

**Space Weather Highlights**  
**13 - 19 January 2003**

**SWO PRF 1429**  
**21 January 2003**

Solar activity was at very low to low levels. On 13 – 17 January, activity was at low levels with the largest event a C6 flare on the west limb on 14 January from Region 242 (S07, L=218, class/area Dai/300 on 11 January). For flare times and magnitudes, please refer to the Energetic Events and Flare List. Region 242 also initiated sympathetic flaring in Region 244 (S23, L=209, class/area Cao/090 on 06 January) on 13 January, producing a C4 flare. On 14 January, Region 242 and 244 rotated beyond the west limb and on 16 January Region 255 (S13, L=130, class/area Cko/200 on 13 January) produced a C5 flare. The only region to show and increase in area coverage or magnetic complexity was Region 259 (N10, L=053, class/area Eao/060 on 19 January). However, activity from this region consisted of only minor plage fluctuations and optical sub-flaring.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. On 19 January, solar wind velocity increased with peak velocities near 600 km/s due to the southern coronal hole extension rotating into a geo-effective position. The Bz component of the interplanetary magnetic field reached an average value of negative 5 nT on 18 – 19 January.

There were no greater than 10 MeV proton events at geo-synchronous orbit during the summary period.

The greater than 2 MeV electron flux at geo-synchronous orbit were at low to moderate levels during the period.

The geomagnetic field was at quiet to active levels. Active conditions were observed on 18 - 19 January due to a southern polar extension. Activity was at quiet to unsettled conditions on 13 – 17 January.

**Space Weather Outlook**  
**22 January - 17 February 2003**

Solar activity is expected to be low during the period. At the time of this report, activity on the east limb suggests a potentially active region rotating onto the visible disk. This is expected to result in isolated moderate levels early in the period and low during the latter half of the period.

No greater than 10 MeV proton events are expected during the forecast period.

The greater than 2 MeV electron flux is expected to reach high levels on 25 – 28 January and again on 01 – 02 February due to recurring coronal holes.

The geomagnetic field is expected to be at quiet to isolated major storm levels during the period. Isolated minor to major storm conditions are possible on 23 -24 January due to a returning trans-equatorial coronal hole. Isolated active conditions are possible on 30 – 31 January due to a smaller recurring coronal hole.



### *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
13 January	172	182	900	B7.1	7	0	0	5	0	0	0	0
14 January	164	176	930	B6.2	9	0	0	0	0	0	0	0
15 January	150	173	810	B4.6	1	0	0	1	0	0	0	0
16 January	145	135	690	B4.1	3	0	0	0	2	0	0	0
17 January	142	150	630	B3.6	1	0	0	1	0	0	0	0
18 January	137	148	600	B3.5	0	0	0	0	0	0	0	0
19 January	130	168	710	B3.5	0	0	0	1	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
13 January	5.0E+4	1.3E+4	3.1E+3		2.6E+6	
14 January	3.6E+4	1.3E+4	2.9E+3		9.8E+5	
15 January	5.1E+4	1.3E+4	3.0E+3		2.1E+6	
16 January	4.4E+4	1.4E+4	3.0E+3		3.0E+6	
17 January	1.0E+5	1.4E+4	3.2E+3		1.3E+6	
18 January	3.3E+5	1.4E+4	2.9E+3		7.1E+5	
19 January	3.1E+5	1.3E+4	3.1E+3		7.7E+5	

### *Daily Geomagnetic Data*

Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
13 January	5	2-1-1-1-1-1-3	8	3-3-2-3-1-1-1-1	8	3-2-1-2-3-3-2-2
14 January	7	3-2-2-2-2-1-1-1	11	3-3-3-4-3-1-0-0	10	3-3-3-3-3-3-2-1
15 January	7	2-1-1-2-2-2-3-2	5	1-1-1-3-2-2-1-0	8	3-2-2-2-3-3-2-2
16 January	4	3-0-1-1-2-1-1-1	8	1-0-1-4-4-1-1-1	7	2-2-1-2-3-3-2-2
17 January	4	1-1-1-2-2-2-0-0	7	0-1-2-4-2-2-1-0	8	2-2-2-3-3-3-2-1
18 January	9	1-1-3-3-3-2-2-2	26	1-1-3-5-6-4-2-4	12	2-2-3-3-4-3-2-2
19 January	9	1-1-2-3-3-3-2-2	53	1-5-4-6-6-7-4-3	16	2-2-3-4-4-4-3-3

