



Supplement of

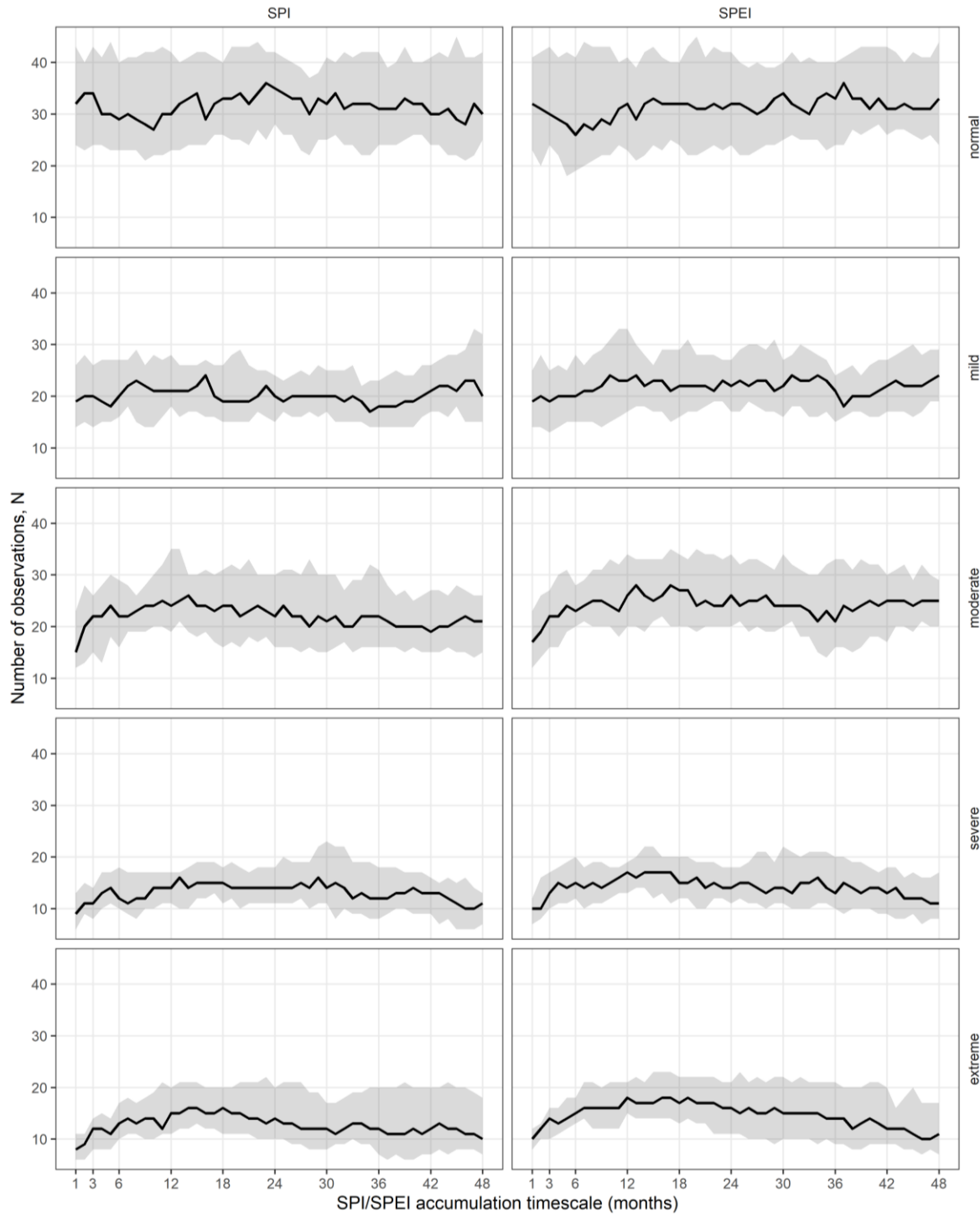
Multiscalar and nonlinear controls of drought impacts in Spain revealed by media-reported data

Ahmed M. El Kenawy et al.

