CCMC Scoreboards

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(CCMC)

CCMC community scoreboards

https://ccmc.gsfc.nasa.gov/challenges/

Flare Scoreboard
Upload your Flare Predictions for Full Disk and/or Active Regions.

SEP Scoreboard
Under development
Help us plan and design.

CME Scoreboard
Submit your CME arrivable time predictions and compare with others.

Leads**: Trinity College Dublin** (S. Murray), **ROB** (J. Adries)

Leads: **BIRA-IASB** (M. Dierckxsens, N. Crosby), **GSFC** (I. Richardson), **UK Met Office** (M. Marsh)

Leads: **CCMC** (L. Mays), **UK Met Office**

IMF Bz Scoreboard
Under development

Leads: **GSFC** (N. Savani), **PredSci** (P. Riley), **CCMC** (L. Mays)

- Collecting and displaying event forecasts from multiple models into **Scoreboards**
- Fostering world-wide **community validation projects** that ultimately help researchers **improve** their CME, flare, and SEP forecasts and determine their **usefulness**.
- Allow a consistent **real-time** comparison of various operational and research forecasts. Complementary to non-real time model assessments.
- The flare and SEP scoreboards are **automated** such that model developers can routinely upload their predictions.
- Forecast data is parsed and stored in a **database** accessible to anyone via an **API**.

CME Arrival Time Scoreboard
Community predictions for the 6 Sep 2017 CME

CME: 2017-09-06T12:24:00-CME-001

Actual Shock Arrival Time: 2017-09-07T22:30Z

Observed Geomagnetic Storm Parameters:
Max Kp: 8.0
Dst min. in nT: -142
Dst min. time: 2017-09-08T02:00Z
CME Note: Associated with X9.3 flare from AR 12673.

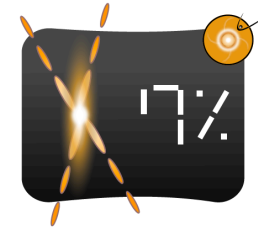| Predicted Shock Arrival Time	Difference (hrs)	Confidence (%)	Submitted On	Lead Time (hrs)	Predicted Geomagnetic Storm Parameter(s)	Method
2017-09-08T06:00Z (-3.0h, +3.0h)	7.50	80.0	2017-09-07T05:00Z	17.50	Max Kp Range: 5.0 - 8.0	WSA-ENLIL + Cone (Met Office)
2017-09-08T06:00Z (-2.0h, +2.0h)	7.50	----	2017-09-07T16:30Z	6.00	----	Ooty IPS
2017-09-08T07:32Z (-5.0h, +6.0h)	9.03	----	2017-09-07T08:33Z	13.95	----	DBM
2017-09-08T08:00Z (-3.0h, +3.0h)	9.50	70.0	2017-09-07T05:40Z	16.83	----	DBM + ESWF
2017-09-08T10:16Z (-4.0h, +4.0h)	11.77	----	2017-09-07T09:00Z	13.50	----	EAM (Effective Acceleration Model)
2017-09-08T10:25Z	11.92	----	2017-09-07T02:13Z	20.28	----	SARM
2017-09-08T10:42Z	12.20	----	2017-09-07T15:55Z	6.58	----	SPM
2017-09-08T12:46Z	14.27	84.0	---	---	Max Kp Range: 4.33333 - 6.5	Average of all Methods
2017-09-08T13:00Z (-7.0h, +7.0h)	14.50	90.0	2017-09-07T08:25Z	14.08	Max Kp Range: 5.0 - 7.0	Other
2017-09-08T13:52Z	15.37	----	2017-09-07T15:46Z	6.73	----	SPM2
2017-09-08T15:48Z (-9.0h, +10.0h)	17.30	100.0	2017-09-07T14:53Z	7.62	Max Kp Range: 4.0 - 6.0	Ensemble WSA-ENLIL + Cone (GSFC SWRC)
2017-09-08T16:00Z	17.50	----	2017-09-09T12:59Z	-38.48	----	WSA-ENLIL + Cone (BoM)
2017-09-08T16:30Z (+14.0h)	18.00	----	2017-09-07T12:32Z	9.97	----	ElEvo
2017-09-08T17:00Z (-12.0h, +12.0h)	18.50	80.0	2017-09-06T22:40Z	23.83	Max Kp Range: 4.0 - 6.0	Other (SIDC)
2017-09-08T18:27Z (-7.0h, +7.0h)	19.95	----	2017-09-06T17:23Z	29.12	Max Kp Range: 3.0 - 5.0	WSA-ENLIL + Cone (GSFC SWRC)
2017-09-08T22:00Z	23.50	----	2017-09-06T23:24Z	23.10	Max Kp Range: 5.0 - 7.0	WSA-ENLIL + Cone (NOAA/SWPC)

