



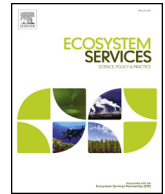
Title	Conceptualizing 'sense of place' in cultural ecosystem services: A framework for interdisciplinary research
Authors(s)	Ryfield, Frances, Cabana, David, Brannigan, John, Crowe, Tasman
Publication date	2019-04
Publication information	Ryfield, Frances, David Cabana, John Brannigan, and Tasman Crowe. "Conceptualizing 'Sense of Place' in Cultural Ecosystem Services: A Framework for Interdisciplinary Research." Elsevier, April 2019. https://doi.org/10.1016/j.ecoser.2019.100907 .
Publisher	Elsevier
Item record/more information	http://hdl.handle.net/10197/9709
Publisher's statement	This is the author's version of a work that was accepted for publication in Ecosystem Services. Changes resulting from the publishing process, such as peer review, editing, corrections, structural formatting, and other quality control mechanisms may not be reflected in this document. Changes may have been made to this work since it was submitted for publication. A definitive version was subsequently published in Ecosystem Services (36, (2019)) https://doi.org/10.1016/j.ecoser.2019.100907
Publisher's version (DOI)	10.1016/j.ecoser.2019.100907

Downloaded 2026-05-02 00:30:28

The UCD community has made this article openly available. Please share how this access benefits you. Your story matters! (@ucd_oa)



© Some rights reserved. For more information



Conceptualizing ‘sense of place’ in cultural ecosystem services: A framework for interdisciplinary research



Frances Ryfield^a, David Cabana^a, John Brannigan^{b,*}, Tasman Crowe^a

^a UCD Earth Institute, University College Dublin, Dublin 4, Ireland

^b UCD Humanities Institute, University College Dublin, Dublin 4, Ireland

ARTICLE INFO

Keywords:

Cultural ecosystem services
Sense of place
Phenomenological research
Ecosystem assessment
Cultural materialism
Interdisciplinarity

ABSTRACT

In this paper we aim to establish a conceptual and practical framework for investigating sense of place as a category of cultural ecosystem services, drawing upon transdisciplinary research on assessing cultural value and ecosystem change in the Irish Sea. We examine sense of place as a material phenomenon, embedded in and expressive of the relationship between determining ecological conditions of particular locations and the determining social and cultural conditions of human habitation. Our emphasis on sense of place as a material phenomenon contrasts with the prevailing tendency in ecosystem services literature to treat cultural ecosystem services as ‘non-material’, ‘immaterial’, or ‘intangible’, and builds on a call to conceptualize cultural ecosystem services in ‘a more theoretically nuanced approach’ which yields practical means of researching and assessing cultural benefits (Fish et al., 2016a, p. 215). The paper emerges from a transdisciplinary project on ‘The Cultural Value of Coastlines’, which seeks to define a mechanism for integrating materialist research on cultural benefits into the ecosystem services framework. We demonstrate the need for a more significant role for sense of place as a category of cultural ecosystem services, and for research practices which can account for the material and socially-produced nature of sense of place.

1. Introduction

As Fish et al. have argued, the widespread tendency to associate cultural ecosystem services with non-materiality and intangibility (and several other negative prefixes), or to characterize cultural ecosystem services as subjective and nebulous, reflects the difficulties encountered by a framework largely dominated by scientific and economic quantitative methods with realms of research based on alternative epistemologies (Fish et al., 2016a). This weakness has the potential to incapacitate the ecosystem services framework as a tool to aid decision-making, as it risks ignoring or marginalizing some of the most fundamental ways in which people engage with, and understand their relationship to, nature: ‘cultural ecosystem services are about understanding modalities of living that people participate in, that constitute and reflect the values and histories people share, the material and symbolic practices they engage in, and the places they inhabit’ (Fish et al., 2016a, p. 210; see also Fish et al., 2016b). In contrast to the widely used definition of cultural ecosystem services provided by the Millennium Ecosystem Assessment report, the source of this emphasis on the ‘nonmaterial’, Fish et al. provide an alternative definition of cultural ecosystem services as ‘a concept around which researchers and

decision makers can understand ecosystems in terms of their life-enriching and life-affirming contributions to human well-being... encompassing a broad symbolic, experiential and virtuous realm of human interactions and understandings of the natural environment’ (Fish et al., 2016a, p. 208). This is the definition upon which we have based our own investigations of sense of place as a cultural ecosystem service in this paper. Interdisciplinary from its inception, the ecosystem services framework has the capacity to embrace a wider epistemological range of research strategies to overcome this tendency to mischaracterize or undervalue cultural ecosystem services, and to capture evidence of sense of place in particular (Chan et al., 2012, Urquhart and Acott, 2014). King et al. (2017) made this call also in relation to the design of programmes to protect and enhance ‘nature’s contribution to people’, specifically by recognizing the ways in which biotic, abiotic and human-made features combined to provide ‘socio-psychological pathways’ by which people constructed sense of place. In this paper, we set out the ways in which we have sought to integrate qualitative, materialist methods of researching sense of place into cultural ecosystem services.

A materialist approach to cultural ecosystem services, which draws upon place-based research in the humanities and social sciences, has

* Corresponding author.

E-mail address: john.brannigan@ucd.ie (J. Brannigan).

much to add to a more holistic understanding and practice of ecosystem services research. Materialism is used here in its philosophical sense as an understanding of human society as fundamentally determined and shaped by matter or the natural environment. As an extension of materialist philosophies, cultural materialism studies all forms of cultural representation as expressive of distinctive social formations and economic and environmental conditions. A key tenet of cultural materialist practice is to discern the ways in which cultural texts, activities or artefacts are both shaped by their material contexts, and in turn shape the way communities see and express themselves. Sense of place, in particular, requires methodologies which can reveal relational, historical, and affective meanings and values. Rick Van Noy argues for a particular fusion of methodologies which can bring sense of place to light: ‘The synthesis of placed experience – the sights, stories, feelings, and concepts – gives us what we call the sense of place. To bring it into being, we need a complex intersection of cartography and literature, a charting of interior and exterior landscapes’ (Van Noy, 2003, p. xvi). Van Noy’s study explores in particular a body of American literary writing explicitly concerned with cartographical surveys, but his comments have wider applicability to cartography and literature as embodying modes of knowledge of place. Mapping has become an increasingly important aspect of ecosystem assessment, especially for cultural services, as it is a means of incorporating participatory research methods with stakeholder groups, and can capture non-quantitative information about stakeholder valuation (Nahuelhual et al., 2014). In addition, as Plieninger et al. (2013) argued, ‘Cartographic representation of perceptions and preferences enables localization of the most highly valued ecosystems in a landscape ... and consequently, identification of critical focal areas for cultural services management’ (119). Another significant advantage of using mapping in ecosystem services research, both as research tools and for stakeholder engagement, is that maps facilitate a diverse range of disciplinary inputs, from demographics and economic metrics, to heritage values, social diversity indices, and stakeholder preferences. However, maps offer little depth in terms of affective registers of the meaning and value of places, and risk simplifying qualitative information as aggregated ‘heat maps’ or clusters of preferences. For this reason, as Van Noy suggests, cartographical information needs to be complemented with cultural sources which can reveal the ‘interior’ knowledge of place.

To mediate between ‘objective’ and ‘subjective’ modes of knowing place, J. Nicholas Entrikin proposed that narrative-based forms of knowledge had a key role, using Paul Ricoeur’s understanding of narrative’s role as ‘the synthesis of heterogeneous phenomena’ (Entrikin, 1991, p. 138). Entrikin points to the importance of narrative in place-making activities, as does Tim Cresswell who writes that ‘places are created by cultural practices such as literature, film, and music, and the investigation of these forms of producing places are a central strand in contemporary human geography and beyond’ (Cresswell, 2015, p. 116). There have been limited attempts to incorporate narrative sources into ecosystem services research, although the potential to do so has been recognized. Claudia Bieling uses short stories as sources for her study of cultural ecosystem services in the Swabian Alb biosphere reserve, and concludes that the stories constitute ‘rich evidence regarding connections to identity, heritage values, inspiration, esthetic values and recreation’ (Bieling, 2014, p. 207). The stories were written by residents of the biosphere reserve as part of a contest to identify local values, and analysis of them is used to discern a number of problems with the conceptual framework of cultural ecosystem services, such as the lack of recognition that cultural services are the outcome of human perception and valuation as well as biophysical features. Other narrative sources of information about cultural ecosystem services have been developed through questionnaire surveys and interviews, which have focused on place-based values, and have demonstrated the potential to elicit information about emotional connections with natural features, as well as perceptions of connections to well-being, heritage, and identity (Gee and Burkhard, 2010; Ratter and Gee, 2012).

In our research project on ‘The Cultural Value of Coastlines’, which focused on the Irish Sea area, we investigated how such narrative and cartographical modes of research can be operationalized in cultural ecosystem services research. We begin this paper with a review of sense of place research, especially in the ecosystem services framework, but with some reference to concurrent debates in phenomenological research in the environmental humanities. We use this review to identify the extent of research undertaken so far, the role afforded to sense of place in ecosystem service classifications currently, and the ways in which research on place in environmental humanities has significance for linking to ecosystem services research. We proceed to the conceptual basis for materialist analysis of sense of place, and to demonstrate the research practices for linking cultural evidence of sense of place with its ecological conditions. The paper concludes with recommendations about how these practices might be integrated into ecosystem services research and assessment.

