Supplementary Material for: Heavy rainfall, sediment, and hydropower in S. France

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Figure S1. Avène lake (left) and Orb dam (right). Credit: A. Foucher, October 2023.

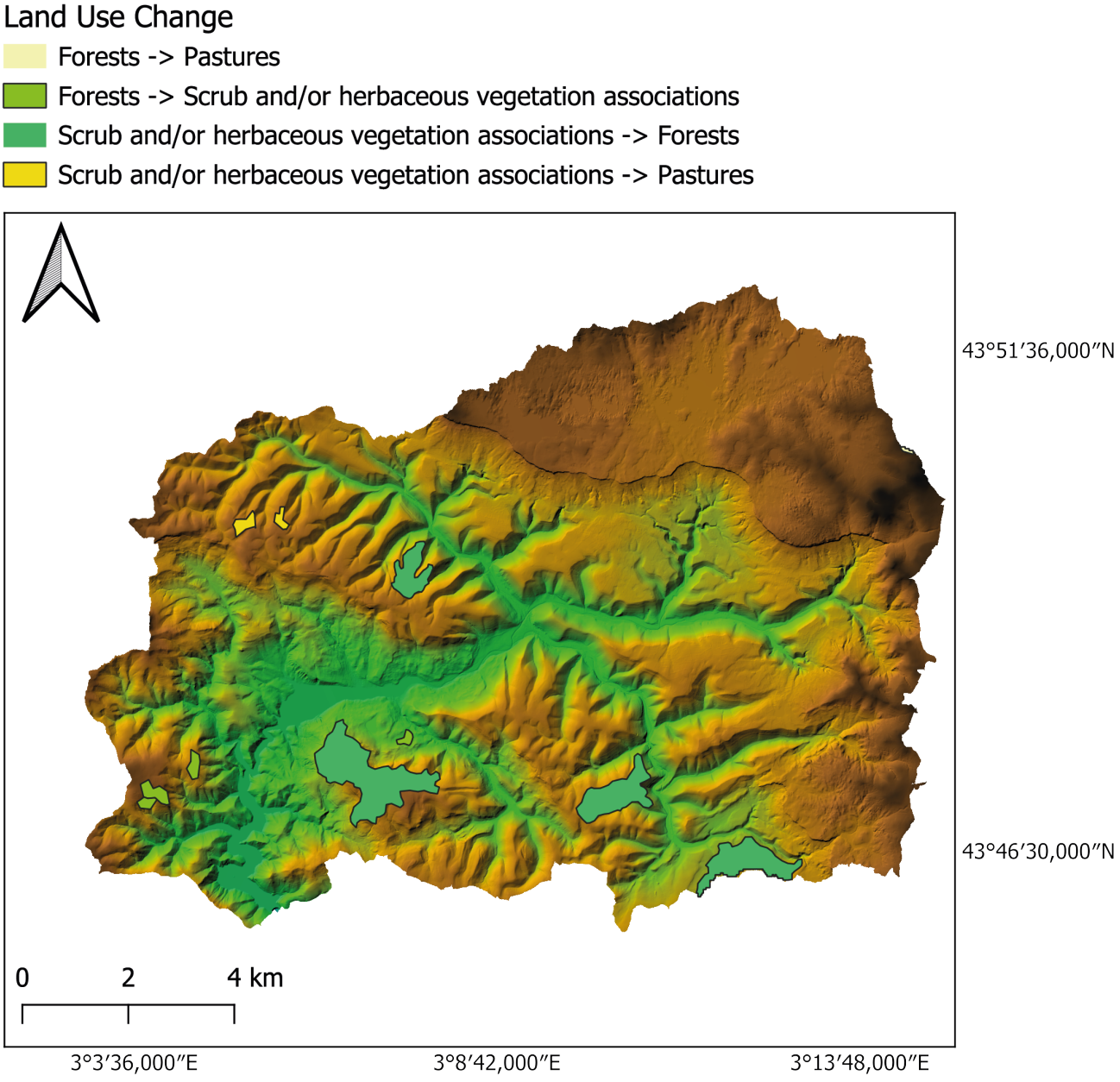

Figure S2. Land use changes (1990-2018) from IGN database showing urbanization patterns.