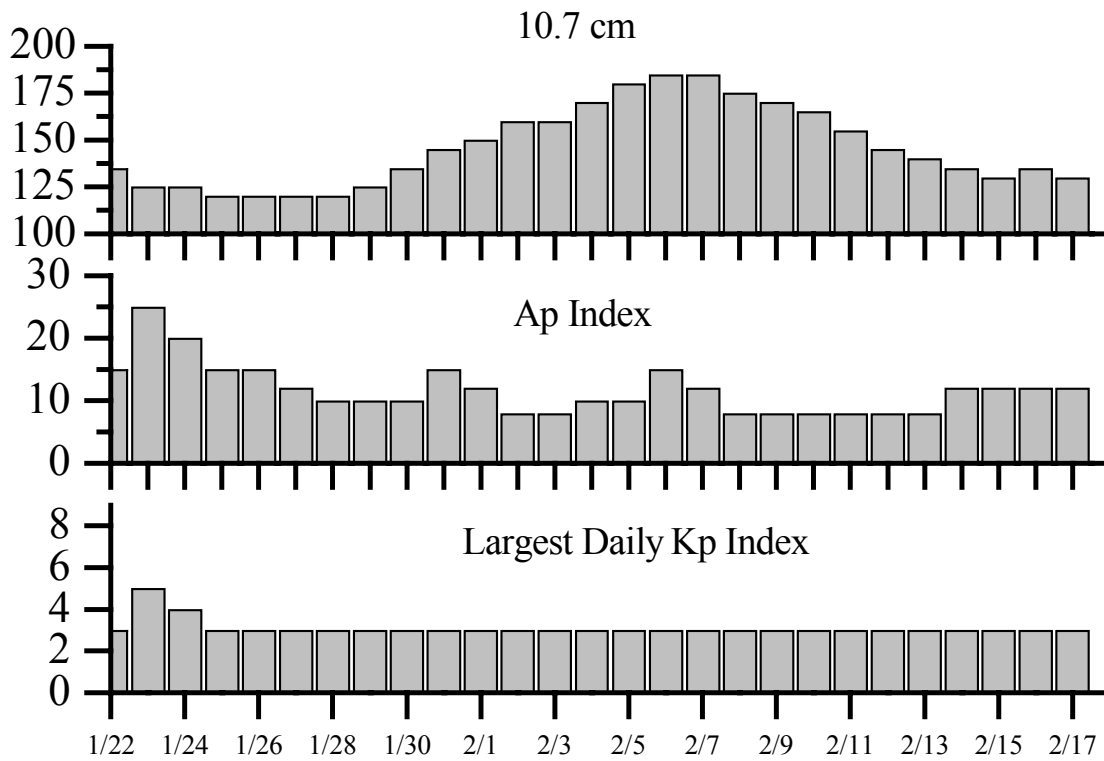


### *Alerts and Warnings Issued*

<u>Date &amp; Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date &amp; Time of Event UT</u>
13 Jan 0017	1 - 245 MHz Radio Burst	12 Jan
14 Jan 0006	1 - 245 MHz Radio Burst	13 Jan
14 Jan 1129	ALERT: STRATWARM	14 Jan
15 Jan 0025	2 - 245 MHz Radio Bursts	14 Jan
15 Jan 0025	245 MHz Radio Noise Storm	14 Jan
15 Jan 1344	ALERT: STRATWARM	15 Jan
17 Jan 0006	1 - 245 MHz Radio Burst	16 Jan
17 Jan 1321	ALERT: STRATWARM	17 Jan
18 Jan 1322	WARNING: Geomagnetic K= 4	18 Jan 1322 -1500
18 Jan 1329	ALERT: Geomagnetic K= 4	18 Jan 1329
19 Jan 1015	WARNING: Geomagnetic K= 4	19 Jan 1015 -1500
19 Jan 1022	ALERT: Geomagnetic K= 4	19 Jan 1022
19 Jan 1326	ALERT: STRATWARM	19 Jan
19 Jan 1450	EXTENDED WARNING: Geomagnetic K= 4	19 Jan 1015 - 2359



