

Plan to Survive

A Canadian
Guidebook for
Dealing with Cli-
mate Change

*Canadian Association for
the Club of Rome
Ottawa 2019*



Plan to Survive

A Canadian Guidebook for Dealing with Climate Change

by the

Canadian Association for the Club of Rome

Ottawa, 2019

Contributors

Art Hunter

Bill Pugsley

David Dougherty

Gordon Kubanek

Ian Whyte

Jennifer Manning

John Hollins

John Maskell

Marianne Armstrong

Phil Reilly

Ted Manning

First Edition July 2019



All photography courtesy

Ted Manning, Tourisk Inc.

Table of Contents

Preface	4
1. Introduction	5
2. Active, potentially damaging event (flood, fire, storm)	7
3. Energy – Before, during and after an emergency	8
4. Water for Survival	10
5. Food for survival	12
6. Survival Kit	13
7. Protect Your Health	15
8. Make Your Residence More Resilient	18
9. Insurance, Risk and Climate Change	20
10. Working with your Community	21
11. Conclusion: be prepared to survive	21
12. Information Sources	22
My Emergency Contact List	23

Preface

The climate is changing, with consequences for humans and all life on Earth. Extreme weather events are happening all over the planet. The efforts of governments to restrain emissions of greenhouse gases are falling short.

It is vitally important for individuals, families, and communities to begin now to prepare to live with the consequences. We all need to be resilient to survive. *Plan to Survive* provides a list of practical steps. It identifies areas where individuals and communities may be impacted and the steps that can be taken to reduce risk to them, their families, and their possessions. Each section presents actions that can be taken to reduce vulnerability and enhance resilience.

This guidebook addresses adaptation from several perspectives:

Timing	Examples	Solutions
Existing emergency — instant action required	Severe damage to residence; loss of grid electricity	Evacuate residence; portable generator
Pending Threat, with warning	Prediction of tornadoes, ice storm, flooding, fire	Install shutters; prepare to: draw on stocks, evacuate
Anticipation	Heat waves, droughts, diseases	Store water and food; understand threat of diseases
Long-term adaptation	Infrastructure	Install renewable energy; grade land around foundation

The basic message is that **advance planning is essential**. Start with this guide and follow the links to develop your own plan.

1. Introduction

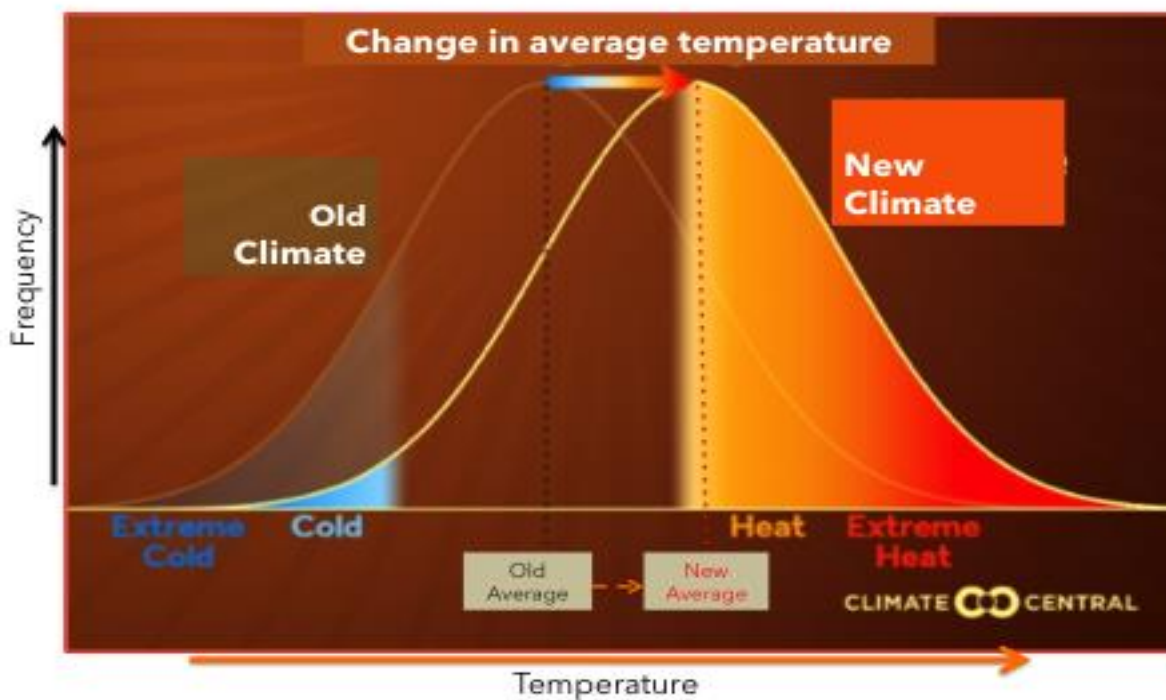
Climate change is real.

Climate and weather are related: weather is what one gets on a daily basis; climate is weather over a long period of time. Both are affected by global warming as carbon dioxide and other greenhouse gases continue without pause to accumulate in the atmosphere. The temperature of the entire globe is now measured routinely by observations from satellites; it is accurately known. It is real news. Canada and the world have full access to measurements of meteorological data from fifty countries through the Meteorological Service of Canada.

Some of the impacts of global warming occur slowly and steadily, such as the thawing of permafrost in Northern Canada and the rise in the level of the oceans of the world. The impacts that are more evident to many citizens are extreme events that occur at the margins of weather, for example, the number of heat waves and floods that occur each year with increasing severity and frequency in Canada and around the world.

As the globe continues to warm, as appears very likely, the number of very hot days will increase, which will cause heat stress, in cities in particular. People in southern Canada should expect the number of days with maximum temperatures above 32°C to increase from less than 10 a year to more than 20 a year during the next 20 years.

