Geophysical Research Abstracts
Vol. 19, EGU2017-19588, 2017
EGU General Assembly 2017

Soil and vegetation carbon turnover times across forest biomes in eastern China

Jingsong Wang and Shuli Niu

1. Resent studies reveal that terrestrial biosphere is now a net carbon (C) sink for atmospheric C dixoide (CO_2), however, whether this C sink can persist with climate change is still uncertain. Such uncertainty comes not only from C input, but also largely from C turnover times in an ecosystem. Knowledge of C turnover times is critical for modelling C cycle and evaluating C sink potential. Our current understanding of how long C can be stored in soils and vegetation and what are their controlling factors are still poorly understood.
2. We used C stocks from 1087 plots in soils and 2753 plots in vegetation and investigated the spatial patterns and controlling factors of C turnover times across the forest transect in the eastern China.
3. Our results showed a clear latitudinal pattern of C turnover times, with the lowest turnover times in the low-latitude zones and highest values in the high-latitude. Mean annual temperature (MAT) and mean annual precipitation (MAP) were the most important controlling factors on the soil C turnover times while forest age accounted for the most majority of variations in the vegetation C turnover times. Our findings also indicated that forest origin (planted forest, natural forest) was also responsible for the variations of vegetation C turnover times while forest type and soil properties were not the dominant controlling factors.
4. Our study highlights different dominant controlling factors on the soils and vegetation C turnover times and different mechanisms underlying above- and below-ground C turnover. The findings can help to better understand and reduce the large uncertainty in predictive models of the coupled carbon-climate system.