

**Environment Advisory Committee
Agenda
September 28, 2022, at 2:00 p.m.**

- 1. Call to Order**
- 2. Present**
- 3. Regrets**
- 4. Additions to the Agenda**
- 5. Approval of Agenda**
- 6. Approval of Minutes:**
 - i. Minutes from July 27, 2022 (TAB 1)
- 7. Presentations**
- 8. Public Input**
- 9. New Business**
 - i. Noxious Weed Control Act (TAB 2)
 - ii. Moratorium on Aerial Spraying (TAB 3)
- 10. Business Arising:**
 - i. Draft Climate Change Plan Update (Kayla Winsor) (TAB 4)
 - ii. Climate Change Intern Extension
 - iii. Clean Ocean Action Committee, Letter of Support (TAB 5)
 - iv. Flood Risk Infrastructure Investment Program Funding (TAB 6)
- 11. Correspondence**
 - i. Home Flood Protection Research Paper (TAB 7)
- 12. Next Meeting Date:** October 26, 2022
- 13. Adjournment**

**Environment Advisory Committee
Agenda
July 27, 2022, at 2:00 p.m.**

1. Call to Order	Chair Bottomley called the meeting to order at 2:00
2. Present	John Bottomley (Chair), Councillor Paula Hafting, Mayor Amery Boyer, County Councillor Clyde Barteaux, Sandi Millett-Campbell, CAO, Levi Cliche, Susan Jost, Climate Change Intern Kayla Winsor, and Recording Secretary Krista Grear
3. Regrets	Starr Cardwell
4. Additions to the Agenda	New business: 9 iii. liaison with Waterfront Development Taskforce
5. Approval of the Agenda	MOTION #EAC2022-07-27-01 It was regularly moved and seconded to approve the agenda with additions. Motion carried
Edits to the Minutes	
6. Approval of the Minutes	MOTION #EAC2022-07-27-02 It was regularly moved and seconded to accept the minutes of April 27, 2022. Motion carried

7. Public Input

8. New Business

i. Climate Change Survey Results

- Kayla Winsor shared a presentation and answered questions. She noted that she had collected all the data from the climate change survey into an easy to read format. There was a total of 74 respondents to the survey that was distributed via MailChimp (284 on mailing list) and Facebook, it was open for two weeks. The target audience for this survey was residents of the Town. It was noted that the survey didn't include personal identifiers or demographic questions.
- Engagement session will be held August 25 at 6:00 pm at the gymnasium

ii. Global Covenant of Mayors for Climate and Energy

- It was noted that Council moved to have Mayor Boyer sign the Covenant. This was the result of a suggestion by Kayla Winsor to Council, between EAC meetings, and was brought forward today as an update to the Committee.
- The Covenant will provide the Town additional information and contacts that can be accessed and use during the development and/or modification of the Climate Change Plan with tools such as a greenhouse gas inventory, risk and inventory assessment, etc. The process typically takes place over a five year period to develop a program plan to

implement all the stages into the climate change plan. CAO Millett-Campbell noted that should there be no Climate Change Intern position in the future that the Committee will have to continue with the process.

- iii. Liaison with Waterfront Development Taskforce
 - This morning Chair Bottomley attended the first meeting of the Waterfront Taskforce where it walked down the waterfront and discussed challenges, opportunities, and solutions/ideas primarily specific to the wharf. The Taskforce is considering recommending smaller projects/incremental activities rather than one large scale. The Taskforce will be meeting again in August and members felt that meeting with the EAC would be necessary in moving forward.

9. Business Arising:

- iv. Sea Level Rise/FRA
 - This is the final report, which has been approved by the Town, and as such can now be used as a resource in the Climate Change plan development. Chair Bottomley noted that between 1998-2008 there had been lots of work done early on which was somewhat surprising
- v. Draft Climate Change Plan Update
 - Kayla Winsor noted that she is in the middle of finding resources and going through documents for relevant information/background info and that a draft can be shared as needed
- vi. Public Education Session on Energy Upgrades
 - Levi Cliche noted that CARP had had a student lined up to do this, and unfortunately the student was ineligible for placement and that there are no staff with this focus or time right now and as such will keep on note for future consideration
- vii. Clean Ocean Action Committee, Letter of Support
 - Chair Bottomley asked members to review the questions and that he will circulate his comments, after which the group can construct and submit answers to the questions
- viii. Parks Canada Grant, REI for engineering study update
 - Council has approved the study to be done by the AIM Network, the first meeting will be next Tuesday or Wednesday. Timeline for completion is December of this year. Grant covered up to \$25,000 (matching grant) and the REI came in at \$25,000 (CAO Millett-Campbell to confirm whether funder will provide all or half since it's a matching funding program). It was noted that Council previously made a motion to match up to \$32,000, and that John's in-kind work on the FRA can be included.

10. Correspondence

- ix. Community Clean-ups
 - A community resident indicated interest in participating in regular community clean ups of garbage, weeds. Kayla Winsor offered to facilitate the first one or two

- x. Modernizing Nova Scotia's Ambient Air Quality Standards (TAB 6)
 - For information purposes

11. **Next Meeting Date:** September 28, 2022

12. **Adjournment**

It was regularly moved to adjourn the meeting at 3:13 pm



Executive Director
Policy and Corporate Services
Department of Agriculture
Roger S. Bacon Building, Suite A
60 Research Drive
Bible Hill, NS Canada

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Email: Heather.Hughes@novascotia.ca

September 13, 2022

CAO Gregory Barr
Town of Annapolis Royal
cao@annapolisroyal.com

Dear CAO Gregory Barr:

I am writing to inform you of changes the Department of Agriculture is proposing to make to the *Agricultural Weed Control Act (Act)*. We want to ensure you are aware of the recommended changes and address any questions or concerns.

The Act protects agricultural land from the introduction and spread of noxious weeds. Noxious weeds can have a significant impact to farmland and in some instances can lead to animal injury and mortality. These weeds can reduce local crop production affecting accessibility and affordability for Nova Scotia consumers and processors. In consultation with the Weed Control Advisory Committee, which consists of members from the Department, Agriculture and Agri-Food Canada, Nova Scotia Federation of Agriculture, Perennia, and Dalhousie Faculty of Agriculture, the Department is proposing to completely replace the Act to modernize its approach.

The proposed changes include:

- Streamlining to one list of noxious weeds, which would be removed from the *Weed Control Regulations* and placed on the Department's website. This will make accessing the list more user friendly and allow the Department to update the list in a timely manner.
- Clarifying that the responsibility for the control and cost of destruction of noxious weeds are the responsibility of the person responsible for the land. This is the current practice, but not accurately reflected in the Act. The Department will continue to provide education and support in the control of noxious weeds through identification and recommended control methods.
- Providing the Nova Scotia Federation of Agriculture with the ability to recommend to the Minister any plant for designation as a noxious weed on behalf of a municipality or producer.

- Authorizing inspectors to investigate and provide enforcement regarding noxious weed issues that may impact agriculture. The Department will use enforcement as a last resort to protect the Nova Scotia agricultural industry, continuing to focus on education and support through identification and recommended control methods.

The proposed changes will allow the Department to better respond to potential risks of noxious weeds, while allowing the flexibility to address the use of weeds for future economic purposes.

If you have any concerns or comments related to these changes, please submit them to Karen Nelson, Senior Policy Analyst, Department of Agriculture at karen.nelson@novascotia.ca or by mail at 60 Research Drive, Suite A, Bible Hill, Nova Scotia, B6L 2R2 by October 3, 2022.

Should you prefer to discuss this Act in person, please feel free to contact Karen to arrange a meeting.

Thank you for your time and consideration of this matter.

Yours sincerely,



Heather Hughes
Executive Director

c. Loretta Robichaud, Deputy Minister Agriculture



COUNTY of ANNAPOLIS
NATURALLY ROOTED

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Website: AnnapolisCounty.ca

September 13, 2022

Hon. Tim Houston, Premier
PO Box 726
Halifax, NS B3J 2T3

Premier@novascotia.ca

~and~

Hon. Tim Halman, Minister
Environment and Climate Change
1700 Granville Street, 4th Floor
PO box 2125, Halifax, NS B3J 3B7

Minister.Environment@novascotia.ca

Dear Premier Houston and Minister Halman,

Re: Moratorium on Aerial Herbicide Spraying

Over the past months, municipal council has been hearing the concerns of Annapolis County citizens regarding aerial spraying of herbicides and pesticides. Approved sites are impacting adjoining private lands, indeed, some residents were unaware of the spraying that would be taking place near where they live, work, and recreate.

On behalf of the Municipality of the County of Annapolis Council, I am requesting that a moratorium be placed on aerial herbicide spraying until a formal report on the net benefits or net losses of such activity to the residents of Nova Scotia, can be obtained by requisition of the provincial government.

We look forward to your early responses, as such activities are scheduled over the next few weeks.

Yours truly,

Alan V. Parish,
Warden

AVP/cy

cc: Chris d'Entremont, MP West Nova Chris.dEntremont@parl.gc.ca
Kody Blois, MP Kings-West Hants Kody.Blois@parl.gc.ca
Hon Jean-Yves Duclos, MP, Minister of Health hcminister.ministresc@hc-sc.gc.ca



Climate Change Plan 2022

The Town of Annapolis Royal



Annapolis Royal

— *Nova Scotia* —

Land Acknowledgment

Annapolis Royal resides in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq peoples. Signed in 1725 between the Mi'kmaq and Wolastoqiyik (Maliseet) and the British Crown, the Treaty of Peace and Friendship were a form of recognition and guideline for establishing rules for an ongoing relationship between nations. This treaty did not deal with the surrender of lands and resources. Indigenous people have developed a sustainable and respectful relationship with nature for hundreds of years. Medicine, culture, art, and livelihoods all depended on this relationship. In turn, the Mi'kmaq people paid their respects through sustainable resource practices and offerings such as tobacco. Many Indigenous people still carry these practices today and bring these traditions onward to the next generation. Moving forward with a world affected by climate change, elders, scholars and other Indigenous knowledge holders are now more critical than ever.



Acknowledgments

Annapolis Royal Town Council

Amery Boyer, Mayor
Pat Power, Deputy Mayor
Holly Sanford, Councillor
Paula Hafting, Councillor
Michael Tompkins, Councillor

Environmental Advisory Committee

John Bottomley, Chair
Amery Boyer, Vice-Chair
Paula Hafting, Councillor
Levi Cliche, Executive Director at CARP
Susan Jost, Community member
Star Cardwell, Community member

Funding Contributors

Clean Foundation
Federation of Canadian Municipalities

Authors

Kayla Winsor, Climate Change Intern
with writing contributions from John
Bottomley and Levi Cliche

Photography

Town of Annapolis Royal
Explorer Guide
Community Members

Graphic Design

Kayla Winsor, Climate Change Intern



Mayors Address

Since 1998, the Town of Annapolis Royal has recognized and begun to address the issues relating to our changing climate. With the assistance of partners, including the Centre for Geomatic Sciences (COGS) at the Nova Scotia Community College (NSCC), Clean Annapolis River Project (CARP), and the Federation of Canadian Municipalities Partners for Climate Protection Program, successive Town councils and staff have received valuable information on the potential impacts for Annapolis Royal and area through various studies, reports and LIDAR mapping.

