

## Supplementary Material

*Natural Hazards and Earth System Sciences*

# High-spatial resolution probability maps of drought duration and magnitude across Spain

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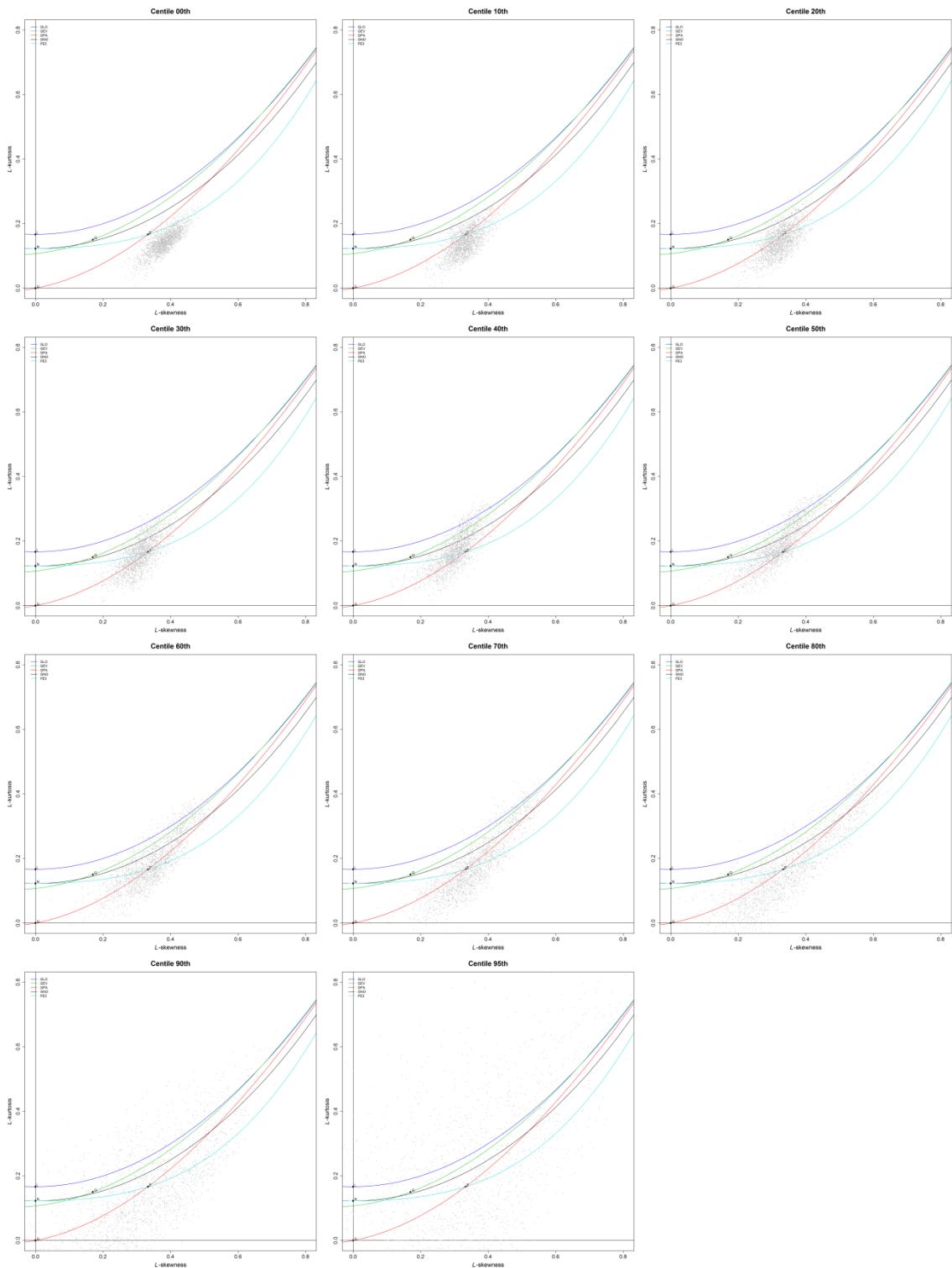
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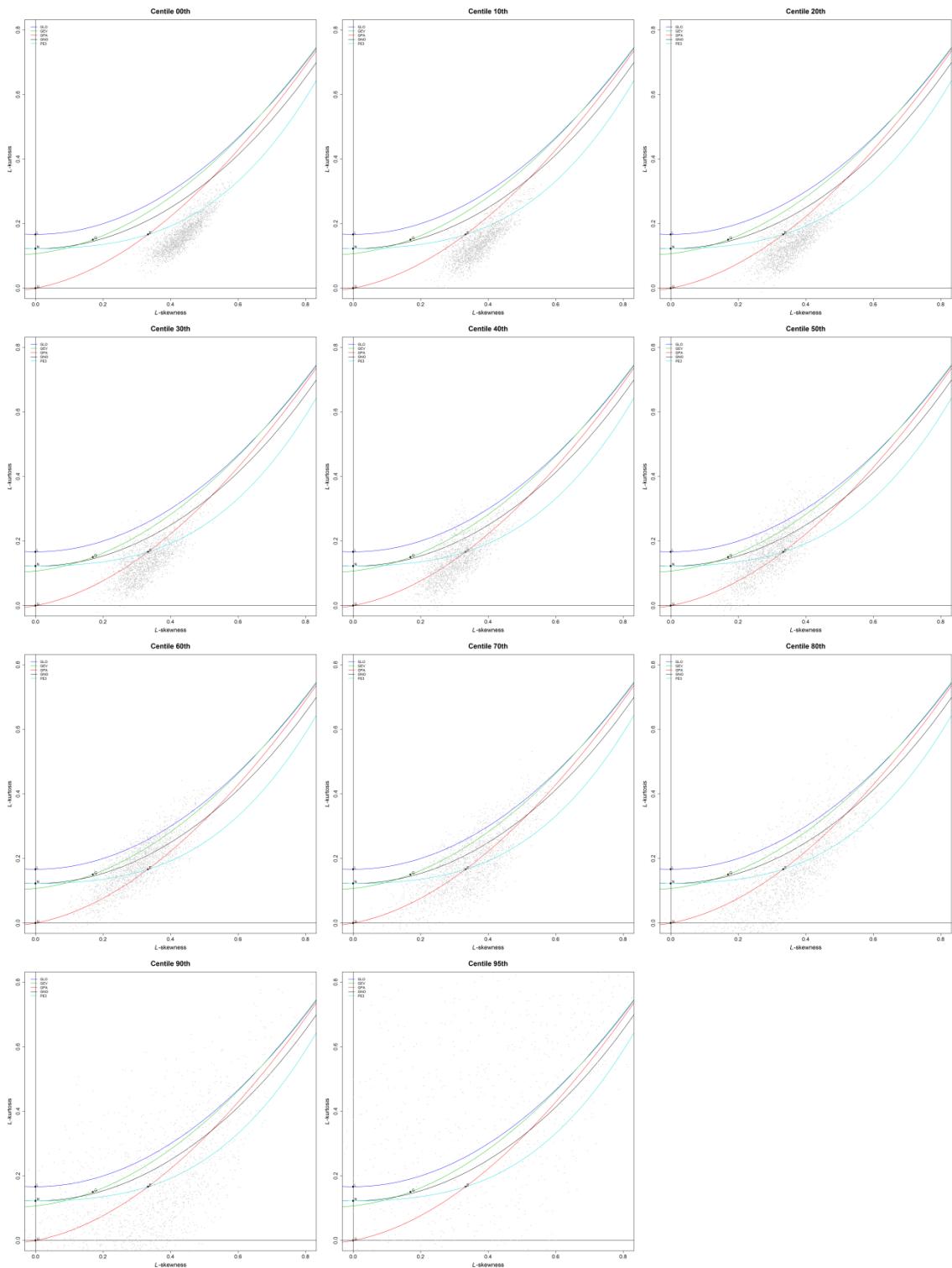
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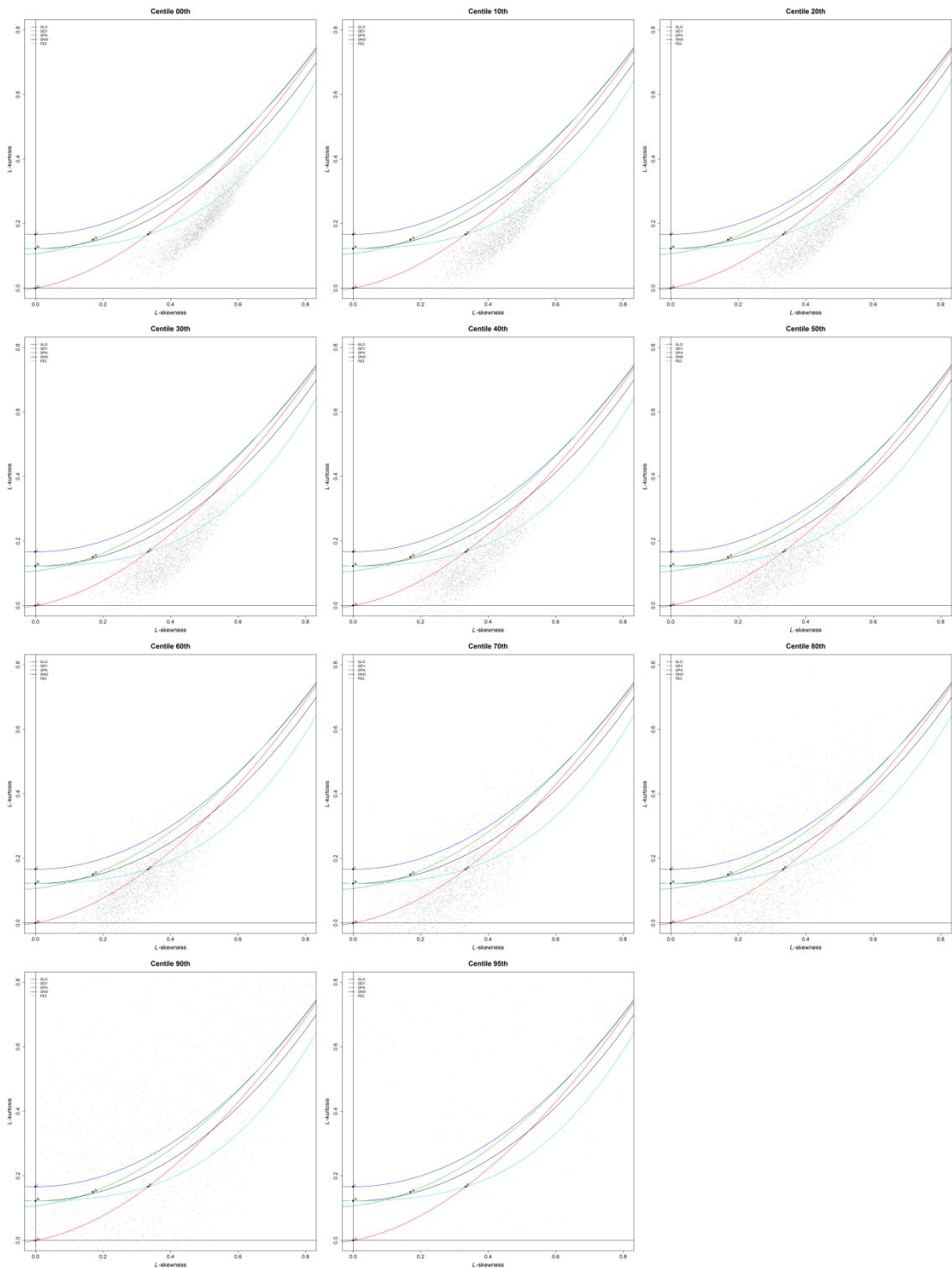
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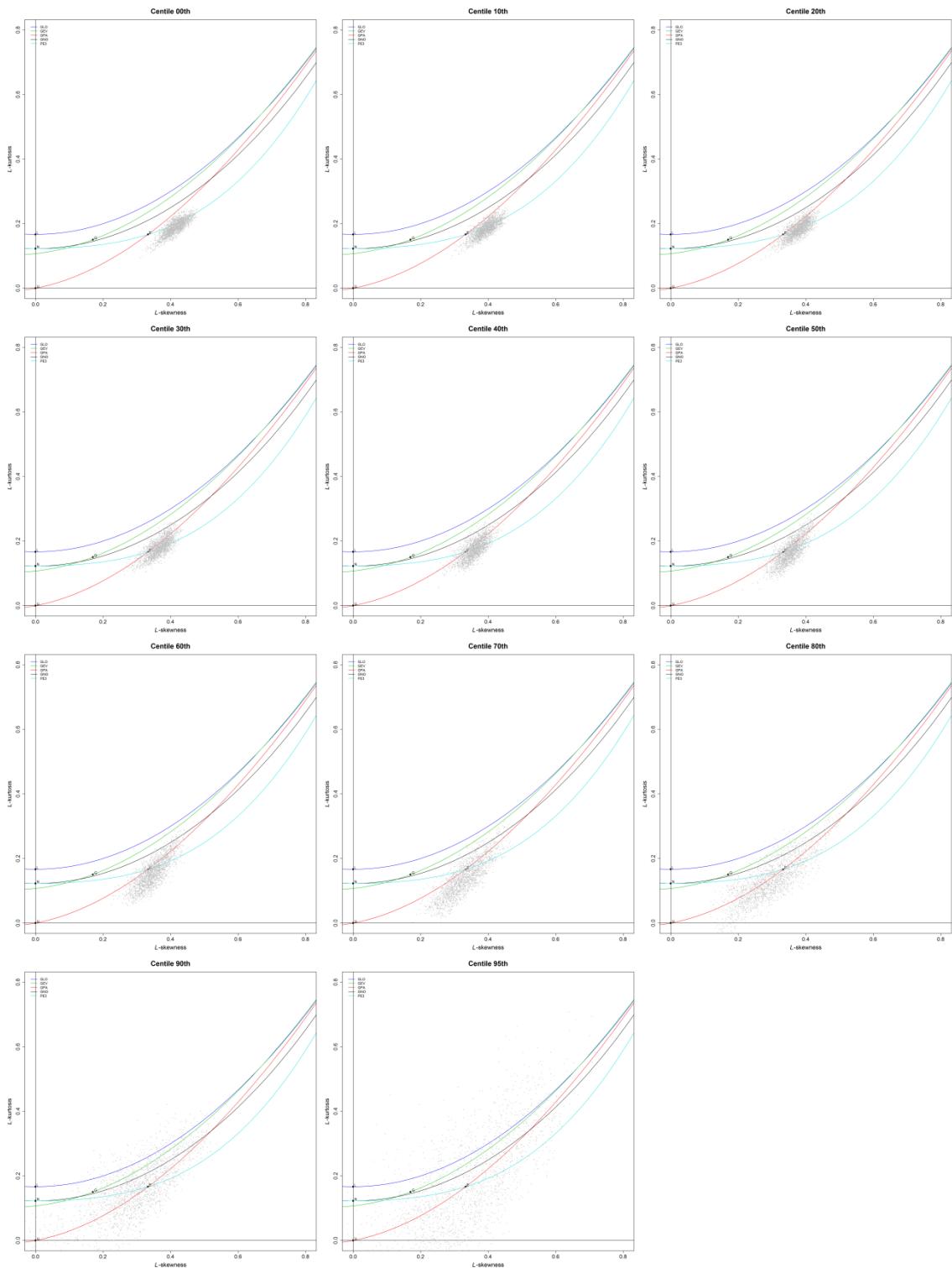
**Supplementary Figure 1: L-moment diagrams for the peak-over-threshold series obtained from the 3-month SPEI duration series**



