

**Space Weather Highlights**  
**24 – 30 September 2007**

**SEC PRF 1674**  
**02 October 2007**

Solar activity was very low. No flares were detected.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels during 24 – 27 and 29 – 30 September.

The geomagnetic field was at quiet to active levels on 24 September. Activity decreased to mostly quiet levels on 25 September. The field remained at quiet levels until approximately 27/1500 UTC, then increased to unsettled to major storm levels. Field activity ranged from quiet to minor storm levels during 28 – 29 September with brief major storm periods detected at high latitudes. Activity decreased to quiet to active levels on the last day of the period. ACE solar wind data indicated a recurrent coronal hole high-speed stream was in progress at the start of the period. Peak solar wind velocity associated with this stream was 704.3 km/sec at 24/0810 UTC, followed by a gradual decrease through around midday on 27 September. An interplanetary shock was detected by the ACE spacecraft at 27/1053 UTC accompanied by increased velocities (peak 628.9 km/sec at 28/0104 UTC), increased total field intensity (peak 14.1 nT at 27/1620 UTC), increased densities (peak 21.6 p/cc at 27/1535 UTC), and periods of southward IMF Bz (minimum -9.7 nT at 27/1527 UTC). A recurrent coronal hole high-speed stream commenced around midday on 28 September. Wind velocities gradually increased to a peak of 720.4 km/sec at 30/0116 UTC, then gradually decreased during the remainder of the period. A minor increase in density (peak 10.0 p/cc at 28/1634 UTC) was associated with the onset of the stream. IMF variance associated with the high-speed stream included a peak IMF total field intensity of 12.3 nT at 28/1801 UTC and a minimum southward Bz of -9.1 nT at 28/1911 UTC.

**Space Weather Outlook**  
**03 October – 29 October 2007**

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 reach high levels during 03 – 10 and 21 – 29 October.

Geomagnetic activity is expected to be at unsettled to active levels during 03 – 04 October due to a recurrent coronal hole high-speed stream. Quiet conditions are expected during 05-16 October. An increase to quiet to unsettled levels is expected during 17-19 October. A further increase to unsettled to active levels is forecast for 20 October as another recurrent coronal hole high-speed stream affects the field. Activity is expected to decrease to quiet to unsettled levels during 21-24 October as the high-speed stream subsides. Activity is expected to increase to unsettled to minor storm levels during 25-26 October due to another recurrent coronal hole high-speed stream. Activity is expected to decrease to quiet to unsettled levels for the rest of the period.



### Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
24 September	66	0	0	<A1.0	0	0	0	0	0	0	0	0
25 September	66	0	0	<A1.0	0	0	0	0	0	0	0	0
26 September	67	0	0	<A1.0	0	0	0	0	0	0	0	0
27 September	67	0	0	<A1.0	0	0	0	0	0	0	0	0
28 September	67	15	40	<A1.0	0	0	0	0	0	0	0	0
29 September	68	16	50	<A1.0	0	0	0	0	0	0	0	0
30 September	65	17	40	<A1.0	0	0	0	0	0	0	0	0

### Daily Particle Data

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
24 September	4.0E+6	1.6E+4	3.7E+3		1.6E+8	
25 September	2.7E+6	1.6E+4	3.7E+3		2.0E+8	
26 September	2.3E+6	1.7E+4	4.0E+3		1.9E+8	
27 September	2.3E+6	1.7E+4	4.0E+3		1.8E+8	
28 September	1.9E+6	1.7E+4	3.6E+3		7.5E+6	
29 September	4.3E+6	1.7E+4	3.7E+3		7.1E+7	
30 September	2.5E+6	1.6E+4	3.6E+3		6.1E+8	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
24 September	7	2-3-2-1-2-1-2-2	12	3-3-2-3-4-2-1-1	10	3-4-2-1-2-1-1-2
25 September	5	3-1-1-1-0-1-2-2	4	2-1-2-0-1-1-1-2	6	3-0-1-1-1-1-3-2
26 September	2	2-1-1-0-0-0-1-0	1	1-1-0-1-0-0-0-0	3	2-1-0-0-1-0-1-1
27 September	10	0-0-0-2-1-4-3-4	10	0-0-0-1-0-5-3-3	19	0-0-0-2-1-6-5-4
28 September	15	3-3-4-2-1-2-3-4	27	3-4-6-5-3-2-2-3	21	4-4-4-3-2-2-4-5
29 September	24	5-5-4-3-3-2-3-3	45	5-5-6-6-5-4-3-3	26	5-5-5-4-3-2-4-3
30 September	11	3-4-3-2-2-1-2-2	17	2-3-5-5-2-2-1-0	12	3-4-3-3-2-1-2-2

