	Catchment-CN with MERRA-2 meteorology (This study)	Catchment-CN with Princeton meteorology	Bonan et al. (2011)
Meteorology	MERRA-2	Sheffield et al. (2006)	NCEP/NCAR reanalysis
Model	Catchment-CN	Catchment-CN	CLM4
Average over	1982-2004	1982-2004	1982-2004
CO2	Increasing CO_2 with diurnal variability applied	Increasing CO_2 with diurnal variability applied	Spatially uniform, annually increasing CO_2
GPP	127 PgC/yr	162 PgC/yr	165 PgC/yr

Table L1. Effects of meteorology vs. model implementation. The spin-up process of the Catchment-CN with the Princeton meteorology was done separately from the case using MERRA-2: both reaching to an equilibrium for year 1850 with the choice of the meteorology and then conducting a transient CO_2 simulation from 1850 onward.

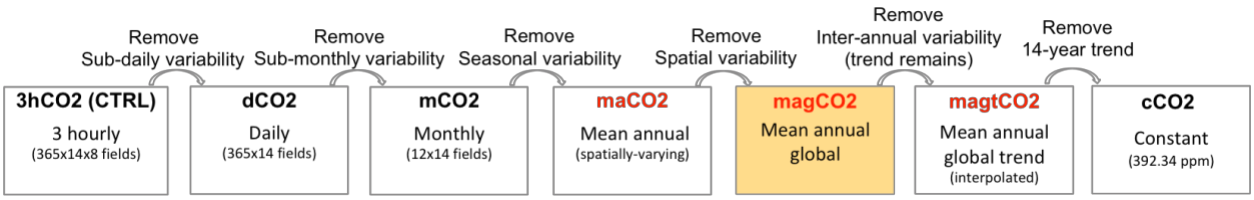

Figure L1: Revised schematic figure of the experimental design (revised Figure 1). The magCO2 indicates the common CO_2 forcing, "annually changing global CO_2". The additional simulations are highlighted in red for the reviewer's convenience.

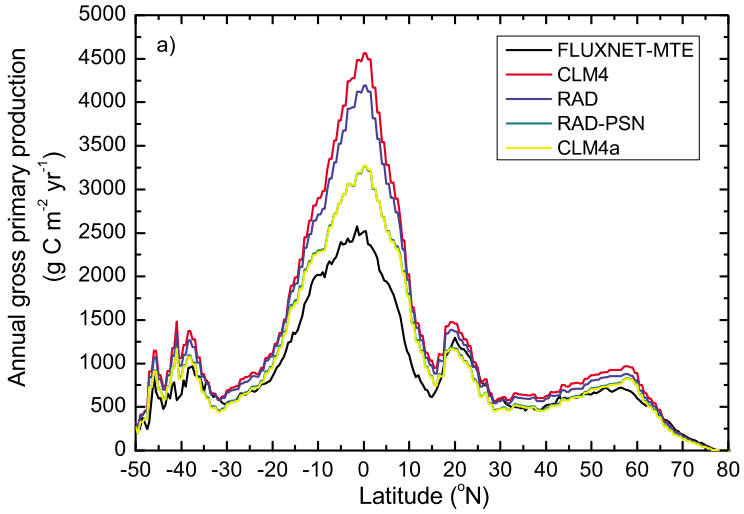

Figure L2a. Figure 5a in Bonan et al. (2011) study.

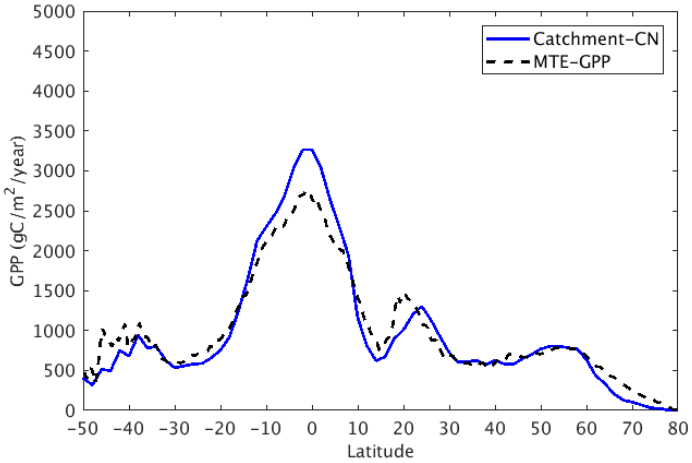

Figure L2b. Annual zonal mean GPP of Catchment-CN (2002-2011)

