Geophysical Research Abstracts
Vol. 13, EGU2011-10033, 2011
EGU General Assembly 2011

Parameterising and validating hydrodynamic models of floodplains from airborne laser scanning data

Christine Gschöpf (1,2), Michael Vetter (1,3), Wolfgang Wagner (1,3), Günter Blöschl (1,2)

(1) Centre for Water Resource Systems, Vienna University of Technology, Austria (gschoepf@waterresources.at) , (2) Institute of Hydraulic Engineering and Water Resources Management, Vienna University of Technology, Austria, (3) Institute of Photogrammetry and Remote Sensing, Vienna University of Technology, Austria

The presented study describes the hydrodynamic processes of an inundated floodplain based on a two-dimensional hydraulic model which is parameterised and validated from highly accurate topographic data from airborne laser scanning (ALS). Besides the common use of the topographic elevation by digital terrain models (DTM), the surface roughness is simultaneously estimated from ALS data. One advantage of this new method is that the input data set remains time consistent because the applied DTM and the roughness parameters for the hydrodynamic model stem from the same date. Therefore, ground surface changes in the vegetation period and after flood events are not a problem. Above all, the starting position for the calibration process in terms of Manning's values is improved because the corresponding roughness classes are based on the analyses of the ALS point cloud which provides additional information of the vertical structure of the ground surface. This information assists in numerical modelling since terrestrial mapping of vegetation types and land use is no longer needed.
The model validation can be improved by validating simulated inundation areas against water area borderlines detected from ALS.