

## **Space Weather Highlights 01 - 07 October 2001**

**SWO PRF 1362  
09 October 2001**

Solar activity reached high levels for the fifth consecutive week. The period began with activity at high levels due to an M9 X-ray flare at 01/0515 UTC. The flare site was near the southwest limb in the vicinity of Region 9628 (S18, L = 292, class/area Fkc/880 on 24 September), which was crossing the west limb at the time of the flare. This region was large and magnetically complex throughout its passage. The same was true of Region 9632 (S19, L = 272, class/area Dki/790 on 24 September), which rotated out of view on 02 October. Both regions had a history of isolated major flare production. With the departure of these regions, activity dropped to mostly low levels. However, isolated low-level, optically uncorrelated M-class flares occurred on 02 and 06 October (for flare times and magnitudes, please refer to the Energetic Events and Optical Flares lists). By the close of the period, the disk was populated by mostly small, simply-structured sunspot regions.

Solar Wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the period. SWEPAM data (speed, density, and temperature) were unreliable during 02/0130 - 1300 UTC due to proton contamination. Multiple CME passages occurred during 01 - 04 October. The most significant effects occurred on 03 October with velocities as high as 600 km/sec along with a sustained period of southward IMF Bz with maximum deflections to minus 23 nT (GSM). CME effects subsided during the latter half of 04 October.

A greater than 10 MeV proton event was associated with the M9 X-ray flare of 01 October. The greater than 10 MeV flux began to increase at around 01/1145 UTC, then reached a peak of 2360 pfu at 02/0810 UTC. The event ended at 05/0330 UTC, but fluxes remained enhanced for the rest of the period.

The greater than 2 MeV electron flux at geosynchronous orbit ranged from normal to moderate levels.

The geomagnetic field was disturbed during 01 - 04 October due to multiple CME passages. Unsettled to major storm levels occurred during this period with brief severe storm conditions detected at high latitudes. Field activity declined to mostly quiet to unsettled levels after 04/1800 UTC.

## **Space Weather Outlook 10 October - 05 November 2001**

Solar activity is expected to range from low to moderate levels. Isolated M-class flares are expected. There will be an increased chance for isolated major flare activity during 15 - 30 October with the return of old Regions 9628 and 9632.

There will be a slight chance for a proton event during 15 - 30 October with the return of old Regions 9628 and 9632.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels during most of the period. However, high flux levels will be possible around 28 October.

The geomagnetic field is expected to be at active to minor storm levels during 11 - 13 October due to an expected CME passage (a halo CME was observed on 09 October). Active conditions will be possible during 26 - 27 October due to coronal hole effects. Quiet to unsettled conditions are expected during the remainder of the period.



### *Daily Solar Data*

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
01 October	217	289	2160	C1.6	2	2	0	5	0	0	0	0
02 October	201	236	1160	C2.5	6	2	0	5	0	0	0	0
03 October	192	196	950	C2.2	7	0	0	9	1	0	0	0
04 October	187	231	1040	C1.2	10	0	0	8	0	0	0	0
05 October	177	160	950	C1.2	7	0	0	5	1	0	0	0
06 October	180	181	1110	C1.5	2	1	0	1	1	0	0	0
07 October	173	154	920	B7.5	7	0	0	5	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
	01 October	4.6E+7	1.1E+7	4.0E+3		5.8E+5
02 October	1.9E+8	5.6E+7	5.0E+3		4.0E+6	
03 October	6.3E+7	6.8E+6	1.8E+3		7.4E+6	
04 October	1.5E+7	1.6E+6	1.9E+3		4.7E+6	
05 October	7.9E+6	6.0E+5	1.8E+3		9.0E+6	
06 October	4.0E+6	4.2E+5	2.2E+3		5.9E+6	
07 October	3.1E+6	5.0E+5	2.8E+3		1.0E+7	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	01 October	25	4-4-4-4-2-2-5	51	4-5-6-6-6-5-3-4	50
02 October	24	3-4-4-4-3-3-5	82	3-4-8-6-4-7-6-5	43	4-5-5-5-4-4-5-5
03 October	26	3-2-4-4-5-4-4-4	58	5-3-5-7-6-6-4-4	53	4-3-5-7-6-6-4-4
04 October	9	3-1-3-3-2-2-2-1	36	4-1-6-5-5-3-3-5	19	4-1-5-4-3-4-3-2
05 October	10	1-1-1-3-3-3-3-2	*	1-0-1-4-*-2-3-1	9	1-1-1-3-2-3-3-2
06 October	6	2-3-2-2-1-1-1-1	11	1-1-3-5-3-0-0-0	8	2-2-2-2-3-2-2-2
07 October	1	0-0-0-0-2-0-0-1	1	1-0-0-1-0-0-0-1	4	0-0-0-1-2-2-2-2

### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
01 Oct 0010	1 - 245 MHz Burst	30 Sep
01 Oct 0010	1 - 245 Radio Noise Storm	30 Sep
01 Oct 0047	K= 5 Warning	01 Oct 0100 - 1500
01 Oct 0222	Proton Event >10MeV >=10pfu Warning	01 Oct 0225 - 1500
01 Oct 0310	Protons Event >10 MeV >=10pfu	01 Oct 0255
01 Oct 0527	X-Ray event M9.1	01 Oct 0515
01 Oct 0858	K= 6 Observed	01 Oct 0600 - 0900

