

Space Weather Highlights
16 March - 22 March 2015

SWPC PRF 2064
23 March 2015

Solar activity was at moderate levels to begin the week. Region 2297 (S17, L=196 class/area Dkc/420 on 13 Mar) produced a pair of M1/2n flares at 16/1058 UTC and 17/2334 UTC. Solar activity was at very low to low levels for the rest of the week. Region 2302 (N12, L=189 class/area Cai/080 on 19 Mar) produced a C9/Sf at 18/0751 UTC as well as several low-level C-class events. Region 2297 also continued to produce C-class activity through the remainder of the period.

The greater than 10 MeV proton flux at geosynchronous orbit was enhanced following a long duration C9/1f flare observed at 15/0213 UTC. The alert threshold was not reached however, as the peak flux observed was 8.5 pfu at 16/0755 UTC.

The greater than 2 MeV electron flux at geosynchronous orbit began the period at normal levels but reached high levels from 18-22 Mar with a peak flux of 22,300 pfu on 20 Mar.

Geomagnetic field activity began at quiet to unsettled levels. Quiet to severe storm levels were observed on 17 Mar followed by minor to major storm levels on 18 Mar due to effects from the 15 Mar CME. Unsettled to minor storm levels were observed on 19-20 Mar due to waning CME effects and the onset of the southern polar coronal hole high speed stream (CH HSS). Quiet to active conditions prevailed on 21 Mar. An isolated major storm period was observed between 0600-0900 UTC on 22 Mar followed by active conditions but settled to quiet levels by 1800 UTC. This activity initially looked to be caused by a co-rotating interactive region ahead of a positive polarity high speed stream but it is difficult to ascertain the true origin as the phi angle settled back to negative following the event. It is possible that a transient caused the increase in activity however, a source could not be easily identified.

Space Weather Outlook
23 March - 18 April 2015

Solar activity is expected to be at low levels to begin the period. Moderate activity is expected from 01-15 Apr with the anticipated return of old Region 2297 followed by low levels 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 at normal to moderate levels for the majority of the period with a chance for high levels following southern polar coronal hole high speed stream (CH HSS) effects on 30 Mar-01 Apr, 04-06 Apr, and 14-18 Apr.

Geomagnetic field activity is expected to reach minor storm levels on 23 Mar followed by unsettled to active levels on 24-25 Mar due to positive polarity CH HSS effects. Mostly quiet conditions are expected on 26 Mar. Conditions are expected to increase to unsettled to active



levels from 27-31 Mar with minor storms likely on 28-29 Mar due to recurrent southern polar CH HSS effects. Mostly quiet conditions are expected to prevail from 01-11 Apr with unsettled conditions possible on 03-04 Apr due to positive polarity CH HSS effects. Unsettled to active conditions are expected from 12-18 Apr with minor storm conditions likely on 13-15 Apr due to a second round of southern polar CH HSS effects.



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
16 March	117	57	390	B3.6	6	1	0	9	2	1	0	0
17 March	114	60	810	B3.3	2	1	0	4	0	1	0	0
18 March	115	44	470	B6.0	18	0	0	18	1	0	0	0
19 March	109	71	420	B3.5	2	0	0	8	0	0	0	0
20 March	113	27	120	B4.8	1	0	0	0	0	0	0	0
21 March	114	40	260	B4.0	2	0	0	0	0	0	0	0
22 March	122	88	380	B4.0	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
	16 March	7.9e+07	2.6e+05	2.3e+03		1.3e+06
17 March	6.0e+07	6.0e+04	1.9e+03		3.0e+05	
18 March	6.3e+06	1.2e+04	2.3e+03		4.8e+07	
19 March	7.0e+06	1.0e+04	2.4e+03		5.0e+08	
20 March	1.2e+06	1.0e+04	2.6e+03		7.6e+08	
21 March	9.0e+05	1.0e+04	2.5e+03		7.9e+08	
22 March	2.7e+06	1.0e+04	2.3e+03		2.7e+08	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	16 March	9	2-3-3-2-2-2-2-2	0	0-0-0-0-0-0-0-0	11
17 March	46	2-4-5-4-6-5-5-6	106	2-3-6-6-8-8-7-5	117	2-5-6-6-8-8-7-8
18 March	32	5-4-3-4-5-5-3-4	60	4-4-6-6-6-7-4-3	52	6-5-4-5-5-6-5-5
19 March	19	4-4-3-4-4-2-2-3	47	3-4-5-6-7-4-4-3	28	4-4-4-5-5-3-3-4
20 March	18	4-2-4-3-3-3-2-4	32	4-3-5-6-4-3-4-3	24	5-3-5-3-3-3-3-5
21 March	12	4-2-3-3-2-2-2-2	18	3-2-5-4-4-2-2-1	14	4-3-4-3-2-2-2-2
22 March	16	2-3-5-4-3-2-1-1	39	2-3-7-5-6-3-1-1	24	2-3-6-4-4-1-1-1



