

Space Weather Highlights

25-31 May 1998

Solar activity was very low to low. Isolated B- and C-class subflares were detected. Most C-class flares were produced by Region 8232 (S19, L = 350, class/area Dko/380 on 05 June). Three moderate-sized filaments disappeared from the southern hemisphere early on 05 June. A partial-halo coronal mass ejection (CME) accompanied the disappearances. An optically uncorrelated Type II radio sweep occurred at 07/0912UT.

Solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft during most of the period. Velocities ranged from 380 - 470 km/sec through 06 June, then increased to 660 km/sec during 07 June. Solar wind particle densities ranged from 02 - 12 p/cc through 04 June. Densities were enhanced during 05 - 06 June, peaking at 17 p/cc, then dropped to 02 p/cc on 07 June. Bz ranged from plus 11 nT to minus 11 nT (GSM) during the period. Solar sector orientation was mostly away (phi angle near 135 degrees) through 02 June, then shifted to mostly toward orientation for the remainder of the period.

The greater than 10 MeV proton flux became slightly enhanced beginning 04/2000UT. Fluxes returned to background levels late on 05 June.

The greater than 2 MeV electron flux at geosynchronous altitude was at moderate to high levels during 01 - 02 June, then declined to normal to moderate levels for the remainder of the period.

The geomagnetic field was quiet to unsettled during most of the period. Brief active periods occurred at all latitudes.

Space Weather Forecast

10 June - 06 July 1998

Solar activity is expected to be low to moderate. M-class probabilities are expected to increase during 12 - 25 June due to the return of old Region 8226, which produced an isolated major flare during its last rotation. The region appeared to be growing as it departed the west limb on 29 May.

No proton enhancements are expected at geosynchronous altitude.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at moderate to high levels through 15 June, then decline to normal to moderate levels for the rest of the period.

The geomagnetic field is expected to be at quiet to unsettled levels. However, active periods are possible during 10 June in response to the CME observed on 05 June. Active periods may also occur during 12 - 13 June in response to a CME that occurred on 08 June (details in next week's issue).



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No. (10^6 hemi.)	Sunspot Area	X-ray Background	X-ray Flux			Flares				
					C	M	X	S	1	2	3	4
01 June	100	59	190	B2.0	0	0	0	1	0	0	0	0
02 June	105	71	550	B2.4	0	0	0	1	0	0	0	0
03 June	113	65	600	B2.8	2	0	0	9	0	0	0	0
04 June	112	92	670	B2.8	2	0	0	6	0	0	0	0
05 June	115	99	650	B4.7	3	0	0	7	0	0	0	0
06 June	115	110	540	B2.4	0	0	0	1	0	0	0	0
07 June	113	96	570	B2.5	1	0	0	3	1	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
01 June	7.8E+5	1.7E+4	4.5E+3		7.8E+7	
02 June	7.5E+5	1.7E+4	4.3E+3		3.9E+7	
03 June	1.4E+6	1.8E+4	4.5E+3		1.6E+7	
04 June	2.2E+6	2.2E+4	4.4E+3		2.8E+7	
05 June	1.2E+6	3.8E+4	3.9E+3		1.4E+7	
06 June	6.1E+5	1.8E+4	3.8E+3		4.5E+6	
07 June	2.3E+5	1.5E+4	3.3E+3		1.1E+7	

Daily Geomagnetic Data

Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
01 June	4	1-1-2-1-1-2-1-1	4	2-2-2-0-0-1-1-1	6	2-1-2-1-1-3-3-2
02 June	6	2-1-1-2-2-1-2-2	9	2-2-1-3-4-1-1-2	7	2-1-1-3-2-2-2-3
03 June	12	2-2-2-3-3-3-3-3	*	*.*-5-4-5-1-3-2	12	2-1-3-3-3-3-3-3
04 June	7	3-2-2-1-2-1-2-2	22	4-2-5-4-5-1-1-1	12	3-3-3-3-3-2-2-2
05 June	10	2-2-2-2-3-3-3-2	23	2-3-2-5-5-5-2-2	13	2-3-2-3-3-3-3-2
06 June	15	2-2-1-2-4-2-4-4	17	2-3-1-5-3-3-3-3	14	2-2-1-4-3-4-3-3
07 June	19	5-4-3-1-3-2-3-3	20	4-5-4-3-2-3-2-2	18	5-4-4-2-2-3-3-3

