Supplement of Biogeosciences, 19, 4361–4386, 2022
https://doi.org/10.5194/bg-19-4361-2022-supplement

Biogeosciences Open Access EGU

Supplement of

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

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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.

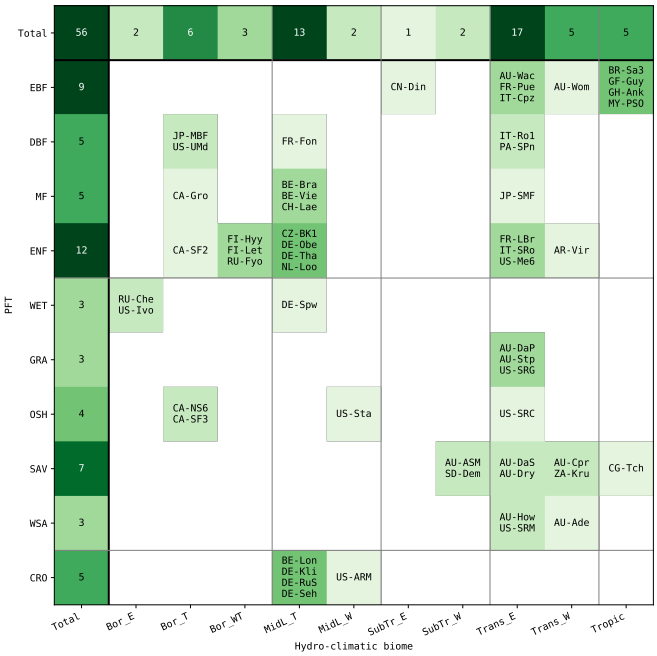

Figure 1. Overview of the selected FLUXNET sites, classified according to PFT and HCB. The colorscale indicates the number of sites in each class.

2 Model options

Surfex namelist: https://pastebin.com/tvvSH0Az
ORCHIDEE namelist: https://pastebin.com/8RFiRpym

