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THE PALAEO TOPOGRAPHIC AND PALAEO DRAINAGE EVOLUTION OF THE SOUTH CHINA SEA HINTERLANDS FROM THE LATE CRETACEOUS TO RECENT.

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The tectonic complexity of Southeast Asia is clearly expressed in the modern hinterland topography and drainage of the region. Consequently, as the underlying tectonics has evolved, so to has the landscape. This has had major implications for the character and flux of clastics into downstream basins through time, which in turn affects hydrocarbon potential at the basin to prospect scale.

In order to help understand this complicated history, we have compiled a series of detailed plate tectonic and palaeoenvironmental reconstructions for the South China Sea region. Upon these maps we have built models of the palaeolandscape and palaeodrainage basins and river systems. The methodologies used in the mapping integrate a re-examination of the underlying structure and tectonics using GETECH's in-house gravity and magnetic data and expertise, with detailed palaeoenvironmental mapping that distinguishes between sediment source areas (regions above contemporary base-level, sensu Wheeler, 1964) and depositional sites (areas below contemporary base-level). By mapping regional base-level, we implicitly include an understanding of the dynamics of the landscape and the boundary conditions (climate, vegetation, rock type, etc). The method also provides the means whereby we can link the maps directly to sequence stratigraphy, with the ultimate aim of developing fully dynamic palaeolandscape models. Topography is then added to these maps through comparison with the elevational distribution of comparable Recent tectonic regimes, fission track, hypsometric analysis and other palaeoaltimetry, sedimentological and provenance data where available.

For Indochina and South China, the maps reveal a complicated history of uplift, erosion and river capture that is manifest in the changing sediment fluxes to the offshore basins, with major rivers such as the Mekong, Red and Pearl only developing their modern topology by the Late Miocene.

This talk will discuss the methods used to generate the maps and show some examples of this work. We will also demonstrate how we are developing methods to provide detailed insights into sediment generation and distribution through the petroliferous basins of SE Asia.