

## **Space Weather Highlights 04 - 10 August 2003**

**SWO PRF 1458  
12 August 2003**

Solar activity ranged from very low to moderate levels. The period began with low level activity on 03 August and to very low levels on 04 August. Region 424 (S18, L=290, class/area Ekc/760 on 06 August) was the largest and most active region on the disk during the period. This region began the period as a beta-gamma spot group and developed a beta-gamma-delta magnetic configuration on 06 August. By 07 August, Region 424's growth phase ended and it began a steady decay phase that continued through the end of the period. Region 424 produced the largest event of the period, an M1/Sn on 05 August at 1249 UTC. This flare was associated with a weak Type II radio sweep measuring 339 km/s. Activity for the remainder of the period, 06 – 10 August was at low levels with the exception of 09 August when activity dropped to very low levels. Region 431 (S13, L=194, class/area Eac/250 on 10 August) rotated onto the visible disk late in the period (09 August) and has shown growth in area coverage as well as an increase in magnetic complexity to a beta gamma configuration. Activity from this region has been limited to one minor C-class flare on 10 August.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. The period began with solar wind speeds in decline from a previous coronal hole high speed stream. Early on 06 August, a prolonged period of southward Bz began at 06/0200 UTC and was followed by an increase in solar wind speed to near 550 km/s. The solar wind data were consistent with the arrival of a co-rotating interacting region (CIR) and a subsequent equatorial coronal hole high speed stream. Wind speed increased on 07 August to near 700 km/s and up to 800 km/s on 08 August. Wind speed slowly decreased on 09 – 10 August down to 600 km/s. Bz from the high speed stream was mostly northward except for the CIR mentioned above and a period late on 07 August when it reached - 10 nT.

There were no greater than 10 MeV proton events at geosynchronous orbit during the

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 04 - 05 August and again on 09 - 10 August.

The geomagnetic field ranged from quiet to minor storm levels. The period began with quiet to active conditions on 04 August and quiet to unsettled conditions on 05 August. On 06 August, activity increased to isolated severe storm levels due the CIR and high speed stream mentioned above. Activity on 07 - 08 August reached minor storm levels due to the period of southward Bz late on 07 August. High speed stream effects decreased on 09 - 10 August with quiet to active conditions.

## **Space Weather Outlook 13 August - 08 September 2003**

Solar activity is expected to range from very low to moderate levels during the period. Activity for most of the period is expected to be at very low to low levels. Region 424 has the potential for isolated M-class activity early in the period and if Region 431 continues to develop it may produce isolated M-class activity.

No greater than 10 MeV proton events at geosynchronous orbit are expected during the period.

The greater than 2 MeV electron flux is expected to reach high levels on 13 -15 August, 25 August - 01 September, and again on 05 - 07 September.

The geomagnetic field is expected to range from quiet to major storm levels during the period. Coronal hole effects are expected to continue on 13 August with isolated major storm levels possible. A large coronal hole high speed stream is due to return to a geoeffective position and is expected to produce minor storm levels on 22 – 29 August.



### *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	
04 August	123	138	1320	B2.6	0	0	0	0	0	0	0	0	0
05 August	131	136	1270	B3.6	2	1	0	3	0	0	0	0	0
06 August	129	155	1270	B2.7	1	0	0	0	0	0	0	0	0
07 August	137	121	1080	B3.6	2	0	0	1	0	0	0	0	0
08 August	133	111	1150	B3.4	2	0	0	1	0	0	0	0	0
09 August	130	107	1120	B3.3	0	0	0	1	0	0	0	0	0
10 August	131	112	980	B3.2	3	0	0	3	0	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
04 August	1.6E+6	1.2E+4	2.5E+3		8.2E+8	
05 August	1.6E+6	1.1E+4	2.5E+3		1.1E+9	
06 August	7.2E+5	1.2E+4	2.4E+3		5.4E+6	
07 August	8.6E+5	1.2E+4	2.4E+3		1.4E+7	
08 August	9.1E+5	1.2E+4	2.4E+3		1.9E+7	
09 August	3.2E+6	1.1E+4	2.4E+3		8.3E+7	
10 August	7.0E+5	1.1E+4	2.3E+3		1.1E+8	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	04 August	12	3-2-3-3-1-2-3-3	14	2-2-4-5-0-2-2-2	14
05 August	6	3-1-2-1-1-1-2-2	3	2-1-1-0-0-1-1-2	9	3-2-1-1-2-3-3-3
06 August	34	5-6-6-4-3-2-2-2	38	4-5-6-6-5-2-2-1	43	6-6-7-5-4-3-3-2
07 August	15	1-2-2-1-4-3-3-4	23	2-2-2-2-5-5-5-3	15	2-2-1-2-3-4-5-4
08 August	22	5-4-4-3-3-3-3-3	41	5-5-6-6-3-4-3-3	32	5-5-5-4-3-4-3-3
09 August	10	2-2-2-2-3-2-3-3	30	2-3-6-6-4-3-2-2	15	3-3-4-4-3-3-3-3
10 August	9	3-2-2-2-3-2-2-2	14	3-3-2-5-2-2-2-1	12	4-3-2-3-2-2-3-2