3 Validation with and without EBC correction

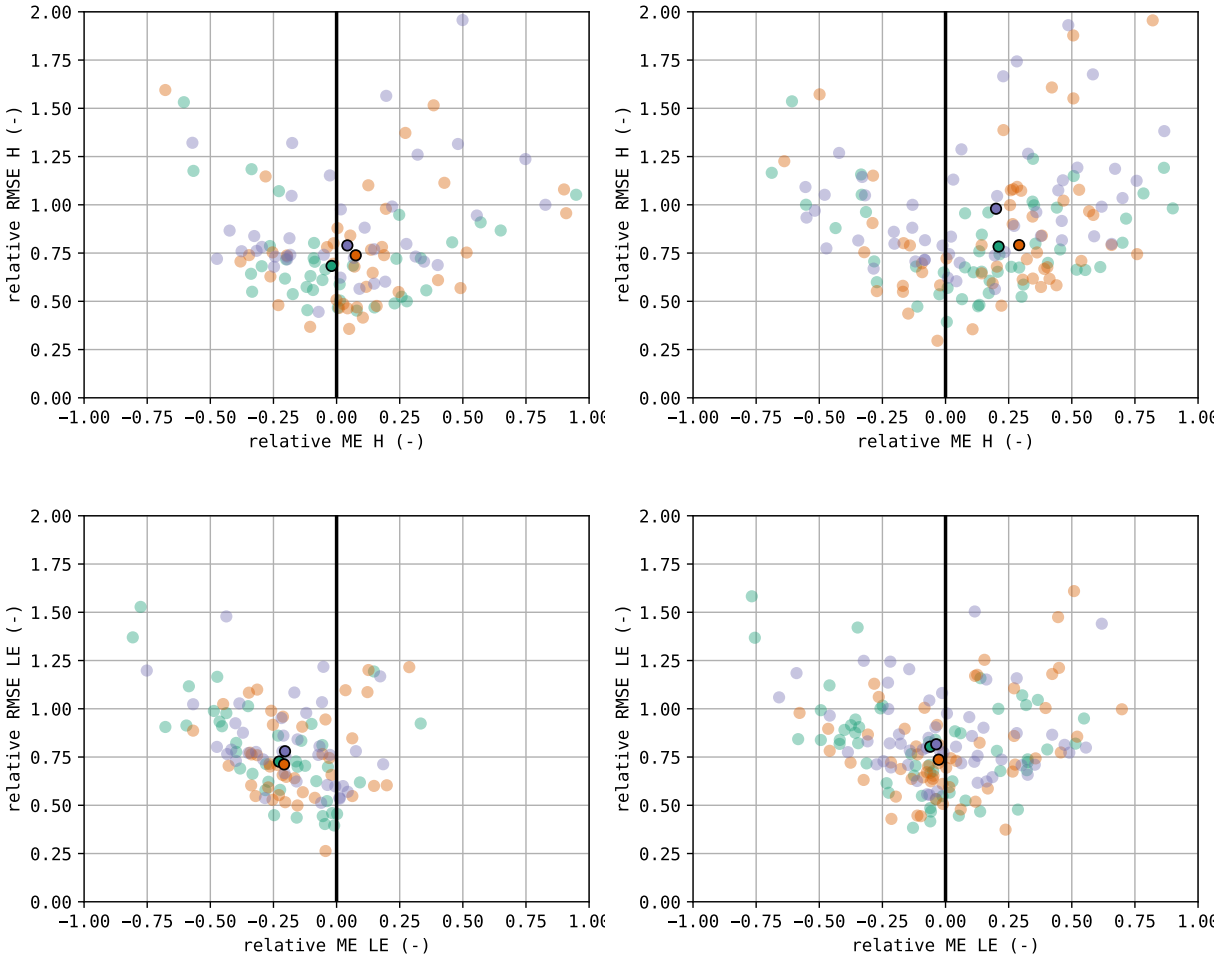

Figure 2. Validation of H and LE (top and bottom row, respectively) with and without EBC correction (left and right column, respectively).

