# Testbed Point Runs for Harvard Forest

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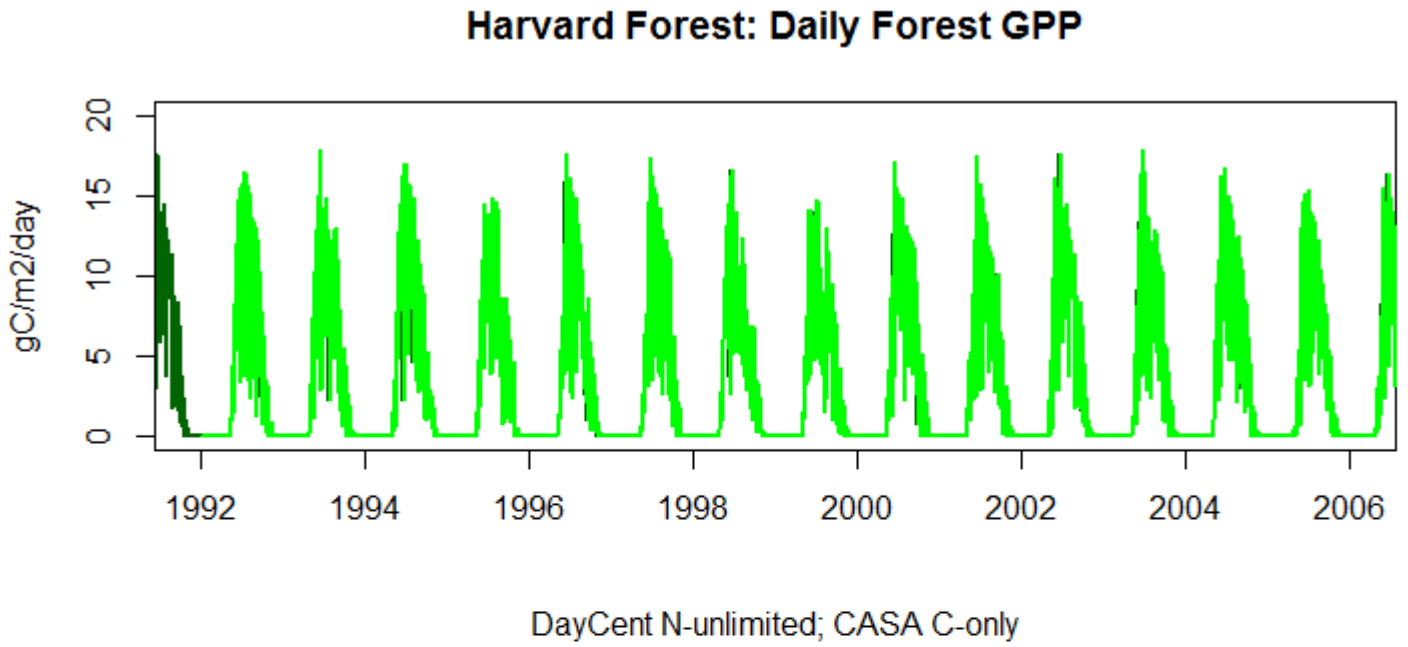
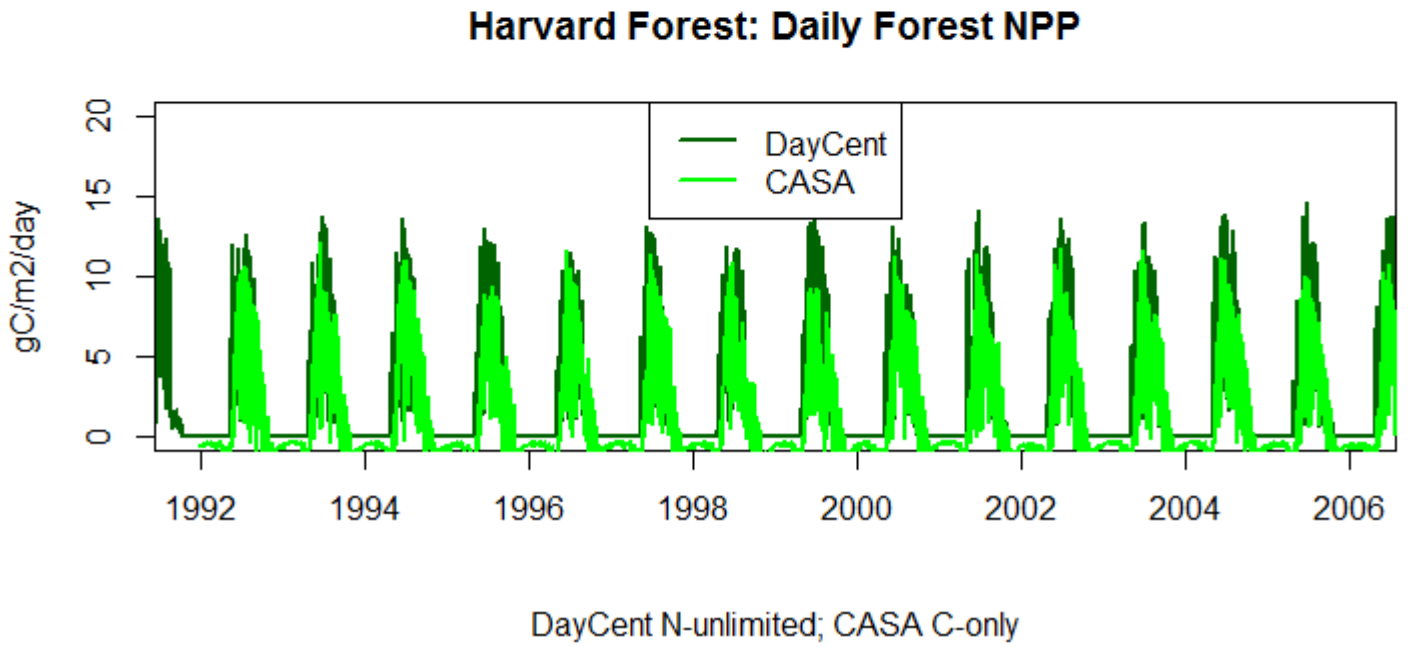
# Overview of Harvard Forest Results

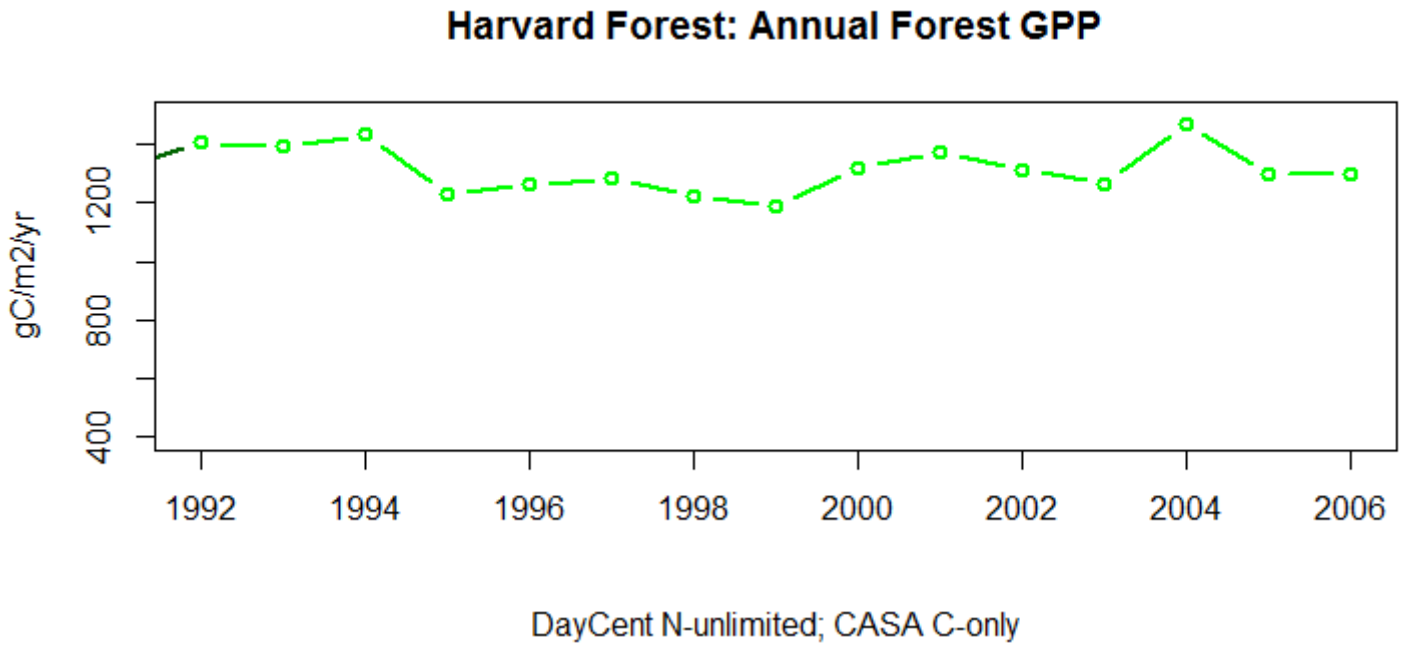
- CASA, MIMICS, and CORPSE were run with Carbon only.
- DayCent was run with an N  fertilizer addition that alleviated N limitation.
- DayCent was run first with observed weather, then CASA, MIMICS, and CORPSE were driven with DayCent GPP, soil temperature, and soil moisture.
- CASA computes NPP by subtracting autotrophic respiration from GPP. CASA litterfall feeds the MIMICS and CORPSE models.



