

Space Weather Highlights
10-16 May 1999

Solar activity ranged from very low to moderate levels. Small- to medium-sized sunspot groups populated the disk during the period, all of which were unremarkable in terms of structure or dynamics. B- and C-class subflares occurred during most days. Isolated, low-level M-class flares occurred on the first and last days of the period. One of these, an M2/2N from Region 8539 (N13, L=227, class/area Dso/050 on 08 May) at 10/0531UT, was associated with a Type IV radio sweep and a full-halo CME.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. A coronal mass ejection passage occurred during 12 - 13 May. The passage caused a velocity increase from 310 - 540 km/sec, increased IMF Bz variability with maximum southerly excursions to minus 14 nT (GSM), a shift to a predominantly toward (negative polarity) solar sector, and a density increase to 30 p/cc.

A greater than 10 MeV proton flux enhancement at geo-synchronous orbit was in progress at the start of the period (the source was an M7 flare on 09 May). The enhancement declined to background levels by 10 May, then remained so for the rest of the period.

The greater than 2 MeV electron flux at geo-synchronous orbit was at moderate to high levels through 12 May, then decreased to normal levels for the balance of the period.

The geomagnetic field was disturbed on 13 May, most likely in response to the halo-CME mentioned above. Active to minor storm levels occurred at all latitudes during the disturbance with brief major storm periods detected at high latitudes. Quiet to unsettled conditions prevailed during the rest of the period.

Space Weather Outlook
19 May -14 June 1999

Solar activity is expected to range from low to moderate levels. There is also a fair chance for an isolated major flare sometime during the period.

There will be a slight chance for a solar proton enhancement or event at geo-synchronous orbit sometime during the period.

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

Geomagnetic field activity is expected to be at unsettled to active levels during 19 May and again during 26 - 28 May due to coronal hole effects. Quiet to unsettled conditions are expected during the rest of the period, barring any Earth-directed coronal mass ejections.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No. (10 ⁶ hemi.)	Sunspot Area	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
10 May	170	174	900	C1.8	12	1	0	7	0	1	0	0
11 May	159	191	850	B8.4	7	0	0	9	1	0	0	0
12 May	153	141	590	B8.7	2	0	0	1	0	0	0	0
13 May	147	118	600	B5.4	0	0	0	6	0	0	0	0
14 May	144	126	680	B4.2	3	0	0	5	0	0	0	0
15 May	144	167	940	B4.6	0	0	0	13	0	0	0	0
16 May	152	151	1020	B4.1	2	3	0	5	2	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
10 May	7.4E+5	3.1E+4	3.2E+3		8.4E+7	
11 May	1.7E+5	1.5E+4	3.0E+3		8.0E+7	
12 May	4.6E+5	1.5E+4	3.1E+3		8.0E+7	
13 May	1.7E+5	1.5E+4	3.2E+3		1.0E+6	
14 May	1.0E+5	1.4E+4	3.3E+3		1.2E+6	
15 May	7.4E+4	1.5E+4	3.5E+3		2.0E+6	
16 May	8.3E+4	1.6E+4	3.6E+3		3.1E+6	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	10 May	3	2-1-1-1-1-1-0-1	4	2-2-0-0-1-1-1-2	5
11 May	1	0-0-0-0-0-0-1-2	1	0-0-0-0-1-1-0-0	5	1-1-0-1-2-3-2-1
12 May	8	1-2-2-2-2-3-2-2	5	0-1-2-2-2-2-2-1	9	1-2-2-2-2-3-3-2
13 May	17	3-4-4-2-4-2-2-3	46	3-5-5-3-7-6-3-2	24	3-5-4-3-5-4-3-3
14 May	7	2-2-3-1-1-1-2-2	9	3-2-3-2-3-2-1-1	9	3-3-3-1-2-2-2-2
15 May	6	2-2-1-2-2-2-1-2	6	2-2-2-2-2-2-0-1	9	2-2-2-2-2-3-2-2
16 May	3	2-1-1-1-1-2-0-0	*	2-2-1-2-0-1-0-*	6	2-2-2-1-2-2-2-2

