

Impact of Climate Change on Shared Water Resources

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In this presentation

- Shared rivers:
 - Blue Nile
 - Euphrates and Tigris, headwaters
 - Senegal river
 - Jordan river
 - Mejerda river
- Conclusions

Results does not include changes in human water consumption

Blue Nile



Characteristics:

Nile basin:

Area: 3 180 000 km²

Length: 6 695 km

Countries: 11

Population: 370 million

Blue Nile:

Precipitation: >1000 mm/y

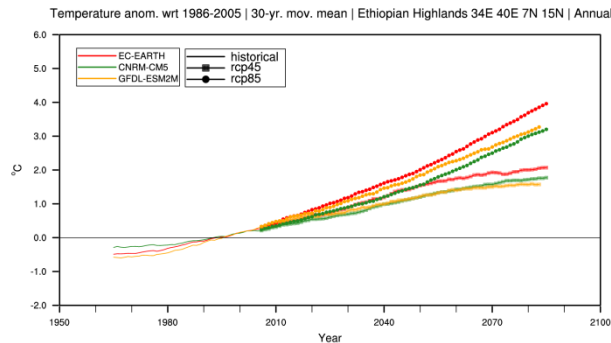
Temperature: 22°C



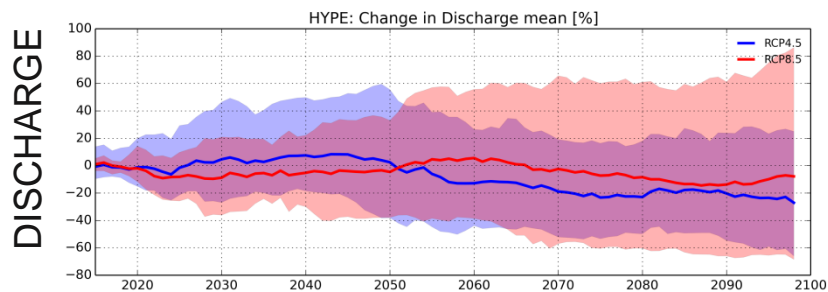
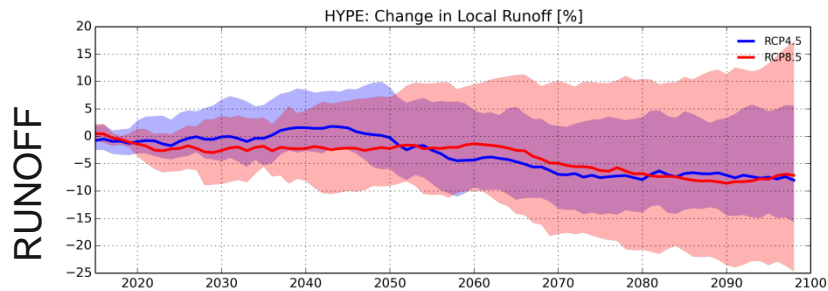
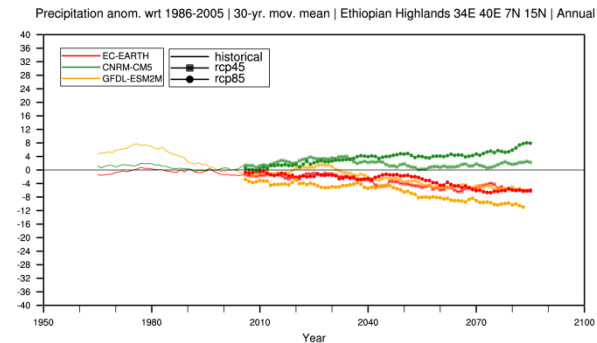
Blue Nile Falls (wikimedia commons)

