

BATHYMETRY AND SEDIMENTATION IN COMRA'S CONTRACT AREA

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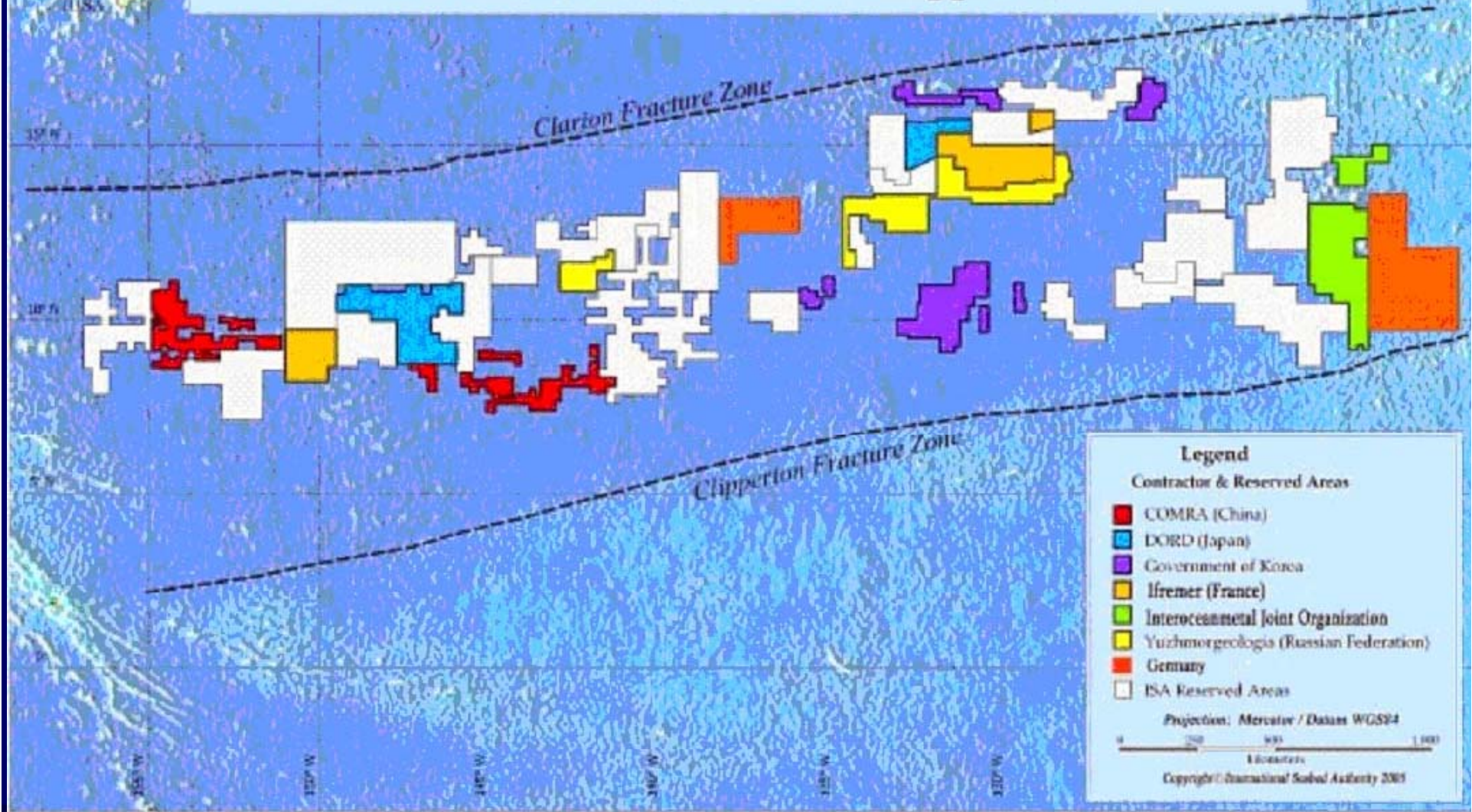
Bathymetry of CCZ is mostly controlled by Pacific Mid-Ocean Ridge Tectonics

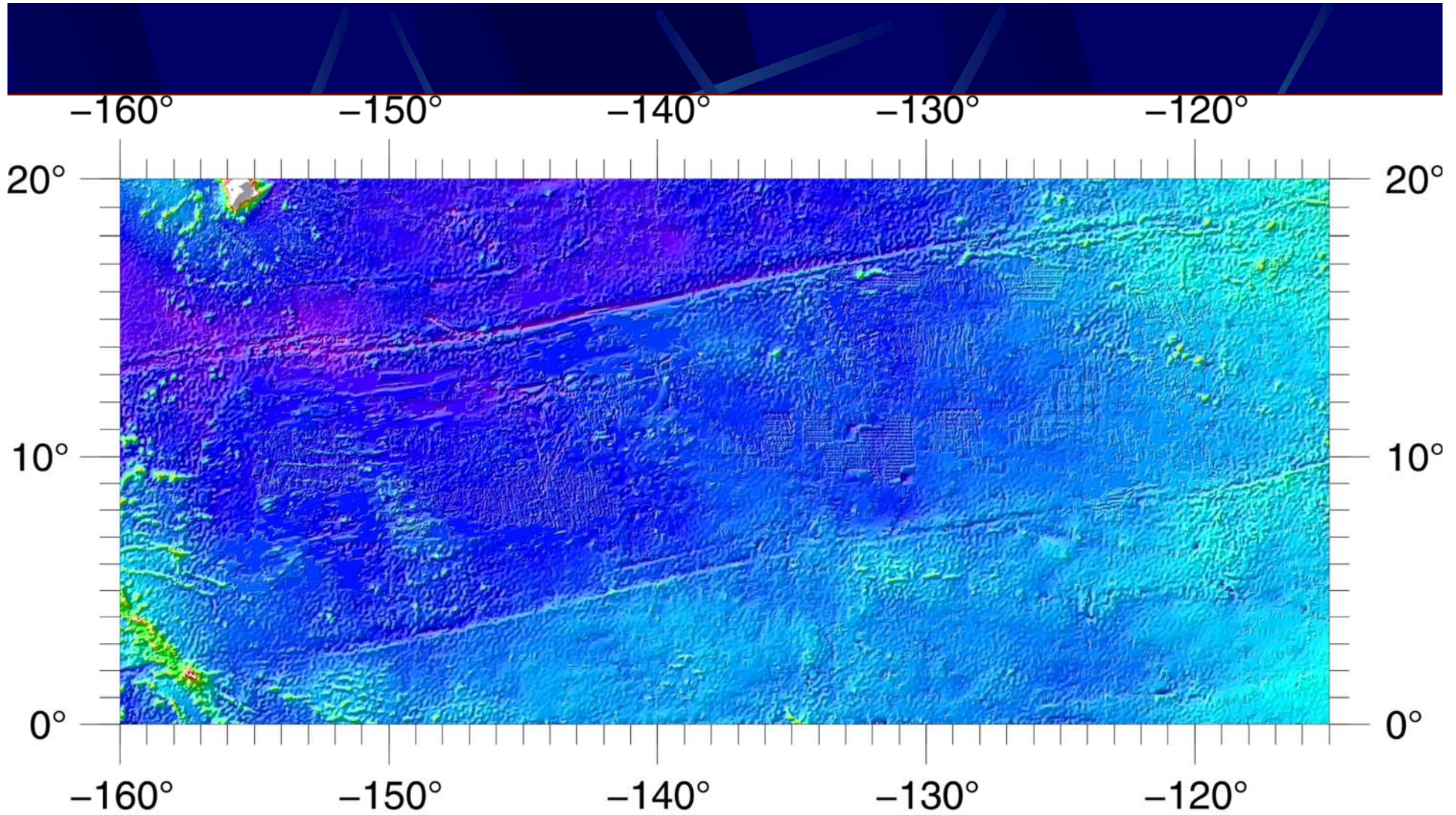
CCZ



The image is a bathymetric map of the Pacific Ocean, showing depth contours and tectonic features. The map uses a color scale where red and orange represent shallow depths (continental shelves and seamounts), yellow and green represent intermediate depths, and blue and purple represent deep oceanic crust. A prominent feature is the Pacific Mid-Ocean Ridge, which runs north-south through the center of the Pacific. The Central and Eastern Pacific Ocean (CEPO) is highlighted with a yellow box and labeled 'CCZ'. Two red dashed boxes are also present, highlighting specific areas of the CEPO. The map shows the influence of tectonic activity on the bathymetry of the region.

