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## Simple or Better: Comparing Two Methods for Mapping Soil Conservation Service of Terrestrial Ecosystems

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Spatially explicit mapping of ecosystem services (ESs) is one of the critical methods for mainstreaming ESs into decision-making that deal with land use and ecological conservation planning. Soil conservation (SC), an important regulating service of terrestrial ecosystems, draws great concerns from stakeholders and decision-makers during the policy-making process. Contemporarily, the Revised Universal Soil Loss Equation (RUSLE)-based empirical soil erosion models are the staple methods used to quantitatively assess the SC of ecosystems. In this paper, we present a newly formulated composite indicator-based method for mapping the SC which can be used at regional or larger spatial scales. After comparing the spatial patterns and temporal variations of SC from the RUSLE-based model and those from the indicator-based method in Jiangxi province of China, the similarities and differences of these methods were revealed. Findings suggest that the biophysical indicator method can effectively rank terrestrial ecosystems on their capability to provide SC service at large spatial scale. The mapping results conform to both the findings based on field observations at various environmental settings and the general implementation of soil conservation practices. Therefore, the biophysical indicator method is suitable for large scale SC mapping with targets of soil conservation planning and conservation effectiveness evaluation even it is much simpler than the traditional empirical models such as RUSLE. RUSLE is similar to the biophysical indicator method in reflecting different ecosystem (or land cover) types on their ranking of SC capability. But it is problematic in the results on spatial pattern of SC due to lack of support from the published literature on the soil conservation monitoring and practical applications. This problem may be largely rooted in its very extreme and unrealistic assumption when RUSLE is borrowed to map SC of ecosystems. In fact, RUSLE has been used and verified globally in soil loss assessment and its environmental risks. But this does not necessarily guarantee its usability as a sound SC mapping tool. On the contrary, the findings of the present research strongly recommend great caution for the use of RUSLE to map the SC service of ecosystems as shown in this paper and the published literature especially to the spatial pattern of SC and its temporal change. Therefore, the newly formulated simple biophysical-based composite indicator method is by no means worse in mapping the rankings and spatiotemporal variations of SC in terrestrial environments; this research revealed its advantages for SC mapping for the purpose of soil conservation planning and conservation performance assessment especially at large spatial scales.