# The LandSHIFT Model: Use and Applications in Oklahoma

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The relationship between human land-use activities and the environment is often described as a coupled human-natural system. Land-use and land-cover change is an important outcome of that relationship with competition between differing human uses and management styles for land parcels. One of the few large scale approaches that integrates functional components to represent both human and environmental aspects of land-use change, is the LandSHIFT model. The LandSHIFT model is a highly modularized large scale land use model that can be adapted to various study regions and several spatial scales. LandSHIFT's main field of application is the simulation of spatially explicit, mid- to long-term scenarios of land-use change involving multiple biophysical (e.g. climate) and socioeconomic (e.g. population growth) factors. LandSHIFT output consists of time series of grid maps with projected land-use/land-cover information that can serve as basis for further impact analysis of research questions related to climate change. These analyses can help to identify where conflict might occur over limited resources, such as water in Oklahoma, due to demands from irrigated agriculture, animal husbandry, and urban growth or demands for cropland and urban land. Here we present the LandSHIFT modeling system and first steps of an implementation of LandSHIFT for Oklahoma for the purpose of modeling potential future changes in land use under various climate scenarios.