Contents

Appendix 2: DayCent Output Files

Time representation in output files

DayCent ASCII output files are produced in addition to the monthly output in the *.bin file. Simulation time in the DayCent output file is represented as a decimal value with the value preceding the decimal point representing the year of the simulation and the value after the decimal point representing the month in the simulation using the following values:

Jan – .00
Feb – .08
Mar – .17
Apr – .25
May – .33
Jun – .42
Jul – .50
Aug – .58
Sep – .67
Oct – .75
Nov – .83
Dec – .92

The *.bin file that is produced when using DayCent contains monthly output values. Simulation times for the monthly output from the *.bin file are represented as a decimal value with the

value preceding the decimal point representing the year of the simulation and the value after the decimal point representing the month in the simulation using the following values:

Jan – .08
Feb – .17
Mar – .25
Apr – .33
May – .42
Jun – .50
Jul – .58
Aug – .67
Sep – .75
Oct – .83
Nov – .92
Dec – 1.00

These month fractions are added to the year value so that, for example January of year 1998 will output as time 1998.08 (1998 + .08) and December of year 1998 will output as time 1999.00 (1999 + 1.00).

Note that the monthly time values in the *.bin files are shifted by 1/12 from the DayCent ASCII *.out output files such that:

*.out file	*.bin file
Jan – .00	Jan – .08
Feb – .08	Feb – .17
Mar – .17	Mar – .25
Apr – .25	Apr – .33
May – .33	May – .42
Jun – .42	Jun – .50
Jul – .50	Jul – .58
Aug – .58	Aug – .67
Sep – .67	Sep – .75
Oct – .70	Oct – .83
Nov – .83	Nov – .92
Dec – .92	Dec – 1.00

*DayCent *.out and *.csv files*

bio.out – Daily above and below ground live carbon

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
aglivc (Column 3) – Carbon in aboveground live for grass/crop (g C m^{-2})
bglivcj (Column 4) – Carbon in juvenile live fine roots for grass/crop (g C m^{-2})
bglivcm (Column 5) – Carbon in mature live fine roots for grass/crop (g C m^{-2})
aglivn (Column 6) – Nitrogen in aboveground live for grass/crop (g N m^{-2})

bglivnj (Column 7) – Nitrogen in juvenile live fine roots for grass/crop (g N m^{-2})
bglivnm (Column 8) – Nitrogen in mature live fine roots for grass/crop (g N m^{-2})
rleavc (Column 9) – Carbon in forest system leaf component (g C m^{-2})
frootcj (Column 10) – Carbon in forest system juvenile fine root component (g C m^{-2})
frootcm (Column 11) – Carbon in forest system mature fine root component (g C m^{-2})
fbrchc (Column 12) – Carbon in forest system fine branch component (g C m^{-2})
rlwodc (Column 13) – Carbon in forest system large wood component (g C m^{-2})
crootc (Column 14) – Carbon in forest system coarse root component (g C m^{-2})
h2ogef(1) (Column 15) – Water effect on crop/grass production (0.0 – 1.0)
h2ogef(2) (Column 16) – Water effect on forest production (0.0 – 1.0)

cflows.out – Daily carbon flows to soil organic matter pools

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
som11tosom21 (Column 3) – Carbon flow from active surface organic matter pool to slow surface organic matter pool (g C m^{-2} d^{-1})
som12tosom22 (Column 4) – Carbon flow from active soil organic matter pool to slow soil organic matter pool (g C m^{-2} d^{-1})
som12tosom3 (Column 5) – Carbon flow from active soil organic matter pool to passive soil organic matter pool (g C m^{-2} d^{-1})
som21tosom11 (Column 6) – Carbon flow from slow surface organic matter pool to active surface organic matter pool (g C m^{-2} d^{-1})
som21tosom22 (Column 7) – Carbon flow from slow surface organic matter pool to slow soil organic matter pool (g C m^{-2} d^{-1})
som22tosom12 (Column 8) – Carbon flow from slow soil organic matter pool to active soil organic matter pool (g C m^{-2} d^{-1})
som22tosom3 (Column 9) – Carbon flow from slow soil organic matter pool to passive soil organic matter pool (g C m^{-2} d^{-1})
som3tosom12 (Column 10) – Carbon flow from passive soil organic matter pool to active soil organic matter pool (g C m^{-2} d^{-1})
metc1tosom11 (Column 11) – Carbon flow from surface metabolic pool to active surface organic matter pool (g C m^{-2} d^{-1})
metc2tosom12 (Column 12) – Carbon flow from soil metabolic pool to active soil organic matter pool (g C m^{-2} d^{-1})
struc1tosom11 (Column 13) – Carbon flow from surface structural pool to active surface organic matter pool (g C m^{-2} d^{-1})
struc1tosom21 (Column 14) – Carbon flow from surface structural pool to slow surface organic matter pool (g C m^{-2} d^{-1})
struc2tosom12 (Column 15) – Carbon flow from soil structural pool to active soil organic matter pool (g C m^{-2} d^{-1})
struc2tosom22 (Column 16) – Carbon flow from soil structural pool to slow soil organic matter pool (g C m^{-2} d^{-1})
wood1tosom11 (Column 17) – Carbon flow from dead fine branch pool to active surface organic matter pool (g C m^{-2} d^{-1})
wood1tosom21 (Column 18) – Carbon flow from dead fine branch pool to slow surface organic matter pool (g C m^{-2} d^{-1})

wood2tosom11 (Column 19) – Carbon flow from dead large wood pool to active surface organic matter pool (g C m^{-2} d^{-1})

wood2tosom21 (Column 20) – Carbon flow from dead large wood pool to slow surface organic matter pool (g C m^{-2} d^{-1})

wood3tosom12 (Column 21) – Carbon flow from dead coarse root pool to active soil organic matter pool (g C m^{-2} d^{-1})

wood3tosom22 (Column 22) – Carbon flow from dead coarse root pool to slow soil organic matter pool (g C m^{-2} d^{-1})

co2.out – Daily CO_2 concentrations by layer

time (Column 1) – Simulation time (see above)

dayofyr (Column 2) – Day of the year (1 – 366)

CO2_ppm[0] (Column 3) – CO2 concentration in first layer of soil profile (index 0), as defined in the soils.in file (ppm)

CO2_ppm[1] (Column 4) – CO2 concentration in second layer of soil profile (index 1), as defined in the soils.in file (ppm)

...

CO2_ppm[n-1] (Column n+2) – CO2 concentration in layer n of the soil profile (index n-1), as defined in the soils.in file (ppm)

NOTE:

n = number of soil layers

daily.out – Daily evapotranspiration, defac, soil temperature, snow water, and growing degree day variables

time (Column 1) – Simulation time (see above)

dayofyr (Column 2) – Day of the year (1 – 366)

PET(cm) (Column 3) – Potential evapotranspiration rate (cm H2O d^{-1})

agdefac (Column 4) – Surface decomposition factor based on temperature and moisture (0 – 1)

bgdefac (Column 5) – Soil decomposition factor based on temperature and moisture (0 – 1)

stemp(C) (Column 6) – Average soil temperature near the soil surface (°C)

snow (Column 7) – Snowpack water content (cm H_2O)

snlq (Column 8) – Liquid snow water content (cm H_2O)

thermunits (Column 9) – Accumulator of thermal units for growing degree day implementation (°C)

aglivc (Column 10) –
aggreenc (Column 11) –
hwstress (Column 12) –
scenfrac (Column 13) –

dc_sip.csv – Daily evaporation, transpiration, respiration, system C, and NPP

time (Column 1) – Simulation time (see above)

dayofyr (Column 2) – Day of the year (1 – 366)

trandly (Column 3) – Water transpired from soil (cm H_2O d^{-1})

evapdly (Column 4) – Water evaporated from the soil (cm H_2O d^{-1})

intrcpt (Column 5) – Evaporation of precipitation that was intercepted by the standing crop and litter biomass (cm H_2O d^{-1})

sublim (Column 6) – Water sublimated from the snowpack (cm H_2O d^{-1})

drain (Column 7) – Water in outflow that comes from drainage out of the soil profile (cm H_2O d^{-1})

runoff (Column 8) – Water (rain or snowmelt) that did not infiltrate soil profile (cm H_2O d^{-1})

ppt (Column 9) – Precipitation for the day (cm H_2O d^{-1})

accum (Column 10) – Snow added to the snowpack (cm H_2O d^{-1})

melt (Column 11) – Snow melted from the snowpack, if daily air temperature is warm enough (cm H_2O d^{-1})

snow (Column 12) – Current snowpack (equiv. cm H_2O)

snlq (Column 13) – The liquid water in the snowpack (cm H_2O)

petdly (Column 14) – Potential evapotranspiration rate (cm H_2O d^{-1})

stemp (Column 15) – Soil surface temperature (°C)

wc_2cm (Column 16) – Water holding capacity of a 2 cm soil layer (cm H_2O)

wc_3cm (Column 17) – Water holding capacity of a 3 cm soil layer (cm H_2O)

wc_5cm (Column 18) – Water holding capacity of a 5 cm soil layer (cm H_2O)

wc_10cm (Column 19) – Water holding capacity of a 10 cm soil layer (cm H_2O)

wc_15cm (Column 20) – Water holding capacity of a 15 cm soil layer (cm H_2O)

wc_30cm (Column 21) – Water holding capacity of a 30 cm soil layer (cm H_2O)

CO2resp (Column 22) – Heterotrophic CO_2 respiration (g C m^{-2} d^{-1})

mcprd(1) (Column 23) – Daily NPP for shoots for grass/crop system (g C m^{-2} d^{-1})

mcprd(2) (Column 24) – Daily NPP for juvenile roots for grass/crop system (g C m^{-2} d^{-1})

mcprd(3) (Column 25) – Daily NPP for mature roots for grass/crop system (g C m^{-2} d^{-1})

mfprd(1) (Column 26) – Daily NPP for live leaves for tree system (g C m^{-2} d^{-1})

mfprd(2) (Column 27) – Daily NPP for live juvenile fine roots for tree system (g C m^{-2} d^{-1})

mfprd(6) (Column 28) – Daily NPP for live mature fine roots for tree system (g C m^{-2} d^{-1})

mfprd(3) (Column 29) – Daily NPP for live fine branches for tree system (g C m^{-2} d^{-1})

mfprd(4) (Column 30) – Daily NPP for live large wood for tree system (g C m^{-2} d^{-1})

mfprd(5) (Column 31) – Daily NPP for live coarse roots for tree system (g C m^{-2} d^{-1})

NPP (Column 32) – Summation of all production values (g C m^{-2} d^{-1})

NEE (Column 33) – Net ecosystem exchange (NPP - CO2resp) (g C m^{-2} d^{-1})

aglivc (Column 34) – Above ground live carbon for crop/grass (g C m^{-2})

bglivcj (Column 35) – Juvenile fine root live carbon for crop/grass (g C m^{-2})

bglivcm (Column 36) – Mature fine root live carbon for crop/grass (g C m^{-2})

rleavc (Column 37) – Leaf live carbon for forest (g C m^{-2})

frootcj (Column 38) – Juvenile fine root live carbon for forest (g C m^{-2})

frootcm (Column 39) – Mature fine root live carbon for forest (g C m^{-2})

fbrchc (Column 40) – Fine branch live carbon for forest (g C m^{-2})

rlwodc (Column 41) – Large wood live carbon for forest (g C m^{-2})

crootc (Column 42) – Coarse root live carbon for forest (g C m^{-2})

tlai (Column 43) – LAI of the tree leaves (m^2 m^{-2})

stdedc (Column 44) – Standing dead carbon (g C m^{-2})

wood1c (Column 45) – Dead fine branch carbon (g C m^{-2})

wood2c (Column 46) – Dead large wood carbon (g C m^{-2})

wood3c (Column 47) – Dead coarse root carbon (g C m^{-2})

strucc(1) (Column 48) – Carbon in structural component of surface litter (g C m^{-2})

metabc(1) (Column 49) – Carbon in metabolic component of surface litter (g C m^{-2})
strucc(2) (Column 50) – Carbon in structural component of soil litter (g C m^{-2})
metabc(2) (Column 51) – Carbon in metabolic component of soil litter (g C m^{-2})
som1c(1) (Column 52) – Carbon in surface active soil organic matter (g C m^{-2})
som1c(2) (Column 53) – Carbon in soil active soil organic matter (g C m^{-2})
som2c(1) (Column 54) – Carbon in surface slow soil organic matter (g C m^{-2})
som2c(2) (Column 55) – Carbon in soil slow soil organic matter (g C m^{-2})
som3c (Column 56) – Carbon in passive soil organic matter (g C m^{-2})
totsysc (Column 57) – Total system carbon, summation of all live carbon, dead carbon, and soil
        organic matter carbon pools (g C m^{-2})

NOTE: This file contains comma separated values.

deadc.out- Daily carbon in dead plant material

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
stdedc (Column 3) – C in standing dead material for grass/crop (g C m^{-2})
metabc(1) (Column 4) – metabolic C in surface litter (g C m^{-2})
strucc(1) (Column 5) – surface litter structural C (g C m^{-2})
wood1c (Column 6) – C in wood1 (dead fine branch) component of forest system (g C m^{-2})
wood1c (Column 7) – C in wood2 (dead large wood) component of forest system (g C m^{-2})
wood3c (Column 8) – C in wood3 (dead coarse roots) component of forest system (g C m^{-2})

dels.out – Daily delta 13C/14C values

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
deloi (Column 3) – Daily delta 13C/14C value for heterotrophic respiration for the OI layer
        (surface metabolic, structural, and som1c) (g C m^{-2} d^{-1})
deloe (Column 4) – Daily delta 13C/14C value for heterotrophic respiration for the OE layer
        (surface som2c) (g C m^{-2} d^{-1})
dsrfclit (Column 5) – Daily delta 13C/14C value for heterotrophic respiration for the surface litter
        (surface metabolic, structural, som1c, and som2c) (g C m^{-2} d^{-1})
dsmnrl (Column 6) – Daily delta 13C/14C value for heterotrophic respiration for the mineral soil
        (soil metabolic, structural, som1c, som2c, and som3c) (g C m^{-2} d^{-1})
dhetresp (Column 7) – Daily delta 13/14C value for heterotrophic respiration (g C m^{-2} d^{-1})
dsoilresp (Column 8) – Daily delta 13/14C value for soil respiration (heterotrophic + root
        autotrophic) (g C m^{-2} d^{-1})
dcmresp (Column 9) – Daily delta 13C/14C value for crop/grass maintenance respiration
        (g C m^{-2} d^{-1})
dfmresp (Column 10) – Daily delta 13C/14C value for forest maintenance respiration (g C m^{-2} d^{-1})
dcgresp (Column 11) – Daily delta 13C/14C value for crop/grass growth respiration (g C m^{-2} d^{-1})
dfgresp (Column 12) – Daily delta 13C/14C value for forest growth respiration (g C m^{-2} d^{-1})
dccarbostg (Column 13) – Daily delta 13C/14C value for crop/grass carbohydrate storage pool
        (g C m^{-2})
dfcarbostg (Column 14) – Daily delta 13C/14C value for forest carbohydrate storage pool
(g C m^{-2})

dN2lyr.out – Daily N$_2$ fluxes due to denitrification by soil layer

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
dN2_g/m2[0] (Column 3) – N$_2$ flux from the first layer of soil profile (index 0), as defined in the
       soils.in file (g N m^{-2} d^{-1})
dN2_g/m2[1] (Column 4) – N$_2$ flux from the second layer of soil profile (index 1), as defined in
       the soils.in file (g N m^{-2} d^{-1})
...
dN2_g/m2[n-1] (Column n+2) – N$_2$ flux from the layer n of soil profile (index n-1), as defined in
       the soils.in file (g N m^{-2} d^{-1})

NOTE:
n = number of soil layers

dN2Olyr.out – Daily N$_2$O fluxes due to denitrification by soil layer

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
dN2O_g/m2[0] (Column 3) – N2O flux from the first layer of soil profile (index 0), as defined in
       the soils.in file (g N m^{-2} d^{-1})
dN2O_g/m2[1] (Column 4) – N2O flux from the second layer of soil profile (index 1), as defined
       in the soils.in file (g N m^{-2} d^{-1})
...
dN2O_g/m2[n-1] (Column n+2) – N2O flux from the layer n of soil profile (index n-1), as defined
       in the soils.in file (g N m^{-2} d^{-1})