https://kauai.ccmc.gsfc.nasa.gov/CMEscoreboard

All prediction methods are welcome and all are encouraged to participate.

Flare Scoreboard

https://ccmc.gsfc.nasa.gov/challenges/flare.php
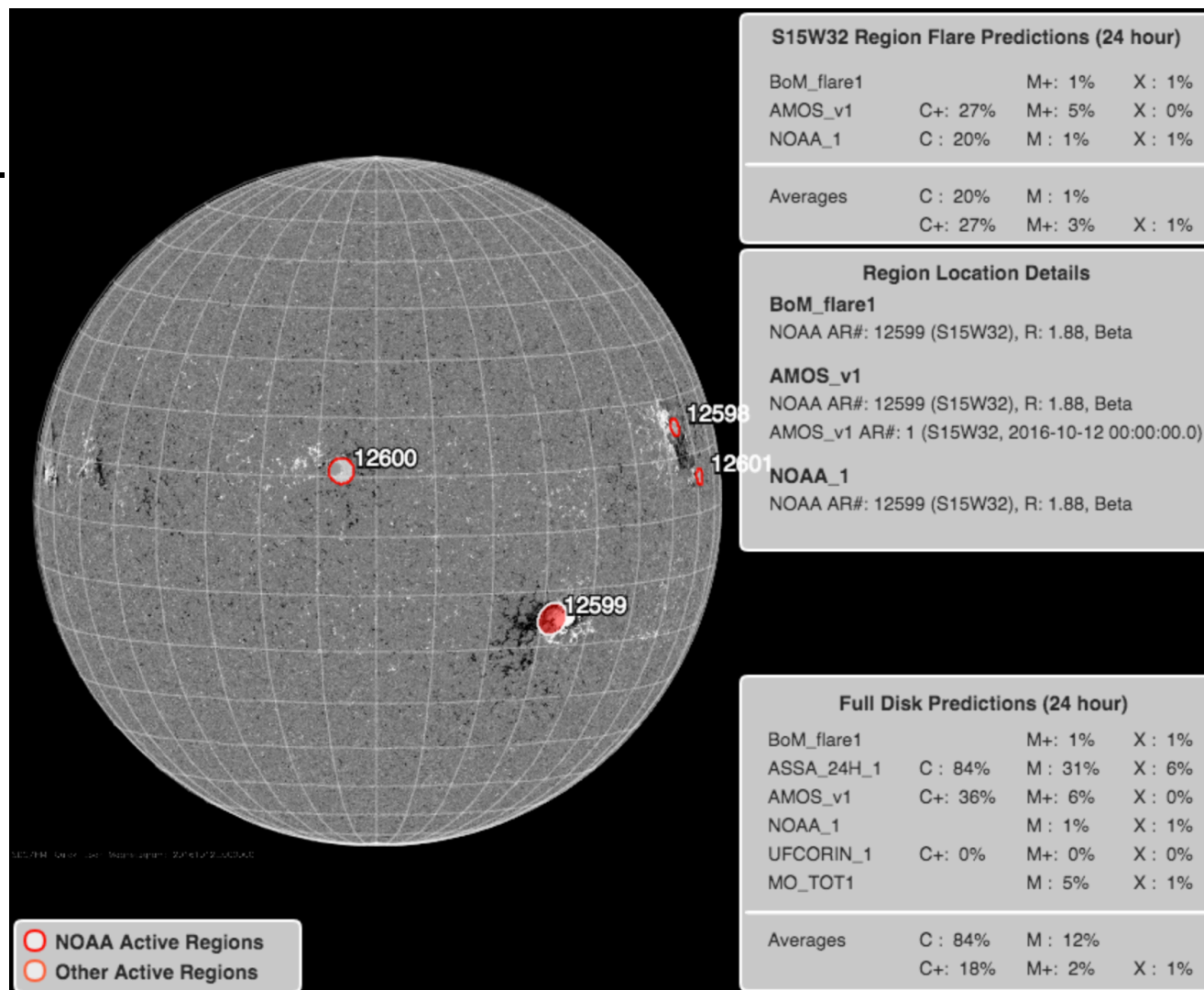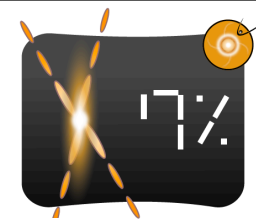
- Allows a consistent real-time comparison of various operational and research flare forecasts.

