SIGNATURE OF PERSISTENT FORCING AND LITHOLOGICAL CONTROLS ON THE EVOLUTION OF THE RIVERS LONG PROFILES. ANALYSIS OF THE TEJO AND DOURO RIVERS TRIBUTARIES.

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The long term incision history of river systems is commonly reconstructed using markers such as river terrace landforms. However, terrace records are often spatially and temporally fragmentary and where preserved are more likely to be associated with higher order trunk river systems. Lower order tributary streams commonly lack terrace records because sediment storage space is limited and the steeper gradients result in higher stream powers which tends to promote sediment erosion and transport. Thus, valley floors of tributary streams are often dominated by bedrock reaches or at the very least, thin transient covers of alluvial material. In such settings, the longitudinal profiles of the tributary streams are often the only geomorphological information that can be used to provide insights into the long term fluvial landscape history.

Conceptually, longitudinal profiles can display 1) concavities, where a stream is graded to transient forms of the river profile with respect to the lithology, structure and base level history or 2) slope-breaks in river profile, where knickpoints/knickzones (Kps) develop in response to persistent forcing conditions (regional uplift, base level fall), or to a more discrete event, as local stream capture, fault rupture or resistant substrate. The former (Kps) represent channel adjustment to a long term change in forcing, consequently, they are transient features in the landscape, while the seconds are discrete and more stationary in the long profile. The two morphologies can be grouped in two categories: slope-break knickpoints and vertical-step knickpoints.

In this presentation we analyze some long profiles of Tejo and Douro river tributaries.

These streams flow through a landscape strongly influenced by variations in bedrock lithology (granites and metasediments), fault structures (e.g. the Sertã, Sobreira Formosa and Vilariça faults) and a base-level lowering history (tectonic uplift / eustatic).