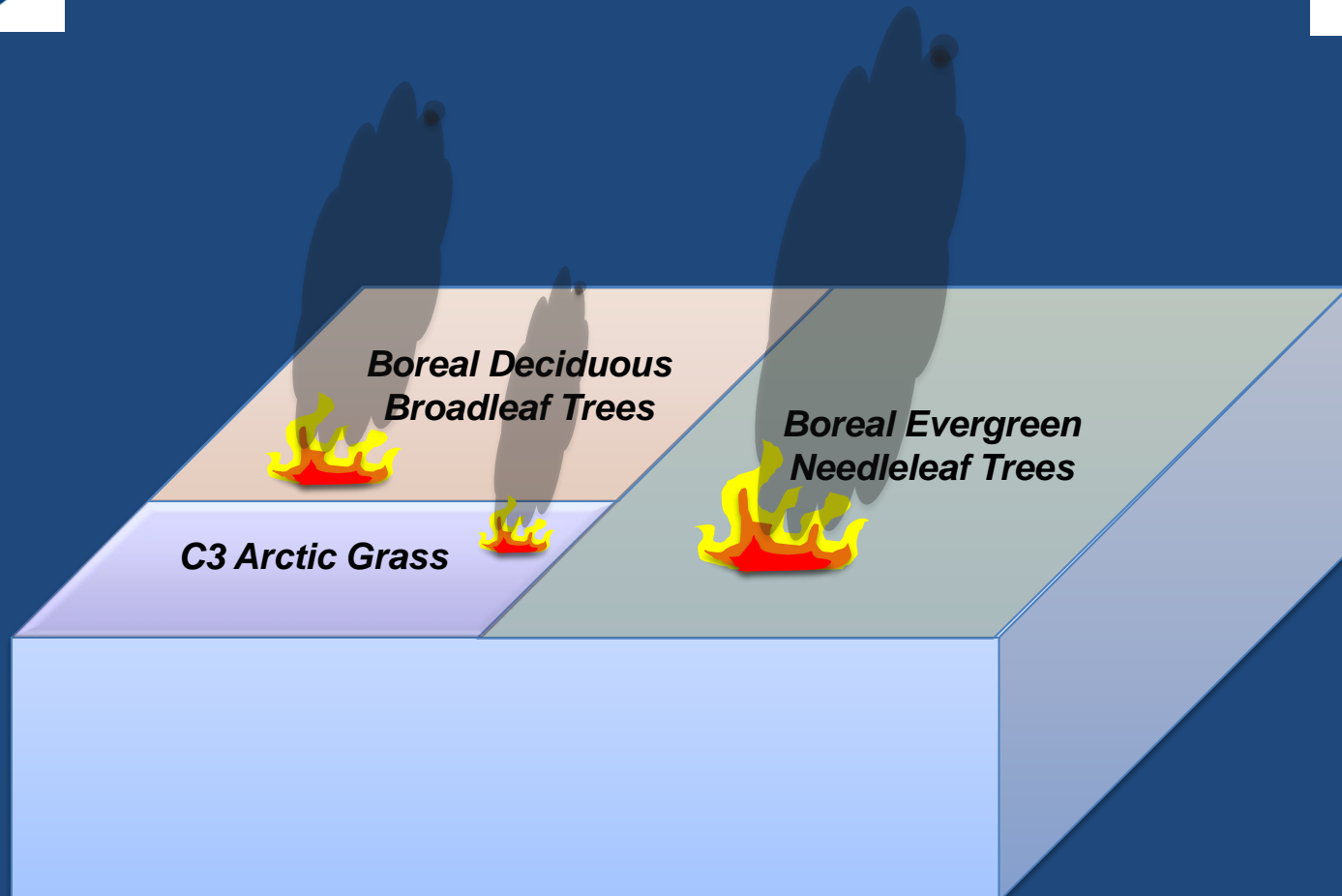


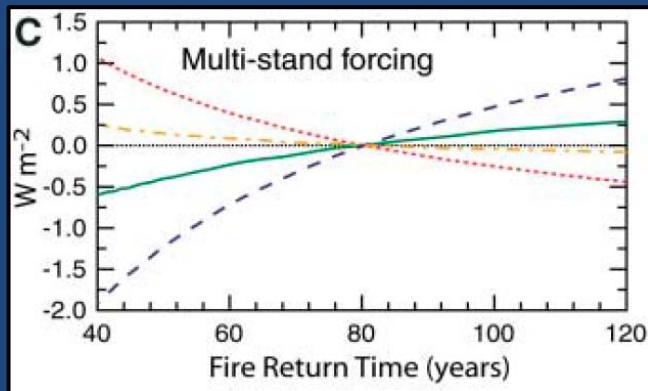
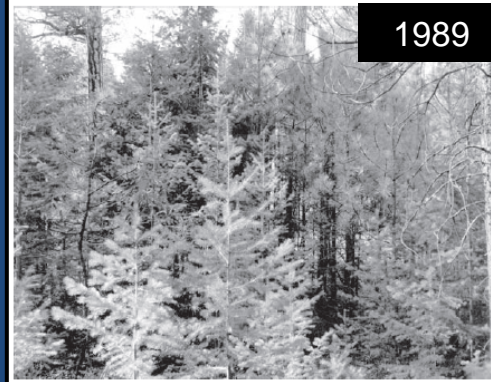
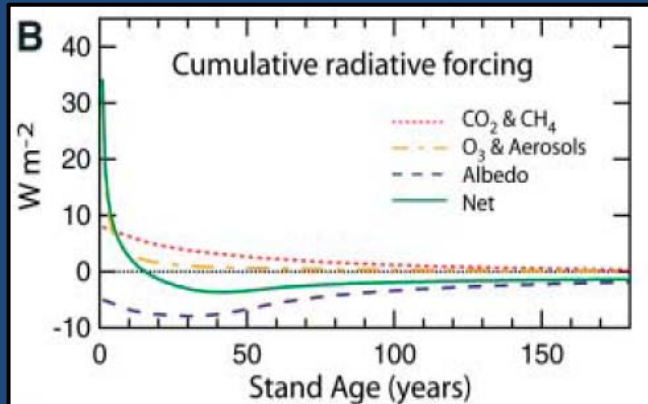
Consequences of post-fire succession for carbon and energy fluxes in CLM



Brendan Rogers, James Randerson
CESM Joint Land and Biogeochemistry Working Group
March 16, 2011



Background: Fire Effects



Randerson et al. [2006]

