

**Space Weather Highlights**  
**16 - 22 January 2006**

**SEC PRF 1586**  
**24 January 2006**

Solar activity ranged from very low to low. Only low-level C-class activity was observed during the period, all from Region 848 (S19, L=321, class/area, Eac/250 on 22 January). Since the region first appeared on the disk on 18 January, significant growth occurred near the central cluster of intermediate spots. No other significant activity was observed.

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

The greater than 2 MeV electron flux at geosynchronous orbit was at normal levels.

The geomagnetic field ranged from quiet to active levels with isolated minor storm periods observed at high latitudes. Solar wind speed ranged from a high of about 575 km/s late on 18 January to a low of near 375 km/s late on 21 January. The Bz component of the IMF did not vary much beyond +/- 5 nT for the entire period with the exception of a 12 hour period beginning early on 16 January. During this timeframe, the IMF Bz fluctuated between +/- 10 nT as a recurrent coronal hole wind stream became geoeffective. As a result, the geomagnetic field responded with unsettled to active conditions at middle latitudes, while high latitudes experienced minor storm periods midday on 16 January. Thereafter, the field was generally quiet to unsettled at middle latitudes, with isolated active periods observed at high latitudes late in the period.

**Space Weather Outlook**  
**25 January - 20 February 2006**

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

No greater than 10 MeV proton events are expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 25 January – 01 February.

The geomagnetic field is expected to range from quiet to minor storm levels. Active periods are possible on 25 January, while active to minor storm periods are possible on 19 – 20 February, both due to effects from recurrent coronal hole wind streams.

Otherwise, quiet to unsettled conditions are expected.



### *Daily Solar Data*

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares								
					X-ray Flux			Optical					
					C	M	X	S	1	2	3	4	
16 January	84	42	130	A3.0	0	0	0	0	0	0	0	0	0
17 January	83	36	130	A3.0	0	0	0	0	0	0	0	0	0
18 January	86	50	160	A2.9	0	0	0	0	0	0	0	0	0
19 January	89	48	190	A5.5	0	0	0	0	0	0	0	0	0
20 January	91	33	170	A5.0	0	0	0	0	0	0	0	0	0
21 January	94	28	200	A9.8	0	0	0	0	0	0	0	0	0
22 January	93	60	260	A7.8	5	0	0	2	0	0	0	0	0

### *Daily Particle Data*

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
	16 January	6.5E+5	1.5E+4	3.4E+3		1.3E+6
17 January	3.4E+5	1.4E+4	3.3E+3		2.2E+6	
18 January	7.6E+5	1.4E+4	3.4E+3		5.0E+6	
19 January	6.4E+5	1.5E+4	3.6E+3		1.1E+7	
20 January	8.3E+5	1.5E+4	3.3E+3		1.9E+7	
21 January	4.4E+5	1.5E+4	3.7E+3		6.8E+6	
22 January	5.3E+5	1.6E+4	3.8E+3		6.6E+6	

