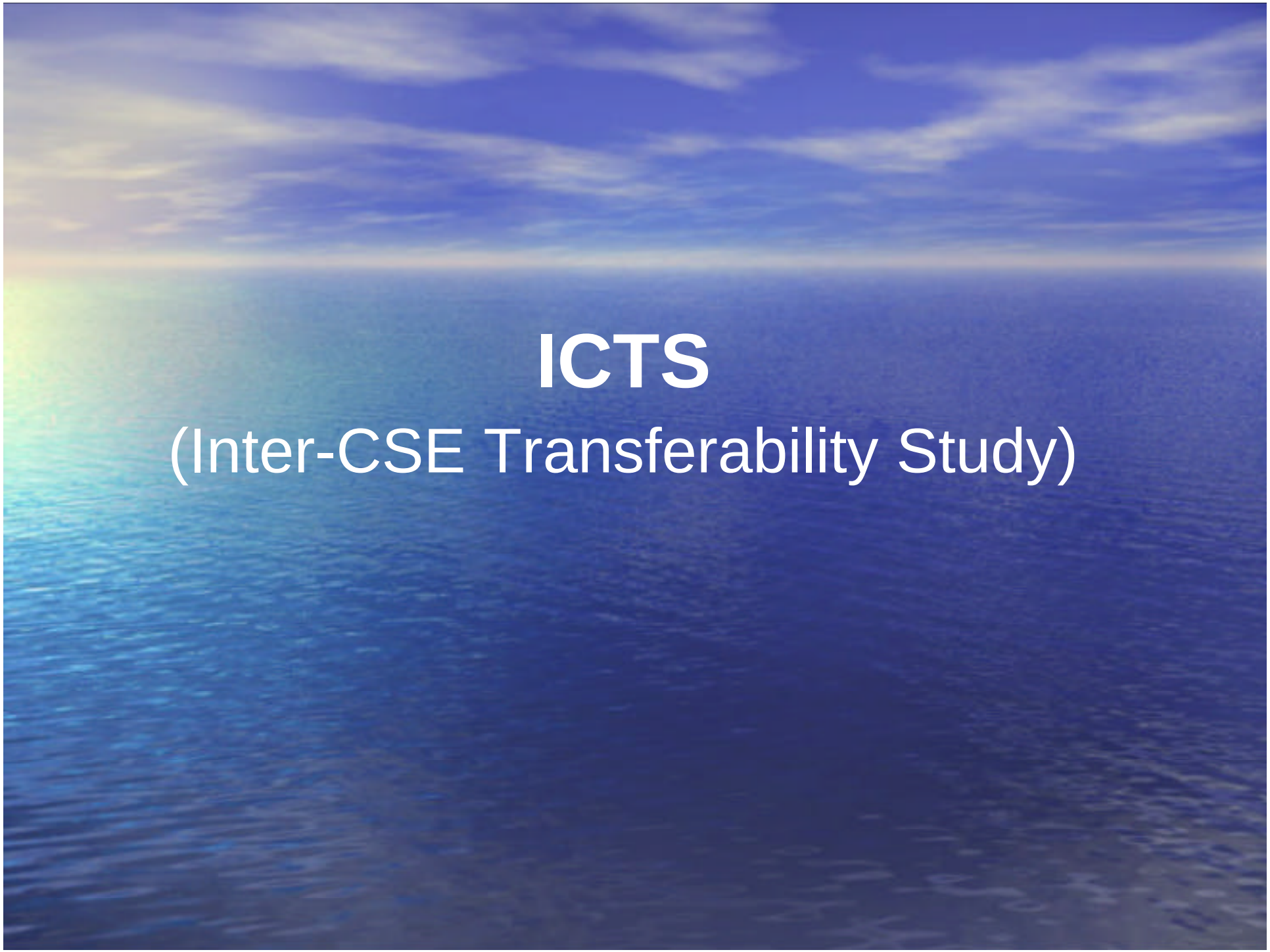

ICTS
(Inter-CSE Transferability Study)

ICTS in the GEWEX Zoo

CEOP Phase 1 time schedule

Year of Activity: 00 01 02 03 04 05 06 07

Planning →

Data Collection →

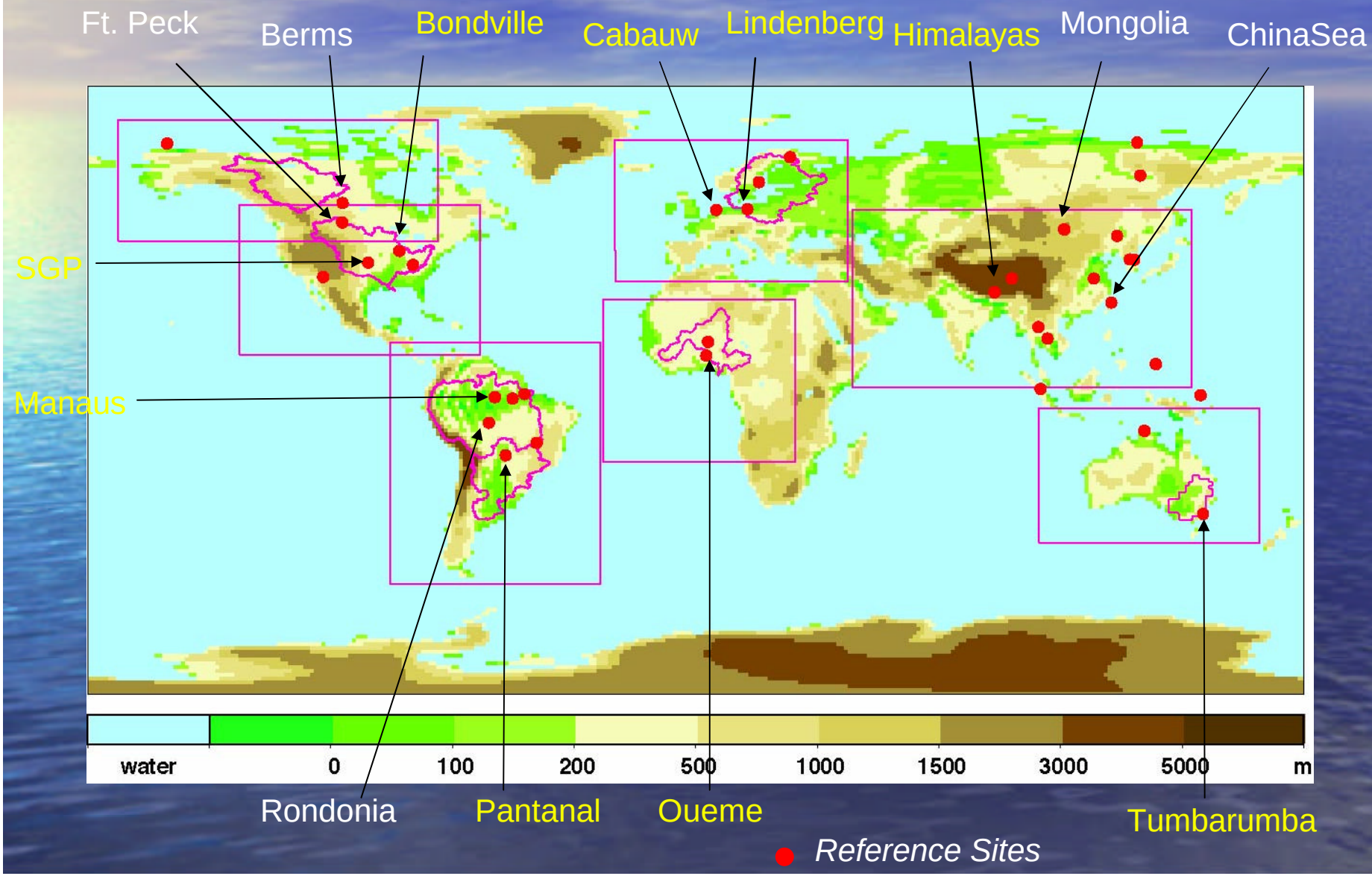
EOPs :

