Distribution of Groundwater Regimes in NW Pannonian Basin, Hungary, Europe: an Overview of Results Obtained in a Regional Scale Case Study

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As in the international practice, the importance of the research of the groundwater systems in large sedimentary basins is also recognized in Hungary. In case of the studied Kisalföld Basin it was also important to know the structure of the groundwater systems and the distribution of the groundwater regimes for the protection of one of the greatest water resource in Middle Europe. The main purposes of the research were (1) to determine the basic directions of the groundwater flow systems, (2) to locate the principal recharge and discharge areas on the surface and (3) to create a general flow net for the NW Pannonian Basin.
The basic sources of the research were archives: (1) hydraulic data, (2) published maps and (3) other important publications. The methods of flow systems investigation were (1) analysing the hydrostratigraphical frames, (2) setting up 2D numeric models in different cross sections (assuming the Kisalföld Basin is hydraulically continuous) (3) processing hydraulic data: constructing h(d) profiles and potentiometric surface maps and eventually (4) explaining the diverse phenomena on the surface which generated by the groundwater flows.
The flownet of the basin has been described by the following characteristics: (1) boundary conditions, (2) directions of flow lines and (3) geometry of the flow systems in vertical profiles.
The results of the above mentioned studies were displayed on maps and cross sections: detailed flownet profiles, potentiometric contour maps, hydraulic head difference maps and a surface hydraulic regime map.

On the basis of real hydraulic data it was possible to determine (1) the distribution of the groundwater regimes on the surface, (2) the gravity forced groundwater systems at least (-1000)m below sea level, (3) the vadose origin of the subsurface water, (4) the steady state conditions of groundwater field on human scale, (5) a non-steady state component of the groundwater field which is superimposed on the steady-state system by the river Danube.