**Inter-Continental Transferability Study
ICTS**

http://icts.gkss.de

Objectives

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- Study the transferability of regional climate models to areas of different continental scale experiments (i.e. to different climate regimes)
- Apply CEOP (satellite, reference sites, global analysis and model data) and other available observational data sets to validate the energy and water cycle in regional models
- Assess the influence of different driving global re-analysis

TRANSFERABILITY INTERCOMPARISON
An Opportunity for New Insight on the Global Water Cycle and Energy Budget

BY E. S. TAKLE, J. ROADS, B. ROCKEL, W. J. GUTOWSKI JR., R. W. ARRITT, I. MEINKE, C. G. JONES, AND A. ZADRA

Transferability intercomparisons provide a new approach for advancing the science of modeling the water cycle and energy budget on regional to global scales by using multiple limited-area models applied to multiple domains.
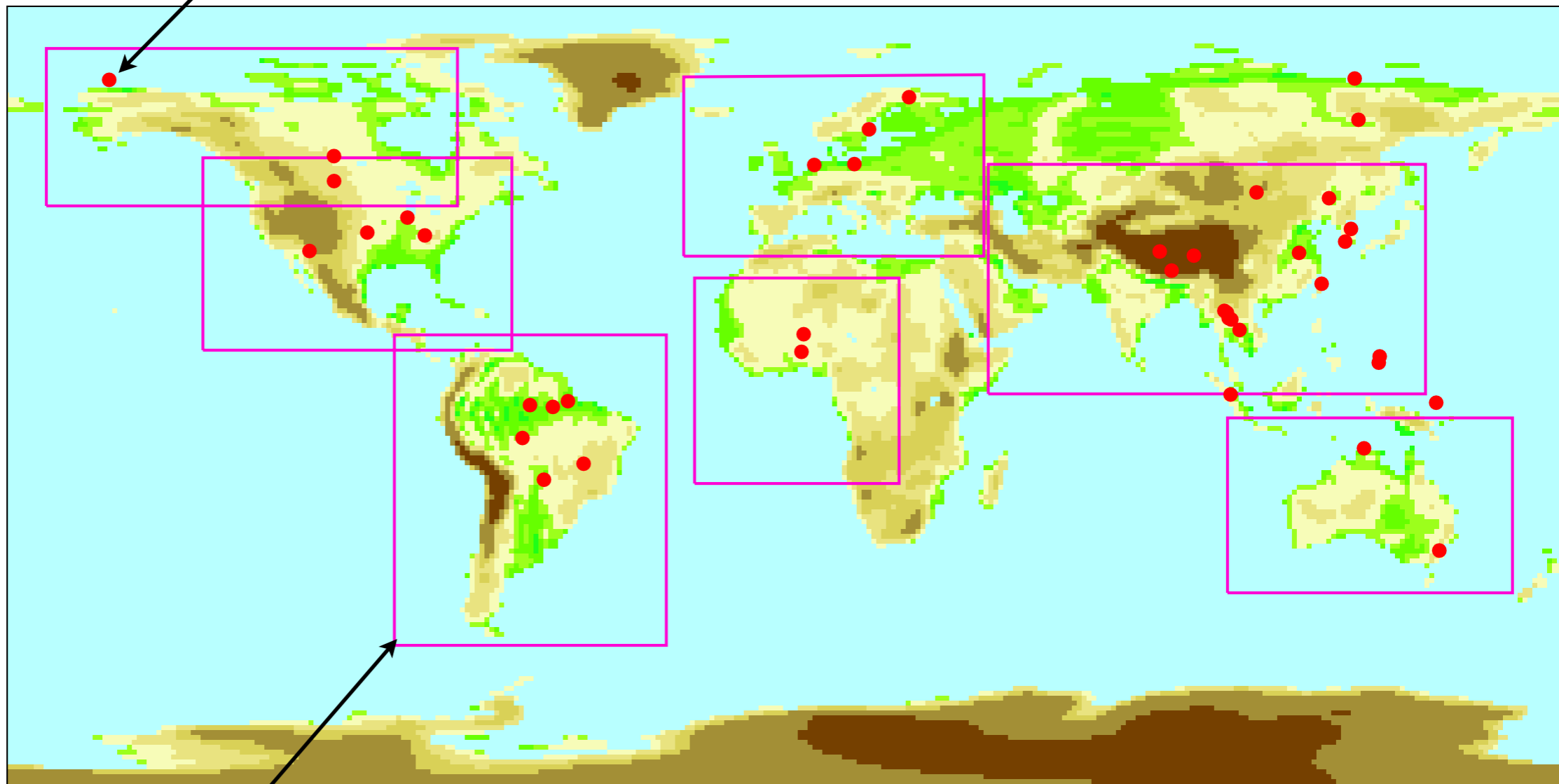
BAMS 2007

