

Activity ranged from very low to high levels. Region 486 (S16, L=285, class/area Fkc/2610 on 29 October) continued to produce major flare activity and Region 488 (N08, L=289, class/area Fkc/1750 on 30 October) contributed a few major flares of its own. High level activity was observed on 03 November with an X2/Sf at 0130 UTC and an X3/2b at 0955 UTC, both from Region 488. Both of these flares were associated with Tenflares, 245 Mhz radio bursts and Type II and Type IV radio sweeps. The most significant flare of the period occurred on 04 November from Region 486. An X-ray flare began at 1931 UTC and saturated the GOES X-ray sensor at the X17.4 level for 12 minutes (1944 to 1956 UTC). Analysis of available data yields an estimated peak X-ray flux of X28 with a peak time at 1950 UTC, making it one of the largest flares ever measured on GOES/XRS. Associated with the X28 were intense radio bursts at all frequencies, including a Tenflare of 20,000 sfu, a 245 Mhz radio burst of 4,800 sfu, and Type II and Type IV radio sweeps. Indications of an extremely fast moving (2301 km/s) full halo CME were seen on LASCO imagery. By 05 November, Region 486 rotated beyond the west limb but still produced an M5/Sf at 1052 UTC. Activity for the remainder of the period, 06 – 09 November, decreased dramatically to very low levels after nearly three weeks of intense solar activity. A full halo CME was observed in LASCO imagery late on 06 November, but was determined to be back-sided. A combination of observed CMEs and long duration low levels X-ray enhancements suggest continued activity from the Regions 484, 486, and 488 on the back-side.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. A CME shock from the X8 on 02 November passed the ACE spacecraft at 0600 UTC on 04 November with solar wind speed increasing to over 800 km/s and Bz dropping to -20 nT in the southward direction. Bz was southward for a short period then turned north for the remainder of the day. Solar wind speed gradually declined to 500 km/s by 06 November when a second CME shock was observed. The CME shock from the X28 flare on 04 November arrived at ACE around 1900 UTC on 06 November with solar wind speed increasing to 625 km/s. Bz dropped briefly to -10nT and Bt measured 15 nT for a brief period. Bt declined below 10 nT by the end of the day on 06 November. Toward the end of the period a corotating interaction region was observed at ACE on 08 November with solar wind speed gradually rising through 08 – 09 November and Bz exhibiting the north-south oscillating signature of a coronal hole high speed stream.

As the period began a greater than 10 MeV proton event was in progress due to the M3 flare on 01 November and the X8 flare on the 2nd. This event reached a peak value of 1570 pfu at 02/0815 UTC and was in decline until 04 November. As proton flux decreased to near threshold levels, an enhancement in proton flux level was observed at 04/2225 UTC due to the X28 flare. This X28 enhancement of 10 MeV proton flux reached a peak value of 353 pfu at 05/0600 UTC. The 10 MeV proton event finally dropped below threshold levels and ended at 07/1230 UTC. The X8 and X28 flares also produced greater than 100 MeV proton events. The X8, 100 MeV proton event began last period at 02/1740 UTC, reached a peak value of 49 pfu at 02/1905 UTC, and ended at 03/1720 UTC. The X28, greater than 100MeV proton event began at 05/0535 UTC, reached a peak value of 1.3 pfu at 05/0540 UTC, and ended at 05/0705 UTC.



The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 03 – 04 November. Late on 05 November and early on 06 November, greater than 2 MeV electron flux data from GOES-11 and GOES-10 were unreliable due to solar radiation contamination of the EPS instrument.

Geomagnetic activity ranged from quiet to severe storm levels. The period began with unsettled to isolated active conditions on 03 November. A shock passage occurred at the NASA/ACE satellite at approximately 0600 UTC on 04 November due to the arrival of a CME from the X8 flare on 02 November. A sudden impulse of 72 nT was observed on the Boulder magnetometer at 04/0627 UTC. The shock produced minor storm levels during the 06-09 UTC period. A brief period of southward Bz after the shock resulted in one period of severe storm levels from 09-12 UTC. Bz then turned northward and remained north through most of the day (04 November) producing only unsettled to active conditions. Quiet to unsettled activity was observed on 05 November and for most of 06 November. Late on 06 November, a shock from the X28 flare from 04 November arrived at 1937 UTC, producing a 31nT sudden impulse on the Boulder magnetometer. Activity from this CME consisted of one isolated period of minor storm levels followed by one period of active levels. Activity was at quiet to unsettled levels on 07 – 08 November. The period ended on 09 November with active to major storm levels due to a co-rotating interaction region marking the onset of a coronal hole high speed stream.

Space Weather Outlook 12 November – 08 December 2003

Solar activity is expected to range from low to high levels. Activity is expected to be low to moderate until Region 484 returns to visible disk on 12 November. Isolated high level activity is possible after that. On 17 – 18 November, Regions 486 and 488 are due to return to the visible disk with continued isolated high level activity possible.

Proton producing flares are possible once Region 484 returns to the visible disk on 12 November.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 12 – 20 November due to a large returning coronal hole.

