

Space Weather Highlights
24 – 30 May 1999

Solar activity ranged from low to moderate levels. Low activity occurred during the first two days of the period due to several small C-class subflares produced by a few small- to moderate-sized regions. Activity increased to moderate levels on 26 May by virtue of an impulsive M1/2N flare at 26/1932UT from Region 8552 (N19, L=347, class/area Eko/360 on 27 May). Activity declined to low levels during 27 - 28 May. However, a series of sympathetic flares occurred around 27/0900UT from Regions 8551 (N32, L=021, class/area Cso/070 on 24 May) and 8554 (N26, L=355, class/area Cao/060 on 27 May) which were followed by a Tenflare and Type II and IV radio sweeps. SOHO/LASCO images showed a large halo CME beginning around 27/1330UT, but this was judged to be a back-side event. Activity rose to moderate levels again on 29 May due to an optically uncorrelated M1 at 29/0315UT with moderate discrete frequency radio bursts, a Type II radio sweep, and a CME (non-Earth-directed). This event likely originated from beyond the southeast limb. Activity declined to low levels on 30 May. However, long-duration C-class X-ray events were detected at 30/0338UT and 30/1155UT. Both events had associated CMEs, but neither appeared to be Earth-directed. The provisional international monthly mean sunspot number for May was 106.3. This was the highest monthly mean observed so far this cycle.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. Coronal hole effects were evident during 25 May with a velocity increase from 400 - 600 km/sec, a brief density increase to 23 p/cc followed by a drop to 02 - 03 p/cc, and southerly IMF Bz deflections to minus 12 nT (GSM).

A solar proton flux enhancement at geo-synchronous orbit began around 27/1130UT, peaked at approximately 27/1230UT, then gradually declined to background levels by midday, 29 May.

The greater than 2 MeV electron flux at geo-synchronous altitude was at normal to moderate levels.

The geomagnetic field was disturbed during 25 May with unsettled to minor storm periods. However, the minor storm periods were brief and limited to the high latitudes. This disturbance appeared to be coronal hole-related. Quiet to unsettled conditions prevailed during the remainder of the period.

Space Weather Outlook

02 - 28 June 1999

Solar activity is expected to range from low to moderate levels. Isolated M-class flares are expected during the period. There will also be a slight chance for a major flare sometime during the period.

No significant proton flux enhancements are expected at geo-synchronous altitude.

The greater than 2 MeV electron flux at geo-synchronous altitude is expected to be at normal to moderate levels.

Geomagnetic field activity is expected to increase to unsettled to active levels around 14 and 21 June due to recurrent coronal hole effects. Otherwise, the field is expected to be at quiet to unsettled levels, 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
24 May	137	104	1030	B5.6	8	0	0	10	0	0	0	0
25 May	143	130	910	B4.2	8	0	0	17	0	0	0	0
26 May	153	152	990	B7.5	4	1	0	15	0	1	0	0
27 May	155	154	870	B6.5	9	0	0	16	2	0	0	0
28 May	152	146	740	B6.6	6	0	0	7	0	0	0	0
29 May	149	151	850	B6.3	2	1	0	7	0	0	0	0
30 May	157	169	1050	B4.7	7	0	0	8	0	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
24 May	1.1E+5	1.2E+4	2.7E+3		2.3E+6	
25 May	5.8E+4	1.3E+4	2.9E+3		2.9E+5	
26 May	8.4E+4	1.3E+4	3.0E+3		2.1E+6	
27 May	8.1E+5	1.8E+5	4.5E+3		3.4E+6	
28 May	7.8E+5	7.8E+4	3.6E+3		3.5E+6	
29 May	2.3E+5	2.9E+4	3.3E+3		8.0E+6	
30 May	1.4E+5	2.0E+4	3.1E+3		4.7E+6	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	24 May	11	3-3-2-2-2-2-3-3	11	2-3-1-4-2-2-1-3	11
25 May	14	4-4-3-3-2-1-2-2	23	4-5-4-4-4-3-2-1	19	5-4-4-4-3-2-2-3
26 May	7	3-1-1-1-2-2-2-2	7	2-1-2-0-3-2-2-2	8	2-2-2-1-2-3-3-2
27 May	7	2-2-1-1-2-1-2-3	4	2-2-1-1-1-1-1-1	10	2-3-3-2-2-3-3-3
28 May	7	2-1-2-2-1-1-2-3	10	3-2-3-3-3-2-1-1	9	3-1-3-3-2-2-2-3
29 May	3	2-0-0-0-2-1-1-1	3	2-1-0-0-1-2-2-0	6	2-1-0-1-2-3-3-1
30 May	3	0-0-0-0-2-1-2-2	5	0-0-0-0-3-3-1-1	5	0-0-0-1-2-2-2-2