The graph below illustrates what happens both overall and at the extremes: as average temperatures increase: extreme heat occurs more often and extreme cold less often. The graph below shows that new extremes occur more frequently with increases in average temperature. (adapted by John Hollins from <https://www.climatecentral.org/gallery/graphics/small-change-in-average-big-change-in-extremes>)



Changes in precipitation are more difficult to estimate, but higher air temperatures will produce more evaporation in areas associated with bodies of water — much of Canada from the Great Lakes to the muskeg — resulting in higher levels of humidity and changes in the duration and amount of rain and snow that falls. One result will be more frequent and more intense floods. Canadians need to consider these risks in their everyday lives and take measures to reduce their vulnerability to damage from them.

Are you ready for change?

Weather is inherently variable and of short-term duration. It is not possible to anticipate exactly what will occur on a given day or month, but it is possible to state that it is likely that we shall experience:

- More extreme cold and more heat waves
- More violent storms with
- Stronger winds
- Flooding
- Coastal storm surges and inundation
- More ice events
- Melting of permafrost
- Changed growing seasons – timing and weather
- Arrival of diseases affecting animals, people, and plants

The direct consequences of these changes include the following

- Threats to health from extreme temperatures and new diseases
- Inundation of property and homes
- Damage to infrastructure
- Interruption of transportation and access, including shortened seasons for transportation on ice roads
- Loss of conditions suitable for growth of current crops

2. Active, potentially damaging event (flood, fire, storm)

A first aid kit should contain

- ☐ Emergency telephone numbers: 9-1-1, local poison control centre, your personal doctors
- ☐ Home and office phone numbers for family members, friends, or neighbours who can help
- ☐ Sterile gauze pads (dressings) in small and large squares to place over wounds
- ☐ Adhesive tape, Canadian Red Cross first aid manual
- ☐ Roller and triangular bandages to hold dressings in place or to make an arm sling
- ☐ Adhesive bandages in assorted sizes
- ☐ Scissors, Tweezers, Safety pins, Instant ice packs
- ☐ Disposable non-latex gloves, such as surgical or examination gloves
- ☐ Flashlight, with extra batteries in a separate bag, Antiseptic wipes or soap
- ☐ Pencil and pad, Emergency blanket, Eye patches, Thermometer
- ☐ Barrier devices, such as a pocket mask or face shield,
- ☐ prescription medications (check the medications every six months to make sure they haven't passed their expiry date)
- ☐ <https://www.redcross.ca/training-and-certification/first-aid-tips-and-resources/first-aid-tips/kit-contents>

In a pending or active emergency, rapid action is essential. A good strategy during an active event is to assemble all residents in one safe area of a residence, for example, with an approaching tornado, a basement under the access stairway or a windowless area, or during a flood event, a raised dry secure area. Immediately after the “all clear” has been signalled — for example, over a portable radio — assessments of personal injury and shelter damage take top priority.

Once it is safe to exit the emergency safe area in a residence, make any needed home or shelter temporary repairs and then secure a small area within the home to provide a reduced area shelter for the next 72 hours. Use of supplies should be reduced before and during any disruption to make them last as long as possible. Having additional clothing layers for cold weather assures essential retention of body heat.

At this stage, a decision to relocate to an alternate shelter could be made and a backup plan, including transportation, to exit the home is implemented.

Maintaining contact with neighbours and community is essential for sharing and collaboration for survival. Camping equipment suppliers are a ready source of ideas and equipment suitable for many situations. Heating and generating electricity from fossil fuel sources should be severely rationed as your local storage of these fossil fuels is always limited.

Shopping frenzies are a feature of emergencies. Plan ahead to ensure that your household has the supplies that it needs. For example, batteries, flashlights, dried foods, and portable generators are often the first to be sold out in an emergency. Act in advance — be prepared!

Maintaining communications with family members and emergency aid personnel through cellular telephones requires a source of electricity or batteries. Alternate charging or sharing arrangements will be an essential part of the planning document.

If phones go down, either landline or cell, and you need emergency responders, flag down a first responder or go to the nearest fire hall or first responder facility. (Cell phone towers and other wireless infrastructure are quite resilient.)

Another way to let people know you are safe if phones aren't working is try social media, as Wi-Fi hotspots may still function.

What you can do to prepare

Before an emergency, you need to assess your exposure and act to be fully prepared. How vulnerable you and your shelter are to climate change is a complex mixture of three realities:

- Exposure to the forces associated with changing weather and climate;
- The sensitivity of infrastructure exposed to these forces;
- The capacity of residents and owners to cope with the consequences.

First Essentials

- Prepare a **written emergency plan**. Discuss, brief, and rehearse duties and responsibilities with all household participants prior to the arrival of a disaster.
- Check periodically the equipment in your energy emergency kit. Repair and replace as needed to avoid malfunction surprises when you need reliability the most.
- Participate in and encourage coordinated planning of energy, communications, and transport with neighbours, community, and municipal authorities ¹.

Get Ready:

The best time to plan your emergency response is when there are no stresses arising from immediate problems. When a disaster is imminent, underway, or has just subsided, it is too late! Writing a plan of action with needs for materials and keeping this plan with other important emergency documentation could become central to survival and recovery.

Some readers may consider the costs of emergency preparations to be a financial burden — but making no emergency preparations is a recipe for self-imposed misery and most likely greater expenditures during recovery from an event. One proven strategy for assembling an emergency kit is to contribute to a fund or purchase an item every month. Items for an emergency kit are a great idea for birthdays and other traditional gift-giving times (survival kit, page 6).

3. Energy – Before, during and after an emergency

Life for almost all Canadians in the 21st Century is completely dependent on access to reliable sources of energy. Shelter, healthcare, clean water, and food all depend on energy, as do communications, transportation, sanitation, cooking, and many other aspects of Canadian lifestyles. Canadians are used to the light going on when we turn a switch and gasoline being available at the pump whenever we visit, not to mention warm showers and a cold beer. Pending changes in weather and climate threaten those expectations.



