

Space Weather Highlights
26 April - 02 May 1999

Solar activity ranged from very low to moderate levels. Isolated B- and C-class subflares occurred during most days. However, activity rose to moderate levels on 29 April by virtue of an M1/1B flare at 29/1954UT from Region 8524 (N22, L = 033, class/area Eao/310 on 29 April).

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. A recurrent, high speed coronal hole wind stream affected the magnetosphere during much of the period. Velocities were elevated, at times reaching 700 km/sec. Densities ranged from 01 to 04 p/cc during most of the period. IMF Bz hovered around zero in the plus 08 to minus 09 nT (GSM) range. Earth was within a toward (negative polarity) solar sector during most of the period. There were no proton enhancements detected at geosynchronous altitude.

The greater than 2 MeV electron flux at geo-synchronous altitude reached high levels during 30 April - 02 May.

The geomagnetic field was disturbed during 28 April - 01 May with active levels at middle latitudes and active to major storm levels at high latitudes. The disturbance appeared to be due to recurrent coronal hole effects.

Space Weather Outlook
05 May - 31 May 1999

Solar activity is expected to range from very low to moderate levels. Region 8525 (N17, L = 300, class/area Fso/290 on 02 May) may produce isolated M-class flares before departing the visible disk on 13 May (this region produced a long-duration M4/2N flare on 03 May - details will be provided in next week's PRF).

Region 8525 provides a slight chance for a solar proton event at geosynchronous altitude through 13 May.

The greater than 2 MeV electron flux at geo-synchronous altitude may reach high levels around 27 - 31 May. Otherwise, normal to moderate levels are expected.

Geomagnetic field activity is expected to increase to active to minor storm levels during 25 - 28 May due to recurrent coronal hole effects. Quiet to unsettled conditions are expected during the rest of the period, barring any Earth-directed CMEs.

New Product Update:

Please note the new ISES Solar Cycle Progression graphs for sunspot and solar radio flux data. These graphs contain monthly and smoothed monthly values as well as Solar Cycle 23 prediction and confidence level values. These graphs replace the previous prediction graphs and the Recent Solar Indices stack plot (group of 3 graphs). The Ap (Estimated) graph will be expanded and presented along with these new graphs, but no prediction data for this index currently exist.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No. (10^6 hemi.)	Sunspot Area (10^6 hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
26 April	105	69	400	A9.1	0	0	0	1	0	0	0	0
27 April	009	82	420	B1.8	1	0	0	5	0	0	0	0
28 April	110	76	440	B3.8	1	0	0	1	0	0	0	0
29 April	122	98	500	B3.7	8	1	0	12	1	0	0	0
30 April	124	80	470	B4.4	3	0	0	3	1	0	0	0
01 May	126	92	470	B3.7	1	0	0	1	0	0	0	0
02 May	136	136	500	B4.3	4	0	0	6	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
26 April	1.3E+6	1.1E+5	3.3E+3		2.0E+7	
27 April	2.4E+5	2.4E+4	3.4E+3		8.5E+6	
28 April	3.2E+5	1.8E+4	3.2E+3		1.1E+7	
29 April	2.5E+5	1.6E+4	3.1E+3		6.4E+6	
30 April	5.5E+5	1.4E+4	3.3E+3		6.0E+7	
01 May	8.0E+5	1.5E+4	3.5E+3		1.9E+8	
02 May	3.1E+5	1.4E+4	3.6E+3		3.3E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	26 April	6	1-0-1-2-3-2-2-1	5	1-0-1-2-2-2-2-1	7
27 April	9	1-1-2-2-2-2-4-2	18	1-0-4-6-2-2-3-2	14	1-1-3-3-3-4-4-4
28 April	14	3-3-2-3-2-2-3-4	29	3-3-5-6-4-4-2-3	19	3-3-3-4-3-3-3-4
29 April	18	2-2-2-3-3-3-4-5	34	3-3-2-6-6-5-3-3	19	3-3-2-4-4-4-4-4
30 April	17	4-3-4-3-3-2-3-3	34	3-4-5-6-5-4-3-3	21	4-4-5-4-2-3-3-3
01 May	15	4-4-3-2-3-2-3-2	28	4-3-5-4-5-5-2-2	19	3-4-4-3-3-3-3-3
02 May	8	2-2-3-1-2-2-2-2	19	2-3-5-4-4-3-2-2	13	2-3-4-3-3-2-3-2