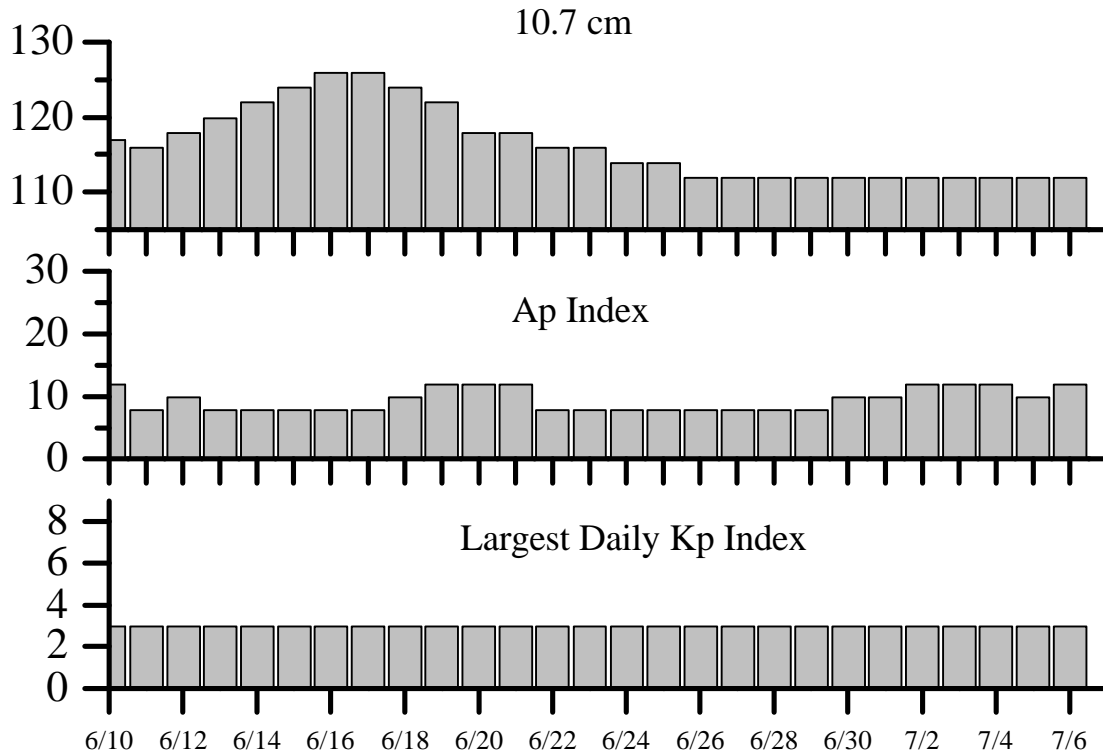


Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
02 Jun 0026	>2MeV Electron Event in Progress \geq 1000pfu	31 May 1925
03 Jun 0021	>2MeV Electron Event in Progress \geq 1000pfu	31 May 1925
04 Jun 0010	2-245 MHz Radio Bursts	03 Jun
04 Jun 0010	245 MHz Radio Noise Storm	03 Jun
05 Jun 0008	3-245 MHz Radio Bursts	04 Jun
05 Jun 0008	245 MHz Radio Noise Storm	04 Jun
06 Jun 1810	K= 4 Observed	06 Jun 15-18
07 Jun 0600	K= 4 Observed	07 Jun 03-06
07 Jun 0951	Type II Radio Emission	07 Jun 0912



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
10 June	117	12	3	24 June	114	8	3
11	116	8	3	25	114	8	3
12	118	10	3	26	112	8	3
13	120	8	3	27	112	8	3
14	122	8	3	28	112	8	3
15	124	8	3	29	112	8	3
16	126	8	3	30	112	10	3
17	126	8	3	01 July	112	10	3
18	124	10	3	02	112	12	3
19	122	12	3	03	112	12	3
20	118	12	3	04	112	12	3
21	118	12	3	05	112	10	3
22	116	8	3	06	112	12	3
23	116	8	3				



Energetic Events

Date	Time (UT)		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp Brtns	Location		Radio Flux		Intensity	
							Lat	CMD	245	2695	II	IV

No Events Observed

Flare List

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
01 June	0657	0700	0721		SF	N22W08	8227
02 June	1252	1253	1300		SF	N30W22	8227
	1418	1423	1428	B7.7			
03 June	0234	0303	0357	C1.4			
	1311	1311	1318	B5.3	SF	N27E65	8233
	1354	1355	1401		SF	N27E65	8233
	1416	1417	1420		SF	N27E64	8233
	1427	1428	1434	B4.7	SF	N26E64	8233
	1504	1509	1511		SF	S21E67	8232
	1508	1509	1519		SF	N26E65	8233
	1550	1551	1553		SF	N25E64	8233
	1612	1619	1640	B4.0	SF	N25E64	8233
	1922	1925	1931		SF	S22E66	8232
	2301	2308	2313	C1.6			
04 June	0821	0822	0825		SF	S25E52	8232
	1122	1125	1128	B7.0	SF	S23E49	8232
	1459	1459	1504		SF	S23E47	8232
	1614	1615	1621		SF	S25E55	8232
	2038	2039	2043	C1.0	SF	S27E51	8232
	2137	2144	2152	C1.0	SF	S25E49	8232
05 June	0029	0031	0036		SF	N27E45	8233
	0302	0308	0313	B6.7			
	0444	0444	0450	C1.4	SF	S26E43	8232
	0647	U0648	A0655	B9.0	SF	S25E45	8232
	0837	0838	0900		SF	N26E40	8233
	0950	0951	0958	C1.2	SF	S23E43	8232
	1419	1419	1427	C1.1	SF	S24E41	8232
	1503	1508	1514	B6.8			
	2254	2254	2257		SF	S23E37	8232
06 June	0118	0121	0123	B4.4			
	0427	0432	0435	B4.1			
	0438	0441	0443	B4.7			
	0658	0659	0706		SF	S18E31	8232
07 June	1112	1115	1121	B5.2	SF	N21W16	8236
	1446	1453	1528	C3.2	1F	S23E12	8232
	1538	1546	1555		SF	S19E14	8232
	1613	1613	1618		SF	S26E13	8232



