

supplementary material:

Publication	Analysis system	Study areas	Study period	Spatial resolution	Time resolution	Data used
Tramblay <i>and al.</i> , 2019 [1]	SAFRAN	TUNISIA	1979 - 2015	5 km	Daily	Rain gauges Weather station data.
						1-Ozone 2-Stratospheric Sounding Unit 3-Infrared sounders 4-Microwave sounders 5-All-sky microwave radiances
Hersbach et al., 2019[2]	ERA5 reanalysis	global weather	1979 to the present	31 km	Hourly throughout (uncertainty 3-hourly)	6-GPS radio occultation 7-Geostationary radiances 8-Atmospheric motion vectors 9-Scatterometers 10-WAVE integrated parameters 11-Conventional 12-Ground-based radar
Häggmark <i>and al.</i> , 2016; Landelius <i>and al.</i> , 2016 [3,4]	MESAN	EUROPE	1989 - 2010	55 km and 22 km	6 h	1-Intergrated Surface Database [5], maintained by NOAA's National Climatic Data Center (NCDC). 2-ECMWFDA MARS archive, the European Climate Assessment & Dataset (ECA & D). 3-Non-public comments used as inputs for E-OBS version 10.0 [6].

						4-National climate databases of GHIS and Météo - France (MF).
						1-Precipitation. 2-Temperature 3-Maximum temperature 4-Minimum temperature 5-Relative humidity 6-Wind speed 7-Total cloudiness 8-Visible radiation 9-Infrared radiation (Data source: AEMET's synoptic and rain-temperature station networks.)
Quintana-Seguí <i>and al.</i> , 2016[7]	SAFRAN	SPAIN	01 September 2009 - 31 August 2010	5 km	6 h	
Soci <i>and al.</i> , 2016[8]	MESCAN	Europe	2007 - 2010	5,5 km	24 h	Synoptic station networks and climate from the European database (ECA&D2, ECMWF, ...)
Vidal <i>and al.</i> , 2010[9]	SAFRAN	FRANCE	1958 - 2008	8 km	1 h	Observations and Reanalysis from the model combining ECMWF global reanalysis archives and all available surface observations in Météo-France climatological database
Quintana-Seguí <i>et al.</i> , 2016[7]	SPAN	SPAIN	01 September 2009 - 31 August 2010	5 km	3h	1-Precipitation. 2-Temperature 3-Maximum temperature 4-Minimum temperature 5-Relative humidity

						6-Wind speed 7-Total cloudiness 8-Visible radiation 9-Infrared radiation (Data source: AEMET's synoptic and rain-temperature station networks.)
Liston et al., 2006[10]	MicroMet	Colorado	23 September 2002 - 27 September 2003	30-m to 1-km	1h	Air temperature, Relative humidity, Wind speed, Wind direction and precipitation. From different weather station.
Kalnay et al., 1996 [11]	NCEP/NCA R Reanalysis	Global Grids	1948/01/01 to present	2.5°-250 km	4-times daily, and monthly values	1-Global rawinsonde data. 2-COADS surface marine data 3-Aircraft data. 4-Surface land synoptic data. 5-Satellite sounder data. 6-Special Sensing 7-Microwave/Imager surface wind speeds 8- satellite cloud drift winds

Table S1. Some analysis systems used in the world.

