

**Space Weather Highlights  
25 – 31 October 1999**

Solar activity ranged from low to moderate levels. Moderate levels occurred during 25 - 27 October with isolated, low-level M-class flares from Regions 8739 (S12, L = 167, class/area Fkc/800 on 26 October), 8741 (S25, L = 147, class/area Eao/280 on 25 October), and 8737 (S14, L = 235, class/area Eao/370 on 25 October) (see the Energetic Events summary for occurrence times). Activity dropped to low levels on 28 October with occasional C-class subflares observed during the rest of the period. Region 8739 was the most interesting of the visible regions due to its moderately complex magnetic structure. However, this region began to slowly decay on 28 October and produced isolated C-class subflares during the rest of the period.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. Coronal hole effects were evident on 25 October with velocities as high as 630 km/sec and densities in the 01 to 04 p/cc range. The coronal hole effects subsided on 26 October. There were periods of sustained southward IMF Bz observed during 27 October and during 28/1200 - 29/1200UT. The 27 October period showed maximum southerly deflections to minus 07 nT (GSM) while the 28 - 29 October interval showed deflections to minus 12 nT. There were no remarkable velocity or density changes noted during this period.

No proton events were detected at geosynchronous orbit during the period.

The greater than 2 MeV electron flux dipped to normal to moderate levels on 29 October, but was at moderate to high levels during the rest of the period.

The geomagnetic field was disturbed during 25 October due to coronal hole effects with unsettled to active levels detected at middle latitudes and active to major storm levels at high latitudes. The field was also disturbed during 27 - 29 October with unsettled to minor storm levels at middle latitudes and unsettled to major storm levels at high latitudes. This disturbance was caused by sustained periods of southward IMF Bz.

**Space Weather Outlook  
03 - 29 November 1999**

Solar activity is expected to be at low to moderate levels. Occasional C-class flares are likely. Isolated M-class flares are also possible throughout the period, especially after 07 November when active longitudes are due to return.

No significant proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at moderate to high levels during 07 - 15 and 20 - 23 November. Normal to moderate fluxes are expected during the remaining days.

The geomagnetic field is expected to be at unsettled to active levels during 06 - 13 and 18 - 21 November due to recurrent coronal hole effects. Quiet to unsettled levels are expected during the rest of the period.



### Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No. (10 <sup>6</sup> hemi.)	Sunspot Area	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	
25 October	179	179	1710	B5.9	8	1	0	19	2	0	0	0
26 October	189	200	2010	C1.8	12	3	0	18	2	0	0	0
27 October	197	193	1740	C1.1	3	3	0	9	1	0	0	0
28 October	184	196	1450	C1.0	2	0	0	11	0	0	0	0
29 October	180	214	1530	B8.4	6	0	0	20	0	0	0	0
30 October	169	217	1410	B6.2	2	0	0	9	0	0	0	0
31 October	160	194	990	B8.1	9	0	0	13	2	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
	25 October	8.3E+5	1.2E+4	2.8E+3		3.5E+8
26 October	5.8E+5	1.2E+4	3.0E+3		3.3E+8	
27 October	2.2E+5	1.3E+4	3.1E+3		7.2E+7	
28 October	4.4E+5	1.4E+4	3.0E+3		3.2E+7	
29 October	4.4E+5	1.4E+4	2.8E+3		1.4E+7	
30 October	1.6E+5	1.3E+4	2.8E+3		2.3E+7	
31 October	3.9E+5	1.3E+4	2.9E+3		2.9E+7	

### Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	25 October	10	3-3-3-2-2-2-2-1	*	3-2-4-6-4-5-1	18
26 October	6	1-2-1-2-2-2-2-2	16	1-1-4-5-4-3-1-1	9	1-3-2-3-3-3-2-2
27 October	10	2-3-2-3-3-2-2-2	40	2-3-4-6-6-6-3-3	17	2-3-3-4-4-4-2-2
28 October	9	0-1-2-1-4-2-3-2	53	1-5-5-3-7-6-6-2	16	2-1-3-1-5-4-3-3
29 October	9	1-2-2-2-2-3-2-3	23	5-2-2-6-4-0-2-2	10	3-2-3-3-3-2-2-2
30 October	4	1-1-1-2-2-1-0-1	18	4-0-4-4-5-3-0-0	7	1-1-1-2-3-2-2-2
31 October	7	2-2-2-2-1-1-2-3	17	5-1-4-4-2-2-2-2	10	2-2-3-3-3-3-2-3

