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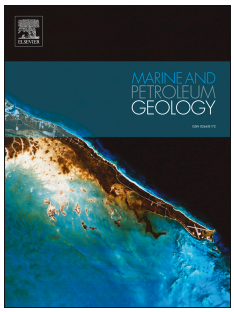

Geometry, internal architecture, and evolution of buried volcanic mounds in the northern South China Sea

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Geometry, internal architecture, and evolution of buried volcanic mounds in the Northern South China Sea

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Abstract: High-resolution seismic and borehole data were used to characterize a volcanic mound in the northern South China Sea, including its internal architecture, lithological characteristics and evolutionary history. On seismic profiles, the mound shows a convex geometry similar to an isolated carbonate buildup. It was therefore previously seen as a carbonate buildup and a significant hydrocarbon target until an industrial well BY7-1 proved its volcanic nature. Ten seismic facies are identified to analyze the internal architecture of the mound under the constraint of borehole data. Petrologic analysis based on cuttings and thin sections reveals that the mound is composed of volcanic tuffs, siliciclastics, carbonates, and basalt layers. Depositions and architecture of the mound are interpreted as a result of an interplay between tephra accumulation during volcanic eruptions, wave-induced re-deposition of volcaniclastics when the volcanic mound emerged above sea level, and subsequent siliciclastic/carbonate deposition when the volcanic mound was flooded during the phases of volcanic quiescence. Furthermore, the correlation of seismic and well data allows us to reconstruct the entire evolutionary history of the mound from its