Ocean Sci. Discuss., 10, C741–C742, 2013
www.ocean-sci-discuss.net/10/C741/2013/

Ocean Science
Discussions
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Interactive comment on "Meridional transport of salt in the global ocean from an eddy-resolving model" *by* A. M. Treguier et al.

Anonymous Referee #1

Received and published: 23 December 2013

General Comments

The authors present a thorough analysis of the salt balance in an eddy-resolving model of the global ocean, the first such analysis to the authors' (and my) knowledge.

The authors clearly set out the definition of salt fluxes in a framework that naturally includes surface freshwater exchange, thus avoiding confusion related to the arbitrary use of reference salinity and "freshwater anomaly" transport.

By decomposing horizontal salt transports into "time-zonal mean", "recirculation" and "eddy" components, key regional processes are identified. In particular, resolved eddies are demonstrated to play an important role in salt transport near subtropical fronts.

The results are in broad agreement with a limited number of previous studies, and the

new framework is verified as most appropriate for future analysis of the salt balance in ocean models. As the authors point out, the same analysis can be undertaken with observations.

The manuscript should be suitable for publication in Ocean Science, subject to technical corrections as indicated below.

Technical Corrections

1. p.2302, line 21: ". . . in terms of . . ."
2. p.2303, line 8: "literature"
3. p.2307, line 24: "negligible"
4. p.2308, line 23: "negligible"
5. p.2310, line 8: "contrast"
6. p.2312, line 17: Should reference be to 15N? (rather than 15S)
7. p.2313, line 2" "In our model . . ."
8. p.2315, line 20: "obeys"
9. p.2322, caption: "envelope"

Interactive comment on Ocean Sci. Discuss., 10, 2293, 2013.