

Space Weather Highlights
03-09 May 1999

Solar activity ranged from low to high levels. The period began with activity at moderate levels by virtue of an M4/2N flare at 03/0602UT from Region 8525 (N17, L=299, class/area Fso/290 on 02 May) with associated Type II and IV sweeps and a halo CME. Activity dropped to low levels during 04 - 06 May with isolated C-class subflares, most of which were optically uncorrelated. Activity increased to moderate levels during 07 - 08 May with isolated M-class flares including an M4/1F at 08/1440UT with Type II and IV radio sweeps from Region 8526 (N21, L=340, class/area Dao/100 on 06 May). Activity rose to high levels on 09 May as Region 8527 (N19, L=331, class/area Eao/230 on 08 May) produced an M7 X-ray flare at 09/1807UT as it crossed the west limb.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. A weak interplanetary shock passed the spacecraft around 05/1500UT accompanied by minor increases in solar wind velocity and IMF Bz variability (maximum southerly deflections to minus 08 nT (GSM)). Densities briefly increased to 30 p/cc as well. This shock was likely associated with the halo-CME that followed the M4/2N flare of 03 May.

A greater than 10 MeV proton enhancement at geo-synchronous altitude began early on 04 May following the M4/2N flare of 03/0602UT. Fluxes remained enhanced through 04 May, then increased to event levels at 05/1820UT (maximum flux was 014 PFU at 05/1955UT) following a weak interplanetary shock passage. The proton event ended at 06/0550UT. Another proton enhancement began around 09/2100UT following the M7 flare at 09/1807UT.

The greater than 2 MeV electron flux at geo-synchronous altitude was at moderate to high levels through the period.

The geomagnetic field was at quiet to unsettled levels. A weak sudden impulse occurred at 05/1542UT (08 nT, Boulder USGS magnetometer), but was not followed by a significant disturbance.

Space Weather Outlook
12 May - 07 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 fair chance for a solar proton enhancement or event at geo-synchronous altitude

The greater than 2 MeV electron flux at geo-synchronous altitude may reach high levels through 20 May and again during 27 - 31 May. Otherwise, normal to moderate levels are expected.

Geomagnetic field activity is expected to increase to unsettled to active levels during 12 - 13, 16 - 17, and 25 - 28 May due to recurrent coronal hole effects (brief storm periods may also occur at high latitudes). Quiet to unsettled conditions are expected during the rest of the period, barring any Earth-directed CMEs.



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
03 May	127	95	370	B4.3	5	2	0	8	0	1	0	0
04 May	139	100	320	B3.7	10	0	0	2	1	0	0	0
05 May	141	145	380	B6.3	3	0	0	0	0	0	0	0
06 May	147	141	570	B5.6	5	0	0	5	0	0	0	0
07 May	163	162	690	B7.6	7	1	0	24	1	0	0	0
08 May	172	192	1500	C1.6	10	2	0	28	3	1	0	0
09 May	178	192	1090	C2.2	6	3	0	21	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
03 May	1.1E+5	1.5E+4	3.7E+3		3.2E+8	
04 May	6.3E+5	6.7E+4	3.7E+3		4.4E+8	
05 May	1.1E+7	3.4E+5	3.8E+3		4.6E+8	
06 May	5.0E+7	5.2E+5	3.4E+3		4.9E+7	
07 May	1.5E+7	1.3E+5	3.3E+3		3.3E+7	
08 May	3.6E+6	3.4E+4	3.3E+3		6.4E+7	
09 May	1.7E+6	3.8E+4	3.2E+3		8.2E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
03 May	8	3-3-2-2-2-1-2-1	12	3-3-4-3-2-2-2-1	9	3-3-2-3-2-2-2-1
04 May	3	1-1-0-1-1-1-2-1	4	0-2-2-2-2-0-1-0	6	1-2-3-1-2-2-2-1
05 May	6	1-0-1-1-2-2-2-3	3	1-0-0-2-0-2-2-1	7	1-0-1-2-2-3-3-3
06 May	9	2-2-2-3-3-2-1-2	17	2-3-3-4-4-4-3-1	11	3-2-3-4-3-2-1-3
07 May	9	3-2-2-1-2-2-3-2	11	3-2-4-3-1-2-2-1	9	3-3-2-1-2-3-3-2
08 May	4	1-2-0-1-1-0-2-2	7	2-2-3-3-1-0-1-1	6	2-2-1-2-2-2-2-2
09 May	4	1-1-1-2-1-1-1-2	8	2-2-1-4-3-0-1-1	6	1-2-1-2-2-2-2-2

