

Space Weather Highlights

22-28 June 1998

Solar activity was low during most of the period, but increased to moderate levels on 27 June. Region 8253 (N18, L = 082, class/area Dac/270 on 25 June) produced the sole M-class flare of the period, an M1/1N at 27/0121UT with minor radio emissions. Region 8253 also produced occasional subflares during most days and exhibited a slight degree of complexity. Another flare of note was a C2/SF at 22/0433UT from Region 8243 (N17, L = 214, class/area Dho/270 on 22 June). Types II and IV radio sweeps accompanied the flare. A 20-degree filament disappeared from the southwest quadrant on 22 June.

Solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft during most of the period. Velocities ranged from 360 - 440 km/sec during 22 - 23 June, then increased to 540 km/sec on 24 June followed by a gradual decrease to 400 km/sec by 25 June. Velocities increased from 400 - 500 km/sec late on 25 June, then gradually decreased to 360 km/sec during the remainder of the period. Particle densities were mostly in the 04 - 16 p/cc range, but were enhanced during 24 June (peak density 25 p/cc) and 26 June (peak density 37 p/cc). Bz ranged from plus 08 to minus 08 nT (GSM) during most of the period. However, Bz became more variable from late 25 June into early 26 June and ranged from plus 18 to minus 14 nT. Solar sector orientation was mostly toward (phi angle near 315 degrees) during 22 - 23 June, then shifted to mostly away orientation (phi angle near 135 degrees) for the balance of the period.

There were no significant proton enhancements detected at geosynchronous altitude.

The greater than 2 MeV electron flux at geosynchronous altitude was at normal to moderate levels during most of the period.

The geomagnetic field was quiet to unsettled during 22 - 23 June. Activity increased on 24 June with brief active periods at middle latitudes and active to minor storm levels at high latitudes. Activity returned to quiet to unsettled levels on 25 June. Activity increased again during the first half of 26 June with active to major storm levels at middle latitudes and active to severe storm levels at high latitudes. Activity declined to quiet to unsettled levels during the latter half of 26 June. The field was quiet during the last two days of the period.

Space Weather Forecast

01 July - 27 July 1998

Solar activity is expected to be low during most of the period with a fair chance for isolated M-class flares.

No proton enhancements are expected at geosynchronous altitude.

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

The geomagnetic field is expected to be at quiet to unsettled levels.



Daily Solar Data

Date	Radio	Sun	Sunspot	X-ray	Flares				Optical			
	Flux 10.7 cm	spot No. (10^6 hemi.)	Area	Background	X-ray Flux			S	1	2	3	4
					C	M	X					
22 June	101	64	420	B2.6	2	0	0	7	0	0	0	0
23 June	96	59	400	B2.2	2	0	0	7	0	0	0	0
24 June	105	64	440	B2.2	7	0	0	8	0	0	0	0
25 June	106	84	460	B2.7	5	0	0	2	0	0	0	0
26 June	109	99	460	B3.8	1	0	0	1	0	0	0	0
27 June	115	125	540	B5.3	4	1	0	10	1	0	0	0
28 June	122	133	680	B4.4	5	0	0	5	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
22 June	3.6E+5	1.4E+4	3.1E+3		2.1E+7	
23 June	6.5E+5	1.6E+4	3.3E+3		5.2E+6	
24 June	3.9E+5	1.4E+4	3.2E+3		2.7E+6	
25 June	2.0E+5	1.4E+4	3.4E+3		1.2E+6	
26 June	8.1E+5	1.3E+4	3.2E+3		2.4E+6	
27 June	3.6E+5	1.4E+4	3.5E+3		4.6E+6	
28 June	2.9E+5	1.5E+4	3.6E+3		6.0E+6	

Daily Geomagnetic Data

Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
22 June	8	3-1-1-1-1-3-3	10	3-2-2-3-1-2-3-2	10	4-2-2-2-2-2-3-3
23 June	8	2-2-1-1-1-2-2-4	6	2-1-2-1-1-1-2-3	10	2-2-2-2-2-3-3-4
24 June	13	2-3-2-3-3-2-2-4	26	2-3-3-4-6-5-2-2	14	3-3-2-3-3-3-2-4
25 June	10	2-3-2-2-1-2-3-3	9	1-3-2-1-0-4-2-2	10	2-3-2-2-1-2-3-3
26 June	29	6-4-5-4-3-2-3-2	32	5-6-4-4-3-4-3-2	48	7-7-5-4-3-2-3-2
27 June	4	2-2-1-0-1-1-1-2	*	1-*-1-3-1-2-0-0	5	1-1-1-2-2-2-1-2
28 June	2	0-1-1-1-1-0-0-1	2	1-1-1-1-1-0-0-0	5	1-1-1-2-2-2-1-2

