[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-disciplinal 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-disciplinal 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-P06]Relationship in anomalous changes in solar-induced chlorophyll fluorescence to the environmental factors for last 10 years

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Solar-Induced Fluorescence (SIF) has been used to estimate the ecosystem photosynthesis (GPP) recently by Satellite remote sensing (Frankenberg et al., 2011 GRL; Guanter et al., 2012 RSE) and by ground observations (Daumard et al., 2010 IEEE TGRE; Porcar-Castell, 2011 Phys Plant). The advantage in using the SIF is to be able to detect the photosynthetic activity on multiple scales. To examine the potential relationship in anomalies between SIF and environmental factors including the VI, we investigated them from the currently available satellite data from GOME-2 (Joiner et al., 2009) and other observationbased datasets including the CRU from UEA, CarbonTracker (Clavelies et al., 2014) and multiple climatic teleconnection indices (NiNo3, SOI, NAO etc.) for 10 years from 2007 to 2016.

High correlations between SIF and both NDVI and inversed land Carbon flux emerged in Australia, Middle of North America, S&W of Africa, NW India, which correspond to grass &shrub lands. This suggests that the photosynthesis in drier and less productive ecosystems showed directly positive reactions to leaf biomass change increase probably due to simple canopy structure.

In terms of teleconnection indices, the relationships between the globally averaged values were unclear overall. Specifically, the SIF anomaly showed clearly positive and negative responses to both T_{surface} and NiNO3 anomalies in northern and southern hemispheres, respectively, on contrary to unclear globally

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