
[JJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG40]Material Circulations in Land Ecosystems

convener:Tomomichi Kato(Research Faculty of Agriculture, Hokkaido University), Takashi Hirano(Research Faculty of Agriculture, Hokkaido University), Hisashi Sato(海洋研究開発機構 地球表層物質循環研究分野, 共同), Ryuichi Hirata(National Institute for Environmental Studies)

Thu. May 24, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Terrestrial ecosystem influences global climate through circulations of water, carbon, and nitrogen between land surface and atmosphere. For better understanding of those behaviors, a great effort has been paid for developing varieties of approaches and techniques such as biometric survey, eddy and chamber methods, near and satellite remote sensing, biosphere modeling and so on.

In particular, the JapanFlux, founded in 2006 as a researchers network of CO₂, H₂O and other trace gas flux measurement, has promoted the multi-disciplinary studies not only for flux measurement community, but also for remote sensing and biosphere modeling communities. Moreover, the Research-Group-on-Integrated-Land-Processes, which was founded in 2006, also has contributed to build networks between Japanese researchers to better understanding of physical and biological processes on interactions between terrestrial surface and atmosphere.

This session unites those multi-disciplinary activities, and promotes the oral and poster presentations on the role of terrestrial ecosystem in material circulations of water, carbon, nitrogen, energy and other substances by any approaches and technics. This session takes over the former session in last year: A-CG47.

[ACG40-P02]Stem respiration of trees in a subtropical evergreen broadleaf forest in Okinawa, Japan

*Mimori Shioyaki¹, Kazuho Matsumoto¹, Shingo Taniguchi¹, Mayo Hayamizu², Atsushi Takashima¹
(1.Faculty of Agriculture, University of the Ryukyus, 2.Graduate School of Agriculture, University of the Ryukyus)

Keywords:stem respiration, subtropical forest

We measured the stem respiration of five tree species in a subtropical mature evergreen broadleaf forest in northern Okinawa Island. In August and September 2017, we measured stem respiration at 50 points on 23 trees and examined the differences along the circumference, among individuals, and among species. No significant circumferential variation in stem respiration was found in the two major species: *Castanopsis sieboldii* and *Schima wallichii*. In these species, although no significant difference was found among individuals within the same species, there was a positive correlation between stem respiration and individual radial stem growth in *Castanopsis sieboldii*. The inter-species difference in stem respiration was not significant. The average stem respiration at all measurement points in the summer was 1.5 $\mu\text{mol m}^{-2} \text{s}^{-1}$. We estimated the total stem and branch respiration on a whole-tree scale by multiplying the average stem respiration per unit stem surface area by the total surface area of the stem and branches, estimated from forest inventory data assessed in 2016. The stand-scale stem and branch respiration per unit ground area calculated by integrating the individual whole-tree values was 3.7 $\mu\text{mol m}^{-2} \text{s}^{-1}$. After the summer measurements, we continued to make monthly measurements for fewer trees. The stem respiration decreased toward winter depending on the air temperature and was 18% of the summer value in January.