

## ***Interactive comment on “U-Th and $^{10}\text{Be}$ constraints on sediment recycling in proglacial settings, Lago Buenos Aires, Patagonia” by Antoine Cogez et al.***

**Anonymous Referee #2**

Received and published: 5 October 2017

This manuscript present some interesting cosmogenic and U-series isotope data. While the combination is interesting, it seems that isotopic systems are used independently with little overlap. Cosmogenic isotopes were used to date the moraines on the one hand, and U-series to infer information about sediment transport on the other hand. It almost reads like 2 independent manuscripts. While I command the authors' efforts, and this work should of course eventually be published, there are many aspects that the authors may want to consider, and which significantly affect how the U-series data are interpreted. I provide detailed comments in the PDF attached but the main points are that: - the fractal correction is possibly not needed and result in an underestimation of recoil fractions. As a result, the authors explore a more complex

C1

(but less constrained) model (previously proposed by Scott et al. in the early 1990's, but also more recently re-introduced). A simple way to test this is to look at the type of isotherms obtained during BET analysis. Only a mesoporous would require the fractal correction to be invoked. I think Lee investigated this but as far as I know this is unpublished, but the authors may want to consider this point. - while the weathering model is presented, there is a lack of details on how it is solved, and what justifies the assumption made in the model (e.g. same 'recycling time' and weathering intensity for all samples? why? this record cover a very variable period of Earth's history). I only recommend rejection because I believe the extent of revisions to be undertaken is large, but a new manuscript should be submitted, taking into consideration the comments above and in the document attached.

Please also note the supplement to this comment:

<https://www.earth-surf-dynam-discuss.net/esurf-2017-45/esurf-2017-45-RC2-supplement.pdf>

---

Interactive comment on Earth Surf. Dynam. Discuss., <https://doi.org/10.5194/esurf-2017-45>, 2017.

C2