

HRM Climate SMART Community Action Guide to Climate Change and Emergency Preparedness

September, 2006



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Satellite Impage	Courtesy National Oceanic and Atmospheric Administration

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The Halifax Regional Municipality (HRM) is pleased to offer this *HRM Climate SMART Community Guide to Climate Change* to the HRM community.

This practical Guide was made possible through the generous funding of Natural Resources Canada's (NRCan) Climate Impact & Adaptation Program (CCIAP), the Federation of Canadian Municipalities (FCM) Green Fund, and the Nova Scotia Department of Energy (DOE).

Special thanks to the Nova Scotia Department of Environment & Labour (NSEL), and Environment Canada Atmospheric Science Division, Atlantic Region, for their technical and resource support to bring this Guide to fruition.

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Thanks to the Lake Echo Volunteer Fire Station for their participation in a focus group that helped validate the benefits and practicality of Guide. Thank you also to HRM Fire and Emergency and Halifax Regional Police for their feedback.

Inspiration for development of this Guide came from the UNESCO/CDERA *Community Emergency Plan, & Family Emergency Plan*: <http://www.cdera.org/preparedness/>.



Halifax Regional Municipality



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Mayor's Message for the Community Guide

Climate change and its impacts on our community are one of the most important issues the Halifax Regional Municipality faces in being a healthy, sustainable, vibrant Community. In fact, our leadership approach to climate change has received both national and international recognition.

The Climate SMART project team in collaboration with the HRM's Sustainable Environment Management Office; Fire and Emergency Services; Emergency Measures; and Regional Police has prepared this Community Climate Change Guide to help each of us address climate change at an individual and community level. Responding to climate change is a shared responsibility between governments, businesses and residents. This Guide provides residents with simple steps to reduce their impact on global warming, but more importantly, how to adapt, prepare and respond to the potential impacts of climate change on our community. This Guide serves as an important resource for each of us to use to be prepared for climate change and its impacts on our Region.

Respectfully, I remain


Peter J. Kelly

Mayor

Chair, Big City Mayors Working Group on
Public Safety, Security and Emergency Preparedness



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From Our Project Partners

The Nova Scotia Department of Energy is pleased to support the development of the Climate SMART community guide. We all have a role to play in helping slow climate change, and it's important that we learn how to deal with the effects of a changing climate on our environment.

We can reduce greenhouse gas emissions by changing the way we consume energy. More renewable power, increased emphasis on energy efficiency, and smart transportation choices can all help; however, the biggest challenge is changing our behaviour and understanding that small changes create big differences - like driving less and converting to energy efficient lighting. Remember, it starts with each of us.

Bill Dooks
Minister, Nova Scotia Department of Energy

“We have supported the Climate SMART project from the beginning because it is an important resource for individuals and communities”, said Environment and Labour Minister Mark Parent. “The project is consistent with our Green Plan which ensures cleaner air, reduction in greenhouse gases and better understanding of the impact of climate change.”

Mark Parent
Minister, Nova Scotia Environment and Labour

The Nova Scotia Environmental Industry Association has been an on-going partner and supporter of the ClimAdapt and Climate Canada Atlantic networks and we have strongly supported HRM in the Climate SMART initiative.

The Halifax Regional Municipalities’ unique approach to climate change was of major interest to participating municipalities, agencies and groups who participated in the COP11/MOP1 conference in Montreal in 2005. We have received many inquiries since that time on the project through the ClimAdapt website.

This practical guide helps bring both aspects of climate change-reducing greenhouse gases and adapting to a changing climate-to the community and individual levels as well as providing guidance on how to be prepared for and what to do in the event of a climate related emergency.

NSEIA is proud to be associated with this unique and dynamic approach to dealing with climate change.

Rick Joseph
Executive Director NSEIA & ClimAdapt host

INTRODUCTION

Why a HRM Climate SMART Community Guide to Climate Change?

One of the greatest challenges facing the world is from global climate change.

In 2003 and 2004, Nova Scotians and we in HRM experienced several extreme weather events - an ice storm, torrential rains and flooding, Hurricane Juan, and the Blizzard of '04 (also known as White Juan). In response to concerns about global climate change and the impacts from such extreme events, which are associated with climate variability brought about from increased emissions of green-house gasses, HRM initiated Climate SMART (Sustainable Mitigation and Adaptation Risk Toolkit). Climate SMART is a leading edge partnership between HRM, the Province of Nova Scotia, the Government of Canada, and private companies. Its goal is to develop management and planning tools to prepare for climate change impacts, and to develop strategies to reduce practices that contribute to global warming in the first place - primarily by reducing greenhouse gas emissions.



After Hurricane Juan
Photo from HRM



Blizzard of '04
Photo from HRM

HRM is making major contributions towards improving air quality and reducing greenhouse gas emissions through sustainable land use planning through its Regional Planning process. HRM is also presently working on a *Clean Air Strategy*, a comprehensive, "all in one place" document or framework to help guide HRM towards clean air for all its residents. As part of the Climate SMART initiative, in 2005 Regional Council unanimously approved a plan to reduce greenhouse gas emissions from municipal operations by 20% from 2002 levels by 2012. HRM is now incorporating measures to reduce GHGs from its buildings and vehicle fleets. In 2006, HRM Council unanimously approved a plan for challenging and supporting the HRM community to reduce GHGs generated by residents, commuters, businesses and industry by 20% below 2002 levels by 2012. These plans include HRM's Corporate Greenhouse Gas Emissions Reduction Plan, Community Greenhouse Gas Emissions Reduction Plan and the Climate SMART strategy. Copies of these plans are available at <http://www.halifax.ca/climate/index.html>.

