

NATURAL VARIABILITY VERSUS ANTHROPOGENIC IMPACTS ON DEEP-SEA ECOSYSTEMS OF IMPORTANCE FOR DEEP-SEA MINING

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Abstract

Deep-sea ecosystems (DSE) undergo changes which result from natural variability and from human activities, with frequent feedbacks between these two dimensions. Given the seriousness and costs of future deep-sea mining (DSM), a substantial human intervention into the natural environment of the deep-sea, this intervention should be successful (providing the benefits intended), sustainable (providing the benefits in a long term) and responsible (causing the least possible disruption of the deep-sea environment and its communities). The success, sustainability and responsibility of DSM require knowledge of conditions under which the intervention will be carried out as well as the ability to predict the severity of mining effects. The present knowledge on the status and natural variability of ecosystems to be impacted by future mining operations, particularly polymetallic nodule fields on abyssal plains and polymetallic sulphides in hydrothermal vent fields on mid-ocean ridges, is severely limited, as is knowledge on possible consequences of the impacts caused by DSM and rates of recovery from it. We present a brief overview of time-series studies carried out to date in the parts of DSE targeted for future mining operations and discuss the two major dimensions of DSE changes, natural and anthropogenic. We conclude by reiterating the need for intensified, high-resolution observation system(s) of DSE and the necessity of having appropriately resolved time-series of data.

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