2. Reviewing the case for sense of place in ecosystem research

Sense of place has been used in the literature of ecosystem services since the late 1990s, and derives mainly from the fields of geography, architecture, and urban planning, in which it has been widely used since the 1970s. Its deployment within the ecosystem services framework can be attributed to two reasons: first, the recognition that ecosystems include people, and that managing ecosystems is inseparable from managing how people use, perceive, and value ecosystems; and second, the understanding that different scales and perceptions of place and belonging affect the potential for conflicting ecosystem uses and values. Norton and Hannon (1997) advocated a ‘place-based approach’ to environmental valuation, positing that a hierarchical methodology and triscalar system could be used to analyse the relationship between people’s orientation towards place and environmental values. However, the hypothesis that proximity was a factor in determining valuation was not straightforward, and place attachment depended on a variety of factors, best understood as ‘a dialectic between a culture and its natural context’ (230; see also Brown et al., 2002, and Stedman, 2003). There was no easy correlation between the physical location of an individual or community, and the extent or location of the ecosystem services most valued. Williams and Stewart (1998, p. 18) proposed that sense of place offered ecosystem managers ‘a way to identify and respond to the emotional and spiritual bonds people form with certain spaces’. In the same year, Cantrill (1998, p. 302) argued that sense of place was especially needed by ecosystem managers when engaging with local communities as ‘an appreciation for how human understandings of where we live, work, and recreate are socially constructed and endowed with value’ (See also Chapin and Knapp, 2015).

It has remained a consistent pattern in ecosystem services literature to identify sense of place as a management or communications tool with which to engage local communities, based on the understanding that ‘emotional attachment to place can serve as a bridge between ecosystem functioning and stakeholders’ engagement in environmental stewardship’ (Masterson et al., 2017, p. 49). However, the Millennium Ecosystem Assessment Report (2005) included sense of place as a cultural ecosystem service in its own right, recognizing that sense of place should be part of the contributions made by ecosystems to human society which needed to be assessed and managed (MA, 2005). Sense of place was defined in the MA report, along with other cultural ecosystem services, as a ‘nonmaterial benefit of ecosystems’, which people valued through associations with ‘recognized features of their environment, including aspects of the ecosystem’ (40). It is also included in the global study of biodiversity loss, *The Economics of Ecosystems and Biodiversity* (TEEB), in which cultural ecosystem services are divided into four groups, one of which is ‘Spiritual experience and sense of place’, which is briefly explained: ‘Nature is a common element of all major religions; natural landscapes also form local identity and sense of belonging’ (TEEB, 2010). TEEB began as an initiative of the German government in

collaboration with the European Commission. In the USA, however, the National Ecosystem Services Classification System (NESCS) does not include any reference to sense of place as a cultural ecosystem service (NESCS, 2015). Nor is sense of place included in the Common International Classification of Ecosystem Services (CICES), developed for the European Environment Agency by Haines-Young and Potschin, in any of its iterations since 2009 (Haines-Young and Potschin, 2018a). Both the NESCS and CICES aim to be as comprehensive as possible, to facilitate widespread adoption, so the absence of sense of place or similar categorizations of the importance of ecosystems to local identities as a service in itself is a significant omission. CICES does make reference in its classification of cultural ecosystem services to 'environmental settings', however, which may be understood to approximate to sense of place as a spatially-specific median concept between the biophysical processes of ecosystems and the opportunities for cultural benefits they provide. This was introduced in CICES v.4 as an adoption of the UK National Ecosystem Assessment explanation of cultural ecosystem services as 'the environmental settings that give rise to the cultural goods and benefits that people obtain from ecosystems' (UK NEA, 2011, 634). In the guidance notes for the latest version of CICES (v.5.1), the definition of cultural ecosystem services implies a closer relationship between 'environmental settings' and the feelings of attachment, belonging or identity associated with place: 'Cultural services are primarily regarded as the environmental settings, locations or situations that give rise to changes in the physical or mental states of people, where the character of those settings is fundamentally dependent on living processes; they can involve individual species, habitats and whole ecosystems' (Haines-Young and Potschin, 2018b). However, even if this can be interpreted as akin to, or inclusive of, sense of place, 'environmental settings' has only a conceptual role in the CICES classification, and is not in itself 'counted' as a final ecosystem benefit. This is particularly out of step with strong evidence of the impact of significant ecosystem change on sense of place, in the case of overfishing or natural disasters, for example (See for examples Micklin, 1988, Longo and Clark, 2012, and Knez et al., 2018).

The argument for a more comprehensive integration of sense of place into ecosystem services research and assessment has been made in four recent articles (Urquhart and Acott, 2014; Hausmann et al., 2016; Poe et al., 2016; Masterson et al., 2017). Urquhart and Acott examined the significance of sense of place to fishing communities in Cornwall, and through semi-structured interviews gathered information on how individual and collective identities and place attachment was dependent upon historic and contemporary fishing practices (Urquhart and Acott, 2014). The article finds that the cultural significance of sense of place, as defined by fishing practices, sometimes takes precedence over economic interests: 'Understanding this deep attachment to fishing and its role in defining identity may partly explain why some fishers are reluctant to diversify into other activities when fishing is no longer viable and why they often do not operate according to economic rationale' (Urquhart and Acott, 2014, p. 11). Hausmann et al. identify sense of place as 'one of the most neglected cultural services', and make a strong case for its importance to conservation decision-making (Hausmann et al., 2016, p. 118). The article also reports a strong correlation between 'people's commitment to places' and 'pro-environmental behaviour, responsible use of resources and waste reduction' (120: see also Devine-Wright and Howes, 2010). They conclude with a call for 'improved assessment and knowledge of the benefits that biodiversity-related experiences provide as a sense of place', in the expectation that this may 'uncover positive benefits for both biodiversity conservation and human well-being' (123; see also Kudryavtsev et al., 2012). Poe et al. begin their study with a crucial distinction between understanding sense of place as a 'nonmaterial' benefit, as it is widely defined in ecosystem services frameworks, and as a series of 'material and social interactions with ecosystems' (Poe et al., 2016, p. 410). The latter is important for their study of sense of place in Puget Sound, where residents associate place values strongly with shellfish

harvesting, which would conventionally be categorized in ecosystem services as either a provisioning or recreational service. The 'non-material' definition of sense of place associates place values with the feelings derived from static features such as 'ocean views', which Poe et al. critique as overlooking how place values are underpinned by issues of 'access, knowledge and ecological integrity' (410). Instead, Poe et al. emphasize a 'practice-based' and 'meaning-based' approach to sense of place. In this definition, sense of place is created and maintained through activities conducted within an ecosystem, including interactions such as swimming, boating, walking, shellfish harvesting, and bird watching, and those activities are inseparable from their place-making functions. There is a similar call for understanding sense of place as 'practice-based' in the review by Masterson et al. of the significance of research on place for social-ecological systems research (Masterson et al., 2017). One of the key recommendations of the article is to insist that 'although values and cognitions are subjectively held and vary within a population and among characteristics of a place, this variation is systematic and can therefore be measured', and on this basis to call for research which develops 'integrated methods and indicators that could make these phenomena more tangible and measurable without neglecting the subjective, qualitative nature of sense of place' (49). One limitation of the approach taken by Masterson et al. is that there is little engagement with phenomenological approaches to understanding how sense of place is constructed, maintained, and practised. However, it is clear that recent work on sense of place in relation to ecosystem services emphasizes a materialist understanding of sense of place as co-produced in human-nature interactions, and as manifested through cultural practices and meanings. This is broadly in line with the conceptualization of cultural ecosystem services offered by Fish et al. (2016a) as 'relational processes and entities that people actively create and express through interactions with ecosystems' (211).

Concurrent with the development of sense of place research in ecosystem services, the environmental humanities have embraced phenomenological research on place, but with a particular emphasis on materialist manifestations of place-attachment from environmental perspectives (Bate, 2000; Garrard, 2004; Malpas, 2010). Such concepts as 'bioregionalism', 'local distinctiveness', 're-inhabitation', 'land ethic', and 'dwelling', which have expressed the commitments of environmental movements to recuperating strong ties between culture and ecology through sense of place, have been developed as critical concepts in the environmental humanities. The distinction between space and place has been crucial to the contribution of humanities research to environmental thought. Libby Robin provides the following distinction, for example: 'space is something *measurable*: it is amenable to Geographic Information Systems and other spatial tools. Place is not measurable in this way. It is defined by the relations between the country and the people who perceive it' (Robin, 2012, p. 74). Place is co-produced by ecological and cultural processes, and requires an understanding of how meanings, knowledge, and values are formed and communicated about specific places, as well as the particular ecosystem features and functions on which those places depend. That place is co-produced is an important difference from what Tim Ingold has described as the 'sterile opposition between the naturalistic view of the landscape as a neutral, external backdrop to human activities, and the culturalistic view that every landscape is a particular cognitive or symbolic ordering of space' (Ingold, 2000, p. 189). The 'naturalistic view' Ingold cites is clearly at work in the CICES concept of 'environmental settings', although it is also common to find in more traditional humanities approaches a similar view of the environment as a mere setting for human endeavour. For the environmental humanities, a key motivation is to break down the idea that nature and culture are binary opposites, and to explore instead the implications of thinking of humanity as dependent upon environment, and of the environment as a domain which is as much cultural as ecological. This is particularly evident in current work informed by new materialist approaches (see Iovino and Oppermann, 2012; Alaimo, 2010; Cohen, 2015). For this

reason, place as a social-ecological construct, as a site of entanglement between human and nonhuman natures, is a key concept in the environmental humanities.

Building on phenomenological approaches to place (largely influenced by Heideggerian philosophies of being-in-place, or dwelling), the environmental humanities research on place can be summarized in four key tenets:

- 1) Places are ‘material things’, made up of objects, the activities we perform there, and the social relations we build and maintain (Casey, 1997, pp. ix–x);
- 2) Places are also socially produced, through representations, memories, buildings, social networks, and other place-making activities (Casey, 2000, pp. 214–215);
- 3) Sense of Place is a dynamic temporal as well as spatial process, an assemblage of materials, connections, flows, ideas, and feelings, which is constantly changing (Harvey, 1996, p. 303);
- 4) Sense of Place is a primary and constitutive condition of existence, the *locus* indeed of how we perceive, understand, and engage with the world around us (Malpas, 1999, pp. 31–32; Heidegger, 2001, p. 145; Cresswell, 2015, p. 50).