4 Validation results per PFT and HCB

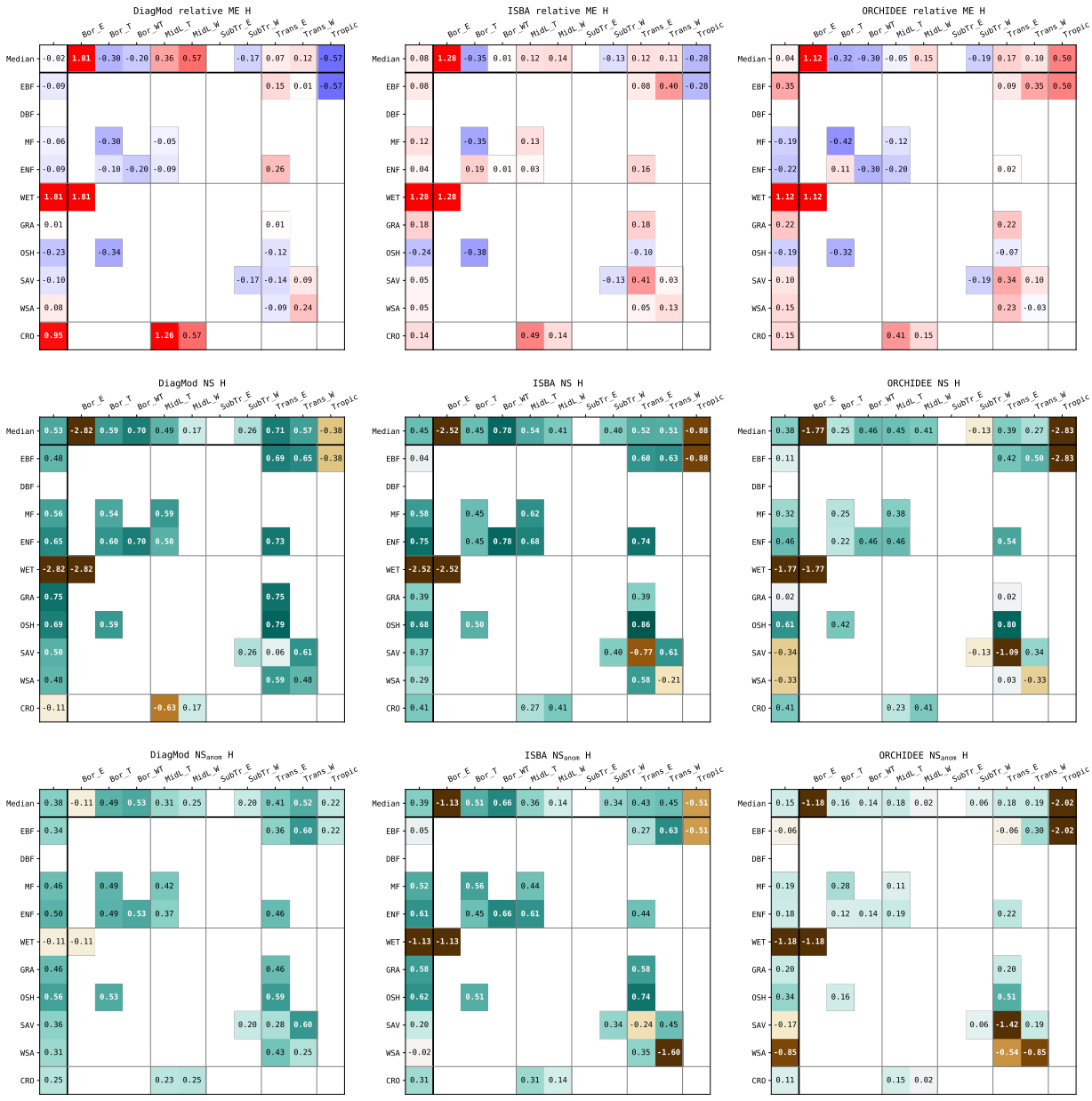

Figure 3. Validation indices for H: a) ME, b) Nash-Sutcliffe, c) Nash-Sutcliffe for the seasonal anomalies

