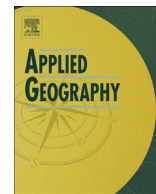




Contents lists available at ScienceDirect

## Applied Geography

journal homepage: [www.elsevier.com/locate/apgeog](http://www.elsevier.com/locate/apgeog)

## Marine resource management: Culture, livelihoods, and governance

Arielle Sarah Levine<sup>a, b, \*</sup>, Laurie Richmond<sup>c</sup>, David Lopez-Carr<sup>d</sup><sup>a</sup> Department of Geography, San Diego State University, 5500 Campanile Drive, San Diego, CA 92182-4493, USA<sup>b</sup> I.M. Systems Group contractor to NOAA Coral Reef Conservation Program, USA<sup>c</sup> Department of Environmental Science and Management, Humboldt State University, Arcata, CA 95521, USA<sup>d</sup> Department of Geography, U.C. Santa Barbara, Santa Barbara, CA 93106-4060, USA

## ARTICLE INFO

## Article history:

Available online xxx

## Keywords:

Marine management  
 Coastal management  
 Marine protected areas  
 GIS  
 Marine spatial planning  
 Human-environment dynamics

## ABSTRACT

The management of marine resources is a politically and culturally driven process, shaped by human livelihoods and perceptions, where notions of both space and place shape policies and decision-making in fundamental ways. An emerging sub-field within geography critically explores geographic aspects of marine resource management. However, there has been little work to fully articulate this field and to describe the contributions of geographic methodologies and lenses to understanding marine resource management processes. This special issue provides one of the first collections of geographic papers focused on the socio-cultural and socio-spatial dimensions of marine resource management, emphasizing research that has or can be applied to management and policy discussions. The papers in this issue cover critical topics within this emerging field, examining the combined influences of social, ecological, cultural, political, economic, historical, and geographic factors on how marine spaces and resources are used, perceived, and managed. Important themes include: emerging spatial approaches to marine resource management, human dimensions of marine protected areas, the roles of mapping and GIS, the integration of quantitative and qualitative data, and the varying ways in which marine spaces and places are conceptualized by marine resource users and managers. Issues of marine resource governance, community engagement, and vulnerability also play key roles in the future of marine resource management. The papers in this issue shed light on space, place, and human-environment interactions in coastal marine systems, making it clear that questions about stakeholder inclusion and representation, particularly in spatial forms, will continue to dominate the field for some time to come. Future research in this field will be fruitfully informed by core geographical heuristics of space, place, and human-environment dynamics.

© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Geography is paramount to coastal and marine resource management. Although marine resource management is often viewed as a field that is rooted in the biophysical sciences, the management of marine resources is fundamentally a politically and culturally driven process, shaped by human livelihoods and perceptions, where notions of both space and place shape policies and decision-making in fundamental ways. A wide range of approaches are currently used to manage marine resources. These include centralized approaches, such as ocean zoning, limiting ocean access through permits or the establishment of marine protected areas, regulating gear use or species harvested, or enforcing fish catch limits. These also include community-based approaches and informal or traditional management regimes, as well as a hybrid of techniques dependent on local social-ecological contexts.

While geographers have long examined physical coastal processes, a sub-field within geography has emerged more recently that critically explores geographic aspects of marine resource management. However, there has been little work to fully articulate this field and to describe the contributions of geographic methodologies and lenses. This special issue provides one of the first collections of geographic papers focused on the socio-cultural and socio-spatial dimensions of marine resource management, emphasizing research that has or can be applied to management and policy discussions. The papers in this issue cover critical topics within this emerging field, examining the combined influences of social, ecological, cultural, political, economic, historical, and geographic factors on how marine spaces and resources are used, perceived, and managed.

Increasingly, marine resource managers are embracing spatial approaches. Many management agencies now focus on ocean zoning and marine spatial planning (Agardy, 2010; Douvere, 2008), which emphasize the regulation of ocean spaces (such as protected

\* Corresponding author. Tel.: +1 619 594 5600.

E-mail address: [alevine@mail.sdsu.edu](mailto:alevine@mail.sdsu.edu) (A.S. Levine).

<http://dx.doi.org/10.1016/j.apgeog.2015.01.016>

0143-6228/© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

areas), as opposed to ocean uses (such as catch or gear). There is also an increasing push to delimit spaces in the ocean for energy creation – whether it be from off-shore wind, wave, or offshore oil drilling – in ways that do not conflict with other ocean uses (Conway et al. 2010). These approaches require that managers have access to spatial information. While biophysical information regarding the ocean environment is often available, spatial information about human uses of and connections to marine places is generally limited. Given this need for improved spatial information and understanding, the field of geography can provide critical insight towards documenting and theorizing marine spaces to better inform management strategies.

Marine Protected Areas (MPAs), for instance, are a particularly central spatial management tool that has received increasing international emphasis over the past few decades, with an international goal of 10% ocean coverage by 2020 established by the Convention on Biodiversity (<http://www.cbd.int/sp/targets/>). MPAs have been promoted to conserve biodiversity and to safeguard sustainable fish harvests (Lubchenco et al., 2003; Toropova et al., 2010). Yet MPAs have not always been successful when applied without appropriate stakeholder participation (Mascia et al., 2010; McCay & Jones, 2011). Research is increasingly demonstrating that social factors are key determinants of MPA success (Rossiter & Levine, 2014). Human engagement in MPAs presents a fertile research opportunity for geographers, as spatial approaches to analysis present an opportunity to combine human dimensions with ecological research for a more integrated approach to research.

