AN EFFORT TO DEVELOPE THE COUPLED WRF BY THE USE OF CPL7

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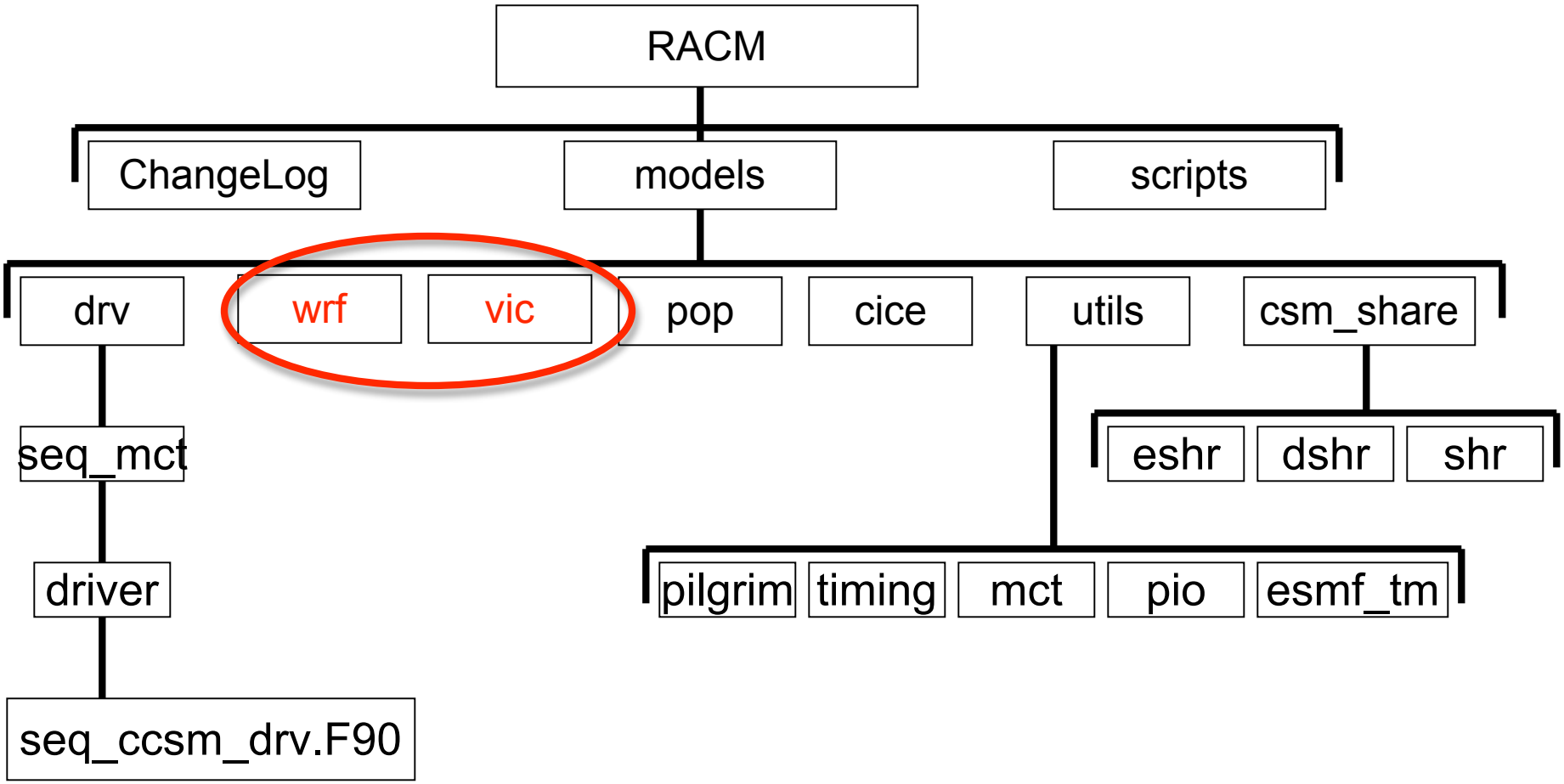
Juanxiong He[1,2] Greg Newby[1] Tony Craig[3] Mark Seefeldt[4]

1. Arctic Region Supercomputing Center, 2. International Arctic Research Center

3. National Center for Atmospheric Research, 4. University of Colorado in Boulder

RACM (Regional Arctic Climate Model) Directory Structure



ccsm4 repository, ccsm4_0_racm03, WRF3.0.1

6.1, John J. Cassano, Thursday

Present status

- Global WRF fully active coupling with POP2, CICE, CLM
- Regional WRF coupling with data model
- Regional WRF coupling with POP2, CICE and land data model
- Merge ESMF time manager of WRF with CCSM4

