[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-P05]Relationships between local surface soil moisture and spring dust source areas in temperate grasslands of Inner Mongolia

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Temperate grasslands, including Inner Mongolia, are one of the source regions for Asian dust outbreaks. Land surface elements (e.g., soil moisture) are considered as an important controlling factor for spring dust outbreaks in temperate grasslands. So far, source area distributions of large-scale dust have been studied extensively. However, very little research on local-scale (e.g., radius of 15 kilometers) dust source areas has been carried out. Therefore, this study aims: 1) to identify local dust source areas in temperate grasslands of Inner Mongolia; 2) to explore the relationships between surface soil moisture and local-scale dust source areas. Local dust source areas are determined from K-M model, which is used to analyze footprint of turbulent scalar fluxes by atmospheric boundary layer characteristics and meteorological data. Surface soil moisture is estimated by thermal inertia, which can be retrieved from a linear heat budget model with forcing variables, such as insolation, air temperature and albedo, are given. In this study, as part of typical temperate grasslands, Abaga is selected as the study area, located in the middle of Inner Mongolia. At Abaga, the dust occurrence ratio (DOR) on strong wind occasions were calculated according to 16 wind directions by observed meteorological data (dust events, wind direction and speed) during 1986 – 2015 springs (March to May). The only time of observed dust storm weather during 2013 and 2015 at Abaga was May 18, 2013, which was taken as an example to calculate spatial distributions of thermal inertia. The results of DOR showed that surrounding

meteorological station, the dust occurrence probability of S, SW, WSW and W directions all exceeded 40%. This indicated that southwest directions are likely one of the local source areas of dust outbreaks. Moreover, in southwest directions, the results of thermal inertia showed a relatively low value, which means the surface soil can be considered as a dry condition. Hence, as a preliminary conclusion, in the direction of low value of thermal inertia, dust occurrence ratio is high to some extent. This indicated that the spatial distributions of thermal inertia can be considered as one of the methods to analyze local source areas of spring dust. Nevertheless, in order to explain the relationships of soil moisture and dust source area more accurately, thermal inertia averages over time periods as well as local dust source areas determined by K-M model are necessary in the next step.