

Solar activity began the period at very low levels on 01-02 April. By 03 April, solar activity increased to low levels and continued at low levels through 04 April due to several low level C-class flares from Regions 1708 (N11, L=190, class/area Dao/090 on 29 March), 1711 (S19, L=158, class/area Cko/580 on 04 April), and 1713 (N10, L=175, class/area Dai/130 on 06 April). By 05 April, solar activity reached moderate levels with an isolated M2 flare at 05/1748 UTC from Region 1719 (N08, L=076, class/area Dsi/150 on 07 April). Earlier on 05 April, a long duration C2 flare was observed at 05/0650 UTC, also from Region 1719 as it began to rotate onto the east limb. An associated coronal mass ejection (CME) was observed off the east limb in SOHO/LASCO C2 imagery beginning at 05/0712 UTC, but was not Earth-directed. By 06-07 April, solar activity returned to low levels with the majority of the C-class flares from Regions 1718 (N20, L=109, class/area Dai/140 on 07 April) and 1719. No Earth-directed CMEs were observed during the reporting period.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 01-05 April and decreased to moderate levels by 06-07 April. The maximum weekly flux value of 5166 pfu was observed at 02/1735 UTC.

Geomagnetic field activity was at quiet levels with isolated active periods at high latitudes mid-day on 01 and 07 April. Solar wind speed began the period decreasing from approximately 480 km/s to a low near 250 km/s by late on 05 April while the total field strength slowly increased from 2 nT to 6 nT. By Early on 06 April, solar wind speed started to increase to 340-370 km/s while total field strength increased to 5-7 nT. Solar wind speed was relatively constant near the 330-350 km/s range through the end of the reporting period. Phi angle was mostly negative (towards) through approximately 07/1500 UTC when a change to a more positive (away) sector occurred.

### **Space Weather Outlook**

**08 April - 04 May 2013**

Solar activity is expected to be at very low to low levels with a chance for M-class flaring from 08-19 April as Regions 1713, 1718, and 1719 continue to transit across the visible disk. From 20 April until the end of the forecast period, very low to low levels are expected.

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 with a chance for high levels on 24 April-02 May due to recurrent coronal hole high speed stream (CH HSS) effects.

Geomagnetic field activity is expected to be quiet to unsettled on 08-09 April due to weak CH



HSS effects. Mostly quiet conditions will prevail until another CH HSS moves into geoeffective position on 23 April. Quiet to unsettled conditions with a chance for isolated active periods are expected on 23 April with quiet to unsettled levels on 24 April. Another CH HSS is expected to become geoeffective on 25-26 April causing unsettled to active conditions with minor storm periods possible. Conditions are expected to return to mostly quiet levels by 27 April through the end of the forecast period.



### ***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
01 April	119	84	650	B2.4	0	0	0	0	0	0	0	0
02 April	122	103	700	B2.5	0	0	0	3	0	0	0	0
03 April	127	109	860	B2.8	3	0	0	3	0	0	0	0
04 April	129	119	820	B3.1	1	0	0	0	0	0	0	0
05 April	134	146	860	B3.6	1	1	0	3	0	0	0	0
06 April	137	117	880	B4.2	8	0	0	10	0	0	0	0
07 April	138	144	910	B4.0	4	0	0	6	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
01 April	3.0e+05	1.2e+04	2.8e+03		1.6e+08	
02 April	3.2e+05	1.2e+04	2.9e+03		2.5e+08	
03 April	4.0e+05	1.2e+04	3.0e+03		2.2e+08	
04 April	2.2e+05	1.1e+04	2.8e+03		1.1e+08	
05 April	3.0e+05	1.2e+04	2.9e+03		8.9e+07	
06 April	3.5e+05	1.1e+04	2.7e+03		2.7e+07	
07 April	3.2e+05	1.1e+04	2.7e+03		1.7e+07	

### ***Daily Geomagnetic Data***

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
01 April	6	1-2-2-2-2-2-1-2	8	2-1-3-4-1-1-0-1	6	1-2-2-2-1-1-1-2
02 April	4	2-0-0-1-1-2-2-1	0	1-0-0-0-0-0-0-0	4	2-1-0-1-1-1-1-2
03 April	3	0-0-1-1-2-1-1-1	0	0-0-0-0-0-0-0-0	3	1-0-1-1-1-1-1-1
04 April	3	0-2-1-1-2-1-1-0	5	0-0-0-0-3-1-0-0	4	1-2-1-1-1-1-0-1
05 April	3	0-1-1-0-1-2-1-2	0	0-0-0-0-0-0-1-0	3	0-1-0-1-1-1-1-1
06 April	4	1-2-1-1-2-1-1-1	3	1-1-2-2-1-0-0-0	5	1-1-2-1-1-1-1-1
07 April	5	1-1-1-2-3-1-2-0	7	1-2-1-3-4-1-0-0	5	1-1-1-1-2-2-1-0

