

Croucher Seminar

Spatially explicit simulation of soil organic carbon dynamics in China's cropland soils

- Speaker:** **Dr. Yongcun ZHAO**
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- Date and Time:** **14 March 2014 (Friday) 1:00 pm – 2:00 pm**
- Chair:** **Prof. So Wing Mui/ HoD of SES**
- Venue:** **Multimedia Laboratory (D4-LP-02, Tai Po Campus)**

Seminar Outline

The terrene environment is the most important living space for human beings and soils are at the core of terrestrial ecosystems. In terrestrial ecosystems the soil carbon reservoir is nearly three times as large as carbon storage for vegetation and twice as large as atmospheric carbon storage. In addition, a slight change in soil carbon may affect the concentration of greenhouse gases in the atmosphere amplifying global change. Therefore, governance of carbon in soils is extremely important for mitigating global climate change. In this seminar, the speaker will report the changes in soil organic carbon (SOC) in cropland soils of China over the past 29 years (1980-2008), and the carbon sequestration potential under different recommended management practices that projected from 2009 to 2028. Two process-based models (Century and DNDC) and GIS database on soil, climate, crop, and farming management were used to simulate the dynamics of SOC after the models were validated at site and regional scales. The results showed that the SOC storage (0-20cm) in cropland of China increased by 500 Tg C over the past 29 years, with an average velocity of 118 kg C/ha/yr, and the scenario analysis showed that the projected carbon sequestration potential under reduced-tillage, increasing crop residue return to 50%, and increasing farmyard manure incorporation rate to 150%, were 350 Tg C, 546 Tg C, and 116 Tg C, respectively. Challenge and perspective on uncertainty assessment of SOC simulation using process-based model and GIS database were also discussed.



About the Speaker

Dr. Zhao is Associate Professor of Soil Science at The Institute of Soil Science, Chinese Academy of Sciences. His current works are mainly concentrated on dynamic modelling of soil organic carbon; spatial variability, spatial prediction (soil-landscape modeling, pedometrics), sampling design, and uncertainty assessment for mapping soil properties.