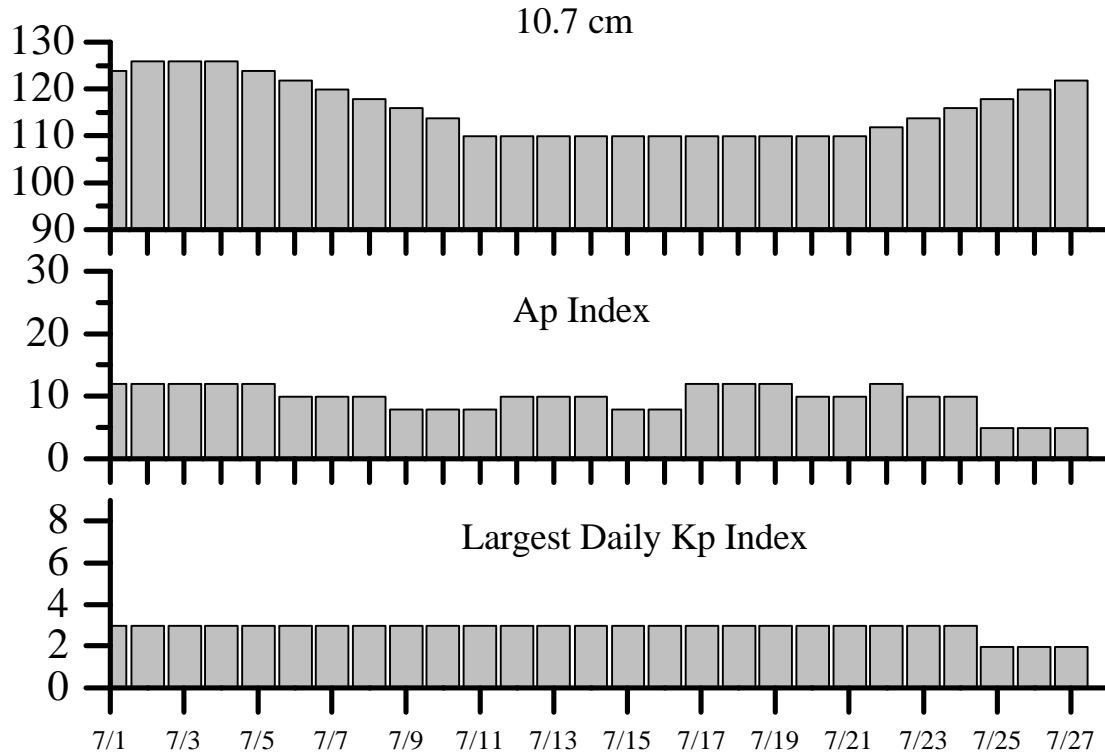


Alerts and Warnings Issued

<u>Date and Time of Issue (UT)</u>	<u>Type of Alert or Warning</u>	<u>Date and Time of Event (UT)</u>
22 Jun 0451	Type II Radio Emission	22 Jun 0436
22 Jun 0522	Type IV Radio Emission	22 Jun 0445
23 Jun 0043	1-245 MHz Radio burst	22 Jun
24 Jun 0000	K=5 Observed	23 Jun 21-24
24 Jun 0027	4 - 245 MHz Radio bursts	23 Jun
24 Jun 1843	A \geq 20 Observed	24 Jun 1800
25 Jun 0000	K= 4 Observed	24 Jun 21-24
26 Jun 0302	K= 6 Observed	26 Jun 00-03
26 Jun 0555	A \geq 20 Observed	26 Jun 0600
26 Jun 0556	K= 6 Observed	26 Jun 03-06
26 Jun 0904	A \geq 30 Observed	26 Jun 0900
27 Jun 0933	A \geq 30 ENDED	27 Jun 0300



