SOUTHERN COUNCILS CLIMATE COLLABORATION

CLIMATE CHANGE ADAPTATION PLAN 2024

BRIGHTON COUNCIL CLIMATE CHANGE RISK ASSESSMENT

Brighton Council

Southern Tasmanian Councils Authority

Regional Climate Change Initiative

SUMMARY

This climate change adaptation plan aims to improve the capability of Brighton Council to manage the risks associated with climate change. Climate change adaptation is defined as *action taken to prepare for actual or expected changes in the climate in order to minimise harm and to cope with consequences*. Climate change is affecting council's service delivery and the infrastructure that the community depends upon by exacerbating the threats that existing extreme weather events pose.

Important drivers of adaptation planning are:

- recognition of the importance of identifying and managing emerging risks to council infrastructure and functions;
- meeting expectations of Council's insurers;
- managing financial risks; and
- managing legal liability in relation to development decisions and asset performance.

This adaptation plan addresses climate related risks to each council business area and overarching corporate considerations. The vulnerability of Council infrastructure and community assets in relation to heavy rainfall, flooding, heat, bushfire and sea level rise to developing climate hazards has been assessed utilising the on-ground expertise and knowledge of council staff. Future modelled climate data specific to the Brighton municipal area was used to frame each risk statement.

Key climate change vulnerabilities identified were:

- Increasing damage to roads, culverts, stormwater infrastructure and bridges from larger flood events.
- Increasing call on council resources for recovering from intense storm events.
- Increasing impacts on low lying coastal and estuarine infrastructure and recreational assets.
- Gaps in modelled data for flooding, in relation to guidance of planning decisions for flood prone areas.
- Legal implications of development decisions made in areas subject to inundation by sea level rise, storm surge and flooding.
- Capacity to efficiently deliver bushfire and flooding disaster support to the community.
- Inadequacy of some roads in areas highly vulnerable to bushfire – ingress, egress and ability to pass.
- Increasing impact on local vegetation communities and landscape/streetscape plantings due to heat and drought.

An adaptation action was identified to address each of the identified risks together with responsibility, suggested timeframe and likely stakeholders. Examples of adaptation actions to address some of the highest rated risks are:

- *Installation of new pull-off areas to enable traffic management and access for fire engines in known high bushfire risk areas.*
- *Plan for infrastructure upgrades to cope with flood events in a prioritised manner based upon asset risk analysis and numbers of people likely to be effected.*
- *Maintaining fuel loads at an acceptable level on council properties and have a documented program to do this. Implement an education and awareness program to address purposeful fire lighting.*

Particular corporate actions are suggested and cover:

- *Management of legal liability in relation to development decisions and asset management which includes:*
  - *keeping up to date on general climate change science and information, particularly in relation to potential risks from natural hazards;*
  - *developing clear and certain criteria for decision making to increase public confidence that decisions are made on the basis of the best available scientific evidence.*
- *Incorporation of climate change action into existing documents and processes such as the Risk Register, Annual Plan, Strategic Plan and Financial Plan.*
- *Emergency response plans should be reviewed, developed and implemented considering hazard changes under climate change projections. Up to date emergency response procedures can minimise consequences when extreme events occur.*

The adaptation plan suggests a mechanism to implement regional adaptation actions where issues in common are identified across councils through both a regional adaptation strategy and ongoing involvement with the Regional Climate Change Initiative which is a forum for progressing actions collaboratively.

This climate change adaptation plan was developed under the Southern Councils Climate Collaboration Project (2021–24).

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1.0 INTRODUCTION

This climate change adaptation plan (CCAP) aims to improve the capability of Brighton Council to manage the risks associated with climate change. It is designed to:

- increase the capacity of council to protect and fortify assets/services;
- respond to increased and intensifying natural hazards;
- reduce exposure to potential liability in decision making; and
- minimise financial risks.

Climate change adaptation is defined as action taken to prepare for actual or expected changes in the climate:

- in order to minimise harm; and
- to cope with the consequences.

Extreme weather events, once deemed a rare occurrence, are evolving into a 'new normal' and need to be managed. The majority of Australians (80%) have experienced some form of extreme weather disaster since 2019.[1]

The term "climate whiplash" has recently been coined to describe the state of our weather as communities are flung between storms and flooding rains to heatwaves and bushfires and back again, a recent example being the carnage wrought across Victoria on 13th February 2024. Closer to home, extreme events in the Tasmanian spring and summer of 2023-24 are redefining the parameters of extreme events in this state, from out-of-season bushfires at Freycinet and Dolphin Sands and the unprecedented deluge in St Helens in February where recently upgraded stormwater systems still failed to cope with the rainfall volume.

Southern Tasmanian storm, May 2018, estimated cost – $135 million

Black summer bushfires 2019–20 – $103 billion in losses, $4.4 billion in response

Recorded extreme weather events have increased worldwide by 90% over the past 20 years. Between 2019-2022, 11 natural catastrophes were declared in Australia and $13 billion in insurance claims were paid.[2]

The cost of natural disasters in Australia is expected to rise from an average $38 billion currently to closer to $94 billion per year by 2060.[3]

Climate change is affecting how council delivers its critical services and maintains infrastructure that the community depends upon by exacerbating the threats that existing extreme weather events pose. Climate change risk statements and ratings, developed according to a standard risk management approach, form the basis of this plan.

Formulation of risk statements was based upon climate change modelling specific to the Brighton municipal area and involved input from council staff representing all business areas.

1 Climate Council (2023), Climate Trauma: The growing toll of climate change on the mental health of Australians. www.climatecouncil.org.au/resources
2 Insurance Council of Australia
3 Update to the economic costs of natural disasters in Australia – Australian Business Roundtable for Disaster Resilience & Safer Communities – Deloitte Access Economics

Climate change adaptation is relevant across all council business areas

Figure 1 depicts the core functions and services of Tasmanian councils – these are common to all councils. The boxes with red borders indicate the roles and responsibilities of councils for which they have statutory responsibility. To ensure good climate governance and mitigate their potential exposure to liability councils need to ensure that climate considerations, at a minimum, have been integrated into strategic and operational systems and processes represented in the purple boxes.

Figure 1: Core functions and services of Tasmanian councils

Corporate

Corporate governance – risk acknowledgement

- Public risk register
- Strategic Plan
- Insurance implications and expectations
- Legal liability

Development approval and control – risk mitigation

- Building approvals
- Development approvals
- Local and regional land use plans

Asset management – manage risks to asset and service delivery

- Stormwater
- Roads
- Built assets
- Parks and reserves

Financial management – resources to prepare, prevent, respond, recover

Emergency management

Environmental health

Workplace health and safety

Community

Community development – facilitate building resilience in the local community

Natural resource management – managing threats to local biodiversity

The climate change adaptation plan includes an 'implementation plan', the first step of which is the identification of adaptation actions, responsibility, and timeframes. For some risks and actions, stakeholders are identified for situations where it provides greater efficiencies for councils to work collaboratively to manage climate change hazards.

'Investment' in adaptation actions can be based upon factors such as risk priority and a cost benefit analysis which weighs up factors such as the value of the asset, the importance of the asset to the community and the average annual cost of protecting and maintaining the asset.

Experience has demonstrated that adaptation investments exponentially decrease economic losses from climate impacts and bigger investments leads to lower losses. However, there will always be costs from residual climate change impacts that adaptation cannot alleviate.[4] The World Resources Institute finds that every dollar invested in adaptation yields net economic benefits ranging from $2 to $10.[5]

This adaptation plan was developed under the Southern Councils Climate Collaboration Project (2021-24) and builds upon work undertaken under the Regional Climate Change Adaptation Project (RCCAP 2010-14).

Image: Graham Green

4 European Environment Agency 2023: assessing the costs and benefits of climate change adaptation.
5 World Resources Institute 2023: Adapt Now: A global call for leadership on climate resilience.

1.1 PROJECT BACKGROUND

The STCA's climate program, The Regional Climate Change Initiative (RCCI) has, since 2010, developed a range of climate resources to support, and increase the capacity of council's climate change management including:

- **Mitigation** (reducing emissions and energy use)

  Corporate:
  - 'How to undertake a corporate council inventory guide'.
  - Council Carbon Calculator and supporting fact sheets.

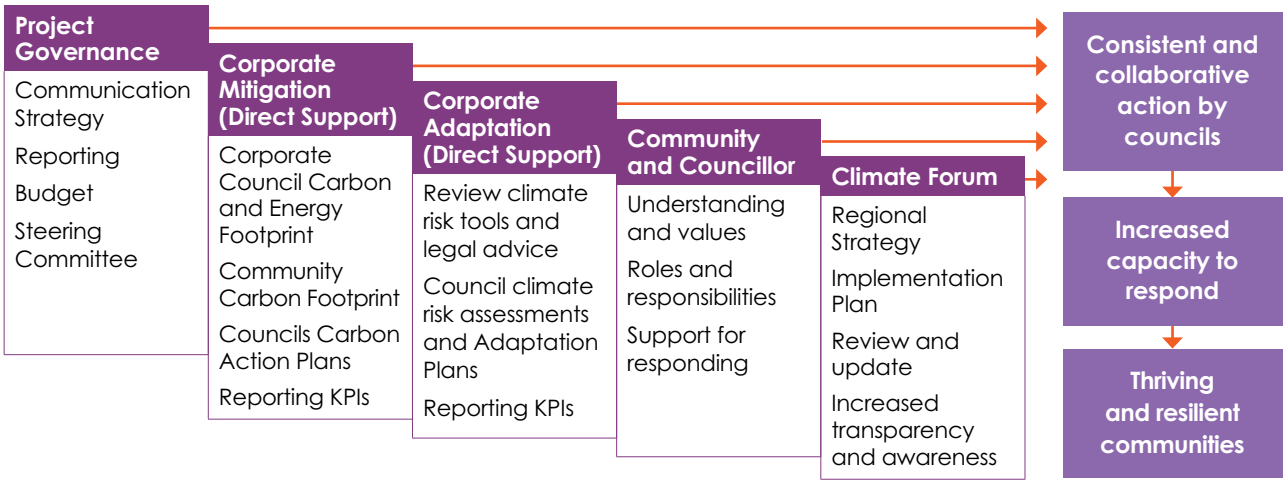
  Community:
  - Community (municipal) energy and greenhouse emissions profiles.
- **Adaptation** (responding to climate impacts and change)
  - Legal advice on councils' exposure to liability for climate change action.
  - Principles and objectives for local government climate change action.
  - Climate (municipal) profiles, based on UTAS Climate Futures program.
  - Corporate Adaptation Planning Modules (climate risk assessment and adaptation options tool).
  - Regional Strategy – adapting to a changing coastline in Tasmania.

