

Space Weather Highlights
29 January – 4 February 2007

SEC PRF 1640
06 February 2007

Solar activity was at very low to low levels. Region 940 (S04, L=041, class/area, Dsi/290 on 28 January) produced B- and C-class flares during the period. No flares were observed during 02 – 05 February.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels during the summary period.

The geomagnetic field ranged from quiet to minor storm levels at middle latitudes, while high latitudes experienced quiet to severe storm levels. A recurrent coronal hole high-speed stream disturbed the field during 29 January – 01 February. Activity ranged from quiet to minor storm levels during the disturbance with major storm periods detected at high latitudes (severe storm conditions also occurred at high latitudes on 29 January). During the disturbance, solar wind speeds reached maximum velocities of about 720 km/s early on 31 January, while the Bz component of the IMF fluctuated between +/- 18 nT midday on 29 January. Activity decreased to quiet levels during the latter half of 01 February, and remained so for the balance of the period. By 30 January, the IMF Bz relaxed, and did not vary much beyond +/- 5 nT for the remainder of the period. Solar wind speed gradually decreased after 31 January, and ended the period near 325 km/s.

Space Weather Outlook
07 February – 05 March 2007

Solar activity is expected to be at very low to low levels.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels during 11 February, 13 – 24 February, and again on 26 February – 04 March.

The geomagnetic field is expected to be at quiet to major storm conditions. Quiet to unsettled conditions are expected during 01 – 10 February. Unsettled to major storm levels are expected during 11 – 14 February due to another recurrent coronal hole high speed stream. Quiet to unsettled conditions are expected on 15 – 24 February. On 25 – 27 February, a recurrent coronal hole high speed stream is expected to produce active to minor storm periods. Quiet to unsettled levels are expected for the remainder of the forecast period.



Daily Solar Data

Date	Radio	Sun	Sunspot	X-ray	Flares							
	Flux	spot	Area	Background	X-ray Flux			Optical				
	10.7 cm	No.	(10 ⁻⁶ hemi.)		C	M	X	S	1	2	3	4
29 January	87	27	350	A7.5	2	0	0	2	0	0	0	0
30 January	88	33	410	A5.1	1	0	0	1	0	0	0	0
31 January	89	32	440	A3.4	0	0	0	0	0	0	0	0
01 February	90	31	440	A5.3	0	0	0	1	0	0	0	0
02 February	90	36	390	A4.6	0	0	0	0	0	0	0	0
03 February	87	35	350	A3.3	0	0	0	0	0	0	0	0
04 February	84	28	310	A2.5	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)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
29 January	3.9E+6	1.8E+4	3.9E+3		3.1E+6	
30 January	8.2E+6	1.6E+4	3.2E+3		1.4E+8	
31 January	2.8E+6	1.5E+4	3.0E+3		3.6E+8	
01 February	1.5E+6	1.5E+4	3.2E+3		6.1E+8	
02 February	2.2E+6	1.6E+4	3.1E+3		5.5E+8	
03 February	1.3E+6	1.6E+4	3.4E+3		6.4E+8	
04 February	2.0E+6	1.6E+4	3.7E+3		5.6E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
29 January	19	2-1-2-2-5-5-3-3	41	1-2-4-2-7-6-5-3	36	3-2-3-2-6-7-5-3
30 January	17	4-4-3-2-3-3-3-3	40	2-4-6-6-6-3-3-3	21	4-5-4-3-3-3-3-3
31 January	13	3-3-3-3-2-3-3-2	33	3-3-5-6-5-3-4-3	16	3-3-3-3-3-3-3-3
01 February	7	3-2-2-2-1-1-2-2	20	5-3-3-5-3-1-2-2	8	3-2-3-3-1-1-2-2
02 February	2	0-0-1-0-1-2-0-1	3	1-1-1-2-1-1-1-0	2	1-1-1-0-0-1-1-1
03 February	1	0-2-1-0-0-0-0-0	2	1-1-1-1-0-0-1-0	3	1-2-0-0-1-0-0-1
04 February	2	0-0-2-1-0-1-1-1	3	0-0-2-3-0-0-0-0	2	0-0-1-1-0-0-1-1