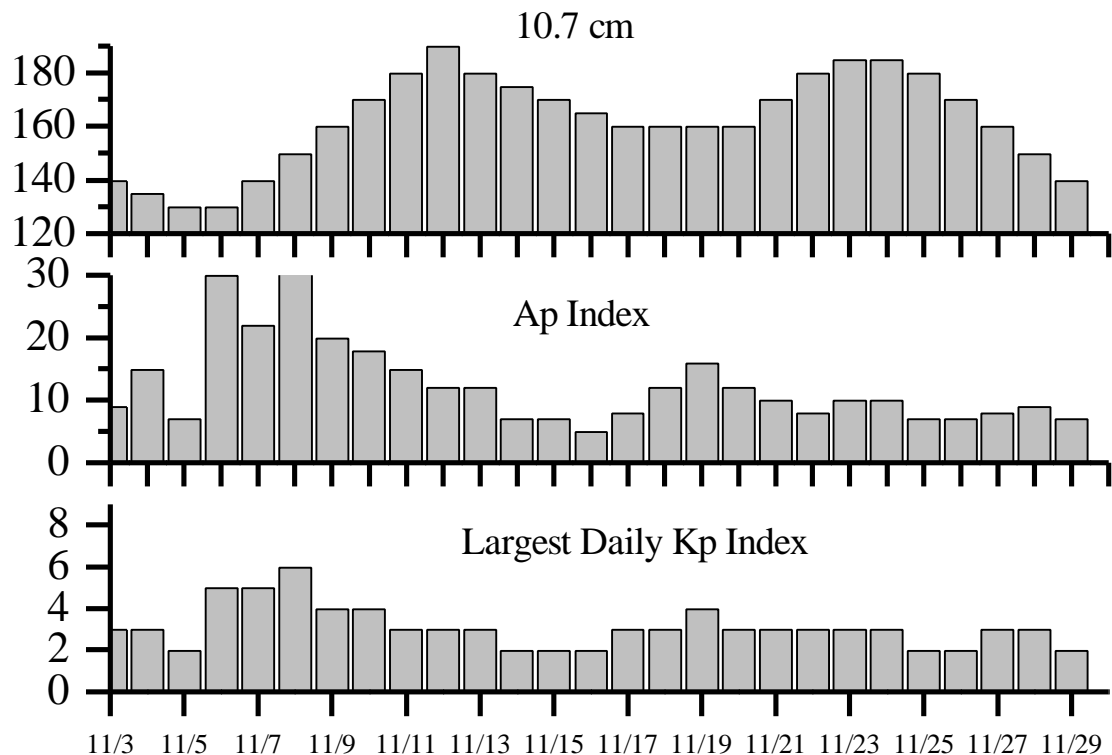


### *Alerts and Warnings Issued*

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
25 Oct 0000	K= 4 Warning	25 Oct 00- 15
25 Oct 0902	K= 4 Observed	25 Oct 06- 09
25 Oct 1149	CONTINUED A $\geq$ 20 Observed	24 Oct 0300
25 Oct 1150	CONTINUED $>$ 2MeV Electron Event $\geq$ 1000pfu	23 Oct 1245
25 Oct 2012	A $\geq$ 20 Watch	26 Oct
26 Oct 0045	3-245 MHz Bursts	25 Oct
26 Oct 1210	CONTINUED $>$ 2MeV Electron Event $\geq$ 1000pfu	23 Oct 1245
26 Oct 2225	Type II Radio Emission	26 Oct 2130
26 Oct 2354	Type IV Radio Emission	26 Oct 2214
27 Oct 0029	8-245 MHz Bursts	26 Oct
27 Oct 0029	245 MHz Radio Noise Storm	26 Oct
27 Oct 0600	K= 4 Observed	27 Oct 03 - 06
27 Oct 0726	Type II Radio Emission	27 Oct 0432
27 Oct 1200	CONTINUED $>$ 2MeV Electron Event $\geq$ 1000pfu	23 Oct 1245
27 Oct 1200	K= 4 Observed	27 Oct 09 - 12
27 Oct 1534	Type II Radio Emission	27 Oct 1329
28 Oct 0037	6-245 MHz Bursts	27 Oct
28 Oct 0037	245 MHz Noise Storm	27 Oct
28 Oct 1334	CONTINUED $>$ 2MeV Electron Event $\geq$ 1000pfu	23 Oct 1245
28 Oct 1417	K= 4 Warning	28/1500 – 29/1500 Oct
28 Oct 1458	K= 5 Warning	28/1500 - 29/1500 Oct
28 Oct 1501	K= 5 Observed	28 Oct 12- 15
28 Oct 1556	A $\geq$ 20 Watch	29 Oct
29 Oct 0034	2-245 MHz Bursts	28 Oct
29 Oct 0034	2-245 MHz Noise Storms	28 Oct
29 Oct 1203	CONTINUED $>$ 2MeV Electron Event $\geq$ 1000pfu	23 Oct 1245
29 Oct 1206	A $\geq$ 20 Observed	29 Oct 1200
30 Oct 1411	$>$ 2MeV Electron Event $\geq$ 1000pfu	30 Oct 1355
31 Oct 0026	245 MHz Noise Storm	30 Oct
31 Oct 1712	$>$ 2MeV Electron Event $\geq$ 1000pfu	31 Oct 1535



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
03 Nov	140	9	3	17 Nov	160	8	3
04	135	15	3	18	160	12	3
05	130	7	2	19	160	16	4
06	130	30	5	20	160	12	3
07	140	22	5	21	170	10	3
08	150	36	6	22	180	8	3
09	160	20	4	23	185	10	3
10	170	18	4	24	185	10	3
11	180	15	3	25	180	7	2
12	190	12	3	26	170	7	2
13	180	12	3	27	160	8	3
14	175	7	2	28	150	9	3
15	170	7	2	29	140	7	3
16	165	5	2				



### *Energetic Events*

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	½	Class	Flux	Imp/ Brtns	Location		Radio Flux		Intensity	
			Max				Lat	CMD	245	2695	II	IV
25 Oct	0626	0631	0634	M1.7	.004	1B	S23E27	8741	61			
26 Oct	0727	0745	0811	M1.2	.026	1N	N09W20	8739	18			
26 Oct	1838	1852	1900	M2.3	.022	1N	S13W02	8739	15			
26 Oct	2109	2125	2137	M3.7	.036				53		1	
27 Oct	1324	1337	1401	M1.8	.028	SF	S16W87	8737			2	
27 Oct	1518	1541	1605	M1.4	.031							

### *Flare List*

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
25 October	0012	0013	0017		SF	S24E30	8741	
	0223	0223	0242	C1.1	SF	S24E29	8741	
	0248	0248	0258		SF	S24E29	8741	
	0300	0305	0311		SF	S26E27	8741	
	0326	0344	0400		SF	S24E29	8741	
	0355	0355	0401	C1.6	SF	N09E71	8742	
	0449	0455	0458		SF	S23E28	8741	
	0520	0532	0547	C2.2	SF	S25E27	8741	
	0628	0630	A0711	M1.7	1B	S23E27	8741	
	B0635	U0640	A0709		SF	S19E19		
	0720	0720	0724		SF	N08E68	8742	
	0738	0739	0748	C2.3	SF	S11E09	8739	
	0804	0806	0811		SF	S27E38	8741	
	0946	0946	0954	C1.2	SF	S13E12	8739	
	1440	1445	1512	C1.2				
	1610	1612	1618		SF	N10E61	8742	
	1638	1644	1750		SF	S12E09	8739	
	1721	1721	1732		SF	N06E60	8742	
	1933	1949	2006	C4.8	SF	S19W69	8737	
	1955	1956	2002		SF	S12E09	8739	
2009	2013	2019		SF	S12E09	8739		
2310	2350	0037	C9.8	1F	S13E02	8739		
26 October	0104	0106	0115		SF	S12E00	8739	
	0223	0232	0234	C2.8				
	0329	0332	0334	C2.3				
	0337	0340	0342	C3.9				
	0402	0404	0409		SF	N06W20	8739	
	0434	0447	0512	C4.0	SF	S12E00	8739	
	0542	0609	0626		SF	N07W20	8739	
	0619	0619	0627		SF	S26E19	8741	
	0719	0737	0844	M1.2	1N	N09W20	8739	



