

# Performance of dynamic vegetation in land-surface models

## A multi-site comparison

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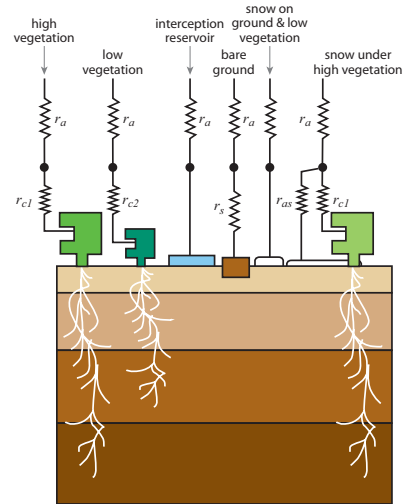
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# Two different Land-Surface Models $\longleftrightarrow$ 23 sites of varying vegetation types and aridity

ECLand (Balsamo et al., 2009; Dutra et al., 2010; Bousetta et al., 2021)



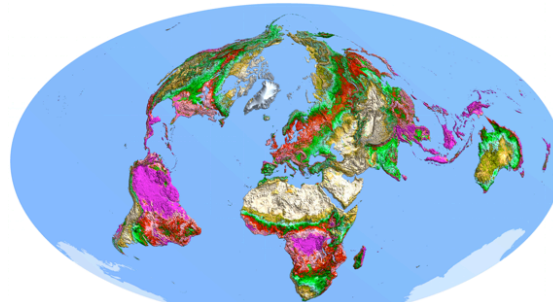
IFS Documentation, 2016



Tower observations (FLUXNET, TERENO)

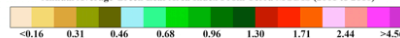
<https://www.csir.co.za/eddy-covariance-flux-towers>, 2022-05-11

MODIS LAI observations

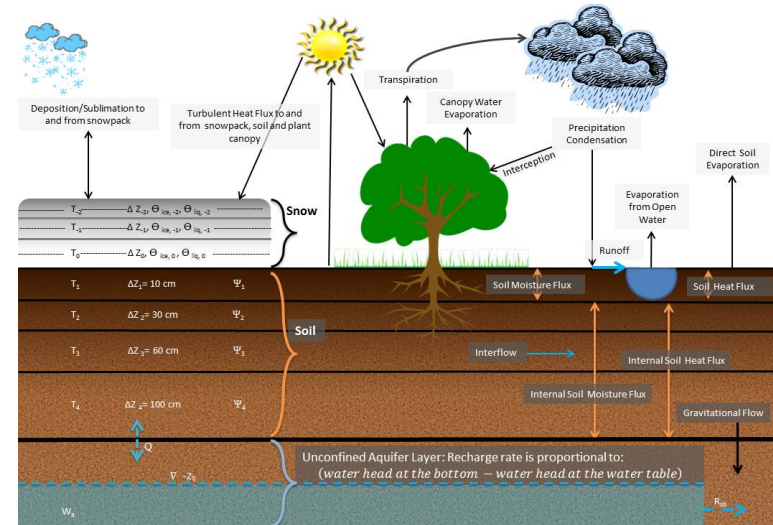


MODIS user guide, 2020

Annual Average Green Leaf Area Index From Terra MODIS (2001 to 2010)



Noah-MP (Niu et al., 2007; Niu et al., 2011)



