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Digital elevation model based geomorphological mapping in the lower River Boyne valley, Ireland

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Interpretation of digital elevation models (DEMs) is rapidly becoming a valuable extension to field-based geomorphic mapping. High-resolution LiDAR data (Light Detection and Ranging; point spacing 1m, vertical accuracy 0.1m) is ideally-suited for mapping areas of complex and subtle geomorphology, such as fluvial landscapes. This poster outlines how LiDAR data are being used to map and characterise the postglacial fluvial terraces of the lower Boyne valley, Co. Meath, Ireland. Comprehensive mapping, together with longitudinal profiles, demonstrate that the valley contains a suite, or 'staircase', of six main fluvial terraces, spanning an altitude range of ca. 20m. These terraces represent a chronosequence of 'palaeo' floodplains, with the highest (T1) being the oldest level, and the lowest (T6) the youngest. The evolution of the valley has thus involved progressive erosion, punctuated by episodes of vertical stability or re-filling. Classified maps of the river terrace sequence indicate that terrace T1 is closely associated with glacial landforms, while T2 exhibits multiple channels with large bar-forms, and could mark a braided river system that conveyed huge water and sediment loads during deglaciation ca. 20-17 ka BP. The 'modern' floodplain (T6) is ubiquitous, and preliminary field studies have dated two of its palaeochannels to >1,000 cal. BP. The LiDAR based model of geomorphic evolution in the lower Boyne valley is being used to underpin field-based geomorphological and sediment studies, focusing on the acquisition of OSL and radiocarbon dates to secure the timing of river terrace formation and to assess the relationships between fluvial development and environmental change since the Late Glacial period.