



Supplement of

Local-scale evaluation of the simulated interactions between energy, water and vegetation in ISBA, ORCHIDEE and a diagnostic model

Jan De Pue et al.

Correspondence to: Jan De Pue (jan.depue@meteo.be)

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1 Test sites

The sites were classified according to plant functional type (PFT) and Hydro-climatic biome (HCB; Papagiannopoulou et al., 2018). The distribution of the sites according to this classification is shown in Fig. 1.

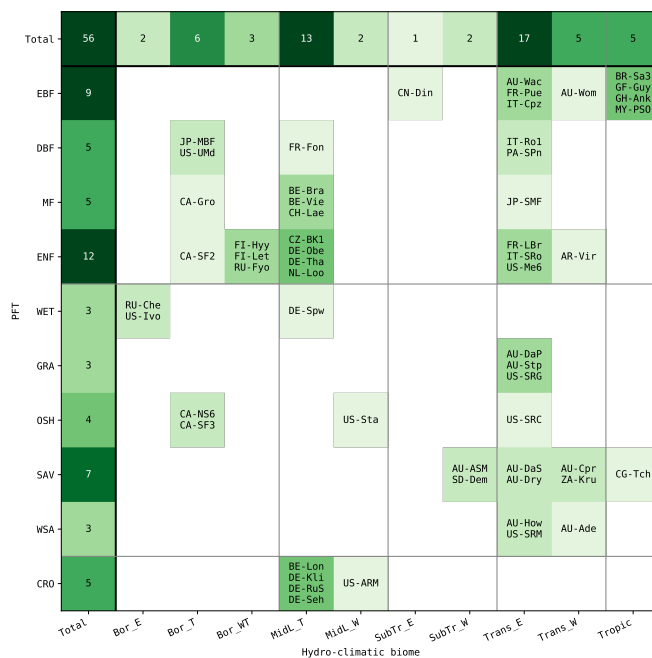


Figure 1. Overview of the selected FLUXNET sites, classified according to PFT and HCB. The colorscale indicates the number of sites in each class.

2 Model options

- 5 Surfex namelist: <https://pastebin.com/tvvSH0Az>
 ORCHIDEE namelist: <https://pastebin.com/8RFiRpyM>