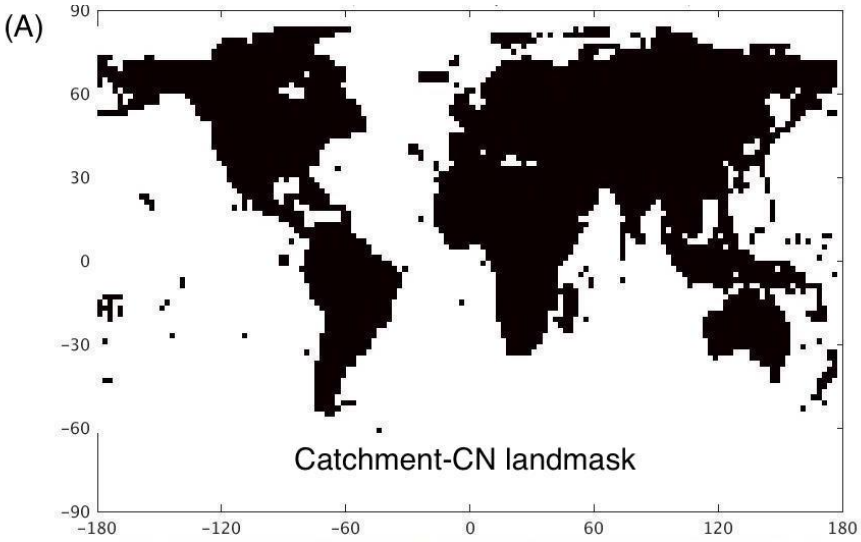

Figure L3a. Landmask of Catchment-CN (previous)

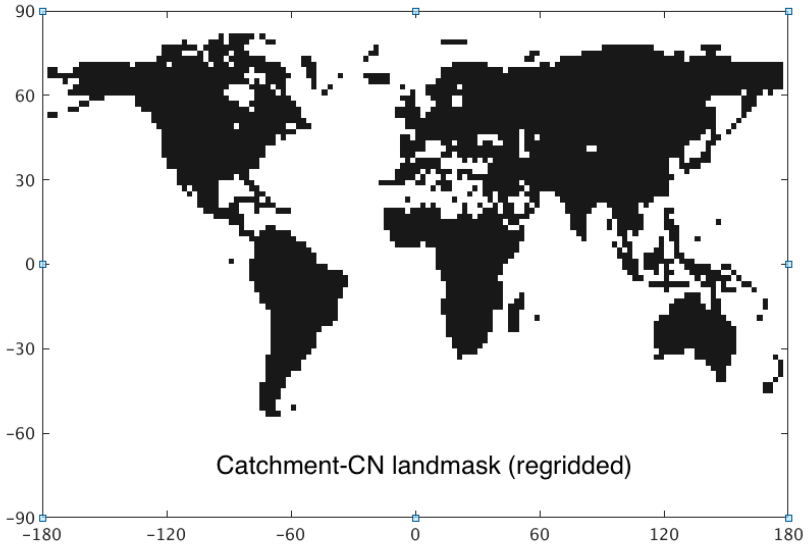

Figure L3b. Landmask of Catchment-CN (regridded)

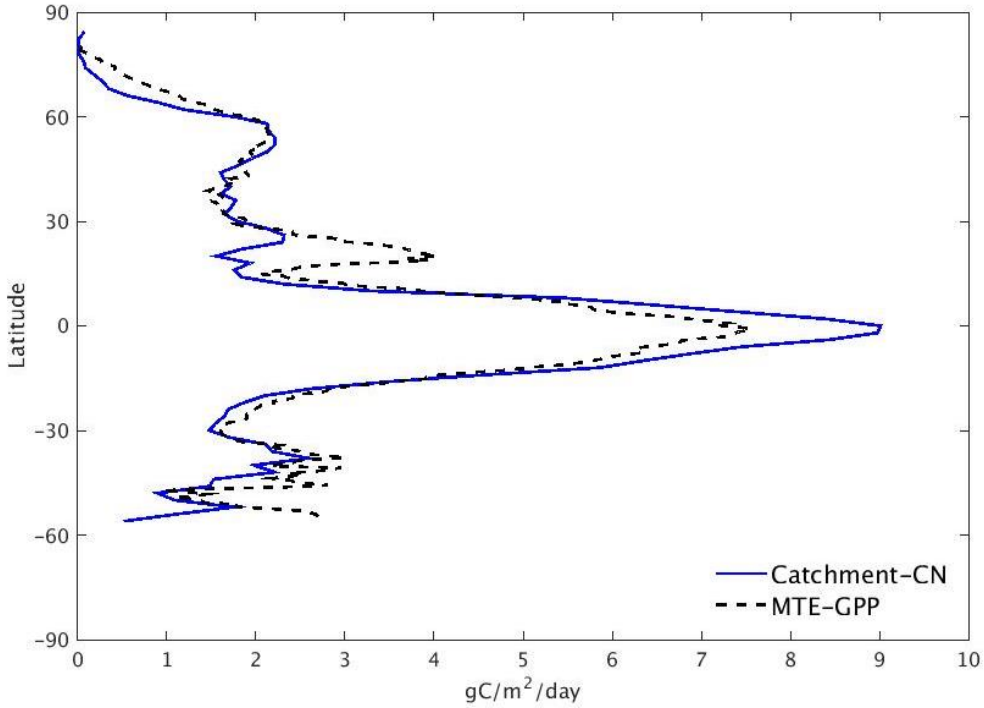

Figure L3c. Zonal GPP (previous Figure 2c)