HRM recognizes that effective action to address this global problem can only be achieved through a consolidated effort by all stakeholders, including public and private sectors, and community groups. This ***Community Guide to Climate Change*** has been prepared as one of the tools to assist the HRM community to do its part to minimize climate change and to adapt to its consequences.



Flooding in 2003
Photo Courtesy of Claude Barbeau

What Can We Do?

As residents and businesses in HRM:

- We can **reduce the greenhouse gas emissions** that cause climate change and its unwanted impacts! This is referred to as “mitigation”.
- We can **be prepared for changes in our climate** by taking steps that will help us to cope with likely impacts. This is referred to as “adaptation”.

This Climate SMART Community Action Guide compliments existing Provincial and Municipal disaster preparedness and response resources. Please note that emergency response is the responsibility of local authorities, such as the local fire department, Nova Scotia Community Services, HRM Emergency Management Operations (EMO), the Red Cross, police (Halifax Regional and RCMP), and other community authorities. However, the community can be prepared to respond to emergency events, until help arrives from local authorities. Our community can also assist when and where Provincial and Municipal EMO resources are stretched thin, such as during Hurricane Juan or the Great Maritime Blizzard, events which are *likely to increase in frequency as a result of global climate change!*

What Are the Key Elements of the Climate SMART Community Action Guide to Climate Change?

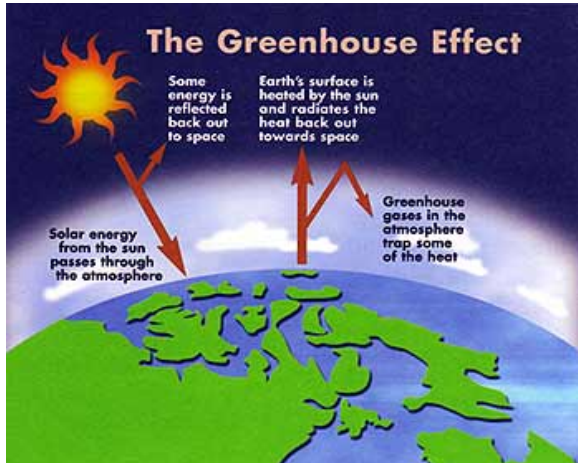
- The Guide provides information on climate change and its risks.
- The Guide suggests actions we can all take to reduce greenhouse gas emissions that cause climate change.
- The Guide provides the knowledge and the tools to help us organize our neighbourhoods to prepare for extreme weather events.
- The Guide will help us to develop a **Climate SMART Community Action Plan**.

Realistically, because of considerable maritime risk from climate variability and extreme weather events, the HRM community will not be able to adequately respond to these threats without incorporating risk management (“adaptation”), emergency preparedness and response, and greenhouse gas emissions reduction (“mitigation”) actions into their regular activities.

We hope this Guide will equip you (families, schools, community groups) with some minimum risk skills and practices to make your community and surrounding environment a safer, more resilient, and more climate ‘adaptive’ place to live.

What is Climate Change? What is Global Warming?

As you can see from the image below, a natural “blanket” of gases protect the earth from the sun’s more harmful rays, and acts like a greenhouse by trapping heat and keeping the earth at a temperature suitable for sustaining human, plant and animal life. This process is called the **Greenhouse Effect**.



Source: Government of Canada

What are Greenhouse Gases?

These are gases caused by the burning of fossil fuels (petroleum, coal) as well as agricultural and industrial activities. Greenhouse gases include carbon dioxide, methane, nitrous oxide, and chlorine-based gases. These gases affect our ozone layer and remain in the atmosphere for hundreds of years after they have been emitted.

However, while the greenhouse effect occurs naturally, carbon dioxide and other gases generated by human activity (called **Greenhouse Gases** or GHGs) have thickened this “blanket” of gases so that the Earth is warming up. This is **Global Warming**. The warming of the atmosphere is projected to drive other climate factors such as extreme weather events; therefore, the term **Climate Change** is being increasingly used to describe the full effects of increased carbon dioxide in the atmosphere.

Why Should We Be Concerned About Global Climate Change?

As a result of global warming, glaciers have been melting, sea levels have risen, and climate zones are shifting. While warmer temperatures may sound like good news to us, with our cool Maritime climate, climate change is more than a warming trend. Increasing temperatures will lead to changes in many aspects of weather. Some regions will experience more extreme heat, while others may cool slightly. Flooding, drought, and intense summer heat could result. Violent storms and other extreme weather events could also result from the increased energy stored in our warming atmosphere. Such climate change could have far-reaching and unpredictable environmental, social and economic consequences.¹

Over the present century, the increase in average temperatures in some regions of Canada, particularly the Far North, could be as much as 7°C. That may not sound like a big difference, but when we consider that today's average global temperatures are only about 5°C warmer than they were during the last Ice Age, we realize that even small changes can have a major impact. In North America, that 5°C change in global average temperatures was enough to melt the vast sheets of ice that once covered much of the continent.