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
01 July	124	12	3	15 July	110	8	3
02	126	12	3	16	110	8	3
03	126	12	3	17	110	12	3
04	126	12	3	18	110	12	3
05	124	12	3	19	110	12	3
06	122	10	3	20	110	10	3
07	120	10	3	21	110	10	3
08	118	10	3	22	112	12	3
09	116	8	3	23	114	10	3
10	114	8	3	24	116	10	3
11	110	8	3	25	118	5	2
12	110	10	3	26	120	5	2
13	110	10	3	27	122	5	2
14	110	10	3				



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	½	Class	Integ Flux	Imp Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
			Max						245	2695	II	IV
27 Jun	0112	0121	0131	M1.0	.008	1N	N18E26	8253	41			

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical Location Lat CMD	Rgn #
	Begin	Max	End				
22 June	0008	0014	0025	B5.8			
	0432	0433	0442	C2.9	SF	N16W46	8243
	0834	0837	0843	B4.0			
	0953	0956	0958	B4.0			
	1457	1458	1502		SF	N37W78	8244
	1605	1606	1612		SF	N16W61	8251
	1731	1735	1743	B6.8			
	2025	2027	2030	B4.2	SF	N17E80	8253
	2032	2036	2044		SF	N18E82	8253
	2110	2113	2115	C1.4			
	2247	2247	2254		SF	N16W52	8243
	2349	2350	2356	B4.7	SF	S26W18	8249
	23 June	0102	0117	0153		SF	N17E76
0254		0304	0324	B5.2			
0527		0529	0548		SF	N16E76	8253
0931		0932	0944	B3.9	SF	N17E73	8253
1031		1033	1041	C1.3	SF	N16E72	8253
1518		1519	1527	B3.0	SF	N14E70	8253
1521		1524	1527	B7.1			8253
1657		1700	1702	B2.6			
1918		1922	1930	C1.9	SF	N15E68	8253
2239		2242	2245	B2.5			
2302	2303	2308		SF	N16W68	8249	
24 June	0225	0228	0232	B3.7			
	0318	0321	0324	B4.9			
	0352	0355	0357	B4.8			
	0451	0451	0455	C1.0	SF	N16E60	8253
	0502	0508	0518	C1.2			
	0905	0906	0910	C1.3	SF	N16E58	8253
	0942	0946	0950	B4.3			
	1025	1033	1039	B7.6			
	1108	1113	1117	B4.1			
	1131	1136	1151	C1.6	SF	N15E62	8253



Flare List-continued

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
24 June	1212	1213	1216	B8.3	SF	N19E61	8253
	1353	1358	1405		SF	N16E63	8253
	1747	1802	1823	C1.6	SF	N19E57	8253
	1841	1852	1900	B9.7	SF	N19E56	8253
	1901	1904	1910	C2.7			
	1911	1918	1928	C3.8			
	2014	2033	2038		SF	N16E57	8253
	2234	2238	2240	B4.7			
	2243	2247	2249	B5.3			
	25 June	0137	0140	0143	B4.6		
0231		0237	0240	B5.8			
0318		0340	0354	C1.6			
0519		0522	0526	B4.0			
0625		0630	0633	B5.2			
0810		0817	0827	C1.1			
1432		1435	1438	B9.5			
1517		1522	1533	B7.2			
1834		1839	1855	C1.0	SF	N18E42	8253
1953		1956	2000	B6.8			
2038		2047	2221	C6.5	SF	N16E41	8253
2145		2151	2209	C2.0			
26 June		2149	2201	2211		SF	N17E28
	2255	2302	2327	C2.1			
27 June	0116	0119	0151	M1.0	1N	N18E26	8253
	0814	0817	0821	B8.7			
	0847	0847	0900	C1.1	SF	N18E24	8253
	1302	1307	1348	B6.8	SF	N16E18	8253
	1304	1441	1509		SF	N29W26	8257
	1349	1355	1412	B7.6	SF	N16E18	8253
	1411	1412	1416		SF	N22E84	8259
	1813	1816	1831	C1.7	SF	N20E18	8253
	1847	1857	1925	B9.2	SF	N18E19	8253
	1904	1907	1910	C1.1			
	2002	2003	2012		SF	N18E18	8253
	2022	2024	2035		SF	N17E17	8253
	2102	2108	2118	C1.0			
	2244	2248	2253		SF	N17E14	8253



