

Resilient South



Southern Region Local Government Implementation Plan 2015-2019

Strengthening Southern Adelaide for changes in our climate





Australian Government
Attorney-General's Department



Government of
South Australia



Local Government Association
of South Australia



Mayors' opening statement

There are times in our lives when we suffer a shock. It may be an illness, the loss of someone close, or forced unemployment that leaves us shaken and vulnerable. The most harmful shocks are those that we are not prepared for.

Our ability to cope with these events and re-bounce from them is most often dependent upon our family and local community. At best, shocks can lead to positive changes including healthier lifestyles, new friends, and greater resilience.

Shocks from natural hazards such as bushfire, flooding and heat-waves are now happening more regularly as a result of climate change. Since 1998, we have recorded the 10 warmest years on record¹. Hotter and drier conditions result in more days with a higher risk of bushfire², as well as an increase in the intensity of bushfires. The changes in our climate that we are experiencing now are expected to continue and intensify.

Our resilience to climate change will depend upon our ability to work together and make changes that enable our region to adapt and prosper.

In 2014, our Councils proved to be leaders in preparing the southern Adelaide region for climate change by adopting the Resilient South Regional Climate Change Adaptation Plan (the Regional Adaptation Plan). This nationally recognised plan was developed with the active participation of 150 champions from the economy, infrastructure, environment and social domains. It is a guide for local and state government, business, and the community in adapting to climate change in southern Adelaide.

Climate Change is a global problem, but we as the Mayors of these Councils understand that we need local action to better prepare our residents for the challenges ahead. We present to you the Southern Region Local Government Implementation Plan (2015-2019). This is a commitment to implement the most important actions for the four Councils from the Regional Adaptation Plan over the next four years. Together we can ensure that we are prepared for the challenges ahead and that we take advantages of any opportunities to strengthen our economy, and improve our health and wellbeing.



Glen Spear
Mayor
City of Mitcham



Kris Hanna
Mayor
City of Marion



Stephen Patterson
Mayor
City of Holdfast Bay



Lorraine Rosenberg
Mayor
City of Onkaparinga

1 National Aeronautics and Space Administration 2015.

Accessed at <http://climate.nasa.gov/news/2221/>

2 Climate Council Be Prepared Climate Change and the South Australia Bushfire Threat.

Accessed at <http://www.climatecouncil.org.au/sabushfirereport>

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Section One

Working together for a Resilient South

Climate change is no longer just an issue for the distant future, some changes are already occurring. Today there are reports of record-breaking heat-waves, more frequent bushfires, flooding and significant storms. The trend for an increasing number of extreme weather events and natural hazards is expected to continue.

Climate change is no longer just an issue for the distant future, some changes are already occurring. Today there are reports of record-breaking heat-waves, more frequent bushfires, flooding and significant storms. The trend for an increasing number of extreme weather events and natural hazards is expected to continue.

There is a real risk that these changes will have significant local impacts. Our business and manufacturing sector, as well as the health of our environment and residents are vulnerable.

The South Australian Climate Change Adaptation Framework was adopted in August 2012 in response to increasing pressure from the Local Government sector, for the state government to provide leadership in developing a response to the likely impacts of climate change.

Fundamental to the framework is the necessity for Councils to work at a regional level in collaboration with government, business and our communities to establish joint strategies to prepare for the significant negative impacts expected in the future. Each of the 12 South Australian Government Planning Regions and its leaders are developing adaptation plans to ensure that the whole of South Australia is prepared for the impacts of climate change.

In addition, under the South Australian Public Health Act 2011 Councils have a statutory obligation to develop a regional public health plan that is consistent with the South Australian Public Health Plan. The state public health priorities include 'Preparing for Climate Change (e.g. improving resilience to extreme weather conditions and hazards, green infrastructure).

Resilient South was initiated in 2008-09, and in 2013 the partner Councils began work on our Regional Climate Change Adaptation Plan (the Regional Adaptation Plan) (Diagram 1). The Regional Adaptation Plan aims to increase the region's resilience to:



Warmer temperatures, and more frequent and intense heat waves



Increased number of days of extreme fire danger



Increased rainfall intensity, but less rainfall overall



Rising sea levels

The Regional Adaptation Plan was developed utilising best practice methods for planning and stakeholder engagement. It incorporated the latest scientific data analysis tools including the Resilient South Maps online tool. This tool enabled a detailed investigation and analysis of spatial data relating to social, natural and economic aspects and their interrelationships.

The Regional Adaptation Plan was adopted by the partner Councils in August 2014. It recommends 57 preferred adaptation actions relating to 10 key decision areas (described as pathways). The economic, environmental and social domains across the southern region can use these pathways to guide their own adaptation action.

The Department of Environment, Water and Natural Resources (DEWNR) has recently released *South Australia's Climate Change Strategy 2015-2050: Towards a low carbon economy*, which reiterated the state Government's commitment to regional adaptation planning. The new strategy commits to the development of a state-wide, whole-of-government, Adaptation Plan. This plan will provide a framework for priority adaptation actions by government, supporting the implementation of regional priorities and recognising that it will be important for some adaptation responses to be coordinated at a state-scale. Areas of interest will include key issues highlighted in regional adaptation planning processes, such as engagement with industry and support for vulnerable communities.

Each level of government has a role to play in adapting to changes in our climate as illustrated in Diagram 2.

