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Supplement of

Oceanic response to changes in the WAIS and astronomical forcing during the MIS31 superinterglacial

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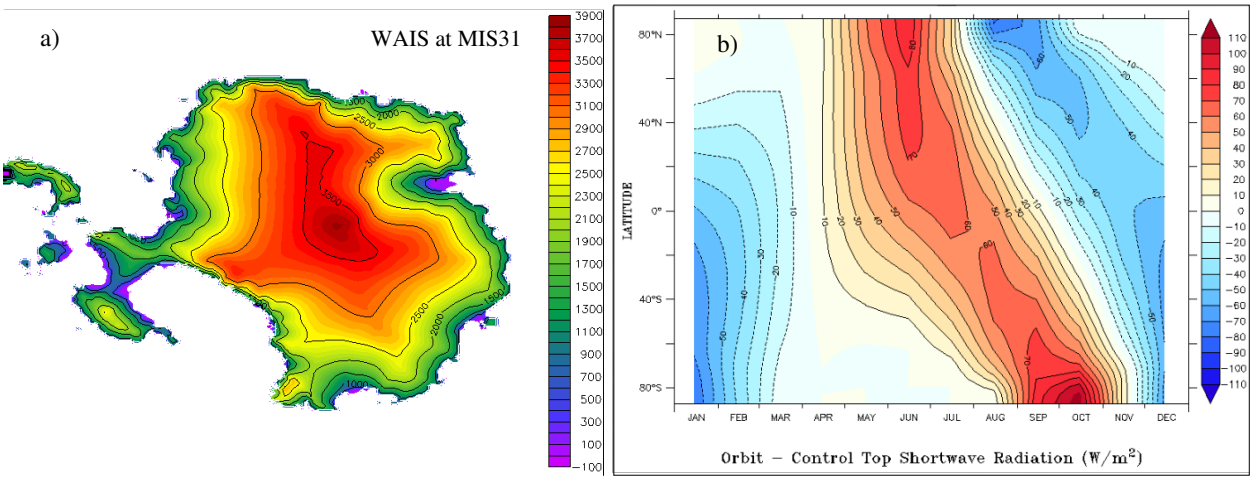


Figure 1.

a) MIS31 WAIS topography (meter)

b) Differences of solar incoming radiation at the top of the atmosphere between the CTR and the MIS31 simulation (W/m2)

Table 1. Boundary conditions (BC) used in the sensitive experiments.

	Control	**MIS31**	**AST**	**TOPO**
Eccentricity	0.0167	0.0559	0.0559	0.0167
Obliquity	23.438	23.898	23.898	23.438
Precession	102.94	289.79	289.79	102.94
WAIS topography	Present day	1.072Ka	Present day	1.072Ka

Figure 2. a) SST differences between MIS31 and ORB (^{o}C). Sea ice cover differences (%) are shown in b) and c). Dotted and hatched regions are significant at 95% based on t-test statistics.

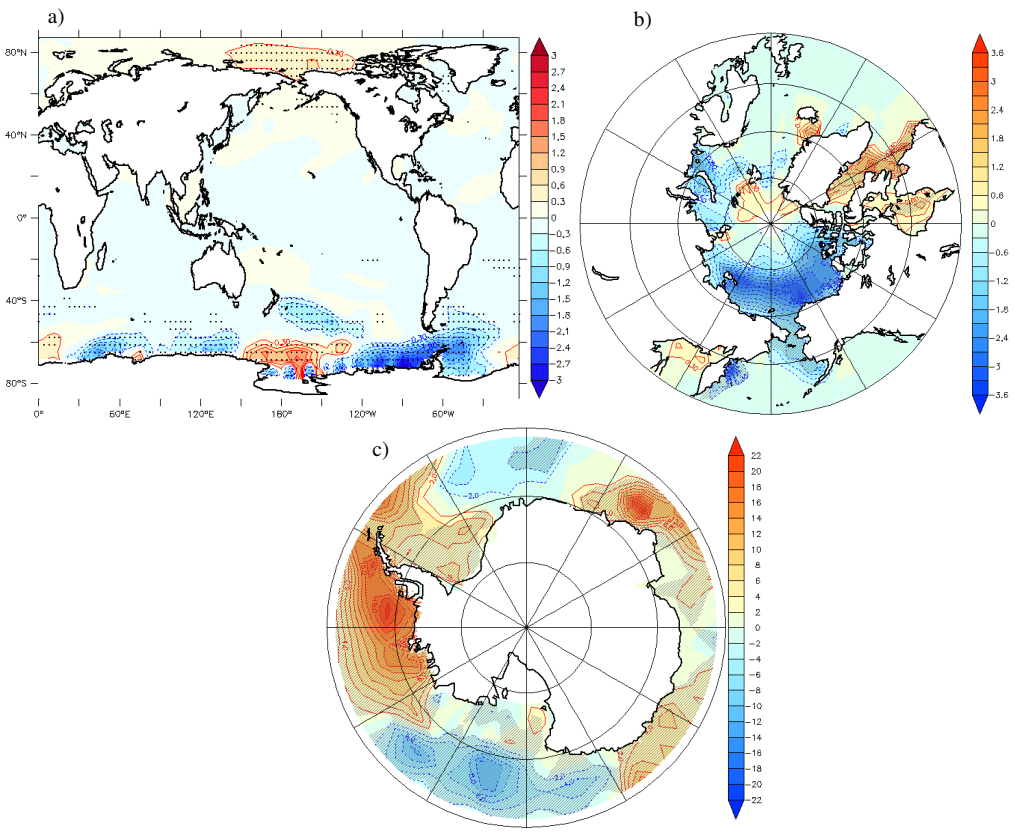


Figure 3. Paleo-proxies distribution used for comparison with the MIS31 modeled results.

