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Creaming and the likelihood of discovering additional giant petroleum fields

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This paper considers sampling in proportion to size from a partly unknown distribution. The applied context is the exploration for undiscovered resources, like oil accumulations in different deposits, where the most promising deposits are likely to be drilled first, based on some geologic size indicators (“creaming”). A lognormal size distribution turns out to have nice analytical features in this context, and fits well available data. The theoretical and practical consequences for the accumulation of knowledge on the underlying distribution based on this scheme, named lognormal creaming, are explored in some detail. The theory is applied for the prediction of remaining sizes of oil accumulations to be found on the Norwegian Continental Shelf with the aim to obtain reasonable predictions of remaining resources and not to provide the best possible explanation of the exploratory behavior itself.

