



**Resilient
Hills &
Coasts**

Regional Climate Action Plan (ReCAP) Renewal 2024 Backcast





Endorsed by the RH&C Steering Committee

July 2024

Resilient Hills & Coasts (2024), ReCAP Renewal Backcast

Available at www.resilienthillscoasts.com

Acknowledgements

The Resilient Hills & Coasts Steering Committee acknowledges and respects the traditional custodians of the Adelaide Hills, Fleurieu Peninsula and Kangaroo Island region, and we pay our respects to their Elders past, present and emerging. We acknowledge and respect the deep spiritual attachment and the relationship that Aboriginal and Torres Strait Islander people have to Country.

The Resilient Hills & Coasts Steering Committee thanks all partner organisations for their ongoing support for and commitment to this regional climate partnership. This is important work. With your valued contributions, we can keep making a significant difference for our region.



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About this document

In 2024, Resilient Hills & Coasts is renewing its Regional Climate Action Plan (ReCAP). The new plan, and the evidence base and robust engagement process that informs it, will set the direction for Resilient Hills & Coasts to keep collaborating to 2030 and beyond.

The ReCAP project is comprised of two stages:

- Stage One – Backcast
- Stage Two – Forecast

This Backcast report provides the background, context and physical evidence base to inform the Forecast. The Forecast includes significant stakeholder engagement and development of the new ReCAP to 2030.

This document was prepared by the Resilient Hills and Coasts Coordinator and shaped by input from the Resilient Hills and Coasts Steering Committee and member organisations.

Why the ReCAP is needed now

We started developing our [Climate Change Adaptation Plan](#) almost a decade ago, in 2014. It was adopted in 2016. In 2020, we reviewed and refocused our efforts in the [RH&C Action Plan](#), which expires in 2025.

Much has changed in the climate change space since 2014. When we started, we were still building an understanding of what climate change would mean for our region, and where we should focus our efforts.

Over the last ten years, our partnership has built a strong track record of enabling joint action and advocacy on climate change, and has provided a vehicle for knowledge sharing, problem solving and collaboration. Our highlights include the delivery of climate risk governance assessments, coastal adaptation plans, enhanced understanding about climate resilient housing, capability raising on water sensitive urban design and resilient agriculture, and more.

The pace of evolving policy and practice is accelerating, which means how we collaborate also needs to evolve. Climate change is now recognised globally, by corporations and by federal, state and local governments, as a strategic risk that needs to be thoughtfully managed as an organisational priority. It is no longer a standalone sustainability issue.

Each of our member organisations are doing more and more work on their own climate projects and programs, but there's a lot that we can and should do together, especially where we can reduce costs and duplication. Collaborations like Resilient Hills & Coasts accelerate climate action by rapidly raising capability, streamlining effort, influencing change, and addressing shared challenges together.

With climate action evolving rapidly, and climate impacts accelerating, now is the time to reset and renew our partnership with a new plan.

About Resilient Hills & Coasts

Resilient Hills & Coasts is a collaborative, cross-sector partnership working to strengthen the climate resilience of communities, economies and natural and built environments across the Adelaide Hills, Fleurieu Peninsula and Kangaroo Island region.

Resilient Hills and Coasts is one of the [Regional Climate Partnerships](#) of South Australia.

Our partners

- Adelaide Hills Council
- Alexandrina Council
- Kangaroo Island Council
- Mount Barker District Council
- City of Victor Harbor
- District Council of Yankalilla
- Hills & Fleurieu Landscape Board
- Kangaroo Island Landscape Board
- Regional Development Australia (RDA) Adelaide Hills, Fleurieu and Kangaroo Island
- Department for Environment and Water
- Southern & Hills Local Government Association



Our core functions



Our foundations

RH&C success is dependent on strong governance, which includes a plan, a Regional Sector Agreement, our Steering Committee, and a jointly resourced Coordinator.

Our partnership first came together in 2014 to develop a regional [Climate Change Adaptation Plan](#) (CCAP) in consultation with our communities. That plan was adopted by partners in late 2016. Our action is now guided by our [RH&C Action Plan 2020-2025](#), which was developed following a 2020 evaluation.

Resilient Hills & Coasts is not its own organisation. It is a partnership that is formally established under a [Regional Sector Agreement](#) (RSA), which is a statutory instrument under the *Climate Change and Greenhouse Emissions Reduction Act 2007*, signed by heads of partner organisations, including Mayors, Chairs, Presidents and the Minister for Climate Change. Partners have committed to working together under two Regional Sector Agreements, the first of which ran from June 2017 to June 2020, and our current Agreement, which was signed in 2021 and will continue until 30 June 2025.

The RH&C Steering Committee oversees, enables and is the engine room of the partnership. The Steering Committee is made up of representatives from each partner organisation, and operates according to its Terms of Reference. The Steering Committee is supported by the RH&C Coordinator. Their role includes identifying and pursuing funding opportunities, facilitating knowledge sharing, supporting strategic projects, and undertaking advocacy and engagement.

We operate on a lean budget, enabled by significant in-kind contributions from all our Steering Committee representatives. RH&C partners contribute to our operational budget, which funds the RH&C Coordinator. Funding for projects is raised separately via partnerships, grants and Council budget bids. Every \$1 invested by members on RH&C operations has attracted \$4 in external project funding.

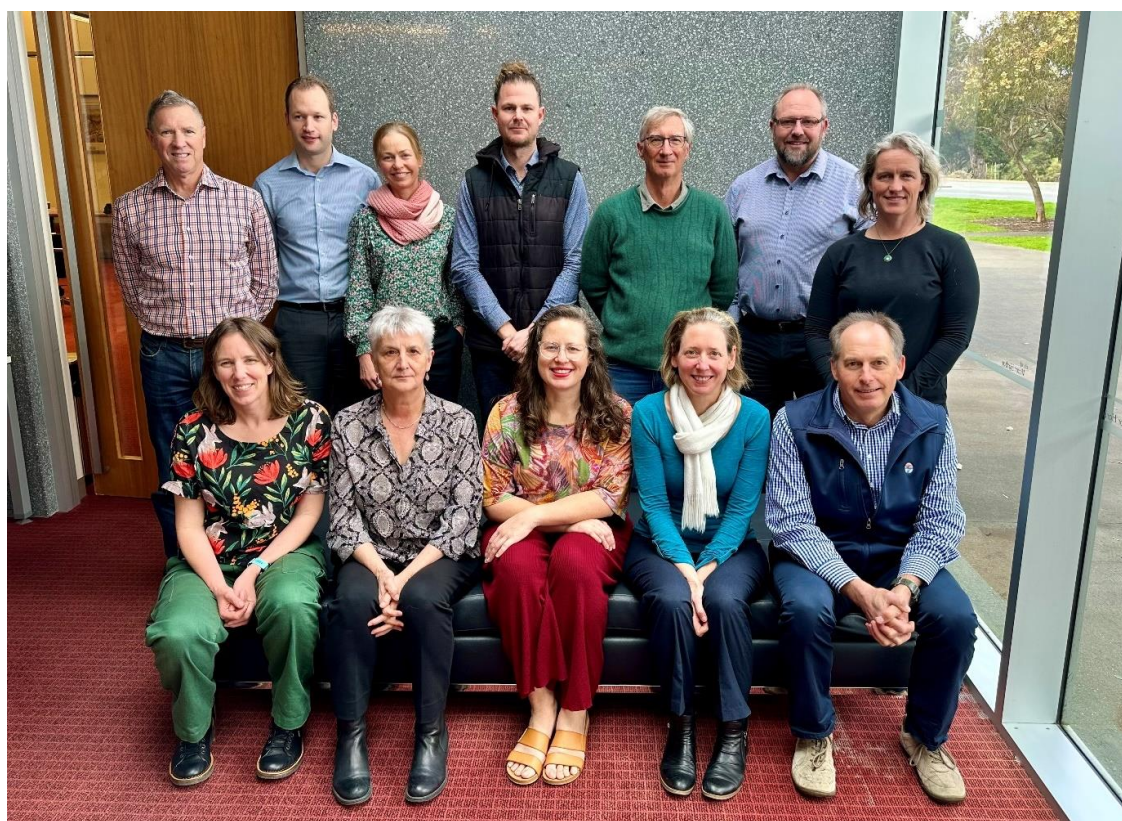


Figure 1: Members of the Resilient Hills & Coasts Steering Committee in 2023

Our region

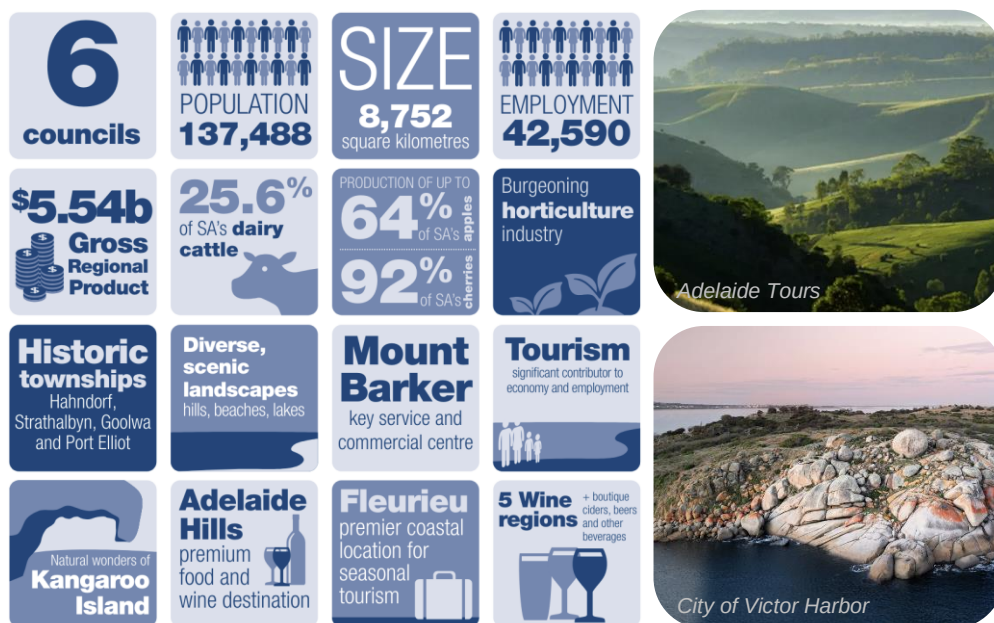


Figure 2: Snapshot of the Adelaide Hills, Fleurieu and Kangaroo Island region. Source: PIRSA, March 2023

Our 2020-2025 priorities

Our goal is to strengthen the climate resilience of our communities, economies and natural and built environments.