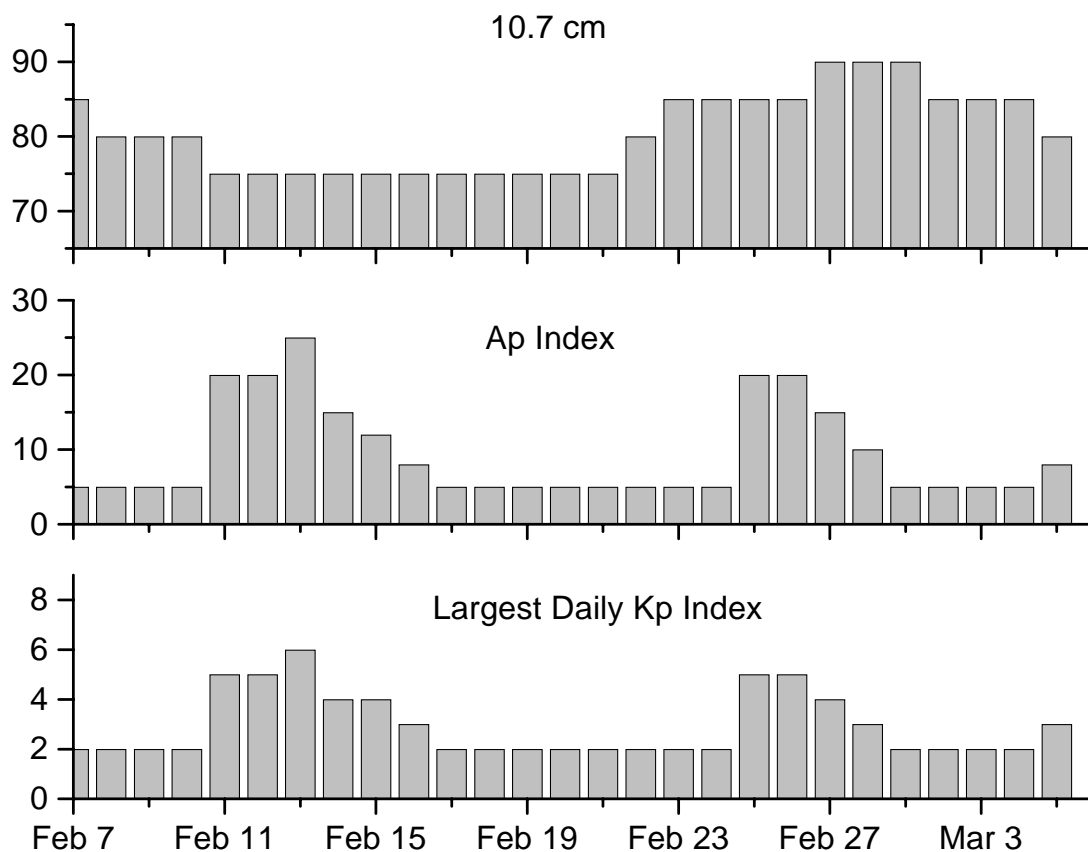


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
29 Jan 0720	ALERT: Geomagnetic K = 4	29 Jan 0719
29 Jan 1426	WARNING: Geomagnetic K = 4	29 Jan 1430 – 1730
29 Jan 1431	ALERT: Geomagnetic K = 4	29 Jan 1431
29 Jan 1437	WARNING: Geomagnetic K = 5	29 Jan 1438 – 1638
29 Jan 1443	ALERT: Geomagnetic K = 5	29 Jan 1442
29 Jan 1633	EXTENDED WARNING: Geomagnetic K = 5	29 Jan 1438
29 Jan 1659	WARNING: Geomagnetic K = 6	29 Jan 1700 – 1900
30 Jan 1252	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	30 Jan 1230
30 Jan 1555	WARNING: Geomagnetic K = 4	30 Jan 1600 – 31/1600
31 Jan 0530	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	31 Jan 0515
31 Jan 0758	ALERT: Geomagnetic K = 4	31 Jan 0758
31 Jan 1554	EXTENDED WARNING: Geomagnetic K = 4	30 Jan 1600 – 01 Feb 1600
01 Feb 0528	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	01 Feb 0515
02 Feb 0501	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	02 Feb 0500
03 Feb 0500	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	03 Feb 0500
04 Feb 0500	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	04 Feb 0500



