CHAPTER 1

Introduction to Emergency Management

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LEARNING OUTCOMES

After completing this chapter, you should be able to:

- Describe basic emergency management concepts.
- Define key emergency management terms.
- Describe the principles that structure emergency management.
- Identify types of legislation that structure emergency management at local, regional, provincial and territorial, and federal levels.
- Explain the evolving nature of the emergency management field.

CHAPTER OUTLINE

Canada is a wonderfully diverse country. Across its provinces and territories and the Nations, you'll find all types of people, communities, natural spaces, and urban areas. However, this means that Canada is also home to a variety of hazards that we must be aware of in our daily lives.

Most Canadians have been affected by an emergency in some way. Some emergencies may have minor effects, like a short-term power outage or a flooded basement. Other emergencies, such as a house fire, an earthquake, or an emergency evacuation from a community, can be traumatic and life changing.

While there will always be some risk of hazards, communities can take steps to make themselves safer. Many will hire **public safety professionals** known as emergency managers to work with residents, governments, and businesses to find ways to live safely. While emergency managers can't prevent all disasters, they can help communities avoid some hazards and lessen the impacts of others. They do this by identifying hazards, creating emergency plans, and making sure a community has the necessary resources to handle the situation.

This textbook introduces the concepts, processes, and tools that public safety professionals use to do their jobs, starting with some of the most important terms used in the emergency management field.

public safety professionals
people who work in the field of public safety, which includes law enforcement, corrections, fire and rescue, border services, security, and related fields; for the purposes of this textbook, this term refers to emergency managers and emergency responders

EMERGENCY MANAGEMENT ACROSS SECTORS

Public safety professionals are people who work in the field of public safety. Within local, municipal, or regional authorities, this field includes law enforcement, fire and rescue, hospitals and health care, and corrections.

Public safety professionals may also work for federal and provincial/territorial government departments, border services, and international aid agencies. These public safety professionals perform many of the same tasks, often with a different scope. For example, an emergency manager working for a local authority may identify local hazards, while one working for a government department may look at economic disruptions. In other cases, public safety professionals may find employment in private businesses and non-profit organizations.

This chapter focuses on public safety professionals who work for local authorities. However, keep in mind that the practices described can be used with all different types of employers. The emergency management ideas introduced here will be examined in more detail later. Some of these concepts can be a bit difficult to understand, but wherever possible, the text will include real-world examples of how these ideas are put into practice.

UNDERSTANDING COMMUNITIES

There are different types of communities organized under a variety of systems of government. Federal governments, provincial and territorial governments, municipal governments, regional governments, Indigenous self-governments, and First Nations governments are examples of formal governments with councils that directly serve residents. These governments are responsible for making planning decisions for their jurisdiction and ensuring that residents have access to services. Officials usually are elected, are appointed, or hold a hereditary title.

community
the residents, visitors, services, and businesses that live and work together in a village, a town, a city, or an electoral area

local authority
the government officials who serve and support the community; includes those who determine what is important to their community and those who coordinate services to the residents

In other parts of the country, you will find unincorporated areas and settlements, which don't have a direct council but fall under the jurisdiction of a regional or provincial government. These settlements may receive services from the regional government or may be supported by a form of governmental agency called a local services board.

Some communities are in urban areas, some are rural, and others are remote. Some have large populations all in one place, while others are spread out over a wide area. Some communities are brand new, while others have existed for hundreds of years.

For this chapter, the term "**community**" will refer to the residents, visitors, services, and businesses that are part of daily life in a village, a town, a city, or an electoral area. Additionally, the term "**local authority**" will refer to the government officials who serve and support the community, including those who determine what is important to their community as well as those who coordinate services to the residents.

Identifying Potential Emergencies

Fundamentally, any **emergency** or disaster begins with an **incident**, which is a natural or human-made occurrence "that requires a response to prevent or minimize loss of life or damage to property or the environment and reduce economic and social losses" (Government of Canada, 2012, p. 52). Essentially, an incident is an event that could lead to an emergency. An example of a natural incident is a rock slide on a busy stretch of road. A human-made incident could be, for example, a crowd surge resulting in people being crushed at a crowded venue. An incident may or may not trigger an emergency.

emergency
an incident (current or imminent) that requires prompt coordination of people and resources to protect the health or safety of people or to limit property or environmental damage

incident
a natural or human-made occurrence "that requires a response to prevent or minimize loss of life or damage to property or the environment and reduce economic and social losses"

An emergency occurs when an incident causes a crisis that is either under way or imminent and that requires prompt coordination of people and resources to protect the health and safety of people or to limit property or environmental damage. As you can see, the definition is a bit vague. This is because it needs to describe a wide range of hazards and their impacts on communities. The definition becomes easier to understand if we consider a few examples, such as:

- *natural emergency*: a river overflowing its banks and flooding nearby homes and businesses;
- *health emergency*: a pandemic, such as COVID-19 and its variants;
- *human-initiated emergency*: someone threatening shoppers with a knife; and
- *technological emergency*: a chemical spill on a highway.

Some emergencies happen with little or no warning, like a landslide during heavy rain. Others can be predicted. For example, we can likely predict that a winter with above-average snowfall may increase spring flooding risk. In some cases, emergency managers may prepare for non-emergency events using emergency management practices. In 2019 when the Toronto Raptors won the NBA championship, some communities opened their emergency management offices to support safety measures during large public celebrations. By having these offices opened, they could gather information, identify the potential effects of celebratory activities across the city, and provide support to first responders.

An emergency can affect people, property, and the environment in some way. For example, a magnitude 6 earthquake in Vancouver would damage buildings and cause injuries and deaths and may cause damage to both the coastline and Stanley Park. This same earthquake in a remote part of the country where few people live and there is no infrastructure to be damaged may not be interpreted as an emergency as there may be no actions necessary to protect life or property.

Emergencies require people to act quickly and in a coordinated way. This means that a local authority needs to figure out how to prepare for an emergency before one ever happens. This is where emergency managers come in. They support the community by planning how they will prepare, respond to, and recover from an emergency before it occurs. This is the basis of emergency management.

Listing all the examples of the types of emergencies that occur or could occur anywhere in Canada would be impossible. But the goal of every emergency management program and every person who works in the field is to be prepared to deal with any emergency that arises quickly and effectively.

disaster
a social phenomenon that results when a hazard exceeds a community's ability to cope; it seriously harms the safety, health, welfare, property, or environment of people

A **disaster** is a social phenomenon (i.e., it affects people, businesses, and infrastructure) that results when an emergency exceeds a community's ability to cope. A disaster causes serious harm to the safety, welfare, property, or environment of people. Examples of disasters include:

- an entire community being flooded in spring,
- a gas explosion that severely damages an entire city block,
- a bomb that goes off in a crowded area, and
- a forest fire near a populated area.

As with emergencies, it would be impossible to list all the disasters that have occurred or could occur across Canada. However, the case studies examined in this book will provide a broader understanding of the types of disasters that emergency management professionals should be aware of.

Let's consider the relationship between an incident, an emergency, and a disaster.

EXAMPLE 1

Incident: an earthquake occurs in the Pacific Ocean off the coast of British Columbia, triggering a tsunami.
Emergency: the tsunami floods communities along the coast of British Columbia.
Disaster: the tsunami causes widespread destruction, injury, and deaths exceeding the resources of the local authorities.

EXAMPLE 2

Incident: a rock slide sends debris, earth, and rocks tumbling onto a busy road.
Emergency: the debris from the rock slide causes a multi-vehicle pileup in both directions.
Disaster: the slide destroys critical infrastructure collocated by the roadside, including natural gas lines, cables used to bring Internet to the community, and railroad tracks. Access to the community is now blocked.

EXERCISE 1.1

Incidents, Emergencies, and Disasters

1. Name (a) one natural incident and (b) one human-made incident that occurred recently in your area. (If you can't think of anything local, broaden the area to your province or territory or all of Canada.) Did these incidents lead to emergencies? Explain why or why not.
2. Name two emergencies that occurred recently in your area. Did these emergencies lead to disasters? Explain why or why not.
3. If possible, name a disaster that occurred recently in your area. In that case, what was the incident, what was the emergency, and how did the emergency escalate into a disaster?

Another term we need to define is "event." An **event** is a significant non-emergency activity that may or may not have been scheduled. Examples include a baseball game, community Canada Day activities, a spontaneous victory celebration, or a protest gathering. Note that an incident may or may not occur at an event.

event
a significant non-emergency activity that may or may not have been scheduled

THE ROLE OF PUBLIC SAFETY CANADA

Public Safety Canada is the federal department responsible for emergency management. Public Safety Canada staff work closely with other federal agencies and provincial governments to support emergency management activities across all government levels. They also coordinate with other agencies around activities to keep Canadians safe. Some of the agencies they work with include:

- Canada Border Services Agency, which enforces laws that manage the movement of people and trade across Canada's borders.
- Canadian Security Intelligence Service, which investigates people, events, and activities that may be security threats.
- Correctional Service of Canada, which operates federal correctional institutions (prisons) and works to rehabilitate offenders.
- Parole Board of Canada, which works to reintegrate offenders into society.
- Royal Canadian Mounted Police, which enforces laws and works to maintain peace, order, and security.

Many of the definitions used in this textbook are based on those developed by Public Safety Canada. You may find that different terminology is used by different communities, provinces, territories, and First Nations. However, these terms give us a common understanding for this chapter and this textbook.

Some of these definitions can be a little complex as they refer to different concepts you might not yet be familiar with. Do not be discouraged if some of the definitions are hard to understand. This is all part of learning new concepts in this discipline.

To learn more about Public Safety Canada, see the Additional Resources section at the end of this chapter.

What Is Emergency Management?

Now that we have an understanding of what emergencies are, we can think about how they can be managed. **Emergency management** is the field responsible for developing, maintaining, and allocating resources related to emergencies, "including all activities and risk management measures related to **prevention and mitigation**, preparedness, response and recovery" (Ministers Responsible for Emergency Management, 2017, definition of "emergency management").

emergency management
the field responsible for developing, maintaining, and allocating resources related to emergencies, "including all activities and risk management measures related to prevention, mitigation, preparedness, response, and recovery"

prevention/mitigation
the continual effort to lessen the impact that disasters have on people, communities, property, and the environment

Emergency management involves developing plans that describe how the local authority will respond to emergencies and how the community will recover from them. A few other concepts in this definition will be explored later in this chapter, such as the all-hazards approach, risk management, and the phases of emergency management. For now, it's enough to know that emergency management involves a lot of planning and preparation.

