Building coastal ecosystem resilience to sea level rise

A case study investigation of community perspectives for adaptation to climate change

PhD project by Heli Wade

Supervisory Team
Dr Shane Orchard (UC)
Distinguished Prof. David Schiel (UC)
Prof. Chris Battershill (UoW)

Overview

This PhD study addresses the need for tools and strategies that can improve the resilience of coastal margin ecosystems (saltmarsh, seagrass and coastal lagoons) to sea-level rise. This project will explore the role of local knowledge, contexts and perspectives on barriers and enabling factors using a case study approach based in the Marlborough region of Aotearoa New Zealand. It is designed to inform and complement the development of climate change adaptation strategies by government agencies, community organizations and iwi in the region.

The study is conducted by Heli Wade from the University of Canterbury | Te Whare Wānanga o Waitaha (UC) and contributes to the MBIE funded Tau ki Ākau (Ridge to Reef) project in collaboration with the University of Waikato (UoW). Tau ki Ākau is addressing the long-term sustainability of coastal ecosystems at a national scale. Read more about the programme here.

Why it is important?

Coastal saltmarshes and seagrass beds are important ecosystems as they are among the most valuable natural environments for storing carbon, supporting biodiversity, improving water quality and buffering the coast against flooding and erosion. Coastal lagoons are important transition zones between freshwater and the sea and are among the most productive ecosystems in the world. These key coastal margin ecosystems are already under pressure from human activities and are becoming increasingly exposed to climate challenges such as sea-level rise. There is now an urgent need to develop adaptation strategies that can effectively address sea-level rise to ensure a sustainable future for these characteristic coastal ecosystems and the many benefits they provide.

Study Objectives

Key objectives for the project include the following:

- Collect and analyse local values and perspectives through participatory research on the focus ecosystems within the study area.
- Review and test the application of selected assessment frameworks for characterising, communicating, and informing policy on management priorities for these ecosystems.
- Develop sea-level rise and ecosystem transition scenarios at case study locations.
- Identify adaptation strategies and resilience building measures that are appropriate for case study locations and contexts as informed by informed by local values and perspectives.

- Apply the scenario models and associated values information to evaluate what communities stand to lose and what can be gained from selected adaptation options.
- Identify key barriers and enabling factors that could help facilitate the ecosystem transitions and land-use changes that would be needed to implement these options.

The overarching objective is to inform the development of transdisciplinary techniques that combine knowledge, mātauranga, local and historical knowledge, lived experience and science to help foster resilient coastal ecosystems that can adapt to SLR while supporting community values.

Proposed Methods

The study will combine technical and qualitative data to explore community perspectives and values in local place-based contexts. GIS techniques will be used to map the location and extent of coastal margin ecosystems and develop scenario models to explore their historical and potential future extents. For participatory research the study will co-create qualitative data with a range of community members (land stewards, community members, agencies, organizations, iwi/hapu/whanau and youth). These aspects will explore place-based values and aspirations associated with these ecosystems in the region, and perspectives on adaptation priorities and potential actions to address sea-level rise.

In combination it is hoped that these participatory approaches will also raise the profile of coastal margin ecosystems as nature-based solutions that can help to combat future environmental challenges associated with climate change and sea-level rise.

Get in touch!

For more information, please feel welcome to make contact any time.

Regular updates on the research programme will be available on the blogsite Resilient Coasts & Communities including opportunities to get involved.

Look out for further information on the participatory research activities events which include a combination of online surveys, workshops, hui and wānanga.

Contact details

Heli Wade
Email: heli.wade@pg.canterbury.ac.nz