*Flare List-continued*

Date	Time			X-ray	Optical		Rgn	
	Begin	Max	End		Imp /	Location		
26 October	0953	0959	1001	C3.1				
	1034	1041	1044	C2.8				
	1150	1152	1159	C6.5	SF	S11W06	8739	
	1259	1301	1311		SF	S12W06	8739	
	1300	1301	1305	C3.1	SF	S15W89	8737	
	1327	1327	1333		SF	S12W07	8739	
	1353	1354	1359		SF	S15W89	8737	
	1422	1423	1446	C3.2	SF	S12W09	8739	
	1458	1458	1525		SF	S12W09	8739	
	1558	1604	1613		SF	S12W02	8739	
	1641	1643	1654		SF	S12W03	8739	
	1700	1701	1707		SF	S10W05	8739	
	1823	1842	1947	M2.3	1N	S13W02	8739	
	2051	2058	2105	C2.2				
	2109	2125	2137	M3.7				
	2214	2215	2220		SF	S12W13	8739	
	2311	2314	2323	C2.6	SF	S11W08	8739	
	2352	2352	2355		SF	S12W10	8739	
	27 October	0310	0312	0321		SF	S22E02	8741
		0405	0407	0416		SF	S12W11	8739
0428		0431	0442	C5.3	1N	N08E34	8742	
0446		0451	0455		SF	S12W13	8739	
0648		0649	0651		SF	S13W85	8737	
0900		U0900	A0904	C2.2	SF	S12W15	8739	
0908		0912	0916	M1.0				
B1141		U1142	A1155		SF	S11W17	8739	
B1203		U1204	1216		SF	S12W13	8739	
1323		1328	1331	M1.8	SF	S16W87	8737	
1518		1541	1605	M1.4				
1814		1826	1855	C5.7				
1946		1947	1949		SF	S12W25	8739	
28 October	0000	0001	0006		SF	N10E58	8747	
	0457	0458	0501	C1.7	SF	S11W20	8739	
	0828	0836	0848		SF	N10E67	8747	
	1026	1026	1032		SF	N09E68	8747	
	1131	1139	1146		SF	N10E64	8747	
	1223	1223	1240		SF	S10W31	8739	
	1442	1443	1446	C1.6	SF	N10E63	8747	
	2112	2115	2119		SF	N12E59		



*Flare List-continued*

Date	Time			X-ray	Optical		Rgn
	Begin	Max	End		Imp /	Location	
28 October	2200	2203	2205		SF	N13E58	8747
	2210	2221	2233		SF	N12E58	8747
	2252	2255	2258		SF	N11E58	8747
29 October	0000	0001	0006		SF	N10E58	8747
	0036	0041	0059	C1.5			
	0534	0534	0544		SF	S11W44	8739
	0554	0554	0621		SF	S12W41	8739
	0617	0618	0626		SF	N09E54	8747
	0655	0658	0725		SF	S12W42	8739
	0706	0724	0737		SF	N10E54	8747
	0941	0952	A0957		SF	N09E51	8747
	1107	1112	1134	C2.5	SF	S11W42	8739
	1107	1109	1112		SF	N11E50	8747
	1124	1128	1132		SF	N11E52	8747
	1228	1229	1250	C2.5	SF	N11E51	8747
	1520	1523	1605		SF	S10W46	8739
	1617	1621	1625		SF	S09W47	8739
	1700	1700	1706		SF	N11E48	8747
	1704	1706	1731	C2.1	SF	S09W47	8739
	1823	1823	1829	C1.2	SF	S09W49	8739
	1847	1849	1851		SF	N11E48	8747
	2008	2013	2018	C1.6	SF	N11E46	8747
	2031	2033	2038		SF	N11E47	8747
B2212	2242	2250		SF	N07E42	8747	
30 October	0022	0023	0035		SF	S14W36	8743
	0137	0209	0218		SF	N09E44	8747
	0152	0201	0207		SF	S16W34	8743
	0629	0630	0638		SF	N10E41	8747
	0806	0811	0816		SF	S11W56	8739
	1244	1244	1252		SF	S18E36	8749
	1313	1338	1344		SF	S18E36	8749
	1446	1449	1452		SF	S12W58	8739
	1643	1646	1719	C1.2	SF	S14W51	8739
	1816	1820	1825	C1.7			
31 October	0005	0010	0023	C2.2	SF	S19E28	8749
	0212	0214	0219		SF	S15E25	8749
	0234	0235	0238		SF	S16E23	8749
	0317	0322	0335		SF	S23W44	8741
	0356	0400	0423	C2.7	SF	S19E27	8749
	0501	0503	0507	C1.4	SF	S20E30	8749



**Flare List-continued**

Date	Time			X-ray Class	Imp / Brtns	Optical	Rgn #
	Begin	Max	End			Location Lat CMD	
31 October	0508	0508	0520		SF	S20E30	8749
	0609	0610	0615		SF	N15E28	8747
	0653	0657	0736	C7.6	1N	S19E26	8749
	1402	1404	1428		SF	S18E21	8749
	1417	1423	1430		SF	S22E26	8749
	1701	1711	1735	C2.4	1F	S22E25	8749
	1717	1718	1722	C3.4	SF	N11E25	8747
	1807	1810	1815	C1.3	SF	S20E24	8749
	1827	1829	1841	C1.6	SF	N11E21	8747
	2248	2252	2256	C1.1			

**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 8735*

16 Oct	N18E40	249	0010	05	BXO	009	B										
17 Oct	N18E22	254	0040	05	DSO	006	B										
18 Oct	N19E09	254	0030	07	CSO	006	B										
19 Oct	N19W06	256	0020	05	CRO	004	B										
20 Oct	N18W19	255	0010	03	BXO	003	B										
21 Oct	N18W32	255															
22 Oct	N18W45	255															
23 Oct	N18W58	255															
24 Oct	N18W71	255															
25 Oct	N18W84	255															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 256





***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

*Region 8736*

17 Oct	S20E35	241	0010	00	HRX	001	A											
18 Oct	S24E20	243	0000	00	AXX	001	A							1				
19 Oct	S21E07	243	0000	06	BXO	002	B											
20 Oct	S25W06	242	0010	01	AXX	002	A											
21 Oct	S25W19	242																
22 Oct	S25W32	242																
23 Oct	S25W45	242																
24 Oct	S25W58	242																
25 Oct	S25W71	242																
26 Oct	S25W84	242																
										0	0	0	1	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 242