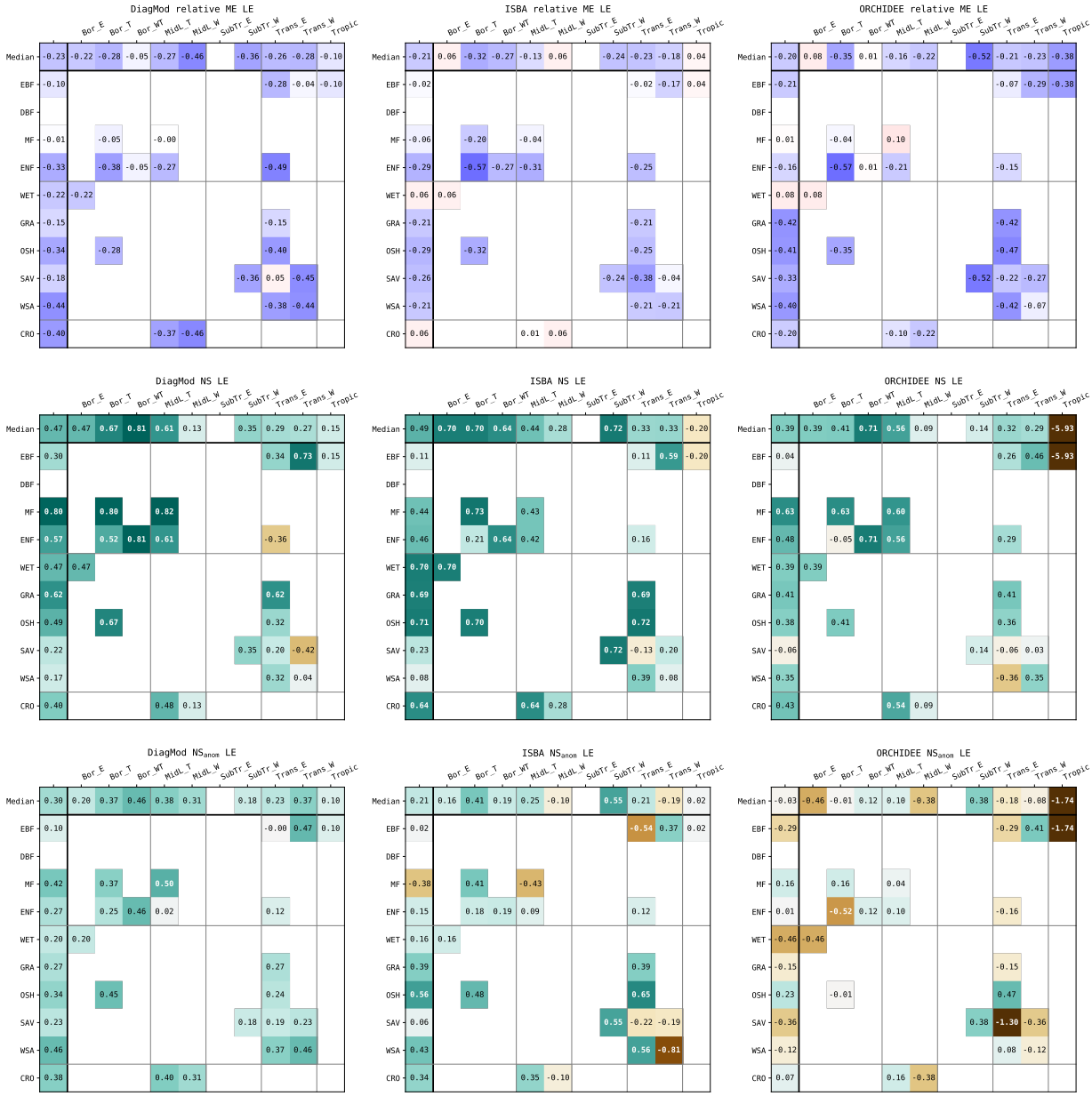

Figure 4. Validation indices for LE: a) ME, b) Nash-Sutcliffe, c) Nash-Sutcliffe for the seasonal anomalies

