



Participatory mapping to elicit cultural coastal values for Marine Spatial Planning in a remote archipelago



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ABSTRACT

As Marine Spatial Planning (MSP) is taking off world-wide as a holistic approach to marine management, there has been a growing need for the inclusion of socio-economic factors in this process. Yet, producing spatial data for cultural values, in particular, remain a challenge because these values are abstract and difficult to extract and quantify. Here, we demonstrate a simple repeatable manual technique for mapping cultural coastal values using in-person interviews and Public Participation GIS (PPGIS) techniques. With 47 participants in the Falkland Islands labelling 745 areas of cultural coastal value, this technique gave rise to the identification of cultural coastal value hotspots across the islands in four categories: Natural Beauty, Recreation, Sense of Place and Cultural History. The locations of values were not affected by their distance to a settlement, nor were participants particularly likely to select areas close to their home. The resulting maps of coastal cultural values have been incorporated in the MSP framework and webGIS for the Falkland Islands, allowing for the integration of these social factors in the decision making processes.

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1. Introduction

Marine Spatial Planning (MSP) is a critical part of managing multiple marine activities to ensure sustainable economies, including valuable fisheries, healthy ecosystems and biodiversity, and clean seas and coasts for people to enjoy in the present and for the future. MSP initiatives are increasing globally as a result of modern targets to achieve an ecosystem-based approach to environmental management (Strickland-Munro et al., 2015; Pita et al., 2013). They have followed on from the early development of land use planning in terrestrial habitats, and are now widely regarded as being a useful tool for the management of our seas. From first advances in looking for a holistic ecosystem-based management of the coasts, efforts have grown to include the entire marine environment (Douve, 2008; Dominguez-Tejo et al., 2016; Merrie and Olsson, 2014). However, coastal zones remain the essential main point of contact between most humans and the marine environment. This is only more so in present day as population numbers living in coastal

areas are increasing (Long, 1990; Martinez et al., 2007).

There are growing interactions and interdependencies between humans and ecosystems (Strickland-Munro et al., 2015), including intangible yet impactful values such as cultural values. Over the last decade in particular, these interdependencies have been well discussed and studied in the literature of cultural ecosystem services (CES) (Milcu et al., 2013; Guerry et al., 2012; Millennium Ecosystem Assessment, 2005; Plieninger et al., 2015). CES is one category of a larger systematization of human benefits from ecosystems, popularized with the Millennium Ecosystem Assessment (2005). Not only do humans enjoy cultural benefits from ecosystems, they often impact the ecosystems in turn as a result of that exploitation. This is particularly true for coastal environments, where the use of CES can have negative impacts on the environment (Barbier, 2011). It is because of these types of relationships that including cultural factors in a process such as MSP has become important globally (Gee and Burkhard, 2010; Schaich et al., 2010).

There has been an increasing amount of attention paid to coastal CES in recent years, with place-based spatial management techniques, such as MSP, allowing their integration into ecosystem assessments, when their valuation is difficult (Jobsvogt et al., 2014). Cultural values as we define them in this study overlap with, but are not synonymous with CES. These are often deep-rooted and can

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define individuals or communities through places of attachment (Poe et al., 2013).

Cultural values include values which the local community either assigns to tangible things such as places and activities or holds for more abstract concepts based on opinions, such as intrinsic beauty, and ideas or notions of responsibility (Lockwood, 1999). Although features such as cliffs and shipwrecks, for instance, may be believed to hold values, these are rather the sources of the values that people hold. They may be significant to people for different reasons, such as personal memories or a recreational value. As such, these features are not the value itself, but are assigned values by people and therefore become a cultural value (Strickland-Munro et al., 2015). Thus, values are not mutually exclusive and a particular feature may be culturally valuable for its recreational possibilities as well as its natural beauty, and potentially even its role in cultural history for the same or different people. Cultural values only exist in the mind of members of a community within a defined period, and these features that are valued may change over time, from generation to generation or with changes in population composition due to, for instance, immigration, changing technology or lifestyles. Therefore, the best way to understand and map cultural values is through elicitation directly from local people.

Involving the local community is essential to gaining data and information on cultural values within an area (Fagerholm et al., 2012; Brown, 2012). Challenges in capturing such information have led to a spike in methodology, including Public Participatory Geographic Information Systems (PPGIS) (Fagerholm and Kayhko, 2009). PPGIS is a technique where the target audience is asked to identify features or attributes of personal value, with a given theme. PPGIS techniques range from high-tech techniques using software such as Google Maps or similar, requiring internet access, to low-tech techniques using pen and paper to create maps of subjective cultural values that are later digitised in a GIS. Through engaging with the general public, a greater understanding can be gained whilst determining which sites are important to individual members and for what reasons.

