

# Offshore marine protected areas: Divergent perceptions of divers and artisanal fishers



Aline Batista de Andrade<sup>a</sup>, Marcelo de Oliveira Soares<sup>a,b,\*</sup>

<sup>a</sup> Instituto de Ciências do Mar (LABOMAR), Universidade Federal do Ceará (UFC), Fortaleza, Brazil

<sup>b</sup> Institut de Ciència i Tecnologia Ambientals (ICTA), Universitat Autònoma de Barcelona (UAB), Barcelona, Spain

## ARTICLE INFO

### Keywords:

Maritime spatial planning  
Scuba divers  
Fisheries Management  
Conflict resolution  
Offshore marine governance

## ABSTRACT

Thorough comprehension of the perceptions of offshore Marine Protected Areas (MPAs) by different local social actors is lacking, especially in developing countries. This study aims to analyze the perceptions and socioeconomic characteristics of divers and artisanal fishers of an offshore MPA, located in Brazilian waters. Data on the perceptions, conflicts, and management of the MPA were gathered through questionnaires and interviews with local actors. The results show that scuba divers and fishers consider the MPA to be very important for biodiversity. They also consider their collaboration in participative management to be of considerable importance, even though they do not form part of the administration. For local actors, the area helps foster the preservation of the marine environment and benefits recreational diving, tourism, and artisanal fishery in local communities. Divers and fishers use the resources and space of the offshore area differently, which results in diverging perceptions and conflicts. Divers propose restricted protection (No-Take Zones), while fishers propose that the MPA should be used exclusively by the poor local communities for artisanal fishing. Conflicts arising from inefficient public administration (lack of environmental zoning, management plans, and participative management) and illegal use of the MPA were also identified. Data stemming from the local actors themselves are central to reducing the conflicts and improving public policies on offshore marine conservation.

## 1. Introduction

The focus of the policy discussion around Marine Protected Areas (MPAs) is usually on the coastal zone, although extensive marine zones lack effective protective measures or environmental management [1,2]. The implementation of offshore MPAs, together with ocean zoning and large marine spatial planning, can be a major tool for ocean governance [3]. An important knowledge gap concerns the role of social factors and the multiple stakeholders (e.g., fishers and divers) in promoting a participatory governance of MPAs [4].

The establishment and management of MPAs, particularly No-Take Zones (NTZs), has led to many conflicts among artisanal fishers, divers, and those managing the MPAs [4,5]. Most of these conflicts were born out of restrictions imposed on fishing activities in areas that were traditionally used by artisanal fishers. In many cases, they also result from creating protected areas without the local community actively participating in the process or in its management. Traditionally, decisions about MPA management consider the biophysical aspects first, then the direct socioeconomic impacts, and, finally, the legal requirements. Often, local actors do not participate in marine environ-

mental planning [4,6,7].

The analysis of the perception of different local actors plays a crucial role in participative management and marine policy [8]. Such analyses are also meant to strengthen and use local knowledge, favoring management and conflict reduction in the MPA. Studies supporting this approach have been on the rise since the 1990s [9–12]. However, the literature lacks data on the characterization and environmental perception of local actors (divers and artisanal fishers) in offshore MPAs, especially in developing countries.

Studies about divers and fishers in MPAs should be valued and carried out so that the management process is improved. This is because the perceptions of different groups of actors may influence the comprehension and acceptance of initiatives in resource management [13]. Moreover, the effects of scuba diving and fishing on the offshore MPAs should be investigated, as these activities might cause environmental degradation (i.e., overfishing, pollution, and physical damage to coral reefs) in marine ecosystems [14–17]. The aim of the present study is to analyze the socioeconomic characteristics and perceptions of recreational divers and artisanal fishers about different aspects of marine management (environmental impacts, importance, and parti-

\* Corresponding author at: Instituto de Ciências do Mar (LABOMAR), Universidade Federal do Ceará (UFC), Fortaleza, Brazil.

E-mail addresses: [marcelosoares@pq.cnpq.br](mailto:marcelosoares@pq.cnpq.br), [marcelosoares@ufc.br](mailto:marcelosoares@ufc.br) (M. de Oliveira Soares).

cupative management). To achieve this target, this study analyzes these local actors in an offshore MPA, located in Brazilian waters.

## 2. Methods

### 2.1. Study area

On marine protection in the southwest Atlantic (Brazilian waters), a study [1] recorded 387 MPAs, of which a minimal number (< 10%) were exclusive submarine protected areas and located in offshore waters [1,18]. Whereas the creation and classification of Brazilian MPAs follows the National Protected Areas System (*Sistema Nacional de Unidades de Conservação* – SNUC in Portuguese), the Conservation Units (*Unidades de Conservação* in Portuguese) are a type of protected area, of which the SNUC defines two categories: Strictly Protected Areas (or restricted protection areas) and Sustainable Use Protected Areas (or direct use areas). The Strictly Protected Areas are similar to NTZs. In the standard SNUC, the management categories for MPAs include Biological Reserve Areas (Class I-IUCN), Marine Parks (Class II), Wildlife Refuges (Class III-IUCN), Private Natural Heritage Reserves and Wildlife Reserves (Class IV), and Environmental Protection Areas (Cat V) [1].

