Regional Climate Models

- ICTS (Burkhardt Rockel)
- SIEVE (Raymond Arritt)
- CEOP/GMPP Connection (Colin Jones)
- Coordinating connections to RCM world in- and outside of CEOP

ICTS Participants

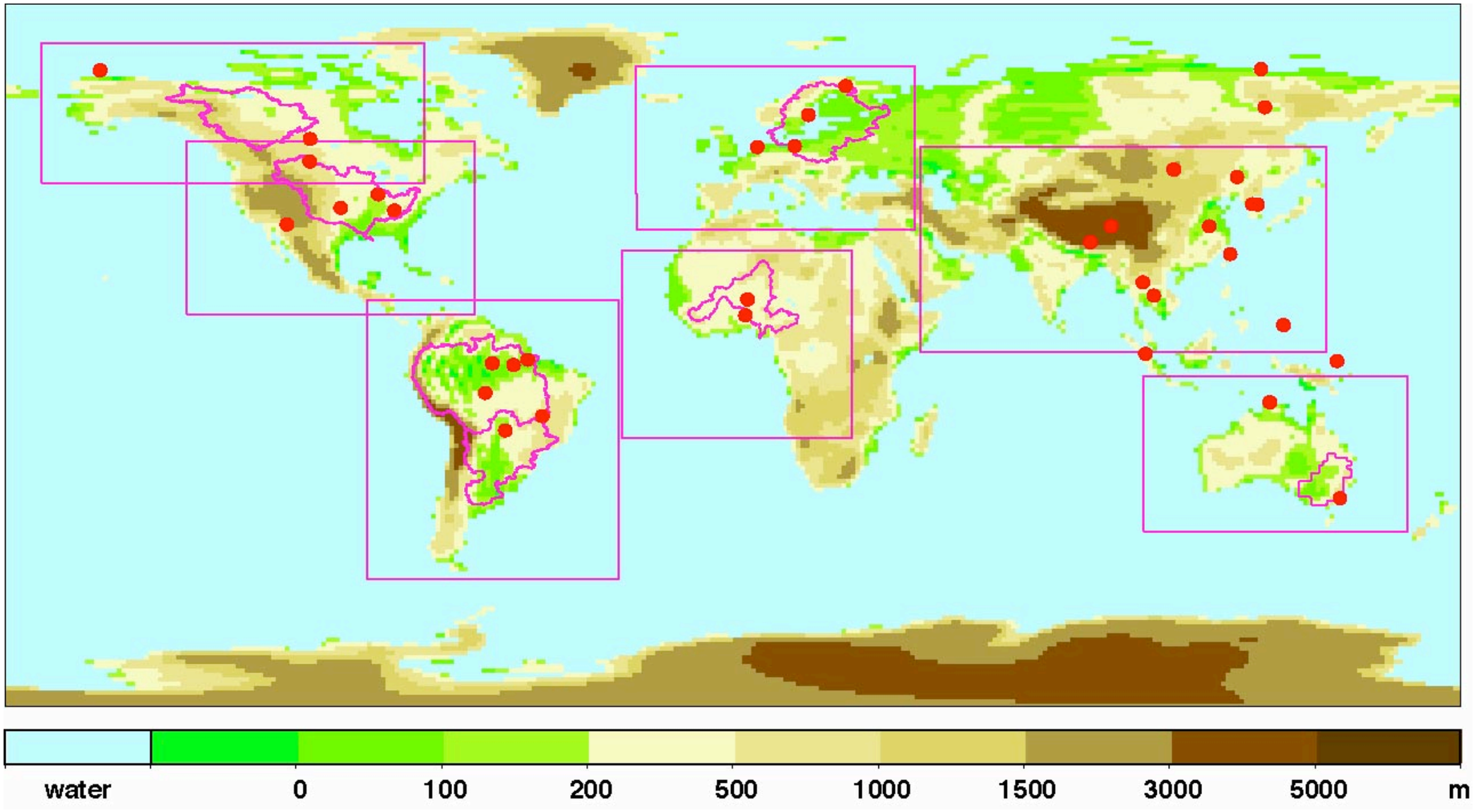
- **CLM** (Climate version of the "Lokalmodel") / GKSS, Europe
- **RSM** (Regional Spectral Model) / ECPC, N-America
- **RegCM3** (Regional Climate Model) / ISU, N-America / Europe
- **MM5** (Mesoscale-Model) / ISU, N-America
- **GEM-LAM** (Global Environmental Multiscale Limited Area Model) / RPN/MSC and UQ, N-America
- **CRCM** (Canadian Regional Climate Model) / OURANOS, N-America
- **RCA3** (Rossby Centre Atmosphere version 3) / SMHI, Europe