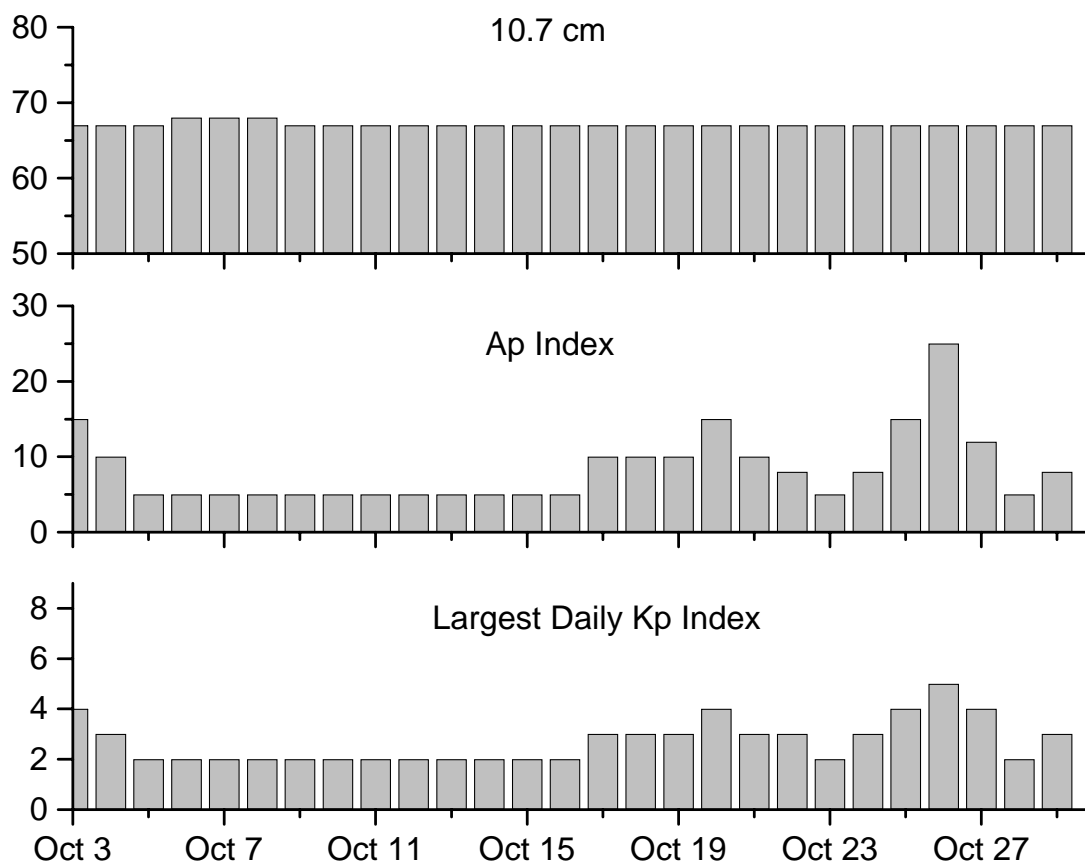


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
24 Sep 0444	ALERT: Geomagnetic K=4	24 Sep 0441
24 Sep 0457	ALERT: Geomagnetic K=5	24 Sep 0455
24 Sep 1042	ALERT: Electron 2MeV Integral Flux >1000pfu	24 Sep 1025
25 Sep 0512	ALERT: Electron 2MeV Integral Flux >1000pfu	25 Sep 0500
26 Sep 0503	ALERT: Electron 2MeV Integral Flux >1000pfu	26 Sep 0500
27 Sep 0511	ALERT: Electron 2MeV Integral Flux >1000pfu	27 Sep 0500
27 Sep 1601	WARNING: Geomagnetic K=4	27 Sep 1601 - 1800
27 Sep 1613	WATCH: Geomagnetic A-index >20	29 Sep
27 Sep 1632	ALERT: Geomagnetic K=4	27 Sep 1630
27 Sep 1705	ALERT: Geomagnetic K=5	27 Sep 1700
27 Sep 2040	ALERT: Geomagnetic K=4	27 Sep 2038
28 Sep 0433	ALERT: Geomagnetic K=4	28 Sep 0431
28 Sep 0725	WARNING: Geomagnetic K=4	28 Sep 0725 - 1600
28 Sep 0837	ALERT: Geomagnetic K=4	28 Sep 0835
28 Sep 1931	WARNING: Geomagnetic K=4	28 Sep 1931 - 29/1600
28 Sep 2201	ALERT: Geomagnetic K=4	28 Sep 2159
29 Sep 0359	ALERT: Geomagnetic K=5	29 Sep 0358
29 Sep 0815	ALERT: Geomagnetic K=5	29 Sep 0815
29 Sep 0817	WARNING: Geomagnetic K=5	29 Sep 0820 - 1600
29 Sep 1426	ALERT: Electron 2MeV Integral Flux >1000pfu	29 Sep 1410
