

**An investigation of the sedimentary characteristics of resurge facies, Wetumpka marine impact structure, central Alabama.**

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Many marine impact craters have interior, crater-filling breccias of high permeability and porosity and are potentially self-sealing with the deposition of the resurge facies, a fine-grained unit characteristic of many marine impacts. Therefore, marine impact craters may be an ideal hydrocarbon reservoir within a petroliferous basin. However, the stratigraphic, sedimentologic, and genetic parameters of the aqueous resurge facies in such craters are not fully understood, particularly those formed in shallow marine settings.

Located in central Alabama, the well-preserved and surficially exposed Wetumpka shallow-marine impact structure is a good field laboratory to study both the sedimentary crater-filling breccias and fine-grained resurge facies. Formed during the deposition of Upper Cretaceous Mooreville Chalk, the Wetumpka marine impact structure has a mixed-target stratigraphy of crystalline bedrock, Upper Cretaceous unconsolidated sediments, and 30-100 meters of water depth. Utilizing a shallow drill-core of ~ 100 meters, crater-filling mega-slumped sands and their overlying glauconitic, calcareous mudstone resurge unit have been studied in detail. This paper reports on the on-going sedimentologic and stratigraphic investigation based on core description, adjacent outcrop description, thin-section petrology, and x-ray computed tomography. Preliminary results from x-ray computed tomography of cores have revealed internal, inclined bedding structures, brecciation of penecontemporaneous sea floor mud clasts, and other features that are revealing the hydrodynamic genesis of these deposits. This will allow better understanding of the mode of emplacement of the impact-derived, fine-grained capping unit at Wetumpka.