

Solar activity was at low levels on 30 December and 05 January. Between 31 December through 04 January, solar activity reached moderate levels due to multiple M-class flares from both Regions 1936 (S16, L=225, class/area Eac/280 on 31 December) and 1944 (S09, L=099, class/area Fkc/1480 on 05 January). Region 1936 produced M-class flares on 31 December, 01 January, and 04 January. It also produced the largest flare of the period, an M9/2b at 01/1852 UTC along with a non-Earth directed coronal mass ejection (CME). On 01 January, Region 1944 rotated onto the southeast limb as one of the largest sunspot groups of solar cycle 24. During the period it produced a total of six M-class flares. The largest of these was a long duration M4 at 04/1946. The source of the flare was actually slightly westward of the sunspots, however extreme ultraviolet imagery showed that the flare loops were connected to the larger leader spot. A Type IV radio sweep and a 550 sfu Tenflare was associated with this flare along with an asymmetric full halo CME (approximate speed of 811 km/s). The CME was first observed in SOHO/LASCO C2 imagery at 04/2148 UTC with the majority of the ejecta slightly south of the ecliptic, however an Earth-directed component was determined to be very likely.

The period started off with the greater than 10 MeV proton flux at geosynchronous orbit enhanced but in decline below the 10 pfu threshold on 30 December which originated from backside activity on 28 December. By 31 December, proton flux levels had returned to near background levels. Conditions continued at background levels until another enhancement below the 10 pfu threshold was observed beginning at 05/0115 UTC, likely associated with the M4 flare from Region 1944 late on 04 January. Proton flux levels peaked at 0.8 pfu at 05/1405 UTC before beginning to slowly decline by the end of the period.

The greater than 2 MeV electron flux at geosynchronous orbit was at low levels from 30 December through 01 January. High levels were observed on 02 January with a peak flux of 1780 pfu at 02/1950 UTC. From 03 January through the end of the period, the electron flux continuously reached moderate levels. Moderate to high levels were in response to coronal hole high speed stream (CH HSS) influence.

Geomagnetic field activity was at quiet levels on 30-31 December and again on 04-05 January. On 01 January, total field began to rise to near 17 nT with the Bz component between +9 nT and -14 nT by mid-day on 01 January followed by an increase in solar wind speed and temperature indicative of a co-rotating interaction region followed by a positive polarity CH HSS. Solar wind speed rose to a maximum near 670 km/s by 02/2100 UTC before slowly declining towards background levels through the end of the period. The geomagnetic field responded with quiet to active levels on 01 January, quiet to minor storm levels on 02 January, and quiet to unsettled levels on 03 January.



## **Space Weather Outlook 06 January - 01 February 2014**

Solar activity is expected to be at moderate levels with a chance for high levels through 15 January when Region 1944 rounds the west limb. Moderate to high levels of activity are again possible after 28 January with the anticipated return of Region 1944. For the remainder of the period, activity is expected to be low with a chance for moderate levels.

There is an increasing chance for proton events at geosynchronous orbit, particularly between 08-15 January as Region 1944 crosses the central meridian and moves towards an ever more favorable position. The threat decreases after 15 January as Region 1944 rounds the west limb. The remainder of the period should see a low potential for proton events in the absence of any new large region development.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels during the forecast period.

Geomagnetic field activity is expected to reach active to minor storm levels, with a slight chance for major storm levels early in the period for 07-08 January as a coronal mass ejection observed on 04 January is expected to arrive at Earth. Unsettled to active conditions associated with recurrent coronal hole high speed streams are possible 10-11, 23-24, and 28-30 January. The remainder of the forecast period is expected to see quiet to unsettled conditions in the absence of any other transient features.



### *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
30 December	143	93	510	B6.9	3	0	0	3	0	0	0	0
31 December	145	136	490	B9.9	8	1	0	6	0	1	0	0
01 January	160	106	610	C1.1	3	1	0	7	0	1	0	0
02 January	161	133	1410	C1.5	6	2	0	5	1	0	0	0
03 January	182	162	1570	C1.2	9	2	0	14	0	0	0	0
04 January	215	178	1710	C1.7	4	3	0	10	0	1	0	0
05 January	218	225	1790	C1.8	3	0	0	14	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
	30 December	9.8e+05	8.3e+04	2.4e+03		6.8e+05
31 December	3.8e+05	1.9e+04	2.5e+03		5.9e+05	
01 January	4.8e+05	1.2e+04	2.2e+03		5.5e+05	
02 January	7.0e+05	1.0e+04	2.3e+03		2.3e+07	
03 January	3.4e+05	1.1e+04	2.3e+03		3.5e+07	
04 January	6.6e+05	1.0e+04	2.5e+03		3.7e+07	
05 January	2.1e+06	3.4e+04	2.6e+03		3.8e+07	

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	30 December	2	0-0-1-0-1-2-1-1	1	0-0-2-1-0-0-0-0	3
31 December	6	1-1-2-2-2-2-2-1	4	0-0-2-3-1-1-1-0	6	2-1-2-2-2-1-2-1
01 January	11	0-1-1-3-4-3-3-2	33	0-0-2-5-7-5-2-3	12	1-2-2-3-4-3-3-3
02 January	15	3-3-3-2-3-3-4-2	29	2-4-3-4-6-5-4-1	20	3-4-4-2-3-3-5-3
03 January	7	2-2-2-2-2-2-2-1	13	1-1-3-4-4-3-2-1	10	3-2-2-3-3-3-3-2
04 January	6	1-1-1-2-2-2-3-1	12	1-0-2-5-4-1-1-1	6	1-1-1-2-2-2-2-1
05 January	4	1-1-2-1-1-2-2-0	2	0-0-2-2-1-0-0-0	4	1-1-2-1-1-1-1-0

