

Space Weather Highlights
24 August – 30 August 2009

SWO PRF 1774
01 September 2009

Solar activity was very low. No flares were observed. The visible disk was spotless.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at moderate levels during 24 – 27 August. Fluxes decreased to normal levels during 28 – 30 August.

Geomagnetic field activity was at quiet levels during 24 – 29 August. Activity increased to quiet to active levels on 30 August, with a single major storm period observed at high latitudes late on the 30th. Activity decreased to quiet levels by 31 August. ACE solar wind data indicated the elevated conditions were due to a recurrent coronal hole high-speed stream (CH HSS). Velocities at ACE increased from a low of about 300 km/s at 25/1856 UTC to a high of near 490 km/s at 30/1730 UTC before gradually decreasing to 450 km/s by the end of the period. Interplanetary magnetic field activity associated with the CH HSS included increased Bt (maximum of 12 nT at 30/0927 UTC) and southward Bz (maximum of -11 nT at 30/1422 UTC).

Space Weather Outlook
02 September – 28 September 2009

Solar activity is expected to be very low.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate flux levels during the period with a chance for high levels during 02 – 04 September.

Geomagnetic field activity is expected to be at mostly quiet levels during the period. Isolated unsettled levels are expected on 02 – 05 and 14 – 17 September with isolated active levels possible on 26 September, all due to recurrent CH HSS effects.



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
24 August	68	0	0	<A1.0	0	0	0	0	0	0	0	0
25 August	67	0	0	<A1.0	0	0	0	0	0	0	0	0
26 August	67	0	0	<A1.0	0	0	0	0	0	0	0	0
27 August	68	0	0	<A1.0	0	0	0	0	0	0	0	0
28 August	68	0	0	<A1.0	0	0	0	0	0	0	0	0
29 August	68	0	0	<A1.0	0	0	0	0	0	0	0	0
30 August	67	0	0	<A1.0	0	0	0	0	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
	24 August	1.3e+06	2.1e+04	4.8e+03		1.0e+07
25 August	1.4e+06	2.0e+04	4.6e+03		1.1e+07	
26 August	1.2e+06	2.1e+04	4.3e+03		2.4e+06	
27 August	1.1e+06	2.0e+04	4.5e+03		7.2e+05	
28 August	5.2e+05	2.1e+04	4.4e+03		1.3e+05	
29 August	5.5e+05	2.0e+04	4.6e+03		1.8e+05	
30 August	2.4e+06	2.0e+04	4.4e+03		8.6e+04	

