CCCC, its meetings and activities including a fall site tour to local flood risk reduction sites and adaptation projects.
2. EOS coordinated three flood risk webinars to help raise awareness about flood risk and adaptation, the new provincial flood risk maps, and actions that homeowners can take to reduce their risk.
3. EOS staff completed training from the AET Group on how to perform home flood risk assessments and use the software program to create reports for homeowners.
4. EOS promoted the home flood risk assessment program in a variety of ways: social media, EOS website, EOS and local community newsletters, stories in local media, bilingual posters in the communities, etc.

5. EOS visited homes, performed assessments, provided information on incentives and rebates, and wrote short private/confidential reports for each homeowner.
6. EOS followed up with homeowners to see if they had implemented any of the suggested opportunities to reduce risk.
7. A project webpage was created and is found at: <https://eosecoenergy.com/en/home-flood-resources/>
8. A final report was written and submitted to funders.

## Challenges

Despite not receiving as much funding as we had hoped and thus not being able to go to as many homes as originally planned, the project was successful, we learned a lot, and we plan to meet all of our updated priority measures (as submitted to ETF in June 2022). We did encounter the following challenges that were out of our control, but also found ways to address them.

The home assessor training (a program of the Intact Centre run originally through Fleming College) was supposed to be offered in January 2022 but got postponed to March 2022 due to not enough enrollment in the online course. It was then cancelled by Fleming College. The Intact Centre then partnered with AET Group to offer the training again. AET Group said the program would be ready in spring 2022. Come May they said they were re-creating the program and it was taking a while to get it reviewed by experts. Come June, they said it would be ready by July, but July turned into late August. Eventually in late September the course was finally ready and EOS staff started right away. It took about a month to complete the course online, including the assignments. There was another delay when assignments were submitted to AET, but their staff were on vacation and could not get marks back to EOS staff for a week. We were not allowed to move on to the next assignment without the first one getting marked. There was also a glitch with gaining access to the online progressive web app, but after a few more days, AET cleared things up and we had access and were able to conduct a practice home flood risk assessment. On October 31<sup>st</sup>, 2022 two EOS staff received official training certificates.

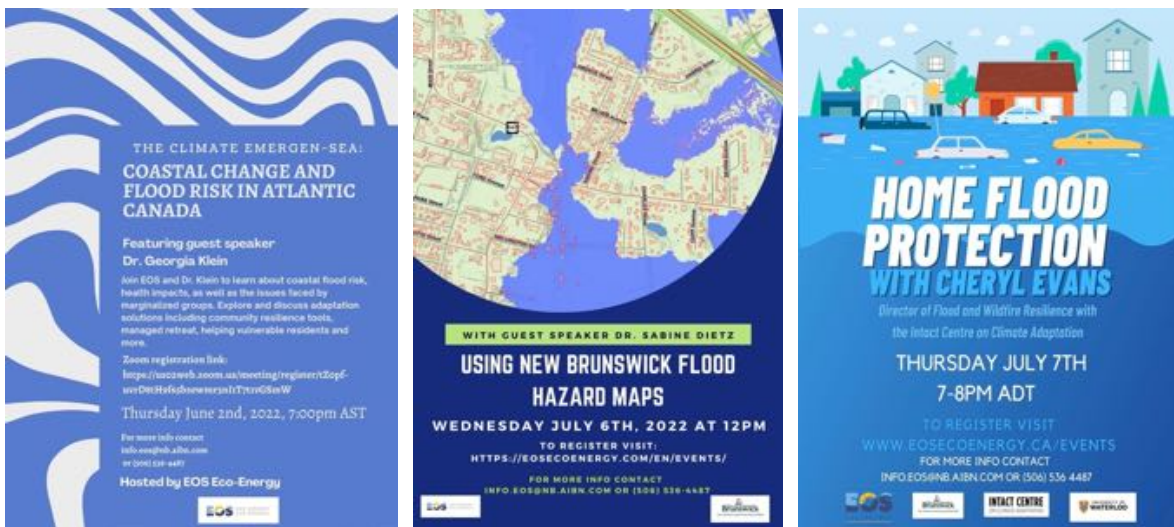
Another challenge came when we discovered we needed an android tablet to take to people's homes to use the software and do the assessments. We had assumed we would use a printable form to record information on site and then input into our laptops back in the office. There was no mention when signing up for the course that we would need special equipment. In fact, along with the tablet, we also needed a tape measure, camera (which we had luckily) and moisture meter. Once all the equipment and materials were purchased, we finally began assessments on November 8<sup>th</sup>, 2022.

Unfortunately, beginning assessments in November was not ideal as it coincided with funding application writing season and the beginning of winter snowstorms and an increase in covid-19 cases. Some assessments had to be postponed because homeowners contracted covid or other respiratory illnesses. We also had to postpone assessments if the weather was too cold or wet because the tablet would not operate properly. Come late January there was too much snow on the ground to adequately complete visual assessments of landscape grading, foundations, basements windows,

downspouts, patios and driveways, etc. It would have been more ideal to do home assessments during spring, summer and fall, but we were pleased to complete so many assessments and have so much interest from local homeowners. EOS plans to continue to complete more assessment through March as the weather warms and the snow melts.

