EGU2020-9342, updated on 20 Oct 2020
https://doi.org/10.5194/egusphere-egu2020-9342
EGU General Assembly 2020

Analysis of carbon sequestration sensitivity to recent changes in land use patterns over Belgium using a combination of models and remote sensing techniques

Arpita Verma[1], Ingrid Jacquemin[2], Louis Francois[1], Nicolas Dendoncker[3], Veronique Beckers[3], Rafiq Hamdi[4], Julie Berckmans[5], and Eric Hallot[6]

[1]University of Liege,Department of Astrophysics, Geophysics and Oceanography,Belgium, (arpita.verma@student.uliege.be)
[2]University of Liege,Department of Environmental Sciences and Management,Belgium
[3]University of Namur, Department of Geography,Belgium
[4]Royal Meteorological Institute, Department of Meteorological and Climatological Research, Ukkel, Belgium
[5]VITO, Boeretang, Belgium
[6]Scientific Institute of Public Service (ISSeP),Liege,Belgium

Changes in land use/land cover (LU/LC) practices are critical to determine and this is one of the crucial driving forces of terrestrial ecosystem productivity and carbon sink variability. However, relatively few studies have quantified the impact of LU/LC change on the terrestrial carbon cycle. In the present study, we developed a workflow for quantifying and assessing changes in terrestrial carbon stocks due to land use change using a dynamic vegetation model. The main objectives are to assess status and variation in carbon stocks across land covers, towards the quantification of spatial distribution and dynamic variation of terrestrial carbon sinks in response to LU/LC change. Here, with the CARAIB dynamic vegetation model, we perform simulations using several sets of LU/LC data to analyse the sensitivity of the carbon sink. We propose a new method of using satellite – and machine learning-based observation to reconstruct historical LU/LC change and compare it with static data from the cadastral map and dynamic data from an agent-based model coupled with CARAIB. It will quantify the spatial and temporal variability of land use during the 2000-2019 period over Belgium at high resolution. This study will give the space to analyse past information and hence calibrate the dynamic vegetation model to minimize uncertainty in the future projection (until 2035). Overall, this study allows us to understand the effect of changing land use pattern and identify the input dataset which minimizes the uncertainty in model estimation.