The Project intends to develop a collaborative and consistent framework for all Tasmanian Councils in addressing climate action. It aims to:

- Provide a clear set of principles to guide Councils in responding to climate change adaptation and mitigation.
- Strengthen the resilience of Councils to climate impacts locally and regionally, and contribute to managing the transition to low carbon economies.
- Review existing strategies and plans and identify necessary updates.
- Provide strategic direction for key council functions including: land use planning, infrastructure/assets management, natural resource management, recreational and cultural values.
- Build awareness of potential liability for decisions and actions associated with climate change impacts, risks and hazards.
- Direct awareness to what councils' key stakeholders are doing to adapt to climate change to encourage collaborative responses and resource sharing.

Figure 2: Core functions and services of Tasmanian councils

The Southern Councils Climate Collaboration 2022 – 2024 is the latest initiative of the RCCI and the project under which this adaptation plan was developed, is summarised as follows:



1.2 PROJECT CONTEXT

In Australia, "Local governments are on the frontline in dealing with the impacts of climate change. They have an essential role to play in ensuring that local circumstances are adequately considered in the overall adaptation response, and local communities are directly involved in adaptation efforts. Local governments are well positioned to inform State and Commonwealth governments about on-the-ground needs of local and regional communities, communicate directly with those communities, and respond to local challenges."[6]

Specifically local governments are responsible for:

- Delivery of adaptation responses that align to State and Australian Government legislation.
- Provision of information about relevant climate change risks and contribution of appropriate resources to prepare, prevent, respond and recover from detrimental climatic impacts.
- Informing other levels of government about the on-the-ground needs of local and regional communities.
- Managing risks and impacts to Council's public assets and to local government service delivery.[7]

Scope is also afforded to Tasmanian Councils to address climate change under the *Local Government Act* (Tas) 1993, which describes the role of Councils to provide for the health, safety and welfare of the community; as well as represent and promote the interests of the community; and provide for the peace, order and good government of its municipal area.[8] Additionally the Local Government (Content of Plans and Strategies) Order 2014 s.8. (2) (2) (b) (vii) requires councils to have in place an Asset Management Policy that includes the planning for climate change adaptation and mitigation.[9]

In managing and preparing for the impacts of climate change, Local Government is well positioned to work with communities due to its:

- core function to directly support and assist local communities;
- local knowledge and experience;
- understanding of community needs and vulnerabilities;
- key role in responding to emergencies;
- role in infrastructure design, construction and maintenance;
- role in review and update of planning schemes (in relation to identified local impacts and threats); and
- ability to effectively disseminate information and provide support to the community.

Local experience, in combination with relevant scientific data and technical expertise, provides the basis for undertaking a well-informed 'risk management' approach to climate change. Effective adaptation requires a portfolio of actions, ranging from fortifying infrastructure to advocacy and collaboration. There is also an appreciation that managing climate change risks has benefits, regardless of the magnitude of climate change that occurs. It is a 'no regrets' approach that can bolster infrastructure, reduce risk and liability, improve community well-being, and protect biodiversity.

6 National Climate Resilience and Adaptation Strategy 2021 to 2025 (dcceew.gov.au)

7 Role and Responsibilities for Climate Change Adaptation in Australia, Council of Australian Governments Select Council on Climate Change 2012

8 *Local Government Act* (Tas) 1993.Section 20 Function and Powers.

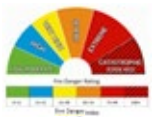
9 https://www.legislation.tas.gov.au/view/whole/html/inforce/current/sr-2014-035

1.3 CLIMATE CHANGE SUMMARY DATA FOR BRIGHTON COUNCIL

The development of this climate change adaptation plan was based upon council-specific, climate projection data provided by Climate Futures for Tasmania. Modelled future climate is continually becoming a more exact science as real world data is fed back into models helping validate outcomes and improve forecasts. The modelling equips us well to forecast future scenarios in relation to council's assets and functions. However, climate change is likely to deliver surprises and potentially unforeseen outcomes through intensifying and intersecting climate driven hazards.

The information below is a summary of Climate Futures data[10] relevant to the Brighton municipal area.

The Forest Fire Danger Index (developed by CSIRO scientist, A. G. McArthur) **combines a measure of vegetation dryness with air temperature, wind speed and humidity**. If you add the daily FDI values over a year for a location, you get what is called the annual accumulated FDI.



Current climate and recent trends

- Brighton Council has a temperate, maritime climate. Long-term average temperatures have risen in the decades since the 1950s, at a rate of up to 0.1 °C per decade, however this rate is now accelerating.
- The average annual rainfall across the municipality is currently around 550 mm. There has been a decline in average annual rainfall since the 'baseline period' (1961-1990).
- Tasmania's southern region is influenced by large-scale climate drivers. For example, the extended dry spell of 1995-2009 coincided with an 'El Nino' pattern; the dry spell of 2018-20 coincided with an Indian Ocean Dipole event; and extended wetter spells, such as between 2020-2022, often coincide with dominance of a 'La Nina' climate driver. It is expected that climate change will exacerbate the impact of these broader scale patterns, and particularly from east-

Table 1: Brighton future climate projection data– from Climate Futures Tasmania (average sub region data) 2019 RCP 8.5 (business as usual) scenario

	Baseline 1961-1990	Current	Mid-century 2040-2060	End of century 2080-2100
Average daily maximum temperature (°C)	16.5	17	18.2	19.5
Average annual hot days (above 30°C)	5	7	10	14
Mean Minimum Asphalt Critical Viscosity	97300	140900	179400	297500
Average annual cumulative Forest Fire Danger Index	1701	1733	1992	2268
Average annual rainfall (mm)	569	556	550	572
Average annual evaporation (mm)	988	996	1087	1217
Extreme rainfall – 24hr AEP 1%	174 mm	178 mm	189 mm	201 mm
Sea level – 1% AEP	1.77	1.92	2	2.6

10 Climate Change Information for Decision Making (2019): T. Remenyi, N. Earl, P. Love, D. Rollins, R. Harris; Climate Futures Programme, Discipline of Geography & Spatial Sciences, University of Tasmania.

coast lows which are expected to intensify with potential to deliver damaging flood events to eastern Tasmania.

1.3.1 Extreme events

The changes in climate that are most likely to impact upon council infrastructure, roads, the local community and the environment are an increase in intensity of extreme events and intersecting hazards. Intersecting hazards include the combined impact of, for example:

- heavy rain and gale force winds associated with storms which may cause road cuts due to both fallen trees and flash flooding;
- heatwave conditions associated with bushfire and smoke pollution;
- a confluence of low pressure, high tide, and in some cases high river levels, have the potential to result in unprecedented coastal inundation, and
- compounding events that exhaust the economic and human resources of councils to manage and respond.
- Increased evaporation and longer dry periods coupled with more extreme temperatures is likely to enhance the occurrence and intensity of bushfires, with more starts due to lightning strikes. Future fire danger. A guide to the increasing bushfire risk under climate change is: twice the danger, twice the area, twice as often.
- Heavier rainfall events than witnessed historically, particularly from east-coast lows, are expected to occur. High daily runoff events are likely to increase, including those that may lead to erosion, landslips or flooding.
- Inundation in vulnerable coastal areas will increase due to sea level rise. The current 100-year coastal inundation event is likely to occur almost every year by 2100.

Aside from the incremental rise of sea level, extreme coastal inundation events with the potential for infrastructure damage and erosion will occur when there is a confluence of low pressure, high tide and localised flooding if heavy rainfall occurs at the same time.