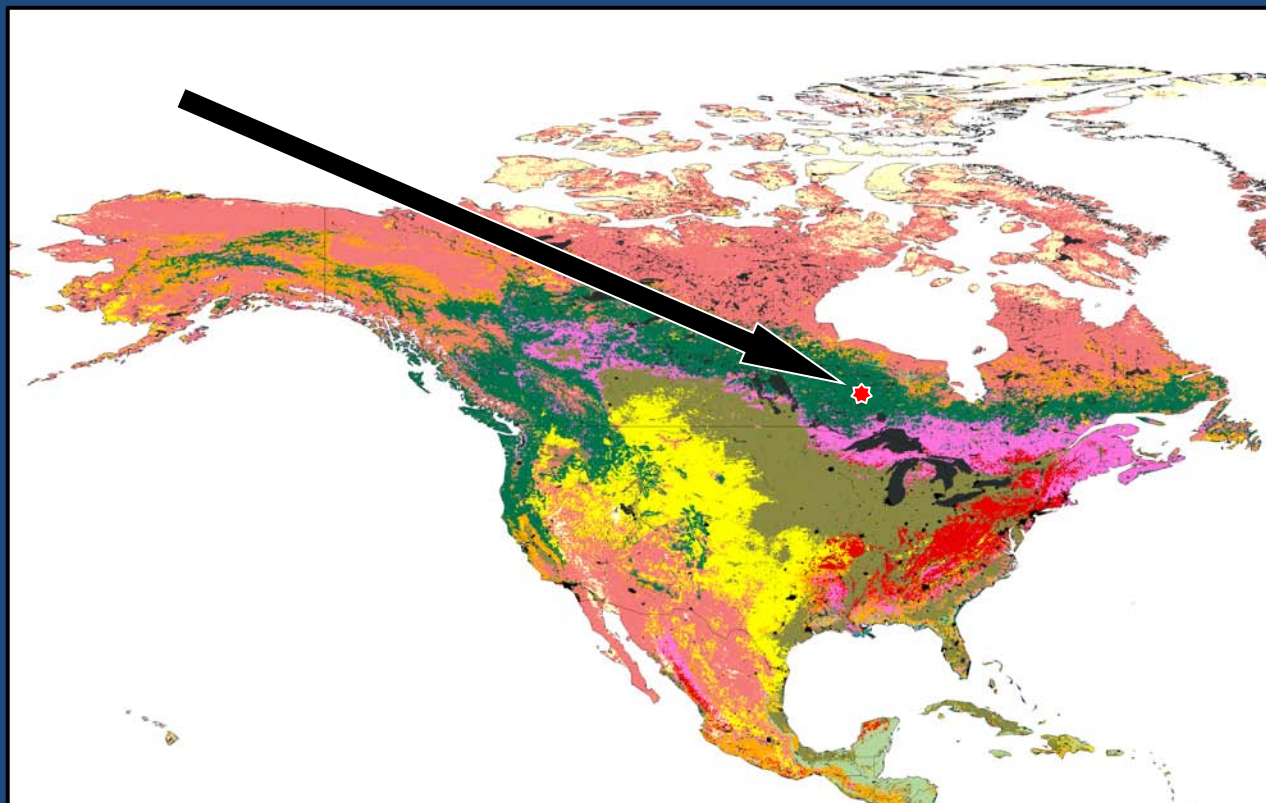
Graham et al. [2004]

Fire effects on climate:

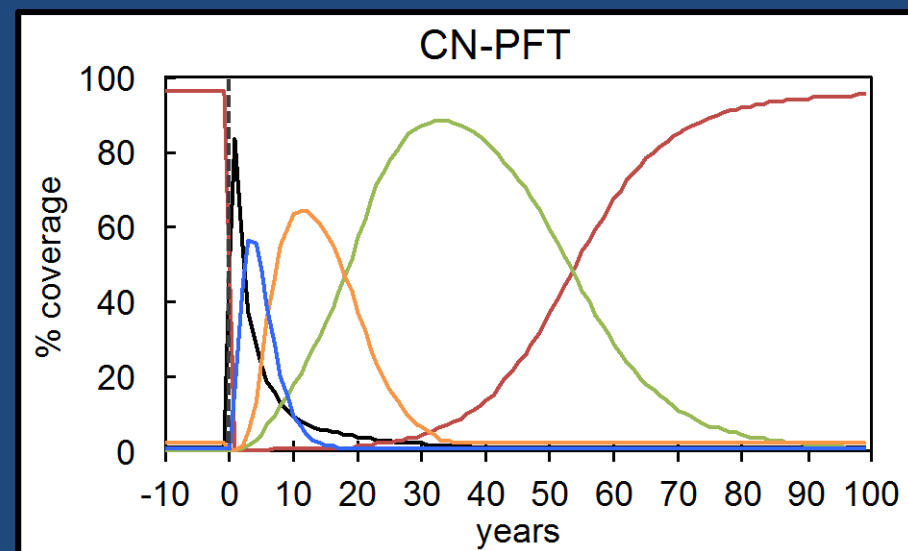
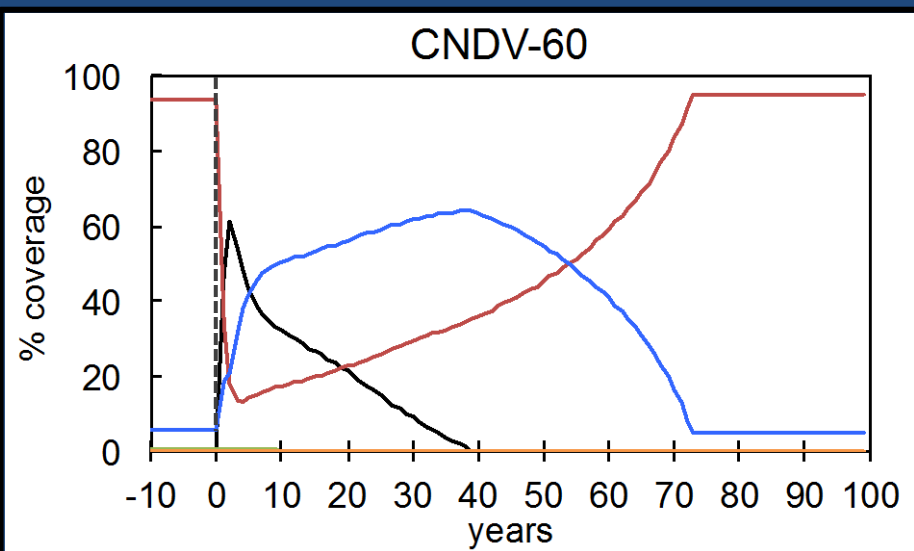
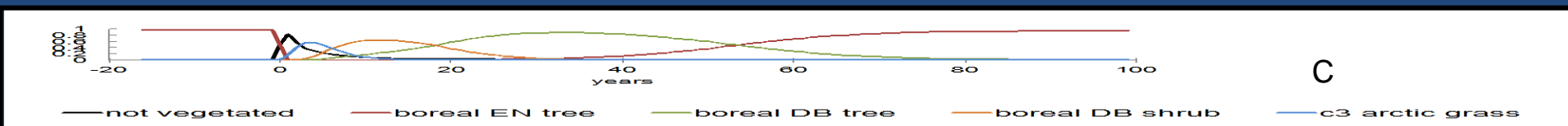
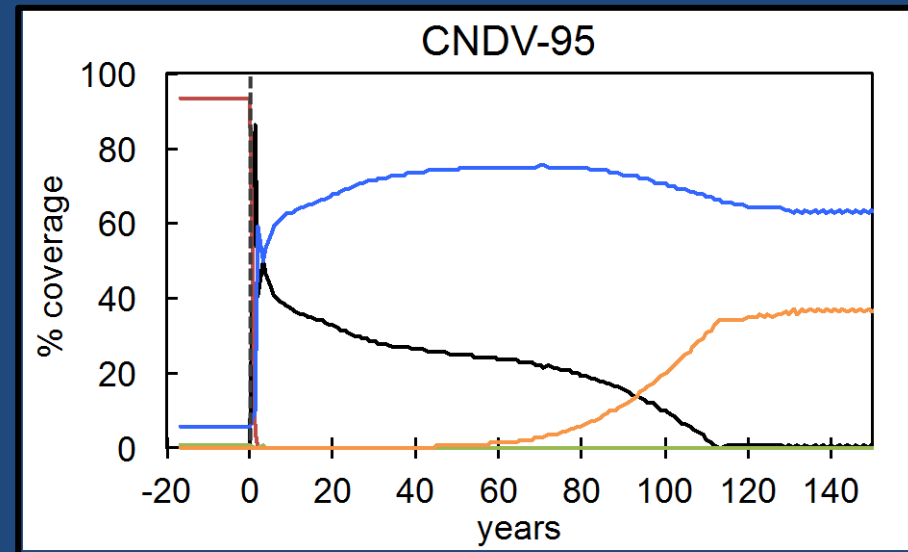
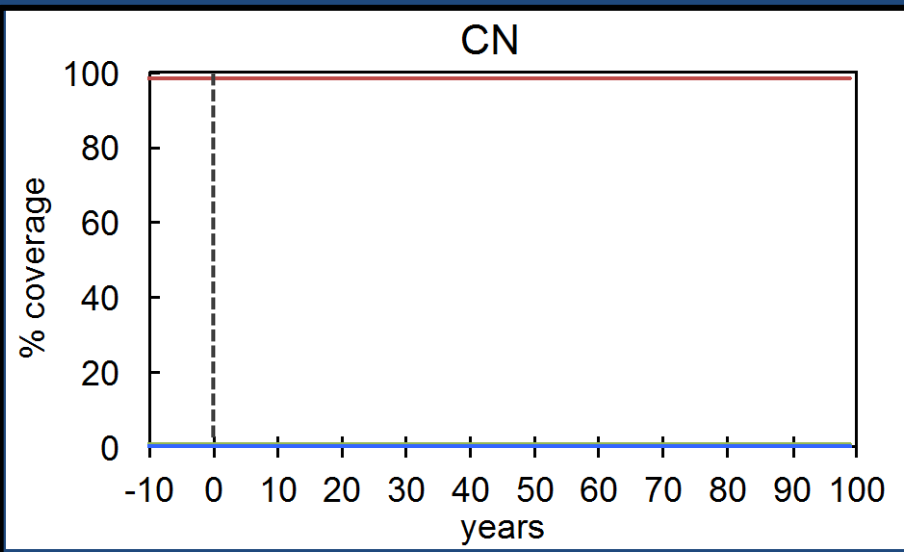
- Emissions
 - Greenhouse gases
 - Aerosols & black carbon
- Landscape
 - ecosystem carbon
 - albedo
 - evapotranspiration
 - sensible heat
 - turbulent transfer