- Automated system; model developers can routinely upload their predictions to an anonymous ftp

- Forecast data is parsed and stored in a database which accessible to anyone via an API

- This project is led by Sophie Murray (TCD) and the planning group includes expert scientists as well as operational space weather prediction centers.
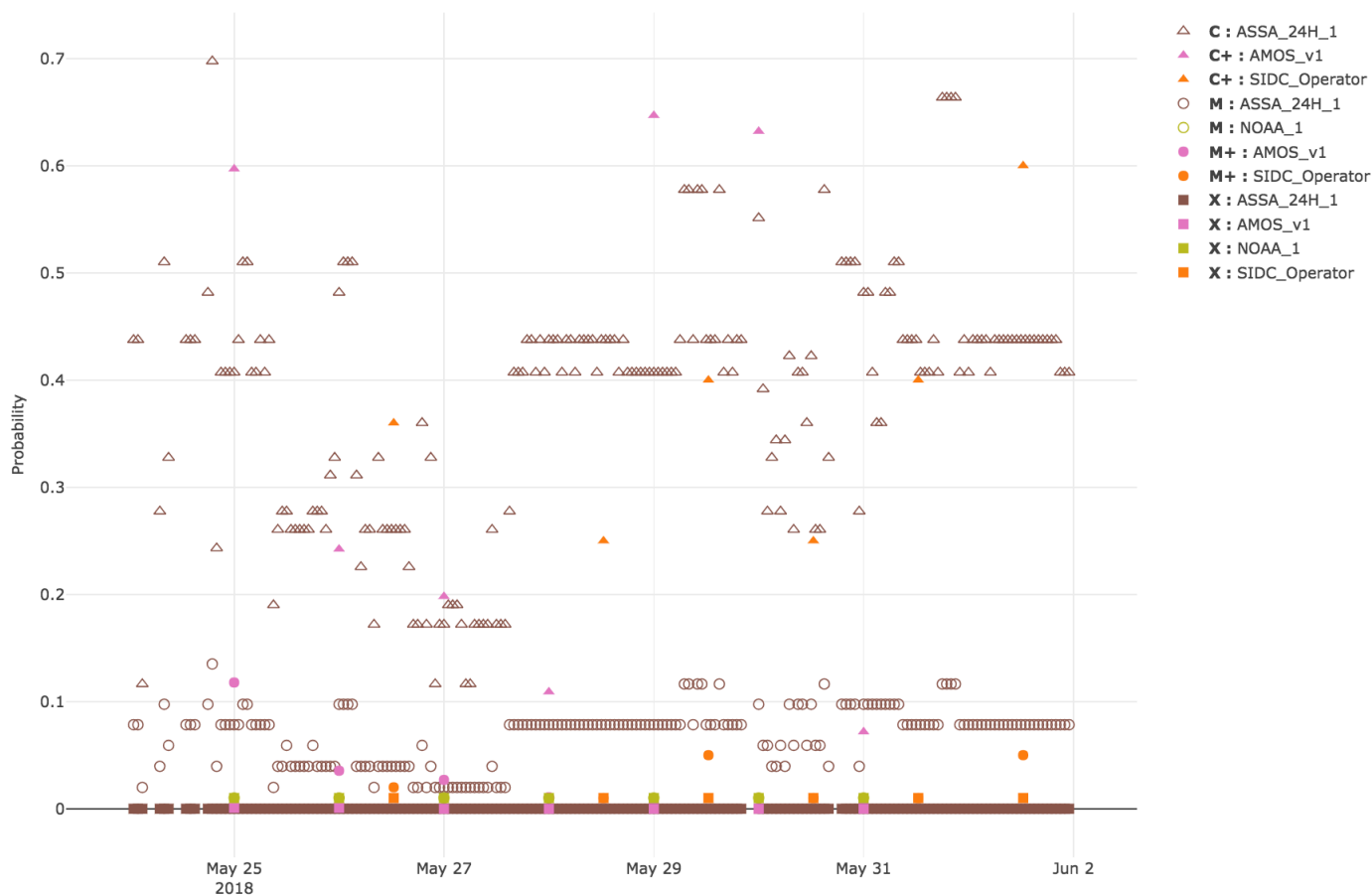

