

## XIV. PRELIMINARY GEOPHYSICAL SURVEY NORTH OF HACHIOJO ISLAND

*Kiyokazu Nishimura, Takemi Ishihara, and Kensaku Tamaki*

Preliminary geophysical surveys involving gravity, geomagnetics and continuous seismic reflection profiling were carried out to the north of Hachijo Island. The survey lines are shown in Fig. XIV-1. Two prominent topographic features, a submarine caldera and the Shinkurose Bank, occur in the area. The caldera belongs to the Shichito volcanic chain, whereas the Shinkurose Bank is isolated to the east in the forearc area, away from the volcanic chain. Free air anomalies, simple Bouguer anomalies (using a rock density of  $2.67 \text{ gr/cm}^3$ ) and magnetic anomalies along the thick lines A, B, C and D in Fig. XIV-1 are shown with topographical profiles in Fig. XIV-2. A free air anomaly contour map is shown in Fig. XIV-3.

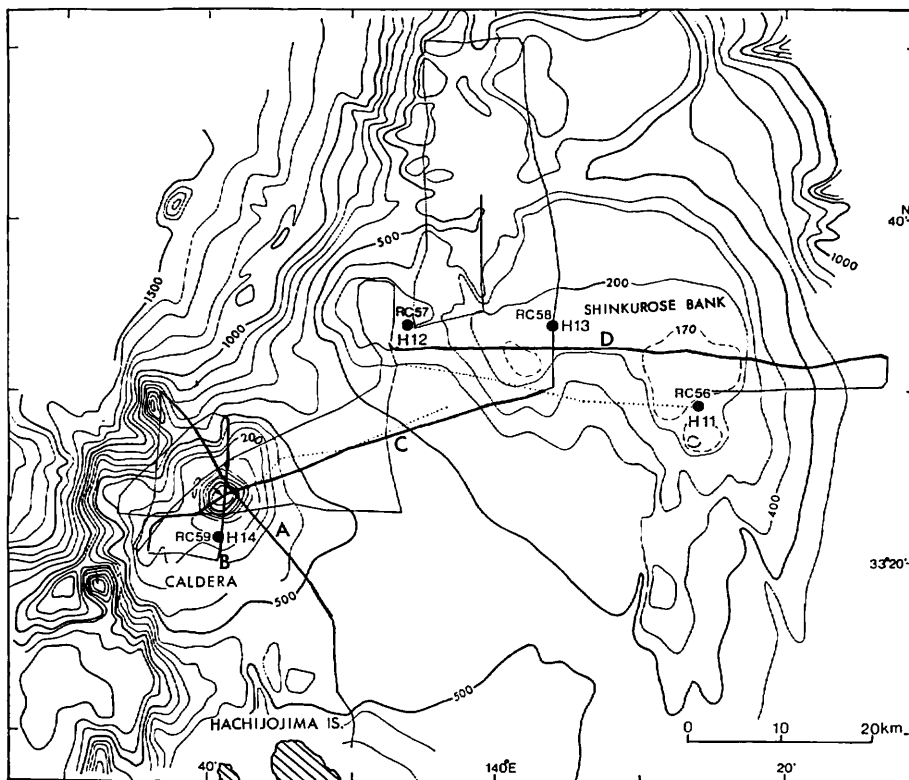
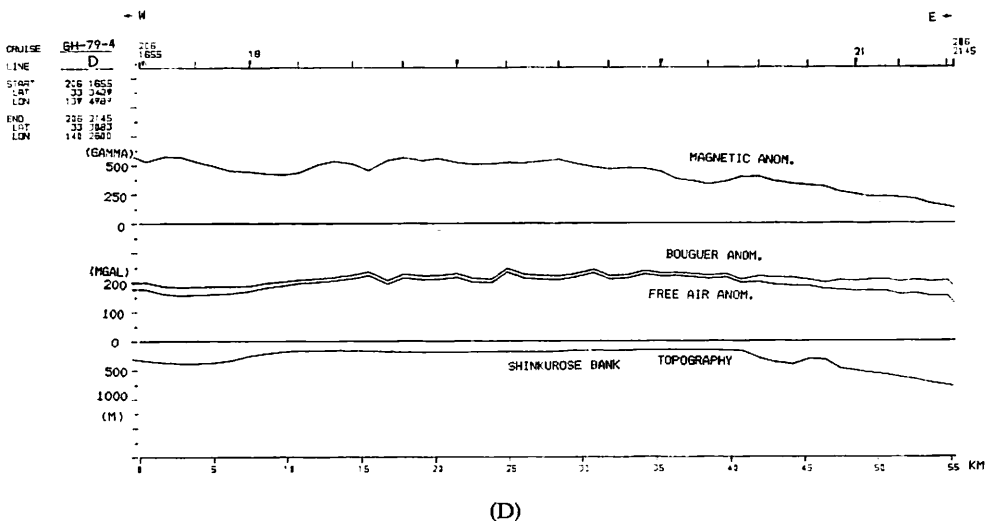
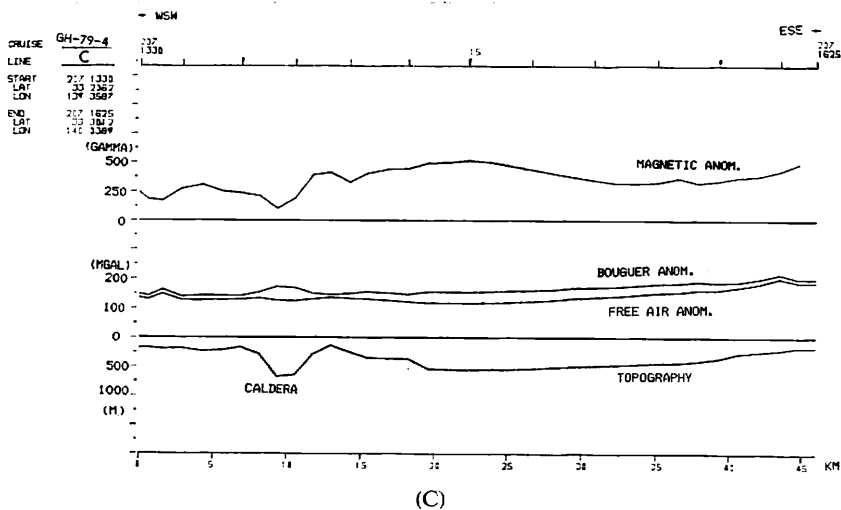