More Information

Detailed information from the Climate Futures Programme on the modelled future climate for Tasmanian sub-regions may be found here: **www.wineaustralia.com/climate-atlas**

Figure 3. Threat multiplier – intersecting hazards

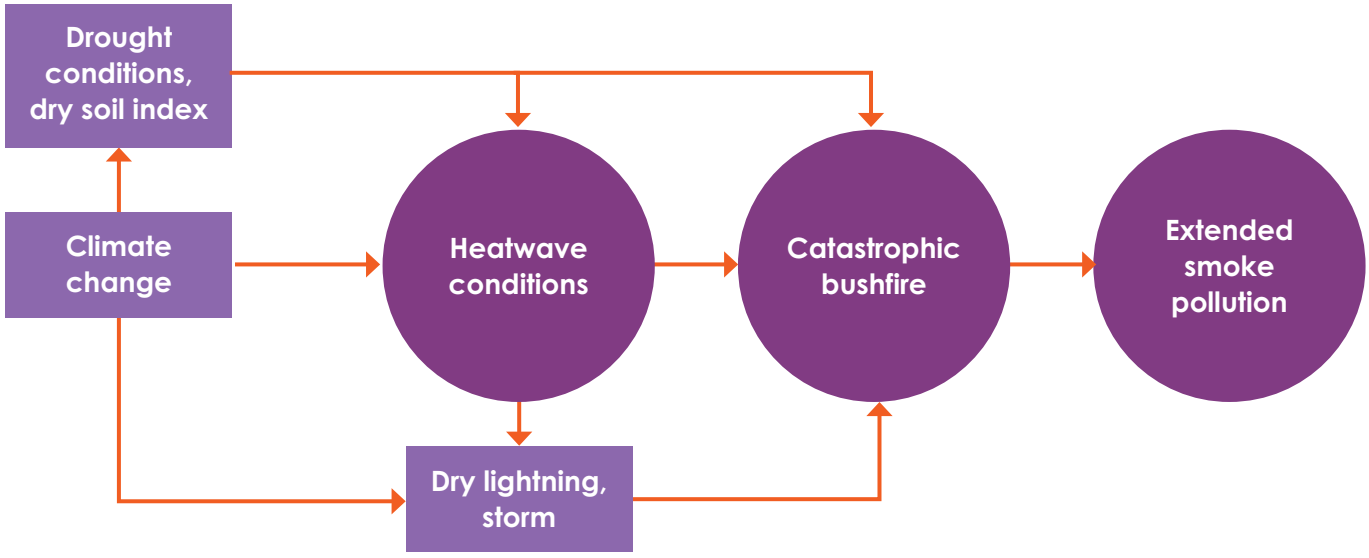


Image adapted from: Tasmanian Disaster Risk Assessment (TASDRA) 2022

2.0 OVERARCHING CORPORATE CONSIDERATIONS

Corporate climate change adaptation considerations fall across all Council strategic, operational and service areas. Engagement with these requires the development of understanding and governance by senior management who have overall responsibility for the setting and delivery of strategic and budgetary parameters. They are also increasingly expected to demonstrate leadership in the response to climate change.

Insurer Expectations

Local government insurer Municipal Association of Victoria (MAV) is increasingly expecting council's to demonstrate responses to climate hazards, exposure and resultant risk. Lack of engagement and action could at a minimum result in insurance premiums rising and at worst litigation for negligence in failure to address risks appropriately. Councils with a solid framework in climate change adaptation procedures will minimise risk to council business and the community who relies on decision making that is well considered, based in up to date facts, and appropriate.

Legal Liability

The threat of climate change is now clearly established through legislation and national and state policy and international agreements. It is likely that a court will construe that the risks and impacts of climate change are now foreseeable.

With increasing vulnerability to climate change impacts councils need to provide solutions to adapt to and manage, identified risks associated with climate change. A key consideration of councils in the face of climate change is potential liability that they are exposed to in discharging their various statutory roles, powers and functions in times where exposure to natural hazards is increasing.

MAV Insurance,[11] has provided advice that councils have a duty of care in the context of climate change adaptation which may arise in the context of:

- Development approvals – where the risk of harm was foreseeable;
- The provision of protective standards in planning schemes e.g. regarding bushfire protection;
- Failure to maintain or build infrastructure e.g. stormwater systems; and
- The provision, or lack thereof, of information which is considered by a court to be negligent.

Baker and McKenzie, in a report to the Australian Local Government Association[12] outlined actions that councils may follow to reduce liability. These include:

- keeping up to date on general climate change science and information, particularly in relation to potential risks from natural hazards;
- developing clear and certain criteria for decision making to increase public confidence that decisions are made on the basis of the best available scientific evidence;
- exercising reasonable care when making planning decisions, taking care to ensure relevant facts are known and understood, and reasons for decisions are clear, accurate and documented;
- increasing public consultation, as this may improve transparency around decision-making processes and limit administrative review; and
- facilitating the provision of up to date information to property owners on potential risks to property.

Useful information and case studies about legal risk and climate change adaptation can be accessed at: https://coastadapt.com.au/sites/default/files/information-manual/IM06_Legal_Risk.pdf

11 MAV Insurance Fact Sheet: Liability Risk & Climate Change Adaptation
12 Local Councils Risk of Liability in the Face of Climate Change Resolving Uncertainties; a report for the Australian Local Government Association, Baker and McKenzie, 22 July 2011.

Emergency Management

As the closest level of government to the community, together with having a responsibility for the wellbeing of their community, councils have an important role in emergency management. Although councils are not a provider of emergency services, council are required to have in place Emergency Management Plans that cover functions including:

- provision of recovery centres and relief services during emergencies or disasters;
- provision of resources and information to emergency service teams such as Tasmania Fire Service and the SES;
- informing the community of the current situation, developments and ongoing prognosis during emergency events; and
- local emergency planning and development of mitigation options using risk analysis, prioritisation and treatment approaches.

As outlined earlier, extreme events and associated emergencies are likely to increase as a result of climate change, potentially resulting in resources for emergency management being required more frequently than in the past. Emergency management planning may be coordinated through a special council committee who have the role of preparing and reviewing a municipal emergency management plan. It is pertinent for this committee to be aware of, and discuss, possible scenarios for intensifying natural hazards and the implications for council's ability to respond appropriately.

Specific identified risks and actions in relation to council's emergency management role are presented in Sections 3 and 4.

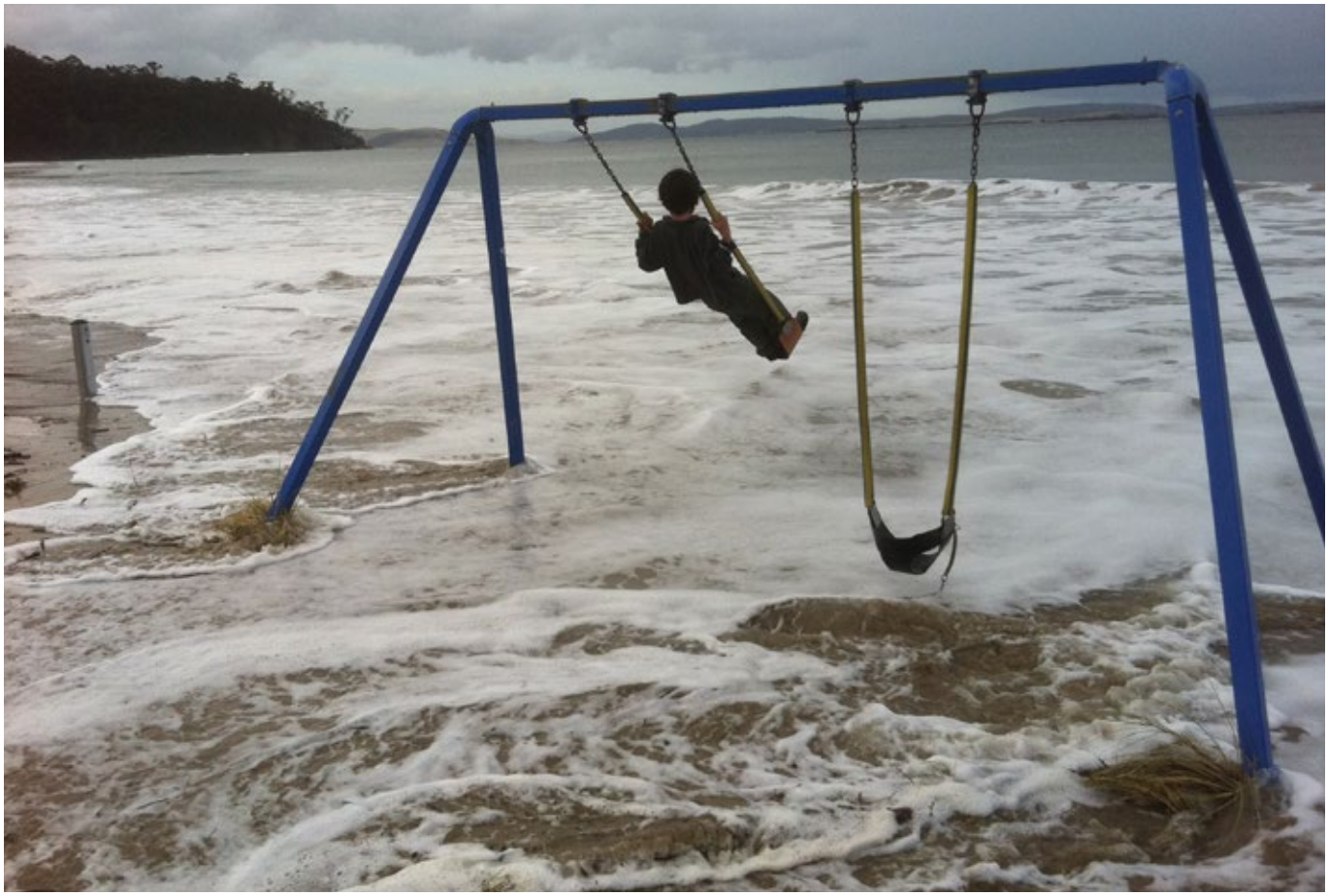


Image: Katrina Graham

3.0 CLIMATE CHANGE IDENTIFIED RISKS AND ACTIONS

Risk is the outcome of the confluence of hazard, vulnerability and exposure. Hazards only become risks if there is exposure, and that there is vulnerability to their impacts.

