

SFTARC Tech Night

Propagation Changes for the ham bands during the 24-hour sun cycle.

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General rules about propagation.

- Charts are from <https://dr2w.de/dx-propagation/>
- The DR2W website has single images and animation available for all ham bands.
- First pages of this presentation are propagation at 9am in North America for all the normal ham bands. (10m, 15m, 20m, 40m and 80m)
- Second part of this presentation is the 24-hour propagation cycle for 40m.
- The WARC bands (12m, 17m and 30m) propagation will be a mix of the two closest ham bands.

General rules about propagation - cont.

- The 30m, 40m and 80m bands will propagate longer distances on the night side of the sun's cycle.
- The 10m, 12m, 15m bands propagate longer distances on the day side of the sun's cycle.
- The 17m and 20m bands have a mixture of day and night propagation throughout the 24-hour sun cycle.
- Gray-line will affect all bands to a degree.
- Notice the rings of radiation intensity. Antenna and band operation affect what these rings will look like.
- Propagation into the Indian Ocean area is challenging for NA due to distance, path loss over the North Pole and the Himalayas.

10M, 9am – all on the day side. Notice rings.

DR2W Ham Radio Contest Station

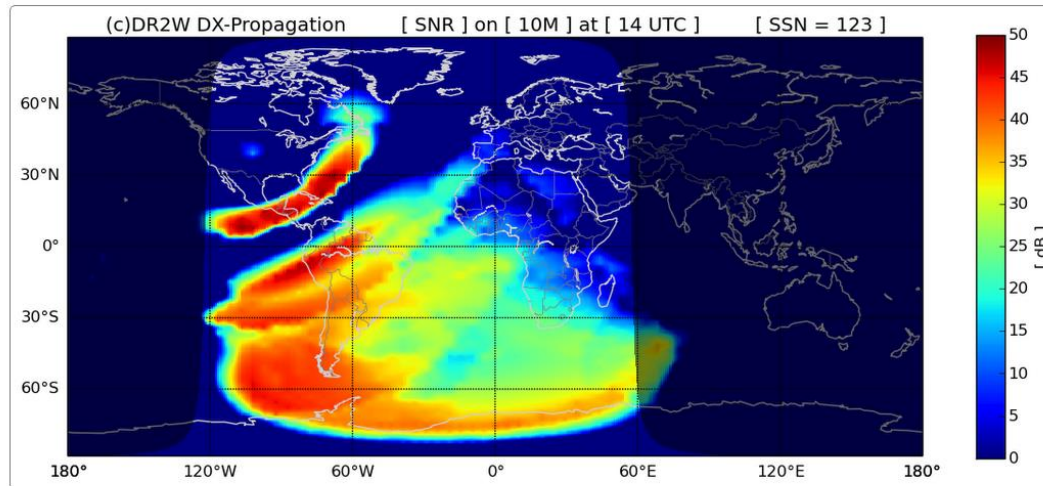
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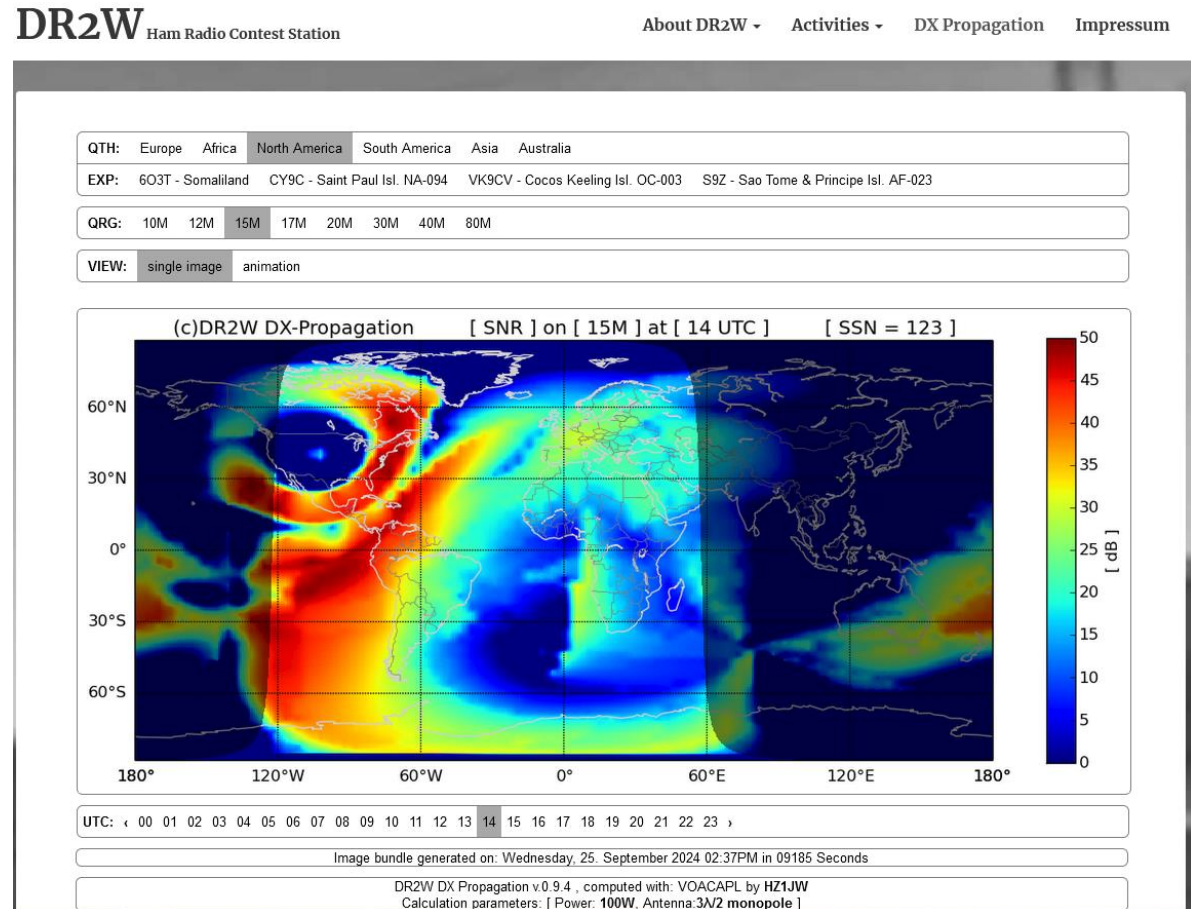
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Image bundle generated on: Wednesday, 25. September 2024 02:37PM in 09185 Seconds

