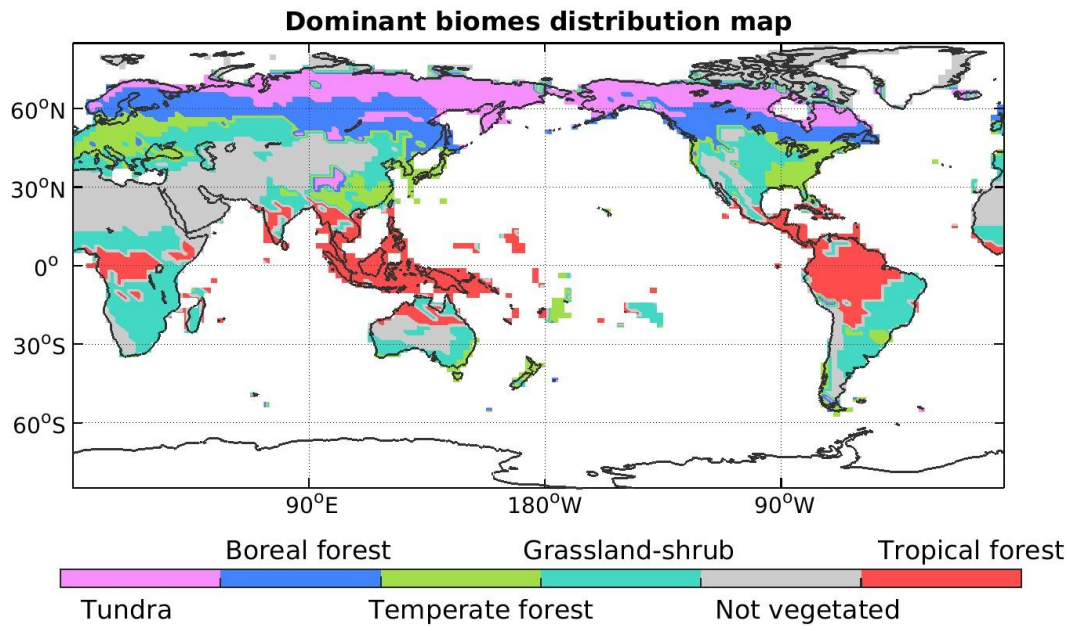Supplementary Information 1: Distribution of dominant biomes on land used in this study.

Dominant biomes distribution map

Boreal forest   Grassland-shrub   Tropical forest

Tundra   Temperate forest   Not vegetated

Supplementary Information 2: Spatial correlation plot between precipitation and NPP. The values used here are the mean of the 2070-2100 time period.

CCT (Corr. Precip-NPP)

MSB (Corr. Precip-NPP)