*Region 8737*

19 Oct	S15E14	236	0050	07	CAO	008	B	1				1						
20 Oct	S16E01	235	0070	08	DAO	017	B											
21 Oct	S15W12	235	0170	13	EAI	028	B	1				1						
22 Oct	S15W26	236	0310	11	EAI	022	B											
23 Oct	S14W40	237	0270	11	EKO	017	B											
24 Oct	S13W54	238	0330	12	EKO	013	B						1					
25 Oct	S13W67	237	0370	13	EAO	005	B	1				1						
26 Oct	S15W78	235	0360	13	EAO	005	B	1				2						
27 Oct	S13W89	233	0140	05	HSX	001	A			1		2						
										4	1	0	8	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 235

*Region 8738*

20 Oct	N16E28	208	0010	00	AXX	002	A											
21 Oct	N17E13	210	0020	03	CSO	003	B											
22 Oct	N17W01	211	0020	02	CSO	003	B											
23 Oct	N17W13	210	0020	05	CSO	006	B											
24 Oct	N18W27	211	0030	04	CSO	006	B											
25 Oct	N18W40	210	0020	03	CRO	004	B											
26 Oct	N17W53	210	0010	03	BXO	003	B											
27 Oct	N17W67	211	0090	02	CSO	002	B											
28 Oct	N17W80	211	0000	00	AXX	001	A											
29 Oct	N17W93	211																
										0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 211



**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 8739</i>																							
20 Oct	S14E71	165	0050	09	CAO	003	B	1				1											
21 Oct	S12E58	165	0130	09	DAO	008	B	2				3											
22 Oct	S13E43	167	0220	10	DAI	019	B	1					1										
23 Oct	S12E30	167	0440	13	EKI	023	B					1											
24 Oct	S12E16	168	0420	13	EKI	036	BG																
25 Oct	S12E03	167	0570	14	EHl	055	BGD	3				5	1										
26 Oct	S11W10	167	0800	16	FKC	062	BGD	4	2			15	2										
27 Oct	S12W23	167	0650	16	FKC	042	BGD	1				6											
28 Oct	S11W37	168	0590	16	FKI	035	BG	1				2											
29 Oct	S12W49	167	0500	17	FHI	026	BG	3				8											
30 Oct	S10W64	169	0390	17	FAI	022	B	1				3											
31 Oct	S11W78	169	0180	16	FAO	008	B																
								17	2	0	44	4	0	0	0	0							

Still on Disk.

Absolute heliographic longitude: 167

*Region 8741*

22 Oct	S25E64	146	0080	12	CAO	007	B													
23 Oct	S25E50	147	0210	13	EAO	017	B	4				6								
24 Oct	S26E36	148	0220	13	EAO	017	B	1				2								
25 Oct	S25E22	148	0280	13	EAO	018	B	2	1			8	1							
26 Oct	S25E09	148	0140	11	EAO	011	B					1								
27 Oct	S25W03	147	0190	13	EAO	019	B					1								
28 Oct	S25W16	147	0150	13	EAO	019	B													
29 Oct	S24W29	147	0200	12	EAI	022	BG													
30 Oct	S24W42	147	0150	12	EAO	013	B													
31 Oct	S25W54	145	0140	12	EAC	007	B					1								
								7	1	0	19	1	0	0	0	0				

Still on Disk.

Absolute heliographic longitude: 147



**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 8742</i>																		
23 Oct	N06E82	115	0250	03	HKX	001	A											
24 Oct	N08E68	116	0280	12	EKO	008	B											2
25 Oct	N08E54	116	0450	15	EKO	019	B	1										4
26 Oct	N09E43	114	0480	13	EKI	024	B											
27 Oct	N08E29	115	0480	12	EKI	025	B	1										1
28 Oct	N08E17	114	0460	13	EKI	029	B											
29 Oct	N10E03	115	0430	14	EKO	033	B											
30 Oct	N10W11	116	0370	13	EAO	034	B											
31 Oct	N09W24	115	0200	13	EAO	020	B											
								2	0	0	0	6	1	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 115

*Region 8743*

25 Oct	S15E20	150	0010	03	BXO	004	B											
26 Oct	S18E08	149	0050	07	BXO	008	B											
27 Oct	S14W07	151	0020	05	DAO	003	B											
28 Oct	S15W18	149	0010	03	BXO	004	B											
29 Oct	S14W33	151	0040	06	DSO	008	B											
30 Oct	S14W47	152	0090	08	DSO	010	B											2
31 Oct	S15W61	152	0110	12	EAO	005	B											
								0	0	0	0	2	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 151

*Region 8744*

25 Oct	N08E43	127	0010	05	BXO	004	B											
26 Oct	N07E30	127	0000	05	BXO	005	B											
27 Oct	N09E16	128	0010	05	BXO	005	B											
28 Oct	N10E03	128	0010	04	BXO	003	B											
29 Oct	N10W10	128																
30 Oct	N10W23	128																
31 Oct	N10W38	129	0010	02	AXX	002	A											
								0	0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 128



**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 8745</i>																	
26 Oct	S14E66	091	0170	02	HAX	002	A										
27 Oct	S14E54	090	0150	03	HSX	002	A										
28 Oct	S15E42	089	0180	06	CAO	007	B										
29 Oct	S14E28	090	0130	06	CAO	006	B										
30 Oct	S15E15	090	0110	07	DAO	010	B										
31 Oct	S15E00	091	0080	06	CAO	006	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 091																	
<i>Region 8746</i>																	
27 Oct	S15E28	116	0010	03	BXO	004	B										
28 Oct	S15E14	117	0010	03	BXO	004	B										
29 Oct	S16E07	111	0010	06	BXO	003	B										
30 Oct	S16W06	111															
31 Oct	S16W24	116															
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 111																	
<i>Region 8747</i>																	
28 Oct	N10E59	072	0040	04	CRO	004	B	1			8						
29 Oct	N11E44	074	0190	07	DAO	008	B	2			12						
30 Oct	N12E30	075	0210	11	EAO	013	B				2						
31 Oct	N11E17	074	0160	09	DAO	012	B	2			3						
								5	0	0	25	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 074																	
<i>Region 8748</i>																	
29 Oct	N19E04	114	0010	03	BXO	005	B										
30 Oct	N19W08	113	0040	03	DAO	006	B										
31 Oct	N19W20	111	0010	04	BXO	005	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 114																	
<i>Region 8749</i>																	
29 Oct	S21E49	069	0000	00	AXX	001	A										
30 Oct	S21E31	074	0010	09	BXO	004	B				2						
31 Oct	S18E15	076	0060	08	DSO	015	B	6			9	2					
								6	0	0	11	2	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 076																	



