



Climate Change Risk Management Tool For Small Businesses In Queensland





Climate change and extreme events affect all Australians. Globally much is being done to reduce carbon emissions and limit the extent and impact of climate change, but the need to adapt remains. Increasingly the finance and insurance sectors are taking a greater interest in how businesses may be impacted by a changing climate, and in what they are doing to understand and reduce any associated risks to their operations, supply chains and staff.

There is clear recognition that small businesses do not have sufficient staff, resources and time to take a proactive approach in considering climate change, yet many are already exposed to extreme events.

Responding to this, the Chamber of Commerce and Industry Queensland (CCIQ) with the support of the Queensland Government and in consultation with Queensland businesses, developed a Small and Medium Enterprises Sector Adaptation Plan for Queensland. The Plan, developed under the Queensland Climate Adaptation Strategy, recommends a number of steps including the development of resources to support SMEs starting their adaptation journey. In response, the Queensland Government funded development of this Climate Change Risk Management Tool.

This tool contains information on climate change (what, where and how much). It is simple and quick to use, but also provides links to other resources that can be accessed and used as required. By taking these first steps in determining risks faced from extreme events and a changing climate, businesses will be better able to address their risks by updating business continuity plans or developing them from scratch. A corresponding resource for households has also been developed.

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This tool contains:

- a rapid risk screening checklist ([page 9](#))
- a detailed risk management checklist ([page 11](#))
- a worked example illustrating the use of the detailed risk management checklist ([page 47](#))
- an information booklet for more information and supporting resources for climate change risk assessment ([page 29](#)).

It is recommended that you familiarise yourself with the contents of the booklet before you start using the checklists.

Frequently Asked Questions

How long will it take to complete this tool?

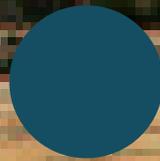
It depends on your prior knowledge about the problem, but typically the rapid risk screening can be done within 30 minutes and detailed risk management checklist can be completed within 1-2 hours.

What is the cost of using this tool?

This tool is free to use, however you have to bear your own cost to implement any identified action.

Who can assist me if I need help?

There is enough information in the information booklet to get you started. However, if you think your risk is higher, you should consider getting some expert advice from a consultant.



Where to start?



I want some background information about climate change risks to businesses.

- **Why should I consider climate change risks to my business?**
Go to [page 5](#)
- **What is the benefit for me and my business if I adapt?**
Go to [page 6](#)
- **What is climate change and sea-level rise?**
Go to [page 31](#)
- **What does the future climate look like in Queensland?**
Go to [page 34](#)
- **What are some of the impacts of climate change on small business?**
Go to [page 38](#)
- **What options do I have for managing my future risks?**
Go to [page 42](#)



I want to do a rapid climate change risk screening of my business

Go to [page 9](#)



I want to do a risk assessment and develop an action plan for my business

Go to [page 11](#)



I want to see a worked example of how to use these checklists.

Go to [page 47](#)

Why should I consider climate change risks to my business?

Weather already affects business

Extreme weather continues to disrupt many Queensland businesses. Recent events include Cyclone Debbie (2016), Cyclone Yasi (2011), and flooding throughout the state in 2011. Extreme events can cause significant damage to property and infrastructure, impacting local communities and businesses and industries. For example from November 2010 to March 2011, 99% of Queensland was declared a natural disaster zone.

A survey of businesses conducted by the Chamber of Commerce and Industry Queensland in 2011 found that although the majority of businesses recovered within six months, many continued to experience abnormal business and economic conditions. A return to business-as-usual was impeded by:

- loss of customers who had been impacted by the floods
- changes to demand from customers
- rebuilding and insurance delays
- lack of available financing.

Recovery in many businesses was assisted by the presence of risk management practices which helped get reduction in insurance premiums, reduce damage costs, increase revenue by strategically selecting warehouse locations to avoid hazards, etc.

Apart from major natural disasters, many businesses have experienced the more subtle effects of weather on productivity or sales, including those from small storms and rising average temperatures. This suggests that businesses are not well adapted to the current climate. Building resilience now will help protect businesses and jobs, reduce the costs of disruption and maximise any opportunities arising from future weather and climate changes.

Financial and legal motivations

Climate risk is increasingly being viewed as an important consideration by the many corporate regulators in Australia and abroad. Even credit rating companies such as Moody's are beginning to assess the risks associated with climate, and the ways in which these risks are being addressed.

The finance sector is being strongly influenced and "motivated" to act on climate change through mechanisms such as the Taskforce on Climate Related Financial Disclosures, and signals from the Australian Prudential Regulation Authority (APRA). As a result, it is possible to reduce or restrict lending to organisations which have a potential climate risk and which have not put mechanisms in place to understand and reduce that risk.

A recent memorandum of opinion prepared for the Centre for Policy Development and the Future Business Council (Hutley QC *et al.* 2016) indicated that Australian company directors could be considered liable if their 'boards' have not considered and acted on climate risk, where any losses are incurred.

These findings emphasise the importance of considering climate risk, and determining, at a minimum, how climate change affects a business's risk profile, risk appetite and whether actions should be taken to manage some of those risks.

What is the benefit for me and my business if I adapt?

Like any other issue facing your business, it is important to understand how extreme weather and climate change impacts could affect you. Planning ahead rather than responding reactively will help you with the following.

1. Cost saving

Make more informed investment decisions by understanding how current and future climate risks will impact your business's operational performance. This will allow you to manage or lower costs in the long-term. It can also potentially help reduce insurance costs and borrowing costs into the future.

2. Business continuity

Address your business's exposure to climate risks and you will give your business a better chance to continue to operate and meet customer demands, while minimising the degree and duration of any extreme weather related disruption.

3. Competitive advantage

Identify possible business opportunities such as developing new products or services, finding ways to reduce costs, or more effectively managing climate risks.

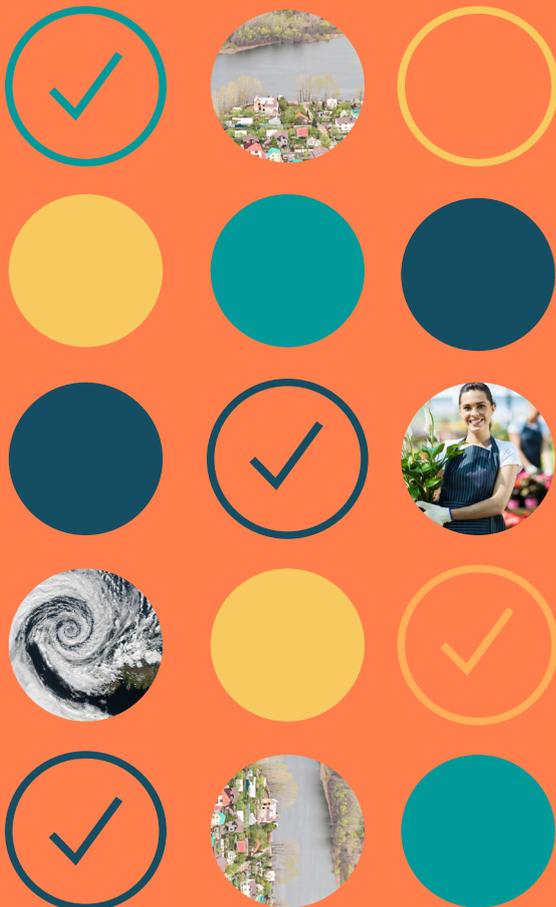
4. Reputational benefits

Demonstrate to your customers and shareholders that the impacts of climate change are being managed. This will increase investor confidence and boost your business's reputation.





Checklist for Rapid Climate Change Risk Screening



Rapid Climate Change Risk Screening

Has your business been affected by extreme events in the past?

Yes No

Has the health and safety of your staff been impacted as a result of past extreme events (heatwave, flood, severe storms, cyclones, etc.)?

Yes No

Have your business premises (shop, warehouse), stocks and assets been affected by extreme events in the past such as floods, cyclones, bushfires, etc.?

Yes No

Has the revenue of your business been affected during and/or after an extreme event (including insurance costs)?

Yes No

Do you wish to understand and manage the potential for climate change to affect your business interests in the future?

Yes No

If you answered yes to any of these questions, then your business is sensitive to climate and might be affected again in future.

Queensland's climate is changing and sea levels are rising. As a result, extreme events such as heatwaves, floods, bushfires, droughts etc. are changing in their frequency and intensity (happening more often with more intensity). Therefore you should consider assessing climate change risks to your business.

How will climate change affect Queensland?

In the future, the state can expect:

-  higher temperatures
-  hotter and more frequent hot days
-  harsher fire weather
-  fewer frosts
-  reduced rainfall in the south-east
-  more intense downpours
-  less frequent but more intense tropical cyclones in the north
-  rising sea level
-  more frequent sea-level extremes
-  warmer and more acidic seas

From [Queensland Government](#). For more information visit [Queensland Future Climate Dashboard](#).

