

**Space Weather Highlights**  
**25 June – 01 July 2007**

**SEC PRF 1661**  
**03 July 2007**

Solar activity ranged from very low to low during the period. Low-level C-class activity occurred on 27 and 29 June. The disk was populated with two weak spot groups; Region 961 (S12, L=221, class/area, Dac/210 on 30 June) and Region 962 (S12, L=190, class/area, Bxo/040 on 28 June).

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels during 25 – 26 June.

Field activity was at quiet to unsettled conditions at all latitudes. Solar wind speed reached a low of about 340 km/s late on 26 June and a high of 565 km/s early on the 30th. The Bz component of the IMF generally did not vary much beyond +/- 5 nT throughout the period. Beginning at about 1800 UTC on 29 June, temperature, density, and wind speed all recorded sharp increases. These increases indicated a co-rotating interaction region in advance of a recurrent coronal hole high-speed stream. Bz showed a brief disturbed period from 29/1800 UTC to 29/2100 UTC where values fluctuated between +10 nT to -12 nT. The geomagnetic field reacted with isolated unsettled periods late on 29 June.

**Space Weather Outlook**  
**04 July – 30 July 2007**

Solar activity is expected to range from very low to low levels.

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 during 04 – 05, 16 – 17, and 22 – 23 July.

Field activity is expected to be at quiet to unsettled levels during 04 – 10 July. Activity is expected to increase to quiet to active levels on 11 – 12 July due to a recurrent coronal hole high-speed stream. Quiet to unsettled conditions are expected during 13 – 17 July. An increase to quiet to active conditions is expected during 18 – 20 July due to another recurrent coronal hole high-speed stream. Mostly quiet conditions are expected 21 – 26 July. A weak coronal hole high-speed stream is expected to rotate into a geoeffective position on 27 – 28 July, and will result in quiet to isolated active conditions. The field will return to quiet to unsettled levels on 28 – 30 July.



### *Daily Solar Data*

Date	Radio	Sun	Sunspot	X-ray	Flares							
	Flux	spot	Area	Background	X-ray Flux			Optical				
	10.7 cm	No.	(10 <sup>-6</sup> hemi.)		C	M	X	S	1	2	3	4
25 June	68	11	110	<A1.0	0	0	0	0	0	0	0	0
26 June	71	11	110	<A1.0	0	0	0	0	0	0	0	0
27 June	73	15	180	<A1.0	1	0	0	0	0	0	0	0
28 June	75	27	220	<A1.0	0	0	0	3	0	0	0	0
29 June	75	29	190	A1.0	1	0	0	5	0	0	0	0
30 June	74	36	240	<A1.0	0	0	0	0	0	0	0	0
01 July	74	30	150	<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
25 June	6.6E+5	1.7E+4	3.9E+3		4.6E+7	
26 June	7.5E+5	1.7E+4	4.0E+3		5.0E+7	
27 June	6.0E+5	1.8E+4	3.9E+3		2.1E+7	
28 June	1.1E+6	1.7E+4	3.9E+3		1.5E+7	
29 June	1.3E+6	1.8E+4	3.9E+3		5.4E+6	
30 June	5.6E+5	1.7E+4	3.8E+3		1.3E+6	
01 July	4.7E+5	1.7E+4	3.8E+3		2.1E+6	

