



| Case Study

The Eyre Peninsula: A case study of effective adaptation policy making and support

Overview

- In 2013, the Eyre Peninsula Integrated Climate Change Agreement (EPICCA) commenced the development of the Regional Climate Change Adaptation Plan for the Eyre Peninsula, building on past climate change planning work in the region.
- The Eyre Peninsula is located in the western part of South Australia bounded in the west by the Great Southern Ocean, the east by Spencer Gulf and the north by the Gawler Ranges.
- The economy of the region is based on a diverse range of activities, including agriculture, aquaculture and fishing, mining, mineral processing and tourism.
- Changing climatic conditions will influence the productivity of primary industries such as farming and fishing, and combined with rising sea levels, will change how people live and work in the region and experience the environment.
- Development of the Plan combined new methods for adaptation planning, including the use of decision timelines and adaptation pathways analysis.
- In total, adaptation pathways maps were developed for eight key areas of decision making developed by

stakeholders as well as a region scale, cross sectoral pathways map which summarised the sequencing of priority adaptation actions across all sectors.

- Learnings from development of the Plan include the value of focussing regional leaders on a discussion about decision making in relation to climate change, rather than just vulnerability. Furthermore, the use of an adaptation pathways approach can cut through the complexity of adaptation planning by considering how to sequence the implementation of adaptation options and therefore spread investment decisions.

Eyre's effective adaptation policy making and support

Farming, business, local government and natural resource management sectors on the Eyre Peninsula have been preparing for the challenge of climate change for at least the past decade - commissioning studies and partnering with research organisations to better understand the impacts of climate change and explore adaptation options.

Background and context

The region

The Eyre Peninsula covers 80,000 km² in the western part of South Australia. It is bounded in the west by the Great Southern Ocean, the east by Spencer Gulf and the north by the Gawler Ranges (Figure 1). The southern areas have a milder, moister climate compared with the warmer and drier north and northwest parts of the region. Mean annual rainfall ranges from 250 to 500 mm (Eyre Peninsula Natural Resources Management Board 2009).

Approximately 56,000 people live across the region, with more than half of the population in the cities of Whyalla and Port Lincoln (Regional Development Australia Whyalla and Port Lincoln 2013). The economy of the region is based on a diverse range of activities, including agriculture, aquaculture and

fishing, mining, mineral processing and tourism. Combined these activities generate a gross regional product of \$3.45 billion (Regional Development Australia Whyalla and Eyre Peninsula 2014).

As with many other parts of southern Australia, climate change on the Eyre Peninsula will lead to warmer and drier conditions on the land, rising sea levels and changing ocean conditions. These changed conditions will influence the productivity of primary industries such as farming and fishing and, combined with rising sea levels, will change how people live and work in the region and experience the environment.