Reference Site Stations (3h timeseries)

Participating
RCMs
CCLM
CRCM
GEM-LAM
RSM
(RCA)
(RegCM3)

Common domain/grid 0.5 deg (gridded daily timeseries)

Present Status

Present Status

- Results of 5 RCMs (MOLTs and gridded data) archived in the CEOP model data archive, 1 RCM in progress

Model	Simulation	CEOP Data Archive	
		Molts	Grid
CCLM	🟩	🟩	🟩
CRCM	🟩	🟩	🟩
GEM-LAM	🟩	🟩	🟩
RCA3	🟩	🟩	🟥
RegCM3	🟩	🟥	🟥
RSM	🟩	🟩	🟩

- Phase 1 archiving finished
- Minor corrections applied to the data base since CEOP 2008 meeting

Archived quantities

MOLTS

- Reference site grid box and eight adjacent
- up to 44 quantities
- up to 41 reference site locations
- 3 hourly temporal resolution

Gridded

- Common grid (0.5 degrees)
- up to 36 quantities
- daily means, sums, min/max

Details see CEOP model data archive http://cera-www.dkrz.de/

Analysis also to be performed in other CEOP projects

Contributions by participants

E.S. Takle, W. J. Gutowski Jr., R. Arritt (Iowa State University)

- Focus
  - Diurnal cycle of surface fluxes

- Reference
  - Takle, E.S., J. Roads, B. Rockel, W.J. Gutowski Jr., R.W. Arrit, I. Meinke, C.G. Jones, and A. Zadra, 2007: Transferability intercomparison: An opportunity for new insight on the global water cycle and energy budget, Bull. Amer. Soc., 88, 375-384

B. Rockel (GKSS) and B. Geyer (GKSS)

- Focus
  - Similiarities in precipitation patterns

- Reference
  - Rockel, B. and B. Geyer, 2008: The performance of the regional climate model CLM in different climate regions, based on the example of precipitation, Meteorol. Z., Volume 12, Number 4, 487-498

I. Meinke (GKSS, former ECPC) and J. Roads (ECPC)

- Focus
  - Convective parameterizations

- Reference
  - Meinke, I., J. Roads, and M. Kanamitsu, 2007, Evaluation of the RSM Simulated Precipitation During CEOP, J. Meteorol. Soc. Japan, Vol. 85A (2007) pp.145-166

Contributions by participants

D. Paquin (Ouranos) and Z. Kodhavala (University Quebec)

- Focus
  - Internal variablility and large-scale nudging impact study in the context of the ICTS project

- Reference
  - Paquin, D., and Z. Kodhavala, 2009, Internal variability and large-scale nudging impact study in the context of the ICTS project, Ouranos, Équipe Simulations climatiques, Rapport interne no 11 (v2)

