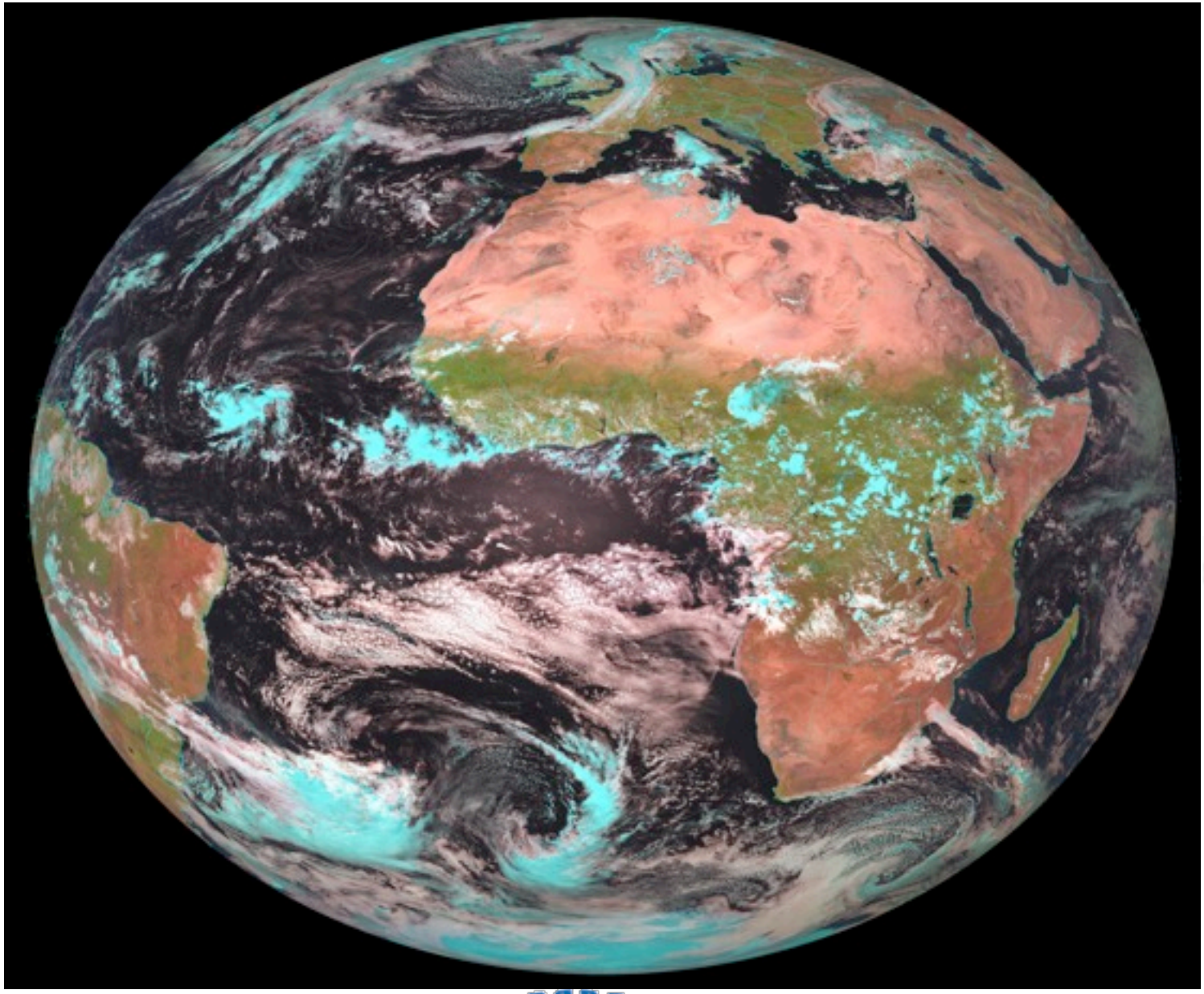
Co-Ordinated Regional Downscaling Experiment

C O R D E X



Thanks to:

Chris Lennard

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General aims of CORDEX

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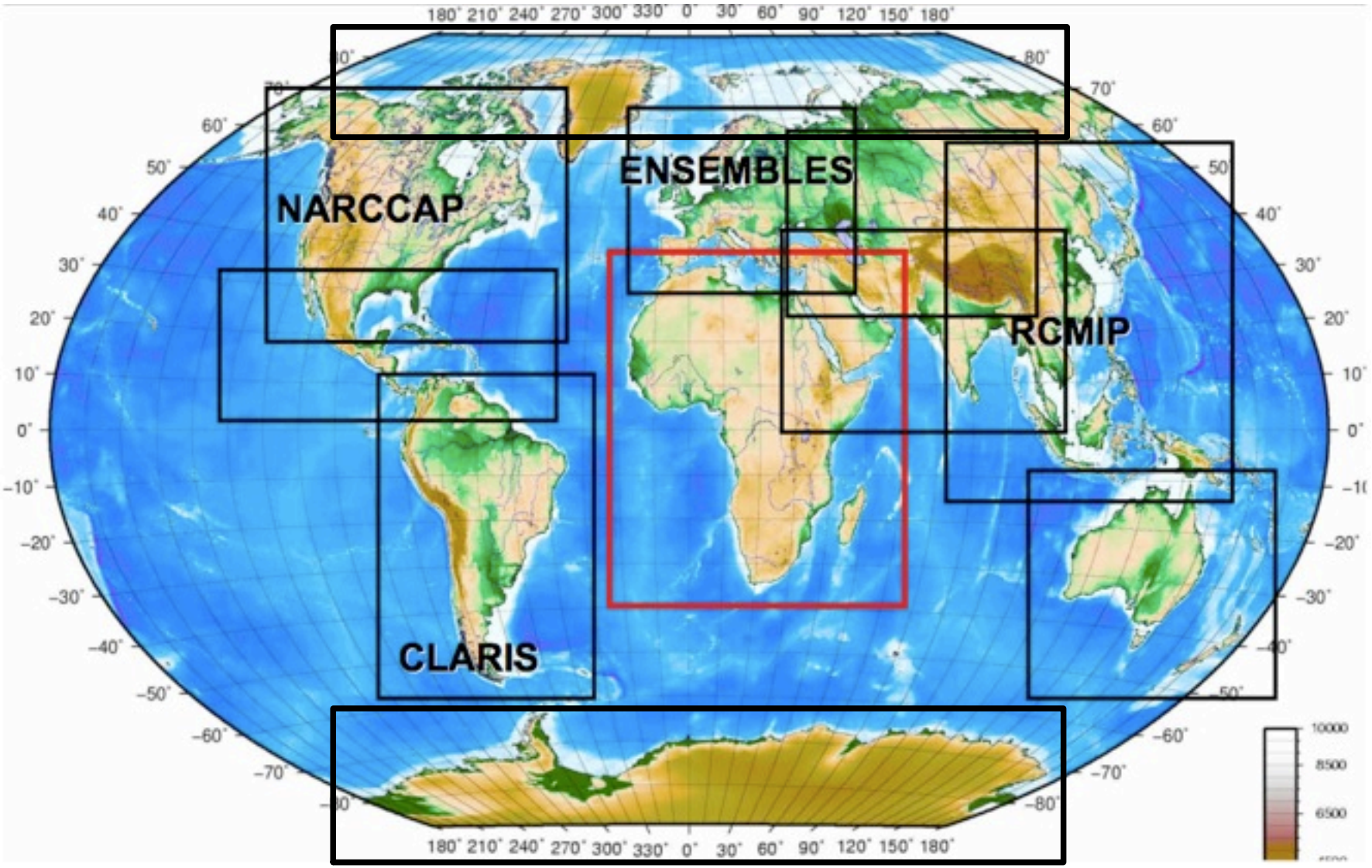
Make these *data sets readily available and useable* to the impact and adaptation communities.

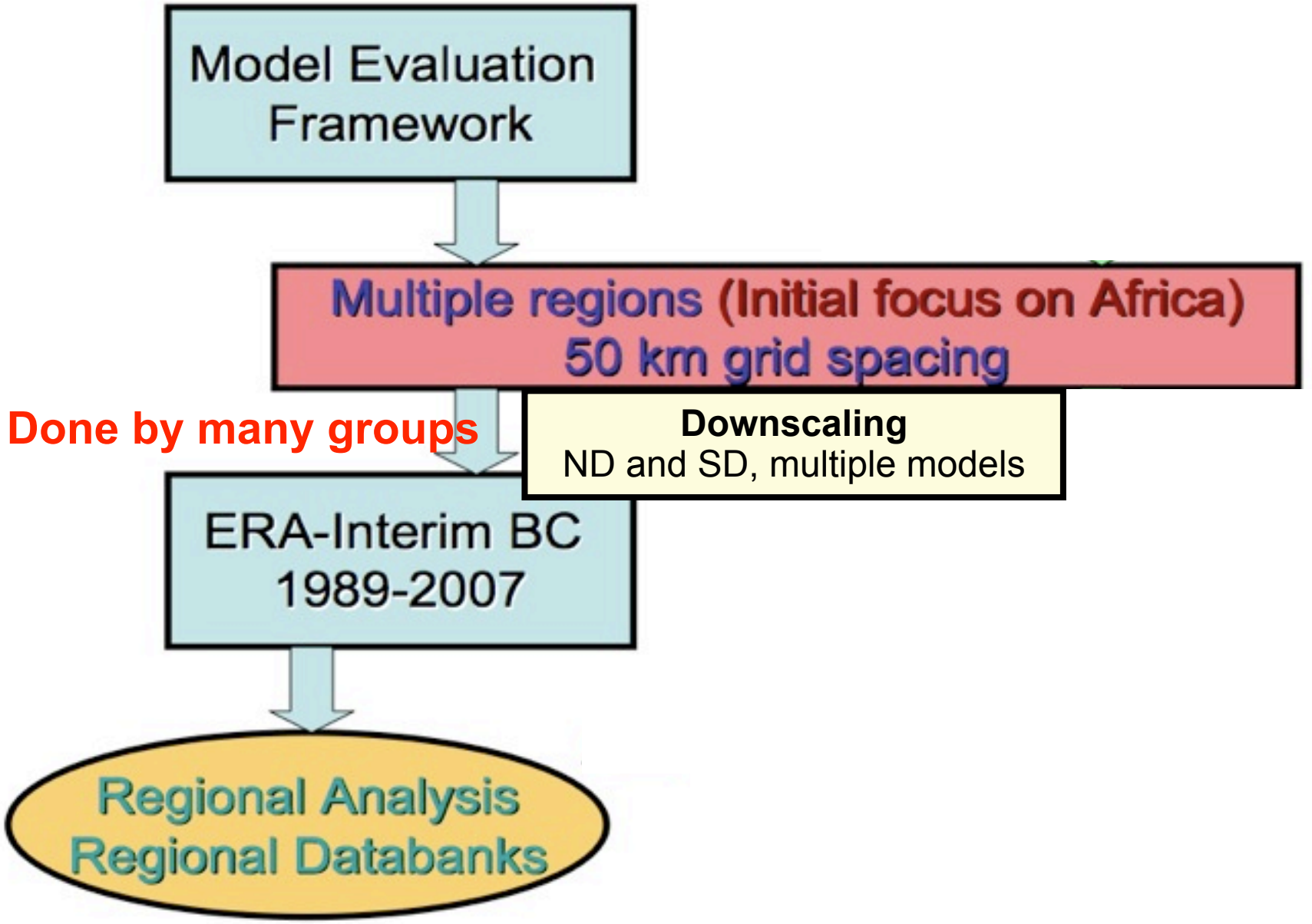
Provide a *generalized framework for testing and applying* regional climate models and downscaling techniques for both the recent past and future scenarios.

Foster coordination between regional downscaling efforts around the world and *encourage participation* in the downscaling process of local scientists/organizations.

Cordex regions



CORDEX Phase I experiment design



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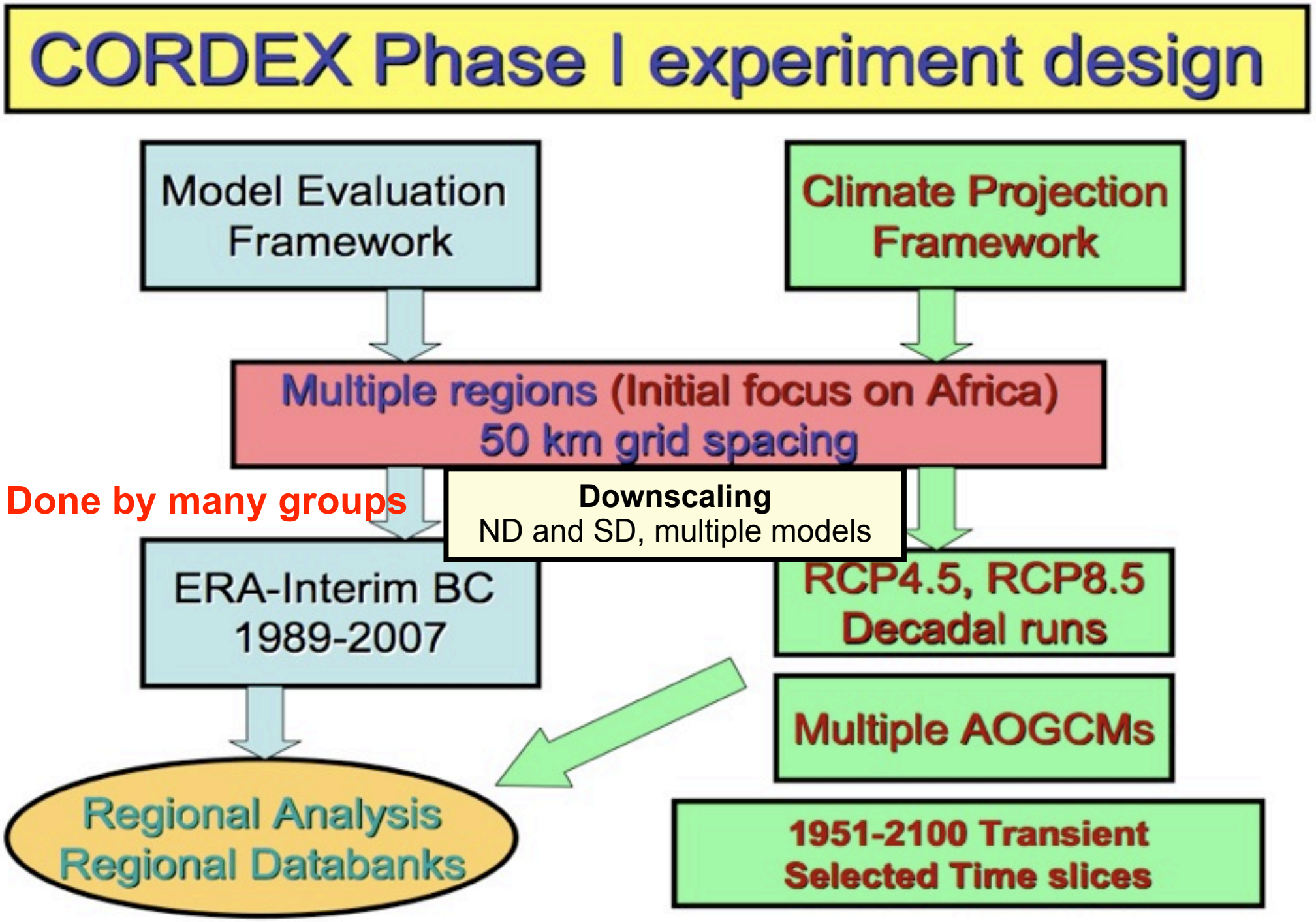

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Cordex Data Archive

Data produced by downscaling centers is divided into 3 tiers:

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Core and Tier One data hosted at the DMI as an ESG node

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http://cordex.dmi.dk/joomla/

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Tier Two data hosted at the downscaling centers and will be provided on a more informal basis

Cordex Data Archive

The data follows strict formatting criteria before it is accepted:

Cordex Data Archive

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2. Time coordinate

All files
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4. File naming conventions

File names should follo

VariableName_Domain
Member_RCMModelNa

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See an example filenam

NetCDF files should be
classic data model (whi
calls as for ease of hand
compressed afterwards,
can be converted to Net

nccopy -k 4 -d 1

VariableName is the CM
appear on that list, plea

Domain is a standard na
table and includes a flag

Table 1 These areas are d
North Pole in the indicated
through the regular North

5. NetCDF with CF conventions

The CF1.4 convention is followed
http://cf-pcmdi.llnl.gov/documents/cf-conventions/latest-cf-conventions-documer

It is the aim to follow PCMDI and CMIP5 as much as possible, including metadata with the starting point being the NARCCAP output formatting requirements (including metadata)

http://rcmlab.agron.iastate.edu/narccap/output_requirements.html
as well as the ENSEMBLES requirements as described at
http://ensemblesrt3.dmi.dk .

All field values should be of type "float", *i.e.*, 4 bytes. Coordinates (time and space) are of type "double" (8 bytes) according to CMIP5 specifications. In files with some missing values, *e.g.*, interpolated files, the out-of-range value is 1e20f and is specified (redundantly) with the variable attributes *_FillValue* and *missing_value*.

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Downscaling Groups

SMHI
ICTP
UKMO
DMI
Univ. Cantabria (Spain)
EU Joint Research Centre
ISU
IPSL
KNMI
CNRM
MPI
UQAM

CSAG – Univ. Cape Town
- Precis model
- WRF model (3 yrs to go)
- Statistical downscaling (end 2012)

CSIR – Pretoria
- CCAM global model

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Cordex – Africa Analysis

Ethos:

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A – Analysis; Developing methods and tools to analyze atmospheric processes over Africa and how these may change into the future

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C – Capacity development; Long-term collaboration between African scientists and key global institutions for career development

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A – Application and Adaptation; Bridging the science-society divide through transforming climate data into actionable information

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- Discussed ERA-Interim runs
- Developed metrics
- Set regions
- Discussed observation data
- Discussed goals for first workshop
- Discussed data dissemination

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Cordex Conference & Workshop (Fri & Sat)

- Formed regional groupings
  - Adjusted regions
    - Reset metrics and variables
      - Training in R
        - Discussed VIA scientists involvement
          - Set goals for next meeting (July 2011)

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Leaders workshop
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        - Discussed VIA aspects
          - Data -> Action

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Cape Town
Data Analysis
VIA scientists

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          - Data -> Action

Atmospheric and VIA scientists (3 streams)
- Continued atmospheric analysis and training
  - VIA scientists
    - Develop questions from VIA perspective
      - Integrate VIA and atmos scientists
        - Set preliminary paper content

Cape Town
Data Analysis
VIA scientists

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Cape Town Group Leaders Analysis and planning

Cape Town Data Analysis VIA scientists

Paper writing workshop 5 days

- Not analysis
- Each day a section
- Teaching how to write a paper
- Paper outline
- Introduction
- Conclusions
- Results
- Workplan

Trieste Writeshop

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Trieste, Italy

IPCC AR5 Deadline - 31 July (submitted)

1. An Assessment of CORDEX Regional Climate Models over West Africa
2. Diurnal cycle and intra-seasonal variability of rainfall over West Africa using CORDEX Models
3. Assessing the Performance of CORDEX RCMs in simulating the East African rainfall
4. Extreme events over southern Africa in CORDEX models
5. Evaluating southern Africa precipitation patterns simulated by Regional Climate Models
6. A diagnostic evaluation of CORDEX models over southern Africa

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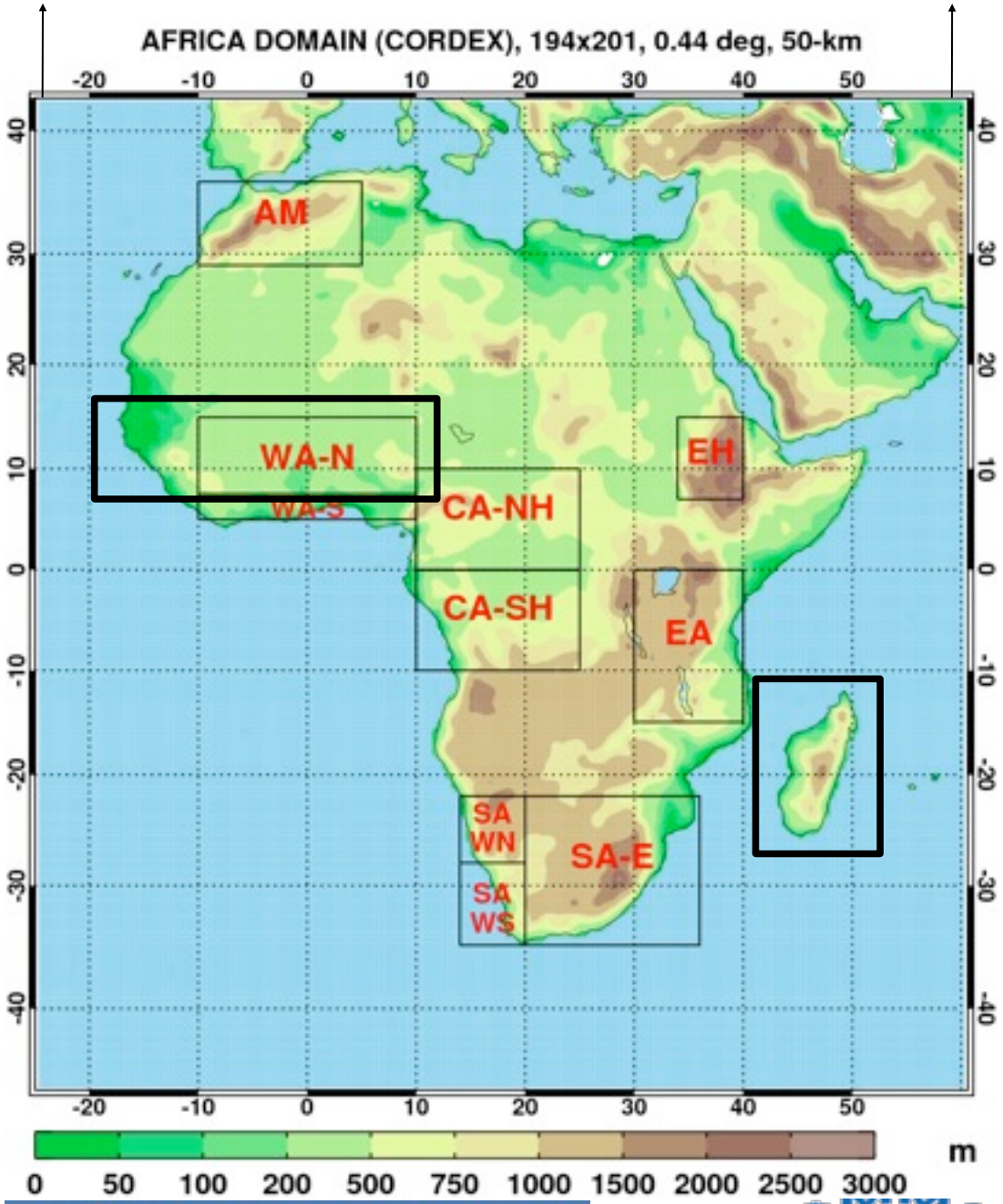

AM	Atlas Mountains
WA-N	West Africa - North
WA-S	West Africa - South
CA-N	Central Africa - North
CA-S	Central Africa-South
EH	Ethiopian Highlands
EA	East Africa
SA-E	South Africa East
SA-WN	South Africa West-North
SA-WE	South Africa West- South
MAD	Madagascar