Model Experiments

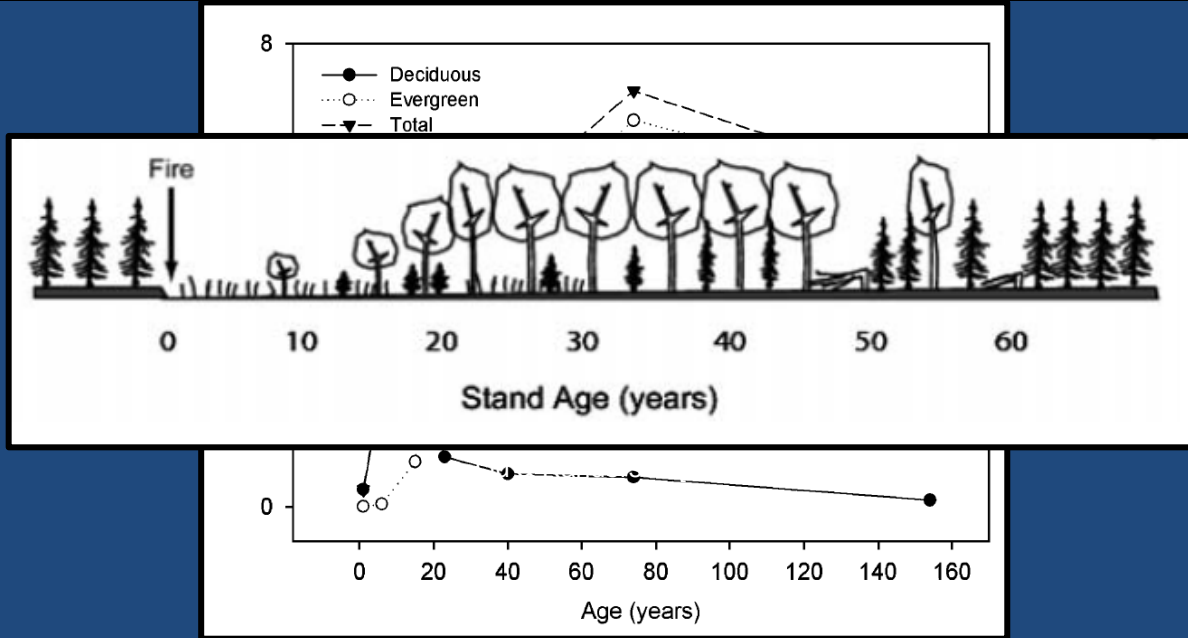
1. CLM-CN, 95% burn (CN)
2. CNDV, 95% and 60% burn (CNDV-95, CNDV-60)
3. CLM-CN, 95% burn + prescribed PFT succession (CN-PFT)



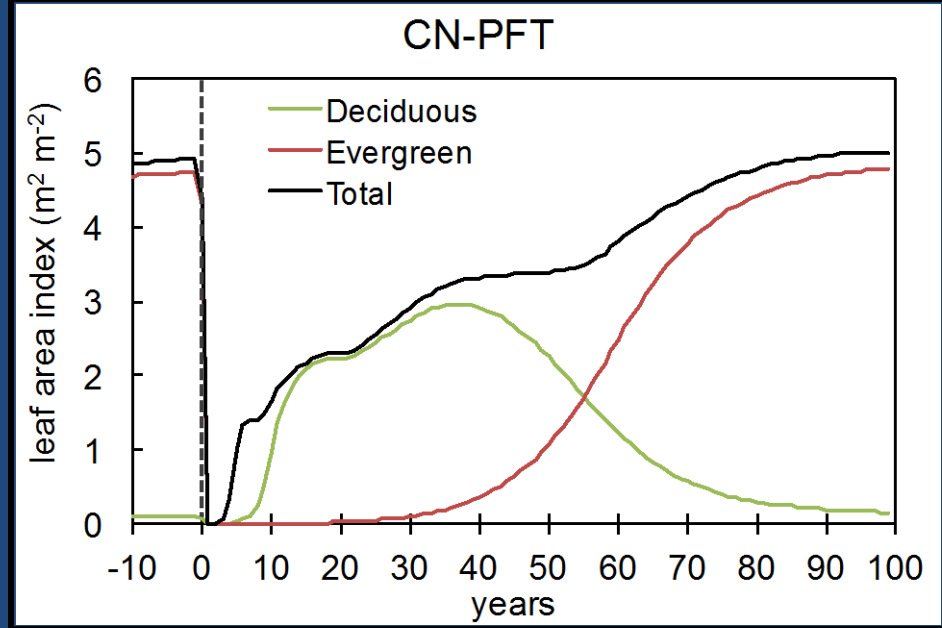
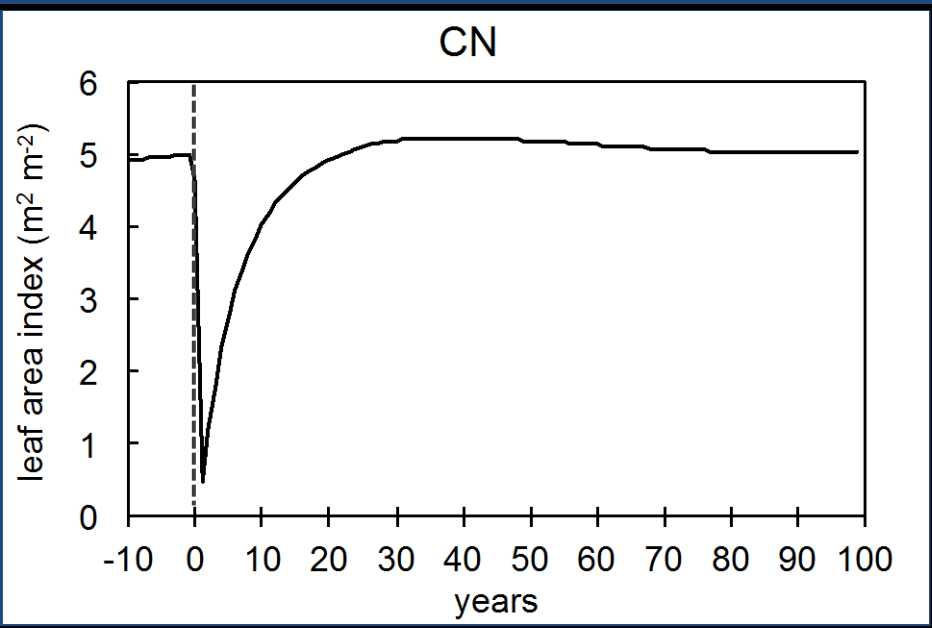
PFTs