**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 8750</i>																					
29 Oct	S18E10	108	0020	02	HRX	002	A														
30 Oct	S18W04	109	0010	03	BXO	004	B														
31 Oct	S16W18	109	0000	03	BXO	003	B														
Still on Disk.								0	0	0	0	0	0	0	0	0	0	0	0	0	
Absolute heliographic longitude: 109																					
<i>Region 8751</i>																					
30 Oct	N20E66	039	0030	01	HSX	001	A														
31 Oct	N21E54	037	0040	01	HSX	001	A														
Still on Disk.								0	0	0	0	0	0	0	0	0	0	0	0	0	
Absolute heliographic longitude: 037																					

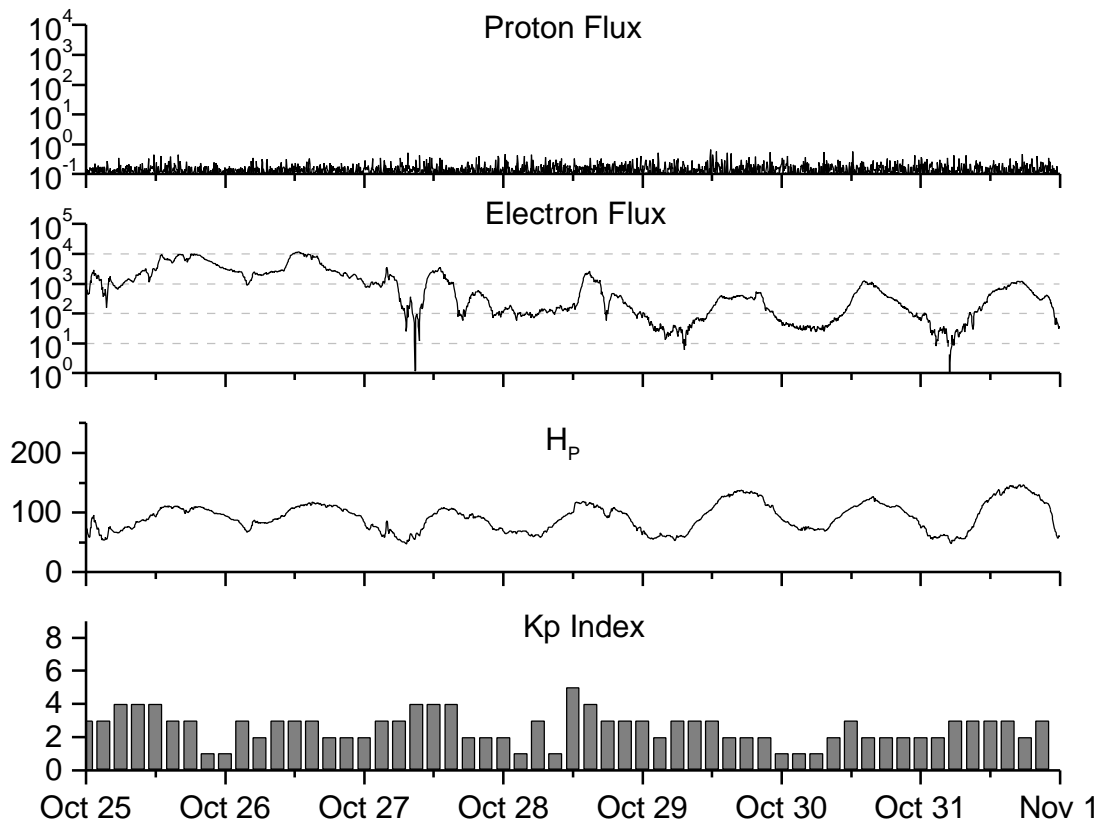


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers				Radio Flux		Geomagnetic		
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
<b>1997</b>									
November	53.5	39.0	0.73	49.3	35.0	99.5	91.3	11	09.0
December	57.9	41.2	0.71	54.2	39.0	98.8	94.2	05	09.5
<b>1998</b>									
January	51.8	31.9	0.62	60.6	43.7	93.4	97.5	08	09.9
February	54.4	40.3	0.74	67.4	48.8	93.4	101.7	08	10.5
March	81.8	54.8	0.67	73.3	53.4	109.1	105.8	13	11.1
April	73.6	53.4	0.73	77.7	56.5	108.3	109.1	10	11.3
May	74.3	56.3	0.76	81.4	59.3	106.7	112.4	18	11.6
June	93.6	70.7	0.76	85.9	62.4	108.4	116.2	10	11.9
July	98.3	66.2	0.67	90.3	65.4	114.0	120.3	11	12.2
August	118.6	91.7	0.77	93.7	67.8	136.0	124.1	18	12.4
September	119.0	92.9	0.78	96.1	69.4	138.4	126.8	13	12.5
October	77.0	55.5	0.72	97.7	70.5	117.3	127.9	13	12.5
November	99.5	74.0	0.74	101.3	73.0	140.2	130.0	16	12.3
December	120.8	81.9	0.69	108.8	77.9	150.1	134.3	08	11.9
<b>1999</b>									
January	94.3	62.4	0.66	116.5	82.6	142.6	139.0	10	11.7
February	93.4	66.3	0.71	120.2	84.6	142.0	142.6	12	11.6
March	100.5	68.8	0.68	120.5	83.8	126.3	144.0	14	11.6
April	092.9	063.9	0.69	123.8	85.4	117.2	145.8	12	12.1
May	140.5	106.3	0.76			148.6		08	
June	208.3	137.4	0.66			169.8		07	
July	169.2	113.5	0.67			165.6		10	
August	136.1	93.7	0.69			170.8		15	
September	107.4	70.9	0.66			135.7		18	
October	167.7	116.4	0.69			164.9		18	

**NOTE:** All smoothed values after January 1998 and monthly values after September 1998 are preliminary estimates. The lowest smoothed sunspot indices 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 25 October 1999*

*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.