These tenets concerning sense of place imply a need within the ecosystem assessment framework to afford greater significance to sense of place as a cultural ecosystem service in its own right, to nest other cultural ecosystem benefits within sense of place, and to develop research practices which can accommodate both the material and socially produced nature of sense of place. In the next section, we will explain how our research practices have been developed from these tenets, and demonstrate how we have tested specific forms of research practice appropriate to the collection and analysis of evidence of sense of place for the purposes of ecosystem services research.

3. Materials and methods

3.1. Dublin Bay UNESCO biosphere reserve

This research paper focuses on methods of researching sense of place as a cultural ecosystem service. These methods were tested as part of a research project funded by the Irish Research Council in the Irish Sea area on the cultural value of coastlines. Our principal case study area was Dublin Bay, on the western shores of the Irish Sea (See Fig. 1).

Encompassing the capital city of Ireland with a population of 1.2 million people, the bay is horseshoe-shaped, extending from the rocky shores of the Hill of Howth in the North, and around to Dalkey Hill in the South. The interior shores of the bay are characterised by extensive, shallow sands, known as the North and South Bulls, which are widely used by Dubliners for recreational activities. The bay is estuary to three main rivers – the Liffey, the Tolka, and the Dodder – and is also home to an island, North Bull Island, which was formed in the nineteenth century as a result of the development of the port infrastructure. The bay was designated as a UNESCO Biosphere Reserve in 2015, which was an extension of an existing UNESCO Biosphere designation of North Bull Island which dated from 1981. The island is the most heavily designated location in Ireland in terms of environmental legislation. It was designated Ireland’s first bird sanctuary in 1931, and became a national nature reserve in 1988. It was also designated as a RAMSAR site for wetlands conservation in 1988, and under EU legislation it has been designated as a Special Area of Conservation (SAC) and Special Protection Area for Birds (SPA). The ecological characteristics which warrant these measures of protection include high quality rare and threatened coastal habitats, such as salt marshes, lagoonal mud and sand flats, and actively accreting dune systems (unique in Ireland), with associated flora and fauna; bird species of international importance, such as Black-tailed Godwit, Bar-tailed Godwit, and Light-bellied Brent Geese, and large numbers of waders and wildfowl who breed on the

island; and both grey and harbour seals use the island as haul-out locations.

The environmental and social pressures on Dublin Bay include discharges of waste and warm water from industrial facilities in the port area, nitrogen pollution carried downriver from farming activities, litter from extensive recreation use and the adjacent urban population, disturbance of habitats from social and recreational use of coastal spaces, the risk of spills and contaminations from shipping in the port area, coastal erosion, floods, and sea level rise.

3.2. Conceptual approach

There are four key research methods outlined below which elicit qualitative data of the kind not usually included in ecosystem services research and assessment, and which we found useful to the evaluation and integration of sense of place (See Fig. 2). These can be divided into two broad themes: observational and participatory research, and co-authored mapping. In combination, these methods provide access to information about a diversity of values and benefits, enable researchers and participants the scope to articulate and explain place-based values, and facilitate identification and mapping of shared and prevailing values. We propose these methods as a series of steps, which develop both the capacity to generate and analyse new information about cultural ecosystem services, and also the capacity to engage communities-of-interest in participatory research. Engaging communities-of-interest through informal meetings, interviews, focus groups, and surveys also has the potential to encourage a sense of ‘ownership’ of the discourse of value in their local environments. We use maps as a key integrative tool for interaction between disciplines, and between researchers and participants, enabling us to identify spatially-specific patterns in the provision, perception, and use of cultural ecosystem services. Through showing the patterns of shared cultural values of coastal ecosystems, specifically around sense of place, and the historical basis of these patterns through cultural representations, we aim to enhance the capacity of the ecosystem services framework to integrate effective assessment of a broader range of cultural ecosystem services.

The methods set out below (3.3 and 3.4) were used in combination to provide a framework in which narrative and cartographical modes of knowledge could be synthesized. For example, maps were used as stimuli in surveys and interviews to prompt participants to articulate memories, associations or experiences that are place-bound. In addition, much of the findings about place-based values elicited from surveys, cultural representations, and interviews can be represented cartographically and to some extent quantitatively. We used these methods not just because they provided access to types of knowledge which are vital to, and currently underdeveloped in, the ecosystem services framework, but also because they engender participatory and inclusive approaches to ecosystem services research. Part of the challenge in adopting these methodologies is ensuring that they are also attributed with the same level of importance as numerical and monetary valuations.

We used the CICES framework to classify cultural ecosystem services identified in our research. The CICES framework was selected over the classifications proposed in the Millennium Ecosystem Assessment and The Economics of Ecosystems and Biodiversity because it (a) is the most finely divided and explicit in relation to cultural services, (b) has a greater emphasis on how humans *interact* with ecosystems as part of the process of deriving benefits from them, (c) is the most operational and the one most widely applied, particularly in a European context, and (d) is an organic framework that continues to evolve and be updated with input from a spectrum of researchers and practitioners. It has also been specifically designed to be complementary to and inter-operable with the other systems, such that the findings we present can easily be drawn into them.

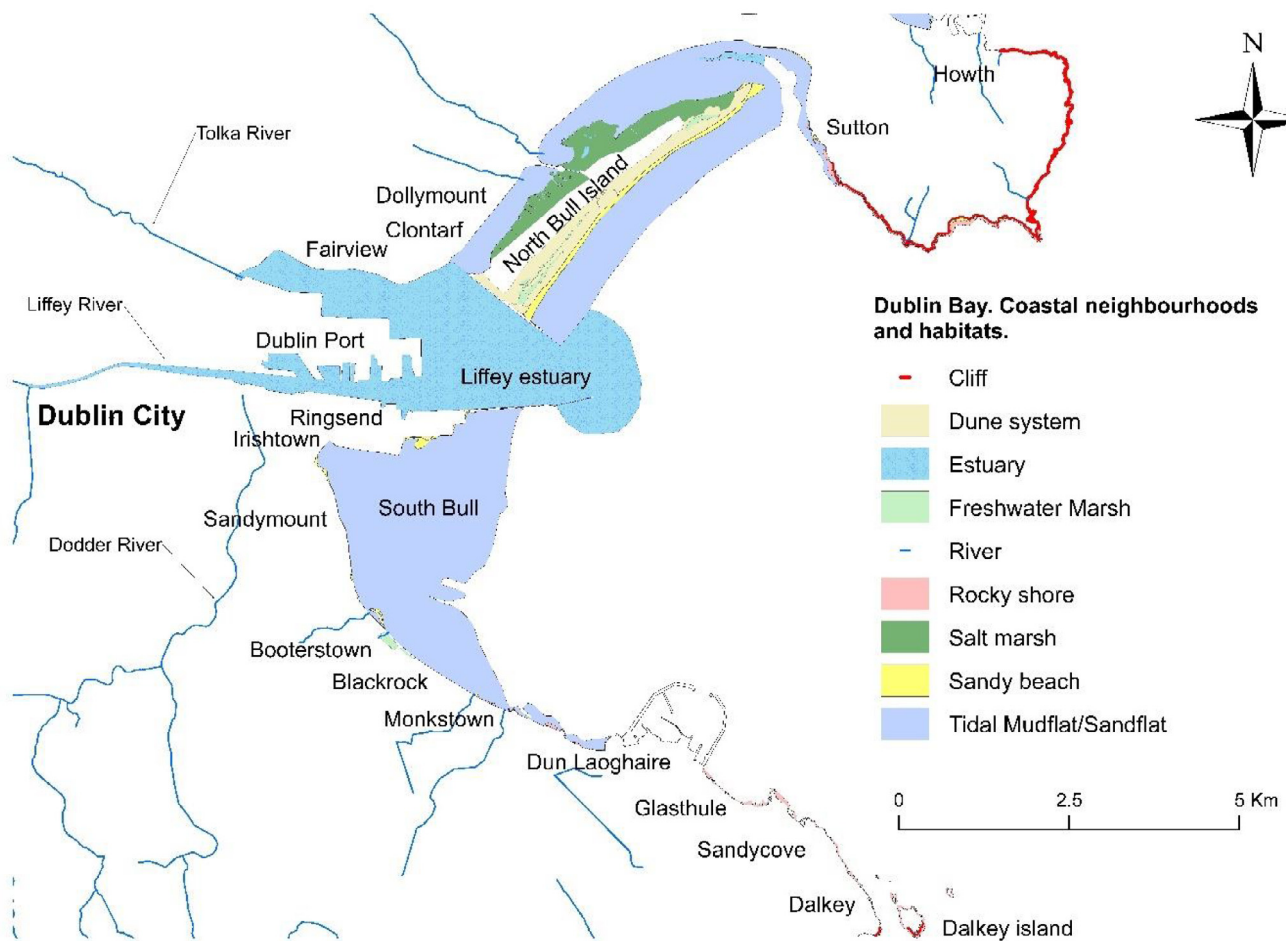


Fig. 1. Map of Dublin Bay.

3.3. Observational and participatory research

3.3.1. Observational and experiential study of place

As an interdisciplinary research team combining ecological and cultural expertise, we visited and traversed key sites around the Bay and observed for evidence of built heritage, cultural uses and activities, signage, patterns of development or neglect, and indications of how communities organized or managed coastal social spaces. This method of getting to know a place is described by the nature writer, Barry Lopez, as ‘an old business, walking slowly over the land with an appreciation of its immediacy to the senses and in anticipation of what lies hidden in it’ (Lopez, 1986, p. 254). It allowed the team to check coastal walks, amenities and habitats against maps and existing data, and to formulate questions from our different disciplinary perspectives about how cultural ecosystem services were dependent upon ecosystem conditions and functions. The observational and experiential study of place was also significantly enhanced by four ‘transect’ walks, in which members of the team walked and talked with four different local experts in coastal and maritime heritage to identify local natural and cultural features in the case study area, and to consider how cultural benefits derived from the coastal ecosystem had changed over time. Information and advice gleaned from these walks helped to shape the survey questions we devised (see 3.4.1), but they were conducted on an informal basis as preparatory meetings and were not recorded. Three of the local experts involved then took part in our focus group (see 3.3.2 below). Visiting key sites and talking with local experts were important correctives to the ‘abstracted’ tendency of remote forms of information gathering, and enabled us to build good relations with local groups of coastal users and residents around the Bay.

