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Spatial analysis of major dry periods in Seyhan River Basin, Turkey

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Introduction

- Drought analysis is particularly important in vulnerable regions such as the Mediterranean where drought is expected to become more frequent and more severe
- Therefore, in this study, we focus on the Seyhan River Basin in the Eastern Mediterranean.

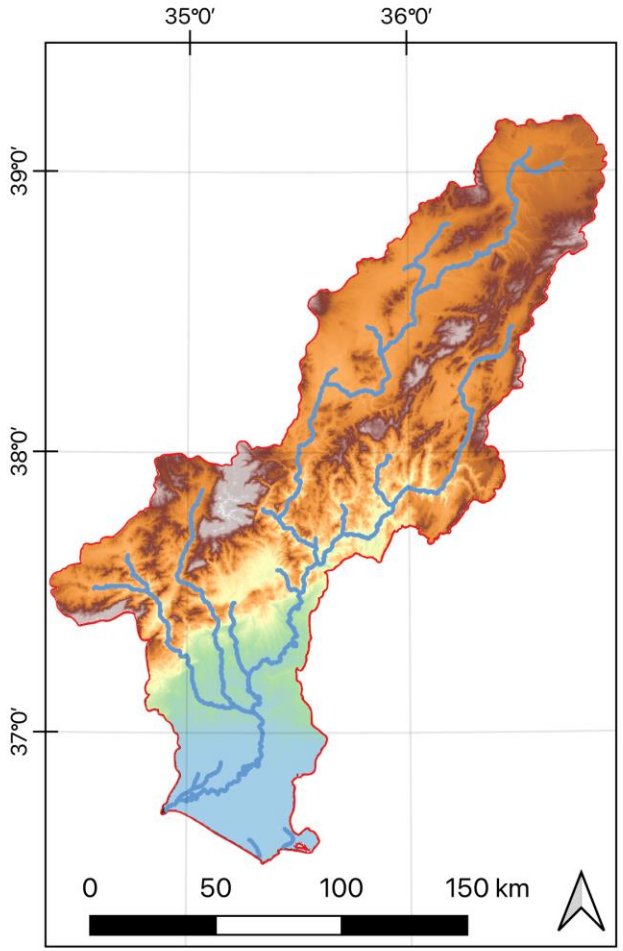
Study area, Dataset and Method

Legend

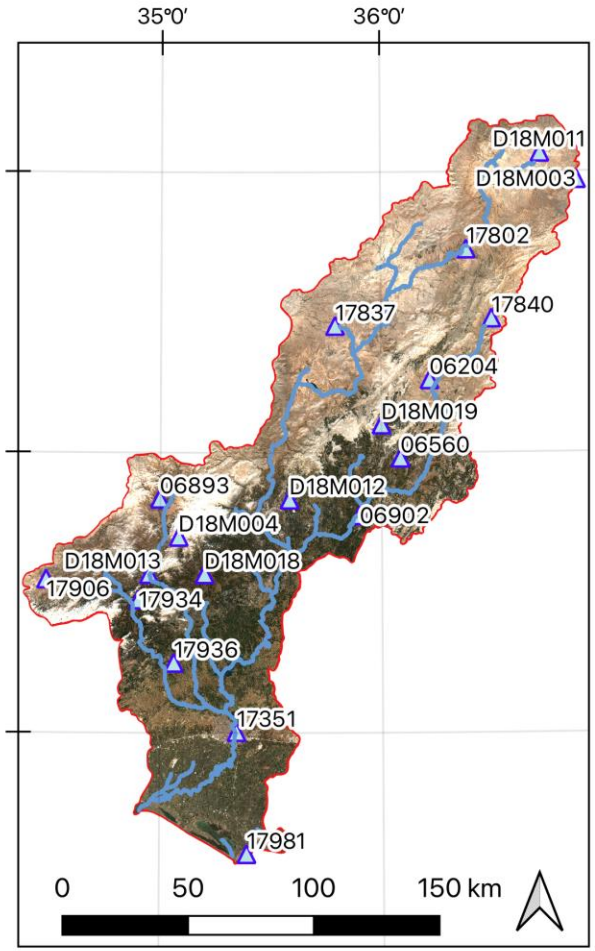
- international borders
- Seyhan basin
- rivers
- meteorological stations

elevation [m asl]