Blue Nile

TEMPERATURE



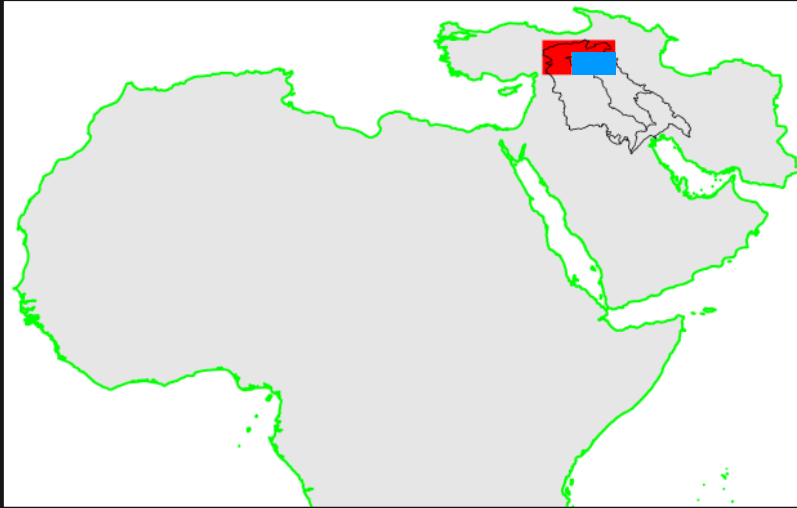
PRECIPITATION



RCP8.5 (Higher emission)
RCP4.5 (Lower emission)

Variable	RCP4.5	RCP8.5	Future change 2100
Temp.	1.8 °C	3.6 °C	
Precip.	-5%	-5%	
Runoff	-8%	-7%	

Euphrates and Tigris, headwaters



Euphrates (wikimedia commons)

Characteristics:

Shatt el Arab basin:

Area: 900 000 km²

Rivers: Euphrates, Tigris, Karun, Karkheh

Countries: 4

Population: >50 million

Euphrates headwater:

Precipitation: 550 mm/y

Temperature: 10°C

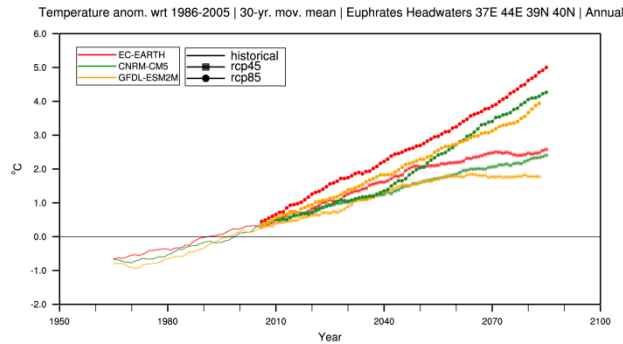
Tigris headwater:

Precipitation: 620 mm/y

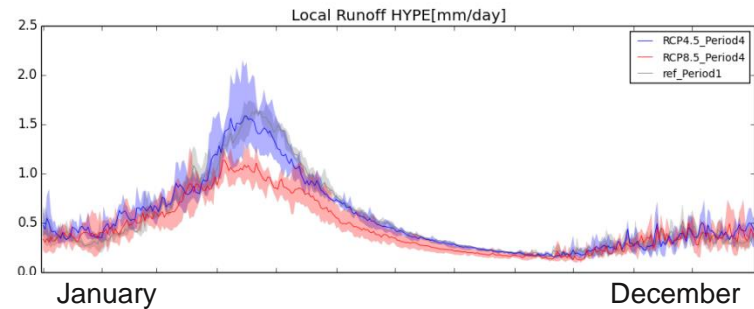
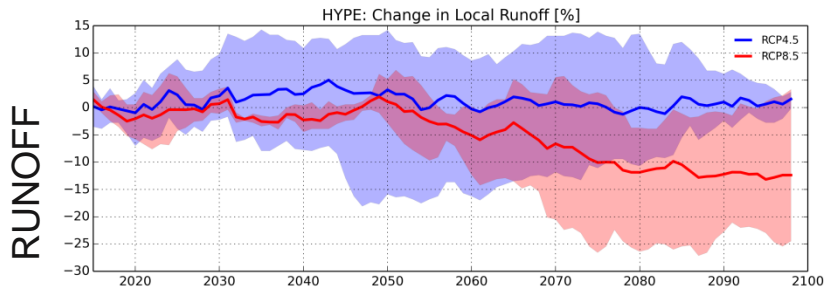
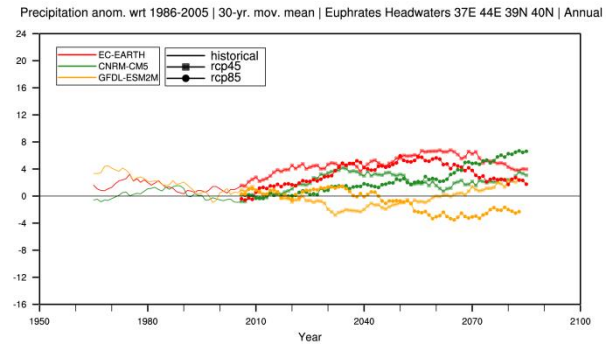
Temperature: 13°C