Correspondence to: Ahmed M. El Kenawy (kenawy@ipe.csic.es)

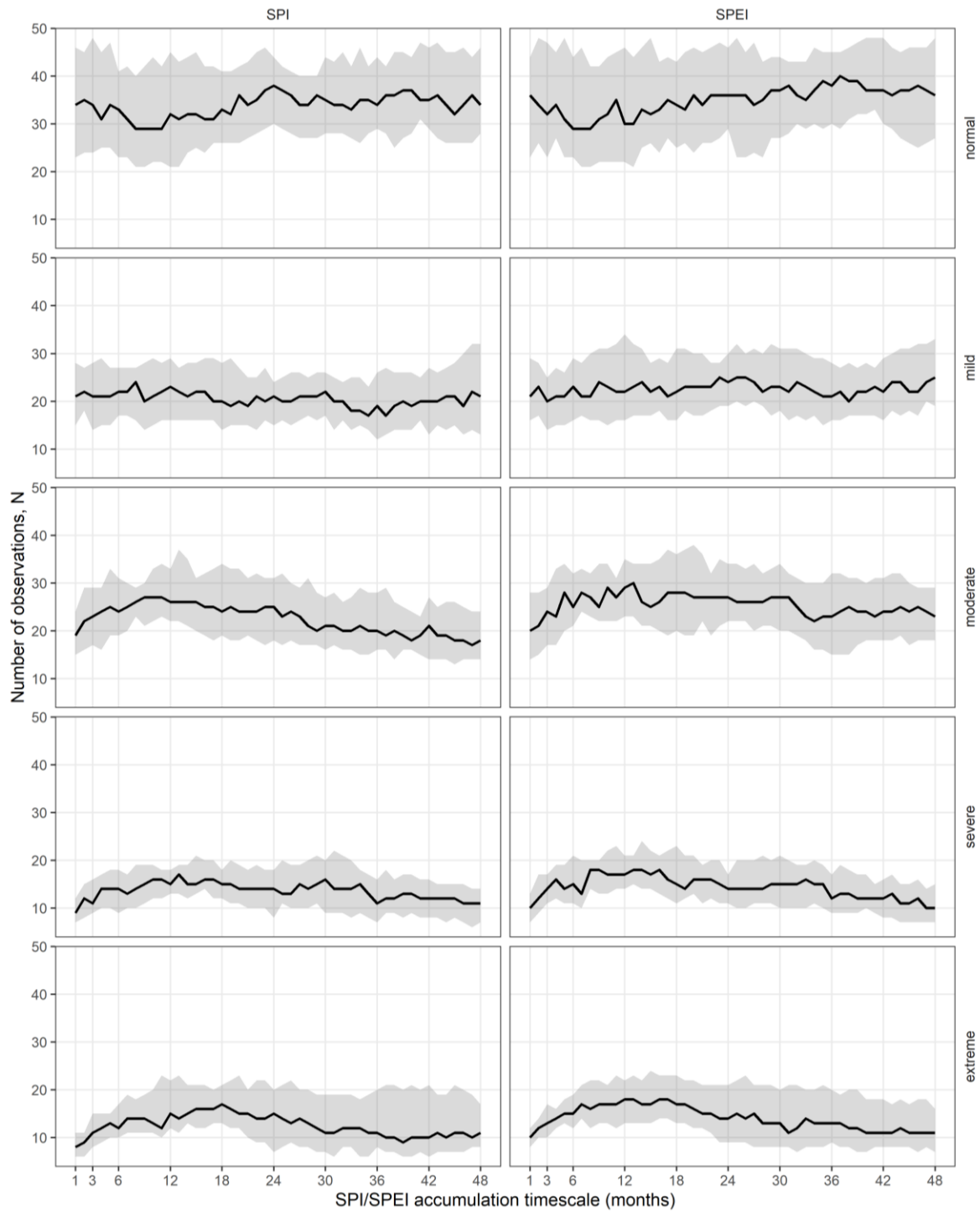
The copyright of individual parts of the supplement might differ from the article licence.

