Answer to Referee #1:

1. Page 6532, line 12 : "A reason for this is a bias in the modeled Southern Hemisphere OMZ, systematically larger than observed" This sentence is not very clear as the IPSL model presents more oxygen than observed.

Agree. Updated to: "A reason for this is a bias in the modeled Southern Hemisphere OMZ, systematically larger than observed except for the IPSL models."

2. Page 6534, line 4 : "In general, all equatorial jets are too weak or inexistent in non eddy-resolving models with the exception of the EUC" EUC tends to be much too slow as well in non eddy resolving models (at least 30 percent) !

Yes, we agree that it is confusing since we already said in the previous section that EUC is underestimated. We changed it to: "In general, the non-EUC equatorial jets are also too weak or in some cases nonexistent in non eddy-resolving models."

3. Page 6534 line 17: "We suggest that consequences of the too slow lateral ventilation of these regions in CMIP5 models include too low subsurface oxygen concentration" I agree, slow lateral ventilation leads to less oxygen transport. However, the argument that you use for the EUC above (= less transport of oxygen but also less transport of nutrients and then less production) might apply here too. Or if not, why is the case ?

We agree that slow lateral ventilation also leads to reduced transport of nutrients from the west Pacific (in addition to less oxygen transport), but these nutrients do not feed the surface layers directly (since most non-EUC ventilation paths are in the low thermocline) so they shouldn't directly modify primary production. The main supply of nutrients to the surface where production takes place is through the EUC. However, it's true that there might be additional nutrient trapping in the euphotic layer due to low lateral ventilation. We now address this in the text:

"We suggest that consequences of the too slow lateral ventilation of these regions in CMIP5 models include too low subsurface oxygen concentration (Fig. 3a) and too large nitrate depletion due to excessive denitrification kicking in when O2 falls below a certain threshold. The low ventilation exacerbates nutrient trapping and potential for runaway feedbacks in the nitrogen cycle (Landolfi et al. 2012)."

New reference:

Landolfi, A., Dietze, H., Koeve, W., and Oschlies, A.: Overlooked runaway feedback in the marine nitrogen cycle: the vicious cycle, Biogeosciences, 10, 1351-1363, 2013 10.5194/bg-10-1351-2013, 2013

4. Page 6535 line 4: Actually Duteil et al (I think you mean 2014) focus on the role of both the EUC and the off equatorial currents in the Atlantic Ocean (and not specifically on the role of deep currents).

Right. We changed it to: Duteil et al. (2014) highlight the need for accurate deep Equatorial ventilation, in addition to EUC, to characterize the eastern tropical Atlantic OMZ.

5. Page 6535 line 12: "However, both versions of MPI-ESM model show similar biases in oxygen distribution and a too deep tropical OMZ (Fig. 1), which suggests that the too deep modeled OMZ is partly caused by biases in biological processes" Maybe another possibility is that in these models the deep OMZ is set by processes occurring in high latitude (too low oxygen in intermediate water) and is not linked with the strength of equatorial currents. Is the MOC or the extra equatorial currents similar?

That's right. The MOC and extra equatorial currents are similar in both versions of MPI-ESM (see MOC plots below), so these could also explain the deep oxygen biases. The lower MOC in the Pacific (blue at depth) is especially low in the two versions of MPI-ESM.

We rewrited the sentence as:
"However, both versions of MPI-ESM model show similar biases in oxygen distribution and a too deep tropical OMZ (Fig. 1), which suggests that the too-deep modeled OMZ is not linked to the strength of equatorial currents but set by high-latitude ventilation processes or/and biological biases at low latitudes."

However, the similarity between the tropical oxygen bias in MPI and NorESM1-ME (with same biological subroutine but very different physical setting) suggests that the bias in MPI might be due to a biological bias (common to NorESM1-ME) and not due to high-latitude ventilation biases. The biological explanation over the physical explanation is detailed in the sub-section **Biased transfer efficiency of POC from 100m to depth** later on.

We have also modified the Appendix relative to MPI to include how a low MOC observed in MPI models could offer a possible explanation for the oxygen bias at low latitudes.