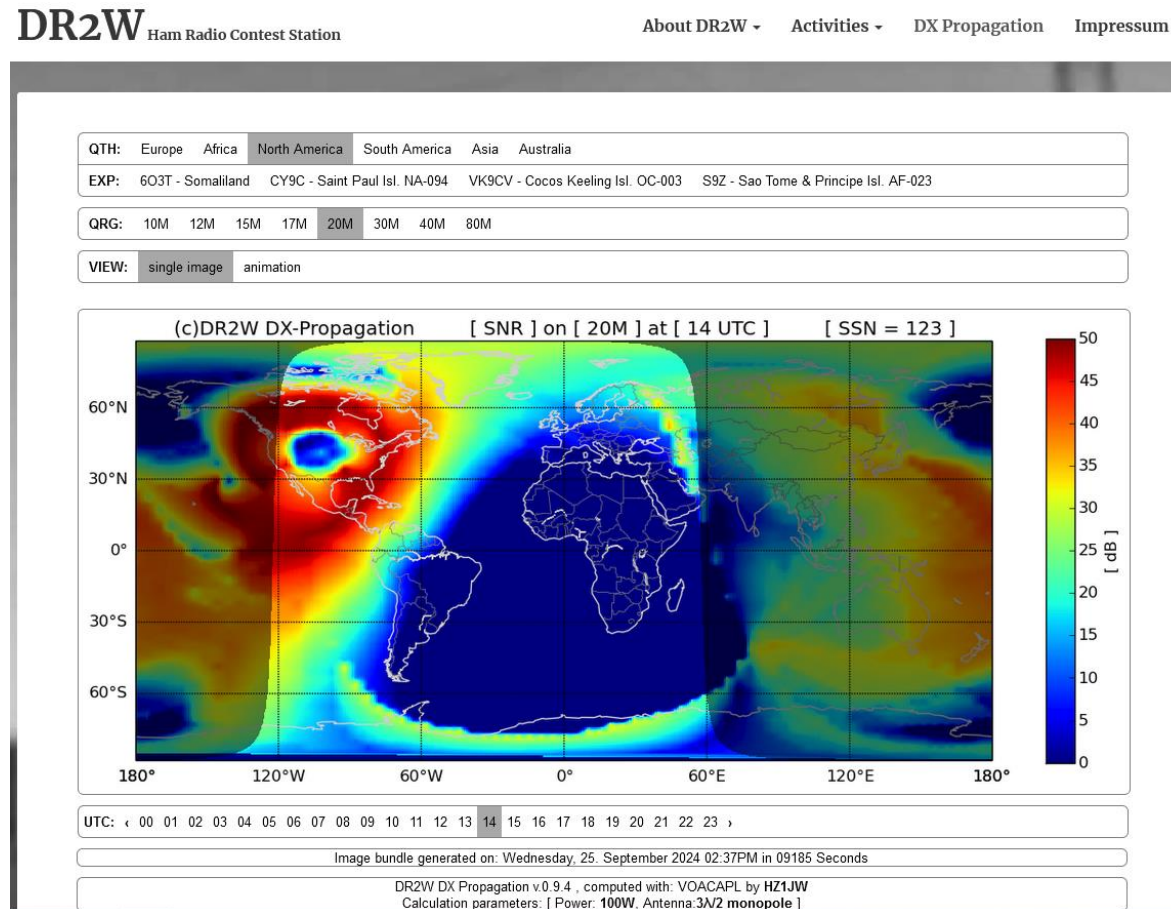
DR2W DX Propagation v.0.9.4 , computed with: VOACAPL by HZ1JW
Calculation parameters: [Power: 100W, Antenna 3λ/2 monopole]

