Space Weather Highlights
08-14 November 1999

Solar activity was moderate during most of the period, but increased to high levels on 14 November. Activity rose to high levels on 14 November due to a pair of major flares. The first was an M8/2B at 14/1801UT from Region 8763 (S14, L=249, class/area Dao/170 on 11 November). The second was an M5/2N at 14/1607UT from Region 8766 (N18, L=210, class/area Dao/190 on 14 November). Both flares were impulsive and were associated with relatively minor discrete radio emission. There were several regions on the disk (including those mentioned above) that produced isolated M-class subflares during the period (see the Energetic Event Summary for event times). All of these regions exhibited mixed-polarity magnetic structures of varying complexity. Regions 8759 (N10, L=287, class/area Fkc/920 on 09 November), 8765 (S12, L=235, class/area Ekc/640 on 14 November, and 8766 (N18, L=210, class/area Dao/190 on 14 November) also contained magnetic delta configurations.

Real-time solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. Coronal hole effects were observed during 08 - 11 November with velocities peaking at 760 km/sec and IMF Bz ranging from plus 09 nT (GSM) to minus 08 nT. Coronal hole effects subsided on 12 November. A change in wind flow characteristics occurred around 12/1600UT followed by increased southward IMF Bz (maximum southerly deflections to minus 12 nT), highly variable solar sector orientation, and minor velocity increases.

No proton events were detected at geosynchronous orbit during the period.

The greater than 2 MeV electron flux was at moderate to high levels during 09 - 13 November. Otherwise, fluxes were at normal to moderate levels.

The geomagnetic field was disturbed during 08 - 11 November due to coronal hole effects with active to minor storm levels detected at middle latitudes and active to major storm levels at high latitudes. The were also localized severe storm periods at high latitudes during the disturbance. Activity decreased to quiet to unsettled levels on 12 November as coronal hole effects subsided. Another disturbance occurred during 13 November due to a sustained period of southward IMF Bz (see the solar wind discussion above). Activity decreased to mostly quiet to unsettled levels on the final day of the period.

Space Weather Outlook
17 November - 13 December 1999

Solar activity is expected to range from low to high levels. Frequent C-class flares are likely. Isolated M-class flares will be possible throughout the period. There is also a good chance for isolated major flares through 25 November, principally from Regions 8765 and 8766. Both regions were growing in size and complexity as the period ended.

There is a chance for a solar proton event at geosynchronous orbit through 25 November due to the major flare potential in Regions 8765 and 8766. Region 8759 also provides a slight chance for a proton event.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at moderate to high levels during 05 - 10 December with normal to moderate levels during the remainder of the period.

The geomagnetic field is expected to be at unsettled to minor storm levels during 04 - 08 December due to recurrent coronal hole effects. Otherwise, activity is expected to vary between quiet and unsettled levels (barring any Earth-directed coronal mass ejections).

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares: X-ray Flux C	M	X	Flares: Optical S	1	2	3	
08 November	192	232	1440	C1.2	7	0	0	18	0	0	0	0
09 November	230	288	1710	C1.3	12	1	0	12	2	1	0	0
10 November	249	343	2000	C3.6	7	3	0	25	4	0	0	0
11 November	240	340	2090	C1.8	12	0	0	24	2	0	0	0
12 November	232	324	1700	C1.6	3	2	0	23	1	0	0	0
13 November	224	251	1680	C1.2	9	1	0	24	1	0	0	0
14 November	219	232	1760	C3.6	9	5	0	37	2	2	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm^2-day-sr) >1MeV	>10MeV	>100MeV	Electron Fluence (electrons/cm^2-day-sr) >.6MeV	>2MeV	>4MeV
08 November	5.2E+5	1.3E+4	2.9E+3		2.2E+6	
09 November	7.6E+5	1.2E+4	2.7E+3		6.7E+7	
10 November	7.0E+5	1.3E+4	2.8E+3		1.7E+8	
11 November	3.7E+5	1.3E+4	2.7E+3		1.1E+8	
12 November	2.1E+5	1.1E+4	2.4E+3		1.6E+8	
13 November	3.1E+5	1.2E+4	2.3E+3		3.8E+7	
14 November	9.8E+4	1.2E+4	2.4E+3		3.1E+6	

