

Using a Terrestrial Laser Scanner to assess the morphological dynamics of a gravel-bed river

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Abstract Braided rivers are dynamic and complex environments shaped by the balance of the flow, sediment regimes and the influence of the riparian vegetation. The balance between sediment supply and transport capacity determines the morphological evolution of a river. The aim of the study is to analyse the short-term morphological dynamics and the processes of erosion and deposition along a sub-reach of a low impacted gravel-bed braided river (the Tagliamento River, Italy) using a Terrestrial Laser Scanner (TLS). The device used is a pulsed TLS able to collect up to 50 000 points per second at a spatial resolution up to one point per mm². The study area is around 23 ha and has been surveyed before and after significant floods of recurrence interval approx. 15 years and 12 years. The differences of the two DEMs (DoD) computed revealed consistent episodes of erosion and deposition within the analysed area, showing a strong dynamic of the Tagliamento River.

Key words difference of DEMs (DoD); Terrestrial Laser Scanner (TLS); fluvial systems; morphological changes; Tagliamento River, Italy