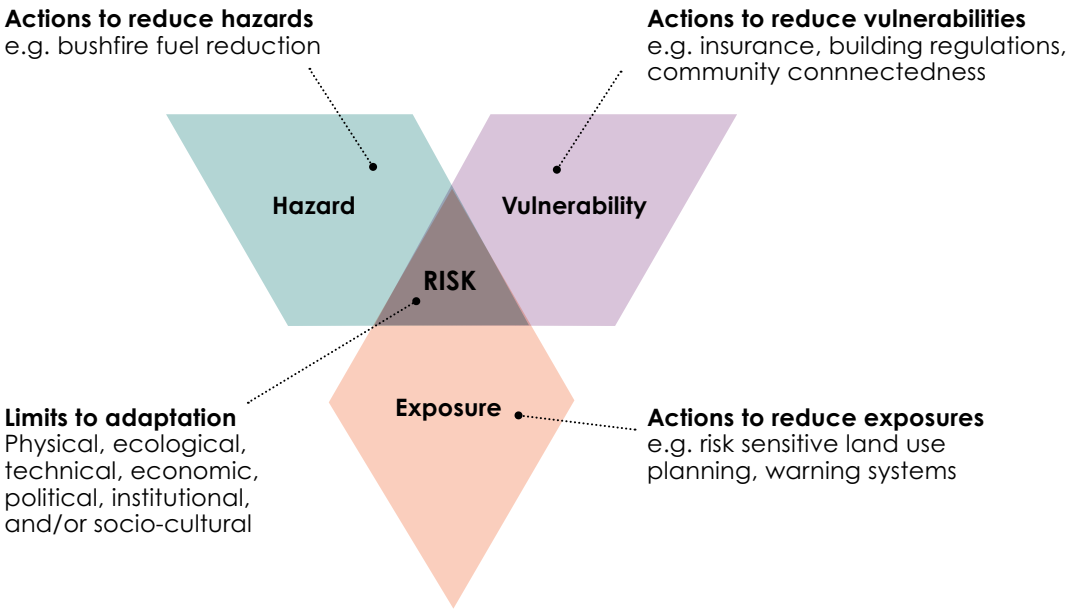


Image adapted from: Tasmanian Disaster Risk Assessment (TASDRA) 2022

Adaptation is about actively reducing exposure or building coping mechanisms for when hazards occur. Adaptation options that are feasible and effective today are likely to become constrained and less effective with increasing global warming. In other words, there are limits to adaptation, in some case moving away from the hazard may be the only option.

'Risk statements' are the key way that Councils define hazards and their implications for council. Climate change requires the development of specific risk statements to cover emerging climate hazards. Components of a meaningful risk statement are:

1. Climate change impact/hazard;
2. Consequence; and
3. Implication for council.

Example risk statement:

Increase in the frequency and intensity of extreme storms will result in heavier rainfall and unprecedented flooding (identify specific locations) leading to infrastructure damage or failure.

The risk management approach used in this adaptation plan was undertaken in accordance with the Risk Management Standard ISO 31 000.

3.1 RISKS AND ACTIONS ASSOCIATED WITH EXTREME EVENTS

3.1.1 Rainfall and Flooding

Heavier rainfall events, particularly from east-coast lows, are expected to create challenging hazards for council:

VULNERABILITIES

Rainfall and Flooding

Increasing extreme rainfall events has the following implications:

- **Exposure of infrastructure vulnerabilities – more frequent damage to assets.**
- **Implications for planning decisions made in areas that are vulnerable to flooding, likely to unprecedented levels.**
- **Absence of up to date modelling or hydrological studies to guide planning decision making.**
- **Exposure of shortcomings in the stormwater system – management of localised flooding associated with council infrastructure.**
- **Testing of emergency services capacity, e.g. managing road closures and recovery centres.**
- **More resources required for dealing with the aftermath of more intense rainfall events.**

Identified risks, ratings and draft actions for rainfall and flooding are presented in Table 2.

Table 2: Identified risk statements, ratings and management for rainfall and flooding

Risk ID	Risk Statement	Primary business area impacted	Primary risk category	Secondary risk category	Risk rating in light of increasing climate change threats (primary risk category)			Existing Controls	Adaptation Action	Target risk level	Responsibility	Timeframe
					Likelihood	Consequence	Risk rating					
RAINFALL AND FLOODING												
1	Increase in heavier rainfall events and unprecedented flooding resulting in infrastructure damage or failure (e.g. road surfaces and bridges).	Asset Services	Financial	Service delivery	**Almost certain**	**Moderate**	**High**	Infrastructure improvements and upgrades	Plan for infrastructure upgrades to cope with flood events in a prioritised manner based upon asset risk analysis and numbers of people likely to be effected.	**Medium**	Asset Services	Ongoing
2	Heavier rainfall and unprecedented flooding events meaning that new developments near waterways could be in harms way, requiring review of information for planning decisions to avoid future litigation risk (e.g. Jordan River flood mapping).	Development & Environmental Services	Financial	Public safety	**Almost certain**	**Minor**	**Medium**		Secure resources to undertake detailed flood modelling where there are data gaps to better define exposure sites and vulnerabilities.	**Low**	Development & Environmental Services	
3	Increase in the frequency and magnitude of flood events leading to road inundation, risk to road users (e.g. Tottenham, Ford Road), and implications for emergency response.	Asset Services	Public safety		**Almost certain**	**Minor**	**Medium**	Deploy signage on affected roads	Greater vigilance and promptness in deploying signage at the start of flood events.	**Low**	Emergency Management Committee	Immediate

Table 2: Identified risk statements, ratings and management for rainfall and flooding (continued)

Risk ID	Risk Statement	Primary business area impacted	Primary risk category	Secondary risk category	Risk rating in light of increasing climate change threats (primary risk category)			Existing Controls	Adaptation Action	Target risk level	Responsibility	Timeframe
					Likelihood	Consequence	Risk rating					
RAINFALL AND FLOODING												
4	Heavier rainfall events leading to greater likelihood that stormwater infrastructure will fail resulting in localised flooding.	Asset Services	Service delivery	Financial	**Almost certain**	**Moderate**	**High**	Council's Stormwater Management Plan lists vulnerable locations	Stormwater Management Plan is the guiding document. Prioritise infrastructure upgrades in hot spot areas that are prone to flooding.	**Medium**	Asset Services	Immediate
5	Increasingly heavy rainfall events exacerbating the risk of tunnel erosion affecting council infrastructure, particularly roads – e.g. Honeywood Drive.	Asset Services	Financial	Service delivery	**Likely**	**Minor**	**Medium**	None	Monitor known high risk areas and ensure a geotech report is required for development applications in vulnerable areas.	**Medium**	Asset Services	
6	Increasing rainfall intensity in storms will result in more resources requitred to attend to clean up and for debris removal.	Asset Services	Service delivery	Financial	**Almost certain**	**Minor**	**Medium**	Map trees in asset register and allocate adequate funds to tree management programs	More funds allocated to tree management programs following hazardous tree analysis and assessment.	**Medium**	Asset Services	Immediate

3.1.2 Increasing Temperature

The modelled temperature rise for Brighton from the baseline period to end of century is 3°C with an expected tripling of hot days (above 30°C) (Table 1).

There are synergies between increasing temperature, decreasing moisture in the landscape, and increasing likelihood of fire-starts. Increasing temperature, particularly resultant temperature extremes and heatwaves, is part of a range of climate-forced factors that often in combination produce an impact. Temperature related risks for Brighton Council are listed in Table 3.

Image: Graham Green

Table 3: Risk statements, ratings and management for temperature change

Risk ID	Risk Statement	Primary business area impacted	Primary risk category	Secondary risk category	Risk rating in light of increasing climate change threats (primary risk category)			Existing Controls	Adaptation Action	Target risk level	Responsibility	Timeframe	Key External Stakeholder
					Likelihood	Consequence	Risk rating						
TEMPERATURE ↑													
7	Changes to mean temperature and increasing 'heat days' and heatwaves will result in diminishing water resources during extended dry spells and hotter weather resulting in implications for water storages and local fire fighting capacity.	Emergency Management	Public safety	Service delivery	**Likely**	**Moderate**	**High**	Awarness of existing dams and water sources	Ensure there is water capacity/ storage in areas of high bushfire risk –- commencing with an audit of what is currently available in the municipality e.g. fast fill stations. Upgrade the emergency management plan accordingly. Advocacy to Taswater and Tas Fire Service to be involved.	**Medium**	Emergency Management Committee	Short term	Tas Fire Service
8	Changes to mean temperature and increasing 'heat days' and heatwaves will result in local biodiversity loss and favour introduced weed species having implications for council's NRM resources and priorities.	NRM	Environ-mental	Financial	**Almost certain**	**Minor**	**Medium**	Tree planting programs, biodiversity protection support initiatives and weed management program	Continue to resource, or seek grant funding for, biodiversity protection and restoration programs. Manage the impact of weeds on land that we control. Increase weed mapping and planning of control measures.	**Medium**	NRM	On a needs basis	State Govt

Table 3: Risk statements, ratings and management for temperature change (continued)

Risk ID	Risk Statement	Primary business area impacted	Primary risk category	Secondary risk category	Risk rating in light of increasing climate change threats (primary risk category)			Existing Controls	Adaptation Action	Target risk level	Responsibility	Timeframe	Key External Stakeholder
					Likelihood	Consequence	Risk rating						
9	Changes to mean temperature and increasing 'heat days' and heatwaves will result in impacts to landscaping and street plantings with implications for species selection, weeding and watering.	Asset Services	Environ-mental		**Likely**	**Minor**	**Medium**	Greening Strategy – Heat and dry resistant species are already being selected	Select only species that are tolerant to heat and dry spells and ensure plantings are made at appropriate times with a follow-up watering program.	**Low**	Asset Services	On a needs basis	
10	Declining mean annual rainfall, longer dry spells and more severe droughts will result in impacts on street trees on our road reserves (loss of limbs), ingress of roots into moist areas (such as around pipes and foundations) resulting in increased workload and costs.	Asset Services	Financial	Public safety	**Almost certain**	**Moderate**	**High**	None	Replace trees at risk of creating issues with those that will withstand emerging conditions of heat and dry. Consider planting street trees into tree cells. Update street tree policy accordingly.	**Medium**	Asset Services	Ongoing	
11	Changes to mean temperature and increasing 'heat days' and heatwaves will result in greater instances of material degradation, particularly road surfaces (but also facades and structures) having consequences for budgets.	Asset Services	Financial	Service delivery	**Likely**	**Moderate**	**High**	None	Advocate for, and adopt, road surface materials that can withstand greater exposure to heat.	**Medium**	Asset Services	Immediate	Contractors

3.1.3 Bushfire

Twice the danger, twice the area, twice as often is a mantra that is now being used to summarise the increasing bushfire risk.

