Space Weather Highlights **SWO PRF 1290**
15 – 21 May 2000 **23 May 2000**

Solar activity ranged from low to moderate levels with a single period of high activity on 15 May. This high activity level was due to six M-class events that occurred within a 24-hour period on 15 May (see the Energetic Event Summary for flare times). Regions 8993 (S21, L = 086, class/area Eao/240 on 15 May), 8998 (S14, L = 333, class/area Fki/470 on 15 May), and 9002 (N18, L = 304, class/area Ehi/940 on 15 May) all produced M-class events on 15 May. Activity was moderate on 16, 18, and 19 May with a single M-class event occurring on each day. Activity was low on 17, 20, and 21 May, although an interesting event occurred on 20 May, a C7/1N, with an accompanying Type II and IV sweep at 20/0535UT from Region 8998. The largest region during the period was 8996 (S21, L = 345, class/area Ekc/1280 on 16 May). Even though this region maintained a Beta-Gamma magnetic classification during most of the period, it produced comparatively little activity.

Real-time solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the period. Solar wind velocity ranged from 370 to 600 km/s during the period, peaking at 600 km/s for short periods on 18 and 19 May.

There were no proton events detected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels.

Geomagnetic field activity was at mostly quiet to active levels through 17 May, with minor storming occurring during the period 17/0300-0900UT at mid-latitudes and 17/0000-0900UT at high latitudes. Activity decreased to quiet to unsettled levels for the rest of the period except for 20 May when the geomagnetic field was quiet.

Space Weather Outlook
24 May - 19 June 2000

Solar activity is expected to vary between low and moderate levels. Isolated M-class flares are likely during the period. There will also be a slight chance for a major flare sometime during the period.

There will be a slight chance for a greater than 10 MeV proton event at geosynchronous orbit sometime during the period.

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

Quiet to unsettled levels are expected for the rest of the period, barring an Earth-directed CME.

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
15 May	244	302	3510	C1.8	10	6	0	33	2	0	0	0
16 May	259	298	3450	C1.3	11	1	0	15	0	0	0	0
17 May	262	342	3190	C2.7	14	0	0	29	0	0	0	0
18 May	253	297	3020	C2.0	12	1	0	27	2	0	0	0
19 May	254	239	2760	C2.9	8	1	0	23	0	1	0	0
20 May	246	282	2920	C2.2	9	0	0	24	3	0	0	0
21 May	232	271	2950	C1.9	6	0	0	18	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ^{2}-day-sr)			Electron Fluence (electrons/cm^2-day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
15 May	2.9E+5	1.6E+4	2.2E+3		4.3E+5	
16 May	6.0E+6	6.2E+4	2.2E+3		3.2E+5	
17 May	5.9E+6	2.5E+4	2.2E+3		9.8E+4	
18 May	2.9E+6	3.7E+4	2.3E+3		2.1E+5	
19 May	1.8E+6	2.2E+4	2.2E+3		4.2E+5	
20 May	9.1E+5	1.9E+4	2.2E+3		4.6E+5	
21 May	2.2E+6	1.6E+4	2.1E+3		1.6E+6	

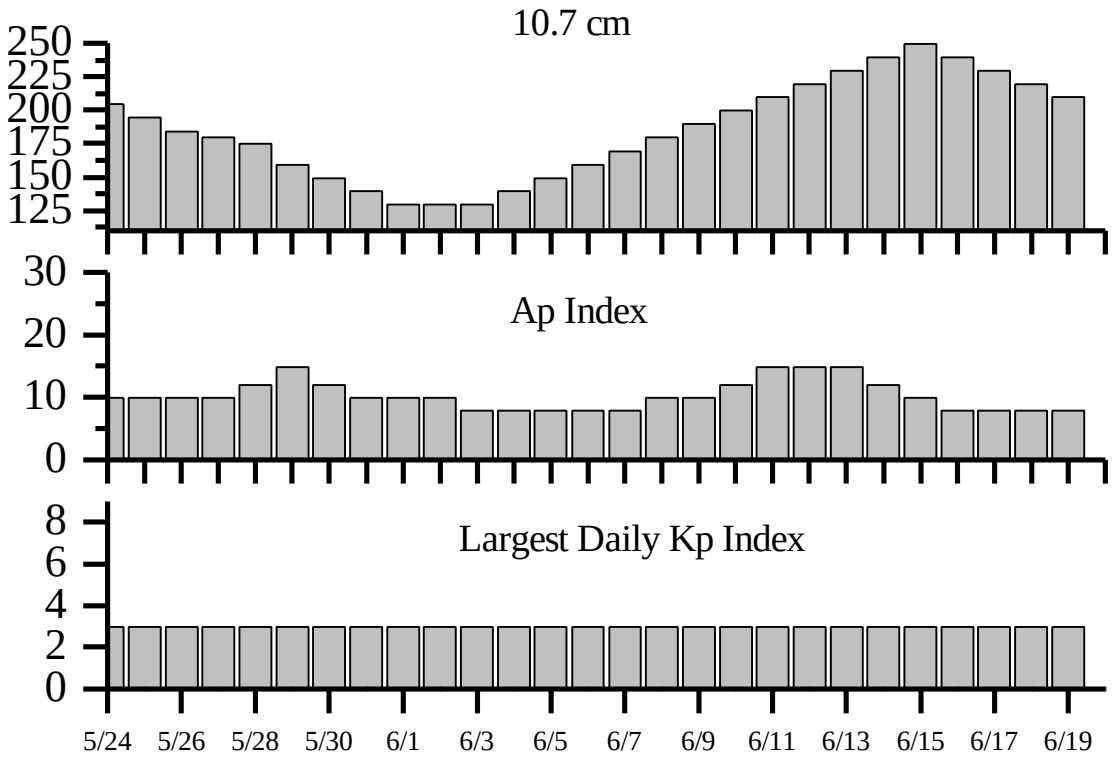
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
15 May	10	4-2-2-2-1-2-2-3	*	4-3-2-6-3-*-*-*	16	4-3-3-4-3-2-2-3
16 May	14	3-4-2-3-3-2-3-2	*	*-*-*-*-*-2-3-2	18	3-4-3-4-3-3-3-3
17 May	20	5-5-4-2-1-1-2-3	20	5-5-3-3-3-1-2-2	22	5-5-5-2-2-2-3-3
18 May	8	3-2-2-2-1-2-2-2	*	4-2-3-4-1-1-*-2	10	3-3-3-2-2-2-3-2
19 May	7	2-2-2-2-2-2-2-1	*	2-2-*-4-2-1-1-1	9	2-3-2-3-3-3-3-2
20 May	4	1-1-1-1-1-1-2-1	3	2-1-1-0-1-1-1-1	6	2-2-1-2-2-2-2-2
21 May	5	1-2-2-1-1-2-1-1	5	2-2-2-2-0-1-1-2	7	2-3-2-2-2-2-2-2