15M, 9am – mix of day & night.

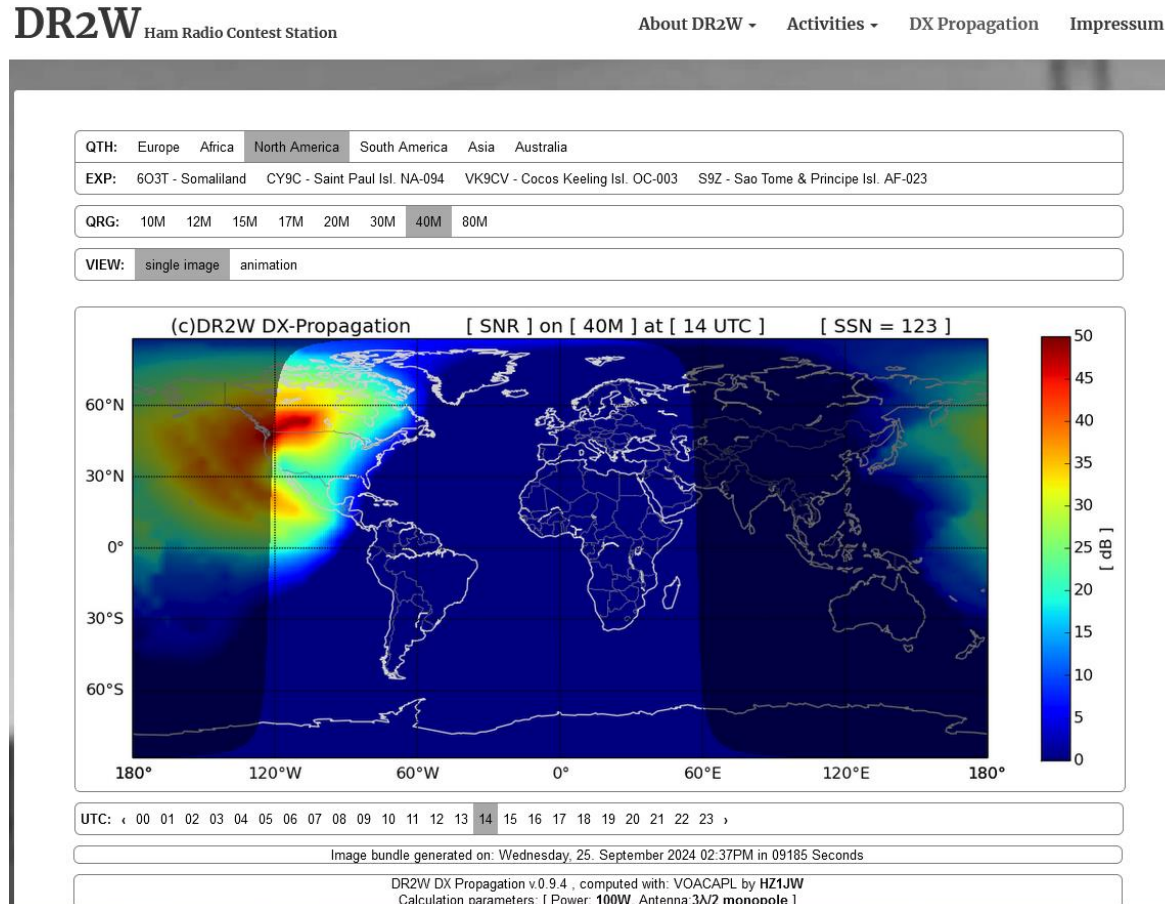
Rings blurred but still distinct. South Pacific night side.



