

Space Weather Highlights
30 August - 05 September 2010

SWPC PRF 1827
07 September 2010

Solar activity was very low. Several B-class flares were observed during the period. The majority of the flares originated from Region 1105 (N19, L=048, class/area Dri/130 on 05 September). A filament lifted off the northwest quadrant observed on SDO AIA 193 at 04/1430Z. An associated CME was observed on SOHO Lasco C3 imagery, with an estimated speed of 368 km/s.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels during 30 August – 02 September. Low to moderate levels occurred on 03-04 September. High levels returned late on 05 September.

Geomagnetic field activity was predominantly quiet during the period. Isolated unsettled levels occurred during 02-03 September. Solar wind observations from the ACE spacecraft showed an enhanced interplanetary field (IMF) intensity (peak 9 nT at 05/2305Z), combined with intermittent periods of southward IMF BZ (maximum deflection of -8 nT at 05/2104Z), with a slight increase in velocities (peak 400 km/sec).

Space Weather Outlook
08 September – 04 October 2010

Solar activity is expected to be predominantly very low. Low levels are possible from 23 September to the end of the period due to the return of old Region 1105 (N19, L=048).

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels from 08-12 September. Low to moderate levels are expected for 13-20 September. High levels are expected to return for 21-29 September. Low to moderate levels are expected for the remainder of the period.

Geomagnetic field activity is expected to be predominantly quiet for 08-18 September. Quiet to unsettled levels, with isolated active periods, are expected for 19-21 September due to a recurrent CH HSS. Quiet levels should prevail for 22 September through the remainder of the forecast period.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
30 August	75	28	180	A6.7	0	0	0	0	0	0	0	0
31 August	75	27	220	A6.7	0	0	0	0	0	0	0	0
01 September	76	51	270	A6.4	0	0	0	0	0	0	0	0
02 September	77	52	180	A5.9	0	0	0	0	0	0	0	0
03 September	77	54	180	A7.2	0	0	0	0	0	0	0	0
04 September	82	53	200	B1.0	0	0	0	4	0	0	0	0
05 September	82	58	260	B1.1	0	0	0	3	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
30 August	9.3e+05	1.5e+04	3.7e+03		4.2e+08	
31 August	1.5e+06	1.5e+04	3.6e+03		4.1e+08	
01 September	1.8e+06	1.6e+04	3.5e+03		2.6e+08	
02 September	2.7e+05	1.4e+04	3.6e+03		3.1e+07	
03 September	1.2e+05	1.5e+04	3.5e+03		3.1e+07	
04 September	1.8e+05	1.5e+04	3.8e+03		3.8e+07	
05 September	4.1e+05	1.5e+04	3.5e+03		5.3e+07	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
30 August	0	0-0-0-0-0-0-0-0	0	0-0-0-0-0-0-0-1	2	1-0-0-0-0-0-0-1
31 August	2	0-0-0-1-2-1-1-1	1	0-0-0-0-0-1-1-0	2	1-0-0-0-1-0-1-1
01 September	3	0-1-0-1-1-1-2-1	3	1-1-0-0-0-1-2-2	4	1-0-0-0-0-2-2-2
02 September	5	2-1-2-2-1-2-1-1	12	2-2-3-5-1-3-0-0	8	2-2-2-3-1-2-2-2
03 September	3	3-0-0-0-1-0-1-0	1	0-0-0-1-0-0-0-0	4	1-0-0-0-1-2-3-2
04 September	0	0-0-0-0-0-0-1-0	0	0-0-0-0-0-0-0-0	3	1-0-0-0-1-1-2-1
05 September	4	0-0-0-1-0-1-2-3	1	0-0-0-0-0-0-1-2	4	0-0-0-0-0-1-1-3

