

[JJ] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-GI General Geosciences, Information Geosciences & Simulations

## [M-GI25]Environmental changes in mountainous area

convener: Keisuke Suzuki (Department of Environmental Sciences, Faculty of Science, Shinshu University), Yoshihiko Kariya (Department of Environmental Geography, Senshu University), Chiyuki Narama (新潟大学理学部理学科, 共同), Akihiko SASAKI (Department of Geography and Environmental Studies, Kokushikan University)

Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Mountainous areas provide water resources to the populated downstream areas, protecting the diversity of ecosystem and providing tourism attraction. To access the mountain environment changes and mitigate the impacts of global warming influences, a cross-cutting session is proposed to share the scientific knowledge among various fields; such as climatology, hydrology, geography, glaciology, water/carbon/material cycle, eco-diversity, etc.

## [MGI25-P01] Seasonal and diurnal patterns of soil respiration in an evergreen coniferous forest: Evidence from six years of observation with automatic chambers

★ Invited Papers

\*Makita Naoki<sup>1</sup> (1.Shinshu University)

Keywords: continuous monitoring, phenology, gross primary production, soil CO<sub>2</sub> efflux, soil temperature, temperature sensitivity

Soil respiration ( $R_s$ ) plays a key role in the carbon balance of forest ecosystems. There is growing evidence that  $R_s$  is strongly correlated with canopy photosynthesis; however, how  $R_s$  is linked to aboveground attributes at various phenological stages, on the seasonal and diurnal scale, remains unclear. Using an automated closed dynamic chamber system, we assessed the seasonal and diurnal patterns of  $R_s$  in a temperate evergreen coniferous forest from 2005 to 2010. High-frequency  $R_s$  rates followed seasonal soil temperature patterns but the relationship showed strong hysteresis. Predictions of  $R_s$  based on a temperature-response model underestimated the observed values from June to July and overestimated those from August to September and from January to April. The observed  $R_s$  was higher in early summer than in late summer and autumn despite similar soil temperatures. At a diurnal scale, the  $R_s$  pattern showed a hysteresis loop with the soil temperature trend during the seasons of high biological activity (June to October). In July and August,  $R_s$  declined after the morning peak from 0800 to 1400 h, although soil temperatures continued to increase. During that period, figure-eight-shaped diurnal  $R_s$  patterns were observed, suggesting that a midday decline in root physiological activity may have occurred in early summer. In September and October,  $R_s$  was higher in the morning than in the night despite consistently high soil temperatures. We have characterised the magnitude and pattern of seasonal and diurnal  $R_s$  in an evergreen forest. We conclude that the temporal variability of  $R_s$  at high resolution is more related to seasons across the temperature dependence.