30 Sep 0531	ALERT: Electron 2MeV Integral Flux >1000pfu	30 Sep 0525
30 Sep 0746	ALERT: Geomagnetic K=4	30 Sep 0742
30 Sep 1042	WARNING: Geomagnetic K=4	30 Sep 1040 - 1600
30 Sep 1043	ALERT: Geomagnetic K=430 Sep 1042	



# *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
03 Oct	67	15	4	17 Oct	67	10	3
04	67	10	3	18	67	10	3
05	67	5	2	19	67	10	3
06	68	5	2	20	67	15	4
07	68	5	2	21	67	10	3
08	68	5	2	22	67	8	3
09	67	5	2	23	67	5	2
10	67	5	2	24	67	8	3
11	67	5	2	25	67	15	4
12	67	5	2	26	67	25	5
13	67	5	2	27	67	12	4
14	67	5	2	28	67	5	2
15	67	5	2	29	67	8	3
16	67	5	2				



### ***Energetic Events***

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

***No Events Observed***

### ***Flare List***

Date	Time			Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				

24 September **No Flares Observed**  
 25 September **No Flares Observed**  
 26 September **No Flares Observed**  
 27 September **No Flares Observed**  
 28 September **No Flares Observed**  
 29 September **No Flares Observed**  
 30 September **No Flares Observed**

### ***Region Summary***

Location		Sunspot Characteristics									
		Flares						X-ray			
Date	(° Lat ° CMD)	Helio Lon	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	C	M	X	S

