Supplement for

[Revisiting ocean carbon sequestration by direct injection: A global carbon budget perspective]

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Introduction

The supplement provides two tables showing the absolute DIC and PH values of the RCP 8.5 Control run at the injection sites and the respective changes in the WE simulations (section 3.2). Plus, the Figures S1 to S4 for section 3.4.2 that illustrate the explanation of the high correlation and apparent synchronicity in land carbon uptake between the WE simulations (Fig. 2 e) as well as Figure S5 that shows the deep convection related carbon uptake in the Southern Ocean in I-1500 (section 3.4.2).

Table S1: Absolute values of the DIC concentration near the injection sites at the end of the injection period (year 2119) of the RCP 8.5 Control run and comparison of absolute changes in the DIC concentration near the injection sites at the end of the injection period (year 2119) between Orr [2004] (Full range) and our WE simulations (WE simulations minus RCP 8.5 Control run).

DIC [µmol/kg^{-1}]	**Biscay**	**New York**	**Rio**	**Frisco**	**Tokyo**	**Jakarta**	**Mumbai**
I-800 (RCP8.5)	2246	2217	2249	2340	2301	2262	2307
I-1500 (RCP8.5)	2207	2195	2187	2361	2341	2272	2307
I-3000 (RCP8.5)	2184	2171	2186	2354	2338	2254	2287
Δ DIC [µmol/kg^{-1}]	**Biscay**	**New York**	**Rio**	**Frisco**	**Tokyo**	**Jakarta**	**Mumbai**
Full range at 800m (Orr, 2004)	261–1821	52 - 406	95 - 360	123 - 3178	58 - 271	79 -1095	159 - 1542
I-800	357	307	187	356	111	211	232
Full range at 1500m (Orr, 2004)	143 - 4165	79 - 904	52 - 495	112 -1565	158 - 514	97 - 811	136 -1209
I-1500	257	281	155	263	260	209	190
Full range at 3000m (Orr, 2004)	210 - 976	162 - 1222	109 - 1211	88 - 780	125 - 393	70 - 517	198 - 1966
I-3000	299	463	245	215	265	175	199

Table S2: Absolute PH values near the injection sites at the end of the injection period (year 2119) of the RCP 8.5 Control run and **c**omparison of absolute changes in PH near the injection sites at the end of the injection period (year 2119) between Orr [2004] (Full range) and our WE simulations (WE simulations minus RCP 8.5 Control run).

PH	**Biscay**	**New York**	**Rio**	**Frisco**	**Tokyo**	**Jakarta**	**Mumbai**
I-800 (RCP 8.5)	7.78	7.84	7.74	7.55	7.72	7.80	7.68
I-1500 (RCP 8.5)	7.84	7.87	7.93	7.56	7.78	7.90	7.88
I-3000 (RCP 8.5)	7.97	7.98	7.97	7.86	7.88	7.93	7.95
Δ PH	**Biscay**	**New York**	**Rio**	**Frisco**	**Tokyo**	**Jakarta**	**Mumbai**
Full range at 800m (Orr, 2004)	(-1.98) - (-.74)	(-1.08) – (-.12)	(-1.03) - (-.24)	(-2.43) - (-.29)	(-0.8) - (-.13)	(-1.8) - (-.17)	(-2.08) - (-.36)
I-800	-.91	-.85	-.57	-.74	-.36	-.64	-.65
Full range at 1500m (Orr, 2004)	(-2.34) - (-.39)	(-1.69) - (-.19)	(-1.29) - (-.12)	(-2.05) - (-.27)	(-1.3) - (-.036)	(-1.67) - (-.22)	(-1.78) - (-.3)
I-1500	-.77	-.83	-.49	-.72	-.73	-.68	-.59
Full range at 3000m (Orr, 2004)	(-1.7) - (-.65)	(-1.63) - (-.42)	(-1.77) - (-.25)	(-1.59) - (-.21)	(-1.09) - (-.33)	(-1.29) - (-.16)	(-2.02) - (-.54)
I-3000	-.90	-1.2	-.77	-.67	-.78	-.57	-.53

