

Comparing Surface and Subsurface Marine Heatwaves in Ocean Reanalyses

Vincenzo de Toma¹, Andrea Storto¹, Ronan McAdam², Antonietta Capotondi^{3,4}, Chunxue Yang¹

¹National Research Council, Institute of Marine Sciences, CNR-ISMAR, Via Fosso del Cavaliere 100, 00133 Rome, Italy

²CMCC Foundation - Euro-Mediterranean Centre on Climate Change, Bologna, Italy

³Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, CO, USA

⁴Physical Sciences Laboratory, NOAA, Boulder, CO, USA

Supplementary Figures

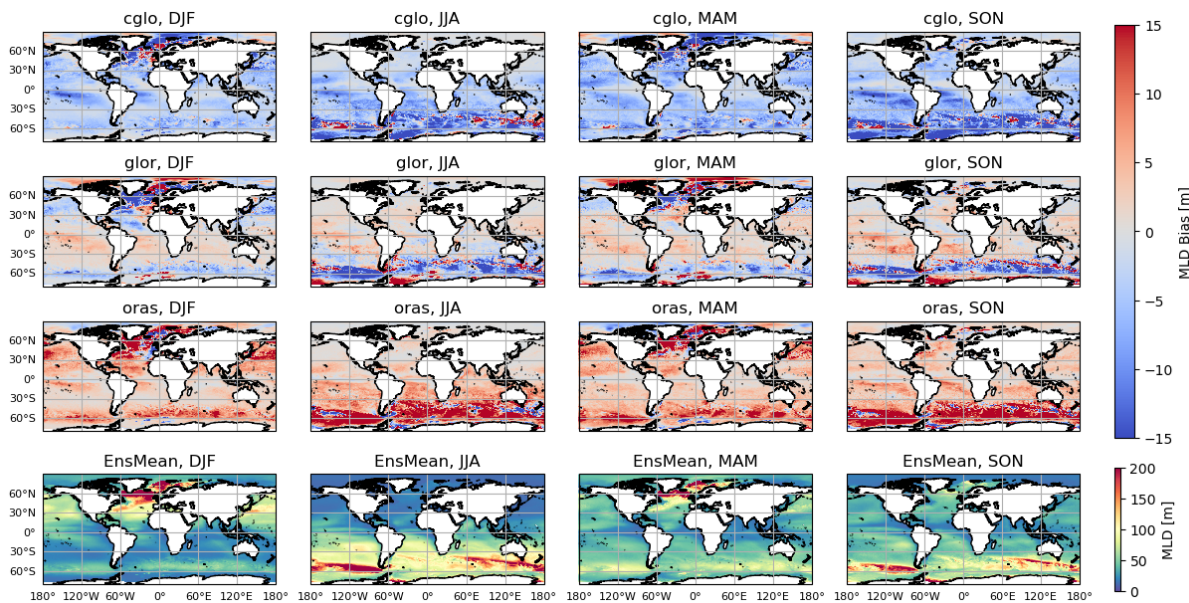


Figure S1. MLD Seasonality over the 1993-2018 period for each dataset. The top three rows are the bias with respect to the ensemble mean, shown in its absolute value on the last row.

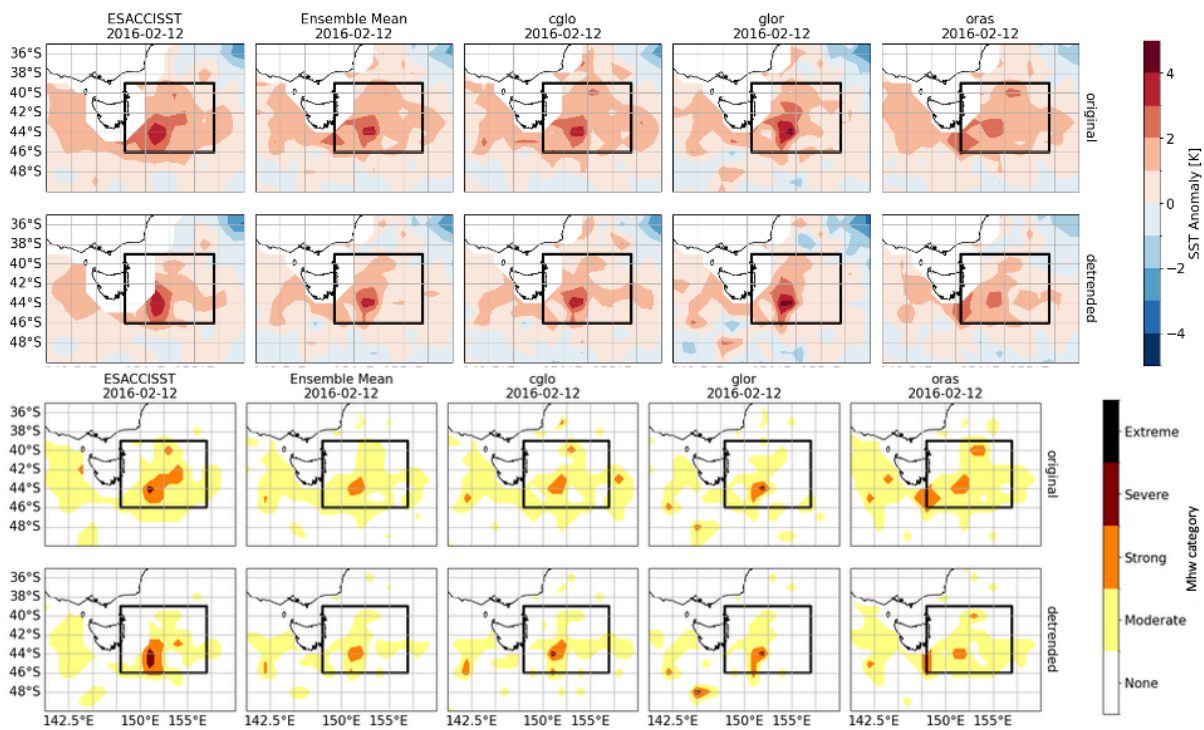


Figure S2. Same as Figure 2, but for the Tasman Sea region.

