Geophysical Research Abstracts
Vol. 15, EGU2013-13796, 2013
EGU General Assembly 2013

How may the regional climate change redraw the European terrestrial wild mammals' living territory in the 21st century?

Julia Nagy (1), Judit Bartholy (1), Rita Pongracz (1), and Levente Hufnagel (2)

(1) Department of Meteorology, Eotvos Lorand University, Budapest, Hungary, (2) Department of Mathematics and Informatics, Corvinus University, Budapest, Hungary

Climate is one of the abiotic factors, which controls primarily the range areas of wildlife. Animals tend to occupy geographical regions with climatic conditions, which are optimal to their specific needs. Due to the projected global warming and climate change the living territory of wild animals' may be reshaped in the future, some of the species may even suffer extinction. In this research we aim to estimate how climate change alters the distributions of European terrestrial mammal species and modifies biodiversity in the 21st century. For this purpose, first, hierarchical cluster analysis is applied to species for forming major groups. Climatic information is provided by using the E-OBS gridded database for 1961-1990. Then, carefully selecting typical species from the major groups it is possible to predict changes in area by displaying their climate indicator profile maps.
For the range datasets the Atlas of European Mammals are analyzed, which was published in 1999 and is now widely used as a reference work. It contains data for pre-1970 and post-1970 presence of mammal species in Europe. Then, in order to assess future changes, available datasets of regional climate model results from the European project ENSEMBLES for 1951-2100 using the moderate SRES A1B emission scenario are considered with 25 km horizontal resolution. Simultaneous analysis of climate simulations and animal range datasets enables us to evaluate the vulnerability of European terrestrial mammal species to regional climate change. The results suggest that rapid change and significant decline in habitats and fauna redraw the wild animals' living territory and make them migrate northward.