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 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, asses and monitor solutions to tackle climate change together with other major global challenges, including sustainable development goals.

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To achieve the research objective, the relationship between vegetative diversity indices (richness and evenness) and climatic variables (rainfall and temperature) was explored based on species data directly collected from the field over a 3-year period and climate data collected from three local stations (Makokoli, Masvingo airport, and Buffalo range). Relationship between NDWI and species diversity indices was examined to confirm the utility of remote sensing in predicting vegetative diversity. NDWI was calculated using the formula:

\[
\text{NDWI} = \frac{\text{NIR} - \text{SWIR}}{\text{NIR} + \text{SWIR}}.
\]

Where NIR and SWIR are the reflectances of the near-infrared (NIR, 0.78–0.89 m) and shortwave-infrared (SWIR, 1.58–1.75 m) regions, respectively.

The species diversity indices were calculated using the Shannon Weave Index which usually combines aspects of richness and evenness. This index was calculated using the formula:

\[
H = -\sum (P_i \ln (P_i))
\]

Where the summation is over all species and \( P_i \) is the relative abundance of species in the quadrat. This index measures the average degree of uncertainty in predicting to what species chosen at random from a collection of species and individuals will belong. Species evenness (E) was calculated using the formula:

\[
E = H / \ln (S)
\]

Where H is the Shannon Weave index and S is species richness observed within the quadrat.

The result predictable model was used to estimate changes in species diversity over a 40-year period (1974–2014). The species diversity data was then regressed with climatic data for the same period. These data were also modelled to project future changes in vegetative diversity in the face of climate change.

Preliminary findings reflect a significant \((p<0.05)\) correlation between species diversity and climatic variables. The results also indicate that there is a significant \((p=0.003; \alpha=0.05)\) relationship between species richness and NDWI. Species evenness was also significantly correlated \((p=0.04; \alpha=0.05)\) with NDWI. This implies that we can use NDWI to assess changes in species diversity over time. The Mann Kendall test revealed a significant \((p=0.04, \alpha=0.05)\) relationship between species richness and climatic variables. The results also indicate that there is a significant correlation between species diversity and climatic variables.

The study concludes that climate change in Mutirikwi sub-catchment is influencing species diversity through changing phenological features, abundance and distribution. Besides being a good indicator of water content in leaves, NDWI has proved to be a useful indicator of species diversity. The study leads to the understanding of the relationship between vegetative species diversity and climate change and this provides a platform for nations to devise strategies to enhance the resilience of ecosystems to climatic changes through the adoption of species based adaptive and mitigative strategies.

P-3330-15

Responding to Climate Change Challenges in Sub Saharan Africa - A case for Water Supply

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Change is a permanent phenomenon in all spheres of life. Many a time changes present both opportunities and threats of change. For instance, climate change affects biodiversity but without focusing on species richness and evenness. A plethora of studies have claimed that climate change affects biodiversity but without focusing on species richness and evenness. This poses challenges in designing adaptive and mitigative strategies that are ecosystem and species specific. This study assesses the effects of climate change on vegetative species diversity in Mutirikwi sub-catchment using the Normalised Difference Water Index (NDWI).

To achieve the research objective, the relationship between vegetative diversity indices (richness and evenness) and climatic variables (rainfall and temperature) was explored based on species data directly collected from the field over a 3-year period and climate data collected from three local stations (Makokoli, Masvingo airport, and Buffalo range). Relationship between NDWI and species diversity indices was examined to confirm the utility of remote sensing in predicting vegetative diversity. NDWI was calculated using the formula:

\[
\text{NDWI} = \frac{\text{NIR} - \text{SWIR}}{\text{NIR} + \text{SWIR}}.
\]

Where NIR and SWIR are the reflectances of the near-infrared (NIR, 0.78–0.89 m) and shortwave-infrared (SWIR, 1.58–1.75 m) regions, respectively.

