Geophysical Research Abstracts
Vol. 21, EGU2019-9191, 2019
EGU General Assembly 2019

Soil properties and climate interact in shaping the future potential distribution of native tree species in Great Britain

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Robust information on the distribution of tree species is essential for many applications in ecology and conservation. Information on how the distribution will adapt to climate change is therefore fundamental. While, at the national level, climate-related variables are important drivers, and often well investigated, soil properties have received less attention, although it is known that they can constrain or favour many species. In this study we addressed how soil properties influence the distribution of native tree species in Great Britain (GB), in the present and in future climate scenarios. We used detailed presence records in GB to model and map the tree species distributions with climate information for the present and for two representative concentration pathways for 2050 and 2070, assessed with four regional climate models. We also used data from soil survey programmes in Scotland and in England and Wales to map soil properties following the GlobalSoilMap specifications. We then modelled observed and future distributions of native tree species based on climate and soil at 100m resolution.
The results highlighted the need to consider soil properties when mapping tree distributions at the national level.