

## **Well Music: Translating Well Data to Music for a New Perspective**

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### **Abstract**

Oil and gas wells are time machines. As they drill, they uncover the history of planet Earth at a given locale, much as tree rings record the history a tree experiences. These wells record millions of years, and now we can artistically express their experience; the lives, the deaths, the droughts, and the floods that the instruments and fossils reveal.

Almost 100 years ago the Schlumberger brothers kicked off well logging by creating long linear graphs of electrical resistivity. Gamma ray, density, spontaneous potential, and more were added through time and used to compare measurements and stratigraphy from one well to another.

While traditional well logs use a visual approach, Leonardo da Vinci, in 1490, used a tube inserted into the water to detect ships by ear. During World War I, the need to detect submarines prompted more research into the use of sound, with an operational passive sonar system in use by 1918.

Well data and musical data as seen in MIDI displays look very similar. How about translating well data into music? What new insights might we gain from well data by experimenting with auditory perception?

This talk explores techniques and results of using log and paleo data to generate music from wells in southern Louisiana and offshore Texas.

The approach is called sonification; the use of non-speech audio to represent information.

In the southern Louisiana recordings, the SP curve plays Bass, the Sonic curve is on Flute, and the Density curve plays Clarinet. A percussive beat sounds every ten feet, with special beats marking fifties, hundreds, and thousands of feet. The musical texture has a jazz quality to it and varies dramatically from the sandy deltaic intervals to the distal shaly section.

The paleo data from offshore Texas results in music that is haunting. Each of the species plays a pitch track and a rhythm track where the faster rhythm equals higher counts for that species. The first time that counts are heard for a given species is the last time it lived at that location.

The sonification approach may also be useful for interpretive purposes, comparing the same intervals across many wells in a field, for example, or for monitoring while drilling.

This novel approach provides a totally different way to experience well data that will leave you in awe of the planet we live on and the secrets that oil and gas wells reveal.

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