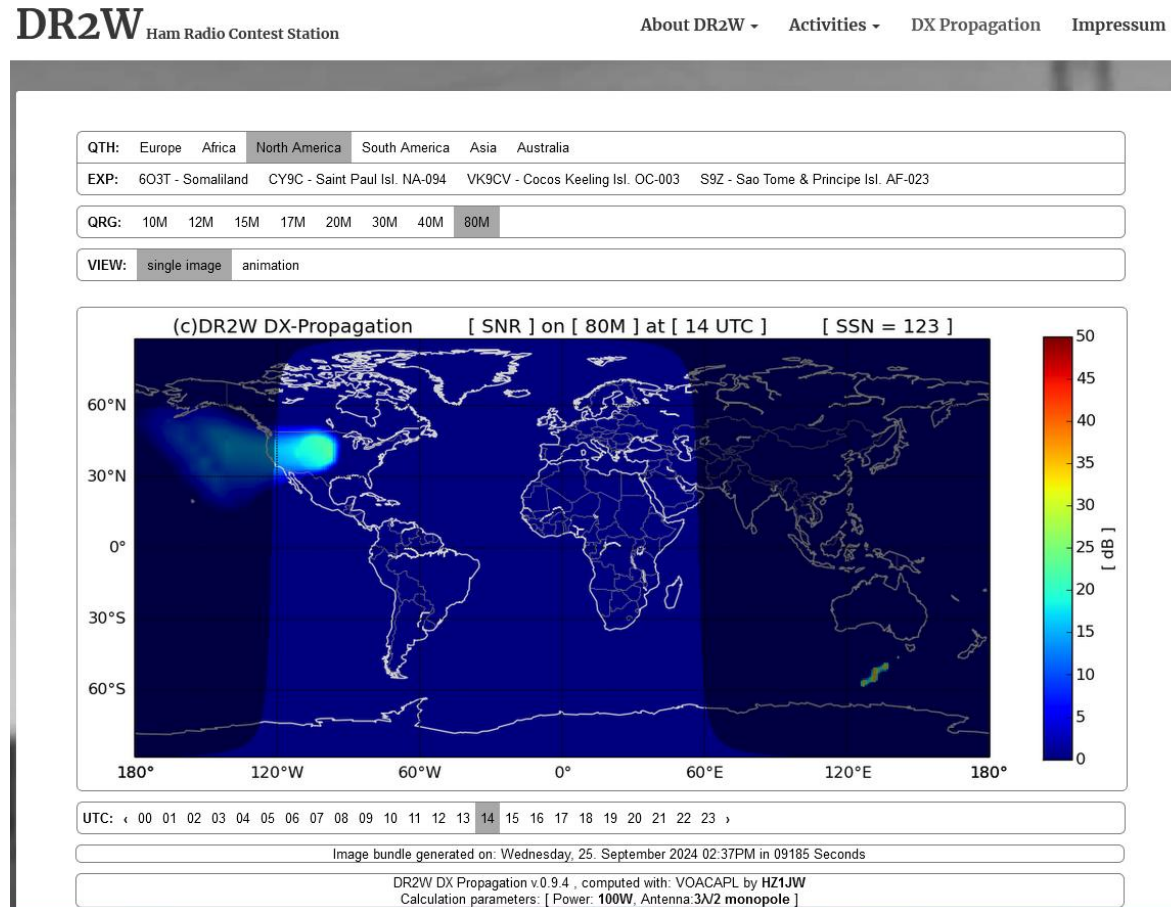
20M, 9am – Good propagation except afternoon sun in southern hemisphere.



40M, 9am – Northern hemisphere best coverage and following sunrise for longer distance.



