

**Space Weather Highlights**  
**28 January - 03 February 2002**

**SWO PRF 1379**  
**05 February 2002**

Solar activity was at low levels during most of the period, but briefly rose to moderate levels on 31 January. Activity was low during 28 – 30 January due to C-class flares. Most of these were from Regions 9800 (N08, L = 047, class/area Fkc/600 on 29 January) and 9802 (S15, L = 022, class/area Ekc/780 on 01 February). Both regions were large and magnetically complex, each exhibiting a magnetic delta configuration for a time. However, both began to gradually decay during the second half of the period, though Region 9802 remained magnetically complex. A large filament disappeared from the Sun's southeast quadrant on 28 January associated with a partial-halo CME. Activity rose to moderate on 31 January due to an M3 X-ray flare at 31/1444 UTC from Region 9787 (S07, L = 130, class/area Dko/470 on 24 January), which was near the west limb. Activity was low during the rest of the period with isolated C-class subflares from Regions 9800 and 9802.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the period. A weak CME shock front passed the spacecraft late on 31 January associated with relatively minor increases in solar wind velocity, temperature, density, and interplanetary field intensity. This passage may have been associated with a partial-halo CME observed near the west limb on 27 January. A second CME passage occurred on 02 February associated with modest increases in velocity and temperature as well as a sustained period of southward IMF Bz with maximum deflections to minus 13 nT. This passage may have been associated with the filament disappearance mentioned above. There were no disturbances during the rest of the period.

There were no proton events at geosynchronous orbit during the period.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels for most of the period.

Geomagnetic field activity was at mostly quiet to unsettled levels through 01 February, although there was a sudden impulse at 31/2127 UTC (19 nT, as measured by the Boulder USGS magnetometer). Activity increased to unsettled to minor storm levels early on 02 February then decreased to quiet to unsettled during the latter half of the day. Quiet to unsettled levels prevailed during the remainder of the period.

**Space Weather Outlook**  
**06 February - 04 March 2002**

Solar activity is expected to be at low to moderate levels. There is a fair chance for isolated low-level M-class flares during the period. There will be a slight chance for an isolated major flare during the period.

There will be a slight chance for a proton flare during the forecast period.

The greater than 2 MeV electron flux is expected to be at normal to moderate levels during most of the period. However, high flux levels will be possible during 07 – 10 February.

Active conditions will be possible during 06 – 07 February due to recurrent coronal hole effects. Quiet to unsettled conditions are expected during the rest 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
28 January	260	207	1670	C1.4	5	0	0	8	0	0	0	0
29 January	261	214	1720	C1.7	6	0	0	7	0	0	0	0
30 January	243	210	1670	C1.6	7	0	0	1	0	0	0	0
31 January	243	238	1970	C1.7	5	1	0	5	0	0	0	0
01 February	246	256	2160	C1.3	2	0	0	5	0	0	0	0
02 February	241	222	1990	C1.0	5	0	0	2	0	0	0	0
03 February	233	273	1660	C1.1	9	0	0	6	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
	28 January	1.0E+6	7.0E+4	2.5E+3		5.7E+5
29 January	4.8E+5	3.0E+4	2.4E+3		7.5E+5	
30 January	1.6E+5	1.9E+4	2.4E+3		1.3E+6	
31 January	2.2E+5	1.8E+4	2.4E+3		1.1E+6	
01 February	1.9E+5	1.3E+4	2.3E+3		1.5E+5	
02 February	1.6E+5	1.1E+4	2.1E+3		9.8E+4	
03 February	4.9E+4	1.2E+4	2.3E+3		8.6E+4	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	28 January	6	2-0-1-2-2-2-2-2	9	1-0-1-4-4-1-1-1	6
29 January	2	1-1-1-1-0-0-0-0	2	0-1-0-2-1-0-0-0	4	2-1-1-2-1-1-1-1
30 January	1	0-0-0-0-0-1-1-1	*	0-0-1-0-2-2-0-*	3	1-0-1-0-1-1-1-2
31 January	6	2-1-0-0-2-2-2-3	*	1-1-0-0-*-*-*	5	2-1-0-0-1-2-1-3
01 February	11	3-2-2-2-3-3-3-1	*	*-*-*-*-*1-4	11	3-2-2-2-3-4-2-2
02 February	14	2-3-4-3-3-3-2-2	*	1-5-*-*-*-*	18	3-3-5-4-4-3-3-2
03 February	6	1-2-0-1-3-3-2-0	*	*-*-*-*-*-*	5	1-2-0-2-2-2-2-0