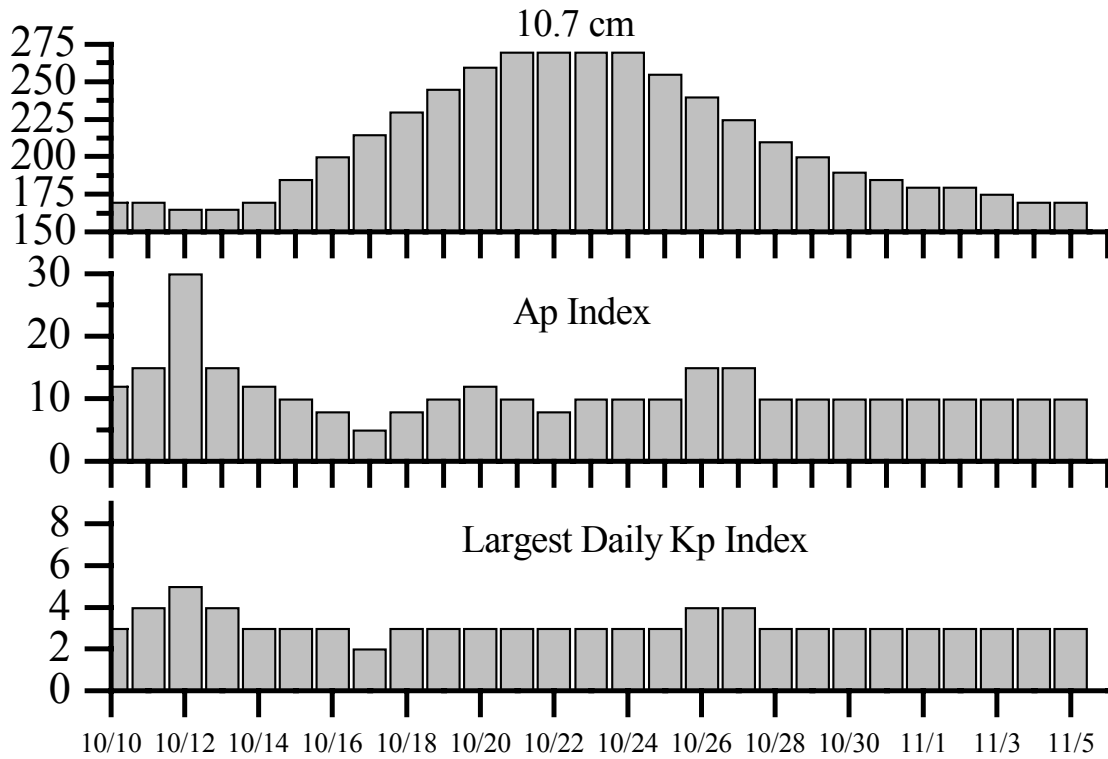


*Alerts and Warnings Issued- continued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
01 Oct 0900	A $\geq$ 20 Observed	01 Oct 0900
01 Oct 0938	A $\geq$ 30 Warning	01 Oct 0940 - 1200
01 Oct 1156	A $\geq$ 30 Observed	01 Oct 1200
01 Oct 1158	K= 5 Observed	01 Oct 0900 - 1200
01 Oct 1453	CONTINUED Proton Event $>10\text{MeV} \geq 10\text{pfu}$ Warning	01 Oct 0225 - 1500
01 Oct 1457	EXTENDED K= 4 Warning	29 Sep 1735 - 02 Oct 1500
01 Oct 1550	A $\geq$ 30 Warning	01/1551 - 02/1500 Oct
01 Oct 2159	A $\geq$ 20 Watch	02 Oct
01 Oct 2202	A $\geq$ 30 Watch	03 Oct
01 Oct 2342	K= 5 Warning	01/2345 - 02/1500 Oct
02 Oct 0000	K= 5 Observed	01 Oct 2100 - 2400
02 Oct 0013	1 - 245 MHz Burst	01 Oct
02 Oct 0013	1 - 245 Radio Noise Storm	01 Oct
02 Oct 0100	CONTINUED Proton Event $>10\text{ MeV} \geq 10\text{pfu}$	01 Oct 0255
02 Oct 0902	K= 6 Observed	02 Oct 0600 - 0900
02 Oct 1453	CONTINUED Proton Event $>10\text{MeV} \geq 10\text{pfu}$ Warning	01 Oct 0225 - 1500
02 Oct 1455	EXTENDED A $\geq$ 30 Warning	01/1551 - 02/2359 Oct
02 Oct 1456	EXTENDED K= 4 Warning	29 Sep 1735 - 02 Oct 2359
02 Oct 2304	EXTENDED K= 4 Warning	29 Sep 1735 - 03 Oct 1500
03 Oct 0100	CONTINUED Proton Event $>10\text{ MeV} \geq 10\text{pfu}$	01 Oct 0255
03 Oct 0705	Type II Radio Emission	03 Oct 0647
03 Oct 0902	ENDED A $\geq$ 30 Observed	01 Oct 1200
03 Oct 1110	K= 5 Warning	03 Oct 1115 - 1500
03 Oct 1200	K= 5 Observed	03 Oct 0900 - 1200
03 Oct 1300	A $\geq$ 30 Warning	03 Oct 1300 - 2359
03 Oct 1319	K $\geq$ 6 Warning	03 Oct 1319 - 2100
03 Oct 1450	EXTENDED K= 5 Warning	03 Oct 1115 - 2359
03 Oct 1458	CONTINUED Proton Event $>10\text{MeV} \geq 10\text{pfu}$ Warning	01/0225 - 04/1500 Oct
03 Oct 1502	A $\geq$ 30 Observed	03 Oct 1500
03 Oct 1502	K= 6 Observed	03 Oct 1200 - 1500
03 Oct 1904	CANCELLED K $\geq$ 6 Warning	03 Oct 1319 -2100
03 Oct 2324	K= 4 Warning	03/2330 - 04/1500 Oct
03 Oct 2329	EXTENDED A $\geq$ 30 Warning	03 Oct 1300 -04/1500
04 Oct 0100	CONTINUED Proton Event $>10\text{ MeV} \geq 10\text{pfu}$	01 Oct 0255
04 Oct 302	K= 4 Observed	04 Oct 0000 - 0300
04 Oct 1441	CONTINUED Proton Event $>10\text{MeV} \geq 10\text{pfu}$ Warning	01 Oct 0225 - 04/2359
04 Oct 1510	ENDED A $\geq$ 30 Observed	04 Oct 1500
04 Oct 1803	K= 4 Observed	04 Oct 1500 - 1800
04 Oct 2321	CONTINUED Proton Event $>10\text{MeV} \geq 10\text{pfu}$ Warning	01/0225 - 05/1600 Oct
05 Oct 0000	ENDED A $\geq$ 20 Observed	04 Oct 2359
05 Oct 0017	1 - 245MHz Burst	04 Oct
05 Oct 0100	CONTINUED Proton Event $>10\text{ MeV} \geq 10\text{pfu}$	01 Oct 0255
05 Oct 1517	ENDED Proton Event $>10\text{ MeV} \geq 10\text{pfu}$	05 Oct 0330
05 Oct 1801	K= 4 Observed	05 Oct 1500 - 1800



**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
10 Oct	170	12	3	24 Oct	270	10	3
11	170	15	4	25	255	10	3
12	165	30	5	26	240	15	4
13	165	15	4	27	225	15	4
14	170	12	3	28	210	10	3
15	185	10	3	29	200	10	3
16	200	8	3	30	190	10	3
17	215	5	2	31	185	10	3
18	230	8	3	01 Nov	180	10	3
19	245	10	3	02	180	10	3
20	260	12	3	03	175	10	3
21	270	10	3	04	170	10	3
22	270	8	3	05	170	10	3
23	270	10	3				



### *Energetic Events*

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp/Location		Rgn #	Radio Flux		Intensity	
						Brtns	Lat CMD		245	2695	II	IV
01 Oct	0441	0515	0523	M9.1	.086				69			
01 Oct	2340	2345	2351	M1.2	.005	SF	S16W86	9632				
02 Oct	1012	1021	1057	M1.4	.025							
02 Oct	1123	1127	1132	M1.0	.005	SF	S15E17	9641	66	28		
06 Oct	0519	0525	0533	M2.8	.020				190	35		

