

Solar activity was low. Region 1635 (N11, L=63, class/area=Dac/270 on 25 December) was the most active region this period, producing twelve C-class flares. The largest of these was a C4/Sf at 1304 UTC on 25 December. Although Region 1635 periodically exhibited beta-gamma magnetic characteristics during its lifetime, it exited the visible disk as a simple spotless plage region. Region 1633 (S07, L=113, class/area=Eai/100 on 24 December) produced a C1 at 2226 UTC on 24 December along with numerous low-level B-class flares throughout the period. Region 1638 (N12, L=310, class/area=Hsx/150 on 29 December) produced a single C1/Sf flare at 1933 UTC on 29 December. A 10 degree filament erupted near N08E20 around 1939 UTC on 27 December. While the bulk of the ejecta from this event was directed north of the ecliptic, a weak impact is expected at earth on 01 January.

No proton events were observed at geosynchronous orbit.

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

Geomagnetic field activity was quiet. Solar wind speed at the ACE spacecraft ranged from around 250 km/s to around 350 km/s throughout most of the period. There was a slight increase to about 490 km/s towards the end of the week as the effects from a coronal hole high speed stream (CH HSS) were felt for about a 24 hour period. They have since settled back down to approximately 400 km/s as the effects of the CH HSS begin to wane. The interplanetary magnetic field total field ranged from around 1 - 8 nT while the Bz component ranged from around +5 nT to -5 nT.

### **Space Weather Outlook** **31 December - 26 January 2013**

Solar activity is expected to be at low levels with a chance of isolated M-class flares throughout the period (31 December - 26 January).

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at background levels throughout the period.

Geomagnetic field activity is expected to be predominately quiet with a chance for unsettled conditions on 01-02, and 10 January with positive polarity coronal hole high speed streams.



### *Daily Solar Data*

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
24 December	113	53	330	B2.1	2	0	0	0	0	0	0	0
25 December	113	58	320	B2.9	5	0	0	3	0	0	0	0
26 December	110	82	210	B3.0	6	0	0	2	0	0	0	0
27 December	107	78	270	B2.3	1	0	0	3	0	0	0	0
28 December	106	54	300	B2.0	0	0	0	0	0	0	0	0
29 December	104	49	240	B2.0	1	0	0	1	0	0	0	0
30 December	107	37	220	B2.2	0	0	0	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	>0.6 MeV	>2MeV	>4 MeV
	24 December	2.0e+05	1.1e+04	3.0e+03		5.6e+06
25 December	1.7e+05	1.1e+04	2.8e+03		2.9e+06	
26 December	1.6e+05	1.1e+04	2.7e+03		1.9e+06	
27 December	2.2e+05	1.1e+04	2.8e+03		2.0e+06	
28 December	3.9e+05	1.2e+04	2.8e+03		2.1e+06	
29 December	1.0e+05	1.2e+04	2.8e+03		1.0e+06	
30 December	3.1e+05	1.1e+04	2.8e+03		1.1e+06	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	24 December	2	0-0-0-0-1-2-1-1	1	0-0-0-0-0-2-1-0	3
25 December	2	0-0-0-1-1-0-1-1	0	0-0-0-1-0-0-0-0	3	1-1-0-1-1-0-0-1
26 December	2	0-1-1-1-1-1-0-0	1	0-0-0-0-2-0-0-0	3	0-2-1-1-1-0-0-0
27 December	0	0-0-0-0-0-1-0-0	0	0-0-0-0-0-0-0-0	1	0-0-0-0-0-0-0-0
28 December	2	0-0-0-0-1-1-1-1	0	0-0-0-0-1-0-0-0	2	0-0-0-0-0-0-1-0
29 December	3	0-1-1-1-1-1-1-1	1	0-0-1-1-0-0-0-0	3	0-1-1-1-0-0-0-1
30 December	4	0-0-1-1-2-2-2-1	4	0-0-0-3-2-1-1-0	4	1-0-0-1-2-2-2-0



