

**Space Weather Highlights**  
**05 - 11 Jul 1999**

Solar activity was at low levels during the week, with the exception of a single M-class event that occurred on 05 July. Region 8611 (S26,L=256, class/area Fai/380 on 05 July) produced an M1/1F flare at 05/1848UT. Numerous C-class events were produced by several different regions, none of which appeared significantly complex.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. A weak interplanetary shock front passed the spacecraft at approximately 06/1417UT. The following changes were observed with the passage: A velocity increase from 340 to 420 km/sec followed by gradually increased velocities that peaked at 550 km/sec at 06/2100UT, a minor density increase, and increased northward IMF BZ. The shock may have been associated with a partial-halo CME observed late on 03 July.

No proton events were detected at geo-synchronous orbit during the period.

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

The geomagnetic field was quiet to unsettled during the week. A sudden impulse was observed of 5 nT was observed on 06/1508UT. There was no significant corresponding geomagnetic activity following the event. The sudden impulse may have been the result of a partial-halo CME observed on 03 July.

**Space Weather Outlook**  
**14 July - 09 August 1999**

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

There will be a slight chance for a proton event at geo-synchronous altitude.

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

Geomagnetic field activity is expected to be at quiet to unsettled levels during most 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	
05 July	174	188	1310	C1.3	10	1	0	27	2	0	0	0
06 July	168	190	1300	B5.5	4	0	0	3	0	0	0	0
07 July	158	158	1280	B7.4	9	0	0	15	0	0	0	0
08 July	149	143	930	B9.1	4	0	0	7	0	0	0	0
09 July	151	170	1020	B4.6	10	0	0	27	1	0	0	0
10 July	156	174	830	B5.4	6	0	0	5	1	0	0	0
11 July	153	202	1110	B7.2	5	0	0	16	0	0	0	0

### Daily Particle Data

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
05 July	1.3E+5	1.7E+4	4.4E+3		1.9E+7	
06 July	6.4E+5	1.8E+4	4.9E+3		2.2E+6	
07 July	1.8E+5	1.7E+4	5.0E+3		4.8E+6	
08 July	1.9E+5	1.8E+4	4.6E+3		4.7E+6	
09 July	7.8E+4	1.8E+4	4.9E+3		4.3E+6	
10 July	7.0E+4	1.5E+4	4.1E+3		4.7E+6	
11 July	7.5E+4	1.6E+4	4.1E+3		5.3E+6	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	05 July	3	0-0-0-0-1-2-2-2	2	0-0-0-0-0-1-2-1	4
06 July	7	2-2-2-1-0-1-3-3	20	2-2-2-2-4-5-5-2	9	2-2-3-2-2-3-3-3
07 July	3	1-1-1-0-0-1-2-2	12	1-2-1-4-5-1-1-1	5	2-1-1-0-1-2-2-3
08 July	6	2-1-1-2-2-2-1-2	*	*-1-1-3-3-4-2-1	8	2-2-1-3-3-2-3-2
09 July	5	2-1-0-0-1-2-1-2	3	3-1-0-0-0-0-0-0	6	3-2-1-1-1-2-1-2
10 July	4	0-1-1-1-2-1-2-1	3	0-1-0-1-0-0-1-1	5	1-1-1-1-2-2-3-2
11 July	2	0-0-1-0-1-1-1-2	3	0-1-0-2-2-1-0-1	6	1-1-2-1-2-2-2-3