Our current priorities for action, as laid out in our Action Plan 2020-2025, are:

<i>Climate-ready development</i>	Leverage our leadership and networks to encourage residential and infrastructure development that avoids natural hazards, is built to maximise resilience, and is energy efficient and water sensitive.
<i>Climate risk reduction</i>	Support partners and communities to map, understand, plan for and adapt to climate risks, especially those arising from coastal, bushfire and urban heat hazards.
<i>Resilient agriculture</i>	Build on and spread regional best practice in enabling agriculture that is regenerative, water smart, resilient to a variable climate, and supports carbon farming as part of a zero emissions pathway.

Our 2016-2020 priorities

Our original Regional Climate Change Adaptation Plan (2016) had nine regional adaptation priorities (see Figure 3), grouped under two strategic themes:

- What We Build – provide leadership in climate-ready development
- Where We Build – improve development planning and management in high-risk areas.

Regional adaptation priorities	
Support adaptive management of protected areas on public lands with a focus on managing fuel loads.	Incorporate design allowances for increases in extreme events by ensuring that new and renewed infrastructure is designed to allow for increases in extreme events.
Develop climate-ready guidelines for public realm and streetscape management that among other things will recommend appropriate material and tree species selection, shade coverings, inclusion of water sensitive urban design features, and opportunities for misting infrastructure.	Improve management of native vegetation on private properties by supporting landholders managing native vegetation on private properties, potentially through the use of well-funded incentives.
Diversify agricultural activities and encourage the use of different varieties and types of crops and pasture, and livestock and livestock management practices, from warmer and drier parts of the state.	Restrict development in hazard prone areas , such as areas at risk from sea level rise along the coast, bushfires inland, and infrastructure and dwellings at risk from flooding following intense rainfall events.
Advocate and facilitate the use of more energy efficient inputs for housing through government incentives and advocacy for the use of appropriate methods and materials, and working with the development industry and research institutes.	Support water quality improvement measures , especially in relation to stormwater.
	Water quantity is an overarching priority for the region, and is considered across multiple themes and sectors.

Figure 3: Nine regional adaptation priorities identified in the Regional Climate Change Adaptation Plan 2016

Our achievements so far

Resilient Hills & Coasts has generated significant momentum, knowledge and practical on-ground action by working together.



Learn

Over a decade, we have forged supportive and productive relationships within and between partner organisations, and beyond. Together, we have kept pace with the rapidly evolving science, policy, practice and technology of climate change. We initiated a Resilient Housing Community of Practice for the state.



Enable

By working together, we have accelerated and streamlined action within our partner organisations. Over the years, our focus areas have included water sensitive urban design, emissions reduction for our operations and our communities, resilient housing, coastal adaptation, climate risk and governance.



Influence

We have become a shared and trusted voice from our region on climate issues that matter. We spearheaded new concepts on insurance affordability in the state. We led the charge in advocating for a coordinated state approach to understanding hazard exposure. With Resilient South, we introduced SA Councils to climate risk and governance. We successfully led the call for the state to reinvest in Regional Climate Partnerships.



Act

Together, we identified shared challenges and attracted funding to address them. We quantified the business case for climate ready housing. We collected the latest knowledge on how to balance bushfire and biodiversity outcomes. We co-devised a pre-feasibility study into council carbon offsets. Together, we engaged our communities with youth summits, webinars and resilient agriculture events.

A decade of action

Our achievements include:

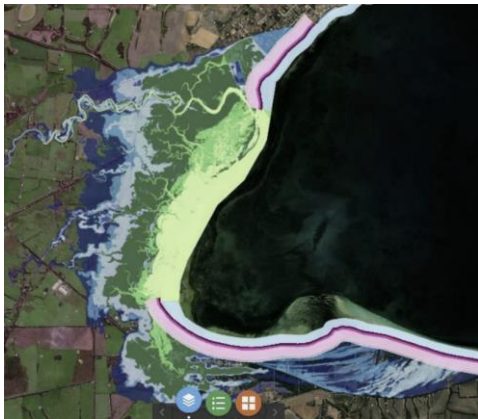
- Winning the NGAA [Partnerships & Building Connections Award](#) (2023)
- Delivering the Bushfire & Biodiversity project, bringing together the latest knowledge and best practice, and mapping next steps for the region to build balanced bushfire and biodiversity resilience (2022)
- Delivering the [Sustainable Homes Expert Webinar](#) series in partnership with other regions, and co-investing in the My Cool Home tool, and commencing the Homes for Tomorrow peer-to-peer marketing campaign, to empower people to get climate ready at home (2023 – 2024)
- Supporting the first three Fleurieu Youth Climate Summits (2022, 2023, 2024), the first two Fleurieu AgFests (2023, 2024) and two Climate Smart Farming Forums (2021, 2022) to engage our communities
- Delivering the [Where We Build What We Build](#) project, providing evidence on the climate resilience of our region's housing stock and the economic benefits of building or retrofitting to a climate ready standard (2020)
- Leading or supporting coastal hazard mapping and adaptation initiatives with [Kangaroo Island](#), [Alexandrina](#) and [Victor Harbor](#) Councils (2019 – 2022)
- Increasing regional capabilities and uptake of water sensitive urban design and urban greening (2020 – 2021)
- Delivering Climate Risk Governance Assessments by five Councils, to assess and embed climate risk management throughout Council business (2019)
- Leading the low carbon transition, including by co-designing and participating in the collaborative Council Carbon Offsets project, securing funding for a statewide Carbon Farming Outreach program for land managers, joining the [Cities Power Partnership](#), installing solar generation, transitioning to LEDs and electric vehicle fleets, accounting for and reducing emissions, and exploring options for a [Community Energy Program](#) (2018 – 2024)
- Influencing numerous policies and plans at the State and Federal Government levels to encourage greater consideration of climate change, including regional plans, legislative reviews and amendments, parliamentary inquiries, and more (2016 – 2024)
- Co-investing in, co-devising and collaborating on cross-regional projects including the Climate Ready Housing Policy project, Net Zero Accelerate program, Carbon Farming Outreach program, You Can't Arb That video series, Council Carbon Credits pre-feasibility assessment, and more (since 2016, accelerating since 2020)
- Collaborating and sharing knowledge with other Regional Climate Partnerships, other climate practitioners in the Resilient Housing and Climate Risk Communities and Practice and broader Climate Practitioners Network, industry bodies, community groups and more
- Coming together in 2014 to develop our [Resilient Hills & Coasts Climate Change Adaptation Plan](#) with significant input from community, business, government, industry and academia (launched 2016).

Case studies



Bushfire & Biodiversity

Recognising the tensions in our region between bushfire risk reduction and biodiversity protection, this project sought to better understand the latest knowledge and best practice, and outline future steps to build a balance between bushfire and biodiversity resilience in our region. As well as bringing together the latest knowledge in one place, including 'snapshots' of critical issues like roadside vegetation, this project brought together regional stakeholders across local councils, landscape boards and state government agencies to exchange perspectives in a way that had not previously occurred.



Coastal Hazard Mapping & Adaptation Strategies

Kangaroo Island and Alexandrina are two of the first Councils in South Australia (following the award-winning lead of Wattle Range) to undertake mapping of projected coastal hazards (including erosion, inundation and storm surge), share maps with communities to help them understand the evolving risks, and co-develop adaptation strategies. This initiative has been highly effective at engaging the community to help them understand the risks, responsibilities and costs of adapting to a change climate.



Water Sensitive Urban Design

RH&C has laid a solid foundation of initiatives to increase uptake of water sensitive urban design in our region. We developed guidelines to retrofit stormwater detention basins into WSUD assets (in partnership with Resilient South), ran two rounds of training for public and private regional practitioners in planning, constructing and maintaining WSUD assets (in partnership with Water Sensitive SA), delivered four on-ground WSUD projects (including streetscape upgrades), and a forum on Urban Growth and Catchment Health in the Eastern Mount Lofty Ranges.



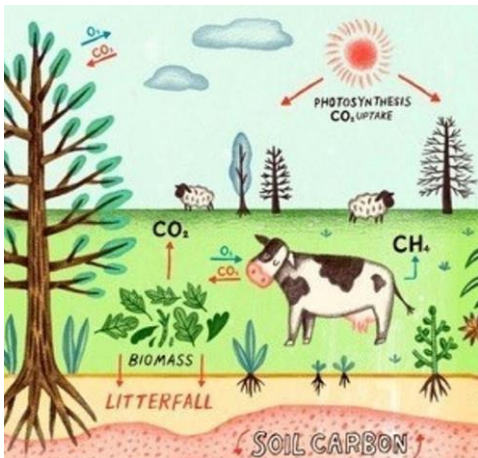
Where We Build What We Build

This comprehensive assessment of the climate resilience of our region's housing stock established RH&C as a leader in climate-ready development. We mapped exposure of existing housing to flood, heat and bushfire risks, categorised its sensitivity to those risks, and analysed the economics of building or retrofitting climate-ready homes in the region. We found that immediately retrofitting the 3,000 hazard exposed homes in the region to a climate-ready standard would deliver a net benefit of \$72 million to the community (in 2020 terms). The project was jointly funded by the Insurance Council of Australia, and the Commonwealth and South Australian Governments under the South Australian Disaster Resilience Grant Program.