#### ***Region 971***

28 Sep	N03E07	113	0040	04	Cro	005	B
29 Sep	N03W06	112	0050	04	Cro	006	B
30 Sep	N02W19	112	0040	04	Bxo	007	B

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 112

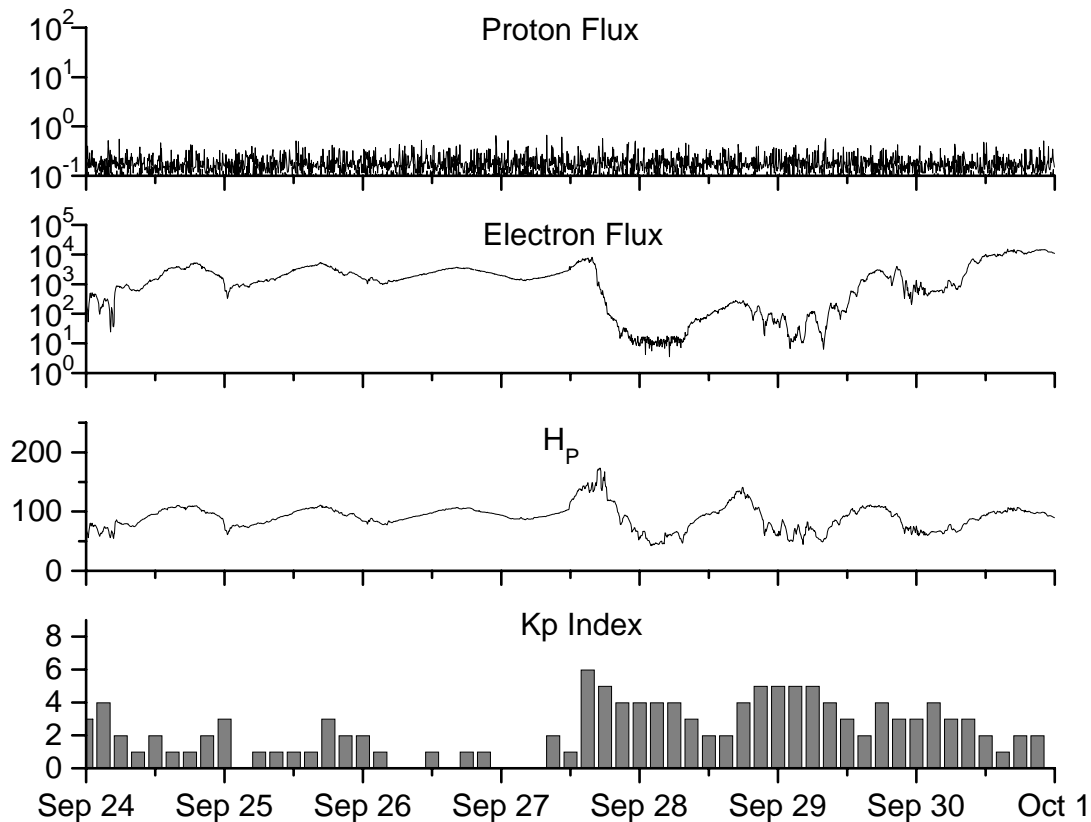


**Recent Solar Indices (preliminary)**  
**Of the observed monthly mean values**

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
2005									
October	13.0	8.5	0.65	42.6	25.5	76.7	87.4	7	11.6
November	32.2	18.0	0.56	42.1	24.9	86.3	86.7	8	11.1
December	62.6	41.2	0.66	40.1	23.0	90.8	85.4	7	10.4
2006									
January	28.0	15.4	0.55	37.2	20.8	83.8	84.0	6	9.9
February	5.3	4.7	0.89	33.4	18.7	76.6	82.6	6	9.2
March	21.3	10.8	0.51	31.0	17.4	75.5	81.6	8	8.4
April	55.2	30.2	0.55	30.6	17.1	89.0	80.9	11	7.9
May	39.6	22.2	0.56	30.7	17.3	81.0	80.8	8	7.9
June	37.7	13.9	0.37	28.9	16.3	80.1	80.6	9	8.3
July	22.6	12.2	0.54	27.2	15.3	75.8	80.3	7	8.7
August	22.8	12.9	0.57	27.6	15.6	79.0	80.3	9	8.7
September	25.2	14.5	0.58	27.7	15.6	77.8	80.2	8	8.7
October	15.7	10.4	0.66	25.2	14.2	74.3	79.4	8	8.6
November	31.5	21.5	0.68	22.3	12.7	86.4	78.5	9	8.5
December	22.2	13.6	0.61	20.7	12.1	84.3	77.9	15	8.5
2007									
January	26.6	16.9	0.64	19.7	12.0	83.5	77.5	6	8.4
February	17.2	10.6	0.62	18.9	11.6	77.8	76.9	6	8.4
March	9.7	4.8	0.49	17.5	10.8	72.3	76.0	8	8.4
April	6.9	3.7	0.54			72.4		9	
May	19.4	11.7	0.60			74.5		9	
June	20.0	12.0	0.60			73.7		7	
July	15.6	10.0	0.64			71.6		8	
August	9.9	6.2	0.63			69.2		7	
September	4.8	2.4	0.50			67.1		8	

**NOTE:** All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000. \*After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.





