Supplementary Information

Competition alters predicted forest carbon cycle responses to nitrogen availability and elevated CO_2: simulations using an explicitly competitive, game-theoretic vegetation demographic model

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Table of contents:

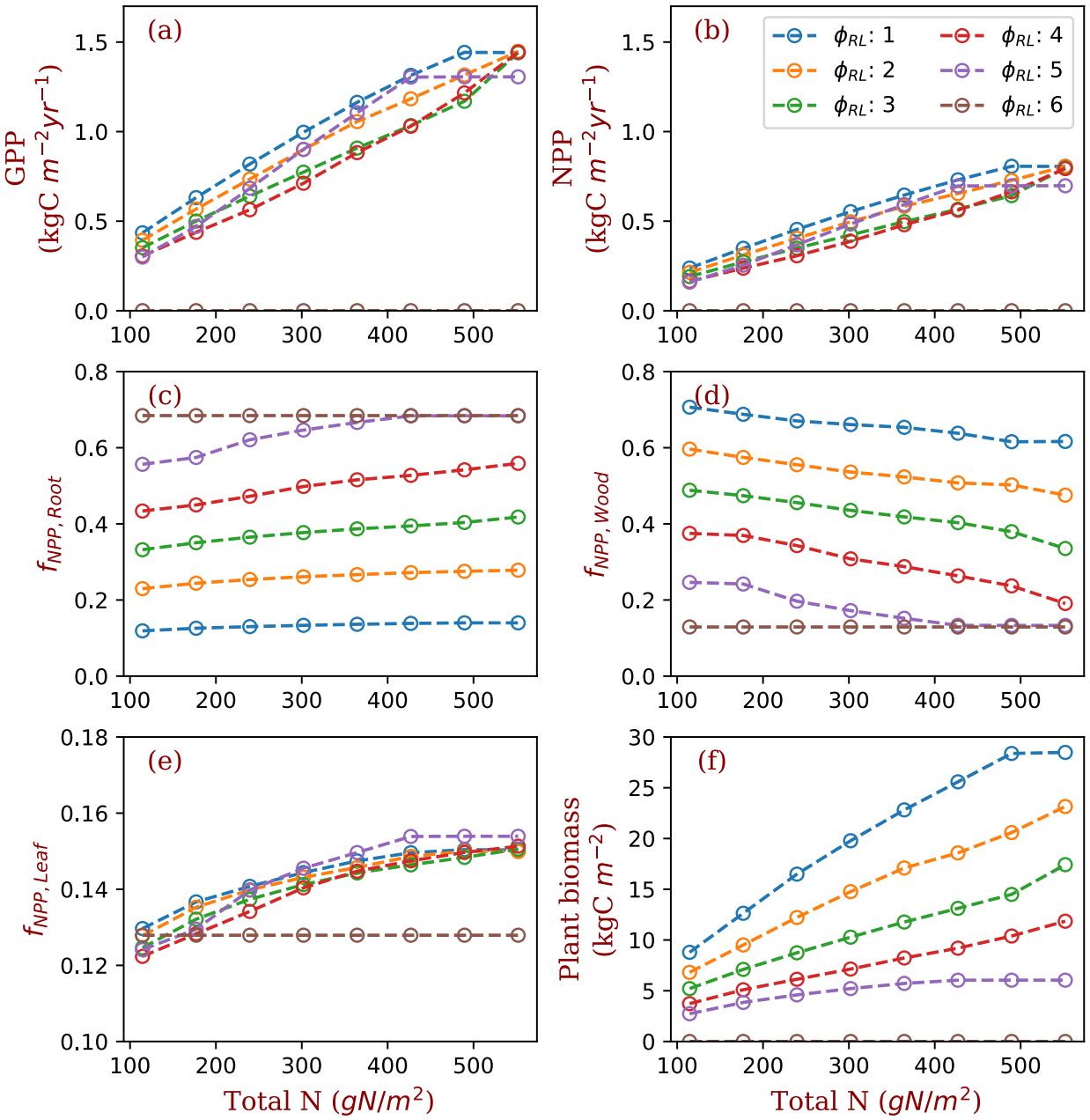
Figure S1 Monoculture runs at ambient [CO_2] (380 ppm)

