Lake Suigetsu 2006 Varved Sediment Project (SG06): Outline and Important Early Outputs

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Whether the late Quaternary abrupt climate changes were globally synchronous or not is a key question of today’s palaeoclimatology, as it provides important information about triggers and responses to climate change. In order to answer this question, it is essential to have well temporally-constrained, high-resolution climate reconstructions from different regions, and correlate these using reliable tools. Suitable archives for such comparison, however, are generally very rare.

The “Lake Suigetsu 2006 varved sediment project” is aiming to provide a reliable template for both chronology and climate changes. In 2006, a > 70 m long, continuous sediment core was recovered from the lake using four overlapping, parallel bore-holes. The
core spans the last ca. 150 kyr, and the top ca. 40 m of the core (ca. 70 kyr) is annually laminated (varved). The sediment also contains a significant number of terrestrial tree leaf fossils and tephra layers (including invisible ones). Annual laminations were counted using two independent methods (XRF and X-radiographic scanning, and thin section microscopy) to establish an independent chronology for the core. More than 600 radiocarbon dates were measured on purely terrestrial leaf fossils from the core. The radiocarbon dataset was further combined with > 300 existing radiocarbon dates from a previous core from the lake (SG93). Pollen analysis, diatom analysis, XRF elemental analysis, biomarker analysis, and biogenic isotope analysis are being conducted to infer palaeoclimatic indices at decadal to sub-annual resolution. Tephra analysis is trying to establish correlation between Lake Suigetsu and marine cores (and possibly with ice cores, too).

In the oral presentation we will report outcomes of the last 4 years’ endeavour. Special emphasis will be given to the timing of climate changes from the Lateglacial to the early Holocene transition, and the implications of the extended terrestrial radiocarbon dataset.