

Space Weather Highlights
25 August 1997-31 August 1997

Solar activity ranged from very low to moderate. Region 8076 (N29, L = 106, class/area Esi/280 on 29 August) produced an M1/SF flare at 29/2332UT (this was the first M-class flare since 21/2015UT May 1997). The flare was accompanied by a 130 SFU Tenflare and minor discrete frequency bursts. In addition, a coronal Moreton wave and a semi-halo coronal mass ejection were observed with this event. The coronal mass ejection appeared to be directed off the northeast limb. Region 8076 also produced isolated C-class subflare activity prior to and following the M-class flare.

Solar wind data were received from the WIND spacecraft a few hours per day. Velocities ranged from 300 - 360 km/sec through 27 August increasing to 460 km/sec during 28 - 29 August. Velocities varied 360 - 430 km/sec for the rest of the period. Particle densities ranged 04 - 12 p/cc during most of the period, but increased to near 30 p/cc on 27 - 28 August. Bz hovered around zero through most of the period varying plus 08 to minus 08 nT (GSM), becoming more variable on 27 - 28 August ranging from plus 07 to minus 14 nT. Solar sector orientation was toward (phi angle near 315 degrees) during 26 - 27 August becoming away (phi angle near 135 degrees) during 28 - 30 August. Solar sector structure was not readily discernible during the remaining days.

There were no significant proton enhancements observed at satellite altitudes.

The greater than 2 MeV electron flux at geosynchronous altitude reached high levels during 30 - 31 August.

The geomagnetic field was quiet at all latitudes through 17 August. Activity increased during 28 - 29 August with active to isolated minor storm conditions observed at all latitudes. The increased activity may have been due to a high-speed, low-density coronal hole wind stream. Activity declined to mostly quiet levels for the remainder of the summary period.

Space Weather Forecast
03 September 1997 - 29 September 1997

Solar activity is expected to be very low to low. Best chances for low activity occur through 06 September and again during 20 - 29 September with the return of (old) Region 8076. There is also an outside chance for an isolated, low-level M-class flare during these intervals.

No significant proton enhancements are expected at satellite altitudes.

The greater than 2 MeV electron flux at geosynchronous altitudes is expected to be normal to moderate during most of the period. However, high fluxes are expected to occur during 26 - 27 September.

The geomagnetic field is expected to be predominately quiet to unsettled. However, increased activity is expected during 24 - 25 September due to a recurrent high speed coronal hole windstream.



Daily Solar Data

Date	Radio Flux	Sun spot No.	Sunspot Area	X-ray Background	X-ray Flux			Flares				
	10.7 cm		(10 ⁶ hemi.)		C	M	X	S	1	2	3	4
25 August	82	32	90	A7.2	2	0	0	3	0	0	0	0
26 August	84	30	160	B1.6	2	0	0	4	0	0	0	0
27 August	82	33	110	A8.7	0	0	0	1	0	0	0	0
28 August	91	61	220	B1.4	0	0	0	3	0	0	0	0
29 August	92	67	280	B2.3	2	1	0	5	0	0	0	0
30 August	92	69	220	B8.6	1	0	0	3	0	0	0	0
31 August	96	80	240	B1.6	3	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
25 August	5.7E+5	1.9E+4	4.7E+3		3.0E+6	
26 August	5.4E+5	1.9E+4	4.8E+3		2.7E+6	
27 August	7.1E+5	1.9E+4	4.7E+3		2.8E+6	
28 August	3.3E+5	1.8E+4	4.4E+3		9.4E+5	
29 August	1.2E+6	1.8E+4	4.1E+3		7.0E+6	
30 August	7.5E+5	1.8E+4	4.1E+3		3.6E+7	
31 August	5.6E+5	1.7E+4	3.9E+3		4.6E+7	