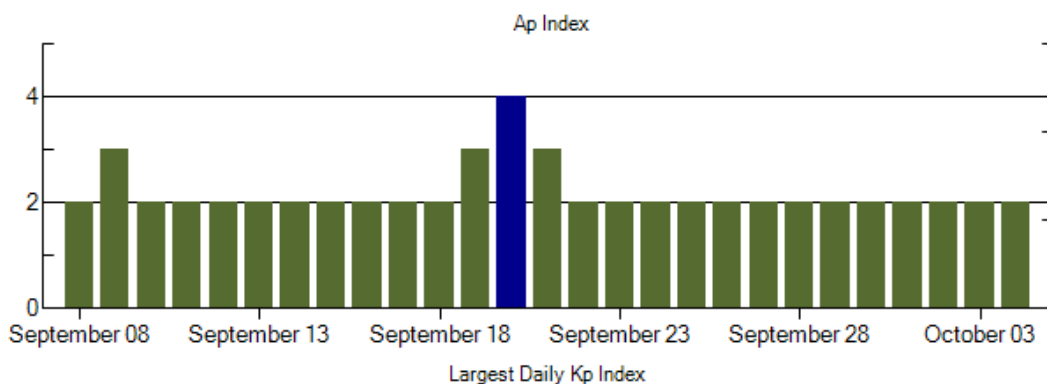
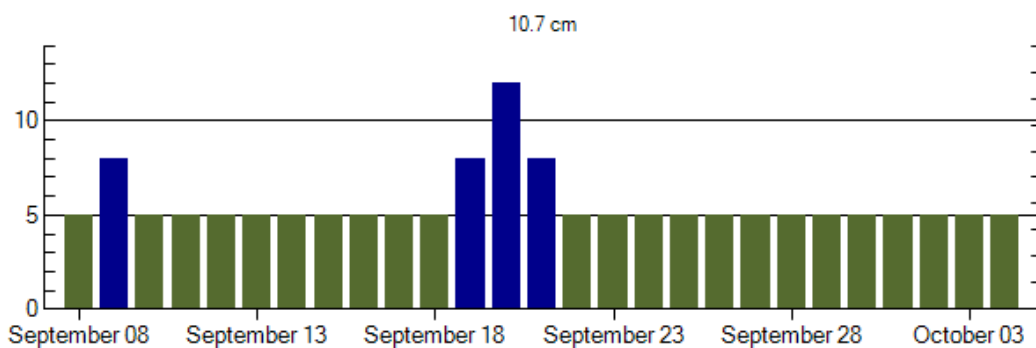
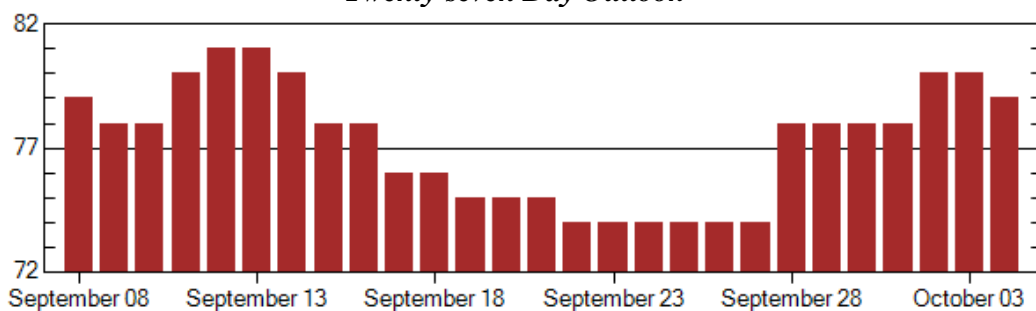


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
30 Aug 0500	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	25 Aug 1555
31 Aug 0500	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	25 Aug 1555
01 Sep 0504	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	25 Aug 1555
02 Sep 1437	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	25 Aug 1555
05 Sep 1530	ALERT: Electron 2MeV Integral Flux >= 1000pfu	05 Sep 1510
05 Sep 2233	WARNING: Geomagnetic K = 4	05 Sep 2300 - 06/1600



Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
08 Sep	79	5	2	22 Sep	74	5	2
09	78	8	3	23	74	5	2
10	78	5	2	24	74	5	2
11	80	5	2	25	74	5	2
12	81	5	2	26	74	5	2
13	81	5	2	27	74	5	2
14	80	5	2	28	78	5	2
15	78	5	2	29	78	5	2
16	78	5	2	30	78	5	2
17	76	5	2	01 Oct	78	5	2
18	76	5	2	02	80	5	2
19	75	8	3	03	80	5	2
20	75	12	4	04	79	5	2
21	75	8	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq	
	$\frac{1}{2}$		Integ		Imp/	Location	Rgn	Radio Flux		Intensity	
	Begin	Max	Max	Class	Brtns	Lat CMD	#	245	2695	II	IV

