

**Space Weather Highlights  
21-27 September 1998**

Solar activity was low during most days, but rose to high levels on 23 September. Region 8340 (N20, L = 013, class/area Dko/540 on 21 September) produced an M6/3B flare at 23/0713UT following a period of slow growth. Major Types II and IV radio sweeps and strong discrete radio emission accompanied the flare. Slow growth continued in Region 8340 following the flare and by 24 September a delta magnetic configuration had formed. Region 8344 (S20, L = 001, class/area Dso/070 on 24 September) also developed a delta magnetic configuration on 24 September following a day of gradual growth. Both regions slowly declined during the remainder of the period and produced isolated B- and C-class flares with minor radio emission.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft during most of the period. An interplanetary shock front (produced by the M6/3B flare) was detected by ACE around 24/2300UT. Bz became strongly southward following the shock with a maximum deflection of minus 27 nT (GSM) detected at 24/2333UT. Bz remained southward until around 25/1800UT. Thereafter, Bz hovered around zero and ranged from plus 07 to minus 07 nT. Solar wind velocities increased from 440 - 880 km/sec early on 25 September following the shock, then gradually decreased during the remainder of the period. Particle densities increased to 14 p/cc early on 25 September, then gradually decreased. Solar sector orientation was away (phi angle near 135 degrees) during most of the period.

A greater than 10 MeV proton enhancement began around 23/1300UT following the M6/3B flare, then increased to event levels beginning 25/0010UT. The event peaked at 44 PFU at 25/0130UT and ended at 25/0230UT. Polar cap absorption associated with the proton event peaked at 1.5 dB at 05/0103UT.

The greater than 2 MeV electron flux at geosynchronous altitude was at normal to moderate levels through 24 September, then increased to moderate to high levels for the balance of the period.

A geomagnetic storm occurred during 25 September in response to the M6/3B flare. Severe storm levels were detected at all latitudes during the disturbance. The field declined to mostly quiet to unsettled levels after 25/1800UT and remained so for the rest of the period although brief storm intervals were detected at high latitudes. A Forbush decrease of minus 15 percent was detected by the Thule neutron monitor during the storm.

**Space Weather Forecast  
30 September - 26 October 1998**

Solar activity is expected to be low to moderate. Isolated M-class flares may occur during the period.

No significant proton enhancements are expected at geosynchronous altitude.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at moderate to high levels through 07 October, then decline to normal to moderate levels for the balance of the period.

The geomagnetic field is expected to be at quiet to unsettled levels. However, active periods are possible during 03 - 04 October in response to a filament which disappeared from the northwest quadrant on 29 September.



### *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
21 September	138	151	910	B3.5	4	0	0	4	1	0	0	0
22 September	141	154	720	B3.5	3	0	0	5	0	0	0	0
23 September	143	162	760	B5.3	4	1	0	8	0	0	1	0
24 September	135	156	800	B4.1	2	0	0	5	1	0	0	0
25 September	139	118	680	B3.7	4	0	0	6	0	0	0	0
26 September	136	115	770	B5.3	4	0	0	8	0	0	0	0
27 September	127	87	620	B4.0	5	0	0	7	3	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
21 September	1.5E+5	1.7E+4	3.8E+3		1.4E+6	
22 September	1.4E+5	1.7E+4	3.9E+3		2.5E+6	
23 September	4.5E+5	3.3E+4	4.1E+3		5.6E+6	
24 September	1.3E+7	1.2E+5	3.9E+3		8.7E+6	
25 September	1.1E+8	3.4E+5	2.4E+3		5.2E+7	
26 September	5.3E+6	2.1E+4	2.2E+3		6.2E+7	
27 September	4.3E+6	2.2E+4	2.4E+3		1.2E+8	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	21 September	10	2-3-3-3-3-2-1-0	14	2-2-4-3-5-1-0-1	14
22 September	6	1-2-3-1-2-1-2-1	7	0-0-3-3-2-2-2-1	10	1-1-4-2-2-3-3-2
23 September	10	3-3-2-2-2-1-3-2	26	2-2-3-6-6-2-2-2	14	3-2-3-3-3-3-3-3
24 September	17	3-4-3-3-2-1-2-5	51	2-5-7-7-3-4-2-4	28	3-5-5-5-3-3-3-5
25 September	60	5-5-8-6-4-3-2-3	98	6-6-7-8-7-6-3-2	121	7-8-9-7-7-5-3-3
26 September	11	2-2-1-2-3-3-3-3	23	2-2-2-2-5-6-3-3	14	2-1-2-2-4-4-3-3
27 September	8	2-2-1-2-3-2-2-2	24	3-3-2-6-5-3-2-1	12	3-2-1-3-4-3-3-2