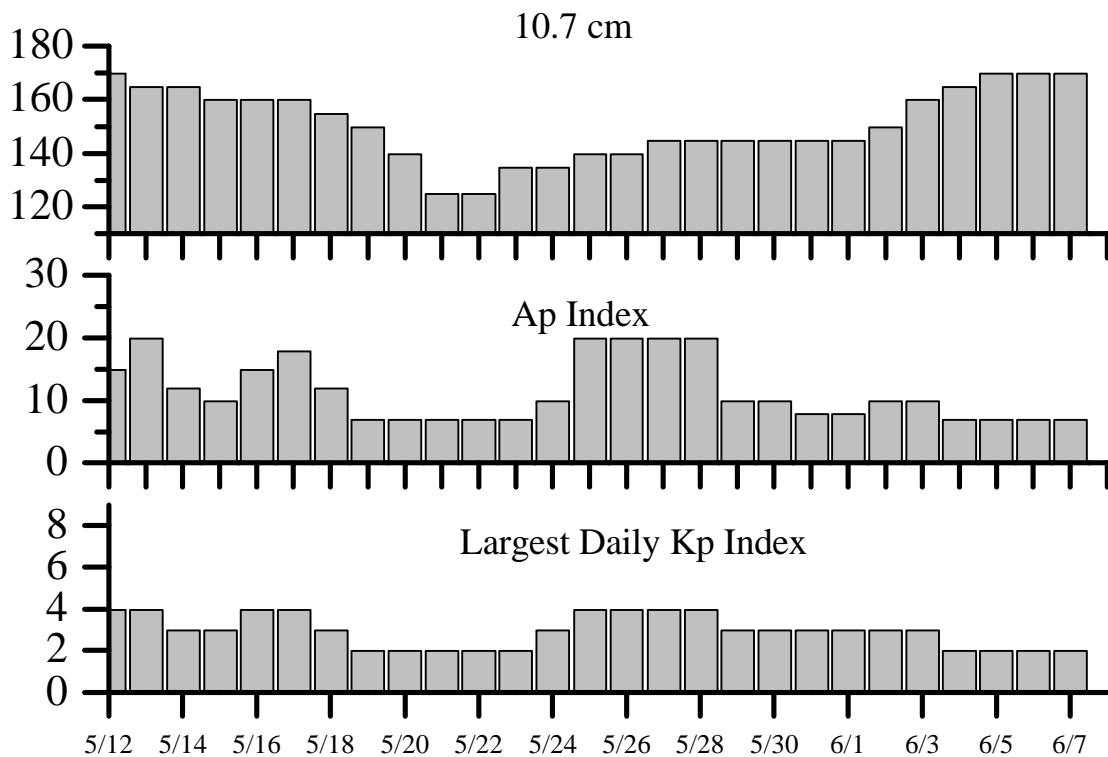


Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
03 May 0715	10cm Radio Burst 220 s.f.u.	03 May 0540
03 May 0715	Type II Radio Emission	03 May 0542
03 May 0740	Type IV Radio Emission	03 May 0606
03 May 0850	Proton Event ≥ 10 pfu @ >10 MeV Warning	03 May 15-24
03 May 1227	CONTINUED >2 MeV Electron Event ≥ 1000 pfu	30 Apr 1320
04 May 0008	1-245 MHz Burst	03 May
04 May 1200	CONTINUED >2 MeV Electron Event ≥ 1000 pfu	30 Apr 1320
04 May 2230	A ≥ 20 Watch	05 May
04 May 2235	A ≥ 20 Watch	06 May
05 May 0011	245 MHz Radio Noise Storm	04 May
05 May 1200	CONTINUED >2 MeV Electron Event ≥ 1000 pfu	30 Apr 1320
05 May 1557	Sudden Impulse observed at Boulder	05 May 1543
05 May 1839	Proton Event ≥ 10 pfu @ >10 MeV	05 May 1830
05 May 1855	Proton Event ≥ 10 pfu @ >10 MeV	05 May 1820
05 May 1958	CANCELLED A ≥ 20 Watch	06 May
06 May 0029	1-245 MHz Burst	05 May
06 May 0029	245 MHz Radio Noise Storm	05 May
06 May 1015	ENDED Proton Event ≥ 10 pfu @ >10 MeV	05 May 1820
06 May 1202	CONTINUED >2 MeV Electron Event ≥ 1000 pfu	30 Apr 1320
06 May 1202	K= 4 Observed	06 May 09-12
07 May 1207	CONTINUED >2 MeV Electron Event ≥ 1000 pfu	30 Apr 1320
08 May 1136	Type IV Radio Emission	08 May 1111
08 May 1336	>2 MeV Electron Event ≥ 1000 pfu	08 May 1320
08 May 1529	Type II Radio Emission	08 May 1452
08 May 1550	Type IV Radio Emission	08 May 1500
09 May 0026	1-245 MHz Burst	08 May
09 May 0026	245 MHz Radio Noise Storm	08 May
09 May 1200	CONTINUED >2 MeV Electron Event ≥ 1000 pfu	08 May 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
12 May	170	15	4	26	140	20	4
13	165	20	4	27	145	20	4
14	165	12	3	28	145	20	4
15	160	10	3	29	145	10	3
