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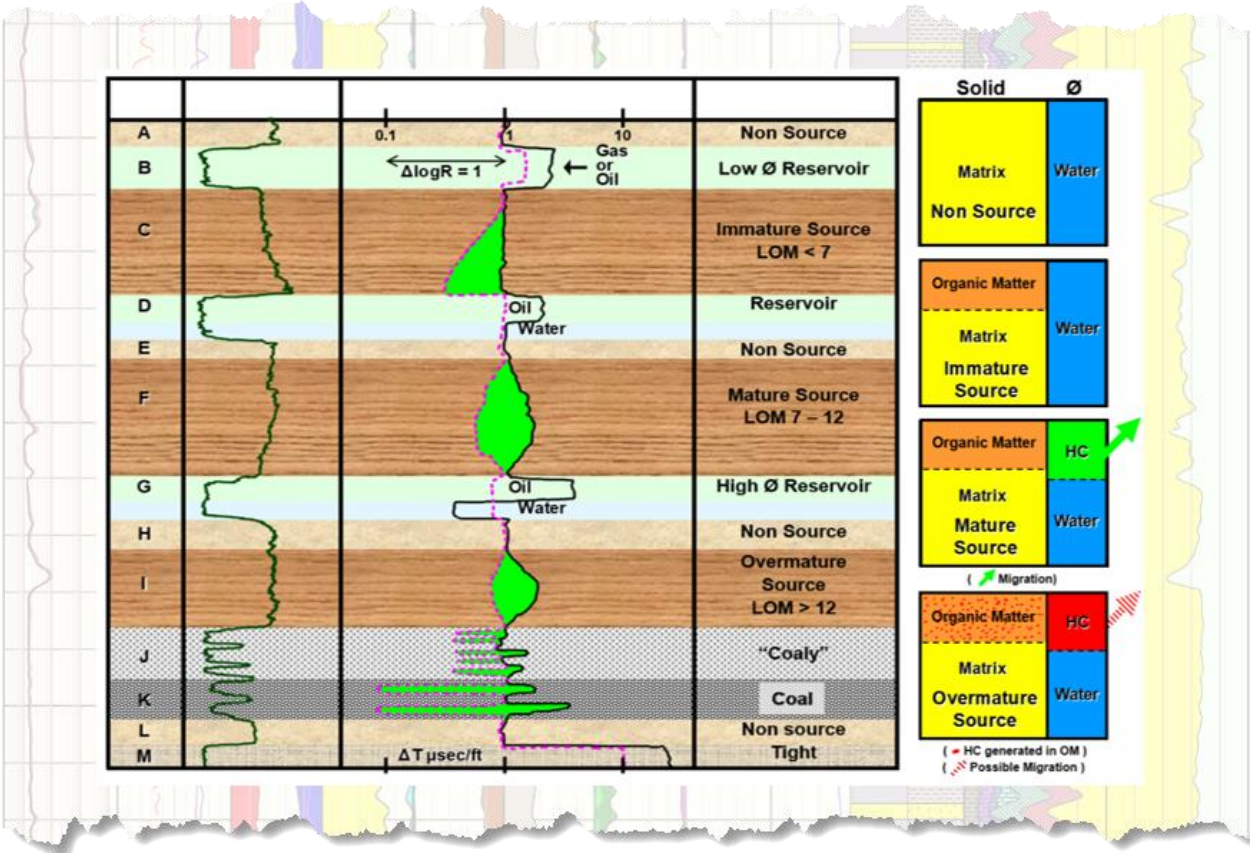
SPWLA TODAY

NEWSLETTER



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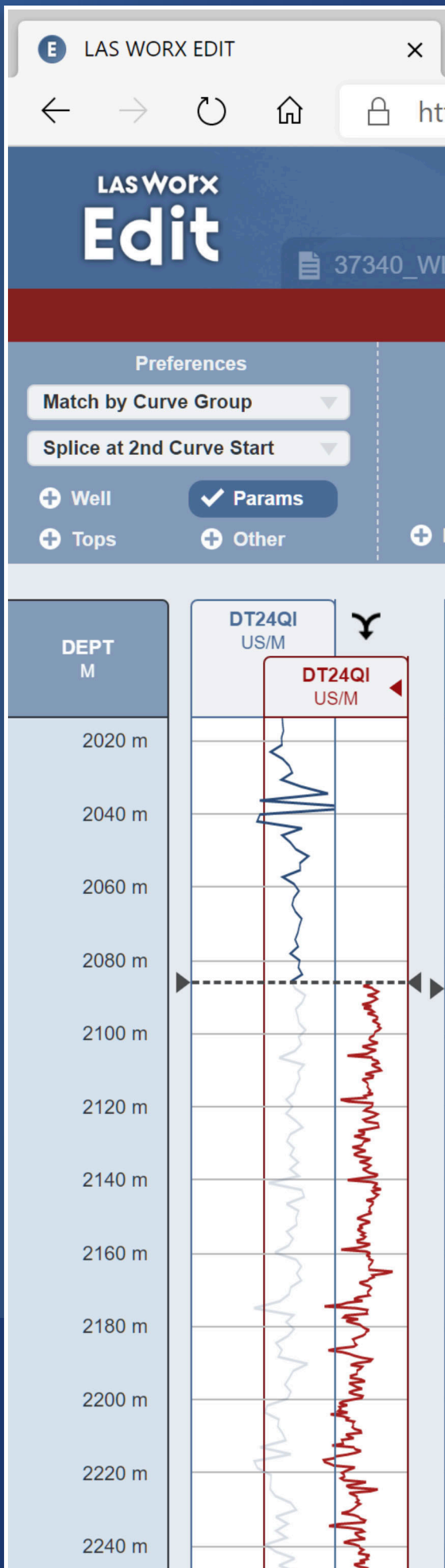

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SPWLA 62nd Annual Symposium 2020

Call for Abstracts closes on November 1

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About the Cover

Quinn Passey offers a tutorial on one of the most well-known contribution to formation evaluation: the ▲logR Source Rock Evaluation Method. Quinn tells us, in his own words, about the story of the ▲logR method and walks us through a step-by-step tutorial to apply this famous workflow.

From the Editor

This is the last *SPWLA Today* issue for the year. The year 2020 has been rough for lots of reasons, but especially because we're battling a worldwide pandemic that has caused a lot of fear, uncertainty, and disruption to our normal routines. Most of us want to do things to make ourselves feel better. The problem is that we choose to do the wrong stuff. I'm guilty of doing this firsthand as your VP-Publications. When times get tough, we think we should just eat something unhealthy, or go inward and avoid people, or just plop down and watch television. But—as you know—there are better, more evidence-based ways to cope!

If 2020 has taught us anything so far, it has taught us that wellness matters. Mental wellness, emotional wellness, and yes...physical wellness. They all matter! Studies reveal a correlation between stress and immunological consequences. Unless stress is managed, it starts to pervade immune function and all aspects of life. My employer is going through a yearlong functional transformation were all staff apply for their jobs through multiple selection events and it that is causing employees (including me) to feel quite stressed and vulnerable. Layoffs impact not only the employee, but entire extended families, often causing huge hardships. It's hard to foresee a lifelong career in the oil industry given the commodity price swings and myopic corporate response to that.

Life is a state of constant change. Some changes are profound and may seem overwhelming, like losing your job or ending a relationship. Others are as simple as driving home a new way. Although there is no magic that can change the conditions on the ground, it's important to take control of change and transition. Focus on areas where you can have some impact and see results, and you may start to regain a sense of being in control/charge. Accept that there are some things outside of your ability to control. By letting go of those, you can begin the process of moving forward.

- Think about the possible opportunities or scenarios you may be in.
- Write down the things you can control, somewhat control, or can't control in the appropriate columns.