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 8225</i>																
23 May	S18E62	134	0000	00	AXX	001	A									
24 May	S18E48	135	0010	00	AXX	001	A									
25 May	S19E36	134	0010	01	AXX	001	A									
26 May	S18E22	135	0000	00	AXX	001	A									
27 May	S18E08	136	0010	00	AXX	002	A									
28 May	S20W03	133	0010	05	BXO	004	B									
29 May	S20W16	133														
30 May	S20W29	133														
31 May	S20W42	133														
01 Jun	S20W55	133														
											0	0	0	0	0	0
Died on Disk.																
Absolute heliographic longitude: 133																
<i>Region 8227</i>																
25 May	N25E73	097	0150	05	DAO	004	B									
26 May	N24E61	096	0230	05	HKX	004	A									
27 May	N26E48	096	0280	06	HKX	006	A	1					2			
28 May	N26E35	095	0200	06	DAO	008	B	1					1			
29 May	N26E21	096	0190	05	HAX	008	A									
30 May	N26E09	095	0170	06	CAO	009	B									
31 May	N26W04	095	0130	04	DAO	008	B									
01 Jun	N25W17	099	0120	05	DSO	009	B							1		
02 Jun	N26W30	094	0120	15	CAO	010	B							1		
03 Jun	N27W43	094	0110	04	HAX	004	A									
04 Jun	N26W56	094	0040	03	HSX	003	A									
05 Jun	N26W69	094	0030	05	CRO	003	B									
06 Jun	N25W80	092	0010	04	BXO	002	B									
											2	0	0	5	0	0
Crossed West Limb.																
Absolute heliographic longitude: 095																
<i>Region 8228</i>																
29 May	S22W13	130	0010	03	BXO	003	B									
30 May	S22W26	130	0010	02	BXO	004	B									
31 May	S22W38	129	0020	05	CSO	003	B									
01 Jun	S23W52	130	0010	05	BXO	003	B									
02 Jun	S22W65	129	0010	03	BXO	002	B									
03 Jun	S22W78	129														
04 Jun	S22W91	129														
											0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 130



Region Summary-continued

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 8229</i>																	
29 May	S18E11	106	0010	03	BXO	003	B										
30 May	S18W02	106															
31 May	S18W15	106															
01 Jun	S18W28	106															
02 Jun	S18W41	106															
03 Jun	S18W54	106															
04 Jun	S18W67	106															
								0	0	0	0	0	0	0	0	0	
Died on Disk.																	
Absolute heliographic longitude: 106																	
<i>Region 8230</i>																	
30 May	S19E60	044	0040	07	CSO	005	B										
31 May	S20E48	043	0050	09	DSO	010	B										
01 Jun	S20E35	043	0060	09	DSO	017	B										
02 Jun	S19E23	041	0200	10	DAO	018	B										
03 Jun	S20E09	042	0200	09	DAO	016	B										
04 Jun	S21W04	042	0220	10	DAO	021	B										
05 Jun	S20W16	041	0180	10	DAO	016	B										
06 Jun	S21W30	042	0160	10	DAO	010	B										
07 Jun	S21W42	041	0140	10	DAO	009	B										
								0	0	0	1	0	0	0	0	0	
Still on Disk.																	
Absolute heliographic longitude: 042																	
<i>Region 8231</i>																	
30 May	S21E33	071	0010	03	BXO	004	B										
31 May	S23E17	074	0000	00	AXX	001	A										
01 Jun	S23E04	074															
02 Jun	S23W09	074															
03 Jun	S23W22	074															
04 Jun	S23W35	074															
05 Jun	S23W48	074															
06 Jun	S23W61	074															
								0	0	0	0	0	0	0	0	0	
Died on Disk.																	
Absolute heliographic longitude: 074																	