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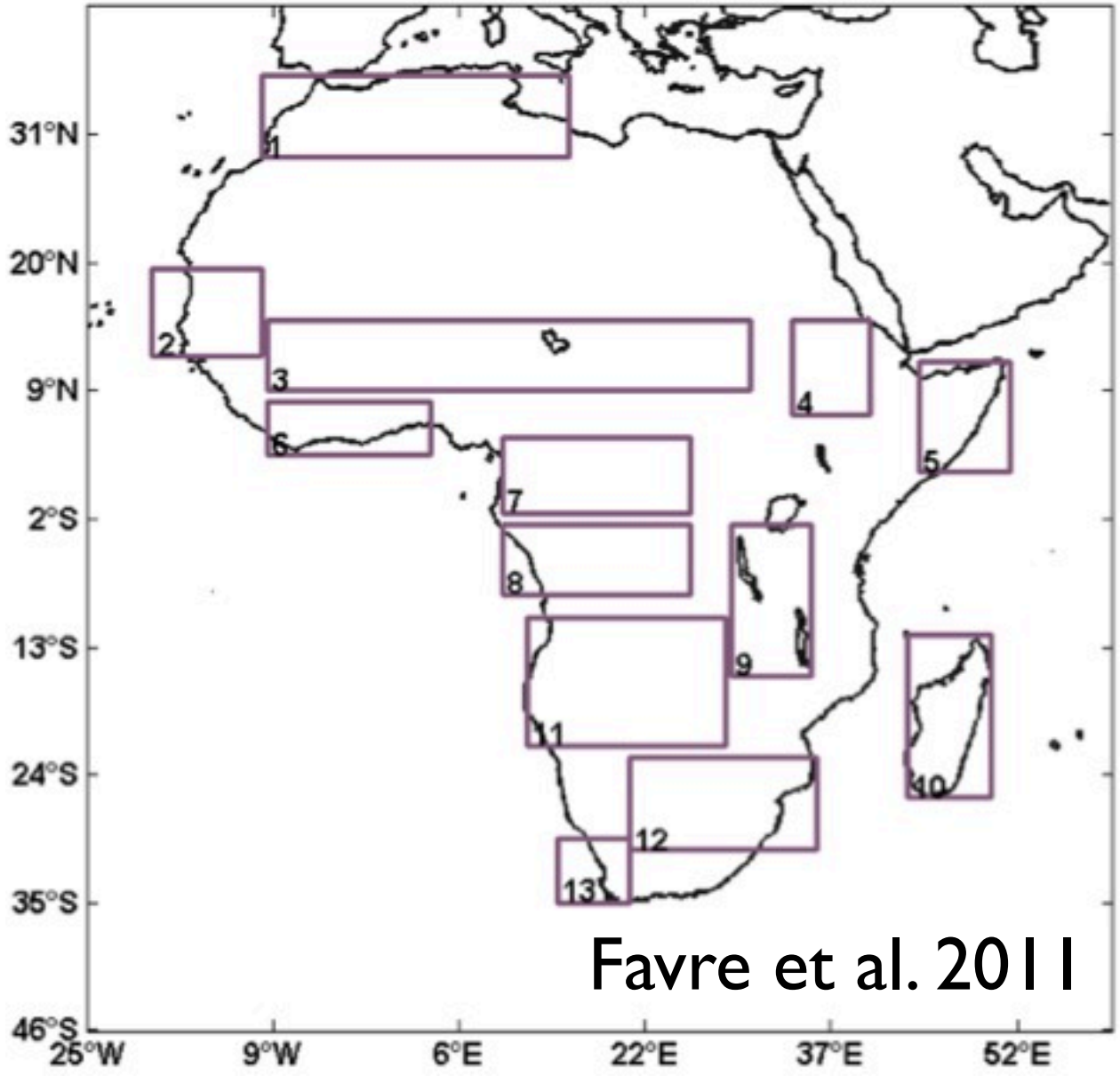

Favre et al. 2011

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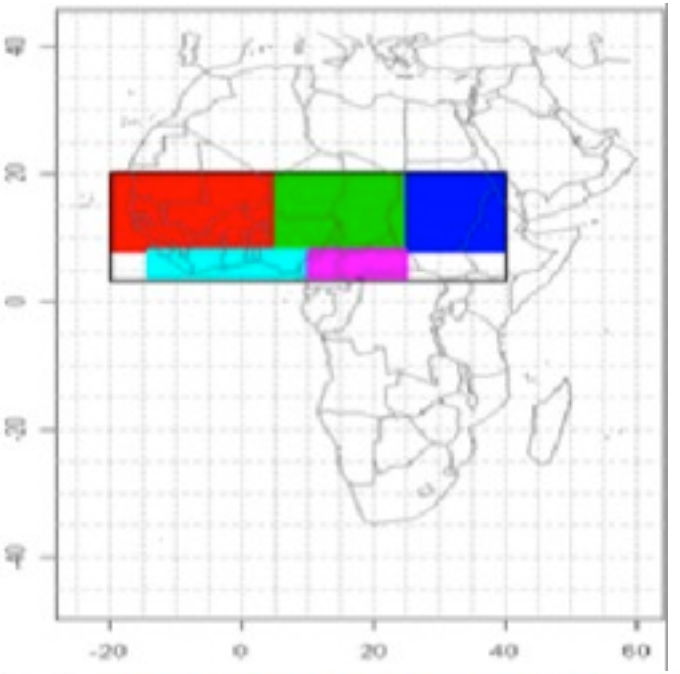

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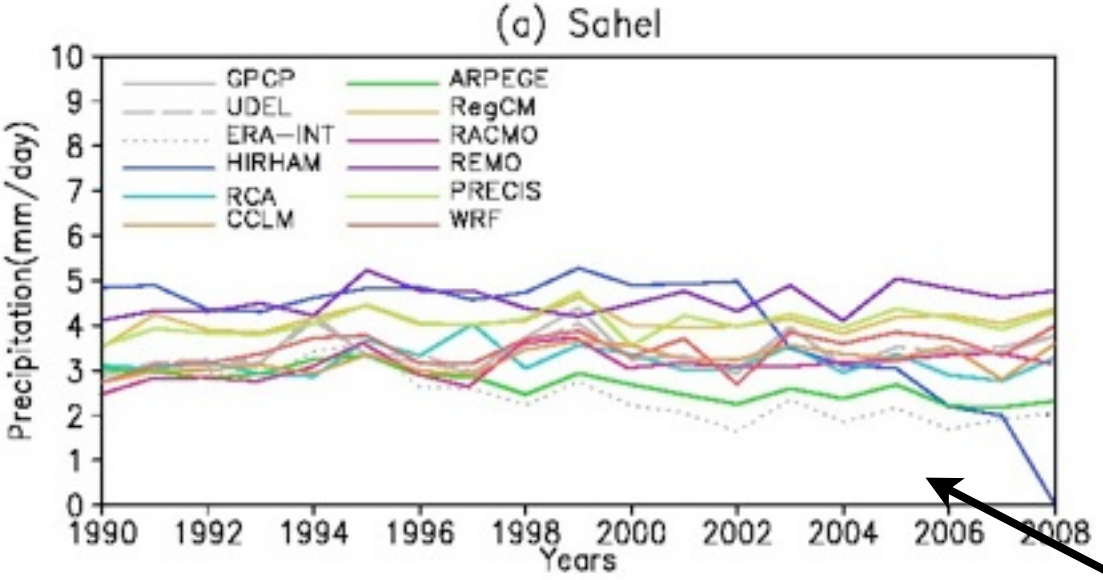

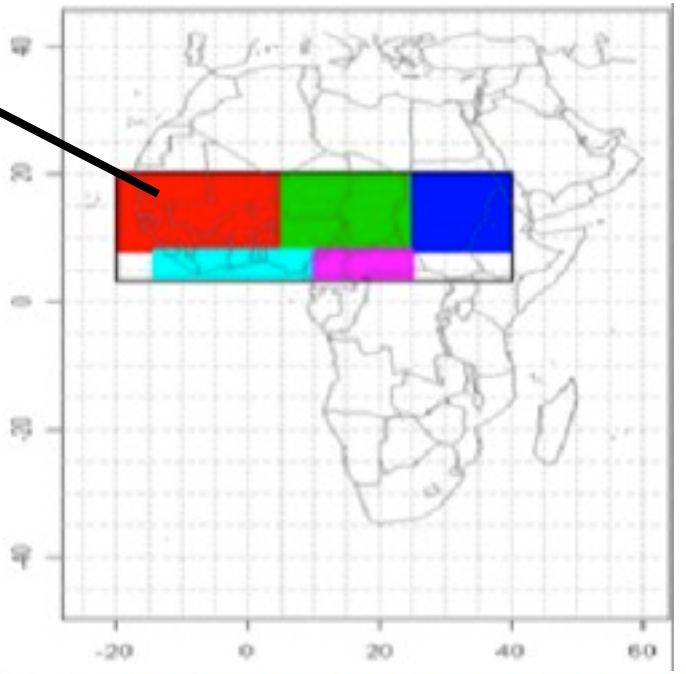

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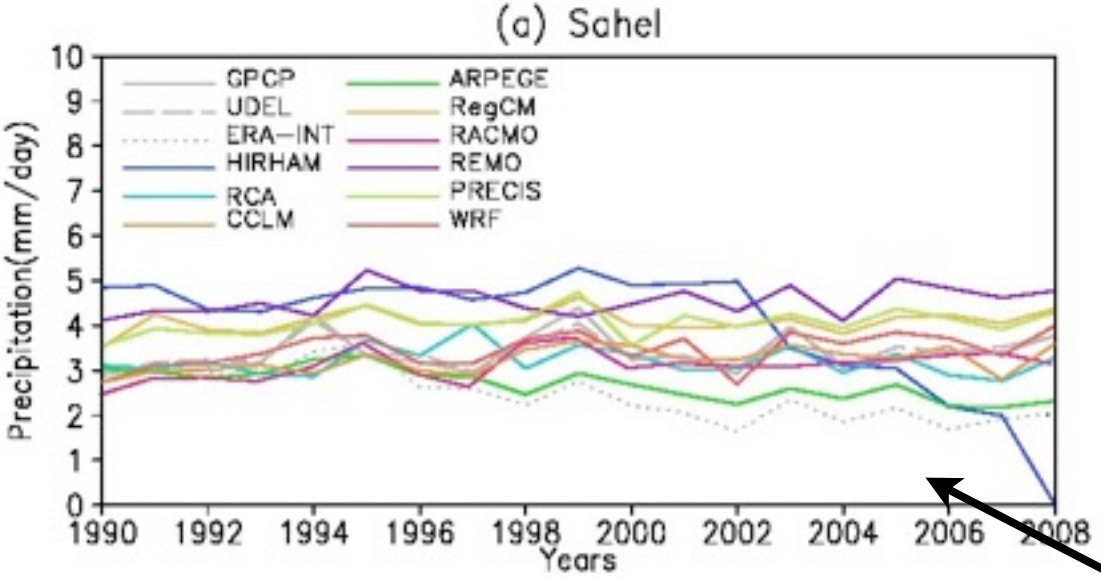

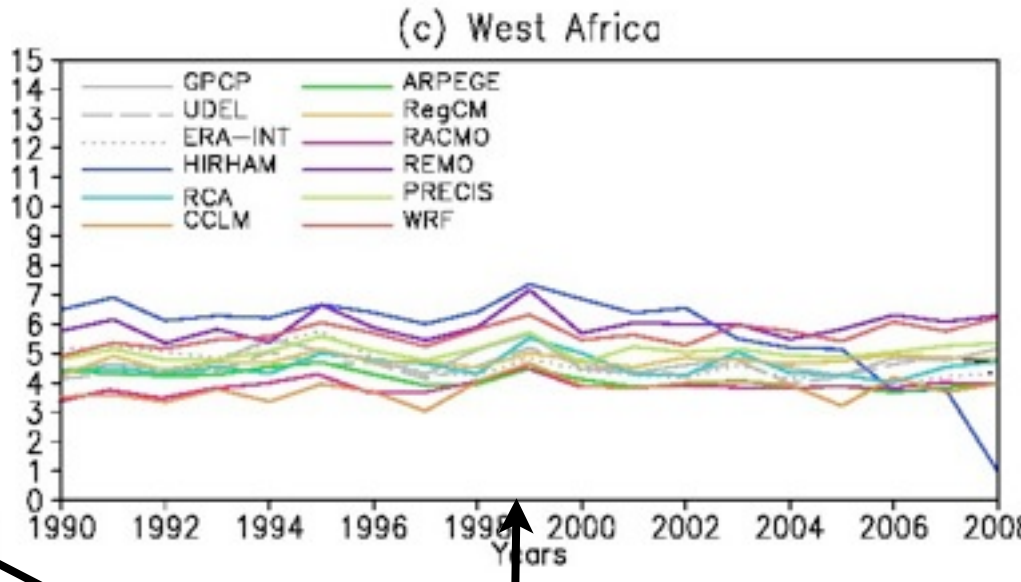

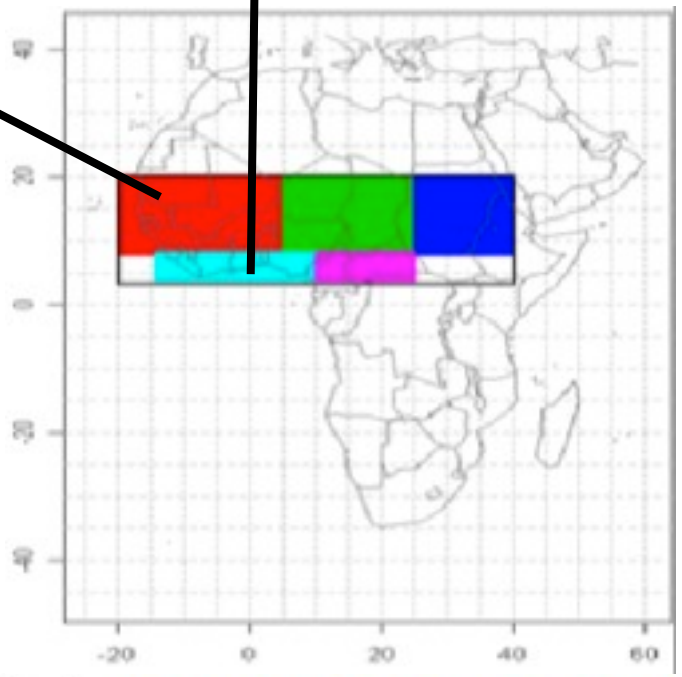

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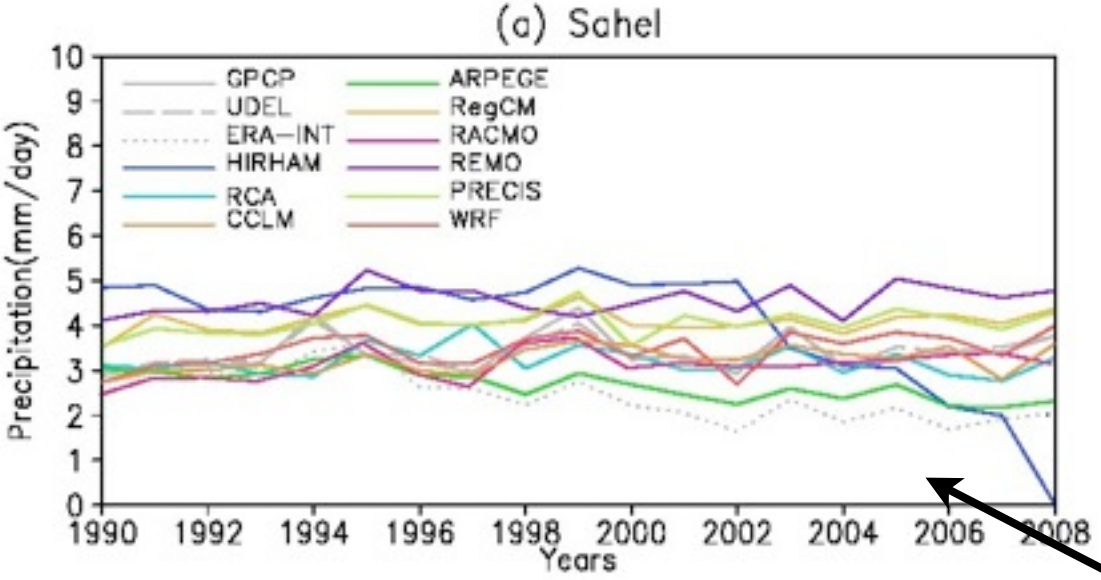

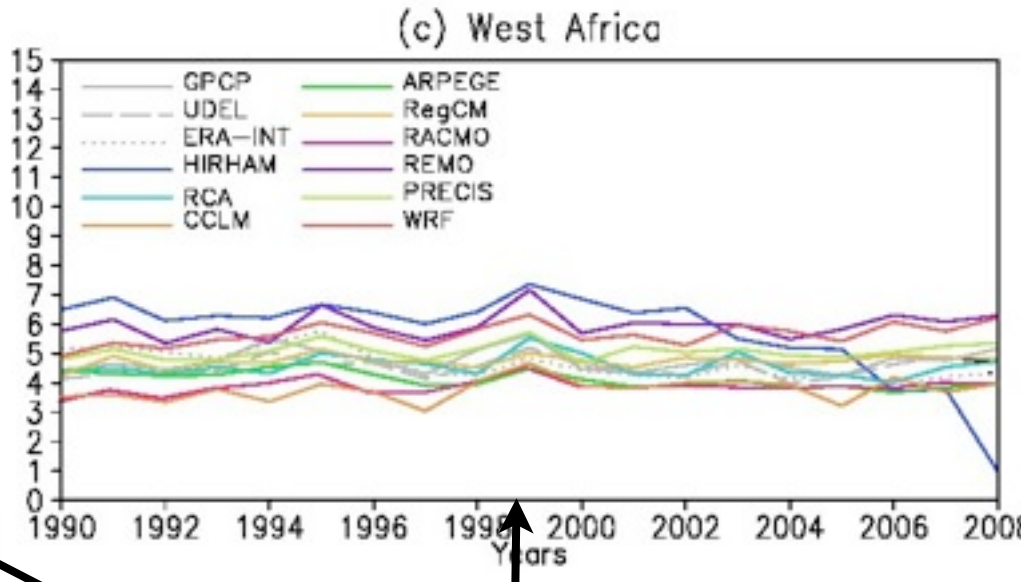

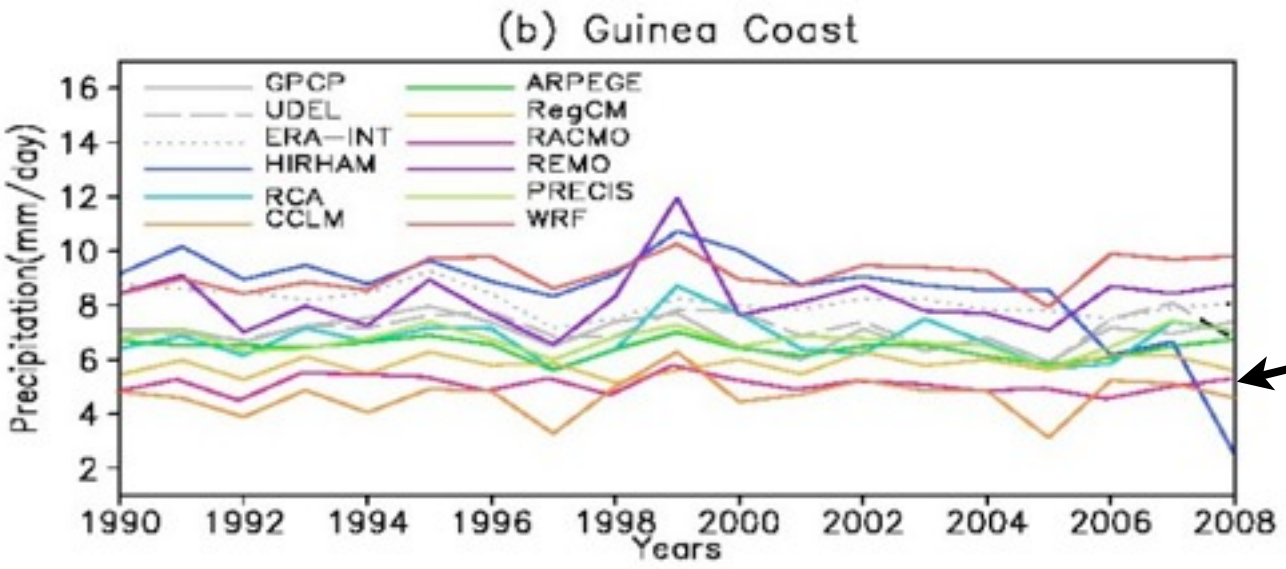

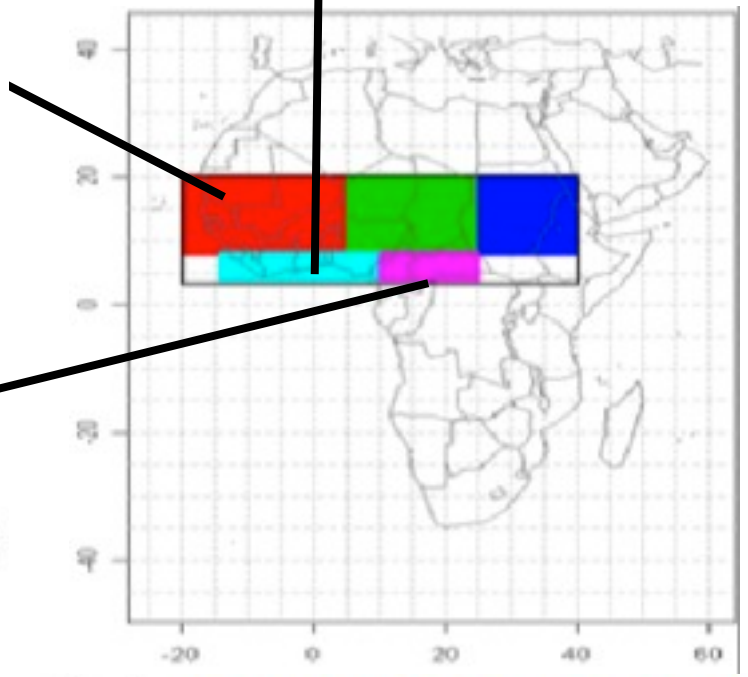

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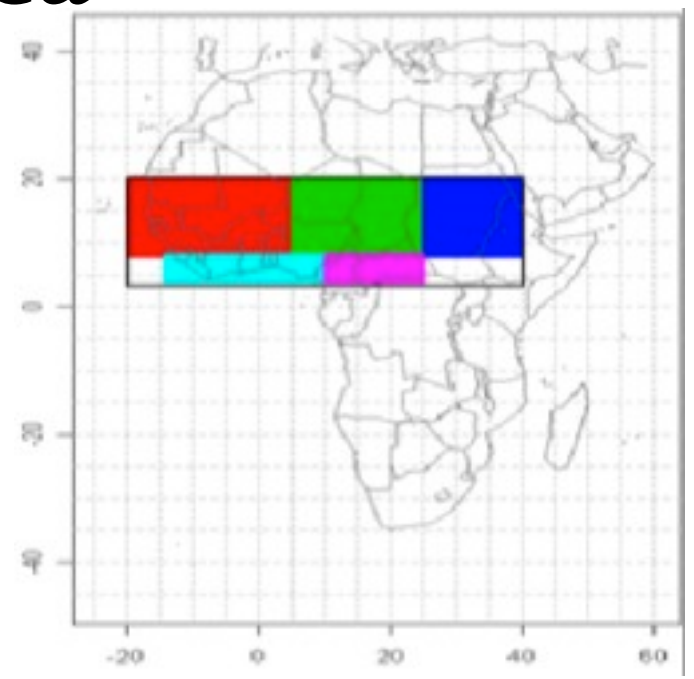

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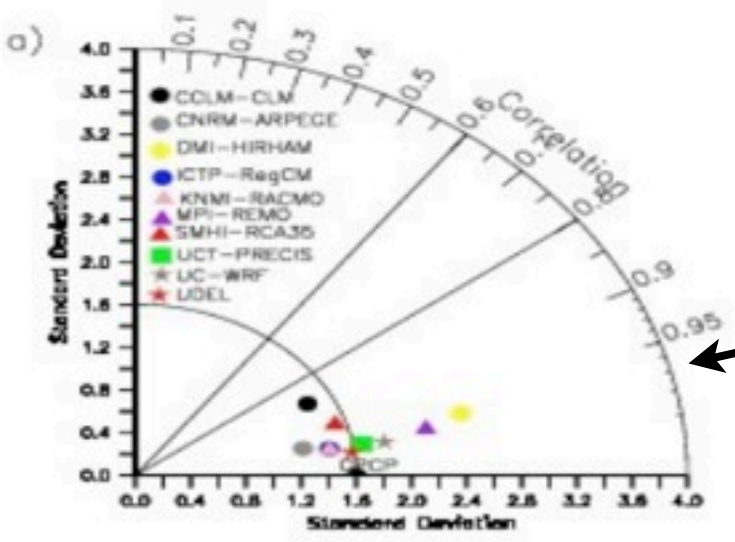