Example of global WRF full active coupling

- Setting

  WRF 120x60x27, POP2 and CICE 100x116x25, CLM 46x72

  30min for CLM and CICE, 1 day for POP2

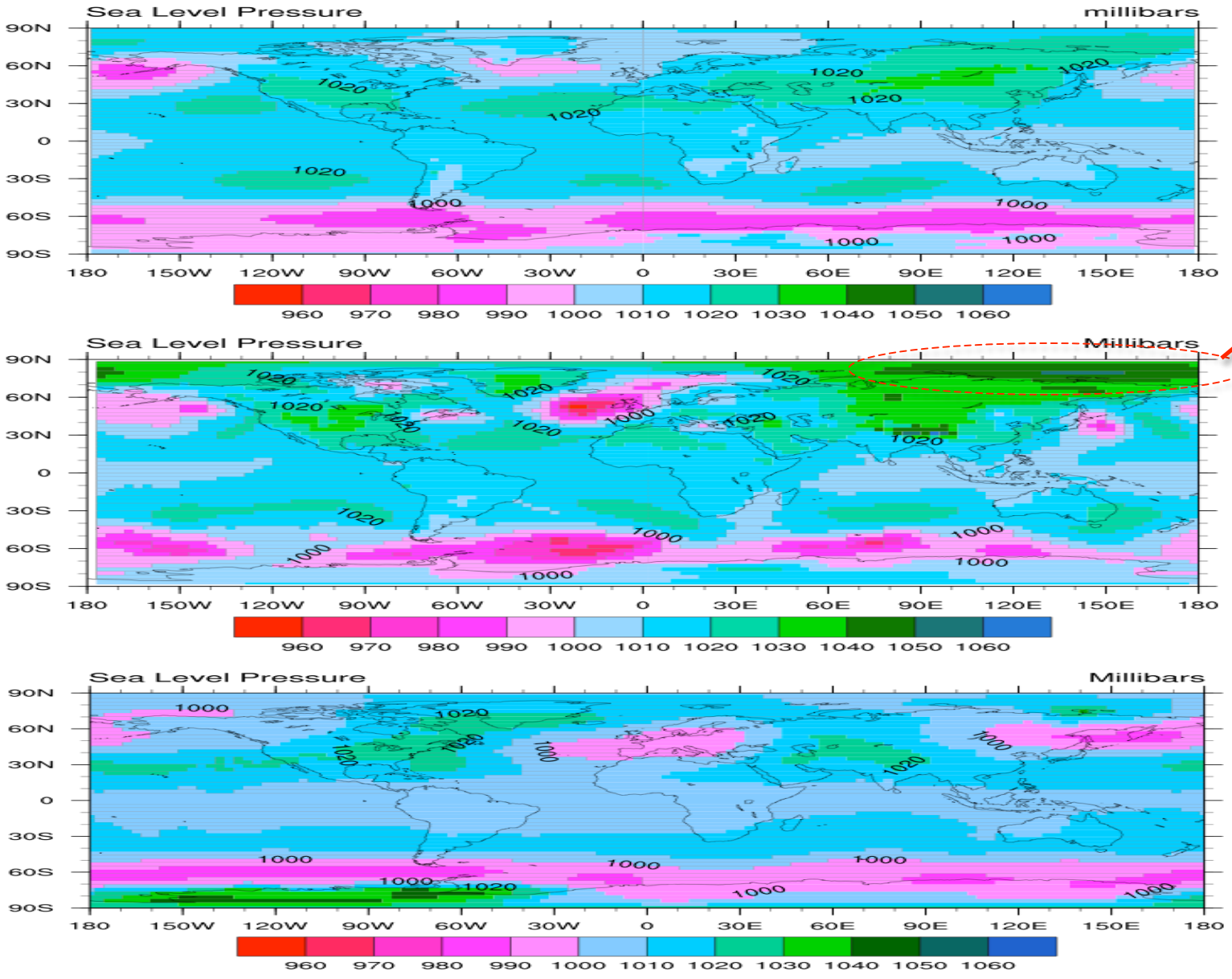
  start at 2001-01-01_00:00:00

- Status

  simulate three months

- **technical test, not the scientific investigation. A step to RACM.**

Monthly Sea level Pressure (January, 2001)



