

Space Weather Highlights
19 January - 25 January 2015

SWPC PRF 2056
26 January 2015

Solar activity briefly reached moderate levels (R1, minor, on the NOAA Scales) when Region 2268 (S10, L=048, class/area=Ekc/BG on 24 January) produced an M1 flare on 22 January at 0452 UTC as it rotated onto the visible disk. The remainder of the week was dominated by low levels of solar activity, with Region 2268 responsible for about two thirds of the C-class events and the rest distributed among five other regions. No Earth-directed coronal mass ejections were noted.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels. Moderate levels were reached on 21 January and from 23-25 January.

The geomagnetic field activity ranged from quiet to active levels during the week. Active levels were observed on 21-22 January in response to a southern hemisphere, negative polarity, coronal hole high speed solar wind stream. Observations at the ACE spacecraft indicated a sector boundary change from positive to negative orientation beginning around 1730 UTC on 20 January. This was followed by a corotating interaction region signature including a jump in density and a significant increase in the Bt component from 5 nT to a peak near 20 nT. Bz was initially mostly positive, but reached a minimum of -15 nT by 1550 UTC on 21 January. Wind speed at ace was initially near 300 km/s early on 21 January and increased over the next 12 hours to over 500 km/s. The enhanced magnetic field gradually relaxed, returning to a Bt near 5 nT by midday on 22 Jan. Then, solar wind speed gradually decreased, ending the week near 300 km/s. The geomagnetic field remained unsettled through the first three synoptic periods of 23 January before returning to mostly quiet levels where it remained for the rest of the week.

Space Weather Outlook
26 January - 21 February 2015

Solar activity is expected to be at low to moderate levels through 09 February with the return of Regions 2255 and 2257 on 27 January. Low levels of activity are anticipated from 10-17 February before increasing to low to moderate levels with the return of Region 2268 on 18 February.

There is a slight chance the greater than 10 MeV proton flux at geosynchronous orbit will exceed the 10 pfu threshold through 09 February and after 18 February.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach moderate to high levels on 31 January-03 February, and again on 08-10 February due to recurrent coronal hole high speed stream (CH HSS) influence.

Geomagnetic field activity is expected to begin at quiet to unsettled levels. Active periods, with a slight chance for minor storm levels, particularly at high latitudes are expected on 29 January-02



February, 06-09 February, and again from 15-21 February in response to recurrent coronal hole high speed solar wind streams.



Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
19 January	130	62	250	B5.1	3	0	0	2	0	0	0	0
20 January	126	57	210	B4.9	2	0	0	1	0	0	0	0
21 January	124	50	160	B6.0	7	0	0	2	0	0	0	0
22 January	120	63	370	B4.5	6	1	0	0	0	0	0	0
23 January	121	70	530	B4.1	6	0	0	7	0	0	0	0
24 January	125	57	540	B3.6	3	0	0	2	1	0	0	0
25 January	127	65	460	B4.3	4	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	>0.6 MeV	>2MeV	>4 MeV
	19 January	5.9e+05	1.3e+04	2.5e+03		1.7e+06
20 January	7.7e+05	1.3e+04	2.7e+03		9.5e+05	
21 January	8.0e+05	1.1e+04	2.5e+03		1.4e+06	
22 January	2.6e+05	1.0e+04	2.5e+03		6.3e+05	
23 January	1.4e+05	1.1e+04	2.6e+03		3.8e+06	
24 January	1.7e+05	1.2e+04	2.7e+03		4.1e+06	
25 January	2.2e+05	1.2e+04	2.7e+03		4.0e+06	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	19 January	2	2-0-0-0-1-1-1-1-1	2	0-0-0-1-1-2-1-1	5
20 January	5	1-1-2-2-1-1-1-2	4	1-0-1-4-0-0-0-0	4	1-1-2-1-1-0-1-1
21 January	7	2-2-1-1-1-2-3-2	10	0-0-0-1-4-4-3-2	11	2-2-2-1-2-3-4-3
22 January	9	3-3-2-2-2-2-2-2	19	3-3-1-5-5-3-2-1	12	4-3-2-3-3-2-2-2
23 January	8	2-3-2-2-2-2-2-1	8	2-2-2-2-3-3-1-1	9	3-3-3-2-2-2-2-1
24 January	5	0-1-1-2-2-2-1-2	7	0-0-0-3-4-2-1-1	7	1-2-1-2-2-2-2-2
25 January	3	0-1-0-0-1-1-1-3	4	0-0-0-3-2-2-1-1	6	1-2-1-0-1-1-1-3