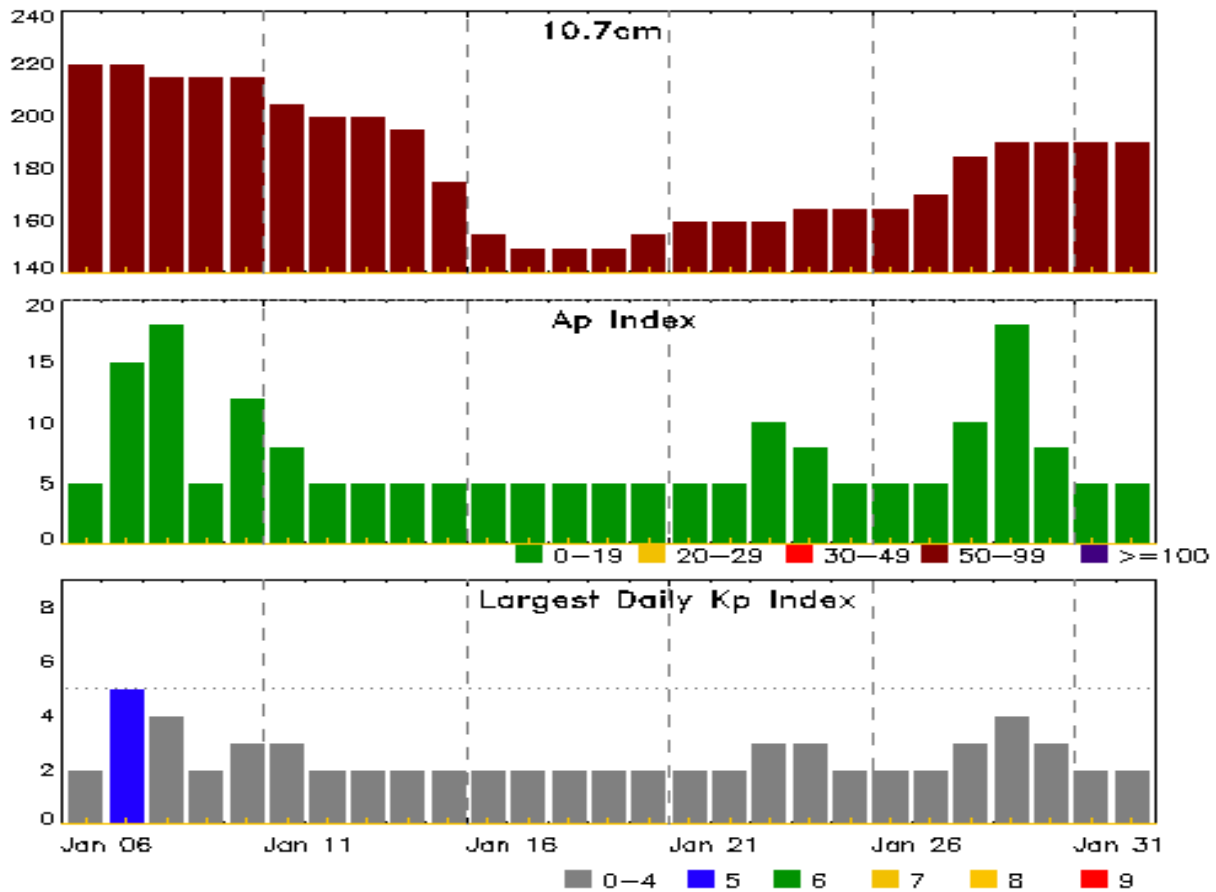


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
31 Dec 1707	WATCH: Geomagnetic Storm Category G1 predicted	
31 Dec 2157	ALERT: X-ray Flux exceeded M5	31/2156
31 Dec 2224	SUMMARY: 10cm Radio Burst	31/2149 - 2155
31 Dec 2331	SUMMARY: X-ray Event exceeded M5	31/2145 - 2220
01 Jan 1245	WARNING: Geomagnetic K = 4	01/1245 - 02/1300
01 Jan 1359	ALERT: Geomagnetic K = 4	01/1346
01 Jan 1847	ALERT: X-ray Flux exceeded M5	01/1847
01 Jan 1915	SUMMARY: X-ray Event exceeded M5	01/1840 - 1903
02 Jan 0444	WARNING: Geomagnetic K = 5	02/0442 - 1000
02 Jan 1308	CANCELLATION: Geomagnetic Storm Category G1 predicted	
02 Jan 1841	WARNING: Geomagnetic K = 4	02/1840 - 03/0400
02 Jan 1909	ALERT: Geomagnetic K = 4	02/1908
02 Jan 1911	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	02/1855
02 Jan 1945	WARNING: Geomagnetic K = 5	02/1943 - 03/0400
02 Jan 2103	ALERT: Geomagnetic K = 5	02/2059
04 Jan 1954	ALERT: Type IV Radio Emission	04/1922
04 Jan 2019	SUMMARY: 10cm Radio Burst	04/1903 - 1931
04 Jan 2252	ALERT: Type IV Radio Emission	04/2204
05 Jan 2205	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
06 Jan	220	5	2	20 Jan	155	5	2
07	220	15	5	21	160	5	2
08	215	18	4	22	160	5	2
09	215	5	2	23	160	10	3
10	215	12	3	24	165	8	3
11	205	8	3	25	165	5	2
12	200	5	2	26	165	5	2
13	200	5	2	27	170	5	2
14	195	5	2	28	185	10	3
15	175	5	2	29	190	18	4
16	155	5	2	30	190	8	3
17	150	5	2	31	190	5	2
18	150	5	2	01 Feb	190	5	2
19	150	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
31 Dec	2145	2158	2220	M6.4	0.091	2N	S16W35	1936	170	160		
01 Jan	1840	1852	1903	M9.9	0.082	2B	S14W47	1936				
02 Jan	0224	0233	0256	M1.7	0.027	SF	S05E76	1944				
02 Jan	2212	2218	2222	M1.2	0.004	1N	S05E72	1944				
03 Jan	1241	1250	1254	M1.0	0.005			1944	530			
03 Jan	2109	2114	2119	M1.1	0.004	SF	S06E56	1944	140			
04 Jan	1016	1025	1041	M1.3	0.014	2N	S05E48	1944		140		
04 Jan	1905	1946	2023	M4.0	0.140			1944	620	550		1
04 Jan	2212	2252	2322	M1.9	0.059			1936				

