

Operational Issues – S. Quigley and T. Onsager

The operational goals of the CCMC are tightly coupled with the research goals. While the research emphasis is on improving our scientific understanding of the solar-terrestrial system and enabling the broad use of validated, state-of-the-art models, the operational emphasis is on using these models to produce accurate nowcasts and forecasts of space weather and its impact on systems. Although not all models of importance to achieving the CCMC's research goals will have significant value to operational applications, there will certainly be space weather parameters that have a high research interest and a high operational usefulness.

The CCMC is an opportunity to exploit the overlap between research and operational goals, both to motivate basic research and to accelerate the application of research progress into space weather operations. In order to maintain the full participation of the operations community, the CCMC must accept models that are relevant to specific space weather applications, and these models should, as much as possible, be made readily useable by the operations centers.

Several issues affect the useability of models in operations. First, an important constraint on the operational use of models is that the relevant information must be directly obtained from the model output or from a desired product, with little or no interpretation required by the forecaster or end user. Second, the model must be executed and the product generated with little or no involvement by the forecaster or end user. Third, the operational execution of models is constrained to use real-time or near-real-time data, and these data are often in a raw, non-validated form.

The CCMC working groups and staff must work together to insure that these issues are considered when models are selected and during their development within the CCMC. Consideration of these issues will greatly simplify the tasks of the RPCs and other applicable groups in transitioning models to operations.

The actions of the CCMC will be guided in part by input provided by the Operations and Validation Working Group. This working group will address the following questions and advise the CCMC steering committee at least once per year.

1. What are the priorities of the operations centers/groups?
2. What data/models are available to drive and to validate models, and how can validation data sets be coordinated between the CCMC and the operations groups?
3. What metrics are recommended for models, both from a research and from an operations perspective?
4. What are the performance statistics for models currently in use at the operations centers/groups and in the CCMC?
5. What are the specific benefits to the operations groups and end-users of products derived from CCMC models delivered to the operations groups?
6. What were the lessons learned concerning transfer of models from the CCMC to the operational groups?
7. What "common practices" of the model developers would benefit the operations and/or the research-to-operations transition groups (RPCs)?

The Operational Issues session included presentations from Stephen Quigley (USAF SMC/DET 11), Ariel Acebal (USAF AFWA), and Terry Onsager (NOAA SEC). These presentations described the current status of the military and civilian operations centers and the issues involved in the operational execution of models and the transition of models from research to operations. The only U.S. space weather operations group not represented at the meeting was NASA's SRAG. Through the discussion during the meeting, the following five recommendations were made:

1. Model Selection for the CCMC:
 - Models that overlap interests in the operations and research communities should be given high priority.
2. Metrics:
 - Metrics with operational value should be applied to the CCMC models.
3. Validation:
 - Validation results should be made publicly available, together with validation performed external to the CCMC (when available).
4. Operations and Validation Working Group
 - This working group should be formalized as soon as possible to begin the coordination between the operational and research goals of the CCMC.
 - Operations representatives for the following groups should be included in the working group:
 - NOAA's Space Environment Center (NOAA/SEC)
 - U.S. Air Force's space weather operations center (AFWA/SWOC)
 - U.S. Air Force's space weather acquisition and transition rapid prototyping center (SMC Det 11/CIT and AFRL/VSBX)
 - NASA's Space Radiation Analysis Group (NASA/SRAG)
5. Model Development "Common Practices":
 - Due to current requirements for operationalization of some space weather models, it would be extremely helpful for model codes to be developed using some of the internationally recognized standards, especially those calling for regular-interval insertion of comments that describe what specific portions of the code accomplish.