Fig. XIV-1 The traverse north of Hachijo Island. Bathymetry in meters.





### The submarine caldera

The submarine caldera is located about 30 km north of Hachijo Island (Lat.  $33^{\circ}24'N$ , Long.  $139^{\circ}41'E$ ). The caldera is 4-6 km in diameter and its bottom is approximately 500 m deeper than its rim. According to seismic profiler records, there are stratified sediments 0.4 sec. thick in the bottom of the caldera and the sediments abut or overlap the base of the caldera rim (Fig. XIV-4). High free air anomalies of approximately 130 mgal were observed in and around the caldera where the variation in gravity value caused by the caldera is not notable. Free air anomalies in the center of the caldera are lower than those at the rim by only about 10 mgal. The center of high anomalies (140 mgal) is located on the caldera rim 3 km southeast of the center of the caldera. A maximum Bouguer anomaly with

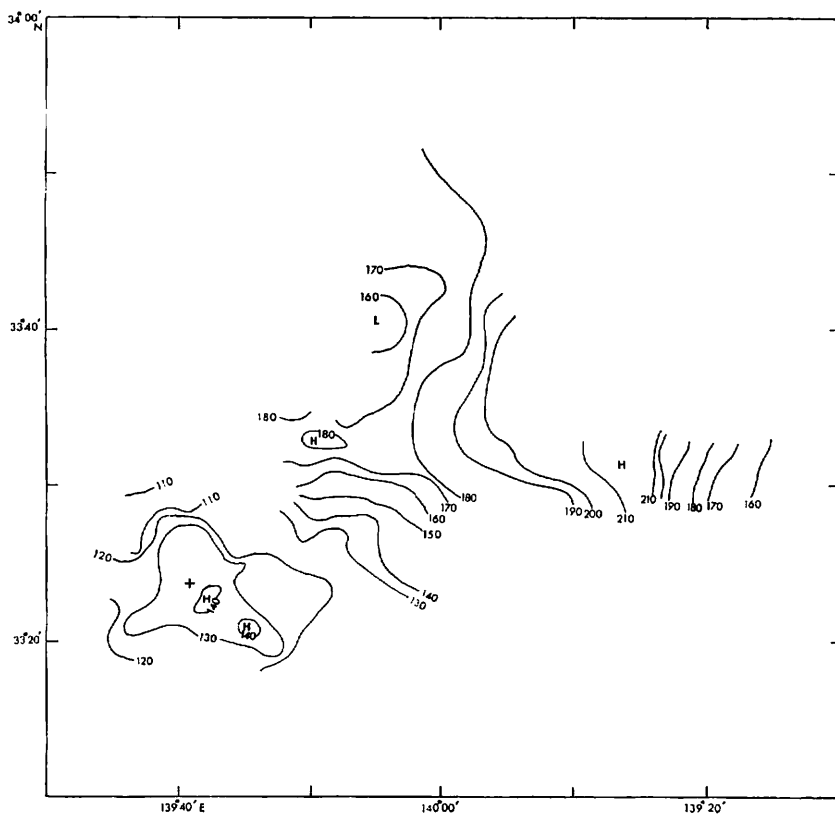


