

Space Weather Highlights
19 - 25 December 2005

SEC PRF 1582
27 December 2005

Solar activity ranged from very low to low with low-level C-class flares observed during the period. No significant activity was detected.

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

No greater than 2 MeV electron events were observed this period.

The geomagnetic field ranged from quiet to major storm levels during the period. Solar wind speed ranged from a low of near 300 km/s early on 19 December to a high of about 600 km/s early on 20 December. The period began with wind speed at about 300 km/s, the IMF Bz was weak, not varying much beyond +/-5 nT, and geomagnetic conditions were quiet. By midday on 19 December, wind speeds began a gradual increase in velocity, while the IMF Bz became enhanced to +/-15 nT. These conditions persisted through late on 20 December, and were consistent with a coronal hole high speed stream. During this period, the geomagnetic field was at mostly quiet to unsettled levels at middle latitudes, while high latitudes observed active to major storm levels. These conditions persisted through late on 21 December. By early on 21 December, wind speeds began to decay from a high of 600 km/s, while the IMF Bz did not vary much beyond +/- 5 nT. These conditions persisted through the remainder of the summary period. As a result, the geomagnetic field responded with quiet to unsettled conditions at all latitudes.

Space Weather Outlook
28 December 2005 - 23 January 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 29 December – 04 January.

The geomagnetic field is expected to range from quiet to minor storm levels. Active to minor storm periods are possible on 28 – 30 December, while unsettled to active periods are expected on 07 January, 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 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
19 December	90	63	390	A6.1	0	0	0	0	0	0	0	0
20 December	88	53	370	A5.5	0	0	0	0	0	0	0	0
21 December	87	45	260	A5.0	0	0	0	0	0	0	0	0
22 December	88	77	280	B1.1	2	0	0	2	0	0	0	0
23 December	93	47	290	B1.6	0	0	0	0	0	0	0	0
24 December	92	70	340	B1.5	0	0	0	0	0	0	0	0
25 December	92	77	300	B1.1	1	0	0	1	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
	19 December	1.4E+6	1.5E+4	3.1E+3		2.9E+6
20 December	4.9E+5	1.4E+4	3.2E+3		1.3E+6	
21 December	1.0E+6	1.5E+4	2.9E+3		4.4E+6	
22 December	4.9E+5	1.4E+4	3.0E+3		8.9E+6	
23 December	5.4E+5	1.4E+4	3.2E+3		1.3E+7	
24 December	5.8E+5	1.9E+4	3.2E+3		9.3E+6	
25 December	3.1E+5	1.4E+4	3.1E+3		1.4E+6	

