

Solar activity ranged from very low to moderate levels. Very low activity was observed on 03 Jan, low level activity on 29 Dec - 01 Jan, and moderate level activity on 28 Dec and 02 Jan. Region 2473 (S22, L=331, class/area=Fkc/590 on 26 Dec), which exhibited a complex beta-gamma-delta configuration, produced all of the significant flare activity (2 M-class, 14 C-class).

On 28 Dec, Region 2473 produced an M1 flare at 28/1245 UTC. Associated with this event was a Type IV radio emission and a partial-halo CME observed off the southern portion of the disk, first visible in LASCO coronagraph imagery at 12/1212 UTC. Analysis of this CME determined that an Earth-directed component was present.

On 02 Jan, Region 2473 produced a long duration M2 flare at 02/0011 UTC. Associated with this event were Type II (1095 km/s) and IV radio emissions and an asymmetric partial-halo CME observed off the southwest limb, first visible in LASCO coronagraph imagery at 01/2324 UTC. Analysis of this CME determined that a weak Earth-directed component was present and would arrive around midday on 03 Jan, though eventually proved to be a miss.

There was greater than 10 MeV proton event on 02 January 2016. The event began at 02/0430 UTC shortly after a long duration M2 flare that occurred at 02/0011 UTC. Proton flux reached a maximum flux value of 21 pfu (S1-Minor) at 02/0450 UTC and ended at 02/0750 UTC.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels throughout the period with the exception of 31 December when moderate flux levels were observed. A maximum flux of 6,782 pfu was observed at 03/1600 UTC.

Geomagnetic field activity ranged from quiet to moderate (G2) storm conditions. At 31/0003 a small shock was observed at the ACE spacecraft. Total field (Bt) increased from 5 nT to 13 nT with a corresponding solar wind speed increase from 350 km/s to 500 km/s. The shock was associated with the arrival of the 28 Dec CME observed in LASCO C2 imagery at 28/1212 UTC. Isolated G1-Minor to G2-Moderate storm conditions were observed midday through late on 31 Dec as well as early on 01 Jan. Mostly quiet conditions were observed on 28 - 30 Dec, 02-03 Jan.

Space Weather Outlook **04 January - 30 January 2016**

Solar activity is expected to be at low levels with a chance for M-class (R1-R2, Minor-Moderate) flare activity from 15 Jan - 28 Jan due to the return of Region 2473 (S22, L=331). Very low solar activity is expected for the remainder of the period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be high from 04 -



13 Jan, 25 - 30 Jan due to recurrent coronal hole high speed streams (CH HSS).

Geomagnetic field activity is expected to be at active levels on 04, 07, and 22 Jan with G1-Minor storm conditions on 06 Jan due to recurrent CH HSS activity. Mostly quiet to unsettled levels are expected for the rest of the period.



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
28 December	112	64	530	B5.8	4	1	0	3	0	0	0	0
29 December	105	54	480	B3.9	4	0	0	1	1	0	0	0
30 December	102	34	250	B3.0	2	0	0	3	1	0	0	0
31 December	96	18	130	B2.8	2	0	0	1	0	0	0	0
01 January	98	40	140	B3.4	3	1	0	2	0	0	0	0
02 January	100	52	140	B5.8	0	0	0	1	0	0	0	0
03 January	102	50	170	B3.1	0	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	>0.6 MeV	>2MeV	>4 MeV
	28 December		1.5e+06	3.3e+04	3.3e+03	
29 December		6.4e+06	1.0e+05	3.1e+03		1.0e+08
30 December		7.6e+06	2.3e+04	3.0e+03		5.8e+07
31 December		8.4e+06	1.5e+04	2.5e+03		1.7e+07
01 January		8.9e+05	1.2e+04	2.9e+03		4.3e+07
02 January		2.1e+07	4.5e+05	4.1e+03		1.5e+08
03 January		1.2e+07	4.5e+04	2.7e+03		2.3e+08

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	28 December	3	1-1-1-1-1-1-1-1	6	1-0-1-3-4-1-0-0	5
29 December	4	2-1-1-0-2-2-1-1	6	2-1-0-1-3-3-1-1	6	2-1-1-1-2-2-2-2
30 December	2	0-0-0-1-1-1-1-1	4	0-0-1-2-3-2-0-0	4	1-0-1-1-1-1-1-2
31 December	25	3-3-4-4-4-3-4-5	61	2-2-6-5-7-6-6-5	43	4-3-4-4-6-4-5-6
01 January	17	5-4-4-3-1-2-2-1	33	5-5-6-5-3-2-2-2	27	6-5-5-3-2-1-2-2
02 January	6	2-2-2-2-2-2-1-1	15	2-2-3-5-3-3-2-1	10	3-2-3-2-2-2-2-2
03 January	5	0-1-2-1-2-2-1-2	5	0-0-2-2-3-2-0-1	3	1-2-2-1-2-2-1-3