### *Daily Geomagnetic Data*

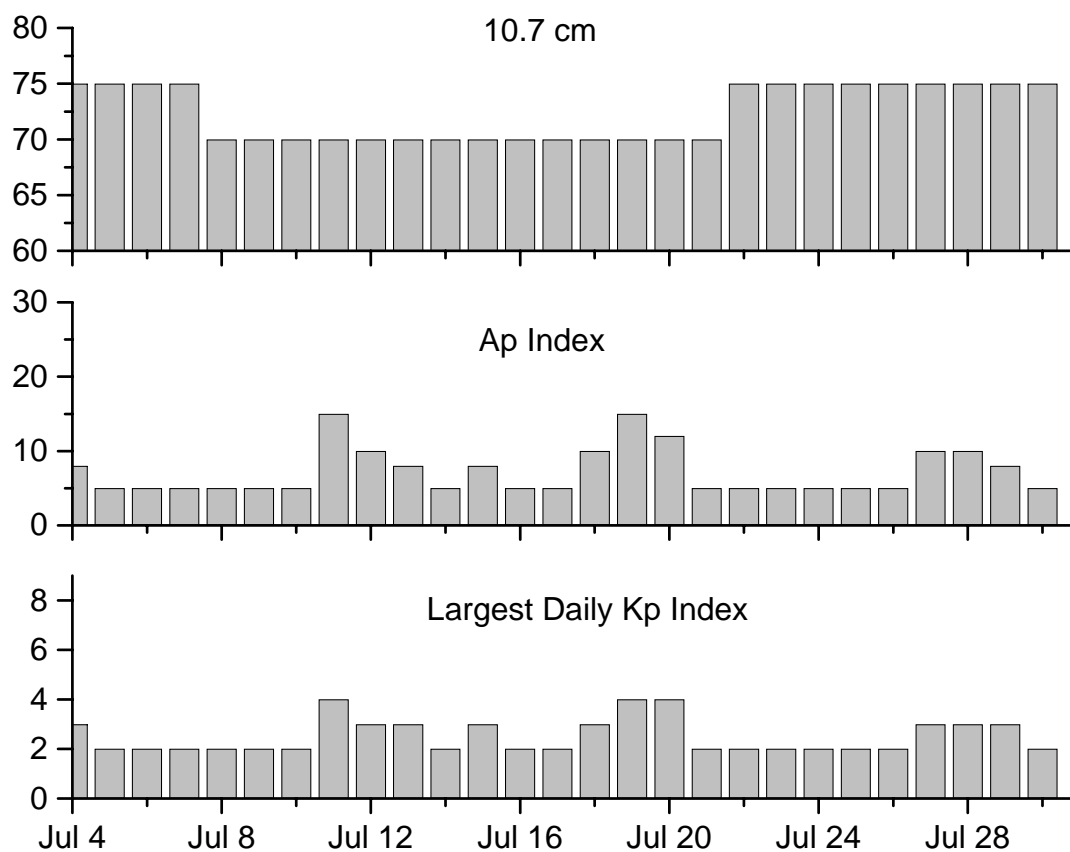
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
25 June	3	2-1-0-0-1-1-1-1	2	2-1-0-0-1-1-0-1	5	2-1-0-0-2-2-2-2
26 June	4	0-0-0-2-1-1-3-1	3	0-1-0-2-2-0-1-0	5	1-0-0-2-3-1-2-2
27 June	5	2-2-2-1-1-1-1-1	4	2-2-2-0-0-1-1-1	5	2-2-2-0-1-1-2-2
28 June	5	2-0-1-1-1-1-1-3	5	1-1-1-2-3-1-1-1	6	1-1-1-1-2-1-2-3
29 June	5	1-1-1-1-1-1-3-2	6	1-2-1-1-1-1-3-2	13	2-1-2-1-3-2-5-3
30 June	4	2-2-1-1-2-1-0-1	3	2-2-2-1-0-0-1-0	6	3-2-1-1-1-1-1-1
01 July	4	1-1-1-1-1-2-1-2	3	0-1-2-2-1-0-0-1	5	2-2-1-1-1-1-1-2

### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
25 Jun 1512	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	25 Jun 1450
26 Jun 1525	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	26 Jun 1500
29 Jun 1742	WARNING: Geomagnetic Sudden Impulse	29 Jun 1740 – 1830
29 Jun 1749	WARNING: Geomagnetic K = 4	29 Jun 1750 – 30/1600



# *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
04 July	75	8	3	18 July	70	10	3
05	75	5	2	19	70	15	4
06	75	5	2	20	70	12	4
07	75	5	2	21	70	5	2
08	70	5	2	22	75	5	2
09	70	5	2	23	75	5	2
10	70	5	2	24	75	5	2
11	70	15	4	25	75	5	2
12	70	10	3	26	75	5	2
13	70	8	3	27	75	10	3
14	70	5	2	28	75	10	3
15	70	8	3	29	75	8	3
16	70	5	2	30	75	5	2
17	70	5	2				



