

COS-based flux partitioning in a tropical rainforest

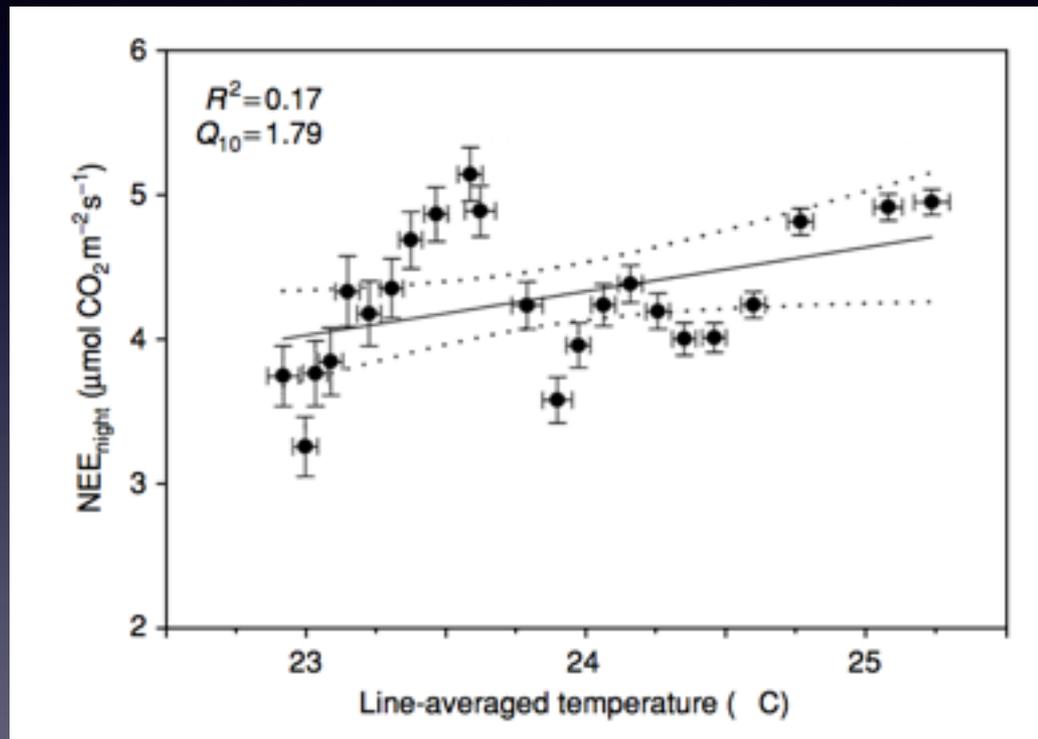
La Selva, Costa Rica

Oct 2013 to Feb 2014



questionable flux partitioning in tropical rainforests

standard flux partitioning based on nighttime NEE vs temp:
no clear correlation, and small temperature range!



Loescher et al 2003: “80% of nighttime flux measurements were made under conditions with low u^* , questionable conditions for eddy covariance.”

