**Spatial resolution impacts projected plant responses to climate change on topographically complex islands**

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Understanding how grain size affects our ability to characterize species responses to ongoing climate change is of crucial importance in the context of an increasing awareness for the substantial difference that exists between coarse spatial resolution macroclimatic data sets and the microclimate actually experienced by organisms. Climate change impacts on biodiversity are expected to peak in mountain areas, wherein the differences between macro and microclimates are precisely the largest. Based on a newly generated fine-scale environmental data for the Canary Islands, we assessed whether data at 100 m resolution is able to provide more accurate predictions than available data at 1 km resolution. We also analysed how future climate suitability predictions of 14 island endemic bryophytes differ depending on the grain size of grids. We used two climate data sets: CHELSA v1.2 (~1 km) and CanaryClim v1.0 (100 m), a downscaled version of the latter utilizing data from local weather stations. Species distribution models generated from CHELSA and CanaryClim exhibited a similar accuracy, but CanaryClim consistently returned higher proportions of newly suitable pixels (8%–28%) than CHELSA models (0%–3%). Consequently, the proportion of species predicted to occupy pixels of uncertain suitability was higher with CHELSA (3–8 species) than with CanaryClim (0–2 species). The resolution of climate data impacted the predictions rather than the performance of species distribution models. Our results highlight the crucial role that fine-resolution climate data sets can play in predicting the potential distribution of both microrefugia and new suitable range under warming climate.