



## Public preferences regarding use and condition of the Baltic Sea—An international comparison informing marine policy

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### ARTICLE INFO

#### Article history:

Received 12 December 2012

Received in revised form

21 January 2013

Accepted 21 January 2013

Available online 28 February 2013

#### Keywords:

The Baltic Sea

Social preferences

Recreation

EU Marine Strategy Framework Directive

### ABSTRACT

Marine environments and the ecosystem services they provide are threatened throughout the world. Using an extensive data set obtained from a coordinated survey across all nine littoral countries, this study examines the recreational use of and public perceptions towards the Baltic Sea, providing support for marine policies, including the European Union Marine Strategy Framework Directive. The findings indicate that the Baltic Sea is an important recreation area for residents of the littoral states, as the majority of people spend leisure time there. Swedes, Danes and Finns use the sea the most, and the most common activities are beach recreation and swimming. People are concerned over the state of the Baltic Sea, especially in Finland, Russia and Sweden. Poles, Danes and Finns have the most positive attitude towards contributing financially to improving the state of the Baltic Sea. Additional coordinated research efforts across all nine littoral countries are needed to quantify the monetary benefits of improving the state of the sea. However, even the present results provide evidence on the cultural importance of the Baltic Sea, suggesting that policy makers need to take stronger action to sustain the provision of recreational ecosystem services and safeguarding the well-being of marine ecosystems to the current and future generations.

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### 1. Introduction

Marine environments throughout the world face increasing pressure from human activities. Among the main threats are pollution from untreated sewage, fertilizers, pesticides and industrial chemicals, overfishing, exploration of resources such as oil and gas, and the effects of shipping. The Baltic Sea, surrounded by nine littoral countries in Northern Europe (Fig. 1), is one of the

most threatened marine environments in the world [1]. The Baltic is a brackish inland sea comprising several sub-basins which differ, for example, in temperature, salinity and ice cover. The Baltic connects with the North Sea through the Belt Sea and the Kattegat channel. Approximately 85 million people live in the catchment area of the Baltic Sea and agriculture in the area is well-developed [2]. Consequently, eutrophication is one of the most serious problems for the Baltic Sea [3].

Several administrative actions have been undertaken in response to the deterioration of European marine environments. Many of these initiatives require economic assessments of the impacts of marine policy on human welfare and economic and social analysis of anthropocentric uses of marine waters. One such initiative is the European Union Marine Strategy Framework Directive (MSFD), which aims at effective protection of the EU's marine waters by establishing a common framework for marine policy [4]. The main goal of the MSFD is to achieve or maintain a good environmental status (GES) of the EU's marine waters by 2020, which corresponds closely to the

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Fig. 1. The Baltic Sea and its littoral countries.

objective of the HELCOM Baltic Sea Action Plan [5,6]. The MSFD requires that different uses of the marine environment, including recreation, are evaluated and stresses the importance of assessing the benefits which marine ecosystem services provide to human populations. In addition, the usefulness of adopting an ecosystem services approach has been emphasised in several instances [7–10]. Thus, there is an increasing awareness that more attention should be devoted to quantifying social preferences for the environmental goods and services which marine ecosystems provide, and recreation as one of the cultural ecosystem services has been identified as a crucial area for further studies [11]. Coordinated research is also important in the context of the MSFD, as the management of marine resources requires international cooperation [12].

This study contributes to the expanding literature on social preferences for marine ecosystem services by assessing recreational usage and perceptions of the condition of the Baltic Sea from the perspective of the general public within the coastal states. Ecosystem services provided by the Baltic Sea and their economic value have been examined previously [see e.g. [11–13]], but the present study is the first consistent attempt to describe recreational use and determine the importance of the Baltic Sea in all littoral countries. This paper presents the results of a survey conducted simultaneously in the nine littoral countries, which collected coherent information on recreation in the Baltic Sea area and public attitudes towards the marine environment and measures for improving it. Such a comprehensive survey of public usages and preferences, comparable across all Baltic Sea countries, has not been available before. Previous studies identifying recreational use patterns or ecosystem values in the Baltic Sea area have been local, or at best, national [11]. The provision of this information is timely because there is a pressing need for comparable cross-country data of this kind to support development of appropriate marine protection policies, for example, under the MSFD.

The paper is organised as follows. Section 2 describes the survey instrument and the data. Section 3 introduces the statistical methods employed in the analyses. Results regarding recreation in the Baltic

Sea area and attitudes towards the marine environment are presented in Section 4. The last section provides discussion and conclusions.

## 2. The survey instrument and sample characteristics

A point of departure for the design of the study was the need for nationally representative results that could be compared across the Baltic Sea region. Thus, an English master copy of the questionnaire was developed and subsequently translated into national languages and contexts by the study team containing partners from all nine littoral countries.<sup>2</sup>

In accordance with the objective of the overall study, the questionnaire assessed the importance of the Baltic Sea to the general public in the nine littoral countries. Recreation-related questions were posed to obtain an understanding of the scope and variety of recreational use of the Baltic by national populations. For example, respondents were asked whether they had ever visited the Baltic Sea to spend leisure time there, and if so, when their last visit had taken place. Those who had visited the Baltic Sea during the last twelve months were asked how often they visited the sea and which main activities they carried out there. The second main objective of the survey was to find out how people across the littoral countries assessed the present condition of the Baltic Sea and to quantify their attitudes toward actions to improve that condition. Survey responses provided insights into the importance of the Baltic Sea to the general public and possible public involvement in funding mechanisms to strengthen environmental protection of the Baltic Sea. Attitudes were measured on a Likert scale of one to five, with the scale ranging in most cases from *totally disagree* to *totally agree* [14]. The order in which

<sup>2</sup> The questionnaire in English is available in [16] and the questionnaires in national languages are available upon request.

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