RICCAR

Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

SMHI

Impact of Climate Change on Temperature, Precipitation & Runoff in the Arab Region

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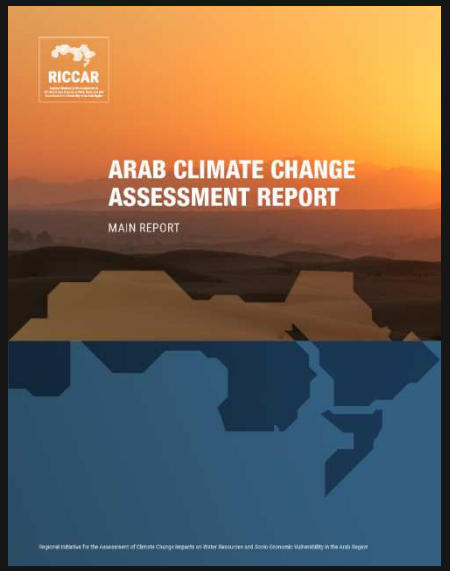
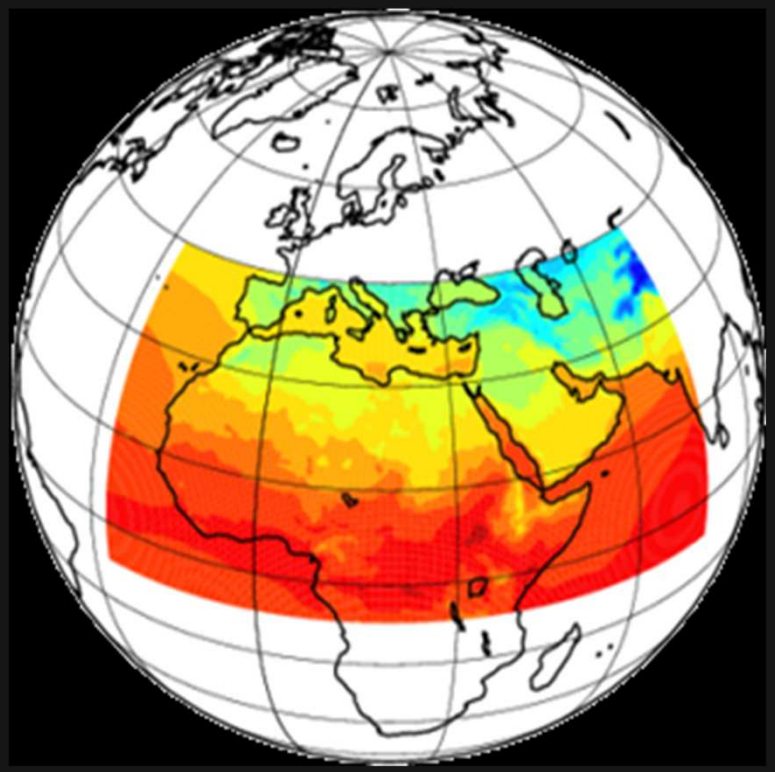
RICCAR Reg Climate Downscaling





Domain Size determined by Arab water resources & climate processes

RICCAR investigated climate change over the Arab region and the source areas for its waters