0
500
1000
1500
2000
2500
3000
3687

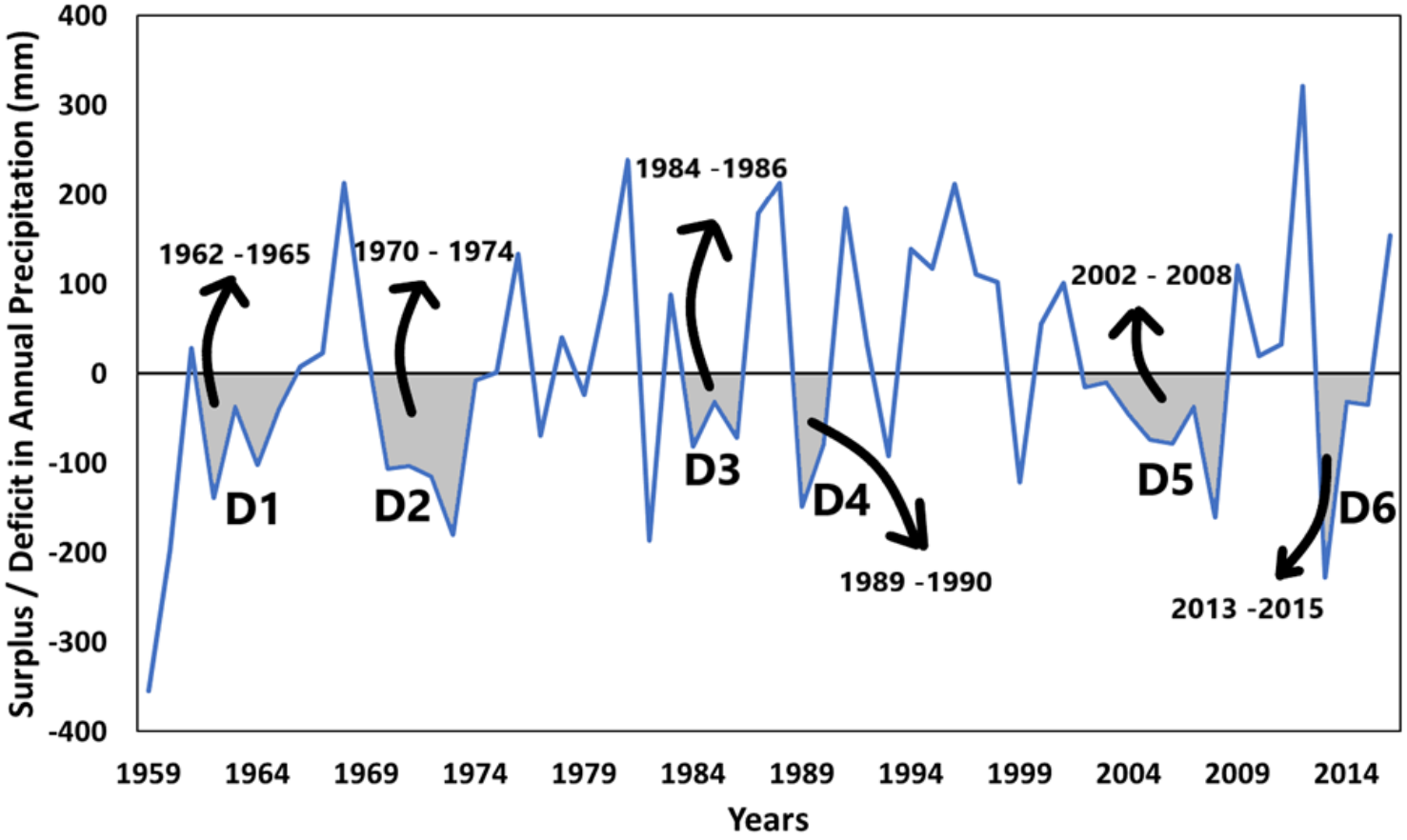


a – MERIT Digital Elevation Model



b – Sentinel-2 annual composite 2021 and location of meteorological stations

Standardized Precipitation Index (SPI)