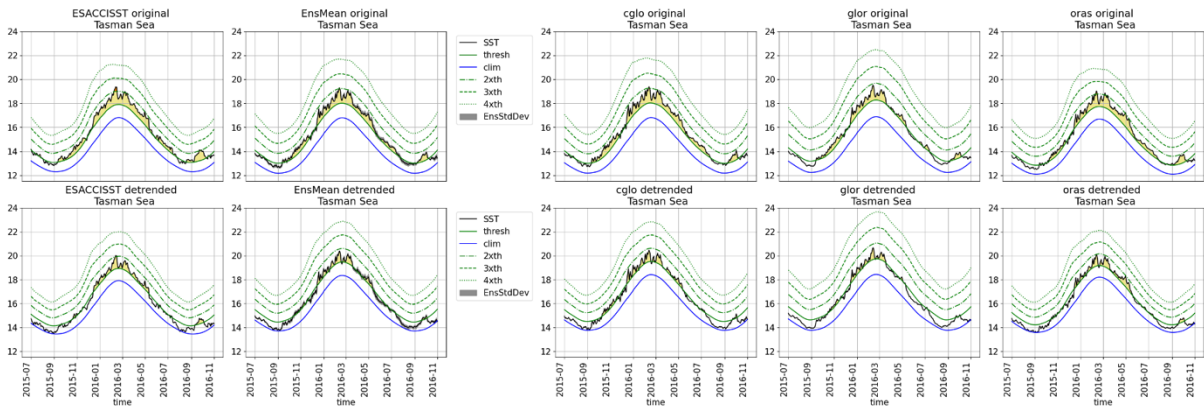
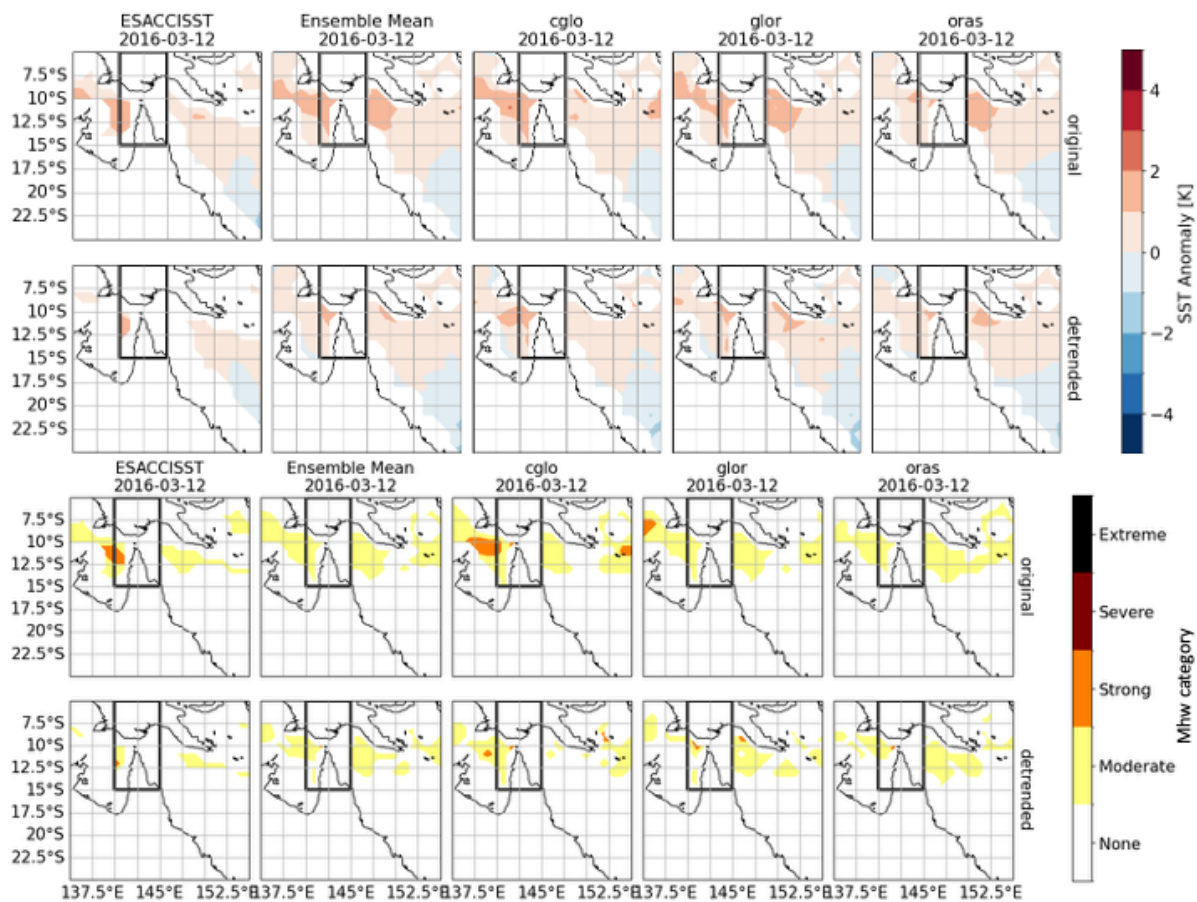


Figure S3. Same as Figure 3, but for the Tasman Sea region.



30 **Figure S4.** Same as Figure 2, but for the Great Barrier Reef region.

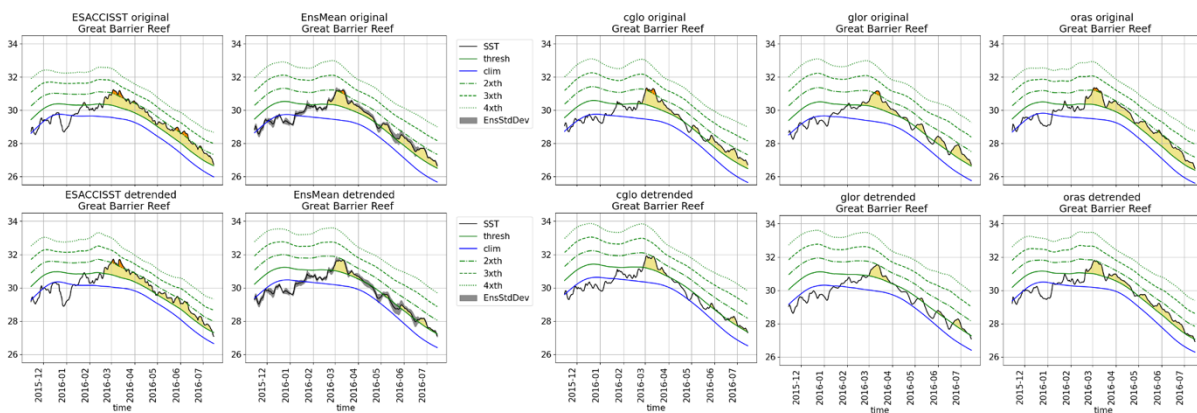


Figure S5. Same as Figure 3, but for the Great Barrier Reef region.

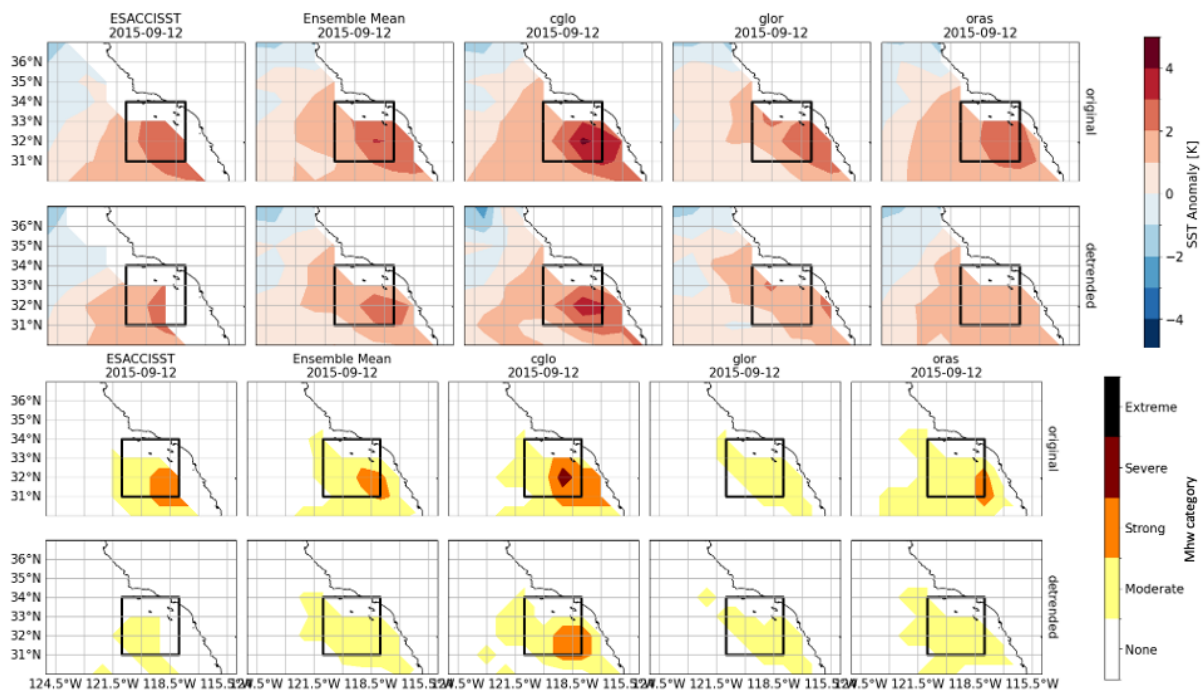


Figure S6. Same as Figure 2, but for the Santa Barbara region.