The geomagnetic field is expected to range from quiet to major storm levels. A large coronal hole is due to return to a geoeffective position on 12-20 November and is expected to produce minor to major storm levels. After 15 November, with the return of old Region 484, geomagnetic activity may increase in association major flare and CMEs.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
03 November	167	76	2830	C3.2	3	1	2	6	0	3	0	0
04 November	168	79	1100	C2.3	3	3	1	1	0	0	1	0
05 November	114	32	130	C1.2	2	2	0	2	0	0	0	0
06 November	98	12	100	B2.5	0	0	0	0	0	0	0	0
07 November	91	11	120	B1.6	0	0	0	0	0	0	0	0
08 November	93	29	50	B1.0	0	0	0	0	0	0	0	0
09 November	93	47	100	A9.7	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
03 November	3.6E+8	8.9E+7	2.2E+5		2.2E+8	
04 November	4.3E+8	1.0E+7	1.7E+4		7.0E+7	
05 November	9.3E+7	1.2E+7	4.7E+4		3.9E+6	
06 November	4.9E+7	3.7E+6	8.6E+3		2.2E+6	
07 November	1.3E+7	8.1E+5	3.4E+3		4.3E+6	
08 November	8.7E+6	3.5E+5	3.6E+3		6.0E+6	
09 November	1.3E+7	1.5E+5	3.7E+3		1.4E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	03 November	15	4-2-1-1-5-2-2-3	12	3-3-1-3-2-3-2-3	10
04 November	20	2-2-5-5-2-2-4-2	34	3-3-5-7-3-2-4-2	31	3-2-5-7-3-3-4-3
05 November	4	1-0-1-2-1-1-2-2	6	2-1-2-1-1-1-2-3	9	2-1-2-2-2-3-3-3
06 November	11	2-2-1-0-2-1-5-3	11	1-2-1-0-3-3-4-3	14	2-2-2-2-3-3-5-4
07 November	6	3-2-1-2-1-1-3-1	11	3-3-3-4-2-1-1-1	8	3-2-1-2-3-3-2-2
08 November	7	0-0-0-3-3-2-2-3	17	0-0-1-4-5-5-2-1	10	1-1-1-3-3-3-3-3
09 November	20	5-2-3-3-4-3-3-3	42	1-1-5-5-7-4-5-3	25	2-3-4-4-6-4-4-3



Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
03 Nov 0046	CONT ALERT: Proton Event 10MeV Integral Flux > 1000pfu	02 Nov 2200
03 Nov 0052	CONT ALERT: Proton Event 100MeV Integral Flux > 1pfu	02 Nov 1740
03 Nov 0111	4 – 245 MHz Radio Bursts	02 Nov
03 Nov 0111	245 MHz Noise Storm	02 Nov
03 Nov 0116	ALERT: X-Ray Flux > M5	03 Nov 0115
03 Nov 0131	ALERT: Type II Radio Emission	03 Nov 0124
03 Nov 0149	SUMMARY: X-ray Event > X1	03 Nov 0109
03 Nov 0153	ALERT: Type IV Radio Emission	03 Nov 0131
03 Nov 0715	SUMMARY: 10cm Radio Burst	03 Nov 0103
03 Nov 0951	ALERT: X-Ray Flux > M5	03 Nov 0549
03 Nov 1007	ALERT: Type II Radio Emission	03 Nov 0956
03 Nov 1029	SUMMARY: X-ray Event > X1	03 Nov 0955
03 Nov 1040	ALERT: Type IV Radio Emission	03 Nov 1000
03 Nov 1043	SUMMARY: 10cm Radio Burst	03 Nov 0948
03 Nov 1134	ALERT: Electron 2MeV Integral Flux > 1000pfu	03 Nov 1110
03 Nov 1559	EXTWARNING: Proton 100MeV Integral Flux > 1pfu	02 Nov 1753 – 03 Nov 2359
03 Nov 1740	SUMMARY: 10cm Radio Burst	03 Nov 1530
03 Nov 2118	SUMMARY: Proton Event 100MeV Integral Flux > 1pfu	02 Nov 1740
03 Nov 2124	CANCEL WARNING: Proton 100MeV Integral Flux above 1pfu	02 Nov 1753 – 03 Nov 2359
03 Nov 2201	WATCH: Geomagnetic A ≥ 50	04 Nov
03 Nov 2321	EXT WARNING: Geomagnetic K= 4	01 Nov 1600 – 04 Nov 1600
03 Nov 2325	EXT WARNING: Proton Event 10MeV Integral Flux > 10pfu	02 Nov 0125 – 04 Nov 2359
04 Nov 0014	8 – 245 MHz Radio Bursts	03 Nov
04 Nov 0122	CONT ALERT: Proton Event 10MeV Integral Flux > 100pfu	02 Nov 1840
04 Nov 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	04 Nov 0500
04 Nov 0609	WARNING: Geomagnetic Sudden Impulse	04 Nov 0620 – 0700
04 Nov 0631	SUMMARY: Geomagnetic Sudden Impulse	04 Nov 0627
04 Nov 0634	WARNING: Geomagnetic K= 6	04 Nov 0640 – 1600
04 Nov 0642	ALERT: Geomagnetic K= 5	04 Nov 0627
04 Nov 1600	EXT WARNING: Geomagnetic K= 4	01 Nov 1600 – 04 Nov 2359
04 Nov 1623	SUMMARY: Proton Event 10MeV Integral Flux > 1000pfu	02 Nov 1105
04 Nov 1637	SUMMARY: Proton Event 10MeV Integral Flux > 100pfu	02 Nov 1105
04 Nov 1936	ALERT: X-Ray Flux > M5	04 Nov 1935
04 Nov 1952	WARNING: Proton Event 10MeV Integral Flux > 10pfu	02 Nov 0125 – 05 Nov 1500
04 Nov 1959	WARNING: Proton 100MeV Integral Flux > 1pfu	04 Nov 2000 – 05 Nov 1500
04 Nov 2021	ALERT: Type II Radio Emission	04 Nov 1942
04 Nov 2035	SUMMARY: X-ray Event > X10	04 Nov 1929
04 Nov 2105	ALERT: Type IV Radio Emission	04 Nov 1947
04 Nov 2213	WATCH: Geomagnetic A ≥ 20	06 Nov
04 Nov 2232	SUMMARY: 10cm Radio Burst	04 Nov 1933
05 Nov 0023	3 – 245 MHz Radio Bursts	04 Nov
05 Nov 0023	245 MHz Noise Storm	04 Nov
05 Nov 0055	CONT ALERT: Proton Event 10MeV Integral Flux > 10pfu	02 Nov 1105
05 Nov 0401	ALERT: Proton Event 10MeV Integral Flux > 100pfu	05 Nov 0345
05 Nov 0535	ALERT: Proton Event 100MeV Integral Flux > 1pfu	05 Nov 0520
05 Nov 1053	ALERT: X-Ray Flux > M5	05 Nov 1052
05 Nov 1109	SUMMARY: X-ray Event > M5	05 Nov 1046
05 Nov 1439	EXT WARNING: Proton 10MeV Integral Flux > 10pfu expected	02 Nov 0125 – 06 Nov 1500
05 Nov 1449	SUMMARY: Proton Event 100MeV Integral Flux > 1pfu	05 Nov 0535
06 Nov 0055	CONT ALERT: Proton Event 10MeV Integral Flux > 100pfu	05 Nov 0345
06 Nov 1150	SUMMARY: Proton Event 10MeV Integral Flux > 100pfu	02 Nov 1105
06 Nov 1455	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	02 Nov 0125 – 07 Nov 1500
06 Nov 1947	WARNING: Geomagnetic K= 4	06 Nov 1948 – 07 Nov 1600