Major dry periods

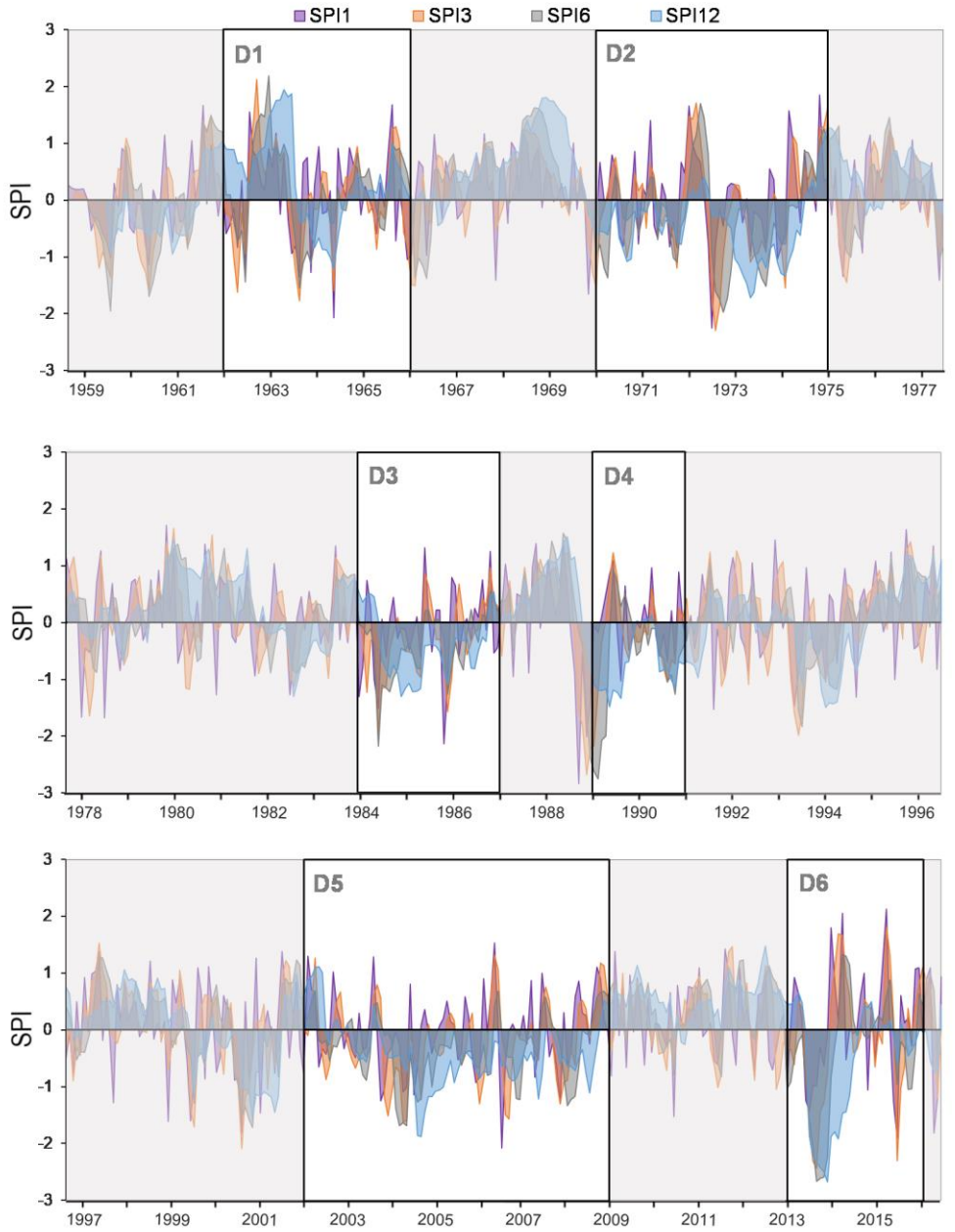
- Major dry periods identified from annual precipitation surplus and deficit time series in the Seyhan river basin
- We call each deficit a dry period.
- A deficit two-year long at minimum is called major dry period.
- In each dry period, we observe droughts with duration shorter than the dry period.

