Geochronology Discuss., community comment CC2
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Reply on CC1

Bernd Zolitschka

Community comment on "Bayesian age–depth modelling applied to varve and radiometric dating to optimize the transfer of an existing high-resolution chronology to a new composite sediment profile from Holzmaar (West Eifel Volcanic Field, Germany)" by Stella Birlo et al., Geochronology Discuss., https://doi.org/10.5194/gchron-2022-22-CC2, 2022

Dear Natalia,

many thanks for your encouraging and constructive comments. I am glad you like our approach documenting “all” age-depth models elaborated with Bacon instead of showing only the supposedly best one. Initially, we were thinking of going even a step further including also age-depth models calculated with OxCal. However, it soon became clear that this would blow up the manuscript unnecessarily and decided to stay with Bacon but document our evaluations very detailed. Perhaps, elaborating a comparison between Bacon and OxCal could become a future task for a separate manuscript, which would then be an even more specialized manuscript that I can see published realistically only in “Geochronology”.

I also completely agree, that excellent knowledge of the software packages is essential to optimize their output. This is another reason to stay only with Bacon, which allows adapting the priors in the best possible manner and in a very competent way. Here the record from Holzmaar can play out all its advantages as we do have a lot of accompanying data at hand, which is usually not the case for the normal client applying age-depth modelling to a new record.

And yes, our intention is that this approach of applying age-depth modelling might become a guideline for future projects with similar challenges: transferring a high-resolution chronology from a record studied in the past to a new record from the same site. And this is happening and will happen more and more, since new technologies are in the laboratories and under development together with big data storage and machine learning evaluations allowing a so far unknown resolution of a variety of parameters – but such efforts usually need a new set of sediment cores. These techniques are fast and efficient unlike the elaboration of chronologies. Therefore, it is logical applying an existing time control and transferring it to the high-resolution spatial record to become a timeseries, which is absolutely needed for regional and global comparisons and interpretations.

Thanks again for your comments and best wishes, Bernd Zolitschka