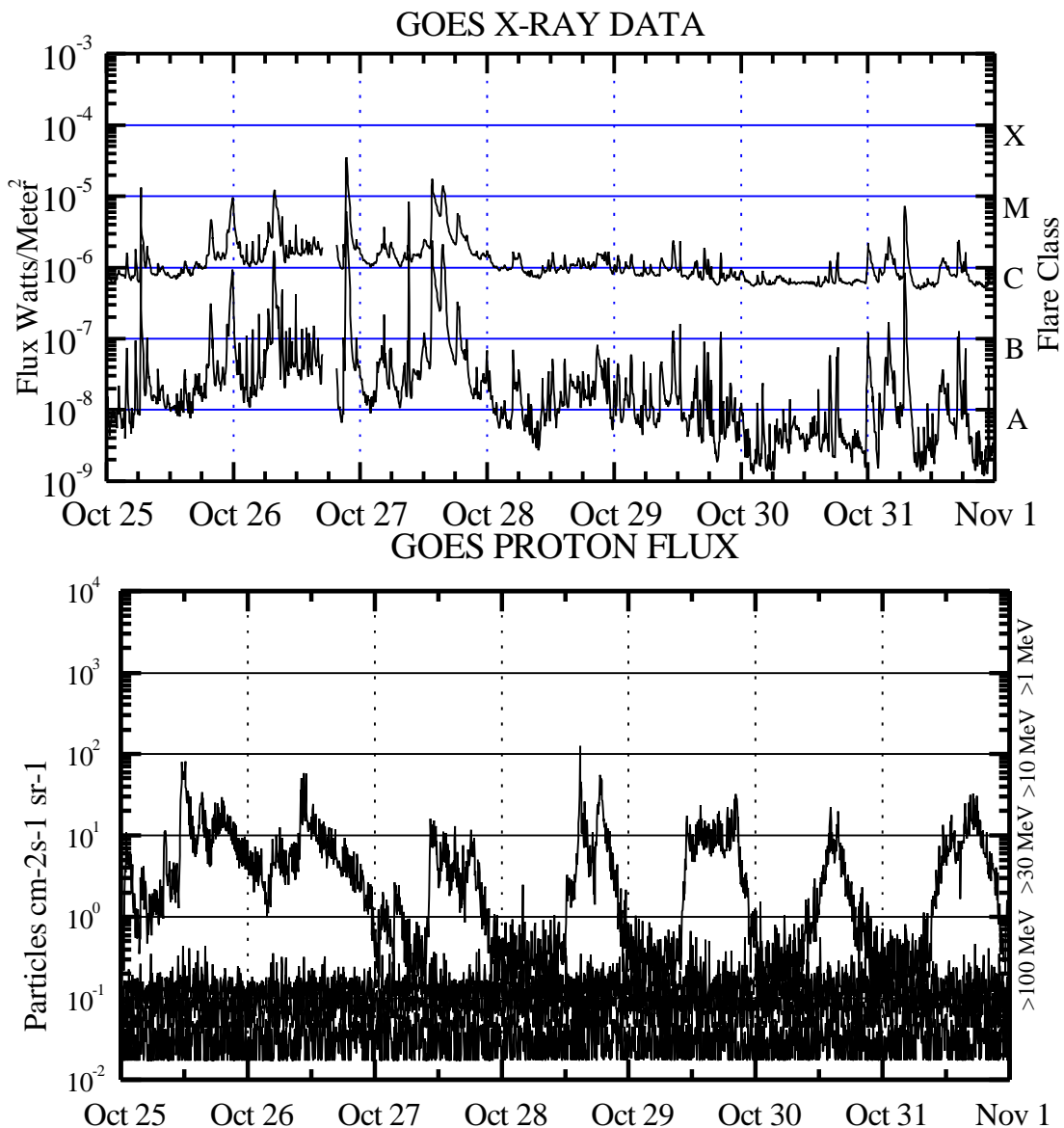
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV at GOES-8.

*Hp* plot contains the five minute averaged magnetic field Hp - component in nanoteslas (nT) as measured by GOES-8. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

*Kp* plot contains the estimated planetary 3-hour K-index (derived by the USAF 55<sup>th</sup> Space Weather Squadron) 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 Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), the British Geological Survey and the US Geological Survey. These may differ from the final Kp values derived from a more extensive network of magnetometers. The official Kp values are available at [http://www.gfzpotdam.de/pb2/pb23/niemegk/kp\\_index/](http://www.gfzpotdam.de/pb2/pb23/niemegk/kp_index/)

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 Kp are "global " parameters that are applicable to a first order approximation over large areas. Hparallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





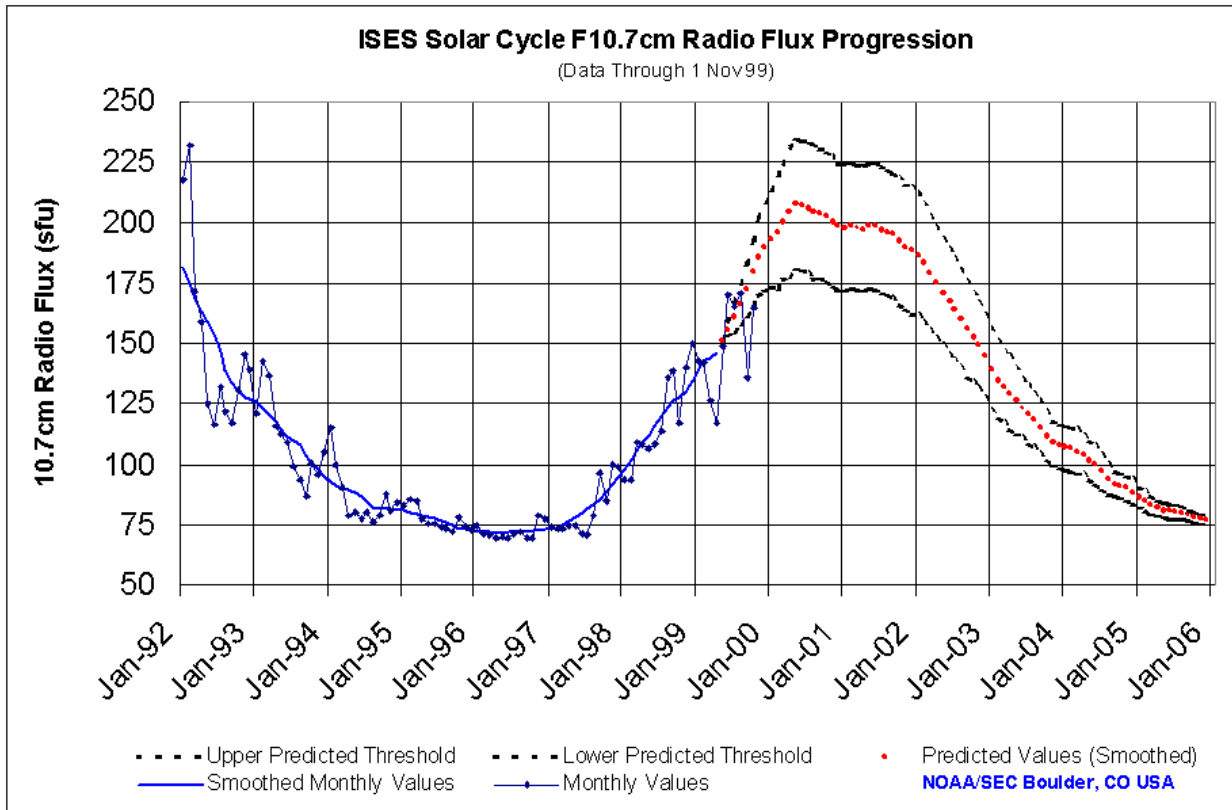
*Weekly GOES Satellite X-ray and Proton Plots*

