

Integration of Deeptow Data for Mapping of Deepsea Resources

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ABSTRACT

Deeptowed photographic and acoustic surveys in the Pioneer Area in Central Indian Basin, resulted in collection of 52,295 photographs, 450 hours of video record and 1129 km of sub-bottom and side scan data. Data-processing involved two main approaches: (i) qualitative-delineation of areas with different features, such as nodules, crusts, biological activity etc., from observation of video record; and (ii) quantitative - mapping of nodules and other seabed features from photographic and acoustic data. Mapping of nodules and other features (crusts, biological activity and sediment characteristics) was carried out by integrating the data from various sources, such as navigation, photographic and acoustic, keeping time as the reference, by specially developed softwares.

Keywords: Deeptow, photographs, nodules, coverage, geoaoustic, data-processing, integration.

INTRODUCTION

Extensive sampling and bathymetric surveys in the nodule areas of Central Indian Basin during the last decade resulted in allocation of 150,000 sq. km of "Pioneer Area" to India by the UNCLOS III to carryout detailed exploration. However, further surveys were required using more sophisticated techniques that could provide new information and data in order to delineate commercially less viable areas within the Indian Pioneer Area, for the purposes of relinquishment as well as candidate mine-site demarcation.

The entire Pioneer Area was divided into 201 blocks of 15' X 15' and nodule abundance in these blocks were calculated from grab data by geostatistical methods. These results formed the basis for selecting areas and profiles for the operation of deeptowed photographic and acoustic system "Abissal" which was chartered alongwith the Russian research vessel *AA Sidorenko*. Four cruises were undertaken exclusively for deeptow surveys from August to December, 1994. In all, 52,295 photographs were obtained alongwith 450 hours of video and 1129 km of sub-bottom and side scan data (Sharma et al., 1995).

This data is being processed and several softwares have been developed in FORTRAN 77, for the following:

1. To calculate
 - (i) the position of every photo by interpolation of navigation data,
 - (ii) the area covered by every photograph from altitude and lens angle and
 - (iii) the distance between photographs from interpolation locations.
2. To calculate depth of the towbody, depth of the seafloor at towbody location and tow cable length from acoustic records.
3. To merge all data sets and maintain a master file of all parameters along every deeptow profile.
4. To prepare maps for various seabed features, eg. zones for occurrence of nodules, crusts, biological activity.