### 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
22 Jan	135	15	3	05 Feb	180	10	3
23	125	25	5	06	185	15	3
24	125	20	4	07	185	12	3
25	120	15	3	08	175	8	3
26	120	15	3	09	170	8	3
27	120	12	3	10	165	8	3
28	120	10	3	11	155	8	3
29	125	10	3	12	145	8	3
30	135	10	3	13	140	8	3
31	145	15	3	14	135	12	3
01 Feb	150	12	3	15	130	12	3
02	160	8	3	16	135	12	3
03	160	8	3	17	130	12	3
04	170	10	3				



### *Energetic Events*

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV
<b>No Events Observed</b>												

### *Flare List*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
13 January	0437	0442	0508	C1.3	Sf	S25E10	0250
	0451	0456	0519	C1.7	Sf	S16E43	0254
	0633	0637	0641	C1.0			
	1257	1305	1312	C2.4			
	1330	1332	1335		Sf	S12E07	0255
	1406	1411	1416	C3.1			
	1600	1601	1608		Sf	S09W80	0242
	1610	1611	1638	C4.2	Sf	S21W76	0244
	2205	2240	2303	C2.1			
14 January	0050	0058	0123	C1.6			
	0455	0508	0603	C1.9			0242
	0620	0636	0651	C6.4			0242
	0942	0948	0954	C2.1			0250
	1039	1044	1048	C2.5			
	1614	1620	1625	C1.4			
	1645	1653	1705	C1.5			
	1734	1740	1757	C1.2			
15 January	0907	0924	0940	C1.2			
	1541	1541	1545		Sf	S26W18	0250
	2023	2048	2100	B7.1			
16 January	0105	0108	0118	C5.3	ln	S11W27	0255
	B0445	U0448	A0448	C1.8	lf	N10E52	0258
	1112	1218	1254	C2.0			
17 January	2023	2031	2037	B7.5			
	0450	0453	0455	B7.7			
	0556	0600	0602	B8.4			
	0731	0734	0737	B7.6			
	1524	1533	1546	B6.6			
	1726	1727	1731	B7.7	Sf	N09E30	0259
	2036	2040	2043	B6.4			
	2106	2110	2113	B9.2			
2329	2334	2338	C1.1				
18 January	1935	1940	1945	B6.8			



*Flare List - continued.*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
19 January	0315	0318	0320	B4.8			
	0421	0423	0425	B5.6			
	0600	0606	0610	B6.0			
	0901	0910	0920	B6.1			
	B1254	U1254	1314	B4.6	Sf	N14E31	0260
	1412	1416	1421	B5.5			

*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 242*

02 Jan	S08E61	214	0030	03	Cso	006	B					1								
03 Jan	S08E48	214	0090	06	Dai	015	B	1				4								
04 Jan	S08E33	216	0180	08	Dai	018	Bg													
05 Jan	S08E20	216	0190	09	Dai	028	Bg	1				4								
06 Jan	S08E03	216	0190	10	Dac	027	B													
07 Jan	S06W09	219	0340	10	Dkc	036	B					4								
08 Jan	S08W22	219	0370	09	Dac	046	Bg	2				4								
09 Jan	S08W34	217	0310	09	Dai	035	Bg	2				4	1							
10 Jan	S08W48	218	0190	09	Dai	023	Bg	2				2								
11 Jan	S07W61	218	0300	09	Dai	028	Bg	4				5								
12 Jan	S07W75	219	0170	08	Dao	012	B	2												
13 Jan	S07W87	218	0120	05	Dao	004	B						1							
												14	0	0	29	1	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 216