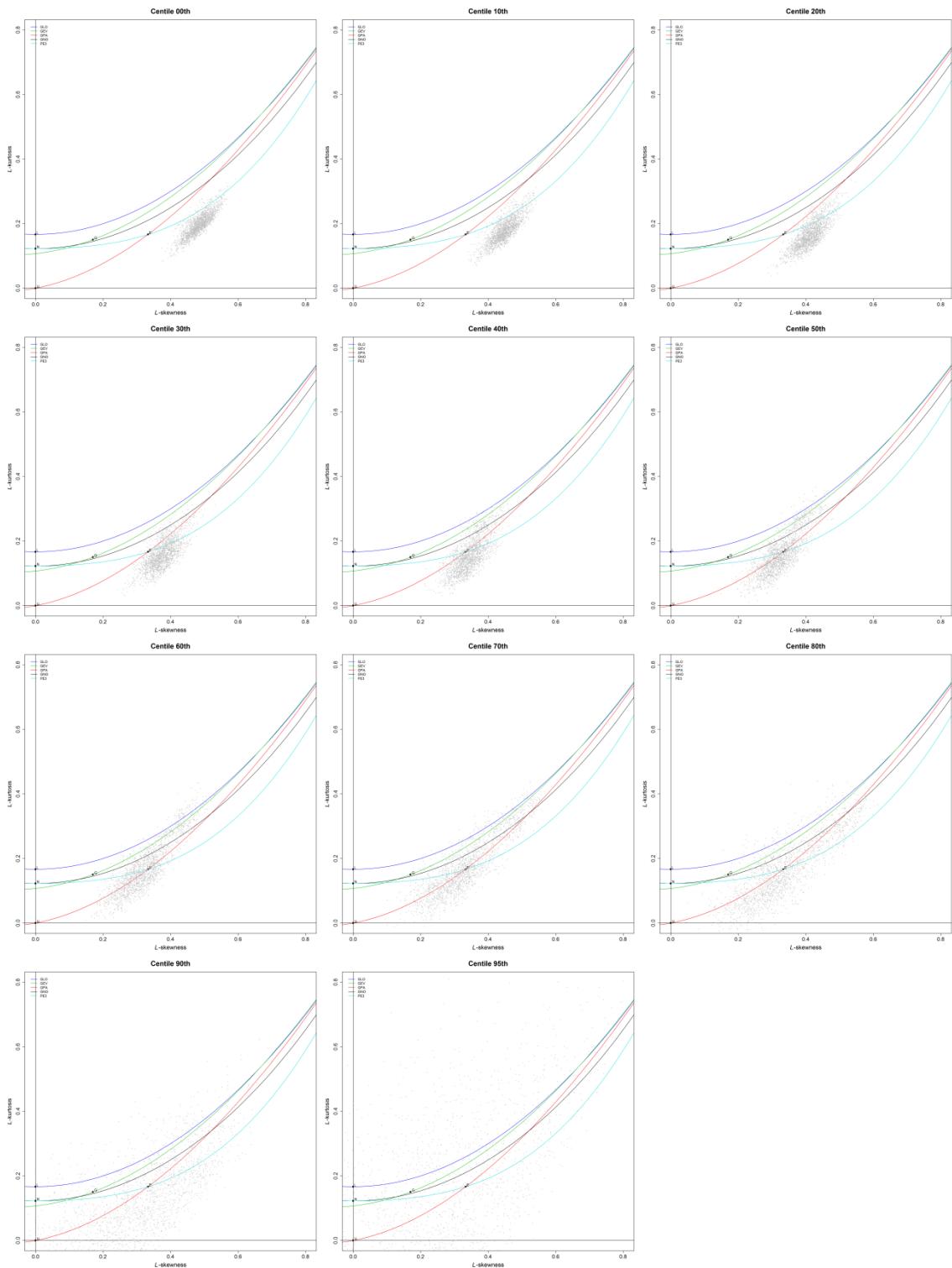
**Supplementary Figure 2: L-moment diagrams for the peak-over-threshold series obtained from the 6-month SPEI duration series**