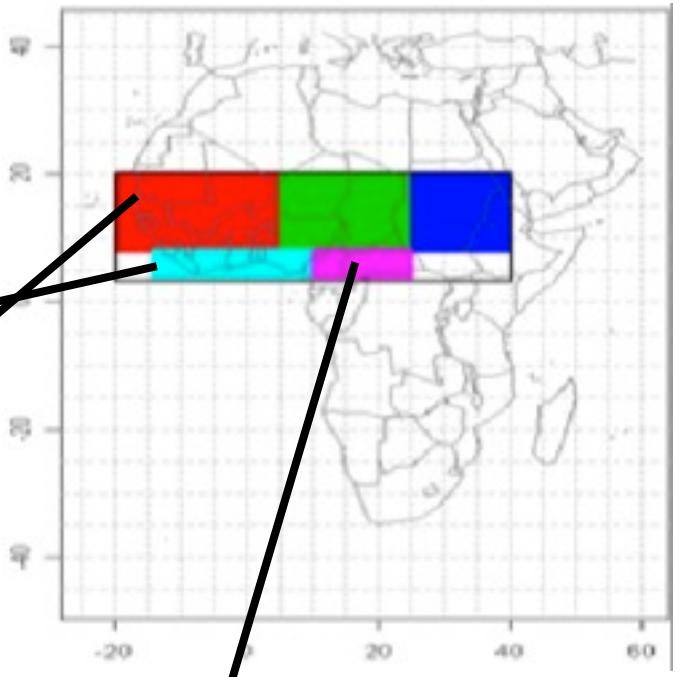

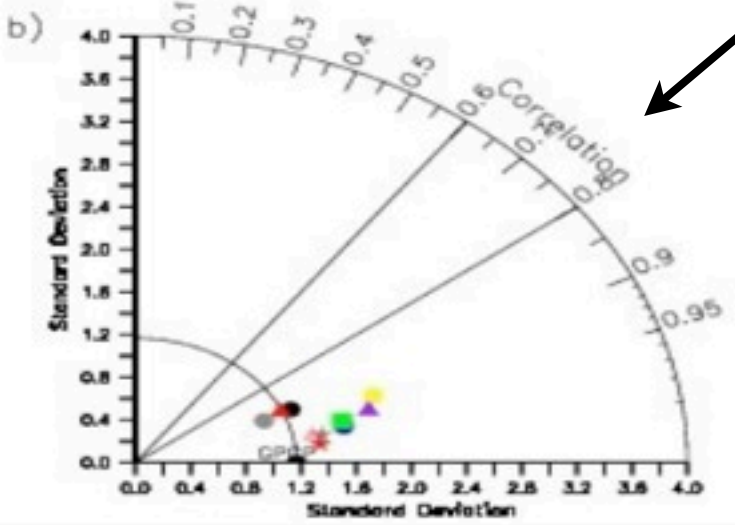

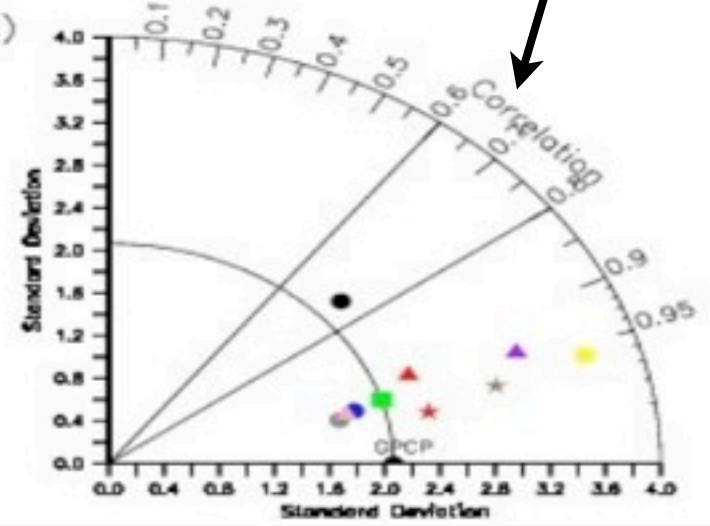

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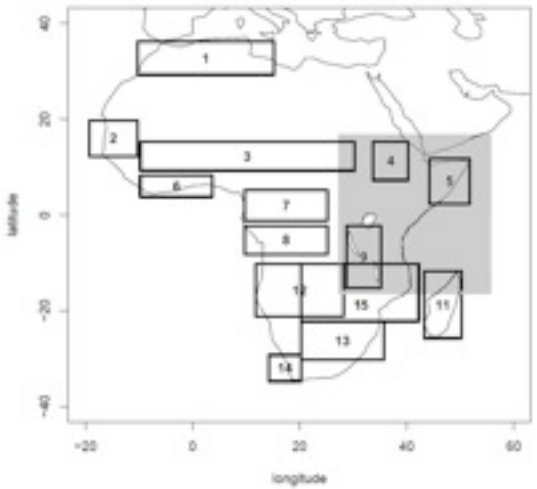

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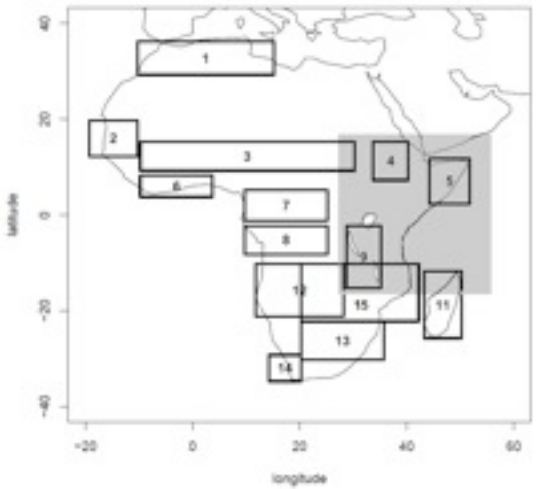

Spatial Correlations between GPCC and the CORDEX RCMs over the study areas

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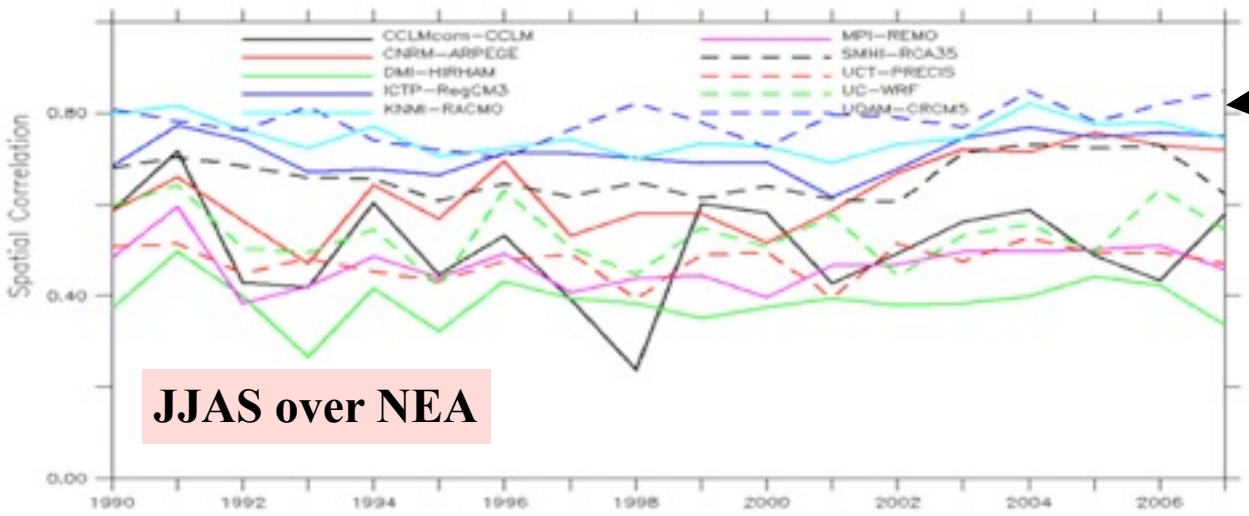

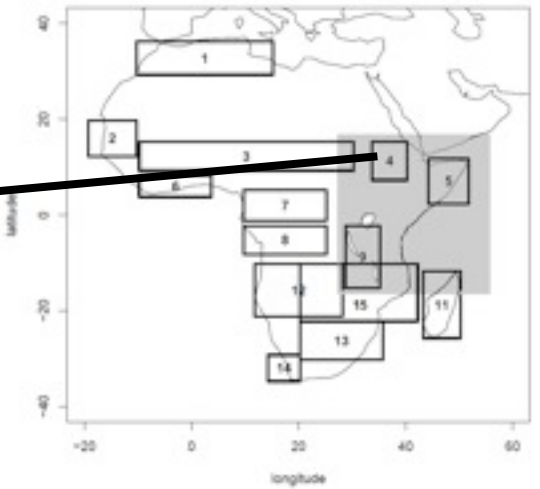

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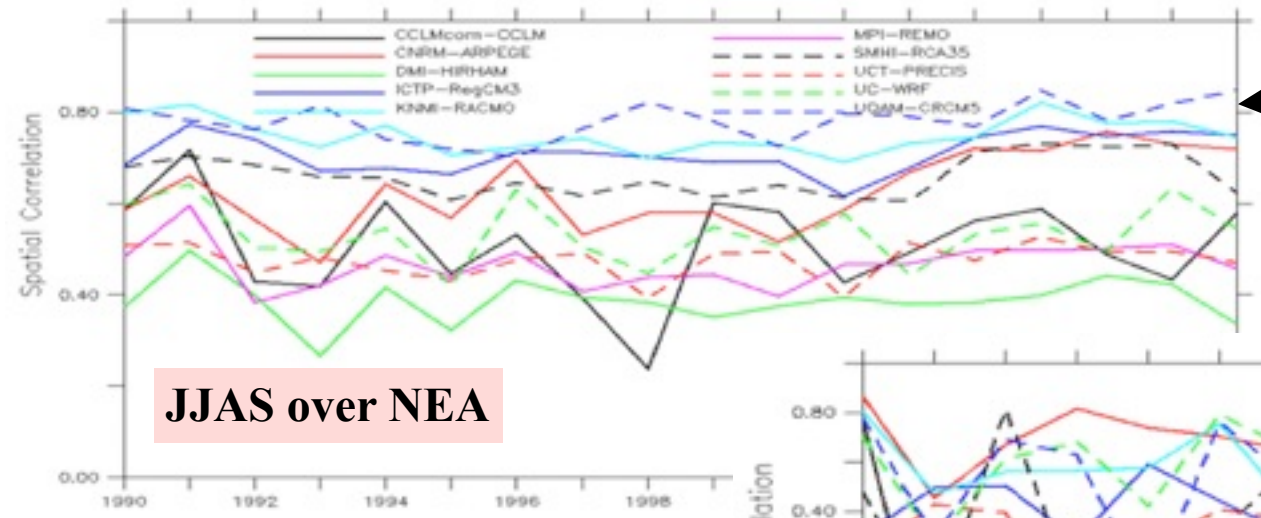

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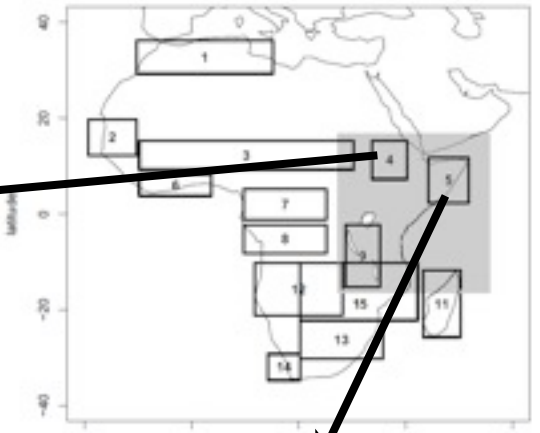

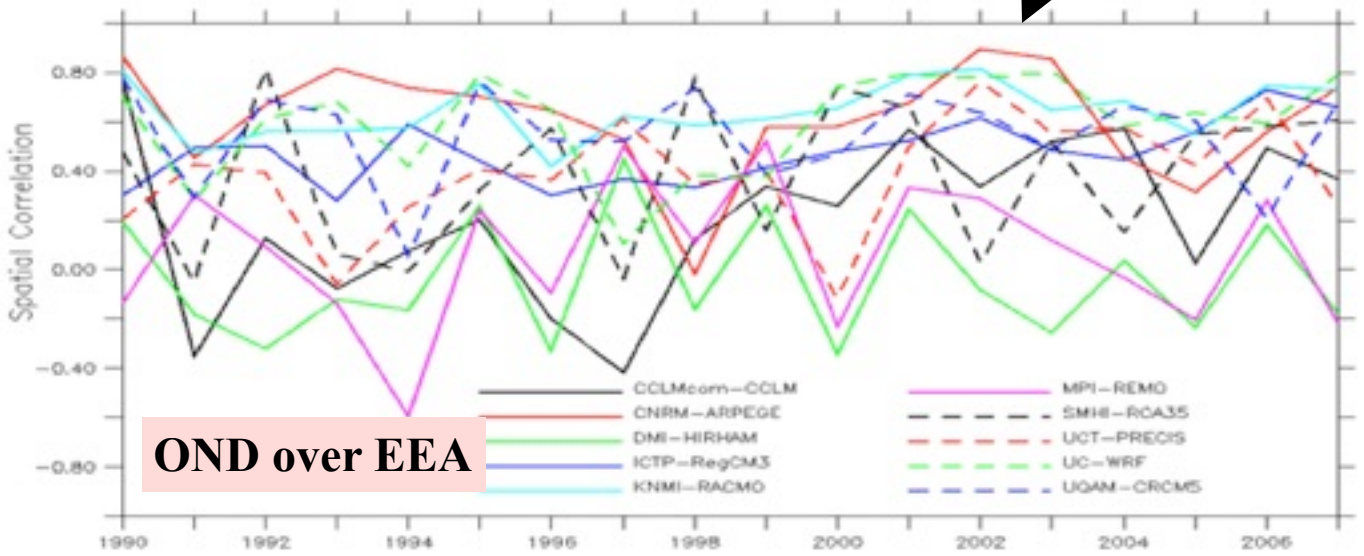

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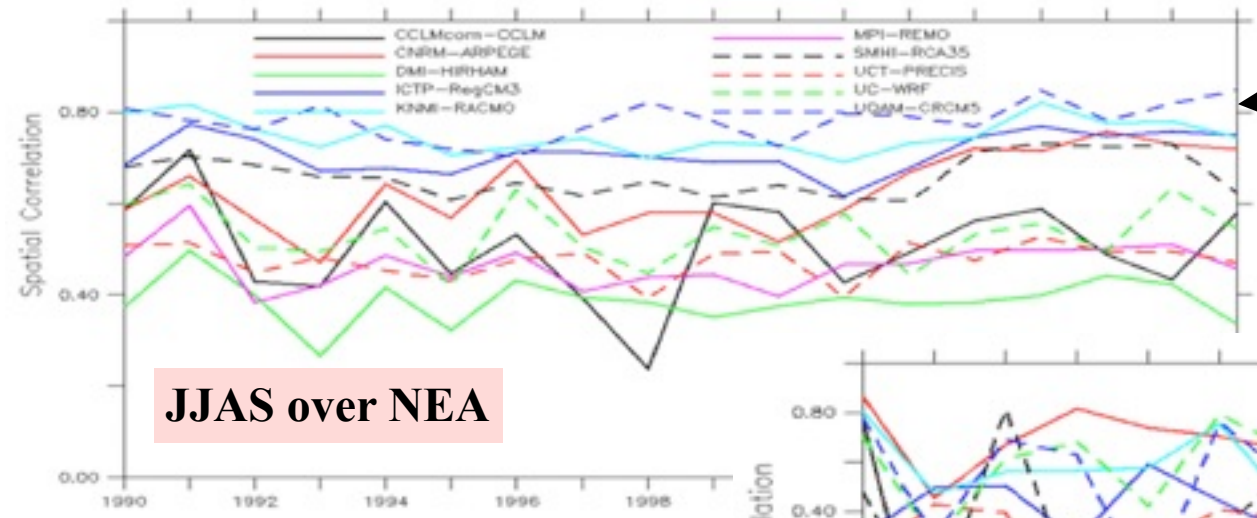

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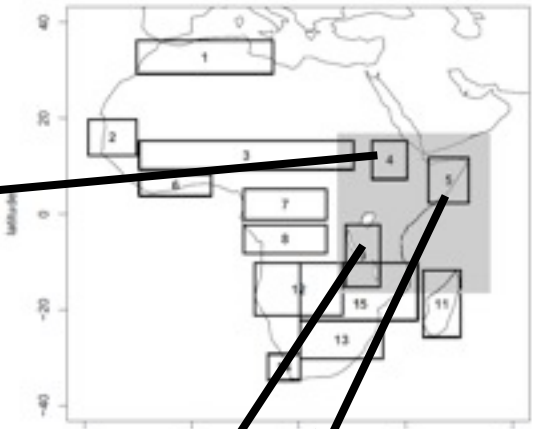

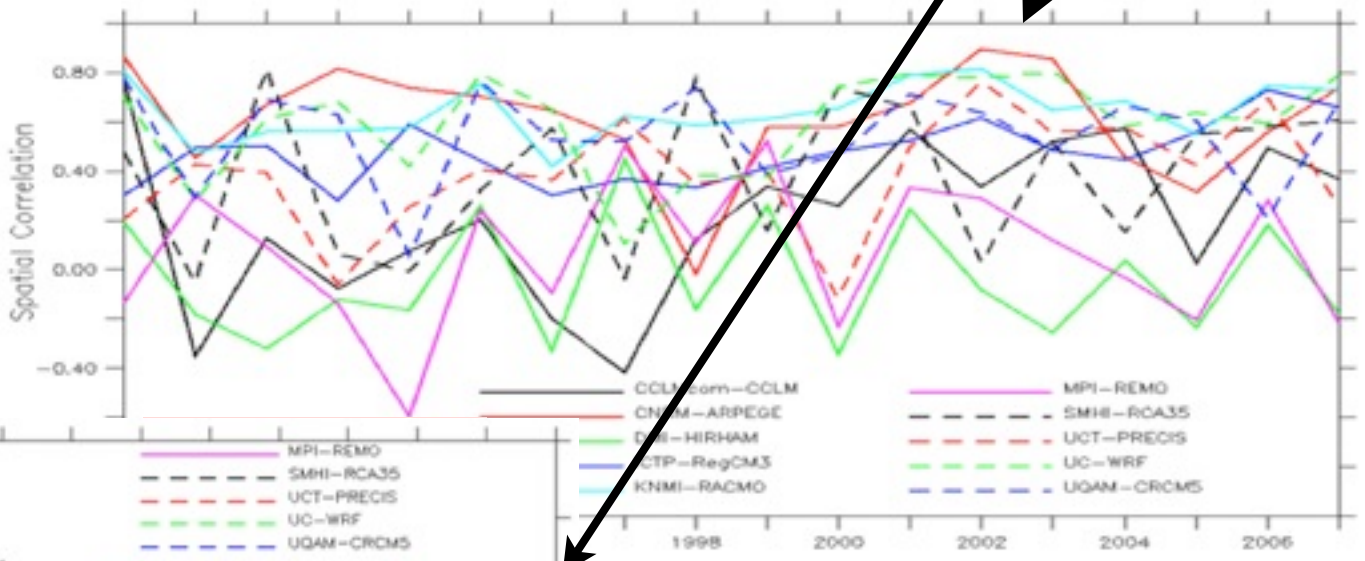

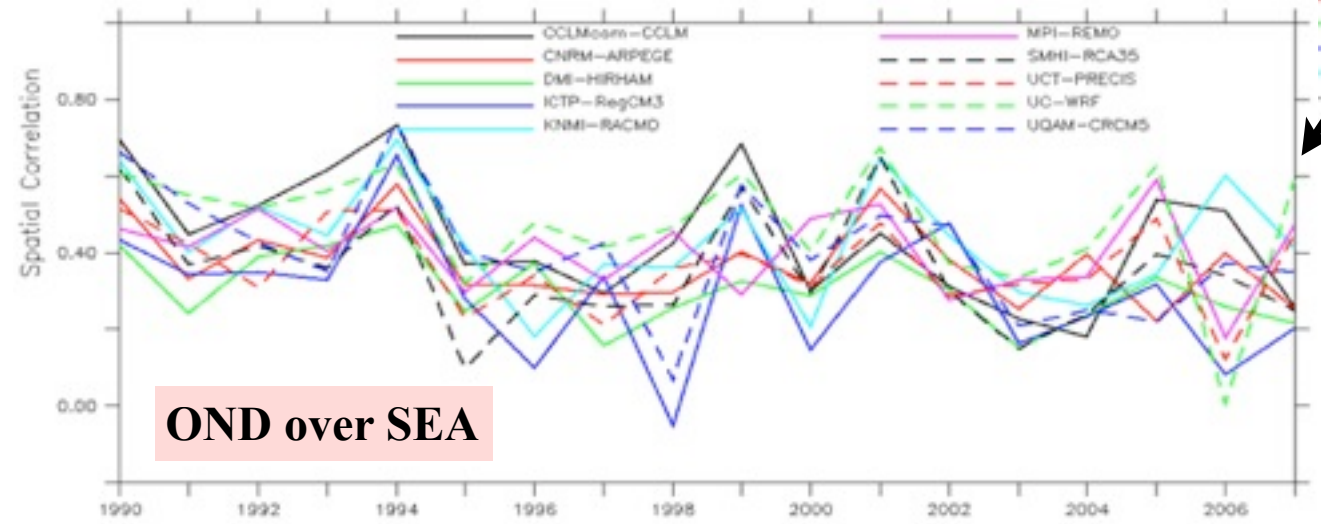

OND over SEA

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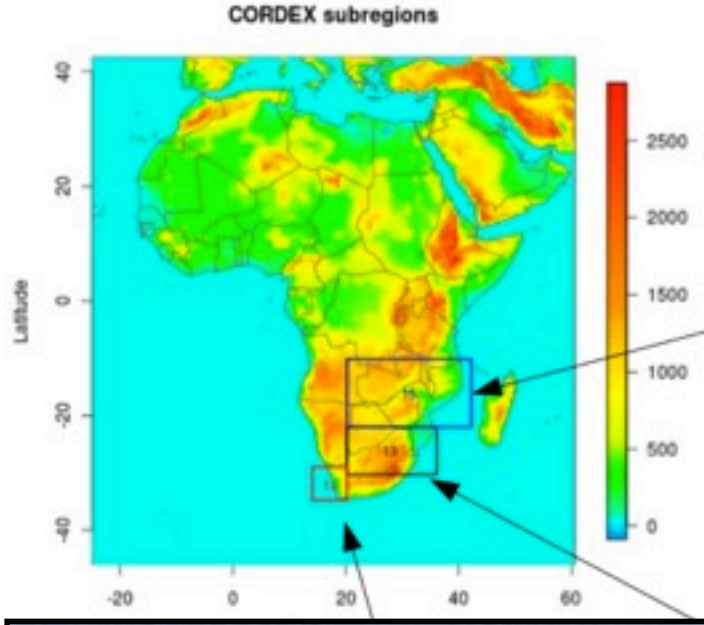

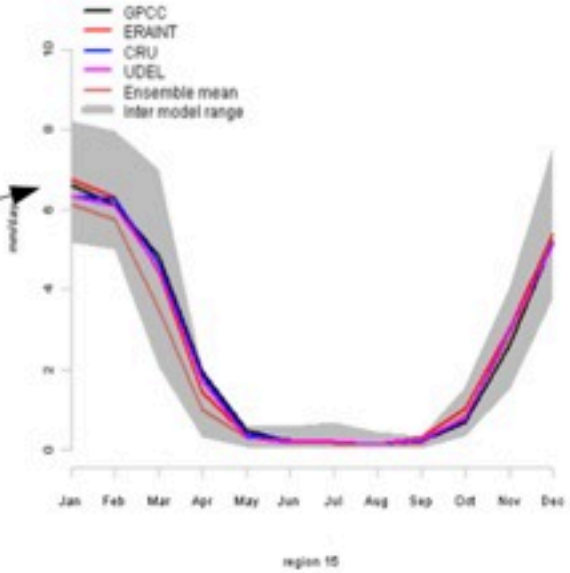

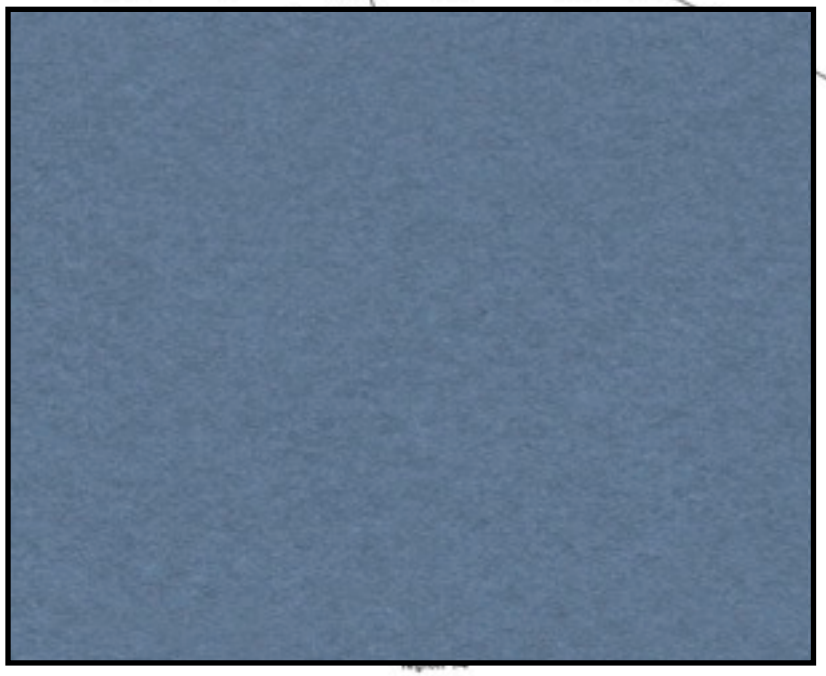

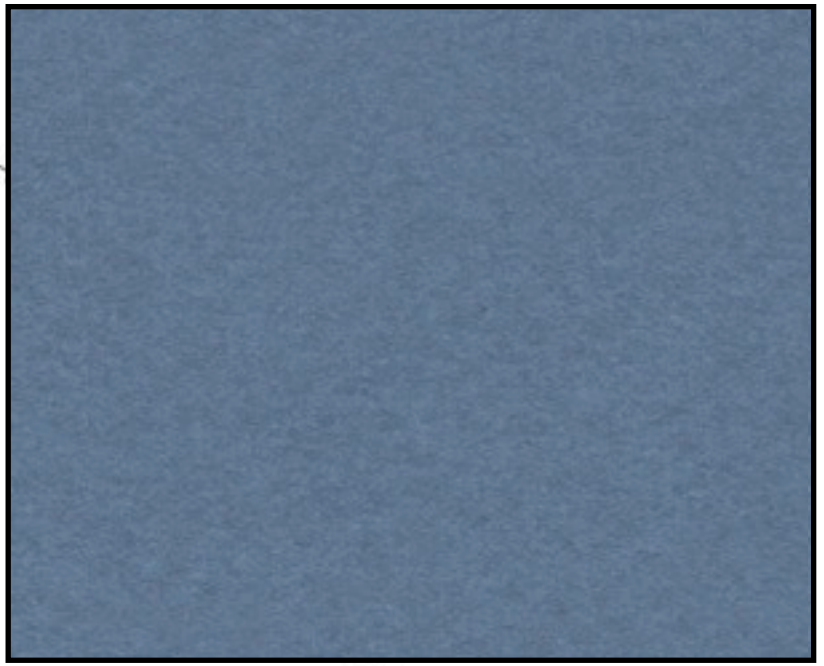

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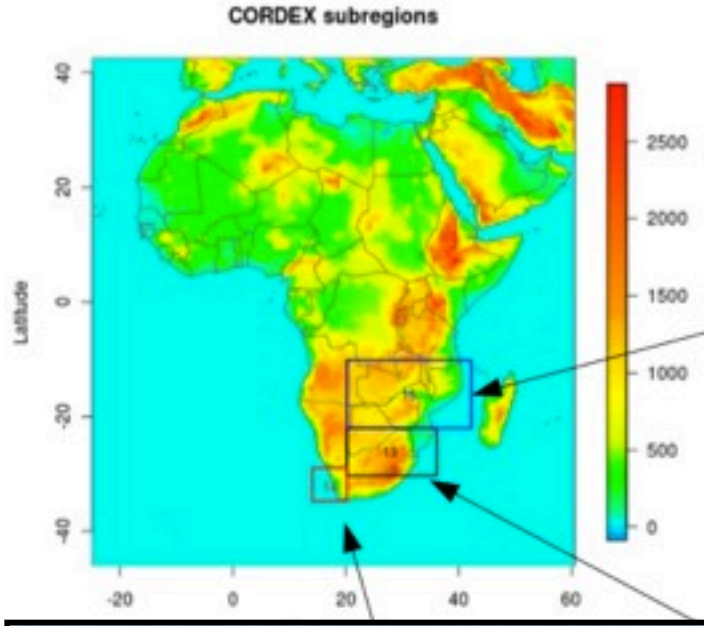