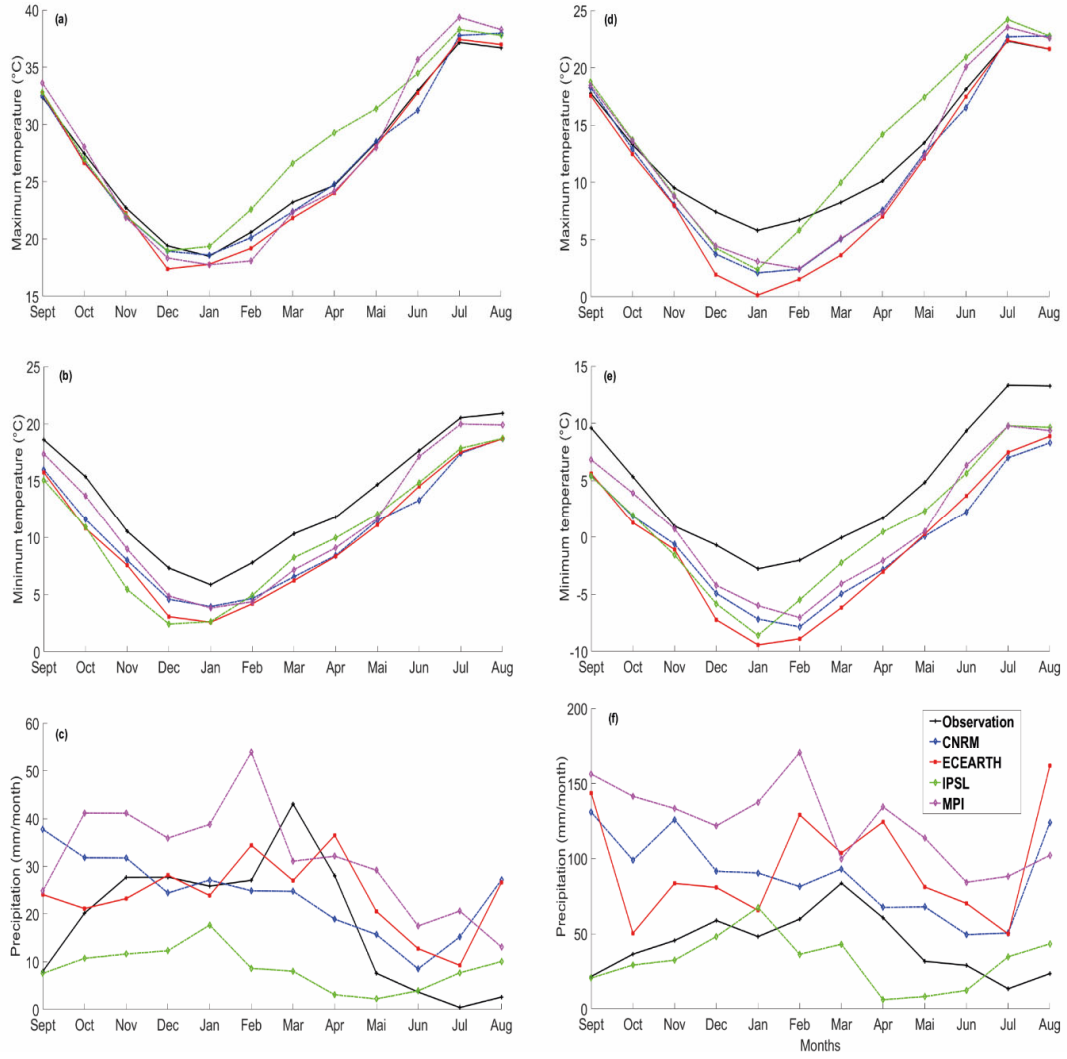


Figure S1. Euro-CORDEX historical data from the 4 RCM models on two stations: Marrakech (left) and Oukaimeden_CAF (right), before the application of the bias correction method (the Quantile-Quantile method).

