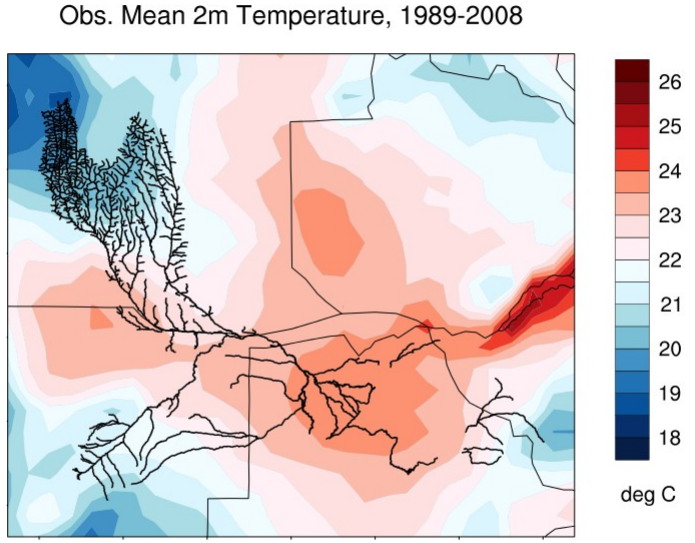
THE FUTURE OKAVANGO

CSC
Climate Service Center
Germany

An institution of Helmholtz-Zentrum Geesthacht

Subproject 01

Climate Change in the Okavango region



THE FUTURE OKAVANGO PROJECT
General meeting 10. – 13. October 2011
Maun-Lodge, Maun, Botswana

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Climate Service Center (CSC), Hamburg, Germany

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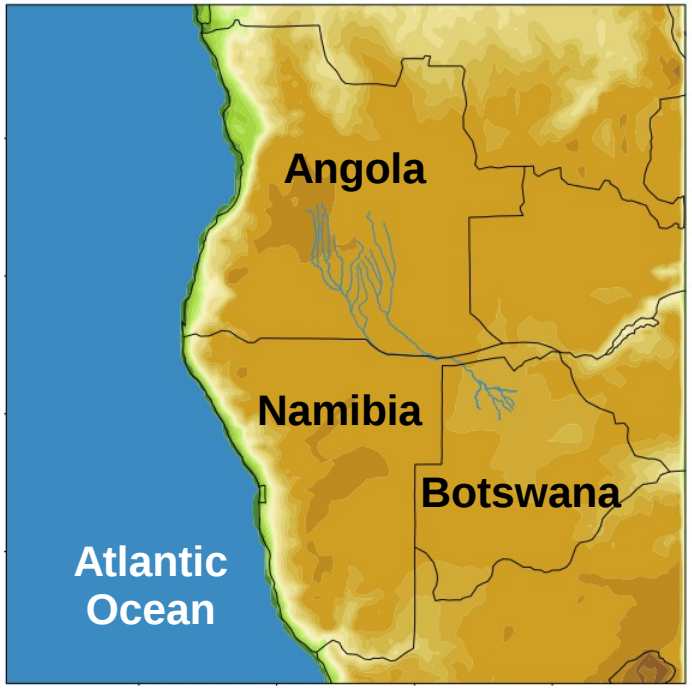
Motivation

Okavango river system is sensitive to climate change

-> climate change information is necessary for adaptation

Challenge for climate change scenarios

- General Circulation Models (GCMs) are too coarse
- Regional Climate Models (RCMs) give an added value
- external climatological influences of the water budget (Sea Surface Temperatur (SST), moisture transport into the region)



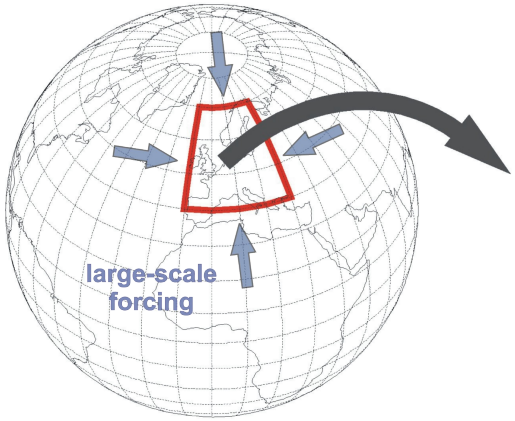
Objectives and key questions

1. Creation of climate change information including uncertainty estimates for the Okavango region and distribution of the information to the project partners.