Given the proliferation of efforts to develop marine protected areas throughout the globe, many papers in this special issue deal specifically with the human dimensions of MPA planning and with the resulting outcomes for marine-dependent communities following the development of MPAs. Richmond and Kotowicz (in this issue), for instance, examine the development of a large marine protected area in the Commonwealth of the Northern Mariana Islands (CNMI). They gathered oral histories to understand the cultural and economic connections that residents of the CNMI have with the protected waters and to consider the potential cultural impacts that the implementation of the MPA could have on the community. Similarly, Guenther et al. (in this issue) examine how the implementation of an MPA in the Channel Islands of California has changed the behavior of lobster fishermen, finding that their fishing effort is redirected in ways that were not expected based on a perception that fishermen would simply “fish the line” after MPAs were established. Chen and Lopez-Carr (in this issue) develop an index of sea urchin fishermen’s vulnerability to the impacts of MPA establishment in California, examining how this varies across space. Levine and Feinholz (in this issue), Rossiter et al. (in this issue), and Quimby (in this issue) each advocate for an improved understanding of actual human perceptions, behavior, and use of marine spaces before management measures (such as MPAs) are implemented.

Documenting and understanding the complex and nuanced ways that humans interact with, relate to, and rely on marine spaces and places is a cross-cutting theme of the articles in this issue. Mapping and GIS present one useful method for understanding spatial human use patterns, as well as for obtaining a sociocultural understanding of marine and coastal environments. While GIS is commonly used within the field of geography to illustrate spatial patterns, mapping marine spaces presents a unique set of challenges. Marine spaces are dynamic, and remotely sensed data cannot be easily used to document marine habitat, changes in resource status, or ocean uses. Levine and Feinholz (in this issue) posit that in data poor contexts (which is often the case for marine resources), resource users represent the best

source of data. Their work uses participatory mapping to engage local resource users and residents to document the range of human uses and activities taking place in areas deemed critical for coral reef management in Hawaii. Sullivan et al. (in this issue) also draw directly from resource user knowledge, combining information from existing GIS layers with information gathered from stakeholder interviews and focus groups to generate a more complete understanding of the complexity of marine space, diverse uses of the marine environment, and potential conflicts with proposed offshore energy development in coastal areas of the US mainland. Similarly, Guenther et al. (in this issue) incorporate information derived from fishermen interviews to better understand the reasons behind unexpected changes in use patterns observed in GIS data derived from fishermen’s catch reports before and after the establishment of MPAs in the Channel Islands.

Several authors in this issue take a novel approach of combining pre-existing or quantitatively derived data with more qualitative information obtained directly from marine resource users. Their work represents an effort to address an emergent tension in the field of marine resource management. A host of geographers, anthropologists, and social scientists critique contemporary fisheries management for its overreliance on technocratic and quantitative information that may oversimplify, misrepresent, and in some cases ignore human relationships to the marine environment (Campbell et al., 2009; Johannes, 1978; Nader, 1996; St. Martin, 2006, St Martin & Hall-Arber 2008). Yet many others are simultaneously developing methodologies and products that seek to represent human connections to the marine environment in technical and quantitative forms that can be integrated into current management practices (Kittinger et al. 2014; Klein et al. 2008; McLain et al. 2013). Levine and Feinholz (in this issue), Sullivan et al. (in this issue), and Guenther et al. (in this issue) all use methodologies to represent human connections to the environment in GIS-ready spatial formats that are easily combined with data collected on biophysical aspects of the marine realm. Chen and Lopez-Carr (in this issue) use a quantitative index to assess fishermen’s vulnerability in ways that can be also be easily incorporated into technocratic approaches to management.

While these approaches remain useful, many aspects of marine resource management prove difficult to quantify. For example, Beitel (in this issue) statistically analyzes return rates to both open access and commonly managed fishing areas in Costa Rica, but concludes that understanding resource use patterns is shaped by more than a simple optimization of returns. Marine spaces are socially produced, and many scholars document a culture of mutual respect and avoidance that can shape natural resource use patterns (Berkes et al., 1989; McCay & Acheson, 1990; Singleton, 1999; Woodhatch & Crean, 1999). Both Beitel (in this issue) and Quimby (in this issue) find an unspoken moral code and informal rules-in-use that must also be understood in order to predict fishermen behavior and determine appropriate management actions. Their work, as well as that of Barnett and Eakin (in this issue), highlights the importance of individual relationships and decision-making in understanding ocean use.

While many authors in this issue document and communicate empirical information about the use of marine space, others focus more theoretically on the ways that marine space is conceptualized by managers and researchers. Rossiter et al. (in this issue), draw on new materialist theory to critique the way that United States fisheries legislation and management regimes conceptualize and manage marine space, arguing that fisheries managers oversimplify human uses of and connections to marine space, failing to account for the complex linkages and interactions between the human and nonhuman elements of what they refer to as “marine assemblages”. Both Rossiter et al. (in this issue) and Levine and Feinholz (in this

Download English Version:

<https://daneshyari.com/en/article/6538570>

Download Persian Version:

<https://daneshyari.com/article/6538570>

[Daneshyari.com](https://daneshyari.com)