

## “Maps have an air of authority”: Potential benefits and challenges of ecosystem service maps at different levels of decision making



Jennifer Hauck<sup>a,\*</sup>, Christoph Görg<sup>a</sup>, Riku Varjopuro<sup>b</sup>, Outi Ratamäki<sup>b</sup>, Joachim Maes<sup>c</sup>, Heidi Wittmer<sup>a</sup>, Kurt Jax<sup>d,e</sup>

<sup>a</sup> Helmholtz Centre for Environmental Research—UFZ, Department of Environmental Politics, Germany

<sup>b</sup> Finnish Environment Institute—SYKE, Environmental Policy Centre, Finland

<sup>c</sup> European Commission, Joint Research Centre, Institute for Environment and Sustainability, Italy

<sup>d</sup> Helmholtz Centre for Environmental Research—UFZ, Department of Conservation Biology, Germany

<sup>e</sup> Technische Universität München—Chair for Restoration Ecology, Germany

### ARTICLE INFO

#### Article history:

Received 15 May 2012

Received in revised form

15 October 2012

Accepted 12 November 2012

Available online 21 December 2012

#### Keywords:

Ecosystem services

EU policies

Land use planning

Saliency

Legitimacy

Participatory mapping

### ABSTRACT

Maps of ecosystem services are repeatedly mentioned in the “EU biodiversity strategy to 2020” as being necessary to achieve the goals of this strategy. On regional and landscape levels too, maps are more and more often suggested to be essential for proper management of ecosystems and their services. This paper presents results drawn from interviews on a regional level and from a focus group discussion on national and EU levels. Both dealt with the question of how exactly spatially explicit information can be used in decision-making concerning biodiversity and ecosystem services. Amongst others the use of maps as a means of fulfilling reporting duties of the Member States to the European Commission; also mentioned was the use of maps as a communication tool; and to improve the targeting of policy measures. However, a number of challenges in relation to the credibility, salience and legitimacy of maps also came up during interviews and discussion. The challenges identified lead us to the conclusion that while maps can be tremendously helpful, they should be used carefully. From the information gathered we derive a number of recommendations on how to deal with the salience and legitimacy of maps.

© 2012 Elsevier B.V. All rights reserved.

### 1. Introduction

In May 2011 a new “EU biodiversity strategy to 2020” was launched with the aim of “Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss” (European Commission, 2011). Target 2 of the strategy is to maintain and enhance ecosystems and their services by 2020 by establishing green infrastructure and restoring at least 15% of degraded ecosystems. In its supporting Action 5, the European Commission committed itself to assist Member States to map and assess the state of ecosystems and their services in their national territory by 2014, to assess the economic value of such services, and to promote the integration of these values into accounting and reporting systems at EU and national level by 2020. The mapping

of ecosystem services is thus presented in the strategic document itself as an important supporting action to achieve its goals.

While not yet standardised in spatial (conservation) planning at regional or landscape level, several case studies argue in favour of considering ecosystem services in planning and management processes in order to better understand the values or trade-offs that arise from changes in land use (e.g. Egoh et al., 2008,2011; Gascoigne et al., 2011; Nelson et al., 2009; O’Farrell et al., 2011). However, the mapping and assessment of the state of ecosystems and their services requires tremendous effort. This justifies asking how exactly spatially explicit information can be used in decision making concerning biodiversity and ecosystem services in order to ensure that these maps are used effectively.

Ecosystem services are available on a range of ecological scales and are supplied to and by stakeholders on a range of institutional scales (Hein et al., 2006). On the political and administrative scale, decisions concerning ecosystem services are made from a global level (e.g. Görg and Rauschmayer, 2009) down to a regional or landscape scale level (e.g. Prager et al., 2012). Each of these levels requires different types of decisions and information. While the new biodiversity strategy, for example, requires decisions about more general goals and strategies relating to biodiversity and

\* Correspondence to: Helmholtz Centre for Environmental Research—UFZ, Department of Environmental Politics, Permoserstraße 15, 04318 Leipzig, Germany. Tel.: +49 341 235 1932; fax +49 341 235 1836.

E-mail address: [jennifer.hauck@ufz.de](mailto:jennifer.hauck@ufz.de) (J. Hauck).

ecosystem services conservation, the implementation level requires decisions about the practical management of ecosystems and the sustainable use of their services, e.g. in terms of landscape planning (Burkhard et al., 2012; De Groot et al., 2010; Prager et al., 2012). Our assumption was therefore that different levels have different requirements for (as well as differing uses of) spatially explicit information. Following some recent suggestions for more socially engaged and open assessments of ecosystem services (e.g. Cowling et al., 2008; Daily et al., 2009; Menzel and Teng, 2009; Norton and Noonan, 2007; Prager et al., 2012), we investigated this assumption in the context of the PRESS (PEER Research on Ecosystem Services) project. To elaborate the potential benefits and challenges associated with using maps for decision support, we selected a number of representatives from the EU, national as well as sub-national levels in Finland, Poland and Germany for interviews and a discussion. This paper presents the results of our research along with the conclusions and recommendations which follow from our discussion of the results and consideration of background scientific literature.