6. Page 6635: section 'Low spatial resolution': I think that it would be more consistent to distribute the content of this section in the sections above or below. Indeed resolution issue it is not really a 'physical cause for OMZ biases', but impacts of course the representation of processes.

a) We moved this entire paragraph into the EUC subsection:
"Increased resolution improves the representation of equatorial currents (especially the EUC; Aumont et al., 1999), which is evident when comparing MPI-ESM-LR (coarse resolution model) and MPI-ESM-MR (quasi-eddy resolving resolution, 0.4º) in Fig. 4 (see also Jungclaus et al. 2013). However, both versions of MPI-ESM model show similar biases in oxygen distribution and a too deep tropical OMZ (Fig. 1), which

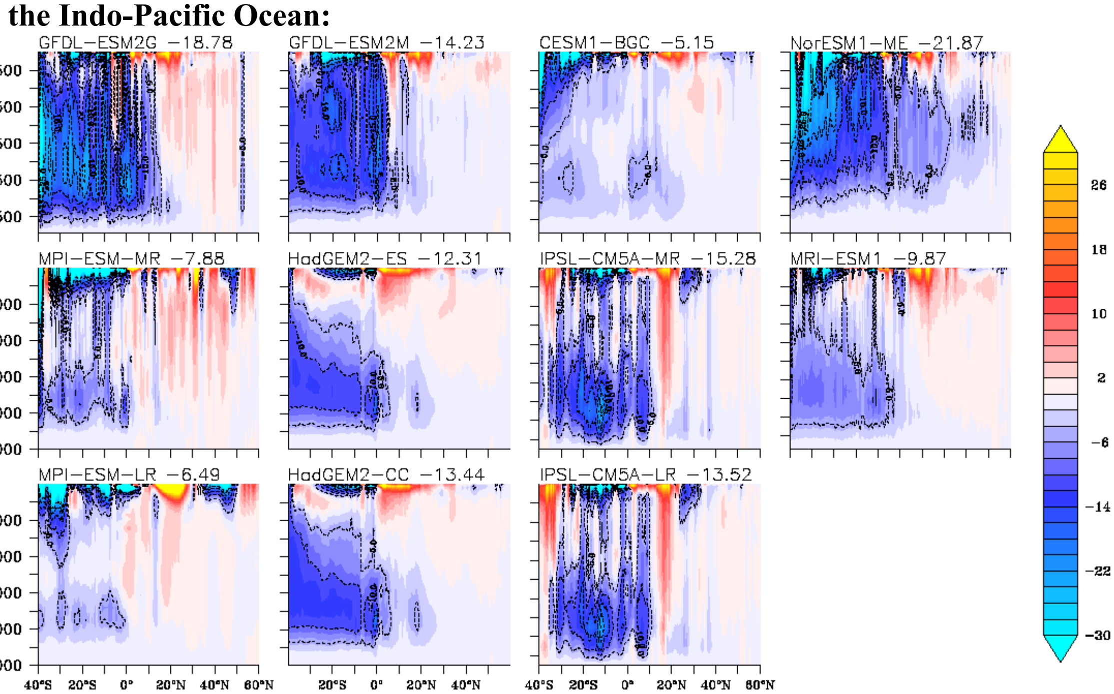
suggests that the too deep modeled OMZ is not linked to the strength of equatorial currents but set by high-latitude ventilation processes or/and biological biases at low latitudes. Both IPSL-CM5A models, with low ocean resolution of ~2º, show similarities with MPI-ESM-LR (same ~2º resolution) in the characterization of a diffuse and weak EUC and nonexistent deep jets. The rest of models have oceanic resolution of ~ 1º, higher than the IPSL-CM5A and MPI-ESM-LR models' one (Table A1), and hence provide a more accurate representation of EUC compared to observations."

b) We moved the following paragraph into the non-EUC subsection:
"Some recent studies showed that the equatorial ventilation is not fully resolved even in eddy-resolving models (Brandt et al., 2008; Eden and Dengler, 2008; Ascani et al., 2010), suggesting that other mechanisms such as submesoscale dynamics, or atmosphere-ocean feedbacks might also be responsible for biases in the equatorial jets and their incomplete representation in models (Lin, 2007; Li and Xie, 2014; Ridder and England, 2014)."

7. Page 6536 : section 'inadequate ventilation : : :' Maybe computing the MOC would quantify the role of water originating from the Southern Ocean ? Indeed a strong MOC should foster high oxygen concentration at depth in tropical ocean.

We calculated the meridional streamfunction in the Pacific Ocean across CMIP5 models and calculated the strength of the AABW cell at depth at 30S (maximum negative value below 2000m at 30S, labeled next to model name in units of Sv). We added a supplementary figure with these new results.