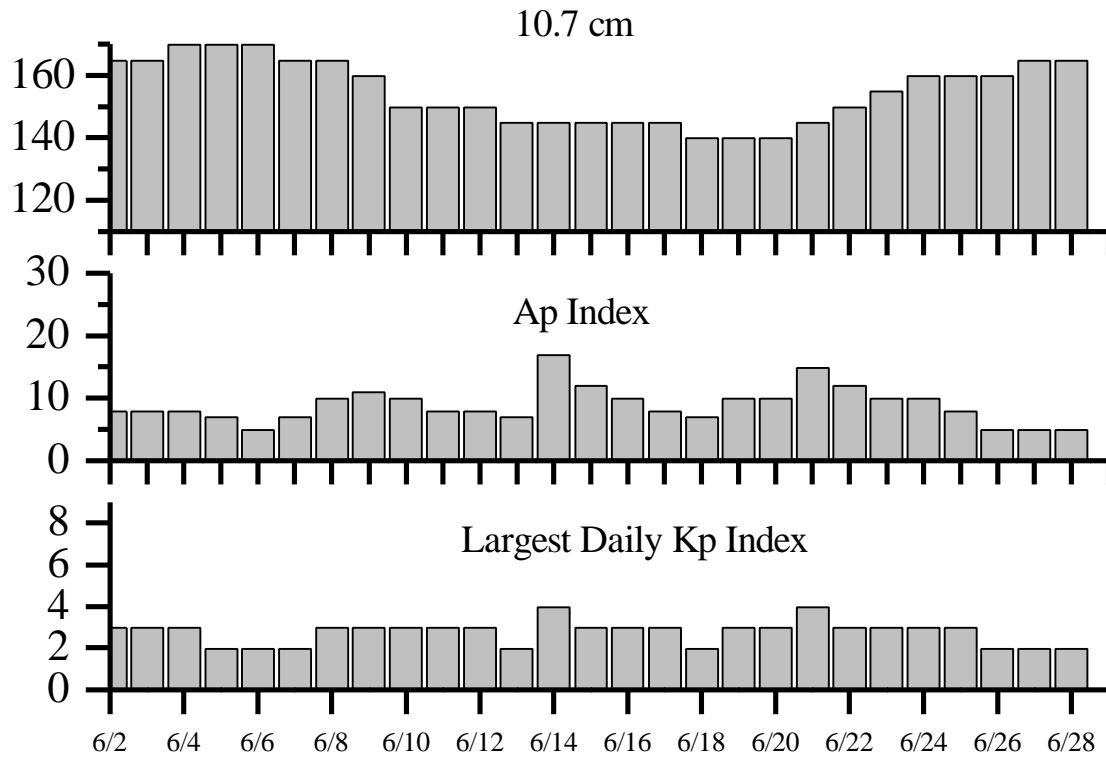


Alerts and Warnings Issued

<u>Date and Time of Issue (UT)</u>	<u>Type of Alert or Warning</u>	<u>Date and Time of Event (UT)</u>
24 May 0028	8 – 245 MHz Radio Bursts	23 May
24 May 0028	245 MHz Radio Noise Storm	23 May
24 May 0608	K= 4 Observed	24 May 03- 06
25 May 0037	7 – 245 MHz Radio Bursts	24 May
25 May 0037	245 MHz Radio Noise Storm	24 May
25 May 0300	K= 5 Observed	25 May 00- 03
25 May 1130	K= 4 Warning valid	25/1130 - 26/0000 May
25 May 1200	K = 4 Observed	25 May 09-12
26 May 0030	2 – 245 MHz Radio Bursts	25 May
26 May 0312	Type II Radio Emission	26 May 0235
27 May 1136	Type II Radio Emission	27 May 1046
27 May 1136	Type IV Radio Emission	27 May 1103
27 May 1255	Proton Event \square 10pfu @ >10MeV Warning	27/1400 – 28/0300 May
27 May 1434	10cm Radio Burst 16000 F.U.	27 May 0931
27 May 1814 CANCELLED	Proton Event \square 10pfu >10MeV Warning	27/1400 – 28/0300 May
28 May 0055	245 MHz Radio Noise Storm	27 May
28 May 0143	A \square 20 Watch	29 May
29 May 0446	Type II Radio Emission	29 May 0311
30 May 0100	245 MHz Radio Noise Storm	29 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
02 Jun	165	8	3	15 Jun	145	12	3
03	165	8	3	16	145	10	3
04	170	8	3	17	145	8	3
05	170	7	2	18	140	7	2
06	170	5	2	19	140	10	3
07	165	7	2	20	140	10	3
08	165	10	3	21	145	15	4
09	160	11	3	22	150	12	3
10	150	10	3	23	155	10	3
11	150	8	3	24	160	10	3
12	150	8	3	25	160	8	3
13	145	7	2	26	160	5	2
14	145	17	4	27	165	5	2
				28	165	5	2



