

Chicxulub Impact Scientific Drilling Project, Yucatan, Mexico

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Impacts of extraterrestrial bodies on Earth, although not frequent, represent important geological processes in the evolution of our planet. Continuous scientific sampling of major impact structures, from cover rocks to target material, has not been previously performed. The first deep scientific drilling and coring of the largest well-preserved impact structure on Earth was executed in the 65 Myr old Chicxulub Crater in Mexico in 2002 with funding from the International Continental Scientific Drilling Program, ICDP.

An integration of rotary drilling techniques and wireline coring technology was applied to drill the 1510 m deep Yaxcopoil-1 well some 40 km SW of Merida, Yucatan. During the course of the project, 900 m of continuous cores were recovered including the transition of post-impact rock to reworked ejecta (~800 m) and the transition from impact-generated rock to target material (~900 m). Coring was complemented by geophysical logging with a set of ICDP slimhole tools. All digital data sets including drilling parameters, detailed sample descriptions and 360° core images were distributed directly via Internet and stored in the ICDP Drilling Information System.

Cores and geophysical data reveal an unexpected thin impact rock layer of 100 m thickness covering the rim of the inner crater. However, the target rocks below show features and melt rock veinlets pointing to large megablock structures as well as a long thermal and fluid transport post-impact history.