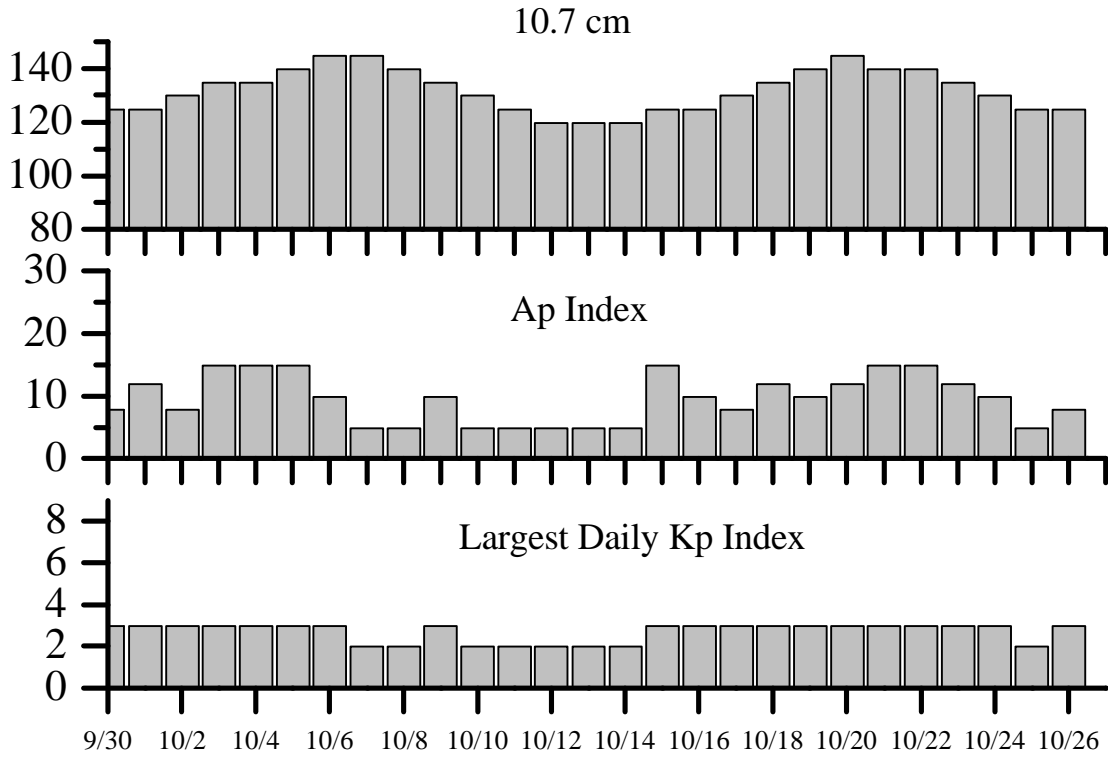


***Alerts and Warnings Issued***

<u>Date and Time of Issue (UT)</u>	<u>Type of Alert or Warning</u>	<u>Date and Time of Event (UT)</u>
22 Sep 0014	2-245 MHz Radio Bursts	21 Sep
22 Sep 0019	1-245 MHz Radio Burst	22 Sep
23 Sep 0828	10cm Radio Burst 1100 s.f.u.	23 Sep 0645
23 Sep 0828	Type II Radio Emission	23 Sep 0656
23 Sep 0900	X-Ray event M6.9/3B	23 Sep 0640
23 Sep 1106	Type IV Radio Emission	23 Sep 0656
23 Sep 1829	A $\geq$ 20 Watch	24 Sep
23 Sep 1829	A $\geq$ 30 Watch	25 Sep
23 Sep 2156	A $\geq$ 20 Watch	26 Sep
24 Sep 0054	8-245 MHz Radio Bursts	23 Sep
24 Sep 0054	245 MHz Radio Noise Storm	23 Sep
24 Sep 0604	K= 4 Observed	24 Sep 03-06
25 Sep 0001	K= 4 Observed	24 Sep 21- 24
25 Sep 0027	Proton Event $\geq$ 10pfu @ $\geq$ 10MeV	25 Sep 0010
25 Sep 0053	9-245 MHz Radio Bursts	24 Sep
25 Sep 0053	245 MHz Radio Noise Storm	24 Sep
25 Sep 0300	A $\geq$ 20 Observed	25 Sep 0300
25 Sep 0300	K $\geq$ 6 Observed	25 Sep 00-03
25 Sep 0610	A $\geq$ 30 Observed	25 Sep 0600