S1 Regression sample size for hydrological-impact reporting



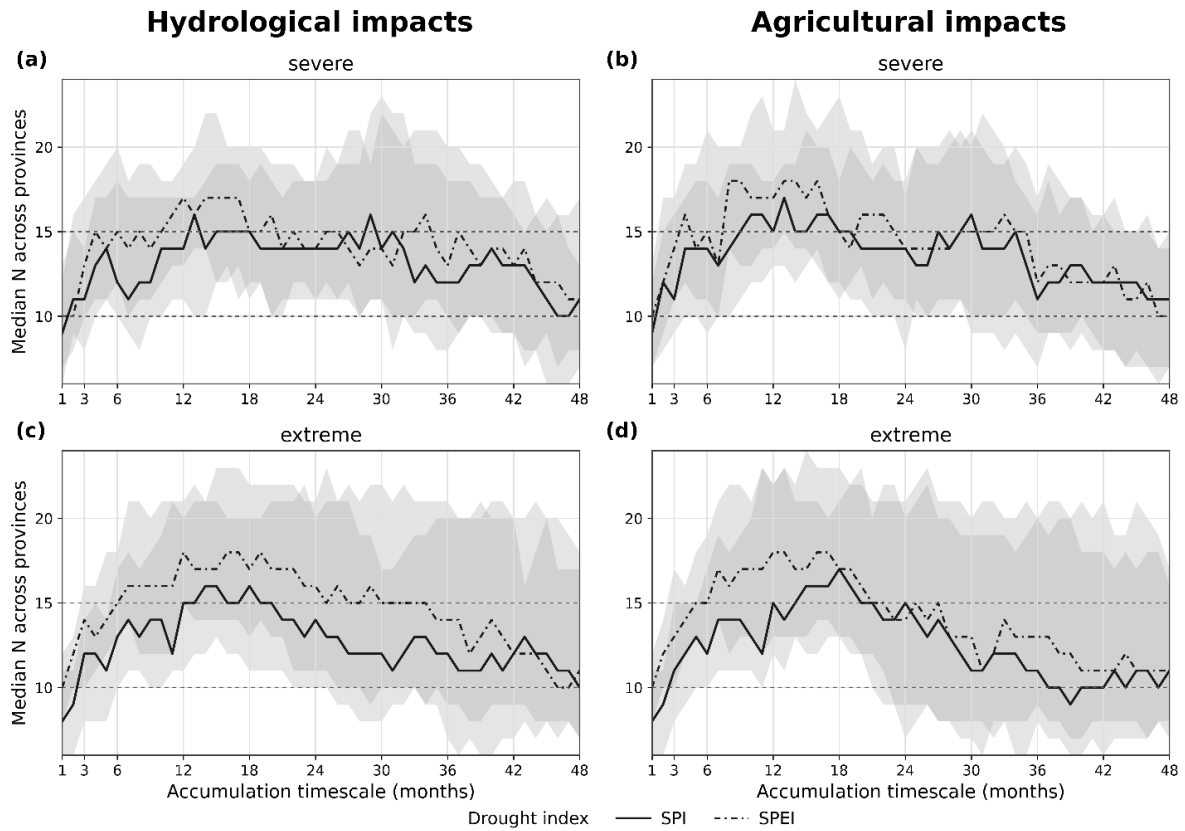
Supplementary Fig. S1. Regression sample size across SPI (left panels) and SPEI (right panels) accumulation timescales (1–48 months) for five drought-severity classes corresponding to hydrological-impact reporting. The black line shows the median number of paired observations (N) across 48 provinces, and the grey ribbon indicates the interquartile range (25th–75th percentiles).