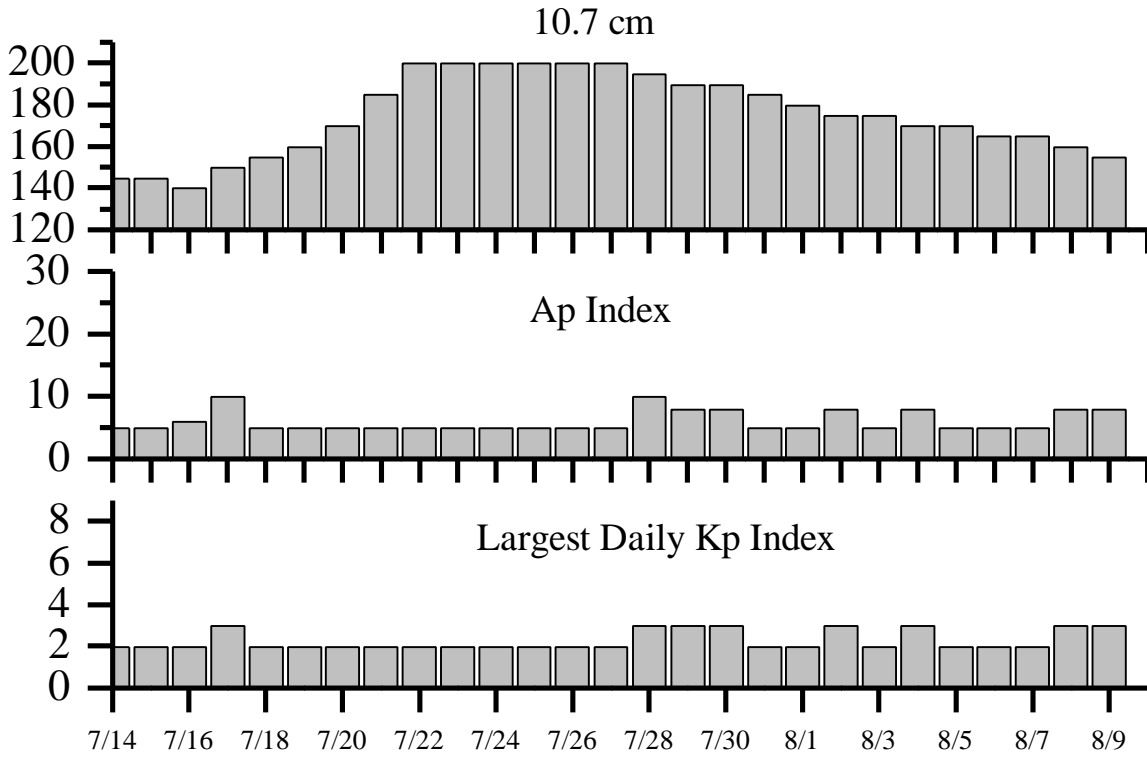


*Alerts and Warnings Issued*

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
05 Jul 0106	8 -245 MHz Bursts	04 Jul
05 Jul 0106	245 MHz Noise Storms	04 Jul
06 Jul 0101	3- 245 MHz Bursts	05 Jul
06 Jul 1533	Sudden Impulse observed at Boulder 5 nT	06 Jul 1508
07 Jul 0108	3 - 245 MHz Bursts	06 Jul
07 Jul 0108	245 MHz Noise Storms	06 Jul
08 Jul 0009	11 - 245 MHz Bursts	07 Jul
08 Jul 0009	245 MHz Noise Storm	07 Jul
09 Jul 0012	245 MHz Noise Storm	08 Jul
10 Jul 012	Type II Radio Emission	09 Jul 2359
11 Jul 110	Type II Radio Emission	11 Jul 0021



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
14 Jul	145	5	2	28 Jul	195	10	3
15	145	5	2	29	190	8	3
16	140	6	2	30	190	8	3
17	150	10	3	31	185	5	2
18	155	5	2	01 Aug	180	5	2
19	160	5	2	02	175	8	3
20	170	5	2	03	175	5	2
21	185	5	2	04	170	8	3
22	200	5	2	05	170	5	2
23	200	5	2	06	165	5	2
24	200	5	2	07	165	5	2
25	200	5	2	08	160	8	3
26	200	5	2	09	155	8	3
27	200	5	2				



