Geophysical Research Abstracts
Vol. 20, EGU2018-10942, 2018
EGU General Assembly 2018

Modeling of the snow hydrological processes and the influence in the runoff of the mountain basins in the semi-arid Andes Central Chile

Yohann Videla-Giering (1,3) and James McPhee (2,3)

(1) Department of Geology, University of Chile, Faculty of Physical and Mathematical Sciences, Santiago, Chile (yv.giering@gmail.com), (2) Department of Civil Engineering, University of Chile, Faculty of Physical and Mathematical Sciences, Santiago, Chile, mcphee@u.uchile.cl, (3) Advanced Mining Technology Center, University of Chile, Faculty of Physical and Mathematical Sciences, Santiago, Chile

The physical processes that dominate the residence time and volume of water stored in the Subtropical Andes, are of great importance to the success in the management of the resource for around 10 million people. Therefore, to know the physical conditions of the snowpack synchronization between the solid and liquid together with the magnitude seasonally accumulated of the resource, it becomes increasingly essential to the understanding of processes that dominate over this part of the Hydrology. Our main objective was compare whith CRHM (Pomeroy et al., 2007) the energy and mass balance of snow and runoff contributions simulates the evolution of seasonal snow cover in the one mountain basin between the period 2000-2016. The model is forced by data from radiation, temperature, humidity, wind and precipitation, from re-analysis “Era-Interim” which have been corrected by temporal and spacial downscale. The modeling are spatially distributed by HRU’s and suggest that low slope areas have close relationship with the thickness and snow water equivalent. The morphological evolution of snow is closely related to the change between the different layers of snowpack and this with the albedo. A 22% of the snow is subject to reallocation by the effect of the topography while the net short wave radiation would explain what major changes in the melting of the mantle nival. A 80% of the flow of summer comes from glacial melting, while temperature and type of soil in the mountain basins would be determining factors in the infiltration and contribution to the runoff at all times of the year, these results enabled better understanding of the hydrological cycle of the snow in the central Andes.

Key words: Hydrological Modelling, Albedo, Water Storage, Snowpack, topography effects, Snow resdistribution.