



Known Knowns, Known Unknowns and Unknown Unknowns in Land Exploration Seismology

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Famously, United States Secretary of Defense Donald Rumsfeld in February 2002 made the following statement in response to the lack of evidence linking the government of Iraq with weapons of mass destruction: "...as we know, there are known knowns; there are things that we know that we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns, the ones we don't know we don't know."

We geophysicists and geologists are generally not eager to compare ourselves with politicians. We are, after all, scientists who come to an understanding of nature from evidence of what is true rather from what we want to be true. But in this case Rumsfeld's efforts to infer definite conclusions about the existence of weapons of mass destruction from a mass of evidence that was largely inaccurate, insufficient and inconsistent shares an uncanny similarity to the job that geophysicists do when processing and interpreting seismic exploration data, especially in land scenarios where seismograms typically contain more noise than signal. In both the political and geophysical situations, definite conclusions need to be made despite the lack of hard and fast evidence. Furthermore, in both cases the lack of definitive evidence is no reason for not clinging strongly to belief in the truth of the conclusions.

Using examples from land exploration seismology I will attempt to explain how simple concepts can provide surprising challenges to how we think and test our integrity as scientists. The concepts are general enough to be of interest of any geoscientist, regardless of her background.

All are welcome.

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11:15 -12:05

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