Daily Geomagnetic Data

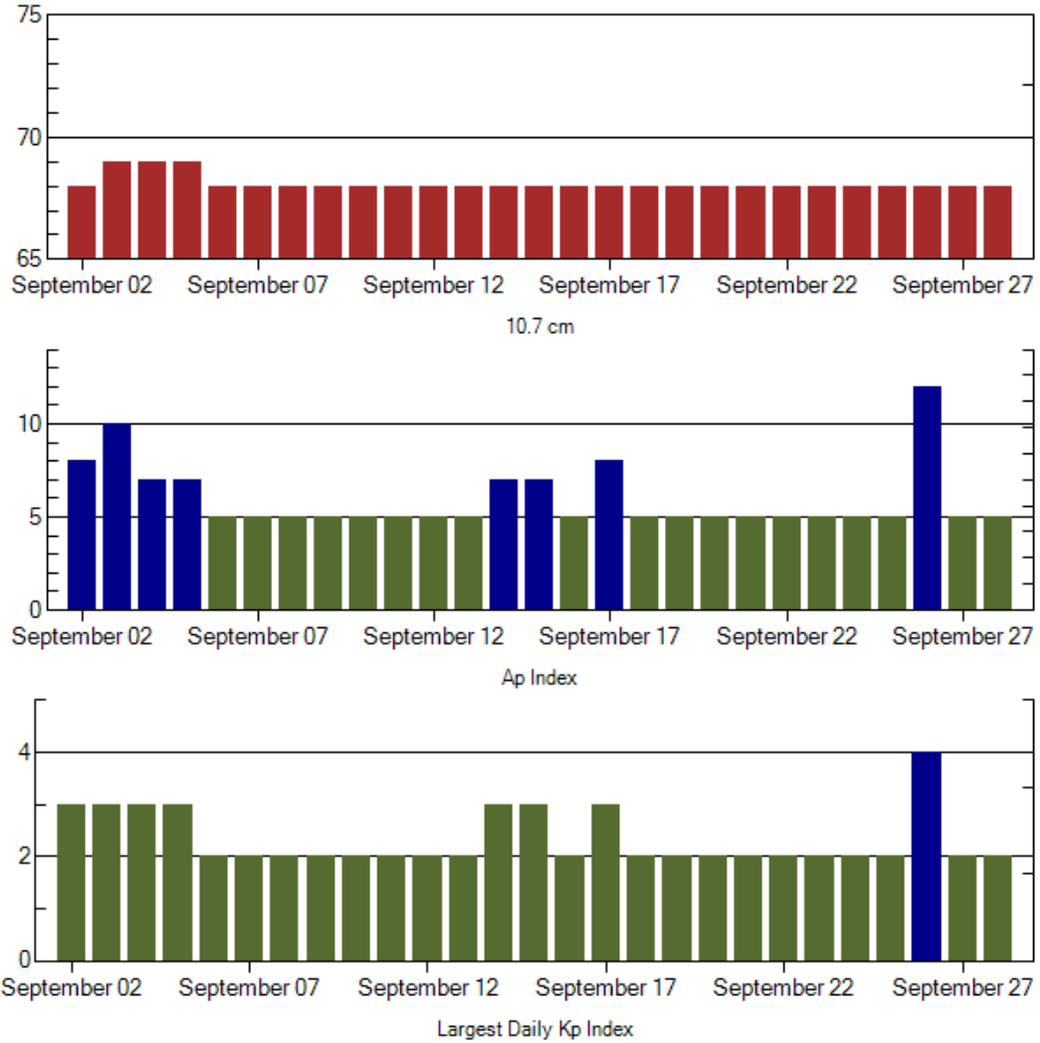
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	24 August	1	1-1-0-0-0-0-0-0	0	1-0-0-0-0-0-0-0	3
25 August	2	0-1-0-0-1-0-1-1	1	1-0-0-0-0-0-0-1	3	1-1-0-0-1-1-0-2
26 August	4	3-2-1-1-1-0-0-0	4	2-1-3-1-0-0-0-0	4	3-1-2-1-0-0-0-1
27 August	4	1-2-0-1-1-2-2-1	3	1-1-0-0-1-2-1-1	5	1-1-0-0-2-2-2-2
28 August	2	1-1-0-0-1-0-0-1	1	0-1-0-0-0-0-0-0	2	1-1-0-0-1-0-0-1
29 August	2	0-1-1-1-1-1-0-0	1	0-0-1-1-0-0-0-0	2	0-1-1-0-1-0-0-1
30 August	12	2-1-3-2-2-4-3-3	24	2-1-4-4-3-6-3-3	19	2-1-3-2-2-6-4-3

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
30 Aug 1533	ALERT: Geomagnetic K = 4	30 Aug 1532
30 Aug 1553	WARNING: Geomagnetic K = 5	30 Aug 1552 - 1800
30 Aug 1618	ALERT: Geomagnetic K = 5	30 Aug 1618
30 Aug 1641	WARNING: Geomagnetic K = 6	30 Aug 1641 - 2100



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
02 Sep	68	8	3	16 Sep	68	5	2
03	69	10	3	17	68	8	3
04	69	7	3	18	68	5	2
05	69	7	3	19	68	5	2
06	68	5	2	20	68	5	2
07	68	5	2	21	68	5	2
08	68	5	2	22	68	5	2
09	68	5	2	23	68	5	2
10	68	5	2	24	68	5	2
11	68	5	2	25	68	5	2
12	68	5	2	26	68	12	4
13	68	5	2	27	68	5	2
14	68	7	3	28	68	5	2
15	68	7	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq
	Begin	Max	Class	Flux	Imp/	Location	Rgn	Radio Flux		Intensity
					Brtns	Lat CMD	#	245	2695	II

No Events Observed

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical	Rgn
	Begin	Max	End			Location Lat CMD	
24 August	No Flares Observed						
25 August	No Flares Observed						
26 August	No Flares Observed						
27 August	No Flares Observed						
28 August	No Flares Observed						
29 August	No Flares Observed						
30 August	No Flares Observed						