Contributions by participants

Z. Kodhavala (University Quebec), C. Jones (SMHI, former UQ)

- Focus
    - e.g. Frequency distributions
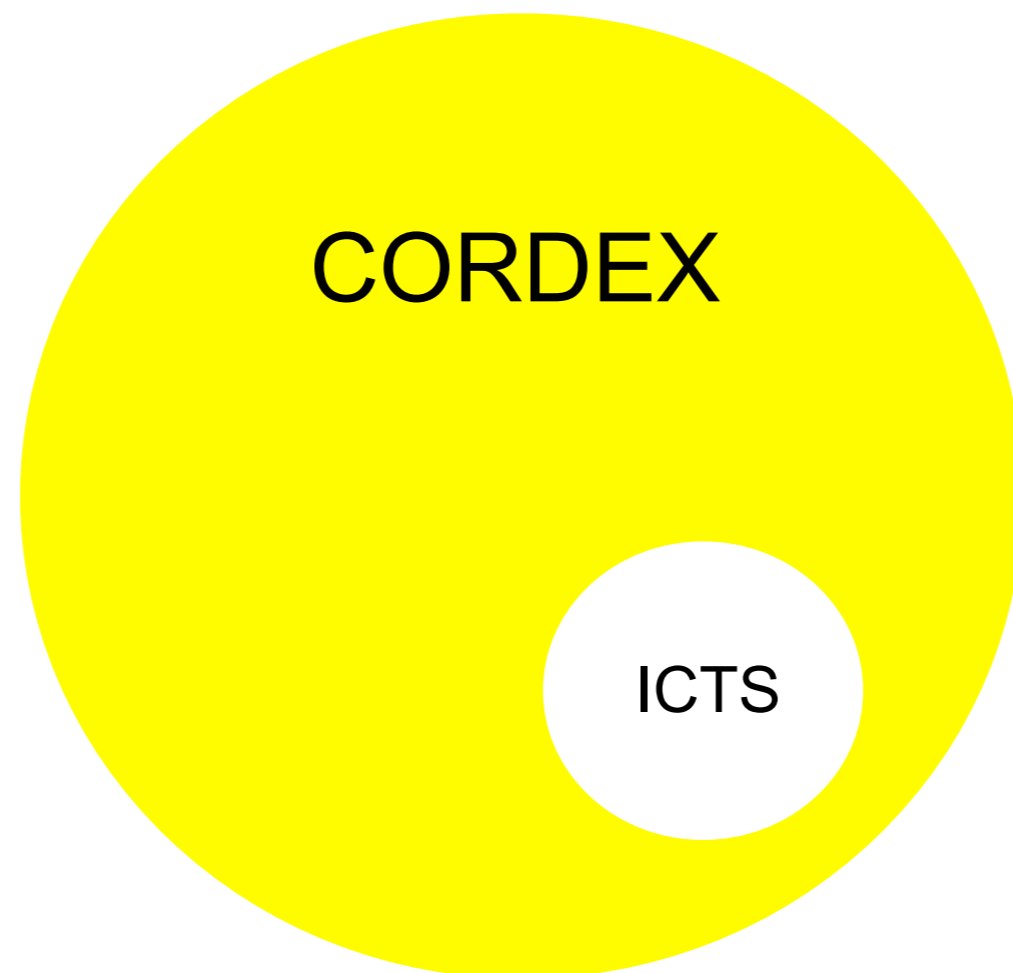
- Reference
    - publication in preparation

Outlook / Plans

ICTS Phase 1 (fixed setup for all regions) finished

ICTS Phase 2 (RCMs driven by different global reanalysis)
- no simulation in ICTS, but use excerpt of CORDEX results

CORDEX
A WCRP Initiative

Coordinators: Colin Jones & Filippo Giorgi

Task Force: Jens Christensen, Greg Flato, Bill Gutowski,
Bruce Hewitson, Krishna Kumar, Won-Tao Kwan, Claudio Menendez,
James Murphy, Wong Li Wah

Some details at:
http://wcrp.ipsl.jussieu.fr/RCD_Projects/CORDEX/CORDEX.html

Provide a set of regional climate scenarios covering the period 1950-2100, for the majority of the populated land-regions of the globe