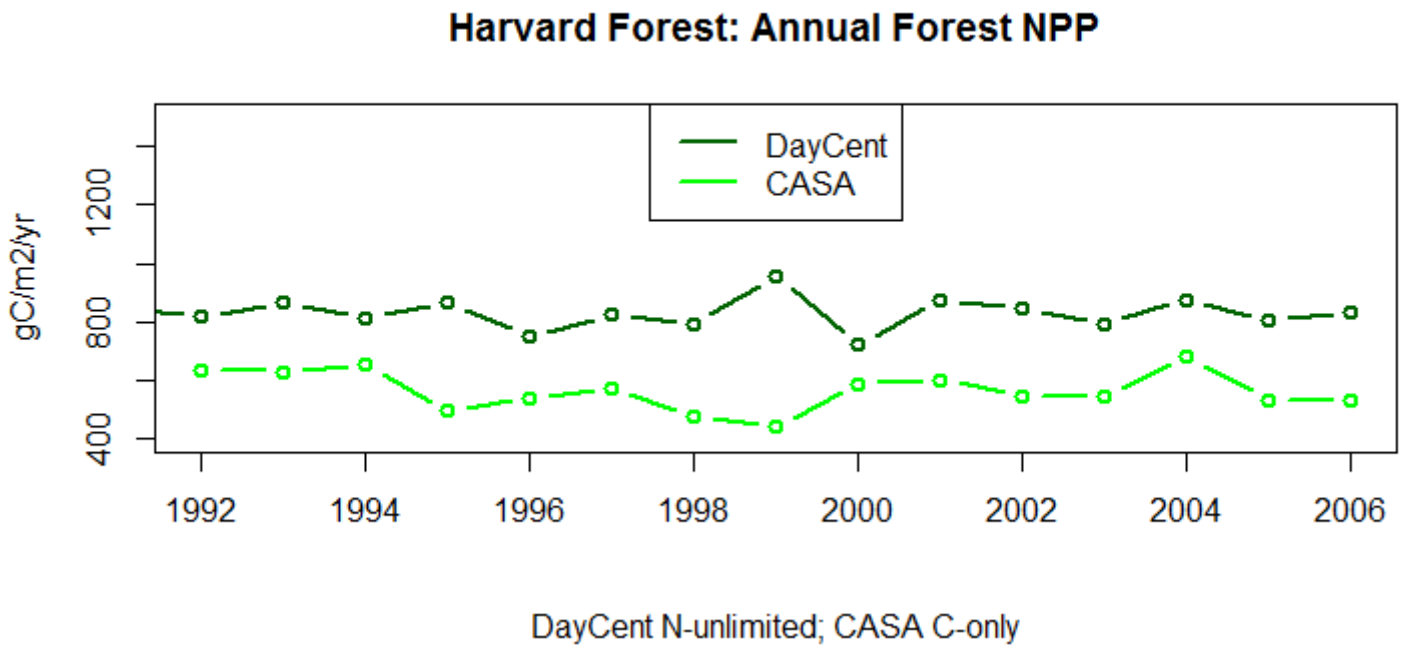

GPP should be identical for both DayCent and CASA.



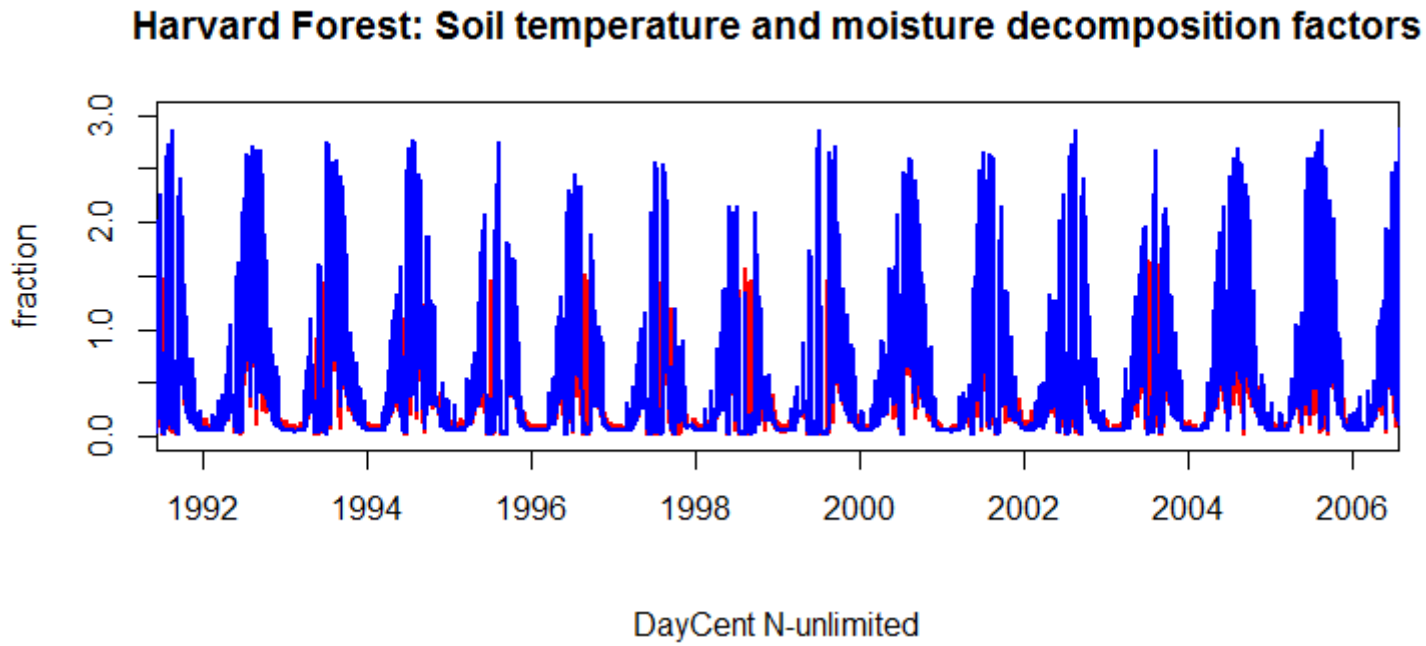

CASA's NPP can be negative. DayCent's NPP is always > 0.