25 Sep 0610	Proton Event $\geq$ 10pfu @ $\geq$ 10MeV ENDED	25 Sep 0010
25 Sep 0901	A $\geq$ 50 Observed	25 Sep 0900
25 Sep 0901	K $\geq$ 6 Observed	25 Sep 06-09
25 Sep 1202	K $\geq$ 6 Observed	25 Sep 09-12
25 Sep 1529	A $\geq$ 30 Watch	26 Sep
25 Sep 1630	>2 MeV Electron Event $\geq$ 1000pfu	25 Sep 1605
26 Sep 1202	A $\geq$ 30 Observed ENDED 26/0600	25 Sep 0600
26 Sep 1202	A $\geq$ 50 Observed ENDED 26/0600	25 Sep 0900
26 Sep 1807	K = 4 Observed	26 Sep 15-18
27 Sep 0828	10cm Radio Burst 410 s.f.u.	27 Sep 0808
27 Sep 1207	>2 MeV Electron Event $\geq$ 1000pfu CONTINUED	25 Sep 1605



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
30 Sep	125	8	3	14 Oct	120	5	2
01 Oct	125	12	3	15 Oct	125	15	3
02	130	8	3	16	125	10	3
03	135	15	3	17	130	8	3
04	135	15	3	18	135	12	3
05	140	15	3	19	140	10	3
06	145	10	3	20	145	12	3
07	145	5	2	21	140	15	3
08	140	5	2	22	140	15	3
09	135	10	3	23	135	12	3
10	130	5	2	24	130	10	3
11	125	5	2	25	125	5	2
12	120	5	2	26	125	8	3
13	120	5	2				



