



Building a National Marine Initiative through the Development of a Marine Cadastre for Australia

Andrew Binns¹ and Ian Williamson²

Centre for Spatial Data Infrastructures and Land Administration,
Department of Geomatics, The University of Melbourne,
Parkville Victoria 3010, Australia

Introduction

In recent times there has been a realization that the interaction of rights, restrictions and responsibilities in time and space do not stop at the high water mark, but interact with those in the maritime environment. This is especially so within the coastal zone (which straddles both land and sea) where the majority of marine-related activities occur. In the terrestrial environment, the cadastre and implementation of Spatial Data Infrastructures (SDI) are aiding in facilitating greater management and decision making of the rights, restrictions and responsibilities on land. There is, however, no such framework in the marine environment with 'task-specific' techniques based within a variety of organizations and agencies being employed.

A joint Australian Research Council (ARC) project between the Department of Geomatics' (University of Melbourne) two state Government Departments and Geoscience Australia has been established in order to define and develop a marine cadastre for Australia. The fundamental objective of this project is to create a spatial data infrastructure whereby the rights, restrictions and responsibilities of the marine environment can be effectively assessed, administered and managed.

This paper discusses the major sustainable development factors that are driving the development of a marine cadastre within Australia, including issues and problems faced by users and stakeholders of the marine environment. The capacity to address such factors is discussed through the ability to define, visualize and realize legally defined boundaries in the marine environment. The technical and policy frameworks that form the basis for the development of a marine cadastre are also discussed, through the utilization of land-based cadastral initiatives. This will aid in developing solutions to not only marine based issues, but those which straddle the land-sea interface, such as the pollution of the marine environment from land-based sources.

Influential Factors Driving the Development of a Marine Cadastre

The major driver in the development of a marine cadastre is the increasing need to meet sustainable development objectives:

- **Economic** - An extension to Australia's marine environment under Article 76 of UNCLOS will provide a greater area to explore, exploit, conserve and manage.
- **Environmental** - Issues of pollution, depleted marine resources and increased threat by man to the health of the marine environment are forcing governments such as Australia's to implement sustainable development measures.
- **Social** - Recognition of the rights of indigenous Australians to access the marine environment. Rights to the sea and seabed formally recognized in 2001, with the granting of non-exclusive rights to a group of indigenous Australians.

Legal

- Current legislative arrangements governing the marine environment are complex and poorly understood;
- There is a degree of ambiguity within legislation in regards to tidal definitions;
- The way in which spatial descriptions are embedded in legislation varies and is often hard to understand.

Institutional

- Current methods involved in the collection and dissemination of spatial data are timely and expensive;
- The same type of data may be collected by various agencies;
- Marine spatial data needs to be compatible with data collected from the terrestrial environment, in order to address coastal zone management issues.

Technical

- Inability to accurately define tidal datums;
- Ambulatory nature of the coastline (Territorial Sea Baseline);
- 3D and 4D nature of the marine environment.

The issues described in this paper often cause competition and conflicting interests between users. In order to address these problems, stakeholders need to have clear spatial and legal certainty of their rights, restrictions and responsibilities in the marine environment, something that the creation of a marine cadastre aims to address.

Marine Cadastre Concept

To address these issues, a conceptual modal for an Australian Marine Cadastre is being developed by the ARC research team at the University of Melbourne, through the use of a concept diagram (Figure 1). The first aim of the diagram is to demonstrate the fact that the marine cadastre should not be developed in isolation from the terrestrial environment. The majority of activity occurs within the coastal zone, straddling the land and sea. The linking of the marine and terrestrial environments will enable a more seamless integration of spatial data at the land-sea interface, facilitating more integrated and effective coastal zone management techniques to be implemented.

The diagram also shows the range of stakeholders and activities that occur within Australia's oceans. A marine cadastre must take into account the legal and administrative boundaries which govern where and when such activities can occur. The rights, restrictions and responsibilities attached to such boundaries must also be recorded.

The important role that the Australian Spatial Data Infrastructure (ASDI) plays in underpinning the availability and reliability of spatial data is also shown. The standards and data access mechanisms that the implementation of the ASDI would put it in place would provide the basis for the integration of the marine and terrestrial environments, helping to facilitate sustainable management objectives across Australia's entire jurisdiction.

Conclusion

The tangible outcome of the marine cadastre concept is the ability for users and stakeholders to "describe, visualize and realize" spatial information in the marine environment (Todd, 2001). The aim of the marine cadastre is to describe the legally defined spatial extent of rights, restrictions and responsibilities in the marine environment, including management boundaries and ocean parcels. Such spatial extents can then be visualized through the continual updating of accurate digital spatial data, including the three dimensional nature of the marine environment together with the advent of time over this space. This will then enable users to realize such spatial extents 'on the ground'. This will aid in managing and creating new fisheries and aquaculture leases, policing marine protected areas and enable an integrated and practical approach to the management of Australia's maritime extent.

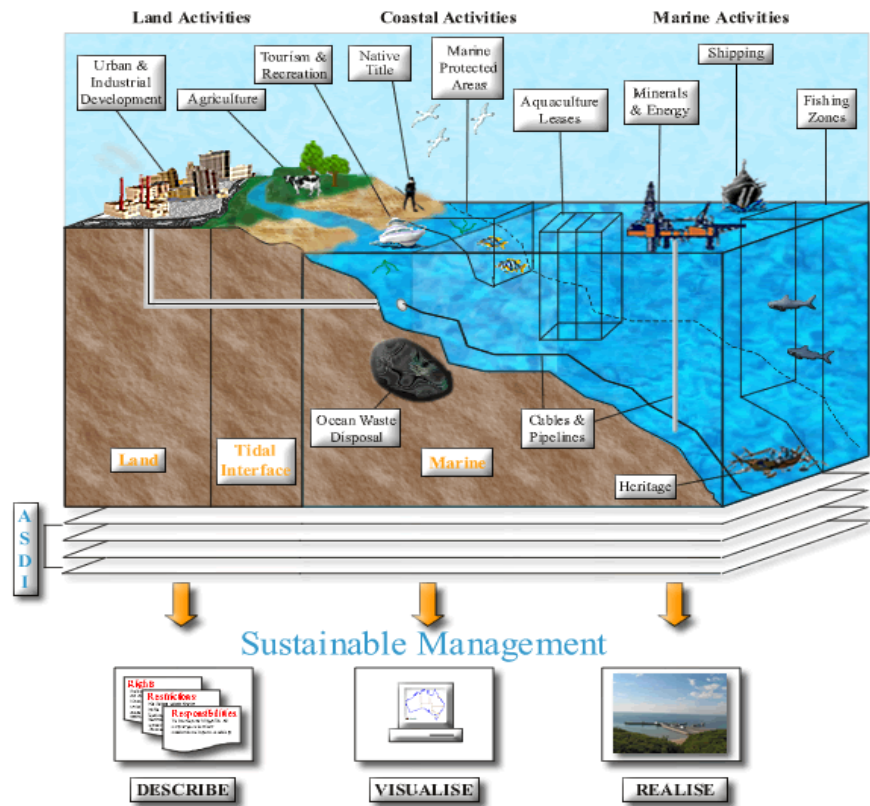


Figure 1 – Marine Cadastre Concept Diagram

References:

Todd, P. (2001) 'Marine Cadastre - Opportunities and Implications for Queensland', A Spatial Odyssey: 42nd Australian Surveyors Congress