

# Hazard Risk Analysis

## Overview and Instructions

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### What is a Hazard?

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A hazard can best be described as:

***A threat to humans and what they value: life, well-being, material goods, and environment.***

There are many things which can be a threat – falling down a flight of stairs can certainly injure someone, as can being involved in a motor vehicle accident. However, here are only concerned with hazards that are likely to cause a major incident or disaster for the entire community. Common examples would be floods, forest fires, snow storms, a disease outbreak, or a train derailment. *Appendix 1* includes a list of potential hazards that could lead to a community experiencing a disaster.

### Types of Hazards

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When people think about hazards they tend to think about the source, or cause of hazards. There are generally three different ways to think about hazards:

1. natural
2. diseases, pest infestations and epidemics
3. human-caused hazards.

## Natural Hazards

Natural hazards are those that were normally thought of as “acts of God” (for example earthquakes and hurricanes). These hazards have their origin in the natural environment – they often occur as a result of weather (like snowstorms) or as a result of something to do with the earth (like landslides).

## Diseases, Pest Infestations and Epidemics

Diseases, epidemics, and infestations may apply to people, animals, or plants. Often it is hard to find the cause or origin of diseases – for example, West Nile virus existed in the Middle East for a long time before humans brought the disease to North Vancouver by taking birds or mosquitoes to the area on a boat or plane.

## Human-Caused Hazards

Human-caused hazards are caused either by people doing things deliberately, such as building of bombs or just not taking the right preparedness steps. When people don't take the proper preparedness steps even when they know they should, it's called an “act of omission”, such as not maintaining a plane, or not building a structure with enough care.

## Natural and Human-Caused Hazards

Some hazards can be both natural and human-caused. For example, a forest fire can be started by humans (like careless campers) or by lightning.

## Why is Understanding Hazards Important?

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It is important to understand which hazards have the potential to threaten your community. Some communities choose not to identify and discuss which hazards exist – kind of like burying your head in the sand and hoping that if you don't talk about them, they won't occur. But a quick look at what has happened to rural, remote, coastal and Indigenous communities in Canada has shown that many hazards have had an impact on many communities.

In many cases the community was directly impacted – sometimes there were deaths, sometimes injuries, but often some financial loss. In some cases communities could be evacuated, but in the end there is no damage – for example, if a forest fire threatened the community but never actually reached the community. In other cases, the community was impacted even though the event originated a considerable ways away – for example, a power transformer might blow up and leave communities without power hundreds of kilometers away. Or in other situations, no one in the community was directly affected but the community responded to rescue tourists and visitors – for example, when an airplane crashes or a boat capsizes nearby. The community rallies together to provide what support it can.

Many communities have been affected by one or more incidents or disasters. Identifying what hazards have happened in the past is one thing to consider. Understanding what has happened to other communities can assist community leaders in determining what hazards have the potential to happen to them.

So, if your community wants to do more than just simply react to hazardous events and disasters, if your community wants to look at ways to reduce the risk of disasters and to become more resilient, then the first step is to identify and understand which potential hazards exist. The second step is to note which hazards have previously had an impact in your community, and if so, when and where they took place.

## Hazard Risk Assessment Instructions

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There are 17 categories of hazards for you to assess (See table below). In an ideal world, you would assess all of these hazards but your planning team may decide to initially focus on just one area of hazards for this risk assessment, because either those hazards are what the community is most concerned about (based on past events), or there might be recent events that have happened to other communities which are making your own community concerned (e.g., pandemic disease, flooding). If you decide not to assess all hazards faced by your community right now, you will want to come back to the other hazards later. It is often the hazards you don't anticipate that can have a serious impact on your community.

Here are six steps to assist you to complete the Risk Assessment:

### 1. Decide on which hazards you will start with:

- Each hazard has a number of factors attached that describe the hazard.
- Make sure you and/or all the members of the team are clear on the definitions of the hazards and the discussion information.
- Additional information can be found in the Hazard Risk Analysis Tool for each hazard under Hazard Risk Analysis list of hazards and in the "Provincial/Territorial Information Guides".

### 2. Consider dividing your community into zones:

- Review the Community Disaster Resilience Planning Resources on Mapping to identify zones for your assessment.

### 3. Rate the factors for each hazard:

- Rate your community against each factor using the following scale:
  - Yes
  - No
  - Need More info
  - Not Applicable
- Place a check in the "yes" box next to each factor you believe is "strong" or relates to your community.
- If you believe the factor is either not present in your community or present only in a minor way, check "no".
- There may be some factors you think do not apply to your community, or you might need more information. In this case, check "not applicable", "needs more information" or cross that indicator out so that it does not count in your assessment of that section.
- Before crossing anything off, make sure you consider whether it really is something you don't have in your community at this time but is worth looking at in the future. If you think it should be looked at and developed in the future, you would not cross off that section.
- If you are working in a group we suggest that you go through each factor and discuss your assessment as team before deciding which box to check.