COS measurements: EC, soil chambers, leaf chambers



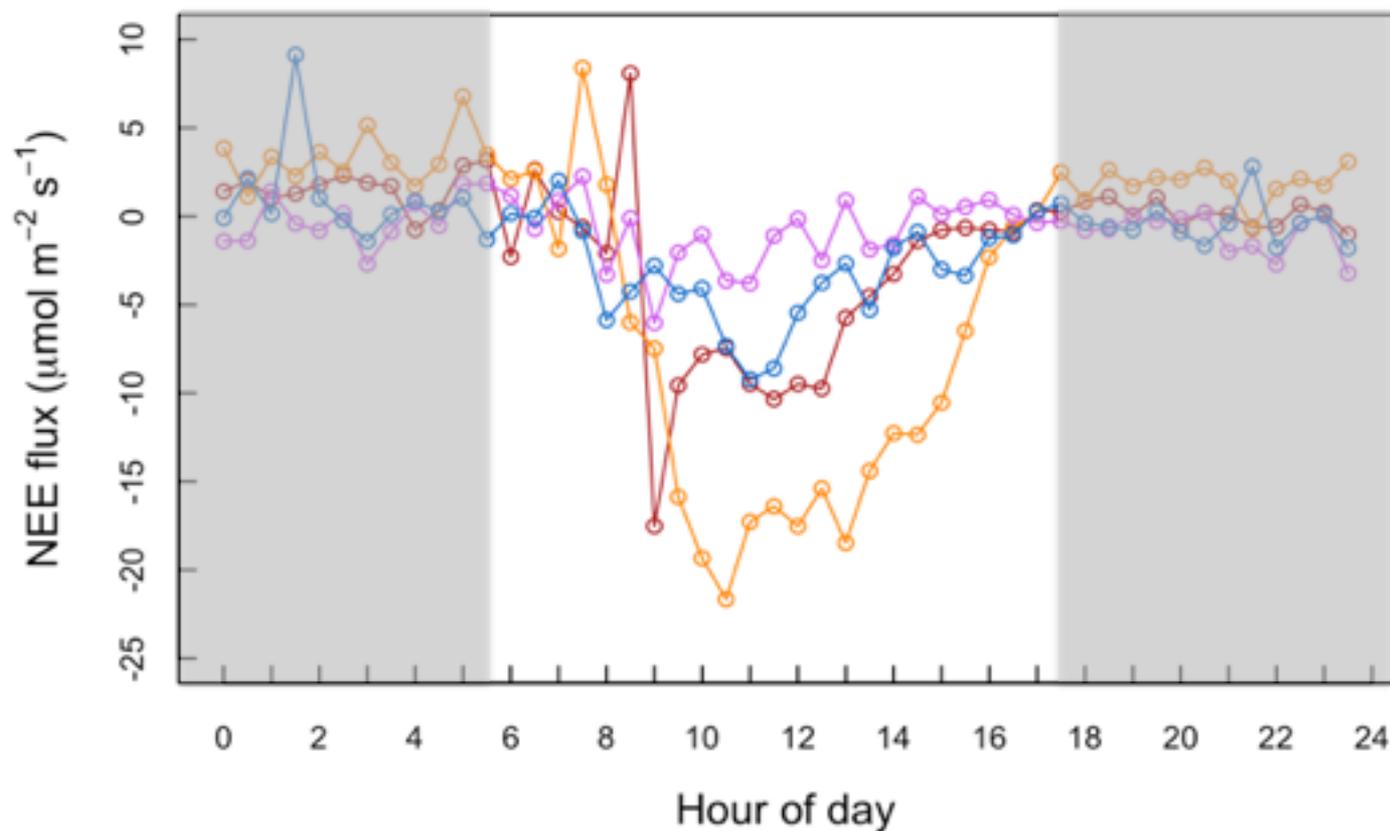
instrumental
"enclosure"

