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A preliminary meltwater deglaciation chronology for the Northern Hemisphere: the central role of Arctic discharge

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In order to better understand the dynamical processes involved in abrupt climate change during glacial periods, the time dependence of meltwater and iceberg discharge is generally assumed to be of paramount importance. Evaluation of the strength and geographic distribution of this forcing requires a detailed meltwater and iceberg discharge chronology. To this end we have derived and will present a full deglacial discharge chronology (complete with error bars) for the Northern Hemisphere. The chronology combines the results of an on-going calibration of a model of North American deglaciation, a previously calibrated Greenland ice-sheet model, and a 500 member ensemble of model runs for the Eurasian ice-sheet complex scored against a large set of relative sea level data. Meltwater drainage is computed self-consistently using a diagnostic down-slope drainage and water storage solver. Comparison against climate records of the disaggregated meltwater and iceberg discharge chronologies during the meltwater pulse 1a and Younger Dryas episodes underlines the critical climatic impact of discharge into the Arctic ocean.