This Climate Change Plan provides direction for us concerning what we can all do to mitigate the adverse effects of climate change and adapt to our changing environment. The challenge will be for all of us to do what we can to reduce our carbon footprint and change the future trajectory.

The environment we live in is the envelope that contains all life; we now have the opportunity to choose a future with or without clean air, water and soil. We can choose to do nothing, or we can choose to care and do what we can to reduce our carbon footprint and change the trajectory for the future.



Amery Boyer

Mayor

Town of Annapolis Royal

A handwritten signature of Amery Boyer in blue ink, written in a cursive style.

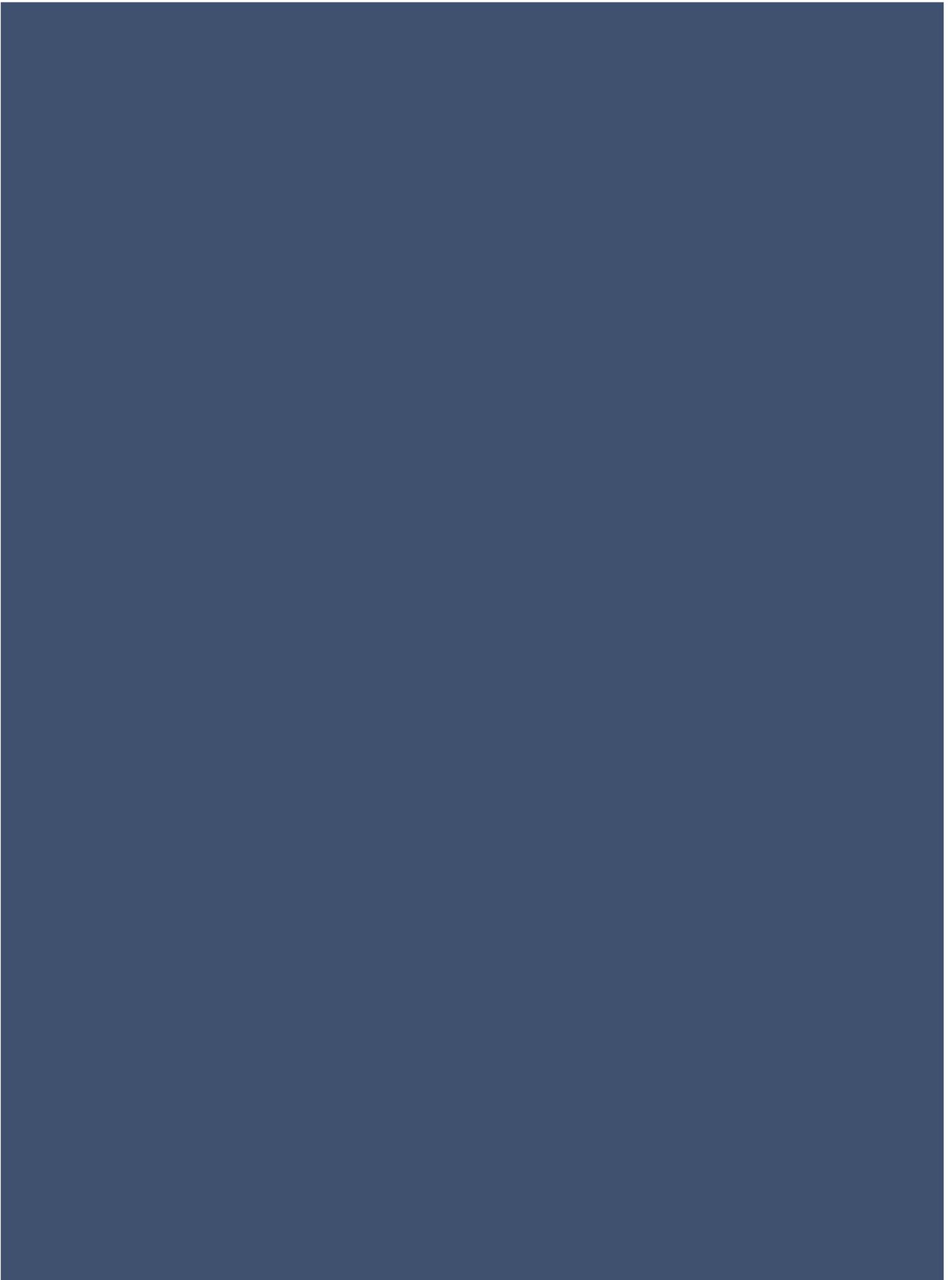
Executive Summary

Climate change remains one of the greatest threats to humans in history. Floods, natural disasters, and unpredictable weather patterns have negatively impacted individuals, communities, and governments for decades and will continue to inflict impacts on a growing scale. Town hall, the Environmental Advisory Committee (EAC), local businesses, and residents have expressed increasing concerns about the effects of rising sea levels on Annapolis Royal. As a result, EAC collectively decided that a new Climate Change Plan (CCP) was necessary for taking definitive actions towards addressing climate change. Annapolis Royal's CCP acknowledges that understanding the risks involved is the first step in combating climate change on a community and individual scale.

For decades, Annapolis Royal has recognized the threats of climate change and continues to uncover solutions to protect and safeguard the economic and social integrity of the town. Annapolis Royal hopes this document aids in understanding climate change and the threats to Annapolis Royal. In addition, this CCP provides a snapshot of the past, present, and future actions in Annapolis Royal and the pathway forward to addressing this small but mighty town's climate change challenges.



Table of Contents



Introduction

Waiting for final edits and comments



What is a Climate Change Plan?

Climate change plans (CCP) are crucial in addressing climate change for any community. CCPs focus on environmental challenges and how they can affect a specific geographic area. CCPs are unique to each location and may contain other valuable documents related to climate change. Plans may also act as supporting documents to help when submitting funding applications. The town of Annapolis Royal hopes this CCP will serve the community for years to come.

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Why is a Climate Change Plan Important to Annapolis Royal?

The Town of Annapolis Royal is highly susceptible to climate change. As a coastal community, sea-level rise is the biggest threat to the town. Therefore, implementing a climate change plan is essential to guide the Annapolis Royal region's resilience to climate change. In addition, Annapolis Royal's CCP will also help prioritize actions needed to reach identified climate change goals successfully. Finally, Annapolis Royal's CPP will provide community members with a document to aid in understanding the changing climate and preventative measures against climate change challenges. Local governments play a critical role in managing the risks of a changing environment. Municipalities are on the front lines of addressing climate change, and plans are essential for local governments to move forward with adapting to climate change.

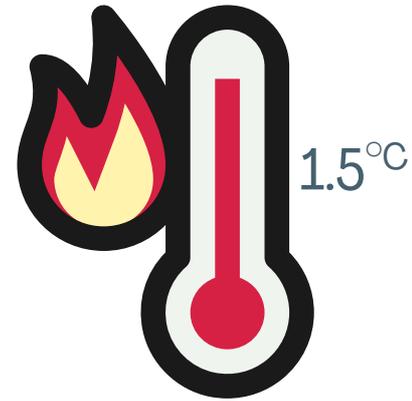
Understanding Climate Change

Climate Change refers to long-term shifts in temperature and weather patterns (United Nations, 2020). Climate change can happen naturally as the earth's orbit shifts, ocean currents change, and volcanos erupt. These natural phenomena have contributed to the changing climate for billions of years and will continue for billions more. However, since the mid-1700s, human activity has exhausted the planet's capacity to keep up with demands, and it has become evident that the earth is showing signs of stress. Human activities such as burning fossil fuels like natural gas, oil and coal are the main drivers of greenhouse gas (GHG) emissions resulting in the rise of global temperatures. The outcomes of climate change present themselves in numerous ways, not just global warming. The planet is a complex system that relies on other aspects of the environment to help support it. Glaciers melting, coral reefs dying, and loss of old-growth forests compromise the unified system sustaining life on earth as we know it. The world has begun to fight back through intense droughts, rising sea levels, severe weather patterns, declining biodiversity, and so much more. However, if human activity continues around the business-as-usual model, actions that negatively impact the environment will continue to intensify. Now is the time to foster community resilience against climate change while transitioning to renewable energy sources and incorporating sustainable practices into everyday life. Climate change is the single biggest challenge of our time. With municipalities influencing roughly half of Canada's GHG emissions, it's essential to scale up local solutions to transition to a resilient, low-carbon future by 2050.



Climate Change Projections

Assessments of observational datasets and historical temperature rise have provided a better scientific understanding of how human-related GHG emissions affect the planet. Since the Paris agreement of 2015, countries have agreed to cut GHG emissions to pursue efforts to limit global temperature rise from reaching 1.5°C above pre-industrial levels (United Nations, 2015). Limiting global temperature rise to 1.5°C would help lower the chances of increased severity of climate change impacts.



Human activities have caused an estimated average of 1.0°C of global warming above the pre-industrial level, indicating a range between 0.8 and 1.2°C globally. If the current emission rates persist, global warming will reach 1.5°C between 2030 and 2052 (IPCC 2018). The number of people affected by natural disasters in 2018 was 68.5 million, with floods, storms and droughts accounting for 94% of the total affected people (Fawzy, S., Osman, A.I., Doran, J. et al., 2020). If the projections continue to rise, the number of those affected due to climate change will grow.

Climate Change Statistics

Health Canada estimates air pollution, including air pollution from human sources in North America, contributes to 15,300 premature deaths per year in Canada (Health Canada, 2021).

Nine of the ten warmest years have occurred during the last 25 years, with 2010 being the warmest on record. Canada's coldest year since 1948 occurred in 1972 at 2.0°C below the reference value (Environment and Climate Change Canada, 2022).

Sea ice in the Atlantic Ocean has declined in winter by 7.5% per decade since 1969. This is consistent with observed upper-ocean warming, which varies in magnitude across the Atlantic region (Cohen, S., Bush, E., Zhang, X., Gillett, N., Bonsal, B. et al., p.424-443, 2019).

Food waste accounts for 10 percent of global greenhouse gas emissions, and over 17 percent of food produced is wasted. (United Nations, 2022).

Without adaptive measures, the number of people who lack sufficient water for at least one month per year will soar from 3.6 billion today to more than 5 billion by 2050. (United Nations, 2022).

The Driver of Climate Change

Greenhouse gas (GHG) Emissions

GHG emissions blanket the earth's atmosphere, trapping the sun's heat and preventing it from escaping. Without the ability to exit the atmosphere, the amount of GHG emissions increases and the temperature of the planet rises. This is a natural phenomenon known as the greenhouse effect, which keeps the planet at a suitable temperature for life. Without the greenhouse effect, the earth would not be a viable place to live. Gases such as carbon dioxide (CO₂), methane, nitrous oxide, and water vapour occur naturally and protect the planet from overheating. However, due to increased CO₂, methane, and nitrous oxide levels from human activity, the atmosphere's temperature has accelerated, creating global warming. Global warming results from pollutants humans make from the six primary sources listed below. For Annapolis Royal, reducing the production of greenhouse gas emissions in the community and corporate sector is a beneficial way to mitigate climate change.