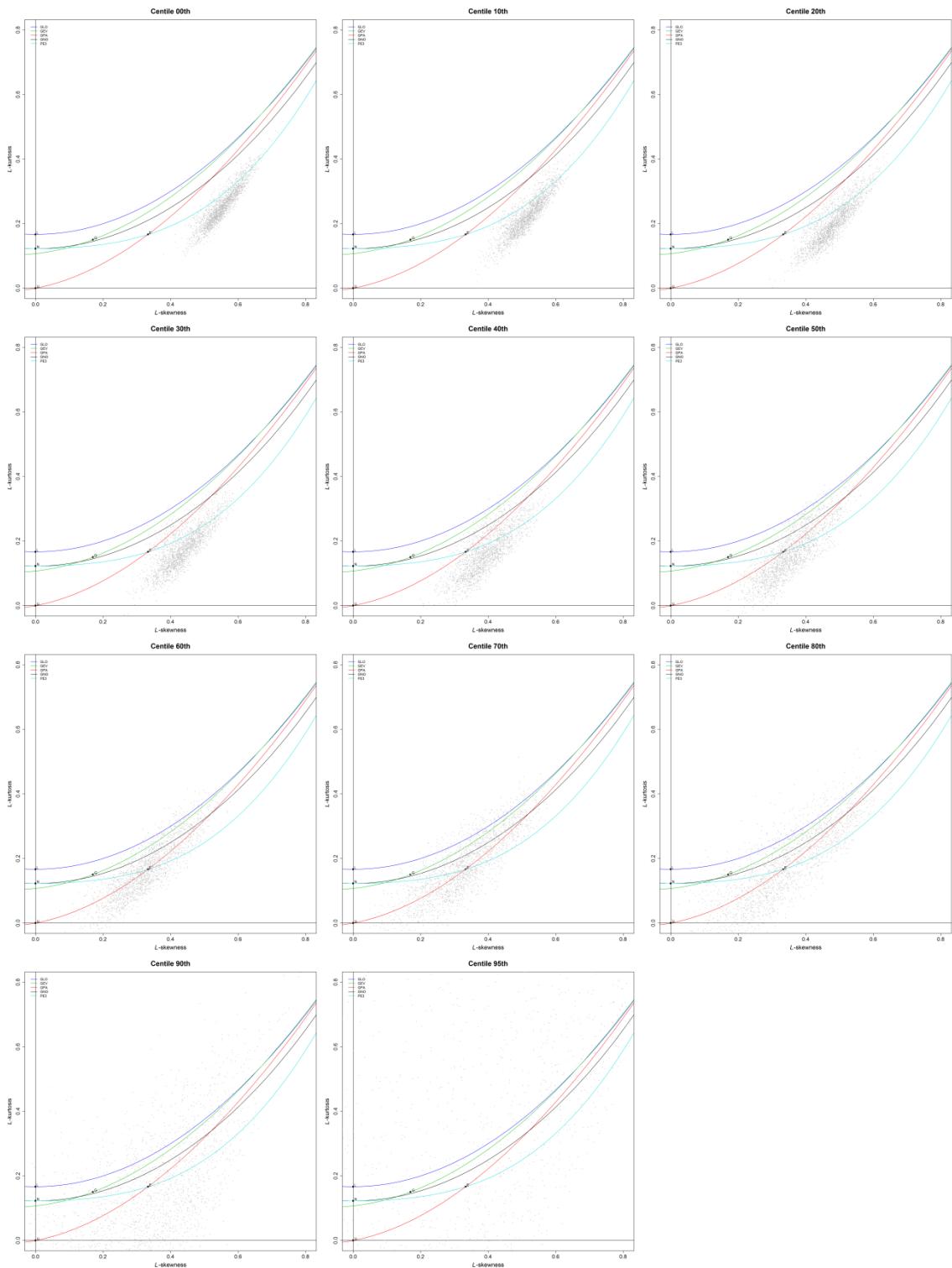
**Supplementary Figure 3: L-moment diagrams for the peak-over-threshold series obtained from the 12-month SPEI duration series**



