



ClimDev-Africa

Climate Patterns and Hydro-climatic Scenarios in the Upper Blue Nile Basin

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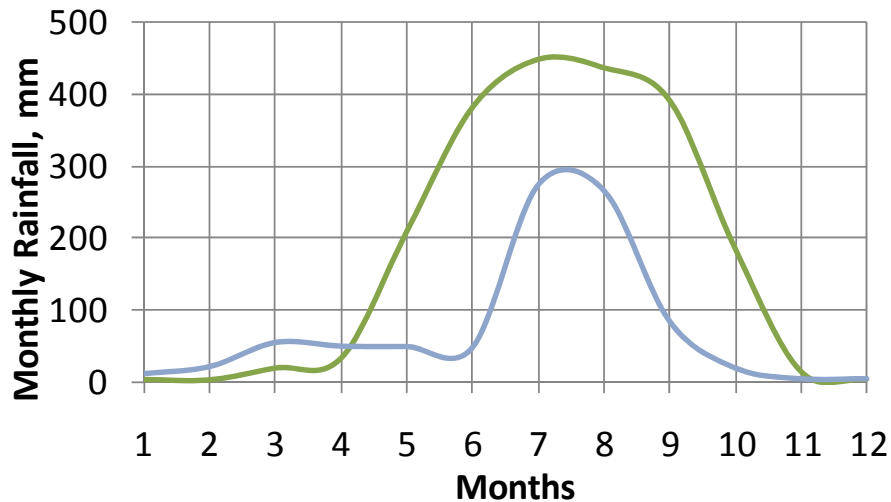
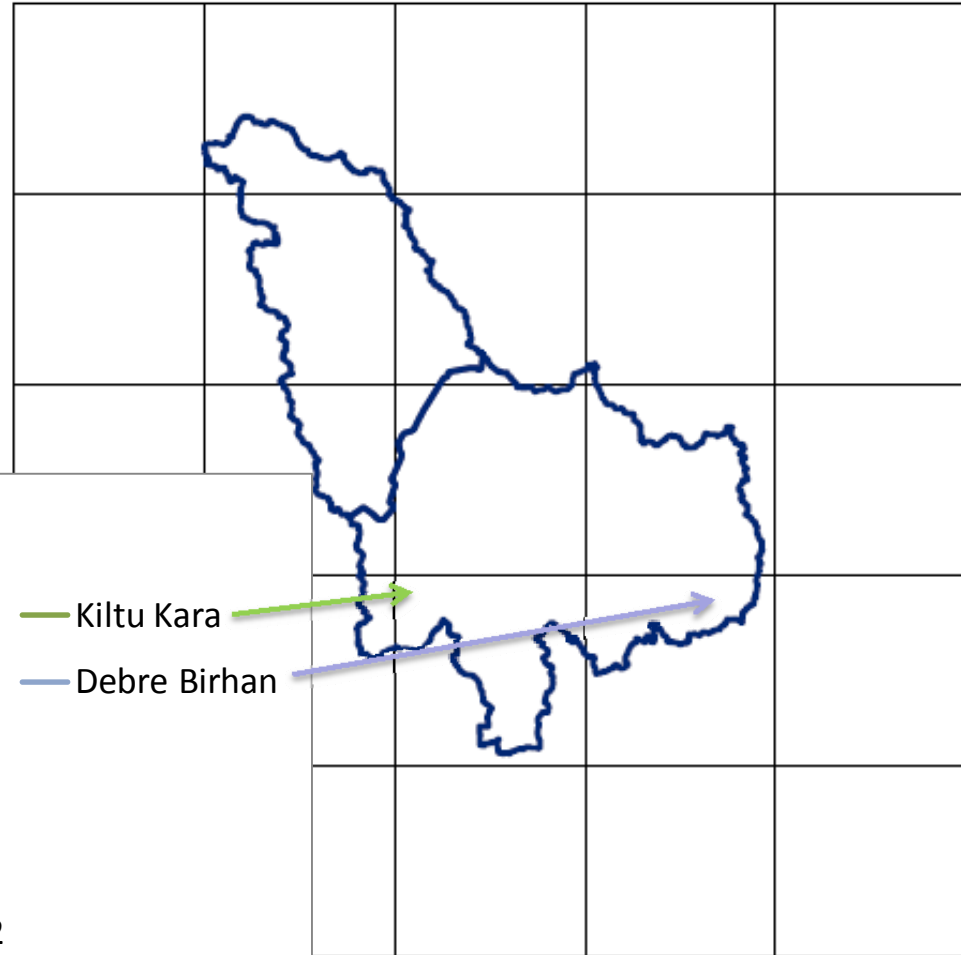
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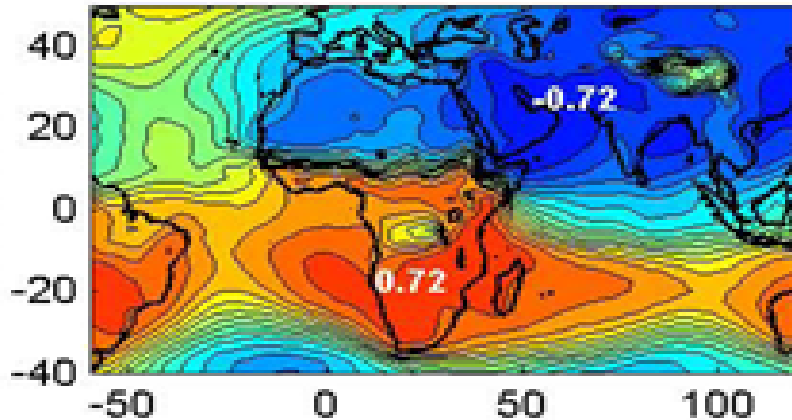
Climate Drivers

