Geophysical Research Abstracts
Vol. 18, EGU2016-16266-1, 2016
EGU General Assembly 2016

Approach to voxel-based carbon stock quanticiation using LiDAR data in tropical rainforest, Brunei

Eunji Kim (1), Dongfan Piao (2), Jongyeol Lee (2), Woo-Kyun Lee (2), Mihae Yoon (3), and Jooyeon Moon (2)

(1) Dept. of Climate environment, Korea University, Seoul, Republic Of Korea (shzzang09@gmail.com), (2) Dept. of Environmental Science and Ecological Engineering, Korea University, Seoul, Republic Of Korea, (3) E3, Seoul, Republic Of Korea

Forest is an important means to adapt climate change as the only carbon sink recognized by the international community (KFS 2009). According to the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report (AR5), Agriculture, Forestry, and Other Land Use (AFOLU) sectors including forestry contributed 24% of total anthropogenic emissions in 2010 (IPCC 2014; Tubiello et al. 2015). While all sectors excluding AFOLU have increased Greenhouse Gas (GHG) emissions, land use sectors including forestry remains similar level as before due to decreasing deforestation and increasing reforestation. In earlier researches, optical imagery has been applied for analysis (Jakubowski et al. 2013). Optical imagery collects spectral information in 2D. It is difficult to effectively quantify forest stocks, especially in dense forest (Cui et al. 2012). To detect individual trees information from remotely sensed data, Light detection and ranging (LiDAR) has been used (Hyyppäet al. 2001; Persson et al. 2002; Chen et al. 2006). Moreover, LiDAR has the ability to actively acquire vertical tree information such as tree height using geo-registered 3D points (Kwak et al. 2007). In general, however, geo-register 3D point was used with a raster format which contains only 2D information by missing all the 3D data. Therefore, this research aimed to use the volumetric pixel (referred as “voxel”) approach using LiDAR data in tropical rainforest, Brunei. By comparing the parameters derived from voxel based LiDAR data and field measured data, we examined the relationships between them for the quantification of forest carbon. This study expects to be more helpful to take advantage of the strategic application of climate change adaption.