### *Flare List*

Date	Time			X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
01 October	0441	0515	0523	M9.1			
	0633	0639	0644		SF	S29W76	9628
	0918	0923	0934		SF	N10W24	9636
	1140	1140	1147		SF	N15W24	9636
	1407	1408	1415	C7.5	SF	S18W88	9628
	2223	2226	2228	C4.1			
02 October	2343	2344	2353	M1.2	SF	S16W86	9632
	0324	0329	0334	C5.8			
	1012	1021	1057	M1.4			
	1125	1127	A1145	M1.0	SF	S15E17	9641
	1201	1217	1228	C6.6			
	1249	1254	1259	C4.0			
	B1541	U1550	1555	C3.8	SF	N11W42	9634
	1709	1731	1820	C4.7			
	1928	1943	2026		SF	S15W11	9645
	2043	2048	2054	C2.4			
	2105	2106	2126		SF	S15W12	9645
	2212	2237	2240		SF	S16W15	9645
03 October	0049	0049	0053	C8.6	SF	S08E80	9648
	0641	0643	0651	C6.1	SF	N19W46	9636
	1233	1238	1247	C5.6	SF	S20E73	
	1409	1409	1421	C2.1	SF	S18W18	9645
	1430	1434	1441		SF	N18W26	9644
	B1708	U1708	A1718	C3.4	SF	N13W55	9634
	1852	1852	1907	C2.0	SF	S15W30	9645
	1917	1928	1939	C2.6	1F	N13W59	9634
	2014	2015	2019		SF	N15W46	9636
	2027	2032	2037		SF	N14W58	9634
04 October	0144	0149	0202	C2.2			
	0204	0209	0213	C2.7			
	0234	0234	0238		SF	N15W58	9636
	0310	0311	0318	C2.6	SF	N15W57	9636
	0411	0416	0422	C2.0			



*Flare List- continued*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
03 October	0609	0613	0615	C2.7	SF	S18W38	9645
	0634	0635	0637	C2.3	SF	S16W39	9645
	0758	0800	0802		SF	S17E65	9650
04 October	1222	1227	1236	C3.1	SF	N11W63	9634
	1416	1419	1426	C2.4	SF	N18W41	9644
	1954	1959	2008	C1.9	SF	S11W16	9641
	2112	2116	2120	C2.0			
05 October	0813	0820	0830	C2.5			
	1133	1134	1141	C1.9	SF	S12W26	9641
	1152	1157	1201	C2.0			
	1343	1346	1349		SF	N12W78	9636
	1353	1355	1401	C2.0	SF	S13E49	9650
	1529	U1530	A1533	C2.7	SF	N11W80	9636
	1823	1827	1832	C1.6			
	2017	2018	2024		SF	S14W68	9637
06 October	2111	2113	2155	C3.7	1F	S12W29	9641
	0519	0525	0533	M2.8			
	1041	1041	1049	C2.6	SF	S14E38	9650
07 October	1723	1736	1811	C3.6	1F	S05E31	9648
	0507	0514	0521	C2.3			
	0730	0731	0737	C1.8	SF	S22E51	9653
	1110	1122	1140	C1.9			
	1637	1637	1645	C1.2	SF	S17E21	9650
	1654	1656	1725	C2.0	SF	S20E10	
	1927	1929	1934	C1.2	SF	S16E19	9650
	2254	2254	2300	C1.2	SF	S16E17	9650



### Region Summary

Date	Location		Sunspot Characteristics				Flares										
	Helio		Area (10 <sup>-6</sup> 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 9628</i>																	
18 Sep	S17E79	291	0160	07	DAO	006	B		1			1					
19 Sep	S18E64	293	0410	15	FKC	016	B	2				3					
20 Sep	S18E51	293	0800	17	FKC	033	BG	3				3					
21 Sep	S18E38	293	0790	16	FKC	044	BG					1					
22 Sep	S17E25	293	0630	17	FAC	058	BG	1				5	1				
23 Sep	S18E12	293	0720	19	FAC	058	BGD	2				7					
24 Sep	S18W01	292	0880	19	FKC	066	BGD	3				11	1				
25 Sep	S18W14	292	0880	19	FKC	066	BGD	3	3			15	2				
26 Sep	S18W25	290	0730	19	FKC	049	BGD	1				6					
27 Sep	S18W37	289	0780	15	EKC	037	BGD	1	1			8					
28 Sep	S18W48	287	0620	17	FKI	027	BGD	4	1			11	1				
29 Sep	S17W62	287	0770	14	EKI	025	BG	2				3					
30 Sep	S17W76	288	0800	14	EKI	020	BG	1	1			5					
01 Oct	S22W91	290	0350	12	EKC	015	BG	1				2					
								24	7	0	81	5	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 292

<i>Region 9632</i>																	
20 Sep	S18E76	268	0390	12	EKO	006	B										
21 Sep	S17E56	275	0640	09	DKI	013	B	2				3					
22 Sep	S18E45	273	0710	09	DKO	020	BG	4				8					
23 Sep	S18E32	273	0780	08	DKI	017	BGD	3	1			4					
24 Sep	S19E19	272	0790	09	DKI	023	BGD				1	1		1			
25 Sep	S19E06	272	0700	09	DKI	023	BGD					5					
26 Sep	S19W08	273	0670	11	EKC	021	BGD					1					
27 Sep	S19W21	273	0710	09	DKC	017	BGD					2					
28 Sep	S18W33	272	0640	11	EKI	015	BGD					6					
29 Sep	S19W48	273	0610	08	DKI	021	BGD										
30 Sep	S18W61	273	0620	07	DKI	019	BG					3					
01 Oct	S21W73	272	0620	11	EKC	020	BG		1			1					
02 Oct	S21W88	274	0220	08	EKI	006	BG										
								9	2	1	34	0	1	0	0		

Crossed West Limb.

Absolute heliographic longitude: 272



**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 9633</i>																	
22 Sep	N23E75	243	0090	03	HSX	001	A										
23 Sep	N23E62	243	0090	02	HSX	001	A										
24 Sep	N22E50	241	0090	03	HAX	001	A										
25 Sep	N22E36	242	0070	02	HSX	001	A										
26 Sep	N22E24	241	0080	02	HSX	001	A										
27 Sep	N22E10	242	0070	02	HSX	001	A										
28 Sep	N22W02	241	0070	02	HSX	001	A										
29 Sep	N22W16	241	0070	02	HSX	001	A										
30 Sep	N22W29	241	0080	02	HSX	001	A										
01 Oct	N22W43	242	0070	02	HSX	001	A										
02 Oct	N21W56	242	0080	03	HSX	003	A										
03 Oct	N21W68	241	0070	02	HSX	001	A										
04 Oct	N23W82	242	0060	02	HSX	001	A										
05 Oct	N22W95	242															
																	0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 241