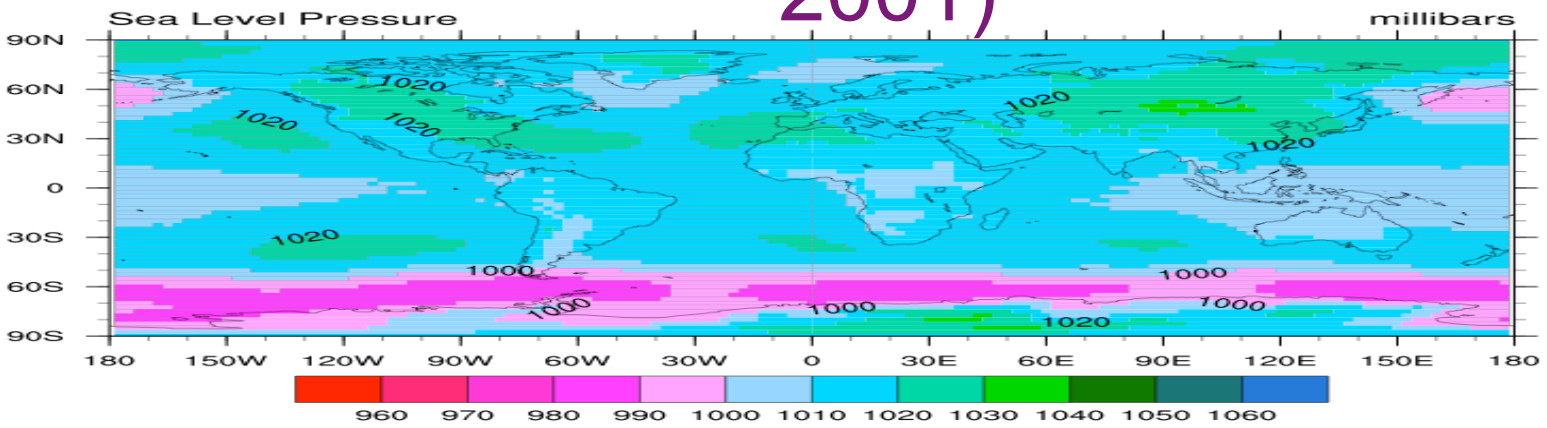
Observation
NCEP
Reanalysis

CICE
spinup

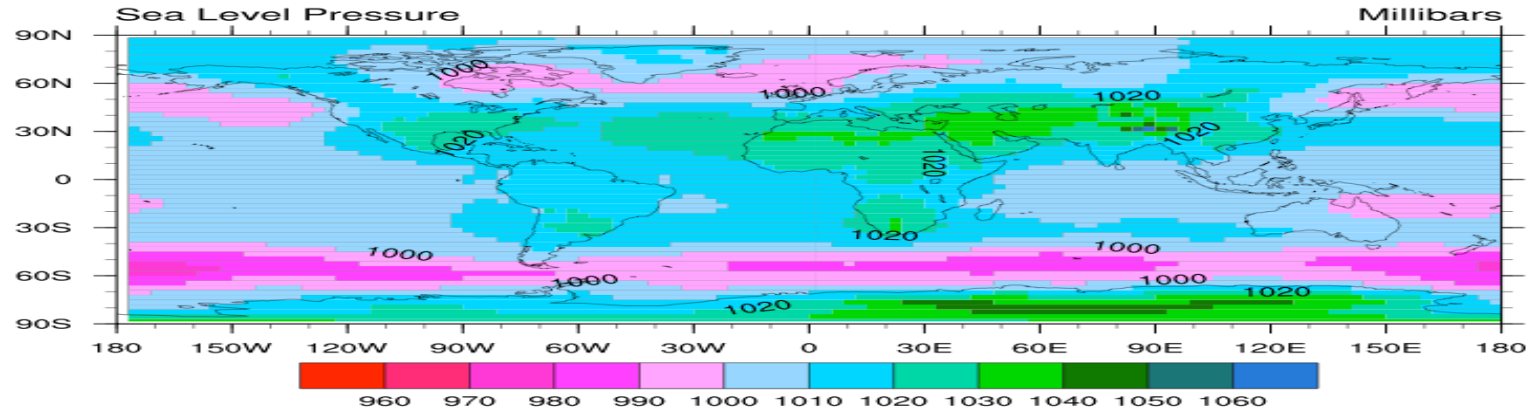
coupling

WRF
alone

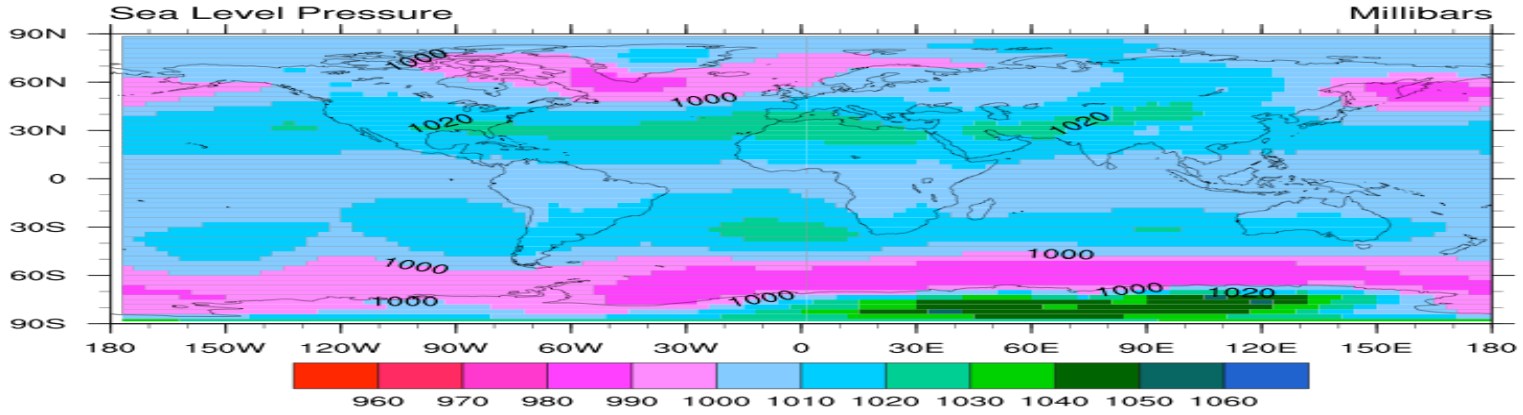
Monthly Sea level Pressure (February, 2001)



