

Extreme groundwater levels caused by extreme weather conditions – the highest ever measured groundwater levels in Middle Germany and their management

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Extreme weather conditions during the years 2009 – 2011 in combination with changes in the regional water management and possible impacts of climate change led to maximum groundwater levels in large areas of Germany in 2011. This resulted in extensive water logging, with problems especially in urban areas near rivers, where water logging produced huge problems for buildings and infrastructure. The acute situation still exists in many areas and requires the development of solution concepts. Taken the example of the Elbe-Saale-Region in the Federal State of Saxony-Anhalt, where a pilot research project was carried out, the analytical situation, the development of a management tool and the implementation of a groundwater management concept are shown. The central tool is a coupled water budget - groundwater flow model. In combination with sophisticated multi-scale parameter estimation, a high resolution groundwater level simulation was carried out. A decision support process with a very intensive stakeholder interaction combined with high resolution simulations enables the development of a management concept for extreme groundwater situations in consideration of sustainable and environmentally sound solutions mainly on the base of passive measures.