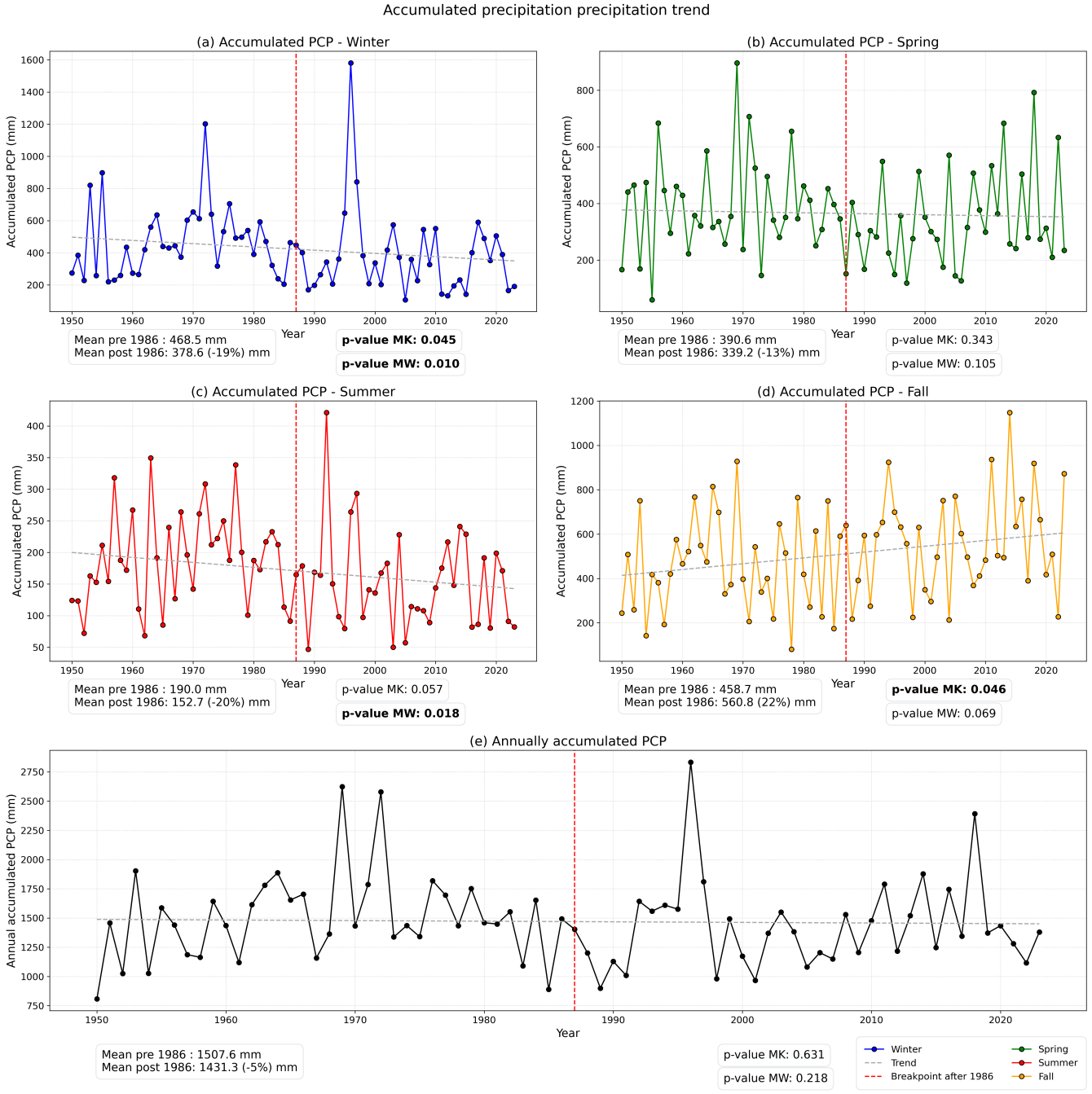

Figure S3. Seasonal and annual precipitation trends. Bold values indicate statistically significant changes (Mann-Whitney U test) and trends (Mann-Kendall test).

