

Global ice volume and climate changes during the last 50,000 years

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Sea-level data from seven different regions have been used to estimate the global change in ocean and ice volumes for the time interval leading into and out of the Last Glacial Maximum (LGM). The estimates are earth-model dependent and parameters are chosen that minimize discrepancies between the individual estimates for each region. Good coherence between estimates from different localities has been found. The main conclusions are: (i) Ice volumes approached their maximum values 30,000 (calendar) years ago and remained nearly constant until 19,000 years ago. This defines the LGM. (ii) The post LGM sea-level rise is marked by changes in rates with maximum rates of about 15mm per year occurring from 16,000 to 12,500 years ago and again from 11,500, to 9,000 years ago. Ice volumes in the interval between these two periods of rapid rise, corresponding to the Younger Dryas, is nearly constant. (iii) The melting at the end of the LGM is characterized by an initially high rate over about 500 years followed by a sea-level fall of about 50 m occurring within a few thousand years. Similar rates of falling and rising sea levels occur during the earlier part of the oxygen isotope stage 3 interval.