Location of Contractors' Exploration Areas and Reserved Areas in the Clarion-Clipperton Zone

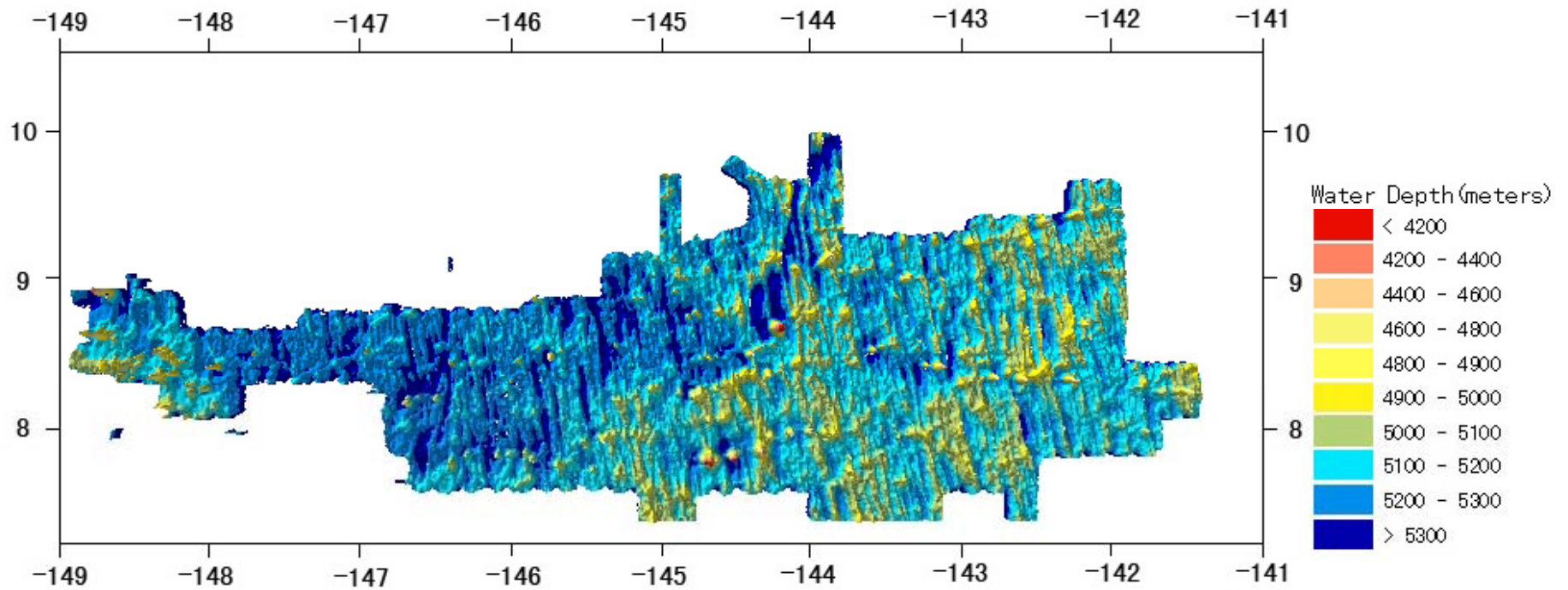




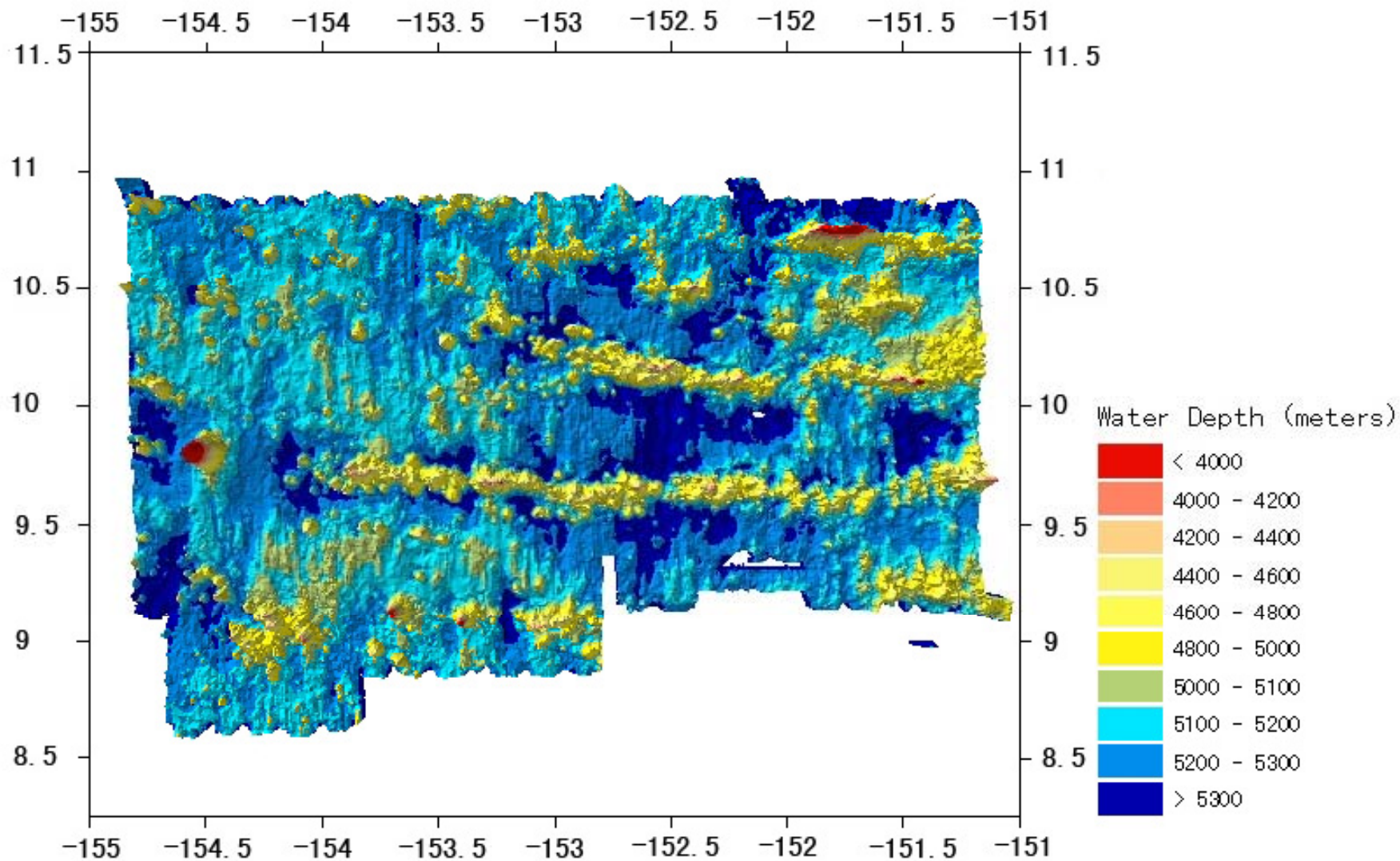
Entire Area - 1-minute Grid

Bathymetry of CCZ- 1minute grid

● Bathymetric Map of COMRA's East Area



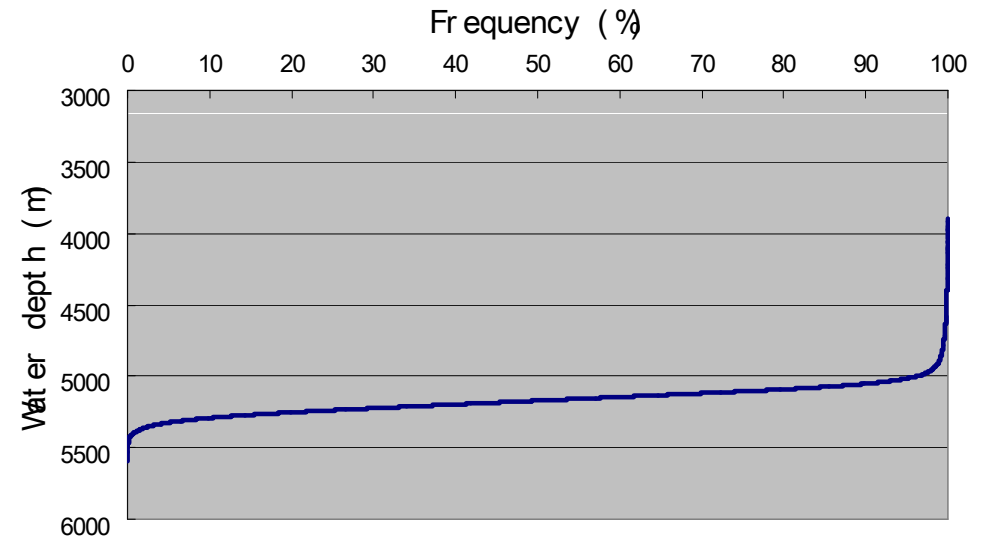
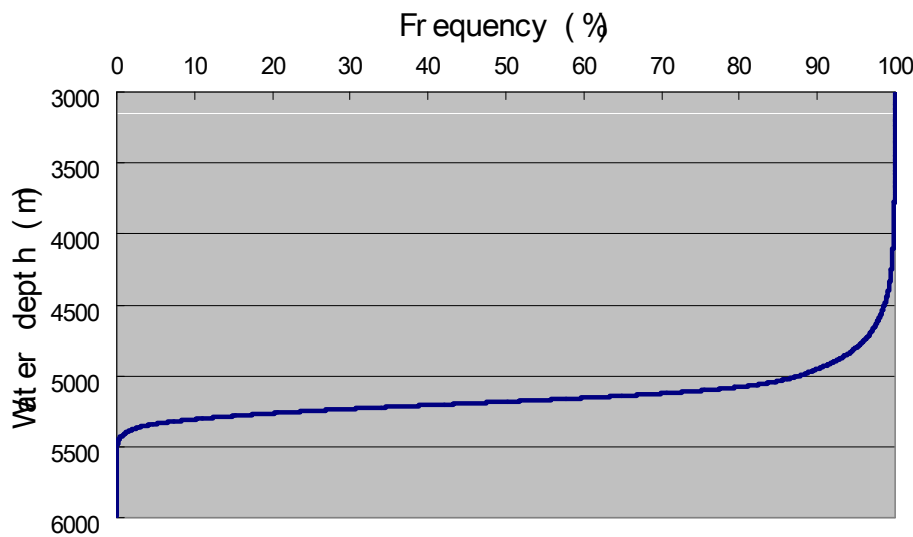
Bathymetric Map of COMRA's West Area

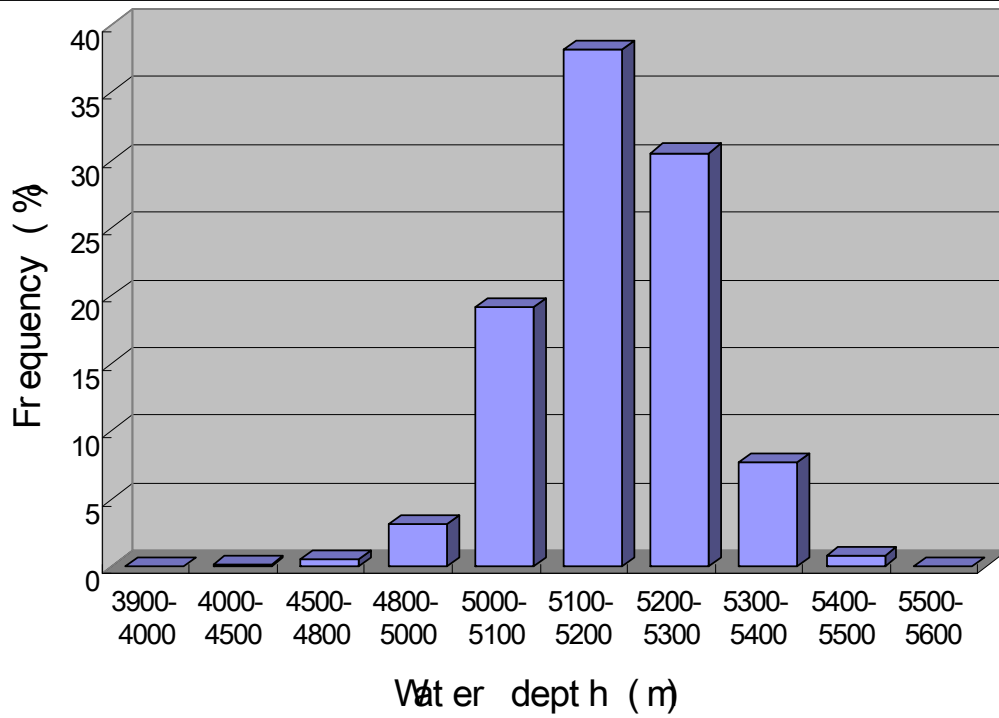


Cumulative Frequency Curve of Bathymetry

