

# Climate Change Adaptation Research Grants Program

## - Settlements and Infrastructure Projects

### Project title:

Coastal urban climate futures in SE Australia: from Wollongong to Lakes Entrance.

**Principal investigators:** Professor Barbara Norman

**Lead organisation:** University of Canberra

### Objectives:

The project objective is to identify what a climate-adapted Australian settlement would look like from the perspective of future climate-adapted coastal small-town communities in 2030. To do this the proposal will focus on a coastal environment stretching from Wollongong (NSW) to Lakes Entrance (Vic). This study area will enable the investigation of a range of coastal settlements – coastal townships, hamlets and villages. It intentionally crosses a state boundary to enable an analysis of futures under two different coastal planning regimes. It will contribute to improved management and practices and performances in the selected coastal region.

### Project design and methods:

The proposal will focus on the coastal environment stretching from Wollongong to Lakes Entrance. This case study area will enable the investigation of a range of coastal settlements - coastal townships, hamlets and villages. This region has been identified as particularly vulnerable to climate change risks, and will be subject to significant social and demographic change over the three decades. The towns will be selected to represent a number of potential differentiating 'gradients' in order to test the robustness of conclusions including the 'Future Scenario! Outcomes' Framework. The sites will be selected to represent a range of different coastal geomorphic features including: open sandy coastlines; coastal lakes including tidal and intermittently open and closed lakes and lagoons; wide embayments; rocky headlands and tidal rivers. The dominant energy regime varies for each coastal feature therefore it can be expected that different impacts from climate change can be investigated at each individual case study site. Impacts to be investigated will include coastal inundation, erosion, shoreline recession and flooding. Some of these areas can include Wollongong, Batemans Bay, Narooma, Merimbula and Lakes Entrance. Each of these centres is a representative coastal feature with different land use and settlement features. The study crosses a state boundary to enable an analysis under two different coastal planning regimes. Analysis of the influence of these planning regimes will also take account of the legislative and governance differences associated with these jurisdictions.

The research will focus on several key dimensions in relation to the primary question 'What would a climate-adapted settlement look like?' These include:

- The regional climate variability and change directions and scenarios
- The future coastal settlement pattern, infrastructure and land-use planning
- The urban design of the built environment
- Water resources availability and use including water quality and ecosystems and water supply and hydrology
- The implications for the coastal landscapes and ecosystems
- The implications for coastal communities including health, social, economic/ industry/ employment and institutional considerations; and the adaptive capacities needed to respond to ongoing change
- Development of future scenarios, goals and enabling strategies, taking account of interdependencies across the above dimensions, integration with other change drivers (including mitigation/ energy futures; population/demographic change; regional development and socio-economic change), and identification of key synergies and trade-offs; this will include a systems based view of the issues and development of a future coastal towns scenario outcomes framework for future use as a repeatable process
- The above will incorporate scenarios that reflect typical coastal adaptation strategies and options.

The research will bring together the strengths of three universities each contributing particular expertise with a geographical focus on the SE coastal corner of Australia:

- UC - urban and regional planning, urban design, coastal planning, adaptation, water
- ANU - climate variability and change, adaptation, environment, energy futures, health
- Uni of Wollongong - coastal processes, environment, infrastructure mapping (including GIS)

The research partners will work with the relevant seven coastal councils providing 'in kind' support with information sharing and cooperation with workshops, regional organisations (including the relevant

Regional Development Australia Committees), water and energy bodies, relevant NSW/ Victorian government agencies, key private sector organisations (including insurers) to provide a comprehensive and integrated framework for a regional approach to coastal urban futures in the context of climate change. Many of these relationships have already been established through the Innovative platform of Canberra Urban and Regional Futures. This work will draw on research already done or under way by each of the above organisations. A Reference Group of researcher and stakeholder representatives will be formed to review and advise on plans, process and outcomes through the life of the project.

### ***Project design detail***

The project design envisages three main phases, as shown in Figure 1. In more detail, these are as follows:

Phase 1: January to March 2012: This phase will involve desktop research, confirmation of case study towns and the first 2 day workshop (in an agreed NSW coastal location) with relevant stakeholders. The case study towns will be selected by desktop research, literature review and confirmed with stakeholders at the first workshop. In the proposed workshop, participants will be presented with information on: a) perception of risks and uncertainties; b) existing frameworks, adaptation policies and measures; c) on-going actions to cope with risks and uncertainties; d) perceptions of adequacy and outcomes of current actions and ideas about perceived challenges; e) synergies and gaps in existing regional and local government area plans in this field; f) means by which community engagement is encouraged in adaptation planning and management. The research team will then work with participants to identify current leading practice, barriers, gaps and opportunities, as well as working to develop ideas and concepts towards a local and regional vision and strategies to achieve such a vision. The project will also involve conducting a review of relevant literature on coastal communities and climate change adaptation, including initiatives in New South Wales and Victoria, as well as a review of emerging literature from new projects in this area (see also section below on 'Details of links with other R&D projects and programs' and literature cited). The results of the literature review will inform the research project and be communicated to project participants as part of the first stakeholder workshop. The links with current and new projects will also be maintained through later phases as respective findings emerge.

Phase 2: April to August 2012: This phase will involve analysis of workshop outcomes, which may lead to more specific desk research. There will be field research with local stakeholder using semi structured interviews and drawing on council led community engagement; links developed with other relevant Australian and international projects and experience and preparation of draft deliverables for presentation at the second workshop. Based on the outcomes of the first workshop, scenarios for future coastal community planning and management will be developed. It is proposed that three scenarios be developed, based on projected risks of climate change, socio-economic circumstances, environmental issues and adaptive capacity.

Phase 3: September to December 2012 - A second 2 day workshop (in an agreed Victorian coastal location) will review and further develop the draft deliverables. This workshop will provide an opportunity for stakeholders to consider the scenarios developed in Phase 2. This review will consider the scenarios with regard to a) links and synergy with existing local and regional planning; b) the consistency of their perception of risks and policy responses; and the c) degree of integration with their future vision. The agreed scenario will be sent to stakeholders on completion.