net ecosystem exchange (NEE) of CO₂

diurnal mean fluxes

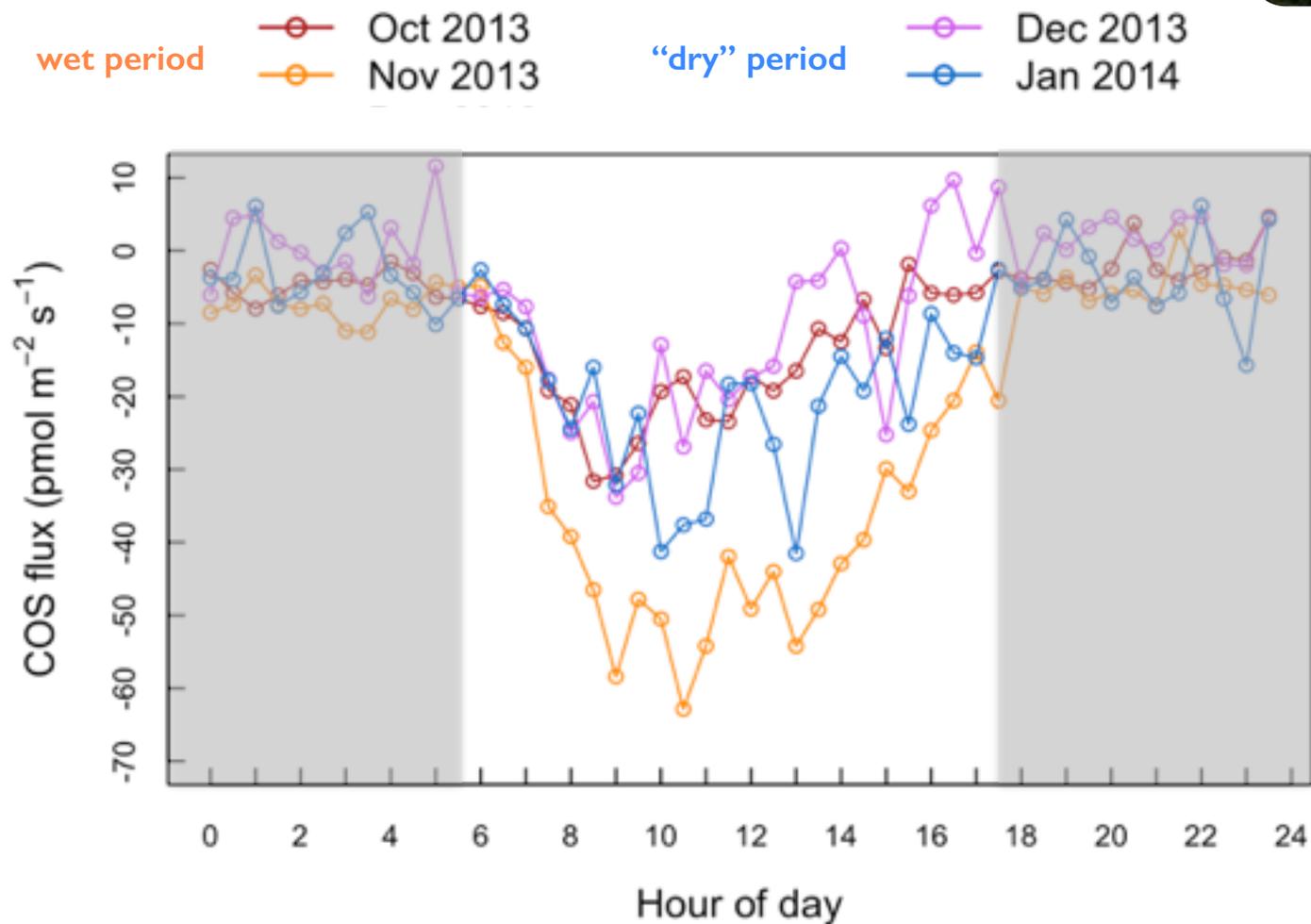


wet period Oct 2013 “dry” period Dec 2013
Nov 2013 Jan 2014



net ecosystem exchange of CO₂

diurnal mean fluxes



what do we need for COS-based partitioning?