Daily Geomagnetic Data

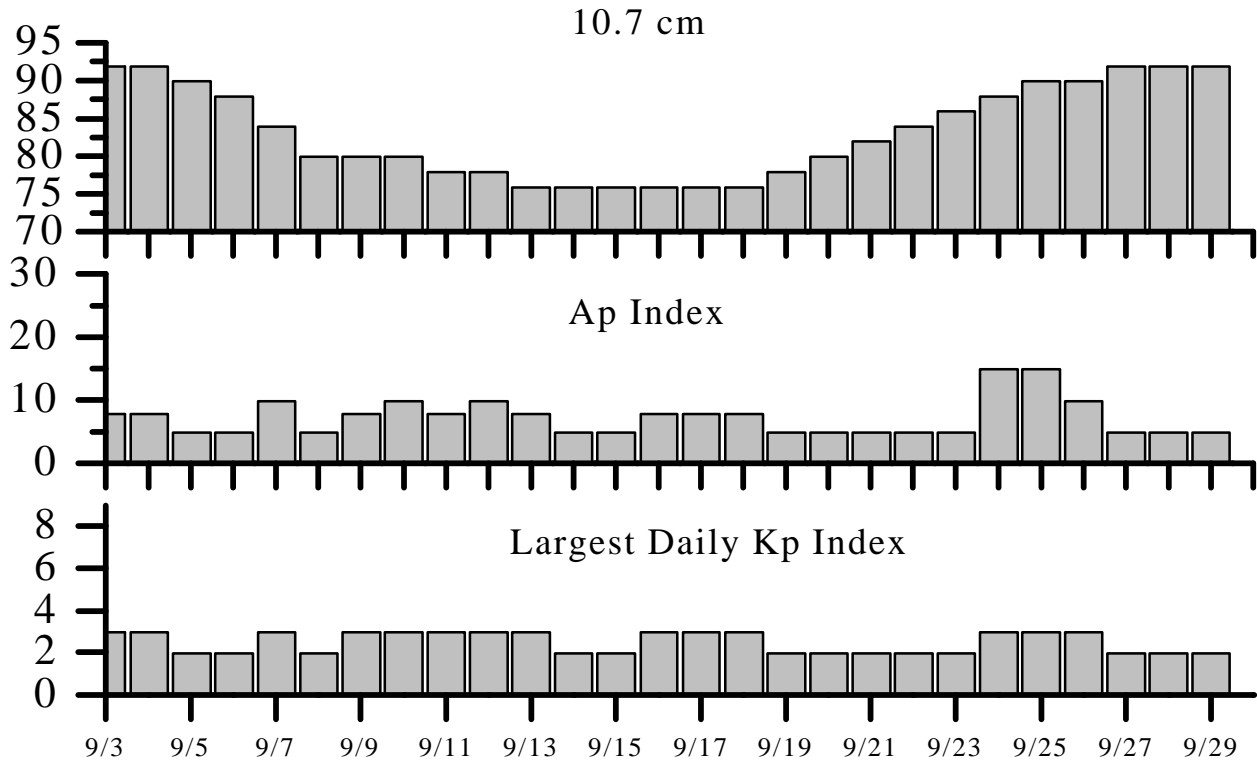
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
25 August	4	2-2-1-1-0-0-1-1	0	1-0-1-0-0-0-0-0	4	2-1-1-2-0-1-2-1
26 August	3	1-0-1-1-1-1-1-1	0	0-0-0-0-0-0-0-0	3	0-0-1-0-1-2-1-1
27 August	4	1-1-2-1-1-1-1-2	0	0-0-1-0-0-0-0-0	5	0-1-3-1-1-2-1-2
28 August	16	2-4-5-2-1-2-3-3	12	2-4-5-1-0-2-1-1	16	2-4-5-3-2-2-3-3
29 August	15	1-3-3-4-3-3-3-3	20	1-1-3-6-4-4-2-1	15	1-3-3-5-3-3-3-3
30 August	12	2-3-2-3-3-3-2-3	6	1-2-0-3-4-0-1-0	11	2-3-2-3-3-2-3-3
31 August	5	1-2-1-2-2-1-2-1	0	1-0-0-1-0-0-0-0	4	1-1-1-1-1-1-1-1



Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
26 Aug 016	245MHz Radio Noise Storm	25 Aug 1637
28 Aug 900	K=4 observed	28 Aug 06-09
29 Aug 0015	245 MHz Radio Burst	29 Aug 2350
29 Aug 1200	K=4 observed	29 Aug 09-12
29 Aug 2349	2695MHz Radio Burst	29 Aug 2331
30 Aug 0015	245 MHz Radio Burst	29 Aug 2350
30 Aug 0600	K=4 observed	30 Aug 03-00
30 Aug 1814	>2MeV Electron Event ≥ 1000 pfu	30 Aug 1658
31 Aug 0040	245MHz Radio Burst	30 Aug 0007
31 Aug 0043	245MHz Radio Noise Storm	30 Aug 0017





Twenty-seven Day Outlook

Radio Flux			Planetary			Largest		
Date	10.7 cm	A Index	Kp Index	Date	10.7 cm	A Index	Kp Index	
03 Sep	92	8	3	17 Sep	76	8	3	
04	92	8	3	18	76	5	3	
05	90	5	2	19	78	5	2	
06	88	5	2	20	80	5	2	
07	84	10	3	21	82	5	2	
08	80	5	2	22	84	5	2	
09	80	8	3	23	86	5	2	
10	80	10	3	24	88	15	3	
11	78	8	3	25	90	15	3	
12	78	10	3	26	90	10	3	
13	76	8	3	27	92	5	2	
14	76	5	2	28	92	5	2	
15	76	5	2	29	92	5	2	
16	76	8	3					



Energetic Event

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½	Class	Integ Flux	Imp Brtns	Location		Rgn #	Radio Flux		Intensity	
			Max				Lat	CMD		245	2695	II	IV
29 Aug	2256	2332	2354	M1.4	.02	SF	N30E17		8076	200	130		

