

## ***Interactive comment on “A generalised approach to reconstructing geographical boundary conditions for palaeoclimate modelling” by M. Baatsen et al.***

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The authors would like to thank the referees, Dietmar Mueller and Matthew Huber, for their thorough review of the paper. They both point at the fact that the modelling community desires more efforts in making easily accessible, reproducible and comparable boundary conditions. However, some elements of the presented workflow still require some additional information and the required set of files has to be completed. This will be taken care of in the final version, with more files being made available and some more focus on the 38Ma reconstruction.

Question specific responses:

C3104

C2134

'workflows not too dissimilar to the one employed here have been used previously' The statement above is true, but the authors believe that the use of masks directly exported from a plate-tectonic reconstruction with the ability to alter the latter should make such workflows easier and more up-to-date.

C2135

'Herold et al. (2008) published a mid-Miocene global elevation model' The workflow is indeed similar with respect to the plate-tectonic reconstruction, albeit that the treatment of shorelines, continental shelves and shallows is slightly different. Furthermore, the period considered has a geography that is very similar to that of the present day and the extension towards other periods or rotational frames is not made. However, the workflow in aforementioned paper does have important similarities to the one used by the authors and will thus be referred to.

'but the Mueller et al. (2008) paleo-age grids' The age grid from Mueller et al. (2008) was indeed used in combination with a reconstruction based on the one presented by Seton et al. (2012). For this part, only the present day age grid was used in combination with the plate-tectonic reconstruction to create a grid that is compatible with the latter, but leaving out gaps where oceanic crust has undergone subduction. The bathymetry grids used to fill in these gaps are adopted from Mueller et al. (2008), as this is the latest available palaeo-bathymetry grid. In addition, oceanic plateaus and ridges were treated separately and thus no paleo-age or -depth grid was used.

'the authors manually edit regions for paleo-topography' An important note here is the fact that the masks used for this are attached to the corresponding plate ID's in the reconstruction. This greatly facilitates the procedure when making another paleotopography for a period that is similar to the one considered previously. Only some minor change to the extent of the masks and the corresponding manipulations may be needed. This will be further clarified in the revised paper

C3105

'which completely eliminates the necessity to convert image files into a gridded format' The masks exported here are not imported as netcdf files but polygons in the reconstruction. In GPlates 1.4, the only way to export these is by taking a screenshot. Here, a PNG was chosen because it is already a gridded format and easy to read by most computational software. If a new feature exists in GPlates 1.5, that allows the user to export polygons drawn within GPlates as netcdf grids, this should certainly be considered and updated.

C2136

'to test different rotational frameworks, would take MUCH longer than a few days'. As stated in an earlier comment, masks used for manual adjustments are fixed to plates in the reconstruction. Therefore, it takes only some small adaptations when a different rotational framework is adopted, since the masks are automatically moved and rotated by the latter.

'the authors haven't provided any of the files needed for it to run' This is indeed problematic for anyone trying to replicate the procedure, most of the files not included were not provided because of their size (mostly netcdf). These will be provided in the final version if required, or added to the supplementary material. A set of .gpml files containing all of the outlines used for the 38Ma reconstruction have been added as a supplement.

'workflow should be based on digital netcdf-type grids only'. As stated earlier, PNG files were only used where an export as netcdf was not possible. The use of polygons in GPlates instead of grid also avoids problems with changing rotations or any other grid-interpolation issues.

'A complete example with working files would be essential for such a community workflow' This will be improved in the final version, providing more of the required files. It is also not the intention of the authors to provide a fully-working software package for any user to use in the exact same way. The aim is mainly to present the workflow and

C3106

make it reproducible for anyone using the same procedure, but leaving some freedom to the latter in their exact implementation.

Please also note the supplement to this comment:

<http://www.clim-past-discuss.net/11/C3104/2016/cpd-11-C3104-2016-supplement.zip>

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Interactive comment on Clim. Past Discuss., 11, 4917, 2015.

C3107