

Blue carbon ecosystems mitigate South Australia's carbon emissions



Blue carbon ecosystems, such as mangroves, salt marsh and seagrass are found throughout the coasts and gulf waters of SA.

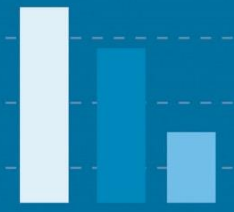


Plants in coastal environments move carbon from the atmosphere to their roots, leaves and into the soil. Once stored, this carbon does not contribute to climate change.

Which ecosystems store the most carbon?

Mangrove and saltmarsh ecosystems store large amounts of carbon per hectare. Seagrass meadows store the most carbon overall because of their much larger area.

Carbon stored per hectare



Soil carbon stocks in SA



■ Mangroves ■ Saltmarsh ■ Seagrass

What size are these ecosystems?

The combined area of all blue carbon ecosystems in SA is around a million hectares, equivalent to more than twice the area of Kangaroo Island.



How much carbon is stored each year?

Every year SA's blue carbon ecosystems lock away the equivalent of up to 3.6% of the state's annual carbon emissions.



The Goyder Institute blue carbon research projects have shown how important conserving and restoring blue carbon ecosystems can be for mitigating climate change.

WHAT ARE BLUE CARBON ECOSYSTEMS?

Blue carbon ecosystems are coastal vegetated areas that capture and store carbon. They are accumulating sediments, which are an effective sink for carbon. The sediment, below-ground biomass (roots) and above-ground biomass (shoots and leaves) of blue carbon ecosystems, provide more effective carbon sequestration than many terrestrial ecosystems.



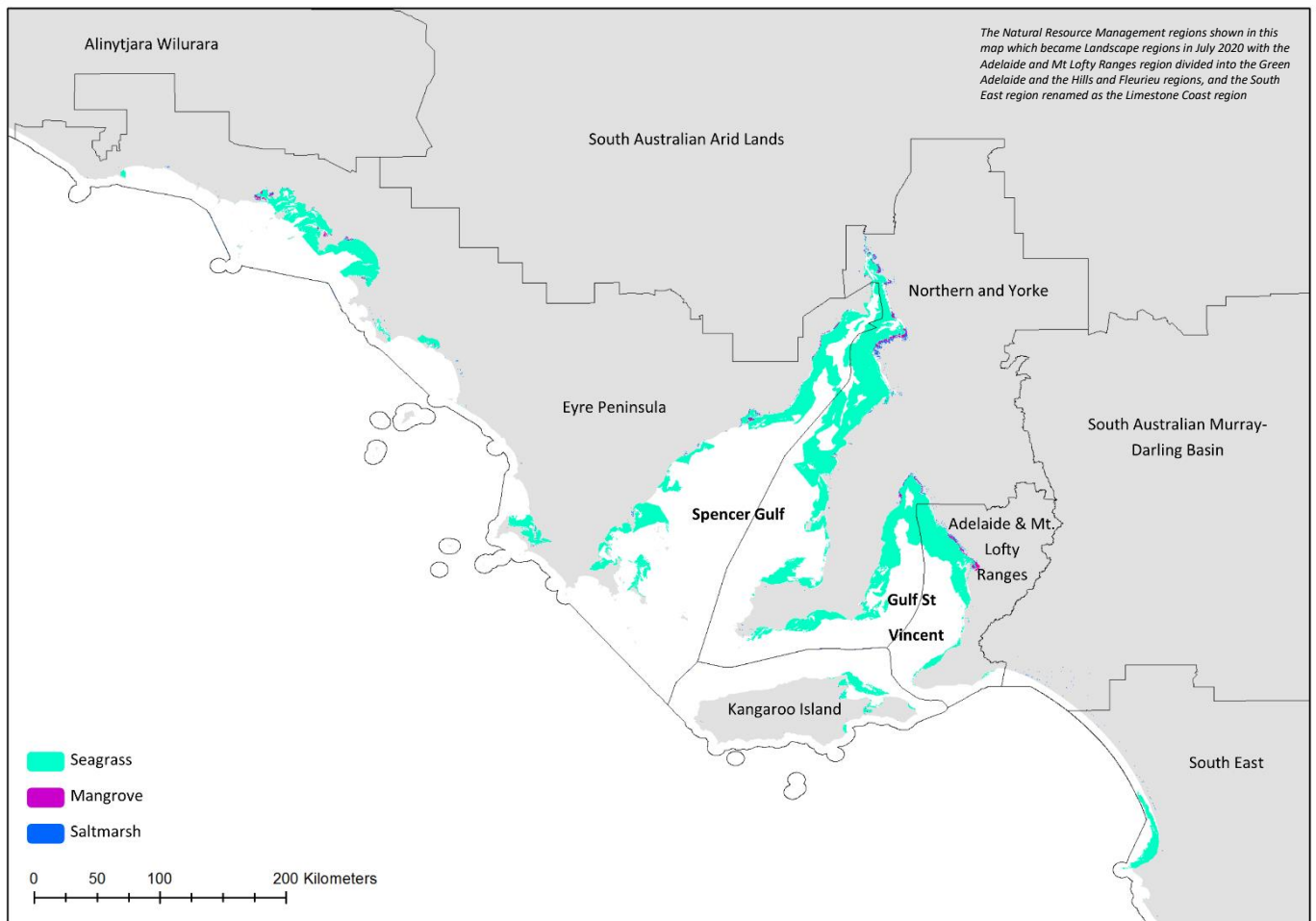
The unique vegetation in blue carbon ecosystems efficiently moves carbon from the atmosphere to their roots and leaves, and deep into the sediment and soil. Once stored, this carbon no longer contributes to climate change.