In the Indo-Pacific Ocean:



This is the list of models sorted by AABW intensity (Sv):

NorESM1-ME GFDL-ESM2G IPSL-CM5A-MR GFDL-ESM2M IPSL-CM5A-LR HadGEM2-CC HadGEM2-ES MRI-ESM1 MPI-ESM-MR MPI-ESM-LR CESM1-BGC
AABW= -21.8790 -18.7870 -15.2800 -14.2370 -13.5280 -13.4450 -12.3180 -9.87690 -7.88220 -6.49780 -5.15950
Depth= 2000.00 2898.40 3257.50 3213.20 3257.50 3257.50 3257.50 3300.00 3395.00 3770.00 1968.90

or sorted by transport of oxygen (intensity* oxygen at maximum) (units 10^3 mol/s):

NorESM1-ME GFDL-ESM2G GFDL-ESM2M HadGEM2-CC HadGEM2-ES MRI-ESM1 IPSL-CM5A-LR IPSL-CM5A-MR MPI-ESM-MR MPI-ESM-LR CESM1-BGC
AABW*Oxygen= -4748.40 -3523.00 -2389.00 -2315.20 -2141.60 -1873.90 -1682.40 -1657.60 -1430.80 -1274.20 -1034.90

In the Pacific Ocean:

This is the list of models sorted by AABW transport (Sv):
NorESM1-ME GFDL-ESM2G IPSL-CM5A-MR IPSL-CM5A-LR HadGEM2-CC HadGEM2-ES GFDL-ESM2M MRI-ESM1 MPI-ESM-MR CESM1-BGC MPI-ESM-LR
AABW (Svd)= -13.5470 -13.1220 -11.4970 -10.0550 -9.12900 -8.07910 -7.55270 -7.16880 -4.52550 -3.92120 -2.67230
DEPTH in meters (max AABW)= 2000.00 3213.20 3257.50 3257.50 2914.90 2914.90 3213.20 3012.50 3395.00 1968.90 3395.00

And sorted by oxygen transport (AABW transport * oxygen at maximum) (units 10^3 mol/s) :

NorESM1-ME GFDL-ESM2G HadGEM2-CC HadGEM2-ES MRI-ESM1 IPSL-CM5A-LR GFDL-ESM2M IPSL-CM5A-MR CESM1-BGC MPI-ESM-MR MPI-ESM-LR
AABW*oxygen= -2461.20 -2237.80 -1389.30 -1243.90 -1229.50 -1112.30 -1079.40 -1064.00 -763.550 -739.940 -411.520

The models NorESM1-ME and GFDL-ESM2G are among the models with the highest AABW transport in the Pacific Ocean, while CESM1-BGC and MPI-ESM are among the models with the weakest transport of AABW.

We added the new calculated AABW strength values in Table A2 and modified the table and the text according to these new results.
These are the changes in the draft:

Inadequate ventilation from the Southern Ocean and North Pacific:

For example, models with excessively deep AABW ventilation (such as NorESM1-ME and GFDL-ESM2G) or excessive NPIW ventilation (such as GFDL-ESM2M) have a reduced extent of the North Pacific OMZ. On the other hand, deficient NPIW ventilation, as in CESM1-BGC, exaggerates the volume of OMZs in the Northern Hemisphere (Fig. 2 and Table A2).

In the Appendix, we changed:

<u>IPSL-CM5A-MR (LR):</u>

The deep overturning ventilation is weak in this model; hence the northern deep Pacific is not well ventilated and develops an extended deep OMZ.

The relatively low exponent in the power law remineralization curve (Fig. 6 and Table 3) amplifies the problem

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The relatively low exponent in the power law remineralization curve (Fig. 6 and Table 3) creates an extended deep OMZ ...

<u>MPI-ESM-MR (LR):</u>

Mechanisms:

Intermediate water masses are well represented in this model. However, AABW formation is underestimated, which might explain the large oxygen bias in the deep low-latitudes and NH. Fig. 4 shows the large bias in equatorial ventilation in the low-resolution version of the model (MPI-ESM-LR), which is much improved in the high-resolution version (MPI-ESM-MR). However, both resolution model versions show similar biases in oxygen distribution and a too-deep OMZ, suggesting that the deep OMZ is mostly due to extra-equatorial ventilation or biological bias.

