Modelling the base of fluvial Quaternary sediments in the “Seewinkel” area (Austria)

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The “Seewinkel” region is the eastern most part of Austria located east of Lake Neusiedl, Austria's largest lake. The area is located in the western part of the Little Hungarian Plain and is characterized by extremely low relief and abundant shallow lakes and pans. The general geological setting shows Quaternary fluvial sediments with minor aeolian cover in places, above Pannonian (Miocene, Tortonian) limnic fine-grained sediments. Recent seismic data show the existence of abundant brittle faults in the subsurface, related to the formation of the Pannonian Basin.

We model the thickness of the Quaternary sediments in this hardly exposed area, to gain insight into their deposition, the influence of pre- and post-tectonic structures and to improve our understanding of the uppermost groundwater storey. This study combines existing borehole data (mainly from OMV, Geological Survey of Austria, Gruppe Wasser Ziviltechnikergesellschaft für Wasserwirtschaft GmbH and Amt der Burgenländischen Landesregierung) and observations from construction sites with high-resolution airborne laser scanning (ALS) topographic data to model the thickness of the Quaternary sediments in an Open-Source geographic information systems (GIS) environment.

The Quaternary fluvial sediments pinch out towards northwest, being virtually zero close to the eastern shore of Lake Neusiedl, and increase in thickness towards east, reaching almost 30 m at the Austrian/Hungarian border. This tendency is mimicking the thickness trend of the underlying Pannonian sediments and most probably is related to the still ongoing regional subsidence in the Little Hungarian Plain.