

Spatial characterization of the snowpack pattern with landscape-based discretization for hydrologic modeling of the snow-dominated Morales River Basin, in the semi-arid andes central chile

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Snow hydrology in mountain environments plays an important role in the availability of hydrological resources in warm climate areas and height effects, since the magnitude of snowpack, its spatial and temporal distribution is very important to determine the availability of water in the snowmelt season and take forward different productive activities

This investigation models and assess the main phenomena hydrological cycle of snow using the software Cold Region Hydrological Model (Pomeroy et al., 2007). The software is a physically based model developed by the centre for hydrology, University of Saskatchewan. The aim of this model is to have a better understanding of hydrological processes involved in cold environments, which are particular in the sense that a host of specific phenomena such as snow and ice accumulation, transport and melt, infiltration through frozen soils, and the like, control the hydrograph timing)

The analysis involved the development of a hydrologic model for the Morales River Basin, with elevations between 1800 and 4550 meters above sea level and 37.7-km watershed in the Andes of Central Chile. Similar basins to these, supplies water resources, to the capital city of Santiago (7 million inhabitants), to a thriving agricultural region, as well as to hydropower and large mining activities.

The paper concludes that there is a differential distribution of snow cover in the study area, determined mainly by steep terrain geomorphology. These factors have been considered in the parameterization of the model, showing considerable variation in storage time, melting intervals, infiltration rates and drainage basin.

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