



See the BONUS ROSEMARIE animation on [www.youtube.com/watch?v=Pd2Sp7SE3go](https://www.youtube.com/watch?v=Pd2Sp7SE3go)

## SCIENTIFIC EVIDENCE ON THE USE OF NON-MONETARY AND MONETARY VALUATION METHODS IN THE BALTIC SEA MANAGEMENT

*Comprehensive and inclusive accounting of values is crucial for sustainable management and use of the Baltic Sea.*

### KEY MESSAGES

1. 106 scientific studies apply monetary valuation methods to assess changes in the Baltic Sea marine environment.
2. The scientific evidence base for non-monetary valuation is extremely limited: only six scientific studies were found.
3. There is a lot of evidence that people value a healthy Baltic Sea, however little evidence that research has been linked to the
4. current policies managing and protecting the Baltic Sea.
5. The ecosystem services approach is rarely applied, and only a limited number of Baltic Sea ecosystem services have been valued.
6. More targeted research calls are needed, where policy involvement throughout the research projects is one of the requirements.

## ECOSYSTEM SERVICES VALUATION FOR THE BALTIC SEA POLICIES

Showing the benefits of marine protection actions, as well as measuring these benefits in monetary or non-monetary terms, is important in planning policies. We have made a systematic review in close cooperation with policy advisors and gathered the existing evidence on and clarified the missing gaps in the literature on

- the use of an ecosystem services approach
- the valued marine ecosystem services, and
- the marine policy relevance.

The systematic review is transparent and repeatable, and hence the database from our conducted review can be updated continuously.

### WHICH VALUATION METHOD IS THE BEST?

Valuation methods can be broadly categorized in two groups: monetary and non-monetary estimations. **Monetary valuation methods** can be cost-, market- or benefit-based (i.e. preference-based). In a nutshell, the cost-based methods can be used when we are only interested in getting to know the cost of reaching or not reaching an environmental improvement. In a sense the costs refer to the minimum amount of benefits gained from the environmental change. However, when we are interested in getting to know how the citizens value the benefits of environmental improvements, or avoidance of degradation, methods that can capture people's well-being and preferences need to be applied. This means applying benefit-based or price-based methods. These methods, in contrast to the cost-based methods, are based on economic theory, which means that these methods can capture and quantify the value of a benefit in a more accurate way. Hence, the sum of individuals' behaviour, such as market behaviour or choices expressed in willingness to pay studies, is assumed to mirror society's preferences for environmental improvements.

**Non-monetary valuation methods** can be qualitative or quantitative, and they cover a range of studies from recreational use frequency and multi-criteria decision analysis to deliberative workshops and citizen juries. They may rely e.g. on statistical data, focus groups, interviews or workshops, and the valuation can be associated with identifying or ranking ecosystem services. Non-monetary valuation thus varies more than monetary valuation with respect to which aspect of ecosystem benefits is elicited and how the values of ecosystem services are expressed. Common to most non-monetary valuation methods, is the assumption that individuals' preferences are shaped by the contexts in which the individuals are embedded. Besides exploring individuals' preferences, they therefore focus on assessing ecosystem services values. These can be expressed through historical, cultural, social, psychological and political contexts and conditions, including norms and social perceptions that shape individually held or commonly shared values. Interest in non-monetary valuation of ecosystem services is growing, and there are compelling arguments for increasing the general knowledge and use of non-monetary valuation in policy-making.

Different valuation methods provide answers to different questions. Monetary valuation methods answer questions such "What is the monetary value of the remediation measures for recreational use in the area?" or "How much does it cost to compensate for the harm caused by the activity in the area?". Similarly, non-monetary approaches can answer questions such as: "What are suitable locations for aquaculture production sites in the Finnish Archipelago Sea?" or "Which coastal stretches ought to be designated as important areas for coastal marine tourism?".