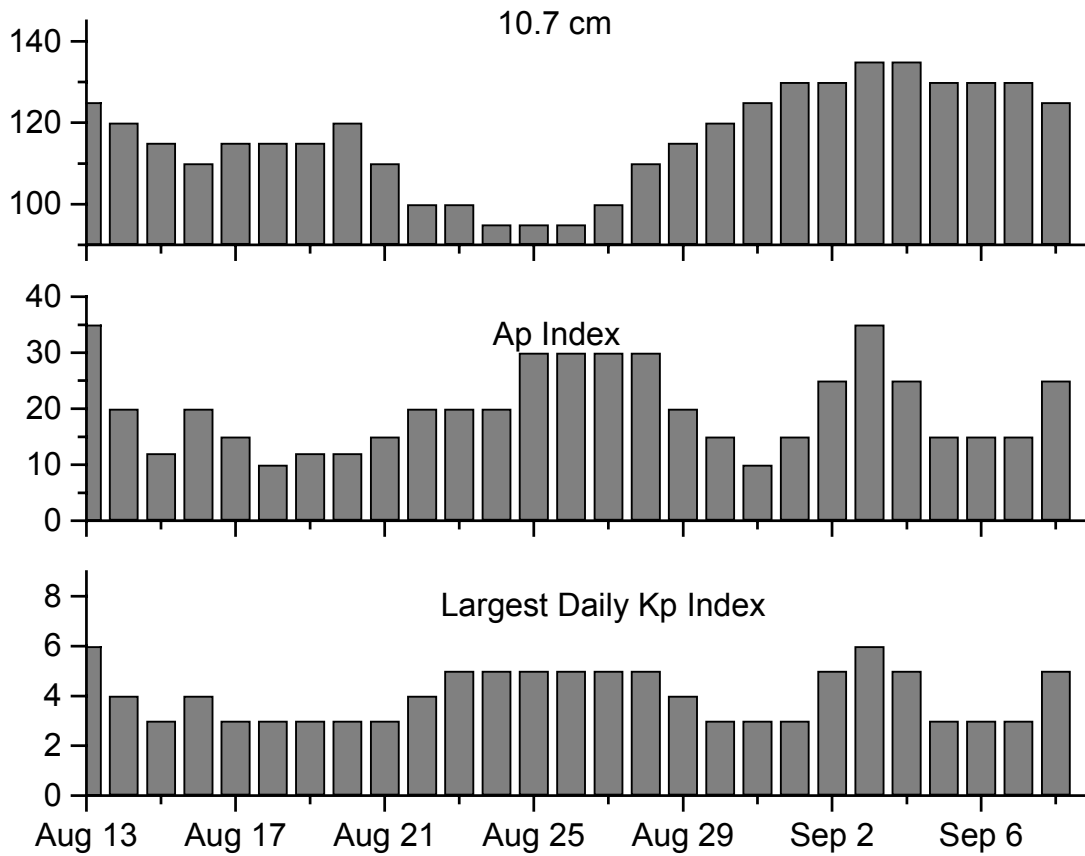


### *Alerts and Warnings Issued*

<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UT</u>
04 Aug 0507	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	04 Aug 0500
04 Aug 0710	ALERT: Geomagnetic K= 4	04 Aug 0709
04 Aug 0930	ALERT: Geomagnetic K= 4	04 Aug 0930
04 Aug 2106	WATCH: Geomagnetic A $\geq$ 20	07 Aug
04 Aug 2245	WARNING: Geomagnetic K= 4	04 Aug 2245 -05 Aug 1500
04 Aug 2248	ALERT: Geomagnetic K= 4	04 Aug 2247
05 Aug 0549	ALERT: Electron 2MeV Integral Flux > 1000pfu	05 Aug 0500
05 Aug 1306	ALERT: Type II Radio Emission	05 Aug 1251
06 Aug 0126	ALERT: Geomagnetic K= 4	06 Aug 0124
06 Aug 0128	WARNING: Geomagnetic K= 4	06 Aug 0130 - 1500
06 Aug 0218	ALERT: Geomagnetic K= 5	06 Aug 0217
06 Aug 0341	WARNING: Geomagnetic K= 5	06 Aug 0341 - 1500
06 Aug 0356	ALERT: Geomagnetic K= 6	06 Aug 0355
06 Aug 0647	WARNING: Geomagnetic K= 6	06 Aug 0650 - 1500
06 Aug 0705	WARNING: Geomagnetic K $\geq$ 7	06 Aug 0706 - 1500
06 Aug 0715	ALERT: Geomagnetic K= 7	06 Aug 0710
06 Aug 1454	EXTENDED WARNING: Geomagnetic K= 5	06 Aug 0341 - 2359
06 Aug 2303	WARNING: Geomagnetic K= 4	06 Aug 2359 - 07Aug 1500
07 Aug 1646	ALERT: Geomagnetic K- 4	07 Aug 1645
07 Aug 1835	WARNING: Geomagnetic K= 4	07 Aug 1836 - 2359
07 Aug 1837	ALERT: Geomagnetic K= 4	07 Aug 1837
07 Aug 2154	WATCH: Geomagnetic A $\geq$ 20	08 Aug
07 Aug 2347	EXTENDED WARNING: Geomagnetic K= 4 expected	07 Aug 1836 - 1500
08 Aug 0157	ALERT: Geomagnetic K= 5	08 Aug 0156
08 Aug 0159	WARNING: Geomagnetic K= 5	08 Aug 0159 - 1500
08 Aug 0221	ALERT: Geomagnetic K= 6	08 Aug 0219
08 Aug 1720	WARNING: Geomagnetic K= 4	08 Aug 1720 - 2359
08 Aug 1721	ALERT: Geomagnetic K= 4	08 Aug 1722
08 Aug 2354	EXTENDED WARNING: Geomagnetic K=4	08 Aug 1720 -09 Aug 1500
09 Aug 1241	ALERT: Electron 2MeV Integral Flux > 1000pfu	09 Aug 1220
09 Aug 2207	WATCH: Geomagnetic A $\geq$ 20	12 Aug
10 Aug 0018	WARNING: Geomagnetic K= 4	10 Aug 0100 - 1500
10 Aug 0213	ALERT: Geomagnetic K-index of 4	10 Aug 0212
10 Aug 1132	ALERT: Electron 2MeV Integral Flux > 1000pfu	10 Aug 1110
10 Aug 2135	WATCH: Geomagnetic A $\geq$ 20	13 Aug



### 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
13 Aug	125	35	6	27 Aug	100	30	5
14	120	20	4	28	110	30	5
15	115	12	3	29	115	20	4