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
16 Mar 0453	WARNING: Geomagnetic K = 4	16/0452 - 1300
16 Mar 0801	WARNING: Proton 10MeV Integral Flux > 10pfu	16/0800 - 2359
16 Mar 2355	EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu	16/0800 - 17/2359
17 Mar 0412	WARNING: Geomagnetic Sudden Impulse expected	17/0430 - 0530
17 Mar 0413	WARNING: Geomagnetic K = 4	17/0430 - 1400
17 Mar 0450	WARNING: Geomagnetic K = 5	17/0449 - 1300
17 Mar 0453	SUMMARY: Geomagnetic Sudden Impulse	17/0435
17 Mar 0502	ALERT: Geomagnetic K = 4	17/0447
17 Mar 0533	WARNING: Geomagnetic K = 6	17/0545 - 1000
17 Mar 0609	ALERT: Geomagnetic K = 5	17/0559
17 Mar 0830	CANCELLATION: Geomagnetic Sudden Impulse	
17 Mar 0831	SUMMARY: Geomagnetic Sudden Impulse	17/0445
17 Mar 0848	EXTENDED WARNING: Geomagnetic K = 5	17/0449 - 1600
17 Mar 0848	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 1900
17 Mar 0848	EXTENDED WARNING: Geomagnetic K = 6	17/0545 - 1300
17 Mar 0848	ALERT: Geomagnetic K = 6	17/0846
17 Mar 1127	ALERT: Geomagnetic K = 6	17/1125
17 Mar 1216	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 2300
17 Mar 1216	EXTENDED WARNING: Geomagnetic K = 5	17/0449 - 2100
17 Mar 1216	WARNING: Geomagnetic K >= 7	17/1215 - 1700
17 Mar 1216	EXTENDED WARNING: Geomagnetic K = 6	17/0545 - 1900
17 Mar 1324	ALERT: Geomagnetic K = 6	17/1320
17 Mar 1334	ALERT: Geomagnetic K = 7	17/1330
17 Mar 1401	ALERT: Geomagnetic K = 8	17/1358
17 Mar 1527	ALERT: Geomagnetic K = 6	17/1524
17 Mar 1642	EXTENDED WARNING: Geomagnetic K >= 7	17/1215 - 1900
17 Mar 1642	ALERT: Geomagnetic K = 7	17/1637
17 Mar 1757	ALERT: Geomagnetic K = 8	17/1754



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
17 Mar 1808	WATCH: Geomagnetic Storm Category G2 predicted	
17 Mar 1844	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 18/1000
17 Mar 1844	EXTENDED WARNING: Geomagnetic K = 5	17/0449 - 18/0800
17 Mar 1844	EXTENDED WARNING: Geomagnetic K = 6	17/0545 - 18/0700
17 Mar 1844	EXTENDED WARNING: Geomagnetic K \geq 7	17/1215 - 2300
17 Mar 1844	ALERT: Geomagnetic K = 6	17/1840
17 Mar 2034	ALERT: Geomagnetic K = 7	17/2030
17 Mar 2155	ALERT: Geomagnetic K = 6	17/2155
17 Mar 2257	WATCH: Geomagnetic Storm Category G3 predicted	
17 Mar 2257	EXTENDED WARNING: Geomagnetic K \geq 7	17/1215 - 18/0600
17 Mar 2313	ALERT: Geomagnetic K = 7	17/2306
17 Mar 2328	ALERT: Geomagnetic K = 8	17/2324
18 Mar 0001	ALERT: Type II Radio Emission	17/2332
18 Mar 0032	ALERT: Geomagnetic K = 5	18/0028
18 Mar 0119	ALERT: Geomagnetic K = 6	18/0113
18 Mar 0835	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 18/1600
18 Mar 0835	WARNING: Geomagnetic K = 5	18/0835 - 1300
18 Mar 1204	ALERT: Geomagnetic K = 5	18/1159
18 Mar 1248	EXTENDED WARNING: Geomagnetic K = 5	18/0835 - 1600
18 Mar 1529	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 18/2300
18 Mar 1529	EXTENDED WARNING: Geomagnetic K = 5	18/0835 - 2300
18 Mar 1534	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	18/1515
18 Mar 1600	WARNING: Geomagnetic K = 6	18/1600 - 1900
18 Mar 1649	ALERT: Geomagnetic K = 6	18/1644
18 Mar 1937	WATCH: Geomagnetic Storm Category G1 predicted	
18 Mar 2238	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 19/0600
18 Mar 2238	EXTENDED WARNING: Geomagnetic K = 5	18/0835 - 19/0300
19 Mar 0234	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 19/1300
19 Mar 0234	EXTENDED WARNING: Geomagnetic K = 5	18/0835 - 19/1000