- Global climate drivers (teleconnections, SST)
- Local climate drivers (Orography, monsoon)
- Rainfall regimes

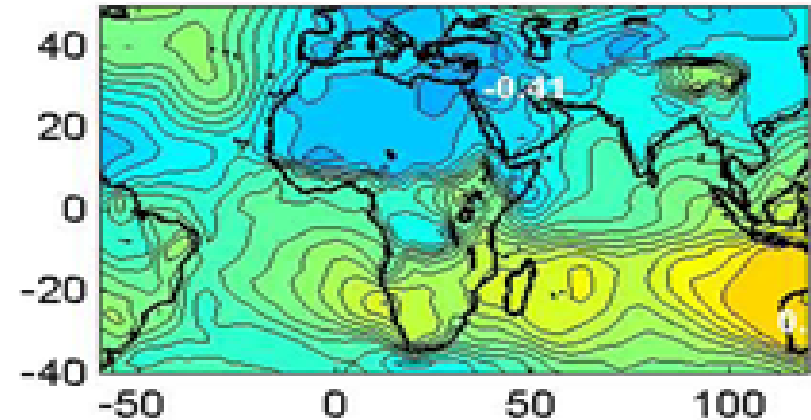


Climate Drivers ...

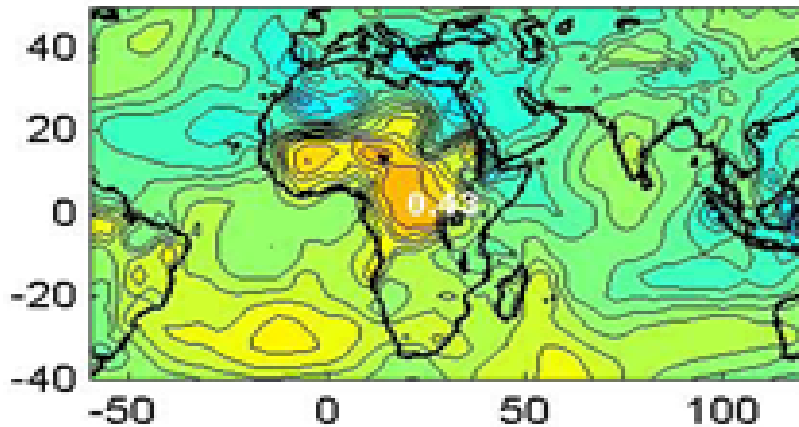
FMAM: KiltuKara



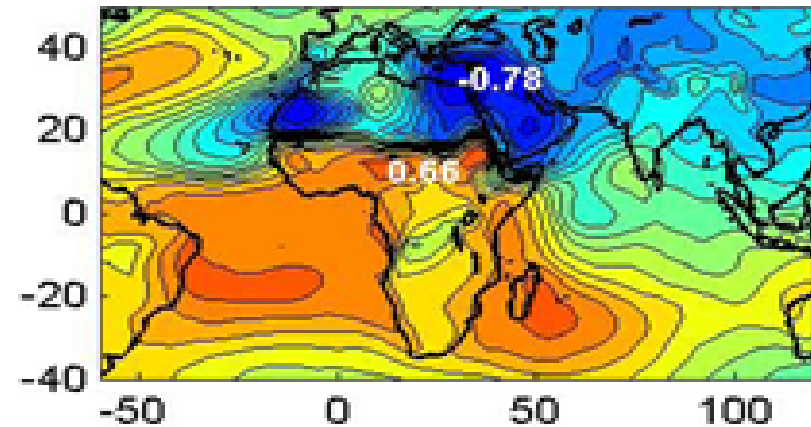
FMAM: DebreBirhan



JJAS: KiltuKara



JJAS: DebreBirhan