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
15 May 0035	1 – 245MHz Radio Burst	14 May
15 May 0232	K = 4 Warning	15 May 0232 - 1200
15 May 0307	K = 4 Observed	15 May 00 - 03
15 May 0920	Proton Event >10MeV @ >=10pfu Warning	15 May 0920 - 1500
15 May 0943	10cm Radio Burst 640 F.U.	15 May 0842
15 May 2130	A >= 20 Watch	18 May
15 May 2346	10cm Radio Burst 1500 F.U.	15 May 1553
16 May 0101	2 – 245MHz Radio Bursts	15 May
16 May 0442	K = 5 Warning	16 May 05 - 15
16 May 0600	K = 4 Observed	16 May 03 - 06
17 May 0000	K = 5 Warning	17 May 00 - 15
17 May 0040	3 – 245MHz Radio Bursts	16 May
17 May 0303	K= 4 Observed	17 May 00 - 03
17 May 0600	A >= 20 Observed	17 May 0600
17 May 0600	K= 5 Observed	17 May 03 - 06
18 May 0042	2 – 245MHz Radio Bursts	17 May
18 May 0042	1 – 245MHz Radio Noise Storm	17 May
18 May 0605	ENDED A >= 20 Observed	17 May 0600
19 May 0108	9 – 245MHz Radio Bursts	18 May
19 May 0108	1 – 245MHz Radio Noise Storm	18 May
20 May 0100	4 – 245MHz Radio Bursts	19 May
20 May 0100	1 – 245MHz Radio Noise Storm	19 May
20 May 1138	Type II Radio Emission	20 May 0556
20 May 1144	Type IV Radio Emission	20 May 0559
21 May 0048	Type IV Radio Emission	20 May 1117
21 May 0055	3 – 245MHz Radio Bursts	20 May
21 May 0055	1 – 245MHz Radio Noise Storm	20 May

Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
24 May	205	10	3	07 Jun	170	8	3
25	195	10	3	08	180	10	3
26	185	10	3	09	190	10	3
27	180	10	3	10	200	12	3
28	175	12	3	11	210	15	3
29	160	15	3	12	220	15	3
30	150	12	3	13	230	15	3
31 May	140	10	3	14	240	12	3
01 Jun	130	10	3	15	250	10	3
02	130	10	3	16	240	8	3
03	130	8	3	17	230	8	3
04	140	8	3	18	220	8	3
05	150	8	3	19	210	8	3
06	160	8	3				

Energetic Events

Date	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV
15 May	0447	0457	0508	M1.3	.011							
15 May	0816	0902	0928	M4.4	.100	SF	N21E75	9002	400	640		
15 May	1046	1050	1056	M1.2	.006			8993		160		
15 May	1638	1644	1649	M1.1	.006	SF	S15E51	8998	100			
15 May	1757	1802	1805	M1.2	.004	SF	S21W69	8993				
15 May	1848	1853	1856	M2.0	.006	1N	N21E73	9002				
16 May	1546	1551	1557	M3.2	.013	SF	N19E61	9002		65		
18 May	1552	1557	1559	M2.7	.005	1B	N23E30	9002	910	60		
19 May	0052	0058	0105	M1.1	.008							

