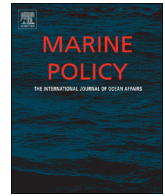




ELSEVIER

Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol

Harmful algal blooms: the impacts on cultural ecosystem services and human well-being in a case study setting, Cornwall, UK

Cheryl Willis^{a,*}, Eleni Papathanasopoulou^b, Duncan Russel^a, Yuri Artioli^b

^a University of Exeter, College of Social Sciences and International Studies, Rennes Drive, Exeter EX4 4RJ, UK

^b Plymouth Marine Laboratory, Prospect Place, The Hoe, Plymouth PL1 3DH, UK

ARTICLE INFO

Keywords:

HABs
Cultural ecosystem services
Coastal
Marine
Well-being

ABSTRACT

Whilst harmful algal blooms (HABs) are a natural phenomenon, the impacts of these events can have devastating impacts on human societies. To date, these have largely been studied with reference to economic and health impacts, which can be significant and have impact at both individual and community levels. This paper builds on previous work and addresses recent calls to more fully understand the nuanced human impacts of HABs. Using a framework of cultural ecosystem services, the paper explores how HABs can impact human well-being through disruptions to therapeutic and inspirational opportunities in the natural environment, opportunities for recreation, aesthetic enjoyment, and losses to traditional ways of life, sense of place and collective identity. A snapshot is gleaned into the lived realities of six local residents of St Austell bay, Cornwall, UK, an area frequently affected by HABs via interviews which illustrate how the impacts of HABs can be felt at a much deeper level than are revealed through economic and health analysis. Whilst it is acknowledged the sample size here is limited, the findings nonetheless point to some of the key impacts of HABs in this specific setting and indicate a need for continued research to incorporate local experiences into decisions about how to respond to environmental shocks and what safeguards could help to buffer against the worst of these. It is argued that locally-directed management policies can be developed at scales more appropriate to coastal communities to better respond to their specific needs when considering HAB impacts.

1. Introduction

The marine environment provides a range of ecosystem services, or benefits for people as defined by the Millennium Ecosystem Assessment (MEA [33]), which are important, if not essential, for human well-being. Benefits include the provision of protein food sources, biomedicines and economic benefits from tourism and fisheries (MEA [33], [17]). Other important, and less tangible benefits include a deep spiritual connection to the sea, a sense of inspiration, stress relief, feelings of being uplifted and invigorated and a sense of well-being that comes from simply knowing the sea exists and will continue to exist for future generations [19,47,48]. Whilst the literature around these marine ecosystem services has burgeoned in recent years (see [12] for a history), understandings of environmental dis-benefits (or dis-services) are equally important to gain a holistic picture of how nature impacts on human societies, and these are attracting increased academic attention [39,40,46]. Harmful algal blooms (HABs) provide an example and the context for exploring these dis-benefits in more depth. HABs occur when certain species of phytoplankton increase in abundance and

cause negative impacts on human uses of marine ecosystem services [27]. Specifically, these HABs can have direct negative impacts on human well-being, mainly through their impact on fisheries, tourism and recreation, as well as on human health through exposure to biotoxins through inhalation, direct contact or through ingestion through the food chain [6]. Whilst the ecological, economic and health impacts typically provide the focus for the HAB literature [14,23,35] it is argued here that disruptions to the wider range of benefits to human well-being can be significant for both individuals and for communities and thus deserve more focussed attention.

This may be especially important given recent arguments that HABs have been increasing in frequency, magnitude and location over the last two decades [1], potentially having wide ranging impacts on a variety of ecosystem services and human well-being. With expanding human populations, particularly in coastal areas, mitigating the impacts of HABs is becoming recognised as a more pressing economic and public health need. This paper aims to extend discussions to include considerations of the more nuanced and contextual human impacts of HABs. It sets discussions within the context of a cultural ecosystem

* Corresponding author. Present address: Natural England, Nobel House, 17 Smith Square, London SW1P 3JR, UK.

E-mail addresses: Cheryl.willis@naturalengland.org.uk (C. Willis), elpa@pml.ac.uk (E. Papathanasopoulou), D.J.Russel@exeter.ac.uk (D. Russel), yuti@pml.ac.uk (Y. Artioli).

<https://doi.org/10.1016/j.marpol.2018.06.002>

Received 25 May 2018; Accepted 2 June 2018

0308-597X/© 2018 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

services framework which explicitly accounts for the intangible benefits of nature and the role they play in contributing to human well-being. Cultural ecosystem services have been described by the Millennium Ecosystem Assessment [33] as ‘non-material’ benefits and include the spiritual, recreational inspirational and aesthetic qualities of nature. Despite considerable advances in techniques to measure and account for these qualities [8,9,41,43], they remain notably elusive in the literature around impacts of environmental shocks such as HAB events [5].