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location		Rgn #	Radio Flux		Intensity	
							Lat	CMD		245	2695	II	IV
26 May	1915	1932	1945	M1.2	.013	2N	N17E46		8552				
29 May	0304	0315	0327	M1.6	.015					140	110	3	

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
24 May	No Flares Observed							
	0618	0619	0631	C1.0	SF	N31E32		8551
	0810	0813	0817	C1.6	SF	N32E29		8551
	0900	0902	0905	C1.7	SF	N21E71		8552
	0909	0913	0919		SF	N20E74		8552
	1004	1006	1011		SF	S13E17		8550
	1022	1023	1025		SF	N20E73		8552
	1214	1219	1223	C1.0				
	1328	1328	1333	C1.0	SF	N33E30		8551
	B1351	U1354	A140	C1.8	SF	S14E15		8550
	1709	1711	1722	C3.3	SF	N20E72		8552
	1741	1741	1756	C2.1	SF	S13E16		8550
	2323	2339	2346	B7.4				
25 May	0602	0604	0612		SF	S14E06		8550
	0708	0710	0716	C1.1	SF	N23E67		8552
	0833	0834	0839		SF	S15E03		8550
	1029	1039	1051	C1.1				
	1238	1239	1241		SF	N18E62		8552
	1300	1301	1307	C1.2	SF	N21E58		8552
	1629	1641	1656	C1.0	SF	N37W5		8545
	1658	1700	1703		SF	N37W5		8545
	1714	1722	1734	C1.6	SF	S14E00		8550
	1729	1729	1734		SF	N20E56		8552
	1735	1736	1739		SF	S14E00		8550
	1806	1814	1838	C1.4	SF	S20W54		8548
	1821	1841	1904		SF	N36W6		8545
	1901	1903	1913		SF	S13E05		8550
	2013	2015	A204	C2.5	SF	N38W5		8545
	2127	2137	2221	C1.6				
	2249	2249	2252		SF	N38W5		8545
	2316	2316	2324		SF	S23W56		8548
	2356	2359	0005		SF	N38W5		8545



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
26 May	0007	0008	0014		SF	S15W03	8550	
	0016	0023	0027		SF	N39W5	8545	
	0032	0036	0039		SF	N39W5	8545	
	0228	0229	0235	C2.3	SF	N22E41	8554	
	0453	0457	0514	C2.7	SF	S14W06	8550	
	0822	0826	0830		SF	N40W6	8545	
	0855	0857	0907	C2.7	SF	N18E46	8552	
	1149	1149	1157		SF	N31E05	8551	
	1405	1412	1418	B9.9	SF	N19E44	8552	
	1427	1428	1431		SF	N18E46	8552	
	1550	1550	1604		SF	N19E48	8552	
	1609	1610	1616		SF	N18E44	8552	
	1745	1747	1813		SF	N24E27	8554	
	1900	1901	1903	B9.7	SF	S20W93	8544	
	1908	1912	1915		SF	N24E26	8554	
	1917	1921	2026	M1.2	2N	N17E46	8552	
	2144	2153	2158	C2.1				
	27 May	0004	0014	0028	C1.5			
		0113	0116	0122		SF	N18E40	8552
		0533	0536	0555	C2.9	SF	N24E21	8554
0913		0917	0920	C1.2				
0923		0925	0930		SF	N31W0	8551	
B1106		U1107	A111		SF	N19E31	8552	
1140		1140	1147	C4.5	SF	S30E78	8557	
1302		1303	1314	C3.4	1F	N18E31	8552	
1417		1417	1423		SF	S22W76	8548	
1426		1433	1436	C2.7	SF	N24E15	8554	
1451		1453	1457		SF	N24E14	8554	
1451		1452	1454		SF	N20E73	8554	
1526		1528	1529		SF	N17E27	8552	
1535		1537	1538		SF	S21W81	8548	
1556		1559	1610	C6.2	SF	S26E81	8557	
1637		1653	1741	C7.4	1N	N24E34	8552	
1647		1647	1652		SF	N38W7	8545	
1837		1847	1855	C2.3	SF	N17E29	8552	
2146		2148	2153		SF	N24E40	8552	
2235		2249	2254		SF	N18E22	8552	
28 May	0551	0552	0602	C2.3	SF	N12E81	8558	
	0823	0831	0840	C1.2				
	0925	0928	0940		SF	N26E10	8554	
	1157	1212	1228	C2.1	SF	S28E63	8557	
	1417	1417	1420	C1.3	SF	N39W8	8545	



