

**BRAZILIAN SOUTHERN MARGIN: AN EXAMPLE OF THE  
IDENTIFICATION OF THE BASE OF THE SLOPE ON A  
PASSIVE CONTINENTAL MARGIN**

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## Introduction

**UNCLOS, Article 76th “... in absence of the evidence to the contrary, the foot of the slope shall be determined as the point of maximum change in the gradient in its base.”**

**Scientific and Technical Guidelines, 5.1.3 – “The Commission interprets the determination of the foot of the continental slope by means of the point of maximum change in gradient at its base, as a PROVISION WITH THE CHARACTER OF GENERAL RULE. The fundamental requirement posed by this provision are:**

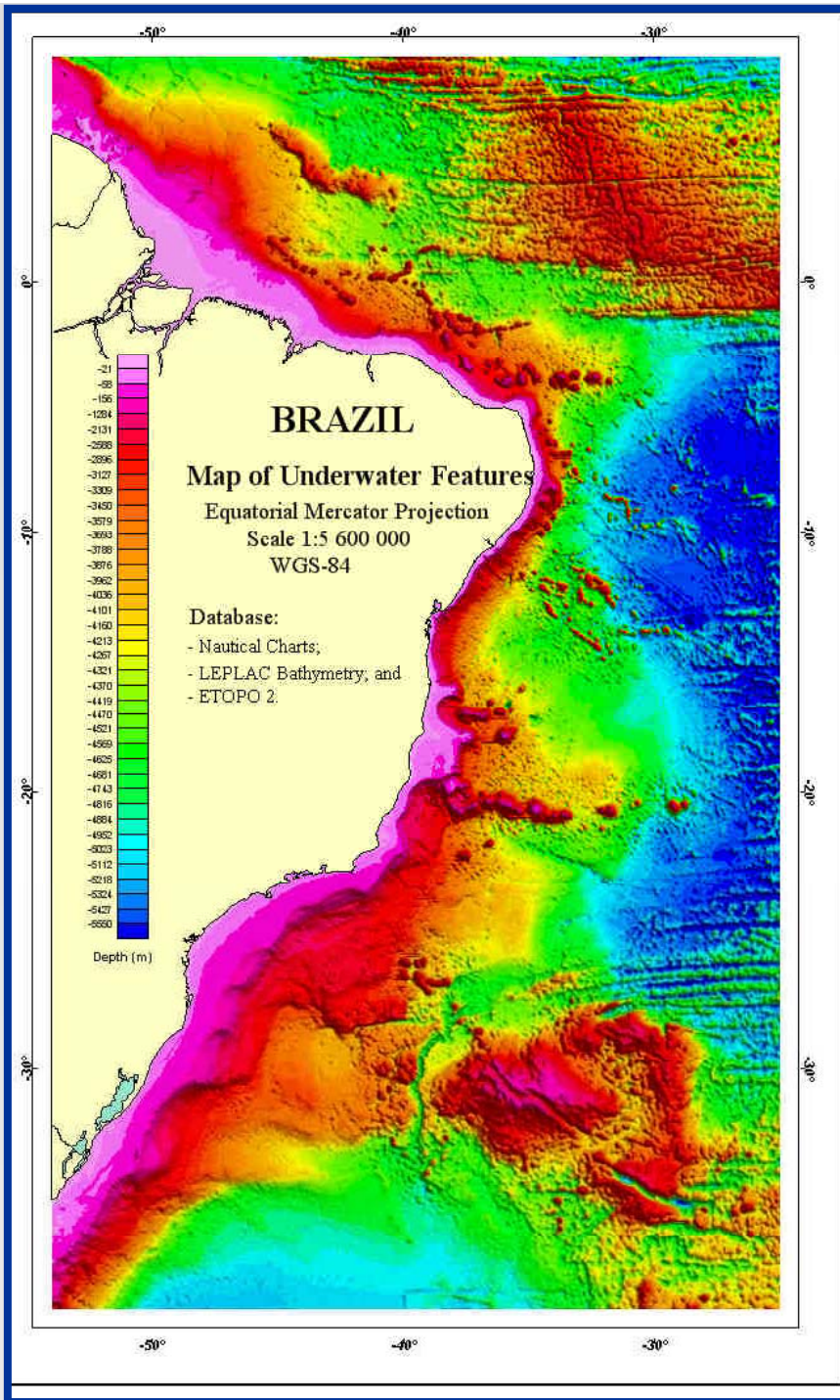
- The identification of the region defined as the base of the continental slope; and
- The determination of the location of the point of maximum change in the gradient at the base of the continental slope.

## Purposes:

The identification of the base of the slope in Brazilian Continental Southern Margin (BCSM)

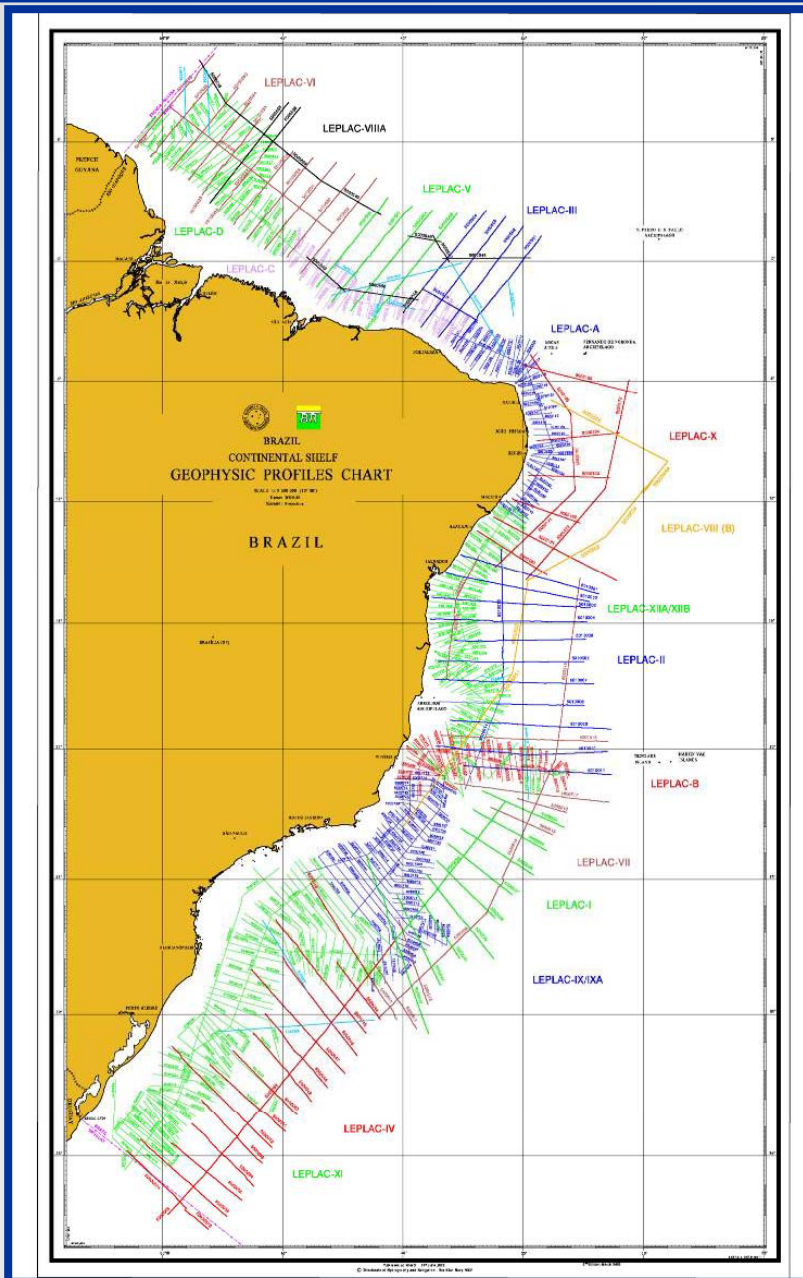
An exercise by the determination of foot of slope invoking evidence to the contrary.