We should follow the example of the military, which at all times instructs its personnel to keep warm, dry, and give great attention to personal hygiene. Moderating threats to survival requires energy to deliver the needed products and services.

Advance planning is essential. Start with this guide, but follow the links and learn more.

¹ See Section 10, Working with your Community, p. 20

Electricity

Electricity is provided to most residences through connections from a central supply at some distant location. Alternative energy resources must be secured when an electrical outage affects a residence. Obvious preparations are to maintain filled backup BBQ tanks, secure reserves of gasoline in approved containers, ensure adequate firewood supply, and to have a survival kit. (see survival Kit Section 6)

There are other potential sources of supply, such as solar arrays ([solar generators](#)), propane tanks, local natural gas or gasoline generators, and stoves and fireplaces using wood or natural gas (which is much less likely to be affected by extreme weather).

Whether a power outage lasts for hours, days, or longer, the absence of electricity has significant impacts on nearly all aspects of living. Power outages can be the result of severe weather, an ice storm, or a tornado touching down. In January 1998, there were major failures in the electrical grids of eastern Canada due to an ice storm that affected millions of Canadians for up to three weeks. Events that affect tens and hundreds of thousands of residents occur routinely.

The Government of Canada provides an example of a written emergency plan at [Get Prepared](#)

At the beginning of an electrical outage, there is normally great uncertainty about its duration. A written planning strategy is a great comfort. It must take personal factors, such as dealing with separation from family members, into consideration. Even if the resident or owner was unable to follow the plan, others may be able to use it. Other parties may otherwise be unaware of personal circumstances and intentions, but a detailed, written emergency action plan will help them to understand and implement your wishes. Brief those who will survive together so that everyone knows their duties and responsibilities when stress is high.

There are often early warnings about possible grid disruptions in the hours before a severe weather event. In Ontario, as an example, one can be added to the email early warning system of Hydro One, which aims to give about 24 hours notice of severe weather threats. These alerts provide information on possible failures of their electrical grid. During this time, follow your written plan and check back-up generators, batteries, and other equipment for functionality.

In addition to dealing directly with the potential loss of electricity, use the time to:

- ☐ Close or install window shutters and covers.
- ☐ Stow lawn furniture or other outside objects which can become projectiles in high winds,
- ☐ Move treasured fragile items to a secure location (away from windows and potentially flooded areas),
- ☐ Re-locate food, clothing and the emergency kit to a protected location,
- ☐ Put survival bedding, water, food, communications, money, important papers in a safe location,
- ☐ Turn off central heating thermostat and hot water tank heater, turn off all other nonessential circuits at the breaker panel to avoid surges when power is restored.

Some of these are reviewed in greater detail in the sections that follow, notably on food, water, buildings and health.

The First Week:

After the first 24 hours without power, the need for larger-scale collaborative action becomes clearer. Discussions with neighbours and assessment of available community resources become important. Tips on energy saving, rationing, collaboration, and production issues can be shared. Extended periods

without grid energy is also likely to create anxiety and conflict issues. Community leaders will be seeking volunteer help to assist those in greatest need.

Energy for personal hygiene and sewage disposal must be arranged in advance. Toilet flushing and sewage disposal can be achieved by re-using water previously used for personal or other cleaning uses.

Access to potable water is essential. Many solutions are available to make lake, river, or pond water safe for drinking. Guidance on selection of [water filters](#) is recommended as there are a wide variety of products.

Batteries are essential for many of today's portable devices. Flashlights, radios, toothbrushes, and cellular telephones are only some of the many devices that should be in your Emergency Kit. Having an ample supply of non-rechargeable replacement batteries is essential. In the absence of power, rechargeable devices are useful for only a day or two.

During most failures in electricity supply, natural gas and bottled gas are still possible to use. If you have non-electrical heating or cooking appliance, cooking may be possible, for example on a barbecue or camp stove. Use such cooking devices out of doors.

Preparations to augment power self sufficiency

Actions now can be done to reduce vulnerability to loss of grid power. Install alternative sources, including solar photovoltaic panels, solar thermal panels, electrical energy storage batteries, electric vehicle charging stations, ground-source or air-source heat pumps, micro hydro, auxiliary fossil fuel power generation, windmills. Self-generation of electrical power for personal consumption; independence and resilience during grid failures; and psychological comfort of knowing that electricity will always be available.

Microgrids are an emerging option. They provide power connections for a single residence or between neighbours. Microgrids can provide partial or complete independence from the electrical grid for individual residences or communities.

4. Water for Survival

A human can live for more than three weeks without food — Mahatma Gandhi survived 21 days of complete food starvation — but water is a different story. The maximum time an individual can survive without drinking water is about a week. In climate-related events, your supply of water may fail or be unsuitable to drink due to contamination. You will need to store some water and plan for access to more if an event lasts more than a few hours.

Drinking Water

Water is essential to maintain human health. Adults require about **3 litres per person per day** to support breathing, sweating, and urinating. Humans begin to feel thirst with the loss of 1% of their body's water. With a 10% loss, humans enter a danger-of-death situation. Importantly, if there is an extreme high temperature during a period of water shortage, additional amounts of drinking water will be necessary to maintain your body's water balance — *and your life*.

Water for Cooking and Personal Cleanliness

Water is needed to allow washing of fresh foods and personal sanitation to avoid transmission of disease organisms, carried primarily by other people, to your digestive or breathing systems. A supply of hand sanitizer liquids or sprays, for maintaining hand sanitation, can be a good substitute for storing less water. See http://www.bvsde.paho.org/bvsacd/cd17/basic_wate.pdf for further information. If you are consuming quantities of dehydrated foods, you will need more water to compensate for the lack of water in the foods being consumed.

Food Preparation and Dish Washing

About 30 litres per person/day is normally required for food preparation and dish washing. In an emergency, it is possible to survive without this but it may be essential to eat raw dry, or canned food (e.g. tuna which can be eaten uncooked) and not wash anything except maybe an eating utensil

Water for Personal Hand Washing and Bathing

About 15 litres of water per person/day is required for normal hand washing. In an emergency it is possible to survive for short periods with less. Alternatively, have bottles of hand sanitizer available if no clean water is available.