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
28 May	1642	1643	1647		SF	S30E64	8557
	1724	1724	1727		SF	S29E64	8557
	1813	1813	1816		SF	S29E62	8557
	2226	2232	2236	C1.7			
	2239	2244	2304	C1.2			
29 May	0304	0315	0327	M1.6			
	0529	0529	0544		SF	S26E55	8557
	0915	0915	0919		SF	N24W0	8554
	0928	0934	0942	C1.1			
	1304	1307	1309		SF	N19E05	8552
	1324	1325	1330		SF	N14E62	8558
	1617	1618	1629	B7.9	SF	N25W0	8554
	2007	2009	2017	C2.3	SF	N24W1	8554
	2038	2040	2043		SF	S18E58	8560
	2315	2318	2320	B7.3			
30 May	0249	0338	0426	C1.8			
	B0427	U0427	0441		SF	N15E53	8558
	0620	0621	0624	C1.1	SF	N31W4	8551
	0634	0643	0654	C1.1			
	1025	1155	1320	C1.1			
	1152	1156	1214		SF	N15E51	8558
	1323	1326	1338		SF	N17E47	8558
	1623	1627	1640		SF	N16E49	8558
	1816	1821	1833		SF	N16E45	8558
	1818	1822	1835	C1.0	SF	N17W1	8552
	1921	1924	1926	C1.2	SF	N15E44	8558
	2331	2345	2354	C8.7			



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 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											
17 May	N36E38	100	0290	05	HKX	003	A						1					
18 May	N37E25	100	0340	03	HKX	001	A	1					2					
19 May	N38E13	099	0350	05	CKO	006	B											
20 May	N36E01	098	0320	06	CKO	005	B						1					
21 May	N36W1	095	0350	06	CKO	006	B											
22 May	N36W2	096	0360	05	HKX	002	A						1					
23 May	N35W3	095	0330	06	CAO	003	B	1					3					
24 May	N36W4	095	0320	05	CHO	003	B											
25 May	N37W6	094	0280	07	CKO	005	B	3					6					
26 May	N37W7	089	0260	08	DSO	005	B						3					
27 May	N37W8	091	0130	09	CAO	004	B	1					1					
								6	0	0	18	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 098

Region 8548

17 May	S21E48	090	0010	00	AXX	001	A											
18 May	S21E35	090	0020	05	BXO	010	B											
19 May	S19E23	089	0020	08	CRO	008	B											
20 May	S20E08	091	0050	09	CSO	016	B											
21 May	S20W06	091	0100	10	DAO	014	B											
22 May	S19W19	091	0110	09	DAO	016	B											
23 May	S20W30	089	0070	11	CAO	011	B											
24 May	S20W47	093	0070	07	CSO	006	B											
25 May	S20W61	094	0050	11	CSO	003	B						2					
26 May	S21W71	090	0080	10	DSO	007	B											
27 May	S21W83	089	0060	11	ESO	007	B	1					2					
								1	0	0	4	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 091



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 8550

20 May	S14E70	029	0120	10	CSO	004	B												
21 May	S14E55	030	0220	10	DAO	008	B						1						
22 May	S14E43	029	0190	11	ESO	014	B						1						
23 May	S13E30	029	0150	12	EAO	014	B	1				1							
24 May	S14E17	029	0210	13	EAO	016	B	2				3							
25 May	S14E02	031	0160	13	EAO	021	B	1				5							
26 May	S14W12	031	0120	10	DSO	017	B	1				2							
27 May	S15W30	036	0050	07	DAO	010	B												
28 May	S15W45	038	0030	06	DRO	008	B												
29 May	S15W57	037	0010	01	AXX	001	A												
30 May	S15W72	039	0010	00	AXX	001	A												
								5	0	0	13	0	0	0	0	0			

Still on Disk.

Absolute heliographic longitude: 031

Region 8551

21 May	N32E62	023	0060	04	CSO	002	B												
22 May	N33E50	022	0050	03	CSO	003	B												
23 May	N32E36	023	0040	07	CSO	006	B	2				2							
24 May	N32E25	021	0070	06	CSO	009	B	3				3							
25 May	N32E10	023	0060	07	CSO	005	B												
26 May	N31W0	021	0050	10	CSO	005	B					1							
27 May	N32W1	020	0050	12	CSO	006	B					1							
28 May	N32W2	018	0020	01	HSX	001	A												
29 May	N31W3	017	0020	01	HSX	001	A												
30 May	N30W4	016	0010	02	AXX	003	A	1				1							
								6	0	0	8	0	0	0	0	0			

Still on Disk.