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
07 Feb	85	5	2	21 Feb	75	5	2
08	80	5	2	22	80	5	2
09	80	5	2	23	85	5	2
10	80	5	2	24	85	5	2
11	75	20	5	25	85	20	5
12	75	20	5	26	85	20	5
13	75	25	6	27	90	15	4
14	75	15	4	28	90	10	3
15	75	12	4	01 Mar	90	5	2
16	75	8	3	02	85	5	2
17	75	5	2	03	85	5	2
18	75	5	2	04	85	5	2
19	75	5	2	05	80	8	3
20	75	5	2				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq	
	$\frac{1}{2}$		Integ		Imp/	Location	Rgn	Radio Flux		Intensity	
	Begin	Max	Max	Class	Brtns	Lat CMD	#	245	2695	II	IV

No Events Observed

Flare List

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
29 January	0805	0809	0816	B1.4	940		
	1316	1327	1335	B2.8			940
	1349	1355	1407	B2.3			940
	1432	1438	1444	B1.5			940
	1647	1651	1717	C3.4	Sf	S05E40	940
	1956	2002	2009	B2.8			940
	2059	2118	2127	B6.9			940
	2134	2140	2145	B8.5			940
	B2238	2243	A2331	C1.5	Sn	S03E36	940
30 January	0055	0100	0104	B3.8			940
	0733	0740	0745	C1.0	Sf	S05E31	940
	1109	1114	1118	B1.2			
31 January	1600	1603	1605	B2.5			
	1229	1233	1237	B1.1			
	1830	1834	1842	B1.2			
	1943	1946	1949	B1.2			
01 February	2103	2122	2131	B7.5			940
	0137	0201	0227	B2.4			940
	0240	0313	0324	B4.7			940
	0441	0444	0446	B1.7			940
	0549	0551	0553		Sf	S03E06	940
	1542	1545	1551	B1.0			
02 February	<i>No Flares Observed</i>						
03 February	<i>No Flares Observed</i>						
04 February	<i>No Flares Observed</i>						



Region Summary

Location			Sunspot Characteristics													
Date	(° Lat ° CMD)	Helio Lon	Flares					X-ray			Optical					
			Area	Extent	Spot	Spot	Mag	C	M	X	S	1	2	3	4	
			(10 ⁻⁶ hemi)	(helio)	Class	Count	Class									
Region 940																
26 Jan	S06E77	039	0120	01	Hax	001	A									
27 Jan	S06E62	041	0170	04	Hax	001	A									
28 Jan	S06E49	040	0180	07	Dao	003	B									
29 Jan	S05E35	041	0240	06	Dso	006	B	2			2					
30 Jan	S04E21	042	0280	07	Dao	012	B	1			1					
31 Jan	S04E09	041	0290	10	Dsi	011	B									
01 Feb	S04W06	043	0290	07	Dso	010	B				1					
02 Feb	S04W19	043	0250	08	Dhi	015	B									
03 Feb	S04W31	041	0210	08	Dai	014	B									
04 Feb	S05W44	041	0190	07	Dso	007	B									
								3	0	0	4	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 043

<i>Region 941</i>															
29 Jan	S09E69	007	0110	05	Hsx	001	A								
30 Jan	S06E56	007	0130	03	Hsx	001	A								
31 Jan	S08E43	007	0150	03	Hhx	001	A								
01 Feb	S07E29	008	0150	02	Hsx	001	A								
02 Feb	S07E17	007	0140	03	Hsx	001	A								
03 Feb	S07E04	006	0140	02	Hax	001	A								
04 Feb	S07W10	007	0120	03	Hsx	001	A								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 006

