

Step-like Rise of Post-Glacial Sea Level and Geological Implications

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Abstract: Post-last glacial maximum (post-LGM) sea-level transgression was punctuated by six relatively short flooding events that collectively accounted for more than 90 m of the 120-m rise. Annual sea-level rise during the two major flooding events (MWP-1A and 1B, 14.3-14.1 and 11.6-11.4 calendar ka BP, respectively) averaged ~60-80 mm/yr, compared to 2-3 mm/y during periods of slow transgression. Most (but not all) of the floodings appear to correspond with paleoclimatic events recorded in Greenland and Antarctic ice-cores, indicative of the close coupling between rapid climate change, glacial melt, and corresponding sea-level rise.

The punctuated transgression produced a series of rapid flooding surfaces on shelves. During MWP-1A (14.3-14.1 ka BP), for example, sea level on the epicontinental East China and Yellow seas transgressed horizontally more than 2000 m/yr, compared to < 25 m/yr before and after. Seismic and chronostratigraphic evidence of two prominent flooding surfaces on the Kiso River delta (southern Japan) correlate with MWP-1B and 1C; delineating other post-LGM examples will require long cores that penetrate flooding surfaces identified in high-resolution seismic profiles.