US-China Carbon Consortium (USCCC) & Its Contribution to Global Change Studies

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US-China Carbon Consortium (USCCC) was established in 2003 in Beijing as a collaborative consortium between American and Chinese institutions that have interests in studying the role of managed ecosystems in the global carbon and water cycles. The overall goal is to develop a network of study sites sponsored by the above institutions in hope that data and results will be shared so that synthesis can be made at inter-continental scale to assess the importance of human influences on carbon and water fluxes in the changing climate. Our central hypothesis is that human disturbances increase variability of C sequestration and water cycle of a landscape in time and space primarily via influencing landscape structure and composition that directly affect the underlying mechanisms. Further we hypothesize that human disturbance regime in US and China is significantly different, suggesting that models predicting carbon, water and energy are different. USCCC sites in northern China are members of NASA's NEESPI team (LCLUC Program) and Moisture Isotopes in the Biosphere and Atmosphere (MIBA) of IAEA. Data will be folded into the GOFC/GOLD and NEESPI programs. Current USCCC members includes:

- Southern Global Change Program of USDA Forest Service (SGCP) (USA)
- University of Toledo (USA)
- North Carolina State University (USA)
- Institute of Botany at Chinese Academy of Sciences (USA)
- Fudan University (China)
- Beijing Forestry University (China)
- Chinese Academy of Forestry (China)
- Nanjing University (China)
- Meteorology Administration of China (China)
- Yale University (USA)
- Northern Global Change Program of USDA Forest Service (NGCP) (USA)

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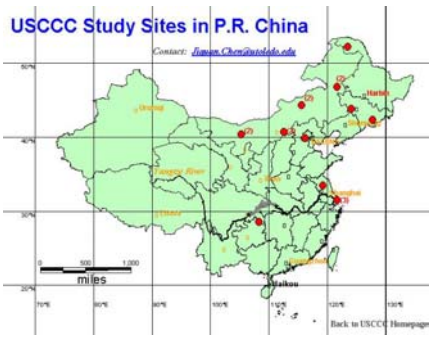
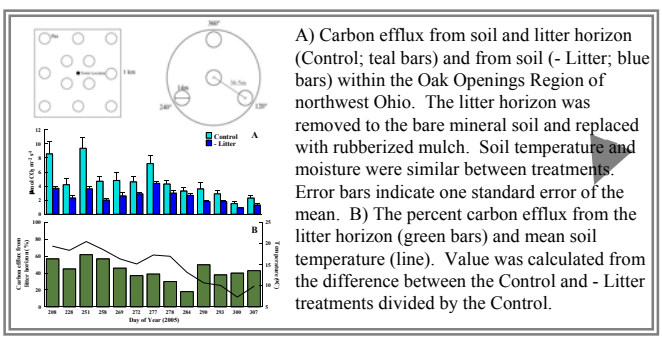


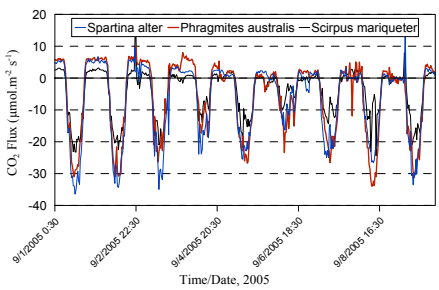
Currently, there are 18 flux measurements sites in eastern China, covering coastal wetlands, aspen plantations, crops, arid ecosystems, and disturbed parries.

In USA, there are 12 flux measurements sites in WI, OH, CT, and NJ, covering various aged/type forests.

Centered around a continuous eddy-covariance flux tower, each study site is intensively studied for its microclimate, community (e.g., phenology, structure), soil, physiology, respiration, decomposition, and carbon allocation (e.g., stable isotopic composition). Ecosystem and remote sensing modeling are also the essential components at the USCCC sites. FIA protocols are used to place long-term monitoring plots (12-16) within the foot print of flux measurements.



A) Carbon efflux from soil and litter horizon (Control; teal bars) and from soil (- Litter; blue bars) within the Oak Openings Region of northwest Ohio. The litter horizon was removed to the bare mineral soil and replaced with rubberized mulch. Soil temperature and moisture were similar between treatments. Error bars indicate one standard error of the mean. B) The percent carbon efflux from the litter horizon (green bars) and mean soil temperature (line). Value was calculated from the difference between the Control and - Litter treatments divided by the Control.



Net ecosystem exchange of CO_2 in three dominant coastal wetlands near Shanghai. *Spartina alter* is an invasive species transplanted to the estuarine islands in 1997 but rapidly expanding (Data from Dr. Bin Zhao)

Over 50 EC flux tower sites have been installed in China where scientific knowledge and data are rare toward a global synthesis of the roles of terrestrial ecosystems. Direct involvements of China is absolutely necessary if our predictions and international policy are expected to be effective. For more information, please visit USCCC webpage at:
http://research.eeescience.utoledo.edu/lees/research/USCCC/