

RESEARCH IMPACT

Restoring the 'kidneys' of the Great Barrier Reef

Seagrasses are disappearing at an alarming rate globally. In Australia, seagrass meadows are

at critical levels which potentially could have disastrous outcomes for our coastal ecosystems.

That's why CQUniversity marine science researcher Dr Emma Jackson and her seagrass restoration project team, have attracted the attention of experts around the world. Dr Jackson hopes that investigating the science of restoring seagrass beds in the Port of Gladstone, will go some way towards putting the brakes on the decline in seagrass numbers around the world, and will help restore health to the world's coastal ecosystems.

This is a massive task given the magnitude of the problem. In 2009, seagrasses globally were shown to be disappearing at an accelerated rate. Interestingly, in the same year the United Nations Environment Programme (UNEP) alerted the world to the fact that seagrass rank among the most intense carbon sinks on the planet, and that by preventing further loss and promoting the recovery of these habitats could contribute to offsetting current fossil fuel emissions.

Dr Jackson says that in Australia, seagrass meadows have also been in the conservation spotlight.

"In Queensland seagrass conservation has legally been enforced under various State and Commonwealth legislation and there has also been statutory protection of seagrass under the Queensland Fisheries Act. In 2015, the risk of further seagrass losses in Queensland was mapped, shining a light on the Port of Gladstone region as one of the highest risk regions," explains Dr Jackson.

"The Port of Gladstone is one of the largest multi-commodity ports in Australia which also sits within the Great Barrier Reef World Heritage Area. The seagrass in this area has shown over 50 per cent reduction in seagrass cover over the last two decades.

"Unlike losses of seagrass in temperate regions, seagrass in Queensland are very dynamic and may come and go depending on the conditions. This makes "restoration" difficult since it is hard to detect where seagrass has actually been lost and intervention is needed."

However, these extreme conditions makes the project all the more important for the global research into seagrass loss and restoration. Unlike seaweed, seagrasses are flowering plants that returned to the ocean a few million years ago. Here, their role cannot be underestimated.

Seagrass meadows deliver a number human benefits. They function as nursery, spawning and feeding grounds for a large number of commercial and recreationally important fish and shellfish. The leaves of these meadows help to prevent erosion and trap carbon.

"They are also great filters, taking up nutrients and pollutants and earning the title the 'kidneys of the Great Barrier Reef'. Finally, and slightly at odds with that, they are also a major food for green turtle, dugong, fish and a range of shore bird populations."

cqu.edu.au/research

DESCRIPTION

CQUniversity's seagrass project continues to explore ways to restore and grow seagrass meadows in the sub-tropical estuary of the Port of Gladstone. Seagrass meadows are susceptible to urbanisation, due to the fact they grow in sheltered parts of the coast and estuaries where urban development occurs. Opportunities exist to use this development to the benefit of seagrass rather than their detriment. Seagrass meadows are vital to the health of the marine ecosystem. They provide 'ecosystem services'.

PARTNERS

Gladstone community and the Gidarjil Development Corporation sea rangers

IMPACT

This research project continues to provide insight into how seagrass meadows can be restored and grown in regions of extreme conditions. It contributes to a global body of research which hopes to restore balance to marine ecosystems around the world.



CMERC Interim Director Dr Emma Jackson at work at Queensland's only seagrass nursery in Gladstone.

Seagrasses tend to grow in sheltered parts of the coast and estuaries. Unfortunately, this tends to be the places where humans develop towns and cities, build ports, and dispose of wastes either deliberately or accidentally.

Restoring seagrass beds in a dynamic sub-tropical estuary like the Port of Gladstone has a number of challenges and identifying methods for promoting resilience is much harder than just finding a suitable site and planting.

In situ and mesocosm-based trials are used to assess the environmental tolerances of the different species. Potential methods for restoration, including the use of donor cores from healthy meadows and seed-based approaches, continue to be investigated.

Investigations into meta-population dynamics of the seagrass populations are also allowing researchers to identify areas where seagrass habitats can be created or restored.

"I am a strong believer that we must work with other researchers, community and industry to achieve real impact from our research. That's why early on in this project I involved the local community in seagrass restoration activities. Most recently, this has involved seagrass flower collecting. We've had people aged 5 to 75 participating in the project."

Local Indigenous sea rangers at the Gidarjil Development Corporation have also supported the seagrass project by collecting and planting. The research team have also worked with the organisation to develop techniques they can use to help restore seagrass to Sea Country.