Figure S2 Monoculture runs at elevated [CO_2] (580 ppm)

Figure S3 Critical height of polyculture and monoculture runs at ambient (380 ppm) and elevated [CO_2] (580 ppm)

Figure S4 Successional patterns at ambient [CO_2] (380 ppm)

Figure S5 Successional patterns at elevated [CO_2] (580 ppm)



21

22 **Figure S1 Fixed-allocation runs at ambient [CO_2] (380 ppm)**

23 GPP: Gross primary production; NPP: Net primary production; $f_{NPP,x}$: the fraction of NPP
24 allocated to x, where x can be Root (fine roots), Leaf (leaves in crown), and Wood (including
25 tree trunk, stems, and coarse roots). The data are from the averages of the model run years from
26 1400 and 1800. Each model run is initiated with one PFT with fixed ratio of fine root area to leaf
27 area (φ_{RL}).

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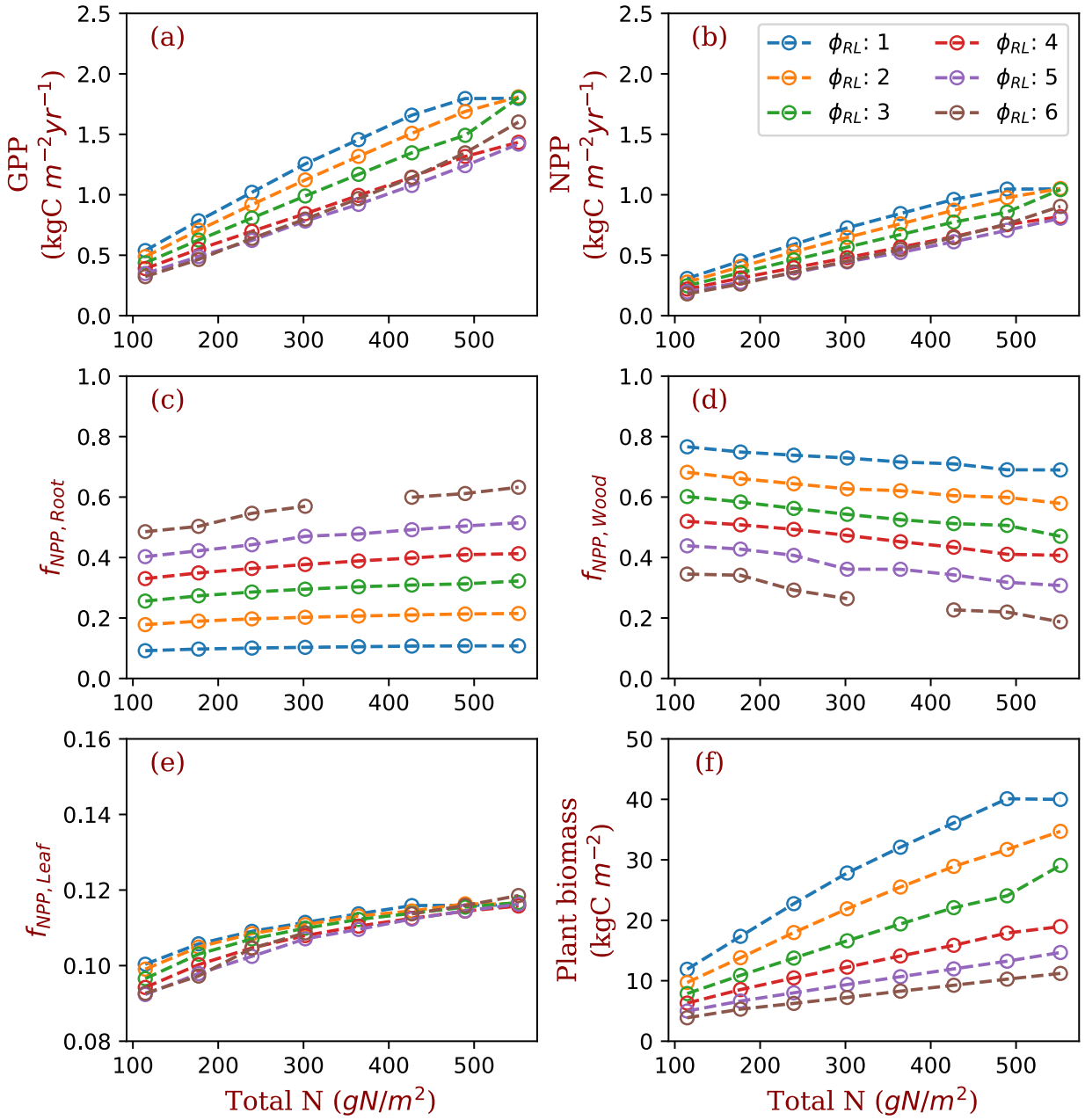