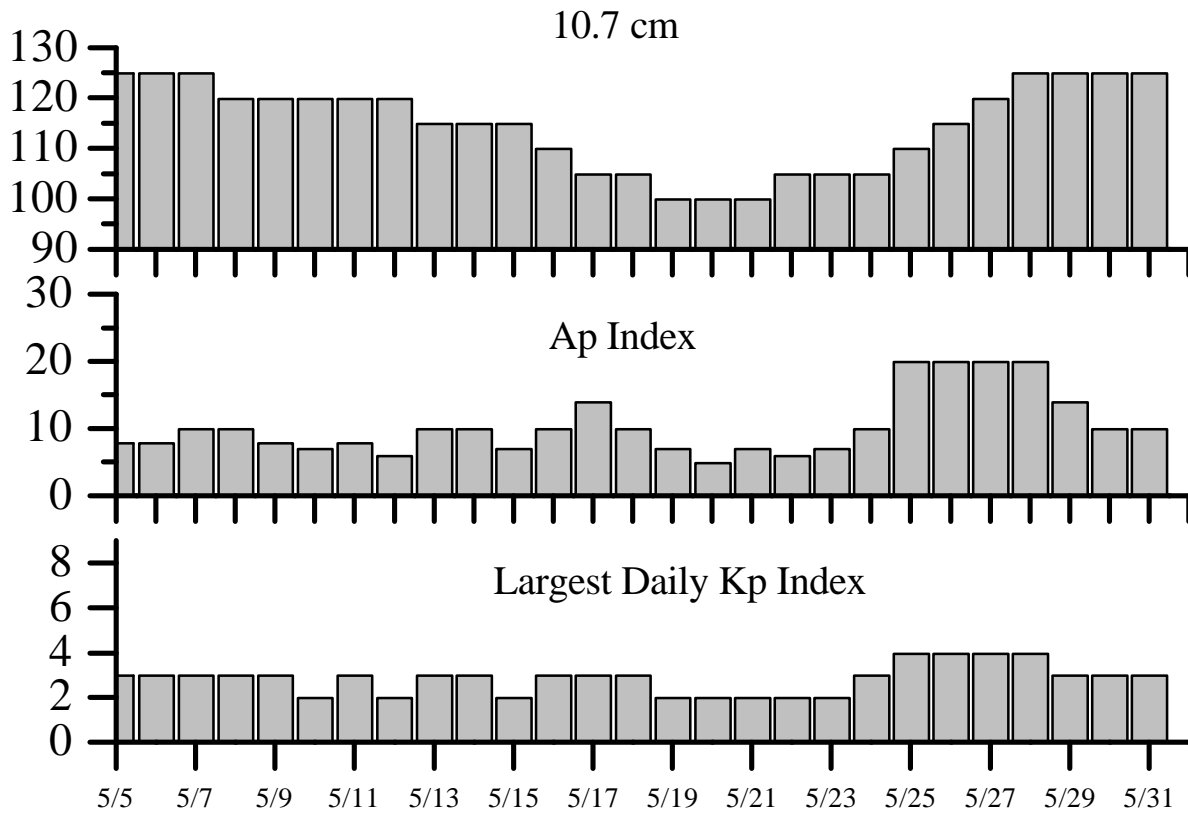


Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
27Apr 0008	1 - 245 Radio Burst	26 Apr
27Apr 0008	1 - 245 Radio Noise Storm	26 Apr
28 Apr 0051	1 - 245 Radio Burst	27Apr
28 Apr 0900	K = 4 Observed	28 Apr 06- 09
28 Apr 1200	K = 4 Observed	28 Apr 09- 12
29 Apr 000	K= 4 Observed	28 Apr 21- 24
29 Apr 1513	K= 4 Observed	29 Apr 12- 15
29 Apr 1513	K= 4 Warning valid	29 Apr 1500- 2 May 1500
30 Apr 300	A \geq 20 Observed	30 Apr 0300
30 Apr 1348	Electron Event \geq 1000pfu @ $>2\text{MeV}$	30 Apr 1320
01 May 1204	CONTINUED $>2\text{MeV}$ Electron Event $\geq 1000\text{pfu}$	30 Apr 1320
02 May 1203	CONTINUED $>2\text{MeV}$ Electron Event $\geq 1000\text{pfu}$	30 Apr 1320



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
05 May	125	8	3	19 May	100	7	2
06	125	8	3	20	100	5	2
07	125	10	3	21	100	7	2
08	120	10	3	22	105	6	2
09	120	8	3	23	105	7	2
10	120	7	2	24	105	10	3
11	120	8	3	25	110	20	4
12	120	6	2	26	115	20	4
13	115	8	3	27	120	20	4
14	115	6	2	28	125	20	4
15	115	7	2	29	125	14	3
16	110	10	3	30	125	10	3
17	105	14	3	31	125	10	3
18	105	10	3				



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Max	Class	Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV
29 Apr 99	1945	1954	2005	M1.1	.009	1B	N22W16	8524		21		