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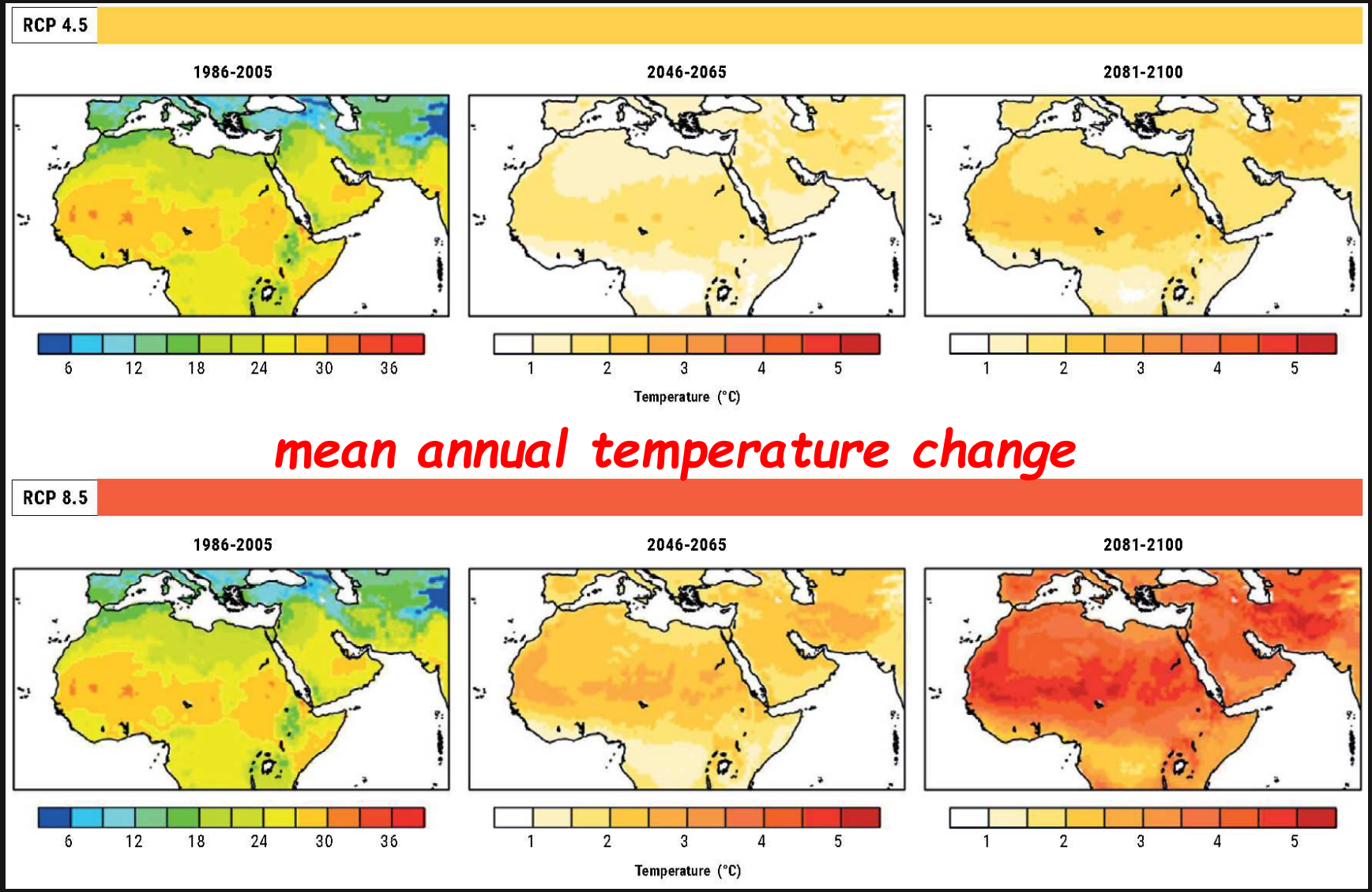
Future Projections - Temperature



