Title of the symposium:

3-D landscape metrics and visualization techniques - applications in spatial planning, environmental assessment and participatory decision processes

Detail of organizer(s):

Responsible

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Symposium abstract

A key element of planning and managing of green infrastructure in urban and rural areas in support of regulating and cultural ecosystem services and for enhancing biodiversity is their functioning and functional connection. The functioning of such areas relies on the type of ecosystems contributing to the green infrastructure, their spatial dimension, but also on the quality of such areas. For instance, the quality of woody areas which are particularly valuable for structuring landscapes can range from highly heterogeneous, natural and undisturbed to very homogeneous, degraded and disturbed . So far, mainly 2-D metrics have been applied to assess the character and quality of the green infrastructure, while their vertical structure was only rarely considered. Even more, also the quality of urban and peri-urban green areas considering their contribution to regulating and cultural services is largely dependent on 3-D shapes that could either enhance or disfavor the provision of such services. Thus, a challenge consists in developing mathematical approaches that support the 3-D characterization of green areas and the translation into quantitative or at least qualitative information how it contributes to their capacity to provide ecosystem services. A broader perspective complementing existing approaches related to the analysis of terrain features could be beneficial and bring new insights. Another challenge is the use of new techniques for visualization of 3-D structures in a way that supports the involvement of perceptions of planning actors in highly realistic manner. Digital visualization techniques but also approaches such as 3-D printing could provide solutions. Particularly planners could benefit from tangible 3D-models of the green infrastructure for communication with

citizens. Consequently, in this symposium, we invite presentations that address 3-D metrics and how these can be derived from spatially highly resolved data sets such as LIDAR data or other data sets. We invite presentations that address innovative mathematical approaches to translate 3-D structures into metrics that support the assessment of ecosystem services. We welcome presentations that present novel methods, techniques and technologies for 3-D visualization. We will discuss existing and potential future applications of 3-D metrics and 3-D visualization techniques in spatial planning, including urban and landscape / regional planning. We welcome particularly presentations that showcase the application of 3-D or combined 2-D/3-D metrics at different scales or address innovative applications in participatory decision processes. Our symposium intends to develop a special issue in Ecological Indicators that builds the bridge from indicator development towards implementation.

How your symposia will improve landscape ecology science?

The assessment of landscape characteristics is often only based on information considering the 2-D pattern and coarsely defined land cover types. In case of 3-D aspects mainly topographical information, but not vegetation or combined vegetation-building structures are considered. Therefore, we suggest to include more information on the vertical structures beyond topography to address ecological processes. We suggest this information improves particularly planning decisions as it connects the management of ecosystems and man-made systems (urban areas) with spatial planning. Our symposium is expected to be a forum for facilitating interdisciplinary interactions and connect landscape ecology scientists with techniques and technologies from other research fields.

Broad thematic areas

Broad thematic areas 1st choice: From landscape pattern to functions (variables, metrics, indicators, monitoring)

Broad thematic areas 2st choice: Geography and landscape ecology

Free Keywords

Landscape metrics, spatial planning, green infrastructure, 3-D metrics, 3-D visualization, assessment of combined topographical and vegetational / building features

Outcomes of symposium

Special issue in a scientific journal (to be negotiated)

Notes

We plan a special issue in Ecological Indicators.