### *Daily Geomagnetic Data*

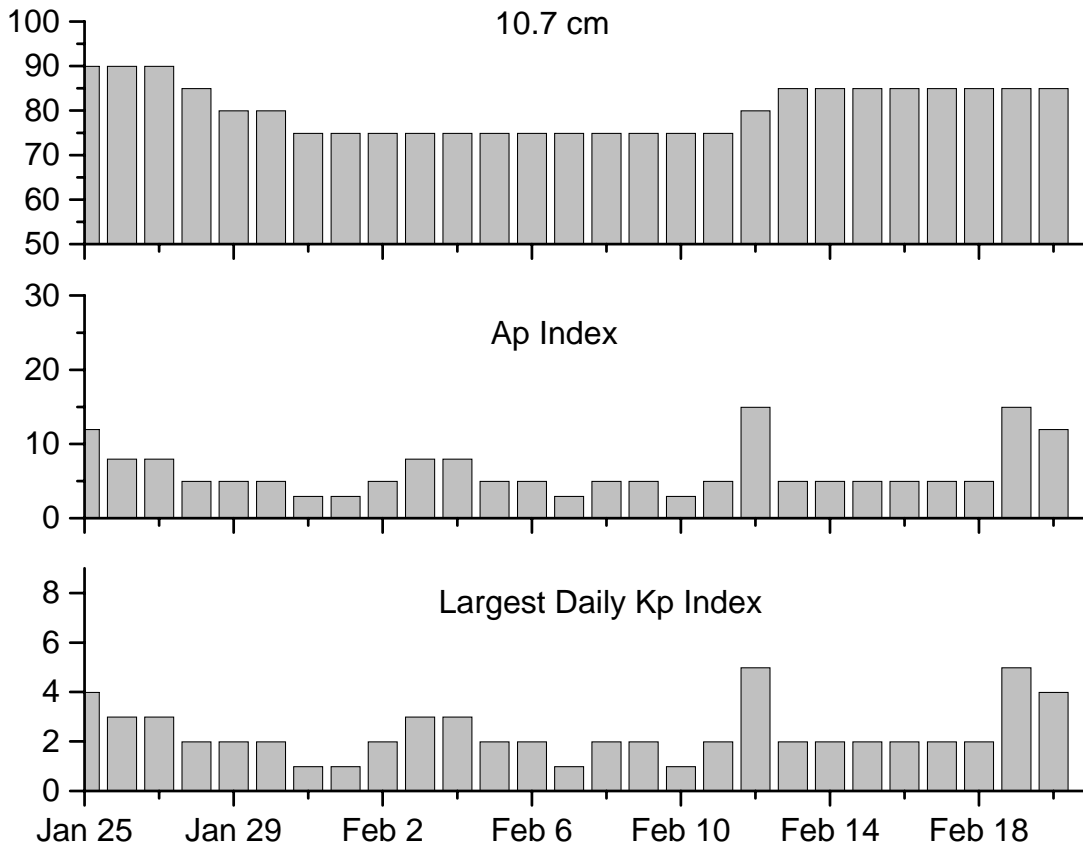
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	16 January	8	0-3-3-2-2-2-2-2	19	0-1-3-5-5-4-2-0	14
17 January	10	2-4-3-3-2-1-1-1	10	2-1-3-3-4-2-1-0	8	2-3-2-2-2-2-1-1
18 January	9	1-2-3-4-1-2-1-1	*	0-*-*-*-3-1-1	5	2-1-1-2-1-2-1-1
19 January	5	1-1-2-1-2-2-1-2	10	2-3-1-4-3-2-1-1	7	2-1-2-2-3-2-1-2
20 January	4	1-1-1-1-2-1-1-1	7	1-0-1-3-3-2-2-1	6	1-1-0-1-2-3-3-2
21 January	4	1-3-1-1-1-1-0-0	6	1-1-1-4-3-0-0-0	4	1-2-1-1-1-0-0-1
22 January	4	0-1-1-2-2-2-1-1	12	0-0-1-4-4-3-4-0	6	1-1-1-2-3-3-0-2

### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
16 Jan 0542	ALERT: Geomagnetic K= 4	16 Jan 0540
18 Jan 1052	ALERT: Geomagnetic K= 5	18 Jan 1050



## 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
25 Jan	90	12	4	08 Feb	75	5	2
26	90	8	3	09	75	5	2
27	90	8	3	10	75	3	1
28	85	5	2	11	75	5	2
29	80	5	2	12	80	15	5
30	80	5	2	13	85	5	2
31	75	3	1	14	85	5	2
01 Feb	75	3	1	15	85	5	2
02	75	5	2	16	85	5	2
03	75	8	3	17	85	5	2
04	75	8	3	18	85	5	2
05	75	5	2	19	85	15	5
06	75	5	2	20	85	12	4
07	75	3	1				



