

Organism-sediment interactions: processes, modeling strategies, and challenges

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The presence of organisms in marine sediments has a profound effect on the transport and exchange of materials across the sediment-water interface. Bioturbation not only mixes sediments, but affects carbonate particle breakdown, porosity profiles, physical resuspension and downslope transport, and seascape evolution. Bioirrigation, or burrow flushing, increases rates of organic matter decomposition and carbonate dissolution. The goal of this presentation is to give an overview of some of the recent advances in modeling organismsediment interactions and their implications for carbonate systems. Examples include stochastic models of bioturbation and bioirrigation, as well as multi-component diagenetic reactive transport models. Ongoing work on coupling bioturbation models to physical sedimentary process models is presented, highlighting some of the outstanding challenges.