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Geophysical investigation of a sink in the northern Harz Foreland (North Germany)

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The river Jerstedter Bach is part of the Ringelheimer Mulde along the northern rim of the Harz Mountains in Northern Germany, a trough structure comprising steeply dipping limestones. The limestones are well karstified and drain part of the region efficiently via sub-surface flow. As the entire region is intensively used by agriculture, contamination of the fast-flowing karst aquifer is a potential problem. During 2006, a small sink (Schluckstelle Windmühlenweg) developed alongside the Jerstedter Bach close to the city of Goslar. The sink developed rapidly, with a small cave within the gravel cover diverting part of the river to the sub-surface karst catchment. We used geophysical methods (gravimetry, geoelectic) around the sink to determine its extent and possible evolution. A large negative Bouguer anomaly was found over the sinkhole, indicating more voids further downstream. The geoelectic survey helped to identify the old meandering course of the small river, which was straightened during the cultural land reform.