Who Works in the Field of Emergency Management?

We have already discussed who public safety professionals are and what parts of the emergency management field they work in. Now let's turn to the other major roles that are part of this field.

emergency responders members of agencies and departments that have specific responsibilities for emergency response, such as police services and paramedics; also called first responders

Emergency responders (also called first responders) are members of agencies and departments who have specific responsibilities for an emergency response, such as police services and paramedics.

emergency manager someone who works with a community, an agency, a First Nation, a government department, an organization, or a private company to help them plan for, prepare for, respond to, and recover from emergencies; may work for a government body or a private company

An **emergency manager** is someone who works with a community, an agency, a First Nation, a government department, an organization, or a private company to help them plan and prepare for, respond to, and recover from emergencies.

Another way to look at the function of emergency managers is to say that they manage emergency programs, which will be discussed in more detail later in this chapter. In brief, this means that they develop emergency plans, train staff, manage a budget, obtain resources, and support the planning for and responses to emergencies. Larger communities may have multiple emergency managers, while smaller communities may combine the emergency manager role with another position. For example, one person might be the deputy fire chief, an elected official, or a band council member.

Emergency managers are usually responsible for a lot of different activities. In a given week, they might write plans, interpret by-laws, train staff, write press releases, hire contractors, and support the response to an emergency. They may also influence the work done in other departments and by other agencies. For example, they may ask other departments to have their staff participate in an emergency exercise (simulation). In these cases, the emergency manager usually doesn't have the authority to tell staff in other departments to participate in the exercise. Rather, they make the case to other managers as to why participation in these exercises is important.

FIRST RESPONDERS AND EMERGENCY MANAGERS

Think about all the emergencies that happen within your community each year. There may be motor vehicle accidents, building fires, power outages, small floods, and more. Most of these emergencies don't require an emergency manager. First responders like police, paramedics, firefighters, and others are well trained in their roles and can handle most events at the "site level"—that is, the location of the emergency situation. Emergency managers become involved when the emergency event exceeds what the first responders can handle without support.

Between emergencies, emergency managers play an important role in preparing the community. This involves meeting with community members to share information on hazards and learn about what is important to them, training government staff and managing exercises, keeping the emergency program current with changes in legislation, and creating plans and agreements with other groups. The emergency manager makes sure the program is ready for potential disasters that will require a larger response.

In Canada, there are no specific rules defining the job description for emergency managers. This can mean that two people with the same job title may have very different types of responsibilities. However, there are a few roles that usually have the same general focus:

- **Business continuity managers** help a community, an agency, or a private company develop plans to "stay in business" during an emergency. They focus on helping staff identify the important services they offer and how a disaster might impact their ability to provide this service. Then, working with staff, they identify how long that service can be interrupted without causing serious hardship to the community and create plans to bring that service back online before that deadline. These activities help build organizational resilience, which is discussed later in this chapter. Larger agencies and government departments may have multiple business continuity managers.
- The term **disaster response specialists** is used by non-governmental agencies, such as Red Cross, Red Crescent, and Doctors Without Borders. These specialists are emergency responders who are specially trained to provide front-line, "boots on the ground" support and humanitarian assistance (direct support for people and communities affected by a disaster) during an emergency response. This can include performing on-the-scene coordination of evacuees, overseeing the set-up of reception centres and group lodgings, and providing psychosocial first aid to people impacted by disasters. Disaster response specialists are often on call and work with teams that might be dispatched on short notice. Some agencies, like Focus Humanitarian Assistance, combine response with longer-term rebuilding and efforts to lower risks from hazards.
- **Resilience officers** are senior officials who work with local authorities to support community-wide emergency planning that will assist residents, government departments, band councils, businesses, and community organizations. This is a relatively new position in Canada, but this role is widely used in different levels of government in European countries. These officers focus on helping people, businesses, and government departments understand the risks from local hazards and employ practices that will help them become more resilient.
- **First receivers** are the doctors, nurses, and other health professionals (including coroners) who treat injured people or manage fatalities during emergencies.

business continuity manager
someone who helps a community, an agency, or a private company develop plans to "stay in business" during an emergency, thus building organizational resilience

disaster response specialists
a term used by non-governmental agencies (e.g., Red Cross, Doctors Without Borders) for emergency responders who are specially trained to provide boots-on-the-ground support and humanitarian assistance during the response to an emergency

resilience officers
senior officials who work for local authorities; they support community-wide emergency planning that covers residents, government departments, band councils, businesses, and community organizations

first receivers
doctors, nurses, and other health professionals (including coroners) who treat injured people or manage fatalities during emergencies

You may see a variety of job titles being used to describe the same job. For example, there are emergency managers, emergency coordinators, and emergency planners. In this case, the variation in title usually refers to the level of responsibility the person has. A manager would oversee an entire emergency program, a coordinator may support a portion of that program, and a planner may focus on developing and maintaining the plans that structure the program. For simplicity, this chapter will use the term "emergency manager" to refer to all of these positions.

What Is an Emergency Program?

emergency program
an organized portfolio of emergency management activities that help a community prepare for, respond to, and recover from emergencies

Emergency managers organize their work by developing an emergency program. An **emergency program** is an organized portfolio of emergency management activities that help a community prepare for, respond to, and recover from emergencies. An emergency program can vary in size and complexity depending on the resources, budget, and staff available. However, most will contain common elements. Let's look at how these programs form and what they contain.

First, a local authority formally establishes the emergency program, often through passing a by-law. Depending on the community, this may be done by the band council, the city council, the regional government, or other group responsible for governance. This decision is important as it provides a legal foundation for the community's preparation for emergencies and keeps the emergency program accountable to the community. Without it, residents could argue that the emergency manager has no authority to spend money or make decisions.

The local authority decides what needs to be in the document that establishes the program. At a minimum, it should describe the focus of the emergency program, the people and roles that will be involved, the types of activities the emergency program will cover, any reporting requirements, and any budget commitments. A link to a generic municipal by-law concerning an emergency program is provided in the Additional Resources section at the end of this chapter.

Once the emergency program has been authorized, the emergency manager can begin setting up the program. The emergency program usually includes the following:

- **A budget**—The emergency manager is going to spend money on a lot of different things, such as purchasing office equipment, training staff, and hiring specialists to help with writing plans. The emergency manager will prepare an annual budget for approval. In cities, emergency management offices may prepare and manage their own budgets. In smaller communities, the emergency management budget may be part of a larger department, such as the fire service.
- **An executive team**—The executive team is made up of people who are responsible for ensuring the success of the emergency program. The team includes the emergency manager, a council member, the chief administrative officer or someone in a similar role, and the heads of other departments. There may also be representatives from community organizations. This diverse mix of people will represent the various areas that might be impacted by the emergency program. It also means that there should be no surprises when the emergency manager rolls out new plans, schedules events, or asks for resources.
- **An emergency plan**—An emergency plan is an official plan that outlines assigned responsibilities, actions, and procedures needed in the event of an emergency. The plan is typically made up of a number of smaller documents. First, there is a base plan that describes the by-law and decisions that authorize the emergency program. Then there are hazard-specific plans (e.g., a pandemic plan), function-specific plans (e.g., an evacuation plan for the community), department-specific response plans, and supporting documents (e.g., a list of hazards). Together these documents make up the community's emergency plan.

emergency plan
an official plan that outlines assigned responsibilities, actions, and procedures needed in the event of an emergency

Emergency planning is covered in Chapter 4.

- **A training and exercise program**—During an emergency, the emergency manager will draw staff from across different departments to help with the response and recovery, so these staff members must be trained to perform these roles. They will also take part in exercises—disaster simulations that allow staff to practise their roles. The training and exercise program includes training goals and a schedule of training and exercises.
- **Arrangements for supporting residents in a disaster**—Local authorities are responsible for supporting residents who have been affected by disasters. For example, residents evacuated from a burning building may not have their wallets, identification, medication, or car keys. In many cases, they might be stuck standing on the sidewalk in their pyjamas and holding their pets. Some communities set up emergency support service programs run by staff or volunteers to support these residents. Other communities may contract with agencies like the Red Cross to provide this support.
- **A neighbourhood preparation program**—A neighbourhood preparation program is carried out by a group of residents in a building or neighbourhood to help residents prepare for and respond to emergencies and disasters. A useful example is the group of residents in a condominium complex that supports building residents in preparing emergency kits.

neighbourhood preparation program
prepared and carried out by a group of residents in a building or neighbourhood to support residents in preparing for and responding to emergencies

The emergency program also needs a place for staff to work. Emergency managers commonly set up an office called an **emergency operations centre (EOC)**, which is a central office where representatives from different departments can work together during an emergency. The EOC has a few important roles:

emergency operations centre (EOC)
a centralized location where stakeholders from different departments and agencies come together to coordinate response and recovery activities and resources during an emergency

- to support first responders by providing resources and information;
- to make decisions that reduce the impact of the emergency or event on other parts of the community;
- to provide information to elected officials to help with their decision-making; and
- to act as a clearinghouse of validated information that can be used for public announcements, response decisions, and after-action reporting.

EOC structures, roles, and responsibilities will be discussed in more detail in Chapter 10.

Most communities identify a boardroom or other space that can be quickly turned into an EOC during an emergency. The emergency manager makes sure equipment is ready to turn this space into an EOC when needed.

The Basic Concepts of Emergency Management

Now that we know about emergency managers and their role in developing an emergency program, we can start to look at some of the concepts that these professionals use every day.

Imagine you are working as an emergency manager for a community in northern Alberta. Based on the summer weather forecast, you expect to see more forest fires than normal this year, and you know that climate change has made these forest fires larger and more dangerous. You need to let residents, businesses, and the local government know about the danger of these fires so that they can prepare. How can you tell them about the danger in a way they will all understand?

Read more on this in Chapter 8, Communications.