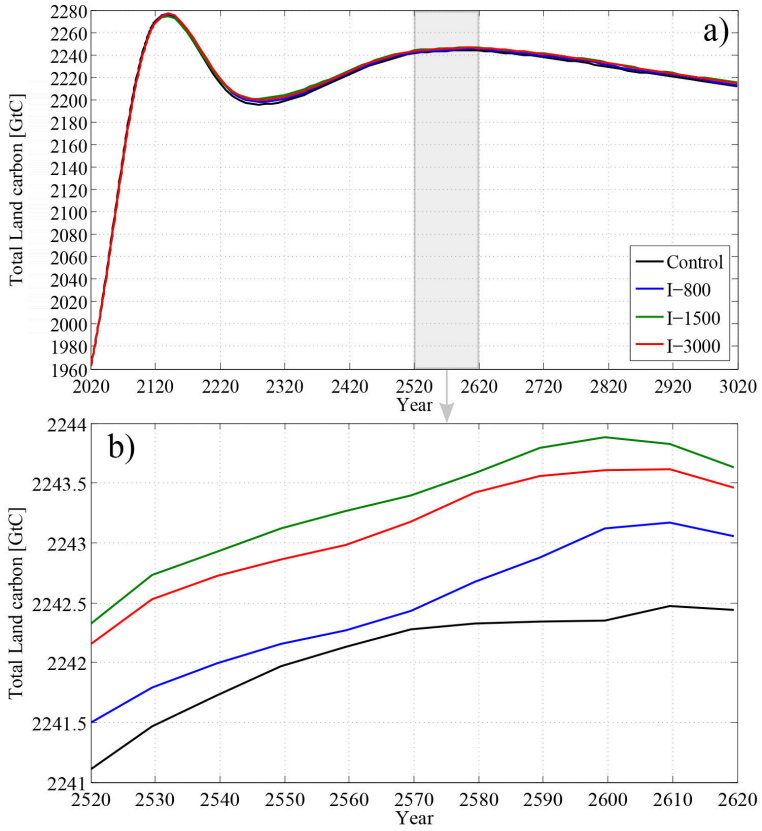

Figure S1: Total land carbon of the RCP 8.5 Control run and the WE simulations for (a) the whole simulation period and (b) the simulation period between the years 2520 and 2620.