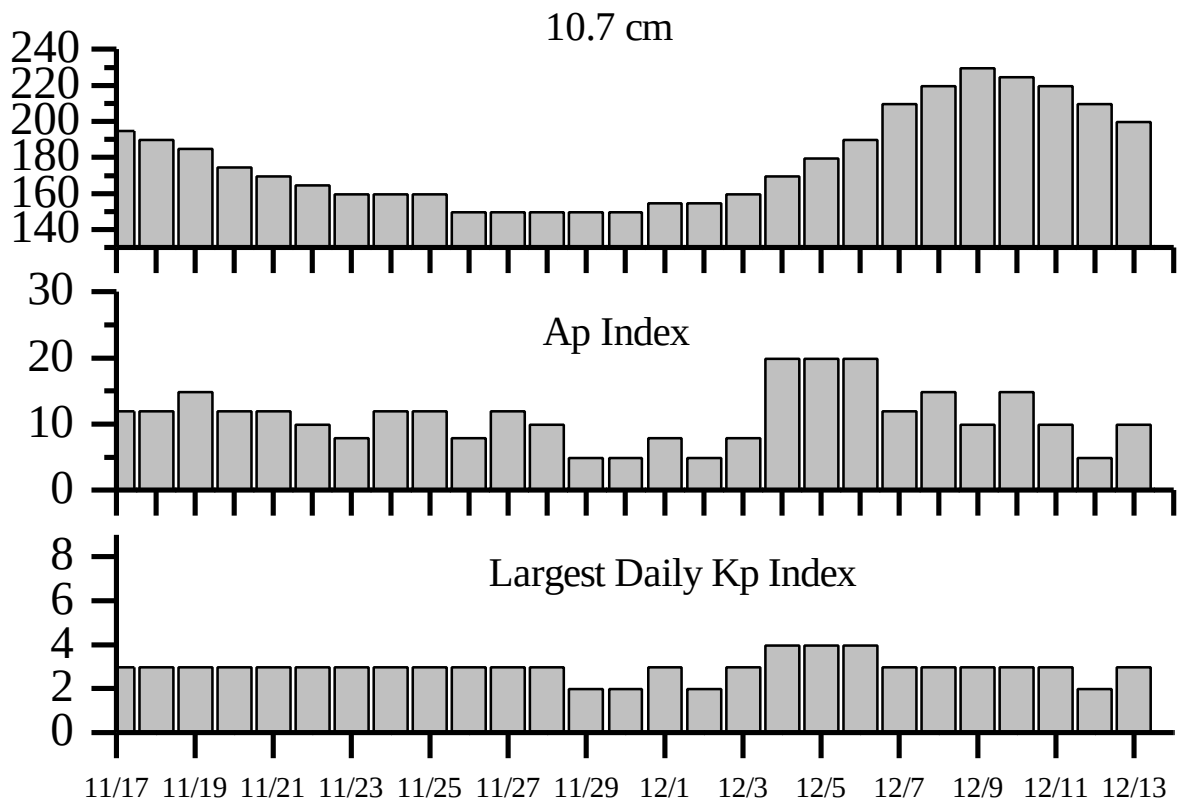
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
08 November	19	2-3-4-3-4-3-4-3	*	3-3-6-6-7-5-5-*	33	3-4-5-5-6-4-4-4
09 November	24	4-4-4-4-3-3-4-4	*	*-*-*-*-*-*-*-*	25	3-4-4-5-4-4-4-4
10 November	13	3-3-2-2-3-3-3-3	*	*-*-*-*-*-*-*-*	12	3-3-2-3-3-3-3-3
11 November	22	3-4-5-4-3-3-3-3	*	*-*-*-*-*-*-*-*	23	3-4-5-4-4-3-3-3
12 November	*	*-*-*-*-*-*-*-*	*	*-*-*-*-*-*-*-*	10	2-1-2-1-3-2-3-3
13 November	*	*-*-*-*-*-*-*-*	*	*-*-*-*-*-*-*-*	31	2-3-4-3-5-4-5-5
14 November	13	2-3-4-3-3-3-2-2	*	*-*-*-*-*-*-*-*	10	2-2-4-3-1-2-1-3

Alerts and Warnings Issued

Date & Time of Issue (UT)	Type of Alert or Warning	Date & Time of Event (UT)
08 Nov 0108	1- 245 MHz Burst	07 Nov
08 Nov 1200	A ≥ 20 CONTINUED	07 Nov 1805
08 Nov 1411	K= 5 Warning	08/1500 - 10/1500 Nov
08 Nov 1500	K= 5 Observed	08 Nov 12 - 15
09 Nov 0057	2 - 245 MHz Bursts	08 Nov
09 Nov 0057	1- 245 MHz Noise Storms	08 Nov
09 Nov 1150	>2MeV Electron Event ≥1000pfu	09 Nov 1035
09 Nov 1200	A ≥ 30 Observed	09 Nov 1200
09 Nov 1815	A ≥ 30 ENDED	09 Nov 1200
10 Nov 0058	10 - 245 MHz Bursts	09 Nov
10 Nov 0058	245 MHz Noise Storm	09 Nov
10 Nov 1200	>2MeV Electron Event ≥1000pfu CONTINUED	09 Nov 1035
11 Nov 0300	K= 4 Observed	11 Nov 00 - 03
11 Nov 0300	K= 4 Warning	11/0300 -12/1500 Nov
11 Nov 0343	K= 5 Warning	11 Nov 0345 -1500
11 Nov 0600	K= 5 Observed	11 Nov 03 - 06
11 Nov 0852	A ≥ 20 Observed	11 Nov 0900
11 Nov 1155	>2MeV Electron Event ≥1000pfu CONTINUED	09 Nov 1035
11 Nov 2029	K= 5 Warning	11/2100 - 12/1500 Nov
11 Nov 2118	A ≥ 30 Observed	11 Nov 2100
12 Nov 0511	Type IV Radio Emission	12 Nov 0140
12 Nov 0612	A ≥ 30 ENDED	11 Nov 2100
12 Nov 0825	K= 5 Warning CANCELED	11/2100 -12/1500 Nov
12 Nov 1152	>2MeV Electron Event ≥1000pfu CONTINUED	09 Nov 1035
13 Nov 0903	K= 4 Warning	13 Nov 09 - 15
13 Nov 0904	K= 4 Observed	13 Nov 06 - 09
13 Nov 1159	>2MeV Electron Event ≥1000pfu CONTINUED	09 Nov 1035
13 Nov 1712	K= 4 Warning	13/1700 - 14/0000 Nov
13 Nov 1805	K= 4 Observed	13 Nov 15 - 18
13 Nov 2104	A ≥ 20 Observed	13 Nov 2100
14 Nov 0808	X-Ray Event M8/2B	14 Nov 0801
14 Nov 0820	10cm Radio Burst 640 s.f.u.	14 Nov 0756
14 Nov 0849	K= 4 Warning	14 Nov 09 - 15
14 Nov 0855	K= 4 Observed	14 Nov 06 - 09
14 Nov 1157	>2MeV Electron Event ≥1000pfu CONTINUED	09 Nov 1035
14 Nov 1158	A ≥ 20 CONTINUED	13 Nov 2100
14 Nov 1619	X-Ray Event M5/2N	14 Nov 1607