Flare List

Date	Time			X-ray	Optical		Rgn
	Begin	Max	End	Class.	Imp / Brtns	Location Lat CMD	
15 May	0008	0008	0015		SF	S22W60	8993
	0034	0043	0059	C5.1	SF	S14E47	8998
	0038	0044	0051		SF	S23W58	8993
	0215	0219	0232		SF	N09W56	8994
	0324	0331	0352	C3.9	SF	S23W64	8993
	0447	0457	0508	M1.3			
	0727	0729	0732		SF	N22E71	9002
	0758	0806	0809		SF	S20W65	8993
	0802	0804	0808		SF	N21E76	9002
	0830	0831	0838		SF	S21W67	8993
	0832	0833	0845		SF	N18W60	8989
	0839	0843	0858		SF	S20W66	8993
	0845	0848	A0910	M4.4	SF	N21E75	9002
	1046	1050	1056	M1.2			8993
	1345	1348	1353		SF	N10E65	9002
	1351	1352	1427		SF	S18W72	8993
	1442	1449	1457		SF	S14E48	8998
	1508	1510	1514		SF	N10E64	9004
	1520	1528	1555	C6.1	SN	S15E47	8998
	1548	1556	1631	C7.8	1F	S24W67	8993
	1640	1645	1716	M1.1	SF	S15E51	8998
	1722	1722	1726		SF	N19W64	8989
	1723	1730	1732	C4.9	SF	N22E74	9002
	1730	1731	1737		SF	S15E51	8998
	1740	1740	1746		SF	N22E41	8999
	1801	1804	1809	M1.2	SF	S21W69	8993
	1820	1828	1832		SF	N10E64	9004
	1826	1833	1854	C4.3	SF	S14E49	8998
	1845	1851	1925	M2.0	1N	N21E73	9002
	1851	1905	1914		SF	N12W46	8990
	1902	1902	1906		SF	S14E34	8998

Flare List – continued.

	Time			X-ray	Optical Imp /	Location	Rgn
Date	Begin	Max	End	Class.	Brtns	Lat CMD	
15 May	1922	1923	1928		SF	N16W65	8989
	2003	2011	2013		SF	N21E72	9002
	2041	2043	2058		SF	N19E68	9002
	2127	2131	2134	C4.9			
	2152	2203	2218	C9.8	SF	S21W72	8993
	2210	2215	2228		SF	S12E43	8998
	2303	2306	2309	C2.8			
	2321	2322	2325		SF	N10E61	9004
	2339	2342	2345	C2.2			
16 May	0104	0106	0115	C2.6	SF	S14E33	8998
	0148	0148	0205	C3.1	SF	S13E45	8998
	0327	0329	0334	C4.5	SF	S20W79	8993
	0411	0412	0419	C2.6	SF	S12E43	8998
	0442	0444	0455	C2.4	SF	S23W78	8993
	0527	0527	0530	C2.8	SF	S14E39	8998
	0609	0616	0623	C4.3			
	0624	0625	0638		SF	S16E39	8998
	0717	0722	0729	C4.0			
	0800	0801	0806		SF	S19E19	8996
	0840	0840	0911	C7.4	SF	N21E64	9002
	1137	1137	1146		SF	S19E17	8996
	1243	1243	1256	C4.0	SF	N20W75	8989
	1245	1249	1300		SF	N19E62	9002
	1502	1506	1510	C3.0			
	1549	1550	1601	M3.2	SF	N19E61	9002
	2341	2342	2351		SF	S22E20	8996
	2359	0023	0053	C7.7	SF	S22E19	8996
17 May	0234	0236	0240		SF	N17E30	8999
	0325	0330	0359	C5.4	SF	N19E54	9002
	0337	0344	0353		SF	S12E26	8998
	0401	0404	0408	C7.1			
	0435	0444	0452	C4.1	SF	S12E25	8998
	0502	0503	0513	C3.7	SF	S23E15	8996
	0645	0646	0704		SF	S19E05	8996
	0713	0718	0748		SF	N19E50	9002
	0757	U0758	0810		SF	S21E13	8996
	0830	0830	0833		SF	S23W88	8993
	0933	U0938	0957	C6.1	SF	S14E29	8998
	1115	1117	1123	C3.1	SF	S20E09	8996
	1202	1203	1220	C4.0	SF	N21E51	9002
	1309	U1328	A1355		SF	S13E25	8998
	1313	1326	1338	C5.5	SF	S22E09	8996

Flare List – continued.

	Time			X-ray	Optical Imp /	Location	Rgn
Date	Begin	Max	End	Class.	Brtns	Lat CMD	
17 May	1443	1444	1451	C3.1	SF	S21E09	8996
	1544	1545	1556		SF	N17E24	8999
	1640	1644	1649		SF	N19E47	9002
	1720	1722	1730		SF	S22E09	8996
	1725	1726	1734		SF	S22W67	9003
	1737	1737	1746		SF	S22W66	9003
	1809	1809	1815		SF	S19E00	8996
	1821	1824	1826	C2.7			
	1911	1912	1915		SF	N20E48	9002
	1947	1949	2004		SF	S23E08	8996
	1955	2009	2015	C4.9	SF	N20E47	9002
	2040	2042	2046		SF	S20W68	9003
	2042	2048	2120		SF	S22E08	8996
	2128	2130	2139	C3.6	SF	S20E02	8996
	2356	2357	0003	C4.3	SF	S20E02	8996
	2356	2357	0007		SF	S15E13	8998
18 May	0032	0033	0042		SF	N26W86	9006
	0051	0053	0058		SF	S21W68	9003
	0126	0153	0214	C4.6	SF	S17W05	8996
	0217	0221	0224	C2.9			
	0526	0529	0541	C2.6	SF	N21E41	9002
	0547	0548	0604	C2.7	SF	N21E41	9002
	0722	0722	0738		SF	S20W06	8996
	0747	0748	0810		SF	S11E11	8998
	0751	0752	0834	C5.0	SF	N21E39	9002
	B0927	U0929	0953		SF	N22E38	9002
	0955	U0959	A1028	C6.2	SF	S09E10	8998
	1112	U1123	A1145	C6.8	SF	N23E39	9002
	B1321	U1321	1328	C4.2	SF	N21E39	9002
	1410	1412	1417		SF	S22W04	8996
	1423	1424	1432		SF	S25W05	8996
	B1429	U1429	1436	C4.0	SF	S09E08	8998
	1517	1518	1524		SF	S19W12	8996
	1526	1531	1533		SF	N10E25	9004
	1542	1545	1554		SF	S12E07	8998
	1555	1556	1611	M2.7	1B	N23E30	9002
	1615	1617	1619		SF	N19E33	9002
	1648	1717	1742	C3.4	SF	N18E34	9002
	1833	1840	1902		SF	S16E12	8998
	1909	1910	1915		SF	S23W13	8996
	1953	1954	2012		SF	N20E35	9002
	B2206	U2207	A2211	C3.5	SF	S12E02	8998
	B2335	U2335	2341		SF	N20E32	9002

Flare List – continued.