Region Summary-continued

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 8232</i>																		
02 Jun	S19E73	351	0220	03	HHX	001	A											
03 Jun	S19E62	349	0280	10	CHO	003	B						2					
04 Jun	S19E49	349	0360	10	CHO	008	B	2					6					
05 Jun	S18E33	352	0380	08	DKO	012	BG	3					5					
06 Jun	S19E19	353	0330	09	DHO	010	BG						1					
07 Jun	S20E09	350	0360	11	CHO	012	B	1					2	1				
								6	0	0		16	1	0	0	0	0	
Still on Disk.																		
Absolute heliographic longitude: 350																		
<i>Region 8233</i>																		
03 Jun	N28E63	348	0010	05	BXO	002	B						7					
04 Jun	N28E48	350	0030	07	BXO	006	B											
05 Jun	N28E35	350	0020	08	BXO	006	B						2					
06 Jun	N28E20	352	0000	04	BXO	003	B											
07 Jun	N31E10	349	0010	02	AXX	004	A											
								0	0	0		9	0	0	0	0	0	
Still on Disk.																		
Absolute heliographic longitude: 349																		
<i>Region 8234</i>																		
04 Jun	N16E65	333	0020	08	BXO	004	B											
05 Jun	N16E52	333	0040	07	BXO	012	B											
06 Jun	N16E37	335	0020	09	BXO	006	B											
07 Jun	N16E21	338	0010	00	AXX	001	A											
								0	0	0		0	0	0	0	0	0	
Still on Disk.																		
Absolute heliographic longitude: 338																		
<i>Region 8235</i>																		
06 Jun	N20W33	045	0000	02	BXO	003	B											
07 Jun	N20W46	045																
								0	0	0		0	0	0	0	0	0	
Still on Disk.																		
Absolute heliographic longitude: 045																		
<i>Region 8236</i>																		
06 Jun	N21W10	022	0020	05	DSO	006	B											
07 Jun	N21W23	022	0040	07	CSO	008	B						1					
								0	0	0		1	0	0	0	0	0	
Still on Disk.																		
Absolute heliographic longitude: 022																		



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares							
	(° Lat ° CMD)	Helio Lon	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
							C	M	X	S	1	2	3	4
<i>Region 8237</i>														
07 Jun	S24E69	290	0010	06	BXO	002	B							
								0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 290