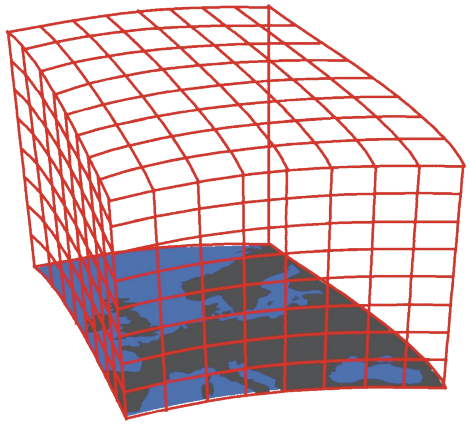
2. Assesment of the influence of the Atlantic Sea-Surface-Temperature (SST) on the moisture transport into the Okavango region.
   What will be the effect of the future changes of the SST on the climate of this region?

Meteorological Approach

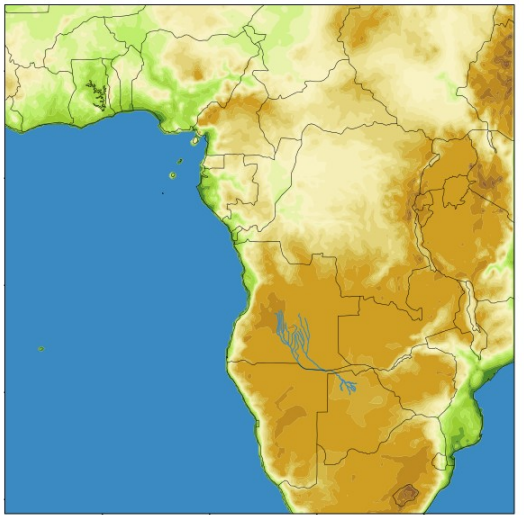
General Circulation Model (GCM)



Regional Climate Model (RCM)