Rapid climate change risk assessment checklist

Climate hazards	Has the hazard affected your business in the past?		How the hazard is likely to change in future	Potential future impacts (indicative)	Are future hazards likely to affect your business?		What could you do about this? Are there any opportunities for your business?
	Yes	No			Yes	No	
Heatwave 	Yes	No	In general, increased average temperatures. Increased number of hot days and nights and length of heatwaves.	Impact on staff health and safety	Yes	No	
				Increased cooling demand and electricity cost.	Yes	No	
				Risk of failure in electricity grid leading to damage to perishable stocks	Yes	No	
Bushfire 	Yes	No	Increased average temperatures combined with dry conditions increases bushfire potential.	Damage to your business premises	Yes	No	
				Disruption to your supply chain	Yes	No	
				Loss of revenue and risk to business continuity	Yes	No	
Flood 	Yes	No	Coastal: Sea-level rise can cause increased flooding in low-lying coastal areas during high tides, cyclones and storm events. Inland: Extreme rainfall can cause inland flooding.	Damage to your business premises	Yes	No	
				Disruption to your supply chain	Yes	No	
				Loss of revenue and risk to business continuity	Yes	No	
Severe storm 	Yes	No	Frequency and intensity of storm events may increase (including excessive rainfall, lightning, hail, etc.). At the same time, sea-level rise will increase the risk of flooding in coastal areas during severe storms.	Risk of damage to assets (buildings and equipment)	Yes	No	
				Business interruption due to loss of water and energy supplies	Yes	No	
				Disruption in supply chain and logistics	Yes	No	
				Increased costs to weatherproof buildings and storage facilities	Yes	No	
				Higher costs of insurance policies	Yes	No	

Climate hazards	Has the hazard affected your business in the past?		How the hazard is likely to change in future	Potential future impacts (indicative)	Are future hazards likely to affect your business?		What are you going to do about this? Are there any opportunities for your business?
	Yes	No			Yes	No	
Drought 	Yes	No	Decrease in future rainfall can lead to drought. Increased hotter days combined with drier conditions will increase bushfire risk.	Increased competition for and cost of water resources.	Yes	No	
				Reduction in agricultural production	Yes	No	
				Loss of revenue and risk to business continuity	Yes	No	
Coastal erosion 	Yes	No	Sea-level rise can increase erosion of low-lying erodible shores. Increased frequency of severe storms in coastal areas can also lead to more erosion.	Risk of damage to assets (buildings and equipment)	Yes	No	
				Business interruption due to loss of water and energy supplies	Yes	No	
				Disruption in supply chain and logistics	Yes	No	
				Increased costs to weatherproof buildings and storage facilities	Yes	No	
				Higher costs of insurance policies	Yes	No	
Cyclone 	Yes	No	Increased available heat in the ocean may affect cyclone behaviour. The number of cyclones may reduce but their intensity may increase.	Risk of damage to assets (buildings and equipment)	Yes	No	
				Business interruption due to loss of water and energy supplies	Yes	No	
				Disruption in supply chain and logistics	Yes	No	
				Increased costs to weatherproof buildings and storage facilities	Yes	No	
				Higher costs of insurance policies	Yes	No	
Acidic ocean 	Yes	No	Increased amount of heat and carbon dioxide (CO ₂) in the ocean can make ocean water acidic, which impacts bio-diversity in the ocean (e.g. corals, fish).	Reduction of revenue in relevant businesses (tourism, fishery and aquaculture)	Yes	No	



Checklist for Climate Change Risk Assessment and Action Plan Development



A simple process to understand your current and future climate related risks

Implement and monitor your plan

Assess effectiveness of your implemented actions and revise if necessary.

Assess whether your implemented plan has worked and if any change is required.



Past climate impacts

Identify previous weather events near your business locations and understand how they have impacted your business and operations in the past.

Identify the impacts (how, when and what).

Current climate risks

Determine your current climate related risks.

If your area has been impacted by a climate hazard in the past and your business has been negatively affected, but you have not taken any measures yet, you have some existing climate related risks to your business.



Action plan

Create an action list for your record including determining when to act.

While listing each task, think about when they are likely to be done (now, within 3 years, after 3 years) and how much this might cost.



Future climate change

Understand the future climate of your area.

Using Queensland Government's regional high-level climate projections ([page 37](#)) understand how future hazards are projected to change in your region.

You can also look at some of the coastal hazard maps produced by your local council to see if you are located in hazard prone coastal areas. Note that all coastal flood maps do not include sea level rise

If you live inland, check flood maps produced by your local council to see if you are located in flood prone areas.



Adaptation options

Identify adaptation options for your business.

[Page 43](#) in the booklet provides some high-level indicative adaptation options to get you started.



Business specific risks and opportunities

Identify future risks and opportunities to your business and operations and when they are likely to occur.

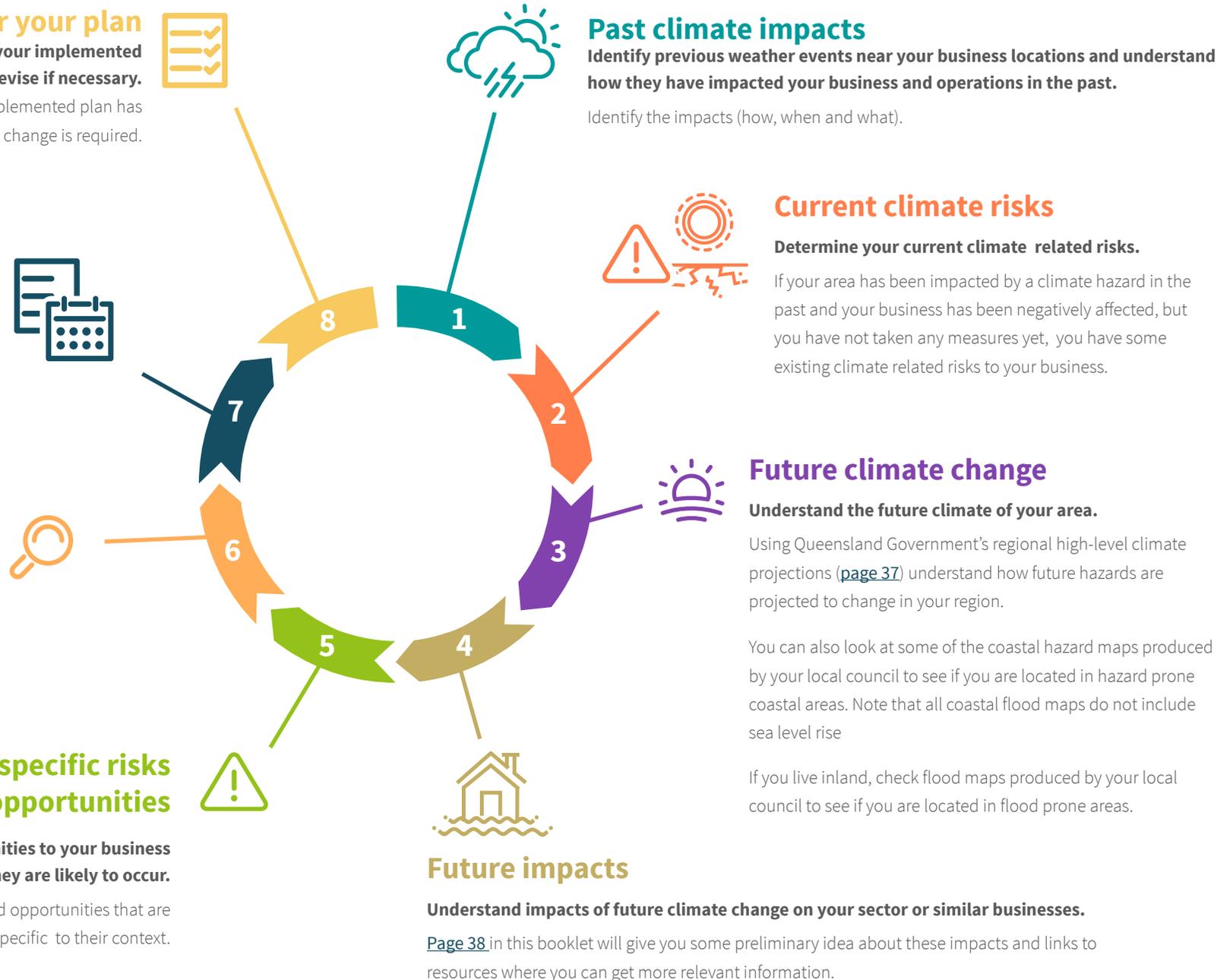
Every business will have risks and opportunities that are specific to their context.



Future impacts

Understand impacts of future climate change on your sector or similar businesses.

[Page 38](#) in this booklet will give you some preliminary idea about these impacts and links to resources where you can get more relevant information.



Climate change related risks

There are four broad risk categories for small businesses that can arise as a result of climate change and extreme events.



Risk to staff and customers

Lives of staff and customers can get disrupted during extreme weather events. It could mean employees are unable to travel to work or tourists are unable to visit attractions or attend events.



Risk to business premises

Physical structures and business assets may be at direct risk from weather extremes, requiring design and/or location changes, affecting asset values, or causing physical damage. There will be a growing need to adapt many of Queensland's buildings and outdoor spaces to hotter and more extreme weather in the years ahead. This could mean retrofitting existing buildings as well as designing new buildings to be more resilient. The location and structure of business premises determines their vulnerability to hazards. Whether owning or renting, it is important to examine any risks to your business premises and respond accordingly.



Risk to business supply chain

Supply chains are likely to be adversely affected as a result of reduced access to raw materials, climate-induced disruption to production lines, unstable energy supplies, damage to infrastructure, and increased vulnerability of the workforce. Climate change could reduce the availability of raw materials that are vital to the production of goods and services. This could have considerable implications for agricultural and forestry commodities including water, and the loss of ecosystems services. Climate change may also undermine access to these materials by damaging the infrastructure and utilities essential for resource extraction and production.



Risk to business continuity

Business continuity will be affected by climate change as increased extreme events can damage assets and property and disrupt essential services such as electricity and water supply. These can lead to increased insurance cost, disruptions in operations and lost sales, which can threaten your financial situation and risk your business continuity.

This checklist will support you to screen risks to these four aspects of your business.



1. Past climate impacts

Past climate extremes in your area

List any previous extreme events in your area that affected you, your business operation, business premises, staff, etc. in the time plot below. Write down the year and/or the name of the event (if you remember) in the boxes. Use local knowledge for this. If you are new in the area, discuss this with long-term residents from the area or conduct a brief internet search. [Hardenup Protecting Queensland](#) also provides links to some historical hazard information, flood maps, etc. for different areas in Queensland.

Table 1: Past extreme events in your area

Heatwaves

Flood

Bushfire

Severe storm

Drought

Coastal erosion

Cyclone

Other





1. Past climate impacts

Have past extreme events caused work related health and safety issues for your staff and customers e.g. extreme temperature affecting worker health and performance?

Yes **No**

In the past were your business premises affected by any extreme events (see your answers in Table 1)?

Yes **No**

In the past, was your business affected by secondary impacts of extreme climate events i.e. your staff, business premises and assets were not directly impacted by extreme events but your operations were affected e.g. as a result of disruptions to your supply chain?

Yes **No**

In the past, was your business continuity affected by extreme climate events? Did you experience damage to your business premises or a loss of stocks and assets? Did a loss of revenue threaten your financial situation, etc.?

Yes **No**

If any of the above answers are **Yes**, how did it impact your business?

