

# Book explains how data analysis can aid in oil, gas exploration

September 10 2014

---

A massive amount of drilling data is archived at the Kansas Geological Survey on KU's west campus and at other institutions around the world. In a new book published by the Oxford University Press, KGS Senior Scientific Fellow John Doveton shows how data obtained from wells can be analyzed in innovative ways to help streamline oil and gas exploration and better understand subsurface geology.

In "Principles of Mathematical Petrophysics," Doveton demonstrates ways to identify properties of oil- and [gas](#)-bearing [rock](#) layers by using mathematical formulas and geologic models to interpret well-logging data acquired over decades, mainly by companies drilling for oil and [natural gas](#).

Petrophysics is the study of the physical and chemical properties of rocks that contain pores filled with oil, natural gas, water and other fluids.

Following drilling, various measurements of those properties may be made using logging tools pulled up through the well. Sensors detect different characteristics of the subsurface rock formations encountered, including rock density and electrical resistivity, which are recorded on graphic logs.

The KGS stores the thousands of logs submitted by law to the Kansas Corporation Commission. Two years after a log is received, the KCC releases it to the KGS, where it is made available to the public.

"Analyzing logs from nearby existing wells before drilling a new well can make oil and [gas exploration](#) more efficient and less costly," Doveton said.

In the book, he offers a variety of case studies and applications, many of them using data acquired in Kansas, to illustrate how archived logs can be better utilized when [drilling](#) new wells as well as when studying subsurface geology.

"Geologists often just look at logs to find tops and bottoms of formations —where the rock units containing oil or natural gas begin and end," Doveton said. "In this book I review how mathematical applications and modeling can be used to determine not just where [oil](#) and gas is likely to be found but whether the characteristics of the source rock make it economically viable to produce."

"Principles of Mathematical Petrophysics" includes mathematical and modeling methods that can be applied to water and environmental as well as energy issues anywhere in the world. Because a number of examples in the book are based on Kansas data, it is also a unique resource for anyone investigating the state's subsurface geology.

**More information:** [www.kgs.ku.edu/PRS/Info/pdf/oilgas\\_log.html](http://www.kgs.ku.edu/PRS/Info/pdf/oilgas_log.html)

Provided by University of Kansas

Citation: Book explains how data analysis can aid in oil, gas exploration (2014, September 10) retrieved 21 June 2024 from <https://phys.org/news/2014-09-analysis-aid-oil-gas-exploration.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is

provided for information purposes only.