Figure S2 Monoculture runs at elevated [CO_2](580 ppm). GPP: Gross primary production; NPP: Net primary production; $f_{NPP,x}$: the fraction of NPP allocated to x, where x can be Root (fine roots), Leaf (leaves in crown), and Wood (including tree trunk, stems, and coarse roots). The data are from the averages of the model run years from 1400 and 1800. Each model run is initiated with one PFT with fixed ratio of fine root area to leaf area (φ_{RL}).

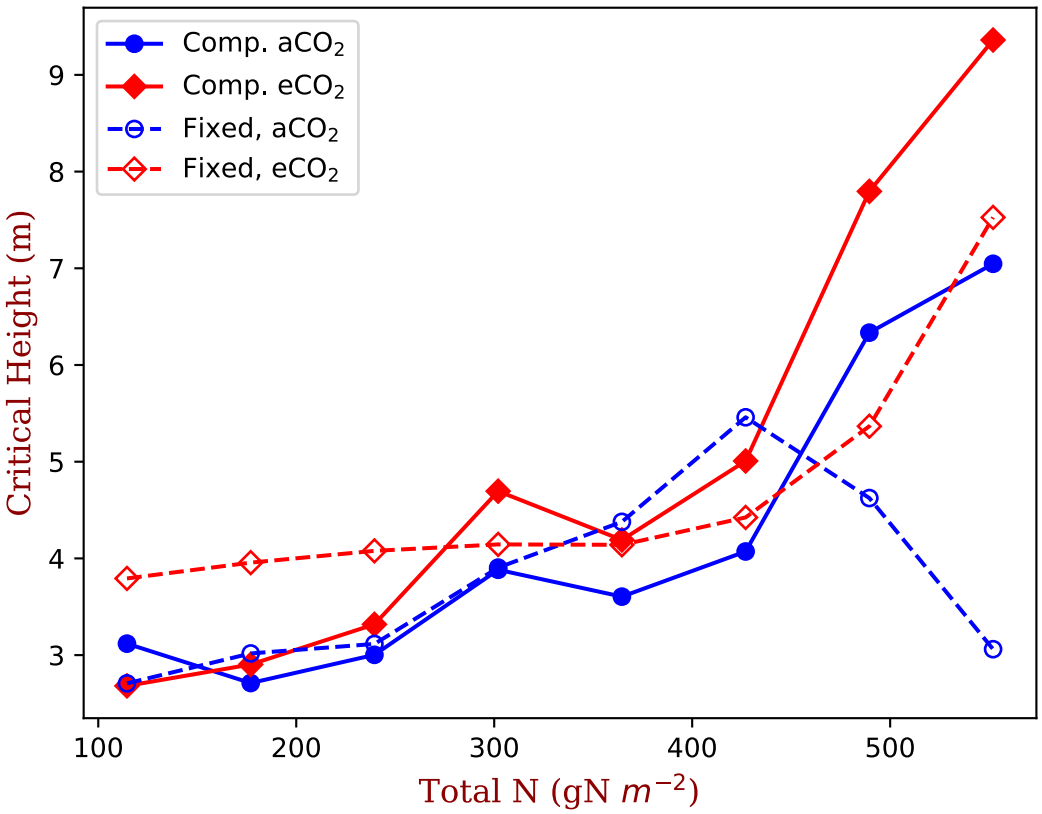

Figure S3 Critical height of competition and fixed-allocation runs at the two [CO_2] levels (380 ppm and 580 ppm). The figure shows the data of the averages of the model run years from 1400 and 1800 of the model runs. The closed symbols with solid line represent competition runs (comp.). The open symbols with dashed lines represent fixed-allocation runs (only the runs of φ_{RL} =4).