	Time			X-ray	Optical Imp /	Location	Rgn
Date	Begin	Max	End	Class.	Brtns	Lat CMD	
18 May	2349	2349	0036		SF	S11E01	8998
	2355	0054	0138	C7.5	1N	N21E30	9002
	2357	0000	0004		SF	S20W11	8996
19 May	0052	0058	0105	M1.1			
	0120	0120	0128		SF	N22E66	9010
	0125	0129	0142		SF	S12E00	8998
	0309	0319	0328	C5.7			
	0455	0455	0459	C4	SF	S11E00	8998
	0559	0600	0613		SF	S12W03	8998
	0636	0636	0654	C3.1	SF	S12W04	8998
	0701	0701	0719		SF	S21W20	8996
	0726	0729	0735		SF	S22W20	8996
	0749	0749	0759		SF	N18E63	9010
	0801	0802	0814		SF	S12W04	8998
	0823	0830	0856	C5.9	SF	N20E24	9002
	1115	1116	1123	C2.9	SF	N19E22	9002
	1248	1259	1302	C3.8			
	1251	1254	A1255		SF	S12W04	8998
	1325	1330	1337	C3.3			
	1346	1350	1404		SF	N19E23	9002
	1432	1432	1442		SF	S13W06	8998
	1453	1517	1544	C8.5	2F	N21E22	9002
	1749	1749	1756		SF	S12W08	8998
	1813	1816	1830		SF	N19E59	9010
	1816	1819	1824		SF	S18W26	8996
	1832	1834	1849		SF	N19E60	9010
	1844	1844	1852		SF	N19W07	8999
	1912	1928	1945		SF	S12W07	8998
	2047	2055	2108		SF	S12W10	8998
	2052	2123	2212		SF	S17W18	8996
	2213	2213	2227		SF	S18W21	8996
20 May	0027	0028	0037		SF	N11E06	9004
	0039	0045	0115		1N	N21W11	8999
	0044	0045	0054	C5.0	SF	S12W12	8998
	0048	0108	0122		SF	S22W27	8996
	0107	0111	0120		SF	S18W36	8997
	0313	0319	0337	C3.6	1F	S12W11	8998
	0437	0438	0444	C2.7	SF	N11E03	9004
	0526	0534	0650	C7.6	1N	S15W08	8998
	0720	0720	0735		SF	S13W13	8998
	0820	0826	0834		SF	S12W15	8998
	0847	0847	0855		SF	S16W22	8996

Flare List – continued.

	Time			X-ray	Optical Imp /	Location	Rgn
Date	Begin	Max	End	Class.	Brtns	Lat CMD	
20 May	B1051	U1051	1054		SF	N14E01	9004
	1143	1144	1147		SF	N14E01	9004
	1156	1157	1203		SF	N22E07	9002
	1414	1414	1420		SF	N21E54	9011
	1450	1516	1525		SF	N20E52	9011
	1519	1520	1526		SF	N19E07	9002
	1527	1529	1536		SF	S19W27	8996
	1658	1700	1727	C4.2	SF	N18E14	9002
	1843	1848	1900		SF	S12W19	8998
	1851	1852	1858		SF	N19W20	8999
	2020	2020	2028	C2.1	SF	S22W40	8996
	2036	2038	2045		SF	S11W22	8998
	2109	2114	2132	C2.8	SF	S20W41	8996
	B2155	U2157	2206	C2.5	SF	N19W23	8999
	2226	2229	2255	C2.6	SF	N21E43	9010
	2247	2249	2305		SF	N18W24	8999
21 May	0009	0009	0013		SF	N19E01	9002
	0009	0009	0020	C3.7	SF	N19E48	9011
	0027	0039	0045		SF	S12W26	8998
	0425	0425	A0443		SF	N19E04	9002
	0631	0635	0645	C2.5	SF	S10W27	8998
	0808	0812	0816	C2.4			
	1004	1022	1041	C8.2	SF	S18W47	8996
	1022	1024	1034		SF	S09W30	8998
	1202	1203	1219		SF	N18W01	9002
	1336	1336	1341		SF	S25W41	8996
	1341	1342	1347		SF	S25W41	8996
	1614	1614	1623		SF	S21W44	8996
	B1645	U1645	1652	C1.9	SF	N10W21	9004
	1836	1839	1845		SF	S22W45	8996
	1841	1841	1846		SF	N21W35	8999
	1923	1943	1959	C2.1	SF	S21W46	8996
	2007	2007	2011		SF	S19W54	8996
	2303	2307	2347		SF	S13W39	8998
	2355	2355	2358		SF	S22W47	8996

