Organic geochemistry of the crater-fill sediments from Boltysh impact crater, Ukraine

Conference or Workshop Item

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The Boltysh impact crater, is a complex structure formed on the basement rocks of the Ukrainian shield which has been dated at 65.17±0.64 Ma [1]. The Boltysh crater has been know for several decades and was originally drilled in the 1960s - 1980s in a study of economic oil shale deposits. Unfortunately, the cores were not curated and have been lost. However we have recently re-drilled the impact crater and have recovered a near continuous record of ~400 m of organic rich sediments deposited in a deep isolated lake which overlie the basement rocks spanning a period ~10 Ma.

At 24km diameter, Boltysh will not have contributed substantially to the worldwide devastation at the end of the Cretaceous. However, the precise age of the Boltysh impact relative to the Chicxulub impact and its location on a stable low lying coastal plain which allowed formation of the post-impact crater lake make it a particularly important locality. After the impact, the crater quickly filled with water in a short marine phase but returned to fresh water which persisted for >10Ma [2]. These strata contain a valuable record of Paleogene environmental change in central Europe, and one of very few terrestrial records of the KT event. This pre-eminent record of the Paleogene can help us to answer several related scientific questions including the relative age of Boltysh compared with Chicxulub, recovery from the impact, and later climate signals.

The organic geochemistry and playnology indicate main inputs to be algal and higher plant within most of the core although there are some marked changes in inputs in some sections. A number of carbon isotope excursions are also present within the core which are currently being further investigated.

[1] Gurov, E.P. *et al*. (2006). In: Cockell, C. *et al*., (Eds.), *Biological Processes Associated with Impact Events*, Spinger-Verlag, Berlin pp. 335-358. [2] Kelley, S.P., Gurov, E. (2002) *Meteorit. Planet. Sci.* 37, 1031–1043.