COMRA's West Area

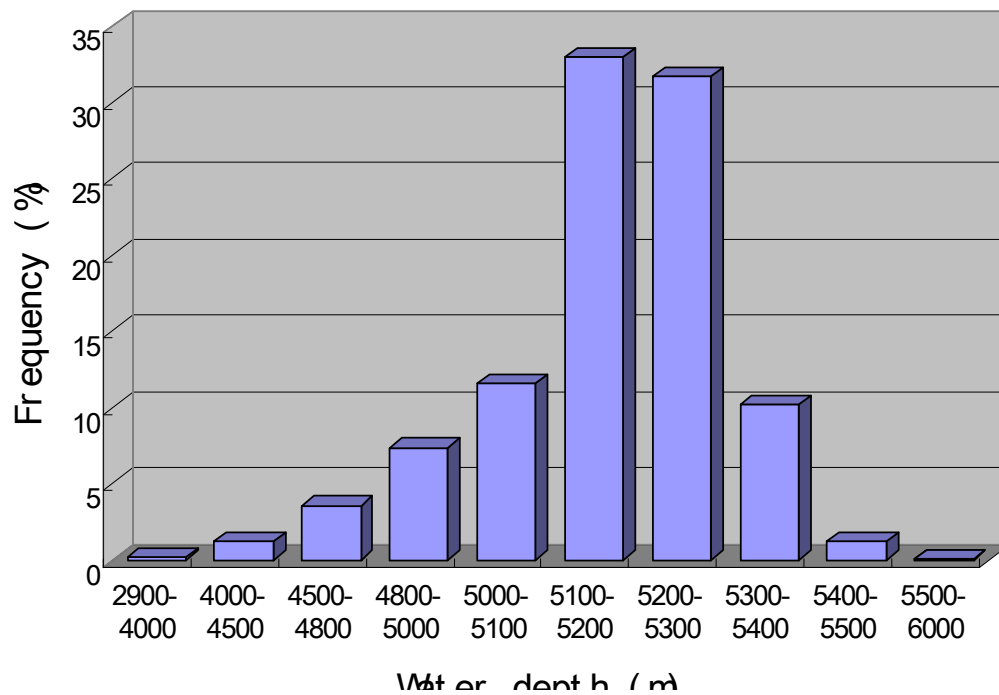
COMRA's East Area





COMRA's East Area

Histogram of Bathymetry



COMRA's West Area

Characteristics of COMRA's Contract Area

- three types of topography: abyssal hills, seamount chains and abyssal basins,
- EW strike of seamount chains and NS strike of sedimentary graben
- Seamount chains are more obvious in the West Area than in the East Area

Data of Sediments from COMRA's Area

1,606 stations by free fall grab samplers;