*Alerts and Warnings Issued*

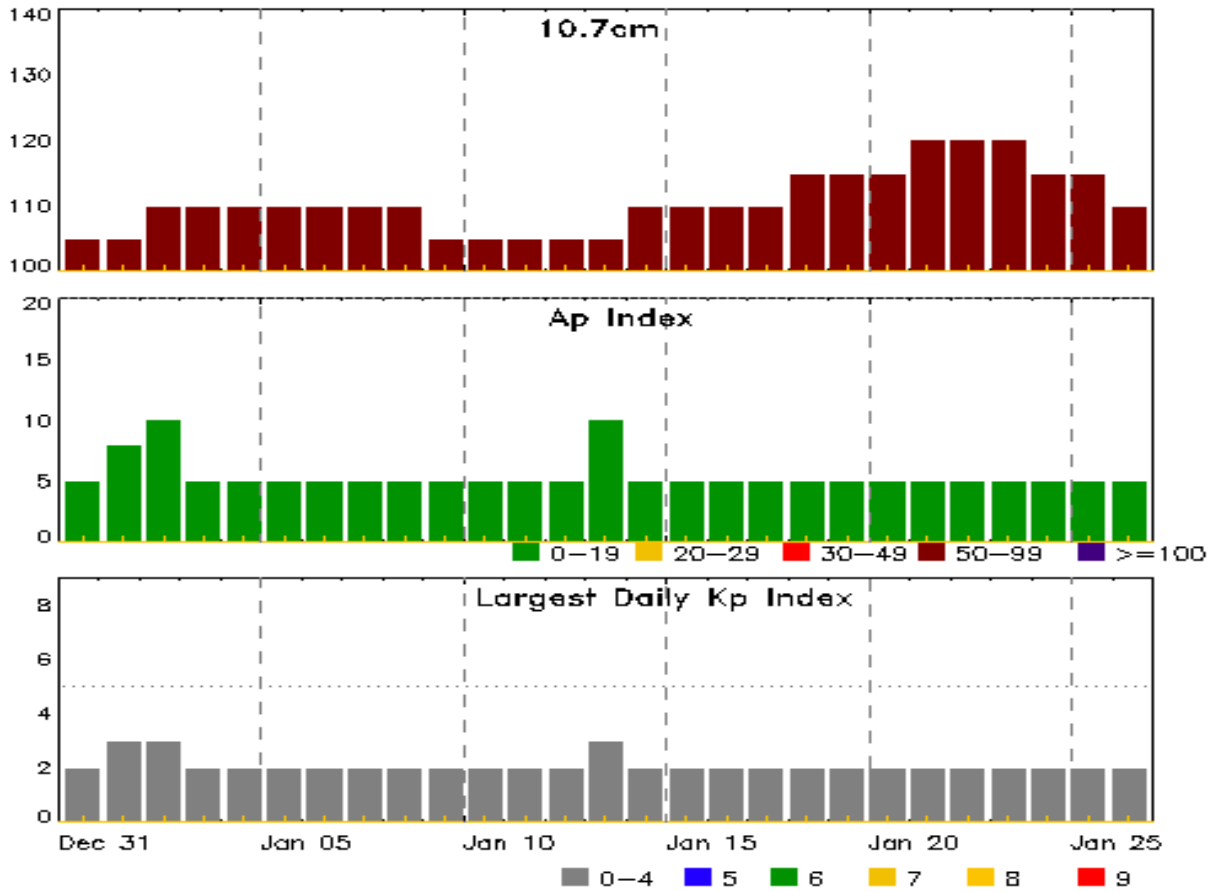
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<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
No Alerts or Warnings Issued		

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## Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
31 Dec	105	5	2	14 Jan	110	5	2
01 Jan	105	8	3	15	110	5	2
02	110	10	3	16	110	5	2
03	110	5	2	17	110	5	2
04	110	5	2	18	115	5	2
05	110	5	2	19	115	5	2
06	110	5	2	20	115	5	2
07	110	5	2	21	120	5	2
08	110	5	2	22	120	5	2
09	105	5	2	23	120	5	2
10	105	5	2	24	115	5	2
11	105	5	2	25	115	5	2
12	105	5	2	26	110	5	2
13	105	10	3				