Region Summary

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

No Active Regions



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

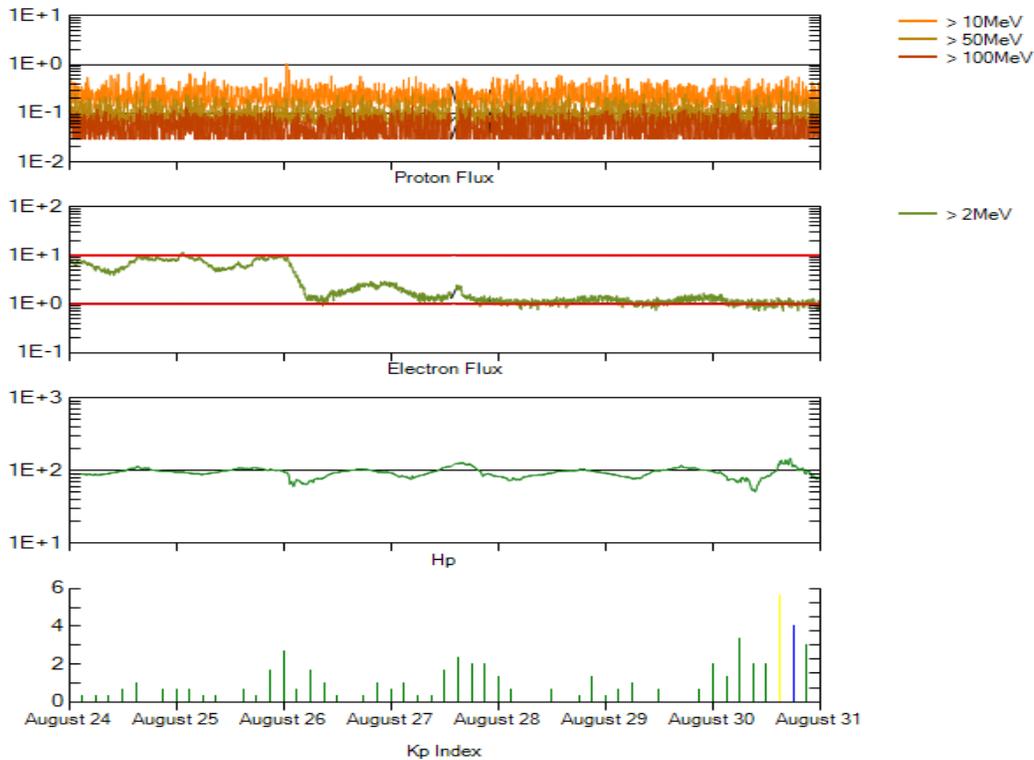
Month	Sunspot Numbers			Smooth values		Radio Flux		Geomagnetic	
	Observed SEC	values RI	Ratio RI/SEC	SEC	RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2007									
September	4.8	2.4	0.50	9.9	5.9	67.1	71.5	9	7.8
October	1.3	0.9	0.70	10.0	6.0	65.5	71.5	9	7.9
November	2.5	1.7	0.68	9.4	5.7	69.7	71.1	5	7.8
December	16.2	10.1	0.62	8.1	4.9	78.6	70.5	4	7.8
2008									
January	5.1	3.3	0.67	6.9	4.2	72.1	70.0	6	7.7
February	3.8	2.1	0.55	5.9	3.6	71.2	69.6	9	7.6
March	15.9	9.3	0.58	5.3	3.3	72.9	69.5	10	7.4
April	4.9	2.9	0.59	5.3	3.4	70.3	69.6	9	7.1
May	5.7	3.2	0.51	5.7	3.5	68.4	69.7	6	6.9
June	4.2	3.4	0.74	5.2	3.3	65.9	69.2	7	6.8
July	1.0	0.8	0.50	4.5	2.8	65.8	68.8	6	6.6
August	0.0	0.5	-1.00	4.4	2.7	66.4	68.6	5	6.2
September	1.5	1.1	0.73	3.7	2.3	67.1	68.4	5	5.8
October	5.2	2.9	0.56	2.9	1.9	68.3	68.2	6	5.4
November	6.8	4.1	0.60	2.7	1.8	68.6	68.3	3	5.1
December	1.3	0.8	0.62	2.7	1.7	69.2	68.5	2	4.9
2009									
January	2.8	1.3	0.54	3.0	1.8	69.8	68.7	3	4.8
February	2.5	1.4	0.56	3.1	1.9	70.0	68.9	4	4.7
March	0.7	0.7	1.00			69.2		4	
April	1.2	1.2	1.00			69.7		4	
May	3.9	2.9	0.74			70.6		4	
June	6.6	2.6	0.39			68.6		5	
July	5.0	3.5	0.70			68.3		5	
August	0.3	0.0	0.00			67.3		5	