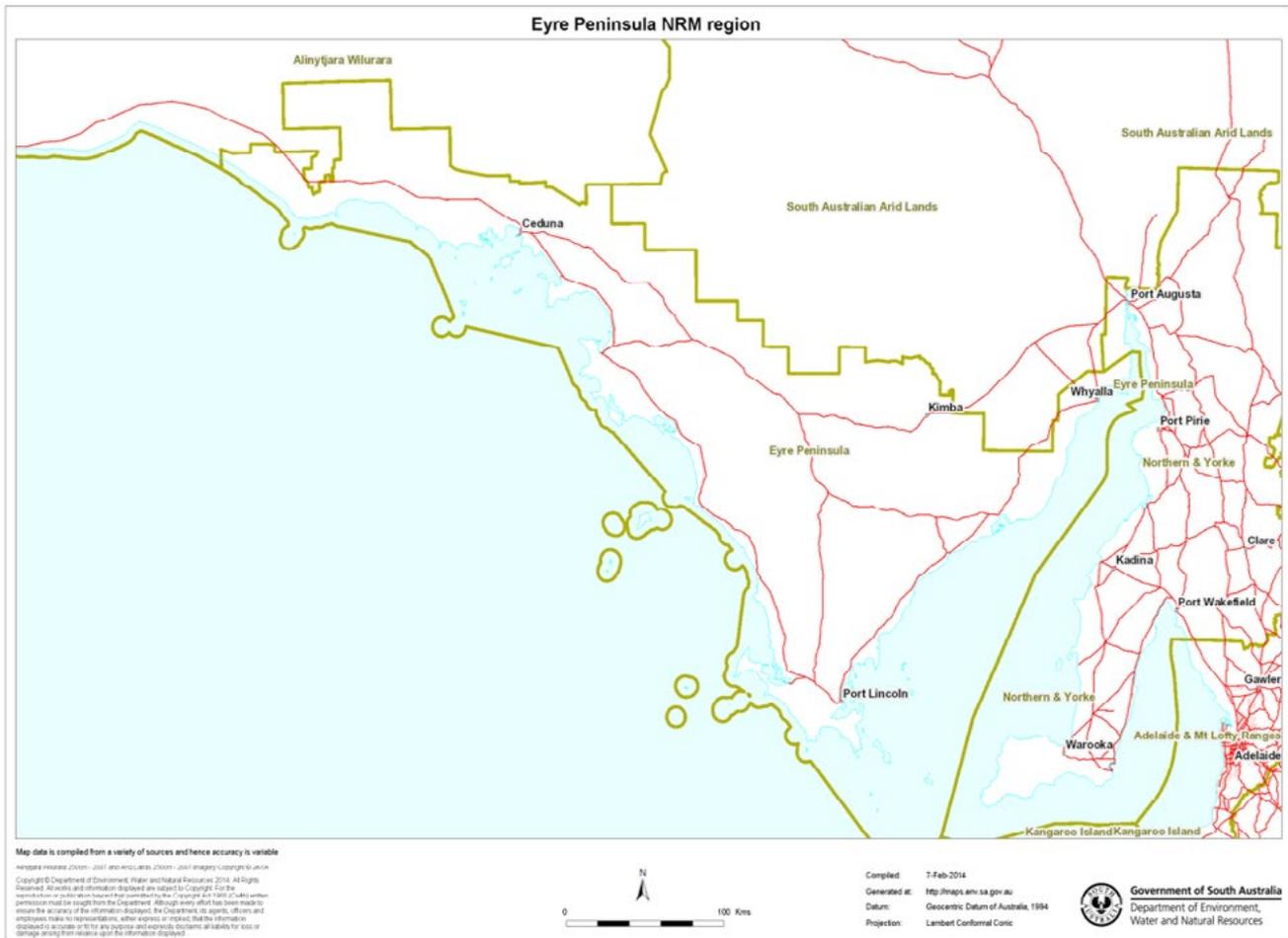


Figure 1: Map of the Eyre Peninsula natural resource management region.
Source: The Government of South Australia, Regional Climate Change Adaptation Plan for the Eyre Peninsula.

Adaptation planning on the Eyre Peninsula – the approach

Since 2009, adaptation planning has been led by the Eyre Peninsula Integrated Climate Change Agreement Committee (EPICCA). The role of EPICCA has been to develop and implement practical, regionally appropriate and sensitive measures to address the likely impacts of climate change by building resilience within the region. The signatories to EPICCA are:

- The Minister for Sustainability and Climate Change
- Eyre Peninsula Natural Resources Management Board
- Regional Development Australia – Whyalla and Eyre Peninsula
- Eyre Peninsula Local Government Association.

In 2013, EPICCA began developing the Regional Climate Change Adaptation Plan for the Eyre Peninsula (the 'Plan'), which provided an opportunity to consolidate past climate change planning work and identify a way forward for adaptation. The Plan was to, where possible, identify actions or areas of interest relevant to multiple sectors where joint action would make the best use of available resources. It was also to satisfy the requirements of the Climate Change Adaptation Framework for South Australia that regional adaptation plans be prepared.