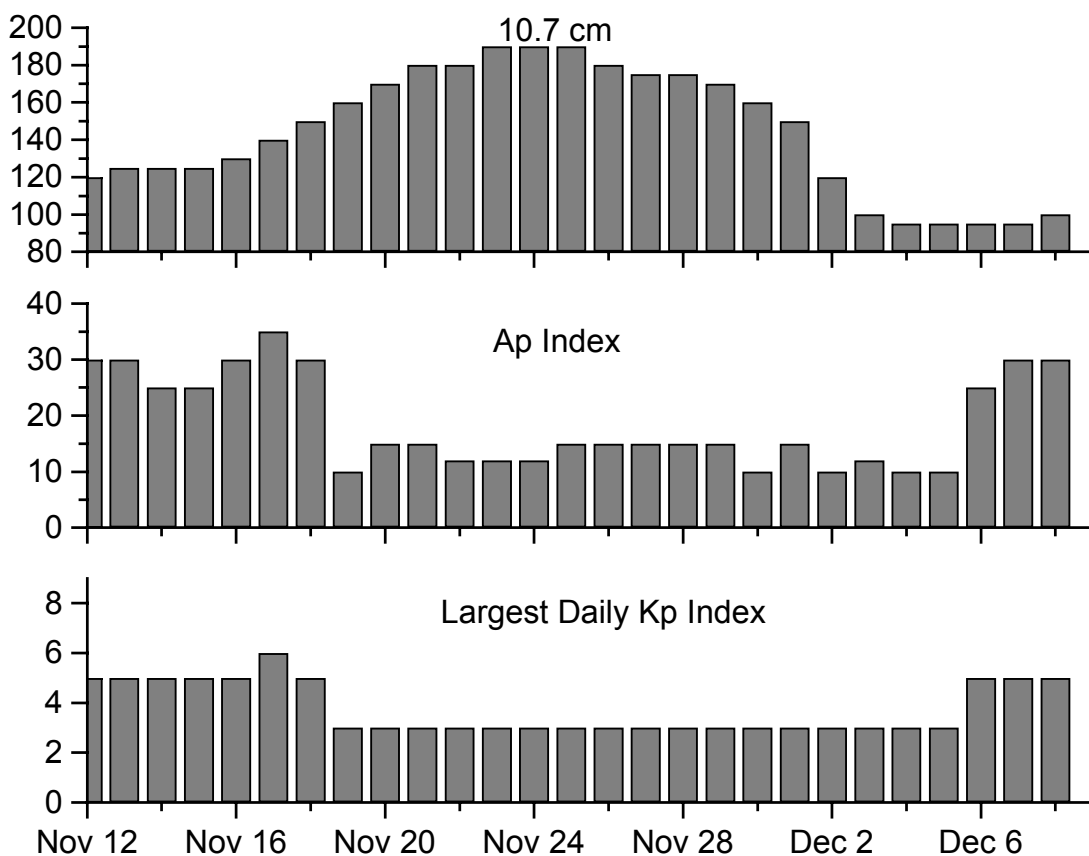


Alerts and Warnings Issued - continued.