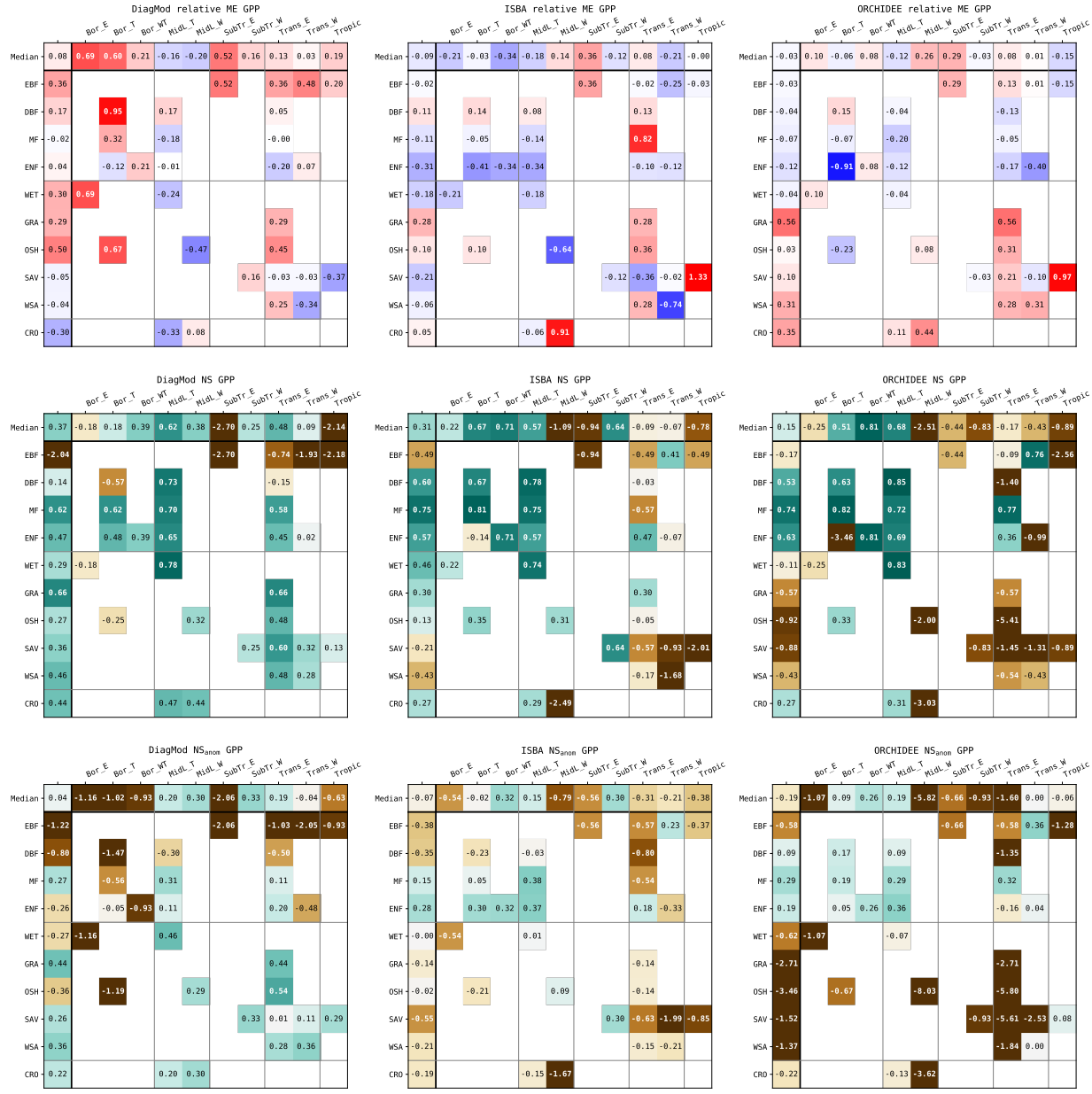

Figure 5. Validation indices for GPP: a) ME, b) Nash-Sutcliffe, c) Nash-Sutcliffe for the seasonal anomalies

