

SB PROP @ ARL \$ARLP012
ARLP012 Propagation de K7RA

ZCZC AP12
QST de W1AW
Propagation Forecast Bulletin 12 ARLP012
>From Tad Cook, K7RA
Seattle, WA March 20, 2015
To all radio amateurs

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The Spring Equinox is today, March 20 at 2245 UTC.

On Tuesday, March 17 a CME struck Earth producing the largest geomagnetic storm of the current solar cycle. Aurora was visible all the way down to the central United States. The planetary A index for the day was 117, an incredibly high number. It looks like the greatest impact was in the second half of the UTC day, when the planetary K index in the four 3-hour periods was 8, 8, 7 and 8.

Average daily sunspot number for this week rose from 32 to 59.1, and average daily solar flux declined from 127.8 to 114.8.

The latest prediction has solar flux at 110 on March 20, 105 on March 21-22, 100 on March 23-26, 105 on March 27, 110 on March 28, 105 on March 29-31 and 110 on April 1. Flux values are expected to reach a peak of 120 (which is not very high) on April 3-5, and a low of 95 on April 17-18.

Predicted planetary A index is expected at 18 and 8 on March 20-21, 20 on March 22-23, 10 on March 24, 5 on March 25-26, then 15, 30 and 25 on March 27-29, then 12, 10 and 8 on March 30 through April 1, and 10, 15 and 12 on April 2-4 and 5 on April 5-6.

Petr Kolman, OK1MGW of the Czech Propagation Interest Group expects geomagnetic conditions to be mostly quiet on March 20, quiet to unsettled March 21, quiet to active March 22, active to disturbed March 23, quiet to unsettled March 24, mostly quiet March 25-26, quiet to unsettled March 27, active to disturbed March 28-29, quiet to unsettled March 30 through April 2, quiet to active April 3, quiet to unsettled April 4-5, quiet on April 6, mostly quiet April 7-10, quiet to unsettled April 11-12, quiet to active April 13-14, and quiet to unsettled April 15.

The planetary A index at 117 was huge, but when was it last that high?

Here is a list of dates when the planetary A index was above 100, in reverse order, along with links to the propagation bulletin reporting it:

12/15/2006 Ap=104

<http://www.arrrl.org/wlaw-bulletins-archive/ARLP052/2006>

<http://www.arrrl.org/wlaw-bulletins-archive/ARLP053/2006>

Notice in the above bulletin is a link to a December 21, 2006 article claiming that the next solar cycle might be the biggest ever. Oh, if only that were true. Cycle 24 was one of the weakest on record, peaking about a year ago instead of 2010 or 2011 as forecast in that article.

http://science.nasa.gov/science-news/science-at-nasa/2006/21dec_cycle24/

9/11/2005 Ap=105

<http://www.arrl.org/wlaw-bulletins-archive/ARLP039/2005>

8/24/2005 Ap=110

<http://www.arrl.org/wlaw-bulletins-archive/ARLP036/2005>

5/15/2005 Ap=105

<http://www.arrl.org/wlaw-bulletins-archive/ARLP020/2005>

11/8/2004 to 11/10/2004 Ap = 189, 120, 181.

<http://www.arrl.org/wlaw-bulletins-archive/ARLP046/2004>

The two STEREO observatories are very close to each other right now. In fact, they will be practically on top of each other early Saturday morning, North American time between 1249 and 1318 UTC when their separation is only .023 degrees.

You can see the latest solar images from this project at <http://stereo.gsfc.nasa.gov/> .

Andy Fugard, M0INF hadn't heard anything on 10 meters before March 7-8 and using an indoor magnetic loop antenna he worked K1IG, W3LPL, 9A1P, YU1EW, N1UR, AA1K, NC1I and LZ4TX from his apartment in London. You can see the antenna hanging in his window on his QRZ.com page.

We had another report about those same dates from Francesco Basta, PE1F. He wrote, "I read your column yesterday and was particularly interested in your note about a solar flare that could cause exceptional propagation conditions at frequencies above 10 MHz. I think I can offer a witness about what happened on 28 MHz.

"I am located in Utrecht (Netherlands), JO22mc. I have some problems with my antenna these days, so I can only use a small internal antenna next to a window that covers 28, 50, 144 and 430 MHz bands. With such an antenna I don't dare to use the full power of my FT-950, so I used rather an FT-817 (5 W). I am located on the ground floor.

"Since about 1030 UTC on March 7 I started hearing weak stations from South America on 10 meters, namely Brazil, like the beacons PY2WFG on 28.203 MHz and PT2SSB/B on 28.210 MHz. At about the same time I could also hear beacons closer to me, like YM7KK/B (from KN90iv) on 28.220 MHz and YM7TEN/B (from KN91rb) on 28.225 MHz (sporadic-E?).

"In the evening I tried to have some QSOs with the US during the ARRL contest, and indeed I managed to work K1KI from Connecticut (1741 UT), W2IRT from NJ (1753 UT) and XL3T from Ontario (1806 UT). Not bad for 5 W and an internal antenna...

"But the really incredible QSO happened the following day, March 8th, at 1706 UT: R1LANR on CW from Antarctica on 28.004 MHz! And I even managed to pass at the third or fourth attempt.

"Finally, I could hear an FM repeater from New York on 29.620 MHz after about 30 minutes, at S9!

"It was really a wonderful experience, which I could not explain until I read your article on ARRL.org."