Rising average temperatures and more frequent extreme temperatures have the potential to contribute to a variety of impacts including: rapid drying of the landscape (flash droughts); longer bushfire seasons; enhanced wildfire intensity; and heatwave related illness and mortality (particularly in vulnerable demographics such as the elderly). Impacts may also be incurred on council's infrastructure and property, and on natural resources.

VULNERABILITIES

Bushfire

Changes to bushfire likelihood and behaviour may result in:

- **Emergency services response capacity challenges.**
- **An increase in repair or replacement costs of council and community infrastructure.**
- **Planning considerations in relation to development in locations with extreme bushfire hazard and exposure.**
- **Difficulty in accessing sufficient water resources when fire is associated with drought.**
- **Significant community disruption leading to a range of public health and safety issues, and delays to core council services.**
- **Exposure of shortcomings in the communications network i.e. mobile phone black-spots and/or damage to communications infrastructure.**
- **Pressure to upgrade roads in vulnerable areas to enable safe evacuation and access for emergency services.**
- **Pressure on natural resources not well adapted to fire.**

Identified risks, ratings and actions for bushfire are presented in Table 4.

Table 4: Identified risk statements, ratings and management for bushfire hazard

Risk ID	Risk Statement	Primary business area impacted	Primary risk category	Secondary risk category	Risk rating in light of increasing climate change threats (primary risk category)			Existing Controls	Adaptation Action	Target risk level	Responsibility	Timeframe	Key External Stakeholder
					Likelihood	Consequence	Risk rating						
BUSHFIRE – twice the danger, twice the area, twice as often													
12	Increasing frequency and intensity of bushfires will result in more areas of the local government area that become unsuitable/ dangerous for residential development having implications for hazard abatement and compliance.	Development & Environmental Services	Community and lifestyle	Financial	**Almost certain**	**Minor**	**Medium**	Increasing requirements for residents to comply with bushfire safety measures on their property	Compliance follow-up together with hazard abatement notices. Develop a planning position on fire bunkers in areas highly vulnerable to bushfire.	**Medium**	Development & Environmental Services	Immediate	Tas Fire Service
13	Increasing frequency and intensity of bushfires will result in increasing likelihood of damage to infrastructure and assets such as community halls that provide public services, having consequences for budgets and 'insurability'.	Asset Services	Financial	Community and lifestyle	**Likely**	**Insignificant**	**Low**	None	Ensure flammable vegetation is removed from the proximity of infrastructure and that mechanisms to minimise implications of ember attack are implemented (e.g. gutter guard). Roadside vegetation management.	**Low**	Asset Services	Immediate	Tas Fire Service

Table 4: Identified risk statements, ratings and management for bushfire hazard (continued)

Risk ID	Risk Statement	Primary business area impacted	Primary risk category	Secondary risk category	Risk rating in light of increasing climate change threats (primary risk category)			Existing Controls	Adaptation Action	Target risk level	Responsibility	Timeframe	Key External Stakeholder
					Likelihood	Consequence	Risk rating						
14	Increasing frequency and intensity of bushfires exacerbating the potential for evacuation and access issues on roads to vulnerable localities, e.g. Dromedary.	Emergency Management	Public safety		**Almost certain**	**Major**	**Extreme**		Installation of new pull-off areas to enable traffic management and access for fire engines in known high bushfire risk areas	**High**	Asset Services	Immediate	Tas Fire Service
15	Increasing high fire risk conditions resulting in a higher probability of fire starts on council land that impact the property of others – resulting in litigation.	Asset Services	Financial	Financial	**Possible**	**Major**	**High**		Keep fuel loads to a reasonable level on council properties – have a documented program to do this. Education and awareness program to address purposeful fire lighting.	**High**	Asset Services	On a needs basis	SES

3.1.4 Sea Level Rise and Storm Surge

There are several useful resources available to council when considering the implications of sea level rise and storm surge, including:

- Regional Strategy – Adapting to a Changing Coastline in Tasmania
- CoastAdapt;
- Sea level rise planning allowances for Tasmania;
- Coastal vulnerability mapping; and
- Tasmanian Coastal Adaptation Pathways Project.

Regional Strategy – Adapting to a Changing Coastline in Tasmania

This 'Strategy' developed by the Regional Climate Change Initiative (RCCI) in 2022, will help Councils to employ a risk management approach to existing or potential hazards on the coastline that threaten harm to public and natural assets, infrastructure, people or property. Risk assessments lead to the identification of several options for responding to hazards, and with stakeholder and community involvement, can be used to develop local coastal hazard plans. These plans outline what actions will be implemented, e.g. re-vegetating dunes or engineering solutions such as sea walls. Retreat or relocation, and 'no action' are sometimes viewed as the most appropriate responses.

The Strategy's coastal 'Principles' cover coastal values, public safety and private property through to the role of council and their coastal management role. The principles are not prescriptive, enabling flexibility for councils to develop responses that suit their local coastal issues and resources.

The Strategy may be downloaded at: https://www.stca.tas.gov.au/rcci/our-projects/our-changing-coastline/

CoastAdapt (coastadapt.com.au)

The CoastAdapt web site has a comprehensive range of useful information and planning tools, for example: data and graphics on inundation and coastal erosion; estuaries and sea level rise; local scale risk assessment guidelines; legal risk; and adaptation options for planning, engineering, environment and community.

Sea level rise planning allowances (SLRPAs) for Tasmania

SLRPAs were implemented by the Tasmanian Government in 2012 to promote consistent decision making concerning future land use and development and to reduce the level of uncertainty around the management of future sea level rise. Based upon emissions scenario RCP 8.5, the sea level planning allowance for Brighton is 0.23 m for 2050 and 0.85 m by 2100.

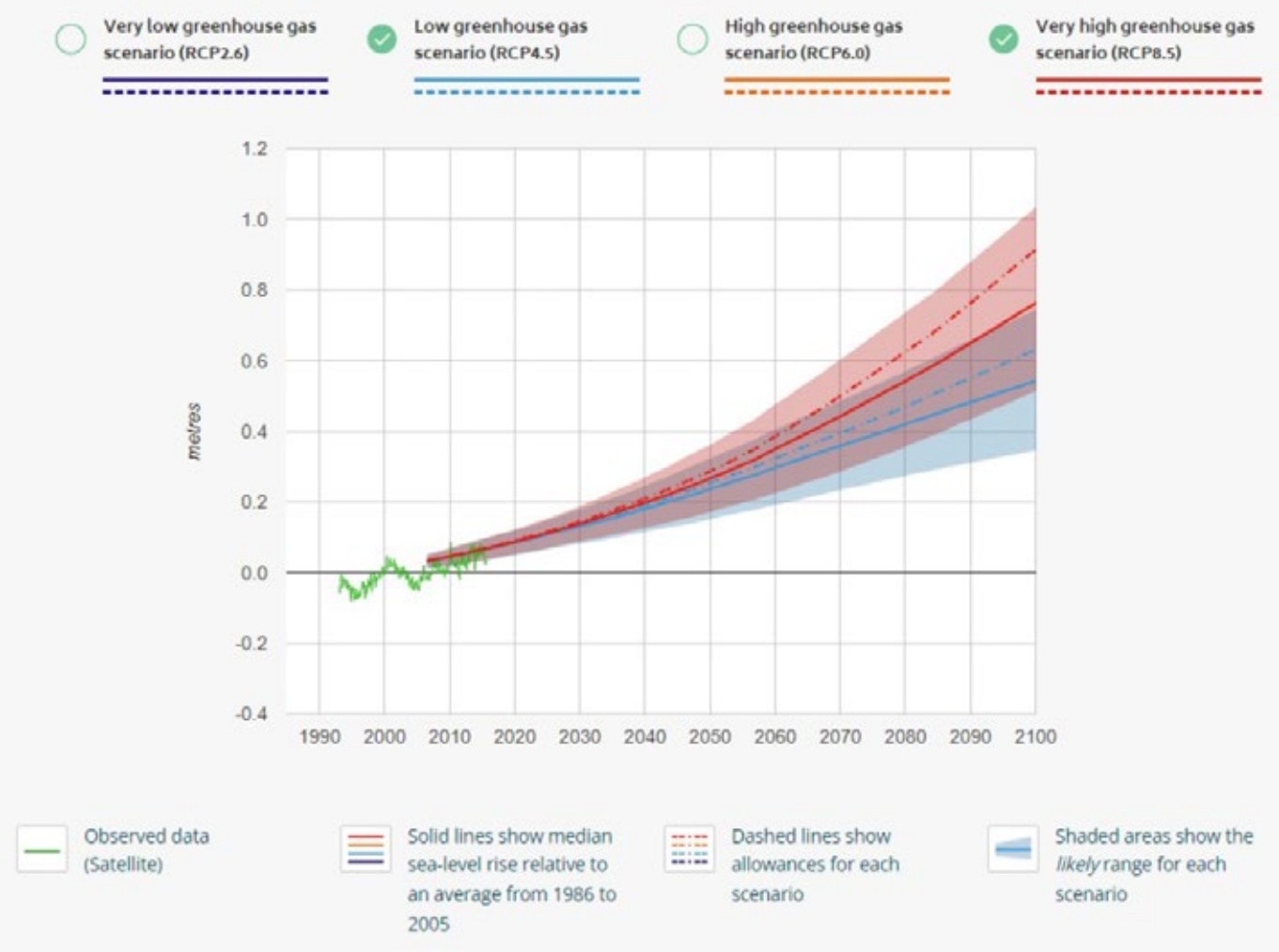
The Tasmanian Government has developed a 'Coastal Hazards Package' in response to the risks posed by coastal erosion and inundation. The Package provides guidance for the management of coastal hazards in terms of land use planning and development resources and can be accessed at: www.dpac.tas.gov.au/divisions/osem/coastal_hazards_in_tasmania

