



CSPG Short Education Course

Core Workshop

Methodology for Describing Carbonate and Clastic Cores

Date: June 28 and 29, 2022 | from 8:30am – 4:00pm (MST)

Location: (CRC) Core Research Centre, 3545 Research Way N.W., Calgary

Instructors: Eva Drivet (Drivet Geological Consulting Ltd.)

Brian Zaitlin (Zaitlin Geoconsulting Ltd.)

David Hills (Farrell Hills Consulting)

Course Fee:

CSPG Members: \$1,700 + GST

CSPG Non-Members: \$1,900 + GST

(Lunch and morning/afternoon snacks will be provided)

Prerequisites:

An introductory knowledge of clastic and carbonate facies and depositional environments, in addition to basic log interpretation skills, are required. Participants are encouraged to review a “20 min pre-course video on how to describe cores”. Link to the video will be sent a few days before the course starts.

Materials Needed:

Hand lens, grain size chart, colored pencils, straight edge, tape measure and graph paper. Course handbook, core description templates and all relevant supportive material (classification charts, logs, core analyses, etc....) will be provided by instructors.

Content:

This two-day workshop will give entry and junior-level geologists, as well as more senior geologists who may need a refresher, the practical, hands-on experience for examining and graphically logging carbonate and clastic core. Each carbonate and clastic section will consist of a half day demonstration and overview from the instructors, followed by a half day spent describing and graphically logging cores. Methods to record contacts, key surfaces, lithologies, sedimentary structures, fossils/trace fossils (as applicable), sampling protocols, tying core to petrophysics and core analysis, and hydrocarbon staining will be introduced. Several methods to ensure the cores are in the right order, how to address missing intervals (such as rubble zones), and calibration core to logs will be taught. Methodology for taking samples for thin section, routine and special core



analyses (e.g. capillary pressure) will be reviewed. Described core will be tied to petrophysical logs and core analysis. Some cored intervals will have thin section petrography to supplement the descriptions. Preliminary facies interpretations will be encouraged. This part of the course is designed to give participants individual mentoring so they can gain practical experience and confidence in all aspects of getting a core description onto paper. Students will also be taught techniques on how to transfer information from core description such as, type of facies, porosity, fracture, diagenesis etc. into the digital realm for use in a geomodelling package.

Day 1 will focus on carbonate cores. Participants will have the option to work on Devonian reef and bank interior facies from Alberta, or chose core examples from ramp depositional systems. This will include dolostone and limestone cores:

- The Swan Hills Formations at Jura Creek and Simonette
- Leduc Formation along the Rimbey trend and at Golden Spike
- Full Winterburn section in Pembina, from Lobstick to the Blueridge Member, basin to shelf transition, with a Zeta Reef
- Nisku core from Fenn (example of dedolomitization and karsted surface)
- Mississippian in the Williston basin (Frobisher/Saskatchewan and Alida/Manitoba)
- Mississippian from Alberta (Pekisko/Shunda)

Day 2 will shift to clastic cores. There will be an opportunity to describe various depositional systems, including incised valley, fluvial, tidal fluvial and estuarine, shoreface and shelf using examples from the Mississippian-Devonian Wabamum – Exshaw -Banff (WEB), , Jurassic – L Cretaceous Rock Creek, Niton, Fernie Basal Quartz Ostracod, and Spirit River (Falher).

The course will wrap up with a discussion led by David Hills, on essential points to consider when describing cores for reservoir modelling, with tools and a workflow. Participants will receive mentoring on how to describe cores from three industry geologists with combined 70 years experience logging many feet of cores (!!)



Biographies

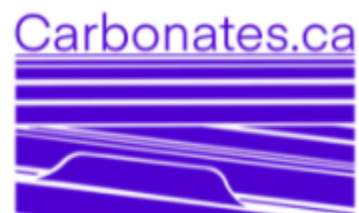
Eva Drivet, Drivet Geological Consulting Ltd. (M.Sc., P.Geol.) www.carbonates.ca



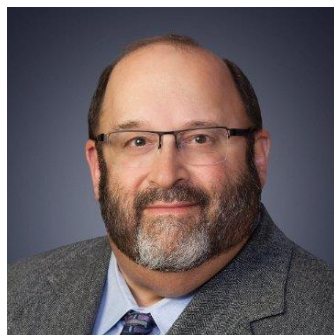
Eva started her career in the petroleum industry in 1995 at Shell Canada, after graduating from a M.Sc. on the Devonian Leduc carbonates from Alberta, under the supervision of Dr. Mountjoy (McGill University). She has offered her carbonate expertise to the petroleum industry for the past 25 years, working on exploration and development projects for major to intermediate sized petroleum companies. In 2008, she founded Drivet Geological Consulting Ltd., offering her services as an independent consultant, generating opportunities within carbonate

reservoirs and mentoring staffs for various companies operating in British Columbia, Alberta, Williston Basin and South America. Her portfolio includes green energy projects. Eva has published several papers on the topic of carbonate sedimentology and diagenesis, and conducts industry Carbonate Core Workshops since 2011. Since November 2020, Eva and David have joined efforts to offer industry carbonate core workshops and a virtual library of core displays and lectures showcased at

www.carbonates.ca Eva is a registered Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA), an active member of the Canadian Society of Petroleum Geologists (CSPG), the Society for Sedimentary Geology (SEPM) and the American Association of Petroleum Geologists (AAPG).



