

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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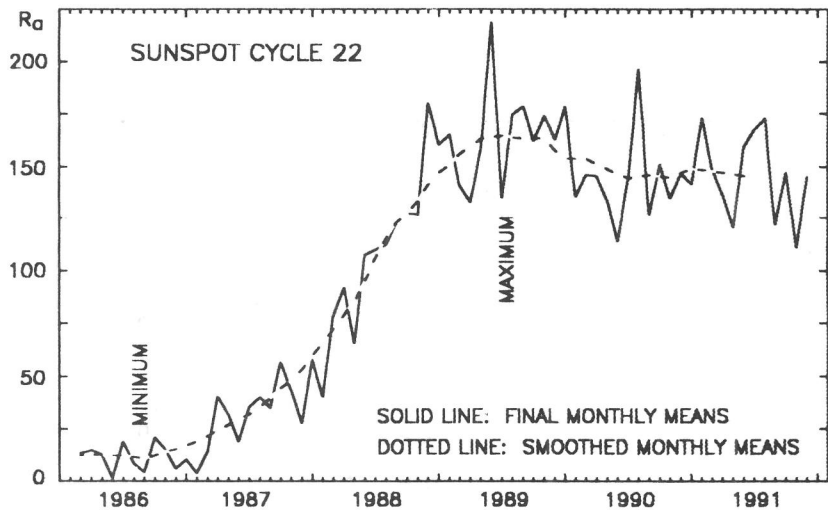


Volume 47 Number 12

December 1991

American Relative Sunspot Numbers for December

	R _a Final		
1) 102	11) 186	21) 103	
2) 93	12) 166	22) 127	
3) 112	13) 167	23) 129	
4) 110	14) 164	24) 136	
5) 130	15) 150	25) 148	
6) 154	16) 129	26) 152	
7) 171	17) 114	27) 154	
8) 185	18) 125	28) 150	
9) 217	19) 124	29) 142	
10) 205	20) 111	30) 152	
		31) 162	
Mean: 144.2			
Number of reports: 97			



December began with activity in the moderate and high range. One X, and ten class M flares were recorded between the 1st and 5th. The strongest event, a X2.2/2B Tenflare, took place on the 3rd in NOAA/USAF Region 6952 (N18, L356, EKI), which also spawned a majority of the class M flares. Limb activity during the period included a bright surge on the 3rd, and an eruptive prominence on the 5th which expanded outward to 0.36 solar radii.

Solar activity continued to be moderate and high during the following week. Thirty class M flares occurred between the 6th and 12th, more than were recorded during the entire month of November. The number of these events peaked on the 8th and 9th, when nine and twelve flares (respectively) attained class M status. Two were major events: a M5.3/SF on the 8th and M7.2/SN on the 9th, both in Region 6961 (N10, L306, EKI).

Moderate activity was the rule between the 13th and 19th; sixteen class M flares were recorded. Eight were without optical correlation, and four erupted in Region 6961, including December's fourth major flare, a M6.9/SN on the 16th. Region 6961 continued to dominate the visible hemisphere, attaining a maximum area of 1430 millionths solar hemisphere on the 15th. The long-lived active area more recently numbered 6929 returned for a fifth disk appearance, and was re-numbered 6972 (S10, L191, FKO).

