Submission date 2013/06/03

Cruise Summary

1. Cruise Information

● Cruise ID: YK13-04-leg2

● Name of vessel: Yokosuka

● Title of the cruise:「The Brazil-Japan Joint Research Initiative in the South Atlantic - R/V Yokosuka and HOV Shinkai 6500 "Iatá-piuna Cruise" in 2013」

● Chief scientist [Affiliation]:

Katsunori Fujikura [Japan Agency for Marine-Earth Science and Technology]

Paulo Y.G. Sumida [Institute of Oceanography, University of São Paulo, Brazil]

● Representative of the science parties [Affiliation]

Proposal 1) Hiroshi Kitasato [Japan Agency for Marine-Earth Science and Technology],

Proposal 2) Kei Shiomi [Japan Aerospace Exploration Agency] (Non-attending)」

● Title of the proposals

Proposal 1) The Brazil-Japan Joint Research Initiative in the South Atlantic - R/V Yokosuka and HOV Shinkai 6500 "Iatá-piuna Cruise" in 2013

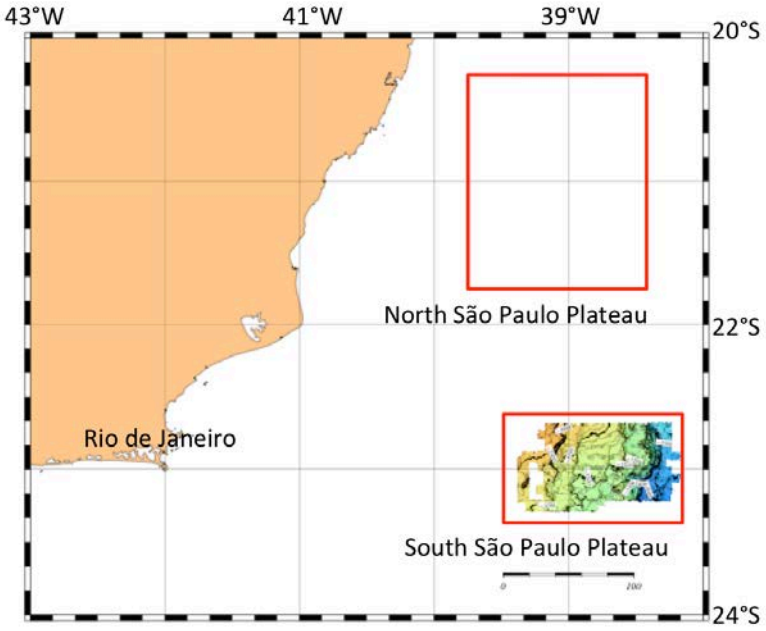
Proposal 2) Ship Observation of Global CO2 Concentration for Atmosphere-Ocean Carbon Exchange Estimation from GOSAT Data (Researchers Non-attending)

● Cruise period: 10 May – 24 May, 2013

● Ports of call: Rio de Janeiro, Brazil 10 May – Santos, Brazil 24 May, 2013

● Research area: São Paulo Plateau, off Brazil

○ Research map



２. Overview of the Observation

● Overview of the observation

- Purpose, background: The Iatá-piuna Cruise is the first detailed geological and biological investigation of deep South Atlantic areas under the cooperation between both countries. The main focus is to investigate deep-sea ecosystems associated with geological and tectonic settings of the continental margins and ocean basins off Brazil.

The “Iatá-piuna Cruise” was divided in two legs. The 1st leg targeted the Rio Grande Rise and the São Paulo Ridge, and the 2nd leg targeted the São Paulo Plateau.

In the São Paulo Plateau area cold seeps associated with natural gas and/or oil seepages are expected occur potentially supporting deep-sea chemosynthetic ecosystems. In this case, chemosynthetic ecosystem studies shall be considered as the main goal of this cruise leg. For comparison between chemosynthetic vs non-seep ecosystems, it is investigated both background and chemosynthetic communities across different sites.

The main subjects of study during the 2nd leg are itemized below:

A - Discovery of methane/sulfide seep communities in the São Paulo Plateau

- Understanding geological and geochemical settings of seep community
- Understanding community structure including faunal and microbial composition (diversity), distribution patterns and trophic structure in comparison with non-seep ecosystems.

B - Biogeography and Evolution

- Understanding phylogeny of organisms
- Compare biogeographic patterns and distribution of seep communities

- Understanding adaptation and tolerance for extreme environment
- Physiological and molecular studies of symbiotic associations.

C – Investigation of diversity and metabolism of microorganisms

- Studying diversity and metabolic pathways of microorganisms
- Isolation of culturable microorganisms
- Investigation the production of enzymes in microorganisms.

D - Geochemistry and Geology in the seep fields

- Understanding production mechanism of each chemical component including CH_4 and H_2S
- Understanding gas production mechanisms with the salt diaper
- Investigate the features related to the outcrop of salt massive
- Identification of interaction of AABW and São Paulo Plateau outer escarpment.