Flare List-continued

Date	Time			X-ray Class.	Imp / Brtns	Optical	Rgn #			
	Begin	Max	End			Location Lat CMD				
28 June	B0353	0401	0422	C2.9	1F	N18E12	8253			
	0604	0608	0617	B7.2						
	0628	0633	0640	C1.2						
	1141	1142	1145	B8.8				SF	N16E06	8253
	1425	1426	1431					SF	S22E72	8260
	1912	1916	1918	C1.2				SF	N18E03	8253
	1958	2003	2007	C1.6				SF	N18E02	8253
	2059	2059	2112	C1.8				SF	N19E02	8253

Region Summary

Date	Location		Sunspot Characteristics				Flares										
	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	4		
<i>Region 8242</i>																	
11 Jun	S20E70	235	0090	02	HSX	001	A										
12 Jun	S22E55	237	0140	02	HSX	002	A	2			3						
13 Jun	S22E43	235	0100	04	CSO	004	B	2	1		5	1					
14 Jun	S21E28	237	0060	03	CSO	004	B				2	1					
15 Jun	S21E16	236	0040	03	CAO	005	B										
16 Jun	S21E03	236	0020	03	BXO	006	B										
17 Jun	S22W10	236	0010	07	BXO	007	B										
18 Jun	S23W23	236	0020	03	BXO	003	B										
19 Jun	S22W39	238	0000	00	AXX	001	A										
20 Jun	S22W52	238															
21 Jun	S20W61	234	0010	02	BXO	004	B										
22 Jun	S20W74	234															
23 Jun	S20W87	234															
								4	1	0	10	2	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 236



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 8245</i>																					
13 Jun	S29E15	263	0020	03	CSO	004	B														
14 Jun	S29E03	262	0020	04	CRO	004	B						1								
15 Jun	S30W08	260	0000	00	AXX	001	A														
16 Jun	S30W08	247	0000	00	AXX	001	A														
17 Jun	S30W21	247																			
18 Jun	S30W34	247																			
													0	0	0	1	0	0	0	0	0
Died on Disk.																					
Absolute heliographic longitude: 262																					
<i>Region 8247</i>																					
13 Jun	S22E31	247	0010	00	AXX	001	A														
14 Jun	S23E17	248	0010	00	AXX	001	A														
15 Jun	S23E04	248																			
16 Jun	S23W09	248																			
17 Jun	S23W22	248																			
18 Jun	S23W35	248																			
													0	0	0	0	0	0	0	0	0
Died on Disk.																					
Absolute heliographic longitude: 248																					
<i>Region 8249</i>																					
15 Jun	S27E74	178	0030	01	HSX	001	A														
16 Jun	S25E62	177	0060	02	HAX	001	A														
17 Jun	S28E49	177	0060	02	HSX	001	A														
18 Jun	S28E36	177	0060	02	HSX	001	A														
19 Jun	S27E22	177	0080	01	HSX	001	A														
20 Jun	S27E10	176	0040	02	HSX	001	A														
21 Jun	S27W03	176	0060	02	HSX	001	A														
22 Jun	S28W15	175	0080	05	HSX	001	A														
23 Jun	S28W28	175	0070	03	CSO	002	B														
24 Jun	S28W41	174	0050	02	HSX	001	A														
25 Jun	S27W55	175	0060	02	HSX	001	A														
26 Jun	S28W68	175	0050	02	HSX	001	A														
27 Jun	S28W80	174	0040	02	HSX	001	A														
													0	0	0	0	0	0	0	0	0
Crossed West Limb.																					
Absolute heliographic longitude: 176																					



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 8250</i>																					
17 Jun	S26E03	223	0010	03	BXO	006	B														
18 Jun	S25W09	222	0000	00	AXX	001	A														
19 Jun	S25W22	222																			
20 Jun	S25W35	222																			
21 Jun	S25W48	222																			
22 Jun	S25W61	222																			
23 Jun	S25W74	222																			

