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## Evidence for Holocene ice sheet history from geomorphology, cosmogenic isotopes, and bird vomit, East Antarctica.

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The post-LGM thinning history of the East Antarctic Ice Sheet is not yet well constrained. Here we report some integrated observations and analyses that constrain the ice sheet thinning history in Western Dronning Maud Land and Coats Land, adjacent to the easternmost Weddell Sea, which is a key area of uncertainty in ice sheet reconstructions. Geomorphological observations show a distinct series of weathering zones with fresh erratics only found in a relatively narrow zone above the present ice sheet margin. We report cosmogenic surface exposure dates of erratics in the different weathering zones, using <sup>10</sup>Be and in situ <sup>14</sup>C. We further report a large number of radiocarbon ages on sub-fossil bird vomit (regurgitated proventricular stomach oil, sometimes termed 'mumiyo') from nesting snow petrels (*Pagodroma nivea*) which record periods of ice sheet absence. Together these analyses allow us to determine a more tightly constrained thinning history of the ice sheet in this sector. We discuss the implications of this thinning history for geologically-based ice sheet reconstructions and for ice sheet models.