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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second largest forest area in the world after the Amazon. Deforestation in Congo Basin countries is generally expected to be low. The assessment of forest cover and forest cover change area is essential for the initiatives mentioned above to determine what is referred to as and to date in the Intergovernmental Panel on Climate Change (IPCC) 2006 guidelines on the Agriculture, Forestry and Other Land Use (AFOLU) sector.

Producing estimates of deforestation in tropical countries in relation to greenhouse gas (GHG) emissions often relies on the use of satellite remote sensing in the absence of National Forest Inventories (NFI). A probability sample combined with an appropriate response design can provide forest cover and forest cover change area estimates and their associated uncertainties in the form of confidence intervals at a set probability threshold as required by the IPCC and for reporting to the United Nations Framework Convention on Climate Change (UNFCCC). However, wall–to-wall mapping is often required by countries to provide an exhaustive assessment of their forest resources and as input to land use plans for management purposes, but implementing a wall–to-wall approach is expensive requiring specialized equipment and staff. The recent release of the Global Forest Change mapping products could provide an alternative for tropical countries wishing to develop their own wall–to-wall forest monitoring mapping products.

A model assisted regression (MAR) estimator was applied nationally in Gabon and for selected regions in Cameroon and CAR using the combination of both reference data obtained from a probability sample and nationally produced forest cover and forest cover change maps and produced from the Global Forest Change data. The resulting area estimate is potentially more accurate than the direct forest cover estimate and provides an estimate of the precision of the estimate which is not available from the map statistics alone.

Results show that the method presented provides a reliable means of producing forest cover and forest cover change area statistics and confirm the low level of deforestation expected in Congo basin countries. It also confirms the high level of forest cover with more than 80% of the country covered by forest covering an area of just over 23.5 million hectares. In Cameroon and CAR, forest represents about 72% of the area of the regions selected with a total of over 5 million hectares.

Forest cover estimates for national level maps lead to coefficients of variation less that 0.3% at national level in Gabon and between 1% and 2% at regional level in Cameroon and CAR thus reducing significantly the level of uncertainty for forest area estimates compared with reference data alone.

Deforestation rates are generally low, with less than 0.4% between 1990 and 2000 in Gabon. In CAR, the deforestation rate is about 1.5% between 1990 and 2000 and 0.8% between 2000 and 2010. However, the deforestation in Gabon is not statistically different from 0 between 2000 and 2010. The same is observed for the CAR deforestation rate and provides an estimate of the precision of the estimate which is not available from the map statistics alone.

Overall, results based on the global forest change data are not as accurate and precise and substantial post-processing and calibration are required to obtain results of similar quality than that of the national maps. However, it is clear that the effort necessary would be considerably less than that for producing the national maps.

Will tropical forests face slow down with ongoing climate changes?

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In the context of climate changes, identifying and then predicting the impacts of climatic drivers on tropical forest dynamics is becoming a matter of urgency. We used a coupled model of tropical tree growth and mortality, calibrated with forest dynamic data from the 20 year study site of Paracou, French Guiana, in order to introduce and test a set of climatic variables. Three major climatic drivers of the tropical forest dynamics were identified through the variable importance in projection (VIP) analysis: satellite-based aerosol loading, water saturation and temperature. Drought decreased annual growth and mortality rates, high precipitation increased mortality rates and high temperature decreased growth.

Interactions between deforestation and climate drivers were investigated, climatic variables were investigated, showing best resistance to drought for trees with high wood density and for trees with small current diameters. We then used S/N ratio, an indicator of model quality, to perform simulations for the next century using predictions from the IPCC S5 AR with 3 different scenarios corresponding to 3 relative concentration pathways. Basal area, above-ground fresh biomass and net primary production (NPP) deforestation rates exhibiting decreasing values as long as the scenario became pessimistic. Temperature is the strongest driver highlighting a drop of 40% in average forest growth for the RCP8.5. Our results highlight the potential slow down danger that tropical forests will face during the next century.