<i>Region 9634</i>																	
22 Sep	N12E76	242	0090	04	DAO	004	B										
23 Sep	N12E68	237	0230	16	FAO	004	B										
24 Sep	N12E54	237	0120	05	DAO	005	B										
25 Sep	N12E41	237	0080	07	DAO	011	B										
26 Sep	N12E24	241	0090	06	DAO	007	B										1
27 Sep	N12E11	241	0110	08	DAO	008	B										3
28 Sep	N12W02	241	0080	09	DSO	009	B	1	1								3 2
29 Sep	N12W15	240	0060	08	DAO	006	B										5
30 Sep	N12W29	241	0070	08	DAO	007	B										
01 Oct	N11W38	237	0070	06	CAO	010	B										
02 Oct	N12W51	237	0050	01	HSX	004	A	1									1
03 Oct	N11W63	236	0060	06	CAO	006	B	2									2 1
04 Oct	N12W76	236	0110	05	CAO	004	B	1									1
05 Oct	N11W89	236															
																	5 1 0 16 3 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 241





**Region Summary - continued.**

Date	Location		Sunspot Characteristics				Flares											
	Helio		Area (10 <sup>-6</sup> 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 9635</i>																		
23 Sep	N22E13	292	0010	03	BXO	003	B											
24 Sep	N21E02	289	0040	06	DSO	008	B	1				1						
25 Sep	N21W12	290	0050	07	DSO	013	B											
26 Sep	N21W25	290	0060	08	DAO	009	B											
27 Sep	N21W38	290	0060	09	DSO	010	B						1					
28 Sep	N21W51	290	0040	08	DSO	007	B	1				1						
29 Sep	N22W65	290	0130	08	DAO	005	B						1					
30 Sep	N22W78	290	0140	08	DAO	003	B											
01 Oct	N20W90	289	0090	08	DAO	004	B											
								2	0	0	4	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 289

<i>Region 9636</i>																		
24 Sep	N12E65	226	0260	11	EAO	007	B						5					
25 Sep	N13E54	224	0300	14	EAO	017	B						2					
26 Sep	N14E41	224	0400	15	EAI	024	BG	1					3					
27 Sep	N13E26	226	0370	18	FAI	028	BG						3					
28 Sep	N14E13	226	0210	18	FAI	024	BG		1			1		1				
29 Sep	N13W02	227	0220	17	FAI	029	BG	1	1			2	1					
30 Sep	N14W15	227	0350	16	FKC	035	BG	4				12						
01 Oct	N13W27	226	0310	13	EAC	034	BG					2						
02 Oct	N14W41	227	0250	14	EAC	018	BG											
03 Oct	N13W56	229	0200	09	DAI	012	BG	1				2						
04 Oct	N13W70	230	0150	07	DSO	007	BG	1				2						
05 Oct	N13W82	228	0170	02	HAX	001	A	1				2						
06 Oct	N13W94	227	0090	02	HSX	001	A											
								9	2	0	36	1	1	0	0			

Crossed West Limb.

Absolute heliographic longitude: 227



***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 9637</i>																	
24 Sep	S14E71	220	0140	09	DAO	003	B					2					
25 Sep	S15E59	219	0180	09	DAO	005	B										
26 Sep	S15E46	219	0210	08	DSO	007	B					1					
27 Sep	S14E32	220	0200	08	DAO	010	B					2					
28 Sep	S15E18	221	0220	08	DSO	009	B	1	1			3	2				
29 Sep	S13E06	219	0170	08	DSO	012	BG										
30 Sep	S13W07	219	0190	09	DAO	019	BG	1				1					
01 Oct	S20W19	218	0120	11	ESO	015	B										
02 Oct	S14W35	221	0090	07	DAO	009	B										
03 Oct	S15W49	222	0080	06	DAO	004	B										
04 Oct	S14W62	222	0060	06	CAO	005	B										
05 Oct	S12W77	223	0040	02	HSX	001	A					1					
06 Oct	S13W89	222	0030	02	HSX	001	A										
								2	1	0	10	2	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 219

<i>Region 9638</i>																		
Date	Location	Area	Extent	Spot Class	Spot Count	Mag Class	Flares											
	( ° Lat ° CMD)	(10 <sup>-6</sup> hemi)	(helio)				C	M	X	S	1	2	3	4				
25 Sep	N03E61	217	0030	01	HSX	002	A											
26 Sep	N03E48	217	0020	01	HSX	001	A											
27 Sep	N03E35	217	0000	01	AXX	001	A											
28 Sep	N03E22	217																
29 Sep	N03E09	217																
30 Sep	N03W04	217																
01 Oct	N03W17	217																
02 Oct	N03W30	217																
03 Oct	N03W43	217																
04 Oct	N03W56	217																
05 Oct	N03W69	217																

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 217



**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 9639*

26 Sep	N04E36	229	0030	05	DSO	003	B											
27 Sep	N04E21	231	0030	06	DSO	007	B											
28 Sep	N03E08	231	0050	08	DSO	006	B											
29 Sep	N03W06	231	0070	08	DSO	007	B											
30 Sep	N04W20	232	0100	09	CSO	008	B											
01 Oct	N04W37	236	0060	02	CSO	004	B											
02 Oct	N03W51	237	0040	02	HSX	002	A											
03 Oct	N04W64	237	0030	01	HSX	001	A											
04 Oct	N07W77	237	0010	00	AXX	001	A											
05 Oct	N07W90	237																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 231

*Region 9640*

27 Sep	N10E67	185	0040	04	CSO	004	B											
28 Sep	N10E56	183	0020	01	BXO	002	B											
29 Sep	N10E41	184	0030	02	HSX	003	A											
30 Sep	N10E26	186	0020	03	CSO	002	B											
01 Oct	N11E12	187	0040	03	CAO	003	B											
02 Oct	N10E00	186	0020	05	CAO	010	B											
03 Oct	N10W13	186	0010	04	BXO	006	B											
04 Oct	N11W27	187	0020	04	BXO	005	B											
05 Oct	N11W40	187																
06 Oct	N11W53	187																
07 Oct	N11W66	187																

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 186



**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 9641</i>																		
27 Sep	S14E77	175	0060	02	HSX	001	A											
28 Sep	S14E61	178	0070	03	HAX	001	A											
29 Sep	S14E47	178	0090	04	CSO	002	B											
30 Sep	S15E38	174	0150	12	CSO	005	B											
01 Oct	S13E23	176	0220	11	EAO	009	B											
02 Oct	S14E08	178	0250	09	DAO	011	B		1			1						
03 Oct	S14W06	179	0180	08	CAO	010	B											
04 Oct	S13W19	179	0140	06	CSO	007	B	1				1						
05 Oct	S13W34	180	0130	04	CAO	003	B	2				1	1					
06 Oct	S13W48	181	0100	03	HAX	003	A											
07 Oct	S13W61	181	0100	03	HAX	003	A											
								3	1	0	3	1	0	0	0			

Still on Disk.