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
17 Nov	195	12	3	01 Dec	155	8	3
18	190	12	3	02	155	5	2
19	185	15	3	03	160	8	3
20	175	12	3	04	170	20	4
21	170	12	3	05	180	20	4
22	165	10	3	06	190	20	4
23	160	8	3	07	210	12	3
24	160	12	3	08	220	15	3
25	160	12	3	09	230	10	3
26	150	8	3	10	225	15	3
27	150	12	3	11	220	10	3
28	150	10	3	12	210	5	2
29	150	5	2	13	200	10	3
30	150	5	2				

Energetic Events

Date	Time (UT)			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
09 Nov	1942	2009	2058	M1.1	.040	1F	N10E53	8759				
10 Nov	0140	0151	0200	M1.3	.012	1N	N10E50	8759				
10 Nov	1544	1549	1551	M1.5	.003	SF	N17W21	8753	2900	47		
10 Nov	2209	2213	2216	M1.1	.003	1N	N17W25	8753	8800	200		
12 Nov	0854	0916	0936	M1.7	.032			8759		32		
12 Nov	1150	1154	1157	M1.1	.004	SF	N10E17	8759				
13 Nov	0114	0258	0351	M1.3	.084	1F	S15E44	8763				
14 Nov	0754	0801	0804	M8.0	.023	2B	S15E27	8763		640		
14 Nov	1547	1607	1613	M5.6	.033	2N	N18E63	8766		78		
14 Nov	1620	1623	1626	M2.2	.007	SN	S11E36	8765				
14 Nov	1654	1704	1719	M1.4	.019	SF	N10W13	8759				
14 Nov	1803	1809	1813	M2.8	.010							

Flare List

Date	Time Begin	Max	End	X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn #	
08 Nov		0003	0006	0011	SF	N38W18	8757	
	0036	0040	0045		SF	N17E50	8758	
	0101	0102	0106		SF	N14E73	8759	
	0114	0136	0222		SF	N38W06	8757	
	0258	0302	0306		SF	N20E16	8753	
	0335	0338	0345		SF	N20E14	8753	
	0440	0454	0505		SF	N13E32	8760	
	0514	0518	0532		SF	N13E32	8760	
	0557	0558	0614	C5.9	SF	S18W82	8749	
	0643	0646	0652		SF	N09E65	8759	
	0857	0900	0907		SF	N13E31	8760	
	B1116	U1117	A1139	C4.6	SN	N12E28	8760	
	1149	1153	1201	C2.0				
	1256	1309	1346	C3.2	SF	N07E54	8759	
	1609	1614	1646	C4.6	SF	N12E24	8760	
	1703	1707	1712	C4.2				
	1838	1852	1923	C8.5	SF	N12E65	8759	
	1957	1957	2001		SF	N21E45	8758	
	2240	2241	2244		SF	N10E49	8759	
	2329	2337	2344		SF	N09E55	8759	

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
09 Nov	0158	0159	0219	C2.7	SF	N20E39	8758
	0203	0206	0216		SF	N12E20	8760
	0217	0218	0228		SF	N12E20	8760
	0324	0327	0400	C4.9	1N	N17E36	8758
	0413	0606	0935	C8.6	2B	N12E18	8760
	0413	0418	0422	C5.8			8760
	0512	0602	0634	C2.6	SF	N09E52	8759
	0526	0531	0538	C3.9			
	0832	0838	0846	C4.3			
	0858	0859	0906		SF	N23W54	8751
	0937	0942	A1015		SF	N16E18	8760
	1244	1258	1301	C5.6			
	1332	1337	1355	C3.9	SF	N06E44	8759
	1446	1447	1500		SF	N14E14	8760
	1532	1536	1539	C4.4			
	1552	1621	1632	C4.3	SF	N11E11	8760
	1619	1622	1627	C4.6			8760
	1719	1720	1723		SF	N14E13	8760
	1739	1749	1814		SF	N14E12	8760
	1926	1927	1929		SF	N12E11	8760
	1946	2007	2042	M1.1	1F	N10E53	8759
10 Nov	0140	0145	0200	M1.3	1N	N10E50	8759
	0143	0144	0154		SN	N16E09	8760
	0208	0209	0212		SF	N12E07	8760
	0223	0224	0227		SF	N12E07	8760
	0246	0252	0317		SF	N19E37	8761
	0249	0249	0253		SF	N12E07	8760
	0250	0252	0305		SF	N17E23	8758
	0331	0332	0350	C5.2	SF	N12E06	8760
	0345	0348	0400		SF	N17E22	8758
	0538	0547	0605		SF	N16E06	8760
	0602	0605	0620	C3.7	SF	N06E36	8759
	0659	0714	0818	C4.9	SF	N21W15	8753
	0741	0751	0813		1F	S18E81	8763
	0914	0921	0942		SF	N12E03	8760
	1439	1441	1455	C3.0	SF	S16E73	8763
	1524	1525	1527		SF	N21W18	8753
	1544	1549	1558	M1.5	SF	N17W21	8753
	1604	1610	1627		SF	N21W22	8753
	1633	1634	1647	C2.8	1F	S16E79	8763
	1708	1712	1720		SF	S18E74	8763
	1728	1732	1737		SF	S13E75	8763