### *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
05 Jul 99	1830	1848	1906	M1.2	.021	1F	S25W43	8611				

### *Flare List*

Date	Time			X-ray Class.	Imp / Brtns	Optical Location Lat CMD	Rgn #
	Begin	Max	End				
05 July	0006	0011	0016		SF	S27W32	8611
	0029	0035	0110	C2.6	SF	S24W31	8611
	0124	0131	0204	C7.6	1F	S27W33	8611
	0141	0144	0148		SF	N16W5	8617
	0241	0241	0251		SF	S24W34	8611
	0331	0335	0353	C1.8	SF	N18E27	8614
	0415	0415	0429		SF	N19E69	8621
	0434	0459	0529	C2.8	SF	N18E26	8614
	0700	0702	0707		SF	S24W37	8611
	0737	0740	0758		SF	N16E24	8614
	0944	0946	0958		SF	N17E22	8614
	1154	1201	1220	C4.3	SF	S25W41	8611
	1316	1317	1331		SF	N16E23	8614
	1419	1423	1428	C1.6	SF	N17E20	8614
	1448	1449	1506		SF	S25W40	8611
	1449	1452	1503		SF	N17W80	8609
	1452	1454	1457		SF	N16W78	8602
	1532	1532	1536		SF	S25W40	8611
	1554	1555	1558		SF	N20W83	8602
	1554	1555	1557		SF	N20W80	8609
	1558	1600	1601		SF	S25W41	8611
	1612	1614	1617		SF	N20W80	8602
	1648	1649	1700		SF	S25W42	8611
	1649	1650	1654		SF	N18E19	8614
	1713	1714	1736	C3.3	SF	S26W43	8611
	1824	1839	1958	M1.2	1F	S25W43	8611
	1833	1833	1839		SF	N17E18	8614
1844	1851	1853		SF	N18E18	8614	
1902	1902	1908		SF	N14W68	8617	
2059	2112	2123	C1.1				
2213	2220	2228	C1.6				
2314	2318	2320	C1.0				



*Flare List-continued*

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
06 July	0041	0044	0047	C1.3			
	0805	0807	0816	C1.1	SF	N18E19	8620
	1154	1207	1217	C2.4			
	1404	1409	1419		SF	S24W52	8611
07 July	2022	2024	2032	C2.1	SF	S28W64	8611
	0013	0016	0019		SF	S31E16	8615
	0104	0104	0108		SF	S28W54	8611
	0344	0345	0349	C1.8	SF	S25W73	8611
	0526	0528	0534	C1.0	SF	S27W64	8611
	0554	0554	0558		SF	S27W64	8611
	0618	0620	0629	C1.2	SF	S26W76	8611
	B0624	U0627	A0651		SF	S27W62	8611
	0848	0848	0855		SF	S29E05	8615
	0903	0903	0906		SF	S26W81	8611
	0916	0919	0921	C1.2			
	1026	1026	1034		SF	N20E40	8621
	1044	1046	1050		SF	S25W65	8611
	1450	1450	1457	C1.2	SF	S22W11	8626
	1524	1534	1547	C1.9			
	1640	1640	1645		SF	S25W69	8611
	1705	1709	1712	C1.3			
	1718	1720	1730		SF	S29W01	8615
	1938	1944	1948	C1.1	SF	S26W69	8611
2301	2321	2357	C1.9				
08 July	0046	0050	0057		SF	N20E33	8621
	0434	0443	0502	B9.4			
	0639	0708	0721	C5.7			
	0926	0928	0936	C2.5	SF	S21W20	8626
	1009	1013	1017	C1.2			
	1330	1332	1342		SF	S21W24	8626
	1930	1931	1934	C1.3	SN	N19E70	8628
	2127	2128	2133		SF	S23W26	8626
	2148	2153	2159		SF	S10E70	8627
	2306	2307	2311		SF	S13E69	8627
09 July	0020	0027	0036	C1.5	SF	S29W19	8615
	0041	0044	0057	C1.0	SF	N19E64	8628
	0057	0058	0108		SF	N23W55	8629
	0132	0134	A0204	B9.6	SF	N23W55	8629
	0142	0142	0150		SF	S20W38	8626
	0212	0212	0220	B8.4	SF	N23W55	8629
	0330	0335	0337	B9.4			