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
28 Dec 1215	ALERT: Type IV Radio Emission	28/1146
28 Dec 1221	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	21/1515
28 Dec 1306	SUMMARY: 10cm Radio Burst	28/1146 - 1231
28 Dec 2129	WATCH: Geomagnetic Storm Category G2 predicted	
29 Dec 0951	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	21/1515
29 Dec 1450	WATCH: Geomagnetic Storm Category G3 predicted	
30 Dec 1341	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	21/1515
30 Dec 2136	WATCH: Geomagnetic Storm Category G3 predicted	
31 Dec 0016	WARNING: Geomagnetic K = 4	31/0030 - 1300
31 Dec 0016	WARNING: Geomagnetic Sudden Impulse expected	31/0030 - 0130
31 Dec 0059	WARNING: Geomagnetic K = 5	31/0058 - 1300
31 Dec 0103	SUMMARY: Geomagnetic Sudden Impulse	31/0051
31 Dec 0105	ALERT: Geomagnetic K = 4	31/0105
31 Dec 0759	WATCH: Geomagnetic Storm Category G1 predicted	
31 Dec 1235	ALERT: Geomagnetic K = 5	31/1234
31 Dec 1245	EXTENDED WARNING: Geomagnetic K = 5	31/0058 - 2300
31 Dec 1245	EXTENDED WARNING: Geomagnetic K = 4	31/0030 - 2300
31 Dec 1324	WARNING: Geomagnetic K = 6	31/1323 - 1800
31 Dec 1346	ALERT: Geomagnetic K = 6	31/1346
31 Dec 2032	EXTENDED WARNING: Geomagnetic K = 4	31/0030 - 01/1400
31 Dec 2032	EXTENDED WARNING: Geomagnetic K = 5	31/0058 - 01/1200
31 Dec 2032	WARNING: Geomagnetic K = 6	31/2040 - 01/0600
31 Dec 2033	ALERT: Geomagnetic K = 5	31/2032
31 Dec 2215	ALERT: Geomagnetic K = 5	31/2214
31 Dec 2339	ALERT: Geomagnetic K = 6	31/2337
01 Jan 0129	ALERT: Geomagnetic K = 5	01/0119
01 Jan 0208	ALERT: Geomagnetic K = 6	01/0159