Water for Waste Disposal

Human waste (and much food waste) is routinely flushed into municipal sewers and then to treatment systems. Household systems may cease to work if power or water pressure is lost. Maintaining sanitary and disease-control practices consumes significant amounts of water. If an event is predicted be prepared to fill your bathtub and other large containers with water to provide for your dish washing, body washing (by hand if necessary), and bodily waste disposal needs. If water supply fails, toilets can be used several times without flushing. Average Canadian toilet use requires about 30 litres per person/day. In an emergency, personal waste can be bagged for future disposal at designated sites thus reducing some water storage needs.

Preparing for shortage of water

It is always useful to have some water on hand, even if only a few bottles. As well, collected fresh rainwater is usually clean enough for washing and if there is rain, it can be gathered in a bucket or tank and stored for flushing of toilets.

To be prepared for extended periods of lack of water supply from household taps, it is wise to have a few large containers with handles to transport water from a temporary supply (such as a street-level located bulk water delivery truck provided by a municipality) to your residence.

Water for growing your own food

Access to your own, home -grown food in season can help if commercial sources fail. Gardeners will need water to maintain plant growth and health. Rainwater harvesting and storage should be a consideration for gardeners who value highly their food production efforts. See the Nanaimo guidebook: <http://www.rdn.bc.ca/cms/wpattachments/wpID2430atID5059.pdf>

Water Pipe Freezing Alert!

Should there be an extended wintertime period of lack of heat in your residence, be prepared to drain water pipes to prevent pipe ruptures caused by the expansion of frozen water. Water damage from previously frozen pipes, when household heating returns and thaws these pipes, is highly likely — and very expensive to repair.

How Much Water Do You Really Need?

- ☐ While 75 litres per adult person/day is a suggested minimum amount of water needed to satisfy the full needs for drinking, cleansing, and waste disposal under normal conditions, in emergencies it is possible to exist on much less
- ☐ *Must Have:* Essential for drinking (per adult person per day) - 3 litres of potable water to maintain bodily functions
- ☐ *Should Have:* A few more litres for hand washing and cooking/
- ☐ *Optional:* if available (per adult person per day):
- ☐ 30 litres of potable water for fresh food washing/rinsing and personal sanitation
- ☐ 15 litres of potable water for basic hand washing
- ☐ 30 litres of any quality water for toilet flushing

5. Food for survival

Access to food when the system is down

The aim of preparing for longer-term periods of food shortages is to have on-hand a range of canned, dehydrated, or freeze-dried packaged foods. These should be in sufficient quantities to serve your needs while lack of accessibility or depleted supply sources are repaired or re-supplied.

Food Storage

- Foods to store range from bulk to sequential purchasing of commercially prepared items (canned, boxed, or bulk) or fresh root vegetables. Alternatively, home processing of fresh produce (either home grown or purchased) can be undertaken during the growing season.
- There are alternatives for storing food at home. Options range from installing specialty shelving, to creating specialty storage rooms, and building insulated buildings, such as traditional called root cellars.
- Different storage conditions may be required: from warm/dry, cool/dry/, cool damp/, to refrigerated/frozen conditions. Dry conditions are normally required for some fresh vegetables (onions, squash, grains, nuts, dried herbs) and canned/plastic contained items. Moist conditions are normally required for many root vegetables (beets, carrots, turnips, and many fruits).
- Here is a table of storage conditions: [Storage Conditions: Fruits & Vegetables](#)

Creating an emergency supply of food and medical supplies in your home is not just a strategy to have them available for an environmental crisis. These are also of benefit should a household member become immobile while recovering from surgery or be confined to the residence during for other medical reasons — especially pertinent if you are living alone.

There are many issues to consider when planning and creating emergency storage accommodations for your food 'stash'.

Keeping Food Edible

Much food must be kept cool or cold to remain safe to eat. Electrical outages become important —especially in hot weather. In winter periods, refrigerated and frozen foods can be temporarily moved to shaded outdoor areas to maintain short-term storage conditions. In summer periods with hot weather, wrapping refrigerated and frozen foods in layers of blankets (even unused clothing) can prolong storage conditions and maintain fresh produce edibility for a few days. If you choose to create an outdoor food 'stash', consider possible attacks by mice, rats, ra-

coons, dogs, etc. Materials such as chicken wire or wooden planks/plywood can help protect your valuable pile of food as can placing them in sealed containers.

Food Handling Tips

A loss of electrical or gas power, for a long period, affects some heat-required meal preparations. Some foods need to be heated to a certain temperature, for health or digestion reasons, before consumption. Also, if water supply is cut off, recently harvested/purchased fresh produce may not be satisfactorily cleaned and may quickly decay or harbour disease-laden organisms.

A supply of food for the family should be everyone's target. It can range from emergency supplies for a few days to survival rations for much longer periods. Depending on continued availability of food delivered '*Just-In-Time*' to wholesalers and retailers is a risky expectation during environmental emergencies. Stockpiling non-perishable foods can be a solution.

Securing Your Food Supply for Long-Term Events

Home Generation of Electricity can be used to maintain refrigerators and freezers (and other services). Homeowners, and some condominium owners, can provide personal, but short to mid-term periods of food storage by installing a permanent whole-house, fossil-fuelled electrical generator which is

automatically activated seconds after a power outage. The bonus to this system is that household heating/cooling, cooking, and refrigerators/freezers continues to function. These do, however, depend on regular (about monthly) truck-delivered fuel refills.

One solution is the creation of an auxiliary “Deep Pantry” of foods to serve as a buffer between a smaller kitchen pantry and items regularly replenished from a grocery store. See a detailed article on [Home Food Storage](#) for details on how this can be done. A deep pantry (located in a basement, garage, closet, or unused room in your house) contains the foods typically used in bulk form—but stores more of them. In normal daily practice you replenish depleted items in your kitchen pantry with available items from your auxiliary deep pantry and subsequently resupply depleted items in the deep pantry.