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

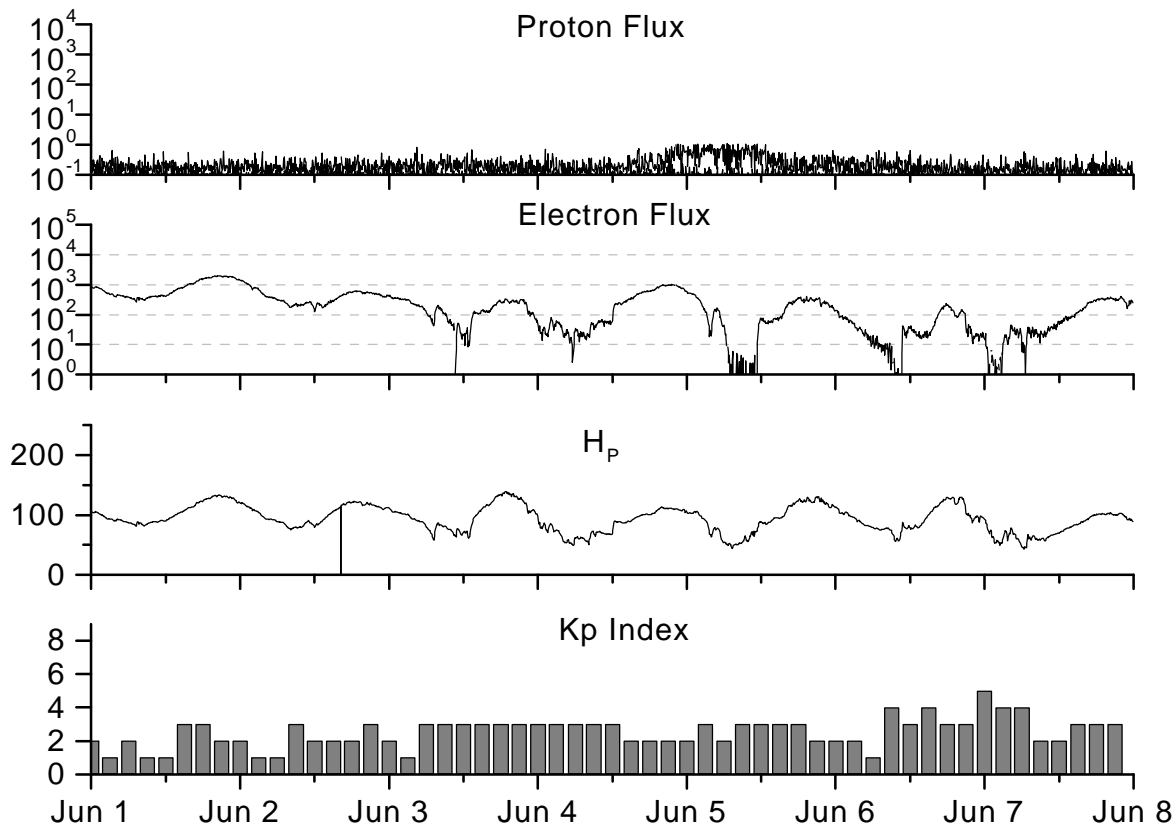
Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed SWO	values RI	Ratio RI/SWO	Smooth SWO	values RI	**Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
1996									
June	18.8	11.8	0.63	13.5	08.5	69.6	71.8	05	09.4
July	13.2	08.2	0.62	13.4	08.4	71.2	72.0	07	09.3
August	20.5	14.4	0.70	13.1	08.3	72.4	72.1	09	09.4
September	02.9	01.6	0.55	13.3	08.4	69.4	72.3	15	09.3
October	02.3	00.9	0.39	14.0	08.8	69.2	72.6	13	09.1
November	26.7	17.9	0.67	15.4	09.8	78.7	73.0	08	09.1
December	21.1	13.3	0.63	16.2	10.4	77.8	73.3	07	09.3
1997									
January	09.0	05.7	0.63	16.5	10.5	74.0	73.4	09	09.3
February	11.3	07.6	0.67	17.4	11.0	73.8	73.7	11	09.2
March	14.4	08.7	0.60	20.4	13.5	73.5	75.1	08	08.9
April	24.5	15.5	0.63	24.0	16.5	74.5	76.8	10	08.6
May	28.6	18.5	0.65	26.4	18.3	74.6	78.4	08	08.6
June	22.1	12.7	0.57	29.0	20.3	71.7	80.1	07	08.7*
July	17.0	10.4	0.61	32.4	22.6*	71.1	81.8*	06	08.5*
August	36.7	24.4	0.66	35.9	25.1*	79.0	83.4*	07	08.3*
September	52.8	51.3	0.88	40.5	28.4*	96.2	85.7*	10	08.2*
October	33.6	22.8	0.68	45.4	31.9*	84.9	88.6*	11	08.3*
November	53.5	39.0	0.73	49.3	35.1*	99.5	91.4*	11	08.7*
December	57.9	41.2	0.71			98.8		05*	
1998									
January	51.8	32.3*	0.62*			93.5*		07*	
February	54.4	40.7*	0.75*			93.6*		07*	
March	81.8	54.8*	0.67*			109.4*		11*	
April	73.6	53.3*	0.72*			108.3*		10*	
May	74.3	56.9*	0.77*			106.6*		18*	

*Preliminary estimates.

The lowest smoothed sunspot indices number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 22, RI=158.5, occurred July 1989.

** From June 1991 onward, 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 01 June 1998

Protons plot contains the five-minute averaged integral proton flux (protons/ cm^2 -sec-sr) as measured by GOES-9 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