Diagram 1

Overview of the development of the Resilient South Regional Climate Change Adaptation Plan



Diagram 2

The roles and responsibilities of governments and non-government organisations in climate change adaptation

Australia

Federal Government

- › Sets national directions and priorities for adaptation

South Australia

State Government

- › Provides state legislation and policy for climate change response through: development rules, public health planning; emergency management; water resource management; biodiversity protection; and other natural resources management
- › Provide access to relevant data
- › Delivers adaptation responses to issues of state significance

Local Government Association of South Australia

- › Advocates governments for adaptation response
- › Assists Councils by providing research and guidelines for adaptation

Southern Adelaide

Resilient South Regional Adaptation and Local Government Implementation Plans

- › Delivers targeted local adaptation responses to benefit residents
- › Contributes to regional collaboration and programs
- › Partners with other governments, business and research institutions

Other

Research institutions

- › Provide research and guidance

Business

- › Influence and deliver adaptation responses

Non-government organisations

- › Influence and deliver adaptation responses



Our region has pioneered the regional adaptation planning process and has received special recognition for its contribution, with the National Climate Change Adaptation Research Facility (NCCARF) naming the Resilient South group of Councils Climate Adaptation Champions for 2014.

In 2014, Resilient South was recognised nationally with an award for its participatory approach and use of the best practice methodologies in developing its Adaptation Plan.

The National Climate Change Adaptation Research Facility (NCCARF) is charged with developing and communicating the knowledge needed by decision makers to adapt to climate change. In presenting Resilient South with the Climate Adaptation Champion (Local Government) Award, NCCARF Director Professor Jean Palutikof said, "This award recognises that Resilient South sets the benchmark for local government response to climate change."

"NCCARF recognises the Resilient South initiative as an Adaptation Champion in 2014 for demonstrating there is strength in numbers, and that action to address climate change can deliver more resilient and sustainable Australian communities," Professor Palutikof said.

The state government and the Local Government Association of South Australia (LGA) have recognised the pioneering role played by our Councils and has partnered with us in the Southern Region Local Government Implementation Plan (the Implementation Plan). The table below summarises the investment made so far from our Councils and partners in implementing climate adaptation in our region.

Table 1

Funding the Southern Region Local Government Implementation Plan 2015-16. Note that the funding identified below is not exhaustive as some councils have other existing projects that are included in their Local Adaptation Plans that have not been included here.

Resilient South & Partners	Funding 2015-16	Totals
City of Holdfast Bay	\$23,600 towards a 0.8 FTE Resilient South Program Coordinator \$2,993.00 for Vegetation Cover (NDVI) Mapping	\$26,593
City of Marion	\$23,600 towards a 0.8 FTE Resilient South Program Coordinator \$2,993.00 for Vegetation Cover (NDVI) Mapping	\$26,593
City of Mitcham	\$23,600 towards a 0.8 FTE Resilient South Program Coordinator \$2,993.00 for Vegetation Cover (NDVI) Mapping	\$26,593

City of Onkaparinga	\$23,600 towards a 0.8 FTE Resilient South Program Coordinator \$23,600 for 0.2 FTE Onkaparinga Resilient South Program Coordinator \$55,000 Tree Canopy Cover and Vegetation Health Mapping \$20,000 Elected Member Climate Change Training \$4,000.00 Thermal Street Imagery	\$126,200
Department of Environment, Water and Natural Resources (DEWNR)	\$25,000 for the Cool Places project to contribute to urban heat island mapping of the Resilient South region.	\$25,000
Resilient South	\$24,000 for the Cool Places project to contribute to urban heat island mapping of the Resilient South region.	\$24,000
Local Government Association of South Australia and DEWNR	Part in-kind funding towards the Elected Member climate change training and facilitating implementation of regional climate change adaptation plans.	\$42,000
Total		\$296,979

Note: Future funding will be subject to the government budget processes. In addition each partner Council will fund their own four year Local Action Plan.

Section Two

Local leadership

Resilient South is now in its implementation phase (Diagram 1) and this Implementation Plan focuses on those areas where local government can exert the most influence in strengthening our communities against the likely impacts of climate change.

When our Councils came to develop this Implementation Plan, we needed to be clear about what role local government should play in implementing adaptation actions and which actions to give the highest priority from a local government perspective.

A criteria and scoring methodology was developed and utilised in a series of workshops (process is described in Appendix 1), with the main aim of focusing regional adaptation actions from the Plan on Councils' role and responsibilities, common regional issues, and priority for action (from a Council perspective). The criteria also highlighted adaptation actions that delivered multiple benefits for Councils.

The criterion was tested with our Program Champions which resulted in 23 priority adaptation actions being identified (Appendix 2). Four foundation projects have been developed which will facilitate the implementation of these priority actions. The projects are described in this Implementation Plan and include strategic actions for

Councils and our partners to work together to accomplish the main outcomes of the Implementation Plan and the Resilient South program as a whole.

In addition, each Council has developed either a Local Action Plan or a Climate Change Policy. The Local Action Plans and Policies identify specific activities or principles that will allow partner Councils to pursue foundation project outcomes in their own locally relevant way. Diagram 3 provides a summary of the relationship between the Regional Adaptation Plan, the Implementation Plan and the Local Action Plans/Policy.

The local action plans and policies recognise and build upon the work already being delivered by our Councils, and take a measured approach to implementing foundation projects over the next four years. Critical to climate adaptation is that action is embedded within Councils' strategic plans, local asset plans and regional public health plans and relevant operational plans. Under legislation Councils are required to regularly review these plans. It is proposed that climate change adaptation principles will be included in this next review.

Diagram 3

Illustrates the relationship between the three levels of adaptation planning in the Resilient South program



Diagram 4

Adapted from the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (2013) *Climate Adaptation Outlook: A Proposed National Adaptation Assessment Framework*



Section Three

Staying on the right path and measuring our success

The Adaptation Plan considers a preferred pathway for adapting to changes in our climate over the next 50 years. It is designed to be a 'live' document that will be periodically evaluated as new information becomes available. This implementation plan considers the most relevant and urgent actions for local government over the next four years.

Monitoring and evaluating the effectiveness of adaptation actions is an emerging policy area. It is complicated by long-time frames, multiple stakeholder and sector involvement, and difficulties in embedding responsibilities for action into existing Council strategic and operational planning processes.