## *Energetic Events*

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

**No Events Observed**

## *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Optical Location Lat CMD	Rgn #
	Begin	Max	End				
24 Dec	0940	0944	0948	B3.9			1635
24 Dec	1607	1614	1622	C1.7			1635
24 Dec	2219	2226	2234	C1.2			1633
25 Dec	0043	0046	0049	B4.6			1635
25 Dec	0240	0245	0252	B6.7			1635
25 Dec	0358	0401	0423	B4.4			1635
25 Dec	0459	0504	0508	C1.1			1635
25 Dec	0531	0535	0540	B7.2			1635
25 Dec	0638	0643	0647	C1.8	SF	N11E25	1635
25 Dec	0902	0905	0910	B5.7			1635
25 Dec	1026	1039	1052	C1.1			
25 Dec	1258	1304	1307	C4.1	SF	N11W14	1635
25 Dec	1547	1556	1602	B6.6			1636
25 Dec	1804	1810	1815	C3.0	SF	N13W17	1635
26 Dec	0424	0430	0437	B9.4			1635
26 Dec	0448	0455	0458	C3.9			1635
26 Dec	0833	0911	0935	C1.5	SF	N10W24	1635
26 Dec	1118	1125	1128	C1.6			1635
26 Dec	1348	1353	1407	C1.0			1635
26 Dec	1645	1648	1650	B8.4			1635
26 Dec	1658	1714	1721	C1.6			1635
26 Dec	2042	2048	2053	C1.2	SF	N12W26	1635
26 Dec	2135	2138	2140	B4.5			
27 Dec	0217	0224	0230	C1.6	SF	N12W29	1635
27 Dec	0231	0239	0240		SF	N13W28	1635
27 Dec	0526	0530	0532	B4.4			1633
27 Dec	0858	0902	0905	B5.6			1633
27 Dec	1312	1320	1325	B9.4	SF	N10W35	1635
27 Dec	1429	1432	1440	B4.5			1633
27 Dec	2139	2143	2147	B4.1			1635
28 Dec	1105	1110	1118	B3.5			1635



## *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
28 Dec	2138	2142	2148	B3.7				
29 Dec	1203	1209	1214	B6.3				1638
29 Dec	1927	1933	1939	C1.5	SF	N12E51		1638
30 Dec	0157	0243	0259	B5.4				1635
30 Dec	0550	0555	0602	B3.7				1637
30 Dec	1916	1921	1924	B7.1				



## Region Summary

Date	Location		Sunspot Characteristics					Flares									
	Lat	CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical					
			Lon	10 <sup>6</sup> hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4	
<b>Region 1633</b>																	
14 Dec	S07E84	109		plage													
15 Dec	S07E69	109		270	15	Ehi	8	B									
16 Dec	S07E54	111		260	12	Eho	11	B									
17 Dec	S07E41	111		340	12	Eki	15	B									
18 Dec	S07E27	111		320	12	Eki	13	BG	1				1				
19 Dec	S07E13	111		260	12	Eko	9	B					1				
20 Dec	S07W00	111		260	12	Eko	13	B									
21 Dec	S07W13	112		260	12	Eki	15	B									
22 Dec	S05W27	113		170	13	Esi	12	B	4								
23 Dec	S07W39	111		200	13	Eai	25	BG	2				3				
24 Dec	S07W55	113		100	12	Eai	7	B	1								
25 Dec	S08W68	114		40	4	Dso	2	B									
26 Dec	S08W86	117		30	4	Dso	2	B									
									9	0	0	5	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 111

<b>Region 1634</b>																	
15 Dec	S13E69	109		90	2	Hsx	1	A									
16 Dec	S12E56	109		90	3	Hsx	1	A									
17 Dec	S13E42	108		70	2	Hsx	1	A									
18 Dec	S13E28	108		80	4	Hsx	5	A									
19 Dec	S13E14	110		60	2	Hsx	2	A									
20 Dec	S13W00	111		60	2	Hsx	2	A									
21 Dec	S13W12	111		60	2	Hsx	2	A									
22 Dec	S12W25	111		60	6	Cso	7	B									
23 Dec	S13W33	105		50	12	Cao	7	B									
24 Dec	S13W47	105		20	14	Cao	3	B									
25 Dec	S13W60	109		plage													
26 Dec	S13W74	107		plage													
27 Dec	S13W88	108		plage													
									0	0	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 111