ICTS

- EOP-1 (Seasonal OP) → (1 July - 30 Sept 2001)
- EOP-2 (Build-up OP) → (1 Oct 2001 - 30 Sept 2002)
- EOP-3 (Annual Cycle OP) → (1 Oct 2002 - 30 Sept 2003)
- EOP-4 (Water & Energy OP) → (1 Oct 2003 - 31 Dec 2004)

Primary Focus 2 Annual Cycle Data Set (2003 Š 2004)

Model areas (transformed)



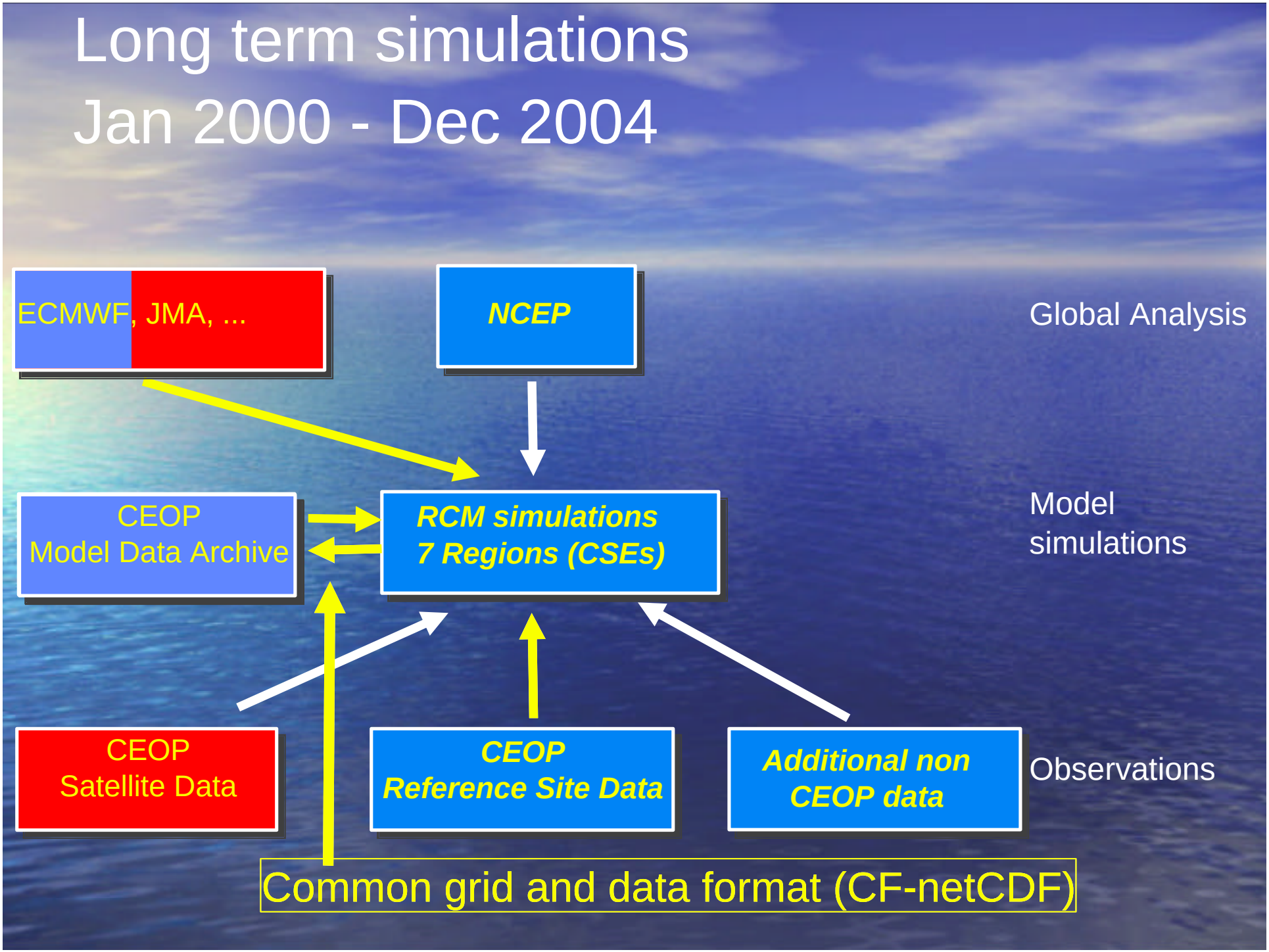
Regional climate models involved so far

status: 2004 2005

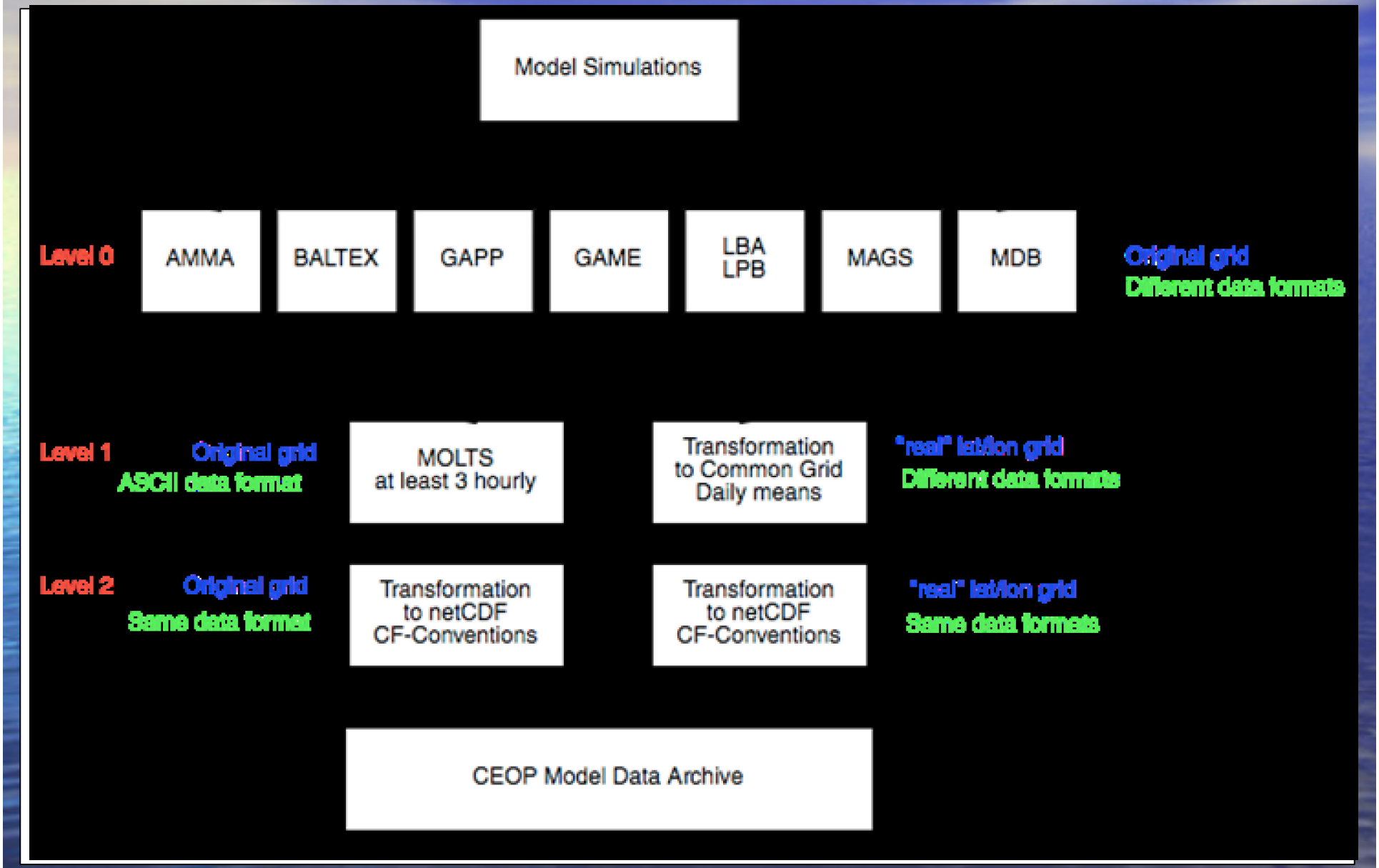
- **CLM** (Climate version of the “Lokalmodel **“)** / GKSS, BALTEX
- **RSM** (Regional Spectral Model) / ECPC, GAPP
- **RegCM3** (Regional Climate Model) / ISU, GAPP
- **MM5** (Mesoscale-Model) / ISU, GAPP
- **GEM-LAM** (Global Environmental Multiscale Limited Area Model) / RPN/MSC and UQ, MAGS
- **CRCM**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