### 4. Highlight factors that are important to your community:

- If you feel that any factor is particularly important to your community, and you want to make sure to identify it as something you want to focus on in your plan, check the "important to my community" box.

## 5. Rate your community's hazard risk level:

- When you have finished your assessment look at the number of boxes you have ticked. Pay particular attention to those that are marked with an asterisk symbol: \* – these indicators are considered to be more important in assessing whether or not the hazard is likely to occur.
- Once you have finished all of the factor boxes for a single hazard, review your checks and rate your community's hazard risk using the following scale:
  - High Risk
  - Low Risk
  - Need more info
  - Not applicable

Be sure you use the “not applicable” rating only for those hazards that have absolutely no chance of taking place in your community – for example, a tsunami in Saskatchewan.

- In some cases, there may be hazards that you need more information on to be able to assess them. In this case you may want to check the “more info” box and see whether others in the community have information that could help you more fully assess this section.

## 6. Complete Hazard Risk Profile Template:

- At this point, you can now determine if the hazard applies to the entire community or not. Note that some hazards will apply to the entire community, while in other cases they will only apply to one specific area in the community. For example, a windstorm will likely happen to the entire community, while a snow-melt flood might only happen in the area by the river.
- Then transfer your rating into the first column of the Hazard Risk Profile Template.
- If you believe that the hazard would apply equally to everyone in the community, then you can leave it as an overall community rating. If you think it would only apply to one or more areas then you should complete the assessment for each of the areas (or zones) that you have identified in your community.

## Comprehensive Classification and Type of Hazards

Category	Hazard
Accidents	Airplane Crashes Marine Accidents Motor Vehicle Crashes Train Derailments
Astronomical	Asteroid, Comets, and Meteor Crashes Geomagnetic and Ionospheric Storms Space Object Crashes
Atmospheric	Blizzards Climate Change Drought Extreme Cold Fog Frost Hailstorms Heat Waves Hurricanes Ice Fogs, Ice Storms, and Freezing Rain Lake-Effect Storms Lightning and Thunderstorms Microbursts Sea Storms and Sea Surges Seiches Snowstorms Tornadoes and Waterspouts Windstorms
Conflictual Social Action	Conflictual Social Action
Contamination	Air Pollution Soil Contamination Water Contamination
Dam Failure and Structural Collapse	Dam Failure Structural Collapse – Buildings Structural Collapse - Transportation
Diseases	Diseases - Animals - Air & Water Diseases - Animals - Human Transmitted Diseases - Animals - Animal Transmitted Diseases - Human - Air and Water Transmitted Diseases - Human - Animal Transmitted Diseases - Human - Human Transmitted Diseases - Human - Food Transmitted Diseases - Plants - Human Controlled Diseases - Plants – General Plant and Pest Infestations
Earthquakes, Tsunamis & Volcanos	Earthquakes Tsunamis Volcano-Ash Falls, Projectiles and Lateral Blasts, Pyroclastic Flows and Lava Flows

## Hazard Risk Analysis Overview and Instructions

Category	Hazard
Fires	Brush, Bush and Grass Fires Community Structural Fires Community Interface Fires Forest Fires or Wildfires Peat Bog Fires
Food Shortages	Food Shortages: For Communities that depend mostly on local food for sustenance For communities that depend mostly on food grown elsewhere for sustenance
Geological Hazards	Dust and Sand Storms Erosion, Deposition and Desertification Expansive Soils Gravitational Mass Movement (Landslides) Land Subsidence and Sinkholes Submarine Slides
Hazardous Material Spills, Explosions and Oil Pipeline and Gas Leaks	Gas Explosions and Gas Leaks Mine Explosions Oil Pipeline Leaks Other Explosions Hazardous Material Spill - On Site Hazardous Material Spill - Air Transport Hazardous Material Spill - Marine Transport Hazardous Material Spill - Land Transport Hazardous Material Spill - Rail Transport
Hydrological Hazards	Avalanches - Natural and Human Caused Flash Floods Ice Jam Floods Local Floods Rain Storm Floods Snow Melt Floods Glaciers Icebergs, Sea Ice and Ice Floes Lake Outbursts
Nuclear Failure	Nuclear Accidents
Power and Water Outages	Power Outages Water Outages
Riots	Riots
Terrorism	Terrorism – General Terrorism – Biological Terrorism – Chemical Terrorism - Cyber Terrorism Terrorism - Explosives and Bombs Terrorism - Nuclear