Using a combination of interviews and stakeholder workshops, the approach in developing the Plan was to move the focus of discussion on from risk and vulnerability (which had in past projects been found to disengage key stakeholders) onto options for decision-making. Planning started with assessing the impacts of climate change and a knowledge audit of adaptation options followed by an integrated vulnerability assessment. The project then deviated from traditional approaches to adaptation planning by using a participatory-based 'adaptation pathways approach'. Rather than being limited to identifying the best single set of adaptation options for a limited set of climate change scenarios, the pathways approach enables decision makers to consider a range of possible adaptation options, whether options have a 'sell by date', and insight into how to sequence the implementation of options through time.

Climate risks and impacts

A changing climate on the Eyre Peninsula

The climate projections used to inform the Plan were based on the results from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) for temperature and rainfall and the IPCC Fifth Assessment Report (AR5) for changing ocean conditions as well as other region scale reports informed by this modelling (e.g. Department of Environment and Natural Resources 2010).

For much of the planning process, discussions with stakeholders focussed on a simple message: the Eyre Peninsula will be impacted by climate change through warmer and drier conditions on the land, rising sea levels on the coast and changing temperatures and pH in the Great Southern Ocean and in Spencer Gulf.

Box 1: Climate change projections for the Eyre Peninsula.

Under a medium emissions scenario, the following changes in the region are projected:

- by 2030, annual average temperatures will rise by 0.8°C and by 1.75°C by 2070
- by 2030, rainfall will decline by 3.5% and by 2070 decline by 15%
- sea level rise for 2050 relative to 1986–2005 could be 0.26 m and up to 0.48 m by 2090
- an increase in the frequency and intensity of extreme heat and fires is also expected.

Impacts of climate change on key sectors

The development of the Plan not only focussed on sectors vulnerable to climate change, but through the use of interviews and a workshop, identified the sectors most relevant to the region's prosperity. This ensured that the Plan was focussed on those issues of most importance to stakeholders. Without successful adaptation, potential impacts for the region could include:

- a decline in agricultural production at a regional scale
- changes in the distribution of native land-based vegetation communities, which in turn will affect the type of habitat available for native fauna
- change in the distribution and abundance of commercial fishery species, including the possible expansion of crabs and prawns in Spencer Gulf, re-distribution of pelagic species (e.g. southern bluefin tuna) and declines in productivity for shellfish aquaculture
- increased frequency of inundation of coastal infrastructure and utilities, e.g. water, sewage, gas, telecommunications, electricity
- higher rates of building deterioration and associated maintenance costs because of bushfires increasing rates of deterioration of road surfaces
- declines in the availability of groundwater, which is a major concern given that the region is almost entirely reliant on groundwater for potable, irrigation and stock and domestic supplies.

Priority adaptation actions

Identifying adaptation options

Adaptation options were identified and filtered through a series of interviews and three workshops held over the course of one year with input from stakeholders including elected members of Local Government and members of the region's NRM Board. The first workshop presented what was understood in the region about climate change projections, potential impacts and existing responses; the second workshop considered potential additional adaptation responses; and the third reviewed draft pathways maps and prioritised future action.

At the outset, the focus of the adaptation plan was narrowed through the use of decision timelines analysis (after Stafford Smith et al. 2010).

This approach recognises that some decisions made today by individuals or organisations have lifetimes that are short (e.g. less than 5-10 years) and less than the timeframes over which the major impacts of climate change will occur. In contrast, there are other decisions made today that have longer lifetimes (e.g. greater than 70-80 years) for which the potential impact of climate change should ideally be considered in their design, development and implementation. The decision timeline diagram developed for the project is presented in Figure 2, showing a mixture of decisions with short through to long lifetimes.

Using the output of the decision timelines analysis "key areas of decision making" were identified, which became the focus of the adaptation plan. For example, recognising the importance of managing coastal development to a range of sectors, stakeholders and the project team identified "How can communities manage existing and new developments in low lying areas close to the coast?" as an important decision making priority for the adaptation plan.

