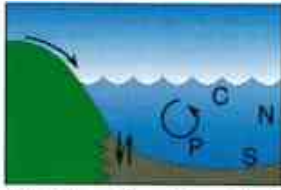


KEMPSEY SHIRE COUNCIL
MACLEAY RIVER ESTUARY PROCESSES STUDY



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MACLEAY RIVER ESTUARY PROCESSES STUDY

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FOREWORD

The Estuary Management Policy is one of a suite of natural resource management policies implemented by the NSW Government using the principles of total catchment management and ecologically sustainable development. The policy focuses on tidal rivers and coastal lakes which are affected by catchment development and uses.

The goal of the policy is to achieve an integrated, balanced, responsible and ecologically sustainable use of the State's estuaries. A specific objective of the policy is to encourage preparation of long term management plans for each estuary, in which all values and uses are considered.

The policy promotes cooperation between various authorities, catchment management, committees, landholders and estuary users in the development and implementation of management plans. The approach is strongly community focussed and is based on implementation by local Councils rather than private landholders.

The process by which the policy seeks to develop and implement estuary management plans can be summarised in the following stages:

- Formation of an Estuary Management Committee;
- Compilation of existing data;
- Estuary Processes Study,
- Estuary Management Study,
- Draft Estuary Management Plan;
- Draft Plan review; and
- Plan adopting and implementation.

The Macleay River Estuary Processes Study constitutes the third stage of the implementation process and was jointly funded by Kempsey Shire Council and the Department of Environment and Climate Change.

MACLEAY RIVER ESTUARY PROCESSES STUDY

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1. INTRODUCTION

1.1. Overview of the Study

The Macleay River estuary is located on the mid north coast of New South Wales, about 400 km north of Sydney. This Estuary Processes Study was prepared for Kempsey Shire Council under the NSW Estuary Management Program with assistance from the Department of Environment and Climate Change. The study was overseen for Council by the Macleay River Coast and Estuary Management Committee.

Webb, McKeown & Associates, now trading as WMAwater, were responsible for project management, review of the relevant catchment characteristics, detailed hydrodynamic analysis, sediment dynamics studies, water exchange modelling and human use assessment. Southern Cross University, School of Environmental Science assisted WMAwater with water and sediment quality analysis and ecological assessments.

The study area (shown in Figure 1) comprises the waterways, foreshores and adjacent lands of the Macleay River estuary from the ocean entrance to the tidal limit, a distance of approximately 54 km. It also includes the tidal reaches of the tributary streams of Kinchela, Belmore and Clybucca as well as the Macleay Arm. The impact of the wider catchment on the estuary was also considered.

The aim of the study was to define baseline conditions for the various estuarine processes and to examine the interactions between the processes and human use of the estuary. The study provides a basis for developing management strategies in the next stage of the Estuary Management Program, which is preparation of an Estuary Management Study and Plan.

The key areas covered by the study include:

1. Catchment Characteristics

This chapter concentrates on those aspects of the catchment that influence estuarine processes. These include the topography, geomorphology, climate, land zoning and land use for the estuary and wider catchment.

2. Hydrodynamics

The hydrodynamics chapter investigates the dynamics and distribution of fluvial and tidal flows throughout the estuary based on both recorded data and model results. It also describes the wave climate, and the flushing and mixing characteristics of the system. Changes in hydrodynamics and flow behaviour since pre-European settlement are estimated and the potential impacts of climate change in terms of sea level rise and changing rainfall patterns are discussed.

3. Sediment Dynamics

This chapter provides a description of the sediment types and distribution throughout the estuary and how these can be used to assist in the definition of different estuary process

FIGURE 1
STUDY AREA



- Macleay River Estuary Catchment Boundary
- Macleay Catchment Boundary
- Natural Tidal Limit
- Floodgate Imposed Tidal Limit

zones. Both existing and historical morphology is examined and compared, to provide an indication of river change.

4. **Water and Sediment Quality**

This chapter provides an overview of existing water quality in the Macleay estuary and summarises the primary processes that influence water quality and composition. The chapter also examines the potential sources and impacts of trace element contamination and acid sulfate runoff on sediment and water quality in the Macleay estuary.

5. **Ecological Characteristics**

A summary of significant terrestrial and aquatic fauna within the Macleay estuary is provided, focusing on threatened species. The chapter also examines the key activities that influence fauna and habitat, such as flooding, eutrophication and overfishing.

6. **Waterway Usage**

A description of human usage of the waterways and surrounding areas is provided. Uses include commercial aquaculture and fishing as well as recreational fishing, boating, swimming and other passive recreational activities. User facilities such as boat ramps, jetties and moorings are discussed. Potential conflicts between different uses of the estuary are also considered.

7. **Summary, Conclusions and Recommendations**

The final chapter provides a summary of the main estuary processes and the issues associated with the interactions between these processes. Recommendations for the Estuary Management Study are also provided.

A glossary of terminology has been provided in Appendix A.

1.2. Key Issues

The purpose of the Estuary Processes Study was to provide a scientific and technical understanding of the estuary's physical, ecological and biogeochemical processes to facilitate the later preparation of an Estuary Management Plan. A number of key issues relating to the estuary were identified by the Kempsey Shire Council's Coast and Estuary Management Committee in consultation with stakeholders and the Mid North Coast Catchment Management Board. These issues have been considered as part of the current Processes Study, and are as follows:

- land use planning and development control,
- riparian land management and bank erosion,
- floodplain wetland management,
- acid sulfate soil management,
- floodgate and drain management,
- boating use,
- sedimentation,
- tourism management,
- habitat protection,
- fish/shellfish management,
- water quality,
- river health,
- climate change and sea level rise,
- information availability, and
- integration of projects.

Whilst this study considers these issues, it focuses on those which have been identified by Kempsey Shire Council and the Department of Environment and Climate Change as being of higher priority and have not already been adequately explored in previous studies.