

**Space Weather Highlights**  
**30 July – 05 August 2007**

**SEC PRF 1666**  
**31 July 2007**

Solar activity was very low. No flares were observed during the period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels during 01 – 05 August.

The geomagnetic field was at quiet to active levels on 30 July. Activity decreased to quiet to unsettled levels on 31 July. Quiet to active levels occurred on 01 August. Quiet to unsettled conditions were observed during the rest of the period. ACE solar wind data indicated the 30 July and 01 August activity was due to a recurrent coronal hole high-speed wind stream. Solar wind velocities were elevated during 30 July – 03 August with a peak velocity of 679 km/sec at 01/1839 UTC. IMF B<sub>t</sub> reached a peak of 9.1 nT at 01/1055 UTC while IMF B<sub>z</sub> reached a minimum of -6.9 nT at 01/1233 UTC during the disturbance. The high-speed stream subsided on 04 August.

**Space Weather Outlook**  
**08 August – 03 September 2007**

Solar activity is expected to be at very low levels.

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 12 – 15 August and 28 August – 01 September.

The geomagnetic field is expected to be at quiet to unsettled levels during 08 – 09 August. A recurrent coronal high-speed stream is expected to disturb the field during 10 – 11 August with unsettled to minor storm levels expected. Activity is expected to decrease to mostly quiet levels during 12 – 15 August. Active periods are expected during 16 – 17 August as another recurrent high-speed stream affects the field. Quiet to unsettled conditions are expected during 18 – 24 August. Activity is expected to increase to unsettled to active levels on 25 August due to another recurrent coronal hole high-speed stream. Quiet to unsettled levels are expected during 26 August – 02 September. Activity is expected to increase to unsettled to minor storm levels on 03 September as another recurrent high-speed stream disturbs the field.



### 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
30 July	69	13	10	<A1.0	0	0	0	0	0	0	0	0
31 July	68	11	10	<A1.0	0	0	0	0	0	0	0	0
01 August	68	0	0	<A1.0	0	0	0	0	0	0	0	0
02 August	69	0	0	<A1.0	0	0	0	0	0	0	0	0
03 August	70	11	10	<A1.0	0	0	0	0	0	0	0	0
04 August	69	11	30	<A1.0	0	0	0	0	0	0	0	0
05 August	69	11	10	<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
30 July	8.7E+5	1.6E+4	3.6E+3		1.6E+7	
31 July	9.0E+5	1.6E+4	3.4E+3		3.5E+7	
01 August	1.6E+6	1.7E+4	3.6E+3		4.3E+7	
02 August	1.3E+6	1.6E+4	3.5E+3		1.3E+8	
03 August	8.9E+5	1.6E+4	3.7E+3		1.3E+8	
04 August	1.1E+6	1.7E+4	3.6E+3		1.4E+8	
05 August	1.8E+6	1.8E+4	3.9E+3		1.8E+8	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
30 July	10	4-3-2-2-2-2-1	18	3-4-5-2-2-2-1-4	10	3-4-3-1-1-2-2-2
31 July	4	0-1-2-1-1-1-1-2	7	1-1-2-3-3-1-1-1	6	1-1-2-2-1-1-1-2
01 August	15	3-4-4-2-3-2-2-3	24	3-3-4-6-4-3-1-2	17	3-4-4-3-2-2-3-3
02 August	5	2-1-2-1-1-2-2-1	8	2-1-2-1-3-4-1-0	5	1-2-2-0-2-2-1-2
03 August	4	1-2-2-0-2-1-1-1	4	1-2-2-0-2-0-1-1	4	1-2-2-0-1-1-1-2
04 August	0	0-0-0-0-0-0-0-1	1	0-1-0-0-0-0-0-1	2	1-0-1-0-0-0-0-1
05 August	2	0-0-0-0-1-0-2-1	0	0-0-0-0-0-0-1-0	2	1-0-0-0-0-1-1-1