This type of communication is one of the emergency manager's bigger responsibilities. To do this, emergency managers use a few different concepts to help people think about emergencies. These concepts give us a framework to understand what the danger is and allow us to compare one emergency to another. They also provide a consistent way to quantify disaster (to express the scale of an emergency in numbers), which is important when speaking to the public, government officials, and partner organizations.

There are four basic concepts emergency managers use almost every day: hazard, risk, vulnerability, and threat.

Hazard

hazard
an incident, a phenomenon, or a human activity that may cause injury or death, property damage, social and economic disruption, and/or environmental damage

This section defines what a **hazard** is and discusses hazards in a preliminary way.

A hazard is an incident, a phenomenon, or a human activity that may cause injury or death, property damage, social and economic disruption, and/or environmental damage. This is a complex definition and needs to be broken down.

First, a hazard can be natural, human caused (either on purpose or by accident), or technology related. Also, a hazard can have a range of effects, some of which can be easily measured, like the number of buildings destroyed or the number of people physically injured. Others may be hard to quantify, like how a community has changed when people are evacuated for a long period of time.

A more detailed discussion of hazards is in Chapter 2.

Every community faces hazards, which can be organized into different categories based on common characteristics. These categories may vary by province/territory or Indigenous Nation, but they have the same general structure and groupings. For example, British Columbia has organized hazards into 13 different categories (Emergency Management BC, 2020, p. 28):

1. Atmospheric: tornadoes, extreme heat, and hail.
2. Disease and epidemics: pandemics, animal diseases, and pest infestations.
3. Fire: wildfires and structure fires.
4. Geological: avalanches, landslides, and sinkholes.
5. Seismic: earthquakes, tsunamis, and liquefaction.
6. Volcanic: ash falls and volcanic flows.
7. Hazardous materials and explosions: pipeline breaks, nuclear accidents, and hazardous material spills.
8. Hydrological: droughts, storm surges, and seiches.
9. Flooding: flash floods, coastal floods, and storm surges.
10. Infrastructure failures: dike, dam, and structure failures.

11. Interruptions to critical services: power outages, food source interruptions, and water interruptions.
12. Security: cyberattacks, riots, and major planned events.
13. Transportation: plane crashes, train derailments, and sinking of vessels.

Ontario uses the following categories:

1. Agricultural and food: farm animal diseases and food contamination.
2. Environmental: droughts, hurricanes, storm surges, ice storms.
3. Extraterrestrial: space weather, meteor hitting Earth.
4. Hazardous materials: chemicals, nuclear, oil, natural gas.
5. Health: water quality, infectious disease.
6. Public safety: civil disorder, cyberattacks, sabotage.
7. Structural: dam failure, fire or explosion, and mine emergency.
8. Supply and distribution: blackouts, communications failures, and blood shortages.
9. Transportation: planes, trains, boats, commuter vehicles, and roads and highways.

Categories used in Alberta include:

1. Mass-movement hazards.
2. Hydrologic hazards.
3. Meteorological hazards.
4. Biological/health-related hazards.
5. Other hazards.
6. Transportation hazards.
7. Infrastructure hazards.
8. Industrial hazards.
9. Intentional or unintentional/threatened or actual hazards (Alberta Emergency Management Agency, 2021).

There are also some hazards that are difficult to categorize but are important to consider. For example, many communities plan for the fall of space debris! This is a rare event but one that poses real risks. In 2011, pieces of a defunct NASA satellite survived re-entry into the atmosphere and landed near Okotoks, Alberta.

Every community faces different potential hazards. Coastal communities may plan for tsunamis and king tides (exceptionally high tides that happen annually). Prairie communities may plan for tornadoes and thunderstorms. Northern communities may plan for loss of power and subsidence caused by melting permafrost. Communities in forested areas may plan for wildfires and insect infestations that kill trees. All communities may plan for hazardous material spills and pandemics. The emergency manager creates a list of these hazards in order to think about them in terms of risk, vulnerability, and threat. (These concepts are defined later in this chapter.)

It's important to note that the term "hazard" is used across a number of different industries in different ways. For example, the Canadian Centre for Occupational Health and Safety, a national agency that promotes safe and healthy workplaces through programs like the Workplace Hazardous Materials Information System (WHMIS), defines a hazard as "any source of potential damage, harm or adverse health effects on something or someone" (Canadian Centre for Occupational Health and Safety, 2020, "What Is a Hazard?"). This definition is meant to be considered in the context of a workplace setting. In this case, hazards are categorized as things (e.g., knives), substances (e.g., caustic chemicals), a physical condition (e.g., a wet floor), and so on. However, this definition is too narrow for the purposes of community planning.

THE DIFFERENT WAYS WE MEASURE HAZARDS

Emergency managers play an important role in helping their communities understand hazards and the damage they can do. This is best done through using plain language that accurately describes the hazard.

Some hazards are easy to quantify, meaning that there are ways we can measure their impact in numbers. For example, there are two ways to measure an earthquake: a magnitude measurement that describes how much Earth moved at the peak of its shaking and an intensity scale that describes movement in terms of observable damage. We have similar measurements for other hazards. Flood waters can be measured in cubic metres per second, rainfall in millimetres per hour, tornadoes in terms of the Enhanced Fujita Scale, and so on.

Some hazards are more difficult to quantify. For example, how do you measure how bad an outbreak of an avian influenza will be or the impact of a weeklong heat wave? For this reason, emergency managers often think of hazards in terms of "risk." Risk can be measured in a somewhat uniform way, allowing us to compare one hazard to another.

Risk

risk
a combined assessment of how likely it is that a specified hazard will occur and how bad the consequences of it might be

A **risk** is a combined assessment of the likelihood that a specific hazard will occur and how bad the consequences of it might be.

In 2010, Ottawa experienced a magnitude 5 earthquake that shook the ground for 30 seconds, breaking windows, damaging buildings, and even causing the collapse of a bridge in Quebec. However, in 2021, a magnitude 4.9 earthquake struck an area 400 kilometres northeast of Dawson City, Yukon. In this case, no damage was reported. Both incidents had a very similar hazard, but the local context means that we understand them differently. The context is very important, so using terms like "dangerous" isn't particularly helpful in understanding hazards.

Risk is usually measured in terms of likelihood (low, medium, or high) and consequence (potential damage). A hazard that has a low likelihood and low consequence requires little planning, while a hazard with a high likelihood and high consequence should be a planning priority.

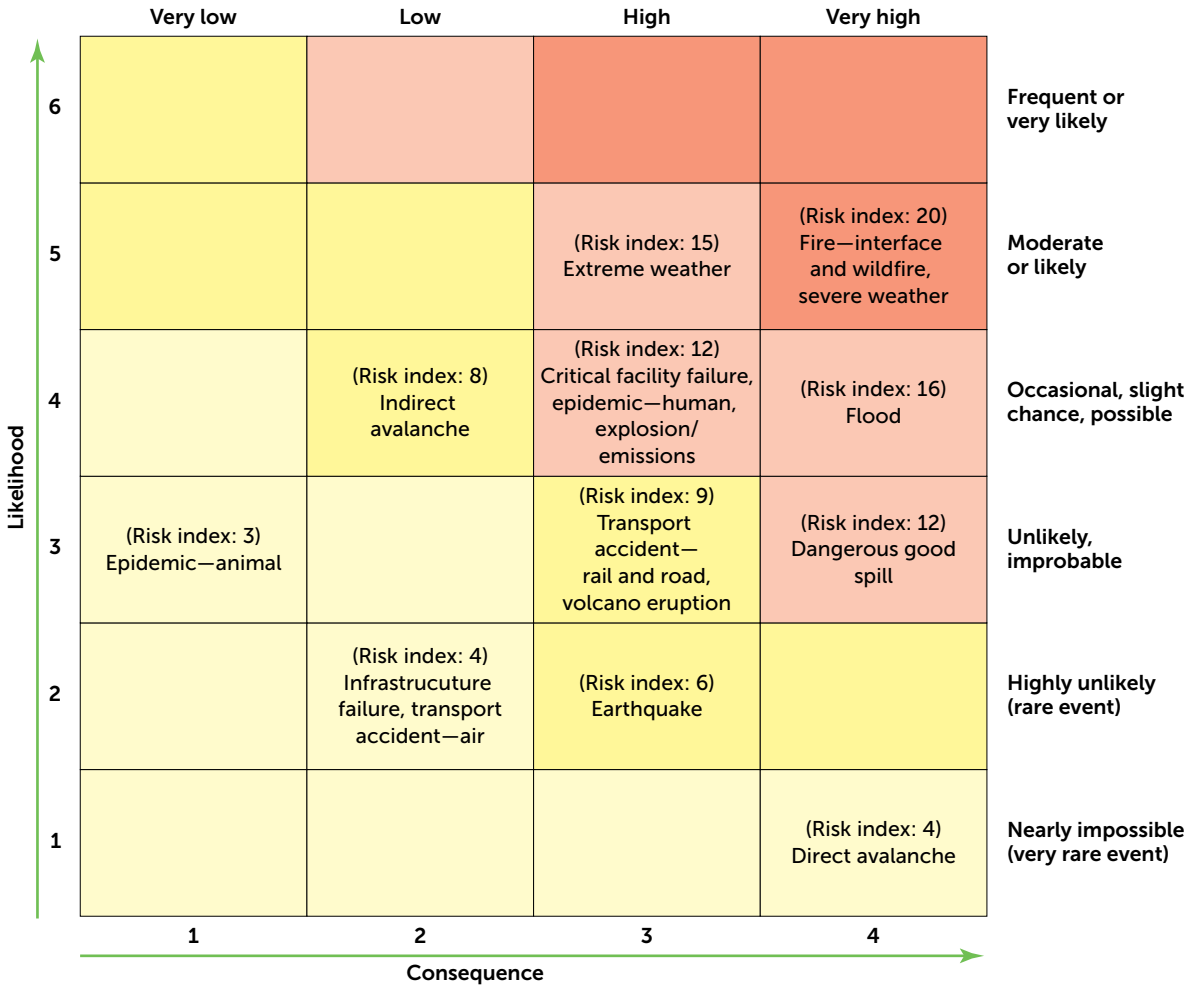
Consider another example. There are an average of 62 tornadoes in Canada each year. In 2018, 33 tornadoes were reported in the Ottawa-Gatineau region (Blackley, 2018). An

emergency manager in Ottawa would look at these statistics and realize that there is a high likelihood of a tornado in the region each year. A little more research would show that tornadoes can cause significant damage in urban areas. By combining those two pieces of information, an emergency manager can make a good argument for why the community should prioritize tornado planning.