Another tactic is to stockpile (and rotate) freeze-dried foods in bulk. There are many vendors selling pre-packaged, freeze-dried foods singly or by the bucketful. These foods can have a shelf life of up to 25 years when stored according to recommendations.

Various pre-packaged freeze-dried food vendors can be located by a web search using [“pre-packaged food survival kits”](#). The trick is to anticipate a range of situations where having backup supply could be needed and to have available what you may need.

6. Survival Kit

All survival strategies depend on one’s personal knowledge. Advance planning is essential. Start with this guide, but follow the links and learn more. A plan gives much a greater chance of success. Start one today! . Many good ideas are presented in Canada’s [Your Emergency Preparedness Guide](#)

The first choice (particularly in an emergency event: fire, flood, extreme storm) is to decide whether to stay put or evacuate. Local authorities can help by suggesting or ordering evacuations to safety. Follow their advice.

Assess your physical ability. If a walk-away would be difficult or impossible, prepare to act sooner rather than later. Identify safe places, hardened rooms, evacuation centres, safe or hardened structures in for example homes of relatives and friends.

If staying at home;

The following items, in appropriate quantities,

- ☐ Lots of water or regular independent access to potable water.
- ☐ A stock of essentials, such as medications, medical supplies
- ☐ A large well stocked pantry.
- ☐ A safe source of energy for cooking, e.g., a camp stove but only if used outside
- ☐ A first aid kit, plus knowledge on how to use it (a first aid book).
- ☐ A source of heating or cooling. A 120 Volt heater with fan if you have access to electricity.
- ☐ A battery or windup radio
- ☐ Spare batteries.
- ☐ Plywood or wood to make repairs to window with appropriate tools.
- ☐ A table of resources in the community.

For Apartment dwellers add:

- ☐ A plan for dealing with no elevators, air conditioners or heating.
- ☐ A plan for dealing with no electricity for cooking (negotiated in advance with the owner of the apartment or condo)

Leaving Home

Have plan, or plans, about what to do in various situations and a list of criteria to aid in making the stay or go decision

Checklist

The following list covers a range of situations. Have them on hand so you can cope in fire, flood, storm, outages, etc.

- | | |
|---|---|
| <ul style="list-style-type: none"> <input type="checkbox"/> Air is essential. Disposable masks/filters may be needed particularly for smoke <input type="checkbox"/> Water is essential, but heavy. Carry a water bottle, water filter or purification tablets. <input type="checkbox"/> Food is always important. Freeze dried is light, but bulky. Dried is more compact but more bother. Canned is heavy. <input type="checkbox"/> First aid kit for travel, essential medical supplies <input type="checkbox"/> Personal feminine supplies, toilet paper, and other supplies as required <input type="checkbox"/> Cash first, then cards, cheques <input type="checkbox"/> Flashlight and batteries <input type="checkbox"/> Very important papers (e.g. insurance, passport, personal phone/address book, banking, passwords, phone numbers) <input type="checkbox"/> Seasonal clothing, weather protection <input type="checkbox"/> Cellular telephone and its charger <input type="checkbox"/> Fire starting tools, tiny saw, lighter, quick-fire packets, candles <input type="checkbox"/> One pot, one cup, multi-purpose pocket knife <input type="checkbox"/> For rural and remote - Snare wire and light cord, Fish line, hooks <input type="checkbox"/> Lightweight camping equipment <input type="checkbox"/> Pet accommodated or taken as a travel companion. <input type="checkbox"/> A backpack appropriate in size for what you're planning to take. Take only what you can readily carry — a maximum of 20% of body weight. <input type="checkbox"/> Leaving by vehicle (see car kit) <input type="checkbox"/> If it is possible to leave by vehicle carry food, water, clothing and footwear, particularly if you lack information on what you will find en route. <input type="checkbox"/> Similarly, carry equipment for eating, water, sleeping, shelter, personal hygiene. <input type="checkbox"/> Plan what you want to take from the residence. | <h3>Car Kit</h3> <ul style="list-style-type: none"> <input type="checkbox"/> Your car should have the following for all eventualities, useful as well for breakdowns or other unforeseen events. <input type="checkbox"/> Flat tire changing gear, spare, a pump to inflate tires, canned sealer <input type="checkbox"/> Whistle – Maps, Flashlight, Rope <input type="checkbox"/> Blanket(s), seasonally appropriate, clothing (for a long walk, or a long sit) <input type="checkbox"/> First aid kit Accident package (rubber gloves, CPR airway, band aids) <input type="checkbox"/> Highway warning placards or flares <input type="checkbox"/> Some candles, lighter <input type="checkbox"/> Food, water, water filter <input type="checkbox"/> Seasonal equipment (shovel, chains, windshield washer fluid) <input type="checkbox"/> Keep your car's gas tank full, carry spare fuel if appropriate <input type="checkbox"/> Tool kit, with duct tape and jumper cables <input type="checkbox"/> A Shovel, a saw for fallen branches, Knife, Duct tape <input type="checkbox"/> Commercially available kits are available from Canadian Red Cross on the CRC website, The Salvation Army a standard kit as well as a car kit, and from many retailers . |
|---|---|

7. Protect Your Health

Climate change threatens our health by affecting the safety of where we live, our food, water, and support systems. The severity of these health risks will depend on the ability of public health and safety systems to address or prepare for these changing threats, as well as factors such as an individual's behaviour, age, gender, and economic status. Impacts will be based on where a person lives, how sensitive they are to health threats, how much they are exposed to climate change impacts, and how well they and their community are able to adapt to change. For further information visit [climate/health](#).

The First 24 hours

Medicines

Ensure that the medicines upon which you depend are readily accessible and that refills are ordered in a timely manner before an emergency hits. Have them ready for an emergency. Store them in a backpack or a duffle bag so you can take them with you if you have to evacuate.

