



Spreading Dynamics and Sedimentary Process of the Southwest Sub-basin, South China Sea: Constraints from multi-channel seismic data and IODP Expedition 349

Weiwei Ding (1), Jiabiao Li (1), and Peter Clift (2)

(1) Second Institute of Oceanography, SOA, Hangzhou, China, (2) Department of Geology and Geophysics, Louisiana State University, Baton Rouge, LA 70803, USA

Neotectonic and sedimentary processes in the South China Sea abyssal basin are still debated because of the lack of drilling evidence to test competing models. In this study, we interpreted four multi-channel seismic profiles across the Southwest Sub-basin (SWSB) and achieved stratigraphic correlation with new drilling data from Integrated Ocean Discovery Program (IODP) Expedition 349. Neogene sediments are divided into four stratigraphic units, each with distinctive seismic character. Sedimentation rate and lithology variations suggest climate-controlled sedimentation. In the late Miocene winter monsoon strength and increased aridity in the limited accumulation rates in the SWSB. Since the Pliocene summer monsoons and a variable glacial-interglacial climate since have enhanced accumulation rates. Terrigenous sediments in the SWSB are most likely derived from the southwest.

Three basement domains are classified with different sedimentary architectures and basement structures, including hyper-stretched crust, exhumed subcontinental mantle, and steady state oceanic crust. The SWSB has an asymmetric geometry and experienced detachment faulting in the final stage of continental rifting and exhumation of continental mantle lithosphere. Mantle lithospheric breakup post-dates crustal separation, delaying the establishment of oceanic spreading and steady state crust production.