Flare List

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
26 April	0227	0231	0235	B1.7			
	0759	0806	0810	B2.1			
	1025	1039	1053	B3.4			
	1254	1310	1322	B3.2			
	1647	1648	1659		SF	N21E29	8524
	2149	2152	2158	B2.6			
27 April	0159	0204	0212	B3.5			
	0931	0937	0942	B5.6			
	A1102	1104	1113	B8.0	SF	N32E10	8523
	1517	1519	1525		SF	N21E18	8524
	1528	1528	1532		SF		8524
	1636	1637	1640		SF	N21E18	8524
28 April	2024	2025	2033	C1.3	SF	N22E16	8524
	0915	0919	0922	B6.2			
	1209	1210	1216	B5.9	SF	N33W03	8523
	1338	1355	1430	B6.6			
	1508	1512	1515	B7.8			
	1743	1749	1754	B7.6			
29 April	1904	1909	1913	B8.2			
	2027	2032	2035	C3.8			
	0316	0320	0323	C1.1			
	0352	0353	0358		SF	N30W10	8523
	0829	0830	0833	C2.5	SF	N14E77	8525
	0925	0927	0931		SF	N33W12	8523
	1142	1144	1148		SF	N30W15	8523
	1206	1208	1231	C1.3	SF	N22W05	8524
	1244	1245	1252		SF	N22W04	8524
	1540	1542	1552	C1.7	SF	N22W08	8524
	1716	1719	1727	C2.9	SF	N22W09	8524
	1722	1722	1726		SF	N15E74	8525
	1737	1740	1755	C3.7	SF	N21W08	8524
1948	1955	2027	M1.1	1B	N22W16	8524	
2031	2033	2038		SF	N22W17	8524	
2049	2054	2114	C1.5	SF	N21W09	8524	
2214	2218	2221	C1.2				



Flare List-continued

Date	Time			X-ray Class.	Imp / Brtns	Optical	Rgn #
	Begin	Max	End			Location Lat CMD	
30 April	0229	0232	0235		SF	N15E71	8525
	0246	0249	0259	C1.8	SF	N21W13	8524
	0354	0355	0408	C4.2	SF	N22W15	8524
	0733	0736	0740	B9.3			
	1213	1216	1237	C8.2	1F	N24W17	8524
01 May	2225	2228	2230	B7.3			
	2258	2259	2308	C3.0	SF	N22W40	8524
02 May	0547	0551	0553	B7.4			
	0754	0759	0816	C4.1	SF	N21W43	8524
	0958	1003	1009	C7.5			
	1218	1221	1235		SF	N16E42	8525
	1437	1440	1502	C2.0	1F	N16E42	8525
	1505	1506	1510		SF	N16E43	8525
	1703	1707	1713	C2.2	SF	N24E52	8527
	1846	1846	1851		SF	N21W49	8524
	2201	2204	2209		SF	N16E38	8525
	2333	2336	2338	B7.8			

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
<i>Region 8516</i>													
14 Apr	S21E68	147	0060	09	CAO	005	B						
15 Apr	S19E55	147	0050	09	CAO	008	B						
16 Apr	S20E44	145	0070	08	CAO	008	B						
17 Apr	S20E30	146	0080	09	CAO	005	B						
18 Apr	S18E16	146	0060	06	CSO	005	B						
19 Apr	S18E03	146	0070	06	CAO	005	B						
20 Apr	S19W11	147	0040	05	CSO	003	B						
21 Apr	S19W25	148	0050	04	CSO	003	B				1		
22 Apr	S20W36	146	0040	08	CSO	006	B						
23 Apr	S19W50	147	0030	06	CRO	008	B						
24 Apr	S19W62	145	0020	08	CRO	010	B						
25 Apr	S19W75	145											
26 Apr	S19W88	145											

0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 146



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

Region 8518

17 Apr	S16E66	110	0060	02	HAX	002	A												
18 Apr	S14E53	109	0080	02	HAX	004	A												
19 Apr	S14E40	109	0100	07	CAO	011	B							2					
20 Apr	S15E29	107	0160	08	DAO	016	B							1					
21 Apr	S15E15	108	0160	08	DAO	017	B												
22 Apr	S15E04	106	0170	11	EAO	018	B												
23 Apr	S14W10	107	0160	09	DAO	018	B												
24 Apr	S14W23	106	0120	08	CAO	009	B												
25 Apr	S13W38	108	0080	04	CAO	008	B												
26 Apr	S13W51	108	0090	02	HSX	002	A												
27 Apr	S13W64	108	0070	02	HSX	001	A												
28 Apr	S13W76	107	0070	02	HSX	001	A												
29 Apr	S13W93	110	0060	02	HSX	001	A												
																			0 0 0 3 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 106