*Flare List-continued*

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
09 July	0500	0508	A0525	C1.1	SF	N23W59	8629
	0950	0951	0956	C1.1	SF	N21W67	8629
	1309	1310	1337		SF	N21W65	8629
	1344	1344	1350		SF	N21W65	8629
	1356	1359	1405		SF	N22W66	8629
	1456	1457	1501	B9.4	SF	S22W40	8626
	1456	1500	1510		SF	S11E59	8627
	1531	1533	1538	B7.4	SF	S22W41	8626
	1602	1604	1613		SF	N22W67	8629
	1758	1802	1811	C3.7	SF	S12E58	8627
	1850	1858	1904	C3.5			
	1905	1907	1911		SF	S29W30	8615
	1905	1910	1916	C2.4	SF	N22W67	8629
	1917	1919	1928		SF	N22W67	8629
	1958	2002	2005	C1.6	SF	N22W68	8629
	2024	2038	2052		SF	N22W68	8629
	2051	2053	2056		SF	S33W14	8615
	2111	2112	2114		SF	S34W16	8615
	2152	2152	2159		SF	N22W69	8629
	2217	2221	2224		SF	S09E55	8627
	2224	2229	2232		SF	N22W69	8629
	2238	2239	2249	C6.9	SF	N22W69	8629
	B2351	2353	0010	C3.1	1N	S13E55	8627
	10 July	0128	0155	0230	C1.4		
0506		0510	0512	C1.0			
B0559		0600	0608	C1.0	SF	S28W36	8615
0700		0704	0706	B9.8			
0755		0758	0801	B7.7			
1217		1220	1229	C1.8	SF	S28W36	8615
1512		1513	1523	B8.4	SF	S13E51	8627
1823		1823	1832		SF	N16E33	8628
1914		1922	1933	C1.5			
2339		0013	0111	C3.0	1N	N18E32	8628
2352	0007	0011		SF	S22W56	8626	
11 July	0018	0021	0032		SF	S19W23	8619
	0154	0158	0204		SF	N18E34	8628
	0445	0513	0529		SF	N18E28	8628



**Flare List-continued**

Date	Time			X-ray Class.	Imp / Brtns	Optical	Rgn #
	Begin	Max	End			Location Lat CMD	
11 July	0547	0553	0559	C1.2	SF	N17E28	8628
	0621	0629	0640	C1.2			
	1245	1259	1311		SF	S21W68	8626
	1310	1319	1330	C2.2	SF	S20W52	8626
	1316	1318	1330		SF	S31W53	8615
	1320	1324	1328		SF	S21W62	8626
	1320	1328	1335		SF	N18E30	8628
	1347	1350	1400		SF	S21W62	8626
	1550	1553	1556	C1.4	SF	S20W70	8626
	1747	1747	1810	C1.2	SF	S27W51	8615
	1820	1820	1829		SF	N19W57	8629
	1826	1827	1830		SF	S21W71	8626
	1855	1859	1908		SF	S20W56	
	1908	1911	1927		SF	S20W71	8626
	2205	2209	2212	B8.6			

**Region Summary**

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

*Region 8602*

23 Jun	N19E75	294	0100	05	CAO	006	B										
24 Jun	N19E57	297	0350	10	DAO	009	B					1					
25 Jun	N18E48	295	0320	12	CAO	016	B										
26 Jun	N17E35	295	0330	09	DKI	021	B	2				4					
27 Jun	N18E22	295	0350	08	DKO	025	B	2				3					
28 Jun	N18E08	295	0260	07	DKO	022	B										
29 Jun	N18W0	297	0260	07	DKO	020	B	2	1			7					
30 Jun	N18W2	298	0210	06	DAO	015	B					3					
01 Jul	N18W3	298	0260	06	DAO	014	B					3					
02 Jul	N18W4	299	0270	06	DKO	011	B	3				5					
03 Jul	N19W6	299	0240	05	DAO	011	B	1				5	1				
04 Jul	N19W7	299	0200	05	CAO	006	B					1					
05 Jul	N17W8	299	0070	04	HAX	002	A					3					
								10	1	0	35	1	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 297