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
06 Nov 1952	SUMMARY: Geomagnetic Sudden Impulse	06 Nov 1937
06 Nov 1957	ALERT: Geomagnetic K= 4	06 Nov 1940
06 Nov 2009	WARNING: Geomagnetic K= 5	06 Nov 2010 – 2359
06 Nov 2012	ALERT: Geomagnetic K= 5	06 Nov 2011
06 Nov 2241	WATCH: Geomagnetic A \geq 20	07 Nov
07 Nov 0603	CONT ALERT: Proton Event 10MeV Integral Flux > 10pfu	02 Nov 1105
07 Nov 1837	SUMMARY: Proton Event 10MeV Integral Flux > 10pfu	02 Nov 1105
07 Nov 1954	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	02 Nov 0125 – 07 Nov 2359
08 Nov 1648	WARNING: Geomagnetic K= 4	08 Nov 1649 – 2359
08 Nov 1713	WATCH: Geomagnetic A \geq 20	11 Nov
08 Nov 2351	EXT WARNING: Geomagnetic K= 4	08 Nov 1649 – 09 Nov 1500
09 Nov 1328	WARNING: Geomagnetic K= 5	09 Nov 1328 – 1500
09 Nov 1333	ALERT: Geomagnetic K= 5	09 Nov 1333
09 Nov 1338	ALERT: Geomagnetic K= 6	09 Nov 1338
09 Nov 1458	EXT WARNING: Geomagnetic K= 4	08 Nov 1649 – 09 Nov 2359
09 Nov 2000	WARNING: Geomagnetic K= 5	09 Nov 2000 – 2100
09 Nov 2109	WATCH: Geomagnetic A \geq 20	10 Nov
09 Nov 2111	WATCH: Geomagnetic A \geq 20	12 Nov
09 Nov 2320	EXT WARNING: Geomagnetic K= 4	08 Nov 1649 – 10 Nov 1500



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
12 Nov	120	30	5	26 Nov	180	15	3
13	125	30	5	27	175	15	3
14	125	25	5	28	175	15	3
15	125	25	5	29	170	15	3
16	130	30	5	30	160	10	3
17	140	35	6	01 Dec	150	15	3
18	150	30	5	02	120	10	3
19	160	10	3	03	100	12	3
20	170	15	3	04	95	10	3
21	180	15	3	05	95	10	3
22	180	12	3	06	95	25	5
23	190	12	3	07	95	30	5
24	190	12	3	08	100	30	5
25	190	15	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Flux	Imp/ Brtns	Location		Radio Flux		Intensity	
							Lat	CMD	245	2695	II	IV
03 Nov	0109	0130	0145	X2.7	.360	2b	N10W83		100	240	1	3
03 Nov	0943	0955	1019	X3.9	.560	2f	N08W77		3900	4400	2	1
03 Nov	1526	1532	1543	M3.9	.025	Sf	S15W79		55	210		
04 Nov	0543	0556	0607	M2.6	.025							
04 Nov	1011	1022	1033	M3.0	.027			488				
04 Nov	1343	1349	1401	M1.1	.009			486				
04 Nov	1929	1950	2006	X28	2.300	3b	S19W83		4800	20000	3	2
05 Nov	0237	0241	0245	M1.6	.005	Sf	S19W89					
05 Nov	1046	1052	1056	M5.3	.017	Sf	S16W90					

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical Location Lat CMD	Rgn	
	Begin	Max	End					
03 November	0029	0029	0033		Sf	S20W63	486	
	0106	0131	0237	X2.7	2b	N10W83	488	
	B0112	0132	A0000		2b	N08W69		
	0450	0452	0500		Sf	S21W70	486	
	0537	0538	0541		Sf	S21W71	486	
	0948	0949	A1006	X3.9	2f	N08W77	488	
	B1021	1053	1109		Sf	N09W79	488	
	1530	1530	1543	M3.9	Sf	S15W79	486	
	1544	1547	1554		Sf	S15W79	486	
	1951	1954	1957	C4.4				
	2031	2037	2041	C5.4				
	2228	2236	2240	C3.1				
	04 November	0404	0411	0419	C5.0			
		0543	0556	0607	M2.6			
0940		0943	0950	C2.8			486	
1011		1022	1033	M3.0			488	
1115		1119	1125	C5.7			486	
1343		1349	1401	M1.1			486	
1932		1957	2049	X28	3b	S19W83	486	
05 November	2049	2049	2054		Sf	S18W81	486	
	0238	0241	0250	M1.6	Sf	S19W89	486	
	0754	0759	0803	C4.7				
	1051	1051	1058	M5.3	Sf	S16W90	486	
06 November	1629	1648	1709	C1.9				
	1105	1110	1118	B5.2				
07 November	1724	1831	1942	B5.8				
	0217	0318	0527	B8.4				
08 November	1517	1726	1939	B4.7				
	No Flares Observed							



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
09 November	0018	0025	0030	B3.8			
	1609	1613	1618	B1.9			
	1629	1634	1637	B2.0			
	1650	1653	1656	B1.7			
	1705	1709	1711	B1.8			

Region Summary

Date	Location		Sunspot Characteristics				Flares										
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical						
		Lon						C	M	X	S	1	2	3	4		
<i>Region 486</i>																	
22 Oct	S16E81	286	0150	05	Hkx	001	A	4	1								
23 Oct	S16E70	285	1160	14	Ekc	024	Bgd		2	2							
24 Oct	S16E57	283	1540	16	Fkc	049	Bgd	1	2	3	2						
25 Oct	S15E45	282	2200	18	Fkc	052	Bgd	1	3	1							
26 Oct	S15E31	283	2170	19	Fkc	094	Bgd		1	2					1		
27 Oct	S16E18	283	2180	19	Fkc	074	Bgd	4	2	7							
28 Oct	S17E04	283	2120	19	Fkc	055	Bgd	1	1	9							1
29 Oct	S16W11	285	2610	18	Fkc	108	Bgd	2	2	1	4	2	1				
30 Oct	S18W23	284	2600	18	Fkc	080	Bgd		1	1							
31 Oct	S17W36	284	2030	20	Fkc	069	Bgd	1		3							
01 Nov	S17W49	284	1900	16	Fkc	099	Bgd	4	1	5	1						
02 Nov	S17W62	284	2160	16	Fkc	060	Bgd	1	1	1	5			1			
03 Nov	S17W75	284	1430	15	Fkc	016	Bgd		1	5							
04 Nov	S17W89	284	0630	13	Ekc	015	Bgd	2	1	1	1					1	
								16	16	7	49	7	3	2	1		

Crossed West Limb.

