

2. Too much heartwood biomass

Total biomass [g/m²]

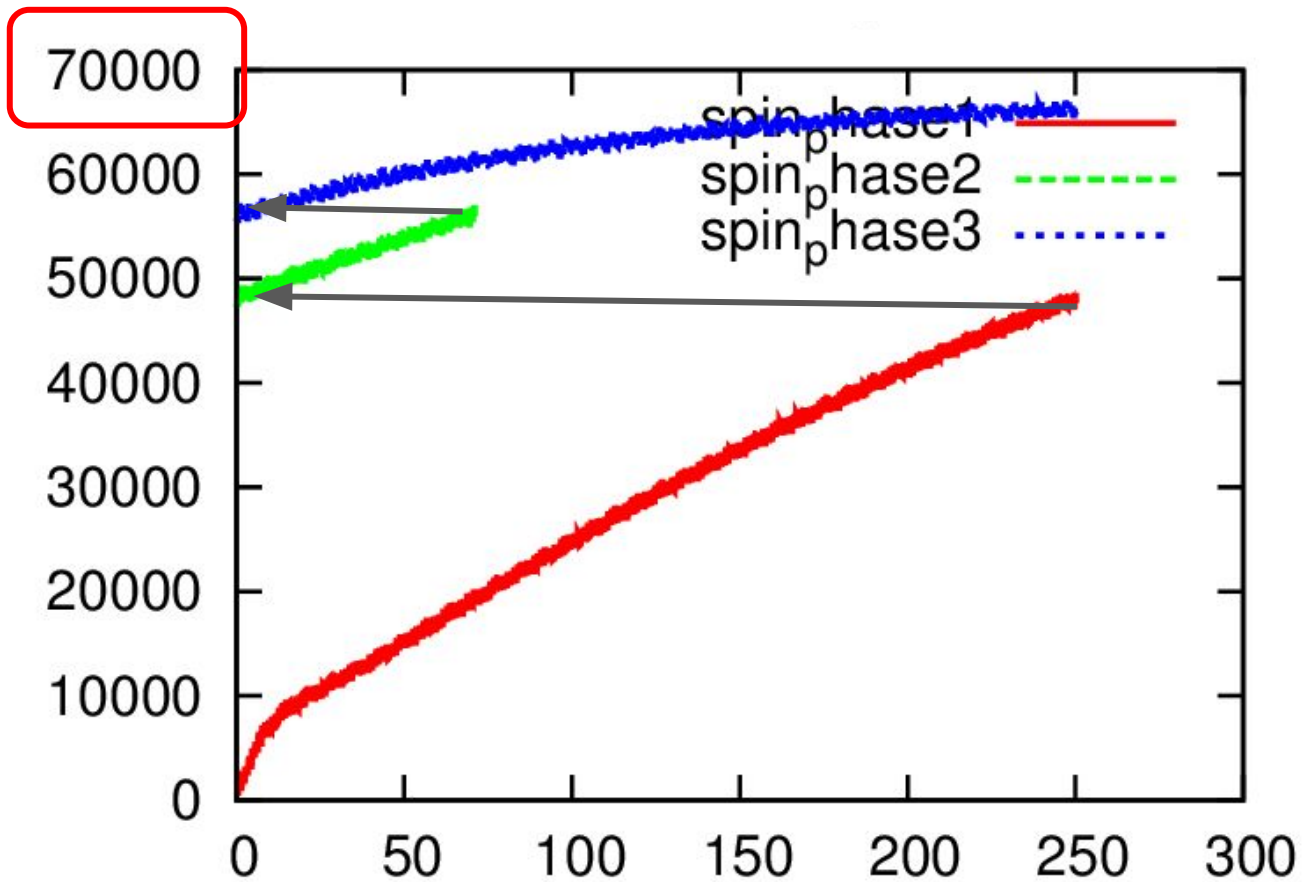


Table 3 Areas, total carbon stocks, and average carbon stocks in the biomass of forests and woodlands in the northern temperate and boreal zones in 1990 (from Goodale *et al.*, 2002)