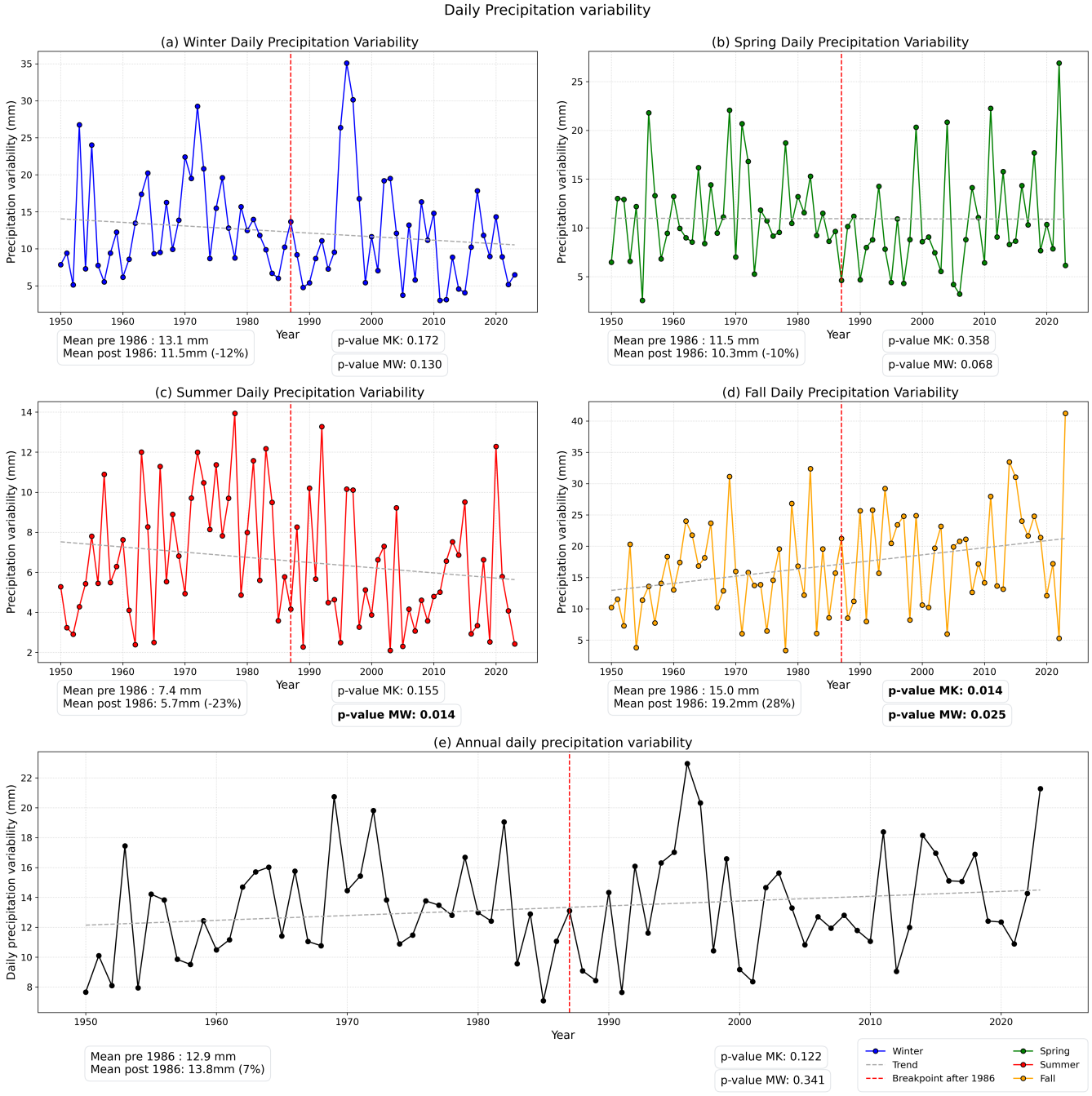

Figure S4. Precipitation variability analysis showing distributional shifts pre- and post-1986 (Mann-Whitney U) and monotonic trends (Mann-Kendall).