Region 8520

19 Apr	N20E12	137	0020	04	CRO	005	B												
20 Apr	N19E00	136	0010	04	BXO	006	B												
21 Apr	N19W15	138	0000	06	BXO	004	B												
22 Apr	N19W28	138																	
23 Apr	N19W41	138																	
24 Apr	N19W54	138																	
25 Apr	N19W67	138																	
26 Apr	N19W80	138																	
																			0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 136

Region 8522

23 Apr	N16E63	034	0010	00	AXX	001	A												
24 Apr	N16E50	033	0010	06	BXO	005	B							4					
25 Apr	N16E38	032	0060	06	DSO	009	B												
26 Apr	N16E26	031	0070	07	DAO	008	B												
27 Apr	N16E13	031	0070	07	DAO	007	B												
28 Apr	N18E00	031	0030	06	CSO	005	B												
29 Apr	N17W14	031	0030	06	CSO	007	B												
																			0 0 0 4 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 031



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

Region 8523

24 Apr	N32E42	041	0000	07	BXO	003	B													
25 Apr	N31E28	042	0010	04	BXO	004	B						1							
26 Apr	N30E16	041	0020	05	BXO	009	B													
27 Apr	N31E03	041	0040	04	CSO	012	B						1							
28 Apr	N32W09	040	0040	06	CRO	011	B						1							
29 Apr	N32W21	038	0020	04	BXO	004	B						3							
30 Apr	N32W35	038	0000	00	AXX	001	A													
01 May	N32W45	035	0000	00	AXX	001	A													
02 May	N30W55	032	0020	05	BXO	004	B													
													0	0	0	6	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 041

Region 8524

24 Apr	N22E53	030	0000	00	AXX	001	A													
25 Apr	N22E39	031	0120	06	DSO	008	B						1							
26 Apr	N22E26	031	0220	08	DAO	010	B						1							
27 Apr	N22E13	031	0240	11	EAO	022	B	1					4							
28 Apr	N22W02	033	0300	13	EKO	019	B													
29 Apr	N22W15	032	0310	13	EAO	024	B	5	1				7	1						
30 Apr	N21W28	031	0270	14	EAI	028	BG	3					2	1						
01 May	N22W40	030	0170	15	EAO	027	BG	1					1							
02 May	N21W55	032	0150	12	ESI	019	BG	1					2							
													11	1	0	18	2	0	0	0

Still on Disk.

Absolute heliographic longitude: 033

Region 8525

29 Apr	N15E68	309	0070	02	HSX	001	A	1					2							
30 Apr	N16E62	304	0200	16	FSO	010	B						1							
01 May	N17E49	301	0280	17	FSO	012	B													
02 May	N17E34	303	0290	17	FSO	016	B	1					3	1						
													2	0	0	6	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 303

Region 8526

29 Apr	N22E35	342	0010	00	AXX	001	A													
30 Apr	N22E22	342																		
01 May	N22E09	342																		
02 May	N23W03	340	0010	03	BXO	005	B													

Still on Disk.

Absolute heliographic longitude: 340



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 8527</i>																	
30 Apr	N27E68	295	0000	00	AXX	001	A										
01 May	N26E53	297	0020	01	HRX	001	A										
02 May	N27E38	299	0020	02	HSX	003	A	1				1					
								1	0	0		1	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 299																	
<i>Region 8528</i>																	
01 May	S15E63	287	0000	00	AXX	001	A										
02 May	S15E51	286	0010	05	BXO	003	B										
Still on Disk.																	
Absolute heliographic longitude: 286																	
<i>Region 8529</i>																	
02 May	S13E10	327	0000	03	BXO	004	B										
Still on Disk.																	
Absolute heliographic longitude: 327																	
<i>Region 8530</i>																	
02 May	N16E53	284	0000	02	BXO	002	B										
Still on Disk.																	
Absolute heliographic longitude: 284																	



