Geophysical Research Abstracts
Vol. 20, EGU2018-19600, 2018
EGU General Assembly 2018

Modelling climate induced geomorphic changes in two small Austrian alpine catchments using CAESAR-Lisflood

Markus Meller (1), Ronald Pöppl (1), Martin Mergili (1,2), Oliver Sass (3), and Eric Rascher (3)

(1) University of Vienna, Geography and Regional Research, Vienna, Austria, (2) BOKU University, Institute of Applied Geology, Vienna, Austria, (3) Karl-Franzens-Universität Graz, Geography and Regional Science, Graz, Austria

Climate change affects temperature as well as precipitation patterns, leading to changes in discharge and respective sediment dynamics in fluvial systems. Especially precipitation and its variability are the main forces driving geomorphic changes in mountainous areas. Alterations of precipitation patterns under consideration of climate change exert an influence on discharge and the sediment budget in alpine catchments, including sediment availability, entrainment, transport and deposition.
The aim of this study is to simulate climate induced geomorphic changes in two small alpine catchments located in the Eastern Alps, focusing on the dynamics within the drainage channels. The Johnsbach and Schöttlbach valleys are quite similar in catchment size and elevation, but differ in terms of their geological settings (limestone and dolomite at Johnsbach; mica schist at Schöttlbach). The detection and quantification of geomorphic changes is performed using a landscape evolution model (CAESAR-Lisflood).
CAESAR uses a digital terrain model, an hourly rainfall record and grain size distributions as input variables to calculate landscape evolution. Future changes in precipitation are derived from climate change scenarios published by the APCC and IPCC. The input data for the model (e.g. bedload measurements) are available from previous studies in the catchment areas under investigation. These data are used for model calibration as well as for validation. Additionally, geomorphic change detection analyses using DoD (Digital Terrain Models of Difference) are carried out.