Now consider the city of Nanaimo on Vancouver Island. Tornadoes can be quite damaging, so the consequence is high. However, Nanaimo has never experienced a tornado, so the likelihood is low to non-existent. Knowing this, emergency managers in Nanaimo can focus on other hazards that are more likely to appear.

Risk is often presented and assessed using tables, which makes it easier to interpret the likelihood and consequence of each hazard. Figure 1.1 was prepared by the City of Nelson in British Columbia as a means of organizing and understanding the hazards that might affect the community.

FIGURE 1.1 Nelson, BC Hazard, Risk, and Vulnerability Analysis Matrix



Source: MacCharles (2019, p. 9). Used with the permission of Len MacCharles, Fire Chief & Director of Emergency Management, NELSON.

Chapter 2 will address how to measure the risk associated with different hazards.

Risk also provides a useful way to communicate the dangers of hazards. For example, the emergency manager in Ottawa could use the statistics related to tornadoes to educate the public about why it is important to prepare for tornadoes and other extreme storms. The emergency manager can also use risk to make a case to city council for why they should include money in the budget for tornado preparation.

Vulnerability

vulnerability
"a measure of how well prepared and equipped a community is to minimize the impact of or cope with hazards"; may be physical, social, economic, or environmental

Emergency managers also think about areas of vulnerability. A **vulnerability** is "a measure of how well prepared and equipped a community is to minimize the impact of or cope with hazards" (Ministers Responsible for Emergency Manage, 2017, definition of "vulnerability"). A simpler definition is that a vulnerability is how a hazard might impact a community or an organization.

Public Safety Canada (Ministers Responsible for Emergency Manage 2017) refers specifically to four types of vulnerabilities: physical, social, economic, and environmental.

Physical vulnerabilities refer to how a hazard might impact things that are built or constructed. A house built in a floodplain (an area prone to flooding) is vulnerable to high waters. A community built on the slope of a large hill or mountainside may be vulnerable to rock slides and avalanches. A rural community in the middle of a forested area may be vulnerable to interface fires (a forest fire that spreads into the town).

Social vulnerabilities refer to the ways a hazard might impact how people interact with each other and how they live. The loss of power during a thunderstorm may cause the lights to go out and computer routers to switch off. If the power stays off for several hours, laptop and cellphone batteries may run out; if it stays off for several days, refrigerated food may spoil. For some people, this is a hassle, but for others who rely on power, it can become a major problem. A number of factors can increase or decrease social vulnerability, including gender, age, health, and family structures. For example, during a heat wave, a person with a higher income may be able to afford air conditioning for their home. Air conditioning may be out of reach for a person with a lower income, meaning that they are more vulnerable to this hazard.

Economic vulnerabilities refer to how the hazard might impact the economy as well as the financial resources of individuals. A business that is forced to close due to flooding will lose revenue. A person who is injured during the flooding and won't be able to work for a time may not receive a paycheque. Insurance companies may have to pay out large amounts of money to cover damages. All of these factors impact the community, province, territory, or First Nation.

Environmental vulnerabilities refer to how hazards might harm ecosystems and the natural world. A chemical spill may contaminate a natural area. A landslide into a river or lake may cause sedimentation, where rocks, sand, and dirt accumulate in a waterway. An outbreak of chronic wasting disease in the north may kill large numbers of elk, caribou, and moose.

CULTURAL VULNERABILITY

One factor that is missing from the Public Safety Canada definition is cultural vulnerability, which refers to how hazards might affect items and places of cultural heritage that are important to people and communities. Cultural vulnerability is a bit harder to measure since it varies by community.

For some communities, where they live is a very important aspect of who they are. Their history in a place can stretch back thousands of years, with their lives being interwoven with the environment and the experiences of their ancestors. For other communities, particular objects or buildings are very important. A religious building may have been the location of important events for community members, such as weddings, funerals, celebrations, and worship. For all of these communities, these places, objects, and buildings are not just part of where they live—they are part of how a person understands their identity.

Traditionally, damage and loss were measured in financial terms. However, the damage or loss of these places, objects, or buildings has an impact that simply cannot be measured in financial terms. Emergency managers who are empathetic to community residents will be better able to work with them to explore what is important to the identity of the community and can develop emergency plans that address more than just physical and economic vulnerabilities.

Almost every hazard touches on each of these vulnerabilities in some way. Additionally, these vulnerabilities can interact in ways that make the hazard's effects more severe for some people. For example, First Nations communities are often more vulnerable to natural hazards, owing in part to ongoing inequities in lands assigned to First Nations and Indigenous peoples. For hundreds of years, the Canadian government would only offer reserve and other lands that were in areas susceptible to different hazards. Furthermore, the Canadian government has only partially fulfilled many of its obligations for resources and services to these communities. This inequity creates a situation where communities might struggle to prepare for emergencies or feel prepared to respond.

Threat

Along with vulnerability, emergency managers also think about threats. The term "threat" has a double meaning. A **threat** is a specific way—an "exposure pathway" (Public Safety Canada, 2017, definition of "threat")—that a hazard can affect a community, an organization, or a country. Threats can be natural or caused by humans and can be accidental or intentional.

threat
a specific way that a hazard can impact a community, an organization, or a country; may be natural or human induced and may be accidental or intentional

Imagine that the road into a rural community crosses an old bridge spanning a river. Every spring, the river level rises from melting snow water. Logs, chunks of ice, and debris are pushed into the bridge columns by the rising waters. In this case, the rising waters and debris are the threats and the aging, weakened support columns are the "exposure pathway." Understanding these specific threats helps emergency managers focus their planning on particular aspects of the community.

The term "threat" can also describe complex relationships between hazards and their associated risks, causes, and impacts. A useful example of this type of threat is climate change. The causes of human-induced climate change are straightforward and

well understood: carbon dioxide and other pollutants are trapping solar radiation in the atmosphere, causing a gradual warming of the planet. This increase in temperature is changing the severity of some hazards as well as creating new ones.

However, these changes aren't always predictable and may vary by region. For example, climate change has led to an increase in the number and severity of severe rainstorms in Ontario. This in turn has led to an increase in localized flooding events. In British Columbia and Alberta, climate change has increased the number of heat waves experienced each summer, causing drought conditions in the northern parts of these provinces. These droughts lead to an increase in the number and severity of wildfires. Both scenarios have the same underlying cause—climate change. However, they are experienced quite differently based on location.

Other examples of threats include terrorism, global pandemics, interdependent critical infrastructure (e.g., interconnected electricity utilities), and attacks on information systems or networks (Public Safety Canada, 2018).

Organizing threats in this way helps emergency managers understand how hazards are changing and how they might impact the community. It also helps them think outside the box about priorities for their emergency programs.

Chapter 2 discusses more specific methods for measuring emergencies.

Understanding hazard, risk, vulnerability, and threat is important for a few reasons. First, they provide a consistent way to measure and describe emergencies. This in turn allows emergency managers to consistently describe each hazard, who might be affected by it, where those effects might occur, and how people can prepare. Also, these concepts provide a way to compare one emergency to another. This becomes important when emergency managers need to prioritize planning for one hazard over another.

What Influences How Emergency Management Is Performed in Canada?

One of the first things new emergency managers often realize is that a variety of emergency management practices are used across the country. The language and structures used in Ontario may be a bit different from those used in New Brunswick, British Columbia, or Nunavut. To understand why this variation in practice exists, it helps to think about where emergency management came from.

The roots of emergency management go back to the start of the 20th century. At the start of World War I, the Canadian government passed the 1914 *War Measures Act*. The purpose of the Act was to grant the federal government powers to take actions that it decided were necessary to keep people safe during wars, invasions, or insurrections. The powers described in the Act included the ability to arrest people, control access to ports and harbours, limit transportation, censor documents, and take over property without permission from the owner.

The Act has only been used (or invoked) three times since it was passed: during World War I, during World War II, and during the October Crisis in the 1970s. All three times, the Act was used to arrest, detain, and sometimes deport Canadian citizens of certain heritages, such as Japanese, German, or Italian. It's important to keep in mind that laws are powerful tools and their application may not always be fair. We need to be very thoughtful in how laws are written and whom they might impact.

For emergency managers, the Act was important for a couple of reasons. First, it created a legal way for the federal government to act during a crisis. At first, this might sound confusing—after all, isn't it the job of the government to act when there is a crisis or disaster? However, it helps to keep in mind that all levels of government require a legal authority to act during an event. While this is an authority they can grant themselves, it is needed in order to create some boundaries as to what they can do and how they can do it. This continues today as governments at the federal, provincial, regional, and local levels pass laws, regulations, and by-laws that describe and define their authority to take action.

The second reason the Act was important was that it began a process of clarifying exactly what the government was responsible for when it came to certain types of crises. The Act was the federal government granting itself the unique authority to do certain things and prohibiting other levels of government from taking the same actions. This also meant that the federal government was responsible for ensuring that it fulfilled these responsibilities. So, in practice, if the federal government said it had sole authority to control the ports and harbours, then it was also committing itself to taking steps to control the ports and harbours because no one else had the authority to do so.

Communities had also begun to consider the hazards that might impact them. In 1894, a river gauge was set up on the Fraser River in the community of Mission, British Columbia. It's still in use today, although it has undergone some modernization. Other communities along the Fraser River were doing the same, often marking the height of the river at different times of year on bridge support columns. These practices show that communities were thinking about hazards in their local context. And in practice, people were starting to think about what was important to their community.

The next big evolution in emergency management occurred in 1988. At that time, two important pieces of federal legislation were passed that created emergency management as we know it today. The first was the *Emergencies Act*, which created modern legal definitions for emergency management concepts. This Act also revised and clarified the unique emergency management responsibilities of both the federal and provincial governments. Importantly, the legislation described the provinces as having the primary role in preparing for emergencies within their borders. This meant that the provinces needed to ensure that they had offices or departments that would focus on emergency management. The second piece of legislation was the *Emergency Preparedness Act*, which described the responsibilities of federal ministers with respect to guiding their ministries in planning and preparing for emergencies.

