Supplement

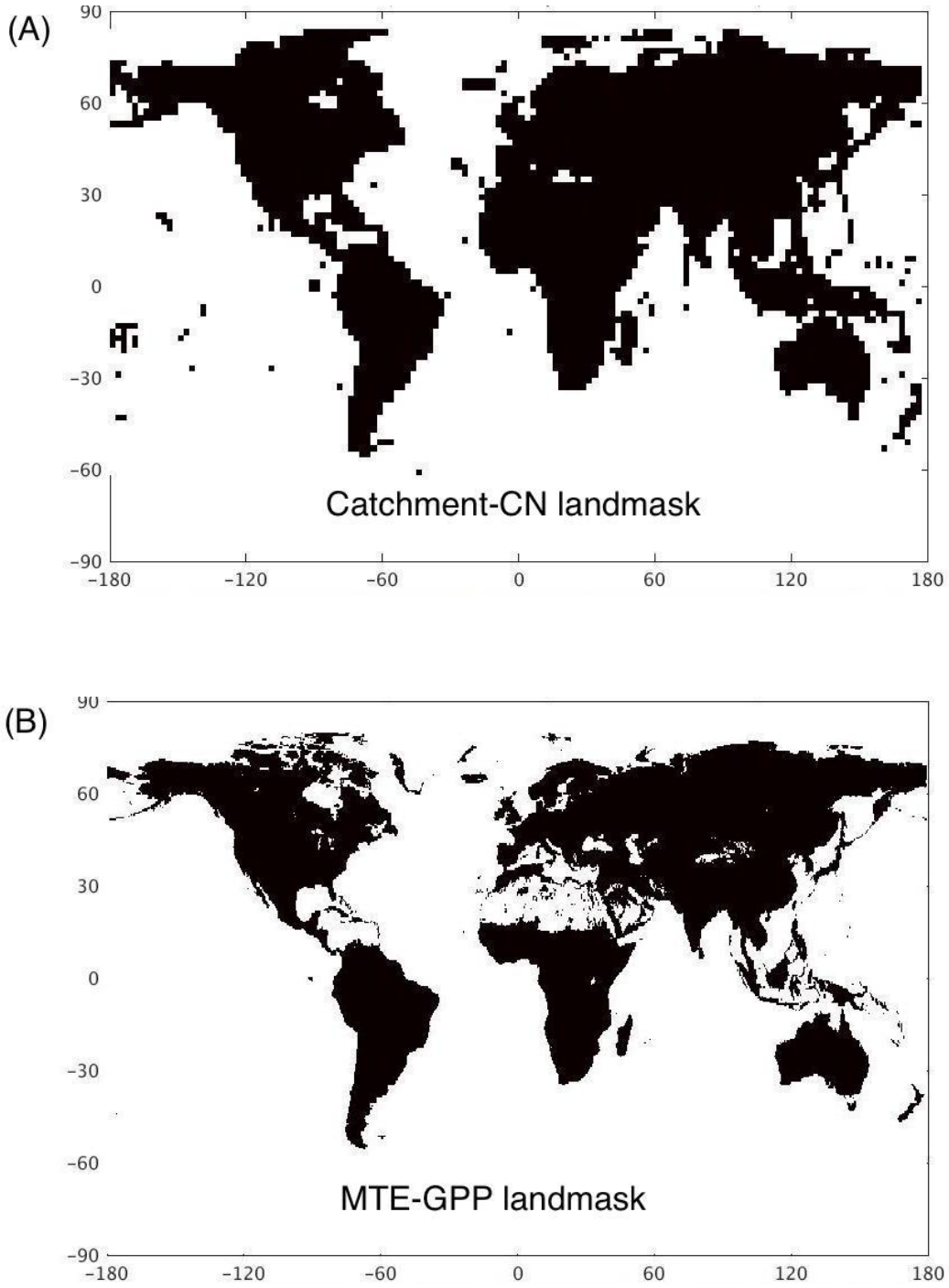
