Paleoceanography and Paleoclimatology

Supporting Information for

Insights on the role of intermediate waters in the ventilation of the deep–ocean carbon reservoir during the last deglaciation

Consuelo Martínez-Fontaine[1,3,4], Ricardo De Pol-Holz[2*], Elisabeth Michel[3], Giuseppe Siani[4], Dharma Reyes-Macaya[5], Gema Martínez-Méndez[5], Tim DeVries[6], Lowell Stott[7], John Southon[8], Mahyar Mohtadi[5] and Dierk Hebbeln[5]

[1]Departamento de Geología, Universidad de Chile; [2]Centro de Investigación GAIA-Antárctica (CIGA) and Network for Extreme Environments Research (NEXER), Universidad de Magallanes, Punta Arenas, Chile; [3]Laboratoire des Sciences du Climat et de l'Environnement (LSCE), Laboratoire mixte CNRS-CEA, Avenue de la Terrasse, 91198 Gif-sur-Yvette Cedex, France; [4]Geoscience Paris Sud (GEOPS) Universities of Paris Sud and Paris-Saclay, CNRS, 91405 Orsay, France; [5]MARUM, Center for Marine Environmental Sciences, University of Bremen, Leobener Straße, 28359 Bremen, Germany; [6]Earth Research Institute, UC Santa Barbara, Santa Barbara CA 93106-3060; [7]Department of Earth Sciences, University of Southern California, Los Angeles, California 90089, USA; [8]Earth System Science Department, B321 Croul Hall, University of California, Irvine, California 92697, USA

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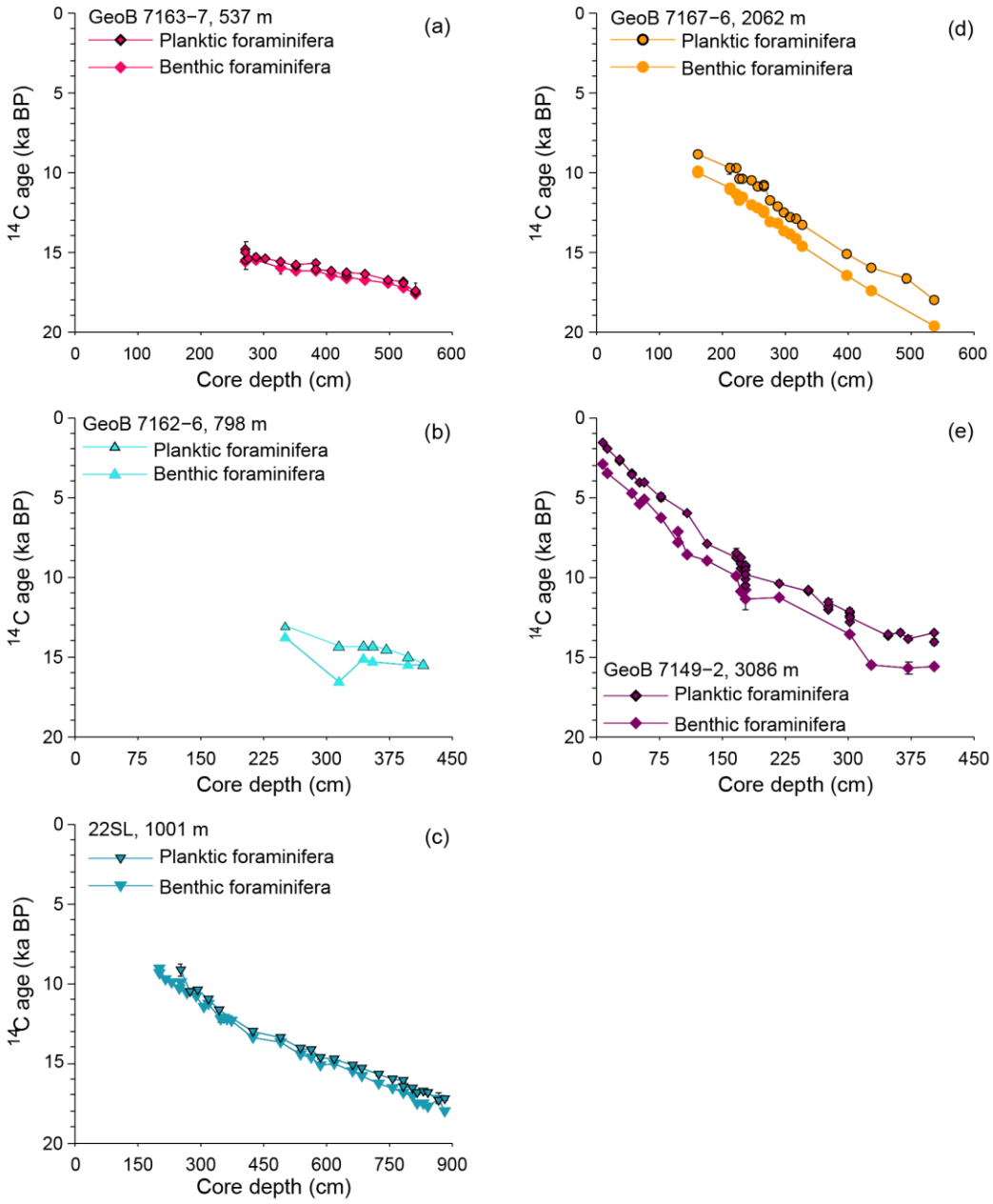