No Events Observed

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location Lat CMD		
30 August	1515	1522	1530	B1.4				1102
31 August	2150	2153	2156	B1.4				1102
	2243	2247	2249	B1.8				1102
01 September	No Flares Observed							
02 September	No Flares Observed							
03 September	1438	1518	1551	B2.8				1105
	2203	2206	2209	B1.2				1105
04 September	0122	0125	0131	B1.0				
	0317	0407	0452	B2.5				1105
	0700	0703	0706	B6.0				1103
	0719	0724	0730	B1.6				
	0751	0755	0759	B1.8				
	1431	1435	1438	B2.5				1101
	1555	1600	1602	B4.3				1101
	1726	1727	1731	B2.5	SF	N18W34		1105
	1912	1913	1915		SF	N18W36		1105
	2208	2208	2215	B3.1	SF	N18W38		1105
	2217	2218	2219		SF	N18W38		1105
	2326	2329	2331	B2.1				
05 September	0123	0124	0128	B3.4	SF	N19W40		1105
	0210	0217	0225	B3.7	SF	N18W38		1105
	0256	0300	0306	B3.5				1101
	0710	0714	0722	B2.5	SF	N17W43		1105
	1216	1223	1240	B3.3				
	1448	1458	1508	B5.6				1105
	2143	2148	2152	B2.4				
	2226	2232	2237	B1.8				



Region Summary

Date	Location		Sunspot Characteristics					Flares							
	° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
		Lon						C	M	X	S	1	2	3	4
<i>Region 1101</i>															
24 Aug	N12E79	0	30	3	HRX	1	A								
25 Aug	N12E61	82	90	2	HSX	1	A								
26 Aug	N13E48	83	90	5	HSX	1	A								
27 Aug	N12E34	84	100	3	HSX	1	A								
28 Aug	N12E21	81	130	3	HSX	1	A								
29 Aug	N12E07	84	140	2	HRX	1	A								
30 Aug	N13W06	85	110	2	HRX	1	A								
31 Aug	N12W19	83	140	2	HRX	1	A								
01 Sep	N12W32	83	150	5	CSO	2	B								
02 Sep	N12W45	82	120	2	HSX	2	A								
03 Sep	N12W57	81	130	4	CSO	3	B								
04 Sep	N12W70	83	110	2	HSX	1	A								
05 Sep	N13W88	89	120	2	HSX	1	A								

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 85

<i>Region 1102</i>															
29 Aug	N27W13	104	30	3	CRO	4	B								
30 Aug	N28W26	103	70	6	DRO	7	B								
31 Aug	N28W40	104	80	6	CRO	6	B								
01 Sep	N26W52	103	100	7	CAO	5	B								
02 Sep	N27W63	100	30	2	CRO	3	B								
03 Sep	N26W76	100	10	1	AXX	1	A								

0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 104

<i>Region 1103</i>															
01 Sep	N25W32	83	10	7	BXO	2	B								
02 Sep	N25W48	85	20	4	CRO	3	B								
03 Sep	N25W63	87	10	1	CRO	2	B								
04 Sep	N26W76	88	20	2	AXX	2	A								
05 Sep	N25W90	87	10		AXX	1	A								

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 83



Region Summary - Continued

Date	Location		Area (10 ⁻⁶ hemi)	Sunspot Characteristics				Flares							
	(° Lat ° CMD)	Helio		Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
		Lon						C	M	X	S	1	2	3	4

Region 1104

01 Sep	N24W27	75	10		BXO	2	B								
											0	0	0	0	0

Died on Disk.

Absolute heliographic longitude: 75

Region 1105

02 Sep	N19W09	49	10	3	BXO	4	B								
03 Sep	N18W22	50	30	6	BXO	8	B								
04 Sep	N18W36	50	70	8	DRI	20	B				4				
05 Sep	N19W52	48	130	8	DRI	26	B				3				
											0	0	0	7	0
															0

Still on Disk.