- **C-CAM** (Conformal Cubic Atmospheric Model) / CSIRO, Australia

5 year period 2000-2004

- MOLTS at Reference Site Locations
  - One grid box plus eight adjacent ones
  - up to 44 parameters
  - 3h temporal resolution (optional 1h)
- 2D Fields
  - Common grid
  - up to 36 parameters
  - 1d temporal resolution

Common areas with common grid (0.5 degrees)



ICTS Data Status

- Data upload in CEOP model data archive at WDCC
  - http://www.mad.zmaw.de/projects-at-md/ceop/
- Parameters stored
- http://icts.gkss.de
- Summary

ICTS Data Status

M&D Modelle & Daten

MODEL & DATA

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Navigation

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CEOP - Coordinated Enhanced Observing Period

Coordinated Enhanced Observing Period: overview of available data sets in the CERA Database.

CERA Gateway

M&D provide a special a **CEOP** Gateway to the CERA database with about **5.504 TByte** CEOP-related data.

Additional information

For a complete description of the CEOP-project, data-links and documents please consult the CEOP-homepage.

An overview of available data sets can be found at the offical CEOP data management page.

A documentation of model output is avaiblable from the CEOP Model Output Documentation page.

CEOP

Available data sets in CERA

Data sets included into CERA (as of 06-FEB-2007)

Centre	MOLTS data	GRID data
NCEP	01-DEC-2002 – 31-MAY-2005 CDAS : -	01-OCT-2002 – 31-JUL-2005(1) CDAS: - 01-OCT-2002 – 31-DEC-2002

World Data Center for Climate, Hamburg

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CERA UI Home | WDCC Home

Browse CERA Experiments

Select keyword(s) and/or project

BMRC
climate simulation
CPTEC/INPE
ECMWF
ECPC
ECPCRII
ECPCSFM
GLDAS
ICTS
JMA

Select keyword(s) | Clear selection

CEOP

Select project | Clear selection | Project information

Experiments

CEOP Inter-Continental Transferability Study: daily mean values of Canadian Regional Climate Model (OURANOS, Canada)
CEOP Inter-Continental Transferability Study: daily mean values of Climate version of the DWD "Lokalmodell"
CEOP Inter-Continental Transferability Study: daily mean values of ECPC Regional Spectral Model
CEOP Inter-Continental Transferability Study: daily mean values of Global Environmental Multiscale Limited Area Model
CEOP Inter-Continental Transferability Study: Model Output Location Time Series (MOLTS) data provided by GKSS/CLM
CEOP Inter-Continental Transferability Study: Model Output Location Time Series (MOLTS) data provided by OURANOS/MRCC
CEOP Inter-Continental Transferability Study: Model Output Location Time Series (MOLTS) data provided by RPNMSC/GEMLAM
CEOP Inter-Continental Transferability Study: Model Output Location Time Series (MOLTS) data provided by SMHI/RCA3

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Related CERA entries for MOLTS_RPNMSC_GEMLAM

Show: ☑ Datasets ☑ Dataset groups ☑ Additional info | Sort by: Name Update display

	Name	Type	Progress
☐	RPNMSC_GEMLAM_FE1_001_MLV: Lindenberg	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_001_PLV: Lindenberg	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_001_SFC: Lindenberg	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_002_MLV: Cabauw	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_002_PLV: Cabauw	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_002_SFC: Cabauw	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_003_MLV: Sodankylae	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_003_PLV: Sodankylae	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_003_SFC: Sodankylae	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_004_MLV: Norunda	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_004_PLV: Norunda	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_004_SFC: Norunda	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_005_MLV: Oueme	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_005_PLV: Oueme	dataset	complete, original
☐	RPNMSC_GEMLAM_FE1_005_SFC: Oueme	dataset	complete, original