Key contents of a medical kit:

- ☐ A first Aid Kit
- ☐ Basic medicines, including your prescriptions, pain killers, antiseptic cream
- ☐ Bottled water in sealed, unbreakable containers, replace the supply every 6 months) and packaged or canned food that won't go bad, (see survival kit page 6) for further information)
- ☐ Walking shoes, rain gear, and a change of clothing
- ☐ Blankets or sleeping bags
- ☐ Toilet paper and other personal supplies
- ☐ An extra pair of glasses
- ☐ A battery-powered radio and flashlight, along with extra batteries
- ☐ Spare cash,
- ☐ An extra set of car keys,
- ☐ A list of your family doctors
- ☐ Important family information such as a list of any medical conditions or medical devices
- ☐ Photocopies of all important identification for you and your family, including health card numbers
- ☐ Store copies of key information on your mobile phone
- ☐ Special items for babies, elderly, or disabled household members
- ☐ Cell phone and contact information for family and friends



First aid medical training

Take a Basic First Aid Course from St. John's Ambulance <https://www.sja.ca> and an advanced injury skills course [https://sjapeel.ca/medical first responder](https://sjapeel.ca/medical_first_responder). Know which of your neighbours are trained. Some key skills that would help in a disaster include:

- stopping the bleeding from a wound and recognizing arterial bleeds;
- cleaning and dressing a wound :
- making a splint for a broken or sprained bone or joint.

Treating shock may be needed before the arrival of first responders. Learn how to recognize the symptoms and treat a person who is going into shock. Keeping a person calm, their feet elevated, and their body warm can help their blood pressure regulate, preventing it from dropping too low. Treating [Hyperthermia](#) and burns can also be important.

More information is available at <https://urbansurvivalsite.com/important-first-aid-skills/>

The First Week

Changes in weather and climate will change the range and level of exposure to extreme conditions and to new or current risks.

Increased risk of Asthma & Allergy

Longer, hotter summers raise the frequency and severity of smog and pollen while decreasing overall air quality. Ozone and pollen can worsen existing allergies and trigger asthma attacks. Air quality in your community can be found at [Air Quality Canada](#).

To reduce risk, limit outdoor activities during times of high pollen, such as early morning, stay indoors during humid or windy days when pollen counts are high, keep windows closed during pollen seasons and use air conditioning/ filters if possible. Further information: [asthma-climate](#).

Heat & humidity – extreme heat events bring risks to health, especially to more vulnerable people. Heat symptoms include: edema (swelling of hands, feet, and ankles), rash, muscle cramps), fainting, exhaustion, heat stroke (fever and often by unconsciousness). Do this: Drink plenty of cool water, stay out of sun/heat – preferably in cool or air conditioned space, take cool showers, dunk your head in cool water to reduce body temperature, if you go outside wear a hat and loose clothing to protect you from the sun and stay in the shade. The Health Canada reference on how to deal with [Extreme Heat](#) can be found at this site.

Mould Moulds can cause nasal stuffiness, throat irritation, coughing or wheezing, eye irritation, or, in some cases, skin irritation. Hotter wetter weather can augment growth of mould. In poorly insulated or

Coping with heat waves

In 30°+ C hot weather periods, cooling is mandatory for survival. In Australia, they counter this [silent killer](#). by suggesting:

- Get down low to the ground in the shade or in a basement.
- Wear a hat and looser-fitting garments.
- Go browsing in an air-conditioned mall.
- Keep chilled water in the refrigerator for drinking.
- A bowl of ice or wet tea towel in front of a fan becomes a small cooling station.
- Turn off non-essential electrical lights/appliances — Every degree counts.
- Chill your pillowcase in the fridge
- Run your wrists under cold water or going to bed in damp socks.
- Travel to somewhere cooler (on the water, to higher altitude)
- Some medications can exacerbate the discomfort caused by heat — consult your doctor about alternatives.

poorly air-sealed homes in the winter mould can grow in your walls. Either increase ventilation with an HVAC system, decrease winter humidity or seal your leaks/add insulation – especially in your attic in an older home.

Water borne diseases During flood events, contamination of wells and surface water is widely assumed, and boil water advisories are generally issued. Waterborne pathogens [e.g. E-coli, salmonella, shigello-sis] are spread through contaminated drinking water, exposure to contaminated water while swimming or through food contaminated with bad water. When in doubt boil water for three minutes during suspected contamination of your water and listen for updated public health announcements.

New Parasites

Changing climate is allowing new parasites to colonize regions of Canada. We now must increasingly think of parasites as a Canadian problem, not just an issue in tropical countries. Assume that anything now in Kentucky or Northern California will arrive in Canada within 25 years. Canadians consuming water or eating fruit/vegetables in tropical countries can import new diseases which may find new climate conditions amenable.

Two important examples follow:

- Learn how to recognize a tick bit and how to pull the tick out properly. How to remove a tick: [Tick Removal](#)
- Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible.
- Pull upward with steady, even pressure. ...
- After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol or soap and water.

Tick borne Lyme disease is invading Canada and is found increasingly in Ontario, Quebec and the Maritimes with only Saskatchewan and Alberta having no reported incidents. Check yourself/pets after every walk in long grass. Wear long pants/boots. See [Lyme Disease](#)

□ *West Nile Virus* Spread by birds it can affect humans and many mammals such as dogs and is especially bad for horses. See [West Nile virus fact sheet](#)

Vaccines - most tropical diseases do not have vaccines [there is a West Nile vaccine for dogs], To avoid the disease, avoid getting bitten by a mosquito and rely on properly cleaned food & water,

