Designing A Marine Spatial Planning Methodological Framework For Algoa Bay (Gqeberha, South Africa): Challenges And Lessons Learned.

Authors: Anne Lemahieu¹, Amanda T. Lombard¹, Hannah Truter¹, Bernadette Snow⁴
¹Nelson Mandela University; ²University Of Strathclyde, Glasgow, Scotland

E-mail Address: anne.lemahieu@gmail.com

ID: 11998

Submission: Background
Increased anthropogenic pressures globally and the shifting uses in marine coastal environments have prompted the advancement of marine spatial planning (MSP) practices. Grounded in an ecosystem-based approach, MSP processes seek to reconcile conservation objectives with blue growth. While many countries still lack a legal framework to effectively implement MSP practices, South Africa has recently enacted the Marine Spatial Planning Act (MSPA). The MSPA sets an overarching vision and set of goals for the design and implementation of Marine Area Plans for the four bio-geographic marine areas of South Africa. Situated in Gqeberha (formally Port Elizabeth), Algoa Bay is home to a wide range of ocean and coastal uses and is also the most physically and ecologically monitored marine area in the Southern hemisphere. As such, it constitutes an ideal pilot site for the design of a national framework and for the first implementation of a Marine Spatial Plan in South Africa. Started in 2017, the Algoa Bay Project aims at providing a social-ecological framework for the design of the first MSP in South Africa. The Project is spearheaded by a transdisciplinary Community of Practice and has been implemented in two phases. Phase I (2017-2019) of the project focused on the collection and mapping of biophysical data and the identification of priority areas for biodiversity features and non-consumptive uses through the use of Systemic Conservation Planning methods (SCP) (Algoa Bay Project, 2019). Phase II of the project, started in 2020 and currently ongoing, focuses on the social and economic dynamics of the Bay and how this impacts upon and is impacted by MSP. This presentation unpacks the methodological steps that form part of the Algoa Bay MSP framework, including the creation of a spatial database and the integration of data to ultimately design a zoning.

Method
Forming part of the Algoa Bay MSP framework designed after existing MSP guidelines, a methodological framework was developed. The data collected between September 2017 and March 2022 were collated in a spatial database. Data were also stored on the online Geonode open source platform. Data was then organised into five broad themes to enable their strategic prioritisation in anticipation of their future integration in a conservation planning software e.g. Marxan with zones. These broad themes decided upon are: 1) the “natural Algoa Bay” which includes all biophysical data, 2) the “busy Algoa Bay” which includes the information relative to human uses, 3) the “fertile Algoa
Bay” which documents the ecosystem services and their value, 4) the “regulatory Algoa Bay” which includes all spatially explicit legal constraints likely to impact the prioritisation process and 5) the “cultural Algoa Bay” which documents the cultural dimensions of the coastal and marine environment. With the use of ArcGis 10 and SEANERGY for the production of the conflict/synergy map, each theme was mapped to inform the MSP process. Finally, a selection of information layers, either from raw or summarised data and considered as key information were strategically chosen for their future use in a conservation planning software to produce a zoning.

Results
A methodological framework comprised of 5 main steps was produced that can guide national and regional MSP processes. These are i) data collation, ii) data summarisation and classification in themes, iii) designing of scenarios, iv) processing of data in a soft-coupling model including Marxan with Zone and Systems Dynamic Modelling, and v) selection of a zoning. In this presentation we present the results of the first 3 steps. A large amount of data was produced to inform the MSP process. More than 150 information layers across the five themes were collated, produced or gathered from Algoa Bay stakeholders. This then informs the MSP process, which also includes additional, non-spatially explicit data e.g. cultural narratives of ocean and coastal use. The online platform Geonode was used to store the spatial database and to allow for a free sharing of the data with the stakeholders and the public. Working with the five themes, a series of thematic maps were produced which will be crucial to inform future stakeholder engagements. For example, these could be used for co-designing of future scenarios, and to produce a zoning for Algoa Bay.

Conclusion
The methodological framework we present in this paper can contribute to guide MSP processes, not solely in the Southern Marine Planning Area or at a national scale, but can also in the WIO. The thematic maps are an important tool to facilitate a structured and clear way to communicate information with stakeholders and ease further engagement. In particular, these can be used for the co-design of scenarios, and reconcile contrasting perceptions of the seascape. We discuss the necessity to design an effective data management plan and the challenges of having to prioritise, summarise and integrate a large amount of data. Because of their nature, or because lacking metadata when it comes to secondary data, it can sometimes be difficult to ensure a spatial translation of the information. Not all data can be easily translated into spatial layers, such as cultural values of ocean and coastal use. The integration of data in MSP therefore comes with challenges and many lessons learnt, which we share here. This will contribute to allowing for better anticipation of MSP process-linked challenges and ensure that the process is time efficient e.g. identification of core information, prioritisation of time-consuming activities, etc.