Related CERA entries for CEOP_ICTS_ECPC_GRID

Show: ☑ Datasets ☑ Dataset groups ☑ Additional info | Sort by: Name Update display

	Name	Type	Progress
☐	ECPC_RSM_FN1_AMMA_ALHFL_S: Latent heat flux at surface	dataset	complete
☐	ECPC_RSM_FN1_AMMA_ASHFL_S: Sensible heat flux at surface	dataset	complete
☐	ECPC_RSM_FN1_AMMA_CLCT: Total cloudiness	dataset	complete
☐	ECPC_RSM_FN1_AMMA_ISOILW: Integrated soil moisture	dataset	complete
☐	ECPC_RSM_FN1_AMMA_LWDOWN_S: Downward longwave radiation at surface	dataset	complete
☐	ECPC_RSM_FN1_AMMA_LWUP_S: Upward longwave radiation at surface	dataset	complete
☐	ECPC_RSM_FN1_AMMA_LWUP_T: Upward longwave radiation at top	dataset	complete
☐	ECPC_RSM_FN1_AMMA_PS: Surface pressure	dataset	complete
☐	ECPC_RSM_FN1_AMMA_QV_2M: 2-meter specific humidity	dataset	complete
☐	ECPC_RSM_FN1_AMMA_SWDOWN_S: Downward shortwave radiation at surf.	dataset	complete
☐	ECPC_RSM_FN1_AMMA_SWDOWN_T: Downward shortwave radiation at top	dataset	complete
☐	ECPC_RSM_FN1_AMMA_SWUP_S: Upward shortwave radiation at surface	dataset	complete
☐	ECPC_RSM_FN1_AMMA_SWUP_T: Upward shortwave radiation at top	dataset	complete
☐	ECPC_RSM_FN1_AMMA_TOT_PREC: Precipitation	dataset	complete
☐	ECPC_RSM_FN1_AMMA_T_2M: 2-meter temperature	dataset	complete

ICTS Data Status

ICTS
Inter-Continental Transferability Study

- Home
- Model Simulations
  - Set Up
  - Domains
  - Status
    - MOLTS
    - GRID
- Participants
- Related Projects
- Publications

MOLTS

X = available through the CEOP model data archive

Parameter	*Description*	*Units*	*C-CAM*	*CLM*	*CRCM*	*GEM-LAM*	*MM5*
AEVAP_S	Evaporation at surface	kg m-2		X	X	X	
ALHFL_S	Latent heat flux at surface	W m-2		X	X	X	
ASHFL_S	Sensible heat flux at surface	W m-2		X	X	X	
ASMHFL	surface snow melt heat flux	W m-2			X		
ASODW_S	Downward shortwave radiation at surface	W m-2		X	X	X	
ASODW_T	Downward shortwave radiation at top	W m-2			X	X	
ASOUP_S	Upward shortwave radiation at surface	W m-2		X	X	X	
ASOUP_T	Upward shortwave radiation at top	W m-2		X	X	X	
ATHDW_S	Downward longwave radiation at surface	W m-2		X	X	X	
ATHUP_S	Upward longwave radiation at surface	W m-2		X	X	X	
ATHUP_T	Upward longwave radiation at top	W m-2		X	X	X	
CLCT	Total cloudiness	0-1		X	X	X	
DZ_PBL	atmosphere boundary layer thickness	m		X			
H500	500hPa height	m					
LCL	Lifting condensation level	m				X	

