CAPT meeting

6/21/04 1:54 PM

Advisory committee report:

The committee was pleased to see the progress that has been made developing the CCPP-ARM Parameterization Testbed (CAPT) capabilities. This is one of the newer scientific activities for PCMDI, where the staff's investment over the last couple of years is beginning to demonstrate significant promise for the concept. This is an example of a new and novel diagnostic capability that has only begun to scratch the surface of what can ultimately be accomplished. The committee recognizes the immediate need to focus on the development of the CAPT capabilities using ARM SGP data. But we would also like to suggest that PCMDI staff begin to:

- develop a vision for how to extend the approach to the investigation of important systematic errors in global climate models
  - which errors in forecast can be seen in climate?
  - Balance in forecast vs. balance in climate (July climate balance for example)
  - Build a catalogue to describe deficiencies in climate and forecasts
  - Can the errors be addressed SCMs? Hierarchy of models
  -
- begin to broaden the scope of observational datasets that might be employed in CAPT studies (e.g., other ARM sites, other non-ARM observational datasets), which should include the development of a detailed, comprehensive process verification database
  - Use TOGA COARE (1992) as case study – match GCSS input data
  - ISCCP clouds
  - Precip
  - Use DIME to look for data for productive cases – quality, variety, problems of interest
  - CEOP get back to John Roads (we want to use this)
- ☑ develop a scientific evaluation strategy that allows a comprehensive examination of the complete parameterized physics package with a process-oriented perspective (i.e., avoid the promotion of CAPT as a "plug-and-play" diagnostic framework)
  - don't just stop at putting new parameterization in the model

- ☑ We also encourage PCMDI to be on the lookout for opportunities to apply the CAPT approach to new roles, such as the evaluation of global modeling frameworks employing so-called super-parameterization capabilities. (What is this?)

- We are doing this…
- Reengage Marat on this

Enhancements in the formal partnerships between NCAR and GFDL parameterization developers are also seen as a positive direction for the continued development and acceptance of the technique.

Status of CAM3

- release on June 23rd
- not ready for CAPT, budget, complete initial data file as standard, easier to add variable to initial file, add history tape, for frozen model read and write is complete, bringing in initial file in one place. This is in main trunk. Need to verify that we can do the budget (T and Q), make sure ads up to Zero. Try to do liquid water. Will do momentum budget too (fewer terms). Also will have conversion terms. This has MOLTS. Can put boundaries. Need to initialize snow cover from analyses, put snow, down and takeit away.
    - Try GDAS for land, drive with observed land data
    - Pay more attention to snow
    - Land model initial data file is complete
- Put grid around ARM site, use for higher resolution – 9 points on ARM, used 4, 16 grids
- Resolution (what to use?)
- Revisit all of our runs, at t42 and t85, large difference in dynamic core (why?)
- Dynamical core (all 3)Don't wait until tuning is done --- is there a dynamical core signal?
- May be able to use CAM2 land in CAM3
- First run T42 in CAM3 and compare w/CAM2 – 30 forecasts, and use this for MOLTS
- What should the standard sampling be. ISCCP, 3 hr, daily, etc.
    - Default start: 1 file/type
        - Global full history
            - 24 hours snapshot for global state, averaged for parameterized terms
        - Individual points Every time step for
            - Same as Global

            - 16 points (at T42) for each SGP, Darwin, NSA, TWP
            - T85 inside T42
        - ISCCP
    - Global 1 hour 2-d slices (lat lon) (all averaged)
        - TOA all sky and clear
        - surface fluxes all and clear
        - precipitation
        - surface temp

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    - ISCCP (3-d) all 49 (average into 3 x 3 boxes?) (1 hour) (ask if the model can made consistent with ISCCP*) labeled
        - Solar on same frequency (averaged)

STATUS of AM2

- Set up to repeat exersizes
    - Initial conditions adapting
        - Filter to resolution for state variables
        - restart netcdf
        - Moving mode to NERSC
        - Move to GFDL do tests to see if the process works

Partners:

- Chris Bretherton
    - Has shallow convection in CAM3
    - Meet in Santa Fe
    - Climate process group CPT
- Leo Donner – meet at Santa Fe
    - Interested in testing it. May not want to do analysis himself
    - May not be ready with CAM3. When he is ready (additional variables) Jerry Olson can help with this.
- Guang Zhang
    - Still in CCM3
    - Ping Liu - test of case studies with MJO- using Tiedtke etc*
        - After more cases
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- Don Johnson

    - Suggesting to diagnostics
- Joel Norris
    - Steve will make contact (frontal clouds) use data to do analysis
- Jay Mace
    - Will visit here
- Poster for CCSM Santa Fe? Highlight the papers.
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- Jeff Anderson
    - May help with Land initialization may not bother with atmosphere. Hasn't done this yet
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UPDATE CAPT web site

GFDL –

- Forecasts AM2 w/ R2 and ERA-40