Mapping social-ecological systems at different scales

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Abstract

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Ecosystem services, i.e. the benefits that people derive from nature, are generated by multifunctional landscapes and combined social-ecological systems. A bundle of ecosystem services that is produced by such a multifunctional landscape represents the trade-offs and synergies between different services that characterize a social-ecological system. In this study we present an approach to mapping social-ecological systems at different scales in South Africa, based on the bundles of ecosystem services that are generated by these systems. To achieve this, we draw on publicly available data from a national census, in which every household in the country was surveyed to assess its socio-economic profile. We use this dataset to map a number of ecosystem services within South Africa, and then analyse the mapped services in a cluster analysis at different scales (varying both grain and extent) to identify different types of ecosystem service bundles. We argue that areas which share a specific ecosystem service bundle type represent the same social-ecological system. Using this approach, we successfully map distinct social-ecological systems across the country, and compare the results of varying the scale of analysis. We show that some patterns are robust to scale while others are not, and discuss these results in the context of social-ecological systems research and the resilience of landscapes to provide services that humans depend upon for their well-being.

Keywords: approaches, cross, scale, ecosystem services, social, ecological systems, trade, offs

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