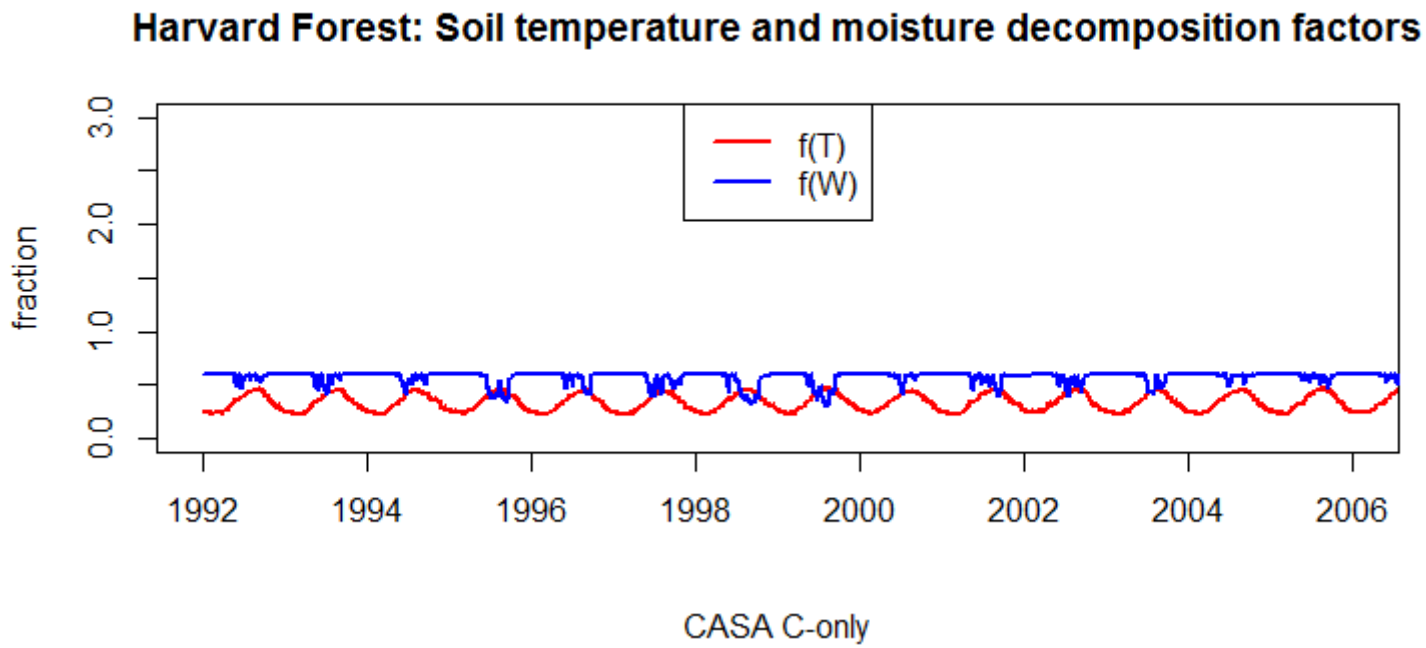


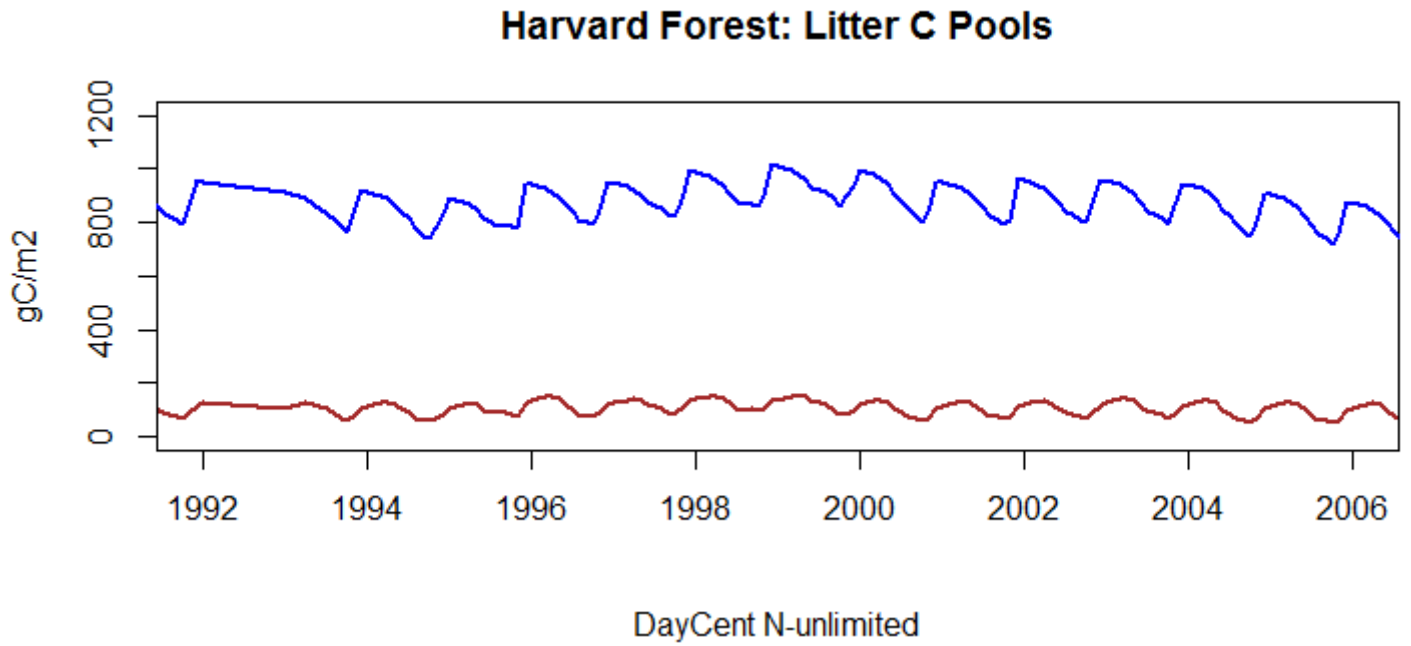

GPP should be identical for both DayCent and CASA.

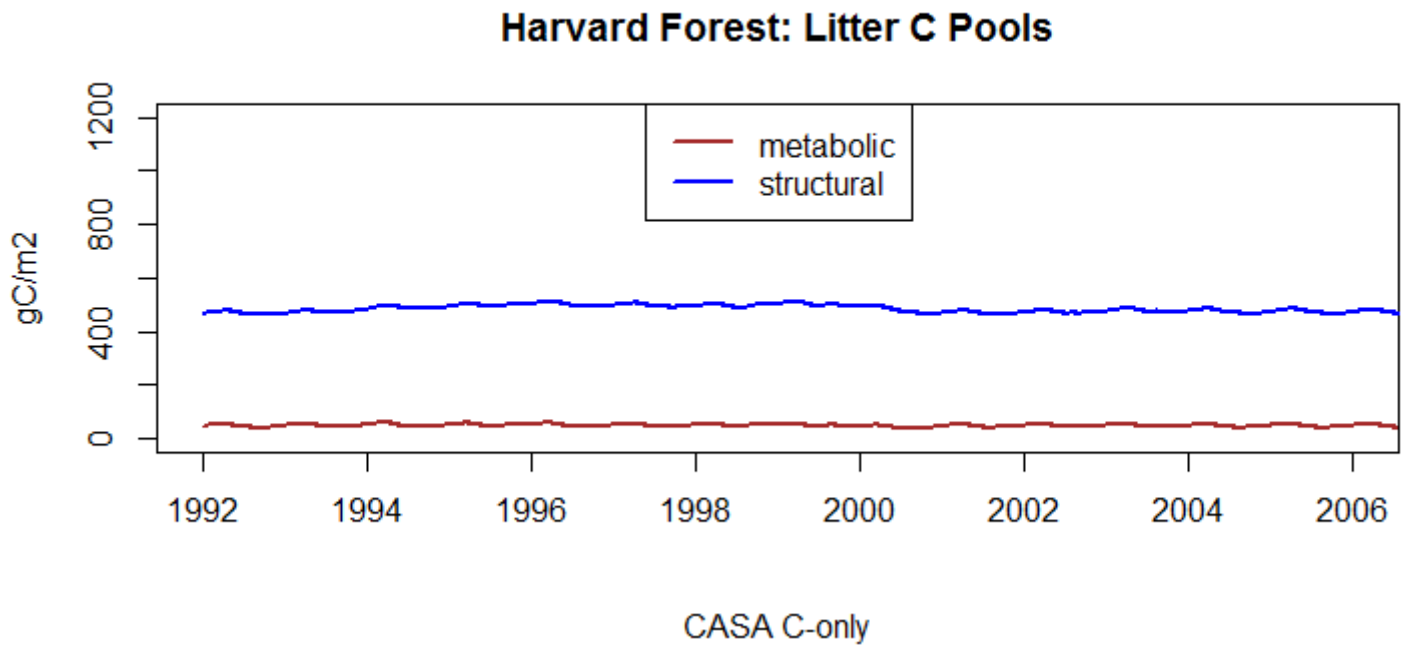



With DayCent's higher NPP one might expect it to have greater SOC, but instead DayCent's soil and temperature decomposition factors are much higher than CASA's.

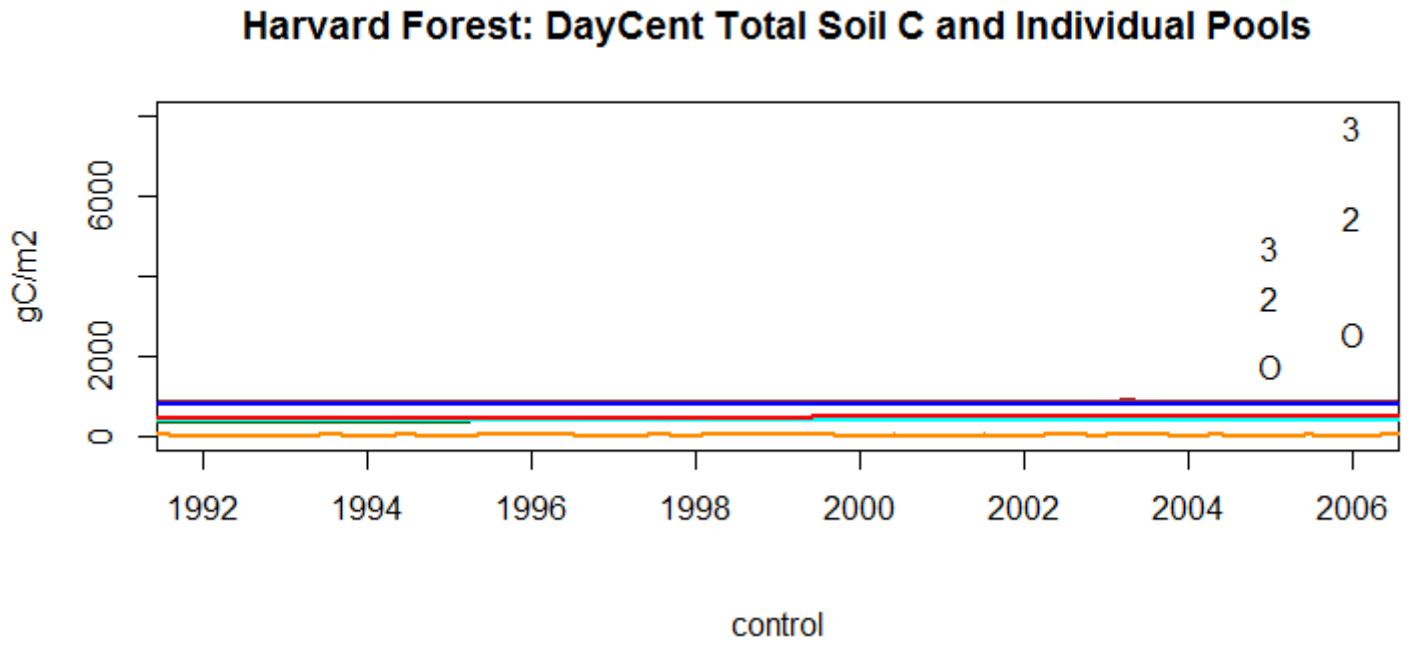

Harvard Forest: Soil temperature and moisture decomposition factors
fraction
0.0
1.0
2.0
3.0
1992
1994
1996
1998
2000
2002
2004
2006
DayCent N-unlimited


