

Space Weather Highlights
24 – 30 January 2005

SWO PRF 1535
01 February 2005

Solar activity was at very low levels. At various times this summary period, seven spotted regions were observed on the visible disk. Of these seven regions, Region 727 (S09, L=019, class/area, Dai/120 on 24 January) was the largest and most magnetically complex, but managed to produce only B-class activity.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. The period began with solar wind speed near 600 km/s and in a declining phase as effects from transient flow associated with the 20 January X7.1 flare subsided. Wind speed continued its slow decline through early on 27 January where velocities bottomed out at near 300 km/s. During this same period, the IMF Bz did not vary much beyond +/- 3 nT. Late on 27 January, an increase in the solar wind speed, temperature, and density, indicated the arrival of a high speed coronal hole wind stream. The stream was preceded by a co-rotating interaction region (CIR). Solar wind speed gradually increased to near 600 km/s by 30 January. The IMF Bz exhibited typical north-south fluctuations ranging from +10 to -15 nT. By early on the 30th, the Bz component of the IMF calmed and did not vary much beyond +/- 5 nT through the end of the period. Wind speed remained steady at near 600 km/s.

No greater than 10 MeV proton events were observed this period.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels from 24 - 28 January.

The geomagnetic field ranged from quiet to active levels with isolated minor to major storming at high latitudes. Quiet conditions were observed at middle latitudes through early on 29 January. A couple of isolated active periods were observed at higher latitudes midday on the 24th and 25th. By midday on 29 January, levels increased to mostly unsettled to active as a coronal hole high speed wind stream rotated into a geoeffective position. Isolated minor to major storming was observed at higher latitudes midday on the 29th and 30th. The period ended with quiet to unsettled conditions.

Space Weather Outlook
02 February - 28 February 2005

Solar activity is expected to be very low to low through 05 February. Based on MDI far-side imagery and backside CME activity, old Region 720 (N13, L=178) appears to have maintained its considerable size and magnetic structure. Therefore, a chance of M-class activity is possible after the return of old Region 720 on 05 February.

A greater than 10 MeV proton event is not expected through early February. Thereafter, a proton event is possible following the return of old Region 720 on 05 February.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 02 - 03 February, 08 - 10 February, and 26 - 28 February.

The geomagnetic field is expected to range from quiet to minor storm levels. Coronal hole high speed wind streams are expected to produce unsettled to active conditions with occasional minor storm periods on 07 – 08 February, 17 – 19 February, and 25 – 28 February. Otherwise, expect quiet to unsettled conditions.



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
24 January	95	42	500	A9.3	0	0	0	0	0	0	0	0
25 January	94	56	330	A8.6	0	0	0	0	0	0	0	0
26 January	89	46	160	A8.7	0	0	0	0	1	0	0	0
27 January	87	43	140	A5.6	0	0	0	0	0	0	0	0
28 January	85	43	150	A4.7	0	0	0	0	0	0	0	0
29 January	86	30	160	A4.4	0	0	0	0	0	0	0	0
30 January	86	38	120	A4.6	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
	24 January	3.0E+6	7.0E+4	5.0E+3		1.2E+9
25 January	2.1E+6	4.0E+4	4.2E+3		1.2E+9	
26 January	1.6E+6	3.1E+4	3.5E+3		9.6E+8	
27 January	3.9E+6	2.7E+4	3.7E+3		8.2E+8	
28 January	3.6E+6	3.8E+4	3.4E+3		5.9E+7	
29 January	2.1E+6	4.6E+4	3.2E+3		5.9E+6	
30 January	1.7E+6	3.8E+4	3.1E+3		2.8E+7	