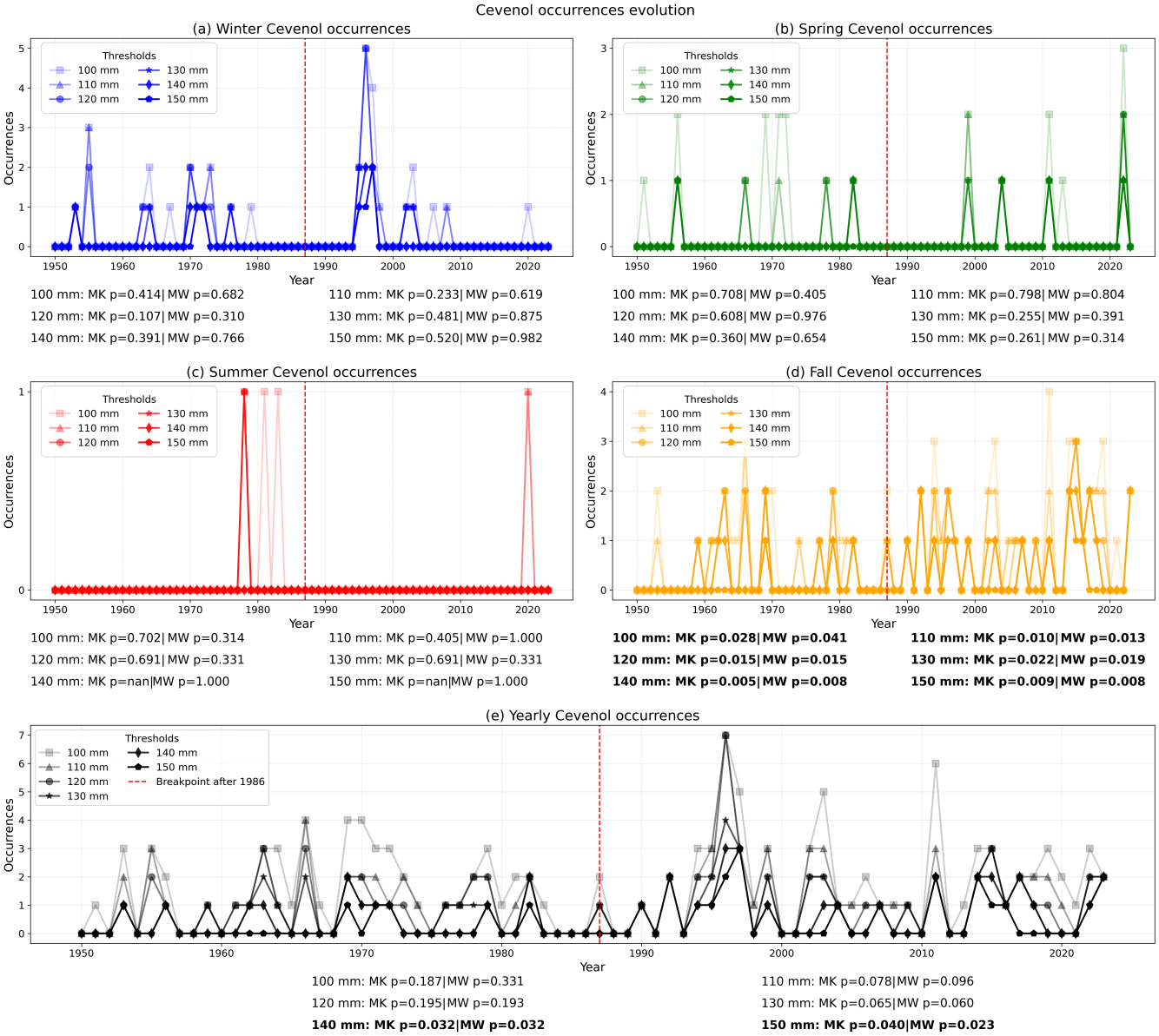

Figure S5. Frequency of Cevenol episodes showing significant increases in autumn (bold values, Mann-Whitney U and Mann-Kendall tests).

Figure S6. Intensity trends of Cevenol rainfall events. Significant results in bold.