Okavango Model Domain



horiz. res. approx. 310 km (equator)
31 vertical level

horiz. res. 0.22 ° x 0.22 ° (25 x 25 km²)
27 vertical level

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Meteorological Approach

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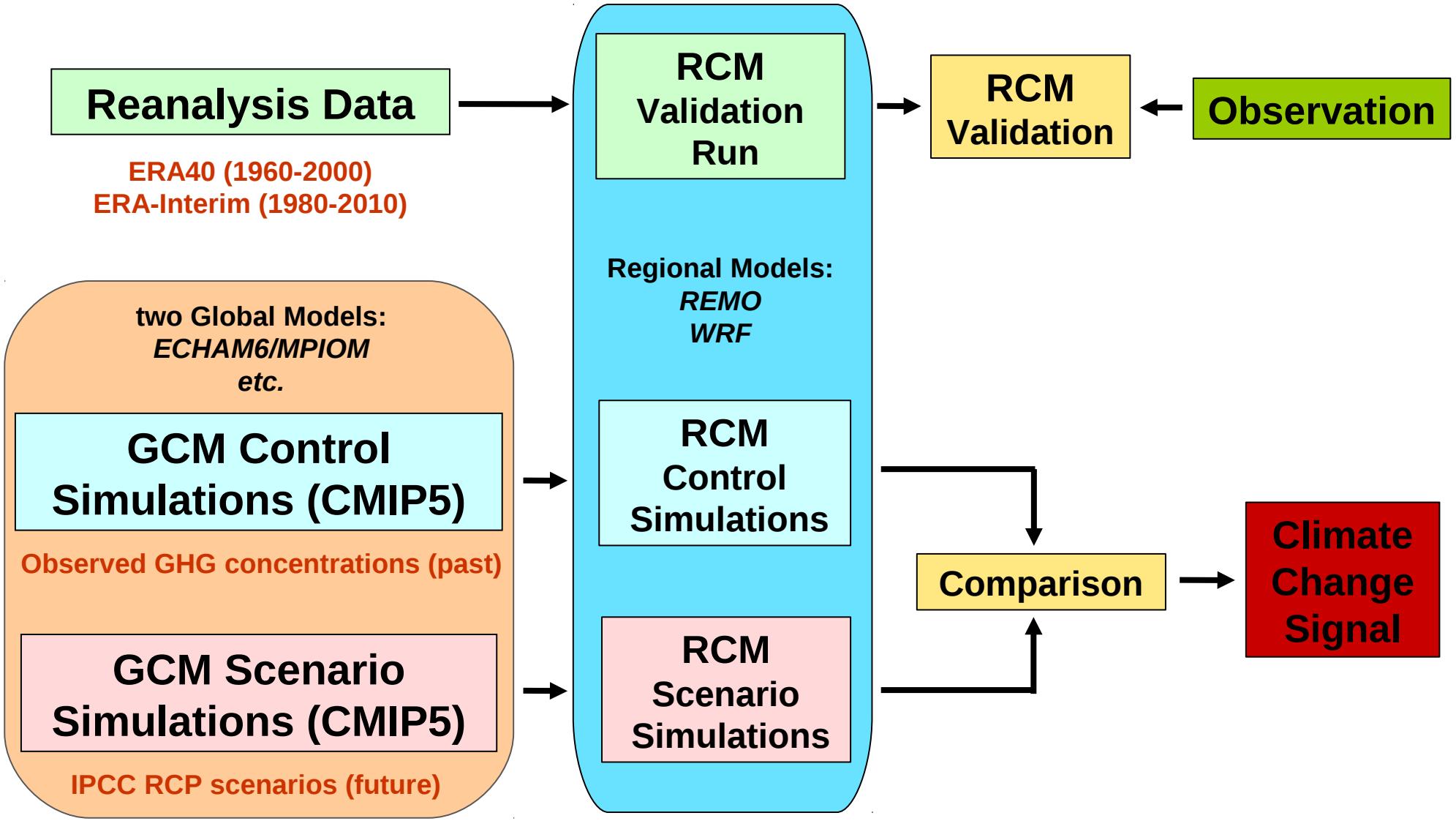
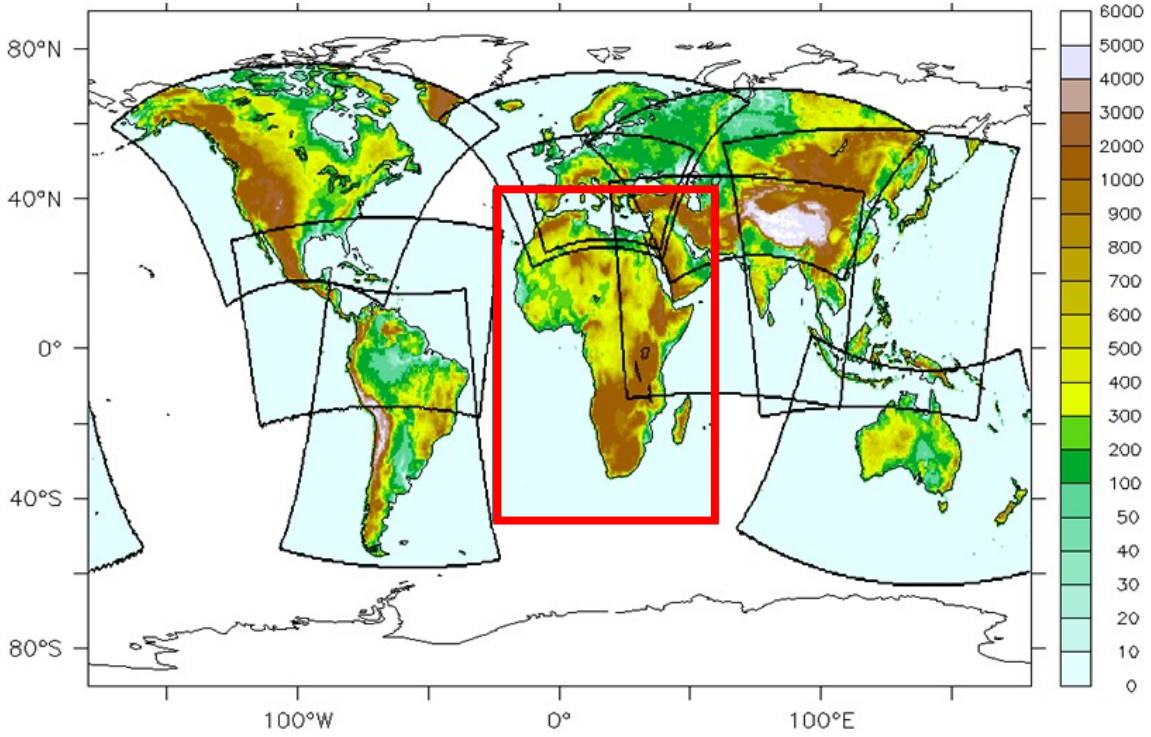


