

Climate Change Risk Assessment for Manitoba Northern Businesses

- Climate Change Risk Assessment training tailored to Manitoba Northern Businesses.



MANITOBA CLIMATE
RESILIENCE TRAINING

CLASS WORKSHEET BOOKLET

**MANITOBA CLIMATE
RESILIENCE TRAINING**

Supported by Natural Resources Canada's Building Regional
Adaptation Capacity and Expertise (BRACE) Program



Worksheet Instructions

Task 1:



Use **WORKSHEET 1** to map out past climate extreme events that created impacts to your business in the prior history of your operations at this location. Consult long-term residents and news archives to look back to years that precede your staff's experience operating the business at this location.

Task 2:



In the previous step you identified the climate extreme events (blizzards, heatwaves and drought, etc.) that occurred in the past at your location. Now, in **WORKSHEET 2** we explore how these hazards and extreme events impacted our business, and in what areas of your business.

Review and answer the questions in **WORKSHEET 2 PART A**.

Most businesses will report YES to indicate that their business was impacted by climate hazards in at least one or more areas of their business.

For each climate hazard that was experienced in the past at your business, indicate if there was impact. If impact did not occur – specify that for the hazard you are considering. If there was impact in the past, indicate if it was minor or significant and add a description of the impact in **WORKSHEET 2 PART B**.

Task 3:



Now, shift your thinking to current climate impacts. Use **WORKSHEET 3** to record any adjustments you currently make at your business to cope with current climate impacts. For example, did you need to respond to wildfire hazard this year? Were your methods to cope with this event effective? What areas of your business were impacted?



Worksheet Instructions...

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Task 4

Look at Climate Atlas climate projections for your location in northern Manitoba. Understand how future hazards are projected to change in your region. Think about how these future climate changes, and trends, may impact areas of your business. Use **WORKSHEET 4** to place checkmarks next to climate hazards with potential to impact your business.

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Task 5:

Use **WORKSHEET 5** to develop deeper detail on relevant climate hazards to your business. For each, decide if the climate hazard poses No Impact, Minor Impact, or Substantial Impact. Add impact descriptions to each and indicate which areas of your business are affected.

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Task 6:

Use **WORKSHEET 6** and the provided 5-Point Scales for Probability (Likelihood) and Impact Severity. For each climate hazard, consider how severe that hazard's impact consequence would be to your business, and use the 5-Point Impact Severity Scale to guide your severity score for each of **4 impact areas: Health & Safety, Business Premises, Supply Chains, and Business Continuity**. Discuss historical patterns for each climate hazard in your location and review Climate Atlas projections to establish if your likelihood rating score would increase or decrease in the future, using the 5-Point Likelihood Scale provided in the worksheet.

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Task 7:

Start plotting the climate hazard risk levels, using **WORKSHEET 7's** Risk Matrix. Obtain values from the climate hazard likelihood scores and your Impact Severity Scores across 4 impact areas from **WORKSHEET 6**. You can use **WORKSHEET 8** to list each of these hazards in a master inventory. You can also sort the RISK LEVEL SCORES in **WORKSHEET 8**, allowing you to prioritise your climate risks from highest priority to lowest priority, on the basis of the Risk Levels shown on **WORKSHEET 7**.

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WORKSHEET 1: PAST CLIMATE EXTREME EVENTS



Documenting Past Climate Extremes in your Operating Region

	Prior Experience from Long Term Residents				Company Operations Begin		Known events since Starting Operations				
Extreme Heat (Heatwaves)											
Wildfire Events											
Extreme Precipitation											
Extreme Snowfall											
Freezing Rain Events											
High Wind Events											
Fog Events											
Drought Events											
Changes in Seasonal Patterns											
Other											
		1975	1980	1985	1990	1995	2000	2005	2010	2015	2020

WORKSHEET 2: PAST CLIMATE IMPACTS FOR YOUR BUSINESS: DETAILS ON HOW YOUR BUSINESS WAS AFFECTED.



2

Business Name: _____

Date: _____

PART A

	YES	NO
Did extreme weather events in the past cause work-related health and safety issues for your staff and customers? (e.g. extreme high temperatures affecting worker health and ability to perform duties).	<input type="radio"/>	<input type="radio"/>
In your operations in the past, was your business affected by extreme events? (refer back to your Worksheet 1 answers to guide your thinking)	<input type="radio"/>	<input type="radio"/>
In your business operations in the past, was your business affected by secondary impacts of extreme climate events? (e.g. your staff, premises and assets were not directly impacted by extreme events, but your operations were affected due to disruptions in your supply chain).	<input type="radio"/>	<input type="radio"/>
Thinking about the past, was your business continuity affected by extreme climate events? For example, Did your business experience damage to its premises, or to its inventory, or other assets? Did a loss in revenue occur with potential to threaten your financial situation?	<input type="radio"/>	<input type="radio"/>

If any of the above answers are YES, then indicate details
on HOW it impacted your business.

