

Department Computational Landscape Ecology

Mission statement & Guiding principles

Research Fields, Objectives and Methods

Our research investigates impacts of human-land use on the environment such as water and matter dynamics, biodiversity, ecosystem functions, and ecosystem services. We aim at obtaining in-depth understanding of human-environment interactions at various temporal and spatial scales (from local, regional to global), which is generalizable or transferable.

Our methods range from complex statistical analysis to integrated simulation models of different complexity and encompasses analysis of field data, multi-variate statistics, inverse parameterisation, exploratory modelling to meta-analytic synthesis studies. If needed model or tools are modified, extended, simplified or newly developed.

Research results allow us to quantify and qualify the impacts of land-use change at various spatial levels. This translates into management schemes and recommendations with respect to the actors sharing and protecting the resource land.

Guiding principles

To conduct this complex interdisciplinary research, we agree on a common understanding:

1. As part of an **interdisciplinary research team** everybody is aware of the diversity of scientific and methodological backgrounds of our colleagues. **Open communication, a common language and open-minded discussions** are important values within our daily work. Those principles are remembered and acknowledged in seminars, colloquia and meetings.
2. We are aware that the **quality of our work** and the reliability of our results are an important pillar of our success. Critical scientific discussion with colleagues, projects partners and open feedback are important elements to strengthen this pillar. We value **active international networks** of colleagues established through important scientific societies and personal contacts. We aim to build and strengthen co-operations with other reputable research institutions and universities to jointly address new research questions and to improve the quality of our research.
3. **Authorship** can be a term of debate as with this come the credits scientists achieve. Especially in interdisciplinary teams, multi-author papers are frequent. In our understanding, co-authorship requires significant contributions to the conception of studies or experiments, to the generation, analysis and interpretation of the data, and to preparing the manuscript (cf. DFG guidelines for good scientific practice). We do not support "honorary authorship". The order of authors results from the individual contributions to the publication and is at best agreed on in an very early stage of the process. PhD students are first authors on their thesis papers. Group leaders or the head of department are not necessarily and automatically last author of those multi-author papers.
4. We support our PhD students by assisting them in designing and carrying out their research. It is our objective to introduce them to cutting-edge methods of data analysis and modelling, to assist them in building a network of colleagues and scientists relevant for their research and to help them keeping track with compiling a **paper-based (cumulative) thesis**.

5. The use of **modelling** and **simulation** as a toolbox requires a sound methodology for model analysis and model verification. We think that model analysis and testing are at least as important as model coding. This means that one, if not both, of the following threads is part of any modelling study: (i) the proof of the robustness of a developed method and (ii) the model test based on real-world data.
6. After a project has come to an end, the compiled data and the related steps of analysis need to be accessible and reproducible as these might serve as input to a follow-up project. In our team, we carefully overview that documentation of data and tools is made available when projects come to an end, and possibly team members changes jobs.
7. Our work is improved the more carefully we consider and incorporate feedback from colleagues. Thus, we **support and promote the open exchange of data and methods**, make our results and tools publicly available and invite colleagues to join our research.
8. We acknowledge our **responsibility** having the opportunity to use our creativity and expertise through the support mostly based on tax payer's money. We thus are aware that we must be able to explain our work outside the science community. This, requires simplification of statements but also helps deriving the key messages of research results. With this in mind, we can derive storylines valuable for informing the public about our recent findings. We, as scientists, are aware of the importance our statement can have made in public or to the press & media. **We strive for the publication of our work (besides reputable international journals) on different streams such as fully open access journals, blogs or Wikis.**