Brief summary of the "ICRC-CORDEX 2019 International Conference On Regional Climate"

Session: B1
Theme: Atmosphere-land
Day and time: Wednesday, 16ᵗʰ October, 15:00-18:00
Chair(s): Hongbo Liu
Rapporteur: Richard Antonio, Bo Huang

ICRC-CORDEX 2019 session B1 (theme: atmosphere-land) was held in Beijing, 16ᵗʰ October 2019. There are 10 oral and 18 poster presentations contributed to this session. Around 200 participants attended the oral session. In this session, we discussed several topics.

Land-atmosphere interaction plays an important role in weather, climate and water recycling systems across a wind range of temporal and spatial scales. Land-use and land cover (LULC) are continuously changing due to environmental changes and anthropogenic activities. LULC changes alter local water and energy budget. Its climate effect shows large spatial variation. More evidences were shown from two presentations which quantify the extreme deforestation and afforestation simulations in Europe (Bo Huang) and Asian countries (Youmin Chen). Land-use may be a suitable proxy of human forcing, which is needed to be integrated into regional climate models (RCMs) to comprehensively quantify the effects of human activities on local or continental climate (Peter Hoffman). Several studies in session B1 also mentioned that LULC changes can exert different extent of influences on biogeographical characteristics, land-atmospheric feedbacks, as well as the meteorological variables.

Realistic LULC information (Bo Huang; Yan Yan) and soil texture (E. Hugo Berbery) should be implemented into model simulations to capture more detailed climate information. Land surface forcing has evident impacts on surface and lower atmosphere variables (Josipa Milovac) as well as the planetary boundary layer stabilities (Lisa Lea Jach). Both surface fluxes and near surface variables respond to the changes in land-cover and soil properties (E. Hugo Berbery; Lisa Lea Jach). And they subsequently drive the boundary layer evolution and lead to a series of feedbacks that influence the regional climate. The simulation results show that the strength of sensitivity to LULC also depends on the model configuration (e.g., land surface model, boundary layer scheme),

season and specific regions (Josipa Milovac; Bo Huang). However, there still exists some uncertainties in land cover types (from both satellite observation and classification algorithms) within model configurations (Jun Ge; Xiaohang Wen), which need further improvements.

Terrestrial water cycle and groundwater-to-atmosphere interactions and feedbacks are also important components of land-atmosphere coupling system. It's found that the incorporation of terrestrial systems modelling platform (TSMP) in RCM allows to simulate all states and fluxes of the terrestrial water and energy cycle and aims to bridge the gap between hydrology and meteorology, which shows potential to predict near-term extreme events (e.g., drought and heatwave) (K. Goergen).