The Lucia Method of Carbonate Reservoir Characterization

A One-Day Short Course by David M. Orchard

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Methods developed by Floyd J. (Jerry) Lucia provide a direct link between rock fabrics and the petrophysical behavior of carbonate reservoir rocks. They are based on core, petrographic and log-based approaches to modeling depositional and diagenetic facies, porosity, permeability, and water saturation versus reservoir height functions in oil reservoirs. They effectively deal with the infamous complexity of carbonate rock properties, and they are applicable to both "quick look" evaluations and detailed reservoir models. They have been widely applied to reservoir studies in the Permian Basin and other carbonate systems.

This one-day course will use lectures and spreadsheet exercises to train attendees in the theory and application of the methods. Mr. Lucia has provided his lecture and exercise materials for use in this seminar, and new case studies will be introduced by the instructor.

David Orchard graduated from Stanford University with a degree in Anthropology, studied undergraduate geology at San Diego State, and received a Master of Arts in Geology from the University of Texas. He began his career in the Houston and Denver offices of Energy Reserves Group and BHP Petroleum (Americas), Inc., as an exploration geologist, exploration manager, and international new ventures project manager. He also worked for several years as a development and operations geologist on conventional clastic and carbonate reservoirs in the Permian Basin for ConocoPhillips. He is currently on contract with Layline Energy, LLC, with responsibilities for geological evaluations of the Company's assets in north and east Texas and the Michigan Basin. In other ventures, he founded and managed a foundation supporting scientifically significant paleontological projects in Venezuela. Mr. Orchard began teaching the Lucia methods upon Jerry's retirement from the lecture circuit.

Lecture 1: Lucia Methods in Historical Context
Lecture 2: Petrophysical Rock Properties of Carbonate Reservoirs
Lecture 3: Data Considerations
Lecture 4: Rock Fabrics and Petrophysical Classes
Lecture 5: Gypsum- and Anhydrite-bearing Reservoirs
Lecture 6: Accounting for Separate-Vug Porosity
Lecture 7: Accounting for Touching Vug Porosity
Lecture 8: Microporous Reservoirs
Lecture 9: Lawyer Canyon (Guadalupe Mtns) Heterogeneity Study
Lecture 10: Rock Fabrics and Model Building