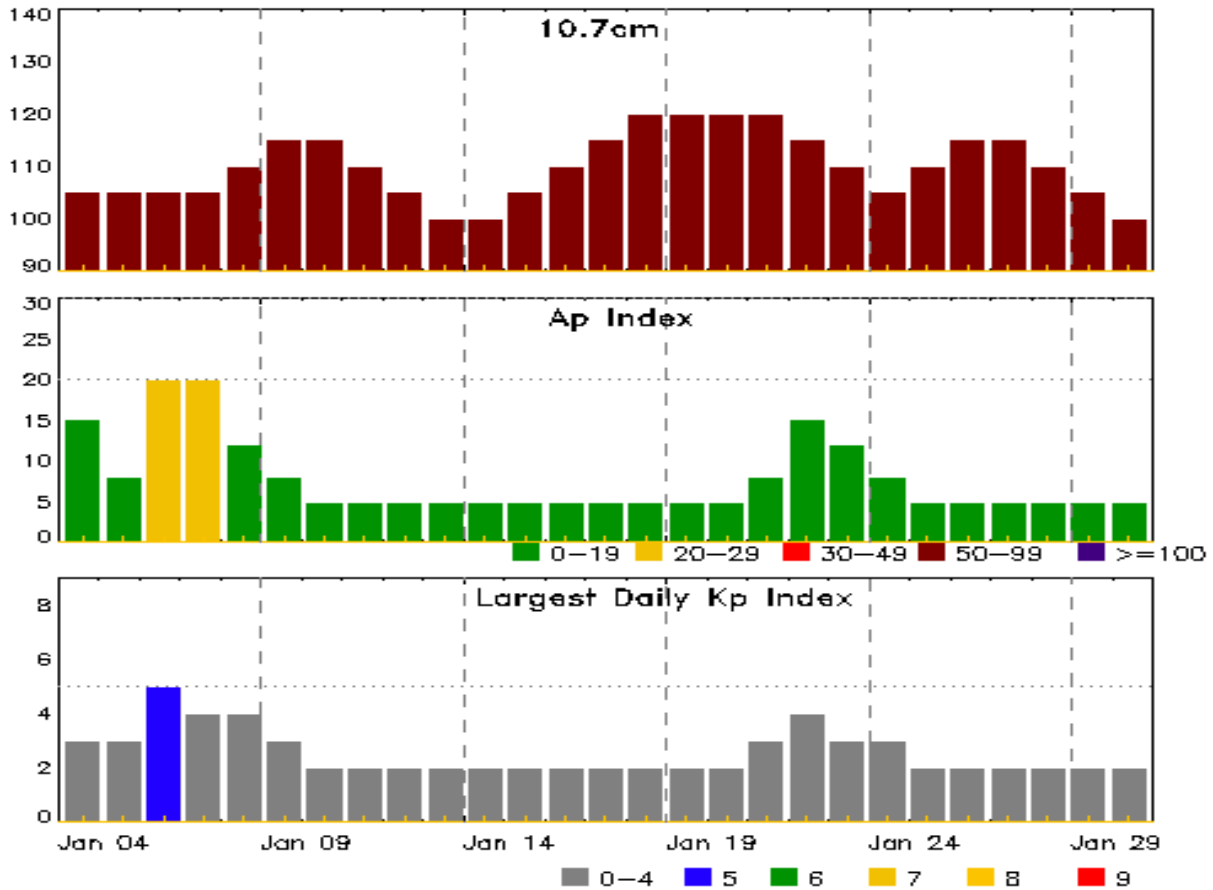


Alerts and Warnings Issued

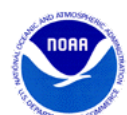
Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
01 Jan 0502	ALERT: Geomagnetic K = 5	01/0501
01 Jan 0830	ALERT: Geomagnetic K = 5	01/0829
01 Jan 1341	EXTENDED WARNING: Geomagnetic K = 4	31/0030 - 01/2100
01 Jan 2051	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	01/2035
01 Jan 2355	ALERT: Type II Radio Emission	01/2322
01 Jan 2355	ALERT: Type IV Radio Emission	01/2324
02 Jan 0103	WARNING: Proton 10MeV Integral Flux $>$ 10pfu	02/0103 - 05/0000
02 Jan 0446	ALERT: Proton Event 10MeV Integral Flux \geq 10pfu	02/0430
02 Jan 1020	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	01/2035
02 Jan 1207	CANCELLATION: Proton 10MeV Integral Flux $>$ 10pfu	
02 Jan 1207	SUMMARY: Proton Event 10MeV Integral Flux \geq 10pfu	02/0430 - 0750
02 Jan 1818	WATCH: Geomagnetic Storm Category G2 predicted	
03 Jan 0716	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	01/2035



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
04 Jan	105	15	3	18 Jan	120	5	2
05	105	8	3	19	120	5	2
06	105	20	5	20	120	5	2
07	105	20	4	21	120	8	3
08	110	12	4	22	115	15	4
09	115	8	3	23	110	12	3
10	115	5	2	24	105	8	3
11	110	5	2	25	110	5	2
12	105	5	2	26	115	5	2
13	100	5	2	27	115	5	2
14	100	5	2	28	110	5	2
15	105	5	2	29	105	5	2
16	110	5	2	30	100	5	2
17	115	5	2				



Energetic Events

Date	Time			X-ray	Optical Information			Peak		Sweep Freq		
	Begin	Max	Half	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
			Max						245	2695	II	IV
28 Dec	1120	1245	1409	M1.8	0.110			2473	470	370		1
01 Jan	2310	0011	0101	M2.3	0.110			2473				1

Flare List

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
28 Dec	0018	0028	0039	C8.0	SF	S20W04	2473
28 Dec	1120	1245	1409	M1.8			2473
28 Dec	1523	1531	1546	C7.5			2473
28 Dec	1656	1700	1703	C4.1	SF	S19W23	2473
28 Dec	2243	2249	2252	C2.8	SF	S19W27	2473
29 Dec	0053	0106	0126	C1.4			2472
29 Dec	B1008	U1031	A1053	C6.8	1F	S20W22	2473
29 Dec	1531	1536	1544	B8.3			2473
29 Dec	1751	1759	1811	C1.5			2473
29 Dec	2007	2019	2034	C2.5	SF	S19W30	2473
30 Dec	0606	0613	0619	B9.3			2473
30 Dec	1339	1417	1444	B9.1	SF	S19W39	2473
30 Dec	1815	1818	1822	B5.9	SF	S20W51	2473
30 Dec	1859	1905	1907	C1.1	SF	S22W50	2473
30 Dec	1918	2007	2014	B7.0			2473
30 Dec	2239	2245	2248	C4.3	1F	S24W39	2473
31 Dec	0214	0218	0222	B5.2			2473
31 Dec	0320	0323	0325	B4.5			2473
31 Dec	0823	0829	0833	B5.8			2473
31 Dec	1319	1326	1329	B7.4			2473
31 Dec	1719	1725	1728	C1.4			2473
31 Dec	1957	2011	2015	C1.6			2473
31 Dec	2300	2305	2311	B6.1	SF	S21W55	2473
31 Dec	2314	2321	2329	B6.7			2473
01 Jan	0438	0441	0451	B6.2			2477
01 Jan	0633	0638	0643	C2.3	SF	S19W67	2473
01 Jan	0936	0948	0956	C2.4	SF	S20W71	2473
01 Jan	1730	1736	1743	B8.4			2473
01 Jan	2018	2021	2023	B5.5			2473



Flare List

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
01 Jan	2225	2230	2233	C2.7			2473
01 Jan	2310	0011	0101	M2.3			2473
02 Jan	0921	0922	0925		SF	S25W89	2473
03 Jan	2020	2024	2027	B4.7	SF	S11E40	2476