Source: Government of Canada Climate Change website

¹ A more detailed explanation of climate change is provided on the HRM Climate SMART website (<http://www.halifax.ca/climate/index.html>)

- Climate change may cause severe weather events – hurricanes, thunderstorms, ice storms, hail, floods and droughts – to occur more often and be more intense.
- Changes in wind and weather patterns can change the amount of plant pollen and mould spores in the air, making conditions worse for people with allergies.



- As climate change brings warmer weather to higher latitudes, warmer weather diseases and pests - like the West Nile virus and the Japanese beetle - will follow.
- Changes to our ecosystem may make the outbreak of water-borne diseases more likely, and hotter weather may cause more outbreaks of illnesses at lakes and beaches.



- As climate change pushes temperatures higher, we can expect more smog days. More smog and more air pollution will cause increases in respiratory problems. The very young, the elderly, and those with chronic lung diseases, such as asthma, are at the greatest risk.

- Lakes and rivers can become contaminated during heavy rainstorms and floods from storm sewer overflows and contaminants picked up and carried by storm runoff.

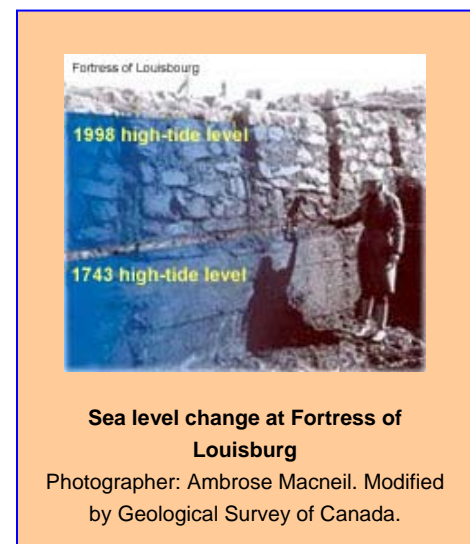


- Higher temperatures, if not balanced by higher precipitation, would lead to greater evaporation of our lakes and rivers. This could result in lower flows of water that could, in turn, lead to an increase in water-borne diseases and to poor water quality due to increased concentrations of pollutants.

- As temperatures warm, the oceans will expand, and ice caps and glaciers will melt, releasing much more freshwater into our oceans, causing sea levels to rise. Canadian research suggests that sea levels on the Atlantic coast of Nova Scotia could rise by 70 cm by 2100. Storm surges will be able to flood areas never before flooded. Low-lying coastal areas will be the most threatened.

- The majority of the Atlantic coast of Nova Scotia, including HRM, is highly sensitive to rising sea levels. The most sensitive areas are low-lying salt marshes, barrier beaches, and lagoons. Higher sea levels will cause increased erosion, smaller or disappearing beaches, and flooding of coastal freshwater marshes, and will affect coastal homes, cottages, bridges, wharves, breakwaters, and roads.

- Sea level rise will also increase the risk of saltwater intrusion into wells near the coast.



- Fish, including valuable commercial species such as salmon and cod, are very sensitive to temperature. Changes in water temperature in the oceans, lakes and rivers would likely impact fish growth, health and distribution, with potentially serious impacts on commercial and recreational fishing.
- Climate change may increase the range and extent of the organisms responsible for toxic algae blooms, such as red tides, requiring closure of fishing areas.
- Climate change may increase the risks to forests in Nova Scotia. For example, warmer winter temperatures may allow invasive insects, such as the gypsy moth, to become more pervasive, while warmer, drier summers would increase the threat of forest fires. Forest type may also be affected by climate change. As temperatures increase, our boreal forests may gradually be replaced by temperate forests.



- Higher temperatures, dryer soil and increased insect infestation are expected to reduce crop yields.

Source: A variety of sources including the Intergovernmental Panel on Climate Change, Government of Canada and others.

Use this HRM link to find a detailed summary of climate change impacts expected in the HRM area:

<http://www.halifax.ca/climate/index.html>.

How Do We Deal With This?

- **Be informed** about the risks from climate change.
- **Take action** to reduce green house gas emissions that cause climate change.
- **Organize** our neighbourhoods to **prepare** for extreme weather events and climate related emergencies.

We can do this in seven steps.

Mitigation: REDUCE GREENHOUSE GAS EMISSIONS

1. Step One: Inventory sources of greenhouse gas emissions in our homes and communities.
2. Step Two: Reduce our greenhouse gas emissions.

Adaptation: MANAGE THE RISKS AND PREPARE FOR CLIMATE RELATED EMERGENCIES

1. Step One: Be aware of how our community may be at risk from climate change.
2. Step Two: Know our vulnerabilities and resources.
3. Step Three: Minimize our risks through adaptation actions.
3. Step Four: Prepare a Climate SMART Action Plan to address climate related emergencies:
 - What to Do Before
 - What to Do During
 - What to Do After
5. Step Five: Publicize, test & evaluate the Climate SMART Community Action Plan.

WE CAN BE CLIMATE SMART!

Mitigation: REDUCE GREENHOUSE GAS EMISSIONS

We can do our part to *mitigate* or lessen climate change by taking actions to reduce our greenhouse gas emissions. We can accomplish this through two steps.

The average Canadian consumer generates over 20 tonnes per year in greenhouse gases, mostly from driving our cars, heating our homes, and using electricity (David Suzuki Foundation: The Science of The Challenge).