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

Long term simulations
Jan 2000 - Dec 2004



Data flow of model simulations



MOLTS Data from RCM sims (1)

Area: Reference site grid box and adjacent ones
Output Interval: 3h (1h, if available)
Data period: 2000/01/01 – 2004/12/31
To be stored at: CEOP model data archive
Format: Time series in netCDF CF conventions

9 grid boxes: the grid box that contains the reference site and the 8 adjacent grid boxes

Vertical Profiles, data at model levels

Parameter	Explanation	Unit
T *	temperature	K
U *	U component of wind	m/s
V *	V component of wind	m/s
GPH*	Geopotential height	m^2/s^2
QV *	Specific humidity	kg/kg
QC	Liquid water content of clouds	kg/kg
QI	Ice water content of clouds	kg/kg
CLC	Cloud cover	0-1

Parameters marked by * will also stored on the following pressure levels:
850, 700, 500, 250 hPa

MOLTS Data from RCM sims (2)

2D data (36 Parameters)

CLCT	Total cloudiness
DZ_PBL	atmosphere boundary layer thickness
EVAP_S	Evaporation at surface
H500	500hPa height
IDIV_ENERG	Vert. integrated energy divergence (Total energy: kinetic, enthalpy, potential)
IDIV_WATER	Vert. integrated water divergence
IENERGY	Vert. integrated energy (Total energy:kinetic, enthalpy)
ISOILW	Integrated soil moisture
IWATER	Vert. integrated water content (vapor&cloud)
LCL	Lifting condensation level
PMSL	Mean Sea Level Pressure
PS	Surface pressure
QV_2M	2-meter specific humidity
RHMAX_2M	Maximum 2-meter relative humidity
RHMIN_2M	Minimum 2-meter relative humidity
RUNOFF	Total runoff
T_2M	2-meter temperature
T_SKIN	Skin temperature
TMAX_2M	Maximum 2-meter temp.
TMIN_2M	Minimum 2-meter temp.
TOT_PREC	Precipitation
VABS_10M	10-meter wind speed
VMAX_10M	10-meter max. wind speed
W_SNOW	Surface snow layer water equivalent
SWUP_S	Upward shortwave radiation at surface
SWDOWN_S	Downward shortwave radiation at surface
LWUP_S	Upward longwave radiation at surface
LWDOWN_S	Downward longwave radiation at surface
SWUP_T	Upward shortwave radiation at top
SWDOWN_T	Downward shortwave radiation at top
LWUP_T	Upward longwave radiation at top
SHFL_S	Sensible heat flux at surface
LHFL_S	Latent heat flux at surface
SMHFL	surface snow melt heat flux

Data on common grid from RCM sims

Area: Entire area of each region
Output Interval: daily (mean, accumulated, min/max)
Data period: 2000/01/01 – 2004/12/31
To be stored at: CEOP model data archive
Common grid: geographical lat/lon
Format: Time series in netCDF CF conventions

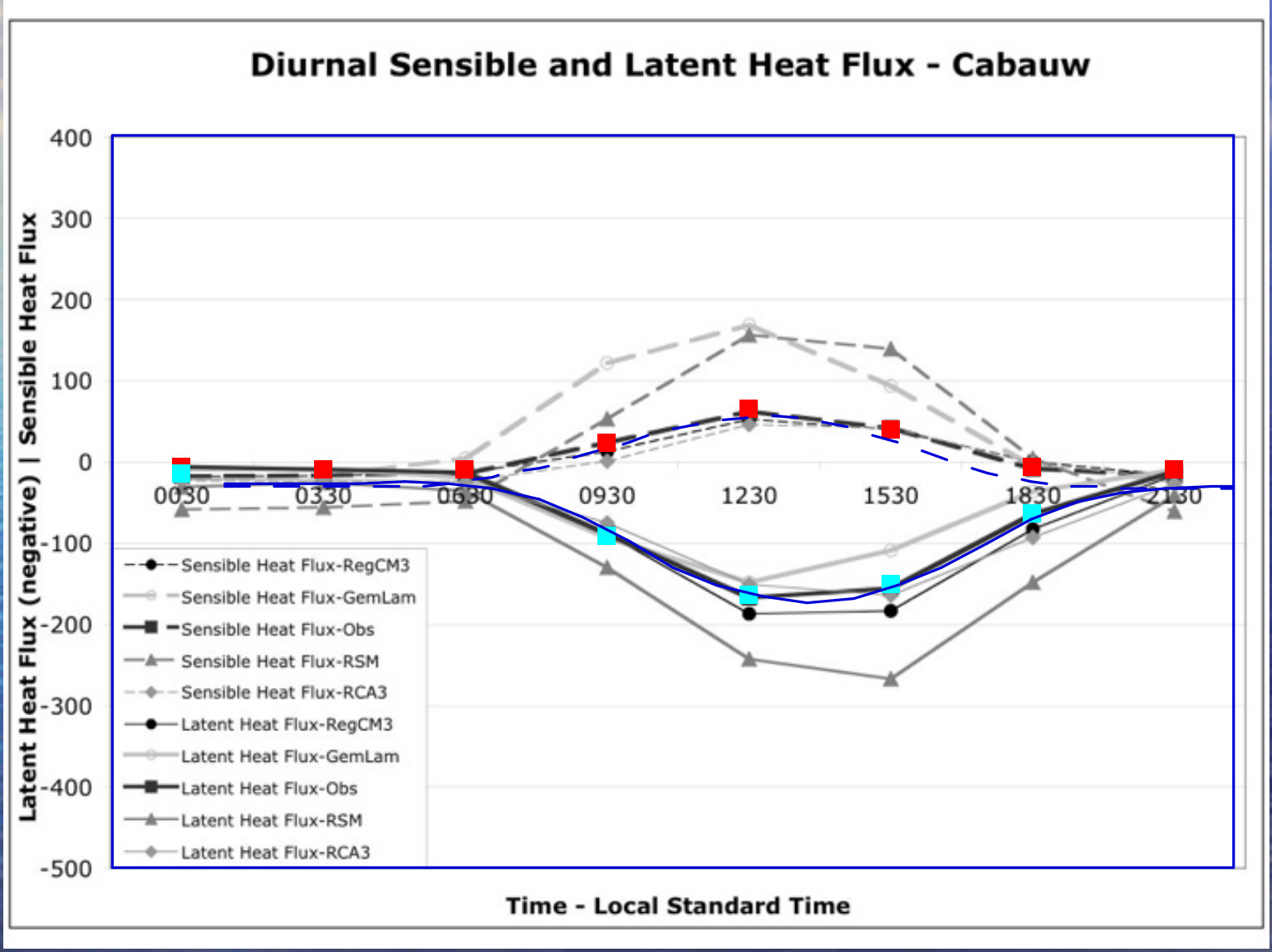
Parameters same as 2D data for MOLTS output