Harvard Forest: Soil temperature and moisture decomposition factors
f(T)
f(W)
fraction
0.0
1.0
2.0
3.0
1992
1994
1996
1998
2000
2002
2004
2006
CASA C-only



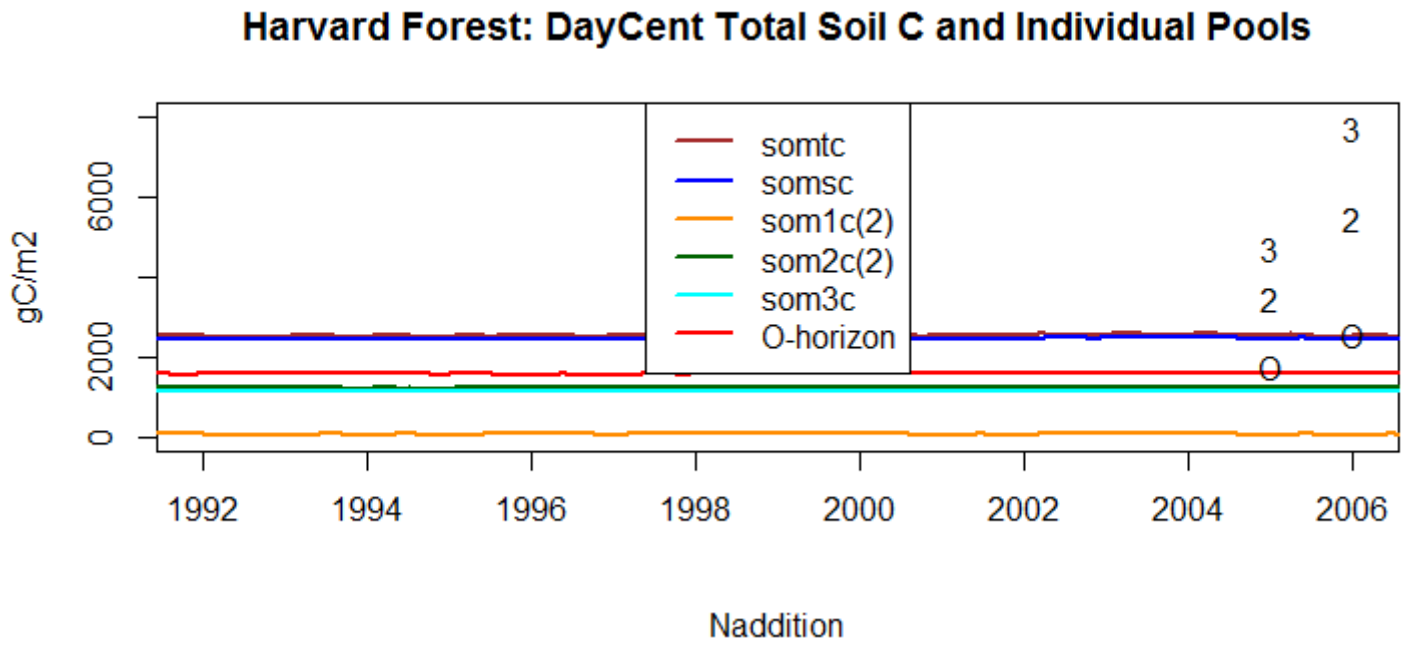




The greater litter biomass in DayCent is due to it's higher NPP.

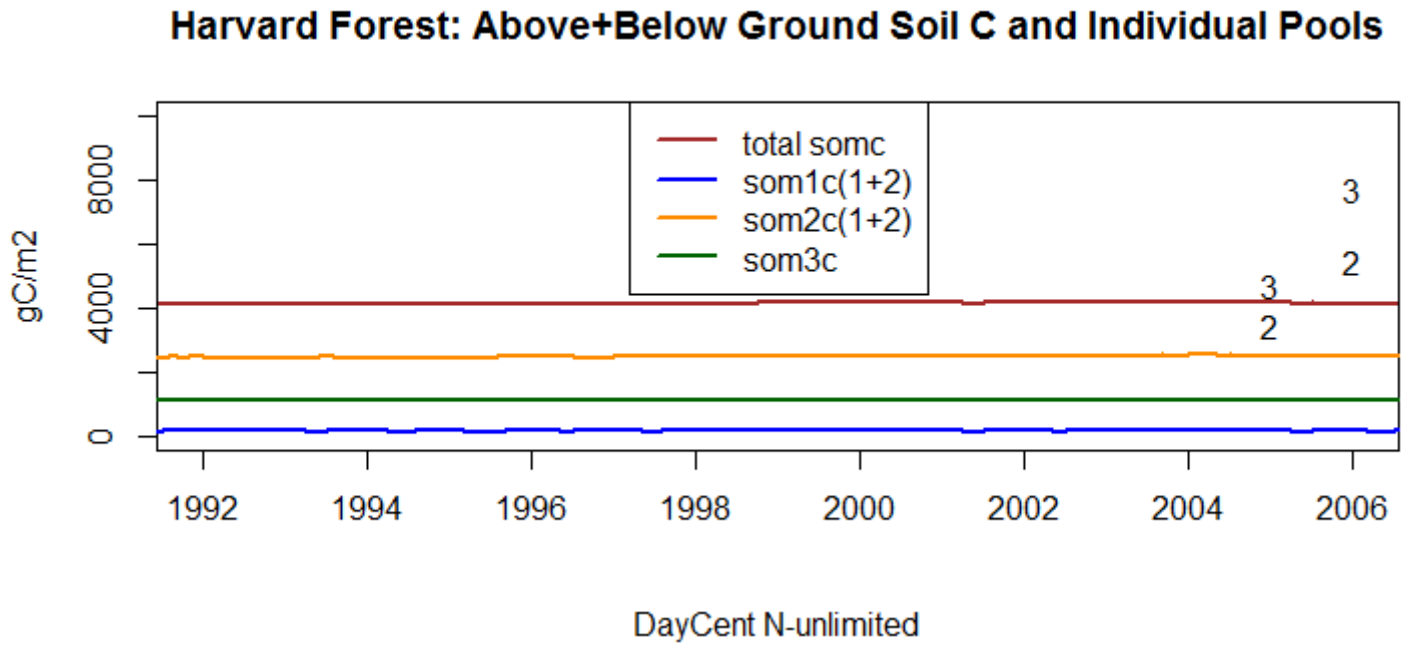


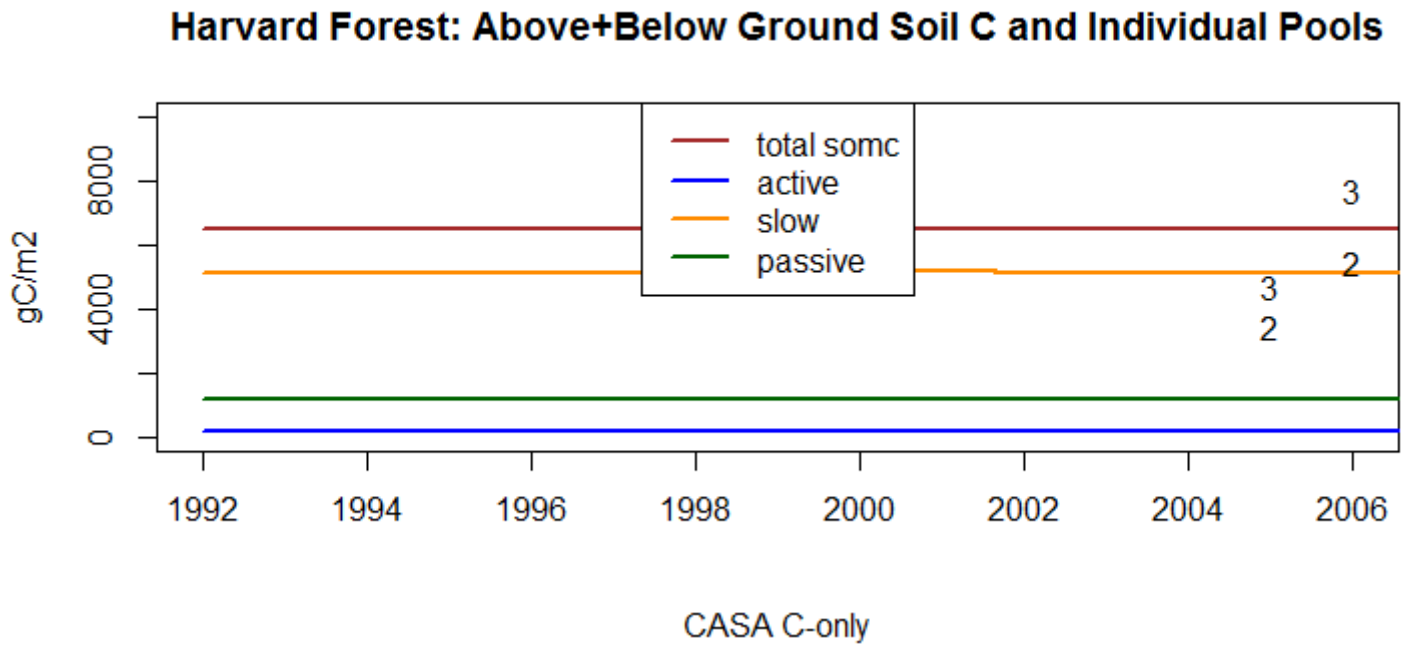

DayCent's "control" run had severe N-limitation.

