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A holistic framework for identifying human wellbeing indicators for marine policy

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ABSTRACT

Marine managers increasingly recognize the interconnections between management strategies, ocean health and human wellbeing. While recent trends in marine policy seek to consider the effects of natural resource management on human wellbeing, most resource management agencies have limited indicators of human elements. Part of the difficulty in addressing human wellbeing is that there is no consensus on its definition nor how it can be influenced by marine health. To address this gap, this paper describes a framework that identifies six domains of human wellbeing that are affected by the status of the environment: physical, psychological, cultural, social, economic, and governance. The framework is then applied in two case studies for developing social attributes and indicators from the Pacific Northwest of the United States. The reactions to the framework and examples of using it to inform marine policy are included, demonstrating that it is a broadly useful, scientifically-grounded structure for selecting environmentally related human wellbeing indicators.

1. Introduction

Since the publication of the Millenium Ecosystem Assessment (MA) in 2005 [37], greater attention has been given to the effect of environmental health on human wellbeing (HWB). This assessment argued that healthy ecosystems support the ability of humans to survive and thrive, and that understanding the interactions between HWB and ecosystem health are critical to promoting a healthy planet. Not only do healthy environments support humans, but the constant search for improved wellbeing influences the way people engage with the environment [14]. Identifying and monitoring the specific linkages between the environment and humans allows for more accurate assessments of socially appropriate environmental management strategies and the impacts of existing strategies on HWB.

The spread of the MA framework has resulted in resource management, ecosystem recovery, and conservation organizations across the globe striving to incorporate HWB into their programs in a variety of ways [9]. For example, the U.S. Environmental Protection Agency developed the EnviroAtlas to promote planning that takes into consideration the public health impacts of nature [54]. To enhance internal programming, The Nature Conservancy recently developed a human dimensions program to understand HWB within their conservation programs [32]. And regionally, the Puget Sound Partnership, a Washington State agency coordinating the recovery of Puget Sound, included two human-focused goals – human health and human wellbeing – within its suite of six ecosystem recovery goals [40]. The recognition of HWB as a goal for environmental management is an important first step to addressing issues associated with social-ecological systems [17]. In practice, however, there is no framework that explicitly supports the incorporation of understanding about HWB-environmental linkages in marine policy planning and decision-making.

To describe the links between the marine environment and HWB, this paper begins with a general review of the academic research on human wellbeing. Within the social sciences, HWB has been found to be influenced by many aspects of people's everyday lives, including material wellbeing, healthy relationships with family and friends, emotional and physical health, productive work environments, and how people feel about their personal safety [19,42]. Subjective wellbeing, which is defined by each individual, is often measured with life satisfaction or happiness surveys that ask people to rank their personal happiness, values, or preferences

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[19]. Objective wellbeing, which is defined by others, has traditionally been measured by indices such as the Gross Domestic Product (GDP) and the Human Development Index [19]. For the most part, HWB researchers agree that a reliance on either subjective or objective definitions is inadequate and that appropriate definitions and measures of HWB must include both [19].

There is a large body of research covering both subjective and objective determinants of HWB in fields such as psychology, sociology, economics, public health, and anthropology [18,19,22]. Rath and Harter [42], for example, summarized data from 150 countries to describe five universal determinants of wellbeing: career, social, financial, physical and community. They explain that a reliance on any one of these over the others would result in personal dissatisfaction, whereas having a balance of all determines overall HWB. Some countries have specifically set out to measure a broader concept of HWB as an indicator of effective policies. Canada's Index of Wellbeing (CIW), for example, measures eight domains that have been proven to correlate to subjective HWB: community vitality, democratic engagement, education, environment, healthy populations, leisure and culture, living standards, and time use [11]. Bhutan's Gross National Happiness index (GNH) was derived from Canada's index but modified slightly for the Bhutanese context. Its domains are: psychological wellbeing, health, time use, education, cultural diversity and resilience, good governance, community vitality, ecological diversity and resilience, and living standards [52]. The GNH index has since been applied to countries across the globe to provide a different perspective to HWB than the traditional measure of GDP that is focused on economic growth.

