SUPPLEMENTARY MATERIAL FOR

SPATIALLY VARYING RELEVANCE OF HYDROMETEOROLOGICAL HAZARDS FOR VEGETATION PRODUCTIVITY EXTREMES

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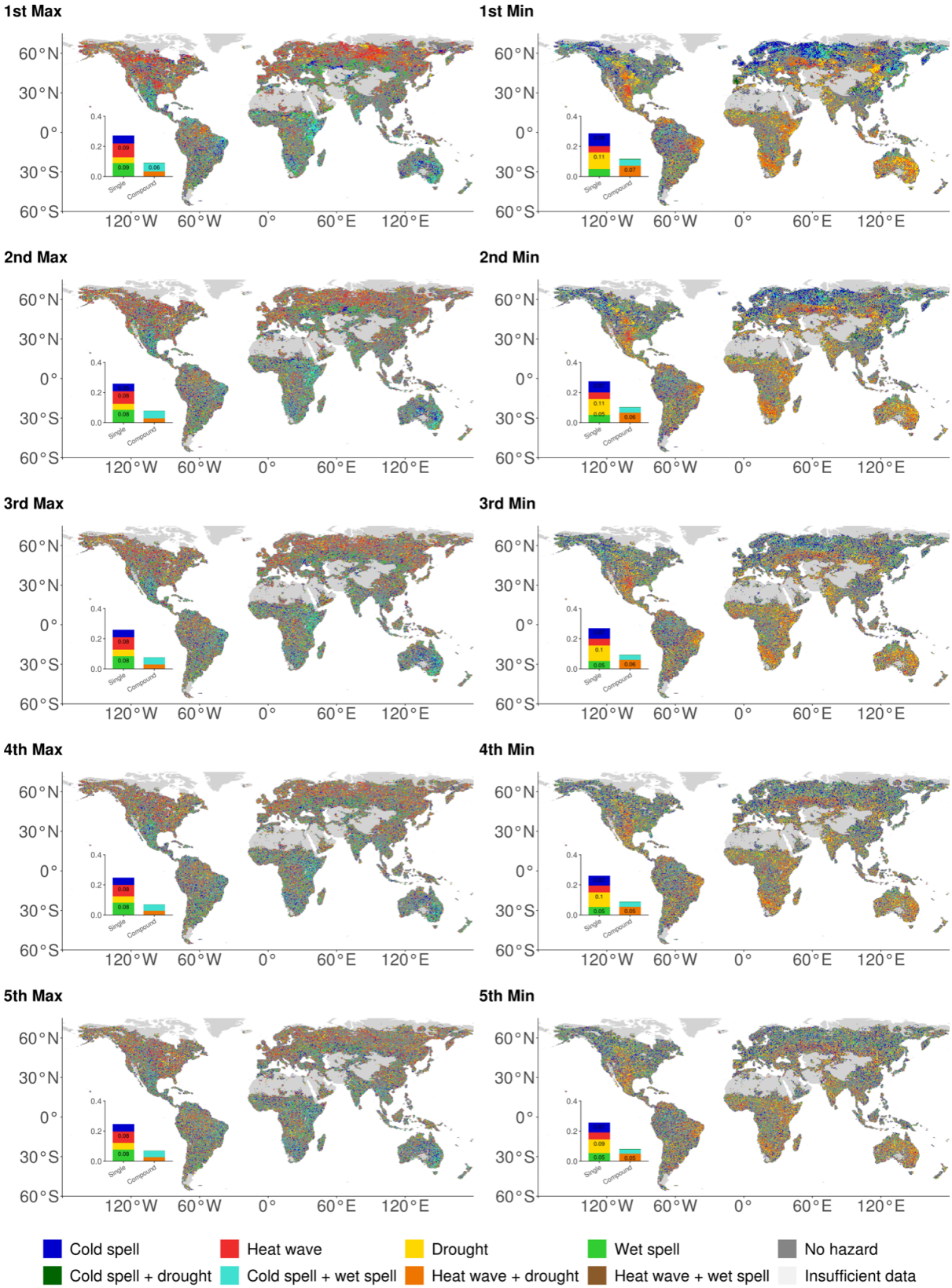

Fig. S1. Hydrometeorological hazards co-occurring with each of the five SIF maxima and minima (1st is the strongest extreme, 5th the weakest one). Temperature and soil moisture anomalies are considered as extreme if they are below/above the 10/90th percentile of 100 randomly sampled temperature and soil moisture anomalies.

