



Tectono-sedimentary characteristics from a rifting margin to an incipient collision zone: Seismic Implications from the case in northeastern South China Sea (Taiwan orogen)

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As sedimentary processes change with tectonic evolution, stratigraphic records reveal the sedimentary history of an ocean basin. The shrinking basin between the northeastern slope of South China Sea and Taiwan orogen becomes a good case for studying the life of a basin which recorded its geological history from opening to closure. Study with our multi-channel seismic data, sedimentary layers in this area can be separated into syn-rift, post-rift, synorogenic deposits. Post-rift deposit reflects the more typical deposition of a passive margin on rifted South China Sea margin. However, syn-orogenic deposits are further divided into “pre-wedging” and “syn-wedging” units in terms of their sedimentary characteristics. The pre-wedging deposits are deposited in front of the wedge (on top of post-rift deposits), reflecting a less confined deepwater environment where the large submarine fans are easy to develop. On the other hand, the syn-wedging deposits on top of the wedge reflecting the structurally-controlled environment with decreasing accommodations and increasing slope gradient where orogenic sediments are mostly bypassed through incised canyons or deposited in the developing piggyback basins as growth strata. For the modern basin, temporal sedimentations under different environments present side by side, including post-rift sedimentation, pre-wedging sedimentation, and syn-wedging sedimentation. Once the depositional environment shifts, the sedimentations move basinward to where the former units stop developing. For example, the sedimentary layers in front of the orogenic wedge are accreted, the uplifted pre-wedging unit is partially eroded by submarine canyons and the developed piggyback basin accommodates the syn-wedging unit. From the case of northeastern South China Sea Basin, we suggest a vertical tectonostratigraphic succession showing depositional environment changes from open to incipient closure, consisting of basement (oceanic crust or continental rifts), syn-rift unit, post-rift unit, pre-wedging unit, and syn-wedging unit, from bottom to top.