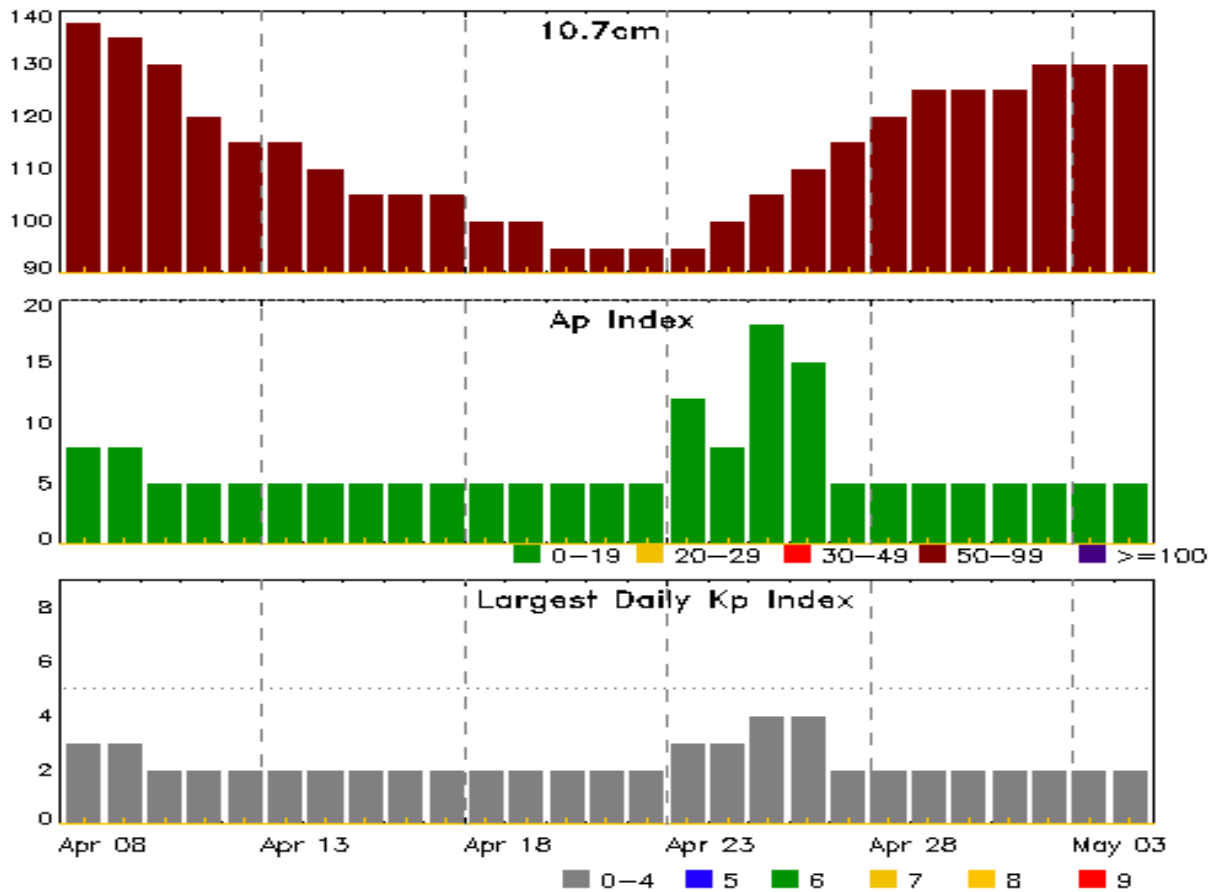


### *Alerts and Warnings Issued*

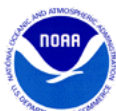
<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
01 Apr 0606	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	30/1335
02 Apr 0507	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	30/1335
03 Apr 0500	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	30/1335
04 Apr 0502	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	30/1335
05 Apr 1031	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	30/1335



## 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
08 Apr	138	8	3	22 Apr	95	5	2
09	135	8	3	23	95	12	3
10	130	5	2	24	100	8	3
11	120	5	2	25	105	18	4
12	115	5	2	26	110	15	4
13	115	5	2	27	115	5	2
14	110	5	2	28	120	5	2
15	105	5	2	29	125	5	2
16	105	5	2	30	125	5	2
17	105	5	2	01 May	125	5	2
18	100	5	2	02	130	5	2
19	100	5	2	03	130	5	2
20	95	5	2	04	130	5	2
21	95	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
05 Apr	1734	1748	1804	M2.2	0.026			1719		100		

