

Space Weather Highlights
25 April - 01 May 2016

SWPC PRF 2122
02 May 2016

Solar activity was reached low levels this period. A total of seven low-level C-class flares were observed through the week, four of which were from Region 2535 (N05, L=124, class/area=Hax/60 on 24 Apr) and the remaining three were from Region 2539 (N16, L=084, class/area=Eai/100 on 01 May). A pair of coronal mass ejections (CMEs) associated with flare activity from Region 2535 were observed in LASCO C2 coronagraph imagery at 28/0216 UTC and 28/0636 UTC, but did not impact Earth as anticipated.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached moderate levels on 25-30 Apr and was at normal levels on 01 May.

Geomagnetic field activity was quiet on 25, 28-29 Apr, quiet to unsettled on 26-27, 30 Apr, and quiet to active on 01 May.

Space Weather Outlook
02 May - 28 May 2016

Solar activity is likely to be low with a slight change for M-class flares (R1-R2 (Minor-Moderate) Radio Blackouts) on 03-16 May due to return of old Region 2529 (N09, L=342) which produced an isolated M6 flare (R2-Moderate Radio Blackout) last rotation. Very low to low levels of solar activity are likely through the remainder of the period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is likely to reach high levels on 11-13 May with normal to moderate levels expected for the remainder of the outlook period.

Geomagnetic field activity is expected to reach G1-G2 (Minor-Moderate) geomagnetic storm levels on 02 May due to an enhanced solar wind environment and prolonged southward magnetic field orientation. G1 (Minor) geomagnetic storms are likely on 11 and 20 May with active levels likely on 10, 12, 14, 19 and 21 May due to the influence of recurrent coronal hole high speed streams (CH HSSs). Quiet to unsettled field activity is expected throughout the remainder 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
25 April	82	38	140	A9.8	0	0	0	0	0	0	0	0
26 April	85	65	200	B1.4	0	0	0	7	0	0	0	0
27 April	93	86	280	B2.1	0	0	0	9	0	0	0	0
28 April	95	84	300	B2.2	4	0	0	6	0	0	0	0
29 April	92	82	300	B2.0	0	0	0	3	0	0	0	0
30 April	94	82	300	B2.1	1	0	0	1	0	0	0	0
01 May	92	76	380	B1.7	2	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
	25 April	3.9e+05	1.2e+04	3.0e+03	5.9e+06	
26 April	3.0e+05	1.2e+04	3.0e+03	6.9e+06		
27 April	8.3e+05	1.2e+04	3.2e+03	8.6e+06		
28 April	2.8e+05	1.2e+04	3.2e+03	1.4e+07		
29 April	4.6e+05	1.3e+04	3.4e+03	1.6e+07		
30 April	4.2e+05	1.3e+04	3.4e+03	7.0e+06		
01 May	2.2e+05	1.3e+04	3.1e+03	1.3e+06		

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	25 April	6	1-2-2-2-2-1-1	9	1-1-2-5-2-1-1-0	5
26 April	6	1-1-1-1-2-1-2-3	8	1-2-1-2-4-1-2-2	7	1-1-1-1-2-1-2-3
27 April	11	1-2-3-3-3-3-2-2	17	1-2-4-3-4-5-2-1	10	1-2-3-2-2-3-2-2
28 April	6	2-1-2-2-2-2-1-1	5	1-1-2-3-2-0-1-0	5	2-1-2-2-1-1-1-1
29 April	3	0-1-0-1-2-1-1-1	0	0-0-0-0-0-0-1-0	4	1-1-0-1-1-0-1-1
30 April	9	1-2-2-2-3-2-2-3	8	0-1-1-2-4-3-1-2	7	1-1-2-2-2-2-2-3
01 May	16	3-2-3-2-4-3-4-3	24	2-2-3-4-5-5-4-3	12	3-2-3-2-3-3-4-4