Daily Geomagnetic Data

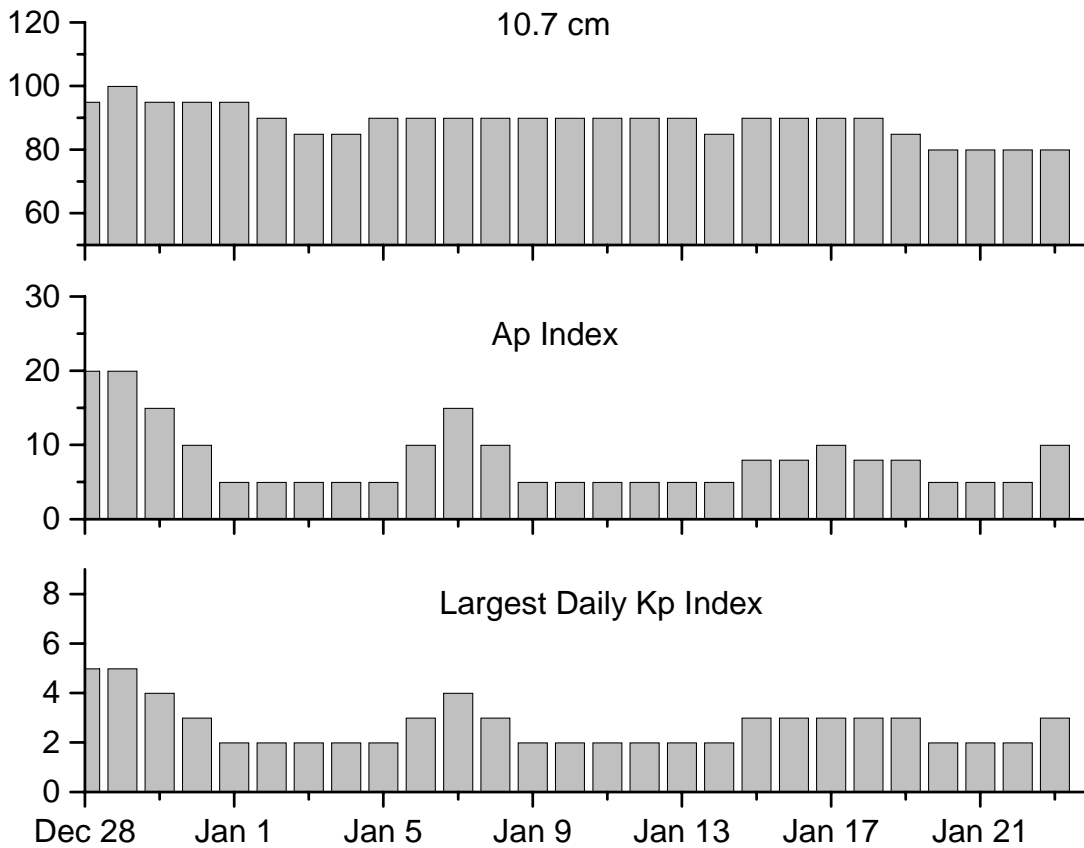
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	19 December	6	1-1-1-1-2-2-2-3	9	0-0-0-3-3-2-4-2	8
20 December	11	3-2-2-2-3-2-3-3	28	2-4-3-5-6-3-3-3	16	4-3-3-2-3-2-4-3
21 December	5	1-1-2-2-2-2-1-1	24	1-1-2-5-6-5-1-0	8	1-2-2-2-3-3-1-2
22 December	4	2-1-1-2-1-1-1-0	2	2-0-1-2-0-0-0-0	4	2-1-1-1-1-1-1-1
23 December	1	0-0-0-0-1-1-0-0	0	0-0-0-0-0-0-0-0	1	0-0-0-0-0-1-0-0
24 December	3	0-0-0-1-2-2-1-1	*	*_*_*_*_*_*_*_*_*_*	3	0-0-0-1-2-1-1-1
25 December	5	1-3-2-2-2-1-0-0	*	*_*_*_*_*_*_*_*_*_*	6	1-3-2-2-3-1-0-0

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
19 Dec 1724	WARNING: Geomagnetic K = 4	19 Dec 1725 - 2359
19 Dec 1744	ALERT: Geomagnetic K = 4	19 Dec 1743
20 Dec 0244	ALERT: Geomagnetic K = 4	20 Dec 0242
20 Dec 1446	ALERT: Geomagnetic K = 4	20 Dec 1445
21 Dec 0011	1 – 245 MHz Radio Noise Storm	20 Dec
23 Dec 0033	2 – 245 MHz Radio Bursts	22 Dec
24 Dec 0034	1 – 245 MHz Radio Burst	23 Dec



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
28 Dec	95	20	5	11 Jan	90	5	2
29	100	20	5	12	90	5	2
30	95	15	4	13	90	5	2
31	95	10	3	14	90	5	2
01 Jan	95	5	2	15	90	8	3
02	90	5	2	16	90	8	3
03	85	5	2	17	90	10	3
04	85	5	2	18	90	8	3
05	90	5	2	19	85	8	3
06	90	10	3	20	80	5	2
07	90	15	4	21	80	5	2
08	90	10	3	22	80	5	2
09	90	5	2	23	80	10	3
10	90	5	2				



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			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
19 December	0649	0653	0655	B4.1			837
	1100	1104	1107	B1.1			837
	1408	1415	1425	B3.0			837
	1456	1500	1502	B2.2			837
	1539	1542	1544	B1.0			837
	1822	1825	1828	B1.4			
	2002	2005	2008	B1.7			837
20 December	0212	0215	0219	B1.0			835
	0839	0845	0854	B1.4			837
	1527	1531	1536	B1.4			835
	1800	1805	1808	B1.3			
	1851	1855	1858	B1.3			837
21 December	2335	2339	2345	B1.0			
	1017	1021	1023	B1.3			837
	1238	1243	1247	B1.2			837
22 December	1311	1315	1319	B4.4			835
	0317	0321	0324	B5.6			
	0556	0612	0633	B2.4			
	0759	0808	0812	B1.8			
	0817	0821	0824	B2.1			837
	0946	0947	0959	C3.5	Sf	N17E39	
	1138	1141	1143	B2.2			
	1215	1227	1237	B9.4			
	1552	1555	1600	B2.0			
	1643	1647	1706	C2.9	Sf	N16E39	
23 December	0235	0242	0253	B9.6			838
	0348	0352	0355	B4.9			838
	0715	0718	0720	B3.0			838
	1234	1301	1321	B6.2			
	1739	1744	1750	B7.0			
	1959	2004	2009	B3.3			
	2042	2104	2127	B6.3			
24 December	1050	1108	1127	B3.3			
	2052	2154	2208	B6.0			841
25 December	0242	0251	0301	B3.6			841
	1008	1011	1031	C1.2	Sf	S08E42	842
	1912	1918	1935	B4.2			841



Region Summary – continued.

