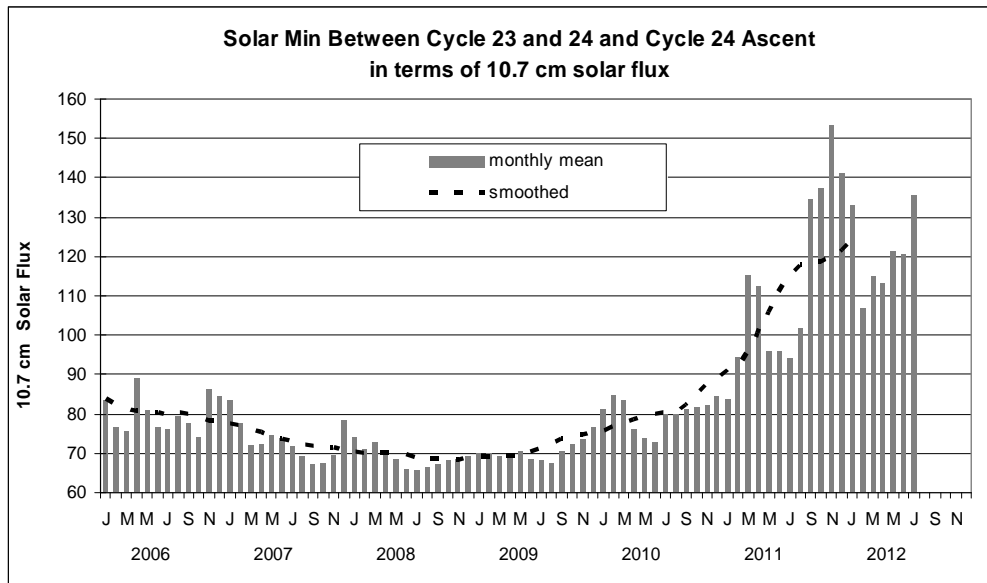


### Seasonal Effects on Propagation

At the Contest Forum at Dayton in May, I talked about where 10-Meters went for the ARRL DX Contests and the CQ WPX PH Contest in February and March of 2012. In case you weren't on, 10-Meters was very productive in the CQ Worldwide Contests in October and November of 2011 and in the ARRL 10M Contest in December 2011, with QSO totals from East Coast stations just under 3000.

But the ARRL DX Contests and the CQ WPX PH contests (and subsequently the CQ WPX CW contest) in early 2012 were a different story. These contests only produced around 600 QSOs on 10-Meters for the same East Coast stations (with the majority of the QSOs towards the south). The major issue here is that Cycle 24's ascent slowed down significantly in early 2012. Figure 1 shows the monthly mean 10.7 cm solar flux values and the smoothed 10.7 cm solar flux values from January 2006 to the present.

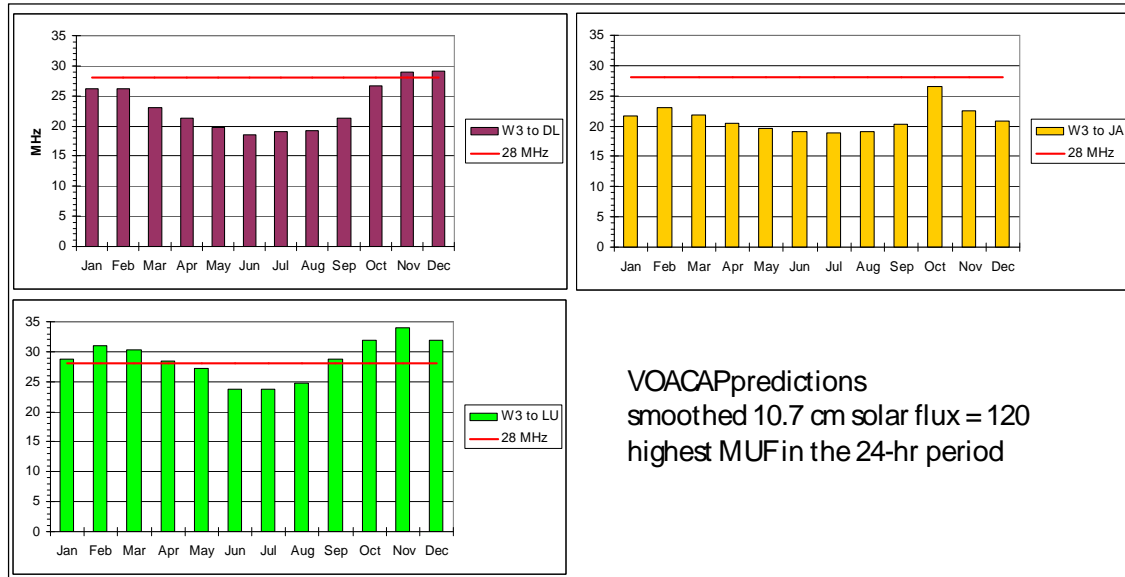


**Figure 1 – 10.7 cm Solar Flux**

The monthly means were increasing nicely up through November 2011, but then the monthly means took a nose dive. Normally that's ok, as the monthly means have their ups and downs as a solar cycle ascends (as can be seen in the early stage of Cycle 24's ascent). But after November 2011 the monthly means didn't come back as quick as expected. The result of this was a leveling off of the smoothed 10.7 cm solar flux around 120 beginning around July 2011. It appears that this leveling off may be temporary as evidenced by the rise of the smoothed 10.7 cm solar flux after December 2011.

With the smoothed 10.7 cm solar flux hovering around 120, worldwide F2 propagation on 10-Meters (especially away from the robust equatorial ionosphere) will not be consistent. In other words, it could be good or it could be not-so-good. And the cause of this is the seasonal effects on the ionosphere when the ionosphere is relatively ‘constant’.

To look at this deeper, I ran propagation predictions with VOACAP at a smoothed 10.7 cm solar flux of 120 from W3 to three areas of the world – Europe, Japan, and South America. I plotted the highest monthly median MUF (maximum useable frequency) in each of the twelve months. Figure 2 is this data.



**Figure 2 – Seasonal MUFs**

For the W3-to-Europe path, October, November, and December are best, with the straight horizontal line highlighting 10-Meters. For the W3-to-Japan path, October is the best. For the W3-to-South America path, September through April is best, confirming that the equatorial ionosphere holds up much better with respect to seasonal effects.

So what happened is the relatively constant smoothed 10.7 cm solar flux (which translates to a smoothed sunspot number of around 60) makes the month of the year all-important for 10-Meter openings. I believe the upcoming CQ World Wide Contests and the 10-Meter Contest will give good worldwide 10-Meter propagation (you should be reading this after CQ WW PH). But if the monthly solar indices don't increase significantly, then we'll see the same problem this coming Spring (2013) as we saw last Spring (2012) – marginal 10-Meter openings in the ARRL DX and CQ WPX Contests.

To reiterate, Figure 1 does hint that the solar activity has picked up a bit again, so let's keep our fingers crossed for the contests in early 2013.