



Hydrological Characteristics of Lowland-Floodplain Landscapes

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For a sustainable management of lowland-floodplain landscapes it is necessary to improve the water quality as well to enhance the eco-hydrological and water balance controlling functions of the floodplains and their interconnected lowlands. The catchment of the Lower Havel River in NE-Germany is a typical example for floodplain dominated lowland landscape. It covers an area of 198 km² and is located about 20 km upstream of the Havel River confluence with the Elbe River. The area is characterised by a wide floodplain with a mean altitude of 25 - 28 m asl surrounded by rather small plates which consist of pleistocene moraines reaching heights of up to 120 m asl. The catchment has been characterised by periodic inundations of large parts of the floodplain caused by either high discharge of the Havel River itself or by high water levels in the Elbe River and a successive backwater into the Havel River. The floodplain, together with the Lower Havel River form one of the largest inland wetlands of Central Europe with high ecological value. In this area, meteorology, groundwater conditions and surface water dynamics as well as soil moisture have been measured in several locations for several years. These measurements and additional field experiments proved the major importance of the interaction processes between groundwater and surface water for floodplain water balance. Simulations with a coupled surface-groundwater model showed how the tight interactions between groundwater and surface waters cause a major control on the temporal and spatial dynamics on the floodplain water balance at several sub-catchments of varying scale. The temporal and spatial pattern of these interactions and their impact on the floodplain water balance is mainly controlled by pressure head gradients as well as by the transmissivity of the soils and sediments.