Jul 1st, 12:00 AM

Feedbacks in socio-environmental land systems

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Abstract: The dynamics of socio-environmental systems are driven by exogenous forces and by the interaction of endogenous system components, both within the social and environmental realms, as well as between them. In recent years, the number of models and modelling frameworks explicitly representing feedbacks has increased. Thus, a synthesis of chances and pitfalls in including feedbacks in such models is needed. Land use systems are an important example of socio-environmental systems and will be used as the main focus of the analysis.

Land use changes are on the one hand caused by a complex interaction of human and/or institutional land use demands and the environment which limits human use in several aspects. But on the other hand, land use changes and their effects at least partly influence the respective driving forces and future land-use decisions, e.g. by affecting the productivity of agricultural land, in- or decreasing the quality of life in (residential) urban areas, increasing accessibility and thereby facilitating the economic development of areas and so forth. Accordingly, feedback loops of (i) land use changes or (ii) changes of the state of the environment on the socio-economic drivers and land-use decisions are crucial for capturing at least some aspects of the complex socio-environmental system.

The workshop will draw upon the presentations given in the corresponding session S16 on land-use focused feedbacks. During the workshop, preliminary versions of one or more synthesising papers on this topic will be discussed. The paper(s) are intended tofocus on land-use related feedbacks in various socio-environmental systems and shall address

- feedbacks that are usually tackled in such models,
- possibly neglected, but important feedbacks
- scales of feedbacks (temporal, spatial)
- implementation issues (calibration, validation, model coupling, how generic is the implementation, effect of initial conditions, uncertainty, scaling issues)

Selected participants will be invited to contribute either as co-authors to a synthesis paper or with separate papers to be published in a special feature of Environmental Modelling and Software (to be confirmed).

Keywords: feedback mechanisms; land use modelling; review; urban and rural land systems.