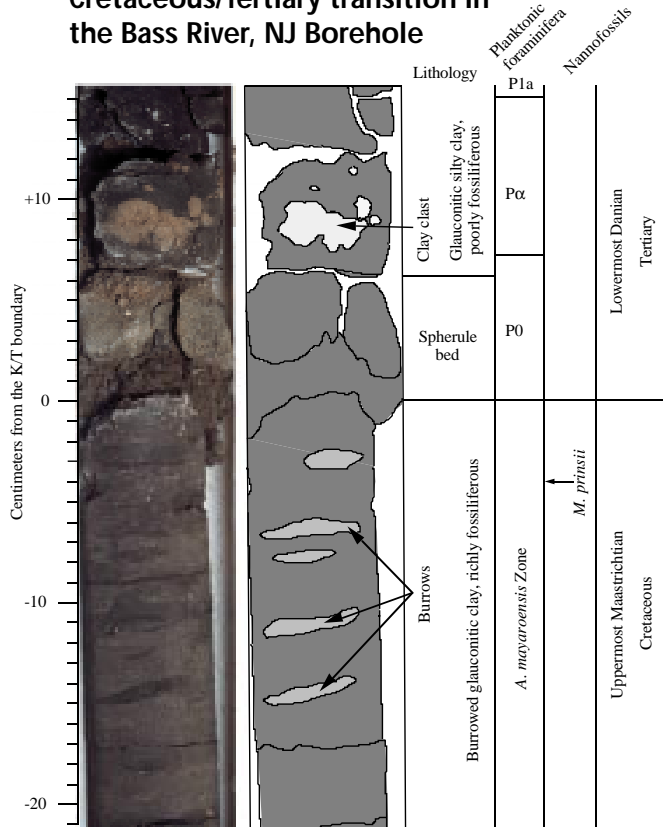


# Ejecta layer at the K/T Boundary, Bass River, New Jersey

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## Cretaceous/Tertiary transition in the Bass River, NJ Borehole



Bass River borehole K/T boundary core showing spherule layer separating uppermost Maastrichtian and lowermost Paleocene and microfossil biostratigraphy. Note burrows in the Maastrichtian and clay clasts in the lower 6 cm of the Paleocene.

In November 1997, the New Jersey Coastal Plain Drilling Project (NJCPDP) recovered a continuously cored Cretaceous-Tertiary (K-T) succession at Bass River, New Jersey. The NJCPDP is a joint effort of the Continental Scientific Drilling, ODP (designated Legs 150X and 174AX), the National Science Foundation (Earth Science Division, Continental Dynamics Program, and Ocean Sciences Division, Ocean Drilling Program), the U.S. Geological Survey, and the New Jersey Geological Survey. A 6-cm-thick spherule layer of ejecta occurs immediately above the boundary. Below the spherule layer, the Cretaceous glauconitic clay is extensively burrowed and contains the uppermost Cretaceous (Maastrichtian) *Micula prinsii* calcareous nannofossil zone. Spherical impressions of spherules (altered tectites) at the top of the Cretaceous indicate soft-sediment deformation and nearly instantaneous deposition of ejecta from a bolide impact at Chicxulub, Mexico. The upper centimeter of the spherule layer contains shocked quartz and may represent in part the "impactor-rich-layer" layer. This is the thickest ejecta layer yet found north of the Gulf of Mexico and it shows clearly that a single impact occurred precisely at K-T boundary time. The occurrence of a 6-cm-thick spherule layer at Bass River is consistent with the southeast low-angle impact hypothesis for the Chicxulub impactor [Schultz and D'Hondt, 1996]. Above the spherule layer, the glauconitic clay contains the lowermost Tertiary (Danian) planktonic foraminiferal and dinoflagellate zones, indicating: 1) a complete K-T succession and 2) continuous deposition interrupted only by fallout of the ejecta layer. Clay clasts containing Cretaceous microfossils occur within a 6 cm interval above the spherule layer and may be rip-up clasts from an impact-generated tsunami or possibly a megastorm event related to the impact. Extinction of the Cretaceous planktonic foraminifers and burrowing organisms occurs abruptly at the K-T boundary. Thus, the Bass River K-T succession unequivocally links the Chicxulub bolide impact to the mass extinctions at the end of the Mesozoic.

### Reference

Schultz, P. H., and S. D'Hondt, Cretaceous-Tertiary (Chicxulub) impact angle and its consequences, *Geology*, 24, 963-967, 1996.