

# Mathematical and statistical challenges in landscape decision making

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## Short Report

Landscapes are complex systems, involving interactions between both biophysical and human processes. A key challenge facing those making decisions about the future management of UK landscapes is how to make better evidence-based decisions that take a holistic view of the landscape. This NERC funded programme aimed to start the collaboration between environmental and mathematical scientists to begin to address this challenge through the use of mathematical modelling.

The programme began with a three-day workshop, the first day of which was a Newton Gateway Open for Business Day. This day included talks from key governmental bodies including Department for Environment, Food and Rural Affairs (Defra), Forestry Commission and the Environment Agency. The first workshop set the scene of the current state of landscape decision making in the UK as well as the key challenges. This informed the discussions and research undertaken throughout the rest of the programme.

Attended by mathematicians, statisticians, economists and environmental scientists, a key goal of the programme was to identify where mathematics could lead to a step change in the modelling currently done in environmental sciences and ultimately provide decision makers with the tools to enable them to make better evidence-based decisions regarding landscapes. A number of skype meetings with Defra guided the key questions and challenges addressed, ensuring the relevance of the research undertaken during the programme to key stakeholders.

The programme ended with a three-day workshop, the last day of which was a Newton Gateway Open for Business day. The workshop synthesized new research frontiers and synergies identified during the programme. In particular, the Open for Business day, attended by the Duncan Wingham, Chief Executive of NERC, identified research road maps which will feed into the next phase of the Landscape Decision Making Strategic Priorities fund.

A key outcome of the programme was that it led to more than ten proposals submitted to the “Landscape and Decisions mathematical and statistical challenges” NERC funding call. These involved new collaborations between mathematicians, statisticians and environmental scientists who attended the programme. Hopefully these collaborations will be built upon as part of the SPF programme ‘Landscape Decisions: Towards a new framework for using land assets’

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