16	110	20	4	30	120	15	3
17	115	15	3	31	125	10	3
18	115	10	3	01 Sep	130	15	3
19	115	12	3	02	130	25	5
20	120	12	3	03	135	35	6
21	110	15	3	04	135	25	5
22	100	20	4	05	130	15	3
23	100	20	5	06	130	15	3
24	95	20	5	07	130	15	3
25	95	30	5	08	125	25	5
26	95	30	5				



***Energetic Events***

Date	Time			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	$\frac{1}{2}$	Class	Integ Flux	Imp/ Brtns	Location		Rgn #	Radio Flux		Intensity	
			Max				Lat	CMD		245	2695	II	IV
05 Aug	1243	1249	1251	M1.7	.003	Sn	S16E33		424	40		1	

***Flare List***

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location Lat CMD		
04 August	0346	0349	0352	B5.5				
05 August	0912	0916	0927	C3.5	Sf	S05W34		421
	1246	1249	1254	M1.7	Sn	S16E33		424
	1717	1721	1723	B5.9				424
	1951	1951	1959	C1.1	Sf	S15E29		424
	2012	2016	2019	B7.1				424
	2313	2318	2324	B8.5				424
	0721	0728	0734	B6.6				
06 August	1134	1138	1142	B5.0				
	2342	0000	0019	C1.0				
	1149	1203	1210	C1.3				
07 August	1703	1705	1716	B7.9	Sf	S05W64		421
	2042	2050	2056	C2.1				
	1210	1213	1216	B7.1				424
08 August	1344	1436	1542	C2.3				
	1634	1635	1639	C1.0	Sf	S10W14		425
	2008	2013	2016	B5.6				
	0003	0005	0009	B5.7	Sf	S18W14		424
09 August	1736	1743	1758	B9.9				
	2255	2259	2302	B7.8				
	0126	0127	0133	C1.8	Sf	S14E64		431
10 August	1016	1021	A1024	C3.5	Sf	S06W36		425
	1057	1128	1144	C2.1				425
	1914	1918	1923	B7.9				424
	2036	2047	2055	B7.1				431
	2315	2315	2319	B8.8	Sf	S17W47		424



### 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

#### Region 420

24 Jul	N11E79	036	0040	01	Hax	001	A											
25 Jul	N10E64	038	0070	02	Hsx	001	A											
26 Jul	N11E51	038	0100	03	Hsx	001	A											
27 Jul	N11E38	038	0070	02	Hsx	001	A											
28 Jul	N11E24	038	0070	02	Hsx	001	A											
29 Jul	N11E11	038	0080	02	Hsx	001	A											
30 Jul	N11W02	038	0080	02	Hsx	001	A											
31 Jul	N11W15	038	0080	02	Hsx	001	A											
01 Aug	N11W30	040	0060	02	Hsx	002	A											
02 Aug	N11W43	040	0060	02	Hsx	001	A											
03 Aug	N11W57	040	0060	01	Hsx	001	A											
04 Aug	N11W71	041	0070	02	Hsx	001	A											
05 Aug	N11W83	040	0050	02	Hsx	001	A											
06 Aug	N12W97	040	0050	01	Hax	001	A											
										0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 038