### ***Flare List***

Date	Time			X-ray Class	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
01 Apr	2343	2349	2358	B7.4				1704
02 Apr	0042	0054	0112	B5.0				1710
02 Apr	0225	0229	0231	B5.7				1713
02 Apr	1015	1019	1024	B4.9				1704
02 Apr	1317	1321	1324	B4.5	SF	N09E31		1713
02 Apr	1458	1514	1538	B9.6	SF	N10E28		1713
02 Apr	2202	2208	2212	B7.9	SF	N11E04		1708
03 Apr	0430	0439	0448	C1.1				1708
03 Apr	0936	0943	0948	C2.7				1708
03 Apr	1111	1116	1118	B6.0	SF	S17E35		1711
03 Apr	1709	1717	1726	B9.6	SF	N09E12		1713
03 Apr	1834	1845	1859	C1.7	SF	S23E31		1711
04 Apr	0810	0814	0819	B5.5				1713
04 Apr	0949	0957	1003	C1.2				1713
04 Apr	1303	1306	1308	B6.2				1704
05 Apr	0348	0352	0354	B6.0				1711
05 Apr	0606	0650	0811	C2.1				1719
05 Apr	B0841	U0853	A0909		SF	S20E11		1711
05 Apr	1338	1340	1345		SF	S09E74		
05 Apr	1445	1445	1449		SF	S09E73		
05 Apr	1734	1748	1804	M2.2				1719
06 Apr	B0519	0522	0627		SF	N23E43		1718
06 Apr	0555	0600	0604	C1.2				1717
06 Apr	0639	0646	0651	C1.0				1718
06 Apr	0758	0802	0809	B9.7	SF	N21E40		1718
06 Apr	0924	0925	0932		SF	N09E74		1719
06 Apr	0937	0944	0948	C1.1				1718
06 Apr	1106	1111	1116	C1.7	SF	N22E40		1718
06 Apr	1153	1225	1244	C1.4	SF	N22E39		1718
06 Apr	1253	1306	1316		SF	N22E38		1718



### *Flare List*

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
06 Apr	1318	1320	1322		SF	N16W35	1715
06 Apr	1321	1330	1348		SF	N22E38	1718
06 Apr	1607	1612	1617		SF	N09E71	1719
06 Apr	1935	1957	2012	C1.2			1715
06 Apr	2117	2130	2149	C1.7			1719
06 Apr	2331	2336	2347	C1.0	SF	N19E34	1718
07 Apr	0039	0106	0140	C1.6	SF	N05E66	1719
07 Apr	0730	0744	0757	C1.4			
07 Apr	1407	1407	1417		SF	N20E28	1718
07 Apr	1555	1600	1604	C3.1	SB	N20E26	1718
07 Apr	1649	1658	1709	C1.6	SF	N12W44	1713
07 Apr	1857	1906	1926	B8.3	SF	N19E23	1718
07 Apr	2137	2138	2140		SF	N19E21	1718



## 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

### Region 1703

22 Mar	S25W59	39	40	5	Dao	5	B				2				
23 Mar	S25W72	39	80	7	Dao	7	B				1				
24 Mar	S26W84	38	40	6	Cao	5	B								
25 Mar	S26W93	38	30	2	Cao	2	B								
								0	0	0	3	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 39

### Region 1704

23 Mar	N15E74	253	60	3	Hsx	1	A								
24 Mar	N16E60	254	80	3	Hax	1	A								
25 Mar	N16E45	255	70	3	Cao	4	B				2				
26 Mar	N16E31	256	70	2	Hax	4	A								
27 Mar	N15E18	255	80	2	Hax	2	A								
28 Mar	N15E06	255	90	4	Hax	1	A								
29 Mar	N15W08	256	90	3	Cao	3	B								
30 Mar	N15W21	256	70	2	Hax	3	A								
31 Mar	N15W34	255	70	2	Hax	2	A								
01 Apr	N14W47	255	80	4	Dao	4	B								
02 Apr	N16W61	255	80	3	Cao	5	B								
03 Apr	N15W74	255	60	2	Hsx	3	A								
04 Apr	N15W89	257	30	1	Hsx	2	A								
								0	0	0	2	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 255

### Region 1705

25 Mar	S12E21	279	30	4	Dao	6	B								
26 Mar	S12E07	280	30	6	Cao	3	B								
27 Mar	S12W11	284	10	1	Axx	1	A								
28 Mar	S12W24	285	plage												
29 Mar	S12W38	286	plage												
30 Mar	S12W52	287	plage												
31 Mar	S12W66	287	plage												
01 Apr	S12W80	288	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 280





### *Region Summary - continued*

Date	Location	Sunspot Characteristics						Flares							
	Lat CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
		Lon	10 <sup>-6</sup> hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
Region 1706															
27 Mar	S06E04	268	10	2	Bxo	2	B								
28 Mar	S06W09	270	10	4	Bxo	2	B								
29 Mar	S06W24	272	plage												
30 Mar	S06W39	274	plage												
31 Mar	S07W52	273	plage												
01 Apr	S07W67	275	plage												
02 Apr	S07W82	277	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 268