*Region 244*

03 Jan	S15E58	204	0050	05	Dao	009	B	1				1								
04 Jan	S23E40	209	0140	07	Dao	009	B	2				4								
05 Jan	S23E27	209	0150	07	Dao	015	B	1				1								
06 Jan	S23E14	209	0090	09	Cao	013	Bg	1				1								
07 Jan	S23W01	211	0080	09	Dao	015	B	1	1			2	1							
08 Jan	S22W16	213	0070	07	Dso	015	B	1				1	1							
09 Jan	S22W31	214	0030	03	Cso	007	B					1								
10 Jan	S22W44	214	0010	02	Cso	003	B													
11 Jan	S22W56	213	0020	03	Cao	004	B	3				4								
12 Jan	S22W71	215	0020	03	Bxo	004	B													
13 Jan	S22W84	215						1				1								
												11	1	0	16	2	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 211



**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 245*

03 Jan	N12E74	188	0070	02	Hax	001	A											
04 Jan	N11E59	190	0110	02	Hax	001	A											
05 Jan	N11E46	190	0080	02	Hax	003	A											
06 Jan	N11E33	190	0030	01	Hax	002	A											
07 Jan	N12E21	189	0030	03	Cso	003	B											
08 Jan	N11E07	190	0030	04	Cso	008	B					1						
09 Jan	N12W05	188	0030	03	Cao	006	B											
10 Jan	N12W20	190	0010	02	Cao	003	B											
11 Jan	N12W33	190																
12 Jan	N12W46	190																
13 Jan	N12W59	190																
14 Jan	N12W72	190																
15 Jan	N12W85	190																
																		0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 188

*Region 246*

06 Jan	N08E10	213	0010	03	Cro	003	B											
07 Jan	N09W02	212	0000	00	Axx	001	A											
08 Jan	N09W15	212																
09 Jan	N09W28	212																
10 Jan	N09W41	212																
11 Jan	N09W54	212																
12 Jan	N09W67	212																
13 Jan	N09W80	212																
																		0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 212



**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 247</i>																		
06 Jan	S17E73	150	0020	01	Hsx	001	A											
07 Jan	S18E59	151	0070	08	Cao	005	B											
08 Jan	S18E47	150	0240	10	Dai	018	B							4				
09 Jan	S17E34	149	0340	10	Dai	036	B							4				
10 Jan	S15E20	150	0300	11	Eai	033	Bg											
11 Jan	S17E07	150	0300	11	Eai	046	B										1	
12 Jan	S16W07	151	0230	11	Eai	044	B	1						1				
13 Jan	S16W21	152	0150	12	Eai	037	B											
14 Jan	S17W33	150	0150	11	Eao	020	B											
15 Jan	S16W46	150	0070	10	Dso	010	B											
16 Jan	S15W64	155	0050	04	Cso	003	B											
17 Jan	S13W76	154	0010	04	Bxo	003	B											
18 Jan	S14W88	153	0030	09	Cso	004	B											
										1	0	0	10	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 150

<i>Region 249</i>																		
07 Jan	S16E18	192	0020	04	Cro	007	B											
08 Jan	S16E05	192	0060	06	Dso	010	B											
09 Jan	S15W08	191	0040	06	Dso	013	B											
10 Jan	S15W21	191	0040	07	Dao	011	B											
11 Jan	S15W34	191	0040	02	Hsx	004	A											
12 Jan	S15W47	191	0040	04	Dao	003	B											
13 Jan	S15W62	193	0020	01	Hrx	001	A											
14 Jan	S15W76	193	0010	01	Axx	001	A											
15 Jan	S14W85	189	0030	01	Axx	002	A											
										0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 192