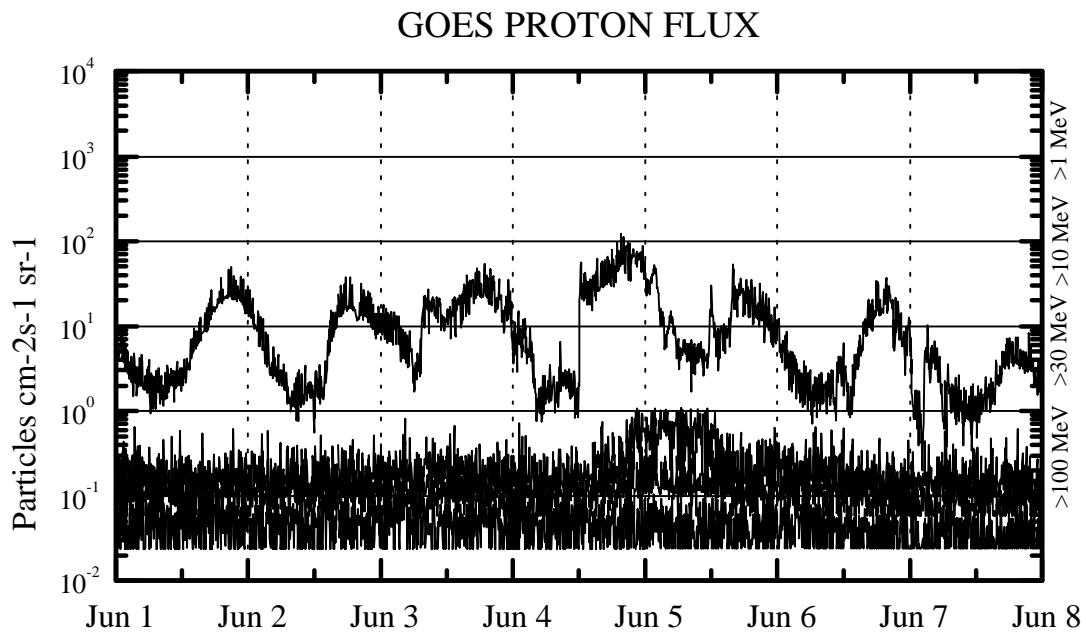
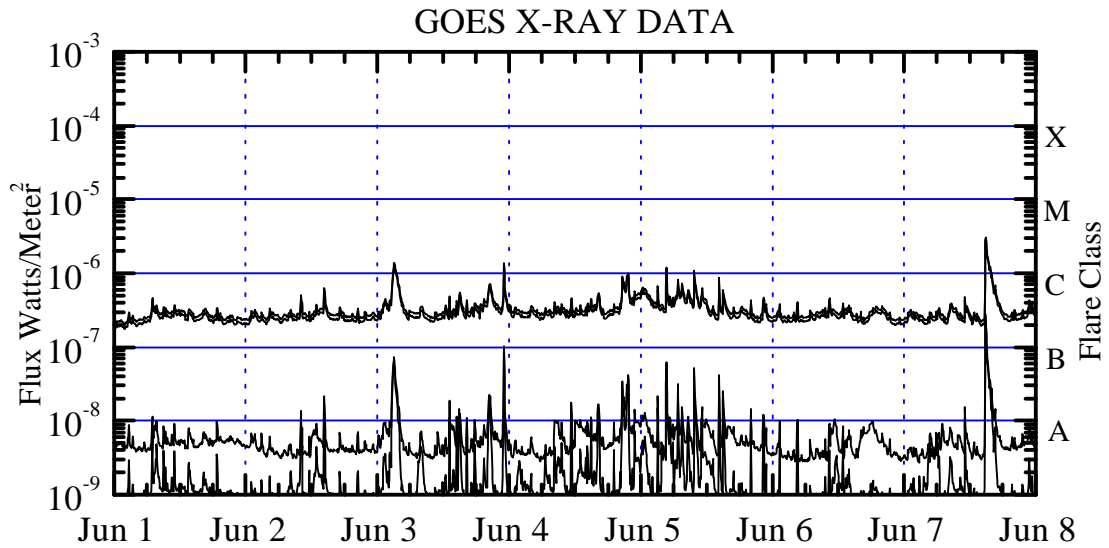
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-9.

H_p plot contains the five minute averaged magnetic field H component in nanoteslas (nT) as measured by GOES-9. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

K_p plot contains the estimated planetary 3-hour K-index (derived by the USAF 55th Space Weather Squadron) 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 Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final K_p values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO 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 K_p are "global" parameters that are applicable to a first order approximation over large areas. H_p is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