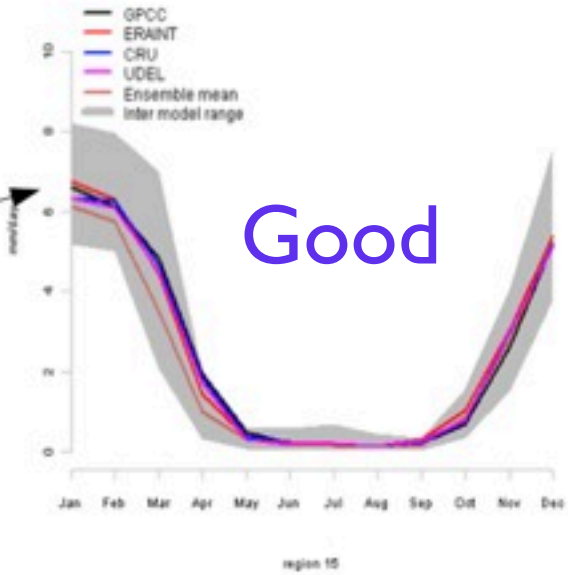

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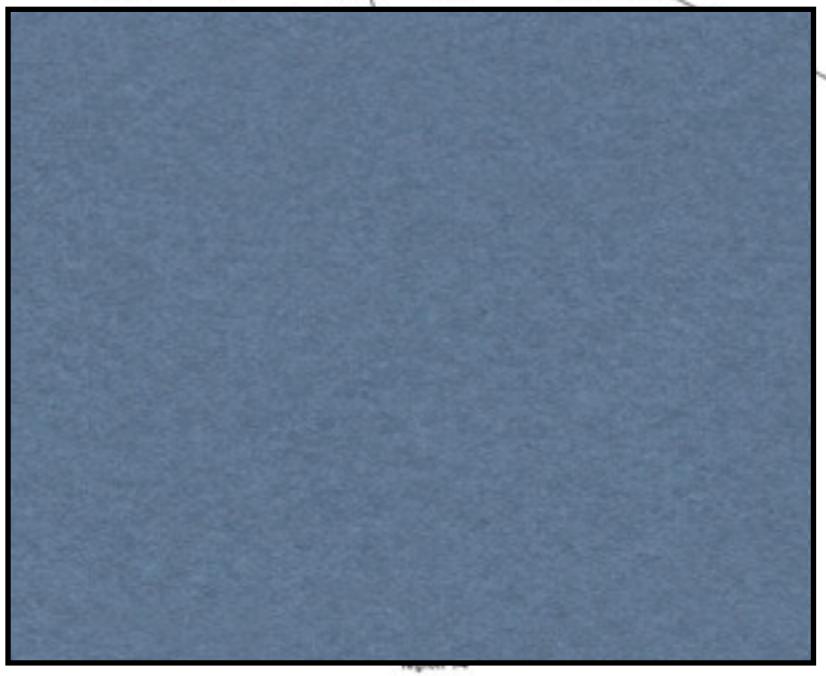

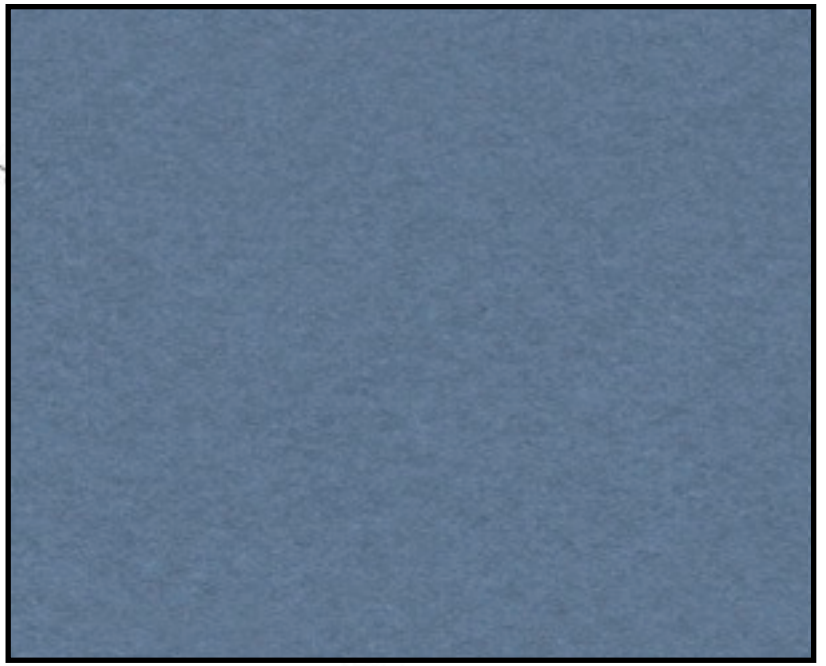

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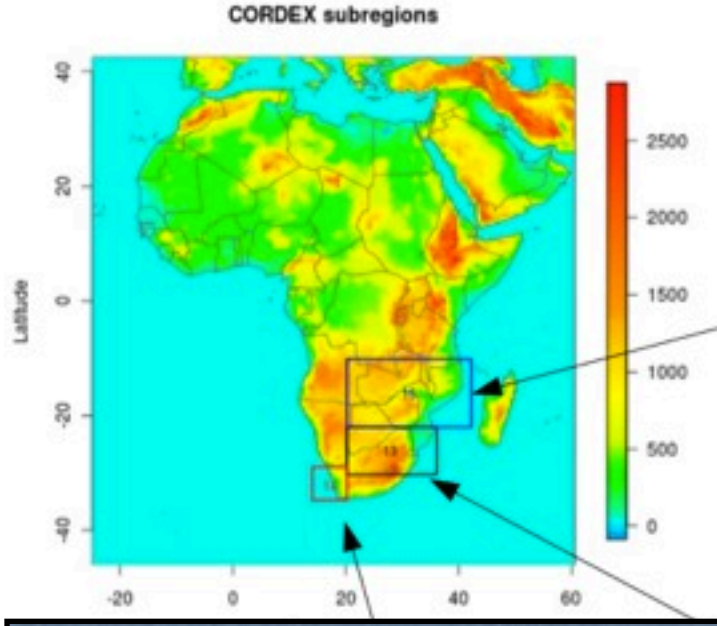

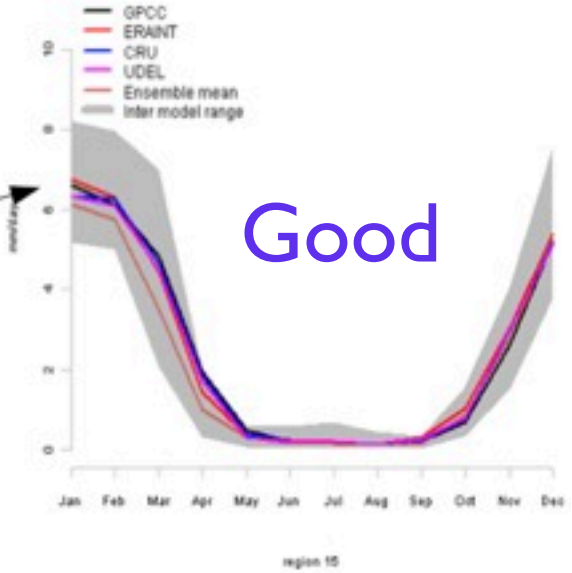

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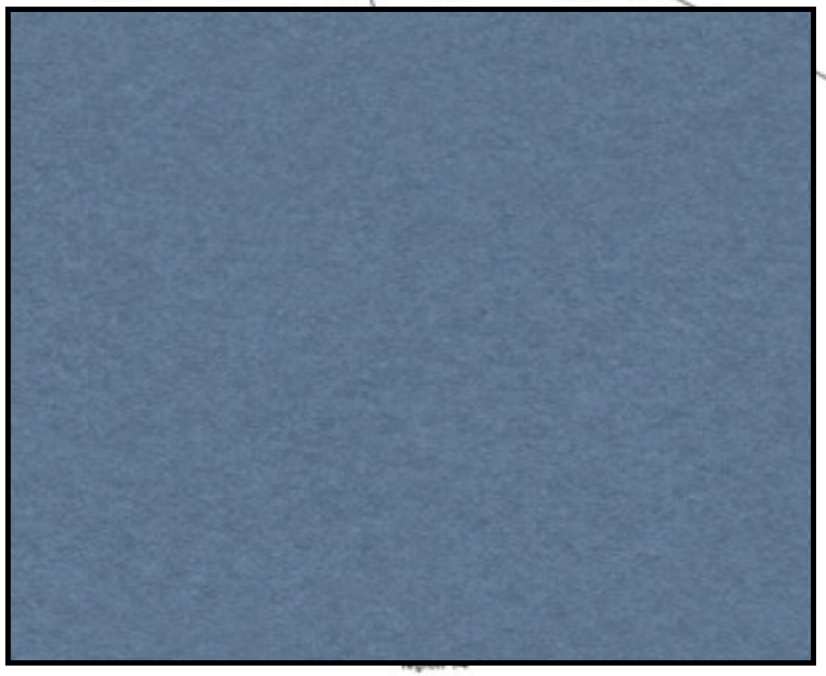

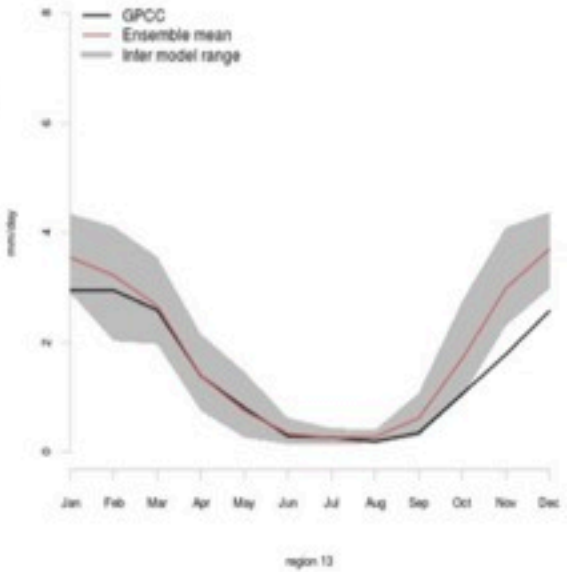

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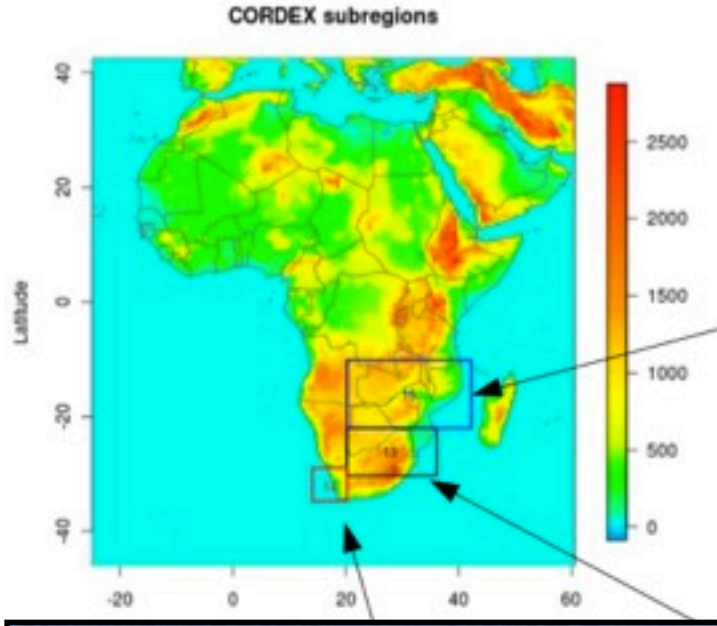

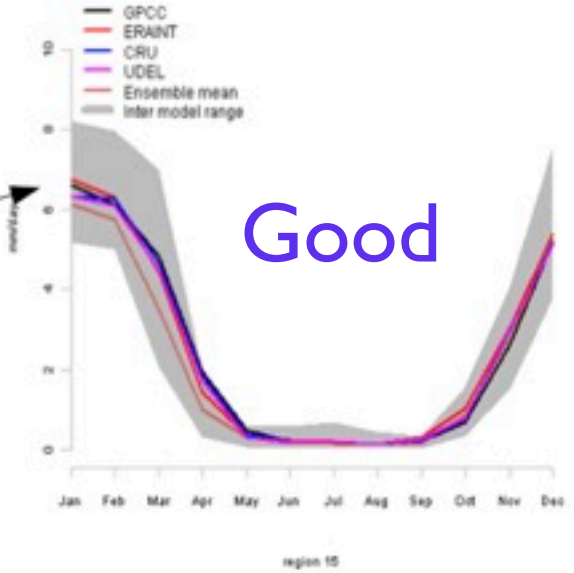

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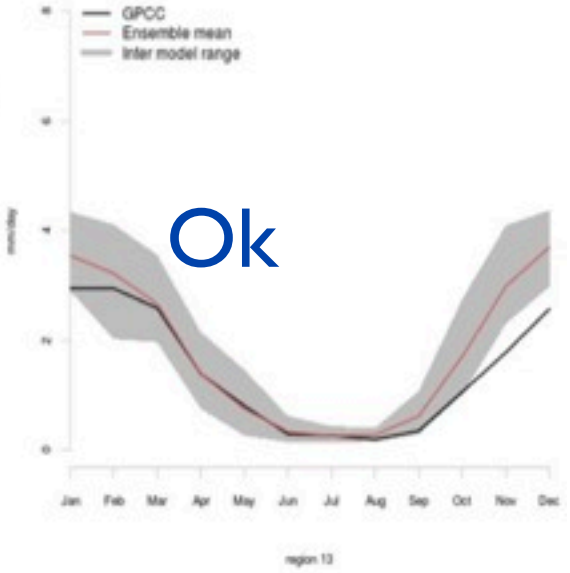

Ok

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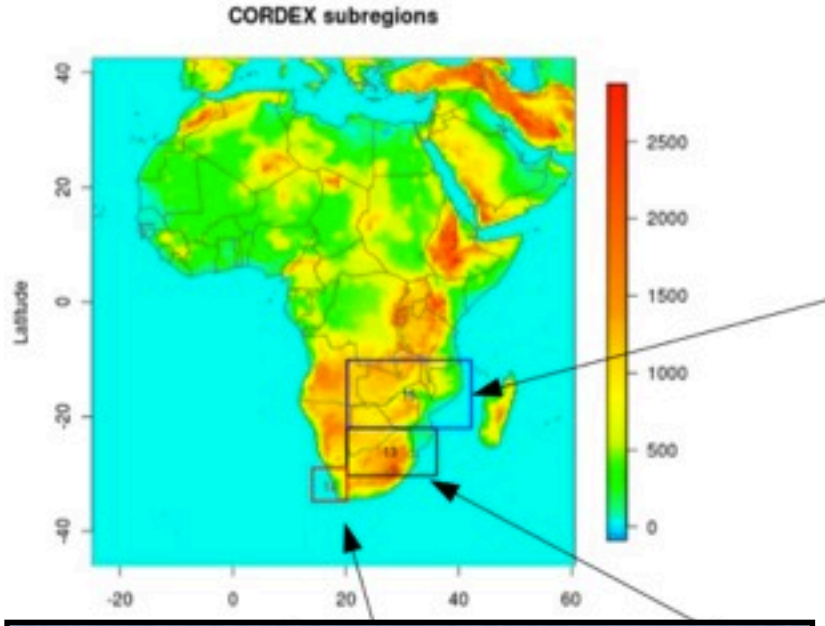

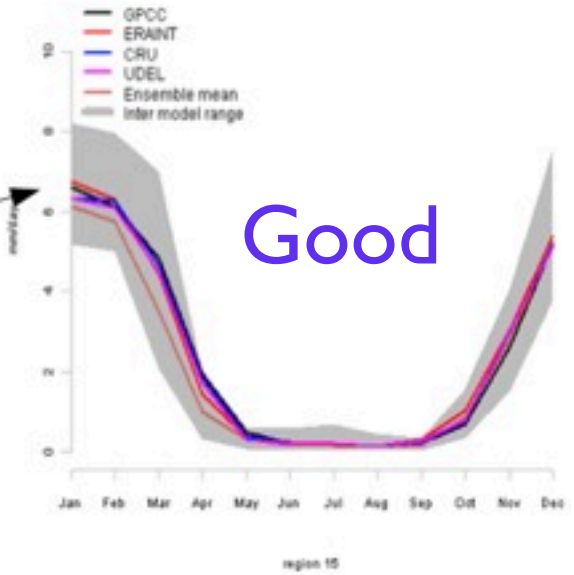

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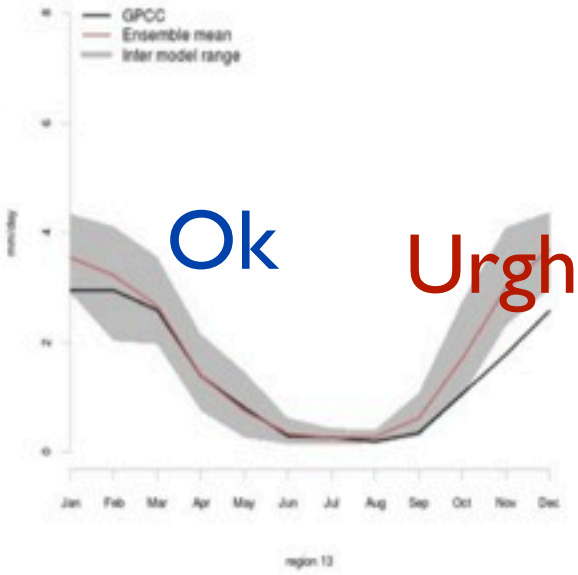

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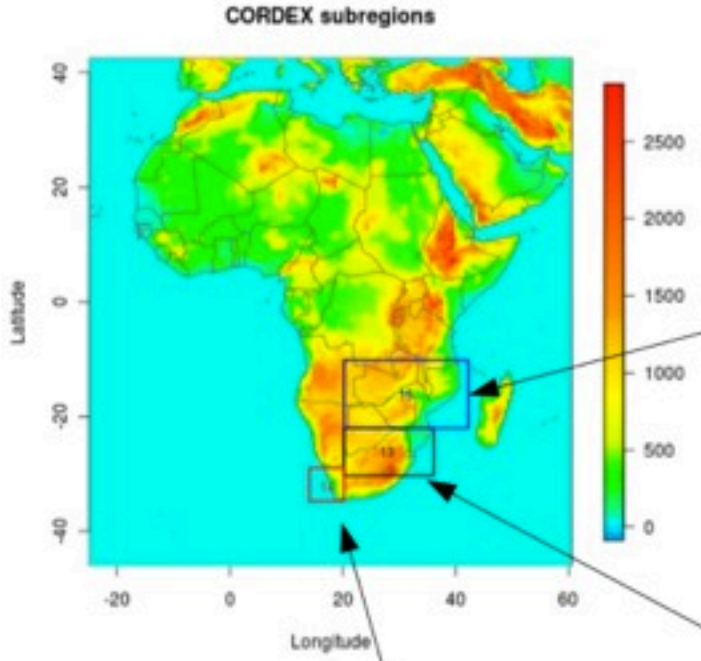

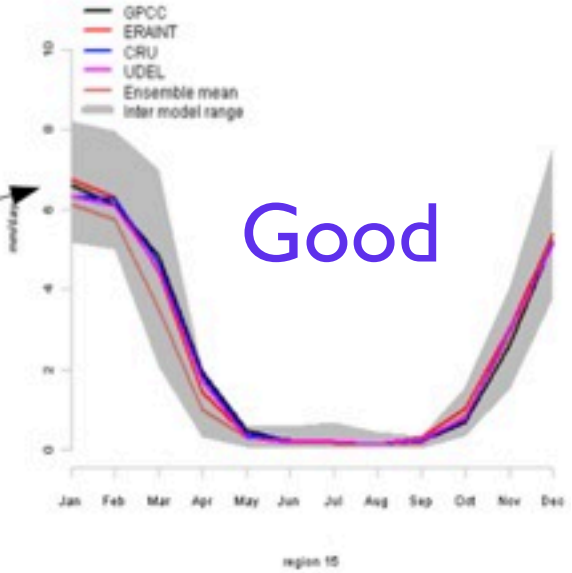

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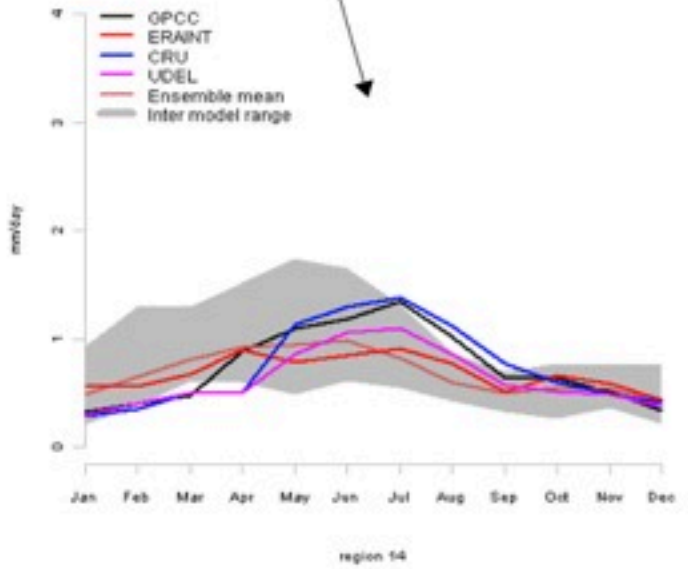