<b>Region 1707</b>															
28 Mar	S11E32	229	20	3	Bxo	4	B								
29 Mar	S11E18	230	50	4	Cao	7	B								
30 Mar	S11E04	231	40	2	Hax	2	A								
31 Mar	S11W12	233	30	4	Cao	5	B								
01 Apr	S10W28	235	30	2	Cro	4	B								
02 Apr	S11W42	236	10	1	Hrx	3	A								
03 Apr	S12W56	238	10	1	Axx	1	A								
04 Apr	S12W70	239	plage												
05 Apr	S12W84	240	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 231



### *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

#### *Region 1708*

28 Mar	N12E71	190	50	4	Cso	2	B								
29 Mar	N11E58	190	90	6	Dao	4	B								
30 Mar	N11E45	190	90	6	Cso	4	B								
31 Mar	N11E30	191	50	5	Cso	4	B								
01 Apr	N11E16	191	40	1	Hax	2	A								
02 Apr	N10E03	191	20	3	Cso	4	B				1				
03 Apr	N10W11	193	20	3	Dro	4	B	2							
04 Apr	N13W25	193	10	1	Axx	1	A								
05 Apr	N13W39	194	10		Axx	1	A								
06 Apr	N13W53	195	plage												
07 Apr	N13W67	196	plage												
								2	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 191

#### *Region 1709*

29 Mar	S33W21	269	10	3	Bxo	4	B								
30 Mar	S33W35	270	plage												
31 Mar	S33W49	270	plage												
01 Apr	S33W63	271	plage												
02 Apr	S33W77	272	plage												
								0	0	0	0	0	0	0	0

Died on Disk.

Absolute heliographic longitude: 269

#### *Region 1710*

29 Mar	S22E49	199	40	4	Cao	5	B								
30 Mar	S21E34	201	70	7	Cao	7	B								
31 Mar	S22E20	201	50	8	Cao	6	B								
01 Apr	S22E07	200	10	6	Bxo	7	B								
02 Apr	S21W06	200	10	4	Bxo	5	B								
03 Apr	S22W18	199	120	4	Dao	9	B								
04 Apr	S22W30	198	60	4	Dao	7	B								
05 Apr	S21W44	199	50	6	Dao	6	B								
06 Apr	S23W55	197	plage												
07 Apr	S23W69	198	plage												
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 200



### *Region Summary - continued*

Location		Sunspot Characteristics						Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10 <sup>-6</sup> hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
Region 1711															
30 Mar	S17E77	158	210	4	Cai	4	B								
31 Mar	S17E62	159	420	5	Cki	4	B								
01 Apr	S20E52	156	480	11	Cki	6	B								
02 Apr	S17E36	157	460	5	Dko	7	B								
03 Apr	S17E24	157	560	6	Cko	15	B	1			2				
04 Apr	S19E10	158	580	6	Cko	19	B								
05 Apr	S15W02	158	530	5	Cko	6	B				1				
06 Apr	S17W16	158	440	5	Dho	5	B								
07 Apr	S19W28	157	400	12	Cko	7	B								
								1	0	0	3	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 158

<b>Region 1712</b>															
31 Mar	N01E38	183	10	3	Cro	2	B								
01 Apr	N02E23	184	10		Axx	1	A								
02 Apr	N02E08	187	plage												
03 Apr	N02W07	189	plage												
04 Apr	N02W22	191	plage												
05 Apr	N02W35	191	plage												
06 Apr	N02W50	192	plage												
07 Apr	N02W64	193	plage												
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 189

<b>Region 1713</b>															
02 Apr	N08E22	171	60	4	Cao	8	B				2				
03 Apr	N10E08	173	30	4	Cro	6	B				1				
04 Apr	N09W06	174	30	7	Cro	17	B	1							
05 Apr	N10W19	174	70	9	Dai	19	B								
06 Apr	N10W33	175	130	9	Dai	16	BG								
07 Apr	N11W47	176	120	8	Dai	13	BG	1			1				
								2	0	0	4	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 174



### *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

#### *Region 1714*

02 Apr	N12E65	129	60	1	Hsx	1	A								
03 Apr	N13E52	129	60	1	Hsx	1	A								
04 Apr	N12E39	129	100	1	Hsx	1	A								
05 Apr	N12E27	129	50	2	Hsx	1	A								
06 Apr	N13E14	128	80	6	Cso	6	B								
07 Apr	N12E02	127	60	6	Cso	6	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 127

#### *Region 1715*

04 Apr	N18W15	183	10	4	Bxo	2	B								
05 Apr	N17W28	183	30	6	Cao	5	B								
06 Apr	N18W39	181	10	2	Bxo	4	B	1			1				
07 Apr	N18W53	182	0	1	Axx	1	A								
								1	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 183

#### *Region 1716*

05 Apr	S19E32	123	10	1	Axx	2	A								
06 Apr	S19E18	124	plage												
07 Apr	S20E04	125	10	2	Bxo	2	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 125