At this time, a federal emergency management department was formed to support emergency preparation and disaster response.

Since the 1980s, this department has undergone a variety of name and mission changes. Some of these changes were in response to known hazards, such as the preparation for potentially devastating impacts from the so-called Y2K bug on critical infrastructure (most of which did not materialize) (National Geographic, n.d.). At other times, changes occurred due to significant world events, such as the 9/11 attacks in 2001. Changes to legislation have also updated the mandate and authority of this department.

Today, this department is known as Public Safety Canada. It works with provincial and territorial emergency management offices in support of planning, response, and recovery. A department called Indigenous Services Canada typically partners with First Nations

around emergency management planning and response. This can be a complex relationship as it involves nation-to-nation negotiation and coordination.

CONTRAST: EMERGENCY MANAGEMENT IN CANADA AND THE UNITED STATES

Canada takes a bottom-up approach to emergency management. This means that the community-level government takes responsibility for emergencies within its borders. In large events or when local resources are becoming exhausted, the community will look to the provincial or territorial government for support. However, the province or territory won't take over. Rather, it will aim to supplement the required resources so that the community can continue to manage the event. When federal resources are needed, the province will request these from federal agencies, but the local community remains in charge of the response. Keep in mind that this is a somewhat oversimplified picture, but it demonstrates how Canadians follow an approach where the community is central to emergency response.

In the United States, response typically takes a top-down model. When a local authority requests support from the county or state level, command is transferred to this higher level.

Neither model is right or wrong. Rather, each speaks to intentional decisions made around how emergency management will be structured and performed.

Canada is a tremendously varied country. Depending on where you go, there are different hazards and geographies, different types of governments and communities, different nations and peoples, different demographics and histories, different values and priorities. All of these factors influence how emergency management is practised as what is right for one community may not be right for another. For this reason, emergency management in Canada is structured around a number of guiding principles. These principles are agreed to by the various provinces, territories, Nations, and federal bodies.

Principles of Emergency Management in Canada

Now that we know some of the basic language and concepts, we can explore how emergency management is put into practice by public safety professionals. These practices are based on a series of principles that guide the work we do. Principles are important as they broadly describe our goals but don't specify exactly how emergency managers are to do their jobs. This allows us to think about what will work best for our communities. These principles are in the Public Safety Canada document *An Emergency Management Framework for Canada* (2017).

Risk-Based Planning

One of the most important principles for emergency management in Canada is the concept of risk-based planning. This means that emergency managers base their planning and response decisions on an evaluation and understanding of hazards, risks, and vulnerabilities (Public Safety Canada, 2017, definition of "risk-based"). The interpretation

of these factors will guide the emergency manager's determination of their community's priorities for preparation.

This approach means that emergency managers need to approach the identification of hazards, risks, and vulnerabilities in a systematic way. After all, if they don't have a good sense of these factors, they won't be able to make good decisions.

Chapter 2 describes methods for identifying these factors.

All-Hazards Approach

An **all-hazards approach** to emergency management recognizes that some components of an emergency plan can be applied to various types of emergencies. Therefore, the approach optimizes emergency planning, response, and support resources. In practice, it involves developing plans, processes, and procedures that can be used for as many different hazards as possible, thus limiting the amount of planning an emergency manager needs to do and reducing the number of resources they will need.

all-hazards approach an approach that recognizes that some components of an emergency plan can be applied to a variety of types of emergencies, thereby optimizing emergency planning, response, and support resources; the opposite of hazard-by-hazard planning

Imagine an emergency manager trying to prepare a new emergency plan for every hazard that poses a risk to their community. There could be dozens of unique hazards, in which case they would spend all of their time updating plans and training their staff. This would be hugely inefficient and confusing for staff. Creating one plan that describes common practices for most events with hazard-specific sub-plans is a more effective strategy. The all-hazards approach is widely used across Canada.

However, the emergency manager needs to be aware that there may still be some hazards and processes that require unique planning. For example, many communities have evacuation plans describing how an orderly evacuation would take place. These usually describe the evacuation of one neighbourhood at a time, specifying the routes that people would travel as well as the use of city buses for people without cars, and so on. However, there are some events, like chemical spills, for which responders require a different approach in order to evacuate people quickly. Area-specific response plans may be created for these types of events.

Division of Responsibilities

The principle of responsibility refers to identifying which roles, departments, and agencies have the responsibility and authority to act during an emergency. This is done through legislation, policies, guidelines, and standards. When responsibilities are clearly explained, those involved will have a better understanding of who is responsible for what action.

As mentioned earlier, each level of government needs to have a legal authority to act, even during an emergency. This is done through the creation of laws and by-laws that identify who can act, what they can do, when they can do it, and what the limits of their power are. These laws and by-laws usually define important concepts and definitions for events. They can also clarify the relationships between different people and groups and describe how emergency planning and responses should be structured.

Consider an example of how these various levels of responsibility are defined for emergency managers at the federal, provincial and territorial, regional, and local levels.

Federal Level

There are two federal laws that describe what federal agencies and departments are responsible for in an emergency (see the Legislation section). This legislation spans

the whole country and describes how the federal government would engage with other nations.

The *Emergencies Act* (1985) creates definitions for emergencies and the powers available to the federal government during an emergency. This legislation clarifies which emergencies are the responsibility of the federal government and which are the responsibility of provincial governments.

The *Emergency Management Act* (2007) describes what responsibilities federal ministers have in preparing their respective ministries for emergencies. This Act requires each minister to ensure that their ministries can continue to provide services to Canadians even during a disaster.

There are also federal laws that describe how federal agencies will fulfill some of these responsibilities.

The *Public Safety Act, 2002* describes the powers available to the federal government to prevent terrorist attacks and respond swiftly in the event of a threat. This Act defines particular actions that the federal government will take and ways that decisions can be made quickly so that these tasks can be performed legally.

The *Quarantine Act* (2005) describes the powers and actions provided to federal agencies to prevent the spread of disease. This Act defines what the federal government will do to stop diseases from coming into Canada through borders as well as steps they can take if a person with a communicable disease attempts to enter the country.

The *National Defence Act* (1985) reconfirms the establishment of Canada's military as well as the actions it may take during an emergency. This Act describes how the provinces, territories, and Nations can request the assistance of the military and what the military can offer.

Provincial and Territorial Level

Similar legislation exists in all provinces and territories. In general, the role that provinces and territories play in emergency management is in developing legislation and providing resources to support emergency preparation, planning, response, and recovery within their borders. These laws are more focused than the federal laws and describe what the provincial or territorial government will do and what is expected of each community within the province or territory.

Regional Level

Within the provinces and territories, some areas may also have regional governments. These governments develop legislation (usually a set of by-laws) describing how emergency management happens across a particular area that spans multiple communities and local authorities. For example, in British Columbia, the City of Vancouver falls under a regional jurisdiction known as Metro Vancouver (formerly the Greater Vancouver Regional District). In Ontario, regional governments exist in a number of areas, including Niagara and York.

Local Level

The councils of local authorities pass legislation (by-laws) to establish the emergency programs for their communities. Local by-laws need to consider all the other layers of

legislation that describe how emergency management is structured to ensure that they are meeting their local requirements.

There is one local authority by-law that needs to be considered: a state of local emergency by-law. A local authority may declare a state of local emergency for emergencies that are especially damaging and require a lot of resources. These by-laws allow a local authority to exercise the special emergency powers listed in the *Emergency Program Act*. These powers can be quite extensive and include the power to:

- acquire and/or use land or personal property;
- require a person to provide assistance during an emergency;
- limit travel to or from an area;
- coordinate the restoration of essential and medical services;
- evacuate people, livestock, animals, and property;
- enter buildings or land;
- demolish buildings and cut down trees and crops;
- perform construction; and
- fix prices and ration supplies like food, water, and fuel.

State of local emergency by-laws are passed by council in order to give them legal authority to use these powers. Council typically must state which powers they are asking for and when those powers will expire.

EXERCISE 1.2

Community Emergency Management By-Laws

Go online and search for the by-law that structures the emergency management program for your community.

1. What is the title of the law or by-law?
2. When was it enacted?
3. In three or four sentences, summarize the main points of the law.

Comprehensive Approach

A comprehensive approach to emergency management involves thinking about emergencies before, during, and after they happen. This is commonly known as the **four pillars model** because it describes four areas of focus: prevention and mitigation, planning and preparation, response, and recovery.

four pillars model a model that identifies the four stages of emergency management as prevention and mitigation, planning and preparation, response, and recovery

Prevention and mitigation is the continual effort to lessen the effect that disasters have on people, communities, property, and the environment. To prevent and mitigate the effects of hazards, the emergency manager works with the community to either remove a hazard or reduce its potential impact. Some examples of prevention and mitigation include reinforcing the banks of a stream to reduce the erosion from high waters, retrofitting buildings to make them more resistant to earthquakes, and clearing brush and trees away from buildings to reduce the risk of fire.

Emergency managers work with specialists to identify how to mitigate hazards. For example, a community located in hilly areas may experience landslides due to erosion. The emergency manager may speak with a geotechnical engineer to find out how rocks and soil move. They may then speak with a forestry expert to learn how trees and plants can help prevent erosion. Through these consultations, the emergency manager may determine that the community should install erosion control blankets on steep hillsides and plant wild grasses in less steep areas to anchor the soil.

However, the emergency manager may not have the budget or the authority to perform these activities. The erosion blankets may need to be installed by a company specializing in the service, and the wild grasses may need to be planted by the community's parks and recreation staff. Someone then needs to pay for all of this work to be done.

Informally, the emergency manager would get quotations for the costs of this work, determine what permits and approvals are needed, and speak with the other department chiefs to get their buy-in on the projects. The emergency manager could then formally present these materials to mayor and council, showing how these projects fit into the overall community plan and asking for approval (and funding) to move ahead with the projects.

