Geophysical Research Abstracts
Vol. 18, EGU2016-17062, 2016
EGU General Assembly 2016

Statistical downscaling of CMIP5 outputs for projecting future maximum and minimum temperature over the Haihe River Bain, China

Tiezhu Yan (1), Zhenyao Shen (1), Lee Heng (2), and Gerd Dercon (2)

(1) Austria (T.Yan@iaea.org), (2) Soil and Water Management & Crop Nutrition Laboratory, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, Department of Nuclear Sciences and Applications, International Atomic Energy Agency, Vienna, Austria

Future climate change information is important to formulate adaptation and mitigation strategies for climate change. In this study, a statistical downscaling model (SDSM) was established using both NCEP reanalysis data and ground observations (daily maximum and minimum temperature) during the period 1971-2010, and then calibrated model was applied to generate the future maximum and minimum temperature projections using predictors from the two CMIP5 models (MPI-ESM-LR and CNRM-CM5) under two Representative Concentration Pathway (RCP2.6 and RCP8.5) during the period 2011-2100 for the Haihe River Basin, China. Compared to the baseline period, future change in annual and seasonal maximum and minimum temperature was computed after bias correction. The spatial distribution and trend change of annual maximum and minimum temperature were also analyzed using ensemble projections. The results shows that: (1)The downscaling model had a good applicability on reproducing daily and monthly mean maximum and minimum temperature over the whole basin. (2) Bias was observed when using historical predictors from CMIP5 models and the performance of CNRM-CM5 was a little worse than that of MPI-ESM-LR. (3) The change in annual mean maximum and minimum temperature under the two scenarios in 2020s, 2050s and 2070s will increase and magnitude of maximum temperature will be higher than minimum temperature. (4) The increase in temperature in the mountains and along the coastline is remarkably high than the other parts of the studies basin. (5) For annual maximum and minimum temperature, the significant upward trend will be obtained under RCP 8.5 scenario and the magnitude will be 0.37 and 0.39 [U+2103] per decade, respectively; the increase in magnitude under RCP 2.6 scenario will be upward in 2020s and then decrease in 2050s and 2070s, and the magnitude will be 0.01 and 0.01 [U+2103] per decade, respectively.