Geophysical Research Abstracts
Vol. 13, EGU2011-2530, 2011
EGU General Assembly 2011

A Model Instrument for Integrated Scenarios of Global Flood Risks

Hessel Winsemius (1), Rens Van Beek (2), Joost Knoop (3), Lineke Woelders (1), and Karin De Bruijn (1)

(1) Deltares, Delft, Netherlands (hessel.winsemius@deltares.nl), (2) Utrecht University, Utrecht, The Netherlands, (3) Netherlands Environmental Assessment Agency, Bilthoven, The Netherlands

Global change will affect flood risks. On the one hand, flood *hazard* may be affected as the result of changes in climate and land cover. These influence the intensity and turnover of the hydrological cycle. Consequently, runoff generation and the probability of flooding may increase or decrease. On the other hand, *impact* of floods will most likely increase as population and economic productivity are generally on the rise and concentrate in floodprone (delta) areas.

"GLObal Flood Risk IMAGE Scenarios" (GLOFRIS) is a novel scenario instrument which estimates the impact of changing land cover, climate and socio-economics on flood risk on a global scale with a spatial resolution of 0.5×0.5 degrees. We use the daily timestep global hydrological model PCRGLOB-WB to assess global flood hazard now and in the future. PCRGLOB-WB is equipped with a dynamic flood routing module, which allows for routing of overbank flow and inundation within river cells. Integrated scenario's of land cover change, climate change and socio-economic changes from the "Integrated Model to Assess the Global Environment" (IMAGE) are used to assess globally (1) how flood hazard may change due to land cover and climate changes, and (2) how flood impact changes as a consequence of socio-economic changes. Flood impacts are expressed by several indicators related to population density and Gross Domestic Product. Output is presented in the form of grid maps and country-level relative numbers. GLOFRIS is built in the open model shell Delft-FEWS.

In this paper, we describe and demonstrate methods to translate IMAGE scenarios into parameterization for PCRGLOB-WB and evaluate the first results of changes in flood impacts from the GLOFRIS system.