South Australia's coasts and gulf waters contain 8.6% of Australia's seagrass meadows, 1.8% of Australia's tidal saltmarshes and 1.1% of Australia's mangroves with a total of 7.4% of the nation's blue carbon ecosystems

WHERE ARE SOUTH AUSTRALIA'S BLUE CARBON ECOSYSTEMS?

Almost 95% of the State's blue carbon ecosystems are found within four of the nine South Australian Landscape regions: Northern and Yorke – 47%, Eyre Peninsula – 37%, Green Adelaide & Hills and Fleurieu regions – 10.9%.

The Spencer Gulf and Gulf St Vincent account for most of this area, while the Limestone Coast and Kangaroo Island hold smaller areas.



KEY FINDINGS:

GOYDER INSITUTE BLUE CARBON RESEARCH PROJECTS

The [Coastal Carbon Opportunities](#) project estimated baseline carbon stocks and carbon storage dynamics at selected seagrass, mangrove and saltmarsh sites and assessed the impact of degradation and restoration on blue carbon sequestration and stocks. Scientists and environmental managers can now estimate, with greater certainty, the effects of positive or negative changes to blue carbon ecosystems, and the implications for carbon abatement.

The [Salt-to-C](#) project developed a proof-of-concept for tidal reconnection and restoration of salt fields as a pathway towards realising blue carbon opportunities using the Dry Creek salt fields in South Australia. The samples collected for this project contributed towards the total dataset that delivered updated estimates of carbon stocks and storage capabilities in SA.

The two projects have contributed significantly to SA's database of blue carbon stocks and sequestration. Simultaneously, they highlighted the need for more inclusive research on all types of SA's blue carbon ecosystems. They clearly identified knowledge gaps on accounting for carbon coming from outside into a project area, valuing of ecosystem services, and understanding the fate of blue carbon as sea levels are rising. The project teams also came together to develop a research agenda for blue carbon research in South Australia.

IMPACT

Blue carbon management and conservation is of significant interest for regional and national climate change mitigation strategies because of its significant contribution to the global carbon cycle. Globally, blue carbon ecosystems experience high rates of degradation and loss, so adding to the body of research is increasingly valuable. South Australia has excellent potential to become a world leader in coastal management and conservation by exploring and demonstrating improved carbon abatement outcomes associated with blue carbon ecosystems.

Given that blue carbon ecosystems also provide a wide range of co-benefits (e.g. recreation, tourism, fishing), protecting and restoring our blue carbon ecosystems is an important economic priority for the South Australian government. Our research has already being used by the SA Department for Environment and Water and the Premier's Climate Change Council to develop blue carbon and climate change strategies.