## 2. Methods

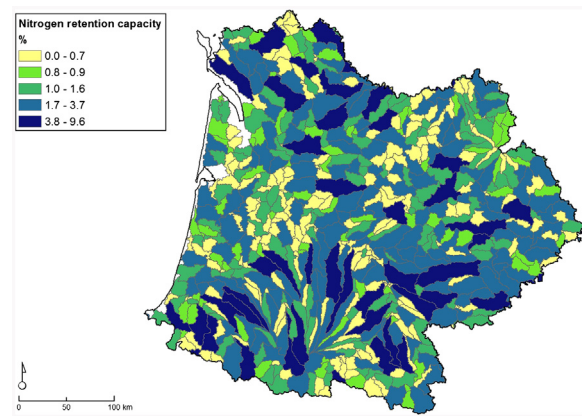
### 2.1. Focus group discussion at EU and national level

At an initial stage of the project, an analysis of EU policy documents was conducted in order to establish an overview of the extent to which ecosystem services are already implicitly taken into consideration in the fields of environmental policy, agriculture and forestry, transportation, regional development and tourism (Maes et al., 2011). Based on this document analysis, members of relevant General Directorates (DG Environment, DG Agriculture and Rural Development, DG Regional Policy) were invited to participate in a focus group discussion. Representatives from the EU Member States Germany, Finland, Poland and the UK were also invited on the basis of existing contacts. Although our questions also have a bearing on other policy fields (and other countries, of course), we restricted the number of participants so as to allow for a more in-depth discussion among the participants. In the end, the focus group consisted of 10 participants, including members of the DG Environment (biodiversity and water units) and DG Agriculture and Rural Development (forestry and agriculture units). Participants from the Member States represented national ministries from the UK, Finland and Poland, covering the environment, forestry, agriculture and regional development.

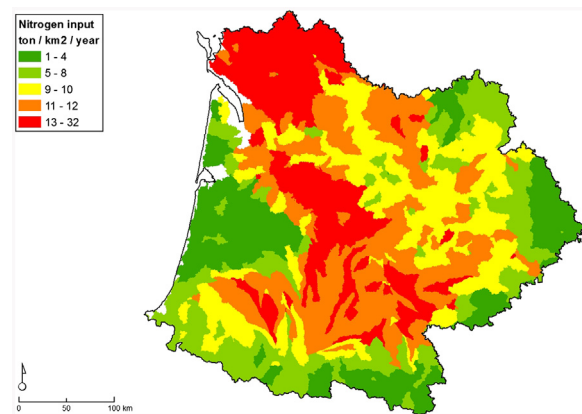
Prior to discussing the issue of maps, the participants of the focus group discussion identified where ecosystem services are implicitly or explicitly addressed in current policies and where potential synergies and trade-offs occur (Maes et al., 2011). They were then presented with a set of maps which showed the spatial trade-off between food production and water quality as a function of nitrogen application and loading. Nitrogen is a key element that provides essential benefits to people, as it increases agricultural production; equally, however, excess nitrogen can contribute significantly to ecosystem pollution (Sutton et al., 2011). All the maps covered the French river basin district of the Adour and Garonne (Maes et al., 2012). The first map (Map 1) showed the capacity of ecosystems to retain nitrogen through various processes in vegetation, soils and water bodies, as an indicator for the ecosystem service “water purification”. Nitrogen retention results in improved water quality in downstream parts of the river basin.

Next, a map (Map 2) of the river basin was presented, showing nitrogen inputs for the ecosystem service “agricultural food production”.

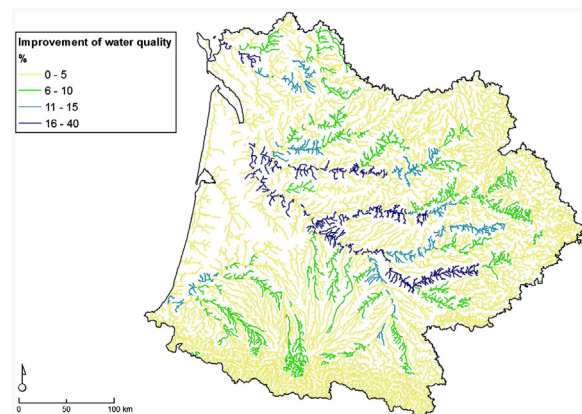
To demonstrate how trade-offs between two ecosystem services can be mapped, another basin scale map (Map 3) was



**Map 1.** Capacity of ecosystems in the French river basin district of the Adour and Garonne rivers to retain nitrogen through various processes in vegetation, soils and water bodies, as an indicator for the ecosystem service “water purification”.



**Map 2.** Nitrogen inputs for the ecosystem service “agricultural food production” in the French river basin district of the Adour and Garonne rivers.



**Map 3.** Improvements in water quality, i.e. the percentages of nitrogen input actually removed by the ecosystem and the associated increase of water quality in downstream reaches of the French river basin district of the Adour and Garonne rivers.

presented that showed the improvements in water quality, i.e. the percentages of nitrogen input actually removed by the ecosystem and the associated increase of water quality in downstream reaches.

The discussion began by looking at these maps, posing the question about the usefulness and challenges of maps of ecosystem services and providing other relevant information; it proceeded in an otherwise unstructured way. The maps of the French

Download English Version:

<https://daneshyari.com/en/article/108120>

Download Persian Version:

<https://daneshyari.com/article/108120>

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