Coordinated Regional climate Downscaling Experiment (CORDEX)



Orography of CORDEX model domains in [m]

- 12 domains with a resolution of 0.44° x 0.44° (approx. 50 x 50 km²)
- **focus on Africa (mandatory domain)**
- different regional models, but identical domains and output variables

WCRP
World Climate Research Programme

Workpackages (scheduled)

Task 1 - Validation of models with measurements:

- hindcast simulations (ERA40/-Interim, REMO, WRF)
- validation of the hindcast simulations
- assessment of the water budget and of the uncertainties for present climate

Task 2 - Hydrological cycle under climate change conditions:

- regional climate change simulations
  (two different IPCC scenarios, ECHAM6/MPIOM, etc.)
- provision of the climate change data to other subprojects
- uncertainty measures for the climate change simulations

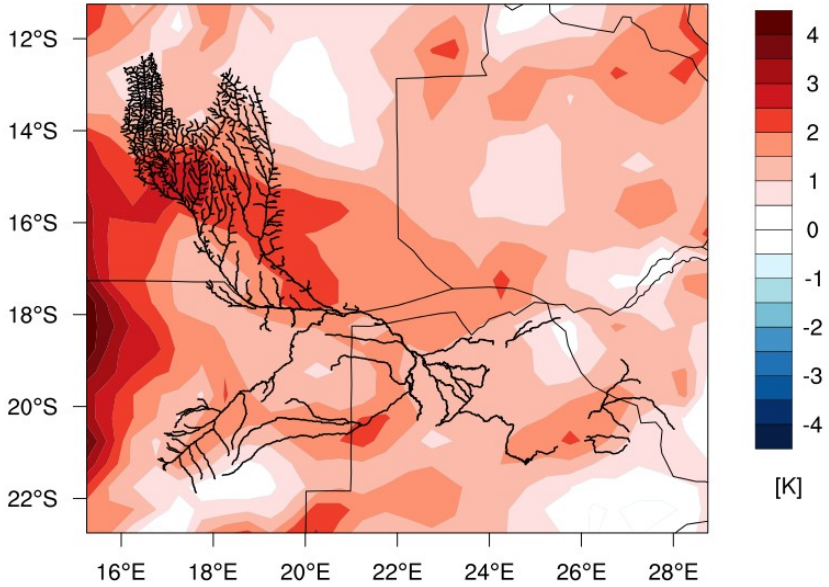
Workpackages (scheduled)