Home > Model Simulations > Status > MOLTS >

ICTS
Inter-Continental Transferability Study

Data on Common Grid

X = available through the CEOP model data archive

Parameter	*Description*	*Units*	*C-CAM*	*CLM*	*CRCM*	*GEM-LAM*	*MM5*	*R*
AEVAP_S	Evaporation at surface	kg m-2		X	X	X		
ALHFL_S	Latent heat flux at surface	W m-2		X	X	X		
ASHFL_S	Sensible heat flux at surface	W m-2		X	X	X		
ASMHFL	surface snow melt heat flux	W m-2			X	X		
ASODW_S	Downward shortwave radiation at surface	W m-2		X	X	X		
ASODW_T	Downward shortwave radiation at top	W m-2		X	X	X		
ASOUP_S	Upward shortwave radiation at surface	W m-2		X	X	X		
ASOUP_T	Upward shortwave radiation at top	W m-2		X	X	X		
ATHDW_S	Downward longwave radiation at surface	W m-2		X	X	X		
ATHUP_S	Upward longwave radiation at surface	W m-2		X	X	X		
ATHUP_T	Upward longwave radiation at top	W m-2		X	X	X		
CLCT	Total cloudiness	0-1		X	X	X		
DZ_PBL	atmosphere boundary layer thickness	m		X		X		
H500	500hPa height	m			X	X		
LCL	Lifting condensation level	m						
PMSL	Mean Sea Level Pressure	hPa		X	X	X		
PS	Surface pressure	hPa		X	X	X		

ICTS Summary of current status and future activities

- Present (remaining for CEOP1)
  - Compilation of surface characteristics of models at reference sites on the ICTS homepage (in progress)
  - Paper on ICTS in general (in progress)
  - Data analysis (ongoing, also in CEOP2)

- Future (possible items in CEOP2)
  - different boundary conditions (LBCs)
  - variable set up
  - higher resolution
  - enhanced simulation period (beyond 2004 i.e. for CEOP2, 10 years)
  - revision of output parameter list
  - additional region
  - update with new model versions
  - additional MOLTS

Scale Interactions in Variability and Extremes (SIEVE)

- What are the important **scale interaction** processes that link regional variability and extremes to large-scale variability?
  - regional manifestations of large-scale variability, e.g., ENSO and PDO
  - long runs to capture feedbacks and land memory effects (per GEWEX Objective 2)
  - transferability and generality of models

Scale Interactions in Variability and Extremes (SIEVE)

- Transferability and generality of models:
  - Are there regimes or locations where models and parameterizations need improvement in order to capture important scale interaction processes? (per GEWEX Objective 3)

CEOP/GMPP Connection

- Regional Models are used both in CEOP and GMPP
  - CEOP: Verification, Description/Quantification of the EW cycle on the regional scale
  - GMPP: Verification, Case Studies, Parameterizations for Climate and NWP models

Coordination

- Many regional climate experiments are ongoing, planned, or have been done.
- There has been little coordination amongst these experiments:
  - Not easy to find out what results are available.
  - Models and experiments do not use consistent formats for output.
  - This limits usefulness to analysts, climate impacts scientists, and scientists in related fields (e.g., hydrologists).

