



What pore water geochemistry can reveal - Identification and Interpretation of the Geologic Record of young slide events

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Three cores from two regional and environmental different locations are presented, showing distinct changes in the pore water concentration profiles of several parameters, a few meters below the sediment surface. These kinks in the geochemical signal are interpreted to be the result of recent slide events. However, the sediment material does not show any indication of non-continuous sequences in the respective parts of the different geological records. Furthermore the radiocarbon based age model of the cores only shows a change in sedimentation rate, but no clearly younger surface below the displaced package has been detected in the represented cores. Considering this observed rapid change of gradient in a certain depth of the concentration profiles in pore water to be caused by a sediment slide event, this 'kink-type' profile cannot show stability over time, except there would be a biogeochemical reaction at this point maintaining it. The change in gradient would be lost with time due to the well-known process of molecular diffusion. Based on this presupposition, modeling the diffusive flows in the pore water fraction of the different cores with a transport/reaction model according to the quantitatively well known processes of diffusion resulted in an age determination of the respective slide events of a maximum age of approx. 10 to 20 years. The presented model concept unites all measurements and observations from pore water and solid phase samples, yielding in a coherent overall picture. The slide events would neither have been recognized nor understood without this study approach and without an appropriate understanding of the pore water concentration profiles. This comparative study with sediment cores from two regional and also environmental different settings, one recovered from a submarine channel system off Mauritania and two previously recovered from the shelf off the coast of Angola, exemplarily shows that such slide events are not just a phenomenon locally limited in their occurrence to the very restricted area of a canyon system but, instead are likely to happen anywhere on continental slopes.