Though PPGIS is deemed highly useful in eliciting cultural ecosystem services, there is still limited evidence of the use of mapped results obtained for decision-making processes and spatial planning (Brown and Fagerholm, 2015). It is generally understood that the use of PPGIS and structured interviews may be highly useful in MSP to understand cultural values but also to identify these values in a bid to aid planning (Klain and Chan, 2012; Gee et al., 2017). Already, PPGIS has been successfully implemented to feed some social data into an approach in Australia for the management of Marine Protected Areas and tourism (Strickland-Munro et al., 2016a; Strickland-Munro et al., 2016b). The integration of PPGIS-elicited cultural values in analytical and decision-making stages of MSP has been uneven to date. There are few examples available and this highlights the need for further work in this field to enhance MSP efficiency (Brown and Fagerholm, 2015) (Böhnke-Henrichs et al., 2013).

The Falkland Islands are a remote archipelago in the South Atlantic, with an economy diversifying from livestock grazing and fishing to include ecotourism for its diverse coastal wildlife (including albatross, penguins and sea lions) and oil and gas exploration. Existing MSP work is underway in the Falkland Islands to identify areas where management or protection is needed, which has included mapping the marine and coastal areas, and establishing the presence of species, habitat types, and human activities. With knowledge of coastal and marine value lacking, preliminary work was done to establish a list of key coastal and marine values of Falkland Islanders (hereafter Islanders) during an MSP public information session gathering 20 local inhabitants and a workshop with local stakeholders in November 2014. The outcomes indicated

that the most important cultural values were related to natural beauty (coastal sceneries, wildlife), recreation (sailing and swimming), connection to home and history (shipwrecks) (Augé, 2015). To add cultural values alongside biophysical factors in the MSP process, and be taken into consideration by decision-makers, these cultural values needed to be made spatially-explicit. In the Falkland Islands, implementing PPGIS was hindered due to existing barriers of poor internet connectivity and remote settlements with difficult access throughout the archipelago. In this study, a manual in-person approach was used to elicit the sites of cultural values from Islanders. The aim was to map the coastal areas of highest values to the community across a representative range of the local population and demonstrate that cultural values can be effectively mapped using manual approaches to inform MSP in a remote archipelago.

2. Methodology

2.1. Study area

The Falkland Islands, a British Overseas Territory in the South Atlantic, is situated approximately 500 km east from the southern tip of South America and comprises of two main islands and over 700 smaller islands (Fig. 1). The population comprises 2932 inhabitants (FIG, 2012), living in the only town (Stanley, approximately 75% of the population), on the UK military base (Mont Pleasant Complex, 15% of population but mostly transient usually staying for 6 months) or at low density remote settlements across the two main and 12 smaller outlying islands (called 'camp', short for campo, which is Spanish for countryside). Due to predominantly coastal residency, the marine environment has played a significant role in shaping the Falkland Islands community throughout its history, from their colonisation in the 18th century to the present day. This coastal history includes industrial activities such as whaling and ship repair early on, with continued activities such as fishing and tourism. Almost all farms have coastlines, in part because of the value of seaweed and coastal flats for livestock feed, but wool was once always collected by boat as well as household provisions brought to 'camp' that way. The Falkland Islands are also well known for their marine wildlife, in particular the many breeding colonies of seabirds (penguins and albatross) and seals along its coastlines (Woods and Woods, 1997). The local inhabitants value this wildlife as it is part of their historical and cultural identity (Augé, 2015). As such, the community was expected to have a strong attachment to the coasts, ranging from familiar vistas to historical wrecks, linked to everyday life on the islands.

The study area was the coastal area of the Falkland Islands defined here as a 1-km buffer along the entire coastline of all islands, hence creating a coastal polygon extending 1 km inland and 1 km seaward of the coastline.

2.2. Data acquisition

Data were elicited in September 2015 from Falkland Islanders' long-term residents defined here as individuals over 18 years old, currently living on the islands and who have spent at least 5 years living on the islands in their life. Residents in Stanley were recruited using an advertisement in the local newspaper and word-of-mouth. Residents in remote settlements (351 residents in 90 homes) were invited to take part in the study by phone calls. All individuals interested in taking part of the study were first checked for eligibility criteria (age and number of years spent on the islands). Only those who fulfilled the criteria were invited for an interview. In total, 47 participants took part in the study out of 1708 estimated eligible participants (FIG, 2012). Participants were from

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