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## Wetumpka Impact Structure, Alabama, and its Impact Ejecta

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### ABSTRACT

Wetumpka impact structure, Alabama, is an inner coastal plain, marine-target impact feature that formed during Late Cretaceous. The target material of this 4.5 mi (7.2 km) diameter impact crater consisted of (in reverse order): a shallow water layer; the lower part of the unconsolidated Upper Cretaceous Mooreville Chalk; unconsolidated Upper Cretaceous Eutaw Formation paralic sands and clays; unconsolidated fluvial facies of the Upper Cretaceous Tuscaloosa Group; and underlying hard, crystalline, pre-Cretaceous basement metamorphic rocks. During the excavation stage of the impact, shocked and melted rocks and minerals were ejected from depths up to about 0.4 mi (0.6 km). Some of the larger ejecta fell within a few crater radii of the impact upon the Late Cretaceous sea floor. Significant volumes of these ejecta were washed back into the impact structure (accompanying a violent return of displaced sea water) following collapse of the southern rim of the impact structure, where we have recovered them. According to the ejecta scaling law, finer ejecta were likely transported many kilometers away, and fell into the adjacent sea and on the coastal lowlands. In a drill core from Dallas County, Alabama, some 45 mi (72 km) away, sediments of the lower Mooreville Chalk, specifically from the upper part of biozone CC16, contain shocked quartz grains (i.e., impact-affected quartz grains), which compare favorably with shocked quartz grains in proximal Wetumpka ejecta and in the crater filling materials. Because these distal, impact-affected quartz grains are at the proper stratigraphic position consistent with the age of the Wetumpka impact—and in view of the lack of other known craters of this age in the area—we infer that these shocked grains are in fact ballistic ejecta from the Wetumpka impact.

King, D. T., Jr., and L. W. Petruny, 2010, Wetumpka impact structure, Alabama, and its impact ejecta: Gulf Coast Association of Geological Societies Transactions, v. 60, p. 369-377.