Recovery and Recolonisation Processes in the Area Disturbed by a Polymetallic Nodule Collector Simulator

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ABSTRACT

In July 1995, Interocceanmetal Joint Organization (IOM) carried out a field experiment called the Benthic Impact Experiment ‘95 (IOM BIE’95) within the IOM pioneer area in the Pacific’s Clarion Clipperton Fracture Zone. The experiment was aimed at studying effects of disturbance, produced by simulated nodule mining, on benthic communities and their habitat. The disturbance was effected by a Deep Sea Sediment Resuspension System (the so-called Disturber towed on the bottom along a course laid out within a 2 x 1.5 km test site. Before and immediately after the Disturber operation, the area was surveyed with the aid of a continuous deep sea camera/video recorder to document changes in the sediment, megabenthos and its Lebenesspuren occurring within the test site. In April-May 1997, 22 months after the original disturbance, the test site was revisited and photo/video-surveyed again. The observed changes in the sedimentary cover involved a considerable weathering of Disturber tracks, most likely due to strong near-bottom currents and/or benthic storms. The intensive feeding activity of motile megafauna, documented immediately after the disturbance, continued 22 months later as evidenced by frequent appearances of fish, shrimps, and holothurians in the test area and lattices of relatively fresh biogenic traces visible on photographs and video recordings.

KEY WORDS: deep-sea, Benthic Impact Experiment, disturbance, recovery, megafauna

INTRODUCTION

The prerequisite of future polymetallic nodule mining operations is that the extent of environmental disturbance they are likely to cause be assessed and predicted beforehand so that potential harmful effects can be minimised (Prep.Com., 1991). One of the ways with which to approach the problem of environmental impact assessment is to carry out in situ experiments during which a similar nature to that likely to occur during a full-scale activity but spatially limited, is created (Underwood, 1996). So far, there have been a number of reports on field experiments aimed at assessing the environmental effects of future polymetallic nodule mining (Fukushima, 1995; Schrieber et al., 1997; Trueblood and Ozturgut, 1997).

In July 1995, Interocceanmetal Joint Organization (IOM) carried out an in situ experiment called the Benthic Impact Experiment ‘95 (IOM BIE’95) within the IOM pioneer area in the Pacific’s Clarion Clipperton Fracture Zone. A follow-up cruise to the area took place in April-May 1997.

In this contribution we are addressing the problem of assessing changes in the sedimentary cover structure and megabenthos