INDEX-BASED ANALYSIS OF THE CLIMATE CHANGE IMPACT ON WETLANDS IN POLAND

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ABSTRACT

This study presents an assessment of climate change impacts on floodplain and groundwater-fed wetlands with the use of an index-based approach for the Vistula and Odra river basins in Poland. Climate change is expected to impact the hydrologic regimes and pose a threat to wetlands and their biodiversity. As part of the project on Climate change impact assessment for selected sectors in Poland (CHASE – PL) we assessed the consequences of climate change in large-scale river basins of the Vistula and Odra. We assessed how climate change causing changes in streamflow and soil water content would influence floodplain and groundwater-fed wetlands. Data on current and future streamflow and soil water content were obtained with the use of the Soil and Water Assessment Tool (SWAT) driven by a set of nine EUROCORDEX Regional Climate Models. We considered Special Protection Areas and Special Areas of Conservation of the Natura 2000 network located (fully or partially) within Odra and Wisła River basins in Poland. We have chosen water dependent habitats of interest and assessed if they are fed by groundwater or surface waters. We established threshold values of streamflow at bankfull flow to identify flood events. Changes in frequency of the floods informed about the alteration to the water supply for wetlands reliant on inundation. The groundwater-fed wetlands were assessed on the basis of the soil water content. The model outputs were used to develop indices which were calculated for the climate change scenarios and the control period. The last step was to convert the results into "traffic light" maps with a use of a grading system. The developed indicators are highly sensitive to projected changes in hydrologic regime in the conditions of changing climate. The results show influence of climate change on floodplain and groundwater-fed wetlands and show the number and kind of wetlands threatened in different regions of Poland.

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