#### Region 421

27 Jul	S08E77	359	0030	02	Hax	001	A											
28 Jul	S08E67	356	0280	13	Eao	005	B	1										
29 Jul	S08E54	355	0310	12	Eao	013	Bg		1		1	1						
30 Jul	S08E41	355	0230	12	Eai	015	Bg											
31 Jul	S08E28	355	0230	11	Eao	017	B											
01 Aug	S08E15	355	0260	16	Fki	025	B											
02 Aug	S08E01	356	0180	12	Eao	019	B											
03 Aug	S08W14	357	0170	12	Eao	026	Bg											
04 Aug	S07W30	360	0130	07	Dso	010	B											
05 Aug	S07W43	360	0100	05	Cso	004	B	1			1							
06 Aug	S07W58	001	0110	04	Cao	005	B											
07 Aug	S07W72	002	0060	02	Hsx	001	A					1						
08 Aug	S07W84	360	0060	02	Hsx	001	A											
										2	1	0	3	1	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 356



**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 423*

31 Jul	S19W03	026	0020	03	Cro	002	B	1										
01 Aug	S18W17	027	0010	03	Bxo	003	B											
02 Aug	S17W32	029	0010	01	Axx	001	A											
03 Aug	S15W38	021	0020	02	Dao	002	B											
04 Aug	S15W49	019	0010	00	Hrx	001	A											
05 Aug	S15W62	019																
06 Aug	S15W75	019																
07 Aug	S15W88	019																
									1	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 026

*Region 424*

01 Aug	S18E77	293	0120	06	Dao	002	B	6										
02 Aug	S18E64	293	0310	10	Dki	006	B	4	1		11	2						
03 Aug	S18E52	291	0580	10	Dki	016	B	5			10	1						
04 Aug	S18E39	291	0730	11	Eki	017	Bg											
05 Aug	S18E26	291	0720	11	Eki	017	Bg	1	1		2							
06 Aug	S18E13	290	0760	11	Ekc	030	Bgd											
07 Aug	S18W01	291	0710	10	Dki	021	Bd											
08 Aug	S18W14	290	0650	10	Dkc	024	Bg											
09 Aug	S18W28	291	0670	11	Ekc	026	Bg				1							
10 Aug	S18W41	291	0450	11	Ekc	021	Bg				1							
								16	2	0	25	3	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 291

*Region 425*

02 Aug	S08E61	296	0120	07	Cso	003	B											
03 Aug	S08E50	293	0140	07	Cso	011	B											
04 Aug	S09E36	294	0240	09	Dao	010	B											
05 Aug	S09E23	294	0210	09	Dai	020	B											
06 Aug	S09E10	293	0190	09	Dso	017	B											
07 Aug	S09W04	294	0170	09	Dso	016	B											
08 Aug	S09W17	293	0180	08	Dso	013	B	1			1							
09 Aug	S09W31	294	0140	08	Dso	009	B											
10 Aug	S09W43	293	0130	07	Dso	008	B	2			1							
								3	0	0	2	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 294







**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 429*

05 Aug	S24E55	262	0050	01	Hsx	001	A											
06 Aug	S24E43	260	0040	07	Cao	006	B											
07 Aug	S24E30	260	0090	08	Dao	007	B											
08 Aug	S24E17	259	0170	08	Dao	009	B											
09 Aug	S24E04	259	0160	09	Dao	011	B											
10 Aug	S24W08	258	0120	09	Dao	013	B											
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 259

*Region 430*

07 Aug	S08W13	303	0010	02	Bxo	004	B											
08 Aug	S08W29	305	0020	03	Cso	003	B											
09 Aug	S08W43	306	0040	04	Dso	005	B											
10 Aug	S08W56	306	0030	05	Cso	004	B											
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 303

*Region 431*

09 Aug	S12E68	195	0110	11	Eso	006	B											
10 Aug	S13E56	194	0250	11	Eac	016	Bg	1				1						
								1	0	0	1	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 194