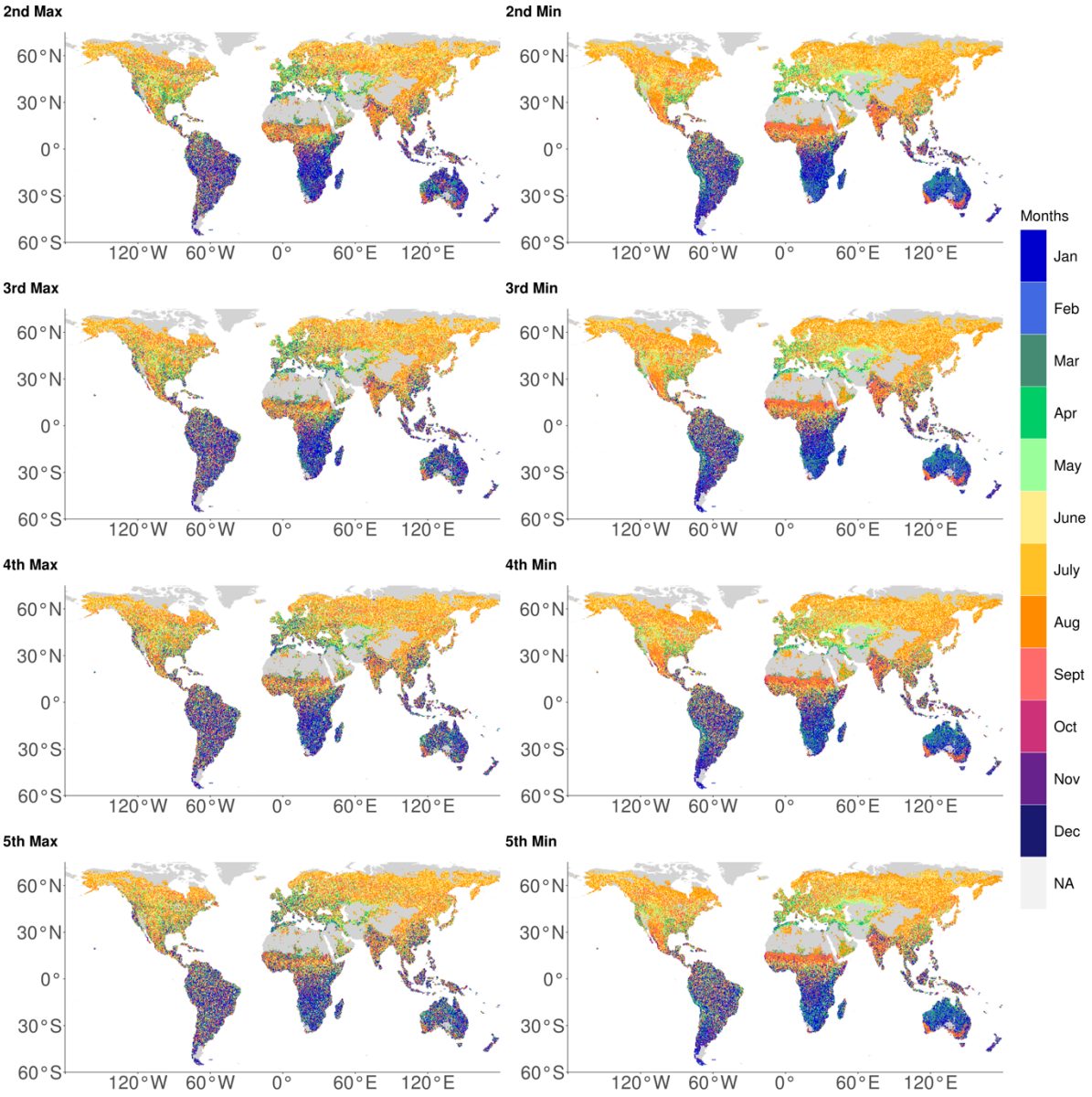

Fig. S2. Global distribution of the month-of-year in which each of the four remaining SIF maxima and minima occurred (2nd is the second strongest extreme, 5th the weakest one).