**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 250</i>																		
07 Jan	S27E79	131	0100	02	Hsx	002	A											
08 Jan	S28E66	131	0190	05	Cao	003	B											
09 Jan	S27E53	130	0160	07	Cao	005	B											
10 Jan	S26E37	133	0170	06	Cao	007	B											
11 Jan	S27E27	130	0180	04	Cko	007	B											
12 Jan	S27E13	131	0180	05	Cko	009	B											
13 Jan	S26E00	131	0130	03	Cao	004	B	1				1						
14 Jan	S26W12	129	0170	06	Cao	012	B	1										
15 Jan	S24W24	128	0150	05	Cao	005	B					1						
16 Jan	S27W36	127	0130	04	Cao	004	B											
17 Jan	S26W50	128	0120	06	Cao	005	B											
18 Jan	S27W63	128	0140	05	Dao	008	B											
19 Jan	S27W77	128	0120	05	Cao	007	B											
								2	0	0	2	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 131

<i>Region 251</i>																		
07 Jan	S14E81	129	0060	02	Hax	001	A		1			1						
08 Jan	S14E70	127	0280	10	Dki	011	Bg	1				2						
09 Jan	S13E58	125	0330	11	Eao	012	Bg	4	1			10	1					
10 Jan	S13E44	126	0340	12	Eho	012	B											
11 Jan	S14E32	125	0380	15	Eko	034	B					1						
12 Jan	S14E21	123	0120	11	Eai	024	B											
13 Jan	S14E09	122	0080	09	Cao	016	B											
14 Jan	S14W05	122	0070	07	Dao	016	B											
15 Jan	S15W14	118	0050	08	Cro	014	B											
16 Jan	S15W28	119	0040	06	Cso	007	B											
17 Jan	S16W41	119	0010	05	Bxo	006	B											
18 Jan	S13W55	120	0010	01	Axx	002	A											
19 Jan	S13W68	120																
								5	2	0	14	1	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 122



*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 252*

09 Jan	S04E61	122	0010	01	Axx	001	A												
10 Jan	S03E46	124	0020	02	Hsx	002	A												
11 Jan	S03E33	124	0020	02	Hax	003	A												
12 Jan	S03E18	126	0010	02	Axx	002	A												
13 Jan	S03E05	126																	
14 Jan	S03W08	126																	
15 Jan	S03W21	126																	
16 Jan	S03W34	126																	
17 Jan	S03W47	126																	
18 Jan	S03W60	126																	
19 Jan	S03W73	126																	

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 126

*Region 253*

10 Jan	N11W36	206	0010	03	Cso	004	B												
11 Jan	N09W48	205	0060	07	Dao	011	B												
12 Jan	N09W61	205	0030	07	Dso	004	B												
13 Jan	N09W73	204	0020	06	Cro	005	B												
14 Jan	N09W86	204																	

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 206

*Region 254*

10 Jan	S15E72	098	0070	02	Hsx	001	A												
11 Jan	S16E63	094	0190	11	Eao	011	B												
12 Jan	S16E44	100	0130	05	Cao	006	B												1
13 Jan	S14E29	102	0100	02	Hax	002	A												1
14 Jan	S14E17	100	0110	04	Cso	006	B												
15 Jan	S15E04	100	0120	04	Cso	005	B												
16 Jan	S14W11	102	0090	03	Hax	001	A												
17 Jan	S14W24	102	0110	02	Hsx	001	A												
18 Jan	S14W37	102	0090	03	Hax	001	A												
19 Jan	S14W51	102	0090	02	Hsx	002	A												

1 0 0 2 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 100



**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 255*

12 Jan	S13E14	117	0200	05	Cko	009	B													
13 Jan	S13E01	130	0200	05	Cko	009	B						1							
14 Jan	S13W12	129	0240	05	Cko	007	A													
15 Jan	S13W23	127	0160	08	Cao	013	B													
16 Jan	S13W39	130	0150	05	Dso	007	B	1						1						
17 Jan	S12W53	131	0130	06	Cao	006	B													
18 Jan	S13W67	132	0110	02	Hax	002	A													
19 Jan	S13W81	132	0130	02	Hsx	001	A													
													1	0	0	1	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 130