The federal government has developed a draft national adaptation assessment framework that considers the drivers, activities and outcomes of good adaptation (Diagram 4). Our Councils have limited ability to influence these drivers. However, implementation of the adaptation actions identified by Resilient South will enable our Councils to achieve many of the activities and outcomes identified in the framework.

Each Partner Council will monitor and evaluate the implementation of their own local adaptation actions through existing Council corporate reporting processes. This information will inform the monitoring and evaluation of the Southern Region Local Government Implementation Plan (see Appendix 3).

Indicators

The proposed national approach to developing indicators to monitor progress in climate change adaptation is to have a small number of high impact indicators that cover the main elements of a plan and to continuously test and refine the indicators.

The following indicators for monitoring and evaluating this Implementation Plan are based on the outcomes that have been identified for each of the foundation projects. These indicators will be refined overtime, and are summarised in Table 2 below.

- 1) **Percentage of Council strategic plans, community plans, local asset plans and regional public health plans (as required under the Local Government Act) that consider climate change.**

This indicator would monitor implementation of strategic actions in the Equip and Source to Sea projects. It will focus on whether high level Council strategic and operational planning processes include objectives, goals and actions that take climate change impacts into account.

- 2) **Councils' participation in government and non-government research, processes, and committees that have the potential to influence state and federal government policies.**

This indicator would monitor implementation of strategic actions in the Equip, Cool Places and Source to Sea

projects. Local government's advocacy for greater climate change adaptation in state and federal government policies and planning can result in a more supportive environment for Councils' own adaptation efforts. This indicator will use partnership agreements, Committee memberships, letters, media releases, and published reports and studies to measure Councils' proactive involvement in external research, processes and committees.

3) **The number of Resilient South Program Champions and their levels of activity.**

This indicator will monitor the success of the Aware project. Resilient South currently has a database of 150 Program Champions that have been actively involved in the development of both the Regional Adaptation Plan and the Local Government Implementation Plan. Champions will be integral to increasing the region's awareness of climate adaptation, and capacity to adapt to climate change. Therefore, monitoring how many champions engage with the program and how they engage will provide an indication of our success in this area.

4) **Our capacity to understand the impact of heat on our region and vulnerable members of the community.**

This indicator will be used to track progress of Cool Places strategic actions that relate to urban heat islands and impacts on vulnerable members of the community. It will assess the effectiveness of research into the urban heat island effect in southern Adelaide, and mapping showing its impact on vulnerable communities, as well as how well our mapping illustrates the value of green infrastructure in mitigating heat.

5) **The completion of a review of Councils' management of our open spaces and outdoor recreational facilities;**

This indicator will be used to track progress of Cool Places strategic actions that relate to open space and public realm. This review will assess Councils' planning considerations relating to climate change and the strategic delivery of regional passive and active open spaces and recreational facilities. It may make recommendations relating to a move towards the provision of high quality regional facilities as opposed to many small and similar facilities provided by individual Councils at a higher cost.

Further progress in national and state policies to monitor and evaluate climate change adaptation activities and projects will be monitored and inform future implementation plans.

Table 2

Illustrates how each foundation project will be monitored and evaluated against the indicators above.

Indicator	Equip	Aware	Cool Places	Source to Sea
1. Percentage of Council strategic plans, community plans, local asset plans and regional public health plans (as required under the Local Government Act) that consider climate change.	✓			✓
2. Councils' participation in government and non-government research, processes, and committees that have the potential to influence state and federal government policies.	✓		✓	✓
3. The number of Resilient South Program Champions and their levels of activity.		✓		
4. Our capacity to understand the impact of heat on our region and vulnerable members of the community.			✓	
5. The completion of a review of Councils' management of our open spaces and outdoor recreational facilities.			✓	

Section Four

The Resilient South Foundation Projects

The Implementation Plan has adopted 23 priority actions from the Regional Adaptation Plan (Appendix 2) and presented them as four foundation projects. These projects will be implemented over the next four years (2015 to 2019). Each foundation project sets high level strategic actions and outcomes. Existing and new partners are identified and links made directly back to the relevant original adaptation actions. An estimate of the timing to implement each of the strategic actions is made but will be subject to funding.





Section Four / Equip

The Resilient South Foundation Projects

Climate Change impact addressed



Description

The Regional Adaptation Plan recognises that for adaptation to occur action must be taken to address existing institutional barriers. The Equip project will integrate adaptation into Councils' strategic plans, community plans, local asset plans and regional public health planning. This will ensure that adaptive thinking is integrated into everyday Council operations and long term decision making.

The Equip project builds on stage two of the Local Government Association of South Australia (LGA) and Department of Environment, Water and Natural Resources (DEWNR) Science to Solutions (StoS) project. The purpose of the second phase of StoS is to progress climate adaptation embedding and implementation activities.

The LGA through the StoS project is partnering with Resilient South on strategic actions 1.2 and 1.5.

Outcomes

This project will deliver:

- › a strategic approach to advocating the state government to include climate change adaptation in state-level policies and procedures;
- › Council strategic plans and operational planning processes that help to implement the Regional Adaptation Plan;
- › Council resourcing policies and procedures that incorporate climate change adaptation into their long-term decision making.

