



Mapping structures of the South China Sea; a synthesis

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The South China Sea margin has been the focus of scientific interest in the past decade including ODP and IODP drilling, oil and gas exploration, and projects from several international teams onshore and offshore. The South China Sea, because of its narrow V shape oceanic crust, the wide extension of its rifted continental crust, and the various styles of rifting is an interesting playground to study the formation of passive margins. We present a synthesis of the main characteristics of the SCS on a structural map focused on the Late Mesozoic and Cenozoic features. The basement, similar in China, Vietnam and part of the western Philippines is undifferentiated. The Mesozoic location of the area was on the upper plate of a subduction zone, resulting in an impressive coverage of Cretaceous granites sometimes separated by narrow Cretaceous molasse basins. These granitic bodies, widespread offshore in the extended crust conditioned the location of the extension via large detachments and normal faults; later cut by steeper faults. The geometries of the faults vary from E-W to NE-SW indicating that the rifting underwent several stages with different stretching directions and a varying degree of extension which ultimately exhumed the mantle. Some faults are low angle detachments and therefore surround the granitic/metamorphic basement structures with an E-W general trend. Platform and reef carbonates occupy some of the bathymetric highs and developed mainly during Late Oligocene to Mid Miocene times and during Late Miocene times. The map also illustrates the coverage of the different units of the NW Borneo wedge, which actually develops offshore in the SE SCS and shifts to the NW of the Sulu Sea. Onshore Borneo, the sub-aerial conditions for the NW Borneo wedge resulted in intense erosion and deltas formation.