



## Phosphorus cycling in marine sediments off Namibia

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The aim of this study is to investigate the benthic phosphorus cycle with regard to the recent formation of phosphorites. Pore water and solid phase data of sediments from one of the most important upwelling areas in the ocean were used to investigate the coupling between the sedimentary cycles of iron and phosphorus and to determine whether authigenic apatite is currently forming. We aim to interpret the results from this complex upwelling system with an existing reaction transport model, which is expanded to include phosphorus diagenesis.

Extraction data provide evidence for the abundant presence of a Fe(III)-bound phosphate mineral in the surface sediment. Model results indicate that release of phosphate from Fe(III) phases through reductive dissolution on one hand, and from the decomposition of organic phosphate on the other hand, dominate the input of phosphate to the pore water and may play a key role in authigenic apatite precipitation. Furthermore, the results suggest that the major burial forms in these sediments are phosphate associated with Fe(III) oxyhydroxides, organic phosphate and biogenic apatite (CaCO<sub>3</sub>-bound).