Planning and preparedness is necessary as there are a number of hazards that can't be entirely mitigated. **Preparedness** "includes all activities, such as plans, procedures, contact lists and exercises, undertaken in anticipation of a likely emergency" (Health Canada, 2019). Planning and preparedness involves getting the community or organization ready to respond to and recover from the effects of these hazards.

preparedness
all planning done and actions taken in anticipation of a likely emergency

Some of these preparation activities involve organizing the emergency program, including:

- Working with the local government departments and staff in developing emergency and business continuity plans.
- Identifying a location for an EOC.
- Training local government staff to work in the EOC.
- Setting up service agreements with contractors and suppliers to prioritize access to resources during an emergency (e.g., road salt, fuel, personal protective equipment).
- Setting up agreements with support organizations to provide services to the community during disasters. Groups like the Red Cross might be contracted to provide immediate services and resources both during and after a disaster.
- Developing a communications strategy to share information with the public during an emergency through social and traditional media.
- Developing standardized messages that can be issued when an emergency occurs.
- Creating social media channels for sharing emergency information.
- Obtaining an equipment stockpile that can be accessed by government staff during an emergency. In earthquake-prone areas, this equipment may be set up in secured shipping containers so that staff don't need to enter potentially damaged buildings.
- Recruiting community volunteers to support emergency program initiatives. This could include volunteer amateur radio operators, emergency support services

staff (volunteers who support residents who have been evacuated during an emergency), and individuals who can lead neighbourhood emergency preparation projects.
- Developing and conducting emergency exercises to validate emergency plans and staff training.
- Staying up to date on emergency management practices across Canada.

Other preparation activities involve working directly with the public to help them prepare:

- Sharing information with the public on local hazards and how they can interpret risks.
- Providing training to residents on how to prepare emergency kits and grab-and-go bags.
- Helping residents set up neighbourhood emergency preparedness programs.
- Supporting local businesses in developing business continuity plans so that they can keep their doors open during a disaster.
- Working with community-based organizations to promote emergency preparedness.

Response involves supporting the work of first response, first receiving, and supporting organizations as they provide front-line response to emergencies.

First response groups include agencies and departments that have specific responsibilities for emergency response. These include law enforcement agencies, fire and rescue departments, paramedics, search and rescue organizations, disaster psychosocial services, coast guard and water rescue services, oil cleanup agencies and consortiums, and animal welfare agencies.

First receiving organizations include groups that provide medical services during emergencies. These include hospital workers, doctors' offices, walk-in clinics, coroners, and other health professionals who may receive injured people or fatalities.

Supporting organizations include groups and departments that are responsible for supporting emergency response but may not be seen as traditional "first responders." These include engineering and public works departments, public transportation departments, parks and recreation departments, utility companies (e.g., natural gas, electricity, water and sewer, telephone and Internet providers), highway contractors, information technology departments, geographic information systems technicians, and communications and public information officers.

Emergency managers support responders and communities in a number of ways. This response is typically provided through the activation of an EOC. Representatives from local government, response agencies, and support agencies share information at the EOC to identify broad response and recovery priorities. This is important since first responders focus primarily on the immediate response to an event and may not have the resources to think about broader community impacts.

Consider the case of a large fire at an apartment building. Each attending response agency will have a unique and usually well-defined role. Firefighters will perform rescues and control the blaze, police will shut down roads and control access to the site,

paramedics will triage casualties and take people to hospital, and utility companies may shut down power and natural gas to the site to prevent electrocutions and explosions. The EOC will support these efforts by communicating with the public, being a buffer between elected officials and the responders, finding specialists to answer technical questions, arranging for additional resources from neighbouring local authorities, identifying the impacts of road closures, and more. They can also support the coordination of some response activities, such as having public works prioritize the availability of water for the response site.

EXERCISE 1.3

Emergency Managers Supporting Incident Responses

Thinking about the apartment fire scenario, describe three actions emergency managers might perform to support the response beyond activating an EOC. Remember that emergency managers don't typically perform site-level response activities. Try to think more broadly about how the event might be affecting the entire community.

First responders at the site are "in charge" at the site. This means that they make decisions based on how they can best resolve the emergency. The emergency manager, EOC, and its staff support the work being done at the site. The first responders' actions are commonly called "site-level activity," and EOC staff actions are referred to as "site support."

recovery
developing a "new normal" in a community after an emergency

Recovery means developing a "new normal" following an emergency. Emergencies change communities in different ways. These changes may be minor, but sometimes they completely transform the community.

An example of a smaller change occurred in Oakville, Ontario in 2018 when the community experienced extremely high water levels on Lake Ontario. High winds pushed waves onto beaches and shores, causing significant damage to waterfront parks and infrastructure. The Town authorized nearly $3.8 million to repair the parks, which included adding retaining walls, relocating pathways and lighting, building seawalls, and stabilizing hillsides (Town of Oakville, 2018). These changes not only repaired the damage but also mitigated the impact of future high waters. While the character and look of the parks had changed, the changes were generally well accepted by the community.

However, recovery can also involve more significant changes. In 2013, extensive flooding in Alberta resulted in over 14,500 homes being damaged. A number of these homes were located in floodways, areas prone to flooding during severe storms or winter snow melts. The Government of Alberta offered to buy some of the homes located in the floodways. The owners who took this money would move out of the flood plains and find homes in non-flood-prone areas. Residents also had the option to receive money to repair their flood-damaged homes on the condition that they would not receive compensation if their homes flooded again. These recovery decisions changed the overall nature of the impacted community. Some families moved away, and their former houses were torn down; others stayed behind and rebuilt, unsure of what future flooding may

look like. As a result, the social fabric that made up those neighborhoods was permanently changed (CBC News, 2013).

Ultimately, the recovery process is built on decisions that can have a far-reaching impact on the community. For this reason, recovery plans often consider community development plans as the community attempts to build what will be the new normal for the community.

Partnerships

Public Safety Canada clearly states that "all Canadians are involved in emergency management," including "[i]ndividual citizens, communities, municipalities, and federal, provincial, territorial governments, Indigenous peoples, emergency first responders, the private sector, volunteer and non-governmental organizations, academia, as well as international organizations and allies" (Ministers Responsible for Emergency Management, 2017, "Partnerships").

That's quite a list of people to coordinate. One of the ways this coordination occurs is through the creation of agreements. Some agreements are formal and legally binding. Others are informal and describe ad hoc agreements. All of these agreements help us understand how we can work together and share information.

At the local authority level, you will find a few different types of partnerships.

Informal cooperation agreements are verbal or written agreements between two local governments. They usually describe how the communities will collaborate on an initiative and how they might support one another.

Mutual aid agreements describe how one agency or community will share emergency resources with another. For example, a community that is dealing with a major apartment fire may ask for additional fire support from neighbouring communities. The mutual aid agreement will describe what resources can be accessed, who pays for the use of the resources, and other logistical matters. Mutual aid agreements are often developed between response agencies.

First Nation–municipal service agreements are purchasing agreements that may be set up between a First Nation and a municipal government. While different federal agencies are generally responsible for providing supports and services to First Nations communities, agreements with local municipalities may include contracting services like fire and rescue, garbage collection, and storm sewer maintenance.

Joint power agreements may exist between two or more local governments and usually focus on joint planning, delivery of services, and financial management. For example, the Integrated Partnership for Regional Emergency Management in Metro Vancouver creates a partnership of 21 municipalities, one treaty First Nation, and one electoral area to allow for the development of regional plans and frameworks. This partnership has led to the development of a regional plan for managing disaster debris, which describes agreements between the various partners on where debris from a major event like an earthquake will be stored and managed.

Academic municipal partnerships involve local authorities working with colleges and universities on unique projects. These partnerships usually focus on developing a solution to a particular problem, often involving research and the creation of an output. These partnerships often qualify for federal funding.

At the higher levels of government, you will find a variety of agreements and partnerships.

Reconciliation agreements are developed to support reconciliation between Indigenous people and other provincial residents, often with a focus on resolving the socio-economic gaps that exist between these people. Agreements may include recognizing Aboriginal titles, creating commissions, identifying shared goals, joint land-use planning, transforming laws, and more. These are important agreements as they help us create a more just society. Refer to the Additional Resources section for information about the work being done on reconciliation agreements in British Columbia.

Critical infrastructure sector entities work with Public Safety Canada to share information, manage risks, and reduce vulnerabilities. Critical infrastructures are organized into ten sectors:

1. energy and utilities,
2. finance,
3. food,
4. government,
5. health,
6. information and communication technology,
7. manufacturing,
8. safety,
9. transportation, and
10. water.

These sectors are each supported by a federal agency. Information sharing and coordination is supported through legislation and agreements between critical infrastructure owners.

Professional networks help public safety professionals from across Canada share information, research, and resources. One influential group is the Canadian Risk and Hazards Network (CRHNet) (see Additional Resources). Members of CRHNet support partnerships and networking between emergency management professionals.

United Nations clusters are groups of international and national organizations that work on projects with a humanitarian focus. The cluster model allows international agencies and non-profit organizations to work together on the response and recovery to disasters. (To learn more about clusters, go to the link in the Additional Resources section.)

Coherency of Action

Coherency of action occurs when public safety professionals—both emergency managers and first responders—try to use the same structures, language, and practices in their work. This makes it easier for public safety professionals to share information, work together, and even share resources. It also helps reduce the number of tools needed for emergency managers to do their work.

Coherency of action can be seen in shared models, systems, and tools.

An example of a shared model is the British Columbia Emergency Management System (BCEMS). BCEMS is a province-wide framework used by communities and provincial agencies. It describes how emergency management is conducted in the province—the different levels of response, the systems that are used, and items that must be included in an emergency program. This model guides emergency managers in understanding what is considered common practice in the province. For example, BCEMS describes standard response goals. These goals describe a rough order of the priorities during a response and include:

- ensuring the health and safety of responders,
- saving lives,
- reducing suffering,
- protecting public health,
- protecting infrastructure,
- protecting property,
- protecting the environment, and
- reducing economic and social losses.

Everything on this list is important, and some of these items can be addressed together. However, the items at the top should be prioritized and addressed before items further down on the list. Having this list helps communities and first response agencies work toward common goals. Learn more about BCEMS in the Additional Resources section.