NOTE:
n = number of soil layers

harvest.csv – State of the system at time of harvest

time (Column 1) – Simulation time
dayofyr (Column 2) – Day of the year (1 – 366)
crpval (Column 3) – numerical representation of the current crop
agcacc (Column 4) – growing season accumulator for aboveground carbon production, reset to
       0.0 on LAST event (g C m^{-2} yr^{-1})
bgcjacc (Column 5) – growing season accumulator for juvenile fine root carbon production, reset
       to 0.0 on LAST event (g C m^{-2} yr^{-1})
bgcmacc (Column 6) – growing season accumulator for mature fine root carbon production,
       reset to 0.0 on LAST event (g C m^{-2} yr^{-1})
cgrain (Column 7) – amount of carbon in harvested grain and tubers during a harvest event
       (g C m^{-2} harvest^{-1})
egrain(N) (Column 8) – amount of nitrogen in harvested grain and tubers during a harvest event
       (g N m^{-2} harvest^{-1})
egrain(P) (Column 9) – amount of phosphorus in harvested grain and tubers during a harvest
       event (g P m^{-2} harvest^{-1})
egrain(S) (Column 10) – amount of sulfur in harvested grain and tubers during a harvest event
       (g S m^{-2} harvest^{-1})

crmvst (Column 11) – amount of carbon removed as straw during a harvest event (sum of cstraw and stdstraw) (g C m^{-2} harvest^{-1})

ermvst(N) (Column 12) – amount of nitrogen in straw removed during a harvest event (sum of estraw(N) and estdstraw(N)) (g N m^{-2} harvest^{-1})

ermvst(P) (Column 13) – amount of phosphorus in straw removed during a harvest event (sum of estraw(P) and estdstraw(P)) (g P m^{-2} harvest^{-1})

ermvst(S) (Column 14) – amount of sulfur in straw removed during a harvest event (sum of estraw(S) and estdstraw(S)) (g S m^{-2} harvest^{-1})

cstraw (Column 15) – amount of carbon removed from aboveground live pool as straw during a harvest event (g C m^{-2} harvest^{-1})

estraw(N) (Column 16) – amount of nitrogen in straw removed from aboveground live pool during a harvest event (g N m^{-2} harvest^{-1})

estraw(P) (Column 17) – amount of phosphorus in straw removed from aboveground live pool during a harvest event (g P m^{-2} harvest^{-1})

estraw(S) (Column 18) – amount of sulfur in straw removed from aboveground live pool during a harvest event (g S m^{-2} harvest^{-1})

stdstraw (Column 19) – amount of carbon removed from standing dead pool as straw during a harvest event (g C m^{-2} harvest^{-1})

estdstraw(N) (Column 20) – amount of nitrogen in straw removed from standing dead pool during a harvest event (estdstraw(N)) (g N m^{-2} harvest^{-1})

estdstraw(P) (Column 21) – amount of phosphorus in straw removed from standing dead pool during a harvest event (estdstraw(P)) (g P m^{-2} harvest^{-1})

estdstraw(S) (Column 22) – amount of sulfur in straw removed from standing dead pool during a harvest event (estdstraw(S)) (g S m^{-2} harvest^{-1})

addsdc (Column 23) – amount of carbon transferred from aboveground live carbon pool (aglivc) to standing dead carbon pool (stdedc) due to a grain harvest event (g C m^{-2} harvest^{-1})

addsde(N) (Column 24) – amount of nitrogen transferred from aboveground live nitrogen pool (aglive(N)) to standing dead nitrogen pool (stdede(N)) due to a grain harvest event (g N m^{-2} harvest^{-1})

addsde(P) (Column 25) – amount of phosphorus transferred from aboveground live phosphorus pool (aglive(P)) to standing dead phosphorus pool (stdede(P)) due to a grain harvest event (g P m^{-2} harvest^{-1})

addsde(S) (Column 26) – amount of sulfur transferred from aboveground live sulfur pool (aglive(S)) to standing dead sulfur pool (stdede(S)) due to a grain harvest event (g S m^{-2} harvest^{-1})

resid (Column 27) – amount of residue straw carbon added to the surface litter pool (metabc(1) and strucc(1)) during a grain harvest event (g C m^{-2} harvest^{-1})

reside(N) (Column 28) – amount of residue straw nitrogen added to the surface litter pool (metabe(1,1) and struce(1,1)) during a grain harvest event (g N m^{-2} harvest^{-1})

reside(P) (Column 29) – amount of residue straw phosphorus added to the surface litter pool (metabe(1,2) and struce(1,2)) during a grain harvest event (g P m^{-2} harvest^{-1})

reside(S) (Column 30) – amount of residue straw sulfur added to the surface litter pool (metabe(1,3) and struce(1,3)) during a grain harvest event (g S m^{-2} harvest^{-1})

irrapp (Column 31) – amount of irrigation applied since the previous HARV event (cm H$_2$O harvest^{-1})

fertapp(N) (Column 32) – amount of nitrogen fertilizer applied since previous HARV event (g N m^{-2} harvest^{-1})

fertapp(P) (Column 33) – amount of phosphorus fertilizer applied since previous HARV event
(g P m^{-2} harvest $^{-1}$)

fertapp(S) (Column 34) – amount of sulfur fertilizer applied since previous HARV event (g S m^{-2}
harvest $^{-1}$)

omadapp (Column 35) – amount of carbon added to the system through organic matter addition
events since the previous HARV event (g C m^{-2} harvest $^{-1}$)

omaeapp(N) (Column 36) – amount of nitrogen added to the system through organic matter
addition events since the previous HARV event (g N m^{-2} harvest $^{-1}$)

omaeapp(P) (Column 37) – amount of phosphorus added to the system through organic matter
addition events since the previous HARV event (g P m^{-2} harvest $^{-1}$)

omaeapp(S) (Column 38) – amount of for sulfur added to the system through organic matter
addition events since the previous HARV event (g S m^{-2} harvest $^{-1}$)

strmac(1) (Column 39) – accumulator of stream flow (base flow + runoff) since the beginning of
the year (cm H$_2$O yr^{-1}).

strmac(2) (Column 40) – accumulator for mineral N leached out of the bottom of the soil profile
into stream flow since the beginning of the year (g N m^{-2} yr^{-1})

strmac(3) (Column 41) – accumulator for mineral P leached out of the bottom of the soil profile
into stream flow since the beginning of the year (g P m^{-2} yr^{-1})

strmac(4) (Column 42) – accumulator for mineral S leached out of the bottom of the soil profile
into stream flow since the beginning of the year (g S m^{-2} yr^{-1})

strmac(5) (Column 43) – accumulator for organic C leached from the soil organic layer into
stream flow since the beginning of the year (g C m^{-2} yr^{-1})

strmac(6) (Column 44) – accumulator for organic N leached from the soil organic layer into
stream flow since the beginning of the year (g N m^{-2} yr^{-1})

strmac(7) (Column 45) – accumulator for organic P leached from the soil organic layer into
stream flow since the beginning of the year (g P m^{-2} yr^{-1})

strmac(8) (Column 46) – accumulator for organic S leached from the soil organic layer into
stream flow since the beginning of the year (g S m^{-2} yr^{-1})

cgracc (Column 47) – accumulator for carbon in harvested grain and tubers since the beginning
of the year (sum of cgrain) (g C m^{-2} yr^{-1})

egracc(N) (Column 48) –accumulator of nitrogen in harvested grain and tubers since the
beginning of the year (sum of egrain(N)) (g N m^{-2} yr^{-1})

egracc(P) (Column 49) –accumulator of phosphorus in harvested grain and tubers since the
beginning of the year (sum of egrain(P)) (g P m^{-2} yr^{-1})

egracc(S) (Column 50) –accumulator of sulfur in harvested grain and tubers since the beginning
of the year (sum of egrain(S)) (g S m^{-2} yr^{-1})

accrst (Column 51) –accumulator of carbon in straw removed during harvest since the beginning
of the year (sum of crmvst) (g C m^{-2} yr^{-1})

accrste(N) (Column 52) –accumulator of nitrogen in straw removed during harvest since the
beginning of the year (sum of ermvst(N)) (g N m^{-2} yr^{-1})

accrste(P) (Column 53) –accumulator of phosphorus in straw removed during harvest since the
beginning of the year (sum of ermvst(P)) (g P m^{-2} yr^{-1})

accrste(S) (Column 54) –accumulator of sulfur in straw removed during harvest since the
beginning of the year (sum of ermvst(3)) (g S m^{-2} yr^{-1})

ctubesj (Column 55) – amount of carbon removed from juvenile fine root carbon pool (bglivcj) as
tubers during a harvest event (g C m^{-2} harvest^{-1})

etubesj(N) (Column 56) – amount of nitrogen removed from juvenile fine root nitrogen pool
(bglivej(N)) as tubers during a harvest event (g N m^{-2} harvest^{-1})

etubesj(P) (Column 57) – amount of phosphorus removed from juvenile fine root phosphorus
pool (bglivej(P)) as tubers during a harvest event (g P m^{-2} harvest^{-1})

etubesj(S) (Column 58) – amount of sulfur removed from juvenile fine root sulfur pool
(bglivej(S)) as tubers during a harvest event (g S m^{-2} harvest^{-1})

ctubesm (Column 59) – amount of carbon removed from mature fine root carbon pool
(bglivcm) as tubers during a harvest event (g C m^{-2} harvest^{-1})

etubesm(N) (Column 60) – amount of nitrogen removed from mature fine root nitrogen pool
(bglivem(N)) as tubers during a harvest event (g N m^{-2} harvest^{-1})

etubesm(P) (Column 61) – amount of phosphorus removed from mature fine root phosphorus
pool (bglivem(P)) as tubers during a harvest event (g P m^{-2} harvest^{-1})

etubesm(S) (Column 62) – amount of sulfur removed from mature fine root sulfur pool
(bglivem(S)) as tubers during a harvest event (g S m^{-2} harvest^{-1})

srfclittrj (Column 63) – amount of dead juvenile fine root carbon transferred to surface litter
pool (metabc(1) and strucc(1)) due to a harvest event (g C m^{-2} harvest^{-1})

esrfclittrj(N) (Column 64) – amount of dead juvenile fine root nitrogen transferred to surface
litter pool (metabe(1,1) and struce(1,1)) due to a harvest event (g N m^{-2} harvest^{-1})

esrfclittrj(P) (Column 65) – amount of dead juvenile fine root phosphorus transferred to surface
litter pool (metabe(1,2) and struce(1,2)) due to a harvest event (g P m^{-2} harvest^{-1})

esrfclittrj(S) (Column 66) – amount of dead juvenile fine root sulfur transferred to surface litter
pool (metabe(1,3) and struce(1,3)) due to a harvest event (g S m^{-2} harvest^{-1})

soillittrj (Column 67) – amount of dead juvenile fine root carbon transferred to soil litter pool
(metabc(2) and strucc(2)) due to a harvest event (g C m^{-2} harvest^{-1})

esoillittrj(N) (Column 68) – amount of dead juvenile fine root nitrogen transferred to soil litter
pool (metabe(2,1) and struce(2,1)) due to a harvest event (g N m^{-2} harvest^{-1})

esoillittrj(P) (Column 69) – amount of dead juvenile fine root phosphorus transferred to soil
litter pool (metabe(2,2) and struce(2,2)) due to a harvest event (g P m^{-2} harvest^{-1})

esoillittrj(S) (Column 70) – amount of dead juvenile fine root sulfur transferred to soil litter pool
(metabe(2,3) and struce(2,3)) due to a harvest event (g S m^{-2} harvest^{-1})

srfclittrm (Column 71) – amount of dead mature fine root carbon transferred to surface litter
pool (metabc(1) and strucc(1)) due to a harvest event (g C m^{-2} harvest^{-1})

esrfclittrm(N) (Column 72) – amount of dead mature fine root nitrogen transferred to surface
litter pool (metabe(1,1) and struce(1,1)) due to a harvest event (g N m^{-2} harvest^{-1})

esrfclittrm(P) (Column 73) – amount of dead mature fine root phosphorus transferred to surface
litter pool (metabe(1,2) and struce(1,2)) due to a harvest event (g P m^{-2} harvest^{-1})

esrfclittrm(S) (Column 74) – amount of dead mature fine root sulfur transferred to surface litter
pool (metabe(1,3) and struce(1,3)) due to a harvest event (g S m^{-2} harvest^{-1})

soillittrm (Column 75) – amount of dead mature fine root carbon transferred to soil litter pool
(metabc(2) and strucc(2)) due to a harvest event (g C m^{-2} harvest^{-1})

esoillittrm(N) (Column 76) – amount of dead mature fine root nitrogen transferred to soil litter
pool (metabe(2,1) and struce(2,1)) due to a harvest event (g N m^{-2} harvest^{-1})

esoillittrm(P) (Column 77) – amount of dead mature fine root phosphorus transferred to soil
litter pool (metabe(2,2) and struce(2,2)) due to a harvest event (g P m^{-2} harvest^{-1})

esoillittrm(S) (Column 78) – amount of dead mature fine root sulfur transferred to soil litter pool
(metabe(2,3) and struce(2,3)) due to a harvest event (g S m^{-2} harvest^{-1})

NOTE: This file contains comma separated values.

livec.out – Daily carbon in live plant material

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
aglivc (Column 3) – C in aboveground live for grass/crop (g C m^{-2})
bglivcj (Column 4) – C in live juvenile fine roots for grass/crop (g C m^{-2})
bglivcm (Column 5) – C in live mature fine roots for grass/crop (g C m^{-2})
rleavc (Column 6) – C in forest system leaf component (g C m^{-2})
frootcj (Column 7) – C in forest system juvenile fine root component (g C m^{-2})
frootcm (Column 8) – C in forest system mature fine root component (g C m^{-2})
fbrchc (Column 9) – C in forest system fine branch component (g C m^{-2})
rlwodc (Column 10) – C in forest system large wood component (g C m^{-2})
crootc (Column 11) – C in forest system coarse root component (g C m^{-2})

methane.out – Methanogenesis and Methane Oxidation

(This file is not generated by versions of DayCent that lack methanogenesis).

year (Column 1) – Simulation year
DOY (Column 2) – Day of the year (1 – 366)
aglivc (Column 3) – C in aboveground live for grass/crop (g C m^{-2})
bglivcj (Column 4) – C in live juvenile fine roots for grass/crop (g C m^{-2})
bglivcm (Column 5) – C in live mature fine roots for grass/crop (g C m^{-2})
prev_mcprd1 (Column 6) – NPP of shoots on the previous day (g C m^{-2} d^{-1})
prev_mcprd2 (Column 7) – NPP of juvenile fine roots on the previous day (g C m^{-2} d^{-1})
prev_mcprd3 (Column 8) – NPP of mature fine roots on the previous day (g C m^{-2} d^{-1})
COM (Column 9) – Sum of CO_2 losses from heterotrophic decomposition of metabc(1),
        metabc(2), strucc(1), strucc(2), som1c(1), som1c(2), som2c(1), som2c(2), som3c (g C m^{-2})
ppt (Column 10) – Precipitation for day (cm H_2O d^{-1})
irri (Column 11) – Irrigation for day (cm H_2O d^{-1})
watr2sat (Column 12) – Amount of water automatically added to the system to bring **
        the soil water content in the full soil profile to saturation (cm H_2O d^{-1})
avgst_10cm (Column 13) – Average soil temperature in top 10 cm of soil profile (°C)
TI (Column 14) – Soil temperature index for CH_4 production (0.0 - 1.0)
Cr (Column 15) – Carbohydrates derived from rice plants (g C m^{-2})
Eh (Column 16) – Effect of water management on soil redox potential (mv)
Feh (Column 17) – Reduction factor of effect of soil redox potential (Eh) on CH_4 production
        (0.0 – 1.0)
CH4_prod (Column 18) – Total CH_4 production (g C m^{-2} d^{-1})
CH4_Ep (Column 19) – CH_4 emitted via plants (g C m^{-2} d^{-1})*
CH4_Ebl (Column 20) – CH_4 emitted via bubbles (g C m^{-2} d^{-1})*
CH4_oxid (Column 21) – CH_4 oxidation (g C m^{-2} d^{-1})

* The net CH_4 flux from flooded systems is CH4_Ep + CH4_Ebl. This sum is less than CH4_prod since it accounts for CH_4 oxidation as CH_4 bubbles to the surface. CH4_oxid applies to dryland soils only.