16	160	15	4	30	145	10	3
17	160	18	4	31	145	8	3
18	155	12	3	01 Jun	145	8	3
19	150	7	2	02	150	10	3
20	140	7	2	03	160	10	3
21	125	7	2	04	165	7	2
22	125	7	2	05	170	7	2
23	135	7	2	06	170	7	2
24	135	10	4	07	170	7	2
25	140	20	4				



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	½	Class	Flux	Imp/ Brtns	Location		Radio Flux		Intensity	
			Max				Rgn #	Lat	CMD	245	2695	II
03 May	0536	0602	0632	M4.4	.099	2N	N15E32		350	220	3	3
03 May	2307	2311	2313	M1.9	.003				78			
07 May	0428	0441	0449	M3.2	.022	SF	N20E87					
08 May	1036	1058	1114	M1.6	.023	SF	N18E64		57	30	2	
08 May	1422	1440	1501	M4.6	.074	1F	N23W75		58	90	2	2
09 May	0036	0047	0058	M1.1	.012	1F	N21E69					
09 May	1152	1227	1248	M1.0	.028							
09 May	1753	1807	1815	M7.6	.061			8537	770	150		

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat	CMD	
03 May	0543	0551	0745	M4.4	2N	N15E32		8525
	0801	0801	0810		SF	N15E31		8525
	0829	0830	0833		SF	N19E39		8525
	0932	0933	0935		SF	N15E22		8525
	1019	U1019	A1027	C2.0	SF	N21W58		8524
	1036	1039	1041	C1.2				
	1253	1254	1258	C1.1	SF	N24W60		8524
	1533	1534	1544	C2.7	SF	N22W60		8524
	1811	1814	1817	B7.2				
	1919	1921	1934	C1.0	SF	N22W62		8524
	2044	2045	2048		SF	N22W16		8526
	2238	2241	2243	B5.9				
	2307	2311	2313	M1.9				
04 May	0636	0643	0655	C1.1				
	1009	1015	1027	C1.1				
	1125	1128	1133	B9.3				
	1258	1302	1306	C1.0				
	1746	1750	1754	C1.0				
	1801	1805	1808	C1.1				
	1831	1844	1846		SF	N23E23		8527
	1846	1858	1924	C2.8	1F	N24E24		8527
	1929	1931	1935		SF	N23E26		8527
	2104	2109	2111	C1.3				
	2138	2143	2145	C1.7				
05 May	2246	2249	2251	C1.2				
	2341	2344	2346	C1.7				
	0818	0831	0844	C1.2				
	1234	1245	1304	C1.0				
	1512	1530	1540	C1.4				



