CAM/WACCM Joint WG Discussion

Feb 2014
CAM Development Timelines

The path towards CMIP6

2013 (CESM1.2)
- Replace GWD with WACCM scheme
- MG2 implementation
- Prescribed MAM implementation
- Consistent sub-grid orography

2014 (CESM1.3)
- Testing alternative cloud physics (UNICON, CLUBB)
- Test TMS and replace scheme with EC scheme
- CAM5 0.25 deg tuning
- Vertical resolution testing (L60)? With CAM5 physics
- Prescribed MAM testing

2015 (CESM1.4)
- Physics decisions for CAM6
- RRTM radiation update
- MAM7 implementation
- Decision for vertical resolution increase
- CAM5 0.25 deg tuning
- Vertical resolution testing With new physics options

2016 (CESM2)
- CAM6 model in CESM2 for CMIP6
- 0.25 deg CAM6 model
- CAM6 low resolution model
- Physics decisions for low-res CAM6
- Efficiency improvements for 2deg CAM5
- Consistent sub-grid orography

Physics decisions for CAM6
- CAM6 model in CESM2 for CMIP6
- 0.25 deg CAM6 model
- CAM6 low resolution model
- Physics decisions for low-res CAM6
- Efficiency improvements for 2deg CAM5
- Consistent sub-grid orography
- CAM5 0.25 deg tuning
- Vertical resolution testing With new physics options
- CAM5 0.25 deg tuning
WACCM Graphical Timeline

2014

- Releases
  - 1.0.6/1.2.2:
    - SC, stability fixes
  - GW
    - CCMI Chemistry
    - Prognostic Volcanic Aero
    - Ionosphere Electro

Development

- Joint Decisions
  - Vertical and Horizontal Resolution
  - Dynamical Core/Transport Scheme
  - GW

- Integration
  - Prognostic Volcanics
  - Test with CAM5+ Physics
  - Iterate with CAM, other WG
  - WACCM ‘Finalization’

CAM5.5 Available

2015

- WACCM-CCMI

2016

CESM2

WACCM6

WACCM6X
Vertical Resolution

• Increased vertical resolution?
  – CAM?
  – WACCM?

• How high should the model top be for CAM?
Momentum Parameterizations

• Can we unify CAM and WACCM Gravity Wave Drag parameterizations?
Dynamical Core/Transport

• What will be the dy core for 1 deg CAM?
• What are target horizontal resolutions?
  – CAM
  – WACCM
Volcanic Aerosols

• Preferred aerosols:
  – Prescribed Volcanic file?
  – Prognostic MAM Volcanic Aerosols?
Other CAM/WACCM Discussion

• Timelines? Does ‘tentative’ plan work?
CAM6 Dev Testing
Vertical Grids & WACCM IC

110L-WACCM

78L CAM

60L CAM

NCAR  ESSL's Climate & Global Dynamics
vertical resolution and QBO tests in FV WACCM4

R. Garcia
vertical resolution as a function of altitude
WACCM4 FV QBO /no QBO new and old L110 grid

effa_beres=0.1

effa_beres=0.6
new L132 grid

high resolution (0.5 km) through most of the stratosphere (to 40 km)
QBO in L132 vs L110 run