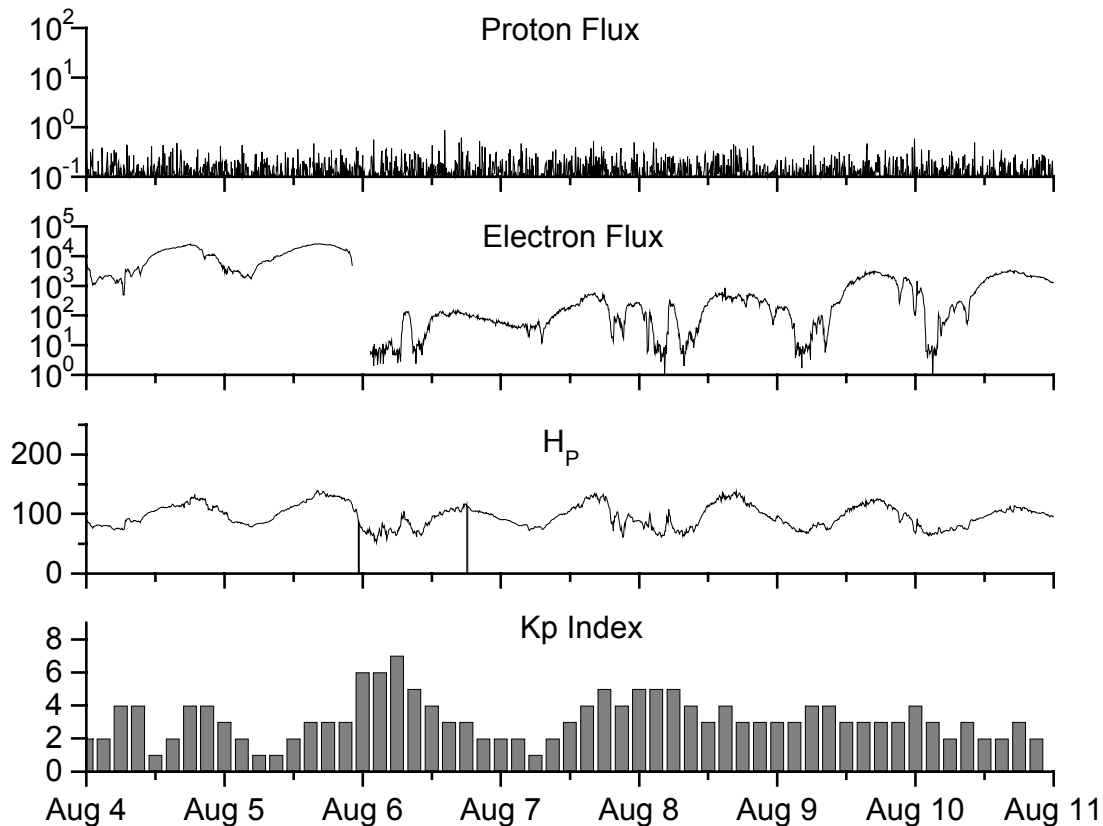


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2001</b>									
August	159.4	106.4	0.67	176.7	113.6	163.1	188.8	11	13.0
September	229.1	150.7	0.66	178.8	114.1	233.8	191.3	13	12.8
October	197.3	125.5	0.64	179.5	114.0	208.1	191.9	20	12.0
November	178.6	106.5	0.60	183.7	115.5	212.7	193.7	16	12.0
December	217.5	132.2	0.61	184.5	114.6	235.6	193.9	09	12.2
<b>2002</b>									
January	189.0	114.1	0.60	184.8	113.5	227.3	194.6	08	12.4
February	194.5	107.4	0.55	188.6	114.7	205.0	197.2	10	12.8
March	153.1	98.4	0.64	188.9	113.4	180.3	195.7	10	13.0
April	194.9	120.7	0.62	186.2	110.5	189.8	191.5	15	13.2
May	204.1	120.8	0.59	183.6	108.9	178.4	188.0	15	13.3
June	146.0	88.3	0.60	179.9	106.3	148.7	183.0	11	13.5
July	183.5	99.9	0.54	175.4	102.7	173.5	173.5	13	13.9
August	191.0	116.4	0.61	169.3	98.7	183.9	169.5	16	14.3
September	206.4	109.6	0.53	163.4	94.6	175.8	164.2	14	14.9
October	153.9	97.5	0.63	158.7	90.5	167.0	159.5	23	15.5
November	159.8	95.5	0.60	150.5	85.3	168.7	154.3	16	16.1
December	147.9	80.8	0.55	144.6	82.1	158.6	150.9	13	17.0
<b>2003</b>									
January	149.3	79.7	0.53	141.7	81.0	144.0	149.2	13	18.2
February	87.0	46.0	0.53			124.5		17	
March	119.7	61.1	0.51			132.5		21	
April	119.7	60.0	0.50			126.3		20	
May	89.6	55.2	0.62			129.3		26	
June	118.4	77.4	0.65			129.4		24	
July	132.8	85.0	0.64			127.8		20	

