



*Water Resources Research*

Supporting Information for

**Underestimation of Frequent Floods when Using Annual Maxima for Frequency Analysis: Drivers, Spatial Variability, and Possible Solutions**

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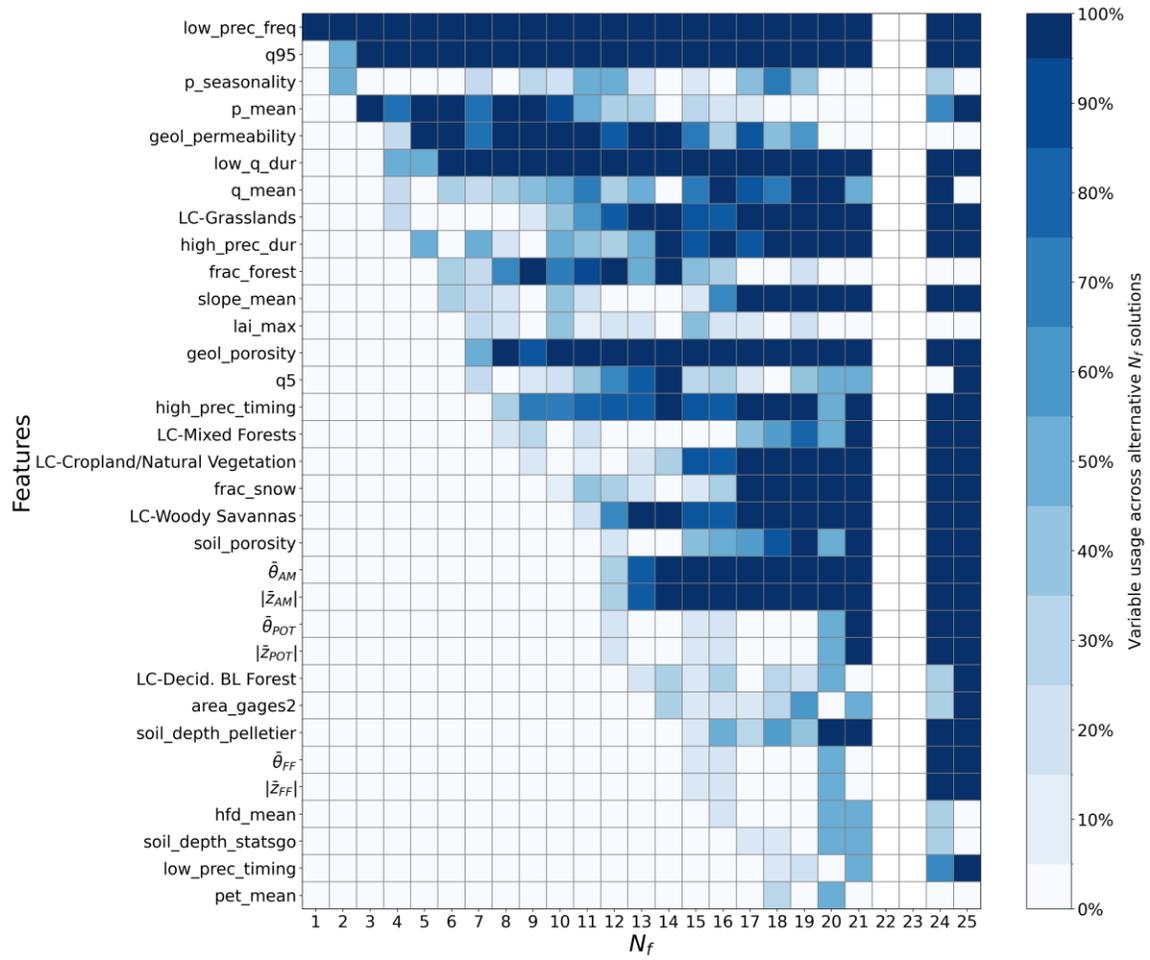
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**Contents of this file**

