

Reply to CE1

During the second revision, we were asked by reviewer 1 to modify Fig. 3 and use 8 day running means for the ESM data instead of the daily data. Before this, we had linearly interpolated the CAFE data to every day. After the second revision, we instead used the actual 8 daily data. The linear interpolation gave very slightly higher values than the actual 8 daily data. Unfortunately, we forgot to update the numbers in Table 1. This oversight was discovered during the proofreading and the table (and text referring to the table) therefore needs to be updated with corrected numbers as shown in the modified text and table below.

In the CAFE data, the day of peak NPP occurs on day 153–177 (early to late June) in the northernmost provinces BPLR, ARCT, SARC, and NADR, while the subtropical gyres NASW and NASE, the Gulf Stream (GFST), and the northwest Atlantic shelf (NWCS) generate an earlier peak NPP, between day 113 (23 April) and day 129 (9 May). Similarly, in EC-Earth3-CC, the three Arctic provinces, BPLR, ARCT, and SARC, display the latest peak NPP, occurring from day 150 to day 166 (30 May to 15 June), while the peak NPP in the North Atlantic drift (NADR) occurs earlier compared with CAFE (day 124, 4 May). The earliest peak NPP occurs in the southeastern part of the domain, in NASE, on day 83 (24 March). As in the CAFE data, the earliest peak NPP in NorESM2-LM occurs in the northwest subtropical gyre (NASW) (26 April, day 116 compared with 23 April in CAFE), while the latest occurs in the continental shelf area, NWCS (day 186, 5 July). In NorESM, the three Arctic provinces display a day of peak NPP of 159 (8 June) for BPLR, 161 (10 June) for ARCT, and 176 (25 June) for SARC. The southeastern province NASE and the Gulf Stream province (GFST) have a day of peak NPP of 138 (18 May) and 148 (28 May), respectively. We note from Table 1 that the annual mean over this period is closer to CAFE in EC-Earth3-CC than in NorESM2-LM for all but one province (GFST), where the annual mean NPP is 38 % higher than CAFE in EC-Earth3-CC and 37 % lower than CAFE in NorESM2-LM. On the contrary, the day of peak NPP in this period is better captured by NorESM2-LM than EC-Earth3-CC in five out of eight provinces. In three provinces, NASW, the continental shelf NWCS, and GFST, is the day of peak NPP closer to CAFE in EC-Earth3-CC although the difference in NASW is very small.

Province	CAFE		EC-Earth3-CC		NorESM2-LM	
	Mean NPP [mgC m ⁻² day ⁻¹]	Day of peak NPP	Mean NPP [mgC m ⁻² day ⁻¹]	Day of peak NPP	Mean NPP [mgC m ⁻² day ⁻¹]	Day of peak NPP
BPLR	404	153	161	166	141	159
ARCT	470	177	321	152	160	161
SARC	525	169	442	150	210	176
NADR	472	161	332	124	203	172
NWCS	477	121	396	100	239	186
GFST	441	129	608	126	276	148
NASW	358	113	442	112	238	116
NASE	419	121	273	83	326	138
Total	424	161	371	121	242	153

Table 1. Mean NPP and mean Day of peak NPP over the time period 2003-2021 for the different provinces shown in Fig. 1. Also shown is the mean values averaged over the entire domain (Total). The ESM data was masked to the real valued CAFE data.