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Redeposition along Steep Platform Margins at the Seismic Scale and Beyond

Redepositions on all scales produce heterogeneous stratigraphic architecture of platform margin and slopes. Larger features such as slumps are visible on seismic sections but most others are beyond seismic resolution. A comparison between outcrop and seismic data reveals a large spectrum of size and nature of redeposited sediments and their controlling processes. An exposed Miocene margin in south-central Turkey documents the dimensions and geometries of various redeposited sediments. A 20 km wide carbonate platform with a barrier margin constructed of coral and algal boundstone developed during the Early-Middle Miocene. Outside of the barrier, various redeposited carbonate bodies can be observed from meter scale blocks to km wide slump deposit. Several slumps are observed as well as rotated and folded strata that are still connected to the detachment surface. Isolated blocks of various sizes occur preferentially at the toes-of-slope. The stratigraphic distribution indicates several phases of slope instability. Seismic data across a Lower Miocene margin in the subsurface of Pearl River Mouth Basin in the South China Sea illustrate the seismic expression of the large-scale redeposited feature. The margin of the Lower Miocene Zhujiang platform displays multiple large scale slumping events distributed along strike. These large slumps have similar dimensions and occur with a comparable frequency as the ones observed in Turkey. The trigger mechanism of the margin failure is not known but in both margin the large scale failures don't seem to be related to the underlying structure.