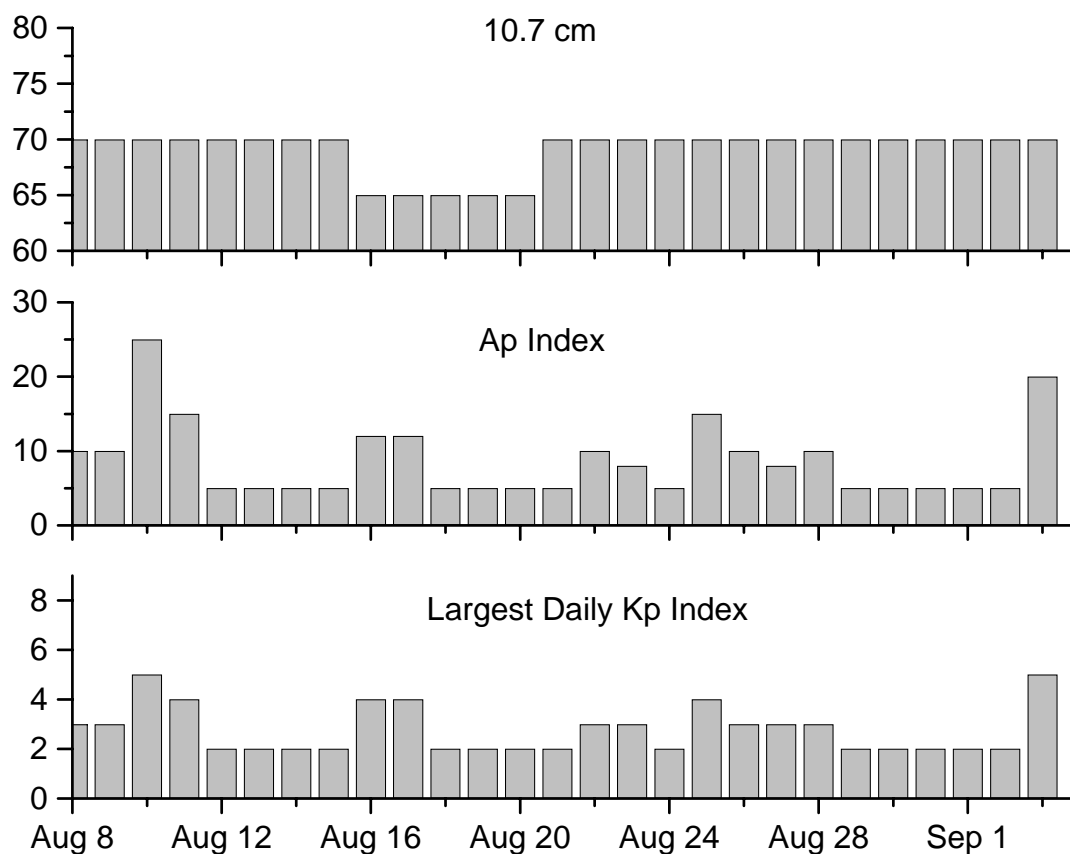


### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
30 Jul 0256	ALERT: Geomagnetic K = 4	30 Jul 0255
30 Jul 0330	ALERT: Geomagnetic K = 4	30 Jul 0328
30 Jul 0430	WARNING: Geomagnetic K = 4	30 Jul 0430 – 1600
01 Aug 0541	WARNING: Geomagnetic K = 4	01 Aug 0545 – 1600
01 Aug 0546	ALERT: Geomagnetic K = 4	01 Aug 0545
01 Aug 0555	ALERT: Geomagnetic K = 5	01 Aug 0555
01 Aug 0617	ALERT: Geomagnetic K = 5	01 Aug 0616
01 Aug 1401	ALERT: Electron 2MeV Integral Flux $\geq 1000$ pfu	01 Aug 1345
02 Aug 0943	ALERT: Electron 2MeV Integral Flux $\geq 1000$ pfu	02 Aug 0920
03 Aug 0839	ALERT: Electron 2MeV Integral Flux $\geq 1000$ pfu	03 Aug 0815
04 Aug 0629	ALERT: Electron 2MeV Integral Flux $\geq 1000$ pfu	04 Aug 0605
05 Aug 0500	ALERT: Electron 2MeV Integral Flux $\geq 1000$ pfu	05 Aug 0500



# *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 Aug	70	10	3	22 Aug	70	10	3
09	70	10	3	23	70	8	3
10	70	25	5	24	70	5	2
11	70	15	4	25	70	15	4
12	70	5	2	26	70	10	3
13	70	5	2	27	70	8	3
14	70	5	2	28	70	10	3
15	70	5	2	29	70	5	2
16	65	12	4	30	70	5	2
17	65	12	4	31	70	5	2
18	65	5	2	01 Sep	70	5	2
19	65	5	2	02	70	5	2
20	65	5	2	03	70	20	5
21	70	5	2				