Climate Risk Governance Assessments

RH&C partnered with Resilient South to deliver a Climate Risks for Councils Workshop in October 2018, followed by the first South Australian pilot of a Climate Risk Governance Assessment pilot (using Climate Planning's Informed.City tool). Five RH&C Councils have now baselined their performance and started to improve climate risk management through the award-winning methodology and a community of practice approach. This initiative has significantly shifted organisational understanding of climate change as a risk management issue.



Low Carbon Transition

Partner landscape boards are upskilling to assist land managers to estimate emissions baselines and explore emission reduction strategies, and have secured funding for a two-year Carbon Farming Outreach program commencing 2024. Partner Councils are leading the transition to a low carbon future, for example through co-designing and collaborating on the Council Carbon Offsets project, joining the Cities Power Partnership, accounting for and reducing emissions, developing Carbon Management Plans, installing solar generation on Council facilities, and transitioning to LED streetlights and electric vehicle fleets.

Our stakeholders

Climate change affects everyone, everywhere. We have now reached the point where many and varied parties are taking climate action within our region in their own way. This complex, multi-pronged approach is absolutely necessary to tackle the complex and urgent challenges posed by climate change.

Resilient Hills & Coasts plays its part in this picture. We engage with stakeholders where there is mutual benefit. A map of our stakeholders is provided in Figure 4. This list is not comprehensive, and may evolve as stakeholders shift, and as new priorities for Resilient Hills & Coasts emerge.



Figure 4: Map of Resilient Hills & Coasts stakeholders, across five domains

Shifting context

The world has changed since we established Resilient Hills & Coasts in 2014.

We have witnessed massive impacts from bushfires, floods, droughts and extreme weather, and the toll these take on communities, towns and landscapes. Sea level rise is an emerging threat, with significant coastal erosion occurring in some locations, and planning underway in others to reduce future risk.

2023 was the warmest calendar year on record, recording a global average of 1.45°C¹ higher than the pre-industrial 1850-1900 baseline, and topping off the hottest ten-year period on record². Emissions continue to rise, with global temperatures expected to consistently exceed 1.5°C by 2030³.

There is now a united global understanding of the need for urgent and decisive action at all levels. Globally, national governments have committed to Net Zero emissions by 2050, and organisations of all types now consider climate risk management an organisational priority.

Climate action is being taken on all fronts, including by Resilient Hills & Coasts and its members. There are multiple, feasible and effective options to reduce greenhouse gas emissions and adapt to climate change, and they are available now⁴. But the pace and scale of action is not where it needs to be, yet.

Most people now recognise that climate change is real, and they are worried about it⁵. Australians are looking for more leadership, and more climate action⁶. They also want to know what they can do, when, and how.

This section provides more detail on the key trends driving climate action:

- More frequent and severe extreme events
- Getting to net zero by 2050
- Managing climate risk
- Climate disclosures becoming mandatory
- People power
- A renewed commitment to the Regional Climate Partnerships in South Australia.

¹ With a margin of uncertainty of $\pm 0.12^{\circ}\text{C}$.

² World Meteorological Organization Press Release, 19 March 2024, [Climate change indicators reached record levels in 2023: WMO](#)

³ [Global Carbon Budget](#) (2023)

⁴ IPCC Press Release, 20 March 2023, [Urgent climate action can secure a liveable future for all](#)

⁵ Leiserowitz, A. et al (2023) International Public Opinion on Climate Change 2023, Yale Program on Climate Change Communication

⁶ The Guardian (2022), [Climate concern the main reason voters swung to independents at federal election, study finds](#)

More frequent and severe extreme events

In our region, extreme events have had devastating impacts on lives, property, landscapes and the economy over the last decade, as outlined below. Climate projections indicate these kinds of extreme events will become more frequent and severe. With increased frequency, we can expect more compounding events (eg. a flood after a fire), and more severe cascading consequences.



Bushfire

The 2015 Sampson Flat fire, the devastating 2019/20 fires across Kangaroo Island (where two lives were lost) and Cudlee Creek, and the January 2021 fire in Cherry Gardens, affected communities, property, landscapes, and key industries including tourism, primary producers, viticulture and forestry. The recovery effort from the more recent fires is still ongoing.

Fire front approaches Parndana in January 2020. Source: Trent Lawson



Extreme weather

Numerous storm events have damaged property, vegetation and powerlines across the region. Among them, damaging wind gusts in September 2016 and November 2022 caused property and tree damage, and blackouts due to transmission line failure. A number of significant localised hailstorms caused significant damage to primary production in the Adelaide Hills in 2017 and 2018.

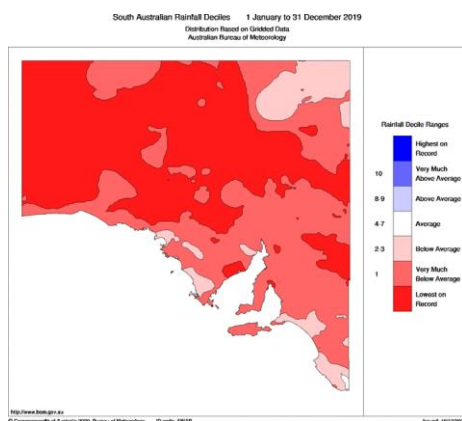
Power cables caught under a fallen tree on Strathalbyn Road at Aldgate in November 2022. Source: Dave Eccles, InDaily



Floods

Significant floods in the region include the September 2016 flash floods in the Mount Lofty Ranges, which washed out and undermined key roads; the River Murray flood in 2022/23 which affected the Lower Lakes and Coorong and coastal areas; flash flooding in Middleton in November 2022 and potential dam breaks in the Mount Lofty Ranges in September 2022 and June 2023, which all resulted in evacuations.

A woman being rescued from the Middleton Caravan Park, which was evacuated during a flash flood in November 2022. Source: The Advertiser



Drought

Following a very dry year in 2018, 2019 was the driest year on record for South Australia, averaging only 80mm rainfall total (far below the 111.4 mm record set in 1944), and second-warmest year on record, at 1.45 °C above average overall. Some sites in the Mount Lofty Ranges recorded their highest ever temperatures, and their lowest annual rainfall in at least 20 years (eg. Macclesfield's had its lowest rainfall since 1992, and for Birdwood and Nairne, since 1982)⁷.

South Australian annual rainfall deciles for 2019, ranging from 'below average' to 'lowest on record' across SA. Source: BoM



*Coastal erosion at Yilki, Encounter Bay.
Source: City of Victor Harbor*

Coastal erosion

Storm events in 2016 caused damage to coastal systems across the region. In June 2022 and 2023, rising tides and storm surges caused severe erosion and damage to the coastline at Yilki, also known as Franklin Parade, Encounter Bay. Emergency response works were implemented to protect the coastline and infrastructure (bike path and road) from further damage, and detailed design work planned for longer-term coastal protection measures. Meanwhile, areas at risk of future flooding and erosion have been identified in Alexandrina and Kangaroo Island, with engagement, monitoring and planning undertaken to understand the risks and management options.

Evolution in emergency management

Globally to locally, emergency management arrangements have evolved over the last decade to strengthen the capacity of governments and communities to prevent, prepare for, respond to, and recover from emergency events. Examples of this evolution of emergency management include:

- The [Sendai Framework](#) is the international strategy for disaster risk reduction, endorsed by the UN General Assembly (2015). It states that to strengthen resilience, countries must prevent new and reduce existing disaster risk. It recognises the (not equally) shared responsibility to do this across tiers of government, the private sector, individuals and other stakeholders. The Sendai Framework introduced investing in resilience as a core priority, alongside understanding disaster risk, strengthening governance, and preparing to 'Build Back Better' in recovery.
- In Australia, the [National Disaster Risk Reduction Framework](#) (2018) guides Australia's efforts to proactively reduce disaster risk associated with natural hazards. It is aligned with the Sendai Framework, translating its goals to the Australian context. Its priorities are: understanding disaster risk; accountable decisions; enhanced investment; and governance, ownership and responsibility. In 2022, the National Emergency Management Authority (NEMA) was established to drive implementation of this framework.

⁷ Bureau of Meteorology (2020), South Australia in 2019: very dry with warm days, available at: <http://www.bom.gov.au/climate/current/annual/sa/archive/2019.summary.shtml>

- The Australian Government's [Future Drought Fund](#) and [Disaster Ready Fund](#) provide funding for initiatives that help Australian farmers and communities prepare for the impacts of drought, and support Australians to manage the physical and social impacts of disasters caused by climate change and other natural hazards.
- South Australia's Disaster Resilience Strategy, [Stronger Together](#) (2019), seeks to provide a foundation for state and local governments, non-government organisations, businesses, and communities to work together to build resilience and make South Australia a safer place. It is aligned with the global and national frameworks. The strategy emphasises, among other things, the importance of strategic and connected networks, which reinforces the importance of collaborations such as Resilient Hills and Coasts.
- South Australia has 11 Emergency Management Zones. Each Zone has a [Zone Emergency Management Committee \(ZEMC\)](#) made up of Local and State Government and emergency management representatives. These committees share operational knowledge and provide regional leadership in emergency management. RH&C member Councils are members of the Adelaide Hills, Fleurieu and Kangaroo Island (AHFKI) Zone Emergency Management Committee (ZEMC). A summary of their [Zone Emergency Management Plan](#) (2018) is publicly available. ZEMC is supported by the South Australian State Emergency Service.
- In South Australia, Councils have improved the maturity of their emergency management in recent years, with assistance from the 2018 to 2021 Council Ready program, and ongoing [Local Government Functional Support Group](#) assistance from the LGA.
- In 2024, all Landscape Boards have been funded by the Australian Government to prepare Emergency Response Plans for Natural Assets, including biodiversity and agricultural natural assets. These are expected to be released later in 2024. This is the first time that natural assets have been specifically and comprehensively targeted for emergency management planning.

