

Evaluation of key parameters controlling phenology-induced variability of surface fluxes in land surface models

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3 models - 3 approaches to phenology

LSA-SAF: remote sensed LAI

ISBA: Prognostic LAI, parameters from TRY database

ORCHIDEE: Prognostic LAI, dedicated phenology module

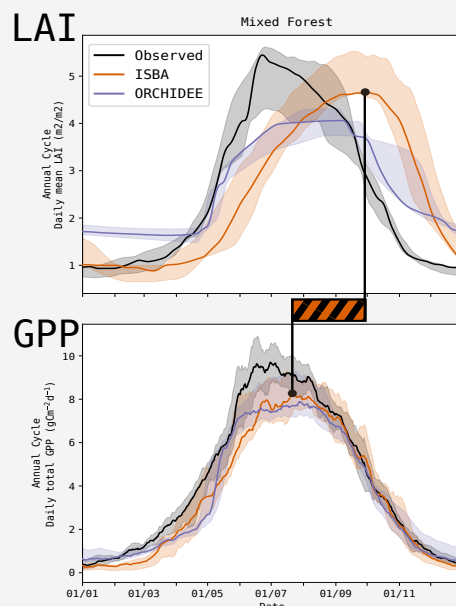
Evaluation of surface fluxes and phenology with FLUXNET2015 & Copernicus GLS LAI data

Delayed LAI cycle

Seasonality of surface fluxes mainly determined by meteorological forcing

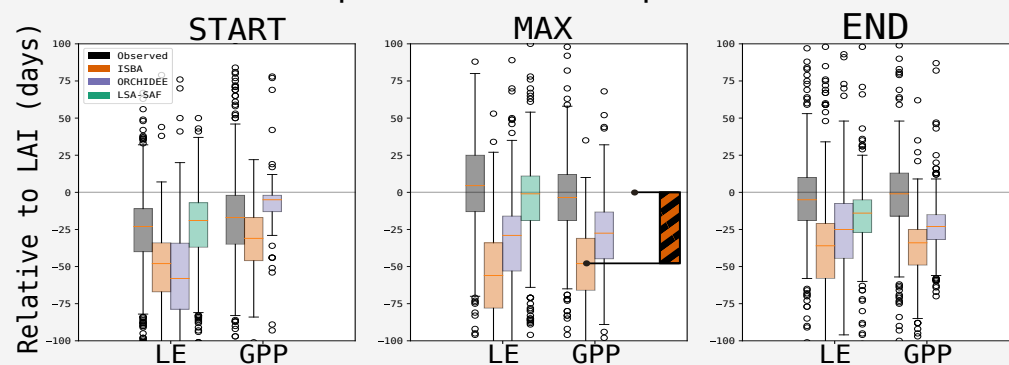
Underestimated GPP

Are models sufficiently sensitive to LAI?



Relation LAI ~ surface fluxes

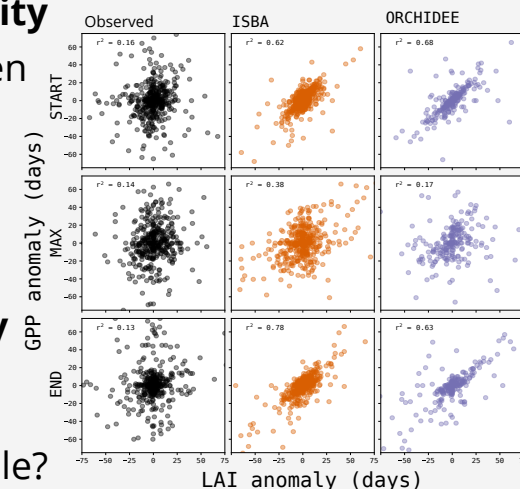
Observations: Seasonal cycle LE & GPP roughly follows LAI
Models: GPP & LE precede LAI (except LSA-SAF)



Phenology-induced variability

No strong correlation between anomalies start/max/end observed GPP & LAI
Contrary To Models

Expected impact phenology on fluxes not evident from observations (LAI)
Other veg. index more suitable?



Improving LAI ~ Surface flux

Tuning parameters:
Vcmax, SLA, ...
limited improvement

Revise biomass allocation modules?
Non-structural carbohydrates needed to kickstart LAI

