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The Heidelberg Basin Drilling Project – Exploring one of the most complete successions of mid-continental Quaternary in Central Europe

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The Heidelberg Basin, located in the northern part of the Upper Rhine Graben (Germany) hosts one of the thickest and most complete successions of Plio-/Pleistocene sediments in continental Mid-Europe. Since Late Pliocene / Early Pleistocene, the River Rhine has acted as the only drainage system that connected the Alps with Northern Europe, especially the North Sea. The ongoing subsidence of the Upper Rhine Graben offers a unique potential for continuous sediment accumulation and preservation. Especially the Heidelberg Basin, as the distal sediment trap for alpine sediments, defines a key location to understand the glacial evolution of the Alps since Late Pliocene. With the aim to establish a reference profile of Quaternary stratigraphy of the region north of the Alps, that must be discussed in the context of the 4-D basin evolution, the Heidelberg Basin is investigated by new cored boreholes at three different locations. Each borehole is between 300 m and 500 m deep. Petrographic, sequence stratigraphic, biostratigraphic, and magnetostratigraphic approaches are included and complemented by geochronological and geophysical data.

First investigations of the core material confirm that the depocenter of the basin is located close to the eastern main fault of the Rhine Graben, as was demonstrated by seismic pre-site surveys. The pollen data of the deepest borehole revealed a pollen assemblage that is interpreted as Tegelen interglacial. In the sense of climate stratigraphy, the sediment succession seems to be complete. Glacials and interglacials are found in superposition along one profile – a unique situation for Western Europe. A significant part of the cored boreholes consists of fine sediments. Therefore, the potential of the material for further research that concentrates e.g. on the control of sedimentation by tectonics and climate, the characterization of Base Quaternary by a combination of different datasets, the detailed characterization of the glacial and interglacials, and the spatial-temporal evolution of the basin, is already given.

Reference

Gabriel, G., Ellwanger, D., Hoselmann, C., Weidenfeller, M. (guest editors). Special Issue 'The Heidelberg Basin Drilling Project'. – Quaternary Science Journal (Eiszeitalter und Gegenwart), 57(3/4), 2008.