

Supplement of

**Historical black carbon deposition in the Canadian High Arctic:
A 190-year long ice-core record from Devon Island**

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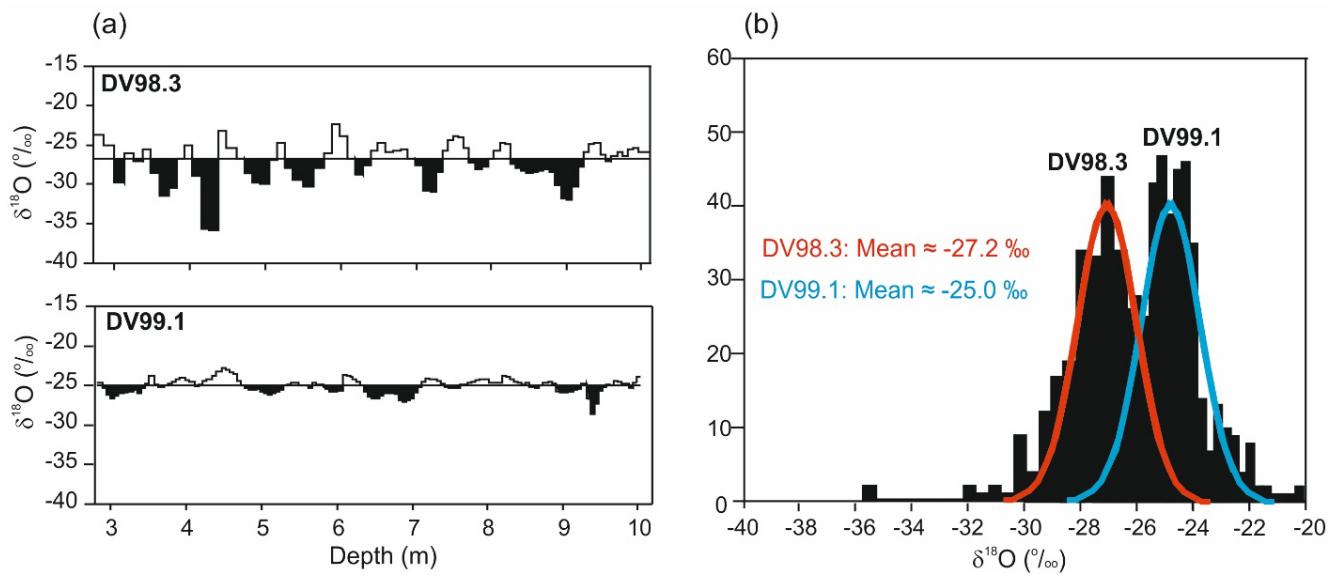


Figure S1: (a) Compared $\delta^{18}\text{O}$ profiles in two shallow sections of the DV98.3 and DV99.1 cores from Devon ice cap, showing the attenuation of seasonal variations in the DV99.1 core relative to the DV98.3 core. (b) Overlaid histograms of $\delta^{18}\text{O}$ values in the core sections shown in (a), with Gaussian models fitted to each. The mean $\delta^{18}\text{O}$ in the DV99.1 core is $\sim 2 \text{ ‰}$ "warmer" than in the DV98.3 core, presumably owing to preferential wind scouring of winter snow layers.

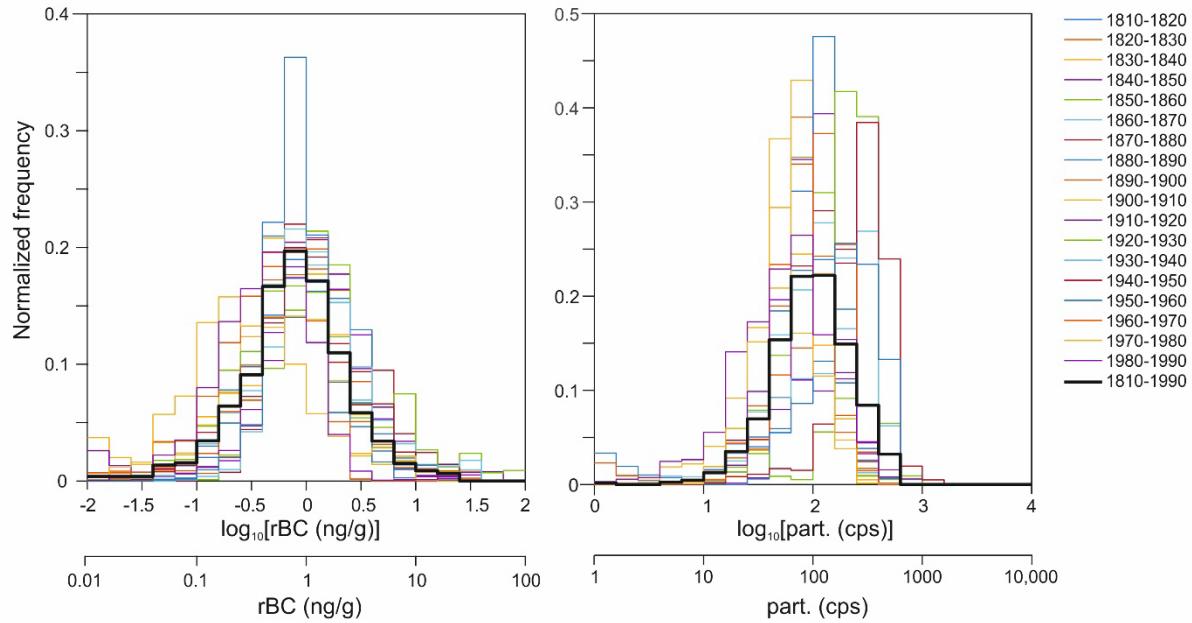


Figure S2: Histograms of rBC and microparticles measured in the DV99.1 core. Bold lines are composite histograms for the entire 190-year record. Note that in this figure, the microparticle data are shown in raw counts per seconds (cps).