#### *Region 1717*

05 Apr	S10E66	89	10	2	Axx	3	A								
06 Apr	S12E51	91	10	2	Bxo	2	B	1							
07 Apr	S13E37	92	10	1	Axx	1	A								
								1	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 92



### *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

#### *Region 1718*

05 Apr	N23E45	110	10	2	Axx	2	A								
06 Apr	N22E33	109	130	7	Dsi	10	BG	5			7				
07 Apr	N20E20	109	140	7	Dai	14	BG	1			4				
								6	0	0	11	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 109

#### *Region 1719*

05 Apr	N08E78	77	90	2	Hsx	1	A	1	1						
06 Apr	N08E66	76	80	2	Cso	4	B	1			2				
07 Apr	N08E53	76	150	6	Dsi	6	BG	1			1				
								3	1	0	3	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 76

#### *Region 1720*

07 Apr	N11W08	137	20	3	Cso	4	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 137

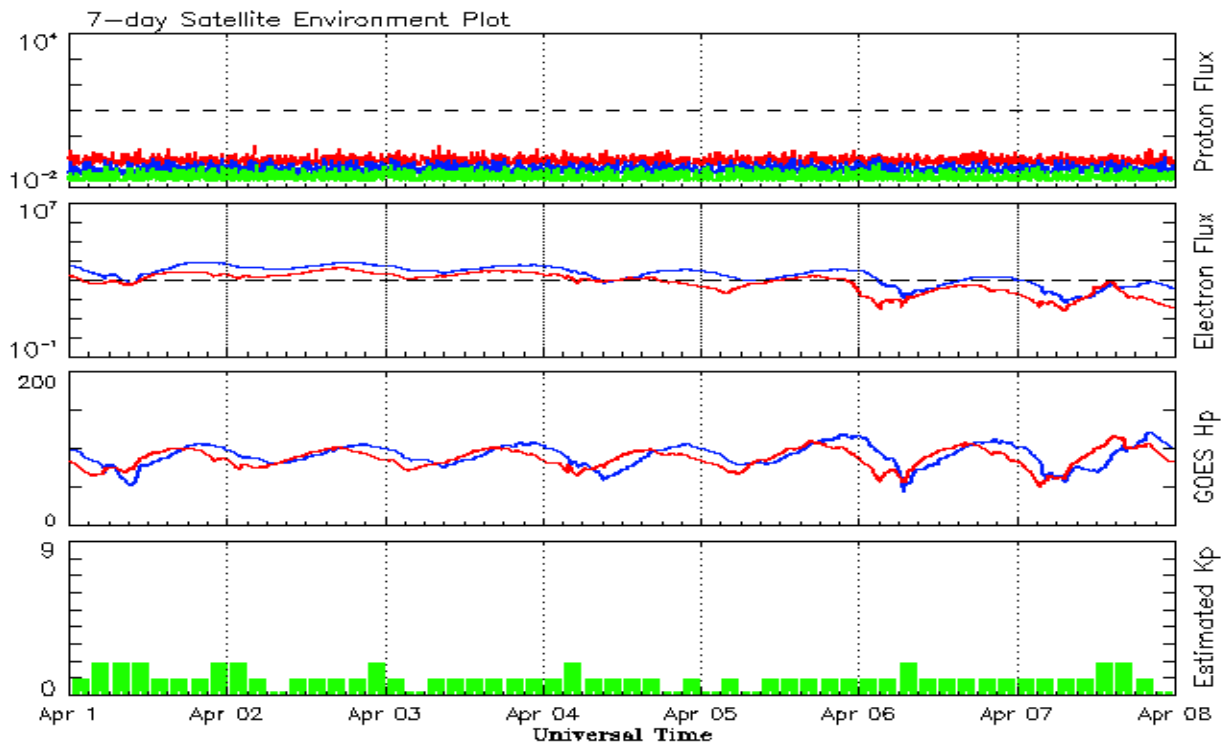


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>2011</b>									
April	81.7	54.4	0.67	61.5	41.8	112.6	100.4	9	7.5
May	61.4	41.6	0.68	69.0	47.6	95.9	105.6	9	7.5
June	55.5	37.0	0.67	76.5	53.2	95.8	110.9	8	7.4
July	67.0	43.8	0.66	82.5	57.3	94.2	115.4	9	7.3
August	66.1	50.6	0.77	84.9	59.0	101.7	117.9	8	7.4
September	106.4	78.0	0.73	84.6	59.5	134.5	118.4	13	7.7
October	116.8	88.0	0.75	84.6	59.9	137.2	118.4	7	8.0
November	133.1	96.7	0.73	86.3	61.1	153.1	119.5	3	8.0
December	106.3	73.0	0.69	89.2	63.4	141.2	121.6	3	8.0
<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			123.3		9	
November	89.2	61.8	0.69			120.9		6	
December	60.4	40.8	0.68			108.4		3	
<b>2013</b>									
January	99.8	62.9	0.63			127.1		4	
February	60.0	38.0	0.63			104.4		5	
March	81.0	57.9	0.71			111.2		9	

