



The effects of climate change on the number of cold spells in the Alps

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Scientific evidence shows that climate change is not only a likely perspective for the end of this century, but also already occurring. In particular, the Alps are one of the regions in Europe where the actual thermal trends are highest. Part of the changes will consist in global warming and increasing temperature variability, both at global and regional scales. The increased variability in the alpine region during the future climate (2071-2100), compared with the present climate (1961-90), is the object of this study, which is focused on the coldest queue of the temperature distribution, i.e. on the occurrence of cold spells in the Alps. For this purpose, a regionalization of the climate change effects was performed within the Alps. To avoid the possible wrong estimates of the 2m air temperature, the analysis was performed on the soil surface temperature. To get realistic values for this variable, a land surface scheme, UTOPIA (formerly known as LSPM), was run on the selected domain, using as driving forcing the output of the Regional Climate Model (RegCM3) simulations, which in turn were driven by A2, B2 and present climate scenarios of a global climate model. The results of the analysis show that, in general, the number of cold breaks is decreasing over the Alps, due to the temperature increment. However, there are certain zones where the behavior is more complicated. The analysis of the model output allowed also finding a relation between the number of cold breaks and their duration. The significance of these results on the whole area will be assessed during the presentation.