



International Workshop

Unlocking the opening processes of the South China Sea

Tongji University, Shanghai. January 31-February 01, 2012.

1. Background introduction

The South China Sea (SCS) is geologically unique:

It is a classical representative of western Pacific marginal seas that developed from continental margin rifting and is floored with oceanic crust.

It is located at the junction of the Eurasian, Pacific, and Indo-Australian plates, and thereby sensitive to their tectonic and climatic changes.

Its relatively small size facilitates easy tectonic comparisons between the two conjugate continental margins, accessible through one single IODP leg.

It has undergone a complete Wilson cycle from continental break-up and seafloor spreading to subduction despite its short evolutionary history and, therefore it is also well suited for studying various plate boundary activities, such as continental margin rifting and geodynamics of continental margin basin formation, oceanic subduction (the Manila Trench), strike slip faulting (the Red River fault), as well as active orogenic processes (Taiwan).

In the style of rifting, the South China Sea margins may represent an intermediary form of continental extension between the end member extremes of the Iberia and Newfoundland-type magma-poor margin and the North Atlantic-type volcanic rifted margin.

All these attributes make the SCS an ideal natural laboratory for studying continental break-up, basin formation, deep mantle evolution, and land-ocean interactions. However, there is not yet one single drilling well in the central SCS basin targeting the transitional zone from continental to oceanic crust, and the oceanic crust itself. This leaves a large margin of error in estimated opening ages and renders various hypotheses regarding its opening mechanism and history untested.

In order to achieve basement drilling in the SCS, we revised the IODP proposal 735-Full in 2011 and resubmitted it as 735-CPP, "Opening of the South China Sea and its implications for Southeast Asian tectonics, climates, and deep mantle processes since the early Mesozoic". With extra funding commitment from the Ministry of Science and Technology of China, this proposal seeks to better understand the following key geological processes:

- (1) Mesozoic tectonic interplays among the Tethys, Paleo-Pacific, and East Asia;
- (2) Geodynamic transition from a Mesozoic active to a Cenozoic passive continental margin and the Cenozoic opening mechanism of the SCS;

- (3) Climatic and deep mantle aftermaths due to the Cenozoic uplift of the Tibetan Plateau and the formation of the western Pacific marginal seas;
- (4) Timings and episodes of the Cenozoic opening of the SCS and prominent unconformities;
- (5) Oceanic crustal accretion and upper lithospheric architecture of the SCS in particular and of the western Pacific marginal seas in general.

Also early 2011, the National Science Foundation of China (NSFC) granted an 8-year (2011-2008) program called “The South China Sea Deep (SCSD)”. This comprehensive research program is directed by Prof. Pinxian Wang and has a total budget of ~ 25M in US Dollar. SCSD will sponsor additional site surveys and post-cruise research activities. For more information on this program and this workshop, interested parties are also invited to attend the special session, “The South China Sea - from tectonics to microbes”, and an evening reception on the SCSD program from 18:30 to 21:00, Dec. 08, at Golden Gate C1 of San Francisco Marriott Marquis Hotel, both to be held at the AGU meeting, 2011.

2. Overall scientific objectives

With this international workshop, we hope to

- boost further international collaborations in geological researches in the SCS,
- broaden the scope of the IODP proposal 735-CPP and,
- identify and refine both regional questions related to East Asian geology and fundamental issues regarding continental breakup and basin formation.

We invite active participations from scientists and engineers working on marine geology and geophysics, Asian geology, paleo-oceanography and paleo-environment, petrology and geochemistry, hydrogeology and deep biosphere, and CORKs.

3. Scope of topics to be covered

(1) Processes on tectonic transitions. A variety of different transitions occurred during the formation of the SCS. They include the early Mesozoic transition from a predominately Tethys regime to a Paleo-Pacific regime, the late Mesozoic transition from an active continental margin to a passive one, the Cenozoic transition from continental breakup to seafloor spreading, and the initiation of ridge jumps and subduction zones. These singular and transient geological processes play critical roles in Earth’s evolution but their mechanisms and processes remain poorly understood.