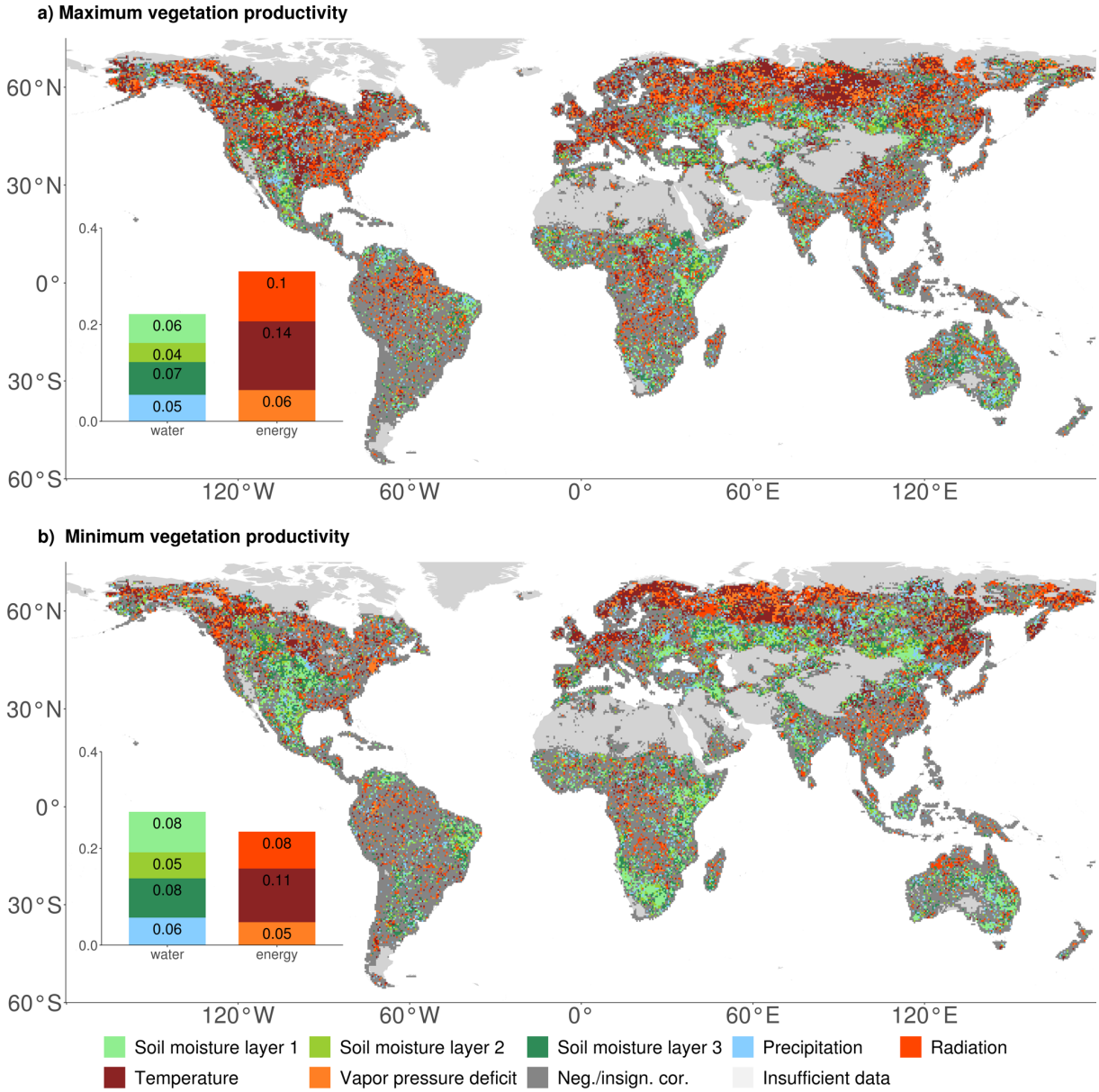

Fig. S3. Global distribution of hydrometeorological controls (with soil moisture from SoMo.ml) of SIF (a) maxima and (b) minima. The displayed variable correlates strongest with SIF in the extreme months, considering only significant and positive correlations. The bar plot indicates the area controlled by each variable relative to the total land area.