Main contributors to GHG emissions



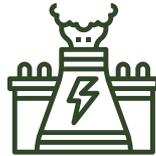
Vehicle Emissions



Air Travel



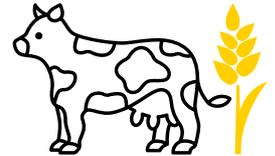
Landfills



Non-renewable Energy Production



Industries



Agriculture

Impacts of Climate Change

The impacts of climate change are interrelated, affecting every aspect of civilization. For example, drought can compromise drinking water and risk low crop yields, and flooding from storms and sea level rise threatens ecosystems and built infrastructure. Further, intense heat waves endanger the health of vulnerable populations. Moreover, temperatures will continue to increase due to the existing atmospheric emissions, and climate change's impacts will gradually intensify. Therefore, Annapolis Royal's municipality must consider the climate change impacts listed below and how they will affect the future of land development and conservation efforts of historical infrastructure and natural assets.



Intense heat waves



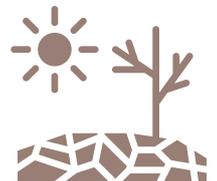
Shorter or longer seasons



Severe weather



Sea level rise



Drought

Guiding Principles for Climate Change Plan

1

Conserving and Enhancing Biodiversity and Ecosystems

2

Improved coordination between neighbouring communities to pinpoint priorities and possibilities to address climate change challenges.

3

Create opportunities for community engagement amongst local government, stakeholders, and citizens.

4

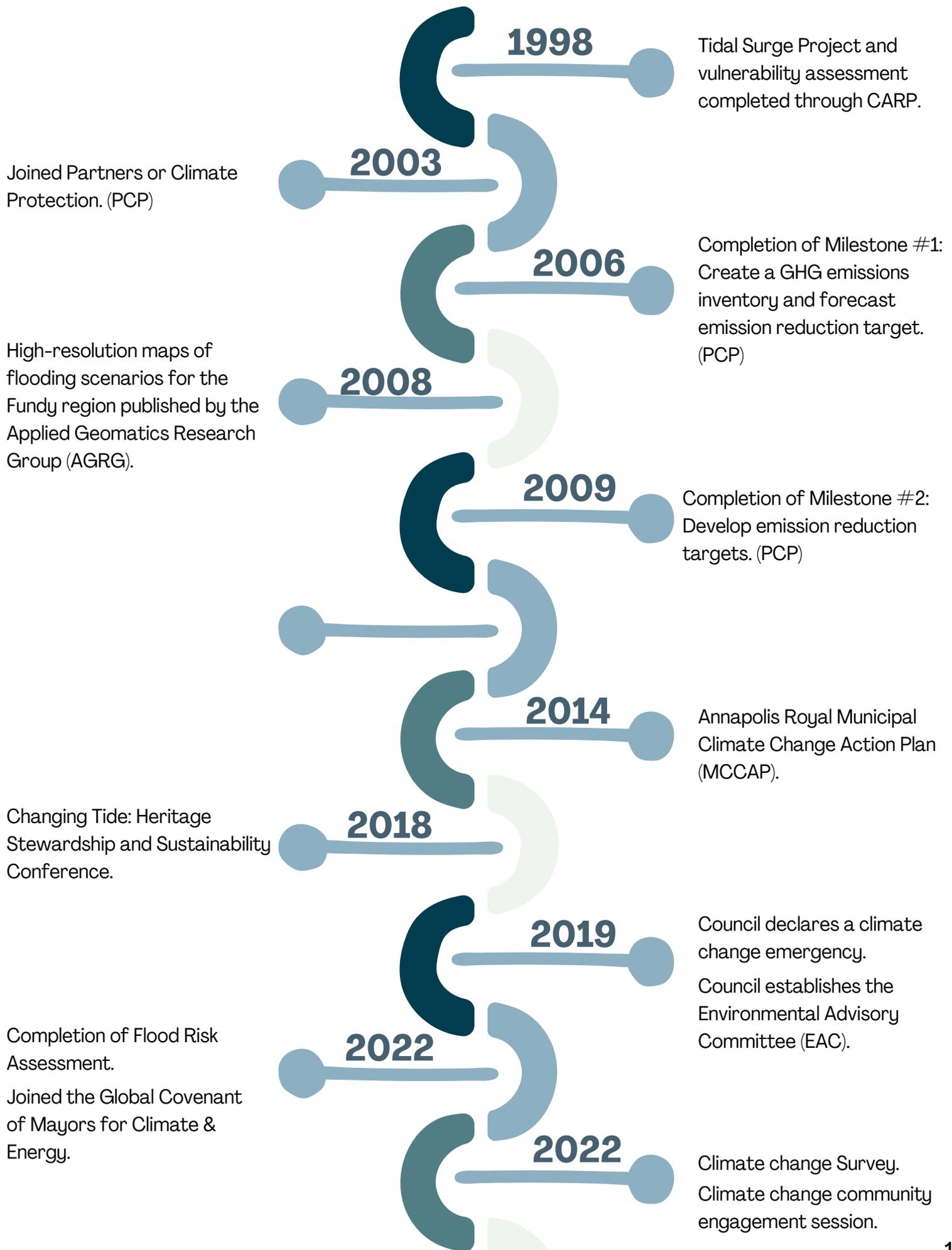
Maximize long-term sustainability and co-benefits of adaptation and mitigation actions with local economic, social, and environmental priorities

Climate Change Goals

- 1.** Pledge to be a climate-smart community
- 2.** Set goals, Inventory emissions, and plan for climate action
- 3.** Increase community use of renewable energy
- 4.** Reduce greenhouse gas (GHG) emissions through climate-smart initiatives
- 5.** Enhance community resilience and prepare for the effects of climate change
- 6.** Support the development of a green innovation economy
- 7.** Commit to an evolving process of climate action



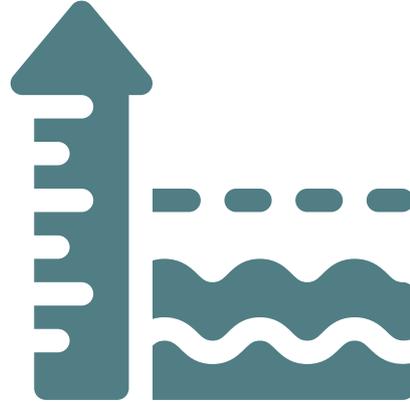
Climate Action Timeline



Areas of Focus

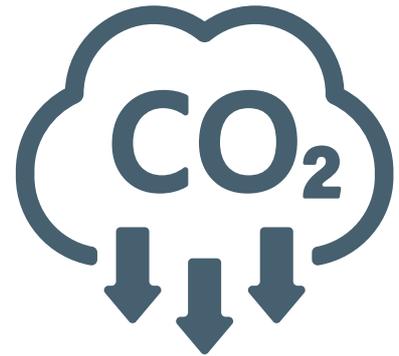
Sea-level Rise

Effects of Sea-level rise
Addressing Sea-level rise



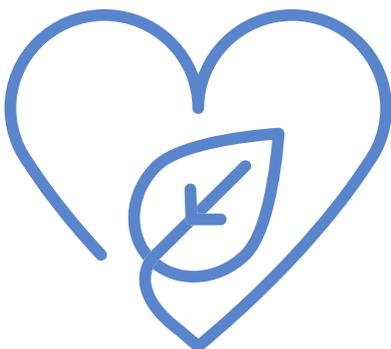
CO₂ Emissions

Effects of excess CO₂ Emissions
Reducing CO₂ Emissions



Preserving Annapolis Royal's Natural Environment

Annapolis Royal's Natural Assets



Sea level Rise

The melting ice sheets, glaciers, and ocean thermal expansion from global warming raise water levels in the world's oceans. Human pollutants such as burning fossil fuels are one of the main drivers of global warming, posing a severe threat to coastal areas. Effects of sea level rise may include flooding, storm surges, erosion, and the destruction of critical aquatic ecosystems such as wetlands and coastal estuaries. Sea level rise affects areas differently due to local, regional, and hemispheric factors. In coastal regions of Nova Scotia, a combination of all three factors result in different sea level changes in each coastal area. In Nova Scotia, the increase in sea level was 0.30 m in the Twentieth Century and will gradually increase the global mean sea level to 1.6 m by 2100 if the melting of polar ice caps continues (MCCAP pg. 4, 2014). Annapolis Royal is recognized as a coastal community and will face the following challenges below due to sea level rise. Acknowledging the issue is no longer enough; action carried through mitigative and adaptative solutions will need to be taken in Annapolis Royal to address sea level rise.



High Tide



Low Tide

Effects From Sea-level Rise

Flooding

Flooding occurs when large amounts of water overflow beyond its standard coastline limit. According to historical flooding events, flooding commonly occurs with snow melt, high tides, heavy rainfall, storm surge or a combination of each (Nova Scotia Gov., n.d). Annapolis Royal is a coastal community susceptible to all the weather events commonly associated with flooding. Heavy rainfall will occur most frequently in the winter, with summer months decreasing precipitation, risking drought in the area. (MCCAP, p.g 12, 2014). Combined with snow melt, high tides and increased rainfall in the early spring, flooding concerns throughout Annapolis Royal are present, especially in the downtown and lower area of St. Geroge Street. Much of Annapolis Royal's land was reclaimed, creating dykes in the 17th century with a naturally receding landscape. (Bottomley, p. 19, 2022). Flooding will continue to threaten the community of Annapolis Royal as climate change progresses and water levels rise. With the knowledge, resources, and tools available to the community, such as the Flood Risk Assessment created by John Bottomley, Ph.D., this year, Annapolis Royal is well aware of the threat and will continue to adapt accordingly.



Storm Surges

Storm surge is a natural event of increasing water levels connected to low atmospheric pressure created by weather events such as cyclones and measured through the elevation in water levels exceeding the average tidal level, not considering waves (Bottomley, pg. 16, 2022). Storm surges have occurred throughout history in Annapolis Royal and will continue to occur as climate change creates more opportunities for severe weather events to create them. Storm surges create flash flooding, and while temporary, storm surges can cause substantial damage to the natural and built assets of Annapolis Royal. (MCCAP, pg. 6, 2014). In addition, floods from storm surges will interfere with access to emergency services, homes, and businesses, resulting in compromised health and safety of residents. (MCCAP, pg. 8, 2014). Therefore, community awareness sessions, home/business flood evaluations, and opportunities to adapt, such as seawalls, living shorelines, restoration of salt marshes and dyke reinforcements, should be considered when the town continues planning for future storm surges. Furthermore, storm surges naturally occur within the natural world. However, due to the impacts of climate change, such as global warming, storm surges' frequency and intensity, causing flooding around the low-lying areas of Annapolis Royal, will increase with each passing year.

Erosion

Erosion occurs from waves, tidal action, wind, surface runoff, and storm surges, slowly deteriorating coastal rocks, soils and sediment along the shorelines. Climate change has accelerated the erosion rate around coastal areas such as Annapolis Royal, compromising prevention structures like dykes. In addition, freeze-thaw conditions combined with high water tables can fracture essential infrastructures such as subsurface pipes and water mains speeding the erosion process. (MCCAP, pg. 11, 2014).