Coastal vulnerability mapping

Coastal hazard layers are available through LISTmap

- Coastal Erosion Hazard Bands 2016
- Coastal Inundation Hazard Bands 2016

Figure 4. Projected sea level rise for Brighton – image from CoastAdapt



Sea level rise outlook for Brighton Council under various emissions scenarios – from CoastAdapt

Tasmanian Coastal Adaptation Pathways Project (TCAP)

The TCAP project aimed to assist Tasmanian communities and decision makers (including councils) to adapt to climate change impacts. Reports have been prepared for several sites in the Southern Region: Kingston Beach, Lauderdale/Roches Beach, and Nutgrove/Long Beach. The Communities and Coastal Hazards Project built upon TCAP with further work undertaken in Kingborough and Glamorgan Spring Bay.

Identified and rated risk statements in relation to the sea level rise hazard in Brighton are presented in the Table 5. As identified in the staff workshop, sea level rise along Brighton's coastline is likely to lead to environmental and financial implications in the short term, and ultimately consequences for infrastructure and service delivery.

Table 5: Identified risk statements, ratings and management for sea level rise and storm surge

Risk ID	Risk Statement	Primary business area impacted	Primary risk category	Secondary risk category	Risk rating in light of increasing climate change threats (primary risk category)			Existing Controls	Adaptation Action	Target risk level	Responsibility	Timeframe	Key External Stakeholder
					Likelihood	Consequence	Risk rating						
SEA LEVEL RISE													
16	Changes in sea level and the frequency of coastal erosion and inundation events will require regular review of planning procedures and controls to ensure development isn't in harms way and that Council is not vulnerable to future litigation stemming from current decision making.	Development & Environmental Services	Financial	Community and lifestyle	**Likely**	**Minor**	**Medium**	Coastal Erosion Hazard Code – coastal erosion hazard area overlay. Sea level rise benchmarks	Keep abreast of legal advice regarding planning decision making in areas of potential risk. Ensure public are made aware of the risks of coastal development, particularly if within the hazard bands of the overlay.	**Low**	Development & Environmental Services		State Govt
17	Changes in sea level and the frequency of coastal erosion and inundation events will result in increased frequency of tidal inundation leading to coastal erosion and requirement for environmental rehabilitation work.	NRM	Environ-mental	Financial	**Likely**	**Moderate**	**High**	Coastal buffering environmental plantings and works	Identify a source of resources for coastal environmental rehabilitation and environmental protection work.	**Medium**	Asset Services		State Govt

Table 4: Identified risk statements, ratings and management for sea level rise and storm surge (continued)

Risk ID	Risk Statement	Primary business area impacted	Primary risk category	Secondary risk category	Risk rating in light of increasing climate change threats (primary risk category)			Existing Controls	Adaptation Action	Target risk level	Responsibility	Timeframe	Key External Stakeholder
					Likelihood	Consequence	Risk rating						
SEA LEVEL RISE													
18	Changes in sea level and the frequency of coastal erosion and inundation events will result in more frequent and higher storm surges leading to damage to coastal assets (such as roads, car parks, playgrounds, buildings and pump stations) and higher maintenance costs.	Asset Services	Financial	Community and lifestyle	**Likely**	**Moderate**	**High**	Buffering and protection works	Impacted assets will ultimately need to be relocated if they can no longer be protected. This needs to be weighed up versus increasing costs to repair damage to coastal assets such as roads and pump stations.	**High**	Asset Services		State Govt
18a	Changes in sea level and the frequency of coastal erosion and inundation events will result in more frequent and higher storm surges leading to damage to coastal assets (such as roads, car parks, playgrounds, buildings and pump stations) and higher maintenance costs.	Asset Services	Service Delivery		**Likely**	**Moderate**	**High**	Acceptance that some infrastructure may ultimately become unprotectable therefore redundant if not relocatable	For assets that can't be relocated or protected – instill in the community through PR an awareness that service delivery in some instances may not be able to be maintained.	**High**	Asset Services		

4.0 STRATEGIC ACTIONS AND SUMMARY ACTIONS FOR COUNCIL BUSINESS AREAS

4.1 STRATEGIC ACTION PRIORITIES – INCORPORATION INTO OTHER DOCUMENTS AND PROCESSES

Strategic priorities are broad level climate change adaptation actions that increase council's climate governance and cross numerous Council service areas. Having these in place enables and facilitates the inclusion of climate consideration across council's corporate strategic and operational functions increasing council's climate resilience and mitigating exposure to potential liability. Success of such actions is dependent on management support. Implementation of strategic actions will provide Council with a solid framework in climate change adaptation and will build an internal culture that supports the implementation of the specific adaptation options listed earlier. Strategic priority examples are provided in Table 6:

Image: Glenorchy City Council Staff

Table 6: Broad level climate change adaptation actions that may be implemented across Council (Strategic Priorities)

Strategic Priority Description	Reasoning
Integrate climate change risk management into existing Council wide risk assessment framework.	Climate change risks should be incorporated into Council's existing risk management processes. From a process point of view this will ensure that climate change risks continue to be properly addressed.
Assign a climate change officer to oversee implementation of this Plan.	A representative from Council is recommended to be assigned to oversee the implementation of actions outlined in the Plan.
Consideration of climate change risks and impacts during the development of other Council strategies, policies and plans.	The climate change impacts and risk process outlined throughout this adaptation action plan should be considered in the development of future plans, policies and strategies to ensure that these issues are incorporated throughout all of Council's service areas. This will also ensure there are mechanisms for actions to be implemented.
Integration of this adaptation action plan and greenhouse gas mitigation measures to prioritise projects that have dual benefits.	Ensure that future emissions are considered in the decision making process of prioritising adaptation actions. Often dual benefits can be achieved for climate change mitigation and adaptation.
Report on climate change adaptation progress into any future publicly available documents or reports.	Reporting on climate change adaptation progress will assist in engaging the community and informing other Councils on Council's progress.
Consider developing climate change related KPIs.	Climate change related Key Performance Indicators (KPIs) which would be reported on through Council's annual report will incentivise continuous improvement.
Ensure that the projected impacts of climate change are properly considered in Council's emergency management planning.	Emergency response plans should be investigated, developed and implemented considering the best available climate change projections. Up to date emergency response procedures can minimise consequences when extreme events occur.
Where required, support the implementation of Regional Councils Climate Change Adaptation Strategies.	Administered through the STCA, the Regional Councils Climate Change Adaptation Strategy aims to drive adaptation in local government for the region and deliver on a number of common actions that are relevant to its member councils. The success of this strategy is dependent on a high level of buy in from each of the Councils across Southern Tasmania.

4.2 ASSET SERVICES

Council's Asset Services team is responsible for overseeing the construction, maintenance and replacement of property and infrastructure assets, including roads, drains and culverts, bridges, stormwater infrastructure, council owned buildings and recreational infrastructure such as walking tracks. For councils, effective asset management is about understanding the required level of service and delivering it in the most cost effective manner. Managing this objective is core business for local government and is key to ensuring council sustainability. The projected impacts of climate change threaten conventional asset management both in terms of financial modelling, as well as the level of service that is acceptable or even achievable.

Projected increases in the intensity and frequency of extreme events directly impact on council's asset base with significant and unpredictable financial and service delivery implications. Council's stormwater system for example is designed for historical climate and with projected climate change, will possibly become under-capacity in places. Council will therefore need to consider the additional cost of managing stormwater at the current acceptable level of service and either fund that cost or accept that a greater frequency of inundation events is likely. This may result in public inconvenience, safety issues, and potentially legal liability for damage to property from poorly performing council infrastructure.

Further to the projected increases in extreme events, incremental changes to the climate such as increasing average temperatures or reduced average rainfall will also have implications for council's capacity to deliver its infrastructure based services. Such changes may result in accelerated structural fatigue in council's infrastructure. Design standards based upon past climate data and patterns may need to be reconsidered for new or replacement infrastructure to account for incremental climate change projections.