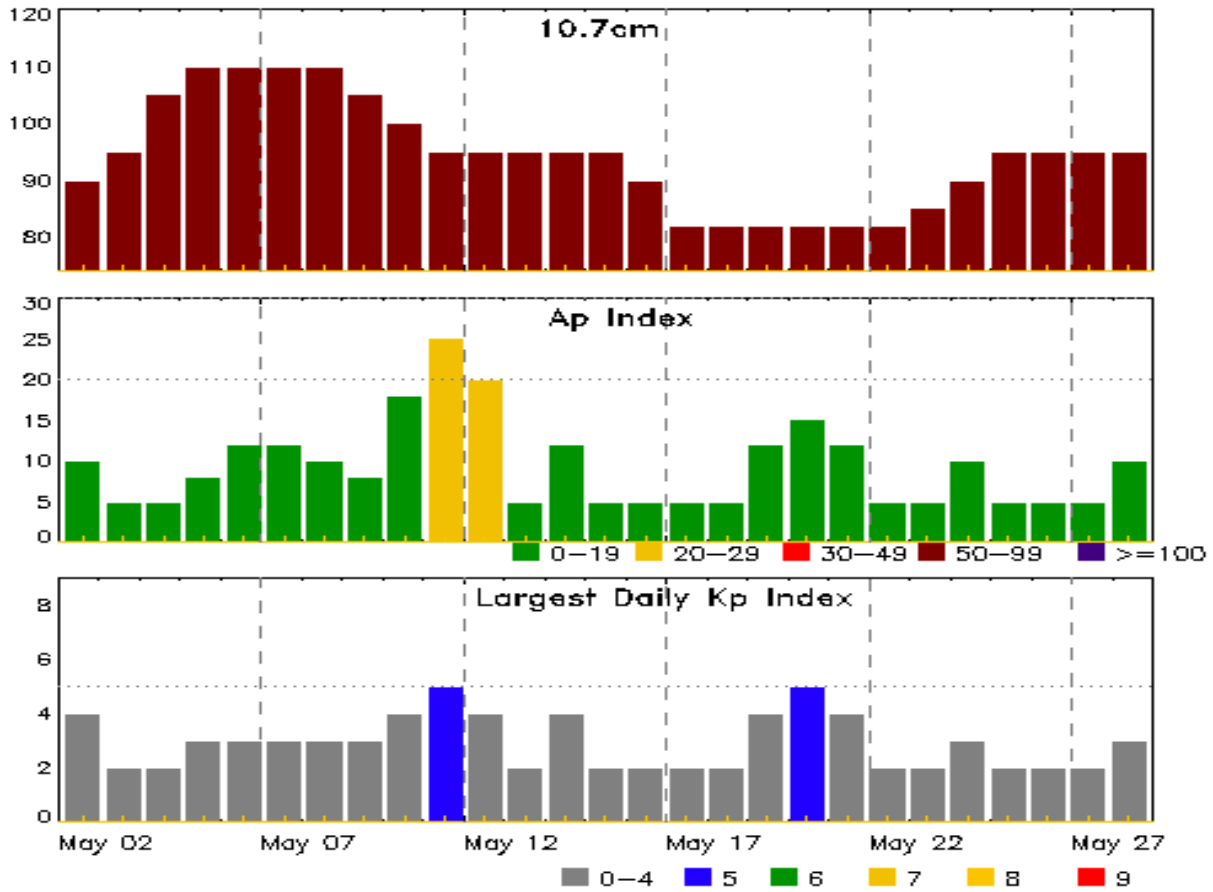


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
27 Apr 1512	WATCH: Geomagnetic Storm Category G1 predicted	
30 Apr 1453	WARNING: Geomagnetic K = 4	30/1452 - 01/0700
01 May 1419	WARNING: Geomagnetic K = 4	01/1419 - 02/0700
01 May 1932	ALERT: Geomagnetic K = 4	01/1931
01 May 2247	WARNING: Geomagnetic K = 5	01/2250 - 02/0700



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
02 May	90	10	4	16 May	90	5	2
03	95	5	2	17	82	5	2
04	105	5	2	18	82	5	2
05	110	8	3	19	82	12	4
06	110	12	3	20	82	15	5
07	110	12	3	21	82	12	4
08	110	10	3	22	82	5	2
09	105	8	3	23	85	5	2
10	100	18	4	24	90	10	3
11	95	25	5	25	95	5	2
12	95	20	4	26	95	5	2
13	95	5	2	27	95	5	2
14	95	12	4	28	95	10	3
15	95	5	2				