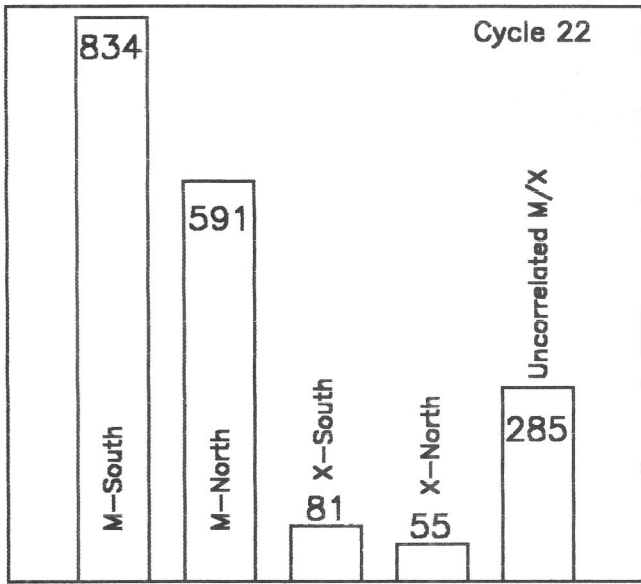
Activity was moderate and occasionally high during the remainder of December. Two X, and thirty-five class M flares occurred. Four were major events: an X3.5/2B Tenflare on the 20th, X1.4/2B on the 24th and M7.8/1B Tenflare on the 28th in Region 6982 (S13, L143, EKI), and a M8.5/2N on the 22nd in the largest spot-group of the month (~ 1600 millionths solar hemisphere) Region 6985 (S17, L098, FKC). The geomagnetic field, unsettled throughout much of December, reached storm levels at middle and high latitudes on the 16th and 17th, and again on the 27th to 29th, probably due to coronal hole effects. A satellite level enhancement of proton flux occurred on the 29th which may have been related to a long-duration M2.7/3B flare in Region 6982 on the 28th.

The smoothed monthly-mean American Relative Sunspot Number for June, 1991 is 144.5. The Sun's Northern Hemisphere was spotless for several consecutive days towards the end of December, but activity in the south continued to be strong. Smoothed monthly mean sunspot numbers in the Southern Hemisphere have outstripped those in the north since March 1990 and continue to increase (see page 2). Northern spot-numbers peaked during June 1989 and gradually declined thereafter. When American, rather than NOAA/USAF (SESC) sunspot numbers are considered, the Northern Hemisphere smoothed mean is currently ~ 35 points below the southern value. The combined total of class X and M X-ray flares in December (94) is the fifth highest for any month of cycle twenty-two. Solar flare activity rooted in the Southern Hemisphere - as measured by the production of these events - has predominated throughout this cycle.

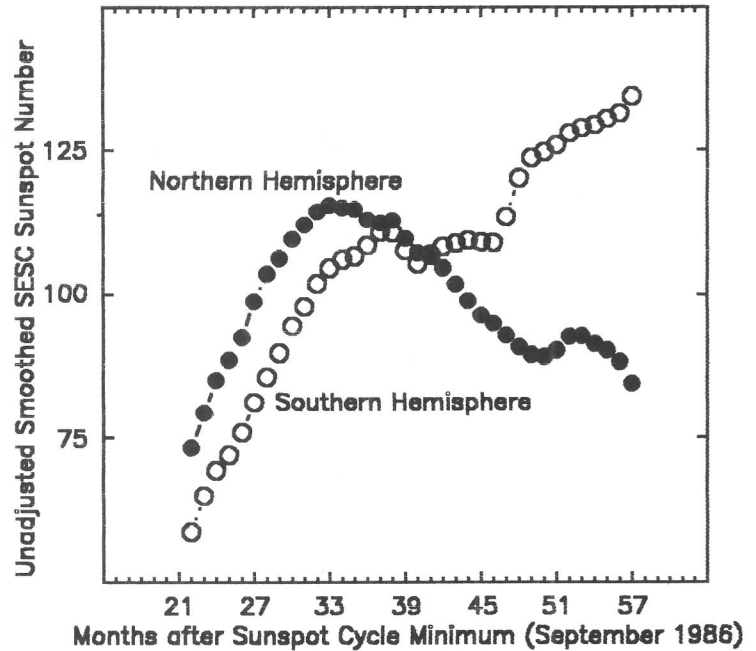
The estimated mean American Relative Sunspot Number for 1-14 January is 152. Twenty-nine class M flares have occurred during this interval, including three major events (M ≥ 5).

[A portion of this information was obtained from the SELDADS data-base.]

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 NOTE: Network contributors are urged to submit their reports via these services whenever possible.



Class X and M Flare Production by Hemisphere



Sudden Ionospheric Disturbances (SES) Recorded During November 1991

Records were received from A1,3,9,19,40,50,52,59,61,62,63,64,65,66,67,68,69,70,71,72,73,74.

Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp	Def
1	0338	1-	5	6	0045	1-	5	9	2052	2	5	17	1832	1+	5
1	0425	1+	5	6	0240	1-	5	10	0130	1+	5	17	1946	1	5
1	1331	1+	5	6	0412	2	5	10	0647	2+	5	17	2224	1	5
1	1401	1+	5	6	0447	2	5	10	1400	2	5	18	1054	2+	5
1	1448	1	5	6	1131	1	5	10	1815	2	5	18	1259	1-	5
1	1512	1	5	6	1332	1+	5	10	2010	2	5	18	1747	1-	5
1	1530	1-	5	6	1810	1-	5	10	2052	1-	5	19	0015	1+	5
1	1637	1	5	6	1843	1	5	10	2121	1	5	19	0931	1+	5
1	1658	1-	5	6	1926	2+	5	11	0115	1-	5	19	1343	1-	5
1	1808	1+	5	6	2355	2	5	11	1245	1+	5	19	1512	1	5
1	1928	1+	5	7	1504	1	5	11	1447	1	5	19	1631	2+	4
1	2030	2	5	7	1517	2	5	11	1639	2	5	19	1724	2+	5
1	2127	1-	5	7	1713	1+	5	11	1703	1	5	19	1923	2	5
1	2200	1+	5	7	1736	1+	5	11	1903	1+	5	19	2023	1+	5
1	2238	1-	5	7	1805	1	5	11	1955	2+	5	20	0059	2	5
1	2351	1-	5	7	1834	1	5	11	2100	1-	4	20	1212	1+	5
2	0123	1-	5	8	0045	1-	5	11	2144	2	5	20	1324	1	4
2	0636	1	4	8	0216	1-	4	12	1633	2+	5	20	1925	1-	5
2	0647	2+	5	8	0230	1	5	12	2030	2+	5	20	1944	1+	4
2	1151	2	5	8	0634	1+	5	13	0053	1-	5	21	1645	1	5
2	1635	3+	5	8	1315	1-	5	13	1500	3	5	21	1722	3	5
2	1744	1-	5	8	1352	2+	4	13	2126	2	5	21	1859	2+	5
2	2233	1+	5	8	1503	1	5	13	2301	2+	5	22	1445	2	5
3	1514	2+	5	8	1709	2+	5	14	1304	2	5	23	1555	2	4
3	1552	1-	5	8	1829	1	4	14	1545	1+	5	24	0824	1	5
3	1620	2	5	8	1907	2	4	14	1800	1	5	24	1530	1	5
3	1950	2	5	8	1936	1+	5	14	1843	1	5	26	0732	1-	5
3	2045	1-	5	8	2016	1+	4	15	1114	2	5	26	1005	1+	5
3	2246	1-	5	8	2137	2	5	15	1343	1-	5	26	2057	1+	5
3	2322	1+	5	8	2224	1+	5	15	1714	1+	5	27	1817	2	5
4	0430	1	5	9	0045	2	5	15	2238	3	5	27	2057	2+	5
4	1538	2+	5	9	0316	2+	5	16	1248	1	5	28	0800	2+	5
4	1810	1-	5	9	1208	1-	5	16	1705	1+	4	28	1345	2+	5
4	1913	2	5	9	1357	1	5	16	1944	2	5	29	1622	1-	5
4	2322	3	5	9	1500	1	5	17	0515	1+	5	29	2014	1	5
5	1617	2	5	9	1510	1	5	17	0708	2+	5	30	0344	1+	5
5	1932	1+	5	9	1538	2+	5	17	0927	1+	5	30	0956	1	5
5	2044	2+	5	9	1853	1-	5	17	1005	1-	5	30	1344	1	5
5	2209	2	5	9	2000	1	5	17	1545	1-	5	30	1717	1	5
								17	1745	1-	5	30	1913	2+	5

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NOW AVAILABLE from Cambridge University Press or Astronomy Book Club (Newbridge Communications):
OBSERVING THE SUN, by Peter O. Taylor.