Correlation between station monthly rainfall and gridded reanalysis MSLP

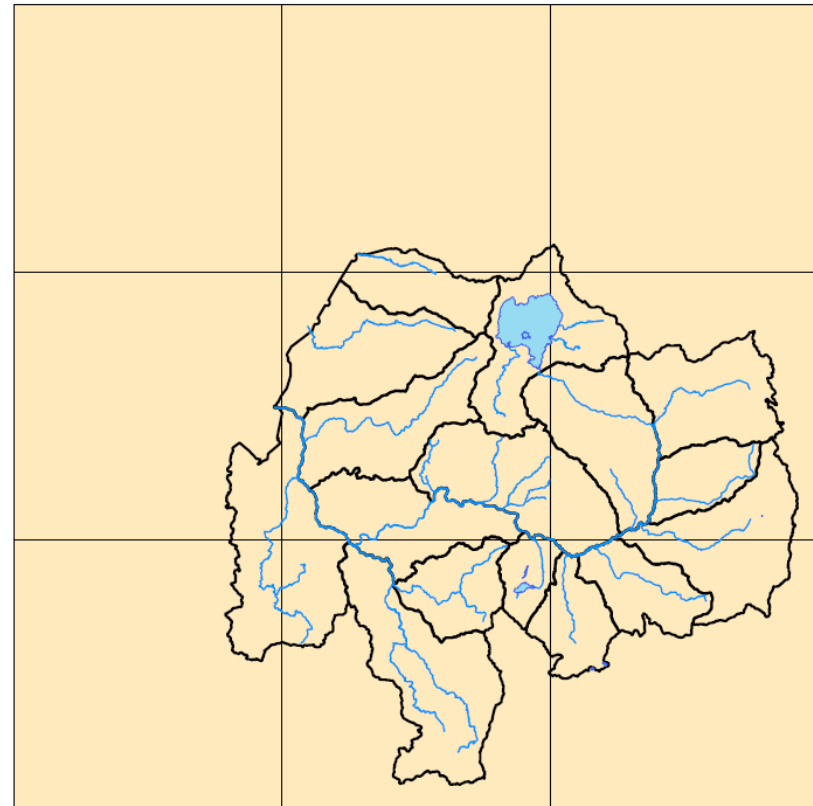
Climate Projections

GCM Projections:

- Coarse spatial resolution
- High uncertainties in surface (regional/local) climate variables
- Less uncertainties in large-scale atmospheric circulation and moisture fields