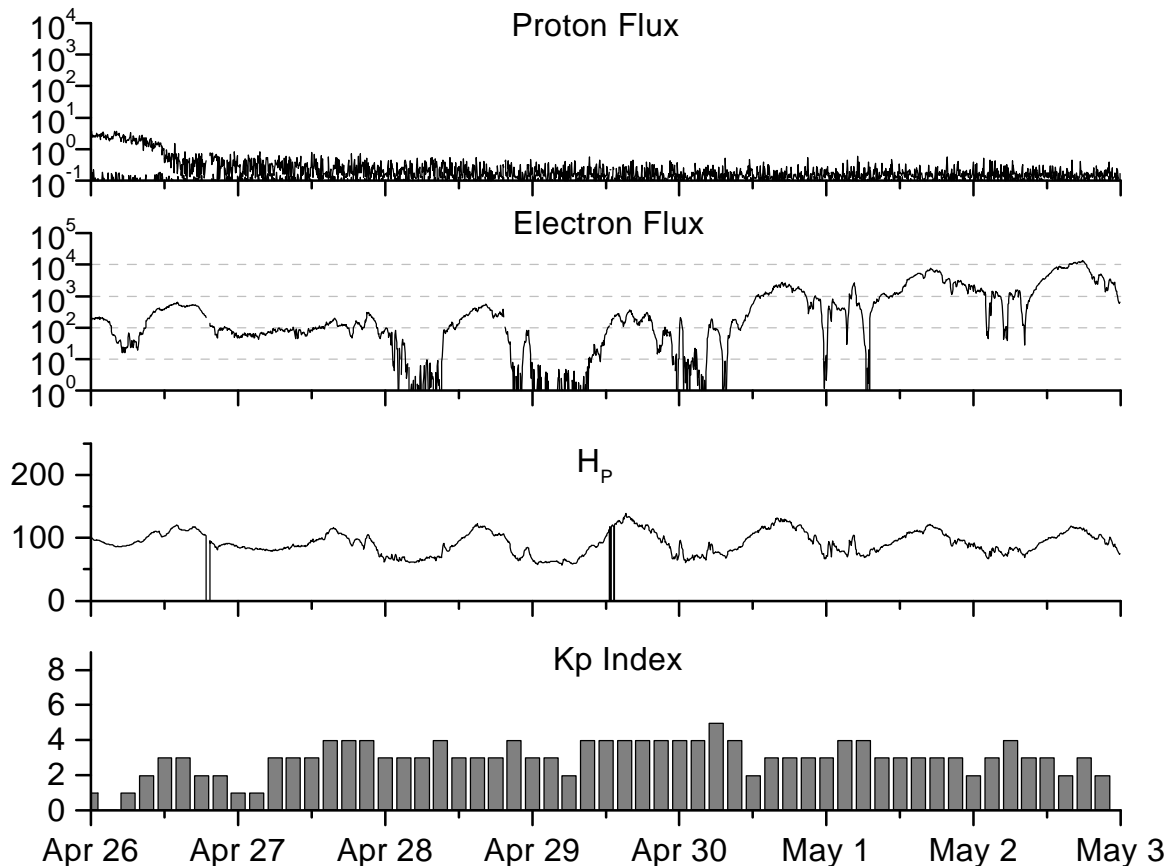
**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers				Radio Flux		Geomagnetic		
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
1997									
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	08.6
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	25.0	79.0	83.4	07	08.3
September	52.8	51.3	0.88	40.5	28.3	96.2	85.7	10	08.4
October	33.6	22.8	0.68	45.4	31.8	84.9	88.6	11	08.6
November	53.5	39.0	0.73	49.3	35.0	99.5	91.3	11	09.0
December	57.9	41.2	0.71	54.2	39.0	98.8	94.2	05	09.5
1998									
January	51.8	31.9	0.62	60.6	43.7	93.4	97.5	08	09.9
February	54.4	40.3	0.74	67.4	48.8	93.4	101.7	08	10.5
March	81.8	54.8	0.67	73.3	53.4	109.1	105.8	13	11.1
April	73.6	53.4	0.73	77.7	56.5	108.3	109.1	10	11.3
May	74.3	56.3	0.76	81.4	59.3	106.7	112.4	18	11.6
June	93.6	70.7	0.76	85.9	62.4	108.4	116.2	10	11.9
July	98.3	66.2	0.67	90.3	65.4	114.0	120.3	11	12.2
August	118.6	91.7	0.77			136.0		18	12.4
September	119.0	92.9	0.78			138.4		14	12.5
October	77.0	55.6	0.72			121.9		13	
November	99.5	73.6	0.74			140.2		16	
December	120.8	81.6	0.68			150.1		08	
1999									
January	94.3	62.4	0.66			142.6		10	
February	93.4	66.1	0.70			142.0		11	
March	100.5	69.1	0.70			126.3		13	
April	92.9	63.9	0.69			117.3		12	

NOTE: All smoothed values after January 1998 and monthly values after September 1998 are 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. * 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 26 April 1999

Protons plot contains the five-minute averaged integral proton flux (protons/ cm^2 -sec-sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