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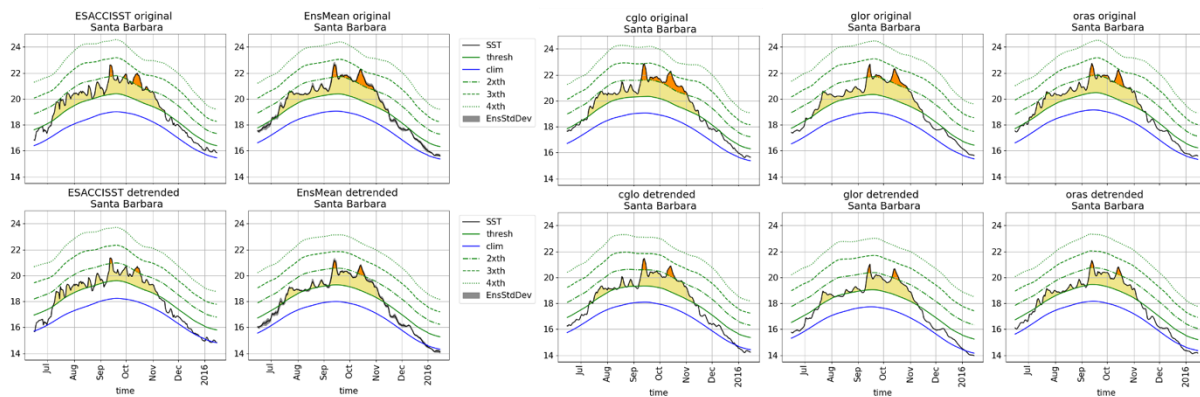


Figure S7. Same as Figure 3, but for the Santa Barbara region.

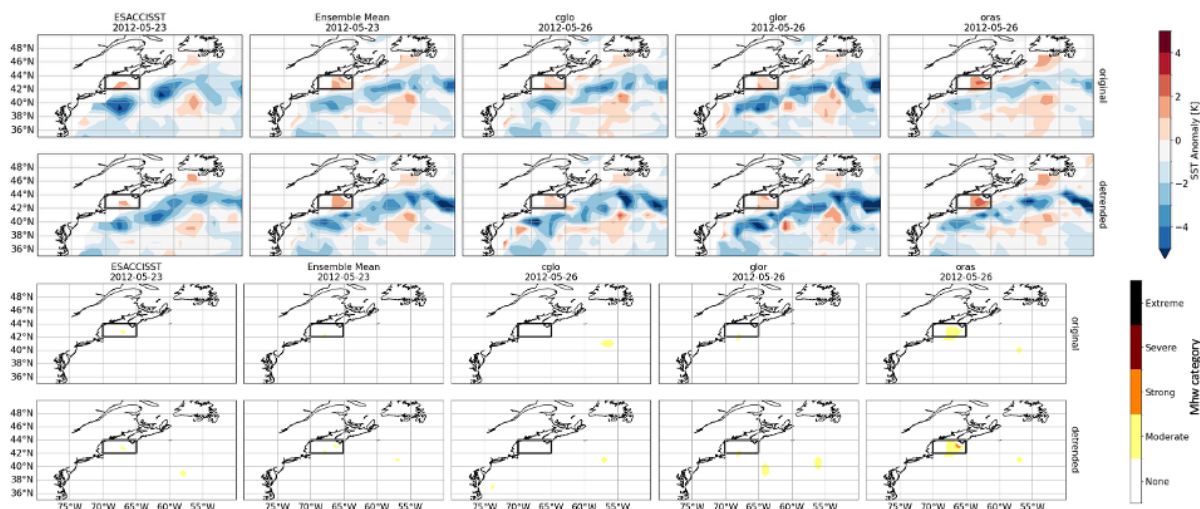


Figure S8. Same as Figure 2, but for the Northwest Atlantic region.

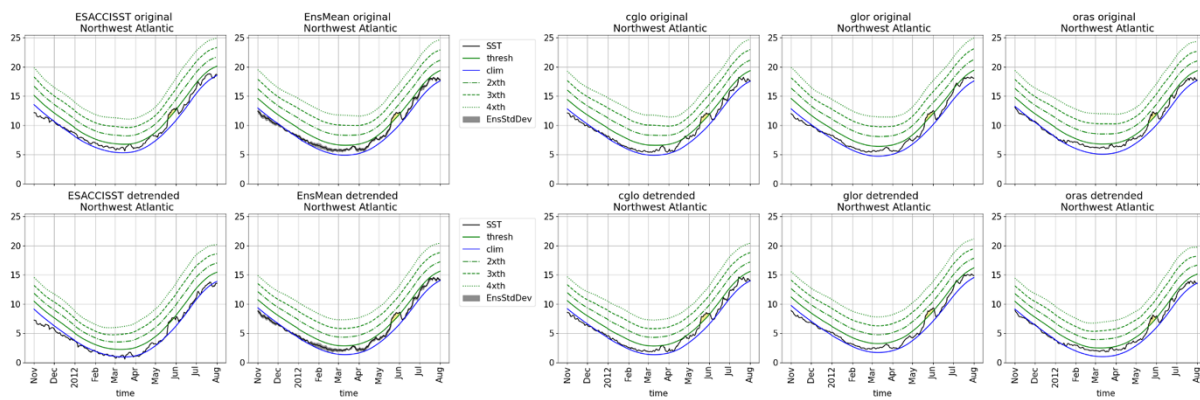


Figure S9. Same as Figure 3, but for the Northwest Atlantic region.