Daily Geomagnetic Data

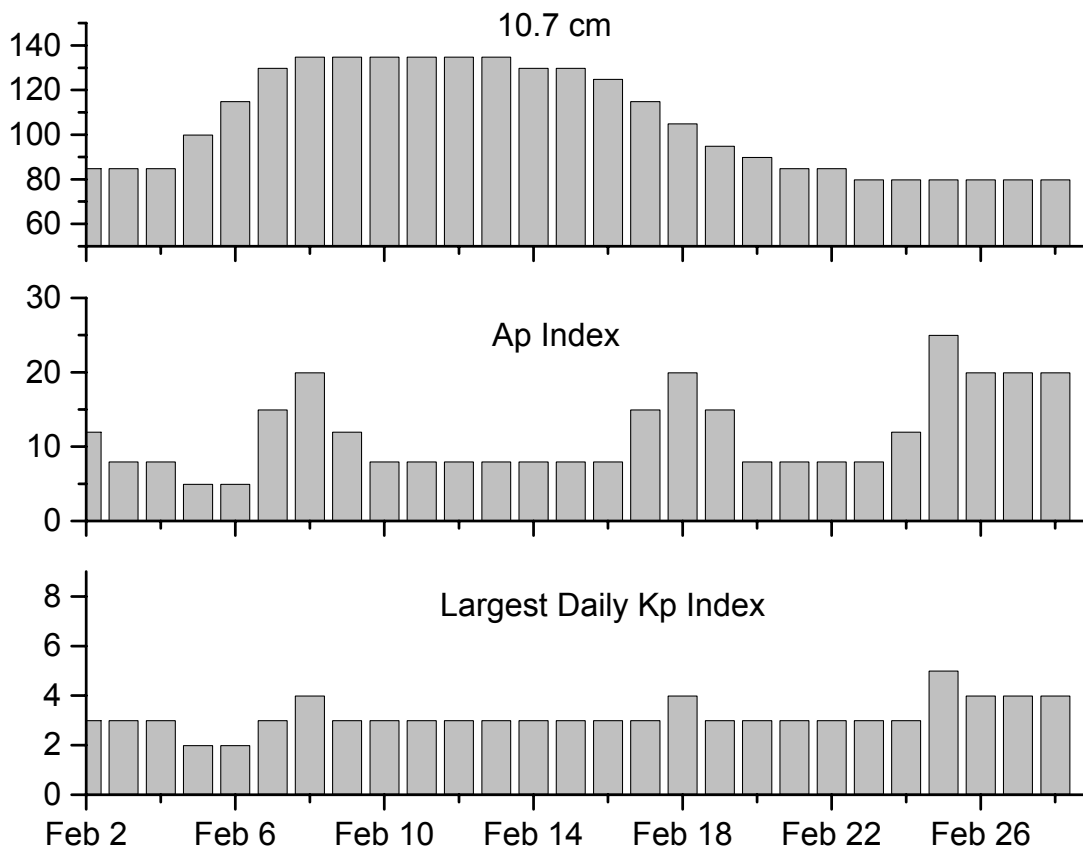
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	24 January	5	2-1-1-2-2-2-1-1	12	3-1-2-3-4-3-2-1	6
25 January	2	1-0-1-0-1-1-1-1	9	1-0-0-4-2-2-3-3	4	1-0-1-1-1-1-2-1
26 January	0	0-0-0-0-0-0-0-0	1	0-0-0-1-1-0-0-0	4	1-1-0-1-1-1-1-1
27 January	2	0-0-0-0-0-2-1-2	0	0-0-0-1-0-0-0-0	3	0-0-0-0-1-2-1-1
28 January	5	2-1-0-0-1-1-2-3	3	0-0-0-1-0-1-2-2	6	2-2-1-0-1-1-3-2
29 January	16	2-2-3-4-3-3-3-4	26	2-1-3-5-5-5-4-3	20	3-2-3-4-3-3-4-4
30 January	10	2-3-2-4-2-2-1-2	23	3-2-2-6-5-3-2-2	16	3-4-3-4-3-2-2-2

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
24 Jan 0518	ALERT: Electron 2MeV Integral Flux > 1000pfu	24 Jan 0500
25 Jan 0559	ALERT: Electron 2MeV Integral Flux > 1000pfu	25 Jan 0500
26 Jan 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	26 Jan 0500
27 Jan 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	27 Jan 0500
28 Jan 1336	ALERT: Electron 2MeV Integral Flux > 1000pfu	28 Jan 1315
29 Jan 0618	WARNING: Geomagnetic K= 4	29 Jan 0620 - 29 Jan 1600
29 Jan 1026	ALERT: Geomagnetic K= 4	29 Jan 1025
29 Jan 1029	WARNING: Geomagnetic K= 5	29 Jan 1028 - 29 Jan 1600
29 Jan 1555	EXTENDED WARNING: Geomagnetic K= 4	29 Jan 0620 - 29 Jan 2359
29 Jan 1625	WARNING: Geomagnetic K= 5	29 Jan 1626 - 29 Jan 1800
29 Jan 2354	EXTENDED WARNING: Geomagnetic K= 4	29 Jan 0620 - 30 Jan 1600