Getting to Net Zero by 2050

Globally, the [Paris Agreement](#) (2015)⁸ seeks to limit the increase in global average temperatures to well below 2°C above pre-industrial levels, and pursue efforts to limit the temperature increase to 1.5°C. To meet the 1.5°C goal, emissions would need to peak before 2025 and then decline by 43% by 2030 (see Figure 5)⁹.

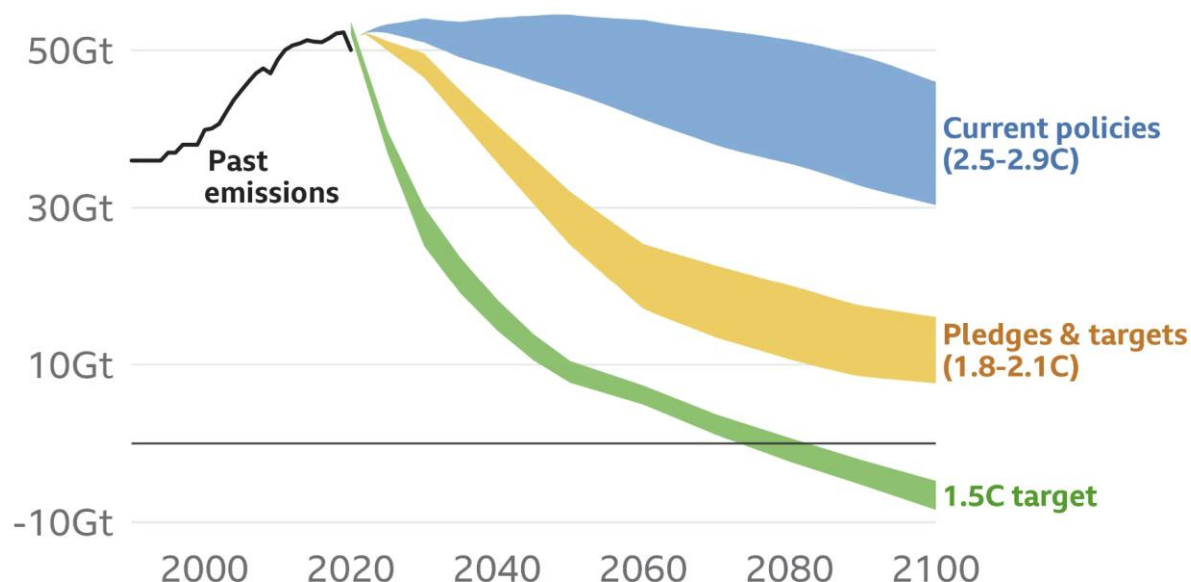


Figure 5: Projected emissions scenarios and resulting range of 2100 warming levels, based on global actions taken (emissions in gigatonnes of carbon dioxide equivalent). Source: Climate Action Tracker, December 2023

The Australian Government has now [legislated its emissions reduction targets](#) of 43% by 2030 and net zero by 2050, under the *Climate Change Act 2022*. To support efforts towards those goals, the Australian Government is now developing a [Net Zero 2050](#) plan; reviewing [Climate Active](#); updating the [Trajectory for Low Energy Buildings](#) (2019) by the end of 2024; strengthening renewable energy policy and funding (including the [Community Energy Upgrades Fund](#)); introducing a [New Vehicle Efficiency Standard](#); and strengthening the Safeguard Mechanism to regulate emissions from Australia's 215 highest emitting facilities.

The South Australian Government is seeking to update its legislated emissions reductions reduction targets to 50% by 2030 and net zero 2050, with interim five-yearly targets between them, through the *Climate Change and Greenhouse Emissions Reduction (Miscellaneous) Amendment Bill 2024* (to update the 2007 Act). It is also developing a [state emissions reduction plan](#) to support progress towards those goals.

Within the RH&C region, some of our partners have also committed to reduce emissions.

⁸ The Paris Agreement replaced the Kyoto Protocol, which was adopted in 1997 and became international law in 2005 (2005 is the baseline year for country emissions reduction commitments)

⁹ UN Climate Change, [The Paris Agreement](#)

Managing climate risk

The [Taskforce on Climate-related Financial Disclosures](#) (TCFD, 2017) has set off a step-change in climate risk governance, assessments and disclosures, initially for the private sector, but increasingly for governments.

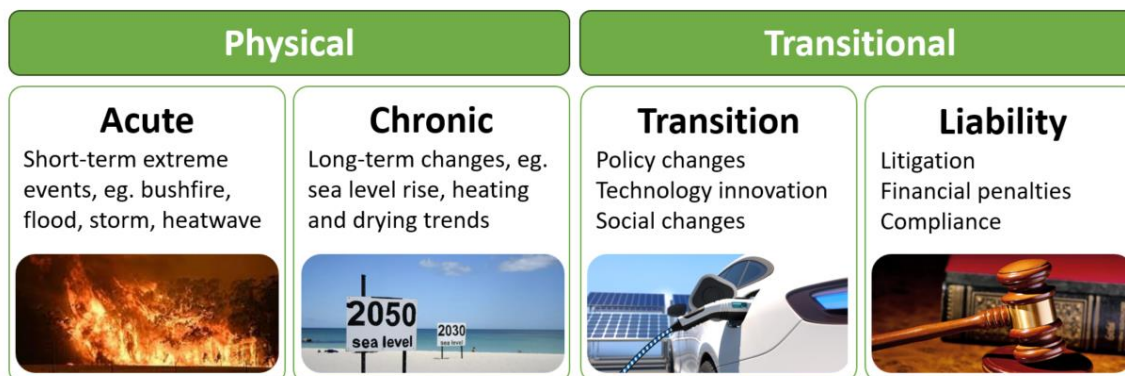


Figure 6: The four types of climate risk. Source: Climate Cavalry, adapted from TCFD (2017) and APRA (2021)

The [Hutley Opinions](#) (by Noel Hutley SC, in 2016, 2019 and 2021) have clarified how Australian law requires companies and their directors to understand, disclose and respond to climate risks. This landmark series of legal opinions prompted interventions by APRA and ASIC, and fast-tracked consideration of climate risk and the TCFD by Australian companies, financial institutions, regulatory bodies and governments. The Centre for Policy Development's [Raising the Bar](#) (2022) further clarified how directors duties in climate risk apply to public authorities, and made six best practice recommendations.

The Australian Government's inaugural first-pass [National Climate Risk Assessment](#) (2024) identified 56 nationally significant climate risks, with 11 prioritised for a second-pass assessment. These include:

- Risks to health and wellbeing from slow onset and extreme climate impacts,
- Risks to adaptation from maladaptation and inaction from governance structures not fit to address changing climate risks,
- Risks to aquatic and terrestrial ecosystem condition and function or landscape function and collapse including through species loss and extinction,
- Risks to primary industries that decrease productivity, quality and profitability and increase biosecurity pressures.

Following its national risk assessment, the Australian Government will undertake a second pass assessment for the 11 top risks, then develop a National Adaptation Plan (to replace the current National Resilience and Climate Adaptation Strategy). To support its own agencies to manage climate risks, the Australian Government has evolved from its first-attempt Climate Compass guide (2018), and is now delivering its [Climate Risk and Opportunity Management Program](#).

The State Government is also in the process of conducting a high-level statewide climate risk assessment in 2024.

Climate risks to local governments have been widely acknowledged, and are outlined in the Climate Council's report [Neighbourhood Issue: Climate Costs and Risks for Councils](#) (2022). The Local Government Association of South Australia has added a policy to the LGA Policy Manual, [4.4 Managing the Risks of Climate Change](#), outlining its expectations of Councils, and is developing a new suite of Climate Risk Training for Elected Members, to be available from mid-2024.

Climate disclosures becoming mandatory

Organisations are increasingly being encouraged, or required, to publicly disclose their climate risks and their carbon emissions, and what they are doing to mitigate both. Organisations responding to community, consumer, investor and voter demands may already voluntarily disclose, especially as part of ESG or social licence. However, these disclosures are increasingly being mandated, either through the market or regulation.

Banks and insurers are moving towards requiring climate disclosures in exchange for service provision. There are moves by some large organisations, concerned with disclosing their own emissions, towards requiring their supply chain to disclose too (for example, abattoirs marketing net zero products and supporting suppliers to baseline and track emissions). Governments and inter-governmental agreements are now rapidly moving to enact mandated requirements for public climate disclosures, aligned with recognised international standards.

Within the next five years, national and state government bodies, publicly listed companies and financial institutions in Australia are all expected to have ISSB-aligned climate disclosures mandated (as outlined below). This requirement may not translate to local and regional bodies, and smaller regional businesses, within that time. However, it is expected that flow-on effects from mandated disclosures may be felt within our region within that period.

Global

The first [Global Stocktake](#) of nations' progress towards the goals of the Paris Agreement concluded at the annual United Nations Climate Change Conference in Dubai (COP 28, 2023). The stocktake is intended to enable countries and other stakeholders to rate both individual and collective progress on climate action and support, identify the gaps, and enable nations to work together on solutions.

Under the terms of the Paris Agreement, countries must also update their [Nationally Determined Contribution](#) (NDC) every 5 years, with each new target more ambitious than the last¹⁰. Australia has submitted two NDCs so far, in 2015 and 2022, with the next due in 2025.

Global standards for [climate](#) and sustainability disclosures were released in 2023, collectively known as the [ISSB Standards](#). Reporting against these standards is now becoming globally mandatory for public listed companies and financial institutions, alongside standard corporate disclosures like annual reports. The ISSB Standards bring together TCFD and other voluntary metrics into a single, global standard. Under ISSB, climate disclosures are required on physical and transitional risks, as well as on governance, strategy, risk management process, and performance against metrics and targets (including reporting Scope 1, 2 and 3 emissions).

National

The Australian Government has set a [Commonwealth Climate Disclosure](#) policy for Commonwealth entities and Commonwealth companies to publicly disclose ISSB-aligned climate information in their annual reports. The pilot tranche will disclose for the first time in 2023-24, with the final tranche commencing disclosures in 2026-27. This initiative is being led by Finance.

