

Figure R1: Summarising the coupling strengths of vegetation functioning (NIRv) with (a) near-surface soil moisture (SSM) and (b) terrestrial water storage (TWS) in the growing season-months across climate (aridity index) and vegetation regimes (fraction of tree cover). The only difference with Figure 3 is the different formulation of AI used in this figure.

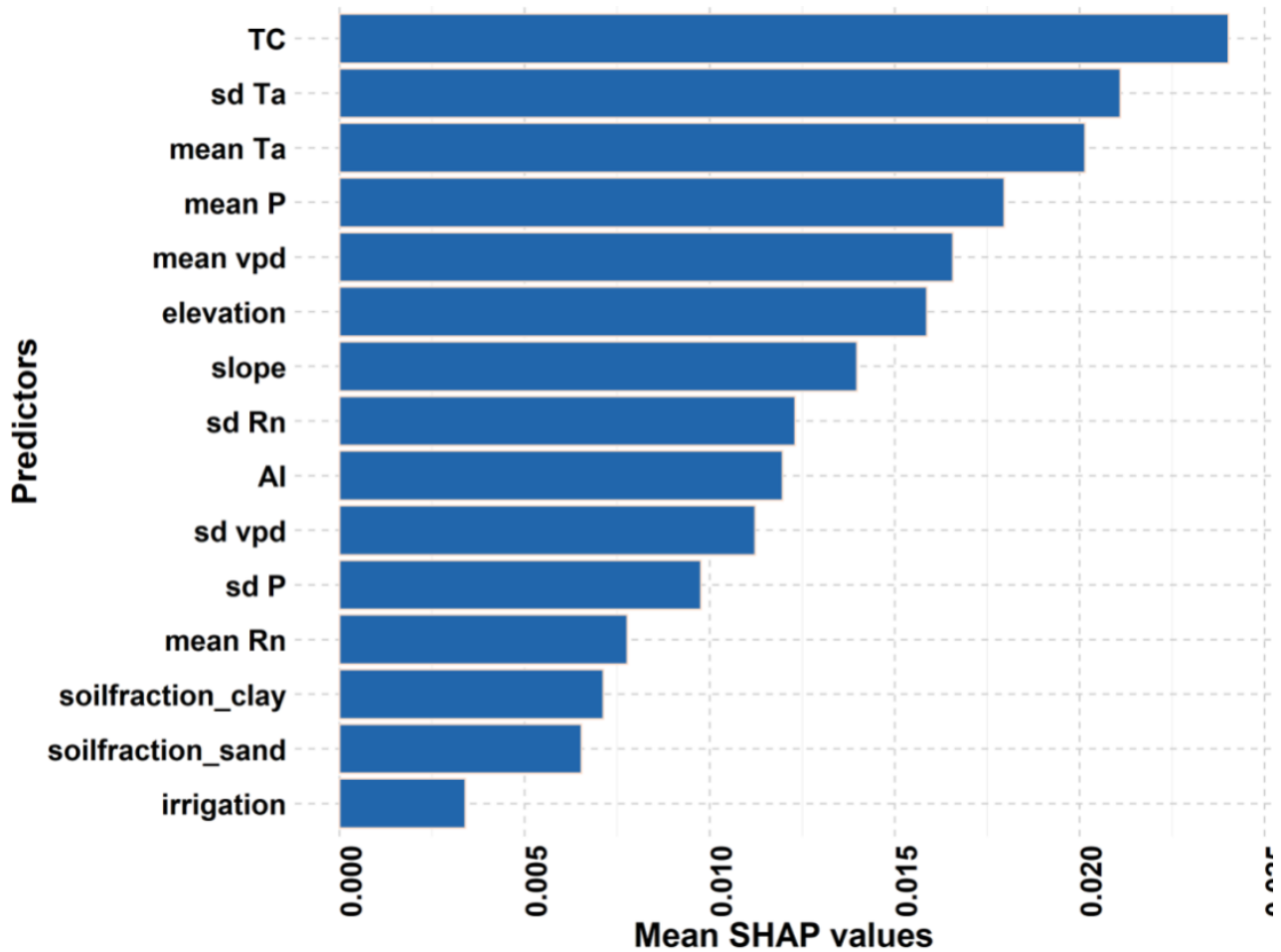


Figure R2: Global feature importance based on the mean absolute magnitude of the SHAP values (including vpd).

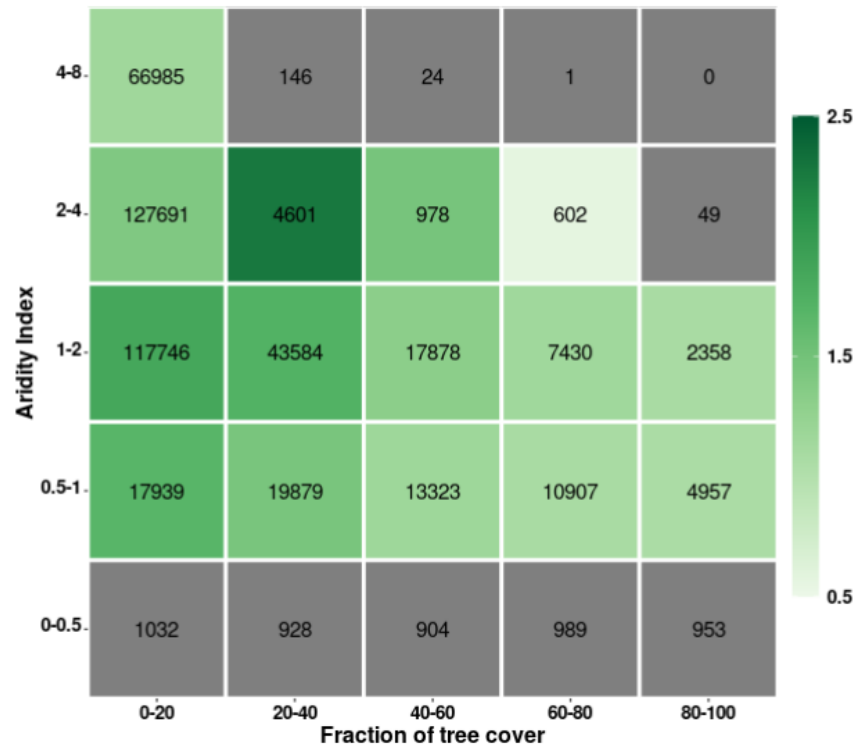


Figure R3: Summarizing the ratio of $r(\text{NIRv} \sim \text{TWS}_{\text{dry}}) - r(\text{NIRv} \sim \text{TWS}_{\text{growing}})$ to $r(\text{NIRv} \sim \text{SSM}_{\text{dry}}) - r(\text{NIRv} \sim \text{SSM}_{\text{growing}})$ across aridity-tree cover classes.