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
10 Nov	1814	1816	1827		SF	N12W05	8760
	1937	2005	2025		SF	N10E35	8759
	1947	1951	2019	C9.6	SF	N19E26	8761
	2010	2018	2029		SF	S15E73	8763
	2052	2055	2057	C3.0			
	2135	2136	2140		SF	S16E71	8763
	2138	2138	2140		SF	N10E33	8759
	2211	2212	2220	M1.1	1N	N17W25	8753
	2244	2308	2321		SF	N09E33	8759
11 Nov	0118	0153	0214		SF	N09E32	8759
	0126	0129	0142	C5.6	SN	N18W27	8753
	0157	0201	0221	C3.8	SN	N37W56	8757
	0248	0249	0327		SF	N09E27	8759
	0300	0303	0338	C3.4	SF	S18E69	8763
	B0427	U0445	A0448	C3.0	SF	N09E26	8759
	B0444	U0458	A0507		SF	N20W24	8753
	B0456	U0457	0521	C3.9	1F	S17E69	8763
	0510	0519	0522		SF	N20W24	8753
	0512	0515	0518		SF	N09E26	8759
	0548	0549	0553		SF	N20W24	8753
	0548	0550	0557		SF	N20E21	8761
	0730	0747	0810	C7.0			
	0918	0932	0946	C3.3			
	1038	1043	1047	C3.2			
	1318	1328	1339	C5.8			
	1441	1443	1512	C8.6	1N	N09E19	8759
	1500	1501	1508		SF	S14E62	8763
	1503	1505	1531		SF	N14W14	8760
	1719	1722	1735		SF	N12W15	8760
	1755	1756	1801		SF	N14W17	8760
	1758	1802	1820		SF	S15E63	8763
	1945	1953	2007		SF	N20W38	8753
	1958	1959	2029	C5.1	SF	N08E18	8759
	2053	2055	2057		SF	S15E61	8763
	2115	2116	2119		SF	N10E23	8759
	2144	2145	2149	C2.9	SF	S15E61	8763
	2152	2152	2156		SF	N14E21	8759
	2247	2248	2258		SF	N15W20	8760
	2253	2256	2301		SF	S15E60	8763

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
12 Nov	B0004	U0015	0026		SF	S18E59	8763
	0121	0130	0138	C4.6			
	B0350	U0350	A0408		SF	S14E55	8763
	0416	0450	0518		SF	N18W35	8753
	0441	0442	0458		SF	N18W30	8764
	0450	0453	0457		SF	N09E12	8759
	0515	0519	0524		SF	S11E67	8765
	0526	0527	0531		SF	N09E12	8759
	0532	0538	0551		SF	N09E12	8759
	0536	0536	0550		SF	N12W21	8760
	0555	0555	0602		SF	N09E12	8759
	0557	0559	0617		SF	N12W22	8760
	0621	0622	0640		SF	N12W22	8760
	0636	0636	0640		SF	S11E66	8765
	0822	0833	0842	C8.6			
	0854	0916	0936	M1.7			8759
	1152	1154	A1200	M1.1	SF	N10E17	8759
	B1238	1238	1244		SF	N08E06	8759
	1424	1427	1438		SF	N07E12	8759
	1427	1441	1507		SF	S15E53	8763
	1440	1441	1450		SF	N13W27	8760
	1617	1726	1820		1F	S17E48	8763
	1826	1828	1838		SF	S14E52	8763
	1827	1827	1848		SF	N11E16	8759
	1843	1843	1847		SF	S15E50	8763
	1849	1849	1903		SF	N12E12	8759
	2340	2341	2352	C1.6	SF	N07E00	8759
13 Nov	B0200	U0219	A0300	M1.3	1F	S15E44	8763
	B0200	U0219	A0300		SF	S09E52	8765
	B0336	U0357	A0404		SF	S09E51	8765
	B0417	U0419	A0423		SF	S15E43	8763
	B0424	U0424	A0429		SF	N20W55	8753
	0438	0442	0449		SF	S15E42	8763
	B0534	U0535	A0542	C2.2	SF	S15E42	8763
	B0806	U0808	A0839	C2.4	SF	S15E40	8763
	B1235	U1235	1246	C3.1	SF	N16W48	8764
	B1235	U1235	A1247		SF	N18W57	8753
	B1257	U1258	1320		SF	S18E37	8763
	B1404	U1406	1445		SF	N12E03	8759
	1517	1518	1535	C2.4	SF	N14E00	8759
	1544	1544	1550		SF	S16E39	8763
	1559	1601	1610		SF	N11E02	8759

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
13 Nov	1614	1630	1645	C6.6	SF	S12E51	8765
	1725	1726	A1744		SF	S12E47	8765
	1745	1746	1751		SF	N15W03	8759
	1822	1825	1827	C2.5			
	1916	1916	1922	C2.6	SF	S13E47	8765
	1924	1925	1929		SF	S13E47	8765
	1924	1925	1933	C4.5	SF	N10W03	8759
	2101	2102	2104		SF	S12E45	8765
	2328	2341	0012	C4.6	SN	S09E40	8765
	2356	0000	0121		SF	S15E32	8763
	2359	0000	0003		SF	N09W12	8759
14 Nov	0015	0026	0030		SF	S09E40	8765
	0037	0048	0104		SF	S09E40	8765
	0111	0111	0114		SF	S09E40	8765
	0122	0126	0137		SF	S15E31	8763
	0142	0142	0149		SF	N17E65	8766
	0142	0144	0207		SF	S15E31	8763
	0147	0147	0155		SF	S09E39	8765
	0156	0156	0200		SF	N17E65	8766
	0212	0215	0217		SF	S09E39	8765
	0256	0256	0300		SF	S10E44	8765
	0348	0352	0414	C5.0	SF	S10E43	8765
	0435	0438	0522	C3.6	1F	N10W09	8759
	0436	0438	0444		SF	N17E64	8766
	0449	0500	0505		SF	N17E63	8766
	0528	0534	0543		SF	S09E37	8765
	0532	0537	0543		SF	N17E63	8766
	0610	0618	0644	C4.9	SF	S09E37	8765
	0627	0642	0706		SF	N17E62	8766
	0647	0650	0658		SF	S09E37	8765
	0714	0715	0717		SF	N17E62	8766
	0720	0721	0723		SF	N17E62	8766
	0720	0720	0723		SF	S09E36	8765
	0756	0800	0830	M8.0	2B	S15E27	8763
	0919	0925	0932	C6.3			
	1211	1229	1236	C4.3			
	1239	1244	1248	C4.3			
	1258	1301	1305	C3.8			
	1309	1315	1322	C7.0			
	B1400	U1401	1526		SF	N18E61	8766
	B1400	U1402	1519		SF	S12E38	8765