### ***Energetic Events***

Energy Events													
Date	Time			X-ray		Optical Information				Peak		Sweep Freq	
	$\frac{1}{2}$			Integ		Imp/	Location		Rgn	Radio Flux		Intensity	
	Begin	Max	Max	Class	Flux	Brtns	Lat	CMD	#	245	2695	II	IV
No Events Observed													

***No Events Observed***

### ***Flare List***

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

30 July ***No Flares Observed***  
 31 July ***No Flares Observed***  
 01 August ***No Flares Observed***  
 02 August ***No Flares Observed***  
 03 August ***No Flares Observed***  
 04 August ***No Flares Observed***  
 05 August ***No Flares Observed***

### ***Region Summary***

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

#### ***Region 965***

28 Jul	S11E24	195	0030	02	Cso	003	B				3				
29 Jul	S11E10	196	0040	03	Cso	004	B								
30 Jul	S10W04	197	0010	02	Bxo	003	B								
31 Jul	S12W15	194	0010	01	Axx	001	A								
01 Aug	S12W28	194													
02 Aug	S12W41	194													
03 Aug	S12W54	194													
04 Aug	S12W67	194													
05 Aug	S12W80	193													

0 0 0 3 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 197

#### ***Region 966***

03 Aug	S04E74	066	0010	01	Hsx	001	A								
04 Aug	S05E62	064	0030	02	Hsx	001	A								
05 Aug	S07E46	067	0010	02	Axx	001	A								