### *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
30 Dec	0100	0100	0106		SF	S16W09	1936
30 Dec	1509	1517	1532	C2.3	SF	S18W12	1936
30 Dec	1638	1643	1702	C2.4	SF	S16W16	1936
30 Dec	1741	1813	1822	C1.7			1936
31 Dec	0229	0240	0246	C5.6			1936
31 Dec	0521	0532	0538	C2.0			1938
31 Dec	0733	0740	0747	C2.2			1936
31 Dec	1023	1150	1232	C8.8			
31 Dec	1642	1649	1655	C2.0	SF	S13E16	1938
31 Dec	1648	1648	1704		SF	S16W16	1936
31 Dec	1805	1805	1807		SF	S14E19	1938
31 Dec	1820	1825	1831	C1.8	SF	S16W16	1936
31 Dec	1853	1859	1903	C4.0	SF	S13W41	1940
31 Dec	1949	1953	1956	C2.9	SF	S13W41	1940
31 Dec	2145	2158	2220	M6.4	2N	S16W35	1936
01 Jan	0027	0044	0144		SF	S14W35	1936
01 Jan	0128	0133	0145		SF	S14E14	1938
01 Jan	0645	0649	0652	C2.1			1944
01 Jan	0721	0726	0729	C3.2	SF	S12W47	1940
01 Jan	0859	0904	0906		SF	S15W40	1936
01 Jan	1540	1548	1609	C6.5			1944
01 Jan	1638	1641	1646		SF	S14W45	1936



## *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
01 Jan	1840	1852	1903	M9.9	2B	S14W47		1936
01 Jan	2309	2311	2313		SF	S15W52		1936
01 Jan	2311	2311	2313		SF	S08E88		1944
02 Jan	0003	0005	0014		SF	S12W56		1940
02 Jan	0224	0233	0256	M1.7	SF	S05E76		1944
02 Jan	0425	0429	0432	C5.3				1944
02 Jan	0743	0749	0751	C4.9	SF	S05E76		1944
02 Jan	1125	1226	1242	C9.5				1944
02 Jan	2030	2038	2055	C3.4	SF	S03E68		1944
02 Jan	2141	2146	2150	C3.1	SF	S05E72		1944
02 Jan	2208	2217	2231	M1.2	1N	S05E72		1944
02 Jan	2337	2343	2351	C2.5				1936
03 Jan	0106	0111	0113		SF	S06E65		1944
03 Jan	0229	0230	0235		SF	S15W65		1936
03 Jan	0248	0252	0255	C2.4				1944
03 Jan	0323	0326	0332		SF	S15W65		1936
03 Jan	0356	0401	0407	C4.6	SF	S06E60		1944
03 Jan	0629	0700	0718	C3.0	SF	S06E63		1944
03 Jan	0812	0818	0830	C3.6	SF	S05E57		1944
03 Jan	1007	1015	1019	C3.3	SF	S05E56		1944
03 Jan	1037	1042	1045	C5.9	SF	S05E55		1944
03 Jan	1140	1144	1149	C1.9				1944
03 Jan	1241	1250	1254	M1.0				1944
03 Jan	1505	1535	1605	C6.9	SF	S05E61		1944
03 Jan	1556	1557	1603		SF	S15W75		1936
03 Jan	1815	1817	1822		SF	S11W41		1937
03 Jan	1827	1835	1919	C4.0	SF	S11W41		1937
03 Jan	2109	2114	2119	M1.1	SF	S06E56		1944
03 Jan	2146	2146	2150		SF	S04E55		1944
04 Jan	0237	0243	0251	C3.6				1944
04 Jan	0622	0640	0710	C5.6	SF	S05E52		1944
04 Jan	0737	0741	0742		SF	S08E50		1944
04 Jan	B0852	U0852	0934		SF	S06E49		1944
04 Jan	0928	0928	0933		SF	S05E40		1944
04 Jan	0948	0951	1003	C2.9	SF	S06E49		1944
04 Jan	1016	1025	1041	M1.3	2N	S05E48		1944
04 Jan	B1123	U1130	A1139		SF	S04E49		1944
04 Jan	B1140	U1156	1240		SF	S04E49		1944



## *Flare List*

Date	Time			Optical			Rgn #
	Begin	Max	End	X-ray Class	Imp/Brtns	Location Lat CMD	
04 Jan	B1412	U1420	A1452		SF	S05E48	1944
04 Jan	1533	1541	1547	C9.4			1944
04 Jan	1905	1946	2023	M4.0			1944
04 Jan	2212	2252	2322	M1.9			1936
04 Jan	2304	2310	2314		SF	S06E39	1944
04 Jan	2348	2348	2353		SF	S15E47	1944
05 Jan	0017	0024	0026		SF	S13W57	1937
05 Jan	0054	0055	0100		SF	S05E39	1944
05 Jan	0110	0110	0115		SF	S13W57	1937
05 Jan	0127	0128	0137		SF	S08E41	1944
05 Jan	0133	0137	0145		SF	S14W57	1937
05 Jan	0211	0211	0216		SF	S13W58	1937
05 Jan	0224	0228	0230	C4.5	SN	S15E45	1944
05 Jan	0313	0314	0320		SF	S09E40	1944
05 Jan	0439	0448	0455		SF	S06E38	1944
05 Jan	0657	0659	0705		SF	S15W58	1937
05 Jan	0707	0708	0712		SF	S15W58	1937
05 Jan	0744	0752	0755		SF	S15W58	1937
05 Jan	0821	0828	0848		SF	S06E35	1944
05 Jan	0845	0858	1010		SF	S15W58	1937
05 Jan	1511	1518	1531	C6.6			1944
05 Jan	1813	1817	1827	C3.4			1944