Task 3 - Sensitivity tests for the water budget due to external influences:

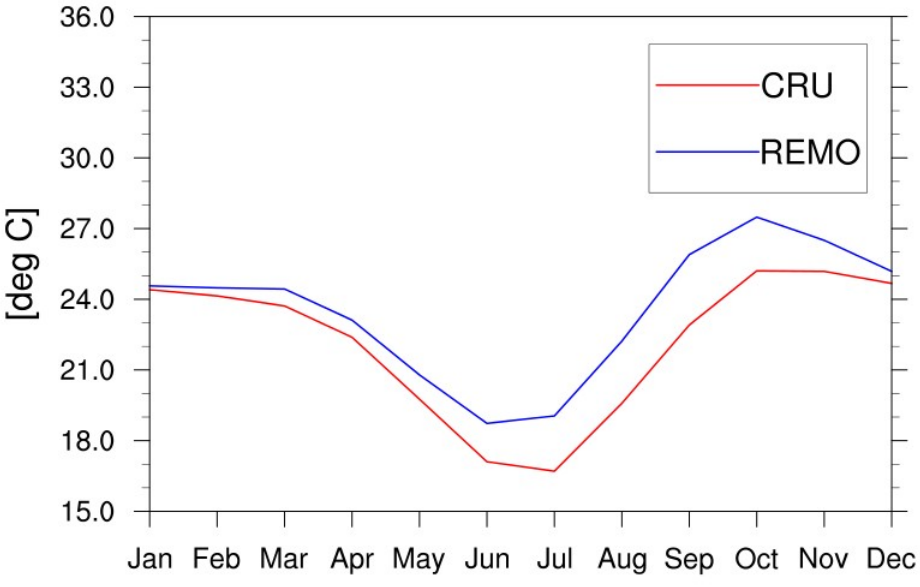
- assessment of the moisture transport into the Okavango region from climate models and observations
- assessment of the role of the Atlantic Sea-Surface Temperature (SST) on the water budget of the Okavango region