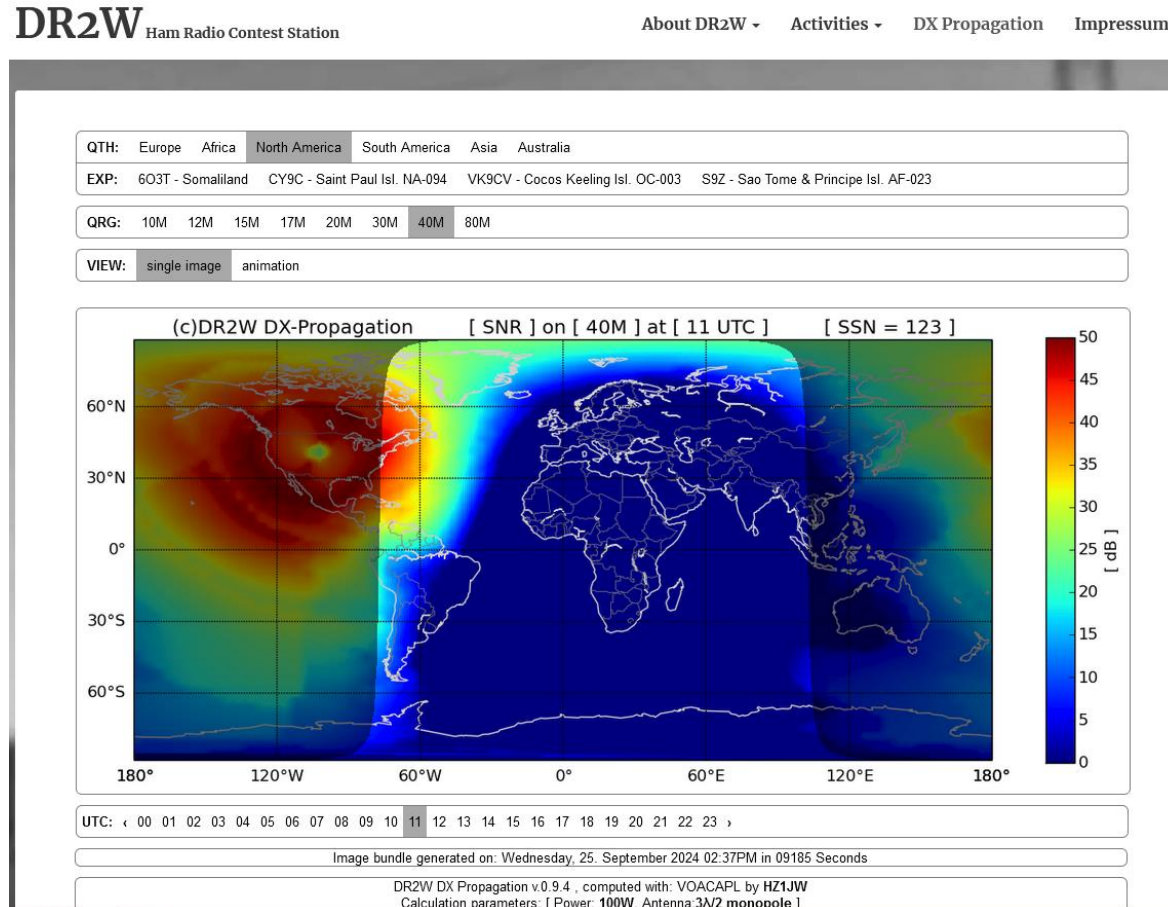
80M, 9am – NVIS and some sunrise propagation but getting much weaker.



What happens to 40m during a day cycle?

- 40m shows the dramatic change from local propagation in NA to a much longer distant coverage during the night-time. Many people will refer to this as "the band is rolling over" meaning that the propagation is going to change from more local in NA to longer distance DX and shortwave station will be heard.
- The 40m band will go through all the changes in propagation during a 24-hour period. Sunrise gray-line, day, sunset gray-line and night propagation are all stages that will happen.

40M, 6am - some DX to the west during sunrise and gray-line time.



40M, 10am – mostly west coverage.

DR2W Ham Radio Contest Station

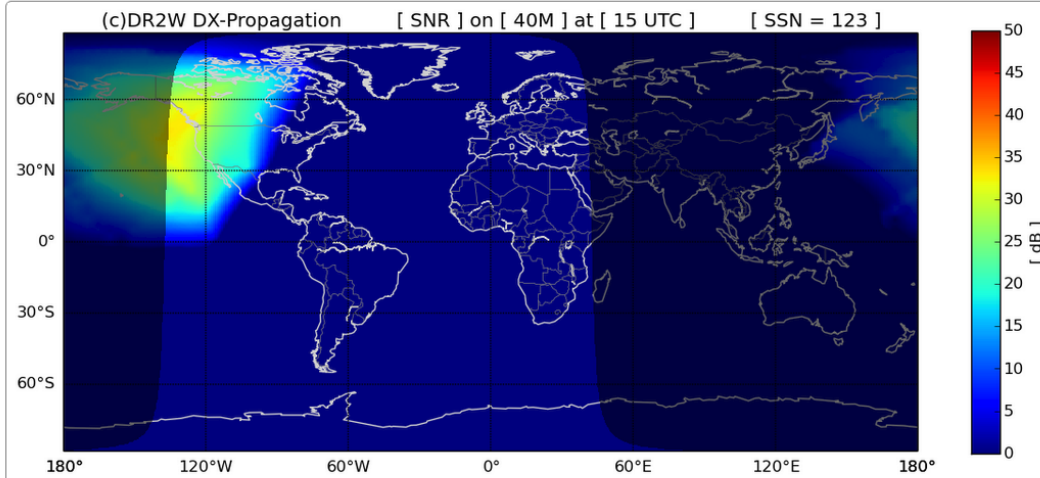
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40M, 2pm – only local or NVIS propagation.