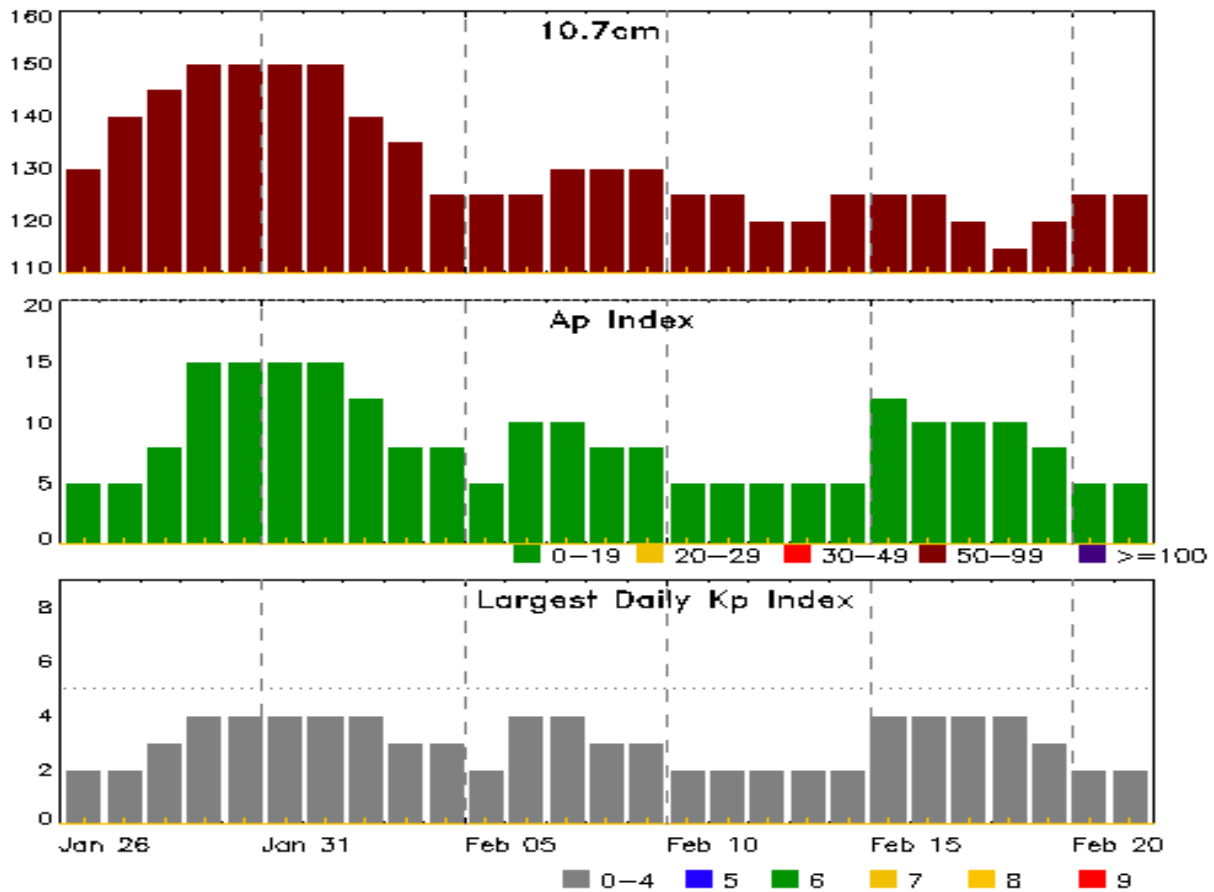


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
21 Jan 1339	WARNING: Geomagnetic K = 4	21/1400 - 22/0300
21 Jan 1356	WARNING: Geomagnetic K = 5	21/1400 - 1900
21 Jan 1555	WARNING: Geomagnetic K = 6	21/1600 - 1900
21 Jan 1855	EXTENDED WARNING: Geomagnetic K = 5	21/1400 - 2300
21 Jan 2056	ALERT: Geomagnetic K = 4	21/2052
22 Jan 0247	EXTENDED WARNING: Geomagnetic K = 4	21/1400 - 22/1400
22 Jan 1339	EXTENDED WARNING: Geomagnetic K = 4	21/1400 - 22/1900
22 Jan 2111	WATCH: Geomagnetic Storm Category G1 predicted	