Shared systems can be used to organize the work of staff at the site and site-support (EOC) levels. Most provinces and territories use either the Incident Command System (ICS) or the Incident Management System. While the two models have slightly different names, they are very similar in the practices they describe, such as the use of coloured vests to indicate roles: green for commanders/directors, blue for planners, orange for operational staff, and so on. By using this system, an emergency manager from one community can enter the EOC in another community and understand the roles of everyone in the room.

You'll learn more about these systems in Chapter 10.

Shared tools help organizations, agencies, and other emergency management bodies communicate. For example, an online geographic information system available to local authorities will allow them to share information with provincial agencies in an easy-to-understand dashboard and map. Staff in an EOC can log into this dashboard and quickly get a sense of the size and impact of an emergency or a disaster. This information is part of the "situational awareness" that EOCs develop to support site-level activities and inform their decision-making.

Resilience

Resilience is defined by Public Safety Canada as "the capacity of a system, community or society exposed to hazards to adapt to disturbances resulting from hazards by persevering, recuperating or changing to reach and maintain an acceptable level of functioning" (Ministers Responsible for Emergency Management, 2017, definition of "resilience"). A slightly different definition is offered by the Resilient Cities Network: "Urban resilience

resilience
the ability to plan for, respond to, and recover from hazards in order to decrease their impact and reduce vulnerabilities in the future

is the capacity of a city's systems, businesses, institutions, communities, and individuals to survive, adapt, and grow no matter what kinds of acute shocks and chronic stresses they experience" (Resilient Cities Network, 2021, "What Is Urban Resilience?"). This term is becoming more widely used in emergency management.

Learn more about resilience in Chapter 7.

Both definitions share a few things in common. Both describe resilience as the ability of a community to weather a disaster while maintaining its basic structure and functions. Also, both refer to systems, community, or society. This means that resilience is a condition that exists in things that are interconnected in some way. All parts of society, from people to governments to businesses, play a part in supporting resilience.

Both definitions describe the need to adapt to hazards. Adapting means having an understanding of what hazards exist and then purposefully changing to reduce their potential impact.

Finally, both definitions describe ways in which this adaptation can happen. It can involve perseverance, which means to focus on a goal and persist in trying to achieve it. It can involve recuperating, which means healing and rebuilding. It can also involve changing, which means transforming how we live so that hazards have less of an impact.

Putting these ideas together, a resilient community is one that:

- has a good understanding of local hazards and their associated risks,
- encourages residents to be prepared to be self-sufficient for at least three days,
- has identified recovery goals to "build back better," and
- incorporates emergency management into all aspects of community life.

One of the big ideas from this definition is the need for the community to transform itself in order to become resilient. This transformation isn't just the responsibility of emergency managers. All residents, government departments, and businesses have a hand in building their resilience.

In Amsterdam, rising ocean levels increase the risk of localized flooding. The local safety region developed a website that allows residents to see what the flood risk is for their homes. The purpose of the project is to have residents take an active role in understanding the hazard and to make decisions about how they might react in a flood. (See Additional Resources regarding the water level tool.)

In Canada, the Resilient-C online platform helps connect coastal communities that have similar risks and hazards. Communities in New Brunswick, Nova Scotia, Prince Edward Island, and British Columbia share the actions they've taken and the lessons learned from past events. Also in Canada, the Justice Institute of British Columbia's Community Disaster Resiliency Planning website (see Additional Resources) provides communities with the tools for developing a resilience plan.

RESILIENCE: A NEW WAY OF THINKING ABOUT DISASTERS

Resilience is becoming a very important concept in emergency management. It provides a way for residents to be active and empowered in preparing for and recovering from disasters. This holistic approach requires some new ways of thinking.

One new idea is the creation of community resilience plans. These plans engage residents in coming up with a vision of the ideal future for the community. Residents then work on developing goals and a work plan to achieve this vision.

New roles may be required to support this planning, such as a chief resilience officer who "is a top-level advisor who reports to the city leadership responsible for leading, coordinating, and developing their city's resilience strategy and policy" (Resilient Cities Network, n.d., "What Is the Role of the Chief Resilience Officer?"). In recent years, a handful of resilience officer roles have appeared in Canada, primarily in larger cities like Montreal, Vancouver, and Toronto.

While concepts like the four pillars model will always be useful, resilience has practitioners thinking about emergency management in a new and more holistic way.

IN THE NEWS

Fort McMurray Wildfire

In 2016, a massive wildfire threatened Fort McMurray, Alberta in an event known as an interface fire. As the fire approached the community, over 88,000 people were evacuated. Over time, evacuations expanded to the Fort McMurray First Nations, Anzac, and Gregoire Lake Estates communities. By the time the fires had died down, an estimated 3,244 buildings had been destroyed and over 589,000 hectares were burned (Ashkar, 2019; O'Brien & Dehaas, 2019).

Evacuees found shelter in a variety of places, including small communities, campgrounds, and cities like Edmonton. Throughout June, evacuees were allowed to return to the community.

While a community can be rebuilt, disasters like this can have long-term psychological effects on people. Cora Dion, who safely evacuated with her family, said, "Our family has pulled through this relatively unscathed I think … (but still), probably 90 per cent of the city has a small heart attack every time we smell a forest fire" (Heidenreich, 2021).

Rebuilding means helping people find a "new normal." This involves helping residents understand the hazards and risks that might impact the community and what they can do to prevent, mitigate, and prepare for these events. Understanding these aspects of disasters is critical to building resilient communities.

You will read more about the Fort McMurray fire in Chapter 3.

Clear Communications

An effective emergency program prioritizes communications with the public. Good communications help the public trust the work that the local authority is doing to keep them safe. Consistent and accurate communications can also persuade the public to follow the requests of first responders and elected officials.

During preparation, the local authority can focus on public education. This includes helping residents understand how information is shared during a disaster, what sources of information are reputable and trustworthy, and how residents can find current information when a disaster strikes.

During an emergency, the local authority needs to provide continual, consistent, and accurate communications. This involves:

- identifying appropriate spokespeople,
- sharing consistent information with the traditional media,
- using social media to reinforce messages, and
- engaging with the public through events like town hall meetings.

There may also be specific communication protocols that a local authority is legally required to follow. These may get a bit technical and require a good understanding of local laws. For example, imagine that you live in a community that is experiencing flooding from a local river. You may decide that you need to evacuate part of the community. The council may authorize you to send out an *evacuation alert*, letting residents know they may need to leave their homes. These alerts provide time for residents to pack some belongings, get their pets ready to travel, fuel up their cars, and request transportation support. To broadcast this information to the community, you could post it on a website, announce it on your social media, have the local radio station include it in their messaging, and have volunteers knock on resident's doors to advise them directly. Often an evacuation alert does not require a legal authority to send it out, meaning that there doesn't need to be an official state of local emergency.

Imagine that the flood waters continue to rise. The council may then authorize the emergency manager to send out an *evacuation order*, letting residents know that they now have to leave their homes. However, the council usually needs to declare a state of local emergency before it has the power to require the evacuation. Once declared, you would need to update all of your communications channels to ensure that the new message is being sent. You would also need to ensure that first response agencies are aware of the order as they may be responsible for managing aspects of the evacuation.

EXERCISE 1.4

Emergency Preparedness Communication

Imagine you are the emergency manager for your community. For Canada's annual Emergency Preparedness Week, your council has set a goal of having every household prepare an emergency kit. This kit would include enough water, food, and supplies to last for three days. Your job is to communicate this to the public.

1. What are some of the points you would make in your message?
2. How would you communicate this message to the public?
3. Who should be the spokesperson or spokespeople for this message?
4. Why is it important to communicate projects like this to the public?

Emergency management communications are discussed in more detail in Chapter 8.

Continuous Improvement

Emergency managers are continually looking for ways to improve their emergency programs. There are a number of ways this can be done.

An emergency manager can schedule ongoing training for staff. It is common for emergency programs to develop annual training schedules that reinforce basic operational activities. Some jurisdictions have legislation requiring that emergency plans and programs be regularly tested in exercises. It is also quite common for this training to be held in the location where it will be used. For example, EOC training should be conducted within the EOC itself. The benefit of creating an annual schedule is that staff can put it in their calendars, increasing the chances they'll attend.

An emergency manager can also develop **disaster exercises** for their staff. A disaster exercise, which is sometimes called a disaster simulation, is a staged emergency event used to train public safety professionals at different levels in or across different departments so that they can respond to emergency situations efficiently and effectively. These exercises test emergency plans and help staff practise for a response.

disaster exercise
a staged emergency event used to train public safety professionals (at different levels and in or across different departments) in how to respond to emergency situations efficiently and effectively

Following both exercises and actual emergencies, emergency managers develop after-action reports. These are formal documents that describe what worked, what didn't work, and what steps can be taken to address deficiencies. These reports often contain insights on how emergencies unfold and how the response might work differently in the future. These reports are significant as they become a record of where the emergency program needs to improve and can be used to identify where training is needed, where plans need to be rewritten, and what new resources need to be acquired.

You will learn more about emergency exercises in Chapter 4.

The emergency manager may also conduct audits of their program. An audit is a way of measuring a program against a set standard. Emergency managers may conduct the audit themselves or contract an outside consultant. A commonly used standard is the Canadian Standards Association's *Z1600-17 Emergency and Continuity Management Program* standard. This standard describes the minimum requirements for an emergency program to be considered to meet the standard.

Ethical Practice

Emergency managers make important decisions every day. Often these decisions will affect how residents live their lives. Emergency managers should also consider both the short- and long-term impacts their decisions will have on others.