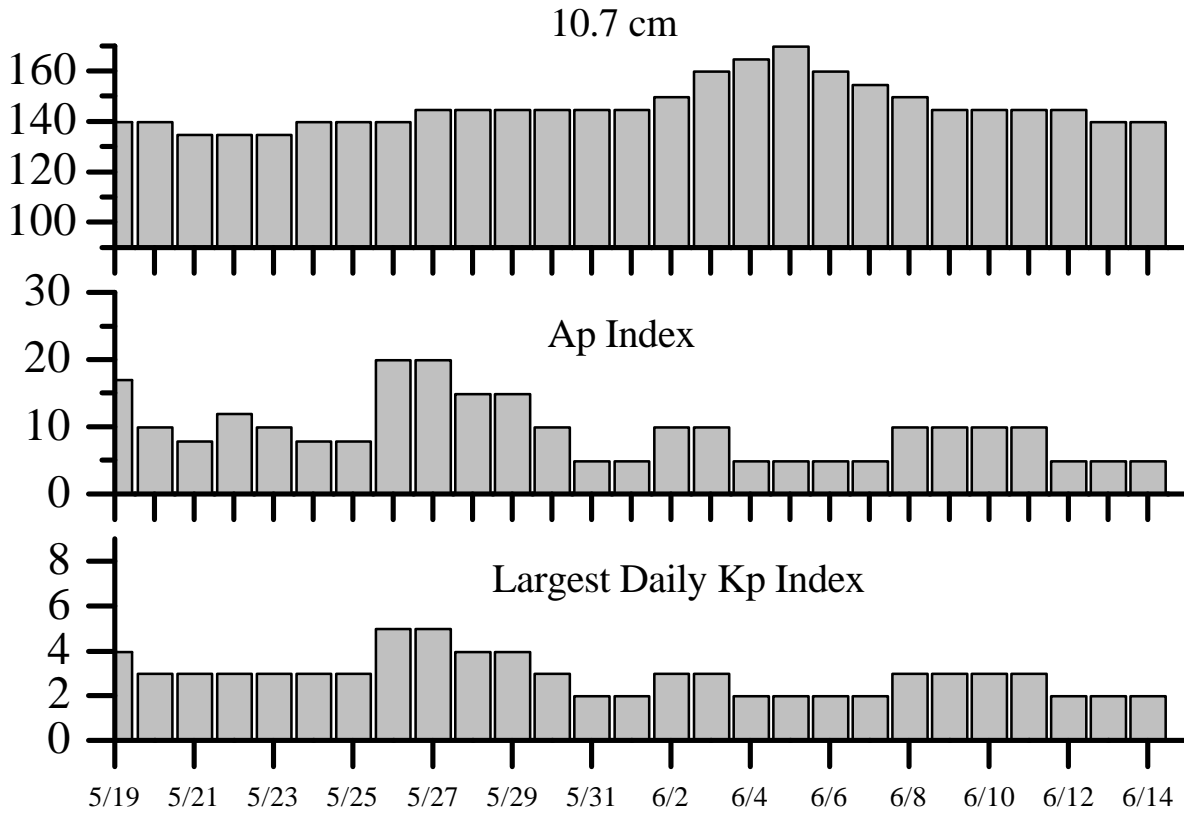


Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
10 May 0007	1-245 MHz Burst	09 May
10 May 0007	245 MHz Radio Noise Storm	09 May
10 May 0837	Type IV Radio Emission	10 May 0516
10 May 1202	CONTINUED >2MeV Electron Event ≥ 1000 pfu	08 May 1320
10 May 1835	X-Ray event M7.6	09 May 1753
11 May 0024	1-245 MHz Burst	10 May
11 May 0024	245 MHz Radio Noise Storm	10 May
11 May 1200	CONTINUED >2MeV Electron Event ≥ 1000 pfu	08 May 1320
11 May 1849	A ≥ 20 Watch	13 May
12 May 0026	1-245 MHz Burst	11 May
12 May 1204	CONTINUED >2MeV Electron Event ≥ 1000 pfu	08 May 1320
13 May 0023	1-245 MHz Burst	12 May
13 May 0023	245 MHz Radio Noise Storm	12 May
13 May 0300	K = 4 Observed	13 May 00 - 03
13 May 0601	K = 5 Observed	13 May 03 - 06
13 May 0601	K = 4 Warning	13 May 06 - 12
13 May 1140	CONTINUED K = 4 Warning	14 May 06-12
13 May 1203	CONTINUED >2MeV Electron Event ≥ 1000 pfu	08 May 1320
13 May 1511	A ≥ 20 Observed	13 May 1500
14 May 0212	2 - 245 MHz Bursts	13 May
14 May 0212	245 MHz Radio Noise Storm	13 May
15 May 0207	1 - 245 MHz Burst	14 May
15 May 0207	245 MHz Radio Noise Storm	14 May



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
19 May	140	17	4	01 Jun	145	5	2
20	140	10	3	02	150	10	3
21	135	8	3	03	160	10	3
22	135	12	3	04	165	5	2
23	135	10	3	05	170	5	2
24	140	8	3	06	160	5	2
25	140	8	3	07	155	5	2
26	140	20	5	08	150	10	3
27	145	20	5	09	145	10	3
28	145	15	4	10	145	10	3
29	145	15	4	11	145	10	3