No Impact **Minor impact** **Significant impact**

Write down impacts



Heatwave



Flood

(coastal or inland)



Bushfire



Severe storm



Drought



Coastal erosion



Cyclone



Other

(list below)

Climate hazard:



2. Current climate risks

Since the occurrence of weather events listed in Table 1, have you made any adjustments or taken any steps to minimise future impact on your business?

Yes **No**

If the answer is **Yes**, list actions that you have taken.

Determine **current climate related risks** to your business (Put mark).

Note: If you have been impacted in the past but have not made any plans to tackle that impact in future, you have climate related risks to your business regardless of climate change.

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

Yes, there are existing climate related risks to my business.

If you think that there are existing climate related risks to your business, which of these aspects are currently at risk:

staff/customers' health and safety

business premises

business supply chain

business continuity

Some questions you should consider asking yourself in order to better understand your current risks:

1. Have the actions that you took in the past to reduce your risks worked?

2. Are any adjustments required to reduce present day climate risks?



3. Future climate change

Future climate outlook of your area

Using regional climate change projections for Queensland (see [page 37](#) of the information booklet), determine the future climate for the area where you operate your business. For more information on future climate projections in your area, please visit “[Queensland Future Climate Dashboard](#)”.

Hazards	How climate change can influence this hazard	Mark the ones that are relevant to you
	Heat and heatwaves In general, increased average temperature is likely to increase the number of hot days and nights and length of heatwaves.	
	Flood (coastal or inland) Coastal: Sea-level rise can cause increased flooding in low-lying coastal areas during high tides, cyclones and storm events. Inland: Extreme rainfall can cause inland flooding.	
	Bushfire Increased average temperatures combined with dry conditions increases bushfire potential.	
	Severe storm Frequency and intensity of storm events may increase (including excessive rainfall, lightning, hail, etc.). At the same time, sea-level rise will increase the risk of flooding in coastal areas during severe storms.	
	Drought Decrease in future rainfall can lead to drought. Increased hotter days combined with drier conditions increase bushfire risk.	



3. Future climate change

Hazards

How climate change can influence this hazard

Mark the ones that are relevant to you



Coastal erosion

Sea-level rise can increase erosion of low-lying erodible shores. Increased frequency of severe storms in coastal areas can also lead to more erosion.



Cyclone

Increased available heat in the ocean may affect cyclone behaviour. The number of cyclones may reduce but their intensity may increase.



Acidic ocean

Increased amount of heat and carbon dioxide (CO₂) in the ocean can make ocean water acidic, which impacts bio-diversity in the ocean (e.g. corals, fish).



Change in seasonal patterns

A slight change in average temperature is enough to impact seasonal patterns of climate. For example, growing seasons are shifting, spring is arriving earlier, winters are shorter, and the number of frost days are declining. These changes affect the timing of many life cycle events, such as when flowers bloom or when pollinators and pests emerge.



Other



4. Future impacts

Using the information gathered from 'Future climate change' in Step 3, determine how future hazards may impact your business. Remember to think about all aspects of your business - staff, premises, supply chain, and continuity (Put mark).

Write down potential impacts to your business in the spaces provided. See "[sector specific impacts](#)" in the booklet on [page 40](#) for some examples and sources of additional information).

	No Impact	Minor impact	Significant impact	Write down potential impacts to your business
				
Heatwave				
				
Flood (coastal or inland)				
				
Bushfire				
				
Severe storm				
				
Drought				
				
Coastal erosion				
				
Cyclone				
				
Other (list below)				



5. Business specific risks and opportunities

RISKS

If you have identified future risks to your business, list the specific future risks (in near-term and longer-term) below.

Examples of the potential future risks to your business

Staff

- If your business requires outdoor work, then during heatwaves staff health and safety might be at risk. Long exposure to heat can cause a range of health conditions and reduce productivity.
- If you do not have air conditioning in your business premises, then during heatwaves staff and customers may be negatively affected, leading to a reduction in staff efficiency, work hours or loss of business.
- Loss of work hours if the families and homes of employees are affected by extreme events. For example, your business premises might be unaffected by flooding, but areas where your key staff live might be affected. This can put your business at risk of not having critical staff available.

Business premises

- If you operate in a flood zone or in a cyclone prone area, then these extreme events may pose a risk to your shops, warehouses, etc.
- Your customers may not be able to get to your shop if access is limited by an extreme event. If customers are not able to access your business after an extreme event then you need to be aware and make appropriate decisions.

- Essential services such as electricity or water supply may fail following an extreme event. This can affect your operations, goods and equipment.
- Without air conditioners or proper ventilation during heatwaves, your business premises and warehouses can become inoperable, affecting goods and equipment.

Business supply chain

- As a result of a flood in another location, trucks may be unable to deliver supplies to your business.
- Extreme events (e.g. drought, flood) can cause fluctuations in the price of, and demand for raw materials that may be critical for your business operation, for e.g. price of bananas after Cyclone Larry.

Business continuity

- Exposure to extreme events such as flooding or drought can damage assets, stock, sales and service that you provide. Such loss can reduce your capacity to recover, leading to significant financial strain (e.g. loans, mortgages). Losses like this can also damage your ability to attract investment, gain financing and get insurance, all of which may threaten your business continuity.



5. Business specific risks and opportunities

	Description of risk
Near-term risks (1-3 years)	Staff and customers' health and safety
	Business premises
	Business supply chain
	Business continuity
Longer-term risks (more than 3 years)	Staff and customers' health and safety
	Business premises
	Business supply chain
	Business continuity



5. Business specific risks and opportunities

OPPORTUNITIES

Can you think of any opportunities for your business as a result of changing climate? Opportunities increase the resilience of your business and your profitability (in near-term and long-term).

Examples of potential opportunities for your business

Staff

- Improve work/life balance by responding to climate change risks with flexible working hours and allowing employees to work from home.

Business premises

- If you locate your business in low-risk areas or premises, you will have competitive advantage during extreme events.
- A warmer climate may reduce heating demand in winter.
- Building green infrastructure and outdoor spaces may provide a more attractive working environment.
- Engineering, design, architecture and planning businesses can lead the way in developing innovative products and services that will enable more resilient buildings and spaces.
- If your premises are damaged by extreme weather, there is an opportunity to rebuild it to a higher standard of resilience, to prevent the same damage from happening again.
- Increasing resilience of your premises may reduce insurance costs.

Business supply chain

- Sourcing alternative suppliers of resources to ensure continuous supply if current suppliers are affected.
- Being aware of risks to supply chain impacts from extreme events enables you to carry more stock in advance of the likely event.

Business continuity

- A proactive risk assessment and implementation plan can limit your risks and reduce your liabilities, which can lead to a reduction in insurance costs.
- Clients and customers are attracted to businesses that can show they are resilient to climate change.



5. Business specific risks and opportunities

Description of opportunities

Near-term opportunities

(1-3 years)

Staff and customers' health and safety

Business premises

Business supply chain

Business continuity

Longer-term opportunities

(more than 3 years)

Staff and customers' health and safety

Business premises

Business supply chain

Business continuity



6. Adaptation options

There are a range of options to help small businesses manage future climate related risks. See the information booklet for some examples of [adaptation options](#) on [page 43](#). For each of your identified risks list adaptation options that might suit your business. Consider options that are fit for your purpose and within your capacity.

Description of available adaptation options

Near-term options
(1-3 years)

Staff and customers' health and safety

Business premises

Business supply chain

Business continuity

Longer-term options
(More than 3 years)

Staff and customers' health and safety

Business premises

Business supply chain

Business continuity



6. Adaptation options

Some questions you should consider asking yourself in order to minimise your risks:

Do you have an up-to-date contact list? This should include staff, customers, clients, suppliers and key local community contacts. This will help you to manage your operation during extreme events.

Do you have flexible working arrangements for staff members during extreme weather, and have you planned how can this be achieved without disrupting business continuity?

Do you have appropriate resilience measures to protect your business premise (e.g. sandbags or metal barriers for flood)?

How well do your buildings and building services cope with high temperatures?

Do you have the skills and equipment to clean up after an extreme weather event? Are you able to purchase this now?

Have you considered whether you could operate from alternative premises if you had to?

Have you considered moving your business to a less risky location?

If you rent your business premises, have you discussed climate related risks with your landlord? Their actions and plans have a material risk to your business.

Is your business or the product that you create or supply weather or climate sensitive? Do you rely on any services that are weather or climate sensitive?



6. Adaptation options

Have you considered diversifying your supply chain (i.e. collect raw materials and other related services from diverse geographical areas)?

Does your business have markets or suppliers that could be affected by climate change in other areas, regions, states or countries?

Have you backed up your data, identified where your back-ups are located (e.g. on laptops, PCs, servers or off-site) and secured them in a safe place?

How would a severe weather event impact your business finances?

Insurance can be challenging and the types of cover you have will vary between providers and your exposure to risk. Given this complexity, are you sure that you have appropriate cover for your needs and interests now and into the future?

Are you covered for floods and storm events and are you aware of what you do NOT have insurance for?

Does your insurance policy replace new for old items (e.g. equipment, supplies, products, etc.) or have limits for repairs?

How would you fund additional costs arising from a severe weather event or a flood in the short term?



7. Action plan

Now we are going to think about your action plan.

List how you plan to manage your identified risks and make the most of opportunities. Where appropriate, indicate who is responsible for each action and how you may assess where the action is achieving its purpose.

	Description of action plan
Near-term action plan (1-3 years)	Staff and customers' health and safety Business premises Business supply chain Business continuity
Longer-term action plan (more than 3 years)	Staff and customers' health and safety Business premises Business supply chain Business continuity



7. Action plan

Summary of Actions to address climate change

Business name:

Date:

Risks that I have identified

(copy the risks from [page 21](#))

What can I do now?