### *Region Summary - continued*

Date	Location		Sunspot Characteristics				Flares																
	Lat CMD	Lon	Helio 10 <sup>6</sup> hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
									C	M	X	S	1	2	3	4							
<b>Region 1635</b>																							
18 Dec	N10E72		65	120	9	Dso	3	B															
19 Dec	N09E58		65	110	7	Cso	5	B															
20 Dec	N09E44		66	250	12	Eki	8	B															
21 Dec	N09E35		64	250	12	Ehi	8	BG	1				5										
22 Dec	N10E22		64	200	11	Esi	18	BG	1				2										
23 Dec	N12E09		63	200	8	Dai	28	BG	1				1										
24 Dec	N11W05		63	210	7	Dac	13	B	1														
25 Dec	N11W17		63	270	9	Dac	22	BG	4				3										
26 Dec	N12W32		64	160	9	Dsc	37	BG	6				2										
27 Dec	N13W45		63	120	8	Dsi	21	B	1				3										
28 Dec	N12W57		64	50	8	Cao	7	B															
29 Dec	N13W74		67	20	1	Hrx	2	A															
30 Dec	N13W88		68	plage																			
										15	0	0	16	0	0	0	0	0					

Still on Disk.

Absolute heliographic longitude: 63

### **Region 1636**

25 Dec	N13E59		347	10	4	Bxo	4	B															
26 Dec	N12E45		347	10	1	Bxo	2	B															
27 Dec	N09E30		350	10	1	Axx	1	A															
28 Dec	N09E16		351	plage																			
29 Dec	N09E02		351	plage																			
30 Dec	N09W11		351	plage																			
										0	0	0	0	0	0	0	0	0	0				

Still on Disk.

Absolute heliographic longitude: 351

### **Region 1637**

26 Dec	N06E47		344	10		Axx	1	A															
27 Dec	N06E34		346	10	1	Axx	1	A															
28 Dec	N06E20		347	10	1	Axx	1	A															
29 Dec	N06E07		346	0	1	Axx	1	A															
30 Dec	N06W06		346	plage																			
										0	0	0	0	0	0	0	0	0	0				

Still on Disk.

Absolute heliographic longitude: 346





**Region Summary - continued**

Date	Location		Sunspot Characteristics				Flares								
	Lat CMD	Lon	Helio 10 <sup>-6</sup> hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
									C	M	X	S	1	2	3

**Region 1638**

27 Dec	N12E67	311	80	2	Hsx	1	A										
28 Dec	N12E56	311	150	3	Hsx	1	A										
29 Dec	N12E43	310	150	3	Hsx	1	A	1				1					
30 Dec	N12E31	309	150	3	Hsx	1	A										
								1	0	0		1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 309

**Region 1639**

27 Dec	S16E67	311	50	5	Dao	4	B										
28 Dec	S16E56	311	90	5	Dao	5	B										
29 Dec	S16E46	307	70	5	Cao	5	B										
30 Dec	S17E32	308	30	4	Cro	4	B										
								0	0	0		0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 308