Region	Forest area (10 ⁶ ha)	Other woodland area (10 ⁶ ha)	Forest living biomass (Pg C)	Woodland living biomass (Pg C)	Average forest biomass (Mg C ha ⁻¹)	Average woodland biomass (Mg C ha ⁻¹)
Canada	316	88	12.9	1.6	40.8	18.2
United States	212	86	13.3	3.3	62.7	38.4
Europe	149	46	7.7	0.2	51.7	4.3
Russia	821	66	33.7	0.6	41.0	9.1
China	119	39	4.6	0.6	38.6	5.0
Other*	92	16	4.7	na	51.1	na
Total	1711	339	77	...	45.0	...

Region	1980	1990	2000
(B) Average biomass of natural forests (MgC ha ⁻¹)‡			
Asia	127	104	70
Africa†	62	58	67
Latin America†	81	100	118
Area-weighted mean for all tropics†	82	86	94

Problem: Aboveground heartwood accumulates very slowly to very high values

Aboveground heartwood [g/m²]

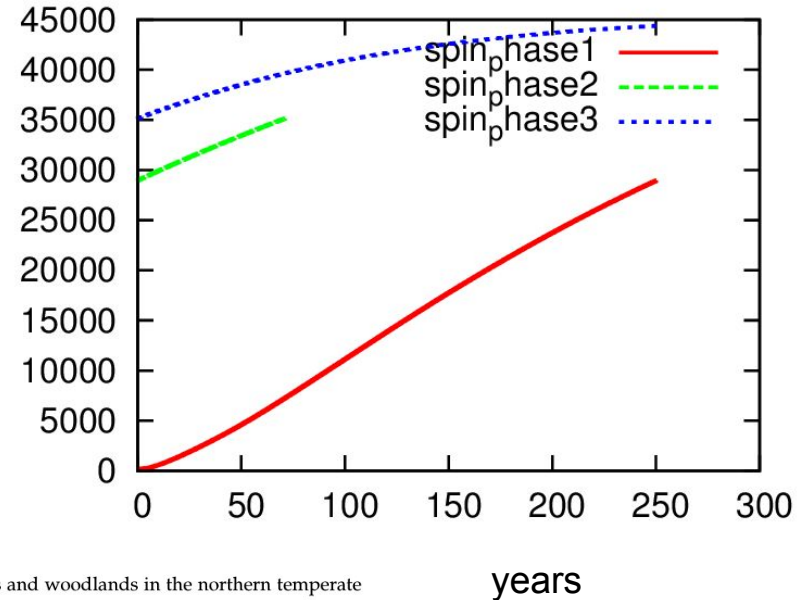


Table 3 Areas, total carbon stocks, and average carbon stocks in the biomass of forests and woodlands in the northern temperate and boreal zones in 1990 (from Goodale *et al.*, 2002)