Shoreline erosion often poses a concern for humans by jeopardizing roads, infrastructure, agriculture, transportation, and other valuable community services. Coastal communities like Annapolis Royal are beginning to face the decision to either protect the shoreline from erosion through engineering strategies or community retreat. No one solution can solve coastal erosion for every community. Depending on shoreline types and sediment present, local decision-makers must consider the uniqueness of the coastline and the specific characteristics that define them. Living shorelines can be an excellent adaptation method for Annapolis Royal to tackle erosion and help the coastline reach a more stable state. Also known as ecosystem services, living shorelines improve water quality and diversify coastal habitats. In addition, living shoreline approaches such as coastal forests, salt marshes, vegetated slopes, and dunes protect shores from erosion and provide flood protection. Erosion is a natural process that transpires over time as the water hits the coastlines. However, with climate change increasing the amount of erosion from extreme weather, Annapolis Royal will need to consider solutions such as living coastlines.

Hazards from Sea level rise



Compromised access to emergency services



Infrastructure damage



Disturbance of natural ecosystems



Water contamination



Obstruction of roadways



Addressing Sea level rise and Flooding

Addressing sea level rise will be Annapolis Royal's most prominent climate change challenge. For decades Annapolis Royal has found ways to gain vital resources and information on how sea level rise will affect the area. For example, flood risk assessments completed with LIDAR data, water model software and historical tidal and flood records have demonstrated that the Town's probability of flooding will increase due to climate change (Bottomley, p. 29, 2022). In 2019, the Town took advantage of an FCM-sponsored Atlantic Infrastructure Management Network grant (AIMS) program to assess its water system. In 2021, Council approved participation in a 2nd AIMS grants to look at the rest of its infrastructure, such as the sewage treatment system. Capital requirement projections will be developed, including life-cycle costs, level of service, and adaptation and mitigation-based solutions. Annapolis Royal recognizes that community development in environmentally sensitive areas may cause risks to foundation stability, create high water tables, and other unsuitable circumstances for substantial growth. The Town utilizes documents like the Land Use By-law and zoning map for development in environmentally sensitive areas and site-specific development examinations (Municipal Planning Strategy p. 30, 2020). Annapolis Royal's Town will continue seeking opportunities to support studies and projects to protect Annapolis Royal from sea level rise. Sea level rise will continue threatening Annapolis Royal in the coming decades, especially in the downtown core. Therefore, the continuation of developing resources such as the Annapolis Royal's flood risk assessment will further support efforts to mitigate and adapt to sea level rise in the town.

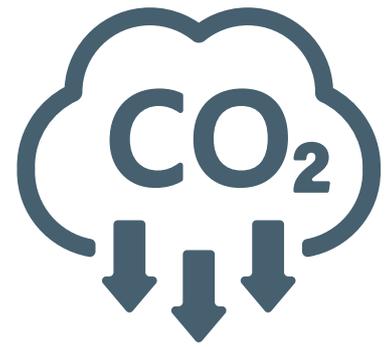
On pages five and six, of Johns bottomley flood risk assessment

Relevant publications indicating the risks of sea level rise for the area are listed in John Bottomley's Flood Risk Assessment (FRA) for the Town of Annapolis Royal. Residents from Annapolis Royal may request to view the FRA document and other publications from Town Hall.

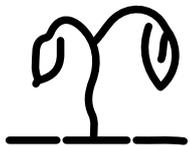


CO₂ Emissions

Carbon dioxide, commonly known as CO₂, is one of the primary GHG surrounding the Earth's atmosphere emitted through human activities. While CO₂ emissions may seem alarming, like most things, CO₂ is good in small amounts. Since CO₂ classifies as a GHG emission, it absorbs heat from the Earth's surface and disperses it in different directions, including back toward the Earth's surface. This heat distribution process in the atmosphere, known as the greenhouse effect, keeps global surface temperatures above freezing, stabilizing the climate. However, the mass burning of fossil fuels like coal, oil and natural gas creates excessive amounts of CO₂ in the atmosphere, accelerating the greenhouse effect and driving global temperature to climb.



Natural Sources of Carbon Dioxide



Decomposition of organic matter



Volcanic eruptions

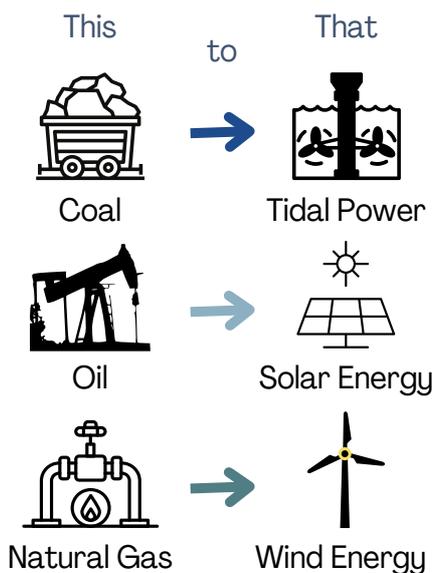


Forest fires



Oceans

Reducing CO₂ Emissions



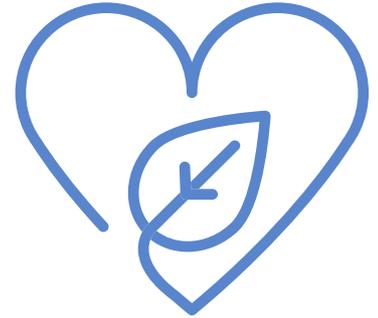
Environmental Advisory Committee (EAC) Recommendations to Address CO₂ Emissions

- Regulate land-use
- Limit international travel
- Low carbon capital item replacement
- Encourage the use of solar panels and curtains
- Encourage the reduction of food and energy waste
- Increase number of tree plantings in the community



Preserving the Natural Environment

Healthy, natural environments support ecosystems by cleaning the water and air, maintaining rich soils full of nutrients, and providing food for those who need it. Without the natural environment supporting these valuable ecosystem services, severe impacts would occur on the planet. species of animals, plants, fungi, and others would be lost due to habitat disruption, affecting the food web and diminishing the quality of life on the planet significantly. In addition, ecosystems of the earth can be resilient, adjusting accordingly to changes within the environment, such as temperature rise or changing weather patterns. However, many years of deforestation, overfishing, emissions, and destruction have created holes in organisms' interdependent relationships within an ecosystem, risking the system's collapse altogether. Therefore, Annapolis Royal will continue to protect identified natural ecosystems within the community, such as the remaining salt marshes and wetland areas.



Annapolis Royal's Natural Beauty

Salt marshes were once a prominent ecosystem in the Annapolis Royal area. Covering the Annapolis basin area, salt marsh ecosystems once provided valuable services that strengthened the overall health of the natural area. For example, salt marshes are the buffer between land and sea, shielding coastal areas like Annapolis Royal from flooding, erosion, and storm surges. In addition, they act as filters for nutrients, run-off, pollution and even heavy metals. Finally, salt marshes in the area would provide food and habitat for terrestrial and aquatic species through extensive vegetative systems (MMCAP p. 25, 2014). Unfortunately, most salt marshes in the area have been reduced or altered due to land development. Construction of the causeway and the dykes, greatly influenced the marshes located by the estuary. The last salt marsh of great significance is located in the Annapolis basin area on Allain's creek and covers approximately 83 hectares (MMCAP p. 25, 2014). Annapolis Royal may be a small town, but it possesses many natural attributes that residents and tourists appreciate and admire. Unfortunately, much of the land in Annapolis Royal and the surrounding area has been cultivated for agriculture or infrastructure development, leaving few forest systems intact. Thus, acknowledging, appreciating and preserving the natural environment in Annapolis Royal is essential in moving forward with environmental stewardship and prosperity.

The ecological integrity and biodiversity of Annapolis Royal is threatened by pollution, climate change, and invasive species.



Areas of Potential Impact

Tourism

Tourism boosts economies, creates jobs, and provides visitors with the experience of different areas on a national and international scale. Annapolis Royal's tourism sector peaks July-September with shoulder months June and October also bringing in increased visitors compared to November through April. Many businesses in Annapolis Royal follow tourism season, limiting hours or closing altogether during quieter months. Many factors contribute to visitors coming to a specific location. Affordability, health and safety, attractions, and accommodations all influence tourists' choices of a destination. Annapolis Royal is home to historical sites, such as Fort Anne, the historic gardens, and many historically preserved homes and infrastructure that intrigue visitors from all corners of the world. However, climate change has become an increasingly considerable influence on tourism. The appeal of Nova Scotia's coastlines, beaches, and seafood largely depends on the environment. In other coastal communities in Nova Scotia, like Annapolis Royal, tourism largely depends on the fishing industry for culinary purposes, natural beauty and infrastructure along coastlines, such as boardwalks/wharves and gift shops. Climate change can impact all these factors through flooding risks, loss of aquatic species, and infrastructure damage.

Annapolis Royal is a major tourist destination in Nova Scotia. Figures from Tourism Nova Scotia indicate that since 2010 the Annapolis – Fundy Bay region has attracted approximately 350,000 tourist bed-nights per year.

"July, August and September are the high season months with June and October being shoulder season months with still considerable numbers of visitors. Approximately 85% of these bed-nights are spent in hotels, motels or B&Bs. A larger number, between 450,000 and 500,000 site-nights are sold at campsites across the region. Total visitation to the region approaches 1,000,000 individuals per annum" (Bottomley, p. 42, 2022).



Natural and Built Environment

The built environment refers to areas of land fundamentally transformed and influenced due to human activity. In contrast to the built environment, the natural environment refers to areas with limited impact due to human activity. Physical infrastructure includes roads, bridges, urban spaces, and any infrastructure for human benefit. However, due to its historical significance, much of Annapolis Royal's infrastructure has been created with little regard for future climate impacts. Climate change has brought extreme weather that produces heavy rains, wind, snow, floods, and other natural weather occurrences.

While some variables increase in severity of weather events and threaten existing infrastructure and facilities in Annapolis Royal, severe storms such as hurricanes bring heavy winds and rainfall to the area, generating the risk of flooding and damaging homes, businesses, roadways, and bridges, especially those located in lower St. George street. Annapolis Royal has worked continuously on finding solutions to protect the community from flooding resulting in the inundation of the town. In addition, further research has been done to support Annapolis Royal's efforts in safeguarding its built infrastructure, such as the town's Flood Risk Assessment and work by AIM (Atlantic Infrastructure Management Network).

The natural environment consists of areas with little to no impact from humans. The natural environment is what fundamentally supports life and ecosystems. Without the natural environment, natural resources such as air and water and ecological systems that work to produce soil to grow food to sustain life would become compromised. Demographic, weather, and temperature all play vital roles in how the natural environment functions. The natural environment changes drastically from continent to continent resulting in different weather patterns, temperatures, and climates. Nova Scotia lies in the mid-temperate zone and experiences ample precipitation, a wide but not extreme temperature range, a late and short summer, skies that are often cloudy or overcast, coastal fog and changing weather conditions from day to day. (N.S Museum p.94, 2013). Nova Scotia is susceptible to these climate patterns due to the sea surrounding most of the province. Due to the significance of water surrounding the land, the sea plays an influential role in managing and moderating Nova Scotia's climate. As a result, the damp environment has created lush and wet conditions for organisms to form working ecosystems. Annapolis Royal is home to old-growth trees, vital waterways such as the estuary, and stunning coastal features. However, native species, natural vegetation, and waterways are all becoming affected due to climate change. Water availability affected by drought can influence the types of vegetation that will flourish and facilitate the spread of invasive species. Storm events and surges can increase sediment load in a watercourse, alter the foreshore environment and damage environmentally sensitive areas. (MCCAP p.25-26, 2014). One of Annapolis Royal's guiding principles for climate action focuses on protecting and enhancing the biodiversity in the area; keeping this in mind, Annapolis Royal hopes to move forward with new and innovative ideas to protect and safeguard the natural environment.