Figure S1 Planktic and benthic foramifera conventional (uncalibrated) ^{14}C ages against core depth. Detailed information in Table S1.

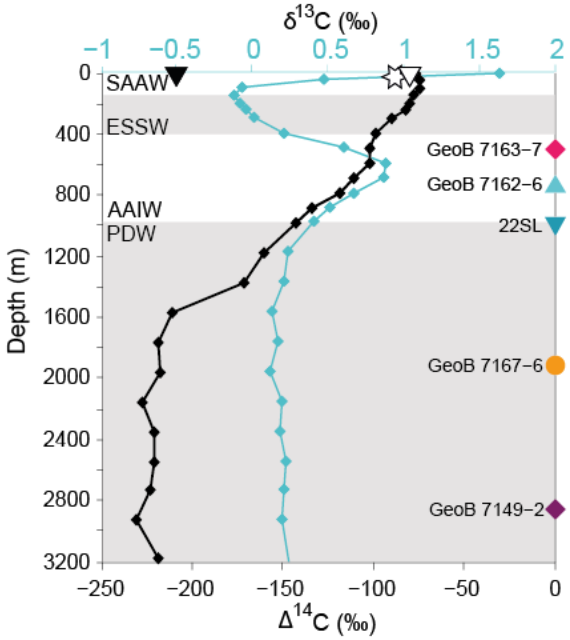

Figure S2 Modern $\delta^{13}C$ (turquoise) and $\Delta^{14}C$ (black) water column data from station P06-E11 (32° 29.64' S, 72° 42.66' W; Kumamoto et al., 2011). For depths shallower than ~1500 m, the ^{14}C coresponds to a natural $\Delta^{14}C$ estimate, based on silicate concentrations, alkalinity and apparent oxygen utilization, deeper than ~1500 m values are the direct mesures Also indicated in the figure are the mean modern $\delta^{13}C$ measured in *G. bulloides* and *N. pachyderma* (dex) in the South East Pacific between ~24–46° S (Mohtadi et al., 2005) and the depth of the studied cores. Black triangle: *G. bulloides* north of ~35° S, white triangle: *G. bulloides* south of ~39° S; white star: *N. pachyderma* (dex) between ~24–35° S and 39–46° S. SAAW: Subantarctic Water; ESSW: Equatorial Subsurface Water; AAIW: Antarctic Intermediate Water; PDW: Pacific Deep Water.