NOTE: All values are preliminary estimates except for RI Sunspot Numbers which are final values when available.

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 less than RI value, so a ratio could not be computed.





Weekly Geosynchronous Satellite Environment Summary
Week Beginning 24 August 2009

GOES-11 designated Primary Electron Satellite and GOES-10 Secondary: December 1, 2008 the GOES-12 Electron sensor began experiencing periods of noise and sensor is unreliable.

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

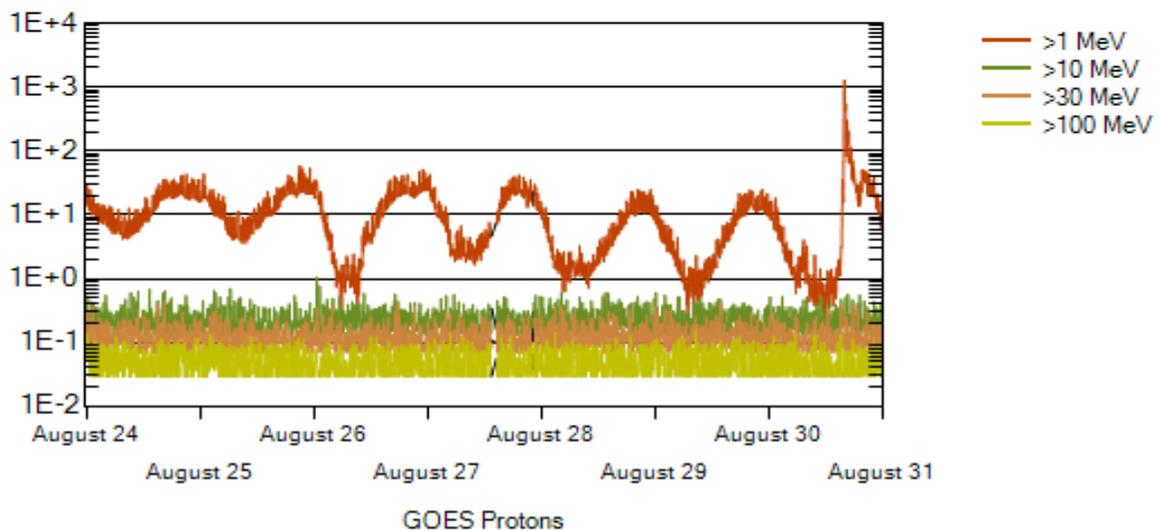
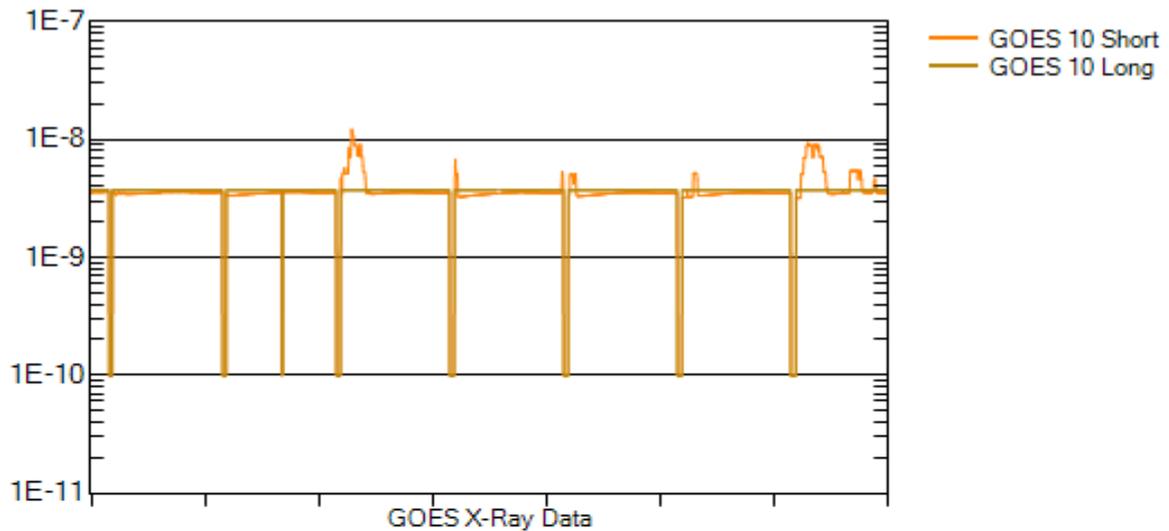
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-11.

