

must have realized and essential importance of this field training for us. It is difficult to explain in words and furthermore in a foreign language all the gratitude that we feel, and we will keep this feeling with us for ever.

The overseas participants of Group Training Course in Hydrographic Survey 1984 are very grateful to all the staff of Hydrographic Department, Maritime Safety Agency, our Coordinator and members of Japan International Cooperation Agency as well as all the Japanese people who helped us in our or other manner and made our stay in Japan useful and pleasant.

Thank you very much.

## **SUBDUCTION OF DAIITI-KASIMA SEAMOUNT INTO THE LANDWARD SLOPE OF THE JAPAN TRENCH**

By Hydrographic Department, M.S.A., Japan

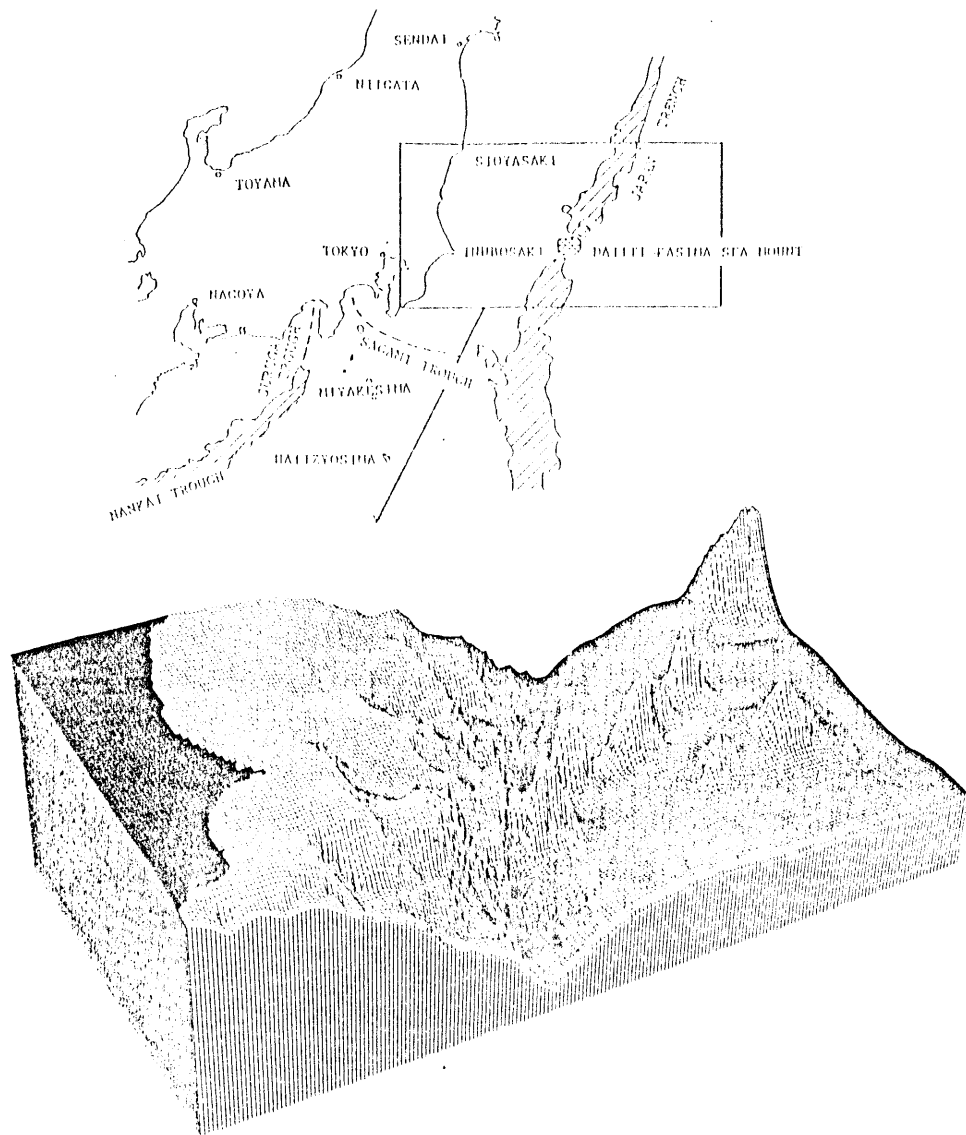
( Abstract )

Daiiti-Kasima Seamount is a 3,000-4,000 m high flat-topped seamount situated in the axis of the Japan Trench lying 220 km east of Tokyo. In 1977, the Hydrographic Department of Japan conducted a survey over this seamount and its adjacent waters. The average spacing of the tracks of the survey was 2 nautical miles, and it was done by Survey Vessel SHOYO as part of "The Basic Map of the Sea Project". It fairly revealed topography, geological structure, geomagnetic feature and gravity anomalies of the seamount. Studies by Mogi and Nishizawa (1980) had provided a hypothesis that a breakdown had taken place, and the seamount was divided into two parts by a large NNE-SSW trending fault, while the western half of the seamount had subducted into the Japan Trench.