DayCent's O-horizon is the surface slow pool, som2c(1).

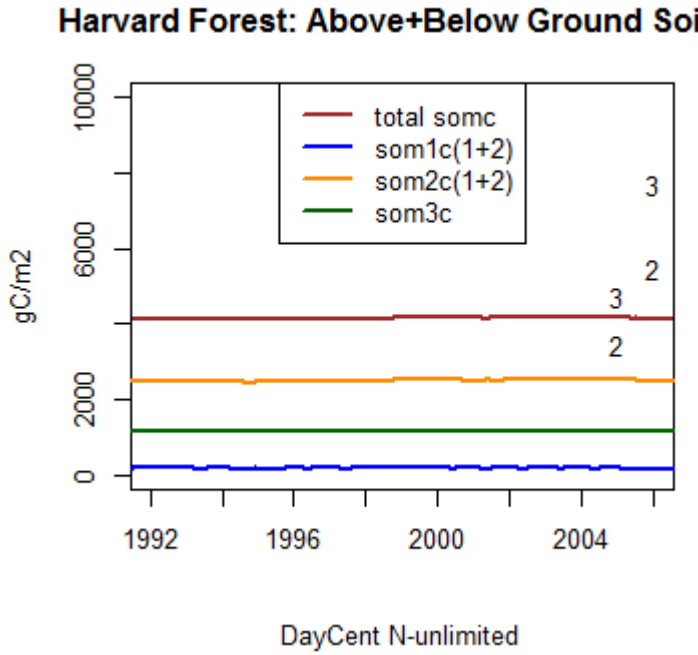



The 'O', '2', and '3' are the observed O-horizon, 20-cm, and 30-cm SOC stocks from site BW (on the left) and site Prospect Hill (on the right).

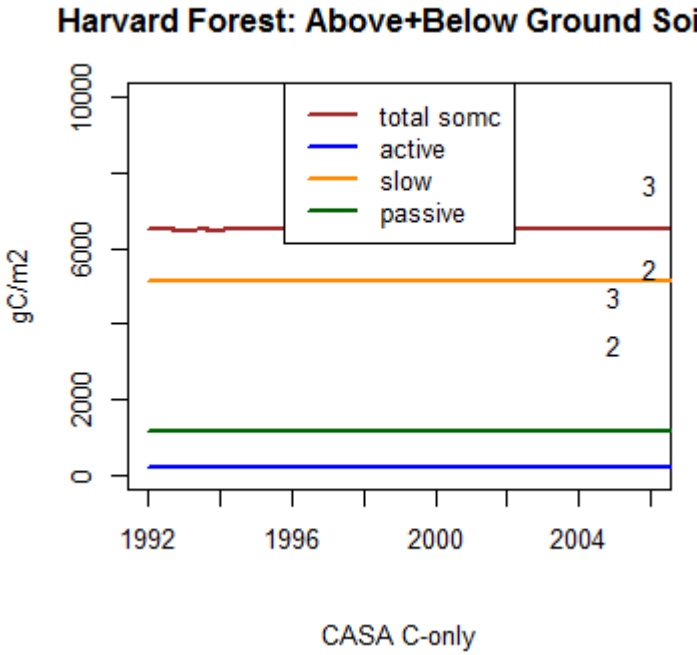


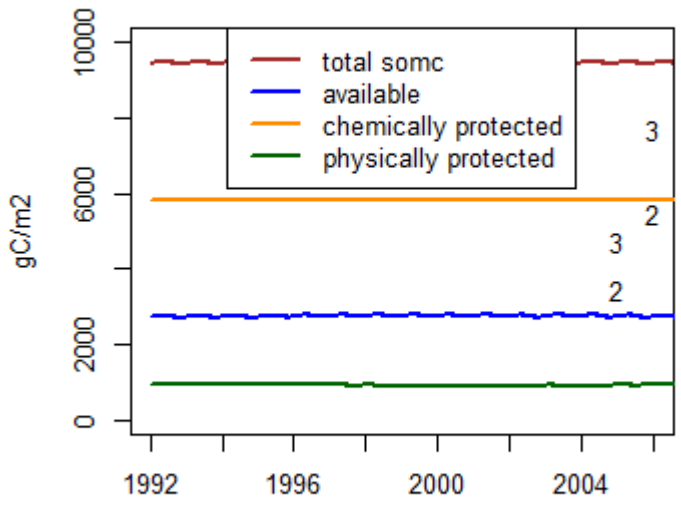

The ‘2’ and the ‘3’ are the observed 20-cm and 30-cm SOC stocks from site BW (on the left) and site Prospect Hill (on the right).



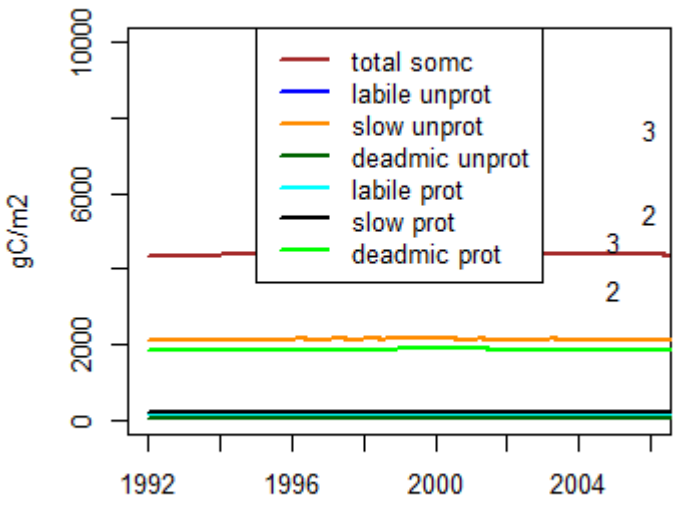

DayCent N-unlimited



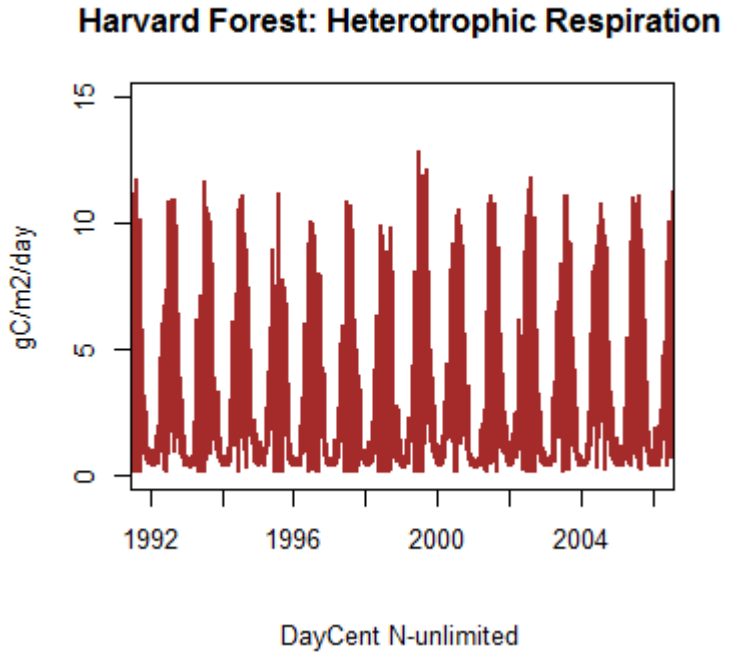

CASA C-only

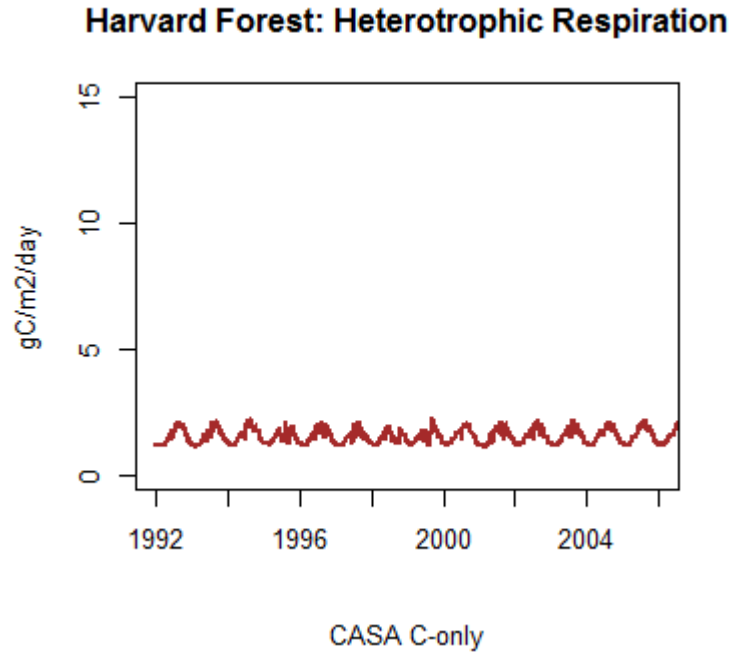



MIMICS




CORPSE


Harvard Forest: Heterotrophic Respiration
gC/m2/day
0
5
10
15
1992
1996
2000
2004
DayCent N-unlimited