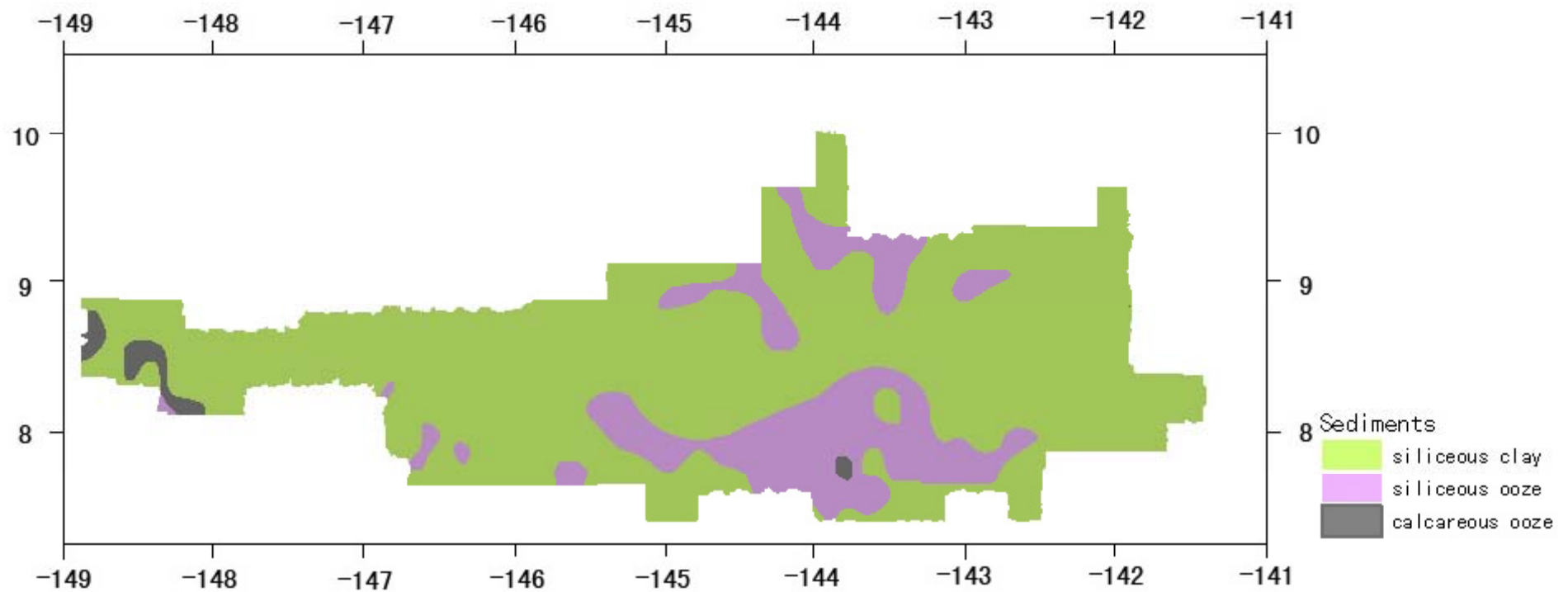
- 849 stations from the East Area;
- 757 stations from the West Area.

Types of Sediment

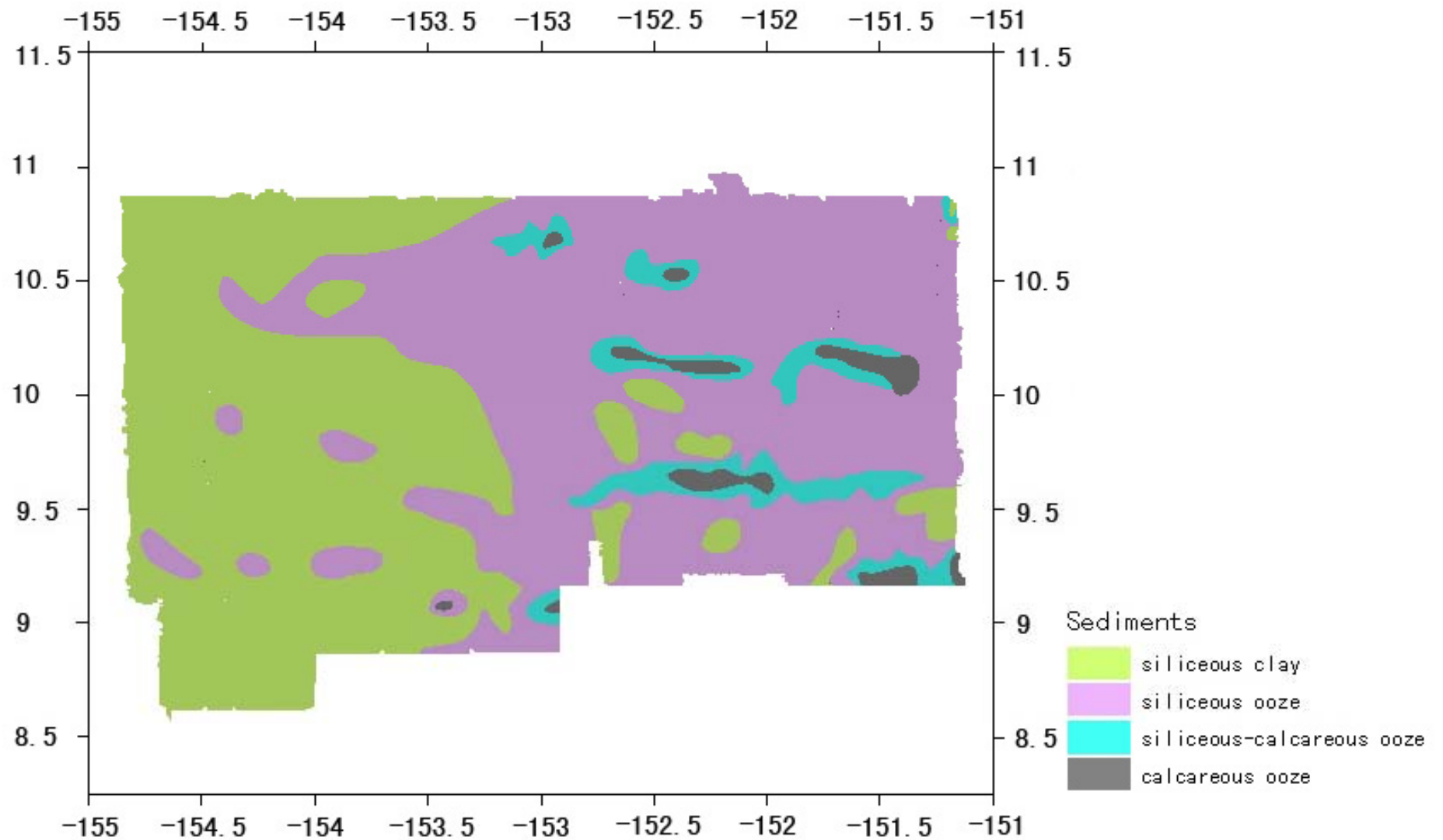
There are generally four types of surface sediment in the COMRA area:

- siliceous clay;
- siliceous ooze;
- siliceous-calcareous ooze;
- calcareous ooze.

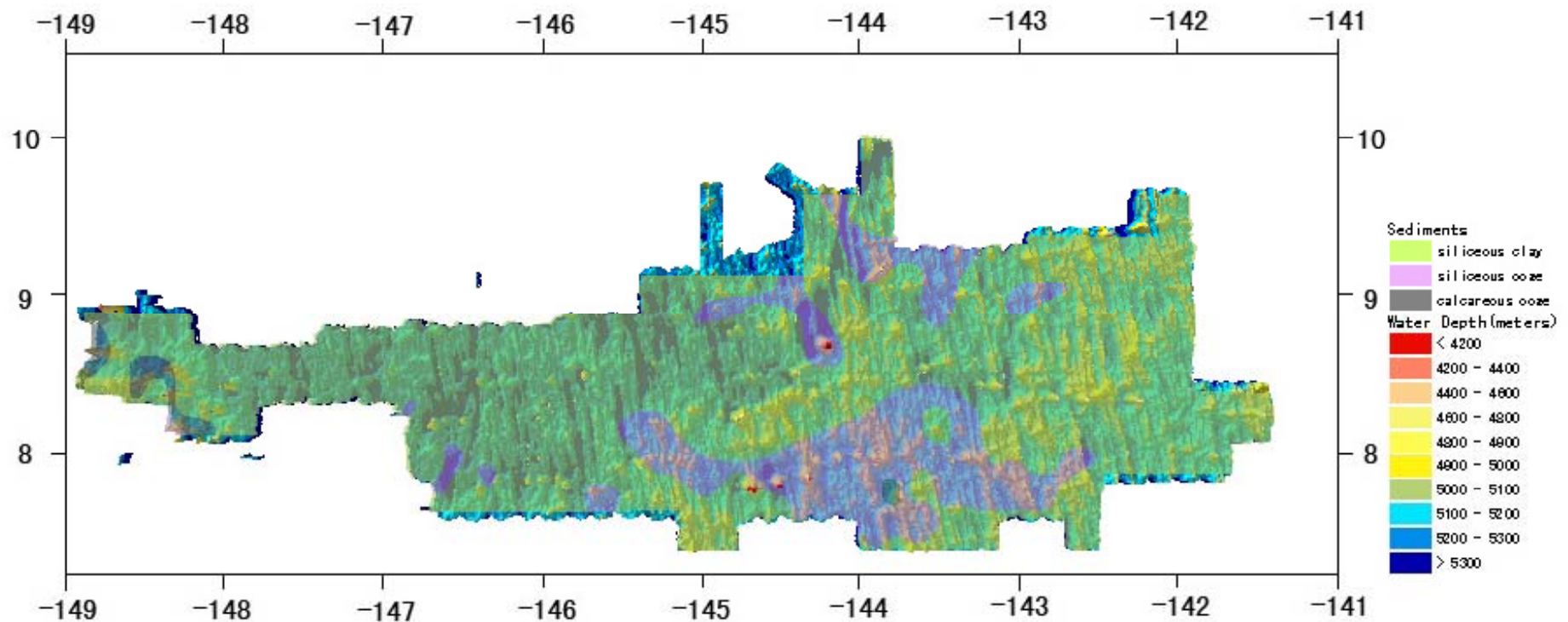
Distribution map of sediment in COMRA's East Area