## Flood Risk Reduction Workshops

To kick off the year and promote the home flood risk assessment program, EOS coordinated promoted and hosted three free public webinars on flood-related topics. The events were promoted on the EOS website, social media pages, EOS newsletter, community newsletters, posters, etc.



*EOS flood risk related webinars during 2022-23*

## Coastal Change and Flood Risk in Atlantic Canada

On Thursday June 2nd, 2022, EOS Eco-Energy held a free webinar with guest speaker Dr. Georgia Klein. Georgia spoke on the topics of Coastal Change and Adaptation and explained how they relate to Atlantic Canada. Throughout the webinar there was a maximum attendance of 16 people. Georgia discussed how climate change is leading to accelerated erosion. She explained that erosion affects more than just sand and rock, it affects the lives, businesses, and culture of those who live on or near the coast. She explained the devastating effects of habitat erosion, for both animals and humans, and discussed possible solutions and prevention methods. Dr. Klein also explained how marginalized groups often experience the effects of climate change more severely than others. She finished off by discussing the detrimental influence climate change can have on the mental health of many and took audience questions. The webinar can be viewed at: <https://www.youtube.com/watch?v=HgkOaAOgYFU>

Participants who filled out the workshop evaluation stated they all found the event through the EOS mailing list. They all rated the content of the talk either a 4 or 5 out of 5 and rated the speaker a 5 out



of 5. Voters found the speaker herself as a highlight of the webinar, stating she spoke clearly, and her content was easy to understand. They found the topic very interesting, and one stated the most interesting part was the discussion on the balance of ecosystems. Most voters said they plan to use the information they learned to educate others, while one said it would influence their work. People who filled out the survey suggested holding differing events, one said more of same, one suggested climate stress workshops and another suggested in person, outdoor events like the Medicine Walk in Fort Folly First Nation. Two of the voters concluded by commending EOS's work.



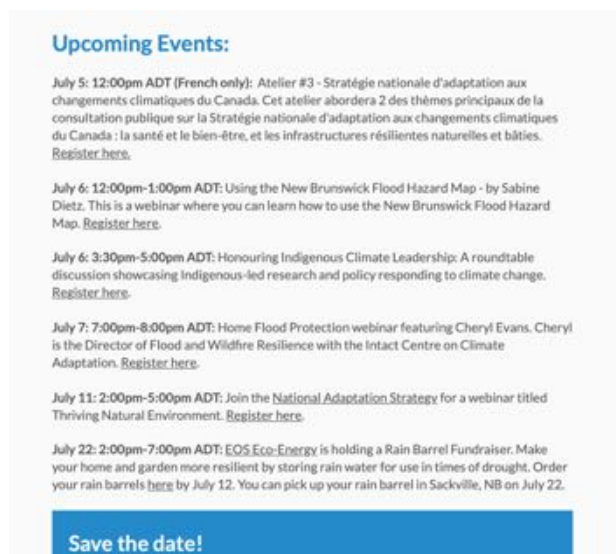
*Dr. Georgia Klein presented a webinar on coastal change and flood risk*

## Using New Brunswick Flood Hazard Maps

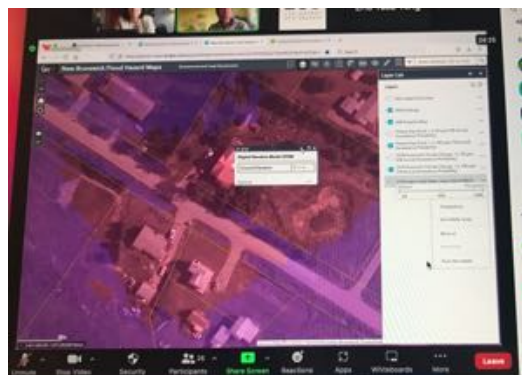
On July 6th, 2022, EOS Eco-Energy hosted a webinar with Dr. Sabine Dietz, the Director of ClimAtlantic. The webinar had 30 people participate and was intended to educate New Brunswickers on how to use the new provincial flood hazard map tool to educate themselves on their current and future flood risks. Sabine explained how the Government of NB designed this website (<https://flooding-inondations-geonb.hub.arcgis.com>) and that it is now available to the public. She gave a walkthrough of the tool by examining some properties more closely. There is the option to use a topo layer or satellite image as a base layer and select from a variety of flooding scenarios. The flood layers assume a static flood – no waves or ice jams, etc. The tool does include flood information for both coastal and inland flooding. But the layers do not include the extra 65cm of sea level rise that is now anticipated. Dr. Dietz explained that the website also provides access to further information on flood hazards, historical floodways, literature on flooding and climate data. After providing general information on the website, she dove into explaining how to use the mapping tool. She discussed the many different potential flood scenarios users can see and taught attendees the many aspects of flooding they should consider (such as access roads or essential services like grocery stores flooding). She said the tool is fantastic because it allows people to see future impacts, to know more about their risks, and to have more information than before when thinking about purchasing or developing land within flood areas. It was also noted that the government will update the images when new data is available and will update flood scenarios as the science changes too. It is important to note that the tool only lists flood depths but does not list which areas are more at risk as that would require more information such as what kinds of protections are already in place, etc. A recording of the webinar can be viewed at:

[https://www.youtube.com/watch?v=0q\\_mOuVUXMA](https://www.youtube.com/watch?v=0q_mOuVUXMA)

Participants who filled out the workshop evaluation stated that they found the webinar through many different platforms including the EOS newsletter, Facebook, Instagram, the EOS website and through word of mouth. Attendees rated on the content of the talk and overall event experience a 3 to 5 out of 5. Respondents to the evaluation form rated the speaker a 4 or 5 out of 5. Attendees were asked what they thought was most interesting part of the webinar. Three stated varying aspects of the map that they found interesting: complexity, accessibility of information and amount of information. One was interested in how vulnerable Sackville is to floods, another was interested in resources within the N.B. website, and another was interested in public engagement with the topic. When asked how they plan to use what they learned, many stated they will share it with people they know, such as neighbours, family, and friends, while another stated they will consider it in the future when purchasing or renting a home. Those who filled out the questionnaire were also asked to suggest future events. Voters suggested many different options such as a session on climate stress, visits to homes and flood preparedness, education and engagement with the provincial government on the climate report, and field trips.



*ClimAtlantic July Newsletter helped promote the webinar*



*Dr. Sabine Dietz provided a webinar on the new provincial flood hazard mapping tool*

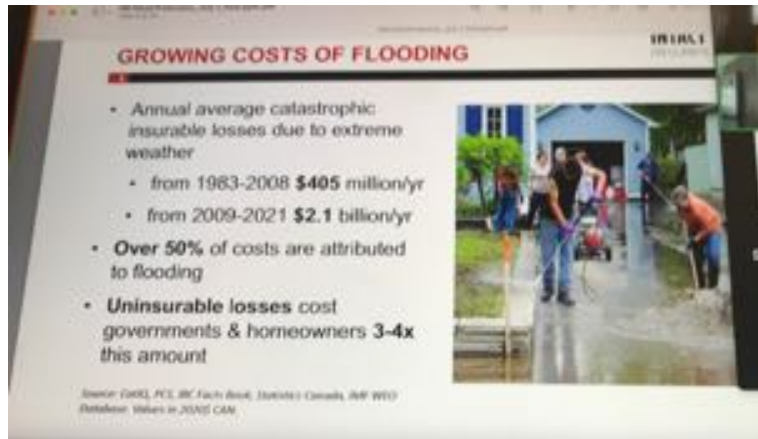
## Home Flood Protection

On July 7<sup>th</sup>, 2022, EOS Eco-Energy hosted a webinar with guest speaker Cheryl Evans, with the Intact Centre, on home flood protection. Cheryl covered many topics throughout the webinar, including flood risks in Canada and New Brunswick, types of flooding and flood damage, flood protection and education resources, etc. Cheryl discussed the growing costs of floods and explained that many insurance companies are limiting which homes qualify for flood insurance. She detailed the many resources available for Canadians and New Brunswickers to find out about their own flood hazards, as well as the types of floods and potential damages. Evans also expanded on the possible options for homeowners to reduce their risk of floods, such as home assessment programs and lot level approaches. Watch a recording of the webinar here: <https://www.youtube.com/watch?v=w4OMb7rA-uA>

Seven people attended the live version of the webinar and, as of July 12<sup>th</sup>, 12 more had gone on to watch the recording on the EOS YouTube channel. Those who attended the webinar were asked to complete a workshop evaluation after the session. Attendees ranked the workshop a 4 or 5 out of 5. When asked what they found most interesting from the webinar, one stated the influence climate change has on flood risk, another found the useful information and checklists the most interesting, and another stated that they found the whole workshop interesting and informative. When asked how they planned to use the information from the webinar, two stated that they planned to share the information with others, while another stated they would use it to improve their home and prevent damage. When asked about future sessions they would be interested in, one participant suggested a session on climate stress, another was interested in water and fire prevention and the third was interested in a medicine walk and talk at Fort Folly First Nation.



The New Brunswick Environmental Network's July Newsletter is one example of promotion for this workshop



Cheryl Evans presented a webinar on home flood protection

## Rain Barrel Bulk Purchase and Fundraiser

Bulk purchases help reduce costs and enable local residents to purchase much needed items together in a community-based approach. During the summer of 2022, EOS Eco-Energy coordinated a bulk order and fundraiser project with RainBarrel.ca. This fundraiser helped raise money for EOS' small local rebate program to help homeowners with the costs of flood risk reduction measures for their homes. We partnered with RainBarrel.ca which was a great way to raise money and we got a lot of community interest. The barrels were all recycled plastic and there were many helpful attachments available for purchase such as filters, diverters, spigots, etc.