(copy near-term action plans from [page 27](#))

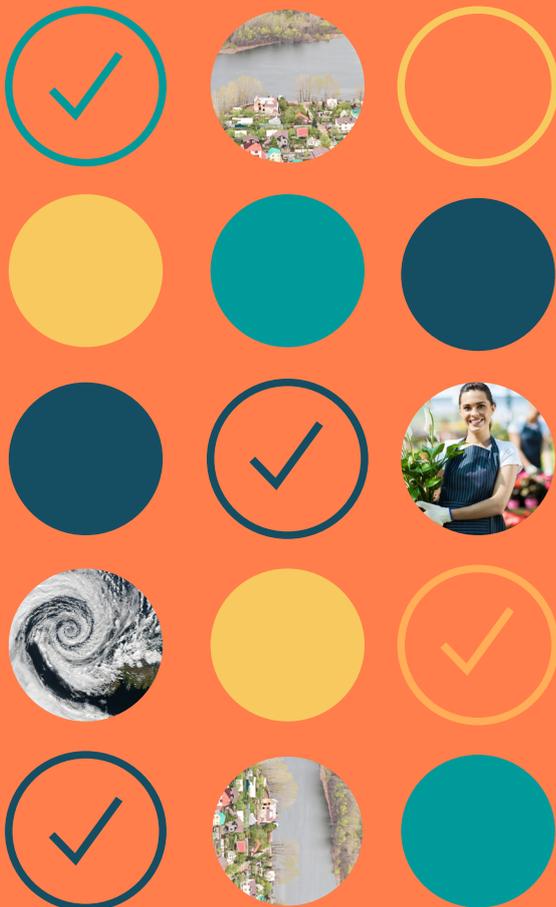
What can I do in future?

(copy long-term action plans from [page 27](#))

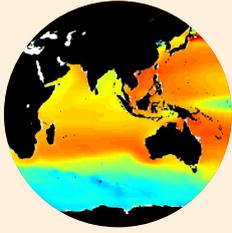
Determine a date when you need to revisit your risks in future. If you think your risk is higher, you should consider getting some expert advice.



Information Booklet



Some basic definitions



Climate change impacts

Changes that occur as a result of future climate.

For example, reduction in average rainfall in the future will increase dry conditions, which will impact the way we conduct our agriculture in certain areas.



Climate change adaptation

Steps governments, businesses, communities and individuals take to deal with risks from climate change impacts.

For example, an agricultural business at risk of drought can plant crops that can survive with low moisture content.



Climate change risks

What a given climate change impact will mean for your business and operations.

For example, if you are an agricultural business, increased dry conditions in some areas of Queensland will increase the risk of losses in production or increases to the cost of production (as cost of irrigation will increase) leading to less profit for your business.



Relationship between climate change impacts, risks and adaptation

Climate change is likely to increase the frequency and intensity of extreme events (flooding, heatwaves, bushfires, cyclones, extreme rainfall, droughts, etc.).

These changes can result in different impacts for sectors within which small businesses operate (e.g. agriculture, tourism, construction and trade, retail, hospitality, food and beverage, etc.). At an individual business scale, these impacts will be contextualised differently which cause business specific risks. Risks are based on factors such as:

- how exposed a business is to extreme events
- the likely consequences for the business if a potential risk eventuates
- how capable the business is to deal with risks

For some businesses new risks may emerge as a result of climate change, but for some there might be new opportunities as well.

What is in the Booklet?

This booklet contains background information to help you prepare a climate change resilience plan for your business. It sets out to answer the following questions:

What is climate change and sea-level rise?

What does the future climate look like in Queensland?

What are some of the impacts of climate change on small business?

What options do I have for managing my climate change risks?

What is climate change and sea-level rise?

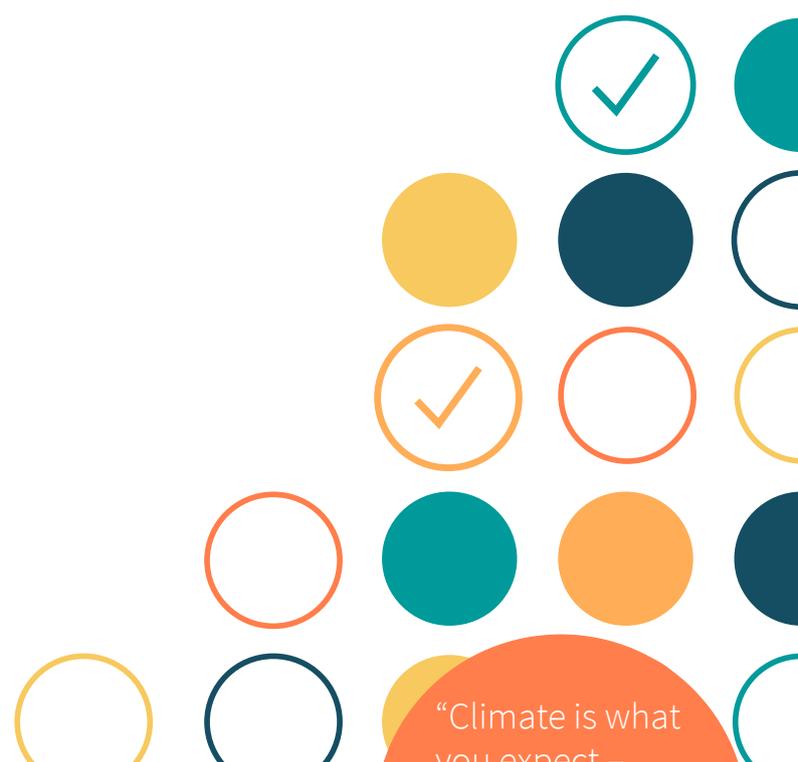
Climate and sea-levels change over timescales from decades to millions of years, in response to solar variations, changes in the Earth's orbit around the Sun, volcanic eruptions, movement of the continents and natural variability such as El Niño and La Niña events.

However, since the start of the Industrial Revolution, human activities have added significantly to greenhouse gases (e.g. carbon dioxide, methane, nitrous oxide, ozone, etc.) in the atmosphere. Greenhouse gases are transparent to much of the radiation from the sun and allow it to pass through the atmosphere to warm the Earth. Some of the outgoing radiation from the Earth is absorbed by the greenhouse gases, warming both the atmosphere and the Earth's surface. This is known as the greenhouse effect and it contributes towards global warming and potentially other effects on our climate such as changes in rainfall distribution and storm intensity.

Around 93% of the additional heat created by global warming has so far been absorbed into the oceans. As water warms, it expands. This expansion has been the major cause of sea-level rise, with a smaller contribution from land-based glacier and ice sheet melt. In the twentieth century, global average sea-levels increased by 19 cm. Over time, the contribution from ice melting is expected to increase substantially. A rise in sea level can provide storm surges a higher base and can allow the sea to come further inland causing inundation of low lying areas.



Some of the additional carbon dioxide in the atmosphere (around 30-40%) dissolves into the oceans, where it decreases the alkalinity of the water (an effect known as *ocean acidification*). The effects have been minimal so far, but will intensify in the future unless action is taken to reduce carbon dioxide emissions. Ocean acidification has the potential to make it more difficult for coral and some plankton to form calcium carbonate, the material used for shell making. There are potentially knock-on effects for marine food chains, for tourism and fishing industries.



“Climate is what you expect – weather is what you get”

R.A. Heinlen, 1973

The difference between weather and climate



Weather is what we experience daily. It varies over the seasons and from year to year. It varies through the day.



Climate is the average weather over time – usually climate is determined by looking at weather patterns over long periods, 30 years or more. Trends are easier to spot and different parts of the country and world have different climates.

The weather is naturally variable but climate is now also changing as a result of greenhouse gas emissions. Although weather events are not in themselves evidence of climate change, exploring the business consequences of extreme weather events can help build an understanding of vulnerability to weather and climate. This is important in helping to inform efforts to adapt to future climate change.

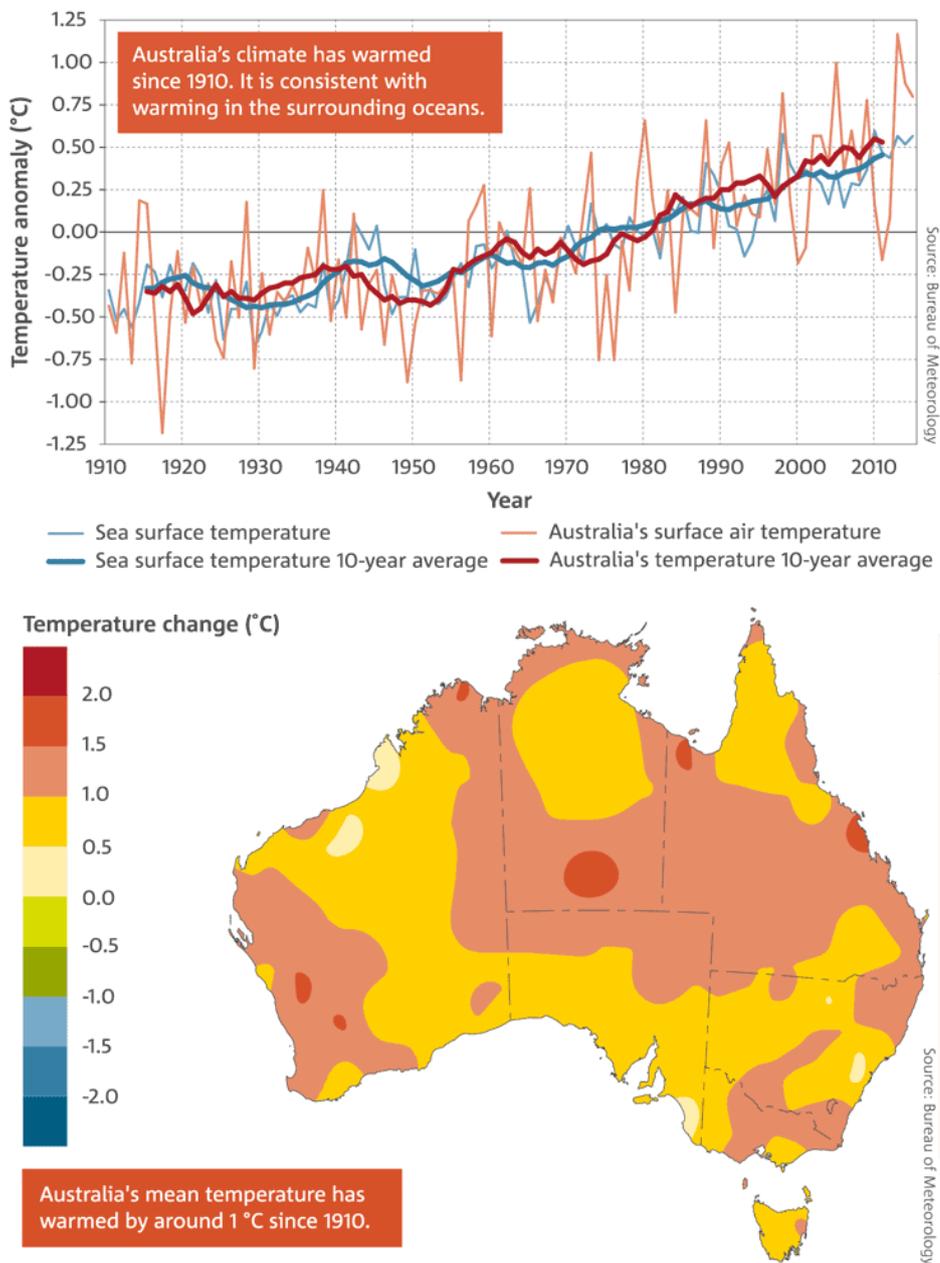


Figure 1: Top: Land and sea temperatures over Australia since the beginning of the twentieth century. Bottom: Map of annual average temperature change since 1910. Bureau of Meteorology and CSIRO Australia © 2017 Commonwealth of Australia and CSIRO.