Absolute heliographic longitude: 49



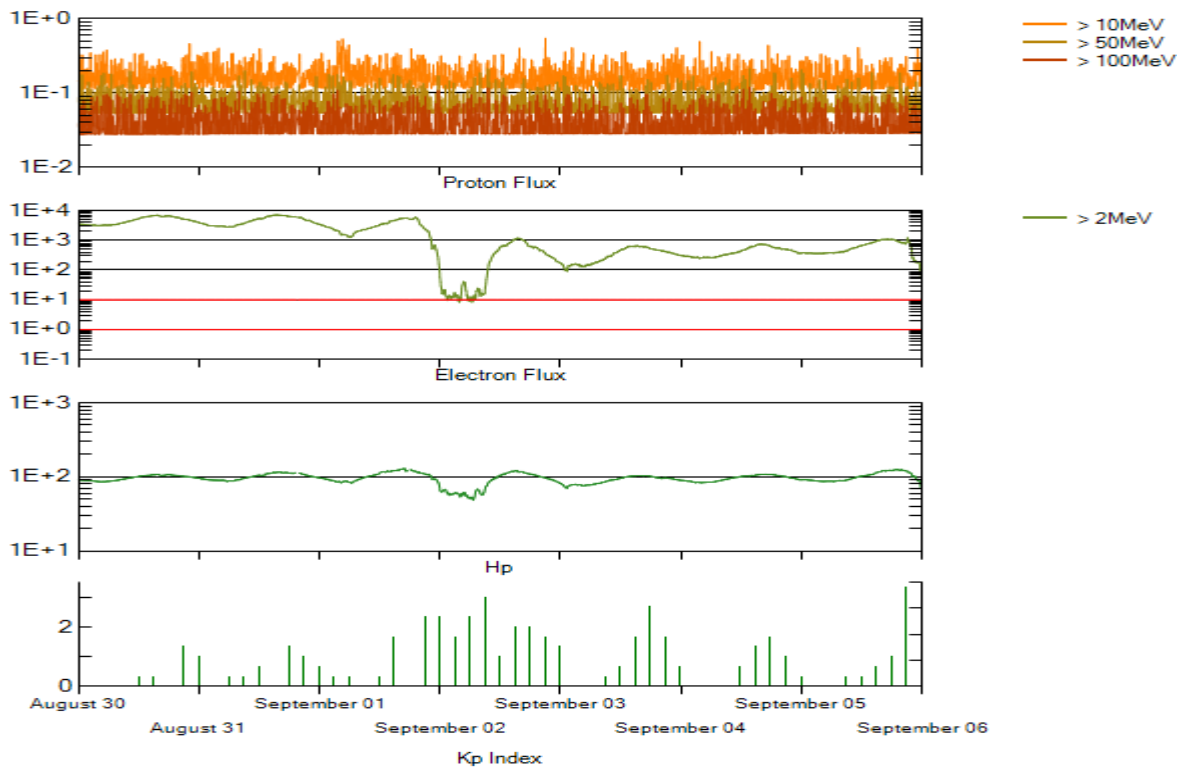
Recent Solar Indices (preliminary)
Of the observed monthly mean values

Month	Sunspot Numbers				Radio Flux		Geomagnetic		
	Observed values	Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth	
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
2008									
September	1.5	1.1	0.73	3.7	2.3	67.1	68.4	6	5.8
October	5.2	2.9	0.56	2.9	1.8	68.3	68.2	7	5.4
November	6.8	4.1	0.60	2.7	1.7	68.6	68.3	4	5.1
December	1.3	0.8	0.62	2.7	1.7	69.2	68.5	4	4.9
2009									
January	2.8	1.3	0.46	3.0	1.8	69.8	68.7	4	4.7
February	2.5	1.4	0.56	3.1	1.9	70.0	68.8	5	4.7
March	0.7	0.7	1.00	3.4	2.0	69.2	69.0	5	4.6
April	1.2	0.8	1.00	3.7	2.2	69.7	69.3	4	4.3
May	3.9	2.9	0.74	3.8	2.3	70.5	69.7	4	4.1
June	6.6	2.9	0.39	4.4	2.7	68.6	70.2	4	4.0
July	5.0	3.2	0.70	5.8	3.6	68.2	71.0	4	3.9
August	0.3	0.0	0.00	7.7	4.8	67.4	72.1	5	3.8
September	6.6	4.3	0.64	9.9	6.2	70.5	73.3	4	3.8
October	7.0	4.8	0.66	11.3	7.1	72.3	74.1	3	4.1
November	7.7	4.1	0.55	12.4	7.6	73.6	74.5	3	4.5
December	15.7	10.8	0.68	13.6	8.3	76.8	74.9	2	4.8
2010									
January	21.3	13.2	0.62	14.8	9.3	81.1	75.5	3	5.0
February	31.0	18.8	0.60	16.7	10.6	84.7	76.5	5	5.1
March	24.7	15.4	0.62			83.3		5	
April	11.2	7.9	0.71			75.9		10	
May	19.9	8.8	0.44			73.8		8	
June	17.9	13.5	0.75			72.6		7	
July	23.1	16.1	0.70			79.9		5	
August	28.2	19.6	0.70			79.7		8	

NOTE: Values are final except for the most recent 6 months which are considered preliminary. Cycle 23 started in May 1996 with an RI=8.0. Cycle 23 maximum was April 2000 with an RI=120.8.

