

Wintersemester / Winter Term 2012-2013

## BayCEER Kolloquium

Vortragsreihe Ökologie und Umweltforschung  
*Lectures in Ecology and Environmental Research*

**Donnerstag 14.02.2013, 17:00 Uhr, H6**

Anschließend Postkolloquium mit Bier und Brezeln im Foyer H6

### Prof. Dr. Gunnar Lischeid

Inst. of Landscape Hydrology, ZALF / Inst. for Earth and Environmental  
Sciences, University of Potsdam

## How many degrees of freedom does a landscape have? A new approach to grasp apparent ecosystem complexity

Ecological research has revealed a confusing interplay of a multitude of processes at different scales. It seems that ecosystems are extremely complex, difficult to understand, and different effects can hardly be differentiated. On the other hand, ecosystems and landscapes clearly exhibit structures and are far from being random ensembles of single entities. Experts often agree that some phenomena are more typical compared to others for given systems, although often without being able to give a clear reason for that assessment. This provides some evidence that ecosystems are much more constrained than current theory and models would predict. The approach presented in this talk is based on the working hypothesis that landscapes are highly constrained systems which results in a low intrinsic dimensionality of landscape (or ecosystem) processes. That means that often only a small number of processes prevail the observed temporal or spatial patterns in landscapes, e.g., of solute concentration, groundwater heads, soil moisture, or air moisture.

This hypothesis can be tested. Furthermore, it provides a basis for very efficient ways to analyze ecosystem behavior. Due to their ease of use, some are suggested for environmental agencies to test for unexpected behavior and to differentiate between natural and anthropogenic effects. Last but not least, powerful methods can be derived to test and to optimize the structure of complex ecosystem models and to deepen our knowledge of landscape processes.

Do. / Thu. 17 st  
Gebäude / Building  
GEO  
Hörsaal / Lect. hall  
H6

Die Vortragsreihe  
ist eine  
interdisziplinäre  
Plattform zur  
Information und  
Diskussion für  
Studierende,  
Forschende und  
Lehrende

Gäste  
sind herzlich  
willkommen

*The lectures serve  
as an inter-  
disciplinary  
platform for  
students, junior  
and senior  
scientists.*

*Guests  
are cordially  
invited!*