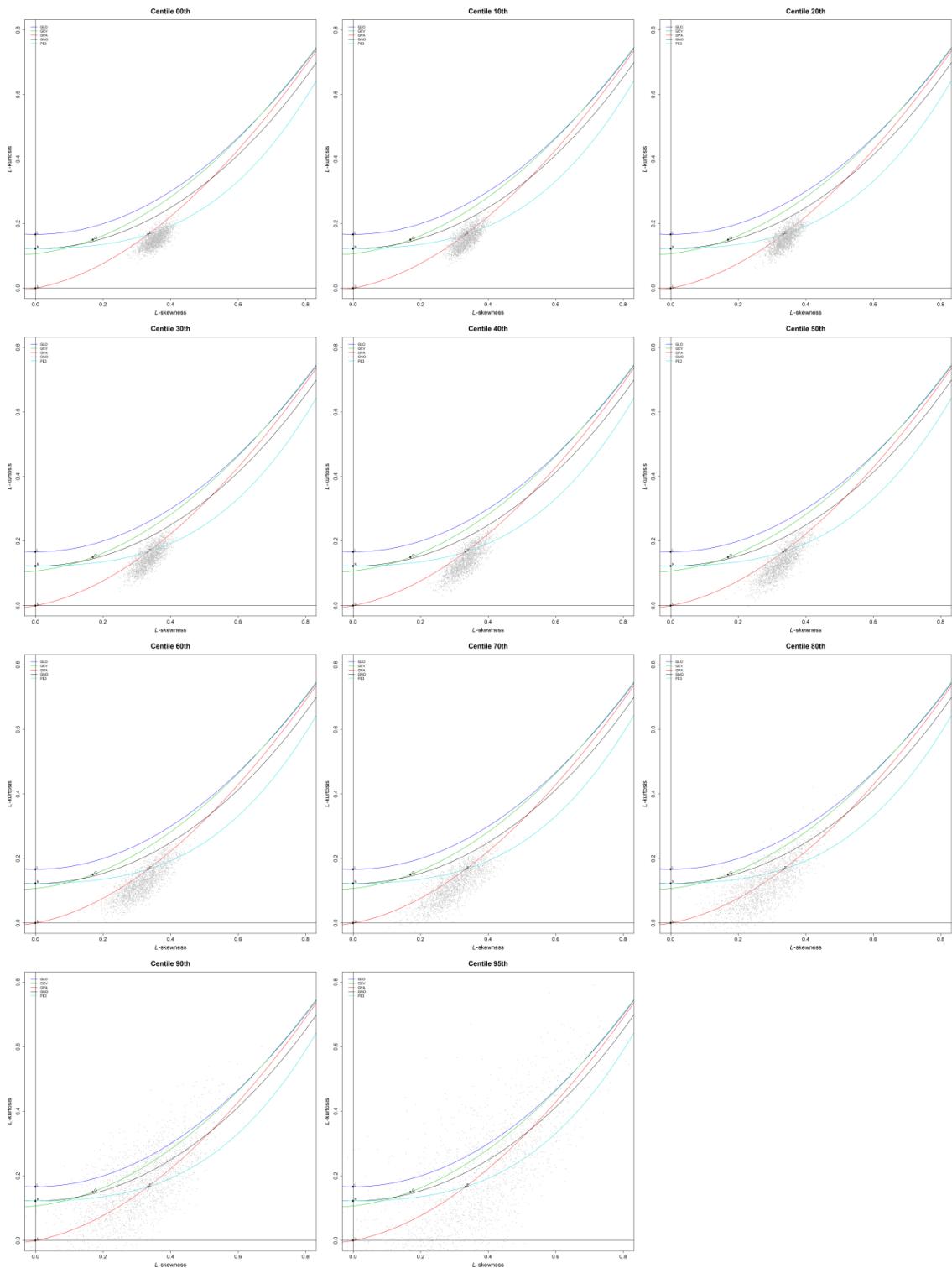
**Supplementary Figure 4: L-moment diagrams for the peak-over-threshold series obtained from the 1-month SPEI magnitude series**



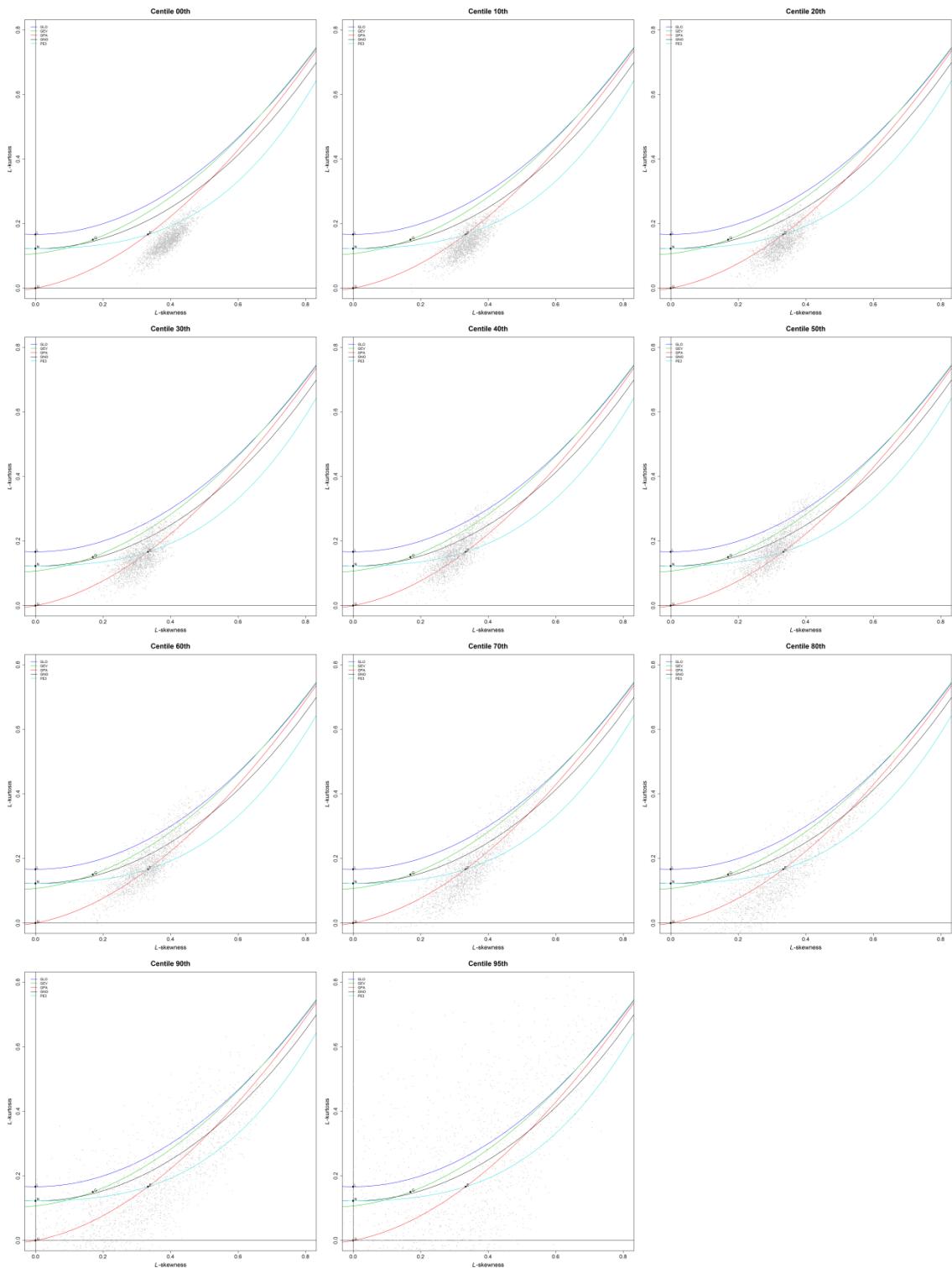
**Supplementary Figure 5: L-moment diagrams for the peak-over-threshold series obtained from the 3-month SPEI magnitude series**



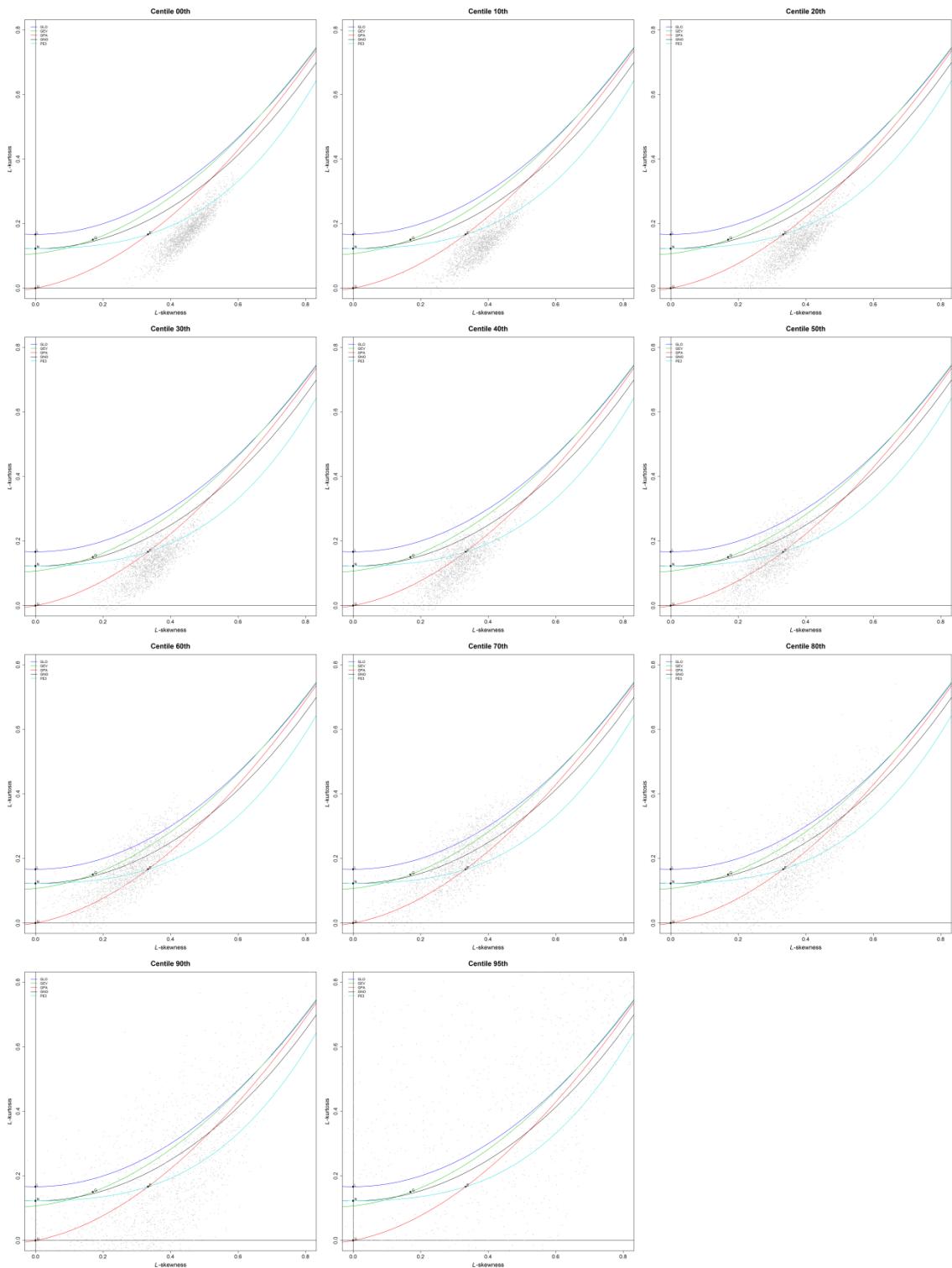
**Supplementary Figure 6: L-moment diagrams for the peak-over-threshold series obtained from the 6-month SPEI magnitude series**