**Region 1640**

30 Dec	N28E20	320	40	6	Dso	2	B										
								0	0	0		0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 320

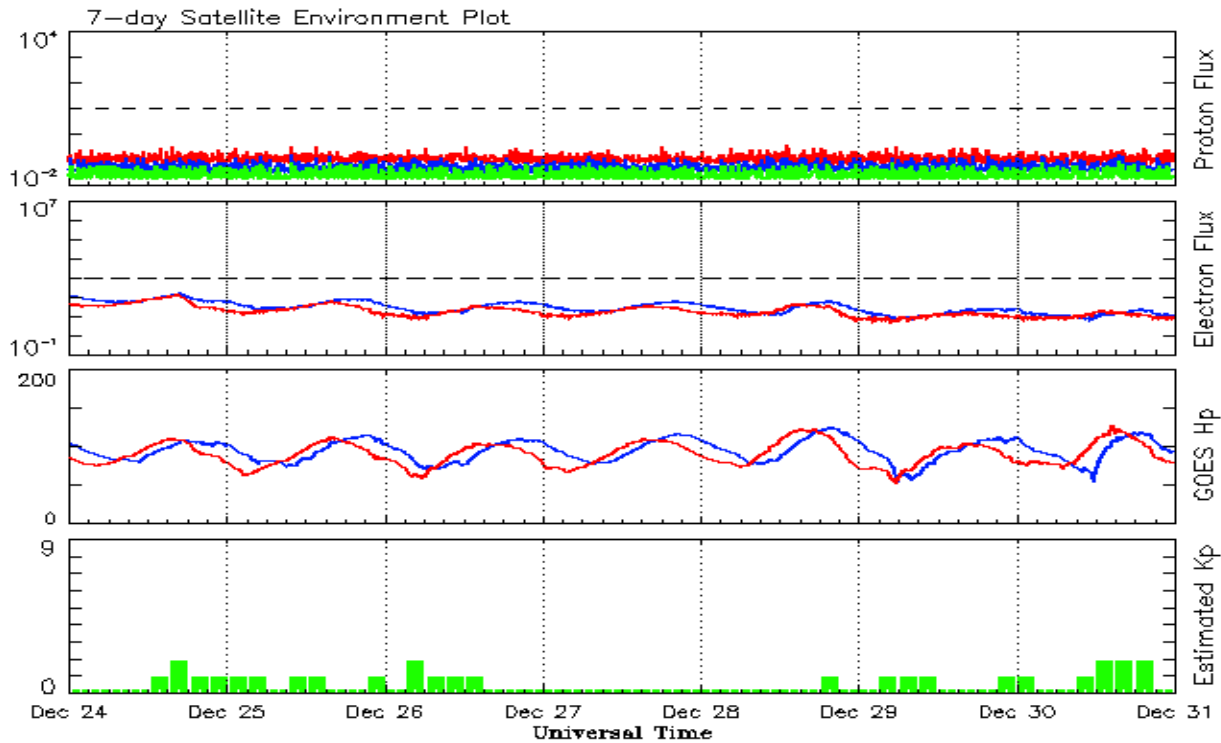


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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
<b>2010</b>									
December	22.0	14.4	0.66	43.8	28.8	84.3	89.6	4	6.5
<b>2011</b>									
January	32.1	18.8	0.59	47.2	30.9	83.7	91.2	6	6.7
February	53.2	29.6	0.55	50.6	33.4	94.5	92.7	6	6.8
March	81.0	55.8	0.69	55.2	36.9	115.3	95.8	7	7.2
April	81.7	54.4	0.67	61.5	41.8	112.6	100.4	9	7.5
May	61.4	41.6	0.68	69.0	47.6	95.9	105.6	9	7.5
June	55.5	37.0	0.67	76.5	53.2	95.8	110.9	8	7.4
July	67.0	43.8	0.66	82.5	57.3	94.2	115.4	9	7.3
August	66.1	50.6	0.77	84.9	59.0	101.7	117.9	8	7.4
September	106.4	78.0	0.73	84.6	59.5	134.5	118.4	13	7.7
October	116.8	88.0	0.75	84.6	59.9	137.2	118.4	7	8.0
November	133.1	96.7	0.73	86.3	61.1	153.1	119.5	3	8.0
December	106.3	73.0	0.69	89.2	63.4	141.2	121.6	3	8.0
<b>2012</b>									
January	91.3	58.3	0.64	92.0	65.5	133.1	124.4	6	8.3
February	50.1	32.9	0.66	94.2	66.9	106.7	126.7	7	8.4
March	77.9	64.3	0.82	94.1	66.8	115.1	126.8	14	8.1
April	84.4	55.2	0.65	91.3	64.6	113.1	125.8	9	8.0
May	99.5	69.0	0.69	87.7	61.7	121.5	123.8	8	8.2
June	88.6	64.5	0.73			120.5		10	
July	99.6	66.5	0.67			135.6		13	
August	85.8	63.1	0.74			115.7		7	
September	84.0	61.5	0.73			123.2		8	
October	73.5	53.3	0.73			123.3		9	
November	89.2	61.4	0.69			120.9		6	

**Note:** Values are final except for the most recent 6 months which are considered preliminary.  
Cycle 24 started in Dec 2008 with an RI=1.7.





*Weekly Geosynchronous Satellite Environment Summary  
Week Beginning 24 December 2012*

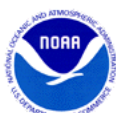
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