Climate change and air quality problems (e.g., smog, acid rain) are largely caused by the same activity – namely, the burning of fossil fuels. In fact, burning fossil fuels such as coal, oil, gasoline and natural gas is the source of the majority of greenhouse gas emissions and air pollutants. Reducing the use of fossil fuels helps to combat both climate change and air pollution, while achieving other benefits. Burning less fossil fuels helps to protect biodiversity, saves money, addresses energy security issues, and saves our nonrenewable fossil fuels for more critical future needs.

STEP ONE **Inventory sources of greenhouse gas emissions** **in our homes and community**

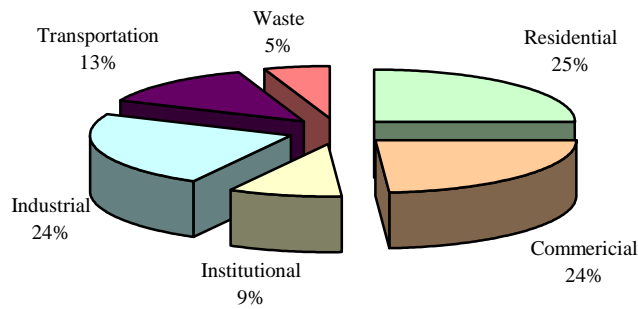
Sources of greenhouse gases include:

- Gas/diesel powered engines – which are found in cars, trucks, ATVs, snowmobiles, boats, etc.
- Heating equipment – including oil or gas furnaces and hot water tanks, and electric baseboard heating systems.
- Cooling equipment – including air conditioners.
- Fueled appliances – including BBQs, camping stoves and gas lights, which use propane, butane or other gases/fuels.
- Open-air burning of garbage.
- Electric appliances and equipment – stoves/ovens, microwaves, refrigerators, computer equipment, televisions, light fixtures, washers and dryers, etc.



In 2002, the residential sector was the largest contributor to greenhouse gases in HRM (through home heating and power use)². The transportation sector, which includes commuter travel, generated another 13% of total greenhouse gases.

² ICLEI Energy Services, 2005. Greenhouse Gas Emissions Inventory, Forecast & Target. Prepared for HRM.



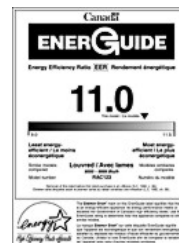
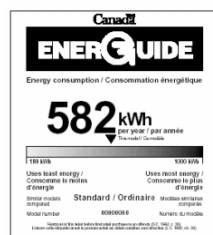
Greenhouse Gas Sources²

You can calculate the greenhouse gas emissions you produce in a year and learn how to reduce them at: <http://www.onelesstonne.ca/>

STEP TWO Reduce greenhouse gas emissions

Reducing greenhouse gas emissions means conserving energy, using energy more efficiently and using greener forms of energy. There are many things we can do to reduce the greenhouse gas emissions we produce individually and as a community, including:

- Use the information provided by two national programs when purchasing energy-using products to ensure that they are the most energy efficient. **EnerGuide** compares the energy efficiency of products, including different models of household appliances, etc. For some of these products, **ENERGY STAR®** goes one step further and identifies those models that meet or exceed premium levels of energy efficiency. The ENERGY STAR® symbol may even appear on an EnerGuide label. When you see ENERGY STAR® on an EnerGuide label, you can be sure that the product is among the most energy efficient available.



- When building or renovating your home, choose an ENERGY STAR® home, windows, sliding glass doors; install a new energy efficient furnace. (It can save you up to 25% of your home heating costs each year.)

- If available, switch from oil to natural gas for heating and appliances (this will reduce greenhouse gases and pollutants). At a minimum, have your furnace checked and maintained annually so that it operates as efficiently as possible.

- Install programmable thermostats and turn down the temperature by two degrees. (This will save approximately 500 pounds of carbon dioxide [a greenhouse gas] per year. You will also save money.)



- Keep blinds, curtains and windows closed during the day in summer. This helps keep your home cooler.

- Ensure you have proper caulking and weather stripping around doors and windows.

- Switch two standard incandescent light bulbs to more efficient ENERGY STAR®-qualified compact fluorescent light bulbs. (A savings of 424 kilograms of greenhouse gases/year.)



- Select the no-heat option on your dishwasher's drying cycle.
- Turn off lights and electrical equipment when you don't need it.
- Walk, bike and take the bus/ferry wherever possible.



Photo Courtesy of HRM



Photo Courtesy of HRM

- Purchase fuel-efficient vehicles. A car that averages 8 litres/100 km rather than one that gets 12 litres/100 km could save 2 tonnes of greenhouse gases per year (based on a savings of 4 litres/100 km and an average of 20,000 km traveled per year).

- Don't idle – when you let your vehicle idle longer than 10 seconds, you burn more fuel than you would restarting the engine. Even during our cold winters, a vehicle needs no more than 30 seconds of idling to “warm up” – driving your car will warm it up. For more information on idling, check the Natural Resources Canada website at: <http://oee.nrcan.gc.ca/communities-government/transportation/municipal-communities/articles/idling-myths.cfm?attr=8>.