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 067

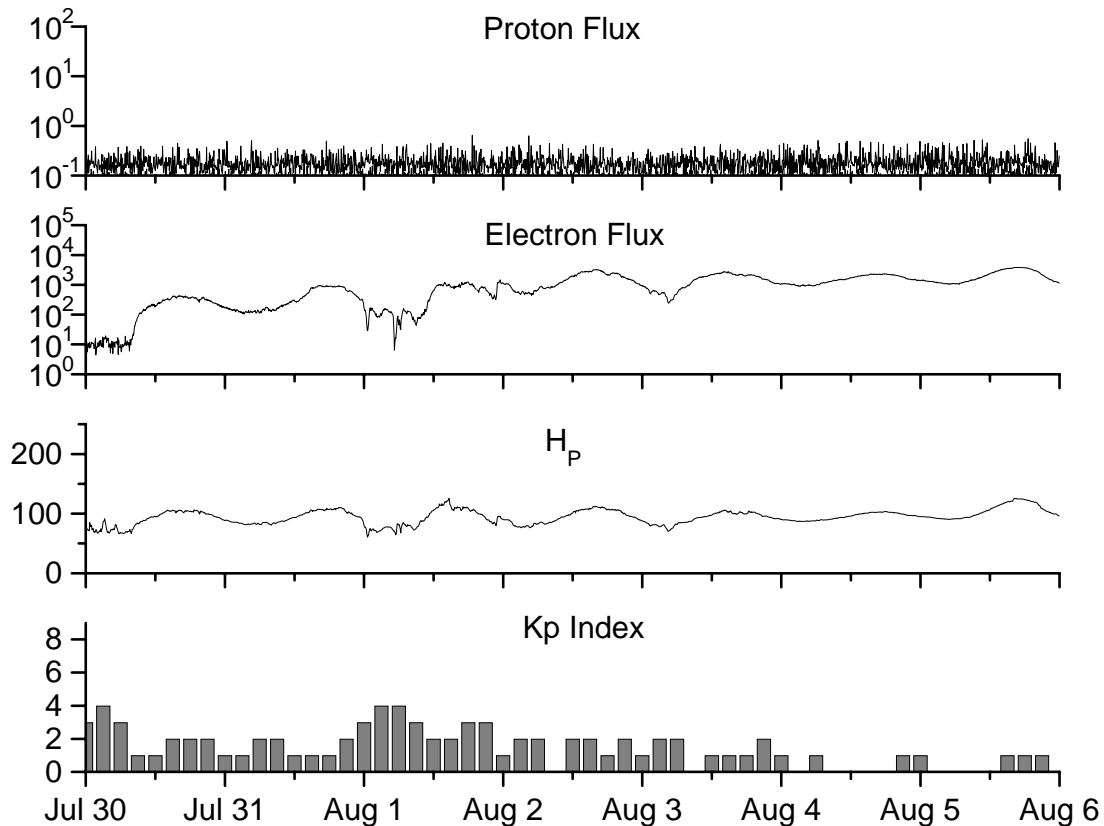


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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									
August	65.6	36.4	0.55	45.4	27.5	90.7	89.3	16	12.2
September	39.2	22.1	0.56	42.9	25.9	90.8	87.8	21	11.8
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			77.8		6	
March	9.7	4.8	0.49			72.3		7	
April	6.9	3.7	0.54			72.4		9	
May	19.4	11.7	0.60			74.5		8	
June	20.0	12.0	0.60			73.7		7	
July	15.6	10.0	0.64			71.6		7	

**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 30 July 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.

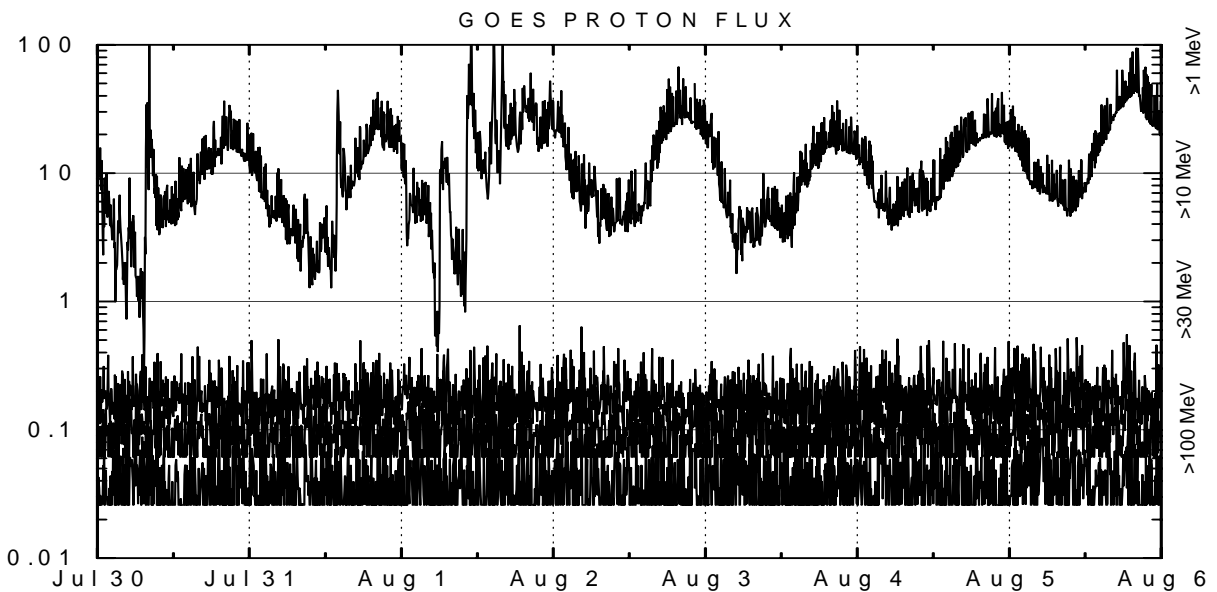
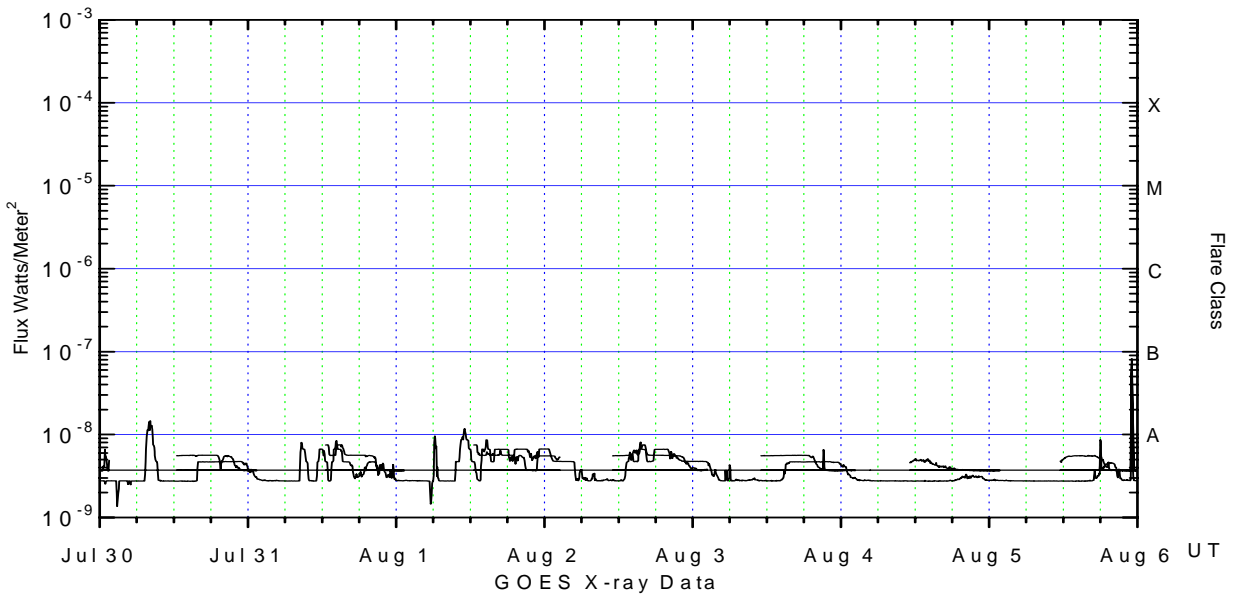
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec-sr) with energies greater than 2 MeV at GOES-12 (W075).