**Region Summary-continued**

Date	Location		Sunspot Characteristics					Flares															
	( ° Lat ° CMD)	Helio Lon	Area (10 <sup>6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical												
								C	M	X	S	1	2	3	4								
<i>Region 8603</i>																							
23 Jun	S16E75	294	0040	05	CSO	002	B																
24 Jun	S15E61	295	0160	13	EAO	009	B	1				2											
25 Jun	S15E54	289	0320	20	FAI	018	B																
26 Jun	S16E43	287	0300	18	FAI	024	B	1				5											
27 Jun	S15E30	287	0360	18	FAI	039	B																
28 Jun	S15E18	285	0210	14	EAI	034	B					4											
29 Jun	S15E04	286	0160	15	EAI	040	B	2	1			4	2										
30 Jun	S14W11	288	0110	13	EAI	036	BG	1	2			13	1	1									
01 Jul	S14W25	289	0170	13	EAI	033	BG	2	1			10	2										
02 Jul	S15W38	289	0220	15	EAI	026	BG	3				3											
03 Jul	S15W54	291	0290	14	EAI	021	BG	3				6											
04 Jul	S16W68	292	0260	13	EAI	014	BG	1				6											
05 Jul	S16W80	291	0140	10	DAO	007	B																
06 Jul	S16W93	291																					
												14	4	0	53	5	1	0	0				

Crossed West Limb.

Absolute heliographic longitude: 286

<i>Region 8611</i>																							
27 Jun	S25E61	256	0040	06	CAO	005	B	2				3											
28 Jun	S25E47	256	0080	06	DAO	007	B	7				10	1										
29 Jun	S25E33	257	0210	10	DAI	019	B	1	1			4	1										
30 Jun	S25E21	256	0250	12	EAI	030	BG	1	1			14	2										
01 Jul	S25E07	257	0340	15	EAI	037	BG	3				14											
02 Jul	S25W07	258	0370	16	FAI	042	BG	1	2			3	1										
03 Jul	S25W20	257	0410	16	FAI	035	BG	2				5											
04 Jul	S25W35	259	0420	17	FAI	039	BG	6				10	3										
05 Jul	S26W45	256	0380	19	FAI	029	BG	4	1			10	2										
06 Jul	S26W59	256	0350	20	FAI	022	BG	1				2											
07 Jul	S26W73	257	0310	18	FAC	017	BG	4				10											
08 Jul	S26W84	255	0190	16	FAI	008	B																
09 Jul	S25W96	252	0170	12	EAO	004	B																
												32	5	0	85	1	0	0	0				

Crossed West Limb.

Absolute heliographic longitude: 257





**Region Summary-continued**

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

*Region 8615*

01 Jul	S29E77	187	0040	02	HSX	001	A										
02 Jul	S29E63	188	0090	03	HAX	001	A										
03 Jul	S29E50	187	0130	03	HSX	001	A	1				1					
04 Jul	S29E37	187	0200	03	HSX	001	A										
05 Jul	S29E25	186	0190	03	HSX	002	A										
06 Jul	S29E11	186	0200	02	HAX	001	A										
07 Jul	S29W02	186	0210	02	HSX	001	A						3				
08 Jul	S29W16	187	0180	02	HSX	002	A										
09 Jul	S29W28	184	0180	07	CSO	007	B	1				4					
10 Jul	S31W40	183	0150	09	CAO	008	B	2				2					
11 Jul	S29W55	185	0190	06	CAO	009	B	1				2					
								5	0	0	0	12	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 186

*Region 8617*

02 Jul	N14W28	279	0010	04	BXO	006	B										
03 Jul	N14W42	279	0100	06	DAO	012	B										
04 Jul	N14W57	281	0190	08	DAO	014	B					1					
05 Jul	N12W69	280	0150	07	DAO	006	B					2					
06 Jul	N13W82	279	0100	08	DAO	005	B										
07 Jul	N14W94	278	0090	09	DAO	003	B										
								0	0	0	0	3	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 279

*Region 8618*

03 Jul	S17E57	180	0010	01	AXX	001	A										
04 Jul	S18E44	180	0010	00	AXX	001	A					2					
05 Jul	S13E31	180															
06 Jul	S17E18	180															
07 Jul	S17E05	180															
08 Jul	S17W08	180															
09 Jul	S17W21	180															
10 Jul	S17W34	180															
11 Jul	S17W47	180															
								0	0	0	0	2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 180





**Region Summary-continued**

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

*Region 8622*

06 Jul	S31W20	217	0020	04	CRO	003	B											
07 Jul	S31W33	217	0010	00	AXX	001	A											
08 Jul	S31W46	217																
09 Jul	S31W59	217																
10 Jul	S31W72	217																
11 Jul	S31W85	217																

Still on Disk.