Harvard Forest: Heterotrophic Respiration
gC/m2/day
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15
1992
1996
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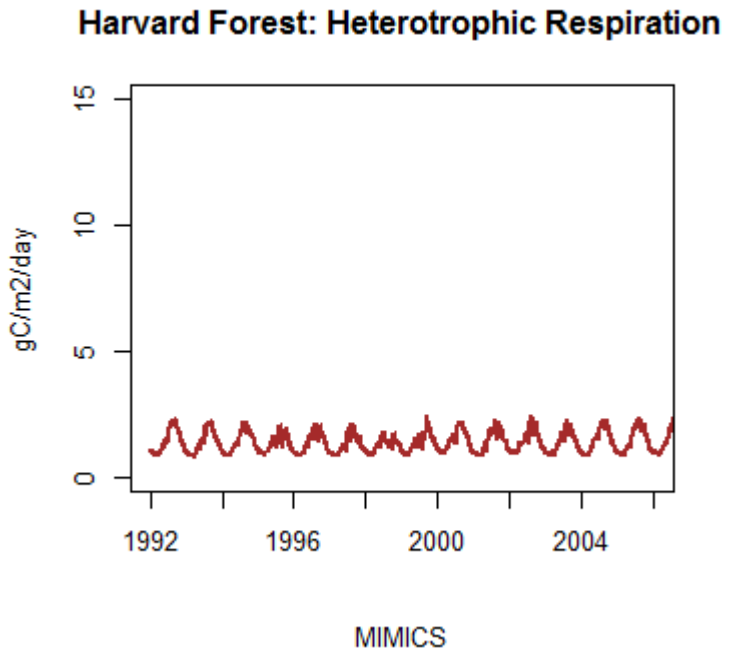
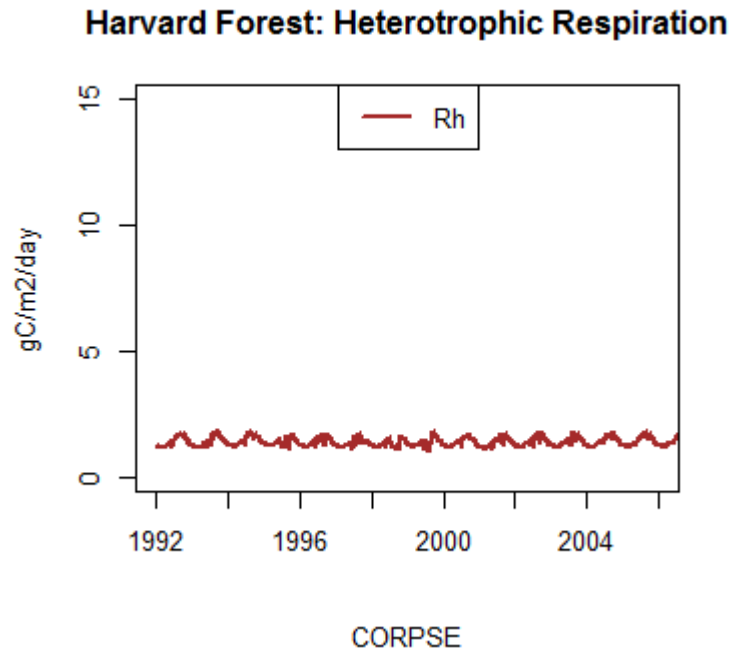
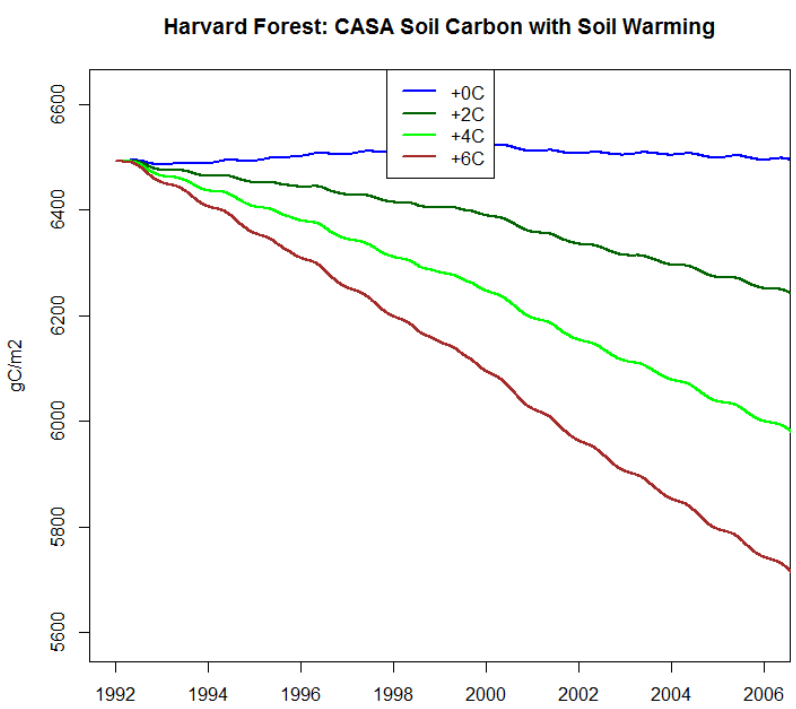
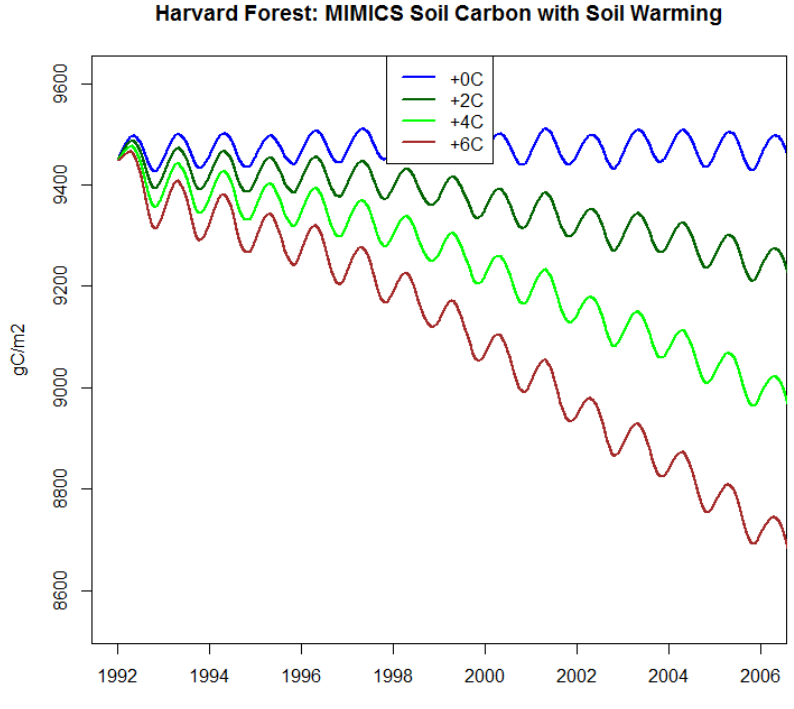
CASA C-only

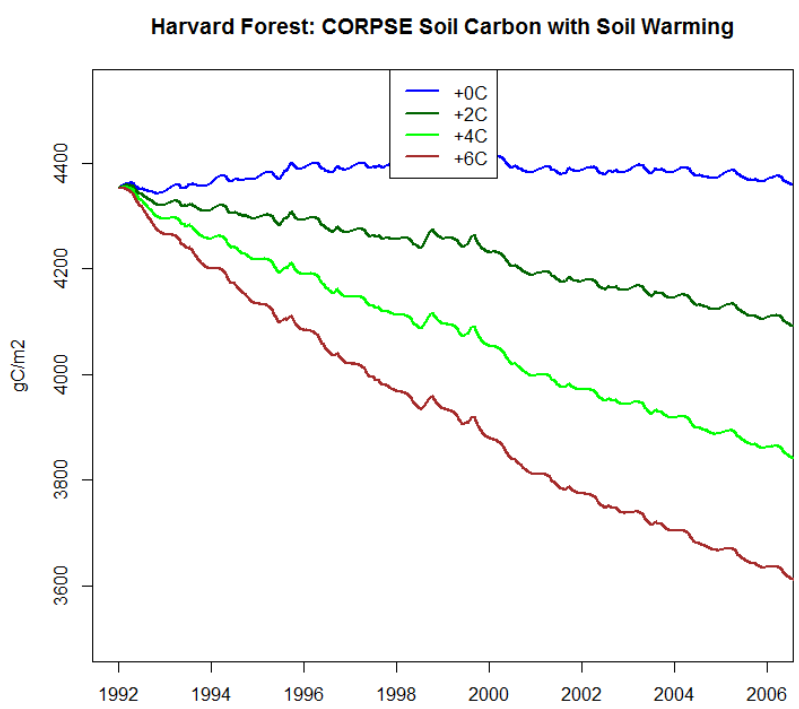

Harvard Forest: Heterotrophic Respiration
gC/m2/day
0
5
10
15
1992
1996
2000
2004
MIMICS