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
06 May	0121	0135	0146	C3.3				
	1041	1048	1059	C2.4	SF	S18E71	8534	
	1047	1058	1119		SF	N18W07	8525	
	1314	1314	1320	C1.3	SF	N20W12	8525	
	1323	1327	1349		SF	N20W12	8525	
	1444	1444	1450		SF	N02E63	8533	
	1942	1946	1951	C1.1				
07 May	2157	2207	2220	C3.1				
	0032	0042	0059	C3.1				
	0254	0254	0259		SF	N13E55	8539	
	0302	0311	0316	C1.8				
	0445	0446	0454	M3.2	SF	N20E87		
	0655	0700	0723	C3.2	SF	N15E59	8539	
	0700	0710	0717		SF	N18W53	8526	
	0914	0914	0921		SF	N20W54	8537	
	1004	1022	1040	C2.9				
	1249	1259	1313		SF	N14E55	8539	
	1336	1338	1344		SF	S26E46	8536	
	1356	1357	1400		SF	N19W21	8525	
	1416	1427	1506	C7.4	1F	N20W21	8525	
	1425	1426	1510		SF	N27W17	8527	
	1608	1612	1614		SF	N18W59	8537	
	1620	1621	1625		SF	S26E44	8536	
	1628	1628	1634		SF	N19W56	8537	
	1630	1633	1638		SF	S26E42	8536	
	1712	1715	1723		SF	N14E53	8539	
	1722	1722	1725		SF	N11W30	8538	
	1755	1758	1802		SF	N19W59	8537	
	1829	1830	1833	C2.3	SF	N12W30	8525	
	1842	1852	1925		SF	N15E56	8539	
	1942	1943	1948		SF	N20W60	8537	
	1953	1958	2004		SF	N20W72	8537	
	2059	2100	2104		SF	N21E80		
	2117	2121	2157	C2.1	SF	N16E50	8539	
	2145	2146	2201		SF	S25E39	8536	
	2331	2332	2334		SF	N20W62	8537	
	08 May	0013	0017	0019	C2.0			
		0037	0037	0041		SF	N19W63	8537
0101		0104	0109	C3.3	SF	N20W62	8537	
0141		0142	0148		SF	N19W61	8537	
0157		0157	0215	C4.6	SF	N19W62	8537	



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
08 May	0248	0251	0254	C3.1				
	0326	0332	0336		SF	N19W62	8537	
	0345	0346	0348		SF	N20W77	8526	
	0411	0411	0415		SF	N17W66	8537	
	0512	0517	0521	C3.2	SF	N17W67	8537	
	0532	0534	0537		SF	N19W63	8537	
	B1052	U1104	1146	M1.6	SF	N18E64	8541	
	1123	1126	1137		SF	N21W71	8537	
	1143	1143	1154		SF	N17E19	8531	
	1156	1158	1212		SF	N20W69	8537	
	1223	1223	1231		SF	N19W70	8537	
	1258	1306	1320		SF	N19W72	8537	
	1323	1324	1337		SF	N19W70	8537	
	1342	1345	1354		SF	N19W71	8537	
	1353	1411	1422	C4.2	SF	N19E71	8541	
	1425	1429	1511	M4.6	1F	N23W75	8526	
	1509	1510	1528		SF	N15W38	8525	
	1519	1520	1530		SF	N23W25	8527	
	1547	1547	1550		SF	N21W78	8526	
	1719	1720	1725		SF	N19W72	8537	
	1822	1835	1858		SF	N19W74	8537	
	1905	1917	1927		SF	N19W70	8537	
	1926	1930	1933		SF	N21E71	8541	
	1939	2031	2100	C2.1	1F	N19W75	8537	
	2105	2116	2155	C2.0	SF	N19W77	8537	
	2156	2204	2221	C2.8	SF	N20W77	8537	
	2226	2329	0044		1F	N21W78	8537	
	2255	2257	2259		SF	S23E27	8536	
	2343	0042	A0143		2N	N21E68	8541	
	09 May	0004	0004	0027	C5.0	SF	N21E69	8541
		0035	0044	0103	M1.1	1F	N21E69	8541
		0254	0256	0301	C2.8	SF	N21E67	8541
0432		0436	0441	C2.5				
0605		0608	0613		SF	N17W82	8537	
0629		0629	0637		SF	N21E63	8541	
0639		0642	0647		SF	N18W78	8537	
0938		0949	0955	C3.0				
1037		1041	1049	C3.2				
1150		1150	1156		SF	N21W46	8525	
1152		1227	1248	M1.0				
1355	1358	1402		SF	N21E62	8541		