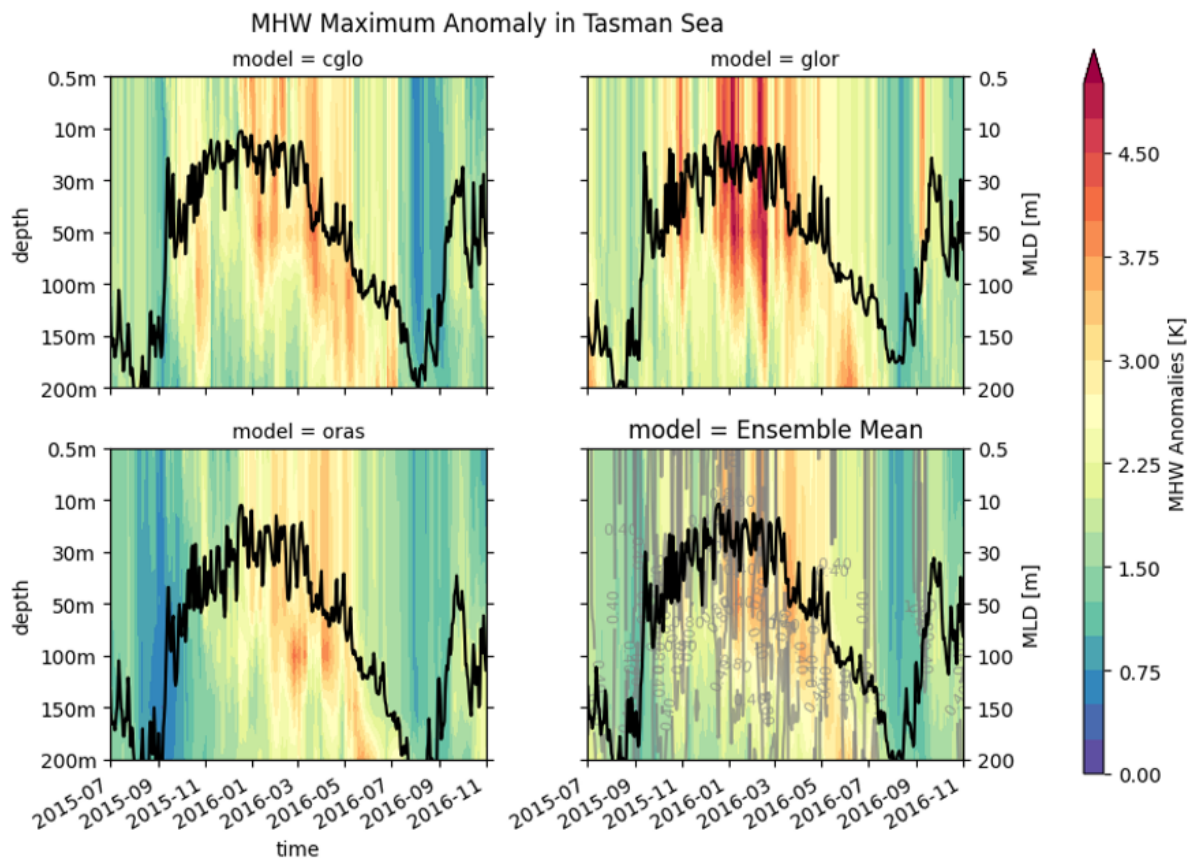


Figure S10. Spatial Maximum of the anomaly above the threshold within its subregion (defined in Table 1) of the Tasman Sea event, depth vs time plots. Superimposed in black is the time variability of the Mixed Layer Depth (MLD) from each reanalysis.

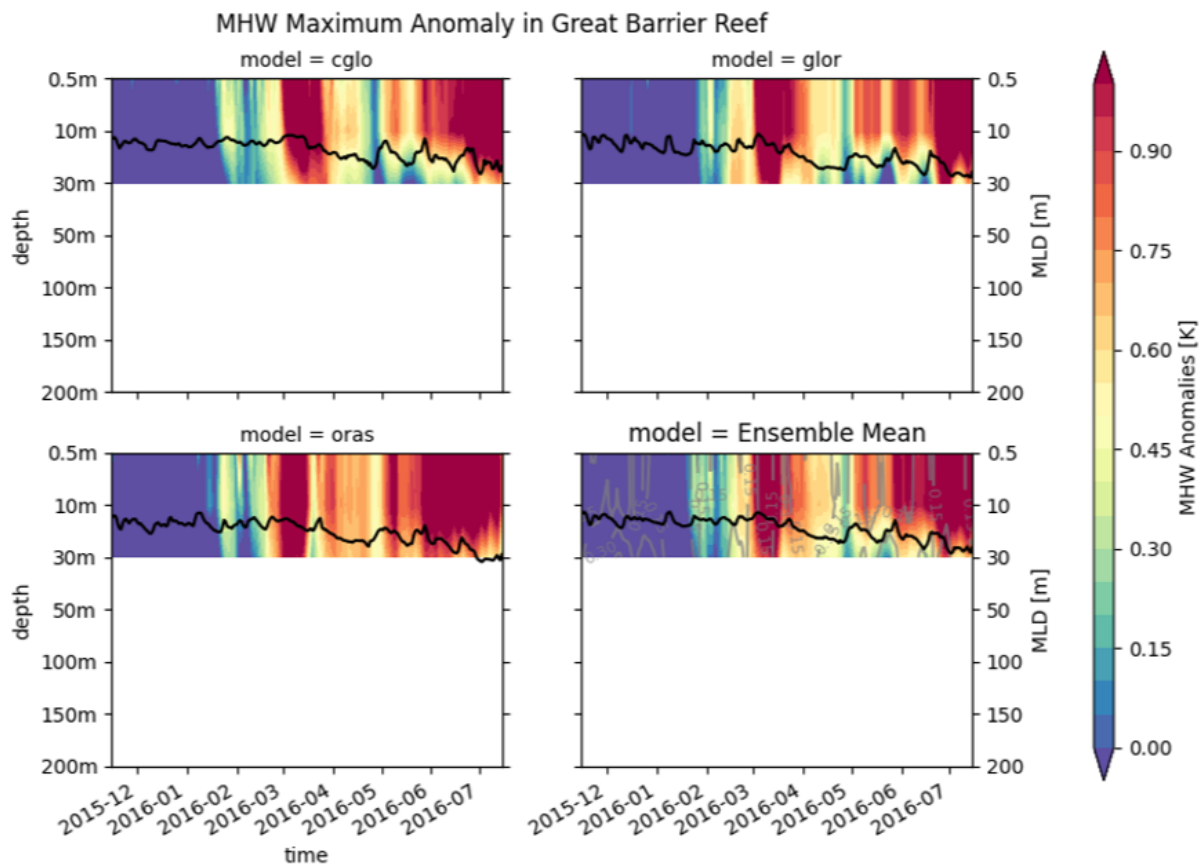
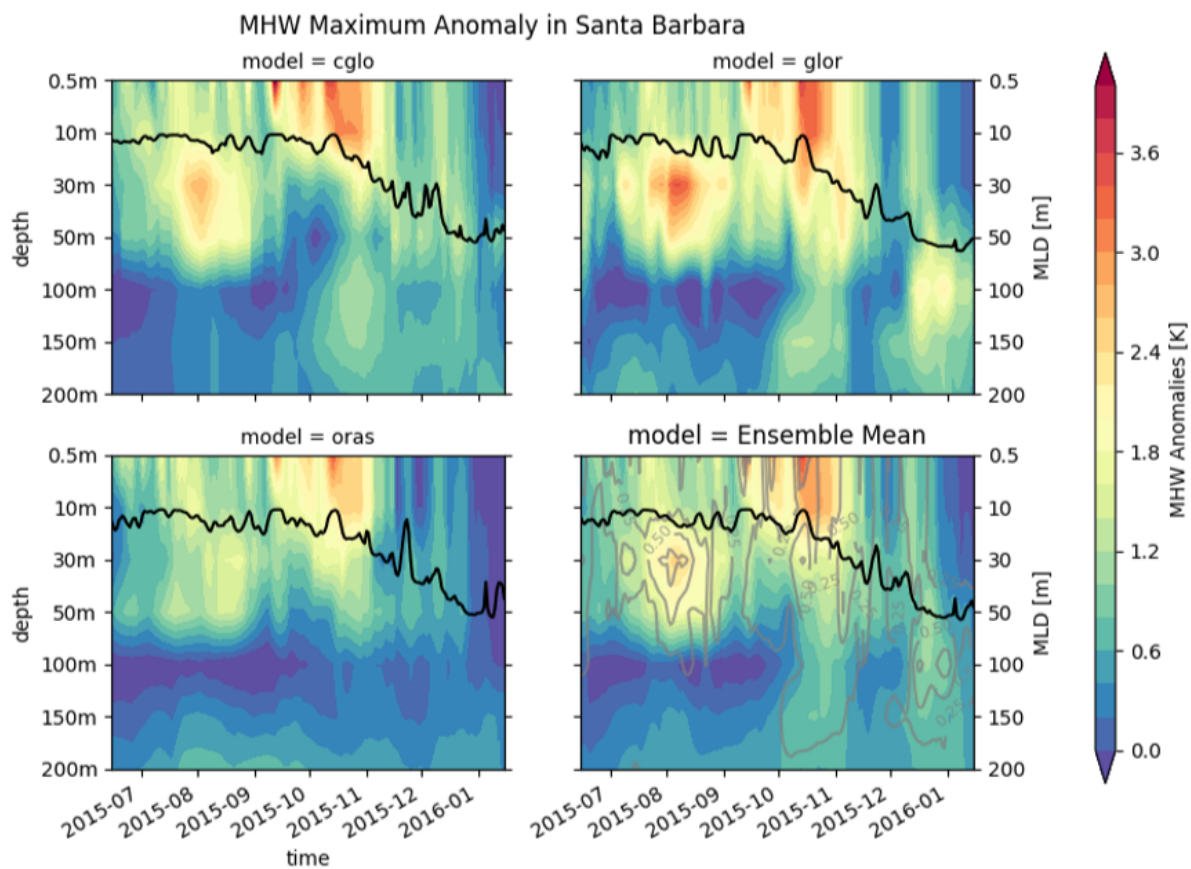
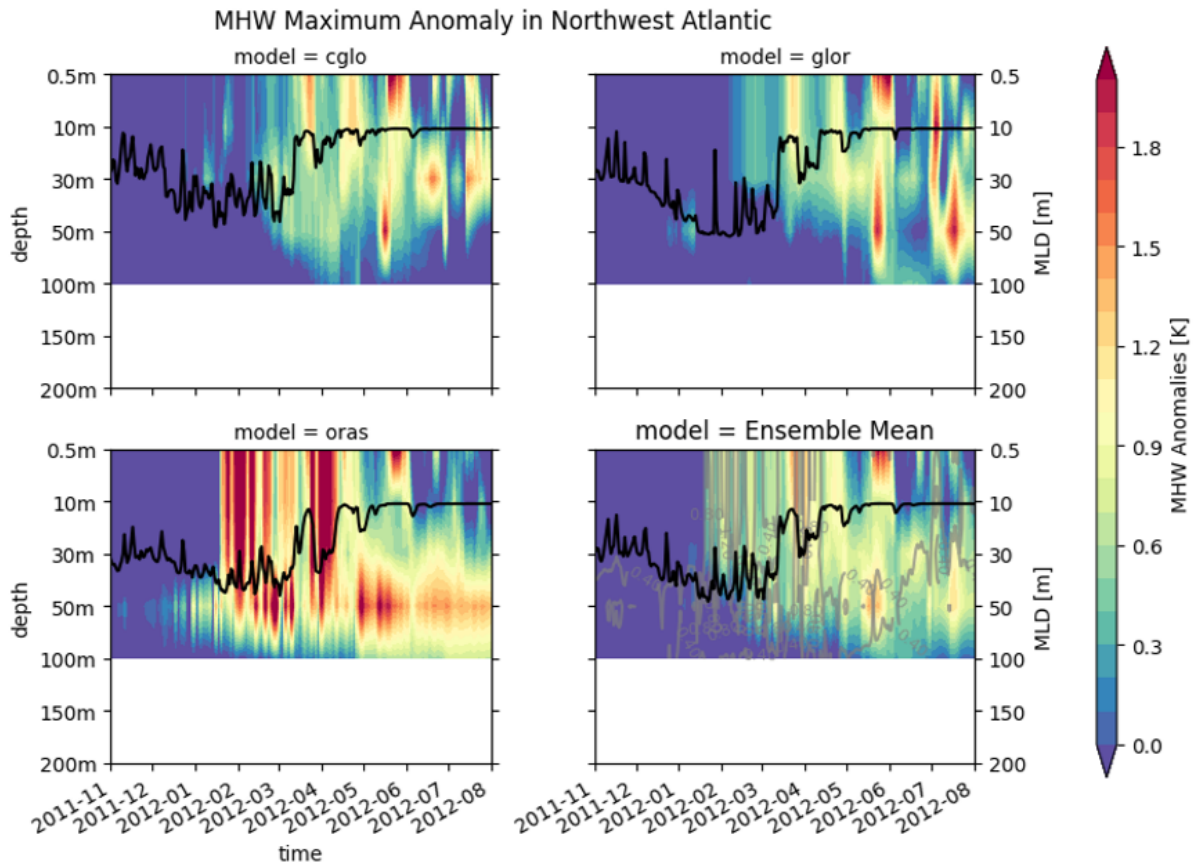