Location		Sunspot Characteristics						Flares																		
Date	(° 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 841</i>																										
24 Dec	N04E74	254	0090	02	Hsx	001	A																			
25 Dec	N12E60	255	0120	07	Cso	004	B																			
Still on Disk.																										
Absolute heliographic longitude: 255																										
<i>Region 842</i>																										
25 Dec	S06E30	285	0010	01	Hsx	001	A	1					1													
Still on Disk.																										
Absolute heliographic longitude: 285																										

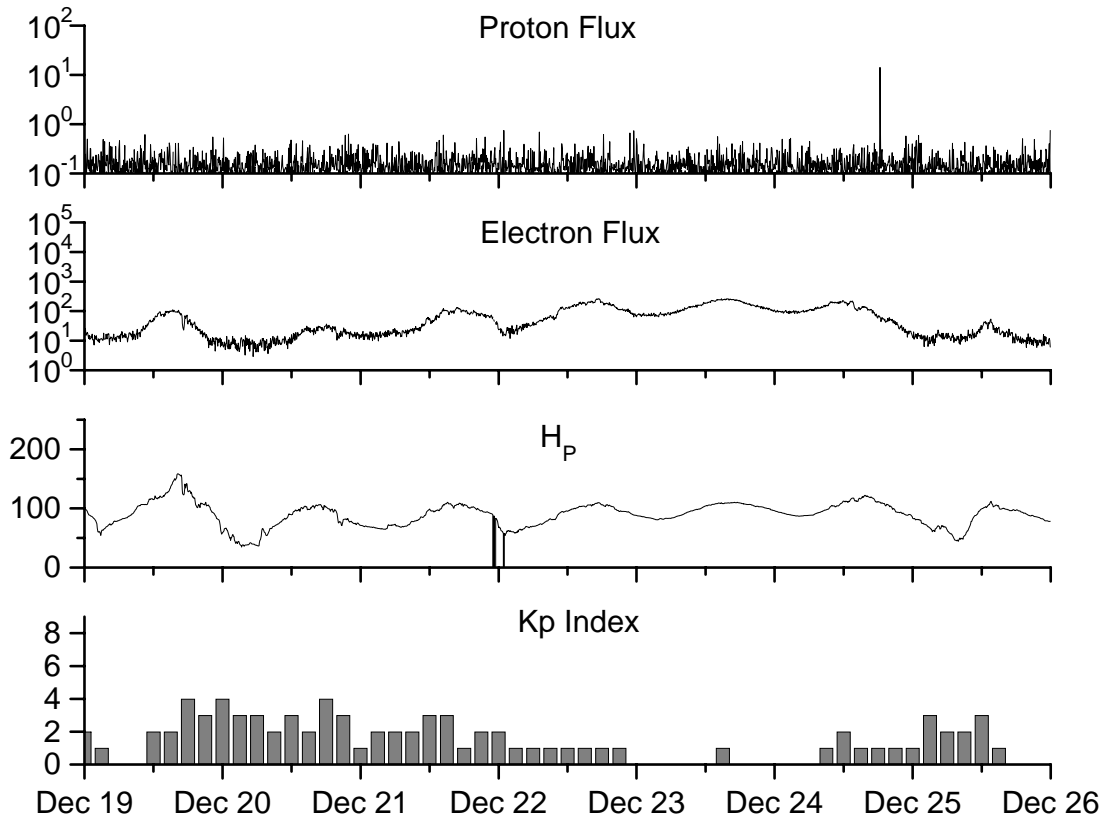


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed SEC	values RI	Ratio RI/SEC	Smooth SEC	values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2003									
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	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
2005									
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			93.7		13	
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	

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 19 December 2005*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W109) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

