



Benefits of collaborative and comparative research on land use change and climate mitigation

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The world's two largest economies are also the latest greenhouse gas emitters. The United States is committed to reduce the net greenhouse gas emission by 28% below the 2005 level by 2025. Similarly China also announced significant climate mitigation steps at the Paris climate convention. These policy plans will require actions including reduction of GHG emissions as well as protection of carbon stored in biologic pools and increase of carbon sequestration by the natural ecosystems. Major drivers of ecosystem carbon sequestration and protection of existing carbon resources include land use, disturbances, and climate change. Recent studies indicate that vegetated ecosystems in the United States remain as a carbon sink but the sink is weakening due to increased disturbances (such as wildfire and harvesting) and aging of forests. Unique land use policies in China such as large-scale afforestation in the recent decades have reportedly led to significant increase in total forest area and aboveground biomass, although it is not clear to what degree the increase has translated to strengthened net uptake of atmospheric CO₂ and the rate of sequestration by vegetated ecosystems. What lessons can we draw from different land management and land use practices in the U.S. and China that can benefit scientific advances and climate mitigation goals? Research conducted collaboratively by the U.S. Geological Survey and China Ministry of Science and Technology has led to improved techniques for tracking and modeling land use change and ecosystem disturbances and improved understanding of consequences of different land use change and management practices on ecosystem carbon sequestration capacities.