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
19 Mar 0538	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	18/1515
19 Mar 0952	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 19/1600
19 Mar 0952	EXTENDED WARNING: Geomagnetic K = 5	18/0835 - 19/1300
19 Mar 1257	EXTENDED WARNING: Geomagnetic K = 5	18/0835 - 19/1600
19 Mar 1550	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 19/2200
19 Mar 2143	WATCH: Geomagnetic Storm Category G1 predicted	
19 Mar 2143	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 20/0500
20 Mar 0131	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 20/0800
20 Mar 0131	WARNING: Geomagnetic K = 5	20/0129 - 0600
20 Mar 0300	ALERT: Geomagnetic K = 5	20/0259
20 Mar 0501	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	18/1515
20 Mar 0635	WARNING: Geomagnetic K = 5	20/0635 - 1300
20 Mar 0635	EXTENDED WARNING: Geomagnetic K = 4	17/0430 - 20/1600
20 Mar 0658	ALERT: Geomagnetic K = 5	20/0658
20 Mar 1356	WATCH: Geomagnetic Storm Category G1 predicted	
20 Mar 1659	WARNING: Geomagnetic K = 4	20/1700 - 2300
20 Mar 2230	ALERT: Geomagnetic K = 4	20/2230
20 Mar 2242	EXTENDED WARNING: Geomagnetic K = 4	20/1700 - 21/1400
20 Mar 2242	WARNING: Geomagnetic K = 5	20/2240 - 21/0500
20 Mar 2243	WATCH: Geomagnetic Storm Category G1 predicted	
21 Mar 0004	ALERT: Geomagnetic K = 5	20/2359
21 Mar 0501	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	18/1515
21 Mar 1302	EXTENDED WARNING: Geomagnetic K = 4	20/1700 - 22/1400
22 Mar 0501	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	18/1515
22 Mar 0623	WARNING: Geomagnetic K = 5	22/0625 - 1400
22 Mar 0727	ALERT: Geomagnetic K = 5	22/0725
22 Mar 0727	WARNING: Geomagnetic K = 6	22/0725 - 1200