Research question

How do these major dry periods change over the river basin?

Application

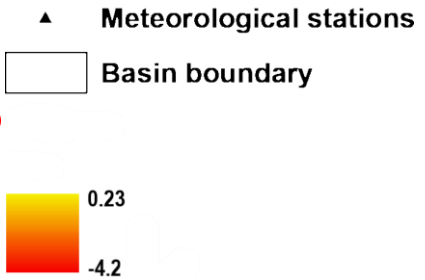
- SPI time series at different time scales
- The most severe month of each dry period
- Spatial maps over the basin



SPI time series of major dry periods at 1, 3, 6 and 12-month time scales

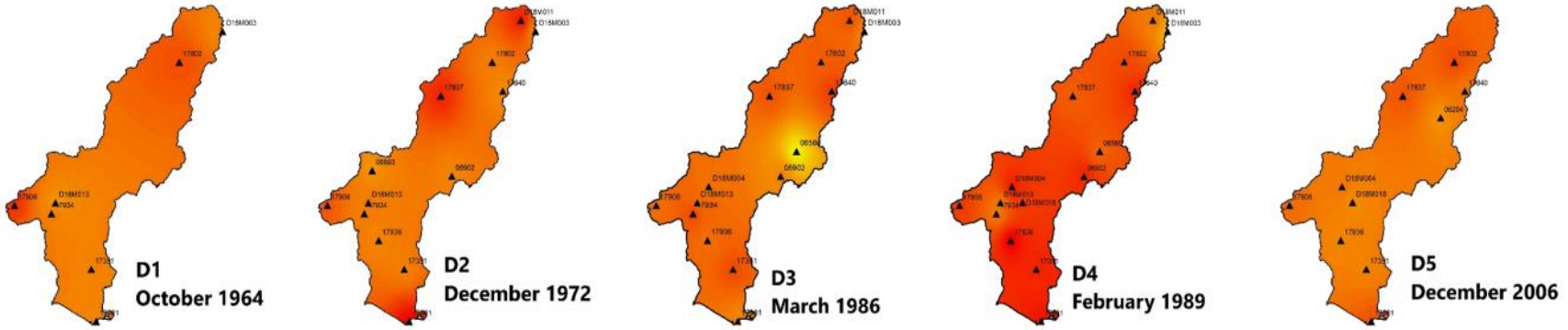
Results - Spatial analysis

D6?