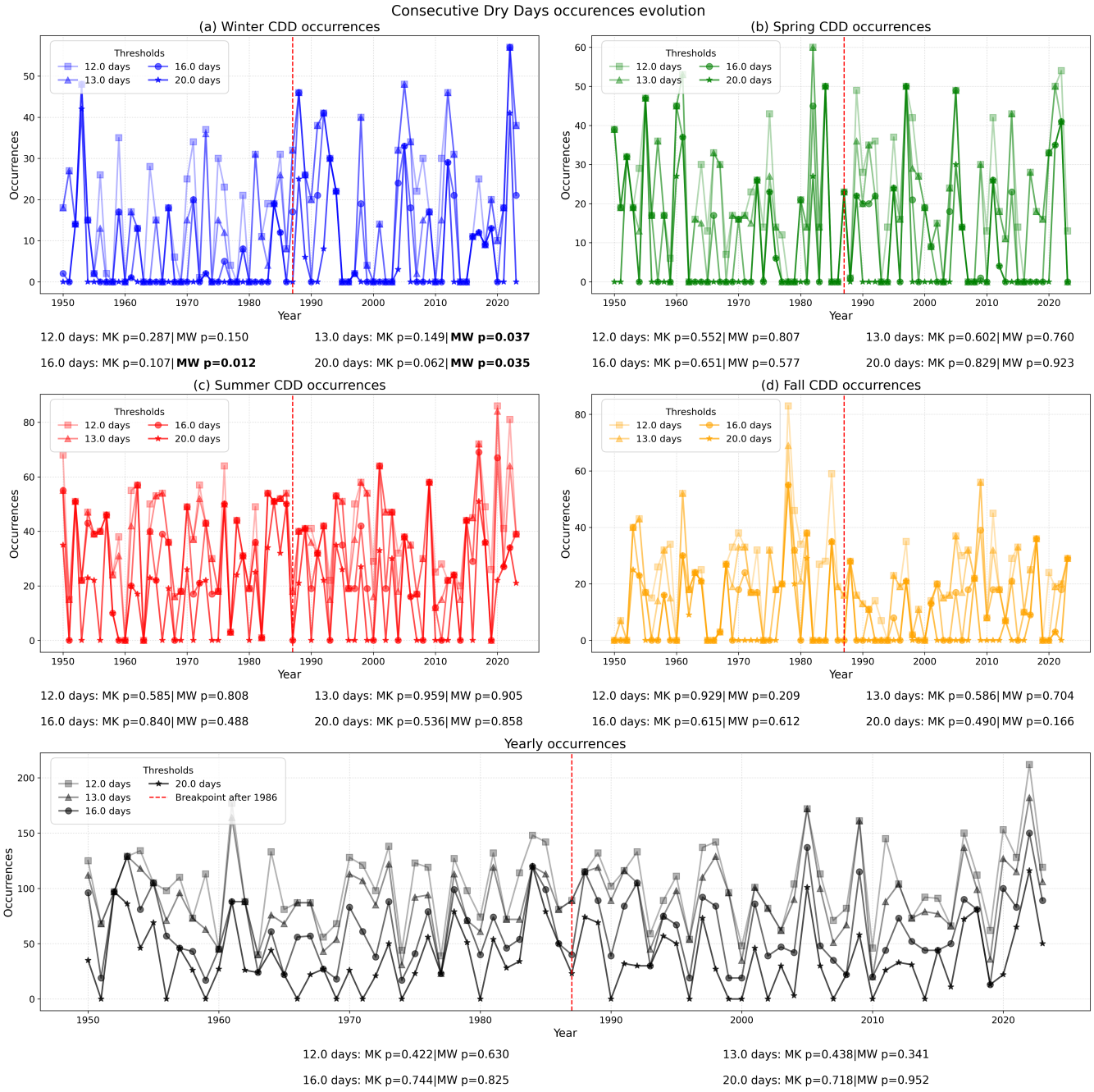

Figure S7. Consecutive Dry Days (CDD) frequency. Significant results in bold.