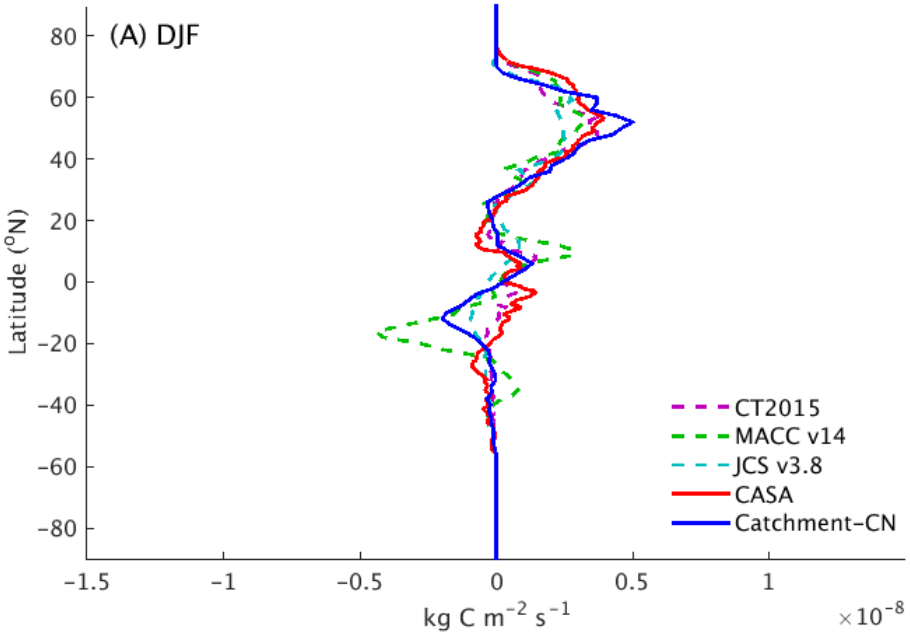
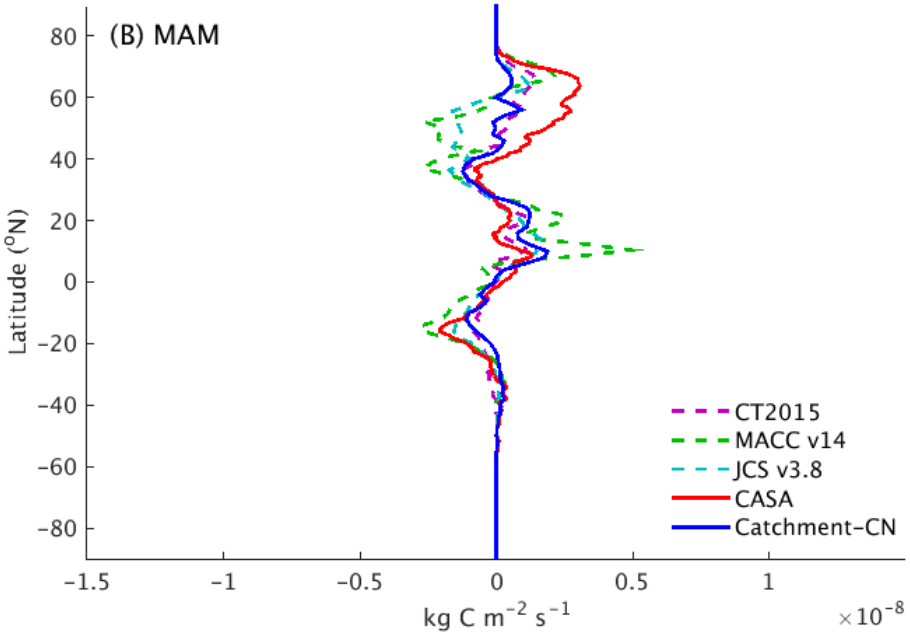