Figure S11. Spatial Maximum of the anomaly above the threshold within its subregion (defined in Table 1) of the Great Barrier Reef event, depth vs time plots. Superimposed in black is the time variability of the Mixed Layer Depth (MLD) from each reanalysis.

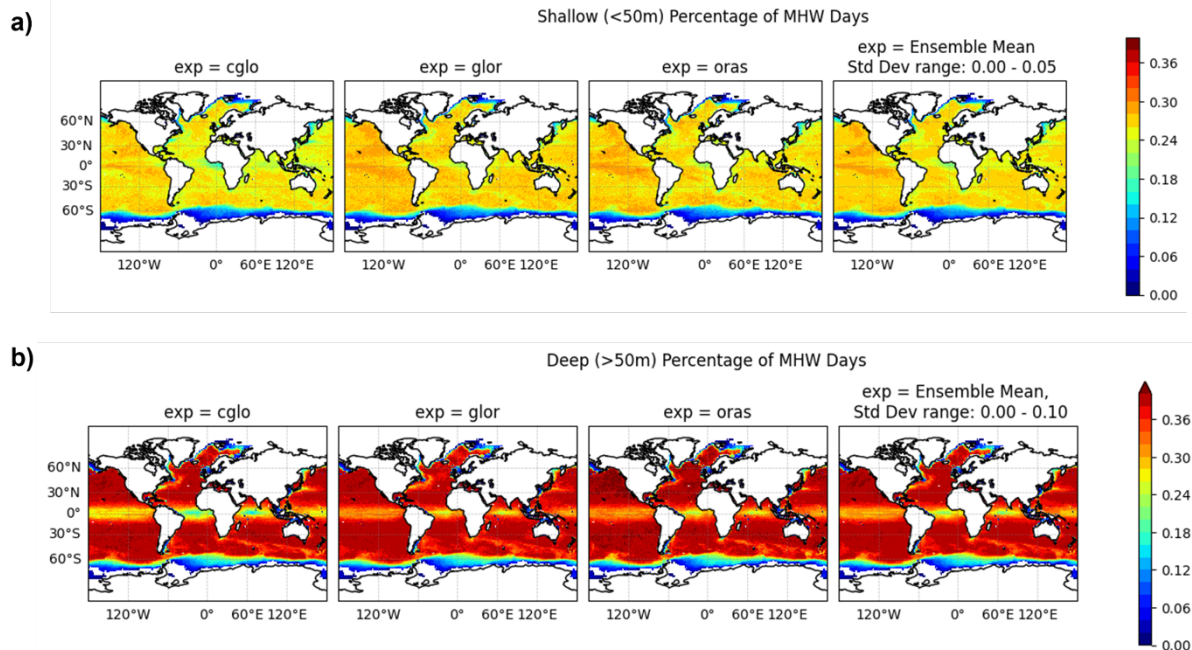


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Figure S12. Spatial Maximum of the anomaly above the threshold within its subregion (defined in Table 1) of the Santa Barbara event, depth vs time plots. Superimposed in black is the time variability of the Mixed Layer Depth (MLD) from each reanalysis.



70 **Figure S13.** Spatial Maximum of the anomaly above the threshold within its subregion (defined in Table 1) of the Northwest Atlantic event, depth vs time plots. Superimposed in black is the time variability of the Mixed Layer Depth (MLD) from each reanalysis.



75 **Figure S14.** Percentage of MHW days from each of the GREP Members (on columns - ensemble mean in the last): Shallow and Deep events on panels a and b, respectively.