** SWPC sunspot number was zero, so a ratio could not be computed.





Weekly Geosynchronous Satellite Environment Summary
Week Beginning 30 August 2010

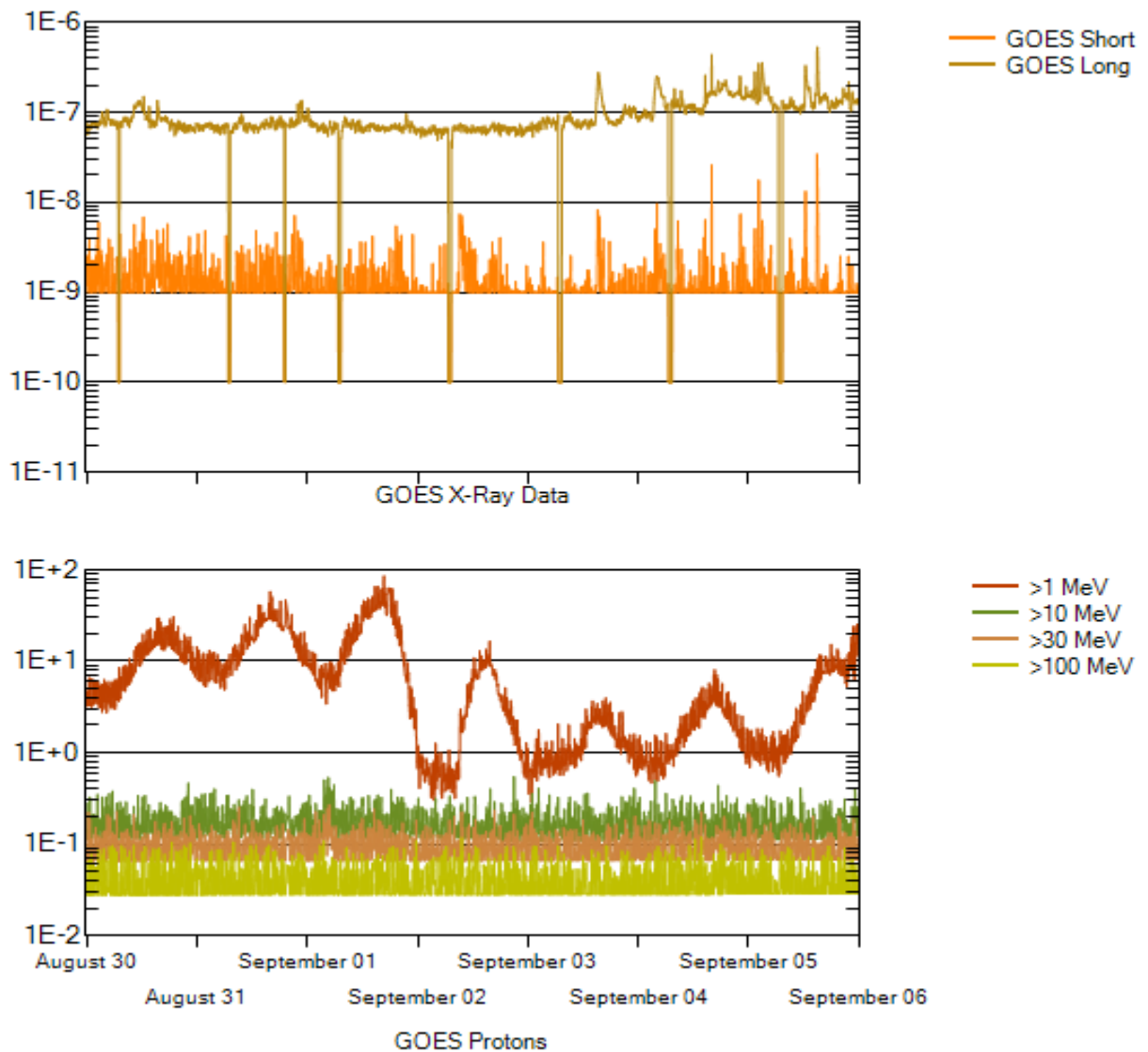
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²–sec–sr) as measured by GOES-13 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV. The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²–sec–sr) with energies greater than 2 MeV at GOES-13.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as measured by GOES-13. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) and the US Geological Survey. These may differ from the final Kp values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWPC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are “global” parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