First Validation Results of REMO/ERA-Interim: *Temperature*

Mean Deviation 2m Temperature
REMO-CRU, 1989-2008

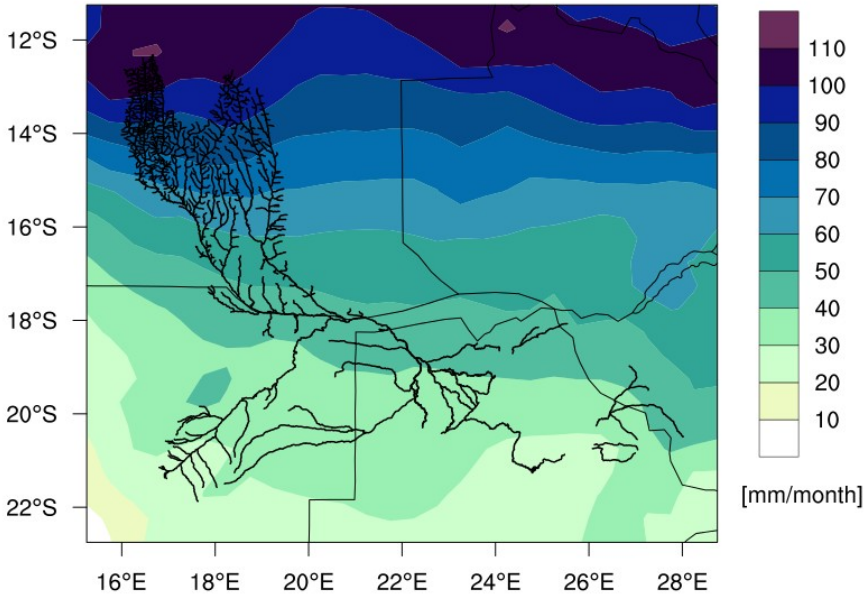


Mean Annual 2m Temperature, 1989-2008

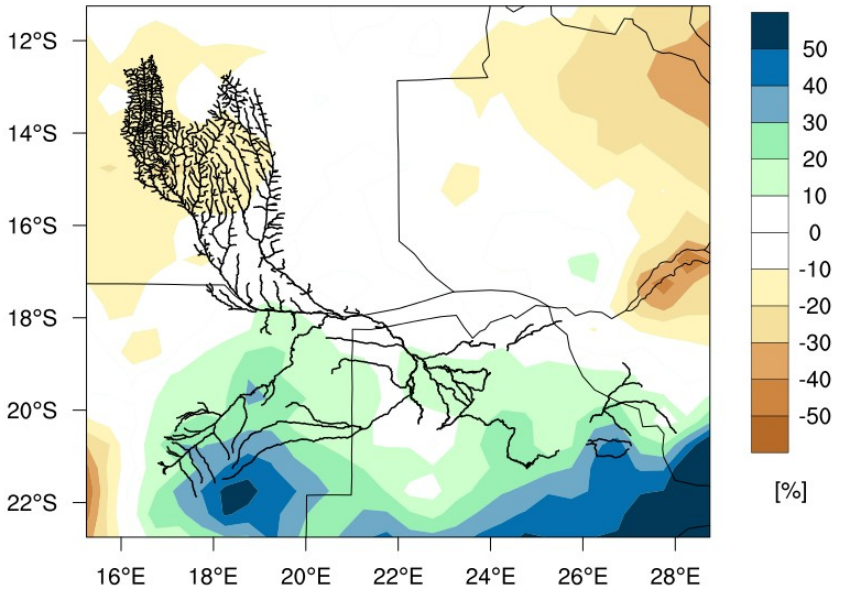


First Validation Results of REMO/ERA-Interim: *Precipitation*

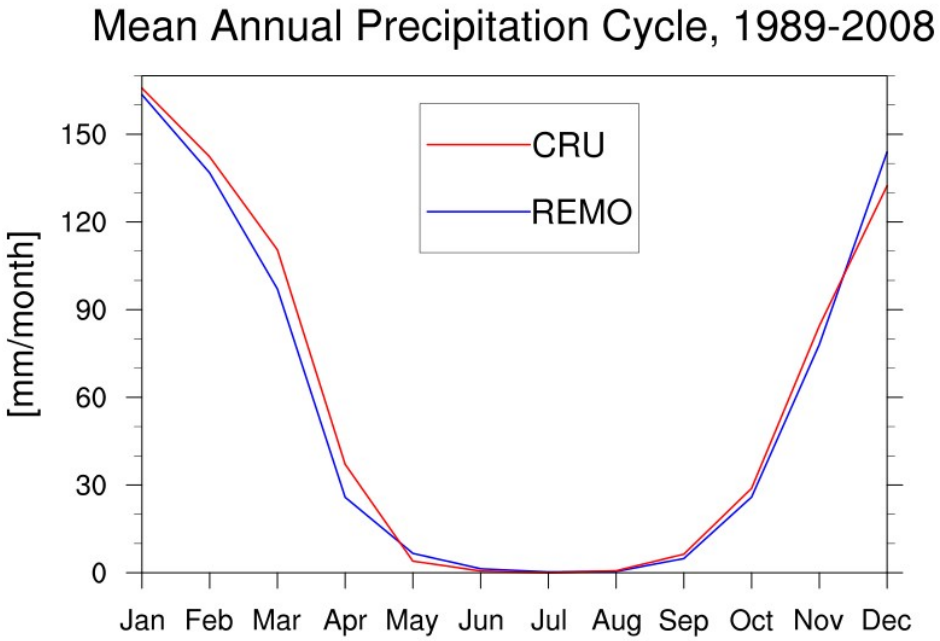