Observation

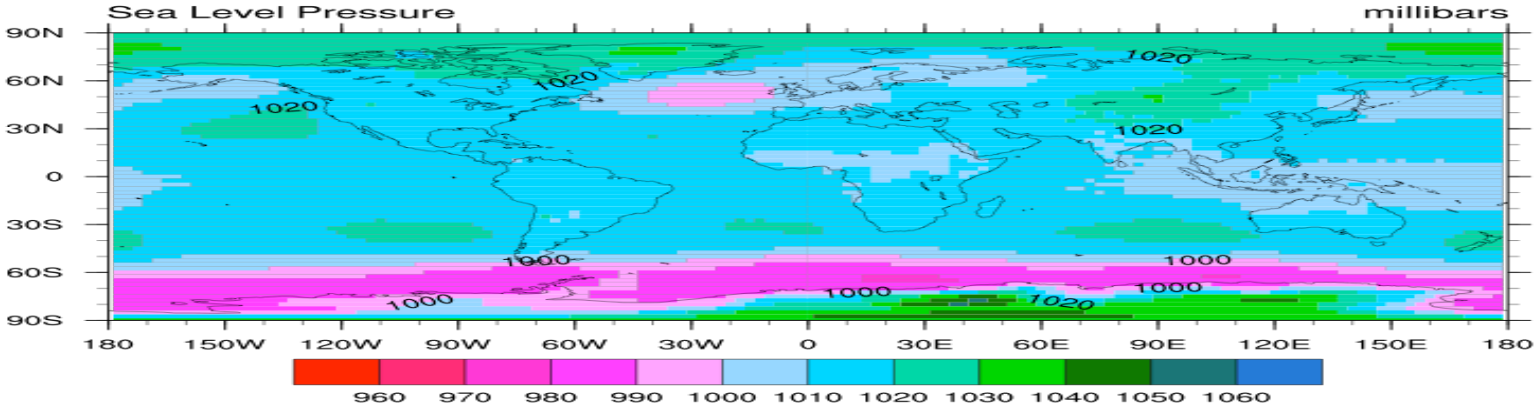


Coupling

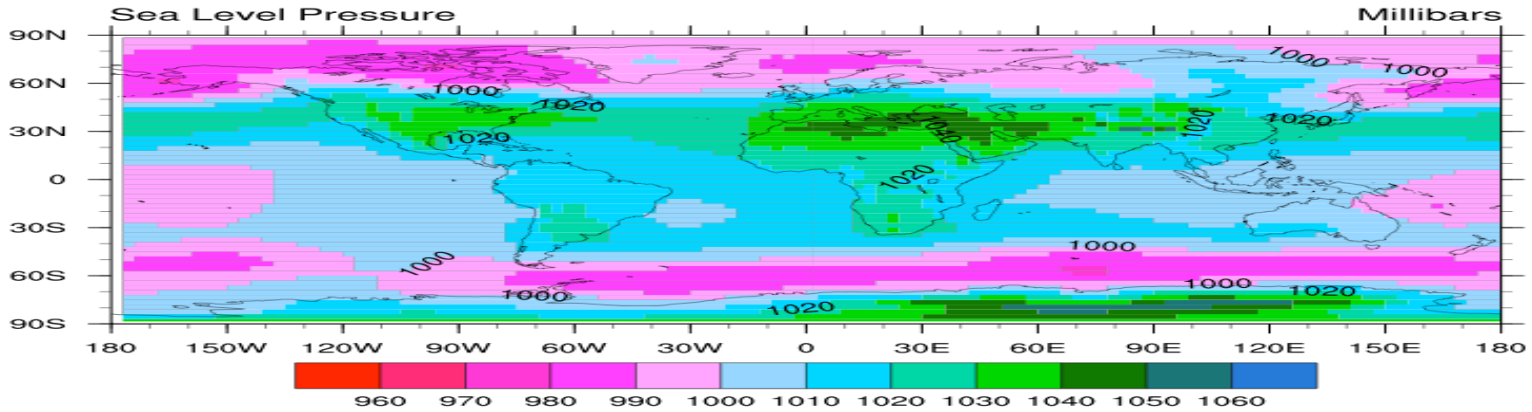


WRF alone

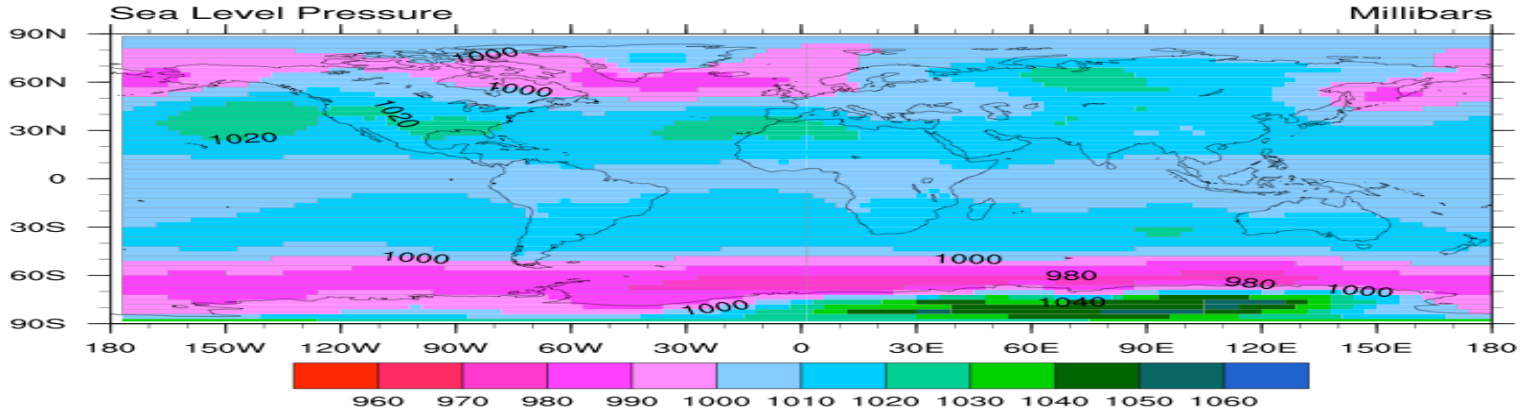
Monthly Sea level Pressure (March, 2001)



Observation



Coupling



WRF alone