Council role

Service Provider (Direct, Regulatory, Agent) Advocate, Initiator
/ Facilitator, Information provider / promoter

Strategic actions	Implementation timing
1.1 Formalise the partnership between the South Australian Government and the four Partner Councils by renewing the Southern Region Climate Change Sector Agreement.	2015 - 2016
1.2 Embed the Regional Adaptation Plan in all Councils' strategic and community plans, local asset plans and regional public health planning.	2015 - 2016
1.3 Promote and maintain 'Resilient South Maps' as an online educational and analysis tool to support climate change adaptation planning and decision-making across the region.	2015 - 2019
1.4 Undertake monitoring and evaluation of the Resilient South Program, reporting to partner Councils and funding partners.	2015 - 2019
1.5 Partner with the Local Government Association of South Australia to: <ul style="list-style-type: none"> a) work with SA Health to embed climate change actions in the Regional Public Health Planning; b) develop and deliver an education program for Elected Members and senior staff to further understand how a changing climate may impact locally and incorporate climate change into long-term planning and decision making; c) review and amend the SA Planning Policy Library in the context of stronger consideration of climate change impacts; d) share with other regions our knowledge, challenges and success in adapting to changes in our climate; e) build financial and technical capability within Partner Councils to implement the Implementation and Local Action Plans. 	2015 - 2016 to 2016 - 2017

Strategic actions	Implementation timing
1.6 Advocate for the state government to: <ul style="list-style-type: none"> a) provide for more flexible operating hours for businesses in industrial areas during heat-waves where there are no negative impacts on adjoining or adjacent land uses. b) undertake a review of how future climate hazards will impact non-government organisation (NGO) service delivery in the social services sector. 	2016 - 2017
1.7 Work with Department of Environment, Water and Natural Resources as a Public Health Partner Authority	2015 - 2016
1.8 Integrate climate change considerations Council regional public health planning.	2016 - 2017
1.9 Ensure that climate risks identified in the Resilient South Program are considered and addressed in the development and implementation of the Southern Adelaide Zone Emergency Management Plan.	2016 - 2017
1.10 Engage with the National Climate Change Adaptation Research Facility (NCCARF) on the development of a Sea Level Rise assessment tool.	2015 - 2016
1.11 Review relevant Council outdoor event guidelines for risk assessment of extreme weather events and natural hazards such as heat wave and bushfire.	2016 - 2017

Strategic Partnerships and complementary programs

- › Review of the SA Policy Planning Library and 30 Year Greater Adelaide Plan
- › DEWNR and LGA – Science to Solutions
- › SA Health – Regional Public Health planning
- › National Climate Change Adaptation Research Facility – Coastal Risk Management Tool
- › Parks and Leisure Australia
- › South Australian Coast Protection Board
- › South Australian Fire and Emergency Services Commission – Zone Emergency Management planning
- › Metropolitan Seaside Councils Committee

Benefits across sectors

This project will assist in the implementation of the following priority adaptation options.

- › Coastal Management (CM3)
- › Water Resources Management (WRM4)
- › Natural Landscapes (NL2)
- › Vulnerable Members of the Community (VMC1)
- › Emergency Services (EM2)
- › Manufacturing and Business (MB1)
- › Enabling Action (EA1 and EA7)



Section Four / Aware

The Resilient South Foundation Projects

Climate Change impact addressed



Description

The Aware Project is about influencing the region's willingness and ability to adapt to a changing climate. It focuses on increasing our awareness of climate impacts, risks, opportunities and vulnerabilities and tailors these messages so that they connect with the values of our target audiences.

Importantly the Aware project identifies the business and manufacturing sector as a priority focus area. This sector will experience negative impacts to business continuity as a result of climate change but can also capitalise on opportunities from new and emerging industries.

The Aware project will also increase the region's capacity to acquire the skills, systems, technologies and behaviour required to adapt.

Outcomes

Our leaders, partners and communities will have an increased:

- › awareness of the impacts of more frequent and intense heat-waves, bushfires, flooding and storm events;
- › capacity to make effective long-term decisions to become resilient to changes in our climate;
- › capacity to identify and capitalise on opportunities arising from climate change;
- › community awareness of how changes in the climate will impact on their open spaces including sporting facilities and local biodiversity.

Council role

Service provider (Agent), Advocate, Facilitator, Information provider/promoter

Strategic actions**Implementation
timing**

-
- 2.1 Engage with the manufacturing and business sector to:
- a) identify economic development opportunities arising from climate change; and
 - b) build capacity of the manufacturing and business sector to respond and adapt to climate change impacts.
-
- 2.2 Work with our partners to increase awareness of climate change adaptation particularly in relation to preparing for and responding to natural hazards including flooding, bushfire and storm events.
-
- 2.3 Work with our partners to provide plain-English information through existing networks, social media and Council websites that:
- a) explains projected climate change impacts;
 - b) raise awareness about managing the impacts of climate change on personal health and wellbeing (e.g. change time of day spaces are used to reduce dehydration from extreme heat);
 - c) raise awareness about the impacts of climate change on infrastructure and open space and public realm and the need for councils to reassess service standards.
 - d) presents potential climate change adaptation actions and other references to specific sectors;
 - e) supports behaviour change to manage potable water security issues;
 - f) supports behaviour change to increase energy efficiency in homes and businesses;
 - g) promote adaptation success stories.
-

Strategic actions**Implementation
timing**

-
- | | |
|---|--------------|
| 2.4 Engage Resilient South Program Champions to: | 2015 - 2019 |
| a) inform their own networks about climate adaptation and the Resilient South Regional Climate Change Adaptation Plan; | |
| b) encourage new Program Champions to become involved in Resilient South; | |
| c) communicate the barriers and enablers to climate adaptation within their own sector; and | |
| d) inform a future review of the Regional Adaptation Plan. | |
| <hr/> | |
| 2.5 Integrate climate change adaptation into community development and social connectivity programs to build resilient communities that can respond to natural hazards. | 2015 to 2017 |
| <hr/> | |
| 2.6 Seek funding and partnership opportunities to develop technological applications and/or social media tools that engage the community and build adaptive capacity to climate change impacts. | 2015 to 2016 |
| <hr/> | |
| 2.7 Develop a Resilient South awards program to encourage adaptation actions within a range of community, business and industry sectors. | 2018 to 2019 |
-

Strategic Partnerships and complementary programs

- › Country Fire Service
- › DEWNR – Climate Change Unit
- › DEWNR and LGA – Science to Solutions
- › South Australian Fire and Emergency Services Commission
- › Department of State Development
- › SA Office of Recreation and Sport
- › Peak sporting bodies
- › SA Health
- › SA Water
- › SA Government – Energy Partners program
- › Southern Adelaide Economic Development Board
- › Australian Red Cross - RediPlan

Benefits across sectors

This project will assist in the implementation of the following priority adaptation options.

