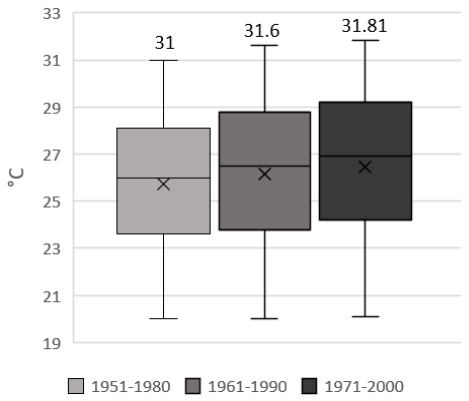
Past and future climate trends focused on synoptic patterns in the northeast of the Iberian Peninsula

Sergi Ventura, Josep Ramon Miró, Juan Carlos Peña and Gara Villalba

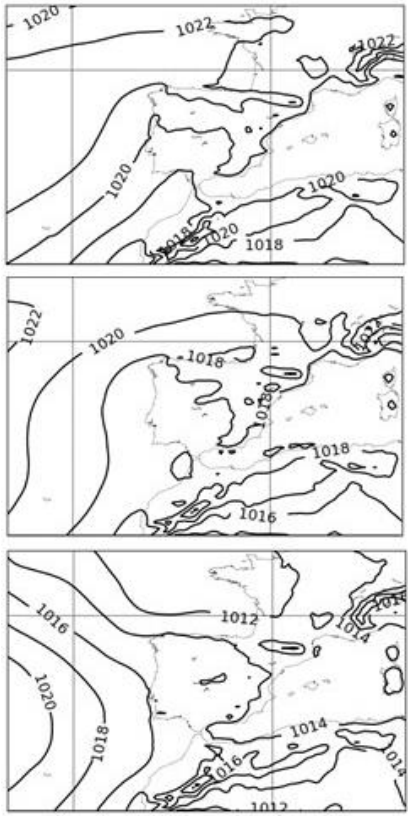


1951-1980: Undetermined pressure gradient / Anticyclonic ridge / higher HW intensity

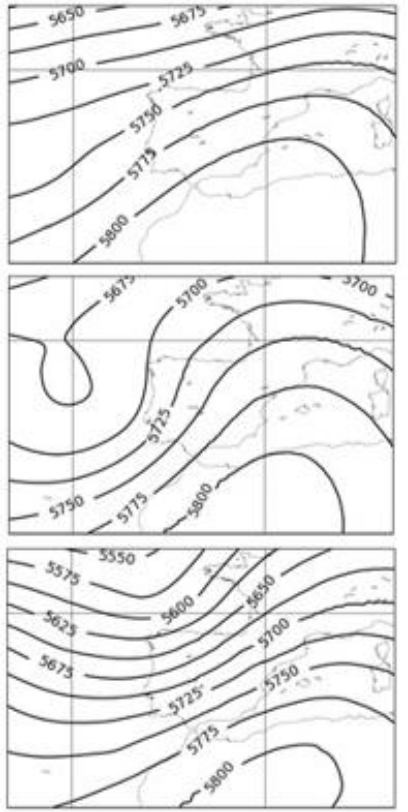
1961-1990: Undetermined pressure gradient / Anticyclonic ridge + cold drop in the west/ medium HW intensity

1971-2000: Undetermined pressure gradient / West Flow/ weak HW intensity

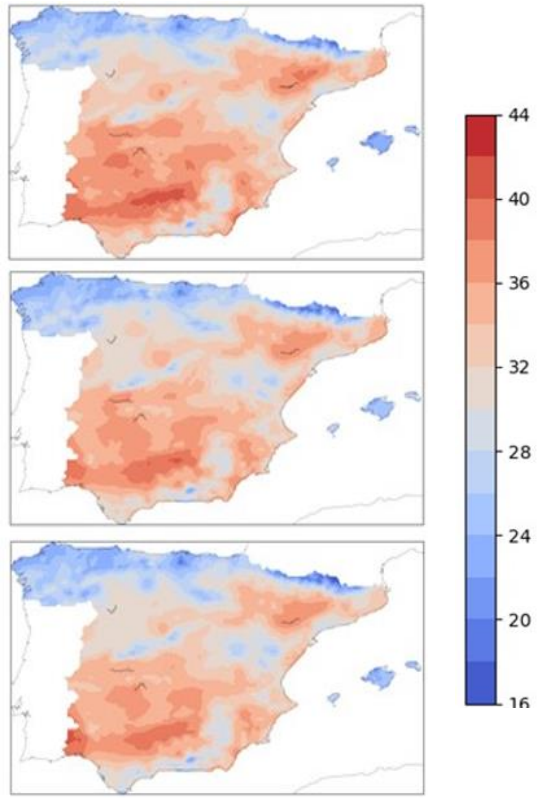
Mean sea level pressure



500hPa geopotential height



Daily maximum temperature



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RCP8.5:

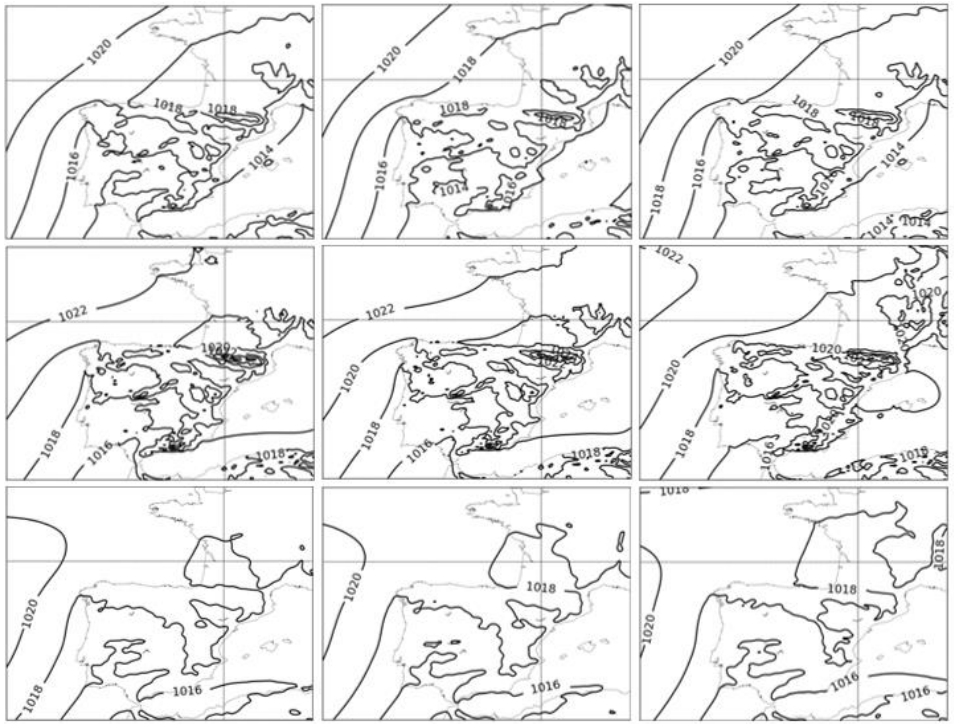
WRF: Undetermined pressure gradient in HW periods /⇧ geopotential height

HIRHAM: Anticyclonic ridge /⇧ geopotential height

REMO: Anticyclonic ridge + SW flow /⇧ geopotential height

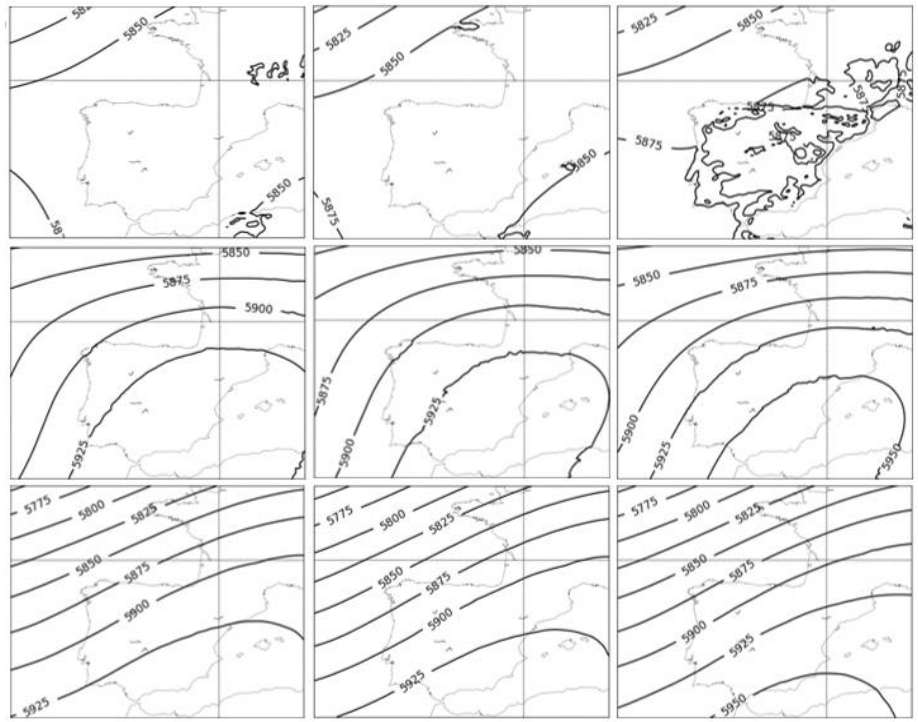
Mean sea level pressure

2011-2040 **2041-2070** **2071-2100**



500hPa geopotential height

2011-2040 **2041-2070** **2071-2100**



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Synoptic pattern	Tau-Kendall	p-value	Trend
West advection	-0.049	0.591	NSDT
Anticyclonic western advection	0.047	0.580	NSIT
Northwest advection	0.058	0.510	NSIT
North advection	-0.156	0.067	NSDT
Northeast advection	0.118	0.163	NSIT
East advection	-0.052	0.556	NSDT
East advection with cut-off low above	**-0.176**	**0.047**	**SDT**
South advection	0.025	0.808	NSIT
Southwest advection	-0.111	0.197	NSDT
Trough	-0.065	0.444	NSDT
Low or cyclone	-0.092	0.267	NSDT
Shallow cyclone or undetermined pressure gradient	0.149	0.070	NSIT
Anticyclone	-0.047	0.612	NSDT

Mann-Kendall test:

- **Historical period: (1951-2000)**

Significant decreasing trend in east advections with cut-off low above

North advection (decreasing) and undetermined pressure gradient (increasing)

- **RCP8.5 (2011-2100)**

Significant decreasing trend of anticyclones (WRF,HIRHAM and REMO) and east advections (WRF)

Significant increasing trend in north advections (WRF and REMO)