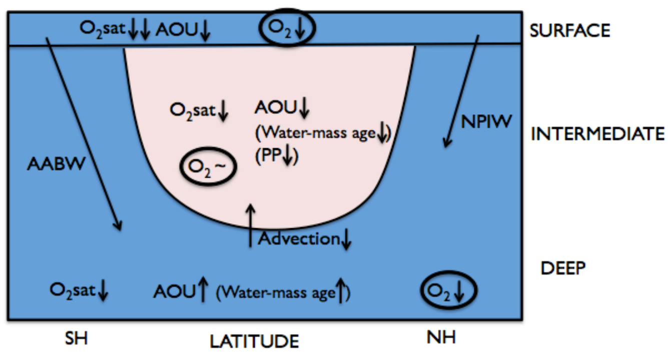
The modeled deep OMZ might result from an exponential remineralization curve with a low exponent (exaggerated with low denitrification rates and complete depletion of nitrate) combined with an overestimate of the POC flux from the euphotic layer (Fig. 5). The OMZ forms at a shallower depth than in other models and observations due to large POC flux in the euphotic layer.

<u>MRI-ESM1-ME:</u>

We removed this sentence:
"..and the excess in AABW translates into higher-than-observed oxygen values at depth."

8. Page 6537 line 5: You emphasize the role of isopycnal mixing, but do you think that *differences in diapycnal mixing could play a significant role? Diapycnal mixing appears in your figure 10 (schematic) and should be at least briefly discussed here.*

Fig. 10 was meant to synthesize the models' response to climate change more than the models' differences in the mean state discussed in section 3.1.1 (to which the reviewer is referring). However, we recognize that we wrongly labeled "mixing" the arrow connecting the deep to the intermediate equatorial Pacific regions in Figure 10. In reality, Gnanadesikan et al. (2007, 2012) refer to a decrease in advective upwelling (rather than vertical diapycnal mixing). This aspect is discussed in Section 3.2 under the " *Low-latitude intermediate depths (200-1000m):"* subsection. We modified the schematics to make this point clearer.



With regards to Subsection 3.1.1 (Physical causes for OMZ biases in historical simulations) we agree with the reviewer that a discussion about the role of diapycnal mixing is important. To this end, we have introduced the following text under the title "Inadequate representation of diapycnal mixing":

"*Inadequate representation of diapycnal mixing*

Duteil and Oschlies (2011) found that OMZ were progressively smaller at low and large background vertical diapycnal diffusivity coefficient K_v (above and below K_v =0.2 cm2/s). At high diffusivities, the OMZs are well ventilated. At low diffusivities, the OMZs are not well ventilated but the consumption of oxygen is low because there is not much biological activity. Only at intermediate coefficients, the OMZs are large due to high consumption combined with relatively low ventilation. Among CMIP5 models, MPI-ESM, IPSL-CM5A, and GFDL-ESM2M assume a background value of K_v =0.1 cm^2/s in the tropics, while models CESM1-BGC, NorESM1-ME, HadGEM2, and GFDL-ESM2G assume a value of K_v =0.01 cm^2/s. According to the findings by Duteil and Oschlies (2011), the former three models should have a larger OMZ compared to the last four models. However, we do not see this expected tendency across CMIP5 models. "

9. Page 6537, line 16 A potential important point is also the -O2:P(N) ratio as it impacts the amount of oxygen consumed / nitrate remineralised and then ultimately primary *production and denitrification. Do all the models present the same -O2:P(N) ratio? In the introduction, you also introduce DOC (page 6528, line 7) but it is not discussed here: could it maybe help to understand the differences in O2 concentration ?*

We agree that the choice of -O2:P(N) ratio might explain some of the inter-model differences in OMZ represenattion. We distinguish three groups from lower to higher ratios. Models with highest ratios should consume more oxygen per unit of nutrient, potentially creating larger OMZs.

Low Ratio (GFDL-ESM2, CESM1-BGC, HadGEM2): O2:P=150, O2:N= 9.38
Medium ratio (MRI-ESM1): O2:P = 160, O2:N = 10
High Ratio (IPSL-CM5A, MPI-ESM, NorESM1-ME): O2:P=172, O2:N= 10.75

However, N:P ratio and C:P ratio may vary depending on the dominant phytoplankton type and physiological response to local environment. This is likely a secondary effect but it is a source of uncertainty in this analysis (Ito et al. 2015).

There is no clear correlation between groups with similar O2:nutrient ratios and groups with similar OMZ biases, so we conclude that this effect is secondary.

