

French Society for Ecology (SFE) annual meeting 2015: “climate and biodiversity: impacts, feedbacks and importance among components of global change »

Key messages

- (1) It is urgently needed to understand synergies between climate change and the ongoing biodiversity crisis
- (2) Measures in favour of biodiversity and ecological processes will contribute to climate stabilisation. Biodiversity loss and degradation of ecosystem functioning will aggravate the consequences of climate change.

Abstract

At the occasion of its 2015 annual meeting, which took place on June 12th in the National Museum of Natural History, Paris, the French Society for Ecology organised a fascinating and insightful day of talks and debates on “climate and biodiversity: impacts, feedbacks and importance among components of global change”.

This meeting highlighted the interactions between climate change and biodiversity dynamics.

Studies demonstrate the complexity of these interactions. More comprehensive scenarios of future dynamics are now made possible by the coupling of increasingly sophisticated models of climate change with a more detailed knowledge of ecosystems responses to global change. Such scenarios should not be seen as a snapshot of future climate and ecosystems. What they tell us, is that impacts will be strong and... quite unpredictable.

Consequences of climate change on biodiversity are already visible at all levels, from genes to ecosystems. This has been demonstrated by **Xavier Morin**, on forest dynamics, and by **Isabelle Chuine**, on the adaptive responses of trees to climate change, in interaction with other components of global change (land use change, fragmentation...).

Jonathan Lenoir focused on species distributional shifts due to climate change. These shifts are largely latitudinal and altitudinal, but Jonathan gave amazing insights on the importance of taking into account longitudinal shifts, and on time lags of species responses to climate change.

Nina Hautekèete addressed some difficulties raised by the concomitance of climate change, other components of global change and neutral processes, through the example of a century of floristic changes at a regional level.

Jérôme Chave presented tropical forest ecosystems carbon sinks and methodological aspects of carbon accounting, with a focus on recent results on the long-term decline of the Amazonian carbon sink. These worrying results are of crucial importance on mitigation scenarios, which are largely based on biomass carbon sinks.

Nathalie Pettorelli addressed some methodological aspects of remote sensing data acquisition and analysis and their key role in climate change biology.

Grégory Beaugrand presented the drastic changes that we can expect in marine communities, in terms of distribution and ecosystem functioning. His models suggest that it is absolutely necessary to maintain the temperature change below 2°C.

Beyond the necessary monitoring and reporting of climate change impacts on terrestrial ecosystems, **Wolfgang Cramer** detailed the complex interpretation of the observed biodiversity changes, and the

careful work of the IPCC to identify the respective part of natural dynamics vs changes consecutive to human activities and climate change.

Sabrina Gaba and **Luc Abaddie** for the SFE Special Interest Group “Agriculture and Ecology” gave a talk and initiated a debate on the necessity of considering ecological feedbacks in order to reconcile agricultural production and measures favouring the decrease of climatic impacts of agriculture.

At the end of the day, **Jane Lecomte** chaired a discussion about the position of ecological sciences in the current debate on climate change.

La journée s’est terminée par un débat animé par **Jane Lecomte** sur la place de l’écologie scientifique dans le débat sur les conséquences du changement climatique. Oral interventions were numerous and highly relevant. They have highlighted the challenges and difficulties ahead especially in the way of putting a synthetic diagnosis in the case of climate change, which can be caricatured by the CO₂ level and by a predictable rise in global average temperature, while it is difficult to synthetise the complex dynamics and drastic changes at multiple levels of understanding, which will be induced by the interaction between land use change, introduction of species and climate change.

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Groupe thématique SFE « Agriculture et écologie » **Sabrina Gaba** (UMR1347 Agroécologie - Tutelles : INRA, CNRS, Université de Bourgogne, AgroSup Dijon) & **Luc Abbadie** (Institut d’écologie et des sciences de l’environnement de Paris (iEES Paris) –UPMC, CNRS, INRA, IRD, Université Paris Diderot, Université Paris Est Créteil Val de Marne)

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