FILE

I.O.S.

INTERNAL DOCUMENT

No 133

DISTAL ABYSSAL PLAIN LIMIT

Madeira A.P. 24-26N, 27-31W

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INSTITUTE OF OCEANOGRAPHIC SCIENCES

GEOPHYSICS

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DISTAL ABYSSAL PLAIN LIMIT

Madeira A.P. 24-26N, 27-31W

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11 May 81

1. Definition of the Abyssal Plain Limit

In the region of 22-26N, 22-31W, the Madeira Abyssal Plain appears to form a general embayment into the abyssal hills. Bathymetric data control is poor in this area and only three Lamont-Doherty seismic reflexion profiles (S.R.P) are known to cross it. As a result, the bathymetry and the definition of the edge of the distal abyssal plain have so far been unavoidably generalised.

On the 2nd & 3rd March 1981, a short survey was carried out as part of Discovery Cruise 118 with an aim to improving this situation. Bathymetric and 2KHz sub-bottom profiles were run concurrently along a track chosen to provide:

(i) several crossings of the estimated edge of the abyssal plain.

(ii) data in areas of the poorest coverage.

A continuous bathymetric profile was recorded on paper using the precision echo sounder (PES). Soundings taken from this record at two minute intervals were logged onto the ship-bourne computer and corrected automatically for variations in transmission velocity using Carter's Corrections. The 2KHz profile was recorded solely as a continuous analogue paper recording.

Using these data, it has been possible to revise the details of the general bathymetry(i) of the area (Figure 1). No major changes have been made although the boundaries of several of the outcropping abyssal hills are now better constrained.

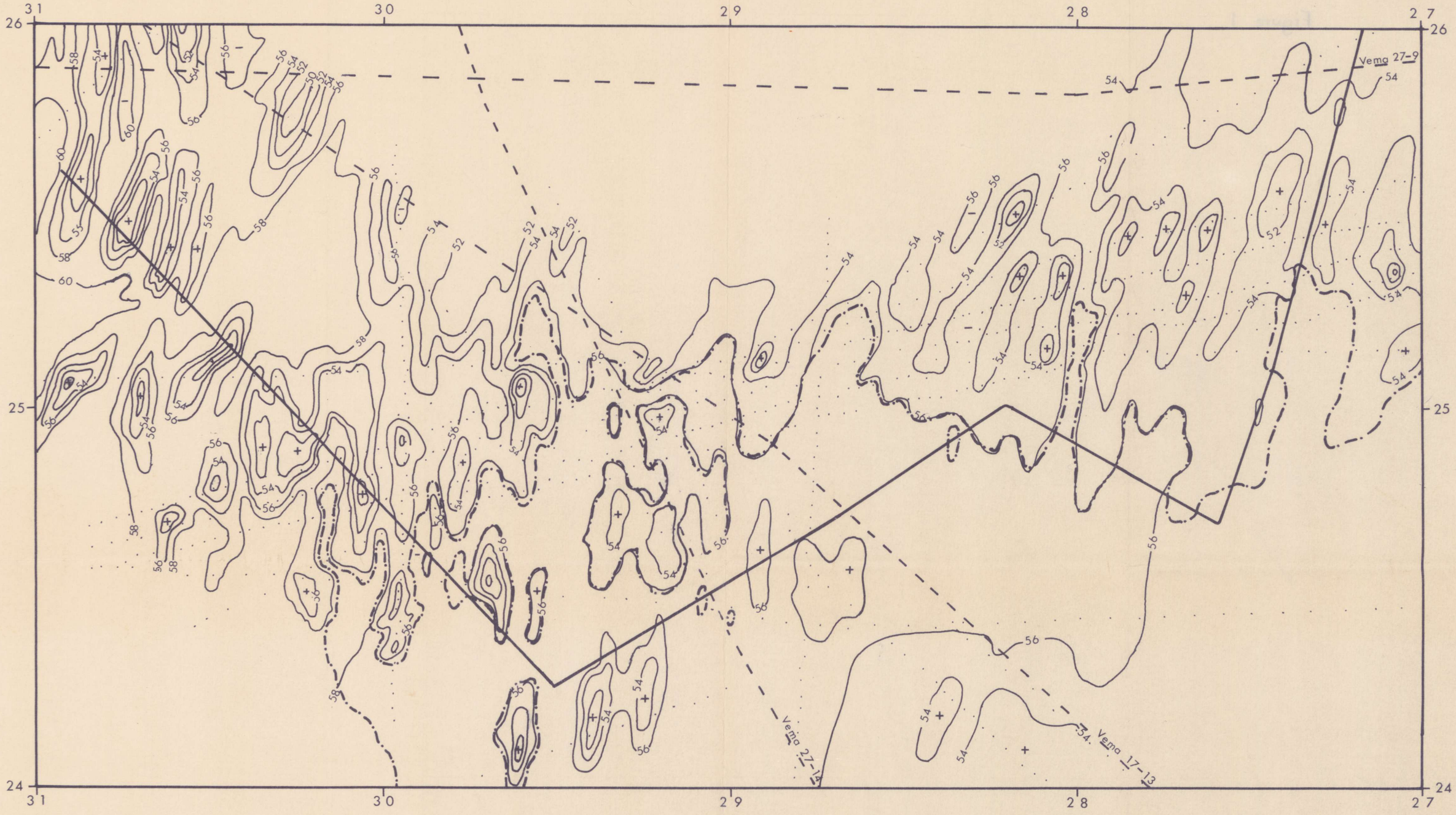
The boundary between the flat lying sediments of the abyssal plain and the outcropping abyssal hills is relatively sharp on the 2KHz profiler records. The depth at which this junction occurs can be extrapolated to provide an estimate of the distal edge of the abyssal plain where it interfingers into the abyssal hills to the north of the Discovery Cruise 118 track (Figure 2).