<https://www.jsg.utexas.edu/noah-mp>, 2022-05-11

# Dynamically modelled LAI not closer to observations than climatology

## Exchange fluxes and soil moisture almost unaffected

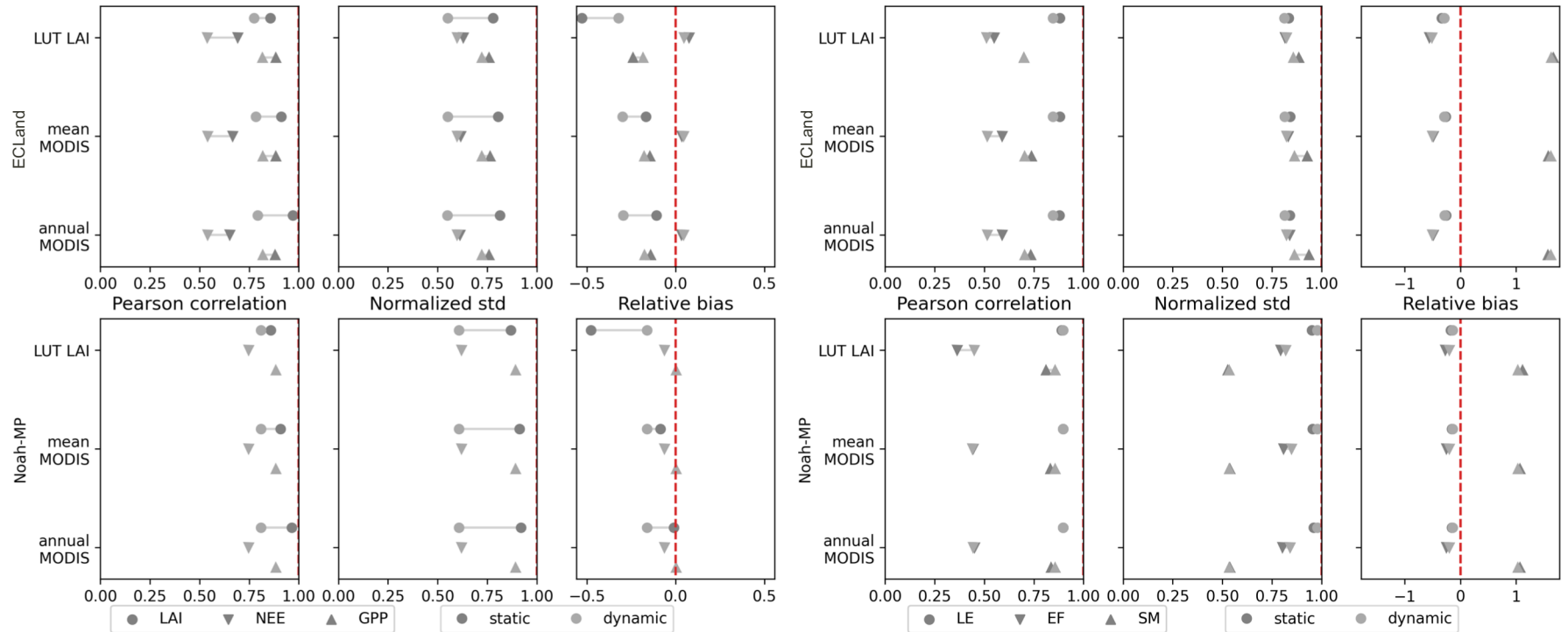


Fig: Example results from TERENO site "Hohes Holz" (Deciduous broadleaf forest)  
(Westermann et al., in prep.)



# Dynamically modelled LAI not closer to observations than climatology

## Exchange fluxes and soil moisture almost unaffected

### Latent heat evaluation

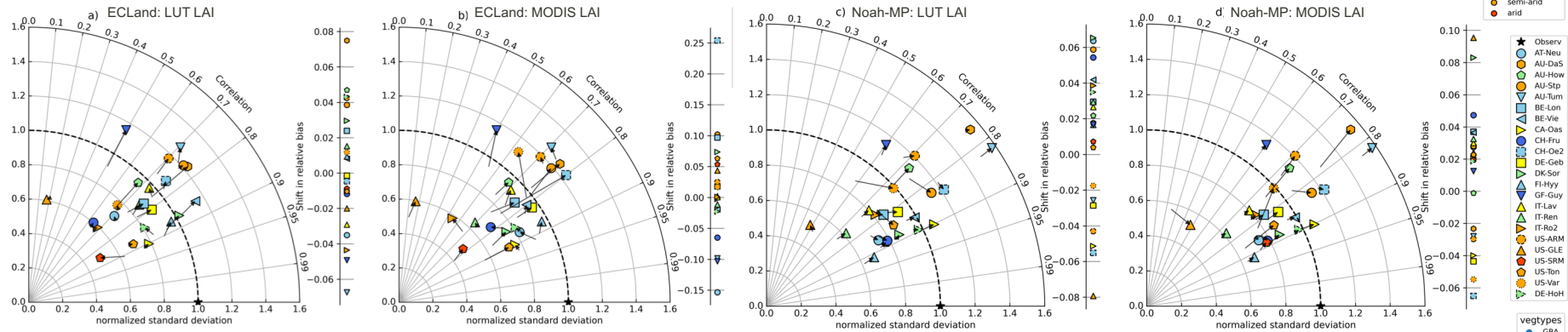


Fig: Changes in latent heat model performance due to activating vegetation dynamics with different initial LAI (Westermann et al., in prep.)

LUT – Look-up table



# Representation of LAI-GPP relationship might be crucial point for further model improvement regarding vegetation modeling

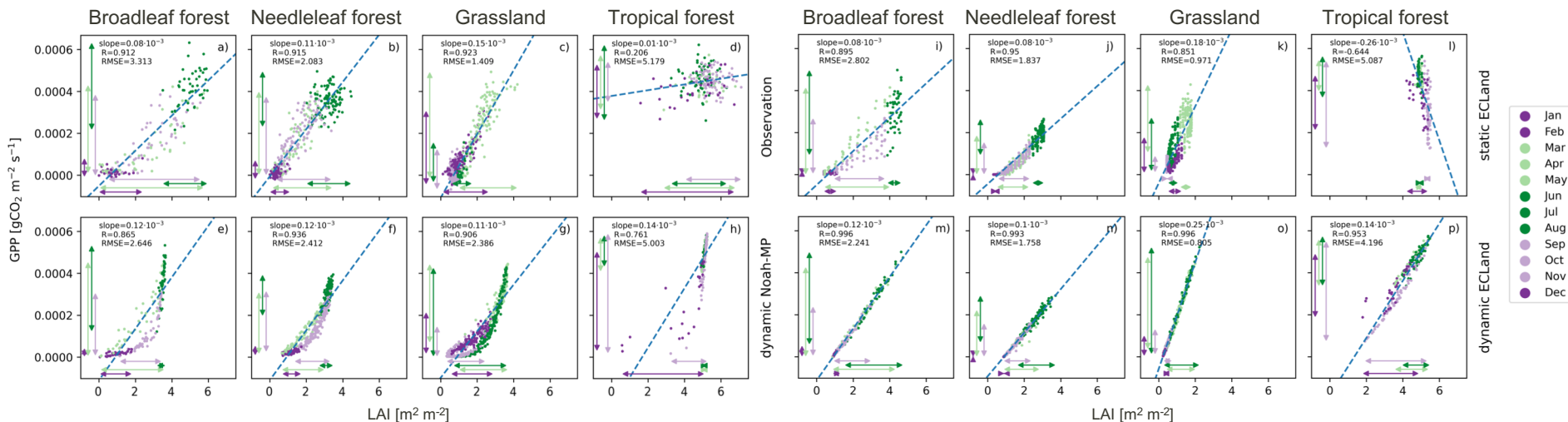


Fig: Correlation between GPP and LAI for four different vegetation types from observation to simulations with both models (Westermann et al., in prep.)