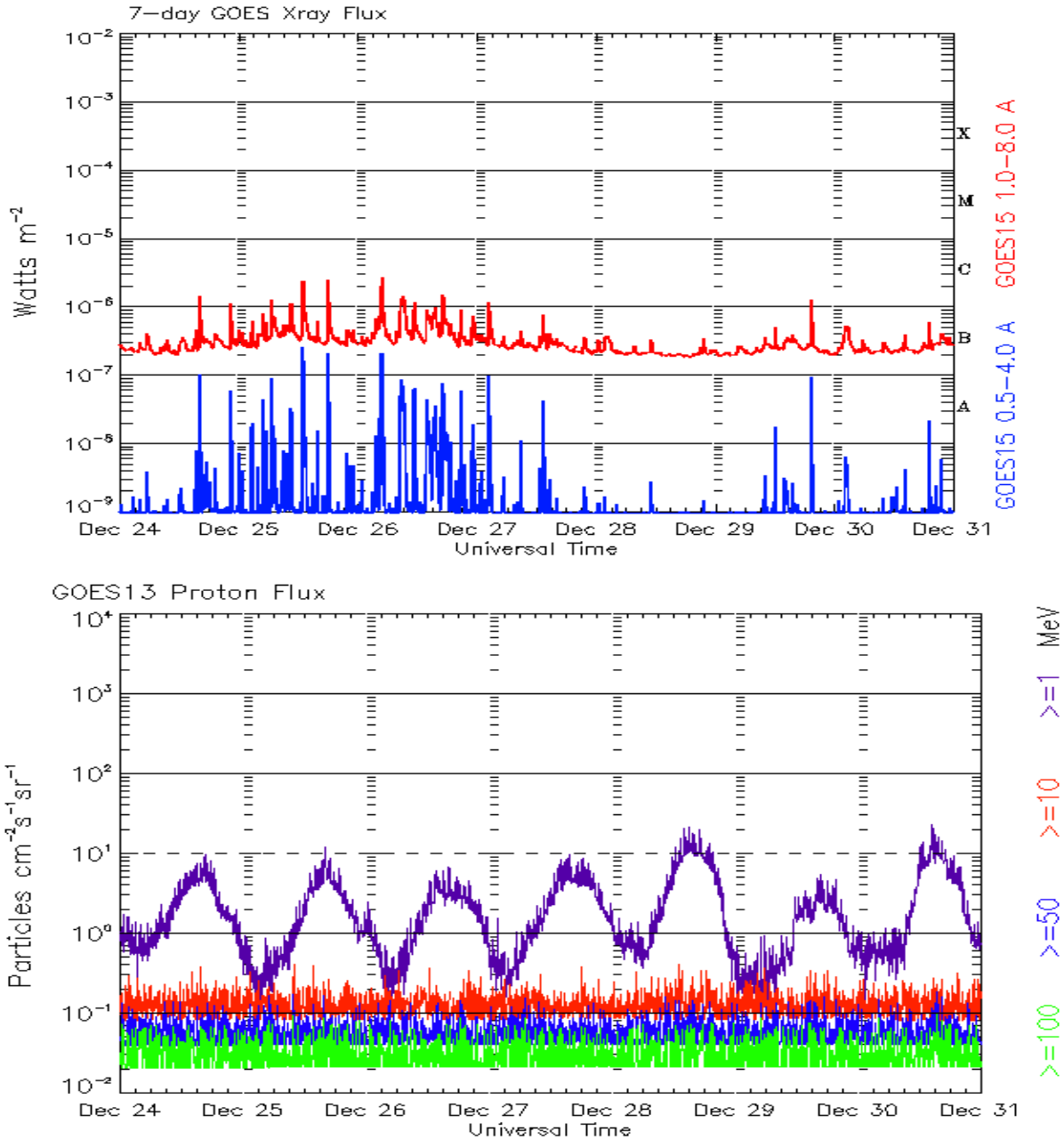
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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

The Estimated 3-hour Planetary Kp-index is derived at the NOAA Space Weather Prediction Center using data from the following ground-based magnetometers: Boulder, Colorado; Chambon la Foret, France; Fredericksburg, Virginia; Fresno, California; Hartland, UK; Newport, Washington; Sitka, Alaska. These data are made available thanks to the cooperative efforts between SWPC and data providers around the world, which currently includes the U.S. Geological Survey, the British Geological Survey, and the Institut de Physique du Globe de Paris.

The data included here are those now available in real time at the SWPC 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. 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  
Week Beginning 24 December 2012*

The x-ray plots contains five-minute averages x-ray flux (Watt/m<sup>2</sup>) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

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



## ***Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)***

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**Notice:** The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

The Weekly has been published continuously since 1951 and is available online since 1997.

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[http://spaceweather.gov/weekly/Usr\\_guide.pdf](http://spaceweather.gov/weekly/Usr_guide.pdf) -- User Guide