## Region Summary

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Helio Lon	Area 10 <sup>6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
<b>Region 1931</b>																		
18 Dec	S14E76	284	100	2	Hax	1	A											
19 Dec	S15E62	286	210	3	Hax	1	A	1										
20 Dec	S15E48	286	190	3	Hax	1	A											
21 Dec	S15E36	285	220	5	Hsx	2	A											
22 Dec	S15E21	287	170	3	Hsx	1	A											
23 Dec	S14E08	286	190	2	Hax	1	A											
24 Dec	S15W04	285	210	4	Hax	1	A											
25 Dec	S16W16	284	230	9	Hax	5	A											
26 Dec	S15W29	284	170	6	Cao	3	B	1				1						
27 Dec	S15W43	286	160	6	Cao	3	B											
28 Dec	S15W58	287	140	3	Hsx	1	A											
29 Dec	S14W73	289	110	3	Hsx	1	A											
30 Dec	S14W87	290	130	2	Hax	1	A											
								2	0	0	1	0	0	0	0	0		

Crossed West Limb.  
 Absolute heliographic longitude: 285

<b>Region 1934</b>																		
19 Dec	S15E79	268	plage									1						
20 Dec	S15E65	269	80	3	Cao	3	B	1	1									
21 Dec	S15E53	268	140	6	Cao	5	B											
22 Dec	S15E40	268	160	8	Dac	9	BG	1	1				2					
23 Dec	S16E27	267	230	9	Dao	12	BG	1				1						
24 Dec	S16E14	267	200	10	Dao	16	BG											
25 Dec	S15E01	267	170	10	Cao	14	BG	1				1						
26 Dec	S15W12	266	150	13	Cao	15	BG											
27 Dec	S16W26	269	190	15	Esi	15	BG	4				4						
28 Dec	S18W38	267	160	13	Esi	15	BGD	2				2						
29 Dec	S18W53	269	160	12	Esc	17	BGD											
30 Dec	S17W68	269	140	12	Eac	9	BGD											
31 Dec	S16W83	272	80	11	Eac	5	BGD											
								10	3	0	8	2	0	0	0	0		

Crossed West Limb.  
 Absolute heliographic longitude: 267



### *Region Summary - continued*

Date	Location		Sunspot Characteristics				Flares														
	Lat CMD	Helio Lon	Area 10 <sup>6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical										
								C	M	X	S	1	2	3	4						
<b>Region 1935</b>																					
23 Dec	S05E49	244	10	1	Bxo	1	B														
24 Dec	S06E33	247	10	1	Axx	1	A														
25 Dec	S07E20	248	10	1	Axx	1	A														
26 Dec	S06E04	250	10	1	Axx	1	A														
27 Dec	S06W08	251	0	1	Axx	1	A														
28 Dec	S06W23	252	plage																		
29 Dec	S06W38	254	plage																		
30 Dec	S06W53	256	plage																		
31 Dec	S06W68	257	plage																		
01 Jan	S06W82	258	plage																		
								0	0	0	0	0	0	0	0	0	0	0			

Crossed West Limb.  
Absolute heliographic longitude: 250

<b>Region 1936</b>																					
23 Dec	S17E71	223	10	6	Bxo	2	B	1													
24 Dec	S16E55	225	50	11	Cao	5	B	1													
25 Dec	S17E43	224	50	13	Cao	7	BG	2			1										
26 Dec	S16E30	224	100	12	Eai	13	BG	1													
27 Dec	S16E19	224	110	11	Eai	12	BG	3			1										
28 Dec	S17E06	223	140	13	Eac	21	BG	4			6										
29 Dec	S17W08	224	170	15	Eac	30	BG	10	1		11	1									
30 Dec	S16W22	223	180	13	Eac	28	BGD	3			3										
31 Dec	S16W36	225	280	14	Eac	36	BGD	3	1		2			1							
01 Jan	S16W49	225	210	13	Eac	18	BGD		1		4			1							
02 Jan	S17W62	225	160	13	Eai	9	BG	1													
03 Jan	S16W75	225	110	8	Dai	5	BG				3										
04 Jan	S15W90	227	60	3	Hsx	2	A		1												
								29	4	0	31	1	2	0	0						

Crossed West Limb.  
Absolute heliographic longitude: 223



### *Region Summary - continued*

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Lon	Helio 10 <sup>-6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
<b>Region 1937</b>																		
26 Dec	S12E60	194	10	6	Bxo	3	B											
27 Dec	S12E46	197	20	7	Bxo	4	B											
28 Dec	S12E33	196	10	6	Bxo	5	B											
29 Dec	S12E19	197	10	4	Bxo	3	B											
30 Dec	S12E05	198	10	4	Bxo	3	B											
31 Dec	S12W09	198	10	4	Bxo	3	B											
01 Jan	S12W23	199	plage															
02 Jan	S12W37	200	plage															
03 Jan	S12W47	197	30	5	Dao	8	BG	1				2						
04 Jan	S12W58	195	80	6	Dac	14	BG											
05 Jan	S13W71	195	160	9	Dac	21	BG					8						
								1	0	0	10	0	0	0	0	0		

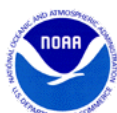
Still on Disk.  
Absolute heliographic longitude: 198

<b>Region 1938</b>																		
27 Dec	S12E62	181	60	4	Hax	1	A											
28 Dec	S12E50	179	120	3	Hax	3	A											
29 Dec	S13E37	179	60	2	Cao	3	B											
30 Dec	S09E22	179	50	1	Hax	2	A											
31 Dec	S09E09	179	30	2	Hax	3	A	2				2						
01 Jan	S12W03	178	30	4	Cro	6	B					1						
02 Jan	S14W16	179	30	5	Cao	4	B											
03 Jan	S14W31	181	10	3	Bxo	3	B											
04 Jan	S14W45	182	10	2	Hrx	3	A											
05 Jan	S14W59	183	10	2	Cro	3	B											
								2	0	0	3	0	0	0	0	0		