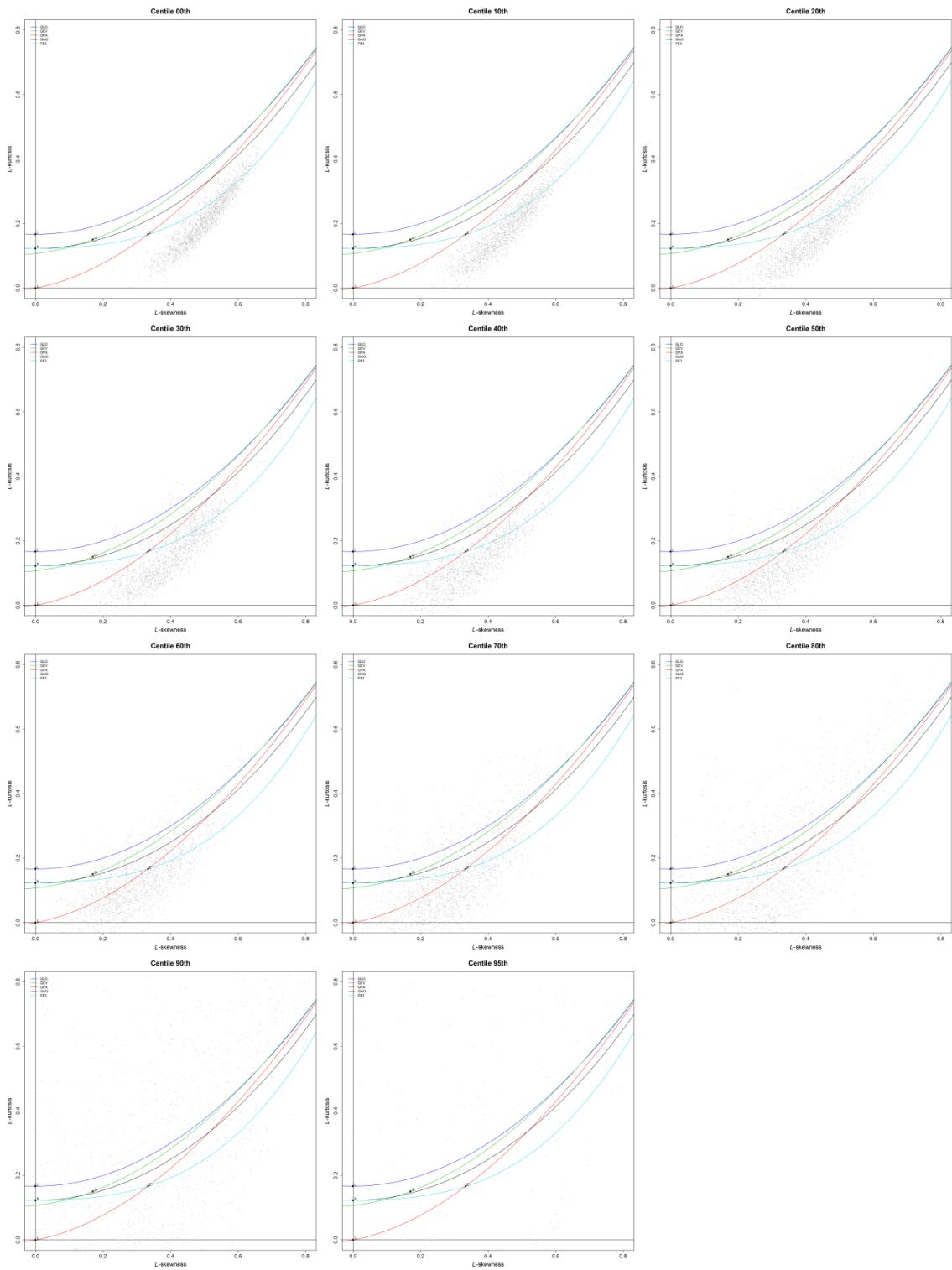
**Supplementary Figure 7: L-moment diagrams for the peak-over-threshold series obtained from the 1-month SPI duration series**



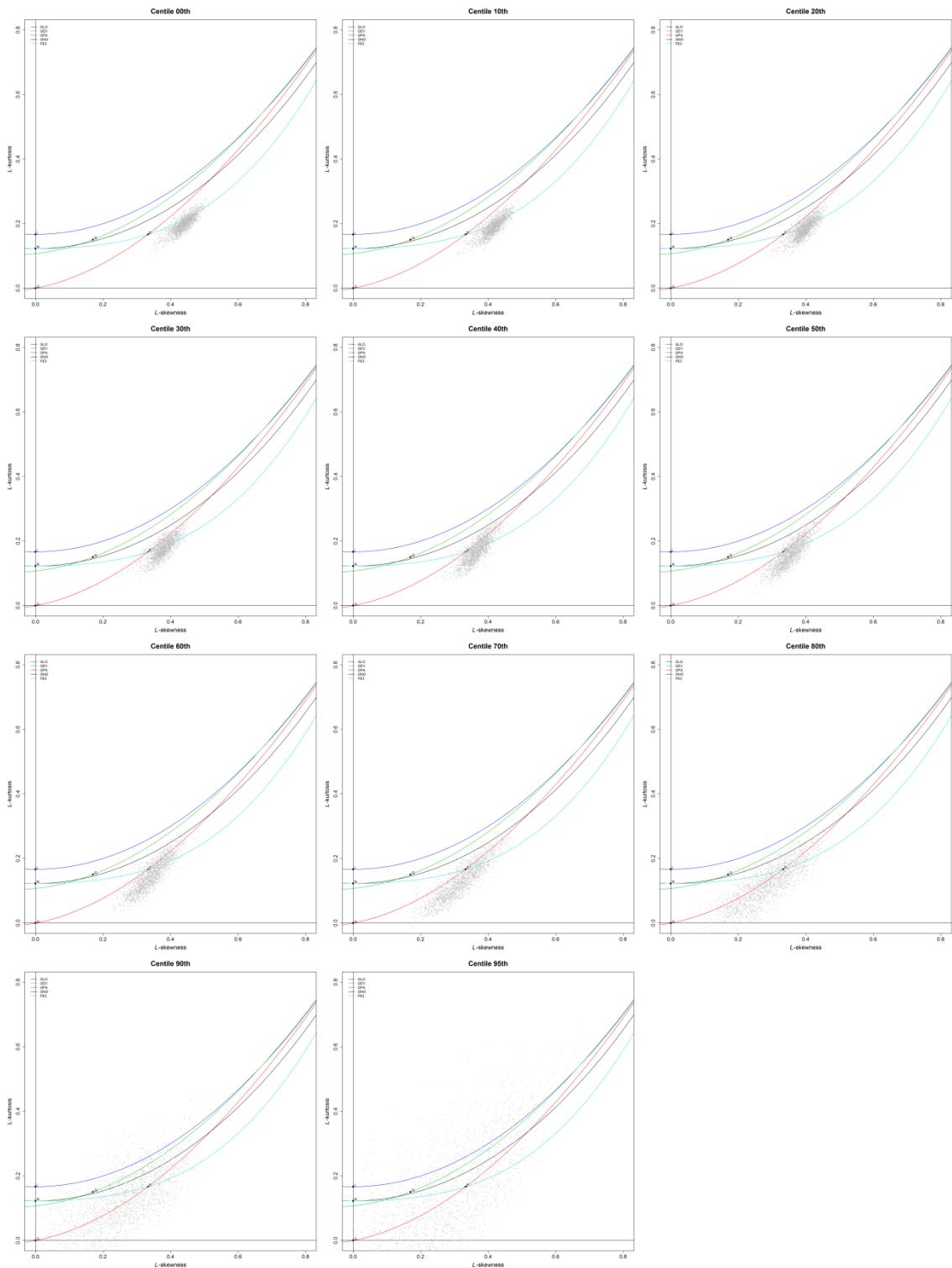
**Supplementary Figure 8: L-moment diagrams for the peak-over-threshold series obtained from the 3-month SPI duration series**