In March 2024, the Australian Government [introduced a Bill](#)¹¹ seeking to amend the *Corporations Act 2001* to establish an ISSB-aligned mandatory climate reporting regime in Australia for publicly listed entities, phased in from 1 January 2025. This reporting is expected to include material climate-related

¹⁰ Department of Climate Change, Energy, the Environment and Water (DCCEEW, 2024), [Net Zero website](#)

¹¹ Schedule 4 to the *Treasury Laws Amendment (Financial Market Infrastructure and Other Measures) Bill 2024*

financial risks, Scope 1 and 2 emissions, and climate governance.

The proposed disclosure requirements for both government and corporate entities are to be set out in new accounting standards, currently under development by [Australian Accounting Standards Board](#) (AASB). AASB consultation on three initial draft standards, based on the ISSB standards, closed on 1 March 2024.

The Climate Change Authority has a statutory role under the Climate Change Act 2022 to keep the Australian Government accountable by providing it with annual, publicly available advice on climate impacts, progress towards goals, and recommendations for further action. This has happened twice so far, with the latest available in the [2023 Annual Progress Advice Report](#). The 2023 recommendations include matters like extending investment in research on cascading and compounding hazards; securing agreement with all levels of government on a 'Climate in All Policies' approach; and facilitating a First Nations peoples-led engagement framework to engage on decarbonisation and adaptation matters.

State

The South Australian Government has drafted a [Climate Change and Greenhouse Emissions Reduction \(Miscellaneous\) Amendment Bill 2024](#), seeking to:

- Enable the Minister to develop policies or plans to outline how public sector entities should manage climate risks and reduce emissions (section 14), and
- Introduce **statutory reporting by public sector entities** on how they are managing climate risk and reducing emissions in government operations and activities (new section 20A).

The South Australian Government has publicly identified both its [highest priority planned actions](#)¹², and the range of [climate actions it is undertaking across government](#)¹³. These come under the focus areas of Clean Energy; Economy; Agriculture, Landscapes and Habitats; Transport; Built and Urban Environments; Communities; and Government Leadership. Most notable is an investment of \$593 million to build a hydrogen power plant, electrolyser and storage facility in Whyalla, and develop a Hydrogen Jobs Plan.

¹² Department of Environment and Water (2022), [South Australia responding to climate change](#)

¹³ Department of Environment and Water (2022), [South Australian Climate Change Actions](#)

People power

Climate emergencies have now been declared in 2,335 jurisdictions in 40 countries¹⁴, including the State Government of South Australia (in 2022), the Local Government Association of South Australia (in 2023), and 17 South Australian Councils (all since 2019). Four Councils in the Resilient Hills & Coasts regions have declared. This movement has been driven from the grassroots level, through Elected Members in local, and then state, government. These declarations acknowledge the climate crisis, and the need to accelerate responses with a degree of urgency. This has seen some councils in the region develop new climate emergency action plans, or take new actions, while the State Government is currently progressing a state climate risk assessment.

The May 2022 federal election was touted as the ‘climate election’, and saw a change of government to Labor, which offered stronger climate change commitments, as well as the rise of the ‘teal independents’, whose campaigns championed stronger action on climate change. The top issues causing voters to swing vote were the climate crisis and the housing crisis (see Figure 7)¹⁵.

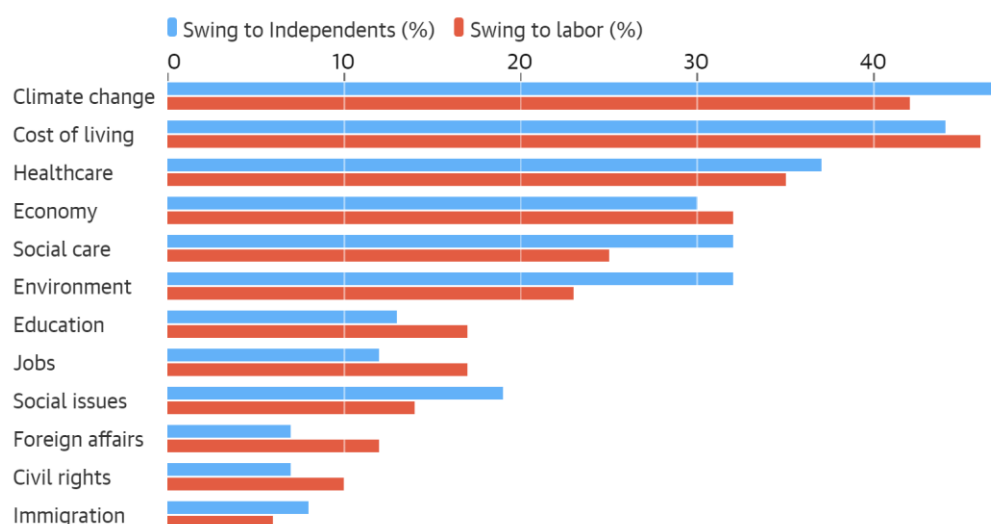


Figure 7: Issues that influenced voters to swing to Labor and independents, 2022 federal election.
Source: The Guardian, using Climate Compass 2022 data

In 2023¹⁶, 70% of surveyed Australians said that climate change is happening. More than 60% are worried about climate change, and 50% said they thought it would harm future generations “a great deal”. Another Australian study in 2022 found that climate deniers are a small majority, with only 5% of Australians believing the climate is not changing¹⁷.

In the nonpartisan Lowy Institute’s flagship annual poll¹⁸, 56% of Australians said their government should take urgent climate action “even if this involves significant costs”, up from just 36% in 2012. Younger Australians (under 30) were far more likely to see global warming as a serious and pressing problem (72%), compared to those aged above 30 (53%).

¹⁴ <https://www.cedamia.org/global/>, as updated January 2024

¹⁵ The Guardian (2022), [Climate concern the main reason voters swung to independents at federal election, study finds](#)

¹⁶ Leiserowitz, A. et al (2023) [International Public Opinion on Climate Change 2023](#), Yale Program on Climate Change Communication

¹⁷ Climate Compass (2022), [Report 2022](#)

¹⁸ Lowy Institute Poll 2023, [Climate change section](#)

A renewed commitment to regional climate partnerships

South Australia's Regional Climate Partnerships (RCPs) are a network of regional, cross-sectoral¹⁹ groups delivering practical and proactive action to strengthen the climate resilience of their communities. This award-winning and nationally emulated model has a proven track record, for over a decade, in delivering real and effective on-ground resilience-building action while successfully leveraging external funding.

Many of the RCPs first came together in the early 2010s with tripartite investment to develop regional climate change adaptation plans, with all 11 regions having completed them by 2016. Some regions have, or are, developing revised adaptation plans, action plans, and other strategies to guide their operation. For example, Resilient South launched its new ReCAP in 2024, and signed its new Regional Sector Agreement, with the Minister for Climate Change and Mayors of member Councils all speaking highly of the partnership and what it has already achieved, and has the potential to achieve still. RH&C and AdaptWest have both secured funding to renew their plans, and Resilient East and Legatus are also looking to renew their Regional Sector Agreements.

Since 2020, the South Australian Government has re-invested in the Regional Climate Partnerships, with a Central Coordinator hosted at LGASA. This role has since been expanded, with another officer joining the team, bringing total capacity to 1.6 FTE. This additional investment reflects the value brought to the partnerships through improved coordination capacity. The Central Coordinator has facilitated the scoping, funding and delivery of numerous strategic projects benefiting participants and the broader network, as well as knowledge sharing and capability raising, including via regular newsletters and two Communities of Practice (Climate Risk and Resilient Housing). This role contributes at a state level in the same manner as the regional Coordinators, and the network of coordinators collaborate to support and deliver these joint efforts.

The Climate Ready Regions initiative is one such collaborative project facilitated by the Central Coordinator. It seeks to explore the business case for the expansion of the Regional Climate Partnerships model and to embed community-led climate resilience in all regions (subject to a future funding round), by creating an evidence-based proposal and program model.

¹⁹ RCP partners vary from region to region, but may include Councils, regional organisations of Councils, RDA Boards, Landscape Boards, and the State Government.

What the science is telling us

How the climate is changing in our region

Climate change is creating a different climate in the Adelaide Hills, Fleurieu Peninsula and Kangaroo Island region. Over the next 30-70 years, our climate will become more like that of the Eyre Peninsula and Upper Spencer Gulf²⁰.

Natural variability in the climate will continue, but on average, our climate is getting hotter and drier, with more extreme events like storms, floods, heatwaves, fires, drought and storm surges²¹. Bushfire, extreme heat and extreme storms were identified in our region's Zone Emergency Management Plan as three of the five top hazards in our region now²², and these can be expected to amplify with the changing climate, becoming more frequent and severe.

Nationally recognised climate change projections for the Hills & Fleurieu and Kangaroo Island Landscape Board regions are available from the [Guide to Climate Projections for Risk Assessment and Planning in South Australia](#) (Department for Environment and Water, 2022). This data is presented visually in the [South Australian climate projections viewer](#).

At a high level, the expected climate changes in our region are summarised in Figure 8 below. For more detailed data, see Appendix 1.