Distribution map of sediment in COMRA's West Area

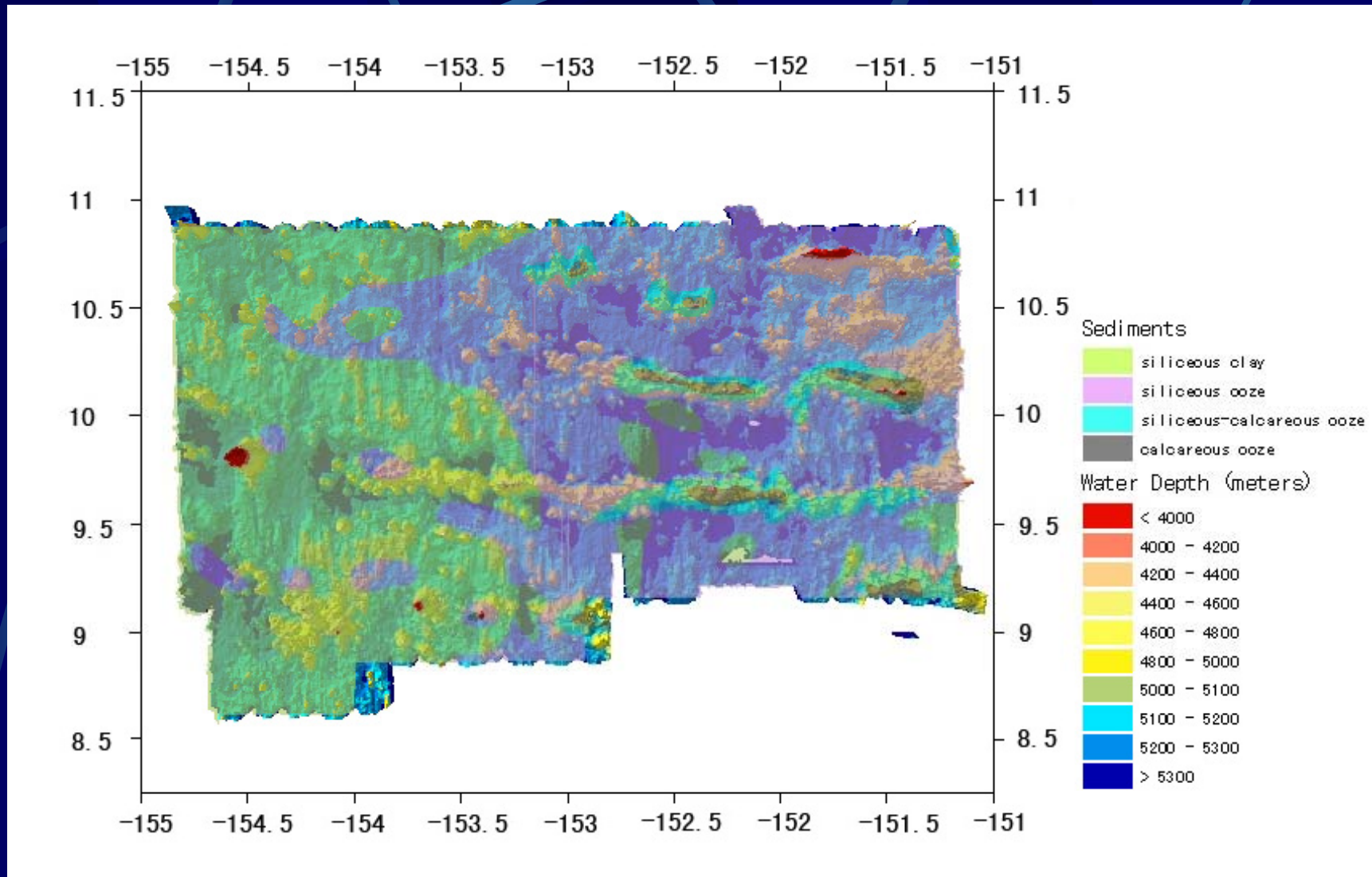


RELATIONSHIPS BETWEEN SEDIMENT TYPES AND BATHYMETRY



the calcareous ooze is only located on the top of seamounts

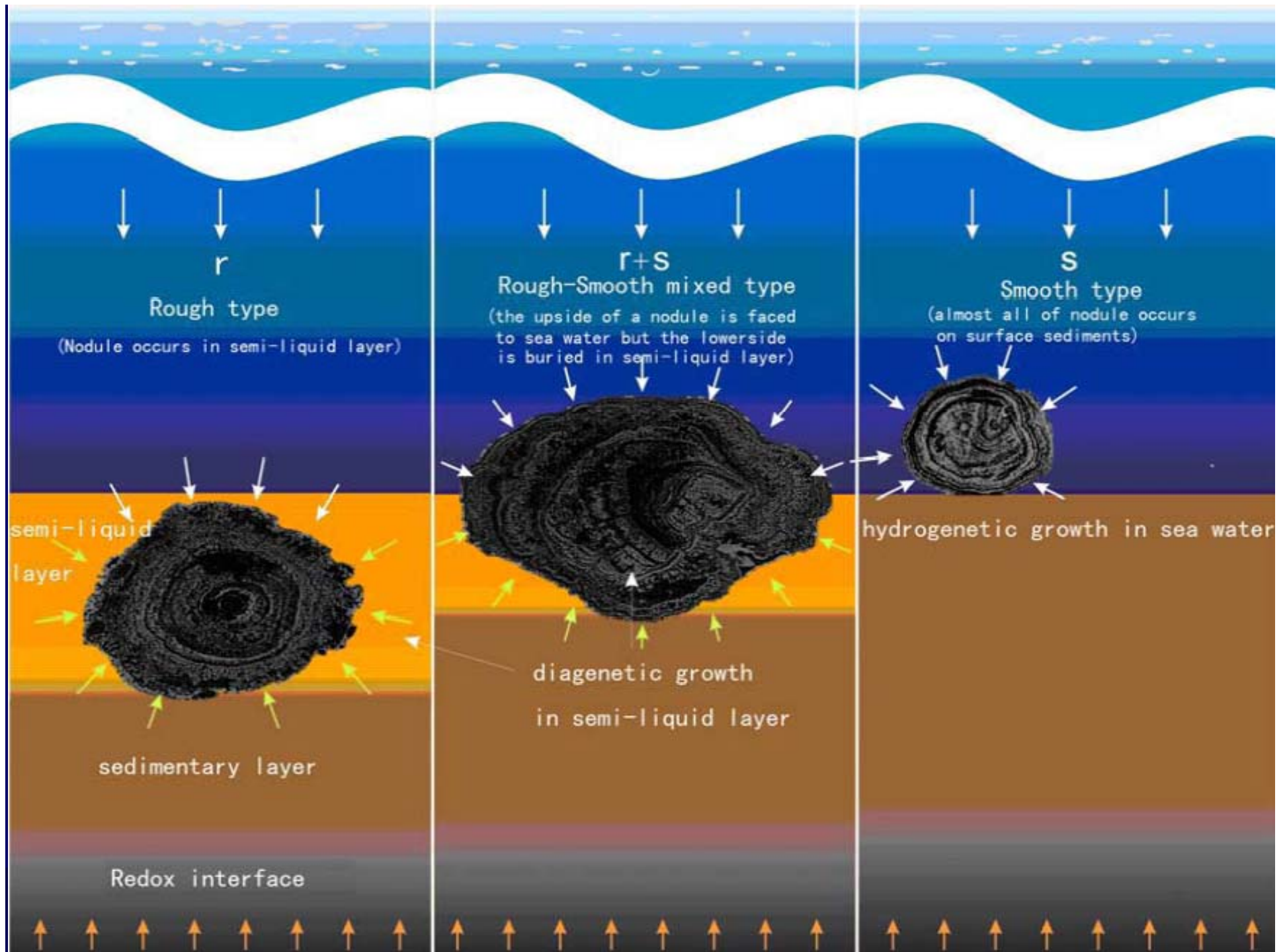
RELATIONSHIPS BETWEEN SEDIMENT TYPES AND BATHYMETRY



the calcareous ooze is only located on the top of seamounts, siliceous-calcareous ooze occurs clearly as transitional zone from calcareous to siliceous oozes.