Present status

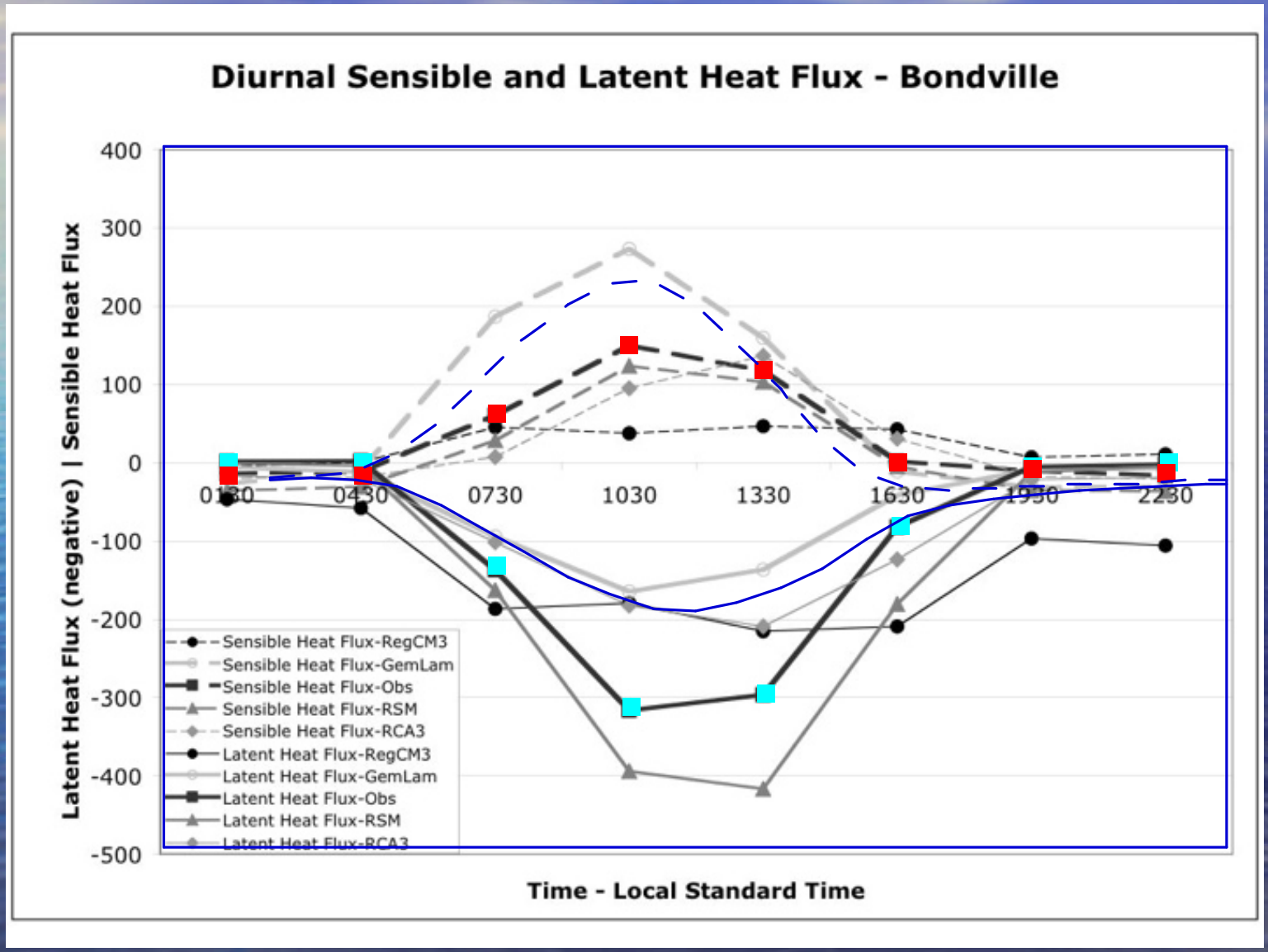
- Participating Institutes (Models): 7
- Models completed simulations: 4
- Models post-processing finished: 2
- Results in CEOP archive: 1


Examples
Diurnal Cycle
CEOP 1

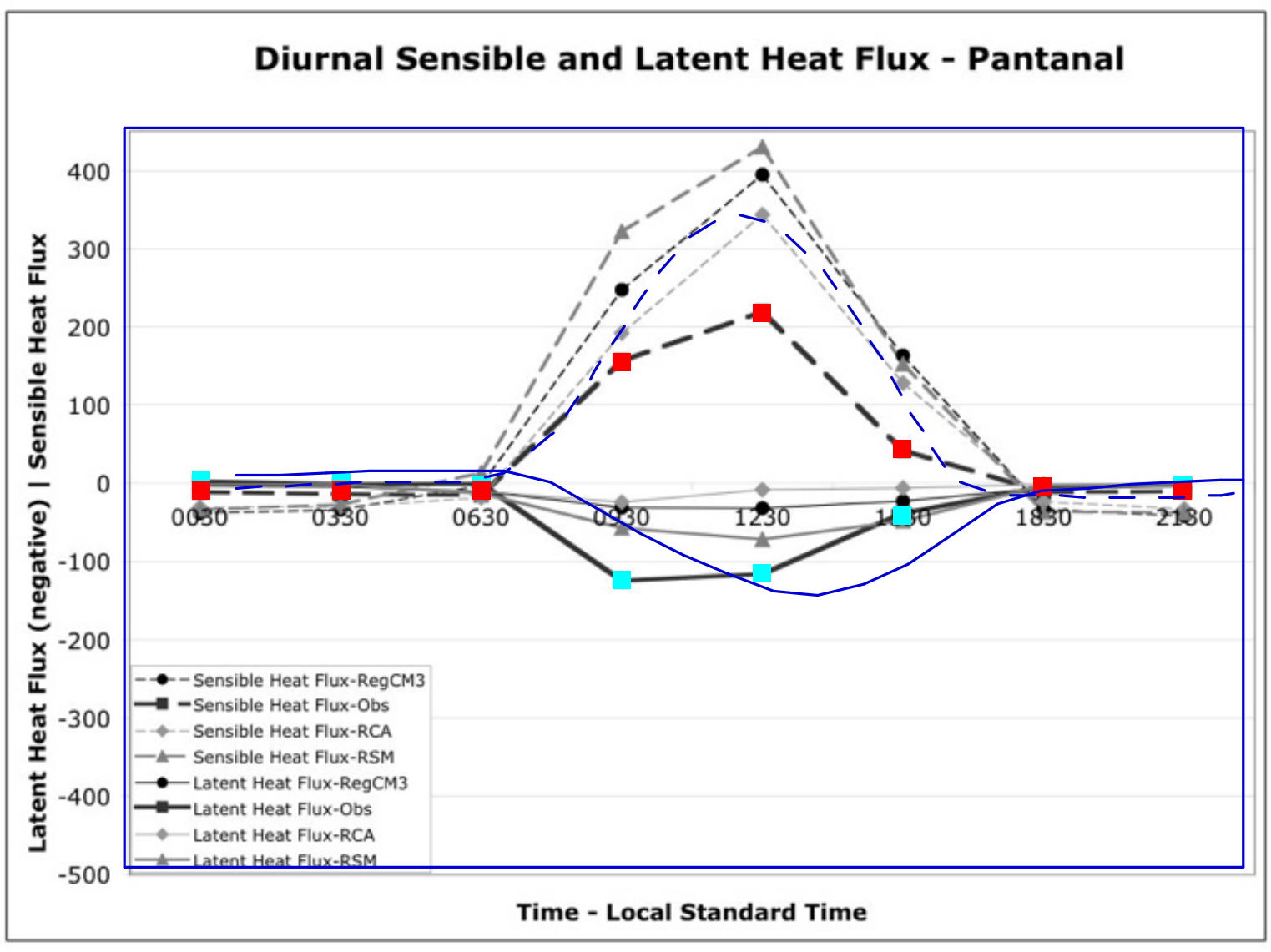
Cabauw (BALTEX)