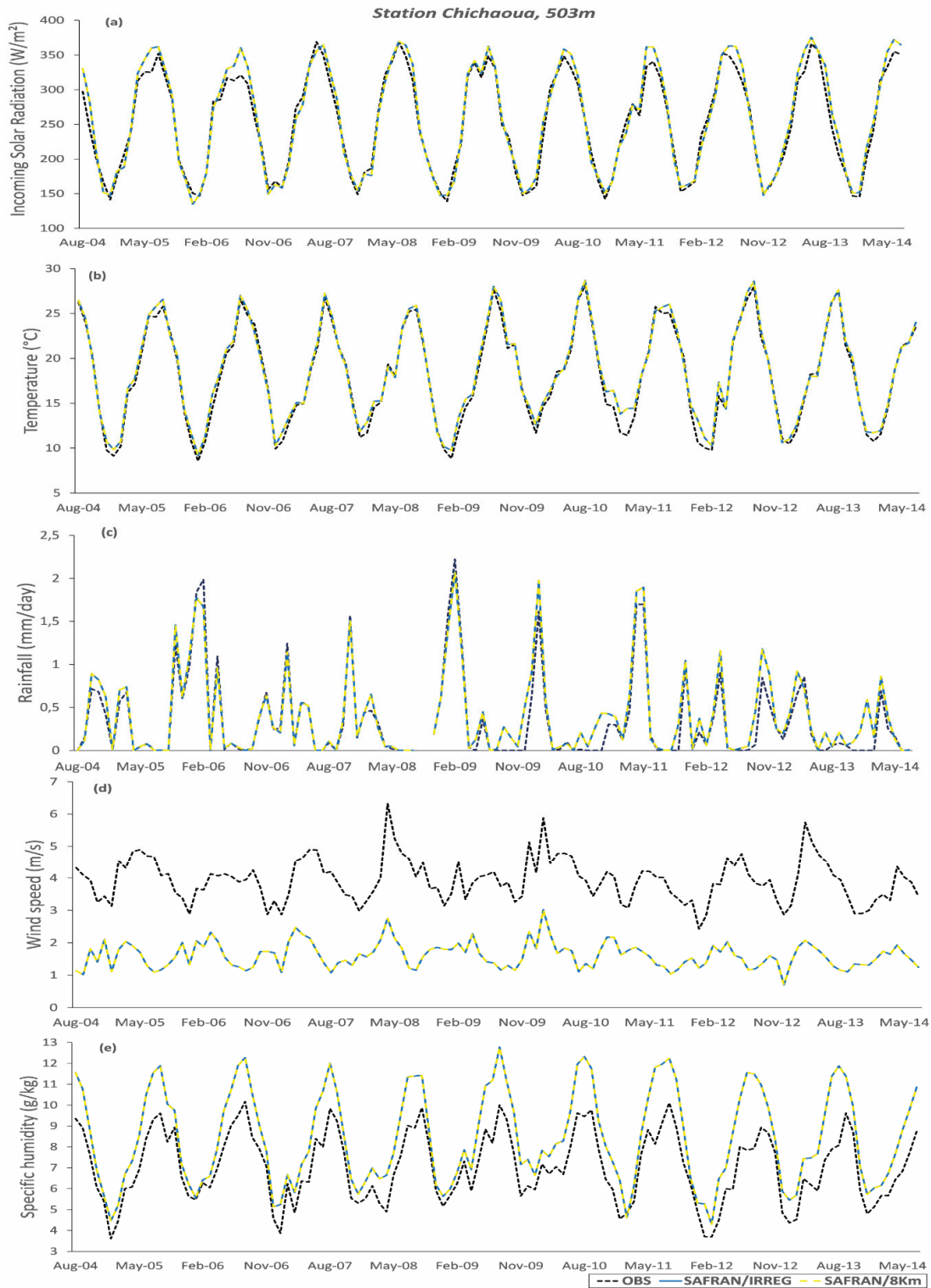


Figure S2. Comparison of the evolution of the reanalysis of two types of grids (Regular of 8 km and Irregular) from the SAFRAN model with the observation at the CHICHAOUA station, for the period 2004-2014.