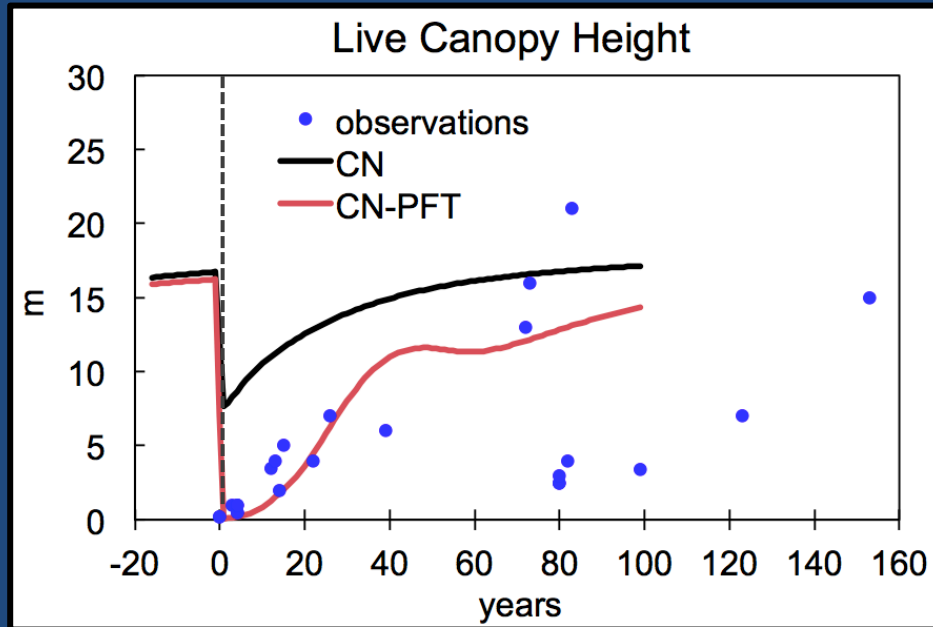
LAI



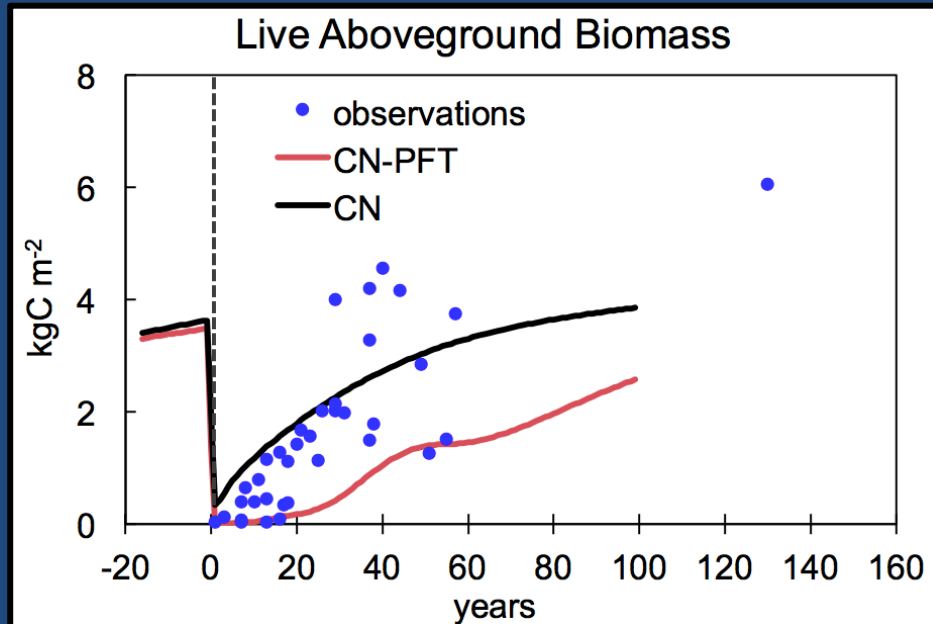
Goulden et al. [2010]



Height & Biomass



Amiro et al. [2006a]

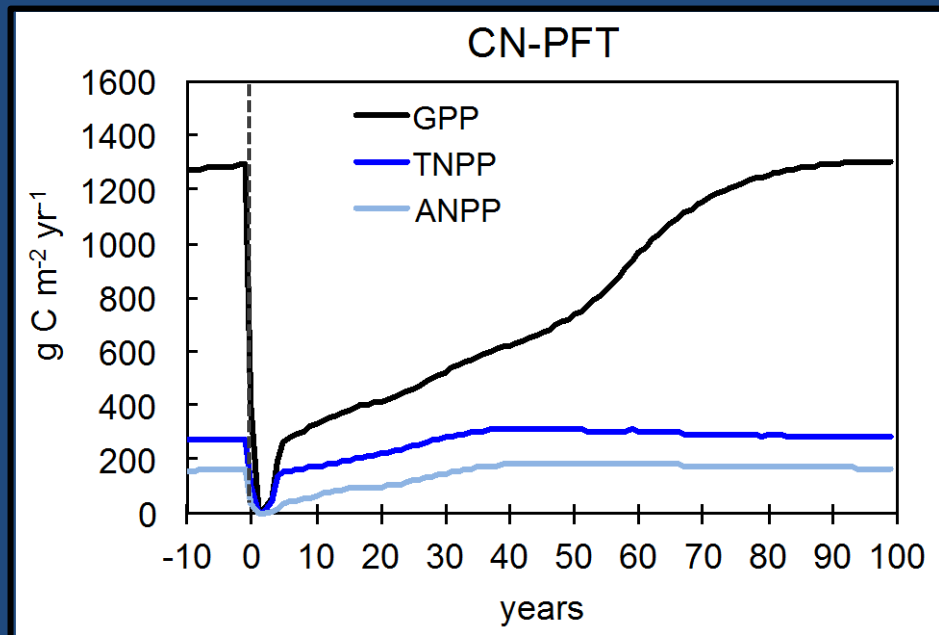
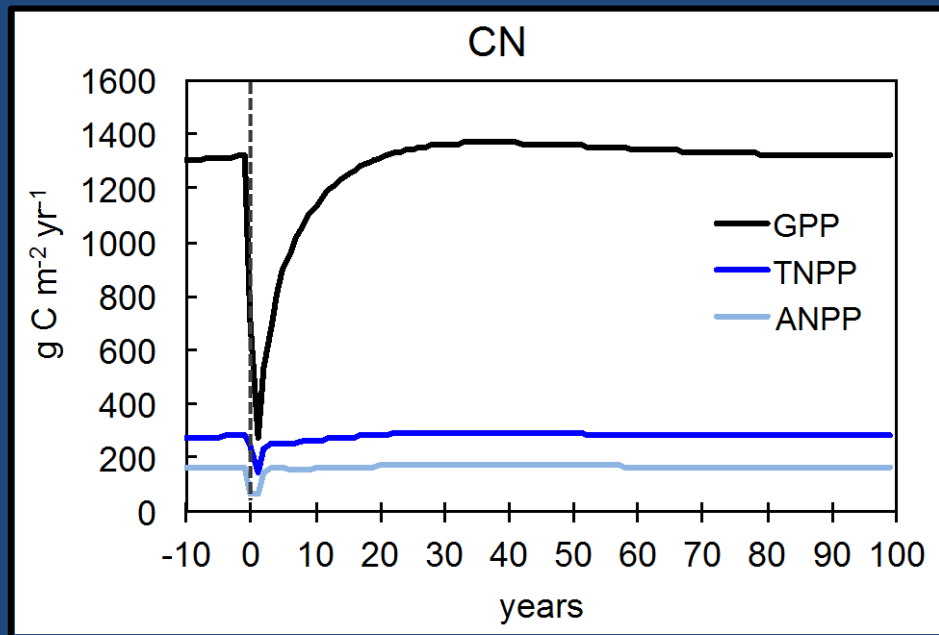


