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Visualization of river geometry using borehole database: an example of incised valley fills under the Arakawa Lowland

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Relatively sandy incised-valley fills deposited during the latest Pleistocene to Holocene distribute under the Arakawa Lowland, central Japan. These coarse deposits, mainly composed of transgressive river sediments are formed by the Paleo-Tonegawa River, now located in the Nakagawa Lowland. Sedimentary facies, radiocarbon ages, and some geochemical properties of those incised valley fills in the Arakawa Lowland have been revealed by the Urban Geological Survey Project of Geological Survey of Japan. The incised valley fills have thick wedge-shaped gravel-rich river sediments deposited in the lowstand stage, thick sand-dominated river sediments deposited in the transgressive stage, muddy delta-plain and delta-front sediments fills an inner-bay in the highstand stage, and thick salt-marsh deposits draping delta-plain sand in the head of the bay in ascending order. In this study, we attempt to visualize the river deposits using the borehole database of the Urban Geological Survey Project. The visualization is based on the evaluation of the sandy-river deposits of 3D-geological models using the borehole database. Visualized transgressive-river sand body shows an accumulative and weakly meandering sand-ribbon confined in the basement, reflecting the transgressive river geometry.

Keywords: Arakawa Lowland, 3D-geological model, sand ribbon, sandy river, incised valley fill