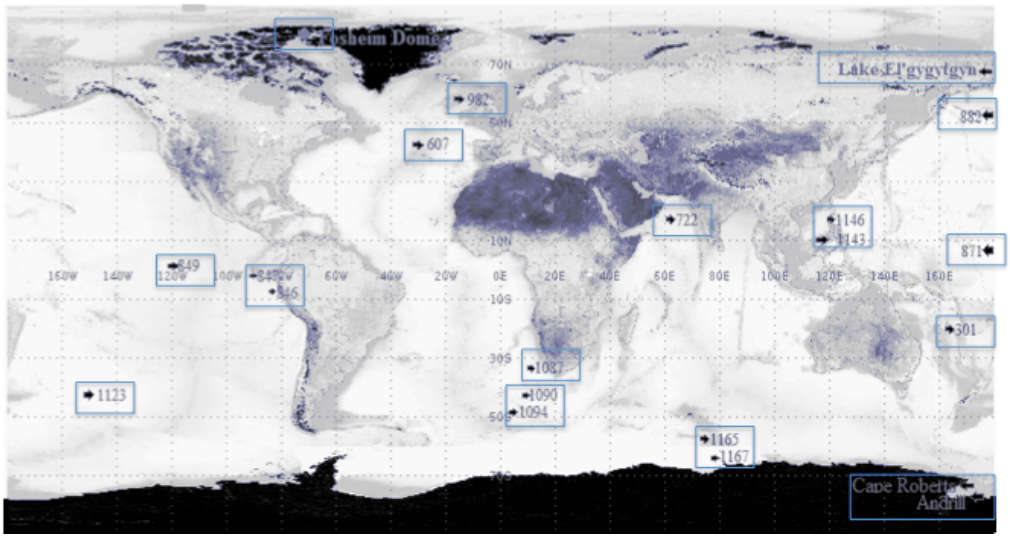


Figure 4. Vertically integrated oceanic heat transport for individual grid cells (OHT, 0.1 PW) showing the zonal

contribution a), b) same as (a) but for differences between the MIS31 and the CTR. c) and d) show the zonal mean of the zonal and meridional contributions to the OHT.

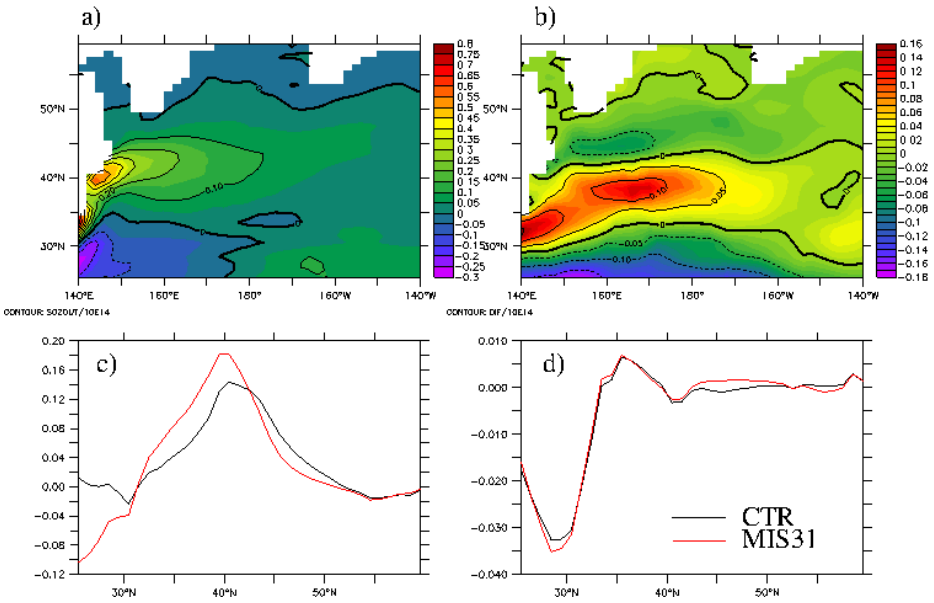
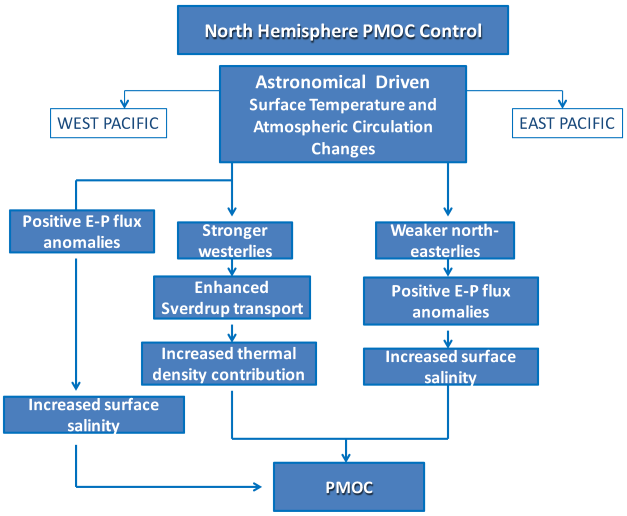


Figure 5. Air-sea interaction mechanisms related to the strengthening of the PMOC during the MIS31 interval.



Initial warming related to the orbital forcing induces modifications in the atmospheric and oceanic circulations. In the northwest and central-north Pacific stronger westerly flow, as compared to CTR, speeds up the subtropical gyre increasing the advection of saltier water from lower latitudes. This in consonance with positive E-P flux anomalies increase surface water density allowing for oceanic convection.