



OUR UNDER  
COMMON CLIMATE  
FUTURE CHANGE

International Scientific Conference  
**ABSTRACT BOOK**

7-10 July 2015 • Paris, France

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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.



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# Welcome to the Conference

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## 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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## Agent-Based Modeling of Reasonable Consumption for Grassland Ecosystem Supply Service in Inner Mongolia, China

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Sustainable ecosystem service is of vital importance to the survival and development of human society. How to balance the conflicts between the ecosystem protection and the ecological consumption of local residents has been a serious challenge today especially in ecologically vulnerable area. In order to find out reasonable consumption approaches of the grassland ecosystem supply service and explore the sustainable land management strategies for the local social-ecosystem, taking Hulun Buir, Inner Mongolia Autonomous Region as the case study region, based on the agents' behaviors rules derived from households survey, a Agent-Based Model (ABM) has been developed in this study for simulating the ecosystem consumption pressure

under different grassland management scenarios. This model links the supply and consumption of grassland ecosystem service by calculating ecosystem NPP supply and households NPP consumption. The model includes three sub-models: Individual growth status sub-model, Households' land-use decision sub-model, and Ecosystem service consumption pressure sub-model. In accordance with the multi-objective land management practices in case study area, four land management scenarios were modeling in this study, (1) business as usual, (2) aiming at increasing household's living level, (3) aiming at ecosystem protection and (4) aiming at balancing the ecosystem protection and living level improvement. The result indicate that reasonable ecosystem service consumption mode is possible in the research region, under which the indicators including ecosystem pressure, NPP supply, forage consumption of livestock, households incomes and herders' living level could reach a reasonable and sustainable level. This reasonable consumption mode is an improvement of traditional grazing mode, which could stimulate herders to control the livestock marketing rate by rational ecological compensation measurements, so as to ensure the NPP consumption is close to but never beyond the threshold.

# 2215 - Tropical degraded forests response to global change: current knowledge and cross-cutting research challenges for monitoring and processes understanding

## ORAL PRESENTATIONS

### K-2215-01

## Tropical Forest Degradation in the context of climate change: increasing role and research challenges

P. Sist (1); J. Chave (2); E. Rutishauser (3)

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While developed countries in temperate regions faced their forest transition about 100 years ago or more, "tropical forest rich" nations still largely depend on forest resources or land clearing for their development. Hence, tropical forests are retreating at an alarming rate from advancing cash crops, such as oil palm, soybean, or cattle ranching. Beside tropical deforestation, tropical forest degradation resulting mostly from human-induced causes (e.g. predatory or illegal logging, non-timber forest product extraction, fuel wood extraction) significantly contributes to greenhouse gas emissions and loss of biodiversity. If deforestation is an obvious ecosystem change, forest degradation is more difficult to discern and quantify. Degraded forests have become a major component of today's tropical landscapes, representing up to 50 % of all tropical forests. For example, almost half of standing primary tropical forests, up to 400 million ha, are designated by national forest services for timber production. The portion of tropical forests managed for timber extraction, hereafter referred to as "managed forests", will therefore play key roles in the trade-off between provision of goods and maintenance of carbon stocks, biodiversity, and other services. However, so far, most of our understanding of tropical forest arise from studies carried out in old-growth undisturbed forests, or secondary forests (i.e. regrowth forests) while the ecology of degraded forests at the regional and continental scale remains poorly studied and their role to mitigate climate change still very poorly known. However, understanding the functions played by degraded forests in providing goods and environmental services in the context of climate change is crucial. We will first discuss the complex concept of forest degradation in the tropics and then define degraded forests. We will show their importance in providing timber while maintaining high levels of biodiversity and carbon stocks. We will further demonstrate that implementation of sustainable forest management can promote long term provision of ecosystem services. Finally, the potential of tropical degraded forests in mitigating climate change will be discussed along with future research challenges on this issue.

### K-2215-02

## R&D efforts, coordination, and needs towards operational forest monitoring systems in the context of an increasing Earth observation data availability

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Deforestation is the second largest source of anthropogenic greenhouse gas emissions to the atmosphere, accounting for 15% to 20% of the total emissions. To meet the challenge of climate change in the Agriculture, Forestry and Other Land Use (AFOLU) sector, the United Nations Framework Convention on Climate Change (UNFCCC) has been developing the Reducing Emissions from Deforestation and Forest Degradation (REDD+) mechanism. The UNFCCC recommends the use of remote sensing for forest monitoring in the frame of REDD+. Forest degradation can be monitored by remote sensing technologies using direct methods like forest gap detection, or indirect methods using logging roads as a proxy. International initiatives such as the Global Observation for Forest Cover and Land Dynamics (GOCF-GOLD) and the Global Forest Observations Initiative (GFOI) of the Group on Earth Observations (GEO) foster sustainable availability of Earth observation data to support national forest monitoring and reporting activities compliant with the good practice guidance of the Intergovernmental Panel on Climate Change (IPCC). GOCF-GOLD and GFOI also provide guidance to countries to develop forest monitoring systems, with the REDD Sourcebook and the Method and Guidance Document, respectively. These international initiatives foster also coordinated research and development (R&D) activities encouraging joint projects between research institutions, in collaboration with space agencies.

The launch of Landsat-8 in 2014 ensures the continuity of Landsat missions with an increased ability to collect data compared to the 1980's (about 14 times more images). Joint to the American effort, Europe will increase further Earth observations capabilities with the advent of the Sentinel satellite constellations. Sentinel 1A was launched in 2014 with a Synthetic Aperture Radar C-band sensor. The launch of the Sentinel-2A carrying a super-spectral optical sensor is scheduled for June 2015. Sentinel-2A will allow a coverage of the land surface every 10 days. Once Sentinel-2B will be launched, the Sentinel-2 satellites combined with Landsat-8 will allow a revisit time period of 3-4 days. Other national and international satellite missions will also will provide or provide already additional imagery, either in the radar and optical domain (e.g., CBERS-4, SPOT series,