PART B

	NO IMPACT	MINOR IMPACT	SIGNIFICANT IMPACT	WRITE DESCRIPTION OF THE IMPACT(S)
Extreme Heat (Heatwaves)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Wildfire Events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Extreme Precipitation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Extreme Snowfall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Freezing Rain Events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
High Wind Events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fog Events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Drought Events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Changes in Seasonal Patterns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

WORKSHEET 3: CURRENT CLIMATE RISKS



During the time since your region and your business were exposed to the weather events listed in **WORKSHEET 1**, has your business made any adjustments or taken any steps to minimize future impacts to your business?

YES

NO

☐
☐

If your answer above is YES, please list any actions you have taken to cope with these weather events below:

Determine current climate-related risks to your business. Place a checkmark to respond to the questions of right:

☐

YES, there are existing climate-related risks to my business.

☐

NO, there are no existing climate-related risks to my business.

If you think there are existing climate-related risks to your business, which of the following aspects of your business are currently at risk due to those impacts?

☐

HEALTH AND SAFETY OF STAFF AND CUSTOMERS

☐

BUSINESS PREMISES

☐

BUSINESS SUPPLY CHAIN

☐

BUSINESS CONTINUITY

Have the actions that were taken in the past to reduce your climate risks worked?

Are any adjustments required to reduce present day climate risks?

WORKSHEET 4: FUTURE CLIMATE CHANGE OUTLOOK

4



Review the climate hazards below and consider how climate change can influence this hazard. Document key points on how climate change can influence this hazard, and place checkmarks beside the hazards that are relevant to your business.

HAZARDS		HOW CLIMATE CHANGE CAN INFLUENCE THIS HAZARD IN MANITOBA	LIKELIHOOD SCORE	PLACE A CHECKMARK BESIDE HAZARDS RELEVANT TO YOU
Extreme Heat (Heatwaves)		In general, increases in average temperature are likely to increase the number of hot days and nights, and the duration of heatwaves.	<input type="checkbox"/>	<input type="checkbox"/>
Wildfire Events		Increased average temperatures, combined with dry conditions, electrical storms and high winds increase the potential for wildfire events.	<input type="checkbox"/>	<input type="checkbox"/>
Extreme Precipitation		For every 1 degree of temperature increase in the atmosphere, that atmosphere can hold 7% more water, leading to potential for increases in short duration, high intensity rainfall events.	<input type="checkbox"/>	<input type="checkbox"/>
Extreme Snowfall		Warmer temperatures can cause a reduction in the amount of precipitation that falls as snow. At the same time, the potential for large, heavy, wet snowfall events has increased for some regions.	<input type="checkbox"/>	<input type="checkbox"/>
Freezing Rain Events		Increases in average winter temperatures have resulted in increases of winter precipitation falling as rain and more rain on snow events.	<input type="checkbox"/>	<input type="checkbox"/>
High Wind Events		Changes in winds are not easy to model for climate change. Ranges of extreme winds are expected to increase as the potential for increased extreme weather activity grows with a warming climate. Winds can cause damages to forests, power lines, and buildings. Wind can also increase the spread of wildfires.	<input type="checkbox"/>	<input type="checkbox"/>
Fog Events		Fog events create visibility concerns for transportation by motor vehicle, boat and aircraft. Prolonged fog events can disrupt modes of transportation and cause delays due to transportation safety concerns.	<input type="checkbox"/>	<input type="checkbox"/>
Drought Events		In Manitoba, climate change means there is potential for increased periods of drought. At the same time, short duration high intensity rainfall events are expected to increase. This creates the potential for drought and localized flooding in the same year.	<input type="checkbox"/>	<input type="checkbox"/>
Changes in Seasonal Patterns		Climate change, particularly increases in average temperature can affect the timing of seasons. This is expected to result in shorter winter seasons and an extension of the annual "shoulder" seasons in autumn and spring.	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="text"/>		<input type="checkbox"/>	<input type="checkbox"/>



WORKSHEET 5: FUTURE CLIMATE IMPACTS

5



Using the information you entered in **WORKSHEET 4** for Future Climate Change, consider how future hazards may impact your business and its operations. Be sure to think of all aspects of your business: staff, buildings, supply chain, business continuity, etc. Place a checkmark in the proper circle below to indicate No Impact, Minor Impact, or Significant Impact.