**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 04 Aug 2003*

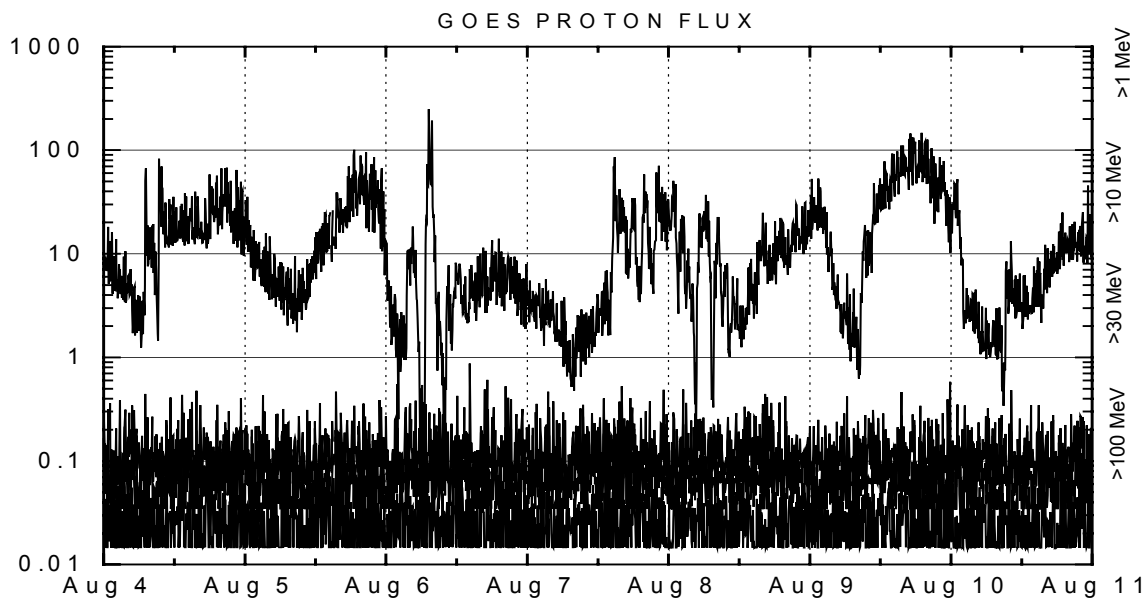
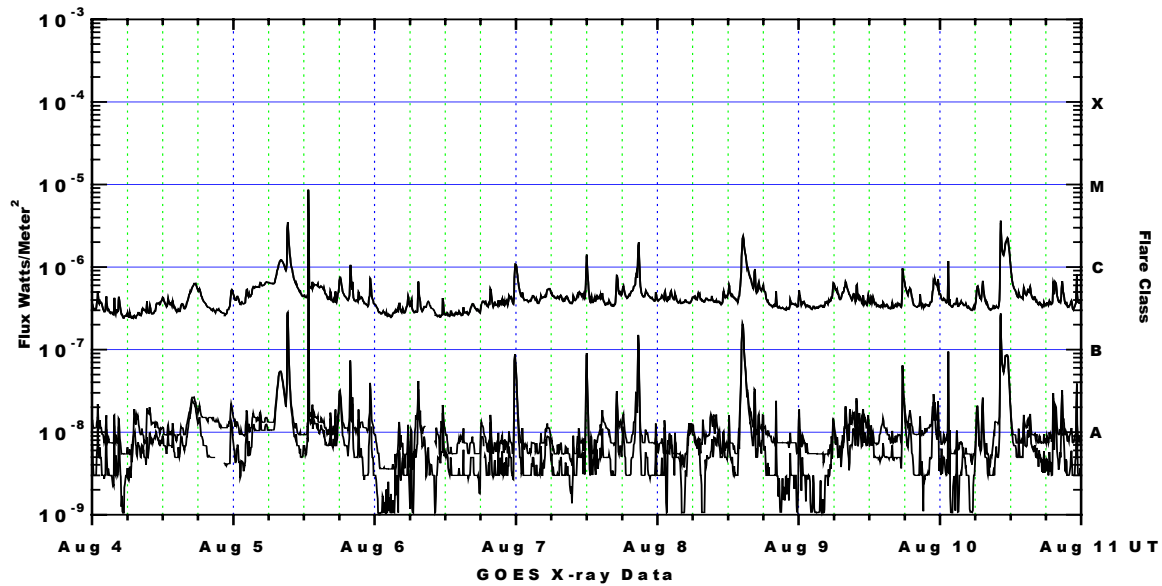
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W113) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

*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-12.

*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. 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>p</sub> is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