Region Summary

Date	Location		Sunspot Characteristics					Flares															
	Lat CMD	Helio Lon	Area 10 ⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical												
								C	M	X	S	1	2	3	4								
Region 2472																							
20 Dec	N04E93	328	plage					5															
21 Dec	N04E78	328	60	5	Hax	1	A	5	2														
22 Dec	N03E62	331	150	7	Dao	10	B	1				2											
23 Dec	N04E49	331	170	8	Dai	10	BG	1				4											
24 Dec	N03E37	330	100	6	Dai	8	B	3				2											
25 Dec	N03E23	330	40	6	Cao	7	B	1				1											
26 Dec	N04E11	329	30	8	Cso	7	B																
27 Dec	N04W02	329	30	7	Cro	9	B	1				1											
28 Dec	N04W16	330	20	7	Cro	8	B																
29 Dec	N04W30	331	10	7	Bxo	6	B	1															
30 Dec	N04W44	331	10	1	Axx	1	A																
31 Dec	N04W59	333	plage																				
01 Jan	N04W74	335	plage																				
02 Jan	N04W89	337	plage																				
								18	2	0	10	0	0	0	0	0							

Crossed West Limb.

Absolute heliographic longitude: 329

Region 2473																							
21 Dec	S22E79	327	30	4	Cso	4	B	4				3											
22 Dec	S23E62	331	230	10	Dac	12	BD	2	1			13	1										
23 Dec	S23E49	331	420	12	Ekc	11	BG	1	1			8	1										
24 Dec	S22E35	332	500	14	Ekc	12	BG		1			11											
25 Dec	S22E22	331	570	15	Ekc	19	BG	5				2											
26 Dec	S22E09	331	590	16	Fkc	36	BGD	4				6											
27 Dec	S22W05	332	530	16	Fhc	38	BD					5											
28 Dec	S22W19	333	510	16	Fhc	36	BD	4	1			3											
29 Dec	S21W33	334	470	16	Fhc	28	B	3				1	1										
30 Dec	S21W47	334	240	15	Eac	13	B	2				3	1										
31 Dec	S21W60	334	130	15	Cao	8	B	2				1											
01 Jan	S21W73	334	110	12	Eso	8	B	3	1			2											
02 Jan	S21W89	337	40	7	Cao	3	B					1											
								30	5	0	59	4	0	0	0	0							

Crossed West Limb.

Absolute heliographic longitude: 332



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 2475																							
25 Dec	N08W06	358	20	3	Cro	4	B																
26 Dec	N08W19	359	plage																				
27 Dec	N08W33	360	plage																				
28 Dec	N08W47	1	plage																				
29 Dec	N08W61	2	plage																				
30 Dec	N08W75	2	plage																				
31 Dec	N08W89	3	plage																				
												0	0	0	0	0	0	0	0	0	0	0	

Crossed West Limb.
 Absolute heliographic longitude: 358

Region 2476																							
01 Jan	S11E61	200	10	1	Axx	1	A																
02 Jan	S10E47	201	20	4	Cro	6	B																
03 Jan	S10E34	201	80	7	Dai	16	B						1										
												0	0	0	1	0	0	0	0	0	0	0	

Still on Disk.
 Absolute heliographic longitude: 201

Region 2477																							
01 Jan	N12E75	186	20	2	Hsx	1	A																
02 Jan	N12E61	187	70	3	Hsx	1	A																
03 Jan	N12E47	188	70	2	Hsx	1	A																
												0	0	0	0	0	0	0	0	0	0	0	

Still on Disk.
 Absolute heliographic longitude: 188

Region 2478																							
02 Jan	N07E53	195	10	2	Bxo	2	B																
03 Jan	N07E38	197	20	2	Cro	3	B																
												0	0	0	0	0	0	0	0	0	0	0	