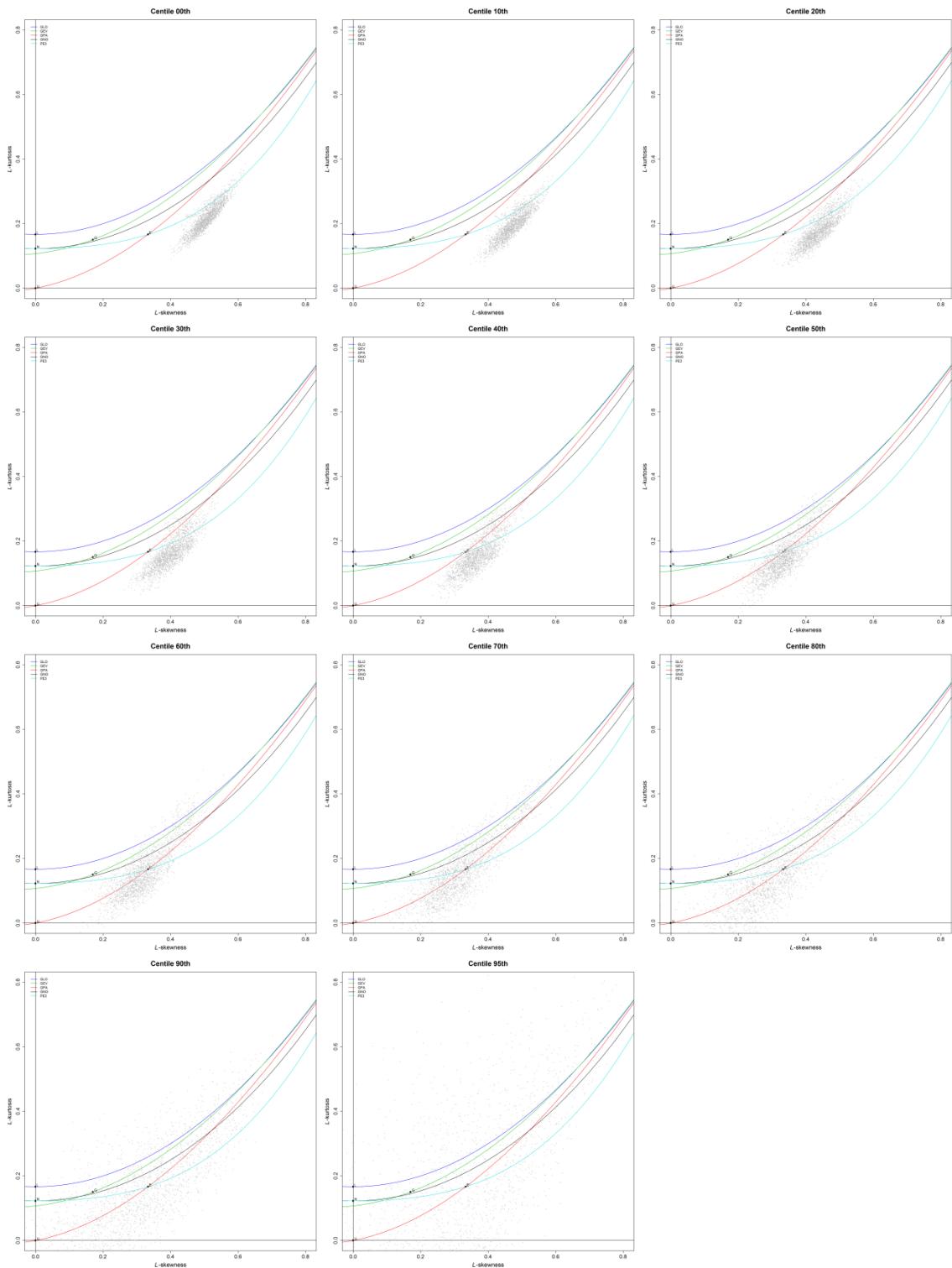
**Supplementary Figure 9: L-moment diagrams for the peak-over-threshold series obtained from the 6-month SPI duration series**



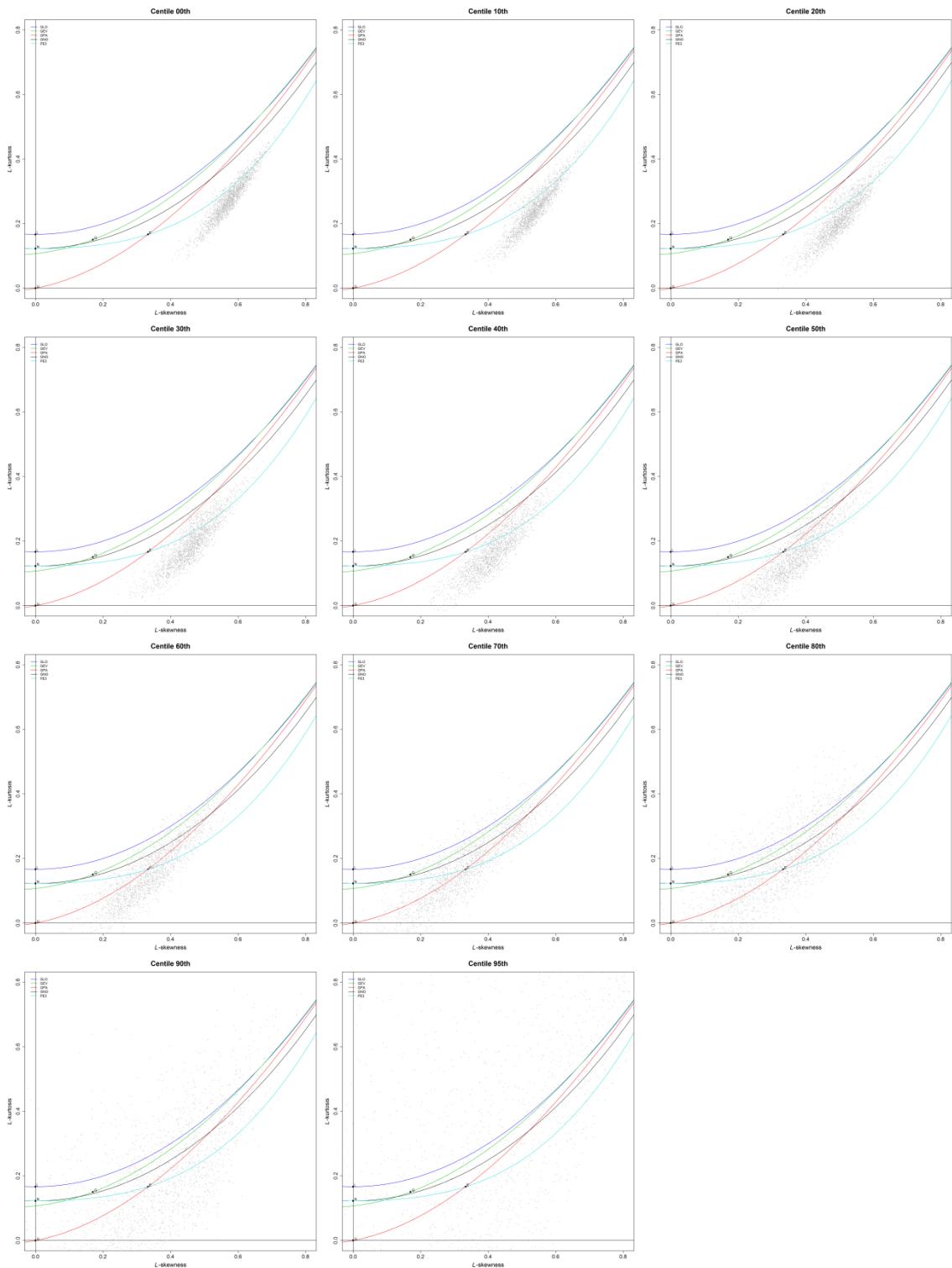
**Supplementary Figure 10: L-moment diagrams for the peak-over-threshold series obtained from the 12-month SPI duration series**