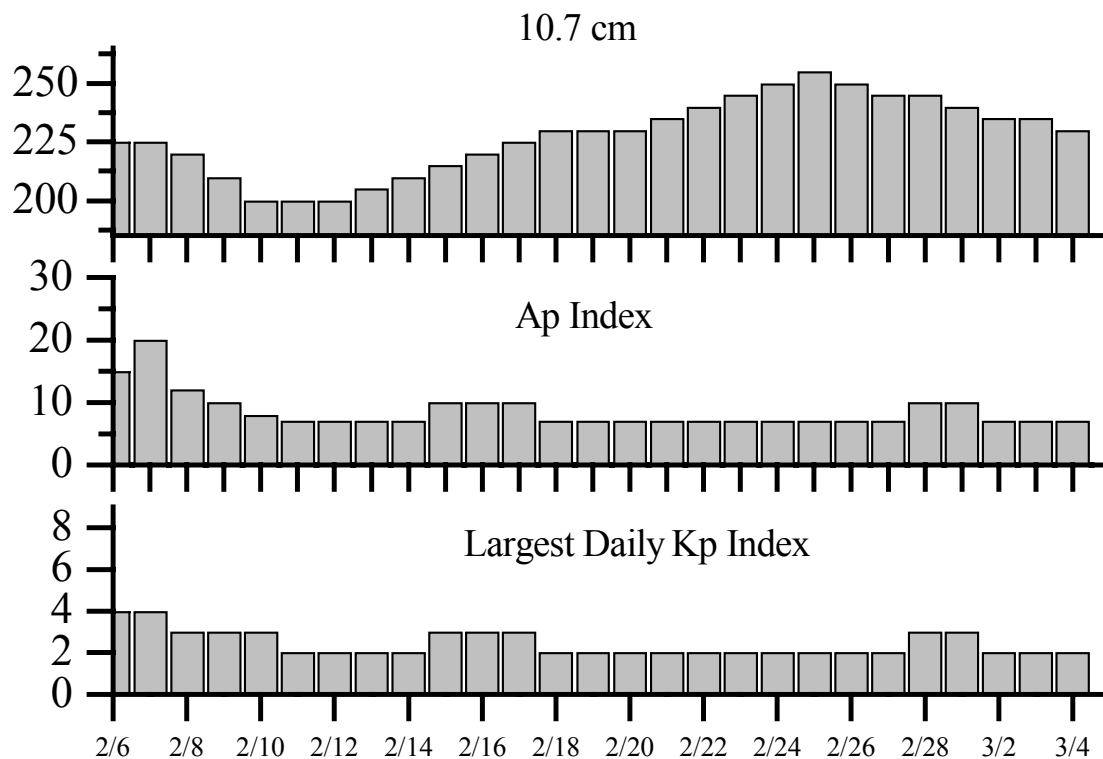


*Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
28 Jan 0011	2 - 245 MHz Bursts	27 Jan
28 Jan 0011	245 MHz Radio Noise Storm	27 Jan
29 Jan 0006	3 - 245 MHz Bursts	28 Jan
30 Jan 0026	1 - 245 MHz Burst	29 Jan
31 Jan 0029	1 - 245 MHz Burst	30 Jan
31 Jan 2159	Sudden Impulse observed at Boulder	31 Jan 2127
02 Feb 0556	K= 4 Observed	02 Feb 0300 - 0600
02 Feb 0614	K= 4 Warning	02 Feb 0615 - 1500
02 Feb 0619	Sudden Impulse observed at Boulder	02 Feb 0558
02 Feb 0639	K= 5 Warning	02 Feb 0640 - 1500
02 Feb 0854	K= 5 Observed	02 Feb 0600 - 0900
03 Feb 0034	1 - 245 MHz Radio Bursts	03 Feb 0034



### 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
06 Feb	225	15	4	20 Feb	230	7	2
07	225	20	4	21	235	7	2
08	220	12	3	22	240	7	2
09	210	10	3	23	245	7	2
10	200	8	3	24	250	7	2
11	200	7	2	25	255	7	2
12	200	7	2	26	250	7	2
13	205	7	2	27	245	7	2
14	210	7	2	28	245	10	3
15	215	10	3	01 Mar	240	10	3
16	220	10	3	02	235	7	2
17	225	10	3	03	235	7	2
18	230	7	2	04	230	7	2
19	230	7	2				



### *Energetic Events*

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	$\frac{1}{2}$	Class	Integ Flux	Imp/Location		Rgn #	Radio Flux		Intensity	
			Max			Brtns	Lat		CMD	245	2695	II
31 Jan	1436	1444	1450	M3.6	.019			9787				

### *Flare List*

Date	Time			X-ray Class.	Imp / Brtns	Optical Location		Rgn
	Begin	Max	End			Lat	CMD	
28 January	0305	0309	0313	C9.6	Sf	N19W71	9788	
	0659	0703	0712		Sf	S06W55	9787	
	0717	0718	0721		Sf	N13W32	9794	
	0818	0818	0825		Sf	S09W51	9787	
	0828	0831	0833		Sf	S09W51	9787	
	1105	1110	1116	C4.6				
	B1318	U1318	1324		Sf	S04W55	9787	
	B1400	U1400	A1406		Sf	S06W60	9787	
	1749	1754	1759	C8.1			9800	
	2236	2238	2240	C2.6	Sf	N05E20	9800	
29 January	2342	2349	2353	C9.6				
	0223	0224	0233		Sf	S20E48	9802	
	0423	0423	0431	C3.6	Sf	N05E17	9800	
	0842	0848	0854	C7.3			9800	
	1015	1015	1036		Sf	S18E42	9802	
	1026	1028	1034	C4.0	Sf	N05E15	9800	
	B1150	U1150	A1155		Sf	N13E59	9805	
	1216	1220	1224	C3.6				
	1300	1300	1322	C5.8	Sf	N05E15	9800	
	1655	1658	1717		Sf	N11W56	9794	
30 January	2127	2236	2254	C3.1				
	0113	0117	0121	C2.9				
	0233	0234	A0250	C3.6	Sf	S17E36	9802	
	1159	1225	1238	C3.3			9805	
	1333	1337	1339	C2.4				
	1637	1639	1640	C7.4				
	1738	1741	1743	C3.3				
31 January	2151	2157	2217	C2.8				
	1010	1012	1019	C3.3	Sf	S16E18	9802	
	1200	1203	1211	C2.2	Sf	S02W55	9798	
	1414	1416	1430	C4.3	Sf	N06W14	9800	
	1436	1444	1450	M3.6			9787	
	1533	1535	1541	C4.6	Sf	S15E12	9802	
	1640	1643	1706	C4.9	Sf	N06W14	9800	
01 February	0149	0150	0154		Sf	S14E05	9802	
	0418	0427	0523	C3.4			9797	
	1453	1453	1456		Sf	N06W28	9800	