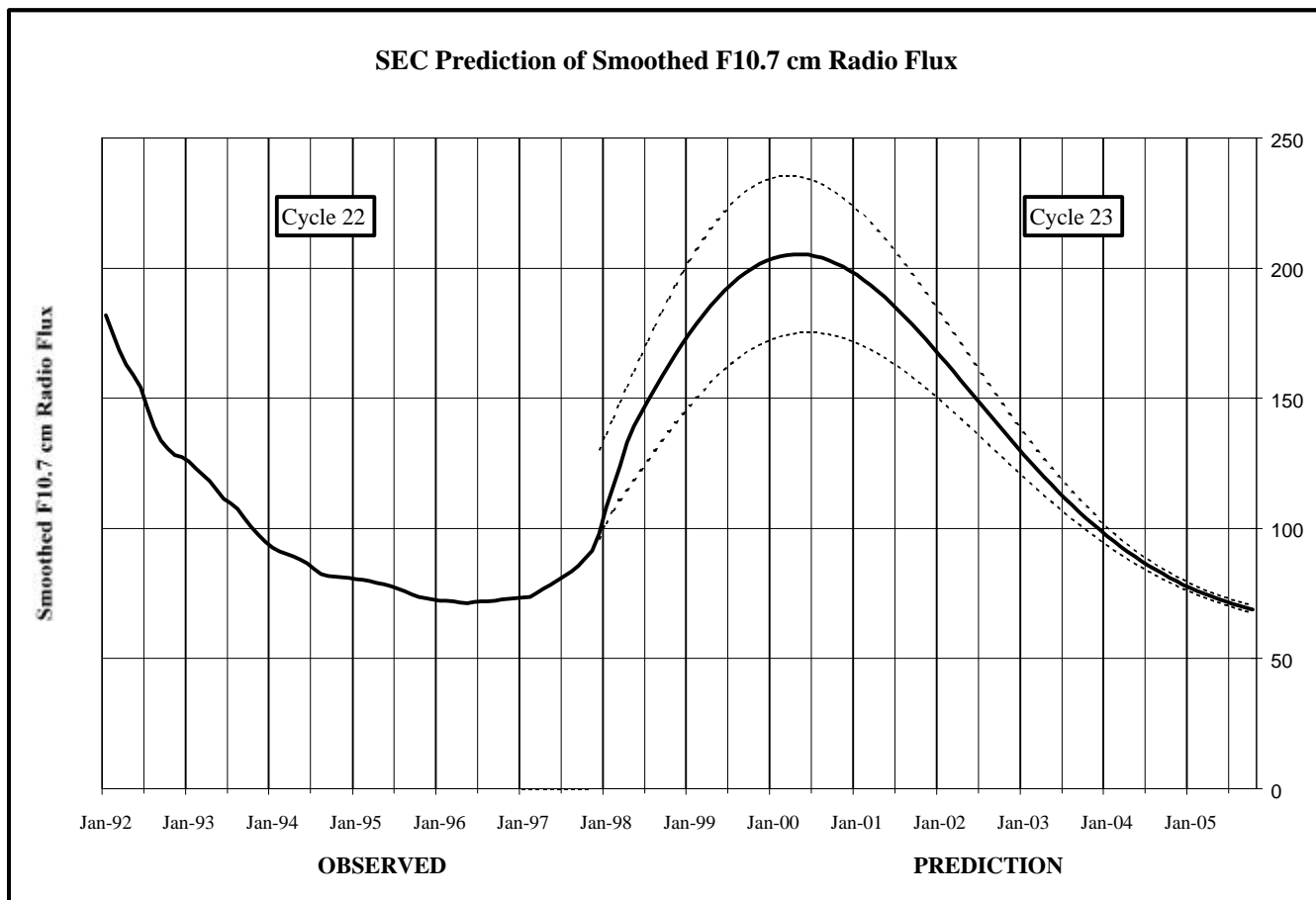
Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five minute averaged x-ray flux (watts/m²) as measured by GOES 8 and 9 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-9 (W135) 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.