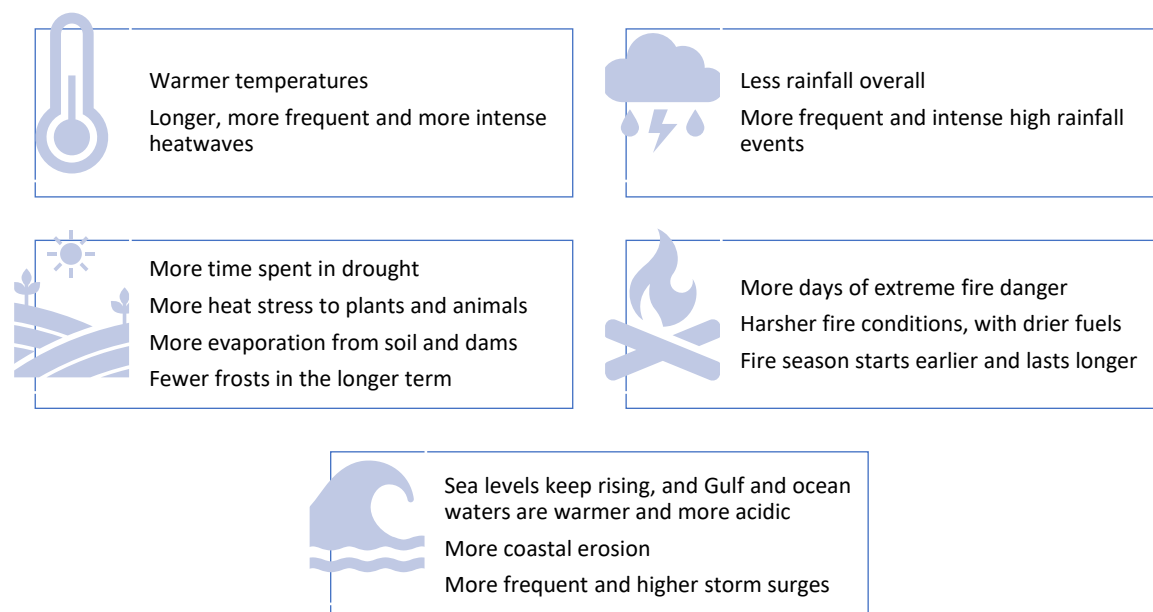


Figure 8: Expected climate changes in the Resilient Hills & Coasts region. Source: DEW Guide to Climate Projections (2022)

²⁰ Climate Change in Australia (2020), [Climate Analogues Explorer](#), accessed May 2024, using Maximum Consensus RCP8.5 Emissions Scenarios for 2050 and 2090, looking at Climate Analogues for Victor Harbor and Kingscote (Analogues include Port Lincoln, Cleve and Peterborough in 2050, and Port Pirie, Streaky Bay, Kimba, Ceduna, Quorn and Hawker in 2090).

²¹ Government of South Australia (2022), [Guide to Climate Projections for Risk Assessment and Planning in South Australia](#)

²² Government of South Australia (2018), [Adelaide Hills, Fleurieu and Kangaroo Island Zone Emergency Management Plan – Key Hazards And Risks Summary](#)

Impacts from our changing climate

As outlined in the [Guide to Climate Projections for Risk Assessment and Planning in South Australia](#) (Department for Environment and Water, 2022), the expected climate changes present a range of potential risks to our region.

Warmer temperatures

- Changes to growing seasons and plant growth
- More potential for algal blooms
- Increased populations, range and migration of pest plants and animals
- More food, water and mosquito borne diseases (eg. E.coli and Ross River virus)

More extreme heat

- More risk of heat related illness and death
- More energy demand for cooling in summer
- More heat stress on livestock
- More damage to yield and quality of crop production
- More demand for irrigation and stock water
- Faster deterioration of exterior surfaces, including road surfaces and buildings
- More incidents of anti-social and violent behaviour

Declining rainfall overall

- More stress on water resources
- More frequent drought and reduced water availability years
- Higher irrigation demand for parks and open space
- Loss of biodiversity associated with watercourses, wetlands and natural areas
- More demand for groundwater
- More risk of respiratory illness as reduced rainfall and drought conditions lead to more frequent dust storms
- Reduced productivity of crops and livestock
- Reduced natural regeneration of native plants.

More extreme rainfall events

- More damage to transport infrastructure, including roads and bridges, with secondary impacts on supply chains, repair and replacement costs
- Higher risk of flooding and demand for emergency response and recovery
- Higher risk of overflow from wastewater treatment ponds or septic tanks
- More damage to crops
- More soil and gully erosion, with secondary water quality impacts.

More dangerous fire weather

- More demand for emergency response and recovery
- Higher bushfire risk and expansion of bushfire-prone areas, increasing risk to public health and safety for residents and visitors
- More damage or destruction of assets and infrastructure including energy generation and distribution networks
- Higher health and safety risks associated with bushfire including smoke inhalation, radiant heat exposure and burns.

Increased evapotranspiration

- Reduced soil moisture, impacting plant health and crop yield
- Higher irrigation demand
- Adverse impacts on wetland and water resource condition
- Adverse impacts on groundwater recharge.

Rising sea levels

- Increase in the extent and frequency of coastal flooding of buildings (eg. homes, SLSCs) and infrastructure (eg. roads, jetties, coastal assets, CWMS)
- More erosion of beaches and damage to coastal infrastructure, impacting safety, amenity and recreation, and tourism opportunities
- More damage to underground assets from sea water intrusion to groundwater and from coastal inundation.

Warmer and more acidic oceans

- Changes in marine nutrient cycling
- Worsening condition and extent of suitable habitat for coastal fisheries
- Adverse impacts on shell-forming organisms including molluscs, crustaceans and foraminifera
- Adverse impacts on fisheries, aquaculture and tourism.

Observed climate trends

The Bureau of Meteorology publishes [State of the Climate](#) reports to describe year-to-year variability and longer-term observed changes in Australia's climate.

Its seventh biennial report in 2022 confirmed a consistent picture of ongoing, long-term climate change interacting with underlying natural variability (see Figure 9). Changes in weather and climate extremes are happening at an increased pace. The past decade has seen record-breaking extremes leading to natural disasters that are exacerbated by human-induced climate change.

Key findings were that, in 2022:

- Australia's climate had warmed by an average of 1.47 °C since national records began in 1910. Since 1950, each decade has been warmer than the last.
- Most years are now warmer than almost any year in the 20th century.
- Very hot months that once occurred 2% of the time (1960–1989), now occur over 11% of the time (2007–21). Extreme heat has caused more deaths in Australia than any other natural hazard.
- Rainfall is decreasing in southern Australia during the cooler months. In the south-east of Australia, April to October rainfall has decreased around 10% since the late 1990s, affecting the main growing season for many crops.
- Streamflow at most gauges across Australia has decreased since 1975.
- Since 1950, extreme fire weather has increased, and the fire season has started earlier, across large parts of the country.
- Oceans around Australia have warmed by over 1°C since 1900, contributing to longer and more frequent marine heatwaves.
- Sea levels have risen around Australia, with higher rates than the global average in the north and south-east of the continent. Global mean sea level has risen by around 25 cm since 1880; half of this rise has occurred since 1970.

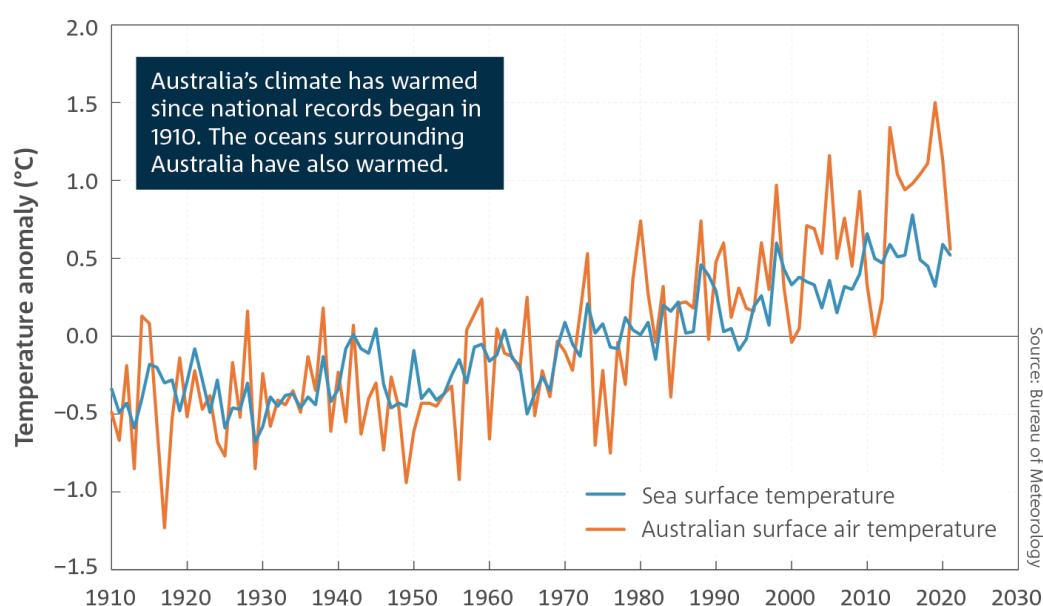


Figure 9: Anomalies in annual mean sea surface temperature, and temperature over land, in the Australian region. Anomalies are the departures from the 1961–90 standard averaging period.
Source: Bureau of Meteorology, *State of the Climate* 2022

A snapshot of our region's emissions

There are global standards²³ on how to estimate regional carbon emissions in a way that does not miss any emissions or count any twice. Our current understanding of our regional emissions profile (Figure 10 below) is based on these standards.

The region emits 5% of South Australia's carbon emissions (1,236,000 t CO₂e)²⁴. The region's major emissions sources are on-road transport (36%) and agriculture (32%). These figures are averaged across the region, with some Council areas higher than others in different emission sources. For example, in Kangaroo Island, 74% of emissions are from agriculture, in Adelaide Hills, 48% are from on-road transport, and in Mount Barker, 31% are from industrial processes and product use (IPPU).