***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
23 Sep	0640	0713	0731	M6.9	.120	3B	N18E09	8340	2900	1100	3	3

***Flare List***

Date	Time			X-ray Class.	Imp / Brtns	Optical Location Lat CMD	Rgn #	
	Begin	Max	End					
21 September	0610	0622	0634		SF	N40E47	8343	
	0710	0714	0717		SF	N42E46	8343	
	0720	0724	0729		SF	N20E37	8340	
	0735	0748	0839	C2.8	SF	N18E35	8340	
	0957	1001	1005	B8.7				
	1332	1336	1338	B5.5				
	1612	1615	1617	B5.9				
	1637	1640	1642	B6.2				
	1816	1818	1905	C2.0	1F	N18E29	8340	
	2029	2035	2040	C1.0				
	2335	2343	2348	C1.9				
	22 September	0238	0242	0245	B6.0			
		0331	0337	0342	B7.5			
0426		0431	0436	B5.7				
0459		0459	0503	B7.6	SF	N20E25	8340	
0506		0510	0512	B9.8				
0615		0623	0634	B9.7				
1036		1040	1043	B4.9				
1101		1104	1108		SF	N21E17	8340	
1105		1105	1112		SF	N39E33	8343	
1205		1207	1217		SF	S21E28		
1829		1832	1835	B6.2				
1846		1850	1854	C1.0				
2041		2059	2105	C3.4				
23 September	B2355	2355	0006	C2.1	SF	N18E14	8340	
	B0035	0037	0103	C9.3	SF	S20E22	8344	
	0437	0439	0441		SF	N40E24	8343	
	0506	0512	0525	C1.2				
	0644	0706	1009	M6.9	3B	N18E09	8340	
	1221	1222	1232		SF	N22E03	8340	
	1948	1949	2001		SF	N21W02	8340	
	2041	2042	2046		SF	N37E14	8343	
	2223	2224	2239	C1.4	SF	S19E12	8344	
	2247	2247	2307	C2.2	SF	N21W04	8340	
	2333	2338	2344		SF	S38W47	8337	



*Flare List - continued*

Date	Time			X-ray Class.	Optical		Rgn #
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
24 September	0431	0436	0441	B6.9			
	0607	0609	0619	B6.5	SF	N20W05	8340
	0812	0814	0847	C6.0	1N	S20E05	8344
	0834	0835	0853	C1.8	SF	N20W11	8340
	1411	1412	1415		SF	N18W08	8340
	1704	1705	1716		SF	N21W08	8340
	2014	2018	2020	B4.3			
	2144	2145	2159	B6.1	SF	N21W18	8340
25 September	0247	0251	0300	B5.5			
	0408	0411	0413	B6.5			
	B1108	U1108	A1121	C1.3	SF	N17W20	8340
	1136	1151	1202	C1.7			
	1314	1315	1328	B7.0	SF	S28E32	8346
	1520	1522	1526		SF	S30W63	8336
	1713	1713	1722		SF	S21W16	8344
	1802	1845	1920	B7.7			
26 September	2219	2225	2257	C1.3	SF	S16W13	8344
	2313	2322	2338	C2.7	SF	S28E27	8346
	0649	0651	0658	C1.6	SF	N24W31	8340
	1341	1343	1346		SF	S15W65	8339
	1348	1349	1354		SF	N19W39	8340
	1429	1431	1438		SF	S14W66	8339
	1448	1454	1457	C1.0	SF	S15W67	8339
	1534	1542	1555		SF	S29E19	8346
	1621	1624	1627	C1.2			
	1623	1624	1631		SF	N22W39	8340
27 September	2216	2221	2227	C1.1			
	2313	2318	2321	B9.8			
	2316	2316	2324		SF	N20W44	8340
	0002	0002	0006		SF	S17W69	8339
	0226	0229	0232	B5.9			
	0236	0240	0307	C6.0	1F	S29E12	8346
	0359	0400	0405	C1.8	SF	N20W46	8340
	0401	0401	0404		SF	S17W75	8339
	0424	0426	0440	B9.6	SF	S29E11	8346
	0511	0515	0521	B7.8			
27 September	0809	0809	0831	C2.6	SF	N21W48	8340
	1629	1641	1655	C5.2	1F	N21W52	8340
	1821	1821	1826		SF	N20W54	8340
	1923	1927	1933		SF	N21W49	8340
	2331	2334	2336	B8.9			
	2338	2341	0000	C6.0	1N	N20W58	8340