Mean Precipitation
CRU, 1989-2008



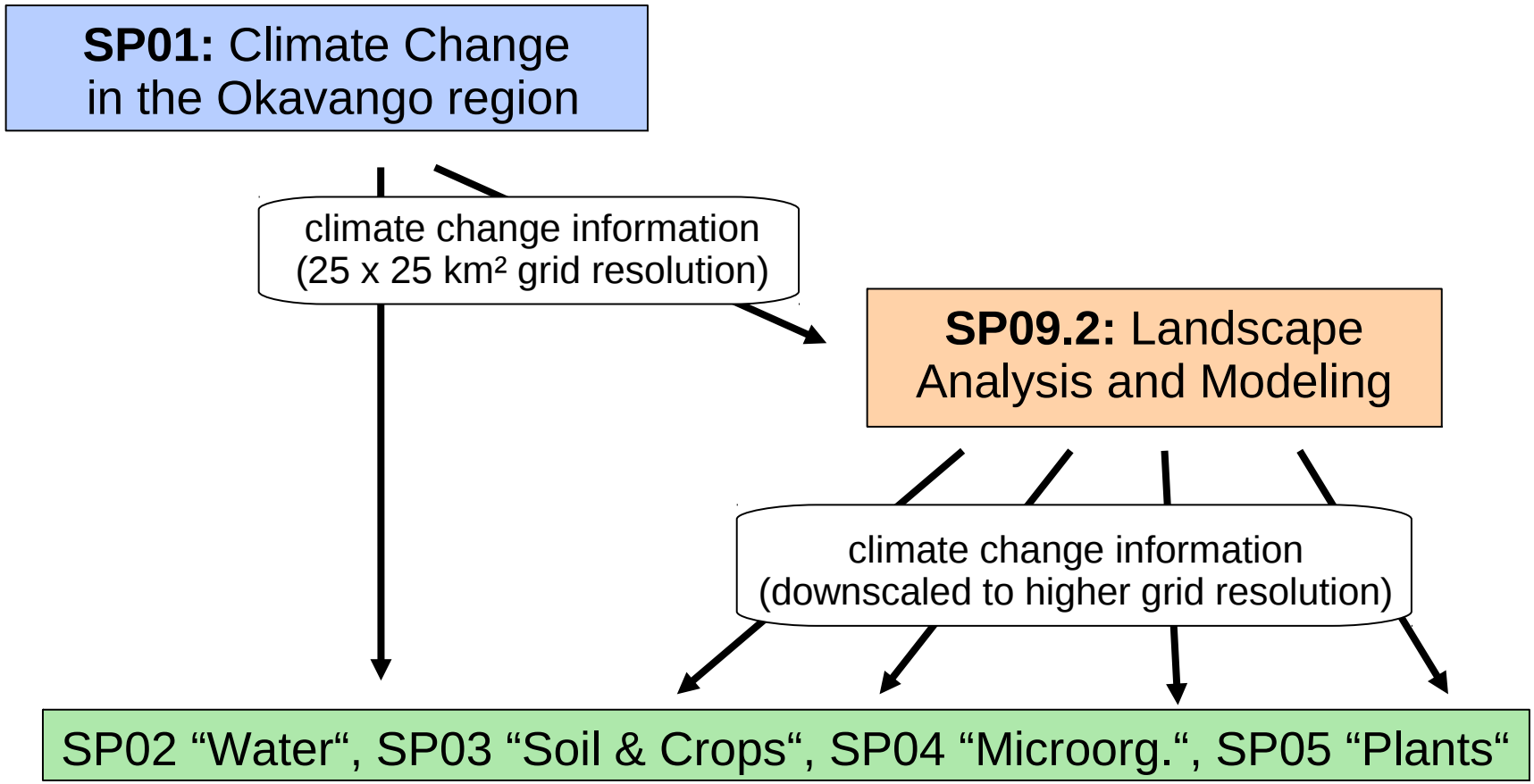
Mean Deviation Precipitation
REMO-CRU, 1989-2008



First Validation Results of REMO/ERA-Interim: *Precipitation*



Contribution to the overall project goals



Thank you for your attention!

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