3.3.2. Interviews and focus groups with communities-of-Interest

Based on engagement with local communities through transect walks, surveys, and social media contacts, more detailed and expansive focus groups and open interviews were conducted. The interviews and focus groups were used to build relationships with communities-of-interest, as well as to gain valuable insight into local issues and contexts. We developed our engagement strategy from the framework proposed by Lopes and Videira (2013) for maritime ecosystem services research and decision-making. As cultural values of place and environment tend to be bundled and interdependent, interviews which elicit more expansive discursive responses can be useful ways of identifying values and benefits not captured fully in the ecosystem services framework, and also of addressing management and policy contexts in more detail. Gould et al. (2015) have argued for the important role such interviews can play in enriching understanding of the results of more closed surveys, and recommend structuring interviews with the use of maps and situational and prompt questions. We conducted informal, open interviews with a nature reserve manager (Bull Island Nature Reserve), a heritage manager (Dublin Port), and a group of museum volunteers (National Maritime Museum).

We conducted a focus group with advisors identified through transect walks, stakeholder relationships and surveys. The focus group in Dublin Bay consisted of ten multi-sector experts and policy decision-makers in the Dublin Bay area, which included a range of people from local government, environmental management, cultural and maritime heritage, and those with local cultural and historical expertise. The focus group was comprised of three parts: 1) A discussion of the ‘cultural values’ of Dublin Bay; 2) Participatory mapping of those values; and 3) Discussion of the key issues, future challenges and policy context

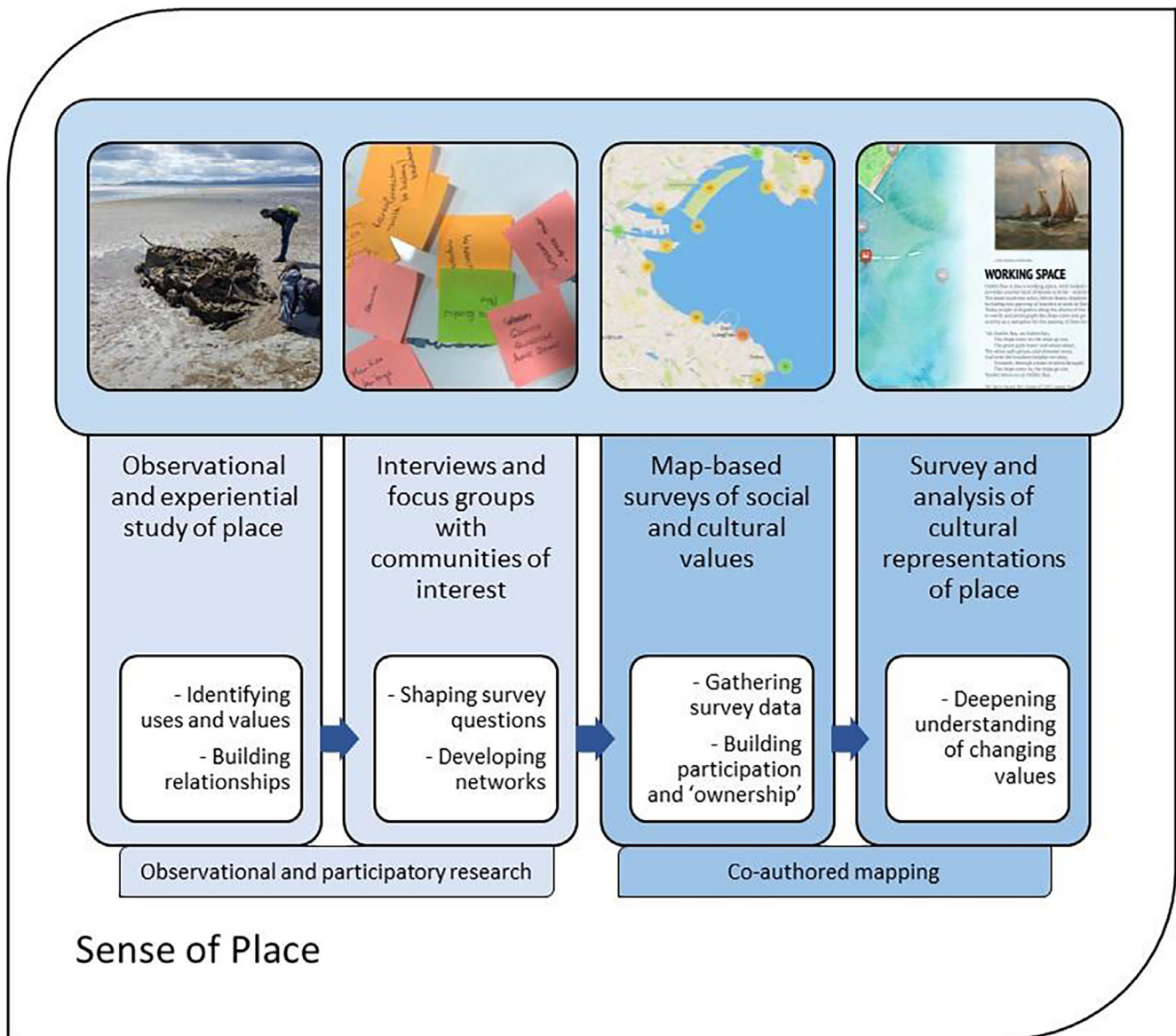


Fig. 2. Research Framework for Sense of Place.

for the bay. With permission from participants, we recorded the discussion in full on video and audio, and participants also completed a written survey giving short summaries of their responses to the questions discussed.

3.4. Co-authored mapping

3.4.1. Map-based surveys of social and cultural values

Based on observational and experiential study, a map-based survey (see appendix) was designed for field and online use, which sought to collect data from participants about activities, heritage, values and benefits of the site under investigation. The survey was tested and revised in January and February of 2018, and then data was collected from the survey between March and May 2018, by which time 231 participants had completed responses. The information gathered from the survey included anonymous data about the participant (age range, gender, and area of residence), the cultural activities and values the participant associates with the Bay, the participant's perception of the relationship between cultural values and the ecological health of the Bay, and the participant's understanding of how the Bay is managed. The survey comprised a combination of multiple-choice and open

questions asking participants about their interaction with Dublin Bay and their views on changes to the bay and management issues. However, we also designed the survey to be sufficiently concise to encourage as many participants as possible to complete it, and to foster goodwill between the researchers and participants. The survey questions were accompanied by a map of the Bay on which participants were invited to indicate the specific routes or locations they prefer to visit, and those they prefer to avoid, and to specify briefly the reasons why. There were advantages to both the field and online versions of the survey. The online survey was efficient, remote, and easy to spread via social media to various interest groups, and the majority of our participants completed the online version, but it was difficult to ensure adequate participation and completion. The field survey took considerable time and effort on the part of the research team, and there were fewer participants, but participants tend to complete the survey, provide longer and more detailed answers, and often shared more insights about their experiences of cultural benefits and ecosystem changes than they might have done online. For this reason, and because field and online versions of the survey can reach different target groups of participants, the combination of field and online versions of the survey is recommended.

The map-based survey we used invited participants to identify the

key cultural benefits they associated with the coastal locations they visited. We used the latest version of the CICES classification (5.1) to codify the cultural ecosystem services we identified, with the exception that we added a separate category for sense of place as a distinctive cultural ecosystem service. In our analysis of both the map-based survey and cultural representations of Dublin Bay, we defined sense of place as the attachment of particular emotions, ideas, or experiences with defined locations which had distinctive identities. The importance afforded to sense of place as a discrete ecosystem benefit can be identified from the responses to the survey. The survey included an open question: ‘Why does the marine and coastal environment in Dublin Bay matter to you?’ It was important to our study that participants were not simply given the opportunity to tick a box identifying sense of place as a benefit, as this is less commonly understood than ‘recreation’ or ‘contact with nature’ for example. Yet, walking along the coast, or swimming in the Bay, may indeed enhance a participant’s attachment to, and appreciation of the distinctive identity of, particular places. The open question, therefore, gave participants the freedom to choose their own terminology to explain how they value the marine and coastal environment, and added a narrative-based dimension to the results shown on the map.

3.4.2. Survey and analysis of cultural representations of place

As a novel form of evidence for cultural ecosystem services, we sought to incorporate analysis of cultural representations (principally art and literature) into our study of Dublin Bay. Because sense of place may be difficult to articulate, and also because sense of place is often intricately linked to history, cultural identity and social relations, cultural representations are invaluable sources of evidence. Cultural representations potentially include all forms of visual, written, sculptural, and aural forms of artistic and material endeavour which make present, stand for, or symbolize a specific time, place, person or other life form. It includes literature, theatre, painting, sculpture, music, photography, and film, as forms which make public art from this process of embodying or symbolising to the mind the thing depicted. Cultural representations are embedded in particular ways of life: they reflect, shape and amplify how particular social groups or communities attribute meaning and value to the world around them. While individual works of art, literature or music are usually the product of one person’s imaginative engagement with the thing or place depicted, and therefore may be understood as subjective, every artist and every work of artistic imagination is the result of a complex social and cultural process, and is therefore readable as both symptomatic and expressive of its historical, social, and environmental contexts. The depth, type and number of cultural representations of places may vary widely, but identifying and analysing cultural representations can provide access to how environments are imbued in human memory and psychology not just with physical and ecological characteristics (as sources of food or shelter, for example), but with social, emotional, spiritual, and aesthetic meanings, which may be as real and embedded in those environments as any physical characteristics.