- › Coastal Management (CM2)
- › Water Resources Management (WRM2)
- › Vulnerable Members of the Community (VMC3)
- › Manufacturing and Business (MB2)
- › Enabling Actions (EA2, EA3, EA4, EA5 and EA6)



Section Four / Cool Places

The Resilient South Foundation Projects

Climate Change impact addressed



Description

The design of our outdoor spaces and places will be increasingly influenced by higher temperatures and more intense heat waves, as well as more frequent storms and flooding - but less rainfall overall. While increased urban density will make these spaces and places more important to our growing population.

Placemaking is about shaping, managing and activating public places. Cool Places aims to build on this work and increase the resilience of vulnerable people and the wider community by mitigating heat, and providing outdoor infrastructure that can deliver positive health and wellbeing benefits.

Cool Places will focus on projects in our open space and public realm where Councils have most influence including our parks, streetscapes, natural landscapes and sporting hubs. The state government has partnered with Resilient South to implement strategic action 3.1 and more information is available in the text box below.

Outcomes

This project will deliver an increased capacity to:

- › understand the urban heat island effect on our local communities including vulnerable members of the community;
- › understand how existing green infrastructure (vegetation, green walls and roofs, water sensitive urban design, stormwater and wastewater re-use) can mitigate urban heat impacts;
- › deliver projects that mitigate heat and result in increased health and wellbeing outcomes for vulnerable members of the community;
- › open spaces that can continue to deliver residents positive health and wellbeing
- › benefits to increase their resilience to climate change;
- › Increased climate change adaptation capacity of essential service providers;
- › fit for purpose outdoor infrastructure that can facilitate climate change adaptation in the delivery of passive outdoor activities (e.g. cycling and walking paths, playgrounds, shade and other outdoor infrastructure); and
- › fit for purpose outdoor infrastructure that can facilitate climate change adaptation in the delivery of organised sport.

Council role

Service Provider (Direct, Part), Owner Custodian, Advocate, Initiator / Facilitator, Information provider / promoter.

Strategic actions

Implementation timing

-
- | | | |
|-----|---|-------------|
| 3.1 | Develop partnerships and funding agreements to assist Partner Councils to establish geospatial evidence relating to the social, economic and environmental impacts of the urban heat island effect and the value of green infrastructure in mitigating these impacts. | 2015 - 2016 |
| 3.2 | Using Resilient South Maps, and other available spatial information, identify and prioritise open space and public realm areas most vulnerable to urban heat impacts that could benefit from green infrastructure. | 2015 - 2016 |
| 3.3 | Develop partnerships and funding agreements to enable Councils and/or communities to deliver their own Cool Places projects at priority locations. | 2015 - 2019 |
| 3.4 | Investigate opportunities for establishing targets for increasing green infrastructure in our region to mitigate urban heat impacts. | 2015 - 2019 |
| 3.5 | Review the way open space is provided and managed regionally to enable Councils to continue to provide positive health and wellbeing benefits for residents despite reductions in rainfall and other climate change impacts. | 2017 - 2018 |
-

Strategic actions**Implementation timing**

-
- | | | |
|-----|--|-------------|
| 3.6 | Develop Council guidelines and advocate for stronger Australian standards for the design and construction of climate sensitive outdoor infrastructure including:
a) Utilising materials that are more resilient to extreme weather such as extreme heat, wind and rainfall;
b) Designing and constructing footpaths and trails that can cope with extreme weather; and
c) Providing shade via vegetation or built structures for playgrounds and adjacent to walking and cycling paths. | 2016 - 2017 |
| 3.7 | Work with essential services providers such as SA Power Networks and SA Water to ensure streetscape design, planning and management delivers climate change adaptation outcomes. | 2016 - 2019 |
-

Strategic partnerships and complementary programs

- | | |
|--|--------------------------------|
| › DEWNR – Climate Change Unit | › Treenet |
| › Office of Recreation and Sport | › Vision 202020 |
| › Flinders University of South Australia | › Parks and Leisure Australia |
| › SA Health - Regional Public Health Plan | › Water Sensitive SA |
| › Environment Protection Authority – Rain Garden 500 | › Peak Sporting Bodies |
| | › Essential services providers |

Benefits across sectors

This project will assist in the implementation of the following priority adaptation options.

- | | |
|--|---|
| › Water Resource Management (WRM6 and WRM8) | › Open Space and Public Realm (OSPR1 and OSPR2) |
| › Vulnerable Members of the Community (VMC7) | |

Cool Places, in partnership with the South Australian Government

Funding: \$25,000 state government, and \$24,000 Resilient South (2015-16).

The Regional Adaptation Plan identified that one of the key climate change impacts for the southern Adelaide region is the increased frequency and intensity of heat-waves. Heat-waves have serious health and wellbeing implications for the elderly and young, culturally and linguistically diverse communities, people from a low socio-economic background and those needing assistance with every day activities.

A number of priority adaptation options from the Regional Adaptation Plan seek to address this impact including 'Develop and maintain vegetated public realm'. However, further information is needed to identify areas within our region that are most vulnerable to heat and can therefore benefit from new investments in planting and maintaining additional vegetation (green infrastructure) and water sensitive urban design.