The sale was promoted in a variety of ways including the EOS website, Facebook page and social media sites, the EOS mailing list and newsletters, community newsletters, posters, etc.



A post promoting the bulk order on the EOS Facebook Page

After some delivery-related delays, the barrels were eventually arrived on August 9<sup>th</sup>. The delivery and pickup event at the Tantramar Civic Centre went very smoothly, though we did have to hold onto a few barrels for a while after as some participants were out of town. Overall, the 29 buyers of the rain barrels were very happy to receive their orders and we did not have any order cancellations, despite the late delivery date. We sold 55 items, 36 of which were barrels. The sale generated \$2665.00, and from this EOS raised \$422.



*Rain barrel bulk purchase poster*



*Some of the rain barrels waiting to be picked up at the Tantramar Civic Centre in Sackville*

## Home Flood Risk Assessment Training

EOS Eco-Energy's executive director and climate change coordinator completed the Intact Centre and AET Group's Home Flood Risk Assessor training on October 31<sup>st</sup>, 2022. The in-depth and detailed training provided background information on flood risk and how to use the assessor software and conduct the 80-point visual assessments of properties, outside homes and in the basements. The program and the assessments focused only on assessing basement flood risks, not upper levels, or roofs, etc. The program focuses only on overland flooding from rainstorms, snow melt, municipal sewer backups, but does not include any considerations for coastal storm surges, extra high tides, or sea level rise.

The online course took about 1 month of part-time self-directed learning to complete. Topics covered included background information (the water cycle and how water moves over land, impacts of impermeable surfaces, climate change, major storm events in Canada, jurisdictions responsible for flood prevention and stormwater management, etc.), municipal considerations (engineering, sanitary and storm drains, bylaws, jurisdictional issues, typical infrastructure according to age of neighbourhood, stormwater management changes over time, examples of government incentive programs, the stormwater treatment train, case studies, etc.), lot level information and solutions (landscape design and grading, rain gardens, bio swales, permeable paving, rain barrels, homeowner responsibilities, etc.), basement considerations (different basement construction techniques, windows, foundations, efflorescence and how to identify it, sewer backups, sump pumps, types of insurance, etc.), and program promotion ideas (education, incentives, social approaches, subsidies and typical conditions, etc.), how to use the assessor software (how to do visual assessments, what to look at, in what order, how to input homeowner answers, how to insert photos, how to draw a site plan, how to generate a report from the assessment software, confidentiality, disclaimers about not making recommendations but presenting best practice options, etc.).

The program was designed in Ontario and had some content that was not suited to the New Brunswick context such as information on the role of Ontario Conservation Authorities. Examples focused on municipalities and storm impacts in Ontario and Alberta, but none in New Brunswick or the Maritimes. The training was offered in English and the assessment software and generated reports were also only in English.

There were quizzes at the end of each section and the training concluded with three assignments where we had to do a practice assessment and submit a report with photos, site plan, etc. EOS staff obtained top marks and were awarded certificates of completion (see below). We then purchased and collected the necessary equipment and materials such as an android tablet to run the assessor software and take to the home assessments, a digital moisture meter (to measure moisture content in foundations, basement walls, etc. which helped located sources of moisture), a tape measure (to see if foundation walls had enough exposure above ground, etc.), flashlight (for dark basements), masks, gloves, etc.



Home flood risk assessor certificate of completion

## Free Home Flood Risk Assessment Program

EOS began promoting the home flood risk assessment program in summer 2022 and local homeowners started signing up right away. Assessments began in November and are ongoing at the time of writing this report. Follow-ups were conducted with participating homeowners to see if they implemented any of the best practice options suggested in their private and confidential reports.

### Promotion

The home flood risk assessment program was promoted to the public in a variety of ways and resulted in many homeowners signing up for the new initiative. EOS created bilingual posters, social media posts, advertised in community newsletters, featured the program in EOS seasonal newsletters, etc. EOS created new project webpages with program details and resources (pre-visit questionnaire form, funding and rebate information, etc. in English and in French (<https://eosecoenergy.com/en/home-flood-resources/> and <https://eosecoenergy.com/fr/inondation-et-votre-maison/>).



Bilingual program promotion



EOS Summer Newsletter promoting the home flood risk assessment program

EOS staff also did public presentations to promote the program such as at the Cape Jourimain Nature Centre's Adaptation Conference held on October 1<sup>st</sup>, 2022. About 26 people took part in the event. We shared some of our recent adaptation projects and approaches including the home flood risk assessment program. A link to the video of the presentation can be found at:

<https://www.youtube.com/watch?v=y10UWs4CiU0>



EOS promoted community-based adaptation projects at Cape Jourimain's 2022 Speaker Series



A story about the program was featured on CHMA (local radio and internet news site) in January: <https://www.chmafam.com/welcome/deluge-in-the-den-flood-risk-assessments-offered-free-to-homeowners-with-basements%EF%BF%BC/>.



CHMA featured a story about the free EOS home flood protection program in January 2023

Information about the program was shared with local networks and resource organizations such as the Chignecto Climate Change Collaborative, NB Social Development, and local food banks as a way to attract lower-income homeowners to the program.