What does the future climate look like in Queensland?

Recent climate trends in Queensland

The average surface temperature over Australia and the surrounding oceans have increased by around 1°C since the beginning of the twentieth century (Figure 1). Seven of the ten warmest years on record have occurred since 2005.

In 2017, Queensland had its warmest year on record in terms of mean temperature, and mean maximum temperature. Large areas of central and western Queensland had below average annual rainfall. Parts of the northern interior, the Gulf Country and east coast south of Bowen received above average rainfall. Severe Tropical cyclone Debbie made landfall near the Whitsunday Islands on 28 March.

One of the outcomes from global warming is sea-level rise, caused by thermal expansion and melting of ice caps and glaciers. Since 1955, more than 90% of the excess heat produced by global warming has gone into the oceans, so thermal expansion is an important component of sea-level rise. Over the period 1901 to 2010, global mean sea-level rose by around 0.19 m. Sea-levels have risen around Australia since the beginning of the twentieth century, with a faster rate (partly due to natural variability) since 1993. There are geographical variations, with higher sea-level rise observed in the north.

Fire threats to tropical and subtropical Queensland have been increasing over the years. Weekly bushfire frequencies in Australia increased by 40 per cent between 2008 and 2013, with tropical and subtropical Queensland the most severely affected regions. Towards the end of 2018, severe bushfires damaged parts of Queensland, resulting in damage to property and infrastructure.



Future climate outlook for Queensland

The impacts of climate change will vary across large areas. Regional projected changes are available for thirteen climate regions across Queensland (figure 4). Visit [this link](#) for an interactive map that will help you understand climate change projections for your region. Additionally, you can download the regional projections by clicking on the relevant links on figure 4. If you are interested in further detailed climate change projections, you can visit [Queensland Future Climate Dashboard](#).

Future sea-level rise in coastal areas

Sea-levels are projected to rise by 0.8 m above present day levels by 2100. However this rise will vary locally. In order to find local variations in sea-levels and inundation hazard maps visit www.coastadapt.com.au or www.coastalrisk.com.au.

How will climate change affect Queensland?

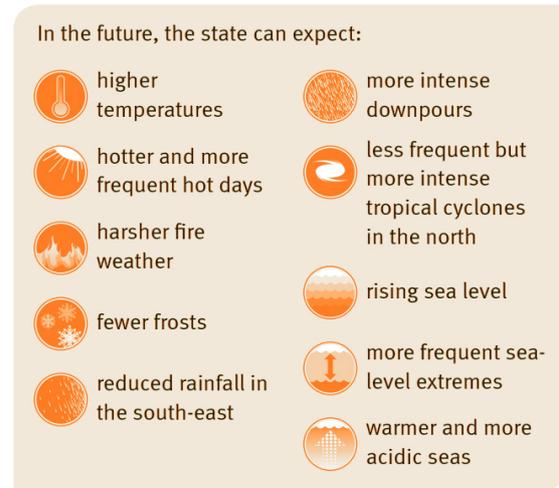


Figure 3: Summary overview of climate change in Queensland. From [Queensland Government](#). For more information visit [Queensland Future Climate Dashboard](#).

Making sense of climate change information

Climate change is primarily caused by increasing amounts of greenhouse gases in the atmosphere, which are trapping heat and warming the air and oceans. To determine what our future climate might be, scientists use global climate models to simulate the Earth's climate system. The models use a set of mathematical formulae that describe the physical processes of the atmosphere, ocean, land and ice. Population, the economy, policy decisions and technology will all affect future emissions of greenhouse gases. We do not know exactly what these effects will be, so to cover a range of possibilities, scientists use emissions scenarios called representative concentration pathways (RCPs) to develop climate projections. These projections range from a lower emissions future, where greenhouse gas emissions are substantially reduced (this pathway is termed RCP4.5), to a high emissions future, where high levels of greenhouse gas emissions are set to continue (this pathway is termed RCP8.5).

These scenarios allow us to consider a range of climate futures when thinking about how climate change may affect us.

Thirteen climate regions of Queensland

Click on a region below to visit a website which has a climate change summary for that region.

[Cape York](#)

[Townsville-Thuringowa](#)

[Central Queensland](#)

[North West Queensland](#)

[Central West Queensland](#)

[South East Queensland](#)

[Eastern Downs](#)

[South West Queensland](#)

[Far North Queensland](#)

[Whitsunday, Hinterland and Mackay](#)

[Gulf Region](#)

[Wide Bay - Burnett](#)

[Maranoa and District](#)



Figure 4: Thirteen climate regions of Queensland

What are some of the impacts of climate change on small business?

Table B1: Broad impacts of climate change on small businesses. Note these are indicative only.

Impacts of Climate Change	Impacts on Small Businesses
 <p>Temperature increase</p>	<p>Businesses may require cooling equipment for employees and to maintain stable temperatures for climate sensitive industrial processes.</p> <p>Changes in the ability to work outdoors.</p>
 <p>Precipitation change impacting agricultural yields</p>	<p>Change in availability and quality of climate-sensitive natural resources as input materials for production resulting in increased competition and cost of resources.</p>
 <p>Sea-level rise and extreme weather events including flooding</p>	<p>Risk of damage to assets (buildings and equipment), interruption to water and energy supplies, supply chain and logistics, increased costs to weatherproof buildings and storage facilities and higher costs of insurance policies.</p> <p>Changes to customer base.</p>
 <p>Water stress</p>	<p>Increased competition for and cost of water resources.</p>
 <p>Biodiversity loss</p>	<p>Change in availability of natural resources as input materials.</p> <p>Impacts on tourism related activities.</p>
 <p>Human health and increased incidence of disease</p>	<p>Health of employees and workers in supply chain compromised, and rising costs of healthcare.</p>
 <p>Changing socio-cultural preferences</p>	<p>Changes in consumer behaviour and demand for specific products and services.</p>



Table B2: Sector specific climate change impacts.

Note that this is not a comprehensive list and the extent of these impacts will vary depending on sector and geographic location.

Sector	Broad likely impacts
<p>Agriculture</p> 	<ul style="list-style-type: none"> • Changes to crop growing season as well as type of crops that can grow in a certain area • Drought conditions can impact livestock • More refrigerated distribution and storage required and problems with livestock transportation during heatwaves. • Damage to transport infrastructure or disruptions to services due to flooding, etc., creating problems with transport of raw materials • Limited availability of water and potential interruption of supply to irrigation systems • Equipment and other investments, as well as expertise of farmers and workforce, are often linked to specific crops, which may become unprofitable or may no longer be viable • Quality issues: overheating of grain, or availability of water for pre-washed products • Access to land during flood or extreme rain conditions • Less frequent frosts will affect quality of certain crops and reduce kill-off of pests/disease • Exposure of workforce to increased heat • Farm buildings may be affected by extreme wind, heat and/or rain. This may also be an animal welfare issue <p style="text-align: right;">More information</p>



Sector	Broad likely impacts	More information
<p data-bbox="217 264 341 327">Food & Beverages</p> 	<ul data-bbox="464 264 1225 869" style="list-style-type: none"> • Risk of food supply and operation interruptions due to extreme weather events • Loss of power can result in loss of produce and inability to serve customers • Longer term weather trends may affect reliability (and quality) of fresh produce supply • Physical risk to water supply and raw materials • Greater risk of animal infections (e.g. avian flu), insect infestation, plant disease, etc. • Disruption of plant operation due to decreased water availability during drought • Increased heat or storms can deter customers from exposed shops and businesses. Increased exposure to these hazards, specifically to heat can also negatively impact staff and customer health and well-being 	More information
<p data-bbox="217 918 368 1012">Building Design and Construction</p> 	<ul data-bbox="464 918 1230 1258" style="list-style-type: none"> • Extreme weather events may disrupt transport for site deliveries and affect site work (e.g. muddy site conditions), restricting work-days • Infrastructure (e.g. drainage) affected by extreme weather events • Excessive heat in summer will affect some construction processes and onsite workforce leading to reduced worker productivity • Design standards may need to be clarified or upgraded in response to changing climate • Insurance may be more expensive 	More information
<p data-bbox="217 1308 288 1335">Retail</p> 	<ul data-bbox="464 1308 1225 1688" style="list-style-type: none"> • Extreme weather events may disrupt supply chains of small businesses including supply of raw materials, distribution of products and services • Extreme weather events can affect sales as customer behaviour varies based on weather conditions (i.e. reduced sales on extreme hot or wet days in street-side shops) • Physical assets such as store, warehouse and equipment can be affected by extreme events such as flood, cyclones, bushfire, heatwave, etc. • Increased energy requirement and cost for cooling due to increased heat. 	More information
<p data-bbox="217 1742 389 1800">Rental, hiring and real estate</p> 	<ul data-bbox="464 1742 1225 1890" style="list-style-type: none"> • Disturbance to infrastructure and business operations due to more frequent and intense natural disasters • Extreme events may cause delays in construction of new real estate projects leading to financial loss 	More information

What options do I have to manage my climate change risks?