- Maintain your vehicle properly – a poorly maintained vehicle can increase fuel consumption by up to 50 percent and greenhouse gas emissions by even more. Maintain proper tire pressure; operating a vehicle with just one tire under-inflated by 6 psi (40 kPa) can reduce the life of the tire by 10 000 km and increase the vehicle's fuel consumption by 3 percent. Virtually all of your vehicle's mechanical systems can affect fuel efficiency if not properly maintained. Follow the manufacturer's recommendations for checking the engine, cooling and ignition system, brakes, drive train and emission-control system. For more information, check the Natural



Resources Canada website at: <http://oee.nrcan.gc.ca/transportation/personal/maintaining/vehicle-maintenance.cfm?attr=8>

- Grow a healthy lawn naturally, and preserve/plant trees. Green areas act as “carbon sinks” - trees, other plants and the soil soak up carbon dioxide and temporarily store the carbon in wood, roots, leaves and the soil. By providing shade to homes and backyards, trees also have a natural cooling effect.
- Water conservation is linked to energy use. Typically, 15 percent of an energy bill goes to heating water. If you're keeping an older hot water appliance, insulate the heater itself and at least the first metre of piping. The insulation prevents the loss of valuable energy into thin air. If you're planning to buy or rent a new water heater, here's a tip that could save you up to \$100 per year: Bigger isn't necessarily better. Look at ways to reduce your hot water use. A low-flow showerhead can cut your water use in the shower by more than 30 percent. Fix leaky taps and install tap aerators that provide the same pressure with less water flow. Using low flow taps and toilets and replacing your showerhead with a low-flow model can save 127 kilograms of greenhouse gases/year. For more information, check the Natural Resources Canada website at: <http://oee.nrcan.gc.ca/residential/personal/water-conservation.cfm?attr=4>
- Start replacing fossil-fuel dependent devices with solar-powered ones, such as solar garden lights and solar powered camping generators.



For more tips on how to conserve energy, cut greenhouse gas emissions and save money, check Natural Resources Canada's Office of Energy Efficiency website:

<http://oee.nrcan.gc.ca/english/index.cfm> or Nova Scotia's Department of Energy's Quick Tips:

<http://www.gov.ns.ca/energy/AbsPage.aspx?ID=1509&siteid=1&lang=1>

Adaptation: TAKING ACTION TO REDUCE THE RISKS FROM CLIMATE CHANGE IMPACTS

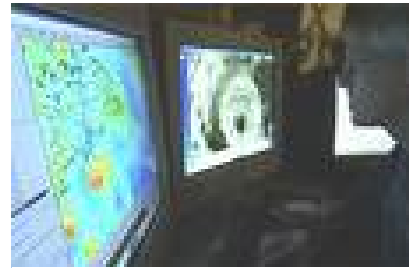
We can do our part to *adapt* to Climate Change by taking action to help communities and ecosystems cope with changing climate conditions. Adaptation measures come in many forms and include changing how we build homes and develop properties. Adaptation also includes emergency planning.

The following four steps describe how your community can adapt to climate change and be prepared for climate related emergencies.

Global climate change will likely increase the frequency and intensity of extreme events affecting HRM, including: tropical storms, hurricanes, coastal storm surges, flash floods, smog alerts, ice storms, and drought.



Blizzard of '04
Photo Courtesy of HRM



Hurricane Juan
Photo Courtesy of Government of Canada



Smoggy day in Halifax
Photo Courtesy of Government of Nova Scotia



Flood of '03
Photo Courtesy Claude Barbeau

STEP ONE
Be aware of how your community may be at risk from climate change

A Hazard is:
A situation with the potential for human injury or death, damage to property, damage to the environment, or some combination of these.
From: HRM Master Emergency Plan

To understand which specific natural and human hazards can create an emergency in our local community, we need to:

- Be familiar with the damage (impacts) from past emergencies associated with natural weather events. Identify specific areas, buildings or activities that during past weather events have been affected by emergencies such as:
 - hurricanes and winter storms
 - storm surge
 - flooding
 - downed trees (and powerlines)
 - severe coastal erosion (undermining)
 - sewage overflows
 - water supply contamination
- Be familiar with climate change projections and expected extreme weather.
- We need to know our community – we need to involve a wide range of residents and business operators from our neighbourhood in planning for emergencies.

Details on the risks from climate change that are likely to affect HRM can be found at <http://www.halifax.ca/climate/change1.html>.

STEP TWO
Know your vulnerabilities and your resources

To determine your potential vulnerability, let's answer the following questions:

- Are there specific residents that are especially vulnerable to weather emergencies?
 - elderly neighbours
 - single parent families
 - neighbours that are disabled or less mobile
 - people who live far from other neighbours

- Are there specific residents/buildings/facilities that are particularly exposed to hazards?
 - In low lying areas and at risk from flooding
 - Near lakes/ivers and at risk from flooding
 - On the coast and at risk from storm surge
 - In exposed high elevation areas and at risk from wind and lightening
 - Located along forested/grassland areas and at risk from fire
 - Rely on shallow or coastal wells that may be impacted from severe weather events such as torrential rains, flooding and storm surges
 - Roads with large trees located next to overhead power lines that may be brought down by high winds, ice storms or hurricanes
- Are there any sensitive natural environments in our neighbourhood that are vulnerable to weather emergencies?
 - Wetland/pond that receives storm runoff (water flows may be excessive or contaminated during torrential rains, hurricane, etc)
 - Lakes, rivers, coastal areas that receive treated or untreated sewage discharges (where contaminants may spread to adjacent properties during storm surges, flooding)
 - Saltmarsh with nesting birds, which may be inundated by storm surge
 - Beach with nesting birds, which may be inundated by storm surge

Next, let's determine what resources are available in your community.