Dive surveys by the HOV Shinkai 6500

We had 9 dives by the HOV (Table)

Table. Dive List

Dive	**Date**	**Dive Site**	**Dive scientist**	**ORGANIZATION**
1340	2013/5/12	South São Paulo Plateau Outer Escarpment	Katsunori Fujikura	Japan Agency for Marine-Earth Science and Technology
		南サンパウロ海台	藤倉克則	海洋研究開発機構
1341	2013/5/13	South São Paulo Plateau Outer Escarpment	Vivian Helena Pellizari	Institute of Oceanography, University of São Paulo
		南サンパウロ海台		
1342	2013/5/14	South São Paulo Plateau Outer Escarpment	Takao Yoshida	Japan Agency for Marine-Earth Science and Technology
		南サンパウロ海台	吉田尊雄	海洋研究開発機構
1343	2013/5/15	North São Paulo Plateau Outer Escarpment	Antonio Fernando Menezes Freire	PETROBRAS
		北サンパウロ海台		
1344	2013/5/16	North São Paulo Plateau Outer Escarpment	Toshiro Yamanaka	Okayama University

		北サンパウロ海台	山中寿郎	岡山大学
1345	2013/5/17	North São Paulo Plateau Outer Escarpment	Cristina Rossi Nakayama	Federal University of São Paulo
		北サンパウロ海台		
1346	2013/5/19	North São Paulo Plateau Outer Escarpment	Yuriko Nagano	Japan Agency for Marine-Earth Science and Technology
		北サンパウロ海台	長野由梨子	海洋研究開発機構
1347	2013/5/20	North São Paulo Plateau Outer Escarpment	Angelo Bernardino	Federal University of Espírito Santo
		北サンパウロ海台		
1348	2013/5/21	South São Paulo Plateau Outer Escarpment	Jing Zhang	University of Toyama
		南サンパウロ海台	張 勁	富山大学

Topographic surveys

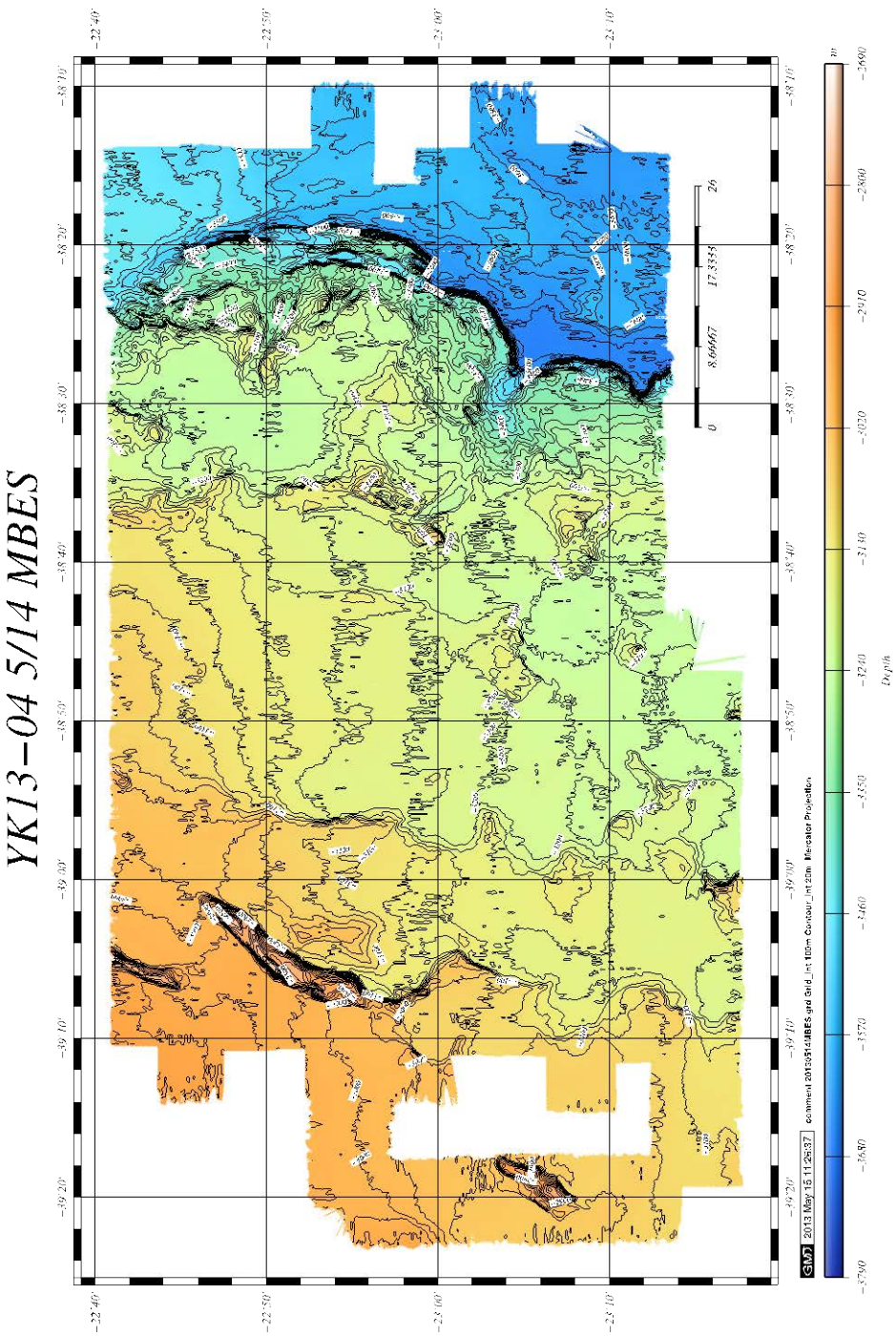


Fig. Topography in the São Paulo Plateau