Region Summary

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
			Region 8989												
07 May	N17E38	082	0020	04	BXO	005	B				1				
08	N16E25	081	0070	04	DAO	009	B				1				
09	N17E12	081	0160	05	DAO	014	B	3			6				
10	N16W01	081	0180	06	DAO	019	B	2			2				
11	N16W15	082	0230	05	DAI	014	B				1				
12	N17W28	082	0340	06	DKI	017	B					1			
13	N17W40	080	0400	07	DKI	022	B				2				
14	N16W54	081	0320	07	DKI	016	B	1			4				
15	N16W67	081	0230	09	DAI	011	B				3				
16	N18W80	081	0180	09	DAI	012	B	1			1				
17	N18W93	081	0200	02	CAO	004	B								
								7	0	0	21	1	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 81

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
			Region 8990												
07 May	N14E63	057	0010	02	AXX	002	A				8	1			
08	N14E48	058	0050	06	DSO	008	B	4			8				
09	N14E33	060	0040	07	CSO	014	B	1			1				
10	N14E20	060	0070	09	CAO	016	B	1					1		
11	N14E05	062	0240	10	DAI	025	B								
12	N15W08	062	0300	10	DAO	032	B								
13	N13W21	061	0360	11	EKI	034	B	1			5				
14	N14W35	062	0230	10	DAI	028	B								
15	N14W48	062	0190	10	DSO	023	B		1		1				
16	N15W61	062	0200	11	CSO	012	B								
17	N17W76	064	0120	09	CSO	005	B								
18	N13W90	064	0050	01	HSX	001	A								
								7	1	0	23	1	1	0	0

Crossed West Limb.
Absolute heliographic longitude: 62

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
	Region 8991														
08 May	N16E71	035	0020	01	AXX	002	A				1				
09	N15E59	034	0080	06	CSO	005	B	1			5				
10	N15E46	034	0110	07	CSO	008	B				2				
11	N16E33	034	0100	07	CAO	010	B								
12	N15E20	034	0060	07	CAO	009	B								
13	N15E07	033	0040	07	CSO	009	B								
14	N16W09	036	0020	04	CSO	005	B								
15	N17W23	037	0010	03	BXO	003	B								
16	N16W35	036	0010	05	BXO	004	B								
17	N16W40	028	0000	01	AXX	002	A								
18	N16W53	028	0000	00		000									
19	N16W66	028	0000	00		000									
								1	0	0	8	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		33													
	Region 8992														
09 May	N09E72	021	0050	01	HAX	001	A								
10	N09E60	020	0090	02	HSX	001	A								
11	N11E47	020	0050	02	HSX	002	A								
12	N10E34	020	0040	02	HSX	003	A								
13	N10E22	018	0030	07	CAO	003	B								
14	N11E09	018	0020	04	CSO	004	B								
15	N09W05	019	0000	00	AXX	001	A								
17	N09W31	019	0010	01	AXX	001	A								
18	N10W44	018	0010	00	AXX	001	A								
19	N10W57	018	0000	00		000									
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		19													
	Region 8993														
10 May	S23W06	086	0050	05	DAO	012	B								
11	S24W18	085	0160	08	DSI	022	B	1			5				
12	S23W31	085	0160	08	DSI	022	B				2				
13	S23W45	085	0200	10	DAI	023	B	3			24				
14	S23W58	085	0290	11	EKO	015	B	3	1		12				
15	S21W72	086	0240	11	EAO	013	BD	3	2		9	1			
16	S21W84	085	0230	12	EKO	006	B	2			2				
17	S23W88	076	0090	02	CSO	003	B				1				
								12	3	0	55	1	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		86													

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8994												
10 May	N11W01	081	0030	04	CRO	006	B								
11	N09W15	082	0010	05	BXO	007	B								
12	N08W30	084	0000	03	BXO	002	B								
13	N08W43	084	0000	00		000									
14	N11W55	082	0000	03	BXO	002	B								
15	N10W70	084	0010	00	AXX	002	A				1				
16	N10W83	084	0030	03	BXO	002	B								
17	N10W96	084	0000	00		000									
								0	0	0	1	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		81													
			Region 8995												
11 May	S19E00	067	0000	02	BXO	003	B								
12	S19W13	067	0000	00		000									
13	S19W26	067	0000	00		000									
14	S19W39	067	0000	00		000									
15	S19W52	067	0000	00		000									
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		67													
			Region 8996												
11 May	S18E77	350	0150	10	DAO	003	B				1				
12	S21E67	347	0520	10	DKI	010	B	1			1				
13	S22E57	343	1210	12	EKI	016	B	4			8	1			
14	S21E44	343	1140	12	EKC	026	B	2			2				
15	S21E31	343	1280	13	EKC	045	BG								
16	S20E18	343	1240	13	EKC	041	BG				4				
17	S21E03	345	1280	13	EKC	053	BG	7			12				
18	S21W09	343	1230	14	EKC	053	BG	1			7				
19	S21W22	343	0950	13	EKC	042	BG				5				
20	S21W35	343	0870	13	EKC	044	B	2			5				
21	S21W49	344	0810	11	EKC	039	B	2			8				
								19	0	0	53	1	0	0	0
Still on Disk.															
Absolute heliographic longitude:		345													