Harvard Forest: Heterotrophic Respiration
Rh
gC/m2/day
0
5
10
15
1992
1996
2000
2004
CORPSE

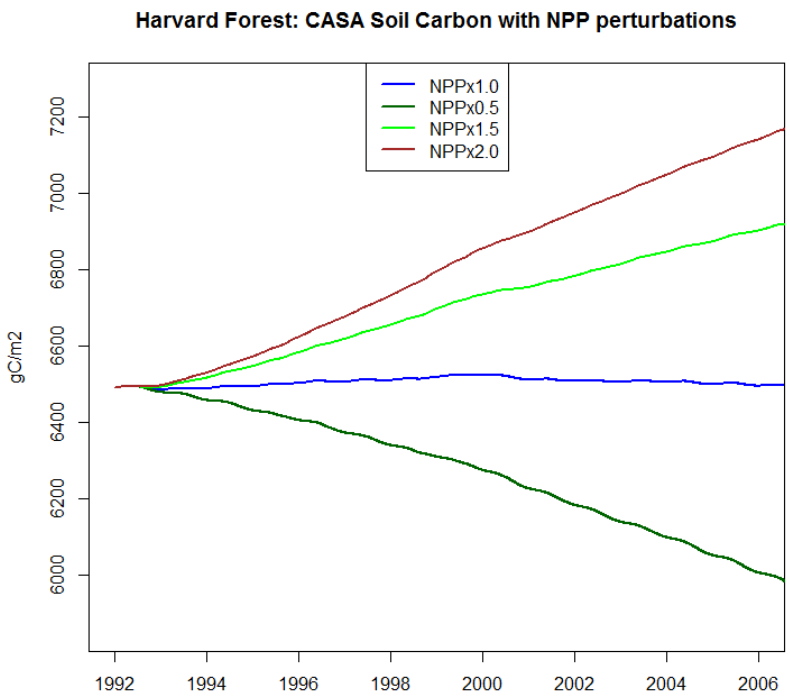
# Soil temperature warming and NPP perturbations…

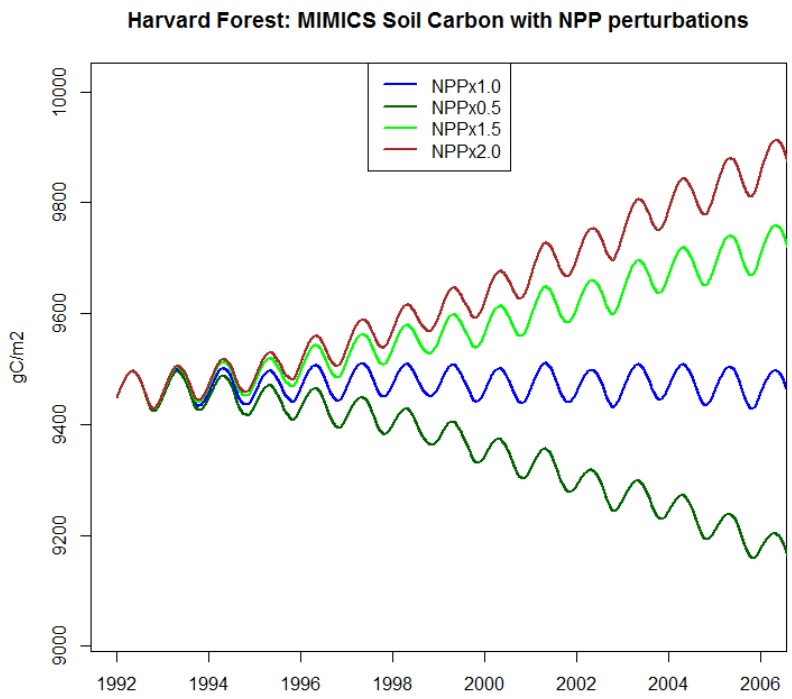


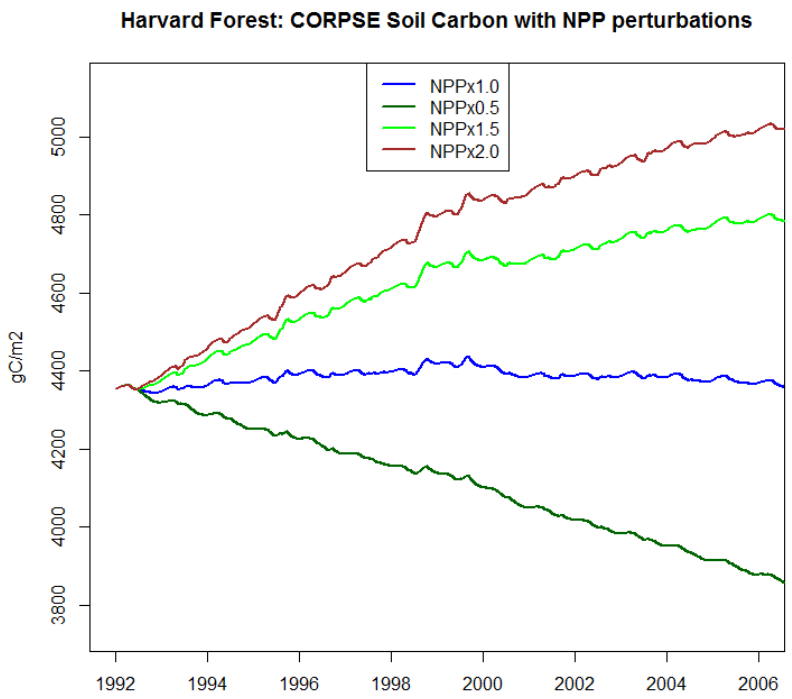



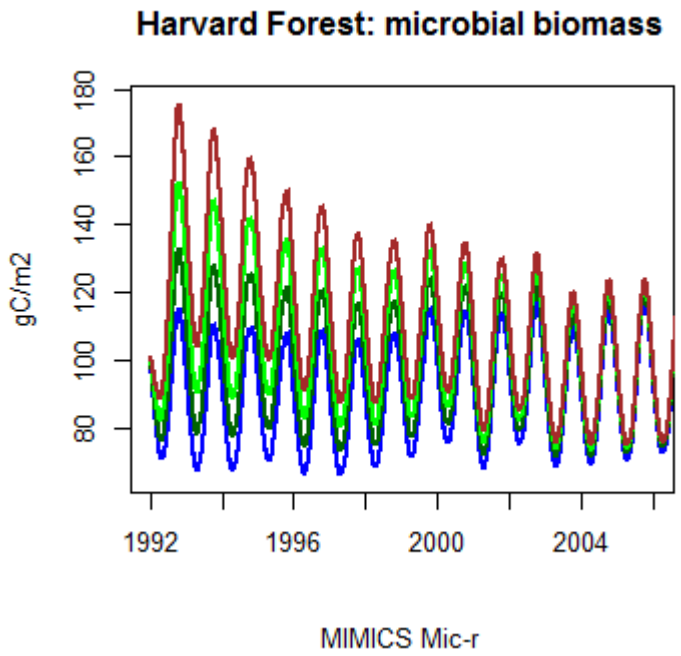

Soil temperature warming (+0 °C, +2 °C, +4 °C, and +6 °C) started in 1992. The blue line is the control.

