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Supplement of

Quantifying legacies of clearcut on carbon fluxes and biomass carbon stock in northern temperate forests

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1 Table S1 Parameter values used in the simulations of PnET-CN for both deciduous broadleaf
 2 forests (DBF) and evergreen needleleaf forests (ENF) in Upper Midwest region of Wisconsin
 3 and Michigan, United States.

Parameter	Description	DBF	ENF
<i>Canopy and photosynthesis</i>			
AmaxA	Intercept (A) and slope (B) for relationship between Foliar N and max. photosynthesis (nmol CO ₂ g ⁻¹ leaf s ⁻¹)	-46	5.3
AmaxB		71.9	21.5
AmaxFrac	Daily Amax as a fraction of early morning instantaneous rate	0.76	0.76
CFracBiomass	Carbon fraction of biomass	0.49	0.49
DVPD1	Coefficients for power function converting VPD to fractional lose in photosynthesis	0.05	0.05
DVPD2		2	2
FolRelGroMax	Maximum relative growth rate for foliage (% year ⁻¹)	0.95	0.3
FolReten	Foliage retention time (year)	1	2.3
HalfSat	Half saturation light level (J m ⁻² s ⁻¹)	150 ^a	150 ^a
k	Canopy light attenuation constant coefficient	0.58	0.48 ^a
PsnTMin	Minimum temperature for photosynthesis (°C)	4	0
PsnTopt	Optimum temperature for photosynthesis (°C)	24	22
SLWDel	Change in specific leaf weight (SLW) with increasing foliar mass above (g dm m ⁻² g ⁻¹)	0.2	0
SLWMax	Top canopy SLW (g dm m ⁻²)	81 ^a	258 ^a
<i>Respiration</i>			
Ksom	Decomposition rate for soil organic carbon pool (year ⁻¹)	0.075	0.075
BaseFolRespFrac	Dark respiration as a fraction of max. photosynthesis	0.05 ^b	0.05 ^b
GRespFrac	Ratio of growth respiration to component production	0.20	0.20
RootMRespFrac	Ratio of fine root maintenance respiration to root biomass production	1	1
RespQ10	Q ₁₀ value for leaf maintenance respiration	2.5 ^c	2.5 ^d
WoodMRespA	Fraction of wood maintenance respiration over total photosynthesis.	0.07	0.07

<i>Allocation</i>			
PlantCReserveFrac	Fraction of non-structural plant C held in reserve after allocation to wood carbon	0.75	0.75
RootAllocA	Intercept (A) and Slope (B) of relationship between foliar and root allocation	0	0
RootAllocB		2	2
MinWoodFolRatio	Minimum ratio of carbon allocation to wood and foliage	0.8	0.5
<i>Turnover</i>			
WoodLitC Lose	Fractional loss of woody mass as CO ₂ in wood decomposition	0.8	0.8
WoodLitLoseRate	Fractional loss of woody mass either to soil organic carbon pool or to atmosphere	0.1	0.1
WoodTurnover	Fractional mortality of live wood per year	0.025	0.02
RootTurnoverA	Coefficients for fine root turnover	0.789	0.789
RootTurnoverB		0.191	0.191
RootTurnoverC		0.021	0.021
<i>Phenology</i>			
GDDFolEnd	Growing degree days of at which foliage production ends (°C)	764	1031
GDDFolStart	Growing degree days of at which foliage production onset (°C)	332	332
GDDWoodEnd	Growing degree days of at which wood production ends (°C)	764	1031
GDDWoodStart	Growing degree days of at which wood production onset (°C)	332	332
SenescStart	Day of year after which leaf drop can occur (days)	270	270
<i>Nitrogen (N)</i>			
FLPctN	Minimum N concentration in foliar litter (%)	0.9	0.45
FolNConRange	Maximum fractional increase in N concentrations	0.5	0.7
FolNRetrans	Foliage N retention time (year)	0.5	0.5
MaxNStore	Maximum N content in non-structural N pool (g N m ⁻²)	76	76
NImmobB	Coefficients for fraction of mineralized N remobilized as a function of soil organic matter	151	151
NImmobA		-35	-35
RLPctN	Minimum N concentration in root litter (%)	1.2	1.2

