

Controls of ecological stability of marine ecosystems over long temporal scales (global evolutionary biogeosciences)

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Conservation of biodiversity and the impact of global change on ecosystems are among the key issues of a world increasingly influenced by mankind. The project will unravel the feedbacks between abiotic change, ecological traits and biodiversity in ecosystems in an evolutionary framework. Focussing on processes in deep time and applying a top-down approach, general principals of the interplay between earth system change and ecological evolution are extracted. Marine ecosystems over the entire Phanerozoic are the scope of the analyses. To analyze patterns and processes over large temporal and spatial scales, large paleobiological and geochemical databases, new approaches to ecological stability metrics, new resampling techniques, and ecological modeling are used. Going down in scale, selected time intervals such as the Jurassic and the Pleistocene will be analyzed in more detail, focussing on ecological stability in a greenhouse world and a strongly fluctuating icehouse world. A further scope will be the role of mass extinctions in altering the resistance and resilience stability of ecosystems. Here, the focus will be on the end-Triassic and the end-Cretaceous mass extinctions, which although similar in magnitude are very different in their biological response.

Projektbeteiligte

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