RCA4: 3-member ensemble

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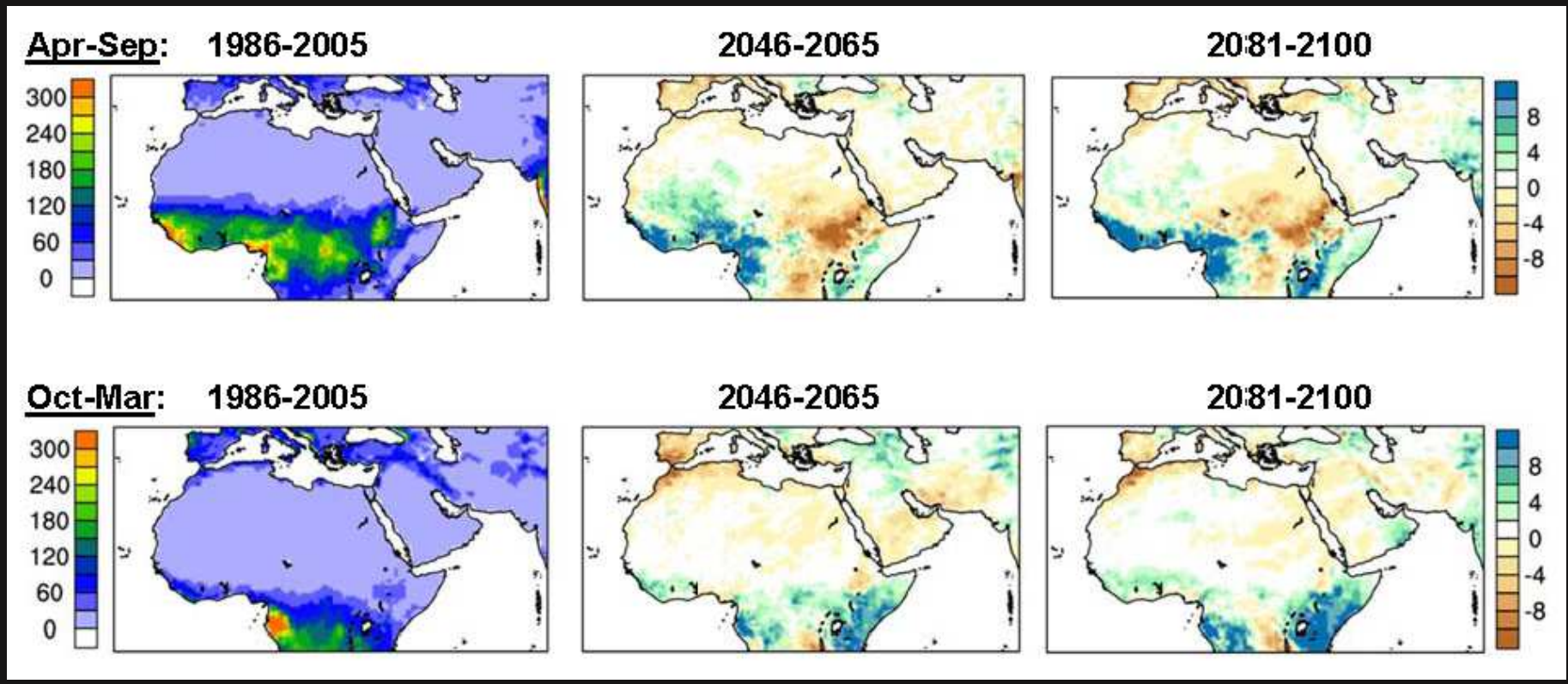
Future Projections - Prec RCP 4.5