Still on Disk.
 Absolute heliographic longitude: 197

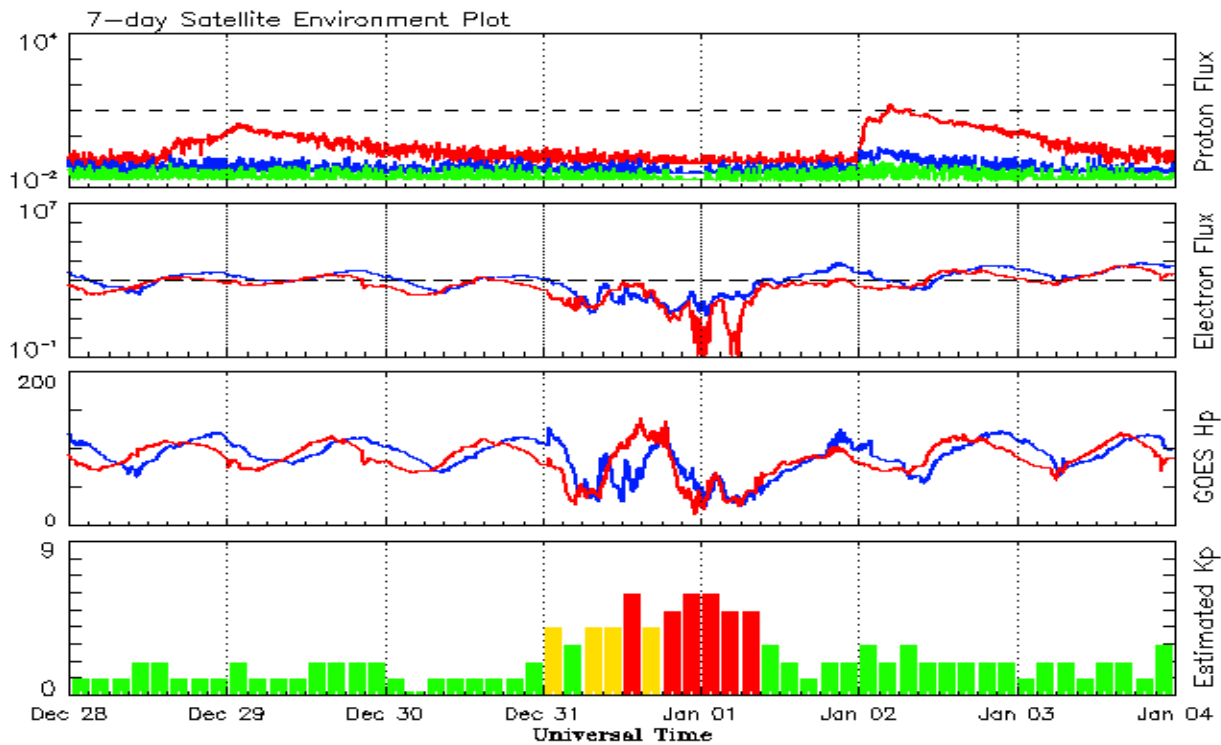


Recent Solar Indices (preliminary)
Observed monthly mean values

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
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	67.5	0.65	124.8	69.8	144.3	143.5	9	7.5
May	116.8	67.5	0.64	122.3	69.0	130.0	144.7	7	7.9
June	107.7	61.7	0.66	121.4	68.5	122.2	145.5	7	8.4
July	113.6	60.1	0.64	120.4	67.6	137.3	145.2	5	8.8
August	106.2	64.1	0.70	115.1	65.0	124.7	142.8	9	8.9
September	127.4	78.0	0.69	107.4	61.1	146.1	140.1	11	9.3
October	92.0	54.0	0.66	101.7	58.4	153.7	138.4	10	9.9
November	101.8	62.2	0.69	97.9	56.8	155.3	137.4	10	10.1
December	120.0	67.7	0.65	95.2	55.3	158.7	137.0	12	10.5
2015									
January	101.2	55.8	0.66	92.1	53.6	141.7	135.8	10	11.0
February	70.6	40.0	0.63	88.3	51.7	128.8	133.8	10	11.5
March	61.7	32.7	0.62	84.2	49.3	126.0	131.2	17	12.0
April	72.5	45.2	0.75	80.5	47.3	129.2	127.3	12	12.4
May	83.0	53.3	0.71	77.5	45.6	120.1	123.3	9	12.7
June	77.3	39.9	0.53	73.1	43.2	123.2	119.5	14	13.0
July	68.4	39.5	0.58			107.0		10	
August	61.6	38.6	0.63			106.2		16	
September	72.5	47.2	0.65			102.1		16	
October	59.5	37.0	0.62			104.1		15	
November	61.8	37.9	0.61			109.6		13	
December	54.1	34.6	0.64			112.8		15	

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 28 December 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.