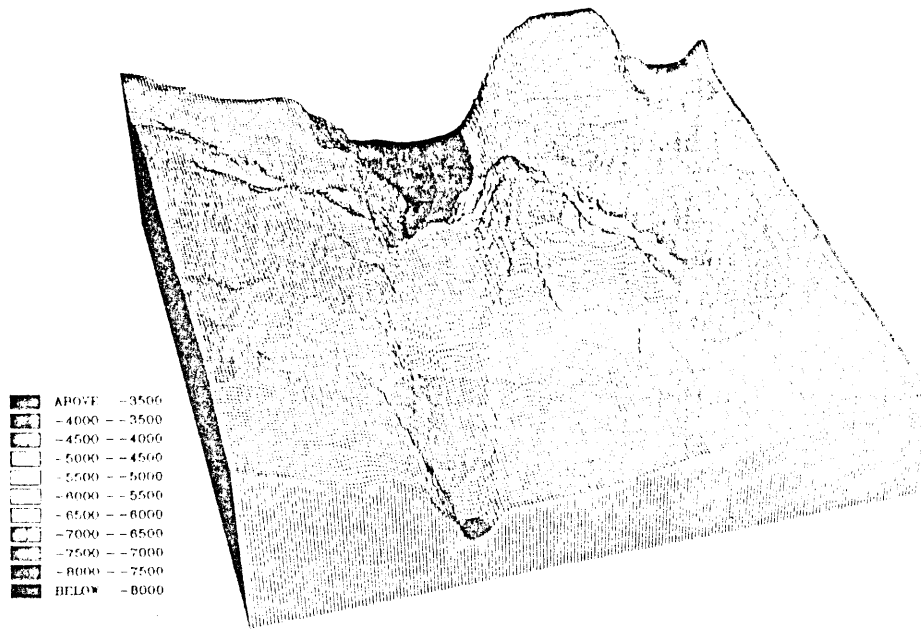
In 1983, the Hydrographic Department of Japan put a new survey vessel TAKUYO (2,600 tons) into commission, in which a set of Sea Beam System, a single and multi-channel seismic profilers, a sub-bottom profiler, magnetometers, a gravimeter and a set of integrated positioning system were

equipped. In December 1983, the Department carried out a detailed survey of Daiiti-Kasima Seamount by TAKUYO to confirm the subduction of the seamount. The survey was done along ten track lines parallel to the trench with 1.5 nautical mile average spacing, and eight track lines perpendicular to the trench with 1 nautical mile average spacing.

Multi-beam bathymetric survey with Sea Beam System has provided a detailed data of the seamount, and bathymetric charts on a scale of 1/40,000 with 50-metre-interval contours were drawn. In addition to that, single-channel seismic reflection, sub-bottom profile, geomagnetic total intensity and gravity were recorded along each track. Multi-channel seismic reflection survey was done along a WNW-ESE trending track line crossing the western half of the seamount.



Bird's-eye view of Daiiti-Kasima Seamount and the adjacent areas



Bird's-eye view of Daiiti-Kasima Seamount

Previous researches could not provide a clear evidence to show that the 1,600 m high steep slope running straight across the central part of the seamount is a fault scarp, but the multi-beam bathymetry confirmed fault scarp characteristics of the slope. It also documented a lot of linear structures, which were considered to be faults running parallel to the trench on the seamount. These faults indicate that the seamount had been affected by tension in the oceanic plate along the outer slope of the trench.

The subducted western half of the seamount was clearly shown beneath the landward slope of the trench on the records of both the single-channel and multi-channel seismic reflection surveys.

An asymmetrical step V shaped depression stretching parallel to the trench, was found along the edge of the landward slope of the trench. Horizontal sediments were absent in the bottom of the depression.

The sub-bottom profiler record taken at a small scale pond sediment on the landward slope of the trench shows a nearly horizontal deposit on the surface and other underlying sediment layers dipping about 2 degrees toward the depression, below some 10 to 20 metres under the surface. It means that the

lower part of the landward trench slope has been tilting toward the depression. From these facts, the depression was considered to be formed by tectonic erosion.

These results provided by the detailed survey of TAKUYO would confirm subduction of Daiiti-Kasima Seamount into the landward slope of the Japan Trench.

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