

Science for Environment Policy

New method to scale up the value of ecosystem services

There is increasing policy demand for the 'scaling-up' of ecosystem service valuations to a national or regional level, but available methods for doing this are limited. A new study has proposed a new scaling-up methodology and tested it by assessing the impact of climate change on European wetlands.

The increasing need for ecosystem service assessments at large geographic scales, such as The Economics of Ecosystems and Biodiversity (TEEB)¹ initiative, requires ecosystem service values to be 'scaled up' from smaller-scale studies, in order to provide economic estimates for large areas. As such, there is policy and academic interest in transferring values derived from existing study sites to similar sites of policy interest (so-called 'policy sites'). The procedure, known as value transfer, often applies a 'value transfer function' to convert the estimate from the study site to the policy site.

The study, funded by the European Environment Agency (EEA)², proposes a methodology which uses a transfer function derived from a meta-analysis (or comparative review) of valuation studies combined with spatial data from a geographic information system (GIS).

The first step of the method is to construct a database of valuation studies on the ecosystem of interest and then, using meta-analysis, to create a value transfer function. This function can estimate value based on spatial factors such as the area covered, variety of ecosystem services provided, abundance of ecosystems and the size of the population benefiting from the services.

Next, a database of policy sites in the region is created using spatial information from GIS. The value transfer function is applied to the spatial data of the policy sites to estimate their value. Each policy site is given a monetary value per hectare per year and, from this, annual values for a regional or national level are calculated.

The study tested the methodology by applying it to the expected changes in value of ecosystem services provided by European wetlands under climate change from 2000 to 2050, using information from 120 valuation studies of wetlands and spatial data on European wetlands provided by CORINE³. Spatially detailed projections of the impact of climate change were not available, so an 8% reduction in wetland area was assumed.

Using the proposed method, the loss of ecosystem services in European wetlands under the effects of climate change was estimated at US\$1billion. The area of wetland change, and the value of this change, varies considerably between countries. For example, Finland was projected to lose 157,757 hectares of wetland, but the value loss is relatively low at US\$34 million, due to the abundance of wetlands and low population density. In contrast, Italy is projected to experience a smaller loss of wetlands (5,511 hectares), but the value of this loss (US\$54million) is considerably higher, as wetlands are scarce in Italy, and the population density is higher.

The researchers highlight several limitations in the method caused by errors in the value transfer function, inaccuracies in land use data and a simplistic assumption of the impacts of climate change. Nevertheless, they suggest it is a pioneering practical method for scaling-up economic values for changing ecosystem services at a large scale.

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1. See: www.teebweb.org

2. See: www.eea.europa.eu

3. See: www.eea.europa.eu/publications/COR0-landcover