We used databases of art and literary works (AHI, EBSCO, IMDB, JSTOR, LION, MLA, as well as national, university and local library catalogues, and the use of full-text search facilities at archive.org, Amazon and Google Books), to identify those works which represented coastal locations around Dublin Bay. We focused only on cultural representations produced since 1750, so that we could track changing patterns of cultural value across a meaningful expanse of historical time, but within the scope of modern environmental history (i.e. since the industrial revolution and modern urbanization patterns). We searched for place-names around the Bay (Dublin Bay, Howth, Sutton, Kilbarrack, Clontarf, Dollymount, Bull Island, Fairview, Dublin Port, Ringsend, Irishtown, Sandymount, Booterstown, Blackrock, Monkstown, Dun Laoghaire, Glashule, Sandycove, and Dalkey) in the meta-data and full-text search facilities. The results of these searches were filtered through analysis of each artwork or literary text to

identify only those works which make substantial reference to, or depiction of, coastal locations around the Bay, and the extent to which they meaningfully represent the bay by attributing particular traits, associations, values, or feelings. The data yielded from this search method is by no means exhaustive, as comprehensive databases of art and literature classified by location are not common or reliable. The filtered results amounted to 160 works, which consisted of 54 paintings, 50 fictional works (novels and short stories), 49 poems or poetic works, and 7 literary works of other miscellaneous kinds. We did not include topographical, academic, or educational texts in the results as we focused only on those works which could be classified as cultural, aesthetic, or literary representations.

We analysed the 160 cultural representations we identified of particular places in the Bay for patterns of changing conditions, changing uses, or changing perceptions of the coast and seascape. The analysis consisted of identifying the location and time period represented in each cultural representation, situating the representation in relation to historical and cultural context, and classifying the values or feelings associated with the coastal area depicted as clearly as possible within the CICES classification. In the case of some cultural representations, classification is relatively easy: scenic appreciation is evident in most paintings which take a seascape as their subject, for example. There is often more than one cultural ecosystem service evident in a painting or novel, however, and it is difficult to distinguish between some classes.

We defined the criteria for identifying sense of place in cultural representations as 1) the place had to be named specifically or clearly identifiable from distinguishing characteristics so as not to be confused by the reader or viewer with any other place; 2) the place had to be attached in the representation with particular feelings, ideas or experiences which were particularly relevant to that place in cultural and historical context; and 3) the affinities with place depicted in the representation had to clearly depend upon biophysical features, whether biotic or abiotic. We analysed the distribution and intensity of cultural representations in relation to sense of place by mapping the key locations represented in art and literature, and compared how works of art or literature represented places around Dublin Bay across the last two centuries. Cultural representations are vital sources of what stories and images people associate with place, especially pertaining to the social, historical, or cultural bonds between a community and its environment, and to defining features of cultural identity and heritage.

4. Results and discussion

4.1. Sense of place in map-based surveys

Using a map-based survey enabled us to obtain a clear graphic representation of the locations around Dublin Bay which respondents identified as their favoured places to visit and use (see Fig. 3).

Of the 231 participants who took the survey, 14 did not answer the question about the cultural benefits they associated with particular locations. Many of the 217 respondents mentioned multiple benefits, which confirms findings that cultural ecosystem services are often bundled or overlapping (Bieling, 2014, p. 213; Tengberg et al., 2012). For example, one respondent answered ‘Essential recreational space and essential biodiversity site’, which we counted under both ‘recreation’ and ‘care for the environment’. The most common benefits referenced were recreational benefits (30%), and amenity benefits (such as access to beaches or the sea: 22%). Sense of Place, or aspects of local distinctiveness, were referenced 40 times (14%) (see Fig. 4). The distribution of locations which respondents identified with particular cultural benefits shows that these benefits are understood to be closely tied to particular places, and often to particular landscape or seascape features. The map-based survey revealed the locations which participants favoured, but the open questions enabled us to gain a deeper sense of the bonds which participants felt with particular places.

The expressions used to indicate sense of place were varied. Place

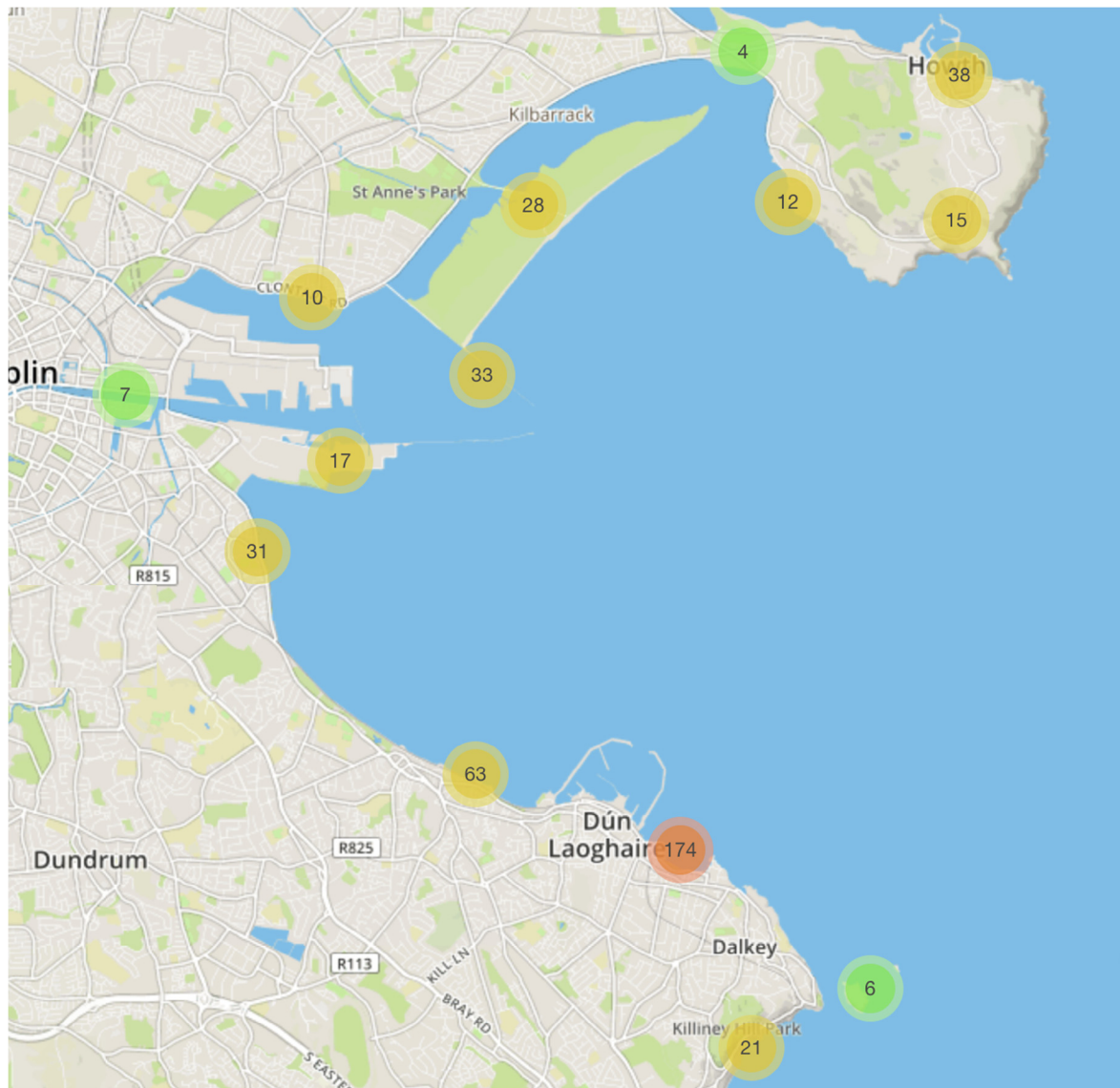


Fig. 3. The online version of the map-based survey was built using the free Ushahidi platform, which enabled us to see which locations respondents identified as their favoured places to visit or use. The coloured circles indicate the number of responses, coded according to density (green for less than 10, yellow for less than 100, and red for 100 and above). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

was mentioned directly in some, such as 'It's a place I love and value hugely'. In others, the value of place is implicit in the articulation of belonging: 'It is the landscape of my life'. Such expressions differ completely from many of the answers which indicated the amenity or recreational value of Dublin Bay, where it is often clear that the Bay just happens to be the coastal location in which people are able to benefit from amenities or recreational opportunities which are also available elsewhere (for example, one respondent wrote: 'I grew up on the Irish Atlantic coast, and Dublin Bay allows me share my love of the ocean with my children'). In contrast, sense of place is where valued socio-ecological characteristics are inseparable from a particular identity, for example in one comment that the marine and coastal environment of Dublin Bay was 'an integral part of Dublin City'. Distinctiveness and pride indicate a strong sense of belonging and sense of place in some comments, such as 'It is a beautiful amenity which is available free to all and which marks Dublin as different from other European capital cities', and 'It is a unique place that should be protected and cherished'. Such expressions of belonging and distinctiveness give an important indicator of the value which participants attribute in narrative forms to places. The open format questions therefore enabled respondents to

express their own sense of value, providing a rich source of qualitative evidence of cultural ecosystem services, and giving respondents a better sense of ownership of the survey. Many respondents also uploaded photographs of their favourite coastal locations, with captions indicating what these locations meant to them personally. The survey was not therefore just a process of collecting information, but also of enriching how people engaged with the process of thinking about and caring for their local environment. As a general limitation, of course, it should be noted that those respondents most likely to contribute rich qualitative data through the survey are probably not a representative sample. However, the quantitative data shows sufficient clustering of locations preferred and cultural ecosystem services identified to have validity for at least significant groups of people.

4.2. Sense of place in cultural representations

In our survey of cultural representations, the importance of sense of place values can be expressed in quantitative terms as a result of our classification of representations according to the CICES index (5.1) with some modification.