### Region Summary

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	4								
<i>Region 8335</i>																							
12 Sep	S22E68	088	0030	07	CRO	004	B																
13 Sep	S22E54	088	0210	08	DAO	003	B																
14 Sep	S22E40	089	0190	09	DAO	005	B							4									
15 Sep	S22E27	089	0190	10	DSO	005	B							1									
16 Sep	S22E14	089	0110	09	DAO	006	B																
17 Sep	S22E01	089	0100	10	DAO	004	B																
18 Sep	S22W12	089	0100	08	DAO	006	B																
19 Sep	S21W26	089	0060	08	DSO	004	B																
20 Sep	S21W39	089	0070	08	DSO	003	B																
21 Sep	S21W52	089	0050	08	CSO	004	B																
22 Sep	S20W68	092	0050	02	HSX	001	A																
23 Sep	S20W81	092	0020	02	HRX	001	A																
														0	0	0	5	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 089

#### *Region 8336*

16 Sep	S30E52	051	0040	06	CSO	002	B															
17 Sep	S28E37	053	0030	07	CSO	003	B															
18 Sep	S25E25	052	0040	07	DSO	008	B															
19 Sep	S30E11	052	0080	08	DSO	010	B							1								
20 Sep	S29W02	052	0070	10	DSI	015	B	1						1								
21 Sep	S30W13	050	0090	10	CSO	019	B															
22 Sep	S29W27	051	0070	09	DSO	013	B															
23 Sep	S29W40	051	0050	10	CAO	010	B															
24 Sep	S28W54	051	0030	05	CSO	005	B															
25 Sep	S27W67	051	0010	04	BXO	002	B							1								
26 Sep	S27W80	051	0000	00		000																
														1	0	0	3	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 052



**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	4			
<i>Region 8337</i>																		
16 Sep	S39E42	061	0010	04	BXO	002	B											
17 Sep	S40E28	062	0010	06	BXO	004	B											
18 Sep	S40E19	058	0040	06	CSO	004	B											
19 Sep	S39E02	061	0030	04	CRO	004	B											
20 Sep	S40W11	061	0020	07	BXO	004	B											
21 Sep	S40W22	059	0010	07	BXO	006	B											
22 Sep	S40W35	059																
23 Sep	S36W50	061	0000	00	AXX	001	A					1						
24 Sep	S36W63	061																
25 Sep	S36W76	061																
26 Sep	S36W89	061																

0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 061

*Region 8338*

16 Sep	N31E81	022	0090	02	HSX	001	A											
17 Sep	N33E68	022	0070	02	HAX	001	A											
18 Sep	N32E57	020	0130	02	HAX	001	A											
19 Sep	N31E43	020	0070	02	HSX	001	A											
20 Sep	N31E31	019	0050	01	HSX	001	A											
21 Sep	N32E18	019	0060	04	CSO	003	B											
22 Sep	N32E05	019	0070	03	HSX	001	A											
23 Sep	N32W08	019	0060	02	HAX	001	A											
24 Sep	N32W21	018	0060	02	HSX	001	A											
25 Sep	N32W32	016	0060	03	HSX	001	A											
26 Sep	N32W45	016	0070	02	HSX	001	A											
27 Sep	N31W58	016	0070	02	HSX	001	A											

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 019





**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 8339</i>																		
17 Sep	S17E42	048	0010	04	BXO	003	B											
18 Sep	S16E30	047	0020	06	CRO	007	B					5						
19 Sep	S17E16	047	0050	07	CSO	007	B					1						
20 Sep	S16E01	049	0050	10	CSO	007	B											
21 Sep	S16W15	052	0050	01	HAX	001	A											
22 Sep	S16W25	049	0050	12	ESO	010	B											
23 Sep	S16W38	049	0030	13	CRO	004	B											
24 Sep	S16W56	055	0000	00	AXX	001	A											
25 Sep	S16W69	053																
26 Sep	S14W71	042	0080	05	BXO	004	B	1				3						
27 Sep	S15W84	042	0080	07	DSO	003	B	1				2						
										2	0	0	11	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 049

