



International Scientific Conference
ABSTRACT BOOK

7-10 July 2015 • Paris, France

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 happen. 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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Native Americans in the United States face a variety of existential threats due to climate change. This paper presents a typology of the specific vulnerabilities these groups face, and explains why they are unique groups when it comes to programs to mitigate the effects of climate change. The variety of climate change vulnerabilities include the well-documented problem of sea level rise and its effects on coastal communities, impacts of drought on such things as water availability and agriculture, increased riparian flooding due to shifts in rainfall patterns and vegetation change, and cultural impacts stemming from the loss of hunting and fishing for migratory species. Vulnerability patterns are furthermore complicated by the fact that the 566 federally-recognized Native American tribes vary considerably in terms of their populations, land areas, and resultant population densities. As semi-sovereign governments with land assets held in trust by the federal government of the United States, these groups represent an interesting problem for climate change mitigation, in that the federal government has specific obligations towards the protection of these groups. What this means for climate change mitigation is unclear. What does the federal government "owe" to a tribe whose land base is under threat due to climate change? Do certain mitigation strategies pose threats to the cultural and/or social fabric of the group, particularly if mitigation involves relocation? After providing the basic typology of climate change vulnerabilities faced by tribes, this paper goes on to describe several mitigation programs currently in the implementation phase. These include federal-tribal land swaps and relocations, as well as renegotiation of water rights. Thus far, these programs have not been controversial due to the fact that the tribes involved were small in terms of population and land base. However, I argue that the political feasibility of these types of mitigation strategies are limited by several factors specific to the types of vulnerabilities being addressed. As an example, the successful negotiation of land swaps and relocation are fundamentally constrained by the availability of federal lands adjacent to affected tribes, and which are not under pressure from additional stakeholders. As a result, the potential for land swaps as a standard mitigation strategy is likely to be limited to small and geographically remote tribes, as land swaps must contend with the principle that land exchanges must involve equivalent sized tracts of land. Thus I argue that larger coastal tribes that are closer to more urban areas are thus more vulnerable, both politically and environmentally, than the groups that have thus far been able to negotiate mitigation programs involving land swaps. The federal response to issues involving water scarcity and other issues, on the other hand, are relatively less well-developed. For instance, while renegotiated water rights accords have strengthened the position of various tribes vis-à-vis other water rights stakeholders, the continued drought throughout much of the American West continues to diminish the total stock of water all users rely upon. As such, the negotiation of more advantageous water rights does not in and of itself address the vulnerability of certain groups if there is no water to be had. Furthermore, the political conflicts in such situations are likely to be much more acute than in the other types of climate change issues faced by other Native American groups insofar that all stakeholders over a broader geographic region face the same underlying vulnerabilities. These type of situations represent zero-sum games and any concessions granted to Native American groups are likely to be perceived as unfair by other stakeholders. The paper concludes with a series of policy recommendations which suggest that a broad and flexible approach to climate change mitigation should be pursued, one which takes into account the specific type of climate change vulnerability, the physical and demographic characteristics of the tribe in question, the costs involved, and the nature of political opposition towards specific policy proposals.

P-2236-05

Global and regionalized land uses in 2050: scenarios taking into account climate change

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How will future changes in land uses – within regions and

on a global level – will affect food security, taking into account possible climate changes, as well as changes in cropping and livestock systems, changes in farm structures, rural and urban relations, food regimes as well as changes in the general context.

The Agrimonde-Terra foresight project on "Land use and food (in)security" considers this question. Launched by the French research institutes Cirad and INRA, the Agrimonde-Terra conceptual framework can be used to build land uses scenarios at national and global levels with narratives and quantitative illustrations. At national and regional levels, the foresight process involves a group of diverse stakeholders, and discussions on the direct and indirect causes of land use changes facilitate thinking about the possible futures (anticipation), getting new ideas and understanding different points of view (appropriation) as well as decision-making (action). A first workshop has taken place in Tunisia and land use scenarios have been built. On top of that, global and regional levels scenarios are built with the support of a Scenarios Advisory Committee and they are the basis for discussions on possible consequences of land use changes on food security. The scenarios have been built combining hypotheses on direct and indirect causes of land use changes, and looking at interactions and retroactions between the variables. The foresight exercise has a holistic approach..

Climate change is one of the important indirect drivers of land use changes. It impacts the food production capacity of ecosystems in several ways. It changes the time maturity of crops, it alters annual yields as well as their inter-annual variability, and it changes the nutritive qualities of crops. As far as climate change is concerned, two contrasted scenarios have been taken into account, focusing on temperature change and biogeochemical cycles. The first scenario, entitled "Stabilization of Global Warming" corresponds to the RCP26 of the AR5. The agricultural system does not experience any major change due to climate conditions compared to the current situation. The area of cropland suitable for agricultural production does not notably change compared to the current situation, but the stabilization of anthropogenic emissions requires massive efforts for sequestering carbon in the vegetation which may take the form of afforestation and/or production of bioenergy production with carbon capture and storage, or agro-forestry. Most of the land use changes, however, occur after 2050. The second scenario entitled "Runaway climate change" corresponds to the RCP 8.5 of the AR5. The agricultural system experiences strong impacts: there are increases in the area of cropland suitable for agricultural production but it is unevenly allocated as it mainly concerns the northern latitudes while arable cropland areas decrease in tropical regions. The average suitability of cropland areas also decrease significantly.

The combination of the climate change scenarios with scenarios concerning the direct and indirect causes of land use changes show that food regimes, cropping and livestock systems, and farm structures, will have to adapt to new situations.

P-2236-06

Geo-political maps of CO2(s) to facilitate scientific policy and public debate

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In the last decades, a humble chemical molecule has become one of the most important actors of modern collective life. Carbon dioxide, or CO₂, is increasingly used as a key marker for politics and economics both at the national and international level. As such, establishing thresholds for CO₂ emissions is one of the main objectives of the UNFCCC (United-Nations Framework Convention on Climate Change).

This does not mean, of course, that the CO₂ has passed from the natural to the political sciences. It means that the molecule has assumed a variety of different meanings according to who use it. Chemists, biologists, geologists, soil scientists, physicists, climatologists, all have different CO₂ definitions. And their definitions differ from those of the economists, geo-politicians and NGOs and probably