Johnson et al. [2000]

Carbon Fluxes



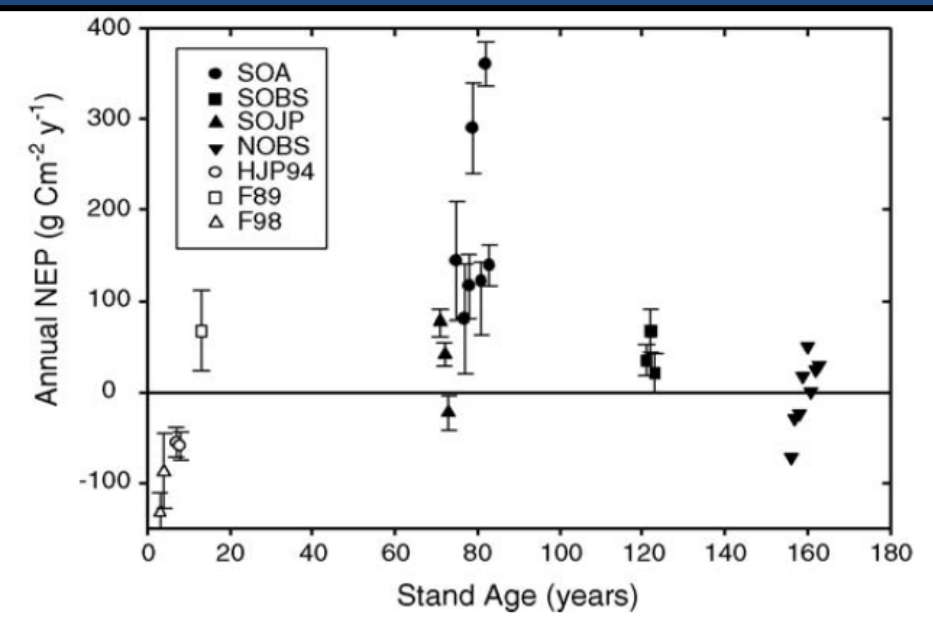
Goulden et al. [2010]



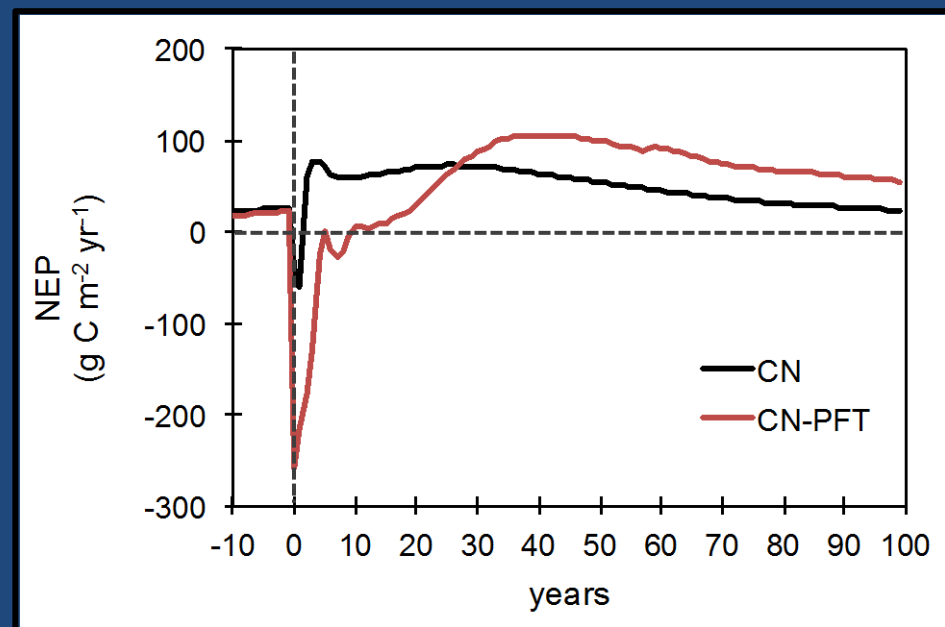
NEP



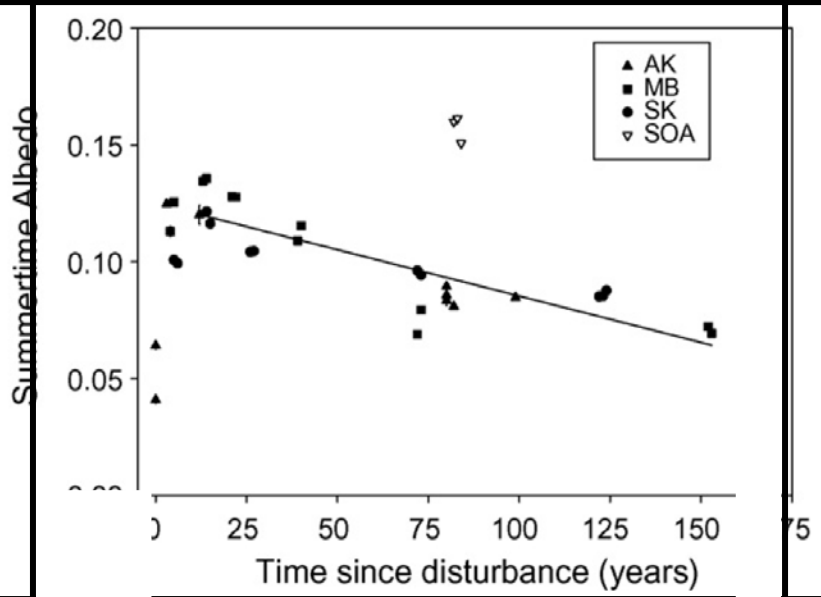
Goulden et al. [2010]