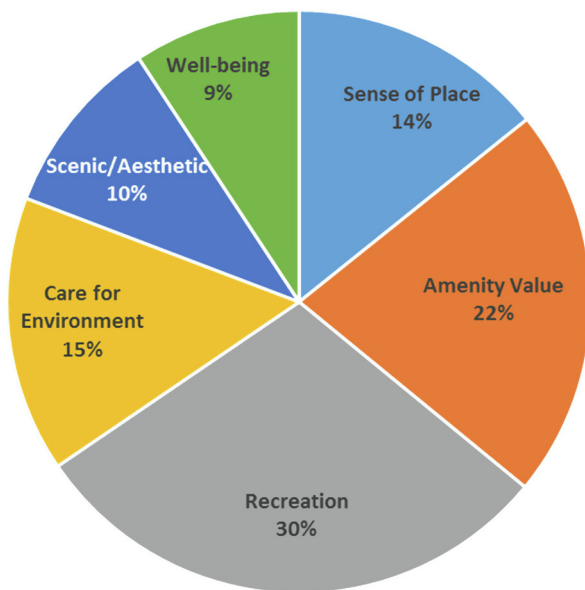


Fig. 4. Responses to the Survey Question - Why does the marine and coastal environment in Dublin Bay matter to you? There were 217 responses overall: this graph shows the proportion of responses which referenced each category.

Fig. 5 shows that sense of place is of major significance as a cultural ecosystem service identifiable in cultural representations. It is also often bundled with other cultural ecosystem services. This finding is particularly important given that it is not currently classified in CICES as a distinct cultural ecosystem service, and our research suggests that it should be. As mentioned above, the cultural representations surveyed consist mainly of visual art (paintings) and literary works (fiction and poetry). It is perhaps not surprising that scenic appreciation tends to be closely associated with visual art, and the more nuanced expressions of sense of place are more likely to be found in fictional and poetic works. As is the case with the open format questions used in the survey (see 4.1), this highlights the significant role that narrative forms of evidence could play in research on cultural ecosystem services.

The distribution of cultural representations of sense of place values

around the Bay reveals some key hotspots, which correlate closely with the distribution of favoured coastal locations in our map-based surveys (Fig. 6). The distribution of sense of place values varies considerably in proportion to the total number of cultural representations of each location (Fig. 7). Given the low numbers involved for some locations, they are not necessarily indicative of the strength of place attachments to those locations. Perhaps understandably, representations of Dublin Bay itself as a watery space tend to be more heavily associated with scenic values than place values – only 7 of the 48 cultural representations of Dublin Bay registered place values. On the other hand, the majority of cultural representations of coastal residential areas such as Ringsend, Sandymount Strand and Dun Laoghaire registered place values more than any other cultural services. As a method of demonstrating patterns in the distribution of cultural ecosystem services, this mapping of cultural representations is useful to consider when combined with the distribution maps from our participatory survey, and also with the maps showing key biophysical features and other ecosystem services. Taken together, our findings from the participatory survey and analysis of cultural representations confirm that aesthetic and cultural benefits of ecosystems are not just a matter of subjective and personal preferences, but as Cooper et al. argued, they are ‘socially shared values... and the outcome of historical processes in shared cultures’ (2016, p. 225).

While the maps showing quantitative indicators of place-attachment are useful ways of showing spatial distributions and concentrations of sense of place, they need to be combined with qualitative modes of knowledge to provide a greater sense of depth. Landscape or seascape paintings are an especially rich source of information about what aspects of the coast have been appreciated over time. Seascape studies of Dublin Bay became popular in the late eighteenth century, and continue to be popular with contemporary artists today. It is clear that the aesthetics of the seascape have been a key source of inspiration for artists, and that several abiotic traits are attractive, including the quality of light, the conditions of the sea (calm or rough), the colours of the seawater, and the sense of space. In addition, the particular shape and forms of the Dublin Bay seascape depicted in paintings convey a strong sense of place. For example, *Dublin Bay Study 2* (Fig. 8) by contemporary artist, Irina Kuksova, combines the iconic chimneys of the Ringsend power station with the rim of Wicklow mountains in the background, with the flat, shallow sands of the North Bull in the

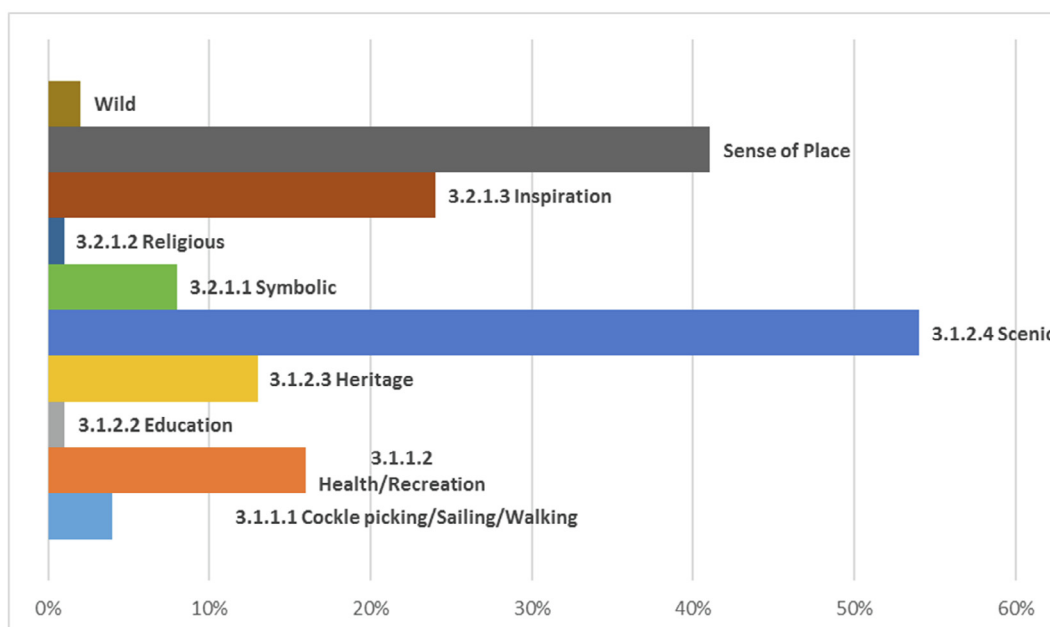


Fig. 5. Percentage of cultural ecosystem services evident in Cultural Representations of Dublin Bay.

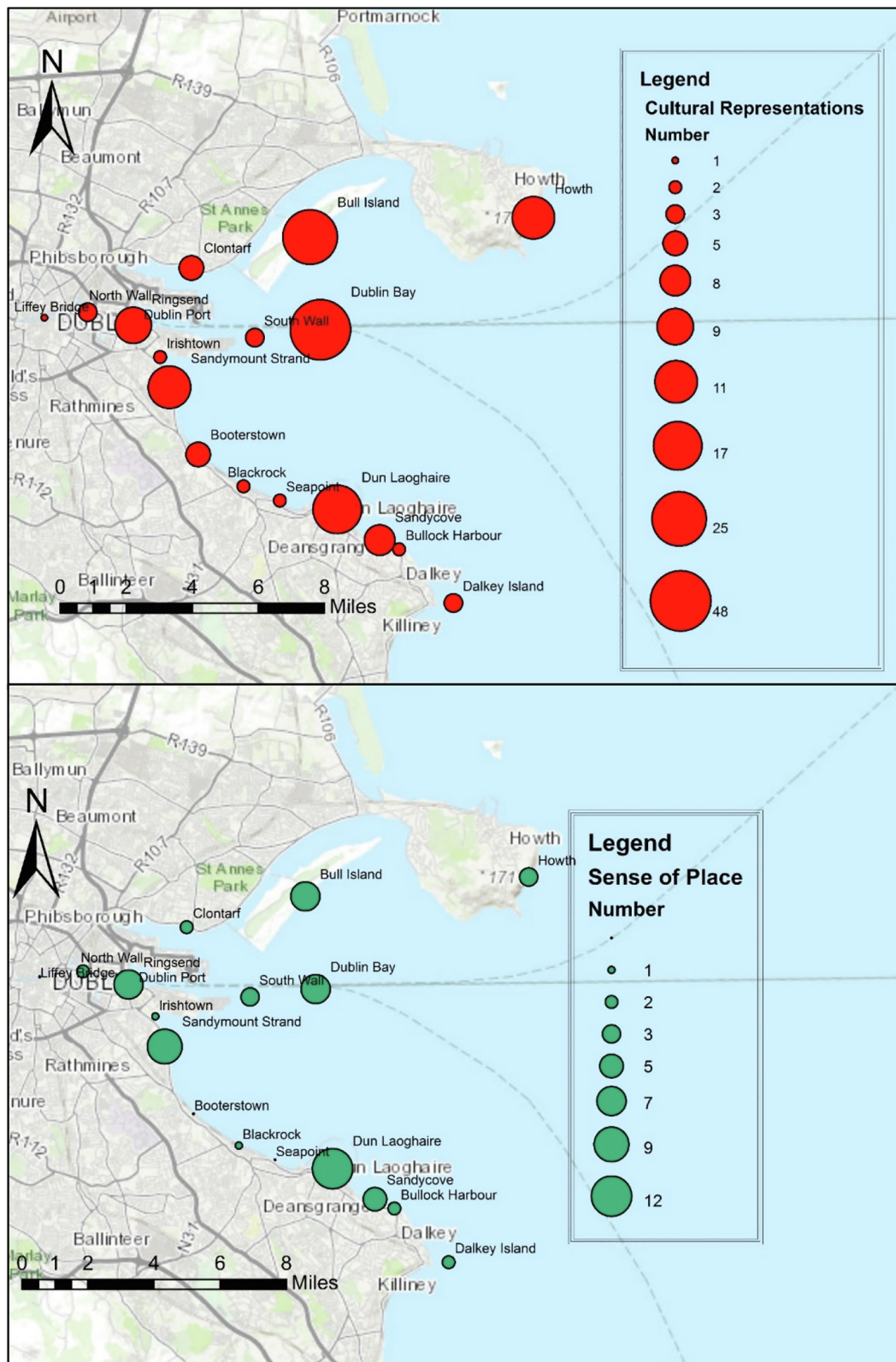


Fig. 6. Dublin Bay – top shows the density of cultural representations associated with each location, while bottom shows the density of cultural representations in which sense of place is a key value.

foreground, to evoke sense of place. It is not just scenic appreciation, which might be of any scenic view appreciated aesthetically, but the specific identifying characteristics of this place which are figured in the painting.