nflux.out – Nitrogen Trace gases

time (Column 1) – Simulation time (see above)

dayofyr (Column 2) – Day of the year (1 – 366)
nit_N2O-N (Column 3) – Nitrous oxide nitrification (g N ha^{-1} d^{-1})
dnit_N2O-N (Column 4) – Nitrous oxide denitrification (g N ha^{-1} d^{-1})
dnit_N2-N (Column 5) – Elemental inert nitrogen gas denitrification (g N ha^{-1} d^{-1})
NO-N (Column 6) – Nitric oxide (g N ha^{-1} d^{-1})
CUM-N2O (Column 7) – Annual accumulator for nitrous oxide (g N ha^{-1} yr^{-1})
CUM-NO (Column 8) – Annual accumulator for nitric oxide (g N ha^{-1} yr^{-1})

psyn.out – Daily photosynthesis for DayCent_Photosyn versions

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
tmindly (Column 3) – Minimum temperature for day (°C)
tmaxdly (Column 4) – Maximum temperature for day (°C)
prcann (Column 5) – Average annual precipitation for site (cm)
pptdly (Column 6) – Precipitation (cm H2O d^{-1})
aetdly (Column 7) – Actual evapotranspiration (cm H2O d^{-1})
petdly (Column 8) – Potential evapotranspiration rate (cm H2O d^{-1})
daylength (Column 9) – Fraction of day that has sunlight (0 – 1)
srad (Column 10) – Mean shortwave radiation during daylight hours (W m^{-2})
avg_temp (Column 11) – Average temperature for daylight hours (°C)
avg_vpd (Column 12) – Average vapor pressure deficit (kPa)
crpLAI (Column 13) – Grass/crop system leaf area index
crpdTemp (Column 14) – Decrease in photosynthesis due to temperature for grass/crop system
        (0 – 1)
crpdVpd (Column 15) – Decrease in photosynthesis due to vapor pressure deficit for grass/crop
        system (0 – 1)
crpdWater (Column 16) – Effect of water stress on photosynthesis for grass/crop system (0 – 1)
crpLtEff (Column 17) – Decrease in photosynthesis due to amount of light absorbed for
        grass/crop system (0 – 1)
crpPGrPsn (Column 18) – Potential photosynthesis, without water stress, for grass/crop system
        (g C * m^{-2} ground area * day^{-1})
crpGrPsn (Column 19) – Gross photosynthesis, with water stress, for grass/crop system
        (g C * m^{-2} ground area * day^{-1})
forLAI (Column 20) – Forest system leaf area index
fordTemp (Column 21) – Decrease in photosynthesis due to temperature for forest system
        (0 – 1)
fordVpd (Column 22) – Decrease in photosynthesis due to vapor pressure deficit for forest
        system (0 – 1)
fordWater (Column 23) – Effect of water stress on photosynthesis for forest system (0 – 1)
forLtEff (Column 24) – Decrease in photosynthesis due to amount of light absorbed for forest
        system (0 – 1)
forPGrPsn (Column 25) – Potential photosynthesis, without water stress, for forest system
        (g C * m^{-2} ground area * day^{-1})
forGrPsn (Column 26) – Gross photosynthesis, with water stress, for forest system
        (g C * m^{-2} ground area * day^{-1})

resp.out – Daily respiration

time (Column 1) – Simulation time (see above)

dayofyr (Column 2) – Day of the year (1 – 366)

oiresp (Column 3) – Daily heterotrophic respiration from OI layer (g C m^{-2} d^{-1})

oeresp (Column 4) – Daily heterotrophic respiration from OE layer (g C m^{-2} d^{-1})

slitrsp (Column 5) – Daily heterotrophic respiration from surface litter (oiresp + oeresp) . For DayCent UV versions, slitrsp also includes abiotic CO_2-C loss from UV degradation of standing dead biomass and surface litter (g C m^{-2} d^{-1})

sminrlrsp (Column 6) – Daily heterotrophic respiration from mineral soil (g C m^{-2} d^{-1})

hresp (Column 7) – Daily heterotrophic respiration (g C m^{-2} d^{-1})

crtjresp (Column 8) – Daily growth and maintenance respiration from crop/grass juvenile fine root pool (g C m^{-2} d^{-1})

crtmresp (Column 9) – Daily growth and maintenance respiration from crop/grass mature fine root pool (g C m^{-2} d^{-1})

frtjresp (Column 10) – Daily growth and maintenance respiration from forest juvenile fine root pool (g C m^{-2} d^{-1})

frtmresp (Column 11) – Daily growth and maintenance respiration from forest mature fine root pool (g C m^{-2} d^{-1})

frtcresp (Column 12) – Daily growth and maintenance respiration from forest coarse root pool (g C m^{-2} d^{-1})

sresp (Column 13) – Daily soil respiration (heterotrophic + root autotrophic) (g C m^{-2} d^{-1})

mresp (Column 14) – Daily maintenance respiration (g C m^{-2} d^{-1})

gresp (Column 15) – Daily growth respiration (g C m^{-2} d^{-1})

mrspflux(1) (Column 16) – Daily maintenance respiration flux from storage pool (CARBOSTG(1,*) to C source/sink for grass/crop system (g C m^{-2} d^{-1})

mrspflux(2) (Column 17) – Daily maintenance respiration flux from storage pool (CARBOSTG(2,*) to C source/sink for tree system (g C m^{-2} d^{-1})

cmrspflux(1) (Column 18) – Amount of daily maintenance respiration flux from aboveground grass/crop material that flows from the grass/crop carbohydrate storage pool (CARBOSTG(1,*)) to the C source/sink pool (CSRSNK) (g C m^{-2} d^{-1})

cmrspflux(2) (Column 19) – Amount of daily maintenance respiration flux from juvenile fine root grass/crop material that flows from the grass/crop carbohydrate storage pool (CARBOSTG(1,*)) to the C source/sink pool (CSRSNK) (g C m^{-2} d^{-1})

cmrspflux(3) (Column 20) – Amount of daily maintenance respiration flux from mature fine root grass/crop material that flows from the grass/crop carbohydrate storage pool (CARBOSTG(1,*)) to the C source/sink pool (CSRSNK) (g C m^{-2} d^{-1})

fmrspflux(1) (Column 21) – Amount of daily maintenance respiration flux from live leaf material that flows from the tree carbohydrate storage pool (CARBOSTG(2,*)) to the C source/sink pool (CSRSNK) (g C m^{-2} d^{-1})

fmrspflux(2) (Column 22) – Amount of daily maintenance respiration flux from live juvenile fine root material that flows from the tree carbohydrate storage pool (CARBOSTG(2,*)) to the C source/sink pool (CSRSNK) (g C m^{-2} d^{-1})

fmrspflux(6) (Column 23) – Amount of daily maintenance respiration flux from live mature fine root material that flows from the tree carbohydrate storage pool (CARBOSTG(2,*)) to the C source/sink pool (CSRSNK) (g C m^{-2} d^{-1})

fmrspflux(3) (Column 24) – Amount of daily maintenance respiration flux from live fine branch material that flows from the tree carbohydrate storage pool (CARBOSTG(2,*)) to the C source/sink pool (CSRSNK) (g C m^{-2} d^{-1})

fmrspflux(4) (Column 25) – Amount of daily maintenance respiration flux from live large wood material that flows from the tree carbohydrate storage pool (CARBOSTG(2,*)) to the C source/sink pool (CSRSNK) (g C m^{-2} d^{-1})

fmrspflux(5) (Column 26) – Amount of daily maintenance respiration flux from live coarse root material that flows from the tree carbohydrate storage pool (CARBOSTG(2,*)) to the C source/sink pool (CSRSNK) (g C m^{-2} d^{-1})

mrspann(1) (Column 27) – Accumulator for annual maintenance respiration for grass/crop (g C m^{-2} yr^{-1})

mrspann(2) (Column 28) – Accumulator for annual maintenance respiration for tree (g C m^{-2} yr^{-1})

tavedly (Column 29) – Mean air temperature over production period (°C)

mrspTempEffect(1,1) (Column 30) – Temperature effect on maintenance respiration for aboveground crop/grass biomass (0.0 – 1.0)

mrspTempEffect(1,2) (Column 31) – Temperature effect on maintenance respiration for belowground crop/grass biomass (0.0 – 1.0)

mrspWaterEffect(1) (Column 32) – Water effect on maintenance respiration for crop/grass system (0.0 – 1.0)

mrspTempEffect(2,1) (Column 33) – Temperature effect on maintenance respiration for leaves, fine branch, and large wood forest system components (0.0 – 1.0)

mrspTempEffect(2,2) (Column 34) – Temperature effect on maintenance respiration for juvenile fine root, mature fine root, and coarse root forest system components (0.0 – 1.0)

mrspWaterEffect(2) (Column 35) – Water effect on maintenance respiration for forest system (0.0 – 1.0)

grspflux(1) (Column 36) – Daily growth respiration flux from storage pool (CARBOSTG(1,*) to C source/sink for grass/crop system (g C m^{-2} d^{-1})

grspflux(2) (Column 37) – Daily growth respiration flux from storage pool (CARBOSTG(2,*) to C source/sink for tree system (g C m^{-2} d^{-1})

cgrspflux(1) (Column 38) – Amount of daily growth respiration flux from aboveground grass/crop material that is blown off into the atmosphere during plant carbon production (g C m^{-2} d^{-1})

cgrspflux(2) (Column 39) – Amount of daily growth respiration flux from juvenile fine root grass/crop material that is blown off into the atmosphere during plant carbon production (g C m^{-2} d^{-1})

cgrspflux(3) (Column 40) – Amount of daily growth respiration flux from mature fine root grass/crop material that is blown off into the atmosphere during plant carbon production (g C m^{-2} d^{-1})

fgrspflux(1) (Column 41) – Amount of daily growth respiration loss from live leaf material that is blown off into the atmosphere during plant carbon production (g C m^{-2} d^{-1})

fgrspflux(2) (Column 42) – Amount of daily growth respiration loss from live juvenile fine root material that is blown off into the atmosphere during plant carbon production (g C m^{-2} d^{-1})

fgrspflux(6) (Column 43) – Amount of daily growth respiration loss from live mature fine root material that is blown off into the atmosphere during plant carbon production (g C m^{-2} d^{-1})

fgrspflux(3) (Column 44) – Amount of daily growth respiration loss from live fine branch material that is blown off into the atmosphere during plant carbon production (g C m^{-2} d^{-1})

fgrspflux(4) (Column 45) – Amount of daily growth respiration loss from live large wood material that is blown off into the atmosphere during plant carbon production (g C m^{-2} d^{-1})

fgrspflux(5) (Column 46) – Amount of daily growth respiration loss from live coarse root material that is blown off into the atmosphere during plant carbon production (g C m^{-2} d^{-1})

grspann(1) (Column 47) – Accumulator for annual growth respiration for grass/crop (g C m^{-2} yr^{-1})

grspann(2) (Column 48) – Accumulator for annual growth respiration for tree (g C m^{-2} yr^{-1})

mcprd(1) (Column 49) – Daily NPP for shoots for grass/crop system (g C m^{-2} d^{-1})

mcprd(2) (Column 50) – Daily NPP for juvenile roots for grass/crop system (g C m^{-2} d^{-1})

mcprd(3) (Column 51) – Daily NPP for mature roots for grass/crop system (g C m^{-2} d^{-1})

mfprd(1) (Column 52) – Daily NPP for live leaves for tree system (g C m^{-2} d^{-1})

mfprd(2) (Column 53) – Daily NPP for live juvenile fine roots for tree system (g C m^{-2} d^{-1})

mfprd(6) (Column 54) – Daily NPP for live mature fine roots for tree system (g C m^{-2} d^{-1})

mfprd(3) (Column 55) – Daily NPP for live fine branches for tree system (g C m^{-2} d^{-1})

mfprd(4) (Column 56) – Daily NPP for live large wood for tree system (g C m^{-2} d^{-1})

mfprd(5) (Column 57) – Daily NPP for live coarse roots for tree system (g C m^{-2} d^{-1})

carbostg(1,1) (Column 58) – Unlabeled C in carbohydrate storage for grass/crop system (g C m^{-2})

carbostg(1,2) (Column 59) – Labeled C in carbohydrate storage for grass/crop system (g C m^{-2})

carbostg(2,1) (Column 60) – Unlabeled C in carbohydrate storage for forest system (g C m^{-2})

carbostg(2,2) (Column 61) – Labeled C in carbohydrate storage for forest system (g C m^{-2})

soilc.out – Daily carbon in soil organic matter pools

time (Column 1) – Simulation time (see above)

dayofyr (Column 2) – Day of the year (1 – 366)

metabc(2) (Column 3) – metabolic C in soil litter (g C m^{-2})

strucc(2) (Column 4) – soil litter structural C (g C m^{-2})

som1c(1) (Column 5) – C in surface active pool soil organic matter (g C m^{-2})

som1c(2) (Column 6) – C in soil active soil pool organic matter (g C m^{-2})

som2c(1) (Column 7) – C in surface slow pool soil organic matter (g C m^{-2})

som2c(2) (Column 8) – C in soil slow pool soil organic matter (g C m^{-2})

som3c (Column 9) – C in passive pool soil organic matter (g C m^{-2})

soiln.out – Daily soil ammonium and nitrate by soil layer

time (Column 1) – Simulation time (see above)

dayofyr (Column 2) – Day of the year (1 – 366)

ammonium (Column 3) – Soil ammonium in top 10 centimeters of soil (ppm)

NO3_ppm[0] (Column 4) – Nitrate in soil layer 1 (index 0) of the soil profile, as defined in the soils.in file (ppm)

NO3_ppm[1] (Column 5) – Nitrate in soil layer 2 (index 1) of the soil profile, as defined in the soils.in file (ppm)

...

NO3_ppm[n-1] (Column n+3) – Nitrate in soil layer n (index n-1) of the soil profile, as defined in the soils.in file (ppm)

NOTE:

n = number of soil layers defined in soils.in file

soiltavg.out – Daily average soil temperature by layer

no column headers

Column 1 – Simulation time (see above)
Column 2 – Day of the year (1 – 366)
Column 3 – Average soil temperature for soil layer 1, as defined in soils.in file (°C)
Column 4 – Average soil temperature for soil layer 2, as defined in soils.in file (°C)
...
Column n+2 – Average soil temperature for soil layer n, as defined in soils.in file (°C)

NOTE:
n = number of soil layers defined in soils.in file

soiltmax.out – Daily maximum soil temperature by layer

no column headers

Column 1 – Simulation time (see above)
Column 2 – Day of the year (1 – 366)
Column 3 – Maximum soil temperature for soil layer 1, as defined in soils.in file (°C)
Column 4 – Maximum soil temperature for soil layer 2, as defined in soils.in file (°C)
...
Column n+2 – Maximum soil temperature for soil layer n, as defined in soils.in file (°C)

NOTE:
n = number of soil layers defined in soils.in file

soiltmin.out – Daily minimum soil temperature by layer

no column headers

Column 1 – Simulation time (see above)
Column 2 – Day of the year (1 – 366)
Column 3 – Minimum soil temperature for soil layer 1, as defined in soils.in file (°C)
Column 4 – Minimum soil temperature for soil layer 2, as defined in soils.in file (°C)
...
Column n+2 – Minimum soil temperature for soil layer n, as defined in soils.in file (°C)

NOTE:
n = number of soil layers defined in soils.in file

stemp_dx.out – Daily soil temperature every few centimeters

no column headers

Column 1 – Simulation time (see above)
Column 2 – Day of the year (1 – 366)
Column 3 – Soil temperature for first soil layer division (°C)
Column 4 – Soil temperature for second soil layer division (°C)

...
Column n+2 – Soil temperature for soil layer division n (°C)

WARNING:
This file can become very large.

summary.out – Daily climate, trace gas, and heterotrophic respiration

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
tmax (Column 3) – Maximum air temperature for day (°C)
tmin (Column 4) – Minimum air temperature for day (°C)
ppt (Column 5) – Precipitation for day (cm)
N2Oflux (Column 6) – Nitrous oxide flux (g N ha^{-1} d^{-1})
NOflux (Column 7) – Nitric oxide flux (g N ha^{-1} d^{-1})
CH4 (Column 8) – Methane oxidation (g C ha^{-1} d^{-1})
NIT (Column 9) – Gross nitrification (g N ha^{-1} d^{-1})
CO2resp (Column 10) – Heterotrophic CO$_2$ respiration for the day (g C ha^{-1} d^{-1})

sysc.out – Daily system carbon

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
livec (Column 3) – C live material (g C m^{-2}) (aglivc + bglivcj + bglivcm + rleavc + frootcj + frootcm
        + fbrchc + rlwodc + crootc)
deadc (Column 4) – C in dead material (g C m^{-2}) (stdedc + metabc(1) + strucc(1) + wood1c +
        wood2c + wood3c)
soilc (Column 5) – C in soil organic matter pools (g C m^{-2}) (metabc(2) + strucc(2) + som1c(1) +
som1c(2) + som2c(1) + som2c(2) + som3c)

sysc (Column 6) – System C (g C m^{-2}) (livec + deadc + soilc)

CO2resp (Column 7) – Summation of heterotrophic CO$_2$ respiration for the day (g C m^{-2})

tgmonth.out – monthly summation of trace gas fluxes

time (Column 1) – Simulation time (see above)
N2Oflux (Column 2) – Monthly accumulator for nitrous oxide (g N m^{-2} mo^{-1})
NOflux (Column 3) – Monthly accumulator for nitric oxide (g N m^{-2} mo^{-1})
N2flux (Column 4) – Monthly accumulator for nitrogen (N$_2$) gas (g N m^{-2} mo^{-1})
CH4 (Column 5) – Monthly accumulator for methane oxidation (g C m^{-2} mo^{-1})
NIT (Column 6) – Monthly accumulator for gross nitrification (g N m^{-2} mo^{-1})
PPT (Column 7) – Monthly accumulator for precipitation, includes irrigation (cm mo^{-1})

vswc.out – Daily volumetric soil water content by layer

no column headers

Column 1 – Simulation time (see above)
Column 2 – Day of the year (1 – 366)