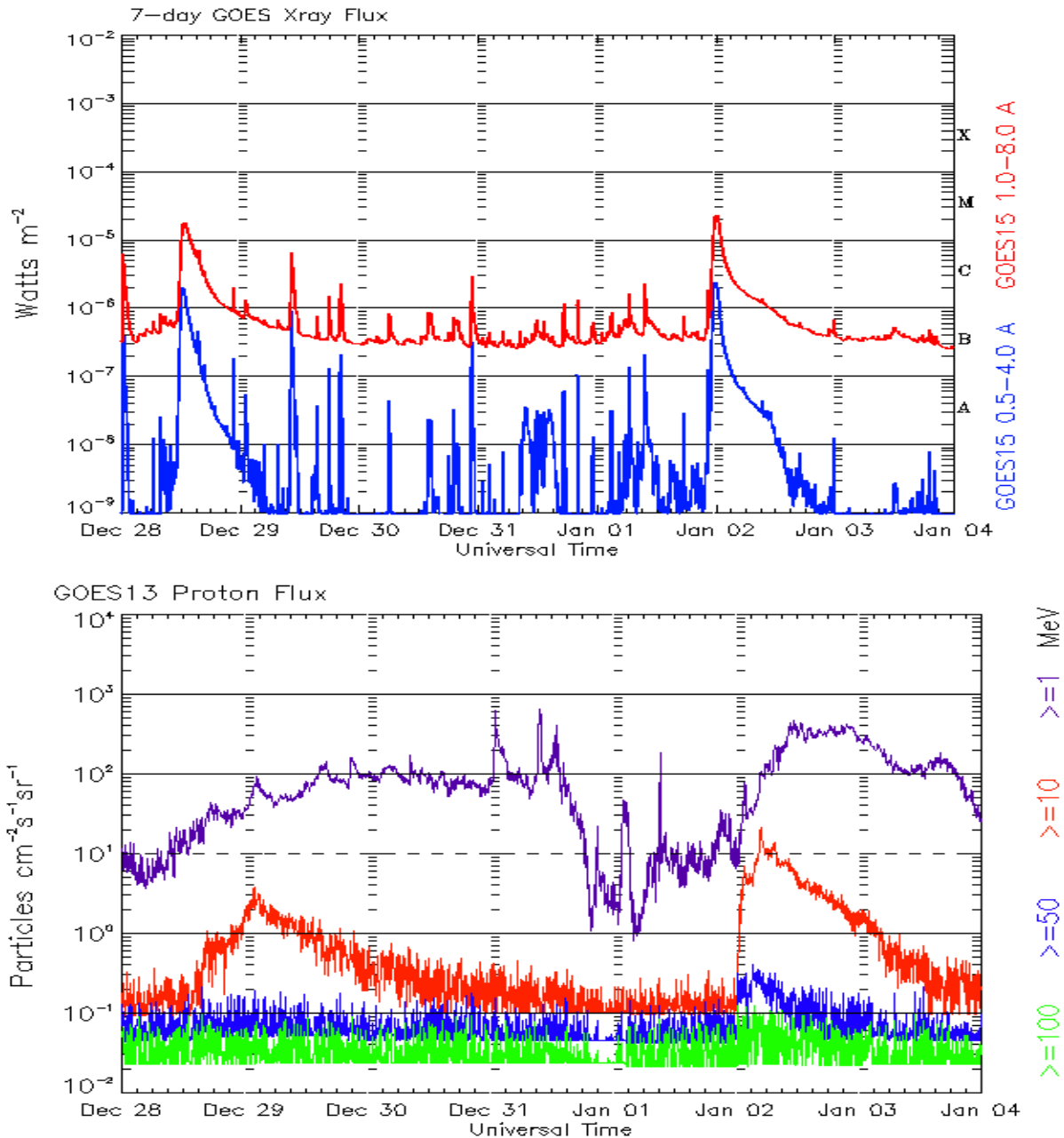
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 28 December 2015*

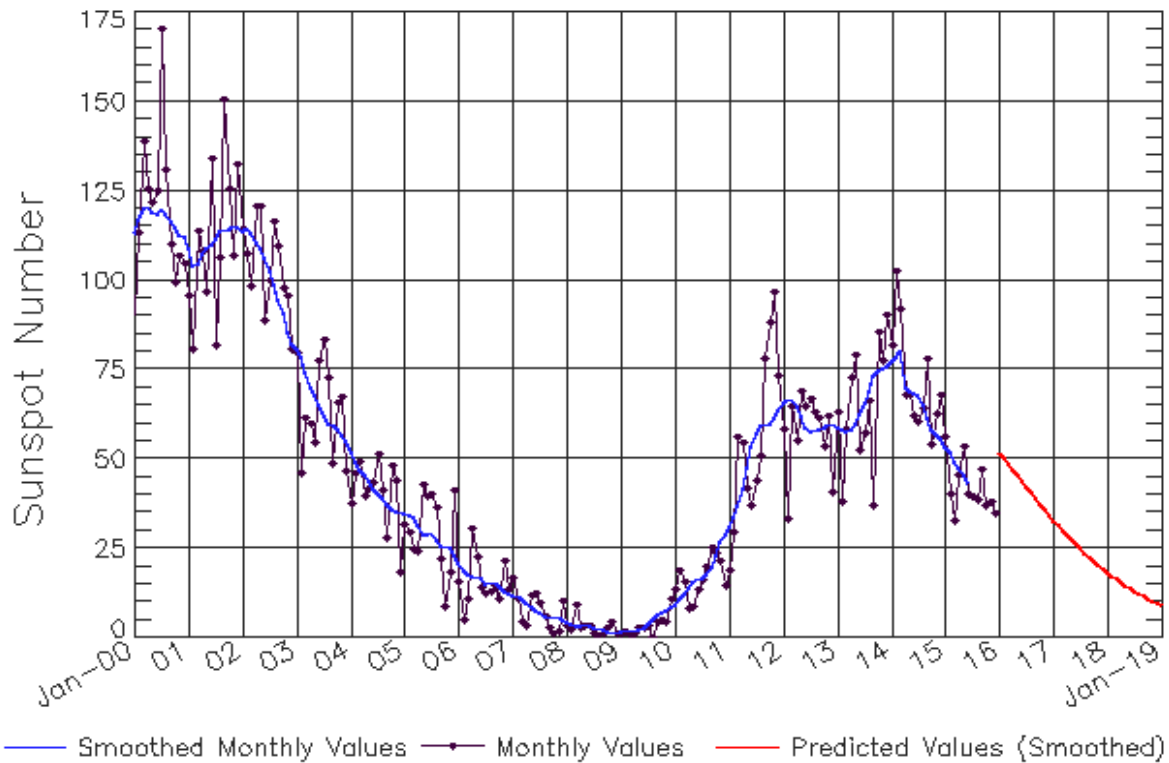
The x-ray plots contains five-minute averages x-ray flux (Watt/m²) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

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.



