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

[A-CG40]Material Circulations in Land Ecosystems

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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-P10]Mapping CO_2 Emission from Ger in the Ulaanbaatar City

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Mongolia has a large amount of grassland area and a long history of stockbreeding. However, the population transferred from local to the capital showed an increasing trend with the change of the structure of the economy and industry due to the introduction of market economy since 1990. Urbanization issues such as traffic congestion and air pollution has now become more and more serious because of more than half of the population distributed in the capital city, Ulaanbaatar. According to the survey of the source of air pollution from air pollution control division, gel, a mobile dwelling used for nomadism, is a major source of air pollution. However, there are no reports about the source, spatial distribution, and the regional characteristics of the air pollution in this city. This is because the large number of around 180,000 gels located surrounding the city. Therefore, this study was conducted to map the spatial distribution of gels, and further to estimate the amount of CO2 emission in Ulaanbaatar city. In order to detect the spatial distribution of gels, we firstly used Google Earth and R[1-3] to make quality controls of the images. To be more specific, we used HSL color space method[4] to select the 40,000 RGB images obtained from Google Earth. Next, polygon processing was performed using the algorithm of S (Saturation), H (Hue) and the L (Lightness). In addition, the area (20-60 m2) and the shape (circular index >0.6) of the gel are set as an index to make selections. We successfully detected the gels surrounding the capital city, and found out the main source of air pollution. Based on the mean annual amount of the coal and firewood in a gel [5], and the coefficient of CO2 emissions, we estimated the total CO2 emissions from the gels and mapped the spatial distribution of CO2 emission at 1 km resolution. Then, we obtained the regional characteristics of the gels in Ulaanbaatar. However, there are several uncertainties in the amount of coal, firewood, and the burn rate used in this study due to their

spatial variances. Therefore, field survey would be conducted to improve the accuracy in future. This study was supported by the project “Development of Innovative Adaptation System and MRV Method for JCM in Mongolia" (2015-present) that funded by Ministry of the Environment, Japan.