



Variability of snow covered area and snow line elevation in the main Slovak river basins in winters 2001-2014

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We have analysed spatial and temporal variability of snow cover patterns in ten main river basins of Slovakia in winters 2001-2014. The main objective was to investigate the factors that control the differences between the basins and winter seasons. Snow cover area (SCA) and snow line elevation (SLE) was determined from MODIS (MOD10A1 and MYD10A1) datasets by using method proposed by Krajčí et al. (2014). The analyzed river basins cover different physiographic conditions of Slovakia. Their size varies between 1966 and 9421 km² and mean elevation ranges between 152 and 852 m a.s.l..

The results show that larger SCA typically tends to start in December. January and February are the months with maximum SCA values in all basins. The median of maximum SCA, however, exceeds 90% only in two basins situated in northern Slovakia. In April, larger SCA (5-10%) occur only in half of the basins. The assessment of SLE indicates that SLE varies between 250 and 650 m a.s.l. in January and increases approximately to 750-1500 m a.s.l. in March and April. The evaluation indicates that snow poor winters with lower SCA occurred in winters 2001, 2007 and 2014. In opposite, the largest SCA was observed in 2006 and partly (in some basins) in 2007.

The poster will also investigate the role of climate factors (air temperature and precipitation) on spatio-temporal variability of SCA and SLE. Sum of negative daily air temperatures and precipitation during the winter months (December-March) will be used to construct typical SCA reduction curves in selected headwater sub-basins. The implications of changing SCA on snowmelt runoff variability will be discussed and an attempt to predict streamflow behavior during the spring (snowmelt) period will be presented.

References

Krajčí, P., Holko, L., Perdigão, R.A.P., Parajka, J., Estimation of regional snowline elevation (RSLE) from MODIS images for seasonally snow covered mountain basins, 2014, *Journal of Hydrology*, 519, 1769-1778.