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
02 Feb	85	12	3	16 Feb	125	8	3
03	85	8	3	17	115	15	3
04	85	8	3	18	105	20	4
05	100	5	2	19	95	15	3
06	115	5	2	20	90	8	3
07	130	15	3	21	85	8	3
08	135	20	4	22	85	8	3
09	135	12	3	23	80	8	3
10	135	8	3	24	80	12	3
11	135	8	3	25	80	25	5
12	135	8	3	26	80	20	4
13	135	8	3	27	80	20	4
14	130	8	3	28	80	20	4
15	130	8	3				



Energetic Events

Date	Time		X-ray	Optical Information			Peak		Sweep Freq	
	Begin	Max	Integ	Imp/	Location	Rgn	Radio Flux		Intensity	
			Class	Flux	Lat	CMD	#	245	2695	II

No Events Observed

Flare List

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
24 January	0540	0544	0547	B3.1			724
	1025	1028	1030	B1.2			
	1348	1351	1356	B2.1			
	1453	1458	1501	B4.6			
	1538	1541	1548	B4.6			
	1628	1633	1636	B4.7			
	1829	1834	1839	B3.4			
	1857	1907	1915	B2.4			
	2032	2042	2046	B4.2			
	2104	2108	2113	B1.8			
25 January	2134	2139	2142	B4.0			727
	0252	0258	0311	B1.2			725
	0644	0650	0726	B1.3			725
	1211	1217	1219	B2.4			725
	1223	1228	1230	B3.6			725
	1337	1341	1343	B2.3			725
	1355	1403	1409	B2.6			724
	2042	2051	2059	B1.6			
26 January	0105	0113	0132	B1.8			
	B0324	0324	0329		1f	S11E64	
27 January	1646	1650	1656	B1.3			
	0306	0311	0313	B6.8			727
	1929	1934	1941	B1.5			
28 January	No Flares Observed						
29 January	0241	0245	0252	B1.4			727
	0403	0406	0409	B2.7			727
	0600	0605	0608	B3.4			727
	1223	1234	1242	B4.9			727
	1518	1526	1533	B1.8			727
30 January	0253	0257	0259	B1.2			727
	1351	1355	1358	B1.2			



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

Region 721

16 Jan	S03E14	149	0020	04	Cso	002	B											
17 Jan	S03E02	148	0000	01	Axx	001	A											
18 Jan	S03W11	148																
19 Jan	S03W24	148																
20 Jan	S03W37	148																
21 Jan	S03W50	148																
22 Jan	S03W63	148																
23 Jan	S03W76	148																
24 Jan	S03W89	148																
0 0 0 0 0 0 0 0 0																		

Crossed West Limb.

Absolute heliographic longitude: 148

Region 723

17 Jan	N06E77	073	0070	02	Hax	001	A											
18 Jan	N07E63	073	0100	02	Hsx	001	A											
19 Jan	N06E52	071	0070	09	Cao	002	B	1				1						
20 Jan	N06E35	075	0080	02	Hsx	001	A											
21 Jan	N06E22	074	0070	02	Hsx	001	A											
22 Jan	N07E07	076	0120	03	Cso	003	B											
23 Jan	N06W04	074	0070	02	Hsx	001	A											
24 Jan	N06W17	074	0070	03	Hsx	001	A											
25 Jan	N06W30	074	0050	01	Hsx	001	A											
26 Jan	N06W44	074	0050	02	Hsx	001	A											
27 Jan	N06W57	074	0050	02	Hsx	001	A											
28 Jan	N05W70	074	0070	03	Hax	002	A											
29 Jan	N06W84	075	0090	02	Hsx	002	A											
30 Jan	N06W97	075																
1 0 0 1 0 0 0 0 0																		

Still on Disk.