What is our capacity to face an emergency, adapt to it to reduce our risk, and prevent future damage? A resource inventory informs us of the availability of community resources in an emergency. It also helps us determine: where the risks are; our ability to organize; what information is available; and how prepared we are to respond to emergencies.

**Community Resources:
places, things and people that can be used to prepare for
and respond to emergencies.**

To understand our potential capabilities for dealing with emergency events, let's identify:

- What volunteer base do we have? (How many individuals, what skills and equipment do they have?)
- What resources do we have available for managing a Climate SMART Community Action Plan (office space/equipment, meetings areas, neighbourhood website, community association)?
- What potential safe places are there within and near our community?
- What kind of equipment is available for sharing within our community (sump pumps, chain saws)?
 - Are we able to assemble basic emergency kits for volunteers?
 - What other useful resources do we have in the community for responding to weather related emergency events?





STEP THREE

Minimize risks through adaptation actions

We can minimize our risk of personal injury and property damage by taking action to adapt to Climate Change:

Minimize your risks:

- Don't build in high-risk locations such as low areas prone to flooding and coastal areas vulnerable to storm surge and erosion.
 - Remove dead, damaged or dying trees and replant with new trees.
 - Plant local varieties of trees, shrubs and flowers to reduce incidents of invasive pests and exotic species that may be more tolerant to changing climate regimes.
 - Support green belts, parks and conservation areas in your neighborhood – they act as carbon sinks (which absorb greenhouse gases) and they help to manage stormwater runoff.
 - Ensure the timely professional removal of any tree limbs from overhead power and telephone lines.
- 
- 
- Where possible, bury electrical and telephone cables underground on the property when building a new home.
 - Organize community re-forestation activities to minimize erosion, flash floods and landslides.
 - Recognize the value of water catchment areas, such as swales, wetlands, streams and ponds on your property - they handle stormwater flows.

Prevent stress to natural ecosystems so that they may be more resilient to floods, droughts, storms, and infestation:

- Do not discharge untreated sewage from homes and cottages into coastal areas, rivers or streams.
- Use natural fertilizers to reduce pollution of coastal areas and freshwater.

Adapt to increased risk for disease (West Nile in the future) from a northward drift of tropical parasites:

- Remove cans, bottles, old tires or other articles in your garden that may collect water and become breeding grounds for mosquitoes.

Adapt to risks to water supplies from storm events and from a changing climate (drier, hotter, flooding):

- Water gardens in the morning or evening to reduce evaporation.
- Respect water conservation orders.
- Recycle water – 'grey water' from sinks can be used to water gardens.
- Mend leaking water pipes; turn off water taps when not in use.
- If drinking water is supplied from a well, install a water treatment system.

STEP FOUR

Prepare a Climate SMART Community Action Plan

Plan what your community will do to prepare for and respond to climate related emergencies. Prepare a Climate SMART Community Action Plan using this Guide. A Climate SMART Community Action Plan has three phases:

1. Before the Emergency
2. During the Emergency
3. After the Emergency

Phase 1

BEFORE THE EMERGENCY - PREPARE

1. Establish a Climate SMART Community Action Team made up of community volunteers.

- Define the skill set available from your volunteers.
- Select a leader.
- Assign responsibilities.
- Assemble a list of team members, with contact information, and distribute amongst the group.
- Develop communication protocols (email, cell phones, order of contact).
- Determine support resources available to the team (secretarial, support from local community associations, meeting place, website access).
- Become educated on liability issues – understand what a volunteer should and shouldn't do in the event of an emergency.
- Become informed about emergency response agencies - who will be in charge, what each agency does (see Phase 2 - During the Event).
- Make contact with the local first response agency (likely the local Fire department) to inform them of the Community Action Plan and Team.



2. Identify risks and hazards in our community.

In order to quickly identify areas at risk during weather emergencies, we need to develop a **Risk Map** for our community.

A Risk Map can be simple and easy to prepare:

- Use a map of your community that shows all the streets by name as well as major environmental features such as lakes, rivers, and wetlands. (This can be a purchased map or hand drawn, or a combination - it just needs to be complete.)
- Identify particular properties and areas that are at risk and note the reason why.



- Update the map regularly if new roads are built.
- Ideally, the map would be available to volunteers via e-mail or on a community website. Otherwise make colour copies and distribute. All volunteers should have a copy.
- Provide a copy of the map to the local fire department.

A property may be at risk if:

- **The bottom floor of the house is less than 3 metres above high tide.**
- **It is prone to flooding.**
- **The shoreline is eroding.**
- **There are large, dead or dying trees near the house or nearby power lines.**
- **The resident(s) are ill, elderly, have limited mobility, are single parents, etc.**

3. Identify Community Resources.

The Team should identify and document the following resources:

VOLUNTEERS

Identify a list of community individuals willing and able to assist the Climate SMART Community Action Team to respond in emergency situations. A list of names, addresses and contact numbers should be developed and maintained and accessible to several lead volunteers.

SAFE PLACES

List and show on a **Resources Map** any green spaces, parking lots and community centres/arenas that could function as temporary emergency shelters /evacuation areas.

Emergency measures organizations will identify these for particular emergencies. Contact these organizations in an emergency to identify safe places nearest to your community and get the word out to your neighbours.

