



Measuring what we value: The utility of mixed methods approaches for incorporating values into marine social-ecological system management



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ABSTRACT

Recent shifts towards ecosystem-based management and other holistic and participatory forms of oceans governance and management have come with demands for ways to better incorporate social data into decision-making processes such as integrated ecosystem assessments. This includes information related to a wide range of values associated with different aspects of marine social-ecological systems. This paper addresses that demand by first discussing various notions of value in the literature, and then presenting two case studies from British Columbia, Canada that illuminate some of the opportunities and complexities of using a mix of quantitative and qualitative approaches to bear on the challenge. Findings suggest that values are diverse and are contextually dependent, varying at small scales. Findings further suggest that values are hierarchically arranged and grouped differently by individuals into what might be called perspectives. Finally, the findings highlight that mixed-methods approaches featuring qualitative and quantitative elements may provide a step towards resolving tensions between, on one the one hand, a need to distil complex systems into observable, measurable indicators where the inevitable tradeoffs involved in resource management can be articulated, weighed, and on the other hand, a sense that characterizing the broad range of values that are relevant in shaping attitudes and conceptions of “what should be” in marine systems requires holistic thinking and attention to scale, context, relationality, subjectivity and rich detail.

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1. Introduction

One of the recent trends in oceans and coastal zone management has been a shift away from the management of single species and single sectors towards more holistic approaches. Various described as ecosystem-based management (or by a host of allied terms) these approaches usually share an interest in incorporating the interests and objectives of a wider range of actors in more inclusive and participatory governance and management processes [8,14,15,39]. Associated with this move has been an increasing interest in finding ways to better incorporate social data into decision-making processes [4,24,28,29]. This includes developing approaches to characterize and (sometimes) measure a range of stakeholder values with the goal of incorporating these values into decision-making processes, from goal setting, to the development of indicators and other metrics, to evaluation

[23,57,59]. This is central, for example, to emerging integrated ecosystem assessment processes [30,41]. This paper addresses this interest by presenting two case studies from British Columbia that illuminate some of the opportunities and complexities of bringing a mix of quantitative and qualitative approaches to bear on this challenge.

Notions of value in the literature are diverse. For example, one strong thread in recent coastal and ocean management literature relates to the identification and valuation of ecosystem services provided by ocean and coastal systems [10,18,26,32]. In many cases, the emphasis has been on quantification and/or the assignment of monetary value to particular services (or bundles thereof) with the goal of creating a ‘common currency’ whereby trade-offs among alternative management decisions can more easily be contemplated and decided upon [1,5,34,36,37]. At the same time, some authors have pointed out that quantifying/monetizing certain services (particularly cultural and social ones) has been difficult, and have pushed the conversation towards finding ways to deal with this complex challenge [14,15,25,27,47].

Moreover, emerging dialogues about values are not limited to

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the assignment of value to ecosystem services. Several authors, for example, have pointed to the distinction between ‘held’ and ‘assigned’ values [12,15]. Held values refer to underlying ideals while assigned values refer to the relative importance of things, the values assigned to things, or preferences for particular actions or consequences. Held values are variably described, but broadly correspond to what matters to people or to their conceptions of ‘the good’. Held values can refer, for example, to preferred modes of human conduct, desired end states, or to certain qualities [12,14,15]. Held values are relatively few in number, are often ordered in terms of the relative weights given to each [49] and both guide action and contextually influence the relative values that we assign to certain actions or to the consequences of those actions.

Values have also been discussed in relationship to other critical concepts such as attitudes and beliefs [12,14,15,43,53].¹ Stern and Dietz [53] offer some helpful insights in understanding attitudes, suggesting that attitudes are based on beliefs about how the attitude ‘object’ affects the sets of people or things that people value (see also [20,22,54]). While the relationship between values and attitudes is complex and should not be thought of in a linear way, the body of literature associated with the New Ecological Paradigm is helpful in providing one way of conceptually connecting – and empirically testing – the relationship between values and attitudes [21,51]. Best and Mayerl [9] see values as cognitive antecedents of NEP, and NEP as the antecedent of environmental attitudes [9]. Here, particular environmental attitudes are mediated or filtered by beliefs or worldview about the biosphere and effects of human action on it. While such a worldview is a complex psycho-social construct that cannot be defined simply or measured holistically, aspects have been convincingly characterized by the NEP scale, which measures broad beliefs about the Earth and human–environment relations [21]. Individuals aligned with this paradigm believe that human survival is dependent on the health of the global environment such that human activity and the biosphere are interconnected [55]. Environmental concerns result from the degree to which this interconnection between the self and nature is recognized [48].

