Mar Geophys Res (2015) 36:99–100
DOI 10.1007/s11001-015-9257-9

EDITORIAL

Introduction to "tectonics and sedimentation of Southeast Asian continental margin and marginal seas"

Zhen Sun[1] · Chun-Feng Li[2] · Guo-Liang Zhang[3] · Hans Christian Larsen[2]

Published online: 9 June 2015

This special issue covers a range of topics in Southeast Asian marginal seas, including continental rifting, basin evolution, seafloor spreading, plate subduction, and associated sedimentation processes.

Two of the papers in this issue deal with subduction processes. Xia et al. (2015, this special issue) uses a 3-D seismic velocity model to quantitatively evaluate the distribution and degree of serpentinization and water contents of the forearc mantle wedge of Kyushu subduction zone. They suggest up to 12 % serpentinization, with the largest degree of serpentinization occurring at about 40–50 km depth. By examining the changes in radial seismic moment of earthquakes occurred in the Sumatra area, Lin et al. (2015, this special issue) show how intraplate stress state responded to the Great Sumatra–Andaman earthquake on 26th/December 2004.

The other works in this special issue mostly focus on marginal seas, especially the South China Sea and the Philippine Sea. The kinematic evolution of the West Philippine Basin (WPB) is controversial. In order to better understand the structure and evolution of the northwestern part of the WPB, Doo et al. (2015, this special issue) analyze the newly collected multi-beam bathymetry data and the records of seafloor magnetic anomalies of the West Philippine Basin and the Huatung Basin and, based on these interpretations, establish a new age model. They propose an age of between 47.5 to 54 Ma for the northwestern corner of the West Philippine Basin, and between 33 and 42 Ma for the Huatung Basin.

Interesting tectonic and sedimentation processes are revealed with the help of high-quality data processing. In a case study of pre-stack depth migration of seismic data in the South China Sea, Wang et al. (2015, this special issue) show high quality subsurface depth images from their data processing scheme. Through Pre-stack depth migration analysis of seismic profile NH973-01, Song and Li (2015, this special issue) identify two major unconformities, namely, the breakup unconformity (BRU) and the mid-Miocene unconformity, in the two conjugate margins of the Southwest Subbasin. They further discuss the dynamic transitional process from rifting to seafloor spreading.

During the early extension stage, the west continental margin of the South China Sea was affected by strike slip faulting along the Red River Fault zone. Zhao et al. (2015, this special issue) argues that the simple shear deformation in the west Qiongdongnan basin may have been controlled by the combined results of the left-lateral movement of the Red River Fault zone and the Cenozoic rifting along the northern continental margin of South China Sea. Liu et al. (2015, this special issue) propose that the Qiongdongnan Basin developed a structural shelf break in the rifting stage and a sedimentary shelf break in the post-rifting stage. During the post-rift stage, the Qiongdongnan Basin experienced a distinct tectonic reactivation since Late Miocene (11.6 Ma) (Mao et al. 2015, this special issue), and strong fault activity and rapid subsidence created a small subbasin with the formation of distinctive axial low topography and a central canyon. In the east part of the Pearl River Mouth

✉ Zhen Sun
zhensun@scsio.ac.cn

[1] Key Laboratory of the Marginal Sea Geology, South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou 510301, China

[2] State Key Laboratory of Marine Geology, Tongji University, Shanghai 200092, China

[3] Key Laboratory of Marine Geology and Environment, Institute of Oceanology, Chinese Academy of Sciences, Qingdao 266071, China

Basin, present deep water sedimentation is characterized by sediment waves (Qiao et al. 2015, this special issue).

In the southern continental margin of the South China Sea, Ding et al. (2015, this special issue) found that during the drifting stage (32–17 Ma), the Reed Bank area showed a decrease in subsidence rate, which facilitated the development of shallow water carbonates. They suggested that the delayed tectonic subsidence in the Reed Bank area might have been related to second order mantle convection under the rift.

Results of Wan et al. (2015, this special issue) on South China Sea spreading center showed a power law relationship between the permeability and magma migration channels, which can help better understand the formation and evolution of oceanic crust and evolution along the South China Sea marginal sea spreading center.