WLPctN	Minimum N concentration in wood litter (%)	0.2	0.2
<i>Water balance</i>			
f	Soil water release parameter	0.04	0.04
FastFlowFrac	Fraction of water inputs lost directly to drainage	0.1	0.1
PrecIntFrac	Fraction of precipitation intercepted and evaporated	0.11	0.11
WUEConst	Water use efficiency at 1 kPa of vapor pressure deficit (g CO ₂ kg ⁻¹ H ₂ O)	10.9	10.9

1 ^a Estimated based on measurements of Ryu et al. (2008).

2 ^b Estimated based on estimated percentage (4.5-9.7%) of leaf respiration to total ecosystem
3 respiration by Bolstad et al. (2004).

4 ^c Estimated based on Q₁₀ range (2.27-2.98) from measured leaf respiration rates of Bolstad et al.
5 (2004).

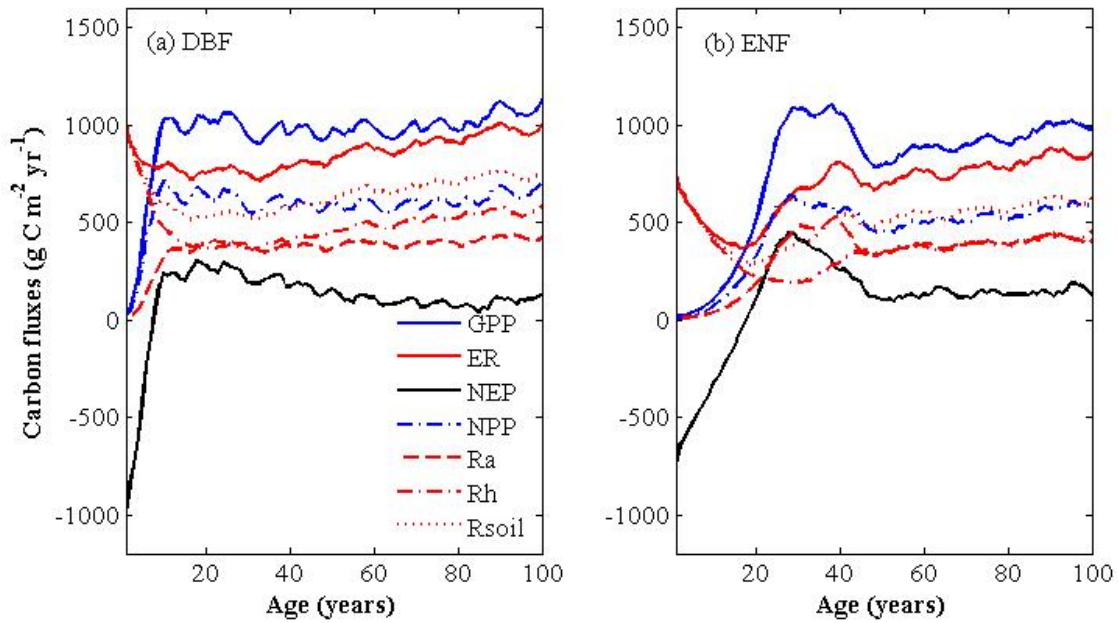
6 ^d Estimated based on the synthesis study of Atkin & Tjoelker (2003).

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2 Figure S1. Simulated trajectories of ecosystem carbon fluxes (GPP, gross primary production;
 3 ER, ecosystem respiration; NEP, net ecosystem production; NPP, net primary production; Ra,
 4 autotrophic respiration; Rh, heterotrophic respiration; Rsoil, soil respiration) with stand age for
 5 (a) deciduous broadleaf forests (DBF) and (b) evergreen coniferous forests (ENF). The simulated
 6 curves were smoothed using a moving average filter with a span of 5.

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