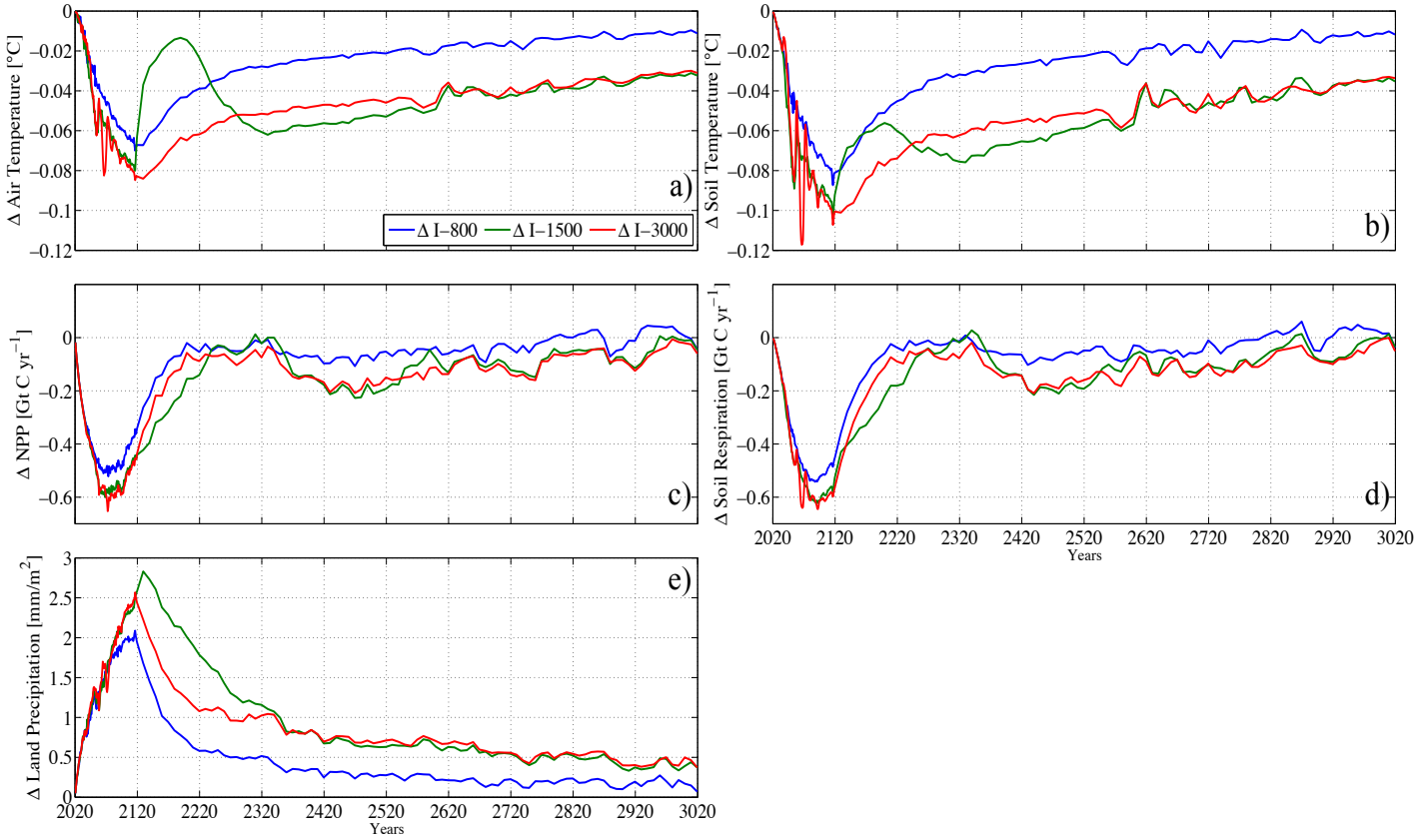

Figure S2: Absolute changes between the WE simulations and the RCP 8.5 control run for (a) global mean surface air temperature, (b) global mean soil temperature, (c) globally integrated net primary productivity on land, (d) globally integrated soil respiration, and (e) global mean precipitation over land