<i>Parameter</i>	<i>Average Observed</i>	<i>Average Analyzed - SAFRAN</i>		<i>Bias - SAFRAN</i>		<i>RMSE - SAFRAN</i>		<i>Simple Correlation - SAFRAN</i>	
		<i>IRREGULAR</i>	<i>8Km</i>	<i>IRREGULAR</i>	<i>8Km</i>	<i>IRREGULAR</i>	<i>8Km</i>	<i>IRREGULAR</i>	<i>8Km</i>
<i>Incoming Solar Radiation (W/m²)</i>	252,46	258,11	258,13	5,65	5,67	92,34	92,34	0,963	0,963
<i>Surface temperature (°C)</i>	18,15	18,58	18,56	0,43	0,41	2,80	2,80	0,939	0,939
<i>Wind (m/s)</i>	3,94	1,61	1,64	-2,33	-2,30	3,49	3,49	0,480	0,480
<i>Precipitation (mm/day)</i>	0,30	0,40	0,40	0,10	0,10	0,95	0,95	0,850	0,850
<i>Specific humidity (g/kg)</i>	7,04	8,50	8,49	1,46	1,45	2,25	2,25	0,780	0,780

Table S2. Validation result of the two grids (regular 8 km and irregular) of the SAFRAN model, averaged over the 10-year period (2004-2014), at the CHICHAOUA station.