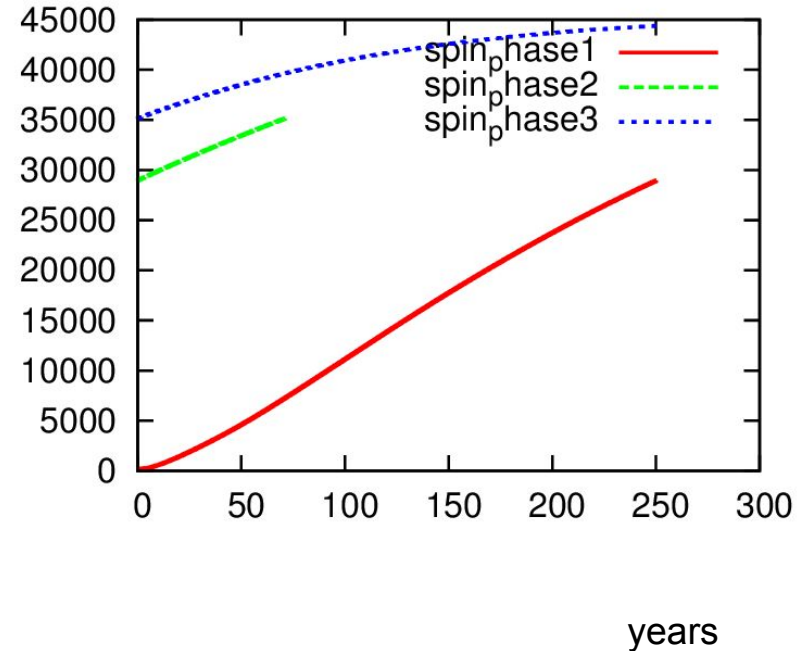
Region	Forest area (10 ⁶ ha)	Other woodland area (10 ⁶ ha)	Forest living biomass (PgC)	Woodland living biomass (PgC)	Average forest biomass (MgC ha ⁻¹)	Average woodland biomass (MgC ha ⁻¹)
Canada	316	88	12.9	1.6	40.8	18.2
United States	212	86	13.3	3.3	62.7	38.4
Europe	149	46	7.7	0.2	51.7	14.3
Russia	821	66	33.7	0.6	41.0	9.1
China	119	39	4.6	0.6	38.6	15.0
Other*	92	16	4.7	na	51.1	na
Total	1711	339	77	...	45.0	...

Problem: too much wood

Why?

- Simulation setup: use of only one size class
- conceptual problem: no physical limit to tree height implemented? Maybe not, self-thinning should prevent super large trees.
- Bug?
- Wrong parameter? τ_{sap} used is very high compared to default value (11680 vs 730 days)

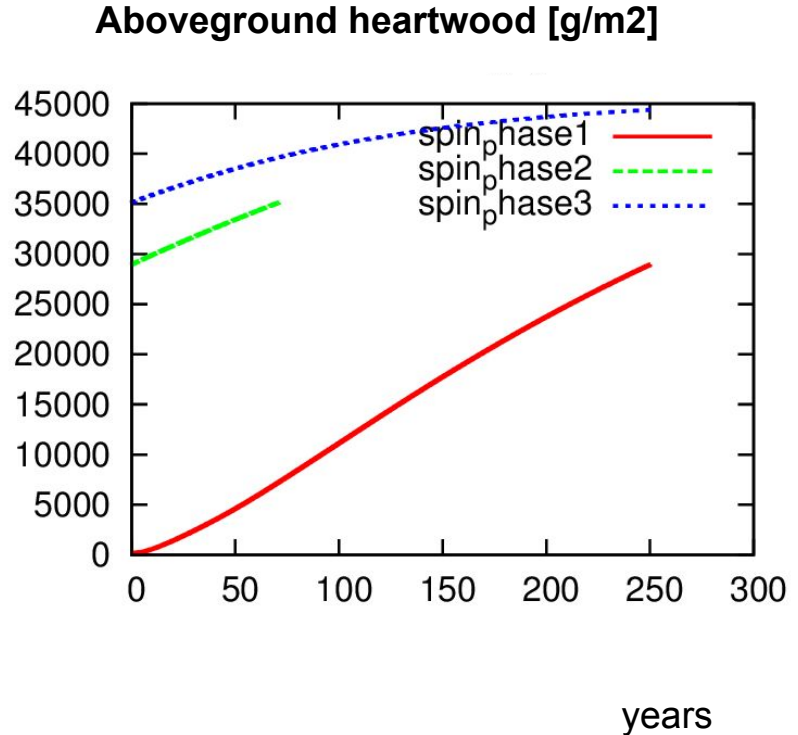
Aboveground heartwood [g/m²]



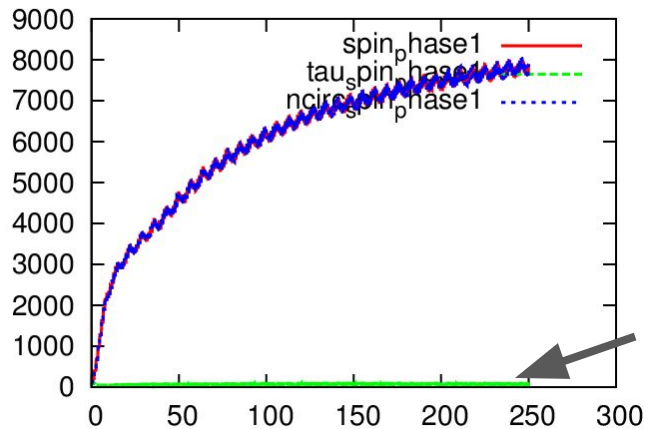
Problem: too much wood

Why?

