SB PROP @ ARL $ARLP001
ARLP001 Propagation de K7RA

ZCZC AP01
QST de W1AW
Propagation Forecast Bulletin 1 ARLP001
>From Tad Cook, K7RA
Seattle, WA January 2, 2015
To all radio amateurs

SB PROP ARL ARLP001
ARLP001 Propagation de K7RA

We are just barely into the New Year 2015, and will review Cycle 24 progress during 2014. It now seems like a sure thing that this cycle peaked in Spring 2014, but fortunately solar cycles usually decline at a slower rate than they rise, so this cycle peak should have plenty of life left.

Solar activity softened over the week of December 25-31 when compared to the previous week. Average daily sunspot numbers dropped 30 points from 132.9 to 102.9, and average daily solar flux was down 55.7 points to 134.9.

Predicted solar flux on January 2-3 is 140, then 145 on January 4-5, 150 on January 6-7, 155 on January 8, then 150, 155, 160, 170 and 175 on January 9-13, 180 on January 14-16, then 175, 165, 155, 140, 135 and 130 on January 17-22, 125 on January 23-24, 130 on January 25-26, 125 on January 27-28, 120 on January 29-31, then peaking at 180 on February 10-12.

Predicted planetary A index is 10 on January 2, 15 on January 3-5, 10 on January 6-7, 8 on January 8, 10 on January 9-10, 12 on January 11, 5 on January 12-20, then 10, 15 and 5 on January 21-23, 10 on January 24-28, then 12, 20, 15 and 12 on January 29 through February 1, 5 on February 2-3, and 18 on February 4.

OK1HH generously sends another geomagnetic prediction this week. He expects the geomagnetic field will be quiet to active January 2, active to disturbed January 3, quiet to active January 4, quiet to unsettled January 5, quiet on January 6, mostly quiet January 7, quiet to active January 8, quiet to unsettled January 9-10.

It's quiet on January 11-17, quiet to active January 18, mostly quiet January 19, active to disturbed January 20, quiet to active January 21, quiet to unsettled January 22, quiet January 23, quiet to active January 24, active to disturbed January 25, quiet to active January 26, quiet to unsettled January 27 and mostly quiet January 28.

At the end of the year, here is what the various sunspot averages look like.

On an annual basis, 2014 had the highest average daily sunspot numbers of any year since 2002. In 2002, average daily sunspot numbers for the whole year were 176.7, and in 2014 it was 121.2. But for all the years in between they were quite a bit lower. The yearly average of daily sunspot numbers from 2003-2013 were 109.2, 68.6, 48.9, 26.1, 12.8, 4.7, 5.1, 25.5, 80.1, 82.3 and 97.1.

For the past few months, the monthly average of sunspot numbers for September-December 2014 were 127.4, 92.1, 101.9 and 120.

Our three-month moving average of sunspot numbers, for the months

ending in March through December 2014, were 146.4, 148.2, 129.6, 118.4, 112.8, 109.2, 115.6, 108.4, 107 and 104.7.

146.4 and 148.2 for the 3 month periods ending in March and April 2014 were the highest average daily sunspot numbers in the current cycle. At the bottom of the cycle in 2008 the three month averages of daily sunspot numbers ending in August through October were 2, 1.1 and 2.5. There seemed to be another minima in 2009 in the 3 month periods ending in February through May which had average daily sunspot numbers of 2.2, 2, 1.5 and 2. Between those dates the 3-month average rose to 4.5 in the three-month period ending in November 2008.

David Moore sent a link to an interesting article about the future of the National Solar Observatory at Big Bear:

http://www.latimes.com/science/la-sci-sn-big-bear-observatory-20141224-story.html

Larry Serra, N6NC of La Jolla, California asked, "What is causing the A index to be so high?"

Check http://spaceweather.com/ and the archives. CMEs and solar wind are disturbing Earth's geomagnetic field, and for some reason this seems to be more prevalent in the declining side of the solar cycle, which we are now in.

You can access the archives to see any day's spaceweather report by entering a date under Archives on the upper right side of the web page at http://spaceweather.com .

You can get daily updates of predicted A index and solar flux at:

ftp://ftp.swpc.noaa.gov/pub/forecasts/45DF/

New predictions are posted every afternoon, North American time, between 2100-2130 UTC.

Tom Lougheed, who did not mention a callsign or his location, wrote: "I resumed building/buying radios and antenna systems after a 40 year absence because this last Summer, all my RC (Radio Controlled) clocks went on strike.

"I spent part of the summer experimenting (unsuccessfully) with ad-hoc relative signal strength meters and resonant loop antenna-antenna boosters for 60 kHz.

"Between the time I bought the LF - HF converter and its arrival, over two nights (Oct 4-6) all of the RC clocks came back online. Two of them got the 60 kHz signal on the night of 4-5 Oct 2014, and all of the rest had received the signal (about a dozen - some are in weather displays, most are cheap clocks I'd purchased to rob for signal detectors).

"The original set of clocks lost the 60 kHz signal gradually, over about a month in the Spring, so I expected them to come back slowly. But they all came on instantly, from no signal by any of them 2:00-4:00 AM PDT all Summer to good signal at noon. It was like someone had thrown a switch.

"So I've been trolling NOAA/Spaceweather and ARRL for reports of something that would suggest an abrupt change in LF propagation, but all of the sites are HF biased, no LF. And the LF sites and references say 'LF propagates swell all year round' (or similar) which I know to be false, since this has been going on regularly for

about 8 years, when I got the first 'weather station' with an RC clock.

"The other option is that someone actually did throw a switch. I've seen references to LF navigation beacons that are going or have gone offline. But that's another department.