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8997												
11 May	S14E64	003	0030	01	HSX	001	A								
12	S17E50	004	0020	01	HSX	001	A								
13	S16E37	003	0020	01	HSX	002	A								
14	S16E22	005	0010	04	BXO	003	B								
15	S16E11	003	0020	06	BXO	005	B								
16	S15W03	004	0010	02	BXO	003	B								
17	S17W16	004	0000	06	BXO	002	B								
18	S17W29	004	0000	00		000									
19	S17W42	004	0000	00		000									
20	S17W55	004	0000	00		000					1				
21	S17W68	004	0000	00		000									
								0	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 4

			Region 8998												
12 May	S14E73	341	0060	08	CSO	002	B	1	1		1	1			
13	S13E66	334	0260	14	EAO	008	B				7	1			
14	S13E54	333	0410	18	FAI	019	B	2			7				
15	S14E41	333	0470	17	FKI	029	BG	3	1		8	1			
16	S13E28	333	0570	19	FKC	042	BG	4			5				
17	S13E16	332	0510	15	EKC	040	BG	2			5				
18	S13E04	330	0580	10	DKC	039	BG	3			7	1			
19	S12W09	330	0490	12	EAC	031	BG	2			10				
20	S12W22	330	0420	12	EAC	032	BG	3			5	2			
21	S12W33	328	0450	12	EAC	037	BGD	1			4				
								21	2	0	59	6	0	0	0

Still on Disk.
Absolute heliographic longitude: 330

			Region 8999												
13May	N21E67	333	0040	06	BXO	005	B	1			3				
14	N20E55	332	0060	08	CSO	005	B				2				
15	N19E42	332	0040	07	CRO	005	B				1				
16	N20E29	332	0020	07	BXO	005	B								
17	N20E17	331	0010	06	BXO	005	B				2				
18	N20E05	329	0010	02	BXO	003	B								
19	N19W09	330	0000	03	BXO	002	B				1				
20	N19W22	330	0020	05	BXO	009	B	1			3	1			
21	N20W36	331	0030	06	CRO	009	B				1				
								2	0	0	13	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 329

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 9000												
13 May	N10E14	026	0010	03	BXO	004	B								
14	N08E00	027	0010	06	BXO	004	B								
15	N10W15	029	0010	02	BXO	002	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 27															
			Region 9001												
13 May	N16W05	045	0000	00	AXX	001	A								
14	N16W18	045	0000	00		000									
16	N16W44	045	0010	03	CSO	003	B								
17	N17W57	045	0000	00	AXX	001	A								
18	N17W70	045	0000	00		000									
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude: 45															
			Region 9002												
14 May	N18E76	311	0190	04	HHX	001	A								
15	N18E70	304	0940	14	EHI	011	BG	1	2		7	1			
16	N18E57	304	0860	15	EHI	013	BG	1	1		3				
17	N18E42	306	0820	14	EHI	029	BG	3			6				
18	N18E31	303	0780	17	FKI	045	BG	7	1		10	2	1		
19	N18E18	303	0730	20	FKC	041	BG	3			3		1		
20	N19E04	304	0720	16	FKI	049	BG	1			3				
21	N19W10	305	0730	16	FKI	058	B				3				
								16	4	0	35	3	2	0	0
Still on Disk.															
Absolute heliographic longitude: 304															
			Region 9003												
14 May	S18W26	053	0010	03	BXO	005	B								
15	S18W40	054	0050	05	DSO	008	B								
16	S17W52	053	0030	05	CRO	005	B								
17	S17W67	055	0020	07	CRO	006	B				3				
18	S18W81	055	0030	06	BXO	009	B				1				
19	S18W94	055	0000	00		000									
								0	0	0	4	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude: 53															

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
			Region 9004												
15 May	N10E61	313	0020	07	BXO	004	B				3				
16	N11E48	313	0060	07	CAO	009	B								
17	N11E34	314	0100	07	DSO	014	B								
18	N11E21	313	0090	06	DSO	016	B				1				
19	N12E06	315	0130	07	DAC	017	B								
20	N12W06	314	0520	07	DKC	014	BD	1			4				
21	N12W21	316	0530	07	DKC	013	BD	1			1				
								2	0	0	9	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		315													
			Region 9005												
16 May	S20W29	030	0000	01	AXX	001	A								
17	S18W46	034	0000	00	AXX	001	A								
18	S18W59	034	0000	00		000									
19	S18W72	034	0000	00		000									
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		30													
			Region 9006												
17 May	N26W88	076	0010	06	BXO	003	B								
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		76													
			Region 9007												
17 May	S42E12	336	0010	02	BXO	002	B								
18	S42W01	335	0010	03	BXO	003	B								
19	S42W14	335	0000	00		000									
20	S42W27	335	0000	00		000									
21	S42W40	335	0000	00		000									
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		335													
			Region 9008												
17 May	S31E50	298	0010	00	AXX	001	A								
18	S30E38	296	0010	00	AXX	001	A								
19	S30E25	296	0000	00		000									
20	S30E12	296	0000	00		000									
21	S30W01	296	0000	00		000									
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		296													