While the determinants and indices mentioned above are critical for identifying the overall predictors of HWB, they are usually out of the purview of environmental management agencies. Even so, marine managers and policymakers can benefit from an understanding of wellbeing research to identify scientifically-supported indicators of HWB that may be affected by ocean health [38]. Such an understanding can enable the selection of HWB indicators that are likely to play a critical role in the overall social-ecological system, thus saving time, money, and increasing the likelihood for broadly-supported policies. This article responds to the need for better incorporation of HWB considerations in marine policy by creating a broad HWB framework based on current understanding about the complex linkages between human wellbeing and environmental management. An overview of this current understanding is first provided, followed by a description of the HWB framework and examples of how this framework was used to select HWB indicators related to environmental management in two contexts in the U.S. Pacific Northwest. Finally, results from application of the framework and areas for future work are discussed.

2. A human wellbeing framework for environmental management

Similar to the way natural scientists often use a hierarchical framework to describe ecosystem components that represent a biophysical system's overall health (e.g. [27,53]), social scientists can use a hierarchical framework, including domains, attributes and indicators, to organize dimensions of HWB related to environmental health. Domains and attributes are concepts that allow us to understand and broadly categorize information in a way that is useful for a specific purposes, i.e. organizing information to support environmental management decisions. At the highest level, domains describe broad categories of HWB (e.g. psychological health). Within each domain, a set of attributes (e.g. stress reduction) further define the domain. Specific indicators, the actual measures that communicate information about the status and trends in HWB for a given system (e.g. frequency of experiencing reduced stressed after being in nature), are defined for each attribute. While there has been no one agreed upon set of domains and attributes to describe HWB, there is substantial overlap in many efforts to do so, as demonstrated in the similarities among the Rath and Harter [42], CIW and GNH frameworks [25,50]. These efforts informed the development of a framework for HWB related to the marine environment that can support the selection of indicators to be used in ocean management.

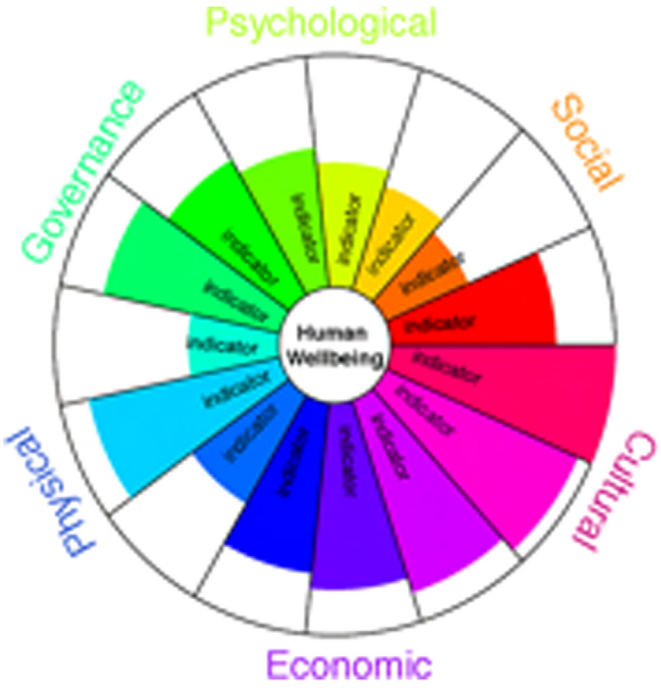

Fig. 1. Visual representation of Human Wellbeing domains for marine policy.

The HWB framework presented here highlights six domains of HWB: physical, psychological, cultural, social, economic, and governance (Fig. 1). The domains consider the breadth and complexity of HWB related to environmental health, as informed by literature review and regional input from tribal community members, environmental managers and scientists. These six domains incorporate most of the domains from the non-environmentally specific frameworks of Gallup, the CIW, and the GNH. They also line up with social science disciplines, making them fairly intuitive and thus easily understood by the public, environmental managers, and scientists alike.

Each of the six domains is described below with example attributes and indicators. Similar to biophysical systems, HWB is complex and no single component exists entirely independent of another component. As such, each of the HWB domains has one or many attributes that are related to other domains in multiple ways, making simple, uni-directional relationships between environmental components and a single HWB domain difficult to describe. That said, the proposed HWB framework is intended to encourage consideration of diverse components of HWB by providing a structure for thinking about their relationship to environmental health and management decisions based on the best available social science. The degree of HWB complexity incorporated in any environmental management effort will be determined by the degree to which HWB is affected by, and has the potential to influence, management decisions.