3 Validation with and without EBC correction

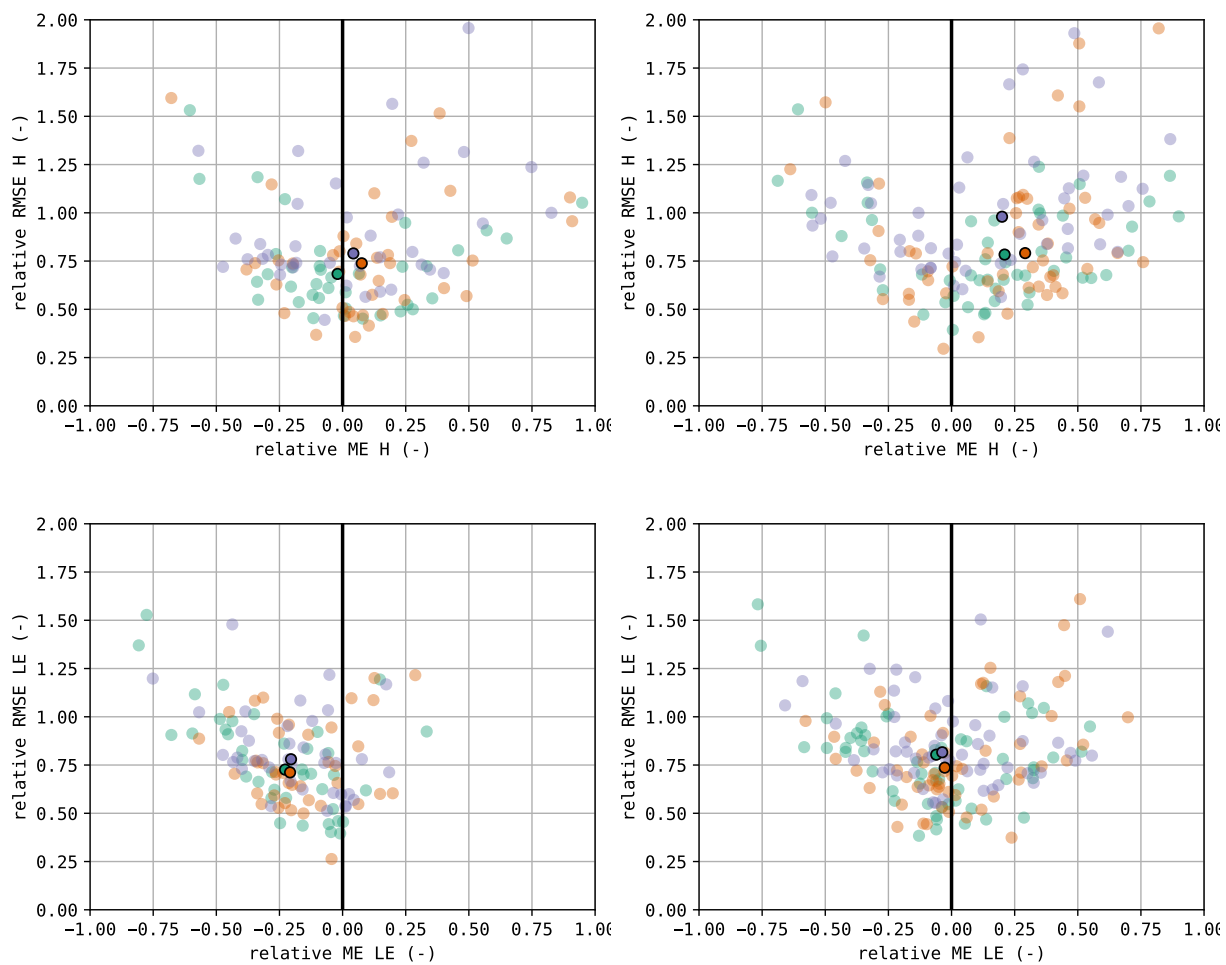


Figure 2. Validation of H and LE (top and bottom row, respectively) with and without EBC correction (left and right column, respectively).

