

Potential for using regional and global datasets for national scale ecosystem service modelling

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Ecosystem service models are increasingly being used by planners and policy makers to inform policy development and decisions about national-level resource management. Such models allow ecosystem services to be mapped and quantified, and subsequent changes to these services to be identified and monitored. In some cases, the impact of small scale changes can be modelled at a national scale, providing more detailed information to decision makers about where to best focus investment and management interventions that could address these issues, while moving toward national goals and/or targets.

National scale modelling often uses national (or local) data (for example, soils, landcover and topographical information) as input. However, there are some places where fine resolution and/or high quality national datasets cannot be easily obtained, or do not even exist. In the absence of such detailed information, regional or global datasets could be used as input to such models. There are questions, however, about the usefulness of these coarser resolution datasets and the extent to which inaccuracies in this data may degrade predictions of existing and potential ecosystem service provision and subsequent decision making.

Using LUCI (the Land Utilisation and Capability Indicator) as an example predictive model, we examine how the reliability of predictions change when national datasets of soil, landcover and topography are substituted with coarser scale regional and global datasets. We specifically look at how LUCI's predictions of where water services, such as flood risk, flood mitigation, erosion and water quality, change when national data inputs are replaced by regional and global datasets. Using the Conwy catchment, Wales, as a case study, the land cover products compared are the UK's Land Cover Map (2007), the European CORINE land cover map and the ESA global land cover map. Soils products include the National Soil Map of England and Wales (NatMap) and the European Soils Database. NEXTmap elevation data, which covers the UK and parts of continental Europe, are compared to global AsterDEM and SRTM30 topographical products. While the regional and global datasets can be used to fill gaps in data requirements, the coarser resolution of these datasets means that there is greater aggregation of information over larger areas. This loss of detail impacts on the reliability of model output, particularly where significant discrepancies between datasets exist. The implications of this loss of detail in terms of spatial planning and decision making is discussed. Finally, in the context of broader development the need for better nationally and globally available data to allow LUCI and other ecosystem models to become more globally applicable is highlighted.