



Involving regional expertise in nationwide modeling for adequate prediction of climate change effects on different demands for fresh water

Wim de Lange (1), Geert. Prinsen (1), Jacco Hoogewoud (1), Ab Veldhuizen (2), Erik Ruijgh (1), and Timo Kroon (3)

(1) Deltares, Utrecht, Netherlands (wim.delange@deltares.nl), (2) Alterra, Wageningen, The Netherlands, (3) RWS-WD, Lelystad, The Netherlands

Nationwide modeling aims to produce a balanced distribution of climate change effects (e.g. harm on crops) and possible compensation (e.g. volume fresh water) based on consistent calculation.

The present work is based on the Netherlands Hydrological Instrument (NHI, www.nhi.nu), which is a national, integrated, hydrological model that simulates distribution, flow and storage of all water in the surface water and groundwater systems. The instrument is developed to assess the impact on water use on land-surface (sprinkling crops, drinking water) and in surface water (navigation, cooling). The regional expertise involved in the development of NHI come from all parties involved in the use, production and management of water, such as waterboards, drinking water supply companies, provinces, ngo's, and so on. Adequate prediction implies that the model computes changes in the order of magnitude that is relevant to the effects. In scenarios related to drought, adequate prediction applies to the water demand and the hydrological effects during average, dry, very dry and extremely dry periods. The NHI acts as a part of the so-called Deltamodel (www.deltamodel.nl), which aims to predict effects and compensating measures of climate change both on safety against flooding and on water shortage during drought. To assess the effects, a limited number of well-defined scenarios is used within the Deltamodel.

The effects on demand of fresh water consist of an increase of the demand e.g. for surface water level control to prevent dike burst, for flushing salt in ditches, for sprinkling of crops, for preserving wet nature and so on. Many of the effects are dealt with? by regional and local parties. Therefore, these parties have large interest in the outcome of the scenario analyses. They are participating in the assessment of the NHI previous to the start of the analyses. Regional expertise is welcomed in the calibration phase of NHI. It aims to reduce uncertainties by improving the rules for manmade re-direction of surface water, schematizations & parameters included in the model. This is carried out in workshops and in one-to-one expert meetings on regional models & the NHI. All results of NHI are presented on the internet and any expert may suggest improvements to the model. The final goal of the involvement of regional parties is the acceptance by decision impact receiving authorities