Absolute heliographic longitude: 074



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 724

18 Jan	S12W07	143	0010	03	Cso	003	B										
19 Jan	S12W20	143															
20 Jan	S12W33	143															
21 Jan	S12W46	143															
22 Jan	S12W59	143															
23 Jan	S12W72	143															
24 Jan	S12W85	143															
25 Jan	S12W98	143															
										0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 143

Region 725

21 Jan	S04W36	132	0090	05	Dsi	008	B										
22 Jan	S04W49	132	0190	05	Dsi	009	Bg										
23 Jan	S03W64	134	0150	06	Cao	007	B										
24 Jan	S03W77	134	0110	05	Cso	003	B										
25 Jan	S03W90	134	0110	02	Hax	001	A										
										0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 132

Region 726

21 Jan	S02E27	069	0040	04	Cso	003	B										
22 Jan	S01E14	069	0020	03	Cro	002	B										
23 Jan	S01W02	072	0010	01	Axx	002	A										
24 Jan	S01W15	072															
25 Jan	S01W28	072															
26 Jan	S01W41	072															
27 Jan	S01W54	072															
28 Jan	S01W67	072															
29 Jan	S01W80	072															
30 Jan	S01W93	072															
										0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 072



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 727

24 Jan	S09E38	019	0320	05	Dai	008	B											
25 Jan	S09E25	019	0120	06	Dai	013	B											
26 Jan	S09E11	019	0100	06	Dao	013	B											
27 Jan	S09W02	019	0080	07	Dao	010	B											
28 Jan	S05W16	020	0070	08	Dai	010	B											
29 Jan	S10W26	017	0070	05	Dso	008	B											
30 Jan	S09W42	020	0110	07	Dai	016	Bg											
									0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 019

Region 728

25 Jan	S14E66	338	0050	01	Hsx	001	A											
26 Jan	S14E53	338	0010	03	Bxo	002	B											
27 Jan	S14E36	341	0010	03	Bxo	002	B											
28 Jan	S14E24	340	0010	01	Axx	001	A											
29 Jan	S14E11	340																
30 Jan	S13E01	337	0010	02	Hsx	002	A											
									0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 337

