

SB PROP @ ARL \$ARLP032
ARLP032 Propagation de K7RA

ZCZC AP32
QST de W1AW
Propagation Forecast Bulletin 32 ARLP032
>From Tad Cook, K7RA
Seattle, WA August 8, 2014
To all radio amateurs

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We saw rising solar activity over the past week, with average daily sunspot number increasing from 107.7 to 136.7. Average daily solar flux went from 125 for the previous seven days to 149.6 for the current period, July 31 through August 6. Thursday, August 7 saw the sunspot number increase to 158 with solar flux at 136.

Predicted solar flux is 130 on August 8, 125 on August 9 and 10, then 120, 110 and 105 on August 11 to 13, 100, 105 and 110 on August 14 to 16, 100 on August 17 to 19, 105 on August 20 and 21, 110 and 115 on August 22 and 23, 120 on August 24 and 26, 125 on August 27 and 28, 120 on August 29 and 30, a jump to 150 on August 31 through September 3, then a decline to 140, 135, 130 and 120 on September 4 to 7, and 115 on September 8 and 9. Flux then drops to a low of 100 on September 13 to 15, before rising again. We've seen no flux values below 100 in the outlook since the August 2 forecast.

Predicted planetary A index is 8 on August 8, 5 on August 9 to 21, 8 on August 22 and 23, 5 on August 24 to 27, 8 on August 28 and 29, 5 on August 30, 8 on August 31 through September 1, 5 on September 2, and 8 on September 3 and 4.

F. K. Janda, OK1HH believes we should see quiet to unsettled geomagnetic conditions August 8, quiet to active August 9, quiet to unsettled August 10, mostly quiet August 11, quiet August 12 to 15, mostly quiet August 16, quiet again on August 17 and 18, mostly quiet August 19 to 21, quiet to unsettled August 22, active to disturbed August 23, quiet to unsettled August 24, mostly quiet August 25, quiet to active August 26 to 29, active to disturbed August 30, quiet to active August 31, quiet on September 1, mostly quiet September 2 and quiet to unsettled on September 3. OK1HH believes there could be increases in solar wind on August 10 to 12, more so on August 11.

Last week's bulletin reported computer network issues at Canada's Dominion Radio Astrophysical Observatory in British Columbia. They came back online catching up with some backlogged data, but now are off again.

Elwood Downey, WB0OEW reports that the problem is due to a cyber attack. He sent us these links:

http://news.gc.ca/web/article-en.do?mthd=index&crtr.page=1&nid=871449&_ga=1.135133491.345880733.1401996591

http://www.nrc-cnrc.gc.ca/eng/cyber/statements/20140729_cyber.html

He also reports that updates will be posted here:

<http://www.nrc-cnrc.gc.ca/eng/index.html>

Check "Latest NRC Headlines."

No updates are posted since July 31.

Don't know what happened this week, but we received no propagation reports or queries from readers, but we did get an interesting question from Bruce Stewart, W8CPG of West Virginia regarding that huge solar flare in 2012 that missed us by several days.

Bruce wrote: "How would the 2012 solar flare announced recently on network news have affected ham radio communications? I understand commercial power grids probably would have been disrupted, but if equipped with auxiliary power, would ham radio operations been disrupted/disabled?"

Bruce is talking about a major solar flare that was aimed squarely into Earth's orbit, but we were about a week away from being in position to receive the effects. If aimed squarely at Earth, I suspect the effect on HF propagation would be major, with at least several days of high absorption along with a wiped out ionosphere.

But a larger concern would be the effects on the power grid. With power transmission lines acting as huge antennas, large 500kV or 765kV transformers could overheat and fail, with the collapse of the electric grid having a domino effect. There aren't a lot of spares sitting around, and lead time on manufacturing new large transformers is at least ten months. But that assumes that you have an operating power grid to support building and transporting new equipment.

An interesting article written early in 2012 before the big flare talks about a study of just such a scenario:

<http://www.nationaldefensemagazine.org/archive/2012/February/pages/CatastrophicSolarFlareScenarioTouchesOffStormyDebate.aspx>

Kappenman, mentioned in the article wrote this report two years prior to that article, for Oak Ridge National Laboratory:

http://www.ferc.gov/industries/electric/indus-act/reliability/cybersecurity/ferc_meta-r-319.pdf

The acronym GIC mentioned frequently in that article stands for Geomagnetically Induced Currents. A web search on the term yields many interesting references.

Bonneville Power Administration released this report on their asset management strategy for their substations, which gives you an idea of some of the metrics involved:

https://www.bpa.gov/Finance/FinancialPublicProcesses/CapitalInvestmentReview/cirdocuments/Transmission_ACSbstations_DAS.pdf

Well, that is way off the subject of our bulletin, but it is interesting to think about the possible worst case effects of a major geomagnetic storm.

For more information concerning radio propagation, see the ARRL Technical Information Service 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 July 31 through August 6 were 139, 165, 178, 152, 111, 93, and 119, with a mean of 136.7. 10.7 cm flux was 156.4, 168, 156, 152, 139, 139, and 137, with a mean of 149.6. Estimated planetary A indices were 5, 10, 11, 7, 12, 10, and 7, with a mean of 8.9. Estimated mid-latitude A indices were 7, 14, 12, 7, 15, 12, and 7, with a mean of 10.6.

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