SEC Prediction of Smoothed F10.7 cm Radio Flux

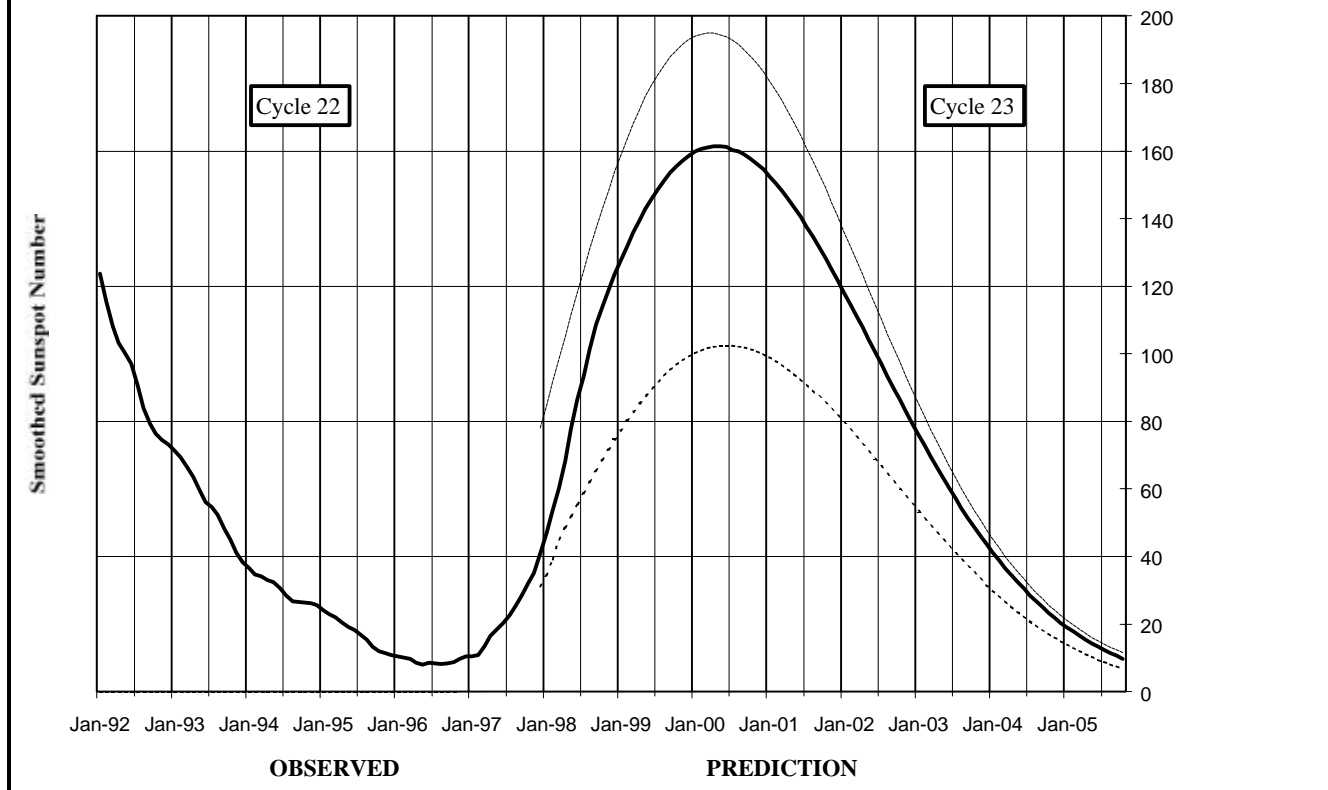


SEC Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	72 (***)	72 (***)	72 (***)	72 (***)	71 (***)	72 (***)	72 (***)	72 (***)	72 (***)	73 (***)	73 (***)	73 (***)
1997	73 (***)	74 (***)	75 (***)	77 (***)	78 (***)	80 (***)	82 (***)	83 (***)	86 (***)	89 (***)	91 (***)	98 (18)
1998	108 (18)	116 (19)	124 (20)	133 (20)	139 (21)	144 (21)	149 (22)	154 (22)	158 (23)	163 (23)	167 (23)	171 (24)
1999	175 (24)	179 (25)	182 (25)	186 (25)	189 (25)	191 (26)	194 (26)	196 (26)	198 (27)	200 (27)	202 (28)	203 (28)
2000	204 (30)	205 (30)	205 (30)	205 (30)	205 (30)	205 (28)	205 (27)	204 (27)	203 (26)	202 (26)	201 (26)	199 (26)
2001	197 (25)	195 (25)	193 (25)	191 (25)	189 (24)	186 (24)	184 (24)	181 (24)	178 (23)	175 (23)	173 (23)	170 (22)
2002	166 (22)	163 (22)	160 (21)	157 (21)	154 (21)	151 (21)	147 (20)	144 (20)	141 (19)	138 (19)	135 (18)	132 (18)
2003	129 (17)	126 (17)	123 (17)	120 (16)	117 (16)	114 (15)	112 (15)	109 (15)	106 (14)	104 (14)	102 (14)	99 (13)
2004	97 (13)	95 (13)	93 (12)	91 (12)	89 (11)	87 (10)	86 (9)	84 (9)	83 (8)	81 (7)	80 (9)	78 (9)
2005	77 (8)	76 (8)	75 (8)	74 (7)	73 (7)	72 (7)	71 (7)	70 (6)	70 (6)	69 (2)	68 (2)	68 (2)



SEC Prediction of Smoothed Sunspot Number



SEC Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	10 (***)	10 (***)	10 (***)	9 (***)	8 (***)	9 (***)	9 (***)	8 (***)	9 (***)	9 (***)	10 (***)	11 (***)
1997	11 (***)	11 (***)	14 (***)	17 (***)	18 (***)	20 (***)	23 (***)	25 (***)	29 (***)	32 (***)	35 (***)	41 (20)
1998	47 (21)	54 (22)	60 (22)	68 (23)	78 (24)	87 (24)	94 (25)	101 (25)	109 (26)	114 (26)	119 (27)	124 (27)
1999	128 (27)	132 (28)	136 (28)	139 (29)	143 (29)	146 (29)	149 (29)	151 (29)	154 (29)	156 (29)	157 (29)	159 (29)
2000	160 (30)	161 (30)	161 (30)	161 (30)	161 (29)	161 (29)	160 (29)	160 (29)	159 (29)	158 (29)	156 (29)	155 (28)
2001	153 (28)	151 (28)	148 (28)	146 (27)	143 (27)	141 (27)	138 (27)	135 (26)	132 (26)	128 (26)	125 (25)	122 (25)
2002	119 (24)	115 (24)	111 (24)	108 (23)	104 (23)	101 (22)	97 (22)	94 (21)	90 (21)	86 (21)	83 (20)	80 (20)
2003	76 (19)	73 (19)	70 (18)	66 (18)	63 (17)	60 (17)	57 (17)	54 (16)	52 (16)	49 (15)	46 (15)	44 (14)
2004	41 (14)	39 (14)	37 (13)	35 (13)	32 (12)	31 (12)	29 (11)	27 (11)	25 (11)	23 (10)	22 (10)	20 (9)
2005	19 (9)	18 (9)	17 (8)	15 (8)	14 (8)	13 (8)	12 (7)	11 (7)	11 (7)	10 (6)	9 (5)	8 (4)