A \$25,000 grant from the state government will enable Resilient South to complete urban heat island mapping. The project will gather and analyse data across the four southern Adelaide Councils to map the areas where the Urban Heat Island effect is most prevalent. It will also evaluate the benefits of the existing green infrastructure and water sensitive urban development in mitigating heat.



Section Four / Source to Sea

The Resilient South Foundation Projects

Climate Change impact addressed



Description

The Regional Adaptation Plan identified a number of climate change impacts for the coasts and our precious water resources. These include; reduced overall rainfall, increasing evaporation, increased stormwater runoff, sea level rise and ocean acidification.

These issues remind us that a 'whole of catchment' approach is required to planning and project delivery that recognises that activities in the upper catchments impact on the downstream freshwater, marine and coastal environments.

The Source to Sea project will work with the Adelaide and Mount Lofty Ranges Natural Resources Management Board (AMLR NRM Board) and the Coast Protection Board to protect our beaches and cliff tops, water quality and marine biodiversity.

Outcomes

This project will deliver:

- › A strategic approach for working with the state government on embedding a 'whole of catchment' approach to policy and flood management programs;
- › Regional and national partnerships that support actions to protect our freshwater, coastal and marine environments in a changing climate;
- › Integration of climate change adaptation principles in 'whole of catchment' management practices;
- › Informed long-term decision making regarding investments in infrastructure for coastal protection;
- › Increased water security for the region through greater reuse of wastewater and stormwater.

Council role

Service provider (agent, regulatory, direct), Owner custodian, Advocate, Initiator / facilitator, information provider / promoter

Strategic actions**Implementation timing**

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- | | | |
|-----|--|-------------|
| 4.1 | Work with the Local Government Association of South Australia (LGA SA) in its advocacy for the state government to develop a strategic management plan to address sea level rise that considers the risk to existing and new development along the coast. | 2015 - 2019 |
| 4.2 | Continue to engage with the National Climate Change Research Facility (NCCARF) on the Coastal Climate Risk Management Working Group to develop systems and processes that build confidence and certainty regarding future projections for sea level rise and robust decisions for the coast. | 2015 - 2016 |
-

Strategic actions**Implementation
timing**

4.3 Work collectively with Metropolitan Seaside Councils Committee to: 2015 - 2019

- › coordinate advocacy for the state and federal governments to improve funding for coastal protection and climate change adaptation in the coastal zone and neighbouring areas;
- › partner with the Coast Protection Board and the Department of Transport Planning and Infrastructure (DPTI) to facilitate development and implementation of a strategic approach to mitigating the impacts of climate change in the metropolitan Adelaide coastal zone.
- › partner with DEWNR and the AMLR NRM Board to secure additional resources to support community volunteer groups that care for our dune, marine and riparian systems; and
- › work with the Coast Protection Board and the Bureau of Meteorology to develop a monitoring strategy to inform the design and timing of construction of hard infrastructure (e.g. storm tide barriers, sea walls, groynes etc.)

4.4 Seek funding and partnership opportunities from DEWNR, AMLR NRM Board, the Environment Protection Authority and other organisations to improve water resource management including to: 2015 - 2019

- a) implement Stormwater Management Plans to reduce climate change related flooding risk across the region;
- b) implement a whole of catchment management approach to provide greater protection and consideration of marine biodiversity in relevant policies and programs;
- c) ensure that the Guidelines for Water Quality are implemented across the region;
- d) build capacity in water sensitive urban design, flood management, water recycling and wastewater reuse, and riparian rehabilitation.

Strategic partnerships and complementary programs

- › LGA and DEWNR – Defining the Sea Level Rise Problem in South Australia
- › Metropolitan Seaside Councils Committee
- › AMLR NRM Board
- › DEWNR
- › Department of Planning, Transport, and Infrastructure
- › South Australian Coast Protection Board
- › Stormwater Management Authority
- › National Climate Change Adaptation Research Facility
- › Water Sensitive SA
- › Environment Protection Authority - Rain Garden 500
- › SA Fire and Emergency Services Commission - Zone Emergency Management Planning

Benefits across sectors

This project will assist in the implementation of the following priority adaptation options.

- › Coastal Management (CM1, CM4 and CM5)
- › Water Resources Management (WRM5, WRM6 and WRM8)
- › Marine Biodiversity (MBIO2 and MBIO4)
- › Emergency Services (EM4)

Appendix One

The criteria and weighting used to prioritise the preferred adaptation options.

Criteria	Weighting/Score
1. What is Councils' role for the adaptation option?	50%
Direct, regulatory, agent, owner/custodian	3
Part	2
Other	1
2. What is the timing for the adaptation option?	10%
Now (including preparatory work)	3
10-15 years	2
More than 15 years	1
3. Is the adaptation option relevant to more than one adaptation pathway / key decision area?	30%
6 plus pathways	3
4-5 pathways	2
1-3 pathways	1
4. Is the adaptation option relevant to the region?	10%
All 4 Councils	3
2-3 Councils	2
1 Council	1

Appendix Two Priority Adaptation Actions

The following table lists the 23 priority adaptation actions for the four Partner Councils. It shows how each option is linked to at least one of the Foundation Projects. Those adaptation actions that were not identified as a priority (i.e. that scored 2.2 or lower) will be considered in future reviews of the Implementation Plan. The priority of adaptation actions may change over time as new information on climate change becomes available.