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	Location Lat CMD	Rgn #
	Begin	Max	End				
25 Apr	0817	0821	0828	B2.0			2532
25 Apr	1522	1527	1532	B2.9			2532
25 Apr	2004	2011	2015	B3.0			2536
26 Apr	0253	0258	0303	B4.0			2536
26 Apr	0401	0407	0410	B4.9			2536
26 Apr	0613	0616	0620	B3.5	SF	N17E63	2536
26 Apr	0651	U0659	A0711	B4.0	SF	N17E63	2536
26 Apr	0955	1001	1011	B2.5			
26 Apr	1137	1144	1149	B5.7	SF	N17E61	2536
26 Apr	1208	1224	1231		SF	N18E62	2536
26 Apr	1242	1243	1251		SF	N18E61	2536
26 Apr	1252	1258	1303	B3.3			
26 Apr	1328	1332	1336	B7.6			2536
26 Apr	1352	1354	1358		SF	N18E60	2536
26 Apr	2037	2043	2046	B8.0			
26 Apr	2128	2131	2133	B4.5			
26 Apr	2237	2239	2242		SF	N15E56	2536
27 Apr	0003	0008	0011	B4.3	SF	N13E53	2536
27 Apr	0050	0057	0105	B5.1	SF	N15E53	2536
27 Apr	0347	0351	0354	B7.2	SF	N14E50	2536
27 Apr	1011	1015	1020	B3.5			2532
27 Apr	1314	1321	1326	B5.7	SF	N04W79	2532
27 Apr	1341	1343	1351		SF	S09W46	2537
27 Apr	1350	1351	1353		SF	N14E46	2536
27 Apr	1447	1447	1456		SF	S09W47	2537
27 Apr	1536	1539	1547		SF	N18E47	2536
27 Apr	1543	1548	1555	B4.9	SF	S09W47	2537
27 Apr	1918	1923	1927	B6.9			2537
27 Apr	2113	2119	2126	B7.5			2532
28 Apr	0118	0125	0136	B8.1			2535
28 Apr	0336	0342	0346	C1.1			2535



Flare List

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
28 Apr	0557	0602	0605	C1.8			2535
28 Apr	B0638	U0639	A0656		SF	N04E26	2535
28 Apr	B0733	U0734	A0747		SF	S10W57	2537
28 Apr	B0814	U0814	A0830		SF	S10W57	2537
28 Apr	0845	0852	0855	C1.7	SF	N04E26	2535
28 Apr	0927	0932	0937	B6.2	SF	N08E24	2535
28 Apr	1246	1251	1254	C1.9	SF	N05E21	2535
28 Apr	1953	1957	2000	B5.6			
28 Apr	2318	2322	2325	B3.4			2535
29 Apr	0351	0359	0407	B6.2			2537
29 Apr	0739	0743	0747	B4.1			2537
29 Apr	1322	1323	1324	B4.7	SF	S06W77	2537
29 Apr	1328	1331	1334	B5.4			2537
29 Apr	1424	1429	1437	B5.3			2537
29 Apr	1539	1542	1557		SF	S06W77	2537
29 Apr	1657	1701	1703	B5.5	SF	N07E05	2535
29 Apr	1936	1943	1952	B4.3			2536
29 Apr	2133	2138	2141	B6.7			2537
30 Apr	0246	0251	0256	B3.6			2537
30 Apr	0429	0434	0442	B4.7			2535
30 Apr	0740	0747	0753	B6.2			2537
30 Apr	1040	1047	1052	C1.2			2539
30 Apr	1210	1217	1221	B5.2	SF	N16E07	2536
30 Apr	1232	1235	1238	B4.7			2536
30 Apr	1442	1451	1459	B5.7			2539
30 Apr	1651	1712	1724	B4.8			2537
30 Apr	2004	2022	2044	B6.9			2537
01 May	0157	0204	0215	B8.6			2537
01 May	0914	0922	0927	C2.4			2539
01 May	1003	1009	1020	B4.8			2539
01 May	1238	1242	1249	B3.0			2539
01 May	1406	1415	1428	B5.8			2540
01 May	2250	2311	2316	B5.0			2539
01 May	2330	2338	2347	C2.5			2539



Region Summary

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

Region 2523

16 Mar	S10W22	15	10	3	Bxo	3	B										
17 Mar	S09W35	15	10	2	Axx	3	A										
18 Mar	S07W50	17	plage														
19 Mar	S07W65	19	plage														
20 Mar	S07W80	21	plage														
									0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 15

