VERIFICATION OF THE NUMERICAL RIVER FLOW MODEL BY USING OF REMOTE SENSING

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The Lower Biebrza Basin is a riparian wetland with the area of ca 300 sq km located in NorthEast Poland. The condition of plant communities developed in this region is strongly related to the phenomena of flooding and flood characteristics. The hydraulic 1D unsteady numerical model of surface water flow was developed for obtaining this type of characteristics. Modeling of the flood flow through the floodplain was calibrated with comparing to measurements of flood extent performed in the period from 17-19 March of 1999 and March of 2002. During these periods, the water levels in different parts of the valley were measured, as well as the flood extent border was localized by GPS. Elaborated numerical model was used for long time flood predictions of years 1997-2002. The output data were analysed on Digital Elevation Model (DEM) in order to determine the inundated area. The model was verified with use of 8 satellite images captured by sensors of Landsat TM and ETM+ between 1997 and 2002 in different flood phases and water levels of floods. The images were processed for determination of the inundated areas. The methodology of image processing was developed with help of extensive field measurements. During verification process, the flood extents obtained from numerical model and DEM were compared to the inundated area determined from satellite images. Results show good agreement between inundation area observed and determined from satellite images and calculated by numerical model and DEM.