- Simulation setup: use of only one size class
- conceptual problem: no physical limit to tree height implemented? Maybe not, self-thinning should prevent super large trees.
- Bug?
- **Wrong parameter? Tau_sap used is very high compared to default value (11680 vs 730 days).**

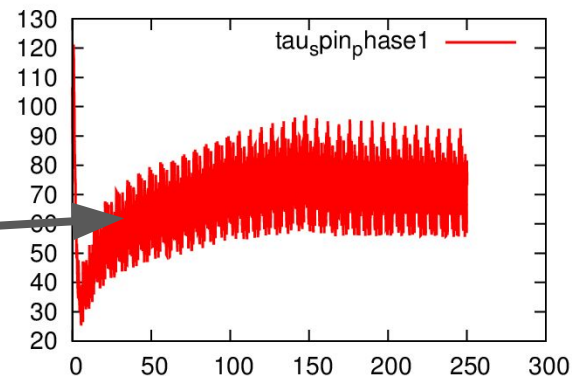


Aboveground sapwood [g/m²]

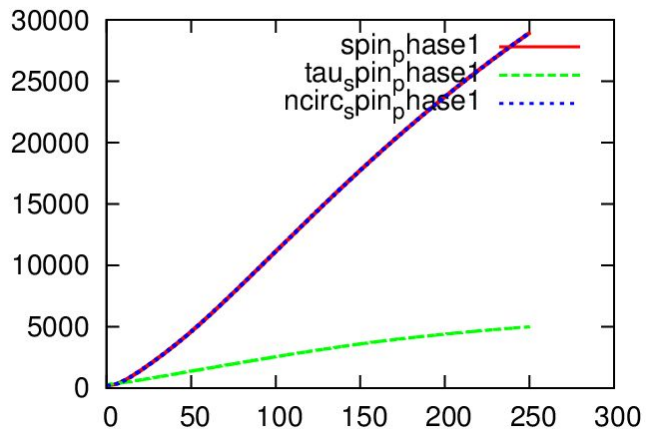


tau_{sap} (can)

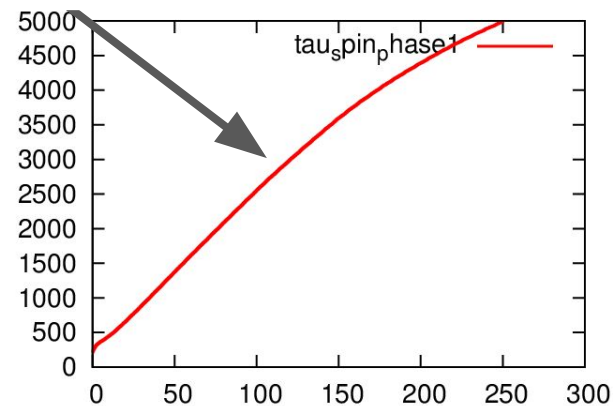
Aboveground sapwood [g/m²]



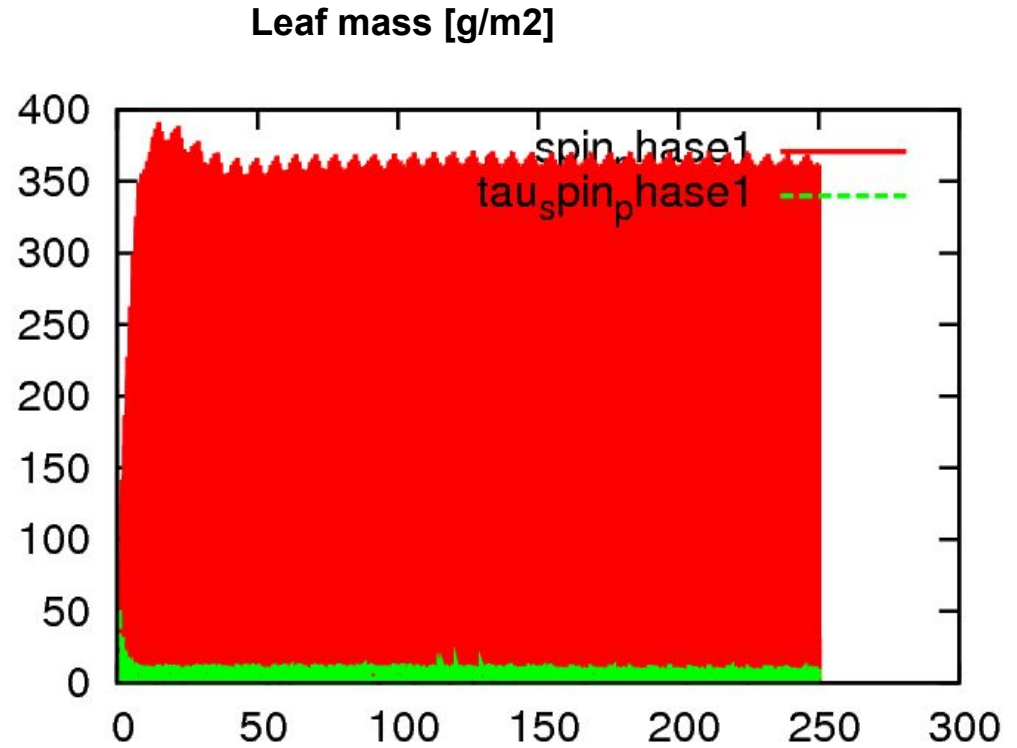
Aboveground heartwood [g/m²]



Aboveground heartwood [g/m²]



tau_sap: using the trunk values results in less heartwood, BUT also in less of everything.



ORCHIDEE:
simulates quite high
biomass stocks for some regions

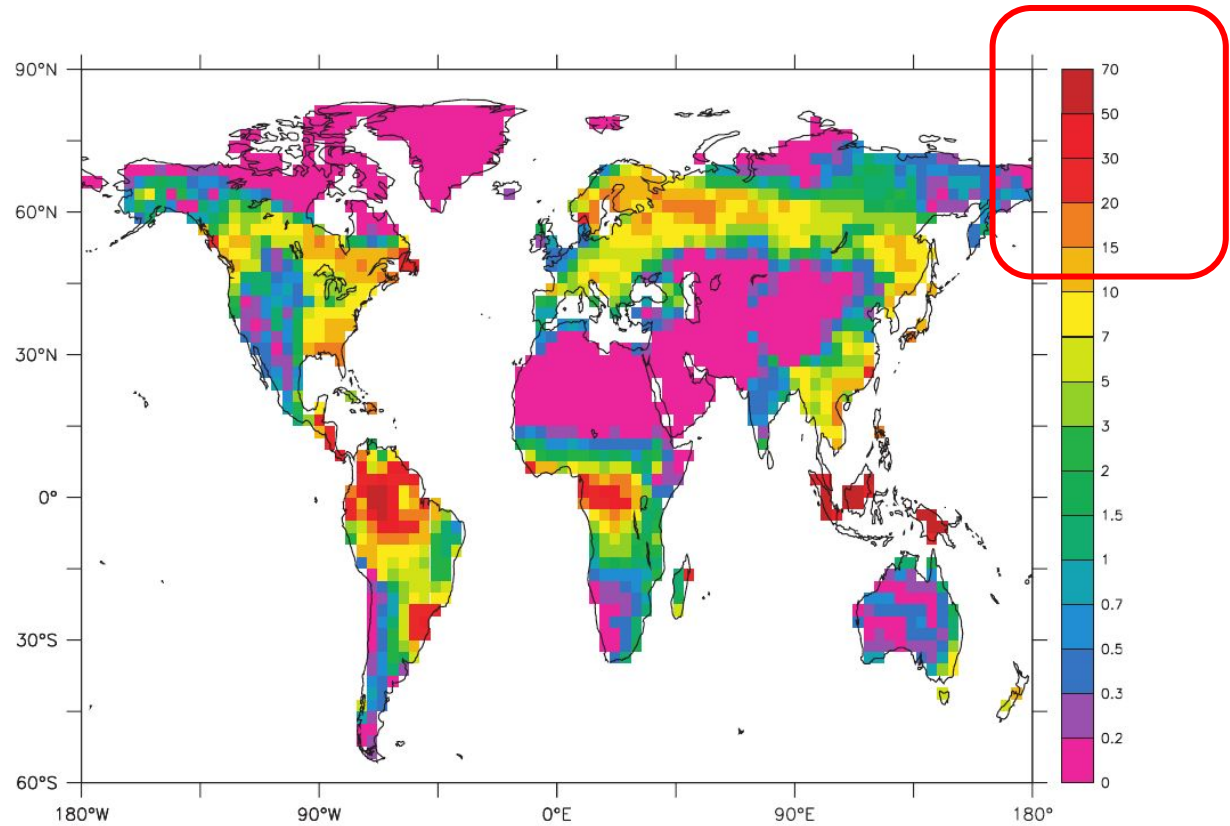
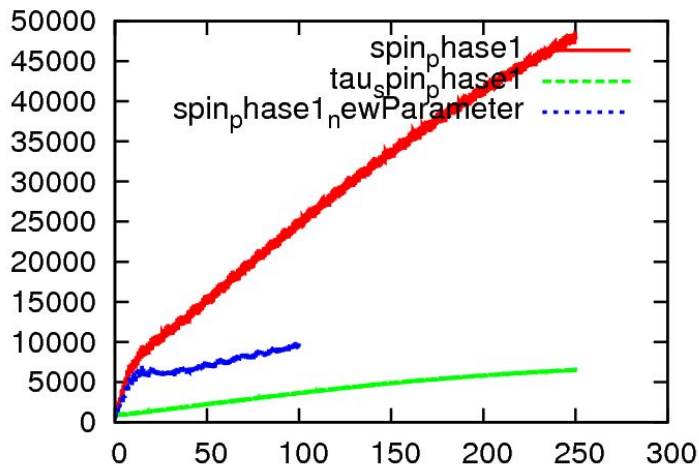


Figure 13. Mean aboveground and belowground biomass of natural vegetation (in kgC/m²) in STAT.

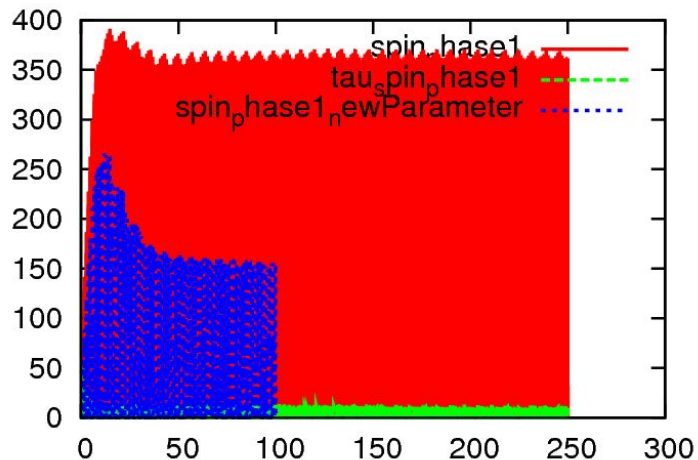
tau_sap: using ORCHIDEE-CAN values
With the new parameter values from NV
(blue).

=> quite high amount of heartwood,
But overall not too unrealistic.

Total biomass [g/m²]



Leaf mass [g/m²]



Heartwood abovegr [g/m²]