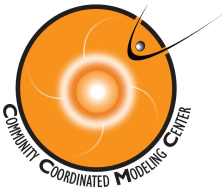**S15W32 Region Flare Predictions (24 hour)**

BoM_flare1			M+: 1%		X : 1%	
AMOS_v1	C+: 27%		M+: 5%		X : 0%	
NOAA_1	C : 20%		M : 1%		X : 1%	
Averages	C : 20%		M : 1%			
	C+: 27%		M+: 3%		X : 1%	

Region Location Details

BoM_flare1
NOAA AR#: 12599 (S15W32), R: 1.88, Beta

AMOS_v1
NOAA AR#: 12599 (S15W32), R: 1.88, Beta
AMOS_v1 AR#: 1 (S15W32, 2016-10-12 00:00:00.0)

NOAA_1
NOAA AR#: 12599 (S15W32), R: 1.88, Beta

Full Disk Predictions (24 hour)

BoM_flare1		M+: 1%	X : 1%
ASSA_24H_1	C : 84%	M : 31%	X : 6%
AMOS_v1	C+: 36%	M+: 6%	X : 0%
NOAA_1		M : 1%	X : 1%
UFCORIN_1	C+: 0%	M+: 0%	X : 0%
MO_TOT1		M : 5%	X : 1%
Averages	C : 84%	M : 12%	
	C+: 18%	M+: 2%	X : 1%

○ NOAA Active Regions
○ Other Active Regions

Flare Scoreboard

https://ccmc.gsfc.nasa.gov/challenges/flare.php

Full Disk 24 Hour Predictions

SEP Scoreboard

`https://ccmc.gsfc.nasa.gov/challenges/sep.php`

- Planning for the SEP Scoreboard has started (led by BIRA-IASB, GSFC, UK Met Office)

- Builds upon the flare scoreboard and CME arrival time scoreboard

- Automated system; model developers can routinely upload their predictions to an anonymous ftp. Forecast data will be parsed and stored in a database which accessible to anyone via an API

- SEP forecasts can be roughly divided into three categories:

Continuous/ Probabilistic

Solar Event Triggered

Non Near Real-Time

- The SEP scoreboard will focus on real-time forecasts (first and second categories) and will collect: proton flux profile, threshold crossing probability, onset time, and duration.

