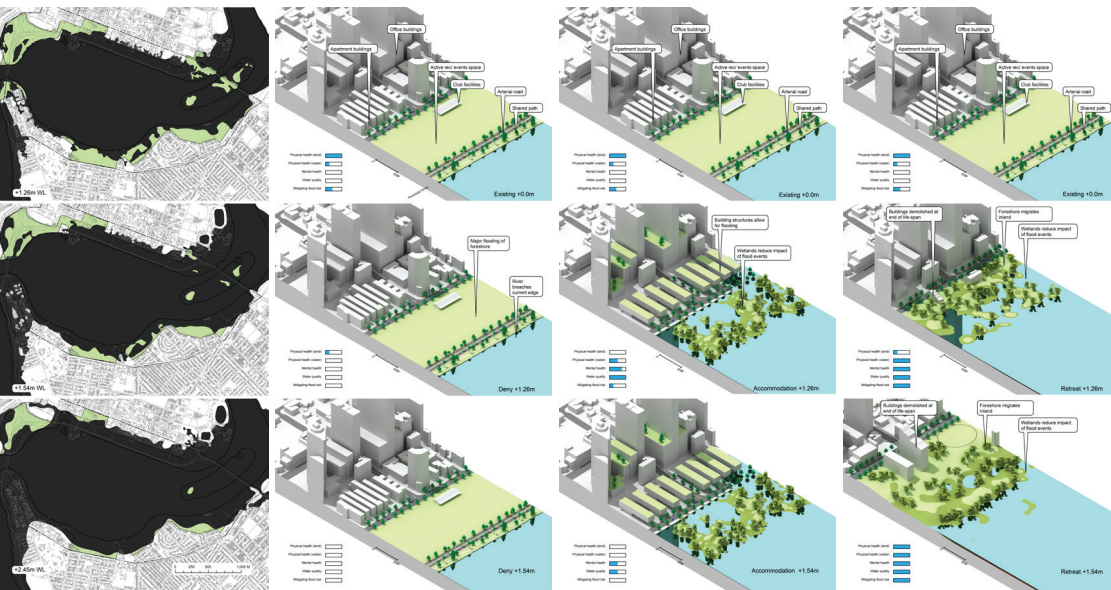


# AUDRC Research Note

## Adapting foreshores to sea-level rise



## How to adapt to sea-level rise while maintaining ecosystem service functions?

### Background

• A global challenge concerns reconciling population growth and increasing built infrastructure with foreshore ecosystems that are 'squeezed' against rising sea levels, hampering their ability to deliver life-sustaining ecosystem services.

• Sea-level rise presents significant threats to coastal areas – through permanent inundation, flooding, storm surges, erosion, and saltwater intrusion. At the same time, projections are for coastal populations and economies to increase in the following decades, compounding the implications of this situation.

• In a localised case study encompassing an estuarine system and the adjacent city centre of Perth, the paper explores how fortification, accommodation, and retreat responses to recent projections for sea-level rise can protect or even enhance ecosystem service provision.

• This paper recognises that while sea-level rise is a global issue, it has significant local consequences. Therefore, local action is critical for 'successful adaptation to take place'.

• Navigating sea-level rise and ecosystem service provision requires a shift in mentality on several fronts. First, urban designers and planners must become more process-oriented in areas subject to sea-level rise. It is immensely complicated to reconcile ecological systems with urban systems, as the 'big squeeze' challenge necessitates.

### Key findings

• This case study has shown that if planners are to engender estuarine foreshore ecosystem service provision functions over the longer term, some retreat of urban areas will inevitably be required, and the migration of the foreshore reserve landward.

• While in the twentieth century, urban waterfront redevelopment shaped coasts, rivers, and estuaries globally, in the twenty-first century (and beyond), these hydrological systems will reassert their power to shape cities.

• This paper considers how this re-assertion can maximise the ecosystem service provision essential to the case study's liveability and identity. While the paper is based on alarming projections for sea-level rise, it is predicated on the belief that successful adaptation to sea-level rise could enhance ecosystem service provision in some rare cases.

• The planning disciplines have a crucial role to play. As Matthew Gandy explains that our thinking around such issues must be realistic yet aspirational.

### Links to related publications

• Bolleter, J., Grace, B., Edwards, N., Foster, S., & Hooper, P. (2022). The big squeeze: maintaining the green infrastructure role of estuarine foreshores while adapting to sea-level rise. *Journal of Urban Design*, 1-29. doi:https://doi.org/10.1080/13574809.2022.2097902

### Contact

For further information, publications, media, and presentation opportunities, please get in touch with Dr Julian Bolleter at julian.bolleter@uwa.edu.au.