Absolute heliographic longitude: 021

Region 8552

24 May	N20E68	338	0200	07	CHO	003	B	2				4							
25 May	N20E54	339	0270	10	CSO	004	B	2				4							
26 May	N11E41	338	0330	13	CHO	006	B	1	1			5		1					
27 May	N20E25	341	0360	14	EKO	016	BG	3				6	2						
28 May	N21E06	347	0170	14	EAI	013	BG												
29 May	N18W0	346	0180	08	DAI	016	BG					1							
30 May	N19W1	345	0200	09	DAO	011	BG	1				1							
								9	1	0	21	2	1	0	0				

Still on Disk.

Absolute heliographic longitude: 347



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 8553

25 May	N25W0	035	0010	07	AXX	005	A											
26 May	N29W0	027	0010	07	BXO	008	B											
27 May	N29W2	027																
28 May	N29W3	027																
29 May	N29W4	027																
30 May	N29W6	027																

Still on Disk.

Absolute heliographic longitude: 035

Region 8554

25 May	N27E39	354	0010	05	BXO	005	B											
26 May	N26E26	353	0030	08	CRO	012	B	1				3						
27 May	N26E11	355	0060	05	CAO	011	B	2				4						
28 May	N27W0	355	0020	06	DRO	007	B					1						
29 May	N24W1	354	0020	07	DRO	004	B	1				3						
30 May	N24W2	354	0010	05	BXO	004	B											

Still on Disk.

Absolute heliographic longitude: 355

Region 8555

26 May	N16E75	304	0050	02	HSX	001	A											
27 May	N15E61	305	0060	02	HAX	001	A											
28 May	N17E49	304	0050	01	HSX	001	A											
29 May	N17E35	305	0050	02	HSX	001	A											
30 May	N16E22	305	0050	01	HSX	001	A											

Still on Disk.

Absolute heliographic longitude: 305

Region 8556

27 May	S14E08	358	0010	03	BXO	004	B											
28 May	S14W06	359	0010	05	BXO	004	B											
29 May	S14W19	359																
30 May	S14W32	359																

Still on Disk.

Absolute heliographic longitude: 359



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 8557</i>																	
27 May	S28E73	293	0090	06	DSO	005	B	2			2						
28 May	S29E56	297	0030	06	DRO	004	B	1			4						
29 May	S30E46	294	0130	03	CAO	007	B				1						
30 May	S30E34	293	0070	03	DAO	005	A										
								3	0	0	7	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 293																	
<i>Region 8558</i>																	
28 May	N14E68	285	0020	02	HRX	001	A				1						
29 May	N16E56	284	0120	09	DSI	012	B				1						
30 May	N16E43	284	0300	09	DAI	029	B	1			6						
								1	0	0	8	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 284																	
<i>Region 8559</i>																	
28 May	N21E13	344	0300	04	HKX	004	A										
29 May	N20E03	337	0250	05	HKX	003	A				1						
30 May	N21W0	335	0330	05	DKO	007	B										
								0	0	0	1	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 337																	
<i>Region 8560</i>																	
28 May	S25E61	292	0090	03	HAX	003	A										
29 May	S23E50	290	0070	05	CAO	005	B				1						
30 May	S24E35	292	0070	04	DAO	007	A										
								0	0	0	1	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 292																	
<i>Region 8561</i>																	
29 May	N22E11	329	0000	01	AXX	001	A										
30 May	N25E06	321	0000	00	AXX	001	A										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 321																	



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 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										
17 May	S19W06	144	0040	02	HSX	001	A										
18 May	S19W20	145	0030	01	HSX	001	A										
19 May	S18W32	144	0030	04	CSO	003	B										
20 May	S18W45	144	0030	01	HSX	001	A										
21 May	S18W59	144	0030	01	HSX	001	A										
22 May	S20W72	144	0030	01	HSX	001	A										
23 May	S20W85	144	0010	01	AXX	001	A										
24 May	S20W98	144															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 145

Region 8544

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										
17 May	S20E20	118	0180	12	EAO	016	B										
18 May	S20E06	119	0150	12	EAO	019	B										
19 May	S19W07	119	0130	13	EAO	023	B										
20 May	S20W20	119	0140	14	EAO	028	B										
21 May	S19W35	120	0170	15	EAI	020	B										
22 May	S21W47	119	0190	15	ESO	014	B										1
23 May	S22W59	118	0150	16	FSO	009	B										
24 May	S20W72	118	0160	17	FAO	007	B										
25 May	S22W80	113	0070	03	CAO	002	B										
26 May	S22W93	112	0060	03	HAX	001	A										1