The representation of sense of place in literary works varies

considerably in extent and depth. In some works, there is a strong association of emotional bonds with a particular place depicted, which makes clear that the emotional or cultural benefits represented are inseparable from that place. In W.H. Drummond's poem, *Clontarf* (1822), for example, the poet writes 'Clontarf, I hail thee. In thy pure and

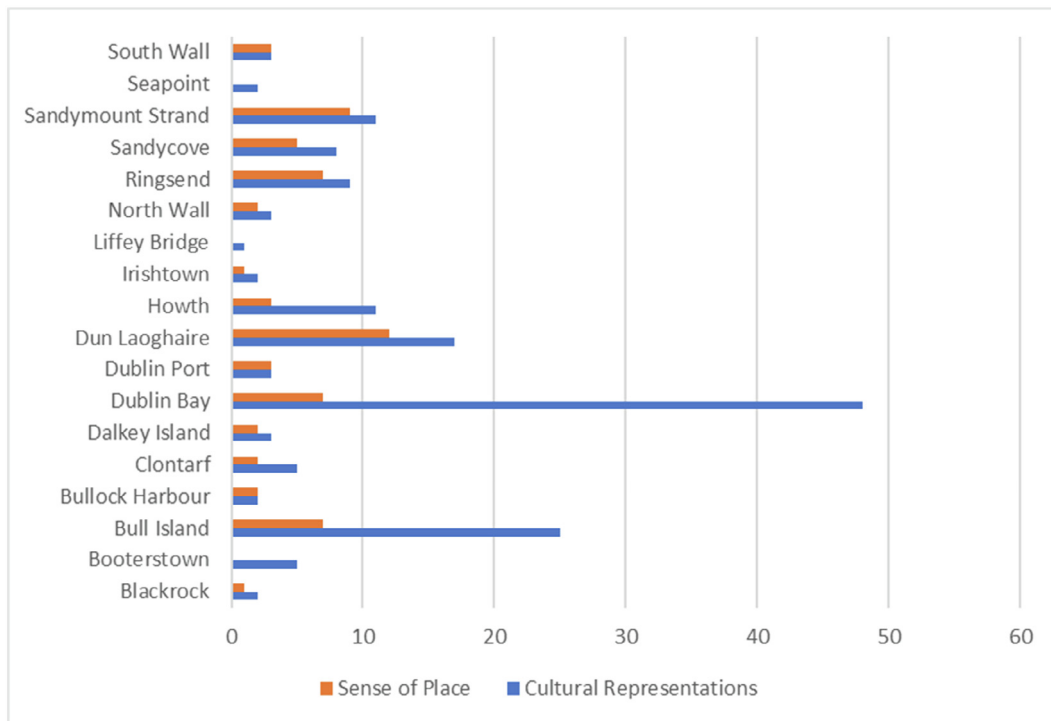


Fig. 7. The proportion of cultural representations of each location which register sense of place as a key value.

fragrant breeze, my soul feels buoyant’, and proceeds to praise the various aspects of Clontarf’s shore which contribute to his emotions (Drummond, 1822, pp. 1–2). It is clear that the distinctive qualities of this singular place account for his pleasure, and not just the activities or amenities available to him. There are also more complex representations of the interdependencies of ecosystems and sense of place, such as in this passage from James Joyce’s novel, *Ulysses* (1993):

The grainy sand had gone from under his feet. His boots trod again a damp crackling mast, razorshells, squeaking pebbles, that on the unnumbered pebbles beats, wood sieved by the shipworm, lost

Armada. Unwholesome sandflats waited to suck his treading soles, breathing upward sewage breath. He coasted them, walking warily. A porter-bottle stood up, stogged to its waist, in the cakey sand dough. A sentinel: isle of dreadful thirst. Broken hoops on the shore; at the land a maze of dark cunning nets; farther away chalkscrawled backdoors and on the higher beach a dryingline with two crucified shirts. Ringsend: wigwams of brown steersmen and master mariners. Human shells. (Joyce, 1993, p. 119)

One key tension between existing Ecosystem Services frameworks and cultural representations such as these is the ability to isolate and



Fig. 8. Irina Kuksova, Dublin Bay Study 2. By kind permission of the artist.

prioritize one service over another. The above passage might be understood to register the inspiration Joyce derived from the Dublin Bay coastline, or to depict his character deriving educational value from it. Sense of place is significant because it allows for the overlapping of multiple cultural ecosystem services, and accommodates more holistic sources of evidence and indicators in ecosystem services assessment. Sense of place allows cumulative depictions of how a text derives cultural benefits from a particular environmental location. The location of the passage is Sandymount Strand, which is part of the South Bull, and the North and South Bulls of Dublin Bay reputedly get their name from the association of the sounds of the waves with the hoof-beats of a bull; Joyce here focuses our attention on the beats of Stephen's walk along the shore, and this sound of foot- or hoof-beats is part of the image system of the chapter; the 'isle of blessed thirst' is an allusion to ancient Irish myths about the 'isles of the blessed', specifically associated with sea-voyages; the driftwood and thoughts of the lost armada may be said to register the notoriety of Dublin Bay as the historic location of many shipwrecks, a crucial context for the modern shape of Dublin Port with its North and South Walls. There is no question that the sensory and cultural pleasures which Joyce depicts in this passage are unique and distinctive to this place, and that literary texts of this kind can be used as evidence for how we understand the uniqueness of place. One limitation upon this methodology, however, is that the volume of cultural representations specific to place is highly dependent on density of population. As a relatively large urban centre adjoining a coastline of considerable variety and scenic attractiveness, Dublin provided an ample number of cultural representations of coastal locations. In less densely populated areas, however, cultural representations might be commissioned in the form of short story writing competitions in the manner described in Bieling's Swabian Alb study (Bieling, 2014), or photography or art competitions. The sourcing of artistic and literary representations can be difficult, but there are a growing number of digital archives of art and literature which are searchable by location and keyword, which will make it easier to identify and catalogue arts and humanities evidence of cultural ecosystem services.

4.3. Integrating cultural evidence of cultural ecosystem services

As indicated above, there are quantitative indicators of the strength of particular cultural ecosystem services associated with specific locations which we can derive from both participant surveys and studies of cultural representations. In addition, the project sought to develop ways of presenting and integrating qualitative analyses of our results. In the study of Dublin Bay, we used StoryMaps to construct spatially-specific narratives of the cultural benefits associated with the Bay. The StoryMaps are important tools for both synthesizing environmental and cultural information, by showing, for example, the spatial relationship between ecosystem habitats and cultural services, and also temporal narratives of historical changes in cultural services. For example, cultural representations showed a strong historical presence of cockle picking and fishing within the Bay, which declined as a result of the degradation of the marine environment due to untreated human effluent and refuse dumping. The dune system on Bull Island appears in our analysis of the social surveys and cultural representations to support a range of cultural activities (not all of which are easily categorized in the ecosystem services framework), but which would be threatened by coastal erosion and sea level rise in the near future. Our StoryMap of cultural representations of Dublin Bay allowed us to show prominent themes in the history of how people have engaged with the sea – as a working space, as a leisure space, as a space for contemplation, as 'edgelands' or wild space, and as an emotional landscape. We were also able to show through StoryMaps that some of the activities people associate most closely with the coast – such as seaside walks, swimming, or pleasure boating – are relatively recent historical developments (there are no cultural representations of such activities that we could find prior to the 1820s). StoryMaps for the project are available on the

project website (www.culturalvalueofcoastlines.com), and have been demonstrated to be useful tools with stakeholder groups for identifying aspects of coastal cultural heritage which depend upon ecosystem health and biodiversity, and which are potentially liable to change or loss. We used them with our focus group, for example, to stimulate discussion about what people value in the Bay, and how the cultural history of interaction with the sea and the coast might be used to encourage people to care more for their coastal environment.

5. Conclusions

This paper set out to develop a conceptual and practical framework for investigating sense of place as a cultural ecosystem service, drawing upon both narrative and cartographical modes of knowledge. It is clear from our results that the spatial locations and extent of emotional bonds with place can be captured through map-based surveys and the mapping of locations represented in art and literature, and that depth can be added to our understanding of those bonds through qualitative forms such as open questions and closer engagement with the place-specific meanings and values depicted in cultural representations. The arguments above are made in the context of evolving ambitions in ecosystem services research to address the full range of ecosystem services (most studies remain focused on a limited number of services), and to transition to an understanding of ecosystem assessment as necessarily involving public engagement. The expected trend towards more holistic or comprehensive forms of assessment, and towards participatory modes of ecosystem research, brings added weight to the importance of sense of place as a distinct category of cultural ecosystem services. This paper invites consideration of the conceptual basis for understanding the importance of sense of place, and suggests some of the methods for qualitative research which are key to identifying and analysing how place attachment and social bonds are interlinked with the active processes of nature.

The broader ambition for this conceptualization and methodological outline of sense of place research is to widen the disciplinary range of ecosystem services research to include the arts and humanities, in order to better source the cultural evidence for cultural ecosystem services. There are clear advantages to conducting this research using integrated research teams, consisting of researchers from the environmental sciences and environmental humanities, and working in partnership with community groups and local stakeholders to engender participatory research methods. Research on cultural ecosystem services remains relatively underdeveloped. The survey of CICES users conducted by Haines-Young in 2016 identified 'cultural ecosystem services' as 'the most frequently cited area of the classification that caused concern' (Haines-Young, 2016, p. 4), with particular concerns expressed about a lack of clear terminology, a lack of direction about where to categorize such cultural benefits as 'local identity, sense of place, or attachment to a landscape', and a lack of clarity about 'to whom' benefits were attributable. A broader and more qualitative range of cultural evidence, and a deeper understanding of how culture and nature co-produce identity and place, will enable ecosystem service researchers to address these gaps.

