CH_4 Flux of Asian Terrestrial Ecosystems Based on a Soil Respiration Chamber Network

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Methane (CH_4) is the second important greenhouse gas (GHG) after carbon dioxide (CO_2), because CH_4 has a relative global warming potential 28-36 times of CO_2 at a 100-yr time horizon. Moreover, atmospheric CH_4 concentration has doubled since 1800 and contributes about 20% to the global radiative forcing. Recently, a process-based coupled biogeochemical model estimated that CH_4 emission from global terrestrial ecosystems was 144.39±12.90 Tg C/yr with an increasing rate of 0.43±0.06 Tg C/yr between 1981 and 2010 (Tian et al. 2015). The dominant sources of CH_4 are nature wetlands and rice fields.
Asian wetlands occupy vast areas from tropical peat swamp forests in Southeast Asia to boreal marsh in Northeast Asia, and as well as alpine meadow on the Tibet Plateau. Furthermore, Monsoon Asia is the largest rice-producing area. The countries of this region together produce 90% of the global output of rice. Thus, Asia plays an important role in the regional exchange of CH_4 between terrestrial ecosystems and the atmosphere. However, currently Monsoon Asia is under various pressures such as land-use and climate changes. Quantifying CH_4 balance is helpful for understanding their response and feedback to the changing world, and simultaneously is critical for setting targets for GHGs (e.g. CO_2, CH_4, N_2O) emission reductions and to identify and promote mitigation strategies. This talk will present CO_2/CH_4 fluxes and their controls of a meadow peatland on Tibet Plateau, a larch forest in central Japan, and a tropical rainforest in the Peninsular Malaysia by using multichannel automated chamber systems.

Keywords: Chamber network, CH4 flux, Larch forest, Tibet Plateau wetland, Tropical rainforest