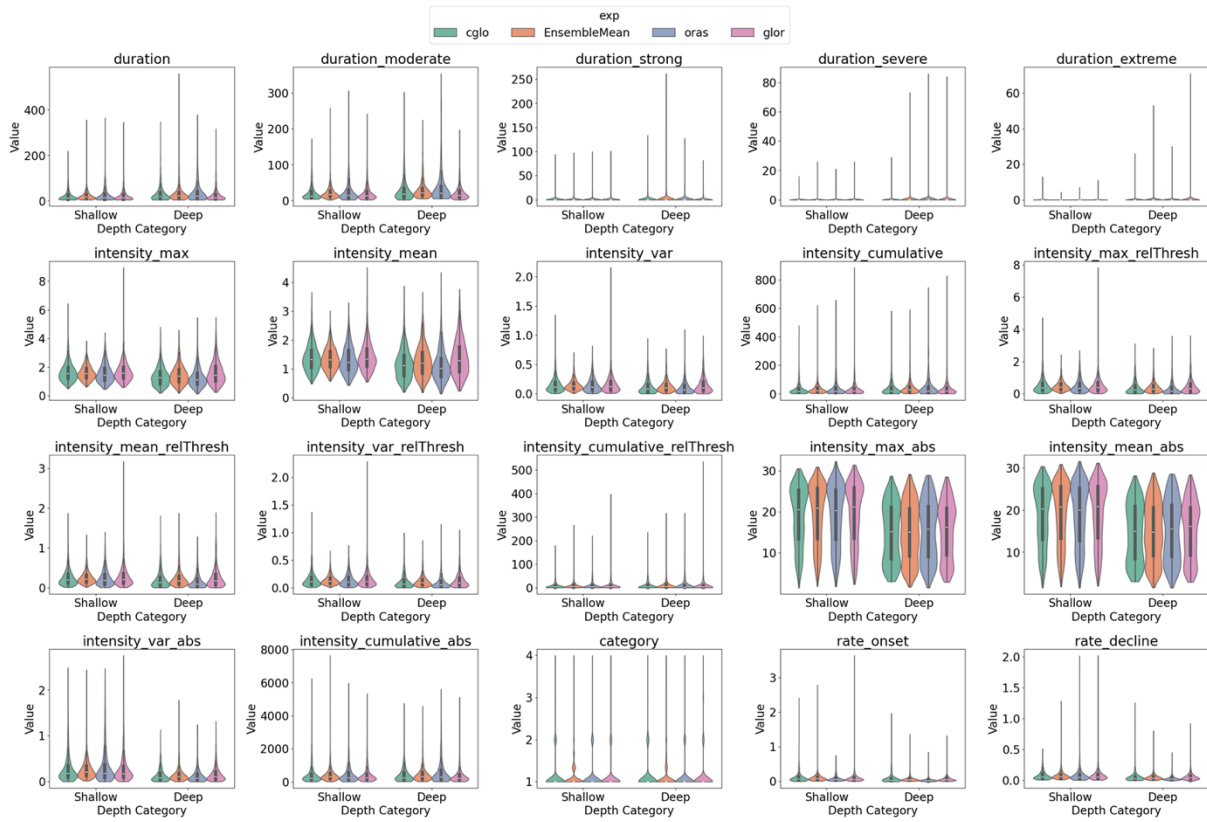


Figure S15. Violin-Plot of the distribution of variables in the Northeast Pacific Blob region, for Surface and Deep Variables, for each of the GREP members, over the entire range of events detected.

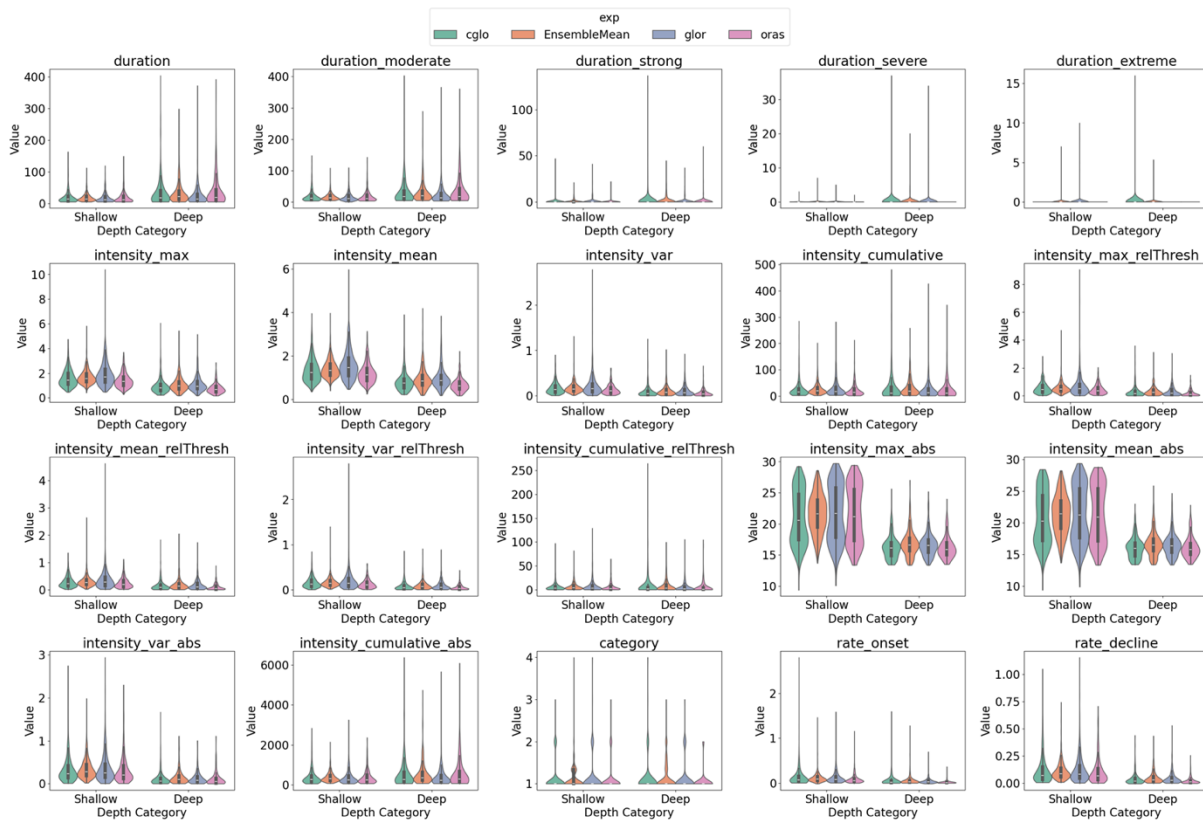


Figure S16. Violin-Plot of the distribution of variables in the Mediterranean Sea region, for Surface and Deep Variables, for each of the GREP members, over the entire range of events detected.