Region 2532

16 Apr	N07E62	240	20	5	Cao	2	B										
17 Apr	N07E53	238	50	2	Cao	5	B										
18 Apr	N06E40	237	30	5	Hax	3	A										
19 Apr	N06E27	238	40	6	Cao	3	B										
20 Apr	N06E13	239	30	4	Cao	3	B										
21 Apr	N06W01	239	20	4	Cro	3	B										
22 Apr	N06W12	237	10	1	Axx	1	A										
23 Apr	N06W27	239	plage														
24 Apr	N05W41	239	40	4	Cao	3	B										
25 Apr	N05W55	241	10	4	Bxo	5	B										
26 Apr	N06W68	240	10	6	Bxo	4	B										
27 Apr	N05W82	241	20	3	Cro	2	B				1						
									0	0	0	1	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 239



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 2533																					
20 Apr	S02E68	184	60	2	Hsx	1	A														
21 Apr	S02E54	184	60	2	Hsx	1	A														
22 Apr	S02E43	182	60	1	Hsx	1	A														
23 Apr	S02E30	180	80	1	Hsx	1	A														
24 Apr	S02E15	182	100	2	Hsx	1	A														
25 Apr	S02E01	185	100	2	Hsx	1	A														
26 Apr	S02W10	182	100	2	Hsx	1	A														
27 Apr	S03W24	183	110	3	Hsx	1	A														
28 Apr	S02W37	183	90	2	Hsx	1	A														
29 Apr	S02W50	183	80	2	Hsx	1	A														
30 Apr	S03W64	183	80	2	Hsx	1	A														
01 May	S03W78	184	70	2	Hsx	1	A														
												0	0	0	0	0	0	0	0	0	

Still on Disk.
 Absolute heliographic longitude: 185

Region 2534																					
24 Apr	N06E48	149	10	1	Axx	1	A														
25 Apr	N11E35	151	plage																		
26 Apr	N11E21	151	plage																		
27 Apr	N11E07	152	plage																		
28 Apr	N11W07	153	plage																		
29 Apr	N11W21	154	plage																		
30 Apr	N11W35	154	plage																		
01 May	N11W49	155	plage																		
												0	0	0	0	0	0	0	0	0	

Still on Disk.
 Absolute heliographic longitude: 152



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 2535																							
24 Apr	N05E74	124	60	1	Hax	1	A																
25 Apr	N05E59	127	30	1	Hax	2	A																
26 Apr	N06E45	127	30	1	Hax	1	A																
27 Apr	N06E30	129	20	1	Hsx	2	A																
28 Apr	N07E16	130	30	4	Cao	5	B	4				4											
29 Apr	N06E02	131	30	3	Cao	5	B						1										
30 Apr	N06W12	131	30	3	Cao	3	B																
01 May	N06W27	133	40	2	Hax	3	A																
								4	0	0		5	0	0	0	0							

Still on Disk.

Absolute heliographic longitude: 131

Region 2536																							
26 Apr	N15E55	117	40	3	Dao	5	B						7										
27 Apr	N15E41	118	80	4	Dao	9	B						5										
28 Apr	N16E28	118	70	6	Dai	7	B																
29 Apr	N16E16	117	90	6	Dai	8	B																
30 Apr	N16E02	117	100	5	Dai	9	B						1										
01 May	N16W11	117	150	5	Dai	11	B																
								0	0	0		13	0	0	0	0							

Still on Disk.

Absolute heliographic longitude: 117

Region 2537																							
26 Apr	S07W36	208	20	3	Cro	4	B																
27 Apr	S07W50	209	40	6	Dao	9	B						3										
28 Apr	S07W65	211	80	8	Dai	9	B						2										
29 Apr	S09W77	210	70	10	Dso	5	B						2										
30 Apr	S09W90	209	20	2	Hax	1	A																
								0	0	0		7	0	0	0	0							

Crossed West Limb.