0 0 0 12 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 119



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares										
	Lat	CMD	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 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										
17 May	N36E38	100	0290	05	HKX	003	A						1				
18 May	N37E25	100	0340	03	HKX	001	A	1					2				
19 May	N38E13	099	0350	05	CKO	006	B										
20 May	N36E01	098	0320	06	CKO	005	B						1				
21 May	N36W1	095	0350	06	CKO	006	B										
22 May	N36W2	096	0360	05	HKX	002	A						1				
23 May	N35W3	095	0330	06	CAO	003	B	1					3				
24 May	N36W4	095	0320	05	CHO	003	B										
25 May	N37W6	094	0280	07	CKO	005	B	3					6				
26 May	N37W7	089	0260	08	DSO	005	B						3				
27 May	N37W8	091	0130	09	CAO	004	B	1					1				
								6	0	0	18	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 098

Region 8548

17 May	S21E48	090	0010	00	AXX	001	A										
18 May	S21E35	090	0020	05	BXO	010	B										
19 May	S19E23	089	0020	08	CRO	008	B										
20 May	S20E08	091	0050	09	CSO	016	B										
21 May	S20W06	091	0100	10	DAO	014	B										
22 May	S19W19	091	0110	09	DAO	016	B										
23 May	S20W30	089	0070	11	CAO	011	B										
24 May	S20W47	093	0070	07	CSO	006	B										
25 May	S20W61	094	0050	11	CSO	003	B						2				
26 May	S21W71	090	0080	10	DSO	007	B										
27 May	S21W83	089	0060	11	ESO	007	B	1					2				
								1	0	0	4	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 091



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 8550</i>																			
20 May	S14E70	029	0120	10	CSO	004	B												
21 May	S14E55	030	0220	10	DAO	008	B						1						
22 May	S14E43	029	0190	11	ESO	014	B						1						
23 May	S13E30	029	0150	12	EAO	014	B	1				1							
24 May	S14E17	029	0210	13	EAO	016	B	2				3							
25 May	S14E02	031	0160	13	EAO	021	B	1				5							
26 May	S14W12	031	0120	10	DSO	017	B	1				2							
27 May	S15W30	036	0050	07	DAO	010	B												
28 May	S15W45	038	0030	06	DRO	008	B												
29 May	S15W57	037	0010	01	AXX	001	A												
30 May	S15W72	039	0010	00	AXX	001	A												
								5	0	0	13	0	0	0	0	0			

Still on Disk.

Absolute heliographic longitude: 031

Region 8551

21 May	N32E62	023	0060	04	CSO	002	B												
22 May	N33E50	022	0050	03	CSO	003	B												
23 May	N32E36	023	0040	07	CSO	006	B	2				2							
24 May	N32E25	021	0070	06	CSO	009	B	3				3							
25 May	N32E10	023	0060	07	CSO	005	B												
26 May	N31W0	021	0050	10	CSO	005	B					1							
27 May	N32W1	020	0050	12	CSO	006	B					1							
28 May	N32W2	018	0020	01	HSX	001	A												
29 May	N31W3	017	0020	01	HSX	001	A												
30 May	N30W4	016	0010	02	AXX	003	A	1				1							
								6	0	0	8	0	0	0	0	0			

Still on Disk.

Absolute heliographic longitude: 021

Region 8552

24 May	N20E68	338	0200	07	CHO	003	B	2				4							
25 May	N20E54	339	0270	10	CSO	004	B	2				4							
26 May	N11E41	338	0330	13	CHO	006	B	1	1			5		1					
27 May	N20E25	341	0360	14	EKO	016	BG	3				6	2						
28 May	N21E06	347	0170	14	EAI	013	BG												
29 May	N18W0	346	0180	08	DAI	016	BG					1							
30 May	N19W1	345	0200	09	DAO	011	BG	1				1							
								9	1	0	21	2	1	0	0				

Still on Disk.

Absolute heliographic longitude: 347



Region Summary-continued

Date	Location		Sunspot Characteristics				Flares							
	Date	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
		(□ Lat □ CMD) Lon						C	M	X	S	1	2	3

Region 8553

25 May	N25W0	035	0010	07	AXX	005	A											
26 May	N29W0	027	0010	07	BXO	008	B											
27 May	N29W2	027																
28 May	N29W3	027																
29 May	N29W4	027																
30 May	N29W6	027																

Still on Disk.

Absolute heliographic longitude: 035

Region 8554

25 May	N27E39	354	0010	05	BXO	005	B											
26 May	N26E26	353	0030	08	CRO	012	B	1				3						
27 May	N26E11	355	0060	05	CAO	011	B	2				4						
28 May	N27W0	355	0020	06	DRO	007	B					1						
29 May	N24W1	354	0020	07	DRO	004	B	1				3						
30 May	N24W2	354	0010	05	BXO	004	B											

Still on Disk.