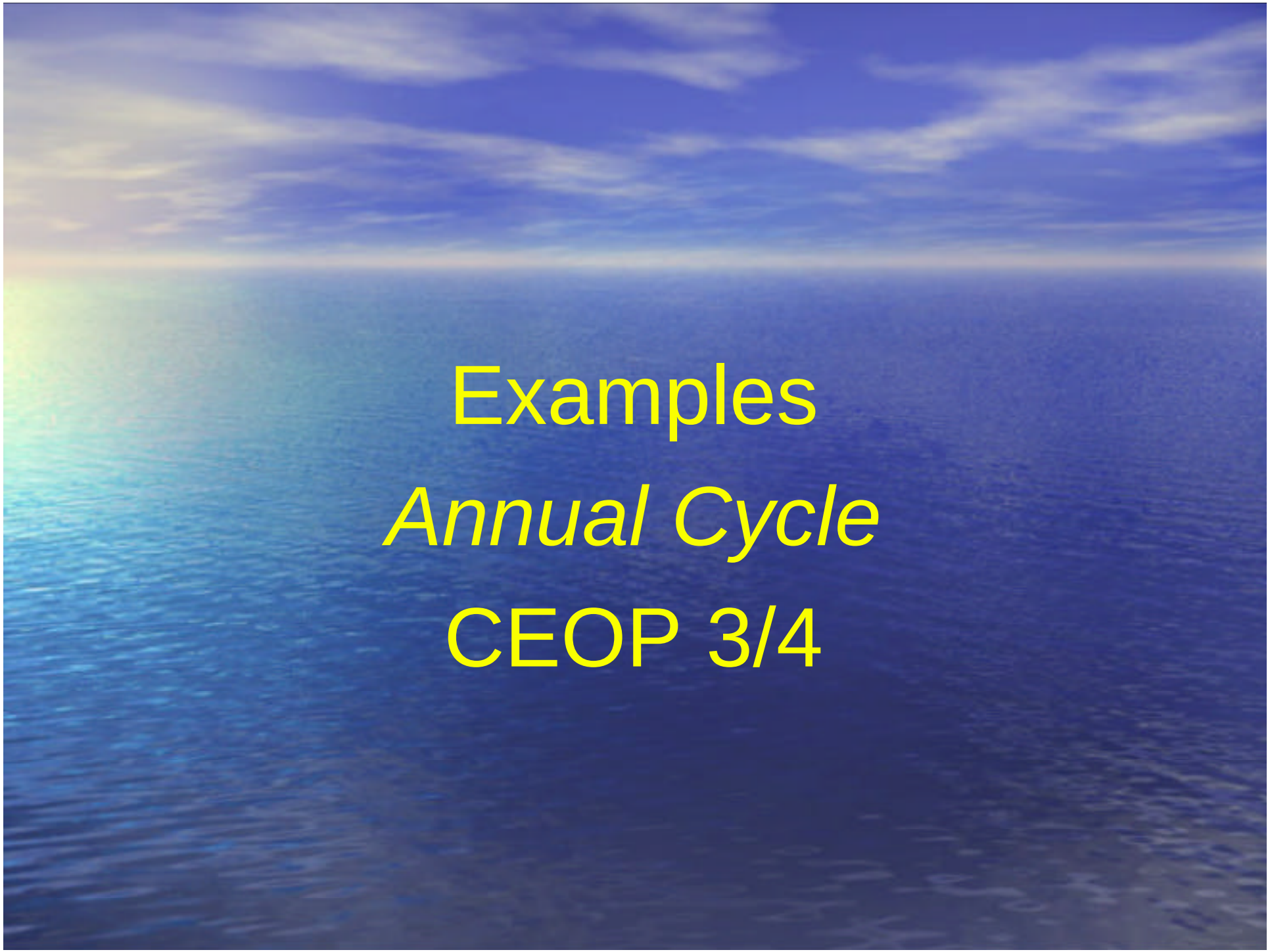


Bondville (GAPP)

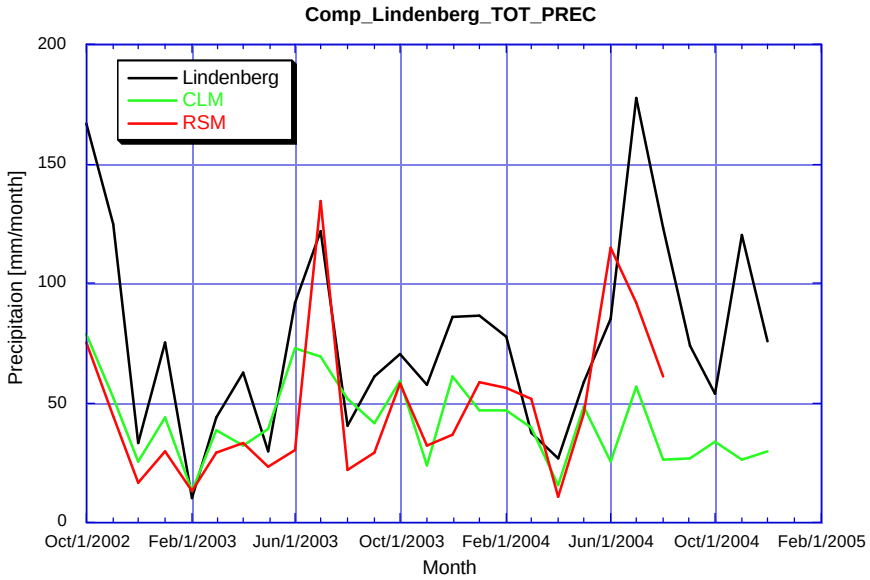


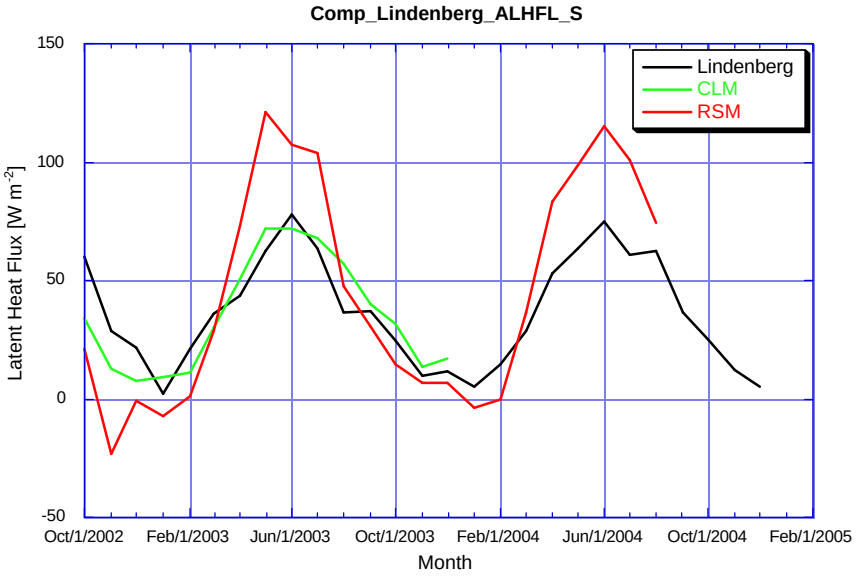
Pantanal (LBA)