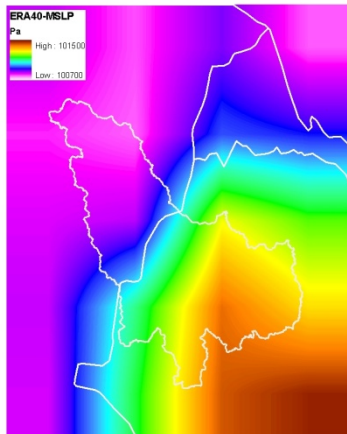
→ **Climate downscaling for impact assessments**

Improve sub-grid climate processes, drivers & feedbacks

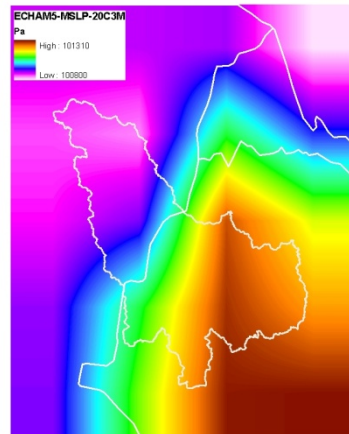


ICBC Selection - MSLP

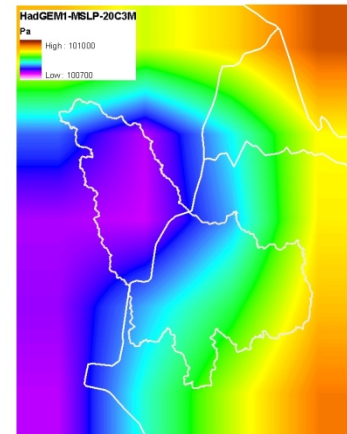
ERA40



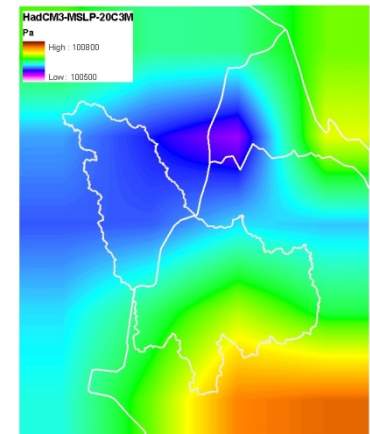
ECHAM5



HadGEM1



HadCM3

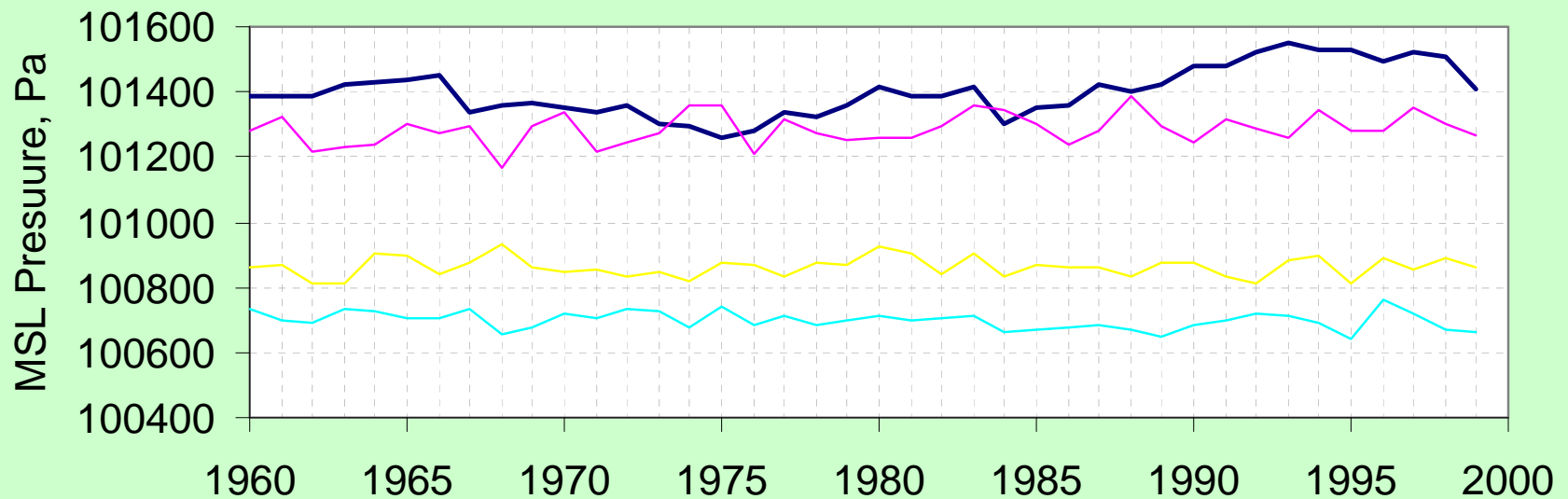