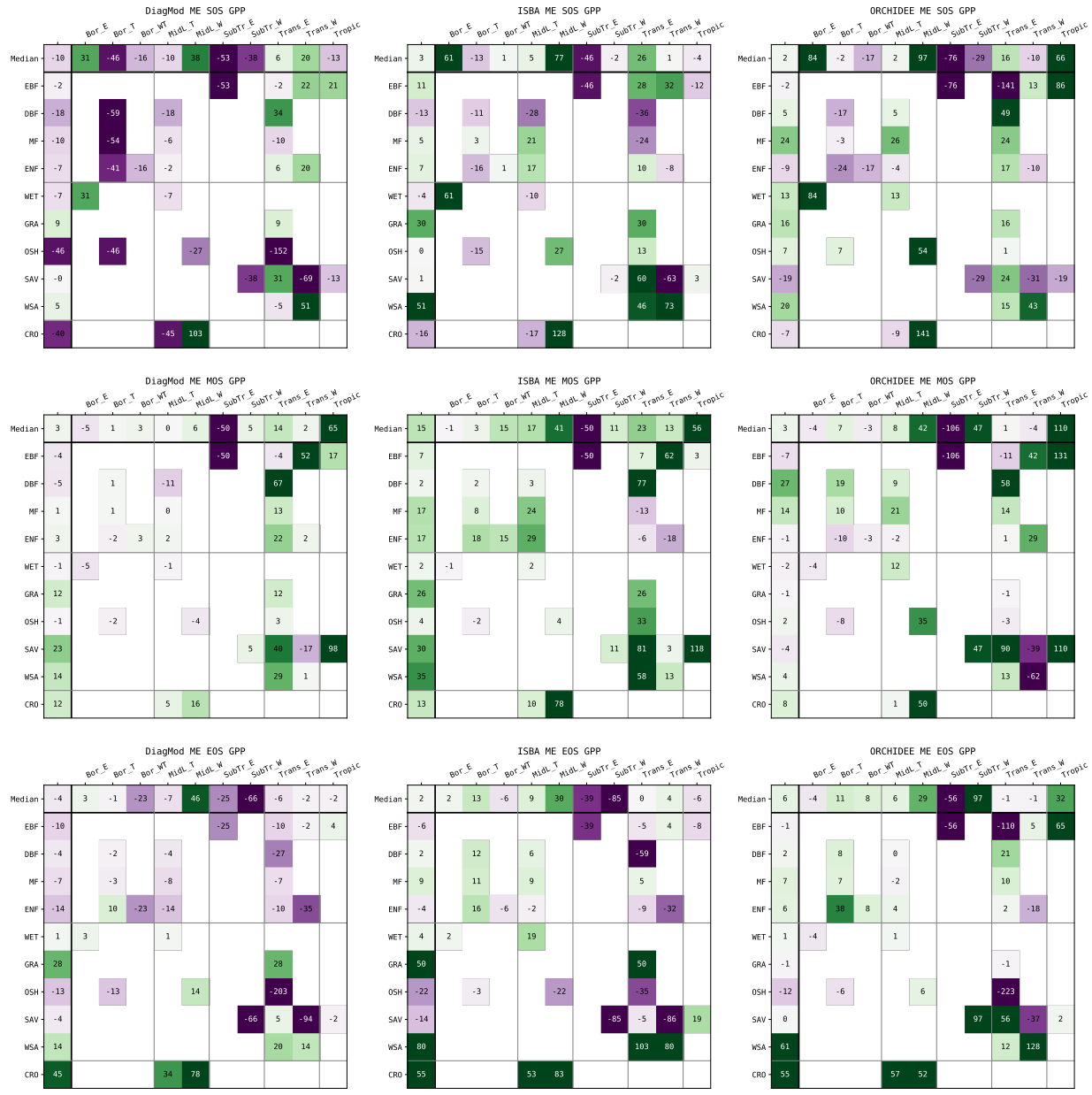

Figure 6. ME of SOS, MOS and EOS for GPP

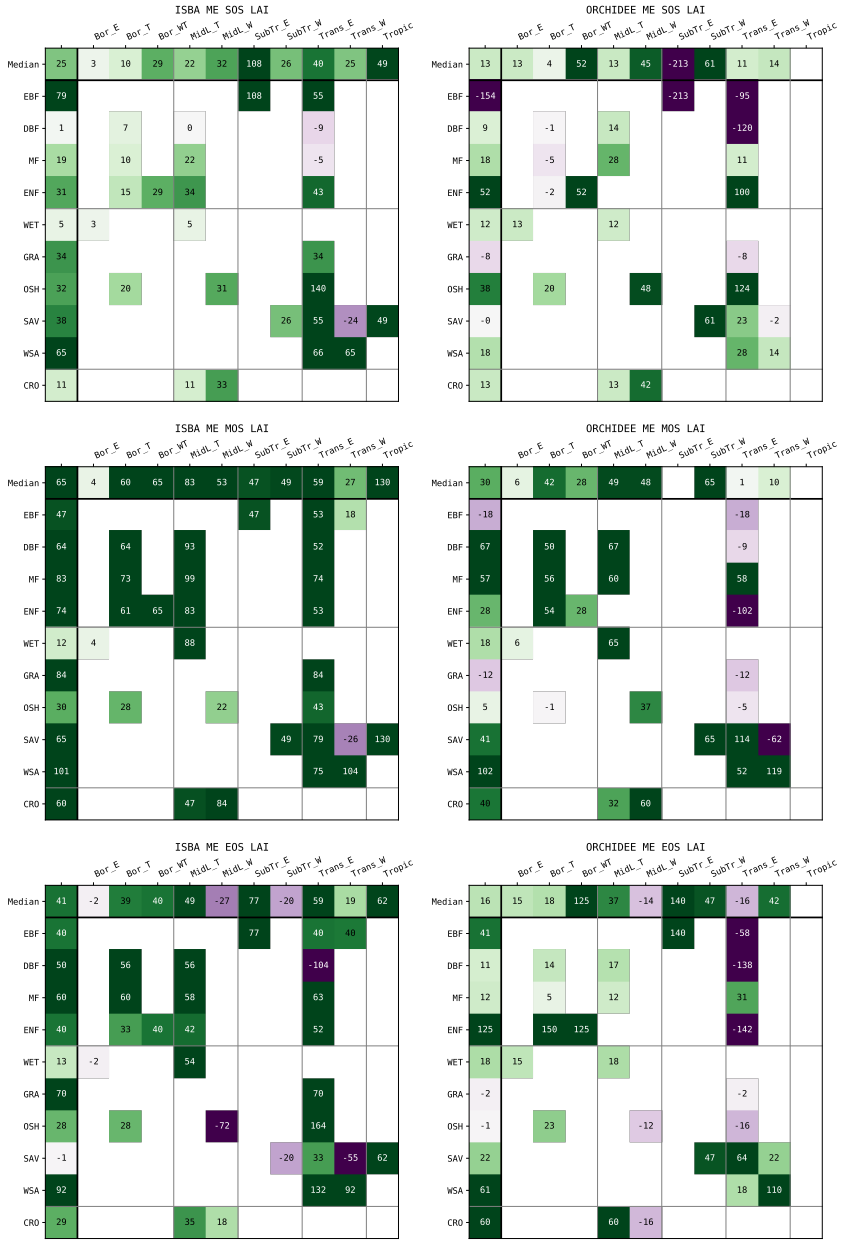

Figure 7. ME of SOS, MOS and EOS for LAI

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

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

6 Diagnostic vs Prognostic