We added the following sentence to the paragraph at the end of line 20 page 6537

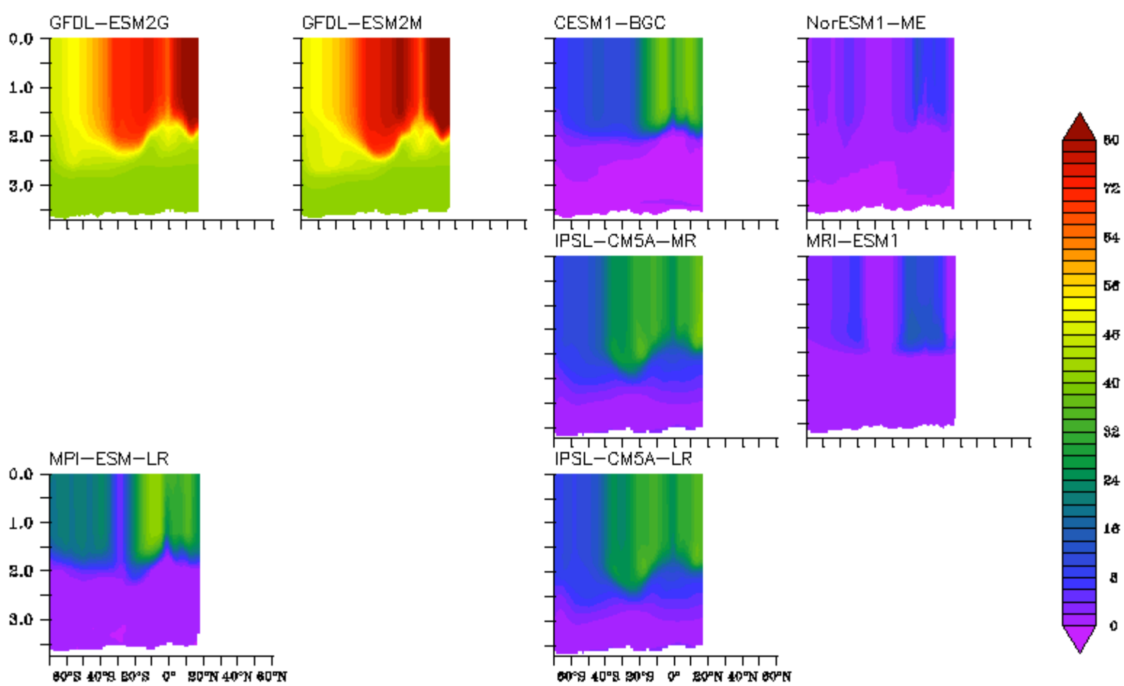
"The main biological drivers of biases in the simulation of OMZs are biases in the export of particulate organic carbon (POC) at 100 m depth, the transfer efficiency of POC from 100 m to depth (defined as the POC export at a given depth divided by POC export at 100 m) and the way POC is treated at the sea floor (Kriest et al., 2010, 2012). We also considered the effect of the variability in models' O_2:nutrient ratios since these ranges from 150 to 172 (in the case of the O_2:P ratio). However, we could not find any direct correlation with OMZ biases."

We also considered the distribution of dissolved organic matter in models to check whether part of the variability in the representation of OMZ's could be explained by biases in the representation of DOM, as suggested by the reviewer. However, we could not find any clear correlation. We added also the following paragraph, right after the above paragraph about the O2:P ratio:

"Finally, we considered the effect of DOC variability across models. The range of observed DOC in the low latitude Pacific is 65-80 mmol/m^3 in the upper 200m, decreasing with depth to background concentrations of less than 40 mmol/m^3 below 1000m (Hansell, 2013). The CMIP5 models that reported DOC (all models but HadGEM2) show very diverse ranges of concentrations but in general they underestimate the observed values by 20 to 55 mmol/m^3 in the upper 200m. Exceptions are the GFDL-ESM2 models that have realistic vertical distributions of DOC at low latitudes. In order to achieve the right distribution of DOC, models should have at least two DOC compartments (as only GFDL-ESM2 models do), one labile and one refractory. Most of the DOC in the ocean is in a refractory or unavailable form with estimated turnover timescales of centuries to millennia (Hansell, 2013), while the remaining DOC is in a labile and reactive form with short turnover timescales. Higher concentrations of dissolved organic matter, in general, allow for nutrient export out of the production region, decreasing the local consumption of oxygen. However, we do not see any correlation between levels of DOC and hypoxia in CMIP5 models. For example, the GFDL models, with a good representation of DOC, show more hypoxia than most models that underestimate DOC."