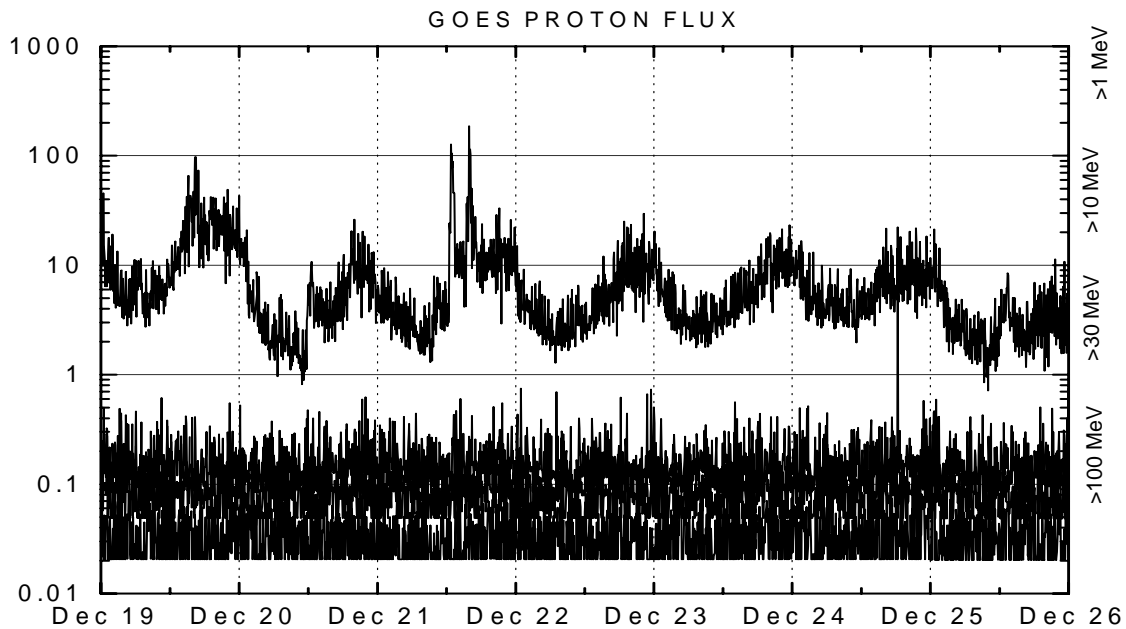
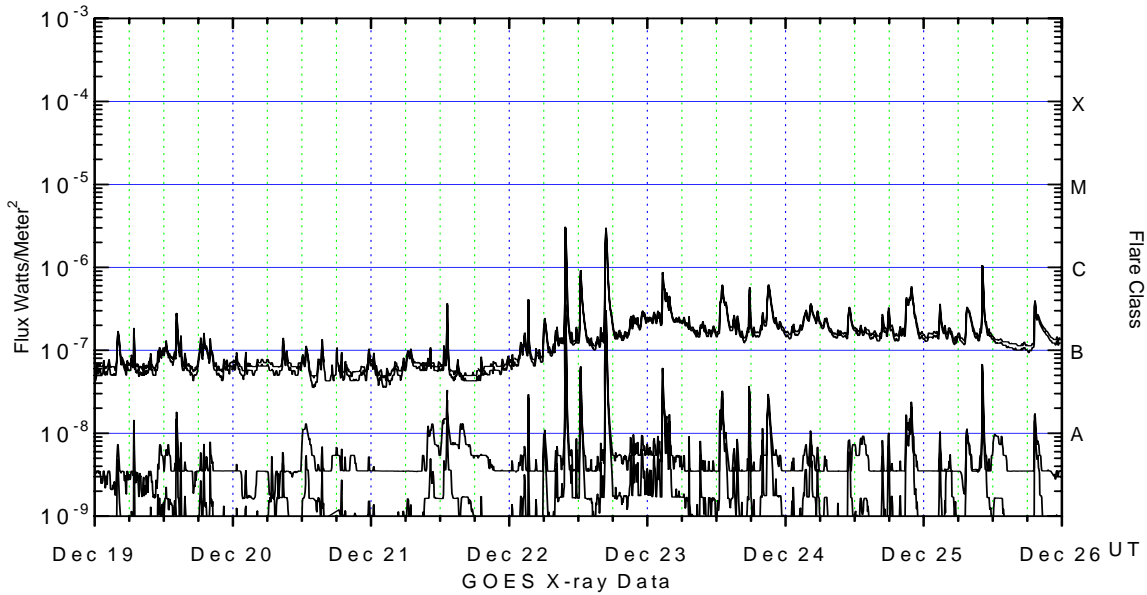
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W75).

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 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 (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 (W110) 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.