30	145	10	3	12	145	5	2
31	145	5	2	13	140	5	2
				14	140	5	2



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	Max	Class	Flux	Imp/ Brtns	Location		Rgn #	Radio Flux		Intensity	
							Lat	CMD		245	2695	II	IV
10 May	0522	0531	0537	M2.5	.014	2N	N16E19	8539	63	85		3	
16 May	1345	1350	1353	M1.2	.003	1N	S17W75	8534	110				
16 May	1720	1725	1728	M1.1	.003	SF	S17W76	8534	70	120			
16 May	2225	2233	2237	M1.0	.004	SF	N22W37	8541	190				

Flare List

Date	Time			X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
10 May	0043	0045	0054		SF	N22E52	8541
	0248	0251	0258	C3.3			
	0302	0305	0307	C3.2			
	0524	0529	0605	M2.5	2N	N16E19	8539
	0711	0714	0718	C2.1			
	0916	0923	0931	C5.3			
	1112	1119	1124	C2.3			
	1155	1156	1207		SF	N20E48	8541
	B1308	1309	1329	C1.9	SF	N20E46	8541
	1406	1412	1423	C1.1	SF	N20E46	8541
	1554	1557	1602	C1.7	SF	N21E47	8541
	1728	1742	1751	C1.6			
	2021	2021	2027	C1.3	SF	S24E33	8540
	2205	2211	2218	C1.6			
11 May	2314	2321	2346	C1.4	SF	N22E44	8541
	0400	0405	0409	C1.3			
	0425	0425	0432		SF	N24E12	8535
	0931	0933	0945	C2.0	SF	N21E37	8541
	0952	0956	1002		SF	N20E37	8541
	1106	1110	1114	C3.9			
	1656	1700	1706	C1.3			
	1906	1906	1914	C1.5	SF	N20E02	8535
	1910	1911	1914		SF	N21E31	8541
	2025	2040	2127	C2.1	1F	N22E31	8541
	2042	2042	2101		SF	S26E22	8540
	2143	2146	2208	C4.7	SF	S19E79	8542
	2145	2146	2300		SF	N21E30	8541
	2228	2231	2248		SF	N21E28	8541
12 May	0430	0437	0449	C2.2			
	1928	1930	1938	C1	SF	S16W18	8534