Our conclusions for CESM1 model were based on 'bad' data. CESM1 output has some anomalously high values around the historical period (1980-1990). If instead, we look at 1950 to 1980, the values are in accordance with the other models, so the anomalously high value seems an output problem. We removed our wrong conclusions about DOC in the Appendix concerning CESM1-BGC.
We removed this sentence:
" Importantly, the level of dissolved organic matter (DOM) is much higher than in the rest of models, suggesting higher transfer of POC to DOM, also alleviating anoxia. "

Figure: DOC at 100W (mmol/m^3) (1950-1980, not during the historical period because CESM1 has a problem there).



10. Page 6538, line 20 "The remaining models predict POC flux values in accordance to

Dunne et al. (2005) and Siegel et al. (2014)" For IPSL as well ? (you state that IPSL underestimates POC : p6533 – line 17)

Yes, for IPSL as well, but this model lies on the lower end when compared to the other models. We changed the previous sentence (p6533 – line 17) to: "As an example, the underestimate of subsurface OMZ volume in the IPSL-CM5A models (Fig. 1a and b) might be related to the fact that nutrients (and hence primary production and POC flux) are underestimated there when compared to the rest of CMIP5 models (Figs. 3b and 5) probably due to a weak EUC (Fig. 4)."

11. Page 6542, line 15. It is possible to use parameterizations as well. For instance, intermediate jets can be parameterized by using an anisotropic diffusion scheme (Getzlaff and Dietze, 2013). Increasing resolution alone is however not sufficient (see MPI-ESM-MR and LR)

We added it, as suggested: "...an accurate description of local equatorial ventilation in the Pacific Ocean would help reduce the large modeled volume of OMZs by providing additional channels for the supply of oxygen-rich waters and the removal of low-oxygen and nutrient-loaded waters. This requires a very high resolution for improving the representation of all the equatorial jets or alternatively a parametrization of intermediate jets, for example by using anisotropic diffusion coefficients (Getzlaff and Dietze, 2013)."

12. Page 6542, line 23 "(...) would improve the representation of the OMZs even before the representation of equatorial ventilation is improved" A general issue is to compensate biases in circulation by biases in biology. To assess better the models maybe an approach using preformed and regenerated quantities would be a possibility (eg. Ito and Follows, 2005; Marinov et al., 2006) (but this is maybe not the scope of the study).

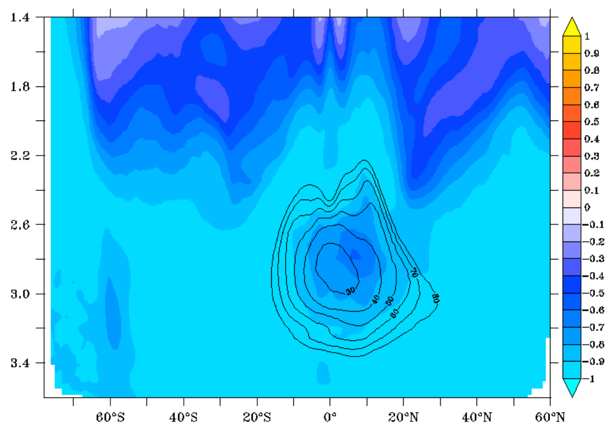
We agree with the reviewer that biases in circulation should not be compensated by biases in biogeochemistry. We also agree that using the partition of nutrients between preformed and regenerated helps in general to better assess the models assuming that preformed nutrients are the result of physical circulation while remineralized nutrients represent the effect of biogeochemical cycling (see Duteil et al., 2012). However, in this specific case we are discussing the effects of equatorial ventilation versus local consumption. The major source of preformed nutrients for the low latitude Pacific is likely to be the Southern Ocean through the northward propagation of Subantarctic Mode Waters (SAMW), which are formed in a region of high surface nutrient concentrations.

On the other hand, the formation region of the equatorial currents, the west tropical Pacific, has low surface nutrients and the nutrient concentrations of the water being carried eastward is progressively enriched by the remineralization of organic matter along the way. This means that a significant part of the nutrients being carried by the equatorial ventilation system into our region of interest is already in the remineralized form. In other words, in this case, the partition preformed/remineralized does not correspond to a clean differentiation between physical and biogeochemical effects or to a differentiation between remote and local effects. The reason is that part of the remineralized nutrient is likely being transported into the region of interested instead of being generated locally.

For this reason we decided not to pursue this approach.

13. Page 6545, line 19 "negative correlation between AOU and O in Fig. S7b" it seems there is a region at 5-10N/500m where the correlation is significantly weaker, do you know why? I compared with fig 8b, and it seems that it is not correlated with the zones where the oxygen are very low (which seem to be at the equator). Maybe you could trace the oxygen concentration on top of FigS7b?