Absolute heliographic longitude: 179

*Region 9642*

29 Sep	N03E71	154	0030	01	HSX	001	A											
30 Sep	N04E56	156	0020	01	HSX	001	A											
01 Oct	N06E43	156	0060	04	HAX	002	A											
02 Oct	N05E28	158	0040	01	HSX	001	A											
03 Oct	N05E15	158	0020	02	HAX	001	A											
04 Oct	N05E02	158	0030	02	HSX	001	A											
05 Oct	N05W12	158	0020	02	HSX	001	A											
06 Oct	N05W27	160	0010	01	HSX	001	A											
07 Oct	N04W40	160	0010	01	HSX	001	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 158

*Region 9643*

01 Oct	S26W26	225	0030	05	BXO	003	B											
02 Oct	S27W37	223	0000	00	AXX	001	A											
03 Oct	S27W50	223																
04 Oct	S27W63	223																
05 Oct	S27W76	223																
								0	0	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 225



**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 9644*

01 Oct	N20W04	203	0030	03	CSO	004	B										
02 Oct	N19W17	203	0030	04	CSO	007	B										
03 Oct	N19W31	204	0010	01	HSX	001	A					1					
04 Oct	N20W42	202	0010	01	AXX	001	A	1				1					
05 Oct	N20W55	202															
06 Oct	N20W68	202															
07 Oct	N20W81	202															
										1	0	0	2	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 203

*Region 9645*

01 Oct	S18E03	196	0060	06	DAO	012	B										
02 Oct	S18W12	198	0030	09	DSO	010	B					3					
03 Oct	S18W27	200	0100	08	DAO	008	B	2				2					
04 Oct	S17W41	201	0150	09	DSO	009	B	2				2					
05 Oct	S18W55	201	0120	08	DAO	008	B										
06 Oct	S18W68	201	0180	14	EAO	010	B										
07 Oct	S18W81	201	0150	13	EAO	004	B										
										4	0	0	7	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 196

*Region 9646*

01 Oct	N12E42	157	0030	05	CAO	003	B										
02 Oct	N12E28	158	0010	07	BXO	002	B										
03 Oct	N12E12	161	0010	01	HRX	001	A										
04 Oct	N13W02	162	0010	03	BXO	003	B										
05 Oct	N13W15	162															
06 Oct	N13W28	162															
07 Oct	N13W41	162															
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 162



**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 9647*

02 Oct	S16E31	155	0000	00	AXX	001	A											
03 Oct	S16E18	159																
04 Oct	S16E05	159																
05 Oct	S18W08	154	0010	01	AXX	002	B											
06 Oct	S18W21	154																
07 Oct	S18W34	154																

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 159

*Region 9648*

02 Oct	S04E78	108	0050	02	HSX	001	A											
03 Oct	S05E64	109	0080	02	HSX	001	A	1			1							
04 Oct	S06E49	111	0110	02	HSX	001	A											
05 Oct	S06E38	108	0110	01	DSO	003	A											
06 Oct	S07E22	111	0080	06	CAO	005	B	1				1						
07 Oct	S07E08	112	0070	05	CAO	005	B											

2 0 0 1 1 0 0 0

Still on Disk.

Absolute heliographic longitude: 112

*Region 9649*

03 Oct	S06E70	103	0030	01	HSX	001	A											
04 Oct	S08E56	104	0040	02	HSX	001	A											

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 105

*Region 9650*

03 Oct	S12E72	101	0070	10	CAO	003	B											
04 Oct	S15E54	106	0040	07	CSO	007	B				1							
05 Oct	S14E44	102	0080	09	DSO	010	B	1			1							
06 Oct	S15E31	102	0130	10	DAO	018	B	1			1							
07 Oct	S14E18	102	0100	09	DAO	019	B	3			3							

5 0 0 6 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 102



**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 9651*

04 Oct	S22W12	172	0030	04	CSO	005	B
05 Oct	S23W26	172	0030	06	DSO	005	B
06 Oct	S24W39	172	0010	05	BXO	005	B
07 Oct	S25W55	175	0000	00	AXX	001	A

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 172

*Region 9652*

04 Oct	N22E14	146	0010	03	BXO	002	B
05 Oct	N22E01	145	0010	01	AXX	001	A
06 Oct	N21W13	146	0020	03	BXO	007	B
07 Oct	N21W26	146	0010	03	CRO	003	B

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 145

*Region 9653*

04 Oct	S23E76	084	0060	05	HAX	001	A
05 Oct	S22E62	082	0220	09	DKO	004	B
06 Oct	S22E50	083	0270	05	DKO	005	B
07 Oct	S22E37	083	0280	07	DKO	008	B

1            1  
1 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 083

*Region 9654*

05 Oct	N07E06	140	0010	01	AXX	001	A
06 Oct	N07W06	139	0010	03	BXO	003	B
07 Oct	N07W19	139					

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 140

*Region 9655*

06 Oct	S22E64	069	0180	04	HKX	002	A
07 Oct	S21E52	068	0180	04	DAO	006	B

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 068



***Region Summary - continued.***

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

*Region 9656*

07 Oct	S21W13	133	0020	04	BXO	004	B	0	0	0	0	0	0	0	0	0
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Still on Disk.