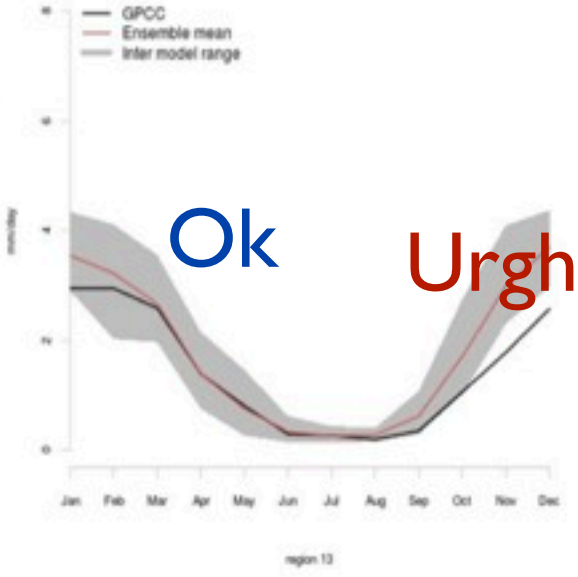

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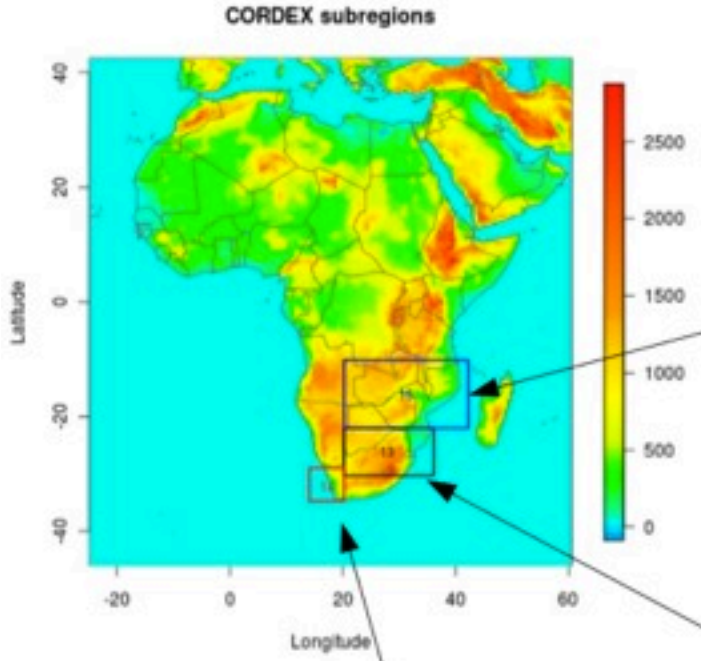

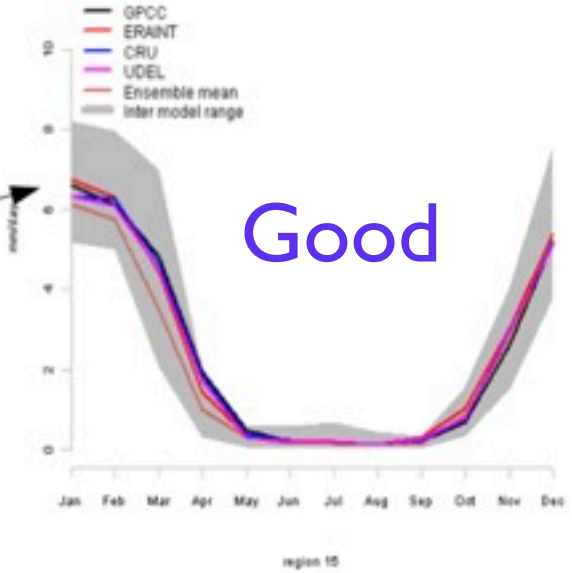

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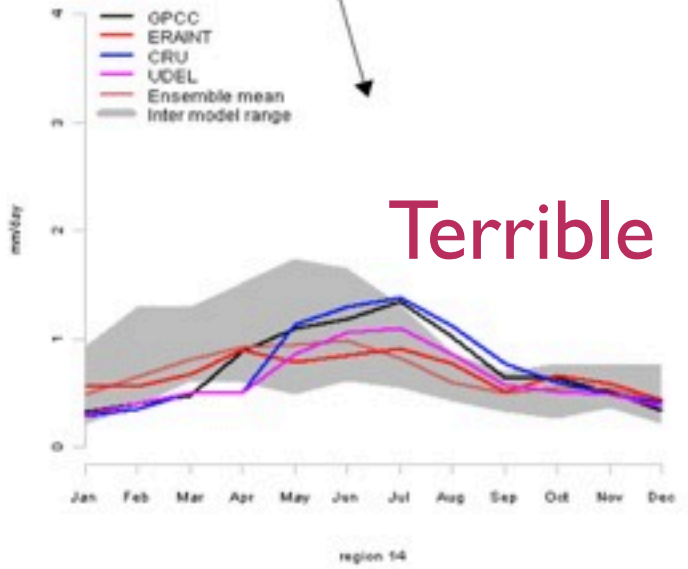

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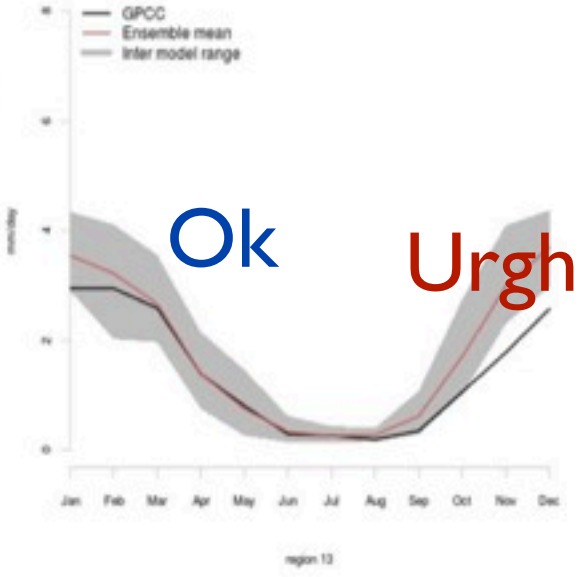

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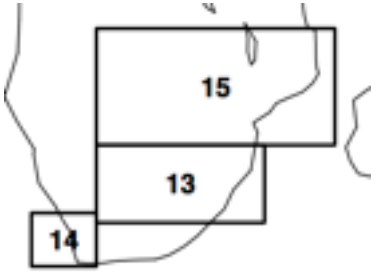

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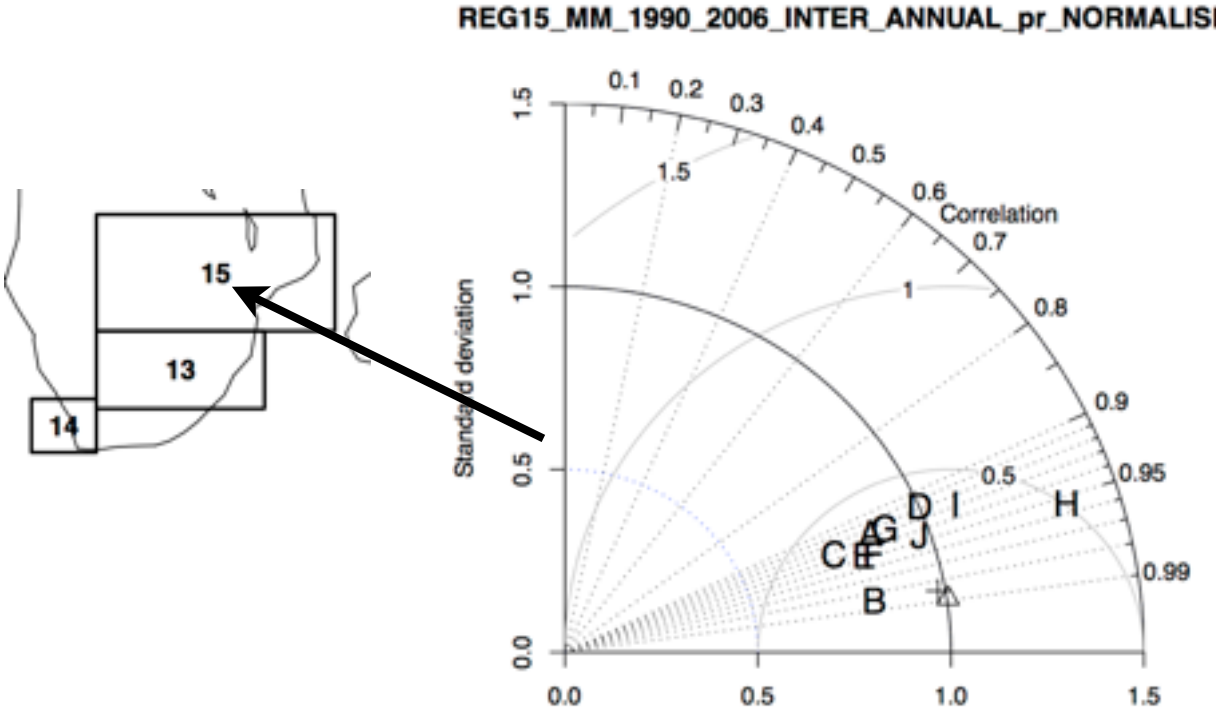

	GPCC
	WILLMOTT
△	ECMWF
+	CRU
A	CCLMcom–CCLM
B	CNRM–ARPEGE51
C	DMI–HIRHAM
D	ICTP–REGCM3
E	KNMI–RACMO2.2b
F	MPI–REMO
G	SMHI–RCA35
H	UC–WRF311
I	UCT–PRECIS
J	UQAM–CRCM5

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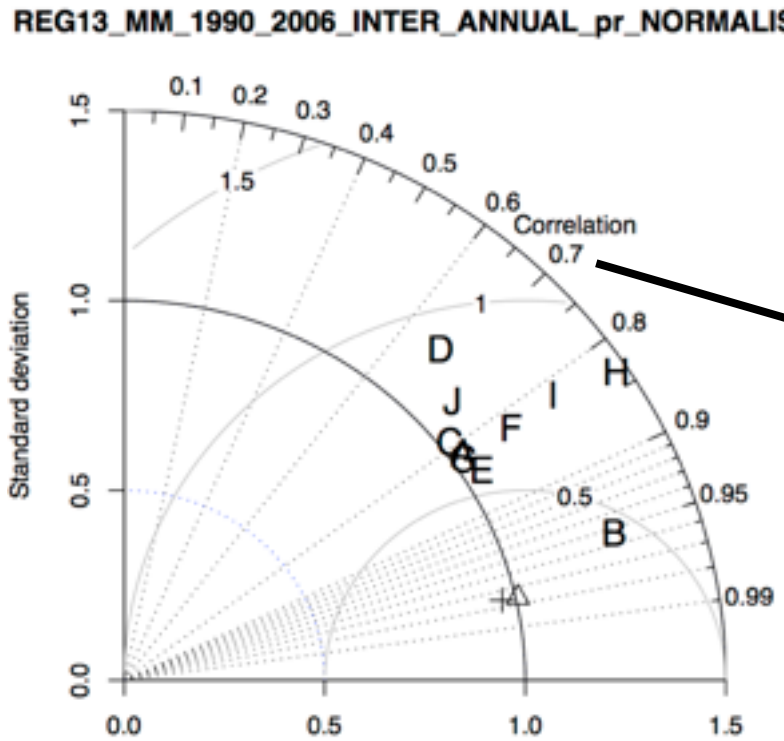

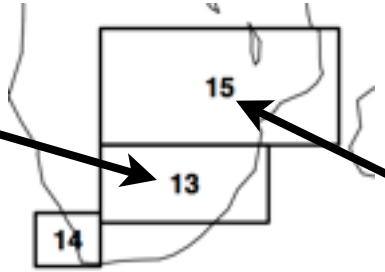

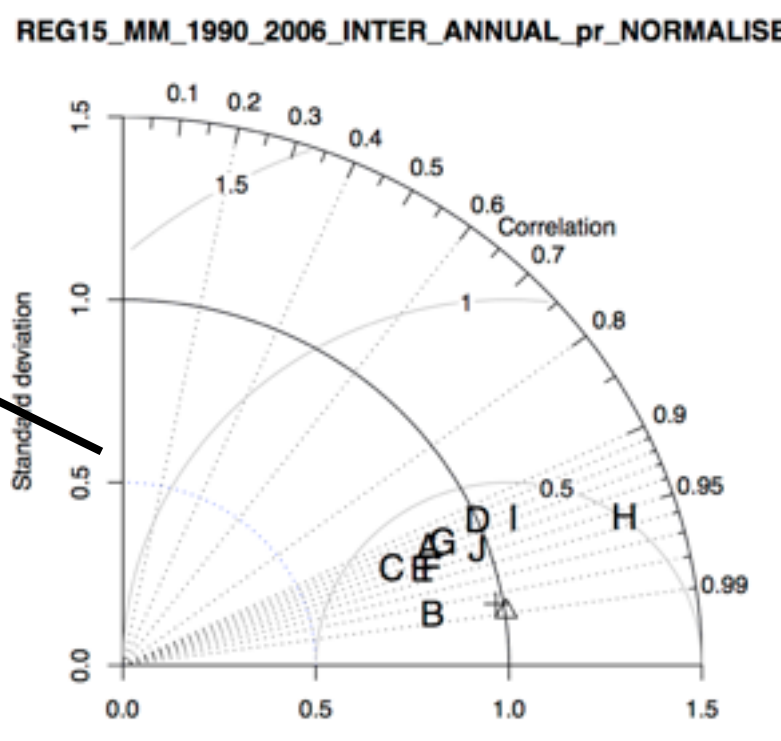

GPCC
WILLMOTT
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A CCLMcom–CCLM
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D ICTP–REGCM3
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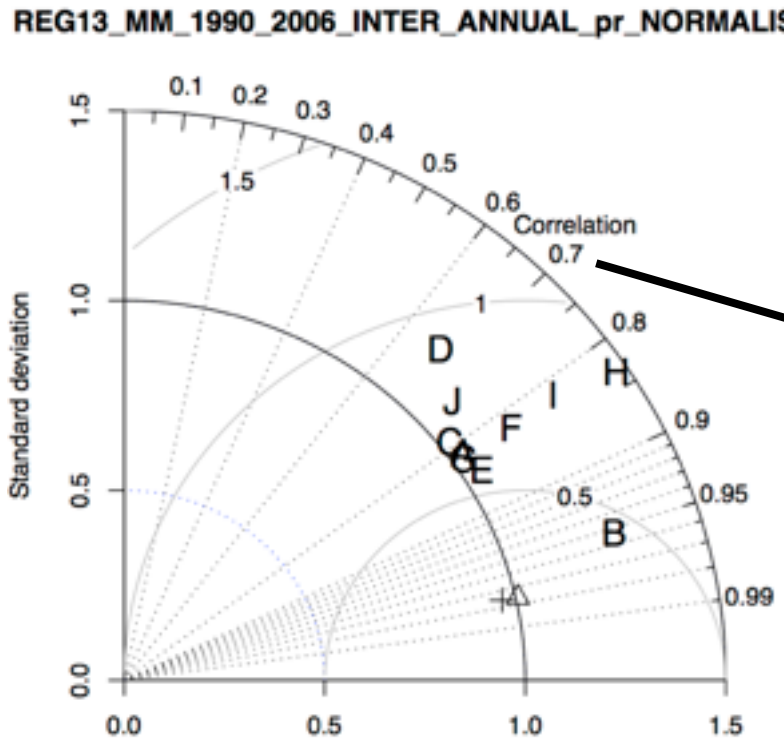

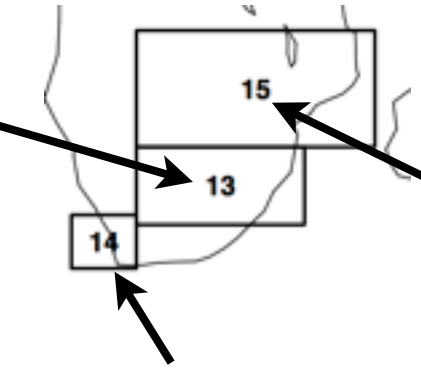

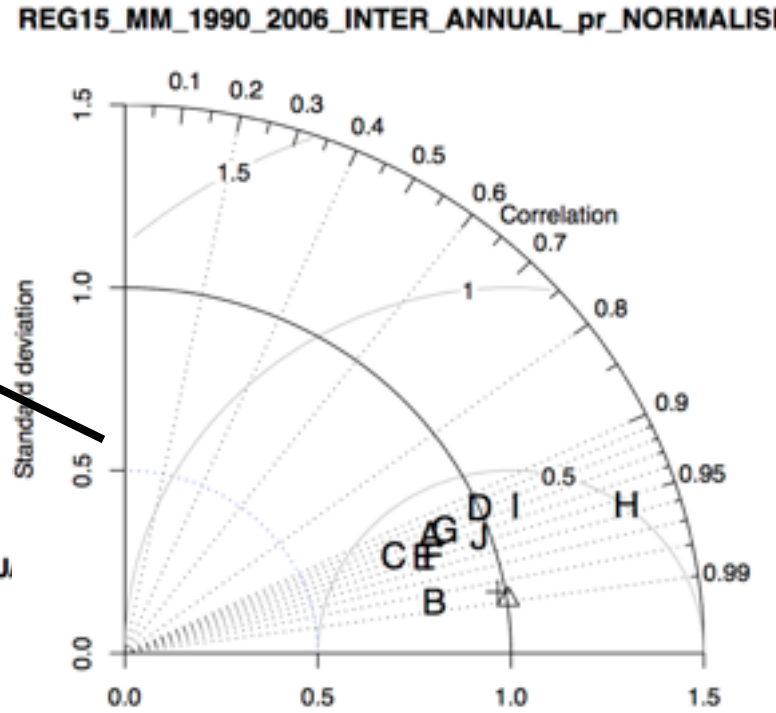

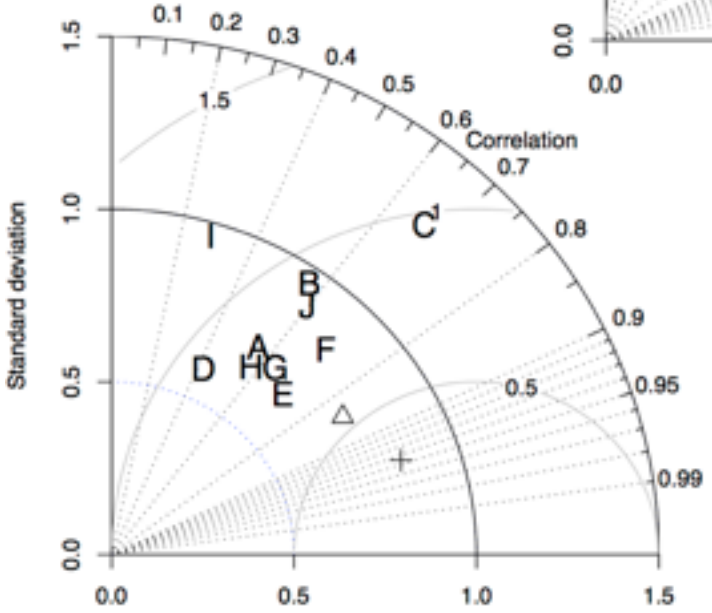

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A CCLMcom-CCLM
B CNRM-ARPEGE51
C DMI-HIRHAM
D ICTP-REGCM3
E KNMI-RACMO2.2b
F MPI-REMO
G SMHI-RCA35
H UC-WRF311
I UCT-PRECIS
J UQAM-CRCM5

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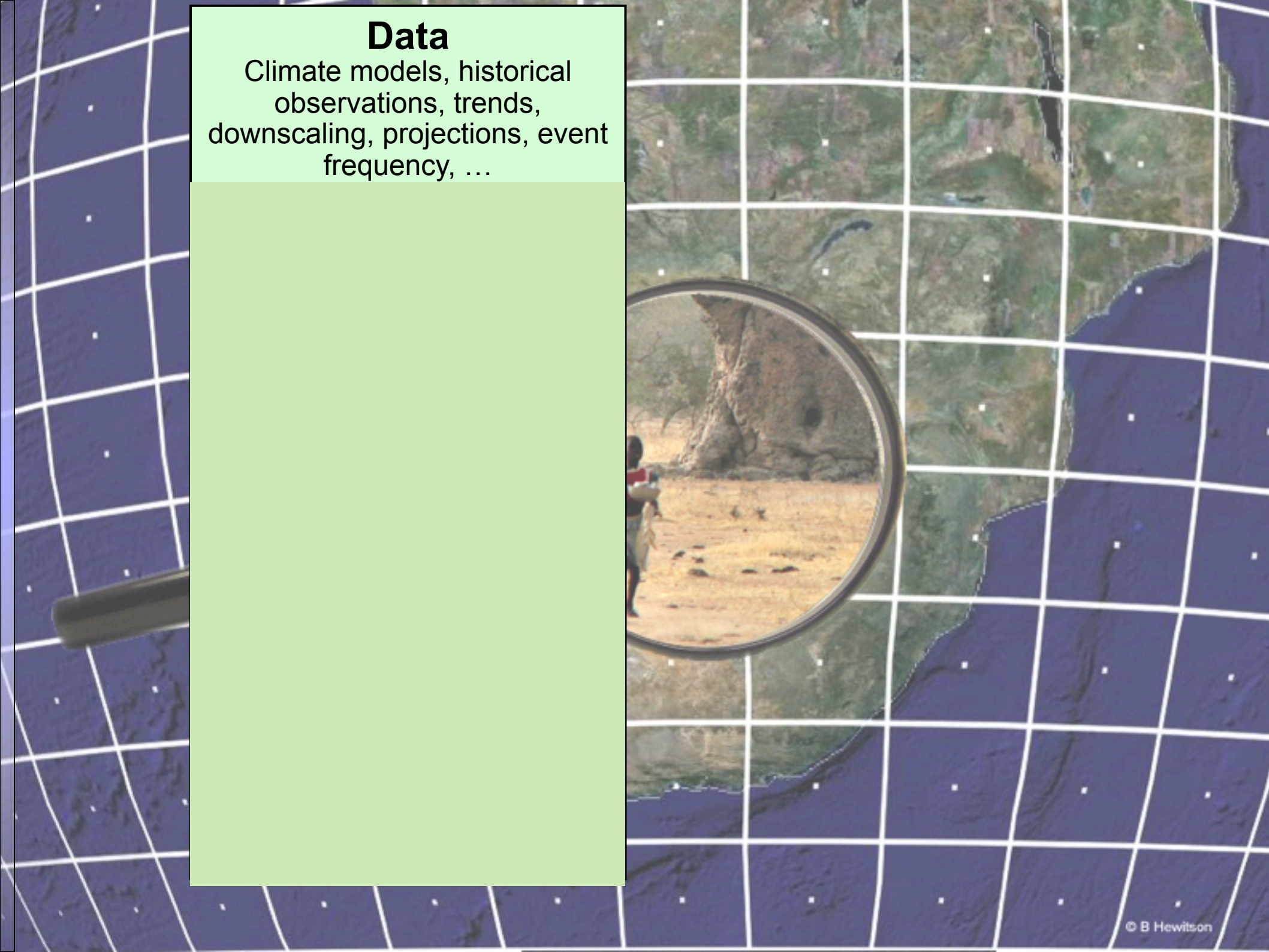
Data
Climate models, historical observations, trends, downscaling, projections, event frequency, …
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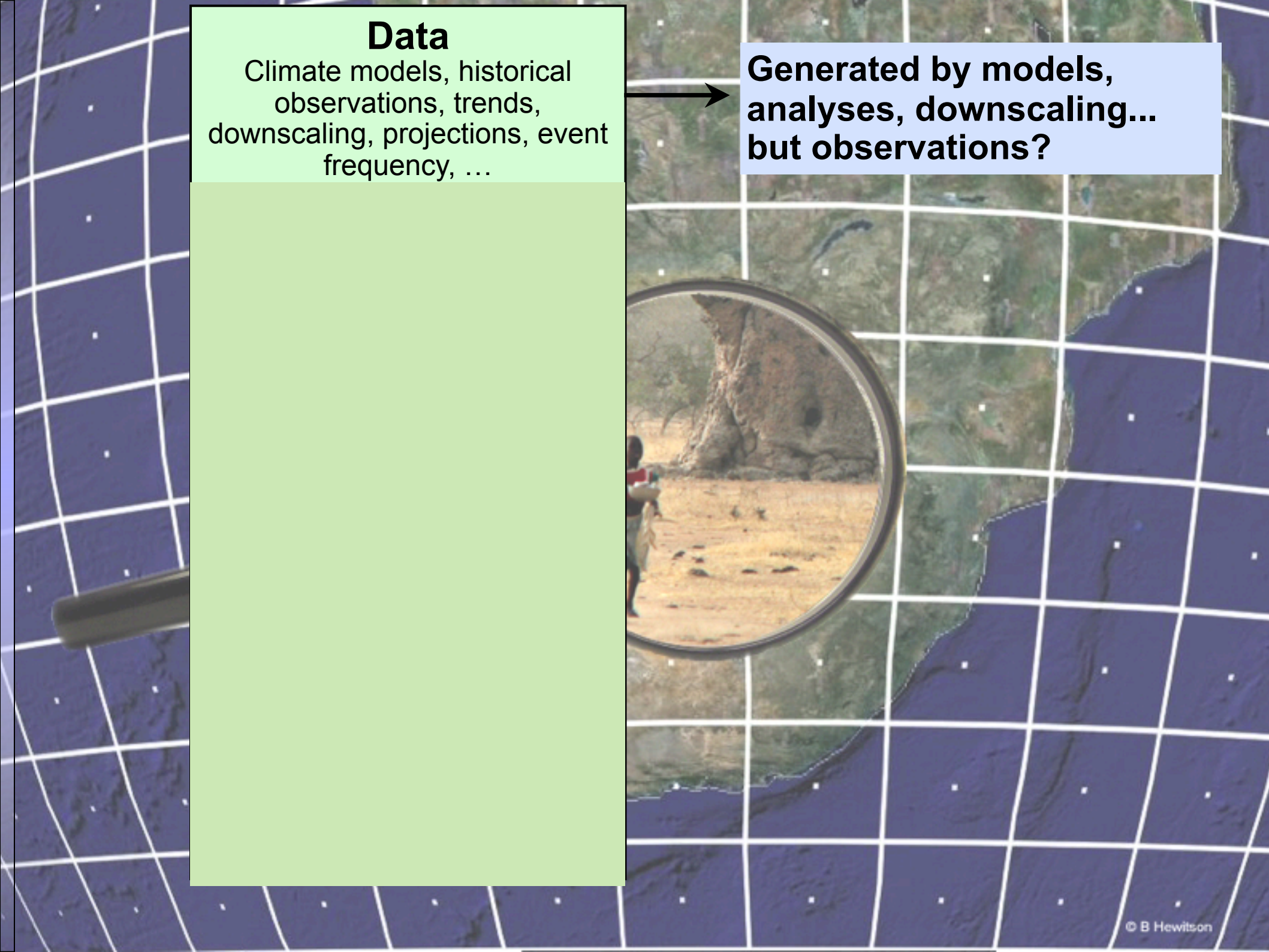

