Individual Evaluation Form

Proposal Number: 07-CCSP_07-0001

Orgnization Name: LMD/IPSL

Principal Investigator: Emily Chien

Evaluation Summary

Solicitation Title:	Earth Science Document Review
Solicitation Number:	NNH07ZDA001R
Evaluation Status:	Submitted (08/08/2007 @ 09:15:26 EDT by Richard Scheffe)
Review:	CCSP - AIR QUALITY CHAPTER ONLY [CCSP AIR QLTY]
Reviewer:	Richard Scheffe (Reviewer)

Overall Grade:

Evaluation Criteria

Question 1 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

Review Comments: CCSP Chapter 2 Air Quality; Lead Author: Daewon W. Byon This chapter includes a relatively well written description of the prevailing issues associated with applying regional scale air quality models within an integrated multiple spatial scale framework consistent with the physical and chemical phenomena acting across multiple scales and germane to both modern day characterization of air quality as well as accounting for expected climate and air quality interactions in future climate change scenarios. The lead author clearly is expert in both the formulation and real world application of the most widely applied regional air quality modeling system, CMAQ, in the United States. In addition, the author is well versed in the prevailing global scale models that are used to generate boundary conditions for regional systems, and the subject of future directions leading to a more dynamic linking across spatial scales of modeling systems.

Question 2 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

While the paper illustrates the author¿s competence of the current state of modeling systems and issues related to improving decision support capability, there really is a lack of a cohesive plan or vision with regard to improving the DSS as it pertains to air quality. The chapter has the potential to provide a fairly organized, well sequenced and comprehensive approach to improving the air quality DSS that would include: 1. use of observational techniques to evaluate major component inputs (meteorological and emission fields) of CMAQ. 2. use of observations to evaluate modeling treatment of geometrical and mixing properties within the model 3. use of observations in evaluating chemical behavior of model, after constraining geometrical, emissions and mixing attributes, and 4. chemical data assimilation techniques perhaps analogous to techniques applied in meteorological modeling systems, and 5 5. development of dynamic linked systems such as meteorological-chemistry exchange, chemical and physical exchange phenomena across environmental media, and bi-directional exchange across spatial scales (hemispheric-regional-urban).

Question 3 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

The authors touch on all of these topics, but not in a particular well sequenced manner that could lead to a comprehensive improvement of a DSS such as CMAQ (actually a more integrated modeling system than current CMAQ framework). The authors acknowledge many existing observational systems such as available polar orbiting satellites providing a wealth of total column chemistry fields with extremely coarse temporal resolution. However, there is little mention of specific observation systems that are needed to improve evaluation, and eventually chemical data assimilation, of the DSS. Examples include potential deployment of Geostationary satellite platforms (e.g. GEOtrace proposal) to greatly enhance temporal (and spatial) resolution, deployment of more routine upward pointing vertical profiling systems for aerosols and trace gases to evaluate satellite products and associated air quality model driven DSS. The discussion on uncertainty could be improved by linking uncertainty, particularly with respect to uncertainty within a particular process or input filed, to the overall model improvement process as a guide for determining important gaps in supporting observations and/or gaps in process knowledge. The concept of uncertainty in the context of such an integrated system with many nonlinearities is an open debate¿ i..e, uncertainty really is not quantifiable for a large integrated system. Uncertainty is more tractable when addressing a specific component or input for the system. Thus, focusing on uncertainty to address model components as a means of guiding component improvement. In summary, the author(s) demonstrate both a breadth of knowledge regarding integration of modeling systems and observational platforms as well as a history of in depth experience in the development and application of the central core of the DSS. The chapter could be improved considerably by providing a more organized and sequenced description of how the overall DSS will be be improved.

Question 4 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

Question 5 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

Question 6 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

Question 7 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

Question 8 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).