Health & Safety

Climate change can influence human health and safety in various ways. Each season, storms and natural disasters carry different risks; depending on the geographical location, some risks are higher than others. For example, Annapolis Royal and the surrounding areas are experiencing storms that create storm surges resulting in flooding. In addition, Saskatchewan communities are experiencing severe forest and grassland fires, increasing invasive species issues. As a result, some existing health threats, such as heatstroke and respiratory health issues, will intensify, and new health threats will emerge. However, age, location, and resources can affect someone's capacity to adapt to risks such as the elderly and low-income households. Ensuring resources are available when disaster strikes are challenging for residents with tight budgets and fixed incomes.

Annapolis Royal's most significant health and safety threats are floodwaters carrying debris and contaminants. In addition, floodwaters paired with heavy rains can strain drainage and waste management systems. High, fast floodwaters increase the risk of drowning, injury and fatalities (MMCAP, p. 9, 2014). Therefore, the Town of Annapolis Royal is partnered with the County of Annapolis and the Town of Middleton to create the Regional Emergency Management Organization (REMO). The organization REMO addresses and coordinates responses to emergencies over the three jurisdictions. REMO recommends that each household always have 72 hours of resources such as water, food, and first aid supplies. REMO has created a regional emergency plan to address situations that affect human health, the environment, and property. The plan outlines significant effects that can negatively impact Annapolis Royal, such as prolonged power outages from hurricanes, blizzards, and freezing rain, and actions when moving forward to ensure health and safety are a top priority.

72 hours of Supplies readily available



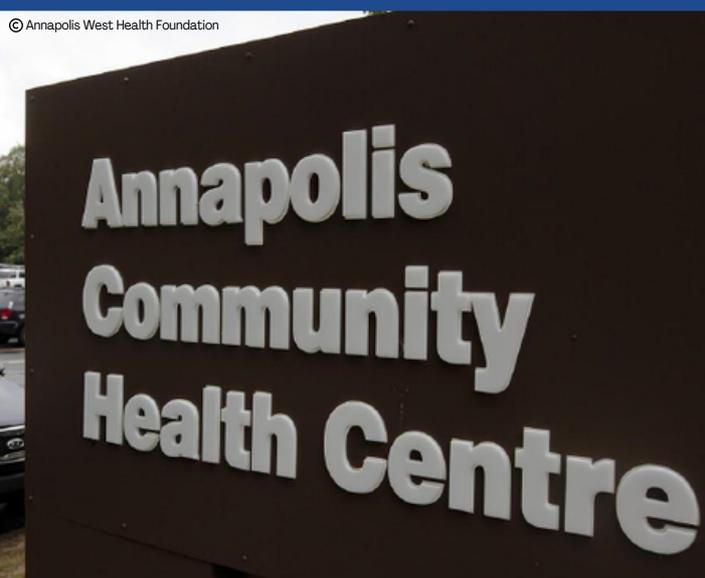
Learn about threats in your area



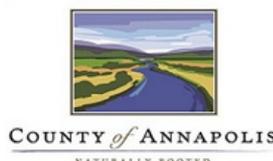
Understand the health risks related to climate change



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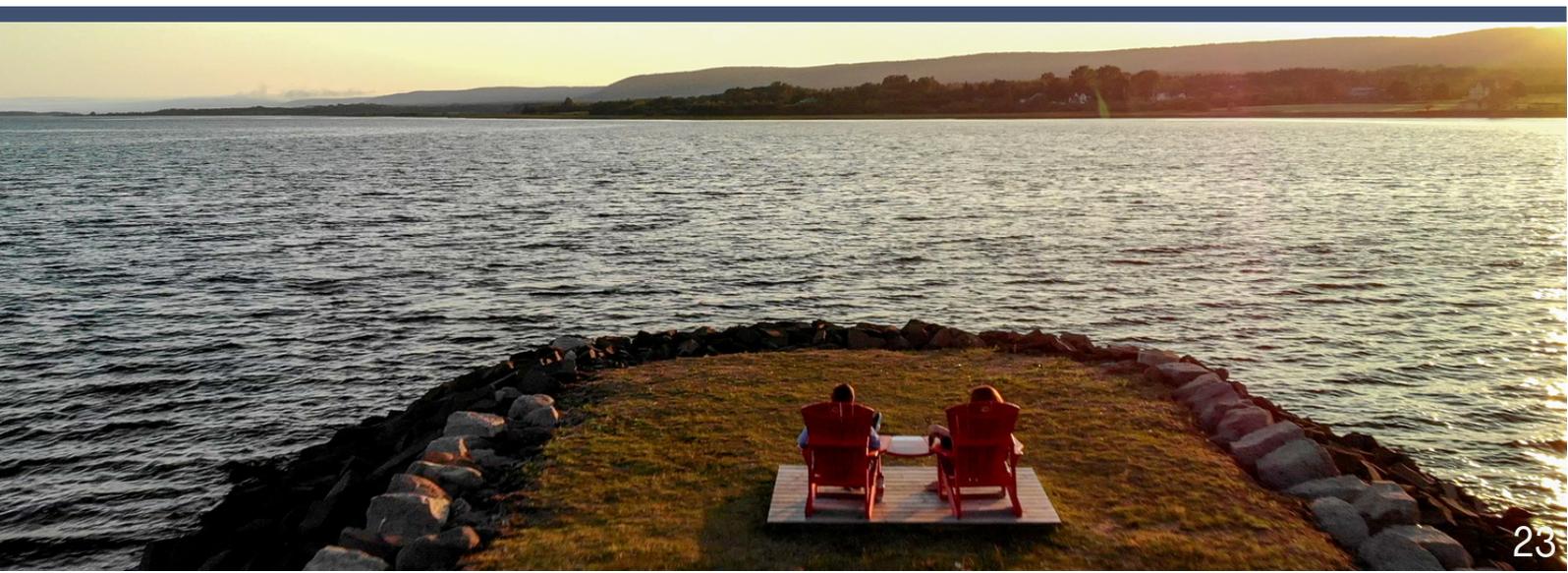
©Annapolis Royal Fire Department



Initiatives

Fourteen initiatives the Town of Annapolis Royal has implemented throughout the years. Each initiative aimed to produce positive results in combating climate change, such as lowering local Greenhouse gas (GHG) emissions by reducing the speed limit in town to 40 km/h and establishing an anti-idling by-law.

1. Bicycle Loan program.
2. Brownfield site remediation.
3. Energy management for Town-owned properties.
4. Idling control.
5. Invasive alien species list.
6. LED holiday light exchange.
7. LED streetlight conversion.
8. Procurement policy.
9. Reducing the speed limit to 40 km/h in town.
10. Renewable environmental-related by-laws.
 - a. Review existing by-law to ensure it applies to existing and future technologies.
11. Tree canopy inventory.
12. Water conservation methods.
13. Separation of stormwater and sewer systems.
14. Zero waste enhancements.



Programs

Global Covenant of Mayors for Climate & Energy



The Global Covenant of Mayors (GCom) Canada is a coalition between the Federation of Canadian Municipalities, Local Governments for Sustainability (ICLEI) Canada, the Global Covenant of Mayors Secretariat and the International Urban Cooperation Project supported by funding from the European Union (GCoM, 2016). Established in 2008, the Global Covenant of Mayors for Climate & Energy is an international partnership of communities and local governments with a long-term vision of encouraging and supporting voluntary action to combat climate change. GCoM has evolved into the most prominent global alliance for climate leadership; with over 11,500 participating communities, GCoM represents over 1 billion people across 142 countries on six different continents. GCoM strives to address climate change through programs to help communities cut GHG emissions and prepare for the future impacts of climate change.

Increasingly, communities and local governments across the globe are heeding the call to action. With nations working towards the goals of the Paris Climate Agreement, community involvement could not be more pressing when addressing GHG emissions and finding adaptive solutions to climate change. Annapolis Royal recognizes the movement's importance and commitment to adapting to climate change. The town of Annapolis Royal is proud to have become a member of GCoM on September 16th, 2022.

Partners for Climate Change Protection

The Partners for Climate Protection (PCP) program is available and funded by ICLEI—Local Governments for Sustainability (ICLEI) Canada and the Federation of Canadian Municipalities. The town of Annapolis Royal joined PCP in 2003 and has since completed numerous milestones. Since the establishment of this program, over 500 municipalities in all Provinces and Territories of Canada have participated, resulting in 70% of the Canadian population being represented in some capacity with PCP.

The program follows a five-step Milestone framework to guide communities in taking action against climate change. The Milestones listed below help municipalities implement lasting and environmentally sustainable changes to reduce emissions.

PCP is managed and delivered by FCM and ICLEI—Local Governments for Sustainability Canada (ICLEI Canada) and receives financial support from the Government of Canada and ICLEI Canada (FCM, 2000).

Milestone one: GHG emissions inventory and forecast emission reduction target

Milestone two: Develop emission reduction targets

Milestone three: Develop a local action plan

Milestone four: Implement the local action plan or set of activities

Milestone five: Monitor progress and report results



Shared Solar Program

On April 7, 2021, the Nova Scotia government introduced Bill 97, amendments to the N.S. Electricity Act aimed at growing the solar industry in Nova Scotia, increasing opportunities for individuals, communities, and businesses to choose electricity generated from renewable sources – and opening up opportunities for solar project development in N.S. (N.S. Gov., 2021). Since the amendment of Bill 97 in 2021, the Nova Scotia Government has begun looking for new pathways to clean, renewable energy sources to grow options for residential solar use. Shared Solar programs will become a unique opportunity for Nova Scotians to adopt renewable energy regardless of home type, such as apartments. This community-oriented program created by the Government of Nova Scotia supports the implementation of solar gardens across the Province.

Solar gardens are open areas with the desired amount of solar photovoltaic (P.V.) systems to generate electricity for participating subscribers. The government will provide further information on this program shortly. Annapolis Royal should take full advantage of this Shared Solar program to help address energy barriers such as low-income housing and support the reduction of GHG emissions in the municipality.