- Focus on those changes you can control or somewhat control. Identify ways to keep you centered on those areas. Let go of the things you can't control.

I can control	I can control somewhat	I can't control

This worksheet has been adapted from the following source: Government of Alberta. Change and Transitions The Path from A to B…, 2002.

Personally, I have started to focus more on family, friends, and exercise (biking, yoga, and hiking), and I can feel the change in my wellness—emotionally, physically, and mentally. In the oil industry, we owe congrats to anyone who is still gainfully employed. If you remain in the fight, reach out and grab the hand of a fallen comrade. Lift them up, encourage them, and most of all, send up a prayer for them and their families. Together, we shall overcome some day.

Best Regards,
Mayank Malik
SPWLA VP-Publications 2020–2022
VP-Publications@spwla.org

From the President

By now, everyone should have received the notice that we will not be able to hold an in-person symposium in Boston as we had hoped. We were in a position where we needed to make some decisions and, more importantly, sign contracts obligating us to commit to the Boston location. Travel bans due to COVID-19 and more travel bans due to low-oil prices left us facing too many unknowns to make a commitment to a rather expensive location at this time. As the announcement said, the symposium will go on as planned, based on a digital online platform.

The pandemic and its effect on our industry continue to be felt by everyone. Monitoring other oilfield-related professional societies, we see that there are no in-person gatherings planned so we are all in the same boat so to speak. As I type this, I see on the news that our governor is issuing new rules limiting the number allowed to gather and strengthening the rules regarding masks. I'm not qualified to speculate on the future and even those who are can't seem to agree. Let's hope for a return to normal as quickly as possible. I say that as if there was ever a "normal" in the oil field.

When I started in the oil industry over 40 years ago, I, like all the other new people, attended many seminars and schools to educate us about what to expect. And in nearly every seminar, there were numerous predictions about the future and what we should prepare for, at least from a business standpoint. You would think that with the closet full of oilfield collectibles that I have amassed that I would have saved many of those forecasts and predictions, at least for my amusement, but more importantly as a way of remembering the past and learning from it. But all I have is memories about how are we going to hire all the people we will need in the future or how will we deal with our industry crashing?

What I remember most from those old schools were the predictions for the future that were essentially straight-line predictions of a trend established over the previous months or years. Those predictions were quickly forgotten and replaced with new predictions with little or no thought about where we went wrong last year, other than "well, we didn't see that coming." Towards the end of my career, I have learned that peak oil did not happen, and the only thing we

can count on is change. I won't suggest that next year will be better, but I am fairly certain that it will be different and almost certainly something we did not expect.

Please keep in touch with those who have lost their jobs. It's stressful enough being worried about keeping your job, but it is even more stressful being unemployed and not knowing what the future holds. News and encouragement can go a long way toward brightening someone's day.

Stay tuned for updates on the 2021 symposium. We have many ideas on making it as interesting and interactive as possible.

Best Regards,
James Hemingway
SPWLA President 2020–2021
(+33) 6 25 16 57 19
President@spwla.org

Up Next

Hello petrophysics friends,

I can't believe we are in autumn already. The craziness of the pandemic is spiking up again in countries all around the world, and I hope everyone is staying safe and healthy.

Our focus for now is to provide as many learning and knowledge-sharing opportunities as possible. We encourage you to visit our new videos we uploaded for our "The More You Know" marketing videos as well as the new "Nuggets of Wisdom" video featuring our very own Hani Elshahawi.

SPWLA Chapters! Start sending me your solicitations for Symposium 2022 proposals, usually held outside of the US. Send them to president-elect@spwla.org. Deadline is October 31.

Thank you, and I hope you all stay well!

Katerina Yared
SPWLA President-Elect 2020–2021
(+1) 720-431-7482
President-Elect@spwla.org

Hello and welcome to my third column for the *SPWLA Today* newsletter.

As you may already know, we have taken the decision to not proceed with the in-person symposium in Boston next year. I'd like to say that it was a difficult decision to make, but it really wasn't. There is a large financial overhead that we would have to have committed to by now, and there is no guarantee that attendees would be allowed to travel to Boston next summer. The Boston organizing committee (OC), led by Paul Craddock, is in complete agreement with the Board of Directors, and it is now our responsibility to realize an online symposium that has learned from the successes of our first online symposium and other online conferences that have been held since the pandemic started.

The Boston OC has made significant headway, and despite the change, it is hoped that they will continue to lead in areas, such as identifying and securing a keynote speaker and sponsorship. Obviously, we will require a rebranding of the SPWLA2020.com website, but that won't be an issue.

As I write this column, abstract submissions for the Symposium have just over two weeks to go, and we're beginning to see the submission rate increase. The closing date is Midnight (Central Time) on Sunday, 25 October 2020 so that still gives you time to complete and submit your abstract. The categories are the same as last year and cover all areas of petrophysics and formation evaluation. In conversations with a few of my fellow board of directors, the consensus is that we would like to see more papers that have practical applications—essentially, papers that our membership can put in to practice as soon as they return to work. Please consider this when you come to submit an abstract. Of course, we still welcome strong theoretical papers, too.

I have written a primer on "How to Submit an Abstract." There is a copy available in this edition of *SPWLA Today*, and it is also available on the SPWLAWorld.org website. Here is a link to the page: https://www.spwlaworld.org/how-to-submit-an-abstract. Abstracts no longer need to be in plain text. They can be written in HTML and support special characters, equations, and images. You can also save an abstract for later modification.

I think it is also important to remind authors again that the abstract submitted must be very similar, if not identical, to the one accompanying the paper submission. In the past, this check has been performed by members of the Technology Committee, and we will rely upon their vigilance again this year. However, we have also written a natural language processing tool that can compare texts to see if they are similar or not. This will be applied automatically to all abstracts and submitted papers, and any failing will be removed from the Symposium and Proceedings.

Notification of acceptance will be made in December 2020. If selected, your abstract will be published online on the Symposium's website in February 2021. You will be required to submit a draft manuscript for the Symposium transactions by Monday, 15th March 2021 and your final manuscript by Monday, 5th April 2021. Any paper not submitted in finalized format by then shall be removed. After submitting, you shall work with two members of the Technical Committee for a review of the manuscript to ensure clarity and to avoid commercialism. We look forward to reviewing your abstracts!

Cofion gynnes a chadwch yn iach os gwelwch yn dda,

Kind regards and please stay health,

Tegwyn J. Perkins
Vice-President Technology 2020–21
VP-Technology@spwla.org

Dear SPWLA members,

The Distinguished Speaker and Global Distinguished Speaker List for 2020-2021 is now available on SPWLA website. Once again, to all SPWLA Distinguished Speakers, I really appreciate your enthusiasm about participating in this program. For all SPWLA Chapter Officers, your SPWLA Regional Director should have already shared this program with you in detail, but please feel free to contact me if you have not received it or if you need more information.

Thank you to everyone who has made time to attend our October Distinguished Speaker Webinar with Jeffrey Miles.

Please mark your calendar for our next webinar. We would appreciate if you can join us:

1. November 12–**Delineating the Geothermal Structure and Flow Properties in a Sub-Horizontal Well with the Use of Wireline and LWD Data in a Multiphysics Approach** (SPWLA-5065) by Erik Wielemaker (SLB).
2. December 3–**Petrological and Petrophysical Implications of Magnesian Clays in Brazilian Pre-Salt Deposits** (SPWLA-5004) by Ricardo Herlinger, Jr (Petrobras).

We've just added The More You Know (TMYK) recorded videos for September and October. We also added a video for Nuggets of Wisdom. Thank you to Katerina Yared who helped to organize and thanks to Hani El-Shahawi for sharing his wisdom with us. You may access all the videos from our website.

Thank you and please continue to send me feedback and ideas. Please stay safe.