Fig. S1. The land masks used in (a) the Catchment-CN model simulations and (b) the MTE-GPP dataset.


(A) DJF
Latitude (°N)
80
60
40
20
0
-20
-40
-60
-80
-1.5
-1
-0.5
0
0.5
1
kg C m^{-2} s^{-1}
×10^{-8}
CT2015
MACC v14
JCS v3.8
CASA
Catchment-CN


(B) MAM
Latitude (°N)
80
60
40
20
0
-20
-40
-60
-80
-1.5
-1
-0.5
0
0.5
1
kg C m^{-2} s^{-1}
×10^{-8}
CT2015
MACC v14
JCS v3.8
CASA
Catchment-CN

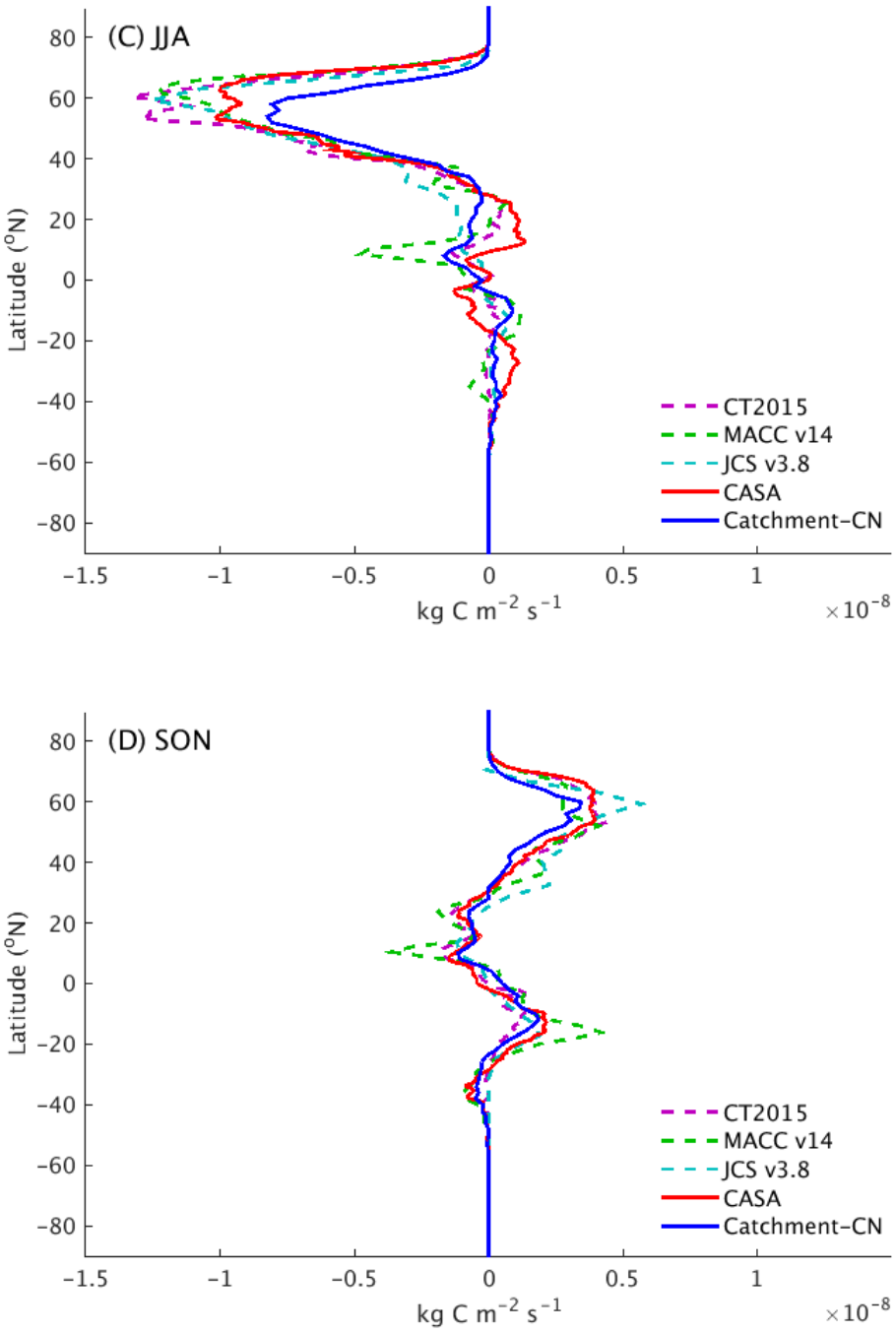


Fig. S2. Mean seasonal NBP of (a) DJF, (b) MAM, (c) JJA and (d) SON, of the Catchment-CN model (blue), the CASA-GFED3 model (red), and inversions (dotted lines) for the period of 2004-2014.