DR2W Ham Radio Contest Station

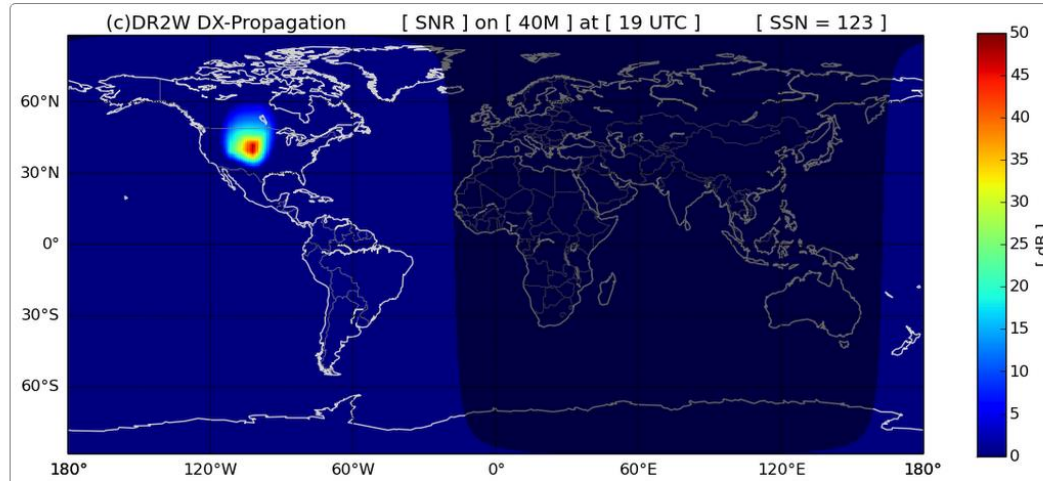
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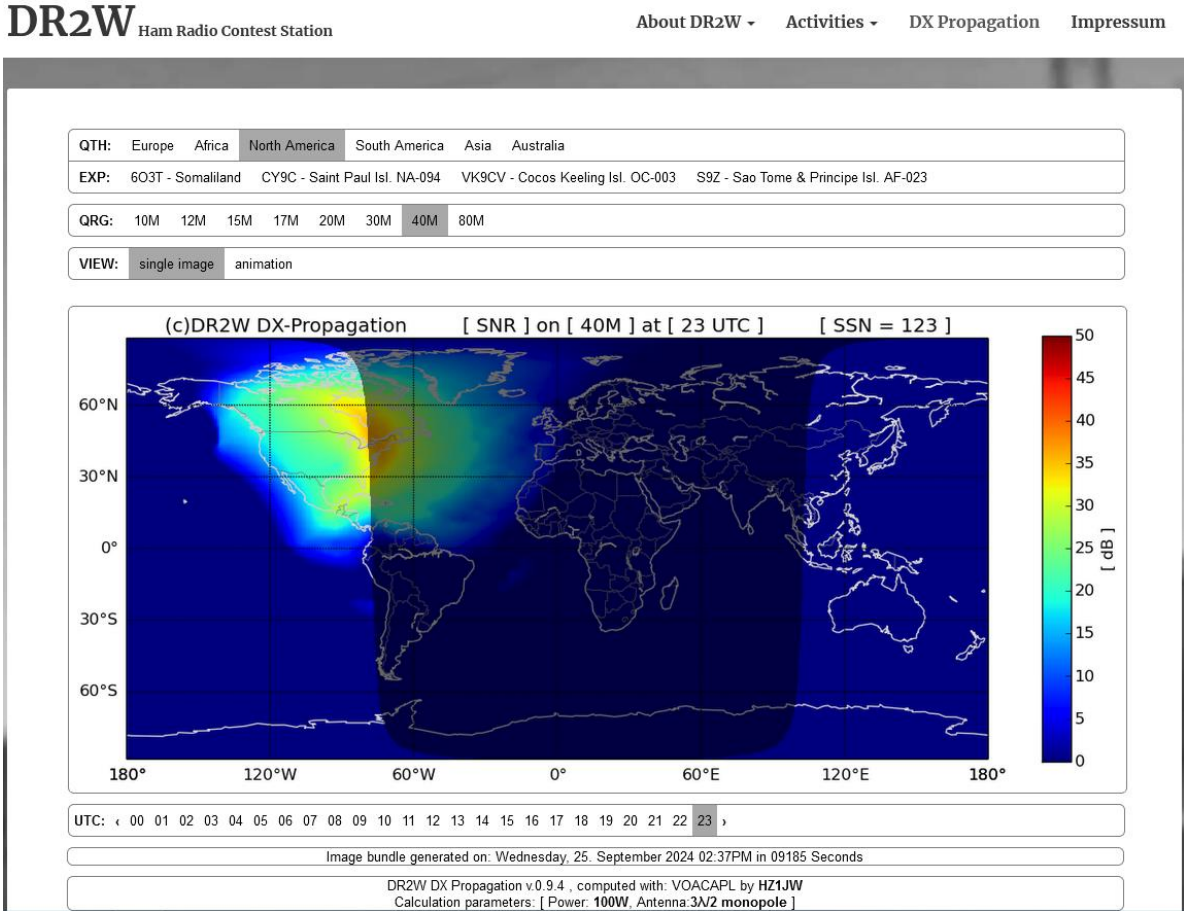


