



Mineralogical and Textural Mapping for Oil/Gas Core: Next Generation Hyperspectral Core Imaging

Date: Wednesday, 28th February 2018

Time: 3:00 pm to 4:30 pm

Registration: Please register online at <https://fesaus.org/>

Numbers are limited, book early to avoid disappointment!

Use Internet Explorer to register, other browsers often don't work. After registration, you should see a "Thank You for Registering" message and receive a confirmation email (could take several minutes).

Place: Department of Natural Resources, Mines, and Energy
1 William Street
Brisbane, QLD 4000

Cost: **FESQ Members and Student Members free**

Presented by: **Brigette A. Martini, Phd**
Chief Geologist, Corescan, Perth, WA

Abstract:

Hyperspectral core imaging reveals continuous, high resolution mineralogical content and textural characteristics of oil/gas core not previously possible. While hyperspectral imaging (or imaging spectroscopy) has existed in its' current incarnation for some 30 plus years, recent advances in optic and detector design as well as increases in sheer computing power/speed and data storage have ushered in a new generation of rock characterisation. Typically focused on mining applications, the advent of hyperspectral into the oil and gas sector has dominantly been spotty and uneven; a state not consistent with the opportunities afforded by continuous mineralogical characterization and quantification. This work demonstrates a broad survey of hyperspectral capability for identification, speciation, and quantification of both typical oil/gas mineralogy of concern (i.e. clays, carbonates and silicates) as well as species or compositional information (e.g. degree of ammoniation, identification of amorphous silica, and mica, clay and carbonate species) not previously extracted at such fine surface spatial scales and extensive, continuous well-scales. Furthermore, direct detection of hydrocarbons are presented (including the future challenges of better type identifications for carbon-based species). Secondary proxy, derivation and synthesis with other macro and micro analytical analyses will be highlighted including simple synthesis with standard geochemical suites and thin section work up into finer detailed analyses such as Qemscan. Fine and macro-scale textures (including lithological discrimination and quantification such as carbonate grain size calculations) are emphasized; an ability only hyperspectral imaging is capable of at such continuous scales. More complex proxy studies such as relative frackability and net-to-gross calculations are also shown. On-going studies from both North and South American tight shale fields are presented including studies of plays in the Vaca Muerta of Argentina and the Bakken and Eagleford of the United States. More conventional plays are also discussed. Ultimately, this work serves to present what's broadly possible using hyperspectral imaging for oil/gas applications and to stimulate further research and development of characterization/mapping processes, variable extraction and potential implementations.

About the presenter: Dr. Brigette A. Martini



Dr. Martini is currently Chief Geologist for Corescan, a hyperspectral core imaging company and service provider out of Perth, Australia. She received her BS in Geology from the University of Arizona and PhD in Earth Science from the University of California – Santa Cruz with emphasis on the use of airborne hyperspectral imaging for resource assessment in volcanic systems. In the past twenty years, she has primarily worked in the resource sector including geothermal, mining and petroleum as well as an academic and subject matter expert in hyperspectral and radar systems for the US Air Force, Army and Navy.

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