

Trend and Condition Report Cards

for South Australia's Environment
and Natural Resources

Summary Paper



Government
of South Australia

Department of Environment,
Water and Natural Resources

Australia's economy, and the wellbeing of all Australians, is dependent on how well we manage our environment and natural resources. The Government of South Australia is committed to looking after our state's natural resources to ensure our state's future prosperity.

A multitude of competing factors including climate change, restoration efforts, land use and management approaches are causing the condition of our natural resources to change over time.

We need to be able to communicate the condition of these resources, and how they are changing (trending) over time, clearly to our stakeholders.

South Australia has released, for the first time, a suite of open access 'Environment Report Cards'. They are comprehensive, consistent, and easy to understand and provide information at statewide and regional scales.

We developed 56 report cards at the statewide scale and 242 at the regional scale. They summarise the trend and condition of our priority environmental resources, and link directly to the data that underpins them. This results in the alignment of all environmental reporting including transforming State of the Environment¹ reporting in South Australia.

Consider this:

A country could exhaust its mineral resources, cut down its forests, erode its soil, pollute its aquifers, and hunt its wildlife to extinction, but measured income would not be affected as these assets disappeared.

Robert Repetto (1989),
former World Resources Institute economist

Developed under the South Australian Natural Resource Management State and Condition Reporting Framework South Australia 2012², our approach is consistent with the methods of *Accounting for Nature*³ proposed by the Wentworth Group of Concerned Scientists, and it moves us towards the United Nation's System of Environmental Economic Accounts (SEEA⁴).

The United Nations SEEA framework aims to address the problem that we currently don't measure or include the extraction and harvest of our natural resources in measures of economic performance, such as Gross Domestic Product.

Accounting for nature

The Accounting for Nature³ model places scientific information in an accounting framework by creating a common (non-monetary) environmental currency to describe the relative condition of one environmental asset with another, and provides the opportunity to aggregate information at different scales and for different assets.



The need for Trend and Condition Report Cards

The South Australian Government is an authority on our state's environment and natural resources. In South Australia, the State Government, Natural Resource Management (NRM) Boards, industry bodies, community groups, and land managers work collaboratively towards the shared objective of sustainable resource management.

We all agree that planning and investing in sustainable resource management practices requires a shared understanding of the trend and condition of priority natural resources. We know that this century will pose considerable challenges for how we manage our environment and natural resources in response to a changing climate.

We have an opportunity now to harness the significant advances in technology and information to better understand our nation's priority natural resource assets; to help us plan for the effects of a changing climate; and to detect and report those changes in a timely manner.

Our approach to environmental reporting through Trend and Condition Report Cards will transform State of the Environment reporting in South Australia.

Five benefits of Trend and Condition Report Cards

1. The trend and condition of our environmental resources can be tracked through space and time; enabling assessment of our capacity to manage these resources and identify knowledge gaps in relation to our priority environmental resources.
2. Enables measurement of the effect of policy and investments operating at local, regional and statewide scales.
3. Alignment of all environmental reporting including transforming State of the Environment reporting in South Australia.
4. Will enable us to respond to the challenges of a changing climate through identifying and measuring changes in condition of our environmental resources.
5. Provide stakeholders with a credible and informative summary of the status of their environmental resources.

United Nation's System of Environmental Economic Accounts

United Nation's System of Environmental Economic Accounts (SEEA⁴) is a framework for understanding the interactions between the economy and the environment and provides an information and analytical framework for linking economic performance to the quantity and quality of environmental assets.

Our approach to Trend and Condition Report Cards

South Australia developed the NRM State and Condition Reporting Framework to facilitate reporting for priority natural resources at statewide and regional scales. The Trend and Condition Report Cards present at statewide and regional scales and give us a shared understanding of the condition of our natural resources.

The Trend and Condition Report Cards describe the current condition of the resource; how the state of the asset is changing over time (trend), and indicates how reliable the information is. The methods behind our Trend and Condition Report Cards are scientifically rigorous, peer reviewed, and provide ongoing, consistent and efficient reporting on our natural resources at state, NRM region, or program level.