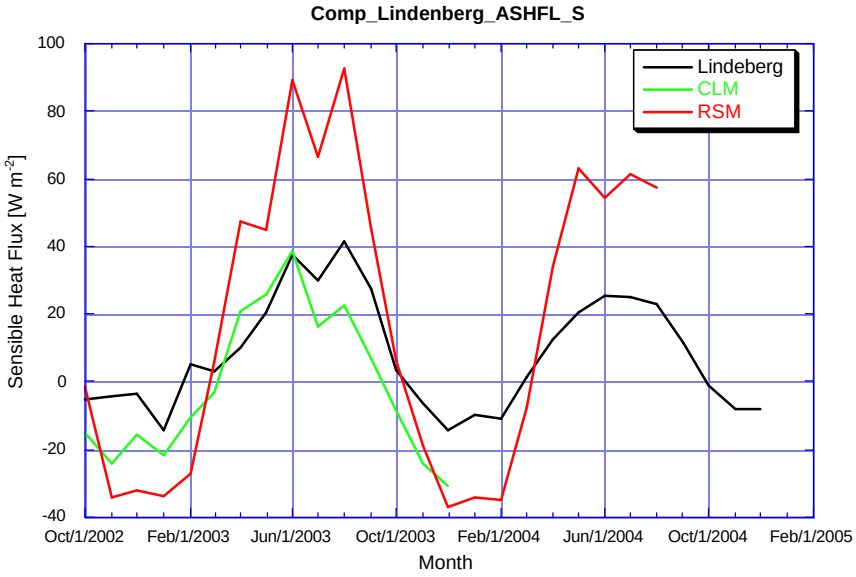



Examples
Annual Cycle
CEOP 3/4

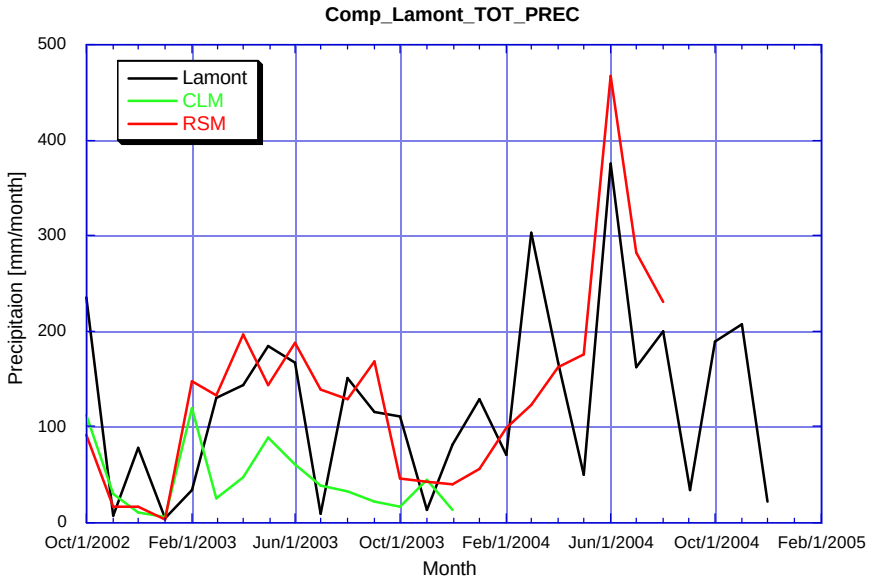
Lindenberg (BALTEX)

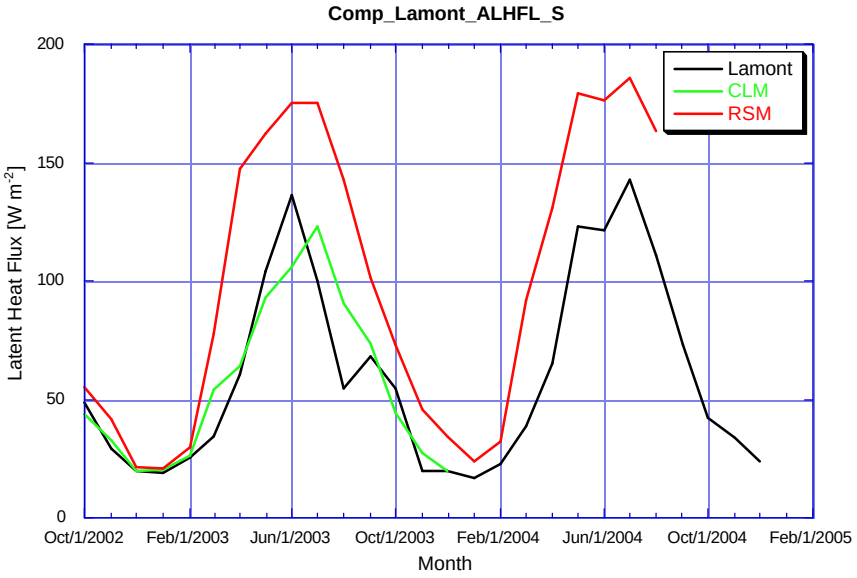


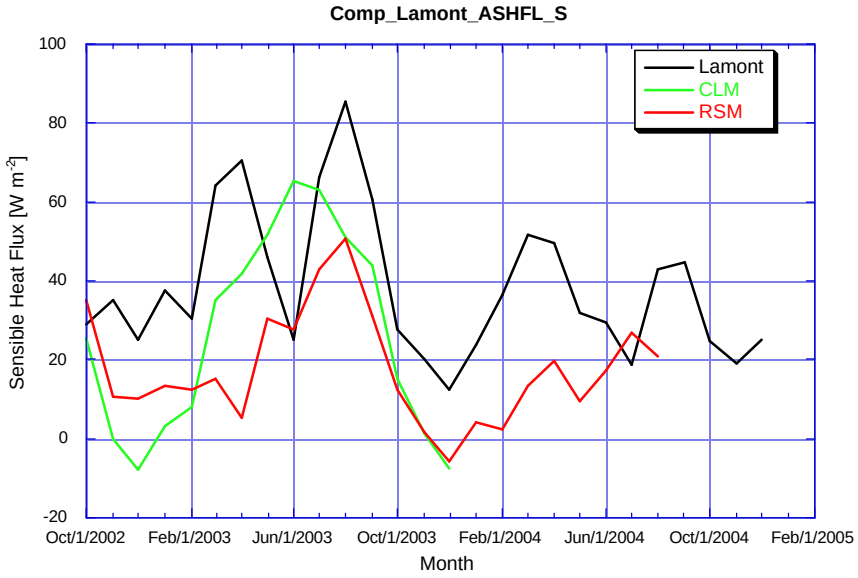




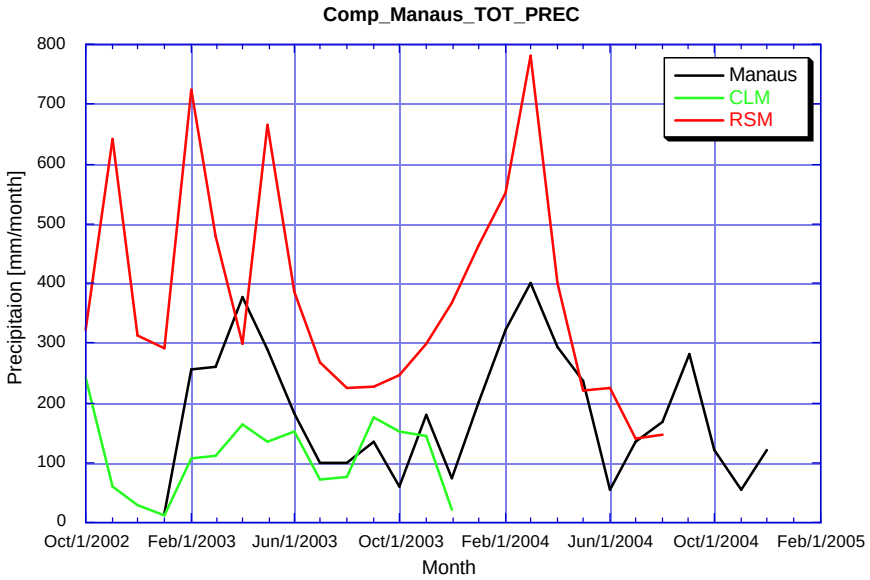
Lamont (GAPP)

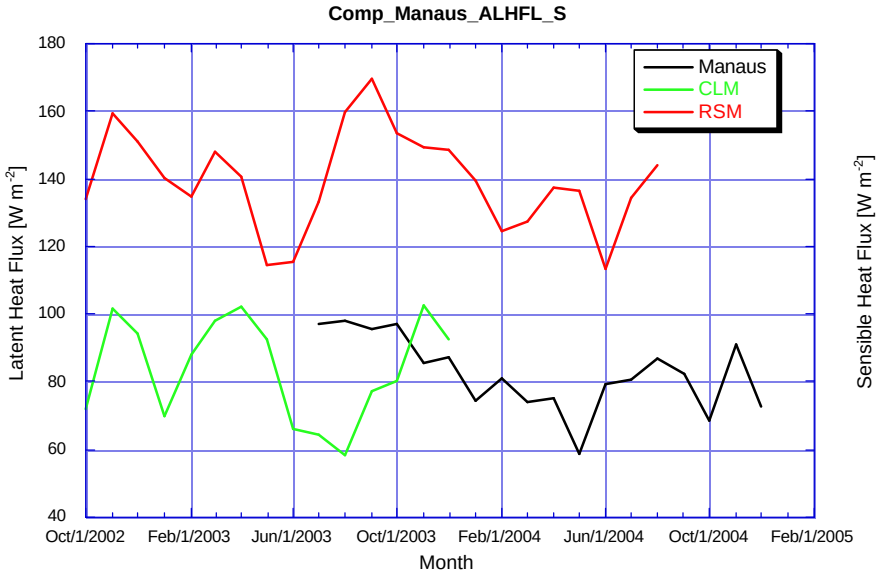

Comp_Lamont_TOT_PREC
Lamont
CLM
RSM
Precipitaion [mm/month]
500
400
300
200
100
0
Oct/1/2002
Feb/1/2003
Jun/1/2003
Oct/1/2003
Feb/1/2004
Jun/1/2004
Oct/1/2004
Feb/1/2005
Month