Weekly GOES Satellite X-ray and Proton Plots

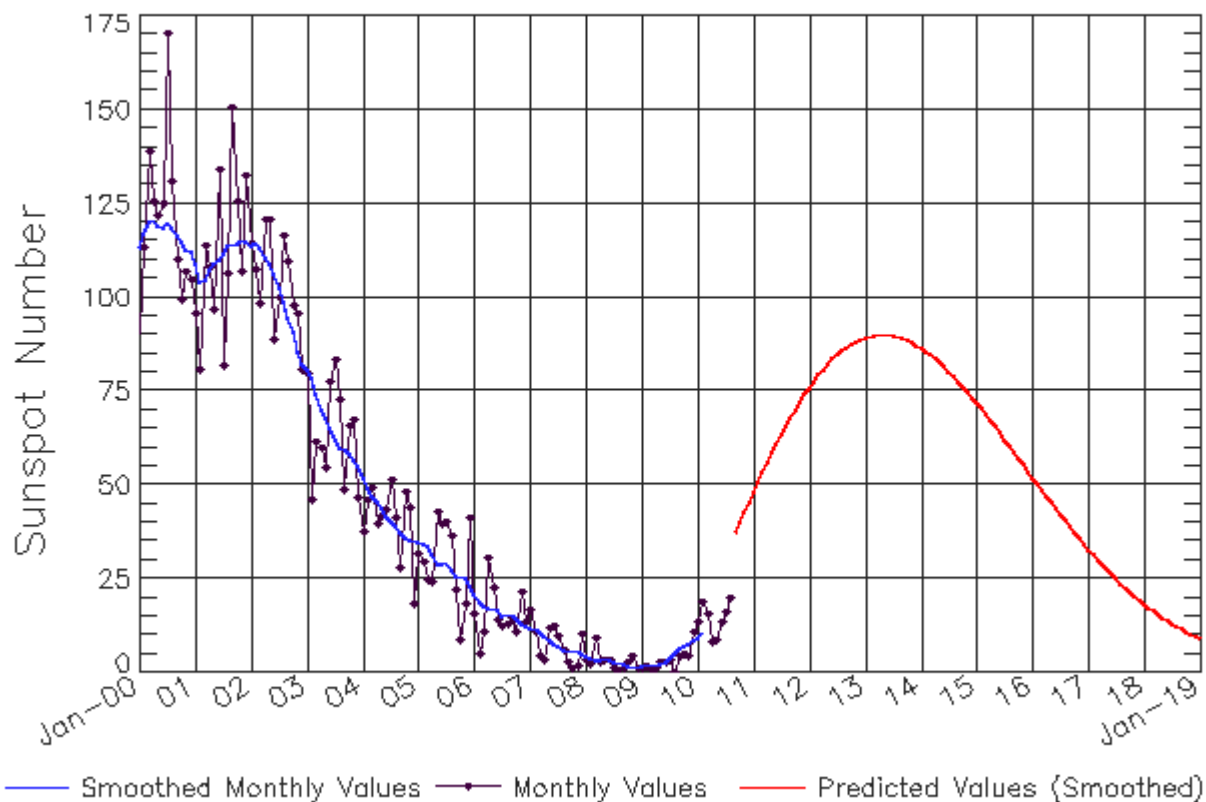
The x-ray plot contains five-minute averaged x-ray flux (Watts/m²) as measured by GOES 14 (W105) in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-13 for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm²-sec-sr) at greater than 10 MeV.



