Coastal Wetland Habitat Dynamics in Selected New South Wales Estuaries.

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Abstract

Intertidal wetland habitats in southeastern Australia have changed significantly during the past sixty years. Mangrove habitats have expanded both seawards and landwards, the latter being at the expense of saltmarsh habitats. This relatively common phenomenon is generally suggested to be an outcome of sea-level rise. Several factors potentially responsible for this change are examined, including changes in mean sea-level during the past 50 to 100 years, changes in climate, population growth, catchment landuse, and estuary type.

A protocol for mapping estuarine habitats was developed and implemented, incorporating the application of geographic information systems. Spatial and temporal coastal wetland habitat changes at nine sites along the New South Wales coast are illustrated. These habitat dynamics were shown to not correlate between sites. The results demonstrate that sea-level rise in this region cannot solely account for the extent of change during the past sixty years. With the exception of one site (Careel Bay), there have been no correlations between contemporary mean sea-level rise and mangrove incursion of the saltmarsh habitats at the study sites, or with rainfall patterns, at the scale of observation in this study, which was largely decadal. The only correlations determined during this study have been between population growth and coastal wetland habitat dynamics in some sites.

In spite of saltmarsh habitat loss being a regional phenomenon, local factors appear to have a profound bearing on the rates of change. Neither contemporary mean sea-level rise, rainfall patterns, estuary type, catchment landuse, catchment natural cover nor population pressure can account solely for the patterns in the spatial and temporal dynamics of the coastal wetlands of New South Wales. It seems apparent that regional factors create preconditions favourable for mangrove incursion, but that localised conditions have been responsible for the extent of these incursions from site to site. That is, despite higher sea-level and greater rainfall, the extent of change has been determined by the unique characteristics of each site.

The results have important implications for current estuary management practices in the state of New South Wales. The lack of spatial and temporal trends in coastal wetland habitat dynamics point to the need for management to be conducted on a localised, rather than regional scale. Additionally, anthropogenic influences must be carefully managed, since the extent of mangrove habitat expansion into saltmarsh areas is unlikely to be a natural occurrence.

This thesis contains no material extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma. Chapter 3: Habitat Mapping Protocols, written specifically for this thesis, has been reproduced in its original form as an Australian Catholic University Technical Report.

No other person's work has been used without due acknowledgment in the main text of the thesis.

This thesis has not been submitted for the award of any degree or diploma in any other tertiary institution.

…… February 2002

Kylee M. Wilton date

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TABLE OF CONTENTS

List of Figures

List of Tables