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
26 Jan	130	5	2	09 Feb	130	8	3
27	140	5	2	10	125	5	2
28	145	8	3	11	125	5	2
29	150	15	4	12	120	5	2
30	150	15	4	13	120	5	2
31	150	15	4	14	125	5	2
01 Feb	150	15	4	15	125	12	4
02	140	12	4	16	125	10	4
03	135	8	3	17	120	10	4
04	125	8	3	18	115	10	4
05	125	5	2	19	120	8	3
06	125	10	4	20	125	5	2
07	130	10	4	21	125	5	2
08	130	8	3				



Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location	Rgn #	245	2695	II	IV
22 Jan	0443	0452	0502	M1.4	0.010			2268				

Flare List

Date	Time			X-ray Class	Optical			Rgn #
	Begin	Max	End		Imp/ Brtns	Location	Lat CMD	
19 Jan	0902	0906	0912	C1.0				2266
19 Jan	1007	1013	1015	C1.3	SF	S21W67		2259
19 Jan	1356	1400	1406	B8.6				
19 Jan	2041	2048	2052	C3.3	SF	S07E06		2266
20 Jan	0459	0511	0519	C1.0				2266
20 Jan	0946	0949	0951	B8.3				2259
20 Jan	1513	1516	1522		SF	S07W10		2266
20 Jan	2257	2318	2336	C2.9				2268
21 Jan	0123	0124	0145		SF	S14W76		2259
21 Jan	0144	0146	0201		SF	S07W17		2266
21 Jan	0503	0515	0524	C1.0				2268
21 Jan	1035	1049	1103	C4.3				2268
21 Jan	1132	1142	1148	C9.9				2268
21 Jan	1524	1534	1550	C5.0				2268
21 Jan	1617	1644	1654	C5.4				2268
21 Jan	2135	2141	2147	C1.2				2268
21 Jan	2221	2230	2244	C5.4				2268
22 Jan	0213	0220	0226	C1.7				2268
22 Jan	0247	0252	0259	C1.2				2268
22 Jan	0400	0405	0416	C1.1				2268
22 Jan	0443	0452	0502	M1.4				2268
22 Jan	0750	0753	0756	C1.0				
22 Jan	0842	0848	0901	C2.1				
22 Jan	1616	1620	1624	B8.9				
22 Jan	1716	1723	1731	B9.7				
22 Jan	1826	1830	1834	C1.3				
23 Jan	0220	0224	0228	B7.8	SF	S12E76		2268
23 Jan	0248	0253	0301	C4.3	SF	S12E76		2268
23 Jan	0301	0307	0322		SF	S12E76		2268
23 Jan	0325	0326	0328		SF	S12E75		2268



Flare List

Date	Time			X-ray Class	Optical		
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #
23 Jan	0843	0846	0849	B6.3			
23 Jan	1233	1237	1240	C1.1			2268
23 Jan	1507	1511	1522	C1.0	SF	S21E66	2270
23 Jan	1524	1529	1535	C1.2			2270
23 Jan	1553	1600	1609	C3.7	SF	S12E69	2268
23 Jan	1743	1746	1748	C1.1	SF	S12E69	2268
23 Jan	1930	1938	1950	B8.8			2268
24 Jan	0707	0711	0715	B6.7	SF	S12E60	2268
24 Jan	0732	0740	0746	C2.0	1F	S12E61	2268
24 Jan	1015	1020	1038	C1.3	SF	S12E57	2268
24 Jan	1155	1200	1203	B7.9			2268
24 Jan	1602	1608	1613	B7.4			2263
24 Jan	1822	1825	1828	B7.0			2267
24 Jan	2041	2046	2052	C1.2			
25 Jan	0155	0201	0206	C1.1			
25 Jan	0226	0229	0232	C1.1			
25 Jan	0747	0751	0756	C1.0			2268
25 Jan	1156	1212	1221	C1.4			
25 Jan	1811	1818	1821	B9.6			2268



