

The Role of Croplands and Grasslands in the Carbon Budget of China

Le Toan, Thuy¹; Huang, Yao²; Tan, BingXiang³; Quegan, Shaun⁴; Wang, Xiaoqin⁵; He, Guojin⁶; Bondeau, Alberte⁷; Buchwitz, Michael⁸; Zhang, Wen²; Sun, Wenjuan²

¹CESBIO, FRANCE; ²Institute of Atmospheric Physics, CAS, CHINA; ³Research Institute of Forest Resources Information Technique, CHINA; ⁴University of Sheffield, UNITED KINGDOM; ⁵Fuzhou University, CHINA; ⁶China RS Satellite Ground Station, CAS, CHINA; ⁷PIK, Potsdam, GERMANY; ⁸IUP, GERMANY

The overall objective of this project is to improve our knowledge of the role of croplands and grasslands in the carbon cycle of China by using satellite data in the models calculating the carbon budget. The proposed approach has therefore two components: 1) an observation methodology bringing together datasets relevant to calculations of C fluxes. The data are from various sources (e.g. meteorological, soil maps...), and information provided by EO. 2) modelling work that adapts and validates existing models to estimate C fluxes in the soil-vegetation-atmosphere system. Models will be adapted to the use of EO-derived data to replace information provided until now by in situ measurements, and by data from national statistics and literature. The works are conducted at two scales: the regional scale which takes into account ecosystem characteristics in three regions: Jiangsu province, dominated by intensive rice cultivation, Fujian province, with a diversity of crop types and rotation, and the Qinghai-Tibet plateau, a mainly grassland region with marked climate warming (~1.8° increase over the last two decades). High resolution EO data (10-50 m) are used to derive land cover and crop maps, and vegetation biophysical parameters such as LAI and biomass. At larger scale, indicators of vegetation activity, phenology, crop calendar, are derived from moderate to low resolution EO data. Trends over 2 decades are derived for phenology, growing season length and seasonal NDVI (which leads to NPP). Model estimates of C fluxes for the whole China will be compared with C fluxes measured from space (Sciamachy). The presentation will summarise the results obtained and will discuss about further studies.