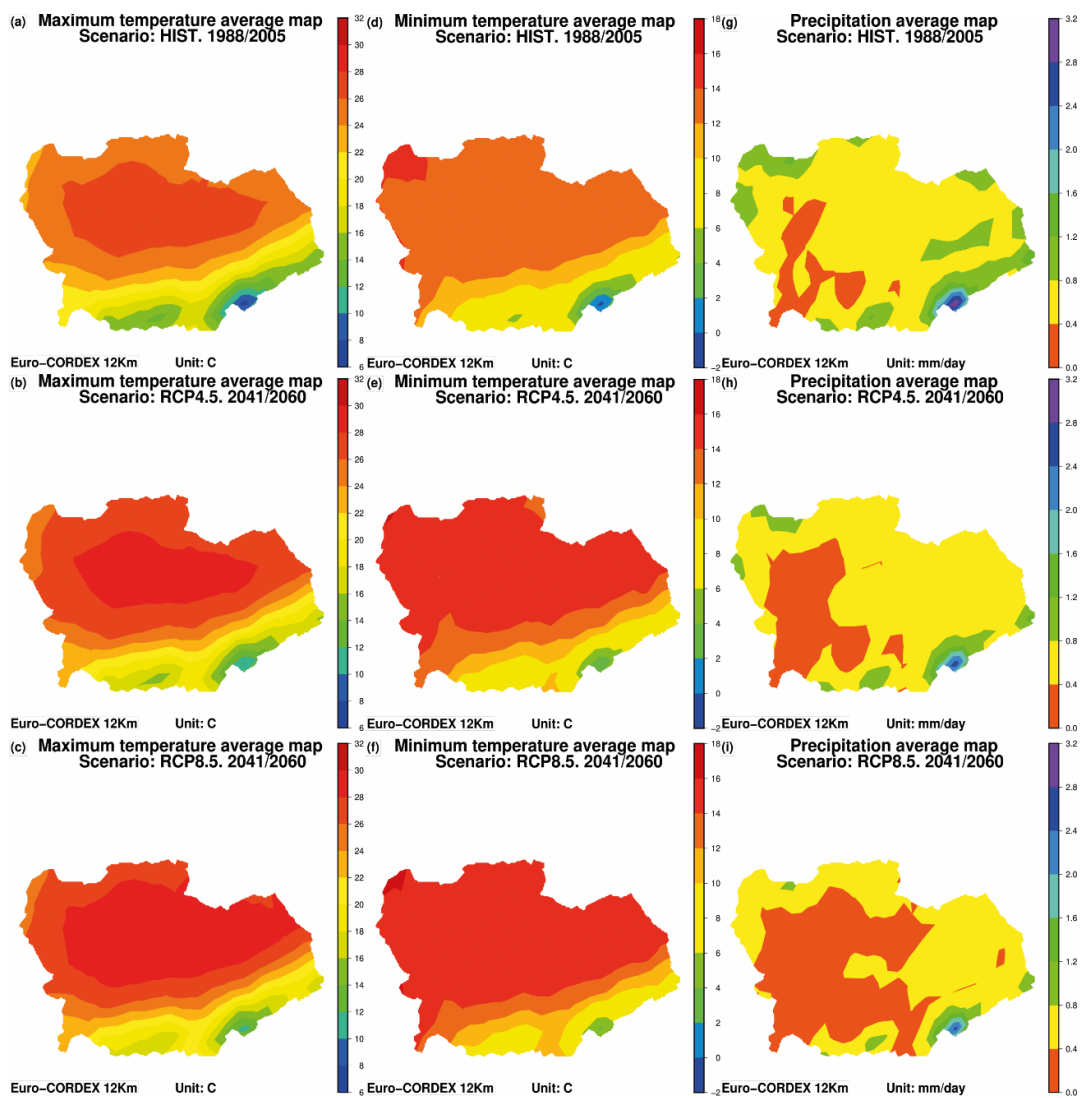


Figure S3. Spatialization map of Euro-CORDEX 12Km futuristic projections on the Tensift Basin, according to the two scenarios RCP4.5 and 8.5 for 2041-2060.

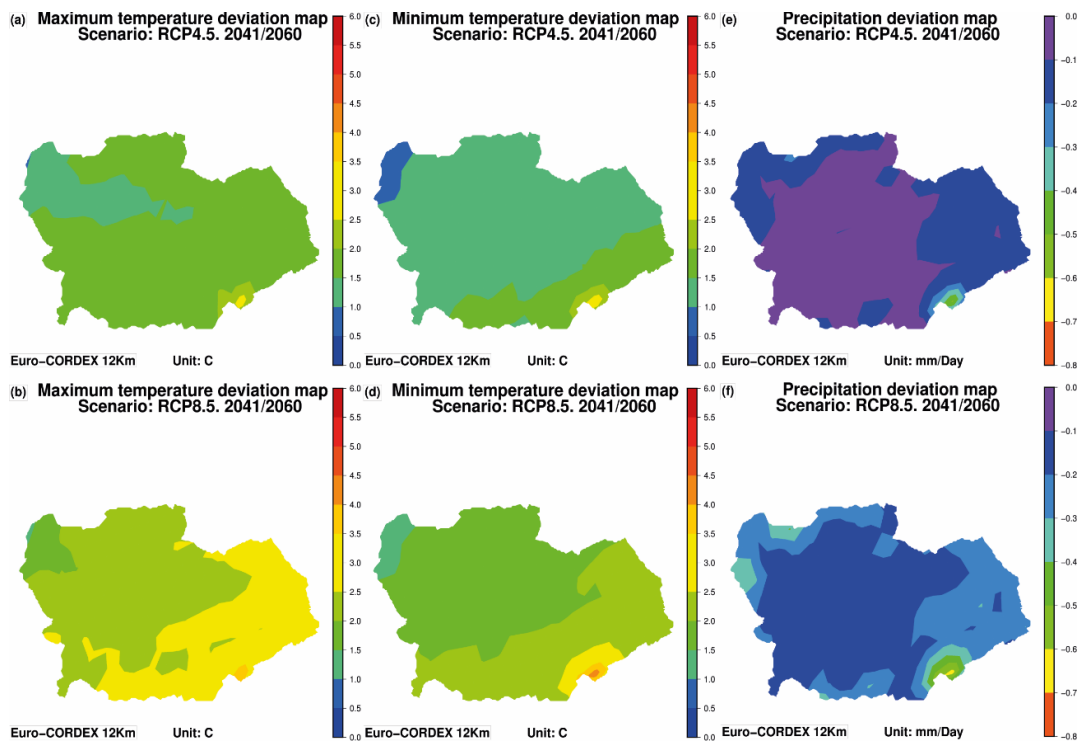


Figure S4. Deviation map of the Euro-CORDEX futuristic projections relative to the two scenarios (RCP4.5 and RCP8.5) compared to the control period used.

References

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