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
13 May	1203	1205	1210		SF	N20E04	8541
	1312	1312	1326	B8.2	SF	S16W28	8534
	1328	1328	1332		SF	N03E54	8543
	1336	1338	1342		SF	N20E03	8541
	1625	1625	1634		SF	N18W53	8531
	2345	2347	2354		SF	S25W38	8536
14 May	0344	0354	0402	C1.5			
	0819	0847	0908	C1.0			
	0925	0928	0942	B9.3	SF	S18W36	8534
	1623	1634	1639		SF	S22E65	8544
	1804	1807	1812		SF	S22E64	8544
	2201	2201	2224		SF	S25W53	8536
15 May	2226	2229	2248	C1.6	SF	S28W16	8540
	0031	0031	0043		SF	S19E63	8544
	0056	0058	0102		SF	S19E61	8544
	0108	0112	0121		SF	S19E61	8544
	0747	0756	0832		SF	S19E59	8544
	0759	0807	0843		SF	N21W09	8541
	0837	0837	0842		SF	N21W11	8541
	0843	0843	0857		SF	N21W09	8541
	0904	0905	0908	B6.8	SF	S19E56	8544
	1120	1121	1128		SF	S19E56	8544
	1131	1134	1140		SF	S20E56	8544
	1635	1639	1643		SF	S25W61	8536
	1645	1646	1648		SF	S22E53	8544
	1740	1743	1745	B6.1	SF	S25W61	8536
16 May	0320	0324	0325		SF	S28W34	8540
	1042	1054	1100	B9.3			
	1346	1350	1359	M1.2	1N	S17W75	8534
	1654	1655	1658	C1.0	SF	S17W76	8534
	1723	1725	1733	M1.1	SF	S17W76	8534
	2010	2012	2024	C5.7	1F	S16W77	8534
	2227	2237	2240		SF	S17W78	8534
	2233	2235	2248	M1.0	SF	N22W37	8541



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

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							
03 May	N18E24	300	0260	17	FSO	016	B		1		3		1						
04 May	N18E10	301	0210	17	FSO	019	BG												
05 May	N18W02	299	0170	16	FSO	015	B												
06 May	N18W16	300	0160	15	CSO	011	B	1			3								
07 May	N16W31	302	0120	11	CSO	006	B	2			2	1	1						
08 May	N17W49	307	0150	02	HSX	001	A				1								
09 May	N17W60	305	0140	02	HSX	001	A		1		1								
10 May	N16W74	304	0110	02	HSX	001	A												
11 May	N15W90	307	0090	04	HSX	001	A												
								5	2	0	16	2	2	0	0				

Crossed West Limb.

Absolute heliographic longitude: 299

Region 8527

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								
03 May	N28E25	299	0010	01	HRX	001	A												
04 May	N26E12	299	0010	01	HSX	001	A	1			2	1							
05 May	N26E00	297	0000	00	AXX	001	A												
06 May	N26W11	295	0000	00	AXX	001	A				1								
07 May	N26W24	295									1								
08 May	N26W37	295									1								
09 May	N26W50	295																	
10 May	N21W63	293		00	AXX	001	A												
11 May	N21W76	293																	
								2	0	0	6	1	0	0	0				

Died on Disk.

Absolute heliographic longitude: 297



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 8528

01 May	S15E63	287	0000	00	AXX	001	A										
02 May	S15E51	286	0010	05	BXO	003	B										
03 May	S13E36	288	0000	00	AXX	001	A										
04 May	S13E23	288	0000	00		000											
05 May	S16E14	283	0020	03	BXO	004	B										
06 May	S15E01	283	0000	00	AXX	001	A										
07 May	S15W12	283															
08 May	S15W25	283															
09 May	S15W38	283															
10 May	S15W51	283															
11 May	S15W64	283															
12 May	S15W77	283															