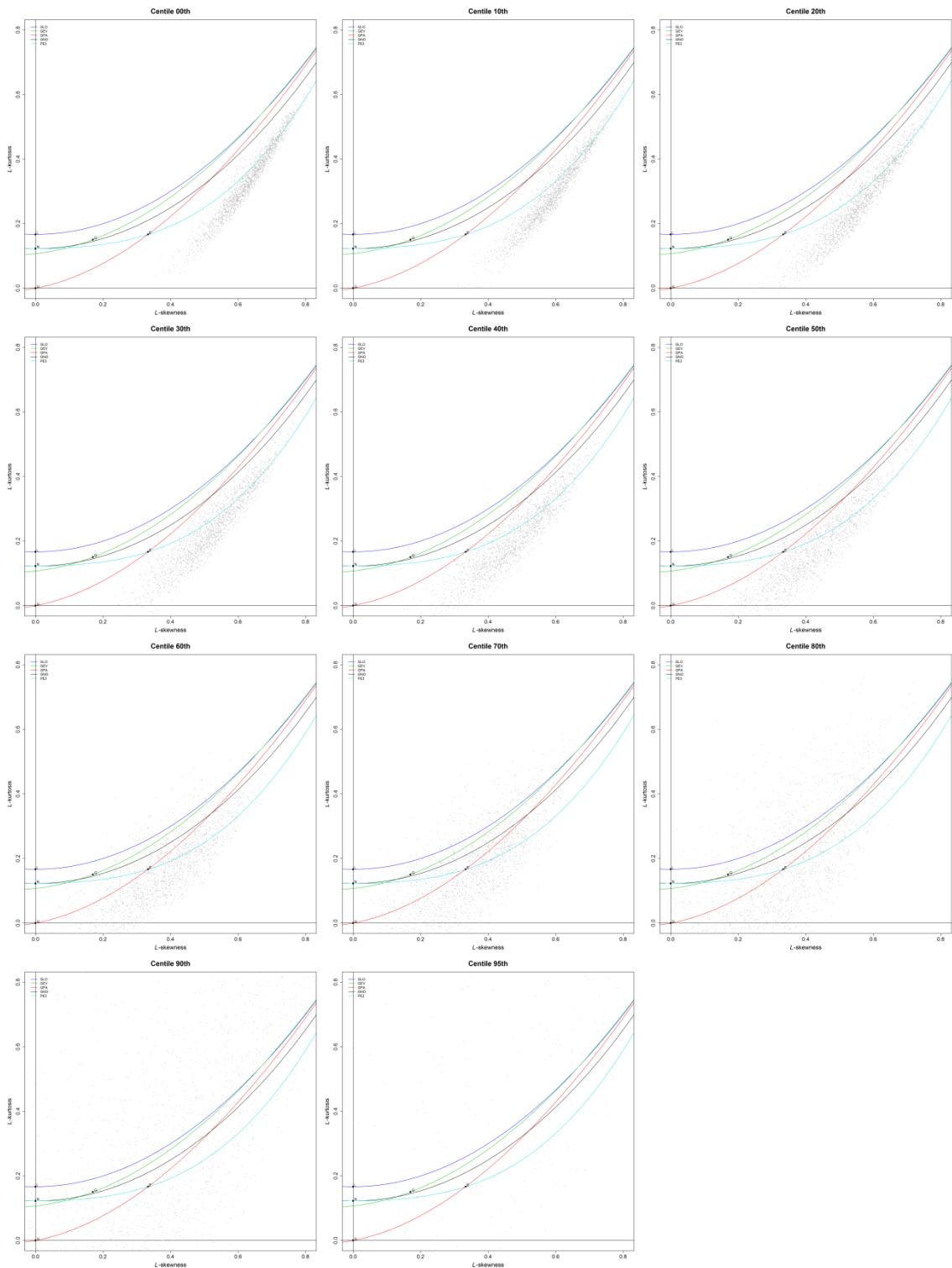
**Supplementary Figure 11: L-moment diagrams for the peak-over-threshold series obtained from the 1-month SPI magnitude series**



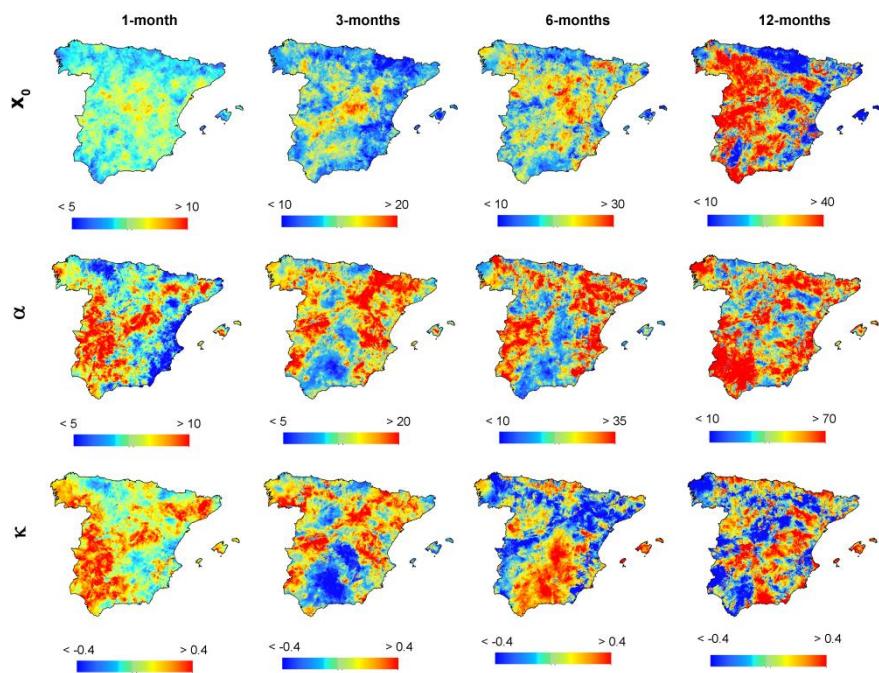
**Supplementary Figure 12: L-moment diagrams for the peak-over-threshold series obtained from the 3-month SPI magnitude series**



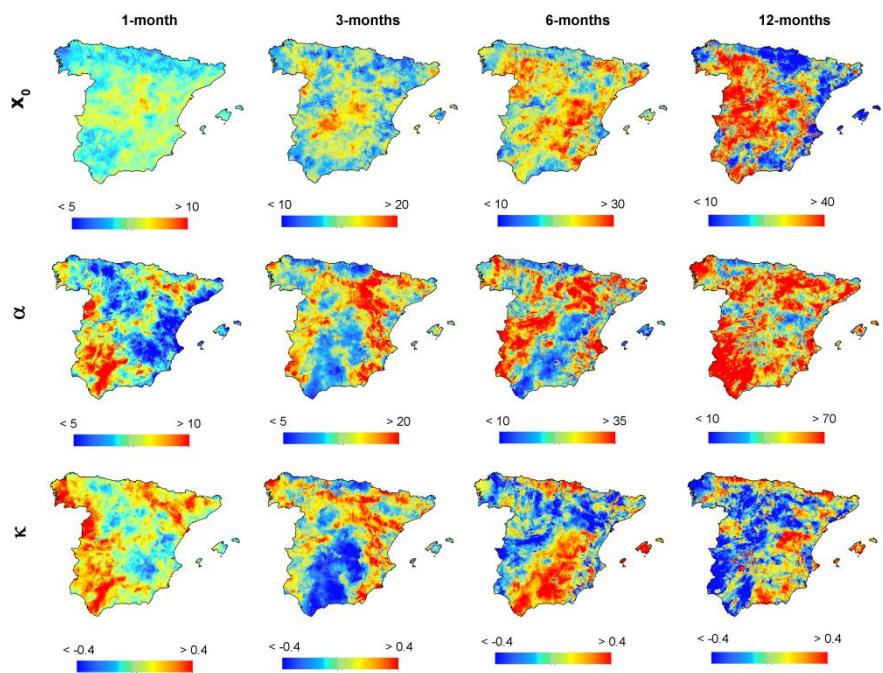
**Supplementary Figure 13: L-moment diagrams for the peak-over-threshold series obtained from the 6-month SPI magnitude series**



