This Abstract book is based on a compilation of all abstracts selected for oral and poster presentations, as of 15 May 2015.

Due to the inability of some authors to attend, some of those works will therefore not be presented during the conference.
Welcome to the Conference

Welcome to Paris, welcome to ‘Our Common Future under Climate Change’!

On behalf of the High Level Board, the Organizing Committee and the Scientific Committee, it is our pleasure to welcome you to Paris to the largest forum for the scientific community to come together ahead of COP21, hosted by France in December 2015 (“Paris Climat 2015”).

Building on the results of the IPCC 5th Assessment Report (AR5), this four-day conference will address key issues concerning climate change in the broader context of global change. It will offer an opportunity to discuss solutions for both mitigation and adaptation issues. The Conference also aims to contribute to a science-society dialogue, notably thanks to specific sessions with stakeholders during the event and through nearly 80 accredited side events taking place all around the world from June 1st to July 15th.

When putting together this event over the past months, we were greatly encouraged by the huge interest from the global scientific community, with more than 400 parallel sessions and 2200 abstracts submitted, eventually leading to the organization of 140 parallel sessions.

Strong support was also received from many public French, European and international institutions and organizations, allowing us to invite many keynote speakers and fund the participation of more than 120 young researchers from developing countries. Let us warmly thank all those who made this possible.

The International Scientific Committee deserves warm thanks for designing plenary and large parallel sessions as well as supervising the call for contributions and the call for sessions, as well as the merging process of more than 400 parallel sessions into 140 parallel sessions. The Organizing Committee did its best to ensure that the overall organization for the conference was relevant to the objectives and scope. The High Level Board raised the funds, engaged the scientific community to contribute and accredited side events. The Conference Secretariat worked hard to make this event happening. The Communication Advisory Board was instrumental in launching and framing our communication activities on different media. We are very grateful to all.

We very much hope that you will enjoy your stay in Paris and benefit from exciting scientific interactions, contributing to the future scientific agenda. We also hope that the conference will facilitate, encourage and develop connections between scientists and stakeholders, allowing to draw new avenues in the research agenda engaging the scientific community to elaborate, assess and monitor solutions to tackle climate change together with other major global challenges, including sustainable development goals.

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Remote sensing observations from six AERONET sites and from MODIS from 1999 to 2013 provide a regional and temporal overview of changes in Amazonian atmosphere. Aerosol Optical Depth (AOD) at 550 nm of less than 0.1 is characteristic of natural conditions over Amazonia. At the time of shifting agriculture, drivers of forest transformation, which have increased population, and accessibility to forest reserves through road transportation network. Corruption, lack of political will and unenforced environmental laws are other major drivers, though these are not easily understood in the study area because of lack of accurate data about them. This study is important to both governments and local people to see the need for better forest conservation.

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Predicting the combined impacts of climate change and selective logging in timber production forests of Central Africa

F. Claey (1); F. Mortier (1); DY. Ouédraogo (2); L. François (3); S. Gourlet-Fleury (1); B. Hérault (4); R. Gaspard (4); A. Fayolle (2); N. Picard (5)

(1) Centre for International Cooperation in Agricultural Research for Development (CIRAD), Tropical Forest Goods and Ecosystem Services (BFGE), Montpellier, France; (2) University of Liège, Biosystems engineering (biose), Gembloux, Belgium; (3) University of Liège, Unit for modelling of climate and biogeochemical cycles (UMCCB), Liège, Belgium; (4) Guyana National Forest Eco-Hot, CFC and rapidly Kourou, France; (5) Centre for International Cooperation in Agricultural Research for Development (CIRAD), Tropical forest goods and ecosystem services (BSyF), Yaoundé, Cameroon.

In the design and the implementation of current rules of sustainable Forest Management (sFM) recommendations in this region is to elucidate the influence on forest dynamics of both climate change and harvesting pressure. This influence will likely consist of major shifts in structure and floristic composition. By opening the stands and increasing light availability, selective logging fosters the development of light demanding species. Some of these species, particularly the pioneers, are thought to be particularly drought sensitive so that global warming could strongly impact logged forests. The study of forest–climate–logging relationships needs therefore to associate all data as well as for national and regional climate strategies. Hence, these forests constitute a major challenge for both adaptation and mitigation.

A prerequisite to ensure the relevance and the effectiveness of sFM recommendations in this region is to elucidate the influence on forest dynamics of both climate change and harvesting pressure. This influence will likely consist of major shifts in structure and floristic composition. By opening the stands and increasing light availability, selective logging fosters the development of light demanding species. Some of these species, particularly the pioneers, are thought to be particularly drought sensitive so that global warming could strongly impact logged forests. The study of forest–climate–logging relationships needs therefore to associate all data as well as for national and regional climate strategies. Hence, these forests constitute a major challenge for both adaptation and mitigation.

To investigate the combined effects of climate and harvesting influence on Central African forests, we conducted long-term simulations of forest dynamics under several scenarios of climate change and timber harvesting. Climate scenarios were based on outputs from simulations of the atmospheric model ARPEGe–Climate of the French National Centre for Meteorological Research (CNRM), performed within the Coupled Model Intercomparison Project Phase 5 (CMIP5) and under several Representative Concentration Pathway (RCP) scenarios of the International Panel on Climate Change (IPCC). We used new climate fields such as soil water and potential evapotranspiration from the model CARbon Assimilation In the Biosphere (CARAIB) of University of Liège obtained under the same climatic scenarios. Logging scenarios were implemented by considering a wide range of felling intensities.

To carry out this work, we developed an innovative method based on a Mixture of inhomogeneous matrix models (MIMM) that permits to test and simulate the influence of timber harvesting and climate change on forest dynamics. While ensuring a satisfactory fitting of vital parameters, such as growth and mortality, these models mainly use species-specific ecological patterns and identify major responses of the forest to climate variables. To do this, we simultaneously clustered species into groups according to species-specific ecological responses and identified major responses of the forest to climate variables. To infer and validate model outputs, we used the M’Baïki site, in the Central African Republic (CAR), a unique experimental site that has been monitored for 30 years through a collaborative partnership with various French and CAR institutional and research organizations.