

## Overview "Japan Deep-Sea Impact Experiment = JET"

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### ABSTRACT

Deep-Sea mineral resources are expected to support the activity of our future industries. At the same time however, biological communities in the same region are thought to be a valuable resource for our future generations. Therefore it is necessary to consider not only the mining development but also ways of protecting and conserving the abyssal communities and organisms that are characterized by their specialized niches, fragility and rare abundance.

In 1991, at the request of the Ministry of International Trade and Industry (MITI), the Metal Mining Agency of Japan (MMAJ) started the project entitled "Environmental Research for Manganese Nodule Development", and in 1994 as a part of this research, an environmental impact experiment named "Japan Deep-Sea Impact Experiment = JET" was initiated to evaluate the effects of sediment resuspension and redeposition resulting from deep-sea mining.

This experiment consisted of three phases, namely a pre-disturbance survey, an artificial disturbance and a post-disturbance survey. In the pre- and post- disturbance surveys, sediment samples were collected using a Multiple Corer(MC). The artificial disturbance was created by a benthic disturber that was designed to dredge sediment and discharge it as a slurry at a height of about 5m above the seafloor. In addition, throughout the experiment period, deep sea currents and sedimentation rates were observed by several mooring systems. As a result, 19 benthic disturber tow transects were conducted in the survey area and 9,200,000 liters of slurry or 352 tons of sediment (dry weight) was discharged and resuspended. 27 sediment samples were collected and analyzed to compare the pre- and post-disturbance conditions. From the preliminary results, some disturbance effects were recognized from environmental and biological parameters, deep sea photographs and sediment trap data.

**KEY WORDS:** JET, pre-,post-disturbance, benthic disturber

### INTRODUCTION

Deep-sea mineral resources are expected to support the activity of our future industries. At the same time however, biological communities in the same area are thought to be a valuable resource for our future generations. Therefore it is necessary to consider not only the mining development but also the ways of protecting and conserving the abyssal benthic communities and organisms that are characterized by their specialized niches, fragility and rare abundance.

At present, our knowledge of benthic communities and organisms is limited so that we are unable to estimate the intensity of the impact of mining operations. To understand the impacts of mining, deep-sea environmental research has been conducted since the 1970'S by several organizations, including some of the mining consortia(Table.1). In the beginning, this research focussed on environmental baseline studies, but from the latter part of the 1980's, surveys were performed to predict the biological responses to artificial impacts resulting from deep-sea mining.

Table 1 Summary of Deep-Sea Environmental Research

Year	Survey or Experiment	Site
1970	The Blake Plateau Mining Test Study	Atlantic / Florida
1972	The Bermuda Rise Study	Atlantic / Bermuda
1972	The Continuous Line Bucket Mining Test Study	North Central Pacific
1975 - 80	The Deep Ocean Mining Environmental Study (DOMES)	North Central Pacific
1983	Echo I	North Central Pacific
1989	Disturbance and Recolonization Experiment (DISCOL)	South Pacific (Peru Basin)
1990	Controlled Impact Experiment (CIE)	North Central Pacific
1991 - 93	Benthic Impact Experiment (BIE)	North Central Pacific
1994 -	Japan Deep Sea Impact Experiment (JET)	North Central Pacific