To the west of the region, reflections are weak or absent from the steep flanked abyssal hills suggesting sediment free outcrops. Well stratified reflectors are only present where ponding has occured. This is in contrast to the hills to the north and east where a thicker (greater than 50m) stratified cover results in a more subdued topography. No large area (greater than one degree square) of abyssal plain free from outcropping,steep flanked abyssal hills exists to the west of 28W in this area. However, two somewhat smaller areas between 28W and 29W appear to be worthy of further investigation as HLRWD study areas.

The region to the south of 24N will be studied in the IOS November 1981 GLORIA cruise.

REFERENCE

(i) GEBCO 5.08 bathymetry Searle et al, in press



REVISED BATHYMETRY

——— Discovery Cruise 118, bathymetry & 2 KHz profiles

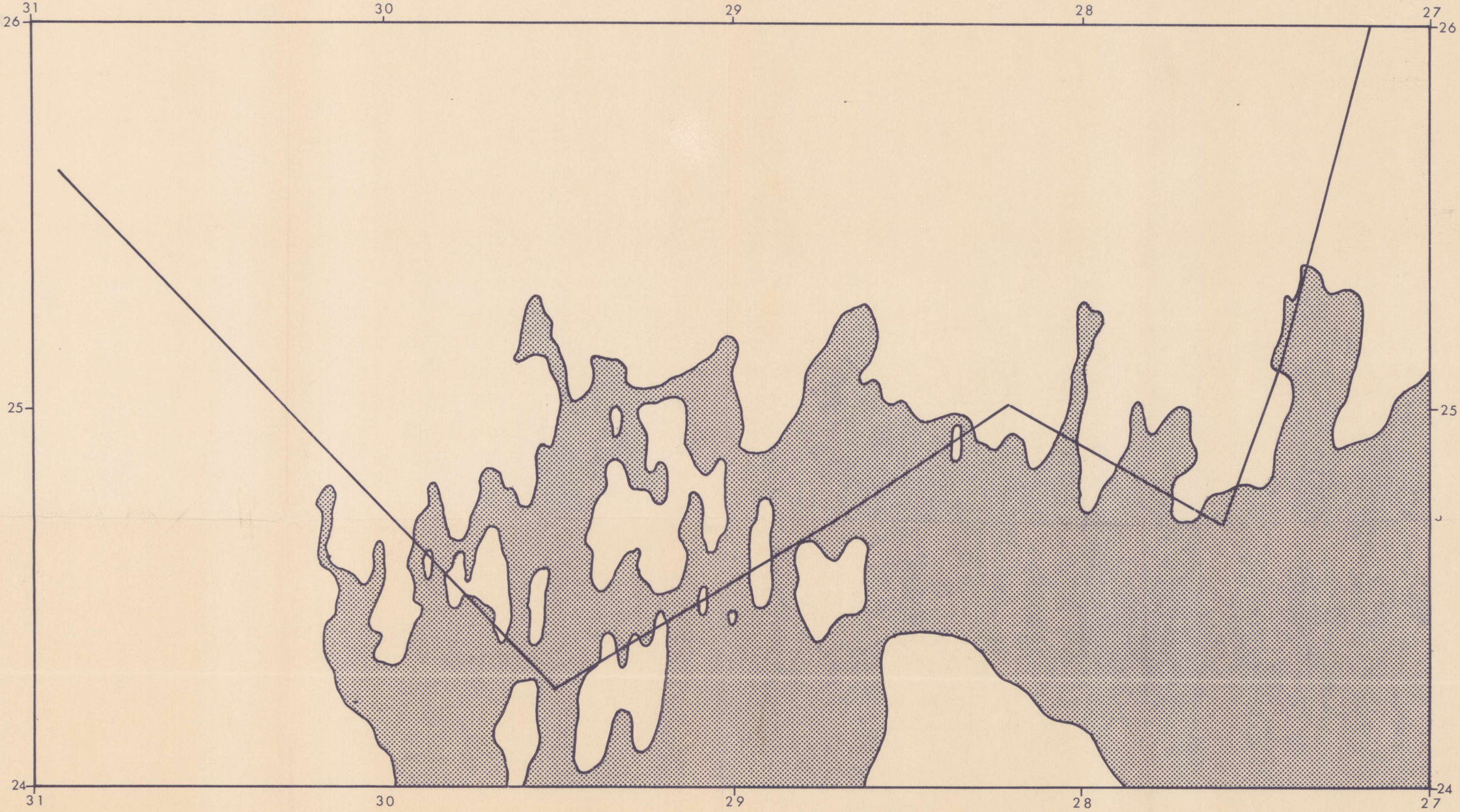
------ Vema (Lamont - Doherty) Seismic Reflection profiles

..... GEBCO soundings

Abyssal Plain Limit

SCALE 1 : 1,000,000 at 33° latitude

Contouring Interval 200m



EXTENT OF THE ABYSSAL PLAIN

——— Discovery Cruise 118 Track

Abyssal Plain

SCALE 1 : 1,000,000 at 33° latitude