

ID: W2792042865

TITLE: National sediment compartment framework for Australian coastal management

AUTHOR: ['B. G. Thom', 'Ian Eliot', 'Matt Eliot', 'Nicholas Peter Harvey', 'David Rissik', 'C Sharples', 'Andrew D. Short', 'Colin D. Woodroffe']

ABSTRACT:

The concept of coastal sediment compartments was first used in the 1960s in the United States. It has since been recognised as appropriate for defining sections of the Australian coast, but had not been uniformly adopted around the nation in the way that has underpinned management, as in other countries. In 2012, the Australian Government supported a project to better understand coastal sediment dynamics using the sediment compartment approach as a framework within which to consider future shoreline behaviour and the impacts of climate change, including rising sea level, changing wave climates and sediment budgets. This paper outlines the sediment compartment project and uses case studies to demonstrate its application. The project consisted of three steps. The first step involved delineation of a hierarchy of coastal sediment compartments following a nationally agreed set of criteria, integrating the onshore/offshore geologic framework with known patterns of sediment movement and those inferred from surface landforms. This identified more than 100 primary compartments bounded by major structural features such as headlands or changes of shoreline orientation. At a finer scale, approximately 350 secondary compartments were identified, many of which encompass smaller scale structural features that define tertiary scale compartments or cells. For verification of this sediment compartments approach to coastal planning and management, the second step of the study comprised case studies of contrasting compartments with different patterns of sediment supply, transport and deposition. The third step, involved embedding all secondary compartments around the continental coast into the Shoreline Explorer, within the CoastAdapt toolbox (National Climate Change Adaption Research Facility). Information regarding the sensitivity of shorelines to change was compiled at the compartment scale, based upon evidence such as substrate, sediment transport attributes and oceanographic forcing, including waves, tides and storm processes. Presentation of information through CoastAdapt within the compartments framework provides a resource to facilitate improved coastal planning and management over different implementation levels, from national strategy scale down to local policy scale. Case studies from several contrasting settings around the Australian coast demonstrated the potential and feasible application of the sediment compartment approach at different spatial and temporal scales.

SOURCE: Ocean & coastal management

PDF URL: None

CITED BY COUNT: 86

PUBLICATION YEAR: 2018

TYPE: article

CONCEPTS: ['Shore', 'Sediment', 'Sedimentary budget', 'Landform', 'Coastal management', 'Geology', 'Sediment transport', 'Scale (ratio)', 'Deposition (geology)', 'Environmental resource management', 'Oceanography', 'Environmental science', 'Geography', 'Geomorphology', 'Cartography']