Acknowledgements

This article is based on research undertaken as part of the 'Cultural Value of Coastlines' project hosted by UCD Earth Institute and UCD Humanities Institute (University College Dublin), and funded by the Irish Research Council New Horizons Scheme (REPRO/2016/46), 2016–2018.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ecoser.2019.100907>.

References

- Alaimo, Stacy, 2010. *Bodily Natures: Science, Environment and the Material Self*. Indiana University Press, Bloomington.
- Bate, Jonathan, 2000. *The Song of the Earth*. Picador, London.
- Bieling, Claudia, 2014. Cultural ecosystem services as revealed through short stories from residents of the Swabian Alb (Germany). *Ecosyst. Serv.* 8, 207–215.
- Brown, G.G., Reed, P., Harris, C.C., 2002. Testing a place-based theory for environmental evaluation: an Alaska case study. *Appl. Geogr.* 22, 49–76.
- Cantrill, James G., 1998. The Environmental self and a sense of place: communication foundations for regional ecosystem management. *J. Appl. Commun. Res.* 26, 301–318.
- Casey, Edward S., 1997. *The Fate of Place: A Philosophical History*. University of California Press, Berkeley.
- Casey, Edward S., 2000. *Remembering: A Phenomenological Study*, second ed. Indiana University Press, Bloomington.
- Chan, K., Satterfield, T., Goldstein, J., 2012. Rethinking ecosystem services to better address and navigate cultural values. *Ecol. Econ.* 74 (2012), 8–18.
- Chapin, F.S., Knapp, C.N., 2015. Sense of place: a process for identifying and negotiating potentially contested visions of sustainability. *Environ. Sci. Policy* 53, 38–46.
- Cohen, Jeffrey Jerome, 2015. *Stone: An Ecology of the Inhuman*. University of Minnesota Press, Minneapolis.
- Cooper, Nigel, Brady, Emily, Steen, Helen, Bryce, Rosalind, 2016. Aesthetic and spiritual values of ecosystems: recognising the ontological and axiological plurality of cultural ecosystem “services”. *Ecosyst. Serv.* 21, 218–229.
- Cresswell, Tim, 2015. *Place: An Introduction*, second ed. Wiley Blackwell, Oxford.
- Devine-Wright, P., Howes, Y., 2010. Disruption to place attachment and the protection of restorative environments: a wind energy case study. *J. Environ. Psychol.* 30 (3), 271–280.
- Drummond, William Hamilton, 1822. *Clontarf: A Poem*. Archer, Hodges and McArthur, Dublin.
- Entrikin, J.Nicholas, 1991. *The Betweenness of Place: Towards a Geography of Modernity*. Johns Hopkins University Press, Baltimore.
- Fish, Robert, Church, Andrew, Winter, Michael, 2016a. Conceptualising cultural ecosystem services: a novel framework for research and critical engagement. *Ecosyst. Serv.* 21, 208–217.
- Fish, Robert, Church, Andrew, Willis, Cheryl, Winter, Michael, Tratalos, Jamie A., Haines-Young, Roy, Potschin, Marion, 2016b. Making space for cultural ecosystem services: Insights from a study of the UK nature improvement initiative. *Ecosyst. Serv.* 21, 329–343.
- Garrard, Greg, 2004. *Ecocriticism*. Routledge, Abingdon.
- Gee, Kira, Burkhard, Benjamin, 2010. Cultural ecosystem services in the context of offshore wind-farming: a case study from the west coast of Schleswig-Holstein. *Ecol. Complexity* 7, 349–358.
- Gould, Rachelle K., Klain, Sarah C., Ardoin, Nicole M., Satterfield, Terre, Woodside, Ulalia, Hannahs, Neil, Daily, Gretchen C., Chan, Kai M., 2015. A protocol for eliciting nonmaterial values through a cultural ecosystem services frame. *Conserv. Biol.* 29 (2), 575–586.
- Haines-Young, Roy, Potschin, Marion B., 2018a. *Common International Classification of Ecosystem Services (CICES)*, V.5.1. Available from: <https://cices.eu/>.
- Haines-Young, Roy, Potschin, Marion B., 2018b. *Common International Classification of Ecosystem Services (CICES) V.5.1 and Guidance on the Application of the Revised Structure*. Available from: <https://cices.eu/>.
- Haines-Young, Roy, 2016. ‘Report of Results of a Survey to Assess the Use of CICES, 2016’. Support to EEA tasks under the EU MAES Process. Negotiated procedure No EEA/NSS/16/002. Available from: <https://cices.eu/>.
- Harvey, David, 1996. *Justice, Nature and the Geography of Difference*. Blackwell, Oxford.
- Hausmann, Anna, Slotow, Rob, Burns, Jonathan K., Di Minin, Enrico, 2016. The ecosystem service of sense of place: benefits for human well-being and biodiversity conservation. *Environ. Conserv.* 43 (2), 117–127.
- Heidegger, Martin, 2001. *Poetry, Language, Thought*. Trans. Albert Hofstadter. HarperCollins, New York.
- Ingold, Tim, 2000. *The Perception of the Environment*. Routledge, London.
- Iovino, Serenella, Oppermann, Serpil, 2012. Material ecocriticism: materiality, agency, and models of narrativity. *Ecozon@* 3.1, 75–91.
- Joyce, James, 1993. *Ulysses*. Oxford World’s Classics, Oxford.
- King, Helen P., Morris, Joe, Graves, Anil, Bradbury, Richard B., McGinlay, James, Bullock, James M., 2017. Biodiversity and cultural ecosystem benefits in lowland landscapes in southern England. *J. Environ. Psychol.* 53, 185–197.
- Knez, I., Butler, A., Ode Sang, Å., Ångman, E., Sarlöv Herlin, I., Åkerskog, A., 2018. Before and after a natural disaster: disruption in emotion component of place-identity and wellbeing. *J. Environ. Psychol.* 55, 11–17.
- Kudryavtsev, Alex, Stedman, Richard C., Krasny, Marianne E., 2012. Sense of place in environmental education. *Environ. Educ. Res.* 18 (2), 229–250.
- Longo, S.B., Clark, B., 2012. The commodification of bluefin tuna: the historical transformation of the mediterranean fishery. *J. Agrarian Change* 12 (2-3), 204–226.
- Lopes, R., Videira, N., 2013. Valuing marine and coastal ecosystem services: an integrated participatory framework. *Ocean Coast. Manage.* 84, 153–162.
- Lopez, Barry, 1986. *Arctic Dreams: Imagination and Desire in a Northern Landscape*. Bantam, Toronto.
- MA (Millennium Ecosystem Assessment), 2005. *Ecosystems and Human Well-Being: Synthesis*. Island Press, Washington DC.
- Malpas, J.E., 1999. *Place and Experience: A Philosophical Topography*. Cambridge University Press, Cambridge.
- Malpas, Jeff, 2010. *Progressive Geographies*. Place Research Network. <https://progressivegeographies.com/2010/11/04/place-research-network/>.
- Masterson, V.A., Stedman, R.C., Enqvist, J., Tengö, M., Giusti, M., Wahl, D., Svedin, U., 2017. The contribution of sense of place to social-ecological systems research: a review and research agenda. *Ecol. Soc.* 22 (1), 49.
- Micklin, P.P., 1988. Desiccation of the Aral Sea: a water management disaster in the Soviet Union. *Science* 241 (4870), 1170–1176.
- Nahuelhual, L., Carmona, A., Latorra, P., Barrena, J., Aguayo, M., 2014. A mapping approach to assess intangible cultural ecosystem services: the case of agricultural heritage in Southern Chile. *Ecol. Indic.* 40, 90–101.
- NESCS, 2015. *National Ecosystem Services Classification System: Framework Design and Policy Application*. US Environmental Protection Agency, Washington, DC.
- Norton, Bryan G., Hannon, Bruce, 1997. Environmental values: a place-based approach. *Environ. Ethics* 19 (3), 227–245.
- Plieninger, Tobias, Dijks, Sebastian, Oteros-Rozas, Elisa, Bieling, Claudia, 2013. Assessing, mapping, and quantifying cultural ecosystem services. *Land Use Policy* 33, 118–129.
- Poe, Melissa R., Donatuto, Jamie, Satterfield, Terre, 2016. “Sense of Place”: human wellbeing considerations for ecological restoration in Puget sound. *Ecol. Soc.* 44 (5), 409–426.
- Ratter, Beate M.W., Gee, Kira, 2012. *Heimat – A German concept of regional perception and identity as a basis for coastal management in the Wadden Sea*. *Ocean Coast. Manage.* 68, 127–137.
- Robin, Libby, 2012. Global ideas in local places: the humanities in environmental management. *Environ. Hum.* 1, 69–84.
- Stedman, R.C., 2003. Is it really just a social construction? The contribution of the physical environment to sense of place. *Soc. Nat. Resour.* 16 (8), 671–685.
- TEEB, 2010. *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB*. Available from: <http://www.teebweb.org/our-publications/teeb-study-reports/synthesis-report/>.
- Tengberg, A., Fredholm, S., Eliasson, I., Knez, I., Saltzman, K., Wetterberg, O., 2012. Cultural ecosystem services provided by landscapes: assessment of heritage values and identity. *Ecosyst. Serv.* 2, 14–26.
- UK National Ecosystem Assessment, 2011. *The UK National Ecosystem Assessment Technical Report*. UNEP-WCMC, Cambridge.
- Urquhart, Julie, Acott, Tim, 2014. A sense of place in cultural ecosystem services: the case of Cornish fishing communities. *Soc. Nat. Resour.* 27, 3–19.
- Van Noy, Rick, 2003. *Surveying the Interior: Literary Cartographers and the Sense of Place*. University of Nevada Press, Reno, NV.
- Williams, Daniel R., Stewart, Susan I., 1998. Sense of Place: an elusive concept that is finding a home in ecosystem management. *J. Forest.* 96 (5), 18–23.