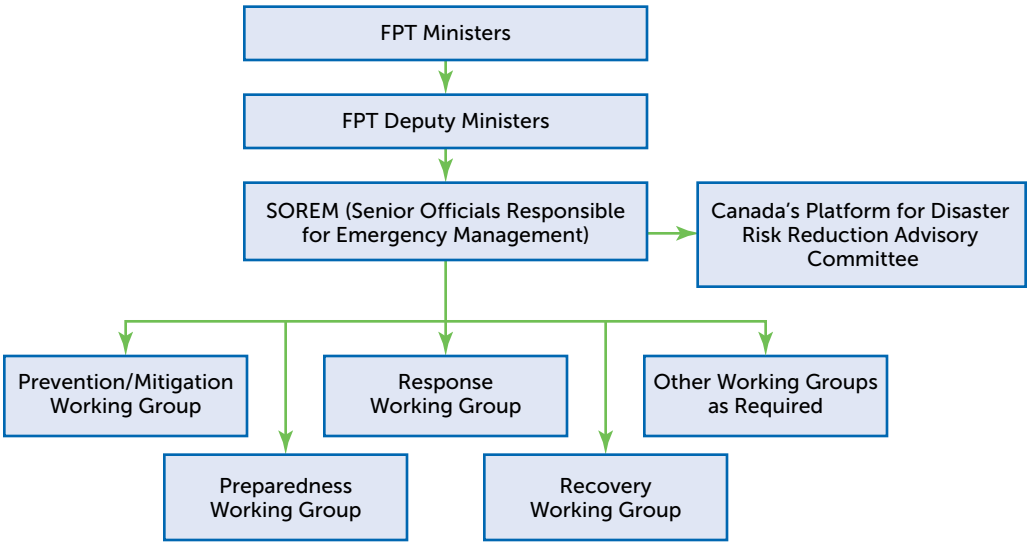
Different codes of conduct are available to emergency managers to help them structure their decision-making. These may vary depending on where the emergency manager works (i.e., the organization or government department). The International Association of Emergency Managers, a professional organization, publishes a code of ethics its members must adhere to (see Additional Resources). Following a code of conduct ensures that decisions are always made with the best interest of the public in mind.

Governance Mechanisms

Emergency management is more than just a set of practices. It involves relationships, coordination, and collaboration. For all of this to work effectively, a few different levels of governance have been developed.

Figure 1.2 shows a few different tiers. Each tier is made up of different representatives providing different inputs. Together they make up the group that governs how emergency management is performed in Canada.

FIGURE 1.2 Federal and Provincial/Territorial Governance Structure



Source: Ministers Responsible for Emergency Management (2017).

Let's look at each role in turn:

- FPT ministers represent federal, provincial, and territorial (FPT) ministries. These ministers have overall responsibility for their ministries and how they conduct emergency management activities. FPT ministers oversee the governance of the emergency management structures used in Canada.
- FPT deputy ministers work to convert ministerial decisions into actions. They work with senior officials responsible for emergency management (SOREM) to identify priorities and action items.
- SOREM is made up of representatives from all provincial and territorial governments' emergency management offices as well as representatives from Public Safety Canada. SOREM members work on action items along with the working groups.
- Working groups are made up of representatives from different sectors of emergency management. They work on targeted projects, develop reports, and work on action items.

This governance structure is important since these are the groups that determine the acceptable emergency management practices in Canada. They do this through consultation and discussion.

Diversifying Voices and Practices

The emergency management concepts and practices described in this textbook have developed over time. A wide range of factors have informed how public safety professionals do this important work, including lessons learned from real-world emergency response, practices borrowed from other disciplines, theories developed by researchers, laws passed by governments, and useful practices identified by professionals. It may seem that these practices are set in stone and perhaps even unchangeable. After all, if a practice is based on a law, isn't it "right"?

Emergency management is a field that helps the public. However, for many years the field has not reflected the public it serves. This is partly due to a lack of diversity in the people who work in this field. Not everyone has had an equal say in what is important to them when it comes to emergency planning, response, and recovery. Also, emergency management practices can reflect and reinforce existing inequities. Some of the concepts they rely on impose interpretations of people and their cultures. In some cases, governments make decisions that can have terrible consequences on individuals—see the Truth and Reconciliation box below for an example.

These underlying challenges not only reflect a lack of fairness, they are also missed opportunities for the emergency management field and society as a whole. For example, the traditional knowledge of First Peoples can provide valuable insights. European colonialist records only go back a few hundred years; traditional knowledge can go back thousands.

Part of being a public safety professional is reflecting on what we do with a critical eye. This includes challenging why we do what we do as practitioners. This can mean having difficult conversations and changing practices. These are important steps to both right past wrongs and ensure a more just society.

During the time that public safety professionals remain in the field, these are some questions they can ask themselves:

- What am I basing my assumptions on?
- Have I heard from everyone who might have a stake in this decision?
- Are there other ways to interpret the ideas I'm hearing?
- What might someone else do if they were in my position?

FIGURE 1.3 Incorporating Reconciliation in Emergency Management

What can *I* do differently?	What can my *ORGANIZATION* do differently?	What can *WE* do differently as a community of practice?
• LISTEN ... • Situate my practice within a historical context • Acknowledge history and trauma • Invest time in sincere relationship building • Incorporate Indigenous science in my work • Expect and confront racism • Develop cultural competency (e.g., ask to learn how to approach Elders; community comes before an individual; the importance of intergenerational living and learning)	• LISTEN ... • Increase representation and diversity (e.g., hire Indigenous people to work with Indigenous and non-Indigenous communities and portfolios) • Elect Indigenous persons on boards/working groups/etc. • Incorporate Indigenous science • Create a space for an Indigenous worldview within work and with/for First Nations communities	• LISTEN ... • Be open to allowing flexibilities in ICS • Incorporate Indigenous science • Expect and confront institutionalized racism • Enable a new generation of First Nation, Inuit, and Métis emergency managers • Rethink standard operating procedures within the context of reconciliation • Evacuation vs. forced relocation and residential school environment • Top-down control structures that discount local knowledge, practices, and needs

Indigenous scholars and emergency management practitioners Dr. Emily Dicken and Dr. Lilia Yumagulova bring to our attention the following questions, concepts, and ideas that can start the dialogue on reconciliation in our field of practice.

Source: Dicken and Yumagulova (2016).

TRUTH AND RECONCILIATION

The Truth and Reconciliation Commission (TRC) was brought together to document the history and impacts of the Canadian Indian residential school system. Many of the truths about the residential school system are not widely known or discussed. However, the impacts of the system have been felt by Indigenous students and their families for generations. The TRC determined that the residential school system amounted to cultural genocide.

As the commission drew to a close in 2015, it issued 94 calls to action. These calls are meant to drive systemic changes to many of the structures that continue to disadvantage Indigenous peoples, covering a broad range of areas including child welfare, education, language and culture, health, and justice. A link to all 94 calls to action is available in the Additional Resources section.

As a Canadian and a professional in public safety, it is important for you to understand and consider these impacts and how they might influence your actions. Public safety professionals across Canada have started looking closely at their emergency programs and thinking about how their actions or the structures of these programs might reinforce inequitable conditions. Figure 1.3 described ways that emergency managers can start—or continue—dialogues around the role their emergency program might play in supporting reconciliation.

CHAPTER SUMMARY

This chapter has explored some basic concepts about emergency management. We began by defining emergencies and disasters as events that threaten people, property, and the environment and that require a coordinated response. We looked at the major roles in the emergency management field. The role of public safety professionals is to help the community and government prepare for, respond to, and recover from emergencies. First responders work on the front lines. Emergency managers develop emergency programs, which include budgets, an executive team, an emergency plan, a training and exercise program, arrangements for supporting residents affected by disasters, and the support provided to residents who are preparing their neighbourhoods for emergencies.

The field of emergency management deals with the processes that are used to address emergencies. We measure hazards in terms of risk, which is a combination of the likelihood and the consequence of each hazard. The effects of an emergency arise through physical, social, economic, environmental, and cultural vulnerabilities. Communities also prepare for threats, which can be very specific "exposure pathways" or larger, complex hazards that impact a community in different ways. Hazards are natural, human-caused, or technological events that can impact a community.

We looked at past and current legislation and federal decisions that have influenced how emergency management formed. This brings us to the present day, where emergency management is structured around core principles, including:

- taking a risk-based approach that focuses on knowing and planning for hazards;
- developing plans that consider an all-hazards approach;
- identifying clear responsibilities for people, departments, and agencies;
- using a comprehensive planning model;
- developing partnerships to support coordination;
- ensuring coherent and shared actions through collaboration;
- working to understand and develop resilience in communities and residents;
- using clear communications during preparation, response, and recovery;
- working toward continuous improvements;
- using ethical frameworks to structure decisions; and
- following the governance mechanisms shared across different levels of government.

Throughout this textbook, you'll learn more about these concepts as well as how to put these ideas into action.

REVIEW QUESTIONS

1. How are the roles of first responders and emergency managers similar? How are they different?
2. What role do local authorities play in emergency management?
3. What is the purpose of an emergency program?
4. What are the main components of an emergency plan?
5. What is an emergency operations centre? What are its functions?
6. What are some of the benefits of thinking about hazards in terms of risk?
7. What are some examples of hazards that might impact your community? Identify at least one example of a natural hazard, a human-caused hazard, and a technological hazard.
8. What role does legislation play in emergency management?
9. Identify a hazard in your community and consider what actions might be taken to address it using the four pillars model: prevention and mitigation, preparation, response, and recovery.
10. Why is it important to think about items like the Truth and Reconciliation Commission's calls to action when developing an emergency program?

BOOTS ON THE GROUND

You are a uniform police patrol sergeant in Fredericton, New Brunswick, and you hear over your police radio that school-age children are trapped in the Saint John River Elementary School and attached childcare centre along the banks of the Saint John River. This has occurred at ten o'clock on a Tuesday morning. You are aware that over 100 children ranging in age from four to ten years should be in this school and childcare centre on any day.

There are immediate reports of the river water flooding into the school through the ground-level doors and windows, and students and faculty are now trapped on the second floor. The school is 100 years old, and there is a strong concern that the surging water could cause structural damage.

You're aware that city officials and emergency responder organizations have been monitoring the increasing water levels of the Saint John River, but nobody expected the sudden and powerful surge that caused the river to break its banks.

Police begin receiving calls from school officials who are trapped with the children on the second floor of the school. The egress from the main floor doors is no longer an option due to the rising water levels.

It's your move, sergeant. What are you going to do?

Discussion Questions

1. Based on this scenario and your understanding of risk, should actions have been taken prior to the river flooding its bank to prevent the flooding of the school?
2. Consider the definition of "vulnerability." Should the city emergency managers, in collaboration with school officials, have been thinking about the vulnerability of the school given its position near the river?
3. Consider the definition of "threat." Was the Saint John River a potential threat to this school and its occupants?
4. In hindsight, what could the city and school officials have done to prevent what happened in this scenario?

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