

Interactive comment on “Younger Dryas ice-margin retreat in Greenland, new evidence from Southwest Greenland” by Svend Funder et al.

R.B. Alley

rba6@psu.edu

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This is a fascinating paper, and the authors are to be congratulated. The possibility is important that the new data document oceanic effect of warm subsurface waters on grounding zones during the Younger Dryas. Please note, though, that retreat during the middle and late Younger Dryas (which the bulk of the ages from this paper support) is also consistent with control by surface temperature as recorded in ice cores. Many proxy records of temperature in Greenland, including the deep ice cores, show a relatively large, rapid cooling at the start of the Younger Dryas, then gradual warming (with some oscillations) through the Younger Dryas, and a sharp rise at the end. The simplest translation of that record into ice-marginal position assuming rapid response to temperature yields net retreat during the Younger Dryas (the modeling by

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Vacco et al., 2009, doi:10.1016/j.quascirev.2008.04.018 provides examples of how this behavior can occur). Young et al. (2019, 10.1130/G46058.1) found moraines from land-terminating glaciers dating from within the Younger Dryas in the Ahklun Mountains of southern Alaska, and citations therein point to similar behavior elsewhere. It is thus likely that additional data or models will be required to separate the influence of air temperature from ocean temperature.

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