Brazilian efforts in order to contribute for the implementation of the UNCLOS Article 76, and



## Brazilian Continental Margin Map of Underwater Features

# Map of Brazilian Continental Shelf Project Geophysical Profiles



## Geophysical Data Carried Out On Brazilian Continental Margin

<b>Geophysical data</b>	<b>Length (km)</b>
<b>Seismic multichannel *</b>	<b>48.500</b>
<b>Bathymetry**</b>	<b>112.000</b>
<b>Gravity</b>	<b>96.000</b>
<b>Magnetometry</b>	<b>91.000</b>

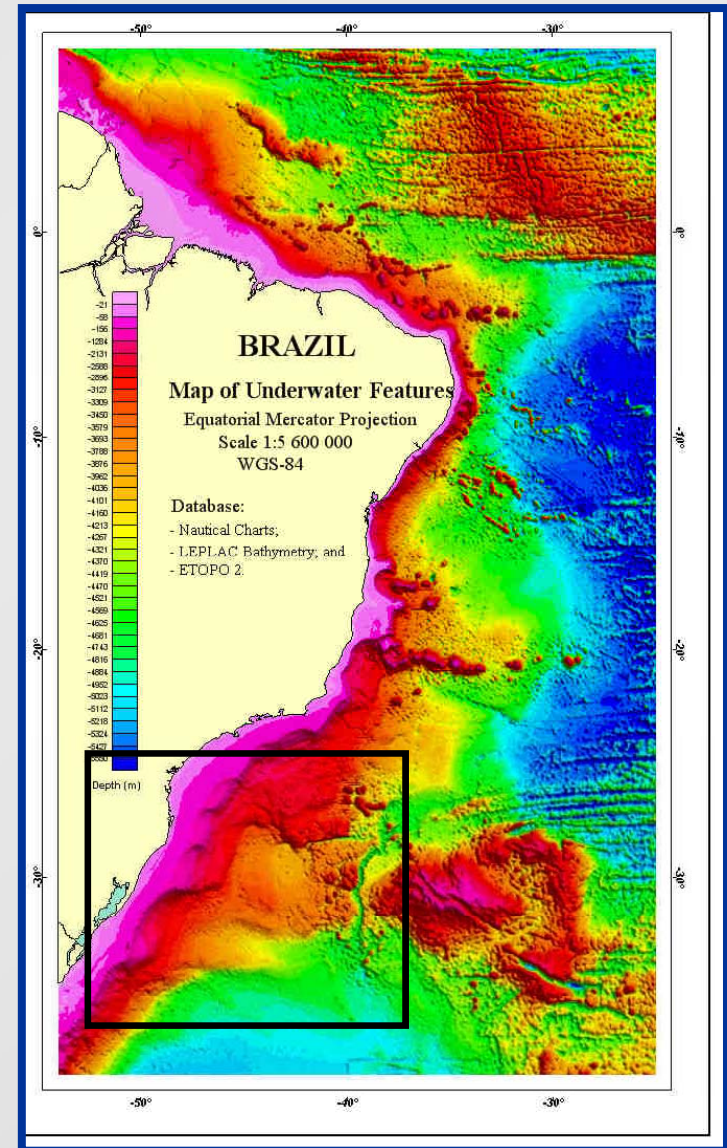
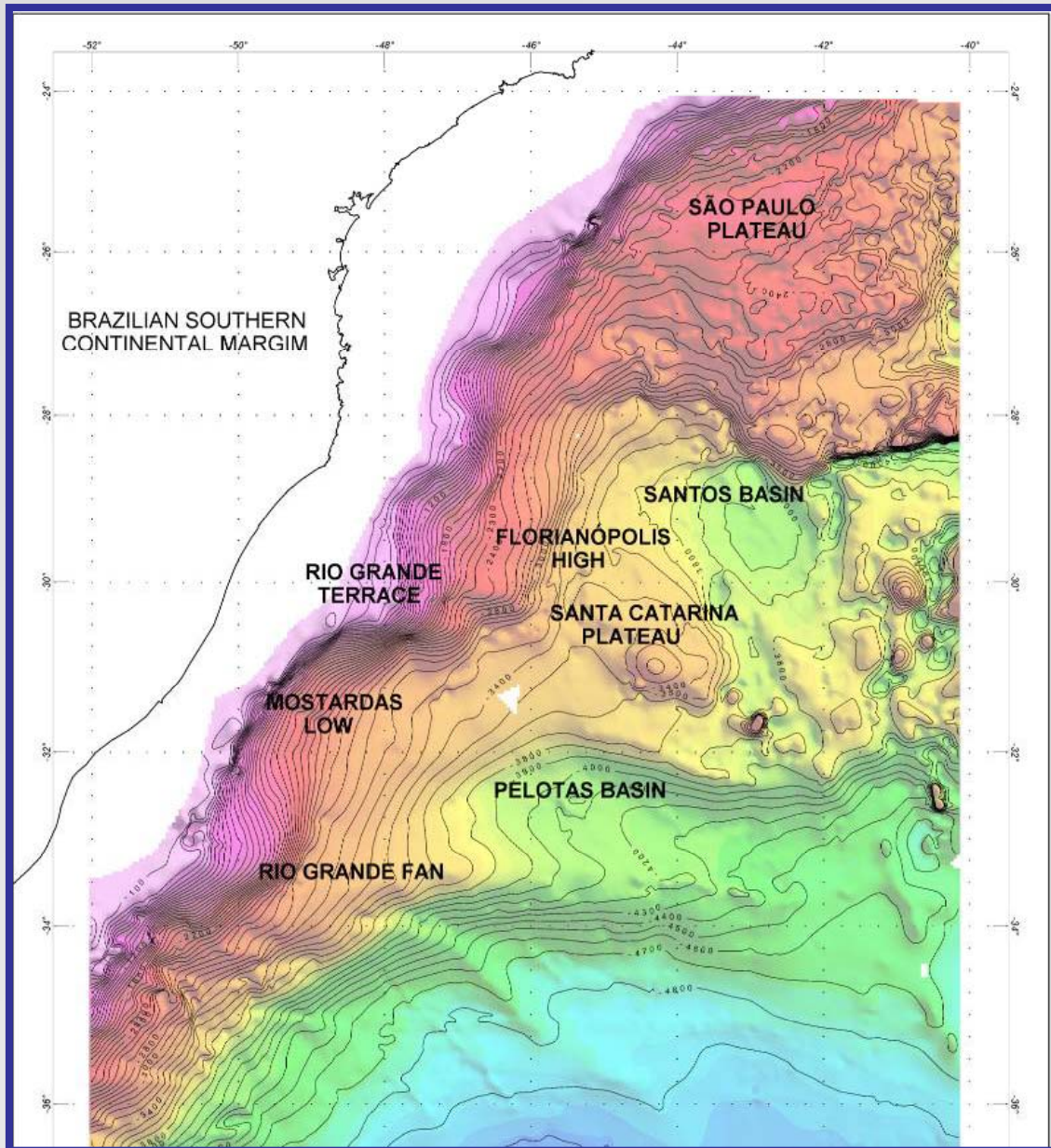
## The Base of the Slope in Brazilian Southern Margin

