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## **Extended Abstracts**

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title: **Hydrogeological aspects of Quaternary sediments in Poland**

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Quaternary evolution of Poland started 2.5 million years ago and comprised of two stages; Prepleistocene — time before glaciations, and Pleistocene glaciations time including Holocene epoch. The river's system with eroded deep valleys existed in Prepleistocene, but the outflow from rivers was oriented towards the Black Sea, White Sea and North Sea. Marine sediments in the vicinity of present Baltic Sea area are said to emerge in the Eemian Interglacial. The rivers on Polish territory have started to orientate towards to the North (Prebaltic) from that time. Deep erosions were repeated at early stages of glaciations followed by gravel and sand fill. These process created buried valleys' up to 200 m deep, which are now abundant Quaternary aquifers. The biggest groundwater aquifers in Poland are in places of interference of these structures and fluvio-glacial sands developed as sandurs. These aquifers are separated by glacial till and silt strata. The most abounding aquifers are delimited and protected (Żurek et al., 1994; Skrzypczyk, 2000). The interglacial sediments are connected to loamy and silty sand often mixed with organic matter and peat accumulated in lakes, swamps and valleys. The average thickness of fresh water layer is ca. 200 m (Kleczkowski (ed.), 1987; Paczyński, Płochniewski, 1996). The salt waters and brines of synsedimentary and infiltration origin and Cl-Na type occur beneath the fresh groundwater on the lowlands (Dowgiało et al., 1974; Różański, Zuber, 2000).

The multiaquifer system' are common in the area of Polish Lowlands (Paczyński (ed.), 1993, 1995). Transmissivity of these water bearing strata often exceeds 200 m<sup>2</sup>/hr. Tremendous groundwater resources and their position close to the ground surface allow for their utilization as water supplies in Poland 2,1 km<sup>3</sup> annually, which means are 51% that of total amount of exploited waters on water intakes comes from the Quaternary aquifers (Herbich, 2005). The recharge areas of these aquifer lie in the highlands whereas the wide river valleys are discharge areas. The mean resident time of groundwater in the Quaternary aquifers in Poland is estimated to be 50 yrs, whereas residence time of water in the sluggish circulation systems in deeper strata, exceeds 1000 yrs.

The Quaternary aquifers are vulnerable to municipal and agricultural pollution (Żurek et al., 1994). Along the Baltic coast lowlands the geogenic pollution as sea water intrusion or brines ascension is observed especially in the vicinity of big water intakes (Burzyński et al., 1999). Trends in water table lowering is noted in the central part of Polish lowlands, possibly due to the climate variability.

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