Absolute heliographic longitude: 217

*Region 8623*

06 Jul	N26W11	208	0000	00	AXX	001	A											
07 Jul	N26W24	208																
08 Jul	N26W37	208																
09 Jul	N26W50	208																
10 Jul	N26W63	208																
11 Jul	N26W76	208																

Still on Disk.

Absolute heliographic longitude: 208

*Region 8624*

06 Jul	N24E26	171	0000	01	AXX	002	A											
07 Jul	N25E13	171	0000	00		000												
08 Jul	N26E00	171	0000	02	AXX	002	A											
09 Jul	N24W14	170	0000	03	BXO	004	B											
10 Jul	N23W27	170	0000	03	BXO	003	B											
11 Jul	N24W41	171	0010	04	BXO	003	B											

Still on Disk.

Absolute heliographic longitude: 171

*Region 8625*

06 Jul	S20E76	121	0020	02	HRX	001	A											
07 Jul	S20E63	121	0040	02	HSX	001	A											
08 Jul	S20E49	122	0040	02	HSX	001	A											
09 Jul	S20E36	120	0040	02	HSX	001	A											
10 Jul	S19E23	120	0030	01	HSX	001	A											
11 Jul	S20E10	120	0020	02	HSX	002	A											

Still on Disk.

Absolute heliographic longitude: 120



**Region Summary-continued**

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

*Region 8626*

07 Jul	S21W16	200	0040	05	BXO	009	B	1			1						
08 Jul	S21W30	201	0080	07	DAO	011	B	1			3						
09 Jul	S21W43	199	0100	08	DAO	012	B				3						
10 Jul	S20W57	200	0080	09	CAO	008	B				1						
11 Jul	S20W71	201	0160	10	DAO	009	B	2			7						
								4	0	0	15	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 200

*Region 8627*

08 Jul	S12E70	101	0040	02	HSX	001	A				2						
09 Jul	S13E61	095	0090	12	ESO	004	B	2			3	1					
10 Jul	S12E47	096	0120	13	ESO	010	B				1						
11 Jul	S14E33	097	0210	16	FAO	015	B										
								2	0	0	6	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 097

*Region 8628*

09 Jul	N18E52	104	0030	04	CRO	003	B	1			1						
10 Jul	N19E36	107	0020	09	CRO	007	B				1	1					
11 Jul	N18E20	110	0170	11	EAO	020	B	2			4						
								3	0	0	6	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 110

*Region 8629*

09 Jul	N23W7	226	0090	05	DAO	007	B	5			16						
10 Jul	N23W8	227	0110	10	CAO	006	B										
								5	0	0	16	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 226

*Region 8630*

09 Jul	S10W55	211	0020	04	BXO	005	B										
10 Jul	S10W68	211	0010	04	BXO	003	B										
11 Jul	S09W82	212	0010	06	BXO	005	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 211



***Region Summary-continued***

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

*Region 8631*

11 Jul	N11E77	053	0080	04	HAX	001	A	0	0	0	0	0	0	0	0	0
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Still on Disk.

Absolute heliographic longitude: 053

*Region 8632*

11 Jul	S19W58	188	0030	04	CSO	003	B	0	0	0	0	0	0	0	0	0
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Still on Disk.