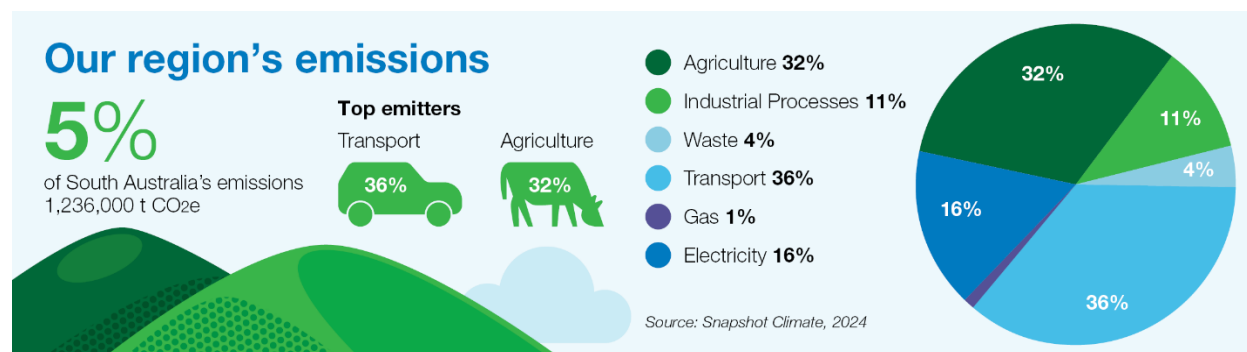


Figure 10: Community emissions profile for the Resilient Hills & Coasts region, for the 2021/22 financial year.
Source: Snapshot Climate, 2024

South Australian and Australian emissions

South Australia has reduced emissions while building its economy. In 2020-21, emissions had reduced by 42% from 2005 levels, and gross state product increased by 31% over the same period²⁵.

South Australia is a world leader in renewable energy, generating more than 70% of its electricity from renewable sources²⁶. By 2025/2026, this is projected to reach 85%, with a target of 100% net renewable energy by 2027. South Australia has the first power system in the world where rooftop solar can, at certain times, exceed the entire state's electricity demand.

According to the Australian Government's 2023 emissions estimates, its policies put Australia on track to reach a reduction of 42% below 2005 levels by 2030. This is a significant improvement from the 2021 estimates, which put Australia on track for a 30% reduction²⁷. However, Australia remains the third-largest fossil fuel exporter in the world.

²³ World Resources Institute (updated 2021), [Global Protocol for Community-Scale Greenhouse Gas Emission Inventories](#)

²⁴ The region has 7.8% of the state's population, and generates 4% of the Gross State Product (Australian Bureau of Statistics, 2022-23)

²⁵ Department of Environment and Water (2022), [South Australia responding to climate change](#)

²⁶ Department for Energy and Mining, <https://www.energymining.sa.gov.au/consumers/energy-grid-and-supply/our-electricity-supply-and-market>

²⁷ Department of Climate Change, Energy, the Environment and Water (DCCEEW, 2024), [Net Zero website](#)

Using emissions scenarios for climate planning

The United Nations Intergovernmental Panel on Climate Change (IPCC) developed Representative Concentration Pathways (RCP) to represent future trends of greenhouse gas emissions, accounting for plausible global responses to mitigate them. RCPs help us understand different potential futures, to inform risk assessments, adaptation planning, and emissions reduction policies. The four RCPs²⁸ range from very low emissions to very high – RCP 2.6, RCP 4.5, RCP 6.0 and RCP 8.5.

Climate planning now generally refers to two scenarios, RCP 4.5 and RCP 8.5, recognising that the window for the rapid decline scenario of RCP 2.6 has passed. In the RCP 4.5 scenario, emissions peak around 2040 then decline. In the RCP 8.5 scenario, emissions continue to rise.

The CSIRO²⁹ and the South Australian Department of Environment and Water (DEW)³⁰ recommend assessing risk based on the climate conditions projected under the highest emissions scenario (RCP 8.5) up to 2050. This is because there are relatively minor differences between emissions trajectories and the resulting projected temperature changes (as illustrated in Figure 11); and observed temperature changes in Australia have been tracking towards the upper end of projected ranges in model simulations. Over longer timescales (beyond 2050), uncertainty on both emissions trajectories and climate projections diverge more significantly.

For a more conservative approach, RCP 8.5 can be used for all timescales. For a more balanced assessment of the likely costs of impacts and risk mitigation, both RCP 4.5 and RCP 8.5 can be used on a case-by-case basis. RCP 8.5 has been used to inform this ReCAP, based on the latest scientific advice. The 2016 RH&C Climate Change Adaptation Plan used RCP 4.5.

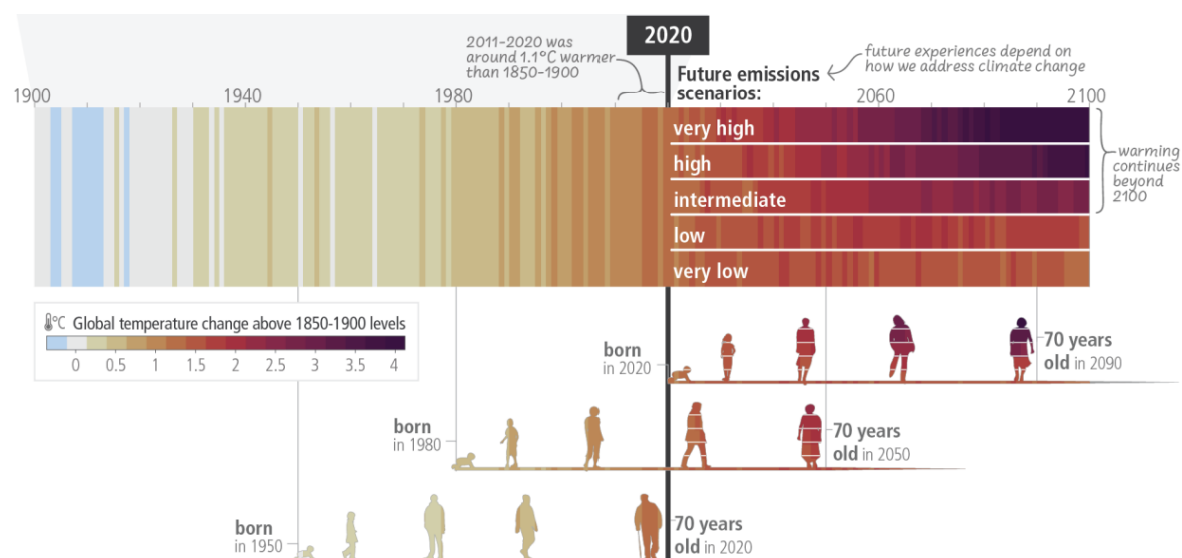


Figure 11: Observed (1900–2020) and projected (2021–2100) changes in global surface temperature (relative to 1850–1900) illustrate the plausible climate changes over the lifespans of three representative generations (born in 1950, 1980 and 2020). Source: IPCC AR6 Synthesis Report (2023)

²⁸ These four RCPs were identified in the IPCC Fifth Assessment Report (AR5, 2014), and inform the latest regionalised projections from DEW. The IPCC's Sixth Assessment Report (AR6, 2021) employs a new set of scenarios called Shared Socioeconomic Pathways (SSPs). Regionalised projections based on the SSPs are not yet available in South Australia.

²⁹ CSIRO and Department of the Environment and Energy (2018) [Climate Compass: A climate risk management framework for Commonwealth agencies](#)

³⁰ Department for Environment and Water (2022) Guide to Climate Projections for Risk Assessment and Planning in South Australia 2022

Regional vulnerabilities

For the 2016 Climate Change Adaptation Plan, two Integrated Regional Vulnerability Assessments were undertaken, for the Hills & Fleurieu region, and for Kangaroo Island. The key findings of these two assessments were combined in the regional plan, expressed as a series of questions, interrogating key areas of decision-making on how the region's values could be sustained in a changing climate.

These questions remain relevant today:

1. **Agriculture** - How do we maintain agricultural productivity and water security, especially for horticulture, viticulture and dryland grazing, given projected declining rainfall and increasing temperature?
2. **Water-dependent ecosystems** - How do we protect water-dependent ecosystems given projected declining rainfall and increasing temperature and fire risk?
3. **Natural landscapes** - How do we maintain the condition of natural landscapes (plains, flanks, uplands) given projected declines in rainfall and increasing temperature and fire risk?
4. **Coastal ecosystems** - How do we maintain the condition and extent of sedimentary coastal ecosystems given projected increases in sea levels?
5. **Public coastal assets** - How do we maintain the condition of public coastal assets given projected increases in sea levels?
6. **Vulnerable members of the community** - How do we enhance the health, safety and well-being of vulnerable members of the community as the risk of extreme events such as fire, extreme heat and flooding (as a consequence of rainfall intensity and sea level rise) increases?
7. **Emergency management services** - How do we respond to the growing demand for emergency management services across multiple sectors as the risk of extreme events such as fire, extreme heat and flooding (as a consequence of rainfall intensity and sea level rise) increases?
8. **Community facilities and open space areas** - How do we maintain and expand community facilities and open space areas for sport and recreation to meet a growing community's demands given projected declines in rainfall and increasing temperature and fire risk coupled with increasing population and development?
9. **Infrastructure assets** - How do we maintain and expand infrastructure assets, such as roads and energy networks, given projected declines in rainfall and increasing temperature and fire risk?
10. **Homes and buildings** - How do we maintain the condition of existing homes and buildings (public and private) and enhance their effective operation as the risk of extreme events such as fire, extreme heat and flooding as a consequence of rainfall intensity and sea level rise increases?

Other vulnerability studies

A number of other reports have been published covering climate vulnerabilities of more specific geographical areas and values:

- In 2024, Kangaroo Island Council published its 'Preparing KI Action Plan'³¹. This plan identified a number of key vulnerabilities to natural hazard risks for **Kangaroo Island**:
- All landscape boards, including Hills & Fleurieu and Kangaroo Island, were in May 2024 undertaking high-level assessments of key risks and vulnerabilities to the region's **agricultural and biodiversity natural assets**, to inform emergency management planning. These plans may be available by July 2024.
- A 2014-15 assessment of the vulnerability of the Adelaide Hills and Mount Lofty Ranges' leading **agricultural** sectors – viticulture, perennial and annual horticulture, annual cropping, extensive livestock and dairy³² – identified key climate impacts to these sectors.
- A 2015-2016 landscape-scale assessment of climate impacts on terrestrial **biodiversity**³³ identified the vulnerabilities of regional landscape classes, and recommended adaptation actions.
- **Coastal** hazard assessments and adaptation plans have been developed for specific locations in Kangaroo Island, Alexandrina and Victor Harbor.
- State mapping, such as Planning and Design Code Hazard Overlays, as well as other region or hazard-specific risk assessments and adaptation plans may also be sources of information on site-specific or regional vulnerabilities.