*Region 8340*

17 Sep	N20E76	014	0150	04	HHX	001	A											
18 Sep	N22E64	013	0360	08	DKO	008	B											
19 Sep	N19E50	013	0470	08	CKO	012	B											
20 Sep	N19E38	012	0490	07	DKO	011	B		1									
21 Sep	N19E25	012	0540	09	DKO	021	B	2				2	1					
22 Sep	N20E11	013	0380	10	DAI	028	B	1				3						
23 Sep	N20W02	013	0460	12	EKO	031	B	1	1			3				1		
24 Sep	N20W15	012	0520	10	DKO	025	BGD	1				5						
25 Sep	N20W27	011	0390	08	DKI	018	BG	1				1						
26 Sep	N21W40	011	0350	09	CKI	018	B	1				4						
27 Sep	N19W54	012	0300	06	CKO	008	B	3				4	2					
										10	2	0	22	3	0	1	0	

Still on Disk.

Absolute heliographic longitude: 013

*Region 8341*

19 Sep	N19W58	121	0020	04	BXO	002	B											
20 Sep	N19W71	121																
21 Sep	N19W84	121																
										0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 121



**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 8342*

19 Sep	N17E38	025	0010	00	AXX	001	A											
20 Sep	N18E25	025	0040	05	CSO	008	B											4
21 Sep	N18E13	024	0100	07	DSO	011	B											
22 Sep	N18E00	024	0070	08	DAO	008	B											
23 Sep	N18W16	027	0070	08	CSO	004	B											
24 Sep	N18W28	025	0060	09	CSO	003	B											
25 Sep	N19W46	030	0060	03	HSX	001	A											
26 Sep	N18W61	032	0080	02	HSX	001	A											
27 Sep	N17W72	030	0070	07	DSO	002	B											
																		0 0 0 4 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 024

*Region 8343*

19 Sep	N42E65	358	0010	00	AXX	002	B											1
20 Sep	N37E47	003	0000	00	AXX	001	A											
21 Sep	N38E38	359	0010	07	BXO	006	B											2
22 Sep	N39E25	359	0020	07	CSO	008	B											1
23 Sep	N38E13	358	0010	07	BXO	008	B											2
24 Sep	N38E00	357	0010	06	BXO	008	B											
25 Sep	N39W10	354	0020	07	CRO	007	B											
26 Sep	N41W21	352	0000	02	BXO	002	B											
27 Sep	N41W34	352																
																		0 0 0 6 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 357

*Region 8344*

22 Sep	S20E22	002	0010	05	BXO	005	B											
23 Sep	S20E09	002	0060	09	DAO	012	B	2					2					
24 Sep	S20W04	001	0070	10	DSO	014	BGD	1							1			
25 Sep	S18W16	360	0070	16	FSI	012	BG	1							2			
26 Sep	S20W31	002	0070	07	CSO	007	B											
27 Sep	S21W48	006	0030	01	HSX	001	A											
																		4 0 0 4 1 0 0 0

Still on Disk.

Absolute heliographic longitude: 001



**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 8345*

24 Sep	N22W06	003	0010	05	BXO	004	B											
25 Sep	N22W19	003																
26 Sep	N22W32	003																
27 Sep	N22W45	003																
												0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 003

*Region 8346*

24 Sep	S30E41	316	0040	09	CSO	005	B														
25 Sep	S30E27	317	0070	10	CSO	007	B	1			2										
26 Sep	S28E13	318	0120	10	DAO	012	B				1										
27 Sep	S28E01	317	0070	12	ESO	012	B	1			1	1									
														2	0	0	4	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 317