Column 3 – Volumetric soil water content for soil layer 1, as defined in soils.in file (0.0 – 1.0)
Column 4 – Volumetric soil water content for soil layer 2, as defined in soils.in file (0.0 – 1.0)
...
Column n+2 – Volumetric soil water content for soil layer n, as defined in soils.in file (0.0 – 1.0)

NOTE:
n = number of soil layers defined in soils.in file

watrbal.out – Daily water balance

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
ppt (Column 3) – Precipitation plus irrigation (cm H_2O d^{-1})
accum (Column 4) – Amount of snow added to the snowpack (cm H_2O d^{-1})
dsnlq (Column 5) – Difference in liquid water in the snowpack from the beginning of the day to
    the end of the day (cm H_2O)
melt (Column 6) – Snow melted from the snow pack (cm H_2O d^{-1})
intrcpt (Column 7) – Evaporation of precipitation that was intercepted by standing crop and
    litter biomass (cm H_2O d^{-1})
evap (Column 8) – Evaporation from the soil (cm H_2O d^{-1})
transp (Column 9) – Transpiration (cm H_2O d^{-1})
sublim (Column 10) – Amount of snow sublimated (equivalent cm H_2O d^{-1})
dswc (Column 11) – Difference in the soil water content from the beginning of the day to the
    end of the day (cm H_2O)
outflow (Column 12) – outflow (Column 12) – Total stream flow. Outflow includes runoff
    (column 16) plus base flow (cm H_2O d^{-1})
balance (Column 13) – Daily water balance, computed as:
balance = (soil water content at beginning of day - soil water content at end of day) +
    precipitation + snow melt - accumulation - interception - evaporation - transpiration -
    outflow (should be equal to zero)
snow (Column 14) – Snow water equivalent (SWE) of frozen water in snow pack (cm H_2O)
snlq (Column 15) – Amount of liquid water stored in the snowpack (cm H_2O)
runoff (Column 16) – Runoff (rainfall/melt infiltration excess) (cm H_2O d^{-1})

NOTE:
Values that are negative represent water losses (i.e. intrcpt, evap, transp, sublim, outflow,
runoff). The model does not attempt to maintain a water balance when simulating a water table
during FLOD events. Irrigation is included in the ppt column.

wflux.out – Daily water flux through the bottom of soil layers

time (Column 1) – Simulation time (see above)
dayofyr (Column 2) – Day of the year (1 – 366)
wflux[0] (Column 3) – Water flux from soil layer 1 (index 0) to soil layer 2 (index 1), as defined in
    soils.in file (cm H_2O d^{-1})
wflux[1] (Column 4) – Water flux from soil layer 2 (index 1) to soil layer 3 (index 2), as defined in
    soils.in file (cm H_2O d^{-1})
...

wflux[n-1] (Column n+2) – Water flux from soil layer n (index n-1) to deep storage layer n+1
(index n) (cm H_2O d^{-1})

NOTES:
Negative wflux values represent upward flow (evaporation), positive values represent
downward flow (drainage).

n = number of soil layers defined in soils.in file

wfps.out – Daily water filled pore space by layer

no column headers

Column 1 – Simulation time (see above)
Column 2 – Day of the year (1 – 366)
Column 3 – Water filled pore space for soil layer 1, as defined in soils.in file, value from 0 to 1
where 1 = saturation
Column 4 – Water filled pore space for soil layer 2, as defined in soils.in file, value from 0 to 1
where 1 = saturation
...
Column n+2 – Water filled pore space for soil layer n, as defined in soils.in file, value from 0 to 1
where 1 = saturation

NOTE:
n = number of soil layers defined in soils.in file

year_cflows.out – Annual accumulators for carbon flows to SOM pools

time (Column 1) – Simulation time (see above)
asom11tosom21 (Column 2) – carbon flow from active surface organic matter pool to slow
surface organic matter pool (g C m^{-2} yr^{-1})
asom12tosom22 (Column 3) – Annual accumulator for carbon flow from active soil organic
matter pool to slow soil organic matter pool (g C m^{-2} yr^{-1})
asom12tosom3 (Column 4) – Annual accumulator for carbon flow from active soil organic
matter pool to passive soil organic matter pool (g C m^{-2} yr^{-1})
asom21tosom11 (Column 5) – Annual accumulator for carbon flow from slow surface organic
matter pool to active surface organic matter pool (g C m^{-2} yr^{-1})
asom21tosom22 (Column 6) – Annual accumulator for carbon flow from slow surface organic
matter pool to slow soil organic matter pool (g C m^{-2} yr^{-1})
asom22tosom12 (Column 7) – Annual accumulator for carbon flow from slow soil organic matter
pool to active soil organic matter pool (g C m^{-2} yr^{-1})
asom22tosom3 (Column 8) – Annual accumulator for carbon flow from slow soil organic matter
pool to passive soil organic matter pool (g C m^{-2} yr^{-1})
asom3tosom12 (Column 9) – Annual accumulator for carbon flow from passive soil organic
matter pool to active soil organic matter pool (g C m^{-2} yr^{-1})
ametc1tosom11 (Column 10) – Annual accumulator for carbon flow from surface metabolic pool
to active surface organic matter pool (g C m^{-2} yr^{-1})

ametc2tosom12 (Column 11) – Annual accumulator for carbon flow from soil metabolic pool to active soil organic matter pool (g C m^{-2} yr^{-1})

astruc1tosom11 (Column 12) – Annual accumulator for carbon flow from surface structural pool to active surface organic matter pool (g C m^{-2} yr^{-1})

astruc1tosom21 (Column 13) – Annual accumulator for carbon flow from surface structural pool to slow surface organic matter pool (g C m^{-2} yr^{-1})

astruc2tosom12 (Column 14) – Annual accumulator for carbon flow from soil structural pool to active soil organic matter pool (g C m^{-2} yr^{-1})

astruc2tosom22 (Column 15) – Annual accumulator for carbon flow from soil structural pool to slow soil organic matter pool (g C m^{-2} yr^{-1})

awood1tosom11 (Column 16) – Annual accumulator for carbon flow from dead fine branch pool to active surface organic matter pool (g C m^{-2} yr^{-1})

awood1tosom21 (Column 17) – Annual accumulator for carbon flow from dead fine branch pool to slow surface organic matter pool (g C m^{-2} yr^{-1})

awood2tosom11 (Column 18) – Annual accumulator for carbon flow from dead large wood pool to active surface organic matter pool (g C m^{-2} yr^{-1})

awood2tosom21 (Column 19) – Annual accumulator for carbon flow from dead large wood pool to slow surface organic matter pool (g C m^{-2} yr^{-1})

awood3tosom12 (Column 20) – Annual accumulator for carbon flow from dead coarse root pool to active soil organic matter pool (g C m^{-2} yr^{-1})

awood3tosom22 (Column 21) – Annual accumulator for carbon flow from dead coarse root pool to slow soil organic matter pool (g C m^{-2} yr^{-1})

year_summary.out – Annual accumulators for trace gas fluxes

time (Column 1) – Simulation time (see above)
N2Oflux (Column 2) – Annual accumulator for nitrous oxide (g N m^{-2} yr^{-1})
NOflux (Column 3) – Annual accumulator for nitric oxide (g N m^{-2} yr^{-1})
N2flux (Column 4) – Annual accumulator for nitrogen gas (g N m^{-2} yr^{-1})
CH4 (Column 5) – Annual accumulator for methane oxidation (g C m^{-2} yr^{-1})
NIT (Column 6) – Annual accumulator for gross nitrification (g N m^{-2} yr^{-1})
ANNPPT (Column 7) – Annual accumulator for precipitation, includes irrigation (cm yr^{-1})

Output variables from the binary (.bin) file

Use the list100 utility to extract any of the following variables from the binary file. Note: soil layer values in this file refer to the Century soil layers as defined in fix.100, not the finer DayCent layers defined in soils.in.

aagdefac – average annual value of *agdefac*, the decomposition factor which combines the effects of temperature and moisture for the surface decomposition (replaces *adefac*)

abgdefac – average annual value of *bgdefac*, the decomposition factor which combines the effects of temperature and moisture for the soil decomposition (replaces *adefac*)

accrst – annual accumulator of C in straw removed for grass/crop (sum of crmvst) (g C m^{-2} yr^{-1})

accrste(1) – annual accumulator for N from harvested straw (sum of ermvst(1)) (g N m^{-2} yr^{-1})

accrste(2) – annual accumulator for P from harvested straw (sum of ermvst(2)) (g P m^{-2} yr^{-1})

accrste(3) – annual accumulator for S from harvested straw (sum of ermvst(3)) (g S m^{-2} yr^{-1})

acrcis(1) – growing season accumulator for unlabeled C production by isotope in forest system coarse root component (g C m^{-2} yr^{-1} season^{-1})

acrcis(2) – growing season accumulator for labeled C production by isotope in forest system coarse root component (g C m^{-2} yr^{-1} season^{-1})

afbcis(1) – growing season accumulator for unlabeled C production by isotope in forest system fine branch component (g C m^{-2} yr^{-1} season^{-1})

afbcis(2) – growing season accumulator for labeled C production by isotope in forest system fine branch component (g C m^{-2} yr^{-1} season^{-1})

afrcisj(1) – unlabeled growing season accumulator for C production in forest system juvenile fine root component (TFST-TLST) (g C m^{-2} yr^{-1} season^{-1}) (replaces *afrcis(1)*)

afrcisj(2) – labeled growing season accumulator for C production in forest system juvenile fine root component (TFST-TLST) (g C m^{-2} yr^{-1} season^{-1}) (replaces *afrcis(2)*)

afrcism(1) – unlabeled growing season accumulator for C production in forest system mature fine root component (TFST-TLST) (g C m^{-2} yr^{-1} season^{-1}) (replaces *afrcis(1)*)

afrcism(2) – labeled growing season accumulator for C production in forest system mature fine root component (TFST-TLST) (g C m^{-2} yr^{-1} season^{-1}) (replaces *afrcis(2)*)

agcacc – growing season accumulator for aboveground C production (g C m^{-2} yr^{-1})

agcisa(1) – growing season accumulator for unlabeled aboveground C production for grass/crop (g C m^{-2} yr^{-1} season^{-1})

agcisa(2) – growing season accumulator for labeled aboveground C production for grass/crop (g C m^{-2} yr^{-1} season^{-1})

agcmth(12) – aboveground C production for the grass/crop for the current month, 1-12 (g C m^{-2})

agcprd – aboveground C production for the grass/crop over the last completed growing season (g C m^{-2} yr^{-1})

agdefac – decomposition factor based on temperature and moisture for surface decomposition (replaces *defac*)

aglcis(1) – unlabeled aboveground C by isotope for grass/crop (g C m^{-2})

aglcis(2) – labeled aboveground C by isotope for grass/crop (g C m^{-2})

aglcn – aboveground live C/N ratio, = -999 if either component = 0 for grass/crop

aglivc – C in aboveground live for grass/crop (g C m^{-2})

aglive(1) – N in aboveground live for grass/crop (g N m^{-2})

aglive(2) – P in aboveground live for grass/crop (g P m^{-2})

aglive (3) – S in aboveground live for grass/crop (g S m^{-2})

alvcis(1) – growing season accumulator for unlabeled C production in forest system leaf
     component (g C m^{-2} yr^{-1} season^{-1})

alvcis(2) – growing season accumulator for labeled C production in forest system leaf
     component (g C m^{-2} yr^{-1} season^{-1})

alwcis(1) – growing season accumulator for unlabeled C production in forest system large wood
     component (g C m^{-2} yr^{-1} season^{-1})

alwcis(2) – growing season accumulator for labeled C production in forest system large wood
     component (g C m^{-2} yr^{-1} season^{-1})

aminrl(1) – mineral N in layer 1 before uptake by plants

aminrl(2) – mineral P in layer 1 before uptake by plants

aminrl(3) – mineral S in layer 1 before uptake by plants

amt1c2 – annual accumulator for surface CO_2 loss due to microbial respiration during litter
     decomposition (g C m^{-2} yr^{-1})

amt2c2 – annual accumulator for soil CO_2 loss due to microbial respiration during litter
     decomposition (g C m^{-2} yr^{-1})

anerb – the effect of soil anaerobic conditions on decomposition; used as a multiplier on all
     belowground decomposition flows

annet – annual evapotranspiration (sum of monthly evap + tran) (cm yr^{-1})

arspmth(1,1) – unlabeled monthly autotrophic respiration for grass/crop system (g C m^{-2})

arspmth(1,2) – labeled monthly autotrophic respiration for grass/crop system (g C m^{-2})

arspmth(2,1) – unlabeled monthly autotrophic respiration for forest system (g C m^{-2})

arspmth(2,2) – labeled monthly autotrophic respiration for forest system (g C m^{-2} mo^{-1})

as11c2 – annual accumulator for CO_2 loss due to microbial respiration during soil organic matter decomposition of surface *som1* to *som2* (g C m^{-2} yr^{-1})

as12c2 – annual accumulator for CO_2 loss due to microbial respiration during soil organic matter decomposition of soil som1 to soil som2 and som3 (replaces *as21c2*) (g C m^{-2} yr^{-1})

as21c2 – annual accumulator for CO_2 loss due to microbial respiration during soil organic matter decomposition of surface som2 to surface som1 (new definition) (g C m^{-2} yr^{-1})

as22c2 – annual accumulator for CO_2 loss due to microbial respiration during soil organic matter decomposition of soil som2 to soil som1 and som3 (replaces *as2c2*) (g C m^{-2} yr^{-1})

as3c2 – annual accumulator for CO_2 loss due to microbial respiration during soil organic matter decomposition of som3 to soil som1 (g C m^{-2} yr^{-1})

asmos(1) – soil water content of layer 1 (cm)

asmos(2) – soil water content of layer 2 (cm)

asmos(3) – soil water content of layer 3 (cm)

asmos(4) – soil water content of layer 4 (cm)

asmos(5) – soil water content of layer 5 (cm)

asmos(6) – soil water content of layer 6 (cm)

asmos(7) – soil water content of layer 7 (cm)

asmos(8) – soil water content of layer 8 (cm)

asmos(9) – soil water content of layer 9 (cm)

asmos(10) – soil water content of layer 10 (cm)

ast1c2 – annual accumulator for CO_2 loss due to microbial respiration during litter decomposition of surface structural into som1 and som2 (g C m^{-2} yr^{-1})

ast2c2 – annual accumulator for CO_2 loss due to microbial respiration during litter decomposition of soil structural into som1 and som2 (g C m^{-2} yr^{-1})

ast1uvc2 - For DayCent UV versions this is an annual accumulator for the abiotic CO_2 loss from UV degradation of surface litter (g C m^{-2} yr^{-1})

astduvc2 - For DayCent UV versions this is an annual accumulator for the abiotic CO_2 loss from UV degradation of standing dead biomass (g C m^{-2} yr^{-1})

avh2o(1) – water available to grass/crop/tree for growth in soil profile (sum of Century layers 1 through claypg or tlaypg) (cm H_2O)

avh2o(2) – water available to grass/crop/tree for survival in soil profile (sum of all Century layers in profile, 1 through nlayer) (cm H_2O)

avh2o(3) – water in the first two Century soil layers (cm H_2O)

bgcjacc – growing season accumulator for juvenile fine root C production for grass/crop (FRST-LAST) (g C m^{-2} yr^{-1} $season^{-1}$) (replaces *bgcacc*)

bgcmacc – growing season accumulator for mature fine root C production for grass/crop (FRST-LAST) (g C m^{-2} yr^{-1} $season^{-1}$) (replaces *bgcacc*)

bgcisja(1) – unlabeled growing season accumulator for juvenile fine root C production for grass/crop (FRST-LAST) (g C m^{-2} yr^{-1} $season^{-1}$) (replaces *bgcisa(1)*)

bgcisja(2) – labeled growing season accumulator for juvenile fine root C production for grass/crop (FRST-LAST) (g C m^{-2} yr^{-1} $season^{-1}$) (replaces *bgcisa(2)*)

bgcisma(1) – unlabeled growing season accumulator for mature fine root C production for grass/crop (FRST-LAST) (g C m^{-2} yr^{-1} $season^{-1}$) (replaces *bgcisa(1)*)

bgcisma(2) – labeled growing season accumulator for mature fine root C production for grass/crop (FRST-LAST) (g C m^{-2} yr^{-1} $season^{-1}$) (replaces *bgcisa(2)*)

bgcjmth(12) – juvenile fine root C production for grass/crop for the current month, 1-12 (g C m^{-2}) (replaces *bgcmth(12)*)

bgcmmth(12) – mature fine root C production for grass/crop for the current month, 1-12 (g C m^{-2}) (replaces *bgcmth(12)*)

bgcjprd – juvenile fine root C production for the grass/crop over the last completed growing season (g C m^{-2} yr^{-1}) (replaces *bgcprd*)

bgcmprd – mature fine root C production for the grass/crop over the last completed growing season (g C m^{-2} yr^{-1}) (replaces *bgcprd*)

bgdefac – decomposition factor based on temperature and moisture for soil decomposition (replaces *defac*)