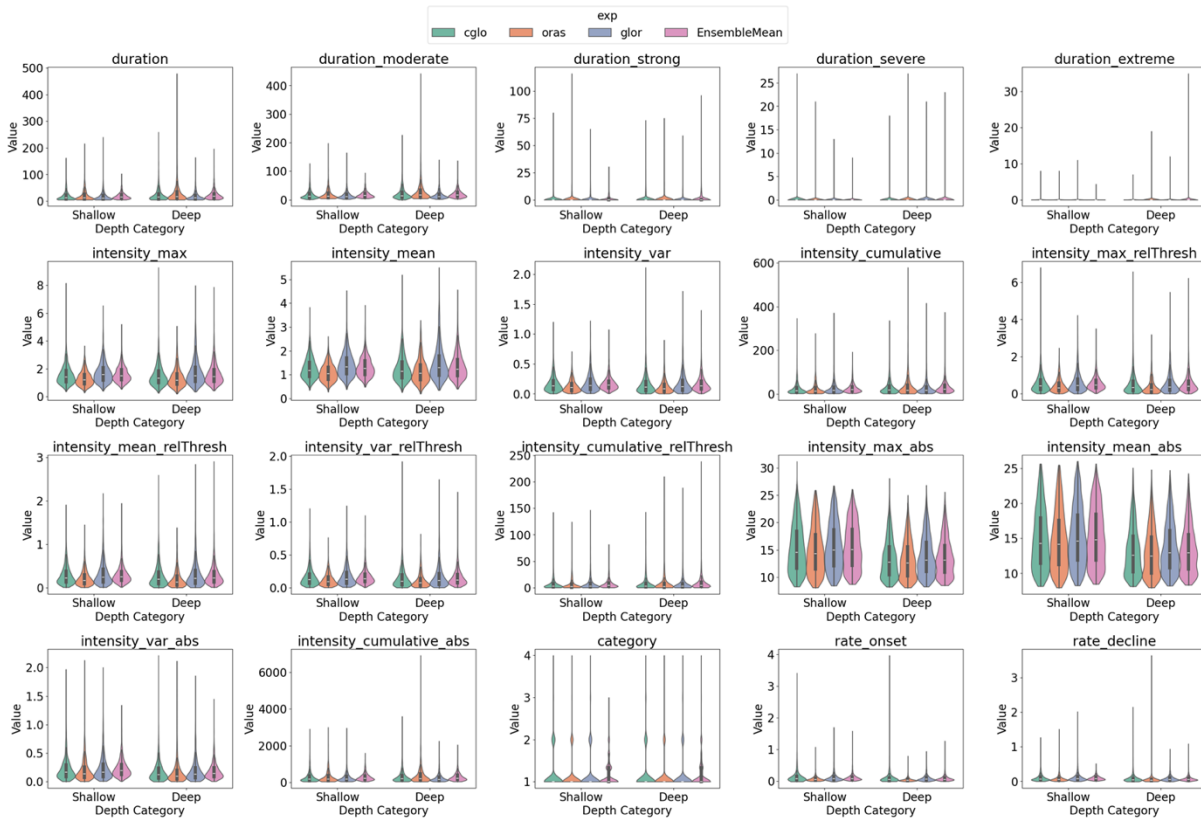


Figure S17. Violin-Plot of the distribution of variables in the Tasman Sea region, for Surface and Deep Variables, for each of the GREP members, over the entire range of events detected.

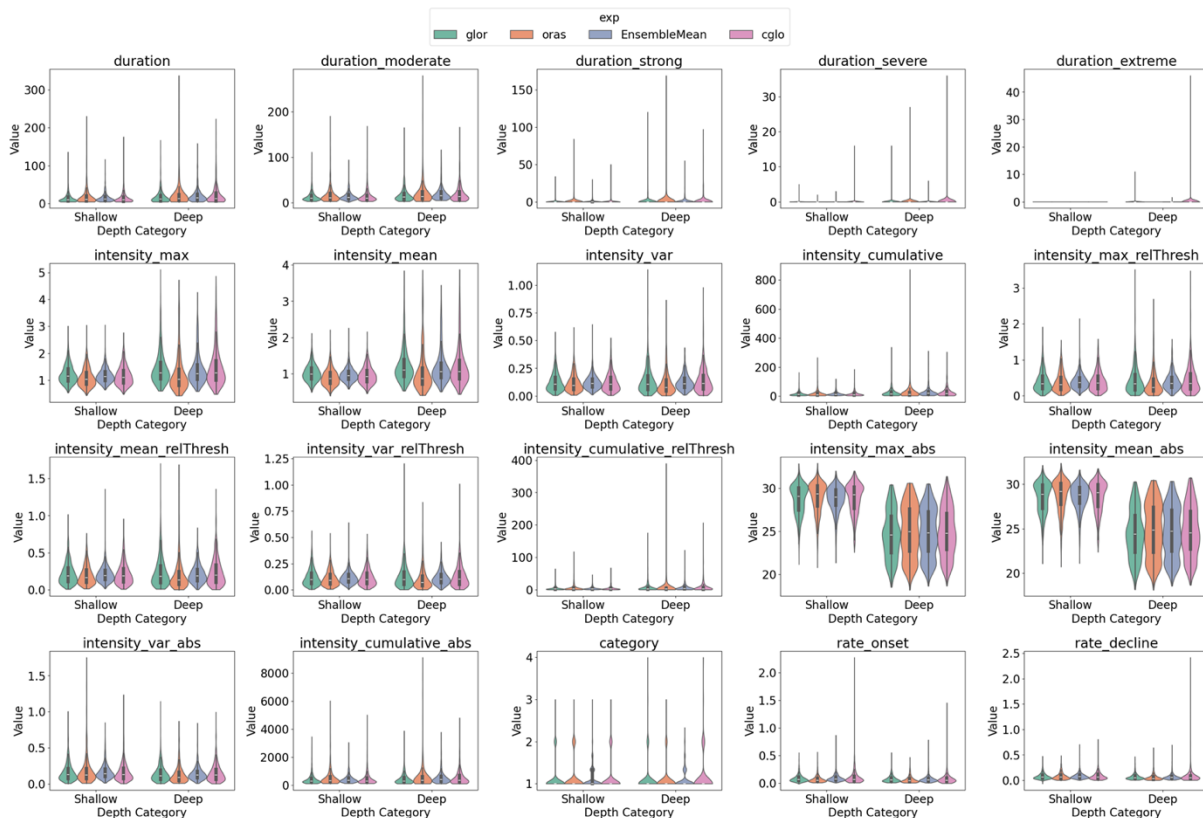


Figure S18. Violin-Plot of the distribution of variables in the Great Barrier Reef region, for Surface and Deep Variables, for each of the GREP members, over the entire range of events detected.