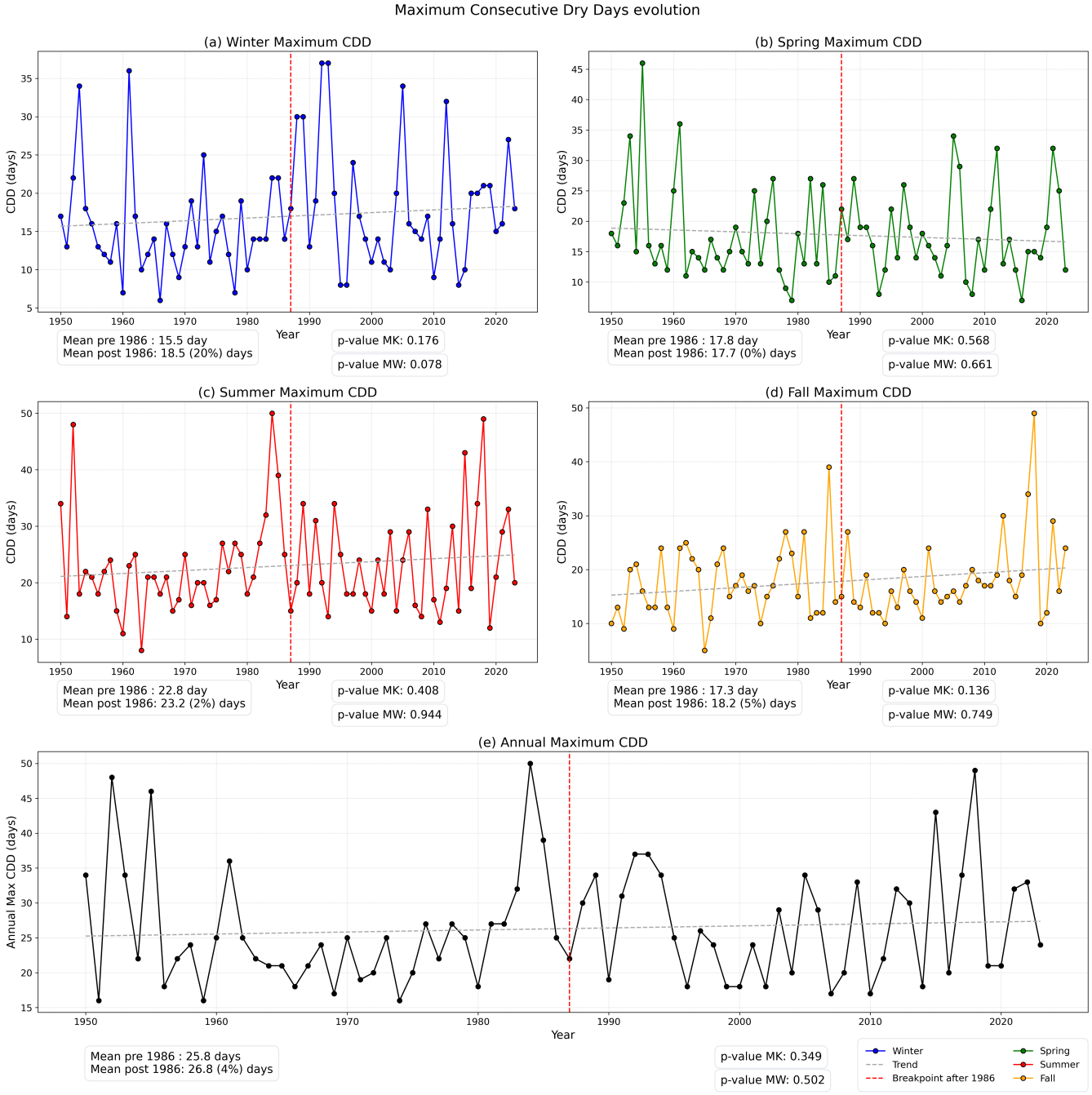

Figure S8. Drought intensity trends. Significance is shown with bold values.

