

Interactive comment on “Modeling variations of marine reservoir ages during the last 45 000 years” by J. Franke et al.

J. Franke et al.

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On the use of present-day wind-fields. ... This is fine in principle, but the energy carried out by winds on the surface ocean might have a quite important effect on the oceanic circulation itself, through the course of the 45,000 years simulated here. In particular, the authors show the over turning computed in the model, which is shown to be coherent with data based estimates (p 88 lines 1-3 and figure 1). Would that still remain under more realistic wind forcing, in the view that winds are generally stronger in GCM simulations (e.g. PMIP-2)? I would appreciate to see some discussion about this fact in the manuscript.

The reviewer is right that changes in the strength of the wind will influence the circulation of the ocean, but no model is yet able to simulate them continuously for the past 50 kyr. Referring to the comment we added a discussion how the UVic ESCM reacts

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to stronger glacial winds.

... I would nonetheless appreciate to see more discussion on the two main discrepancies seen from the figures of the manuscript: the upwelling zones (mentioned in the text by the authors but not discussed) and the deep north Pacific 64257;c which appears to be too low with respect to data. ...

Coarse resolution models have generally problems to simulate equatorial upwelling. The ¹⁴C distribution in the deep Pacific Ocean is already clearly improved in comparison to the models in the OCMIP-2 final report (Orr et al., 2002). A comment to this issue has been added to the manuscript.

I would recommend the authors to be slightly more cautious in the use of their modeling results towards the data community. In particular the sentence (page 95-96): the model results will be a useful tool to estimate reservoir ages for any marine sample is overselling ...

The text regarding the suggested use of the model results has been rephrased and is now more cautiously stated.

Minor points

Page 84, line 20 : Intercomparision => Intercomparison

Done

Page 86, line 17 : and were run for => and was run

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Done

Page 89, line 19 : the influence of circulation change => circulation changes

Done

Page 91, line 16 : an temporally => a temporally

Done

Page 91, line 22: can be treated comparable to => (meaning ?) can be treated as ?

Done

Page 92, line 9: nearly simultaneous => nearly simultaneously

Done

Page 92, line 15-16: was once at => which was once at

Done

Page 92, line 19: small reservoir age => smaller reservoir age

Done

Interactive comment on Clim. Past Discuss., 4, 81, 2008.

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