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
14 Nov	B1403	U1404	1446		SF	N09W15	8759
	1536	1540	1542	C5.0			8766
	1536	1607	1803	M5.6	2N	N18E63	8766
	1538	1810	1854		1N	S11E36	8765
	1621	1623	A1743	M2.2	SN	S11E36	8765
	1714	1728	1840	M1.4	SF	N10W13	8759
	1750	1752	1800		SF	S16E18	8763
	1803	1809	1813	M2.8			
	1819	1821	1824		SF	N18E60	8766
	1851	1853	1857		SF	N17E55	8766
	1910	1917	1926		SF	S11E36	8765
	1944	1945	1948		SF	S11E36	8765
	1949	1952	2028		SF	S11E36	8765
	2045	2046	2053		SF	S12E36	8765
	2114	2116	2129		SF	S12E31	8765
	2243	2244	2358		SF	S15E19	8763
	2314	2314	2320		SF	N17E53	8766
	2327	2335	2344		SF	N17E53	8766

Region Summary

Date	Location (° Lat ° CMD)	Location 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 8747												
28 Oct	N10E59	072	0040	04	CRO	004	B	1			8				
29 Oct	N11E44	074	0190	07	DAO	008	B	2			12				
30 Oct	N12E30	075	0210	11	EAO	013	B				2				
31 Oct	N11E17	074	0160	09	DAO	012	B	2			3				
01 Nov	N12E03	075	0120	09	DAO	011	B	2			2				
02 Nov	N12W11	076	0100	10	DAO	013	BG								
03 Nov	N12W25	077	0090	12	ESO	011	B				2				
04 Nov	N11W39	078	0090	10	DSO	007	B				1				
05 Nov	N11W52	077	0120	07	DSO	005	B				1				
06 Nov	N10W64	076	0070	06	CSO	006	B								
07 Nov	N12W78	077	0030	06	CAO	003	B								
08 Nov	N12W90	076	0030	02	HAX	001	A								
								7	0	0	31	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 075

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 8749														
29 Oct	S21E49	069	0000	00	AXX	001	A								
30 Oct	S21E31	074	0010	09	BXO	004	B				2				
31 Oct	S18E15	076	0060	08	DSO	015	B	6			9	2			
01 Nov	S18E02	076	0160	12	EAO	023	B	4			6				
02 Nov	S18W11	076	0210	13	EAO	027	BG	1			2				
03 Nov	S18W26	078	0210	13	ESO	026	BG	1			1	1			
04 Nov	S18W39	078	0230	13	EAO	014	BG	5			4	2			
05 Nov	S18W51	076	0290	13	EAO	015	BG		1		1	1			
06 Nov	S18W64	076	0260	14	ESO	012	BG	1			1				
07 Nov	S18W76	075	0140	14	EAO	005	B	1			2				
08 Nov	S18W89	075	0030	06	AXX	002	A	1			1				
								20	1	0	29	6	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 076

	Region 8751														
30 Oct	N20E66	039	0030	01	HSX	001	A								
31 Oct	N21E54	037	0040	01	HSX	001	A								
01 Nov	N21E40	038	0030	01	HSX	001	A								
02 Nov	N21E28	037	0040	02	HSX	001	A								
03 Nov	N23E14	038	0040	03	HSX	002	A								
04 Nov	N21E02	037	0040	05	CSO	003	B								
05 Nov	N22W10	035	0080	06	CSO	006	B								
06 Nov	N22W23	035	0060	06	CSO	009	B								
07 Nov	N23W36	035	0030	05	CAO	003	B								
08 Nov	N23W50	036	0020	04	CSO	004	B								
09 Nov	N22W63	036	0010	04	BXO	002	B				1				
10 Nov	N23W78	037	0010	02	BXO	002	B								
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 037

	Region 8752														
03 Nov	S14E01	051	0000	00	AXX	001	A								
04 Nov	S13W14	053	0010	03	BXO	005	B								
05 Nov	S13W27	052	0020	04	BXO	007	B								
06 Nov	S13W39	051	0020	03	CRO	002	B								
07 Nov	S13W52	051													
08 Nov	S13W65	051													
09 Nov	S13W78	051													
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 051

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 8753												
03 Nov	N21E63	349	0000	00	AXX	001	A								
04 Nov	N21E50	349													
05 Nov	N21E37	349													
06 Nov	N20E29	343	0020	05	CSO	007	B								
07 Nov	N20E16	343	0020	07	DRO	010	B				1				
08 Nov	N21E03	343	0110	08	DAO	017	B				2				
09 Nov	N21W10	343	0160	10	DAI	027	B								
10 Nov	N19W24	343	0200	11	EAI	042	B	1	2		4	1			
11 Nov	N18W37	343	0150	12	EAO	040	B	1			5				
12 Nov	N19W51	344	0080	11	EAO	023	BG				1				
13 Nov	N19W64	344	0060	12	CAO	008	B				2				
14 Nov	N22W80	347	0010	09	BXO	004	B								
								2	2	0	15	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 343