### ***Energetic Events***

Energy Events													
Date	Time			X-ray		Optical Information				Peak		Sweep Freq	
	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 /	Location	Rgn
	Begin	Max	End	X-ray Class.			
25 June	<i><b>No Flares Observed</b></i>						
26 June	<i><b>No Flares Observed</b></i>						
27 June	0221	0227	0231	B1.9			
	1005	1019	1025	B3.1			
	1302	1305	1308	B1.1			
	1405	1418	1424	B3.7			
	1749	1800	1803	C1.3			
28 June	0110	0117	0121	B1.2			
	0702	0708	0732	B1.5	Sf	S08E73	962
	0803	0804	0808		Sf	S07E68	
	1410	1423	1431	B2.9			
29 June	1713	1715	1719	B3.2	Sf	S09E72	962
	0023	0028	0033	B1.4			
	0055	0100	0105	B1.4			
	0115	0124	0130	B3.2			
	0231	0238	0252	B3.7	Sf	S08E66	962
	0450	0455	0501	B1.0	Sf	S09E64	962
	0754	0754	0758		Sf	S09E24	961
	0807	0823	0837	B3.0	Sf	S08E63	962
	1001	1008	1014	B9.5			962
	1832	1836	1839	B2.5	Sf	S09E57	962
	1942	1947	1959	B1.3			
	2004	2013	2017	C1.1			962
30 June	<i><b>No Flares Observed</b></i>						
01 July	0822	0828	0832	B2.2			
	2144	2149	2153	B2.9			



### ***Region Summary***

Location			Sunspot Characteristics												
			Flares												
Date	( ° Lat ° CMD)	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
		Lon	(10 <sup>-6</sup> hemi)	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
Region 961															
25 Jun	S09E77	219	0110	04	Hsx	001	A								
26 Jun	S11E60	223	0110	05	Hsx	001	A								
27 Jun	S11E50	220	0180	07	Cko	005	B								
28 Jun	S11E36	221	0180	04	Cso	005	B								
29 Jun	S14E23	220	0170	05	Cso	007	B				1				
30 Jun	S12E09	221	0210	05	Dac	014	B								
01 Jul	S10W04	221	0140	04	Dso	008	B								
								0	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 221

<i>Region 962</i>															
28 Jun	S12E67	190	0040	06	Bxo	002	B				2				
29 Jun	S12E53	190	0020	07	Bxo	002	B	1			4				
30 Jun	S10E37	193	0030	03	Axx	002	A								
01 Jul	S08E25	189	0010	01	Axx	002	A								
								1	0	0	6	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 189