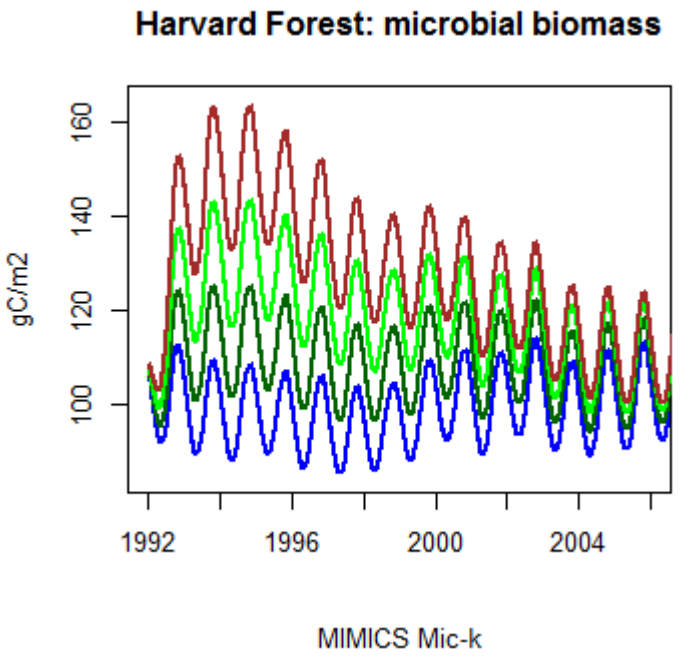


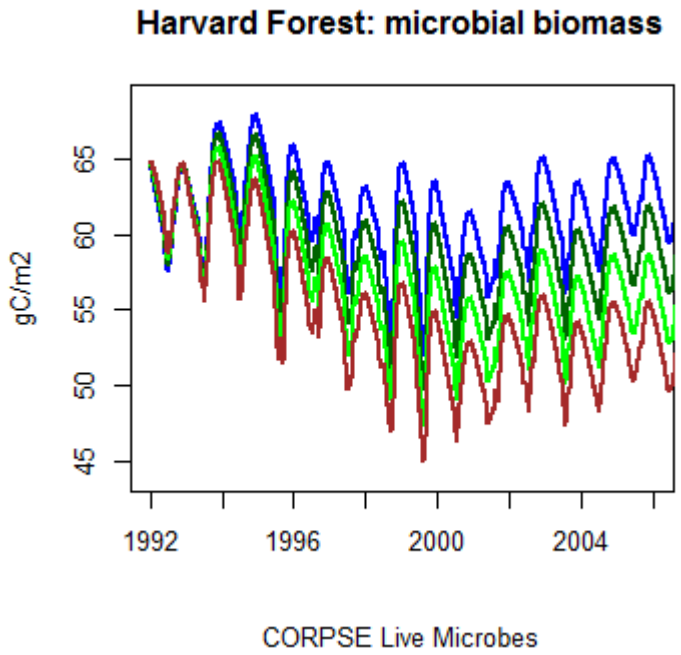



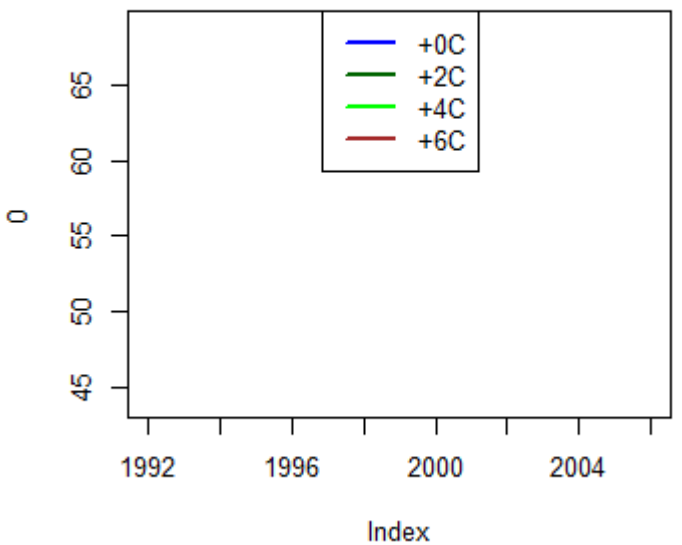




NPP reductions (-50%) and increases (+50%, +100%) started in 1992. The blue line is the control.

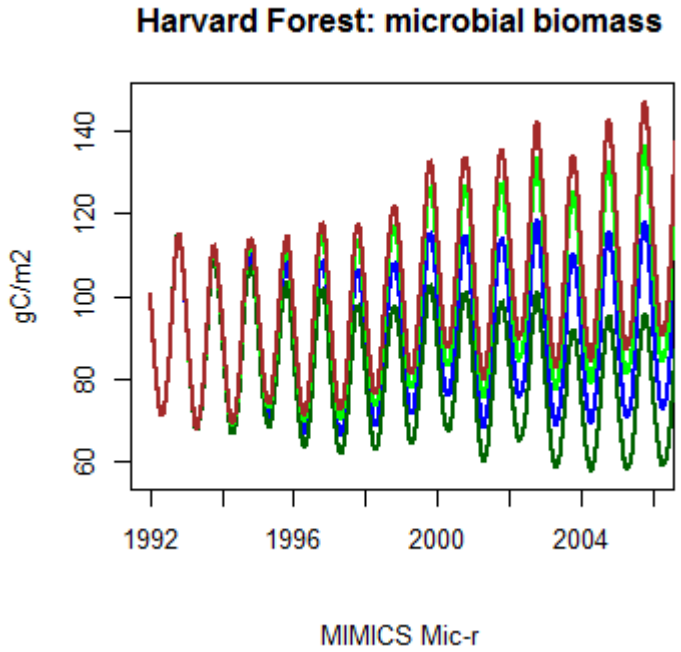


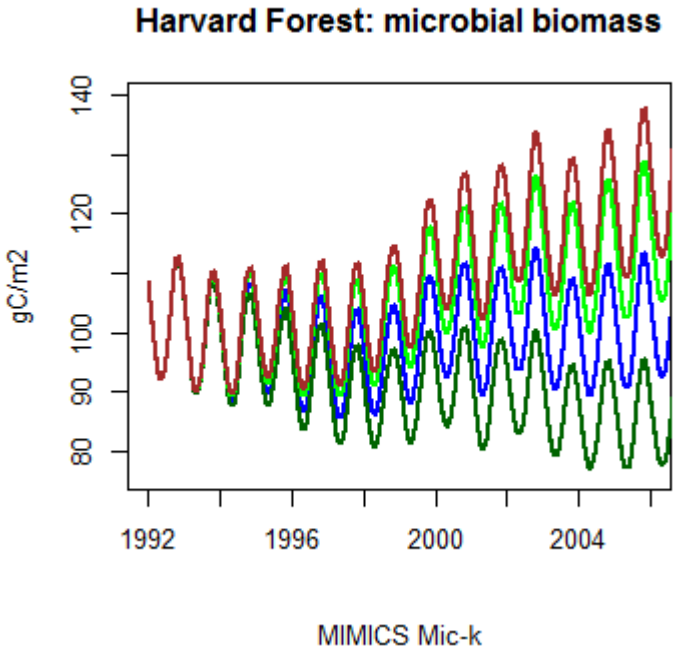



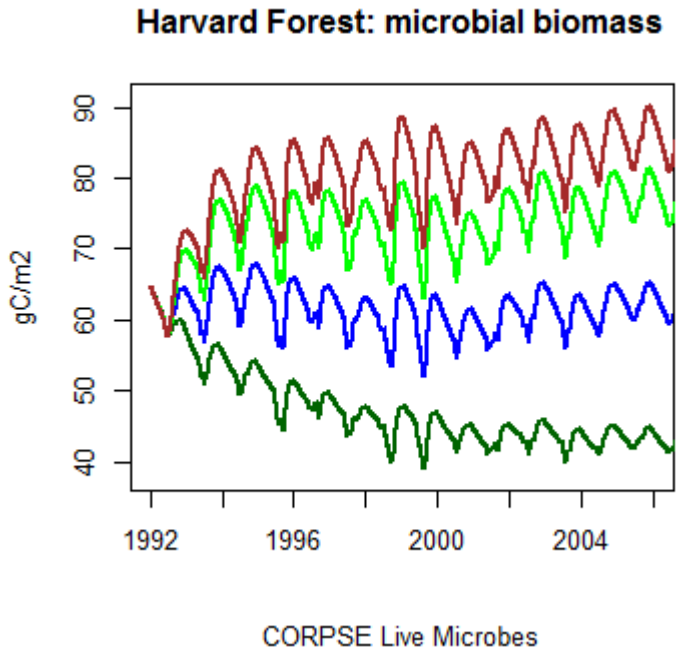



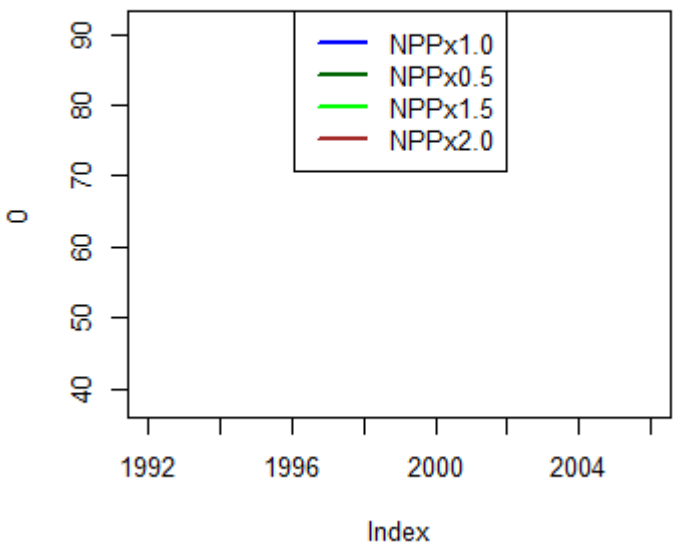




Soil temperature warming started in 1992. The blue line is the control.




NPP reductions and increases started in 1992. The blue line is the control.