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 8754												
04 Nov	S08E66	333	0050	02	HSX	001	A								
05 Nov	S09E55	330	0060	03	CSO	003	B								
06 Nov	S09E41	331	0060	03	CSO	005	B								
07 Nov	S09E26	333	0030	04	CSO	005	B								
08 Nov	S10E13	333	0030	03	CSO	002	B								
09 Nov	S06E00	333	0030	01	HSX	001	A								
10 Nov	S07W14	333	0020	02	HSX	001	A								
11 Nov	S08W26	332	0020	02	HSX	001	A								
12 Nov	S07W40	333	0000	00	AXX	001	A								
13 Nov	S07W53	333													
14 Nov	S07W66	333													
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 333

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 8755												
05 Nov	N19E71	314	0120	08	DAO	003	B								
06 Nov	N21E57	315	0080	01	HSX	001	A								
07 Nov	N21E42	317	0100	03	HAX	001	A								
08 Nov	N23E29	317	0080	02	HSX	001	A								
09 Nov	N23E16	317	0080	02	HSX	001	A								
10 Nov	N22E04	315	0080	02	HSX	001	A								
11 Nov	N22W11	317	0110	04	CSO	004	B								
12 Nov	N22W22	315	0070	02	HSX	002	A								
13 Nov	N23W36	316	0070	02	HSX	001	A								
14 Nov	N23W48	315	0070	02	HSX	001	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 315

			Region 8756												
05 Nov	N18E11	014	0010	04	BXO	004	B								
06 Nov	N18W02	014	0010	03	BXO	004	B								
07 Nov	N18W18	017	0000	01	BXO	002	B								
08 Nov	N16W36	022	0000	00	AXX	001	A								
09 Nov	N16W49	022													
10 Nov	N16W62	022													
11 Nov	N16W75	022													
12 Nov	N16W88	022													
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 014

			Region 8757												
05 Nov	N38E09	016	0010	05	BXO	004	B								
06 Nov	N38W03	015	0030	07	CRO	009	B								
07 Nov	N38W16	015	0120	09	DAO	015	B				4				
08 Nov	N38W31	017	0090	12	EAO	011	B				2				
09 Nov	N39W43	016	0090	14	ESO	010	B								
10 Nov	N38W55	014	0090	13	ESO	009	B								
11 Nov	N37W68	014	0130	11	ESO	010	B	1			1				
12 Nov	N36W81	014	0060	06	CAO	006	B								
								1	0	0	7	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 015

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 8758												
06 Nov	N18E64	308	0100	04	CSO	004	B								
07 Nov	N17E52	307	0080	06	CAO	005	B	1			2				
08 Nov	N18E41	305	0070	10	CAO	010	B				2				
09 Nov	N18E25	308	0060	05	CAO	015	B	2			1	1			
10 Nov	N18E13	306	0040	04	DAO	009	B				2				
11 Nov	N18W01	307	0020	03	BXO	006	B								
12 Nov	N17W15	308	0000	01	AXX	003	A								
13 Nov	N18W26	306	0000	00	AXX	001	A								
14 Nov	N18W39	306													
								3	0	0	7	1	0	0	0
Still on Disk.															
Absolute heliographic longitude:		307													
			Region 8759												
06 Nov	N10E78	294	0110	05	CSO	003	B	1			1				
07 Nov	N08E70	289	0440	15	EKC	016	BG								
08 Nov	N13E58	288	0850	19	FKC	034	BG	2			6				
09 Nov	N10E45	288	0920	19	FKC	067	BGD	2	1		2	1			
10 Nov	N10E32	287	0870	18	FKC	073	BG	1	1		4	1			
11 Nov	N10E19	287	0630	18	FKC	080	BG	3			7	1			
12 Nov	N10E06	287	0390	20	FKC	082	BG	1	2		10				
13 Nov	N10W07	287	0350	20	FKC	067	BG	2			6				
14 Nov	N11W21	288	0270	22	FAI	056	BG	1	1		2	1			
								13	5	0	38	4	0	0	0
Still on Disk.															
Absolute heliographic longitude:		287													
			Region 8760												
07 Nov	N13E35	324	0010	03	BXO	010	B								
08 Nov	N14E22	324	0090	07	DAO	025	B	2			5				
09 Nov	N14E09	324	0310	11	EAI	053	B	4			8		1		
10 Nov	N13W04	323	0520	12	EKI	060	BG	1			8	1			
11 Nov	N13W18	324	0630	15	EKI	051	BG				4				
12 Nov	N14W32	325	0580	16	FKO	048	BG				4				
13 Nov	N14W45	325	0570	15	EKO	031	BG								
14 Nov	N15W59	326	0460	16	FKO	018	B								
								7	0	0	29	1	1	0	0
Still on Disk.															
Absolute heliographic longitude:		323													