SAI (Corr. Precip-NPP)
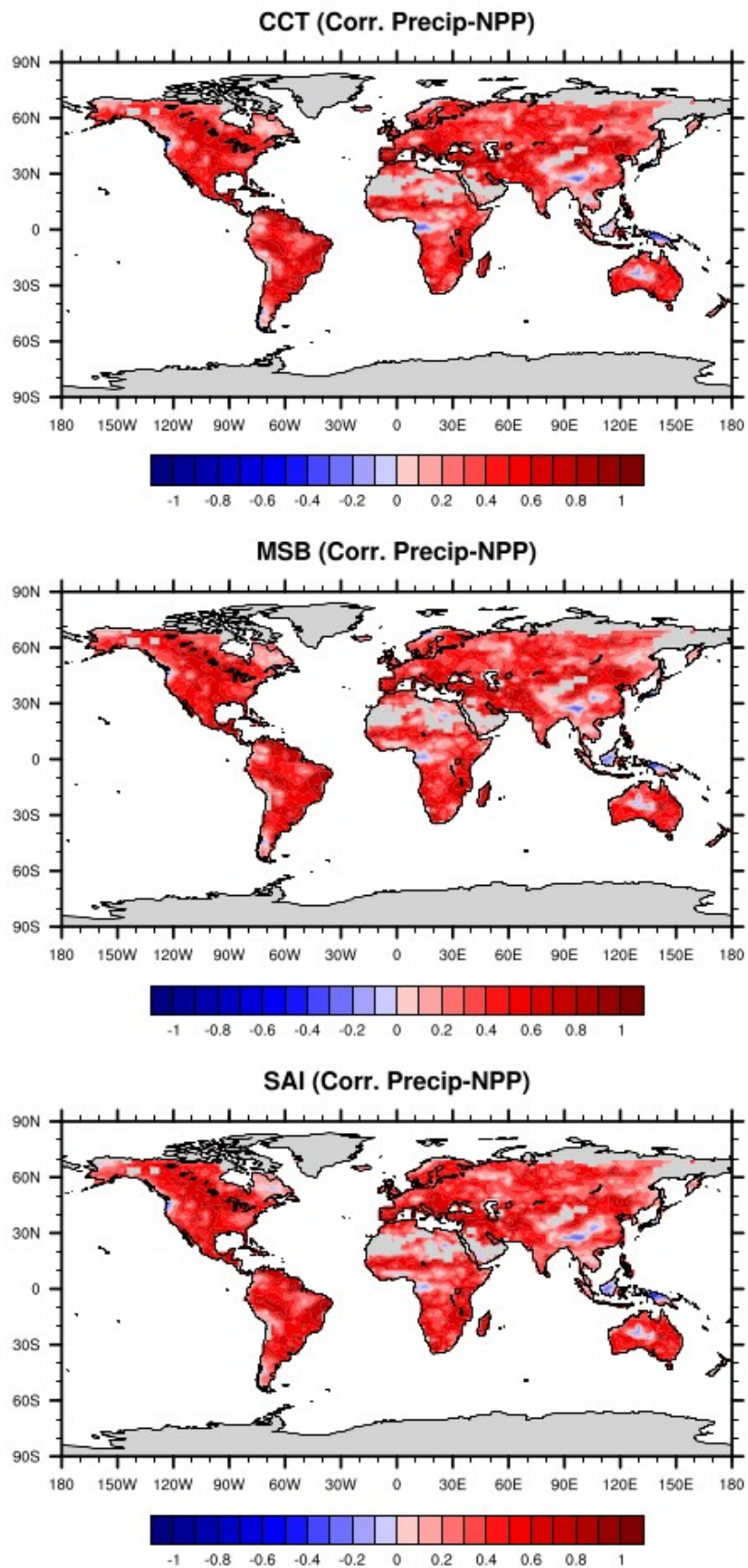
Supplementary Information 3: Monthly climatology showing seasonality change in rain and air temperature under RCP4.5, RCP8.5, CCT, MSB, and SAI simulations. The values shown here are - 60 to 70°N mean from land area and the mean difference of the 2070-2100 time period.
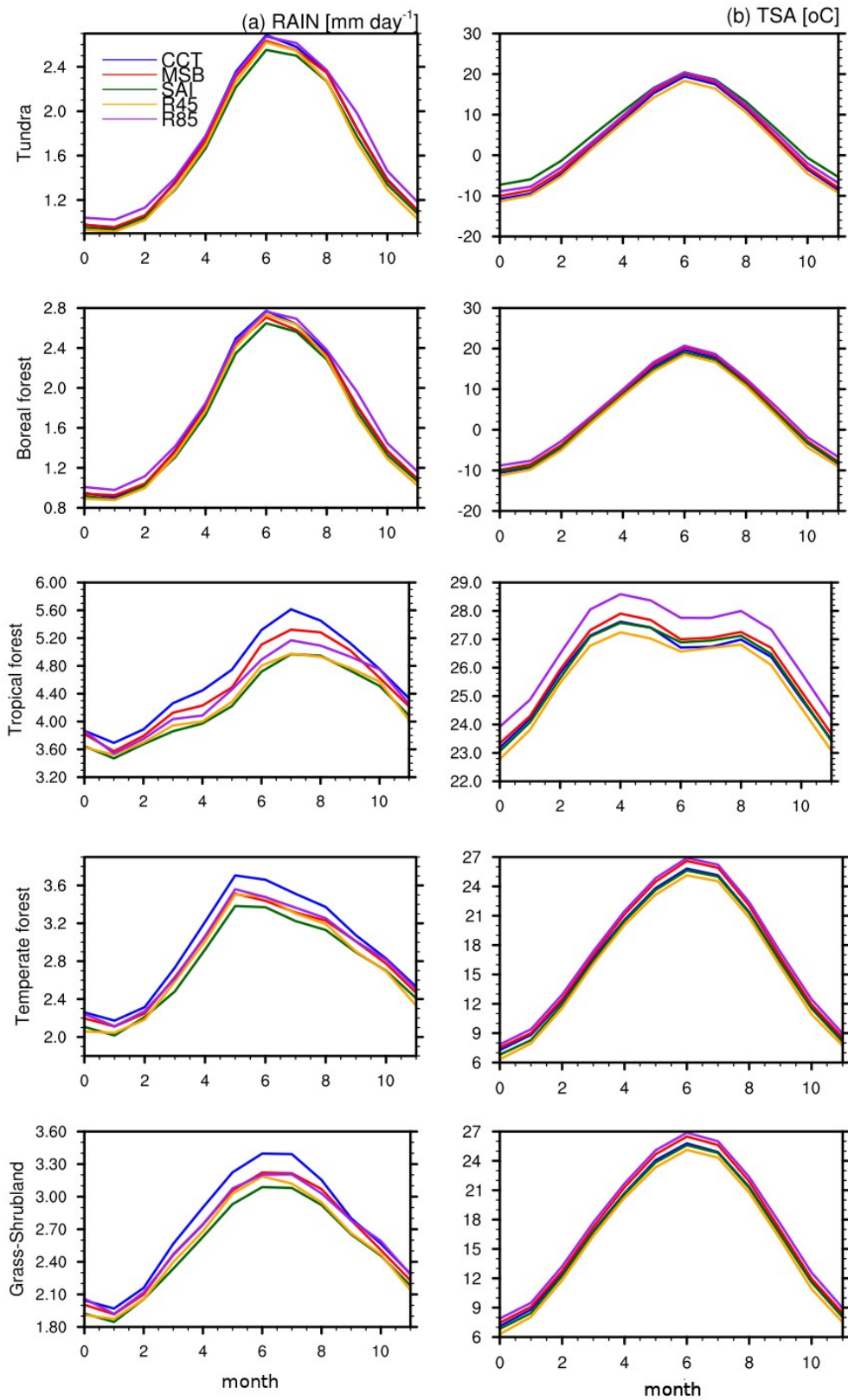
Supplementary Information 4: Monthly climatology showing seasonality change in NPP and LAI under RCP4.5, RCP8.5, CCT, MSB, and SAI simulations. The values shown here are -60 to 70°N mean from land area and the mean difference of the 2070-2100 time period.