$H_p$  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.

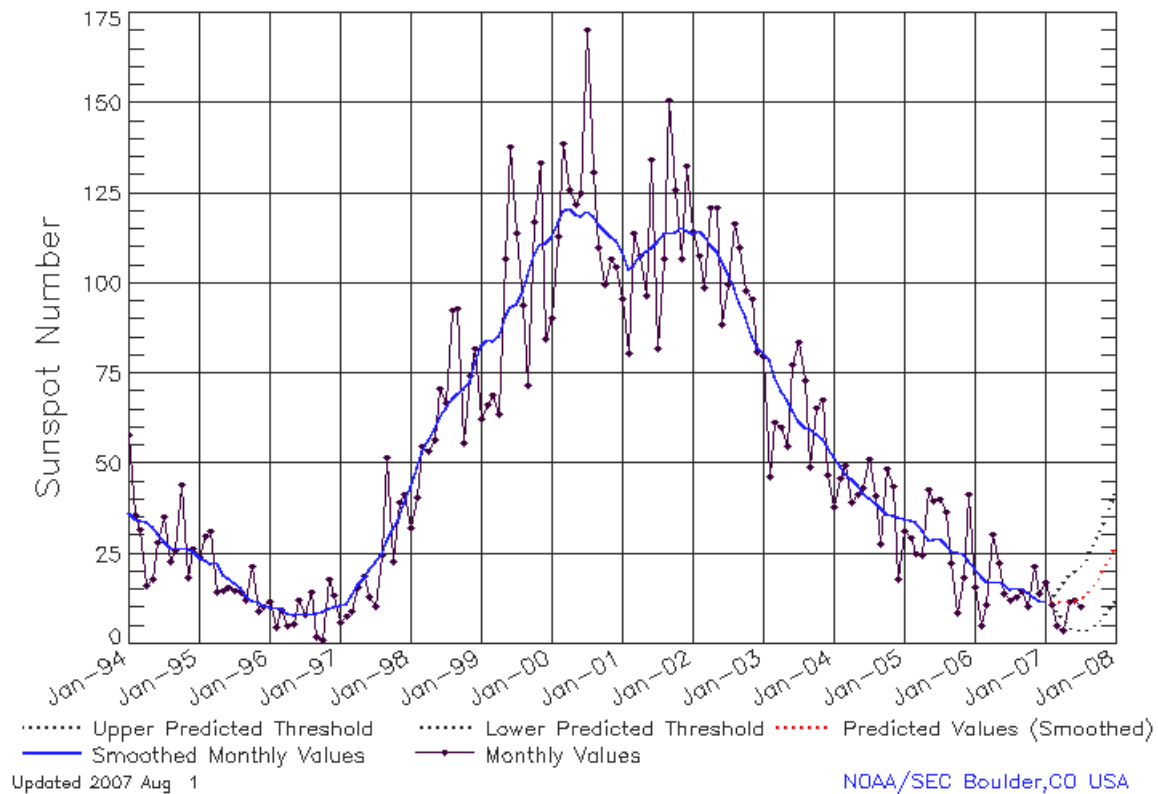
Proton plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.