0 0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 283

Region 8530

02 May	N16E53	284	0000	02	BXO	002	B										
03 May	N16E40	284															
04 May	N16E27	284															
05 May	N16E14	283	0010	02	BXO	002	B										
06 May	N16E01	283															
07 May	N16W12	283															
08 May	N16W25	283															
09 May	N16W38	283															
10 May	N16W51	283															
11 May	N12W63	280	0010	01	AXX	002	A										
12 May	N12W76	280															

0 0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 283



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 8534

05 May	S18E74	223	0030	01	HAX	001	A											
06 May	S18E60	224	0040	04	CAO	003	B	1				1						
07 May	S18E47	224	0040	02	HSX	001	A											
08 May	S17E35	223	0060	04	CSO	004	B											
09 May	S18E21	224	0040	03	CSO	004	B											
10 May	S18E08	222	0030	05	CSO	004	B											
11 May	S18W06	223	0050	04	CAO	011	B											
12 May	S18W19	223	0090	05	DAI	014	B	1				1						
13 May	S17W33	224	0080	07	DAO	011	B					1						
14 May	S17W47	225	0090	06	DAO	010	B					1						
15 May	S17W60	225	0090	07	DAO	006	B											
16 May	S16W77	228	0050	02	HAX	001	A	2	2			3	2					
								4	2	0		7	2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 223

Region 8535

06 May	N20E67	217	0160	03	HAX	001	A												
07 May	N21E54	217	0260	04	CHO	003	B												
08 May	N22E42	216	0300	05	DHO	004	B												
09 May	N21E30	215	0330	09	DKO	007	B					1							
10 May	N21E16	214	0310	06	CKO	008	B												
11 May	N21E06	211	0320	12	CKO	010	B					2							
12 May	N22W09	213	0270	10	CKO	011	B												
13 May	N22W23	214	0370	06	CKO	009	BG												
14 May	N21W36	214	0330	06	CKO	009	B												
15 May	N22W49	214	0370	06	CKO	007	B												
16 May	N22W62	213	0340	05	HKX	002	A												
												0	0	0	3	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 211



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

Region 8536

06 May	S24E51	233	0030	03	CAO	003	B										
07 May	S24E38	233	0030	06	CSO	005	B										4
08 May	S24E25	233	0070	08	DSO	015	B										1
09 May	S24E12	233	0080	08	DSI	019	B										
10 May	S24E00	230	0100	09	DAI	018	B										
11 May	S24W14	231	0090	09	DAO	019	B										
12 May	S24W27	231	0030	09	BXO	009	B										
13 May	S23W41	232	0010	05	BXO	002	B										1
14 May	S23W54	232															1
15 May	S23W67	232															2
16 May	S23W80	232															
																	0 0 0 9 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 230

Region 8538

07 May	N10W33	304	0020	04	CRO	006	B										1
08 May	N11W46	304	0050	06	CRO	007	B										
09 May	N11W62	307	0020	04	BXO	007	B										1
10 May	N11W76	306	0010	04	BXO	004	B										
11 May	N10W88	305	0040	03	CRO	004	B										
																	0 0 0 2 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 304

Region 8539

07 May	N13E45	226	0030	08	BXO	006	B	2									6
08 May	N14E31	227	0050	08	DSO	006	B										
09 May	N14E16	229	0020	06	BXO	004	B										
10 May	N13E03	227	0010	05	BXO	002	B		1								1
11 May	N13W12	229	0010	04	BXO	002	B										
12 May	N13W25	229															
13 May	N13W38	229															
14 May	N13W51	229															
15 May	N13W64	229															
16 May	N13W77	229															
																	2 1 0 6 0 1 0 0

Still on Disk.