soil COS fluxes

LRU - leaf COS and CO₂ fluxes

PAR profiles

leaf fluxes at different heights

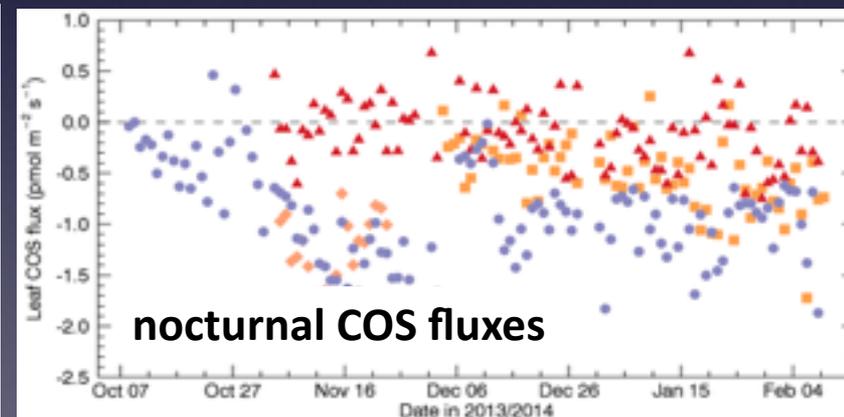
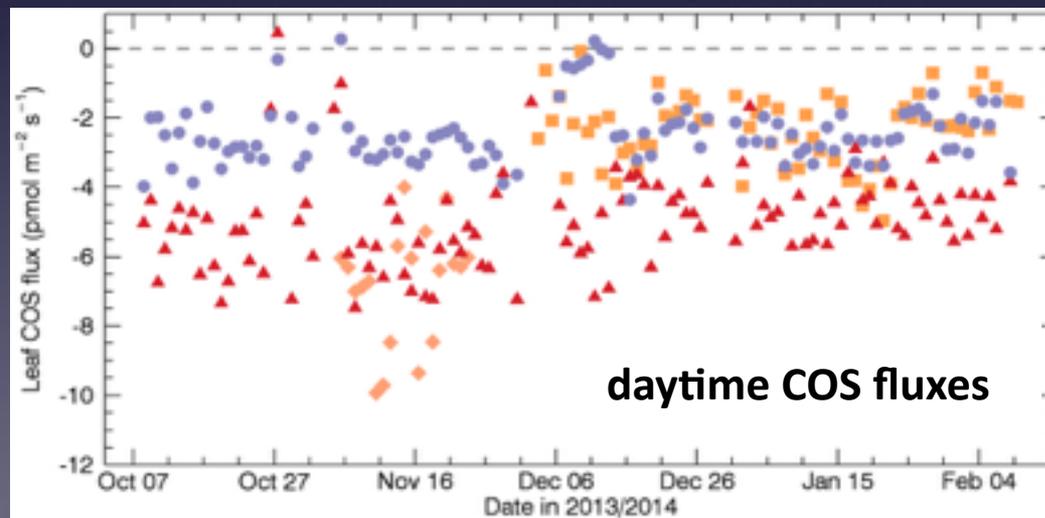
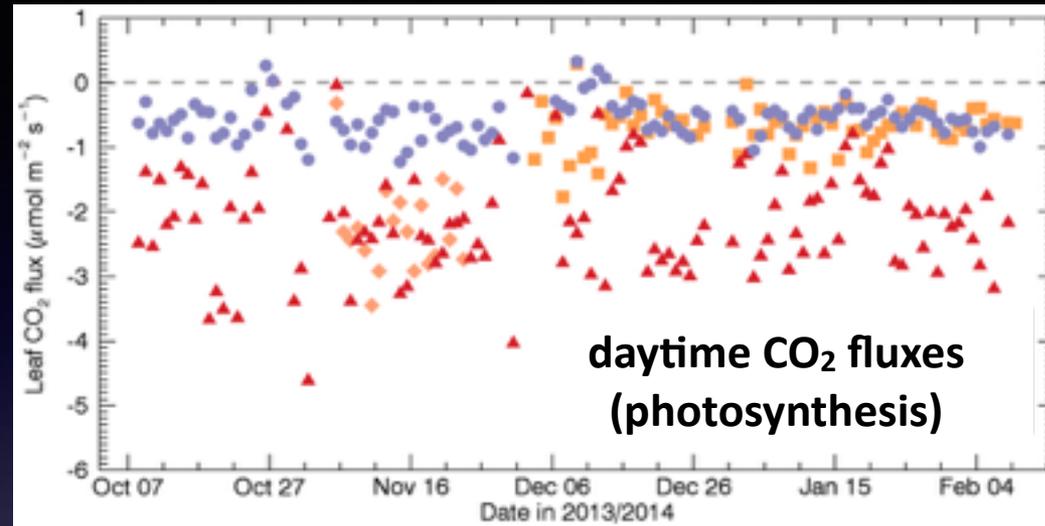