Still on Disk.  
Absolute heliographic longitude: 178

<b>Region 1939</b>																		
29 Dec	S06W69	285	10	5	Bxo	5	B											
30 Dec	S06W84	287	plage															
								0	0	0	0	0	0	0	0	0		

Crossed West Limb.  
Absolute heliographic longitude: 285



### *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 1940*

31 Dec	S12W44	233	20	4	Dro	4	B	2			2						
01 Jan	S12W59	235	40	4	Cao	3	BG	1			1						
02 Jan	S12W73	236	70	6	Dao	7	B				1						
03 Jan	S12W85	235	70	5	Dao	4	B										
								3	0	0	4	0	0	0	0	0	0

Crossed West Limb.  
Absolute heliographic longitude: 233

#### *Region 1941*

31 Dec	S13W22	211	30	4	Dro	3	B										
01 Jan	S12W34	210	40	5	Dao	4	BG										
02 Jan	S13W48	211	30	5	Dao	4	B										
03 Jan	S13W61	211	20	5	Cso	3	B										
04 Jan	S13W78	215	20	1	Hrx	1	A										
								0	0	0	0	0	0	0	0	0	0

Crossed West Limb.  
Absolute heliographic longitude: 211

#### *Region 1942*

31 Dec	N10E62	127	20	1	Hrx	1	A										
01 Jan	N10E49	126	20	1	Cro	1	B										
02 Jan	N10E37	126	30	6	Cao	4	B										
03 Jan	N10E23	127	30	5	Cao	4	B										
04 Jan	N10E08	129	30	2	Hsx	1	A										
05 Jan	N10W06	130	20	1	Hsx	3	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 130

#### *Region 1943*

31 Dec	S11E67	122	20	1	Cro	1	B										
01 Jan	S11E57	118	20	3	Cro	1	B										
02 Jan	S11E45	118	20	3	Cro	2	B										
03 Jan	S12E30	120	10	2	Cro	3	B										
04 Jan	S11E17	120	20	1	Hrx	3	A										
05 Jan	S11E07	117	30	4	Cro	7	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 117



### *Region Summary - continued*

Date	Location		Sunspot Characteristics					Flares															
	Lat	CMD	Helio Lon	Area 10 <sup>6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
									C	M	X	S	1	2	3	4							
<b>Region 1944</b>																							
01 Jan	S07E75		101	250	7	Dko	3	B	2			1											
02 Jan	S08E64		99	1060	16	Fkc	19	BG	5	2		4	1										
03 Jan	S09E53		97	1280	16	Fkc	37	BG	8	2		9											
04 Jan	S08E38		99	1470	20	Fkc	60	BGD	4	2		10		1									
05 Jan	S09E25		99	1480	18	Fkc	112	BGD	3			6											
									22	6	0	30	1	1	0	0							

Still on Disk.

Absolute heliographic longitude: 99

#### **Region 1945**

02 Jan	N12E18		145	10	4	Bxo	4	B														
03 Jan	N11E04		146	10	5	Dro	5	B														
04 Jan	N11W12		149	10	1	Axx	2	A														
05 Jan	N11W25		149	10	1	Axx	1	A														
									0	0	0	0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 146

#### **Region 1946**

04 Jan	N12E41		96	10	3	Bxo	2	B														
05 Jan	N09E21		103	80	5	Dai	8	B														
									0	0	0	0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 103

