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title: **Patchiness of soil and wetland salinization due to hydrodynamic interplay between gravity-driven and overpressured groundwater flow regimes, Duna-Tisza interfluves, Hungary**

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The Duna-Tisza Interfluve in Hungary has an agricultural economy but is plagued by severe problems of soil and wetland salinization. The study's objective was to determine the source of the salts and the controls and mechanism of their distribution.

Based on regional hydrostratigraphic, hydraulic and hydrogeochemical evaluation, two groundwater flow-domains were identified: a gravity-driven meteoric "fresh" water domain and an over-pressured deeper domain of saline water. Gravitational flow-systems are perched hydraulically upon the rising salt waters. A schematic pattern of groundwater flow was proposed for the Interfluve region, the "Duna-Tisza Interfluve Hydrogeological Type Section" (Fig. 1) (Mádl-Szőnyi and Tóth, 2009). (Ca,Mg)-$(HCO_3)_2$-type meteoric fresh water infiltrates in the ridge region of the Interfluve and is hydraulically perched on the rising saline waters of the overpressured regime. The salts are found to originate partly from the NaCl-type water of 10000–38000 mg·L^{-1} TDS of the basement and deep-basin sediments. This water rises into a zone of the higher Neogene sediments where the $NaHCO_3$-type waters (TDS: 450–2500 mg·L^{-1}) are the second source of the salts. These waters mix and the Cl^-, originated from the basement can be used as a natural tracer of deep waters at near surface depths.

Salinity distribution at the surface is explained by the tectonically driven cross-formational rise of deep saline waters channeled in and mixed with fresh waters by near-surface sediments and gravity flow-systems.

The hydrodynamic interaction between these fresh and saline deep waters seems adequately to explain the pattern of soil and wetland salinization as well as the contrasting chemistry between the wetlands of the low-lying Danube Valley and the elevated Ridge Region.

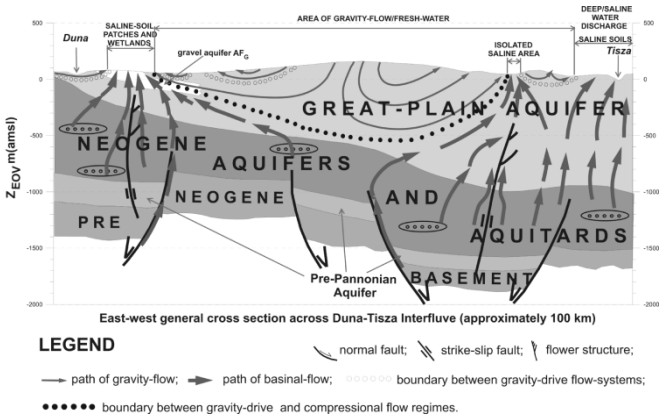

Figure 1. The Duna-Tisza Interfluve Hydrogeological Type Section.

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