(a) NPP [gC m^{-1} month^{-1}]

(b) TLAI
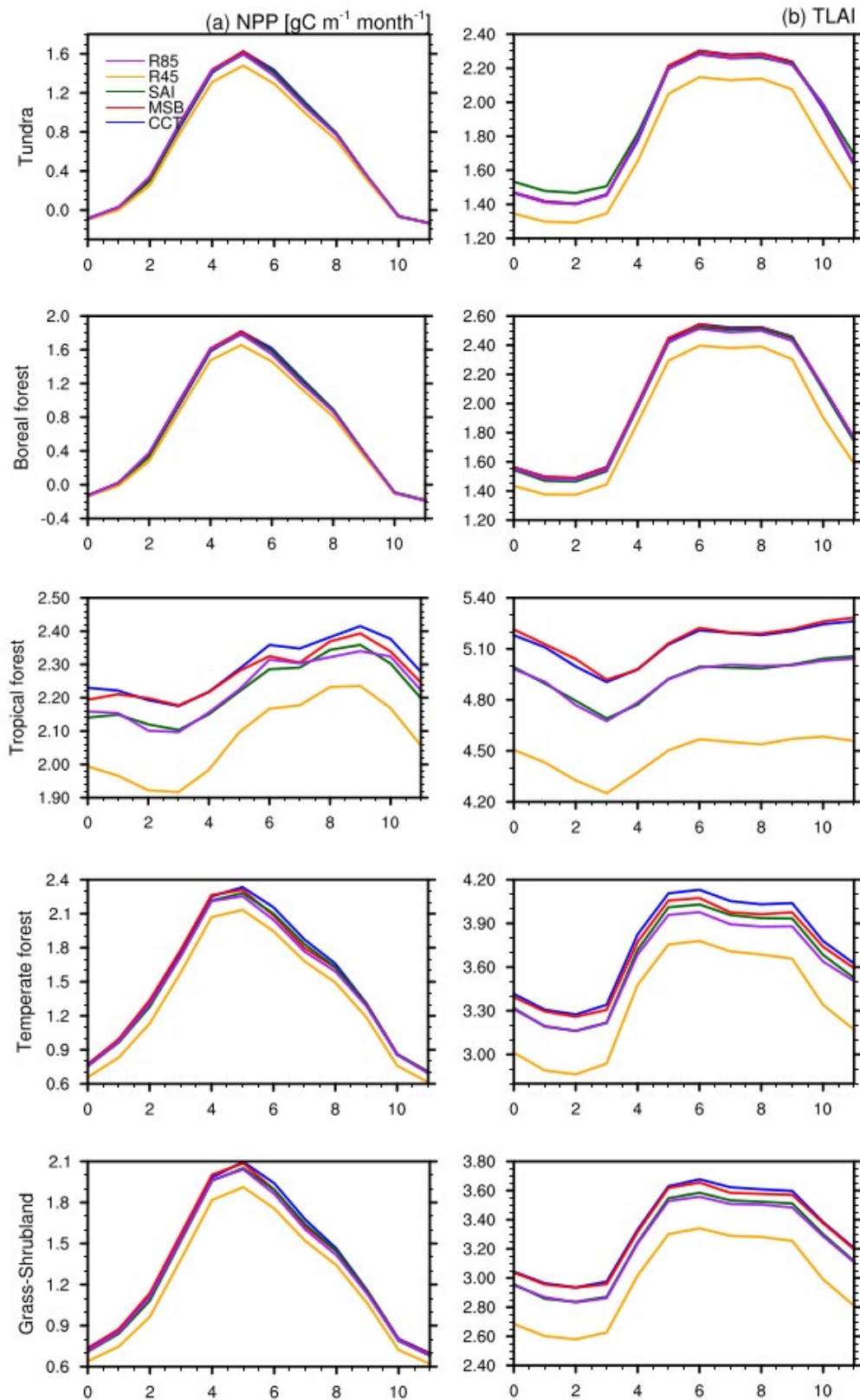
Supplementary information 5:Total vegetation and soil carbon anomaly from RCP8.5 for SAI, MSB, and CCT methods. The values shown here