

# Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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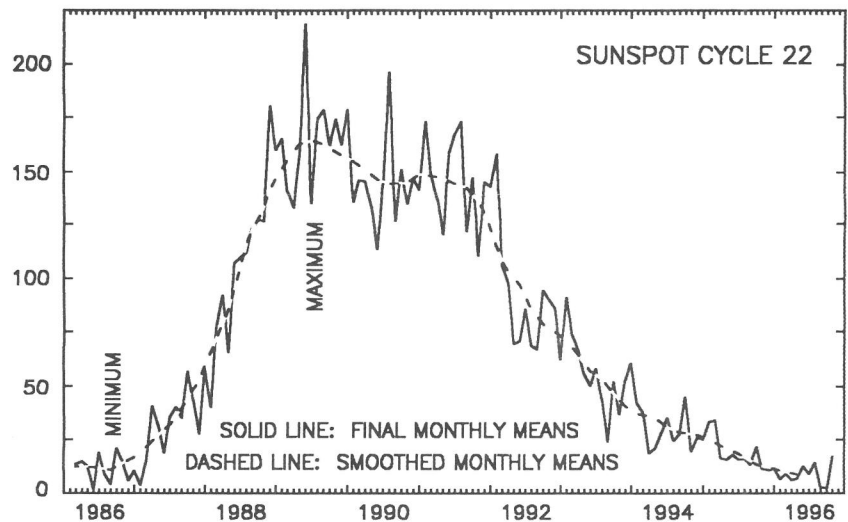
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## American Relative Sunspot Numbers for November

		R <sub>a</sub> Final			
1)	0	11)	14	21)	15
2)	0	12)	9	22)	22
3)	0	13)	9	23)	36
4)	0	14)	12	24)	40
5)	0	15)	18	25)	50
6)	0	16)	31	26)	50
7)	0	17)	22	27)	36
8)	0	18)	13	28)	26
9)	6	19)	9	29)	23
10)	13	20)	9	30)	20

Mean: 16.1  
Number of reports: 90



**November Summary:** The Sun's visible hemisphere continued to be spotless during the first week of November. The geomagnetic field was generally quiet with a few intervals of slightly disturbed conditions. The >2 MeV electron flux began the period at moderate and high levels, then rapidly declined to normal on the 4th.

Activity was very low throughout the second week of November. Several small sunspot groups appeared between the 9th and 12th, all associated with the current cycle. One of these -- NOAA/USAF Region 7993 (S02, L322, BXO) -- produced a few class-B X-ray flare enhancements. New cycle Region 7996 (N32, L288, AXX) emerged on the final day, but otherwise the disk was relatively quiet as expected during these times of near-minimum. The geomagnetic field was also quiet, with a few active or unsettled periods due to recurrence. The >2 MeV electron fluence continued to be normal.

Although solar activity remained in the very low range between the 15th and 21st, up to four small spot-groups (including Region 7996 from the new cycle) were visible at the beginning of the period. The geomagnetic field was quiet with intervals of active or unsettled conditions, and >2 MeV electron flux measurements were generally moderate or high.