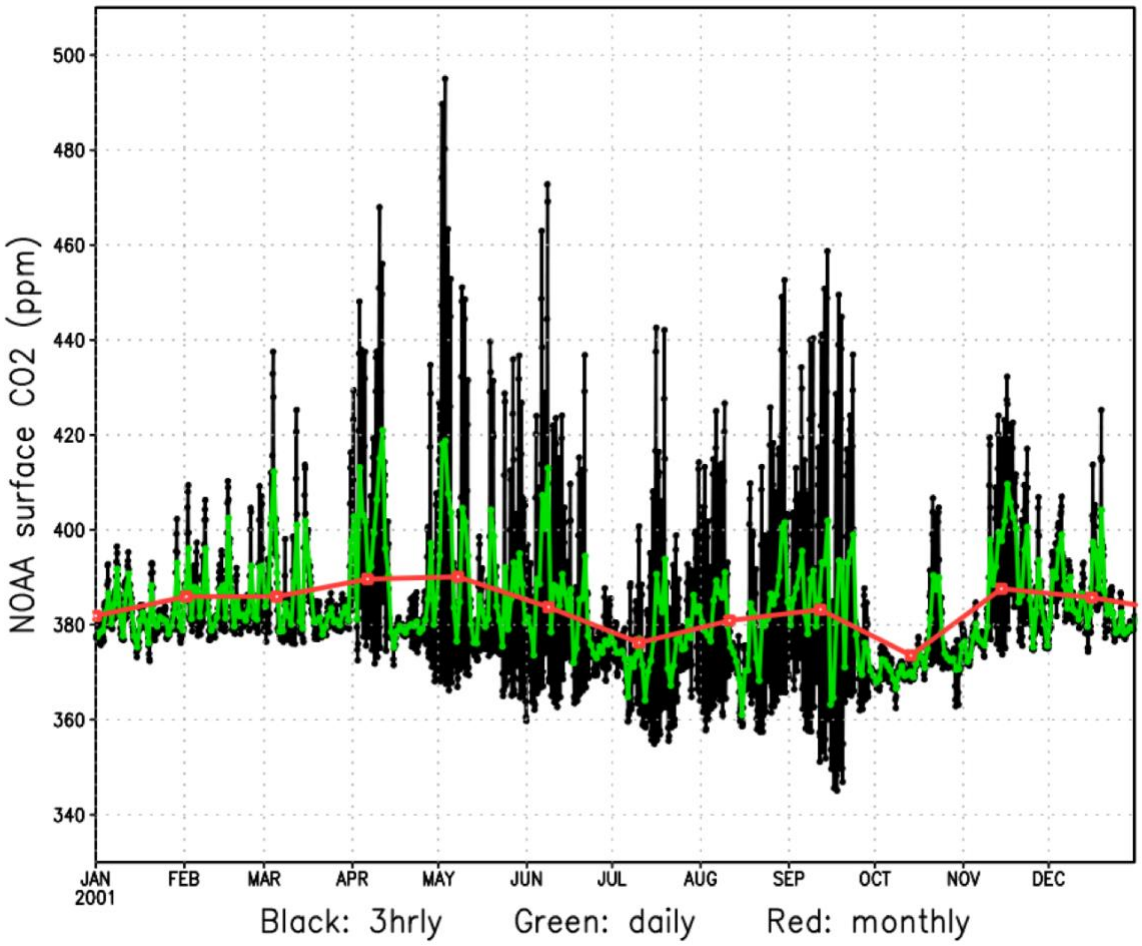


Fig. S3. An example of the atmospheric CO_2 from the CarbonTracker at 37N and 79W for year 2001. The amplitude of the diurnal cycle (black) varies as much as 120ppm in early growing season, while the seasonal change of CO_2 (red) varies only about 20ppm. Green indicates the mean daily CO_2 and red the mean monthly CO_2.