ISES Solar Cycle Sunspot Number Progression

Observed data through Dec 2015



Updated 2016 Jan 4

NOAA/SWPC Boulder, CO USA

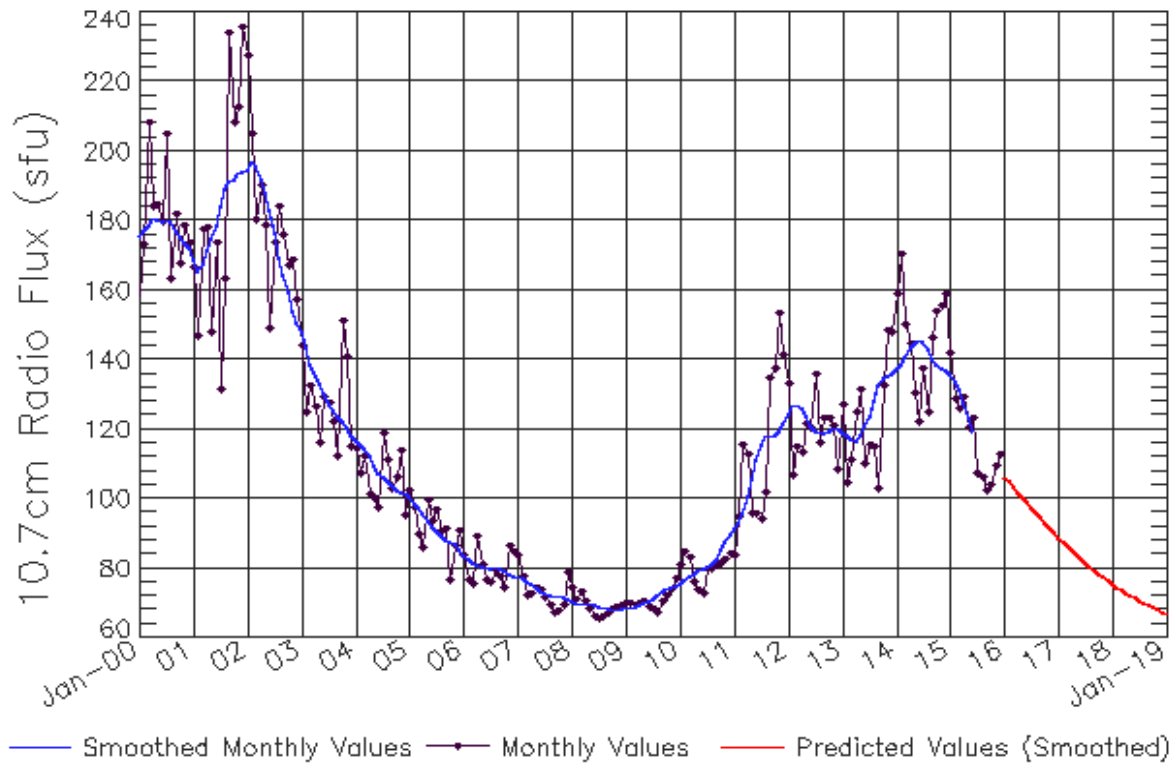
Smoothed Sunspot Number Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	9	10	11	13	15	16	17	17	20	23	27	29
	(1)	(2)	(3)	(5)	(5)	(6)	(7)	(7)	(8)	(9)	(9)	(10)
2011	19	30	56	54	42	37	44	51	78	88	97	73
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2012	58	33	64	55	69	65	67	63	61	53	62	41
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2013	63	38	58	72	79	53	57	66	37	86	78	90
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2014	82	102	92	68	68	62	60	64	78	54	62	68
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2015	56	40	33	45	53	40	40	39	47	37	38	35
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2016	52	50	49	47	45	44	42	40	39	37	36	34
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2017	33	31	30	29	27	26	25	24	23	21	20	19
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2018	18	17	16	15	15	14	13	12	12	11	10	10
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2019	9	8	8	7	7	6	6	6	5	5	4	4
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)