Seasonal Precipitation Change

RCA4: 3-member ensemble

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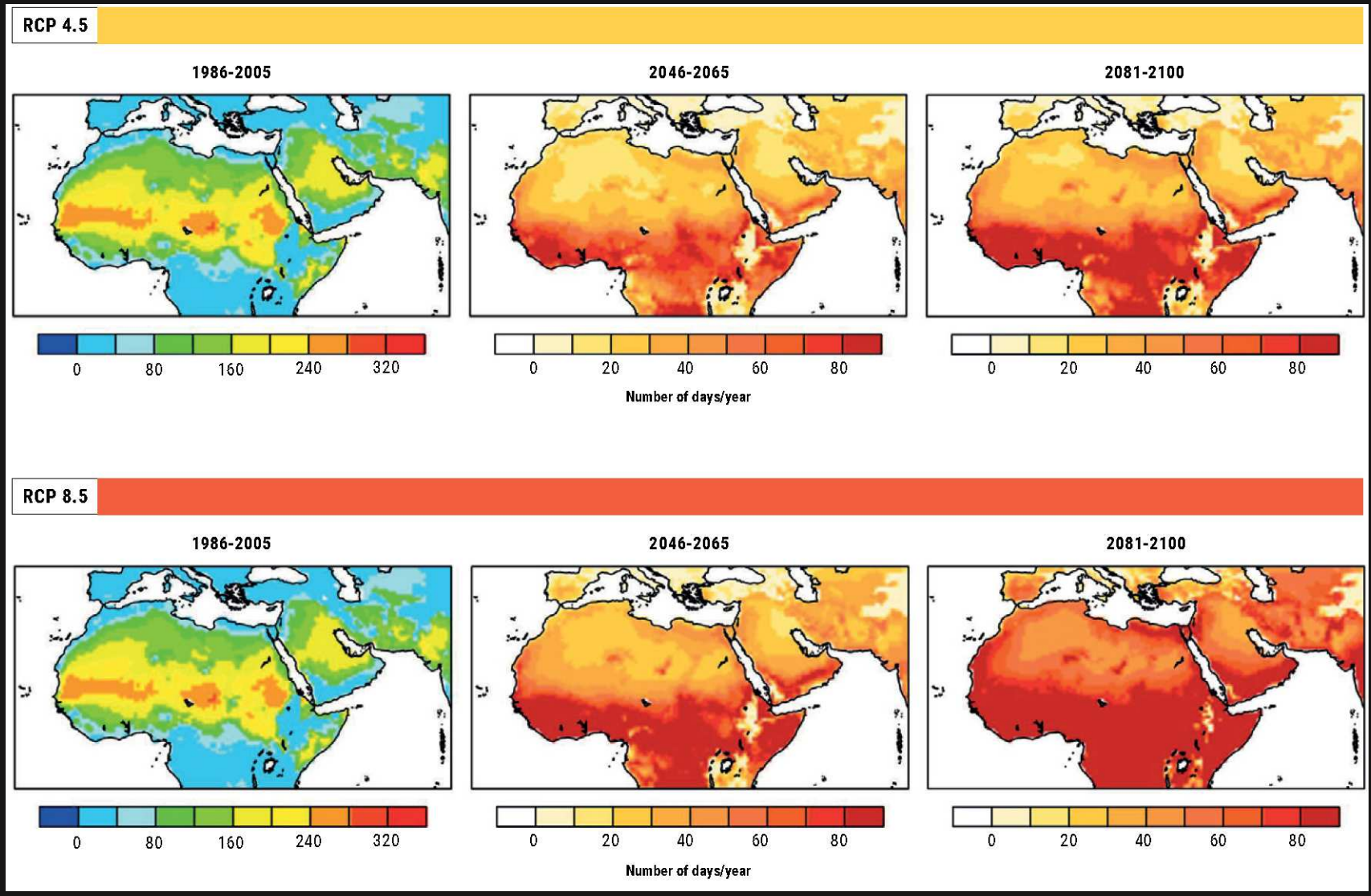
Temperature – "Hot" days (>35ºC)