The species diversity indices were calculated using the Shannon Weave Index which usually combines aspects of richness and evenness. This index was calculated using the formula:

\[
H = -\sum (P_i \ln (P_i))
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Where the summation is over all species and \( P_i \) is the relative abundance of species in the quadrat. This index measures the average degree of uncertainty in predicting to what species chosen at random from a collection of species and individuals will belong. Species evenness (E) was calculated using the formula:

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**P-3330-17**

**Impacts of climate variability and agricultural intensification on the origin of runoff: the case study of the watershed Kolondieba in the south of Mali**

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As part of the international research program RIPIECSA (Interdisciplinary and Participatory Research on Interactions between Ecosystems, Climate and Society in Africa), water discharge in the Kolondieba (under the influence of climatic variability) has been studied in order to understand the mechanism of runoff process in order to improve hydrological model in a context of strong climate variability and agricultural intensification. The study is based on mineralization of rainfall and surface water, and groundwater with the integrator chemical parameter (Electrical Conductivity), showed very little mineralization of rainfall with an average of 16.99 ± 8.53 μScm⁻¹. Mineralization of surface water is closer to the rainfall's, but it's far from the groundwater's consist of shallow aquifers and deep ones with respectively 120.58 ± 90.07μScm⁻¹ and 133.57 ± 85.68 μScm⁻¹ in average. The high relationship between water compartments showed that deep aquifers don’t contribute enough to the runoff. This allowed to deduct a double origin of the runoff on the watershed consists of stormflow and subsurface flow. The hypothesis of the HYAVE model (2010) gave a contribution of stormflow about 77%. This contribution has increased by 3% in dry year (2011). In these conditions runoff doesn’t depend only on rainfall variability, it can be assigned to the land use because cotton culture area is increasing on the basin since 1960.

**P-3330-18**

**Climate projections in West Africa: evidence and uncertainties**

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The Subsaharan Africa response to global warming was uncertain in the models of the third phase of the Coupled Model Intercomparison Project (CMIP3) used for the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC), which even disagree on the sign of future rainfall anomalies over this region. This disagreement remains even among models that correctly simulate the twentieth-century West African climate. Our study involving a new ensemble of state-of-the-art climate models which participated of the fifth phase of CMIP (CMIP5) and raises several questions. Do the models agree more on Subsaharan Africa rainfall projections? Do they well simulate the partial rainfall recovery observed over the last decades? How well are models able to reproduce the main features of the West African Monsoon (WAM)?

Preliminary results of twelve CMIP5 models have shown, in despite of great progress in the representation of MAC characteristics, little changement on their climate projections on West Africa compared to CMIP3. Robust tendency to warming over the Sahel, larger by 15 to 50% compared to global warming is noticed. The spread of models’ projections for the present day is about 2°C for the surface air temperature and precipitations. But the dispersion in surface air temperature is large over the Sahel and Sahara and seems to be linked to the radiative aerosols properties and surface albedo in this region. Most of CMIP5 models project increasing temperature with 1.8–4.2°C amplitude in a rcp4.5 scenario (3.5–8.5°C in a rcp8.5) in Western Sahel (15°W–35°W) : these values being slightly higher in Eastern Sahel (10°E–35°E). The future changes will have dramatic consequences as those associated with precipitation. An opposite scenario of the western and eastern Sahel for rainfall projections seems to be robust. However, some « outliers models » predict rainfall increase which cancels part of the Sahel warming during the summer monsoon. This finding on the western Sahel gathers more and more models as we advance into the 21st century: 40% for the period 2011–2040, 60% for the 2041–2070 period and more 80% in the last period. In contrast, the eastern Sahel, although the consensus model is relatively high, it decreases by 80% in the first period to 70% in the last period. The rcp4.5 scenario shows precipitation oscillations around a mean value (positive for the first zone/negative for the second) as well in the modelled, the rcp8.5 scenario shows that the uncertainty temperature changes lead to a reduction of abnormal rainfall in the eastern reaches 100 mm at the end of the 21st century. A particular domain (5°W–10°E), encompassing the depression of Barkina Faso, northern Nigeria and the eastern Niger, is the one that is most clearly highlighted by global warming. Impacts simulations between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions between ecosystems, Climate and society in Africa), (interdisciplinary and participatory research on interactions...