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The Cryosphere Discussions

Interactive comment on "Net accumulation rates derived from ice core stable isotope records of Pío XI glacier, Southern Patagonia Icefield" *by* M. Schwikowski et al.

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Schwikowski et al. provide a valuable multi-year accumulation record from a core record from a location that has defied measurement of this nature to date. This is a valuable contribution. The comments below are mainly looking for reference to work completed in Alaska and British Columbia that are likely the best region for comparison. More detail on the frequency of ice layers during specific years and the overall distribution of thicknesses would be valuable.

Specific Comments

5293-7: Should mention the tidewater glacier cycle. This cycle leads glaciers to be

relatively insensitive to climate during portions of the cycle (Meier and Post, 1987). In Alaska today Taku and Hubbard Glacier, neither surging, are at maximum positions while most of their neighboring glaciers have experienced exceptional retreat (Ritchie et al., 2008; Pelto et al., 2008).

5297-11: It would be useful to identify the distribution of ice layer thickness through the core. Did the number of layers differ greatly between different years?

5298-3: Given the timing of the drilling late in the winter season would this lead to the just below 0 C temperature, and would this rise to 0 c during the melt season? This has been observed in the accumulation zone of several Alaskan glaciers to be the case.

5298-10: What percentage of the surface melt is refrozen, all of it?

5299-2: Regarding Figure 4, the proposed attribution of annual layers is simply based on derived time scale. This is fine, but does the annual layer thickness results differ if instead the thickness is measured from maximum value to maximum value?

5300-15: Any idea why there four and not six maxima for the pollen records, and each is missing during different years?

5300-25: Put this in context of other maximum accumulations noted. In southeast Alaska another region that can compete for the wettest-snowiest Rasmussen et al (2011) noted maximum depths of on Columbia Glacier of 4-5 meters. Pelto and Miller (1999) noted maximum depths on Taku Glacier of 4 m. It is important to relate your core results to the results from Mount Waddington BC (Neff et al., 2012). They observed similar accumulation to those reported here and also a seasonal isotope signal. This makes the observations exceptional as is expected. How do your results differ from Waddington?

5301-7: Why is the observed net accumulation considered a lower limit? The site was selected to have less wind erosion than typical. Wind erosion is a key process that impacts snow accumulation and only be avoided in relatively few selected locations,

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that would likely not be representative.

5301-20: Date range of temperature maximum?

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