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical Location		Rgn #
	Begin	Max	End			Lat	CMD	
25 August	0149	0154	0158	B1.7				
	0248	0251	0254	B1.2				
	B1407	U1408	A1413		SF	N30E82		
	1519	1523	1543	C1.2	SF	N28E69		8076
	1639	1655	1714	C1.2	SF	N27E69		8076
	2226	2231	2237	B4.2				
26 August	0003	0007	0009	B2.6				
	0054	0054	0101	C4.0	SF	N21E57		8076
	0505	0508	0512	B2.2				
	B0531	U0532	0614	C4.5	SF	N26E55		8076
	1218	1222	1227	B2.3				
	1958	2001	2005	B5.3				
	2010	2013	2042	B8.8	SF	N29E54		8076
	2308	2310	2316		SF	N29E53		8076
27 August	0150	0155	0158	B1.8				
	0224	0227	0229	B1.7				
	0308	0311	0313	B1.4				
	1514	1517	1523		SF	S23E38		8077
	1623	1630	1638	B1.9				
28 August	2119	2124	2129	B1.5				
	0408	0411	0413	B4.3				
	0715	0720	0728	B3.5				
	1053	1054	1059		SF	N30E36		8076
	1121	1124	1133		SF	N27E32		8076
	1211	1215	1225	B6.2				
	1618	1619	1623		SF	N27E31		8076
	2028	2045	2100	B9.3				
	0417	0428	0438	C4.0				
29 August	0617	0619	0625	B3.1	SF	N29E25		8076
	0839	0844	0849	B5.2				
	0921	U0925	A0945	B6.7	SF	N31E24		8076
	1513	1513	1517		SF	N31E22		8076
	1727	1729	1754	C1.0	SF	N30E20		8076
	B2314	U2317	0047	M1.4	SF	N30E17		8076
30 August	0548	0552	0555	B4.2				
	0723	0725	0733	B5.7	SF	N24E10		8076
	1035	1042	1059	B5.5				



Flare List – continued.

Date	Begin	Time		Class.	X-ray Brtns	Optical		Rgn
		Max	End			Imp / Lat CMD	Location #	
30 August		1115	1121	1133	C1.9	SF	N23E03	8076
		1509	1525	1536	B6.3	SF	N28E05	8076
		1709	1715	1720	B5.1			
31 August		1129	1133	1138	C2.7	SF	N29W05	8076
		1350	1351	1358		SF	N27W14	8076
		1449	1449	1452		SF	N29W06	8076
		1504	1505	1508		SF	N29W07	8076
		1652	1656	1705		SF	N27W11	8076
		1910	1914	1920	C1.2	SF	N29W10	8076
		1924	1925	1931		SF	N29W12	8076
		2222	2223	2232	C1.4	SF	N30W12	8076
		2237	2241	2247	B4.5			

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

Region 8075

15 Aug	N29E46	256	0000	00	AXX	001	A								
16 Aug	N29E31	258	0010	00	AXX	001	A								
17 Aug	N29E18	258													
18 Aug	N29E05	258													
19 Aug	N29W08	258													
20 Aug	N29W21	258													
21 Aug	N29W34	258													
22 Aug	N29W47	258													
23 Aug	N29W60	258													
24 Aug	N29W73	258													
25 Aug	N29W86	258													

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 258



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 8076</i>																	
25 Aug	N29E63	107	0080	05	CRO	009	B	2			3						
26 Aug	N30E51	106	0160	07	DAI	009	B	2			4						
27 Aug	N29E37	107	0100	08	CSO	011	B										
28 Aug	N29E24	107	0200	10	DSI	025	BG				3						
29 Aug	N28E11	107	0280	13	ESI	032	BG	1			5						
30 Aug	N28W01	105	0200	15	ESI	029	BG	1			3						
31 Aug	N29W15	106	0210	15	ESI	032	B	3			8						
								9	0	0	26	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 105

<i>Region 8077</i>																	
25 Aug	S23E59	111	0010	03	BXO	003	B										
26 Aug	S22E45	112	0000	00	AXX	001	A										
27 Aug	S22E32	112									1						
28 Aug	S22E19	112															
29 Aug	S22E06	112															
30 Aug	S22W07	112															
31 Aug	S22W20	112															
								0	0	0	1	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 112

<i>Region 8078</i>																	
27 Aug	N17E26	118	0010	01	AXX	002	A										
28 Aug	N16E12	119	0010	02	AXX	003	A										
29 Aug	N21E05	113	0000	00	AXX	002	A										
30 Aug	N20W05	109	0010	03	BXO	005	B										
31 Aug	N21W20	111	0010	03	BXO	004	B										
								0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 113

<i>Region 8079</i>																	
28 Aug	N15E10	121	0010	02	AXX	003	A										
29 Aug	N15W03	121	0000	02	AXX	003	A										
30 Aug	N15W16	121															
31 Aug	N15W29	121															
								0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 121



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 8080

30 Aug	N18W31	135	0010	04	BXO	005	B											
31 Aug	N18W43	134	0000	01	AXX	003	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 135

