



The fisherly imagination: The promise of geographical approaches to marine management



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ABSTRACT

The management of the sea has increased exponentially in the last half-century, and different academic disciplines have been vital in shaping this management. Human geography, despite its explicit focus on the human–environment nexus, has so far had little impact on human relations with the sea. Based on empirical research conducted in England and Scotland, we argue that human geography is uniquely placed to offer effective solutions to marine resource management problems, and that geographers have the potential to offer key insights into how human populations can best interact with the living seas. Three of the most important current scholarly ‘imaginings’ of the sea, and the policies they inform (economics and market-based management, conservation biology and area based protection, and anthropology and community management), are outlined. A potential ‘geographical imagination’ of the sea, drawing on key themes in contemporary scholarship is then presented, and grounded in empirical research. It is argued that human–ocean relations should be a key feature of geographical research agendas.

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1. Introduction

The management of the sea is a hot topic in environmental policy, attracting attention from international and national governance bodies, non-governmental organisations, the global media and the wider public. Despite this political spotlight, geography – the archetypal academic discipline for dealing with human–environment relations – is surprisingly quiet on human–sea relationships and the exploitation of oceanic life.

This paper suggests how geography might play a stronger role in marine policy, particularly in relation to the exploitation of oceanic creatures. The marine management landscape has been distinctly shaped by various academic disciplines, and this multi-disciplinary influence can be seen in three popular approaches currently used to manage the ocean: market-based fisheries management (based on bioeconomics), area-based conservation (based on conservation biology) and community management (based on anthropology).

The disparate and piecemeal application of these disciplines in marine management has been criticised by [Degnbol et al. \(2006\)](#) who call for the development of a more integrated policy approach. The development of integrated management systems that bring together economic, environmental and social considerations, and take into account political commitments to ecosystemic and mixed-use marine spatial planning concerns, is currently a priority for governments worldwide. Based on research conducted with fishers in England and Scotland, we consider human geography – an inherently interdisciplinary social science with a focus on the human–environment nexus – to be particularly well placed to inform this integrated development.

This paper attempts a call-to-arms for human geographers to engage more readily with the saltwater environments that make up so much of our living earth. We begin by outlining three major trends in the marine management landscape, and the role of academic disciplines in informing these (Section 2). Section three presents the particular potential of geography for future marine management, outlining existing geographical work on the sea. This argument is supported by a presentation of original empirical research in Section 4. This research draws on the geographical relationships between fishers and the sea. The potential for a solutions-based, applied geographical approach to marine management is then explored in Section 5.

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2. Academic disciplines and the contemporary marine management landscape

A number of methods are currently used to manage the sea. These include marine spatial planning, marine licensing limitations, effort restrictions for fishers, eco-labelling of marine products and ecosystem-based management. Of these, this paper will focus on three central trends in contemporary policy: market-based management, area-based protection (marine protected areas) and community management. In this section, we present a brief overview of the history and application of these approaches, and give a typology of their relationship to three academic disciplines: economics, conservation biology and anthropology.

2.1. The economic solution: market-based management

The most common methodology used worldwide for fisheries management is single species biomass forecasting. This uses mathematical modelling to estimate the amount of any given fish species in the sea, the results of which are used by governments to limit the total allowable catch (TAC). Governments may choose to do this however they wish, but The United Nations Convention on the Law of the Sea (1982) mandates signatories to set catch levels using Maximum Sustainable Yield (MSY). Although often considered a biological, conservation-focused approach, MSY management is deeply rooted in economics. As Jennifer Hubbard writes in her extensive history of the tool, MSY explicitly aims to achieve the highest possible economic returns over time (Hubbard, 2014).

With an objective of MSY, a common method of management (managing about 500 species in 40 countries globally) is to grant individuals or groups an exclusive right (or property right) to a potential share of the catch (see [Environmental Defense Fund, 2015](#)). Secure property rights have been advocated by economists for decades (Scott, 1955). Economic logic further dictates that for maximum efficiency these property rights should be transferable (Christy, 1973). Transferable systems are the most popular form of catch-share management, with around 25% of global fish catches estimated to take place within a market-based system (Arnason, 2012).

