SAGES
Scottish Alliance for Geoscience, Environment and Society

University of Dundee

Fully funded PhD Opportunity

Abertay University

Planning and Managing for multiple benefits: Identifying landscape patterns and ecosystem services bundles for strategic land use policy and practice.

The PhD will focus on how to plan and manage future landscapes, so as to equitably deliver multiple benefits to society. To do so, it aims to develop a conceptual model and decision-support tool for planners / land managers to visualise and classify multiple ecosystem service benefits (as 'bundles') at the landscape scale; relate these bundles to bio-physical characteristics; and, through the use of co-developed scenarios, inform consequences of land management and environmental change - thus challenging the dominant sectoral approach to land use policy and practice.

The Ecosystem Approach has the potential to address these challenges, particularly at the landscape scale, but utilisation of ecosystem services in planning and management raises many challenges, including mapping areas with multiple ecosystem services and trade-offs between them. Identifying groups or 'bundles' of ecosystem services that appear to consistently occur together in time and space and are delivered by specific bio-physical characteristics would be a novel approach to simplify and include complex relationships in land use planning and integrated catchment management. The inter-relationship between services is complex; their interactions driven in part by distinct social-ecological dynamics, but also by quality and effectiveness of relevant (often uncoordinated) governance frameworks. Some studies and models attempt to incorporate trade-offs or service flows, but these consider neither landscape patterns and dynamics, nor governance and policy, although we know service delivery can be maximised by strategic location within landscapes.

Other conceptual and practical questions also remain:

- how do bundles vary across landscapes - compositionally, spatially and temporally; and
- how do they respond to management and governance interventions?

Any new approach needs to enable management to balance outcomes by focusing on larger service-producing areas, rather than trying to enhance single services in the landscape, and to be acceptable to users at an operational level.

A multi-disciplinary team from Dundee and Abertay universities, encompassing Environmental science, Landscape processes, Geography, Ecology and Law will supervise the student, and ensure pathways to impact are fully exploited.

Working at a landscape scale, the student will co-design the proposal with stakeholders and potential end-users:
1) Set scope and context: - Identify case-studies (potentially from the Scottish Borders Land Use pilot, building on ecosystem service mapping and planning work already done), and the choice of ecosystem services for inclusion;
2) Identify inter-relationships and classify ecosystem services bundles: - Investigate role of spatial scale, bio-physical characteristics and land management in determining bundle composition/integrity, and inter-bundle synergies/trade-offs;
3) Determine influence of environmental change on delivery of multiple ecosystem services through scenario modelling: - Use scenarios to analyse how bundles reflect changing supply and demand; and
4) Develop conceptual model and decision-support tool; pilot test with stakeholders: - Identify key management, policy and governance practices that optimise sustainable delivery of services; pilot to inform final model and decision-support tool.

We invite applications for the above project from students in geography, environmental science, natural resource management, agriculture, engineering, computing, social sciences, law or planning who have an interest in adaptation, catchment management, planning, governance and environmental protection. The deadline for applications is February 10th. The 2 best candidates will be selected for interview, to be held in Edinburgh between 21-24 February 2017. Applicants should send a CV (including 2 references) and a covering letter to Prof Chris Spray (C.J.Spray@dundee.ac.uk), from whom, along with Dr Rebecca Wade (r.wade@abertay.ac.uk) and Mr Andrew Allan (A.A.Allan@dundee.ac.uk) further details can be obtained.