Region 8081

31 Aug	N34E72	019	0020	01	HRX	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 019



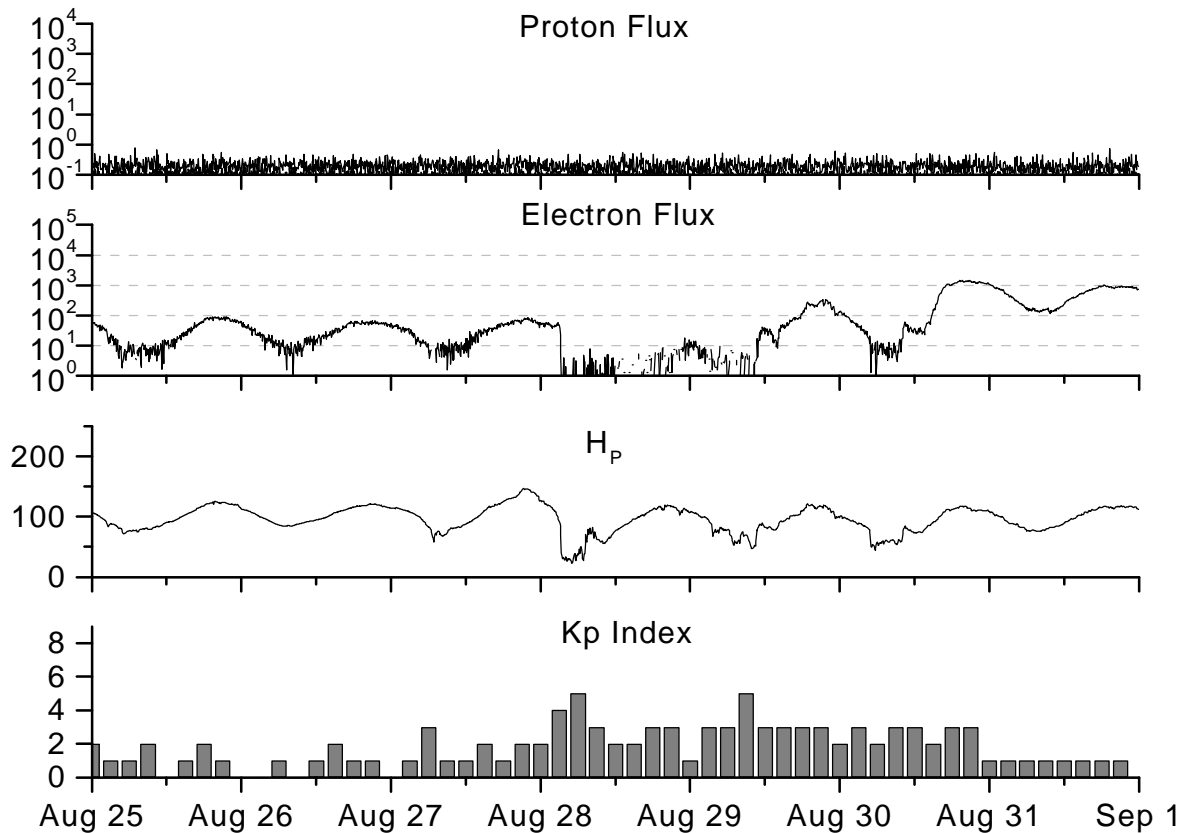
**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		**Penticton	Smooth	Planetary	Smooth
	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
1995									
September	16.5	11.8	0.72	22.0	13.4	72.0	74.8	13	11.8
October	31.6	21.1	0.67	19.7	12.1	77.9	73.8	16	11.4
November	15.7	09.0	0.57	18.5	11.4	74.2	73.2	09	10.7
December	16.2	10.0	0.62	17.6	10.8	72.6	72.8	09	10.0
1996									
January	17.6	11.5	0.55	16.8	10.4	74.5	72.4	09	09.8
February	09.1	04.4	0.48	16.2	10.1	71.5	72.2	10	09.8
March	12.1	09.2	0.76	15.4	09.7	72.7	72.1	11	09.9
April	08.5	04.8	0.60	13.6	08.5	69.3	71.6	11	09.7
May	11.8	05.5	0.47	12.9	08.0	72.1	71.4	07	09.5
June	18.8	11.8	0.63	13.5	08.5	69.6	71.8	05	09.4
July	13.2	08.2	0.67	13.4	08.4*	71.2	72.0	07	09.3
August	20.5	14.4	0.68	13.1	08.3*	72.4	72.1	09	09.4
September	02.9	01.6	0.62	13.3	08.5*	69.4	72.3	15	09.3
October	02.3	00.9	0.78	14.0	08.9*	69.2	72.6	13	09.1
November	26.7	17.9	0.72	15.4	09.9*	78.7	73.0	08	09.1
December	21.1	13.3	0.60	16.2	10.5*	77.8	73.3	07	09.3
1997									
January	09.0	06.5*	0.72*	16.5	10.6*	74.0	73.4*	09	09.3*
February	11.3	07.6*	0.67*	17.4	11.2*	73.8	73.6*	11	09.2*
March	14.4	08.8*	0.61*			73.5		08	
April	24.5	15.8*	0.64*			74.5		10	
May	28.6	18.5*	0.64*			74.6		08	
June	22.1	13.1*	0.59*			71.7		07	
July	17.0	10.5*	0.62*			71.1*		06*	
August	36.7	24.7*	0.67*			76.8*		08*	

*Preliminary estimates.