**The base of the continental slope was identified and defined in accordance with the Scientific and Technical Guidelines section 5, specially in the following paragraphs:**

**5.4.5. – “The Commission defines the base of the continental slope as a region where the lower part of the slope merges into the top of the CONTINENTAL RISE, or into the top of the DEEP OCEAN FLOOR WHERE A CONTINENTAL RISE DOES NOT EXIST. ... First, the search for its seaward edge should start from the rise, or from the deep ocean floor where a rise is not developed, in a direction towards the continental slope. Secondly, the search for its landward edge should start from the lower part of the slope in the direction of the CONTINENTAL RISE, or the DEEP OCEAN FLOOR WHERE A RISE IS NOT DEVELOPED.”**

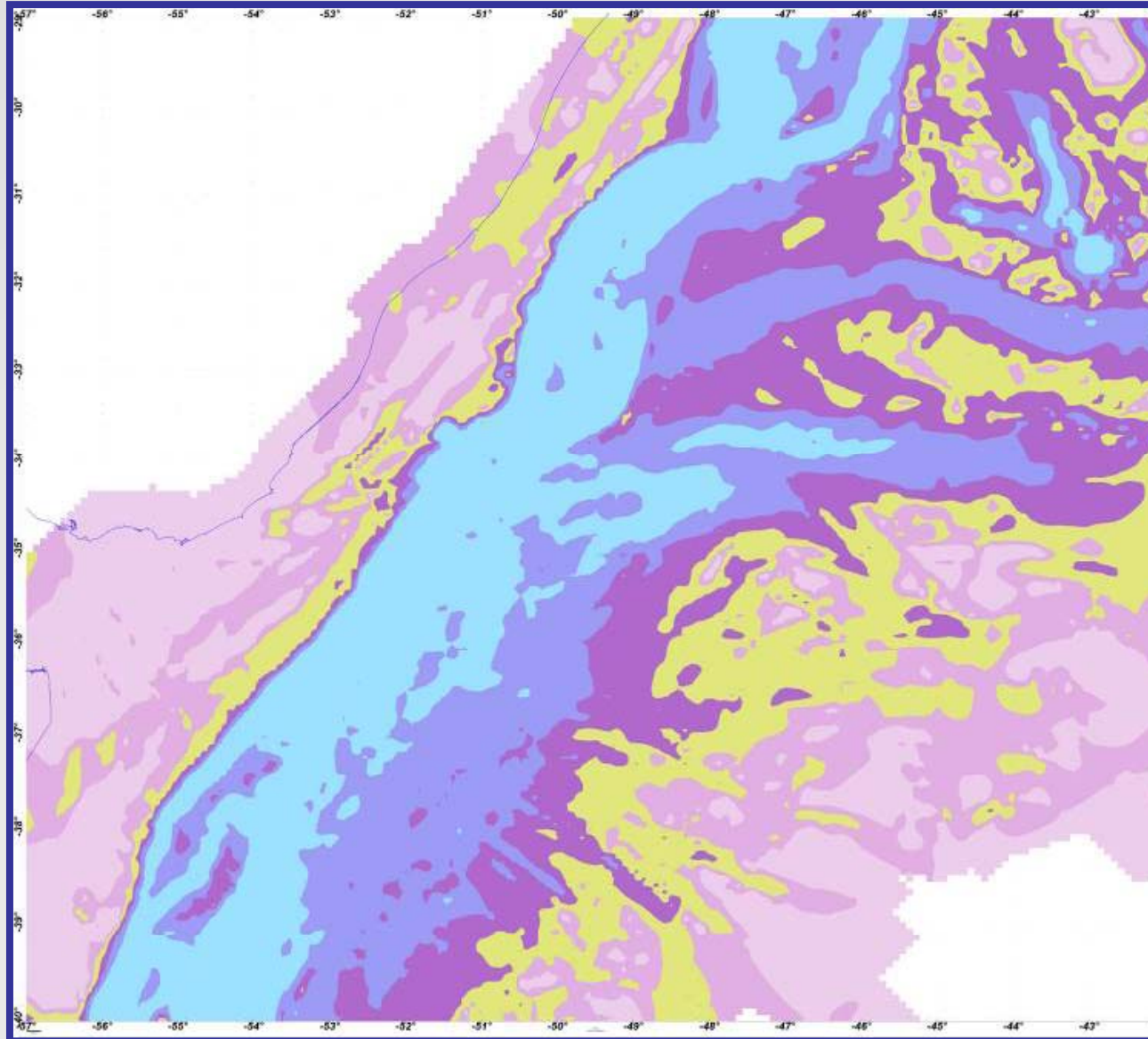


