**Session Proposal**

# **Session Title**

Soil organic matters dynamics and nutrient cycling in global forests under climate change

# **Session Description**

There is increasing evidence of widespread shifts in carbon (C) and nutrient cycles of global forests under climate change and land degradation. Soil organic matter (SOM) (below ground C) dynamics and changes in above-ground biomass C stock in global forest ecosystems play an important role in global C cycle, with increasing and widespread water limitation from both rising atmospheric CO2 concentration and global warming due to accelerating greenhouse gas emissions (particularly CO2). This leads to widespread warmer and drier futures. Such climate-change induced global decoupling of temperature and water relationships would accelerate the shift in the C cycle of global forests from a negative to positive feedback to climate change. Such increasing water limitation and decreasing nitrogen (N) availability due to the closely coupled C and N relationship would accelerate the shift in global N cycle, leading to acceleration of greenhouse gas emissions of CO2, methane (CH4) and nitrous oxide (N2O) in global forests. This Session will provide exciting opportunities to highlight the latest conceptual breakthroughs and technological developments in the SOM dynamics and nutrient (particularly N) cycling, and identify the challenges for developing and applying step-change concepts and enabling technologies to unravel the interactive and dynamic C, N and hydrological cycles in global forest ecosystems.

# **Session Organizers**

Conveners of IUSS Forest Soils Working Group: Session Chair - Professor Zhihong Xu, School of Environment and Science, Griffith University, Brisbane, Queensland 4111, Australia (email: zhihong.xu@griffith.edu.au); and Session Co-Chair – Professor Chirs Johnson, Department of Civil & Environmental Engineering, Syracuse University, Syracuse, New York, USA (email: cejohns@syr.edu).

# **Target Audience**

This Session is expected to attract soil chemists, soil physicists, soil biologists, forest ecologists, plant nutritionists, tree physiologists, climate change scientists and landscape ecologists as well as postgraduate students and postdoctoral researchers in soil and forest sciences, ecology and climate change science.

# **Format**

This Session would consist of oral presentations (selected and limited number of oral presentations, including 1-2 invited keynote presentations), 10-20 mins panel discussions at the end of oral presentations, and poster presentations for most of the Session participants.

# **Proposed Speakers**

Two invited keynote speakers are expected, including Professor Scott Chang, an eminent forest soil scientist in the C and N cycles of different forest ecosystems in temperate, boreal and subtropical climates, from the University of Alberta, Canada and Zhejiang Agricultural and Forestry University, Hangzhou, Zhejiang, China. The other keynote speaker might come from Australia, Europe and China, but will be firmed up once the proposed Oral Session would be confirmed.

# **Relevance**

This proposed Session with both oral and poster presentations in “Soil organic mater dynamics and nutrient cycling in global forests under climate change” is directly relevant to the central theme of IUSS’s 23rd World Congress of Soil Science – “***Soil and the Shared Future for Humankind*”** since both Soil Science and Human Societies are confronted with the greatest and pressing global challenge of past, current and future climate change.