



## Assessing the potential of ecosystem services with land use data

**A new study** has developed a system to assess the potential of ecosystems to supply ecosystem services in the EU-25 plus Switzerland and Norway. It is one of the first to use historical and projected data on land use change at a continental scale to estimate the provision of ecosystem services and to assess possible trade-offs between them.

**The assessment of ecosystem services (ESs)** is an important policy topic but there is a lack of evidence-based information on the level and rate of service that can be delivered by ecosystems. The study examined how to use land cover and land use data to monitor changes in ecosystem service potential or the 'capacity' of land to deliver ESs. By doing so it also explored the currently under-researched area of trade-offs between ESs.

The research used historical data from the Land and Ecosystem Accounting (LEAC)<sup>1</sup> database for 1990-2000 and 2000-2006 created by the EEA. Projected data was based on land use scenarios for 2000-2030 from EURURALIS 2.0<sup>2</sup> (a tool produced by the Wageningen university in the Netherlands to support European policy makers in discussions about the future of agricultural and rural areas). In combination these data describe the characteristics of the land in a map format for EU-25 plus Switzerland and Norway. Examples of land characteristics are arable, forest, wetlands, mountains etc. Using relevant academic literature, research and expert opinion the research made simple binary links between land characteristics and the provision of four types of ESs: crop-based production, wildlife products (such as the provision of non-edible raw materials that are not produced by agriculture such as timber used for furniture), habitat diversity and recreation. The binary links expressed whether the land characteristic had a supportive role or a neutral role for a given ES. This allowed the potential for provision of the four types of ESs to be depicted on the map of EU-25 plus Norway and Switzerland. Each ecosystem service had a series of maps relating to the different time periods.

The published research did not have the scope to analyse each ES in detail but used the ecosystem service of crop-based production as an example of its assessment. The results indicate that in the year 2000 the areas that support this service the most were in the eastern part of the UK, France, parts of Belgium and the Netherlands and Denmark together with a large amount of land in Germany and Poland. Mountains and the Nordic regions showed little support for crop-based production. Looking at the changes in land use and cover between 1990 and 2000 it appears there are more areas that show a reduction in their capacity to support crop-based production during this time than there are areas that show an enhancement in their capacity. Portugal and the western Mediterranean coast of Italy show the most marked transformations in terms of reduced capacity. Indeed it appears that this decreasing trend in areas that can support crop-based production will continue under the projected EURURALIS scenario. In comparison there appears to be an increase in the areas with the potential to support the ecosystem service of recreation.

The research also investigated possible trade-offs between ecosystem services. In general there is a clear trade-off between the potential for the service of habitat diversity and crop-based production. In addition there appears to be a number of areas where the potential for habitat diversity and recreation have improved at the expense of crop-based production. The researchers describe their results as a 'quick scan' assessment of the state of ecosystem services at European scales. They highlight that their assessment does not aim to replace more detailed assessments or modelling but allows a rapid initial appraisal to flag up important trends and help decision makers identify areas in need of more intensive assessments.

1. See: <http://sia.eionet.europa.eu/LEAC/>

2. See: <http://www.eururalis.eu/>

**Source:** Haines-Young, R., Potschin, M. & Kienast, F. (2012) Indicators of ecosystem service potential at European scales: Mapping marginal changes and trade-offs. *Ecological Indicators* 21:39-53. Doi: 10.1016/j.ecolind.2011.09.004

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