Make these data sets readily available and useable to the impact and adaptation communities
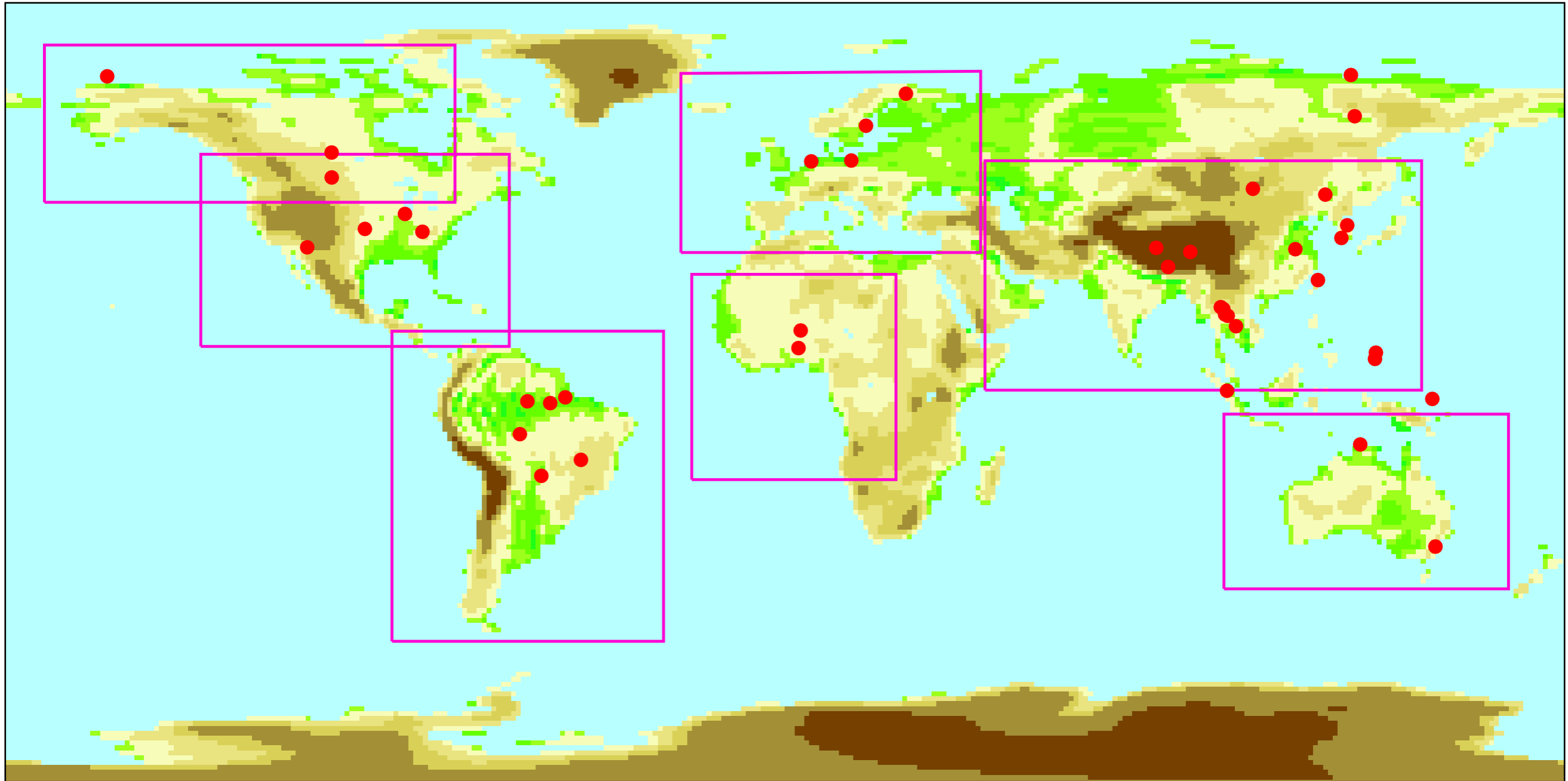
Provide a generalized framework for testing and applying regional climate models and downscaling techniques for both the recent past and future scenarios