FLOODING EQUIPMENT

Develop a list of sump pumps available in your neighbourhood, for residents to borrow in the event of an emergency.

MEANS OF TRANSPORTATION

Develop a list of residents and business operators willing to transport equipment and/or people (to hospital, safe places) when those in need are not able to provide transportation themselves in an emergency.

BASIC FIRST AID EQUIPMENT

Assemble basic first aid kits available to volunteers who will act in emergency situations.

COMMUNITY ORGANIZATIONS

Develop and maintain a list of contacts (names and phone numbers) of agencies that may provide assistance to your community during emergencies. This may include the local Fire Department, Ground Search and Rescue, Red Cross, Salvation Army, Food Banks, and community associations such as ratepayers associations, Rotary or Lions Clubs, cultural and religious associations. Contact the local fire department to prioritize the list of contacts for your neighbourhood.

4. Identify the actions to be taken by the Climate SMART Community Action Team.

This may include:

- Practicing emergency response measures/plans before any emergency event.
- Meeting to identify areas/people at risk (using the Risk Map prepared in advance) once a weather warning is issued.
- Contacting at risk individuals to confirm their risk and to offer assistance.
For example, should the Team check on an elderly neighbour? Set times to check in. provide contact numbers to call if they need assistance.
- Contacting sump pump owners who have volunteered to share their equipment, to be on stand by when flooding is expected.
- Arranging transport of people and/or equipment, if necessary.



Actions may be specified for particular events such as hurricanes, power outages (particularly in winter time), flooding, storm surge, etc.

5. Inform the community of the Climate SMART Community Action Plan

This should also include education on individual preparedness. See the following list for recommendations on the contents of an emergency kit.

Individual Emergency Pack and Equipment

You should encourage everyone in your community to have emergency supplies available for times of power outages, severe weather emergencies or evacuation.

- Water (at least 2 litres per person per day for 3 days)
- Camping Stove, cooking fuel
- First aid kit
- Prescription medications required by family members
- Flashlight and batteries
- Candles with a sturdy holder
- Matches or lighter
- Battery operated or wind-up radio and batteries
- Cell phone for communication
- Non-perishable (canned & dry) food supply for at least 72 hours
- Can opener (manual)
- Cash
- Contact list of emergency services
- Extra warm dry clothing
- Extra keys.



The Nova Scotia Emergency Management Office website contains self-help brochures for individual preparedness. Refer to the "Be Prepared, Not Scared" brochure for more suggestions on preparing for emergencies.
<http://www.gov.ns.ca/emo/AbsPage.aspx?id=1003&siteid=1&lang=1>

The Public Safety and Emergency Preparedness Canada website provides information on what you can do during the first 72 hours of an emergency - <http://www.psepc-sppcc.gc.ca/prg/em/gds/genprep-en.asp>

Tip: If using a back-up generator, have it installed by a professional and operate it according to the manufacturer's directions, in order to avoid other hazards such as fire and carbon monoxide inhalation.

Phase 2 DURING THE EMERGENCY - RESPOND

Emergency response is the responsibility of organizations and authorities, such as the local fire department, HRM Emergency Management Operations (EMO), Halifax Regional Police, the RCMP, 911, the Red Cross, the Salvation Army, and Nova Scotia Community Services. A list of these agencies and contacts is provided at the end of this guide. These agencies have the responsibility, training and resources to:

- Issue orders for evacuation and inform the community.
- Identify safe places for evacuation.
- Provide emergency response and first aid.
- Deal with downed power lines.
- Clear streets of downed trees and debris.
- Identify which water supplies are contaminated and which are safe.



Photo Courtesy Nova Scotia Emergency Measures Organization

But, the community can be prepared to assist when and where EMO resources are stretched thin and until help arrives!!

The Climate SMART Community Action Team should initiate the Plan:

- The Team should briefly confer to assign and confirm responsibilities and availability of Team members.
- Establish contact with local emergency response agencies.
- In consultation with emergency measures authorities, identify meeting points and temporary community shelters to be available during the emergency. Systematically communicate with your neighbours:
 - Provide information on emergency procedures underway during an emergency.
 - Identify anyone requiring assistance.
 - Encourage residents to keep young children at home during the emergency.
 - Encourage residents to stay off the roads during the emergency to keep emergency routes clear for emergency and clean up vehicles.



- Team members to maintain regular communication amongst themselves.

- Provide assistance to residents in need:
 - Transport to safe places or medical facilities.
 - Arrange for temporary shelter and/or food supply within the community.
 - Locate and if necessary transport emergency supplies or equipment available in the community.
- Provide a preliminary damage assessment to local authorities.



Flooding in 2003
Photo Courtesy Andrew Spicer



Damage from Hurricane Juan Storm Surge
Photo Courtesy Chris Fogarty



Damage from Hurricane Juan
Photo Courtesy Peter Hayes

**Phase 3
AFTER THE EMERGENCY –
REHABILITATE & RESTORE**

We can't avoid natural disasters, but we can minimize their impact and damage!

REHABILITATION
During this Phase, you can help to re-establish critical services and meet the needs of the affected community.

Rehabilitation actions may include the following:

- Organize Neighborhood Action Teams to assist with basic rehabilitation tasks such as helping to clear debris from houses and properties. *Please note that large trees and trees against or near powerlines pose a very real and significant danger and require removal by qualified individuals. Please*

contact HRM Transportation and Public Works or Nova Scotia Power in these situations. Be patient – staff will be very busy following extreme events.