This research was conducted in the “Parque Estadual Marinho da Pedra da Risca do Meio” (PEMPRM), a completely submarine MPA, located in the continental platform to the northeast of Brazil. The only MPA in the state of Ceará that is totally underwater, it is 12 nautical miles northeast of Fortaleza (Fig. 1). It covers an area of 33.20 km<sup>2</sup> [18]. This rectangular MPA shelters submerged reefs between 14 and 25 m deep. These reef formations are from one to three meters above the sea floor and are approximately linear. The area has a rich diversity of poorly studied fish and benthic species [19,20]. In this MPA, recreational and commercial scuba diving is carried out alongside traditional legal artisanal fishing (using hook and line). Moreover, illegal fishing occurs along the coast of Fortaleza [18].

Fortaleza is a popular national and international destination for tourists interested in coastal landscapes, seascapes, and leisure. There are coral reefs and shipwrecks a few kilometers off the coast, increasing the number of tourist attractions available to visitors. Three diving schools and 32 diving sites are within a 90-min drive from Fortaleza

(Ana Flávia Pantalena, personal communication), which is famous for its seascapes and tropical marine biodiversity. As an alternative leisure activity that attracts Brazilian and international scuba divers with different levels of experience and interests, scuba diving is practiced around Fortaleza. The most visited diving site is the offshore MPA. Fortaleza's population has increased in the last 70 years to approximately 2.55 million. In the last 70 years, the landscape has transformed from that of a medium-sized city with mangroves, sand dunes, and Atlantic forests to a high-density urban area due to the increase of tourism (including scuba diving), services, and vertical urbanization. However, artisanal fishing remains in practice along the coast of Fortaleza (and in the MPA) for subsistence and generation of income for fishers. This region is known mainly for its lobster (*Panulirus* spp.) fishery, which has declined significantly in the last 50 years due to illegal fishing and overfishing [9,18].

The offshore MPA (PEMPRM) was conceived to cope with the chaotic and unsustainable situation of the state fisheries, protecting the artisanal fishers and restricting the use of high-impact fishing methods (e.g., fishing nets, bottom trawling, and underwater hunting). In this regard, a letter and manifest was issued in 1996 with the support of the local fishers, defending the creation of the park. The state environmental agency responded in 1997 with the elaboration of a law that created the PEMPRM and also set the rules for its use. According to the rules, underwater hunting or capture of any sort of marine organism was prohibited. The lobster fishery and the use of traps, long lines, or any artifact with the potential to degrade the environment were also banned. Artisanal fishery was allowed, but only with a single hook and line. Despite this legal protection, many unsustainable activities were reported in the area after 1997, such as lobster fishery and capture of ornamental fish. With the dual goals of protecting the environment and also the artisanal fishers, its classification by the state as a “park” is in contradiction to the SNUC federal law (9985/2000). According to the SNUC, “park” is a category for restricted protection (No-Take Zone), which means that resource exploitation is not allowed. It is worth noting that the PEMPRM was created three years before the SNUC, justifying the inadequacy of the category employed by the state. Nevertheless, the legal situation of the PEMPRM must be amended [18]. Therefore, it is an important area from the point of view of conflicts between fishing and diving in the South Atlantic waters and

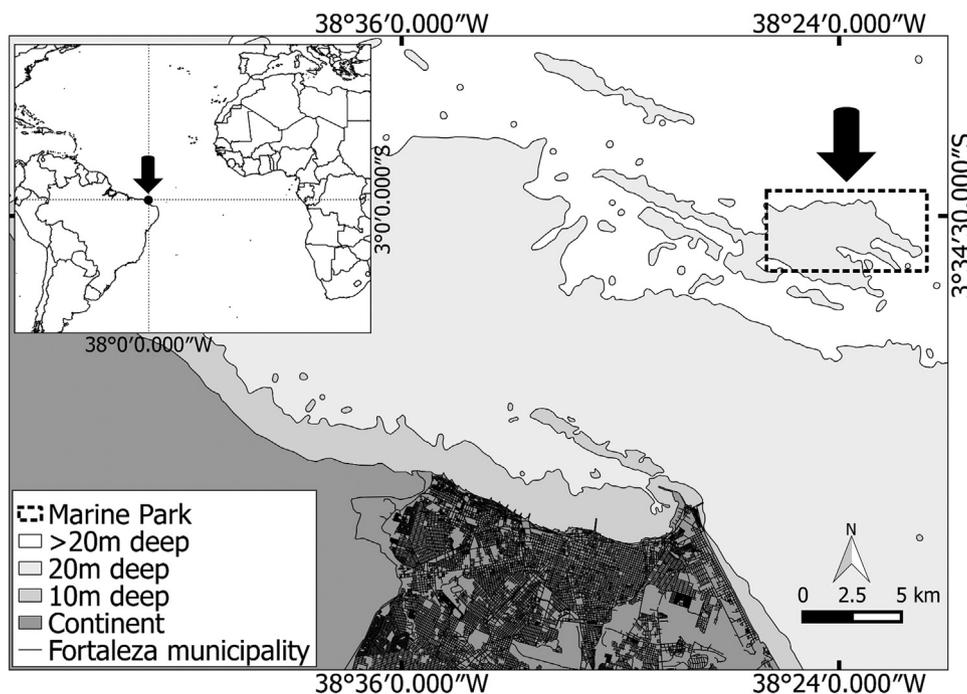


Fig. 1. – Location of offshore MPA “Parque Estadual Marinho da Pedra da Risca do Meio” (NE, Brazil).

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات