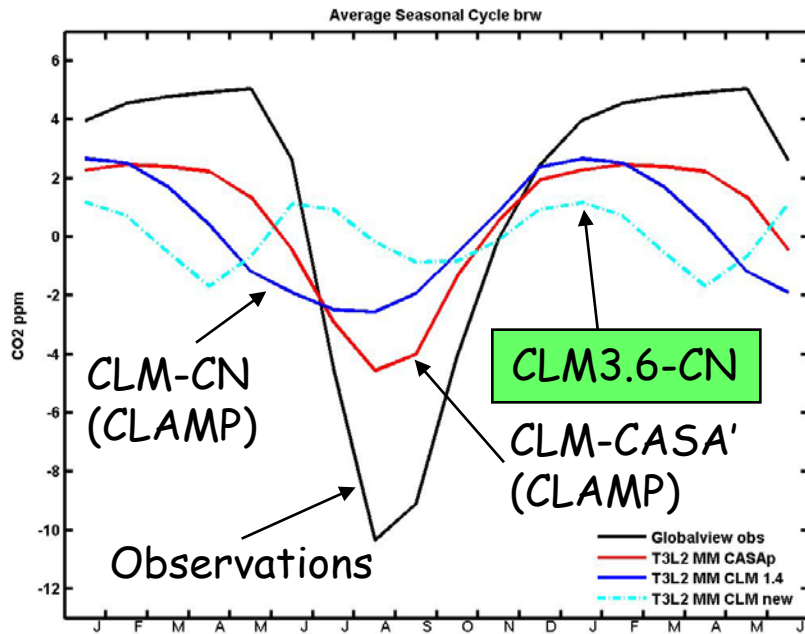
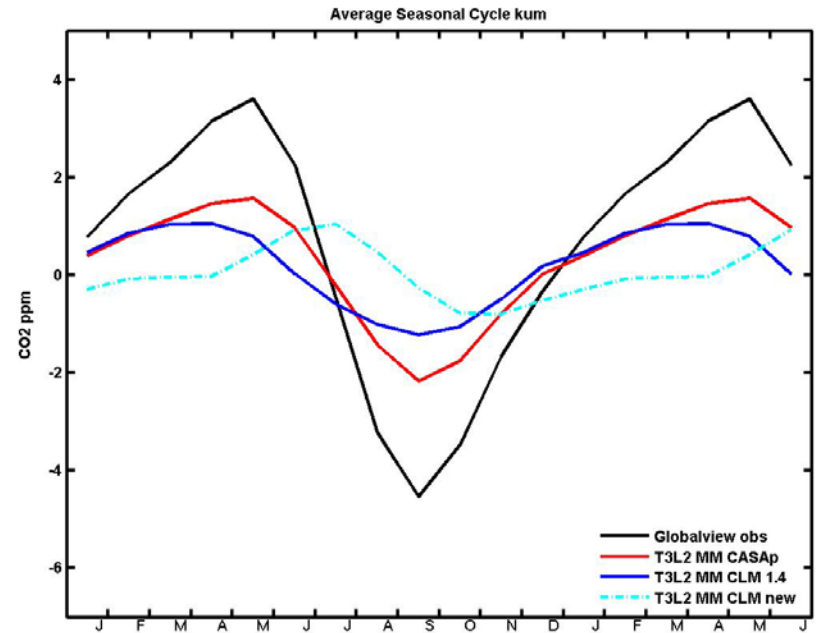


13 July 2008: Cindy Nevison and Jim Randerson identified a deficiency in simulated CO₂ flux for CLM3.6-CN

Barrow (71N)



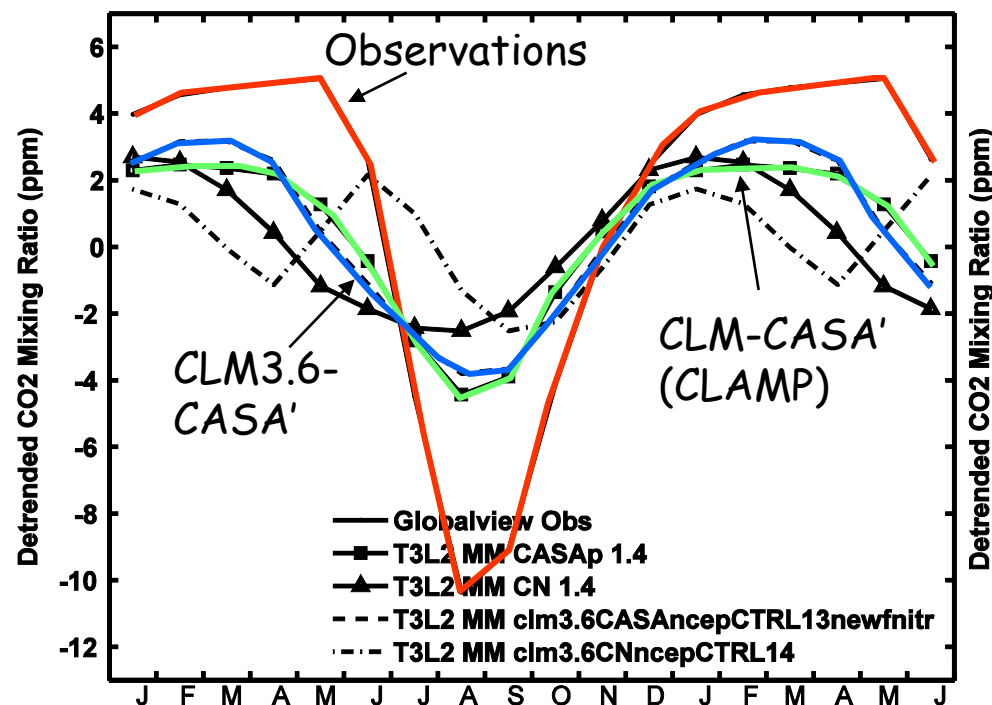
Kumukahi (19.5N)



Simulations with CLM3.6-CASA' do not show a similar degradation of atmospheric CO₂

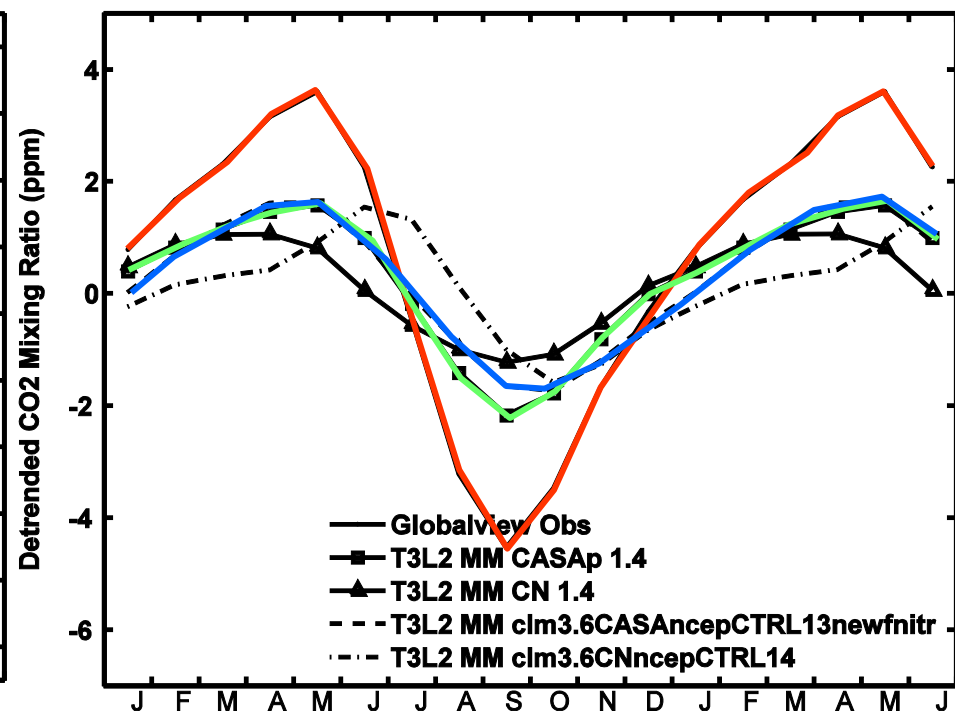
Barrow (71N)

Average Seasonal Cycle brw



Kumukahi (19.5N)

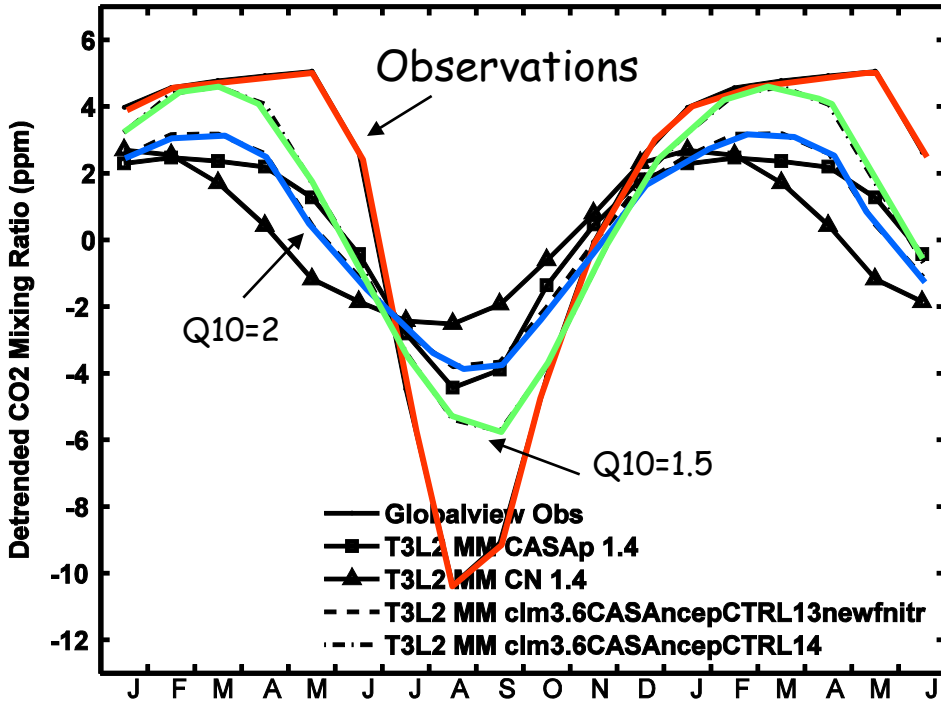
Average Seasonal Cycle kum



Leads to improved annual cycle of CO₂ in CLM3.6-CASA'

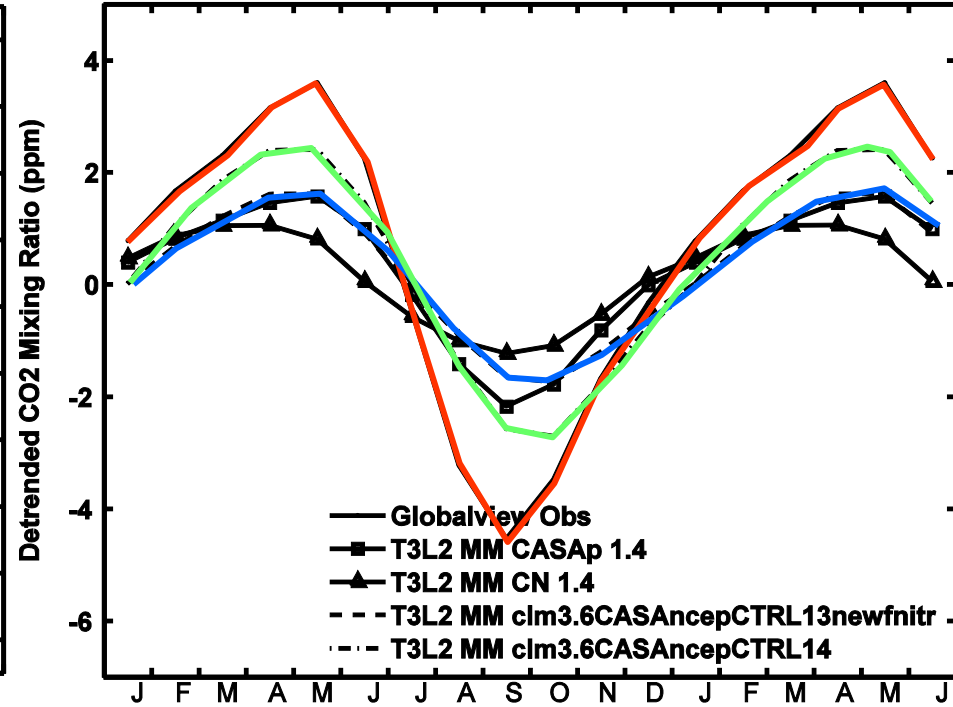
Barrow (71N)

Average Seasonal Cycle brw

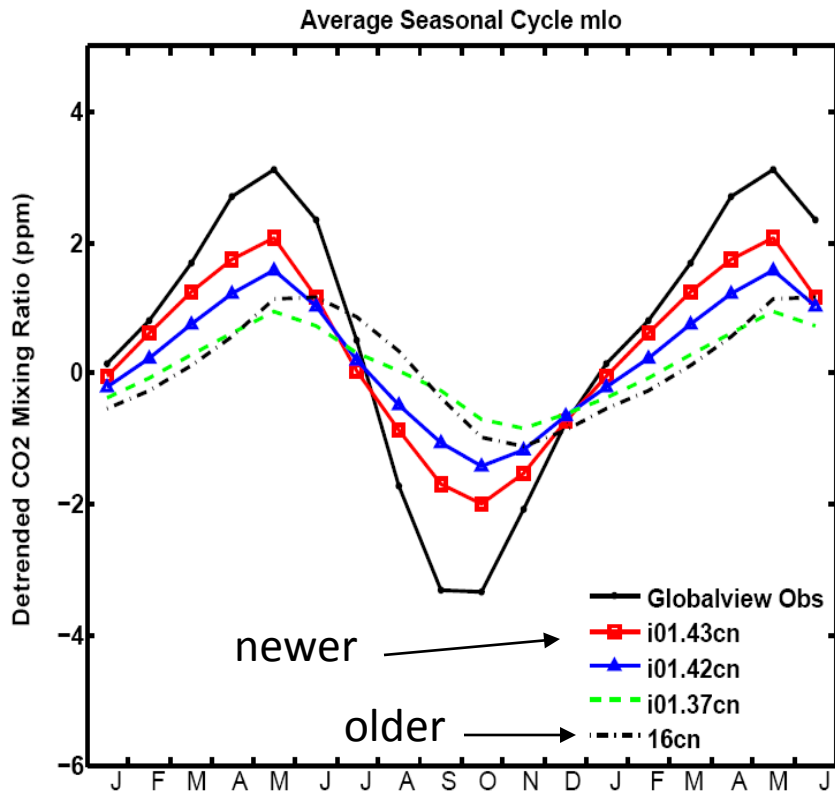


Kumukahi (19.5N)

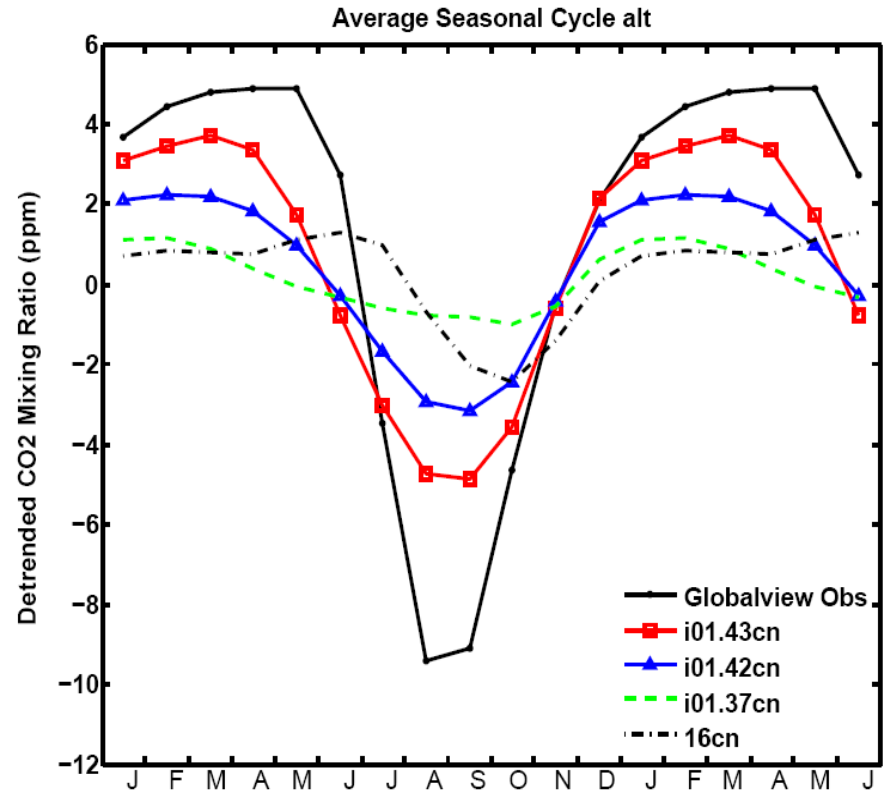
Average Seasonal Cycle kum



Example results: improved seasonal cycle (sequence of four modifications with progressive improvement)