Euphrates headwaters

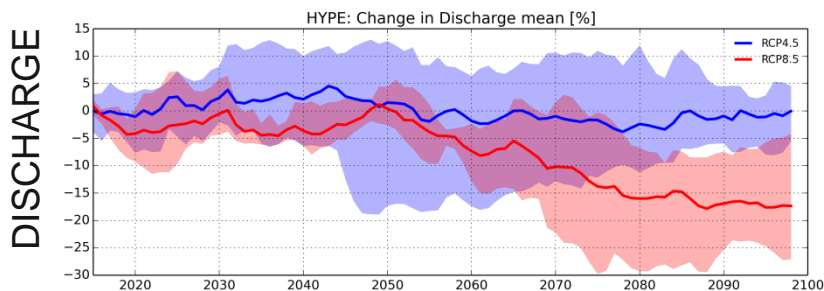
TEMPERATURE



PRECIPITATION



RCP8.5
RCP4.5
Ref.

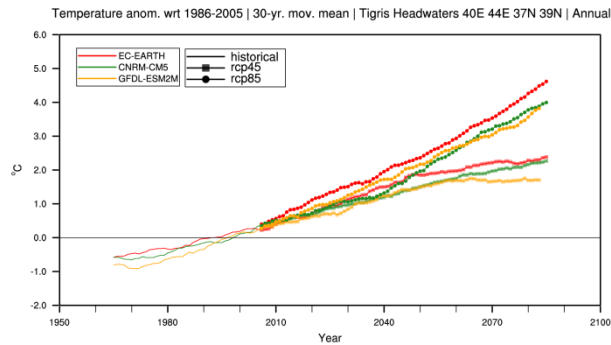


Variable	RCP4.5	RCP8.5
Temp.	2.3°C	4.8°C
Precip.	7%	5%
Runoff	-2%	-12%

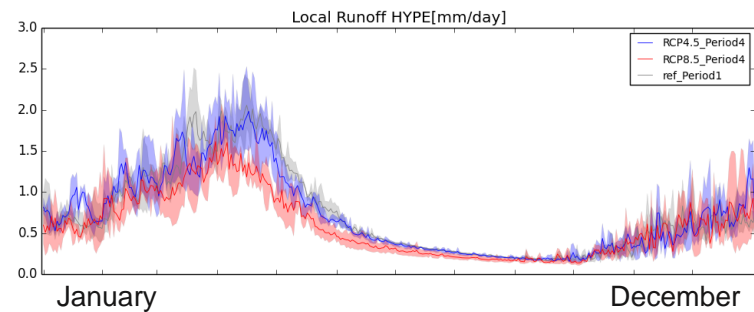
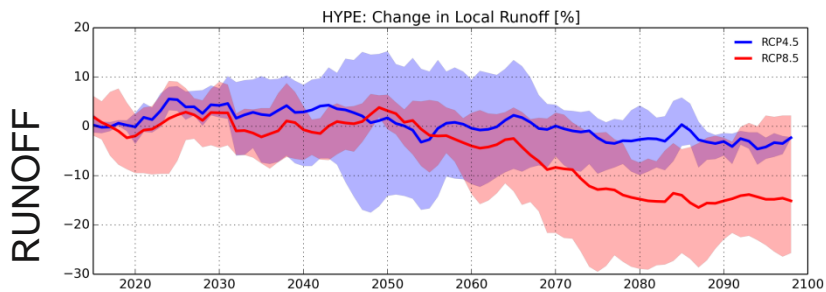
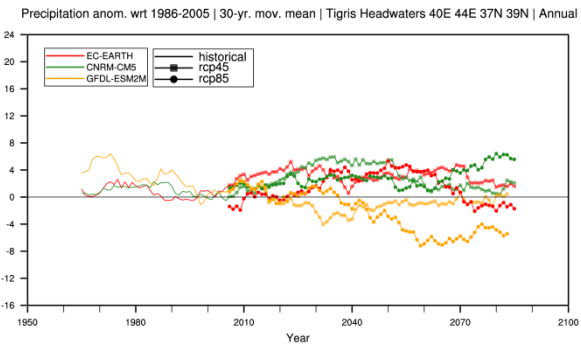
Future change
2100