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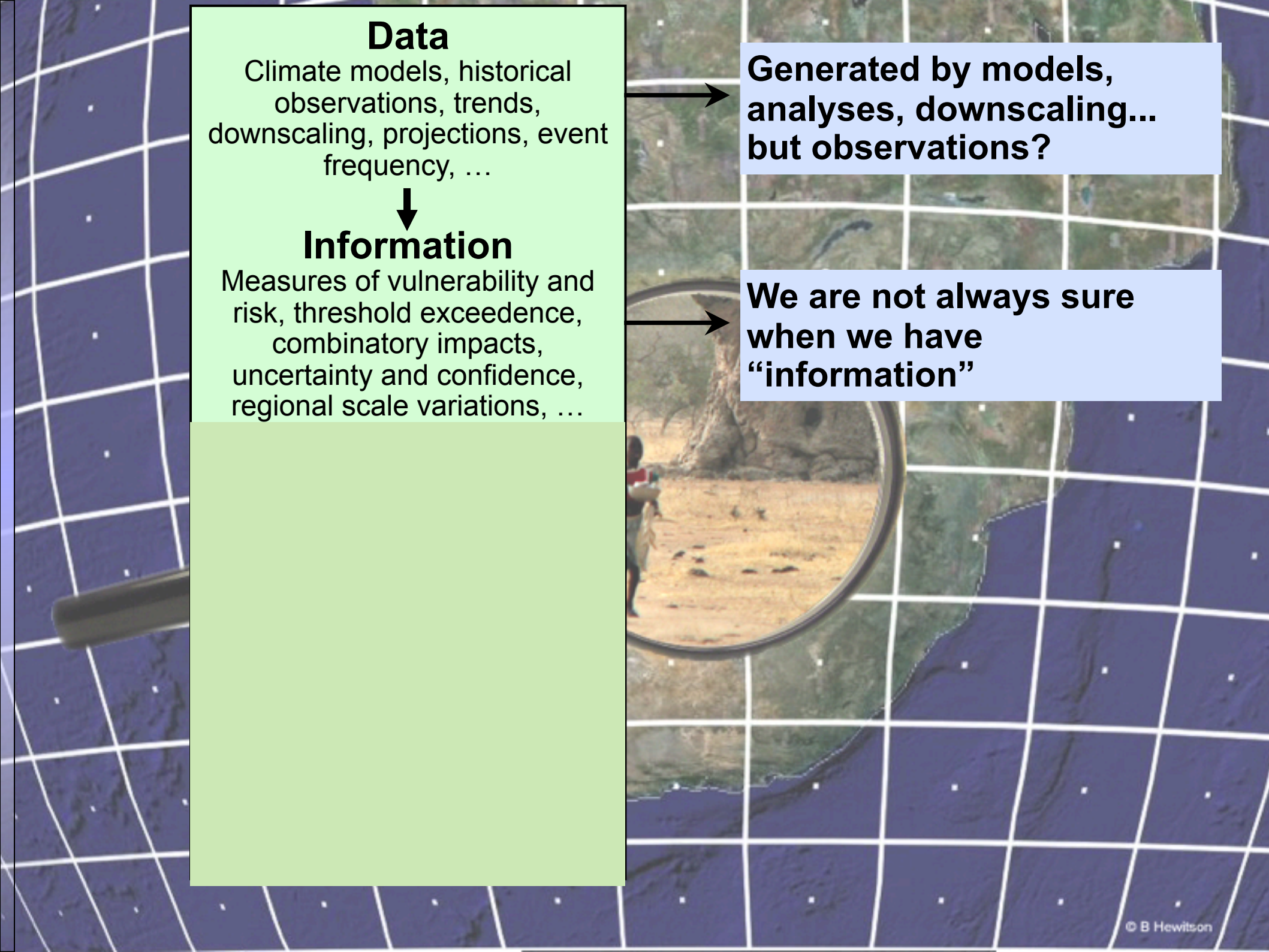

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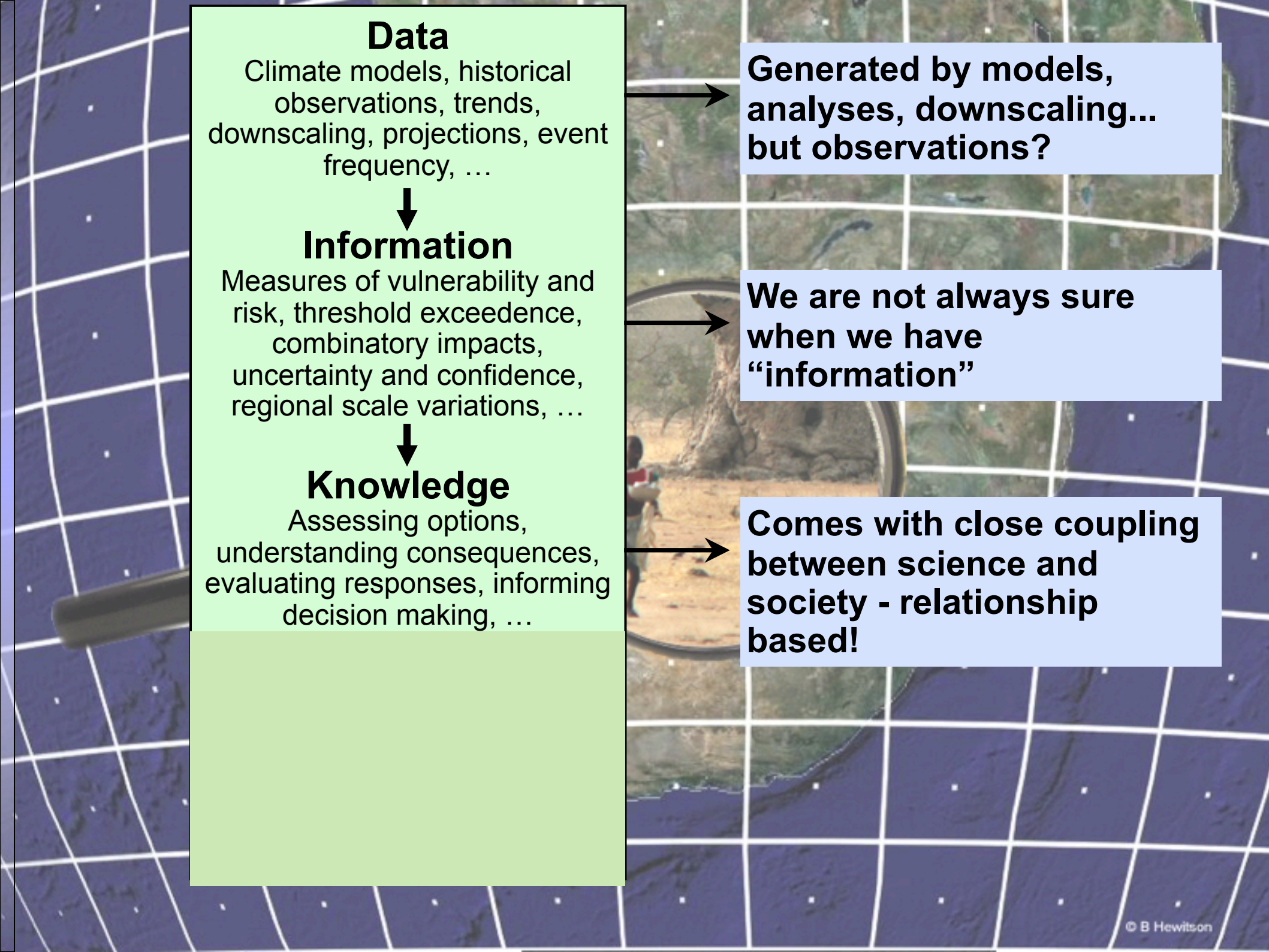
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Comes with close coupling between science and society - relationship based!
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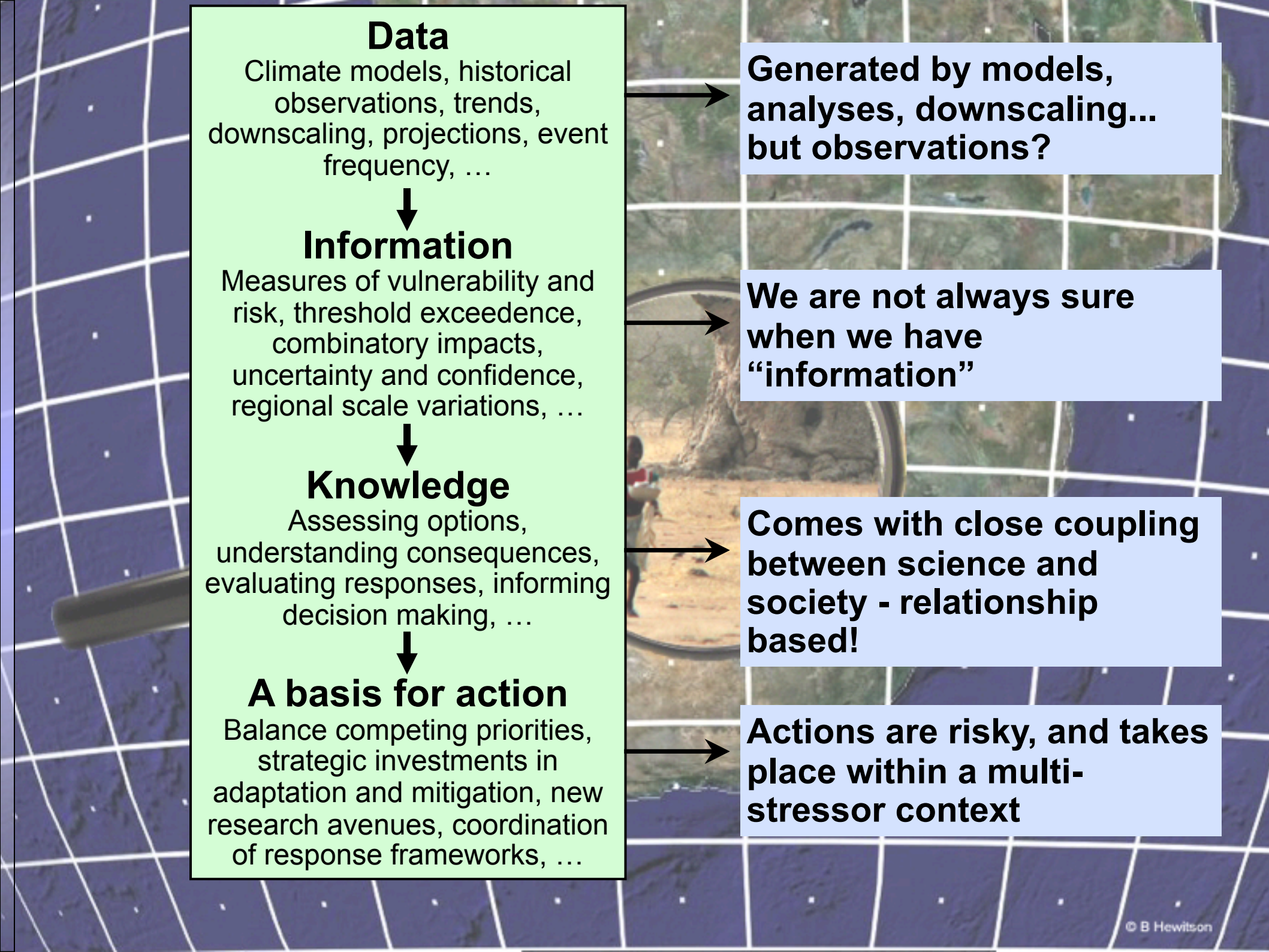
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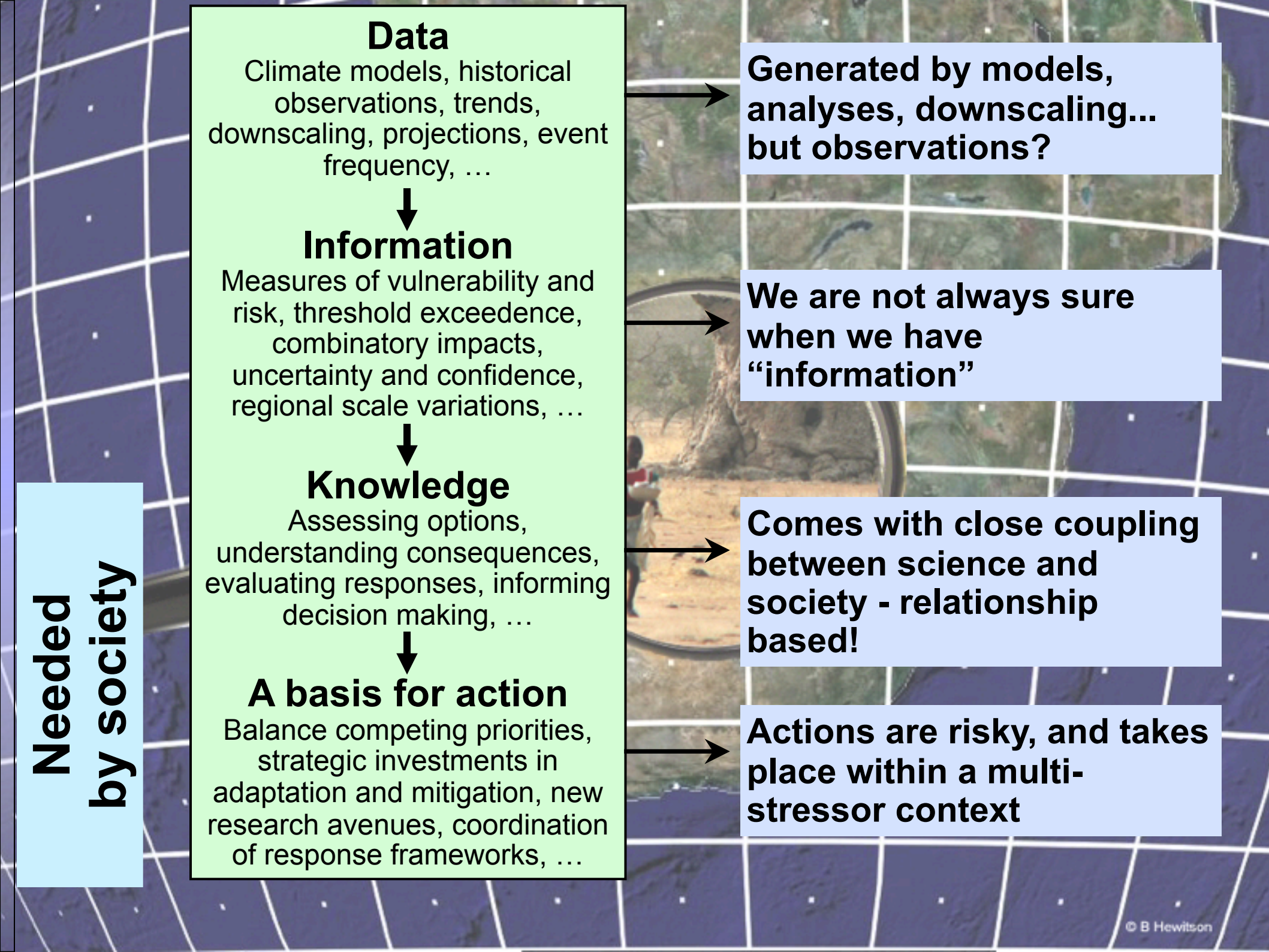
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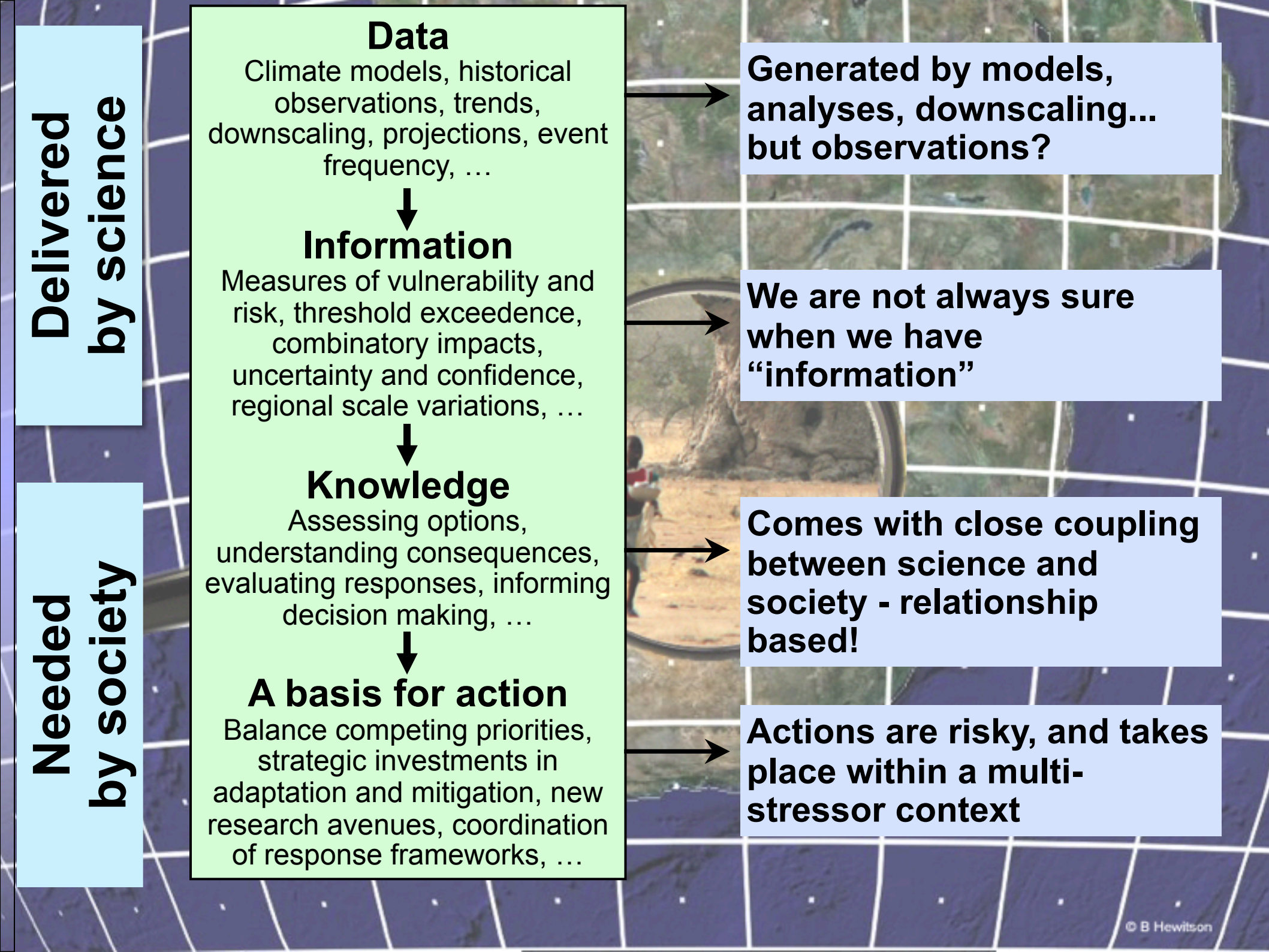
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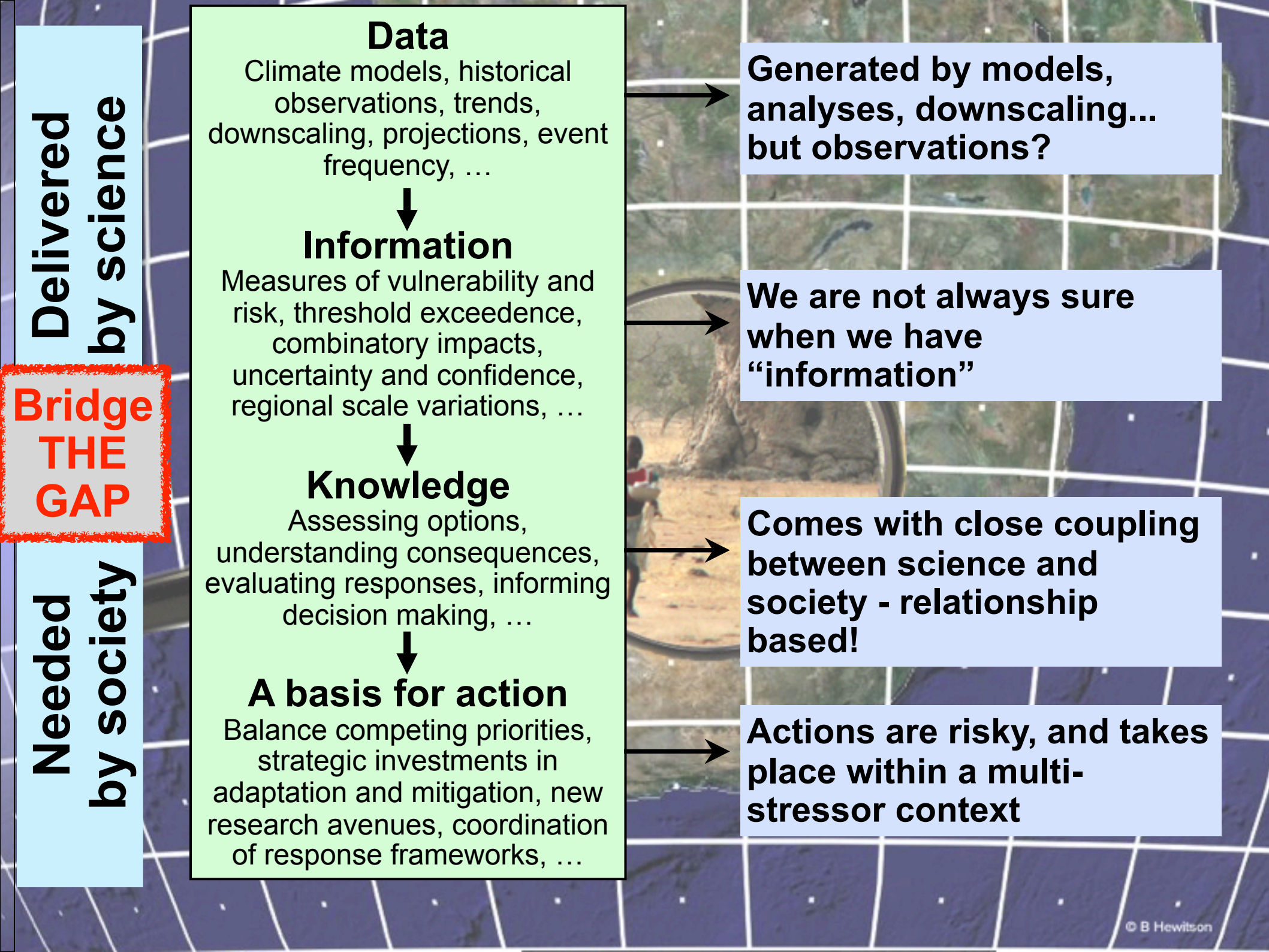
Delivered by science
Bridge THE GAP
Needed by society
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Cordex - Africa

Mixing climate and VIA communities....it's complicated!