Kind regards,

Fransiska Goenawan
VP-Education@spwla.org

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Dear SPWLA members,

It has been a few months since I have submitted a column for your reading pleasure, and I apologize for being absent. However, now it is a long rambling one.

The Distinguished Speaker list from this year's SPWLA Symposium is out now. I hope to listen to some of the ones I may have missed when they were in a different time zone from me when originally aired. I will try to keep an eye and ear out and promote them when I see them announced by email or LinkedIn to my connections through the hashtags #petrophysics or #spwla.

I also attended the GeoConvention at the end of September here in Canada (www.geoconvention.com). It is an annual convention for geoscientists hosted by three partner societies: Canadian Society of Petroleum Geologists (CSPG), Canadian Society of Exploration Geophysicists (CSEG), and Canadian Well Logging Society (CWLS). This year being a decadal year turned it into a fully integrated geoscience conference with the Mineralogical Association of Canada (MAC), Geological Association of Canada (GAC), and the International Association of Hydrogeologists (IAH) as partners in the convention. With all six societies, there were people from all over the world attending this year with the new virtual meeting setup listening to over 600 talks in 90 different sessions over three days. The sessions ran the gamut from oil sands to nitrate in groundwater to geoscience teaching to volcanology to data analytics, oh my!

The virtual platform allowed for live viewing of presentations, but this year they added on-demand viewing. Almost all the talks are still available for viewing for all attendees through October. I am now watching all the talks I may have missed.

There was one session exclusively on petrophysics, but as is the case with the large geoscience focus, you have to find the rest in different sessions when they focus on a specific reservoir, such as the Montney and Duvernay, or on geomodeling, geophysics, and machine learning. Great to see the range of petrophysical work being done here in Canada.

And now onto the word of the day, **PIVOT**. It was spoken many times during the GeoConvention and throughout the O&G industry. We need to **PIVOT** the expertise of our oil and gas industry

and diversify our portfolio of resources and experience we have relied on for too long. One resource being thousands of unemployed and underutilized oil and gas workers.

There are also new subsurface projects requiring a **PIVOT**ing petrophysicist here in Western Canada: geothermal, hydrogen, helium, potash, and carbon capture utilization and storage (CCUS). I have been lucky to be able to **PIVOT** and work on both a geothermal and a CCUS project up here in Saskatchewan.

I am also currently **PIVOT**ing to web and app development, python programming, business intelligence (BI), machine learning, and artificial intelligence to complement my petrophysical background. How many others of you are currently **PIVOT**ing?

In our industry, there is always a new set of variables to be determined, a new type of data to integrate into our workflows. It just requires you to sometimes turn on your heel and **PIVOT** to a new direction using your inertia to carry you forward.

And to finish…It has reached that time here on the prairies in Canada, where there is a hopeful wish for every child to be able to wear their Halloween costumes without their winter jackets. Only a handful of times do I remember going out without one, both as a child and a parent. Well, winter has arrived here by snowing while I write this column. No fall here, just an extended summer ending with a snowfall signifying winter has arrived. The bigger question on kids' minds is will there be Halloween at all? Hopefully, with costumes and masks they are already used to wearing…under their jackets.

Hopefully, all this has created discussion, so email me if you want to continue the musing at Director-NA2@spwla.org.

Stay safe and healthy and remember to vote!

Kelly Skuce

SPWLA Regional Director, North America 2

Pseudo Sonic Log Generation With Machine Learning: A Summary of SPWLA PDDA Machine Learning Contest 2020

Yanxiang Yu, Chicheng Xu, Michael Ashby, Siddharth Misra, Weichang Li (Contest committee)
Wen Pan, Tianqi Deng, Honggeun Jo, and Javier E. Santos (Team UTFE)
Lei Fu and Chengran Wang (Team iwave)
Arkhat Kalbekov and Valeria Suarez (Team RocketAbuser)
Epo Prasetya Kusumah, Mohammad Aviandito, and Yogi Pamadya (Team SedStrat)
Hossein Izadi (Team iPetro)

Background

Machine learning has gained increasing momentum in petrophysical applications in recent years (Xu et al., 2019; Misra et al., 2019). It is imperative to prove the capability of machine learning in solving real petrophysics problems. Started on March 1 and concluded on May 7, 2020, the first machine-learning contest was hosted by the SPWLA PDDA SIG, focusing on synthetic sonic log generation from other "easy-to-acquire" well logs. During the competition, the contest committee received more than 30 submissions from over 50 registered teams globally. Each team was composed of at most five team members, and they were allowed three submissions maximum. The highest score from the three submissions was used for the final ranking. A notebook that detailed the best submission was provided in order to be ranked. The top model beat the performance of the benchmark model by 31% in the root mean squared error (RMSE) score. The complete leaderboard and solutions from each team for the competition are listed on the competition website hosted by Github. We briefly summarize the competition and describe the five solutions submitted by the top winning teams.

	Winner	RMSE Score	Solution	Contact
1st Place	UTFE	12.359	Neural Network	[Wen Pan](wenpan@utexas.edu)
				[Tianqi Deng](tianqizx@utexas.edu)
				[Honggeun Jo](honggeun.jo@utexas.edu)
				[Javier Santos](jesantos@utexas.edu)
2nd Place	iwave	12.551	LSTM	[Lei Fu](lei.fu.rice@gmail.com)
3rd Place	RockAbusers	13.216	Random Forest	[Arkhat Kalbekov](akalbekov@mines.edu)
				[Valeria Suarez](vasuarezbolivar@mymail.mines.edu)
4th Place	StuckAtHome	13.431	Ensemble Trees	
5th Place	SedStrat	13.845	Ensemble Model	[Epo Prasetya Kusumah](epo.kusumah@gmail.com)
				[Mohammad Aviandito](aviandito@gmail.com)
				[Yogi Pamadya](yogipamadya@gmail.com)

Table 1—Top 5 scoring teams and their contact information.

Competition

Compressional and shear sonic travel time logs (DTC and DTS, respectively) are crucial for subsurface characterization and seismic-well tie. However, these two logs are often missing or incomplete in many oil and gas wells. The competition aims to predict the DTC and DTS logs from seven "easy-to-acquire" conventional logs using machine-learning methods. A tutorial was published in the 2020 March issue of *SPWLA Today* newsletter as a benchmark to the competition (Yu et al., 2020). A total number of 20,525 data points (corresponding to distinct depths) from three wells were collected to train regression models using machine-learning techniques. Each data point had seven features, consisting of the conventional "easy-to-acquire" logs: caliper, neutron porosity, gamma ray (GR), deep resistivity, medium resistivity, photoelectric factor, and bulk density, respectively, as well as two sonic logs as the target. The separate data set of 11,089 samples from a fourth well was then used as the blind test data set. The prediction performance of the model was evaluated using RMSE as the metric. In the tutorial, a random forest regressor model was trained, and an RMSE score of 17.93 was achieved on the test data set.

The top five models, on average, beat the performance of our benchmark model by 27% in the RMSE score. From their submissions, we found that data cleaning and clustering were critical to improving the performance of their models. Different models, including neural network, long-short-term memory (LSTM), and ensemble trees, were used by different teams, achieving impressive performance. In this paper, we have selected five solutions from the top submissions and present their techniques in detail on how they tackled this competition.

TOP AWARD-WINNING SOLUTIONS (Github link)

1st Place–Team UTFE (Wen Pan, Tianqi Deng, Honggeun Jo, and Javier E. Santos)

2nd Place–Team iwave (Lei Fu and Chengran Wang)

3rd Place–Team RocketAbuser (Arkhat Kalbekov and Valeria Suarez)

5th Place–Team SedStrat (Epo Prasetya Kusumah, Mohammad Aviandito, and Yogi Pamadya)

7th Place–Team iPetro (Hossein Izadi)

Summary

This contest demonstrated a distributed and collaborative technology development effort. Over a two-month span, teams from all over the world worked diligently on improving their models. We saw some great results and a significant improvement in their models' performance compared to the benchmark model. Figs. 1 to 6 show more details about the comparison of the performance of different models in generating pseudo-compressional and shear sonic logs.