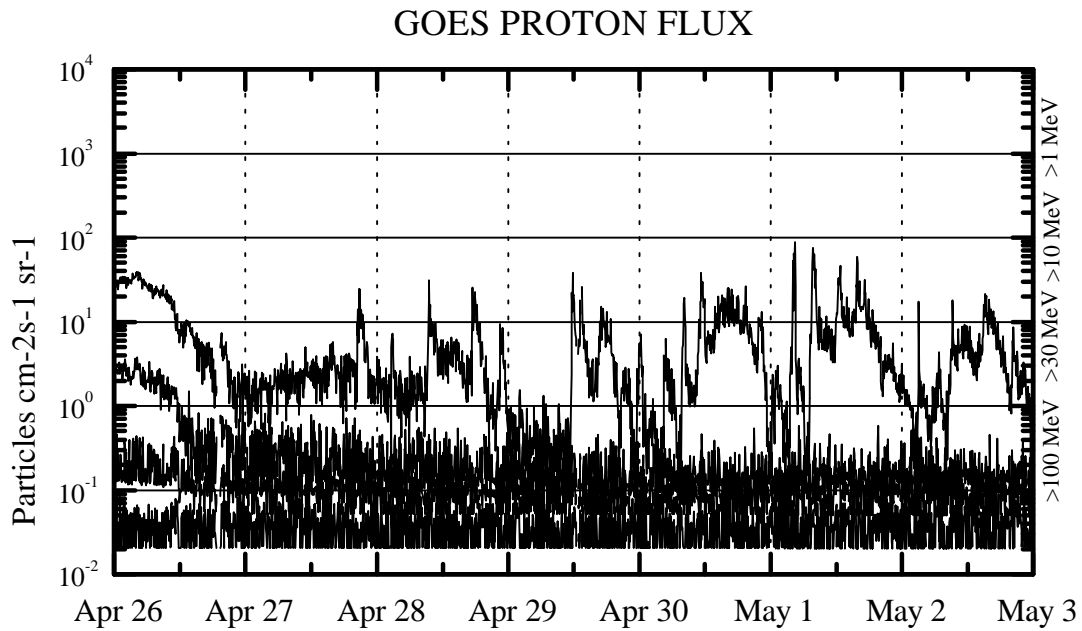
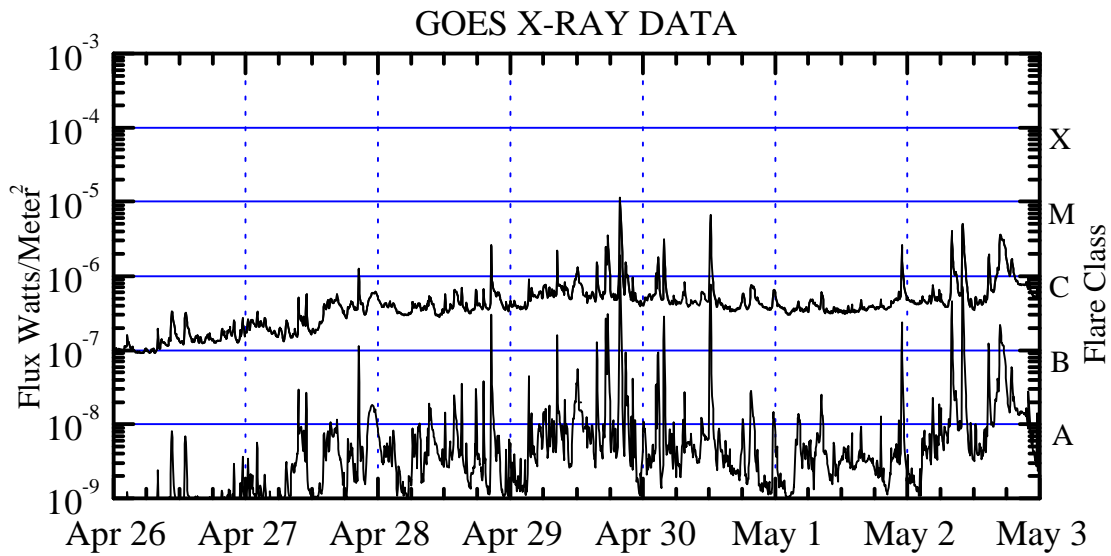
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-8.

H_p plot contains the five minute averaged magnetic field H component in nanoteslas (nT) as measured by GOES-8. 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

