A global comparison of drivers and ecosystem service impacts of regime shifts

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Abstract

Rapid, far-reaching social and ecological changes around the world are increasing the risk of regime shifts – large, nonlinear and potentially irreversible changes in social-ecological systems, arising from changes in the underlying feedback dynamics in these systems. Regime shifts in social-ecological systems are of considerable policy concern as they can have large impacts on ecosystem services, such as fisheries or climate regulation, and therefore major consequences for human economies, security and health. In an era of rapid global change, many of these regime shifts are becoming more likely due to changes in drivers of regime shifts, such as atmospheric temperature and landcover change. Although a fair amount of knowledge exists on the drivers and dynamics underlying individual regime shifts, there have been very few comparisons of regime shifts across different types of systems.

In this session we will present a framework we have developed to enable comparison of regime shifts, and emerging insights based on a comparison of 25 major types of regime shifts. We also present different approaches that are being developed to identify new types of social-ecological regime shifts that arise entirely from the interaction between social and ecological systems, and discuss some of the challenges and opportunities in taking this work forward. We will conclude with an interactive panel discussion. The proposed speakers include a mix of senior and junior researchers.

PRESENTATIONS (45 min, 10 min each)

• The Regime Shifts Database: Analytical Framework & comparison of ecosystem service impacts (Reinette Biggs)
• Causes and Consequences of Regime Shifts: A Network Analysis of Global Environmental Change (Juan Rocha)
• Exploring social-ecological regime shifts: An empirical assessment of multistability using global land cover data (Daniel Ospina)
• Regime shifts of human-environment systems: historical analysis and modelling (Roman Seidl)

PANEL DISCUSSION (15 min)

• Introductory synthesis: Challenges and opportunities (Garry Peterson) (5 min)

*Speaker
Questions to the speakers and panel discussion (10 min)

**Keywords:** Agriculture, Cross, scale, Ecosystem services, Global change, Long term dynamics, Feedback, Regime shift, Resilience, Social, ecological systems, trade-offs, Trajectories, Trap, Transformation