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

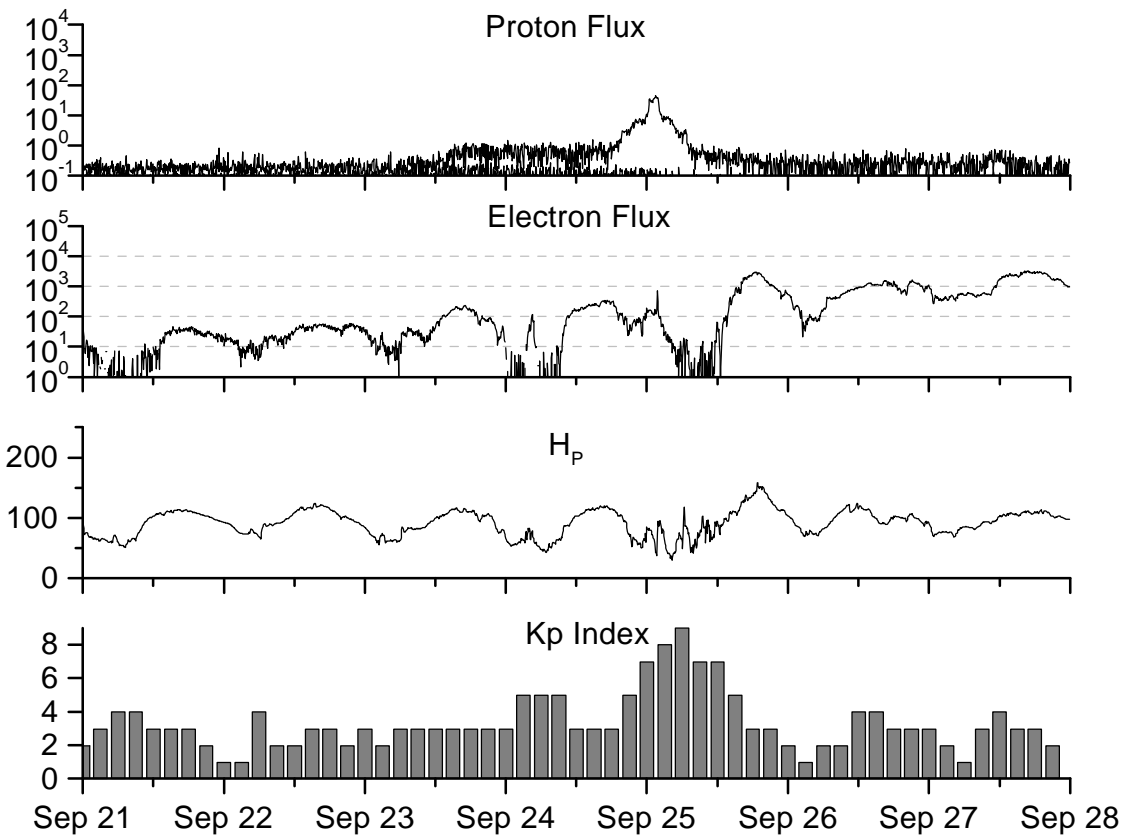
Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	**Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>1996</b>									
September	02.9	01.6	0.55	13.3	08.4	69.4	72.3	15	09.3
October	02.3	00.9	0.39	14.0	08.8	69.2	72.6	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
<b>1997</b>									
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	08.6
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
<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			109.1		13	
April	73.6	53.4	0.73			108.3		10	
May	74.3	56.3	0.76			106.7		18	
June	93.6	70.7*	0.76*			108.4*		10	
July	98.3	66.2*	0.67*			114.0*		11*	
August	118.6	91.7*	0.77*			136.0*		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 21 September 1998*