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 8761												
08 Nov	N22E51	295	0040	05	BXO	004	B								
09 Nov	N20E36	297	0040	04	DSO	008	B								
10 Nov	N20E25	294	0030	04	CSO	008	B	1			2				
11 Nov	N19E11	295	0020	03	CSO	002	B				1				
12 Nov	N20W01	294	0000	04	BXO	003	B								
13 Nov	N20W15	295	0000	03	BXO	002	B								
14 Nov	N20W28	295													
								1	0	0	3	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		294													
			Region 8762												
09 Nov	N07W32	005	0010	03	BXO	004	B								
10 Nov	N06W46	005	0010	03	CSO	004	B								
11 Nov	N06W60	006	0040	06	BXO	003	B								
12 Nov	N06W76	009	0010	01	AXX	001	A								
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		005													
			Region 8763												
10 Nov	S13E74	245	0120	07	CAO	011	B	2			5	2			
11 Nov	S14E59	247	0170	09	DAO	011	B	3			6	1			
12 Nov	S15E46	247	0140	09	DSO	017	BG				5	1			
13 Nov	S14E32	248	0070	08	CSO	016	BG	3	1		7	1			
14 Nov	S15E18	249	0070	08	CSO	011	BG		1		4		1		
								8	2	0	27	5	1	0	0
Still on Disk.															
Absolute heliographic longitude:		249													
			Region 8764												
10 Nov	N17W15	334	0010	03	BXO	003	B								
11 Nov	N16W28	334	0020	04	BXO	004	B								
12 Nov	N18W42	335	0020	01	HRX	001	A				1				
13 Nov	N18W56	336	0010	05	BXO	004	B	1			1				
14 Nov	N18W69	336													
								1	0	0	2	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		334													

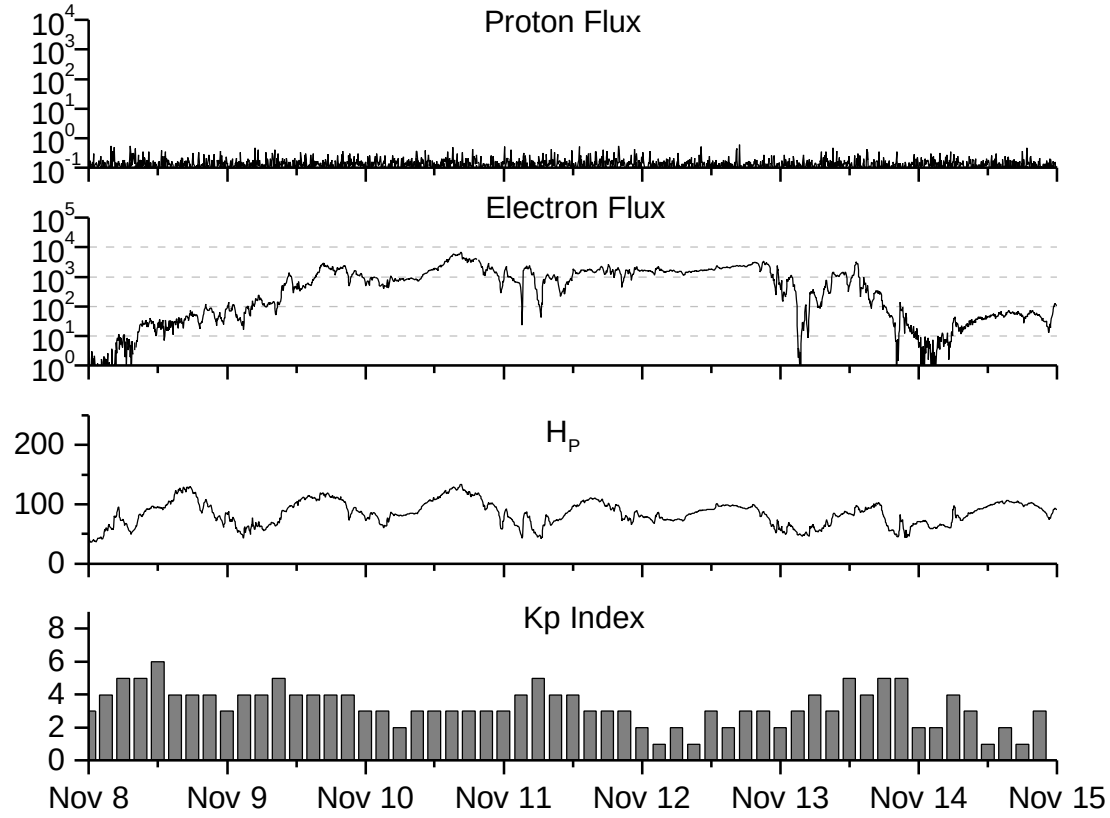
Region Summary-continued

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 8765														
11 Nov	S10E72	234	0150	08	CAO	008	B								
12 Nov	S12E58	235	0350	10	DAC	017	BG				2				
13 Nov	S12E45	235	0490	10	DAC	016	BG	2			8				
14 Nov	S14E32	235	0640	12	EKC	031	BG	2	1		18	1			
								4	1	0	28	1	0	0	0
Still on Disk.															
Absolute heliographic longitude:		235													
	Region 8766														
13 Nov	N18E68	212	0060	06	DAO	005	B								
14 Nov	N17E57	210	0190	06	DAO	009	BD	1	1		13		1		
								1	1	0	13	0	1	0	0
Still on Disk.															
Absolute heliographic longitude:		210													
	Region 8767														
14 Nov	N43W29	296	0020	04	CSO	004	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		296													
	Region 8768														
14 Nov	N17E33	234	0030	05	DSO	008	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		234													