(2) Magmatism and its role in rifting, spreading, and underplating. What is the origin of the post-rifting magmatic activity? Are there high-velocity lower-crustal bodies at the margins? What is the nature of the “transitional crust” between the continental margins and oceanic crust in the deep SCS basin? Volcanic flows? Exhumed mantle? Middle/lower continental crust? Hyperextended continental crust ?

(3) Deep-marine sedimentary responses to tectonic and climatic events. As relative small marginal basins immediately surrounded by numerous continental blocks, the SCS and the Huatung Basin are very sensitive to East Asian and western Pacific tectonic and climatic pulses and have recorded these information in the post-drifting sediments. These marginal basins are ideal places for studying continent-

ocean interactions and their climatic and sedimentary consequences.

(4) **Deep mantle-seawater-biosphere interactions and co-evolution in responses to continental breakup and seawater infiltrations.** Specific problems include (a) whether and how the western Pacific marginal basins are related to the eastward mantle flow caused by the India-Eurasia collision, to the westward subduction of the Pacific, or the northward convergence of the Indo-Australian plate, and (b) whether and how the uppermost mantle is magnetized, potentially linked to in-situ serpentinization caused possibly by infiltration of seawater through large transform faults. These complicated processes and their manifestations in geophysical fields and their influences on deep biosphere need be better formulated through a workshop.

4. Program

Detailed program will be announced later. In addition to a number of oral presentations from keynote and invited speakers, we encourage all workshop participants to have poster presentations to best facilitate discussions and communications.

5. Workshop conveners

Pinxian Wang, Tongji University. Email: pxwang@tongji.edu.cn

Chun-Feng Li, Tongji University. Email: cfl@tongji.edu.cn

Dieter Franke, Federal Institute for Geosciences and Natural Resources, Germany.

Email: dieter.franke@bgr.de

6. Logistics

Timing: January 31-February 01, 2012.

On-site registration starts from 12:00 PM on Jan. 30. The meeting ends at 6:00 PM on Feb. 01.

Meeting venue: Tongji University, 1239 Siping Road, Shanghai 200092, China

Hotel: Days Hotel Tongji Shanghai

50 Zhangwu Road, Shanghai 200092, China.

Tel: 86-21-33626888, Fax: 86-21-33626777



7. Post-meeting field excursion

A post-meeting field excursion to the nearby Suzhou City is scheduled on Feb. 02. Please indicate whether you will participate in the field excursion.

8. Local contact

Jun Tian (Director) Email: tianjun@tongji.edu.cn
Shouting Tuo Email: iodp_china@tongji.edu.cn
IODP-China Office
Tongji University, Shanghai

9. Workshop sponsors

IODP-MI
IODP-China
“South China Sea Deep” Program, NSFC
State Key Lab of Marine Geology, Tongji University

10. Application for participation and travel support

We encourage active participations from scientists and graduate students working on marine geology and geophysics, Asian geology, paleo-oceanography and paleo-environment, petrology and geochemistry, and hydrogeology and deep biosphere. Scientists from the surrounding countries of the South China Sea are particularly encouraged to apply. Travel and accommodation support will be provided to successful applicants. For logistical reasons, we could accommodate no more than 60 participants. Application deadline is December 22, 2011.

To apply for this workshop, please fill out this form and send it back to Chun-Feng Li (Email: cfl@tongji.edu.cn)
Shouting Tuo (Email: iodp_china@tongji.edu.cn)

Application form

First name	Last name	Affiliation	Postal address	Email and Telephone

Please identify your research interest _____.

Please include a brief vita outlining your educational background and research experiences.

Do you need an invitation letter for your visa? _____.

Will you participate in the 1-day field excursion on Feb. 02? _____.