bglcisj(1) – unlabeled juvenile fine root live C for grass/crop (g C m^{-2}) (replaces bglcis(1))

bglcisj(2) – labeled juvenile fine root live C for grass/crop (g C m^{-2}) (replaces *bglcis(2)*)

bglcism(1) – unlabeled mature fine root live C for grass/crop (g C m^{-2}) (replaces *bglcis(1)*)

bglcism(2) – labeled mature fine root live C for grass/crop (g C m^{-2}) (replaces *bglcis(2)*)

bglcnj – juvenile fine root live C/N ratio for grass/crop; = -999 if either component = 0 (replaces *bglcn*)

bglcnm – mature fine root live C/N ratio for grass/crop; = -999 if either component = 0 (replaces *bglcn*)

bglivcj – C in juvenile fine root live for grass/crop (g C m^{-2}) (replaces *bglivc*)

bglivcm – C in mature fine root live for grass/crop (g C m^{-2}) (replaces *bglivc*)

bglivej(1) – N in juvenile fine root live for grass/crop (g N m^{-2}) (replaces *bglive(1)*)

bglivej(2) – P in juvenile fine root live for grass/crop (g P m^{-2}) (replaces *bglive(2)*)

bglivej(3) – S in juvenile fine root live for grass/crop (g S m^{-2}) (replaces bglive(3))

bglivem(1) – N in mature fine root live for grass/crop (g N m^{-2}) (replaces *bglive(1)*)

bglivem(2) – P in mature fine root live for grass/crop (g P m^{-2}) (replaces *bglive(2)*)

bglivem(3) – S in mature fine root live for grass/crop (g S m^{-2}) (replaces *bglive(3)*)

carbostg(1,1) – unlabeled C in carbohydrate storage for grass/crop system (g C m^{-2})

carbostg(1,2) – labeled C in carbohydrate storage for grass/crop system (g C m^{-2})

carbostg(2,1) – unlabeled C in carbohydrate storage for forest system (g C m^{-2})

carbostg(2,2) – labeled C in carbohydrate storage for forest system (g C m^{-2})

cautoresp(1) – annual accumulator for unlabeled autotrophic respiration for grass/crop system (g C m^{-2} yr^{-1})

cautoresp(2) – annual accumulator for labeled autotrophic respiration for grass/crop system (g C m^{-2} yr^{-1})

cgracc – annual accumulator for grain and tuber production for grass/crop (sum of cgrain) (g C m^{-2} yr^{-1})

cgrain – economic yield of C in grain + tubers for grass/crop from the most recent harvest event (g C m^{-2} harvest^{-1})

cgrspflux(1) – monthly growth respiration flux from aboveground live grass/crop material that is blown off from the carbohydrate storage pool (*carbostg(1,*)*) into the atmosphere (*csrsnk*) during plant carbon production (g C m^{-2})

cgrspflux(2) – monthly growth respiration flux from juvenile live fine roots grass/crop material that is blown off from the carbohydrate storage pool (*carbostg(1,*)*) into the atmosphere (*csrsnk*) during plant carbon production (g C m^{-2})

cgrspflux(3) – monthly growth respiration flux from mature live fine roots grass/crop material that is blown off from the carbohydrate storage pool (*carbostg(1,*)*) into the atmosphere (csrsnk) during plant carbon production (g C m^{-2})

cinput – annual C inputs

cisgra(1) – unlabeled C in grain (g C m^{-2}) for grass/crop

cisgra(2) – labeled C in grain (g C m^{-2}) for grass/crop

clittr(1,1) – surface, unlabeled residue (g C m^{-2})

clittr(1,2) – surface, labeled residue (g C m^{-2})

clittr(2,1) – soil, unlabeled residue (g C m^{-2})

clittr(2,2) – soil, labeled residue (g C m^{-2})

cltfac(1) – effect of cultivation on decomposition for som1; = clteff(1) if cultivation occurs in the current month; = 1 otherwise

cltfac(2) – effect of cultivation on decomposition for som2; = clteff(2) if cultivation occurs in the current month; = 1 otherwise

cltfac(3) – effect of cultivation on decomposition for som3; = clteff(3) if cultivation occurs in the current month; = 1 otherwise

cltfac(4) – effect effect of cultivation on decomposition for structural; = clteff(4) if cultivation occurs in the current month; = 1 otherwise

cmrspflux(1) – monthly maintenance respiration flux from aboveground live grass/crop material that flows from the grass/crop carbohydrate storage pool (*carbostg(1,*)*) to the C source/sink pool (*csrsnk*) (g C m^{-2})

cmrspflux(2) – monthly maintenance respiration flux from live juvenile fine root grass/crop material that flows from the grass/crop carbohydrate storage pool (*carbostg(1,*)*) to the C source/sink pool (*csrsnk*) (g C m^{-2})

cmrspflux(3) – monthly maintenance respiration flux from live mature fine root grass/crop material that flows from the grass/crop carbohydrate storage pool (*carbostg(1,*)*) to the C source/sink pool (*csrsnk*) (g C m^{-2})

co2cce(1,1,1) – the calculated effect on grass/crop minimum C/N ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(1,1,2) – the calculated effect on grass/crop minimum C/P ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(1,1,3) – the calculated effect on grass/crop minimum C/S ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(1,2,1) – the calculated effect on grass/crop maximum C/N ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(1,2,2) – the calculated effect on grass/crop maximum C/P ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(1,2,3) – the calculated effect on grass/crop maximum C/S ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(2,1,1) – the calculated effect on forest minimum C/N ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(2,1,2) – the calculated effect on forest minimum C/P ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(2,1,3) – the calculated effect on forest minimum C/S ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(2,2,1) – the calculated effect on forest maximum C/N ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(2,2,2) – the calculated effect on forest maximum C/P ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cce(2,2,3) – the calculated effect on forest maximum C/S ratios of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cpr(1) – in a grass/crop system, the calculated effect on potential production of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2cpr(2) – in a forest system, the calculated effect on potential production of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2crs(1) – in a grass/crop system, the calculated effect on root-shoot ratio of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2crs(2) – in a forest system, the calculated effect on root-shoot ratio of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2ctr(1) – in a forest system, the calculated effect on grass/crop transpiration rate of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

co2ctr(2) – in a forest system, the calculated effect on forest transpiration rate of doubling the atmospheric CO_2 concentration from 350 ppm to 700 ppm

cproda – annual accumulator of C production in grass/crop + forest = net primary production $(g\ C\ m^{-2}\ yr^{-1})$

cprodc – total monthly C production for grass/crop $(g\ C\ m^{-2}\ mo^{-1})$

cprodf – total monthly C production for forest $(g\ C\ m^{-2}\ mo^{-1})$

creta – annual accumulator of C returned to system during grazing/fire for grass/crop $(g\ C\ m^{-2}\ yr^{-1})$

crmvst – amount of C removed through straw during most recent harvest event for grass/crop $(g\ C\ m^{-2}\ harvest^{-1})$

crootc – C in forest system coarse root component $(g\ C\ m^{-2})$

croote(1) – N in forest system coarse root component $(g\ N\ m^{-2})$

croote(2) – P in forest system coarse root component $(g\ P\ m^{-2})$

croote(3) – S in forest system coarse root component $(g\ S\ m^{-2})$

crpstg(1) – retranslocation N storage pool for grass/crop $(g\ N\ m^{-2})$

crpstg(2) – retranslocation P storage pool for grass/crop $(g\ P\ m^{-2})$

crpstg(3) – retranslocation S storage pool for grass/crop $(g\ S\ m^{-2})$

crpval – a numerical representation of the current crop, used for sorting output by crop; created by a system of assigning values to characters as in A=1,B=2,etc. and 1=0.1, 2=0.2, etc. and adding the values together (example: AB2 = 3.2)

crtacc – growing season accumulator for C production in forest system coarse root component $(g\ C\ m^{-2}\ yr^{-1}\ season^{-1})$

crtcis(1) – unlabeled C in forest system coarse root component $(g\ C\ m^{-2})$

crtcis(2) – labeled C in forest system coarse root component $(g\ C\ m^{-2})$

crtprd – coarse root component C production for the forest system over the last completed growing season $(g\ C\ m^{-2}\ yr^{-1})$

csrsnk(1) – unlabeled C source/sink $(g\ C\ m^{-2})$

csrsnk(2) – labeled C source/sink $(g\ C\ m^{-2})$

dautoresp(1) – delta 13/14C value for autotrophic respiration for grass/crop system for stable isotope labeling

dautoresp(2) – delta 13/14C value for autotrophic respiration for forest system for stable isotope labeling

dbglivc – delta 13C/14C value for grass/crop belowground live, juvenile and mature live fine roots, for stable isotope labeling

dbglivcj – delta 13C/14C value for grass/crop juvenile live fine roots for stable isotope labeling

dbglivcm – delta 13C/14C value for grass/crop mature live fine roots for stable isotope labeling

dblit – delta 13C value for belowground litter for stable isotope labeling

dcarbostg(1) – delta 13/14C value for grass/crop system carbohydrate storage pool for stable isotope labeling

dcarbostg(2) – delta 13/14C value for forest system carbohydrate storage pool for stable isotope labeling

deloe – delta 13C/14C value for OE layer (soil structural, metabolic, som1c, som2c, and som3c) for stable isotope labeling

deloi – delta 13C/14C value for OI layer (surface structural, metabolic, som1c, and som2c) for stable isotope labeling

dfrootc – delta 13C/14C value for forest belowground live, juvenile and mature fine roots, for stable isotope labeling

dfrootcj – delta 13C/14C value for forest juvenile live fine roots for stable isotope labeling

dfrootcm – delta 13C/14C value for forest mature live fine roots for stable isotope labeling

dhetresp – delta 13/14C value for heterotrophic respiration for stable isotope labeling

dmetc(1) – delta 13C value for metabolic surface C in for stable isotope labeling

dmetc(2) – delta 13C value for metabolic soil C in for stable isotope labeling

dslit – delta 13C value for surface litter for stable isotope labeling

dsoilresp – delta 13/14C value for soil respiration for stable isotope labeling

dsom1c(1) – delta 13C value for som1c(1) for stable isotope labeling

dsom1c(2) – delta 13C value for som1c(2) for stable isotope labeling

dsom2c(1) – delta 13C/14C value for *som2c(1)* for stable isotope labeling

dsom2c(2) – delta 13C/14C value for *som2c(2)* for stable isotope labeling (replaces *dsom2c*)

dsom3c – delta 13C value for som3c for stable isotope labeling

dsomsc – delta 13C value for soil organic matter for stable isotope labeling

dsomtc – delta 13C value for total soil C for stable isotope labeling

dstruc(1) – delta 13C value for belowground structural surface C for stable isotope labeling

dstruc(2) – delta 13C value for belowground structural soil C for stable isotope labeling

egracc(1) – annual accumulator of N in grain + tuber production for grass/crop (sum of egrain(1)) (g N m^{-2} yr^{-1})

egracc(2) – annual accumulator of P in grain + tuber production for grass/crop (sum of egrain(2)) (g P m^{-2} yr^{-1})

egracc(3) – annual accumulator of S in grain + tuber production for grass/crop (sum of egrain(3)) (g S m^{-2} yr^{-1})

egrain(1) – economic yield of N in grain + tubers for grass/crop from the most recent harvest event (g N m^{-2} $harvest^{-1}$)

egrain(2) – economic yield of P in grain + tubers for grass/crop from the most recent harvest event (g P m^{-2} $harvest^{-1}$)

egrain(3) – economic yield of S in grain + tubers for grass/crop from the most recent harvest event (g S m^{-2} $harvest^{-1}$)

elimit – indicator of the limiting element

> = 1 if N is the limiting element
> = 2 if P is the limiting element
> = 3 if S is the limiting element

eprodc(1) – annual monthly N uptake for grass/crop (g N m^{-2} mo^{-1})

eprodc(2) – annual monthly P uptake for grass/crop (g P m^{-2} mo^{-1})

eprodc(3) – annual monthly S uptake for grass/crop (g S m^{-2} mo^{-1})

eprodf(1) – annual monthly N uptake in forest system (g N m^{-2} mo^{-1})

eprodf(2) – annual monthly P uptake in forest system (g P m^{-2} mo^{-1})

eprodf(3) – annual monthly S uptake in forest system (g S m^{-2} mo^{-1})

ereta(1) – annual accumulator of N returned to system during grazing/fire for grass/crop
(g N m^{-2} yr^{-1})

ereta(2) – annual accumulator of P returned to system during grazing/fire for grass/crop
(g P m^{-2} yr^{-1})

ereta(3) – annual accumulator of S returned to system during grazing/fire for grass/crop
(g S m^{-2} yr^{-1})

ermvst(1) – amount of N removed as straw during most recent harvest event for grass/crop
(g N m^{-2} $harvest^{-1}$)

ermvst(2) – amount of P removed as straw during most recent harvest event for grass/crop
(g P m^{-2} $harvest^{-1}$)

ermvst(3) – amount of S removed as straw during most recent harvest event for grass/crop
(g S m^{-2} $harvest^{-1}$)

esrsnk(1) – N source/sink (g N m^{-2})

esrsnk(2) – P source/sink (g P m^{-2})

esrsnk(3) – S source/sink (g S m^{-2})

eupacc(1) – growing season accumulator for N uptake by grass, crop or tree
(g N m^{-2} yr^{-1} $season^{-1}$)

eupacc(2) – growing season accumulator for P uptake by grass, crop or tree (g P m^{-2} yr^{-1} $season^{-1}$)

eupacc(3) – growing season accumulator for S uptake by grass, crop or tree (g S m^{-2} yr^{-1} $season^{-1}$)

eupaga(1) – aboveground growing season accumulator for N uptake by plants for grass/crop
(g N m^{-2} yr^{-1} $season^{-1}$)

eupaga(2) – aboveground growing season accumulator for P uptake by plants for grass/crop
(g P m^{-2} yr^{-1} $season^{-1}$)

eupaga(3) – aboveground growing season accumulator for S uptake by plants for grass/crop
(g S m^{-2} yr^{-1} $season^{-1}$)

eupbga(1) – belowground growing season accumulator for N uptake by plants for grass/crop
(g N m^{-2} yr^{-1} $season^{-1}$)

eupbga(2) – belowground growing season accumulator for P uptake by plants for grass/crop
(g P m^{-2} yr^{-1} $season^{-1}$)

eupbga(3) – belowground growing season accumulator for S uptake by plants for grass/crop
(g S m^{-2} yr^{-1} season^{-1})

eupprd(1) – N uptake by grass, crop, or tree over the last completed growing season
(g N m^{-2} yr^{-1})

eupprd(2) – P uptake by grass, crop, or tree over the last completed growing season (g P m^{-2} yr^{-1})

eupprd(3) – S uptake by grass, crop, or tree over the last completed growing season (g S m^{-2} yr^{-1})

eupprt(1,1) – growing season accumulator for N leaf uptake by forest component
(g N m^{-2} yr^{-1} season^{-1})

eupprt(1,2) – growing season accumulator for P leaf uptake by forest component
(g P m^{-2} yr^{-1} season^{-1})

eupprt(1,3) – growing season accumulator for S leaf uptake by forest component
(g S m^{-2} yr^{-1} season^{-1})

eupprt(2,1) – growing season accumulator for N fine root uptake by forest component
(g N m^{-2} yr^{-1} season^{-1})

eupprt(2,2) – growing season accumulator for P fine root uptake by forest component
(g P m^{-2} yr^{-1} season^{-1})

eupprt(2,3) – growing season accumulator for S fine root uptake by forest component
(g S m^{-2} yr^{-1} season^{-1})

eupprt(3,1) – growing season accumulator for N fine branch uptake by forest component
(g N m^{-2} yr^{-1} season^{-1})

eupprt(3,2) – growing season accumulator for P fine branch uptake by forest component
(g P m^{-2} yr^{-1} season^{-1})

eupprt(3,3) – growing season accumulator for S fine branch uptake by forest component
(g S m^{-2} yr^{-1} season^{-1})

eupprt(4,1) – growing season accumulator for N large wood uptake by forest component
(g N m^{-2} yr^{-1} season^{-1})

eupprt(4,2) – growing season accumulator for P large wood uptake by forest component
(g P m^{-2} yr^{-1} season^{-1})

eupprt(4,3) – growing season accumulator for S large wood uptake by forest component
(g S m^{-2} yr^{-1} season^{-1})

eupprt(5,1) – growing season accumulator for N coarse root uptake by forest component
(g N m^{-2} yr^{-1} season^{-1})

eupprt(5,2) – growing season accumulator for P coarse root uptake by forest component (g P m^{-2} yr^{-1} season^{-1})

eupprt(5,3) – growing season accumulator for S coarse root uptake by forest component (g S m^{-2} yr^{-1} season^{-1})

evap – monthly evaporation including bare soil evaporation, evaporation of precipitation intercepted by plant and litter biomass, and sublimation (cm mo^{-1})

fautoresp(1) – annual accumulator for unlabeled autotrophic respiration for forest system (g C m^{-2} yr^{-1})