ISES Solar Cycle Sunspot Number Progression

Observed data through Aug 2010



Updated 2010 Sep 7

NOAA/SWPC Boulder, CO USA

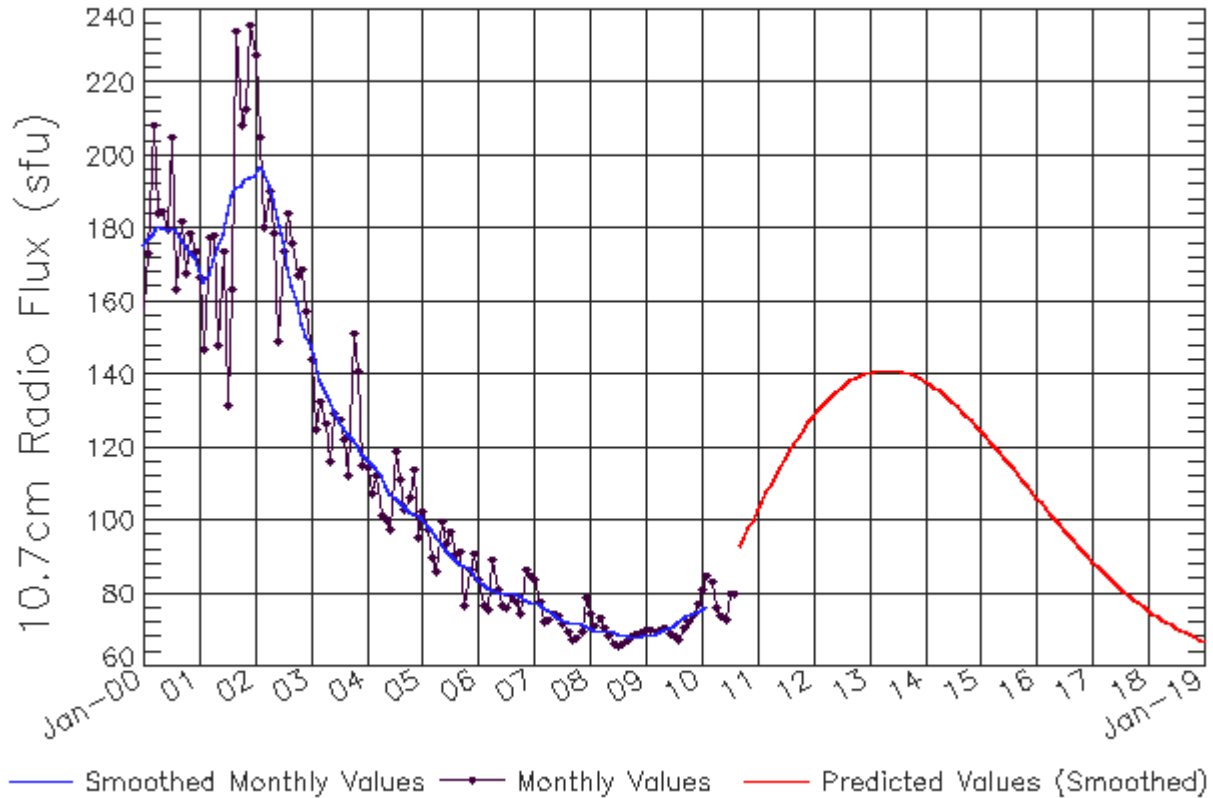
Smoothed Sunspot Number Prediction

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	2 (***)	2 (***)	2 (***)	2 (***)	2 (***)	3 (***)	4 (***)	5 (***)	6 (***)	7 (***)	8 (***)	8 (***)
2010	9 (***)	11 (***)	13 (1)	16 (2)	19 (3)	22 (5)	25 (5)	27 (6)	30 (7)	34 (7)	38 (8)	42 (9)
2011	46 (9)	50 (10)	53 (10)	56 (10)	59 (10)	61 (10)	63 (10)	66 (10)	68 (10)	70 (10)	72 (10)	74 (10)
2012	76 (10)	78 (10)	79 (10)	81 (10)	82 (10)	84 (10)	85 (10)	86 (10)	87 (10)	88 (10)	88 (10)	89 (10)
2013	89 (10)	90 (10)	90 (10)	90 (10)	90 (10)	90 (10)	90 (10)	89 (10)	89 (10)	89 (10)	88 (10)	87 (10)
2014	86 (10)	86 (10)	85 (10)	84 (10)	83 (10)	81 (10)	80 (10)	79 (10)	78 (10)	76 (10)	75 (10)	73 (10)
2015	72 (10)	70 (10)	69 (10)	67 (10)	65 (10)	64 (10)	62 (10)	60 (10)	59 (10)	57 (10)	55 (10)	54 (10)
2016	52 (10)	50 (10)	49 (10)	47 (10)	45 (10)	44 (10)	42 (10)	40 (10)	39 (10)	37 (10)	36 (10)	34 (10)
2017	33 (10)	31 (10)	30 (10)	29 (10)	27 (10)	26 (10)	25 (10)	24 (10)	23 (10)	21 (10)	20 (10)	19 (10)
2018	18 (10)	17 (10)	16 (10)	15 (10)	15 (10)	14 (10)	13 (10)	12 (10)	12 (10)	11 (10)	10 (10)	10 (10)
2019	9 (10)	8 (10)	8 (10)	7 (10)	7 (10)	6 (10)	6 (10)	6 (10)	5 (10)	5 (10)	4 (10)	4 (10)