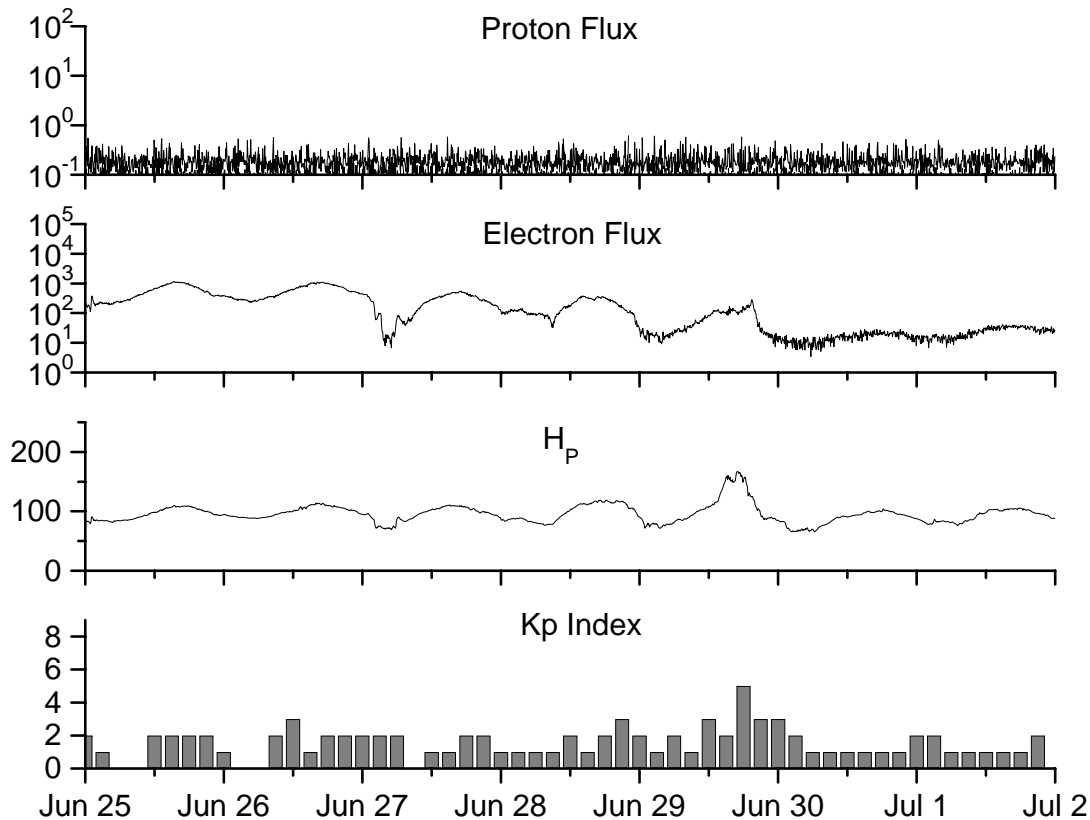


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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									
July	71.0	39.9	0.56	48.1	29.2	96.6	90.9	16	13.1
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			83.5		6	
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	

**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 25 June 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.

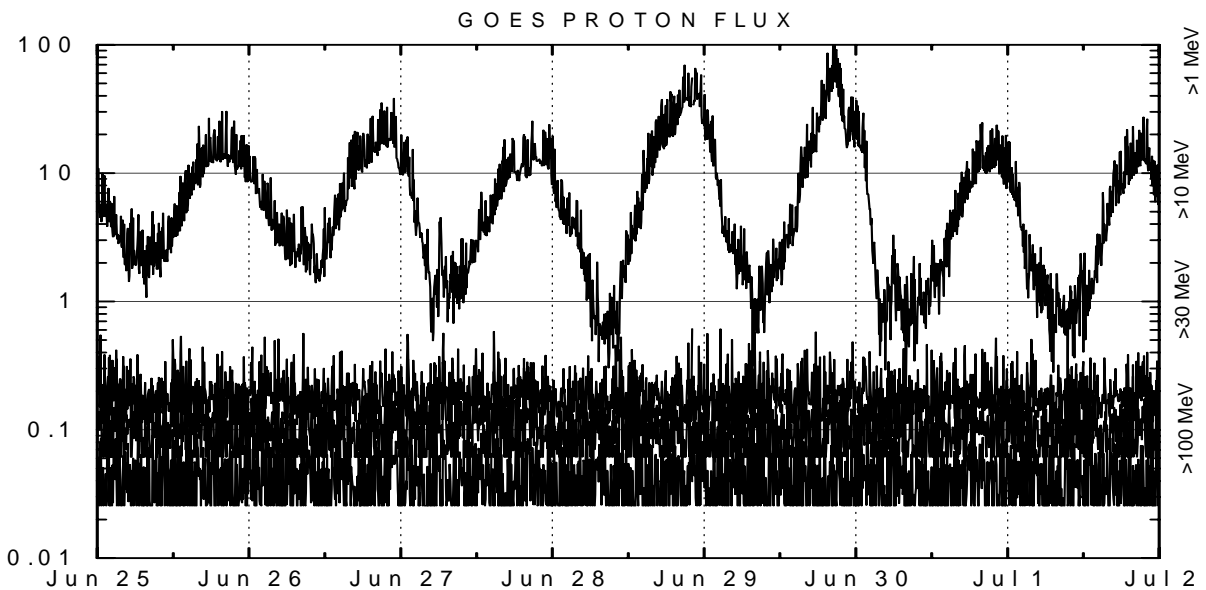
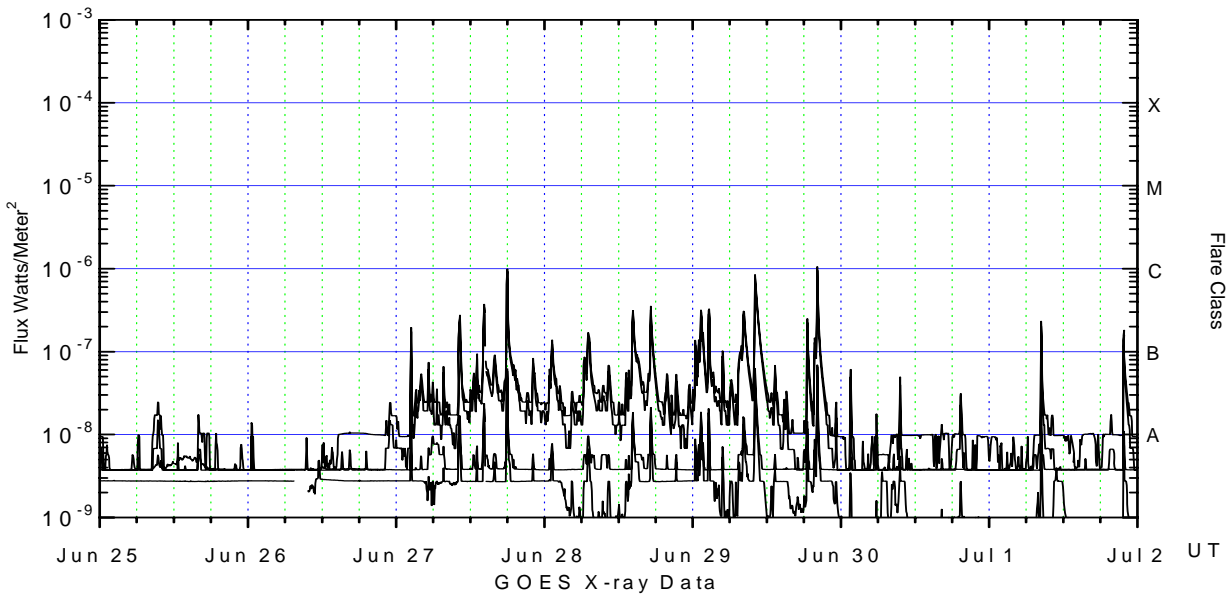
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec-sr) with energies greater than 2 MeV at GOES-12 (W075).

