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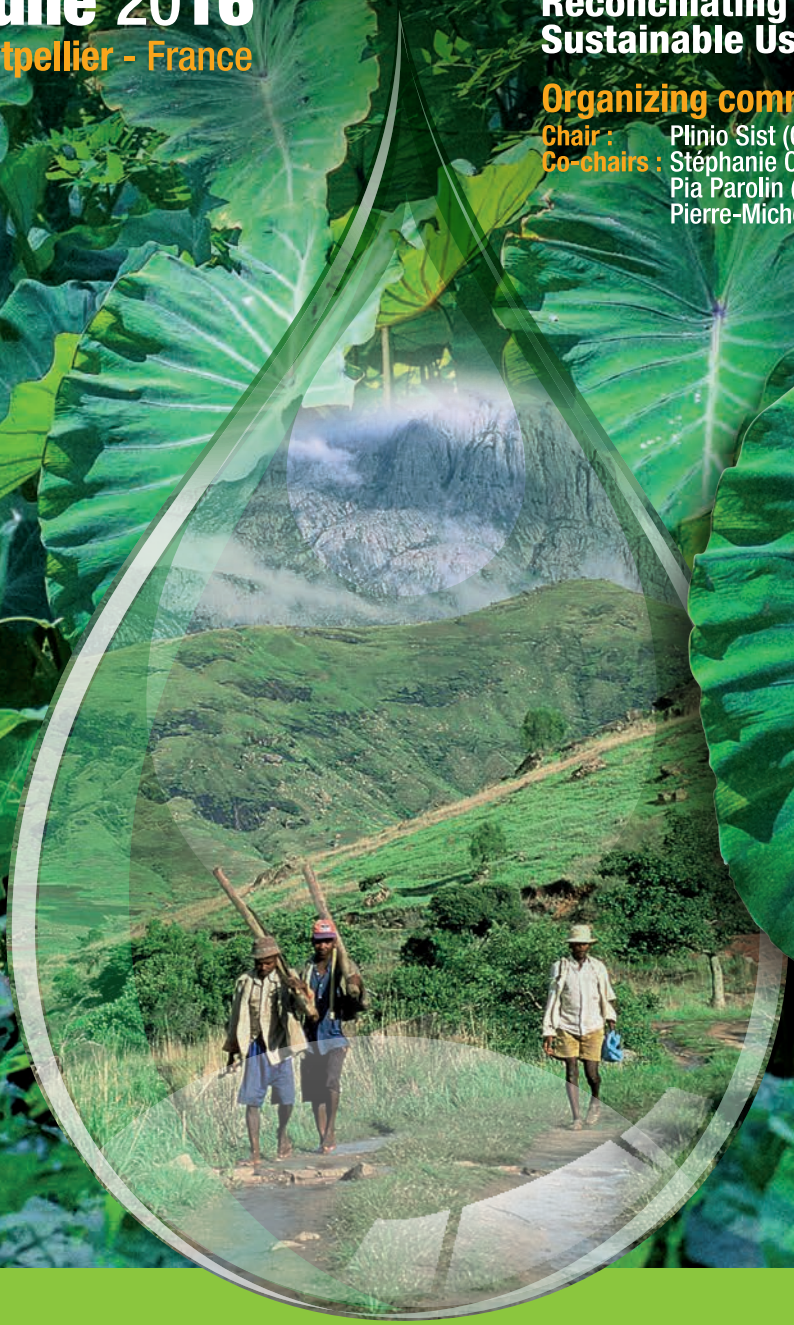

PROGRAM & ABSTRACTS

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O58-03 – S58 *Monitoring and mapping tropical biodiversity and ecosystem services with remote sensing*
Thursday 23 June / 10:30-12:00 – Sully I

Characterizing texture- structure relationship in the tropical forests of Western Ghats of India using high resolution Cartosat Imagery

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Context: Regional assessment of forest aboveground biomass (AGB) in tropical forests is spoilt by uncertainty. There is thus a major challenge in providing accurate carbon stock assessments especially in the context of REDD+ program. One of the major reasons for uncertainty in AGB estimates is the saturation of remote sensing signals at relatively low AGB values, for both optical reflectance and radar backscattering signatures. Canopy texture analysis of very high resolution (VHR) imagery have provided encouraging results for retrieving forest stand structure parameters for different tropical forests in Central Africa, French Guiana and India, with AGB values going above 650 Mg/ha. The method, Fourier Transform Texture Ordination (FOTO), performs well in characterizing texture-structure relationships and quantifying AGB variations, when tested for areas with a given forest type. However the robustness of such approaches across different forest types characterized by different forest structure and allometries, is more demanding and yet under investigation.
Method: In this study we focused on a gradient of tropical forest types, in the Western Ghats of India, ranging from dry deciduous to wet evergreen forests, in the Yellapur division, Uttara Kannada, Karnataka, India. Canopy texture analysis was done using the FOTO method in order to characterize the texture gradient present in the study area using Cartosat-1a imagery, a 2.5 m spatial resolution panchromatic sensor (500 to 850 nm) launched by Indian Space Research Organization (IRSO). We established 14 1-ha forest plots covering the whole gradient of canopy texture and forest types encountered in the study area and forest structural data was obtained. These 14 plots were used to calibrate texture - structure model for the forest types present in the area.
Result: Correlation between observed and predicted AGB was found to be good (R2 = 0.83) for nine plots lying in wet evergreen and moist deciduous zone which both displayed closed canopy, however the correlation dropped when four plots lying in fairly open canopy in dry deciduous or dry to moist transition zone were added to the analysis.
Conclusion: The FOTO method performed well in characterizing texture-structure relationships even with strong gradients present in the study area. However further investigations would be needed to test a larger gradient in forest types, such as including fairly open canopy forests in the dry deciduous region.

O58-04 – S58 *Monitoring and mapping tropical biodiversity and ecosystem services with remote sensing*
Thursday 23 June / 10:30-12:00 – Sully I

Understanding changes in the landscape based on a Landsat remote sensing analysis in the Karbi Anglong hills, Assam, India

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The landscape of the Karbi Anlong hills (State of Assam, India), south of the Kaziranga National Park, is shaped by small-scale farmers of the Karbi tribe. They traditionally practice jhum cultivation of upland rice and have started to cultivate cash crops such as bamboo, tea and rubber to improve their livelihoods. The forests of the Karbi Anglong hills also provide a crucial habitat for many flagship species, such as the Rhinoceros (Rhinoceros unicornis) and Tiger (Panthera tigris) during the monsoon months, while the Brahmaputra river floods the plains of Kaziranga.
Analyzing the historical changes in the landscape is a necessary first step to understand the forces driving land use and land cover change in the Karbi Anglong ecosystem. This information can then be used to identify practices, understand drivers and then design management interventions and policies, as part of an integrated landscape approach.
The forests of Karbi Anglong were analyzed through a GIS analysis of Landsat images from 1988 to 2016. Prior to classifying the forests, a succession and landscape dynamic model of this region was designed. Then a supervised classification was conducted throughout the northern Karbi Anglong hills to gain a full understanding of the forest structure and composition.
Human influence has shaped the landscape of the northern Karbi Anglong hills, whereas of lately an extensification was observed, which qualitative interviews attribute to political instability. This observation could be proven by the analysis of the Landsat (5&8) imagery as large proportions of young succession and immature forests were found throughout the study area. In addition fewer young yum fields were found within the study area.
Within this study we were able to establish a first result on landscape change that will serve as the foundation for future work in developing a landscape approach in the Karbi Anglong hills.