Mauna Loa



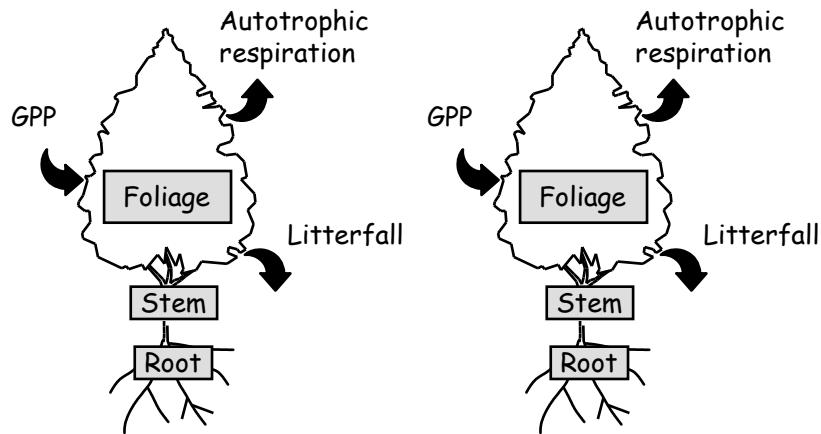
Alert

Influence of new parameterizations on C-LAMP metrics (all metrics except seasonal cycle)

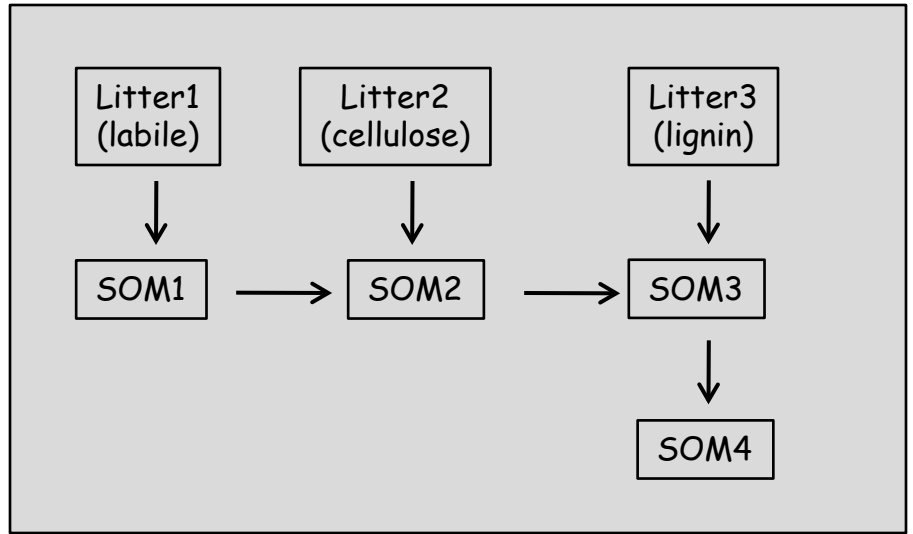
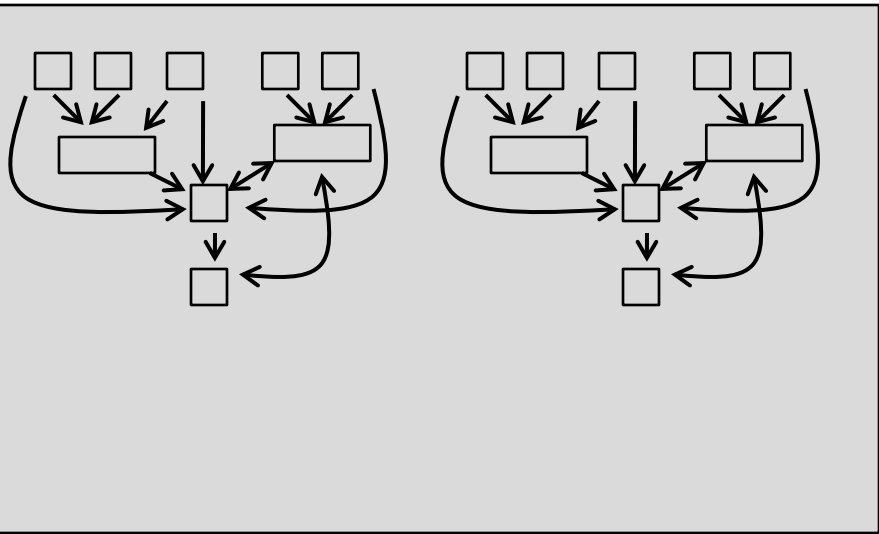
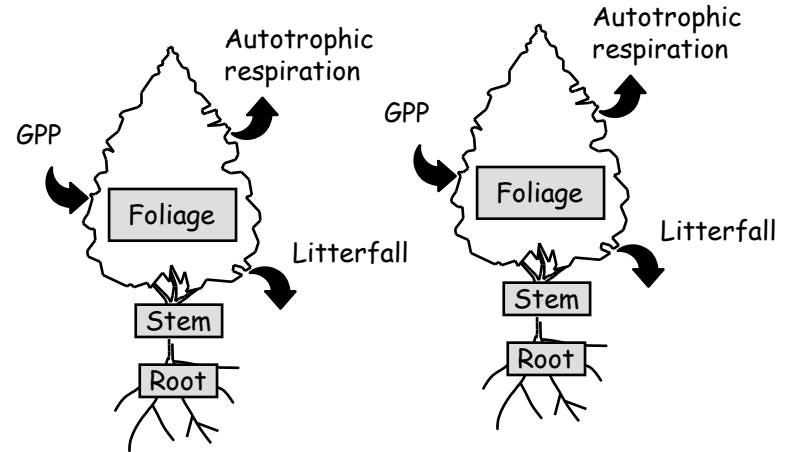
Parameterization	Old	New	delta
L&T to Q_{10}	49.61	49.64	+0.03
HR: Q_{10} from 2.0 to 1.5	50.15	49.90	-0.25
Daylength control on GPP	49.64	50.67	+1.03
MR: Q_{10} from 2.0 to 1.5	51.88	51.33	-0.55
All changes together	49.74	51.34	+1.60