For each key area of decision-making, the next step was to ask stakeholders the following questions:

- what options should be implemented immediately
- what options should be implemented in the future
- when will options no longer be effective in addressing the key area of decision making
- what are the likely conditions, or thresholds, which when met will result in a change in the options that should be implemented
- given the full range of possible adaptation options, what is the preferred combination for implementation, known as the 'preferred' pathway.

The project team specifically designed its pathways approach to be delivered as a participatory process, with pathways maps being generated from information collected at the second of three workshops, before being reviewed by stakeholders in the final workshop.

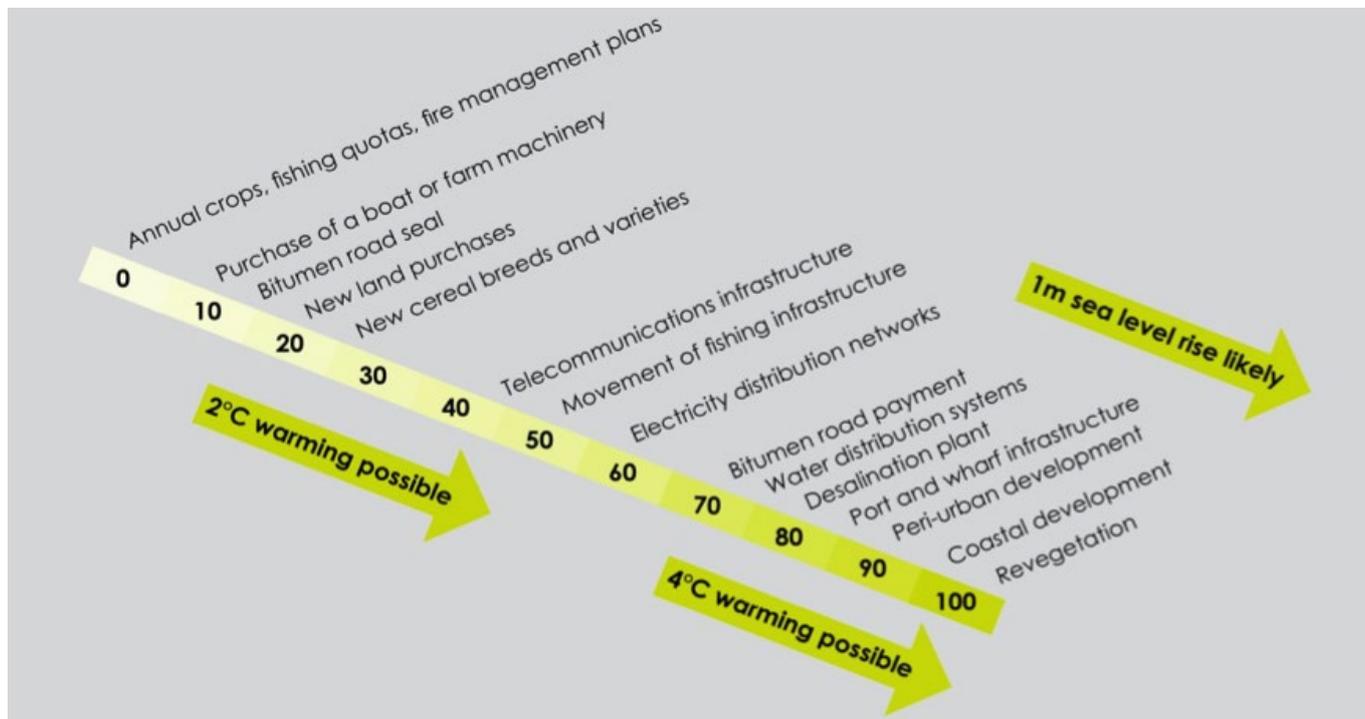


Figure 2: Decisions and their lifetimes identified for key sectors on the Eyre Peninsula from Siebentritt et al. 2014. Source: This diagram has been modelled on the decision lifetime figure presented in Stafford Smith et al. 2010.