Legend	Scores
Very High priority	3
High priority	2.7
Medium priority	2.5 & 2.4
Low priority	2.2 & lower

Adaptation Option No.	Priority and Preferred Adaptation Options	Scoring	Equip	Foundation Projects		
				Aware	Cool Places	Source to Sea
Coastal Management						
CM1	Coordinated planning and monitoring of climate change impacts in the coastal zone	2.7				✓
CM2	Inform and educate the community and encourage behaviour change to support climate change adaptation in coastal areas	2.7		✓		
CM3	Review and amend Development Plan policy to include consideration of climate impacts in coastal areas	3	✓			
CM4	Develop soft structural options to mitigate climate change impacts in the coastal zone	2.7				✓

Adaptation Option No.	Priority and Preferred Adaptation Options	Scoring	Equip	Foundation Projects		
				Aware	Cool Places	Source to Sea
CM5	Construct hard structural options like storm tide barriers or sea walls	2.7				✓
Water Resources Management						
WRM1	Ongoing research to inform adaptation and management of water resources	1.7				
WRM2	Educate communities	2.7		✓		
WRM3	Calibrate water resource plans, policy and legislation	2.2				
WRM4	Review and amend Development Plan policy with a focus on water security	3	✓			
WRM5	Improve flood management and riparian rehabilitation	2.7				✓
WRM6	Continued adoption of water sensitive urban design to mitigate climate change impacts	3				✓
WRM7	Increased domestic and industrial capture of rainwater	2.2				
WRM8	Greater water recycling and waste water re-use	2.5				✓
WRM9	Increased managed aquifer storage	2.2				

Natural Landscapes

NL1	Monitoring and research to undertake situation appraisal and review of climate impacts on natural landscapes (hills, plains and hills face, coastal)	1.7	
NL2	Review and amend Development Plan policy to include consideration of climate impacts on natural landscapes (hills, plains and hills face, coastal)	3	✓
NL3	Address current and emerging climate change threats to natural landscapes (hills, plains and hills face, coastal)	2.2	
NL4	Maintain habitat values in non-conservation areas (hills, plains and hills face, coastal) in a changing climate	2.2	
NL5	Protect and improve refugia (plains and hills face)	1.5	
NL6	Move species and ecosystems and implement ecosystem engineering (coastal and estuarine)	1.7	

Marine Biodiversity

MBIO1	Research climate change impacts on marine biodiversity and ecosystems	1.4	
MBIO2	Address marine biodiversity in water management plans	2.4	✓

Adaptation Option No.	Priority and Preferred Adaptation Options	Scoring	Equip	Foundation Projects		
				Aware	Cool Places	Source to Sea
MBIO3	Develop marine pest plant and animal management plan that considers climate change impacts	1.4				
MBIO4	Reduce non-climate change threats to marine biodiversity	2.7				✓
Vulnerable Members of the Community						
VMC1	Support for service systems (to assist the young, elderly/frail aged and those reliant on assistance for core activities)	2.4	✓			
VMC2	Develop emergency management plans that incorporate climate change risks	1.9				
VMC3	Education, awareness raising, cultural change and building social connectivity to support adaptive capacity and resilience to climate change	2.4		✓		
VMC4	Provide essential services subsidies	1.4				
VMC5	Continue to develop technology for emergency situations	1.4				
VMC6	Establish emergency response centres and provide assisted transport	1.4				
VMC7	Develop and maintain vegetated public realm	2.7			✓	✓

VMC8	Construct climate sensitive developments to increase livability	1.7			
Emergency Services					
EMS1	Improve community connectivity, communication, education, awareness and preparation for climate related emergencies	1.9			
EMS2	Review and amend Development Plan policy	2.7	✓		
EMS3	Increase the number of trained emergency services volunteers	1.4			
EMS4	Continue to improve stormwater management to reduce flooding risk	2.7			✓
Open Space and Public Realm					
OSPR1	Encourage change in the way public realm and open space is used and managed in a changing climate	2.7	✓	✓	✓
OSPR2	Install new climate sensitive outdoor infrastructure (cycling, walking, outdoor recreation, tree shades, shading of playgrounds)	2.7	✓		✓
Essential Services					
ES1	Strategically manage power outages on high fire risk days	1.4			
ES2	Manage native vegetation near power lines to reduce risk of bushfire and power disruption	1.4			

Adaptation Option No.	Priority and Preferred Adaptation Options	Scoring	Foundation Projects			
			Equip	Aware	Cool Places	Source to Sea
ES3	Conduct streetscape planning that considers impacts on essential services infrastructure	2.7			✓	
ES4	Protect key essential services assets from bushfire (e.g. feeders)	1.3				
ES5	Increase distributed energy	1.4				
ES6	Increase electricity feeder automation	1.4				
ES7	Undergrounding of power cables	1.4				
ES8	Upgrade cooling systems for telecommunication exchanges	1.4				
ES9	Install backup power supplies	1.4				
Manufacturing and Business						
MB1	Review and amend Development plan policy to facilitate/enable adaptation to climate change by business and manufacturing sector	2.4	✓			
MB2	Educate and build capacity of the manufacturing and business sector to respond and adapt to climate change impacts	2.4		✓		

MB3	Improve the continuity of supply of essential services, especially electricity, to businesses in the region	1.4		
Viticulture				
V1	Plant cover crops between rows to prevent erosion	1.3		
V2	Improve vine canopy management	1.3		
V3	Develop bushfire management plans in wine producing areas	1.3		
V4	Undertake smoke taint testing / mini fermentation	1.3		
V5	Adopt irrigation efficiency measures in vineyards	1.3		
V6	Plant grape varieties more resilient to higher temperatures and less rainfall	1.3		
V7	Develop alternative water sources for irrigation of vineyards	1.8		
Enabling Actions				
EA1	Recognition of the Regional Adaptation Plan in Councils' and other organisations' Strategic Plans	NA	✓	
EA2	An "Adaptation Roadshow" – taking the Regional Adaptation Plan to organisations within the Region and seeking support and involvement to implement the adaptation pathways	NA		✓

