



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.



# OUR UNDER COMMON CLIMATE FUTURE CHANGE

## 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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7-10 JULY 2015 | PARIS, FRANCE

International Scientific Conference

ABSTRACT BOOK

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and post-monsoon (October–December) seasons. This task is carried out through the analysis of a series of standard indices of precipitation extremes applied to the daily precipitation projections.

The results reveal that West Africa evolves towards increasingly arid and semi-arid regimes with the recession of moist and wet zones, thus adding another element of vulnerability to future anthropogenic climate change for the ecosystems and agricultural lands in the regions.

In addition, analysis of the changes in the annual of high intensity precipitation events indicate that the pre-monsoon season experiences the largest changes in daily precipitation statistics. These changes are particularly towards an increased risk of drought associated to a decrease in mean precipitation and frequency of wet days, and increased risk of flood associated with very wet events. Both these features can produce significant stresses on important sectors such as agriculture and water resources at a time of the year (e.g. the monsoon onset period) where such stresses can have stronger impacts.

## O-3330a-02

### Trends in West African floods: A comparative analysis with physiographic indices

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After the drought of the years 1970 In West Africa, the variability of rainfall and land use changes affected mostly flow, and recently, flooding is said to be an increasingly common occurrence throughout the whole of West Africa. These changes aroused many questions about the impact of climate change on the flood regimes in west african countries.

This paper investigates whether floods are becoming more frequent or more severe, and to what extend climate patterns have been responsible of these changes. We analyze the trends in floods of 14 catchments within the main climate zone of West Africa. The methodology includes two types of sampling flood events, namely the AM (Annual maximum) method and the POT (Peak over threshold), and two perspectives of analysis are presented, precisely long term analysis based on two long time series of flood, and regional perspective involving 14 catchments with shorter length of series.

Mann Kendall trend test and Pettitt break test are used to assess the stationarity of the time series. The trends

detected in flood time series are compared to the trends of rainfall indices in one hand and vegetation indices in the second hand using contingency tables, in order to identify the main driver of change in flood magnitude and Flood frequency. The dependency between flood index and physiographic index is evaluated through a Success Criterion and the CramerV criterion calculated from the contingency tables.

The results point out the existence of trends in flood magnitude and flood frequency time series with two main patterns. Sahelian flood show increasing trends, and some sudanian catchments present decreasing trends. For the overall studied catchments, the maximum five consecutive days rainfall index (Rx5d) seems to follow the trend of floods, while NDVI indices do not show significant link between with the trends of floods, meaning that this index has no impact in the behaviour of flood in the region.

## O-3330a-03

### Evolution of surface temperature and heat waves over West Africa during the near and the far future

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The aim of this work is to study the spatio-temporal variability of the future evolution of surface temperature and heat waves over West Africa using regional climate models outputs engaged in Coordinated Regional climate Downscaling Experiment (CORDEX) project. CORDEX is an international project implemented by many research centers worldwide which aims to supply reliable climate change scenarios to the scientific community. These simulations are performed with the latest state of the art regional climate models over most emerged lands of the planet for environmental impact studies and also to characterize the associated uncertainties. The data analyzed within the framework of this work are the climate change projections performed with the latest greenhouse gaz emission scenarios: RCP4.5 and RCP8.5.

This work focuses on the near (2020–2050) and the far (2070–2100) future and analyzes the spatio-temporal variability of the surface temperature and heat waves episodes over West Africa; these heat waves remain under studied over this region despite their negative impacts on the populations and their socio-economic activities.

# 3330b - Facing climate change in Sub-Saharan Africa

## ORAL PRESENTATIONS

### K-3330b-01

### Assessing climate impacts and adaptation options for cereal systems in West Africa

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Much has been learned in recent years about the nature of climate changes in the West African region, including robust projections of delayed monsoon onset and, in many locations, increased late-season rainfall. This talk will examine the implications of these changes for crop adaptation strategies. Two process-based crop models (AFSIM and SARRAH-H) are used to explore climate change impacts under various management and cultivar scenarios for sorghum, the main crop in the region. Potential

adaptation strategies we test include more conservative sowing rules (to reduce risks of early-season drought stress and crop failure), a switch to longer-season varieties (to avoid shortening of the growth period), increased fertilizer rates and planting density (to take advantage of increased late-season rainfall), switching from photo-sensitive to photo-insensitive varieties, and rainwater harvesting to provide supplemental irrigation. The results are analyzed in terms of effects on both average and variability of yields, with the goal being to identify strategies that will very likely reduce negative impacts of climate trends on average and/or variability of yields, while not sacrificing performance in the current climate. Such strategies could then be promoted as adaptation priorities in the region.

## K-3330b-02

### The challenge of water resource management in the Lake Victoria basin, East Africa

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