



## **Snow Modelling in the Ižera Mountains, Czech Republic**

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Snow melt is an important source of Spring flooding in the Ižera Mountains. It is responsible not only for floods in inhabited regions downstream, but also controls the erosion patterns and water regime in mountain catchments. The amount, timing and duration of snow melt determine the moisture conditions in the catchments during the most important period for the maintenance of the catchments' eco-systems. The aim of this work is the derivation of a snow cover evolution model able to describe snow formation and snow melt processes under varying climatic conditions typical of mountain catchments. We are attempting to produce, therefore, a model which can be used with the data sets which are typically available. Climatic forcing is represented by daily temperature and precipitation measurements. Due to the limited number of observations available, the choice of models is restricted to black-box, Transfer Function type models. However, the models are formulated in a stochastic framework, enabling estimates of the model predictions to be derived. In this work we follow a data-based mechanistic approach to modelling, which means that we try to explain the relationships derived from the data in a physically meaningful fashion. The available data include hourly precipitation, temperature and flow observations, but only daily snow height measurements for the winters of 2004-2008. Daily snow cover models are built for each year but also they are validated against each other and differences in the model parameters are examined. Subsequently, the models for quantification of flow from snow melt are built using temperature, precipitation and snow cover as input variables. The results show that reasonably good predictions of snow cover formation and snow melt can be obtained using simple models that are not data demanding.