The teams were able to demonstrate their machine-learning workflow on a practical petrophysical problem: data set preparation and quality assurance, feature engineering with outlier handling and clustering, training and testing a regression model, and finally, blind-testing (similar to the real-world deployment) the model on the hidden data set. Various models have been adopted by the different teams, and we found that for this particular petrophysical problem, where the data set was relatively small (with a training data set of ~20,000 samples from only three wells), the model itself might not be the key to the success of predicting on the new data set, but rather many other methods that are applied to improve the performance and stability of the model, such as making special treatments for the anomalies and outliers, train different models for zones that show a very distinct DTC/DTS range, train multiple regression models, and/or combine them.

We observed that some modeling inconsistency could also be due to borehole quality and poor raw measurements in both the training and testing data. These can result in erroneous well-log responses that do not represent the formations. Being able to predict these logging errors does not aid in formation evaluation. Caution must be exercised to minimize these artifacts before starting training and testing. As petrophysicists, we want to be able to use the data to accurately describe the rocks, pores, and fluids.

The proprietary nature of the oil and gas industry, in general, limited many machine-learning methods to be adopted in the petrophysical domain. With open data sets becoming more readily available, we hope this contest provides an example of the enthusiasm and talent to help build up a shared knowledge base of the industry.

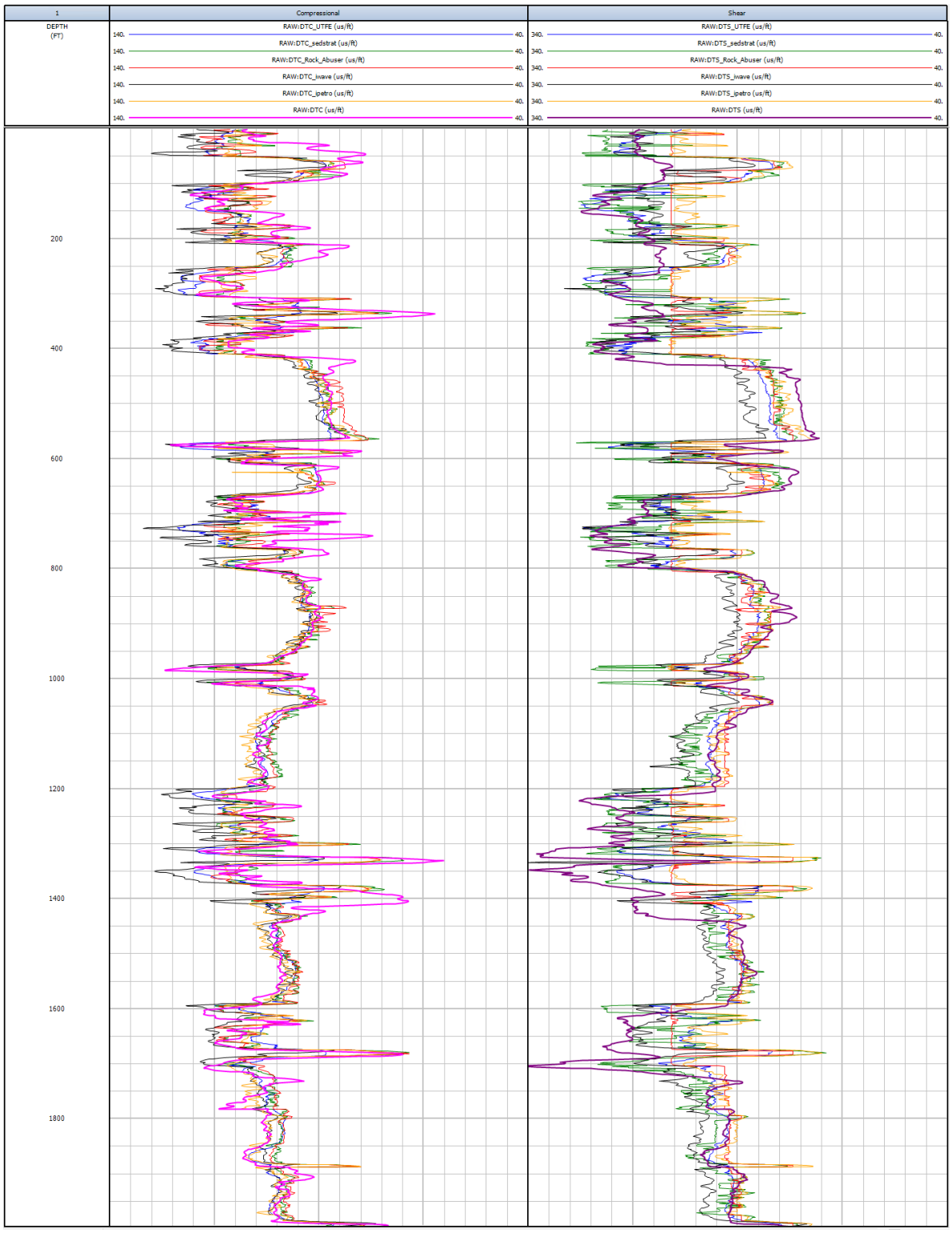

Fig. 1—Comparison of all winning teams in a log profile over the shallow interval DTC and DTS. Compressional track: DTC predictions UTFE: Blue; SedStrat: Green; Rock Abuser: Red; iwave: Black; ipetro: Orange; and Original: Fuchsia. Shear track: DTS predictions UTFE: Blue; SedStrat: Green; Rock Abuser: Red; iwave: Black; ipetro: Orange; and Original: Purple.