sun leaves

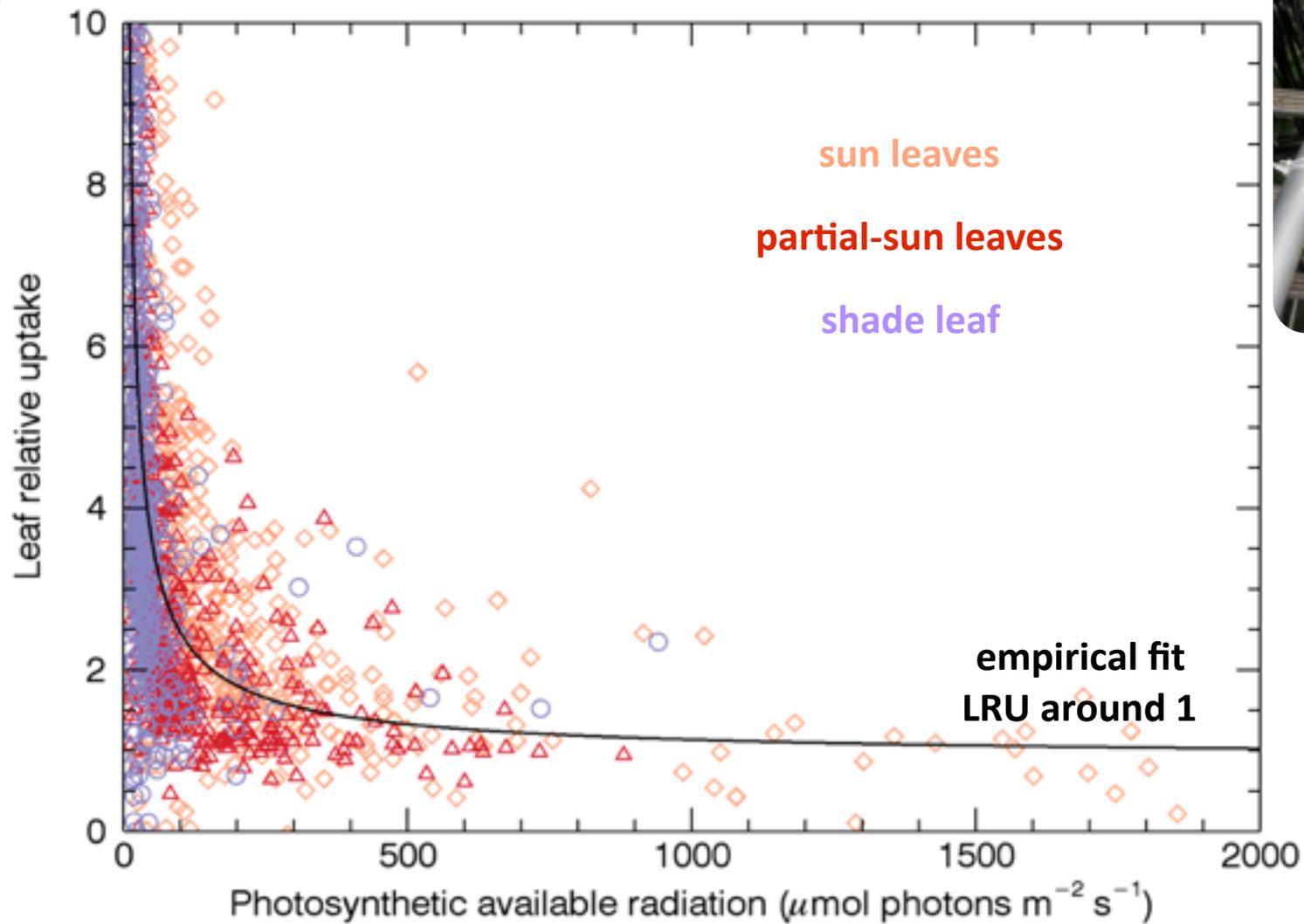
partial-sun leaves

shade leaf

branch chambers



LRU vs PAR similar along canopy profile

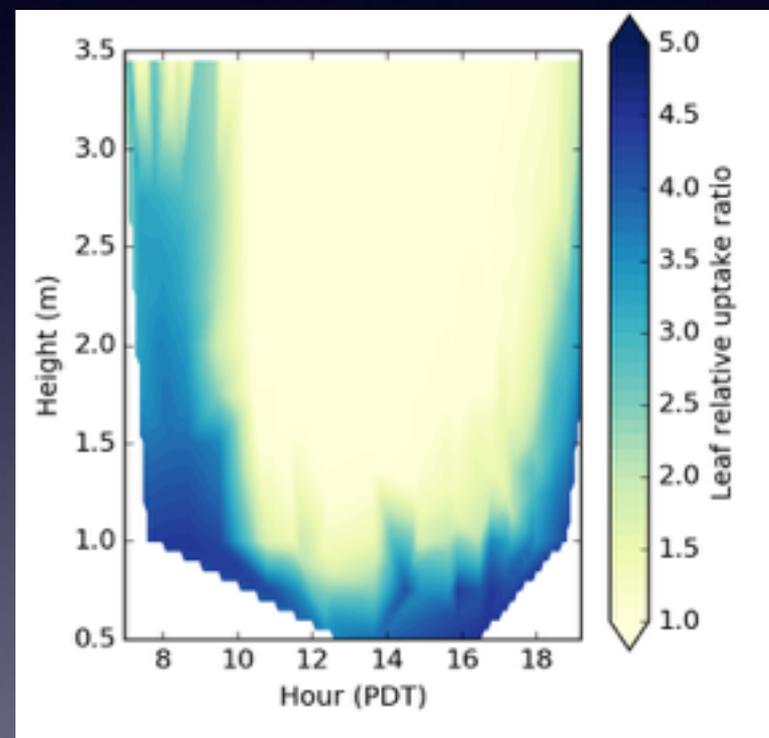
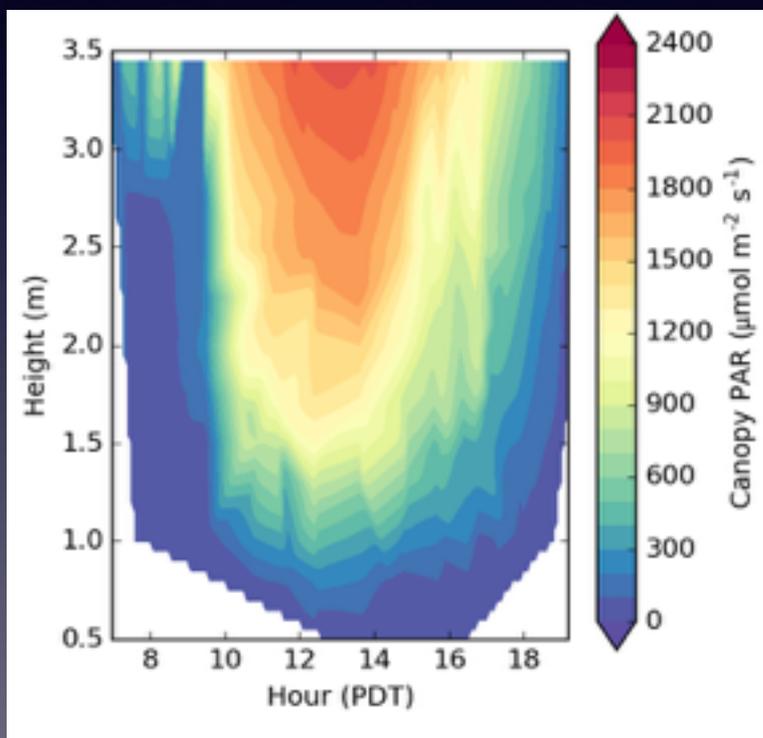