# Major Underwater features of the BCSM





## Gradient Map as tool to support the region defined as the Base of the Slope (BOS)

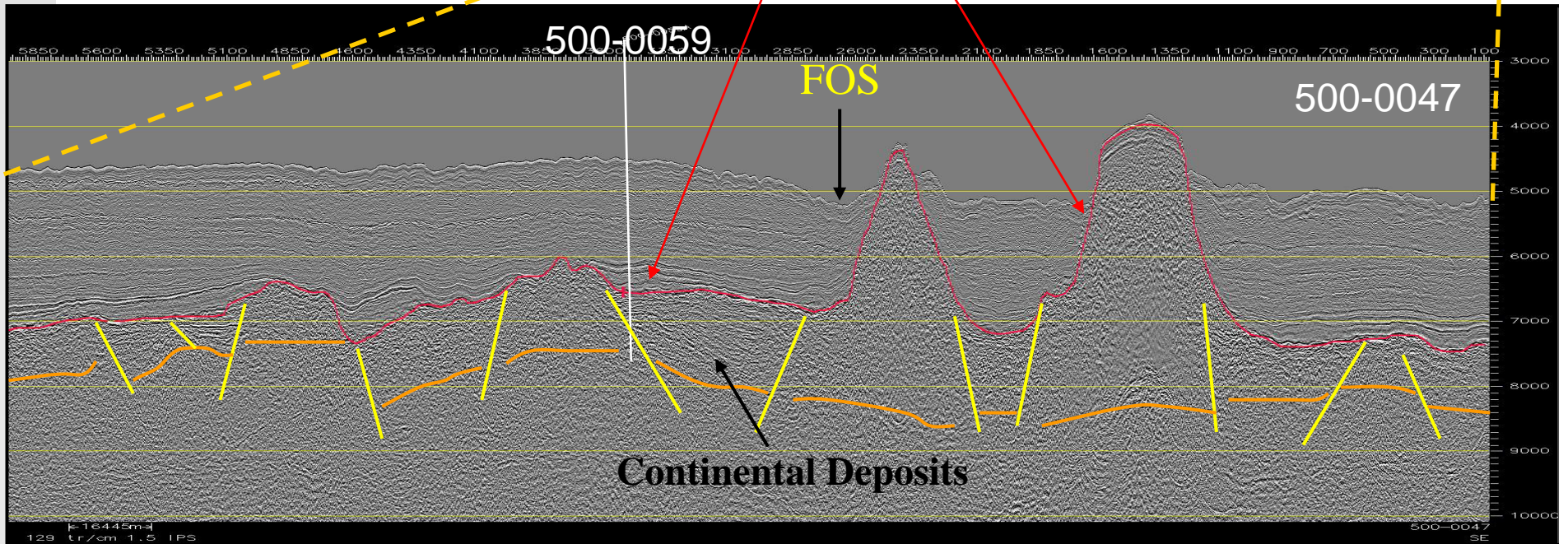
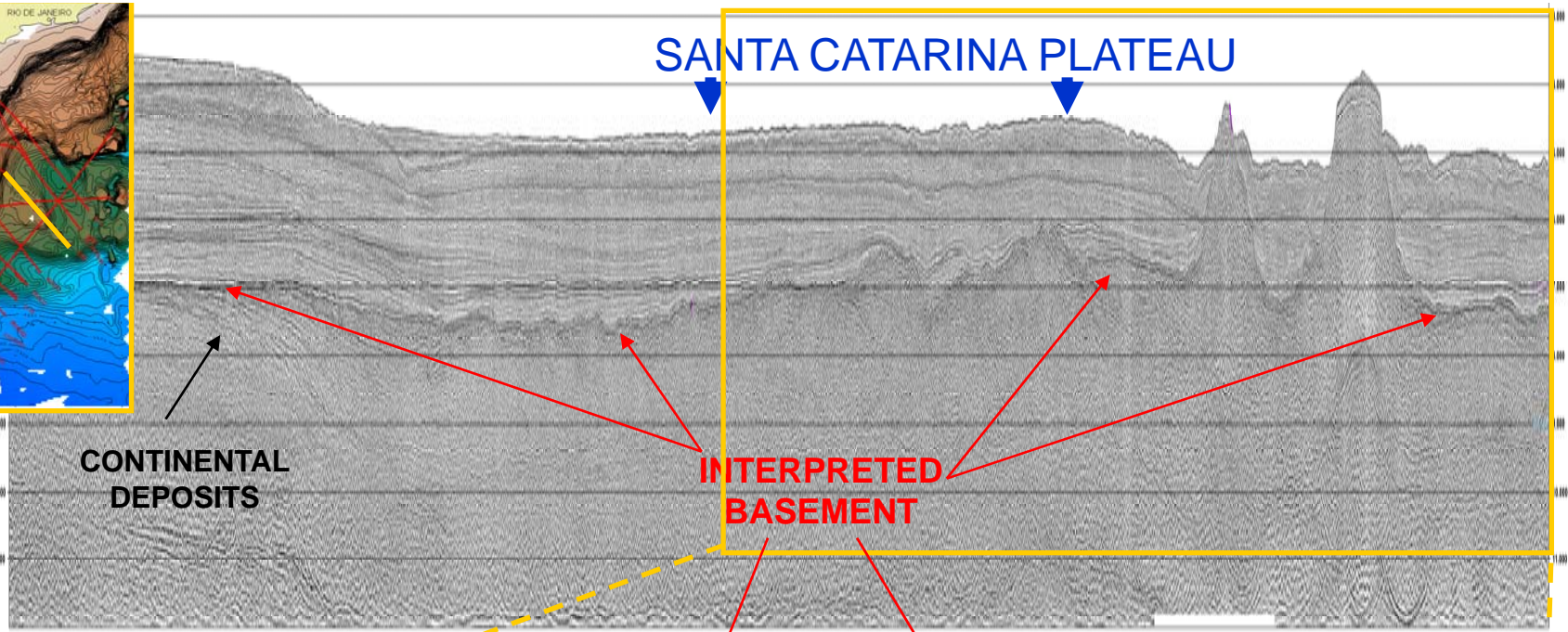
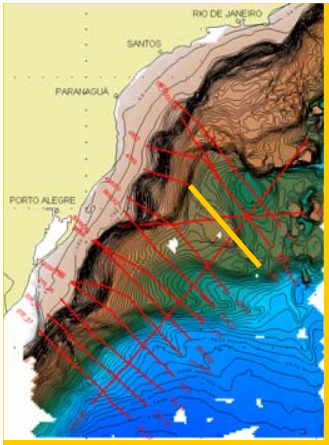


## The Base of the Slope in Brazilian Southern Margin

The base of the continental slope was identified and defined in accordance with the Scientific and Technical Guidelines section 5, specially in the following paragraphs:

**5.4.6** – As a general rule, whenever the base of the continental slope can be clearly determined on the basis of morphological and bathymetric evidence, the Commission recommends the application of that evidence. GEOLOGICAL AND GEOPHYSICAL data can also be submitted by Coastal State TO SUPPLEMENT PROOF THAT THE BASE OF THE CONTINENTAL SLOPE IS FOUND AT THAT LOCATION”.