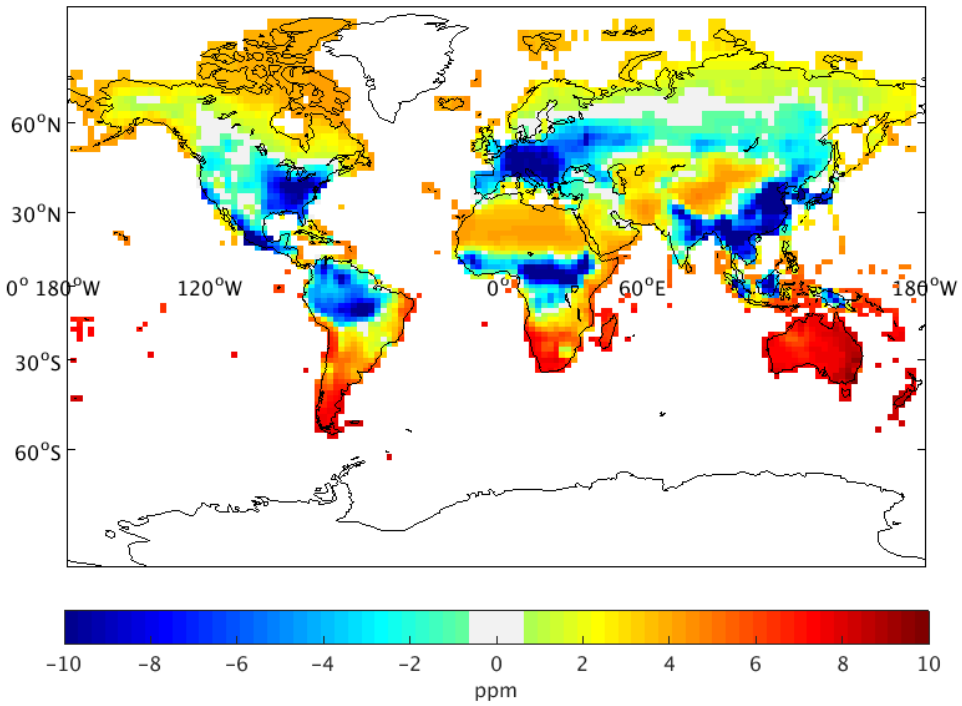


Fig. S4. Difference between the CO_2 concentration (ca. 390ppm) imposed in cCO2 and the time mean of the concentrations imposed in aCO2.

