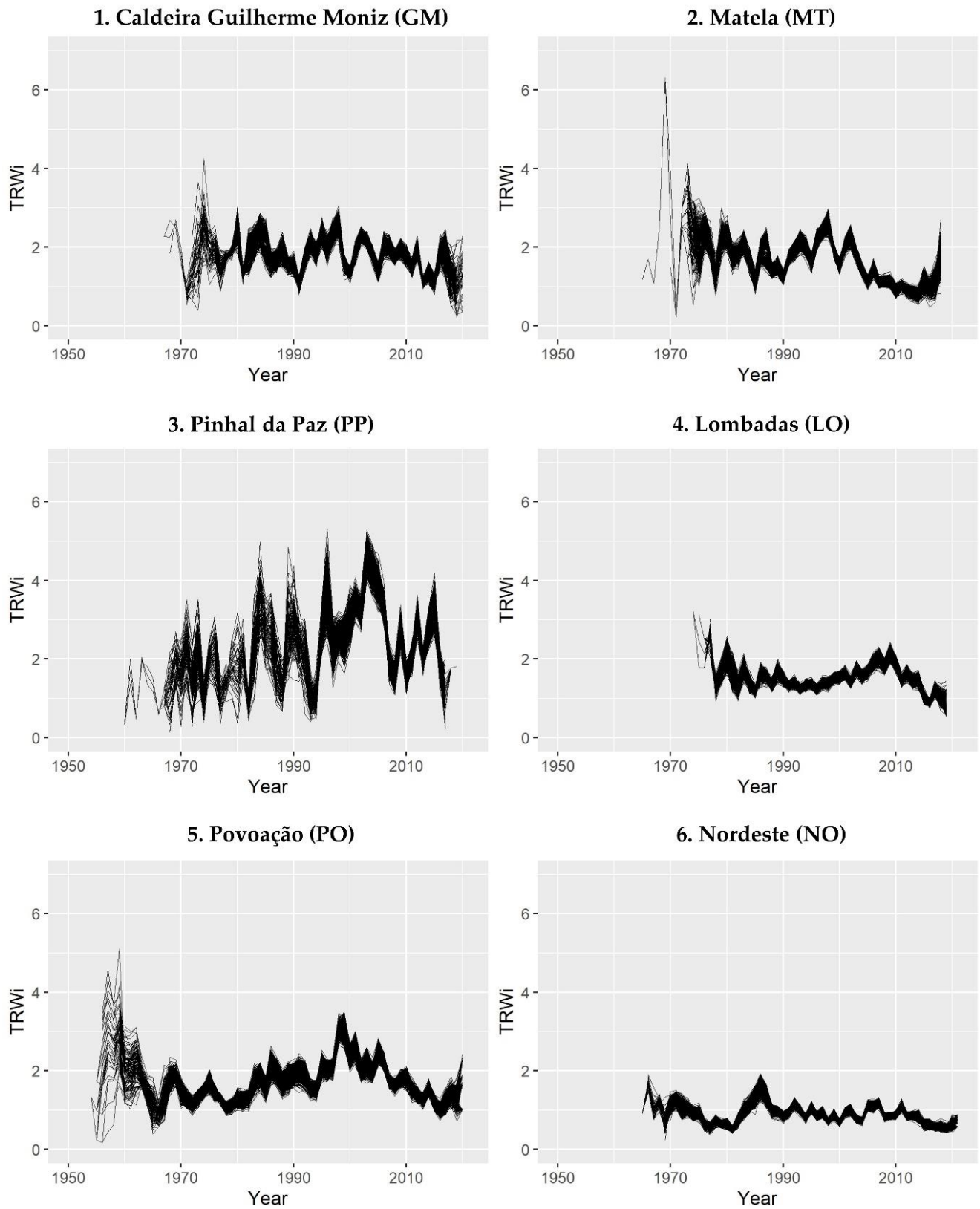
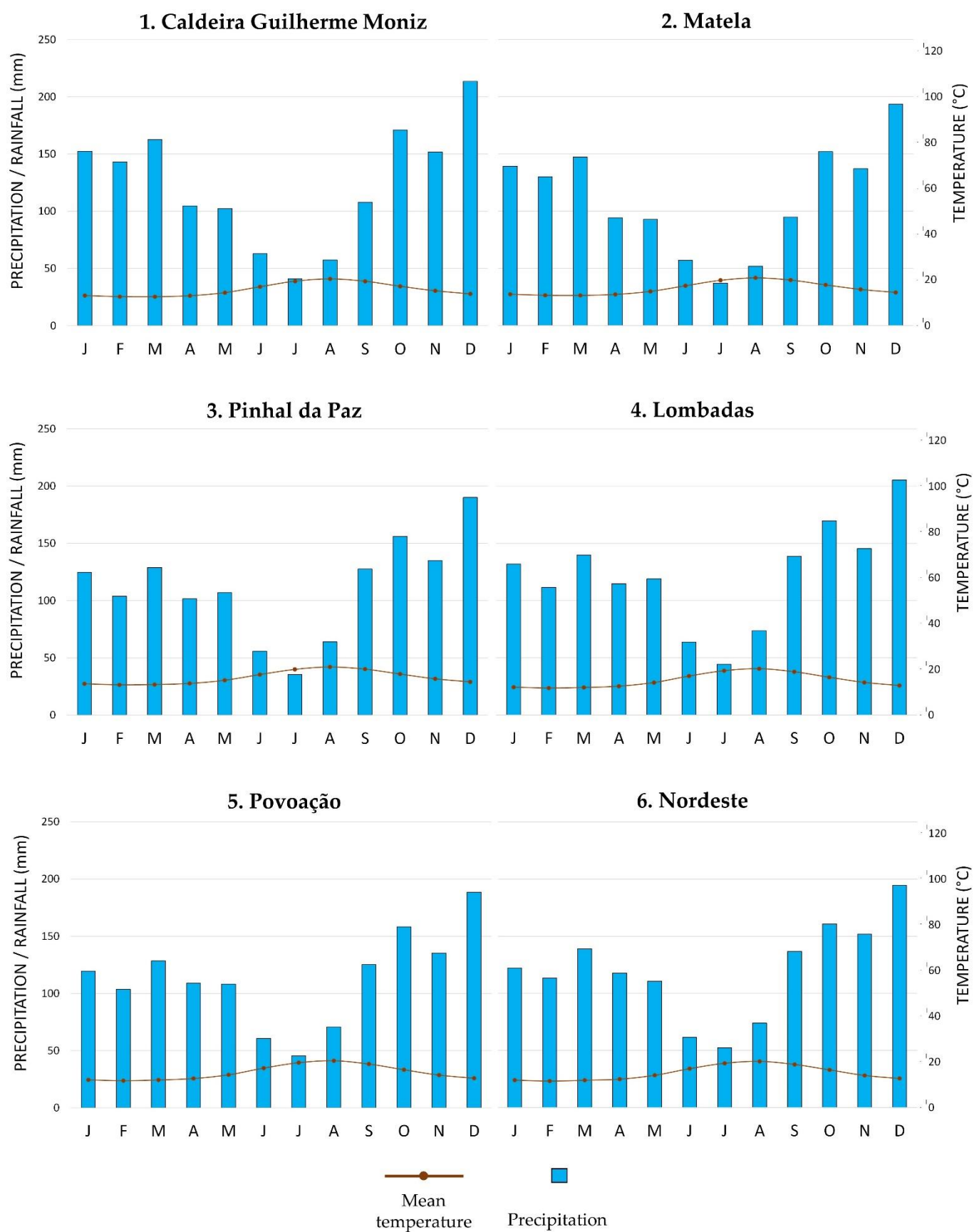


## Supplementary Material



**Figure S1.** Bootstrapped mean chronology for all studied sites. Years on x axis and tree-ring indices (TRWi) on y axis.



**Figure S2.** Average temperatures (lines) and monthly precipitation (bars) for all study sites. Data was extracted from CHELSA timeseries dataset with a spatial resolution of 30-degree seconds.

**Table S1.** Results from the first RF step (various combinations of climatic variables, i.e., temperature and precipitation from current and/or previous year) for composite and site chronologies, with the respective variable importance (%IncMSE). Those variables that were selected for the second step of RF are marked in green.

**Table S2.** Results from second RF step (based on the variables selected on the first RF step), for composite and site chronologies, with the respective variable importance (%IncMSE) and increase in node purity (IncNodePurity). Those variables that were selected for the GLM analysis are marked in green.

**Table S3.** Performance of all RF and GLM tested models (based on the variables selected on the second RF step) for composite and site chronologies, with the respective regression coefficients for each explanatory variable, AIC, AICc, Null Model AIC, adjusted R<sup>2</sup>, mean of squared residuals and % of explained variance.