Absolute heliographic longitude: 283



Region Summary - continued.

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

Region 490

27 Oct	S10E25	276	0050	05	Cso	006	B												
28 Oct	S11E11	276	0030	01	Hrx	001	A												
29 Oct	S11W03	277	0010	05	Cro	005	B												
30 Oct	S12W14	275	0010	01	Hrx	003	A												
31 Oct	S12W27	275																	
01 Nov	S12W40	275																	
02 Nov	S12W53	275																	
03 Nov	S12W66	275																	
04 Nov	S12W79	275																	

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 277

Region 491

27 Oct	S06E09	292	0050	04	Dao	003	B												
28 Oct	S07W05	292	0050	05	Dao	006	B												1
29 Oct	S06W19	293	0100	06	Dao	013	B												
30 Oct	S06W32	293	0120	07	Dso	010	B												
31 Oct	S07W47	295	0060	07	Dao	012	B												
01 Nov	S07W60	295	0040	07	Dso	007	B												
02 Nov	S08W73	295	0030	02	Axx	002	A												
03 Nov	S08W86	295																	

0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 292

Region 493

28 Oct	N09E04	283	0010	04	Bxo	002	B												
29 Oct	N09W09	283																	
30 Oct	N09W22	283																	
31 Oct	N09W35	283																	
01 Nov	N09W48	283																	
02 Nov	N09W61	283																	
03 Nov	N09W74	283																	
04 Nov	N09W87	283																	

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 283



Region Summary - continued.

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

Region 494

30 Oct	S23E08	253	0010	00	Axx	001	A										
31 Oct	S23W05	253															
01 Nov	S23W18	253															
02 Nov	S23W31	253															
03 Nov	S23W44	253															
04 Nov	S23W57	253															
05 Nov	S23W70	253															
06 Nov	S23W83	253															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 253

Region 495

30 Oct	S22E20	241	0240	08	Dso	010	B										
31 Oct	S22E05	243	0210	08	Dso	016	B										
01 Nov	S22W08	243	0220	09	Dsi	014	B										
02 Nov	S22W21	243	0130	09	Dso	011	B										
03 Nov	S22W35	243	0110	09	Dso	005	B										
04 Nov	S22W48	243	0120	10	Dho	007	B										
05 Nov	S22W60	242	0110	09	Cso	005	B										
06 Nov	S21W76	245	0100	03	Cso	002	B										
07 Nov	S18W89	245	0120	03	Hsx	001	A										

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 243

Region 496

31 Oct	S12E09	239	0020	04	Cso	004	B										
01 Nov	S12W04	239	0020	07	Cro	008	B										
02 Nov	S12W17	239															
03 Nov	S12W30	239															
04 Nov	S12W43	239															
05 Nov	S12W56	239															
06 Nov	S12W69	239															
07 Nov	S12W82	239															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 239



Region Summary - continued.

Date	Location		Sunspot Characteristics				Flares															
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
		Lon						C	M	X	S	1	2	3	4							
<i>Region 497</i>																						
04 Nov	N10W45	240	0010	06	Bxo	003	B															
05 Nov	N10W58	240																				
06 Nov	N10W71	240																				
07 Nov	N10W84	240																				
								0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Crossed West Limb.																						
Absolute heliographic longitude: 240																						
<i>Region 498</i>																						
08 Nov	S03W26	168	0020	03	Dro	004	B															
09 Nov	S04W39	168	0030	03	Dso	006	B															
								0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Still on Disk.																						
Absolute heliographic longitude: 168																						
<i>Region 499</i>																						
08 Nov	S17W19	161	0030	04	Dso	005	B															
09 Nov	S16W33	162	0040	07	Dao	004	B															
								0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Still on Disk.																						
Absolute heliographic longitude: 161																						
<i>Region 500</i>																						
09 Nov	S08W22	151	0030	04	Cao	007	B															
								0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Still on Disk.																						
Absolute heliographic longitude: 151																						