The methods for aggregating data to report at regional and statewide scales are based on the *Accounting for Nature* approach and are outlined in the National Environmental Accounts Framework³. These methods were adopted to improve the alignment of NRM reporting, both across NRM regions and statewide, to make it easier to use regionally-based information in statewide reports. This enabled the use of regional datasets of asset information that were previously unable to be compared to each other.

Trend and Condition Report Cards are a move towards environmental accounting at the appropriate scale – the NRM regional level. They can be readily used by policy makers, NRM practitioners, not-for-profit organisations, investors (banks, corporations), researchers, and interested community stakeholders and are publicly available through the Enviro Data SA website.

1. State of the Environment Reporting is completed every 5 years in accordance with state legislation under the Environment Protection Authority (EPA) Act. epa.sa.gov.au/data_and_publications/state_of_the_environment_reporting

2. Government of South Australia (2012). Natural Resource Management State and Condition Reporting Framework data.environment.env.sa.gov.au/NRM-Report-Cards

3. Accounting for Nature: A Model for Building the National Environmental Accounts of Australia (2008). Wentworth Group of Concerned Scientists. wentworthgroup.org

4. System of Environmental-Economic Accounting 2012 - Central Framework, United Nations (2014). unstats.un.org

How do we use Trend and Condition Report Cards?

Three case studies:

See report cards on pages 7-9

1. Soil Erosion Condition and Trend Report Card

Why this example?

This report card illustrates effective implementation of a management measure at the scale that makes an impact.

Why is knowledge of this resource important?

Prevention of topsoil loss is crucial to support agricultural production in South Australia.

What is this Report Card telling us?

This report card shows that combined efforts across the agricultural sector to adopt 'no-till' farming methods has been increasingly protecting the topsoil of South Australia's major cropping regions over the last ten years. The number of days soil is exposed has significantly reduced: 50 days in 2000, down to 15 days in 2016.

2. Groundwater Use Condition and Trend Report Card

Why this example?

This report card illustrates the effectiveness of water policy and implementation across the state.

Why is knowledge of this resource important?

Sustainable management of groundwater resources is imperative to the state's agriculture, industry, communities, and our environment.

What is this Report Card telling us?

This report card shows that our prescribed groundwater resources have been managed sustainably over the last ten years.

3. Mangroves Condition and Trend Report Card

Why this example?

This report card indicates a policy knowledge gap in regards to the changes in the condition of our mangroves over time and identifies a priority environmental resource that we will need to understand better in the future.

Why is knowledge of this resource important?

Mangrove ecosystems are important for coastal protection and are important fish breeding habitat. They are also incredibly carbon-rich habitats and this makes them a priority natural asset for implementation of our state's future carbon offset sequestration strategies.

What is this Report Card telling us?

This report card shows that we know little about changes in the condition of our mangroves over time. This will not be sufficient to support emerging policy needs.



What did we learn?

A review of the project based on key stakeholder feedback indicated five key learnings:

1. The Trend and Condition Report Cards are acknowledged as a useful communication tool. There is support for them to continue to be produced to highlight data gaps and reliability issues to a broad audience including: policy makers and investors; environmental managers; and the community.
2. There are issues with data availability, access, consistency and transparency, which will need to be addressed and improved over time in future Trend and Condition Report Cards.
3. The indicators – or measures – reported on were based on those outlined in the State NRM Plan. Not all of these are considered to be the most appropriate or relevant for those assets. These will be reviewed as part of the current State NRM Plan review and a set of agreed measures will be determined for future Trend and Condition Report Cards.
4. Greater alignment of reporting relevant to project, regional, state, program and State of the Environment is seen as imperative.
5. Better clarity is needed around ‘target evaluation’ reporting, which should measure the impact or outcome of an investment at a project, regional, state or program scale. However the ‘trend and condition’ reporting reflects the status of an environmental resource and its change based on impacts that affect its condition. In some cases, the same reporting can be used for both (e.g. soil erosion), and in others it cannot (e.g. threatened species).

