

Geosci. Model Dev. Discuss., community comment CC1  
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## Comment on gmd-2021-132

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Community comment on "Sensitivity analysis of Ocean Temperature Regressor v1.0; a data-driven model of ocean temperature" by Rachel Furner et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-132-CC1>, 2021

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- *"Specifically, we analyse the coefficients of our regression model and find that the predictions for a grid cell are based heavily on the density at the surrounding points, and the interaction between temperature at the grid cell and its neighbouring points. The importance of temperature interaction at surrounding points is representative of advective and diffusive processes which take place across the domain. The importance of density is in line with the the simulator representing, to some extent, density driven currents which are responsible for much of the changes in temperature in this GCM configuration"*

Density drives climate variability in terms of El Nino/La Nina cycles via the bouyancy of the themocline, where slight density changes above and below the thermocline will impact the effective gravity at the interface. How much of the regression model is sensitive to this narrow equatorial region? Or is it the larger AMO overturning circulation that is a stronger regressor?