*Flare List - continued.*

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
01 February	1818	1818	1821		Sf	N03W32	9800
	1818	1818	1821		Sf	S15W04	9802
	2112	2114	2130	C5.8	Sf	N05W31	9800
02 February	1132	1135	1137	C1.4			
	1157	1203	1209	C1.5			
	1535	1535	1541	C2.2	Sf	S18W13	9802
	2000	2004	2018	C2.9	Sf	S19W16	9802
	2154	2158	2201	C2.9			
03 February	0050	0101	0107	C2.3			
	0231	0232	0234		Sf	S27E34	9807
	0306	0306	0308	C3.7	Sf	S19W17	9802
	0450	0454	0514	C2.3			
	0548	0552	0559	C4.7	Sf	S27E32	9807
	1300	1301	1306	C1.4	Sf	N15E20	9808
	1509	1514	1543	C4.4	Sf	S17W27	9802
	1718	1738	1744	C1.3			
	1851	1852	1858	C1.7	Sf	S26E25	9807
	2216	2221	2225	C3.7			



### Region Summary

Date	Location		Sunspot Characteristics				Flares											
	( ° Lat ° CMD)	Helio	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
		Lon						C	M	X	S	1	2	3	4			
<i>Region 9787</i>																		
17 Jan	S08E85	130	0120	05	Hhx	001	A											
18 Jan	S07E71	131	0210	04	Hax	002	A											
19 Jan	S07E59	130	0360	10	Cko	006	B	1	1			2						
20 Jan	S07E46	130	0420	10	Cko	006	B					4						
21 Jan	S07E32	130	0430	11	Eko	007	B											
22 Jan	S06E19	130	0400	07	Dko	013	Bg	1				2						
23 Jan	S07E06	130	0440	08	Dki	010	Bg	2				2						
24 Jan	S06W06	129	0470	10	Dko	010	B					2						
25 Jan	S09W21	131	0400	06	Dko	008	B											
26 Jan	S09W33	130	0410	10	Dko	012	B											
27 Jan	S08W48	131	0450	05	Cko	005	B	1				1						
28 Jan	S08W60	130	0420	06	Dko	008	B					5						
29 Jan	S07W73	130	0380	05	Dho	005	B											
30 Jan	S07W89	133	0190	05	Dso	002	B											
								5	1	0	18	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 130

#### *Region 9788*

18 Jan	N16E52	150	0030	01	Cro	002	B											
19 Jan	N17E40	149	0080	07	Dso	008	B	1				1						
20 Jan	N17E27	149	0090	07	Dso	016	B	2				3						
21 Jan	N18E13	149	0160	08	Dai	014	B	2				2						
22 Jan	N18E00	149	0200	10	Dai	018	Bg											
23 Jan	N17W14	150	0170	11	Eai	020	Bg											
24 Jan	N18W30	153	0150	12	Eao	010	B											
25 Jan	N17W43	153	0120	06	Dao	011	B											
26 Jan	N15W57	154	0190	10	Dao	017	B	1				4						
27 Jan	N17W70	153	0120	09	Dao	012	B					1						
28 Jan	N18W85	155	0060	07	Dso	003	B	1				1						
29 Jan	N18W98	155																
								7	0	0	12	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 149



**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 9790*

19 Jan	N28E25	164	0010	01	Hsx	001	A											
20 Jan	N28E12	164	0000	00	Axx	001	A											
21 Jan	N28W02	164	0100	04	Bxo	003	B											
22 Jan	N29W15	164	0010	03	Cso	003	B											
23 Jan	N29W28	164	0000	00	Axx	001	A											
24 Jan	N29W39	162																
25 Jan	N28W55	165	0010	03	Bxo	003	B											
26 Jan	N27W69	166	0010	01	Axx	001	A											
27 Jan	N25W82	166																
28 Jan	N25W95	166																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 164

*Region 9792*

20 Jan	N07E23	153	0010	03	Bxo	002	B											
21 Jan	N07E10	153																
22 Jan	N07W03	153																
23 Jan	S03W16	152	0010	03	Bxo	005	B											
24 Jan	S03W28	151																
25 Jan	S03W41	151																
26 Jan	S03W54	151																
27 Jan	S03W67	151																
28 Jan	S03W80	151																
29 Jan	S03W93	151																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 153







**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 9796*

23 Jan	N09E18	118	0030	05	Cso	004	B											
24 Jan	N09E03	120	0020	07	Cro	005	B											
25 Jan	N09W08	118	0040	05	Cao	006	B											
26 Jan	N10W21	118																
27 Jan	N10W34	118																
28 Jan	N10W47	118																
29 Jan	N10W60	118																
30 Jan	N10W73	118																
31 Jan	N10W86	118																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 120

*Region 9797*

23 Jan	S16E32	104	0020	01	Hsx	002	A											
24 Jan	S16E19	104																
25 Jan	S16E06	104																
26 Jan	S18W12	109	0010	03	Bxo	003	B											
27 Jan	S18W25	109																
28 Jan	S18W38	109																
29 Jan	S18W51	109																
30 Jan	S18W64	109																
31 Jan	S18W77	109																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 104