Absolute heliographic longitude: 208



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 2538																	
27 Apr	S04E34	125	10	3	Bxo	3	B										
28 Apr	S04E22	124	0		Axx	1	A										
29 Apr	S04E07	126	0	1	Axx	1	A										
30 Apr	S04W08	127	plage														
01 May	S04W23	129	plage														
								0	0	0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 126

Region 2539																	
28 Apr	N17E66	80	30	2	Hax	1	A										
29 Apr	N17E51	82	30	2	Cao	2	B										
30 Apr	N17E38	81	50	8	Cao	6	B	1									
01 May	N16E22	84	100	12	Eai	8	B	2									
								3	0	0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 84

Region 2540																	
30 Apr	N21E51	68	20	2	Hrx	2	A										
01 May	N21E38	68	20	2	Hrx	3	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 68

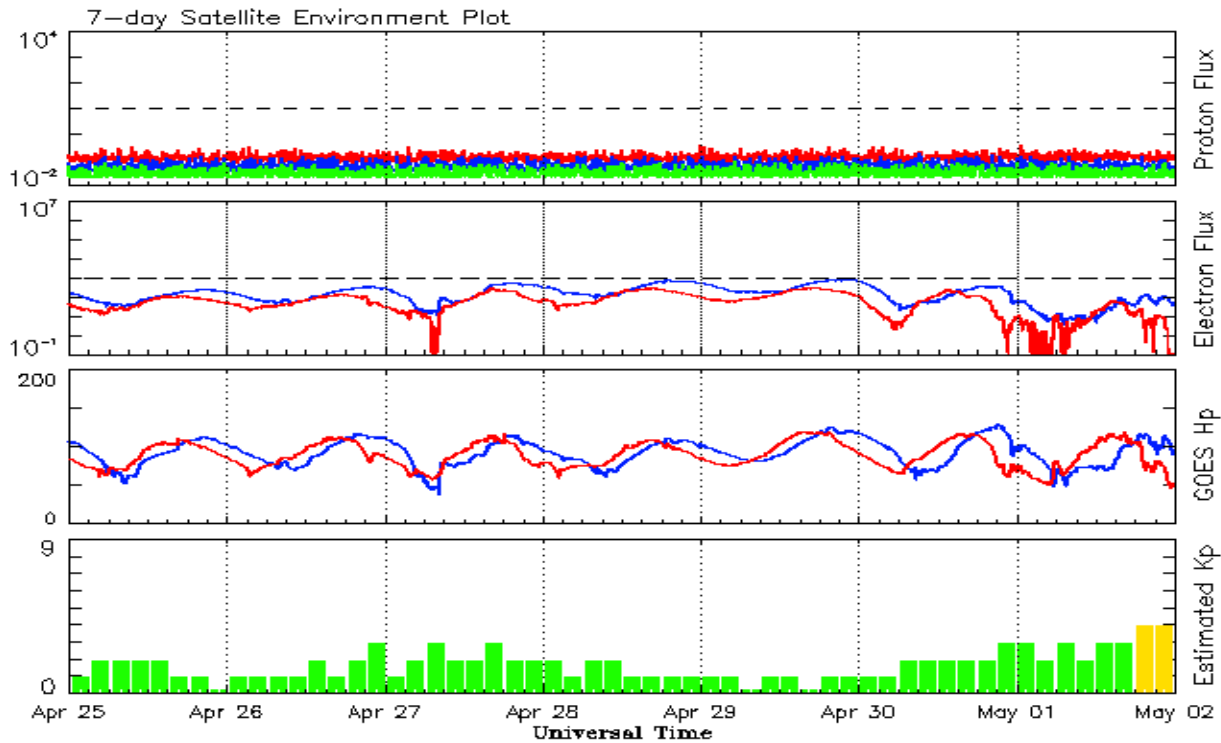


Recent Solar Indices (preliminary)
Observed monthly mean values

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										
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	45.7	120.1	123.3	9	12.7	
June	77.3	39.9	0.53	73.1	43.3	123.2	119.5	14	13.0	
July	68.4	39.5	0.58	68.2	41.0	107.0	116.0	10	13.1	
August	61.6	38.6	0.63	65.5	39.8	106.2	113.3	16	13.1	
September	72.5	47.2	0.65	64.0	39.6	102.1	110.8	16	12.8	
October	59.5	38.2	0.62	61.8	38.6	104.1	107.9	15	12.5	
November	61.8	37.3	0.61			109.6		13		
December	54.1	34.8	0.64			112.8		15		
2016										
January	50.4	34.0	0.67			103.5		10		
February	56.0	34.3	0.61			103.5		10		
March	40.9	32.9	0.80			91.6		11		
April	39.2	22.8	0.58			93.4		10		

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 25 April 2016*

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.