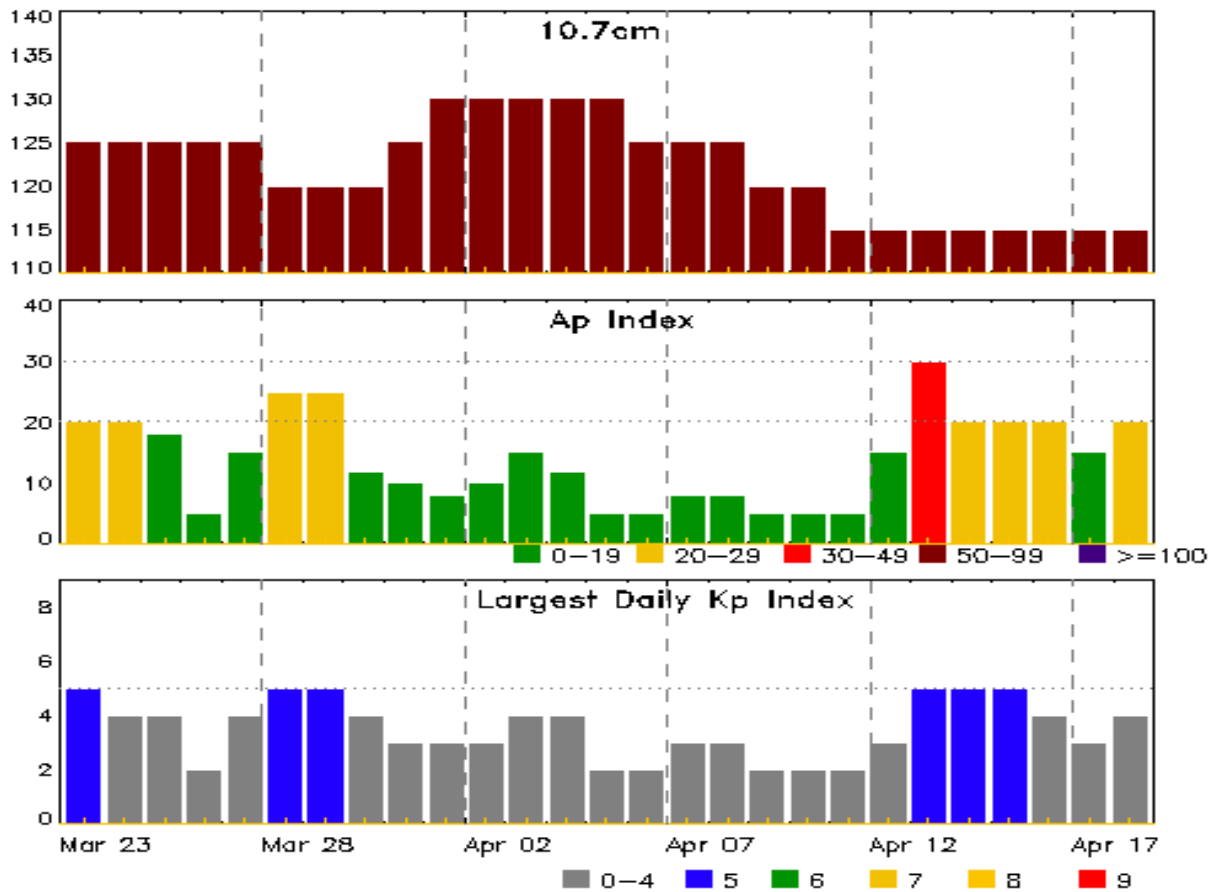


Alerts and Warnings Issued

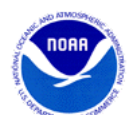
Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
22 Mar 0733	ALERT: Geomagnetic K = 6	22/0733
22 Mar 1325	EXTENDED WARNING: Geomagnetic K = 5	22/0625 - 23/0400
22 Mar 1325	EXTENDED WARNING: Geomagnetic K = 4	20/1700 - 23/1000



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
23 Mar	125	20	5	06 Apr	125	5	2
24	125	20	4	07	125	8	3
25	125	18	4	08	125	8	3
26	125	5	2	09	120	5	2
27	125	15	4	10	120	5	2
28	120	25	5	11	115	5	2
29	120	25	5	12	115	15	3
30	120	12	4	13	115	30	5
31	125	10	3	14	115	20	5
01 Apr	130	8	3	15	115	20	5
02	130	10	3	16	115	20	4
03	130	15	4	17	115	15	3
04	130	12	4	18	115	20	4
05	130	5	2				

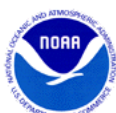


Energetic Events

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	Intensity IV
16 Mar	1039	1058	1117	M1.6	0.025	2N	S17W39	2297				
17 Mar	2249	2334	2348	M1.0	0.014	2N	S21W56	2297	1500	110	2	