*Region 9798*

23 Jan	S03E42	094	0020	06	Cso	004	B											
24 Jan	S02E30	093	0050	06	Cro	007	B											
25 Jan	S02E15	095	0060	04	Cao	009	B											
26 Jan	S01E01	096	0010	03	Bxo	002	B											
27 Jan	S02W13	096	0020	04	Cro	005	B											
28 Jan	S03W22	092	0010	09	Cso	004	B											
29 Jan	S02W39	096	0010	01	Axx	002	A											
30 Jan	S02W52	096																
31 Jan	S02W65	096								1			1					
01 Feb	S02W78	096																
02 Feb	S02W91	096																

1 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 096







**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 9804*

28 Jan	S19E27	043	0020	01	Axx	001	A								
29 Jan	S19E13	044	0010	02	Axx	002	A								
30 Jan	S19E00	044	0000	00		000									
31 Jan	S19W13	044	0020	02	Bxo	004	B								
01 Feb	S17W26	043	0030	06	Cao	003	B								
02 Feb	S17W38	042													
03 Feb	S17W51	042													
											0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 044

*Region 9805*

28 Jan	N14E64	006	0010	01	Hrx	001	A								
29 Jan	N14E51	006	0040	05	Dso	004	B				1				
30 Jan	N14E39	005	0010	04	Cso	004	B	1							
31 Jan	N12E30	001	0030	04	Cso	005	B								
01 Feb	N15E13	005													
02 Feb	N15E00	005													
03 Feb	N15W13	005													
											1	0	0	1	0

Still on Disk.

Absolute heliographic longitude: 005

*Region 9806*

28 Jan	N11E70	000	0040	02	Hsx	001	A								
29 Jan	N10E57	000	0030	02	Hsx	001	A								
30 Jan	N10E44	000	0040	01	Hsx	001	A								
31 Jan	N12E31	000	0050	03	Cao	004	B								
01 Feb	N11E17	000	0040	02	Hsx	002	A								
02 Feb	N11E03	000	0050	05	Dso	004	B								
03 Feb	N11W08	360	0040	04	Dso	004	B								
											0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 000

*Region 9807*

30 Jan	S27E74	330	0160	14	Eso	005	B								
31 Jan	S26E64	327	0370	12	Eko	007	B								
01 Feb	S27E51	326	0320	13	Eai	013	Bg								
02 Feb	S27E38	326	0210	13	Eai	016	Bg								
03 Feb	S27E26	326	0120	13	Esi	026	B	2			3				
								2	0	0	3	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 326



**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 9808*

31 Jan	N15E54	337	0030	03	Cso	004	B										
01 Feb	N16E41	336	0060	04	Cao	008	B										
02 Feb	N16E28	336	0050	05	Cao	006	B										
03 Feb	N17E15	337	0030	06	Dso	010	B	1			1						
								1	0	0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 337

*Region 9809*

31 Jan	S06E68	323	0130	05	Dso	002	B										
01 Feb	S06E55	322	0120	05	Dao	003	B										
02 Feb	S06E42	322	0120	06	Dso	003	B										
03 Feb	S06E29	323	0060	06	Dso	005	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 323

*Region 9810*

01 Feb	N10E81	296	0110	02	Hax	002	A										
02 Feb	N09E68	296	0200	04	Cso	002	B										
03 Feb	N09E55	297	0200	04	Cao	003	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 297

*Region 9811*

02 Feb	S27E83	281	0090	02	Hax	001	A										
03 Feb	S27E70	282	0120	08	Cso	004	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 282

*Region 9812*

02 Feb	N12W16	020	0010	03	Dso	002	B										
03 Feb	N12W29	021	0030	05	Dso	005	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 020

*Region 9813*

03 Feb	S24W13	005	0010	01	Hsx	002	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 005



***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 9814*

03 Feb	N07E15	337	0010	04	Bxo	004	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 337

*Region 9815*

03 Feb	N12E70	282	0080	03	Hsx	001	A								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 282



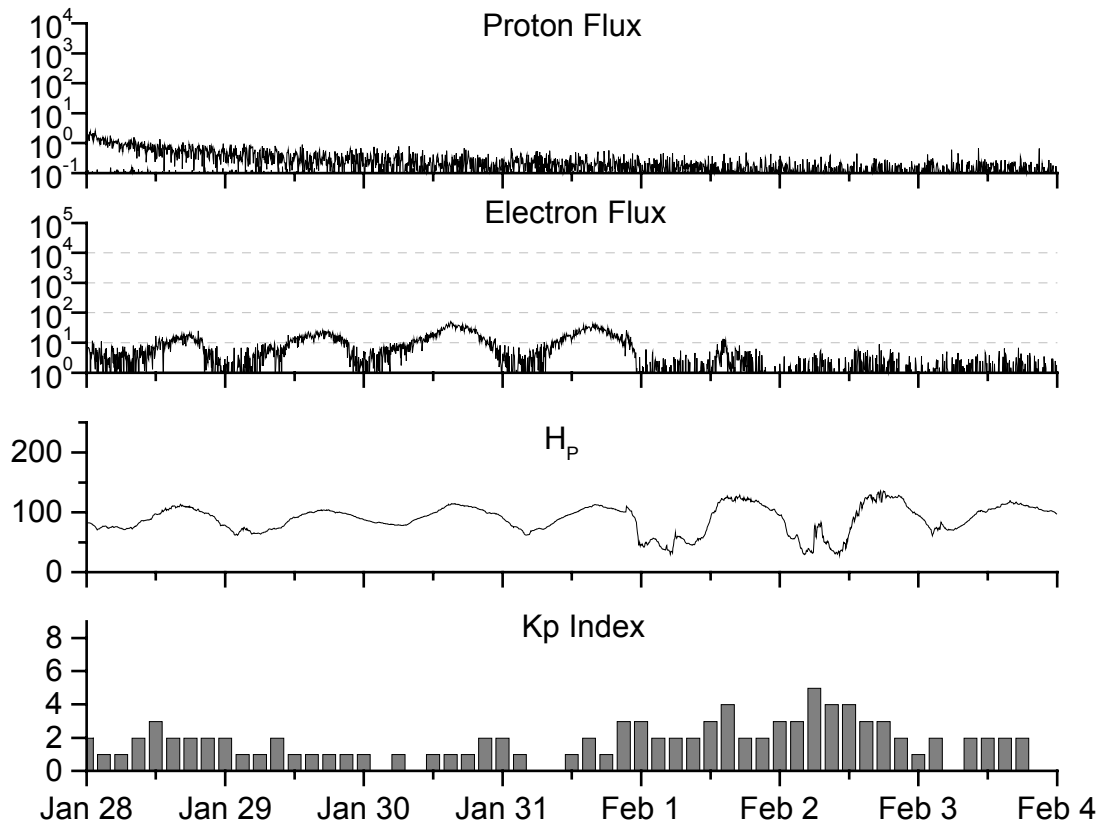
**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

