53rd ATBC 2016

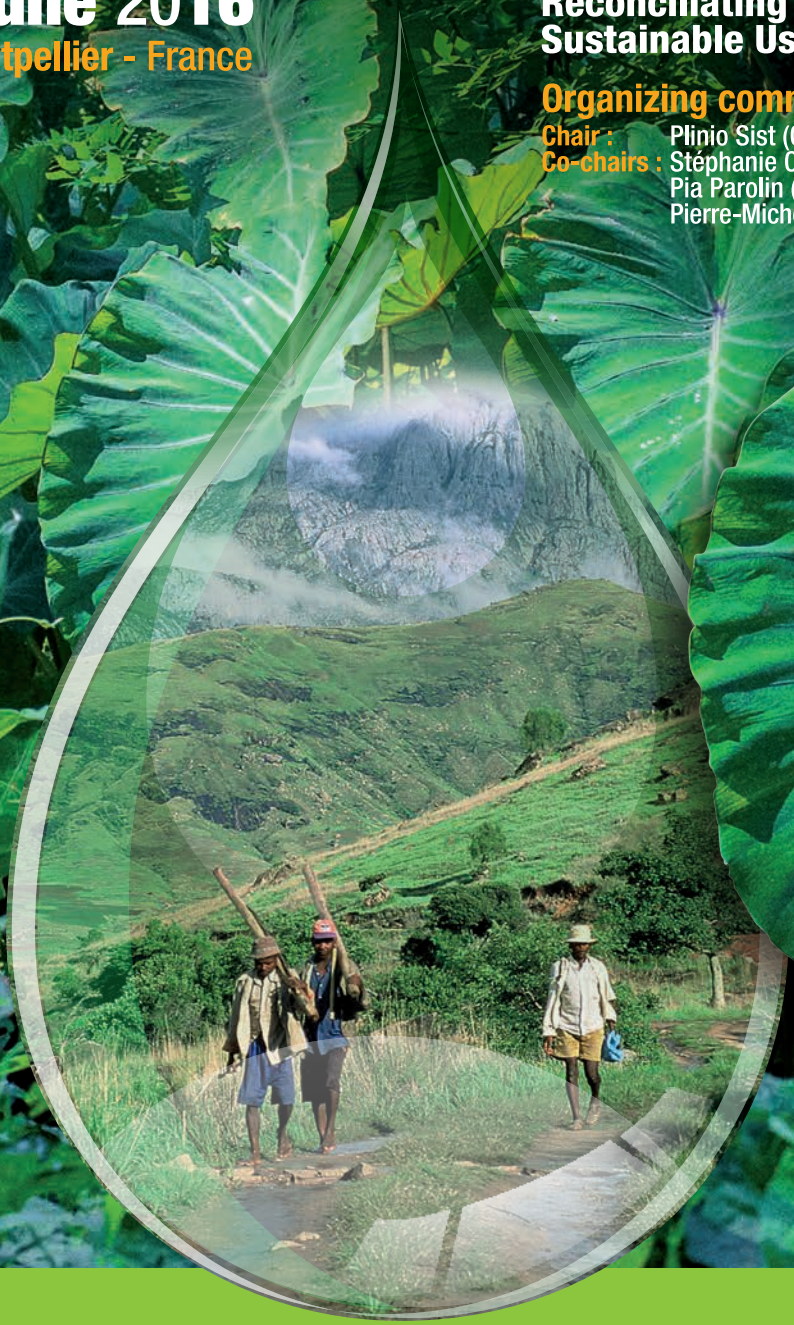
Annual Meeting of the Association for Tropical Biology and Conservation

19-23 June 2016
Le Corum, Montpellier - France

Tropical Ecology and Society
Reconciliating Conservation and Sustainable Use of Biodiversity

Organizing committee :

Chair : Plinio Sist (CIRAD)
Co-chairs : Stéphanie Carrière (IRD)
Pia Parolin (INRA)
Pierre-Michel Forget (MNHN, CNRS-INEE)



PROGRAM & ABSTRACTS

www.atbc2016.org

Association for Tropical Biology and Conservation

cirad

IRD Institut de recherche pour le développement

INRA SCIENCE & IMPACT

MUSÉUM NATIONAL D'HISTOIRE NATURELLE

cnrs

CIFOR

CONGRESS OFFICE
HOPSCOTCH CONGRÈS
23/25, rue Notre-Dame des Victoires
75002 Paris | France
www.hopscotchcongres.com

O56-01 – S56 *Towards refined carbon budgets of managed forests*
Thursday 23 June / 14:30-17:00 – Einstein

What is the carbon balance of tropical managed forests?