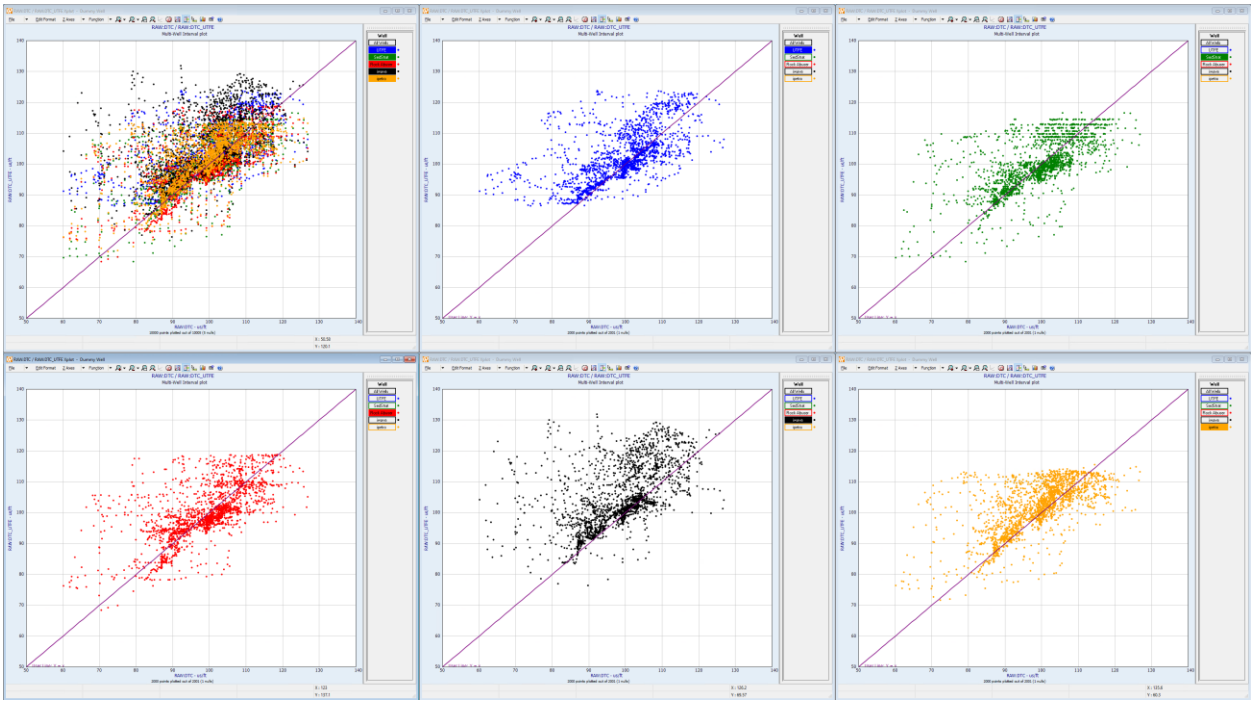

Fig. 2—DTC comparison of all winning teams in the crossplot space over the shallow interval.
Original DTC: *x*-axis, Predicted DTC: *y*-axis.
DTC predictions UTFE: Blue; SedStrat: Green; Rock Abuser: Red; iwave: Black; and ipetro: Orange.

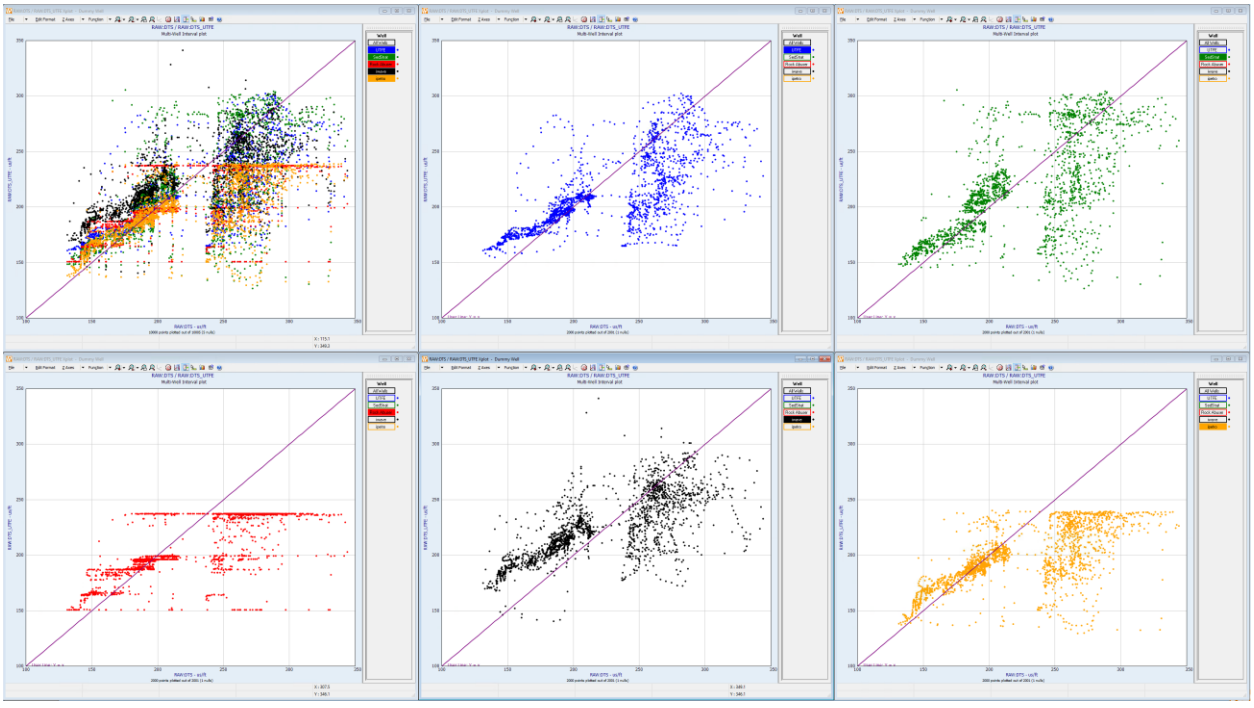

Fig. 3—DTS comparison of all winning teams in the crossplot space over the shallow interval.
Original DTS: *x*-axis, Predicted DTS: *y*-axis.
DTS predictions UTFE: Blue; SedStrat: Green; Rock Abuser: Red; iwave: Black; ipetro: Orange.

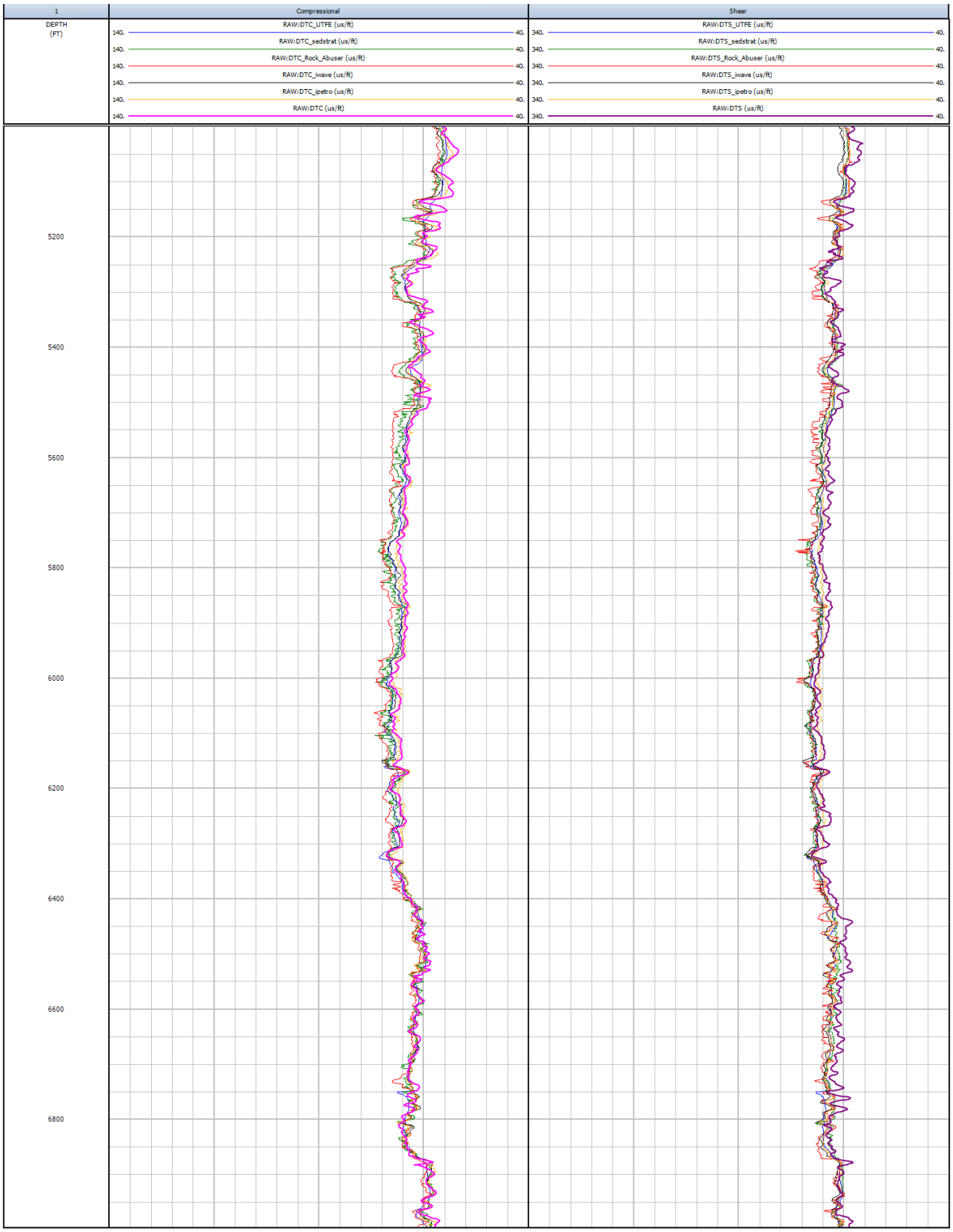

Fig. 4—Comparison of all winning teams in a log profile over the deeper interval DTC and DTS. Compressional track: DTC predictions UTFE: Blue; SedStrat: Green; Rock Abuser: Red; iwave: Black; ipetro: Orange; Original: Fuchsia. Shear track: DTS predictions UTFE: Blue; SedStrat: Green; Rock Abuser: Red; iwave: Black; ipetro: Orange; Original: Purple.

