

# Climate change planning call for 'sea change' regions



Erosion along the Gold Coast's beaches will likely worsen in future. Bruce Miller

Scientists have highlighted that concerted preparations need to be made to combat sea-level rise along coastal areas. They are particularly calling for the development of constructive national and international partnerships to underpin efforts to manage climate change.

'As more Australians move to the coast in search of a lifestyle "sea change", planning for a changing climate, including sea-level rise, is a mainstream issue in need of informed consideration,' says Dr John Church, a CSIRO oceanographer and leading sea-level rise scientist with the Antarctic Climate and Ecosystems Cooperative Research Centre.

'Sea-level rise will have serious consequences during the 21st century and beyond, and will impact the lives of tens of millions of people,' he says. 'In Australia, including the potential impacts of climate change in our dreams of owning our own coastal getaway will be one way to lessen future impacts.'

Dr Church, and colleagues at CSIRO and the Antarctic Climate and Ecosystems CRC – Dr John Hunter, Dr Neil White and Dr Kathy McInnes – present a review of the current scientific literature in the latest edition of *Australasian Science* magazine, and point to stronger national and interna-

tional partnerships being required in order to plan for climate change impacts.

The authors note that about half of Australia's population lives within seven kilometres of the coast and that as many as 30 per cent (or about six million people)

live within two kilometres of the coast. Juxtaposed with this rush to the coast is a changing climate.

Over the last century, about 70 per cent of the world's sandy shorelines were retreating, between 20 to 30 per cent were stable, and fewer than 10 per cent were advancing. As sea levels rise, coastal erosion is expected to continue, resulting in the landward movement of the coastline typically at rates of tens to hundreds of times the rate of sea-level rise.

No single coastal flooding event can be blamed on climate change and associated sea-level rise. However, increasing sea levels, potentially reinforced by increases in the number of intense tropical cyclones, as

suggested in some recent analyses, means that the risk of major flooding events and loss of life in the future will increase.

The authors say there is now a clear consensus among leading climate scientists that the rise in concentrations of carbon dioxide and other greenhouse gases is a result of human activities and is leading to global warming and other changes in the Earth's climate.

Dr Church says Australians are beginning to recognise that climate science is presenting them with outcomes – and suggesting options for adaptation. Appropriate strategies and investment in coastal adaptation, if implemented early enough, can dramatically reduce the potential for economic loss and human tragedy during the 21st century.

Strategies include: planning (for example, to ensure escape and emergency routes are available for future flooding events and to increase the resilience of coastal developments and communities); development of setbacks for regions susceptible to flooding and erosion; increased beach renourishment; and protection measures such as sea walls for some coastal locations and retreat or abandonment of others.

'One example of an adaptation strategy currently being planned is the investment of billions of pounds to upgrade the Thames Barrier to protect the City of London from sea-level rise and storm surges,' Dr Church says.

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'Adaptation needs to consider not only modern urban development but also allow for the protection of historical sites and sensitive environmental areas and ecosystems.

'With appropriate planning we can substantially lessen the impact of 21st century sea-level rise,' he says.

On time scales of centuries, the authors argue that sea-level rise will be measured in metres unless a significant reduction of greenhouse gas emissions is achieved.

'We have options – but there are nations in the Pacific and Asian rim where the only options are internal or external relocation,' Dr Church says.

● Craig Macaulay