9 Perspectives

Scaled 2D sandbox simulations were used to investigate the influence of kinematic boundary conditions as well as erosion on bivergent wedge-evolution. Analysis of experimentally derived data focused on: (i) the spatio-temporal distribution of deformation, (ii) the associated surface uplift and (iii) particle paths. These results were compared with observations from other simulation as well as field studies and were found to be in general agreement. A variety of predictions has been derived, among them: (i) the four-staged evolutionary model, (ii) the accretion cycle, which imposes an internal clock to wedge-scaled deformation, (iii) strain partitioning in time and space, (iv) the system-immanent variability in strain accumulation, (v) the derivation of an end-member model, i. e., time-predictable versus spacing-predictable, which bears some implications for hazard assessment studies, (vi) far-field effects, i. e., retro-wedge erosion influences the deformation within the pro-wedge and thus the evolution of the pro-foredeep, (vii) the Flysch to Molasse transition and finally, (viii) implications for fluid flow and associated ore/hydrocarbon deposits in continental collision zones. Nevertheless this study could be faced with the question that no individual natural laboratory has been used to tie and to compare with. However, two arguments are raised in favour of the strategy, which investigates parameters first and looks at specific mountain belts second. First, not all data needed to compare experimental results with nature are available for one orogen or for a specific time interval. Second, and probably most importantly, boundary conditions do matter. The perception of how nature works commonly guides the setup of physical and numerical simulations. The respective results and interpretations do however only mirror the interplay of the kinematic and dynamic boundary conditions and thus reflect finally the initial perception. In addition, subtle parameter variations, whose natural variations are poorly known, may not be appropriate for a first order study, unless testable predictions are derived. We finally conclude that changing the boundary conditions during simulations, identifying their equivalents in nature while transferring experimentally derived time-series to nature, is and remains a very crucial issue to unravel such beautiful processes as mountain building. Future work shall be aimed at testing the above predictions and hypotheses.