Absolute heliographic longitude: 188



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

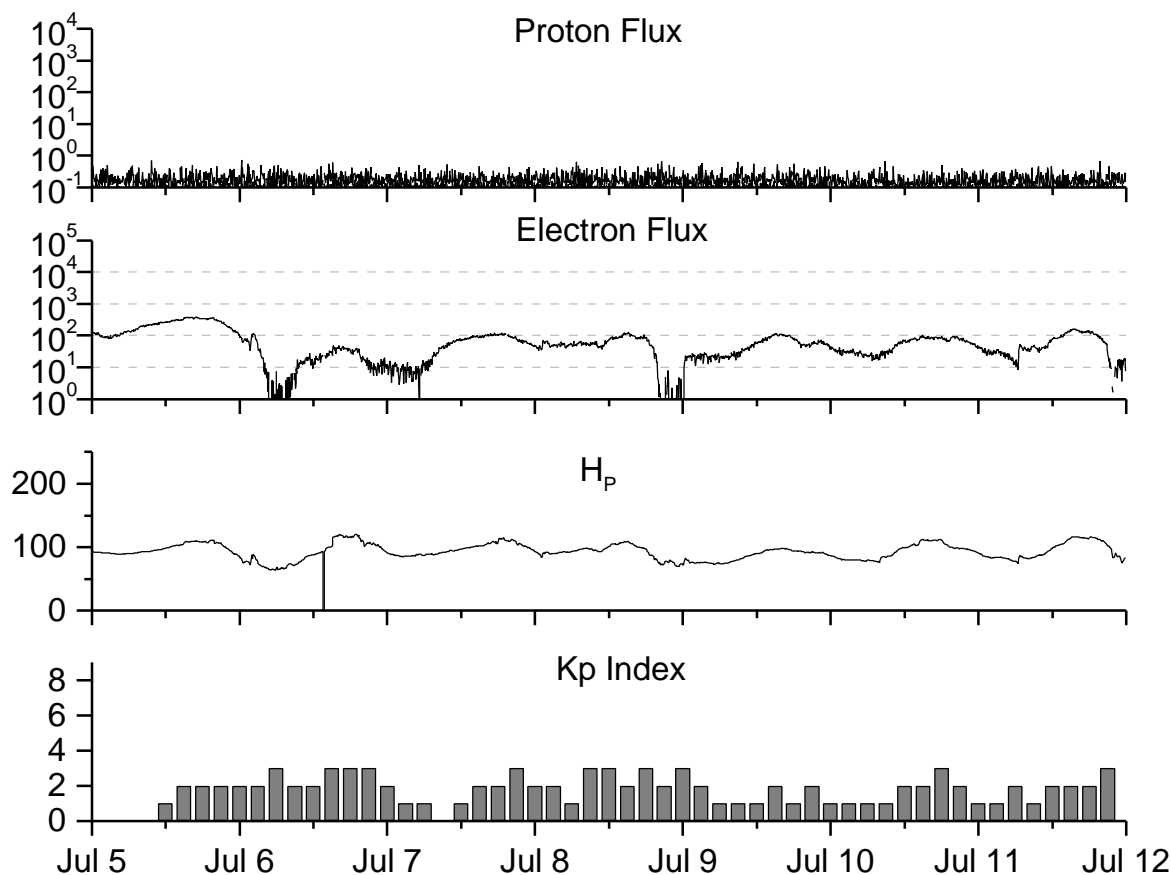
Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>1997</b>									
July	17.0	10.4	0.61	32.4	22.6	71.1	81.8	06	08.5
August	36.7	24.4	0.66	35.9	25.0	79.0	83.4	07	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
<b>1998</b>									
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	93.7	67.8	136.0	124.1	18	12.4
September	119.0	92.9	0.78	96.1	69.4	138.4	126.8	13	12.5
October	77.0	55.5	0.72	97.7	70.5	117.3	127.9	13	12.5
November	99.5	74.0	0.74	101.3	73.0	140.2	130.0	16	12.3
December	120.8	81.9	0.69	108.8	77.9	150.1	134.3	08	11.9
<b>1999</b>									
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	
May	140.5	106.3	0.76			148.6		10	
June	208.3	137.4	0.66			170.0		08	