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-11. The H 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

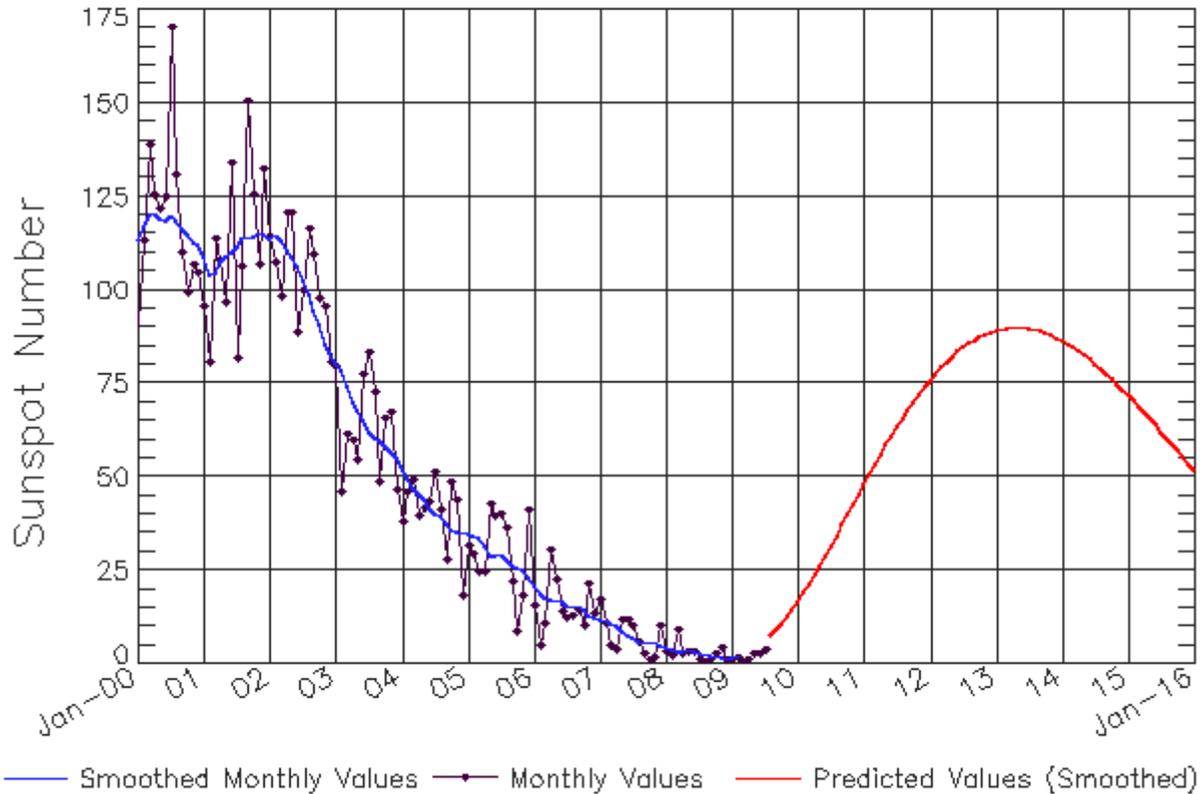
X-ray plot contains five-minute averaged x-ray flux (watts/m²) as measured by GOES 10 (W060) and GOES 11 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 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