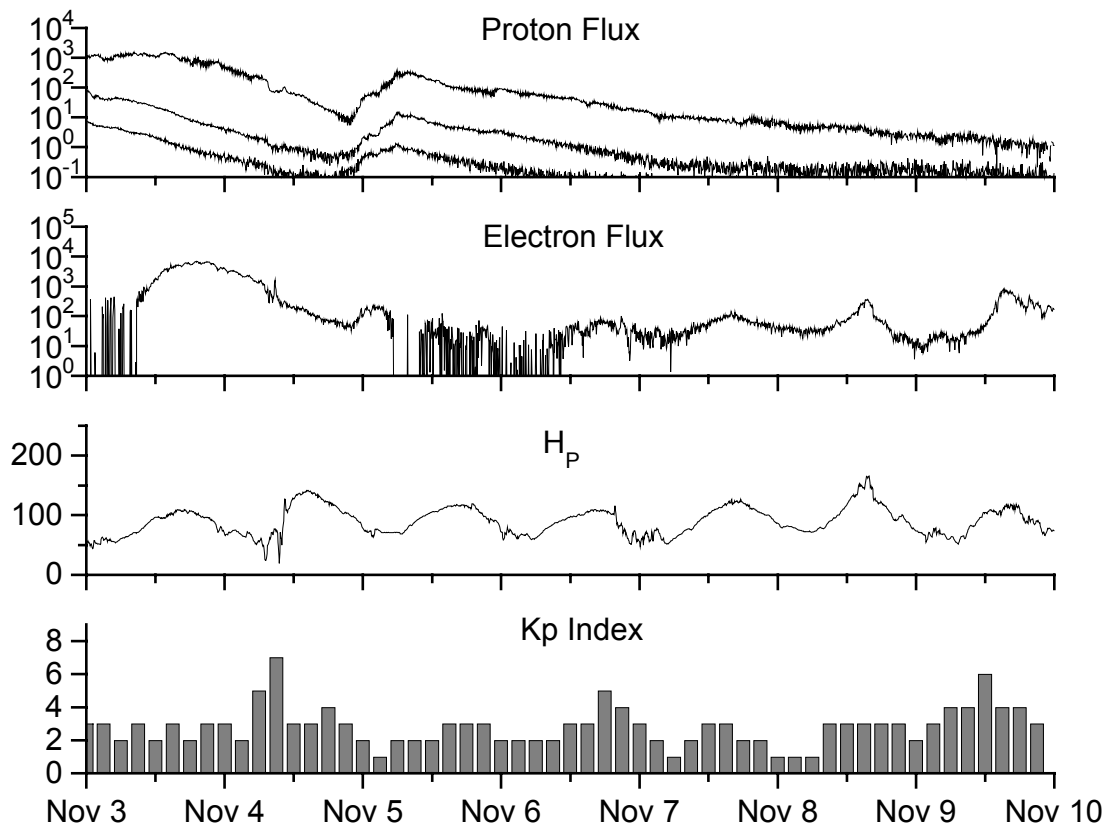


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
2001									
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
2002									
January	189.0	114.1	0.60	184.8	113.5	227.3	194.6	08	12.3
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	113.3	180.3	195.7	10	12.9
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	99.6	0.54	175.4	102.7	173.5	176.3	11	13.7
August	191.0	116.4	0.61	169.2	98.7	183.9	169.5	16	14.2
September	206.4	109.6	0.53	163.4	94.6	175.8	164.1	14	15.0
October	153.9	97.5	0.63	158.8	90.5	167.0	159.4	23	15.6
November	159.8	95.5	0.60	150.9	85.2	168.7	154.8	16	16.3
December	147.9	80.8	0.55	144.6	82.1	158.6	150.9	13	17.0
2003									
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	136.4	78.5	124.5	144.7	17	18.9
March	119.7	61.1	0.51	128.1	74.2	132.2	139.5	21	19.4
April	119.7	60.0	0.50	121.5	70.3	126.3	136.3	20	20.0
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	
August	114.3	72.7	0.64			122.1		23	
September	82.6	48.8	0.59			112.3		19	
October	118.9	65.6	0.55			153.1		32	

NOTE: All smoothed values after September 2002 and monthly values after March 2003 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 23, RI = 120.8, occurred April 2000. *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 03 November 2003

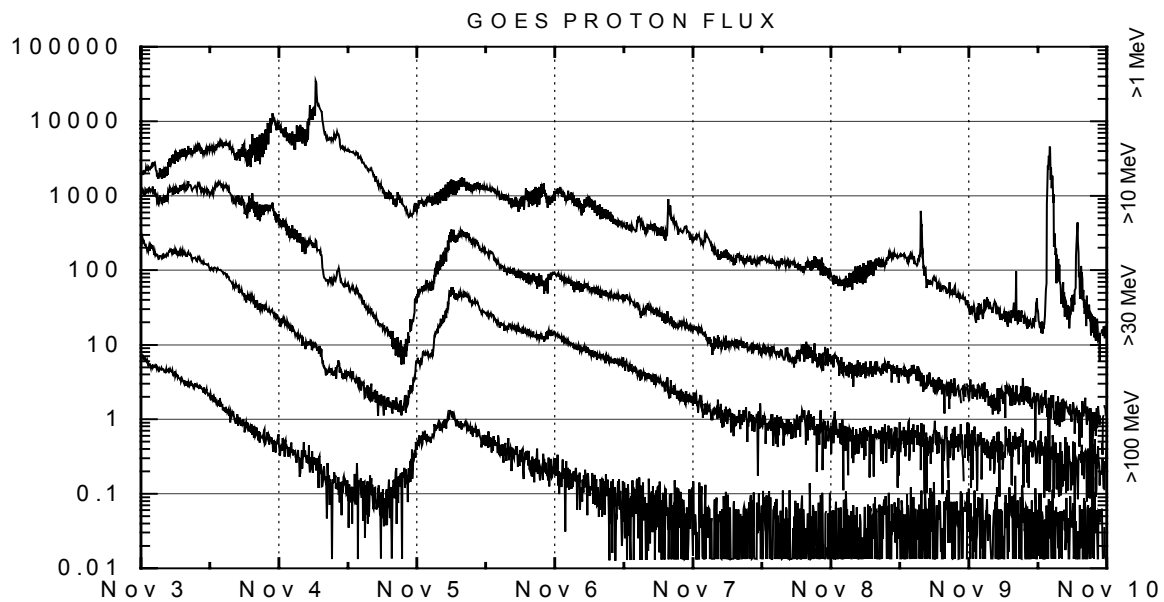
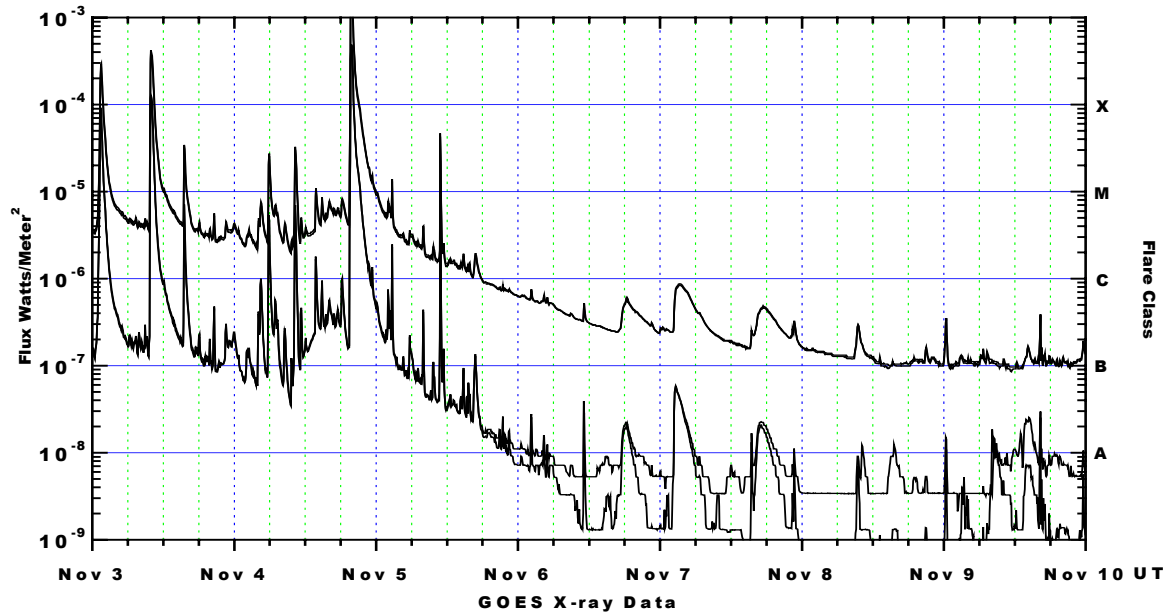
Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W113) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-12.