Foster coordination between regional downscaling efforts around the world and encourage participation in the downscaling process of local scientists/organizations
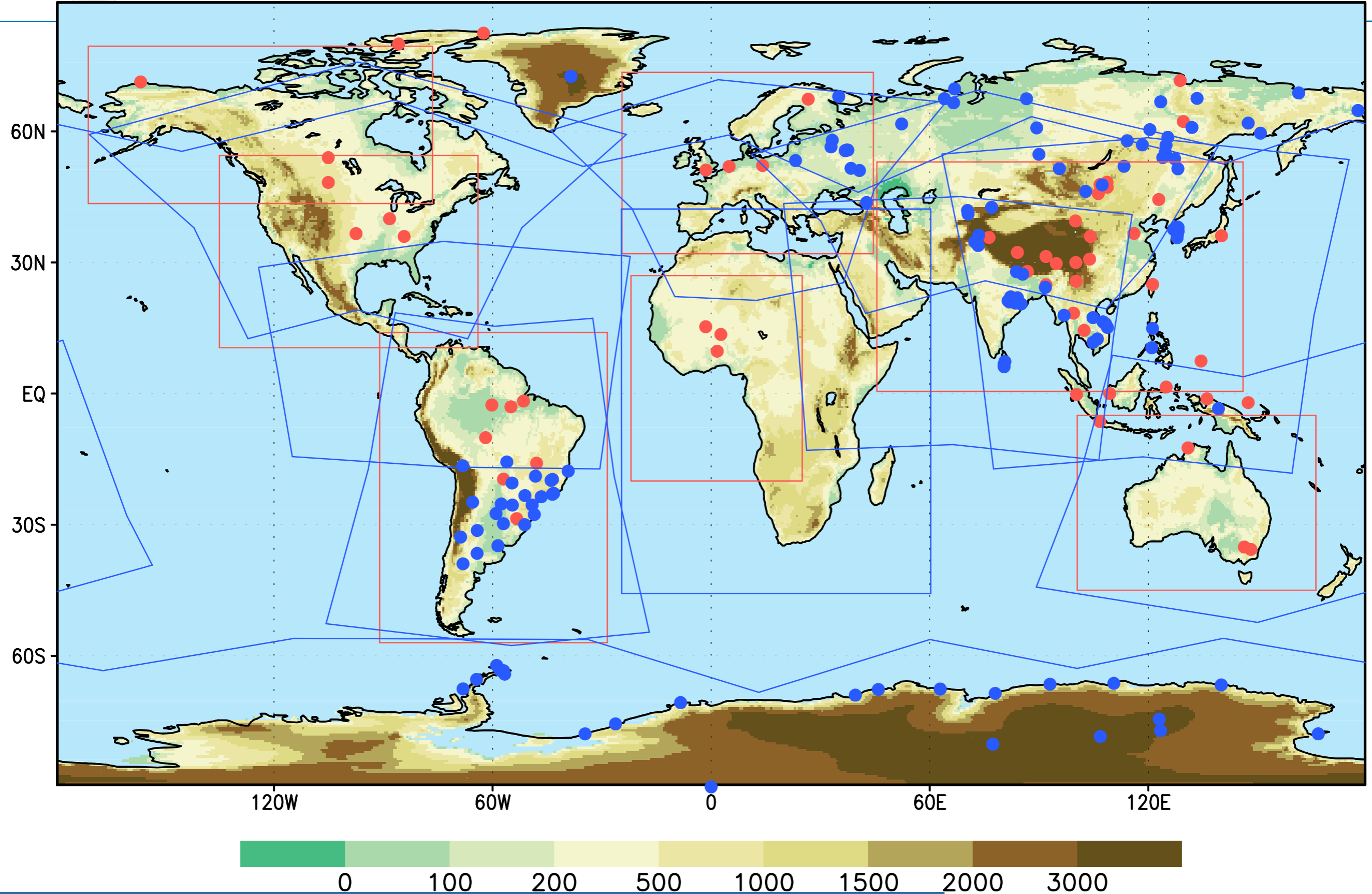
courtesy: W. J. Gutowski Jr.