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>2000</b>									
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	159.4	107.7	178.3	171.7	18	12.7
May	135.1	97.3	0.72	163.1	108.8	148.7	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			163.2		13	
September	229.1	150.7	0.66			233.3		12	
October	197.4	125.6	0.64			208.2		18	
November	178.6	106.5	0.60			212.5		14	
December	217.5	131.8	0.61			236.6		08	
<b>2002</b>									
January	189.0	113.9	0.60			226.4		07	

**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 28 January 2002*

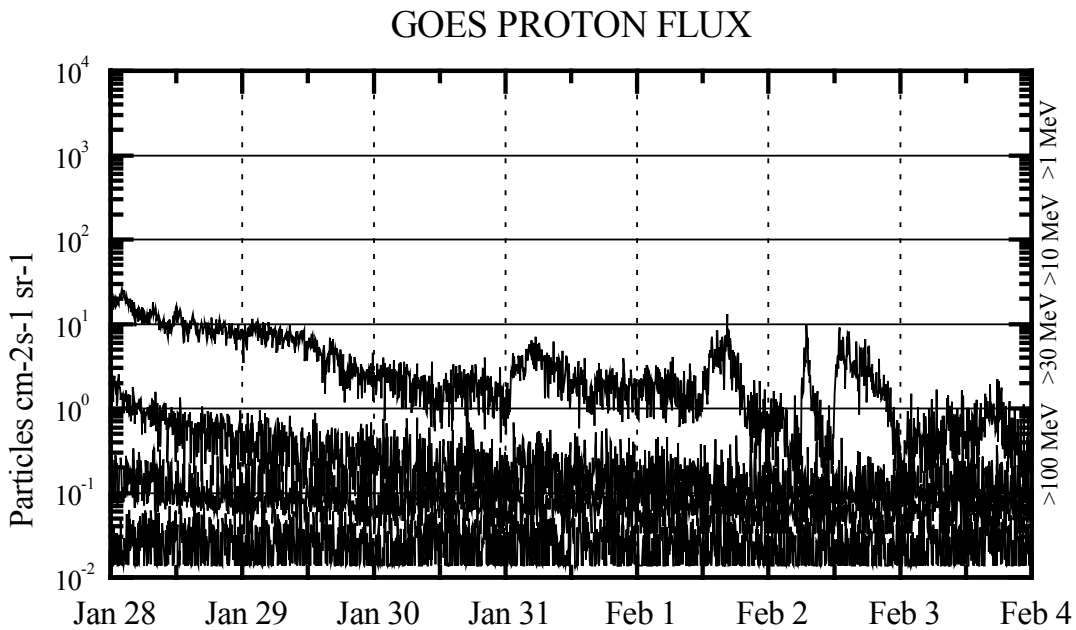
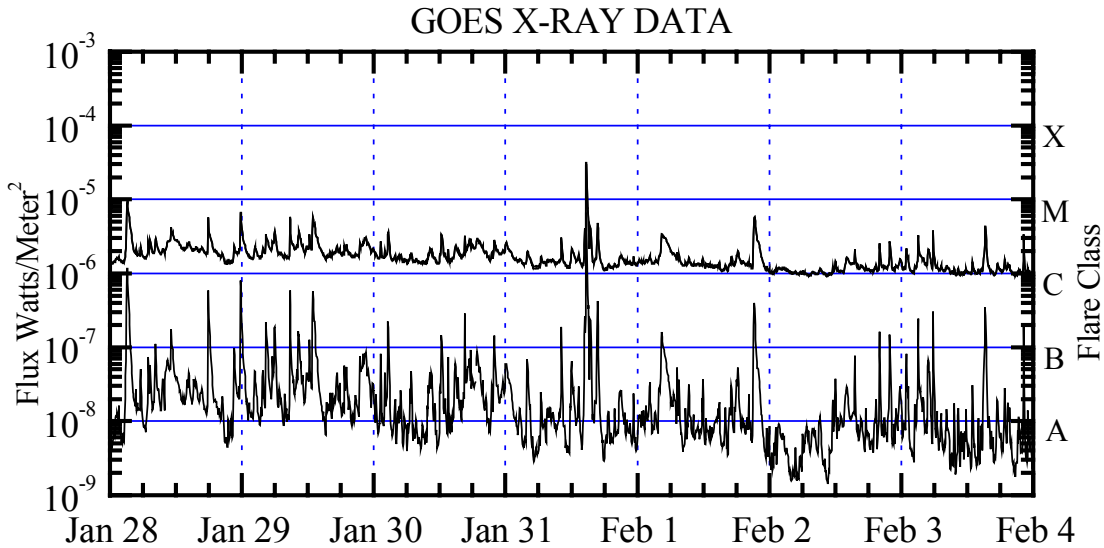
*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

*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.