## Home Assessments Performed

### Assessment Procedure

The home assessment process involved homeowners contacting EOS to sign up for an assessment. They filled in a pre-visit questionnaire with background info to help us prepare for the assessment (age of house and neighbourhood, any previous flooding, what kind of flooding, any measures taken to reduce risk already, how worried they are, questions they had, etc.). Generally, people wanted to know what else they could do to reduce their flood risk or to avoid another flooded basement. Many homes visited sit on very highwater tables with sump pumps or floor drains and toughs running frequently even during the driest parts of the year. A few wanted reassurances that they had already implemented best practices. Trained EOS staff met with the homeowners and performed a visual assessment outside their house looking at landscape grading, trees, eaves, foundations, basement entrances, patios, etc. and then in the basement looking at foundation walls, floors, condition of sump pumps, evidence of efflorescence, floor drains, etc. EOS staff asked homeowners a series of maintenance-related questions about each item as well. EOS staff took pictures of the top opportunities to reduce risk and filled in the assessment template with the homeowners' answers. We

later drew and labelled site plans to indicate where the opportunities were and generated customized and confidential reports for each homeowner. We also provided each participating homeowner with a list of available rebates (the small EOS rebate program and the federal Greener Homes Grant, resiliency section).



*EOS staff and homeowner inspect the landscape grading, foundation walls and windows. Photo: A. Marlin*

## Homes Visited

Our updated priority measure target from June 2022 was to assess 35 homes. At the time of writing this final report we had visited 22 homes and have 13 more homes that have signed up (for a total of 35 homes, which was our target). Homeowners continue to sign up for the program as well, so our numbers will continue to increase. We must wait for warmer weather to conduct the rest of the assessments so that the tablet used in the assessments works properly outside and for snow to melt because we need to see and assess landscape grading, condition of foundations, patios, driveways, walkways, basement windows, etc.

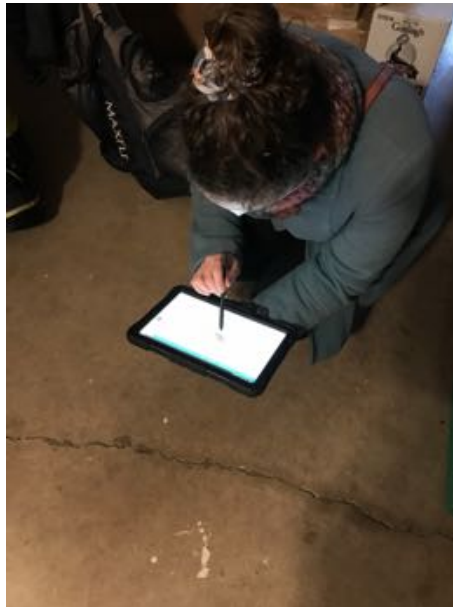
For the assessments done so far, homes were located across our region, with most being in downtown flood prone areas of Sackville, as well as the low-lying community of Baie Verte. A few other assessments were in the rural areas around Sackville, and in Dieppe and Grand Digue. For the most part, participants had either participated in previous EOS programs such as residential rain gardens, bulk orders of sump pumps, backwater valves and/or rain barrels, draft-proofing parties, etc. or were new to the Maritimes and were looking for information on how else to protect their homes from storms and conditions that they were not used to. Some homeowners knew they had risks (such as constant wet basements, mouldy walls or floors, etc.) but were not sure where to begin and wanted an organised, prioritized to do list.

## Common Opportunities to Reduce Risk

The individual assessments are confidential, private and for the homeowners only. They are not shared with government, funders, or anyone else. The best practice options provided in the customized assessment reports include ways to direct water away from the house and the basement

foundation and to remove it from the basement quickly should it find its way in. The options range in price from low (raising valuables off the floor or extending down spouts) to high (landscape grading, installing a sump pump, etc.).

Due to the limitations of the assessor training and software and because we are not licenced plumbers, landscape designers, foundation specialists, builders or engineers, we could not recommend any actions (only provide a list of best practice options) and could not comment on whether homes could benefit from a backwater valve (a plumber must do this) or any extensive foundation work such as installing weeping tiles, etc. The reports indicate when a homeowner may want to talk to these experts for professional advice.



*EOS staff assess a crack in a basement floor. Photo: A. Marlin*

Some of the most common options to reduce risk among the homes we assessed included:

- Patch foundation cracks
- Install eaves and extend downspouts
- Fix landscape grading so that water can flow away from the house
- Disconnect stormwater pipes and sump pump discharge pipes from the municipal sanitary sewer (to reduce overflowing the sanitary system during heavy rains and risk of sewage backups)
- Clean or maintain a backwater valve regularly (some homeowners who had backwater valves did not know what they were or that they should be cleaned out to ensure proper function)
- Obtain a second sump pump and/or battery backup for sump pumps
- Extend sump pump discharge pipes 6 ft from the house
- Solve efflorescence issue (efflorescence, a mineral salt deposit, is an indication of water moving through cement foundations and moisture is present)
- Replace leaky windows
- Install window well covers

- Closed circuit video scope of the sanitary sewer line if the house is more than 25 year old



A homeowner and EOS staff examine a sump pump with battery backup and investigate evidence of efflorescence beside it. Photo: A. Marlin

## Follow Ups, Feed Back and Rebates

EOS followed up with each participating homeowner a few weeks after their assessment to see what they thought of the program, how it could be improved and if they had implemented any of the best practice options offered in their customized home assessment report.

