



Impacts of climate change on water quantity and quality in Rhineland-Palatinate/Germany

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The Ministry of the Environment of Rhineland-Palatinate, Germany, launched an interdisciplinary research project dealing with "climate and land use change in Rhineland-Palatinate" (KlimLandRP). The aim of KlimLandRP is to specify adaptation strategies and to find current research gaps. The University of Trier/Germany undertakes the task of quantifying the impact of climate change on hydrological cycle and on water quality.

In the first phase of the project (2008/2009) the models STOFFBILANZ and WaSiM-ETH are applied. WETTREG projections (2050/2100) and newly high resolution CCLM (2015-2024) projections for Rhineland-Palatinate are used to indicate the spectrum of climate change. Possible land use scenarios for agricultural regions are furthermore adopted.

Using STOFFBILANZ it is possible to get approximate spatial information about present and future distribution of water, nitrate and phosphorus balance in Rhineland-Palatinate and to identify sensitive regions. Based on achieved results, regions which are vulnerable to water economy are identified and adaptations proposed. With the application of WaSiM-ETH the impact of climate change on water balance of forest sites is quantified. The relation between climate parameters and tree growth indices is applied in forest management planning, particularly for forest site mapping.

In the future, also the rainfall-runoff model LARSIM will be applied to quantify the impacts of climate change on the hydrological cycle of mesoscale catchment basins.