April 2010 — March 2011 — July 2011 — November 2011 — February 2012

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Cordex – Africa Analysis

Vulnerability, Impacts, Adaptation Sector

Agriculture

Rain season characteristics including spatial variability, temperature thresholds, growing season length, scale (space and time - daily at a point?)

Ecology

Thresholds, effects on ecosystem services and productivity

Water resource management

Extreme rainfall and early warning; wind and humidity

Health

Space and time scales; communication

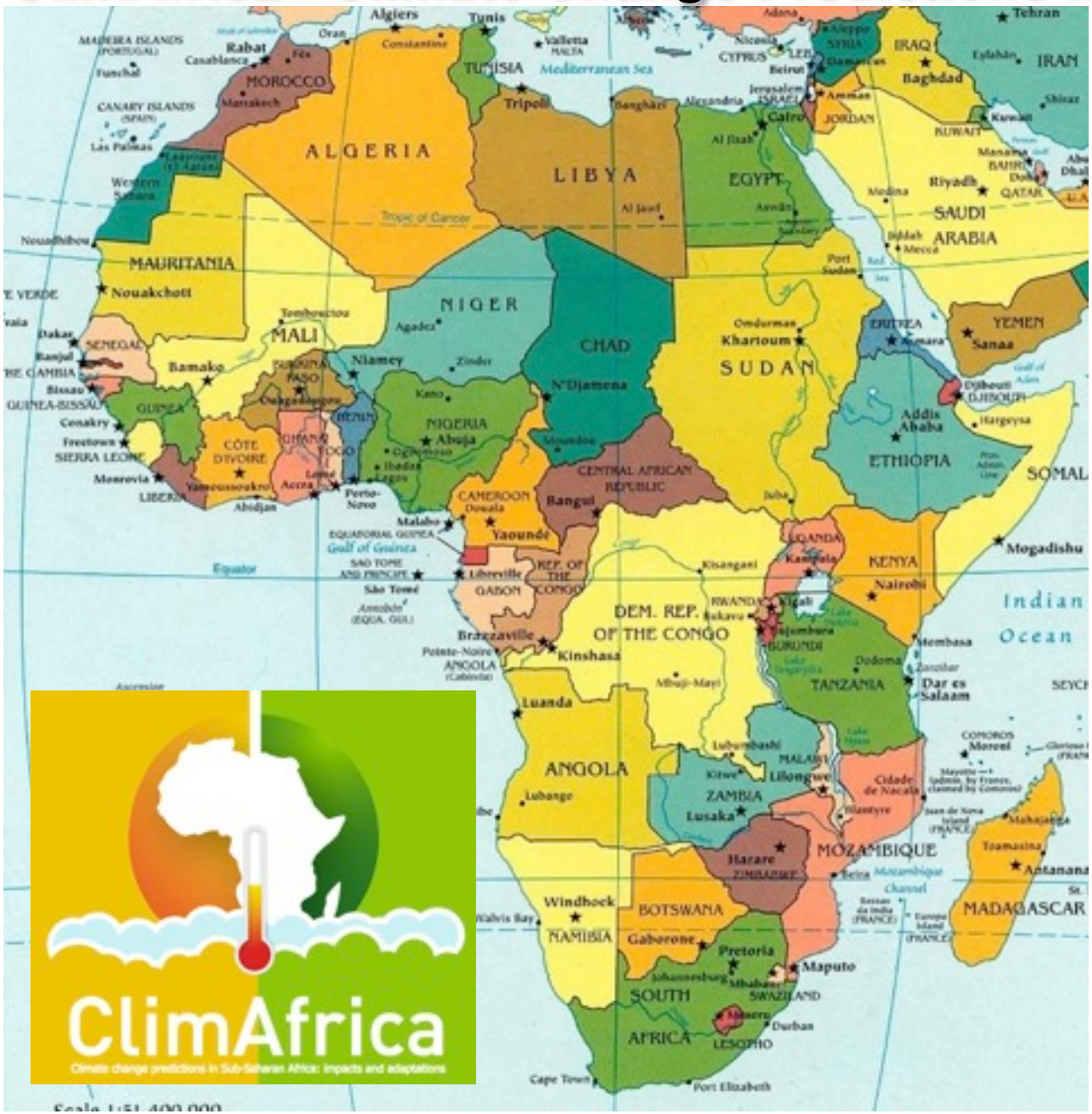
Policy makers

What information is need for decision making? How to package it?

Linking with other projects - maximize efficiencies through collaboration

ClimAfrica - Climate Change Prediction in sub-Sarahan Africa

ClimAfrica - Climate Change Predictions in SSA



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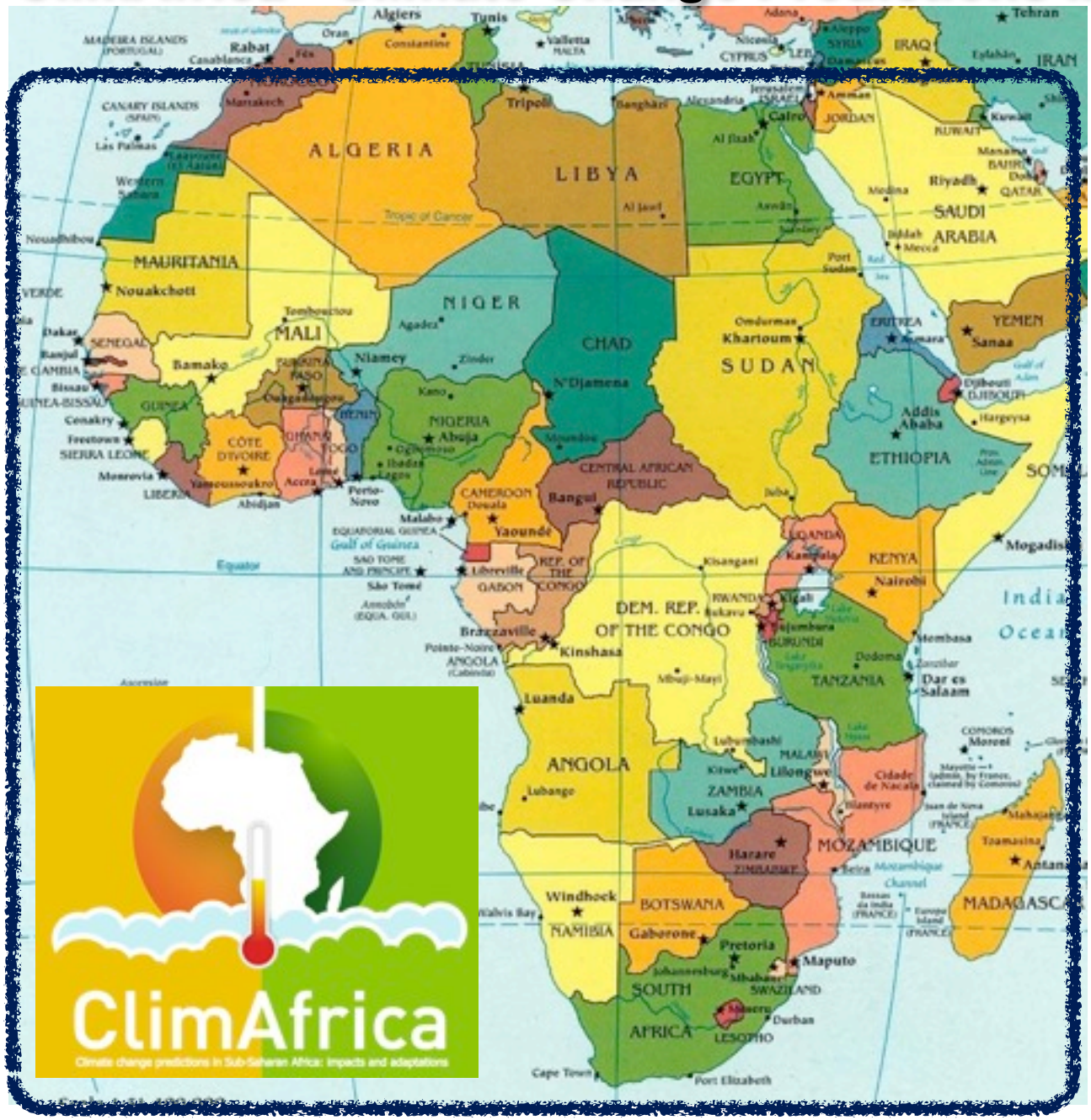

- All sub-Saharan Africa at 0.5 degrees 2010-2030 (SD and ND - UCT)

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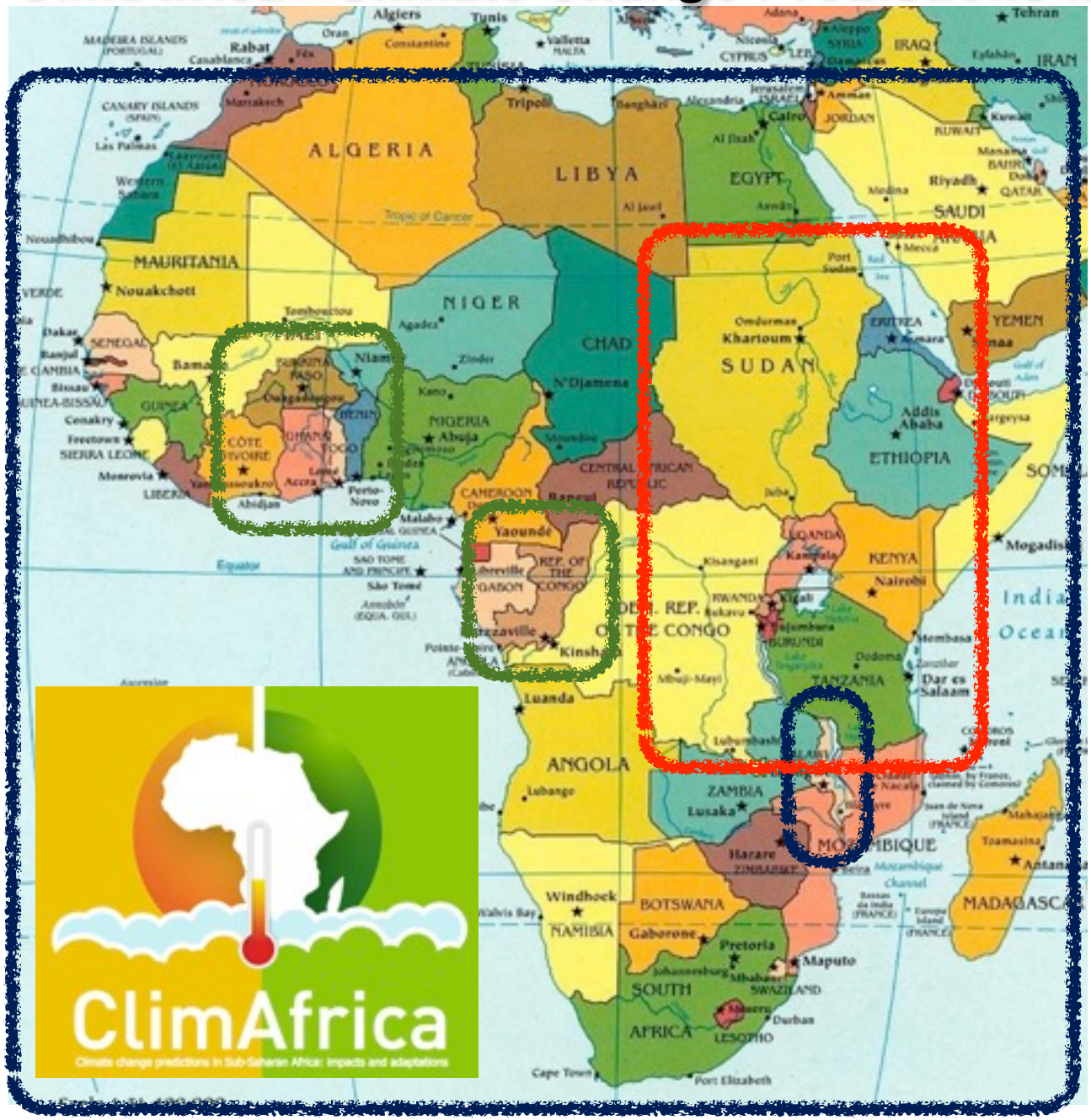

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- Three selected countries at higher resolution (0.22 degrees)

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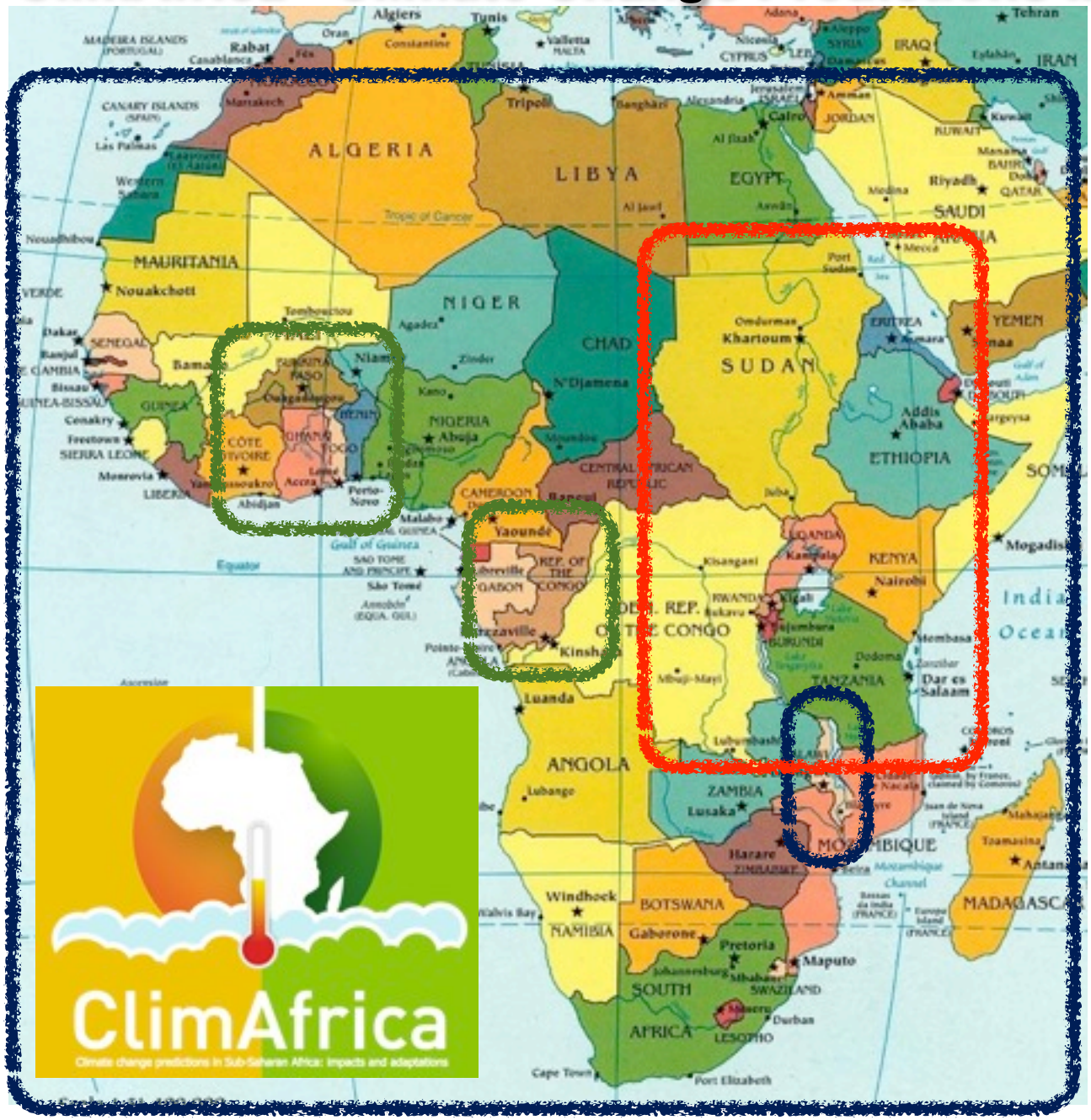

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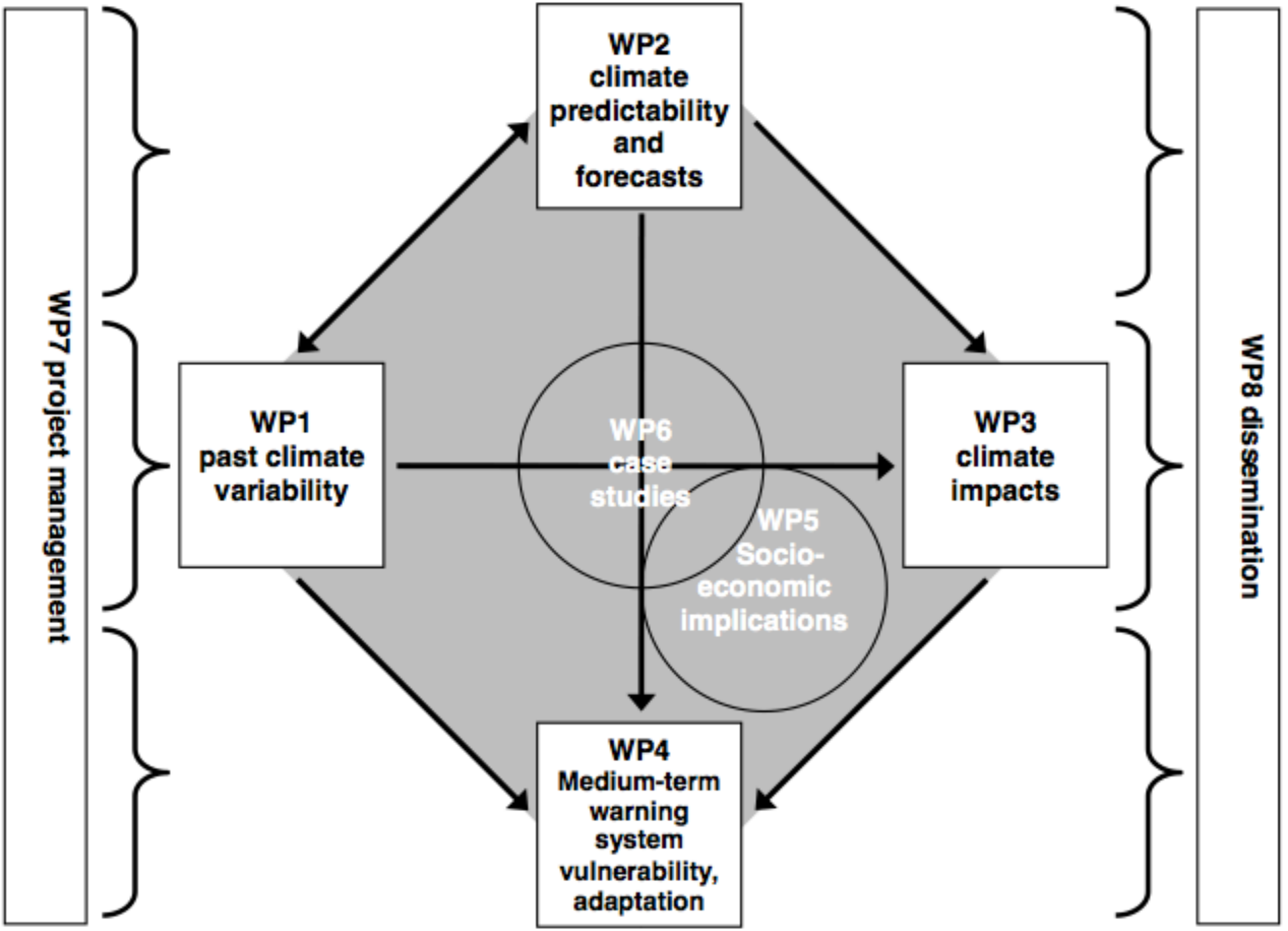
- Case study regions at the point scale (SD)
- Three selected countries at higher resolution (0.22 degrees)
- 3 modelling groups:
  - UCT (SA)
  - ICPAC (Kenya)
  - VUA (Holland)

Work Flow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WP1 past climate variability
WP6 case studies
WP5 Socio-economic implications
WP3 climate impacts
WP4 Medium-term warning system vulnerability, adaptation
WP8 dissemination