H_p 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_p 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_p values derived from a more extensive network of magnetometers. The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K_p are “ global ” parameters that are applicable to a first order approximation over large areas. H_p 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

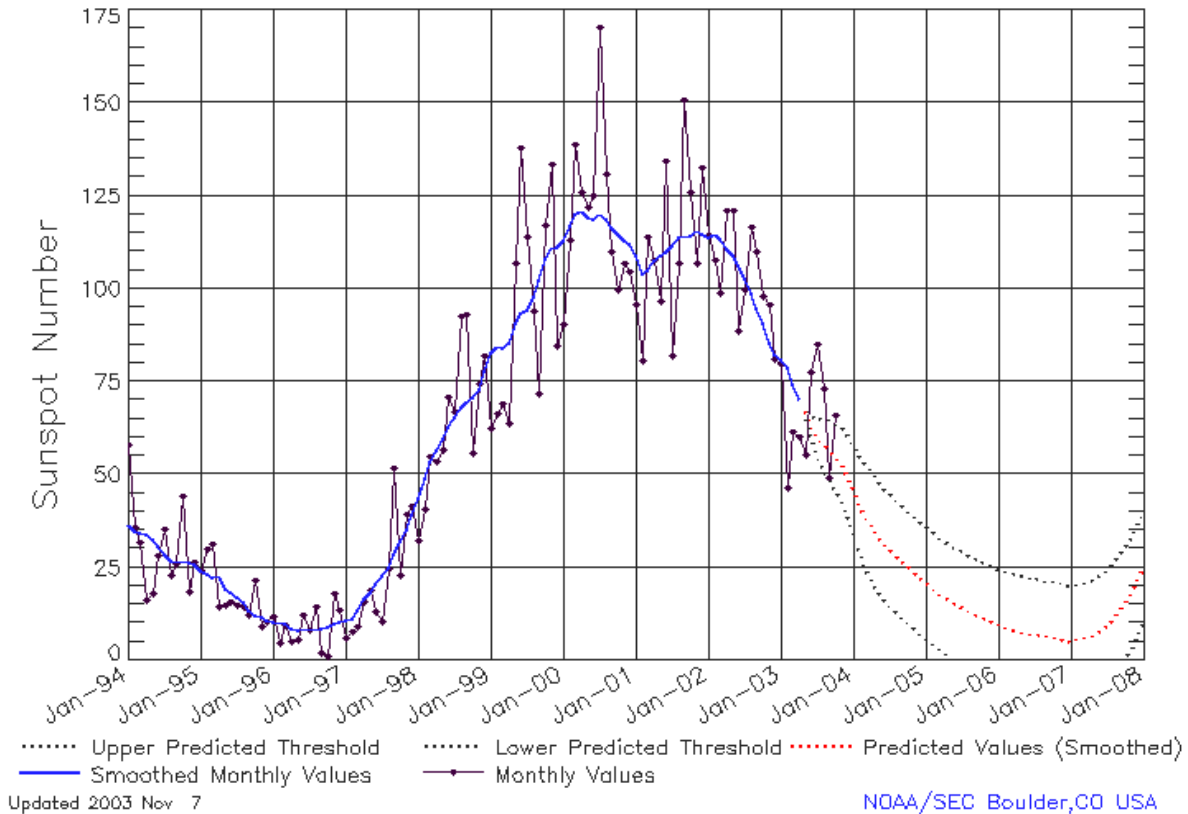
X-ray plot contains five-minute averaged x-ray flux (watts/m²) as measured by GOES 12 and 10 in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm²-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/cm²-sec-sr) at greater than 10 MeV.



