## **EES** Landscape Ecology & Ecosystem Science Lab

The LEES Lab at the CGCEO of Michigan State University, directed by Dr.Jiquan Chen, is interested in scientific investigations and education in fundamental ecosystem and landscape processes for understanding ecosystem functions and management.

## **Research Projects and Objectives**

Our studies focus on the carbon and water cycles of different ecosystems—grassland, desert, forest, cropland, wetlands, freshwater—and investigate multiple spatial and temporal scales, bioenergy systems and resource uses, human-nature coupled interactions, sustainable management, and conservation. Across North America and Asian landscapes, we employ state-of-the-art equipment and technology, monitoring stations, methods and modeling, and remote sensing technology. Our work is strengthened through collaboration with multiple institutions,

including Chinese Academy of Science, Mongolian Academy of Sciences, University of Bari, United States Forest Service, Auburn University, and University of Michigan.

## Coupled Human and Natural Systems on the Mongolian Plateau

**(CHN/NSF & LCLUC/NASA**): We examine current and historic land-use change, carbon, water and energy balances, and socioeconomic shifts on the Mongolia Plateau. These are analyzed for their importance to ecosystem functions and possible conservation strategies.

**Sustainable PV Systems (SEP/NSF)**: Solar photovoltaic electricity technology is considered one of the top choices to meet the future's need for CO<sub>2</sub>-free sources. Our objective is to develop the concepts, materials, and processes necessary to economically produce environmentally friendly thin-film solar cells from earth-abundant, benign (EAEB) materials.

**Productions of Bioenergy Systems (GLBRC/DOE)**: In this project, we use the eddy covariance method as our primary tool in making intensive, continuous measurements of the net ecosystem production, evapotranspiration, and energy balance at six Kellogg Biological Station-GLBRC "scale-up fields", which include switch grass, restored prairie, and corn.

**Urbanization and sustainability under global change and transitional economies: Synthesis from Southeast, East and North Asia (SENA)**: Transitional economies in SENA have witnessed dramatic shifts in their economy and government over recent decades. We measure urban sustainability during socioeconomic transformation and climate change.







## MICHIGAN STATE

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