Absolute heliographic longitude: 133



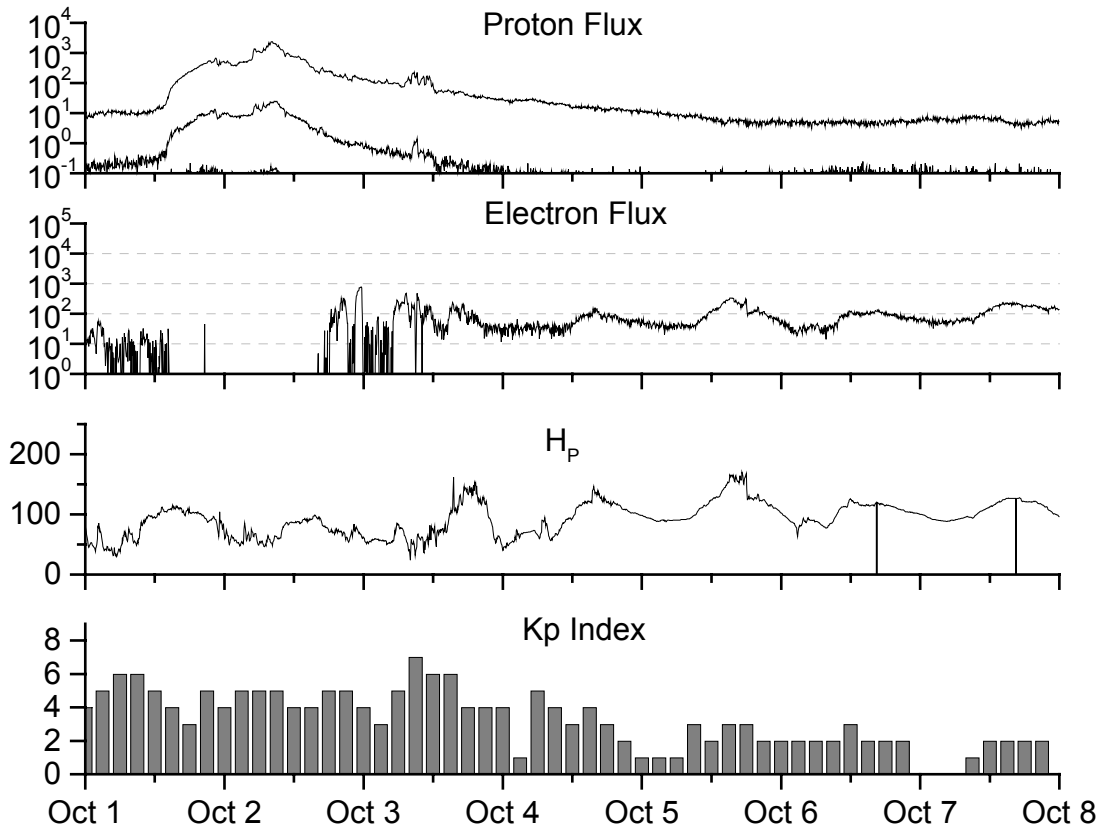


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	RI	Ratio RI/SWO	Smooth values SWO	RI	*Penticton 10.7 cm Value	Smooth Value	Planetary Ap	Smooth Value
<b>1999</b>									
October	167.7	116.7	0.70	158.5	107.8	164.8	167.2	19	12.7
November	199.3	133.2	0.67	164.7	110.0	191.5	171.5	14	13.1
December	123.5	86.4	0.69	165.9	111.1	169.8	173.4	10	13.8
<b>2000</b>									
January	140.8	90.1	0.64	168.0	112.9	158.1	175.5	13	14.5
February	161.9	112.9	0.70	172.1	116.7	173.2	176.8	15	15.0
March	203.6	138.5	0.68	175.4	119.9	208.2	178.4	09	15.0
April	193.4	125.5	0.65	176.3	120.8	184.2	180.5	15	15.0
May	188.8	121.6	0.64	173.1	119.0	184.5	180.0	15	15.0
June	190.3	124.9	0.66	172.0	118.7	179.8	179.7	15	15.1
July	236.7	169.1	0.71	173.0	119.7	204.7	180.2	21	14.8
August	166.6	130.5	0.78	171.8	118.6	163.1	179.5	16	14.2
September	157.9	109.9	0.70	169.0	116.2	182.1	177.1	18	14.2
October	138.9	100.1	0.72	166.2	114.4	167.7	175.6	18	14.6
November	149.9	106.5	0.71	162.7	112.7	178.8	173.6	17	14.6
December	146.4	104.5	0.71	160.8	112.1	173.6	172.0	08	14.4
<b>2001</b>									
January	142.7	95.1	0.67	156.3	108.8	166.7	168.8	08	13.8
February	131.0	80.1	0.61	151.4	104.2	147.3	165.8	06	13.3
March	166.7	114.2	0.69	154.0	104.9	177.7	167.9	17	12.9
April	163.6	108.2	0.66			178.3		18	
May	135.1	97.3	0.72			148.7		12	
June	196.7	134.0	0.68			173.7		12	
July	124.6	82.2	0.66			131.3		11	
August	159.4	106.8	0.67			163.2		13	
September	229.1	150.7	0.66			233.3		12	

**NOTE:** All smoothed values after June 1999 and monthly values after December 2000 are preliminary estimates. The lowest smoothed sunspot index 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 01 October 2001*

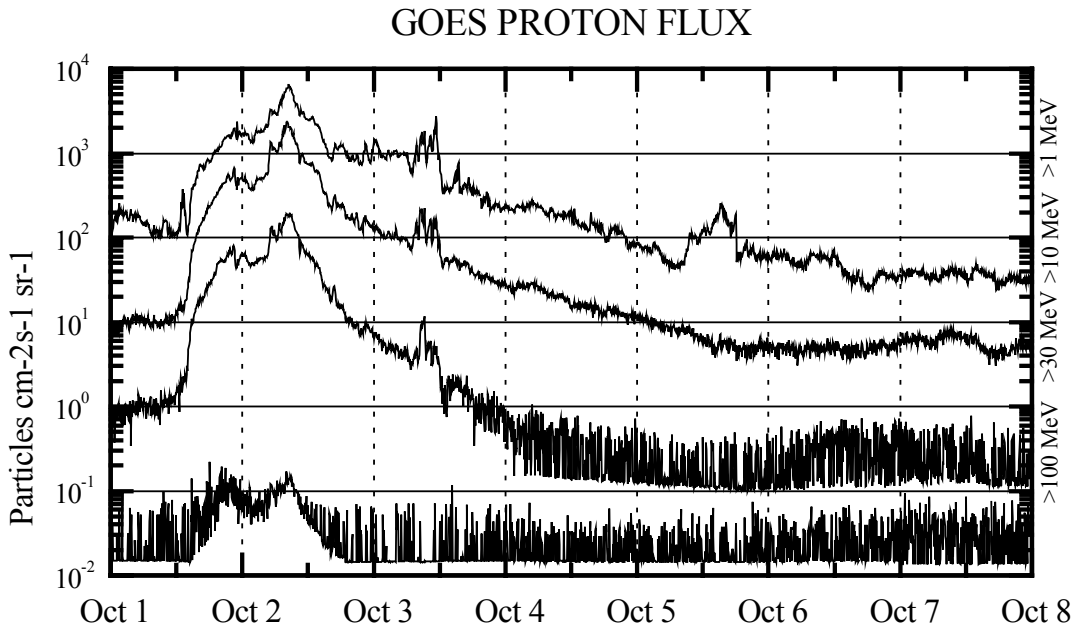
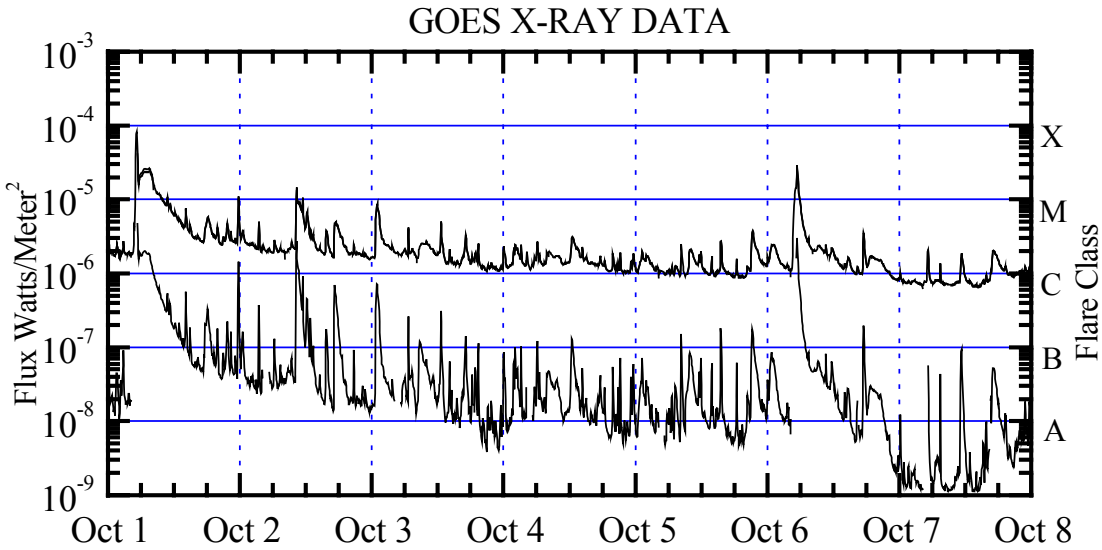
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