— ERA40

— ECHAM5

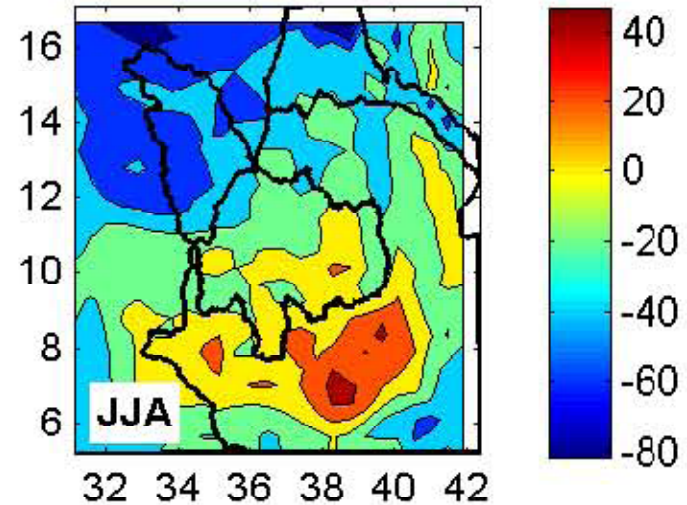
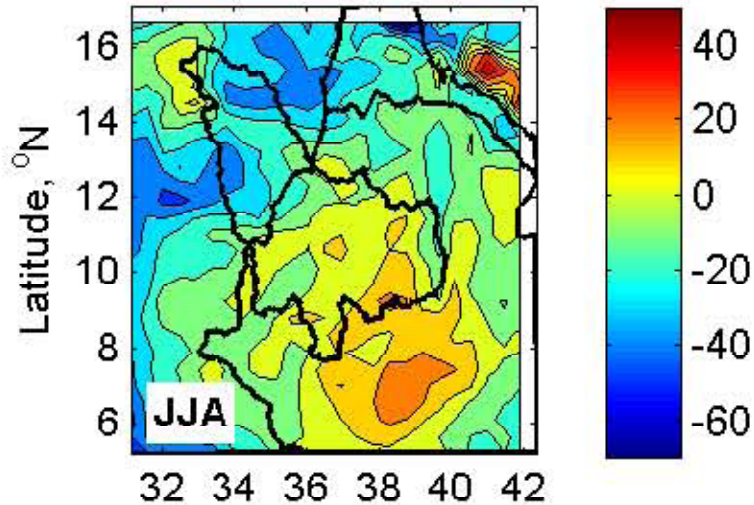
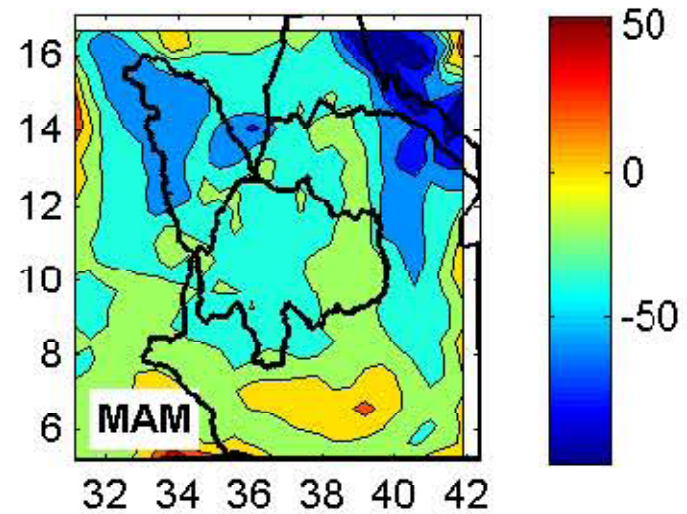
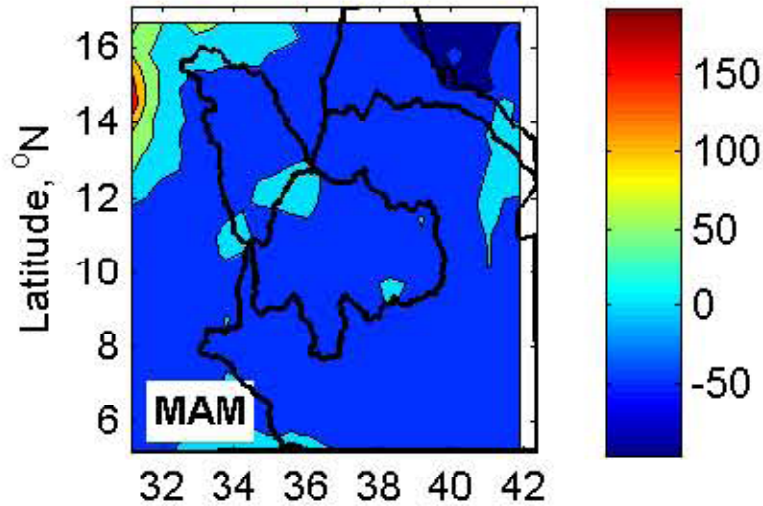
— HadGEM1