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

Proton plot contains the five minute averaged integral proton flux (protons/cm<sup>2</sup> –sec –sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.



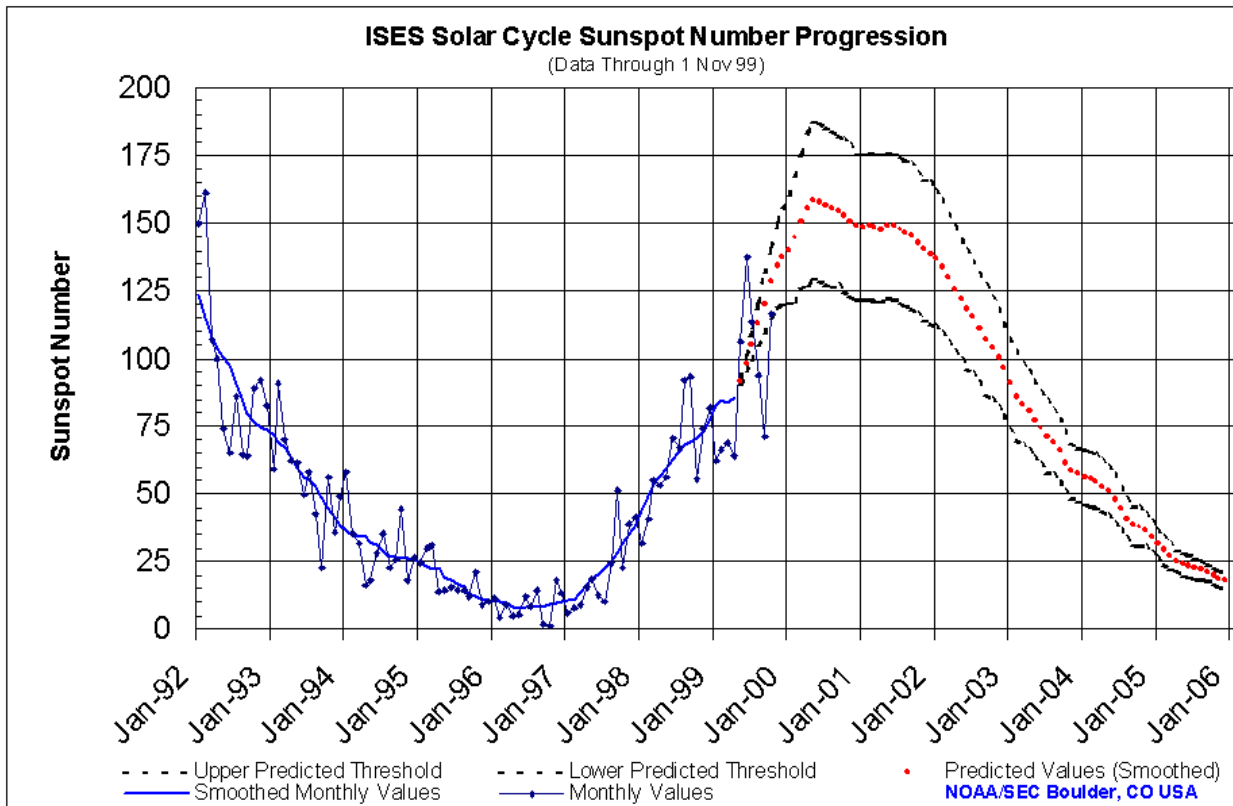




### SEC Prediction of Smoothed F10.7cm Radio Flux

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1996	72 (***)	72 (***)	72 (***)	72 (***)	71 (***)	72 (***)	72 (***)	72 (***)	72 (***)	73 (***)	73 (***)	73 (***)
1997	73 (***)	74 (***)	75 (***)	77 (***)	78 (***)	80 (***)	82 (***)	83 (***)	86 (***)	89 (***)	91 (***)	94 (***)
1998	98 (***)	102 (***)	106 (***)	109 (***)	112 (***)	116 (***)	120 (***)	124 (***)	127 (***)	128 (***)	130 (***)	134 (***)
1999	139 (***)	143 (***)	144 (***)	146 (***)	<b>151</b> (1)	<b>156</b> (3)	<b>161</b> (6)	<b>166</b> (8)	<b>172</b> (11)	<b>179</b> (13)	<b>186</b> (16)	<b>190</b> (18)
2000	<b>193</b> (20)	<b>196</b> (23)	<b>200</b> (24)	<b>205</b> (27)	<b>208</b> (27)	<b>207</b> (27)	<b>206</b> (27)	<b>204</b> (28)	<b>204</b> (27)	<b>202</b> (27)	<b>200</b> (27)	<b>198</b> (26)
2001	<b>198</b> (26)	<b>198</b> (26)	<b>198</b> (26)	<b>197</b> (26)	<b>198</b> (26)	<b>198</b> (26)	<b>197</b> (26)	<b>196</b> (26)	<b>195</b> (26)	<b>192</b> (26)	<b>190</b> (26)	<b>188</b> (26)
2002	<b>187</b> (25)	<b>184</b> (25)	<b>179</b> (24)	<b>175</b> (23)	<b>171</b> (22)	<b>167</b> (22)	<b>164</b> (21)	<b>160</b> (20)	<b>156</b> (20)	<b>153</b> (19)	<b>149</b> (18)	<b>145</b> (17)
2003	<b>140</b> (17)	<b>135</b> (16)	<b>132</b> (15)	<b>130</b> (15)	<b>126</b> (14)	<b>123</b> (12)	<b>120</b> (12)	<b>118</b> (11)	<b>115</b> (11)	<b>112</b> (10)	<b>110</b> (9)	<b>108</b> (9)
2004	<b>107</b> (9)	<b>106</b> (9)	<b>105</b> (9)	<b>104</b> (8)	<b>102</b> (8)	<b>100</b> (8)	<b>97</b> (7)	<b>94</b> (6)	<b>92</b> (5)	<b>91</b> (5)	<b>90</b> (5)	<b>88</b> (5)
2005	<b>87</b> (4)	<b>85</b> (4)	<b>83</b> (4)	<b>82</b> (3)	<b>81</b> (3)	<b>81</b> (3)	<b>80</b> (3)	<b>80</b> (3)	<b>79</b> (2)	<b>78</b> (2)	<b>78</b> (2)	<b>77</b> (2)