The research highlighted the importance of generating SA-specific data on the opportunities for carbon sequestration in South Australia's coastal ecosystems. As a relatively emerging research area, further strategic sampling around South Australia's coast is recommended in order to build up the database on blue carbon, inform national greenhouse gas inventory reporting, and support South Australia' Blue Carbon Strategy and Climate Change Action Plan. Benefits for SA include:

- reduced uncertainty in assessments
- more comprehensive data for inventory reporting
- data and maps to understand state-wide blue carbon and co-benefit opportunities
- promotion of blue carbon projects
- improved carbon market mechanisms, integrated planning and regulatory frameworks.

NEXT STEPS

Next for blue carbon research could include:

- comprehensively mapping habitats and conditions, to improve quality of datasets
- measuring blue carbon stocks and sequestration at strategic locations of South Australia's coast
- quantifying the co-benefits and value of blue carbon ecosystems, in alignment with other coastal management approaches
- supporting the Commonwealth's Emission's Reduction Fund initiatives and explore alternative carbon marketing mechanisms
- facilitating ongoing collaborative research efforts.

MORE INFORMATION

The following reports contain a summary of the Goyder Institute's blue carbon research findings:

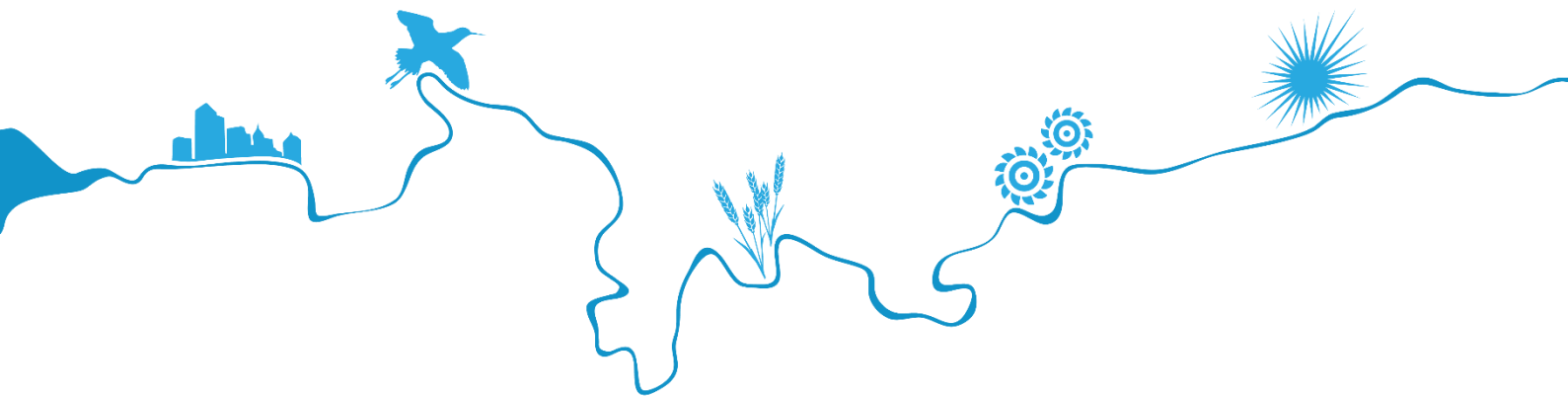
- Jones, A.R., Dittmann, S., Mosley, L., Beaumont, K., Clanahan, M., Waycott, M., and Gillanders, B.M. (2019) [Goyder Institute blue carbon research projects: synthesis report](#). Goyder Institute for Water Research Technical Report Series No. 19/30
- Dittmann, S., Mosley, L., Jones, A.R., Clanahan, M., Beaumont, K., and Gillanders, B.M. (2019) [Research agenda for blue carbon in South Australia](#). Goyder Institute for Water Research Technical Report Series No. 19/31

A number of technical reports associated with the research projects are located at www.goyderinstitute.org/publications/technical-reports/



Contact:

-  209A, Level 2, Darling Building, The University of Adelaide, North Terrace, Adelaide, SA 5005
-  +61 (08) 8313 5950
-  enquiries@goyderinstitute.org
-  [@goyderinstitute](https://twitter.com/goyderinstitute)
-  www.goyderinstitute.org



PARTNERS



ASSOCIATE PARTNERS

