

**Potential distribution in future of *Mertensiella caucasica* (Waga, 1876)**

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**Aim of the study:** To examine ecological niche modelling of *Mertensiella caucasica* under different climate scenarios to understand how change in climate affects the Caucasus salamander, and how the distribution of species will respond to change in climate.

**Material and Methods:** All distribution data for *M. caucasica* were assembled by searching (1) the available literature, (2) HerpNet, which is a global network of herpetological collections data (<http://www.herpnet.org/>), and (3) field observations between 2002 and 2014 years. A total of 85 records were selected to use as training points data for modelling. Raster data with 2.5 arc-minutes resolution (~5 km×5 km) for current (~1950-2000) were imported from generic grids on WorldClim. Future climatic conditions (2050s (average for 2041-2060) and 2070s (average for 2061-2080)), composed of 19 bioclimatic variables, were downloaded from the Climate Change, Agriculture and Food Security website (CCAFS). Two emissions scenarios named as Representative Concentration Pathways (RCPs) from the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) were used for climatic projections (RCP 4.5 and RCP 8.5). The known localities of *M. caucasica* and bioclimatic data were used to build the model. In order to quantify the relationship between known distribution of *M. caucasica* and bioclimatic variables, the Maxent Modelling Algorithm was used.

**Results:** Future projections based on the HadGEM2-ES models under RCP 4.5 and RCP 8.5 scenarios generally exhibited small differences. Both RCP 4.5 and RCP 8.5 maps, which identified the most suitable regions for *M. caucasica*, are mostly similar. The future distribution was similar to the current distribution in terms of the absence of *M. caucasica* in the Russian Federation, the Greater Caucasus, south and southeast of the east Lesser Caucasus. The future distribution showed a remarkable expansion towards the northwest part of the Greater Caucasus whereas it indicated a regression from the west in the western Lesser Caucasus up to the Greater Caucasus. The greatest habitat declines for this species were predicted in the western Lesser Caucasus (2050 and 2080 in the RCP 8.5). In fact, there was a projected increase for habitat suitability towards a large part of the Lesser Caucasus and up to the Greater Caucasus in all scenarios of HadGEM2-ES scenarios in 2050s and 2080s. The west Lesser Caucasus, on the other hand, showed a projected decline in habitat suitability during each time period. In particular, habitat loss seems to occur most in the west Lesser Caucasus including the northeast of Turkey; moreover, habitat suitability for *M. caucasica* showed trends towards extinction according to both scenarios.

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