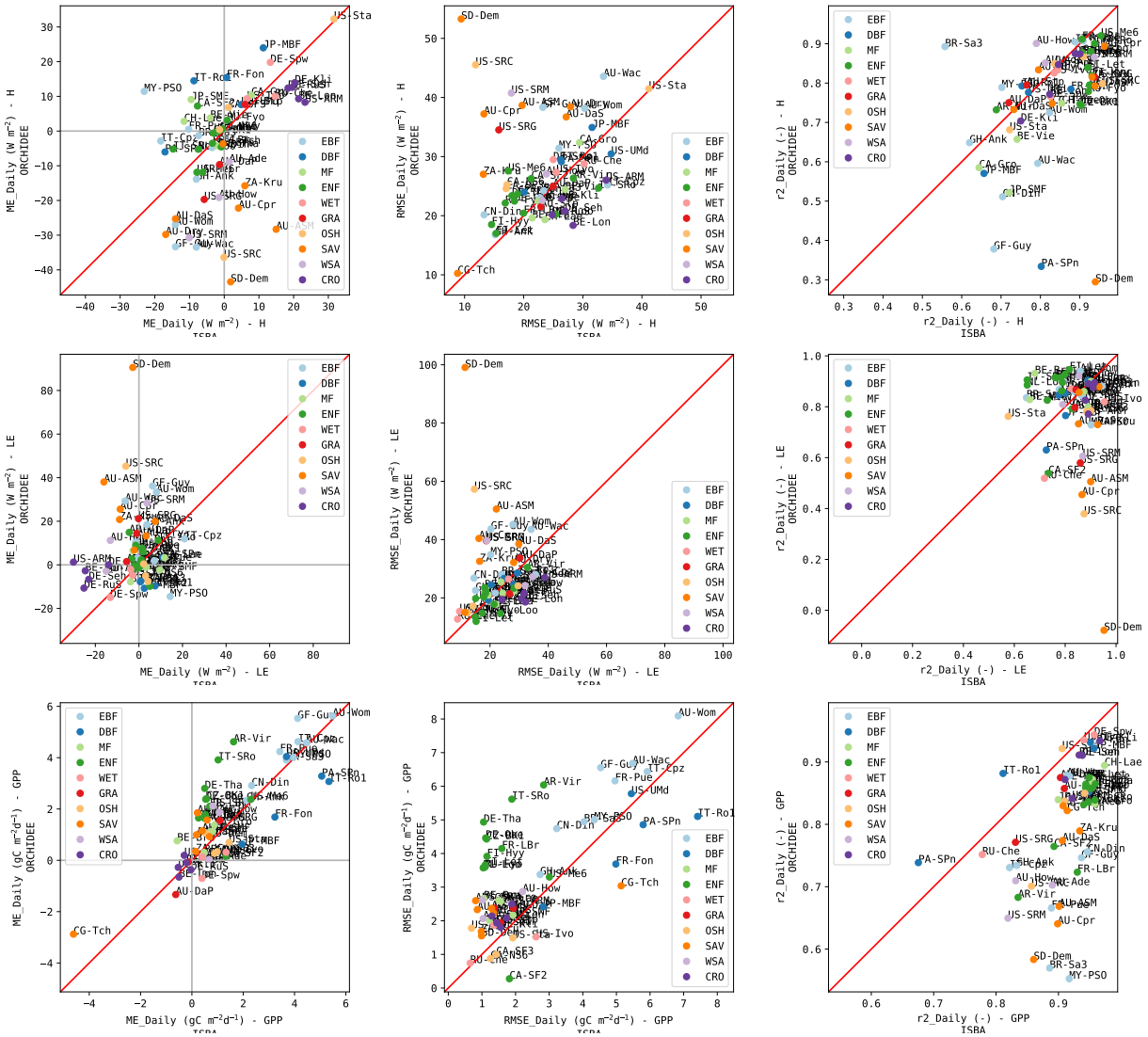

Figure 10. ME, RMSE and Pearson r (left, middle, right) of the comparison between diagnostic model vs the prognostic models (ISBA and ORCHIDEE) for H, LE and GPP (top, middle, bottom)

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.