Flare List

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
16 Mar	0000	U0047	0116		SF	S18W31	2297
16 Mar	0324	0341	0358		SF	S17W34	2297
16 Mar	0417	0421	0424	B8.0			2297
16 Mar	0721	0725	0731	B6.4	SF	S22W37	2297
16 Mar	0818	0823	0828	B8.7	SF	S17W37	2297
16 Mar	0833	0952	0959	C1.8	SF	S16W37	2297
16 Mar	0938	0952	0959	C1.9	SF	S18W38	2297
16 Mar	1016	1020	1024	B9.6			2297
16 Mar	1039	U1057	A1151	M1.6	2N	S17W39	2297
16 Mar	1255	1259	1301	C1.1			2297
16 Mar	1349	1354	1359	C2.8	SF	S16W41	2297
16 Mar	1755	1759	1801	B8.7			2297
16 Mar	1842	1845	1847	B6.2			2297
16 Mar	1945	1946	1949		SF	N11W38	2297
16 Mar	2000	2015	2033		1N	S17W44	2297
16 Mar	2012	2015	2020	C5.5			2297
16 Mar	2038	2049	2100	C8.1	1N	S22W48	2297
16 Mar	2332	2332	2340		SF	S15W50	2297
17 Mar	0145	0152	0154	C1.9	SF	S19W48	2297
17 Mar	0343	0345	0347		SF	S18W50	2297
17 Mar	0931	0935	0936		SF	S18W50	2297
17 Mar	2114	2119	2125	C1.1			
17 Mar	2249	2334	2348	M1.0	2N	S21W56	2297
17 Mar	2256	2308	2348		SF	N10W54	2302
18 Mar	0213	0220	0245	C1.7	SF	S20W60	2297
18 Mar	0244	0244	0246		SF	N10W57	2302
18 Mar	0340	0359	0419	C6.1	1N	S20W60	2297
18 Mar	0455	0457	0459		SF	S21W60	2297
18 Mar	0504	0508	0531		SF	S22W62	2297



Flare List

Date	Time			X-ray Class	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
18 Mar	0641	0658	0720	C3.9	SF	N10W59		2302
18 Mar	0734	0736	0741	C9.3	SF	N10W59		2302
18 Mar	0827	0828	0831		SF	N08W59		2302
18 Mar	0832	0951	1000	C2.8	SF	N08W61		2302
18 Mar	B0949	U1006	1026		SF	S25W61		2297
18 Mar	1016	1031	1051	C5.5	SF	N08W61		2302
18 Mar	1051	1102	1106		SF	S24W66		2297
18 Mar	1059	1101	1103		SF	N08W62		2302
18 Mar	1115	1120	1125	C1.1				2302
18 Mar	1150	1150	1152		SF	N08W62		2302
18 Mar	1221	1227	1230	C1.0	SF	S21W67		2297
18 Mar	1247	1314	1325	C3.8	SF	N09W66		2302
18 Mar	1353	1357	1403	B7.4				2297
18 Mar	1419	1424	1427	C1.3				2297
18 Mar	1427	1432	1436	C1.4				2302
18 Mar	1605	1610	1615	C3.5				2302
18 Mar	1618	1631	1642	C7.6				2297
18 Mar	1756	1800	1802	C2.3				2302
18 Mar	1831	1836	1840	C2.2				2297
18 Mar	2059	2102	2104	C1.3				2302
18 Mar	2230	2236	2241	C2.0				2302
18 Mar	2255	2301	2305	C3.4	SF	N10W66		2302
18 Mar	2302	2309	2316		SF	S20W70		2297
18 Mar	2333	2337	2339		SF	N11W68		2302
19 Mar	0009	0011	0015		SF	N11W68		2302
19 Mar	0018	0019	0023		SF	N11W68		2302
19 Mar	0044	0130	0148	B9.5	SF	N10W63		2302
19 Mar	0120	0131	0134	C2.2				2302
19 Mar	0204	0205	0213		SF	N11W68		2302
19 Mar	0238	0240	0247		SF	S20W72		2297
19 Mar	0342	0344	0347		SF	S20W72		2297
19 Mar	0424	0431	0437		SF	S18W72		2297
19 Mar	1233	1302	1314	C1.2				2297
19 Mar	B2231	2314	2329		SF	N02W77		
19 Mar	2349	2352	2355	B5.6				
20 Mar	0057	0133	0211	C7.9				2297
20 Mar	2159	2206	2217	B7.9				
21 Mar	0000	0004	0007	B6.8				



Flare List

Date	Time			Optical			Rgn #
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	
21 Mar	0013	0018	0023	C1.4			2297
21 Mar	0735	0809	0925	C1.7			
22 Mar	2133	2139	2146	C1.1			
22 Mar	2212	2218	2224	C1.3			



