Geophysical Research Abstracts,
Vol. 11, EGU2009-5427, 2009
EGU General Assembly 2009

Can hydrological modelling be used as a tool for water management in disturbed catchments?

O. Cainelli, A. Bellin, G. Brentari, and D. Alberici
Civil and Environmental Department, Engineering Faculty, University of Trento, Italy (oscar.cainelli@ing.unitn.it)

Water management in large watersheds requires accurate and detailed information of runoff generation, soil use, and water demand. These data are typically obtained by monitoring rainfall intensities over the study area and the hydraulic regimes at specified cross-sections within the river network. However, monitoring these hydrologic quantities over large catchments requires a large number of measuring stations leading to large investment and operational costs. We hypothesized that the coupling of a relatively sparse monitoring network with a large scale hydrologic model could be a cost effective solution of this problem. Therefore, we developed a new fast, accurate, and detailed semi-distributed continuous hydrologic model named GEOTRANSF. The model takes into account for anthropogenic aspects such as the presence of reservoirs and spatially and temporally varying water uses. We performed a detailed hydrologic analysis of three alpine basins located in Trentino (Italy) and characterized by strong anthropogenic influences. We calibrated the model with flow discharges monitored over six years at few gauging stations. Comparisons of observed and predicted discharges showed good agreements with Nash's coefficients larger than 0.6. Here, we show and discuss our model performance and runoff coefficients in details for one of these three watersheds, the Noce river basin. We estimated the runoff coefficients of several sub-basins within this basin. These values presented good matches with those calculated with local hydrologic analyses. Our results support our proposed approach as a rather inexpensive tool for water management of large watersheds.