Despite a growing weight of evidence around the interconnections between the sea and human health and well-being, and the growing understanding of the role that cultural ecosystem services play in this, ([16,17]; MEA, 2003), there is less clear evidence around the impacts that disruptions to these services might have for the well-being of those who experience them. Moreover, despite a small amount of HAB literature calling for further exploration of these more nuanced human effects of HABs on people and their well-being, [31,5,6], there remains a paucity of studies in this area. It is important that this gap is filled as the link between the quality of the marine environment and the well-being of coastal communities is an emerging policy concern. The UK Marine Policy Statement [20], for example, frequently mentions this link and emphasises that marine plans should both take into consideration local perspectives and ensure they contribute to vibrant coastal communities by considering cultural heritage, local environmental quality and improving quality of life. This paper responds to these needs by providing a window into the experiences and lived realities of six local residents in Cornwall, UK, who have first-hand experiences of HABs and the ways in which these dis-benefits impact on both the quality of the environment and on their quality of life. Whilst it is recognised that this is a small sample, this paper nonetheless demonstrates the range of impacts and the depth of feeling around HABs in a specific area, which are rarely captured in the existing literature. It asks questions about how these understandings might be important in more locally responsive management decisions and points to the need for further research to more fully investigate the implications of changing environmental conditions on human well-being.

First, the important elements are highlighted from the academic discussions around the well-being benefits provided to people by the coastal and marine environment before the impacts of HABs at a local level are discussed, through a small case study investigation from Cornwall, UK. Importantly the interviews conducted show that disruptions are not only at the level of individual well-being, but they are also noted as impacting on wider community well-being through disruptions to traditional practices and industries and the potential erosion of place identity and regional distinctiveness. The paper argues for a broader picture of human well-being to be considered to understand HAB impacts more holistically and to be able to devise more locally responsive management activities.

2. Coastal/marine environments and cultural ecosystem services

At the heart of discussions about the human-nature relationship is a profound sense that nature deeply touches people and what it means to be human. Kellert and Wilson [28] for example, assert that ‘human identity and personal fulfilment somehow depend on our relationship to nature’ (p. 42). They discuss the satisfaction derived from nature in terms of benefits which include a sense of fascination, wonder and awe and mental and physical well-being associated with nature experiences. Given this powerful relationship, some authors suggest that people may form a protective impulse for natural resources which may translate into place-protective and pro-environmental behaviours [13,22]. Such connections to nature deserve greater recognition in decisions concerning the natural environment, given the profound, meaningful and, arguably, enduring nature of them. These need to be made explicit so they can be considered alongside other more tangible (often monetised) values in decision-making processes.

This call for greater recognition of the intangible values of nature has found popular expression and global recognition in recent years in the idea of cultural ecosystem services which are found in almost every assessment of ecosystem services. They have been defined in various ways but most notably by the Millennium Ecosystem Assessment [34] as ‘the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences’ (p. 8). The growing body of literature concerned with the links between cultural services and human well-being provides compelling evidence that coastal and marine environments are particularly conducive to well-being benefits. Kellert [29] for example, notes how coastal environments are areas rich in physical, intellectual, emotional, aesthetic and spiritual opportunities which aid human growth and development and that they can be so powerful that they lead to an ‘attitude of reverence’ for nature (p. 18). Similarly Kearns and Collins [26] consider the strong emotional connections that people develop with the coast and how these can be a resource and motivation for place-protective behaviours. This in part, may explain the profound connections that people appear to have with the coast and the sea [2,19,47,48] and the reason why so many find such settings to be therapeutic and seek out the coast for ‘stillness, solace and rehabilitation’ ([29]: 17). Cultural ecosystem services are thus important as they influence how people respond to the natural environment and they give indications of how they might behave in those environments and respond to changes in them. For coastal communities in particular evidence suggests that cultural ecosystem services can be understood as an expression of the profound connection and sense of place and identity that people feel that is intrinsically connected to the sea [18,19,45].

The consequences of HABs to human well-being is significant and largely researched in terms of the economic and health impacts on human populations. These are of course important because many human activities are located at coastal margins which means that closures of beaches and fisheries to protect public health can result in losses of recreational and commercial opportunities and losses in food supply. The economic impacts of these are evidenced to be considerable and come from public health impacts, losses to local service businesses such as restaurants and hotels, increased costs of beach clean-ups, lost recreational opportunities, reduced fishery yields and mortalities of passively valued species [24]. Through the lens of cultural ecosystem services, a new dimension is provided to understanding the impacts of HABs in a broader sense. Such events, for example, disrupt opportunities to interact with coastal and marine settings and connect with nature in ways which enhance well-being. Changing environmental conditions may therefore, erode the attachments and therapeutic opportunities that people have at the coast and significant efforts are required to fully understand these impacts and the implications of them. The following section presents some evidence of impacts and what they mean to a small group of people who have been affected by HABs in Cornwall, south-west England. These stories are important for conceptualising key issues of concern to local people, including disruptions to well-being for local people and communities which have not been captured fully in much of the existing HAB literature.

3. Case study selection

HAB events in the south west of England are a regular and natural occurrence. The Harmful Algae Event Database for example, records this area as having ‘a relatively high number of results’ (<http://haedat.iode.org>) and annual reports from the Centre for Environment, Fisheries and Aquaculture Science (Cefas) provide evidence of regular HAB activity. Cornwall, in addition, provides a good case for this study as its identity and history are strongly influenced by the sea and this connection also underpins a thriving tourist economy [11] which may be impacted by increased HAB events. The biggest impact of HABs is on the local aquaculture industry which is significant in this area [32] as shellfish such as mussels, scallops and oysters are filter feeders and thus

Download English Version:

<https://daneshyari.com/en/article/11031315>

Download Persian Version:

<https://daneshyari.com/article/11031315>

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