Absolute heliographic longitude: 227



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

Region 8540

07 May	S28E70	201	0060	09	CSO	003	B											
08 May	S28E59	199	0140	11	EAO	005	B											
09 May	S28E46	199	0080	10	DSO	009	B											2
10 May	S27E33	197	0100	10	DSO	010	B	1										1
11 May	S26E19	198	0050	12	BXO	013	B											1
12 May	S27E08	196	0040	13	CRO	012	B											
13 May	S27W05	196	0020	12	BXO	006	B											
14 May	S25W22	200	0010	05	BXO	005	B	1										1
15 May	S25W33	198	0000	05	BXO	002	B											
16 May	S31W38	189	0000	00	AXX	001	A											1
2 0 0 6 0 0 0 0																		

Still on Disk.

Absolute heliographic longitude: 196

Region 1541

08 May	N22E67	191	0130	11	ESO	009	B	2	1			3						1
09 May	N22E53	192	0190	12	EAI	020	B	1	1			10						1
10 May	N22E38	192	0230	14	EAI	024	B	4				6						
11 May	N22E25	192	0170	13	FAC	023	B	3				5						1
12 May	N21E13	191	0130	14	ESO	022	B											
13 May	N21W01	192	0090	14	ESO	018	B											2
14 May	N21W14	192	0080	12	ESO	015	B											
15 May	N21W26	191	0100	14	ESO	027	B											3
16 May	N20W39	190	0130	11	EAO	019	B			1								1
10 3 0 30 2 1 0 0																		

Still on Disk.

Absolute heliographic longitude: 192

Region 8542

12 May	S19E58	146	0030	01	HSX	001	A											
13 May	S19E44	147	0030	01	HSX	001	A											
14 May	S19E32	146	0070	02	HSX	001	A											
15 May	S19E18	147	0040	01	HSX	001	A											
16 May	S19E06	145	0030	02	HSX	001	A											
0 0 0 0 0 0 0 0																		

Still on Disk.

Absolute heliographic longitude: 145



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 8543</i>																								
13 May	N06E45	146	0000	00	AXX	001	A															1		
14 May	N06E32	146																						
15 May	N06E16	149	0000	01	AXX	002	A																	
16 May	N06E03	148	0000	03	BXO	002	B																	
																						0 0 0 1 0 0 0 0		
Still on Disk.																								
Absolute heliographic longitude: 148																								
<i>Region 8544</i>																								
14 May	S20E60	118	0010	04	BXO	003	B																2	
15 May	S21E48	117	0090	08	DAO	012	B																8	
16 May	S20E34	117	0160	10	DAO	015	B																	
																							0 0 0 10 0 0 0 0	
Still on Disk.																								
Absolute heliographic longitude: 117																								
<i>Region 8545</i>																								
14 May	N37E71	107	0080	03	HSX	001	A																	
15 May	N36E62	103	0230	03	HKX	001	A																	
16 May	N37E49	102	0260	05	HKX	002	A																	
																							0 0 0 0 0 0 0 0	
Still on Disk.																								
Absolute heliographic longitude: 102																								
<i>Region 8546</i>																								
15 May	S33W45	210	0000	02	BXO	002	B																	
16 May	S34W61	212	0030	04	CSO	003	B																	
																								0 0 0 0 0 0 0 0
Still on Disk.																								
Absolute heliographic longitude: 210																								
<i>Region 8547</i>																								
15 May	N22W15	180	0020	03	BXO	007	B																	
16 May	N21W30	181	0020	06	CSO	005	B																	
																								0 0 0 0 0 0 0 0
Still on Disk.																								
Absolute heliographic longitude: 180																								