**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 01 April 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.

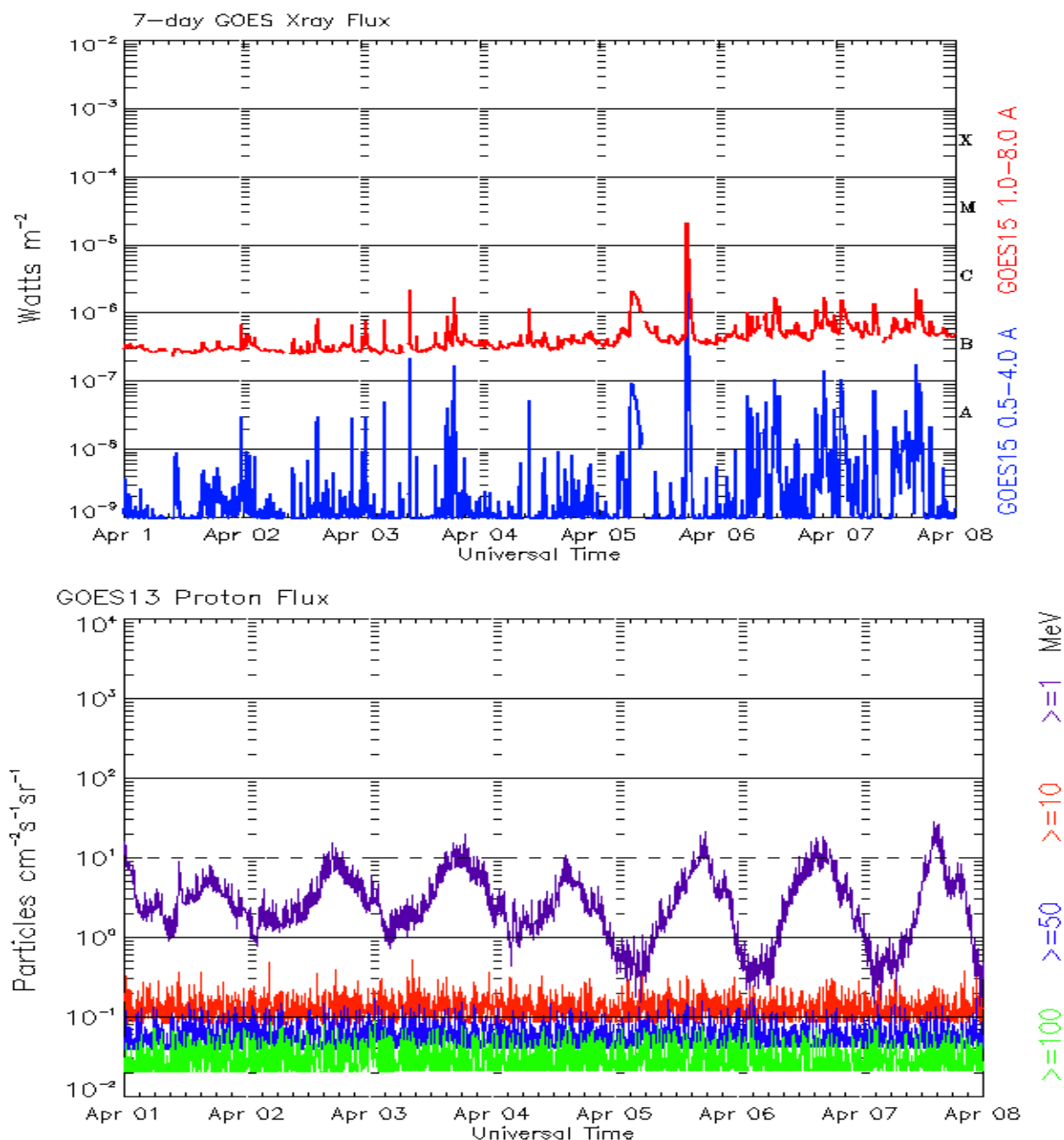
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 01 April 2013*

