Geophysical Research Abstracts
Vol. 16, EGU2014-1150-2, 2014
EGU General Assembly 2014

Testing of a coupled model of the HBV model and a glacier retreat model on a Himalayan basin

Hong LI (1), Chongyu Xu (1), Stein Beldring (2), Kjetil Melvold (2), and Sharad Jain (3)

(1) University of Oslo, Norway(hongli@geo.uio.no), (2) Norwegian Water Resources and Energy Directorate, Norway, (3) National Institute of Hydrology, India

The Himalayan glaciers are source of numerous large Asian river systems, including the Indus, Ganges, and Brahmaputra, which provide water for 1.5 billion people. This region is among areas that are the most sensitive to climate change. Shrinking of the glaciers is expected to significantly affect hydrologic responses of glaciated basins. Retreat of glaciers in these basins is predicted to cause severe water crisis in these basins. However, glacier behaviours are not well represented in most current hydrological models. The objective of the present study is to test performance of a coupled model consisting of a hydrological model and a glacier retreat model. The hydrological model is a distributed HBV model, simulating runoff response to water input into catchment. The glacier retreat model is a distributed glacier-specific model, Δh-parameterization describing ice redistribution caused by glacier movement. The Beas River basin in the Northern India is selected as focus area because of its high representativeness of the Himalayan basins and availability of data. This study will not only improve the HBV model for hydrological studies in glaciated catchments, but also contribute to improved understanding and modelling of glacier hydrology. The coupled model will be a useful tool for water resources projections and hydropower planning in a far future on highly glaciated basins.