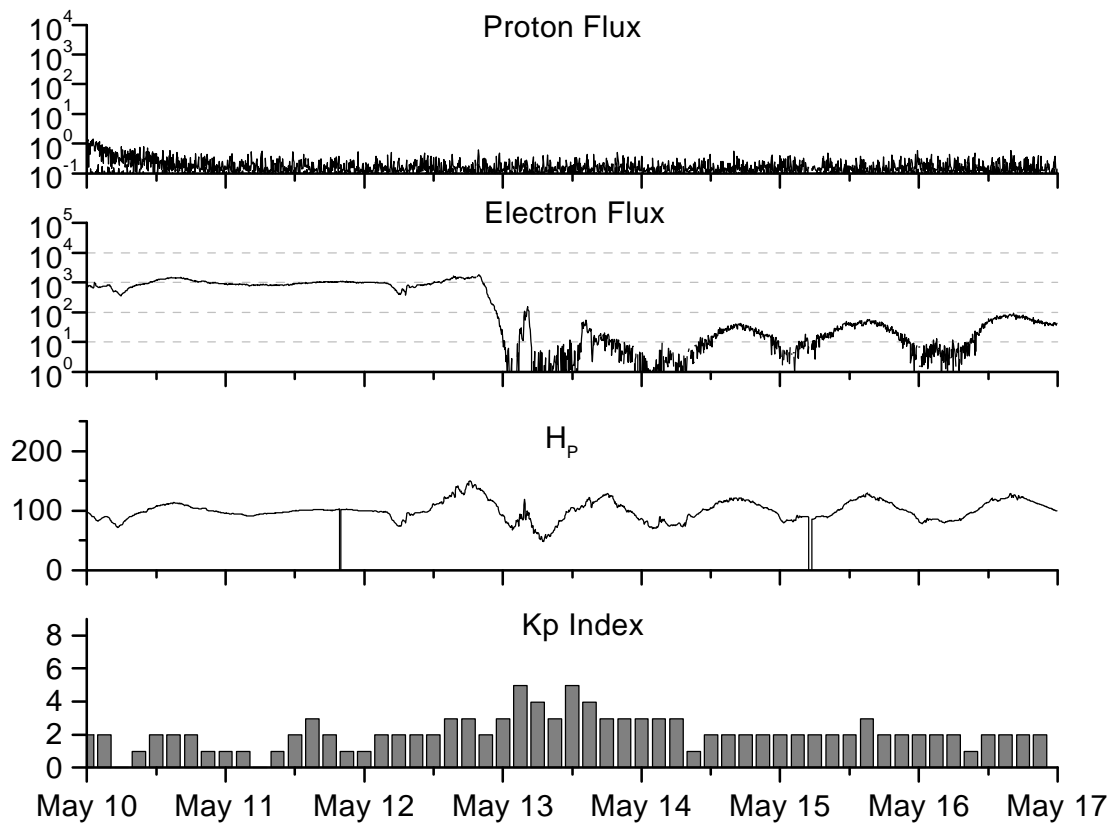
**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
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 10 May 1999*

Protons plot contains the five-minute averaged integral proton flux (protons/ cm²-sec-sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