Flare List-continued

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
09 May	1405	1408	1412	C3.7				
	1534	1535	1539		SF	N19W89	8537	
	1609	1609	1614	C5.1	SF	N20W89	8537	
	1645	1645	1651		SF	N20E59	8541	
	1653	1653	1657		SF	N12W57	8538	
	1753	1807	1815	M7.6			8537	
	1754	1755	1808		SF	N19E29	8535	
	1755	1800	1805		SF	N21E55	8541	
	1806	1806	1813		SF	N18W02	8531	
	1940	1945	1954		SF	N20E57	8541	
	2107	2108	2123		SF	N23E56	8541	
	2116	2116	2122		SF	N20W89	8537	
	2223	2235	2259		SF	N20E51	8541	
	2322	2327	2333		SF	N21E56	8541	
	2325	2325	2329		SF	S29E56	8540	
	2330	2332	2341		SF	S29E58	8540	

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

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									
03 May	N30W68	032														

0 0 0 6 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 041



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 8524</i>																		
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						
03 May	N20W69	033	0080	12	ESO	007	B	4				4						
04 May	N22W80	031	0030	07	BXO	005	B											
								15	1	0		22	2	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 033

<i>Region 8525</i>																		
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						
								5	2	0		16	2	2	0	0	0	

Still on Disk.

Absolute heliographic longitude: 299



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 8526

29 Apr	N22E35	342	0010	00	AXX	001	A											
30 Apr	N22E22	342	0000	00		000												
01 May	N22E09	342	0000	00		000												
02 May	N23W03	340	0010	03	BXO	005	B											
03 May	N23W16	340	0010	05	BXO	004	B					1						
04 May	N22W31	342	0020	05	BXO	008	B											
05 May	N20W44	341	0050	05	DAO	008	B											
06 May	N20W56	340	0100	10	DAO	009	B											
07 May	N19W70	341	0050	08	CSO	005	B	1				1						
08 May	N19W80	338	0260	11	EAO	005	B		1			2	1					
									1	1	0	4	1	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 340

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																
									2	0	0	6	1	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 297

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																
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																
									0	0	0	0	0	0	0	0	0	

Still 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 8529

02 May	S13E10	327	0000	03	BXO	004	B												
03 May	S14W03	327	0010	04	BXO	006	B												
04 May	S14W17	328	0020	04	CSO	005	B												
05 May	S14W30	327	0010	05	BXO	004	B												
06 May	S14W45	329	0010	05	BXO	004	B												
												0	0	0	0	0	0	0	0

Died on Disk.

Absolute heliographic longitude: 327

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																	
												0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 283

Region 8531

04 May	N18E65	246	0030	04	CSO	002	B												
05 May	N18E52	245	0030	05	BXO	005	B												
06 May	N19E38	246	0010	05	BXO	004	B												
07 May	N18E24	247	0010	05	BXO	003	B												
08 May	N19E08	250	0020	05	CRO	004	B												1
09 May	N20W05	250	0010	05	BXO	003	B												1
												0	1	0	2	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 250

Region 8532

05 May	S40W14	311	0010	03	BXO	002	B												
06 May	S40W27	311	0000	00		000													
												0	0	0	0	0	0	0	0

Died on Disk.