³¹ Meridian Urban and Water Technology (2024), [Preparing KI: A Whole-of-Island Disaster Risk Reduction and Mitigation Action Plan](#), for Kangaroo Island Council

³² Thomas, D., Hayman, P. and Bachar, Z. (2016) [A Comparative Climate Vulnerability Assessment for Key Agricultural Industries in the Adelaide and Mount Lofty Ranges Natural Resource Management Region](#). Adelaide and Mount Lofty Ranges Natural Resources Management Board, Adelaide.

³³ West, A. (2016) [Climate Change and Biodiversity Landscape Scenario Assessment for the Resilient Hills and Coasts Region](#). Natural Resources Adelaide and Mount Lofty Ranges, Department of Environment, Water and Natural Resources, Adelaide.

Where to find more information

The global consensus on climate drivers, impacts, risks and risk management

- The Intergovernmental Panel on Climate Change's (IPCC) [Sixth Assessment Report \(AR6 2023\)](#) unequivocally concluded that humans have warmed the planet, driving more extreme weather. IPCC reports provide a comprehensive summary of what is known globally about the drivers of climate change, its impacts and future risks, and how adaptation and mitigation can reduce those risks. They are drafted and reviewed in several stages to guarantee accuracy, objectivity and transparency, and represent global consensus.

The Australian Government's climate science programs

- The [Australian Government](#) invests in climate science through the Australian Climate Service, CSIRO, the Bureau of Meteorology, the National Environmental Science Program, the Australian Community Climate and Earth System Simulator (ACCESS), and the Australian Antarctic Science Program.
- Key services include an [Analogues Explorer](#), which match the projected future climate of a location with the current climate of another location in Australia. Using this tool, both Kingscote and Victor Harbor's climates are expected to become like the current climate of Port Lincoln and Bordertown by 2050, and like Port Pirie by 2090 (under the high emissions scenario RCP8.5).

South Australia's best available data

- The Department for Environment and Water is the climate science lead for the South Australian Government. In late 2023, they released a [South Australian climate projections viewer](#). This interactive online viewer is a spatial representation of data from the [Guide to Climate Projections for Risk Assessment and Planning in South Australia](#) (2022³⁴). It allows users to zoom into a Landscape Region, Local Health Network region, or ten by ten kilometre grid cell. It includes data on rainfall and temperature changes, but not on hazards such as flooding, bushfire, urban heat, coastal inundation, extreme heat and heatwaves.
- Spatial hazard data is starting to be integrated across state government decision-making. For example, PlanSA is creating Overlays within the Planning and Design Code, which trigger consideration of policies for new developments. The intent is to direct development away from areas exposed to climate risks, or where they may exacerbate climate risks. These include:
 - State Significant Native Vegetation Areas Overlay and the Native Vegetation Overlay which seek to protect, retain and restore areas of native vegetation;
 - Hazards (Bushfire) Overlays to better protect people and buildings, and enable emergency vehicle access, in the event of a bushfire;
 - Hazards (Flooding) and Hazards (Flooding - General) Overlays to ensure new development acknowledges the impacts of future flood events; and

³⁴ This data is derived from NARcliM 1.5 projections released in 2021, which are based on global projections in the IPCC's 5th Assessment Report. The latest global projections in the 6th Assessment Report will be included in NARcliM 2.0, which is underway and is expected to be updated on the spatial viewer during 2024.

- Coastal Areas and Coastal (Flooding) Overlays seek to conserve and enhance the natural coastal environment and provide for natural coastal processes and hazards due to sea level rise, flooding and erosion.
- In our region, localised coastal hazard mapping has been undertaken in Kangaroo Island, Alexandrina and Victor Harbor Council areas.

Sea level rise data and mapping

- NASA's [Sea Level Projection Tool](#) allows users to visualise and download the sea level projection data from the IPCC 6th Assessment Report (AR6). Users can click on a point anywhere in the ocean to obtain sea level projections for that spot.
- A [coastal risk mapping tool](#) has been developed by the Australian CRC for Spatial Information. The tool allows users to investigate projected sea level rise and storm surge scenarios for their locality, using data from the IPCC 6th Assessment Report (AR6).
- The [CoastAdapt](#) website provides sea level rise and inundation information for all Australian coastal councils, based on 2016 data. It also provides links to the coastal geomorphology dataset Smartline, which maps shoreline erodibility, and graphs showing available observed sea level rise based on satellite data.
- The [Enviro Data SA Coastal Flood Mapping Viewer](#) is an interactive flood mapping tool hosted by the Department for Water, containing LiDAR-derived coastal flood map projections for the Eyre Peninsula and Limestone Coast. Other coastal areas of South Australia are expected to be added in 2024.

Appendix 1. Climate projections for the Resilient Hills & Coasts region

Table 1: Summary of climate scenarios data for the Hills & Fleurieu region (white) and Kangaroo Island (grey) (or surrogate locations where regional data not available, as indicated in sources), for a high emissions scenario (RCP8.5) in 2030, 2050 and 2090, and for a medium emissions scenario (RCP4.5) in 2090.

CLIMATE VARIABLE		BASELINE Rain: 1981–2010 Temp: 1986–2005 Sea: 1986–2005	EMISSIONS SCENARIO			
			2030 RCP8.5	2050 RCP8.5	2090 RCP8.5	2090 RCP4.5
	Annual rainfall decrease (most significant decrease in Spring: -40% H&F and -41% KI in 2090 RCP8.5) *	625 mm	-3%	-9%	-29%	-12%
		564 mm	-4%	-10%	-29%	-12%
	Extreme rainfall events increase **	0.38 1-in-1000 rainfall events	+58%	+55%	+121%	+87%
			+58%	+55%	+121%	+87%
	Mean daily maximum temperatures increase * (most significant increase in Spring: +4.1°C H&F and +3.7°C KI in 2090 RCP8.5)	18.4°C	+1.0°C	+1.6°C	+3.5°C	+1.9°C
		18.2°C	+1.0°C	+1.5°C	+3.3°C	+1.8°C
	Mean daily minimum temperatures increase *	10.3°C	+0.9°C	+1.4°C	+2.8°C	+1.6°C
		10.6°C	+0.9°C	+1.3°C	+2.7°C	+1.5°C
	Number hot days over 35°C increase *	7	+2	+4	+12	+5
		1	0	+1	+3	+1
	Fire weather danger increase ^	4.2 severe fire danger days	+11.9%	-	+64.3%	+26.2%
			+11.9%	-	+64.3%	+26.2%
	Evapotranspiration increase ~ (evaporation and water stress to vegetation)	-	+3.1%	+5.2%	+9.9%	+5.1%
		-	+2.4%	+4.1%	+8.4%	+4.2%
	Sea level rise increase #	-	+13cm	+24cm	+60cm	+45cm
		-	+13cm	+24cm	+60cm	+45cm

Data Sources, Locations & Confidence

* **Hills & Fleurieu and Kangaroo Island** regional data for **rainfall and temperature** from the second generation of NARClIM projections released in 2021 (NARClIM 1.5), South Australian climate projections viewer. Very high confidence in temperature projections, high confidence in rainfall projections.

** Table 4-2 Projected change in climate variables for **Adelaide RCP8.5 (extreme rainfall events only)**. High confidence in rainfall projections, low confidence in magnitude of increase in extreme rainfall events. *Guide to Climate Projections for Risk Assessment and Planning in South Australia* (Department for Environment and Water, 2022).

^ Table 10-2 Number of severe **fire danger** days (FFDI > 50) (**Southern and South Western Flatlands**). High confidence in frequency, low confidence in magnitude (strongly dependent on summer rainfall projection). *Guide to Climate Projections for Risk Assessment and Planning in South Australia* (Department for Environment and Water, 2022).

~ Table 8-1 Change in annual potential **evapotranspiration (Hills & Fleurieu and Kangaroo Island)**. *Guide to Climate Projections for Risk Assessment and Planning in South Australia* (Department for Environment and Water, 2022).

Table 11-2 Projected change in **sea level rise** relative to 1986–2005 (m) (**Victor Harbor**). Very high confidence. *Guide to Climate Projections for Risk Assessment and Planning in South Australia* (Department for Environment and Water, 2022)

Further notes from the Guide to Climate Projections (DEW, 2022)

Drought – Drought is generally used to refer to a time of acute water shortage. The Climate Change in Australia projections used the standardised precipitation index that considers monthly rainfall as it has contributed to the previous 12 months rainfall and compares this to the long-term record. Droughts under this definition last for longer than one year (CSIRO and Bureau of Meteorology, 2015). By 2030, time spent in drought (over a 20-year period) is projected to nearly double in the Hills and Fleurieu and Kangaroo Island Landscape Regions. This means that up to 65% of time could be in drought by 2030. By 2030 the frequency of extreme drought will more than double. By 2050, time spend in drought is projected to more than double in the Hills and Fleurieu and Kangaroo Island Landscape Regions. This means the region could be in drought up to 70% of the time.

Wind speed – Small changes (less than $\pm 2\%$) are projected with high confidence for mean surface wind speeds by 2030. Decreases in wind speed in winter are projected for 2090 under RCP4.5 and RCP8.5 with high confidence based on model results and the projection of a reduction in storminess. Changes in other seasons are small compared to natural variability. (high confidence)

Sea level rise – Mean sea level will continue to rise and height of extreme sea level events will also increase. (very high confidence). Sea level projections for the Australian coastline by 2090 are comparable to the global mean sea level projections of 45– 82 cm under RCP8.5 (medium confidence). These ranges of sea level rise are considered likely (at least 66% probability). However, if a collapse in the marine based sectors of the Antarctic ice sheet were initiated, the projections could be up to several tenths of a metre higher by late in the century. For all scenarios, global mean sea level is projected to continue to rise after 2100, most likely at much greater rates.





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