Propagation in the Sea of Cortez

05NOV2013

The Australian Government has set up transmitters around the world to measure reflected waves from the ionosphere each hour. The measurements are combined with other factors into a computer model to determine what the last hour's propagation actually was. http://www.ips.gov.au/HF_Systems/6/6/1

Since this is a web site that is available to everyone except most cruisers on the hook, I monitor and summarized the information onto one graphic chart. The chart shows how for a given area, the Sea of Cortez, the sky wave propagation will change significantly. When you transmit with HF SSB, there are three components.

1. Direct wave: Similar to VHF line of sight from one antenna to another.
2. Ground Wave: Follows over the surface of the earth for up to 150 miles at the lower frequencies.
3. Sky wave: The signal that bounces off the ionosphere and returns to earth. Where the signal lands is dependent on several factors, one being time of day (Sun's rays changing the ionosphere.)

Our morning and evening nets in the Sea of Cortez operate in the 4 and 6 MHz range. While these frequencies have a good ground wave component throughout the Sea of Cortez, it appears the sky wave component is marginal which in effect may be shortening the potential coverage of the net. Clearly the Southbound net was probably had better coverage of the Sea of Cortez on the old 8 MHz frequency.

The graph below represents the primary and secondary frequencies from IPS on an hourly basis using Zulu time on the x axis (across) and frequency on the y axis (up). Note there were periods during the daylight hours that no usable sky waves are present. The times for unusable sky waves changed each day and could have been a model issue.

Disclaimer: While this is what the model shows, in HF radio there are so many factors involved that other frequencies may work fine and these frequencies may not work for your location. The model provides the best scientific guess possible. These frequencies will also very with the seasons so I will update this graph in December.