how do we get from the leaf to canopy scale?

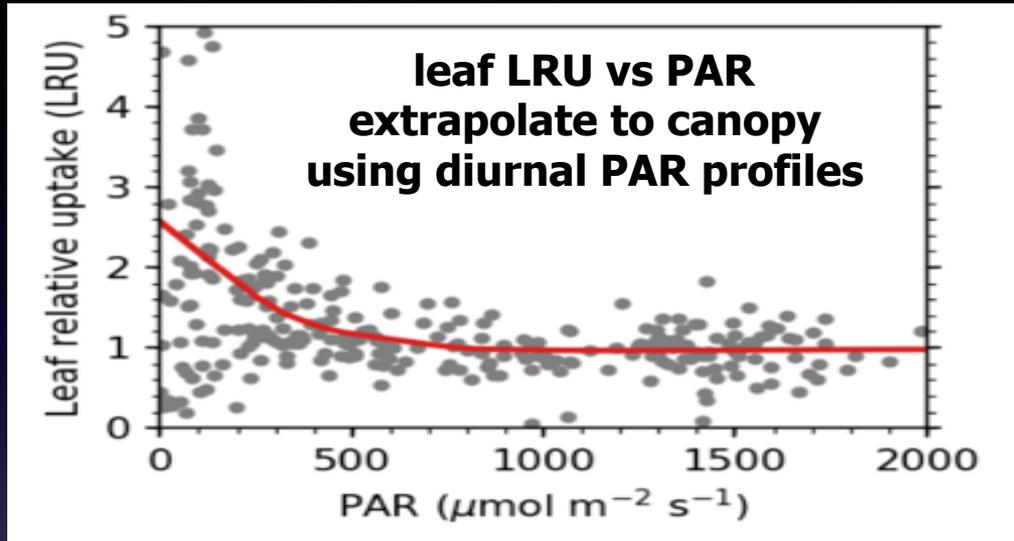
example from
another site

canopy PAR profiles

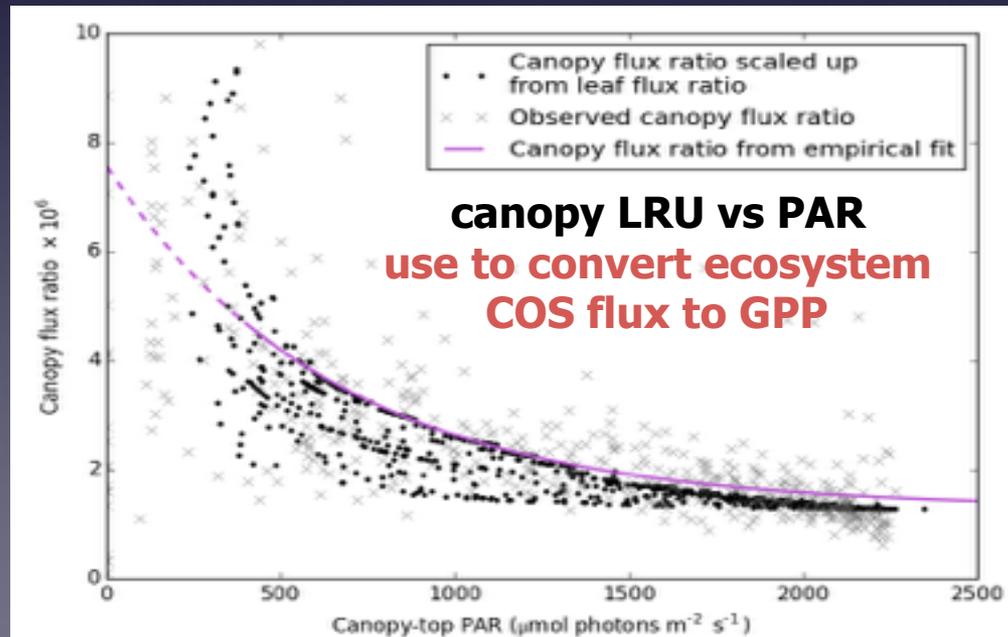
canopy LRU profiles



how do we get from the leaf to canopy scale?