Absolute heliographic longitude: 311



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 8533

05 May	N05E74	223	0050	04	CAO	003	B										
06 May	N03E60	224	0060	07	CAO	004	B						1				
07 May	N03E46	225	0030	06	CSO	005	B										
08 May	N04E34	224	0040	05	CSO	005	B										
09 May	N04E20	225	0010	06	BXO	004	B										
								0	0	0	1	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 225

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										
								1	0	0	1	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 224

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				
								0	0	0	1	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 215

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										
								0	0	0	5	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 233

Region 8537

07 May	N19W60	331	0040	08	CSO	009	B						7				
08 May	N19W73	331	0230	11	EAO	007	B	6				19	2				
09 May	N20W88	333	0170	07	DAO	004	B	1	1			5					
								7	1	0	31	2	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 331



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 8538</i>																					
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									
													0	0	0	2	0	0	0	0	
Still on Disk.																					
Absolute heliographic longitude: 304																					
<i>Region 8539</i>																					
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														
													2	0	0	6	0	0	0	0	
Still on Disk.																					
Absolute heliographic longitude: 229																					
<i>Region 8540</i>																					
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									
													0	0	0	2	0	0	0	0	
Still on Disk.																					
Absolute heliographic longitude: 199																					
<i>Region 8541</i>																					
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								
														3	2	0	13	1	1	0	0
Still on Disk.																					
Absolute heliographic longitude: 192																					



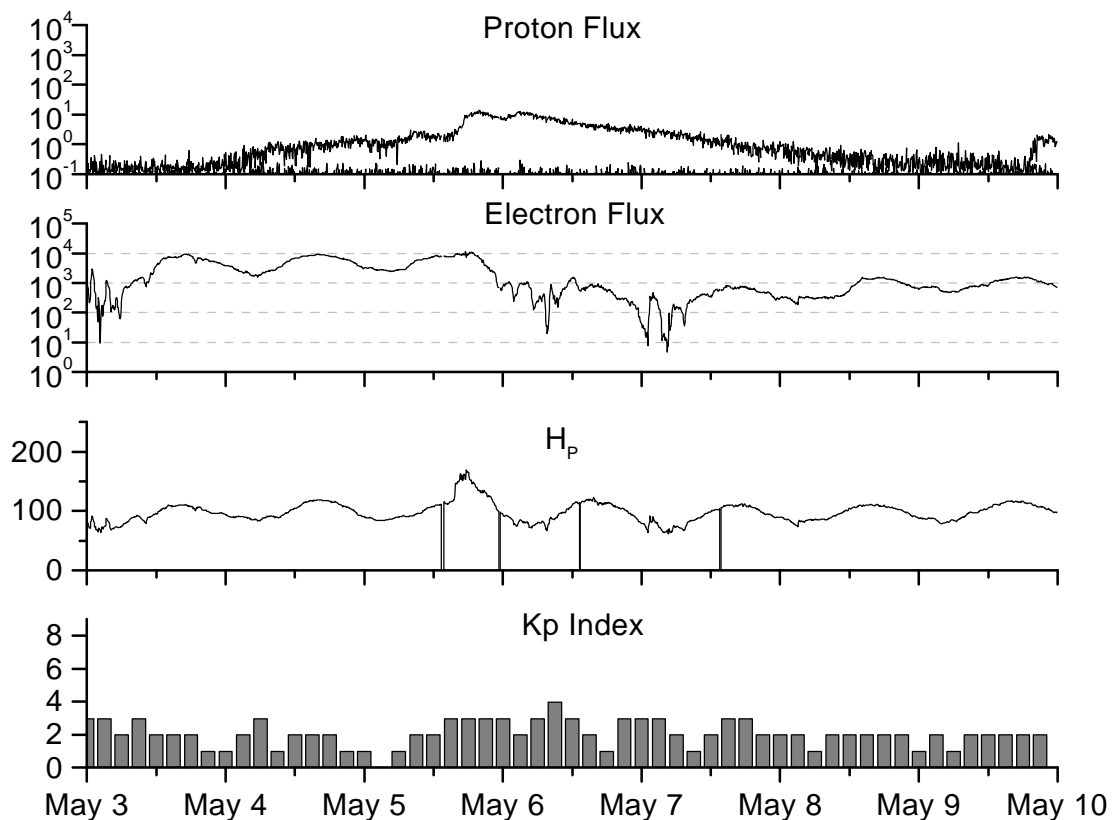
**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth 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 03 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.