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 2297																							
05 Mar	S17E95		195	plage					3	1													
06 Mar	S17E81		195	30	3	Hrx	1	A	6	2		1											
07 Mar	S17E66		197	180	9	Dsi	10	BG	4	1		2											
08 Mar	S17E52		198	260	10	Dhc	13	BGD	2			5	2										
09 Mar	S16E39		196	260	10	Dac	19	BD	10	2		14	6	1									
10 Mar	S16E26		197	280	10	Dkc	32	BGD	13	2		21		1									
11 Mar	S16E14		196	350	8	Dkc	19	BGD	12	3	1	8	3	1									
12 Mar	S16W00		197	340	9	Dkc	20	BGD	8	5													
13 Mar	S17W13		196	420	10	Dkc	23	BGD	6	2		4											
14 Mar	S17W25		196	320	13	Ekc	21	BGD	12	1		13	1	1									
15 Mar	S18W38		195	370	13	Ekc	21	BGD	7	2		10	2										
16 Mar	S17W52		196	380	11	Ekc	24	BGD	6	1		9	2	1									
17 Mar	S16W64		194	390	16	Fkc	17	BGD	1	1		3		1									
18 Mar	S17W77		193	290	12	Ekc	6	BGD	6			7	1										
19 Mar	S17W88		193	250	12	Cko	6	BG	1			3											
									97	23	1	100	17	7	0	0							

Crossed West Limb.

Absolute heliographic longitude: 197

Region 2299

12 Mar	S07E60		137	10	2	Cro	3	B	2														
13 Mar	S07E47		136	10	5	Bxo	4	B															
14 Mar	S05E32		139	10	1	Axx	1	A															
15 Mar	S05E19		138	10	1	Axx	1	A															
16 Mar	S04E05		139	0	1	Axx	1	A															
17 Mar	S04W10		141	plage																			
18 Mar	S04W25		143	plage																			
19 Mar	S04W38		143	10	3	Bxo	2	B															
20 Mar	S04W53		144	plage																			
21 Mar	S04W68		146	plage																			
22 Mar	S04W82		147	plage																			
									2	0	0	0	0	0	0	0	0	0					

Still on Disk.

Absolute heliographic longitude: 139



Region Summary - continued

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

Region 2300

13 Mar	N13W51	234	10	3	Bxo	3	B										
14 Mar	N13W63	234	plage														
15 Mar	N13W77	234	plage														
									0	0	0	0	0	0	0	0	0

Died on Disk.

Absolute heliographic longitude: 234

Region 2301

13 Mar	S16E13	170	20	3	Cro	4	B										
14 Mar	S16W00	171	20	3	Cro	4	B										
15 Mar	S17W13	170	10	2	Bxo	2	B				1						
16 Mar	S16W27	171	10	1	Axx	2	A										
17 Mar	S16W41	172	10	1	Axx	1	A										
18 Mar	S16W55	173	plage														
19 Mar	S16W69	174	plage														
20 Mar	S16W83	174	plage														
									0	0	0	1	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 171

Region 2302

17 Mar	N10W54	184	10	1	Cri	1	B				1						
18 Mar	N10W73	189	80	7	Cai	7	BG	12			11						
19 Mar	N12W84	189	80	7	Cai	8	BG	1			4						
								13	0	0	16	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 184

Region 2303

17 Mar	N19E65	66	400	2	Hkx	1	A										
18 Mar	N19E51	67	100	2	Hax	1	A										
19 Mar	N18E39	65	70	3	Hax	2	A										
20 Mar	N19E25	66	110	2	Hsx	2	A										
21 Mar	N19E11	67	120	2	Hsx	1	A										
22 Mar	N20W02	67	100	3	Cso	4	B										
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 67



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 2304

19 Mar	N17W31	135	10	2	Cro	3	B										
20 Mar	N16W45	136	10	4	Bxo	5	B										
21 Mar	N16W59	137	plage														
22 Mar	N16W73	138	plage														
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 135

Region 2305

21 Mar	S08E67	11	120	4	Dao	5	B										
22 Mar	S08E58	7	220	11	Eac	10	BG										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 7

Region 2306

21 Mar	S17W52	130	20	3	Cro	4	B										
22 Mar	S18W66	131	10	2	Bxo	2	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 130

Region 2307

22 Mar	S18E24	41	20	4	Cro	5	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 41

Region 2308

22 Mar	N17W46	111	20	4	Cao	4	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 111



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares									
	Lat CMD	Lon	Heli 10 ⁻⁶ hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
									C	M	X	S	1	2	3	4
<i>Region 2309</i>																
22 Mar	N11W11	76	10	4	Bxo	3	B	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 76