*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 Air Force Weather Agency) 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>parallel</sub> is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



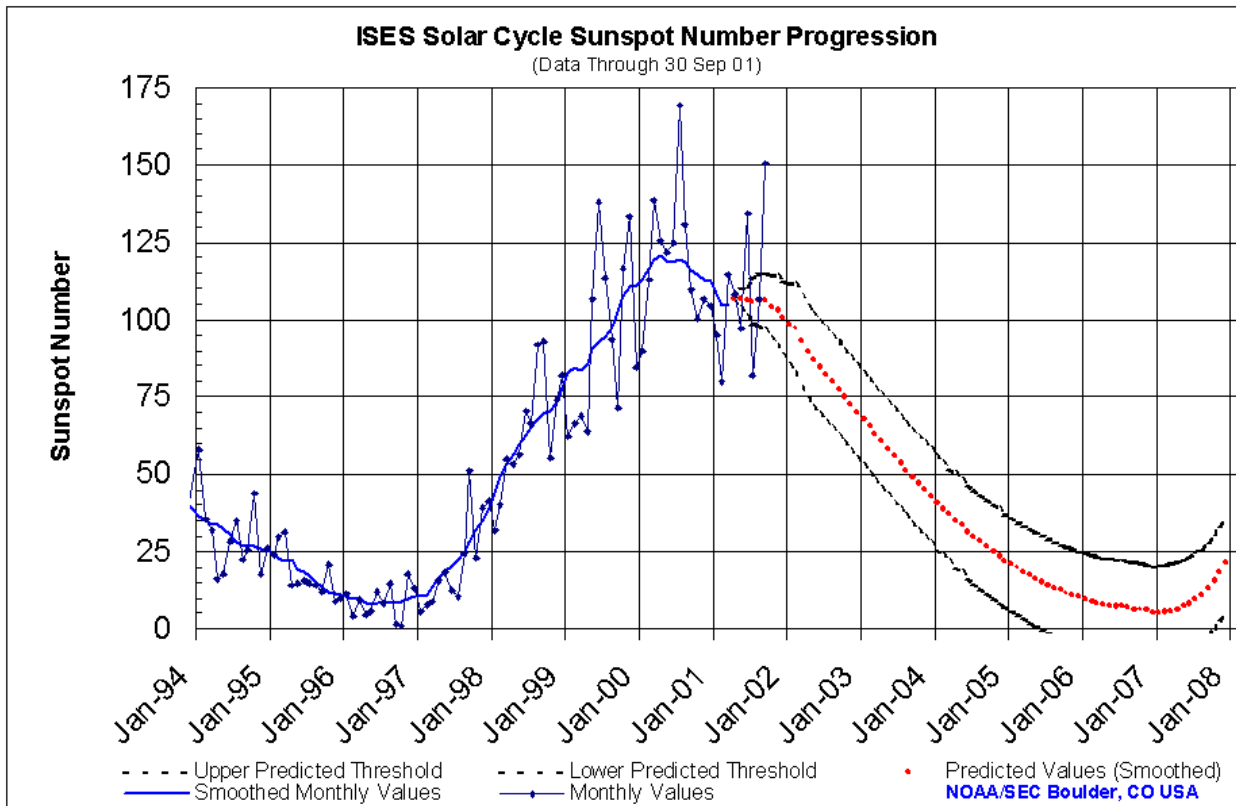


*Weekly GOES Satellite X-ray and Proton Plots*

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.