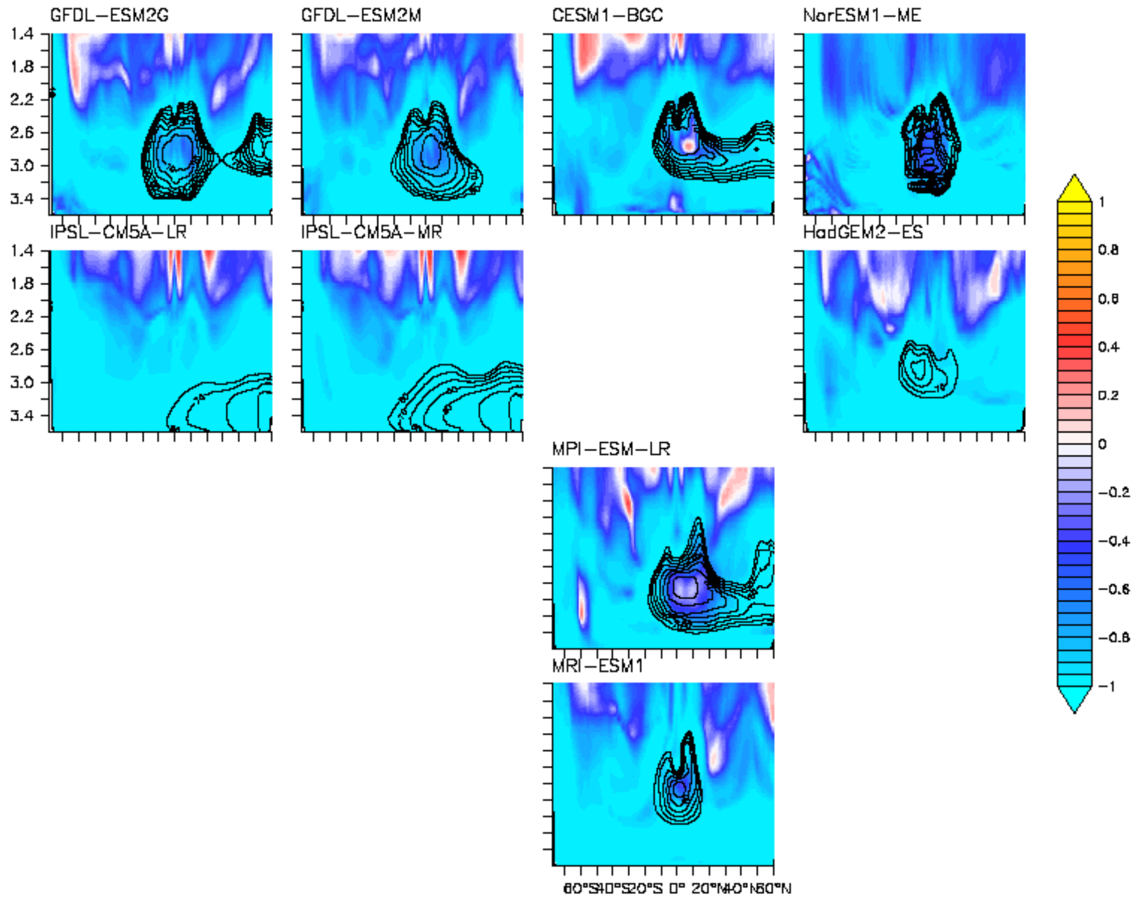
We traced the oxygen concentration on top of FigS7b as suggested and found that the mentioned zone of low correlation is indeed correlated with low oxygen in each model separately. When averaging over all the models, the correlation is a bit off from the oxygen minima but still clear.



We have changed FigS7b with this new figure and added the following to the figure caption:

Figure S7: Interannual correlations calculated in a 100-year long control sample ("piControl" scenario). We show the multi-model average across all the available CMIP5 models. Oxygen contours are shown in Fig. S7b to show that low correlation at depth in the tropics is correlated with low oxygen zones.

Here we show the temporal correlation O2-AOU across models and add the contours for oxygen levels. The weakly correlated regions at 5N-10N and around 1000m coincide with low oxygen in all the models separately.