Identified Asset Services actions are listed in Table 7.

Table 7: Asset Services Identified Adaptation Actions

Risk ID	Risk statement	Primary risk category	Risk rating	Adaptation Action	Timeframe
14	Increasing frequency and intensity of bushfires exacerbating the potential for evacuation and access issues on roads to vulnerable localities, e.g. Dromedary.	Public safety	Extreme	Installation of new pull-off areas to enable traffic management and access for fire engines in known high bushfire risk areas	Immediate
1	Increase in heavier rainfall events and unprecedented flooding resulting in infrastructure damage or failure (e.g. road surfaces and bridges).	Financial	High	Plan for infrastructure upgrades to cope with flood events in a prioritised manner based upon asset risk analysis and numbers of people likely to be affected.	Ongoing
4	Heavier rainfall events leading to greater likelihood that stormwater infrastructure will fail resulting in localised flooding.	Service delivery	High	Stormwater Management Plan is the guiding document. Prioritise infrastructure upgrades in hot spot areas that are prone to flooding.	Immediate
10	Declining mean annual rainfall, longer dry spells and more severe droughts will result in impacts on street trees on our road reserves (loss of limbs), ingress of roots into moist areas (such as around pipes and foundations) resulting in increased workload and costs.	Financial	High	Replace trees at risk of creating issues with those that will withstand emerging conditions of heat and dry. Consider planting street trees into tree cells. Update street tree policy accordingly.	Ongoing

Table 7: Asset Services Identified Adaptation Actions (continued)

Risk ID	Risk statement	Primary risk category	Risk rating	Adaptation Action	Timeframe
11	Changes to mean temperature and increasing 'heat days' and heatwaves will result in greater instances of material degradation, particularly road surfaces (but also facades and structures) having consequences for budgets.	Financial	High	Advocate for, and adopt, road surface materials that can withstand greater exposure to heat	Immediate
15	Increasing high fire risk conditions resulting in a higher probability of fire starts on council land that impact the property of others – resulting in litigation.	Financial	High	Keep fuel loads to a reasonable level on council properties – have a documented program to do this. Education and awareness program to address purposeful fire lighting.	On a needs basis
17	Changes in sea level and the frequency of coastal erosion and inundation events will result in increased frequency of tidal inundation leading to coastal erosion and requirement for environmental rehabilitation work.	Environ-mental	High	Identify a source of resources for coastal environmental rehabilitation and environmental protection work.	
18	Changes in sea level and the frequency of coastal erosion and inundation events will result in more frequent and higher storm surges leading to damage to coastal assets (such as roads, car parks, playgrounds, buildings and pump stations) and higher maintenance costs.	Financial	High	Impacted assets will ultimately need to be relocated if they can no longer be protected. This needs to be weighed up versus increasing costs to repair damage to coastal assets such as roads and pump stations.	
18a	Changes in sea level and the frequency of coastal erosion and inundation events will result in more frequent and higher storm surges leading to damage to coastal assets (such as roads, car parks, playgrounds, buildings and pump stations) and higher maintenance costs.	Service delivery	High	For assets that can't be relocated or protected – instill in the community through PR an awareness that service delivery in some instances may not be able to be maintained.	
5	Increasingly heavy rainfall events exacerbating the risk of tunnel erosion affecting council infrastructure, particularly roads – e.g. Honeywood Drive.	Financial	Medium	Monitor known high risk areas and ensure a geotech report is required for development applications in vulnerable areas.	On a needs basis
6	Increasing rainfall intensity in storms will result in more resources requitred to attend to clean up and for debris removal.	Service delivery	Medium	More funds allocated to tree management programs following hazardous tree analysis and assessment.	Immediate
9	Changes to mean temperature and increasing 'heat days' and heatwaves will result in impacts to landscaping and street plantings with implications for species selection, weeding and watering.	Environ-mental	Medium	Select only species that are tolerant to heat and dry spells and ensure plantings are made at appropriate times with a follow-up watering program.	On a needs basis
13	Increasing frequency and intensity of bushfires will result in increasing likelihood of damage to infrastructure and assets such as community halls that provide public services, having consequences for budgets and 'insurability'.	Financial	Low	Ensure flammable vegetation is removed from the proximity of infrastructure and that mechanisms to minimise implications of ember attack are implemented (e.g. gutter guard). Roadside vegetation management.	Immediate

4.3 CORPORATE AND COMMUNITY

Brighton Council has an important role in community and economic development, particularly through encouraging investment and job growth, and enhancing liveability and environmental attributes which may influence individual's decisions to live in the municipal area.

Maintaining assets that are fundamental to council operation and community services is an important role of councils. Increasing climate hazards have the potential to cause more frequent impacts on and damage to council buildings. Insurance premiums are likely to rise, as are repair and replacement costs if damage is sustained. Weighing up the value of the asset, the importance of the asset to the community, and the average annual cost of protecting and maintaining the asset are important considerations in determining where to allocate limited resources.

Councils also have an important role in creating healthy vibrant communities, in fact most of council's roles and functions have a bearing on the wellbeing of residents. Climate change, and its resultant range of hazards, is now a well-documented influencer of mental health and is beginning to regularly disrupt the fabric of communities. The majority of Australians (80%) have experienced some form of extreme weather disaster since 2019.[13]

If the community is not prepared for the impacts of climate change then Council may be required to invest increasing resources in community support to assist residents through tough times, including clean-up effort, and support due to disruption to local businesses. For rural councils, programs that Councils may consider referring local businesses and individuals to in challenging times are: Drought Ready Tasmania (www.droughtready.tas.gov.au) and Rural Alive and Well (www.rawtas.com.au).

There is a potential role for council in disseminating specific information to the community in relation to climate change to assist in preparing for changes that could be challenging.

There is also a toll on council staff in assisting the community through extreme events, particularly when their frequency is escalating. Council may be required to invest extra resources in the way staff are managed to avoid burnout, anxiety and fatigue.

13 Climate Council (2023), Climate Trauma: The growing toll of climate change on the mental health of Australians. www.climatecouncil.org.au/resources

4.4 DEVELOPMENT SERVICES

Climate change risks have implications for council's role in planning and development approval, particularly in relation to possible litigation if risk to property from climate change related disasters are not adequately identified or communicated.

In relation to changes in flood and bushfire risk from a warming climate, planning scheme overlays should be updated if and where possible to incorporate modelled data to appropriately guide development. If there remain grey-areas, or uncertainty about potential impact from natural hazards, then additional information to guide decision making should be sought.

With increasing bushfire likelihood it may be useful to have the State Planning Provisions modified to require planning schemes to be informed by modelled fire data that could include: vegetation flammability; slope; ignition potential; and suppression capability.

The Bushfire-Prone Areas Code overlay covers the majority of the municipal area. It prompts thinking around appropriateness of developments in terms of location, access and water supply. For each development a detailed bushfire attack level (BAL) assessment is required as part of the planning assessment process. This assessment informs detail around positioning of buildings, buffer areas, construction technique, and appropriate building materials to minimise bushfire impact and flammability.

Identified Development Services actions are listed in Table 8.

Table 8: Development Services Identified Adaptation Actions

Risk ID	Risk statement	Primary risk category	Risk rating	Adaptation Action	Timeframe
2	Heavier rainfall and unprecedented flooding events meaning that new developments near waterways could be in harms way, requiring review of information for planning decisions to avoid future litigation risk (e.g. Jordan River flood mapping).	Financial	**Medium**	Secure resources to undertake detailed flood modelling where there are data gaps to better define exposure sites and vulnerabilities.	On a needs basis
12	Increasing frequency and intensity of bushfires will result in more areas of the local government area that become unsuitable/ dangerous for residential development having implications for hazard abatement and compliance.	Community and lifestyle	**Medium**	Compliance follow-up together with hazard abatement notices. Develop a planning position on fire bunkers in areas highly vulnerable to bushfire.	Immediate
16	Changes in sea level and the frequency of coastal erosion and inundation events will require regular review of planning procedures and controls to ensure development isn't in harms way and that Council is not vulnerable to future litigation stemming from current decision making.	Financial	**Medium**	Keep abreast of legal advice regarding planning decision making in areas of potential risk. Ensure public are made aware of the risks of coastal development, particularly if within the hazard bands of the overlay.	

4.5 ENVIRONMENTAL HEALTH

Councils have a statutory role for the provision of environmental health services across their communities. In addition to these formal roles other functions may include: aged care, child health, special needs care, supported accommodation and counselling and support services. Climate change has many implications for community health. Gradual shifts over time in temperature, humidity and rainfall patterns can create ideal conditions for disease vectors, such as mosquitos, in areas where there was no previous exposure.

Direct impact of extreme events such as bushfire and heatwaves can result in emergency services and community support services being stretched beyond their capacity. There is now an established link between extreme heatwaves and an increase in mortality in vulnerable sectors of the community.

Severe seasonal conditions such as drought lead to tough environmental and economic situations which can result in more widespread mental health challenges. Councils have an important community role in promoting and maintaining links to relevant support services in times of hardship.

4.6 NATURAL RESOURCE MANAGEMENT

Council's role in natural resource management (NRM) is focused on management of local reserves, protecting local biodiversity and managing threats such as weeds.

The natural environment is under pressure from climate change. The climate change we are now experiencing is occurring relatively rapidly. In natural vegetation communities this change is likely to favour some species and disadvantage others. A possible outcome is loss of vulnerable species and changes in structure, function and composition of vegetation communities. Additionally, exacerbated threat to vegetation communities may occur through proliferation of weeds which may be favoured by changing temperature and rainfall conditions. Direct physical impacts on natural systems may also be exacerbated under climate change, for example, rivers and streams are likely to experience flood flows at levels not seen before, creating vulnerability to erosion in riparian areas.

