GMI TASKS TO DISCUSS/PRIORITIZE

PATH I: GOAL IS TO HAVE AURA SIMULATIONS, REPLAY, AND HINDCAST.

A. WE WOULD LIKE TO HAVE A "MERRA" PRODUCT FOR THE AURA PERIOD (?) (SIMILAR TO THE GEOS-4 ONE). Options are: a Reprocess MERRA and use GMI (reprocessing will start soon for 2004, at least for comparison to Replay; b) Wait for Replay?

I suggest option in ORANGE, because of B.

Need to: a) reprocess MERRA fields (under ARRA?)

Run 5 years

SIVO (ARRA?)

However, do we want to wait for solution of the following:

Update Fast Jx

Resolve O1D discrepancy

Isoprene?

Lightning?

Do we want to include gas-phase/aerosol coupling?

Emissions

Diagnostics in Replay?

These would involve non-SIVO people.

B. DO "SYNTHETIC TRACER" RUNS IN REPLAY, GMI (SIVO, non-SIVO)

D. FINISH WHATEVER IS NEEDED IN GAS-PHASE/AEROSOL

E. FULL CHEMISTRY GMI/REPLAY COMPARISON

F. GO AHEAD WITH REPLAY DECISION

G. RESOLVE LIGHTNING ISSUE (NON-SIVO)

H. START HINDCAST SIMULATIONS

ABOUT 10 YEARS AT LEAST?

IF REPLAY, WHO?

PATH II: OTHER MET. FIELD STUDIES

A. ECMWF

DEFINE SCIENCE PATH BY END OF MEETING (BREAK-OUT?)
ALSO FOR AM3 (OTHER THAN LIU'S PROPOSAL).
SYNTHETIC TRACER RUNS

B. DO REQUIRED ECMWF RUNS, AM3 RUNS

HOW MANY YEARS FOR AM3?

C. OTHER MET. FIELDS WITHIN GEOS-5 ARCHITECTURE? REPLAY?

NON-SIVO, SIVO

PATH III: OTHER MODEL STUDIES?

A. SOM ADVECTION ALGORITHM

B. NITRATE

C. MICROPHYSICS?

D. OTHER TYPES OF AEROSOLS? (SOA, BUT…)

E. CLOUD OVERLAP, ETC.

F. NEW WET DEPOSITION SCHEMES..

WILL REQUIRE STRONG EFFORT IN MODEL CHANGES, ETC.

PI USE OF “OTHER” MET. FIELDS

PRATHER – NEED TO DEFINE EXPERIMENTS REALISTICALLY

Given a set of GEOS5-MERRA and ECMWF/Oslo for the Aura period (at least two years)

1) Quantify model transport error due to different CTM formulations (advection scheme, operator split, etc).

Run a series of carefully designed simple tracers in both GMI and UCI CTMs with the EC fields

Cannot do trop O3 since the chemistries of the GMI and UCI are not the same and GMI cannot run SOM.

2) Quantify - at least for the EC, MERRA, and GEOS5? fields - the uncertainty in some key atmospheric chemistry diagnostics controlling future composition.

Possibly relate it to a minimum error in modeling such values.

Key params would be, e.g., impact of 10% change in surface NOx on O3, L-NOx, CH4 feedback factor and amount of trop O3 produced per ppb of CH4, etc.

This would run the GMI CTM "best" chemistry with the three fields!

Good to have two versions from DAO plus one from EC. Note that the current L40 EC fields are 'weak' on the stratosphere and we may need to go to lower resolution T42 (2.8 deg) to get L60

STRAHAN

My MAP proposal is pretty specific about either 1) doing analyses of Aura and ACE satellite data (sometimes with the goal of developing model diagnostics) or 2) doing analyses/evaluation of transport characteristics of Geos5DAS or GEOS5CCM. this includes sensitivity studies of simulations to horizontal resolution. So there really isn't anything in my proposal that relates to other met fields. However, the data analyses and diagnostics can be applied to the evaluation of other met fields.

LOGAN

Extend evaluation, tests of convection to other fields (ECMWF)

Issue with GEOS fields:

No wave-1 pattern of ozone in tropics (should see if it is also a problem in other fields; GCM?)

Overestimate CO in Southern tropics (if we use emissions from inversions) (gradient)

Meteorological diagnostics?

Hindcast – 1990 through AURA period (have ECMWF for part of that period)

ACTION ITEMS

1. RESOLVE O1D ISSUE/FAS T JX COMPARISON BETWEEN GEOS-CHEM, GMI
NATARAJAN, RODRIGUEZ

2. INCORPORATE NEW LIGHTNING
DERIVENAVERAGE REGIONAL SCALINGS FROM MERRA (GET CONVECTIVE MASS FLUXES)
INTERANNUAL VARIABILITY DRIVEN BY INTERANNUAL CONVECTION
CONSTANT NOX PRODUCTION/FLASH
STEENROD, ALLEN, GMAO

3. CONTINUE PROCESSING MERRA MET. FIELDS – INTERACT WITH YANTOSCA
MEGAN, RODRIGUEZ

4. FINISH GAS PHASE/AEROSOL, NITRATES – INCLUDE NITRATES IN COUPLING
BIAN, STEENROD

5. INCORPORATE/EVALUATE LATEST ADVECORE?
RUN SOME SIMPLE TRACER RUNS WITH NEW ADVECCORE – CROSS-POLAR FLUX
JULES

6.RUN GEOS5/MERRA AURA (2004 – PRESENT)
DAMON

7. FINISH PROCESSING/RUNNING ECMWF
PRATHER, STEENROD

8. INCORPORATE/TEST AM3
LIU, CHOI, STEENROD/OTHERS?

9. RUN STANDARD SIMPLE TRACERS WITH MERRA, ECMWF,AM3,REPLAY?

STEENROD, PRATHER, CHOI, GMAO, OTHERS – NEED TO THINK ABOUT THESE TESTS

fCO2
e90
SYNOZ
LINOZ?
Rn (or CONVECTIVE TRACER)/CH3I
LEAD 210
BE 7?

10. UPDATE FASTJX, HISTORICAL EMISSIONS, ETC.

11. RUN MULTI-YEAR WITH MERRA, ECMWF, AM3 FULL CHEMISTRY, (REPLAY?)

HINDCAST: EARLY 90'S
FUTURE/CLIMATE (AR5?)

"PHASE II" (AT LEAST ONE YEAR AWAY)

ADVECTION ALGORTHM
ISOPRENE
OTHER NEW DEVELOPMENTS… (WET DEPOSITION, ISOPRENE…)