Early Modification Stage Emplacement of Shallow Crater-Filling Units, Wetumpka Impact Structure, Alabama

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ABSTRACT

Wetumpka, Alabama is the site of a 5 km diameter, Late Cretaceous, marine-target impact structure located on the inner part of the Gulf Coastal Plain of Alabama. During Late Cretaceous, Wetumpka was situated offshore from a barrier-island shoreline, and the impact target was the shallow continental shelf area in the northern reaches of the Gulf of Mexico. The submarine target material consisted of Upper Cretaceous sediments that were unconformably overlying weathered Piedmont schists and gneisses. This paper focuses on the nature of and emplacement order of crater-filling sediments along a geologic half-transect (a shallow cross section from rim to center) through the northwestern interior of the impact structure. In order from northwest to southeast, the half-transect includes deformed crystalline rim terrain, a zone of crystalline megablocks and sedimentary target megablocks, a highly deformed and overturned stratigraphic sequence of (interpreted as a massive trans-crater slide unit composed of intact sedimentary block units), interior polymict impact breccia beds, and resurge chalk deposits. Analysis of cores drilled near the transect line indicates that sedimentary target megablocks and impactite sands of mixed provenance occur below exposed sections of the trans-crater slide unit and that resurge chalk deposits rest upon all other units in the crater fill. The relative timing of the crater-filling units is related to a sequence of formative events during the early modification stage of crater formation. All units studied likely represent the last few minutes during Wetumpka's early modification stage.

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