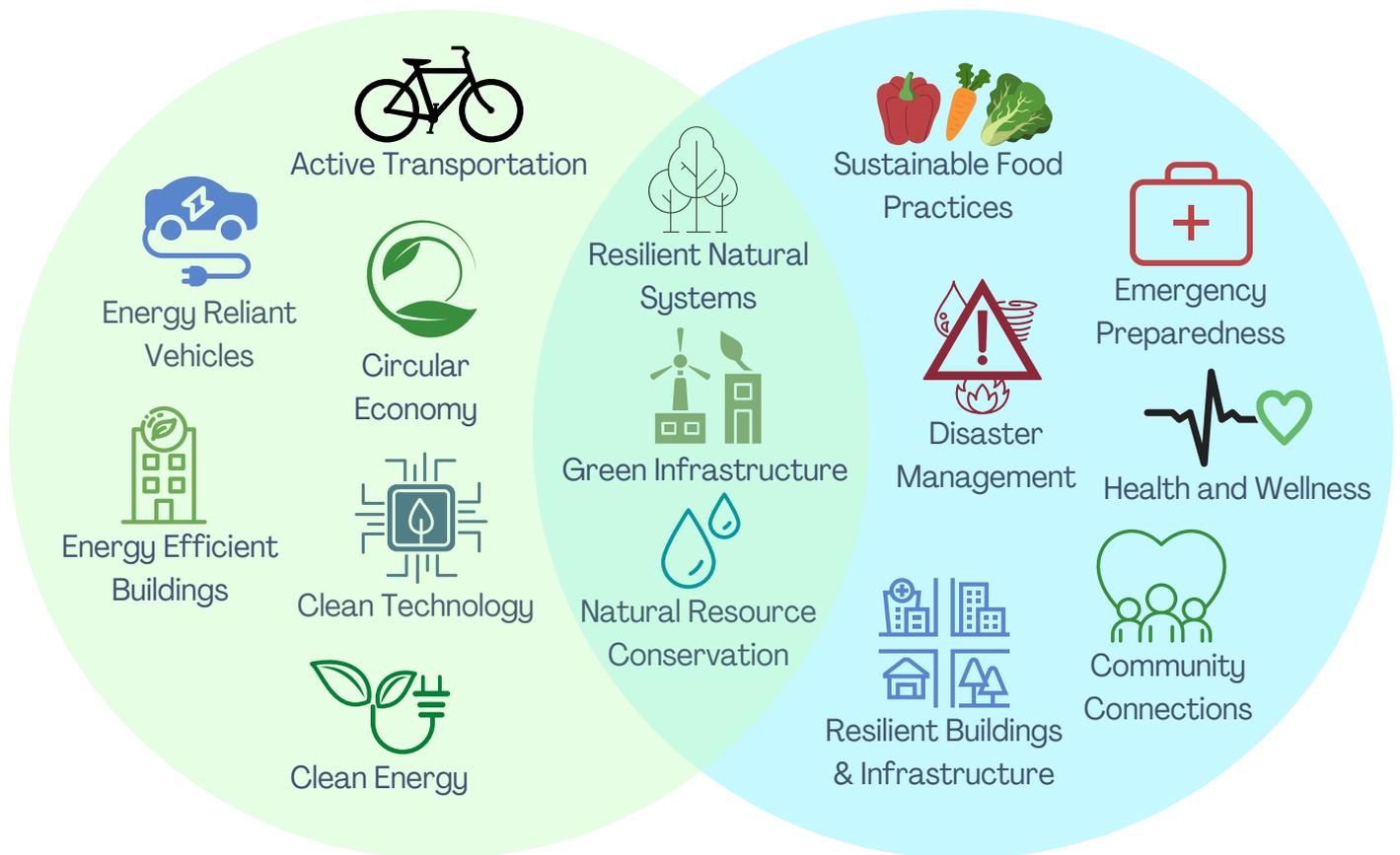
Community Solar Garden Pilot was created by Nova Scotia Power in Amherst Industrial Park.

Pace Program

Property Assessed Clean Energy (PACE) programs are ways to finance energy efficiency advancements and cleaner energy solutions for residential dwellings. Energy efficiency upgrades and transitions to renewable energy, such as installing solar panels, can prove to be an expense many homeowners cannot endure. PACE programs support participants with low-cost upfront financing to support efficient dwelling upgrades and break down barriers to the affordability of home efficiency. PACE programs are available in communities such as Bridgewater, the District of Lunenburg, Amherst, New Glasgow and other communities across Nova Scotia. Annapolis Royal should reevaluate the option of implementing a PACE program within the community or in partnership with the County of Annapolis Royal. The PACE program will provide information and support to residents on energy consumption, how energy consumption can be reduced, the most cost-effective clean energy measures, and overall equipping homeowners with the tools to invest in their homes and receive long-term benefits in economic and environmental ways.

NovaScotiaPACE

Mitigation & Adaptation



Mitigate to Prevent

Mitigation strategies focus on concrete actions to reduce GHG emissions and prevent the atmosphere from rising in temperature rise.

Adapt to Prepare

Adaptation focuses on proactive behaviours and solutions to protect a community's social, environmental, and economic systems.

Mitigation and adaptation both aim to address climate change. The difference between mitigation and adaptation is how each method approaches climate change challenges. Mitigation approaches seek to reduce GHG emissions produced and released into the atmosphere to slow or halt temperature rise. In contrast, adaptation acknowledges the inevitable impacts of climate change. Adaptation prepares communities through flood risk assessments, emergency preparedness procedures, and newly built infrastructure modelled with environmental considerations. While these approaches may seem very different, mitigation and adaptation initiatives are not always mutually exclusive and can have advantages in both areas. The fewer global emissions emitted from mitigative solutions, the more manageable it will become for communities to adapt. Adaptation and mitigation are both needed to accomplish climate change goals. Mitigation solutions at the personal level can be made by reducing emissions in everyday life. For example, adopting clean energy through installing solar panels, switching to a hybrid or electric vehicle, expressing support to local representatives on climate-smart policies, and choosing active transportation as much as possible are ways to reduce personal carbon footprints.

Mitigation towards Climate Change

Climate change Mitigation directs efforts to reduce or prevent the emission of greenhouse gases. Mitigation can suggest adopting new technologies and renewable energies and consumer and industry behaviours (UNEP, 2021). Mitigation efforts do not present immediate results on climate change. Instead, mitigation actions take decades to affect global temperatures making adaptation measures the quickest response to climate change to help communities protect themselves from climate change that will continue to affect people in the foreseeable future. Mitigation efforts rely on the steps to transition from fossil fuel dependence onto clean, renewable energy.

Actions toward reaching net zero carbon emissions are not the only solutions to mitigate the effects of climate change. Trees and forests store carbon and then release oxygen back into the air. The bigger the tree, the more carbon storage they contain, resulting in old-growth forests and jungles such as the Amazon becoming one of the world's most valuable ecosystems. Clear-cutting trees for agriculture and material purposes degrade the ecosystem's services. In addition, the stored carbon from the trees will be released into the atmosphere in the form of carbon dioxide, further contributing to global warming. The efforts of mitigation methods such as reducing carbon emissions, deforestation, and restoration of natural habitats will not be apparent until the coming decades as shifts in global temperatures change over a long period. This is not to say mitigative measures are unnecessary; mitigation efforts are seen as measures to implement now or soon to create a positive impact sooner for the future of the planet and people.

Finding Mitigation Solutions

Mitigation strategies incorporate retrofitting buildings for energy efficiency, embracing renewable power sources like solar and wind, developing innovative active transportation strategies to promote walking, biking, transit use and electric vehicles, and promoting sustainable land, forest, and natural space use. For example, Annapolis Royal is home to many large, beautiful trees. Knowing the importance of trees in storing carbon, the Town of Annapolis Royal should consider adopting a policy to protect trees of considerable size from deforestation unless they pose a risk of injury. Other mitigative solutions for Annapolis Royal include increasing EV charging stations around town to promote the use of electric vehicles, conducting a walkability assessment for downtown, and updating policies such as enforcing the idling control policy and the invasive alien species policy. In addition, the town has taken steps to mitigate climate change by reducing the speed limit from 50 km/h to 40 km/h in the downtown area. The town will continue seeking ways to incorporate mitigative solutions into planning, policies, and by-laws. Lowering emissions will not only help with temperature rise but also reduce health-related illnesses due to bad air quality and heatwaves and also deliver economic benefits in supplying jobs within the green sector. In addition, green technology and installation, retrofitting, and much more provide steady employment, boosting the local economy by selecting local businesses and contractors for the projects. However, mitigation is no longer enough to address the climate challenge challenges in Annapolis Royal. Therefore, adaptation is also necessary to address climate change.



PV system located on the roof of the Community Hub on Ritchie Street, Annapolis Royal
Photo courtesy of CARP's website <https://www.annapolisriver.ca/home>

Adaptation towards Climate Change

Adaptation involves efforts to minimize the impacts of climate change. The world is already experiencing temperature changes, weather and seasonal patterns, and slow onset events such as sea level rise. Climate change will continue to happen, and the more communities avoid implementing adaptive measures, the greater the cost it will become to adapt to climate change. According to the Insurance Bureau of Canada, the expenses of inactions on climate adaptation are increasing over time. For example, severe weather events across Canada in 2019 resulted in \$1.3 billion of insured damages (IBC, 2020). This statistic only accounts for insured damages from extreme weather, thus making the overall cost of climate change much higher in 2019. In addition, resources such as food, water, fuel, building materials, and other human necessities are rising in cost due to depleting resources, low crop yields, and pollution contaminating waterways. Therefore, adaptation is imperative to addressing climate change challenges in Annapolis Royal and ensuring necessary measures are in place to protect the town's economic, environmental, social, and historical integrity. Adaptation measures can show in the form of policy changes and adjusting to the expected shifts in the climate (Government of Canada, 2015). Anticipated environmental changes include sea level rise, frequent and extreme weather events, flooding, and other changes that can create social, environmental, and economic impacts on Annapolis Royal, which are discussed further in this report. Adapting to life in a changing environment can be challenging and involves adjusting to present and expected future climate changes. However, adopting innovative ways to address climate change can help reduce infrastructure damage, the loss of life and the amount of devastation to a community.

Finding Adaptive Solutions

Adaptation solutions vary from community to community due to different needs to adapt. Adaptation requires understanding local risks and developing plans to understand further how to move forward in addressing threats such as sea level rise. Documents such as flood risk assessments (FRA) and emergency preparedness plans help take action in putting systems and strategies in place to react to the impacts Annapolis Royal is experiencing today and will see in the foreseeable future. Adapting to climate change can be by diversifying crops to handle changing weather patterns and seasons, creating stronger connections within the community to address the challenges together, properly managing natural resources in the context of climate change and promoting wellness and health to ensure residents can adjust to changes in the environment. There are also nature-based solutions that aid in adapting to climate change. Nature-based solutions protect, restore, and manage ecosystems that benefit people while enhancing biodiversity and improving the function of services ecosystems provide. For example, watersheds preserve water while regulating the streamflow of rivers, lakes, and groundwater sources while supporting wildlife and plants. Solutions to restore and strengthen ecosystems should be considered when managing climate risk and growing resilience. The Municipal Climate Change Action Plan (MCCAP), created in 2014, outlines adaptation strategies that are still relevant today. Below are the suggestions provided in this MCCAP document.