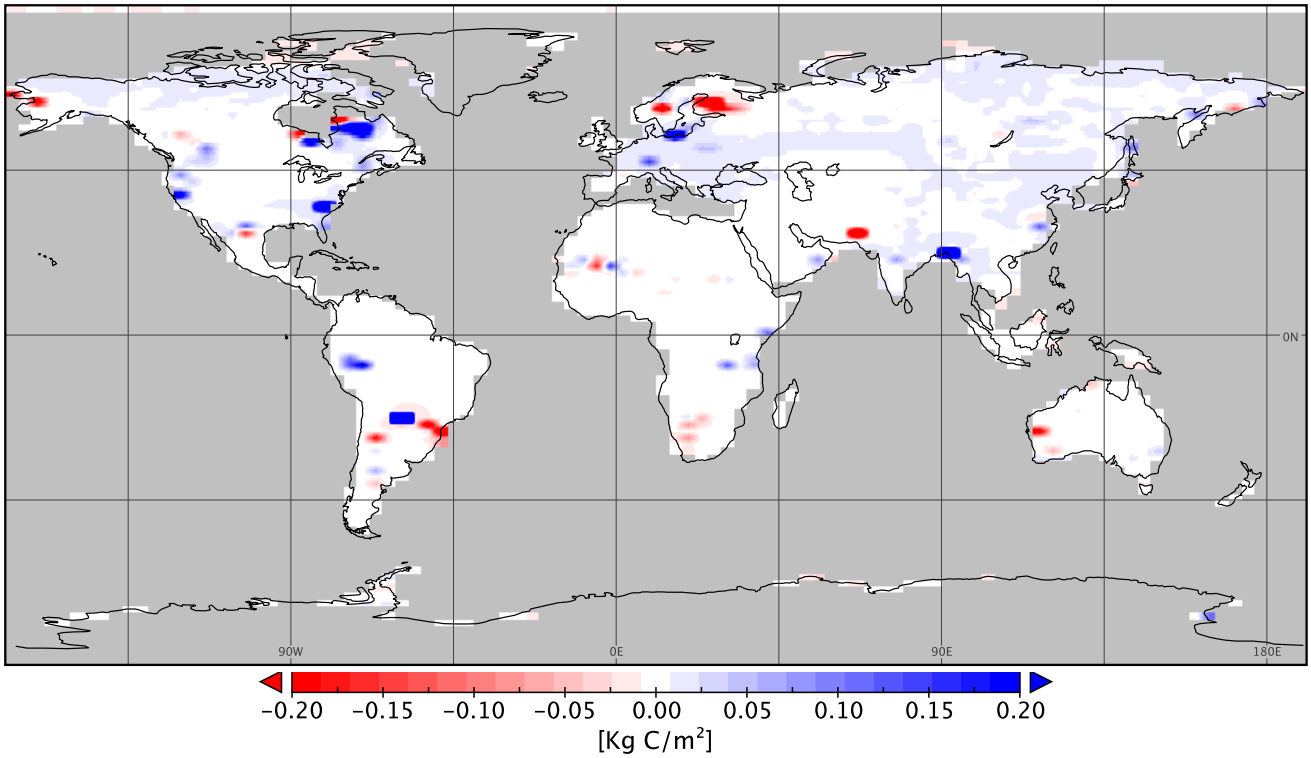

Figure S3: Absolute changes in land carbon between I-800 and the RCP 8.5 Control run for the synchronic increase illustrated in Figure 2 g, i.e., year 2600 minus 2570.