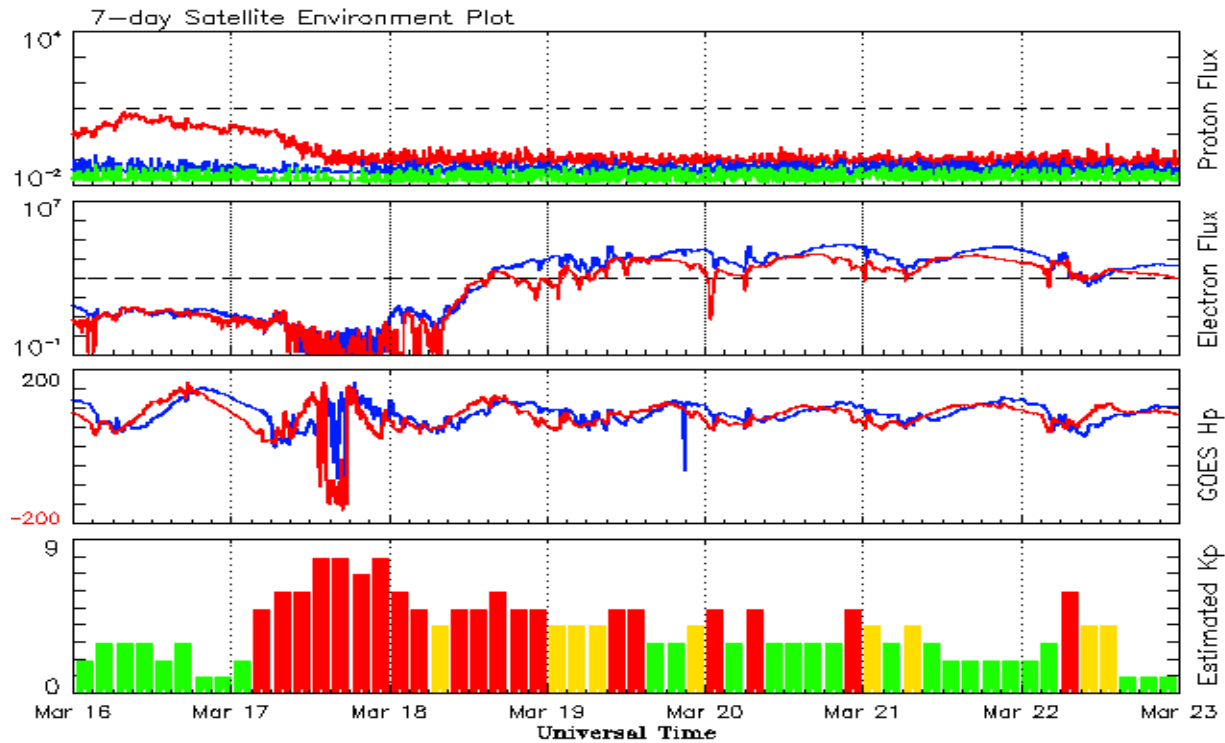


Recent Solar Indices (preliminary)
Observed monthly mean values

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									
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	120.4	78.6	137.3	145.2	5	8.8
August	106.2	74.6	0.70	115.1	75.6	124.7	142.8	9	8.9
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	
2015									
January	101.2	67.0	0.66			141.7		10	
February	70.6	44.8	0.63			128.8		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 16 March 2015*

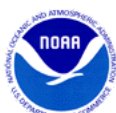
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