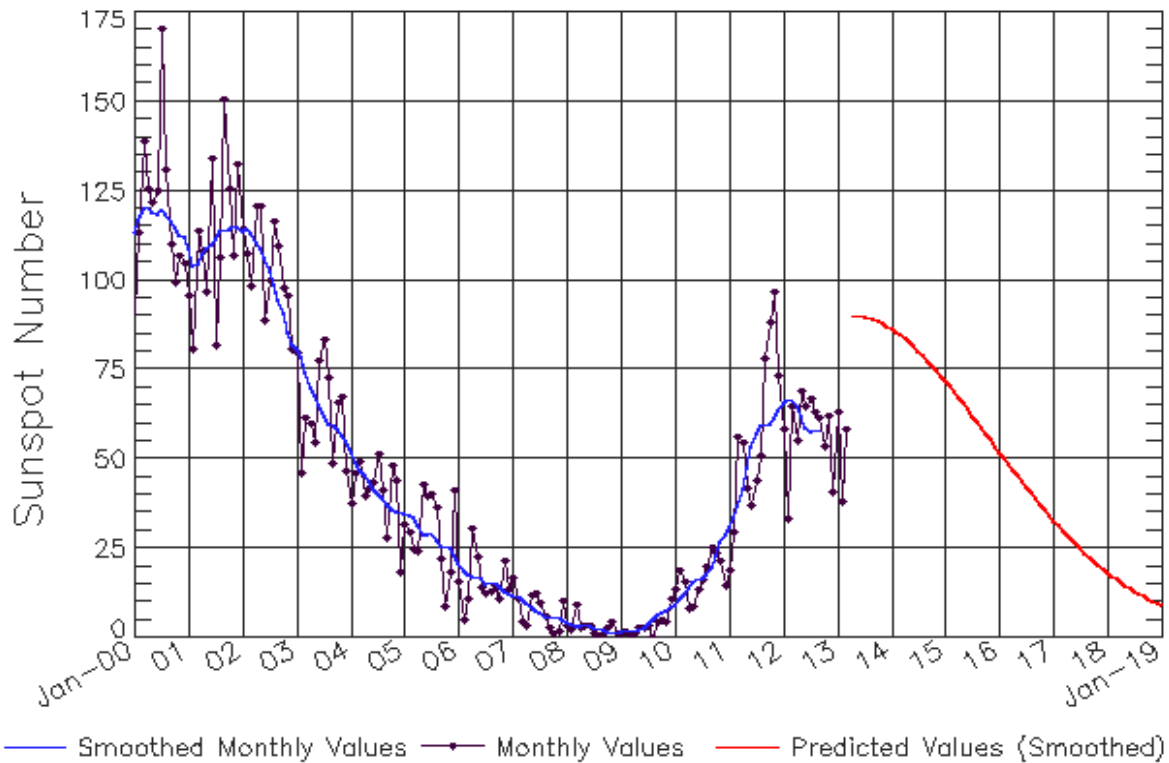
The x-ray plots contains five-minute averages x-ray flux ( $\text{Watt/m}^2$ ) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged integral flux units (pfu = protons/ $\text{cm}^2$  -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.