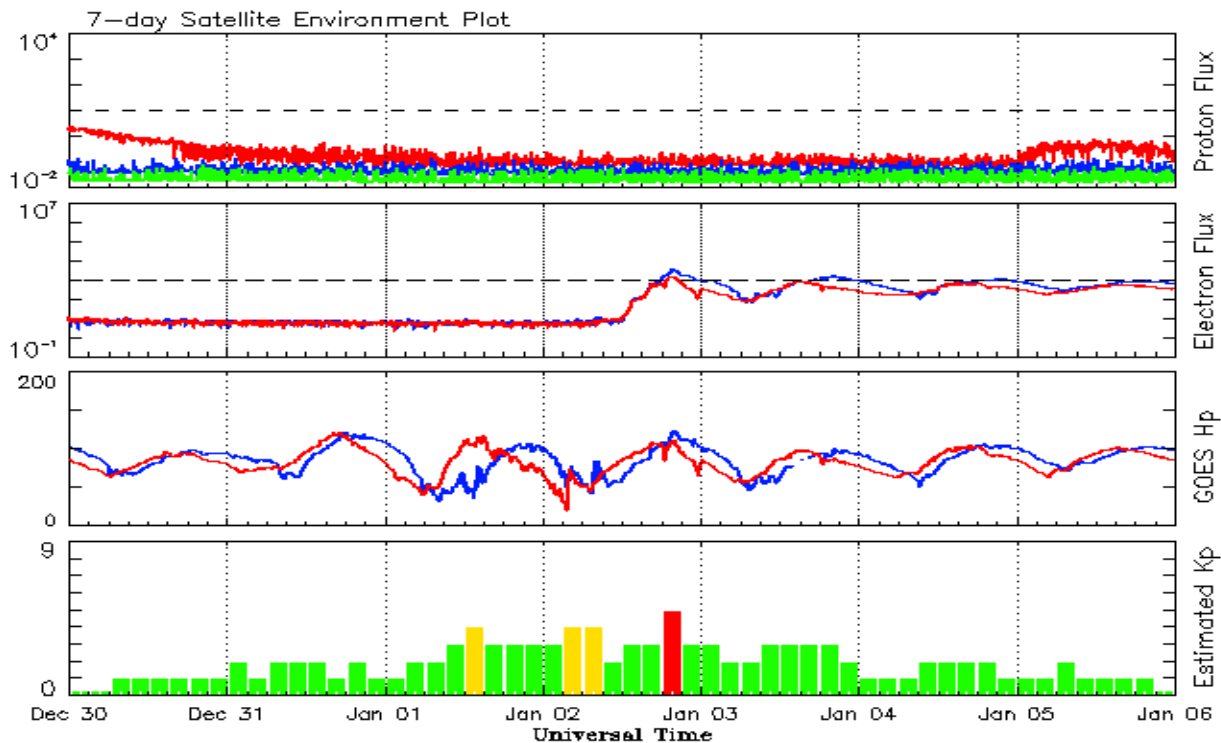


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>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	83.9	58.9	120.5	121.1	10	8.3
July	99.6	66.5	0.67	82.4	57.8	135.6	119.5	13	8.3
August	85.8	63.0	0.74	83.1	58.2	115.7	119.2	7	8.1
September	84.0	61.4	0.73	83.7	58.1	123.2	118.9	8	7.8
October	73.5	53.3	0.73	85.0	58.6	123.3	119.2	9	7.4
November	89.2	61.8	0.69	87.3	59.7	120.9	120.1	6	7.3
December	60.4	40.8	0.68	88.0	59.6	108.4	120.1	3	7.5
<b>2013</b>									
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	57.5	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			115.6		9	
August	90.2	66.0	0.73			114.7		9	
September	55.0	36.9	0.67			102.7		5	
October	127.1	85.6	0.67			132.3		7	
November	125.7	77.6	0.62			148.4		5	
December	118.2	90.3	0.76			147.7		5	

**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 30 December 2013*

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.

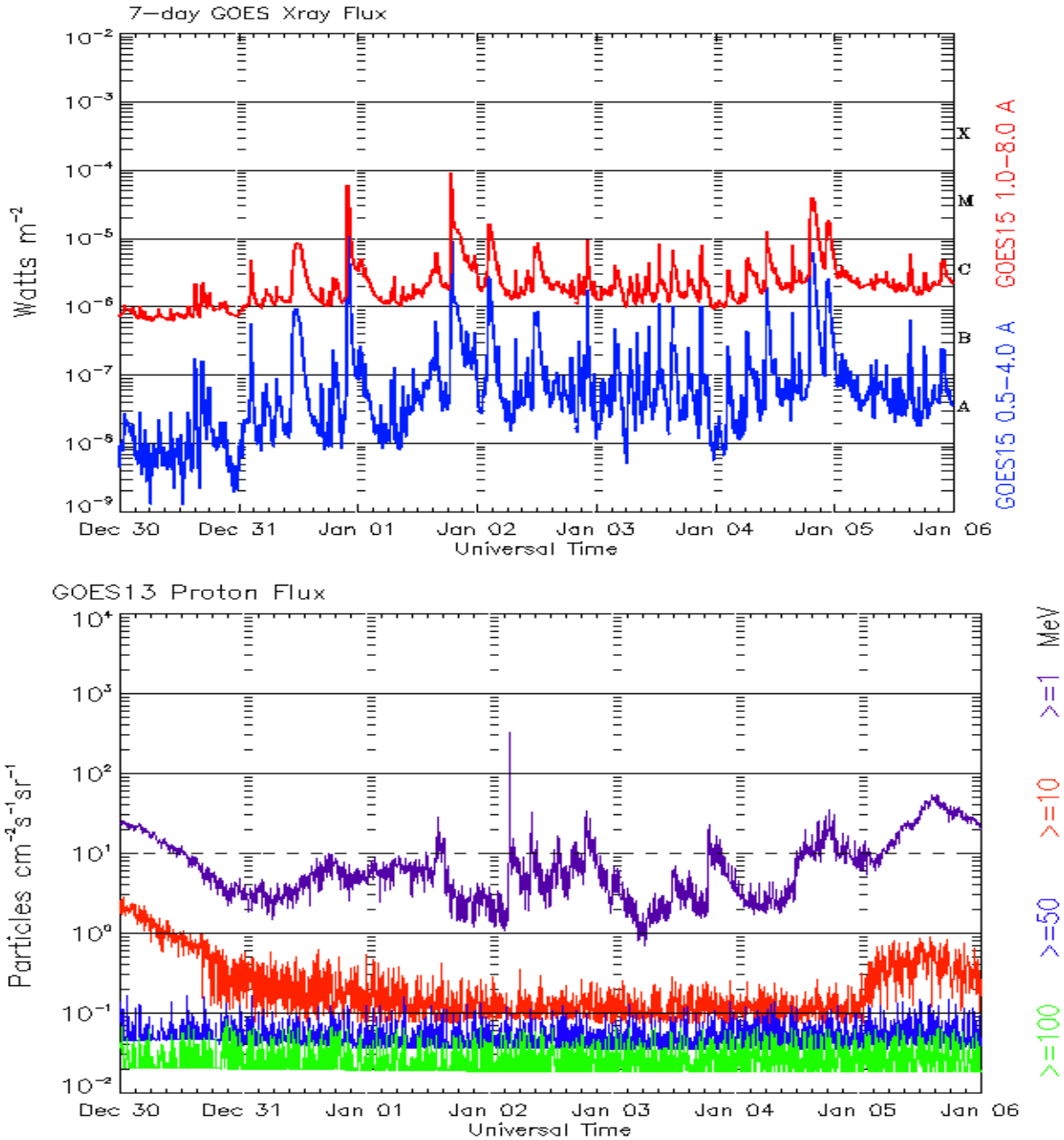
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 30 December 2013*

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.