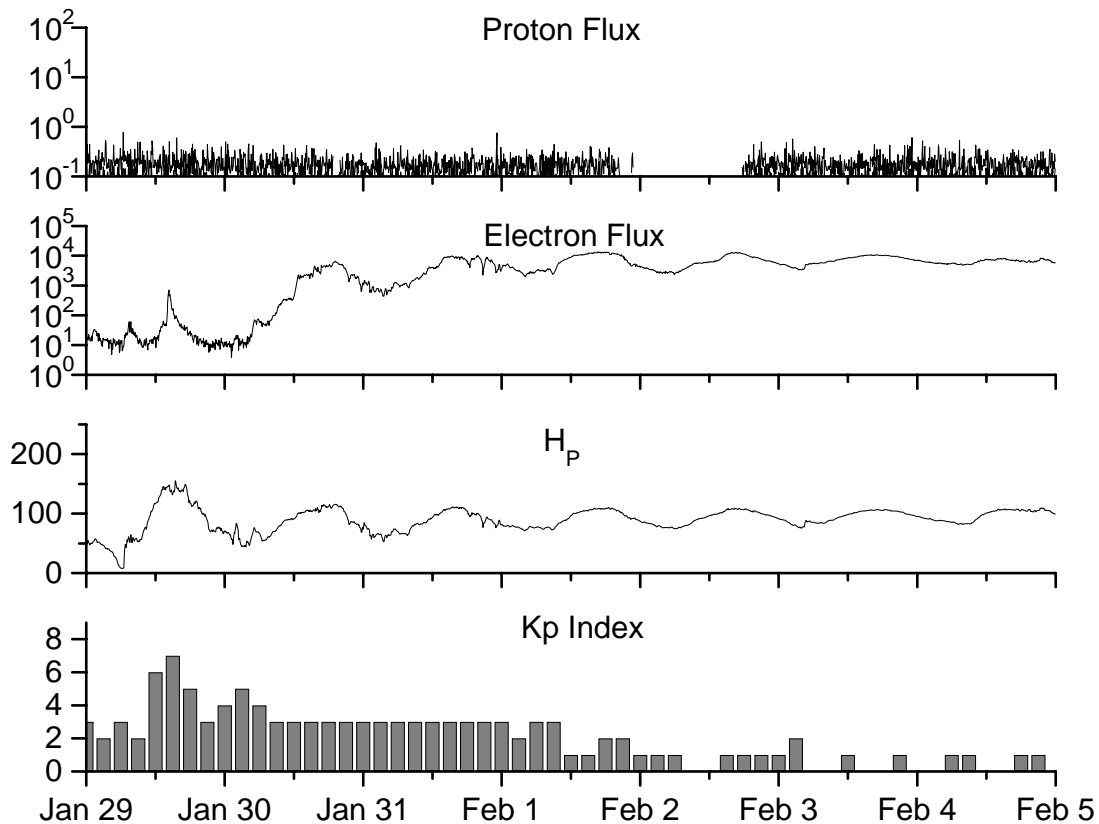


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values	Ratio	Smooth values	*Penticton	Smooth	Planetary	Smooth		
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
2005									
February	45.4	29.1	0.64	56.4	34.0	97.3	98.5	11	14.6
March	41.0	24.8	0.60	55.8	33.6	90.0	97.2	12	15.3
April	41.5	24.4	0.59	52.6	31.7	85.9	95.5	12	15.7
May	65.4	42.6	0.65	48.3	29.0	99.5	93.2	20	14.8
June	59.8	39.6	0.66	47.9	28.9	93.7	91.9	13	13.9
July	71.0	39.9	0.56	48.1	29.2	96.6	90.9	16	13.1
August	65.6	36.4	0.55	45.4	27.5	90.7	89.3	16	12.2
September	39.2	22.1	0.56	42.9	25.9	90.8	87.8	21	11.8
October	13.0	8.5	0.65	42.6	25.5	76.7	87.4	7	11.6
November	32.2	18.0	0.56	42.1	24.9	86.3	86.7	8	11.1
December	62.6	41.2	0.66	40.1	23.0	90.8	85.4	7	10.4
2006									
January	28.0	15.4	0.55	37.2	20.8	83.8	84.0	6	9.9
February	5.3	4.7	0.89	33.4	18.7	76.6	82.6	6	9.2
March	21.3	10.8	0.51	31.0	17.4	75.5	81.6	8	8.4
April	55.2	30.2	0.55	30.6	17.1	89.0	80.9	11	7.9
May	39.6	22.2	0.56	30.7	17.3	81.0	80.8	8	7.9
June	37.7	13.9	0.37	28.9	16.3	80.1	80.6	9	8.3
July	22.6	12.2	0.54	27.2	15.3	75.8	80.3	7	8.7
August	22.8	12.9	0.57			79.0		9	
September	25.2	14.5	0.58			77.8		8	
October	15.7	10.4	0.66			74.3		8	
November	31.5	21.5	0.68			86.4		9	
December	22.2	13.6	0.61			84.3		15	
2007									
January	26.6	16.9	0.64			83.5		5	