*Weekly Geosynchronous Satellite Environment Summary*  
*Week Beginning 24 September 2007*

Protons plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

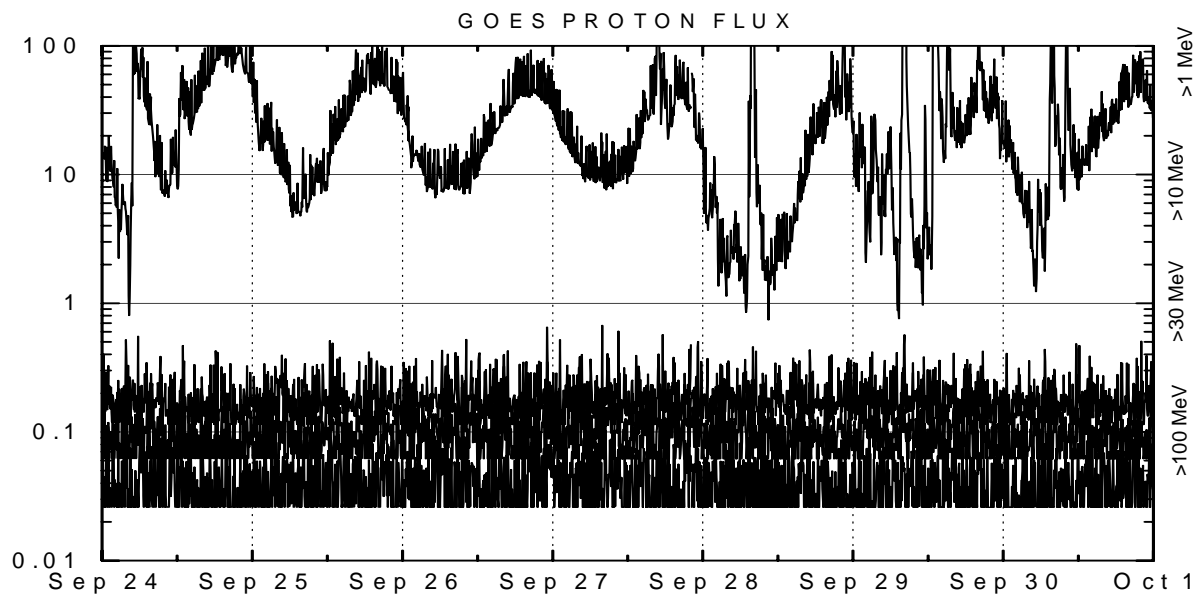
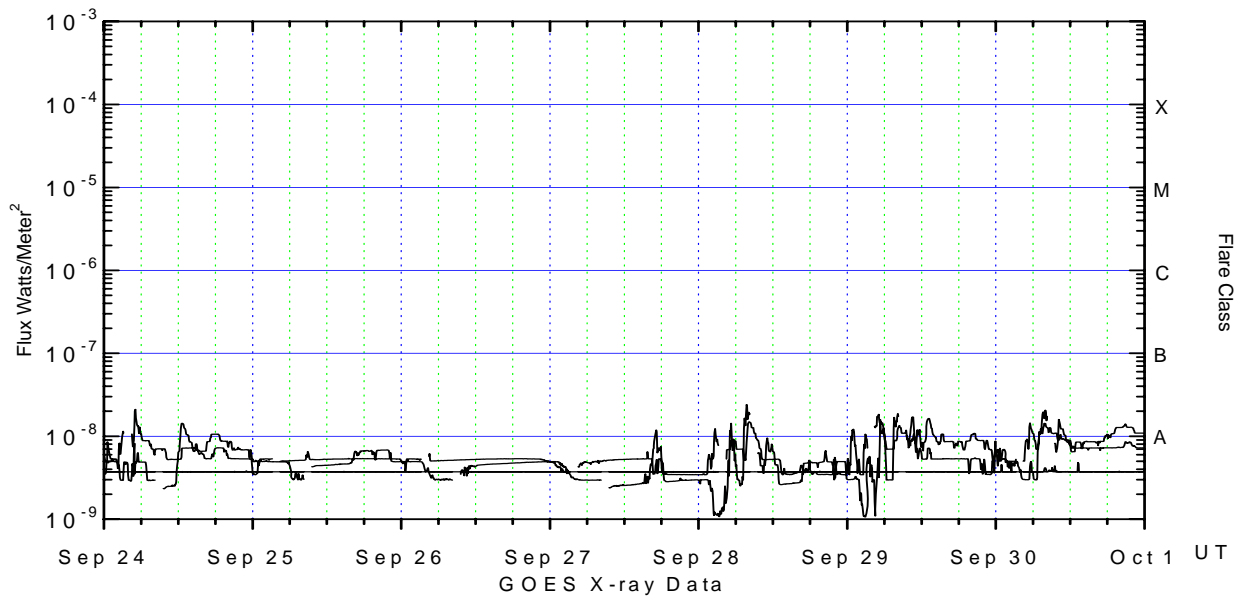
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec-sr) with energies greater than 2 MeV at GOES-12 (W075).