$H_P$  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 ( $\text{watts/m}^2$ ) 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.

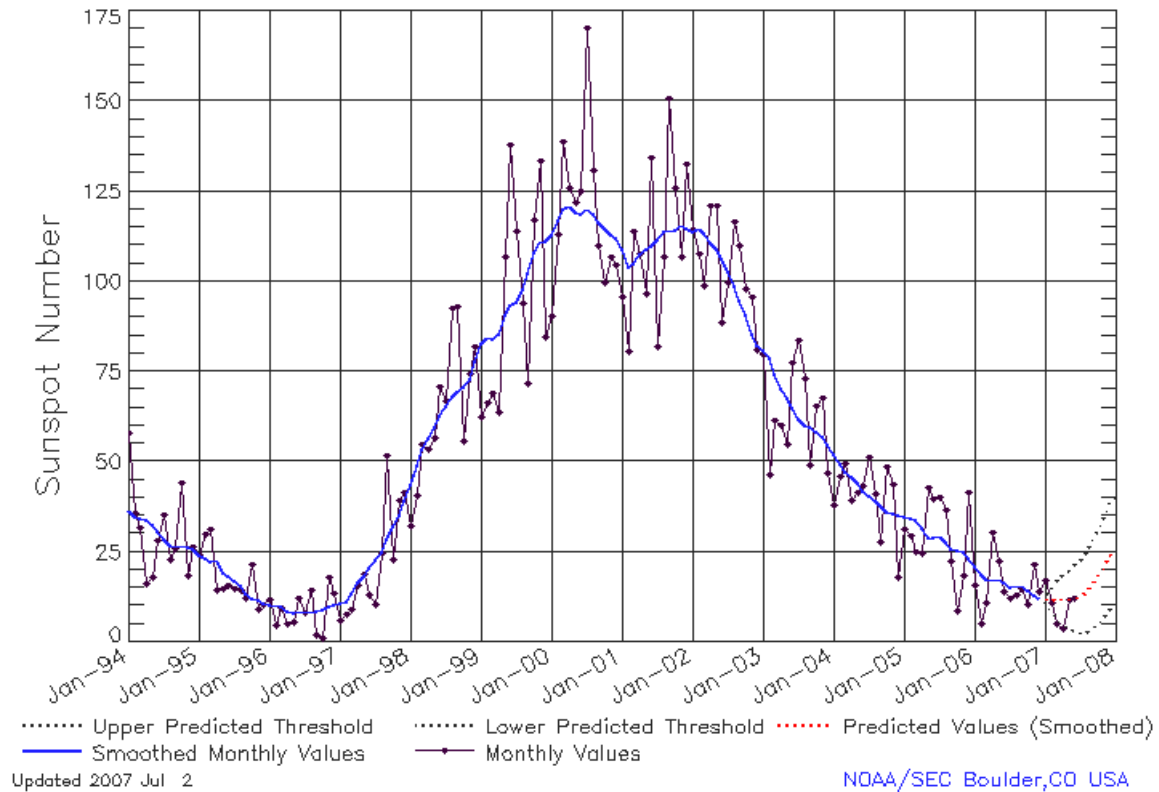
Proton plot contains the five-minute averaged integral proton flux ( $\text{protons/cm}^2\text{-sec-sr}$ ) as measured by GOES-11 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ( $\text{protons/cm}^2\text{-sec-sr}$ ) at greater than 10 MeV.