14. Page 6545, line 27 "Decreased ventilation (Fig. S6) is accompanied by decreased AOU" Maybe this is linked with the amount of saturation of surface water, as the assumption O2 = 100% saturated at surface is not always true (Ito et al., 2004). If the percentage of surface saturation increase you might bury more oxygen in the interior ocean (which might ultimately decrease AOU even if respiration increases)

The referee is offering an alternative explanation to explain why NorESM1-ME would show decreased ventilation (age increase) accompanied by decreased AOU (exception to the rule). We agree with this explanation and we add a sentence in accordance.

"Moreover, with climate change, the percentage of saturated O_2 could increase, which then would increase the input of oxygen into the ocean interior, ultimately decreasing the estimated AOU (that assumes O_2 to be 100% saturated at the surface) even if respiration increased (Bernardello et al., 2014)."

New Reference:

Bernardello, R., Marinov, I., Palter, J. B., Sarmiento, J. L., Galbraith, E. D., Slater, R. D.: Response of the ocean natural carbon storage to projected twenty-first-century climate change, Journal of Climate, 27 (5), 2033-2053, 10.1175/JCLI-D-13-00343.1, 2014

15. Page 6546, line 10 "O2sat decreases in zones of deep water-mass formation (Fig. 8f) due to 21st century warming, contributing (...) to the decrease in oxygen levels" Changes in Intermediate waters will affect tropical OMZs but I don't know if deep waters (AABW) have an impact on tropical regions at a 100 year time scale: is it the case?

The largest effect to tropical regions at a 100 year time scale is due to increased stratification and reduced upwelling of high AOU deep waters (Gnanadesikan et al. 2007, 2012) as explained in the subsection "*Low-latitude intermediate depths (200-1000m)"*. This effect is related to an overall slowdown of circulation everywhere, not specifically associated to AABW. The sentence that the referee is mentioning refers to changes in oxygen localized at high latitudes instead (explained in subsection "*Zones of subduction and propagation of deep water masses"*. A slow down of AABW waters should propagate fairly quickly towards lower latitudes (via density structure adjustments carried by planetary waves) but assessing this link is out of the scope of this paper.

We added ... IN DEEP WATERS at the end of the sentence to make it clearer.

16. Page 6554. line 18 "(...) For example driven by changes in trade winds associated with the Pacific Decadal Oscillation (Deutsch et al., 2011, 2014; Czeschel et al., 2012)" More mechanistically, trades winds regulate the strength of the subtropical-tropical cells (eg. Luebbecke et al., 2008) and then the amount of oxygen transferred from the gyres to the eastern Pacific Ocean (Duteil et al., 2014b).

Added referee's suggestion. "Trade winds regulate the strength of the subtropical-tropical cells (eg. Luebbecke et al., 2008), which modify the amount of oxygen transferred from the gyres to the eastern Pacific Ocean (Duteil et al., 2014b)".

New references (added):

Lübbecke, J. F., Böning, C. W., and Biastoch, A.: Variability in the subtropical-tropical cells and its effect on near-surface temperature of the equatorial Pacific: a model study, Ocean Sci., 4, 73-88, doi:10.5194/os-4-73-2008, 2008

Duteil, O., Böning, C. W., and Oschlies, A.: Variability in subtropical-tropical cells drives oxygen levels in the tropical Pacific Ocean, Geophys. Res. Lett., 41, 8926–8934, doi:10.1002/2014GL061774, 2014b.

17. Table A1, A2, A3 I didn't understand exactly the difference between HadGEM2-ES and CC / IPSL-CM5A-MR and LR. These models are discussed together and from the tables A1,A2,A3 it seems that the circulation and biogeochemistry are identical.

However, there are some large difference in nutrients between IPSL-CM5A-MR and LR (figure 3). Maybe some forcing or parameterizations are different (could it be stated anywhere in Table A1,A2 or A3) ? HadGEM2-CC does not appear in figure 3.

Added the main differences between these two pairs of models in the caption of Table A1: The major differences between HadGEM2-ES and -CC are the inclusion of an interactive tropospheric chemistry component in -ES, and different vertical atmospheric resolution in -ES (L30) and -CC (L60). The only difference between IPSL-CM5A-LR and -MR is the atmospheric horizontal resolution, 1.9º x 3.75º for -LR (low res.) and 1.25º x 2.5º for -MR (medium res.).

The two versions of HadGEM2 show almost identical results, so we decided not to plot both models in all the figures. We added a note stating that in all the figures where we don't plot HadGEM2-CC (Fig. 1, Fig. 3, Fig. 7, and Fig. 11): "The model HadGEM2-CC (not shown) shows results similar to HadGEM2-ES"