Region Summary

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Lon	Helio 10 ⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
Region 2258																		
06 Jan	N14E71	261	10	1	Axx	1	A											
07 Jan	N12E58	261	30	1	Hrx	1	A											
08 Jan	N13E51	254	30	11	Cro	6	B	1										
09 Jan	N13E38	255	30	12	Cro	3	B											
10 Jan	N14E25	255	20	13	Cro	4	B											
11 Jan	N16E12	255	10	2	Bxo	3	B											
12 Jan	N16W02	256	plage															
13 Jan	N16W16	257	plage															
14 Jan	N16W30	257	plage															
15 Jan	N16W44	258	plage															
16 Jan	N16W58	259	plage															
17 Jan	N16W72	260	plage															
18 Jan	N16W86	261	plage															
								1	0	0	0	0	0	0	0	0	0	

Crossed West Limb.
 Absolute heliographic longitude: 256

Region 2259																		
08 Jan	S18E62	244	200	11	Eao	6	B	2										
09 Jan	S18E50	243	280	11	Eko	5	BG	2			1							
10 Jan	S18E38	242	290	12	Eko	9	BG	1			3							
11 Jan	S16E26	241	310	11	Eko	8	BG	1			1							
12 Jan	S15E13	239	350	12	Eko	9	BG				1							
13 Jan	S15W01	241	360	13	Eko	10	BG	1										
14 Jan	S15W13	240	260	11	Ekc	15	BGD	4			6							
15 Jan	S16W24	238	160	7	Dac	13	BD				1							
16 Jan	S17W36	237	130	6	Dai	13	BG											
17 Jan	S16W48	236	100	5	Dao	14	B				5							
18 Jan	S16W62	237	90	3	Cso	5	B	1			1							
19 Jan	S16W74	235	70	2	Hsx	1	A	1			1							
20 Jan	S15W89	237	40	3	Hsx	1	A											
								13	0	0	20	0	0	0	0	0		

Crossed West Limb.
 Absolute heliographic longitude: 241



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares													
	Lat CMD	Lon	Helio 10 ⁻⁶ hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical								
									C	M	X	S	1	2	3	4				
Region 2261																				
09 Jan	S10E72	221	30	1	Hsx	1	A													
10 Jan	S11E57	223	30	2	Hsx	1	A													
11 Jan	S11E45	222	30	2	Hsx	2	A													
12 Jan	S11E31	223	30	2	Hsx	1	A	1				1								
13 Jan	S11E17	223	30	2	Hax	1	A													
14 Jan	S11E04	223	30	1	Hsx	1	A													
15 Jan	S11W09	223	20	2	Hax	1	A													
16 Jan	S12W22	223	20	2	Hsx	2	A					1								
17 Jan	S11W34	222	10	1	Axx	1	A													
18 Jan	S11W47	222	0	1	Axx	1	A													
19 Jan	S11W61	223	plage																	
20 Jan	S11W75	224	plage																	
21 Jan	S11W89	224	plage																	
									1	0	0	2	0	0	0	0	0			

Crossed West Limb.
 Absolute heliographic longitude: 223

Region 2263																				
15 Jan	N22E50	164	30	3	Cro	4	B													
16 Jan	N22E36	165	30	5	Dro	5	B													
17 Jan	N22E21	167	10	6	Bxo	4	B													
18 Jan	N21E09	166	10	3	Bxo	2	B													
19 Jan	N21W05	167	plage																	
20 Jan	N21W19	168	plage																	
21 Jan	N21W33	168	plage																	
22 Jan	N21W47	169	plage																	
23 Jan	N21W61	170	plage																	
24 Jan	N21W75	171	plage																	
25 Jan	N21W89	172	plage																	
									0	0	0	0	0	0	0	0	0	0		

