

Lessons from implementing interdisciplinary approaches for climate change adaptation

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THE PROBLEM

- Climate change adaptation requires interdisciplinary approaches because of the scale and scope of the impacts across ecological, social, cultural, economic, and governance systems.
- Climate change impacts at the coast are already emerging with increasing future implications deeply uncertain across different domains.
- Rapid update of changes in knowledge and community perceptions are required to underpin effective, efficient, and flexible adaptation.
- Effective adaptation involves continual communication of hazards and risks and working with those impacted, informed by the monitoring of changes.
- Media coverage can focus on temperature and sea-level rise extreme (and often unsound) projections that create public anxiety and feelings of helplessness and reduce motivation to mitigate and adapt.



Photo: NIWA.

TRANSDISCIPLINARY KNOWLEDGE PRODUCTION

- The research undertaken across three government-funded coastal programmes (Resilience to Nature's Challenges and Deep South National Science Challenges and the SeaRise programme) has developed and experimented with new adaptive approaches and tools for use at many scales and levels of government and with the community and iwi/hapū Māori for making decisions under uncertain conditions (Lawrence, Bell et al., 2019). These are now embedded in national guidance (Bell et al., 2017) for coastal hazards and climate change decision-making (Fig. 3).
- Many disciplines working together with communities through co-production increase knowledge by integrating processes and data from coastal geomorphology, engineering, geography, social sciences, engagement, communications, economics, policy, and political sciences (Kench et al., 2018).
- Knowledge and practice experience can together deliver adaptive decision-making at the coast with leadership, good governance, and transparent decision-making frameworks.
- A representative survey of 1100 New Zealanders in 2019 for the SeaRise programme showed that the surveyed public had a poor understanding of sea-level rise mechanisms (primary mechanism identified as melting of sea ice - Fig. 1) and over-estimated the amount of sea level rise that could occur by 2100 (over 50% expecting 2 metres or more and approximately 20% expecting 8 metres or more - Fig. 2). These findings have implications for science communication and media coverage of climate change and for how decision-making processes are designed and implemented.

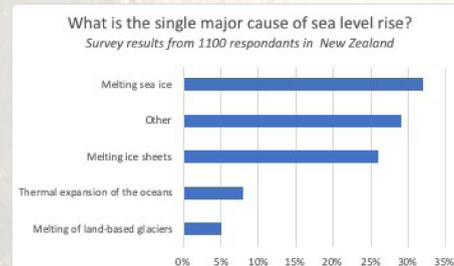


Figure 1. Source: Priestley, Heine, Milfont (in preparation).

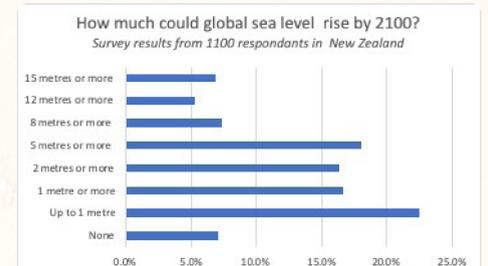


Figure 2. Source: Priestley, Heine, Milfont (in preparation).

LESSONS LEARNED

- Working in inter-disciplinary teams across New Zealand and with international collaborators has brought innovative research and practice to bear on local adaptation through deep uncertainty methods (Lawrence, Haasnoot et al., 2019; Stephens et al., 2017).
- Monitoring and communicating new knowledge about climate changes and human responses to them require interdisciplinary methods with transdisciplinary outcomes (Priestley, Heine, Milfont, in preparation).
- Decision-making practice with regional/local governments and communities provide locally relevant knowledge, practices, and adaptation.
 - Transparent and enabling governance arrangements are key to effective coastal adaptation
 - Shared learning across disciplines with national and regional/ local government, Māori iwi and hapū, and community using serious games, narratives, and scenarios enables better understanding of adaptation thresholds (Flood et al., 2018; Colliar et al., 2018).
 - Interdisciplinary approaches can enable a shift from short termism to longer timeframes (at least 100 years) (Lawrence & Haasnoot, 2017).



Tangoia game session. Source: Colliar et al., 2018.

THE TEN-STEP DECISION CYCLE

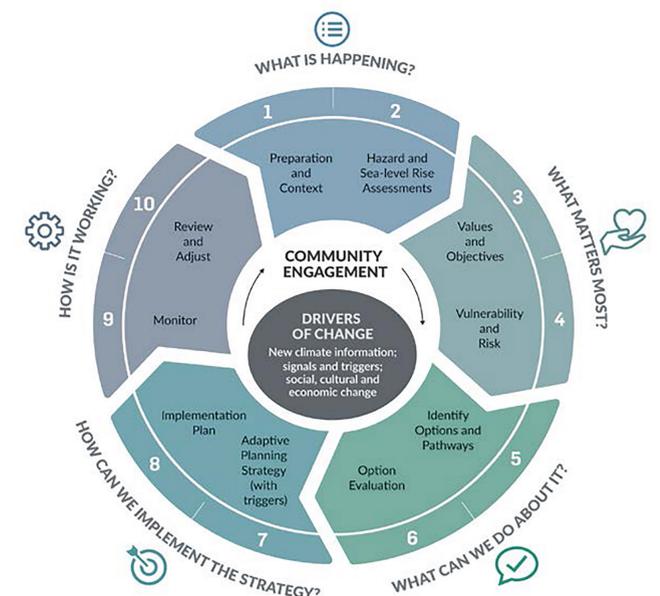


Figure 3. A ten-step decision cycle grouped around five questions. Source: Bell et al., 2017.

CONCLUSION

- Working in interdisciplinary teams in the climate change adaptation space has been valuable in New Zealand and internationally for practice progress and lessons learned.
- It has resulted in:
 - the use of tools and methods that deal with uncertainty and long timeframes (that are now embedded in national guidance); enhanced communication of knowledge to the public; and better public acceptance and understanding of climate change knowledge; and
 - transdisciplinary decision-making approaches and processes that are collaborative and allow shared learning.

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