4 Validation results per PFT and HCB

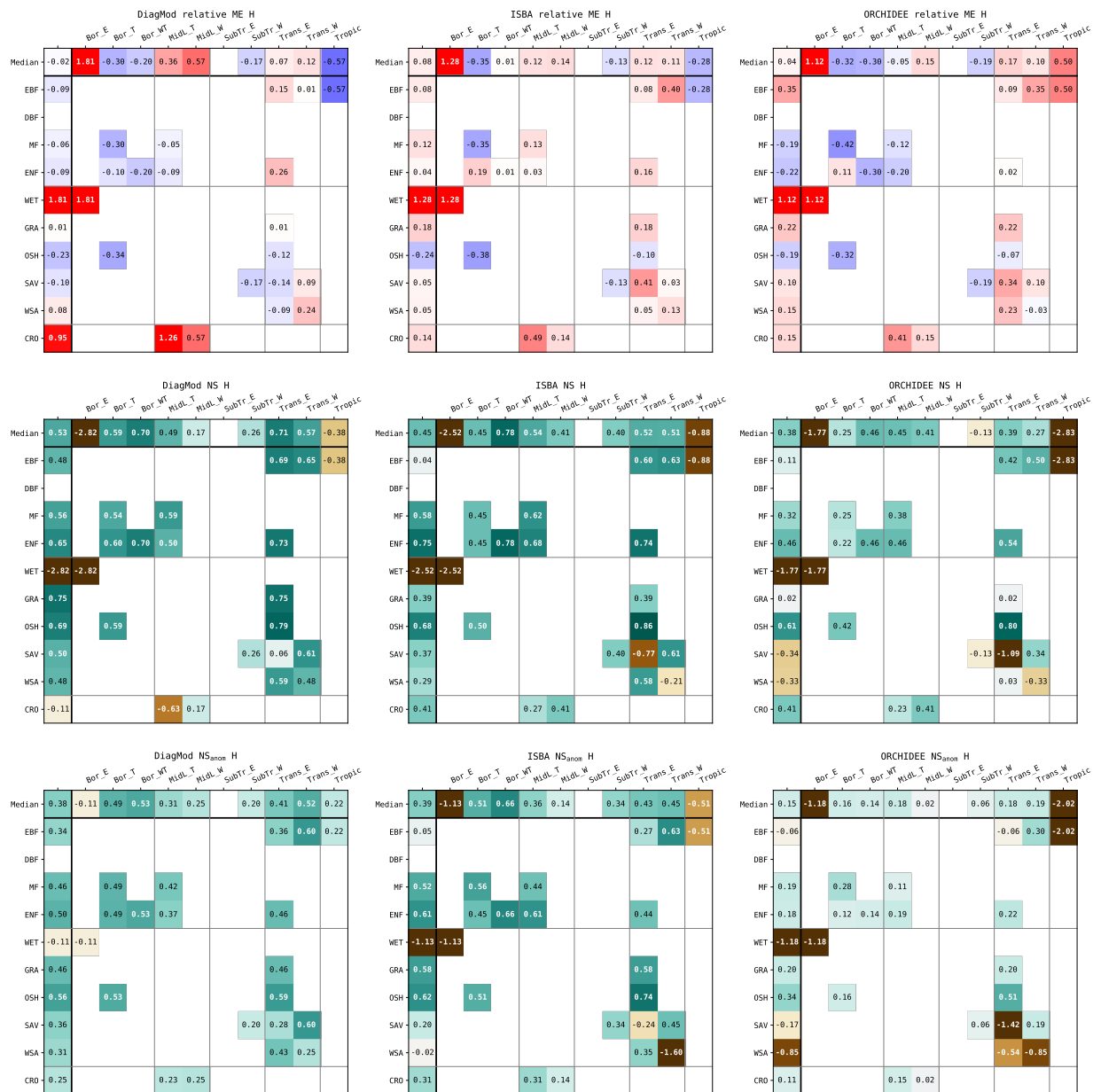


Figure 3. Validation indices for H: a) ME, b) Nash-Sutcliffe, c) Nash-Sutcliffe for the seasonal anomalies