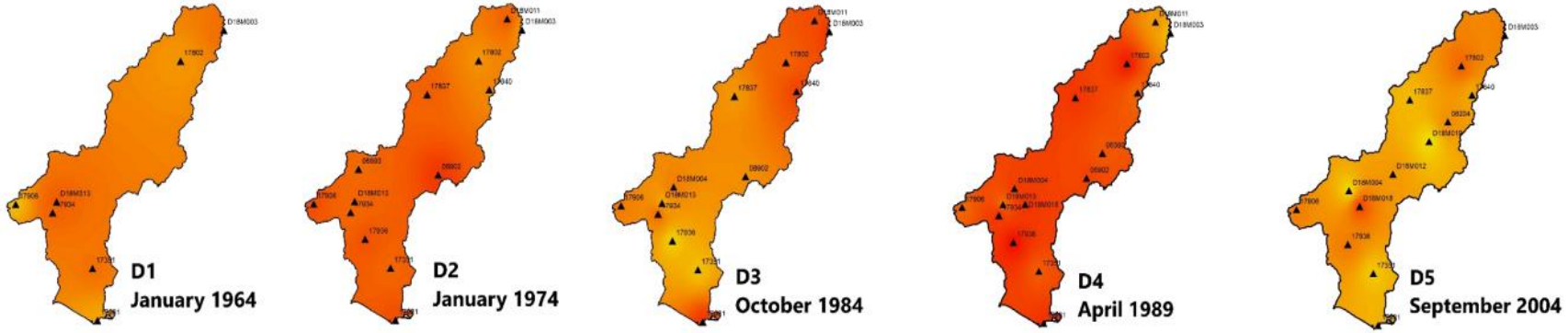


D1 D2 D3 D4 D5

SPI1

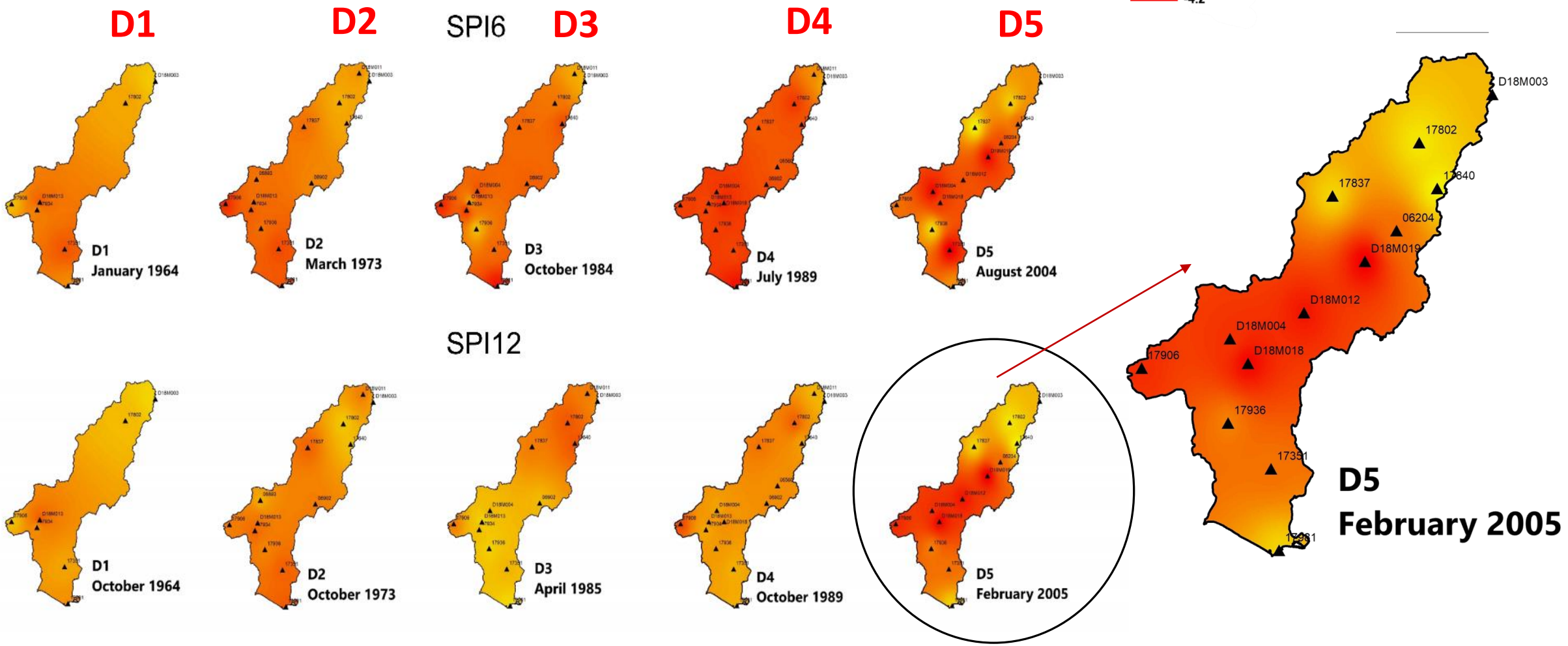


SPI3



- The drought severity does not vary greatly over the river basin and it decreases as the time scale increases
- D4 (1989-1990) is the shortest but the most strengthened.

Results - Spatial analysis



Conclusion

- Major dry period D4 (1989-1990) is the most severe compared to the others.
- This shows that a short-duration drought can be as important as a long-duration drought.

Thank you!

Questions and feedback?

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