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Estimation of mass changes caused by vegetation using AMSR-E

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Vegetation is one of the most important compartments in the global ecosystem, influencing soil, water balance, atmosphere, and the climate in general. Even though this is a known fact, large areas of rain forest are still destroyed for wood production or by food industries increasing their agricultural areas for soy production and stock farming. But also wild fires devastate large amounts to vegetation. Therefore, it is essential to monitor the changes of vegetation globally.

In our study we address the question how big the mass changes in vegetation are. We observe the following sources of changes: 1) wild fires, 2) clear cut and 3) seasonal variations of vegetation. For the first two items we consider only forest areas where the biggest mass variations are taking place. The third point takes the entire range of vegetation classes into account.

In order to observe vegetation globally we use remote sensing data from the sensor AMSR-E (Advanced Microwave Scanning Radiometer – EOS) aboard of Nasa's Aqua satellite. This sensor provides data from 2002 until 2011. The data include information about the vegetation water content and are therefore ideal for our purpose.

We validate our results with the help of additional databases listings, on e.g. large fire events, from literature as well as from in-situ data. The talk is concluded with a global map of hotspots of big vegetation mass changes and their triggers.