The lowest smoothed sunspot indices number for Cycle 21, RI = 12.3, occurred September 1986. 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 25 Aug 1997

Protons plot contains the five minute averaged integral proton flux (protons/ $\text{cm}^2\text{-sec-sr}$) as measured by GOES-9 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

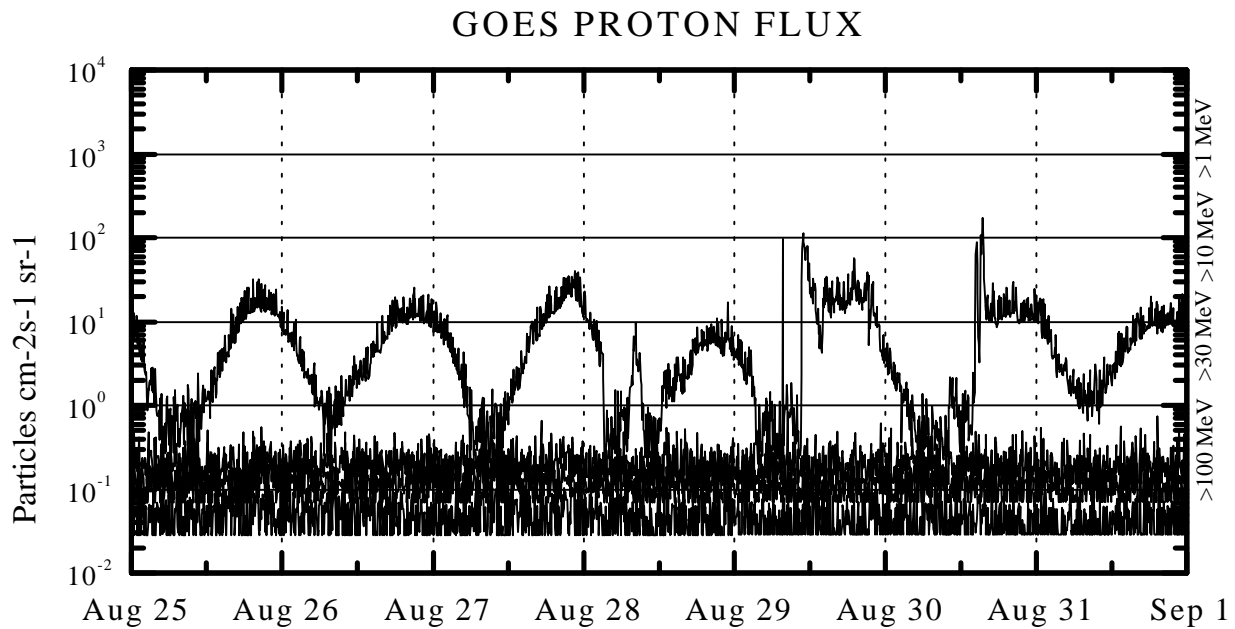
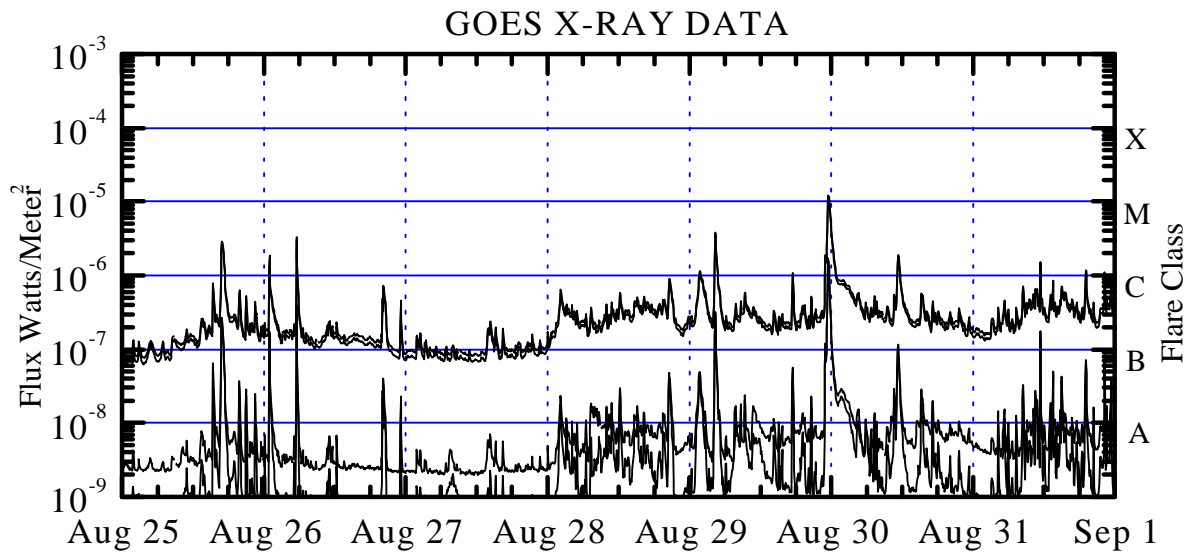
Electrons plot contains the five minute averaged integral electron flux (electrons/ $\text{cm}^2\text{-sec-sr}$) with energies greater than 2 MeV at GOES-9.