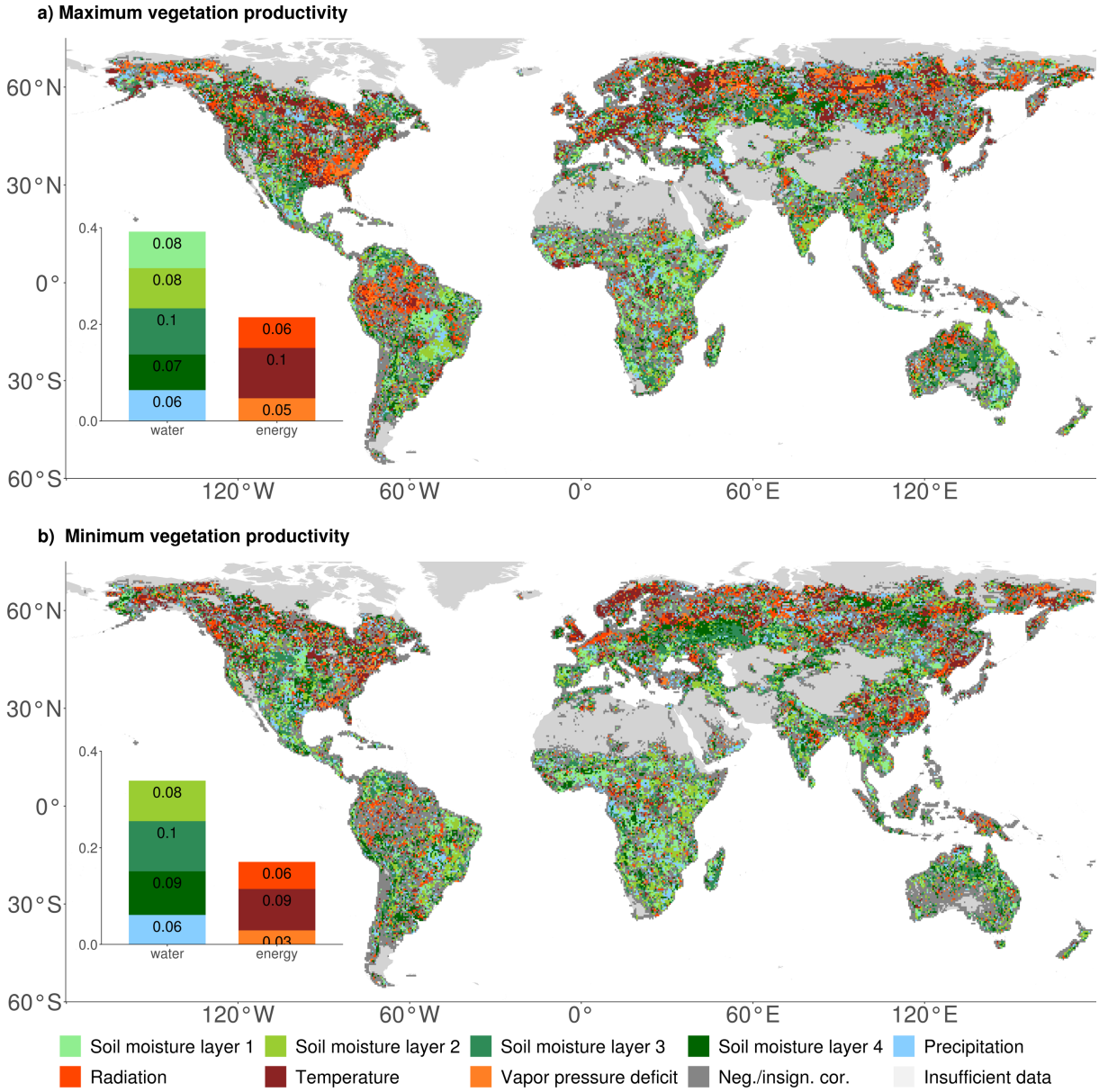

Fig. S4. Global distribution of hydrometeorological controls (ERA5 land) of NDVI (a) maxima and (b) minima. The displayed variable correlates strongest with SIF in the extreme months, considering only significant and positive correlations. The bar plot indicates the area controlled by each variable relative to the total study area.