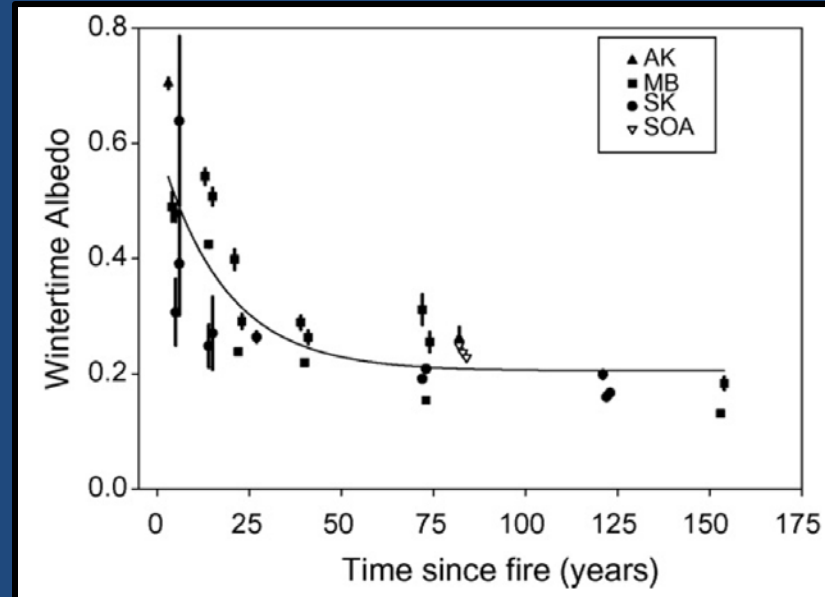
Amiro et al. [2006b]



Albedo

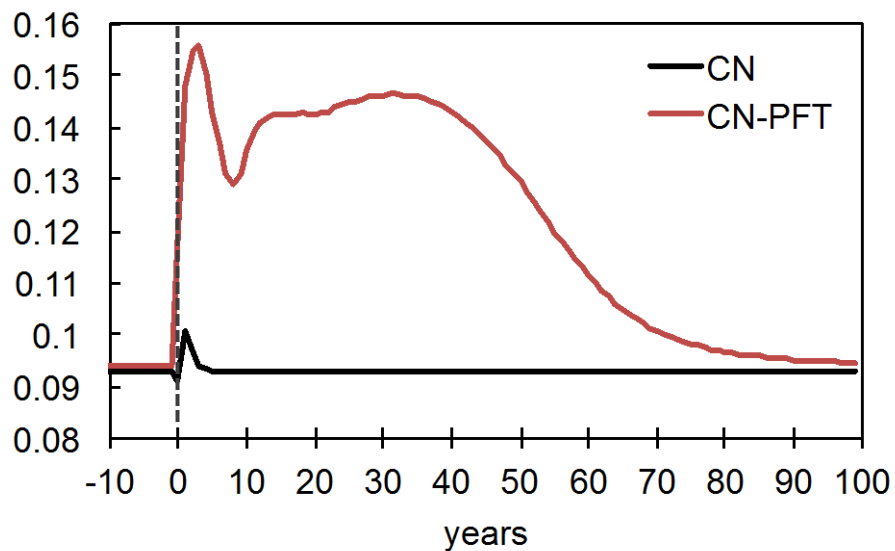


Albritton et al. [2006a]

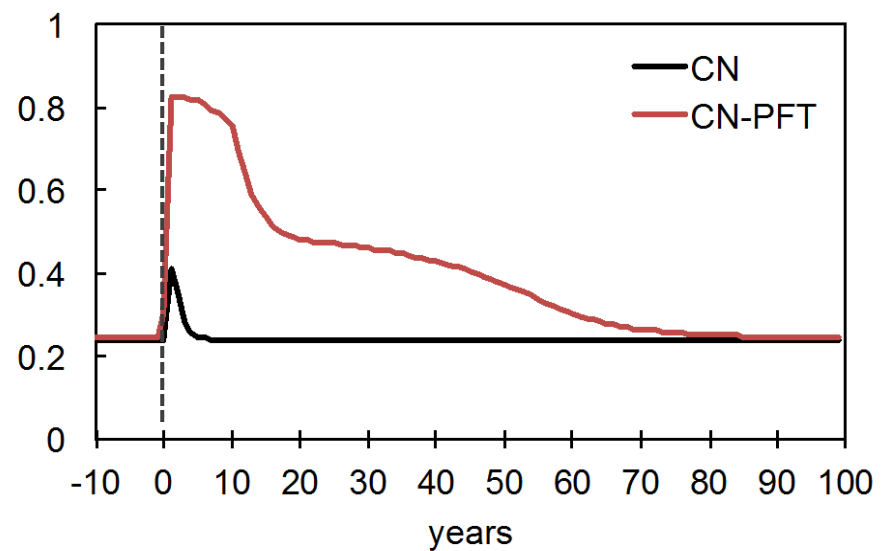


Amiro et al. [2006a]

Summer (July) Albedo

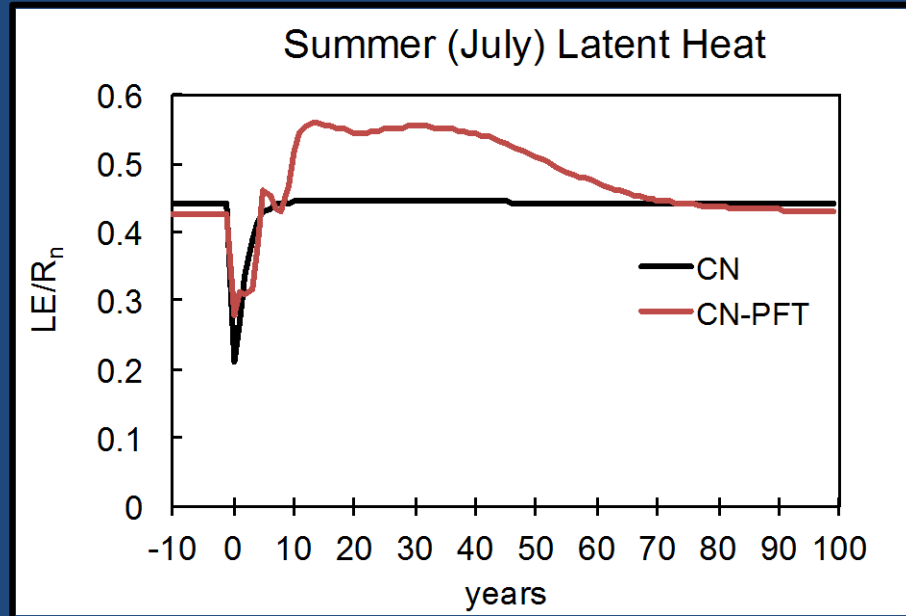
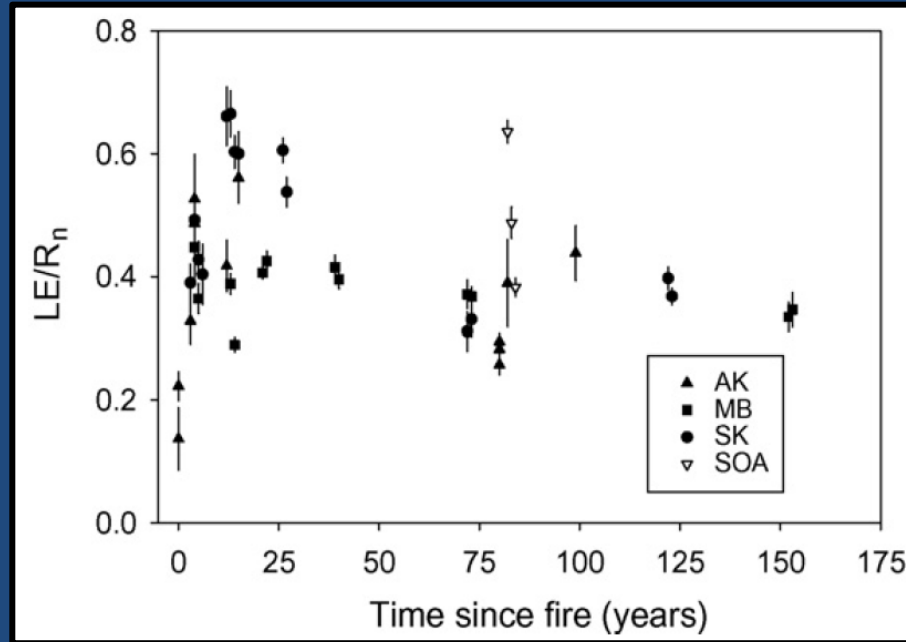


