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DATED – A dating Database and GIS-based Reconstruction of the Eurasian Deglaciation

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The chronology and pattern of the deglaciation of the Eurasian ice sheet is of key importance for Late Quaternary environments, on a local scale as well as globally. The increasing resolution of glacier and climate models demands detailed information about the deglaciation on a calendar year time scale in a digital format. This is the rationale for the ongoing project DATED, which is aimed to serve as a primary source of information about the ice growth towards LGM and the following deglaciation of the Eurasian ice sheet. Data compiled from the literature is presented as a Geographical Information System (GIS) containing digitized ice margins and other features relevant for the deglaciation reconstruction. The GIS is coupled to a relational database containing deglaciation dates with geographic coordinates and stratigraphic information. The DATED database can thus be searched using any criteria, such as author, time period or geographic extent, or combinations thereof. The area comprised in DATED includes all land and sea areas covered by the NW-Eurasian ice sheets. The dating database is referred to as the Database on Eurasian Deglaciation Dates (DATED 1) and the GIS as the Digital Atlas of the Eurasian Deglaciation (DATED 2). DATED will be successively updated, and the first version of will be published and made available on the internet in 2007.

The database is aimed to contain all available dates of the Eurasian deglaciation, based on radiocarbon (^{14}C), optically stimulated luminescence (OSL), thermoluminescence (TL), cosmogenic exposure (e.g. ^{10}Be, ^{36}Cl), and clay varve records. In order to include ice growth towards the LGM, the older limit of the database is set to dates of the preceding interstadial at about 40 kyr BP. All dates in the database are also given in a calibrated format (representing calendar years), using INTCAL04 where applicable.

A critical evaluation of all data is done as it is entered into the database, where dates considered less reliable are flagged rather than omitted, in order to enable future re-evaluation. In areas where the ice margin locations are unclear or in conflict, the original margins are edited to construct a consistent and glaciologically plausible pattern in the GIS. The edited lines are stored separately in the GIS, with thorough referencing. This editing is performed in collaboration with the relevant authors, using additional stratigraphic information, satellite images, and high-resolution digital elevation models.

The main purpose with DATED is to serve as an updated source of interpreted ice margins and dates for the growth and decay of the most recent Eurasian ice sheet, in order to provide accurate digital maps with calendar year isochrones to modelers and other researchers. It will also provoke new research by showing where data is lacking, and will facilitate re-interpretation of the deglaciation pattern. This task is a part of the British-Dutch-Norwegian co-operative project Ocean Reconstruction and Modelling of the European deglaciation (ORMEN).