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 29 January 2007

Protons plot contains the five-minute averaged integral proton flux (protons/cm²–sec–sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

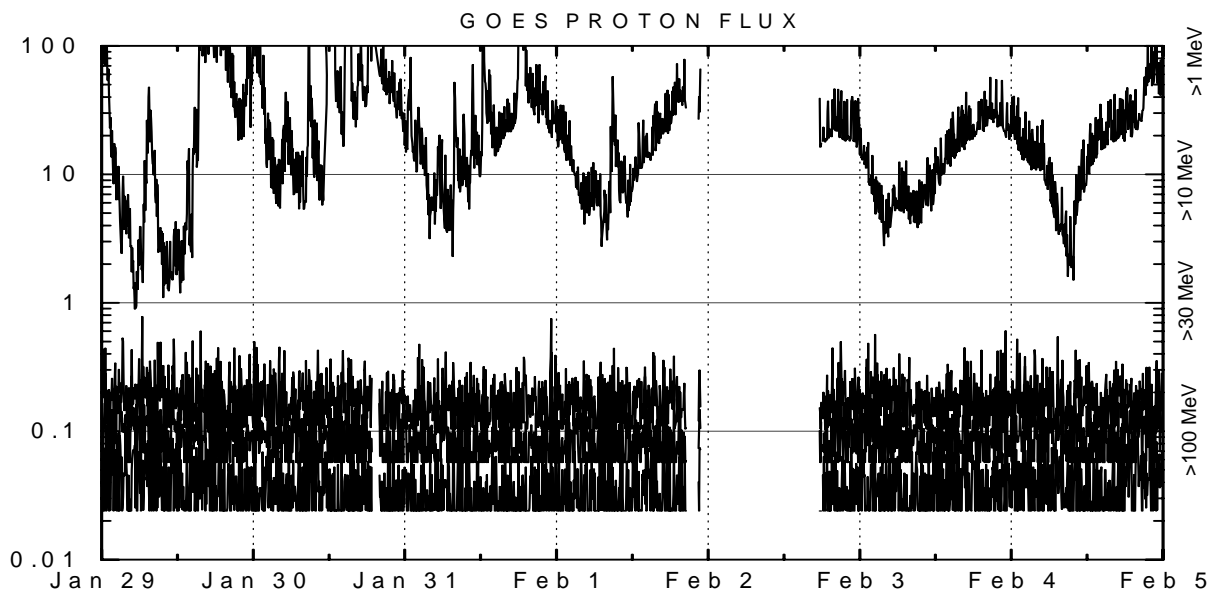
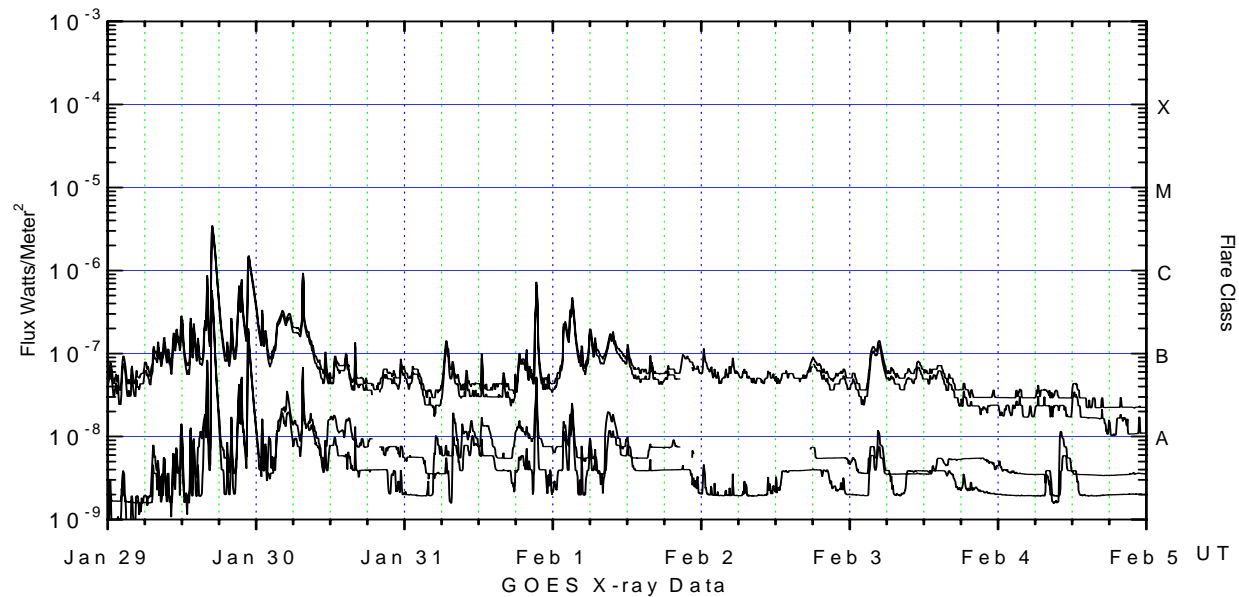
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²–sec–sr) with energies greater than 2 MeV at GOES-12 (W075).