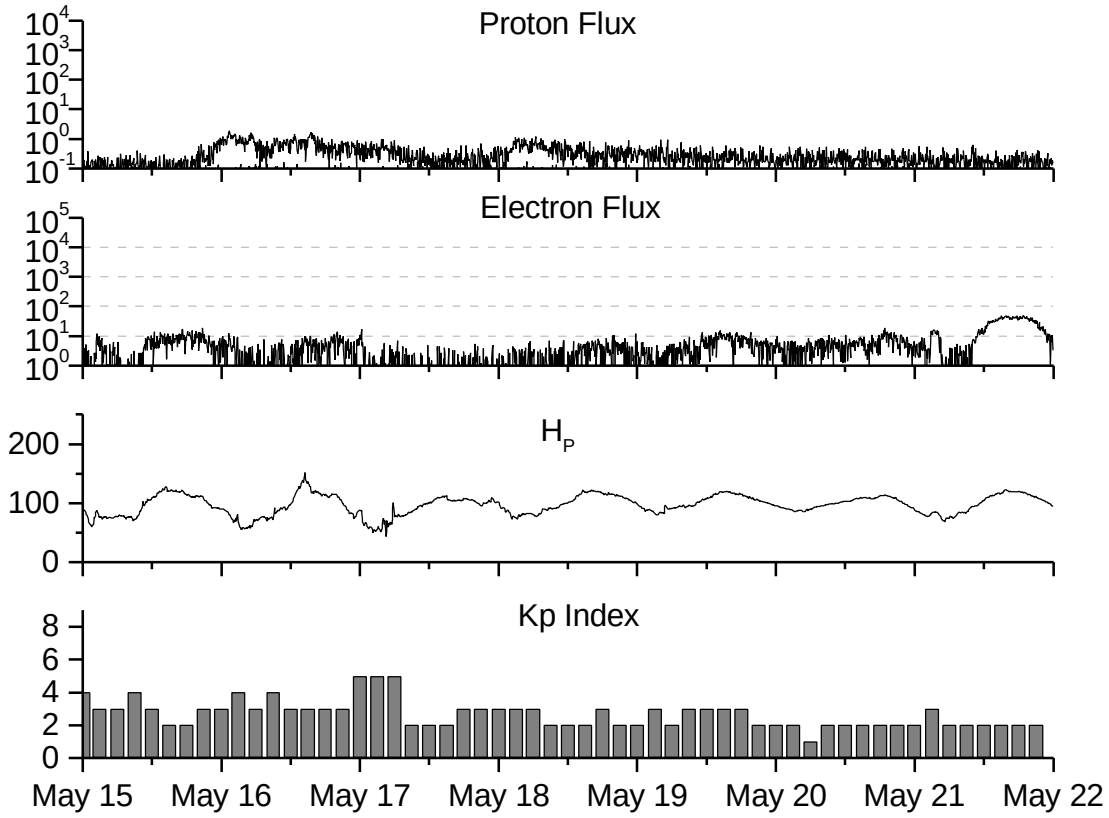
Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
		Region 9009													
18	S15E68	266	0050	01	HSX	001	A								
19	S13E55	266	0040	01	HSX	001	A								
20	S14E42	266	0030	01	HSX	002	A								
21	S15E29	266	0040	10	CSO	005	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		266													
		Region 9010													
18 May	N16E74	260	0170	15	ESO	005	B								
19	N20E58	263	0180	14	EHO	009	B				4				
20	N21E42	266	0090	07	CAO	011	B	1			1				
21	N21E30	265	0110	08	CAO	017	B								
								1	0	0	5	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		265													
		Region 9011													
19 May	N19E69	252	0240	05	HSX	002	A								
20	N17E53	255	0240	02	HAX	002	A				2				
21	N17E40	255	0250	03	HKX	002	A	1			1				
								1	0	0	3	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		255													
		Region 9012													
19 May	S29W24	345	0000	03	BXO	004	B								
20	S29W36	344	0010	05	BXO	004	B								
21	S29W50	345	0000	00	AXX	001	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		345													
		Region 9013													
20 May	S06W61	009	0000	03	BXO	004	B								
21	S06W74	009	0000	00		000									
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		9													
		Region 9014													
20 May	S43E21	287	0000	00	AXX	001	A								
21	S43E08	287	0000	00		000									
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		287													

Recent Solar Indices (preliminary)
of the observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
Month	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
				1998					
May	74.3	56.3	0.76	81.4	59.4	106.7	112.0	18	11.6
June	93.6	70.7	0.76	85.9	62.5	108.4	115.8	10	11.9
July	98.3	66.6	0.68	90.3	65.5	114.0	120.3	11	12.2
August	118.6	92.2	0.78	93.7	67.8	136.0	124.1	18	12.4
September	119.0	92.9	0.78	96.1	69.5	138.3	126.8	13	12.6
October	77.0	55.5	0.72	97.7	70.5	117.3	127.9	13	12.8
November	99.5	74.0	0.74	101.3	73.0	140.2	130.0	16	12.4
December	120.8	81.9	0.68	108.8	77.9	150.1	134.3	08	11.9
				1999					
January	94.3	62.0	0.66	116.5	82.6	142.6	139.0	10	11.7
February	93.4	66.3	0.71	120.2	84.6	142.0	142.6	12	11.6
March	100.5	68.8	0.68	120.5	83.8	126.3	144.0	14	11.7
April	92.9	63.7	0.69	123.8	85.4	117.2	145.8	12	12.2
May	140.5	106.3	0.76	131.7	90.4	148.6	150.0	08	12.4
June	208.3	137.4	0.66	136.0	93.0	169.8	152.9	07	12.4
July	169.2	113.5	0.67	138.0	94.4	165.6	154.4	10	12.6
August	136.1	93.7	0.69	142.8	97.5	170.8	156.4	15	12.8
September	107.4	70.9	0.66	150.0	102.3	135.7	161.1	19	12.6
October	167.7	116.4	0.69	158.5	107.7	164.9	167.3	19	12.5
November	199.3	132.7	0.67			191.7		14	
December	123.5	86.4	0.70			169.8		10	
				2000					
January	140.8	90.2	0.64			158.3		13	
February	161.9	112.3	0.69			173.7		13	
March	203.6	138.2	0.68			208.2		09	
April	193.4	125.3	0.65			184.2		15	

NOTE: All smoothed values after June 1999 and monthly values after December 1999 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 22, RI= 158.5, occurred July 1989. * After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.