Where to next for Trend and Condition Report Cards in South Australia?

South Australia will identify priority natural assets and will report on them regularly. How often we report our priority natural assets will be determined by the monitoring available, or the expected change of the asset. For example, groundwater resources will need to be monitored often, and native vegetation condition will need to be monitored over longer periods of time.

The release of Trend and Condition Report Cards demonstrated that a move towards an environmental accounting approach is possible and desirable.

The NRM Reporting Framework and Trend and Condition Report Cards pursue greater alignment of reporting relevant to project, regional, state, program and state of the environment.

South Australia will publish a complete set of report cards every year and we are currently responding to stakeholder feedback with a new, more user-friendly design to help communicate key information.

Environmental accounting will, in the longer term, provide better priority natural asset reporting to inform sustainable resource management for South Australia and identify the ongoing challenges faced by our natural assets, and to help adapt to a changing climate.

Case studies

Trend and Condition
Report Cards

Protecting agricultural land from erosion



2013 State report card



Trend
Getting better



Condition
Good



Info reliability
Excellent

Where have we come from?

Ongoing efforts will be needed to continue to protect our soils

Protection from soil erosion is measured by the number of days each year that vegetation adequately covers the soil to prevent erosion.

Protection of soil from erosion has steadily improved, from 272 days in 2003 to 332 days in 2013 (map top right and graph bottom right).

Information on protection from soil erosion is not available for the Adelaide and Mount Lofty Ranges or Kangaroo Island NRM regions.

Land managers are adopting more sustainable farming practices with support from government agencies, Natural Resource Management boards, agricultural industry groups and private agronomists. About two thirds of our crops are now sown using no-till cropping methods, but the rate of adoption is levelling off, as is the trend in erosion protection (graph to right).

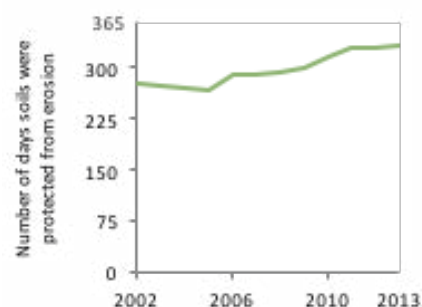
These efforts lead to reduced sediment and nutrient loss into the atmosphere (e.g. dust storms) and waterways.

Where we are?

Soil was protected from erosion for 332 out of 365 days in 2013. Improvements since 2003 closely match the increasing adoption of no-till cropping methods.

Ongoing efforts will be needed to maintain or improve erosion protection by land managers through stubble retention, no-till cropping and best practice timing and duration of grazing.

Agricultural soils were protected from erosion for **332/365** days



Healthy soil provides us with food and fibre through our crops and livestock. Healthy soil provides nutrients for crops and pastures, stores and cycles water and carbon, and resists erosion.

South Australian agriculture is worth \$6 billion each year. Our main agricultural regions are the South East, South Australian Murray-Darling Basin, Northern and Yorke, and Eyre Peninsula, where about two-thirds of the land is used for agriculture.

Some agricultural soils are susceptible to erosion by wind or water. Erosion causes a loss of topsoil and a decline in fertility of agricultural land. It also causes dust storms and increases sediment and nutrients in our waterways.

Sustainable land management practices, such as no-till cropping, reduce the risk of erosion because crops are sown with minimal disturbance. Stubble from previous crops slows the wind at the soil surface and dissipates rain, and the roots bind the soil.



Government of
South Australia

Sustainable use of groundwater resources

2014 State report card



Where have we come from?

Groundwater resources have been used within sustainable limits since 2006

Since 2006, all of our prescribed groundwater resources have been used within sustainable limits (graph on right).

The Far North and the Eastern and Western Mount Lofty Ranges prescribed areas have sustainable limits, but do not yet have accurate water use information. Estimates of water use and monitoring indicate that they are being used within their limits. The Clare Valley and Barossa prescribed areas do not have sustainable limits, but water use is considered to be sustainable.

