Ocean Science

Discussions

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# Interactive comment on "Dynamical Connections between Large Marine Ecosystems of Austral South America based on numerical simulations" by Karen Guihou et al.

**Anonymous Referee #1**

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The manuscript titled "Dynamical Connections between Large Marine Ecosystems of Austral South America based on numerical simulations" by Karen Guihou, Alberto R. Piola, Elbio D. Palma, and Maria Paz Chidichimo presents the analysis of a high resolution ($1/12°$) simulation of the area previously done by Combes and Matano (2014a), which is compared with the results from another ($1/12°$) numerical simulation. The connectivity between the Humboldt and the Patagonia Large Marine Ecosystems (HLME and PLME, respectively) are studied using the lagrangian tool ARIANE (Blanke and Reynauld, 1997) by calculating the transport across several defined sections.

This is a very interesting article that addresses an area of research that needs more

understanding, the connection between both sides of the South American southern coast. There is a very good design of the numerical experiments with ARIANE, and the analysis is details.

Minor issues:

a) L107-109: It is described that the domain extends to $81°W$. However, Fig. 2 has its western boundary at $78°W$. Please mention this detail to the reader.

b) L119: artic – should be Artic

Major issues:

A) It is stated that the Drake Passage and Cape Horn Shelf (CHS in manuscript) represent a key region (L212). However, both models have a limited representation of other pathways, namely the Magellan Strait and the Beagle Channel, and thus their impact cannot be understood with the models used. This is mentioned in L389-393, but please discuss further this issue in your analysis and describe a (numerical) solution to address it (not only "higher spatio-temporal resolution" L389).

B) L166-L67: state that the models used are "in good overall agreement" while several of the mean values from Table 1 show a quite large difference between them, particularly for the South Chilean Shelf (SCHS), which, it seems, is poorly represented by both models due to their grid size ($1/12°$), understanding that a model's effective resolution is larger (7-10 dx). Please moderate this optimistic statement comment on the issue.

C) Table 1 Shows mean, std, min and max values for the calculated transport. I would prefer to see the compared histograms of the calculated transport in both model. This would help to understand if the probability distribution function of the obtained volumes is gaussian and, thus, is adequate to use mean and std values as a statistical descriptors. Authors could also express the agreement for different percentiles for purposes of comparison-

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