0 0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 223

<i>Region 8251</i>																				
19 Jun	N16W24	223	0010	00	AXX	001	A													
20 Jun	N16W39	225	0010	06	CRO	006	B													
21 Jun	N16W53	226	0030	06	CSO	008	B													
22 Jun	N15W66	226	0040	06	CSO	007	B													
23 Jun	N15W83	230	0030	07	BXO	003	B													

0 0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 223

<i>Region 8252</i>																				
20 Jun	S29W03	189	0000	03	BXO	003	B													
21 Jun	S29W16	189	0010	05	BXO	002	B													
22 Jun	S29W29	189																		
23 Jun	S29W42	189																		
24 Jun	S29W55	189																		
25 Jun	S29W68	189																		
26 Jun	S29W81	189																		

0 0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 189



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 8253</i>																		
22 Jun	N18E76	084	0030	01	HSX	001	A	1										
23 Jun	N18E66	081	0090	04	CAO	003	B	2										
24 Jun	N18E54	079	0240	05	DAO	009	B	2										
25 Jun	N18E39	081	0270	07	DAC	012	BG	2										
26 Jun	N17E26	081	0230	08	DSO	021	B											
27 Jun	N17E12	082	0220	08	DSC	024	B	2	1				1					
28 Jun	N18W01	082	0200	09	DSI	028	B	4					1					
										13	1	0	0	2	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 082

<i>Region 8254</i>																		
24 Jun	N22W54	187	0000	00	AXX	001	A											
25 Jun	N23W67	187	0000	00	AXX	001	A											
26 Jun	N23W80	187																
										0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 187

<i>Region 8255</i>																		
24 Jun	S22E64	069	0000	00	AXX	001	A											
25 Jun	S23E51	069	0020	02	BXO	006	B											
26 Jun	S22E39	068	0070	08	CSO	009	B											
27 Jun	S22E26	068	0080	08	DAO	007	B											
28 Jun	S22E13	068	0080	08	CAO	004	B											
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 068

<i>Region 8256</i>																		
25 Jun	S26E68	052	0010	01	AXX	002	A											
26 Jun	S25E58	049	0060	10	CSO	004	B											
27 Jun	S25E46	048	0070	12	ESO	003	B											
28 Jun	S24E33	048	0050	12	CSO	005	B											
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 048



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 8257</i>																	
26 Jun	N29W19	126	0010	03	BXO	003	B										
27 Jun	N29W32	126	0010	05	BXO	005	B										
28 Jun	N29W46	127	0010	07	BXO	005	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 126																	
<i>Region 8258</i>																	
26 Jun	S14E64	043	0040	01	HSX	001	A										
27 Jun	S16E54	040	0070	09	CSO	002	B										
28 Jun	S14E39	042	0060	02	HSX	001	A										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 042																	
<i>Region 8259</i>																	
27 Jun	N25E73	021	0010	02	AXX	002	A										
28 Jun	N27E63	018	0090	09	CSO	003	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 018																	
<i>Region 8260</i>																	
27 Jun	S21E74	020	0040	01	HSX	001	A										
28 Jun	S22E64	017	0190	16	FAO	005	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 017																	
<i>Region 8261</i>																	
28 Jun	N32E16	065	0000	04	BXO	002	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 065																	