Identifying risk management options is an important step in the adaptation process. This step involves considering what your business is doing at present to manage climate related risks (and other pressures), and investigating whether any changes are warranted or any new management options are required to address future risks.

There are many potential options for adapting to climate change and it is important to identify a wide range of options that may suit your business circumstances and resources. Some options may help to cope with present climatic extremes, while others will help once effects of climate change become greater. A good way forward is to develop a sequence of options that can be implemented as effects of climate change become more apparent.

At the early stage it is not necessary to consider detailed sequencing or the costs and benefits of possible actions, but it is an opportunity to build a list of possible management options that may be useful, or would be acceptable to your business circumstances and stakeholders (staff, clients, investors, etc.). Identifying a wide range of management options enables you to consider their interactions (i.e. how best to achieve multiple benefits and to consider sequencing of actions) which then can be linked to trigger levels (i.e. when to activate a given management option).

Selected options should match the broader goals of the business and its stakeholders. It is important to consider any opportunities and co-benefits that might result from the selected options. In determining responses to address climate risk it is important that actions do not increase emissions and further exacerbate the issue.

In this tool we have focused on actions that are relatively easy for a business to achieve, tackling issues that are within your control or influence.

However, for managing your climate risks, it is critical to engage and collaborate with all your business stakeholders (staff, customers, investors, owner of the premise where you operate your business etc.). For example, engaging with landlords and building strong relationships with nearby businesses can help you manage climate risks by facilitating cost and resource sharing after disasters.



Table B3: A list of indicative adaptation options and opportunities (not an exhaustive list).

What	How	Benefits	Risks
Ensure that new physical assets of the business are not developed in hazard prone areas.	Access hazard maps available through local councils or state governments to check whether proposed assets fall inside the hazard area.	Reduces exposure to future disruption to business and loss of assets. If new assets are developed in hazard prone areas and are affected by climate change, shareholders can take legal action as a result of failure to manage duty of care.	May increase development costs.
Undertake business continuity planning accounting for likely increases in extreme weather and events.	Conduct a rapid risk screening using the checklists in this tool.	Allows businesses to bounce back quickly after extreme events.	Low risk
Shift existing assets out of current or future hazard zones.	Access hazard maps available through local councils or state government to check whether proposed assets fall inside the hazard area.	Reduces exposure to future disruption to business and loss of assets.	May cause temporary disruption to business operation leading to temporary impact on revenue.
Enable flexible working arrangements for employees during extreme weather such as heatwave.	Discuss contingency plans for extreme events with staff (i.e. how they plan to get to work during extreme events).	Reduces loss of staff time during extreme events. Makes the business more resilient to extreme events.	Low risk

What	How	Benefits	Risks
<p>Diversify customer base and products so that risk of disruption to business due to extreme events can be limited.</p>	<p>Understand how sensitive your current products and services are to climate and consider how such sensitivity can be reduced or made more resilient. Also consider exploring new and less climate sensitive products and services for your business.</p>	<p>Having products and services with varying degree of sensitivity to climate will help diversity your products.</p>	<p>Low risk</p>
<p>Consider having appropriate insurance coverage for your business against extreme weather events.</p>	<p>Assess climate risks for your business and operations using the checklists in this tool and understand how sensitive your business is to current and future climate events. Aim to have appropriate insurance cover in place.</p>	<p>Increases the resilience of your business and assists you to bounce back quickly if affected by climate extremes.</p>	<p>May increase business operation cost</p>
<p>If any of the risks that you have identified are critical for your business, you may consider knowing more about these risks by discussing with experts.</p>	<p>Engage with experts and consultants to conduct a formal climate change risk assessment for your business and operations.</p>	<p>Helps you identify your critical risks, when they are likely to become critical, options you have to get prepared, your legal responsibilities or duty of care, etc.</p>	<p>Can be expensive</p>



Case study

Construction of clear roofed compost shelter at Simon's farm

Rationale

Simon and his wife purchased a 225ha farm in 2010. With the help of 4 employees, they milk 560 cows (twice daily) and supply milk all year round. Simon wanted to protect his cows from harsh summers and winters. Therefore he built them a shelter that cost \$280,000. This shelter is rated to withstand 165kph winds, has a life of more than 10 years and will cost between \$12,000 to \$14,000 to replace its plastic roof. Having his cows in a shelter does not just protect his cows, but also his pasture stock. The shelter also has a compost bedding area of 4,000m².

Outcome

During hot weather, all cows use the shelter as it is cooler than the outside temperature. A cooling breeze generally keeps good air movement in the shelter and cows rarely pant from heat stress. In winter, the cows are not wet or cold. There is no slipping on bedding and cows feel safe, especially when on heat.

The new shelter has allowed Simon to better manage the farm during extreme weather events, particularly during hot summers and wet weather. Improved utilisation and reduced damage to pasture has allowed him to increase cow numbers from 420 (pre-shelter) to 560. This was achieved without a significant increase in land area or imported feeds. Since the construction of the new shelter there is a 10% increase in pasture growth and production of milk solids (dry milk) has improved from 200 tonnes to 315 tonnes in 2 years.



Available resources:

Climate change related resources for all sectors

[Climate change in Australia website for climate change projection across Australia](#)

[Queensland Government's Regional Climate Change Projections](#)

[Queensland Future Climate Dashboard](#)

[Queensland Government's Coastal Hazard Maps](#)

[NCCARF climate change and sea level rise projections and maps for coastal councils](#)

[CoastAdapt First-pass risk assessment guidelines and templates](#)

[Role of insurance in climate change adaptation](#)

[Reducing the risk of legal challenge](#)

Queensland Government's Sector Adaptation plan for Small and Medium Size businesses.

Present day hazard related resources

[Australian Flood Risk Information Portal](#)

[Bushfire prone area - Queensland series](#)

Disaster preparedness resources

[Guideline for preparing your business for natural disasters](#)

[Get Ready Queensland](#)

[Queensland Fire and Emergency Service Bushfire Survival Plan](#)

Sector specific resources

[Nursery and Garden Industry Queensland "Natural disaster preparedness manual"](#)

[Dairy Australia climate change tool](#)

[Dairy Australia climate change tool pasture predictions](#)

Worked example:

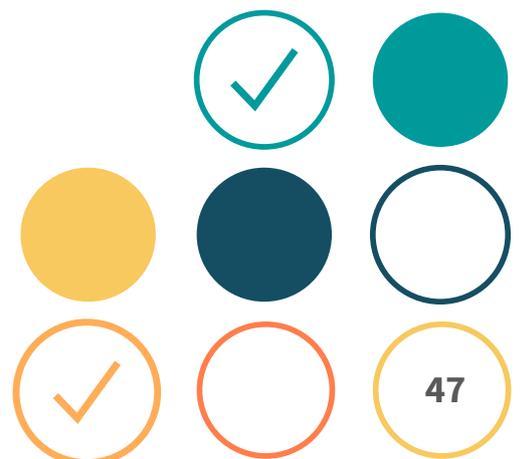
Climate Resilience of Tom and Liana's Café

Tom and Liana have run a café in a small tourist town in North Queensland since 2005. The café is next to a popular tourism destination with a range of beach related activities. In 2016 Cyclone Gloria hit this small town. The access road to the beach and nearby facilities was damaged. The café is located on a small street side, in a small complex that houses 10 businesses including a supermarket. The building is about 20 years old and its roof was partially damaged during Cyclone Gloria, resulting in water leakage in three shops, including Tom and Liana's café. This caused moderate damage to the café's furniture (\$5000 AUD replacement cost). The café was closed for a week, resulting in loss of revenue. While the café was covered by the complex's building insurance, this did not include damage to contents and Tom and Liana had to bear all the expenses related to this.

There has been erosion in the nearby beach in the past (including during Cyclone Gloria), but at the moment this is under control. There was a flood event in the town in 2007 that did not physically impact Tom and Liana's café, but they could not get any new supplies for a week as the access road was damaged and their supplier's warehouse was flooded. Tom and Liana estimated that this reduction in new supplies halved their sales for two weeks following the flood event.

In the summer of 2017, there was a heatwave in the town that resulted in a significant increase of beach goers during hot days and nights resulting in increased sales for the café.

Tom and Liana have heard a lot about climate change through the media and are concerned about how it may affect their business. Therefore they decided to use this small business climate change risk management tool.