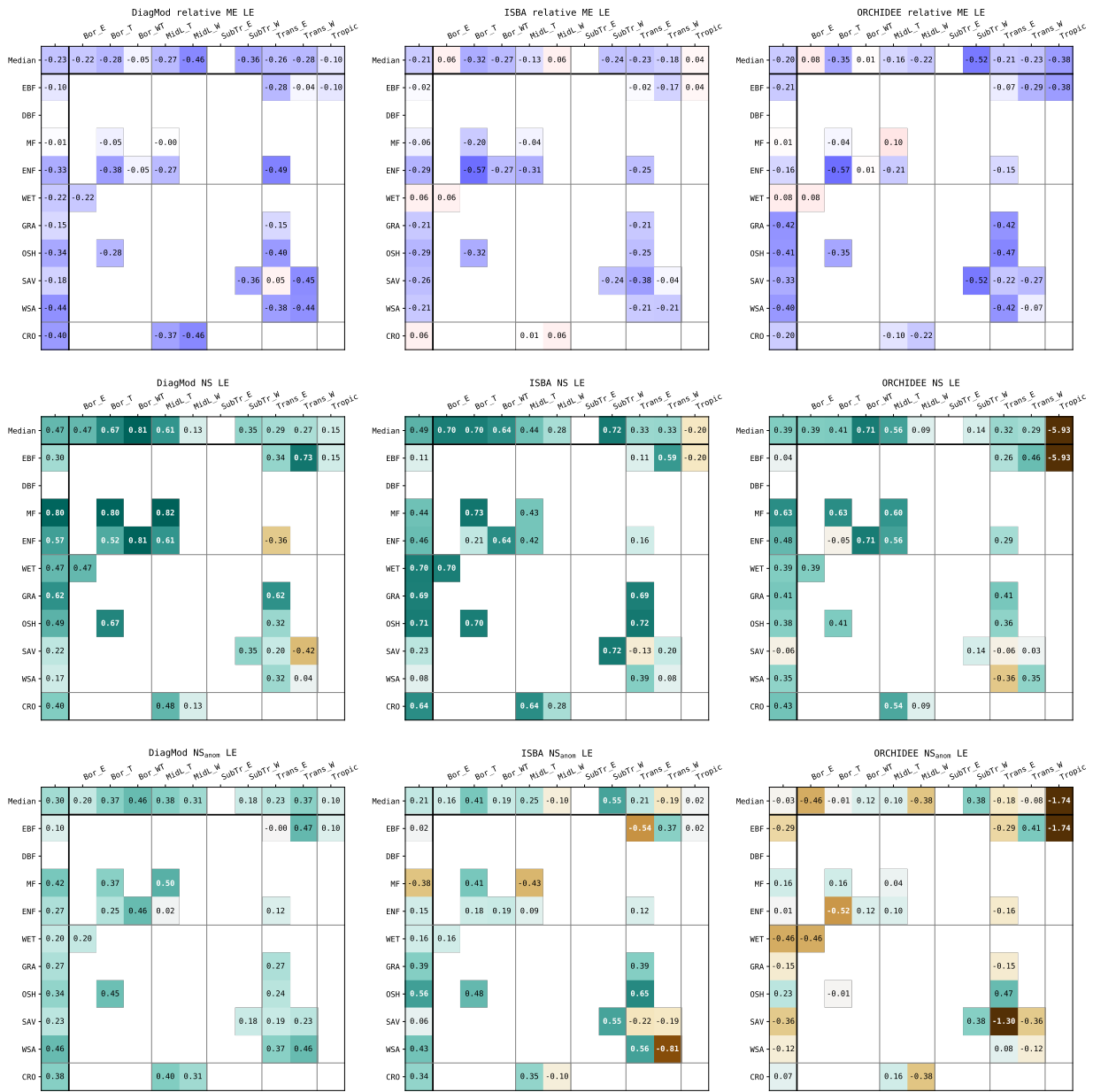


Figure 4. Validation indices for LE: a) ME, b) Nash-Sutcliffe, c) Nash-Sutcliffe for the seasonal anomalies