*Region 256*

12 Jan	S17E55	089	0080	03	Cao	005	B													
13 Jan	S17E41	090	0070	02	Hsx	001	A													
14 Jan	S16E28	089	0060	02	Hsx	001	A													
15 Jan	S17E16	088	0050	02	Hsx	001	A													
16 Jan	S16E03	088	0040	02	Hax	002	A													
17 Jan	S16W12	090	0040	05	Cao	005	B													
18 Jan	S16W25	090	0020	05	Cso	006	B													
19 Jan	S16W39	090	0010	03	Cro	003	B													
													0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 088

*Region 257*

13 Jan	N16E23	108	0010	03	Bxo	003	B													
14 Jan	N16E09	108	0020	04	Cso	006	B													
15 Jan	N16W03	107	0020	05	Cso	004	B													
16 Jan	N15W19	110	0010	01	Axx	001	A													
17 Jan	N16W36	114	0010	04	Bxo	003	B													
18 Jan	N16W48	113	0020	06	Cso	006	B													
19 Jan	N16W62	113	0050	06	Dso	004	B													
													0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 107



**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 258*

14 Jan	N07E56	061	0050	03	Cao	005	B											
15 Jan	N07E44	060	0060	09	Cso	005	B											
16 Jan	N08E27	064	0070	02	Hsx	002	A	1					1					
17 Jan	N07E12	066	0070	02	Hsx	001	A											
18 Jan	N07W01	066	0080	02	Hax	002	A											
19 Jan	N07W15	066	0100	02	Hsx	002	A											
								1	0	0	0	0	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 066

*Region 259*

14 Jan	N13E72	045	0050	02	Hax	002	A											
15 Jan	N11E58	046	0030	02	Hsx	003	A											
16 Jan	N10E41	050	0040	07	Cso	007	B											
17 Jan	N09E26	052	0060	11	Eao	017	B						1					
18 Jan	N10E12	053	0070	10	Dao	014	B											
19 Jan	N10W02	053	0060	11	Eao	019	B											
								0	0	0	0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 053

*Region 260*

15 Jan	N14E77	027	0070	03	Hsx	001	A											
16 Jan	N14E65	026	0070	02	Hax	001	A											
17 Jan	N14E53	025	0070	03	Cao	003	B											
18 Jan	N14E40	025	0030	02	Hax	003	A											
19 Jan	N14E26	025	0050	03	Cao	010	B						1					
								0	0	0	0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 025