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 Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) 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 SEC 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 parallel 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

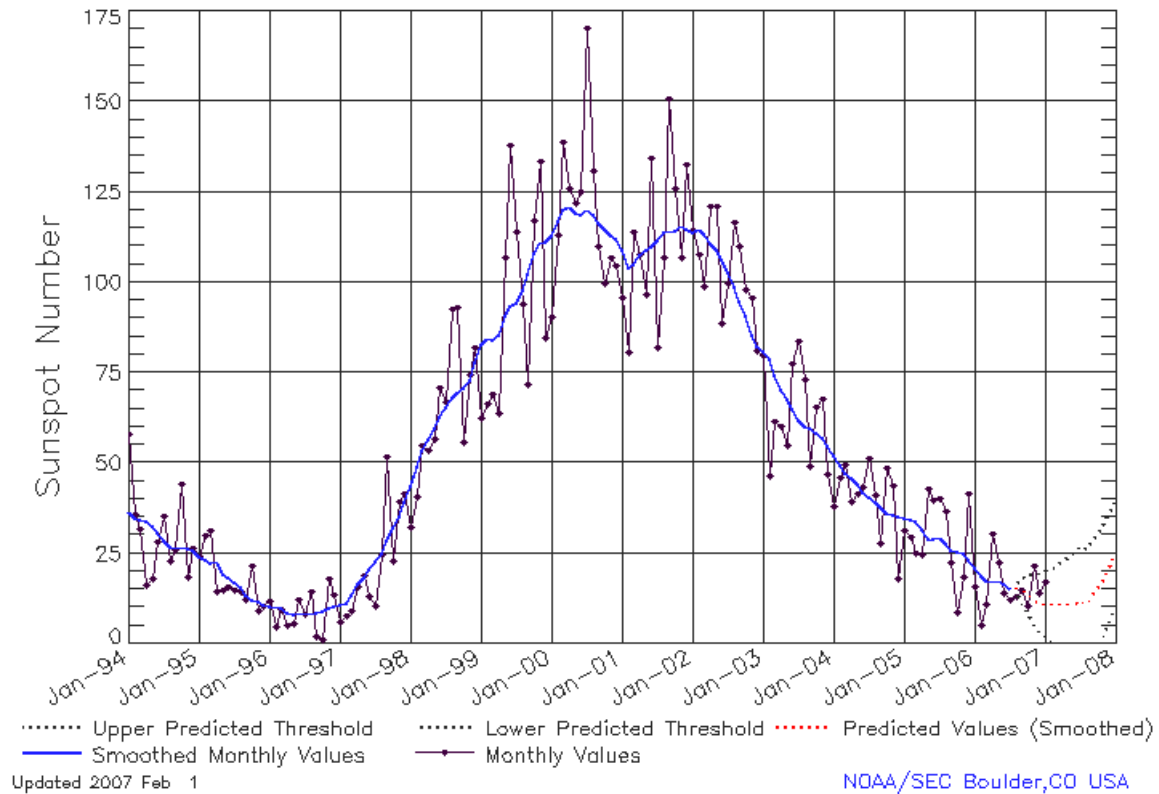
X-ray plot contains five-minute averaged x-ray flux (watts/m²) as measured by GOES 12 (W075) and GOES 11 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W135) 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 Jan 07