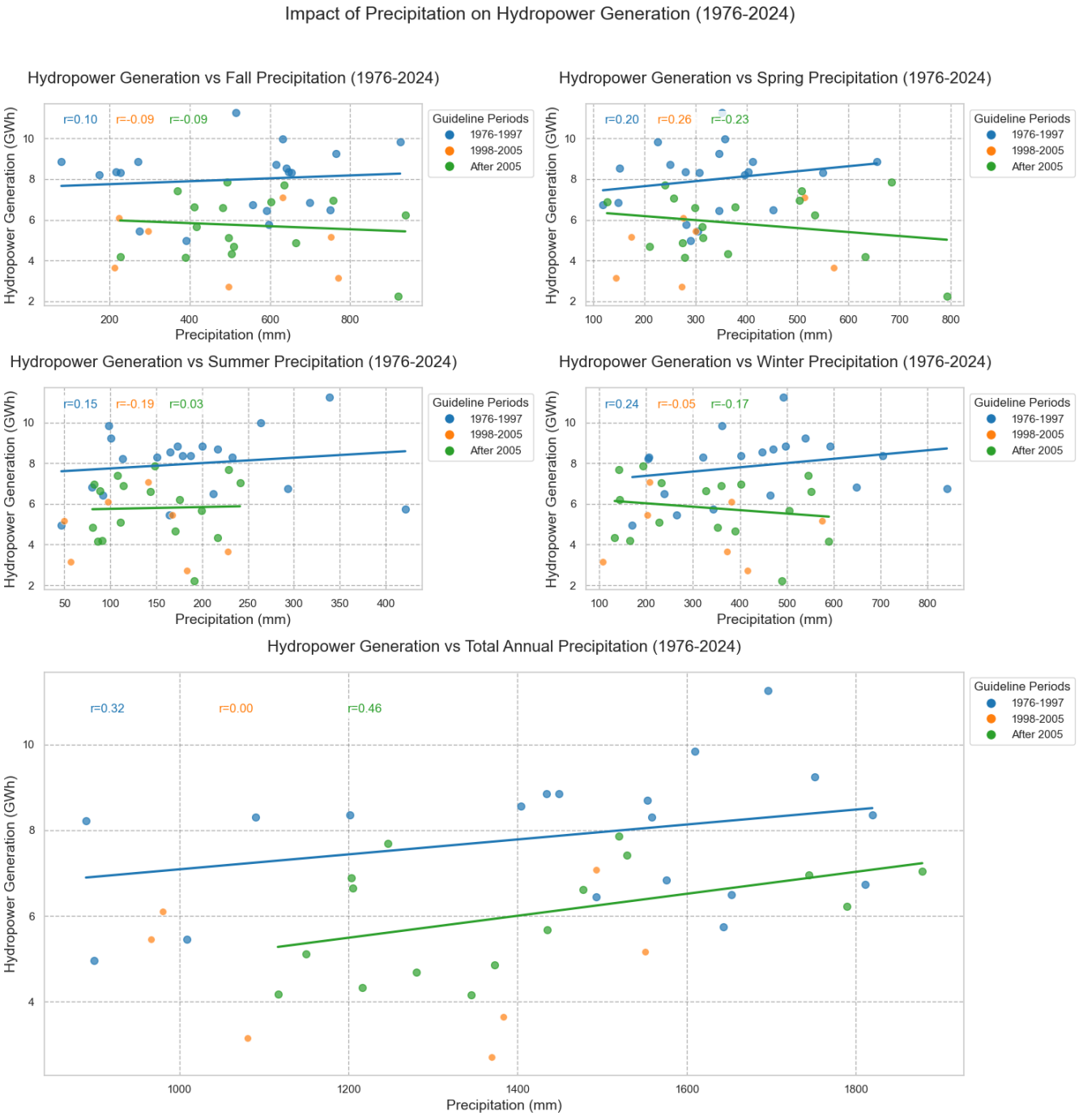

Figure S9. Hydropower production correlations with annual and seasonal precipitation.

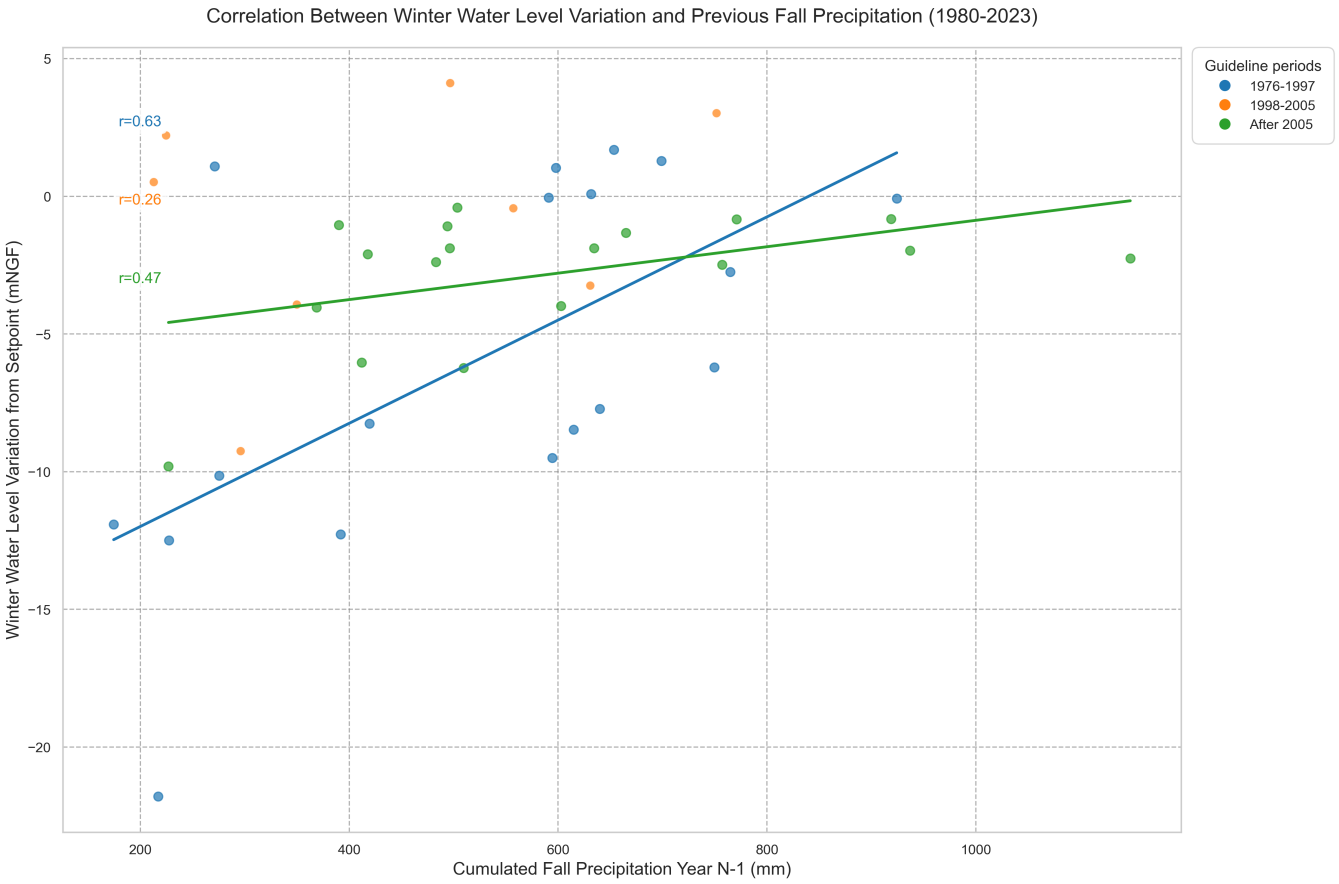

Figure S10. Correlation between average winter water level at year N and precipitation in fall at year N-1.

