

Forests on the fringe:

role of mangroves in estuary evolution and prospects under rising seas

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PHOTO CREDIT: Dr David Roper (NIWA)

Abstract:

The role of mangrove forests in the geomorphic evolution of estuaries and coasts has historically been of considerable scientific interest. In systems remote from river-sediment inputs, mangroves influence coastal geomorphology through biological sedimentation. This contrasts with the mangrove forests of continental margins and high islands (e.g., NZ) that are largely supplied with sediments delivered by rivers. In these “sediment rich” systems there are conflicting views about the geomorphic role of mangroves. Is mangrove ecology largely driven by physical processes (e.g., sedimentation), with mangroves colonising intertidal flats after they become ecologically suitable? Alternatively do biophysical feedbacks enhance sedimentation so that mangroves accumulate sediment more rapidly than would otherwise occur?

Mangrove forests are vulnerable to sea-level rise (SLR) associated with climate warming as they occupy a relatively narrow zone in the mid-to-upper intertidal. Resilience of mangrove forests to SLR is an important question in the Indo-Pacific region. Here, some of the world’s largest mangrove forests provide resources for coastal communities (e.g., food, coastal hazards mitigation). What is the capacity of NZ mangrove forests to keep up with SLR through sedimentation and what are the key processes that control this? Observations from the Firth of Thames made over a range of time-scales (seasons to decades) are used to address these questions. These data include high-resolution radioisotope dating, sediment surface-elevation dynamics, GPS measurements of vertical land motion and observations of meteorological, hydrological and estuarine processes driving sediment delivery to the mangrove forest. New research on Ouvéa Atoll (New Caledonia) is introduced – an end-member system entirely isolated from river-sediment supply and dominated by biological sediment production. How will such “sediment poor” mangrove forests respond/adapt to rising seas?

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12:00 noon, Thursday, 22 August 2019

L1 Lecture Theatre

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