"Any recommendations and or links you might have for abrupt propagation events between the end of 2014-09 and beginning of 2014-10 would be gratefully received."

I replied, "I have three of those wall clocks, and the worst problem I have is when the time changes from Daylight to Standard time, they are unreliable for up to a few days. Also their reliability varies according to the position in the house.

"You didn't say what part of the world you are in, but I would guess that high geomagnetic activity could degrade reception of the 60 KHz longwave signal, especially at higher latitudes. I am at 47.669 degrees north. I danced with a woman last week who is from Yellowknife, Northwest Territories, and I was curious at what latitude she lives at. She didn't know, but she did confirm that she sees lots of aurora. Yellowknife is way up there at 62.45 deg N, and the Arctic Circle is at 66.5622 deg N, so I believe she lives about 457 km or 284 miles south of the Arctic Circle.

"Here are links to geomagnetic data for the second half of 2014:

"ftp://ftp.swpc.noaa.gov/pub/indices/old_indices/2014Q3_DGD.txt

"ftp://ftp.swpc.noaa.gov/pub/indices/old_indices/2014Q4_DGD.txt

"My guess would be when the planetary A index gets up into the higher double-digits, closer to 30, that this might be a problem for VLF signals, particularly if you are at a high latitude.

"WWVB, the source of our time signals is at 40.678 deg N, 105.048 deg W, which places it 980 miles from me, at a bearing of 113.2 deg. If you are close to WWVB, I expect your reception would be great no matter what conditions are."

Richard Sussman, W2HIC of Greenacres, Florida wrote, "I could use your guidance. Although I have been a ham for well over 56 years I will admit that the subject of solar propagation still mystifies me. I wish I had the interest to do the studying necessary to educate myself but I am not motivated at all. I have noticed that the low bands (20 and 40 meters especially) have been terrible for DX contacts over the past several years. Can you steer me towards a simple to understand website so I can see when it pays to get on 20 and/or 40 meter CW to try to work DX from my QTH in Southeast Florida?

"I use low power, less than 100 watts, and an indoor dipole resonant on 20 and 40 meters. The homeowner's restrictions down here prohibit outdoor antennas so I have to try to find an optimal sunspot cycle to maximize my results. I have found that the ARRL website leaves me with a foggy brain and a headache (through no fault of yours). I just don't have much interest in mass ejections and other solar astrophysical data. If I can hear the DX I can usually work them but I hear very little these days, even domestically.

"I would appreciate any advice you can give me."

My reply: "A number of variables affect propagation, including the

level of solar activity, the location of the station you are trying to work, your location, the season of the year, the time of day, and the frequency. So there isn't any web site that can tell you when which bands will have good propagation to many distant locales.

"But you can do your own predictions. You could download W6ELprop from here:

"http://k9la.us/html/tutorials.html

"K9LA also has a tutorial there.

"You can figure your lat/long coordinates from your street address here:

"http://www.latlong.net/convert-address-to-lat-long.html

"You can get the most recent sunspot numbers here:

"ftp://ftp.swpc.noaa.gov/pub/indices/DSD.txt

"You can average the sunspot number for the past few days, which I show as around 103.

"Given your location, for example, today to work Costa Rica, 10 meters should be good at 1530-2030 UTC, and perhaps best 1800-1930 UTC. 15 meters would likely be open over this path at 1330-2300 UTC, and 40 meters should be open at all times of the day and night, with strongest signals overnight from 2300 UTC to 1200 UTC. 20 meters looks good 1230-0100 UTC over that path.

"There is also a subscription service at http://www.k6tu.net/ that you can use, which will work out all the calculations for you. It is based on the predicted smoothed sunspot number for the month. This may be the website you had in mind, as it is easy to use and will give you detailed hour-by-hour readings of propagation from your location to many others.

"Have fun!"

Oleh Kernytskyy, KD7WPJ of Ramona, California wrote, "During Quarry Mountain activation (SOTA W7U/NU-067) I received a call from FK8IK on 28.060 MHz CW on December 24 at 2230 UTC. The distance was approximately 7000 miles, and I used a FT-817ND (2.5 W) with dipole approximately 7 feet above the ground."

For those who like to keep their own archives of solar data, I've just uploaded an updated solar data file for Scott Craig's Solar Data Plotting Utility, which has all sunspot and solar flux data from the start of 1989 through the end of 2014.

You can download the free program and updated data file at http://www.craigcentral.com/sol.asp . You can update it weekly automatically from the data at the bottom of our propagation bulletins.

If you would like to make a comment or have a tip for our readers, email the author at, k7ra@arrl.net.

For more information concerning radio propagation, see the ARRL Technical Information Service web page at, http://arrl.org/propagation-of-rf-signals. For an explanation of the numbers used in this bulletin, see http://arrl.org/the-sun-the-earth-the-ionosphere. An archive of past

propagation bulletins is at
http://arrl.org/w1aw-bulletins-archive-propagation. More good
information and tutorials on propagation are at http://k9la.us/.

Monthly propagation charts between four USA regions and twelve
overseas locations are at http://arrl.org/propagation.

Instructions for starting or ending email distribution of ARRL
bulletins are at http://arrl.org/bulletins.

Sunspot numbers for December 25 through 31 were 100, 92, 111, 108,
113, 102, and 94, with a mean of 102.9. 10.7 cm flux was 145.3, 137,
134.1, 132.6, 131.5, 130.4, and 133.6, with a mean of 134.9.
Estimated planetary A indices were 13, 17, 7, 11, 23, 18, and 8,
with a mean of 13.9. Estimated mid-latitude A indices were 9, 15, 5,
8, 15, 14, and 7, with a mean of 10.4.
NNNN
/EX