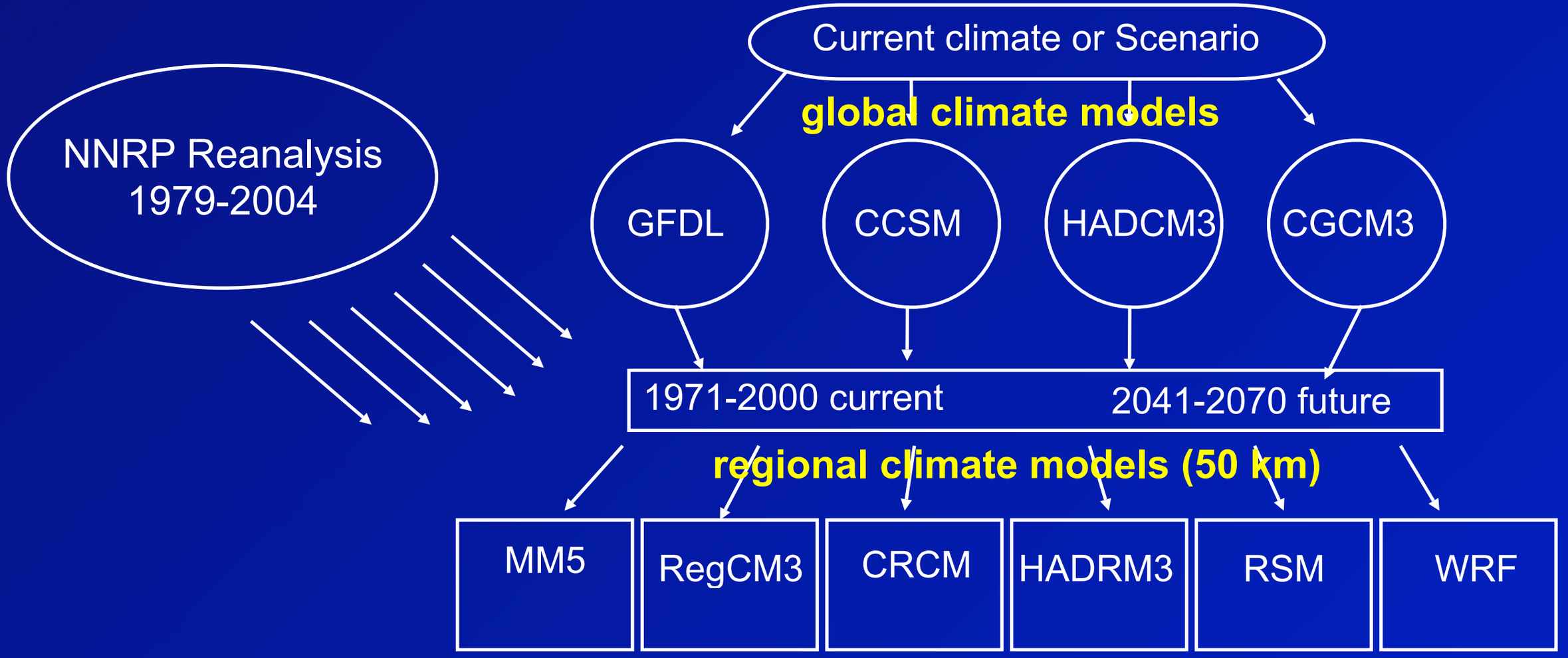
Coordination

- Registry: Who is doing what; where to obtain output. („One stop shopping list“ S.W.)
- Propose a common output format for regional models:
  - Inspired by highly successful AOGCM output coordination for IPCC AR4.
  - Draw on lessons learned in regional experiments, e.g., PRUDENCE, NARCCAP, ENSEMBLES.

North American Regional Climate Change Assessment Program (NARCCAP)

- Phase I: RCMs simulate 1979-2004 driven by reanalysis.
- Phase IIa: RCMs driven by AOGCM 20th century (1971-2000).
- Phase IIb: RCMs driven by AOGCM SRES A2 (2041-2070)

Phase 1 Phase 2



ENSEMBLES Hindcasting (Phase 1)

- Hindcasting of RCMs with ERA40 as driving reanalysis
- 50km and 25km for 1961-2000
- HadCM3, REMO5.7, ALADIN, HIRHAM3, HIRHAM4, CLM3, RACMO, RegCM3, RCA3, PROMES, MRCC
- Purposes:
  - general model reliability assessment
  - development of model weighting procedures

ENSEMBLES Model Simulation Matrix (Phase 2)

Regional Climate Model Resolution 25 km for 1950-2050/2100 A1B (red=funded, blue=voluntarily)

		METO-HC	MPIMET	IPSL	CNRM	NERSC	HadCM3.a	HadCM3.b
HadRM3.0	METO-HC							
REMO 5.7	MPIMET							
ALADIN	CNRM							
ALADIN	CMHI							
HIRHAM5	DMI							
HIRHAM4	met.no							
CLM3	ETHZ							
CLM3	GKSS							
CLM3	JRC							
RACMO	KNMI							
RegCM3	ICTP							
RCA3	SMHI							
RCA3	C4I							
PROMES	UCLM							
HadRM3.a	METO-HC							
HadRM3.b	METO-HC							

ENSEMBLES Data

- All model data (global and regional) are stored in same data format (netCDF CF-Conventions)
  - global model data at WCDC in Hamburg
  - regional model data at DMI in Kopenhagen

Data needs for RCMs from RHP and SRS

- a consistent, homogeneous combined data set covering at least one annual cycle gridded on 0.1 degree or higher
  - 1h temporal resolution
  - CF-netCDF format
  - parameters: surface fluxes, radiation fluxes, near surface atmospheric quantities, cloud cover, liquid water path
  - ranges of uncertainty
- --> high resolution regional analysis
- Consistent treatment of missing data across all sites
- Purpose:
  - Model validation, model improvement, transferability, RCM added value