Long-Term Adaption

Health Policy Recommendations

As the climate warms, most of Canada will see a higher number of very hot days, much drier if you live in a dry zone like Lethbridge and much more humid if you live in a wet zone like Ottawa. Climate zones are predicted to shift significantly in summer, so that by 2080 Toronto's climate will resemble that of today's Nashville, Tennessee (see link for more details: [North American cities](#)). Canadians can prepare to live with heat as well as cold. Planting trees to shade your home, and having a cool basement area available if you lose power are examples. The medical journal, Lancet notes: "The effects of climate change are being felt today, and future projections represent an unacceptably high and potentially catastrophic risk to human health. See link for more details: [WHO](#)

Mental Health & Trauma

Post Traumatic Stress Disorder — depression, anxiety, and substance use — can occur from climate related stress or events. If affected, understand your symptoms as 'normal' trauma responses, particularly

if they are short-lived. Symptoms can include: poor concentration, confusion, self-blame, withdrawal, intrusive thoughts about the event, and a broad range of emotions. Being prepared improves the chances of a healthy recovery. Increase Your Psychosocial Resilience by being optimistic, cognitively flexible, having active coping skills, maintaining a supportive social network, attending to personal physical

8. Make Your Residence More Resilient

Extreme events and changes in the overall climatic conditions can negatively affect your home or workplace. Most existing structures have not been explicitly designed to withstand the predicted changes likely from climate change. It is likely that your house or apartment was built to meet the standards of the time when it was built. As climate changes, your home may need alteration or reinforcement to be more robust particularly during extreme weather events. In low coastal areas and valleys, it may become essential to relocate or at least to raise and reinforce structures, if continued residency in the threatened areas is acceptable. .

There are some short-term actions, which can reduce damage, harden vulnerable places, or help make structures more habitable during a heat or cold event, or violent storm. Some of these can be phased in over time as repair or replacement (e.g. rooves, drains) is done.

The most probable short-term impacts on homes will come from wind (including falling trees and flying debris), water (flooding), extreme heat or cold events and loss of water and energy sources.

Short Term Actions to respond to climate change

What can I do now to reduce my vulnerability?

- ☐ Make sure your insurance covers wind and water damage including structural integrity, and roof and siding repairs.
- ☐ Install storm shutters as soon as severe weather is forecast.
- ☐ Install extenders on downspouts
- ☐ Keep trees near buildings trimmed
- ☐ Install a one-way valve for sewage
- ☐ Have a generator and keep it working
- ☐ Have backup power for a sump pump or a second pump if your foundation has a sump.
- ☐ Keep cleats or ice grips available
- ☐ Keep products to melt ice available
- ☐ Identify a safe location (inner walled room) for violent storm events for protection from flying broken window glass
- ☐ To limit overland flooding, remove snow and debris from overland drainage flow paths (also have on hand a backup sump pump).
- ☐ Install covers over drainage wells (basement windows) and keep clean

Keep Your Stuff Safe

Put away or secure outdoor furniture, recreational vehicles and children's toys when not in use. Cover, secure (tie down/ otherwise secure), or put away. Reduce the risk of loss of those items and limit also damage to your surroundings from wind, hail, heavy rain or ice. Protection can be inexpensive such as rope, bungee cords or a heavy rock on a cover or just taking the item indoors. Done for the day, secure/ put it away.

Medium Term Actions to reduce vulnerability

Changes to the property itself can make it more robust when faced with significant changes to climatic conditions or exposure to extreme weather events. Such alterations can often be postponed to the point when it is time, for example, to replace a roof or a heating or cooling system. Others can be done as general improvements to the property over a few years.

- ☐ Alter landscaping to divert water away from structures
- ☐ Install awnings to reduce solar gain.
- ☐ If you live in a fire-prone area either remove trees from near your home or plant trees that are less flammable [i.e. not pine]
- ☐ Install windows with an R rating (heat retention) of at least 3-5 and that open
- ☐ Install a reservoir to store runoff water (even a rain barrel helps)
- ☐ Install a metal roof when replacement is needed
- ☐ Install solar panels/backup generator/home batteries
- ☐ Grow food in your garden instead of grass
- ☐ Install a cold-storage room
- ☐ Plant drought or heat resistant shrubs/trees
- ☐ Move to one story/low rise residence if stairs are a challenge

Long Term actions

- ☐ Install some or all of the components of a microgrid (page 9) or join a neighbourhood microgrid
- ☐ Install a Green roof – on flat or gently-sloped roofs ([Green roof](#))
- ☐ Install a safe room (e.g., a storm cellar - may double as storage for safety kit or other uses). flood proof or raise dwelling
- ☐ Relocate away from a flood zone

For Shore side and waterfront

Short term:

- ☐ Storage of goods and equipment well above water line,
- ☐ Dwelling flood resistance improvement. (e.g. Backup valves,)
- ☐ For flooding, keep catch basins/ drains clear and ensure downspouts and eaves troughs are unobstructed. ie. stay on top of home maintenance in good weather prior to a disaster.
- ☐ Secure boats well to withstand high winds or heavy precipitation

Medium Term

- ☐ No cellars below maximum water line, reposition decks and docks to secure areas,
- ☐ Use floating docks, well secured to shore
- ☐ Locate septic tank and tile bed above flood zone
- ☐ Harden water barriers or redirect watercourses if needed

Actions for owners or renters

In addition to an emergency survival kit those who are renters or who live in high rises can take specific precautions:

- ☐ · Become part of your coop or condo or rental association board, make sure when replacing or updating infrastructure they take into account flooding, wind, heat, and snow risk and other risks.
- ☐ If updating your rental home for resiliency, discuss with your landlord. The updates done could be discounted vs. your rent. (e.g, updating/ extending downspouts to reduce flooding risk or having overgrown shrubs or trees cut back to reduce damage from ice storms or windstorms or tropical storms, having vents or opening windows and shades.
- ☐ For hi-rise) have an emergency plan if loss of electricity eliminates heat control or elevator service (particularly for less mobile residents)
- ☐ Have an agreement that allows use of e.g. barbecue or camp stove on a balcony in the event of power failure.