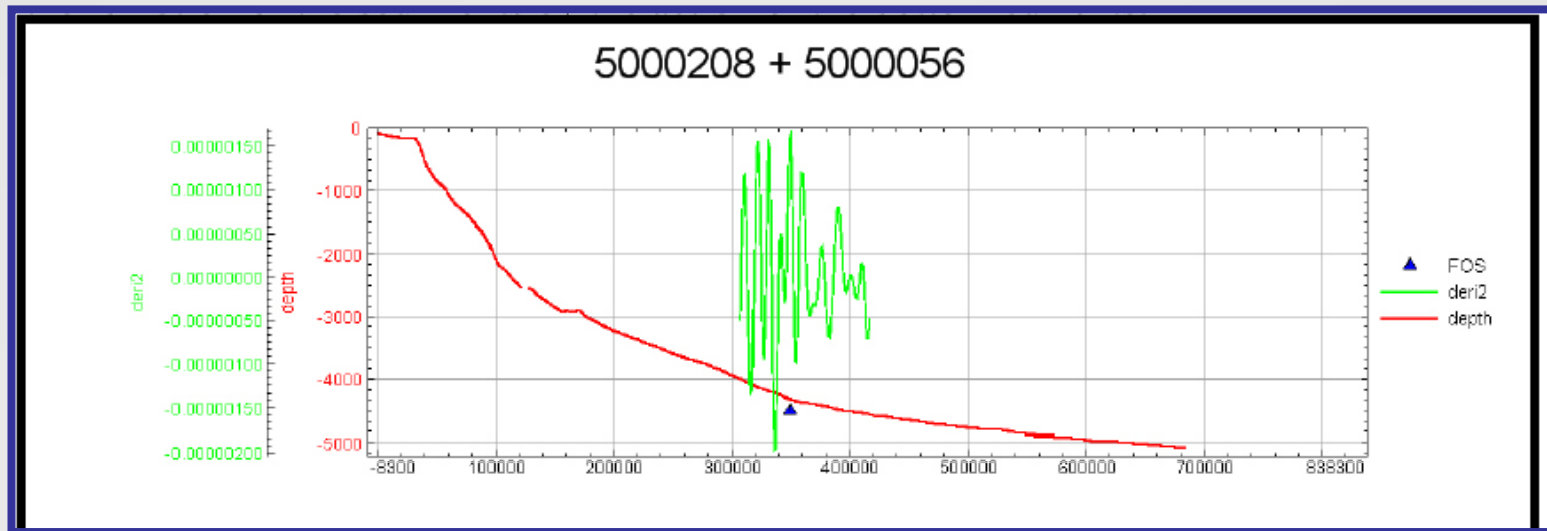
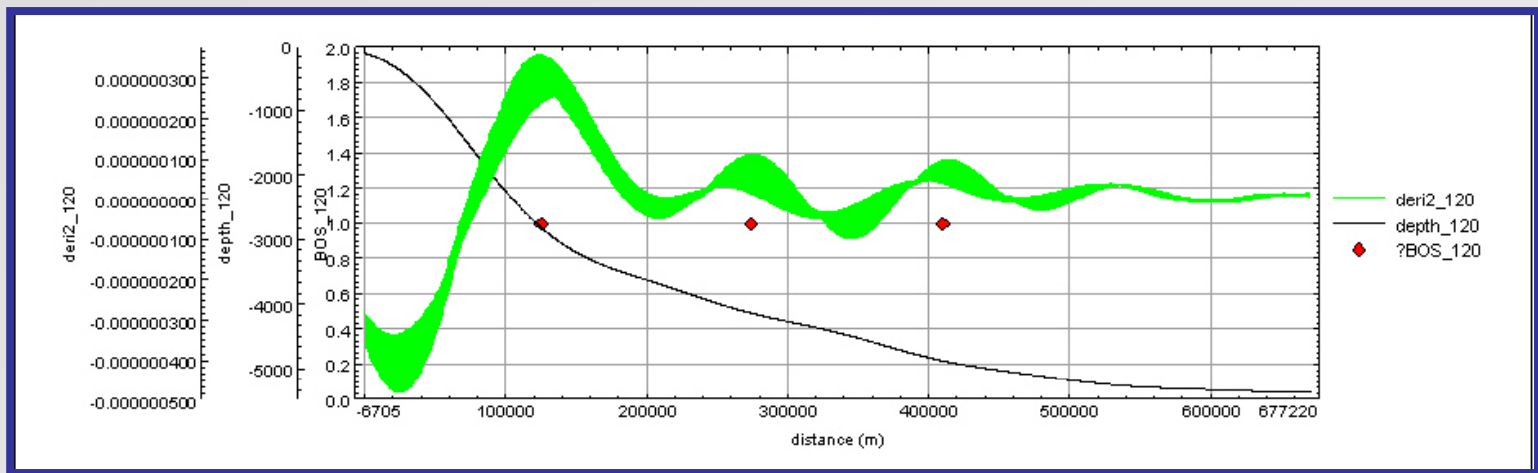
## Determination of the Foot of Slope