Winter (Jan - Feb) Albedo

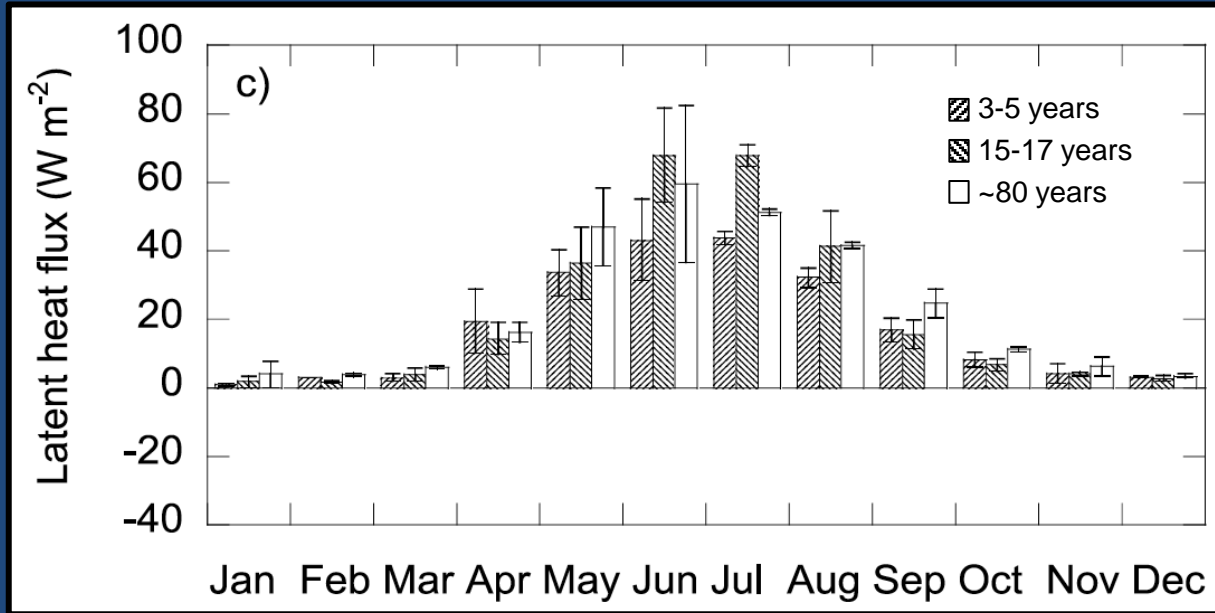


Latent Heat

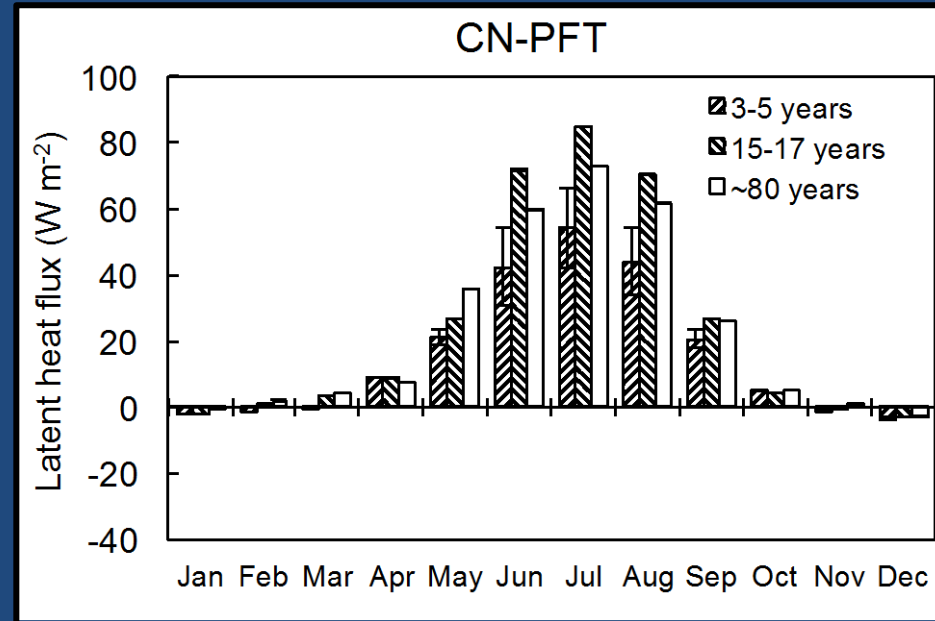
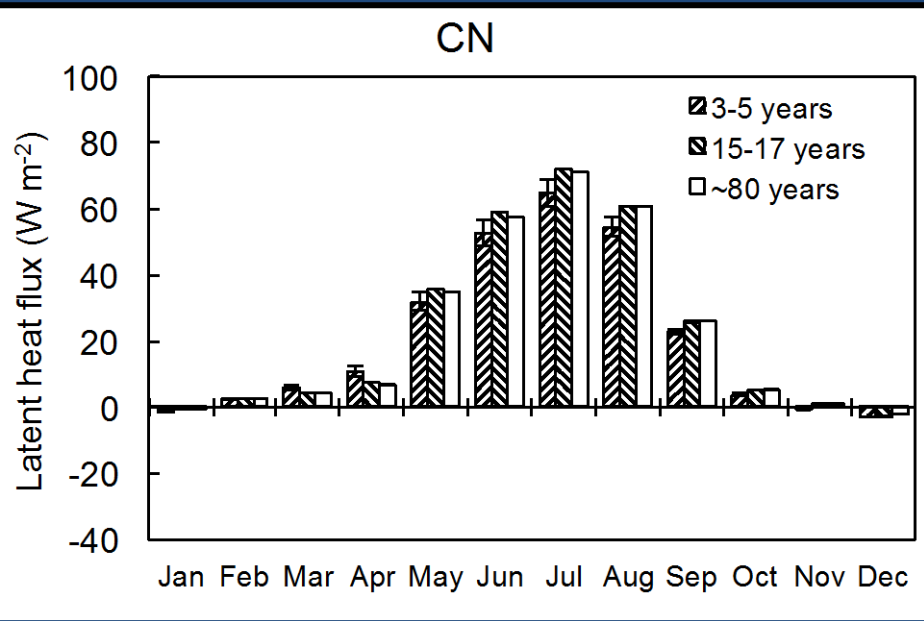
Amiro et al. [2006a]