Change in number of days per year

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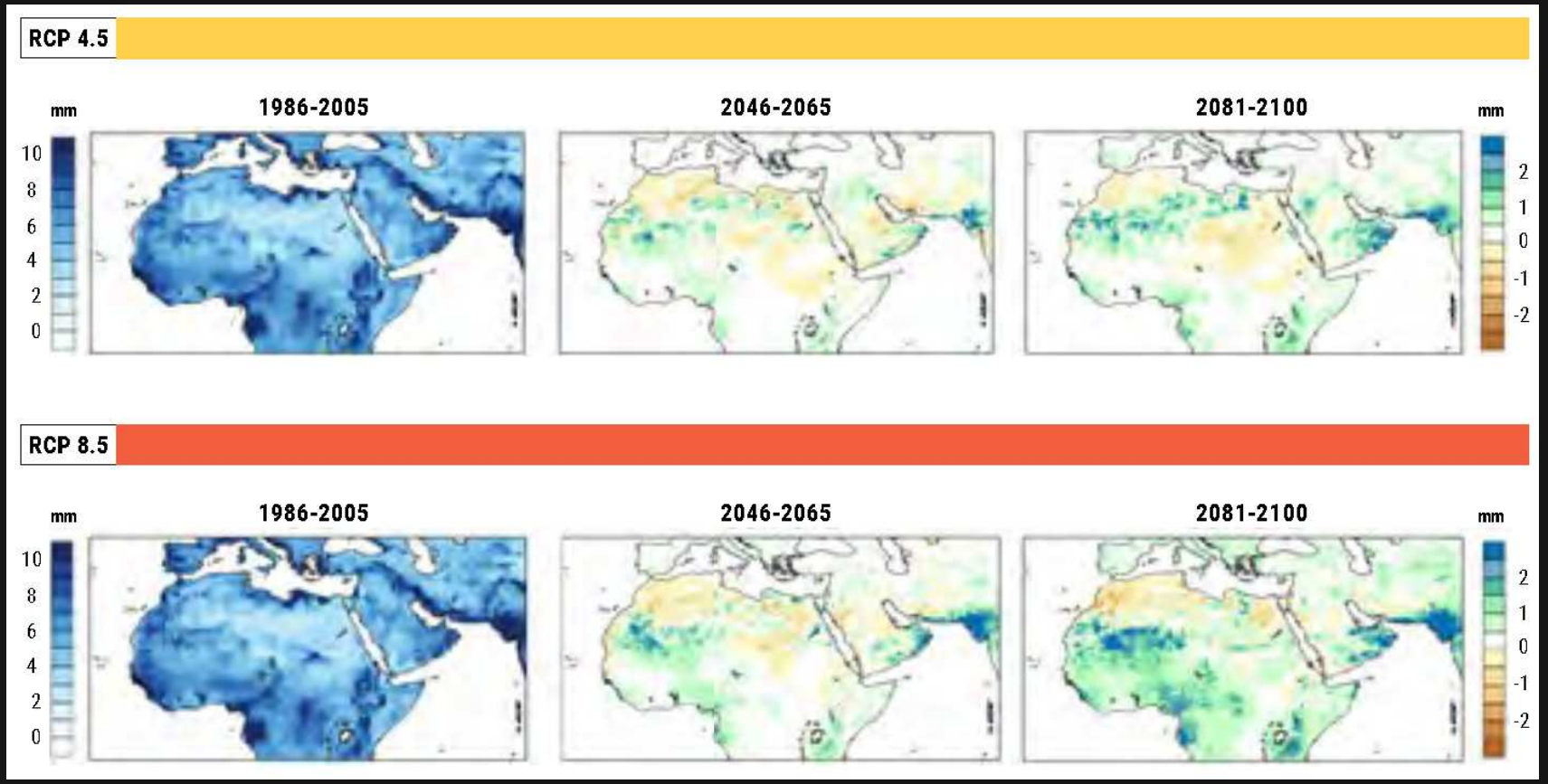
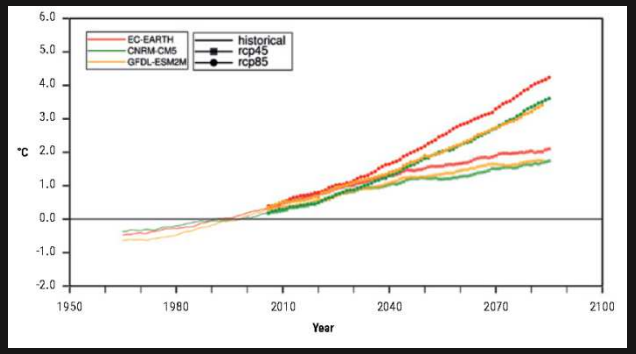
Intense Rainfall – SDII