Market-based systems work by apportioning a set of tradable harvest rights to companies, individuals, cooperatives or other legal entities. In a market-based system, the right to catch up to the TAC is split into commensurable units (usually based on weight) that can be bought or sold. These saleable units are usually referred to as 'catch shares', 'quota', or 'individual transferable (or tradable) quota' with the common acronym "ITQ" (Arnason, 2012).

The first market-based management schemes were introduced in Iceland, the Netherlands and Canada in the 1970s (Chu, 2009). The seemingly immediate successes of these has since led to the widespread adoption of market-based schemes, which are now used in 158 large-scale fisheries worldwide (Lynham, 2014). Numerous celebratory articles advocating market-based management have been published (e.g. Costello et al., 2008; Pascoe, 2006).

Market-based management is explicitly based on economic principles. Although economics had had a profound effect on fisheries biology since its foundation in the 19th century (Hubbard, 2014), the idea of using the market to control catches was first proposed in the 1950s. This approach came through the new discipline of bioeconomics, which was formally established by economists working on theorising the optimum exploitation of fish (Gordon, 1954; Scott, 1955).

These bioeconomists argued that equilibrium could be achieved where the 'perfect' or optimal amount of fish – in terms of

long-term production yields – could be caught. Importantly, this amount was not 'zero': this was an economic, rather than a conservation measure. Under an open-access regime, the economists argued, an erroneous equilibrium would be reached, whereby the resource (and, more importantly, its rent) would be dissipated. It was then argued that the only way to avoid this dissipation was through attributing property rights and sole ownership (Scott, 1955). In this way, the tragedy of the commons (Hardin, 1968) – in which a theoretically unlimited number of fishers would chase a limited number of fish with no incentive to limit individual harvest – could be avoided.

Mirroring wider trends in approaches to nature through the 1960s and 1970s, economists continued to develop this mathematical, theoretical modelling of fisheries, with private property increasingly presented as the solution (Munro, 1992). In 1973, Francis Christy introduced the idea of ITQ: a tradable currency of fishing rights. These economic ideas were presented shortly before nations worldwide began looking for ways to manage their newly enclosed fish-stocks following the introduction of national exclusive economics zones under the United Nations Convention on the Law of the Sea (UNCLOS, in 1982).

Throughout its history, bioeconomics has been a specifically applied field, with economists not only presenting theories for the optimal management of fisheries, but also vocally advocating for these theories to be applied (Wilens, 2000). The explosion of market-based management in oceans around the world over the last forty years can be traced directly to the advocacy work of economists, and the development of natural resource economics according to neoclassical and neoliberal theory (Harvey, 2005). The US state department also exerted significant foreign policy pressure in favour of the adoption of bioeconomic principles internationally (Finley, 2011).

Advocates of market-based fisheries management argue that it is uniquely effective in conservation terms, increasing fish stocks and reversing the tendency towards fishery collapse; that the market is an efficient, responsive allocation tool; and that the ownership rights over potential fish catches foster stewardship behaviour among fishers (Pearse, 1992). Critics point to the consolidation of fishing rights ownership in a small number of hands, which often means devastation for traditional coastal communities. These social effects have led to intense criticism of market-based management approaches from anthropologists, sociologists and human geographers (Carothers and Chambers, 2012). The legality of creating property rights for – and thus effectively privatising – the wildlife harvested from the sea has also been questioned, both by academics and in the courts (see UNHRC CCPR/C/91/D/1306/2004; R (UKAFPO) v Secretary of State for Environment, Food and Rural Affairs [2013] EWHC 1959).

Furthermore, many of the tenets of market-based fisheries management rest on economic assumptions that are purely theoretical and either remain untested or are not played out in a fisheries context. One significant assumption is that having a property right over a resource increases fisher stewardship and protection of that resource. Empirical studies have cast doubt on the applicability of this argument in practice (Gilmour et al., 2012; van Putten et al., 2014).

2.2. The conservation biologist's solution: area-based conservation

Area-based marine conservation has similarly proliferated in recent years, with an increasing number of marine protected areas being introduced worldwide (IUCN and UNEP, 2013). Marine area-based conservation is similar to terrestrial area-based conservation in that a given area of sea is delineated as a protected area and certain activities (usually, but not limited to, the harvesting of wild species) are prohibited or highly circumscribed in order to

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