# ISES Solar Cycle Sunspot Number Progression

Data Through 30 Jun 07



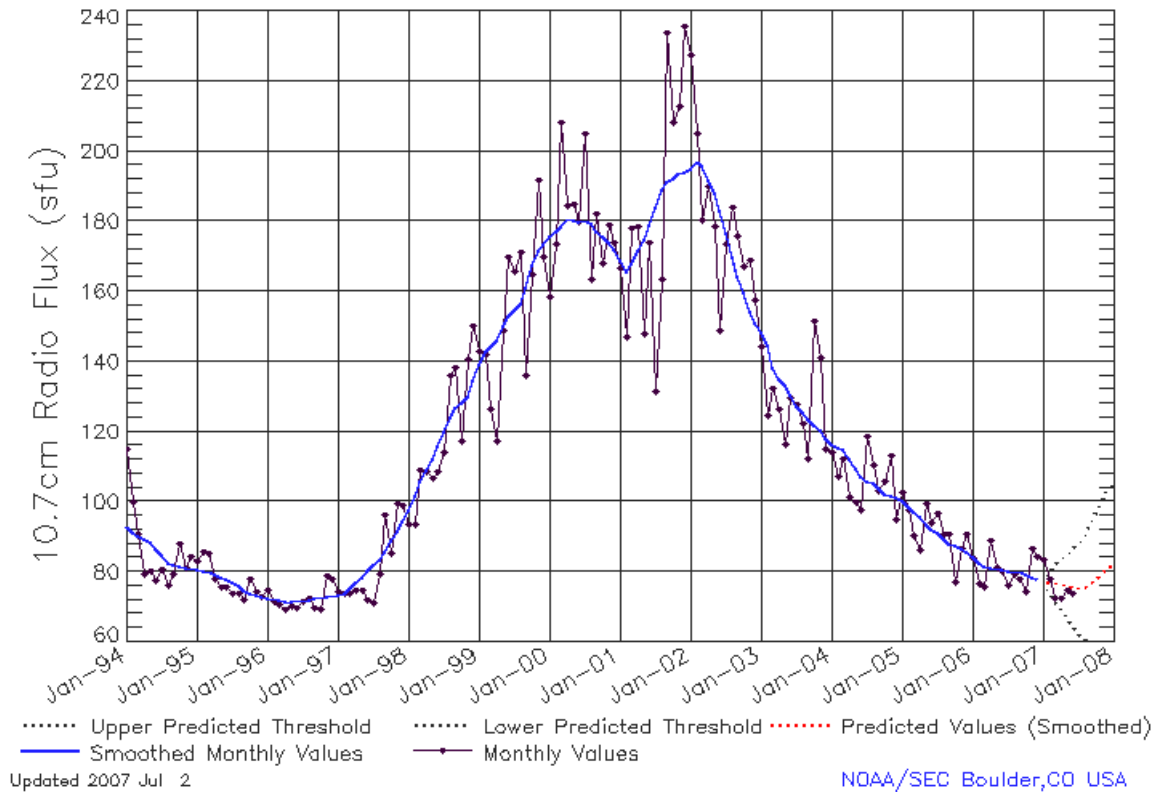
## SEC Prediction of Smoothed Sunspot Number

	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	<b>12</b>	<b>12</b>	<b>11</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>14</b>	<b>16</b>	<b>18</b>	<b>21</b>	<b>21</b>
	(1)	(3)	(5)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)



# ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 30 Jun 07



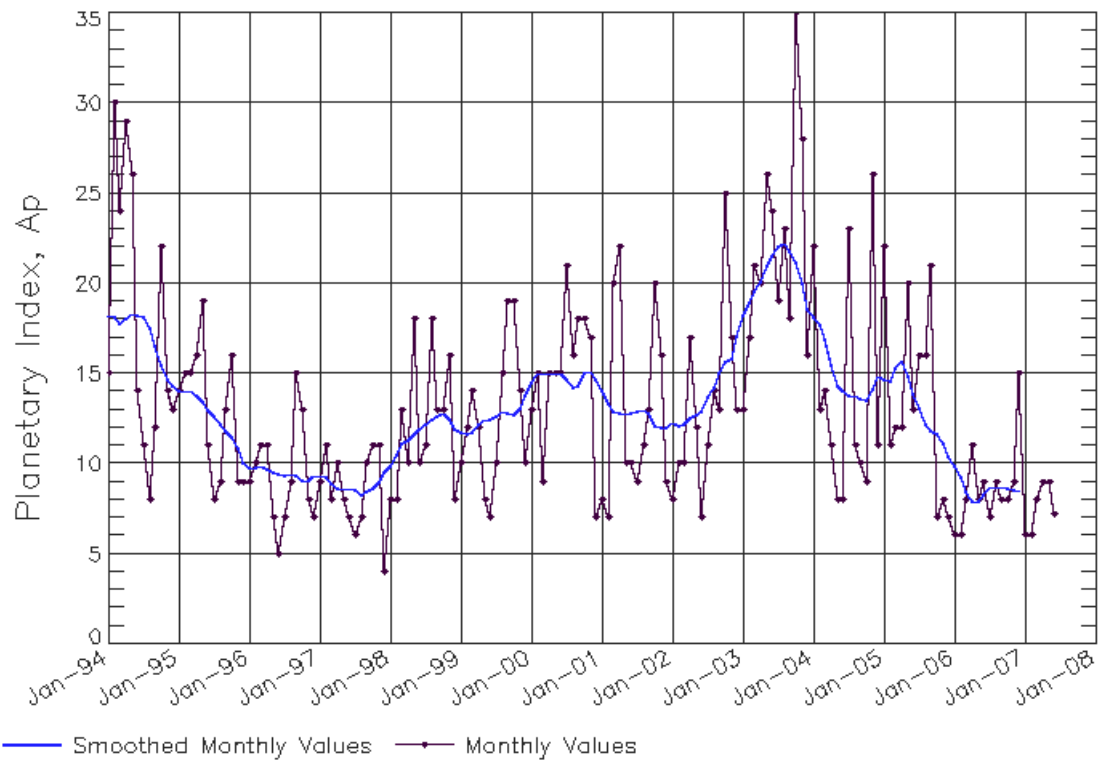
## SEC Prediction of Smoothed F10.7cm Radio Flux

	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	<b>78</b>	<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)	(11)