— HadCM3



RegCM3 - Rainfall Scenarios

2030s - 1990s

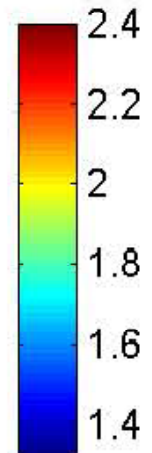
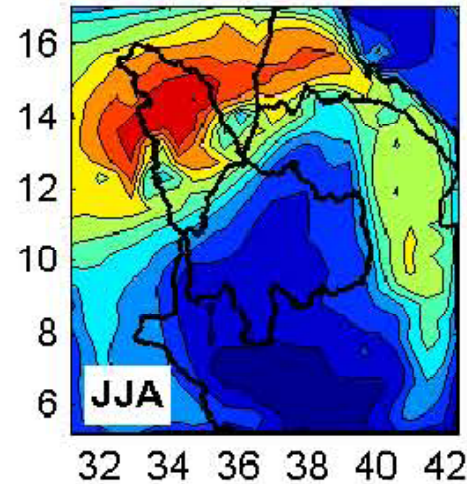
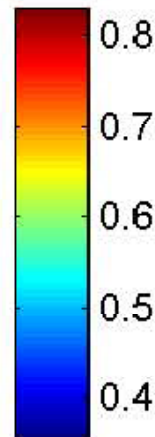
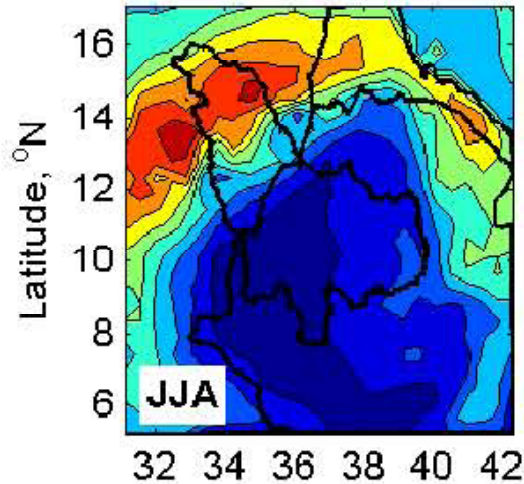
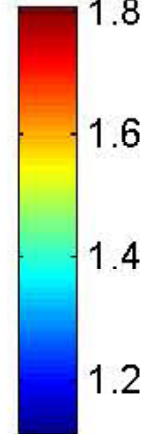
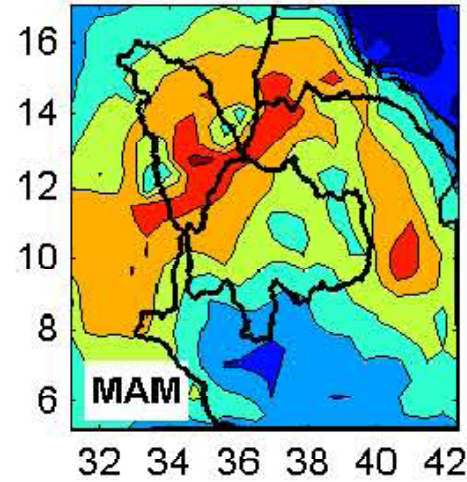
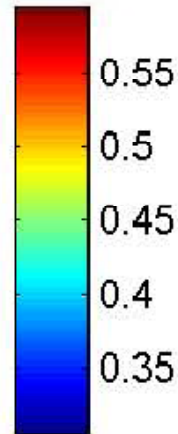
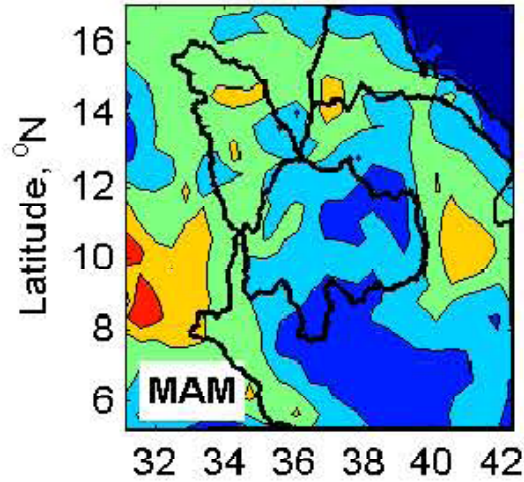