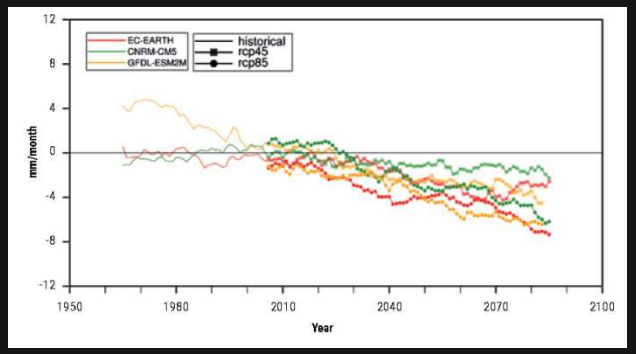
Change in *Simple Precipitation Intensity Index*

Future Projections – Runoff

Moroccan Highlands



Temperature Change



Precipitation Change

FIGURE 50

Mean change in seasonal runoff (April-September) over time for ensemble of t

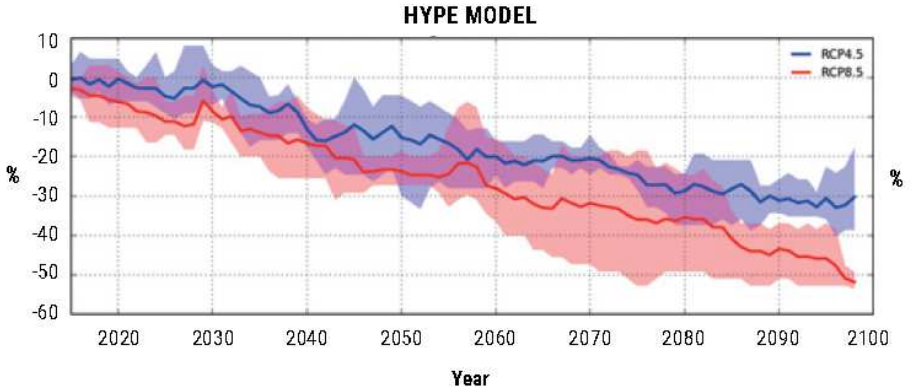
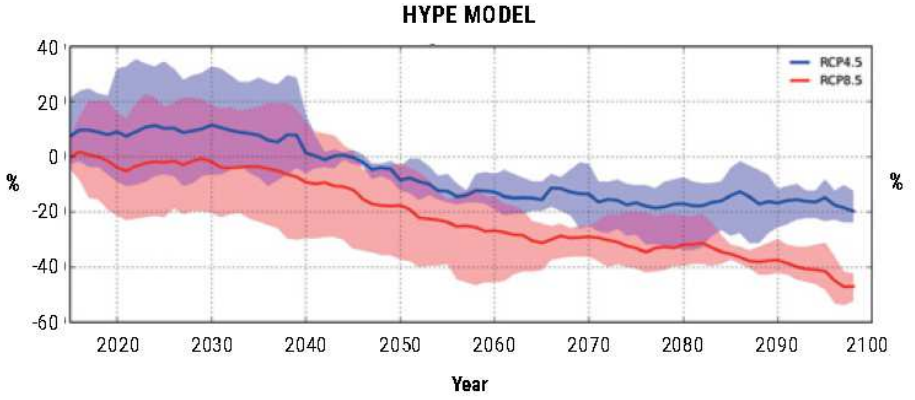


