

## A REVIEW OF SOUTH AUSTRALIAN PLANNING PROCESSES IN RESPONSE TO PREDICTIONS OF SEA-LEVEL RISE: A KINGSTON SE CASE STUDY

### INTRODUCTION:

South Australia is vulnerable to sea-level rise and extreme events as over 90% of the population lives near the coast and nearly half of the South Australian coast is composed of sandy beaches (Department of Climate Change, 2009). Socio-economic impacts of sea-level rise are likely to include a loss of economic, ecological and cultural values associated with the loss of land, infrastructure and coastal habitats, along with an increased risk of flooding to people, land and infrastructure (Feenstra *et al.*, 1998, Bedsworth and Hanak, 2010). Continued development in coastal settlements will increase the risks faced by governments resulting from loss of life and/or property, increased pressure to provide costly protection measures, the relocation or replacement of infrastructure, and litigation.

### PROJECT SIGNIFICANCE TO ADAPTING AND PROTECTING AUSTRALIA'S SETTLEMENTS AND INFRASTRUCTURE:

Land-use planning is widely accepted as a climate change adaptation strategy. The Council of Australian Governments' National Climate Change Adaptation Framework has called on States to assess the effectiveness of their planning systems to reduce vulnerability to climate change. This research responds by analysing whether South Australian planning processes adequately plan for and respond to projected sea-level rise in coastal settlements associated with climate change.

The research involved a review of the latest climate change science, global and regional sea-level rise projections, and the use of land-use planning as a climate change adaptation strategy for coastal areas in Australia. Current State Government land-use planning and coastal legislation, policy and governance arrangements were then analysed to determine their efficacy in reducing the vulnerability of coastal settlements to sea-level rise. A case study focusing on the small regional settlement of Kingston SE was used to test the findings and provided a practical application of the research. The Kingston District Council was identified in the First Pass National Assessment as having 40–70% of residential buildings at risk of a 1.1m sea-level rise (Department of Climate Change, 2009), and is representative of other local government authorities in regional South Australia that are significantly under resourced and have limited adaptive capacity to plan for climate change impacts.

### MAJOR FINDINGS AND OUTCOMES:

South Australia has remained firmly committed to the sea-level rise benchmarks and policies it introduced twenty years ago. Adaptation to sea-level rise is incorporated as a land-use planning policy within all coastal volumes of the State's Planning Strategy, and state-wide policy in the general section of coastal planning schemes. The research found that while the South Australian planning system provides a sound framework for the consideration of sea-level rise, its efficacy is limited by:

- Planning decisions that are inconsistent with coastal hazard advice provided by the Coast Protection Board
- A focus on protection and accommodation as the predominant forms of adaptation to sea-level rise, with little consideration of planned retreat as an alternative adaptation option

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- Inadequate knowledge of the vulnerability of coastal settlements to sea-level rise which has resulted in areas at risk not being adequately recognised in zoning and policy provisions of planning schemes
  - Inconsistent application of adaptation measures within and between local government areas
  - Sea-level rise benchmarks that no longer adopt the precautionary approach they did when implemented in 1991, as they no longer take into consideration the full range of uncertainty regarding the upper range of recent sea-level rise projections
  - An inability to consider the cumulative impact of individual planning decisions.

The research found that consideration of projected sea-level rise in the South Australian planning system would be improved by:

1. The State Government undertaking high-resolution coastal vulnerability mapping throughout South Australia so that exposure to predicted sea-level rise is understood and data is consistent. Coastal vulnerability mapping will build local and State government adaptive capacity, as adaptation options will become apparent (Stern, 2007). It will also assist to reduce existing maladaptive planning policies that allow intensification of development in high-risk areas. Low cost, no-regret land-use planning adaptation responses that maintain or enhance adaptation options will also be more readily identifiable.
2. Coastal vulnerability mapping should be systematically incorporated into local Development Plans via hazard overlays, zone boundaries and policy through a participative Development Plan Amendment process that exceeds the public notification requirements of the *Development Act, 1993*.
3. Schedule 8 of the *Development Regulations, 2008* should be amended to provide the Coast Protection Board with a power of direction over coastal hazards, including sea-level rise. This amendment would ensure consistent state-wide application of sea-level rise policy, as well as provide a 'way out' for local councils who are under pressure from individual development applicants.
4. Sea-level rise benchmarks should be reviewed to consider the upper range of recent sea-level rise predictions, as it no longer holds that the benchmarks adopt the precautionary approach that they did 20 years ago when first implemented. A process of continual monitoring and review of the benchmark should occur as part of an adaptive management process, with updated benchmarks being incorporated into Development Plans as soon as they are adopted. The cyclic review of Development Plans provided for by the *Development Act, 1993* should be used as an opportunity for State and local governments to ensure that land-use planning adaptation options are reviewed and updated as sea-level rise occurs and/or the science becomes more certain.
5. The State Government should implement an adaptation response of planned retreat in areas identified as significantly exposed to sea-level rise, and where protection of assets will not be economically viable in the long term.

The case study identified that significant areas of Kingston SE are at risk with a 0.3 and 1.0m sea-level rise. Protection of the entire township as a result of its long linear nature and low population will not be economically viable in the long term. The response of the Kingston District Council Development Plan to predicted sea-level rise is currently one of accommodation, however it is not consistently applied across the existing zoning. The research found that the resilience of Kingston SE to projected sea-level rise would be improved by implementing the following land-use zoning and policy amendments:

1. A strategic land-use planning approach that implements a policy of retreat in Rosetown, and no intensification of development along Marine Parade, Wyomi and Pinks Beach.
2. New development should be concentrated in areas of the town that are not vulnerable to sea-level rise, including elevated land within the existing deferred urban zone.

3. The Kingston District Council Development Plan should be amended to implement minimum floor levels across all zones that include land that is vulnerable to sea-level rise consistent with Coast Protection Board policy.
4. The Coast Protection Board and the Kingston District Council should consider whether the minimum floor levels along areas of open coast should be raised given the increased exposure to wave set up.
5. Council should require a surveyor's certification of finished floor levels prior to occupation of buildings to ensure they are constructed to the required minimum floor level.

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Kingston SE



Wyomi



Pinks Beach

