An Integrated Coastal Zone Management Plan for Zoning Marine Touristic Area in Northern-Central Coast of Santa Catarina State/Brazil: Basis for Discussion

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ABSTRACT


The northern-central coast of Santa Catarina State located in South Brazil, had a fastly transition from the natural to the urban landscape which has increased negative transformations on terrestrial and marine natural areas, as well as in social, cultural, economical and political aspects. Based upon an analysis of 23 different uses of the sea, institutional aspects as well as a legislation criteria it was possible to make a primary marine zonation of six different areas in order to give support for the State Integrated Coastal Zone Management Program. The establishment of a marine zoning consists in an important way to render conflicts among different kinds of stakeholders at the studied area. The present task is to elaborate and to implement marine parks, recreational areas, mariculture areas, based on the need of the local and tourist populations. It was surveyed the main problems and stakeholders responsible for the solutions of the problems, as well which are the immediate actions for resolutions for these problems. Lack of a master plan and problems concerned on land use, water quality and conflicts between the traditional communities and the tourists are the main problems observed. As the results of this research, a seascape use map was created taking into account cultural, historical, economics and ecological aspects in order to minimise conflicts of uses and interests. It is clear that a marine zoning will be effective with the active participation of different segments of the society in several other moments that will follow in this process as enforcement and environmental communication.

ADDITIONAL INDEX WORDS: Brazilian coastal zone, marine zoning, Santa Catarina State, stakeholders.

INTRODUCTION

The northern-central coast of Santa Catarina State located in South Brazil (Figure 1), experienced a rapid transition from a natural to an urban landscape which has had negative impact on terrestrial and marine natural areas, as well as in social, cultural, economical and political aspects. Based upon an analysis of 23 different uses of the sea, institutional aspects, and a legislation criteria it was possible to make a primary marine zonation of six different areas in order to lend support to the State Integrated Coastal Zone Management Program.

The establishment of marine zoning consists in an important way to render conflicts among different kinds of stakeholders at the study area. The present task is to elaborate and to implement marine parks, recreational areas, mariculture areas, based on the need of the local and tourist populations (Figure 2).

A survey was conducted to identify the main problems and stakeholders responsible for the solutions to these problems, as well as the immediate actions for resolutions to these problems. The main problems observed from the survey was the lack of a master plan, problems concerning land use, water quality, and conflicts between the traditional communities and the tourists. From the results of this research, a seascape use map was created taking into account cultural, historical, economical and institutional aspects in order to minimize conflicts of uses and interests. It is clear that marine zoning will be an effective tool with the active participation of different segments of the society in function including its importance that will follow in this process as enforcement and environmental communication.

BACKGROUND

The present marine zoning proposal constitutes a new challenge for the brazilian coastal zone management program. Managing marine areas is an advance for a regional and local planning, but instead of this, in a methodological point of view it is also a challenge for federal, state and municipal institutions as well as for coastal regional universities and local stakeholders.
From those marine zoning procedure it is also possible to analyse the coastal zone as an integral point of view understanding both terrestrial and marine aspects.

The present paper has several objectives including structuring an integrated coastal zone management plan for zoning the marine area of the northern-central coast of Santa Catarina State; to identify the main uses of the sea along the coastal area and the main environmental legislation at the marine area; to propose different zones in order to implement the plan in a short and medium space of time; to discuss through methodological analysis the importance of marine zoning for the Brazilian National Coastal Zone Management Programme, and to understand how different stakeholders are engaged in marine activities.

Each day the use of marine areas in the northern-central coast of Santa Catarina State has become more complex due to the several current uses of the human occupation at the terrestrial areas. It is important to highlight that originally this area was completed occupied by communities of artisanal fishermen. As the time progressed activities of nautical tourism, navigation, industrial fishery and mariculture, for instance, turned marine areas into a places of conflicts of interests and uses by several local stakeholders. Therefore it is necessary to understand this new space dimension, and this can be firstly addressed with the understanding of what is happening at the marine surface area, a bi-dimension point of view. It is certainly also important to understand the marine area with its three dimension, considering all ecological and oceanographic aspects. This work therefore intends to began this discussion by the institutional, legal and marine use point of view.