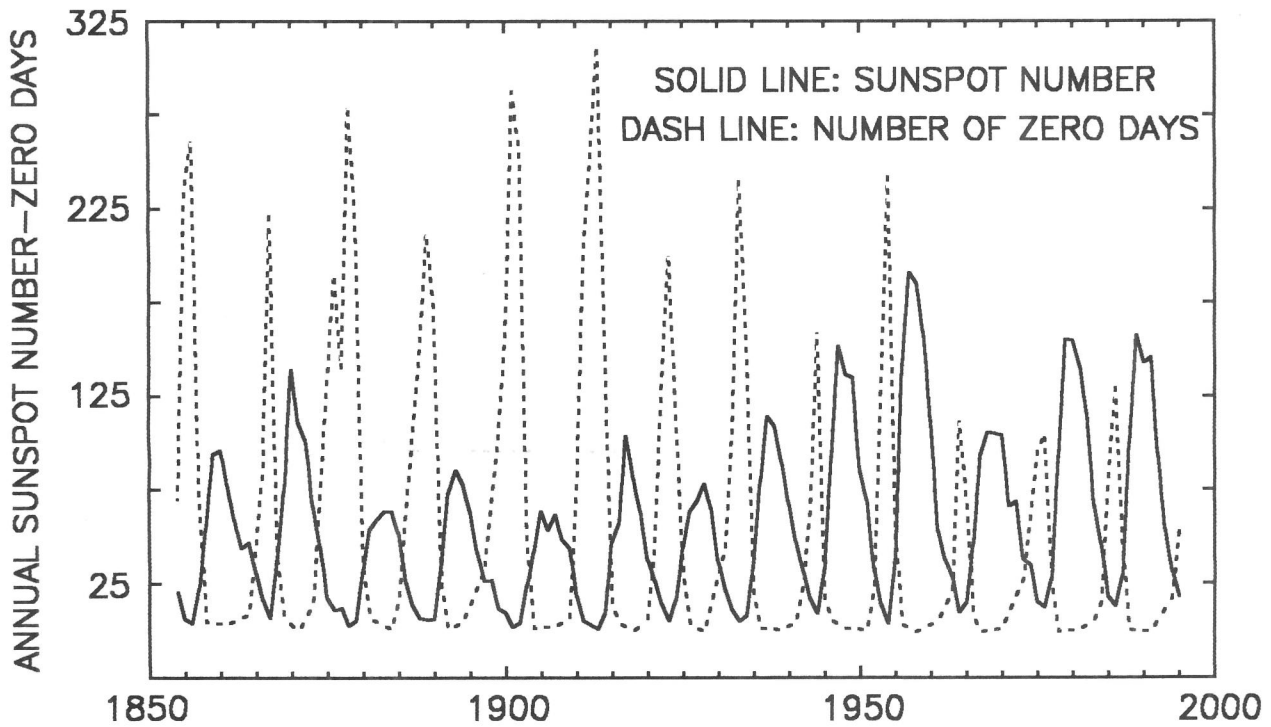
Solar Cycle 22 showed that it still had a bit of life during the fourth week of November. Activity ratings rose to low after the production of a number of class-C flares in Region 7999 (S04, L169, EKC). This spot-group grew to encompass more than 880 millionths of the visible solar hemisphere near mid-week, and was seen as a naked eye object by some alert observers. The evolution of this region, coupled with the presence of two smaller groups, served to push the relative sunspot number above 50 on the 25th. By week's end, however, Region 7999 was showing some signs of decay, and sunspot numbers were declining accordingly. The other highlight of the period was a coronal mass ejection above the west limb towards the end of the week. This was a massive event with a diameter greater than the Sun's near its peak, but due to its extreme westerly location the eruption is not expected to have a significant impact on the terrestrial environment. The geomagnetic field was quiet becoming quiet to unsettled, and the >2 MeV electron fluence declined to normal.

Activity climbed into the moderate range after Region 7999 produced the month's only class-M flare -- a M1.0/1F late on the 29th. This prolific group also continued to spawn class-C and lesser intensity events throughout the remainder of the month. The geomagnetic field was quiet. The smoothed monthly American Relative Sunspot Number continued to decline, reaching a value of 8.0 for May.

The estimated American Relative Sunspot Number for 1-15 December is 11.

[A Portion of the above information was obtained from SWO]

Decreasing Numbers of Spotless Days?



The annual numbers of recorded spotless days on the Sun has decreased. The graph plots the number of such days versus the annual relative sunspot number, circa 1854-1995. But has the actual number of these "zero days" really changed? One explanation for the apparent decline which argues in the negative attributes the decrease (noticeable after 1915, and particularly conspicuous after 1955) to the increased observational coverage -- timewise -- of the later series of observations. Our thanks to US contributor, **James C. Carlson**, for suggesting the concept which led to this diagram, and for supplying the annual counts of spotless-days.

-- the editor --

**Sudden Ionospheric Disturbances (SES) Recorded During November 1996**

Records were received from A9,40,50,52,61,62,63,68,69,70,71,72,73,75,77,78,80,81,82,83,84,85,86.

Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp	Def
13	1917	1-	3	24	1745	2+	5	25	1225	1-	4	30	1455	1	5
23	1530	1-	5	24	2004	1-	5	25	1310	2+	5	30	1533	1-	5
23	1540	1	5	24	2200	1-	5	25	1838	2	5	30	1717	1-	5
23	1915	1-	5	25	0020	2	5	29	2044	2+	5	30	2101	2+	5
24	1641	2+	5	25	1114	1-	5	30	1314	1-	5				

**Analysts:** J. Ellerbe; S. Hansen; P. King; A. Landry; D. Levit; G. Rosenberg; D. Overbeek; A. Stokes; P. Taylor; L. Witkowski.

Frequencies recorded (kHz): 16.8; 18.3; 19.6; 20.3; 21.4; 23.4; 24.0; 24.8; 30.6; 48.5; 51.6; 71.6.