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Enriching of surface water in nutrients and DOC on the area of drained Kuwasy Mire in North-East Poland

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The object of this study was fundamental mineral component concentration (N-NO3, N-NH4, PO4, K, Na, Ca, Mg, Cl, Fe) and dissolved organic carbon concentration (DOC) in surface water in artificial canal running across drained fen area. Also pH, electrical conductivity and abssorbance A280 in water samples were measured. The investigations were localized on the area of drained and agricultural used Kuwasy Mire, which are situated in the middle basin of Biebrza River, in North-East Poland. Currently on the object there is superiority of peat-moorsh soils with moorsh layers to 25 cm of depth. The bog depth is determined from 60 to 140 cm. The most of area is occupied by soils with 110-120 cm organic layer which are intensive agricultural used. Mean annual ground water table amounted 55 cm. On the distance of 8 km (about 1100-1200 ha catchment area) fen space is crossed by Kuwaski Canal collecting water from draining network above describing peatland. Surface water samples were collected every month in three constant point of canal: at entrance on peatland (upper point) in the middle part (middle point) and in border part of peatland (lower point). The study was carried out in 2001-2009.
The aim of this study was to determine enriching of surface water in individual mineral and organic components during flowing across peatland area. Mean concentration in whole research period for all investigated components was higher together with flowing of water in canal across fen area. The higest increments of mean concentration between upper a lower point of canal was connected with phosphorous and amonia. The concentrations of these compounds were adequately 4,8 i 2,6 times higher in lower part of canal. Mean concentrations of remaining compounds were 2-14% higher in water in lower point in comparision to upper point of canal. In course of interflow through peatland pH of water was decreasing but electrical conductivity and abssorbance A280 were increasing. When we take into consideration annual quantity of water flowing by canal only on biological level (0,5 m3/s) the increments load of PO4 in this distance amounted 3,6; N-NH4 – 4,6; N-NO3 – 3,0; DOC - 9,5 t.year-1. At mean interflow 3 m3/s the load of describing components was increasing to 21, 27, 20 i 57 t.year-1 in research part of canal.