Table 5.1 Classification and Characteristics of CCZ Nodules

Classification	Surface shape	Morphology	Mineralogy	Chemical Make-up	Occurrence	Genesis
S-type	Smooth	Spherical, aggregate with poly-nucleus, irregular	Vernadite	Rich in Fe, Co, poor in Mn, Cu, Ni, ratio of Mn/Fe is less than 2	Exposure at surface	<u>Hydrogenous</u> : Source of elements is sea water
R-type	Rough, grainy, papillate shape	Spherical, kidney	Todorokite and vernadite	Rich in Mn, Cu, Ni, ratio of Mn/Fe is larger than 5	Buried or mostly buried in surface layer	<u>Diagenetic</u> : Elements are from pore waters
S-R type	Smooth on the top side surface, rough on the lower side surface	Generally asymmetric elliptical, some tabular or irregular	The top is similar to S-type and the lower side similar to R-type	The top is similar to S-type but the lower side is similar to R-type	Semi-buried in surface layer	<u>Mixed Genesis</u> : hydrogenous for the top side and diagenetic for the lower side



DY95-8 Cruise DeepTow Manganese Nodule Coverage & SeaBeam Topography Map

Mercator Projection Scale 1:125000 1998 COMRA

No. DY958-E01-09

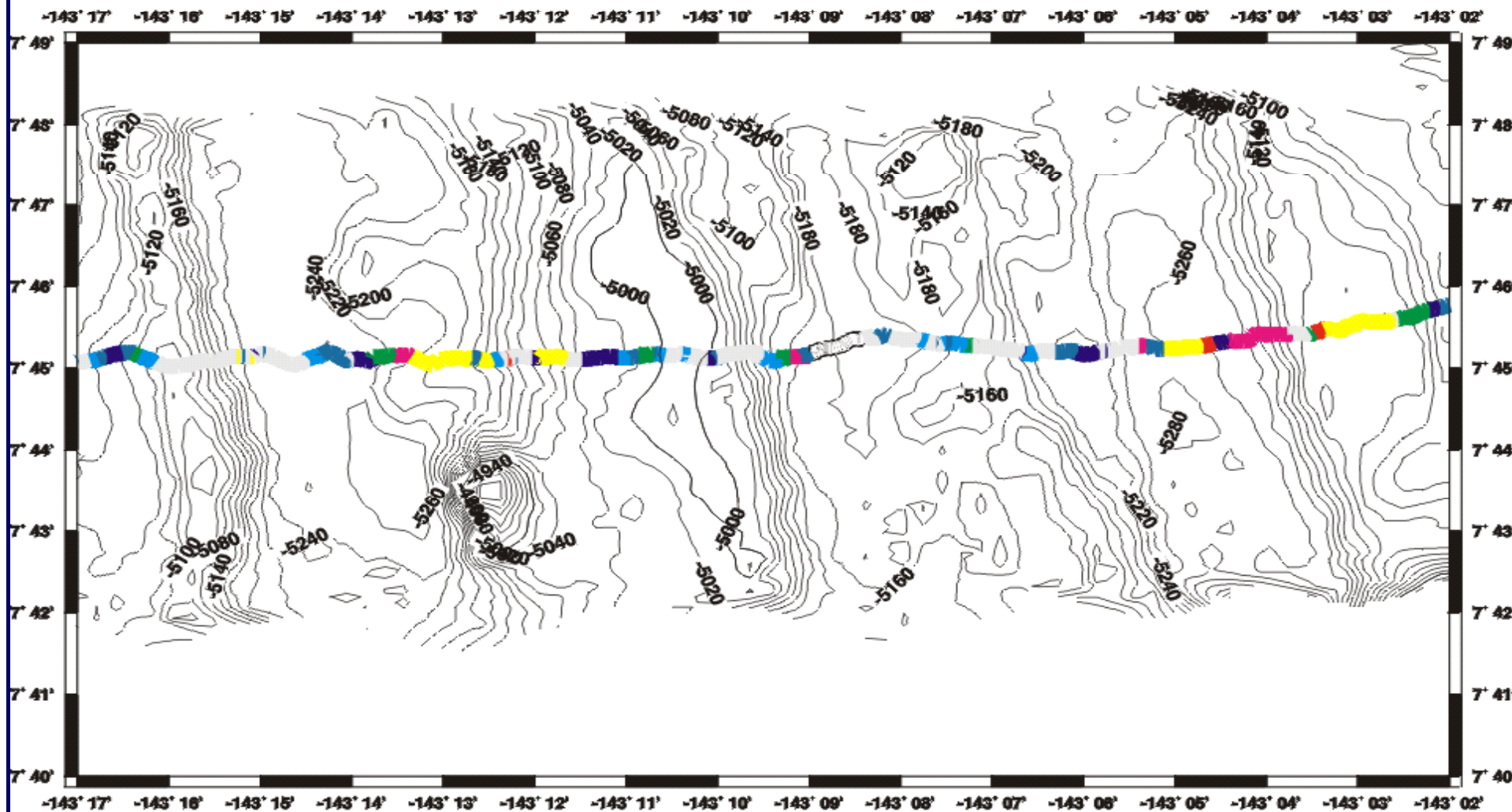


Illustration of Manganese Nodule Coverage(%)



DY95-8 Cruise DeepTow Manganese Nodule Abundance & SeaBeam Topography Map

Mercator Projection Scale 1:125000 1998 COMRA

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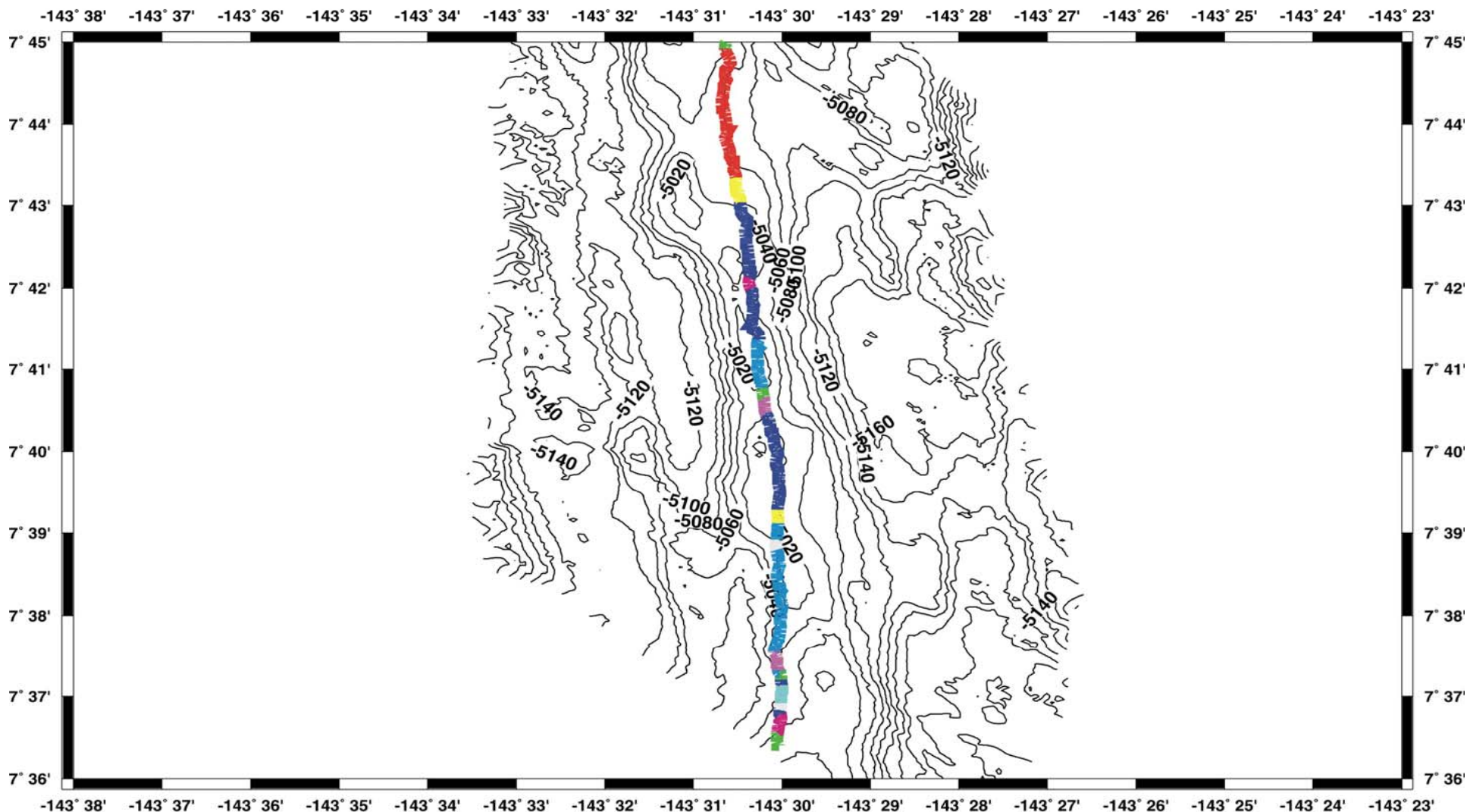