*Region 261*

19 Jan	N26W47	098	0040	04	Cso	004	B											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 098



***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

*Region 262*

19 Jan	S05W45	096	0050	04	Dso	003	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 096

*Region 263*

19 Jan	S13W11	062	0010	02	Axx	003	A								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 062

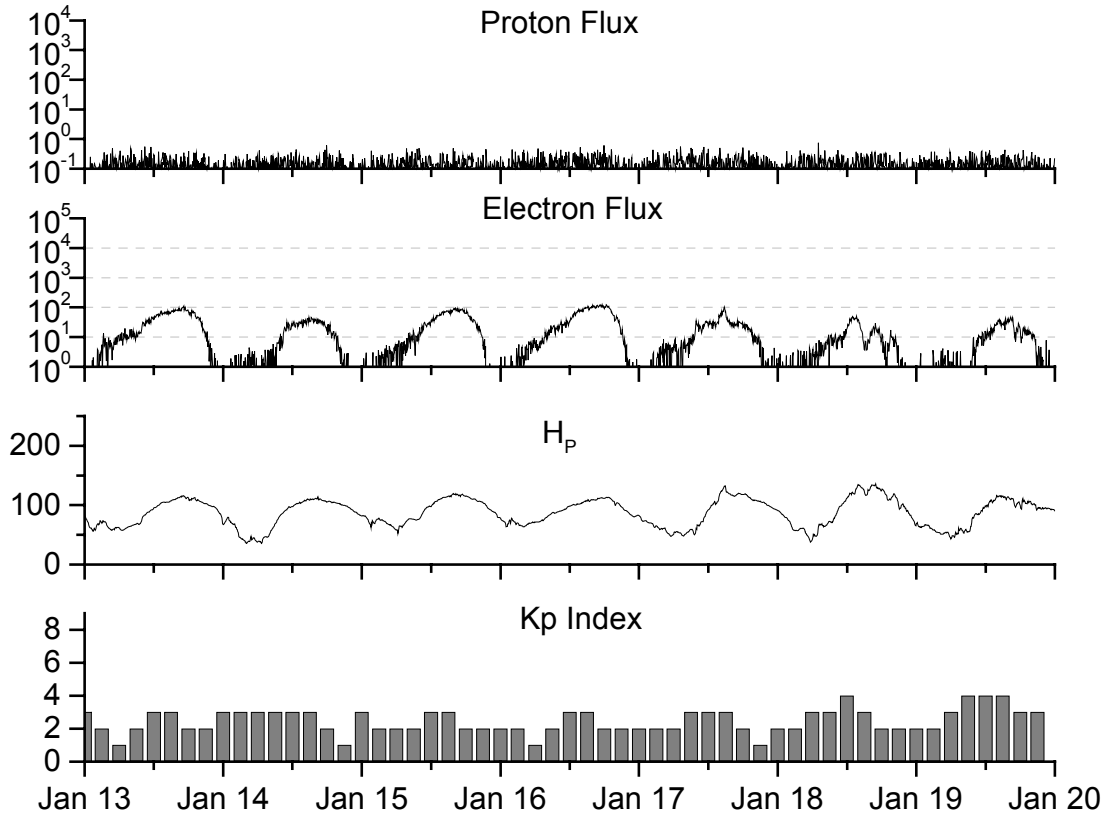


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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>2001</b>									
January	142.7	95.1	0.67	156.3	108.8	166.6	168.8	08	13.8
February	131.0	80.1	0.61	151.4	104.2	146.7	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	159.4	107.7	178.1	171.7	18	12.7
May	135.1	97.3	0.72	163.1	108.8	147.9	174.8	12	12.5
June	196.7	134.0	0.68	167.2	109.9	173.7	178.8	12	12.4
July	124.6	82.2	0.66	172.1	111.8	131.3	183.9	11	12.4
August	159.4	106.8	0.67	176.7	113.8	163.1	188.8	13	12.5
September	229.1	150.7	0.66	178.8	114.3	233.8	191.3	13	12.8
October	197.4	125.6	0.64	179.5	114.1	208.1	191.9	20	12.0
November	178.6	106.5	0.60	183.7	115.6	212.7	193.7	16	12.0
December	217.5	131.8	0.61	184.5	114.7	235.6	193.9	09	12.2
<b>2002</b>									
January	189.0	113.9	0.60	184.8	113.5	227.3	194.6	08	12.4
February	194.5	108.0	0.56	188.6	114.7	205.0	197.2	10	12.8
March	153.1	98.1	0.64	188.9	113.3	180.3	195.7	10	13.0
April	194.9	120.4	0.62	186.2	110.4	189.8	191.5	15	13.2
May	204.1	120.8	0.59	183.6	108.8	178.4	188.0	15	13.3
June	146.0	88.5	0.61	179.9	106.2	148.7	183.0	11	13.5
July	183.5	99.9	0.54			173.5		13	
August	191.0	116.4	0.61			183.9		16	
September	206.4	109.3	0.53			175.8		14	
October	153.9	97.5	0.63			167.0		23	
November	159.8	95.0	0.59			168.7		16	
December	147.9	81.6	0.55			158.6		13	