Prescribed groundwater resources were all used within sustainable limits

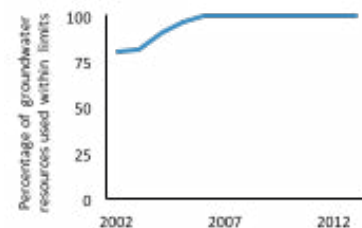
Where we are?

All of our groundwater resources were used within their sustainable limit in 2013 (map on right). Licensed use of water in these areas ranged from zero in the unconfined aquifer of the Peake-Roby-Sherlock Prescribed Wells Area (SA Murray-Darling Basin NRM region), to nearly 100 per cent of the limit in the Wanilla aquifer in the Southern Basins Prescribed Wells Area (Eyre Peninsula NRM region).

Groundwater use in the Central Adelaide, Clare Valley, Barossa, Baroota and Far North prescribed areas is within sustainable limits, although there are some information gaps in these areas - either sustainable limits have not been established or water use data are not available for all users.

In the Eastern and Western Mount Lofty Ranges prescribed areas, groundwater use is sustainable, but some localised areas are at risk of overuse.

Managing our prescribed groundwater resources within their sustainable limits relies on consistent and timely measurements of rainfall, water levels, salinity and water use.



As the largest freshwater resource in South Australia, groundwater is vital for our agricultural, mining and manufacturing industries. Groundwater provides us with town water supplies and sustains a range of ecosystems.

Excessive use of groundwater can cause water levels to drop and salinity to increase, which can impact industries and degrade water-dependent ecosystems, particularly if climate change impacts on rainfall patterns and reduces the rainfall needed to refresh groundwater aquifers in the future.

The groundwater resources we rely on the most and those that were at the greatest risk of degradation are now prescribed with sustainable use limits defined in water allocation plans. These plans ensure water

resources will be able to provide for us in the future. There are 19 prescribed groundwater management areas (map below), which are made up of 35 separate groundwater resources (aquifers) that have sustainable limits for water use.

This report card assesses if groundwater resources are used within their sustainable limits, based on groundwater status reports and water allocation plans.

The water levels and salinity of groundwater are reported here.



Government of South Australia

Extent and condition of mangroves

2013 State report card



Trend
Unknown

Condition
Good

Info reliability
Good

Where have we come from?

Ongoing efforts will be needed to monitor and protect our mangroves

Broad-scale mapping across South Australia by the Department of Environment, Water and Natural Resources between 1997 and 2007 classed most mangroves in 'good' condition.

Field surveys across the Eyre Peninsula NRM region in 2012 assessed the mangroves as being in good condition with a score of 71 out of 100 (where 100 represents pristine, undisturbed condition). Detailed field surveys of mangrove condition have not been undertaken in the Adelaide and Mount Lofty Ranges or Northern and Yorke NRM regions.

Mangroves are present in the Adelaide and Mount Lofty Ranges, Northern and Yorke and Eyre Peninsula NRM regions.

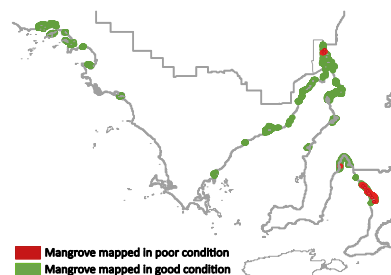
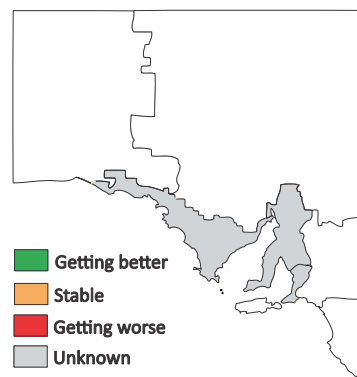
In the Adelaide and Mount Lofty Ranges NRM region, mangroves cover 80 per cent of their former extent. Changes in the extent of mangroves in the Eyre Peninsula and Northern and Yorke NRM regions are unknown (map bottom right).