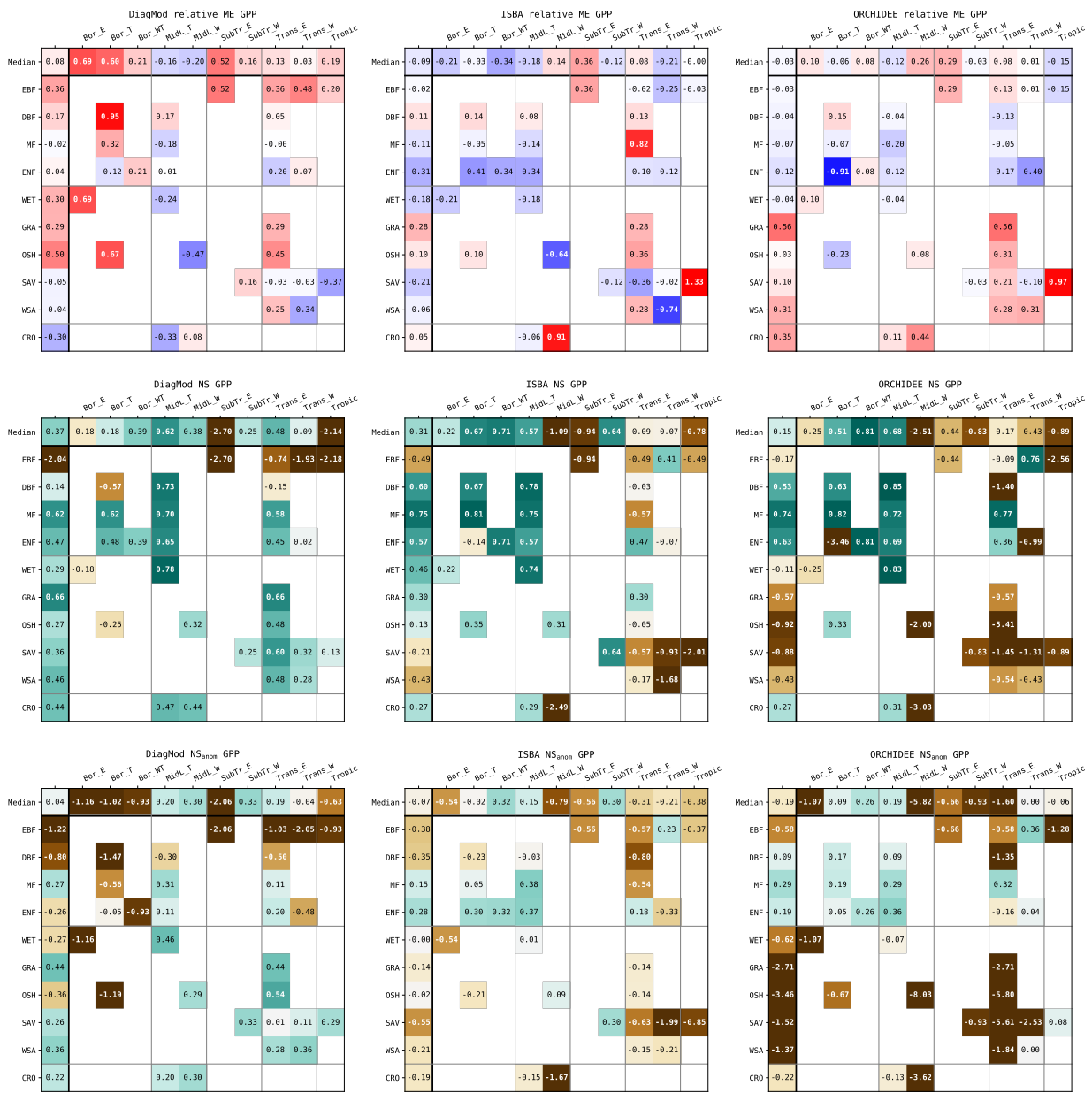


Figure 5. Validation indices for GPP: a) ME, b) Nash-Sutcliffe, c) Nash-Sutcliffe for the seasonal anomalies

