



Signal propagation in sediment routing systems: an application for granulates prediction (location, grain-size)

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The consideration of entire "Source to Sink" systems is one of the most recent and challenging advances in earth surface dynamics and sedimentary geology. To understand S2S systems it is necessary to enhance sharing of knowledge and concepts between (1) geomorphology, which focuses on the understanding of erosion processes driving landform evolution and sediment fluxes, (2) stratigraphy/sedimentology, which focuses on the nature of sedimentary deposits and their distribution in time and space, and (3) tectonics and structural geology, which set the dimensions, geometry and dynamics of source/transfer areas and sedimentary basins (the sink). Understanding S2S systems also involves other Geosciences disciplines such as paleoclimatology and geochemistry, because they allow quantifying the factors controlling S2S systems dynamics (climatic controls on erosion, solid vs. solute fluxes, etc.).

The main challenges are (1) to get all the above mentioned disciplines working together on geological or numerical approaches of the whole S2S system, in different tectonic and climatic settings and (2) to convince some industries of the merits of this approach, e.g. industries dealing with geothermy or granulates.

We here present one example of academia – industry transfer of knowledge for granulates: the low accommodation alluvial system of the Armorican Massif of Messinian to Pliocene age, major source of granulates for the development of the Brittany Province (western France). The understanding of the base level fluctuations sensu Wheeler (1964), joined to an knowledge of the uplift history, the climate variations, and the source of sediments (Eocene laterite profiles) gave tools for a better prediction on the location and quality of the granulates.