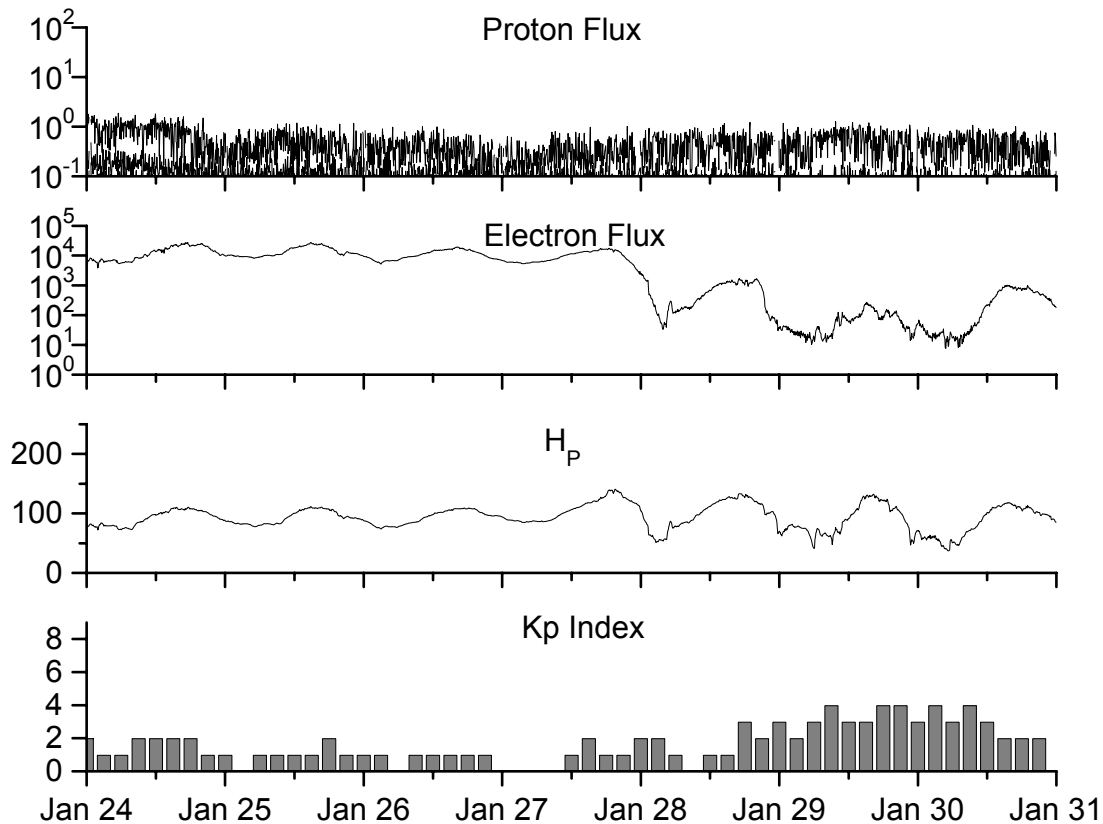


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
2003									
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	135.0	20	20.1
May	89.6	55.2	0.62	118.3	67.8	129.3	133.1	26	21.0
June	118.4	77.4	0.65	113.6	65.2	129.4	130.2	24	21.5
July	132.8	85.0	0.64	106.9	62.0	127.8	127.2	19	22.0
August	114.3	72.7	0.64	102.8	60.3	122.1	125.2	23	22.2
September	82.6	48.8	0.59	100.7	59.8	112.3	123.7	18	21.8
October	118.9	65.5	0.55	96.6	58.4	153.1	121.8	35	21.1
November	118.9	67.3	0.57	93.6	57.0	153.1	120.1	28	20.0
December	75.4	46.5	0.62	91.4	55.0	115.1	118.0	16	18.6
2004									
January	62.3	37.7	0.61	87.9	52.0	114.1	116.3	22	18.1
February	75.6	45.8	0.61	84.2	49.4	107.0	115.5	13	17.7
March	81.0	49.1	0.61	80.9	47.2	112.2	114.6	14	16.9
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59			110.1		11	
September	50.0	27.7	0.55			103.1		10	
October	77.9	48.4	0.62			105.7		9	
November	70.5	43.7	0.62			113.2		26	
December	34.7	17.9	0.52			94.6		11	
2005									
January	52.0	31.3	0.60			102.4		22	

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 24 January 2005*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W108) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

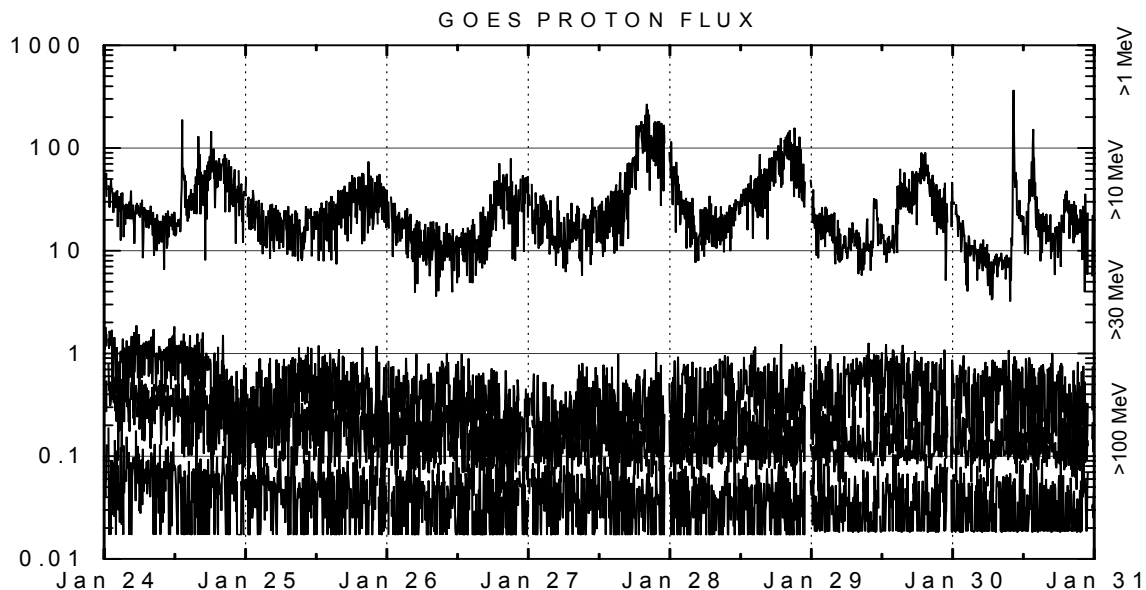
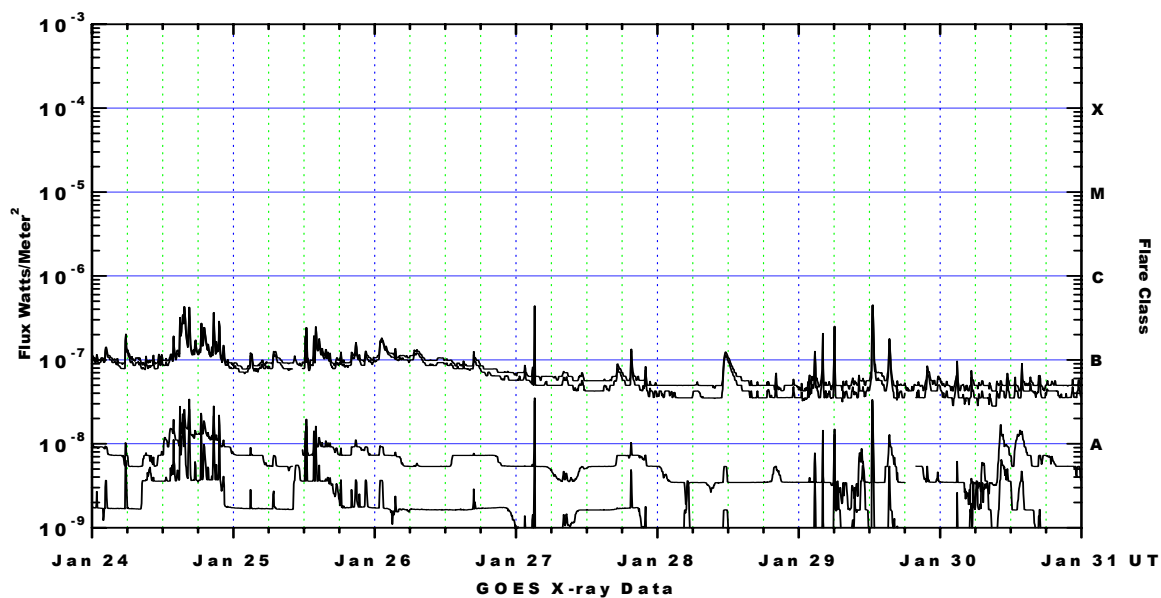
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