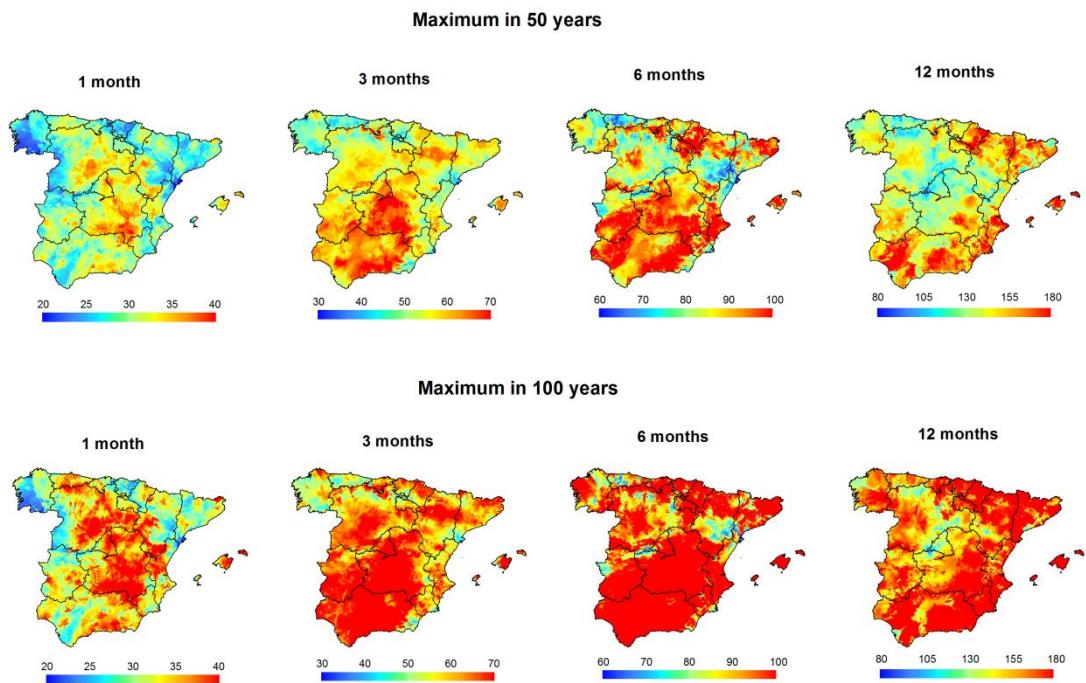
**Supplementary Figure 14: L-moment diagrams for the peak-over-threshold series obtained from the 12-month SPI magnitude series**



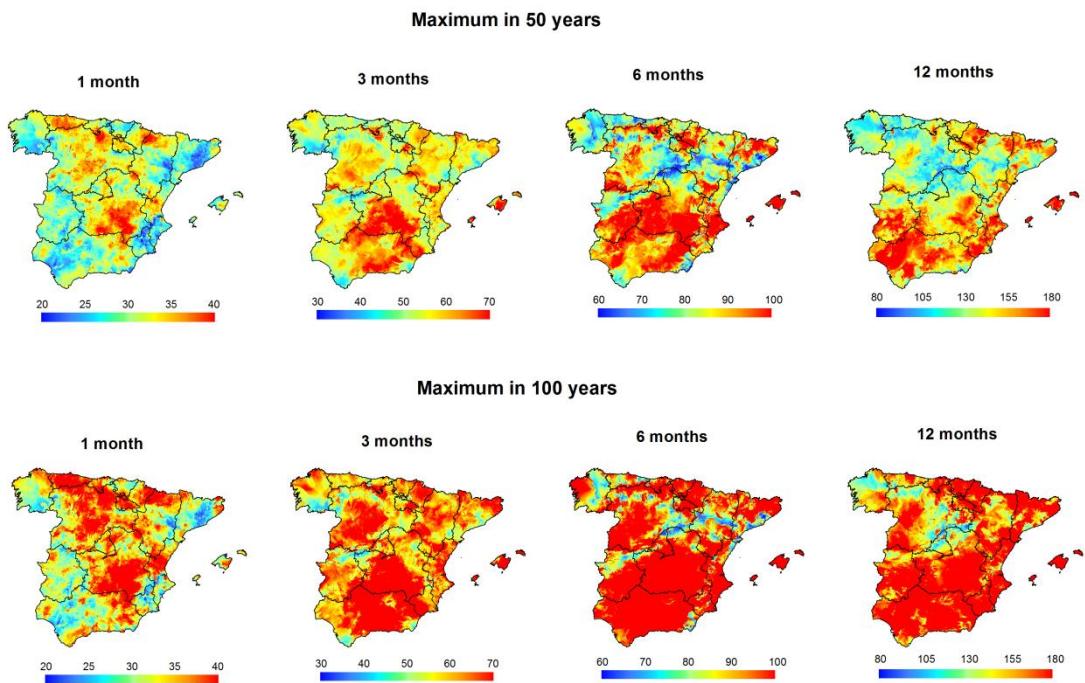
**Supplementary Figure 15: Spatial distribution of the parameters of the GP distribution for the SPI magnitude series**



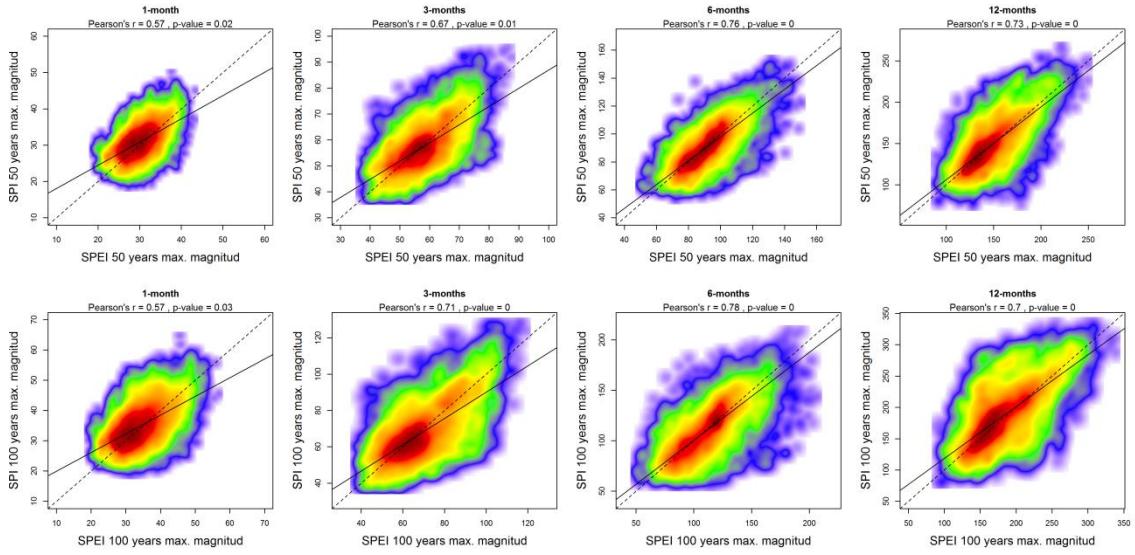
**Supplementary Figure 16: Spatial distribution of the parameters of the GP distribution for the SPEI magnitude series**



**Supplementary Figure 17: Spatial distribution of the maximum drought magnitude (in SPEI units) from the 1-, 3-, 6- and 12-month SPEI series in a period of 50 and 100 years.**



**Supplementary Figure 18: Spatial distribution of the maximum drought magnitude (in SPI units) from the 1-, 3-, 6- and 12-month SPI series in a period of 50 and 100 years.**



**Supplementary Figure 19: Scatterplots showing the relationship between the maximum drought duration (in weeks) expected in a period of 50 and 100 years considering 1-, 3-, 6- and 12- SPEI and the SPI. Colors represent the density of points, with red denoting the highest density. Given the large sample used, the significance of the Pearson's  $r$  coefficients was estimated by means of a Montecarlo approach using  $10^3$  random samples, with each sample containing 30 cases.**