There may be a need to refocus NRM activities in the future away from addressing issues in isolation to a strategic approach that is well informed about landscape-scale ecological processes. This approach will enable limited resources to be deployed wisely and in ways that address several issues, for example, revegetation in conjunction with landscape connectivity priorities.

Table 9: Natural Resource Management Identified Adaptation Actions

Risk ID	Risk statement	Primary risk category	Risk rating	Adaptation Action	Timeframe
8	Changes to mean temperature and increasing 'heat days' and heatwaves will result in local biodiversity loss and favour introduced weed species having implications for council's NRM resources and priorities.	Environ-mental	**Medium**	Continue to resource, or seek grant funding for, biodiversity protection and restoration programs. Manage the impact of weeds on land that we control. Increase weed mapping and planning of control measures.	On a needs basis

4.7 EMERGENCY MANAGEMENT

Increasing frequency and magnitude of extreme events associated with climate change may result in resources for emergency management being stretched at times. Significant effort should be invested to ensure that relevant staff are well briefed to respond and that Emergency Management Plan and procedures are reviewed regularly so council's roles in emergency response run seamlessly.

Refer also to Section 2.3 – Council's corporate responsibilities in Emergency Management.

Emergency management risks, additional to standard emergency management responsibilities, are listed in Table 10.

Table 10: Emergency Management Identified Adaptation Actions

Risk ID	Risk statement	Primary risk category	Risk rating	Adaptation Action	Timeframe
7	Changes to mean temperature and increasing 'heat days' and heatwaves will result in diminishing water resources during extended dry spells and hotter weather resulting in implications for water storages and local fire fighting capacity.	Public safety	High	Ensure there is water capacity/ storage in areas of high bushfire risk – commencing with an audit of what is currently available in the municipality e.g. fast fill stations. Upgrade the emergency management plan accordingly. Advocacy to Taswater and Tas Fire Service to be involved.	Short term
3	Increase in the frequency and magnitude of flood events leading to road inundation, risk to road users (e.g. Tottenham, Ford Road), and implications for emergency response.	Public safety	Medium	Greater vigilance and promptness in deploying signage at the start of flood events.	Immediate

5.0 ADAPTATION PLAN IMPLEMENTATION AND REVIEW

The implementation of this Plan requires a co-ordinated approach, both across council business, in partnership with other councils, and with external stakeholders. Key components of implementation include:

- a process for adaptation plan endorsement by council;
- a logical way for incorporation of key local risks and adaptation actions into council documents and processes such as risk registers, strategic plans, annual plans or asset management plans; and
- an appropriate mechanism to implement sub-regional and regional adaptation actions either through advocacy or collaboration.

It is important that management play a role in Plan implementation by assuming responsibility for implementing adaptation actions. Implementation of adaptation actions may provide Council with a buffer to the challenges posed by climate change.

5.1 FINANCIAL AND RESOURCE REQUIREMENTS

Financial and resource availability are critical factors for enabling implementation of adaptation actions. The adaptation options identified in this Plan will come at varying degrees of cost and resource requirement. It is likely that Council will initially support implementation of those adaptation actions which are cost effective and align with current resource capacity and availability. As mentioned earlier in this document every dollar invested in adaptation typically yields net economic benefits ranging from $2 to $10,[14] hence implementation of prioritised actions may be viewed as a 'no regrets' approach.

Prioritising 'investment' in adaptation actions can be based upon factors such as:

- risk priority; and
- cost benefit analysis - weighing up the value of the asset, the importance of the asset to the community, and the average annual cost of protecting and maintaining the asset.

In some cases it may not be financially feasible to protect or fortify an asset, hence consideration of relocation of an asset may be the only option.

It is important to recognise that not all climate change action within Council will require its own funding, but will become embedded in the operational business of Council through appropriate governance arrangements, planning and policy. Notwithstanding this, some of the more complex adaptation options, such as road relocation or coastal fortification will require substantial financial support and resources. For these actions, pursuing grant funding and establishing partnerships for collaborative or common actions can be effective in reducing the overall cost of action for Council, enabling the full cost of action to be offset.

14 World Resources Institute 2023: Adapt Now: A global call for leadership on climate resilience.

5.2 STAKEHOLDER INVOLVEMENT AND COLLABORATION

Climate change is likely to impact either directly or indirectly on all aspects of council function. Further to this, impacts are likely to be felt throughout the community affecting other organisations that council has involvement with. A collaborative adaptation response between all stakeholders is therefore essential for council to maintain its service level in a changing climate. It is important that:

- linkages between organisations and commonalities of hazards and risks are identified;
- there is a clear understanding of roles and responsibilities in relation to management of identified climate change risks;
- there is awareness of what stakeholders are doing to manage climate change;
- recognition of opportunities to develop or strengthen existing collaborations and share resources; and
- duplication of efforts is avoided wherever possible.

Image: Graham Green

5.3 REGIONAL STRATEGY

The former Regional Councils Climate Change Adaptation Strategy (2013-17) for southern Tasmania, provided a policy platform and the parameters for cohesive and effective regional and sub-regional action(s) and, importantly, to strengthen the role of councils in adapting to climate change. Its underlying principles were:

- Climate change is a global issue requiring local solutions.
- Climate change action is a shared responsibility between local, state and Commonwealth governments, communities and the private sector.
- Local governments have an important role in leadership and educating communities at both the municipal and regional level on climate change and adaptation.
- Councils must prepare for and manage the impacts of climate change on its assets and services.
- Early climate change adaptation action is more cost effective than late action.
- Collaboration and cooperation on climate change adaptation actions by local government provides more effective use of resources.

Implementation of the Strategy is ongoing through a regional working group (the Regional Climate Change Initiative) who develop and implement an action plan to progress shared risks and actions between councils through a 'regional register'. Regional actions relate to the following themes:

- education and awareness raising;
- advocacy to State/Australian Government/stakeholders;
- collaboration on regional strategy;
- collaboration on climate action;
- cost sharing on research, study and technical advice; and
- reviewing design standards.

Regional actions are prioritised by the RCCI in relation to considerations such as: level of urgency, resourcing requirements, staff availability, funding opportunities, strategic directions and policy settings.

Completion of the Southern Councils Climate Collaboration provides an opportunity to re-appraise the risks and actions in common across the southern councils that are best addressed collectively through the regional approach.

For example the following corporate actions in relation to legal liability could be most effectively pursued through collective advocacy to the State Government:

1. Amendment to *Local Government Act* (Tas) 1993, by the State Government, to insert an equivalent section to s733 *Local Government Act* (NSW) that exempts local governments from civil liability for the impacts of climate change where statutory powers, planning scheme provisions and assessment of development applications are done in good faith and in accordance with manual/s prepared by the State Government.

2. Formulation of State-wide codes to deal with climate change impacts to achieve a uniform set of provisions across the State that: contain specific development controls; removes discretionary decision making from technical assessments; does not require risk analysis; and identifies prescribed levels for sea level rise in developed coastal regions throughout the State.

5.4 EVALUATION AND REVIEW

Monitoring and evaluation of climate change adaptation is necessary to ensure a flexible response and effective allocation of resources. Despite increasing accuracy of modelling based upon the input of real-world data as time goes by, climate change is likely to deliver surprises and potentially unforeseen outcomes. This is because we are entering uncharted waters and it is often difficult to predict how infrastructure and the environment will respond to unprecedented, intensifying and intersecting climate driven hazards.

Monitoring and evaluation is important to evaluate the progress of adaptation actions; integrate new knowledge about climate change projections and potential impacts; keep abreast of legal implications and planning considerations; evaluate and incorporate new technology that can assist with defining hazards, exposure and risk.

Establishment of executive leadership and an appropriate staff team to conduct risk re-assessment involving staff from all operational areas is important. Staff who have local knowledge and influence over potential impacts, including ability to implement actions and allocate resources, must be involved in these assessments.

A component of the Southern Council's Climate Collaboration 2022-23 was a review of the risk tool and legal advice. The tool is a resource that enables comprehensive in-house review of the risk management process. Climate change adaptation tools that provide a guide to the whole process of adaptation planning are available at:

www.stca.tas.gov.au/rcci/our-projects/regional-council-climate-adaptation-project/

Image: Glenorchy City Council Staff

5.5 RELATED RESOURCES

Tasmanian Disaster Resilience Strategy 2020-2025
www.dpac.tas.gov.au/divisions/osem/tasmanian_disaster_resilience_strategy_2020-2025

Tasmanian Climate Change Action Plan 2023-25
https://recfit.tas.gov.au/climate/climate_change_action_plan

Of particular relevance to local government in the Action Plan:

- an undertaking to update the fine-scale climate projections for Tasmania;
- development of a state-wide Climate Change Risk Assessment;
- development of a consistent state-wide approach to managing the impacts of coastal hazards under a changing climate.

Detailed information from the Climate Futures Programme on the modelled future climate for Tasmanian sub-regions may be found here: **www.wineaustralia.com/climate-atlas**

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The Climate Change Adaptation Plan 2023 has been prepared under the auspices of the Southern Tasmanian Councils Authority, Regional Climate Change Initiative by the 12 Councils of southern Tasmania: Brighton, Clarence City, Central Highlands, Derwent Valley, Glamorgan Spring Bay, Glenorchy City, City of Hobart, Huon Valley, Kingborough, Sorell, Southern Midlands and Tasman.

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