### Actions Implemented

Because the program was delayed and assessments were done in late fall and winter, it was not the most ideal time to implement some of the best practice options, especially exterior things like patio repairs, landscape grading, installing window wells, patching foundation cracks or installing eaves, etc. Twelve of the 22 homeowners provided feedback by the time of writing this final report. The total number of actions implemented or planned for this spring so far is 19 actions from ten homes. This includes six homeowners who have completed some of their suggested best practice options already. The remaining 10 homeowners did not provide feedback by the time of writing this final report.

Actions heard from homeowners include:

1. *Already extended one downspout since the assessment. Planning to regrade the back yard, re-do the patio, re-direct the back downspout away from the patio, and patch 2 foundation cracks this spring.*
2. *Getting a new sewer line connected to the house in March.*
3. *A further plumbing investigation is planned for the spring.*
4. *Installed a rain deflector over our below grade stairwell. Installing window well covers, contacting foundation professional, getting backwater valve cleaned, extended one downspout 6ft from house.*
5. *This spring I plan to add some eavestrough and slope a couple of areas away from foundation.*

6. *Would like to do a CCTV scope of sewer lateral this spring, but plumbers are very busy.*
7. *Cleaned up efflorescence in basement.*
8. *Fixed a leaking hot water tank that was identified during the assessment.*
9. *Re-grading the front yard in spring.*
10. *Getting sump pump inspected for the first time ever!*

## **EOS Eco-Energy's Flood Risk Reduction Rebate Program**

EOS will extend its rebate program into the new year and continue to offer \$100 rebates to homeowners participating in the assessment program to help them with the cost of repairs, upgrades and equipment purchases mentioned in their assessment reports. One homeowner has accessed our rebate program and we know that at least 5 more homeowners plan to access our rebate program in the spring for things such as repairing a patio that has heaved and cracked, sanitary sewer lateral work, a CCTV scope of a sanitary sewer lateral, and other repairs. EOS also plans to continue fundraising for our flood risk reduction rebate program as it helps to fill an important gap in government incentive programs.

## **General Comments about the Home Flood Risk Assessment Program**

Homeowners also provided feedback on the assessment program in general. Some were disappointed that the assessment did not look at roofs or windows and leaks in upper stories. The program also does not include any consideration for storm surge or coastal flooding situations and some homeowners living near the coast would like assistance in reducing their risk in these situations. This could present an opportunity to create a new assessment program for coastal homes. Homeowners were also disappointed that government incentive programs do not exist to the same extent that energy efficiency incentives do. All homeowners were very grateful for the experience and everyone learned something new through the program. One mentioned that it was really nice to see two women doing the assessments. I found it easier to talk to them. Some participants also said it would be nice to have a seasonal maintenance list.

## **Chignecto Climate Change Collaborative**

### **Coordination of the CCCC**

During 2022-2023 the CCCC working group continued to have excellent participation from members. We also gained new members from NB EMO, ClimAtlantic, and the new local entity of Tantramar. Twenty-one people attended CCCC networking meetings over the course of the year. Due to limited funding, the CCCC working group met only 3 times throughout the year to network, share updates on their work, plan the event series, and take part in shared learning. The meetings and events are summarized below.

CCCC Meetings and Events During 2022-2023

Meeting	Main Points Discussed	Length
June 15 <sup>th</sup>	Project planning for the year ahead. Fall site tour planning. Networking and updates from CCCC members.	1hr
September 21 <sup>st</sup>	Fall site tour	5 hrs
Nov 1 <sup>st</sup>	Brainstormed ETF application ideas	1.5hr
Total Hours		7.5hrs



November CCCC meeting.

EOS staff prepared the second annual CCCC newsletter to the broader network. It was sent to 99 members on September 9, 2022. The newsletter contained news, project updates and an invite to the fall CCCC site tour.