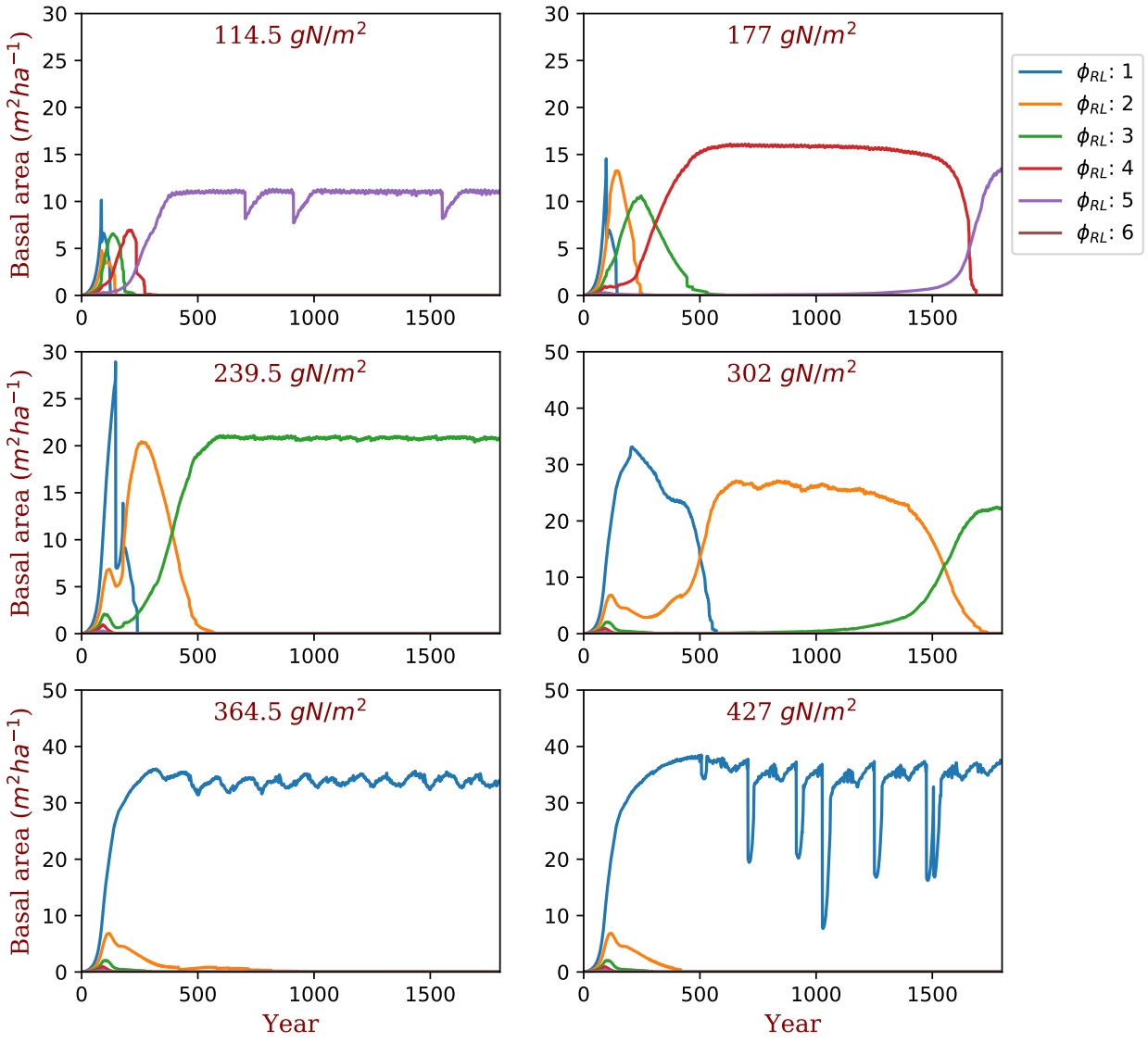

Figure S4 Successional patterns at ambient [CO2] (380 ppm).