Tigris headwaters

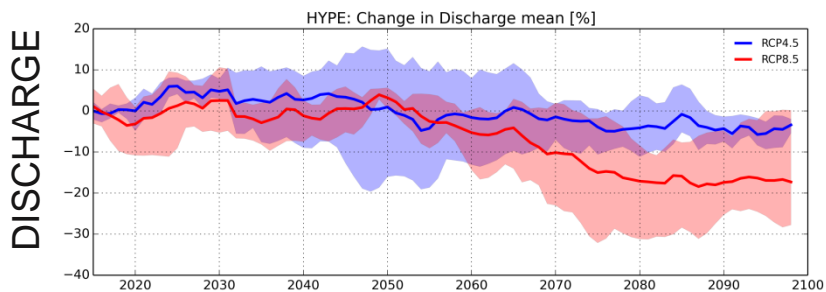
TEMPERATURE



PRECIPITATION



RCP8.5
RCP4.5
Ref.



Variable	RCP4.5	RCP8.5	Future change 2100
Temp.	2.2°C	4.5°C	
Precip.	1%	-4%	
Runoff	-2%	-15%	

Jordan, Senegal and Mejerda rivers

Jordan river



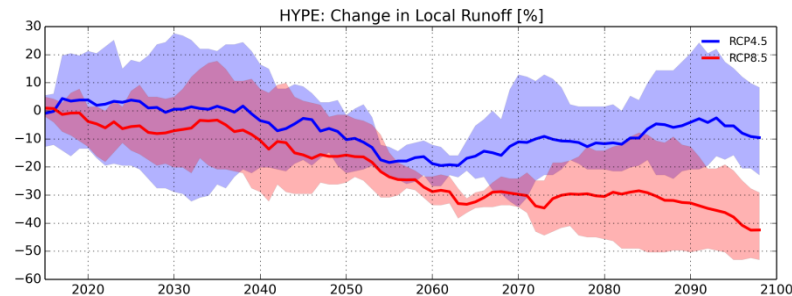
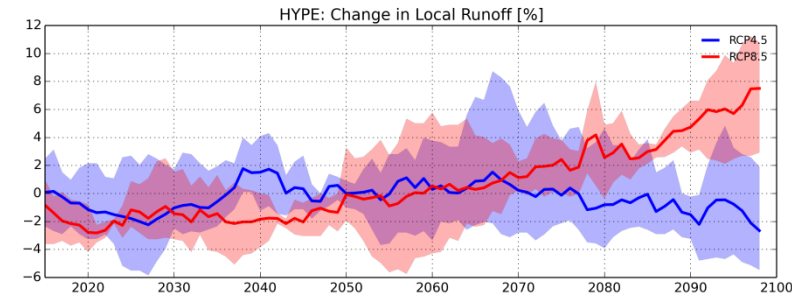
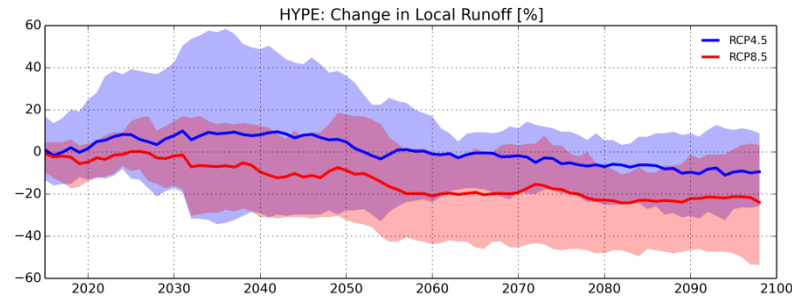
Senegal river



Mejerda river



Runoff RCP8.5 RCP4.5



Future change - 2100

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

Variable	RCP4.5	RCP8.5
Temp.	2.1°C	4.3°C
Precip.	2%	9%
Runoff	-3%	8%

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

Conclusion

- The impact on runoff and river discharge are often more pronounced (and severe) in the RCP8.5 emission scenario.
- The uncertainties in the RCP8.5 scenario is often larger than for the RCP4.5 emission scenario.
- How shared rivers will be impacted by climate change varies over the Arab Region.

Each river is unique



RICCAR

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