Latent Heat

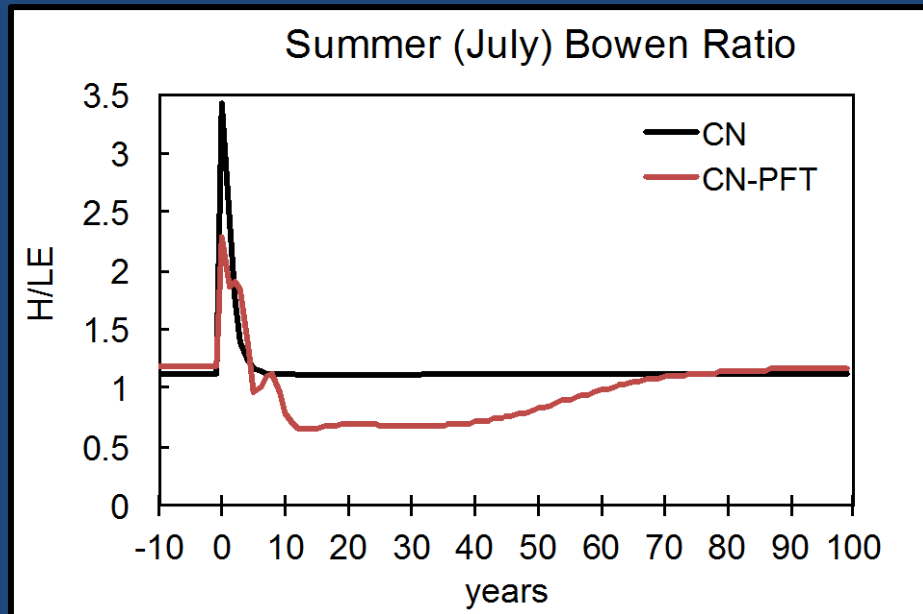
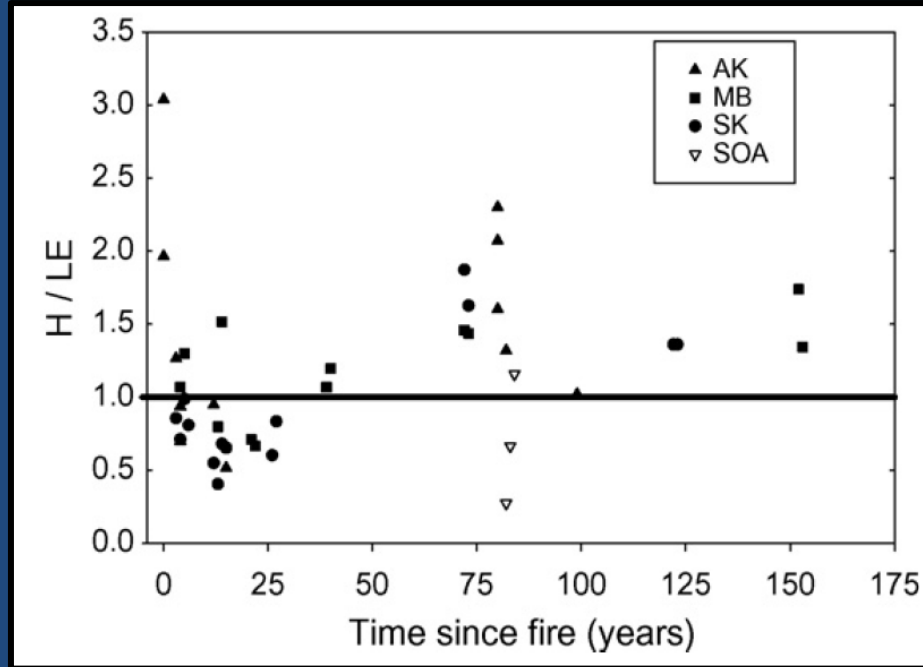


Liu & Randerson [2008]



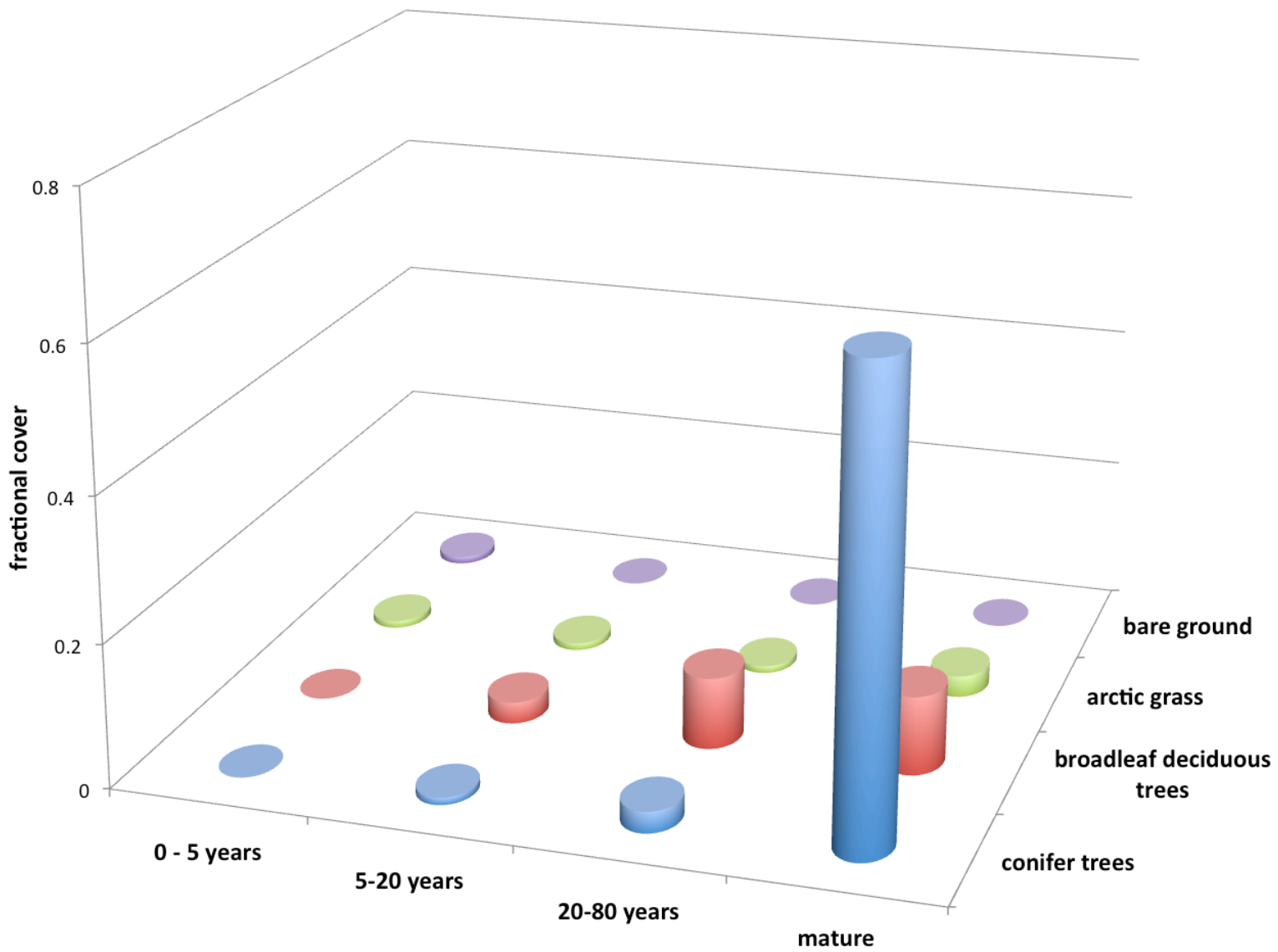
Bowen Ratio

Amiro et al. [2006a]



Future Directions

- Address known issues
 - boreal DB tree NPP
 - boreal EN tree GPP
 - heterotrophic respiration
 - on-site black carbon deposition
- Work with CNDV to represent PFT-succession
- Introduce age classes
 - more easily simulate succession
 - address issues of scale



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 - address issues of scale
- Expand globally
- Modeling experiments
 - consequences of fire on regional/global vegetation structure, climate



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