Weekly Geosynchronous Satellite Environment Summary
Week Beginning 15 May 2000

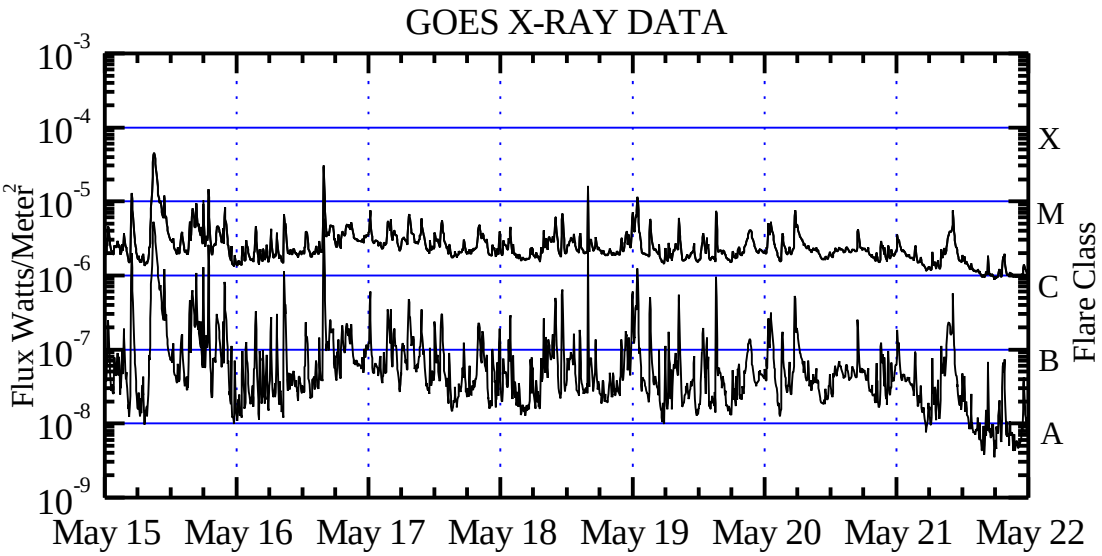
Protons plot contains the five-mine averaged integral proton flux (protons/cm^2–sec –sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

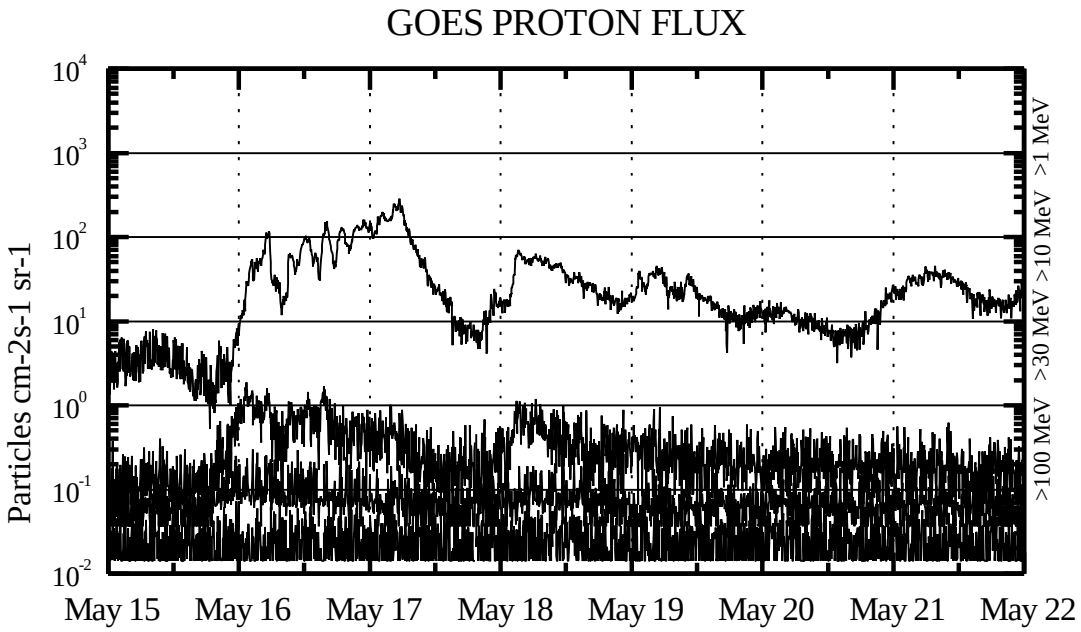
Electrons plot contains the five-mine averaged integral electron flux (electrons/cm^2–sec –sr) with energies greater than 2 MeV at GOES-8.

Hp plot contains the five mine averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-8. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp plot contains the estimated planetary 3-hour K-index (derived by the USAF 55th Space Weather Squadron) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final Kp values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO 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. Hparallel 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

X-ray plot contains five mine averaged x-ray flux (watts/$m^{2)}$ as measured by GOES 8 and 10 in two wavelength bands, .05 -. 4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five mine averaged integral proton flux (protons/cm^2 –sec-sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm^2-sec-sr) at greater than 10 MeV.