These changes improved the seasonal cycle and the other C-LAMP metrics

CASA' - each PFT has own soil bgc



CN - PFTs share common soil bgc on a single soil column



The path forward to a community model

CN aboveground
(plant) code

GPP

Autotrophic respiration

Maintenance

Growth

Allocation (displayed, storage, transfer)

Leaf

Live stem → dead stem

Live coarse root → dead coarse root

Fine root

Phenology

Evergreen

Seasonal deciduous (temperature, daylength)

Stress deciduous (temperature, soil water)

Litterfall (leaf, fine roots)

Evergreen (background)

Seasonal deciduous (offset period)

Stress deciduous (offset period, background)

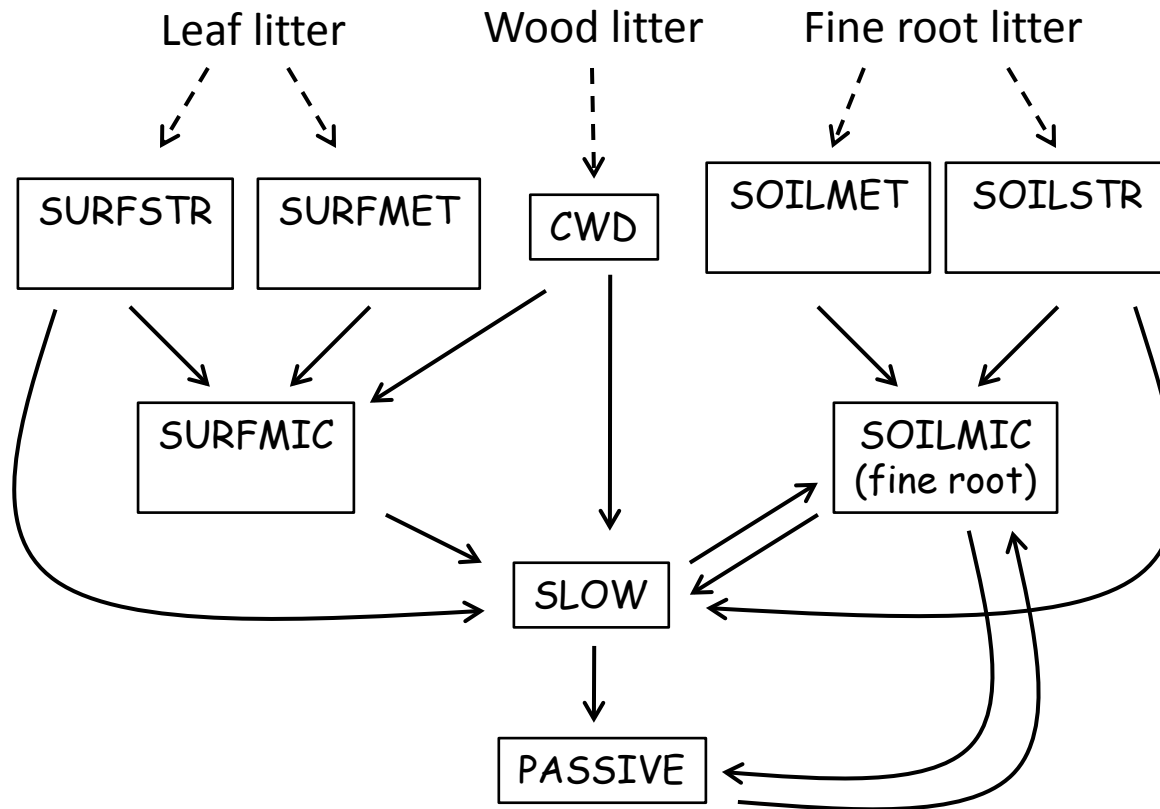
Mortality (woody plants, 2% per year)

Leaf and fine roots (displayed, storage)

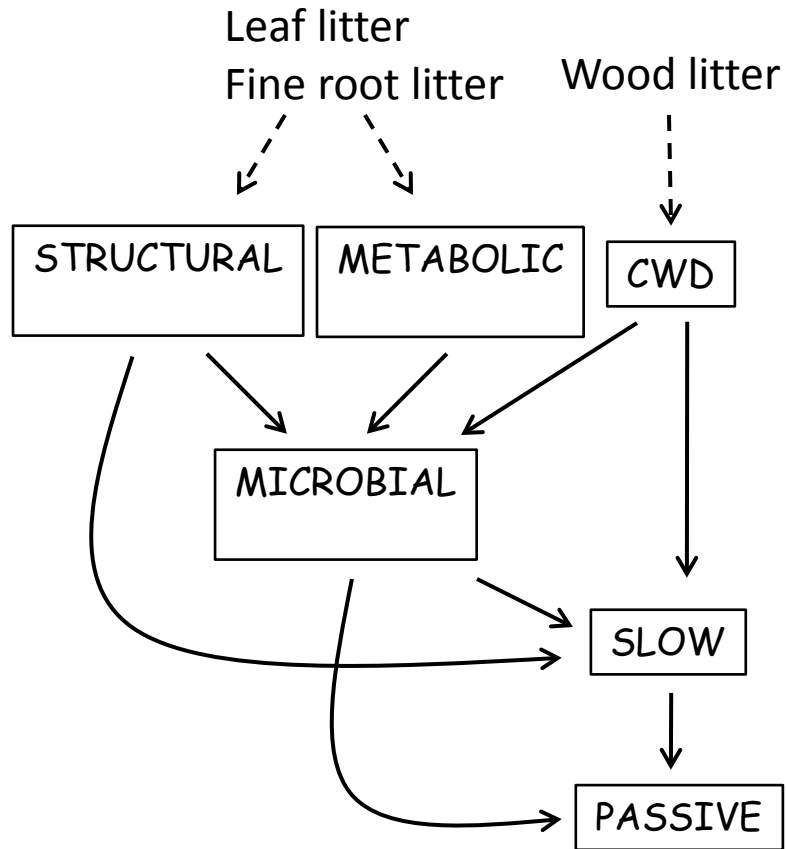
Live stem, dead stem

Live coarse root, dead coarse root

CASA' soil bgc (PFT-based, C-only)



CASA-CNP soil bgc (PFT-based, CNP)



CN soil bgc (column-based, CN)