**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 05 July 1999*

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

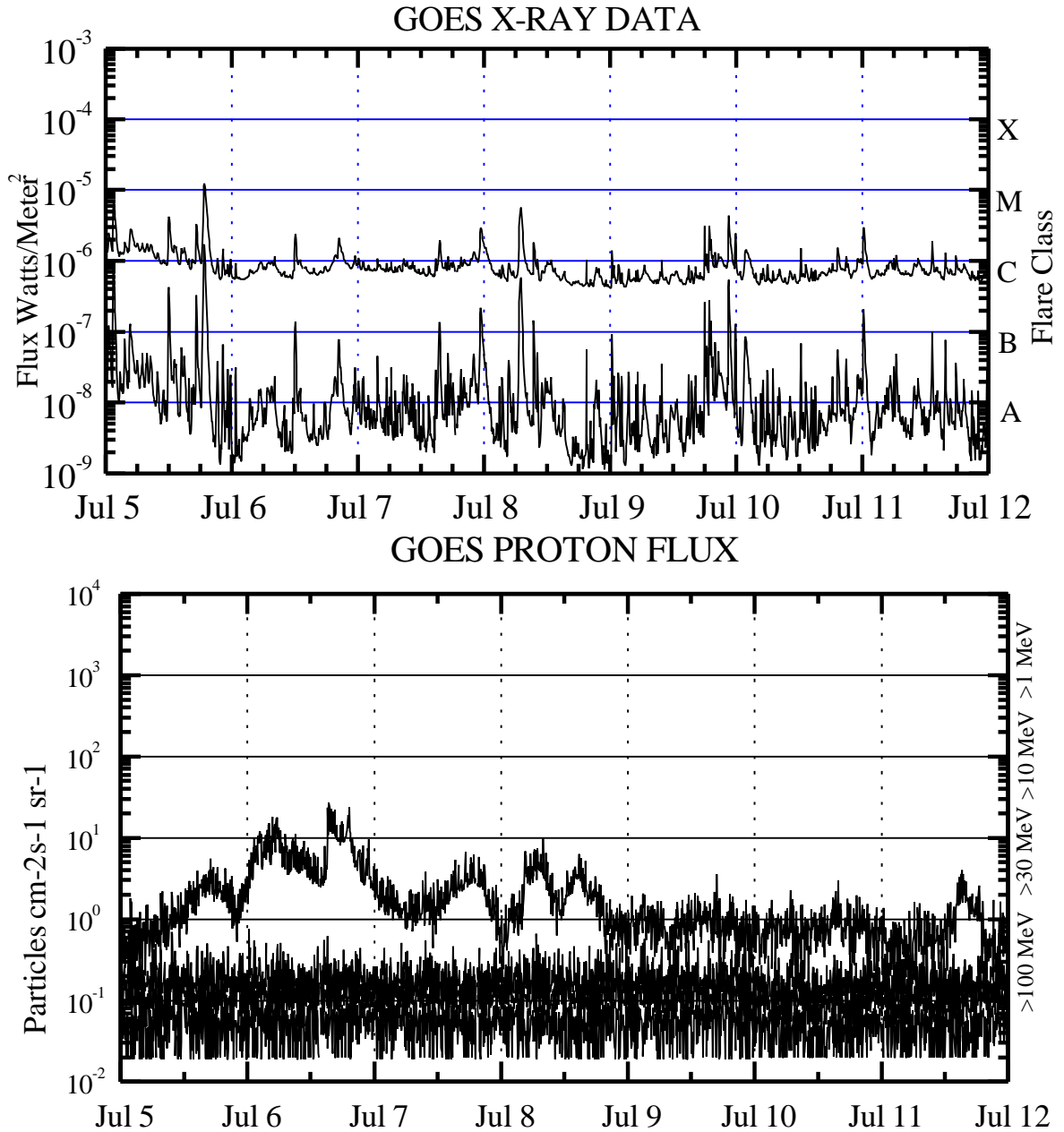
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-8.

*H<sub>p</sub>* 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<sub>p</sub>* plot contains the estimated planetary 3-hour K-index (derived by the USAF 55<sup>th</sup> 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<sub>p</sub> 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<sub>p</sub> are “ global ” parameters that are applicable to a first order approximation over large areas. H<sub>p</sub> is subject to 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<sup>2</sup> ) 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/cm<sup>2</sup> –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/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.



# M5 or Greater X-Ray Flares



Space Environment Center

June 1999  
( Month 33 )

Preliminary data

Comparison of Cycles at current month in cycle