*Weekly GOES Satellite X-ray and Proton Plots*

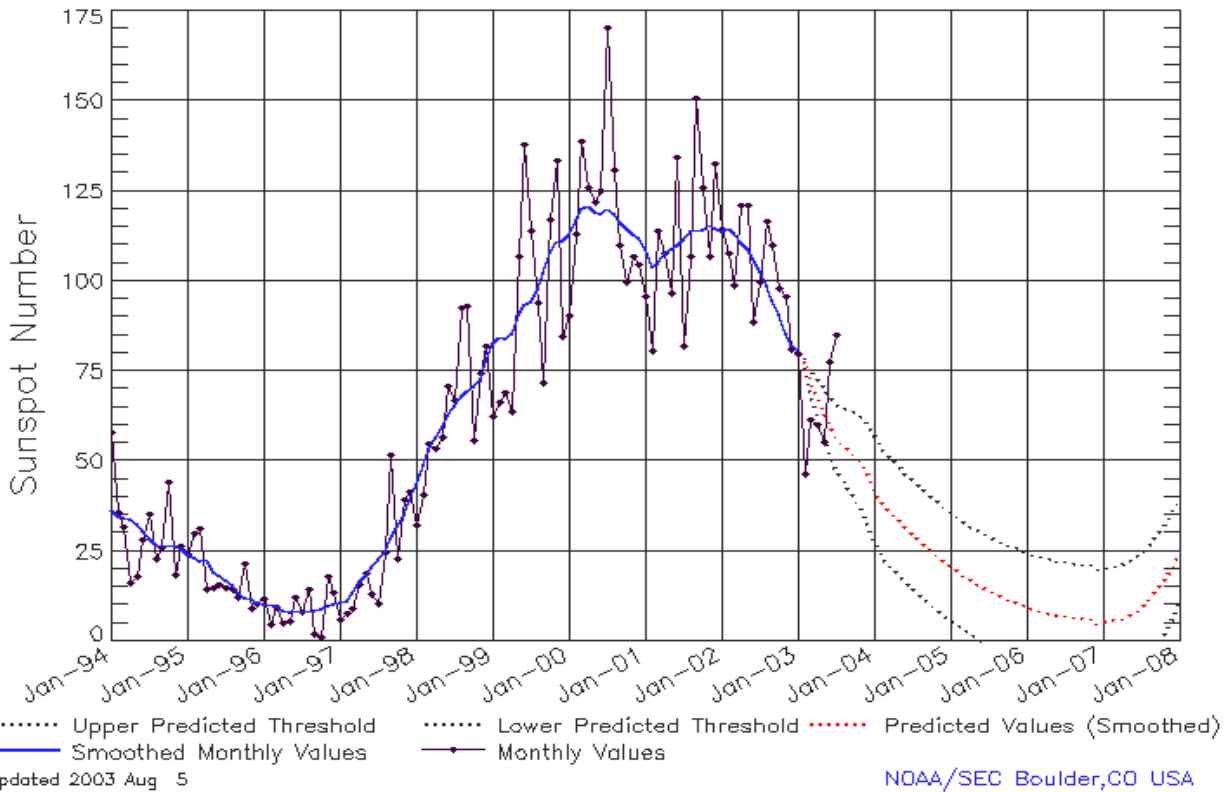
X-ray plot contains five-minute averaged x-ray flux (watts/m<sup>2</sup>) as measured by GOES 12 and 10 in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W113) 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.



# ISES Solar Cycle Sunspot Number Progression

Data Through 31 Jul 03



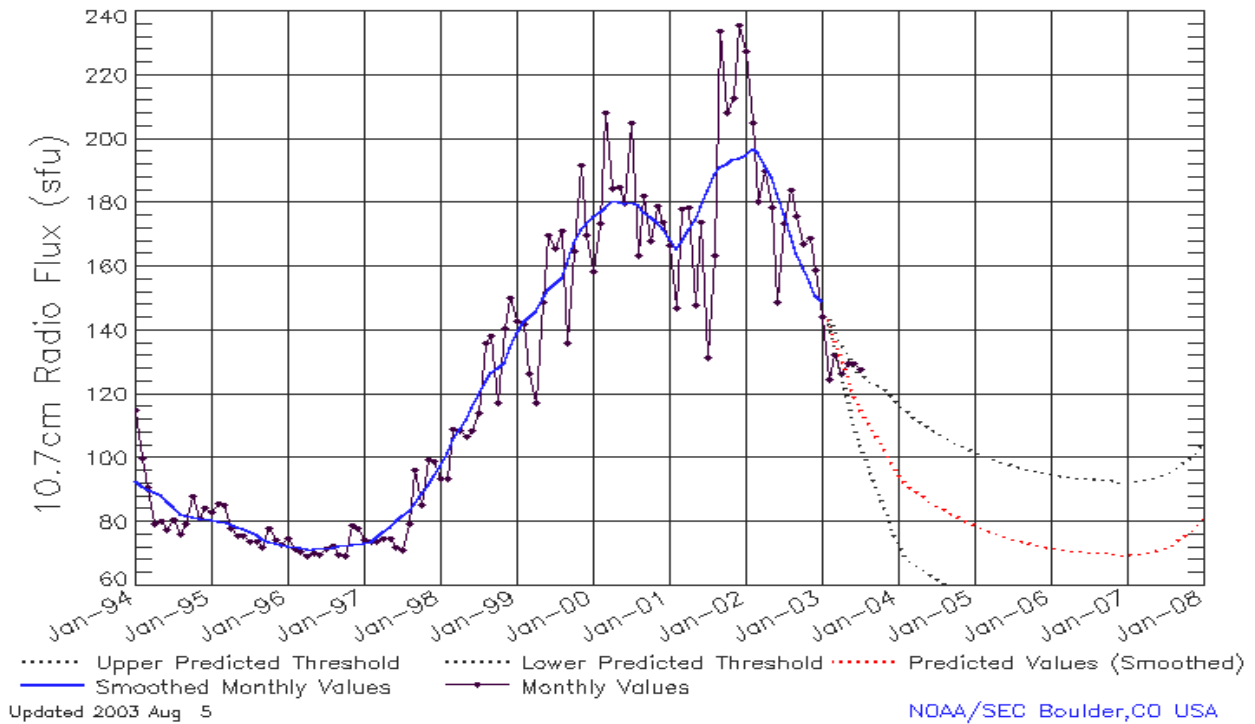
## SEC Prediction of Smoothed Sunspot Number