- Conduct an assessment of local community damage and basic community needs, and report to the appropriate local authority.

RECONSTRUCTION
Reconstruction is the process of restoring structures and environment affected by the event to their original state.

Reconstruction actions may include:

- Cleaning up your own property and adjacent areas.
- Volunteering your support to municipal and community organizations in their efforts to repair/reconstruct local community buildings, facilities, and green spaces.
- Helping to set-up community-based neighbour-to-neighbour support groups to help victims overcome post-traumatic stress syndrome.
- Respect emergency public service announcements (tune in to Radio 97.9 FM), and pay particular attention to emergency curfews and traffic restrictions.



STEP FIVE
Publicize, test & evaluate the Action Plan

To test and evaluate the climate SMART Community Action Plan:

- Inform your community about the Plan.
- Provide information on the Plan (perhaps through a community meeting).
- Hold a realistic emergency simulation. This will tell you:
 - The Plan's effectiveness.
 - What works or needs changing to be effective.
 - Who knows and remembers what.



PLEASE REMEMBER:

Prevention and preparedness planning equip us for extreme weather and emergencies. They are the best community adaptation measures to reduce the risks associated with global climate change.



CLIMATE CHANGE RESOURCES AND EMERGENCY LINKS

Fill in the phone numbers for your community.

- **911** (Fire, Ambulance, Police)
- Local Fire Department _____
- HRM Emergency Measures Office: <http://www.halifax.ca/emo/index.html>
 - For emergency, dial 911
 - 24 hour non-emergency (490-5020)
 - general inquiries, Mon to Fri., 8:30-4:30 (490-5400)
- Nova Scotia EMO: <http://www.gov.ns.ca/EMO/AbsPage.aspx?siteid=1&lang=1&id=1>
 - General enquiries (424-5620)
 - 911 inquiries and information (424-6208)
 - toll free (1-800-388-3911)
- Nova Scotia Power Inc (NSPI): http://www.nspower.ca/customer_service/outage_information/
 - For power outages, 24-hour (428-6004)
- HRM Transportation and Public Works
 - For trees down on roads, snow removal, sewage overflows, road flooding
 - HRM Call Centre (490-4000)
- Nova Scotia Community Services: http://www.gov.ns.ca/coms/emergency_ss.html
 - Community Services Emergency Social Services Program (424-8333)
 - HRM Call Center (490-4000)
- Canadian Red Cross: <http://www.redcross.ca/article.asp?id=000283&tid=025>
 - Halifax Regional Office (423-3680)
- Salvation Army:
 - Halifax (422-1598)
 - Dartmouth (466-6847)
- Public Security Emergency Preparedness Centre (PSEPC): <http://www.psepc.gc.ca/>
 - 426-2082
- Environment Canada Climate Centre:
<http://atlantic-web1.ns.ec.gc.ca/climatecentre/default.asp?lang=En&n=0D8BAF5C-0>
(provides weather forecasts and warnings)
 - For weather reports (426-9090)

REFERENCES AND LINKS

Reference Documents/Links

- <http://www.halifax.ca/climate/index.html>
- WWF Climate Change in The Pacific Mitigation & Adaptation Community Action Guide: http://www.sprep.org/ws/att/publication/000431_CBDAMPIC.pdf

Other HyperLinks

- Red Cross/Red Crescent Climate Centre: Preparedness for Climate Change, Implications for the International Federation of the Red Cross & Red Crescent Societies. A Study to assess the future impact of climatic changes upon the frequency and severity of disasters, and the implications for humanitarian response and preparedness. www.climatecentre.org; climatecentre@redcross.nl
- Intergovernmental Panel on Climate Change (IPCC): www.ipcc.ch. The IPCC website includes a vast array of reports on current scientific consensus on climate change
- United Nations Framework Convention on Climate Change (UNFCCC): www.unfccc.org. The UNFCCC is the international mechanism for negotiations on climate change
- RETScreen International Clean Energy Decision Support Centre: RetScreen seeks to build the capacity of community planners, decision-makers and industry to implement renewable energy and energy efficiency projects by; developing decision-making tools. Tools include: software, training materials, e-textbooks and case studies relating to wind energy, small hydro, biomass and solar air/water heat. www.retscreen.net
- World Meteorological Association: www.wmo.ch. The WMO coordinates global scientific activity on issues like: weather prediction, climate change, depletion of the ozone layer, and air pollution. There are links to weather and climate forecasts, and a listing of National Weather Services
- United Nations International Strategy for Disaster Reduction (UNISDR): www.unisdr.org. The UN body that promotes disaster risk reduction
- Provention Consortium: www.proventionconsortium.org. The Provention Consortium, currently based at the International Federation of the Red Cross/Red Crescent in Geneva, is a global coalition of governments, international organizations, academic institutions, private sector and civil society organizations dedicated to increasing the safety of vulnerable communities, and reducing the impact of disasters in developing countries
- Netherlands Red Cross and Free Voice work jointly on climate change and disaster risk reduction in Central America and the Caribbean: The Netherlands Red Cross and Free Voice aim to strengthen the resilience of people most vulnerable to the risks of climate change in Guatemala, Nicaragua, Costa Rica, Colombia, Dominican Republic and Haiti, through partnerships, improved education, and community level actions
- www.novaweather.net. The website has reports and photos of major weather events and current weather information.