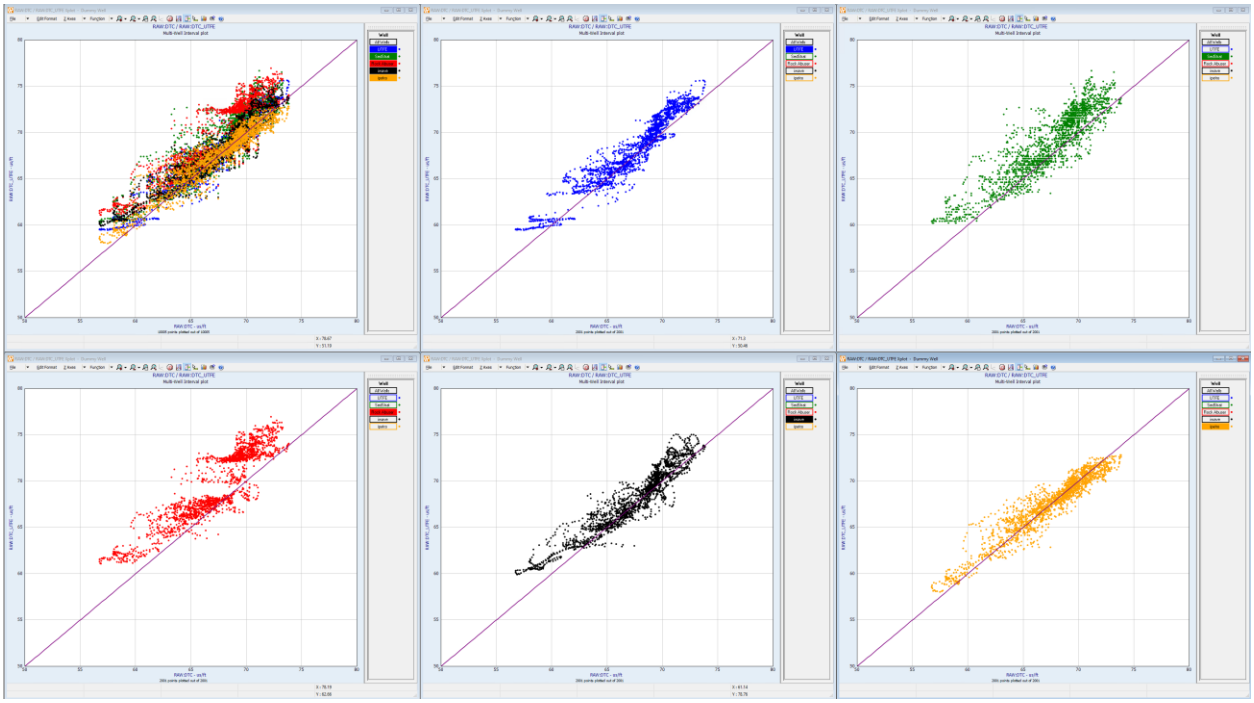

Fig. 5—DTC comparison of all winning teams in the crossplot space over a deeper interval.
Original DTC: *x*-axis, Predicted DTC: *y*-axis.
DTC predictions UTFE: Blue; SedStrat: Green; Rock Abuser: Red; iwave: Black; ipetro: Orange.

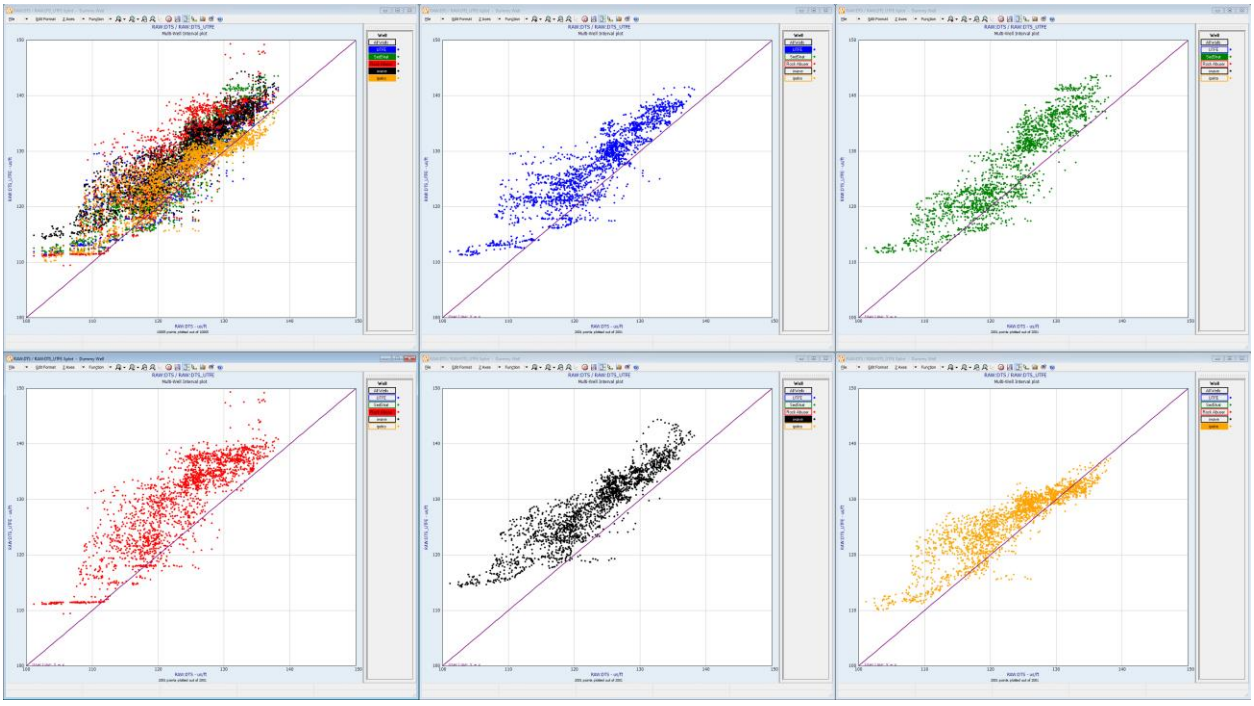

Fig. 6—DTS comparison of all winning teams in the crossplot space over a deeper interval.
Original DTS: *x*-axis, Predicted DTS: *y*-axis.
DTS predictions UTFE: Blue; SedStrat: Green; Rock Abuser: Red; iwave: Black; ipetro: Orange.

ACKNOWLEDGMENTS

A note of thanks goes to SparkCognition for sponsoring the event and to Equinor for releasing the Volve data set. We also thank the other members of the SPWLA PDDA SIG ML Contest Committee: Brendon Hall, Bin Dai, Zheng Gan, and Yan Xu for their contribution.