ISES Solar Cycle F10.7cm Radio Flux Progression

Observed data through Aug 2010



Updated 2010 Sep 7

NOAA/SWPC Boulder, CO USA

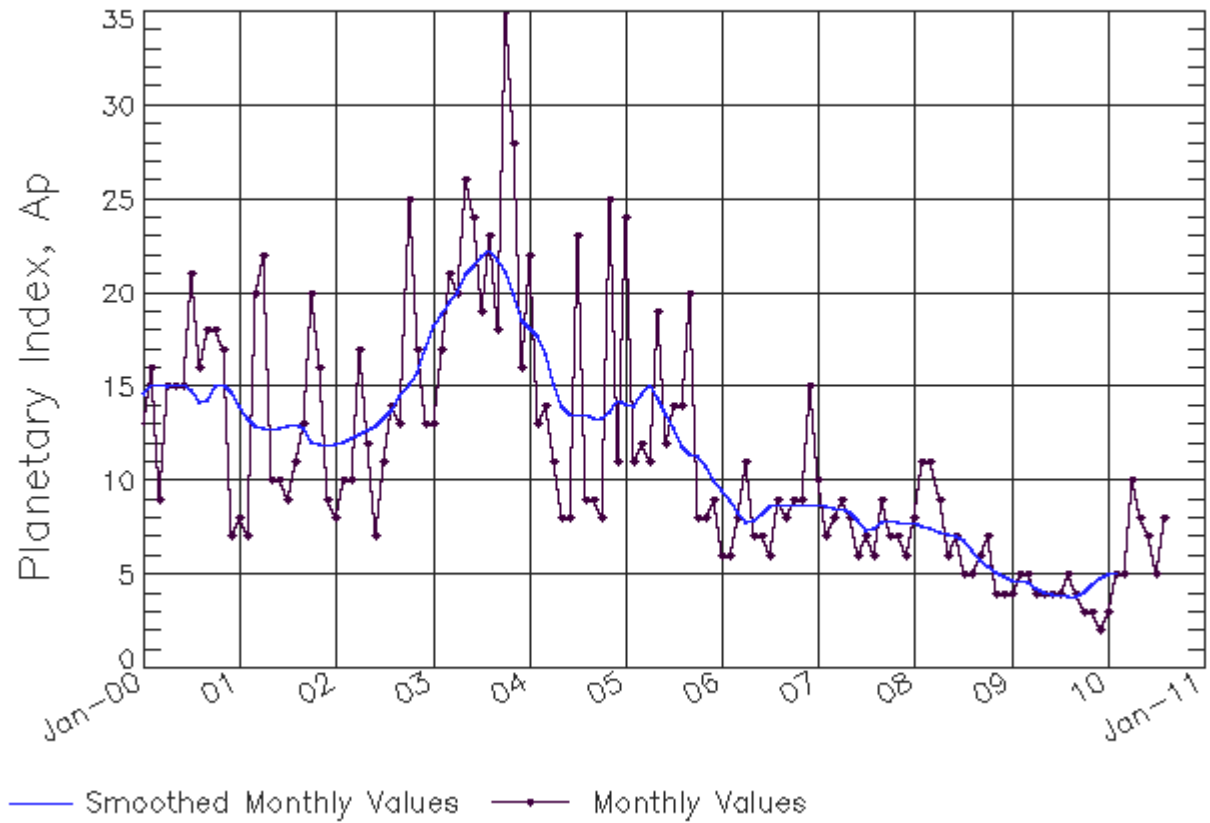
Smoothed F10.7cm Radio Flux Prediction

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	69 (***)	69 (***)	69 (***)	69 (***)	70 (***)	70 (***)	71 (***)	72 (***)	73 (***)	74 (***)	75 (***)	75 (***)
2010	76 (***)	77 (***)	78 (1)	80 (1)	82 (2)	84 (3)	86 (4)	87 (4)	89 (5)	92 (6)	95 (7)	98 (8)
2011	101 (8)	105 (9)	108 (9)	110 (9)	112 (9)	115 (9)	117 (9)	119 (9)	121 (9)	123 (9)	125 (9)	127 (9)
2012	128 (9)	130 (9)	132 (9)	133 (9)	134 (9)	135 (9)	136 (9)	137 (9)	138 (9)	139 (9)	140 (9)	140 (9)
2013	141 (9)	141 (9)	141 (9)	141 (9)	141 (9)	141 (9)	141 (9)	141 (9)	140 (9)	140 (9)	139 (9)	139 (9)
2014	138 (9)	137 (9)	136 (9)	136 (9)	135 (9)	134 (9)	132 (9)	131 (9)	130 (9)	129 (9)	127 (9)	126 (9)
2015	125 (9)	123 (9)	122 (9)	120 (9)	119 (9)	117 (9)	116 (9)	114 (9)	113 (9)	111 (9)	110 (9)	108 (9)
2016	106 (9)	105 (9)	103 (9)	102 (9)	100 (9)	99 (9)	97 (9)	96 (9)	94 (9)	93 (9)	92 (9)	90 (9)
2017	89 (9)	88 (9)	86 (9)	85 (9)	84 (9)	83 (9)	82 (9)	80 (9)	79 (9)	78 (9)	77 (9)	76 (9)
2018	75 (9)	75 (9)	74 (9)	73 (9)	72 (9)	71 (9)	71 (9)	70 (9)	69 (9)	69 (9)	68 (9)	67 (9)
2019	67 (9)	66 (9)	66 (9)	65 (9)	65 (9)	65 (9)	64 (9)	64 (9)	63 (9)	63 (9)	63 (9)	63 (9)



ISES Solar Cycle Ap Progression

Observed data through Aug 2010



Updated 2010 Sep 7

NOAA/SWPC Boulder, CO USA