Still on Disk.
 Absolute heliographic longitude: 167



Region Summary - continued

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

Region 2264

16 Jan	N09E46	155	10	1	Axx	1	A										
17 Jan	N09E32	156	plage														
18 Jan	N09E19	156	plage														
19 Jan	N09E05	157	plage														
20 Jan	N09W09	158	plage														
21 Jan	N09W23	158	plage														
22 Jan	N09W37	159	plage														
23 Jan	N09W51	160	plage														
24 Jan	N09W65	161	plage														
25 Jan	N09W79	162	plage														
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 157

Region 2265

18 Jan	S23W05	180	20	3	Cro	7	B										
19 Jan	S23W10	172	20	4	Cao	4	B										
20 Jan	S21W24	172	20	2	Cro	1	B										
21 Jan	S21W36	171	10	4	Hrx	2	A										
22 Jan	S21W51	173	10	1	Axx	1	A										
23 Jan	S21W65	174	plage														
24 Jan	S21W79	175	plage														
									0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 180

Region 2266

18 Jan	S07E08	167	30	4	Cri	13	B					1					
19 Jan	S06W03	165	130	6	Dai	16	BG	2				1					
20 Jan	S06W18	167	120	7	Dso	14	B	1				1					
21 Jan	S06W31	166	130	9	Dao	17	B					1					
22 Jan	S04W45	167	110	9	Dao	7	B										
23 Jan	S05W58	167	80	9	Dso	4	B										
24 Jan	S05W70	166	60	7	Dso	3	B										
25 Jan	S05W84	167	50	8	Cao	3	B										
									3	0	0	4	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 165



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares																
	Lat CMD	Lon	Helio 10 ⁶ hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
									C	M	X	S	1	2	3	4							
Region 2267																							
19 Jan	N18E58	104	30	1	Hax	1	A																
20 Jan	N18E44	105	30	1	Hrx	1	A																
21 Jan	N18E32	103	20	1	Hrx	1	A																
22 Jan	N18E17	105	10	1	Hrx	2	A																
23 Jan	N18E06	103	10	3	Cro	2	B																
24 Jan	N18W07	103	10	4	Bxo	2	B																
25 Jan	N18W21	104	plage																				

Still on Disk.
 Absolute heliographic longitude: 103

Region 2268																							
22 Jan	S10E67	54	230	3	Dao	1	B	3	1														
23 Jan	S10E60	49	420	14	Ekc	7	BG	4				6											
24 Jan	S10E48	48	460	15	Ekc	8	BG	2				2	1										
25 Jan	S10E35	48	360	15	Eki	10	BG	1															

Still on Disk.
 Absolute heliographic longitude: 48

Region 2269																							
22 Jan	N08E36	85	10	3	Bxo	2	B																
23 Jan	N08E22	87	10	4	Bxo	5	B																
24 Jan	N09E09	87	10	4	Bxo	4	B																
25 Jan	N09W06	89	10	6	Bxo	3	B																

Still on Disk.
 Absolute heliographic longitude: 89

Region 2270																							
23 Jan	S18E55	54	10	1	Axx	2	A	2															
24 Jan	S18E41	55	plage																				
25 Jan	S18E27	56	plage																				

Still on Disk.
 Absolute heliographic longitude: 56



Region Summary - continued

Location		Sunspot Characteristics					Flares								
Date	Lat CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
		Lon	10 ⁻⁶ hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
<i>Region 2271</i>															
25 Jan	N18E09	74	40	6	Cao	9	B	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 74