$H_P$  plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. 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 SEC 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/m<sup>2</sup>) 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.

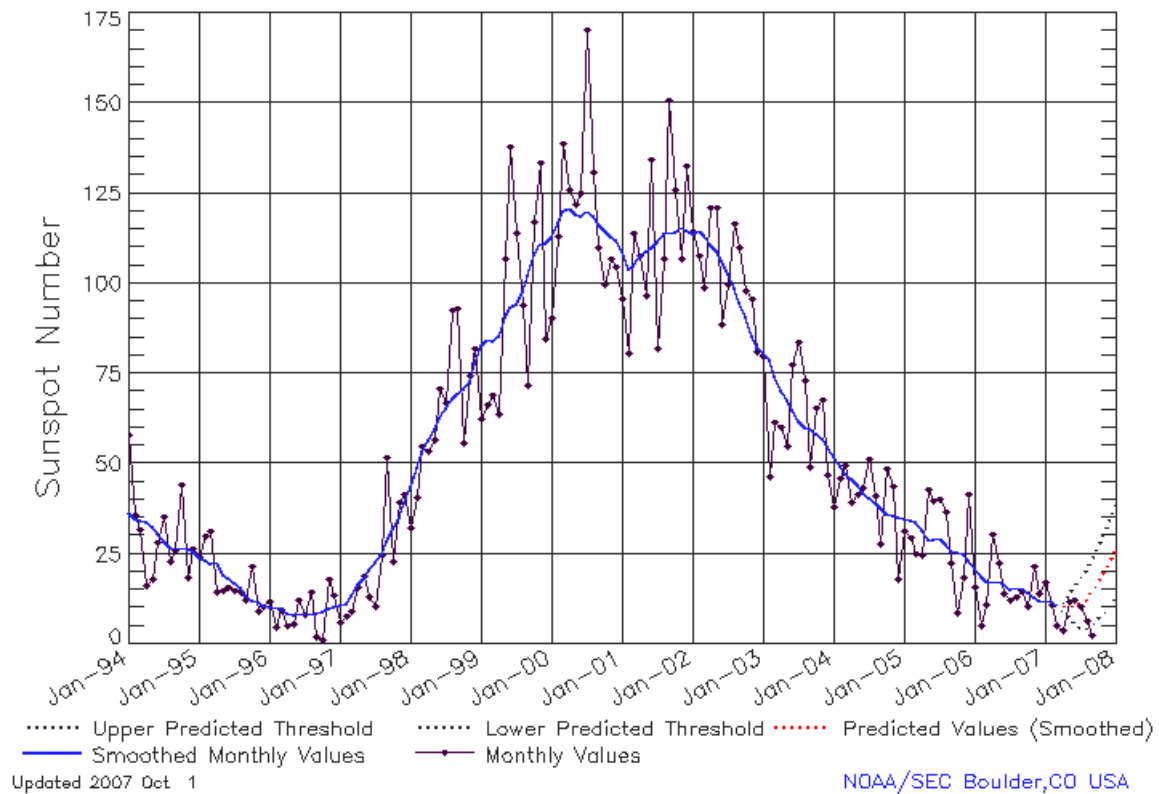
Proton plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.