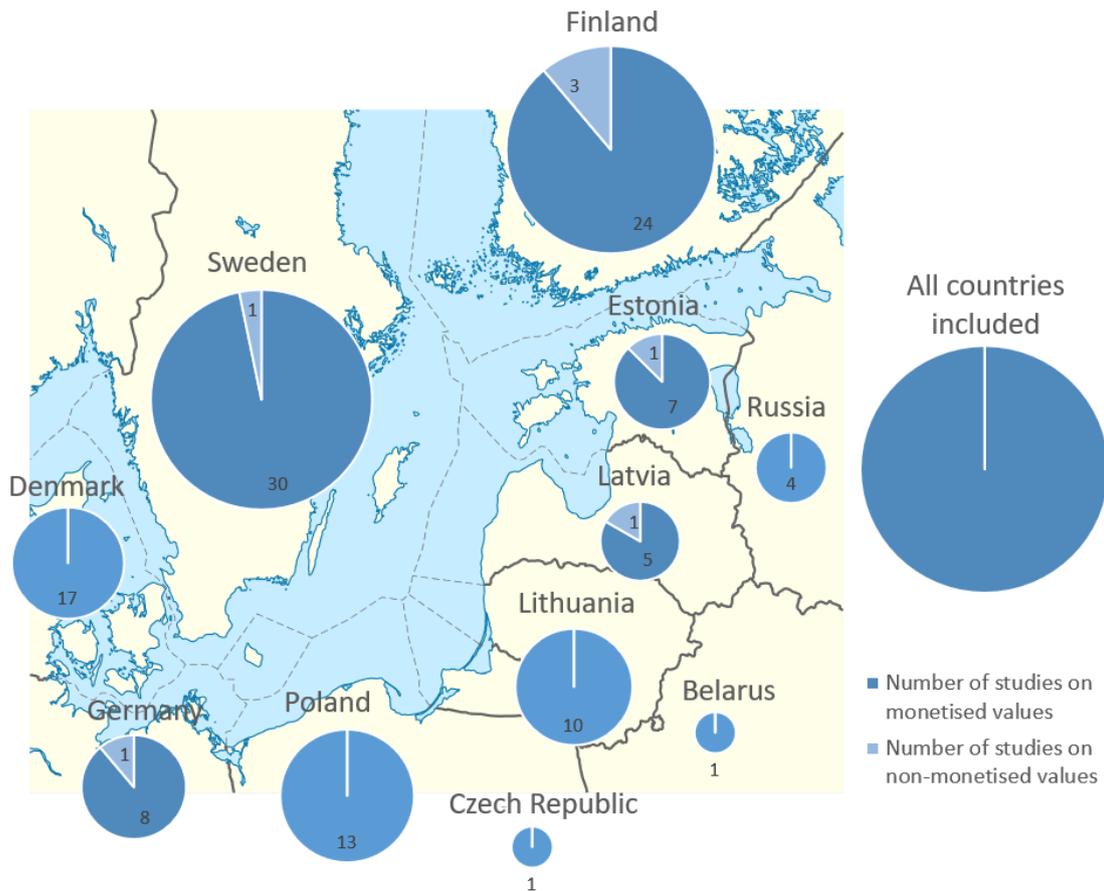


Figure 1 The occurrence of monetary and non-monetary valuation methods used in the articles per countries in the Baltic Sea area (n=112)\*

### VALUATION RESEARCH HAS NOT BEEN LINKED TO THE BALTIC SEA POLICIES

In the systematic review, **106 papers on monetised values** were found in total. The review results very clearly highlight that generally, researchers conducting valuation studies on environmental changes and marine ecosystem services in the Baltic Sea are unaware of the policy relevance of their research. For example, only ten per cent of the papers that conducted a social cost-benefit analysis considered policy relevance in the study formulation. Also, the relevant policy documents were not often even mentioned in the research papers; only two per cent mention the EU Biodiversity strategy and less than 20 per cent the EU Marine Strategy Framework Directive.

### VALUATION RESEARCH HAS NOT APPLIED ECOSYSTEM SERVICES APPROACH

About 30 percent of papers mentioned ecosystem services, and less than 10 percent in

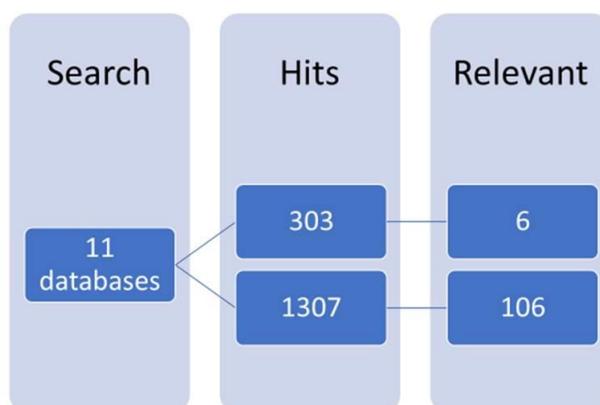
the keywords. However, many studies could have easily been adjusted so that their results could have been directly used in policy-making. For example, a large proportion of the studies could be linked to the HELCOM BSAP's biodiversity and eutrophication goals.

Further, even though the number of valuation studies is increasing, the number of marine ecosystem services being valued is still very limited. That is, the same environmental changes and marine ecosystem services as earlier, and therefore the same valuation methods, are in focus. Namely, abatement costs are used for finding cost-effective ways for reduced nitrogen emissions, and methods based on people's preferences are used for estimating increased benefits of recreational and non-use values due to improved water quality.

In the systematic review, **six papers on non-monetary values** were found in total. If non-monetary valuation is to be used in the assessment of Baltic Sea policies, more research is needed.

## THE BONUS ROSEMARIE PROJECT

The BONUS ROSEMARIE project followed the systematic review approach and guidance from the Collaboration for Environmental Evidence (<https://www.environmentalevidence.org/>) in collecting the evidence base. The literature underlying this policy brief was searched from 11 databases that returned 1610 research articles, 303 for the non-monetary valuation search and 1307 for the monetary valuation search. The articles found were screened according to a predetermined protocol and used CADIMA software (<https://www.cadima.info/>) for the recording. The search equation and the reference of the 1610 articles are provided for future use. Iterative stakeholder dialogue with HELCOM GEAR group was an essential part of the project. BONUS ROSEMARIE research group is sincerely grateful for this science-policy dialogue. The project partners were the Finnish Environment Institute, the Kungliga Tekniska Högskolan, the Estonian University of Life Sciences and Gottfried Wilhelm Leibniz Universität Hannover. The project received funding from BONUS (Art. 185), which is funded jointly by the EU, the Swedish Research Council Formas and the Estonian Research Council.



*Figure 2 BONUS ROSEMARIE found 1610 research articles of which 112 applied non-monetary and monetary valuation methods to assess how people and societies value changes in the Baltic Sea marine environment*

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## FURTHER READING

The evidence synthesis of the variety of value descriptions used in monetary and non-monetary valuation studies on benefits from ecosystem services in the Baltic Sea can be found in [the BONUS ROSEMARIE webpage](#). A compilation of the reviewed articles can be found in: <http://hdl.handle.net/10138/316225>

\*The original background map of the Baltic Sea area is published under [CC-BY-SA-3.0-DE](#) by [NordNordWest/Wikipedia](#)