# Sudden Storm Commencements and Impulses



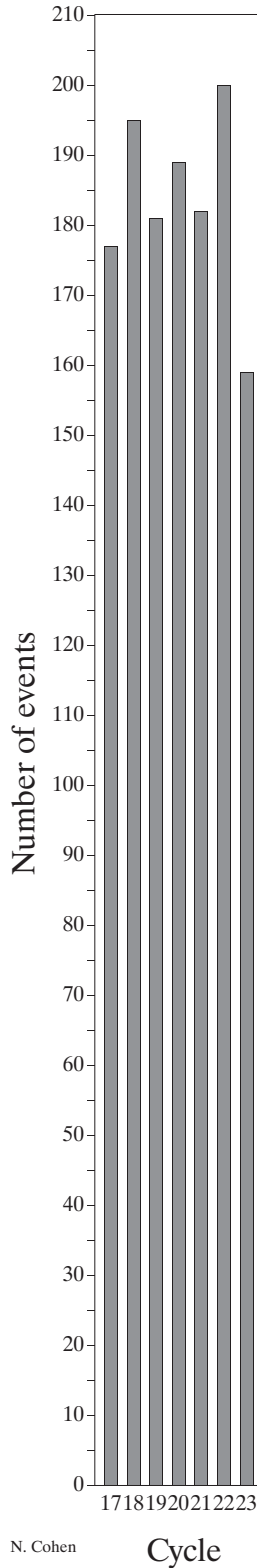
Space Environment Center

January 2002  
(Month 64)

