

Subject: Re: Fwd: RE: SWPC sunspot numbers

From: William Denig <William.Denig@noaa.gov>

Date: Fri, 15 Apr 2011 08:22:21 -0600

To: leif@leif.org

CC: Leif Svalgaard <lsvalgaard@gmail.com>, Doug Biesecker <Doug.Biesecker@noaa.gov>, Christopher Balch <Christopher.Balch@noaa.gov>, Ken Tegnell <Ken.Tegnell@noaa.gov>, Tom Bogdan <Tom.Bogdan@noaa.gov>, Justin Mabie <Justin.Mabie@noaa.gov>, Craig A Clark <Craig.A.Clark@noaa.gov>

Lief - Current SRS is at

<http://www.swpc.noaa.gov/ftplib/latest/SRS.txt>

Historical SRS (in pdf format) are available at

http://www.ngdc.noaa.gov/nndc/struts/results?op_0=eq&v_0=solar_region_summaries&op_1=eq&op_2=eq&t=102827&s=2000&d=2002&d=2000&d=9

or downloaded from the SWPC warehouse.

Historical SRS (in text format) are also available at

ftp://ftp.ngdc.noaa.gov/STP/swpc_products/daily_reports/solar_region_summaries/data/text_solar_region_summaries/

- Bill Denig

On 4/14/2011 5:31 PM, Leif Svalgaard wrote:

Thanks Doug. Save me some time: URL to SRS?

On Thu, Apr 14, 2011 at 4:28 PM, Doug Biesecker <Doug.Biesecker@noaa.gov> wrote:

Yesterday's number was 153. If you look at yesterday's SRS, you find

Nmbr Location Lo Area Z LL NN Mag Type

1185 N16W48 026 0030 Cao 04 10 Beta

1186 N22W33 010 0070 Csi 14 15 Beta

1187 S22W15 352 0010 Bxo 03 02 Beta

1189 N21W59 036 0010 Axx 02 02 Alpha

1190 N12W00 338 0150 Eac 11 34 Beta-Gamma

1191 N08E56 281 0140 Hsx 02 01 Alpha

1192 N10W15 352 0020 Bxo 04 03 Beta

1193 N17E71 266 0220 Dao 09 06 Beta

For a G=8 and S = 73

I'm guessing k=1 is used for the SEON sites.

Doug

On 4/14/2011 5:16 PM, Leif Svalgaard wrote:

thanks.

Now, take today as an example. The sunspot number is reported as 131.

Which stations is that based on and what were their G and S numbers?

On Thu, Apr 14, 2011 at 4:12 PM, Christopher Balch

<Christopher.Balch@noaa.gov> wrote:

Doug:

The SWPC number is derived from observations provided by the USAF SEON network. The number of optical observatories has varied over my time here,

and I believe it also varied before I got here in 1983. Observatories I know

of during my time are Holloman (still active), Palehua (no longer taking optical data), Learmonth (still active), San Vito (still active), Ramey PR

(no longer active). I think they also had an observatory in Iran before

the revolution there - it is possible that NGDC has statistics on the optical patrol that this network provided. In addition, there was a period of time when we also did a local sunspot drawing in Boulder and added that into the averaging that is done daily. (The equipment is lying dormant out in the observatory). Obviously we are not currently actively doing this and have not been for many years.

The typical telescope/equipment used is something I don't really know. I suspect it is also something that has changed over time. I don't know who the expert would be on this - the first person that comes to mind is Frank Guy - Ken might know some of this too, or at least some contacts. I suspect the equipment changed over time at each site - I have no idea when or how it changed.

We don't actually apply a 'K' factor from the observations we receive - we do an averaging of the number of spots based on all the reports we have available and calculate a 10G+S for our number here directly. There is not any correction for observer seeing, enthusiasm, experience, etc. The determination of a 'group' is based on the procedure for assigning NOAA numbers that we have in the forecast operations center.

There isn't a hard and fast rule for what a sunspot is - basically if the observer can see something dark in white light and can draw it on a piece of paper, then it's a sunspot.

Criteria for assigning a NOAA number:

- 1) Any group which has penumbra
- 2) Any group which we know has produced a flare, either in H-alpha or x-rays
- 3) For groups without penumbra, we generally required two independent observations, 12 or more hours apart
- 4) We also generally try to assign one Region number per bipole. If we see two bipoles that have a couple degrees separation in latitude or longitude we generally try to split them out as separate regions. Of course the Sun is very creative in what it comes up with, so sometimes it is not obvious whether a group of spots that are clustered together should be split up or not. The general rule is to keep the spots together if we are in doubt.

Hope this helps.

--Chris

On 4/14/2011 2:56 PM, Doug Biesecker wrote:

Chris and Ken,

I suspect you two are the most knowledgeable about how we end up with a SWPC sunspot number (still called the SWO number I believe.)

Doug

----- Original Message -----

Subject: RE: SWPC sunspot numbers
Date: Thu, 14 Apr 2011 14:34:34 -0600
From: Tom Bogdan<Tom.Bogdan@noaa.gov> <<mailto:Tom.Bogdan@noaa.gov>>
To: leif@leif.org<<mailto:leif@leif.org>>, 'William Denig'
<William.Denig@noaa.gov> <<mailto:William.Denig@noaa.gov>>,
Doug.Biesecker@noaa.gov<<mailto:Doug.Biesecker@noaa.gov>>
CC: 'Cliver Edward W Civ AFRL/VSBXS' <Edward.Cliver@hanscom.af.mil>
<<mailto:Edward.Cliver@hanscom.af.mil>>

Bill and Doug,

Can one of you field this question? Please copy me on the response.
Thanks!

Tom

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National Weather Service
National Oceanic and Atmospheric Administration
325 Broadway/Room 2C109/W/NP9
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<http://www.spaceweather.gov>

-----Original Message-----

From: Leif Svalgaard [<mailto:lsvalgaard@gmail.com>]
Sent: Tuesday, April 12, 2011 12:07 PM
To: Tom.Bogdan@noaa.gov<<mailto:Tom.Bogdan@noaa.gov>>
Cc: Cliver Edward W Civ AFRL/VSBXS
Subject: SWPC sunspot numbers

Hi Tom,

As part of our ongoing sunspot calibration program it would be useful to have some information about how the SWPC [NOAA, Boulder, whatever the correct name is] sunspot number is calculated. Things like

- 1) number of observers
- 2) typical telescope data for the observers [magnification, aperture, visual or projection]
- 3) how the 'k' factor in $SSN = k(10G+S)$ is determined for the observers
- 4) criteria for what a sunspot is, what it takes to number an active region

Are there any guidelines for such things around

Thanks

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Leif
leif@leif.org<<mailto:leif@leif.org>>

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