Adaptation Option No.	Priority and Preferred Adaptation Options	Scoring	Equip	Foundation Projects		
				Aware	Cool Places	Source to Sea
EA3	Develop targeted programs linked to climate change adaptation priorities that: Connect to sector values Share planning processes, tools and insights Inspire, encourage and support adaptation	NA		✓		
EA4	Promote the implementation of specific reward and recognition mechanisms for effective behaviour change and climate adaptation efforts, e.g. the Resilient South Awards	NA		✓		
EA5	Tailor communications associated with the Regional Adaptation Plan to connect and appeal to stakeholders' existing values	NA		✓		
EA6	Maintain connections and host sector-based forums to inform implementation decisions relating to climate change adaptation	NA		✓		
EA7	Investigate broader adoption of City of Onkaparinga's Climate Change Response Fund or like	NA	✓			

Appendix Three

Monitoring and evaluation roles, responsibilities, and timing

Criteria	Responsible Stakeholder	Timing
Establish monitoring and evaluation framework	Resilient South Program Coordinator and Program Management Committee	July 2015
Monitor and evaluate Southern Region Local Government Implementation Plan	Resilient South Program Management Committee	Annually 2015-2019
Monitor and evaluate Partner Council Local Action Plans/Policy	Each Partner Council	Progress reports via corporate reporting framework to Councils
Review Monitoring and Evaluation Framework	Resilient South Program Management Committee	2016-17

Glossary

Term	Definition
Adaptation	Taking action to avoid, withstand or benefit from current and projected climate changes and impacts.
Adaptive capacity	<p>Adaptive capacity is the ability to adjust to climate change impacts (including climate variability and extremes), moderate potential damages, take advantage of opportunities, or cope with consequences.</p> <p>In determining adaptive capacity, consideration is given to what extent a feature or its function in its current form, with current management practices or funding, able to continue to function, cope or adjust to the expected climate conditions (in the case of Resilient South) at 2070.</p> <p>For example, water sensitive urban design (WSUD) can provide the ability for a streetscape to function in response to reduced rainfall, but if no WSUD measures are in place now, then the adaptive capacity would be considered to be less than if WSUD was currently in place.</p>
Climate	Climate summarises the average, range and variability of weather elements, e.g. precipitation, wind speed, air temperature, humidity, and sunshine hours (solar radiation), observed over many years (typically > 30 years) at a location or across an area.
Climate change	Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity.
Climate variable	Climate variables are different climate impacts projected for a particular timeframe and include increased frequency of bushfire, coastal inundation, reduced rainfall, rainfall intensity, temperature increase, increased frequency of heat-waves, increased temperature of Gulf waters etc.

Term	Definition
Domain	<p data-bbox="515 551 1353 629">Resilient South viewed the Southern Region and its stakeholders through the framework of domains, specifically:</p> <ul data-bbox="515 674 1007 808" style="list-style-type: none"> <li data-bbox="515 674 916 703">› Economy and infrastructure <li data-bbox="515 725 842 754">› Social and community <li data-bbox="515 777 1007 806">› Environment and natural resources
Exposure	<p data-bbox="515 864 1334 1077">Exposure considers the likelihood of a feature or its function being subjected to a climate variable. For example, beaches are exposed to coastal inundation, but not exposed to increased frequency of bushfires. For Resilient South, exposure relates to predicted changes in the climate at 2070.</p>
Maladaptation	<p data-bbox="515 1133 1142 1200">Maladaptation occurs when an attempt to adapt produces unintended negative consequences.</p>
Mitigation	<p data-bbox="515 1256 1362 1285">Taking action to reduce or prevent emission of greenhouse gases.</p>
Model of Receptivity	<p data-bbox="515 1341 1410 1509">A tool for considering factors influencing the willingness and ability of organisations to change behaviour and practices which proposes that for change to occur, capacity must exist or be created across the four attributes of awareness, association, acquisition and application.</p>
Project Champions	<p data-bbox="515 1565 1353 1733">Stakeholders representing the three domains and sectors that makes up the Southern Region who actively participated throughout the project. This participation directly influenced key outputs and shaped the direction of key stages of the project.</p>
Receptivity	<p data-bbox="515 1789 1190 1856">The willingness and capability to receive information and the capacity for acting upon that information.</p>
Resilience	<p data-bbox="515 1912 1267 2080">The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.</p>

Glossary

Term	Definition
Sector	<p data-bbox="515 551 1423 674">Resilient South viewed the Southern Region and its stakeholders through the framework of the three domains described above. Under each of the domains sits the following sectors, specifically:</p> <ul data-bbox="515 712 1423 1155" style="list-style-type: none"><li data-bbox="515 712 778 790">› Environment and natural resources<li data-bbox="515 813 767 842">› Water resources<li data-bbox="515 864 834 898">› Coastal management<li data-bbox="515 920 703 954">› Biodiversity<li data-bbox="515 976 850 1055">› Community health and individual wellbeing<li data-bbox="515 1077 879 1111">› Emergency management<li data-bbox="515 1133 823 1167">› Culture and heritage<li data-bbox="983 712 1246 745">› Energy and water<li data-bbox="983 768 1098 801">› Waste<li data-bbox="983 824 1121 857">› Tourism<li data-bbox="983 880 1145 913">› Transport<li data-bbox="983 936 1209 969">› Food and wine<li data-bbox="983 992 1417 1025">› Infrastructure and urban areas<li data-bbox="983 1048 1385 1081">› Manufacturing and services
Sensitivity	<p data-bbox="515 1249 1423 1328">The degree to which a characteristic/feature or its functions are affected by a climate variable.</p> <p data-bbox="515 1361 1423 1485">For example, the quality of open space is sensitive to reduced rainfall, dunes are sensitive to coastal inundation, built structures are sensitive to bushfires.</p>
Vulnerability	<p data-bbox="515 1541 1423 1619">The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change.</p> <p data-bbox="515 1630 1423 1753">Vulnerability to the impacts of climate change is a function of exposure to climate conditions, sensitivity to those conditions, and the capacity to adapt to the changes.</p>