Tyler Suydam, KC2LST of Parsippany, New Jersey wrote, "A couple of anecdotes from last Saturday's M-class flare, which I didn't know

had occurred until after the ARRL DX SSB contest ended. On Saturday night around midnight US east coast time, I worked two stations in Hawaii on 40M phone, which I had never done before in my 8 years of being active on HF with my low dipoles. However, that day and the next, I was unable to hear, let alone work, any stations in Alaska or Japan on any HF band, which I have been able to do regularly during this 'peak' period of the current solar cycle. So from my locale, it seemed the attenuating effect was confined to the Pacific Rim, or at least did not affect the Hawaiian Islands. It would be interesting to know whether stations there noticed unusual propagation conditions as a result of the flare."

Mike Carter, K8CN of Durham, New Hampshire wrote on March 17, "I just read in the news of the level 4 geomagnetic storm that reached Earth earlier today (10 AM EDT by the news account). I hadn't been active on the bands for the past several weeks due to a death in the family, but was on the 20, 30, 40, and 80 meter bands over the past 24 hours and noticed unusually good propagation to areas that had several weeks ago produced noticeably weaker signals. I run strictly QRP CW, but was able to easily work E51 and VK on 30 meters yesterday around 1045Z, and easily worked VK again this morning on 40 meters about the same time. Last night (about 0230Z) I heard strongly, but couldn't break the pileups, E30FB and 9Q0HX on 20 meters. To my amazement I copied but did not work FK8 and RW0 on 80 meters around 1030Z this morning. Both were weak, but copyable, and the pileups built quickly.

"I know that the Vernal Equinox provides enhanced HF propagation, especially along the gray line, and no doubt the openings I cited may be just due to this phenomenon. I am curious if the outer edges of the geomagnetic storm that arrived today might have actually enhanced HF propagation prior to the main blast's arrival, or is that not possible?"

Rich Zwirko, K1HTV wrote, "March 17, 2015, St. Patrick's Day, was a memorable one for VHF DXers. With the K Index between 7 and 8 we were treated to some nice propagation via aurora. From my Amissville, VA QTH, on 144 MHz, I heard or worked stations as far east as Maine and as far west as Iowa including:

"UTC
2037 K9MRI IN EN70
2107 WB8AUK OH EN90
2043 W9ZIH IL EN51
2107 W9EWZ WI EN52
2128 VE3VHB ON FN24
2146 KC0CF IA EN32 (Best 2M DX this aurora, 867 miles. Also heard K0KD in EN31, but he got away.)
2155 VE3ZV ON EN93 (on SSB)
2222 W9JN WI EN54
2232 KF6A MI EN73

"At 2059 UTC the aurora was intense enough to reflect signals between W9ZIH (IL EN51) and K1HTV (FM18ap) for my first ever 432 MHz aurora QSO."

Quite impressive. That is 617 miles on 432 MHz.

Many people emailed me the call sign for Bob MacKenzie, mentioned on Spaceweather.com last week, and I heard from him via email a couple of days later. He is VA3RKM. He wrote, "A friend of mine, Jose VA3PCJ, mentioned to me that it was interesting that I worked three amateur stations in Japan between 2233 and 2240 UTC on March 7, 2015 on the 10 metre band (28.4 MHz) only minutes after the M9 flare with just 5 watts of single-sideband power and a single-element vertical antenna in my backyard. It's a rare event to work Japan so easily with such little power on phone and not Morse code. The annual ARRL

International DX Phone contest was on at the time so there were plenty of DX stations on the air, making this observation of unusual propagation possible.

"My station is located in Ottawa, Canada (see QRZ.com under VA3RKM). We were wondering about propagation paths to here. The first contact with Japan (JA0JHA in Niigata, according to qrz.com) required a few repeats and the next two (JA0QNJ also in Niigata; JA7OWD in Haramachi Hukushima, Fukushima? according to qrz.com) were remarkably easy."

Jon Jones, N0JK wrote, "Regarding the spaceweather.com report that solar flares can be 'good and bad for radio communications' I was operating on 50 MHz from the south tip of Maui on March 11 around 0000z. I heard LW3EX (GF05) calling CQ on 50.096 MHz CW. I called and got a reply, then Walt faded out as a M-Class solar flare occurred from AR2297. Fortunately the adverse effects of the solar flare were brief, and Walt reappeared with a stronger signal and we were able to complete a contact about 10 minutes later. I was mobile with a 1/4 wave whip antenna. 12,000 km from Hawaii to Argentina."

Chris Parker, AF6PX of Torrance, California wrote, "I fly a Bombardier Challenger biz jet with two very expensive Rockwell Collins HF9000 radios for long-range aeronautical communications. Turns out they also work great for amateur band aeronautical mobile use. With 150W PEP, and an antenna at 41,000 feet, it's virtually impossible that I can't work anyone I can hear. Except Tuesday, March 17th. On that day, on a flight from Arizona to the San Francisco Bay area, I tuned across the 20M, 17M, and 15M bands and didn't hear a soul. I knew something was up; but I didn't know what until I watched the evening news. That's when I found out that a powerful CME had impacted the Earth and caused a disruptive geomagnetic storm. I sure hope this settles down quickly, because I can't wait to get back to my aeronautical mobile DX!"

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/wlaw-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 March 12 through 18 were 56, 87, 56, 54, 57, 60, and 44, with a mean of 59.1. 10.7 cm flux was 126.7, 119.4, 115.6, 114.4, 117.2, 114.3, and 114.8, with a mean of 117.5. Estimated planetary A indices were 8, 6, 5, 7, 11, 117, and 52, with a mean of 29.4. Estimated mid-latitude A indices were 6, 5, 5, 7, 9, 46, and 32, with a mean of 15.7.

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