Fig. XIV-3 Contour map of free air anomalies. Contour interval is 10 mgal, the cross mark indicates the center of the caldera.

a value of 180 mgal occurs in the center of the caldera. Geomagnetic anomalies with an amplitude of 250-300 gammas were measured in the caldera.

### The Shinkurose Bank

The Shinkurose Bank is located about 60 km northeast of Hachijo Island (Lat. 33°32'N, Long. 140°10'E). The bank is at a depth of approximately 160 m. Free air anomalies in the vicinity of the bank are very high, especially on the eastern shallower part (155 m deep) where they reach approximately 220 mgal. This maximum seems to be the center of a large area of high free air anomalies east of Hachijo Island (Fig. IV-3). Inclined reflectors among strong bottom echoes on the seismic profiler record of the bank imply that the bank is composed mainly of sedimentary rocks (Fig. XIV-4).

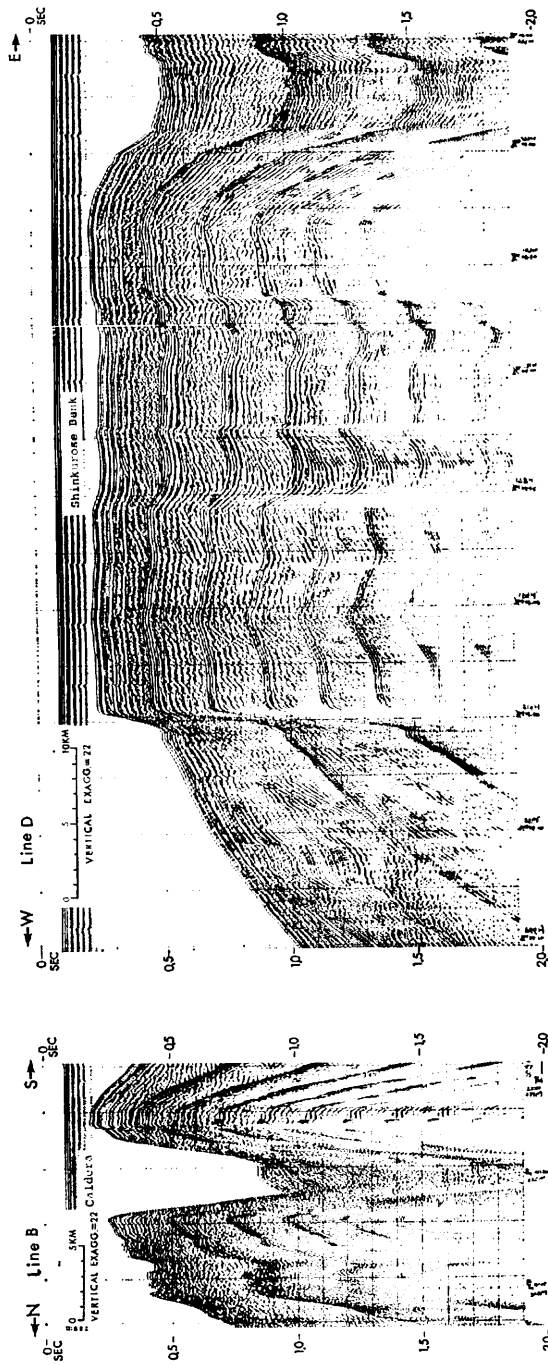


Fig. XIV-4 Seismic profiler records of line B and D in Fig. XIV-1