Absolute heliographic longitude: 355

Region 8555

26 May	N16E75	304	0050	02	HSX	001	A											
27 May	N15E61	305	0060	02	HAX	001	A											
28 May	N17E49	304	0050	01	HSX	001	A											
29 May	N17E35	305	0050	02	HSX	001	A											
30 May	N16E22	305	0050	01	HSX	001	A											

Still on Disk.

Absolute heliographic longitude: 305

Region 8556

27 May	S14E08	358	0010	03	BXO	004	B											
28 May	S14W06	359	0010	05	BXO	004	B											
29 May	S14W19	359																
30 May	S14W32	359																

Still on Disk.

Absolute heliographic longitude: 359



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 8557

27 May	S28E73	293	0090	06	DSO	005	B	2			2						
28 May	S29E56	297	0030	06	DRO	004	B	1			4						
29 May	S30E46	294	0130	03	CAO	007	B				1						
30 May	S30E34	293	0070	03	DAO	005	A										
								3	0	0	7	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 293

Region 8558

28 May	N14E68	285	0020	02	HRX	001	A				1						
29 May	N16E56	284	0120	09	DSI	012	B				1						
30 May	N16E43	284	0300	09	DAI	029	B	1			6						
								1	0	0	8	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 284

Region 8559

28 May	N21E13	344	0300	04	HKX	004	A										
29 May	N20E03	337	0250	05	HKX	003	A				1						
30 May	N21W0	335	0330	05	DKO	007	B										
								0	0	0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 337

Region 8560

28 May	S25E61	292	0090	03	HAX	003	A										
29 May	S23E50	290	0070	05	CAO	005	B				1						
30 May	S24E35	292	0070	04	DAO	007	A										
								0	0	0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 292

Region 8561

29 May	N22E11	329	0000	01	AXX	001	A										
30 May	N25E06	321	0000	00	AXX	001	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 321



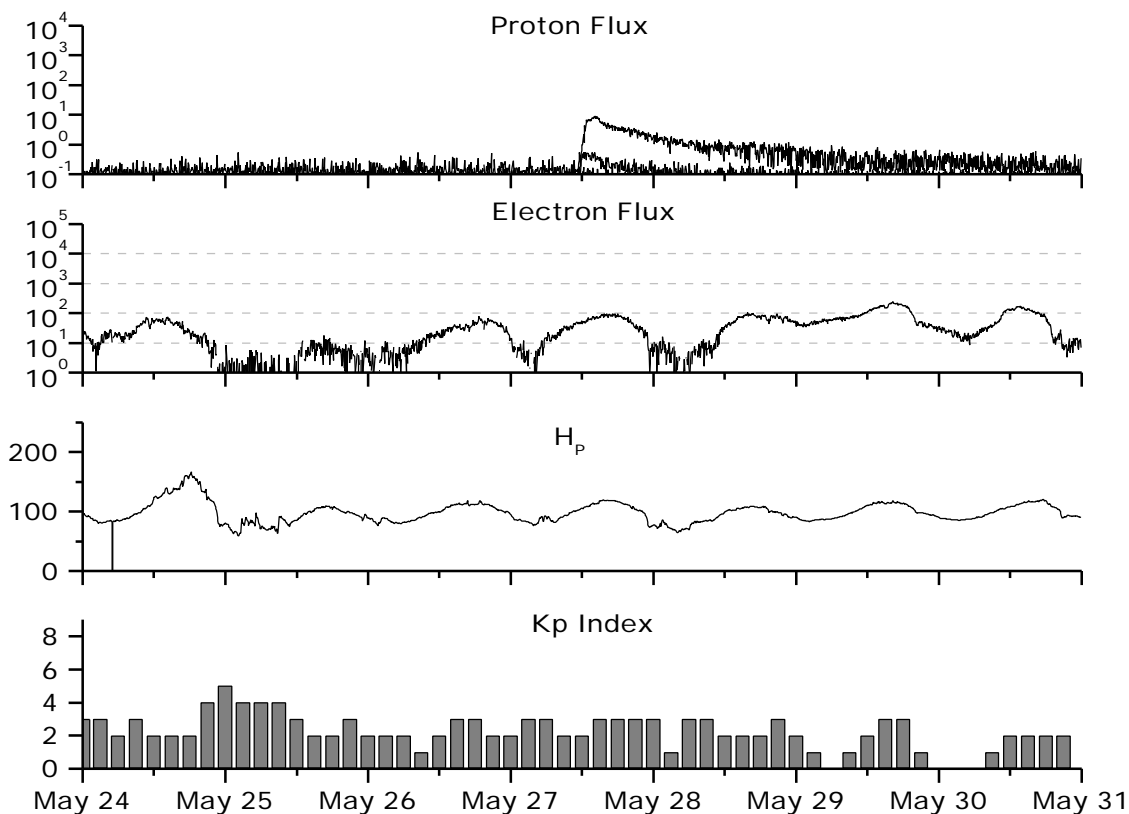
**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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 24 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.