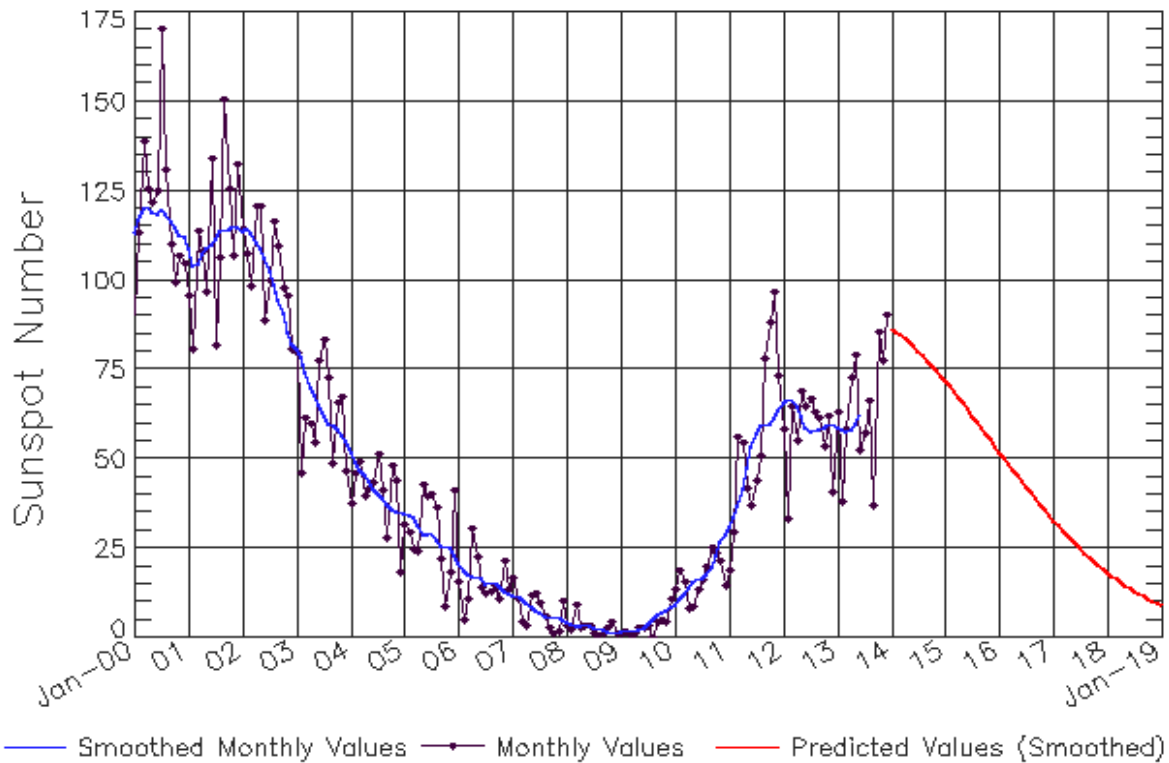
The proton plot contains the five-minute averaged intergral flux units (pfu = protons/cm<sup>2</sup> -sec -sr) as measured by the primary SWPC GOES Proton satellite for each of the energy thresholds: >1, >10, >30, and >100 MeV. The P10 event threshold is 10 pfu at greater than 10 MeV.