The Institute for Catastrophic Loss Reduction has an excellent set of booklets in both English and French exploring what a homeowner can do to deal with loss and prevention. <https://www.iclr.org/homeowner/>. A good municipal source is the Clean Air Council [Clean air partnership](#), which has publications on municipal and homeowner approaches and an excellent municipal example of Durham at [Durham regional clean air partnership](#).

9. Insurance, Risk and Climate Change

The insurance industry has long known and accepted the fact that human activity has a measurably negative impact on the stability of global and local climate. Extreme weather events have a clear effect on insurance claims increasing year over year. The Insurance Bureau of Canada (IBC) reports that 2018 insurance claims for severe weather events across the country cost \$1.9 billion. This is the fourth highest claims record in history for extreme weather events. However, unlike the Quebec and Eastern Ontario Ice Storm of 1998, the Calgary floods of 2013 or the Fort McMurray wildfires of 2016 (the other three highest years), no single event caused the high losses in 2018. In 2018 Canadians experienced significant losses from a host of less extensive severe weather events coast to coast. [Severe weather 2018](#)

Severe weather insurance claims currently represent about 3.5% of the gross premium revenue of the insurance industry in Canada. In the words of a local broker, these increasing costs show up in higher premiums, higher deductible thresholds, and the appearance of “riders” which effectively move the claimable risks out of the general insurance and into special categories for severe weather with additional premiums. As these higher costs mature into increased premiums, there may also be “discounts” for policyholders who can demonstrate preparedness for mitigating insurable damage resulting from severe weather events.

It is not only insurance companies that pay the increasing cost of severe weather. The IBC estimates that damage repair costs governments, mostly local governments, at least three times the value of commercial and householder insurance claims for severe weather. Over time, these costs will show up directly or indirectly as tax increases.

The IBC actively encourages people to increase their “insurance literacy”. It has an informative website <http://www.ibc.ca/> which provides details on insurable risks and suggestions for actions which commercial and householder policy holders can take to be prepared for and mitigate damages before they happen. Whatever unfolds with respect to extreme weather, in the short-term there are many actions that can be taken to adapt to local extreme weather. Not only should householder and commercial insurance policy holders be themselves knowledgeable about and prepared for extreme weather events, they should also lobby and encourage their governments make advanced and appropriate response, recovery and adaptation plans.

Insurance companies already understand the costs of not acting. If you don’t take sensible actions you will pay more, and/or you may not be able to afford insurance by not taking precautions to ensure your safety and health. The costs of repairs may well exceed what you are able to pay and all costs are your own if you do not act to insure and mitigate costly risks.

10. Working with your Community

Your community can be the greatest asset in dealing with climate change and in particular with emergencies. Neighbours, community associations and local authorities will be allies and de facto first responders. Your friends and neighbours can normally be expected to pitch in when needed. The best strategy is to get them involved and get involved yourself before it is essential to do so.

- ☐ Ask around to find out who is also interested in helping others and themselves in the community
- ☐ Set up neighbourhood links with your neighbours and others on whom you may have to depend or aid.
- ☐ Prepare plans involving your neighbours (like block captains, support groups neighbourhood watch or similar)
- ☐ Have a planning session
- ☐ Work with the broader community to be prepared (determining who to contact in an emergency,
- ☐ Make a list of who has the skills to help and who will likely need your help
- ☐ Lobby your municipality to have an adaptation plan and keep it up to date.
- ☐ Have a community emergency protocol defined and widely known. (where is an emergency shelter, will the schools be open or serve as shelters?
- ☐ Community support: talk to your representative regarding who will help?
- ☐ Is it possible to stockpile supplies at the community level – such as emergency water and food at a community centre or school? Arrange to share supplies and equipment in the event of an emergency.
- ☐ For predictable situations hold the rehearsal brackets for example what to do in a flood [why not have it at the community picnic?]

Note: Britain has produced community emergency plan toolkit that is a useful reference: [UK Tool Kit](#)

A Canadian source: [Emergency Response Canada](#)

11. Conclusion: be prepared to survive

This guidebook has been prepared by the Canadian Association for the Club of Rome summarizes a wide array of readily available information in a single document to help people prepare to both cope with the changing climatic conditions and be prepared for emergency events associated with climate change. The sections have identified what one can do now that will reduce your exposure and vulnerability to climate and weather events. This document also includes the things you can do over time to make your life and your property as well as your community safer. Weather and climate are changing and because of this people may have to do things differently. Those who are prepared will be better able to cope with unforeseen or predictable impacts.

12. Information Sources

Opt-in to a notification system if offered by your local emergency management organization.

Include these sites in your emergency plan and bookmark them for quick access:

- Public Safety Canada's website on emergency preparedness, GetPrepared.ca and the mobile version, m.GetPrepared.ca
- Canadian Red Cross: www.redcross.ca
- Environment Canada: www.ec.gc.ca
- St. John Ambulance: www.sja.ca
- The Salvation Army: www.salvationarmy.ca
- The Canadian Hurricane Center: www.ec.gc.ca/ouragans-hurricanes

- Sign up to receive regular safety tips from GetPrepared.ca.
- Follow Public Safety Canada and GetPrepared on Twitter:
 - Public Safety Canada: [@Safety_Canada](https://twitter.com/Safety_Canada)
 - GetPrepared: [@Get_Prepared](https://twitter.com/Get_Prepared)

Readers are encouraged to share this document electronically with others, and to make copies to circulate. The document has been formatted so that if needed it can be printed on normal printer paper. It is expected that this edition will be revised periodically as new information becomes available.

My Emergency Contact List	Phone # (could keep on speed dial)
Fire, Paramedic, Police, Poison control	911 or...
Doctor	
Pharmacy	
Next door neighbour	
Relative or friend to contact	
Electric Utility	
Gas	
Water	
Insurance Company - home	
Insurance Company - vehicle	
Community organization	
Pet Hospital/Veterinarian	
Animal control	
Others: e.g., school, business	
<p>Note: if communications are down you may have to travel to get ability to contact these numbers. Keep a paper copy available for emergency use.</p>	