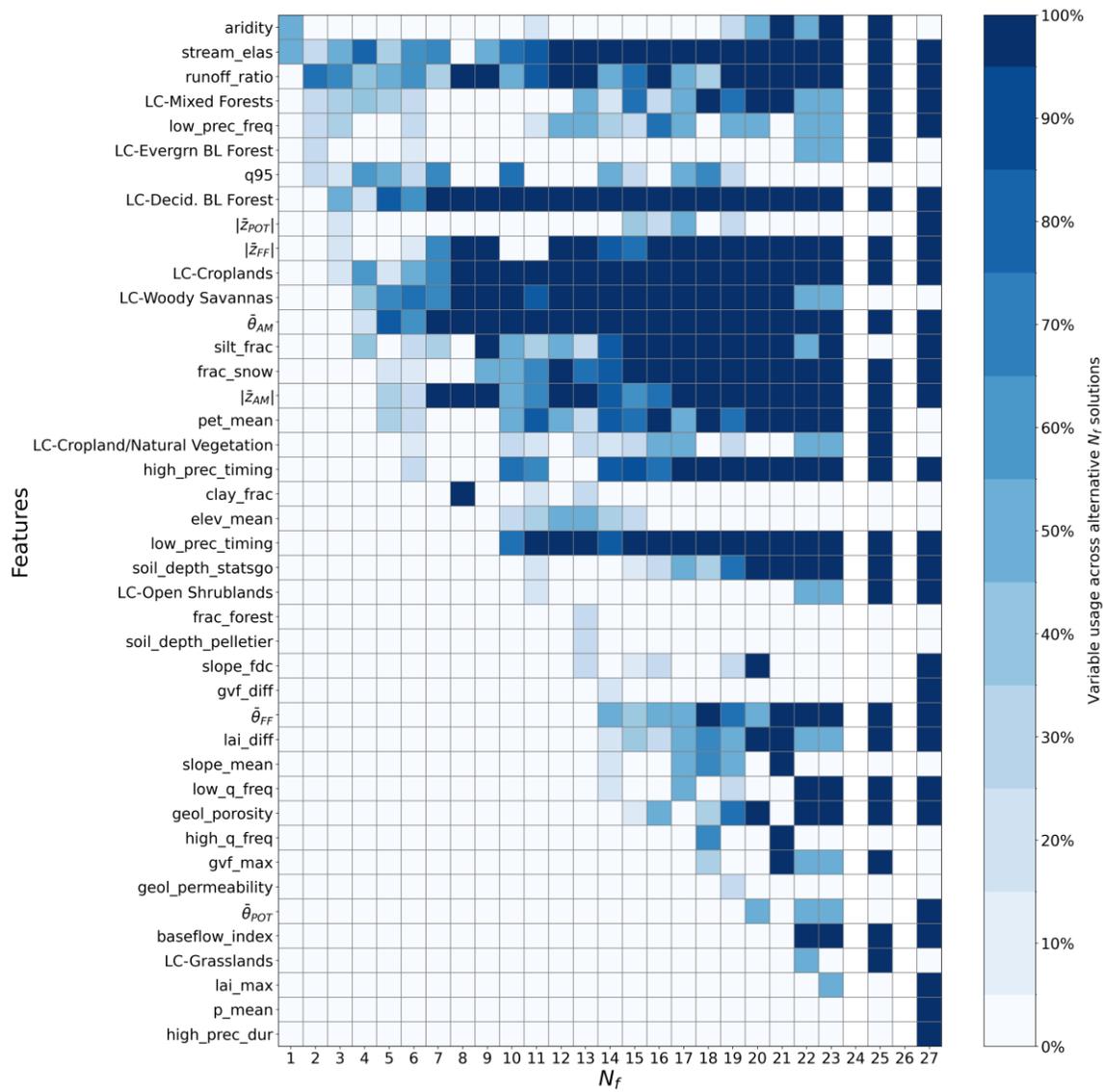
Figures S1 to S2

**Introduction**

Support information in this document includes the full extent heatmaps of usage of optimal basin attributes (Figures S1 and S2), to complete those in Figures 6b and 8b in the main article. The full extent heatmaps here consider all the trade-off solutions in the Pareto Fronts in Figures 6a and 8a in the main article. Figures 6b and 8b in the main article show the heatmaps only for parsimonious solutions with a number of features  $N_f$  up to 10, for two reasons: 1) focusing on the most important predictors only, and 2) breaking down parsimonious solutions in the Pareto fronts by a high degree of detail, by specifying what features are included in each trade-off solutions through the markers in the heatmaps. Figures S1 and S2, on the other hand, do not report any markers, for lack of space.



**Figure S1.** Heatmap with the frequency of usage of variables as optimal predictors in different solutions with same  $N_f$ , for predicting  $\sigma_g/\mu_g$ . All trade-off solutions from the optimal Pareto front in Figure 6a (in the main article) are considered.



**Figure S2.** Heatmap with the frequency of usage of variables as optimal predictors in different solutions with same  $N_f$ , for detecting basins where the duality is not valid. All trade-off solutions from the optimal Pareto front in Figure 8a (in the main article) are considered.