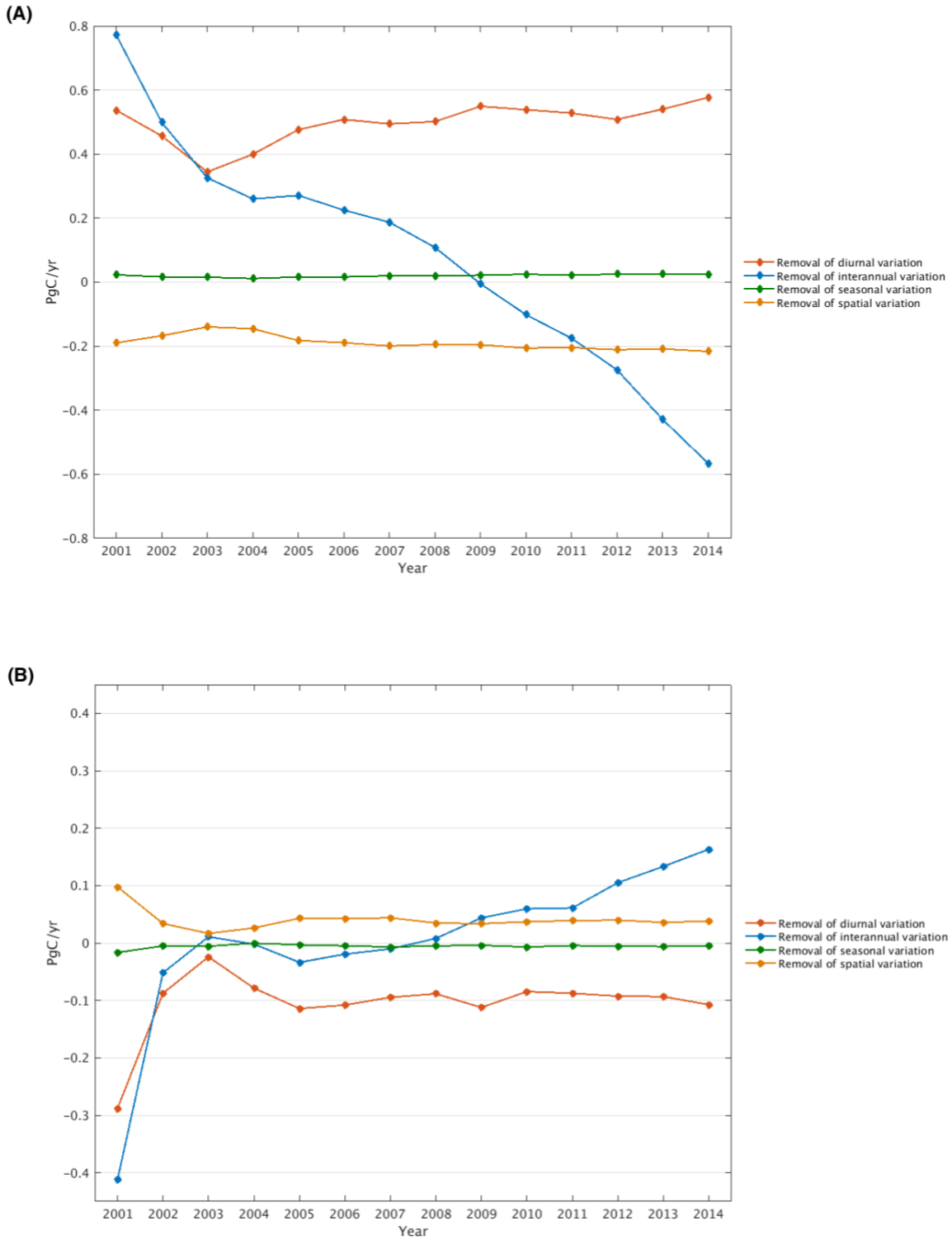


Fig. S5. Differences in annual mean (a) GPP and (b) NBP for 2001-2014.

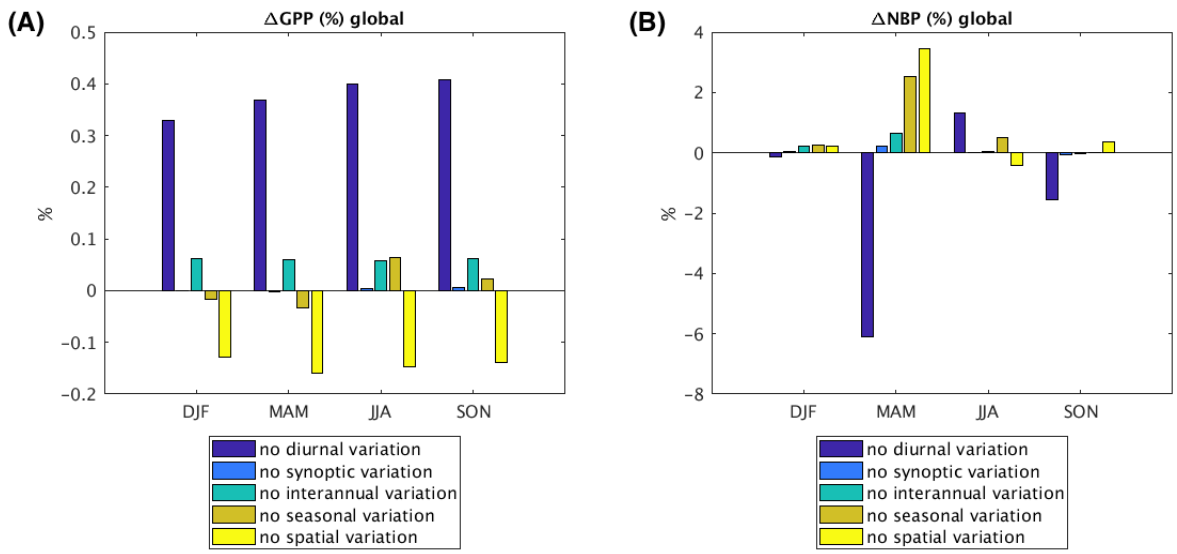


Fig. S6. Difference in mean global (a) GPP and (b) NBP for DJF, MAM, JJA, and SON, by removing each variability of the atmospheric CO_2 concentrations.