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

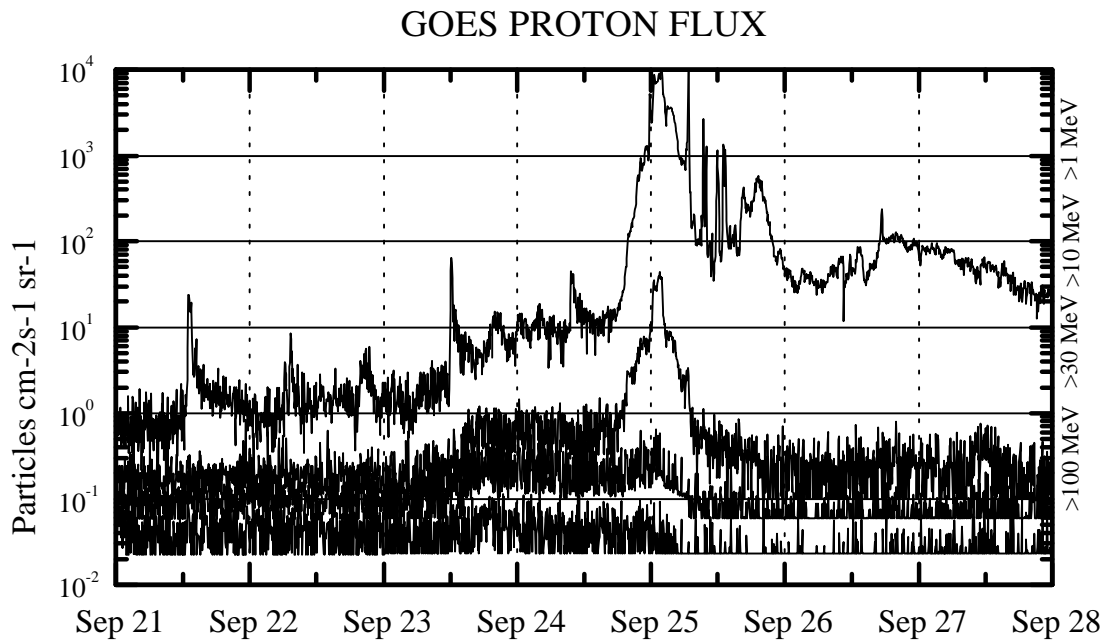
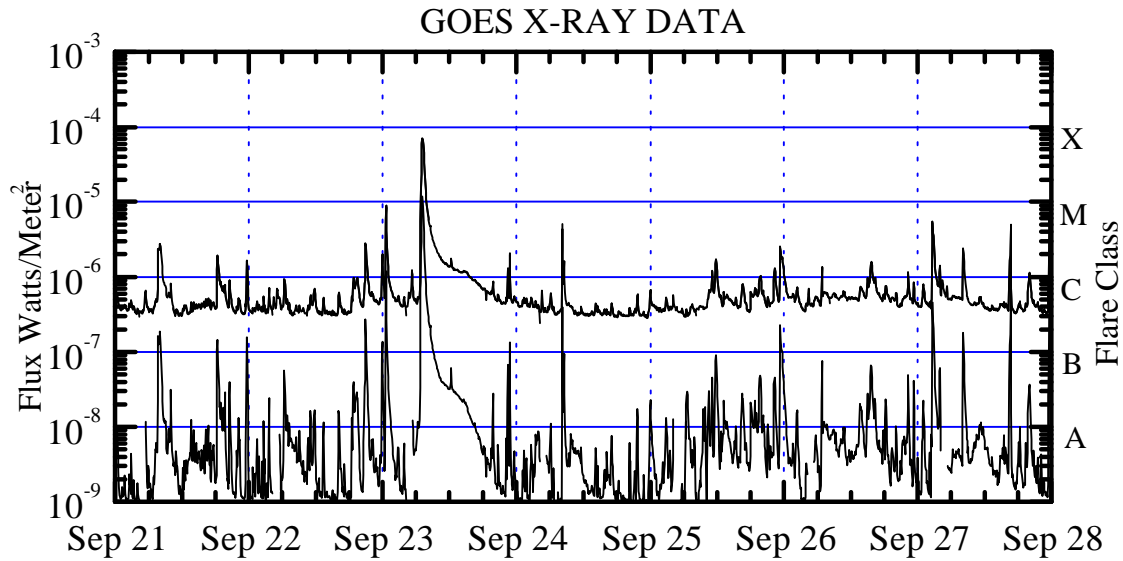
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/  $\text{cm}^2$ -sec-sr) with energies greater than 2 MeV at GOES-8.

*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.

*Kp* 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 Kp 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 Kp are "global" parameters that are applicable to a first order approximation over large areas. H<sub>parallel</sub> is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





*Weekly GOES Satellite X-ray and Proton Plots*

X-ray plot contains five minute averaged x-ray flux (watts/m<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.