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

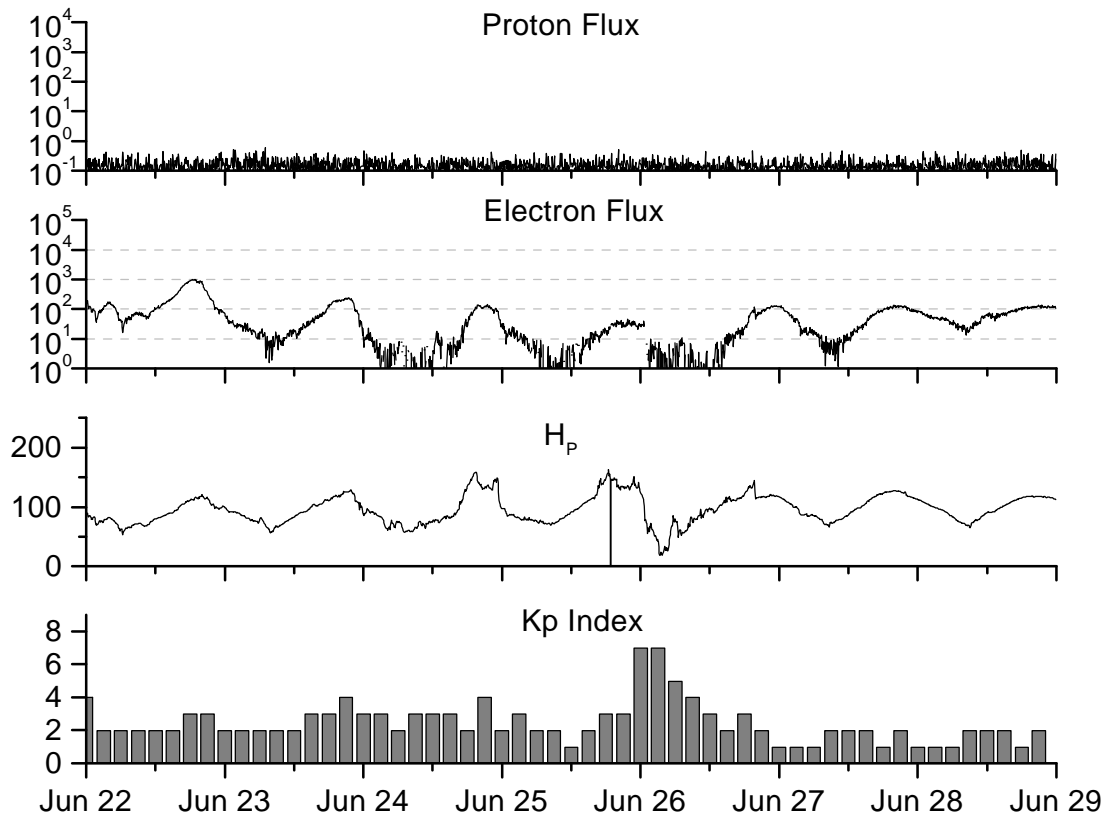
Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed SWO	values RI	Ratio RI/SWO	Smooth SWO	values RI	**Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
1996									
June	18.8	11.8	0.63	13.5	08.5	69.6	71.8	05	09.4
July	13.2	08.2	0.62	13.4	08.4	71.2	72.0	07	09.3
August	20.5	14.4	0.70	13.1	08.3	72.4	72.1	09	09.4
September	02.9	01.6	0.55	13.3	08.4	69.4	72.3	15	09.3
October	02.3	00.9	0.39	14.0	08.8	69.2	72.6	13	09.1
November	26.7	17.9	0.67	15.4	09.8	78.7	73.0	08	09.1
December	21.1	13.3	0.63	16.2	10.4	77.8	73.3	07	09.3
1997									
January	09.0	05.7	0.63	16.5	10.5	74.0	73.4	09	09.3
February	11.3	07.6	0.67	17.4	11.0	73.8	73.7	11	09.2
March	14.4	08.7	0.60	20.4	13.5	73.5	75.1	08	08.9
April	24.5	15.5	0.63	24.0	16.5	74.5	76.8	10	08.6
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	08.7*
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	25.1*	79.0	83.4*	07	08.3*
September	52.8	51.3	0.88	40.5	28.4*	96.2	85.7*	10	08.2*
October	33.6	22.8	0.68	45.4	31.9*	84.9	88.6*	11	08.3*
November	53.5	39.0	0.73	49.3	35.1*	99.5	91.4*	11	08.7*
December	57.9	41.2	0.71			98.8		05*	
1998									
January	51.8	32.3*	0.62*			93.5*		07*	
February	54.4	40.7*	0.75*			93.6*		07*	
March	81.8	54.8*	0.67*			109.4*		11*	
April	73.6	53.3*	0.72*			108.3*		10*	
May	74.3	56.9*	0.77*			106.6*		18*	

*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.

