Geophysical Research Abstracts
Vol. 13, EGU2011-2185, 2011
EGU General Assembly 2011

Mobile and efficient monitoring of floodplain inundation

Heiko Apel, Sergiy Vorogushyn, Knut Günther, Heiko Thoss, and Benjamin Creutzfeldt

GFZ German Research Center for Geoscience, Section 5.4 Hydrology, Potsdam, Germany (hapel@gfz-potsdam.de, +49 331 2881538)

Floodplain inundation is analysed for various planning purposes and risk assessment studies. Typically it is estimated by discharge scenarios combined with hydrodynamic simulations of the floodplain inundation process in order to derive estimates of the inundated area and depth. However, the major drawback of those simulations is the chronic lack of inundation data for calibration and validation of the models. A significant improvement of this data scarcity situation has been the recently increasing availability and use of radar-based remote sensing imagery. This provides spatial explicit data of inundation extents against which the models can be tested. Combining high-resolution sensors with high-resolution Digital Elevation models even spatially explicit inundation depths can be derived. However, the low temporal coverage typically does not allow for a proper assessment of the ability of the models to simulate the temporal inundation dynamics. Therefore we developed a simple monitoring method enabling time-continuous monitoring of floodplain inundation at a number of locations, thus also providing information about the spatial dynamics. The monitoring devices consist of small absolute pressure probes for recoding water levels, which are attached to ground anchors and small position buoys. This enables easy and fast deployment at arbitrary number of locations in the floodplains and also recovery of the probes at any point in time. This network of pressure probes can be supplemented by radar doppler discharge measurements from bridges crossing the floodplain, if existing. The proposed system can be installed within short times, i.e. enabling short term installation a few days prior to forecasted or expected floods and can be reused multiple times, because no permanent installations are required. The system has been tested during a deliberate flooding of polders at the river Odra in December 2010 and first results are presented here.