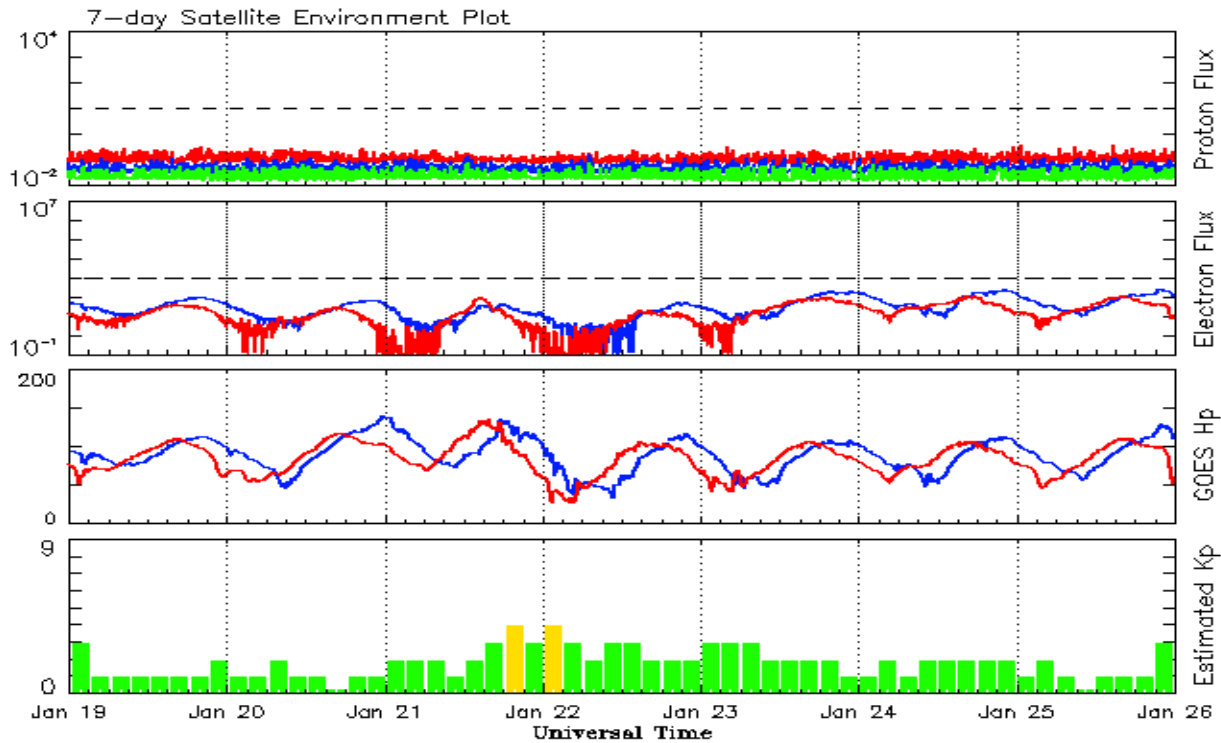


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2013									
January	99.8	62.9	0.63	87.1	58.7	127.1	118.9	4	7.5
February	60.0	38.1	0.63	86.7	58.4	104.4	118.0	5	7.4
March	81.0	57.9	0.71	85.7	57.6	111.2	117.1	9	7.4
April	112.8	72.4	0.64	86.7	57.9	125.0	116.6	5	7.2
May	125.5	78.7	0.63	90.5	59.9	131.3	118.1	10	7.0
June	80.1	52.5	0.66	94.4	62.6	110.2	120.9	13	7.1
July	86.1	57.0	0.66	97.9	65.5	115.6	123.9	9	7.3
August	90.2	66.0	0.73	103.7	68.9	114.7	127.9	9	7.6
September	55.0	37.0	0.67	111.0	73.0	102.7	132.3	5	7.8
October	127.1	85.6	0.67	114.3	74.9	132.3	134.7	7	7.8
November	125.7	77.6	0.62	114.6	75.3	148.4	135.4	5	7.9
December	118.2	90.3	0.76	115.4	75.9	147.7	135.9	5	7.5
2014									
January	125.9	81.8	0.65	117.7	77.3	158.6	137.3	6	7.1
February	174.6	102.3	0.59	119.5	78.3	170.3	138.6	12	6.9
March	141.1	91.9	0.65	123.2	80.8	149.9	140.8	6	7.2
April	130.5	84.7	0.65	124.8	81.9	144.3	143.5	9	7.5
May	116.8	75.2	0.64	122.3	80.5	130.0	144.7	7	7.9
June	107.7	71.0	0.66	121.4	79.7	122.2	145.5	7	8.4
July	113.6	72.4	0.64			137.3		5	
August	106.2	74.6	0.70			124.7		9	
September	127.4	87.6	0.69			146.1		11	
October	92.0	60.6	0.66			153.7		10	
November	101.8	70.1	0.69			155.3		10	
December	120.0	78.0	0.65			158.7		12	

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 19 January 2015*

The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-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.

