Geophysical Research Abstracts
Vol. 12, EGU2010-11227, 2010
EGU General Assembly 2010

GPS inland water buoys for precise and high temporal resolution water level and movement monitoring

Heiko Apel (1), Nguyen Nghia Hung (1,2), Heiko Thoss (1), and Andreas Güntner (1)

(1) German Research Center for Geoscience GFZ, Section 5.4 Hydrology, Potsdam, Germany (hapel@gfz-potsdam.de, +49 331 2881570), (2) Southern Institute for Water Resources Research SIWRR, Ho Chi Minh City, Vietnam

Monitoring of river and lake stages is one of the basic issues in understanding catchment hydrology and hydraulic systems. There are numerous techniques available for this, but in case of large water bodies technical as well as financial problems may restrict the use of traditional techniques. Therefore we explored the potential of GPS based altimetry for stage monitoring by developing small and easy to handle buoys with mounted high precision GPS devices. The advantages of the buoys are the freedom of positioning over the whole water body and their quick and easy deployment. The developed devices were tested in the Mekong Delta, Vietnam in two different locations: On the Mekong river where high currents over the flood season occur and in a small lake with hydraulic connections to a major channel with hardly any currents present. The collected GPS data were processed differentially and tested against standard pressure gauge data. The recorded stages proved to be of high quality and a valuable resource for flood monitoring and modeling. In addition to the stage data, the high-precision GPS positioning data could also be used for monitoring the movement of the buoys, from which alternating currents caused by ocean tides and flood waves could be detected, thus providing an additional information on the hydraulic system. We conclude that the developed buoys add well to the existing hydrological monitoring pool and are a goof option for the monitoring in large water bodies where a) traditional methods are technically difficult to deploy or are too costly, and b) where additional information about flow direction is needed.