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 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

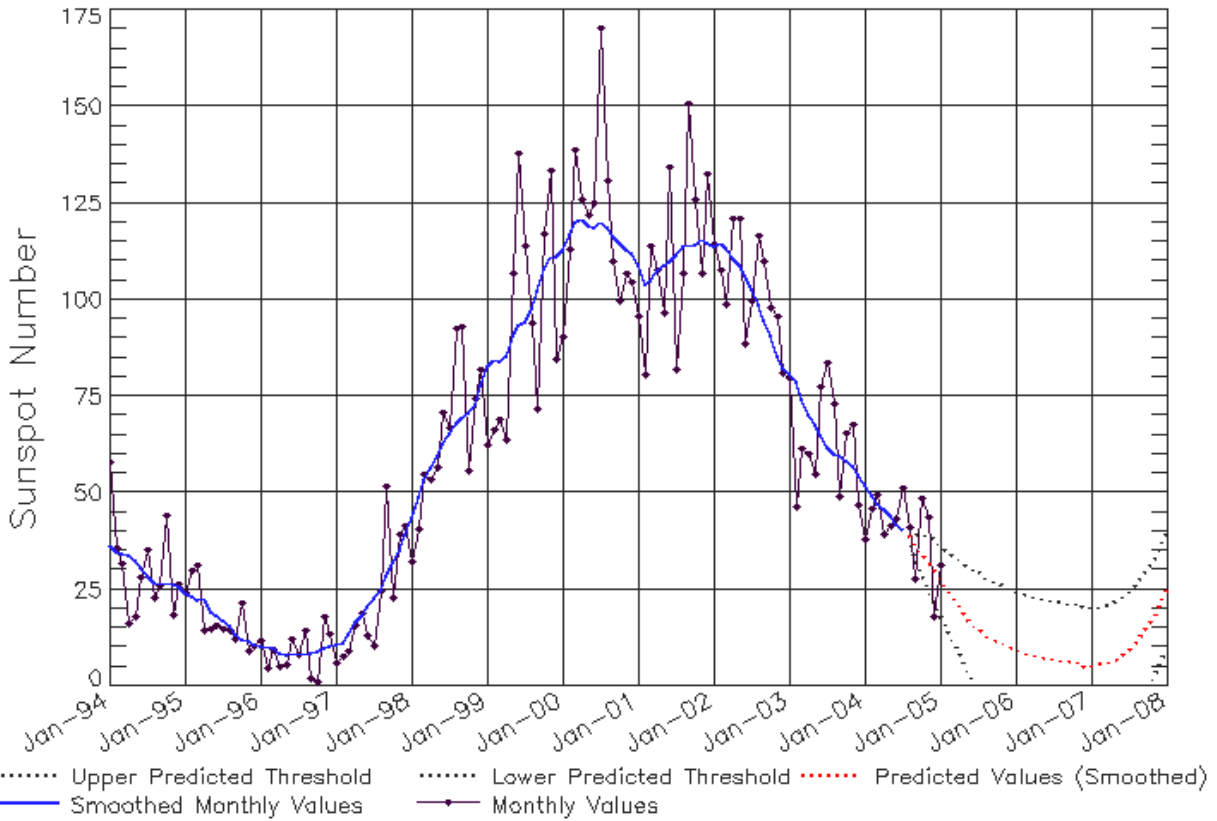
X-ray plot contains five-minute averaged x-ray flux (watts/m²) as measured by GOES 12 (W75) and GOES 10 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W108) 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 05



