

Formation of a gravelly sand bar in the Yahagi River, central Japan, inferred from a Ground Penetrating Radar (GPR) survey

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GPR survey is useful for interpreting subsurface structures and revealing formation of fluvial bars. GPR profiles of fluvial bars are characterized by inclined-, horizontal-, trough-shaped reflectors, and set of multiple reflectors bounded by channeled-shaped surface, which represent downstream-migrating foreset of a bar and lateral accretion of a side bar, dunes, bedload sheet, and secondary channel scours and fills, respectively. We conducted a GPR survey of a gravelly sand bar in the Yahagi River, central Japan, which is 725 m long and 160 m wide, to clarify the three-dimensional architecture of the bar deposits. The survey was carried out in January 2015 using 250-MHz antennas. Obtained GPR profiles showed upward accretion of the inner part of the bar, chute channel incision and fill, and lateral accretion of the bar. The formation history of the bar deposits may present changes in bed load transport associated with recent disturbance, including dam constructions and dredging operations.

Keywords: the Yahagi River, gravelly sand bar, ground-penetrating radar (GPR) survey