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Climate Proof Areas: Adaptation of water management in coastal areas to climate change

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Due to future climate change coastal areas within the North Sea region will be faced with severe water management problems. On the one hand, mean sea level as well as storm tides will remarkably rise within the 21st century, and on the other hand it can be expected that the mean runoff from coastal river catchments will increase as well. The increase in runoff in Northwest Germany mainly will be caused by a changed seasonality of the water cycle (increase in runoff generation during winter, decrease in runoff generation during summer) and an increase in flooding intensity. Large parts of the German North Sea coast consist of low lying marsh and fen areas which are already intensively drained to be cultivable as agricultural land and to be usable to build settlements. Water management will have to adapt in order to be able to still use those areas in the presence of climate change. Innovative strategies for coastal protection and drainage will be required, considering the increased probability in summer drought periods as well which might accelerate salt water intrusion into surface and groundwater in summer time in particular inducing the need of irrigation.

This contribution firstly introduces the hydrological effects of expected future climate change on the water cycle at the Lower Saxon North Sea coast (Germany). Then, the EC funded Interreg IVb project 'Climate Proof Areas' is introduced, focusing on the development of adaptation strategies for water management in the North Sea region. Based on a participatory approach, future water management problems are defined, priorities and necessities are assessed, and possible approaches for a sustainable, future water management within the Wesermarsch region are developed. The scenario technique is used in order to elaborate and evaluate different, partly contrasting development paths and adaptations strategies. First water management adaptation scenarios point out potential conflicts between the diverse interests of different stakeholders. Although all stakeholders agree that adaptation is necessary, the directions of possible adaptation are quite different due their different interest to use the coastal environment. Therefore, their individual focus is set on different priorities towards possible adaptation. Nevertheless, the scenarios also show possibilities to reduce potential conflicts by integrative and innovative solutions.