

Interactive comment on “Atmospheric gas records from Taylor Glacier, Antarctica, reveal ancient ice with ages spanning the entire last glacial cycle” by Daniel Baggenstos et al.

T. Sowers (Referee)

tas11@psu.edu

Received and published: 28 March 2017

This paper is very well written and should be published with minor revisions. In general, the length of the paper was a bit excessive but warranted I think in this case, as it presents the first overall survey of the Taylor Glacier mining expeditions and results.

Couple of thoughts came to mind in reviewing the discussion of Figure 6. First, the $\delta^{18}\text{O}_{\text{atm}}$ data is superb in the agreement with WAIS. This makes for a very convincing stratigraphy. However, the CH_4 data is less impressive. For the bulk of the glacial period, TG CH_4 data are elevated above WAIS. But, during the transition, TG CH_4 data are lower than WAIS for the most part (Bolling/Alerod and PreBoreal for sure). What is the significance of this apparent mismatch and how important is this in constructing

C1

the stratigraphy?

The end of the “easily interpretable stratigraphy” seems to be 47ka. There you have a single point (around 13km) where the CH_4 value is high, the $\delta^{18}\text{O}_{\text{atm}}$ is Ok but the $\delta^{15}\text{N}$ value is very low (~ 0.07). I’d argue that this particular sample is the beginning of the unconstrained region where more work is needed to verify the integrity of the record down to the terminus. I think it would be fair to place a vertical dashed line at 47ka denoting the switch from well constrained stratigraphy to the dark side.

Interactive comment on Clim. Past Discuss., doi:10.5194/cp-2017-25, 2017.

C2