**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 13 January 2003*

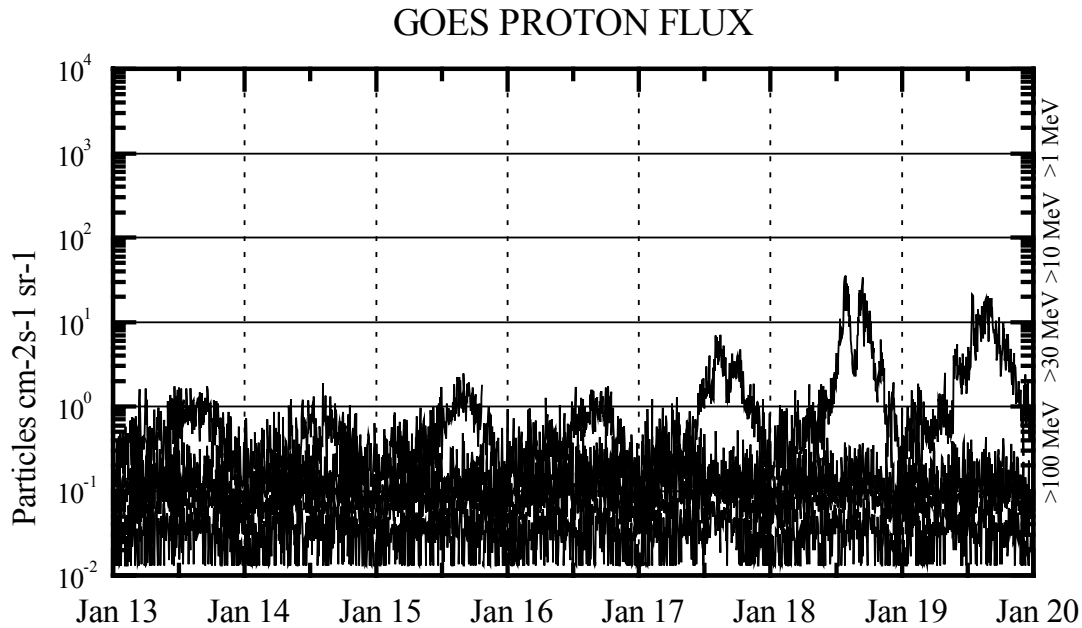
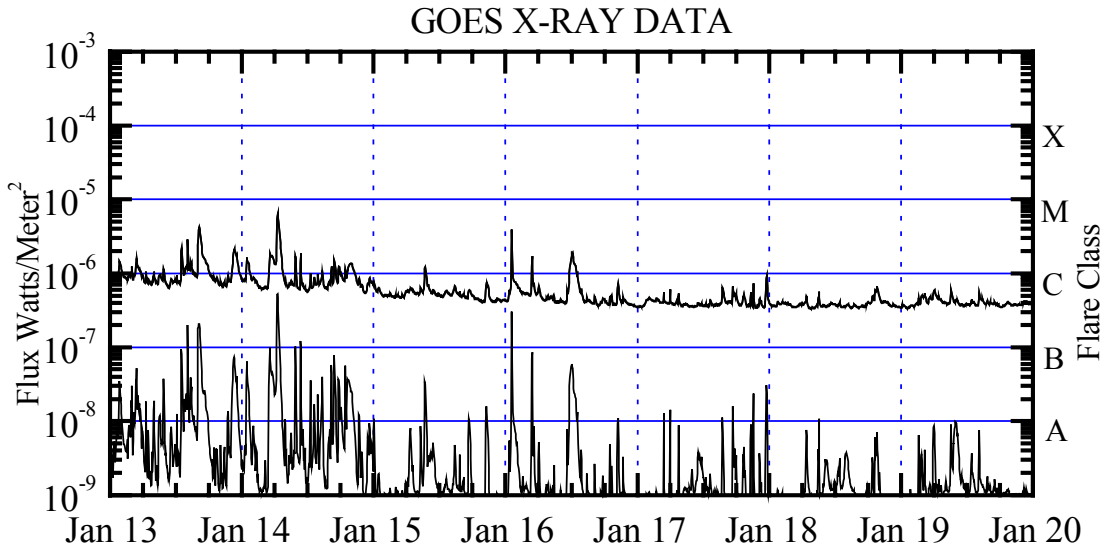
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

*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>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 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.

