

## **Session B2: Human-climate regional interactions, towards RESMs**

Wednesday May 18

Chairs Chris Lennard and Fredolin Tangang, rapporteur Chris Lennard

14:00 - Diana Rechid (invited speaker): EURO-CORDEX-LUC: A new initiative on coordinated regional land use change experiments

14:30 - Rafiq Hamdi: Future climate of Brussels and Paris for the 2050s under the A1B scenario

14:45 - Marta Llopart: The role of land use change over Amazon Forest in simulating climatology and extreme hydroclimatic indices

15:00 - Michal Belda: Urban climate - air quality interactions in regional scale over Central Europe

15:15 - *Coffee break*

15:45 - Gamil Gamal Abd El-Motey: Impacts of land use change and horizontal resolution in local climate by RegCM4 model

16:00 - Kirsten Warrach-Sagi: An Integrated Land System Model System to study soil-vegetation-atmosphere feedbacks in agricultural landscapes under climate change

16:15 - Solmon Fabien: Regional climate-chemistry simulations over the MED-CORDEX domain

16:30 - Gustav Strandberg: Biogeophysical effects from land-cover changes in Europe

16:45 - Tianbao Zhao: Contributions of anthropogenic and external natural forcings to climate changes over China based on CMIP5 model simulations

Regional earth-system models will need to account for the impact of many processes on the regional and local scale climate from modelling land-sea-air interactions to the modelling urban heat islands. Presentations in this session reflected this complexity and dealt with land-use land-cover change, urban models and atmospheric chemistry.

The LULC change presentations presented results from observational and modelling studies in Europe, South America and the Nile Basin and once again highlighted the critical necessity of understanding feedbacks on the local and regional atmosphere due to LULC change and demonstrated that higher horizontal resolutions improve our understanding of regional fluxes and hence rainfall and temperature feedbacks. Very high-resolution simulations investigating the urban context and demonstrated that meteorological effects of the urban canopy (e.g. wind), soil moisture and to a lesser extent the radiative feedback of urban emissions affect the temperature of urban regions. The impact of aerosols and aerosol transport at the regional to synoptic scale on local climates was presented and demonstrate the added value of including these in regional climate modelling. Furthermore, the individual impacts of aerosols and LULC change could be detected, however, these were not as large as the effect increasing greenhouse gasses had over the study region.

The presentations and discussion highlighted the need to further explore and develop the coupling of various components of the air-sea-land system. It is likely that capturing the processes associated with LULC change, aerosols, urban effects adds value to local and regional climate change assessment not apparent

when only greenhouse gas forcing is considered. Therefore the development of regional earth system models is highly desirable for a more complete understanding of regional and local change in a warming world.