

Using subjective wellbeing to assess the cultural ecosystem services provided by the marine environment

Summary

To recognise the extensive nature of cultural ecosystem services (CES), there is a need to develop non-monetary methods to measure their influence on human health and wellbeing so they can be better incorporated into decision-making. We developed a survey instrument to measure a diverse range of cultural benefits provided by marine areas at a national scale providing evidence of the cultural value of all sites proposed for protection as part of a UK network of marine conservation zones. By highlighting regional trends in types of cultural wellbeing and identifying biophysical characteristics of marine sites that influence overall cultural wellbeing, we provide evidence supporting 1) better integration of CES in the ecosystem service framework and 2) decisions about marine protection that consider socio-cultural values alongside economic and ecological factors.

Abstract

A failure to recognise the importance of cultural ecosystem services (CES) can lead to environmental management decisions that do not fully reflect the ways in which society values the natural resources at stake. To recognise the extensive nature of cultural ecosystem services (CES), there is a need to develop non-monetary methods to measure their influence on human health and wellbeing so they can be better incorporated into decision-making. It is frequently argued that CES cannot be properly measured using metrics and scales and are not commensurable with other ecosystem services. However, there is a pressing need to improve such methods so that environmental managers and policy makers have a toolkit equipped for more balanced decision making.

The great importance of cultural benefits as a source of human wellbeing is increasingly recognised in society-environment interactions. The integration of CES into the ecosystem services framework remains a challenge due to the difficulties associated with accurately defining, articulating and measuring cultural services and the range of relatively intangible benefits they provide.

In this study, we define the dimensions of cultural wellbeing that benefit recreational users of the marine environment and then analyse how marine sites across the UK deliver cultural benefits. Finally we investigate to what extent the provision of cultural benefits can be predicted based on the biophysical attributes of sites.

The degradation of marine ecosystems is a global issue. As society seeks to protect and restore marine habitats to ensure the provision of multiple ecosystem services, much more weight needs to be given to cultural ecosystem services in policy decisions and management plans, through a nuanced understanding of how management might influence societal wellbeing.

A well-integrated ES framework that includes full recognition of cultural values can provide a comprehensive evidence base to support management and designation decisions. The dimensions of cultural wellbeing experienced through use of the marine environment have not been defined and it is unknown what characteristics of the marine environment influence cultural wellbeing.

We developed a survey instrument to measure subjective wellbeing experienced by recreational marine users in existing and proposed marine protected areas (MPAs) they had visited, based on a

priori wellbeing constructs evidenced by the CES and green space literature. Factor analyses revealed the dimensions of cultural wellbeing experienced by individuals and, using multivariate analysis, we evaluated how these dimensions mapped onto the network of 147 MPAs across the UK. We found that sites could not consistently be characterised by the same dimensions of wellbeing as experienced by individual participants indicating that people experience sites in different ways. However there were clear regional patterns in how sites provided wellbeing benefits and we were able to quantify the extent to which different elements of wellbeing showed spatial variation.

Analysis revealed the existence of several wellbeing dimensions including 'engagement with nature', 'place identity' and 'therapeutic value'. Overall sites were of high cultural value. There was regional variation in degree to which different cultural benefits were experienced across the network of sites. We found that certain biophysical attributes of sites had a positive impact on the provision of cultural benefits, such as the presence of charismatic species and the diversity of vulnerable marine life in addition to features such as ship wrecks and certain habitat types. This provides evidence that could be used to understand how changes in marine management may influence cultural ecosystem services in marine areas. The survey instrument used in the study may be adapted for use across a range of terrestrial environmental settings for improved integration of CES in environmental management. The subjective wellbeing indicators developed here have the potential to be used alongside established methods such as monetary valuation for a more holistic assessment of ecosystem value, better balancing socio-cultural values with economic and ecological factors.