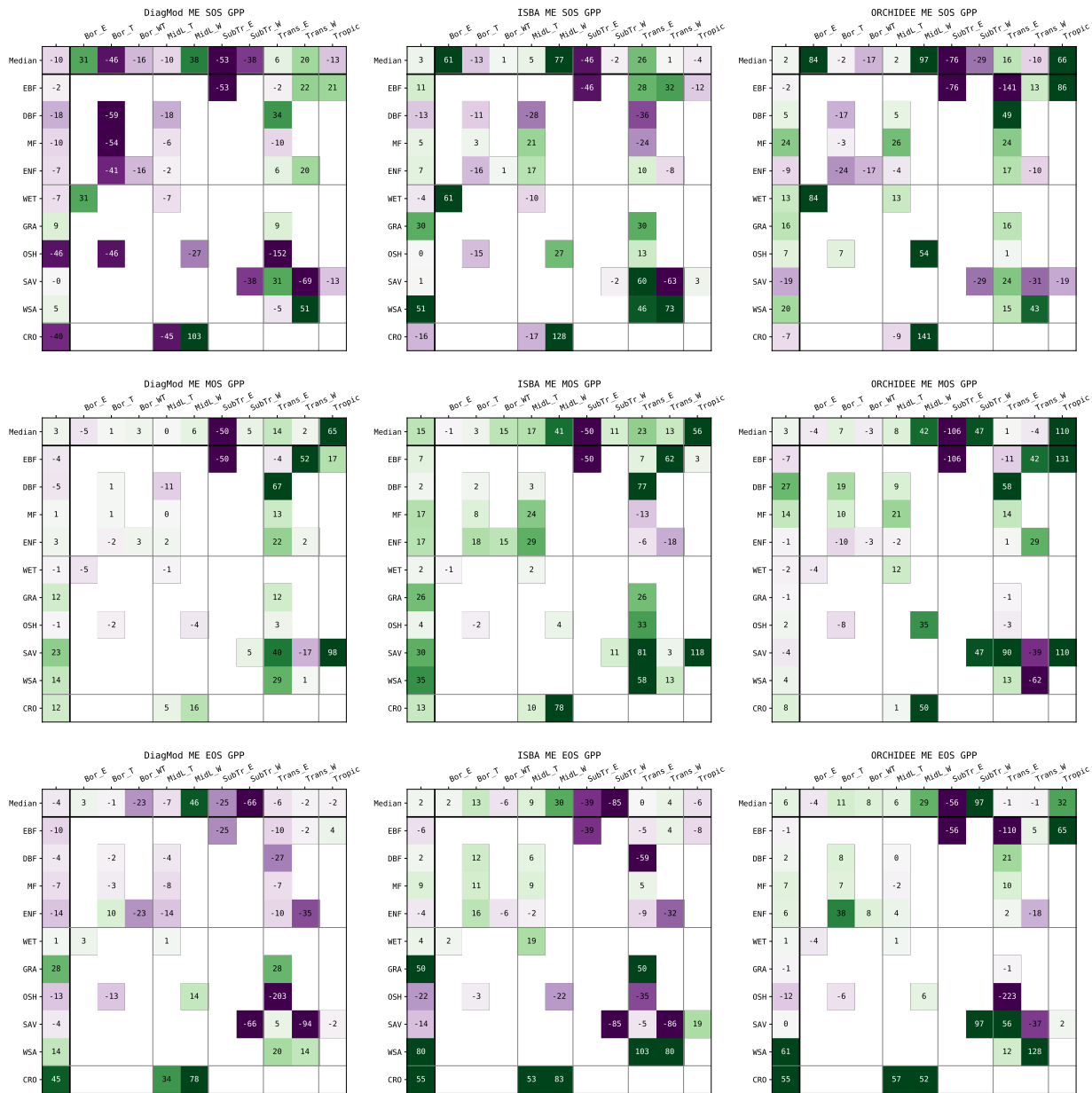


Figure 6. ME of SOS, MOS and EOS for GPP

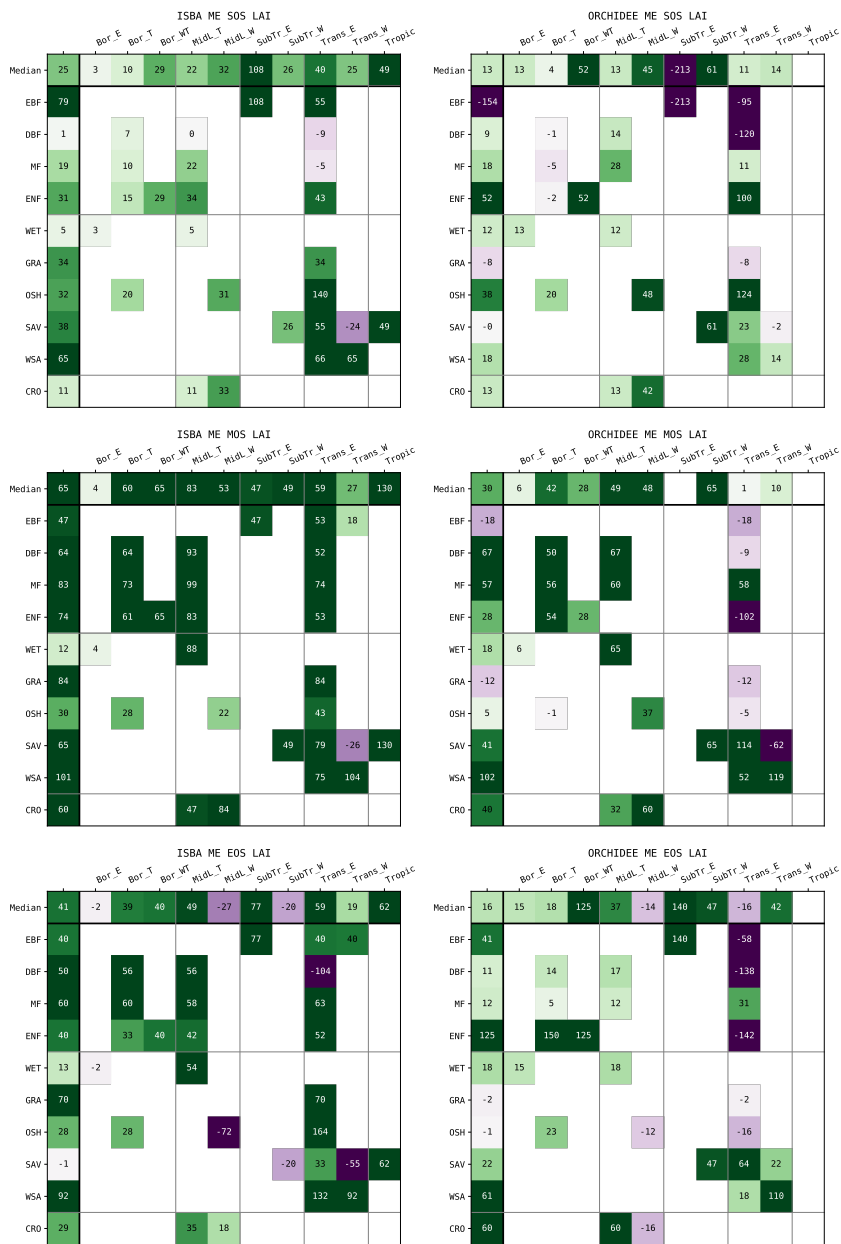


Figure 7. ME of SOS, MOS and EOS for LAI



Figure 8. RMSE of SOS, MOS and EOS for GPP



Figure 9. RMSE of SOS, MOS and EOS for LAI

6 Diagnostic vs Prognostic

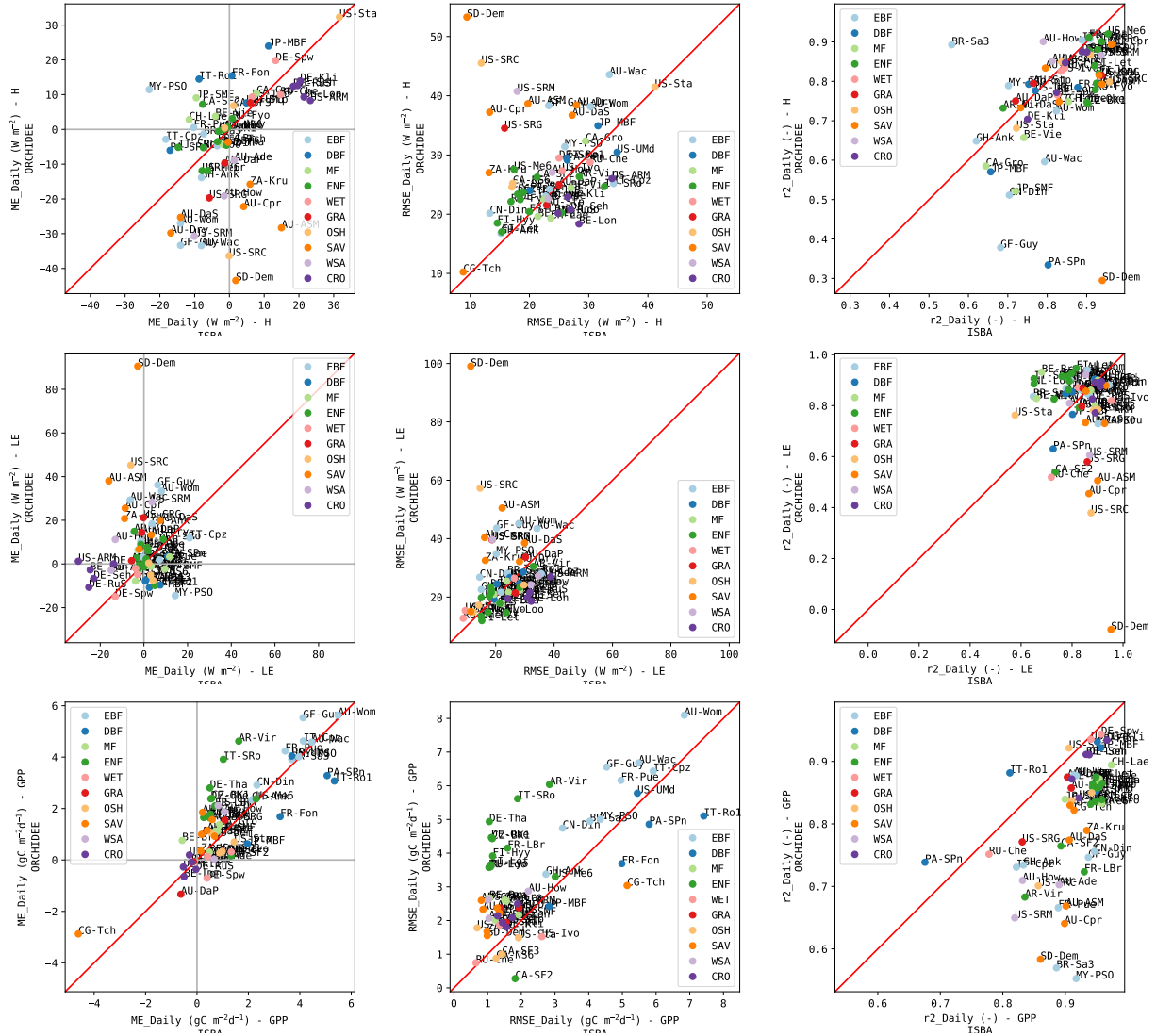


Figure 10. ME, RMSE and Pearson r (left, middle, right) of the comparison between diagnostic model vs the prognostic models (ISBA and ORCHIDEE) for H, LE and GPP (top, middle, bottom)

References

Papagiannopoulou, C., Gonzalez Miralles, D., Demuzere, M., Verhoest, N., and Waegeman, W.: Global hydro-climatic biomes identified via multitask learning, *Geoscientific Model Development*, 11, 4139–4153, 2018.