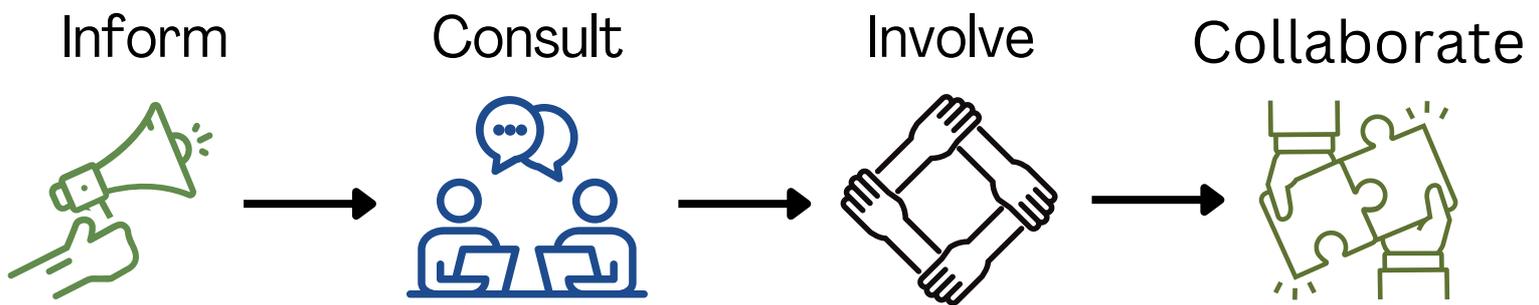
- Account for sea level rise in shoreline infrastructure design and maintenance
- Additional emergency preparedness considerations
- Education
 - Telling people about what the town is doing about climate change
 - Encourage people to talk about think about identified risks
- Increase the size of levies and infill at the water's edge
- Build additional protective structures (breakwaters seawalls and soft solutions such as beach nourishment)
- Provide targeted workshops for land-use planners and other decision-makers (MCCAP p. 26-27, 2014)

Community Engagement

Community engagement is a critical component in addressing climate change. With a growing concern for climate change and the challenges to follow, the importance of community engagement for equitable decisions that improve the livability of local communities has never been so crucial.

Residents of communities are the ones who are directly affected by climate change challenges. Residents share lived experiences, insights, and ideas and provide essential and valuable information to those who can implement change within the community. In addition, community members who are informed and educated on the issues at hand may contribute meaningfully to engagement and have the capacity to help guide discussions with other residents. Overall, including the diverse voices of those affected by climate change helps drive the narrative of community empowerment and community-based solutions.

Community engagement improves efficiency, transparency, and legitimacy amongst stakeholders resulting in high approval ratings for initiatives to combat climate change. When local leaders make informed decisions by engaging with and carefully mapping out residents' needs, opinions and visions, it becomes easier to promote sustainable decisions by recognizing and communicating the needs and interests of different parties, such as business and property owners. Climate change and addressing the challenges continue to become a growing concern on a local, national and international scale. Therefore, the Town of Annapolis Royal will continue to assure transparency around climate change and value residents' thoughts, ideas, and opinions.

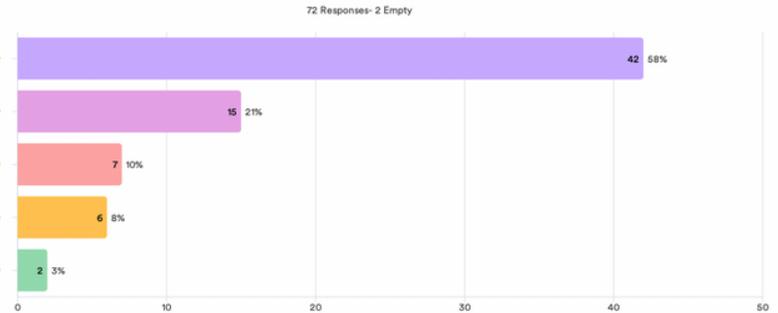


Climate Change Survey

The Town of Annapolis Royal conducted a climate change survey at the beginning of June 2022 that lasted three weeks. Residents received the survey via Mailchimp and the town's Facebook page. Seventy-four participants took the 10-question survey and submitted results anonymously through the survey website, email, and physical copies at town hall. The climate change survey's primary focus was to gain a better insight into how community members in Annapolis Royal understand climate change and the effects of climate change relating to Annapolis Royal.

The overall results showed deep concern for climate change and the impact of sea level rise in Annapolis Royal. The response of deep concern to sea level rise was predicted due to Annapolis Royal being a small coastal community with most of its assets at risk from rising sea levels. Residents displayed high interest in a community engagement event on climate change. In August, Annapolis Royal hosted its first community engagement session centred explicitly around climate change challenges. Clean energy technologies such as wind, solar, and tidal were also of high interest amongst participants. A survey conducted by CARP outlined the need for energy efficiency and renewable energy, further amplifying the need for the transition to green energy. Annapolis Royal will use the data collected from the survey as helpful information when planning for community engagement events centred around climate change.

How concerned are you about climate change on a scale of 1-5?



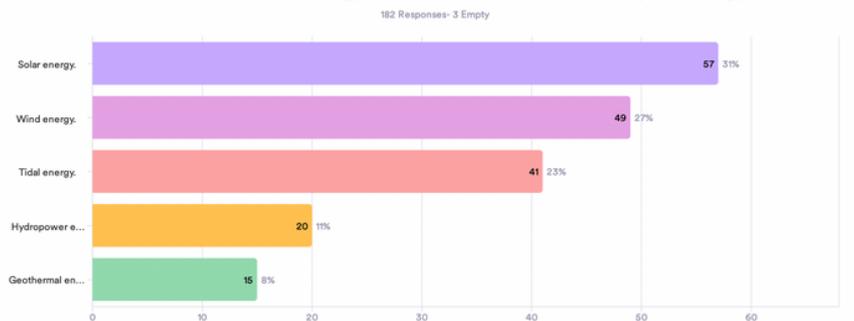
Data	Response	%
★★★★★	42	58%
★★★★☆	15	21%
★★★☆☆	7	10%
★★☆☆☆	6	8%
★☆☆☆☆	2	3%

Annapolis Royal is a coastal community under threat from sea-level rise. On a scale of 1-5, how concerned are you with this climate change challenge?



Data	Response	%
★★★★★	40	56%
★★★★☆	16	23%
★★★☆☆	9	13%
★★☆☆☆	3	4%
★☆☆☆☆	3	4%

What form(s) of renewable energy would best suit Annapolis Royal's energy needs?



Data	Response	%
Solar energy.	57	31%
Wind energy.	49	27%
Tidal energy.	41	23%
Hydropower energy.	20	11%
Geothermal energy.	15	8%

*Residents may review the full survey results through town hall upon request.

Climate Change Community Engagement Session

On August 25th, 2022, the Town of Annapolis Royal held a community engagement session focused on four topics related to climate change. Over the course of two hours, community members in groups of four or five rotated to discuss for 30 minutes the following subjects below. Each table included a facilitator to guide the conversation and large pieces of paper and markers to write down ideas, thoughts, and discussions. The main points/themes presented during the engagement session are listed below. In addition, a full report discussing the details of the engagement sessions will be completed.

Sea level Rise and Flooding

- The importance of transparency and ensuring community members are aware of risks and vulnerability.
- Risks related to wastewater treatment settlement ponds.
- Visual representations of sea level rise risk for Annapolis Royal, such as art installations.
- The discussion of adaptation with sea walls and dykes.

Roles and Collaboration for Tackling Climate Change Issues

- Identification of which groups are part of tackling climate change issues (Individuals, groups/organizations, local, provincial, and federal government).
- The role of local government as an essential communicator to the provincial and federal government for resources and support.
- The roles of individuals in putting pressure on politicians to reinforce and establish climate change policies and initiatives.

Reducing Greenhouse Gas (GHG) Emissions in Annapolis Royal

- Revisit policies such as the anti-idling policy
- Increased EV charging stations.
- Solar gardens, wind farms, and tidal power.
- Education programs on bike safety, renewable energies, and biodiversity.

Community Resilience against Climate Change

- Discussions surrounding the development of environmental and health impact assessments.
- Bike rentals to promote active transportation
- Strengthen the town's communication with residents during emergencies.
- Identification of challenges on personal and community levels towards resilience, such as regulatory hurdles.



Moving Forward

Waiting for final comments and edits



Committees & Organizations

Clean Annapolis River Project

Clean Annapolis River Project (CARP) is a charitable, non-profit organization incorporated in 1990 with a mission to enhance the ecological health of the Annapolis River watershed for current and future generations through science, leadership, and community engagement.

Over the years that CARP has operated, the organization has built strong ties with numerous partners from within the charitable sector, academic institutions, community organizations, stakeholder groups, and government partners at the Municipal, Provincial, and Federal levels. CARP has delivered a wide range of environmental enhancement, education, research, and monitoring projects and is recognized as a regional leader in environmental stewardship.



Environmental Advisory Committee

The Environment Advisory Committee (EAC) was established in March 2018. The motion establishing the Committee states: 'The mandate of the Environment Advisory Committee is to recommend proactive measures, educate, promote, and provide feedback on environmental issues related to sustainability, advocacy, and stewardship within the Town of Annapolis Royal.'

Many issues have been discussed, including how best to address the question of one-use plastics, the efficiency of the Town's idling by-law, how to deal with discarded cigarette butts, the value of Extended Producer Responsibility, the potential for sustainable energy production and the like. In addition, a critical approach has been to try and find ways to educate the public concerning an issue and suggest how behaviours can be changed to effect an improvement.

The most consistently addressed issue has been the impact of climate change on the Town and its operations. Briefing notes submitted to Council for information in early 2021 identified an increase in the frequency of extreme weather events, including hurricanes, hotter summers and warmer winters, changes in the rainfall regime, an increase in the number and variety of invasive species and the spread of diseases currently not found in Nova Scotia, as likely impacts. However, the biggest single issue identified was the threat posed by the Town by rising sea levels. As a result, much of the work of the EAC over the past eighteen months concerns this threat. This resulted in the submission to Council in March 2022 of a Flood Risk Assessment for the Town. This document informed an application to the National Cost-Sharing Program for Heritage Places for funds to conduct a preliminary engineering assessment of works needed to mitigate the likely impacts of sea-level rise.



Potential Partners for Climate Change Action

- Atlantic Infrastructure Management Network (AIMS)
- Alternative Resource Energy Authority and Flood Control Canada
- Clean Annapolis River Project (CARP)
- Clean Foundation
- Centre of Geographic Sciences (COGS) with Nova Scotia Community College (NSCC)
- Dentiballis Marsh
- Ecology Action Centre
- Emera Energy
- Federation of Canadian Municipalities (FCM)
- FCM Green Funds: Low Carbon Communities
- Municipal, Provincial, Federal Government, Natural Resources Canada
- Nova Scotia Power
- Soluna Energy

Canada

NOVA SCOTIA



Potential Funding Opportunities for Climate Change Action

Annapolis Royal staff are working consistently to find funding to help support climate change initiatives and projects within the town. However, funding opportunities can change or be discontinued, resulting in other funding programs taking its place. Staff will continue to work hard to find new programs and applications to address climate change challenges.

Atlantic Infrastructure Network

Clean Foundation Science Program

Community Sparks Program

Disaster Mitigation and Adaptation Fund

Federation of Canadian Municipalities Partners for Climate Change

Green Municipal Fund

Municipal, Provincial, and Federal

Nova Scotia Property Assessed Clean Energy Financing Program



Acronyms

AGRG	Applied Geomatics Research Group
AIM	Atlantic Infrastructure Management Network
CARP	Clean Annapolis River Project
CBCL	Engineering consultants
CO2	Carbon Dioxide
COGS	Centre for Geomatic Sciences
DEM	Digital Elevation Model
DMAF	Disaster Mitigation and Adaptation Fund
FCM	Federation of Canadian Municipalities
GCoM	Global Covenant of Mayors for Climate & Energy
GHG	Green House Gas Emissions
ICLEI	International Council for Local Environmental Initiatives
ICSP	Integrated Community Sustainability Plans
LIDAR	Light Detection and Ranging
MCCAP	Municipal Climate Change Action Plan
NCSPHP	National Cost-Sharing Program for Heritage Places
NRCan	Natural Resources Canada
NSCC	Nova Scotia Community College
NSPI	Nova Scotia Power Inc.
PACE	Property Assessed Clean Energy
PCP	Partners for Climate Change
SREP	Smart Renewables and Electrification Pathways Program
UN	United Nations
UNEP	United Nations Environmental Programme

Glossary

Adaptation: Adjust natural or human systems to a new or changing environment. Adaptation to climate change refers to natural or human systems adjusting to actual or expected climatic stimuli or their effects, which moderate harm or exploit beneficial opportunities.