CORDEX experiment design
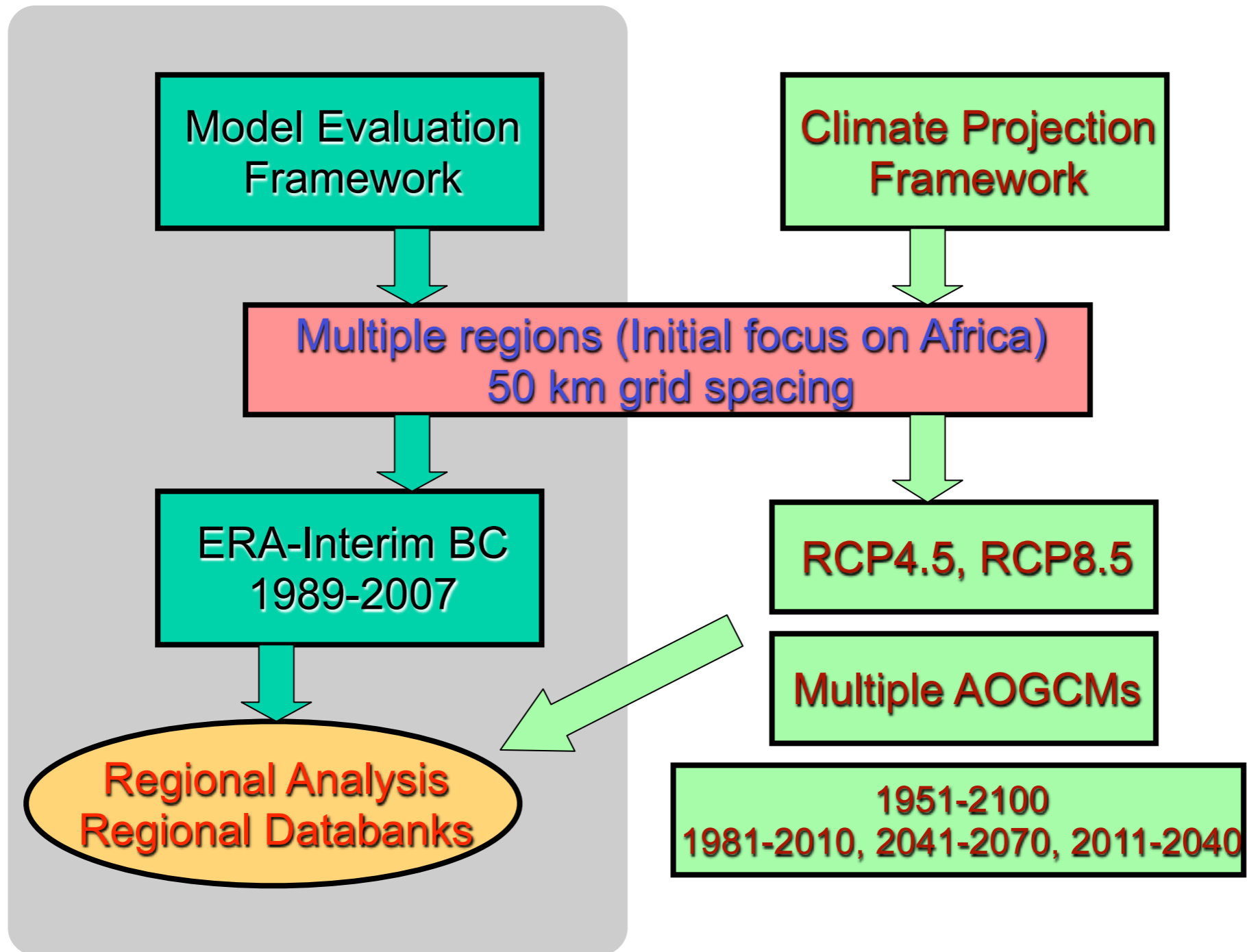
ICTS - CORDEX Domains
CEOP1 - CEOP2 MOLTS
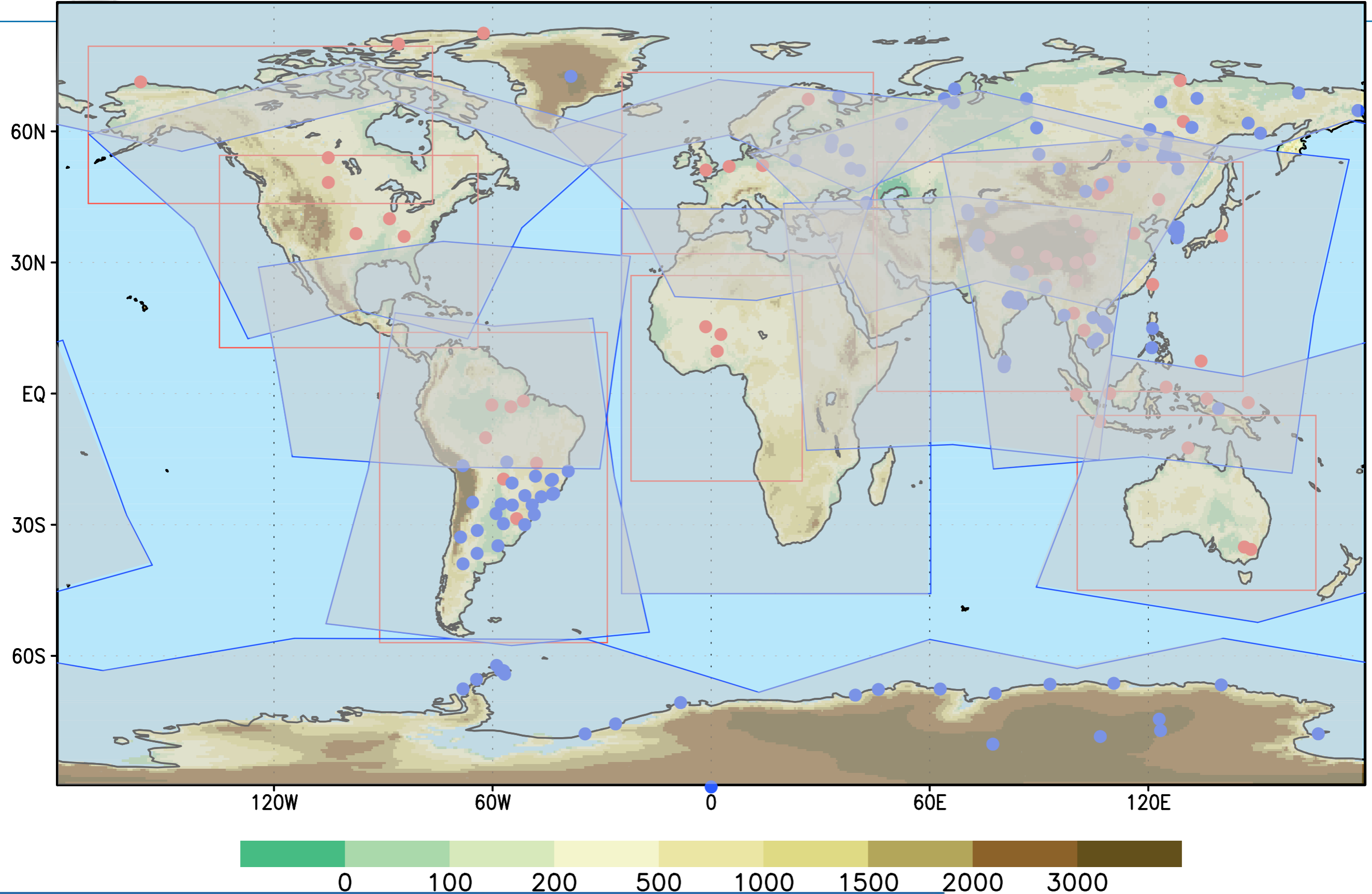
ERA-Interim as boundary conditions