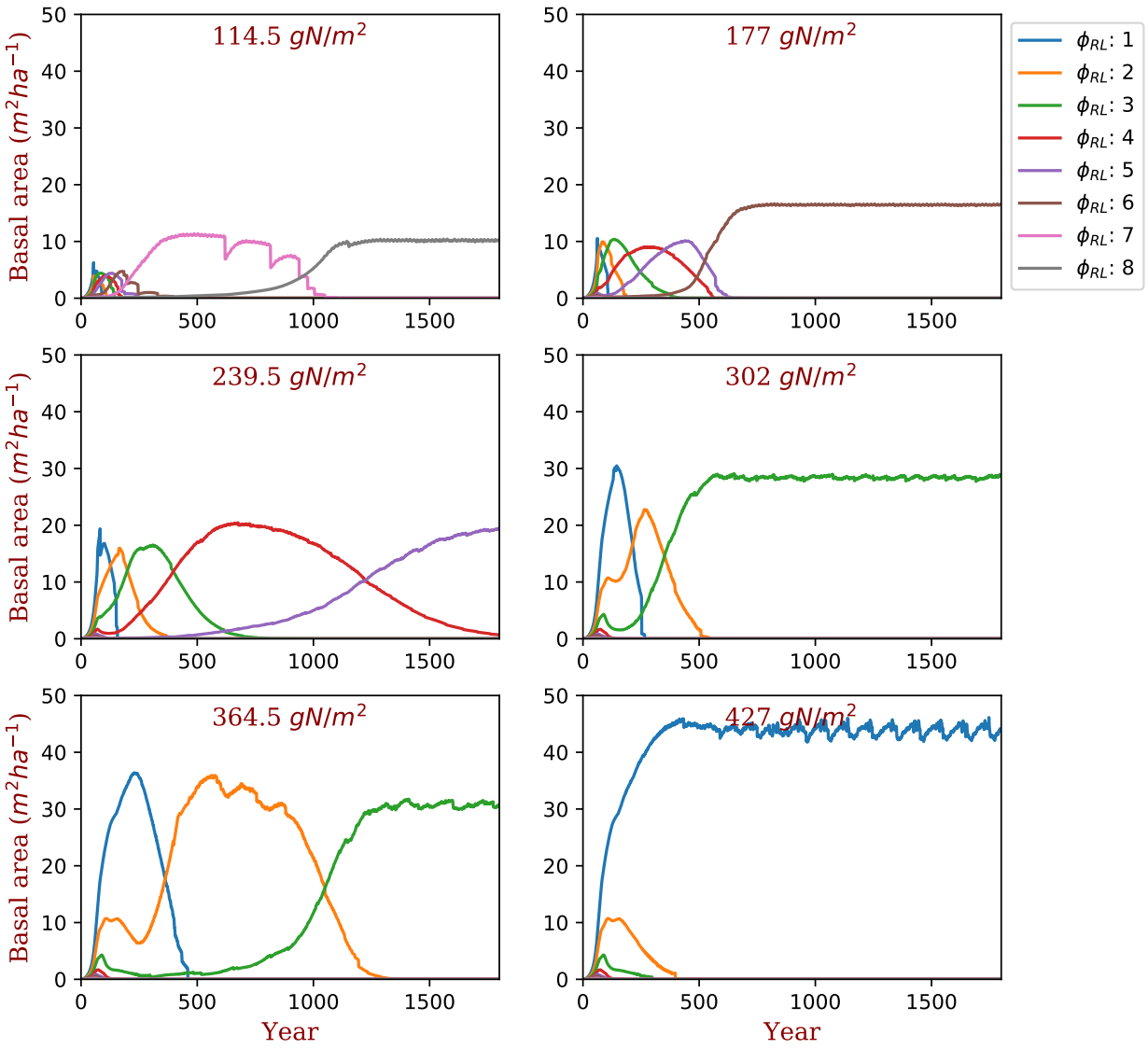

Figure S5 Successional patterns at elevated [CO_2] (580 ppm).