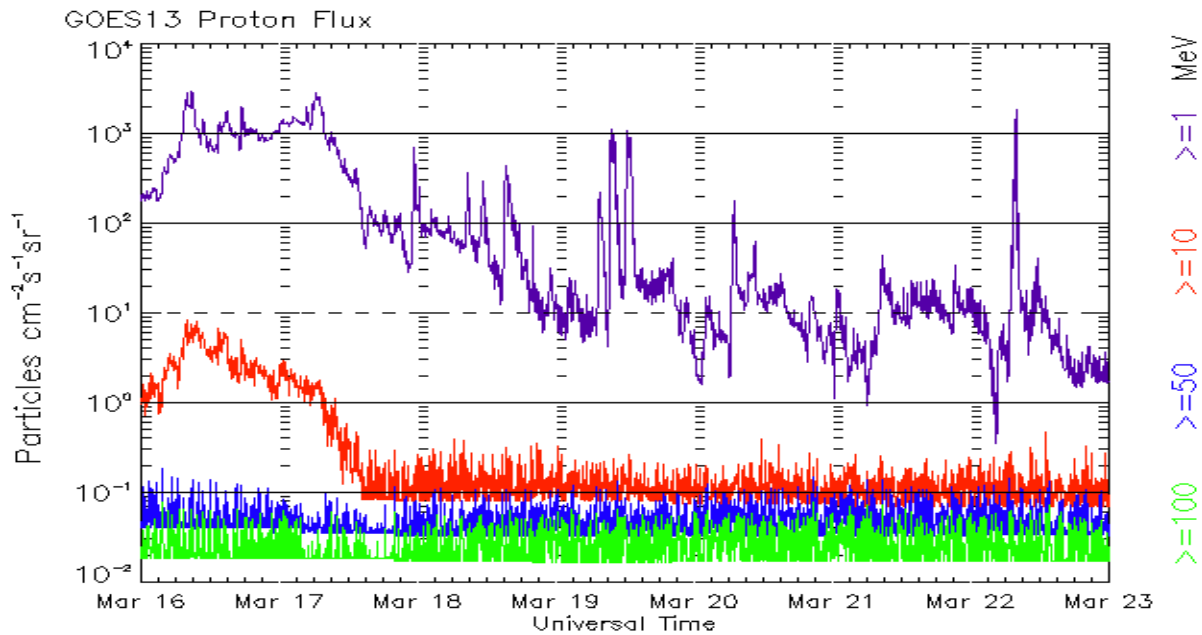
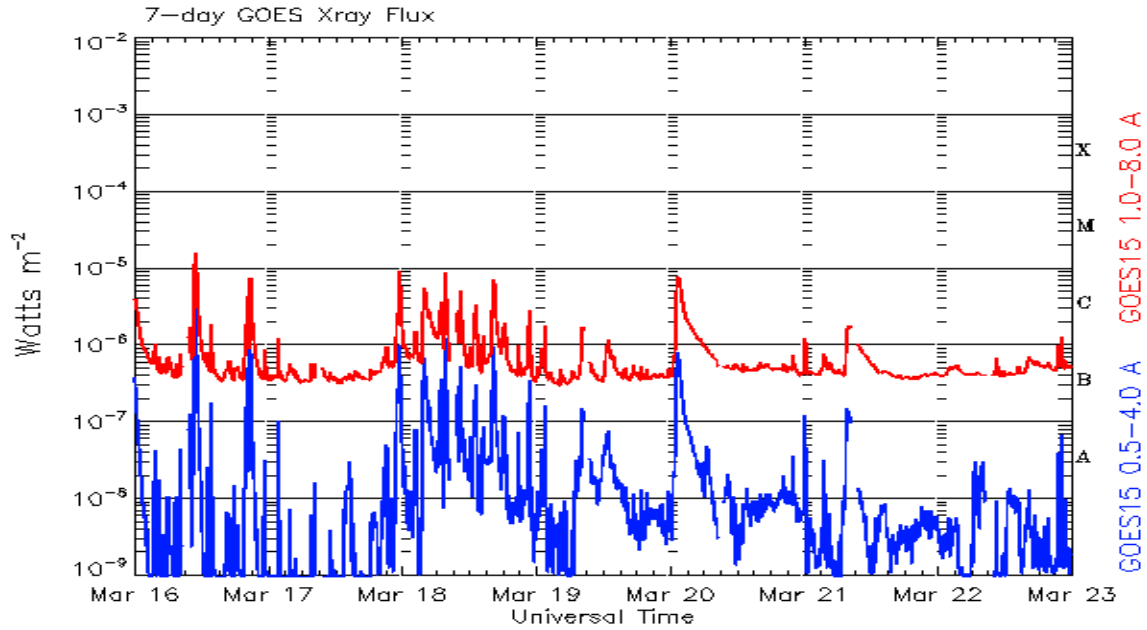
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 16 March 2015*

The x-ray plots contains five-minute averages x-ray flux ($Watt/m^2$) 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 integral flux units (pfu = protons/ cm^2 -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.



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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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