



## Lake El'gygytyn Drilling under way: State of the operation and first results

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Lake El'gygytyn, located in central Chukotka, NE Siberia, was formed 3.6 million years ago by a meteorite impact and has never been glaciated or desiccated. This makes Lake El'gygytyn a unique target of an interdisciplinary, multi-national drilling campaign, which currently is carried out as part of the International Continental Drilling Program (ICDP).

Drilling operations started in Nov./Dec. 2008, when a 142 m long sediment core was retrieved from the permafrost deposits in the western lake catchment by the local drilling company Chaun Mine Geological Company (CGE). The core penetrated coarse-grained, ice-rich alluvial sediments with variable contents of fine-grained material. It will be investigated for the environmental history, including potential lake-level changes, and the permafrost characteristics, in order to learn more about the influences of catchment changes on the lake sedimentation. Besides, the hole was permanently instrumented for future ground temperature monitoring as part of the Global Terrestrial Network for Permafrost ([www.gtnp.org/index\\_e.html](http://www.gtnp.org/index_e.html)).

The major drilling effort will commence in Febr. 2009, when two sites in the central part of Lake El'gygytyn shall be drilled down to 630 m below the lake floor. Drilling will be carried out by DOSECC, using a new GLAD 800 system that will be operated from an enclosed platform on the lake ice. Drilling objectives include replicate overlapping cores from the up to 420 m thick lake sediment fill. The cores promise to yield the longest, most continuous record of climate change in the terrestrial Arctic, extending back one million years prior to the intensification of the Northern Hemisphere Glaciation at the Pliocene/Pleistocene boundary, thus offering unique insight into the climatic and environmental history of the Arctic and its comparison with records from lower latitude marine and terrestrial sites to better understand hemispheric and global climate change. Coring shall be continued up to 300 m into the underlying impact breccia and brecciated bedrock in order to additionally investigate the impact process and the response of the volcanic bedrock to the impact event.

The field season will continue into May, when surface melting on the lake will push to start evacuation of the drill rig. In summer 2009, the cores will be flown by chartered cargo plane to St. Petersburg. Later they will be trucked to the University of Cologne, Germany, for sub-sampling starting in September by the international team and their students. The archive core halves will be shipped to the University of Minnesota LacCore Facility in the US for post-moratorium studies.

This talk will provide an introduction into the drilling objectives, summarize the first conclusions that can be drawn from the field data, and outline the next steps towards multidisciplinary investigation of the core material by the international science team.