

Climate Change Adaptation Research Grants Program

- Social, Economic and Institutional Dimensions Projects

Project title:

Costs and coasts: an empirical assessment of physical and institutional climate adaptation pathways.

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Lead organisation: CSIRO

Objectives:

Provide an empirical, grounded and context-sensitive analysis of economic, social and institutional requirements for distributing the costs, risks and responsibilities for adapting to future coastal inundation risks under climate change scenarios.

Project design and methods:

(1) Economic valuation of coastal inundation: We will evaluate the economic benefits of climate adaptation across a range of case study settlements. We will scale nationally by building towards a typology of vulnerable settlements types. We will explore settlements from within the Sunshine Coast Regional Council, Cairns Regional Council, and Moreton Bay Regional Council. We will focus on adaptation to changing exposures to coastal inundation as climate changes.

Case study settlements were selected based on stakeholder interest, but importantly they will complement case studies undertaken in the completed DCCEE funded project: *'The economics of adaptation to coastal inundation'* (Fletcher, 2010-2011). Past DCCEE funded case studies included an affluent canal estate, a bayside and an Inner city estuarine community. In this new study, contrasting insights will be generated by studying adaptation economics in ocean frontage, coastal north Queensland, less affluent canal estate and mixed used communities. It is important to note that the past DCCEE funded project did not include council service provisional infrastructure whereas this is included in this NCCARF proposal.

Our focus is on how the distribution of the costs and benefits of responding to extreme coastal weather events impact on motivations regarding when, where and if people take adaptive action. Most Australians hold their personal wealth in their residential properties. While the majority of existing literature examines the impact of inundation on built Infrastructure, the reality is that in the majority of highly populated settlements it is the land that represents the largest investment. Furthermore, land values appreciate, while infrastructure depreciates - how much people will spend today to defend assets from future events is critically determined by whether asset value is increasing or decreasing. From a council perspective, damage to service-provision infrastructure needs to be factored in to the analysis. The empirical economic analysis to result from this investigation will be embedded into a simulation model, the results of which will provide the basis for an evaluation of Institutions and guide their refinement.

(2) Designing the institutional response: We will use data from two rounds of in-depth interviews with local governments and other key stakeholders to identify what changes to existing local policy mechanisms are required to improve the management of inundation risk. Key to this method will be understanding how local governments re-appraise their management strategies in response to the results of the economic modelling.

Our interviews will be conducted with key public and private actors involved in managing inundation risk in our local government case study areas, and/or those actors subject to costs of changed inundation regimes. Our in-depth interviews will explore the likely character of institutional change and process for implementing those changes. These changes may sit within legal, regulatory, organisational, market, public or political domains of action. Particular attention will be given to areas

of convergence and divergence on interpretations of the required changes and means by which these changes might be made.

Our approach will identify what changes to existing institutional strategies may be required to improve the management of risk associated with increased coastal inundation in local government areas related to future climate scenarios. Here we consider the question of practical institutional change in response to improved understanding of the spatial, temporal and 'actor-based' distributions of physical impacts and economic costs from inundation as revealed by our economic analysis.

We will (i) describe the existing set of institutional mechanisms (policy instruments) local governments currently rely on for managing inundation risk (ii) assess the likely adequacy and acceptability of those mechanisms in light of the economic analyses; and (iii) explore the design or refinement of policy instruments against these new problem parameters. The assessment will also consider the relationship between the performance of local mechanisms and regional and state level institutions as part of a multi-scalar analysis (below).

(3) Multi-scalar analysis of adaptation pathways: The connectivity and interdependency between scales in urban governance is widely described in the literature. Local decision making and action is framed within higher-order institutional parameters. At the same time local politics act to contextualise (and resist) decisions made at these higher levels. We will assess the economics of a range of additional pathways; however, as distinct from existing efforts, institutional adaptation pathways that share the risks across scales (including national) will be explicitly addressed. This will involve an analysis of how government and non-government actors currently seek to scale-up or scale-down responsibilities for action, conflict resolution and risk sharing for more effective adaptation. Trade-offs between institutional and physical pathways will be explored.