Figure 3 is an example of an adaptation pathways map generated for the Eyre Peninsula – in this case for coastal development. It shows the results of the stakeholder assessment. The stakeholders agreed that in the short term, planning, mapping and educational responses will provide some measure of adaptation to sea level rise, particularly in relation to preventing new development occurring in high vulnerability, low lying areas. Within two to three decades, retreat and protection initiatives will be required for existing development. Although action may not be required in the short term, planning is needed now for these longer-term actions given the complexity and cost involved in implementing them.

In total, adaptation pathways maps were developed for eight key areas of decision making as well as one at the region scale that summarised how priority adaptation options would be sequenced across all sectors. This last pathways map suggests that in the short term, regional scale adaptation will likely focus on a continuation of current best practice within sectors, integrated strategic planning initiatives and revising development plan policy. However, in the medium and longer term, adaptation will require protect and retreat strategies and transformation of some sectors.

Outcomes and next steps

In finalising the Plan, stakeholders discussed a range of factors that could prevent or support implementation of the priority adaptation options. The approach used in the workshop drew on a values-rules-knowledge framework (see Gorddard et al. 2016) to understand the decision making context. Working through small group discussions followed by a group debrief, stakeholders were invited to identify whether the barriers to implementing their priority adaptation options were due to misalignment between proposed options and community or organisational values, an absence of appropriate rules (e.g. policies, legislation or governance arrangements) and/or the need for further knowledge to underpin implementation.