	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	108	109	110	112	114	114	114	116	115
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2002	114	115	113	110	109	106	103	99	95	91	85	82
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2003	81	<b>78</b>	<b>72</b>	<b>68</b>	<b>64</b>	<b>60</b>	<b>57</b>	<b>55</b>	<b>53</b>	<b>51</b>	<b>49</b>	<b>47</b>
	(***)	(1)	(3)	(5)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2004	<b>42</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)



## ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 31 Jul 03



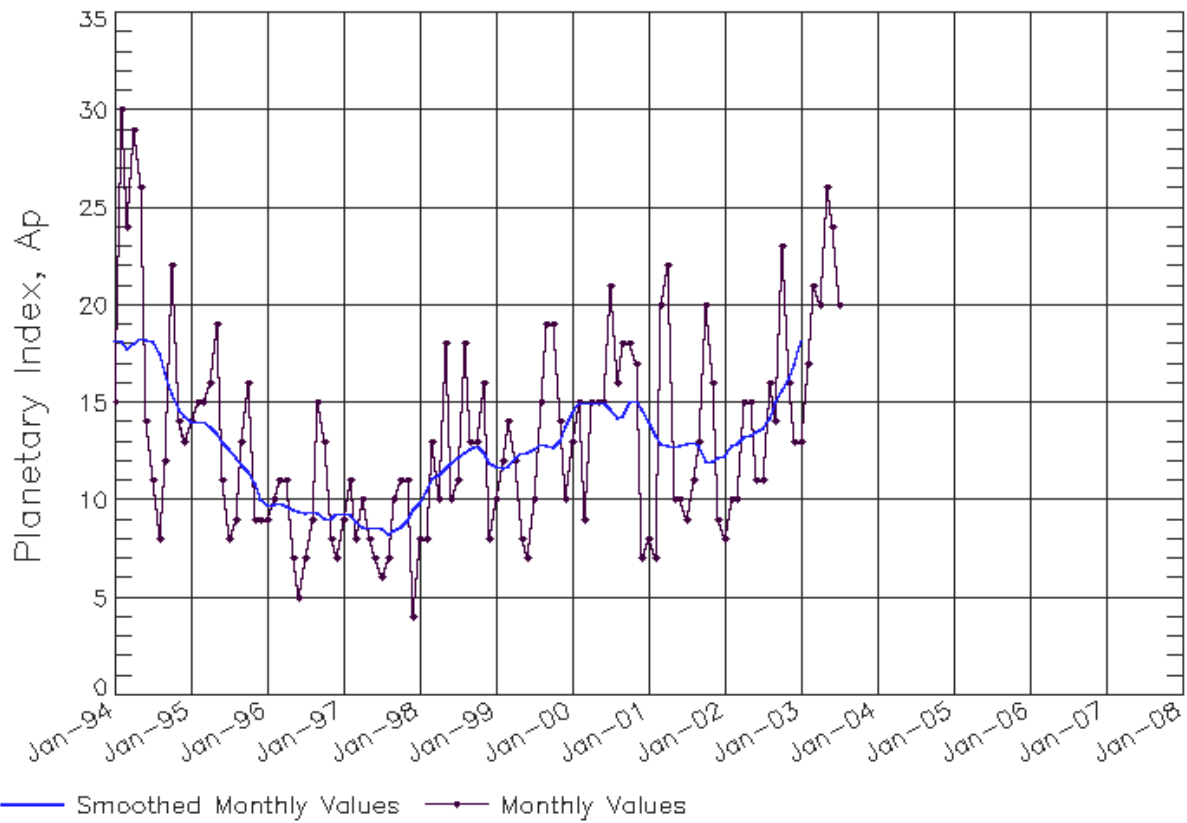
### SEC Prediction of Smoothed F10.7cm Radio Flux

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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	172	175	179	184	189	191	192	194	194
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2002	195	197	196	192	188	183	176	170	164	159	155	151
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2003	149	<b>144</b>	<b>137</b>	<b>131</b>	<b>126</b>	<b>120</b>	<b>115</b>	<b>112</b>	<b>109</b>	<b>105</b>	<b>102</b>	<b>99</b>
	(***)	(1)	(3)	(5)	(7)	(9)	(11)	(13)	(15)	(17)	(19)	(21)
2004	<b>95</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>
	(22)	(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 31 Jul 03



Updated 2003 Aug 5

NOAA/SEC Boulder, CO USA