ISES Solar Cycle Sunspot Number Progression

Data Through 31 Oct 03



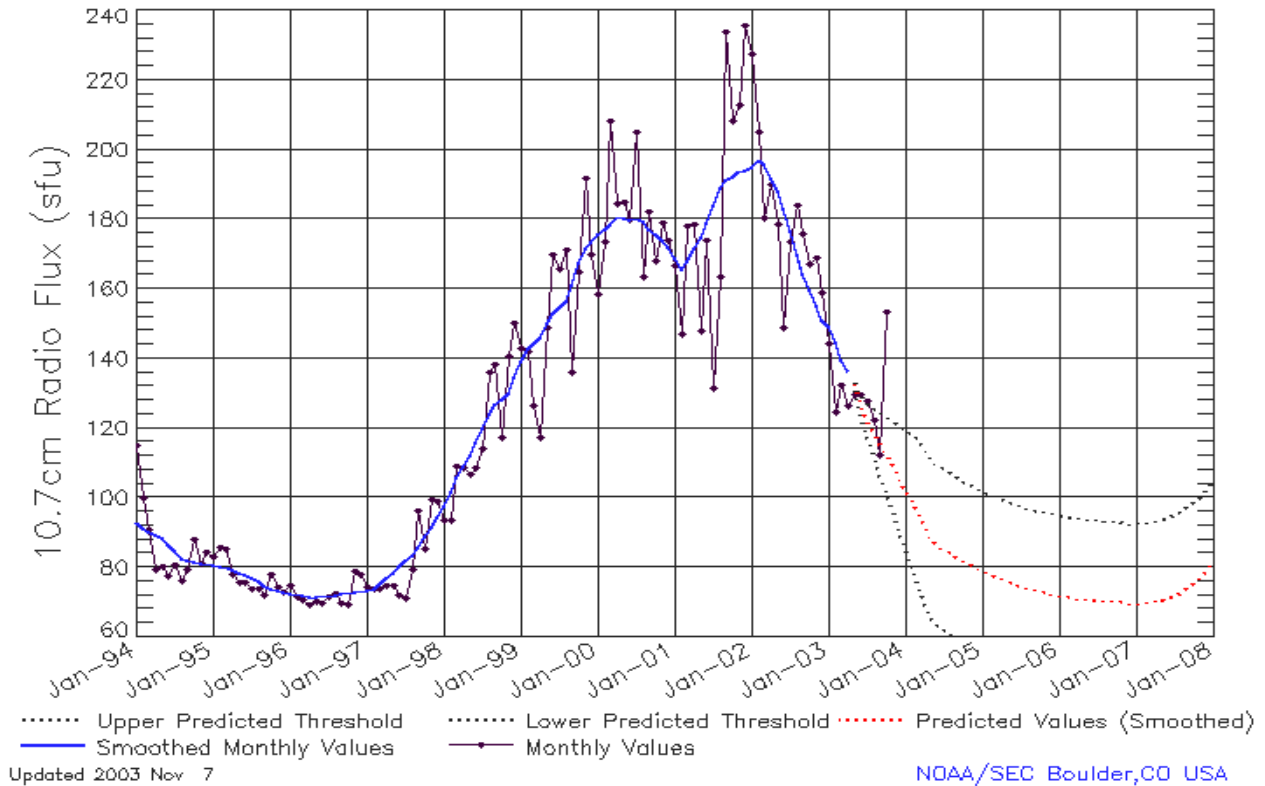
SEC Prediction of Smoothed Sunspot Number

	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 (***)	79 (***)	74 (***)	70 (***)	67 (1)	63 (3)	60 (5)	58 (7)	57 (8)	55 (9)	53 (10)	50 (11)
2004	46 (12)	42 (13)	39 (14)	36 (15)	33 (15)	31 (15)	30 (15)	28 (15)	27 (15)	25 (15)	24 (15)	22 (15)
2005	21 (15)	20 (15)	18 (15)	17 (15)	16 (15)	15 (15)	14 (15)	13 (15)	12 (15)	12 (15)	11 (15)	10 (15)
2006	10 (15)	9 (15)	8 (15)	8 (15)	8 (15)	7 (15)	7 (15)	7 (15)	7 (15)	6 (15)	6 (15)	5 (15)
2007	5 (15)	6 (15)	6 (15)	6 (15)	7 (15)	8 (15)	10 (15)	11 (15)	13 (15)	16 (15)	18 (15)	21 (15)



ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 31 Oct 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 (***)	145 (***)	140 (***)	136 (***)	133 (1)	127 (3)	122 (5)	119 (7)	116 (9)	113 (11)	109 (13)	106 (15)
2004	102 (17)	99 (19)	96 (21)	92 (22)	88 (23)	87 (23)	85 (23)	84 (23)	83 (23)	82 (23)	81 (23)	80 (23)
2005	79 (23)	78 (23)	78 (23)	77 (23)	76 (23)	75 (23)	75 (23)	74 (23)	74 (23)	73 (23)	73 (23)	73 (23)
2006	72 (23)	72 (23)	71 (23)	71 (23)	71 (23)	71 (23)	71 (23)	71 (23)	70 (23)	70 (23)	70 (23)	70 (23)
2007	70 (23)	70 (23)	70 (23)	70 (23)	71 (23)	71 (23)	72 (23)	73 (23)	74 (23)	76 (23)	77 (23)	79 (23)



ISES Solar Cycle Ap Progression

Data Through 31 Oct 03