# ISES Solar Cycle Sunspot Number Progression

Data Through 30 Sep 07



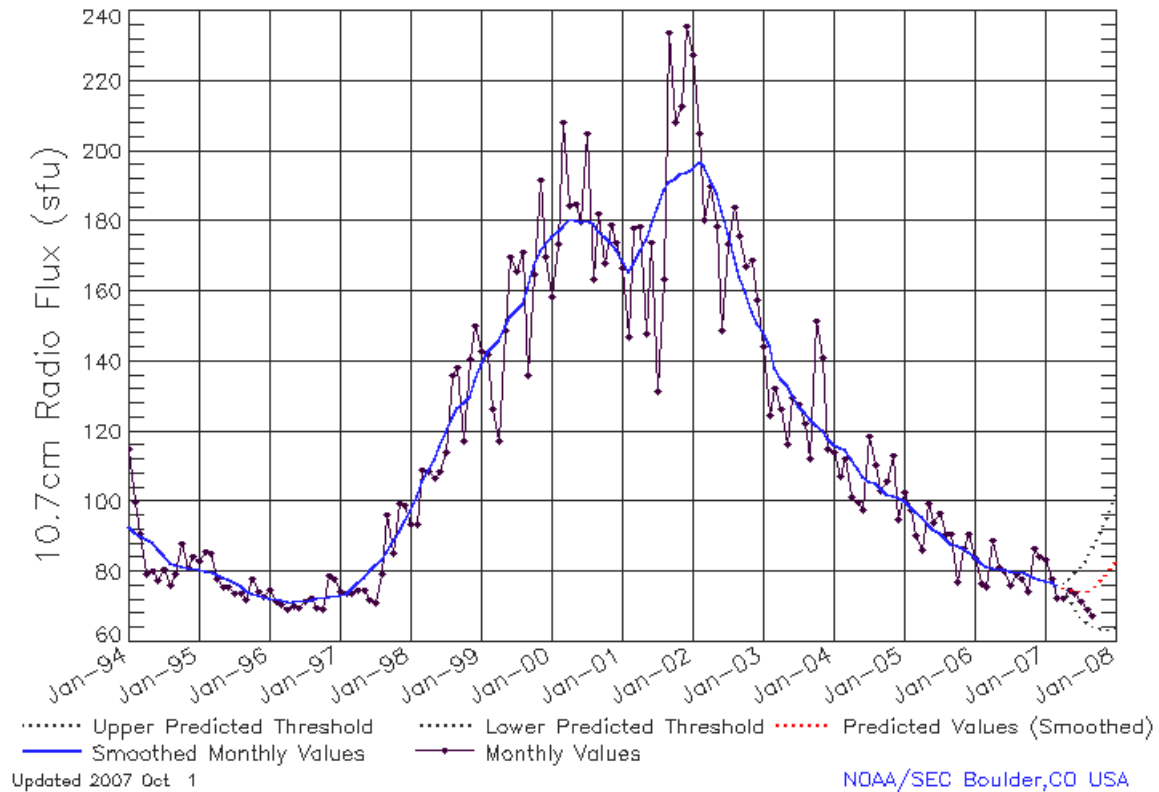
## SEC Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	44	49	53	57	59	63	66	68	70	71	73	78
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
1999	83	85	84	86	91	93	94	98	102	108	111	111
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2000	113	117	120	121	119	119	120	119	116	115	113	112
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2001	109	104	105	108	109	110	112	114	114	114	116	115
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2002	114	115	113	111	109	106	103	99	95	91	85	82
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2003	81	79	74	70	68	65	62	60	60	58	57	55
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2004	52	49	47	46	44	42	40	39	38	36	35	35
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2005	35	34	34	32	29	29	29	28	26	26	25	23
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2006	21	19	17	17	17	16	15	16	16	14	13	12
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2007	12	12	11	<b>11</b>	<b>11</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>15</b>	<b>17</b>	<b>20</b>	<b>23</b>
	(**)	(**)	(**)	(1)	(3)	(5)	(7)	(8)	(9)	(10)	(11)	(12)



# ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 30 Sep 07



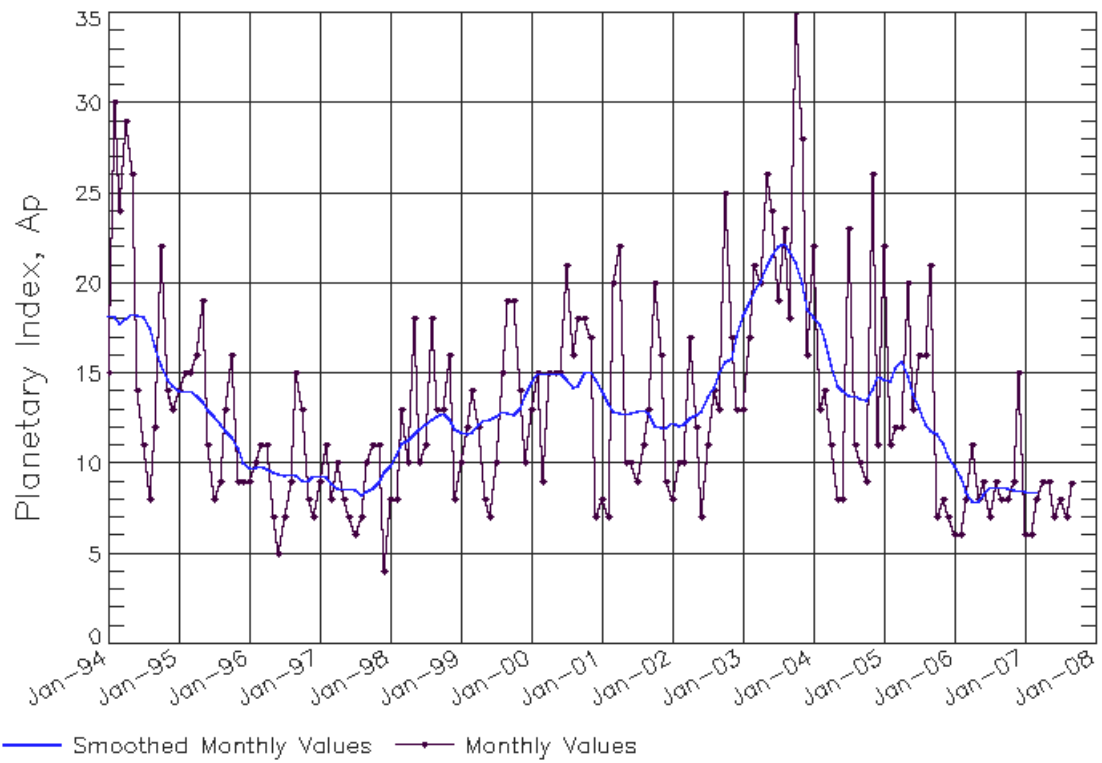
## SEC Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	98	102	106	109	112	116	120	124	127	128	130	134
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
1999	139	143	144	146	150	153	154	156	161	167	172	173
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2000	176	177	178	181	180	180	180	179	177	176	174	172
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2001	169	166	168	172	175	179	184	189	191	192	194	194
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2002	195	197	196	192	188	183	176	170	164	159	154	151
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2003	148	145	138	135	133	130	127	125	124	122	120	118
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2004	116	116	115	112	109	107	106	105	104	102	102	101
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2005	100	99	97	96	93	92	91	89	88	87	87	85
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2006	84	83	82	81	81	81	80	80	80	79	79	78
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2007	78	77	76	<b>76</b>	<b>75</b>	<b>75</b>	<b>75</b>	<b>75</b>	<b>76</b>	<b>77</b>	<b>79</b>	<b>81</b>
	(***)	(***)	(***)	(1)	(3)	(5)	(7)	(9)	(13)	(13)	(14)	(14)



# ISES Solar Cycle Ap Progression

Data Through 30 Sep 07



Updated 2007 Oct 1

NOAA/SEC Boulder, CO USA