- The coupling WRF works fine from the technical viewpoint.
- The performance of the coupling WRF relates to the single WRF strongly

Example of regional WRF coupling with data model

- Setting:

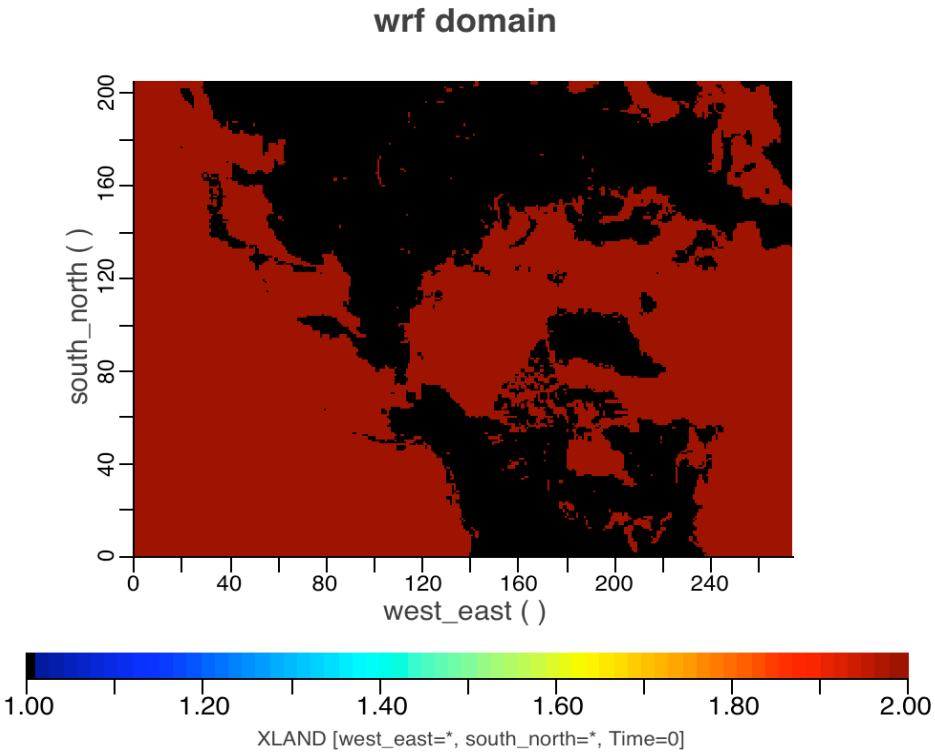
  wr50a_wr50a (276x206x35, 50km, dt=2min)

