

## ***Interactive comment on “Modeling the statistical distributions of cosmogenic exposure dates from moraines” by P. J. Applegate et al.***

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Again, we thank Reviewers #1 and #2 for reading the paper and for their insightful comments. We will use these comments to improve the manuscript.

Both Reviewers #1 and #2 commented on the scientific significance of the manuscript, as required by the Manuscript Evaluation Criteria of GMD. Reviewer #1 felt that the material on estimating moraine ages from cosmogenic exposure dates was of wider interest than the remainder of the paper, and suggested that this material should receive greater emphasis. Reviewer #2 felt that the manuscript contained few new insights into the general problem of exposure dating of moraine boulders. We acknowledge these concerns, and we hope to address them fully.

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The companion paper will perhaps show the significance of this body of work more clearly. This second manuscript will describe inverse methods that allow explicit comparisons between the models developed in the GMDD manuscript and particular data sets. This work thus allows us to make better estimates of the ages of moraines, using what we know about geomorphic processes. A version of this manuscript is available as chapter 3 of P. Applegate’s dissertation (<http://etda.libraries.psu.edu/ETD-db/ETD-search/browse>; scroll down). Thus, the companion paper is nearly ready for submission, though we acknowledge Reviewer #2’s point that it may never be published.

We hope to publish this second manuscript in a journal that is widely read by the cosmogenic exposure dating community. In general, these journals do not encourage extensive model descriptions. However, model inversions should be preceded by model evaluation and sensitivity analysis, which we have presented in the GMD manuscript.

Thus, the present manuscript provides the foundation for future papers. We feel that this use is consistent with the Aims and Scope of the journal, Geoscientific Model Development.

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