

## **Land Use and the Carbon Cycle**

Science and Applications in Coupled Natural-Human Systems

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*Land Use and the Carbon Cycle* discusses contemporary theories and approaches combined with state-of-the-art technologies to provide insight into how scientists are studying coupled natural-human systems at the intersection of land-use and land-cover change, land management, and the carbon cycle. It examines the social, political, economic and ecosystem processes of land-use and land-cover change and land management and how they drive carbon flux and storage in terrestrial ecosystems. The central theme is that land-use and land-cover change and land management are tightly integrated with the carbon cycle and it is necessary to study these processes as a single natural-human system to improve carbon accounting and mitigate climate change. Land users manage their property to design and create patterns and quantities of land cover that influence the rate and amount of carbon storage over time. Affected by socio-economic, demographic, political, and ecological contexts, land users regularly make choices about how to use and manage the landscape, and will face new challenges under a changing climate and increasing requirements for carbon management. How we observe, measure, and model these factors influences our ability to evaluate their effects on carbon flux and storage. Observations of reductions in carbon storage in tropical forests and increasing carbon storage in northern temperate zones have led to the development of forest transition theory as one explanation for the change from a carbon source to a sink in these regions over time. *Land Use and the Carbon Cycle* provides a contemporary perspective on these ideas and contemporary research to help students, scientists, and others interested in land-use and land-cover change, and land management, to better understand the functioning of the terrestrial carbon cycle in an increasingly human-dominated world.

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