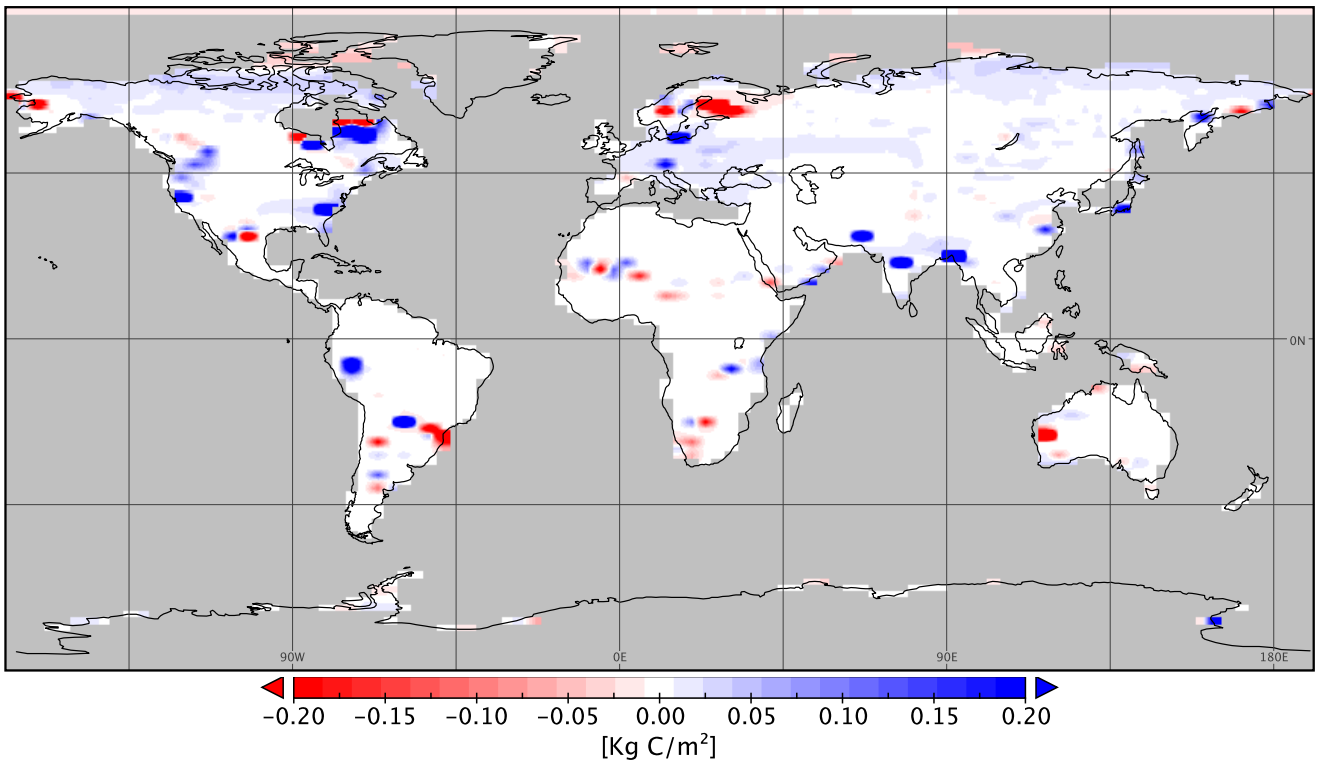

Figure S4: Absolute changes in land carbon between I-1500 and the RCP 8.5 Control run for the synchronic increase illustrated in Figure 2 g, i.e., year 2600 minus 2570.