**METHODOLOGICAL PROCEDURES**

For marine zoning implementation, the following steps were developed and proposed:

**PHASE 1: Information gathering;**
- Bibliographical review;
- Identification of the main uses of the sea along the coastal area with a GPS;
- Identification of the main environmental legislation at the marine area;
- Identification of the different stakeholders (governmental and non-governmental) engaged in marine activities.

**PHASE 2: Thematic Mapping (1:50.000);**
- Obtaining data for mapping (bathymetry, topography, etc.);
- Mapping the main uses of the sea with a GPS along the coastal area (video, boat, aerialphoto) (Figure 3);
- Mapping environmental legislation at the marine area.

**PHASE 3: Stakeholder involvement and Marine Zoning;**
- Identification of main governmental and non-governmental stakeholders
- Interview the stakeholders about their institution profile; main problems at the marine areas; solutions; involvement; and strategies;
- Analysis and synthesis of the interviews;
- Workshop with the Stakeholders;
- Proposal of different marine zones;
- Debate with the stakeholders (indicators of efficiency);
- Mapping different zones in order to implement it in a short and medium period of time;
- Debate with local authorities;
- Debate with State and Federal authorities;
- Marine zoning mapping;
- Elaboration of final document;
- Implementation through availability of data at the web (g10.cttmar.univali.br/sigerco);
- Implementation actions at local level;
- Adoption of measures at all institutional levels
- Evaluation.

**PROPOSAL OF CATEGORIZATION OF THE AREA-TYPE IN THE SEA SPACE**

For the purpose of establishing the categorization of the marine space, the National Plan of Coastal Zone Management was considering to take into account also the Orla Project, so the area would comprehend from the beach area up to the 12 nautical miles limit (Exclusive Economical Zone - EEZ).

The fear in treating such a subject is due to several factors:
- In spite of the scientific community to act in the area by continuous research on the physical-chemistry, biological, geological areas, there are few knowledge on understanding on the structure, changes and functions of the local marine environment;
- At the sectorial level (mariculture, fisheries, tourism, etc.) the activities for using the marine space are still largely unknown by the different social groups, in spite of the competition for use of marine space that has been occurring in the past years;

![Figure 3. Main marine uses of the center-coast of Santa Catarina State Source: (http://gis.cttmar.univali.br/sigerco/).](image-url)
conserved offer possibilities of wider protection. This focus drove a categorization of uses of the areas, that took into account the uses permitted, the criteria of framing of the areas (uses of the sea, legal aspects, fragility, economy, use of the adjacent sea), as well as the environmental goals, and can be divided into:

- Protection Areas;
- Marine Handling Areas;
- Special Use Areas;
- Recreation Areas;
- General Use Areas; and
- Recovery Areas.

**FINAL CONSIDERATIONS**

It is clear along this paper that the implementation of the Economical-Ecological Zoning ZEE instrument, specially at the marine area of the center-north coast of Santa Catarina State, is one the challenges for implementing local laws at Federal, State and municipal/district levels.

It was possible to identify the main uses of the sea along the coast using the adopted methodology, which could be considered efficient and should be repeated. The gathering of the main environmental legislation applicable to this coastal section could be considered fundamental for understanding the main conflicts between the use of the sea, and it also offers an excellent basis to guide local stakeholders to understanding their rights towards the use of this area in a sustainable way.

The importance of physical, chemistry and ecological aspects considering its structure, function and changes in order to make the marine zoning at “seascape” level is unquestionable. However, such an analysis require high financial costs. In developing countries, this unfortunately causes such studies to be a further step towards the understanding of marine areas as a system, integrating cultural, social, economic and spatial aspects. This is a challenge to be overcome.

**LITERATURE CITED**


[Available online at gis.cttmar.univali.br/sigerco/g10.cttmar.univali.gci/sigerco](gis.cttmar.univali.br/sigerco/g10.cttmar.univali.gci/sigerco)