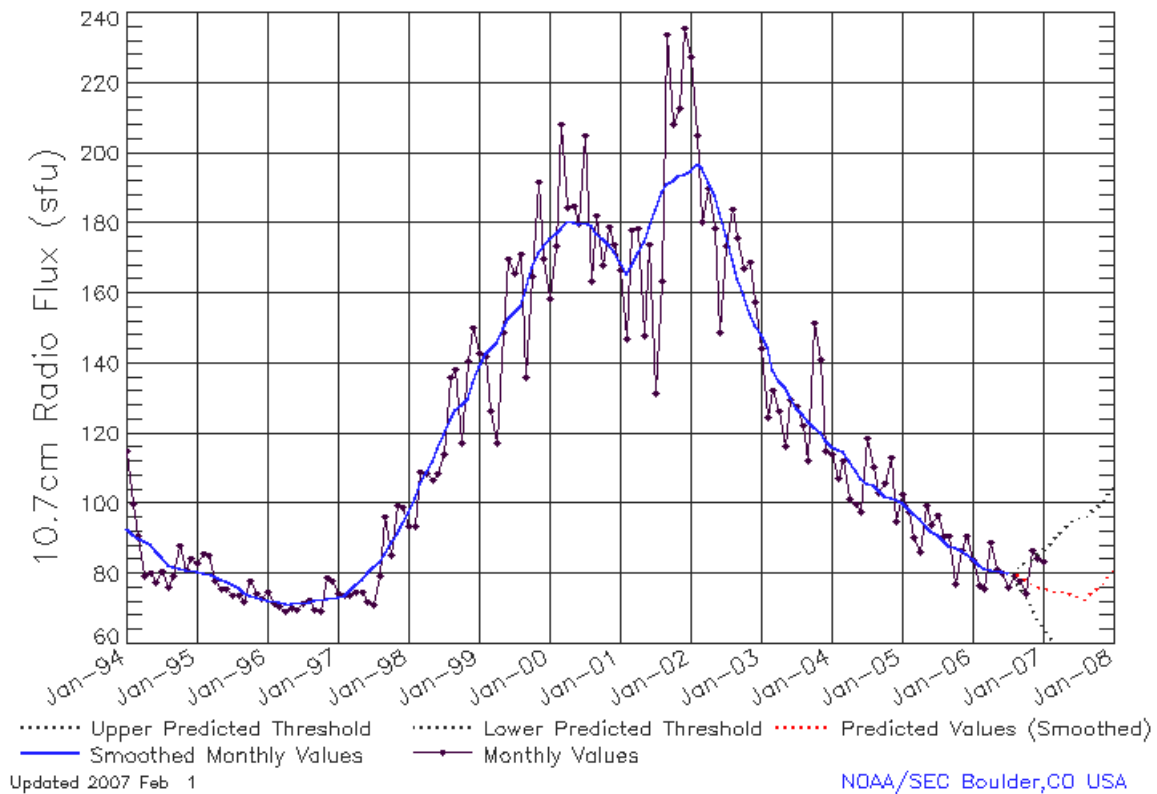
SEC Prediction of Smoothed Sunspot Number