# ISES Solar Cycle Sunspot Number Progression

Data Through 31 Jul 07



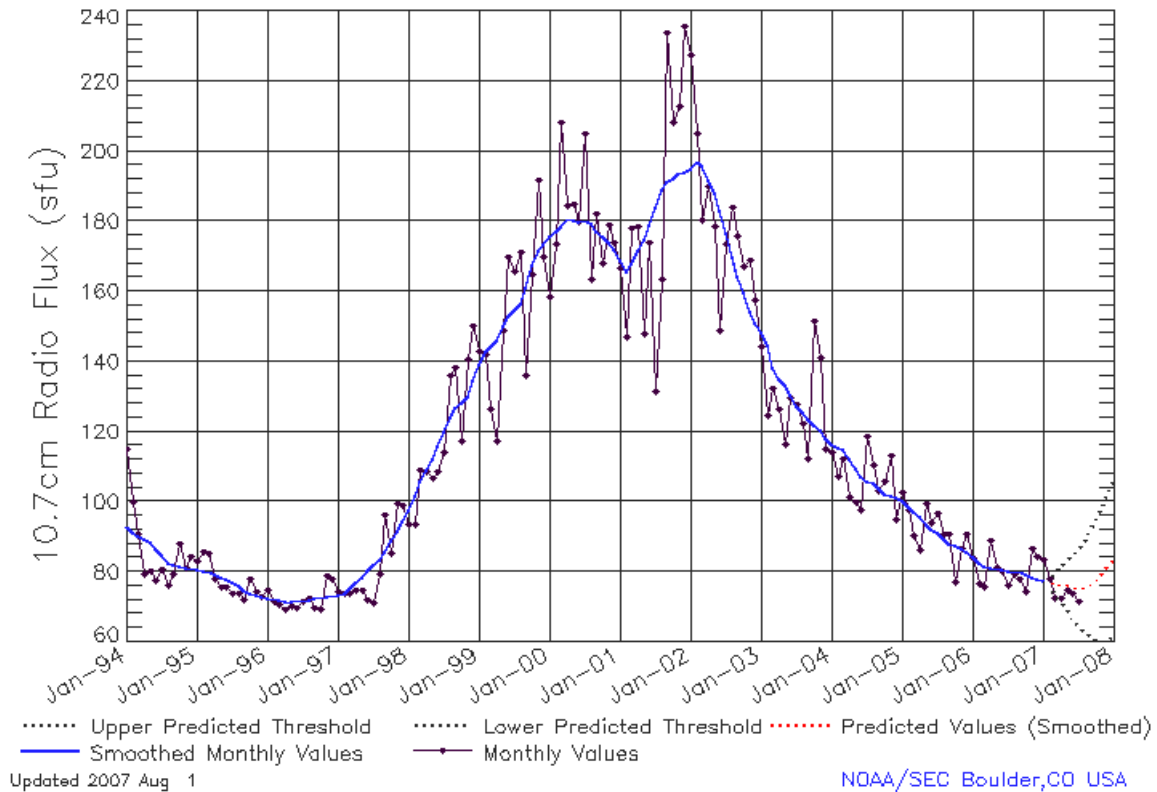
## SEC Prediction of Smoothed Sunspot Number

	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	<b>12</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>16</b>	<b>18</b>	<b>21</b>	<b>24</b>
	(**)	(1)	(3)	(5)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)



# ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 31 Jul 07



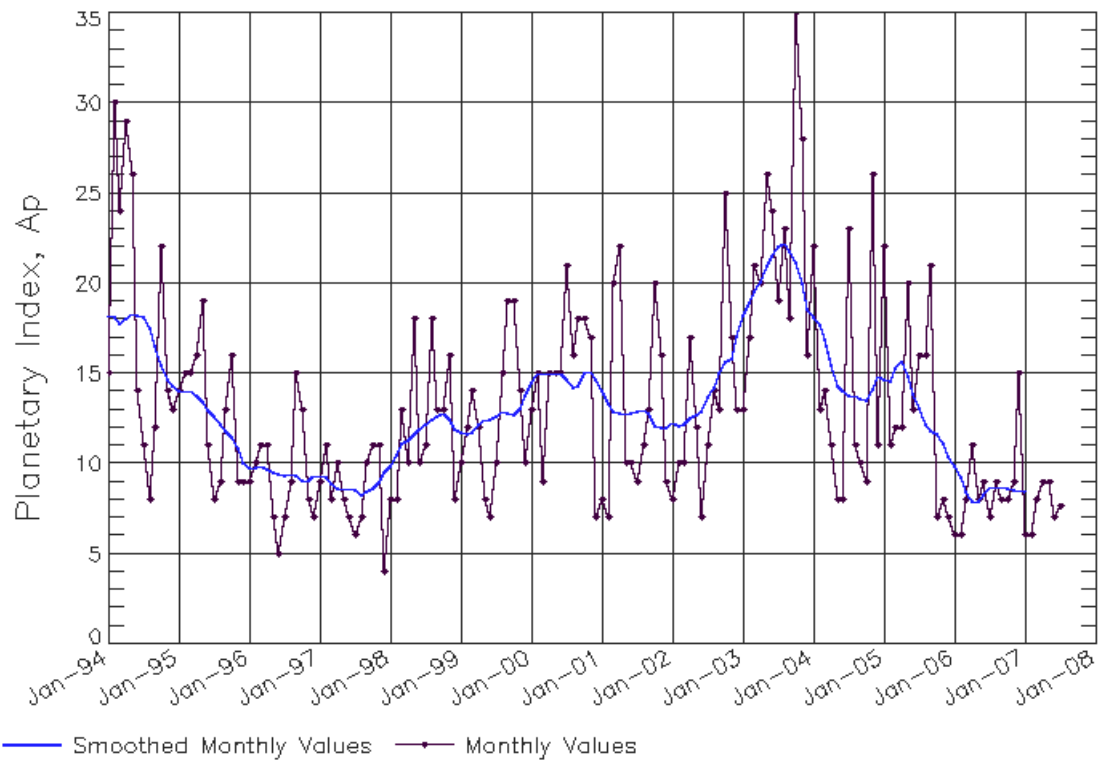
## SEC Prediction of Smoothed F10.7cm Radio Flux

	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	<b>77</b>	<b>77</b>	<b>77</b>	<b>76</b>	<b>76</b>	<b>75</b>	<b>76</b>	<b>77</b>	<b>78</b>	<b>80</b>	<b>82</b>
	(***)	(1)	(3)	(5)	(7)	(9)	(13)	(13)	(14)	(14)	(13)	(12)



# ISES Solar Cycle Ap Progression

Data Through 31 Jul 07



Updated 2007 Aug 1

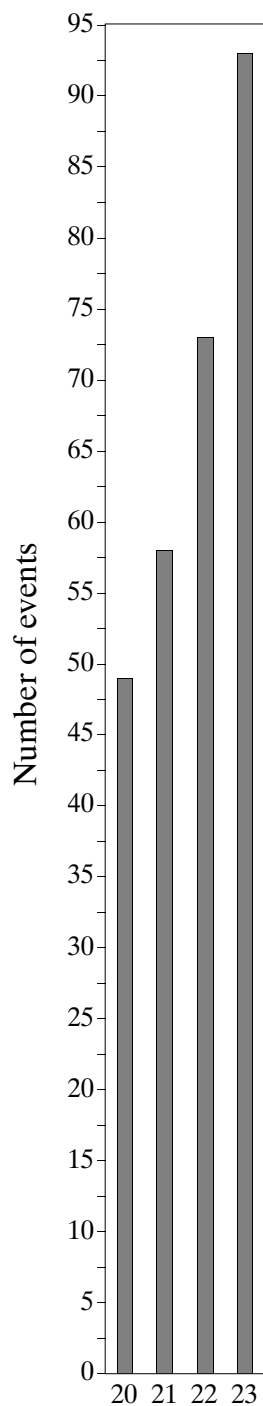
[NOAA/SEC Boulder, CO USA](#)