fits perfectly in ICTS objective No.3

Domains not exactly the same as in ICTS Phase 1

but CEOP reference sites and RHP catchment areas covered

Only gridded data in CORDEX archives

MOLTS for CEOP to be extracted from 3h gridded data

Open Items/Issues

Model Data Analysis

CORDEX Domain	RHP	
North America	CPPA	B. Gutowski
South America	LBA/LPB	
Europe	BALTEX	B. Rockel
Caribbean		
Africa	AMMA	
SW-Asia	MAHASRI	
SE-Asia	MAHASRI	
N-Asia	NEESPI	
Austalia/NewZealand	MDB	J. Evans
Arctic		
Antarctic		

CMIP and CORDEX: netCDF CF

Data Format

CMIP and CORDEX: netCDF CF

NARCCAP, PRUDENCE, ENSEMBLES: netCDF CF

CMIP and CORDEX: netCDF CF

NARCCAP, PRUDENCE, ENSEMBLES: netCDF CF

NCEP-RA: netCDF (CF ?)

CMIP and CORDEX: netCDF CF

NARCCAP, PRUDENCE, ENSEMBLES: netCDF CF

NCEP-RA: netCDF (CF ?)

ECMWF: netCDF (CF) optional

CMIP and CORDEX: netCDF CF

NARCCAP, PRUDENCE, ENSEMBLES: netCDF CF

NCEP-RA: netCDF (CF ?)

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CEOP global model data
- gridded: netCDF CF (MAC)
- MOLTS: netCDF CF

Data Format

CMIP and CORDEX: netCDF CF

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- gridded: netCDF CF (MAC)
- MOLTS: netCDF CF

CEOP regional model data
- ICTS (gridded and MOLTS): netCDF CF

Data Format

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NARCCAP, PRUDENCE, ENSEMBLES: netCDF CF

NCEP-RA: netCDF (CF ?)

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CEOP global model data
- gridded: netCDF CF (MAC)
- MOLTS: netCDF CF

CEOP regional model data
- ICTS (gridded and MOLTS): netCDF CF

Proposal:

Data Format

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CEOP global model data

- gridded: netCDF CF (MAC)
- MOLTS: netCDF CF

CEOP regional model data

- ICTS (gridded and MOLTS): netCDF CF

Proposal:

All CEOP data, Obs (RefSites, Satellite, gridded products) and model data in netCDF CF (either stored or optional)

Data Format

CMIP and CORDEX: netCDF CF

NARCCAP, PRUDENCE, ENSEMBLES: netCDF CF

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CEOP global model data
- gridded: netCDF CF (MAC)
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CEOP regional model data
- ICTS (gridded and MOLTS): netCDF CF

Proposal:

All CEOP data, Obs (RefSites, Satellite, gridded products) and model data in netCDF CF (either stored or optional)

Regional high resolution data sets (<10 km) for E&W components
What can RHP´s provide?