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. 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_{parallel} is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



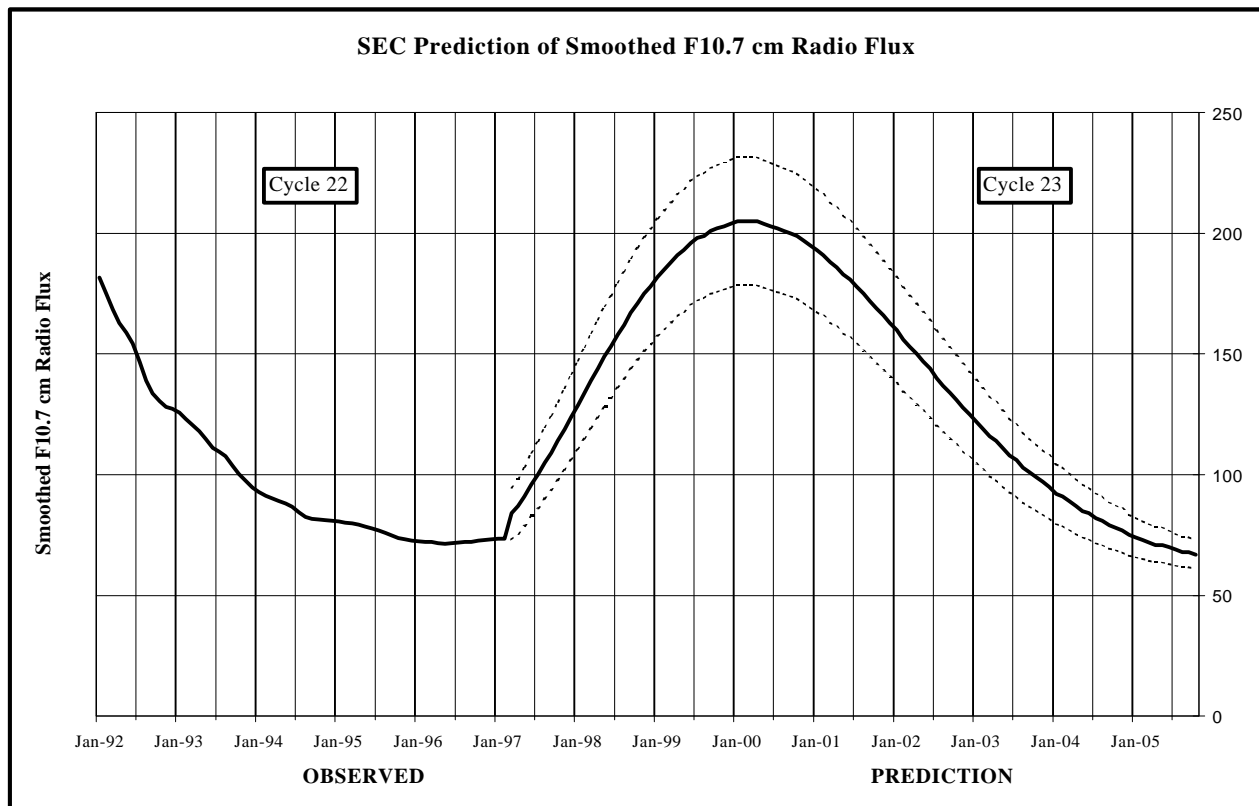


Weekly GOES Satellite X-ray and Proton Plots

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.

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.