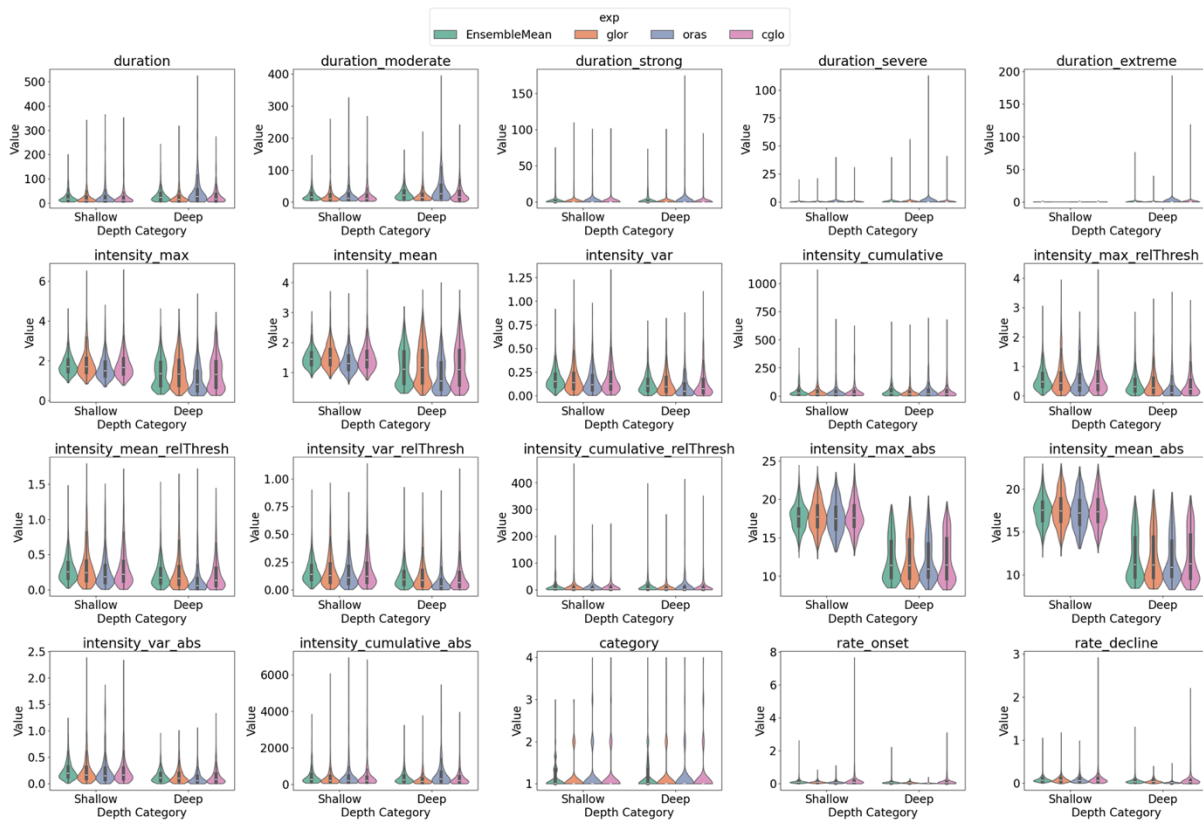
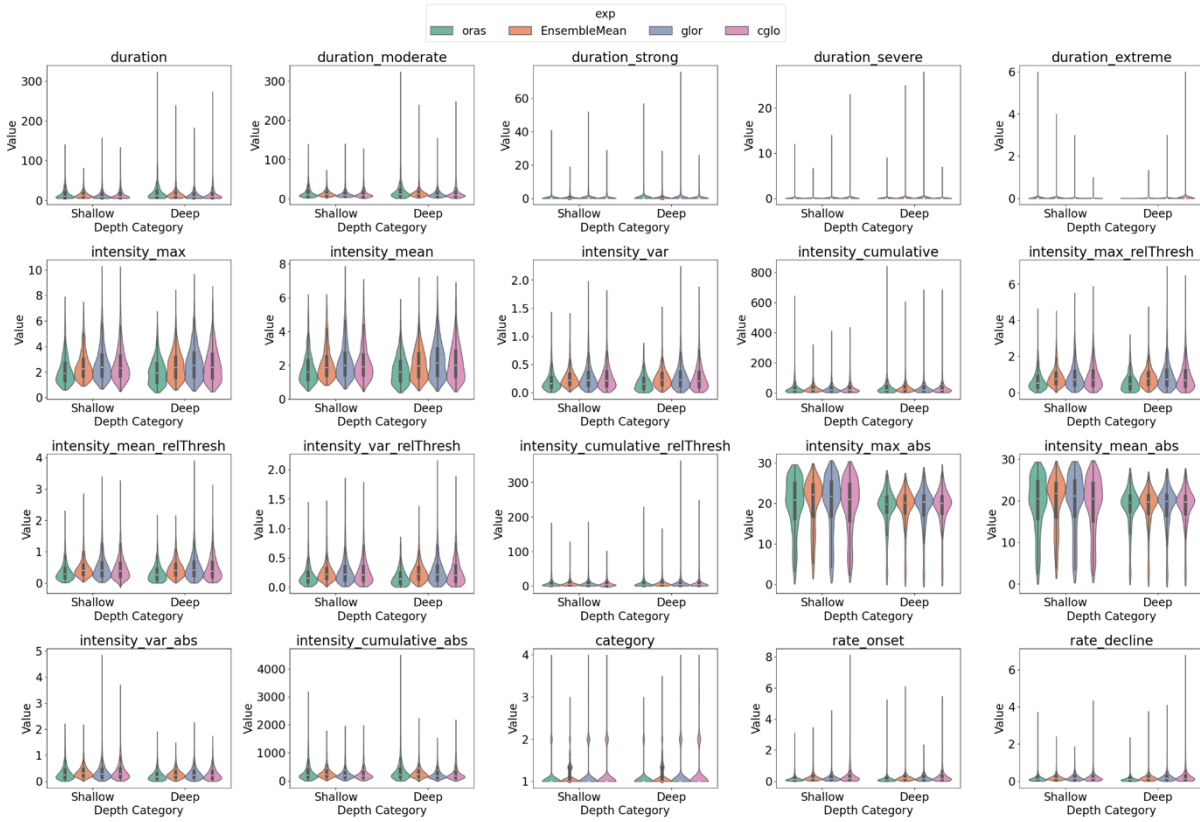


Figure S19. Violin-Plot of the distribution of variables in the Santa Barbara region, for Surface and Deep Variables, for each of the GREP members, over the entire range of events detected.



95 **Figure S20.** Violin-Plot of the distribution of variables in the Northwest Atlantic region, for Surface and Deep Variables, for each of the GREP members, over the entire range of events detected.

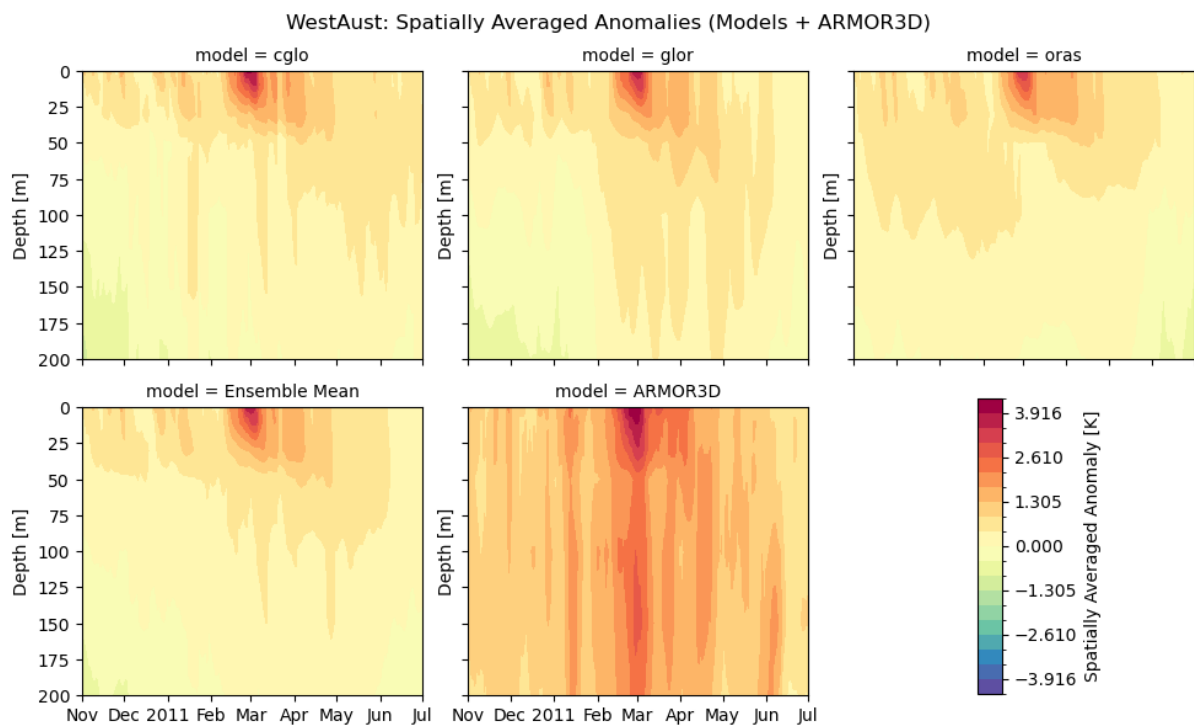


Figure S21. Spatially averaged anomalies over the Western Australia region, validation of the mean state against ARMOR3D data.

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