

Coastal Zones 2016: Advancing marine spatial planning across the Sydney Harbour, NSW, Australia - Elianny Licelotte Dominguez Tejo - University of New South Wales

Abstract

Planning a supportable future for sea-bounded megacities would need demanding evaluation of coastal management contexts and the way they participate human activities. The Marine Spatial Planning framework has been supporting integrated management of marine resources; however, prior research shows implementation challenges in accounting for adjoining land-use and catchment plans, and the need to deliver multidisciplinary planning approaches. The Sydney Harbour in New South Wales, Australia, presently deficiencies an united method environmental resource development. This affects management of estuarine and coastal resources, as enhanced understanding is required on how environmental impacts affect social systems. Hence, research into a prototype decision network is underway to help coastal councils analysing management alternatives. The prototype builds on an existing network to incorporate a Bayesian Belief Network to model relationships between planned management scenarios and key social, economic and environmental community values. Initial work included a comprehensive review of six existing coastal management plans and 275 community surveys to gather information on community demographics, environmental and socio-economic values, and perceptions of coastal threats. In-depth meetings with management executives are planned to mutually develop management goals and active objectives, design management situations and to confirm an preliminary model.

Community-based validation will take place through local workshops. Research outcomes are expected to support the comparison of alternative coastal management scenarios by assessing their influence on community values. Such multi-criteria approach can anticipate outcomes of marine spatial planning process and provide valuable insights into potential impacts from stakeholder trade-offs and environmental policies.

As human pressures on the marine environment rise, Marine Spatial Planning (MSP) is being gradually acknowledged as a context for united management of coastal zones. The execution of MSP faces two important challenges: accounting for adjoining catchment plans and for diverse human values. The Sydney Harbour is an inlet with a rich history of accelerating human incidence within its natural limitations which grasp high levels of sea marine biodiversity.

Despite the broad organizational structure in situ for resource management, several environmental and social impacts are yet to be addressed within the harbour area. The aim of the research is to increase government capacity to analyse marine management alternatives that account for key social, economic and environmental factors, as well as catchment management plans. Hence, we are developing a proto type Decision Support System (DSS) that supports assessment of such alternatives. Located within Australia's largest city, the iconic Sydney Harbour sustains a highly diverse marine environment, where local

managers operate within a layered and complex governance structure that is yet to adopt a holistic integrated approach to resource management. Planning a sustainable future for our sea-bounded society requires enhanced understanding of the responses of natural and socio-economic systems to human actions, and improved management of the multiple human uses of our marine ecosystems. Recent criticism to marine resource management systems of the Sydney Harbour catchment area include lack of integration of management actions impeding effective planning and management of marine and estuarine resources; limited understanding of interactions between ecological and social systems; poor definition of management targets and outcome-oriented management plans; and insufficient integration between catchment and coastal planning. Integrated resource planning and management can address identified weaknesses, and Ecosystem-Based Marine Spatial Planning (EBA-MSP) offers a strategic framework that can facilitate a more structured approach to resource planning, recognizing the full array of interactions within ecosystems, including human uses. This research proposed the adoption of the EBA-MSP approach to improve the methodological approach to resource planning and enhance the integration of the social dimension into management plans, using Manly Local Government Area as a representative catchment area of the harbour. The research aimed to enhance local government capacity to develop integrated coastal management plans consistent with EBA-MSP principles, accounting for key social, economic and environmental factors relevant to a sustainable management of the harbour. In fulfilling this aim, the research established specific objectives of: appraising EBA-MSP case studies, assessing coastal planning and resource management plans at local scale, identifying and

characterising socio-economic and biological targets, and designing and developing a prototype Decision Support Tool (DST) based on a Bayesian Belief Network (BBN) to support planning processes. The development of the BBN DST was informed by: an assessment of key variables of resource management using the Drivers-Pressures-State-Impacts-Responses framework (DPSIR); stakeholder consultation through a community survey and in-depth interviews and meetings with council staff members; characterization of the social, physical and managerial settings of local recreational areas using the Water and Land Recreational Opportunity Spectrum framework (WALROS); and inputs from a predictive model which determines the likelihood of community beach preferences based on demographics variables. Pilot testing of the BBN-based DST evidenced it can: improve understanding of key interactions among coastal management targets, specifically social targets; provide accountability on the decision-making process; and facilitate the assessment of potential management scenarios. This research provides initial theoretical and practical foundations for local government to adopt EBA-MSP as an overarching planning framework that can deliver healthy resilient marine ecosystems sustaining human uses. Evidence from this research argues the notion that main streaming EBA-MSP into local resource management will require extensive amendments in both the planning process and the development of management plans. In support of these findings, the BBN-based DST developed here can play an important role in facilitating these changes, integrating further feedback from end-users and community members and continuing to increase government capacity to develop integrated resource management plans under an EBA-MSP approach.

This work is partly presented at International Conference on Coastal Zones on May 16-18, 2016 held at Osaka, Japan.

Elianny Licelotte Dominguez Tejo
University of New South Wales -Email: e.dominguez@student.unsw.edu.au

[International Conference on Coastal Zone](#)

May 16-18, 2016

Volume 8 . Issue 1