

Dear Editors,

I read and commented on the initial version of the manuscript, which was already a very interesting and useful paper. The main point in our comment was that, to a first approximation, the observed heterogeneity in  $^{14}\text{C}$  ages could be predicted from the sediment accumulation rate, typical bioturbation depths, and an established simple physical model of bioturbation. One of the potential applications of their method is as an independent test of these simple bioturbation models.

In this revised version the authors now consider their results in the context of this simple bioturbation model and also consider an expanded model that would features of the data not explained by the simple model. In addition to this, several other minor issues have been dealt with in this revised version.

In my opinion the paper is ready to be published and would be a perfect fit for *Climate of the Past*.

Dr Andrew M. Dolman.