# ISES Solar Cycle Ap Progression

Data Through 30 Jun 07



Updated 2007 Jul 2

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



# M5 or Greater X-Ray Flares

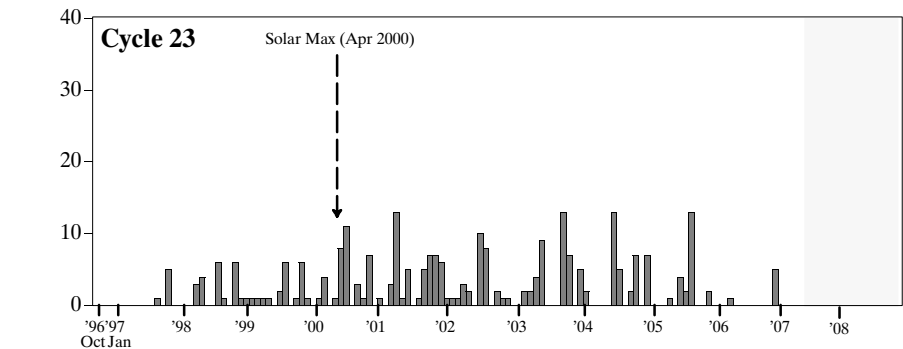
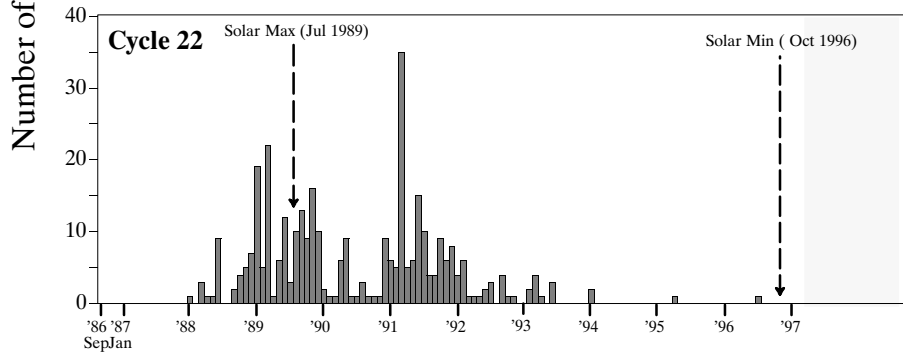
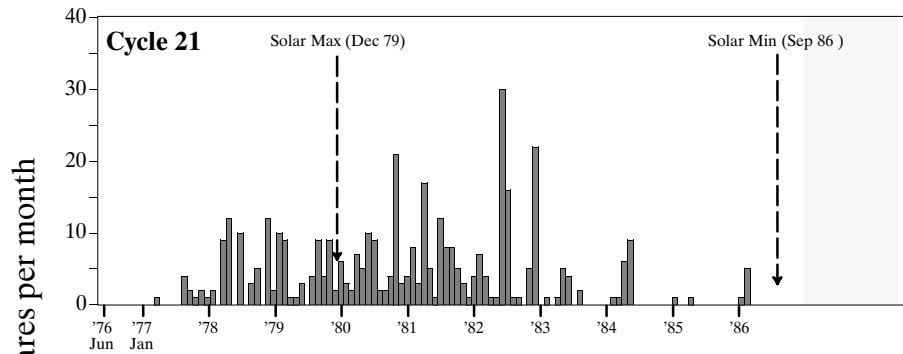
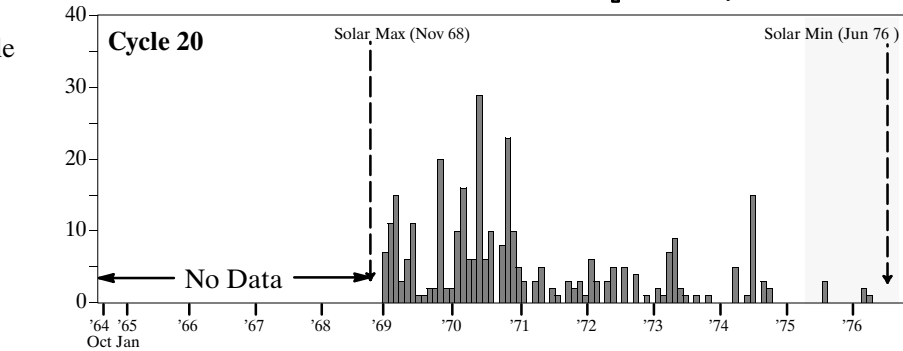
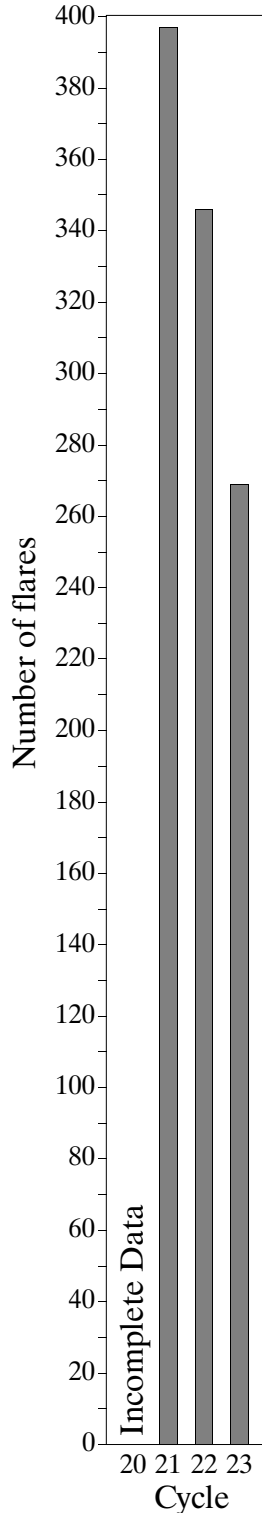


Space  
Environment  
Center

May 2007  
(Month 128)

Preliminary data

Comparison of Cycles  
at current month in cycle



K. Tegnell/N.Cohen