FIGURE 51

Mean change in seasonal runoff (October-March) over time for ensemble of th



Seasonal change: 3-member ensemble

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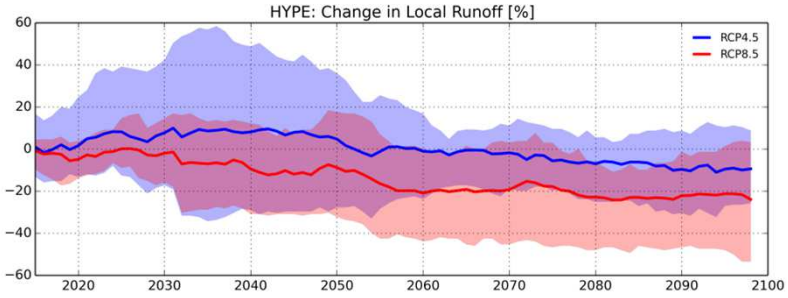
Jordan, Euphrates & Mejerda Rivers

Runoff **RCP4.5** **RCP8.5**

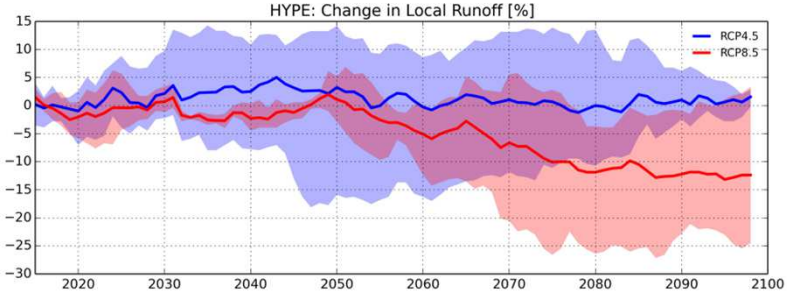
Jordan R.



Future change - 2100

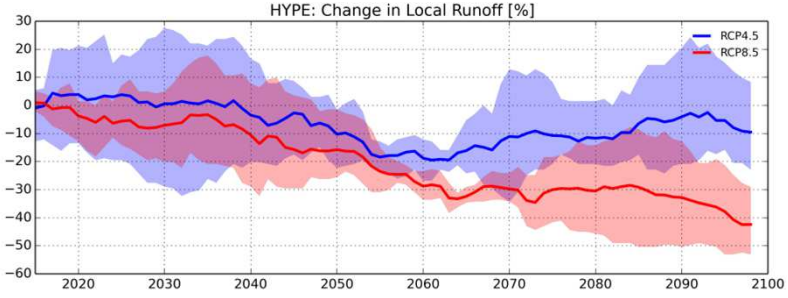
Variable	RCP4.5	RCP8.5
Temp.	1.5°C	3.2°C
Precip.	-7%	-13%
Runoff	-9%	-23%

Euphrates R.



Variable	RCP4.5	RCP8.5
Temp.	2.3°C	4.8°C
Precip.	3%	0%
Runoff	-2%	-12%

Mejerda R.



Variable	RCP4.5	RCP8.5
Temp.	1.6°C	3.5°C
Precip.	-4%	-9%
Runoff	-10%	-42%

Annual change: 3-member ensemble

Highlights from RICCAR Projections

- Mean annual temperature change over the entire Arab domain is projected to
  - **1.6 °C** at mid-century, **1.9 °C** by end-of-century for **RCP 4.5**
  - **2.2 °C** at mid-century, **4.0 °C** by end-of-century for **RCP 8.5**

    (with variations over different regions)

- A number of regions show larger temperature increase during summer than during winter
  - large increases for “hot” days (>35°C) and “very hot” days (>40°C)
  - much more severe for **RCP 8.5** than for **RCP 4.5**

- Precipitation changes vary considerably over the region – many areas show decreases
  - more severe for **RCP 8.5** than for **RCP 4.5**
  - length of dry periods mostly increasing in both RCPs

- Runoff changes follow precipitation changes, but are further influenced by temperature change

  (which can enhance evapotranspiration)