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
					1997				
November	53.5	39.0	0.73	49.3	35.0	99.5	91.3	11	09.0
December	57.9	41.2	0.71	54.2	39.0	98.8	94.2	05	09.5
					1998				
January	51.8	31.9	0.62	60.6	43.7	93.4	97.5	08	09.9
February	54.4	40.3	0.74	67.4	48.8	93.4	101.7	08	10.5
March	81.8	54.8	0.67	73.3	53.4	109.1	105.8	13	11.1
April	73.6	53.4	0.73	77.7	56.5	108.3	109.1	10	11.3
May	74.3	56.3	0.76	81.4	59.3	106.7	112.4	18	11.6
June	93.6	70.7	0.76	85.9	62.4	108.4	116.2	10	11.9
July	98.3	66.2	0.67	90.3	65.4	114.0	120.3	11	12.2
August	118.6	91.7	0.77	93.7	67.8	136.0	124.1	18	12.4
September	119.0	92.9	0.78	96.1	69.4	138.4	126.8	13	12.5
October	77.0	55.5	0.72	97.7	70.5	117.3	127.9	13	12.5
November	99.5	74.0	0.74	101.3	73.0	140.2	130.0	16	12.3
December	120.8	81.9	0.69	108.8	77.9	150.1	134.3	08	11.9
					1999				
January	94.3	62.4	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	11.6
April	092.9	063.9	0.69	123.8	85.4	117.2	145.8	12	12.1
May	140.5	106.3	0.76			148.6		08	
June	208.3	137.4	0.66			169.8		07	
July	169.2	113.5	0.67			165.6		10	
August	136.1	93.7	0.69			170.8		15	
September	107.4	70.9	0.66			135.7		18	
October	167.7	116.4	0.69			164.9		18	

NOTE: All smoothed values after January 1998 and monthly values after September 1998 are preliminary estimates. The lowest smoothed sunspot indices 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 08 November 1999

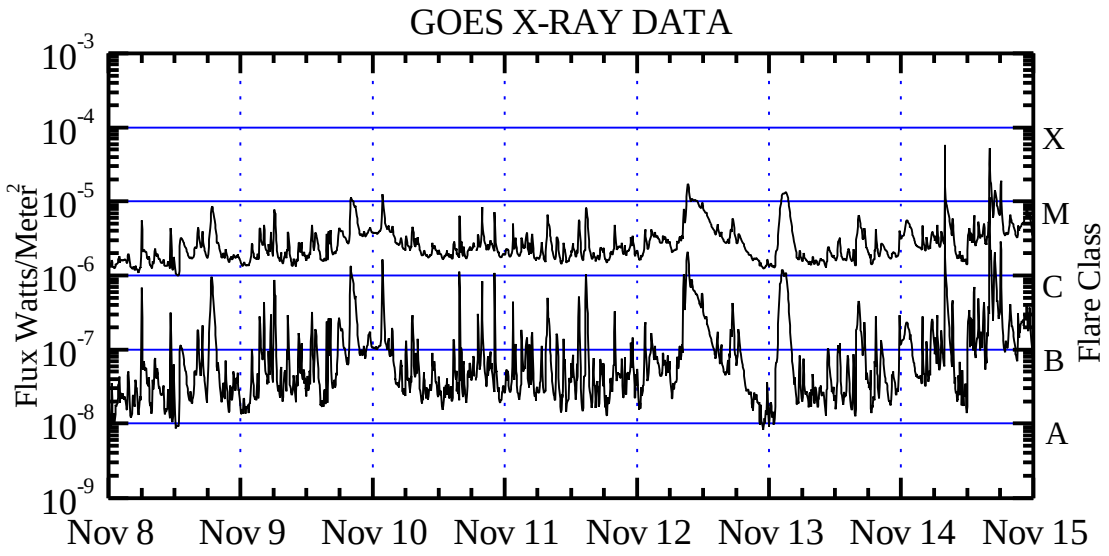
Protons plot contains the five-minute averaged integral proton flux (protons/cm^2–sec –sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

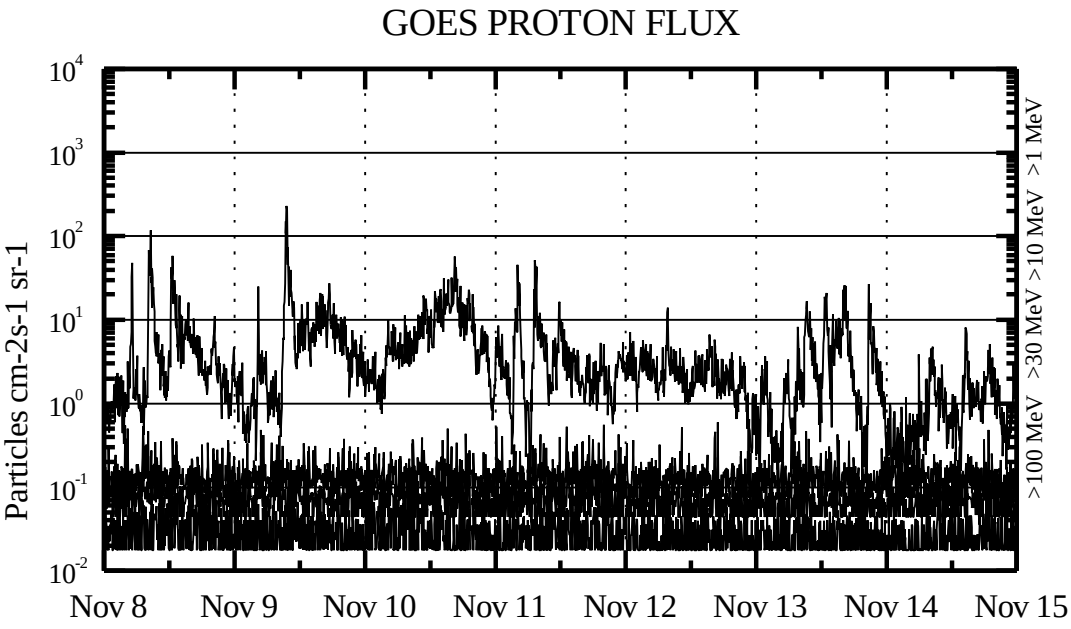
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm^2 –sec –sr) with energies greater than 2 MeV at GOES-8.

Hp plot contains the five minute 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 minute 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 minute averaged integral proton flux (protons/cm2 –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.