Except from the first annual CCCC newsletter. It was sent to 99 members on September 9, 2022

## Adaptation and Flood Risk Reduction Fall Site Tour

On September 21<sup>st</sup>, 14 members of the CCCC joined the fall site tour. The site tour was planned as a networking and joint-learning opportunity for CCCC members to safely reconnect after the early years of the pandemic and lockdowns. The theme of collaborating and partnering for climate adaptation was apparent through all tour stops. Participants learned about the partnership between EOS and Fort Folly First Nation in creating the beginning of a community healing forest. Then it was on to the then Sackville Town Hall where EOS and Town staff explained the project, challenges and lessons learned. A picnic lunch was enjoyed outside at the Beaubassin Research Station and DUC staff explained the research and student projects that take place there. DUC and MTA staff explained their salt marsh restoration work and their research to calculate the carbon stored in new salt marshes. The day ended with a demonstration of electromagnetic technology to measure geophysical properties in the dykes. Everyone enjoyed the chance to safely connect in person outside, some meeting for the first time since the pandemic began. Positive comments were heard afterwards such as: *"Big thank you to Amanda for organizing a great tour yesterday. It was so nice to see/meet folks in person and visit some of the projects taking place in the region."*

**Chignecto Climate Change Collaborative**

**CCCC Fall Site Tour of Flood Risk Reduction and Climate Adaptation**  
 Wednesday, September 21, 2022 (Storm Date: Friday, September 23)  
 By invitation only. Spaces are limited.  
 RSVP to [ecos@nb.altn.com](mailto:ecos@nb.altn.com) or 506-536-4417 by September 18th

CCCC members are invited to participate in a fun, relaxed, informal day of outdoor learning about climate adaptation projects in the Chignecto Border Region. The day features hikes to forests, roof tops, marshes and dykes. Don't miss out on a chance to reconnect with CCCC members while we learn together.

Time	Location	Host(s)	Description
10:00am-11:00am	<b>Fort Folly First Nation's new Community Healing Forest</b> On Cherry Burton Road, just beyond Bernard Trail and the reserve boundary. (Parking along side of road)	Nicole Dubé, Fort Folly First Nation; Michelle Knockwood, Fort Folly Habitat Recovery; & Amanda Martin, EOS Eco-Energy	Learn about a great partnership between EOS Eco-Energy and Fort Folly First Nation to create a community healing forest with benefits for flood risk reduction, food security, culture and healing. Go on a short hike through the forest to see what was planted and experience this special spot.
11:15am-12:00pm	<b>Green Roof, Sackville Town Hall</b> 31 Main St, Sackville, NB Meet outside at the front door, then we'll head up together. (Parking behind the building)	Amanda Martin, EOS Eco-Energy & Town of Sackville staff	Visit the newly expanded green roof on the Sackville Town Hall. Learn about the partnership between EOS and the Town, how the green roof was constructed, the many benefits, and get a tour of the roof.
12:15pm-1:00pm	<b>Ducks Unlimited Canada's Beaubassin Research Station</b> Brown Road, Aulac, NB (Parking on the lawn behind the house)	Ducks Unlimited Canada	Enjoy your picnic lunch on the grounds of the Beaubassin Research Station, overlooking the beautiful Tantramar Marshes and Bay of Fundy. Have a chance to safely network and reconnect with colleagues outside.
1:00pm-2:30pm		Nic McCallan, Ducks Unlimited Canada & Dr. Jeff Cloutier, Mount Allison University	Learn about a nearby dyke realignment, salt marsh restoration work, and carbon research by DUC and MTA. Hear about the research that takes place at Beaubassin Research Station. Go on a hike out to the dykes.
2:30pm-3:00pm		Dr. Peter Lavoie, Mount Allison University	Continue your walk on the dykes. Learn about work by MTA and UNB to use geophysics to learn about the dykes, and how this connects to dyke realignment work. A possible live geophysical survey demonstration.

**What to Bring:**

- Bring your own vehicle (or carpool with others)
- Hiking boots, rain jacket
- Sunscreen, hat, bug/lick spray
- Picnic lunch, lots of water
- Lawn chair or picnic blanket
- A mask for inside and when you can't distance

**Other things to note:**

- Please **DO NOT** attend if you are feeling ill, have covid-19, and/or have been in contact with someone with covid-19 within 7 days before the tour. We want this to be a safe and successful event for everyone attending.
- Bathroom facilities are located at the Gipsy Gas and Tobacco on Cherry Burton Road in Fort Folly First Nation, in the Sackville Town Hall and at Beaubassin Research Station.

**The Route to Follow:**

CCCC Fall Site Tour Invitation



*Nicole Porter, Knowledge Keeper and Cultural Coordinator for Fort Folly First Nation explains the community healing forest project with EOS during the CCCC Site Tour. Photo: A. Marlin*



*Kieran Miller, Senior Manager with the Town of Sackville (now Tantramar) explains the Green Roof project in partnership with EOS. Photo: A. Marlin*



*Dr. Jeff Ollerhead (MTA) and Nic McLellan (DUC) explain their salt marsh restoration work and carbon storage research by Beaubassin Research Station. Photo: A. Marlin*





*Dr. Peter Lelievre explains his geophysical research on the dykes. Photo: A. Marlin*

## Youth Education on Flood Risk Reduction

On October 31<sup>st</sup>, 2022, EOS staff organized a fun hands-on activity for kindergarten to grade 4 students at Salem Elementary School's Halloween-themed Outdoor Day in Sackville. Students learned about flooding and experimented with how water moves over the land. We dug little stream beds and placed little houses by them. The students had time to build little dykes or protections around their homes. Some chose to use sand, twigs, leaves and/or pebbles. Others got creative using other toy trucks and small pumpkins to act as barriers. One smart group moved their home back from the river and some built their homes higher up on mounds of dirt. We simulated a rainstorm with watering cans sending water down the little streams and overflowing the banks. The students watched eagerly to see how their protective measures would perform. A lot was learned about the flow of water, such as when you block a stream, water can overflow and flood in behind your home. The activity was a lot of fun and kids enjoyed playing in the dirt and water. We took opportunities to explain about flood protection measures such as proper grading around homes, retreat from shorelines, building in flood risk zones, runoff, erosion and more. During the course of the morning, we engaged 143 students.