1. Past climate impacts

WORKED
EXAMPLE

Past climate extremes in your area

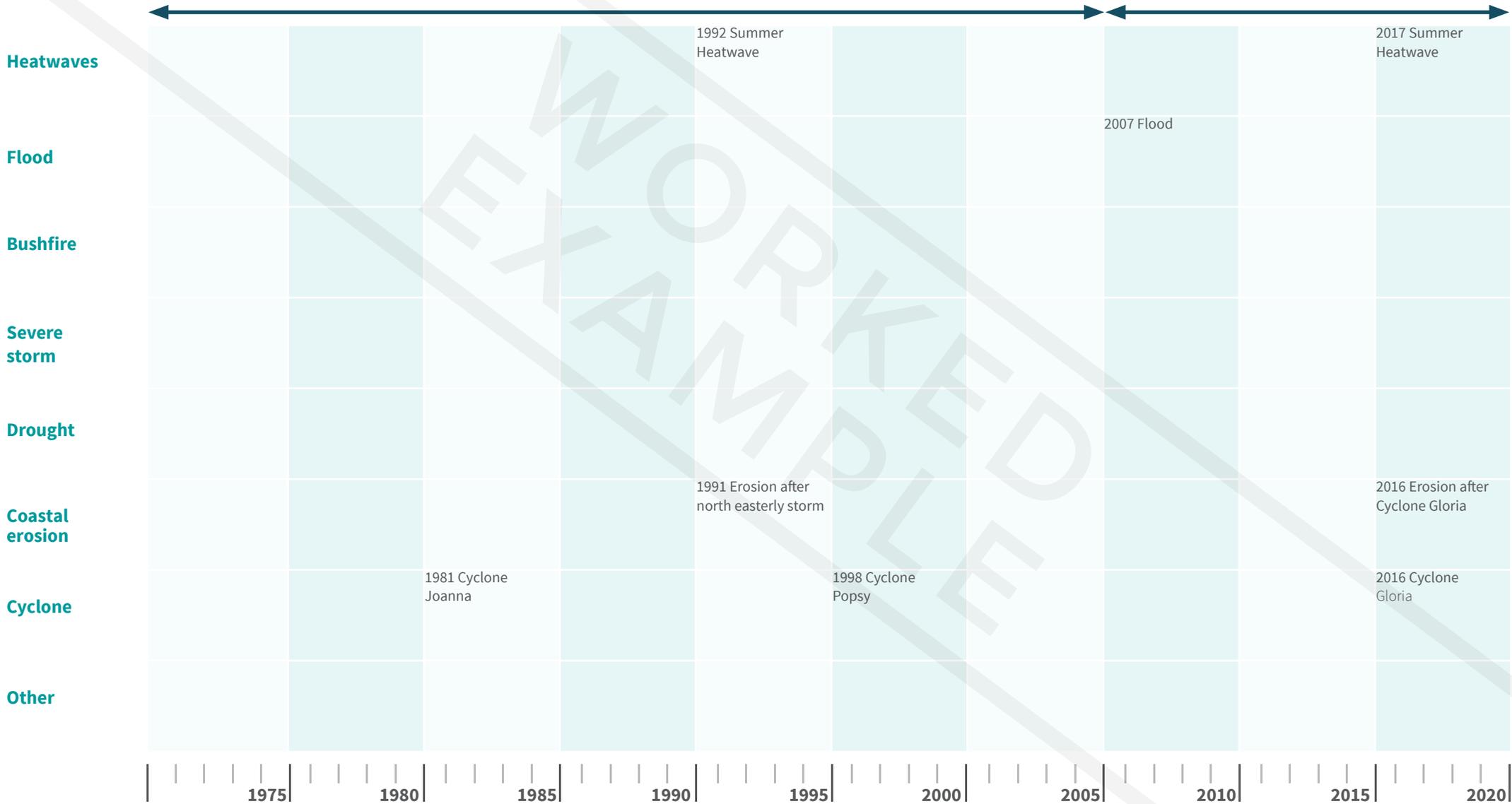
List any previous extreme events in your area that affected you, your business operation, premises, staff, etc. in the time plot below. Write down the year and/or the name of the event (if you remember) in the boxes. Use local knowledge for this. If you are new in the area, discuss this with long-term residents from the area or conduct a brief internet search.

[Hardenup Protecting Queensland](#) also provides links to some historical hazard information, flood maps, etc. for different areas in Queensland.

Table 1: Past extreme events in your area

← What we have heard from others who have been living in the area for a long time

← What we know since we bought the cafe →





1. Past climate impacts

Have past extreme events caused work related health and safety issues for your staff and customers e.g. extreme temperature affecting worker health and performance?

Yes No

In the past were your business premises affected by any extreme events (see your answers in Table 1)?

Yes No

In the past, was your business affected by secondary impacts of extreme climate events i.e. your staff, premises and assets were not directly impacted by extreme events but your operations were affected as a result of disruptions to your supply chain?

Yes No

In the past, was your business continuity affected by extreme climate events? Did you experience damage to your business premises or to stock and assets? Did a loss of revenue threaten your financial situation, etc.?

Yes No

If any of the above answers are **Yes**, how did it impact your business?

	No Impact	Minor impact	Significant impact	Write down impacts
 Heatwave	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
 Flood (coastal or inland)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Supply chain was impacted as bakery supplier's warehouse was flooded in 2017 and we had to buy from a more expensive supplier for two months
 Bushfire	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
 Severe storm	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Minor water leak from roof during severe storms in the past, resulting in inconvenience to customers and staff.
 Drought	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
 Coastal erosion	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	There was a reduction in tourists on the beach after the 2016 Cyclone. This reduced our sales volume significantly.
 Cyclone	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Water damage resulting from leaked roof during 2016 cyclone resulted in \$5000 repair cost and we had to close the shop for one week.
 Other (list below)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Climate hazard:				



2. Current climate risks

WORKED
EXAMPLE

Since the occurrence of weather events listed in Table 1, have you made any adjustments or taken any steps to minimise future impact on your business?

Yes **No**

If the answer is **Yes**, list here any actions that you have taken.

Did not take any specific action

Determine **current climate related risks** to your business (Put mark)

Note: If you have been impacted in the past but have not made any plans to tackle that impact in future, you have climate related risks to your business regardless of climate change.

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

Yes, there are existing climate related risks to my business.

If you think that there are existing climate related risks to your business, which of these aspects are currently at risk:

staff/customers' health and safety

business premises

business supply chain

business continuity

Some questions you should consider asking yourself in order to better understand your current risks:

1. Have the actions that you took in the past to reduce your risks worked?

The roof has been fixed, but it has not been tested since as we have not had any event yet.

2. Are any adjustment required to reduce present day climate risks?

N/A



3. Future climate change

Future climate outlook of your area

Using regional climate change projections for Queensland (see [page 37](#) of the information booklet), determine the future climate for the area where you operate your business. For more information on future climate projections in your area, please visit [Queensland Future Climate Dashboard](#).

Hazards	How climate change can influence this hazard	Mark the ones that are relevant to you
 Heat and heatwaves	In general, increased average temperature is likely to increase the number of hot days and nights and length of heatwaves.	<input checked="" type="checkbox"/>
 Flood (coastal or inland)	Coastal: Sea-level rise can cause increased flooding in low-lying coastal areas during high tides, cyclones and storm events. Inland: Extreme rainfall can cause inland flooding.	<input checked="" type="checkbox"/>
 Bushfire	Increased average temperatures combined with dry conditions increase bushfire potential.	<input type="checkbox"/>
 Severe storm	Frequency and intensity of storm events may increase (including excessive rainfall, lightning, hail, etc.). At the same time, sea-level rise will increase the risk of flooding in coastal areas during severe storms.	<input checked="" type="checkbox"/>
 Drought	Decrease in future rainfall can lead to drought. Increased hotter days combined with drier conditions increase bushfire risks.	<input checked="" type="checkbox"/>



3. Future climate change

Hazards

How climate change can influence this hazard

Mark the ones
that are relevant
to you



Coastal erosion

Sea-level rise can increase erosion of low-lying erodible shores. Increased frequency of severe storms in coastal areas can also lead to more erosion.



Cyclone

Increased available heat in the ocean may affect cyclone behaviour. The number of cyclones may reduce but their intensity may increase.



Acidic ocean

Increased amount of heat and carbon dioxide (CO₂) in the ocean can make ocean water acidic, which impacts bio-diversity in the ocean (e.g. corals, fish).



Change in seasonal patterns

A slight change in average temperature is enough to impact seasonal patterns of climate. For example, growing seasons are shifting, spring is arriving earlier, winters are shorter, and the number of frost days are declining. These changes affect the timing of many life cycle events, such as when flowers bloom or when pollinators and pests emerge.



Other





4. Future impacts

Using the information gathered from 'Future climate change' in Step 3, determine how future hazards may impact your business. Remember to think about all aspects of your business - staff, premises, supply chain, and continuity (Put mark).

Write down potential impacts to your business in the spaces provided. See "[sector specific impacts](#)" in the booklet on [page 40](#) for some examples and sources of additional information)

	No Impact	Minor impact	Significant impact	Write down potential impacts to your business
Heatwave	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	More visitors to the beach can increase our sales. However, the air conditioned area of our café is limited and we use an outdoor patio. If exposed for longer periods in heatwave, staff health and safety can be impacted and visitors will not want to eat or drink at the café.
Flood (coastal or inland)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Looking at the sea-level rise inundation map around our beach, it seems that our complex might be at risk in 2030. Although not an immediate impact, it might increase the insurance cost of our complex, which might be passed on to all shops in the complex. If we lose the beach to sea-level rise, we will have fewer visitors.
Bushfire	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Severe storm	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Severe storms and excessive rainfall could expose the roof of our shop again. Generally business on severe storm days is slow as not many people come to the beach during those days.
Drought	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	More dry days may means more beach visitors. However, due to drought fresh produce price may increase.
Coastal erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Our shop is away from erosion prone areas, so there is no direct impact. However, sea level rise may increase erosion which can impact tourism on our beach (erosion may reduce tourism related activities)
Cyclone	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Cyclone winds and rain can impact the roof of our shop. Damage to infrastructure and loss of power can cause disruption to our business operation. People do not visit during and after cyclones. Bad media for the area.
Other (list the name below)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Increased coral bleaching can reduce tourism activity in the beach.
Increased coral bleaching				



5. Business specific risks and opportunities

WORKED EXAMPLE

Description of risk

Near-term risks
(1-3 years)

Staff and customers' health and safety

1. We do not have air conditioning in half of our shop so we are exposed to outdoor heat during heatwaves. Longer exposure to heat during heatwaves could dehydrate our employees who work in the exterior part of our shop. Customers might choose to go to an air conditioned shop on those hot days to get some relief.
2. Home delivery driver/cyclist will also be exposed to heat therefore can be at risk.
3. A few of our employees live near the lake, which has flooded in the past during severe storms and the access road in and out of the area has been blocked. If that happens again in future, those staff members might struggle to get to work. This could impact our operations during and after floods. Also if there is a danger of floodwaters reaching their residences, our staff will want to leave to secure their homes.

Business premise

Roof of the shop has been fixed after Cyclone Gloria but since then it has not been tested against any storm or cyclone event, therefore similar damage might happen again.

Long-term power outages after a storm can cause issues for our fridge.

Business supply chain

Bakery supplier's warehouse is in the flood plain and was flooded in 2017 and we did not get any baked goods for a week and had to buy from a more expensive supplier for two months until their warehouse was fixed. This might happen again in the future if the lake floods again.

Business continuity

1. Summer is our peak business period. We do not have air conditioning in the outdoor section of the café, so we might lose business as customers might look for cooler environments during a heatwave.
2. Loss of revenue if the shop closes again due to water leakage.
3. Loss of revenue if our any of our suppliers are impacted by extreme events. If this happens frequently, it will strain our business.

Longer-term risks
(more than 3 years)

Staff and customers' health and safety

Business premises

Business supply chain

If the drought condition continues in Queensland and affects agricultural production, our suppliers of bakery items might increase their price as raw materials will become more expensive.