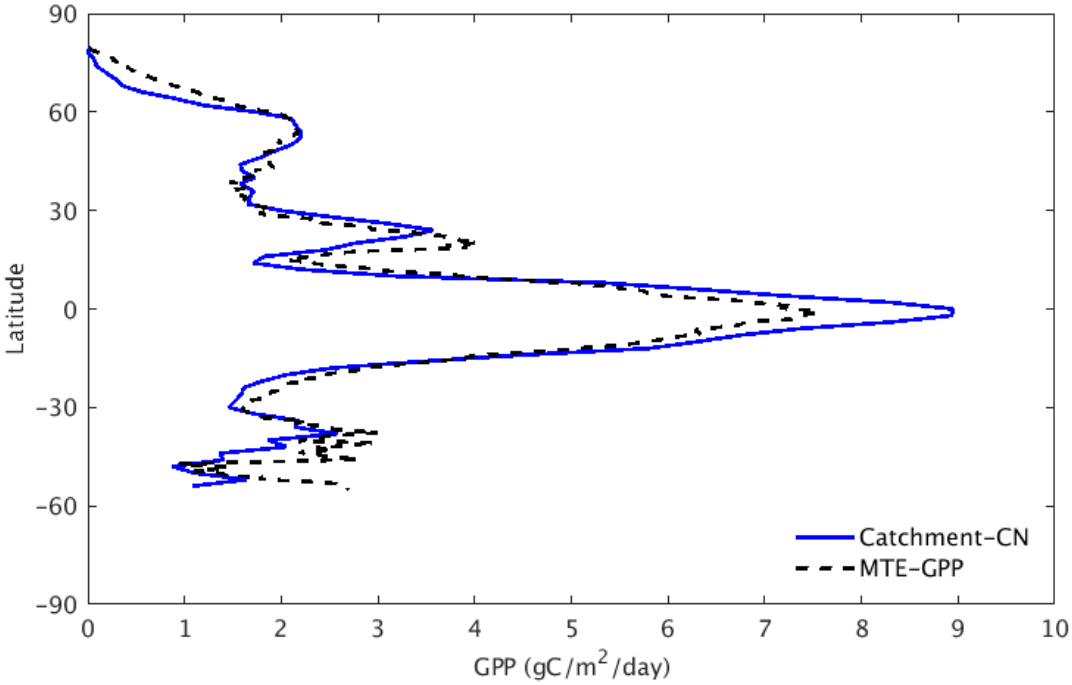

Figure L3d. Zonal GPP with regridded landmask (revised Figure 2c).

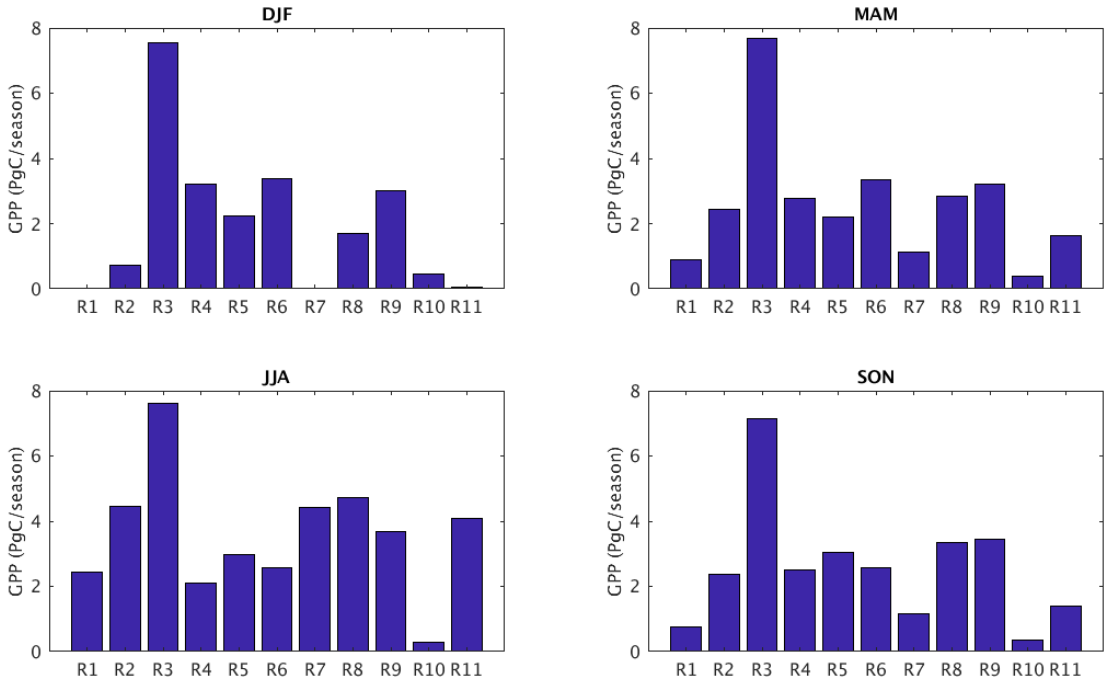

Figure L4. Histograms of regional GPP (PgC/season) for DJF, MAM, JJA and SON