Updated 2005 Feb 1

NOAA/SEC Boulder, CO USA

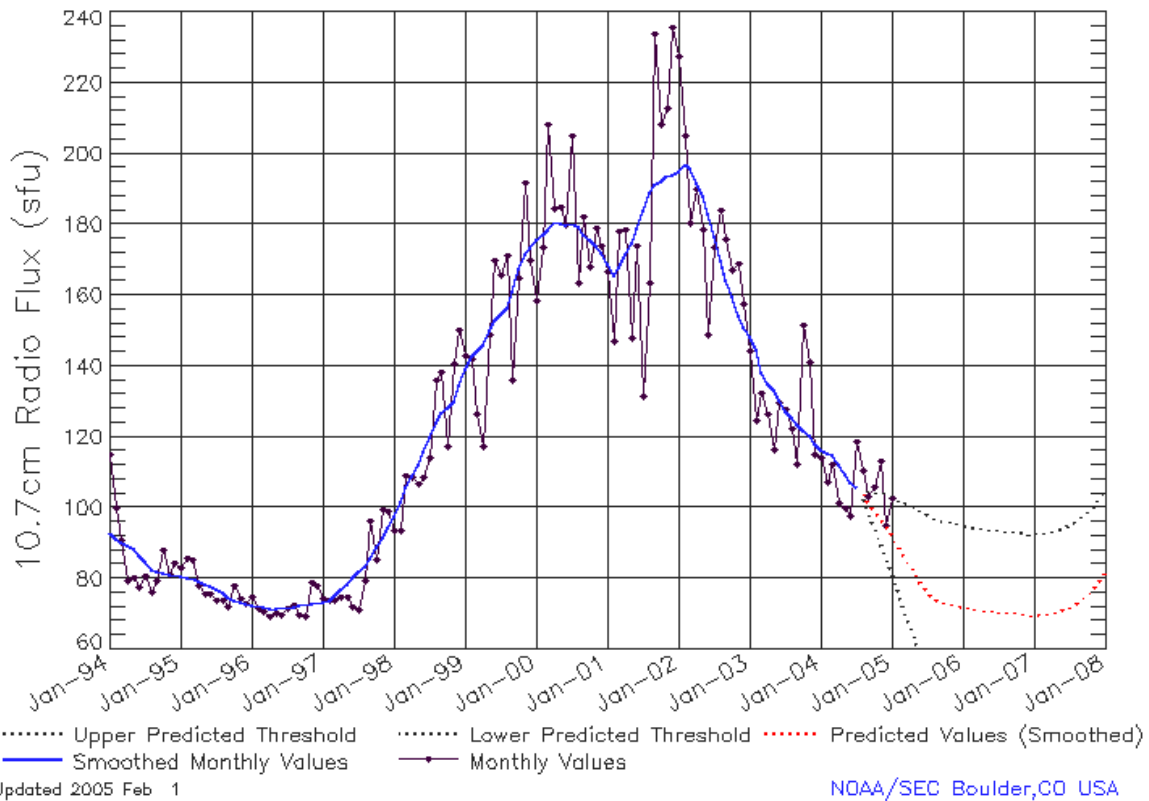
SEC Prediction of Smoothed Sunspot Number