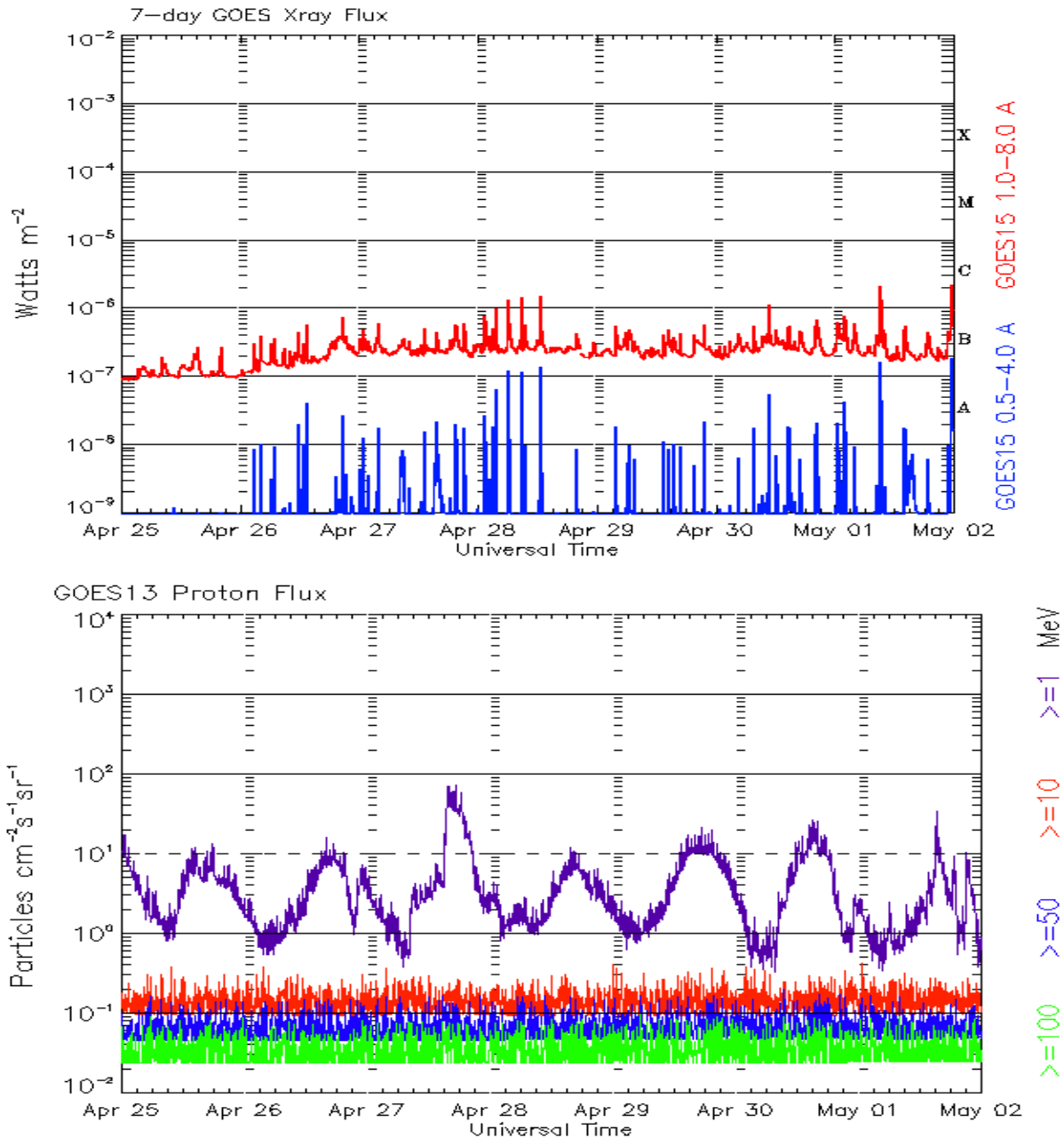
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 25 April 2016*

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)

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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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