***Energetic Events***

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½	Max	Integ	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
									245	2695	II	IV

***No Events Observed***

***Flare List***

Date	Time			Optical	Imp/ Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
16 January	0404	0408	0414	B1.4			847
	1105	1108	1111	B3.3			847
17 January	0107	0112	0116	B1.7			846
18 January	1905	1908	1910	B1.4			848
	2300	2306	2311	B2.3			848
19 January	0058	0115	0127	B3.9			847
	1028	1032	1035	B1.1			
	1308	1312	1315	B2.4			848
20 January	1407	1410	1413	B1.6			848
	0857	0910	0916	B1.9			847
	1112	1118	1126	B1.2			847
	1726	1729	1732	B1.6			848
21 January	2311	2318	2328	B1.3			847
	0133	0138	0155	B1.7			848
	0447	0453	0504	B1.8			848
	0534	0543	0552	B2.3			848
	0803	0806	0809	B1.8			848
	0905	0909	0913	B1.2			848
	1028	1031	1033	B1.3			848
	1347	1350	1352	B1.6			848
	1359	1406	1415	B4.1			848
	1425	1430	1436	B4.3			848
	2046	2051	2056	B2.7			848
2202	2206	2209	B3.2			848	
2301	2305	2308	B1.8			848	
2314	2318	2329	B3.5			848	



**Flare List- Continued**

Date	Time			Optical X-ray Class.	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End				
22 January	0653	0658	0701	B1.5			848
	0753	0756	0759	B1.3			848
	0811	0814	0818	B1.2			848
	0821	0825	0827	B1.9			848
	0909	0913	0917	B2.8			848
	1003	1007	1013	B4.2			848
	1003	1016	1026	B4.8			848
	1049	1056	1101	B5.0			848
	1232	1243	1250	C1.3			848
	1321	1325	1327	B4.0			848
22 January	1401	1410	1415	C4.1			848
	1654	1658	1704	C2.0	Sf	S19W12	848
	1805	1812	1815	B3.8			848
	1929	1937	1940	B3.6			848
	1959	2003	2006	B4.0			848
	2019	2034	2040	B3.3			848
	2051	2055	2102	B2.8			848
	2125	2125	2128	C1.7	Sf	S20W15	848
	2144	2150	2158	C1.8			848
	2338	2341	2344	B1.0			848

**Region Summary**

Date	Location		Sunspot Characteristics							Flares				
	° Lat ° CMD	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 846*

15 Jan	N05W30	068	0040	05	Dso	007	B										
16 Jan	N06W44	069	0070	06	Dai	011	B										
17 Jan	N04W56	068	0070	07	Dao	008	B										
18 Jan	N04W71	070	0050	07	Dao	004	B										
19 Jan	N04W88	073	0020	01	Axx	001	A										