2090s - 1990s



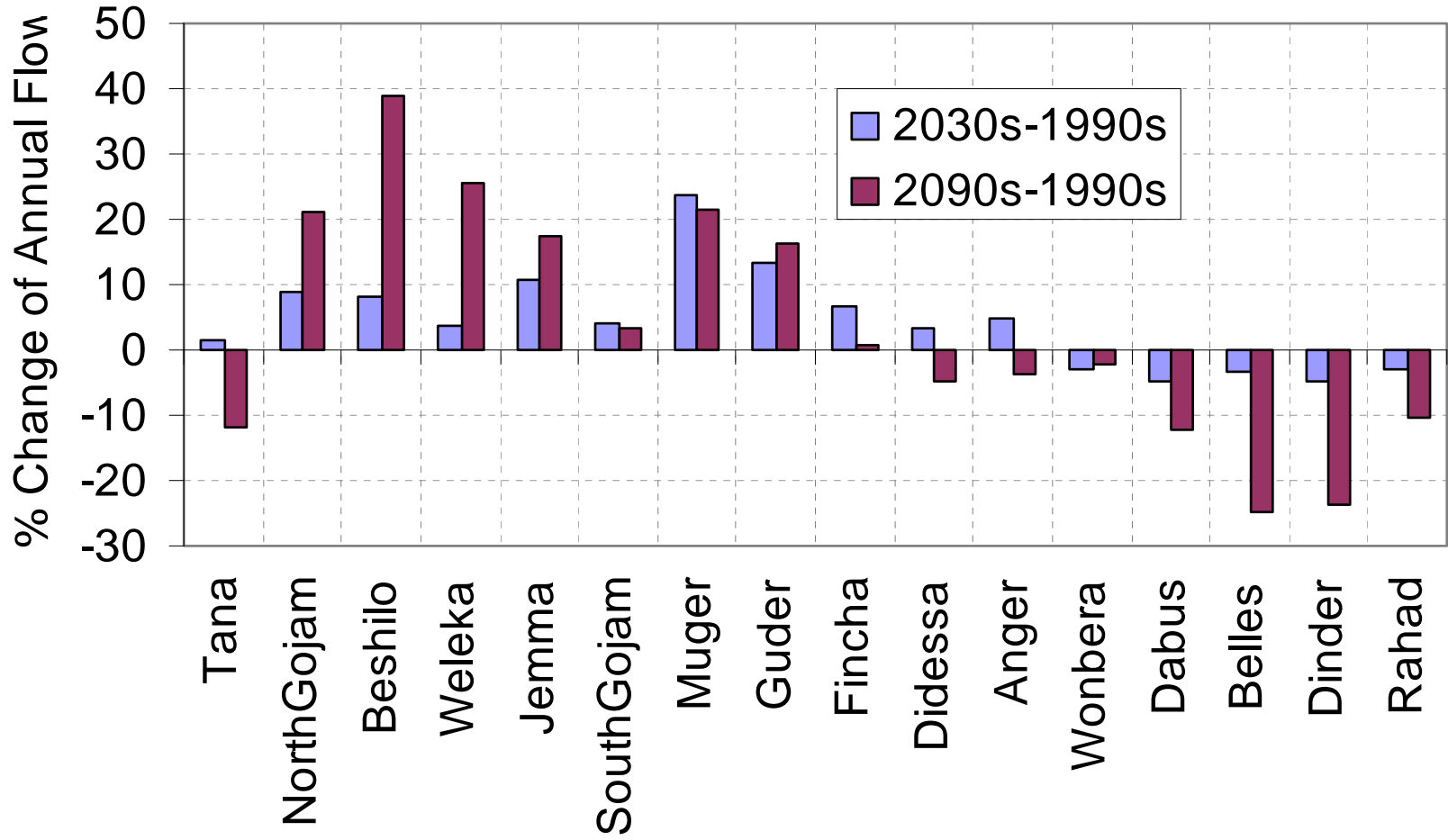
RegCM3 - Temperature Scenarios

2030s - 1990s



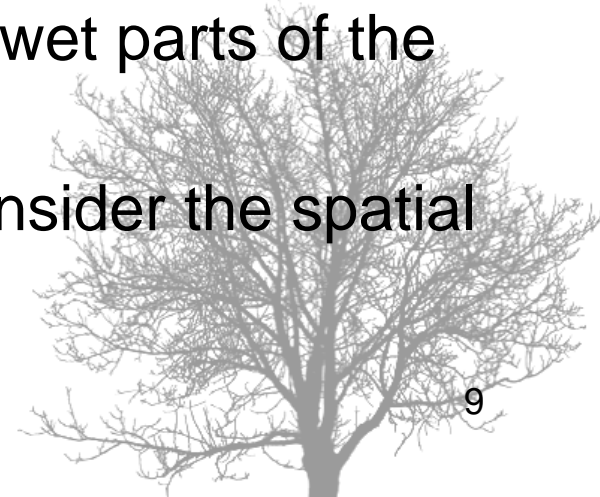
2090s - 1990s

Flow Scenarios



Conclusions

- The relative dominance of global and local climate drivers varies with season, altitude and location within the basin
- The complex nature of the East African climate requires comprehensive and dynamic downscaling approach
- The reliability and suitability of global climate datasets should be checked before applying for climate impact and vulnerability assessment
- The future plausible hydro-climatic scenarios in the UBN basin exhibits greater spatial variability; wet parts of the basin get wetter and dry parts get drier.
- Climate adaptation measures should consider the spatial signals of climate and flow scenarios



Thank you!

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IWMI – East Africa and Nile Basin