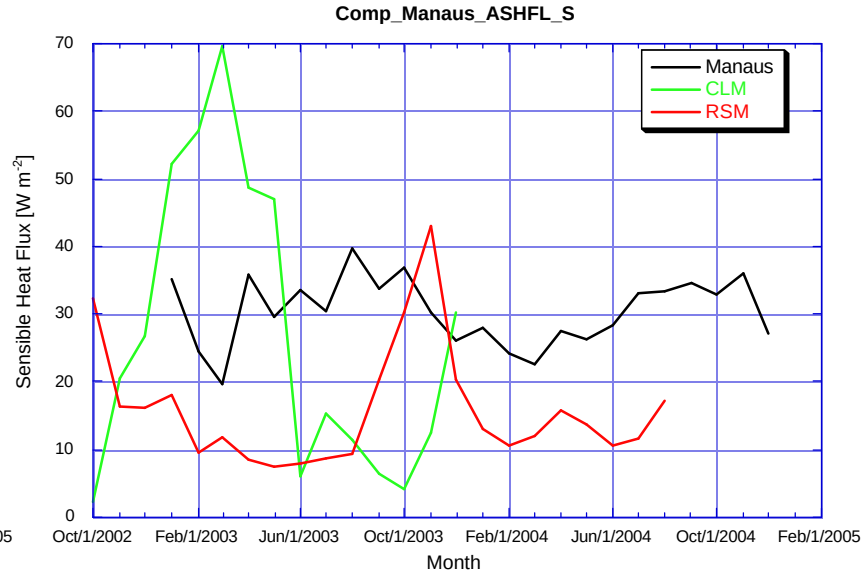

Comp_Lamont_ALHFL_S
Lamont
CLM
RSM
Latent Heat Flux [W m-2]
200
150
100
50
0
Oct/1/2002
Feb/1/2003
Jun/1/2003
Oct/1/2003
Feb/1/2004
Jun/1/2004
Oct/1/2004
Feb/1/2005
Month


Comp_Lamont_ASHFL_S
Lamont
CLM
RSM
Sensible Heat Flux [W m-2]
100
80
60
40
20
0
-20
Oct/1/2002
Feb/1/2003
Jun/1/2003
Oct/1/2003
Feb/1/2004
Jun/1/2004
Oct/1/2004
Feb/1/2005
Month

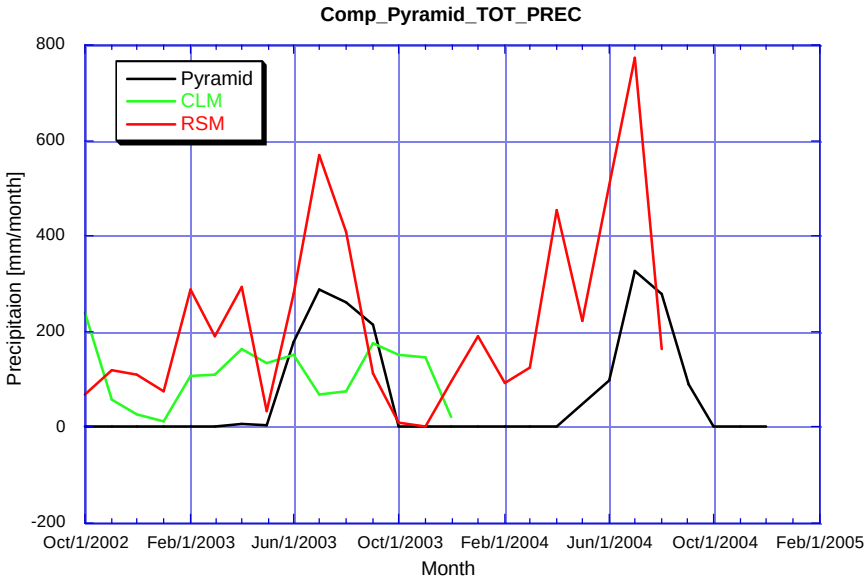
Manaus (LBA)


Comp_Manaus_TOT_PREC
Precipitaion [mm/month]
800
700
600
500
400
300
200
100
0
Manaus
CLM
RSM
Oct/1/2002
Feb/1/2003
Jun/1/2003
Oct/1/2003
Feb/1/2004
Jun/1/2004
Oct/1/2004
Feb/1/2005
Month

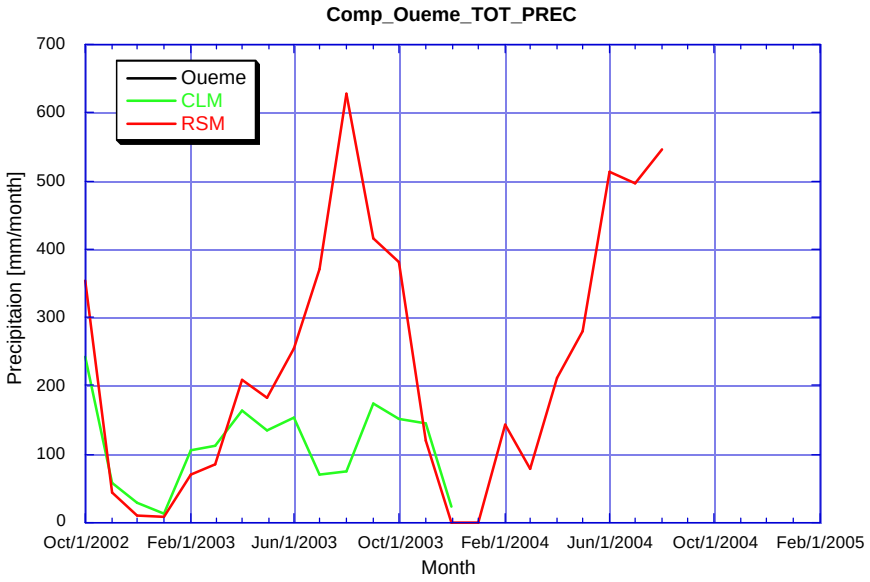

Comp_Manaus_ALHFL_S
Latent Heat Flux [W m-2]
180
160
140
120
100
80
60
40
Manaus
CLM
RSM
Oct/1/2002
Feb/1/2003
Jun/1/2003
Oct/1/2003
Feb/1/2004
Jun/1/2004
Oct/1/2004
Feb/1/2005
Month

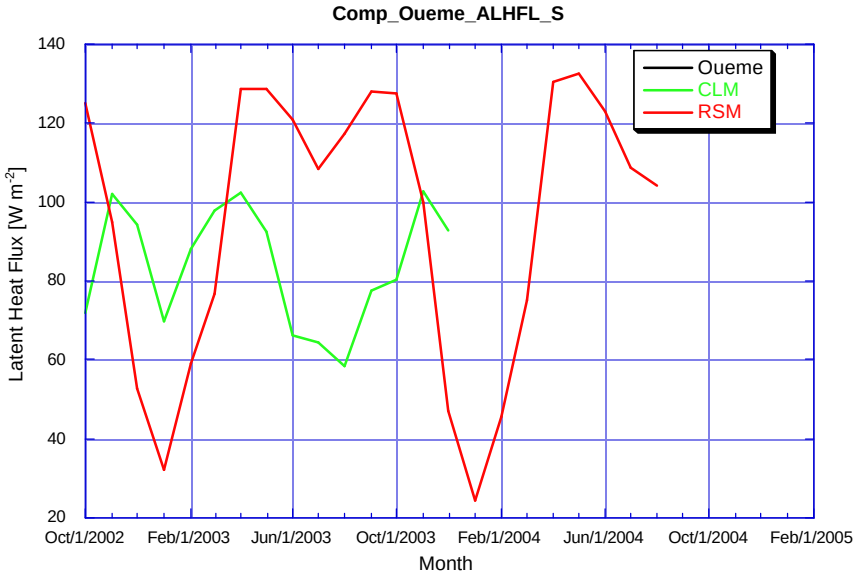

Comp_Manaus_ASHFL_S
Sensible Heat Flux [W m-2]
70
60
50
40
30
20
10
0
Manaus
CLM
RSM
Oct/1/2002
Feb/1/2003
Jun/1/2003
Oct/1/2003
Feb/1/2004
Jun/1/2004
Oct/1/2004
Feb/1/2005
Month