An emerging literature on defining and measuring well-being also informs this discussion. In a parallel to discussions about the valuation of cultural/social services, and broadening our notions about which values are important to consider, a number of authors have been developing the concept of well-being to help move beyond using economic and/or purely quantifiable metrics to characterize the human–environment relationship and to expand the types of considerations that should be taken into account in making management decisions [11,60]. At a conceptual level, notions of well-being and values are also linked: we value what we perceive to be contributing to our well-being. Some have argued that more socially defined conceptions of well-being are needed, noting that what contributes to well-being is contextually dependent and that *subjective* evaluations of objective circumstances are socially and culturally mediated by the local contexts in which individuals are embedded, and by the relationships that they have ([2,16,17]). Material and relational dimensions of well-being are ultimately understood through the subjective dimension and the values that underwrite it. Incorporating a subjective dimension into understanding well-being helps to better illuminate what individuals value, the dynamics of coastal communities, and choices that they make with respect to marine and coastal resources.

A particular area of interest has been how to incorporate holistic thinking about values and/or well-being into management

processes. For example, the National Oceanic and Atmospheric Administration's (NOAA) Integrated Ecosystem Assessment (IEA) program suggests that the goal of EBM should be improving human well-being, and that EBM should reflect values, goals and desires when evaluating management strategies [41]. The importance of incorporating values is apparent in several stages of the suggested IEA implementation process. For example, the first step in NOAA's IEA is to ‘define EBM goals and targets’ and Levin et al. [31] highlight the importance of process, considering scope, and refer to a framework developed by Sainsbury and Sumaila [45] for developing an ecosystem vision (and/or objectives) that articulates ‘the way things should be’. The second step in the NOAA IEA process is to develop indicators, which Levin et al. [31] see as involving quantitative measures of key system attributes that serve as ‘effective measures of the many ecosystem services that concern policy-makers and stakeholders...’.

Though not conducted as part of a management process per se, the design of the two projects described in this article was guided by a desire to employ methods related to the characterization of values that could be of use in terms of management in the area, and that would deliver insights that would be applicable elsewhere. We were also interested in providing empirical results, rather than another largely conceptual ‘desktop’ treatment of values. The projects differed in the ways that values were conceptualized and approached, but were linked geographically and by the use of methods that featured both qualitative and quantitative elements. Drawing on the concept of well-being, the first project explored what local residents value about the social-ecological system in which they live (Baynes Sound), how the presence of a shellfish aquaculture industry is perceived to impact their sense of well-being, overall attitudes toward that industry, and what sorts of individual attributes, including NEP scores, might be correlated with those attitudes. As an emerging industry often touted as a source of economic opportunity and a ‘green alternative’ to other modes of protein production [42,50,58], understanding the impacts of shellfish aquaculture on local communities is of growing importance.

Recognizing a growing need to consider the production of seafood more holistically, the second project broadened the perspective beyond a single sector and characterized the wide-ranging values that members of a nearby community (Campbell River) hold related to the production, consumption and management of seafood. There were several key rationales for focusing on the seafood sector in a single community. First, the project sought to move beyond the specific values and actors associated with/assigned to particular activities or services (such as fishing or fish) in order to facilitate capture of a wider range of values, while still maintaining a distinct ‘touchstone’ (seafood) to help orient discussions about those values. Second, the project acknowledged the blurring of lines between ‘wild capture’ and farming and the rising importance of aquaculture in sea-protein production overall, and that the seafood of the future may come from different places and modes of production than it does now [35]. Third, the project assumed that the values associated with seafood may underlie attitudes about activities in traditional sectors (aquaculture, fishing, etc.) and the management actions that regulate those activities.

2. Methods and study sites

As noted this article presents an overview of key results from two case studies. As such, methods and study descriptions are divided into two sections below.

2.1. Case Study 1: the impacts of shellfish aquaculture production on

¹ Many researchers have also explored the relationships between values and behaviors [6,43,49,51,52], though this is not the focus of this study.

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