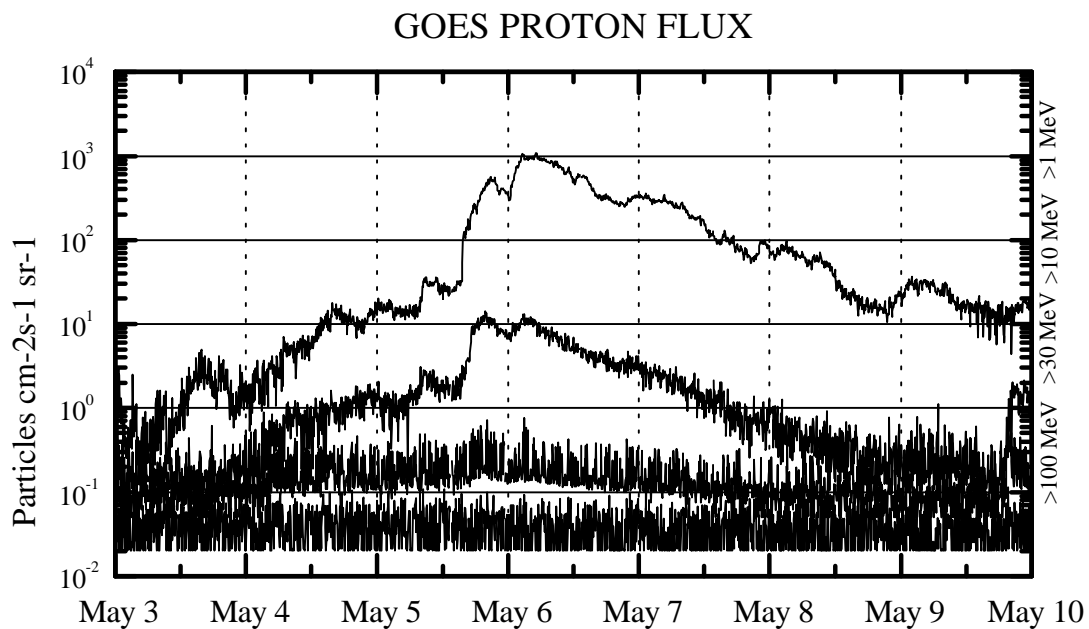
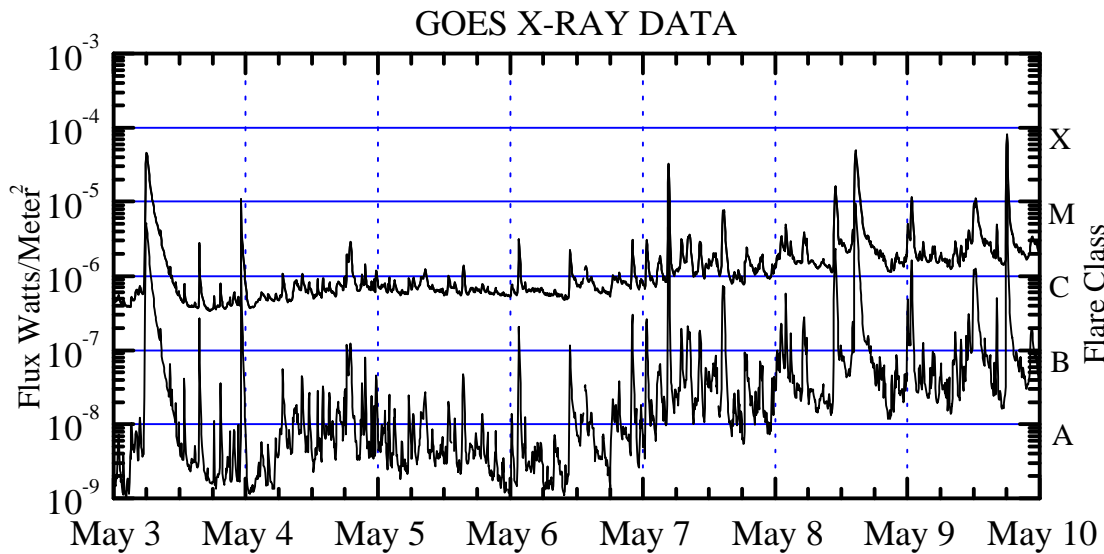
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm² -sec-sr) with energies greater than 2 MeV at GOES-8.

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/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.



Quiet ($A_p \leq 7$) Geomagnetic Conditions



Space Environment Center

Comparison of Cycles at current month in cycle

