

How can the CCMC help NOAA?

Two important criteria for selecting models for operations:

- Operational value: How accurate is the model and how well does it satisfy a user need?
- Implementation readiness: What are the costs to acquire, run, and maintain the model in operations? Are data available to drive and validate the model in real time?

Operational Value:

- **With broad community usage, a model's accuracy and scientific value will be revealed.**
- **CCMC can conduct long-term, quantitative tests of models and establish metrics**
- **CCMC can compare different models and evaluate relative strengths and weaknesses**
- **CCMC can prioritize its efforts based in part on operational needs**

Implementation Readiness:

- **CCMC can encourage the development of “black box” versions of existing codes enhance the level of documentation**
- **The ease or difficulty of implementing a model at the CCMC will be a useful indicator of a model’s readiness for implementation in operations**
- **CCMC can encourage version control, which is essential to know that a model will perform as the validation and metrics indicate**
- **Software and data services (frameworks) that mature will increase the efficiency of implementing a model on operational systems**

High Operational Impact Areas for CISM Model Development

- 1. Solar energetic particle event prediction**
 - protons and heavy ions
 - occurrence probability, peak flux, and spectra
- 2. Regional geomagnetic activity forecast and nowcast**
 - electrojet variability (dB/dt)
 - auroral precipitation (HF outages)
- 3. Radiation belt electron forecast and nowcast**
 - low-altitude flux (ISS orbit)
- 4. Ionospheric scintillation and TEC forecast and nowcast**
- 5. Long-term view (~ 27 days)**
 - neutral density
 - geomagnetic activity indices

Priority* Guidance Based on Customer Need

Priority	Model	Customer Examples	Impact Area	Lead Time
1	Solar energetic particle forecast	Commercial Airlines HF Communication	Solar energetic particles	5 - 12 hours
		Satellite Launch		12 hours
		Manned Space Flight		5 days
2	Regional geomagnetic activity forecast and nowcast	Electric Power	Geomagnetic Activity	Different actions are taken for different lead times and skills
		Commercial Airlines HF Communication		
2	Relativistic electron forecast for International Space Station	Manned Space Flight	Radiation belt electrons	5 days
3	Ap prediction	Various military and civilian users	Geomagnetic Activity	1-3 days, 7 days, and 27 days
3	Ionospheric disturbance forecast and nowcast	Navigation (GPS) Exploration/surveying	Ionospheric scintillation	1 day
4	Dst prediction	Various military and civilian users	Geomagnetic Activity	Storm onset, strength, time of maximum and time to recover

*** Priorities vary with factors such as readiness, accuracy, lead time. Different aspects of each model or model area could have different priorities.**