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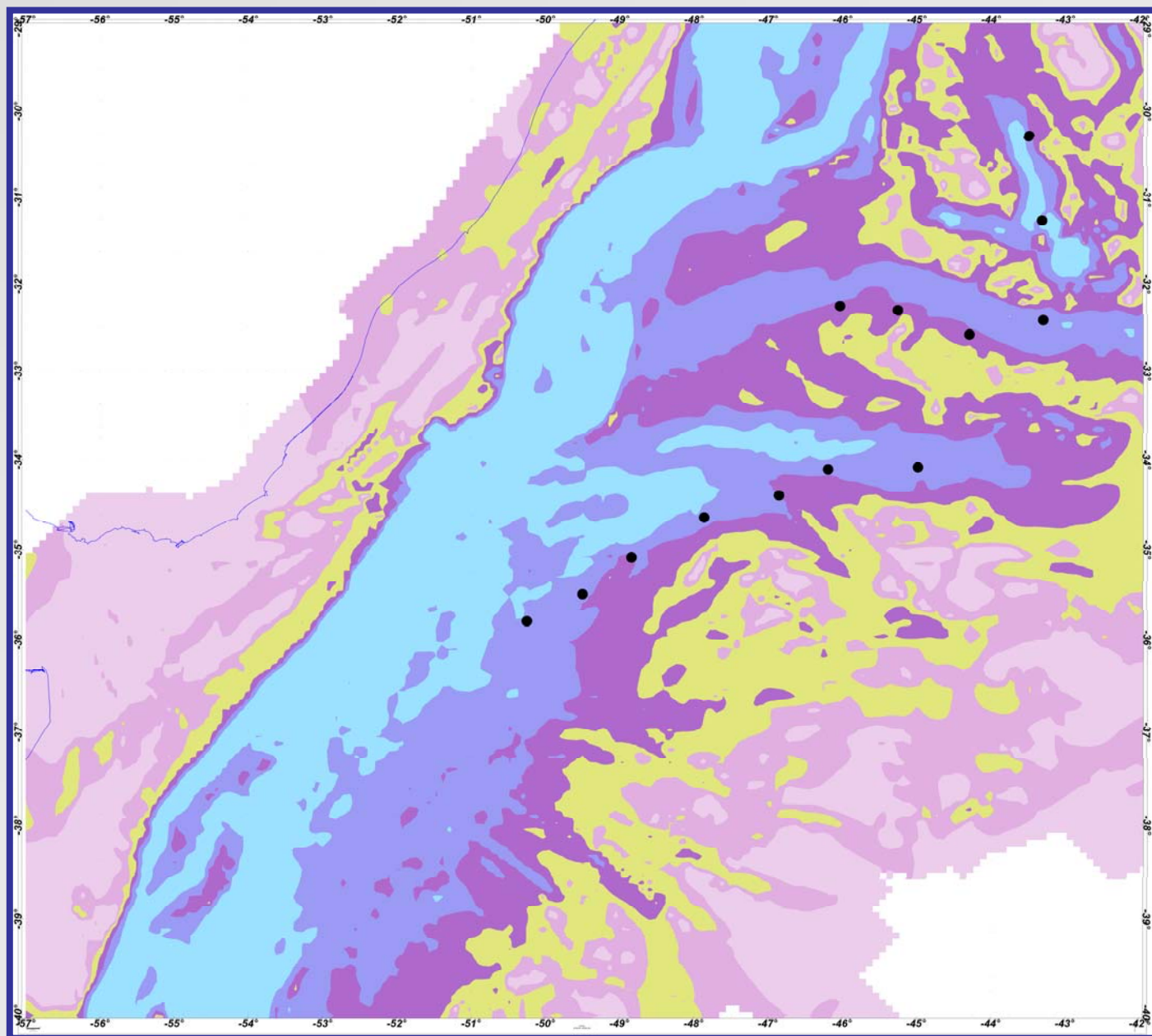
- The identification of the region defined as the base of the continental slope; and
- The determination of the location of the point of maximum change in the gradient at the base of the continental slope.







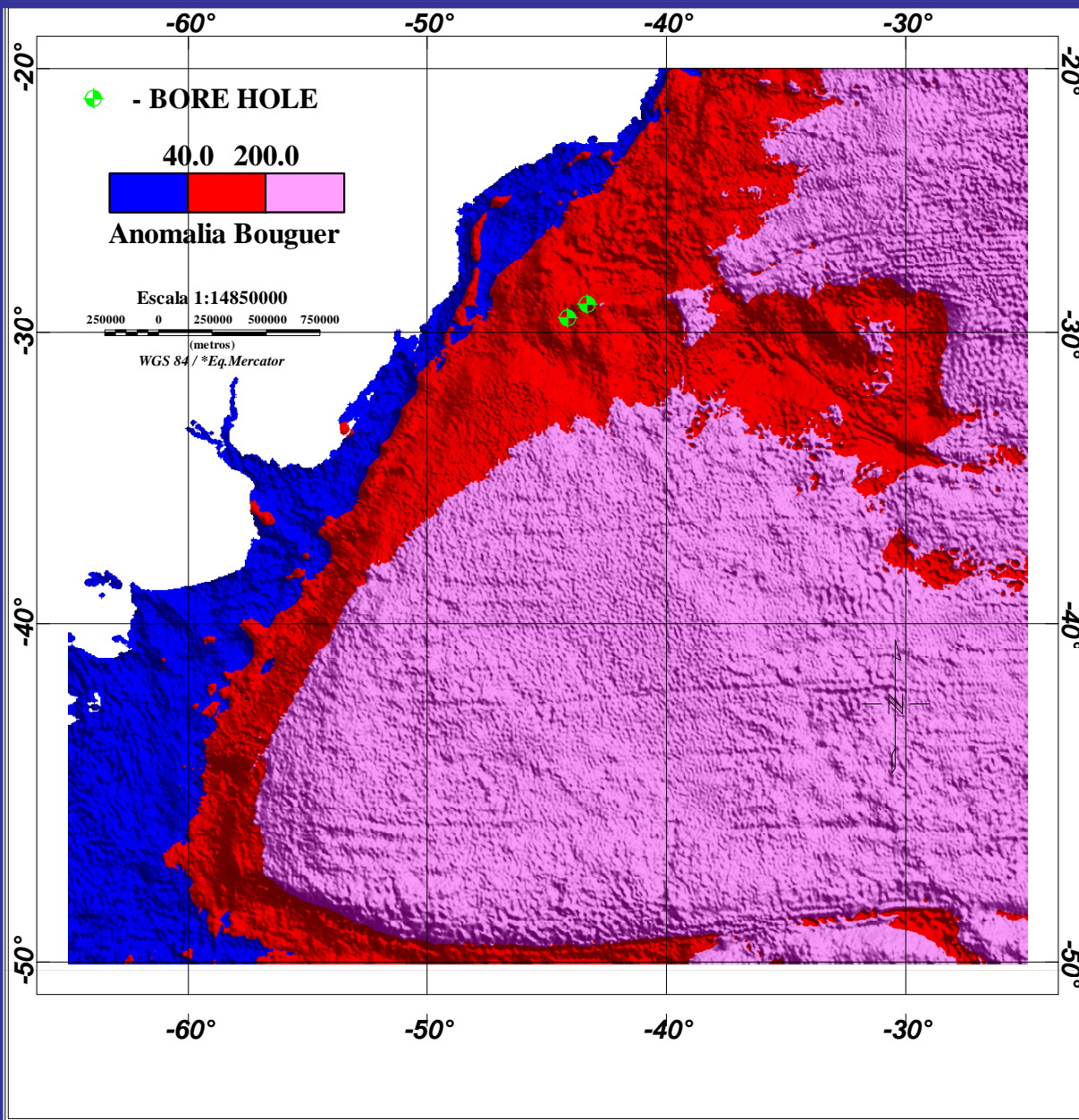
## Foot of Slope plotting over Gradient Map



