

Towards a new generation of integrated land system models – a review of modelling approaches

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Abstract

Processes of land-use change are the result of complex interactions between human and environmental driving factors. One approach for capturing this complexity is the analytical framework of land systems as coupled human-environment systems, a concept that is a central component of the science plan of the Global Land Project. Starting point of this presentation is a first definition of key elements that characterize integrated land system models and distinguishes them from land-use change models. Then, it is analyzed how these key elements are implemented by state-of-the-art model approaches for the regional and global scale levels. Here, the focus lies on the representation of the human and environmental sub-systems as well as on the modeling of interactions and feedback between these two components. Based on these results, further research needs for the development of a new generation of integrated land system models are identified.