S2 Regression sample size for agricultural-impact reporting



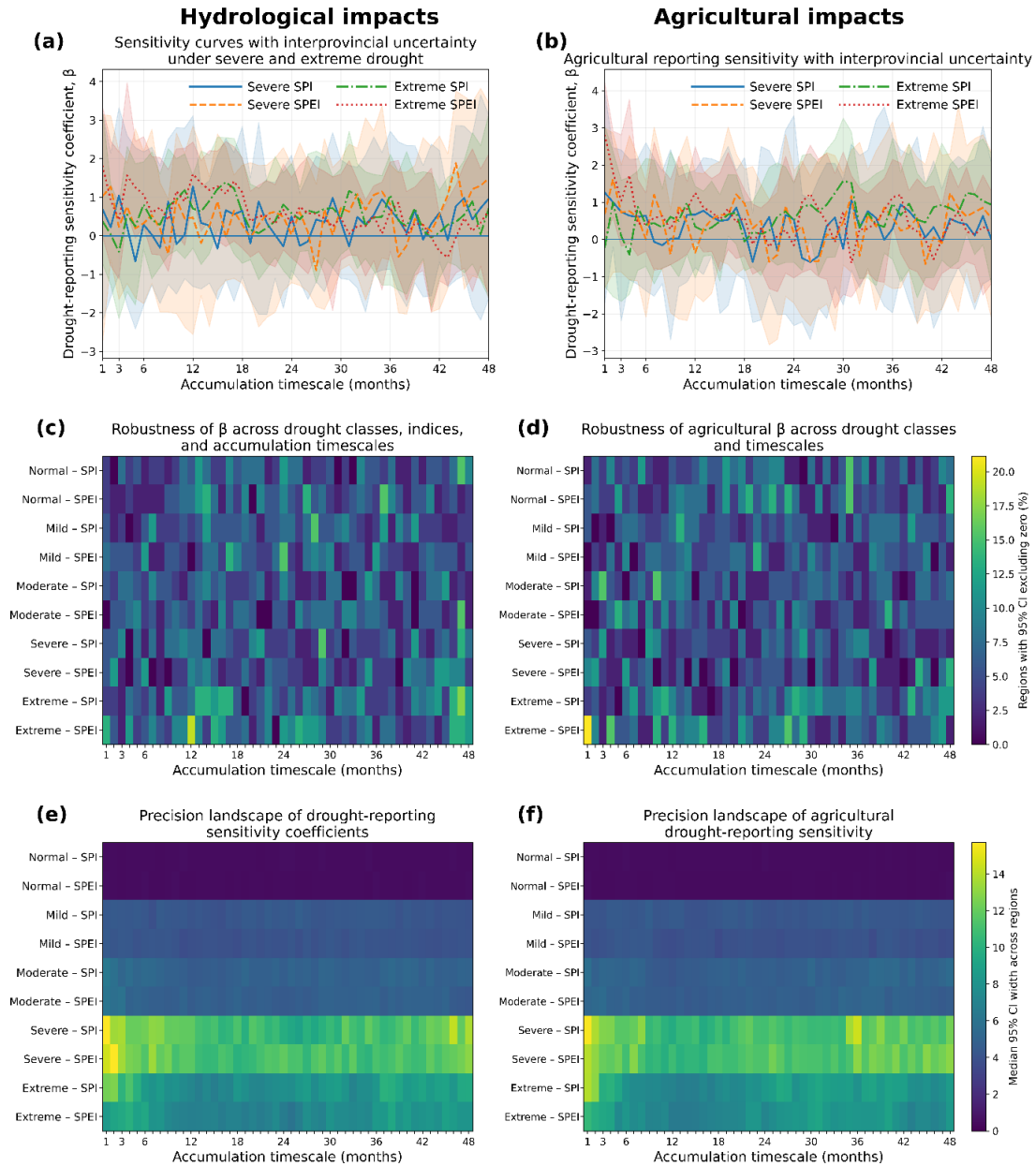
Supplementary Fig. S2. Regression sample size across SPI (left panels) and SPEI (right panels) accumulation timescales (1–48 months) for five drought-severity classes corresponding to agricultural-impact reporting. The black line shows the median number of paired observations (N) across 48 provinces, and the grey ribbon indicates the interquartile range (25th–75th percentiles).