** From June 1991 onward, 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 22 June 1998*

Protons plot contains the five-minute averaged integral proton flux (protons/ cm²-sec-sr) as measured by GOES-9 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

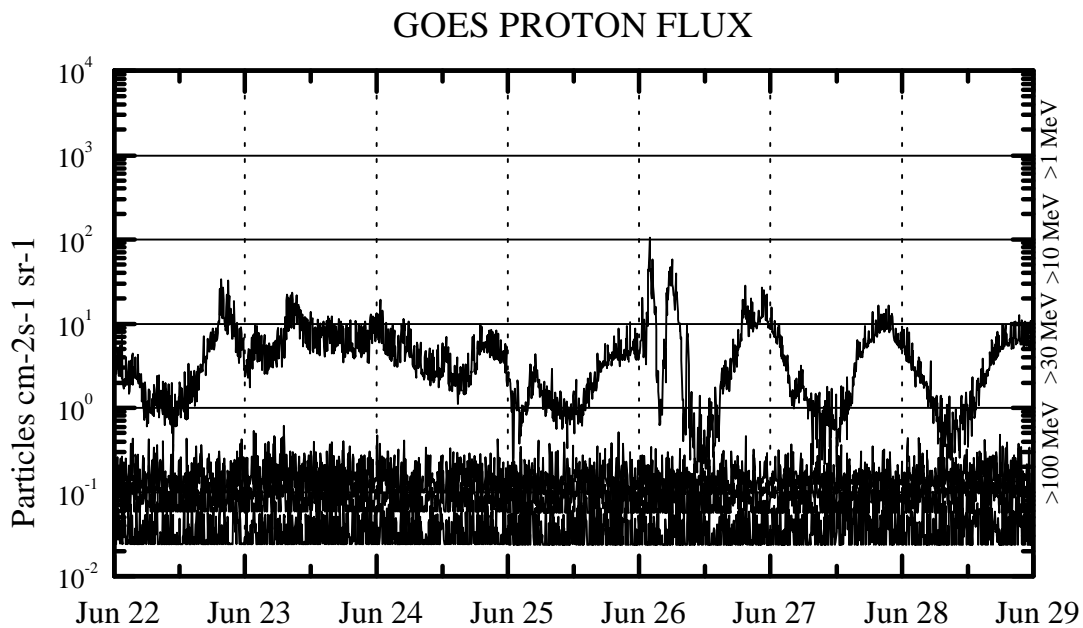
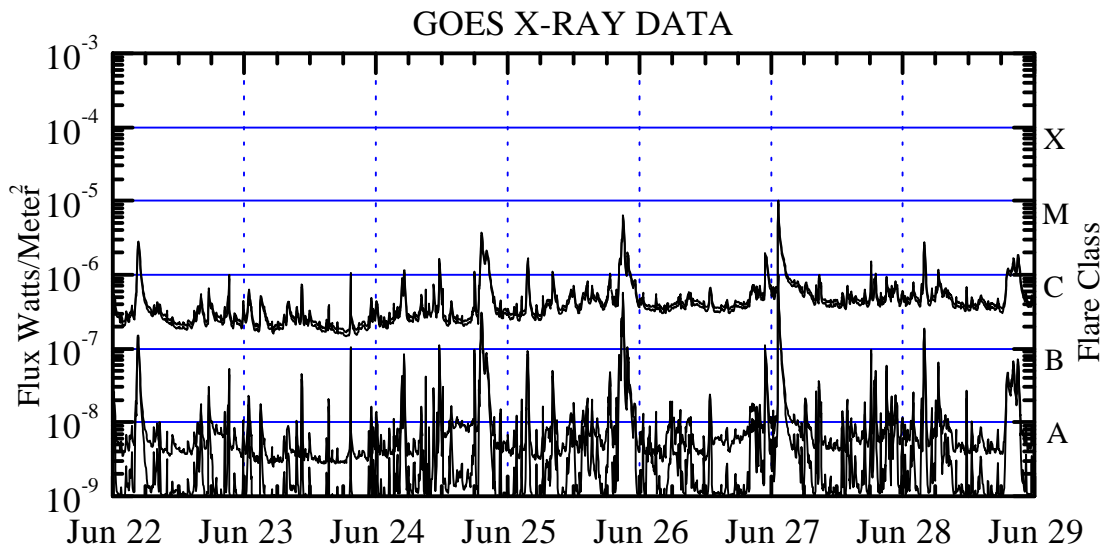
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm²-sec-sr) with energies greater than 2 MeV at GOES-9.

H_p plot contains the five minute averaged magnetic field H component in nanoteslas (nT) as measured by GOES-9. 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_pparallel 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 9 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-9 (W135) 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.

