Geophysical Research Abstracts
Vol. 18, EGU2016-14674, 2016
EGU General Assembly 2016

Influence of long-term trends of flooding on habitat conditions in lowland riparian wetlands under low antropopression

Dorota Mirosław-Świątek and Mateusz Grygoruk

Warsaw University of Life Sciences (SGGW), Department of Hydraulic Engineering, Warsaw, Poland (dorotams@levis.sggw.pl)

Temporal, volumetric and areal trends of flooding remain dominant factors shaping habitat conditions of riparian wetlands. In contemporary Europe, where the pristine extent of riparian wetlands strongly decreased due to antropopression and the flow regime of majority of rivers was decently modified in agricultural and hydropower purposes, valuable riparian habitats that remained in good ecological state require appropriate maintenance of floods. Even though multiple environmental regulations were implemented worldwide in order to mitigate negative effects of antropopression to flow regime and habitats, it is the climatic change that challenges riparian ecosystem management to the extent comparable (if not higher) than the direct human interventions. Wishing to detect probable influence of the ongoing climatic change on the flood regime one should search for catchment systems of a low antropopression, where the long term variability of flood extents, flood depths and recurrence intervals are likely to reflect climatic changes rather than human activity.

In our study we analysed 60-years long time series of the discharge data of Biebrza river (NE Poland) that was found in numerous studies a reference in a temperate-continental European riparian and mire ecosystem research. Daily data of river discharge was used as boundary conditions in the WETFLOD – a developed integrated river-floodplain-groundwater flow model applied to the environment of Lower Biebrza Basin. The model was used to simulate and analyze trends of changes in flood extent and water depths in selected, well preserved vegetation patches namely the Caricetum appropinquatae, Caricetum gracilis, Phragmitetum communis and Glycerietum maximae. Temporal trends were analysed on the basis of distribution deciles of flood extents, depths and recurrence intervals.

Study revealed that flood extents and flood depths in the first decade of the 21st century were decently different from the ones modeled for the second part of the 20th century. This is considered a challenge for habitat management as the most recent hydrological dynamics of these riparian habitats entail different temporal balance of oxic-anoxic conditions.