## **Determination of the Foot of Slope**

**UNCLOS, Article 76th “... in absence of the evidence to the contrary, the foot of the slope shall be determined as the point of maximum change in the gradient in its base.”**

# The Foot of Slope by Means of Evidence to the Contrary

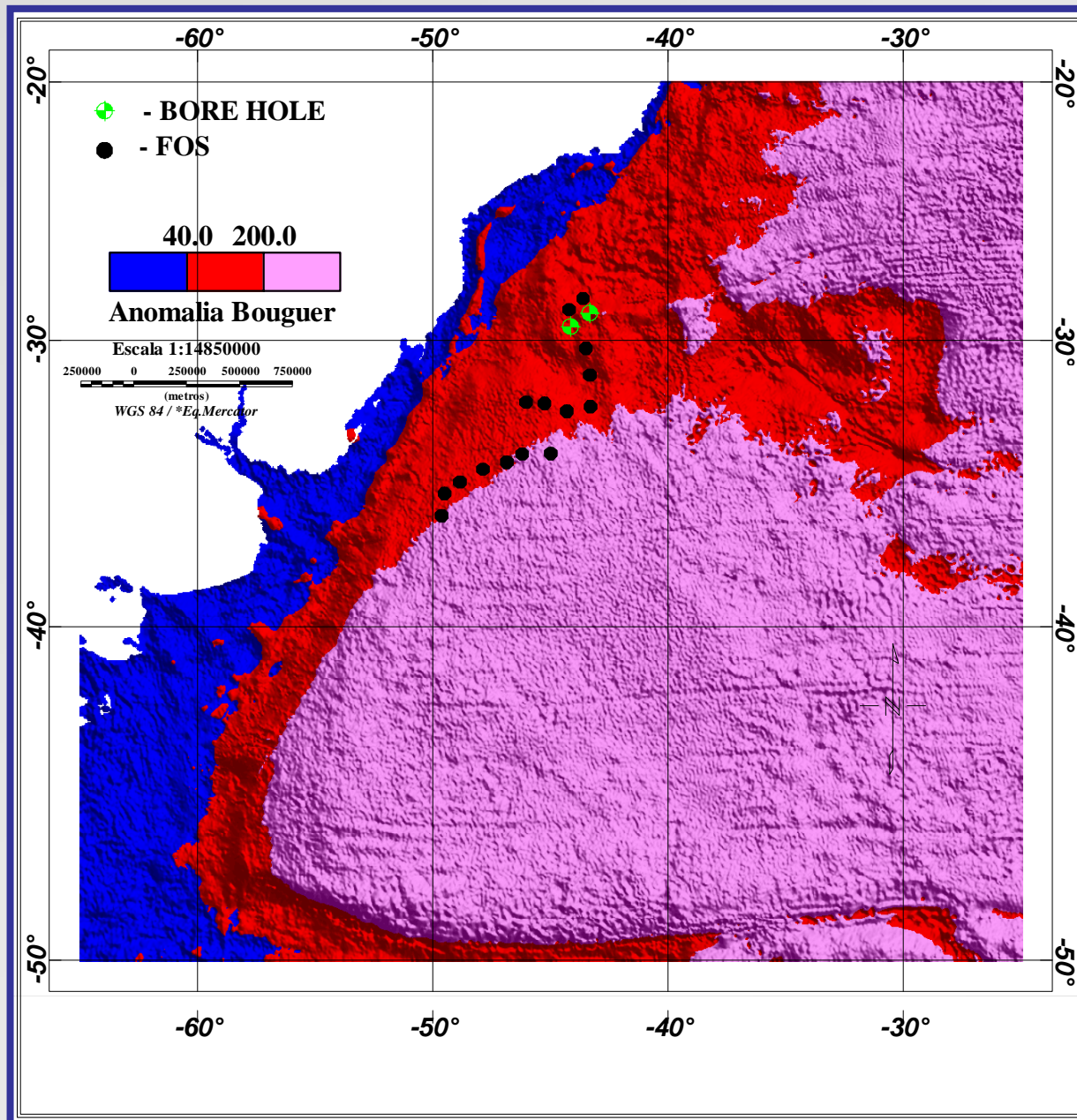


**The Borehole Plotted  
over Bouguer Gravity  
Map**

**Map constructed from  
public domain database.**



## Final Results

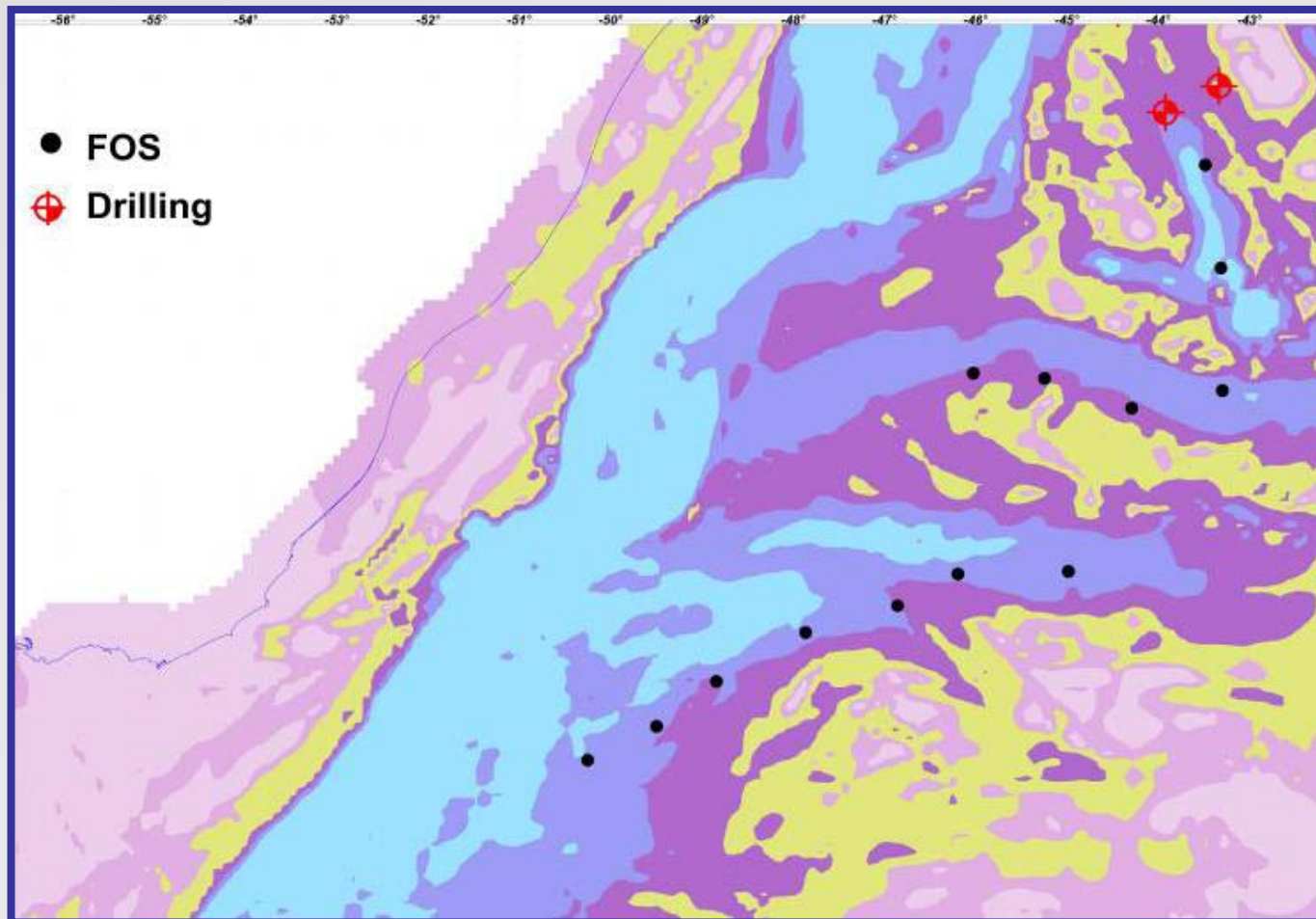


**The Foot of Slope and  
Borehole plotted over  
Bouguer Gravity Map**

**Map constructed from  
public domain database.**

## Final Results

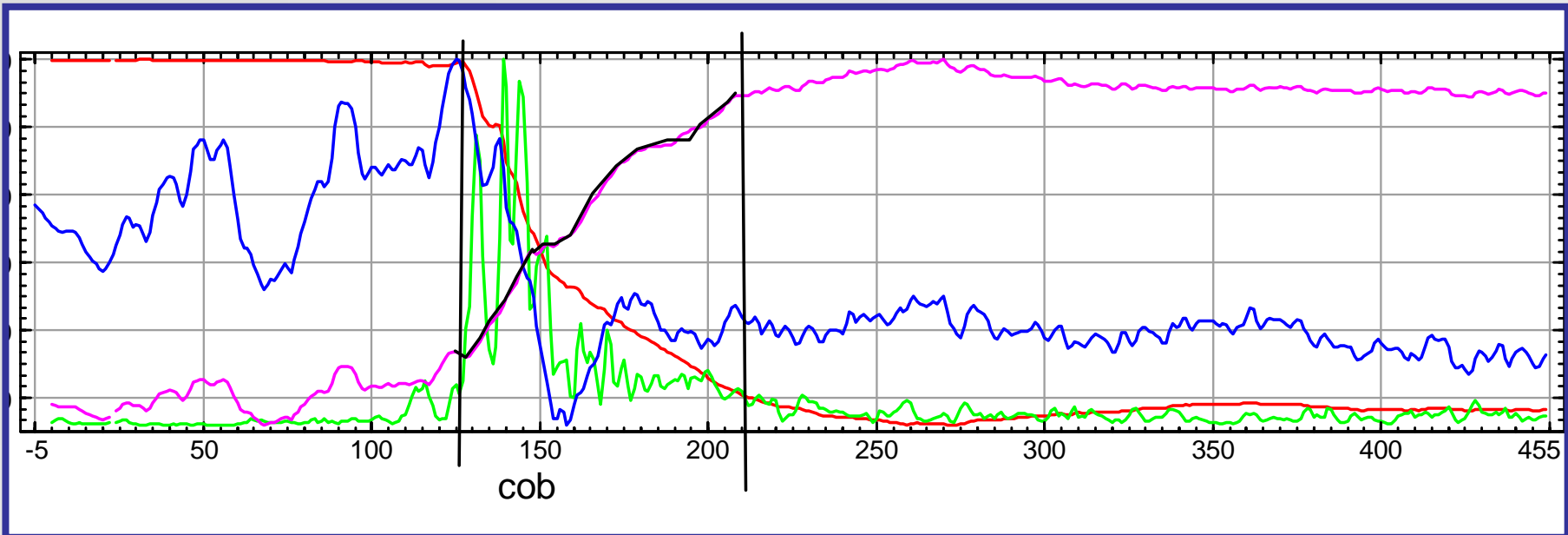
### The Foot of Slope and Borehole Plotted over Gradient Map



Map constructed  
from public  
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## Final Results



Profiles derived from the grid:

Red line - bathymetry,

Green line - gradient of bathymetry,

Blue line - free air gravity and

Purple line - Bouguer gravity.

The current profile is in the vicinity of Brazil and Uruguay Lateral Maritime Boundary.

## Final Remarks

BOS - sensible interpretation for the implementation of the UNCLOS Article 76

Gradient Map - points out as a useful aids in terms of identification of the regional base of the slope.

The application of tools which measures seabed gradient may be take into consideration that the characteristics of development of margin. Usually margin developed under huge continental sedimentation presents smooth gradient if compared with “hungry” continental sedimentation margin, where, usually, presents sharp variations on seabed gradient.

Typical parameters (break of geological shelf, slope and continental elevation) adjusted for a specific margin, not necessarily, will present the same adjustment when applicable on another margin.

BOS - geomorphologic approach would be improved if integrated with additional geological and geophysical evidences.

The determination of the foot of slope by means of maximum change of gradient in its base points out as the most advantageous method in this region.

## Acknowledgements

The authors would like to express the deepest thankfulness to:

The members of the Brazilian Continental Shelf Project who have had remarkable involvement in the material presented in this paper, and

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Thank you !!!!!!!!!!!!!!!!!!!!!

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