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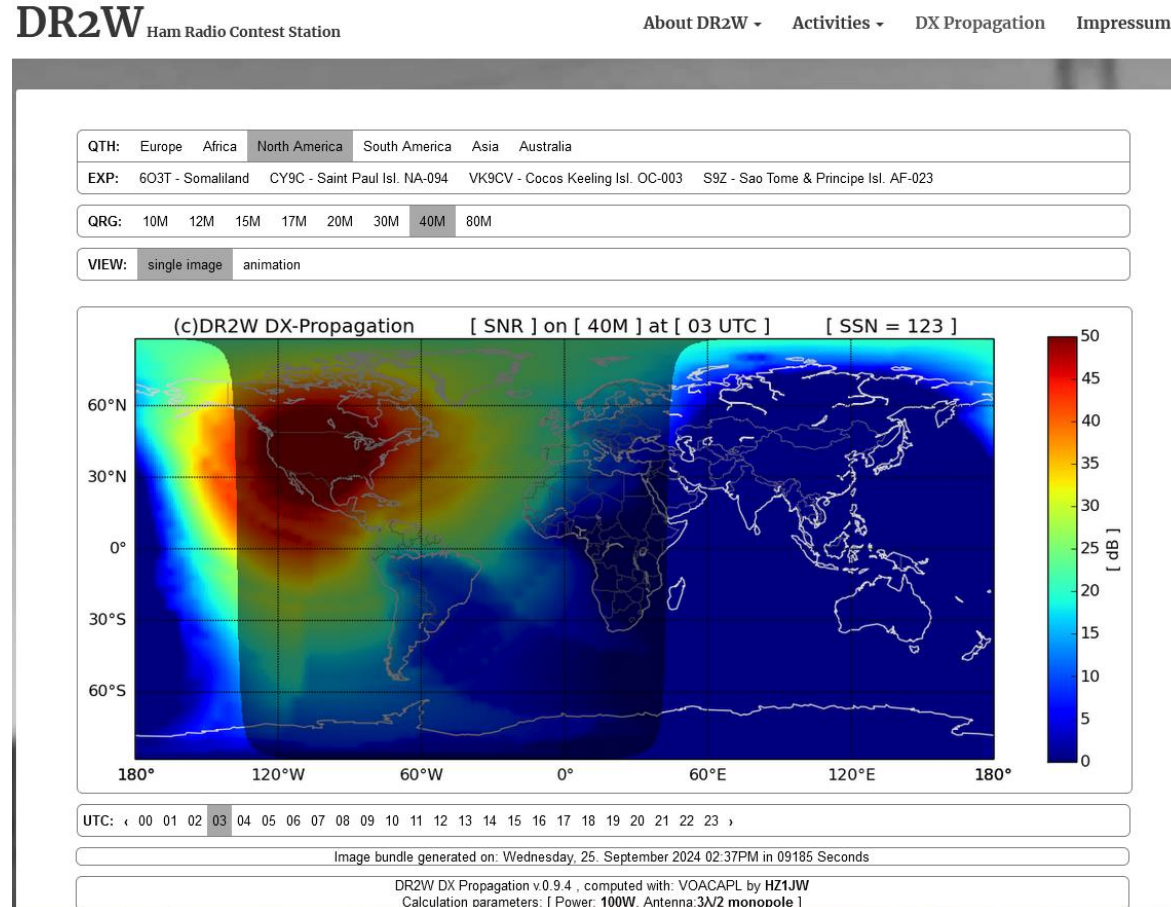
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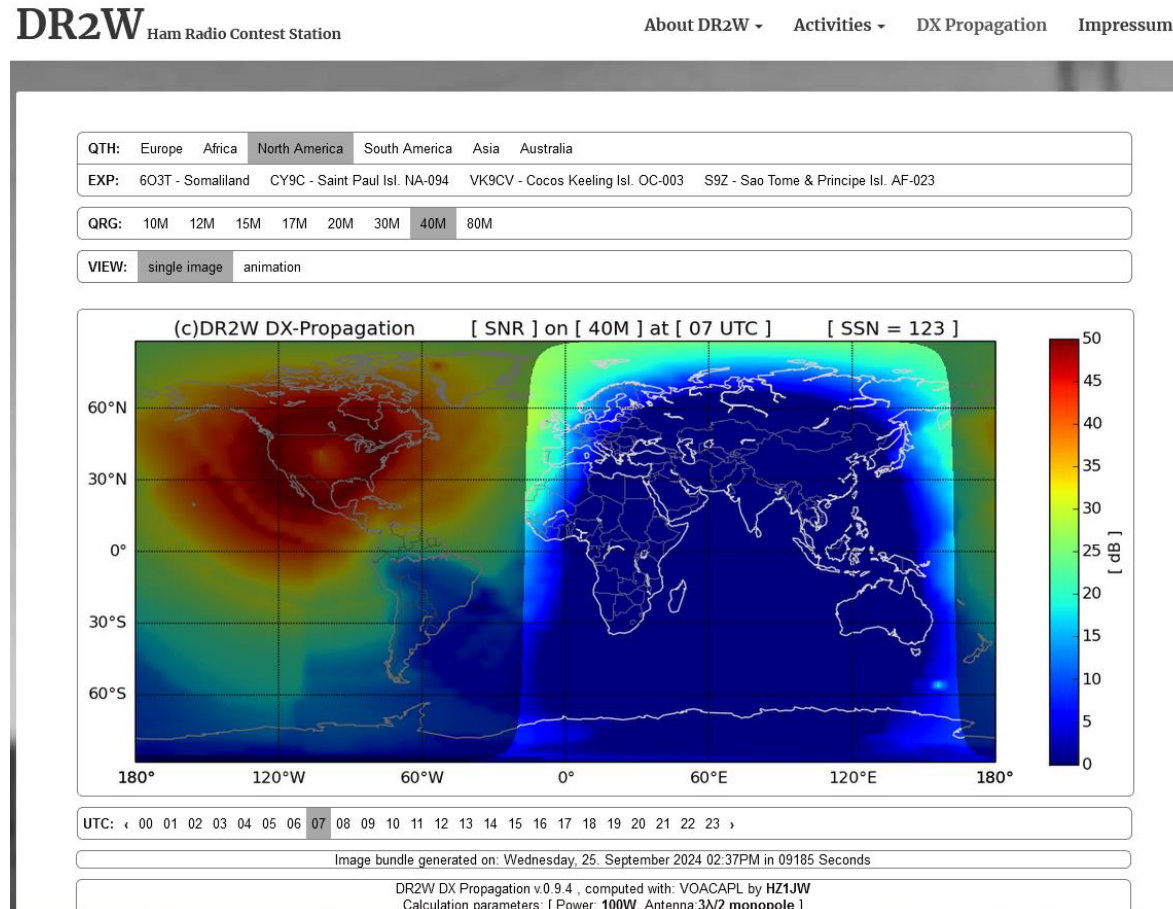
40M, 6pm – coverage extending at sunset and gray-line.



40M, 10pm – coverage greatly expanded and will have SA and Europe/Africa propagation possible.



40M, 2am – Europe is declining, stations in Pacific Ocean are still good.



Propagation summary.

- Every ham band will have propagation changes during the day and night.
- The sunspot cycle and geomagnetic effects will change propagation.
- Gray-line is a real event that happens every day. DX stations will come out of the noise quickly then be strong for a period and then fade away very quickly as the layers of the atmosphere change due to the sun's radiation.