  WRF, DLND, DOCN, DICE

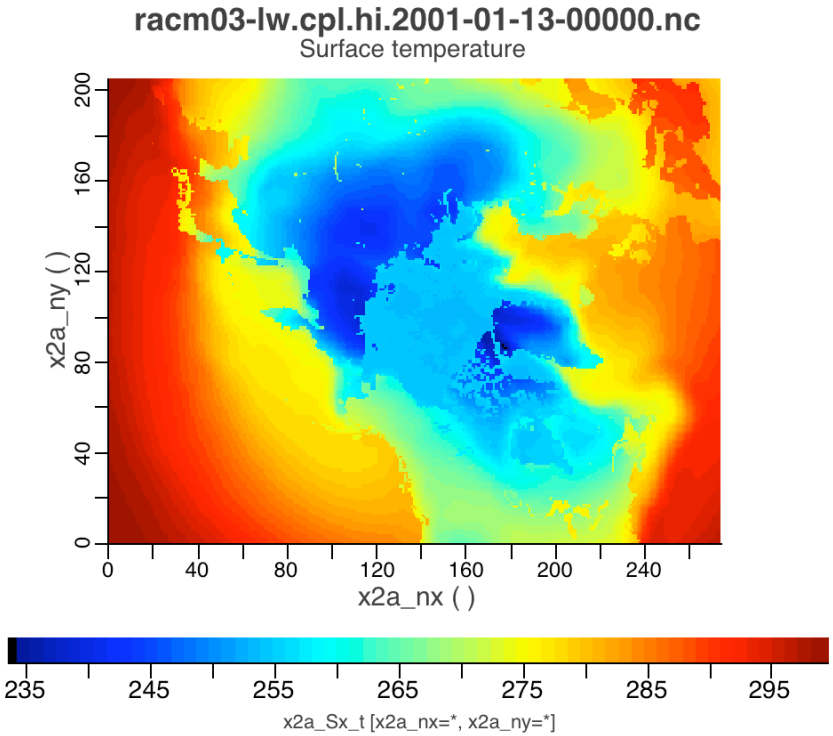
  start at 2001-01-01_00:00:00

- Status: simulate 12 days

Example of regional WRF coupling with data model

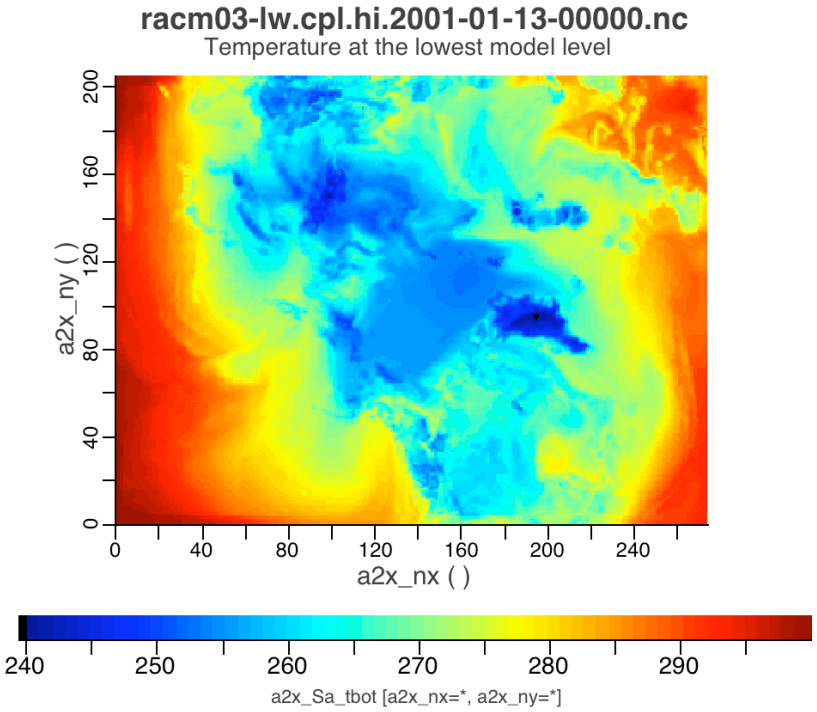


Atmosphere domain

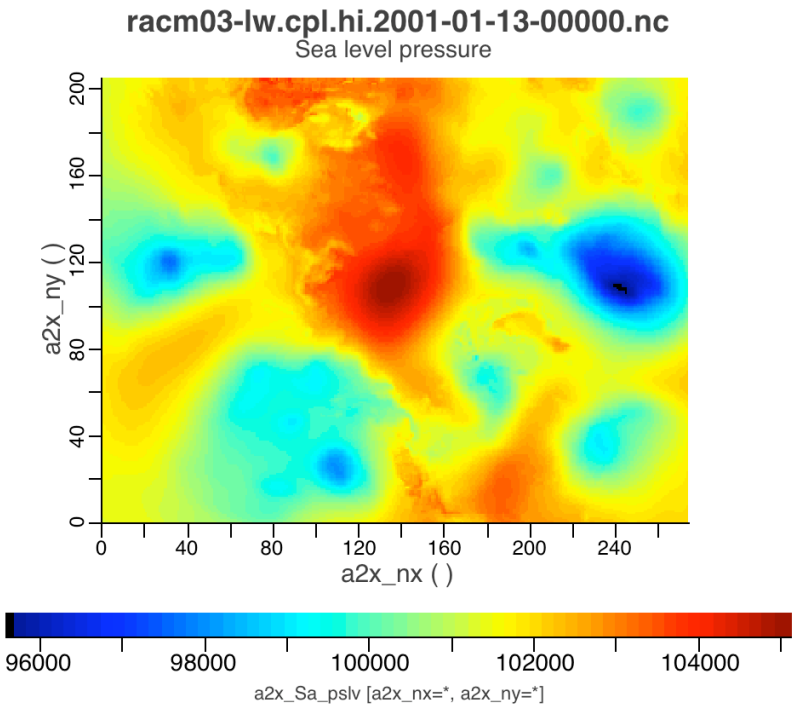


Surface temperature from the coupler at 2001-01-13_00:00:00

Example of regional WRF coupling with data model



Air temperature at bottom level 2001-01-13_00:00:00



Sea level pressure at 2001-01-13_00:00:00

Example of regional WRF coupling with POP2, CICE and land data model

- Setting:

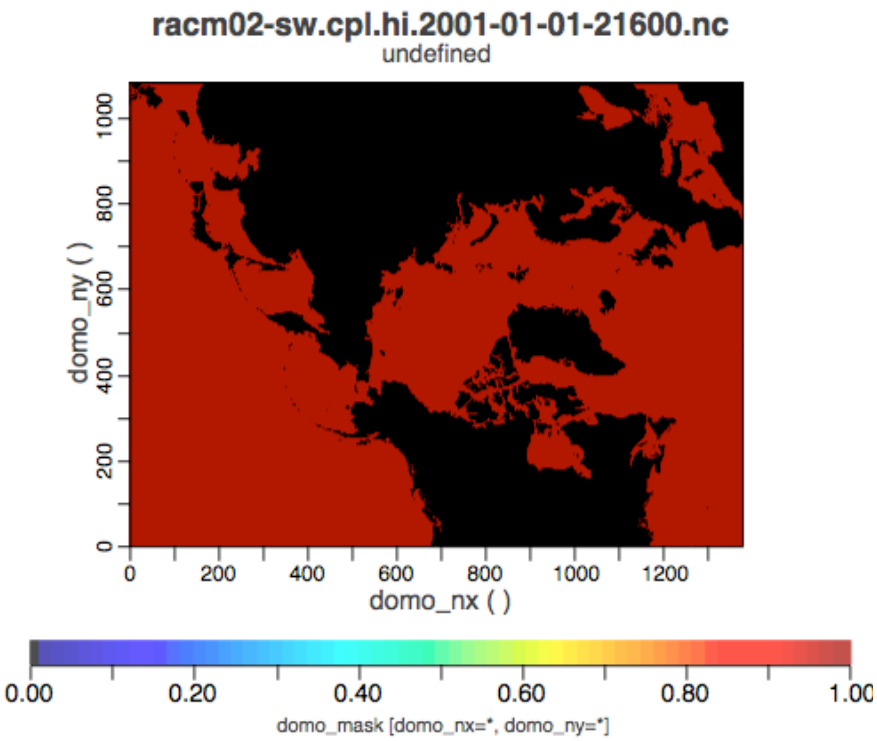
  wr50a_ar9v2 (276x206x35_1380x1080x45)

