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River-bed morphology changes during winter season in the regulated channel of the Wilga River, Poland

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ABSTRACT

Field investigations of the river bed morphology in the regulated channel of the Wilga River in Poland are presented. All data were collected with the use of an echo sounding system mounted on the ADCP, which was also used to obtain the water flow velocities and discharges during the days of measurements. It is shown that the analysed channel consists mostly of regular sand waves, which change their length and height during the winter season. The dependence of the shape of bed forms and river bed morphology on the existence of vegetation patch, which is directly associated with decreasing water temperature, is discussed briefly. The paper confirms changes in bed profiles with the increase in the water discharge. Moreover, a digital elevation model of the channel obtained with use of the ArcGis software is introduced. In addition, the single-sided spectra of bed-elevation are analyzed. The results suggest that in the case of vegetation existing in the channel, the spectra are characterized by the scaling region with exponent "-2", which tends to be "-3" when the plants disappear.