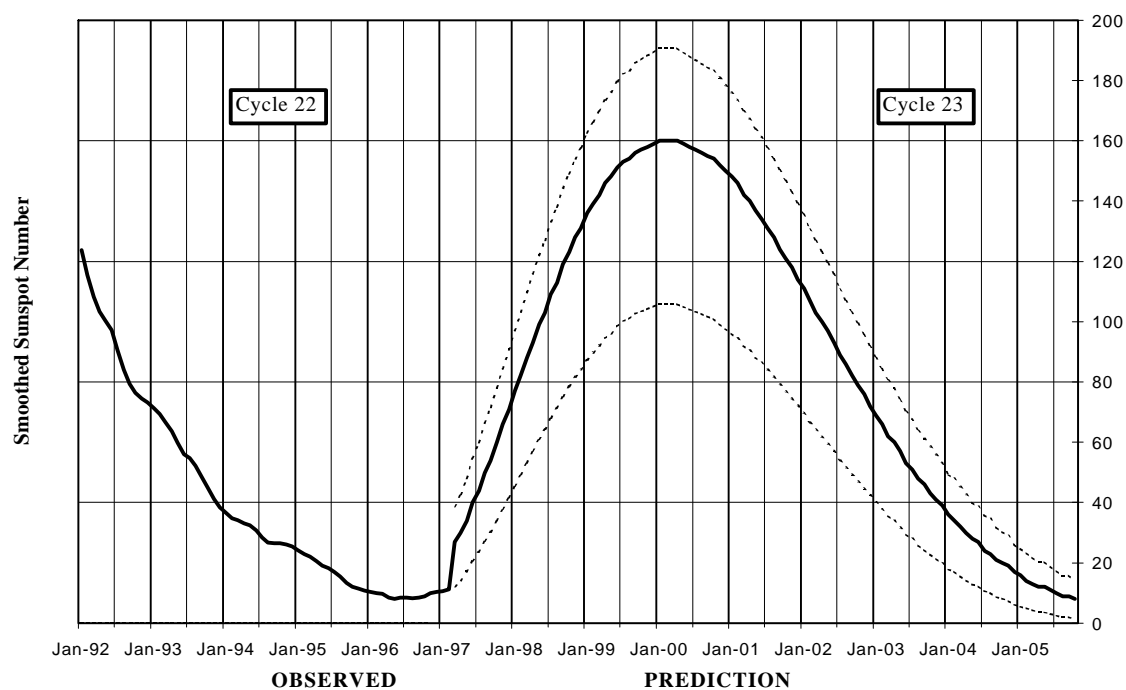


SEC Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	72 (***)	72 (***)	72 (***)	72 (***)	72 (***)	71 (***)	72 (***)	72 (***)	72 (***)	73 (***)	73 (***)	73 (***)
1997	73 (***)	74 (***)	84 (11)	87 (11)	91 (12)	96 (13)	100 (14)	105 (15)	109 (15)	114 (16)	119 (17)	124 (18)
1998	129 (18)	134 (19)	139 (20)	144 (20)	149 (21)	153 (21)	158 (22)	162 (22)	167 (23)	171 (23)	175 (23)	178 (24)
1999	182 (24)	185 (25)	188 (25)	191 (25)	193 (25)	196 (26)	198 (26)	199 (26)	201 (27)	202 (27)	203 (28)	204 (28)
2000	205 (30)	205 (30)	205 (30)	205 (30)	204 (30)	203 (28)	202 (27)	201 (27)	200 (26)	199 (26)	197 (26)	195 (26)
2001	193 (25)	292 (25)	188 (25)	186 (25)	183 (24)	181 (24)	178 (24)	175 (24)	172 (23)	169 (23)	166 (23)	163 (22)
2002	160 (22)	156 (22)	153 (21)	150 (21)	147 (21)	144 (21)	140 (20)	137 (20)	134 (19)	131 (19)	128 (18)	125 (18)
2003	122 (17)	119 (17)	116 (17)	114 (16)	111 (16)	108 (15)	106 (15)	103 (14)	101 (14)	99 (14)	97 (13)	95 (13)
2004	92 (12)	91 (12)	89 (12)	87 (11)	85 (11)	84 (11)	82 (10)	81 (10)	79 (10)	78 (9)	77 (9)	75 (9)
2005	74 (8)	73 (8)	72 (8)	71 (7)	71 (7)	70 (7)	69 (7)	68 (6)	68 (6)	67 (6)	** (***)	** (***)



