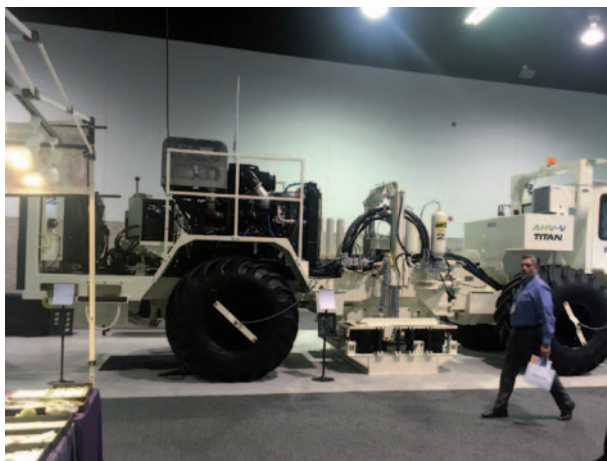


Environmental geophysics



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Exhibition Hall 2018 SEG conference, Anaheim, California.

Reflections on the 2018 SEG conference

Welcome readers to this issue's column on geophysics applied to the environment. In October I had the pleasure of attending the 2018 SEG conference in Anaheim, California. I attended to report on a Geoscientists without Borders grant that some colleagues at Flinders University and I received for work in Laos on the use of geophysics to help characterise the depth to groundwater in the Vientiane Basin (more on that in a future column). I have been pretty involved with ASEG conferences over the years, as many of you know, but this was my first SEG conference. I enjoyed attending if for no other reason than to compare how the SEG do conferences to how we do them.

So, the most obvious difference is ... scale, the SEG conference is quite a bit bigger than an ASEG conference (that might change now that we are holding our combined AEGC conferences) – but this one was apparently only about two-thirds the size of any SEG conference held in Texas (home to so many of the big energy companies – see accompanying photo for the obligatory shot of a large device used to shake the Earth).

As with ours, the Ice Breaker was on Sunday (one free drink only, hmmm), but talks didn't start until midday Monday and then finished at midday on Thursday – so the same three days of conference that we run, just in a slightly different format. By my count there were something like 768 talks presented over those three days in 16 parallel streams, with a morning set of talks and an

afternoon set of talks, each just over three hours long. The good thing about this, is it left from about 11.45 am to 1.50 pm for lunch. Interestingly, the conference did not supply lunch (although some of the exhibitors did – I guess in the interest of keeping people in the venue). Being Southern California there was also an excellent Mexican restaurant within walking distance – so between exhibitors' lunches and good Mexican food the situation was more than acceptable. As far as I could make out, there were something like 96 sessions over the three days, and only two were dedicated to mineral exploration. Another session was about geophysicists in the workforce; one was about geophysics applied to medical imaging (unfortunately I couldn't go to this as it clashed with another session I wanted to go to at the same time – how does that always happen?). Eight more sessions were dedicated to engineering/near surface/hydrogeophysics. The rest (~84) were more or less dedicated to energy/petroleum.

So what were some of the interesting trends to note in the world of near surface / environmental geophysics? I am happy to see that fewer 'sounding based' resistivity surveys are being done in the developing world. I'm talking about those surveys where limited numbers of Schlumberger/Wenner array soundings (VES) are made over an area to characterise the hydrogeological setting; these surveys certainly have their place, but I think that they are too slow and therefore can't offer the data density that is needed to really characterise an area. I was pleased to see that more multichannel dipole-dipole etc. type resistivity arrays (often called 'tomographic surveys' or ERT) are being done in these settings. To

me, these efficiently provide much more information to depth over much large lateral areas than the individual sounding data. I suspect that this trend reflects that the results from multichannel systems are getting more exposure and, maybe, that system prices are coming down.

Other interesting talks included one by Esben Auken on a towed time domain EM system that his group at Aarhus University are developing (similar to, but a definite improvement on similar work that I have been involved in here in Australia). Burk Minsley of the USGS talked about how large scale geophysical surveys (think especially AEM) 'can inform key scientific and societal studies' as they are covering larger and larger areas with sufficient detail to really improve our understanding of the hydrogeology at both large and small scales. He stressed the importance of establishing uncertainty in these data sets and that this is carried through to the various 'products' that are derived from the base data sets. He showed data from an ongoing survey on the Mississippi Alluvial Plain (MAP) project <https://www2.usgs.gov/water/lowermississippigulf/map/>. This project will ultimately cover a huge swath of the central US (see map in link above for an idea of what's involved) with geophysical data including AEM, ground TEM, towed resistivity, and NMR data sets (this is just a partial list of the data sets being collected – including huge quantities of other hydrogeological information).

Overall, it was a very good meeting, with a nearly overwhelming number of talks to sift through – as I look through the program now I am actually disappointed in the number of talks that I missed. I guess I'll just have to read the papers...