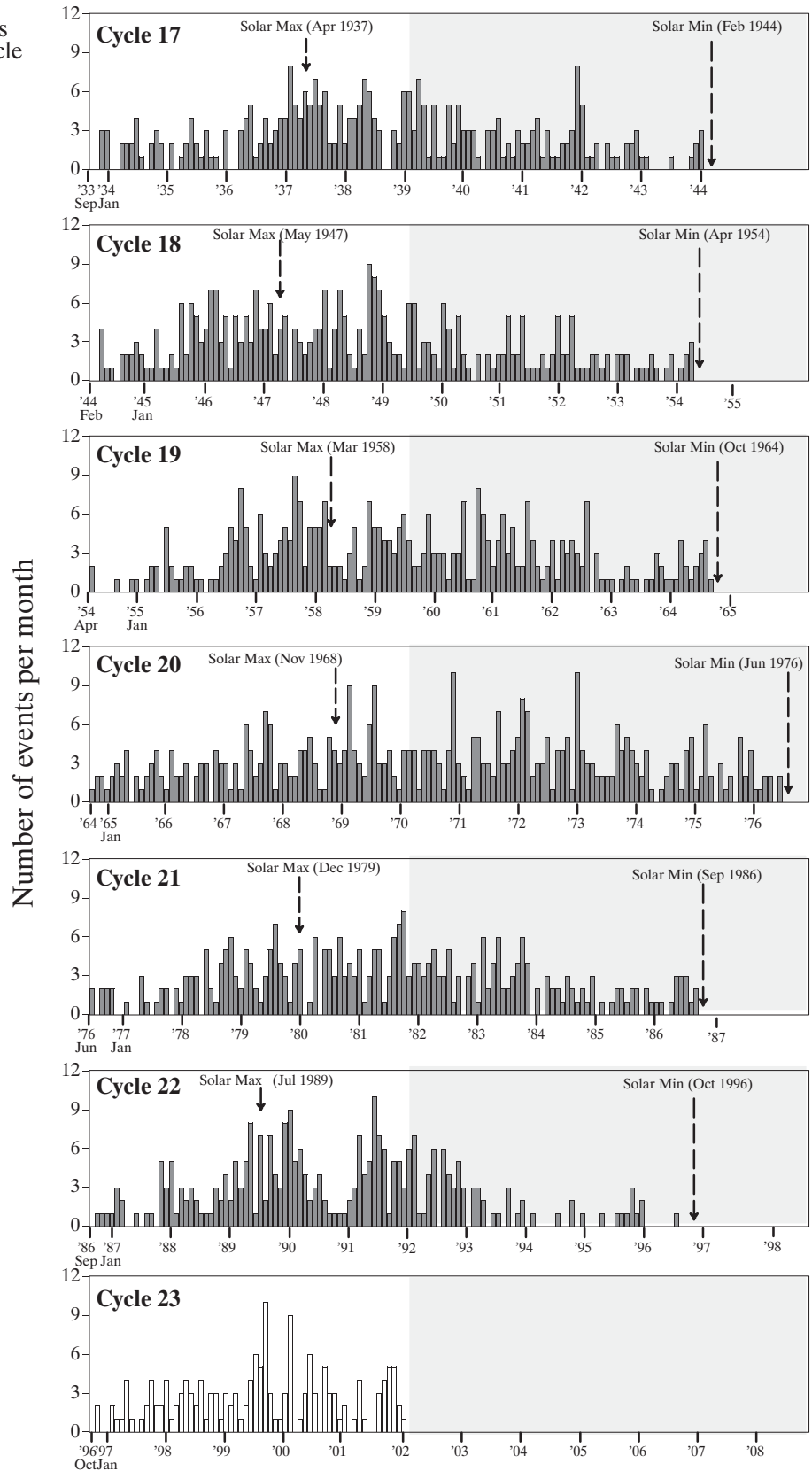
Preliminary data



Comparison of Cycles at current month in cycle

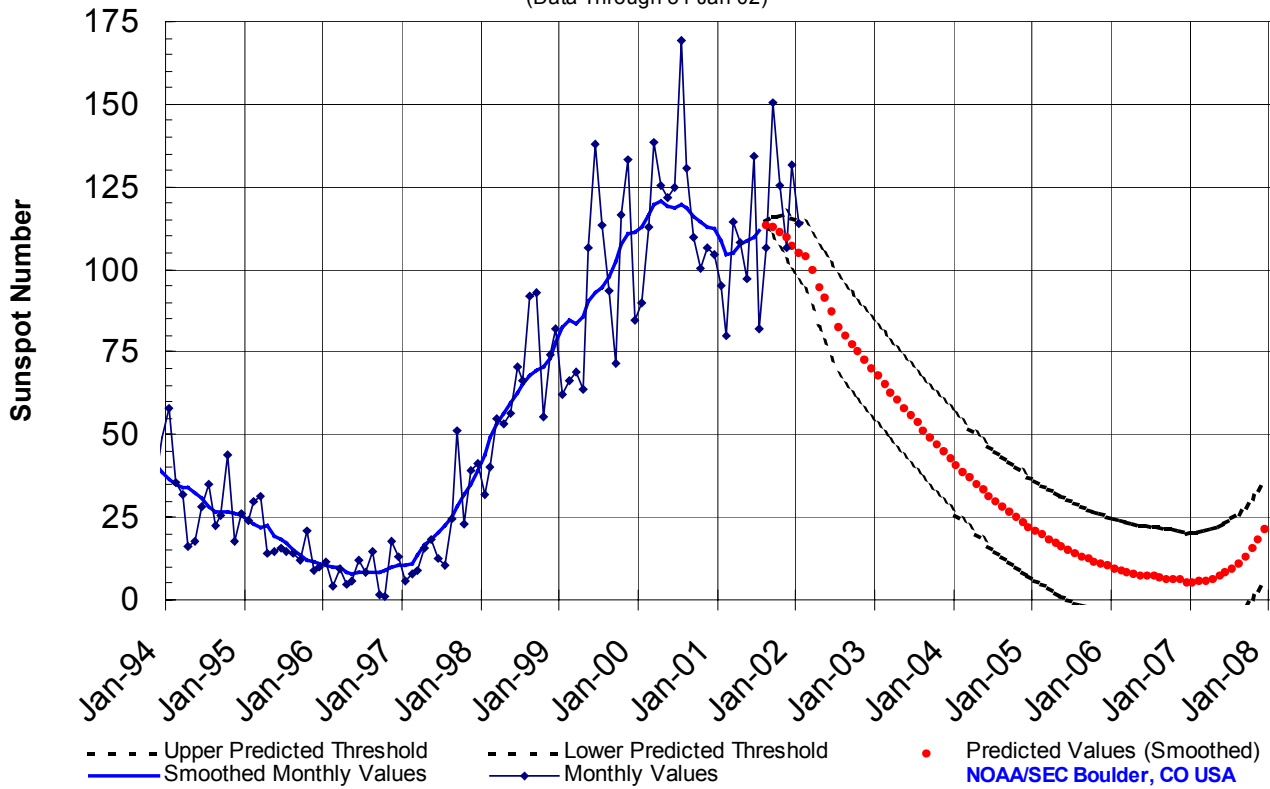


N. Cohen



### ISES Solar Cycle Sunspot Number Progression

(Data Through 31 Jan 02)



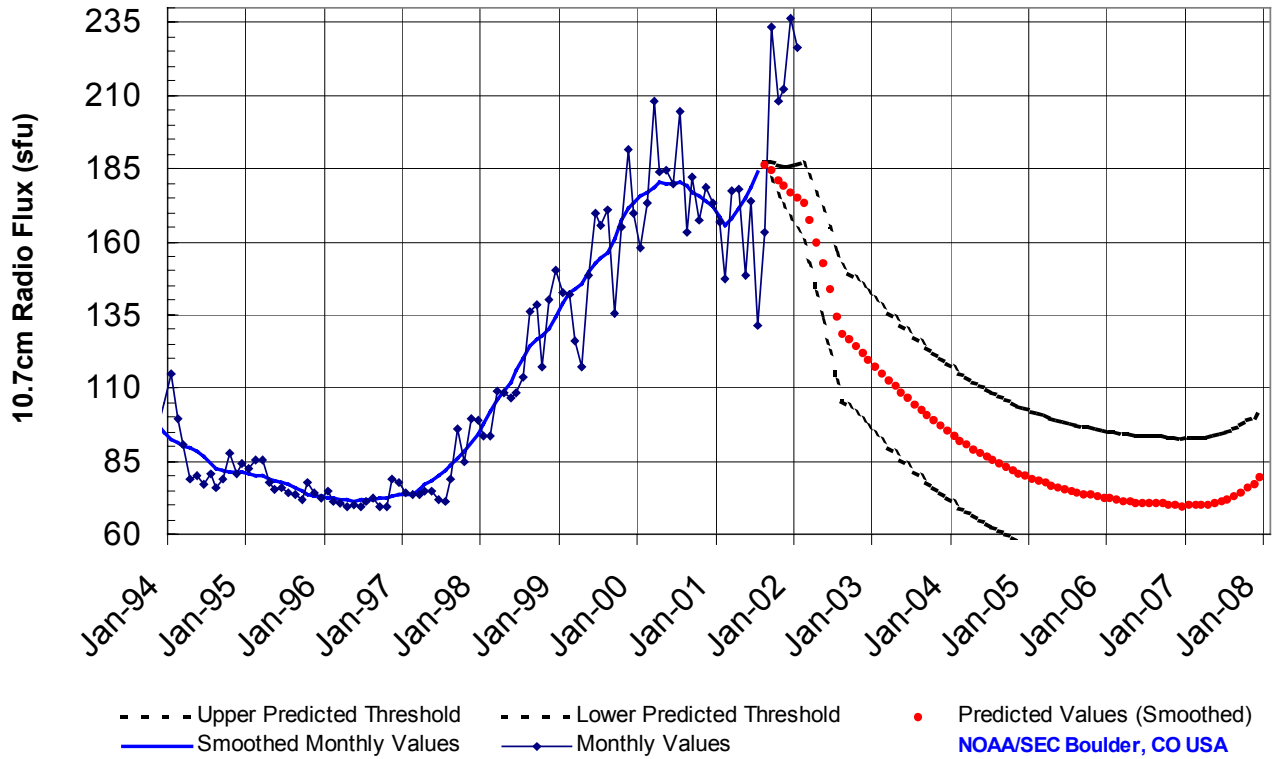
### SEC Prediction of Smoothed Sunspot Number

