# Observations of Seismic "Whistlers" & Hums in USArray

Young, B.A.[1]

[1] CERI/University of Memphis

Unusual seismic signals in several Transportable Array (TA) stations in the Central US are observed: seismic "whistlers" and long-period harmonic hums. The observed whistlers bear a superficial resemblance to downward-sweeping VLF electromagnetic waves spawned by lightning called "whistlers." Although not likely related to their electromagnetic cousins, these "seismic whistlers" are primarily seen in two distinct categories: low frequency and high frequency. Low frequency seismic whistlers are typically seen from 3 to 7 Hz over a period of about five minutes and show a multi-harmonic downsweeping signal followed 12 to 15 minutes thereafter by an upsweeping signal with similar harmonics. These coincide with long periods (tens of minutes to over an hour) of continuous low-frequency signal with multiple harmonics. The continuity of this signal over time is suggestive of a nearby man-made source. High frequency seismic whistlers are rarer, however, and they are typically observed in a frequency band from 20 to 15 Hz over a time period of one or two minutes. Like electromagnetic whistlers, these consist of a single downsweeping harmonic. Though the source of these signals is unknown, we attempt to determine when and where these signals are observed in the seismic data and, where available, barometric and infrasound data. Observed harmonic hums come in three varietes: low-frequency (where they often coincide with low-frequency whistlers), high-frequency, and full-sprectrum. The origin of these signals remains enigmatic. Audio renditions of the data were used to help identify seismic whistlers and will be available via a YouTube link on the poster.
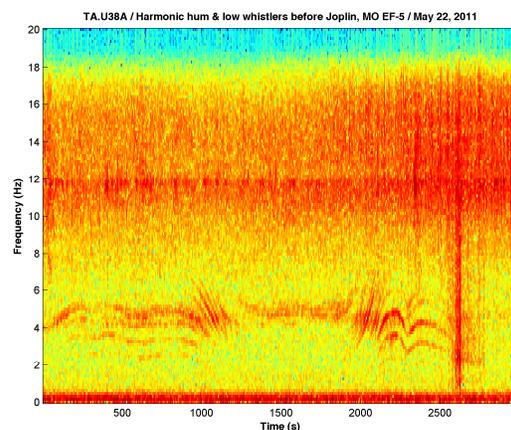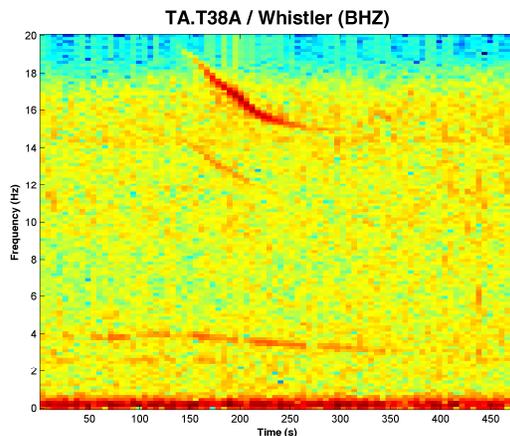


Opportunities for E&O include showing that there are still "Wow!" signals out there in science—a lot of scientific work is difficult and mundane, but there are still weird things to look at, mysteries to unravel, and the passion for discovery lives on.