Illustration of Manganese Nodule Abundance(kg/m²)



DY95-8 Cruise Deep Tow Manganese Nodule Coverage & SeaBeam Topography Map

Mercator Projection Scale 1:125000 1998 COMRA

No. DY958-W04-07

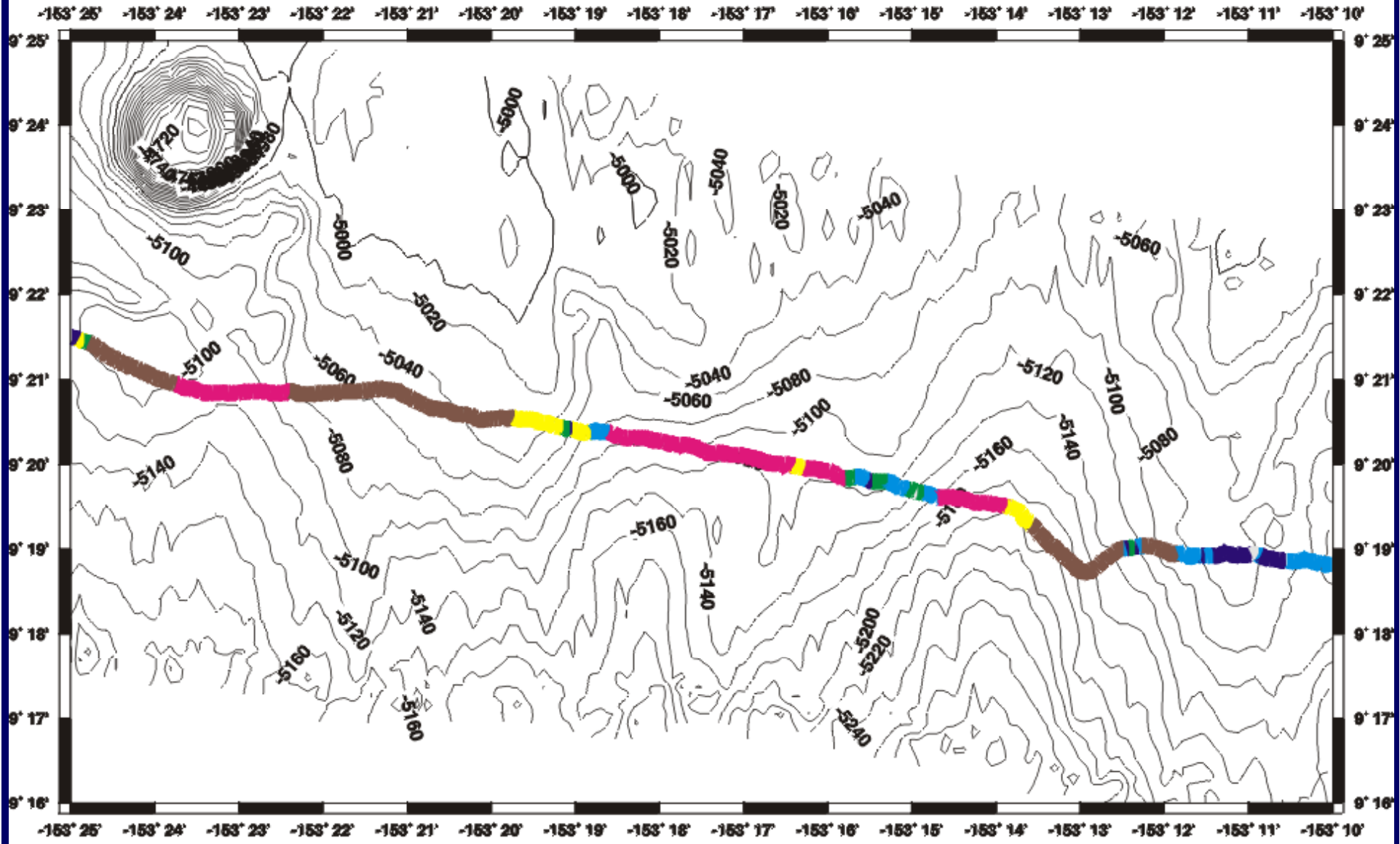
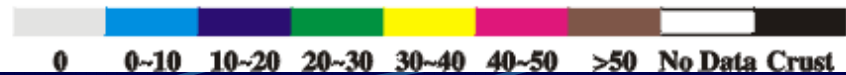
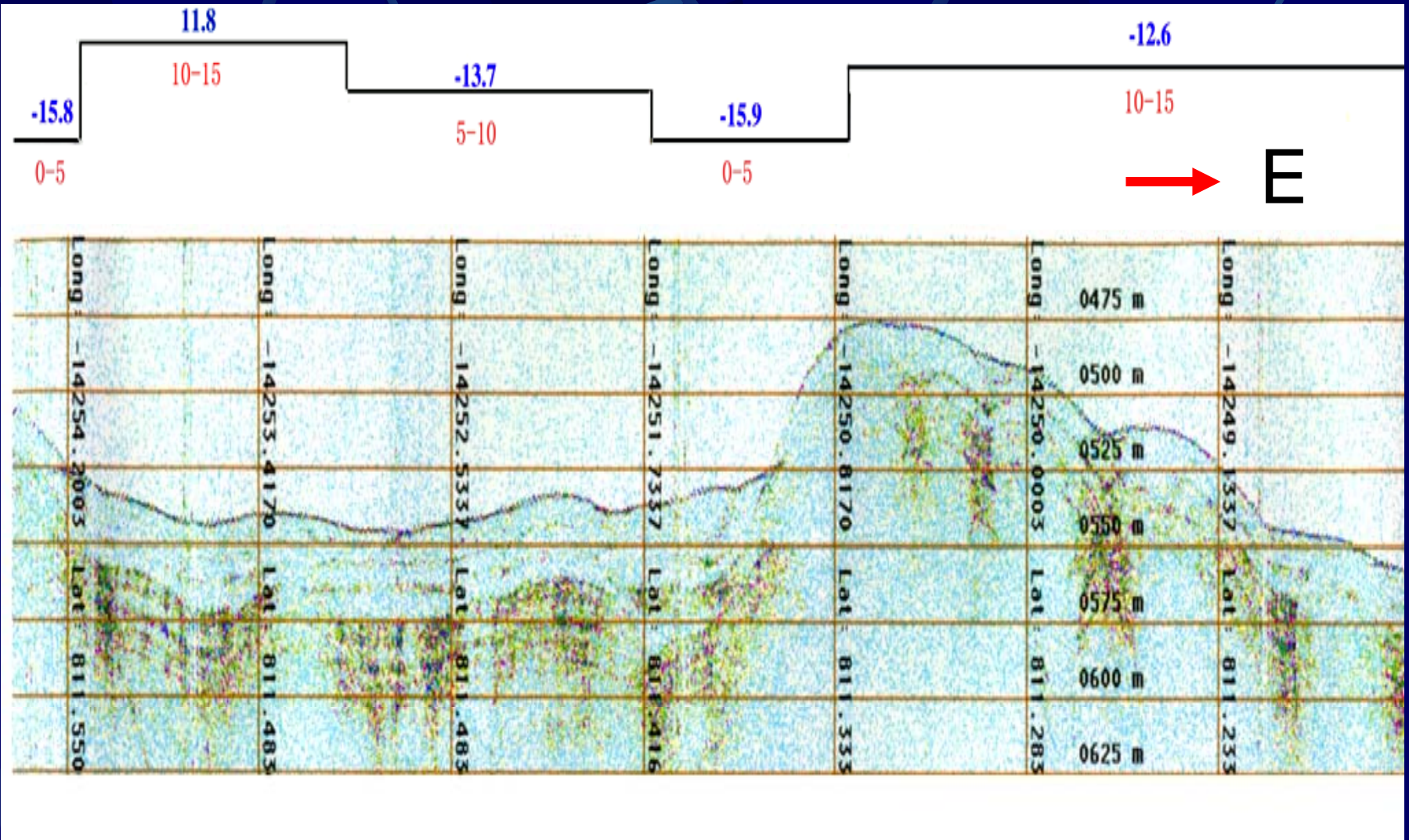