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 068



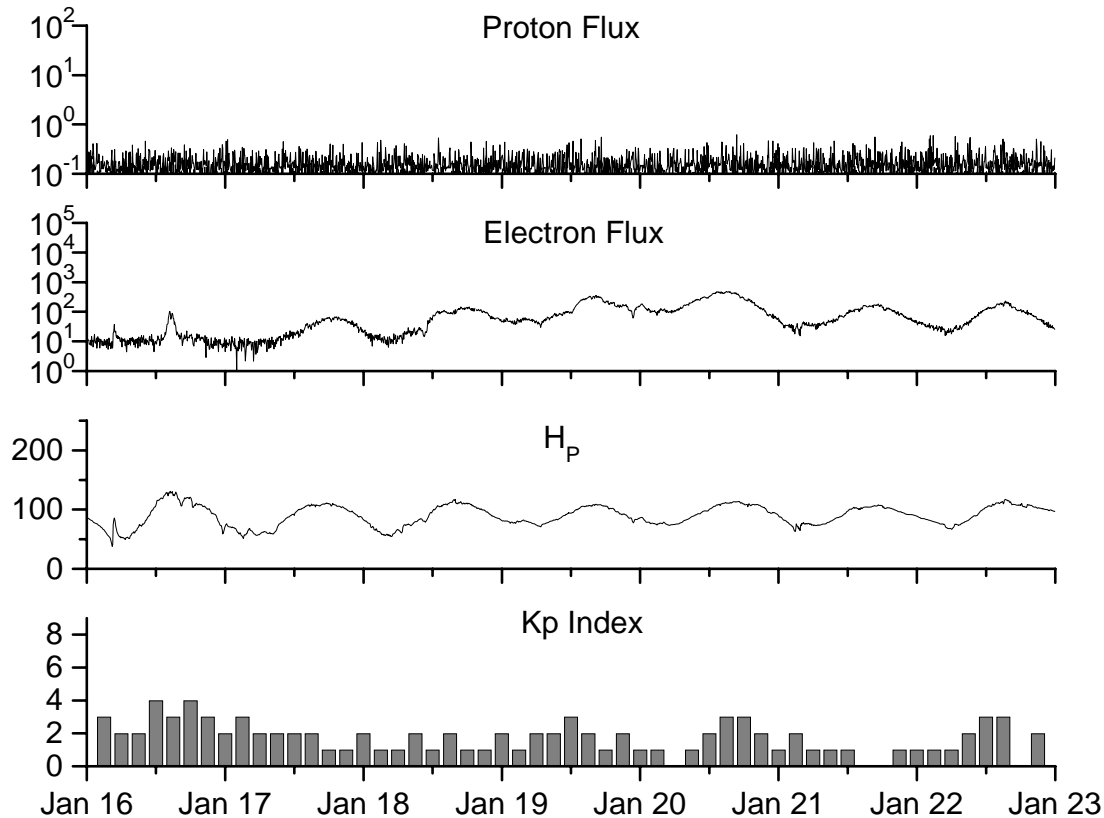


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers			Smooth values		Radio Flux		Geomagnetic	
	Observed SEC	values RI	Ratio RI/SEC	SEC	RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
<b>2004</b>									
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	66.6	39.3	110.1	105.0	11	13.8
September	50.0	27.7	0.55	63.7	37.6	103.1	103.7	10	13.6
October	77.9	48.4	0.62	61.3	35.9	105.7	102.1	9	13.5
November	70.5	43.7	0.62	60.0	35.4	113.2	101.5	26	14.1
December	34.7	17.9	0.52	58.8	35.3	94.6	101.3	11	14.8
<b>2005</b>									
January	52.0	31.3	0.60	57.3	34.7	102.4	100.3	22	14.7
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			96.6		16	
August	65.6	36.4	0.55			90.7		16	
September	39.2	22.1	0.56			90.8		21	
October	13.0	8.5	0.65			76.7		7	
November	32.2	18.0	0.56			86.3		8	
December	62.6	41.2	0.66			90.8		7	

**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 16 January 2006*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by GOES-11 (W107) 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-12 (W75).