	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 (***)	<b>113</b> (1)	<b>113</b> (3)	<b>111</b> (5)	<b>110</b> (7)	<b>107</b> (8)
2002	<b>105</b> (9)	<b>104</b> (10)	<b>100</b> (11)	<b>95</b> (12)	<b>91</b> (13)	<b>87</b> (14)	<b>83</b> (15)	<b>80</b> (15)	<b>77</b> (15)	<b>75</b> (15)	<b>73</b> (15)	<b>70</b> (15)
2003	<b>68</b> (15)	<b>65</b> (15)	<b>63</b> (15)	<b>61</b> (15)	<b>58</b> (15)	<b>56</b> (15)	<b>54</b> (15)	<b>51</b> (15)	<b>49</b> (15)	<b>47</b> (15)	<b>45</b> (15)	<b>43</b> (15)
2004	<b>41</b> (15)	<b>39</b> (15)	<b>37</b> (15)	<b>35</b> (15)	<b>33</b> (15)	<b>31</b> (15)	<b>30</b> (15)	<b>28</b> (15)	<b>27</b> (15)	<b>25</b> (15)	<b>24</b> (15)	<b>22</b> (15)
2005	<b>21</b> (15)	<b>20</b> (15)	<b>18</b> (15)	<b>17</b> (15)	<b>16</b> (15)	<b>15</b> (15)	<b>14</b> (15)	<b>13</b> (15)	<b>12</b> (15)	<b>12</b> (15)	<b>11</b> (15)	<b>10</b> (15)
2006	<b>10</b> (15)	<b>9</b> (15)	<b>8</b> (15)	<b>8</b> (15)	<b>8</b> (15)	<b>7</b> (15)	<b>7</b> (15)	<b>7</b> (15)	<b>7</b> (15)	<b>6</b> (15)	<b>6</b> (15)	<b>5</b> (15)
2007	<b>5</b> (15)	<b>6</b> (15)	<b>6</b> (15)	<b>6</b> (15)	<b>7</b> (15)	<b>8</b> (15)	<b>10</b> (15)	<b>11</b> (15)	<b>13</b> (15)	<b>16</b> (15)	<b>18</b> (15)	<b>21</b> (15)



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

(Data Through 31 Jan 02)



### 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 (***)	<b>186</b> (1)	<b>185</b> (3)	<b>181</b> (5)	<b>179</b> (7)	<b>177</b> (9)
2002	<b>175</b> (11)	<b>174</b> (13)	<b>168</b> (15)	<b>160</b> (17)	<b>153</b> (19)	<b>144</b> (21)	<b>134</b> (22)	<b>129</b> (23)	<b>126</b> (23)	<b>124</b> (23)	<b>122</b> (23)	<b>120</b> (23)
2003	<b>117</b> (23)	<b>115</b> (23)	<b>113</b> (23)	<b>111</b> (23)	<b>109</b> (23)	<b>107</b> (23)	<b>104</b> (23)	<b>103</b> (23)	<b>101</b> (23)	<b>99</b> (23)	<b>97</b> (23)	<b>95</b> (23)
2004	<b>94</b> (23)	<b>92</b> (23)	<b>91</b> (23)	<b>89</b> (23)	<b>88</b> (23)	<b>87</b> (23)	<b>85</b> (23)	<b>84</b> (23)	<b>83</b> (23)	<b>82</b> (23)	<b>81</b> (23)	<b>80</b> (23)
2005	<b>79</b> (23)	<b>78</b> (23)	<b>78</b> (23)	<b>77</b> (23)	<b>76</b> (23)	<b>75</b> (23)	<b>75</b> (23)	<b>74</b> (23)	<b>74</b> (23)	<b>73</b> (23)	<b>73</b> (23)	<b>73</b> (23)
2006	<b>72</b> (23)	<b>72</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>70</b> (23)	<b>70</b> (23)	<b>70</b> (23)	<b>70</b> (23)
2007	<b>70</b> (23)	<b>70</b> (23)	<b>70</b> (23)	<b>70</b> (23)	<b>71</b> (23)	<b>71</b> (23)	<b>72</b> (23)	<b>73</b> (23)	<b>74</b> (23)	<b>76</b> (23)	<b>77</b> (23)	<b>79</b> (23)



### ISES Solar Cycle Ap Progression

(Data Through 31 Jan 02)