ISES Solar Cycle F10.7cm Radio Flux Progression

Observed data through Dec 2015



Updated 2016 Jan 4

NOAA/SWPC Boulder, CO USA

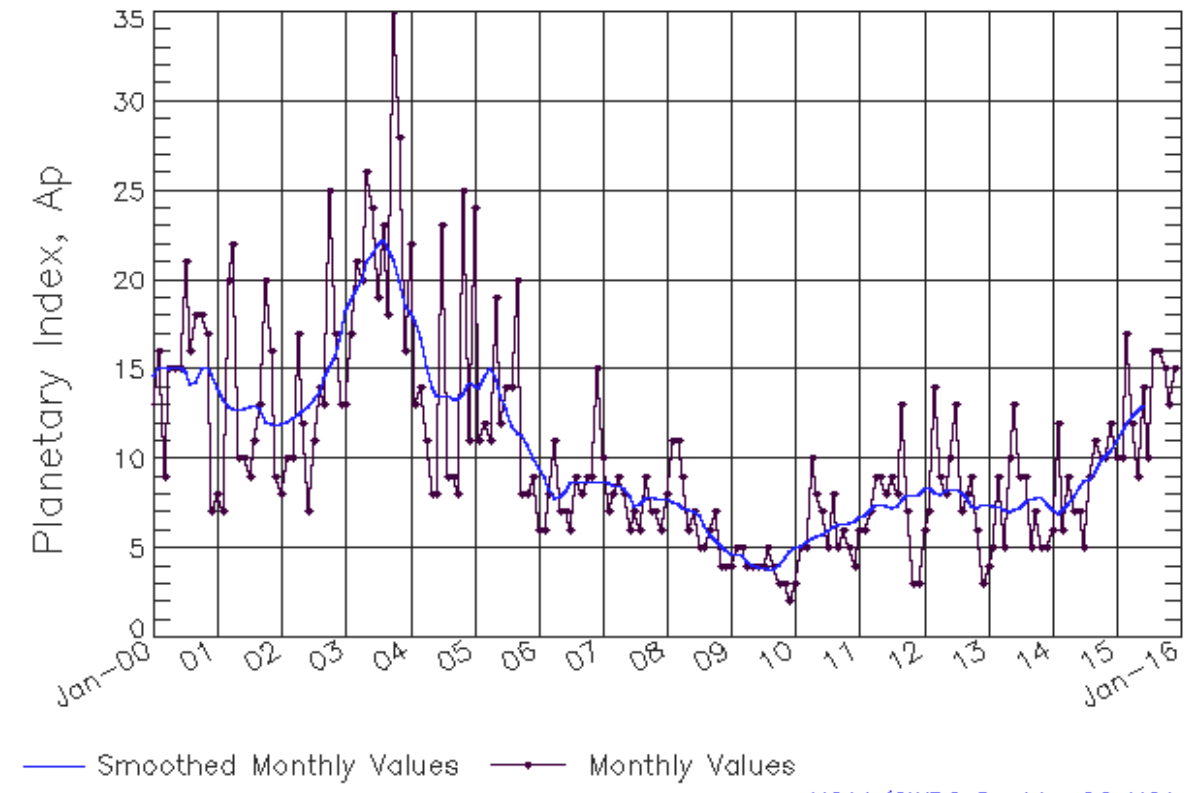
Smoothed F10.7cm Radio Flux Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	76 (***)	77 (***)	78 (***)	78 (***)	79 (***)	80 (***)	80 (***)	81 (***)	82 (***)	85 (***)	88 (***)	90 (***)
2011	91 (***)	93 (***)	96 (***)	100 (***)	106 (***)	111 (***)	115 (***)	118 (***)	118 (***)	118 (***)	120 (***)	122 (***)
2012	124 (***)	127 (***)	127 (***)	126 (***)	124 (***)	121 (***)	120 (***)	119 (***)	119 (***)	119 (***)	120 (***)	120 (***)
2013	119 (***)	118 (***)	117 (***)	117 (***)	118 (***)	121 (***)	124 (***)	128 (***)	132 (***)	135 (***)	135 (***)	136 (***)
2014	137 (***)	139 (***)	141 (***)	144 (***)	145 (***)	146 (***)	145 (***)	143 (***)	140 (***)	138 (***)	137 (***)	137 (***)
2015	136 (***)	134 (***)	131 (***)	127 (***)	123 (***)	120 (***)	116 (1)	114 (1)	112 (2)	110 (3)	108 (4)	106 (4)
2016	104 (5)	104 (6)	103 (7)	102 (8)	101 (8)	99 (9)	97 (9)	96 (9)	94 (9)	93 (9)	92 (9)	90 (9)
2017	89 (9)	88 (9)	86 (9)	85 (9)	84 (9)	83 (9)	82 (9)	80 (9)	79 (9)	78 (9)	77 (9)	76 (9)
2018	75 (9)	75 (9)	74 (9)	73 (9)	72 (9)	71 (9)	71 (9)	70 (9)	69 (9)	69 (9)	68 (9)	67 (9)
2019	67 (9)	66 (9)	66 (9)	65 (9)	65 (9)	65 (9)	64 (9)	64 (9)	63 (9)	63 (9)	63 (9)	63 (9)



ISES Solar Cycle Ap Progression

Observed data through Dec 2015



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Solar Cycle Comparison charts are temporarily unavailable.



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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

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<http://spaceweather.gov/SolarCycle/> -- Solar Cycle Progression web site

<http://spaceweather.gov/contacts.html> -- Contact and Copyright information

http://spaceweather.gov/weekly/Usr_guide.pdf -- User Guide