fautoresp(2) – annual accumulator for labeled autotrophic respiration for forest system (g C m^{-2} yr^{-1})

fbracc – growing season accumulator for C production in forest system fine branch component (g C m^{-2} yr^{-1} season^{-1})

fbrchc – C in forest system fine branch component (g C m^{-2})

fbrche(1) – N in forest system fine branch component (g N m^{-2})

fbrche(2) – P in forest system fine branch component (g P m^{-2})

fbrche(3) – S in forest system fine branch component (g S m^{-2})

fbrcis(1) – unlabeled C in forest system fine branch component (g C m^{-2})

fbrcis(1) – labeled C in forest system fine branch component (g C m^{-2})

fbrprd – fine branch component C production for the forest system over the last completed growing season (g C m^{-2} yr^{-1})

fcacc – growing season accumulator for C production in forest system (g C m^{-2} yr^{-1} season^{-1})

fcmth(12) – forest system C production for the grass/crop for the current month, 1-12 (g C m^{-2})

fcprd – forest system C production over the last completed growing season (g C m^{-2} yr^{-1})

fertac(1) – annual accumulator for N fertilizer (g N m^{-2} yr^{-1})

fertac(2) – annual accumulator for P fertilizer (g P m^{-2} yr^{-1})

fertac(3) – annual accumulator for S fertilizer (g S m^{-2} yr^{-1})

fertot(1) – accumulator for N fertilizer

fertot(2) – accumulator for P fertilizer

fertot(3) – accumulator for S fertilizer

fertprd(1) – growing season accumulator for N fertilizer (g N m^{-2} yr^{-1} season^{-1})

fertprd(2) – growing season accumulator for P fertilizer (g P m^{-2} yr^{-1} season^{-1})

fertprd(3) – growing season accumulator for S fertilizer (g S m^{-2} yr^{-1} season^{-1})

fertmth(12,1) – N fertilizer added to the system for the month, 1-12 (g N m^{-2})

fertmth(12,2) – P fertilizer added to the system for the month, 1-12 (g P m^{-2})

fertmth(12,3) – S fertilizer added to the system for the month, 1-12 (g S m^{-2})

fgrspflux(1) – monthly growth respiration flux from live leaf material that is blown off from the carbohydrate storage pool (*carbostg(2,*)*) into the atmosphere (*csrsnk*) during plant carbon production (g C m^{-2})

fgrspflux(2) – monthly growth respiration flux from juvenile live fine root material that is blown off from the carbohydrate storage pool (*carbostg(2,*)*) into the atmosphere (*csrsnk*) during plant carbon production (g C m^{-2})

fgrspflux(3) – monthly growth respiration flux from live fine branch material that is blown off from the carbohydrate storage pool (*carbostg(2,*)*) into the atmosphere (*csrsnk*) during plant carbon production (g C m^{-2})

fgrspflux(4) – monthly growth respiration flux from live large wood material that is blown off from the carbohydrate storage pool (*carbostg(2,*)*) into the atmosphere (*csrsnk*) during plant carbon production (g C m^{-2})

fgrspflux(5) – monthly growth respiration flux from live coarse root material that is blown off from the carbohydrate storage pool (*carbostg(2,*)*) into the atmosphere (*csrsnk*) during plant carbon production (g C m^{-2})

fgrspflux(6) – monthly growth respiration flux from mature live fine root material that is blown off from the carbohydrate storage pool (*carbostg(2,*)*) into the atmosphere (*csrsnk*) during plant carbon production (g C m^{-2})

fmrspflux(1) – amount of monthly maintenance respiration flux from live leaf material that flows from the tree maintenance respiration storage pool (*carbostg(2,*)*) to the C source/sink pool (*csrsnk*) (g C m^{-2})

fmrspflux(2) – amount of monthly maintenance respiration flux from juvenile live fine root material that flows from the tree maintenance respiration storage pool (*carbostg(2,*)*) to the C source/sink pool (*csrsnk*) (g C m^{-2})

fmrspflux(3) – amount of monthly maintenance respiration flux from live fine branch material that flows from the tree maintenance respiration storage pool (*carbostg(2,*)*) to the C source/sink pool (*csrsnk*) (g C m^{-2})

fmrspflux(4) – amount of monthly maintenance respiration flux from live large wood material that flows from the tree maintenance respiration storage pool (*carbostg(2,*)*) to the C source/sink pool (*csrsnk*) (g C m^{-2})

fmrspflux(5) – amount of monthly maintenance respiration flux from live coarse root material that flows from the tree maintenance respiration storage pool (*carbostg(2,*)*) to the C source/sink pool (*csrsnk*) (g C m^{-2})

fmrspflux(6) – amount of monthly maintenance respiration flux from mature live fine root material that flows from the tree maintenance respiration storage pool (*carbostg(2,*)*) to the C source/sink pool (*csrsnk*) (g C m^{-2})

forstg(1) – retranslocation N storage pool for forest

forstg(2) – retranslocation P storage pool for forest

forstg(3) – retranslocation S storage pool for forest

frootcj – C in forest system juvenile fine root component (g C m^{-2}) (replaces *frootc*)

frootcm – C in forest system mature fine root component (g C m^{-2}) (replaces *frootc*)

frootej(1) – N in forest system juvenile fine root component (g N m^{-2}) (replaces *froote(1)*)

frootej(2) – P in forest system juvenile fine root component (g P m^{-2}) (replaces *froote(2)*)

frootej(3) – S in forest system juvenile fine root component (g S m^{-2}) (replaces *froote(3)*)

frootem(1) – N in forest system mature fine root component (g N m^{-2}) (replaces *froote(1)*)

frootem(2) – P in forest system mature fine root component (g P m^{-2}) (replaces *froote(2)*)

frootem(3) – S in forest system mature fine root component (g S m^{-2}) (replaces *froote(3)*)

frstc – sum of C in forest system live components (g C m^{-2}) (rleavc + frootc + fbrchc + rlwodc + crootc)

frste(1) – sum of N in forest system live components (g N m^{-2}) (rleave(N) + froote(N) + fbrche(N) + rlwode(N) + croote(N))

frste(2) – sum of P in forest system live components (g P m^{-2}) (rleave(P) + froote(P) + fbrche(P) + rlwode(P) + croote(P))

frste(3) – sum of S in forest system live components (g S m^{-2}) (rleave(S) + froote(S) + fbrche(S) + rlwode(S) + croote(S))

frtjacc – growing season accumulator for C production in forest system juvenile fine root component (TFST-TLST) (g C m^{-2} yr^{-1} season^{-1}) (replaces *frtacc*)

frtmacc – growing season accumulator for C production in forest system mature fine root component (TFST-TLST) (g C m^{-2} yr^{-1} season^{-1}) (replaces *frtacc*)

frtcisj(1) – unlabeled C in forest system juvenile fine root component (g C m^{-2}) (replaces *frtcis(1)*)

frtcisj(2) – labeled C in forest system juvenile fine root component (g C m^{-2}) (replaces *frtcis(2)*)

frtcism(1) – unlabeled C in forest system mature fine root component (g C m^{-2}) (replaces *frtcis(1)*)

frtcism(2) – labeled C in forest system mature fine root component (g C m^{-2}) (replaces *frtcis(2)*)

frtjprd – juvenile fine root component C production for the forest system over the last completed growing season (g C m^{-2} yr^{-1}) (replaces *frtprd*)

frtmprd – mature fine root component C production for the forest system over the last completed growing season (g C m^{-2} yr^{-1}) (replaces *frtprd*)

fsysc – total C in forest system i.e. sum of soil organic matter, trees, dead wood, forest litter

fsyse(1) – total N in forest system i.e. sum of soil organic matter, trees, dead wood, forest litter

fsyse(2) – total P in forest system i.e. sum of soil organic matter, trees, dead wood, forest litter

fsyse(3) – total S in forest system i.e. sum of soil organic matter, trees, dead wood, forest litter

gromin(1) – gross mineralization of N (g N m^{-2} mo^{-1})

gromin(2) – gross mineralization of P (g P m^{-2} mo^{-1})

gromin(3) – gross mineralization of S (g S m^{-2} mo^{-1})

grspann(1) – total annual growth respiration for grass/crop system (g C m^{-2} yr^{-1})

grspann(2) – total annual growth respiration for forest system (g C m^{-2} yr^{-1})

grspflux(1) – growth respiration flow from the carbohydrate storage pool (*carbostg(1,*)*) for the grass/crop system (g C m^{-2})

grspflux(2) – growth respiration flow from the carbohydrate storage pool (*carbostg(2,*)*) for the forest system (g C m^{-2})

grspmth(1) – total monthly growth respiration for grass/crop system (g C m^{-2} yr^{-1})

grspmth(2) – total monthly growth respiration for forest system (g C m^{-2} yr^{-1})

harmth – = 0 in non-harvest months
        = 1 in a harvest month

hi – harvest index (cgrain/aglivc at harvest) for grass/crop

irract – actual amount of irrigation (cm H$_2$O mo^{-1})

irrtot – accumulator for irrigation (cm H$_2$O)

lhzcac – accumulator for C inputs to 0-20 cm layer from the lower horizon pools associated with soil erosion (g C m^{-2})

lhzeac(1) – accumulator for N inputs to 0-20 cm layer from the lower horizon pools associated with soil erosion (g N m^{-2})

lhzeac(2) – accumulator for P inputs to 0-20 cm layer from the lower horizon pools associated with soil erosion (g P m^{-2})

lhzeac(3) – accumulator for S inputs to 0-20 cm layer from the lower horizon pools associated with soil erosion (g S m^{-2})

metabc(1) – total C in metabolic surface litter (g C m^{-2})

metabc(2) – total C in metabolic soil litter (g C m^{-2})

metabe(1,1) – total N in metabolic surface litter (g N m^{-2})

metabe(1,2) – total P in metabolic surface litter (g P m^{-2})

metabe(1,3) – total S in metabolic surface litter (g S m^{-2})

metabe(2,1) – total N in metabolic soil litter (g N m^{-2})

metabe(2,2) – total P in metabolic soil litter (g P m^{-2})

metabe(2,3) – total S in metabolic soil litter (g S m^{-2})

metcis(1,1) – unlabeled C in metabolic surface litter (g C m^{-2})

metcis(1,2) – labeled C in metabolic surface litter (g C m^{-2})

metcis(2,1) – unlabeled C in metabolic soil litter (g C m^{-2})

metcis(2,2) – labeled C in metabolic soil litter (g C m^{-2})

metmnr(1,1) – net mineralization for N for surface metabolic litter (g N m^{-2} mo^{-1})

metmnr(1,2) – net mineralization for P for surface metabolic litter (g P m^{-2} mo^{-1})

metmnr(1,3) – net mineralization for S for surface metabolic litter (g S m^{-2} mo^{-1})

metmnr(2,1) – net mineralization for N for soil metabolic litter (g N m^{-2} mo^{-1})

metmnr(2,2) – net mineralization for P for soil metabolic litter (g P m^{-2} mo^{-1})

metmnr(2,3) – net mineralization for S for soil metabolic litter (g S m^{-2} mo^{-1})

minerl(1,1) – mineral N content for layer 1 (g N m^{-2})

minerl(2,1) – mineral N content for layer 2 (g N m^{-2})

minerl(3,1) – mineral N content for layer 3 (g N m^{-2})

minerl(4,1) – mineral N content for layer 4 (g N m^{-2})

minerl(5,1) – mineral N content for layer 5 (g N m^{-2})

minerl(6,1) – mineral N content for layer 6 (g N m^{-2})

minerl(7,1) – mineral N content for layer 7 (g N m^{-2})

minerl(8,1) – mineral N content for layer 8 (g N m^{-2})

minerl(9,1) – mineral N content for layer 9 (g N m^{-2})

minerl(10,1) – mineral N content for layer 10 (g N m^{-2})

minerl(1,2) – mineral P content for layer 1 (g P m^{-2})

minerl(2,2) – mineral P content for layer 2 (g P m^{-2})

minerl(3,2) – mineral P content for layer 3 (g P m^{-2})

minerl(4,2) – mineral P content for layer 4 (g P m^{-2})

minerl(5,2) – mineral P content for layer 5 (g P m^{-2})

minerl(6,2) – mineral P content for layer 6 (g P m^{-2})

minerl(7,2) – mineral P content for layer 7 (g P m^{-2})

minerl(8,2) – mineral P content for layer 8 (g P m^{-2})

minerl(9,2) – mineral P content for layer 9 (g P m^{-2})

minerl(10,2) – mineral P content for layer 10 (g P m^{-2})

minerl(1,3) – mineral S content for layer 1 (g S m^{-2})

minerl(2,3) – mineral S content for layer 2 (g S m^{-2})

minerl(3,3) – mineral S content for layer 3 (g S m^{-2})

minerl(4,3) – mineral S content for layer 4 (g S m^{-2})

minerl(5,3) – mineral S content for layer 5 (g S m^{-2})

minerl(6,3) – mineral S content for layer 6 (g S m^{-2})

minerl(7,3) – mineral S content for layer 7 (g S m^{-2})

minerl(8,3) – mineral S content for layer 8 (g S m^{-2})

minerl(9,3) – mineral S content for layer 9 (g S m^{-2})

minerl(10,3) – mineral S content for later 10 (g S m^{-2})

mrspann(1) – total annual maintenance respiration for grass/crop system (g C m^{-2} yr^{-1})

mrspann(2) – total annual maintenance respiration for forest system (g C m^{-2} yr^{-1})

mrspflux(1) – maintenance respiration flow to storage pool from grass/crop system (g C m^{-2})

mrspflux(2) – maintenance respiration flow to storage pool from forest system (g C m^{-2})

mrspmth(1) – total monthly maintenance respiration for grass/crop system (g C m^{-2} yr^{-1})

mrspmth(2) – total monthly maintenance respiration for forest system (g C m^{-2} yr^{-1})

mt1c2(1) – total monthly unlabeled surface CO_2 loss due to microbial respiration during litter decomposition (g C m^{-2} mo^{-1})

mt1c2(2) – total monthly labeled surface CO_2 loss due to microbial respiration during litter decomposition (g C m^{-2} mo^{-1})

mt2c2(1) – total monthly unlabeled soil CO_2 loss due to respiration (g C m^{-2} mo^{-1})

mt2c2(2) – total monthly labeled soil CO_2 loss due to respiration (g C m^{-2} mo^{-1})

nfix – amount of symbiotic N fixation (g N m^{-2} yr^{-1})

nfixac – accumulator for amount of symbiotic N fixation (g N m^{-2} yr^{-1})

n2oacc – growing season accumulator for N$_2$O flux, reset to 0.0 on LAST event (g N m^{-2} yr^{-1})

n2oprd – N$_2$O flux over the last completed growing season (g N m^{-2} yr^{-1} season^{-1})

n2omth(12) – monthly accumulator of N$_2$O flux for the current month, 1-12 (g N m^{-2})

occlud – occluded P (g P m^{-2})

omadac – annual accumulator of C added to system through organic matter addition events
(g C m^{-2} yr^{-1})

omadae(1) – annual accumulator of N added to system through organic matter addition events
(g N m^{-2} yr^{-1})

omadae(2) – annual accumulator of P added to system through organic matter addition events
(g P m^{-2} yr^{-1})

omadae(3) – annual accumulator of S added to system through organic matter addition events
(g P m^{-2} yr^{-1})

omadmte(12,1) – N added to the system through organic matter addition events for the month,
1-12 (g N m^{-2})

omadmte(12,2) – P added to the system through organic matter addition events for the month,
1-12 (g P m^{-2})

omadmte(12,3) – S added to the system through organic matter addition events for the month,
1-12 (g S m^{-2})

omadmth(12) – C added to the system through organic matter addition events for the month, 1-
12 (g C m^{-2})

omadprd – growing season accumulator of C added to system through organic matter addition
events (g C m^{-2} yr^{-1} season^{-1})

omadpre(1) – growing season accumulator of N added to system through organic matter
addition events (g N m^{-2} yr^{-1} season^{-1})

omadpre(2) – growing season accumulator of P added to system through organic matter
addition events (g P m^{-2} yr^{-1} season^{-1})

omadpre(3) – growing season accumulator of S added to system through organic matter
addition events (g S m^{-2} yr^{-1} season^{-1})

omadtot – annual accumulator for C added to the system through organic matter addition
events (g C m^{-2} yr^{-1})

omaetot(1) – annual accumulator for N added to the system through organic matter addition events (g N m^{-2} yr^{-1})

omaetot(2) – annual accumulator for P added to the system through organic matter addition events (g P m^{-2} yr^{-1})

omaetot(3) – annual accumulator for S added to the system through organic matter addition events (g S m^{-2} yr^{-1})

parent(1) – parent material N (g N m^{-2})

parent(2) – parent material P (g P m^{-2})

parent(3) – parent material S (g S m^{-2})

pet – monthly potential evapotranspiration (cm mo^{-1})

petann – annual potential evapotranspiration (sum of monthly pet) (cm yr^{-1})

plabil – sum of labile phosphate in all layers (g P m^{-2})

prcann – annual precipitation computed as the sum of site.100 file PRECIP(*) values after precipitation scalars are applied (cm yr^{-1})

prcfal – fallow period precipitation; the amount of rain which falls during the months after harvest until the month before the next planting (cm)

ptagc – growing season accumulator for potential aboveground C production for grass/crop (g C m^{-2} yr^{-1} season^{-1})

ptbgc – growing season accumulator for potential belowground C production for grass/crop (g C m^{-2} yr^{-1} season^{-1})

pttr – potential transpiration water loss for the month (cm mo^{-1})

rain – monthly precipitation (including rainfall and snowfall) (cm mo^{-1})

relyld – relative yield for grass, crop, or tree production

resp(1) – annual unlabeled CO_2 respiration from decomposition (g C m^{-2}). For DayCent UV versions, resp(1) also includes unlabeled abiotic CO_2 loss from UV degradation of standing dead biomass and surface litter (st1uvc2(1) + stduvc2(1)).

