Geophysical Research Abstracts, Vol. 7, 02053, 2005
SRef-ID: 1607-7962/gra/EGU05-A-02053

Development of a model-based high resolution extreme surface wind climatology for Switzerland

S. Goyette

Department of Geosciences, University of Fribourg, Pérolles, 1700, Switzerland

(stephane.goyette@unifr.ch)

Some features of the development of a high-resolution climatology of extreme winds over Switzerland using a numerical modelling approach are discussed is this study: these include the methodological aspects, the input data used and the validation steps. The Canadian Regional Climate Model (CRCM) to which is applied a windgust parameterisation is used at various spatial resolutions. As input data, this study employs NCEP-NCAR reanalysis data as well as the simulated outputs of the UK HADLEY Center's coupled ocean-atmosphere global model - available in the EU 5^{th} Framework Program "PRUDENCE" project - for the 1961-1990, as well as for the 2071-2100 periods under the IPCC SRES A2 scenario. Datasets are first sorted out to identify the probable synoptic conditions leading to windstorms over Switzerland. These then serve to prescribe the model's evolving lateral and lower boundary conditions for the CRCM runs at coarse resolution. Then, using the multiple self-nesting methodology of the CRCM, these situations are downscaled at 20-, 5-, and finally at 2-km resolution over Switzerland. The preliminary analysis of 10 simulated windstorms is very encouraging: the mean synoptic conditions of sea-level pressure, p_{msl} agree with the corresponding mean NCEP-NCAR one for deep cyclogenesis in the North Atlantic. The 2-km wind speeds simulated at the surface ($i.e.$, 10 m) average over the Swiss territory produce a pattern that agree generally well with observations (ANETZ). Therefore, more storms need to be simulated to encompass the full range of situation that may lead to strong winds since the ultimate goal is to assess the change of the extreme wind climatology following the IPCC A2 greenhouse-gas warming-scenario.