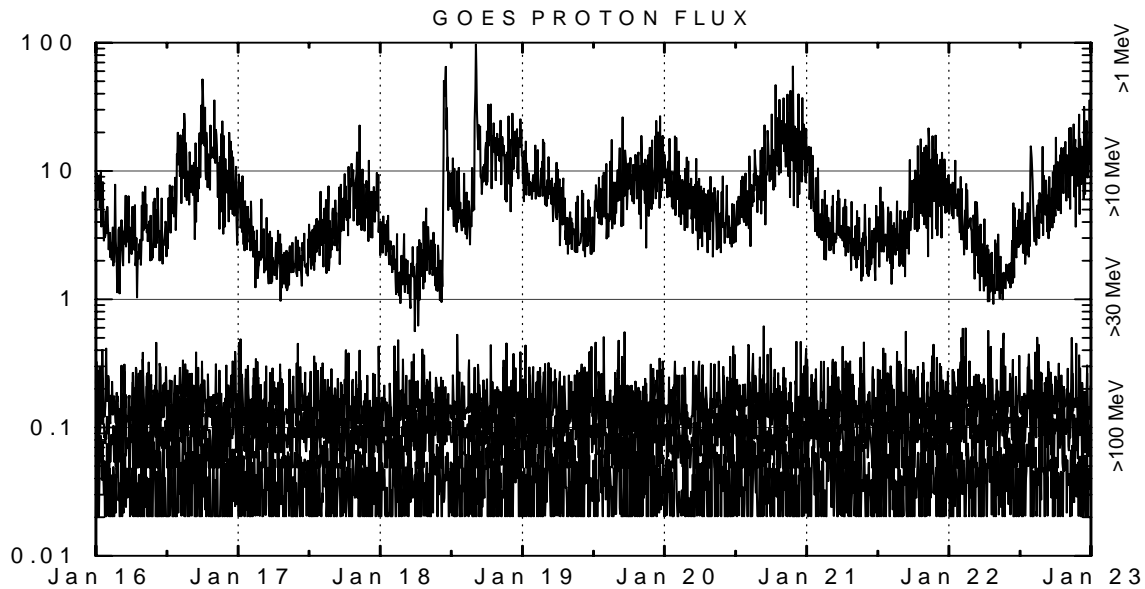
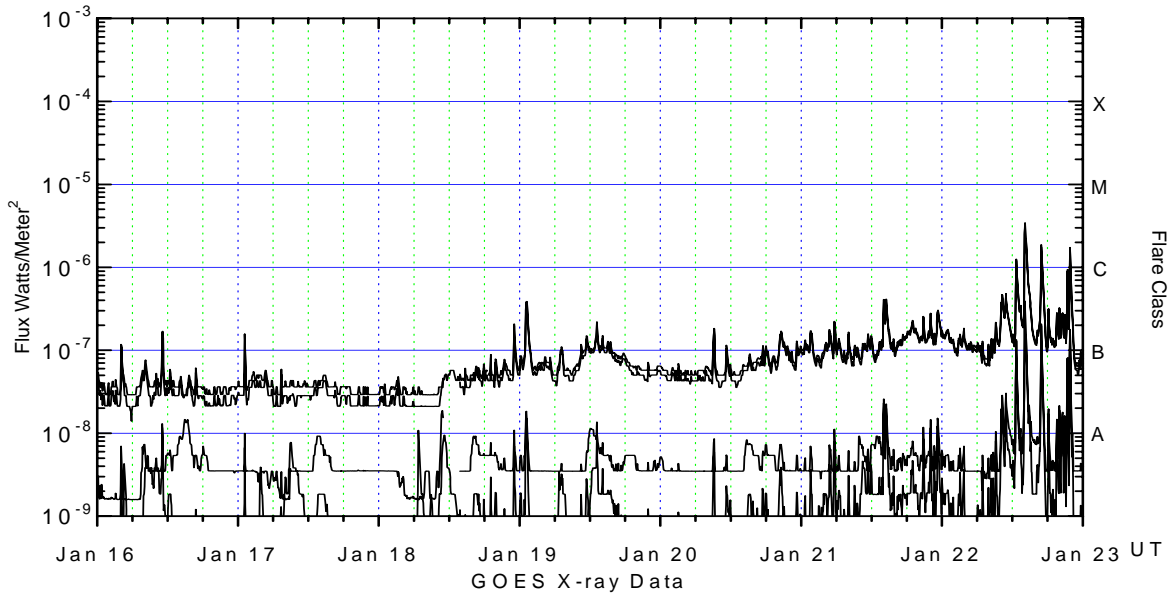
*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

*K<sub>p</sub>* plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and 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<sub>p</sub> values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the 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<sub>p</sub> 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/m<sup>2</sup>) 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/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W107) 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.