S3 Sample-size support for severe and extreme drought regressions



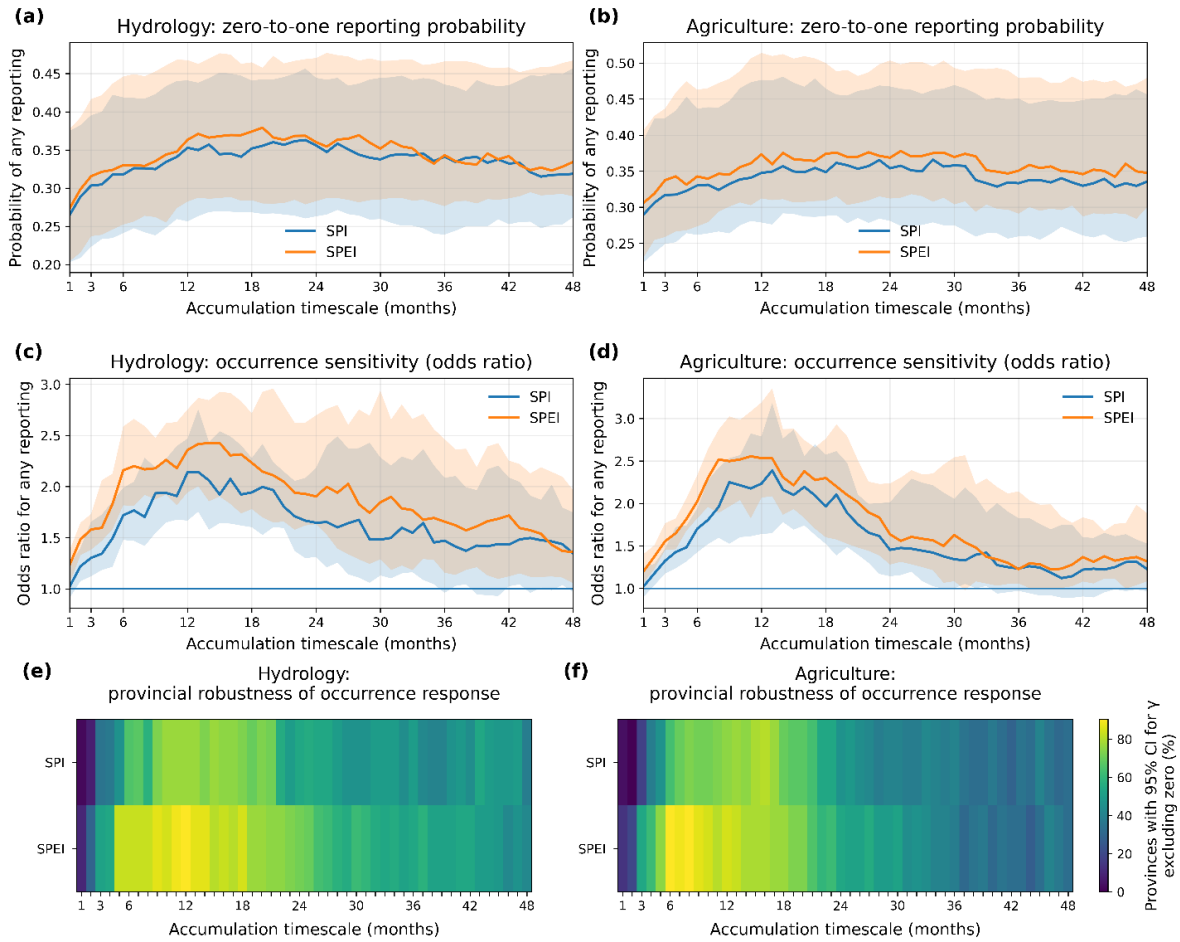
Supplementary Fig. S3. Sample-size support for severe and extreme drought regressions across accumulation timescales (1–48 months) for hydrological- and agricultural-impact reporting. Hydrological-impact reporting is shown in the left panels and agricultural-impact reporting in the right panels; severe drought is shown in the upper panels (a, b) and extreme drought in the lower panels (c, d). Solid and dash-dotted lines show the median number of paired observations (N) across provinces for SPI and SPEI, respectively, while grey shaded bands indicate the corresponding interquartile ranges. Horizontal dashed lines denote reference sample sizes of (N = 10) and (N = 15).

S4 Uncertainty and robustness of drought-reporting sensitivity coefficients



Supplementary Fig. S4. Uncertainty and robustness of drought-reporting sensitivity coefficients (β) for hydrological- and agricultural-impact reporting. Hydrological-impact reporting is shown on the left and agricultural-impact reporting on the right. (a, b) Mean β across provinces for severe and extreme droughts, with shaded interquartile ranges indicating interprovincial variability. (c, d) Percentage of province-level regressions whose 95% confidence intervals exclude zero, indicating the spatial robustness of the drought-reporting sensitivity coefficient across drought classes, indices, and accumulation timescales. (e, f) Median 95% confidence-interval width across provinces, with larger values indicating lower precision. Overall, statistical uncertainty tends to increase under severe and extreme drought, indicating that broad multiscale reporting-response patterns are more robust than individual province-level slope estimates.

S5 Zero-inclusive occurrence response of drought-related impact reporting



Supplementary Fig. S5. Zero-inclusive occurrence response of drought-related impact reporting across hydrological and agricultural sectors. Hydrological-impact reporting is shown on the left and agricultural-impact reporting on the right. (a, b) Median probability of any reporting, $P(I > 0)$, across provinces as a function of SPI and SPEI accumulation timescale; shaded envelopes denote the interquartile range. (c, d) Median odds ratio derived from the zero-inclusive logistic occurrence model, quantifying the change in the odds that impact reporting occurs with increasing drought magnitude; values above 1 indicate increasing reporting likelihood with increasing drought severity. (e, f) Spatial robustness of the reporting-occurrence relationship, expressed as the percentage of province-level logistic coefficients (γ) whose 95% confidence intervals exclude zero. Together, the panels show that the transition from zero to positive impact reporting is drought-sensitive, with the strongest and most spatially coherent occurrence responses generally concentrated at short-to-intermediate accumulation timescales, particularly for SPEI.