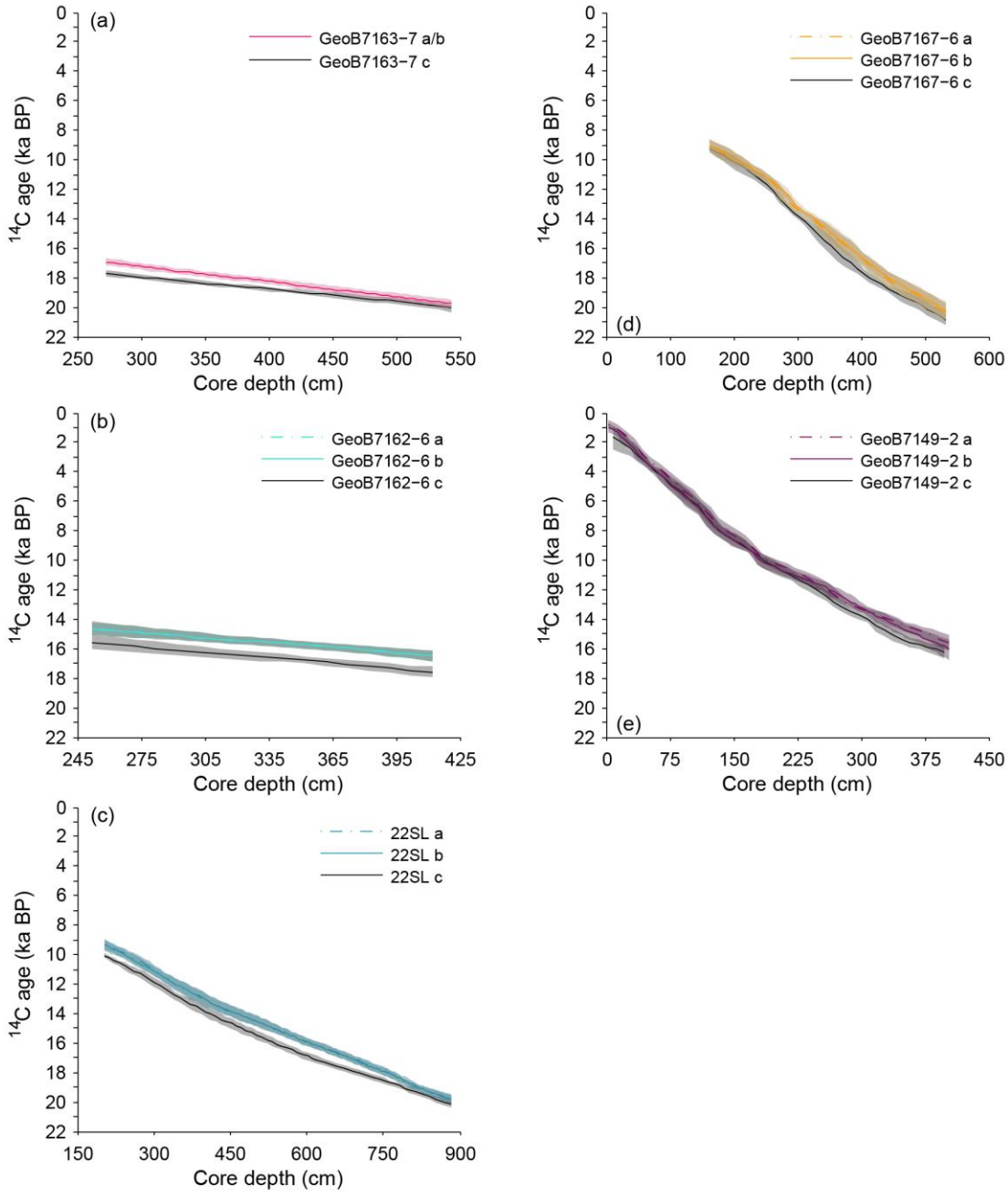

Figure S3. Resulting age models for the cores used in this study using the Bacon algorithm (Blaauw & Christen, 2011). The R_S choice for each scenario is discussed in the main text: a) surface water from SAAW was advected north of 46° S reaching as far north as 31° S throughout all the considered period, and thus the R_S from core MD07-3088 are applied to all studied cores; b) between ~13 and ~11 ^{14}C ka BP the upwelling of 14C–depleted ESSW increases the R_S at ~36° S (22SL, GeoB 7167–6, GeoB 7162–6) and thus equatorial R_S from core TR163-23 are assigned for this interval to cores at ~36° S; c) no changes occur in R_S and thus constant values, equivalent to the modern mean in the closest latitude with available information (Merino–Campos et al., 2019) are

assigned; d) at ~31° S (Geob 7149-2) exclusively equatorial waters flow in the whole interval, and thus for ages older than ~11 ka ^{14}C BP, RS from core TR163–23 (~0° N) are assigned and for ages younger, R_S ages from ~32° S are assigned (Carré et al., 2015). The colored line corresponds to the weighed mean and its corresponding 1σ envelope is plotted, derived from the Bacon.