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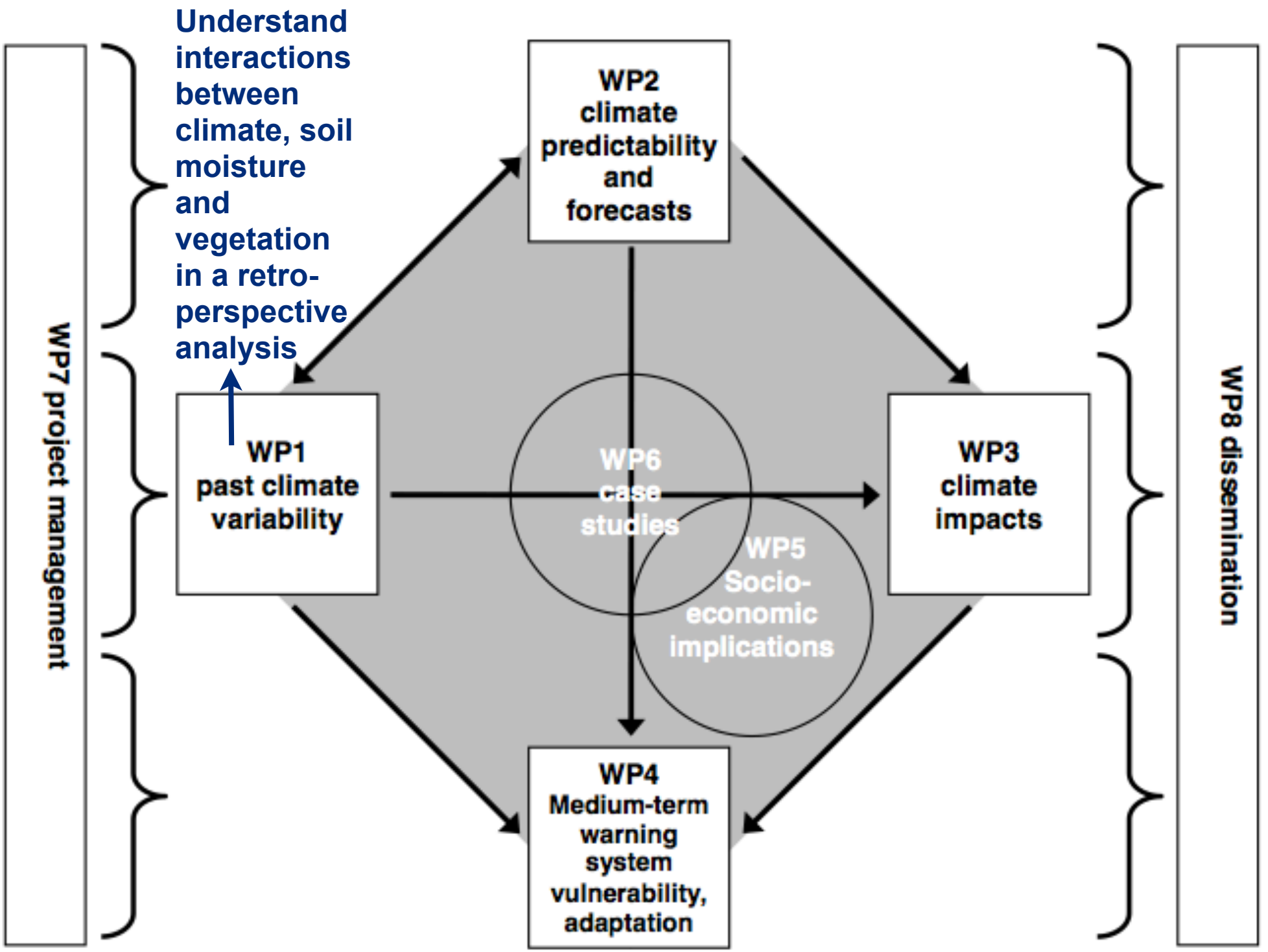
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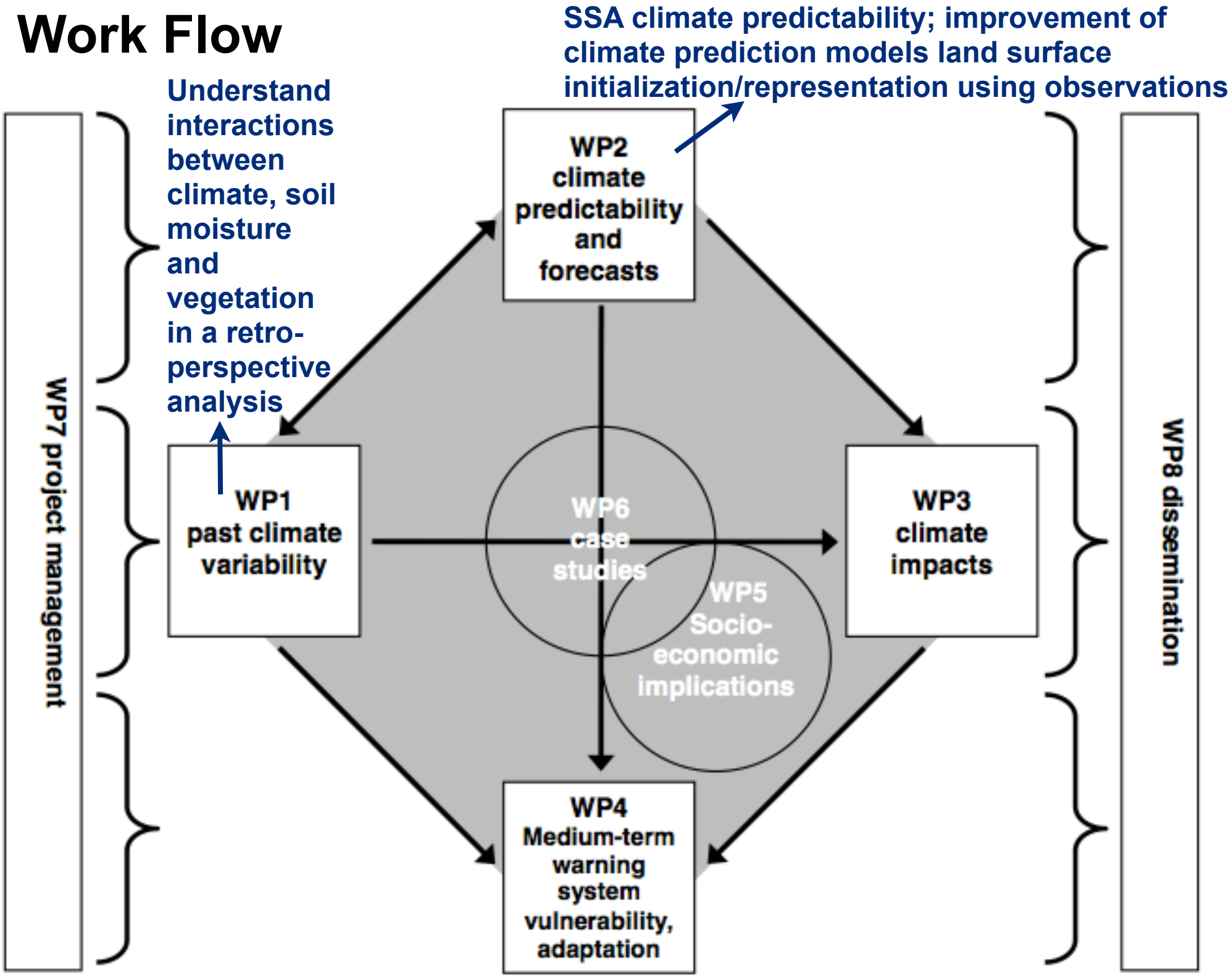
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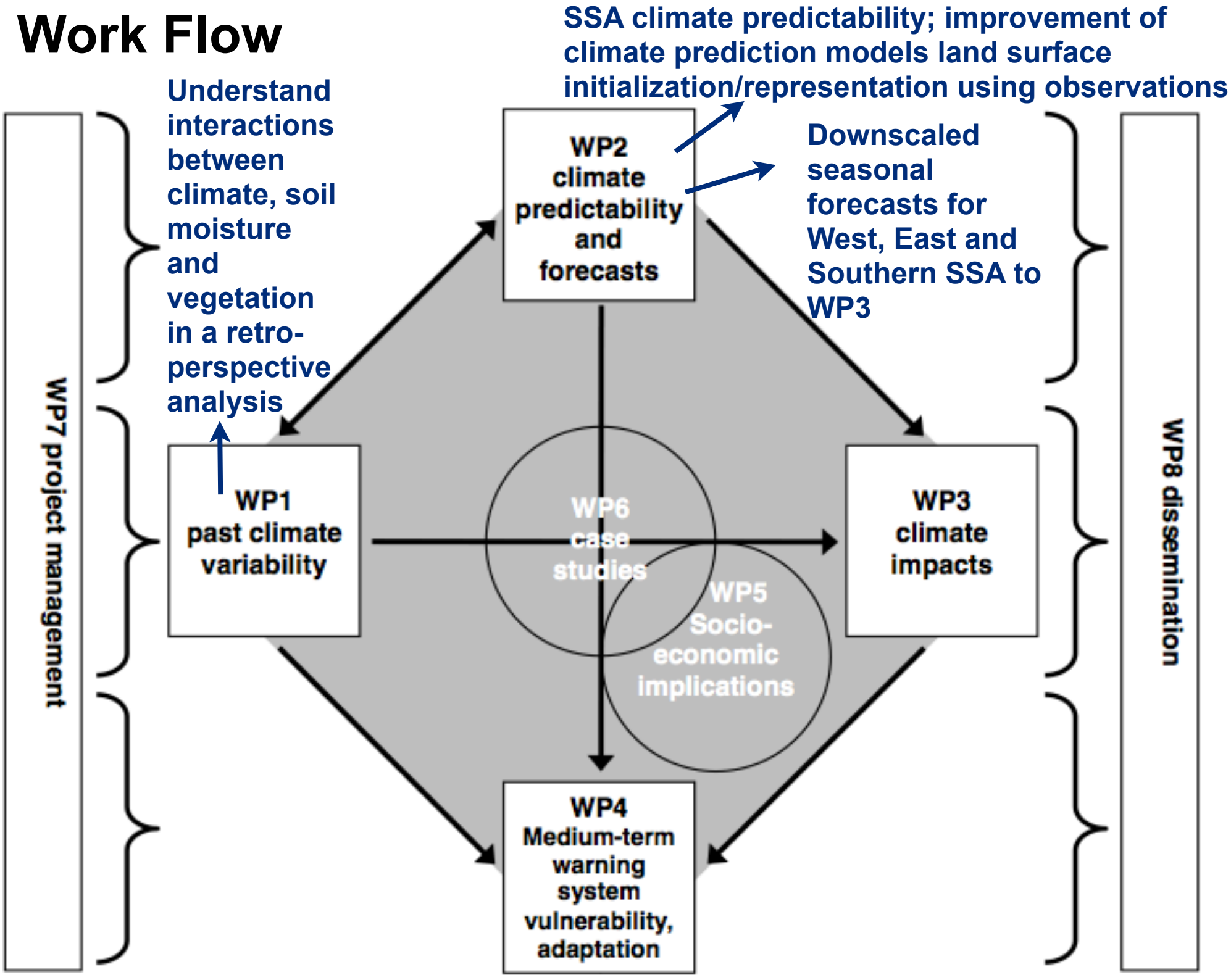
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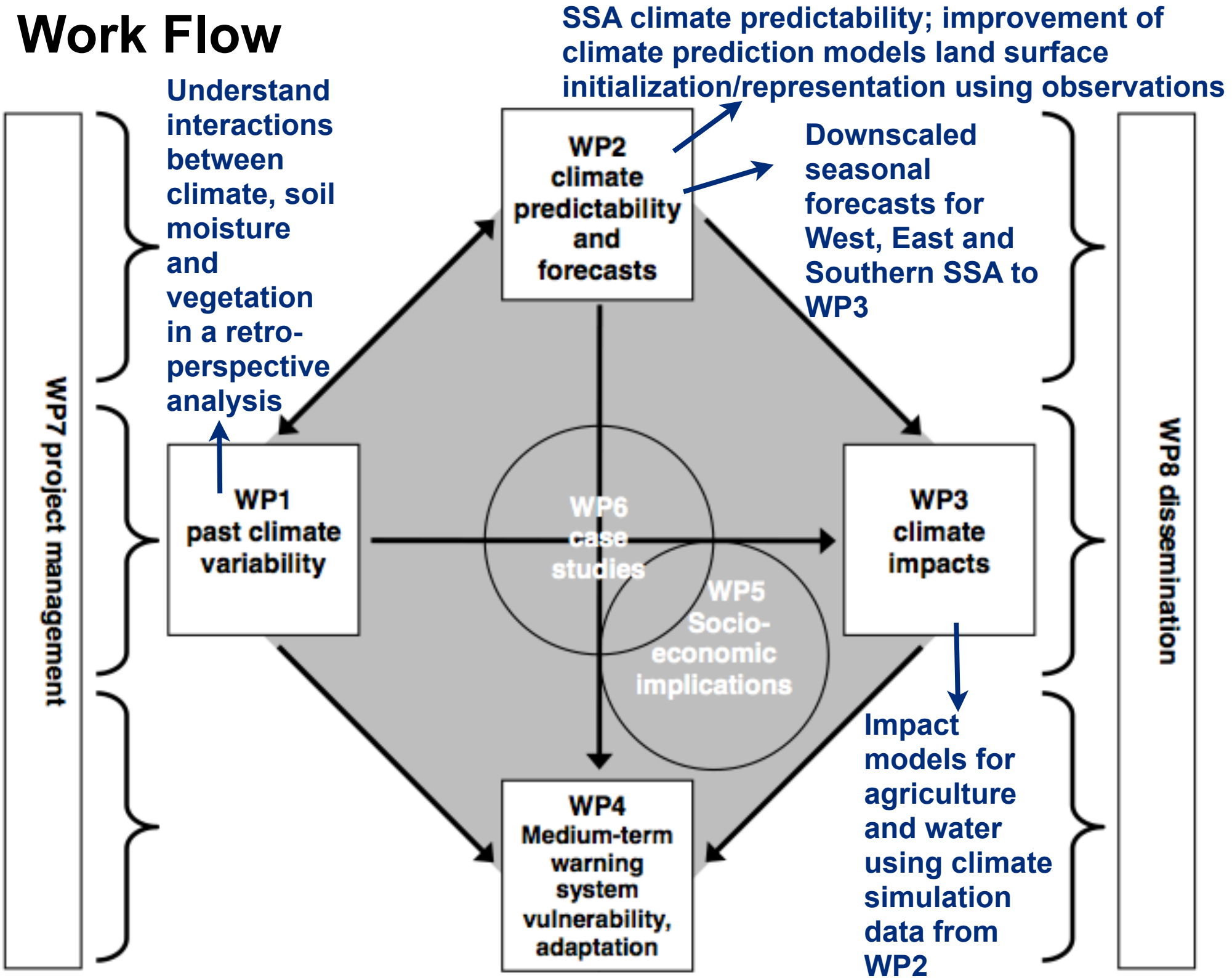
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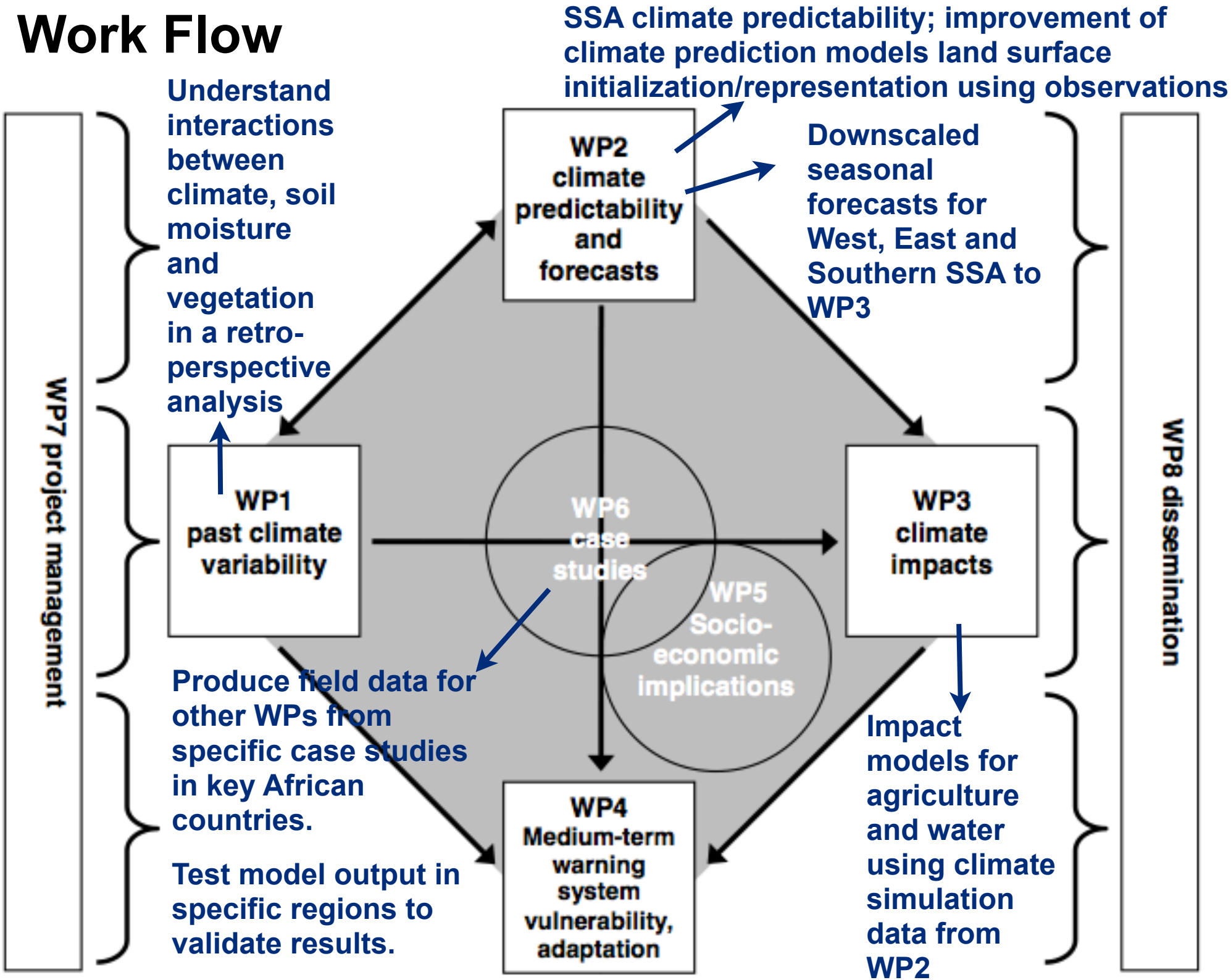
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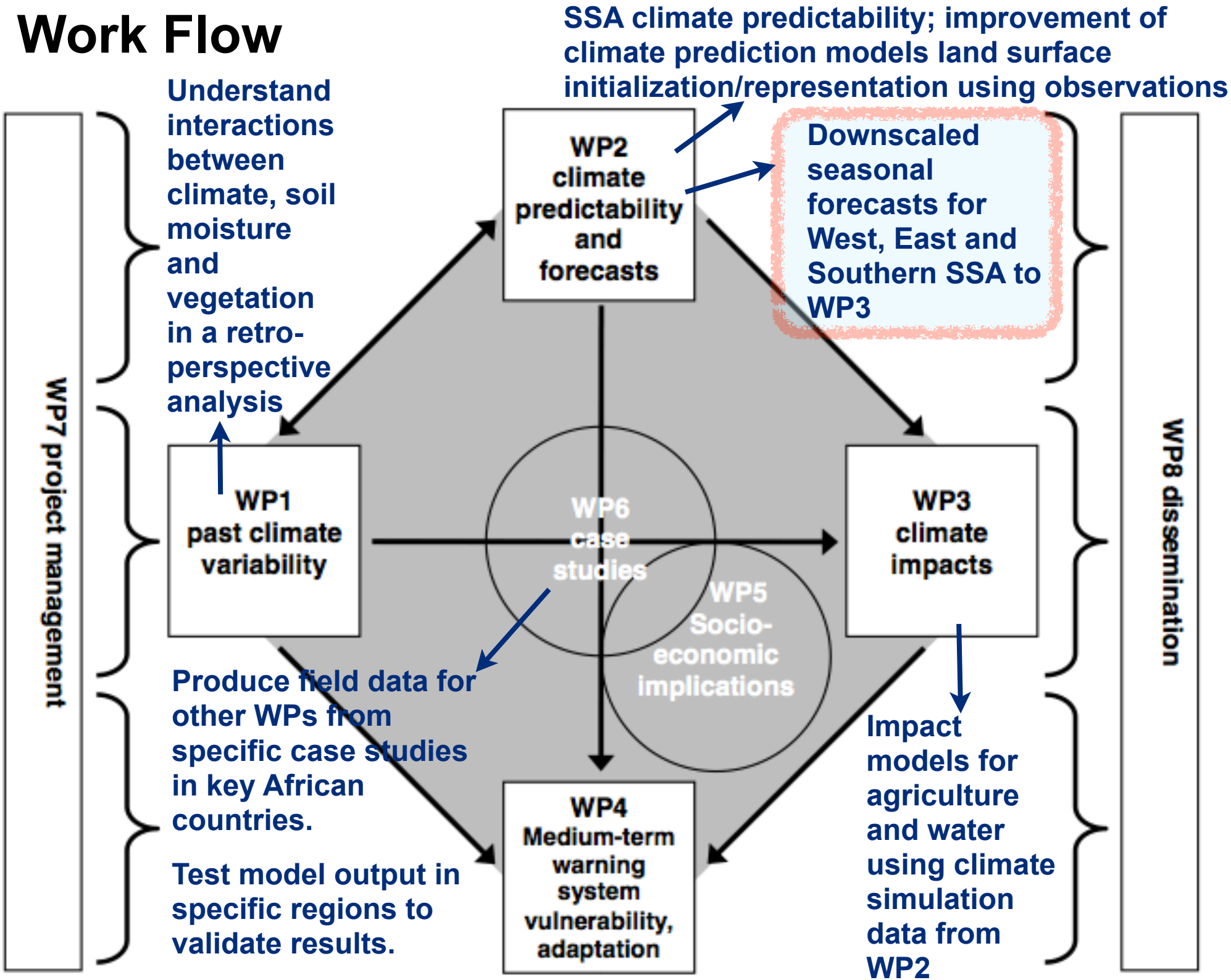
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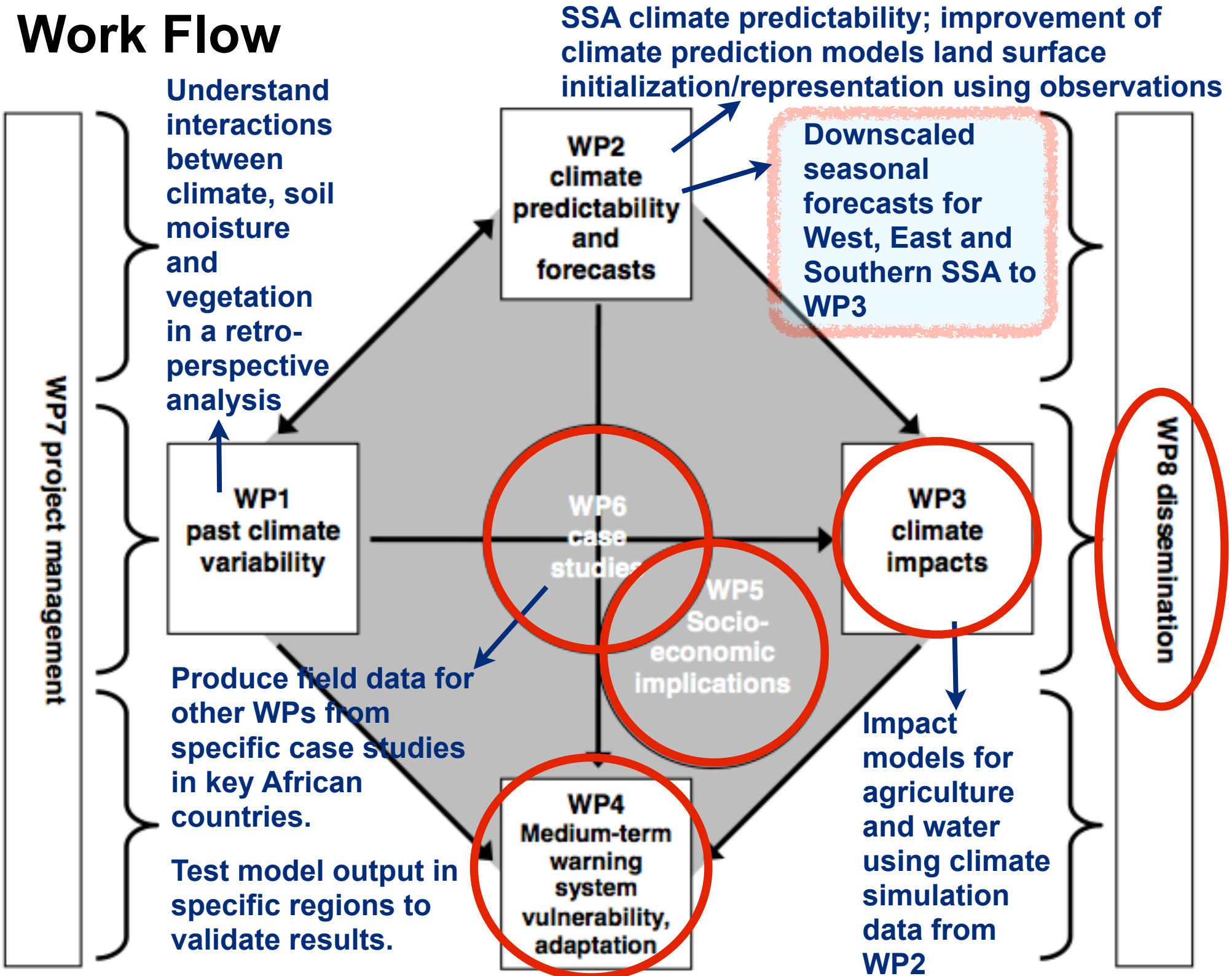
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- 1 writeshop

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Putting the 'CO' in CORDEX.....

..... A LOT OF WORK!

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Cordex Web Presence

The official WCRP CORDEX page

http://wcrp.ipsl.jussieu.fr/SF_RCD_CORDEX.html

CORDEX Africa

http://www.csag.uct.ac.za/cordex

CORDEX Europe

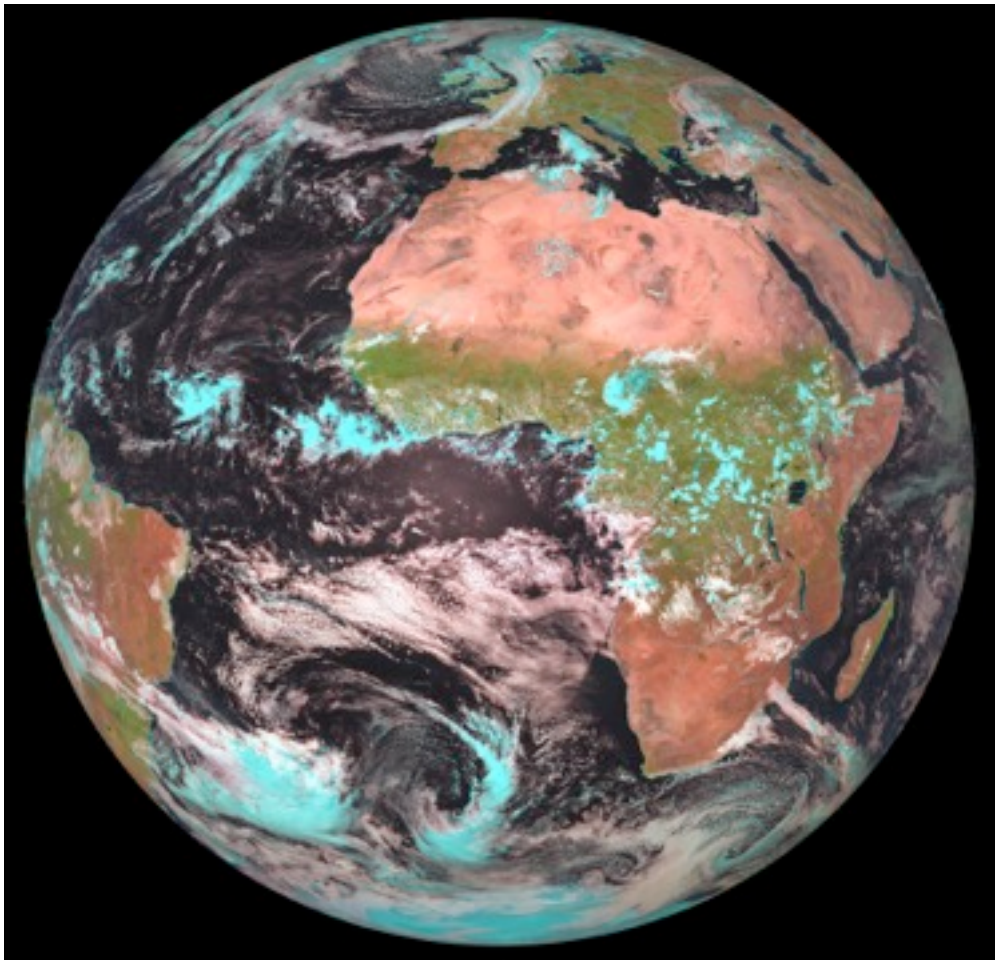
http://www.eurocordex.com

DMI Archive

http://cordex.dmi.dk/joomla/

ClimAfrica

http://www.climafrica.net/



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