# ISES Solar Cycle Sunspot Number Progression

Observed data through Dec 2013



Updated 2014 Jan 6

NOAA/SWPC Boulder, CO USA

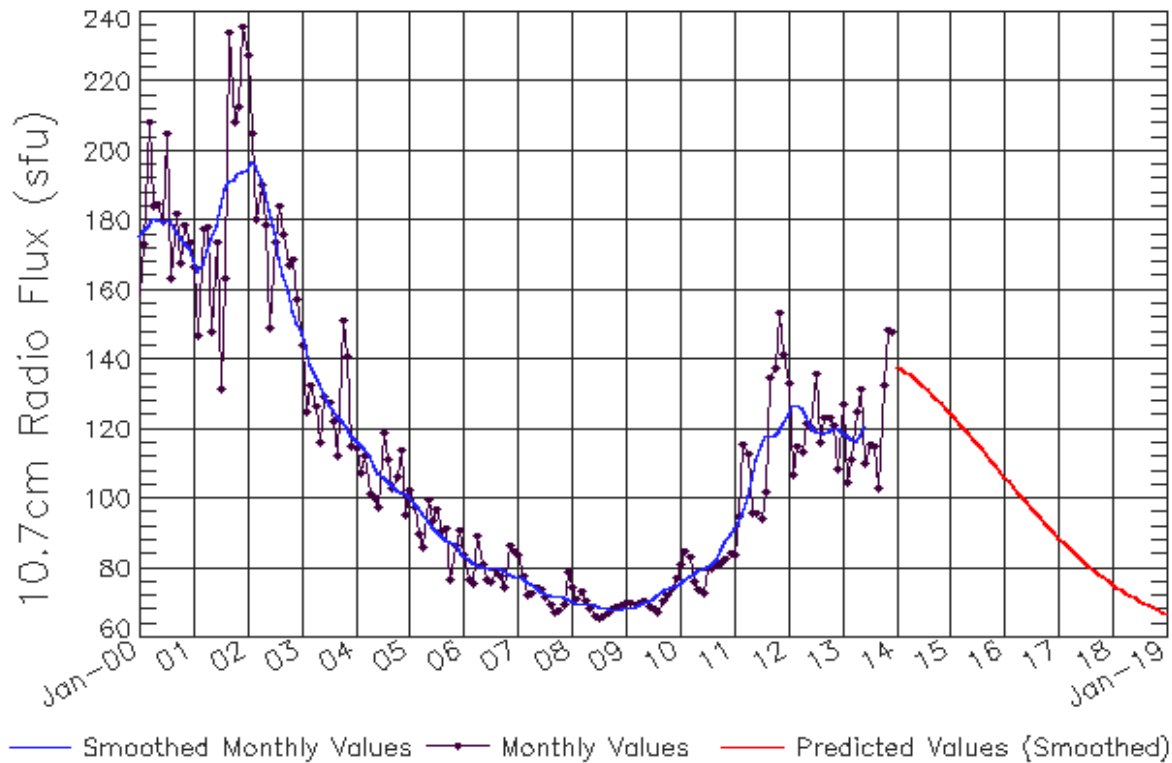
## Smoothed Sunspot Number Prediction

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	9 (***)	11 (***)	12 (***)	14 (***)	16 (***)	16 (***)	17 (***)	17 (***)	20 (***)	23 (***)	27 (***)	29 (***)
2011	31 (***)	33 (***)	37 (***)	42 (***)	48 (***)	53 (***)	57 (***)	59 (***)	60 (***)	60 (***)	61 (***)	63 (***)
2012	66 (***)	67 (***)	67 (***)	65 (***)	62 (***)	59 (***)	58 (***)	58 (***)	58 (***)	59 (***)	60 (***)	60 (***)
2013	59 (***)	58 (***)	58 (***)	58 (***)	60 (***)	63 (***)	66 (1)	69 (2)	72 (3)	73 (5)	74 (5)	75 (6)
2014	78 (7)	79 (7)	81 (8)	83 (9)	82 (9)	81 (10)	80 (10)	79 (10)	78 (10)	76 (10)	75 (10)	73 (10)
2015	72 (10)	70 (10)	69 (10)	67 (10)	65 (10)	64 (10)	62 (10)	60 (10)	59 (10)	57 (10)	55 (10)	54 (10)
2016	52 (10)	50 (10)	49 (10)	47 (10)	45 (10)	44 (10)	42 (10)	40 (10)	39 (10)	37 (10)	36 (10)	34 (10)
2017	33 (10)	31 (10)	30 (10)	29 (10)	27 (10)	26 (10)	25 (10)	24 (10)	23 (10)	21 (10)	20 (10)	19 (10)
2018	18 (10)	17 (10)	16 (10)	15 (10)	15 (10)	14 (10)	13 (10)	12 (10)	12 (10)	11 (10)	10 (10)	10 (10)
2019	9 (10)	8 (10)	8 (10)	7 (10)	7 (10)	6 (10)	6 (10)	6 (10)	5 (10)	5 (10)	4 (10)	4 (10)



# ISES Solar Cycle F10.7cm Radio Flux Progression

Observed data through Dec 2013



Updated 2014 Jan 6

NOAA/SWPC Boulder, CO USA

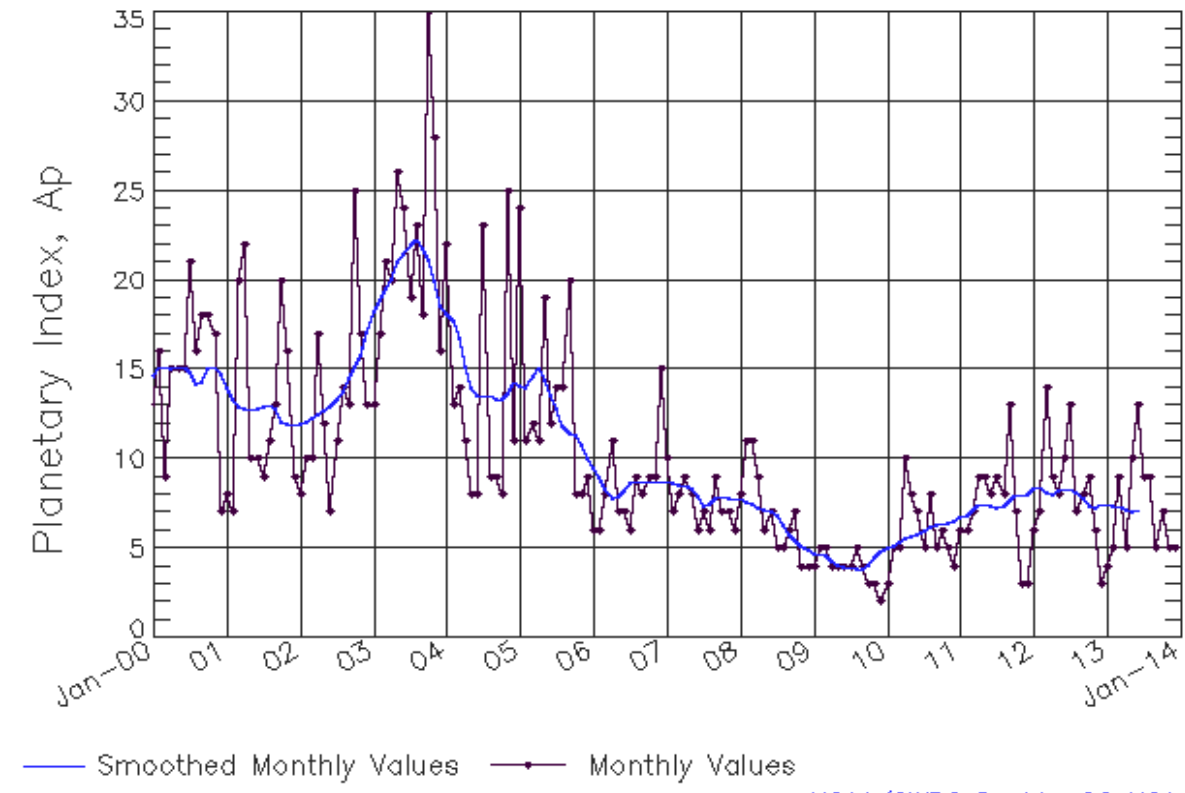
## Smoothed F10.7cm Radio Flux Prediction

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 (**)	123 (1)	125 (1)	127 (2)	129 (3)	129 (4)	130 (4)
2014	132 (5)	134 (6)	135 (7)	136 (8)	135 (8)	134 (9)	132 (9)	131 (9)	130 (9)	129 (9)	127 (9)	126 (9)
2015	125 (9)	123 (9)	122 (9)	120 (9)	119 (9)	117 (9)	116 (9)	114 (9)	113 (9)	111 (9)	110 (9)	108 (9)
2016	106 (9)	105 (9)	103 (9)	102 (9)	100 (9)	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 2013



Updated 2014 Jan 6

NOAA/SWPC Boulder, CO USA

*Solar Cycle Comparison charts are temporarily unavailable.*



## ***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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