Data Through Aug 09



Updated 2009 Sep 1

NOAA/SWPC Boulder, CO USA

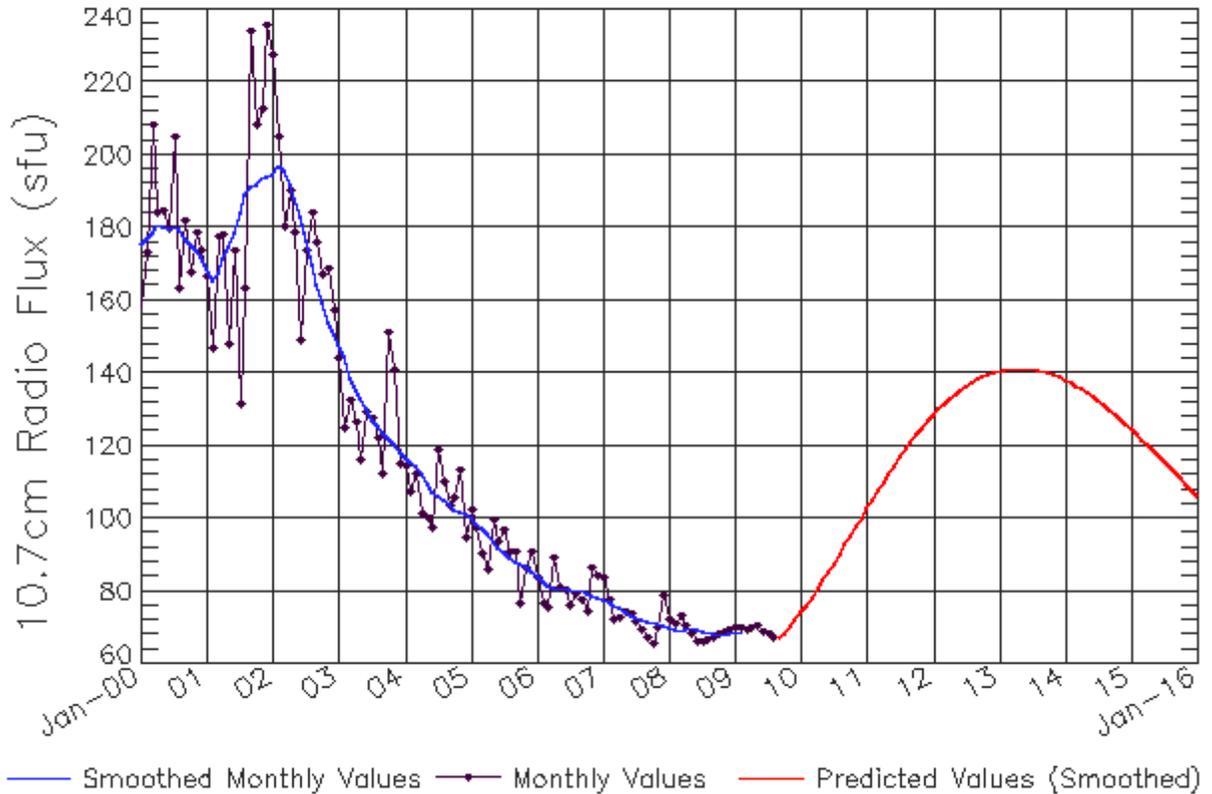
Smoothed Sunspot Number Prediction

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	4	4	3	3	4	3	3	3	2	2	2	2
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2009	2	2	3	3	4	5	6	8	9	11	13	15
	(***)	(***)	(1)	(2)	(3)	(5)	(5)	(6)	(7)	(7)	(8)	(9)
2010	17	20	21	24	26	29	32	34	37	40	43	45
	(9)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2011	48	51	53	56	59	61	63	66	68	70	72	74
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2012	76	78	79	81	82	84	85	86	87	88	88	89
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2013	89	90	90	90	90	90	90	89	89	89	88	87
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2014	86	86	85	84	83	81	80	79	78	76	75	73
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2015	72	70	69	67	65	64	62	60	59	57	55	54
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)



ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through Aug 09



Updated 2009 Sep 1

NOAA/SWPC Boulder, CO USA

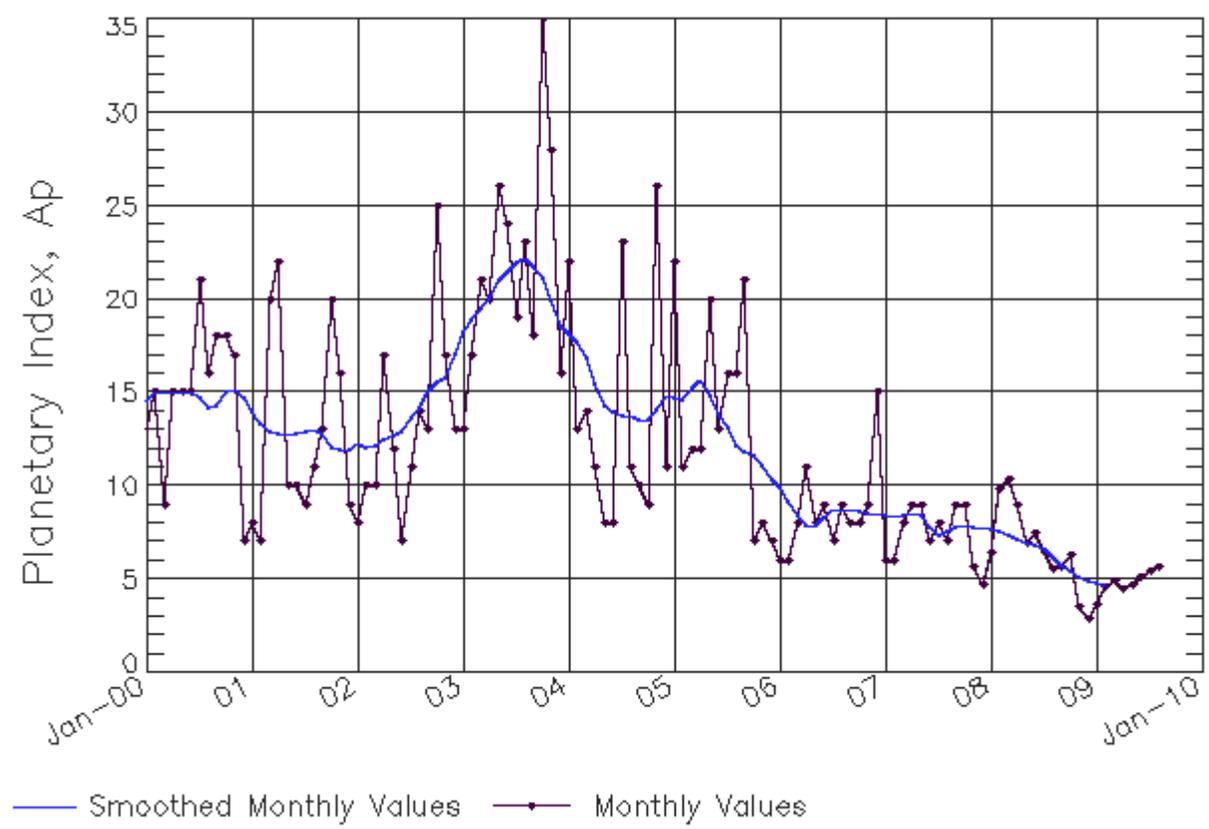
Smoothed F10.7cm Radio Flux Prediction

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	70 (***)	70 (***)	70 (***)	70 (***)	70 (***)	69 (***)	69 (***)	69 (***)	68 (***)	68 (***)	68 (***)	69 (***)
2009	69 (***)	69 (***)	69 (1)	69 (1)	69 (2)	69 (3)	69 (4)	70 (4)	71 (5)	71 (6)	72 (7)	74 (8)
2010	75 (8)	77 (9)	78 (9)	81 (9)	83 (9)	85 (9)	88 (9)	90 (9)	93 (9)	95 (9)	98 (9)	100 (9)
2011	103 (9)	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)	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)



ISES Solar Cycle Ap Progression

Data Through Aug 09



Updated 2009 Sep 1

NOAA/SWPC Boulder, CO USA





Space Environment Center

Solar Terrestrial Indices

Cycle 23 Monthly Values

August 2009

Month 155

Preliminary data