SEC Prediction of Smoothed Sunspot Number

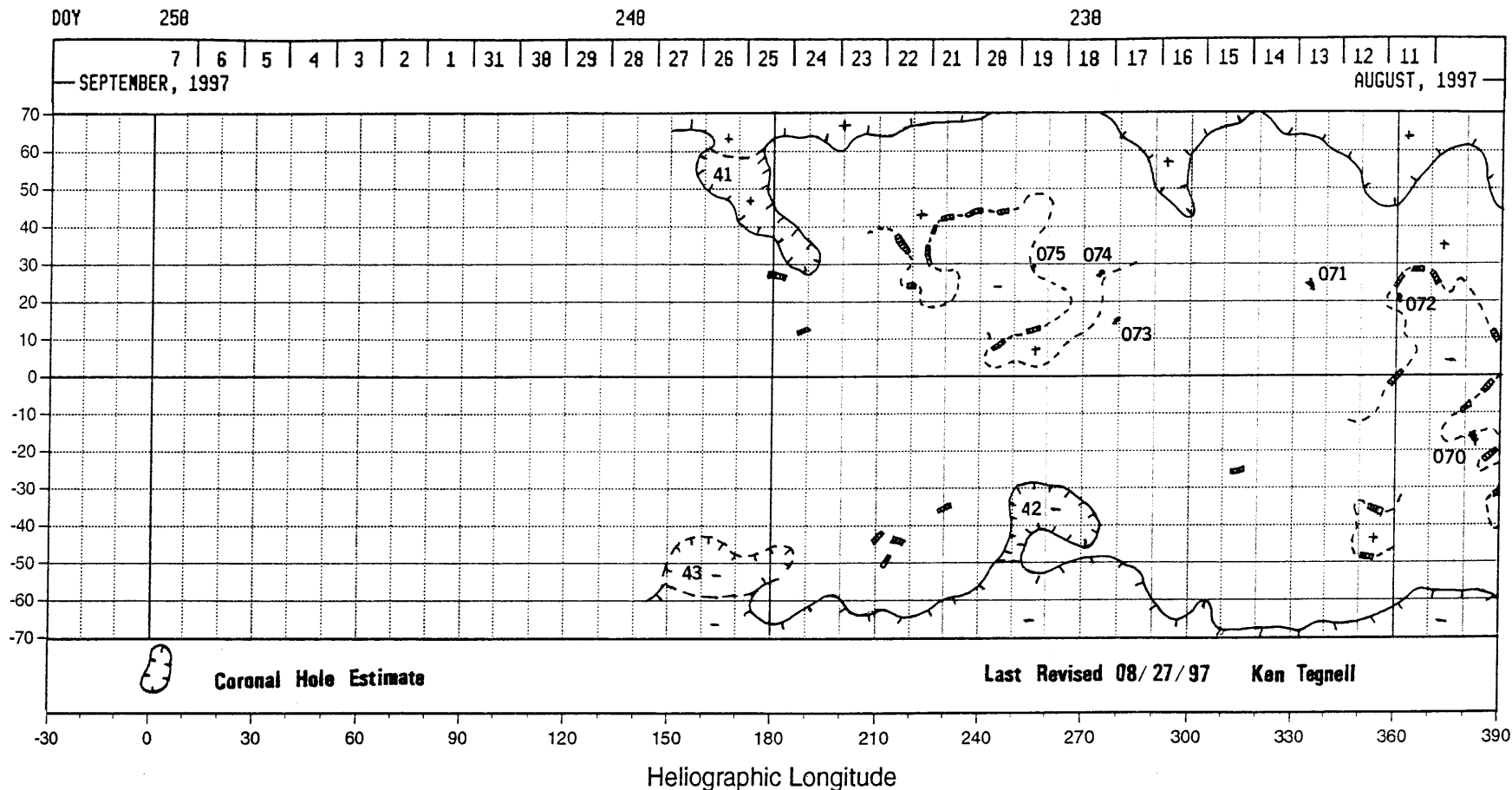


SEC Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	10 (***)	10 (***)	10 (***)	9 (***)	8 (***)	9 (***)	9 (***)	8 (***)	9 (***)	9 (***)	10 (***)	11 (***)
1997	11 (***)	11 (***)	27 (12)	30 (13)	34 (14)	40 (15)	44 (16)	50 (17)	54 (18)	60 (19)	66 (20)	71 (20)
1998	77 (21)	82 (22)	88 (22)	93 (23)	99 (24)	103 (24)	109 (25)	113 (25)	119 (26)	123 (26)	128 (27)	131 (27)
1999	136 (27)	139 (28)	142 (28)	146 (29)	148 (29)	151 (29)	153 (29)	154 (29)	156 (29)	157 (29)	158 (29)	159 (29)
2000	160 (30)	160 (30)	160 (30)	160 (30)	159 (29)	158 (29)	157 (29)	156 (29)	155 (29)	154 (29)	152 (29)	150 (28)
2001	148 (28)	146 (28)	142 (28)	140 (27)	137 (27)	134 (27)	131 (27)	128 (26)	124 (26)	121 (26)	118 (25)	114 (25)
2002	111 (24)	107 (24)	103 (24)	100 (23)	97 (23)	93 (22)	89 (22)	86 (21)	82 (21)	79 (21)	76 (20)	72 (20)
2003	69 (19)	66 (19)	62 (18)	60 (18)	57 (17)	53 (17)	51 (17)	48 (16)	46 (16)	43 (15)	41 (15)	39 (14)
2004	36 (14)	34 (14)	32 (13)	30 (13)	28 (12)	27 (12)	24 (11)	23 (11)	21 (11)	20 (10)	19 (10)	17 (9)
2005	16 (9)	14 (9)	13 (8)	12 (8)	12 (8)	11 (8)	10 (7)	9 (7)	9 (7)	8 (6)	** (***)	** (***)



Carrington Rotation 1926



H-alpha Synoptic Chart - a partial and preliminary map of the sun in absolute heliographic coordinates (solar latitude and longitude). The Carrington Rotation serial number appearing at the top of the chart is a continuation of the sequence begun by R. Carrington on 09 November 1852. Dates along the top of the chart are the times of central meridian passage of the solar longitudes directly below those dates. Features on the map are as follows: filaments (cross-hatched areas), filament channels (solid lines outside an active area), plage corridors (solid lines inside an active area), 01 and estimated neutral lines (dashed lines) are lines of magnetic polarity change (neutral lines), plages (dotted areas whose dot density is roughly equal to brightness), strong active regions (stippled areas overlaid with diagonal lines; source of x-ray flares class M2 or greater, or two or more class M1 flares), large sunspots (large dots), coronal holes (solid lines with tick marks directed toward center of coronal hole, from 1083 nm spectroheliograms), SWO region number showing the last 3 digits of a 4-digit number.