*EOS at Salem School's Halloween-Themed Outdoor Day teaching about flooding. Photo: A. Marlin*

## Results: Tracking Priority Measures

Priority #1 - Addressing climate change – This measure tracks the number of people taking part in a climate change education/awareness initiative.

We are in the process of meeting or have already exceeded all priority measure targets. See the table below for a summary.

Events	Updated Targets (June 2022)	Results
CCCC working group meetings	A) 20 members B) Active learning/discussion C) 3 meetings x 1.5 hours = 4.5 hours	Total people: 20 Total meetings: 2 Total hours: 2.5
CCCC fall site tour (annual event/conference)	A) 50 people B) Active learning C) 6 hours	Total people: 14 Total events: 1 Total hours: 5
Flood risk reduction workshops	A) 60 people B) Active learning C) 3 events x 1.5 hours = 4.5 hours	Total people: 65 Total events: 3 Total hours: 4.5
Home flood risk reduction assessments	A) (35 homes)70 people B) Active learning C) 35 hours (1hr per home)	22 homes completed and 13 more have signed up* = 35 homes 42 homeowners reached and ~26 homeowners waiting = 68 people 1.5 hrs/home = 33hrs completed and 19.5 hrs to come Total hours: 52.5
Additional educational events	Cape Jourimain presentation 1 hour, 26 people Salem School Outdoor Day 4 hours, 143 students	Total people: 169 Total events: 2 Total hours: 5
TOTALS	A) 200 people B) 42 events C) 50 hours	Total people: 310 people so far Total events: 30 (with 13 more home assessments set up and waiting for better weather) = 43 Total hours: 50 so far <b>Targets met or exceeded</b>

\*EOS plans to complete the remaining home assessments in March 2023.

**Priority #2 - Building Sustainable Communities – Other**

EOS tracked the number of homes participating in the home flood risk assessment, the number of recommended actions completed by homeowners, and the number of items purchased in the bulk order. The results were:

Measure	Updated Targets (June 2022)	Results
Number of homes in the home flood risk assessment program	35 homes	22 homes completed and 13 waiting for better weather/less snow* = 35 homes <b>Target being met</b>
Number of actions completed by homeowners	15 actions (spread across participating homeowners)	19 actions (from 10 homes) so far <b>Target met</b>
Number of participants in the bulk order fundraiser	10	29 participants <b>Target exceeded</b>
Number of items purchased	10	55 items including 36 rain barrels <b>Target exceeded</b>

\*EOS plans to complete the remaining home assessments in March 2023.

**Summary: Impacts and Community Benefits**

In summary, the project had a positive impact on communities in the Memramcook-Tantramar -Strait Shores region and helped reduce flood risk in a variety of ways. Participants in the flood risk reduction workshop series learned about flood risk and coastal adaptations from across Atlantic Canada, as well as how to use the new online provincial flood hazard mapping tool, and about how to protect their homes from floods. EOS staff gained training and capacity to assess homes for flood risk, thereby increasing the resiliency of our region. Homeowners and their families who participated in the free home flood risk assessment program learned how to reduce flood risk on their properties and in their basements and many have or are planning to implement the best practice options presented in their home assessment reports. Members of the CCCC increased their learning about local adaptation projects and flood risk reduction projects during the fall site tour and networking meetings. Students at Salem School learned about flooding, how water moves over land and various adaptation measures to keep homes safe, all while have a lot of fun in the mud and water.

**Recommendations and Next Steps**

As a result of this project, EOS recommends continuing the important work of the CCCC and further helping municipal governments, communities, and residents adapt to climate change impacts and

build capacity to be resilient in 2023-2024. Specifically, EOS plans to continue offering more home flood risk assessments for vulnerable homeowners, monitor the uptake of improvements, gather feedback, provide educational resources, and share lessons learned with government and other environmental groups in NB. The home assessments completed so far have highlighted the impacts of climate change on residents and associated health risks (from wet basements, mould, etc.). Thus, EOS seeks to conduct a climate change and health vulnerability and adaptation assessment using the newly released NB HealthADAPT tools. The data collected will eventually feed into new climate adaptation plans for the new Tantramar and Strait Shores local entities. If funding is secured, EOS and the Chignecto Climate Change Collaborative (CCCC) plan to promote these and other regional adaptation activities during a climate change awareness session at Tantramar Regional High School. Considering the HealthADAPT results, EOS and the CCCC plan to review and reflect on the CCCC's existing 5-year action plan and conduct a strategic planning session to chart the next 5 years.