resp(2) – annual labeled CO_2 respiration from decomposition (g C m^{-2}). For DayCent UV versions, resp(2) also includes labeled abiotic CO_2 loss from UV degradation of standing dead biomass and surface litter (st1uvc2(2) + stduvc2(2).

respmth(1) – total monthly unlabeled CO_2 respiration from decomposition (g C m^{-2}). For DayCent UV versions, respmth(1) also includes unlabeled abiotic CO_2 loss from UV degradation of standing dead biomass and surface litter.

respmth(2) – total monthly labeled CO_2 respiration from decomposition (g C m^{-2}). For DayCent UV versions, respmth(2) also includes unlabeled abiotic CO_2 loss from UV degradation of standing dead biomass and surface litter.

rleavc – C in forest system leaf component (g C m^{-2})

rleave(1) – N in forest system leaf component (g N m^{-2})

rleave(2) – P in forest system leaf component (g P m^{-2})

rleave(3) – S in forest system leaf component (g S m^{-2})

rlvacc – growing season accumulator for C production in forest system live leaves (g C m^{-2} yr^{-1} season^{-1})

rlvcis(1) – unlabeled C in forest system large wood component (g C m^{-2})

rlvcis(2) – labeled C in forest system large wood component (g C m^{-2})

rlvprd – leaf component C production for the forest system over the last completed growing season (g C m^{-2} yr^{-1})

rlwacc – growing season accumulator for C production in forest system large wood component (g C m^{-2} yr^{-1} season^{-1})

rlwcis(1) – unlabeled C in forest system large wood component (g C m^{-2})

rlwcis(2) – labeled C in forest system large wood component (g C m^{-2})

rlwodc – C in forest system large wood component (g C m^{-2})

rlwode(1) – N in forest system large wood component (g N m^{-2})

rlwode(2) – P in forest system large wood component (g P m^{-2})

rlwode(3) – S in forest system large wood component (g S m^{-2})

rlwprd – large wood component C production for the forest system over the last completed growing season (g C m^{-2} yr^{-1})

rnpml1 – mineral N/P ratio used to control soil N-fixation using a regression equation based on Kansas data

runoff – monthly runoff (cm H_2O mo^{-1})

rwcf(1) – relative water content fraction for layer 1 (0.0 – 1.0, 1.0=field capacity)

rwcf(2) – relative water content fraction for layer 2 (0.0 – 1.0, 1.0=field capacity)

rwcf(3) – relative water content fraction for layer 3 (0.0 – 1.0, 1.0=field capacity)

rwcf(4) – relative water content fraction for layer 4 (0.0 – 1.0, 1.0=field capacity)

rwcf(5) – relative water content fraction for layer 5 (0.0 – 1.0, 1.0=field capacity)

rwcf(6) – relative water content fraction for layer 6 (0.0 – 1.0, 1.0=field capacity)

rwcf(7) – relative water content fraction for layer 7 (0.0 – 1.0, 1.0=field capacity)

rwcf(8) – relative water content fraction for layer 8 (0.0 – 1.0, 1.0=field capacity)

rwcf(9) – relative water content fraction for layer 9 (0.0 – 1.0, 1.0=field capacity)

rwcf(10) – relative water content fraction for layer 10 (0.0 – 1.0, 1.0=field capacity)

s1mnr(1,1) – net mineralization for surface active pool *som1e*(1,1) (g N m^{-2} mo^{-1})

s1mnr(1,2) – net mineralization for surface active pool *som1e*(1,2) (g P m^{-2} mo^{-1})

s1mnr(1,3) – net mineralization for surface active pool *som1e*(1,3) (g S m^{-2} mo^{-1})

s1mnr(2,1) – net mineralization for soil active pool *som1e*(2,1) (g N m^{-2} mo^{-1})

s1mnr(2,2) – net mineralization for soil active pool *som1e*(2,1) (g P m^{-2} mo^{-1})

s1nmr(2,3) – net mineralization for soil active pool *som1e*(2,1) (g S m^{-2} mo^{-1})

s2mnr(1,1) – net mineralization for N for surface slow pool *som2e*(1,1) (g N m^{-2} mo^{-1})

s2mnr(1,2) – net mineralization for P for surface slow pool *som2e*(1,2) (g P m^{-2} mo^{-1})

s2mnr(1,3) – net mineralization for S for surface slow pool *som2e*(1,3) (g S m^{-2} mo^{-1})

s2mnr(2,1) – net mineralization for N for soil slow pool *som2e*(2,1) (replaces *s2mnr(1)*)
    (g N m^{-2} mo^{-1})

s2mnr(2,2) – net mineralization for P for soil slow pool *som2e*(2,2) (replaces *s2mnr(2)*)
    (g P m^{-2} mo^{-1})

s2mnr(2,3) – net mineralization for S for soil slow pool *som2e*(2,3) (replaces *s2mnr(2)*)
    (g S m^{-2} mo^{-1})

s3mnr(1) – net mineralization for N for passive pool *som3e*(1) (g N m^{-2} mo^{-1})

s3mnr(2) – net mineralization for P for passive pool *som3e*(2) (g P m^{-2} mo^{-1})

s3mnr(3) – net mineralization for S for passive pool *som3e*(3) (g S m^{-2} mo^{-1})

s11c2(1) – total monthly unlabeled CO_2 loss due to microbial respiration during soil organic matter decomposition of soil som1 to som2 and som3 (g C m^{-2} mo^{-1})

s11c2(2) – total monthly labeled CO_2 loss due to microbial respiration during soil organic matter decomposition of soil som1 to som2 and som3 (g C m^{-2} mo^{-1})

s12c2(1) – total monthly unlabeled CO_2 loss due to microbial respiration during soil organic matter decomposition of soil som1 to som2 and som3 (replaces *s21c2(1)*) (g C m^{-2} mo^{-1})

s12c2(2) – total monthly labeled CO_2 loss due to microbial respiration during soil organic matter decomposition of soil som1 to som2 and som3 (replaces *s21c2(1)*) (g C m^{-2} mo^{-1})

s21c2(1) – total monthly unlabeled CO_2 loss due to microbial respiration during soil organic matter decomposition of surface som2 to surface som1 (g C m^{-2} mo^{-1}))

s21c2(2) – total monthly labeled CO_2 loss due to microbial respiration during soil organic matter decomposition of surface som2 to surface som1 (g C m^{-2} mo^{-1})

s22c2(1) – total monthly unlabeled CO_2 loss due to microbial respiration during soil organic matter decomposition of soil som2 to soil som1 and som3 (g C m^{-2} mo^{-1})

s22c2(2) – total monthly labeled CO_2 loss due to microbial respiration during soil organic matter decomposition of soil som2 to soil som1 and som3 (g C m^{-2} mo^{-1})

s3c2(1) – total monthly unlabeled CO_2 loss due to microbial respiration during soil organic matter decomposition of som3 to soil som1 (g C m^{-2} mo^{-1})

s3c2(2) – total monthly labeled CO_2 loss due to microbial respiration during soil organic matter decomposition of som3 to soil som1 (g C m^{-2} mo^{-1})

satmac – accumulator for atmospheric S deposition (g S m^{-2})

sclosa – accumulated C lost from soil organic matter by erosion (total C for entire simulation) (g C m^{-2})

scloss – total C loss from soil organic matter by erosion for current month (g C m^{-2})

sdrema – annual accumulator of C removed from standing dead during grazing/fire for grass/crop (g C m^{-2} yr^{-1})

sdrmae(1) – annual accumulator of N removed from standing dead during grazing/fire for grass/crop (g N m^{-2} yr^{-1})

sdrmae(2) – annual accumulator of P removed from standing dead during grazing/fire for grass/crop (g P m^{-2} yr^{-1})

sdrmae(3) – annual accumulator of S removed from standing dead during grazing/fire for grass/crop (g S m^{-2} yr^{-1})

sdrmai(1) – annual accumulator of unlabeled C removed from standing dead during grazing/fire for grass/crop (g C m^{-2} yr^{-1})

sdrmai(2) – annual accumulator of labeled C removed from standing dead during grazing/fire for grass/crop (g C m^{-2} yr^{-1})

secndy(1) – secondary mineral N (g N m^{-2})

secndy(2) – slowly sorbed P (g P m^{-2})

secndy(3) – secondary mineral S (g S m^{-2})

shrema – annual accumulator of C removed from live shoots during grazing/fire for grass/crop (g C m^{-2} yr^{-1})

shrmae(1) – annual accumulator of N removed from live shoots during grazing/fire for grass/crop (g N m^{-2} yr^{-1})

shrmae(2) – annual accumulator of P removed from live shoots during grazing/fire for grass/crop (g P m^{-2} yr^{-1})

shrmae(3) – annual accumulator of S removed from live shoots during grazing/fire for grass/crop (g S m^{-2} yr^{-1})

shrmai(1) – annual accumulator of unlabeled C removed from live shoots during grazing/fire for grass/crop (g C m^{-2} yr^{-1})

shrmai(2) – annual accumulator of labeled C removed from live shoots during grazing/fire for grass/crop (g C m^{-2} yr^{-1})

sirrac – accumulator for irrigation S inputs (g S m^{-2})

snfxac(1) – annual grass/crop accumulator for symbiotic N fixation

snfxac(2) – annual forest accumulator for symbiotic N fixation

snlq – liquid water in snowpack (cm)

snow – snowpack water content (cm H$_2$O)

soilnm(1) – annual accumulator for net mineralization of N in soil compartments (soil organic matter + belowground litter + dead coarse roots) (g N m^{-2} yr^{-1})

soilnm(2) – annual accumulator for net mineralization of P in soil compartments (soil organic matter + belowground litter + dead coarse roots) (g P m^{-2} yr^{-1})

soilnm(3) – annual accumulator for net mineralization of S in soil compartments (soil organic matter + belowground litter + dead coarse roots) (g S m^{-2} yr^{-1})

som1c(1) – total C in active surface organic matter pool (g C m^{-2})

som1c(2) – total C in active soil organic matter pool (g C m^{-2})

som1ci(1,1) – unlabeled C in active surface organic matter pool (g C m^{-2})

som1ci(1,2) – labeled C in active surface organic matter pool (g C m^{-2})

som1ci(2,1) – unlabeled C in active soil organic matter pool (g C m^{-2})

som1ci(2,2) – labeled C in active soil organic matter pool (g C m^{-2})

som1e(1,1) – total N in active surface organic matter pool (g N m^{-2})

som1e(1,2) – total P in active surface organic matter pool (g P m^{-2})

som1e(1,3) – total S in active surface organic matter pool (g S m^{-2})

som1e(2,1) – total N in active soil organic matter pool (g N m^{-2})

som1e(2,2) – total P in active soil organic matter pool (g P m^{-2})

som1e(2,3) – total S in active soil organic matter pool (g S m^{-2})

som2c(1) – total C in slow surface organic matter pool (g C m^{-2})

som2c(2) – total C in slow soil organic matter pool (g C m^{-2})

som2ci(1,1) – unlabeled C in slow surface organic matter pool (g C m^{-2})

som2ci(1,2) – labeled C in slow surface organic matter pool (g C m^{-2})

som2ci(2,1) – unlabeled C in slow soil organic matter pool (g C m^{-2})

som2ci(2,2) – labeled C in slow soil organic matter pool (g C m^{-2})

som2e(1,1) – total N in slow surface organic matter pool (g N m^{-2})

som2e(1,2) – total P in slow surface organic matter pool (g P m^{-2})

som2e(1,3) – total S in slow surface organic matter pool (g S m^{-2})

som2e(2,1) – total N in slow soil organic matter pool (g N m^{-2})

som2e(2,2) – total P in slow soil organic matter pool (g P m^{-2})

som2e(2,3) – total S in slow soil organic matter pool (g S m^{-2})

som3c – total C in passive soil organic matter pool (g C m^{-2})

som3ci(1) – unlabeled C in passive soil organic matter pool (g C m^{-2})

som3ci(2) – labeled C in passive soil organic matter pool (g C m^{-2})

som3e(1) – total N in passive soil organic matter pool (g N m^{-2})

som3e(2) – total P in passive soil organic matter pool (g P m^{-2})

som3e(3) – total S in passive soil organic matter pool (g S m^{-2})

somsc – sum of labeled and unlabeled C from som1c(2), som2c(2), and som3c (g C m^{-2})

somsci(1) – sum of unlabeled C in som1c(2,1), som2c(2,1), som3c (g C m^{-2})

somsci(2) – sum of labeled C in som1ci(2,2), som2ci(2,2), som3ci(2) (g C m^{-2})

somse(1) – sum of N in som1e(2,1), som2e(2,1), and som3e(1) (g N m^{-2})

somse(2) – sum of P in som1e(2,2), som2e(2,2), and som3e(2) (g P m^{-2})

somse(3) – sum of S in som1e(2,3), som2e(2,3), and som3e(3) (g S m^{-2})

somtc – total soil C including belowground structural and metabolic: somsc + strucc(2) + metabc(2) (g C m^{-2})

somtci(1) – total unlabeled C in soil including belowground structural + metabolic: somsci(1) + strcis(2,1) + metcis(2,1) (g C m^{-2})

somtci(2) – total labeled C in soil including belowground structural + metabolic: somsci(2) + strcis(2,2) + metcis(2,2) (g C m^{-2})

somte(1) – total N in soil organic matter including belowground structural + metabolic: somse(1) + struce(2,1) + metabe(2,1) (g N m^{-2})

somte(2) – total P in soil organic matter including belowground structural + metabolic: somse(2) + struce(2,2) + metabe(2,2) (g P m^{-2})

somte(3) – total S in soil organic matter including belowground structural + metabolic: somse(3) + struce(2,3) + metabe(2,3) (g S m^{-2})

srspann(1) – total annual soil respiration for grass/crop system (sum of maintenance and growth respiration for fine roots) (g C m^{-2})

srspann(2) – total annual soil respiration for forest system (sum of maintenance and growth respiration for fine and coarse roots) (g C m^{-2})

srspmth(1) – total monthly soil respiration for grass/crop system (sum of maintenance and growth respiration for fine roots) (g C m^{-2})

srspmth(2) – total monthly soil respiration for forest system (sum of maintenance and growth respiration for fine and coarse roots) (g C m^{-2})

st1c2(1) – total monthly unlabeled CO_2 loss due to microbial respiration during litter decomposition of surface structural into som1 and som2 (g C m^{-2} mo^{-1})

st1c2(2) – total monthly labeled CO_2 loss due to microbial respiration during litter decomposition of surface structural into som1 and som2 (g C m^{-2} mo^{-1})

st2c2(1) – total monthly unlabeled CO_2 loss due to microbial respiration during litter decomposition of soil structural into som1 and som2 (g C m^{-2} mo^{-1})

st2c2(2) – total monthly labeled CO_2 loss due to microbial respiration during litter decomposition of soil structural into som1 and som2 (g C m^{-2} mo^{-1})

stdcis(1) – unlabeled C in standing dead for grass/crop (g C m^{-2})

stdcis(2) – labeled C in standing dead for grass/crop (g C m^{-2})

stdedc – C in standing dead material for grass/crop (g C m^{-2})

stdede(1) – N in standing dead for grass/crop (g N m^{-2})

stdede(2) – P in standing dead for grass/crop (g P m^{-2})

stdede(3) – S in standing dead for grass/crop (g S m^{-2})

st1uvc2(1) - For DayCent UV versions this is unlabeled abiotic CO_2 loss from UV degradation of surface litter (g C m^{-2} mo^{-1})

st1uvc2(2) - For DayCent UV versions this is labeled abiotic CO_2 loss from UV degradation of surface litter (g C m^{-2} mo^{-1})

stduvc2(1) - For DayCent UV versions this is unlabeled abiotic CO_2 loss from UV degradation of standing dead biomass (g C m^{-2} mo^{-1})

stduvc2(2) - For DayCent UV versions this is labeled abiotic CO_2 loss from UV degradation of standing dead biomass (g C m^{-2} mo^{-1})

stemp – average soil temperature (°C)

strcis(1,1) – unlabeled C in structural surface litter (g C m^{-2})