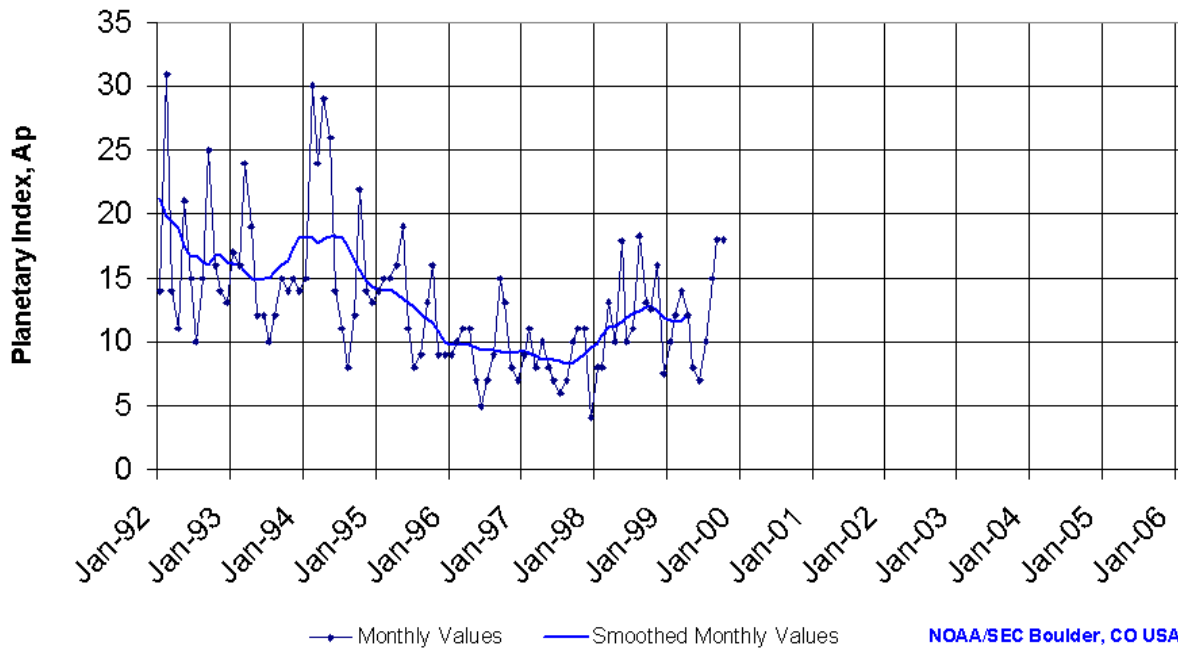
### SEC Prediction of Smoothed Sunspot Number

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	10 (***)	10 (***)	10 (***)	9 (***)	8 (***)	9 (***)	8 (***)	8 (***)	8 (***)	9 (***)	10 (***)	10 (***)
1997	11 (***)	11 (***)	14 (***)	17 (***)	18 (***)	20 (***)	23 (***)	25 (***)	28 (***)	32 (***)	35 (***)	39 (***)
1998	44 (***)	49 (***)	53 (***)	57 (***)	59 (***)	63 (***)	66 (***)	68 (***)	70 (***)	71 (***)	73 (***)	78 (***)
1999	83 (***)	85 (***)	84 (***)	85 (***)	<b>91</b> (1)	<b>98</b> (3)	<b>105</b> (6)	<b>113</b> (8)	<b>120</b> (11)	<b>128</b> (13)	<b>134</b> (16)	<b>137</b> (18)
2000	<b>140</b> (20)	<b>144</b> (23)	<b>150</b> (25)	<b>155</b> (28)	<b>159</b> (29)	<b>158</b> (29)	<b>156</b> (29)	<b>155</b> (29)	<b>154</b> (28)	<b>153</b> (28)	<b>151</b> (28)	<b>148</b> (27)
2001	<b>148</b> (27)	<b>149</b> (27)	<b>148</b> (27)	<b>148</b> (27)	<b>149</b> (27)	<b>149</b> (27)	<b>147</b> (27)	<b>146</b> (27)	<b>145</b> (27)	<b>143</b> (26)	<b>140</b> (26)	<b>139</b> (26)
2002	<b>137</b> (25)	<b>134</b> (25)	<b>130</b> (24)	<b>125</b> (23)	<b>122</b> (22)	<b>118</b> (22)	<b>115</b> (21)	<b>111</b> (20)	<b>107</b> (20)	<b>104</b> (19)	<b>100</b> (18)	<b>96</b> (17)
2003	<b>91</b> (17)	<b>86</b> (16)	<b>83</b> (15)	<b>81</b> (15)	<b>77</b> (14)	<b>74</b> (13)	<b>71</b> (13)	<b>69</b> (12)	<b>66</b> (12)	<b>62</b> (11)	<b>59</b> (10)	<b>57</b> (10)
2004	<b>56</b> (10)	<b>56</b> (10)	<b>55</b> (10)	<b>53</b> (9)	<b>51</b> (9)	<b>48</b> (9)	<b>44</b> (8)	<b>41</b> (7)	<b>38</b> (7)	<b>38</b> (7)	<b>36</b> (6)	<b>34</b> (6)
2005	<b>31</b> (5)	<b>29</b> (5)	<b>27</b> (5)	<b>25</b> (4)	<b>24</b> (4)	<b>23</b> (4)	<b>23</b> (4)	<b>22</b> (4)	<b>21</b> (3)	<b>20</b> (3)	<b>19</b> (3)	<b>18</b> (3)



### ISES Solar Cycle Ap Progression

(Data Through 1 Nov 99)





Space Environment Center

# Active Regions

October 1999  
(Month 37)



Preliminary data

Comparison of Cycles at current month in cycle