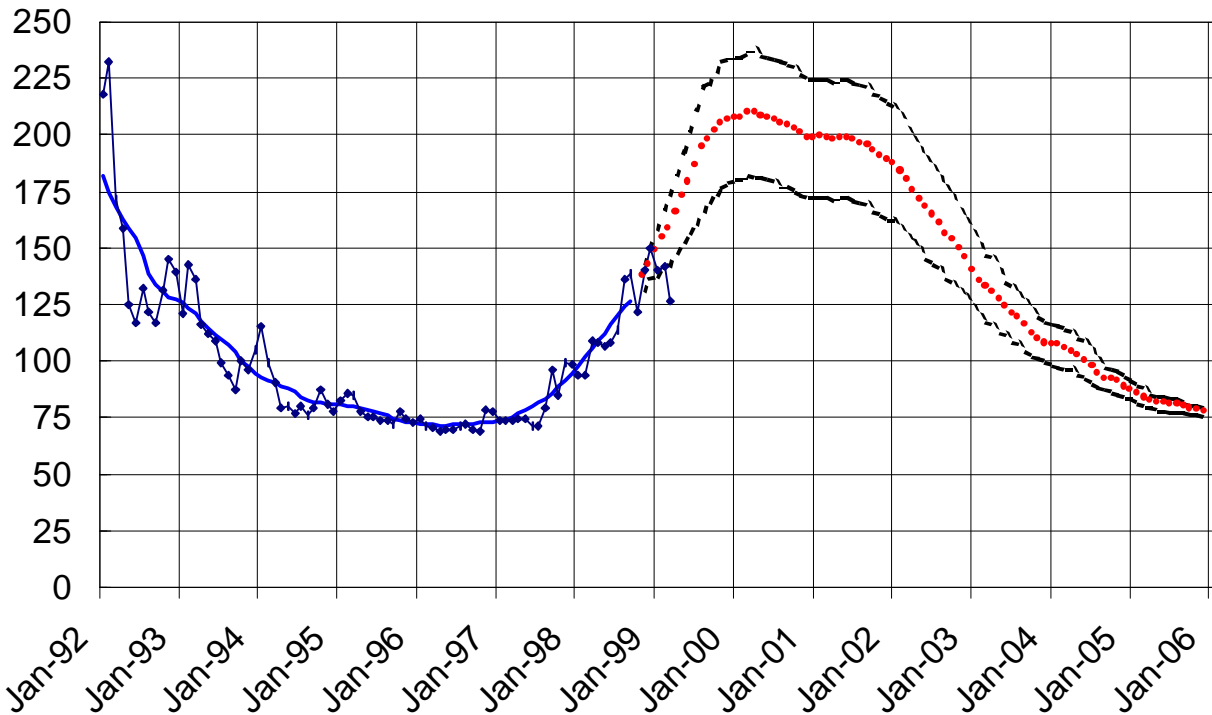
X-ray plot contains five minute averaged x-ray flux (watts/m²) as measured by GOES 8 and 10 in two wavelength bands, .05 -.4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-8 (W75) 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 F10.7cm Radio Flux Progression

(Data Through 1 May 99)