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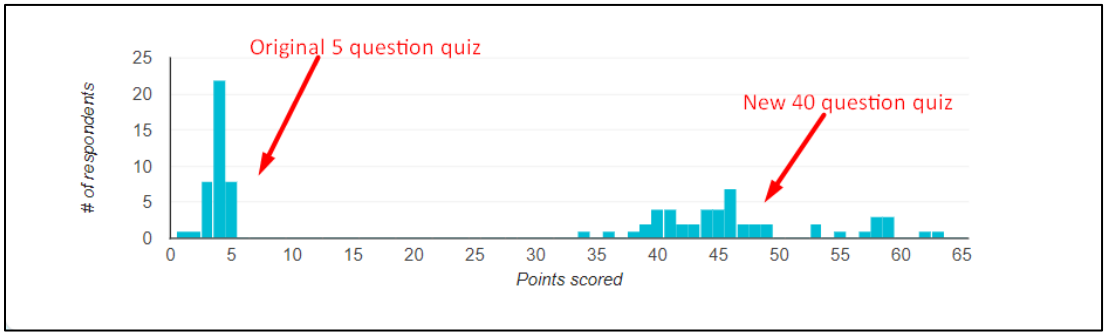
Petrophysics Quiz and Delightful Statistics by Adam Haecker

In August, Mayank Malik (SPWLA VP-Publications 2020–22) launched the SPWLA app. The app can be downloaded for Android devices via the Google Play store and for iOS devices via Apple's App store. In the app, there was a fun quiz. It initially had five questions, which we then expanded to 40 questions. The last question counted for a lot more than the rest because it is a fun quiz (25 pts).

Below are the answers to the most frequently missed questions and statistics on how everyone did. You can see two people almost had a perfect score. Well done whoever you are! There were a few results that caused me to question my answer key since more people answered what I thought was an incorrect response than the correct one; however, most questions had a strong distribution relating to the correct answer.

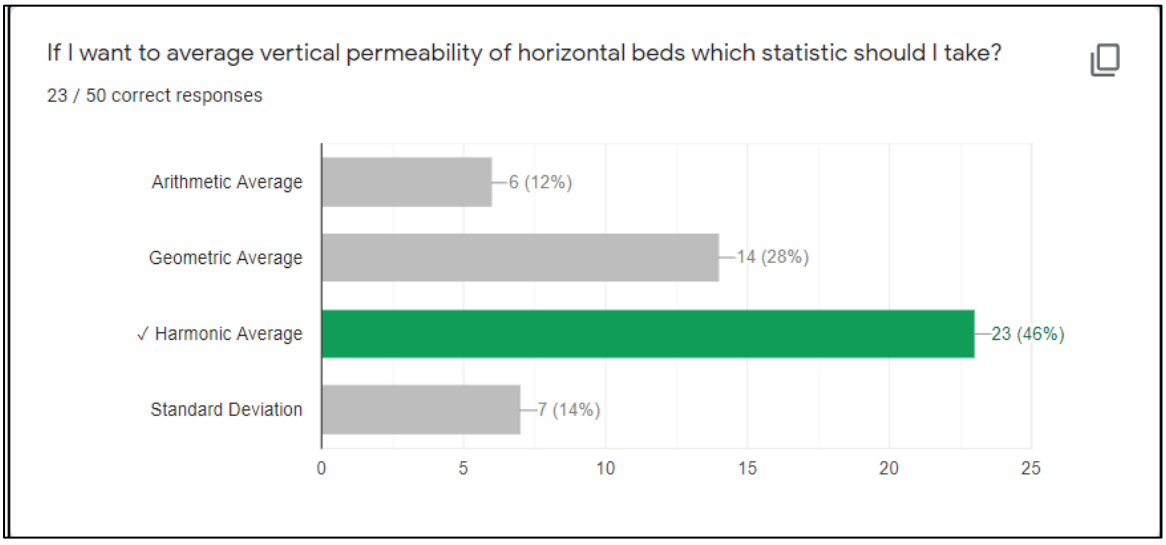


Going forward, we will be rolling out five to 10 questions each month and retiring the older questions. Therefore, in order to test your petrophysical might, you will have to sign into the app periodically. Hopefully, we can continue to publish the statistics regarding the question responses. If you have an idea for a quiz question, be sure to reach out to me via LinkedIn.

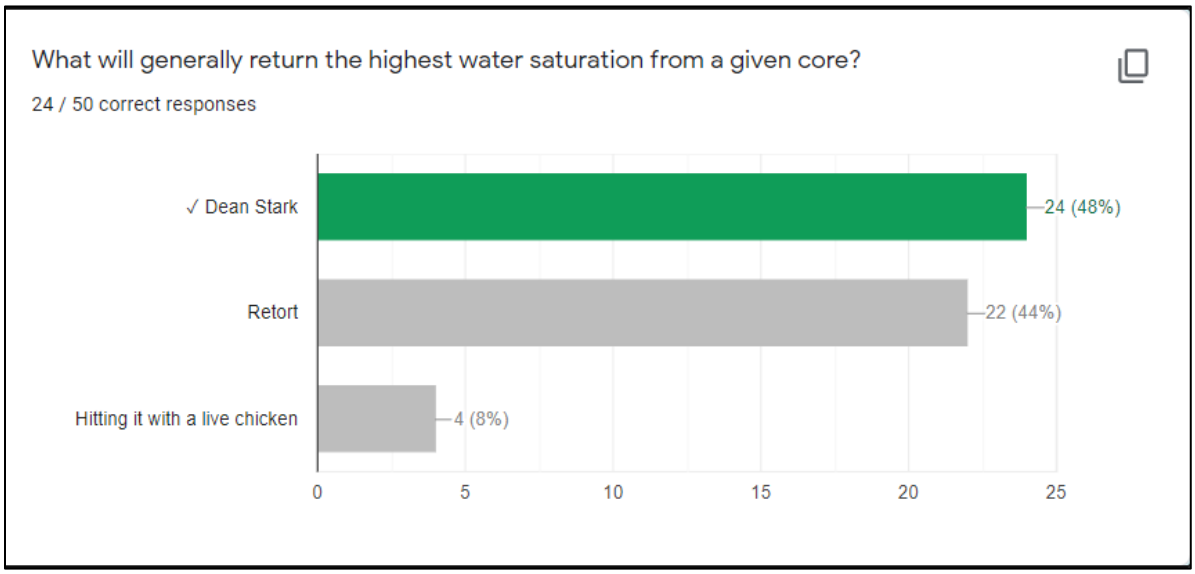
–Adam Haecker

Below are the most frequently missed questions and the answers to those questions.