BRUNO HÉRAULT[1], CAMILLE PIPONIOT-LAROCHE[2]
[1]Cirad, UMR EcoFoG, 97310, Kourou, French Guiana
[2]Universite de Guyane, UMR EcoFoG, 97310, Kourou, French Guiana

Managed forests are a major component of tropical landscapes and almost half of standing primary tropical forests, up to 400 million ha, are designated by national forest services for timber production. However, so far, most of our understanding of the tropical forest carbon cycle yields is from plot networks located in old-growth undisturbed forests while the carbon balance of managed forests at the regional and continental scale remains poorly studied. Here we propose a methodological framework in order to quantify the carbon footprint of selective logging at a regional scale. The yearly balance of a logged forest unit is modeled by aggregating 3 sub-models dealing with (i) emissions from extracted wood, (ii) emissions from logging damages and (iii) storage from biomass recovery after logging. Models are parameterized and uncertainties are propagated through a MCMC algorithm. We used the 30-years statistics from the National Forest Service to estimate the carbon balance of managed forests in French Guiana. Over this period, selective logging emitted 0.76 Tg C in the atmosphere. Our results highlight the key role of the local carbon cycle in managed forests for climate regulation at the global scale.

O56-02 – S56 *Towards refined carbon budgets of managed forests*
Thursday 23 June / 14:30-17:00 – Einstein

Effects of logging on forest stand carbon recovery and tree biomass

ERVAN RUTISHAUSER[1], BRUNO HÉRAULT[2], PLINIO SIST[1]
[1]CIRAD, UR B&SEF, 34000, Montpellier, France
[2]CIRAD, UMR EcoFoG, 97387, Kourou, Guyane Française

We will present recent findings arising from the Tropical managed Forests Observatory. Results from the first regional analysis of above-ground carbon stocks dynamics post-logging in Amazon managed forests will be presented. We found that the percentage of initial carbon lost during logging was the main driver of post-logging dynamic, enabling on his own to accurately predict time of recovery wherever in the Amazon Basin. Moving from forest stand to tree responses, we show how logging, by releasing competition for light, may affect trees morphology. We found a significant reduction of both total and bole heights proportional to logging intensity in a tropical logged forest in French Guiana. This resulted in a 10-13% reduction of tree biomass and timber volume.
These results will be discussed in terms of future management and provision of ecosystem services in tropical production forests.

O56-03 – S56 *Towards refined carbon budgets of managed forests*
Thursday 23 June / 14:30-17:00 – Einstein

Modelling aboveground biomass dynamics in Amazonian selectively logged forests

CAMILLE PIPONIOT-LAROCHE[1], LUCAS MAZZEI[2], ERVAN RUTISHAUSER[3], PLINIO SIST[4], BRUNO HÉRAULT[5]
[1]Université de Guyane, UMR EcoFoG, 97310, Kourou, French Guiana
[2]Embrapa, Amazônia Oriental, Belém, Brazil
[3]CarboForExpert, Hermance, Switzerland
[4]Cirad, UR BSEF, 34398, Montpellier, France
[5]Cirad, UMR EcoFoG, 97310, Kourou, French Guiana

Large areas (2 million hectares per year) of Amazonian forests are selectively logged in a polycyclic harvest system. Modeling the post-logging dynamics of these production forests is thus of primary importance to assess their future carbon storage capacity as well as the structural and dynamic features of the forest that will be found in the next logging cycle. In this study, we used a network of 100 permanent sample plots in 10 sites spread across the Amazon basin to model three post-logging biomass fluxes (recruitment, growth and mortality). The temporal evolution of these biomass fluxes (recruitment, growth and mortality) for surviving trees and recruits and their relative importance in explaining biomass recovery through the Amazonian basin were modeled taking into account spatial as well as temporal autocorrelation in a mixed model framework. Incorporating both the environmental variability and the logging characteristics in the developed model indicate that the two key drivers of post-logging biomass fluxes are the relative biomass loss due to logging and the initial aboveground biomass. Overall, environmental factors had little additional weight in explaining the Amazon-wide variations of post-logging biomass fluxes. Our results stress the importance of developing specific modelling frameworks to account for the peculiar carbon cycle in managed tropical forests in order to better recognize their key role for climate regulation at the global scale.