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Numerically simulated climatology of winds in Iceland 1961-1990

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Flow over Iceland has been simulated over a 30 years period using the PSU/NCAR MM5 mesoscale model. There is a considerable spatial variability in the mean annual wind speed as well as temporal variability between the four seasons (SON, DJF, MAM and JJA). This variability can to a large extent be explained by a combination of large scale seasonal effects and orographic processes that are theoretically fairly well known. However, theoretical knowledge of these processes is of limited use for producing quantitative maps of the wind climate as is done here. These maps can be used as a first step towards assessment of wind energy resources.

The simulations indicate that the mean winds are very strong over the largest glaciers and at their foothills. The simulations are in general in fairly good agreement with observed wind speeds. Observed discrepancies can be explained by the model resolution, i.e. the orography not being properly resolved, and/or incorrect land use parameters as well as uncertainties in observations. It is further speculated that to little mixing near the surface contributes to the simulated wind speeds being too low in the interior of Iceland.