# ISES Solar Cycle Sunspot Number Progression

Observed data through Mar 2013

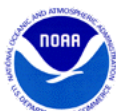


Updated 2013 Apr 8

NOAA/SWPC Boulder, CO USA

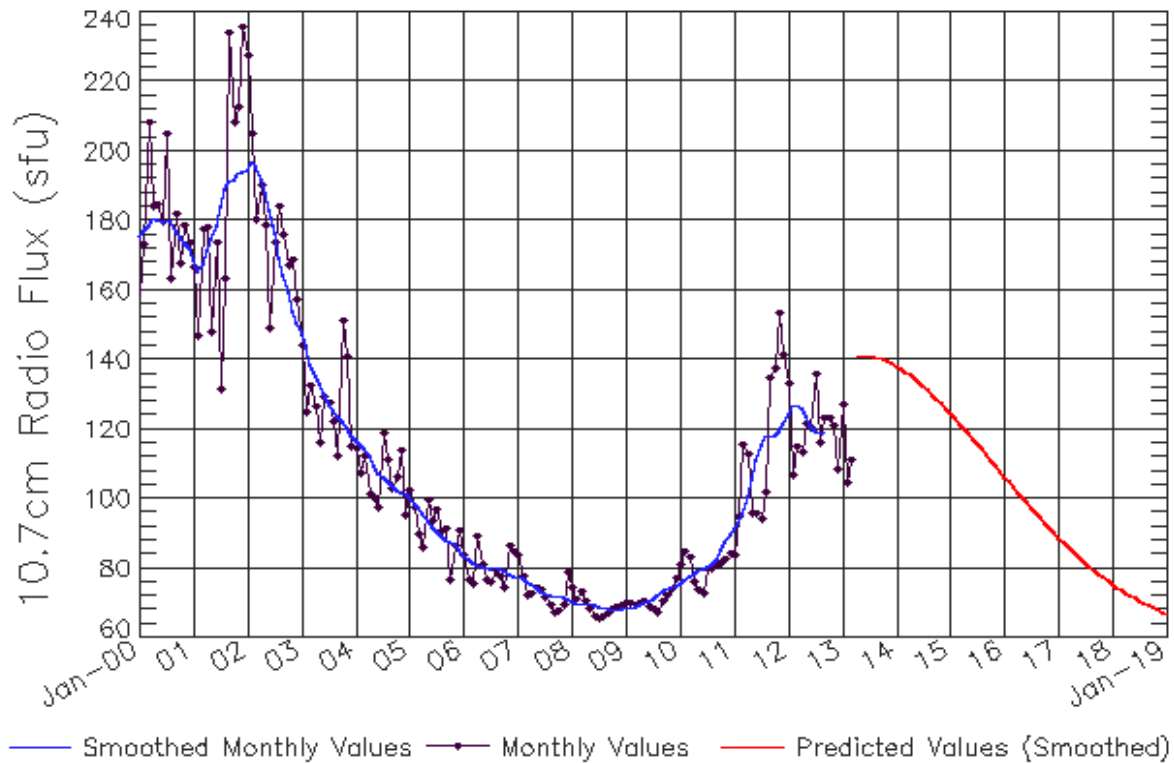
## Smoothed Sunspot Number Prediction

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 (1)	62 (2)	64 (3)
2013	66 (5)	68 (5)	70 (6)	73 (7)	75 (7)	78 (8)	81 (9)	84 (9)	87 (10)	89 (10)	88 (10)	87 (10)
2014	86 (10)	86 (10)	85 (10)	84 (10)	83 (10)	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 Mar 2013



Updated 2013 Apr 8

NOAA/SWPC Boulder, CO USA

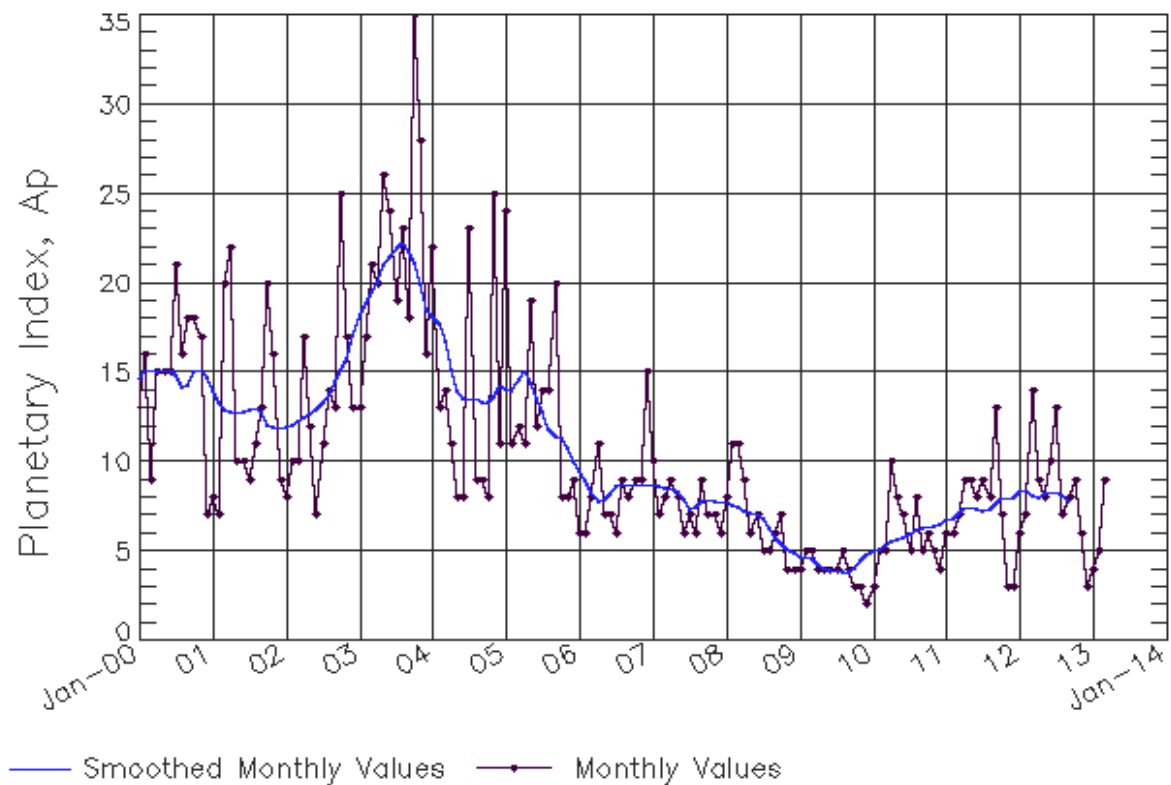
## Smoothed F10.7cm Radio Flux Prediction

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 (***)	120 (1)	122 (1)	124 (2)
2013	125 (3)	126 (4)	128 (4)	129 (5)	131 (6)	133 (7)	134 (8)	136 (8)	139 (9)	140 (9)	139 (9)	139 (9)
2014	138 (9)	137 (9)	136 (9)	136 (9)	135 (9)	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 Mar 2013



Updated 2013 Apr 8

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](mailto:SWPC.Webmaster@noaa.gov)

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