are -60 to 70°N mean from land area.
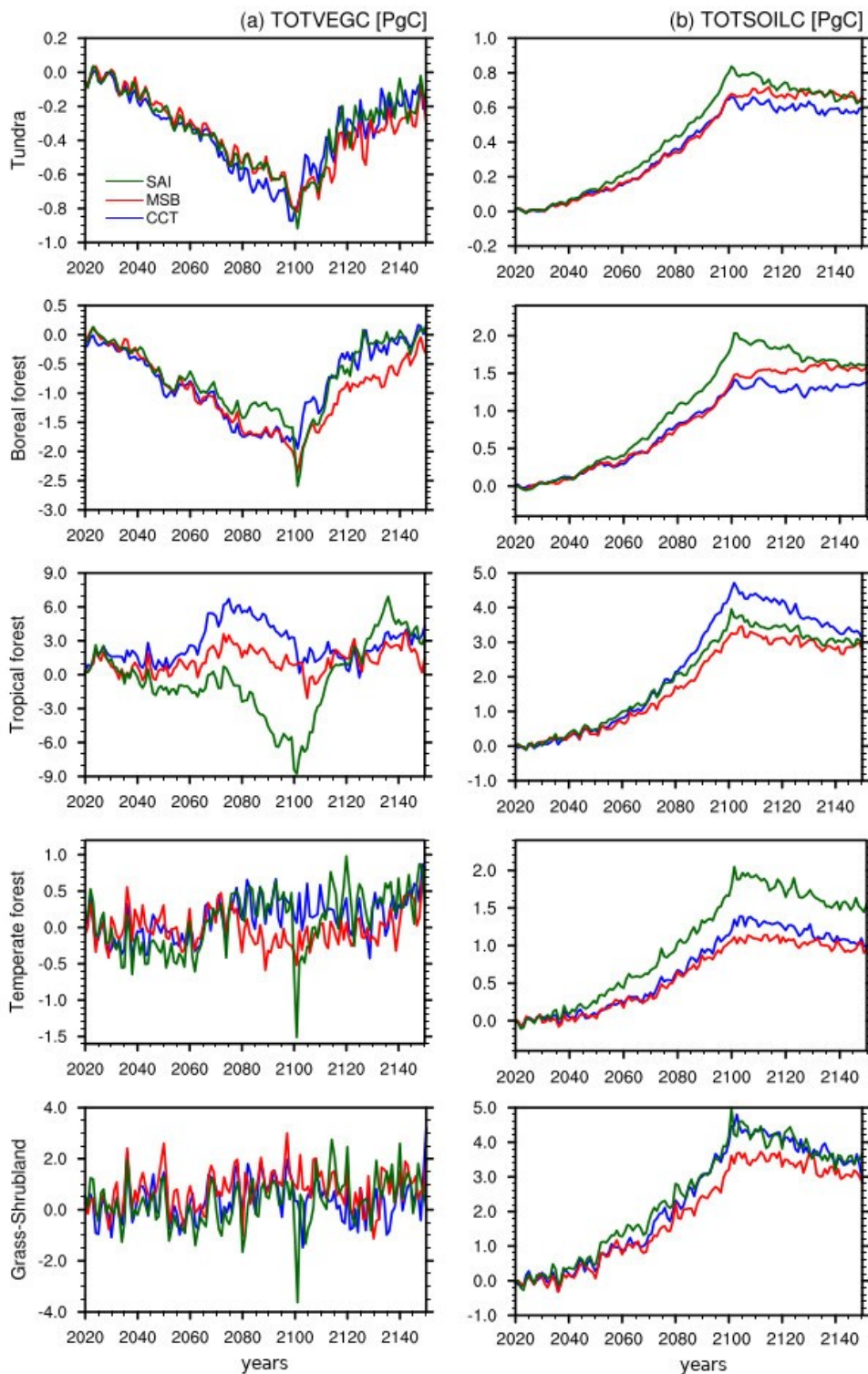
Supplementary information 6: global vegetation and soil C storage

TOTVEGC [PgC]

Legend:
- SAI
- MSB
- CCT
- RCP8.5
- RCP4.5

TOTSOILC [PgC]