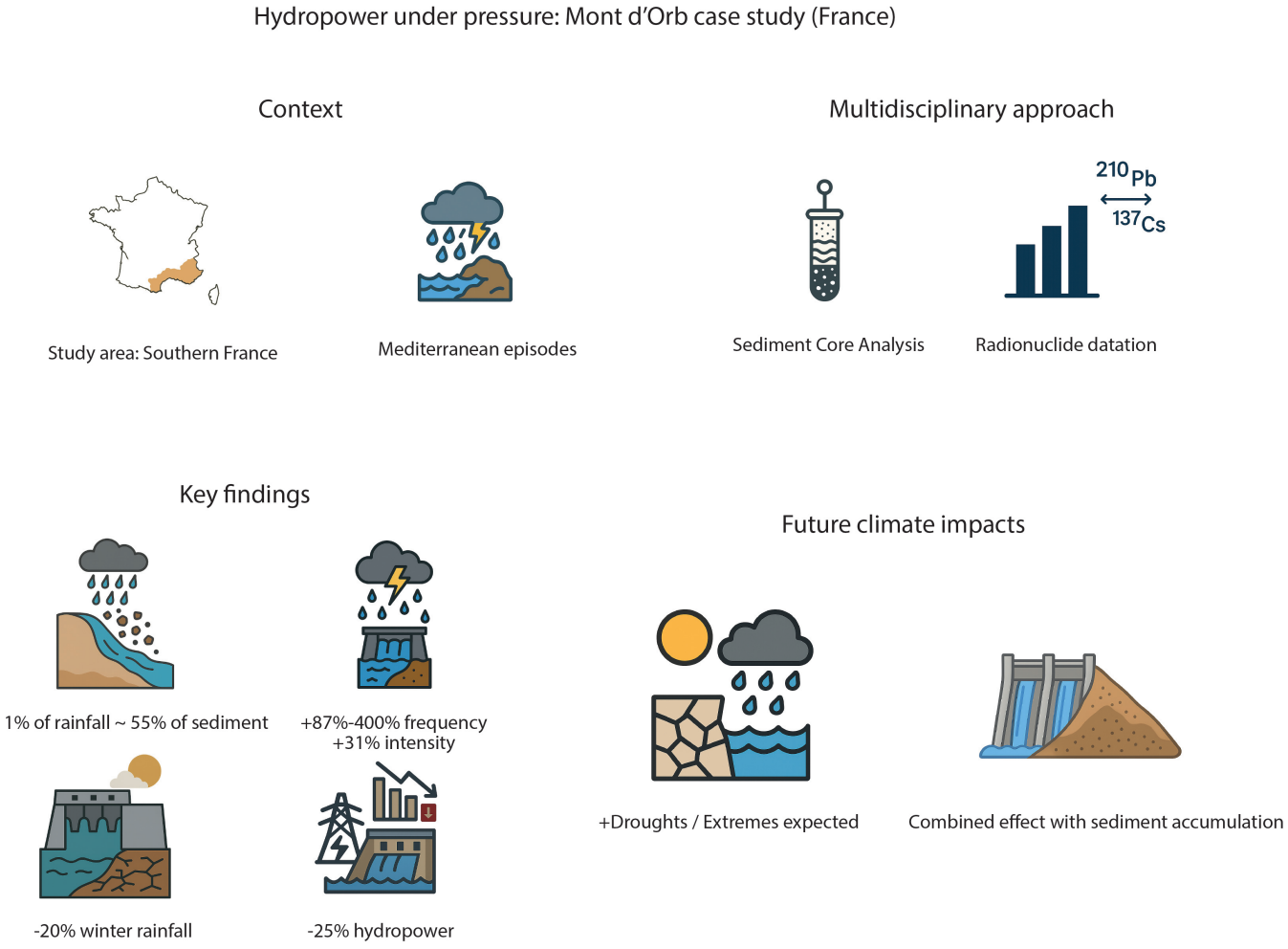

Figure S11. Graphical abstract summarising the key findings and methodological approach of the study.