Brian Zaitlin (Ph.D., P. Geol., C.P.G.):



Zaitlin Geoconsulting Ltd. (ZGL) was established in 2014 to provide geological consulting services and applied training seminars to the petroleum industry. ZGL specializes in proprietary/exclusive regional exploration evaluation, prospect generation, basin analysis, production/reservoir geology, pool studies, reservoir characterization, acquisition & divestiture evaluations, and geological training, focusing on clastic reservoirs and depositional systems.

Brian A. Zaitlin is currently President and Founder of Zaitlin Geoconsulting Ltd. Brian has ~40 years of front-line exploration/exploitation, R&D and A&D experience, and has progressively worked as a Geologist, Explorationist, Technical Specialist, Technical and Exploration Advisor and Chief Geologist with a variety of E&P companies (e.g. Gulf, Esso,



PanCanadian, Encana, Suncor, Enerplus Resources Fund, and EOG Resources) and in Corporate Banking/Private Equity with the BMO A&D Advisory Group and Native American Resource Partners.

Brian's focus is on both conventional and unconventional new play development throughout the Western Canada Sedimentary Basin, Rocky Mountain Basins, Appalachia, and various international basins. His research interests lie in the understanding of siliciclastic fluvial, coastal, and shallow-marine depositional systems and their preserved stratigraphy, and in applying this knowledge to reservoir characterization and modeling. He is the author of more than 100 peer-reviewed technical papers and authored and co-authored oral presentations and is the recipient of numerous awards including the CSUR Sproule Innovation and Achievement Award, CSPG Medal of Merit for best published paper, CSPG Tracks Award for Education, CSPG Ph.D. Thesis award, co-authored AAPG, SEPM and CSPG Best Paper/Oral Paper Awards, and was an AAPG Distinguished Lecturer.



Brian holds a B.Sc. (Geology) from Concordia (Loyola) University (1979), a M.Sc. (Geology) from University of Ottawa (1981), and a Ph.D. (Geology) from Queen's (Kingston) University (1987). Brian is a registered Professional Geologist (APEGA), Certified Petroleum Geologist (AAPG-DPA) and a member of the AAPG, CSPG, CSUR, RMAG and SEPM.

David Hills, Farrell Hills Consulting (M.Sc., P.Geol.) www.carbonates.ca



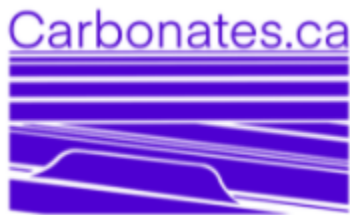
David has an increasingly alarming 23 years of geological experience in the Canadian oil patch, which amazingly, nearly all of which have focused on carbonate rocks. David completed his B.Sc. in Geology and Oceanography from the University of Southampton in 1993 and then moved to the University of Alberta to study carbonates under Dr. Brian Jones, where he became a leading light in the study of algal coatings on rocky debris, in

lagoons, in the Pleistocene. Shedding the chains of academia, David changed his name to Dave and moved south to make his fortune in Calgary, where, after a brief stint as a 'geological intern and dog walker', he made his mark as a writer for Canadian Discovery. There he has written and illustrated over 80 articles, detailing new exploration across the entire WCSB. Dave then moved onto the true patch oil job with Devon Energy, spending ten years as an area geologist, working the carbonate fields of



the Debolt at Dunvegan and Slave Point at Swan Hills, before eventually scaling the lofty heights of technical adroitness to become Devon Canada's 'Carbonate Specialist' - just in time to be divested to CNRL.

David has recently wrapped up a stint of eight years in the role of Senior Geoscientist for Enhance Energy Inc. where he has helped implement the development of Carbon Capture, Utilization and Sequestration programs in Central Alberta. In addition to his role as geoscientist and reservoir modeller, he has had a lead role in developing and writing Enhance's Monitoring, Measurement and Verification (MMV) Plan.



David is also an occasional graphic artist and photographer, creating a body of geological illustrations over the years for Canadian Discovery including cover designs for the Canadian Discovery Digest, and more recently, illustrations for actl.ca and enhanceenergy.com websites. To view his galleries, go to www.farrellhills.com.

He is putting these latent skills to better use as 'Graphics Lead' and 'Marketing Lead' for the new, CSPG led megaproject; Atlas 2027 www.atlas2027.ca. He is also co-chair for the 2022 Mountjoy Conference, not that anyone is counting. David is co-founder of www.carbonates.ca with Eva Drivet, a local place for all of your carbonate needs.

In the interest of balance, David is quite bad at math and remembering where he put his keys. Also, never be alone with him if there is a karaoke machine in reach.

David Hills is a registered Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA). He is an increasingly active member of the Canadian Society of Petroleum Geologists (CSPG), is a fairly inactive member of the American Association of Petroleum Geologists (AAPG).