Business continuity

Erosion on the beach and coral bleaching can reduce tourism in our area. If that happens, it will be difficult to keep our business open in the longer term.



5. Business specific risks and opportunities

WORKED EXAMPLE

Near-term opportunities

(1-3 years)

Staff and customers' health and safety

Description of opportunities

1. Provide staff with training so that they know the risk of dehydration during hot days. This will improve Health and Safety of the work place.
2. Opportunity of more ice cream and cold drink sales during heatwaves. Consider additional cold items we may sell during those times.
3. If we can remain open and operating at full capacity following floods, we may get additional business from people who need to get a meal and cannot cook at home. But staff availability is essential.

Business premises

We should talk to the shopping complex owner to retrofit the roof to a higher standard in terms of cyclone proofing and waterproofing during extreme rainfall, etc. Retrofit might reduce our content insurance premium.

Business supply chain

1. Increasing resilience of our supplies can ensure that we keep operating during extreme events, which can give us an edge over other, less resilient competitors.
2. Prepare stock based on expected weather events. If the forecast is for high temperatures, we can keep a large stock of cold items (ice cream, cold juice, soft drinks, bottled water, etc.).

Business continuity

Having appropriate insurance cover will help us to start operating quickly after a disaster.

Longer-term opportunities

(more than 3 years)

Staff and customers' health and safety

Use a car to deliver food and ensure it has air conditioning. We can then deliver at all times.

Business premises

In the longer-term, we can consider relocating the shop to a nearby shopping center which is under construction now.

Business supply chain

In the longer-term, before getting into a new contract with a supplier, we should check whether they are located in hazard prone areas.

Business continuity



6. Adaptation options

There are a range of options to help small businesses manage future climate related risks. See the information booklet for some examples of [adaptation options](#) on [page 43](#). For each of your identified risks list adaptation options that might suit your business. Consider options that are fit for your purpose and within your capacity.

Near-term options
(1-3 years)

Staff and customers' health and safety

Description of available adaptation options

1. Having flexible working hours for staff during heatwaves.
2. Making sure staff wear appropriate clothing and drink lots of water.
3. Develop a contingency plan to ensure staff availability during extreme events.
4. Identify where employees live and mark on map. Keep the map with other important documents and during event contact staff who live in unaffected areas to help us in the shop.

Business premises

- Retrofit the roof to a higher standard.
- Having contents insurance to cover any damage to the interior of our café.

Business supply chain

- Diversify all our suppliers.

Business continuity

- Undertake business continuity planning, accounting for likely increases in extreme weather events.

Longer-term options
(More than 3 years)

Staff and customers' health and safety

- Having air conditioner for the whole café. Talk to complex manager and other stores about installing solar panels.

Business premises

- Move our shop to a newly constructed shopping center.

Business supply chain

- In the longer-term, before getting into a new contract with a supplier, we should check whether they are located in hazard prone areas.

Business continuity



6. Adaptation options

Some questions you should consider asking yourself in order to minimise your risks

Do you have an up-to-date contact list? This should include staff, customers, clients, suppliers and key local community contacts. This will help you to manage your operations during extreme events.

Yes

Do you have flexible working arrangements for staff members during extreme weather, and have you planned how can this be achieved without disrupting business continuity?

If it is too hot to work, we send staff home.

Do you have appropriate resilience measures to protect your business premises (e.g. sandbags or metal barriers for flood)?

No

How well do your buildings and building services cope with high temperatures?

Half of the café is air conditioned, so seems OK during hot days. But remaining half is exterior and exposed to heat.

Do you have the skills and equipment to clean up after an extreme weather event? Are you able to purchase this now?

We already have these.

Have you considered whether you could operate from alternative premises if you had to?

Not possible for us.

Have you considered moving your business to a less risky location?

No.

If you rent your business premises, have you discussed climate related risks with your landlord? Their actions and plans have a material risk to your business.

We had some discussion in the past, but not enough. We will initiate the discussion again, specifically about improving the quality of the roof.

Is your business or the product that you create or supply weather or climate sensitive? Do you rely on any services that are weather or climate sensitive?

Yes, our business is climate sensitive, as our sales volume changes with customer availability, which is affected by local climate and tourism factors.



6. Adaptation options

Have you considered diversifying your supply chain (i.e. collect raw materials and other related services from diverse geographical areas)?

No, but considering now.

Does your business have markets or suppliers that could be affected by climate change in other areas, regions, states or countries?

No.

Have you backed up your data, identified where your back-ups are located (e.g. on laptops, PCs, servers or off-site) and secured them in a safe place?

Have not thought about this, need to discuss with Tom

How would a severe weather event impact your business finances?

It may lead to fewer customers leading to reduction in sales volume.

Insurance can be challenging and the types of cover you have will vary between providers and your exposure to risk. Given this complexity, are you sure that you have appropriate cover for your needs and interests now and into the future?

No.

Are you covered for floods and storm events and are you aware of what you do NOT have insurance for?

I am not sure what we are NOT covered for, need to check

Does your insurance policy replace new for old items (e.g. equipment, supplies, products, etc.) or have limits for repairs?

Yes, new for old

How would you fund additional costs arising from a severe weather event or a flood in the short term?

Have not thought about this yet, need to discuss with Tom



7. Action plan

Now we are going to think about your action plan.

List how you plan to manage your identified risks and make the most of opportunities. Where appropriate, indicate who is responsible for each action and how you may assess where the action is achieving its purpose.

		Description of action plan
Near-term action plan (1-3 years)	Staff and customers' health and safety	<ol style="list-style-type: none"> 1. Explore possibility of arranging appropriate training for staff or educate them about health risks during heatwaves. 2. Discuss with staff about their choice of working hours during heatwaves. 3. Investigate what can be done to safeguard the delivery driver during heatwaves. 4. Include staff availability issue after extreme events in the business contingency plan. 5. Discuss individual situations with staff and determine how they plan to commute to work if the lake floods again in the future or if we can call on unaffected employees to help us in that period.
	Business premises	<ol style="list-style-type: none"> 1. Engage with shopping centre owner and manager to discuss the robustness of the roof and find out any opportunity to retrofit it to a higher standard. 2. Buy contents insurance for the café.
	Business supply chain	<ol style="list-style-type: none"> 1. Secure a new baked goods supplier that is located outside the flood zone and put necessary contract in place. 2. Consider weather before forecasting stock supplies.
Longer-term action plan (more than 3 years)	Business continuity	<p>Compare content insurance types and costs and select the best one.</p> <p>Consider getting business continuity insurance.</p>
	Staff and customers' health and safety	<p>Discuss with business partners about option of investing in air conditioning for the remainder of the shop.</p>
	Business premises	<p>Consider moving our shop to a newly constructed shopping center.</p>
	Business supply chain	<p>In the longer-term, before getting into a new contract with a supplier, we should check whether they are located in hazard prone areas.</p>
	Business continuity	<p>In the longer-term, we may consider talking to council to understand what their plan is to manage erosion of our beach.</p>



7. Action plan

WORKED
EXAMPLE

Summary of Actions to address climate change

Business name: Tom and Liana's cafe

Date: 7th March 2019

Risks that I have identified	What can I do now?	What can I do in future?
<p>1. We do not have air conditioning in half of our shop so we are exposed to outdoor heat during heatwaves. Longer exposure to heat during heatwaves could dehydrate our employees who work in the exterior part of our shop. Customers might choose to go to an air conditioned shop on those hot days to get some relief.</p> <p>2. Home delivery driver/cyclist will also be exposed to heat therefore can be at risk.</p> <p>3. A few of our employees live near the lake, which has flooded in the past during severe storms and the access road in and out of the area has been blocked. If that happens again in future, those staff members might struggle to get to work. This could impact our operation during and after floods. Also if there is a danger of floodwaters reaching their residences, our staff will want to leave to secure their homes.</p>	<ol style="list-style-type: none"> 1. Explore possibility of arranging appropriate training for staff or educate them about health risks during heatwaves. 2. Discuss with staff about their choice of working hours during heatwaves 3. Investigate what can be done to safeguard the delivery driver during heatwaves. 4. Include staff availability issue after extreme events in the business contingency plan. 5. Discuss individual situations with staff and determine how they plan to commute to work if the lake floods again in the future or if we can call on unaffected employees to help us in that period. 	<p>Discuss with business partners about option of investing in air conditioning for the remainder of the shop.</p>
<p>Roof of the shop has been fixed after Cyclone Gloria but since then it has not been tested against any storm or cyclone event, therefore similar damage might happen again.</p> <p>Long-term power outages after a storm can cause issues for our fridge</p>	<ol style="list-style-type: none"> 1. Engage with shopping centre owner and manager to discuss the robustness of the roof and identify opportunities to retrofit it to a higher standard. 2. Buy contents insurance for the café. 	<p>Move our shop to a newly constructed shopping center.</p>
<p>Bakery supplier's warehouse is in the flood plain and was flooded in 2017 and we did not get any baked goods for a week and had to buy from a more expensive supplier for two months until their warehouse was fixed. This might happen again in the future if the lake floods again.</p>	<ol style="list-style-type: none"> 1. Secure a new baked goods supplier that is located outside the flood zone and put necessary contract in place. 2. Consider weather before forecasting stock supplies. 	<p>In the longer-term, before getting into a new contract with a supplier, we should check whether they are located in hazard prone areas.</p>
<ol style="list-style-type: none"> 1. Summer is our peak business period. We do not have air conditioning in the outdoor section of the café, so we might lose business as customers might look for cooler environments during a heatwave. 2. Loss of revenue if the shop closes again due to water leakage. 	<p>Compare content insurance types and costs and select the best one.</p> <p>Consider getting business continuity insurance.</p> <p>Having air conditioner for the whole café.</p>	<p>Talk to complex manager and other stores about installing solar panels.</p>
<p>Erosion on the beach and coral bleaching can reduce tourism in our area. If that happens, it will reduce our business and it will be difficult to keep it open in the longer term.</p>	<p>Can't do much about this now</p>	<p>In the longer-term, we may consider talking to council to understand what is their plan to manage erosion of our beach.</p>

Determine a date when you need to revisit your risks in future. If you think your risk is higher, you should consider getting some expert advice.