HAZARDS	NO IMPACT	MINOR IMPACT	SIGNIFICANT IMPACT	For ONLY the Hazards that you have checked off as MINOR or SIGNIFICANT IMPACT, Document potential impacts for your business. All hazards indicated as "No Impact" are dropped from consideration.
Extreme Heat (Heatwaves)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Check those that apply, add brief description of each impact Staff/Customer Health & Safety <input type="checkbox"/> Business Premises <input type="checkbox"/> Business Supply Chains <input type="checkbox"/> Business Continuity Planning <input type="checkbox"/>
Wildfire Events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Staff/Customer Health & Safety <input type="checkbox"/> Business Premises <input type="checkbox"/> Business Supply Chains <input type="checkbox"/> Business Continuity Planning <input type="checkbox"/>
Extreme Precipitation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Staff/Customer Health & Safety <input type="checkbox"/> Business Premises <input type="checkbox"/> Business Supply Chains <input type="checkbox"/> Business Continuity Planning <input type="checkbox"/>
Extreme Snowfall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Staff/Customer Health & Safety <input type="checkbox"/> Business Premises <input type="checkbox"/> Business Supply Chains <input type="checkbox"/> Business Continuity Planning <input type="checkbox"/>
Freezing Rain Events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Staff/Customer Health & Safety <input type="checkbox"/> Business Premises <input type="checkbox"/> Business Supply Chains <input type="checkbox"/> Business Continuity Planning <input type="checkbox"/>
High Wind Events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Staff/Customer Health & Safety <input type="checkbox"/> Business Premises <input type="checkbox"/> Business Supply Chains <input type="checkbox"/> Business Continuity Planning <input type="checkbox"/>
Fog Events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Staff/Customer Health & Safety <input type="checkbox"/> Business Premises <input type="checkbox"/> Business Supply Chains <input type="checkbox"/> Business Continuity Planning <input type="checkbox"/>
Drought Events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Staff/Customer Health & Safety <input type="checkbox"/> Business Premises <input type="checkbox"/> Business Supply Chains <input type="checkbox"/> Business Continuity Planning <input type="checkbox"/>
Changes in Seasonal Patterns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Staff/Customer Health & Safety <input type="checkbox"/> Business Premises <input type="checkbox"/> Business Supply Chains <input type="checkbox"/> Business Continuity Planning <input type="checkbox"/>
Other <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Staff/Customer Health & Safety <input type="checkbox"/> Business Premises <input type="checkbox"/> Business Supply Chains <input type="checkbox"/> Business Continuity Planning <input type="checkbox"/>

WORKSHEET 6: IMPACTASSESSMENT



1 UNLIKELY Not expected to occur	2 REMOTE Not expected to occur	3 OCCASIONAL Expected infrequently	4 CERTAIN Expected eventually	5 FREQUENT Expected to occur often
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PROBABILITY/LIKELIHOOD



Climate Hazard	Likelihood Score		Impact Severity		Impact Areas					Comments
			Minor	Significant	Staff/Customer Health & Safety	Business Premises	Supply Chains	Business Continuity		
Extreme Heat (Heatwaves)	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
Wildfire Events	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
Extreme Precipitation	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
Extreme Snowfall	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
Freezing Rain Events	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
High Wind Events	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
Fog Events	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
Drought Events	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
Changes in Seasonal Patterns	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
Other	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		
Other	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5		

Impact Severity: 1 Negligible 2 Marginal 3 Major 4 Serious 5 Catastrophic

IMPACT SEVERITY

5 CATASTROPHIC	Risk will effect extensive damage long-term effect
4 SERIOUS	Risk will cause significant loss, injury or damage
3 MAJOR	Risk may cause considerable loss, injury or damage
2 MARGINAL	Risk may cause minor loss but little overall effect
1 NEGLIGIBLE	Risks have minimal damage or long-term effect

WORKSHEET 7: CLASSIC 5POINT SCALE RISK MATRIX



IMPACT SEVERITY

5 CATASTROPHIC Risk will effect extensive damage long-term effect					
4 SERIOUS Risk will cause significant loss, injury or damage					
3 MAJOR Risk may cause considerable loss, injury or damage					
2 MARGINAL Risk may cause minor loss but little overall effect					
1 NEGLIGIBLE Risks have minimal damage or long-term effect					
	1 UNLIKELY Not expected to occur	2 REMOTE Not expected	3 OCCASIONAL May occur intermittently	4 CERTAIN Expected to occur eventually	5 FREQUENT Likely to occur soon and often

PROBABILITY LIKELIHOOD

Risk = P x S SCORE	RISK LEVEL	RESPONSE
1-2	CONTROLLED	Limited Monitoring Only
3-6	SERIOUS	Active Monitoring
8-9	DISRUPTIVE	Investigation Needed
10-16	SEVERE	Rapid Action Required
20-25	CRITICAL	Immediate, Crucial Priority

Date: [illegible]