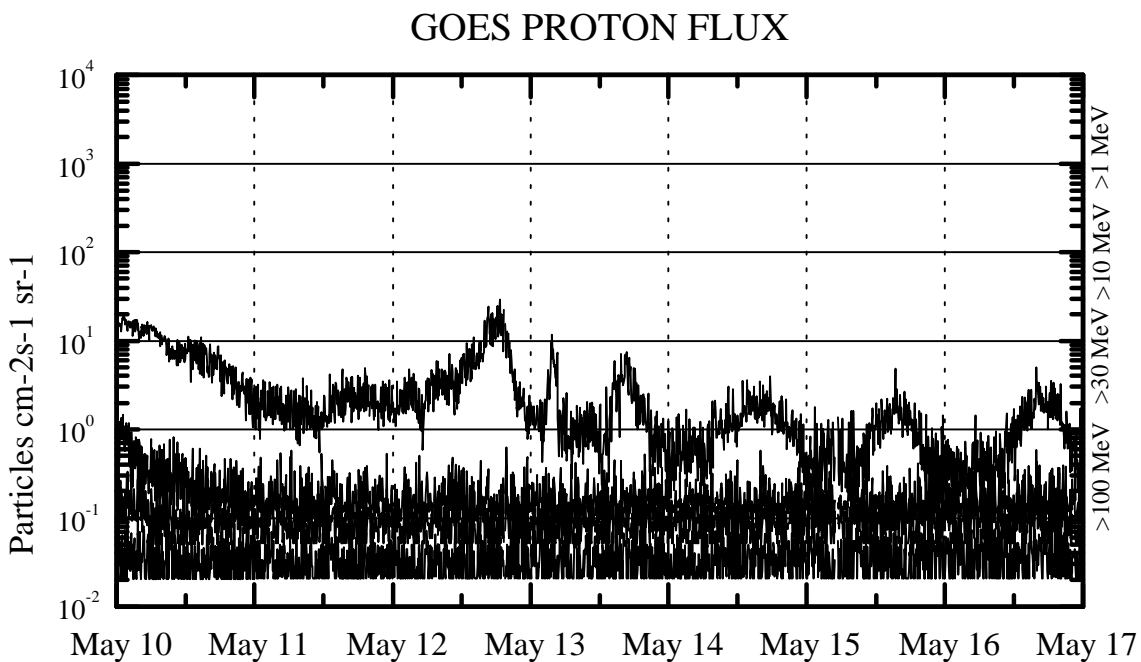
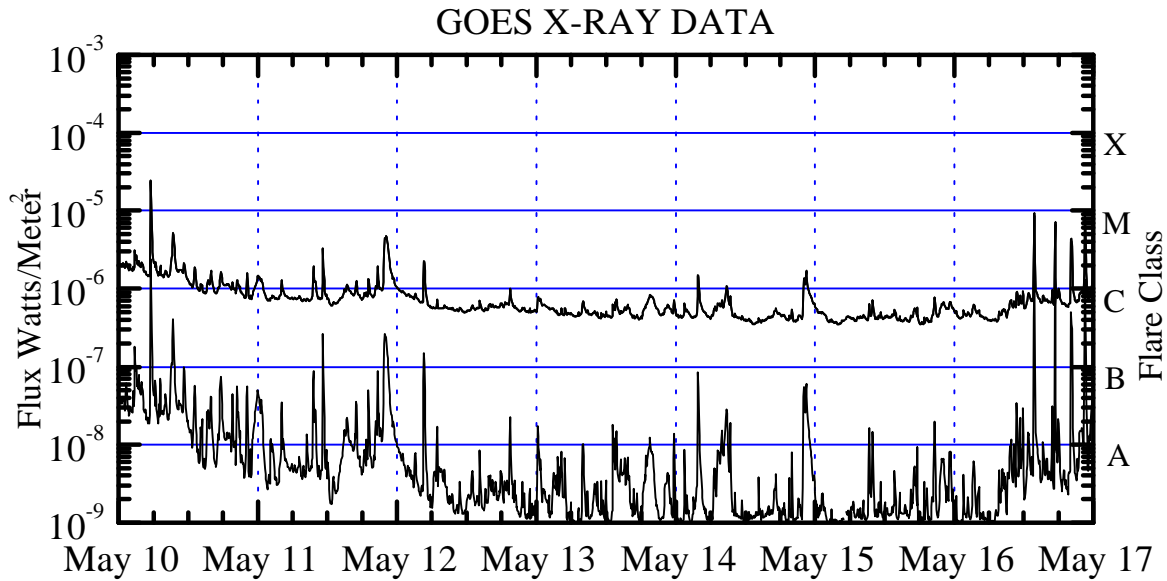
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm²-sec-sr) with energies greater than 2 MeV at GOES-8.

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/m^2) 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 ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-8 (W75) for each of the energy thresholds: >1 , >10 , >30 and $>100\text{ MeV}$. P10 event threshold is 10 pfu ($\text{protons/cm}^2\text{-sec-sr}$) at greater than 10 MeV.



Cosmic-Ray Ground-Level Events



Space Environment Center

April 1999
(Month 31)

Preliminary data

Comparison of Cycles at current month in cycle