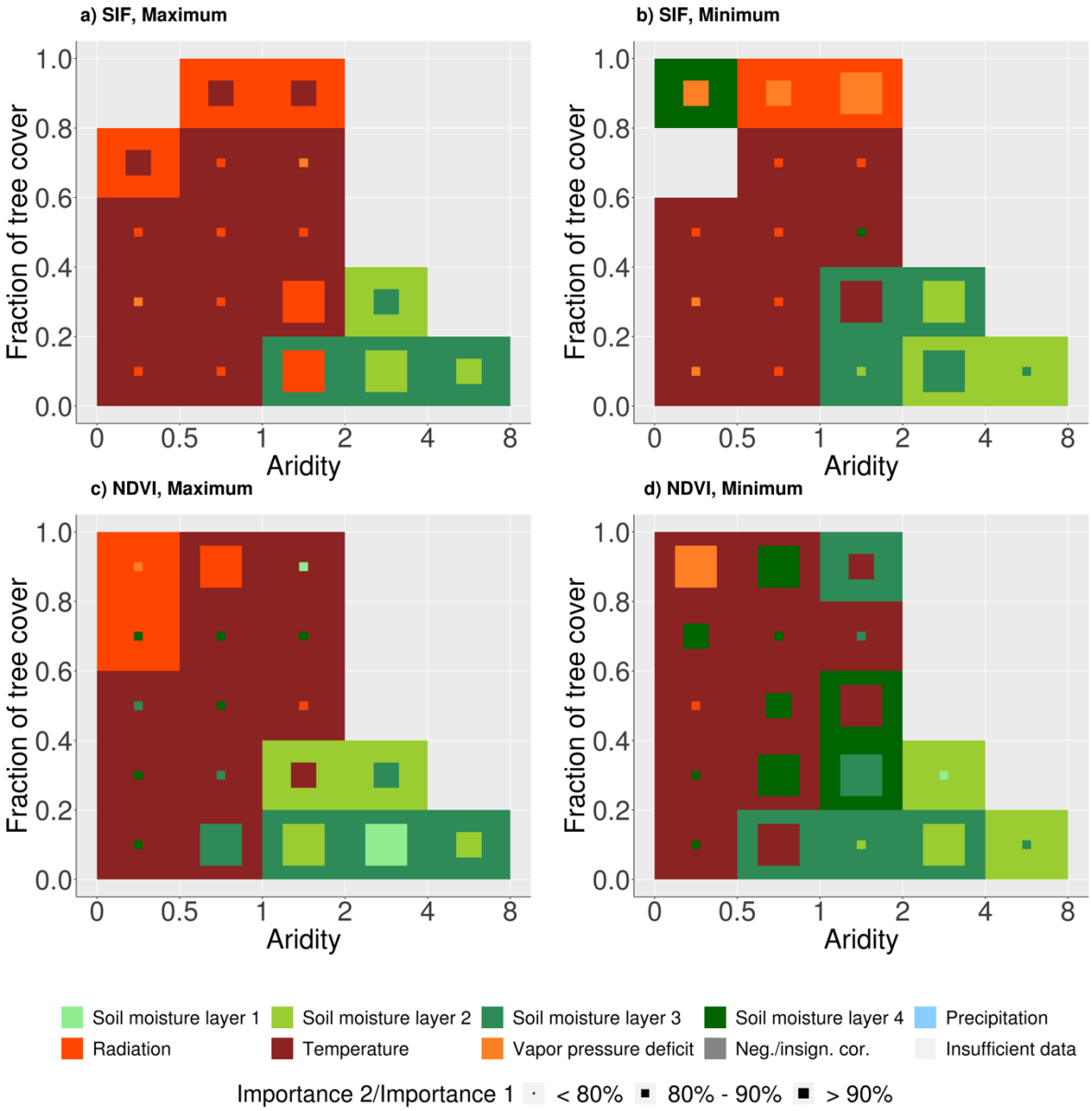

Fig. S5. Hydrometeorological controls (ERA5 land) of different vegetation regimes. Grid cells are grouped by their fraction of tree cover and aridity (unit-adjusted net radiation/precipitation). The variables which is important for most of the grid cells for vegetation productivity extremes (a) and b) SIF; c) and d) NDVI) in one vegetation regime is used to color the box, the second most important variable colors the smaller squares. Their ratio is denoted in the size of the squares.

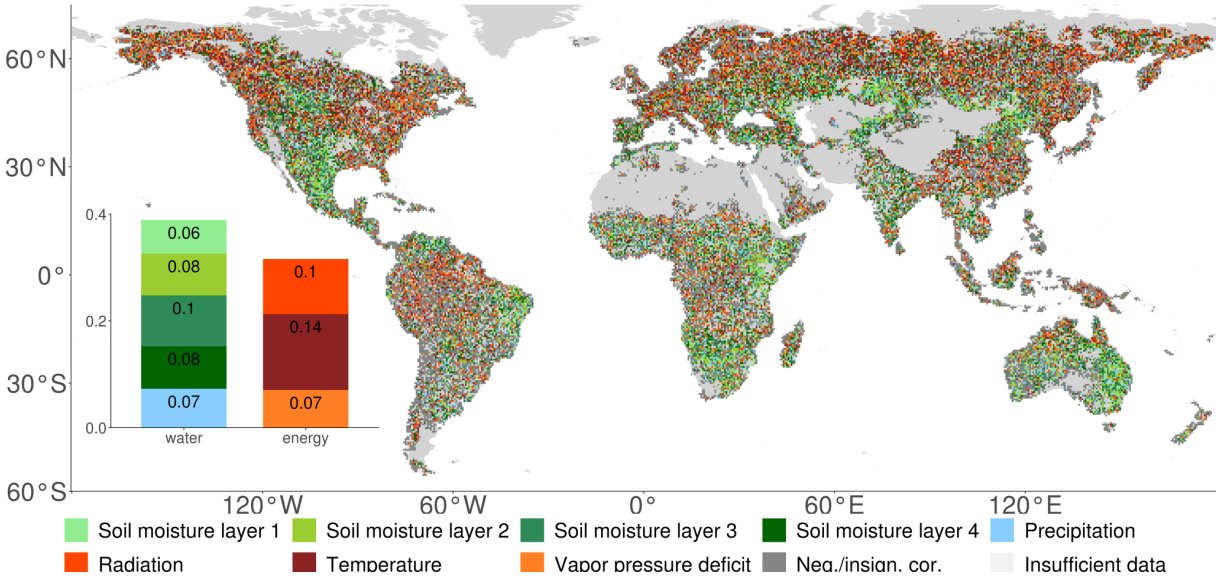

Fig. S6: Global distribution of hydrometeorological controls of non-anomalous SIF. The displayed variable correlates strongest with SIF in 5 randomly chosen months (from 25-75% range of the SIF anomaly distribution), which have a similar variation as the 5 maximum SIF months. Only significant and positive correlations are considered. The bar plot indicates the area controlled by each variable relative to the total study area (which is slightly different here compared with FIg. 4 as non-extreme SIF anomalies with similar variability might not be found in every grid cell).