	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	98	102	108	111	111
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2000	113	117	120	121	119	119	120	119	116	115	113	112
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2001	109	104	105	108	109	110	112	114	114	114	116	115
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2002	114	115	113	111	109	106	103	99	95	91	85	82
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2003	81	79	74	70	68	65	62	60	60	58	57	55
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2004	52	49	47	46	44	42	40	39	38	36	35	35
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2005	35	34	34	32	29	29	29	28	26	26	25	23
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)
2006	21	19	17	17	17	16	15	15	15	14	12	12
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(1)	(3)	(5)	(7)	(8)
2007	11	11	11	11	11	11	12	11	13	16	18	21
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(15)	(15)	(15)	(15)	(15)



ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 31 Jan 07



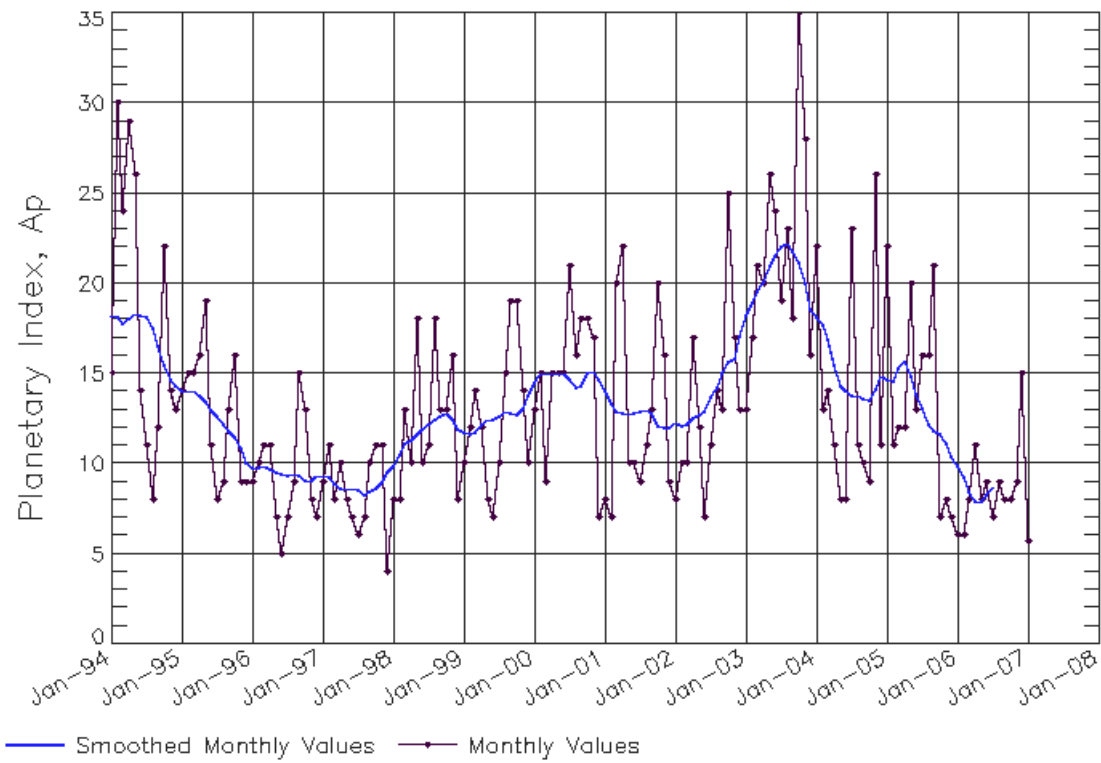
SEC Prediction of Smoothed F10.7cm Radio Flux

	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	176	177	178	181	180	180	180	179	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	154	151
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2003	148	145	138	135	133	130	127	125	124	122	120	118
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2004	116	116	115	112	109	107	106	105	104	102	102	101
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2005	100	99	97	96	93	92	91	89	88	87	87	85
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(***)
2006	84	83	82	81	81	81	80	80	80	79	77	77
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)	(3)	(5)	(7)	(9)
2007	76	76	75	75	75	74	74	73	74	76	77	80
	(13)	(13)	(14)	(14)	(13)	(12)	(11)	(10)	(10)	(10)	(10)	(10)



ISES Solar Cycle Ap Progression

Data Through 31 Jan 07



Updated 2007 Feb 1

NOAA/SEC Boulder, CO USA