Illustration of Manganese Nodule Coverage(%)

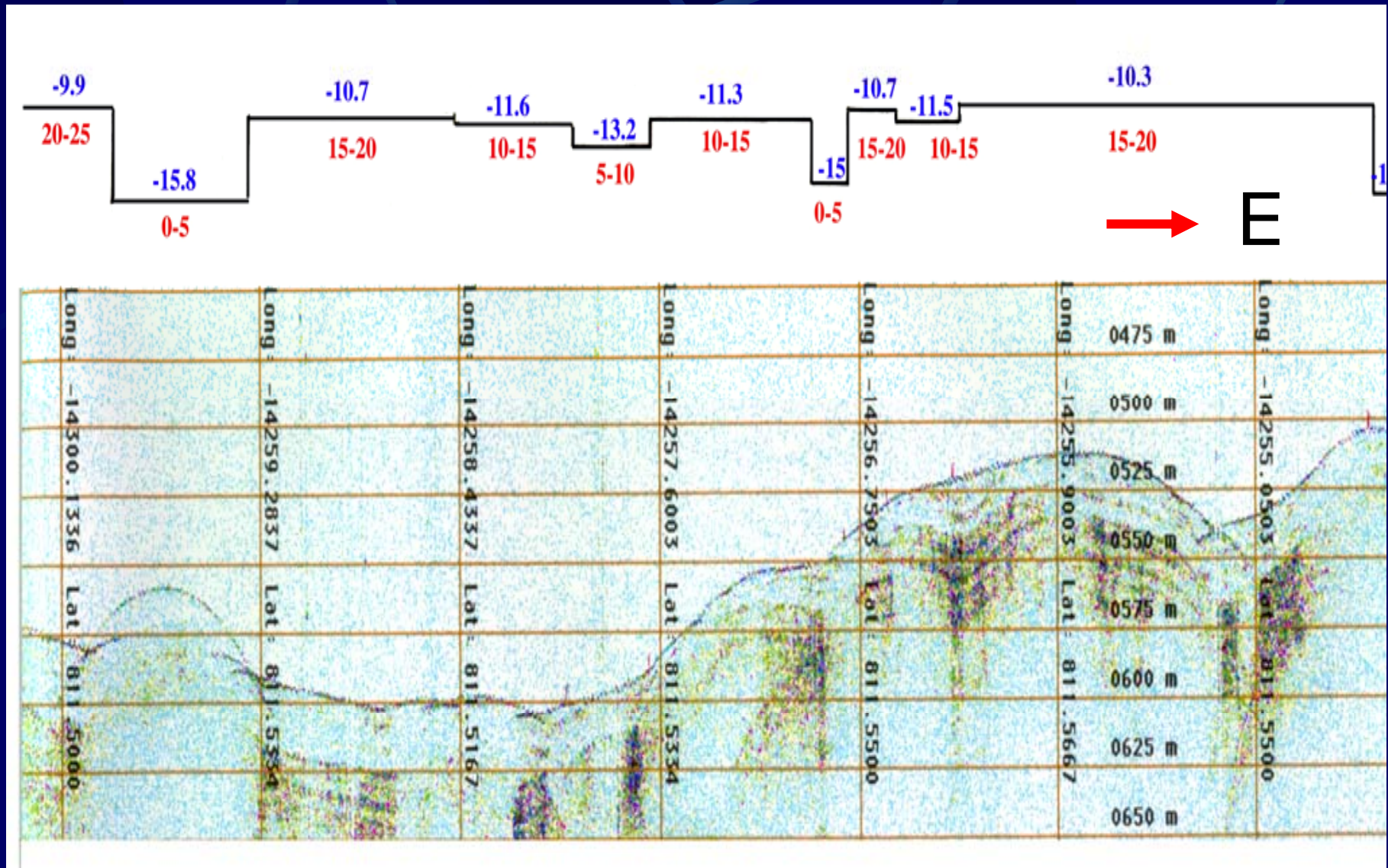


East Block of COMRA Area

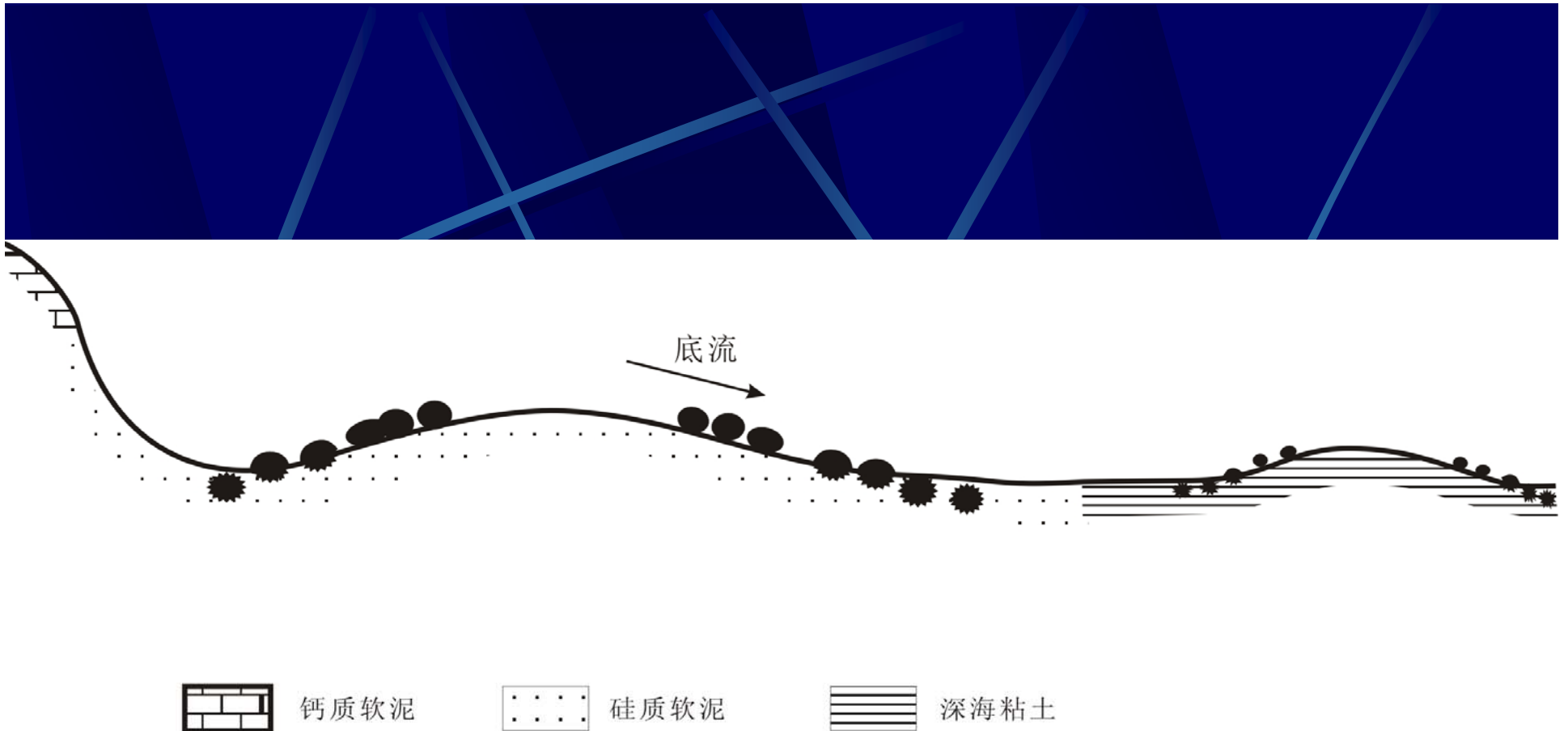


Relationship among topography, reflection and coverage (blue line is reflection(dB); data in red is coverage of nodule)

East Block of COMRA Area



Relationship among topography, reflection and coverage (blue line is reflection(dB); data in red is coverage of nodule)



- Patchy distribution of nodules
- A patch of nodules could be from several square meters to dozens of square kilometers