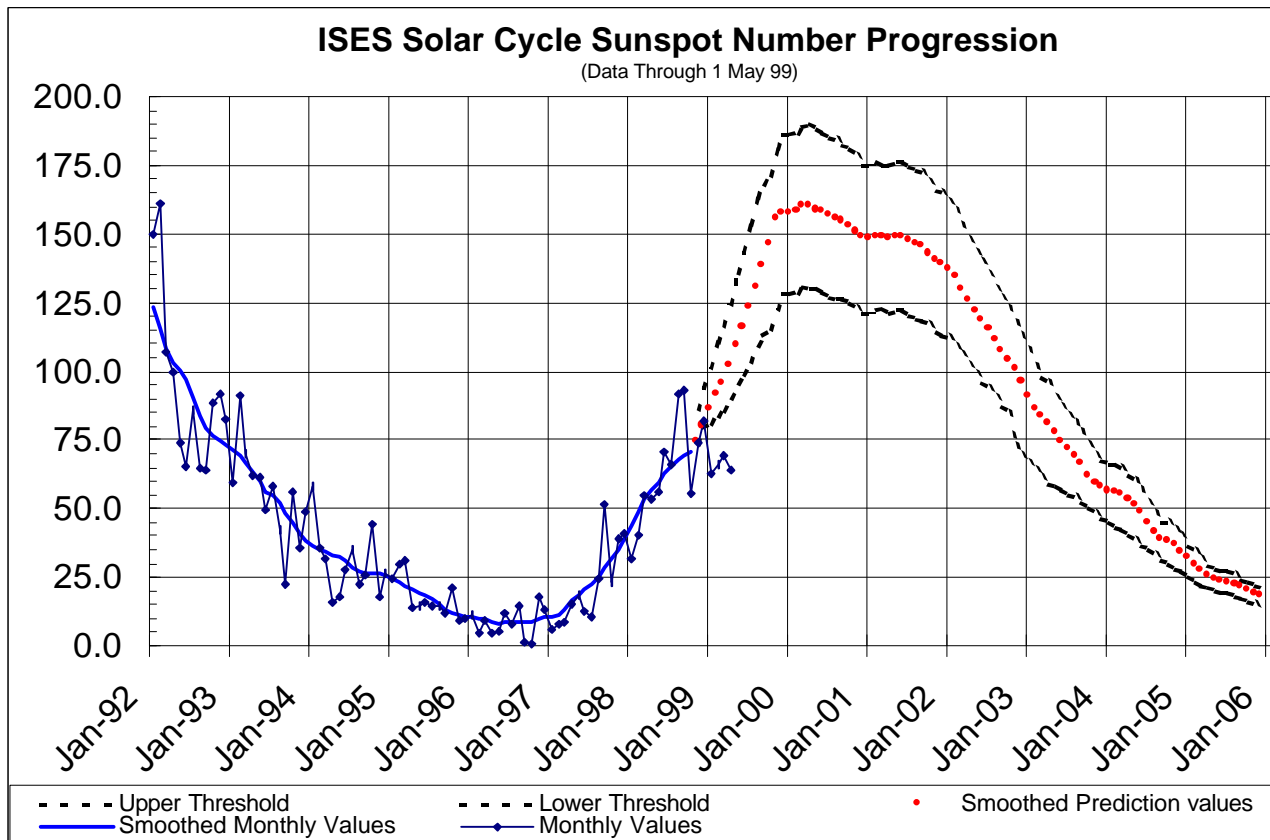


- - - Upper Threshold
- - - Lower Threshold
• Smoothed Prediction Values
— Smoothed Monthly Values
—• Monthly Values

ISES Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	73 (***)	72 (***)	72 (***)	71 (***)	71 (***)	72 (***)	71 (***)	71 (***)	71 (***)	72 (***)	72 (***)	73 (***)
1997	73 (***)	74 (***)	75 (***)	77 (***)	78 (***)	80 (***)	82 (***)	83 (***)	86 (***)	88 (***)	91 (***)	94 (***)
1998	98 (***)	102 (***)	106 (***)	109 (***)	112 (***)	116 (***)	120 (***)	124 (***)	127 (***)	128 (***)	137 (6)	142 (8)
1999	148 (10)	154 (13)	158 (15)	165 (17)	172 (20)	179 (22)	186 (25)	194 (27)	197 (26)	201 (27)	204 (28)	206 (27)
2000	207 (27)	207 (27)	209 (27)	209 (28)	208 (27)	207 (27)	206 (27)	204 (28)	204 (27)	202 (27)	200 (27)	198 (26)
2001	198 (26)	198 (26)	198 (26)	197 (26)	198 (26)	198 (26)	197 (26)	196 (26)	195 (26)	192 (26)	190 (26)	188 (26)
2002	187 (25)	184 (25)	179 (24)	175 (23)	171 (22)	167 (22)	164 (21)	160 (20)	156 (20)	153 (19)	149 (18)	145 (17)
2003	140 (17)	135 (16)	132 (15)	130 (15)	126 (14)	123 (12)	120 (12)	118 (11)	115 (11)	112 (10)	110 (9)	108 (9)
2004	107 (9)	106 (9)	105 (9)	104 (8)	102 (8)	100 (8)	97 (7)	94 (6)	92 (5)	91 (5)	90 (5)	88 (5)
2005	87 (4)	85 (4)	83 (4)	82 (3)	81 (3)	81 (3)	80 (3)	80 (3)	79 (2)	78 (2)	78 (2)	77 (2)





ISES Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	10	10	10	8	8	9	8	8	8	9	10	10
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
1997	11	11	14	17	18	20	23	25	28	32	35	39
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
1998	44	49	53	57	59	62	65	68	69	71	74	80
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(6)	(8)
1999	86	91	95	102	109	115	123	130	138	146	155	157
	(10)	(13)	(15)	(17)	(20)	(22)	(25)	(27)	(27)	(28)	(29)	(29)
2000	157	158	160	160	159	158	156	155	154	153	151	148
	(29)	(29)	(29)	(30)	(29)	(29)	(29)	(29)	(28)	(28)	(28)	(27)
2001	148	149	148	148	149	149	147	146	145	143	140	139
	(27)	(27)	(27)	(27)	(27)	(27)	(27)	(27)	(27)	(26)	(26)	(26)
2002	137	134	130	125	122	118	115	111	107	104	100	96
	(25)	(25)	(24)	(23)	(22)	(22)	(21)	(20)	(20)	(19)	(18)	(17)
2003	91	86	83	81	77	74	71	69	66	62	59	57
	(17)	(16)	(15)	(15)	(14)	(13)	(13)	(12)	(12)	(11)	(10)	(10)
2004	56	56	55	53	51	48	44	41	38	38	36	34
	(10)	(10)	(10)	(9)	(9)	(9)	(8)	(7)	(7)	(7)	(6)	(6)
2005	31	29	27	25	24	23	23	22	21	20	19	18
	(5)	(5)	(5)	(4)	(4)	(4)	(4)	(4)	(3)	(3)	(3)	(3)



Smoothed and Monthly Values

(Data Through 1 May 99)

