

# Chapter 46

## Meso-Scale Kinematic Indicators in Exhumed Mass Transport Deposits: Definitions and Implications

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**Abstract** In this study we combine observations and analytical data from large-scale (10–100s of m-thick and 100 m<sup>2</sup>-extensive), siliciclastic and carbonate MTD/MTCs belonging to the Oligocene – Miocene foredeep and wedge-top successions of the Northern Apennines and the Paleocene – Eocene Friuli basin of the northwestern Dinarides (Italy and Slovenia), to discuss the deformation processes critical to the emplacement of submarine landslides. We focus on the identification of meso-scale structures, used as diagnostic kinematic indicators of local paleo-transport directions. These structures, represented by linear-planar and complex-shaped elements such as tabular shear zones and detached slump-type folds, are the product of ductile-plastic deformation developed at relatively low-confining pressure that involves water-saturated, un- to poorly-lithified sediments, along with liquefaction/fluidization processes. Their final appearance is thus mainly controlled by the mechanical-rheological behavior of deformed sediments, and eventually by tectonic fabrics inherited from deeper structural levels of deformation. Due to this parallelism these structures have been termed and classified accordingly. They reflect strain partitioning due to differential movements within the slide mass, which is in turn controlled by the overall landslide typology. Due to the parallelism with classified tectonic structures and structural associations, we have thus redefined and classified accordingly meso-scale kinematic indicators in ancient MTD/MTCs.

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