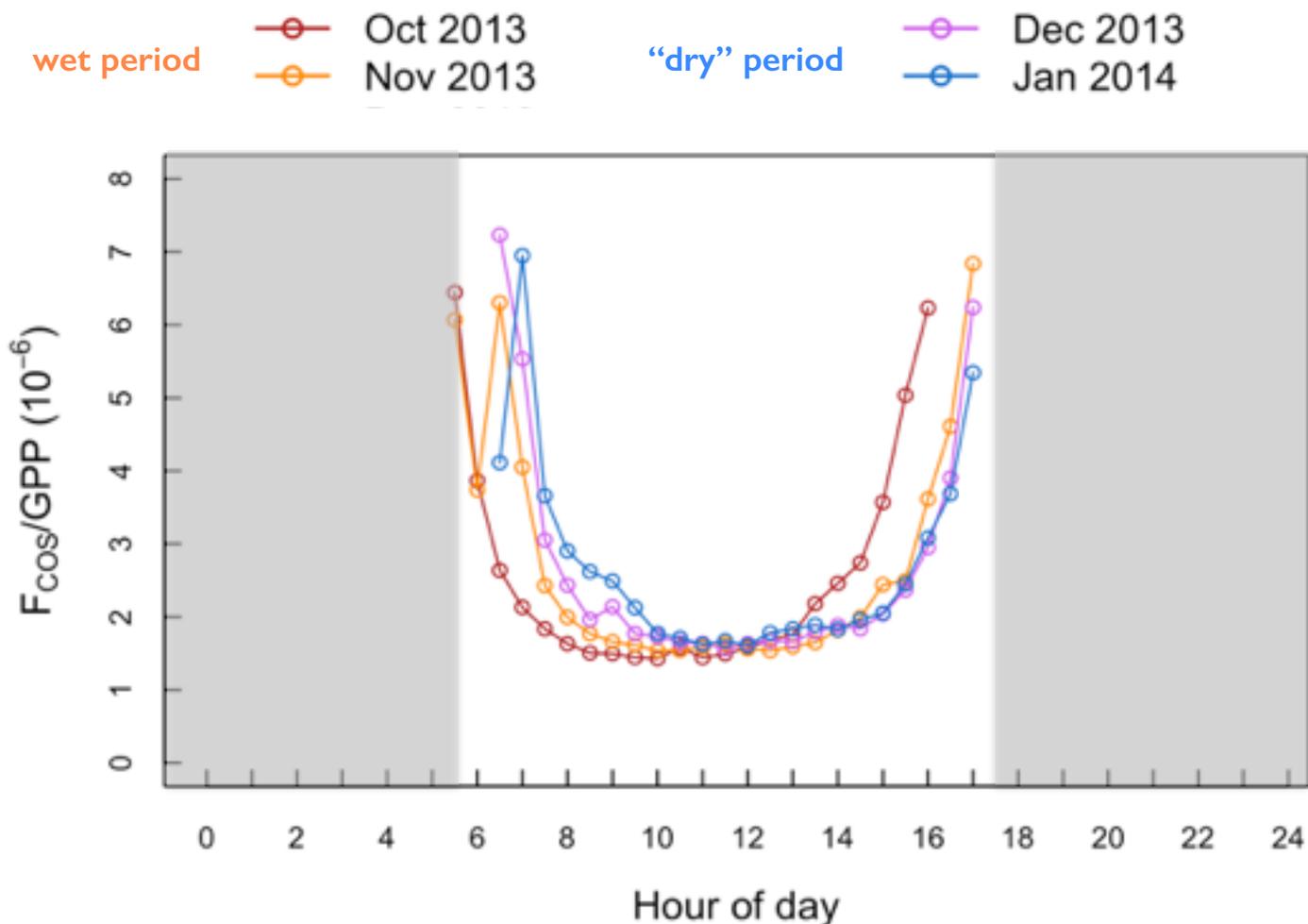


example from
another site



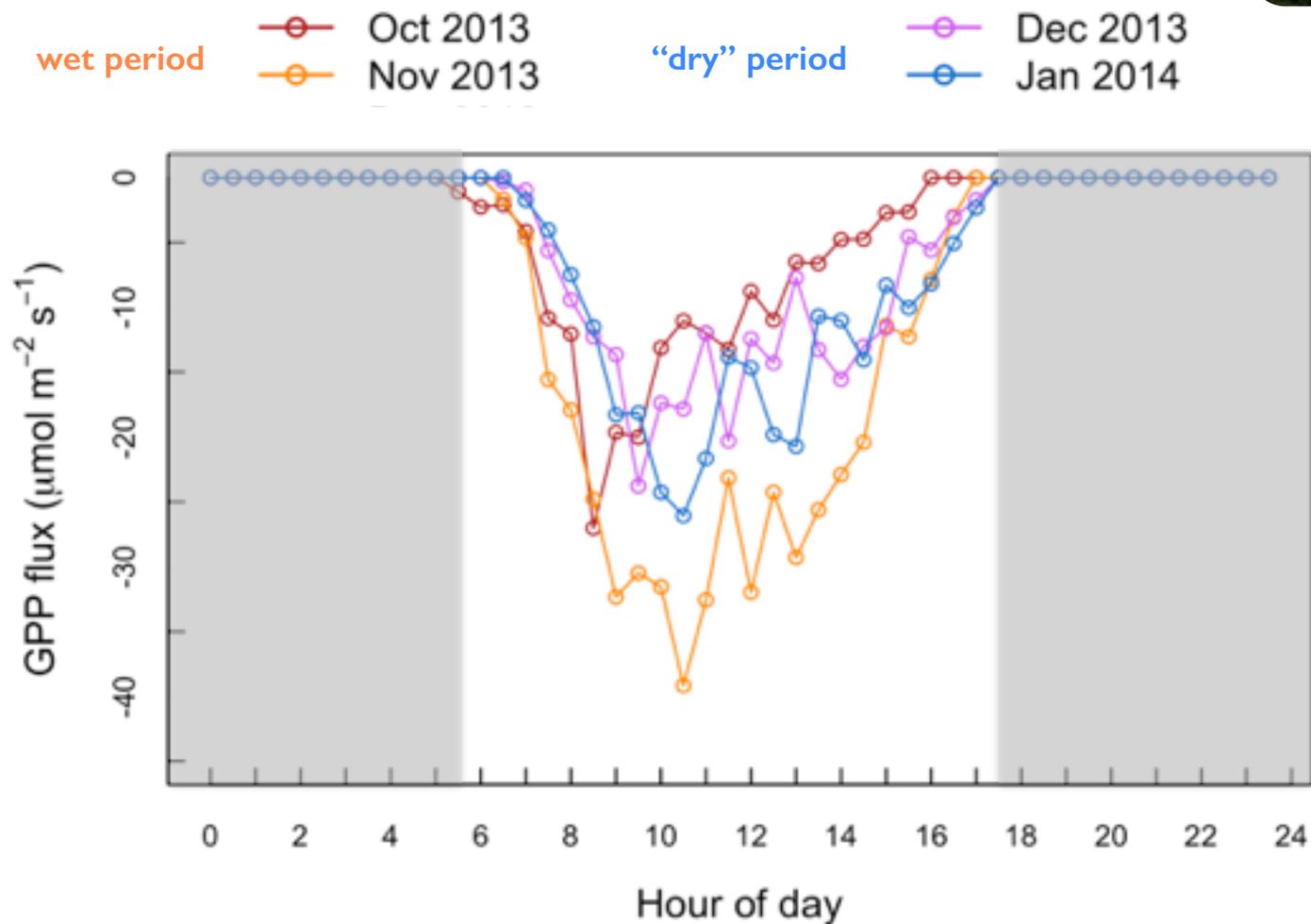
COS:CO₂ flux ratios, from leaf chambers

diurnal mean ratios (not LRU)



canopy GPP from COS fluxes

diurnal mean fluxes



Ecosystem respiration (R_{eco}) as residual

diurnal mean fluxes, work in progress



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