

Author's Response- bg-2023-146

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Thank you for accepting our manuscript for publication in Biogeosciences.

In response to the comment from the file validation check (below), the indicated figures have been carefully reviewed. The manuscript results can still be clearly interpreted from the line plots (Figures 1 and 11) even with colour vision deficiencies, and the colour palette has been modified in the top row of panels of Figure 6 where distinctions between regions became ambiguous with some forms of colour blindness. See below for a detailed response.

The indicated comment read,

"Regarding the figures 1, 6, 11: please ensure that the colour schemes used in your maps and charts allow readers with colour vision deficiencies to correctly interpret your findings. Please check your figures using the Coblis – Color Blindness Simulator (<https://www.color-blindness.com/coblis-color-blindness-simulator/>) and revise the colour schemes accordingly."

In the case of Figure 1 which shows several lines from various experiments, for the anomalous trichromatic conditions (deuteranomaly, protanomaly and tritanomaly, with prevalences of 2.7%, 0.66% and 0.01% respectively in the total population) the line colours are all still distinct. For red-green dichromatic views (protanopia and deuteranopia, 0.59% and 0.56%) there is a loss of distinction between two of the lines shown. However, the context of these two lines are quite different and it is straight forward to determine which experiment is represented. One line is the control experiment that is constant on average with time, while the second is the ZEC experiment furthest from the control experiment. For the blue-deficient dichromatic view (tritanopia, 0.015%), different pairs of lines become less distinct, however again, context readily allows a reader to associate the different lines and experiments.

In the case of Figure 11, another series of line plot panels, the lines are distinct for all conditions of colour blindness.

Figure 6 contains multiple panels, including line plots (with the same colour scheme as Figure 1, discussed above), panels with centred-diverging red-blue palettes that are distinct for all colour blindness conditions, and panels on the top row with the absolute-sequential values of salinity. The colours of this top row were still distinct for anomalous trichromatic conditions, but there was some loss of distinction between upper ocean water at low latitudes and waters with lower salinity at  $\sim 50^{\circ}\text{S}$  for dichromatic vision. These panels in the top row are included primarily for context and are not critical to the findings. However, these panels have been modified in the resubmitted manuscript here with a viridis palette so that it is clear even with colour vision deficiencies.

Regards,

Matt Chamberlain