	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	37	34	32	30
	(***)	(***)	(***)	(***)	(***)	(***)	(***)	(1)	(3)	(5)	(7)	(8)
2005	27	25	23	21	18	16	15	13	12	12	11	10
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(15)	(15)	(15)	(15)	(15)
2006	10	9	8	8	8	7	7	7	7	6	6	5
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)
2007	5	6	6	6	7	8	10	11	13	16	18	21
	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)	(15)



ISES Solar Cycle F10.7cm Radio Flux Progression

Data Through 31 Jan 05



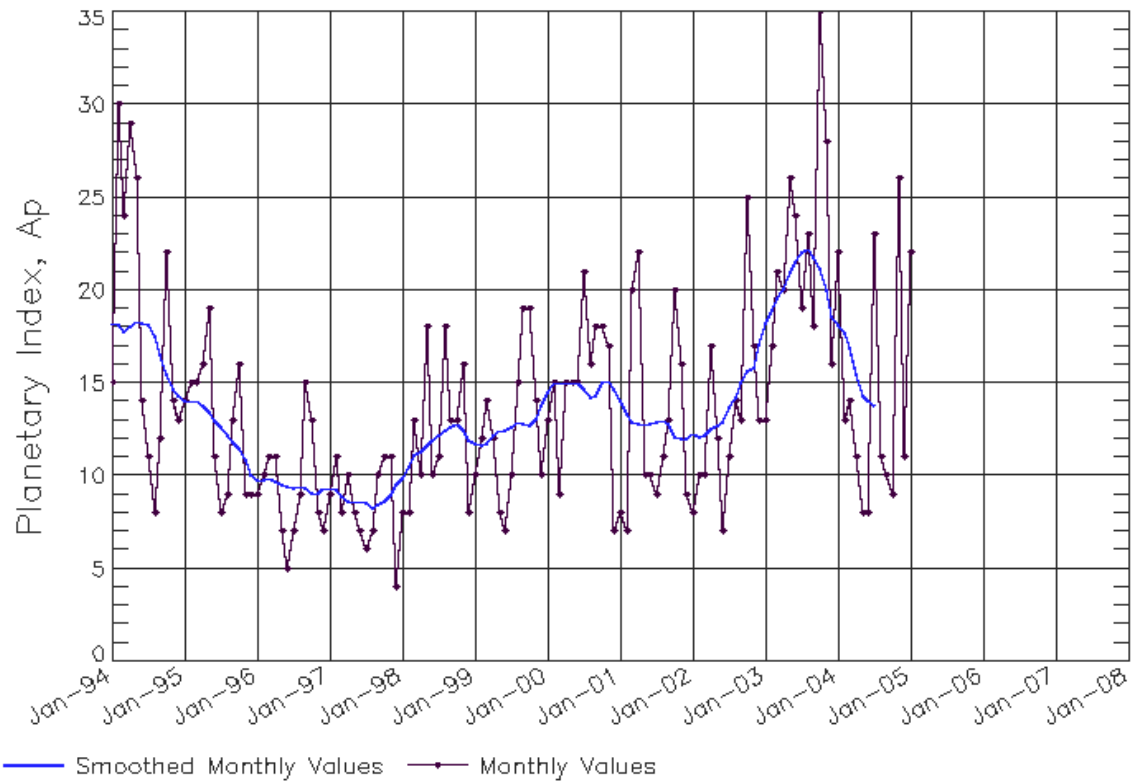
SEC Prediction of Smoothed F10.7cm Radio Flux

	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	104	102	99	97	95
	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(1)	(3)	(5)	(7)	(9)
2005	93	89	86	84	81	78	76	74	74	73	73	73
	(11)	(13)	(15)	(17)	(19)	(21)	(22)	(23)	(23)	(23)	(23)	(23)
2006	72	72	71	71	71	71	71	71	70	70	70	70
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)
2007	70	70	70	70	71	71	72	73	74	76	77	79
	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(23)



ISES Solar Cycle Ap Progression

Data Through 31 Jan 05



Updated 2005 Feb 1

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