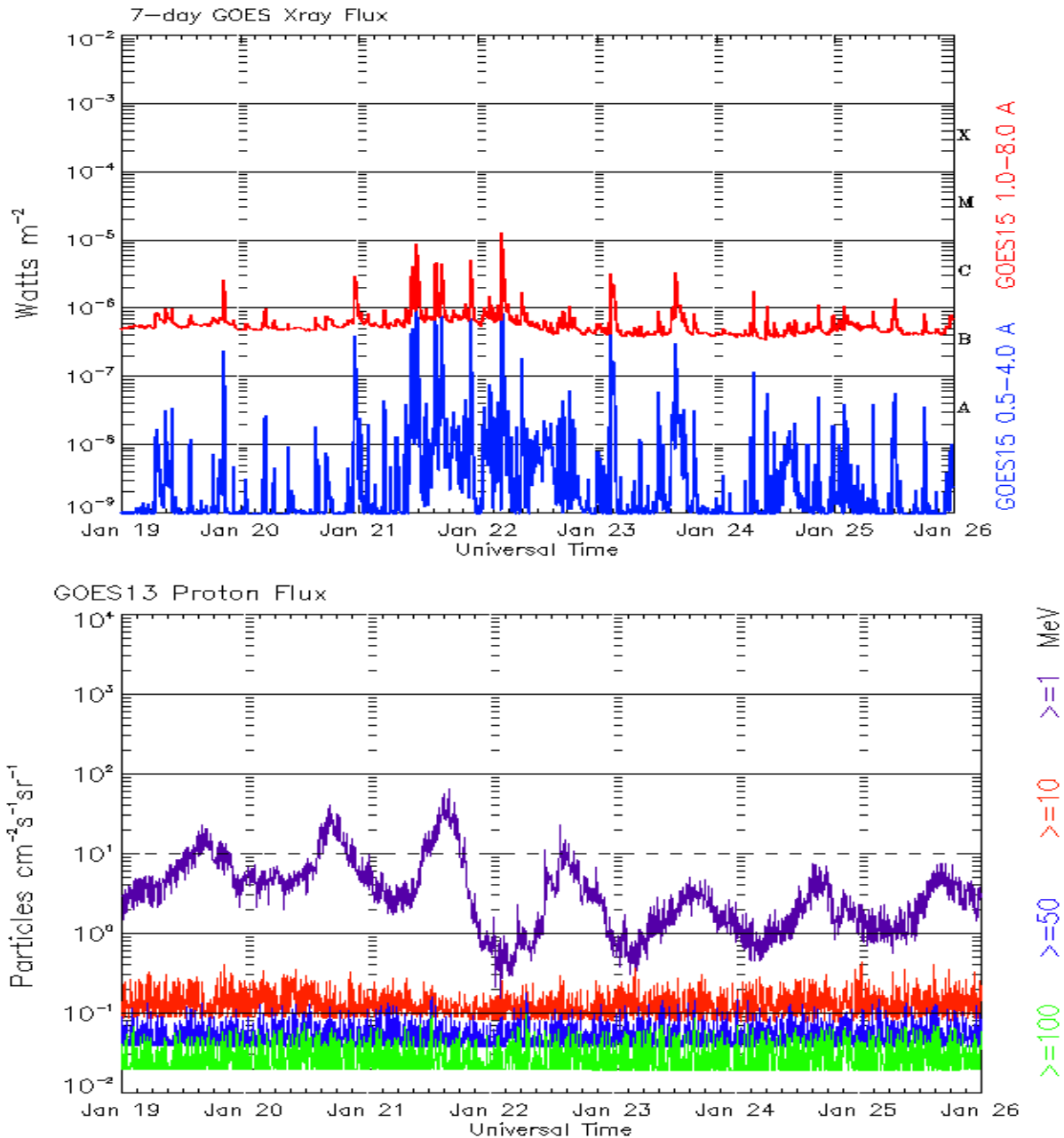
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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.

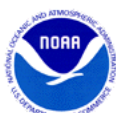




*Weekly GOES Satellite X-ray and Proton Plots
Week Beginning 19 January 2015*

The x-ray plots contains five-minute averages x-ray flux (Watt/m²) 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/cm² -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)

Published every Monday by the Space Weather Prediction Center.

U.S. Department of Commerce
NOAA / National Weather Service
Space Weather Prediction Center
325 Broadway, Boulder CO 80305

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

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