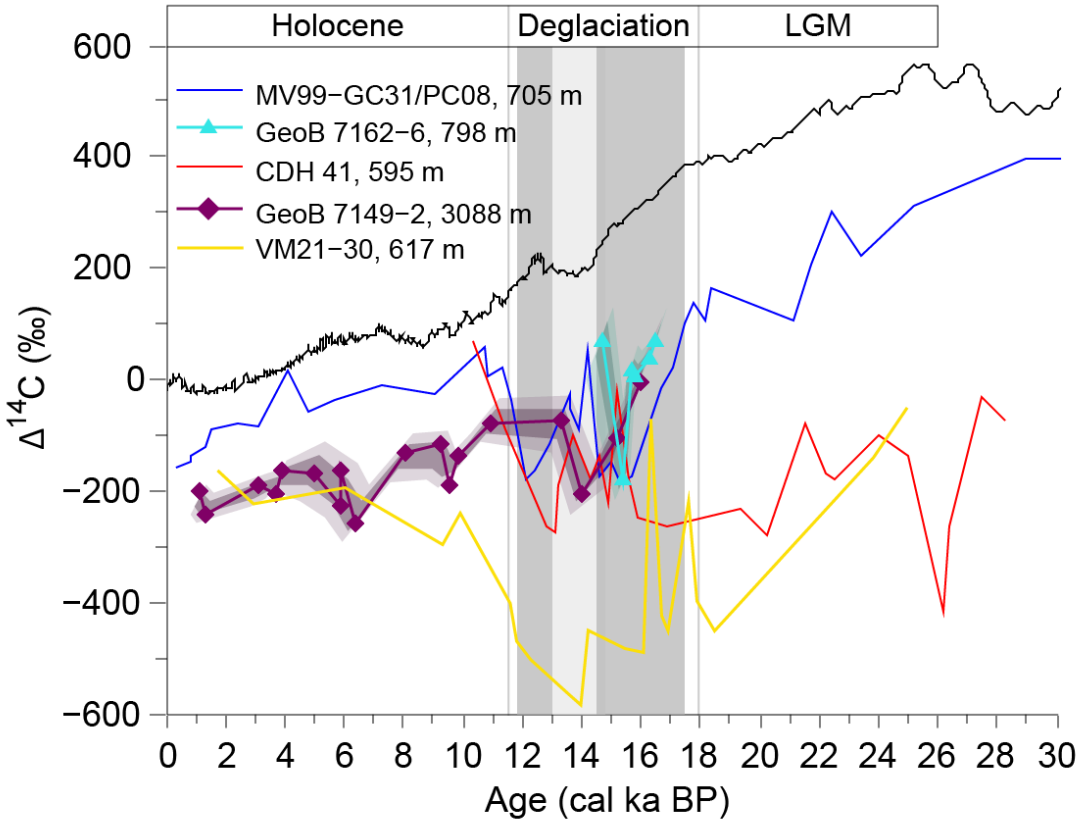

Figure S4 Comparison of $\Delta^{14}C$ in intermediate and deep water from the South East Pacific (this study) with core MV99-MC19/GC31/PC08 in Baja California (23.5° N, 111.6° W, 705 m; Marchitto et al., 2007) and cores Equatorial East Pacific: CDH 41 (1°15.94' S, 89° 41.88' W, 595 m; Bova et al., 2018) and VM21-30 (1°13'S, 89°41'W, Stott et al., 2009). The black curve is the atmospheric $\Delta^{14}C$ (Reimer et al., 2013).

Table S1 Planktic and benthic radiocarbon dates for all cores, calendar and $\Delta^{14}C$ obtained according to the text.

Table S2 $\delta^{13}C$ measurements presented in Figure S2. Ages marked with an * correspond to the original ^{14}C ages, whereas the rest are the extrapolated ages.

Table S3 Cores location

Core	Latitude	Longitude	Depth (m)
GeoB 7149-2	31°29.14'S	72°00.00'W	3086
GeoB 7163-7	36°25.54'S	73°35.73'W	537
GeoB 7167-6	36°27.19'S	73°55.50'W	2062
GeoB 7162-6	36°32.52'S	73°40.02'W	798
22SL	36°13.26'S	73°40.50'W	1001

Table S4 Reservoir ages used in different age models described in the text.

Age model	**>13 ka 14C**	**13-11 ka 14C**	**<11 ka 14C**
a	Rs from MD07-3088	Rs from MD07-3088	Rs from MD07-3088
b	Rs from MD07-3088	Rs from TR163-23	Rs from MD07-3088
c	Rs modern	Rs modern	Rs modern
d (core GeoB 7149-2)	Rs from TR163-23	Rs from TR163-23	Rs from ~32° S
Age model	**>13 ka 14C**	**13-11 ka 14C**	**<11 ka 14C**
a	Rs from MD07-3088	Rs from MD07-3088	Rs from MD07-3088
b	Rs from MD07-3088	Rs from TR163-23	Rs from MD07-3088
c	Rs modern	Rs modern	Rs modern
d (core GeoB 7149-2)	Rs from TR163-23	Rs from TR163-23	Rs from ~32° S