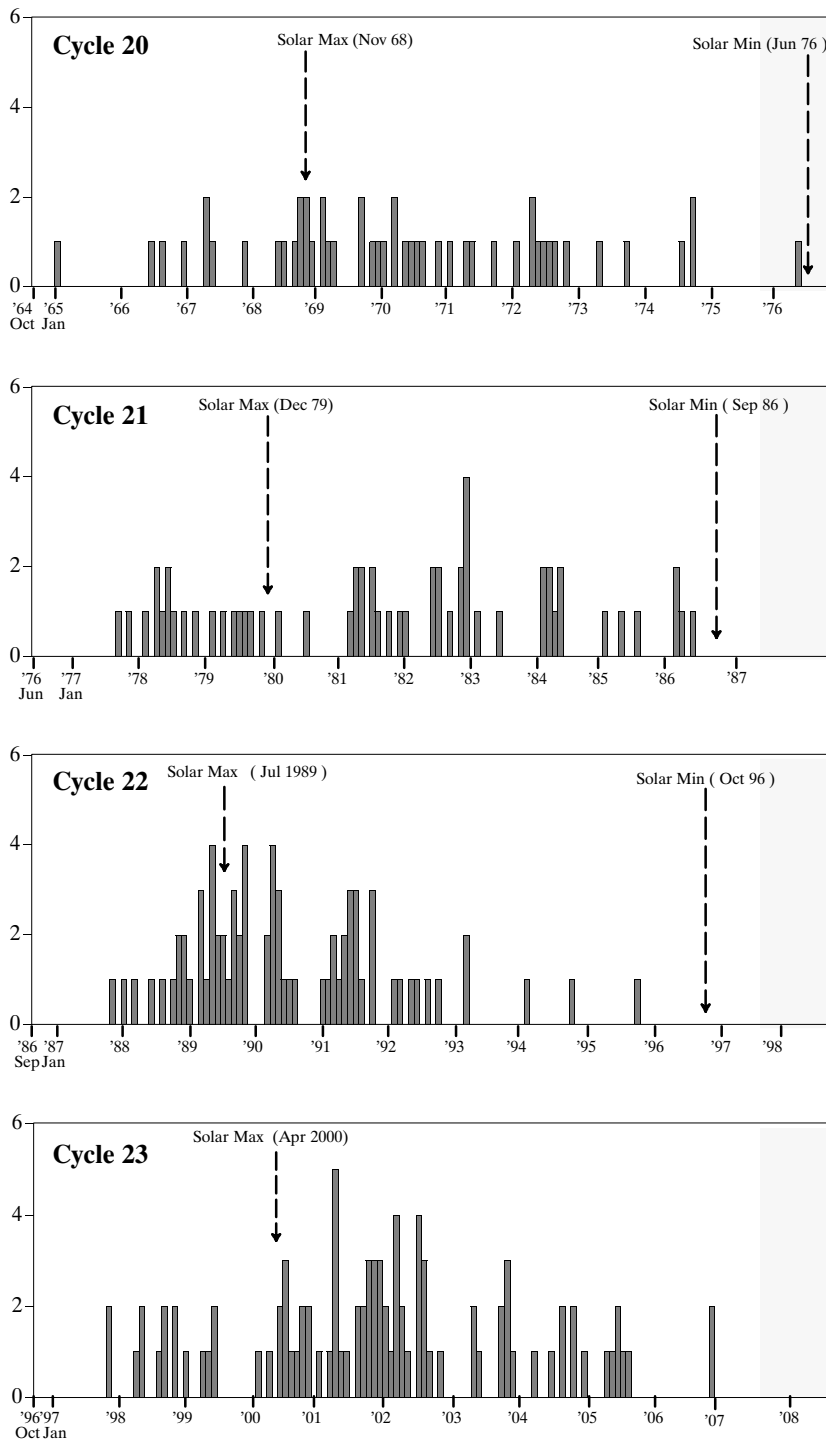


# Proton Events

July 2007  
(Month 130)



Number of events per month



SEC defines Proton Events as periods (in excess of 15 minutes) when the geosynchronous >10MeV proton flux remains above 10 pfu (particle flux unit =  $1\text{p/cm}^2\text{cm}^2\text{s}\cdot\text{sr}$ ). Events continue and are counted as a single event until fluxes remain below 10 pfu regardless of whether enhancements from new sources occur. Using different event criteria may result in different event totals.