

## Symposium: **Towards global-scale behavioural models of land use change**

15-17 December 2021, Schloss Herrenhausen, Hannover

Organisers: Dr Calum Brown, Prof. Tatiana Filatova, Dr Birgit Müller, Dr Derek Robinson, Prof. Mark Rounsevell, Prof. Maja Schlüter

### Overview

The symposium will take place between 09:00 on Wednesday 15 December and 15:30 on Friday 17 December 2021. The symposium (as well as meals) will be hosted in Schloss Herrenhausen, and we will stay in a hotel in the centre of the city. Accommodation and meals will be provided, and there is limited travel funding for participants unable to cover their own expenses.

### General description

This symposium will gather together an international group of researchers to tackle one of the most important challenges facing Earth System Science: the development of large-scale (national/continental to global) land-use models that are based on human behaviour, agency and decision-making processes. Participants will engage with theories, methods and tools that can support this development across the land use modelling community. The ultimate aim of the work initiated here will be to identify pathways to sustainability that account for fundamental processes in human and natural systems in uncertain future conditions. As such, these pathways are not detectable through current modelling approaches that do not represent the relevant processes. Participants will work together to support the development of a common land system 'modelling framework'. This framework will build on recent advances in theoretical and computational representations of human decision-making to determine which processes and relationships are most important, and how they can best be modelled.

In creating an alternative to the current range of 'top-down' global models based on macro-economics, the symposium will contribute to the development of a working laboratory to test theories of human decision making, assess the impacts of different forms of decision-making on land system outcomes, and undertake social simulation experiments in a globally connected world. This includes new representations of institutional processes and their relationships with local land users. We also envisage coupling of large-scale, land-use models with other model types, such as Dynamic Global Vegetation Models (DGVMs), biodiversity models and/or climate emulators. These coupled models can then be used to explore a wide range of environmental change drivers and to evaluate the consequences of these for ecosystem services. The symposium will involve a mix of research presentations, open discussions, workshops and informal time for networking and planning.

### Purpose

The main purpose of the workshop will be to build on recent work within the behavioural modelling community to plan specific collaborative efforts leading towards global-scale modelling. To this end, participants will be invited to complete a pre-workshop survey on their experience and ideas for developing joint work, and to briefly present their own work in flash presentations. We will also try to learn lessons from other fields facing similar challenges. Survey responses will be developed during the workshop to produce a 'ways forward' paper and to inform development of the modelling framework.

## Contributions

**Flash talk and poster submissions are welcome.** Flash talks will last 10 minutes with 10 minutes of questions. Talks and posters should be oriented around the symposium's aims, and be relevant to large (continental-global) scales. If you would like to present a talk or poster, **please send a title and short outline (100 words) by 29 October 2021.**

We will also ask participants beforehand to prepare one page/slide on potential starting points for collaboration based on their current projects, and to answer a few key questions about research achievements and priorities.

## Outputs

We hope to achieve a number of outputs from the symposium, including development of the large-scale behavioural modelling network and specific plans for producing the common modelling framework. Further outputs are anticipated to include a paper on ways forward for large-scale behavioural modelling and research funding proposals.

## Agenda

	Day 1 (15 December)	Day 2 (16 December)	Day 3 (17 December)
09:00-10:15	Welcome and introduction, objectives  Flash talks (where are we now?)	Presentation of pre-workshop survey on collaboration/ways forward, general discussion on supporting future progress, ideas & tools	Presentation & discussion: Organisation of further work – ideas from pre-workshop survey and yesterday's sessions
10:15-10:45	<b>Coffee</b>	<b>Coffee</b> (posters)	<b>Coffee</b>
10:45-12:00	Flash talks & discussion	Workshops: 1) Conceptual (theory) ways forward 2) Technical (modelling/ data) ways forward	Planning: identifying specific objectives, timelines and how to achieve them
12:00-13:30	<b>Lunch &amp; free time</b>	<b>Lunch &amp; free time</b> (posters)	<b>Lunch &amp; free time</b>
13:30-15:00	Parallel workshops: 1) theories of human behaviour: advances & gaps 2) Models of human behaviour: advances & gaps	Reporting back & discussing, combining technical & conceptual advances	General discussion: future options, role of working group, future meetings
15:00-15:30	<b>Coffee</b>	<b>Coffee</b> (posters)	<b>Coffee &amp; meeting end</b>
15:30-17:00	Reporting back & discussing	Panel discussion: Journal editors on publishing research in this field	
17:00-18:00	Free time & posters	Free time & posters	