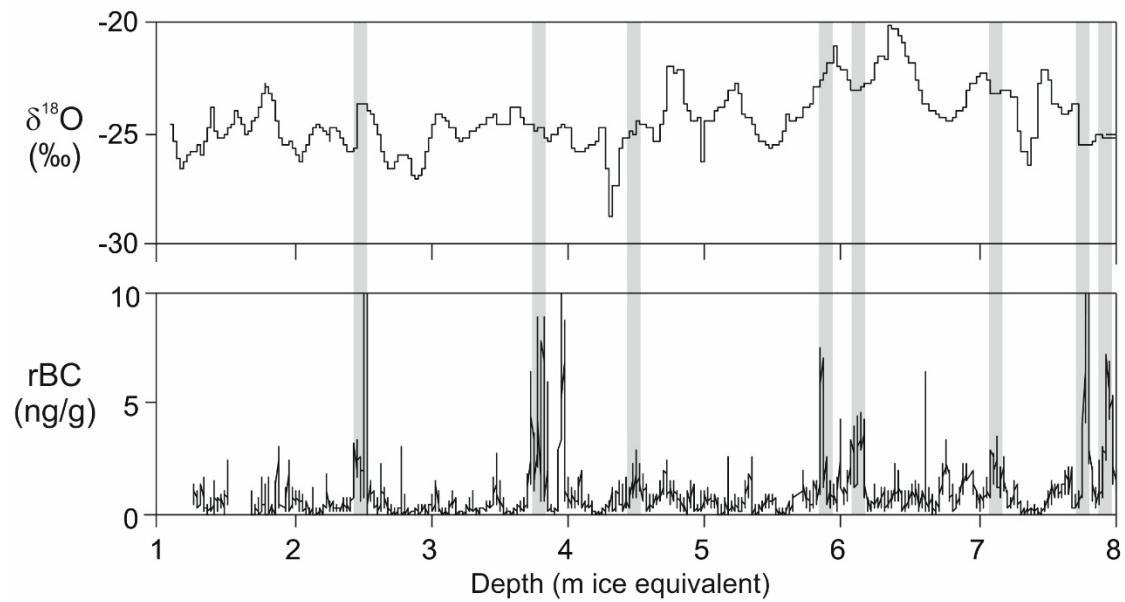


Figure S3: Variations of $\delta^{18}\text{O}$ and rBC concentration measured in the uppermost 8 m (ice-equivalent) of the DV99.1 core. Some of the most outstanding peaks in rBC concentrations are highlighted by grey shading.

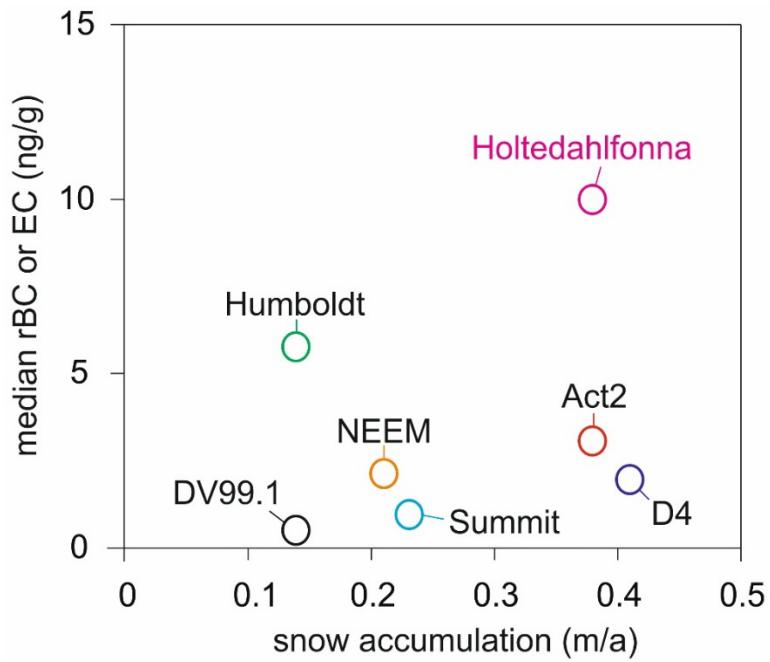


Figure S4: Scatter plot of median rBC or EC concentrations in firn and glacial ice vs. mean snow accumulation rates over the period ~1960-1990 at the Arctic sites shown on Fig. 5. Data sources for rBC and EC: McConnell *et al.*, (2007), Koch *et al.* (2011), Zennaro *et al.* (2014), Ruppel *et al.* (2014) and Sigl *et al.* (2015). Data sources for snow accumulation rates: Banta and McConnell (2007) and Bales *et al.* (2009).

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