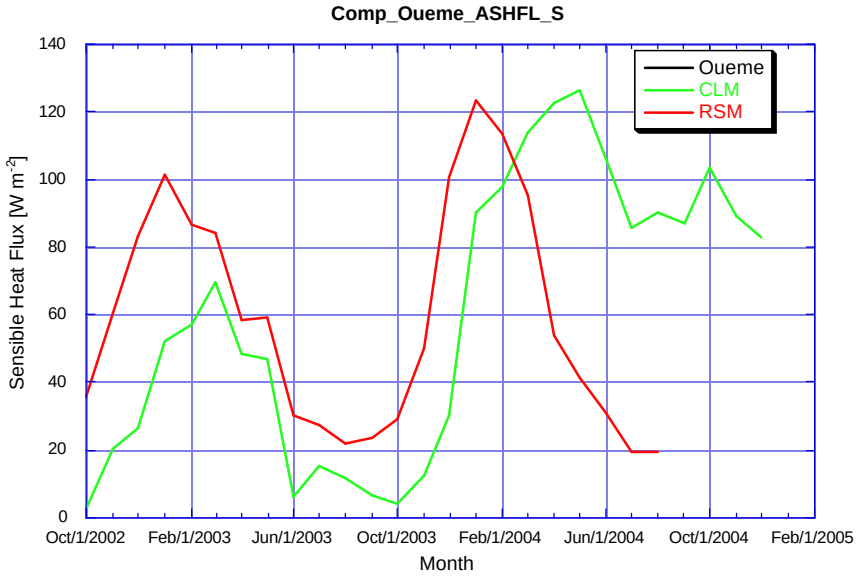
Pyramid (GAME)



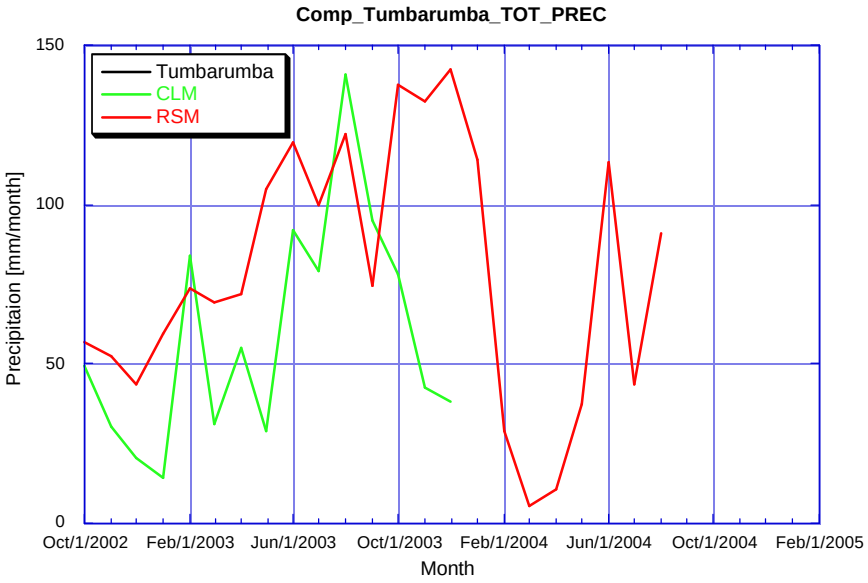
Oueme (AMMA)

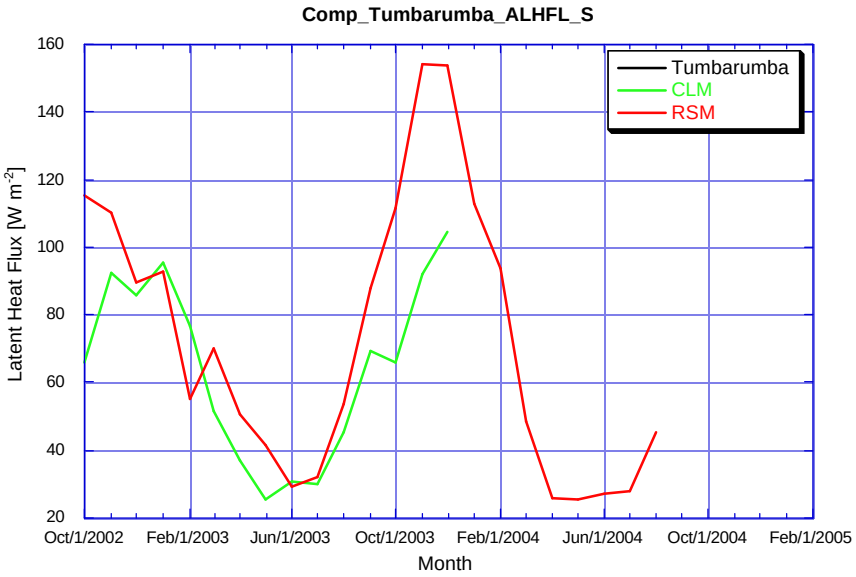

Comp_Oueme_TOT_PREC
Oueme
CLM
RSM
Precipitaion [mm/month]
700
600
500
400
300
200
100
0
Oct/1/2002
Feb/1/2003
Jun/1/2003
Oct/1/2003
Feb/1/2004
Jun/1/2004
Oct/1/2004
Feb/1/2005
Month

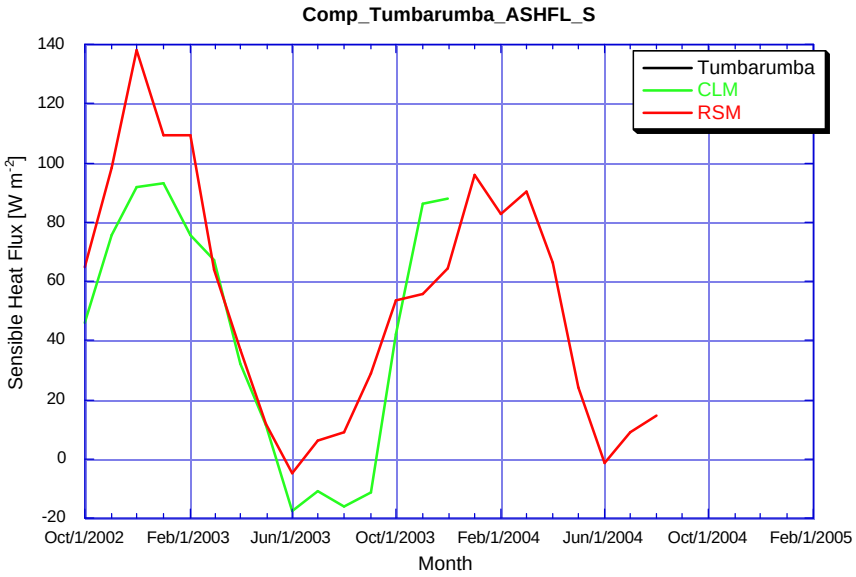

Comp_Oueme_ALHFL_S
Oueme
CLM
RSM
Latent Heat Flux [W m-2]
140
120
100
80
60
40
20
Oct/1/2002
Feb/1/2003
Jun/1/2003
Oct/1/2003
Feb/1/2004
Jun/1/2004
Oct/1/2004
Feb/1/2005
Month


Comp_Oueme_ASHFL_S
Oueme
CLM
RSM
Sensible Heat Flux [W m-2]
140
120
100
80
60
40
20
0
Oct/1/2002
Feb/1/2003
Jun/1/2003
Oct/1/2003
Feb/1/2004
Jun/1/2004
Oct/1/2004
Feb/1/2005
Month

Tumbarumba (MDB)







Outlook

- Finish long term simulations July 1999 - December 2004 with NCEP Global Re-Analysis boundary data.
- Prepare and send results to CEOP model data archive
- Comparison to CEOP reference site, satellite data and global analyis models for two years period 2003/2004