  WRF, SLND, POP2, CICE

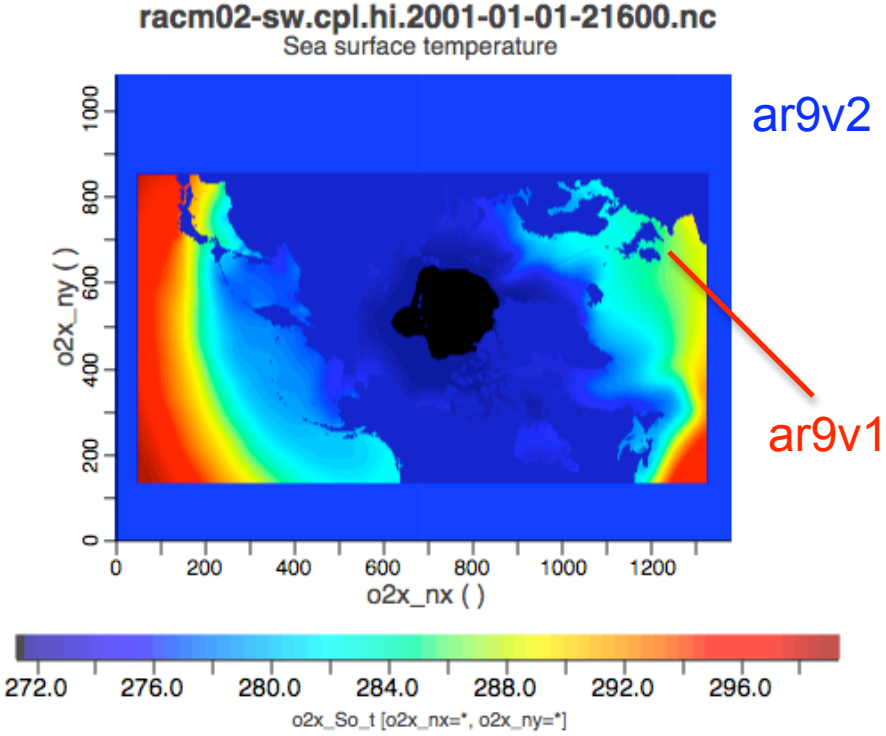
  start at 2001-01-01_00:00:00

- Status: crash after simulating 6 hours

Example of regional WRF coupling with POP2, CICE and land data model

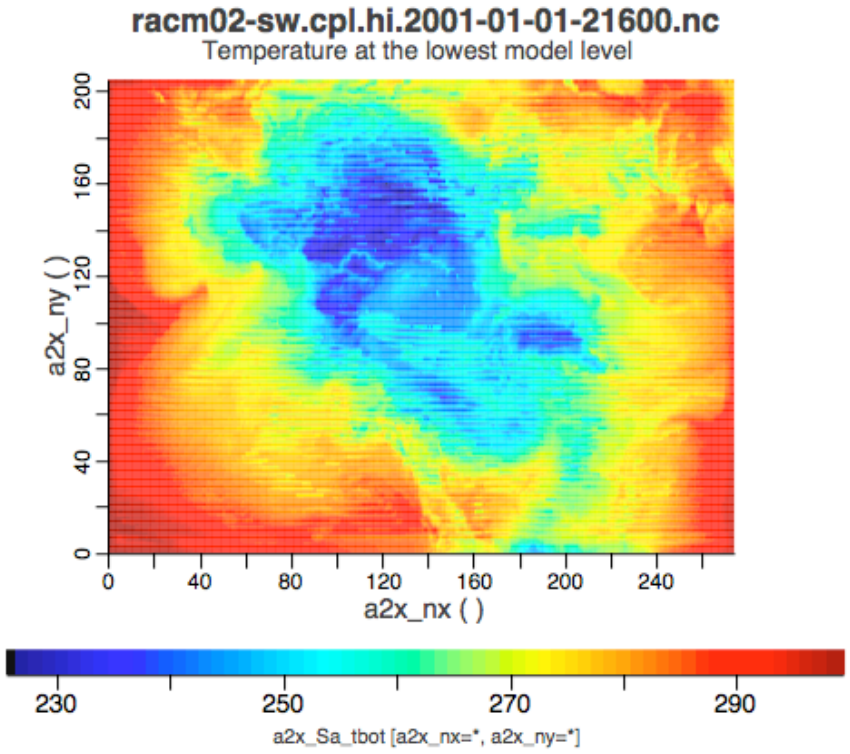


Ocean domain

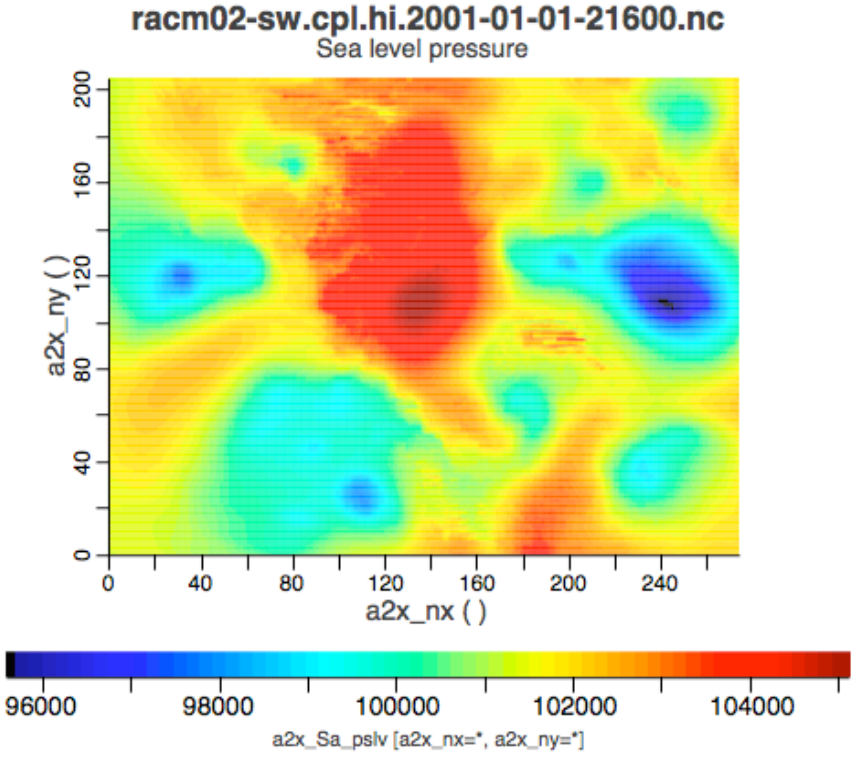


Surface temperature from the coupler at 2001-01-01_06:00:00

Example of Regional WRF coupling with POP2, CICE and land data model



Air temperature at the bottom level at 2001-01-01_06:00:00



Sea level pressure at 2001-01-01_06:00:00

Next

- WRF, VIC, POP2 and CICE fully regional coupling
- Other possible regional coupling skills based on CCSM4
- Investigate and improve the global WRF full active coupling with POP2, CICE and CLM, especially for the high resolution

Thank you!