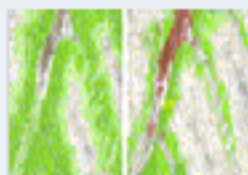
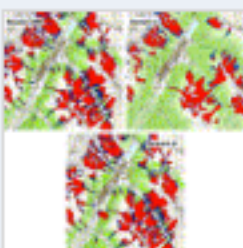
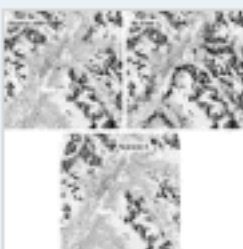
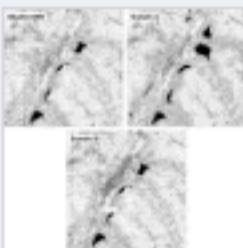


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[2.3. Process-based models](#)
[2.4. Economic valuation](#)
[3. Results](#)
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Abstract

Planning frequently fails to include the valuation of public goods and services. This can have long-term negative economic consequences for a region. This is especially the case in mountainous regions such as the Alps, which depend on tourism and where land-use changes can negatively impact key ecosystem services and hence the economy. In this study, we develop a semi-automatic procedure to value ecosystem goods and services. Several existing process-based models linked to economic valuation methods are integrated into a geographic information system (GIS) platform. The model requires the input of a digital elevation model, a land-cover map, and a spatially explicit temperature dataset. These datasets are available for most regions in Europe. We illustrate the approach by valuing four ecosystem services: avalanche protection, timber production, scenic beauty, and habitat, which are supplied by the "Landschaft Davos", an administrative district in the Swiss Alps. We compare the impacts of a human development scenario and a climate scenario on the value of these ecosystem services. Urban expansion and tourist infrastructure developments have a negative impact on scenic beauty and habitats. These impacts outweigh the benefits of the developments in the long-term. Forest expansion, predictable under a climate change scenario, favours natural avalanche protection and habitats. In general, such non-marketed benefits provided by the case-study region more than compensate for the costs of forest maintenance. Finally, we discuss the advantages and disadvantages of the approach. Despite its limitations, we show how this approach could well help decision-makers balance the impacts of different planning options on the economic accounting of a region, and guide them in selecting sustainable and economically feasible development strategies.

Keywords

Alpine regions; Ecosystem services; Environmental management; Geographic information system; Economic valuation; Land-use change; Scenarios