- The SEP scoreboard team will also coordinate with the SEP Working Team for historical comparisons, particularly for those physics-based models in the third category that are not ready or relevant for real-time modeling.
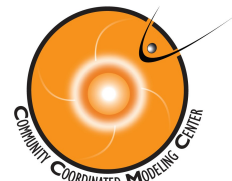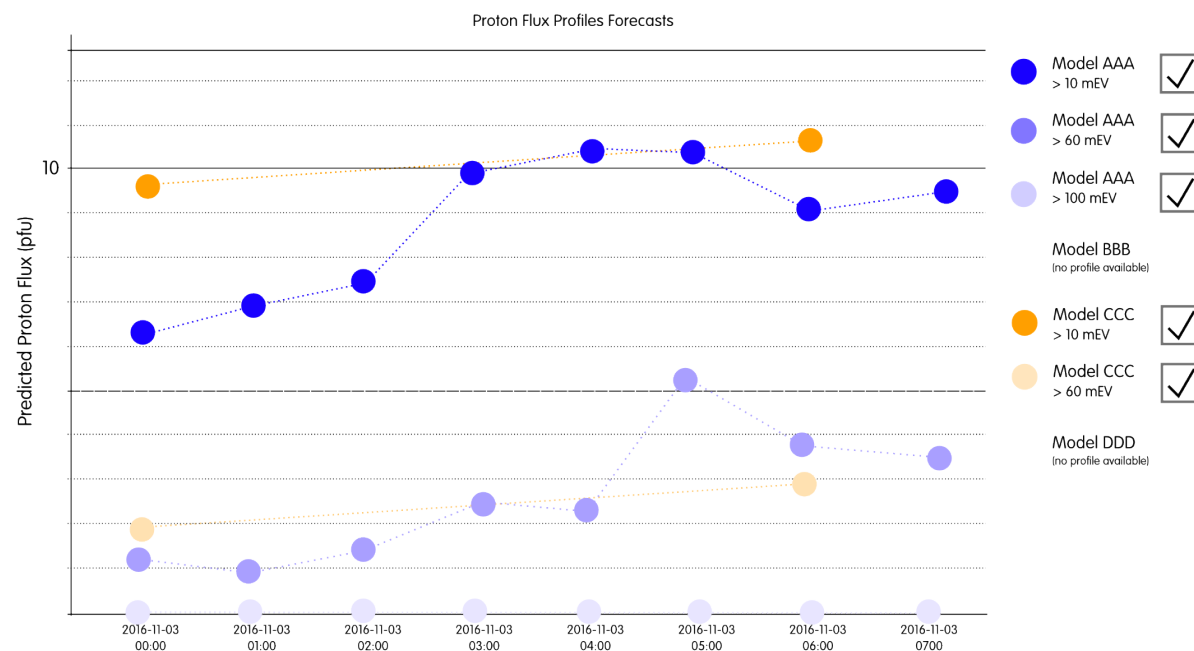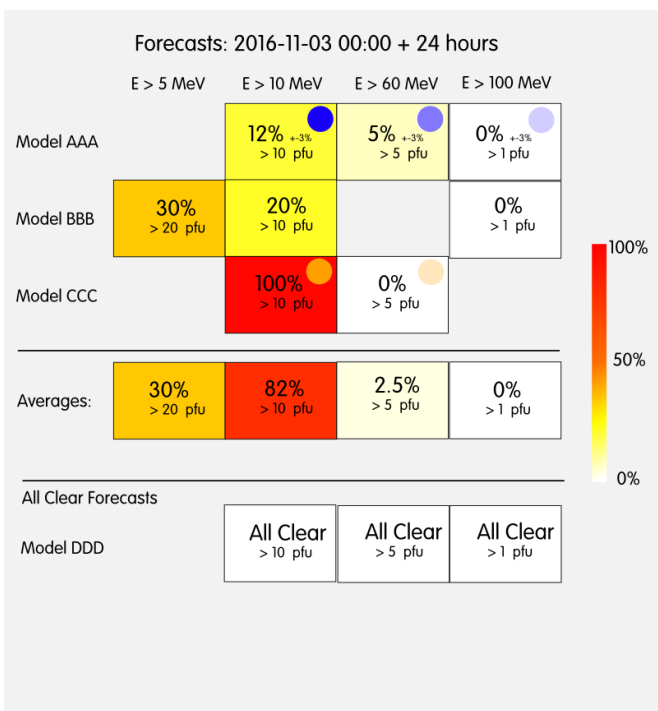
SEP Scoreboard Planning
Display ideas

SEP Scoreboard

Probability heat map at a single time

https://ccmc.gsfc.nasa.gov/challenges/sep.php

Predicted proton flux time-series