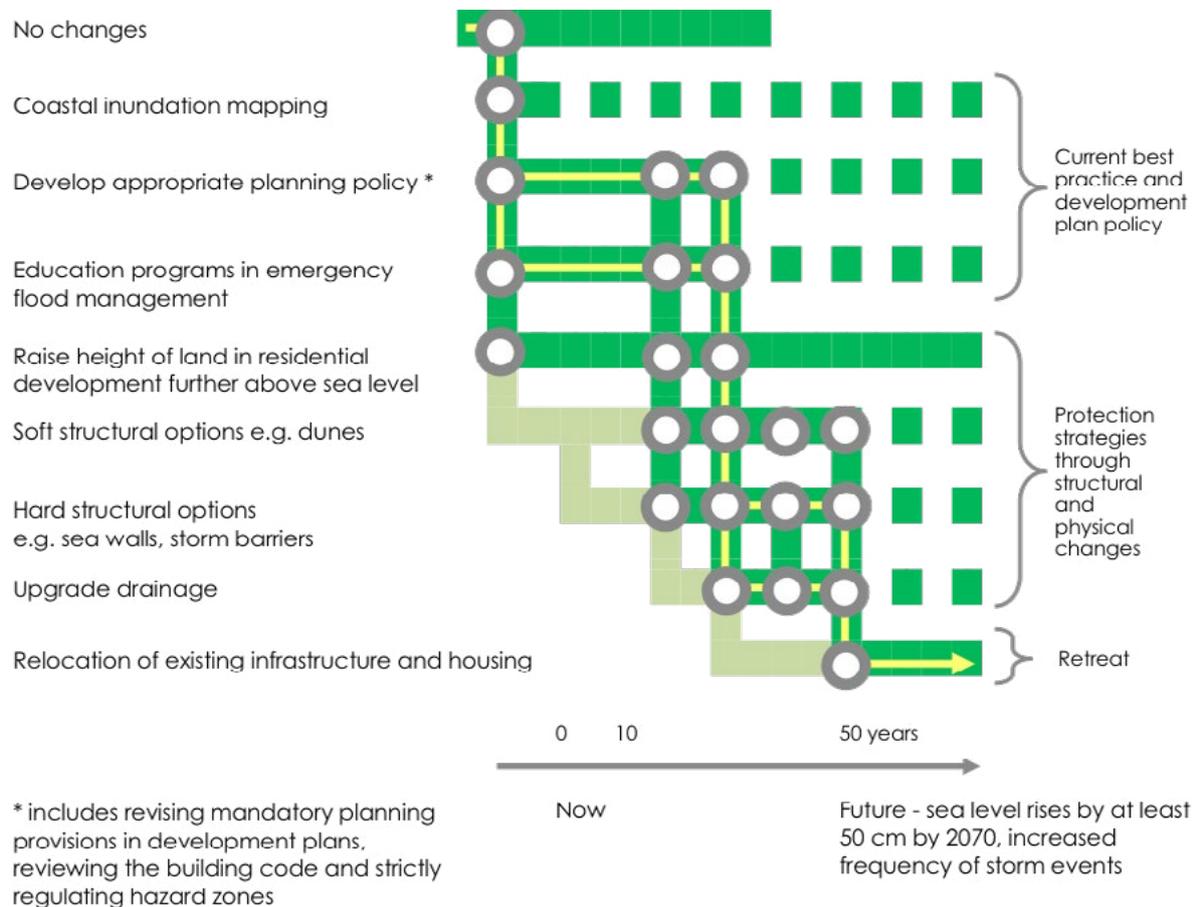


Figure 3: An adaptation pathways map for assessing options regarding how communities can manage existing and new developments in low-lying areas close to the coast in the face of rising sea levels and related impacts. Source: Siebentritt et al. 2014.

Stakeholders concluded that it was necessary to continue to promote sectoral planning activities that take account of interactions with other sectors (e.g. adaptation planning in the agriculture sector needs to consider interactions with the transport and water management sectors) and that an emphasis on further developing the regional governance approach and training the next generation of industry and community leaders was needed.

There was also agreement amongst stakeholders that adaptation planning in the future will be required by individual sectors but should be guided by the following principles:

- build economic resilience
- prepare not repair
- take joint responsibility
- identify long lifetime decisions
- seek out and avoid cross sectoral maladaptation.

In March 2015, one year after the completion of the Plan, the Eyre Peninsula Natural Resources Management Board established a new Adapt NRM Grant Program. In its first year of operation the initiative provided funding of \$194,700 to six projects to assist local government, regional bodies and industry associations promote the sustainable management of natural resources and address priority adaptation options outlined on the pathways maps.

The next steps in progressing development and implementation of adaptation strategies in the Eyre Peninsula are focused on:

- regional leadership and collaboration
- implementation of the adaptation plan
- supporting sector adaptation
- knowledge – science and research
- education and communication.

Leadership, collaboration and adaptation will be facilitated by a regional governance model and a single economic development plan to be actioned through the 11 councils in the region and industry. A regional land use development plan will also play an important role.

Further emphasis will also be placed on training stakeholders, industry managers and officers in the pathways methodology to get further on-ground understanding of the approach so that each stakeholder can take responsibility for their own planning.

Conclusions and lessons learnt

Development of the Plan trialled several new and innovative approaches to better engage stakeholders in adaptation planning. Reflecting on the development of the Plan and observations since its completion has led to a number of conclusions:

1. An engagement strategy that targets people with leadership and decision making responsibilities for involvement in the assessment process can improve the ability to identify strategically important and transformative adaptation options, and a greater clarity on the conditions that must be in place for action to happen.
2. The focus of the process on the challenge of decision making, especially in relation to uncertainty, rather than assessing and ranking vulnerability, can lead to high levels of engagement.
3. The use of the adaptation pathways approach helps cut through the overwhelming complexity often confronted in adaptation planning. It sequences options for immediate versus future implementation, and helps identify which of the current suite of options will no longer be effective in addressing key areas of decision making in the future. It also helps understand how investment decisions can be spread through time, which is a key concern for decision makers.



Figure 4: Venus Bay, Eyre Peninsula. Source: © John White, AdobeStock.

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Further reading

The Regional Climate Change Adaptation Plan for the Eyre Peninsula can be accessed from: www.naturalresources.sa.gov.au/eyrepeninsula/projects-and-partners/climate-change [accessed 25 May 2017].

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