

Spatial overlapping areas of several teleconnection indices on Spain's Mediterranean façade according to spring rainfall

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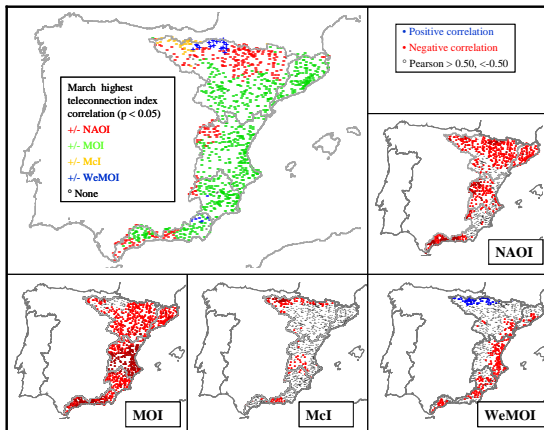
INTRODUCTION.

Hydrological cycle modification by global warming might affect precipitation. This impact might be more important than the global warming itself.

Global projections are not useful at local scale. Spatial analysis at high resolution are required.

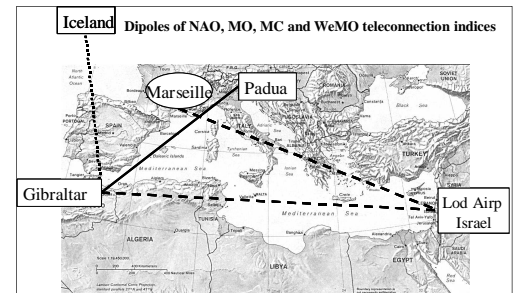
HYPOTHESIS.

✓ Monthly precipitation on the Mediterranean façade of Spain during spring time are synchronically under the influence of different atmospheric patterns.



STUDY AREA AND DATABASE

- Mediterranean façade of Iberian Peninsula (Spain),
- Monthly, homogeneous and complete database, over 1,100 meteorological stations (period 1951-2000), overall density 1 station / 150-200 km²



METHODS.

Pearson's correlation coefficient between monthly dataset and teleconnection indices Dec to Feb.

- ✓ NAOI series from Jones et al. (1997, IJC 17, 1433-1450)
- ✓ MOI series from CRU web site
- ✓ MCI series from Brunetti et al. (2002, IJC 22, 1455-1471)
- ✓ WeMOI series from Martin-Vide and Lopez-Bustins (2006, IJC 26, 1455-1475).

RESULTS.

- During March MOI expands northwards, even towards the East coast. NAOI appears in Pyrenees. MCI and WeMOI, in their respective negative phases, are the most correlated indices over upper Ebro catchment.
- In April NAOI is the most highly correlated index. WeMOI (negative phase) is predominant over the SE, and MCI (negative phase) over the NW.
- The overall spatial distribution of the teleconnection indices influence is inhomogeneous in May. NAOI is still the most correlated index with precipitation on the Iberian Mediterranean façade.

CONCLUSIONS

- The Atlantic fluxes have a strongest influence on rainfall of the eastern Iberia than those Mediterranean ones in spring. (These results are opposed to those ones obtained in autumn analyses).
- Monthly analysis allows detecting spatial shifts of the highest correlated areas between precipitation and the several teleconnection indices.
- The low correlation (although significant) between NAOI and precipitation suggests that MOI explains better than NAOI February-March precipitation over eastern Iberian Peninsula.
- The pattern analyses might help us to understand the nature of eastern Iberia rainfall variability.