Adaptive Capacity: The ability to adjust to climate change, including moderating damages, taking advantage of opportunities, and coping with the consequences. (e.g. Can the emergency response system adjust to more frequent hazards without high costs and disruption?)

Carbon Footprint: Measuring the impact activities have on the amount of carbon dioxide produced through burning fossil fuels (usually expressed as CO₂ emissions produced in tonnes).

Climate Change: A change of climate that alters the composition of the global atmosphere and is in addition to natural climate variability observed over periods.

Energy Conservation: The practice of using less energy.

Energy Efficiency: Using less energy to provide the same service.

Energy Transition: The shift from fossil fuel-based energy sources to using a majority of renewable energy sources, maximizing energy efficiency and managing energy use better.

Mitigation: Measures are undertaken to limit the adverse impact of natural, environmental degradation and technological hazards. In climate change, mitigation means human intervention to reduce the sources or enhance the sinks of greenhouse gases.

Renewable Energy Technologies: Technologies that produce sustainable clean energy from sources such as the sun, wind, plants, or water. Renewable Energy Technologies could include biomass, geothermal, hydrogen, hydropower, ocean, solar energy, and wind turbines.

Resilience: Resilience is the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the same capacity for self-organization and the same power to adapt to stress and change. Increased resilience is the objective of adaptation actions. (e.g. Can we maintain a comfortable outdoor environment given changing demands, climate, and levels of development?)

Risk: Risk measures an uncertain event's expected outcome, estimated by combining an event's likelihood with the desired consequence. The concept of risk helps to grapple with uncertainties and allows for comparing potential impacts.

Vulnerability: The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is the function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.

Weather: Weather is the short-term, day-to-day condition of the atmosphere and can be described concerning heat, moisture, air pressure, cloudiness, wind, sunshine, precipitation, etc.

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Comments on the Nova Scotia Coastal Protection Act

My overall comment is that the Town needs to be well informed about and possibly be involved in the development of the regulations that are to accompany the Act.

The document *A Detailed Guide to Proposed Coastal Protection Act Regulations* outlines the process of getting involved. Six areas are identified for which input is being sought. (p 19).

The basic purpose of the Act is to create a Coastal Protection Zone. This is, in my view, a mis-leading title as the thrust of the report is concerned with ensuring that development can only proceed in areas not threatened by coastal processes. A better title for the zone might be a Coastal Development Zone. Ensuring that development does not threaten coastal processes is discussed but seems to be a secondary concern. As noted below it is **regulations to the Act that will determine the extent of the zone:** see below.

Regulations will identify the area included in the Coastal Protection Zone, where the Act and regulations will apply. The Coastal Protection Zone will be a narrow band surrounding the province's coast, including land and water-covered areas on either side of the ordinary high-water mark. This zone will include islands, major tidal rivers where they near the ocean, and other estuaries that are directly connected to coastal waters. (p.2)

Regulations will obviously, in principle, apply in Annapolis Royal. The document goes on to say:

The Coastal Protection Zone boundaries will be identified using the high-water mark (which may be set out in regulations as the ordinary high-water mark, or similar reference line approximating water levels at high tide). The area that starts at the high-water mark and extends inland, in most cases, will be called the "upland" area of the zone. The width of the upland area has not yet been finalized, but government is proposing it be in the range of 80 to 100 meters. (p.3)

Within this area, municipalities will need to ensure building permits and construction are compliant with two new setbacks: the minimum building elevation for different regions of the coast; and a horizontal building setback determined for the specific property by a Designated Professional, as defined under the regulations. (p.3)

The above would clearly have significant implications for the Town but for the provisos below concerning (a) *Boundaries along Water Control Structures* and (b) *Modified Requirements for Developed Downtown Waterfronts*.

(a) In areas where the shoreline is formed by human-built structures designed to restrict or prevent the upstream or inland flow of water, such as a dam, roll-over dam, or aboiteau, the seaward side of the structure will be taken as the ordinary high-water mark for setting the upland boundary.

The body of water on the upstream side of the structure would not be included in the Coastal Protection Zone because water levels and flow on this side of the water control structure are generally under human control. (p.5)

This proviso will largely exclude the Town from the Coastal Protection Zone and attendant regulations. **The Town should monitor regulations as they are developed.**

(b) Many waterfront areas along the coast are important economic and public centers for municipalities and communities. To preserve the economic potential and character of an existing developed waterfront that provides public amenities and mixed-use commercial/ residential space, it is proposed that some regulations be modified for specific types of structures within these areas. (p.7)

We are currently exploring definitions for these areas to avoid putting any more structures at risk from flooding due to sea level rise. A possible definition could be, “developed downtown waterfront areas as dominated by mixed-use structures with a public amenity or multi- unit residential component where there are no gaps of greater than 75 meters between existing mixed-use structures, or where the area was zoned for commercial, mixed use or equivalent prior to the Act coming into effect”. (p.7)

The Town will need to monitor and possibly be involved with the development of these regulations.

Regulations are to be developed to cover the following areas.

- Structures covered.
- Approval of building permits.
- Modification and Repair of existing structures.
- Permit and agreement administration.
- Subdivision of lots
- Acceptance of reports from designated professionals
- Ensuring compliance.

Monitoring and possible input will be needed.

The section **Protecting Coastal Ecosystems** includes the following.

*The proposed approach is designed to balance environmental protection with the need to protect existing legally located structures from erosion risk.
(p.17)*

The section goes on to indicate that regulations will:

... restrict or limit works and construction that may interfere with the dynamic nature of the coast or disrupt sensitive coastal ecosystems. (p.17)

... ensure that wharves, boat ramps and other structures are designed, constructed and located to allow natural shoreline movement and protect sensitive coastal ecosystems (p.17)

and that:

Shoreline armouring, which by its nature disrupts movement of the shoreline and in some cases may accelerate erosion, will only be allowed on Crown land seaward of the high-water mark when needed to protect an existing structure from risk. (p.17)

Regulations developed in this area clearly will have implications for any future DMAF applications and for any works designed to stabilize the wharf should funds be obtained to address issues with this structure.



**Municipal Affairs and Housing
Office of the Minister**

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August 24, 2022

Amery Boyer, Mayor
Town of Annapolis Royal

VIA E-MAIL: mayorboyer@annapolisroyal.com

Dear Mayor Boyer:

Thank you for your recent request for funding under the Flood Risk Infrastructure Investment Program for the Protecting the Historic District in Annapolis Royal Study Project.

I am pleased to advise the Department of Municipal Affairs and Housing will contribute 50% of the eligible costs, up to a maximum contribution of \$43,278 toward the cost of this project.

Projects are to follow the terms and conditions outlined in the Program guidelines, and a final report including proof of expenditures must be submitted within 60 days of project completion.

Please refer to the attached Agreement for more information on the terms and conditions of the funding approval. If you accept this offer, please sign the Agreement and send to the program e-mail listed below.

Upon receipt of the signed Agreement, an advance of 50% of this grant will be sent to you. The balance of the funding will be delivered upon satisfactory completion of the project.

The Department is coordinating a public program announcement and may reach out to you during that process. In the interim, I would ask you to keep the funding information confidential until such time as the public announcement occurs.

Please contact Eva Mooers, Senior Engineer at friip@novascotia.ca should you have any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "John Lohr".

Honourable John A. Lohr
Minister of Municipal Affairs and Housing

Attachment

c: Sandi Millett Campbell, CAO, cao@annapolisroyal.com

From: [Sandi Millett-Campbell](#)
To: [Krista Gear](#)
Subject: FW: Home Flood Protection Program and Research Paper
Date: Wednesday, September 7, 2022 12:14:02 PM
Attachments: [image002.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)

EAC agenda

Sandi

From: Amery Boyer <MayorBoyer@annapolisroyal.com>
Sent: Saturday, September 3, 2022 8:17 AM
To: Sandi Millett-Campbell <cao@annapolisroyal.com>; Kayla Winsor <KWinsor@annapolisroyal.com>; levicliche@annapolisriver.ca; John Bottomley <johnbo@eastlink.ca>
Subject: Fw: Home Flood Protection Program and Research Paper

FYi.

Regards,

Amery

From: Heather Pitman <hpitman@aet98.com>
Sent: Friday, September 2, 2022 9:41 AM
To: Amery Boyer <MayorBoyer@annapolisroyal.com>
Subject: Re: Home Flood Protection Program and Research Paper

Caution

This email comes from an outside sender. Verify the sender and use caution with any requests, links or attachments.

Good morning Amery Boyer,

As the threat of flooding becomes more of a reality for Canadians, we need to arm ourselves against the rising waters and rainfalls. AET has written a research paper about lot-level flooding and increasing resilience in Canada, and we thought you might be interested in reading it and learning more about the Home Flood Protection Program. Please visit <https://www.aet98.com/about/learning-downloads/flooding-in-canada-why-is-it-happening-and-what-are-we-doing-about-it/> to receive your copy of the research paper.

The Home Flood Protection Program (HFPP) is a basement flood risk reduction education program that provides free online self-help resources to homeowners and one of either an on-site assessment or remote assessment for participating homeowners, known as the “Home Flood Protection Assessment.” The HFPP was initially developed by the Intact Centre on Climate Adaptation (Intact

Centre) at the University of Waterloo and delivered by AET Group Inc. from 2017 to 2018. In 2019 AET Group Inc. received a license from the University of Waterloo to continue delivering the program across Canada.

Successful launches of the program have been completed in Burlington ON (2017, 2018), Toronto ON (2018), Saskatoon SK (2018), and Rocky View County AB (2019, 2020, 2021). In addition to these targeted launches, assessments have been completed in various communities within Ontario. To date, over 700 assessments have been completed across Canada.

The HFPP offers the following benefits to homeowners:

- Free self-help resources (print and online)
- Custom on-site assessment (approx. 90 minutes) or remote assessment (approx. 60 minutes)
- Concise, easy to read report that identifies top ranked action to reduce, manage, and understand various types of flood risk
- Live customer service helpline
- Follow-up opportunity with Assessor
- Seasonal maintenance reminders
- Optional involvement in on-going research study conducted by the Intact Centre

Reports and media coverage:

- Intact Centre 2019 Full Report - [Water on the Rise: Protecting Canadian Homes from the Growing Threat of Flooding](#)
- Intact Centre 2019 Report – [Executive Summary](#)
- Interview with Cheryl Evans, Director, Home Flood Protection, Intact Centre – [CTV News Saskatoon](#)
- Promotional Video – [Homeowner Testimonial](#)

If you are interested in making the HFPP available to homeowners in your area, please contact AET Group Inc., by replying to this email.

I look forward to hearing from you.

Heather Pitman
Administrative Coordinator





AET Group Inc.

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