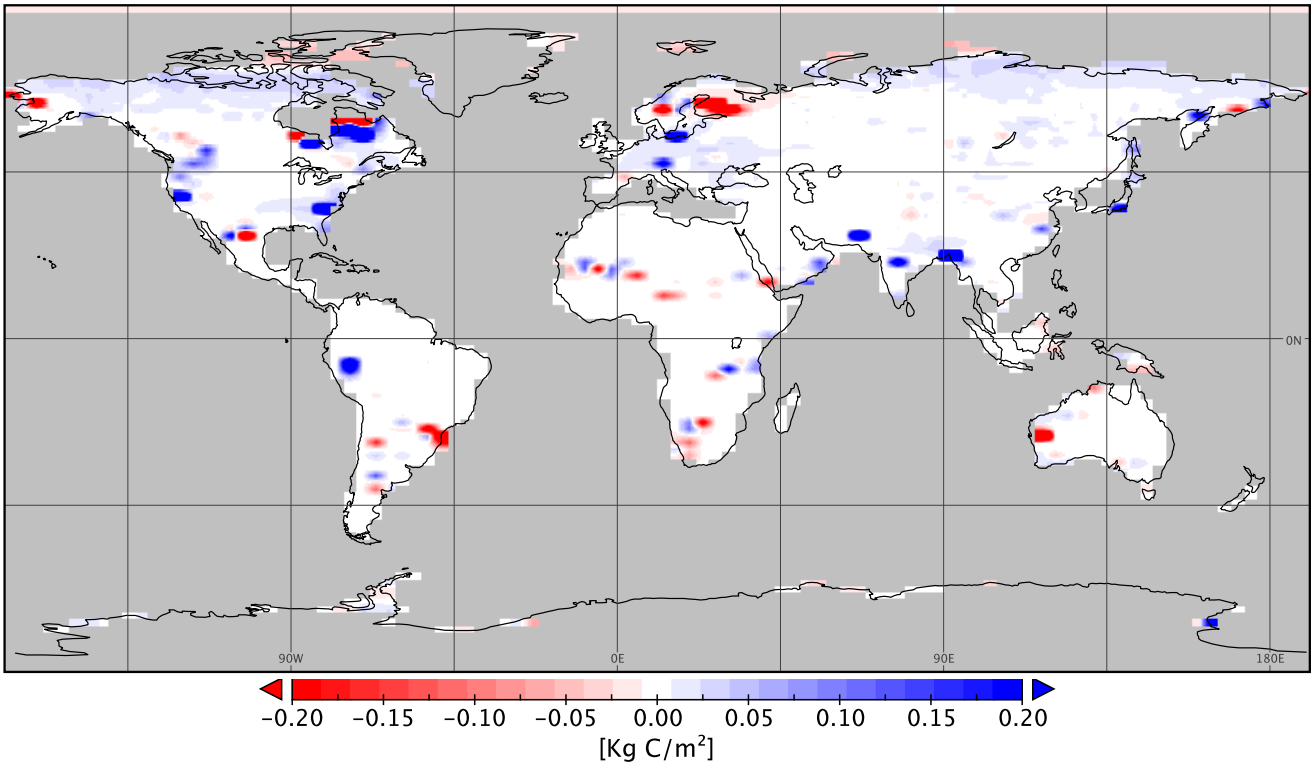

Figure S5: Absolute changes in land carbon between I-3000 and the RCP 8.5 Control run for the synchronic increase illustrated in Figure 2 g, i.e., year 2600 minus 2570.

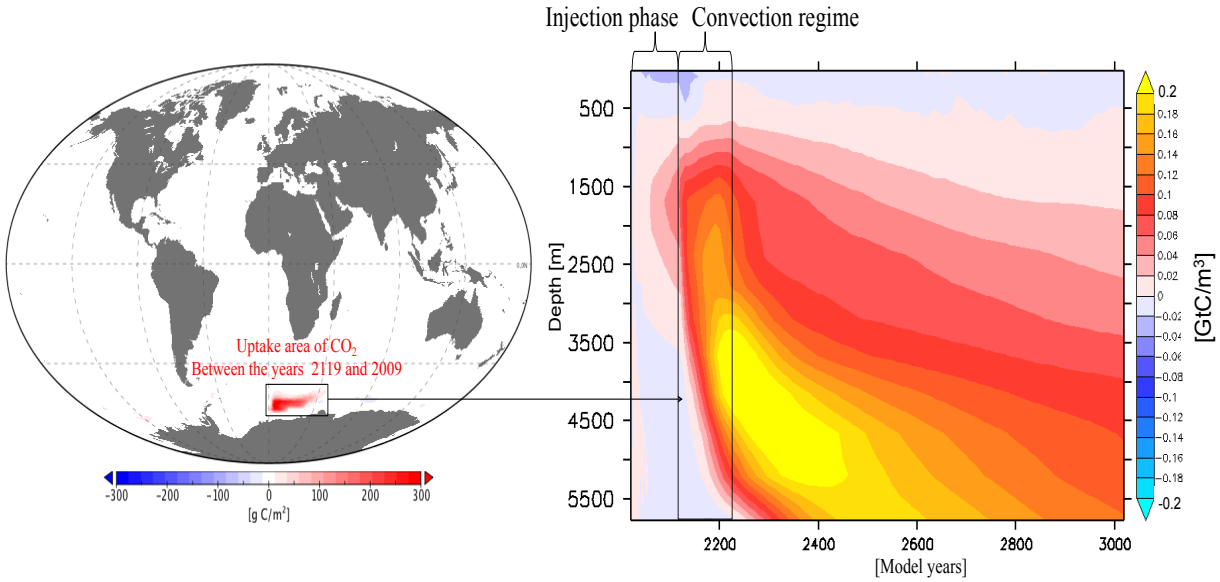

Figure S6: Downward carbon flux between the years 2119 and 2209 (I-1500 minus RCP 8.5 Control run) (left panel) Absolute change in total oceanic carbon (I-1500 minus RCP 8.5 Control run) (left panel)