

Statistical Aspects of Exploration Risk

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Abstract

In this expository talk I will describe several statistical and probabilistic aspects of the risks encountered in exploration of natural resources such as oil and gas. I will discuss matters pertaining to the distribution of deposit size (is it a lognormal, a Weibull, a Pareto, or something else?), inferential considerations based on expert testimonies of geologists and wildcatters, encountered distributions, economic filtering and related such matters. This topic has attracted the attention of the likes of Kolmogorov, Epstein, Halmos, and more recently Barndorff-Nielson. Bayesian thinking and ideas will be introduced as appropriate. I do not profess to offer any solutions; my aim is to introduce this topic as a possible source of problems to reliabilists, risk analysts, probabilists, and statisticians. My choice of this topic is in recognition of the venue of MMR 2009, Gubkin Russian State Oil and Gas University.