strcis(1,2) – labeled C in structural surface litter (g C m^{-2})

strcis(2,1) – unlabeled C in structural soil litter (g C m^{-2})

strcis(2,2) – labeled C in structural soil litter (g C m^{-2})

stream(1) – stream flow (base flow + runoff) (cm H$_2$O mo^{-1})

stream(2) – mineral N leached out of the bottom of the soil profile into stream flow
(g N m^{-2} mo^{-1})

stream(3) – mineral P leached out of the bottom of the soil profile into stream flow
(g P m^{-2} mo^{-1})

stream(4) – mineral S leached out of the bottom of the soil profile into stream flow
(g S m^{-2} mo^{-1})

stream(5) – organic C leached out of the soil organic layer into stream flow (g C m^{-2} mo^{-1})

stream(6) – organic N leached out of the soil organic layer into stream flow (g N m^{-2} mo^{-1})

stream(7) – organic P leached out of the soil organic layer into stream flow (g P m^{-2} mo^{-1})

stream(8) – organic S leached out of the soil organic layer into stream flow (g S m^{-2} mo^{-1})

strlig(1) – lignin content of surface structural residue (g lignin / g C of structural residue)

strlig(2) – lignin content of soil structural reside (g lignin / g C of structural residue)

strmac(1) – annual accumulator for stream(1), stream flow (base flow + runoff) (cm H$_2$O yr^{-1})

strmac(2) – annual accumulator for stream(2), mineral N leached out of the bottom of the soil
profile into stream flow (g N m^{-2} yr^{-1})

strmac(3) – annual accumulator for stream(3), mineral P leached out of the bottom of the soil
profile into stream flow (g P m^{-2} yr^{-1})

strmac(4) – annual accumulator for stream(4), mineral S leached out of the bottom of the soil
profile into stream flow (g S m^{-2} yr^{-1})

strmac(5) – annual accumulator for stream(5), organic C leached out of the soil organic layer
into stream flow (g C m^{-2} yr^{-1})

strmac(6) – annual accumulator for stream(6), organic N leached out of the soil organic layer into stream flow (g N m^{-2} yr^{-1})

strmac(7) – annual accumulator for stream(7), organic P leached out of the soil organic layer into stream flow (g P m^{-2} yr^{-1})

strmac(8) – annual accumulator for stream(8), organic S leached out of the soil organic layer into stream flow (g S m^{-2} yr^{-1})

strmnr(1,1) – net mineralization for surface N for structural litter (g N m^{-2} mo^{-1})

strmnr(1,2) – net mineralization for surface P for structural litter (g P m^{-2} mo^{-1})

strmnr(1,3) – net mineralization for surface S for structural litter (g S m^{-2} mo^{-1})

strmnr(2,1) – net mineralization for soil N for structural litter (g N m^{-2} mo^{-1})

strmnr(2,2) – net mineralization for soil P for structural litter (g P m^{-2} mo^{-1})

strmnr(2,3) – net mineralization for soil S for structural litter (g S m^{-2} mo^{-1})

strucc(1) – total C in structural surface litter (g C m^{-2})

strucc(2) – total C in structural soil litter (g C m^{-2})

struce(1,1) – total N in surface structural litter (g N m^{-2})

struce(1,2) – total P in surface structural litter (g P m^{-2})

struce(1,3) – total S in surface structural litter (g S m^{-2})

struce(2,1) – total N in soil structural litter (g N m^{-2})

struce(2,2) – total P in soil structural litter (g P m^{-2})

struce(2,3) – total S in soil structural litter (g S m^{-2})

sumnrs(1) – annual accumulator for net mineralization of N from all compartments except structural and wood (g N m^{-2} yr^{-1})

sumnrs(2) – annual accumulator for net mineralization of P from all compartments except structural and wood (g P m^{-2} yr^{-1})

sumnrs(3) – annual accumulator for net mineralization of S from all compartments except structural and wood (g S m^{-2} yr^{-1})

sumrsp – monthly maintenance respiration in the forest system (g C m^{-2})

tave – average air temperature (° C)

tcerat(1) – total C/N ratio in soil organic matter including belowground structural + metabolic

tcerat(2) – total C/P ratio in soil organic matter including belowground structural + metabolic

tcerat(3) – total C/S ratio in soil organic matter including belowground structural + metabolic

tcnpro – total C/N ration for grass, crop, or tree production

tcrem – total C removed during forest removal events (g C m^{-2})

terem(1) – total N removed during forest removal events (g N m^{-2})

terem(2) – total P removed during forest removal events (g P m^{-2})

terem(3) – total S removed during forest removal events (g S m^{-2})

tgzrte(1) – total N returned in feces and urine from a grazing event (g N m^{-2})

tgzrte(2) – total P returned in feces and urine from a grazing event (g P m^{-2})

tgzrte(3) – total S returned in feces and urine from a grazing event (g S m^{-2})

tlittr(1,1) – unlabeled surface residue (*clittr(1,1)*) plus unlabeled surface som1c *(som1ci(1,1)*) and unlabeled surface som2c (*som2ci(1,1)*) (g C m^{-2})

tlittr(1,2) – labeled surface residue (*clittr(1,2)*) plus labeled surface som1c (*som1ci(1,2)*) and labeled surface som2c (*som2ci(1,2)*) (g C m^{-2})

tlittr(2,1) – unlabeled soil residue (*clittr(2,1)*) plus unlabeled soil som1c (*som1ci(2,1)*) and unlabeled soil som2c (*som2ci(2,1)*) (g C m^{-2})

tlittr(2,2) – labeled soil residue (*clittr(2,2)*) plus labeled soil som1c (*som1ci(2,2)*) and labeled soil som2c (*som2ci(2,2)*) (g C m^{-2})

tminrl(1) – total mineral N summed across layers (g N m^{-2})

tminrl(2) – total mineral P summed across layers (g P m^{-2})

tminrl(3) – total mineral S summed across laters (g S m^{-2})

tnetmn(1) – annual accumulator of net mineralization for N from all compartments (g N m^{-2} yr^{-1})

tnetmn(2) – annual accumulator of net mineralization for P from all compartments (g P m^{-2} yr^{-1})

tnetmn(3) – annual accumulator of net mineralization for S from all compartments (g S m^{-2} yr^{-1})

tomres(1) – total unlabeled C in soil, belowground, and aboveground litter

tomres(2) – total labeled C in soil, belowground, and aboveground litter

totalc – total C including source/sink (g C m^{-2})

totale(1) – total N including source/sink (g N m^{-2})

totale(2) – total P including source/sink (g P m^{-2})

totale(3) – total S including source/sink (g S m^{-2})

totc – minimum annual total non-living C (g C m^{-2}), where total is:
  som1c(SOIL) + som1c(SRFC) + som2c + som3c + strucc(SOIL) + strucc(SRFC) +
  metabc(SOIL) + metabc(SRFC)

totsysc – total system C *(aglivc + bglivcj + bglivcm + stdedc + strucc(1) + strucc(2) + metabc(1) +*
  metabc(2) + rleavc + frootcj + frootcm + fbrchc + rlwodc + crootc + wood1c + wood2c +
  wood3c + som1c(1) + som1c(2) + som2c(1) + som2c(2) + som3c) (g C m^{-2})

totsyse(1) – total N in system (*aglive(1) + bglivej(1) + bglivem(1) + stdede(1) + struce(1,1) +*
  struce(2,1) + metabe(1,1) + metabe(2,1) + rleave(1) + frootej(1) + frootem(1) + fbrche(1)
  + rlwode(1) + croote(1) + wood1e(1) + wood2e(1) + wood3e(1) + som1e(1,1) +
  som1e(2,1) + som2e(1,1) + som2e(2,1) + som3e(1) (g N m^{-2})

totsyse(2) – total P in system (*aglive(2) + bglivej(2) + bglivem(2) + stdede(2) + struce(1,2) +*
  struce(2,2) + metabe(1,2) + metabe(2,2) + rleave(2) + frootej(2) + frootem(2) + fbrche(2)
  + rlwode(2) + croote(2) + wood1e(2) + wood2e(2) + wood3e(2) + som1e(1,2) +
  som1e(2,2) + som2e(1,2) + som2e(2,2) + som3e(2) (g P m^{-2})

totsyse(3) – total S in system (*aglive(3) + bglivej(3) + bglivem(3) + stdede(3) + struce(1,3) +*
  struce(2,3) + metabe(1,3) + metabe(2,3) + rleave(3) + frootej(3) + frootem(3) + fbrche(3)
  + rlwode(3) + croote(3) + wood1e(3) + wood2e(3) + wood3e(3) + som1e(1,3) +
  som1e(2,3) + som2e(1,3) + som2e(2,3) + som3e(3) (g S m^{-2})

tran – monthly transpiration (cm mo^{-1})

voleac – annual accumulator for N volatilization as a function of N remaining after uptake by
  grass, crop, or tree (g N m^{-2} yr^{-1}). This output variable is no longer valid for DayCent. See
  year_summary.out for annual N-gas emissions from nitrification/denitrification.

volex – volatilization loss as a function of mineral N remaining after uptake by grass, crop, or
  tree (g N m^{-2} mo^{-1}). This output variable is no longer valid for DayCent. See tgmonth.out
  for monthly N-gas emissions from nitrification/denitrification.

volexa – accumulator for N volatilization as a function of N remaining after uptake by grass,
  crop, or tree (total N for entire simulation) (g N m^{-2}). This output variable is no longer

valid for DayCent. See year_summary.out for annual N-gas emissions from nitrification/denitrification.

volgac – annual accumulator for N volatilized as a function of gross mineralization (g N m^{-2} yr^{-1}). This output variable is no longer valid for DayCent. See year_summary.out for annual N-gas emissions from nitrification/denitrification.

volgm – volatilization loss of N as a function of gross mineralization (g N m^{-2} mo^{-1}). This output variable is no longer valid for DayCent. See tgmonth.out for monthly N-gas emissions from nitrification/denitrification.

volgma – accumulator for N volatilized as a function of gross mineralization (g N m^{-2}) (total N for entire simulation). This output variable is no longer valid for DayCent. See year_summary.out for annual N-gas emissions from nitrification/denitrification.

volpac – annual accumulator for N volatilized from plants at harvest, senescence, and/or from grazing removal for grass/crop (g N m^{-2} yr^{-1})

volpl – volatilization of N from plants during at harvest, senescence, and/or from grazing removal for grass/crop (g N m^{-2} mo^{-1}).

volpla – accumulator for N volatilization at harvest, senescence, and/or from grazing removal for grass/crop (total N for entire simulation) (g N m^{-2})

w1lig – lignin content of dead fine branches of forest system (fraction lignin in wood1, 0.0 – 1.0)

w1mnr(1) – N mineralized from the wood1 (dead fine branch) component of a forest system (g N m^{-2})

w1mnr(2) – P mineralized from the wood1 (dead fine branch) component of a forest system (g P m^{-2})

w1mnr(3) – S mineralized from the wood1 (dead fine branch) component of a forest system (g P m^{-2})

w2lig – lignin content of dead large wood of forest system (fraction lignin in wood2, 0.0 – 1.0)

w2mnr(1) – N mineralized from the wood2 (dead large wood) component of a forest system (g N m^{-2})

w2mnr(2) – P mineralized from the wood2 (dead large wood) component of a forest system (g P m^{-2})

w2mnr(3) – S mineralized from the wood2 (dead large wood) component of a forest system (g S m^{-2})

w3lig – lignin content of dead coarse roots of forest system (fraction lignin in wood3, 0.0 – 1.0)

w3mnr(1) – N mineralized from the wood3 (dead coarse root) component of a forest system (g N m^{-2})

w3mnr(2) – P mineralized from the wood3 (dead coarse root) component of a forest system (g P m^{-2})

w3mnr(3) – S mineralized from the wood3 (dead coarse root) component of a forest system (g S m^{-2})

wd1c2(1) – total monthly unlabeled dead fine branch respiration (g C m^{-2} mo^{-1})

wd1c2(2) – total monthly labeled dead fine branch respiration (g C m^{-2} mo^{-1})

wd1cis(1) – unlabeled C in forest system wood1 (dead fine branch) material (g C m^{-2})

wd1cis(2) – labeled C in forest system wood1 (dead fine branch) material (g C m^{-2})

wd2c2(1) – total monthly unlabeled dead large wood respiration (g C m^{-2} mo^{-1})

wd2cis(1) – unlabeled C in forest system wood2 (dead large wood) material (g C m^{-2})

wd2cis(2) – labeled C in forest system wood2 (dead large wood) material (g C m^{-2})

wd2c2(2) – total monthly labeled dead large wood respiration (g C m^{-2} mo^{-1})

wd3c2(1) – total monthly unlabeled dead coarse roots respiration (g C m^{-2} mo^{-1})

wd3c2(2) – total monthly labeled dead coarse roots respiration (g C m^{-2} mo^{-1})

wd3cis(1) – unlabeled C in forest system wood3 (dead coarse root) material (g C m^{-2})

wd3cis(2) – labeled C in forest system wood3 (dead coarse root) material (g C m^{-2})

wdfx – annual atmospheric and non-symbiotic soil N fixation based on annual precipitation (wet and dry deposition) (g N m^{-2})

wdfxa – annual N fixation in atmosphere (wet and dry deposition) (g N m^{-2})

wdfxaa – annual accumulator for atmospheric N inputs (g N m^{-2} yr^{-1})

wdfxas – annual accumulator for soil N-fixation inputs (g N m^{-2} yr^{-1})

wdfxma – monthly N fixation in atmosphere (g N m^{-2})

wdfxms – monthly non-symbiotic soil N fixation (g N m^{-2})

wdfxs – annual non-symbiotic soil N fixation based on precipitation rather than soil N/P ratio (g N m^{-2})

wood1c – C in wood1 (dead fine branch) component of forest system (g C m^{-2})

wood1e(1) – N in wood1 (dead fine branch) component of forest system (g N m^{-2})

wood1e(2) – P in wood1 (dead fine branch) component of forest system (g P m^{-2})

wood1e(3) – S in wood1 (dead fine branch) component of forest system (g S m^{-2})

wood2c – C in wood2 (dead large wood) component of forest system (g C m^{-2})

wood2e(1) – N in wood2 (dead large wood) component of forest system (g N m^{-2})

wood2e(2) – P in wood2 (dead large wood) component of forest system (g P m^{-2})

wood2e(3) – S in wood2 (dead large wood) component of forest system (g S m^{-2})

wood3c – C in wood3 (dead coarse roots) component of forest system (g C m^{-2})

wood3e(1) – N in wood3 (dead coarse roots) component of forest system (g N m^{-2})

wood3e(2) – P in wood3 (dead coarse roots) component of forest system (g P m^{-2})

wood3e(3) – S in wood3 (dead coarse roots) component of forest system (g S m^{-2})

woodc – sum of C in wood components of forest system (g C m^{-2})

woode(1) – sum of N in wood components of forest system (g N m^{-2})

woode(2) – sum of P in wood components of forest system (g P m^{-2})

woode(3) – sum of S in wood components of forest system (g S m^{-2})

NOTE: The growing season accumulator values for carbon production (*acrcis(*), afbcis(*), afrcis(*), agcacc, agcisa(*), alvcis(*), alwcis(*), bgcacc, bgcisa(*), crtacc, fbracc, fcacc, frtacc, ptagc, ptbgc, rlvacc, rlwacc*) and the growing season accumulator values for E uptake (*eupacc(*), eupaga(*), eupbga(*), and eupprt(*,*)*) output for the simulation were being reset to 0.0 at the start of the growing season, when a FRST, PLTM, or TFST event occurred. These production output variables would seem to indicate that production was still occurring because the output variables were not set back to zero at the end of a growing season and would retain a constant value until the next FRST, PLTM or TFST event occurred. These accumulators are now being reset to 0.0 at the end of the simulation timestep in which a LAST or TLST event occurs, after the output for the timestep has been saved to the output file.

Old way:
       Accumulators initialized to 0.0 at start of run
       Accumulators reset to 0.0 on FRST, PLTM, or TFST and begin accumulation
New way:

Accumulators initialized to 0.0 at start of run
Accumulators begin accumulation on FRST, PLTM, or TFST
Accumulators reset to 0.0 on LAST or TLST after output written to file

The new growing season production variables, AGCPRD, BGCPRD, CRTPRD, EUPPRD(*), FBRPRD, FCPRD, FRTPRD, RLVPRD, and RLWPRD, are set equal to the value of their associated accumulator value when a LAST or TLST occurs. These values can be used when examining yearly output to see the amount of production that occurred over the previously completed growing season. These growing season production variables will be set back to zero in January if no production has occurred over the previous 12 month period.

The new growing season accumulators for fertilizer addition (FERTAC, FERTMTH, and FERTPRD), organic matter addition (OMADAC, OMACAE, OMADMTE, OMADMTH, OMADPRD, and OMADPRD), and N$_2$O flux (N2OACC, N2OMTH, and N2OPRD) are currently being tracked for the grass/crop system only and will be reset on a LAST event.