Where we are?

Over 95 per cent of mangroves are in 'good' condition

Approximately 80 per cent of the mangroves in South Australia are in the Northern and Yorke (52 per cent) and Eyre Peninsula (28 per cent) NRM regions.

Over **95%** of mangroves are in 'good' condition however we do not know how they are trending.



The marine environment provides valuable resources for regional economies, supporting tourism, commercial and recreational fishing, aquaculture, shipping and mining. Most South Australians live near the coast, and many coastal and marine systems are under pressure from human impacts.

Mangrove areas, where mangrove trees grow in dense thickets, are located in tidal estuaries, saltmarshes and on muddy coasts, and form a transition zone between land and marine ecosystems.

Mangroves trap sediment and prevent coastal erosion. They also maintain coastal water quality, cycle nutrients, store carbon and provide food and shelter for marine animals, including commercial fish in their juvenile stages.

Mangroves are threatened by clearance, coastal development, construction of tidal barriers and drains, and changes in freshwater inputs that decrease salinity and increase nutrients, pollutants and sediments.

The health of mangrove ecosystems relies on the management of coastal development and water quality within catchments.



Government of South Australia

Snap shot

of Trend and Condition Report Cards

Carbon storage in trees



Trend Stable
Condition Poor
Info 4/5

Extent and connectivity of native vegetation



Trend Stable
Condition Fair
Info 3/5

Carbon storage in soils



Trend Unknown
Condition Unknown
Info 2/5

Estuaries



Trend Unknown
Condition Poor
Info 2/5

Extinct or threatened ecological communities



Trend Getting worse
Condition Poor
Info 5/5

protecting agricultural land from erosion




Trend Getting better
Condition Good
Info 5/5

River Murray Water Quality



Trend Stable
Condition Good
Info 4/5

Distribution and abundance of weeds



Trend Variable
Condition Poor
Info 1/5

Seagrass



Trend Stable
Condition Unknown
Info 3/5

Use of **surface water** resources within allocation

Trend **Variable** Condition **Good** Info **3/5**

Ecological condition of **rivers, drains and streams**

Trend **Unknown** Condition **Fair** Info **4/5**

Extinct or threatened species

Trend **Getting worse** Condition **Poor** Info **5/5**

Condition of **native vegetation**

Trend **Unknown** Condition **Fair** Info **2/5**

Diseases affecting our **aquatic species**

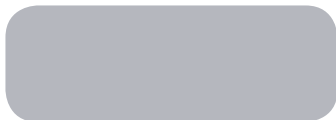
Trend **Stable** Condition **Good** Info **3/5**

Protecting **mangrove habitat**

Trend **Unknown** Condition **Good** Info **3/5**

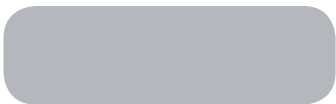
Distribution and abundance of **pest animals**

Trend **Variable** Condition **Poor** Info **1/5**



Water flows and River Murray quality to support **eco systems**

Trend **Variable** Condition **Variable** Info **3/5**



Water levels and salinity of prescribed **groundwater resources**

Trend **Stable** Condition **Good** Info **4/5**

Control programs for priority **weeds and pests**

Trend **Getting better** Condition **Good** Info **5/5**

For further information please contact

Department of Environment, Water and Natural Resources phone information line (08) 8204 1910, or see SA White Pages for your local Department of Environment, Water and Natural Resource office.

Disclaimer

While reasonable efforts have been made to ensure the contents of this publication are factually correct, the Department of Environment, Water and Natural Resources makes no representations and accepts no responsibility for the accuracy, completeness or fitness for any particular purpose of the contents, and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of or reliance on the contents of this publication.



Licensed under Creative Commons Attribution 4.0 Australia License
www.creativecommons.org/licenses/by/4.0/au

2017 © Department of Environment, Water and Natural Resources
Published June 2017 | FIS 94167

www.environment.sa.gov.au/report-cards