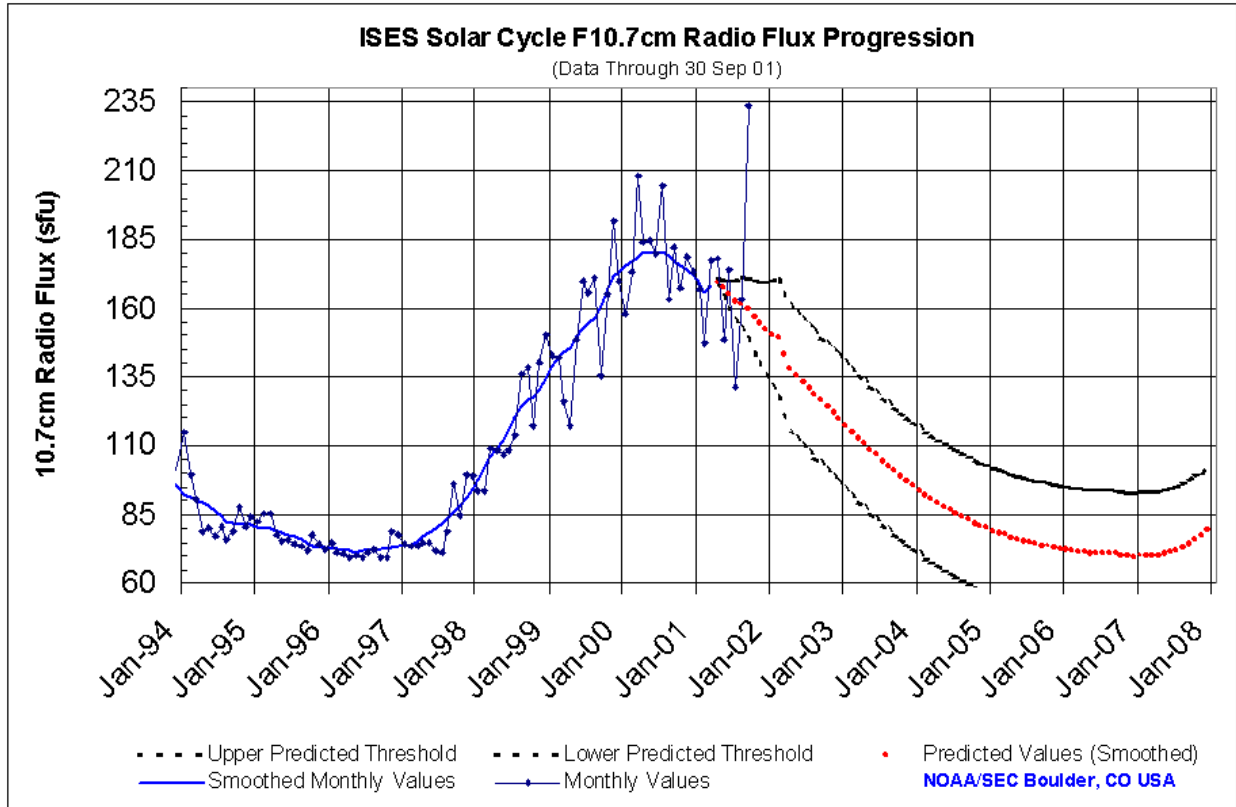




### SEC Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	44	49	53	57	59	63	66	68	70	71	73	78
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
1999	83	85	84	86	91	93	94	97	102	108	111	111
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2000	113	117	120	121	119	119	120	119	116	114	113	112
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2001	109	104	105	<b>107</b>	<b>107</b>	<b>106</b>	<b>106</b>	<b>106</b>	<b>106</b>	<b>104</b>	<b>103</b>	<b>100</b>
	(**)	(**)	(**)	(1)	(3)	(5)	(7)	(8)	(9)	(10)	(11)	(12)
2002	<b>98</b>	<b>97</b>	<b>93</b>	<b>89</b>	<b>87</b>	<b>85</b>	<b>82</b>	<b>80</b>	<b>77</b>	<b>75</b>	<b>73</b>	<b>70</b>
	(13)	(14)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)
2003	<b>68</b>	<b>65</b>	<b>63</b>	<b>61</b>	<b>58</b>	<b>56</b>	<b>54</b>	<b>51</b>	<b>49</b>	<b>47</b>	<b>45</b>	<b>43</b>
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)
2004	<b>41</b>	<b>39</b>	<b>37</b>	<b>35</b>	<b>33</b>	<b>31</b>	<b>30</b>	<b>28</b>	<b>27</b>	<b>25</b>	<b>24</b>	<b>22</b>
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)
2005	<b>21</b>	<b>20</b>	<b>18</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>12</b>	<b>11</b>	<b>10</b>
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)
2006	<b>10</b>	<b>9</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>5</b>
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)
2007	<b>5</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>10</b>	<b>11</b>	<b>13</b>	<b>16</b>	<b>18</b>	<b>21</b>
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)





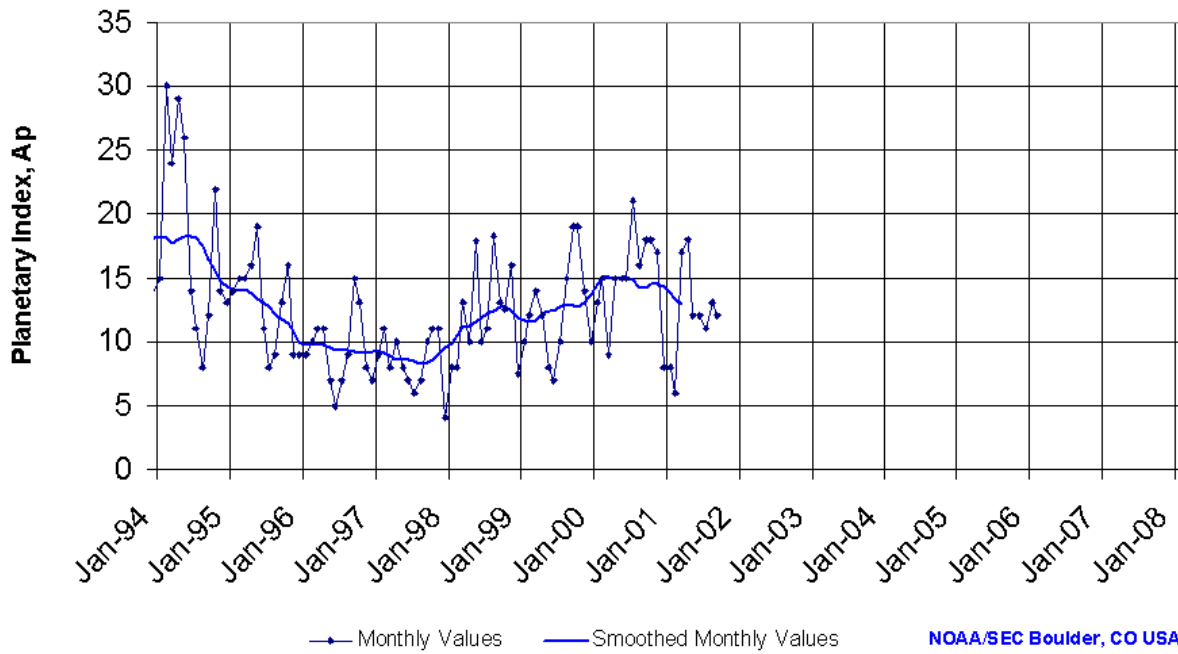
### SEC Prediction of Smoothed F10.7cm Radio Flux

	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
1998	98	102	106	109	112	116	120	124	127	128	130	134
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
1999	139	143	144	146	150	153	154	156	161	167	172	173
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2000	175	176	178	181	180	180	180	180	177	176	174	172
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2001	169	166	168	<b>169</b>	<b>167</b>	<b>165</b>	<b>163</b>	<b>162</b>	<b>160</b>	<b>157</b>	<b>155</b>	<b>152</b>
	(***)	(***)	(***)	(1)	(3)	(5)	(7)	(9)	(11)	(13)	(15)	(17)
2002	<b>151</b>	<b>149</b>	<b>143</b>	<b>138</b>	<b>136</b>	<b>133</b>	<b>131</b>	<b>129</b>	<b>126</b>	<b>124</b>	<b>122</b>	<b>120</b>
	(19)	(21)	(22)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2003	<b>117</b>	<b>115</b>	<b>113</b>	<b>111</b>	<b>109</b>	<b>107</b>	<b>104</b>	<b>103</b>	<b>101</b>	<b>99</b>	<b>97</b>	<b>95</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2004	<b>94</b>	<b>92</b>	<b>91</b>	<b>89</b>	<b>88</b>	<b>87</b>	<b>85</b>	<b>84</b>	<b>83</b>	<b>82</b>	<b>81</b>	<b>80</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2005	<b>79</b>	<b>78</b>	<b>78</b>	<b>77</b>	<b>76</b>	<b>75</b>	<b>75</b>	<b>74</b>	<b>74</b>	<b>73</b>	<b>73</b>	<b>73</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2006	<b>72</b>	<b>72</b>	<b>71</b>	<b>71</b>	<b>71</b>	<b>71</b>	<b>71</b>	<b>71</b>	<b>70</b>	<b>70</b>	<b>70</b>	<b>70</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2007	<b>70</b>	<b>70</b>	<b>70</b>	<b>70</b>	<b>71</b>	<b>71</b>	<b>72</b>	<b>73</b>	<b>74</b>	<b>76</b>	<b>77</b>	<b>79</b>
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)



### ISES Solar Cycle Ap Progression

(Data Through 30 Sep 01)



# Optical Flares



Space Environment Center



September 2001  
(Month 60)

█ Preliminary data

Comparison of Cycles at current month in cycle