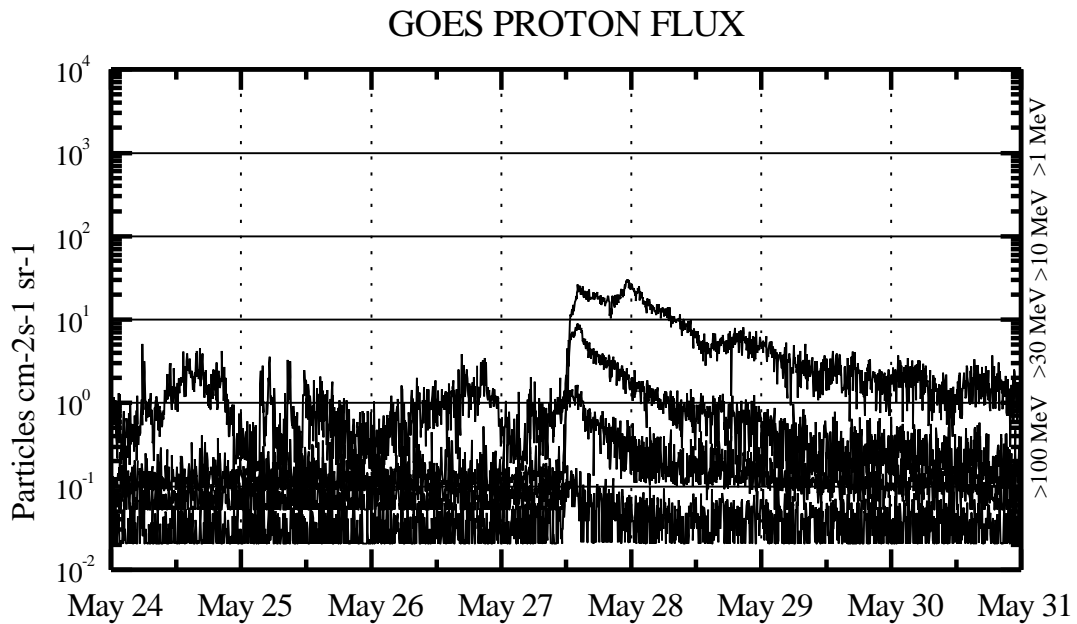
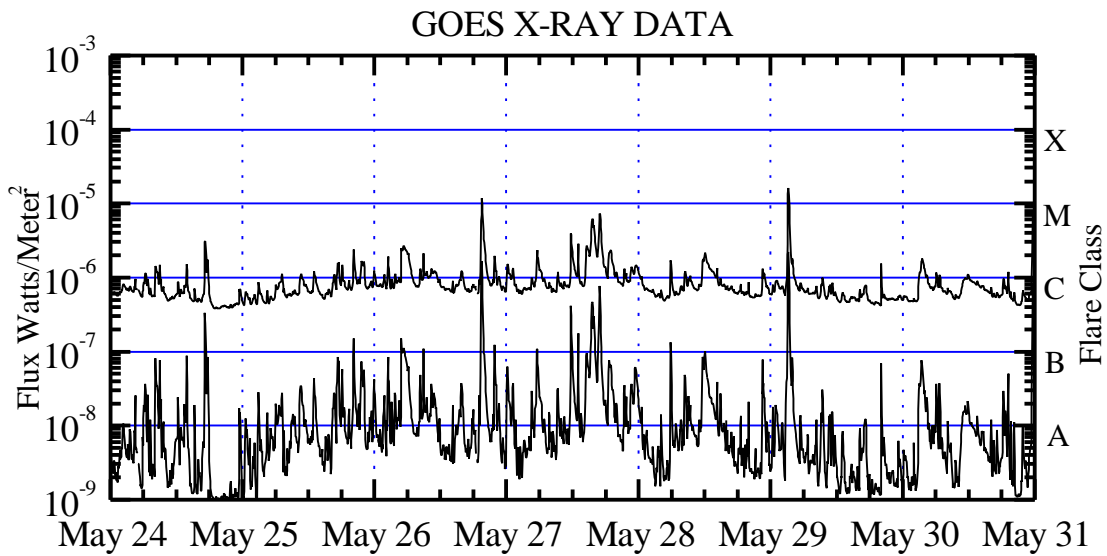
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm²-sec-sr) with energies greater than 2 MeV at GOES-8.

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.