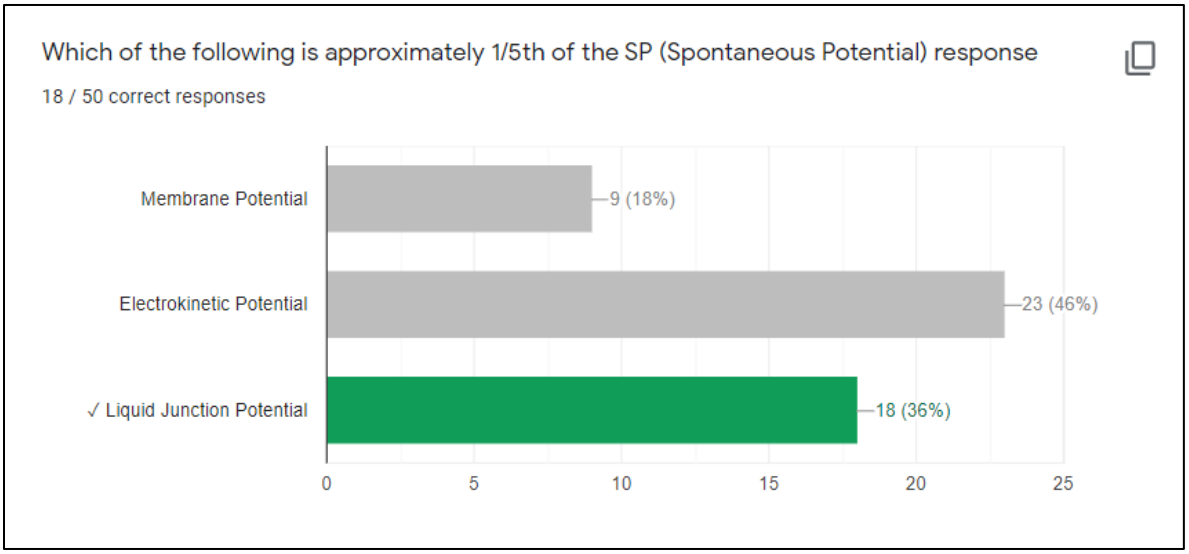
Question	Correct responses
If I want to average vertical permeability of horizontal beds which statistic should I take?	23 / 50
What will generally return the highest water saturation from a given core?	24 / 50
Which of the following is approximately 1/5th of the SP (Spontaneous Potential) response	18 / 50
Who coined the term Petrophysics?	14 / 50
Original Gamma Ray tools before 1950 measured in what unit?	14 / 50
What is the theoretical upper limit of Kerogen density? (assume hexagonal configuration)	20 / 50
What is the energy of a AmBe9 thermal neutron source?	22 / 50
In shales, Which of the following measurements are typically anisotropic (different depending on direction) ?	20 / 50
T1 is the time it takes to reach how much % of it's final polarization?	16 / 49
Which of the following are ways to determine elemental composition in core analysis?	13 / 50
Which of the following influences the T2 but not the T1?	7 / 16
What class of minerals has both high density and high hydrogen index? >3 g/cc and >40% Neutron	17 / 45
Which of the following fluids would have the longest T2 if all other things were equal?	20 / 42



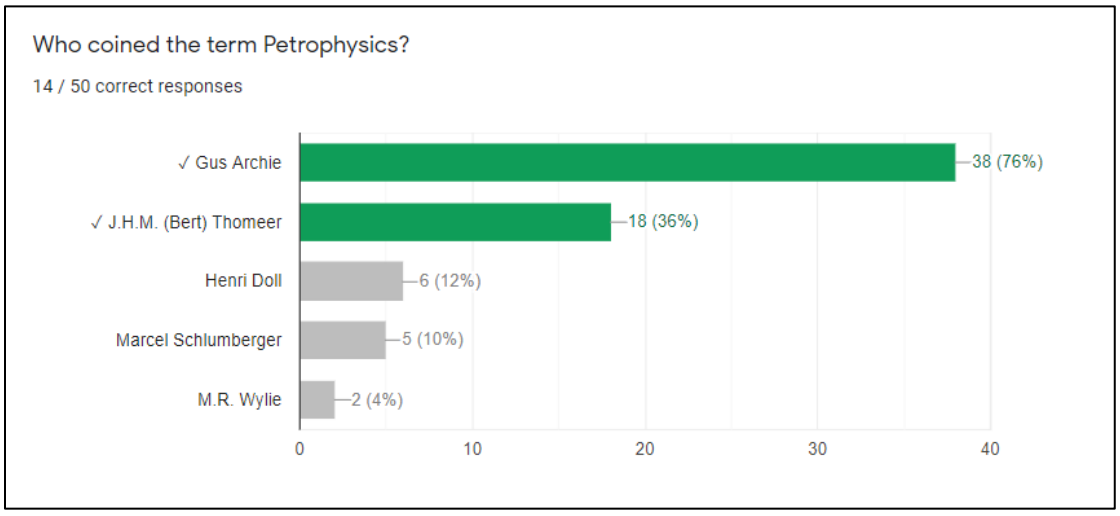
This question made me realize I should have been more specific. Depending on the temperature ramp, retort *CAN* return more water if taken up to really high temperatures. I should have specified if retort is taken to 300°F.

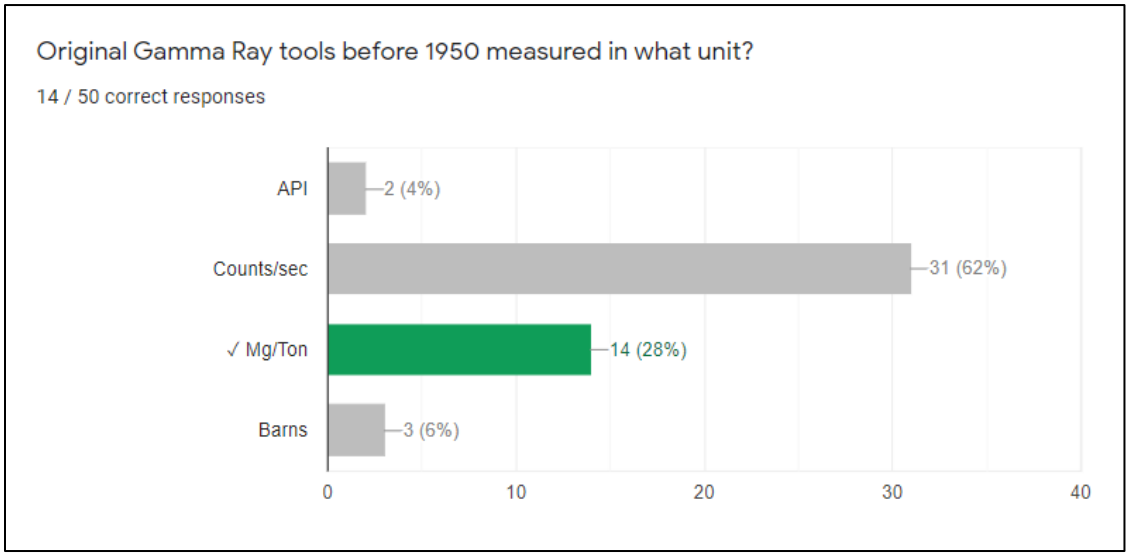


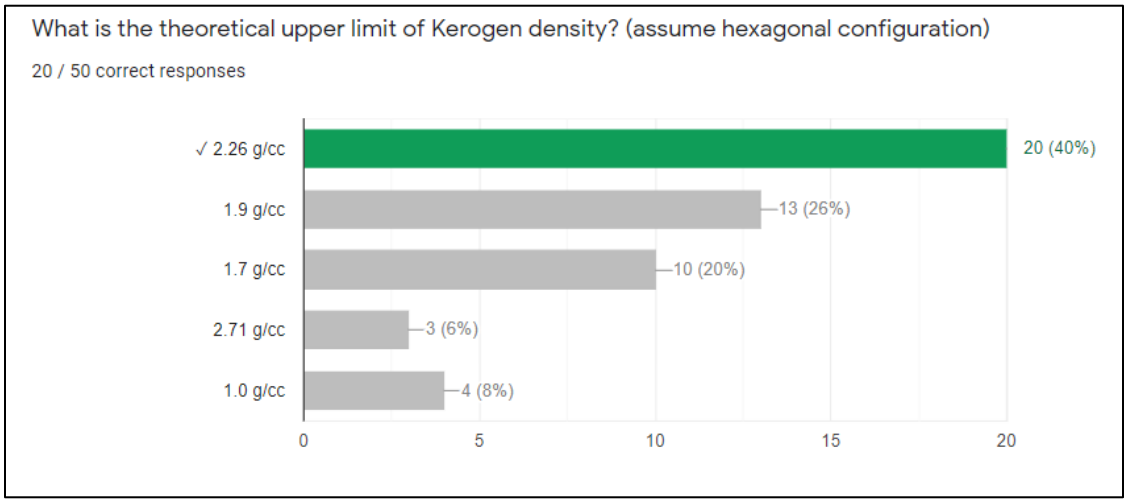
This question actually had more incorrect responses. I looked it up in my handy textbook just to check my sanity.



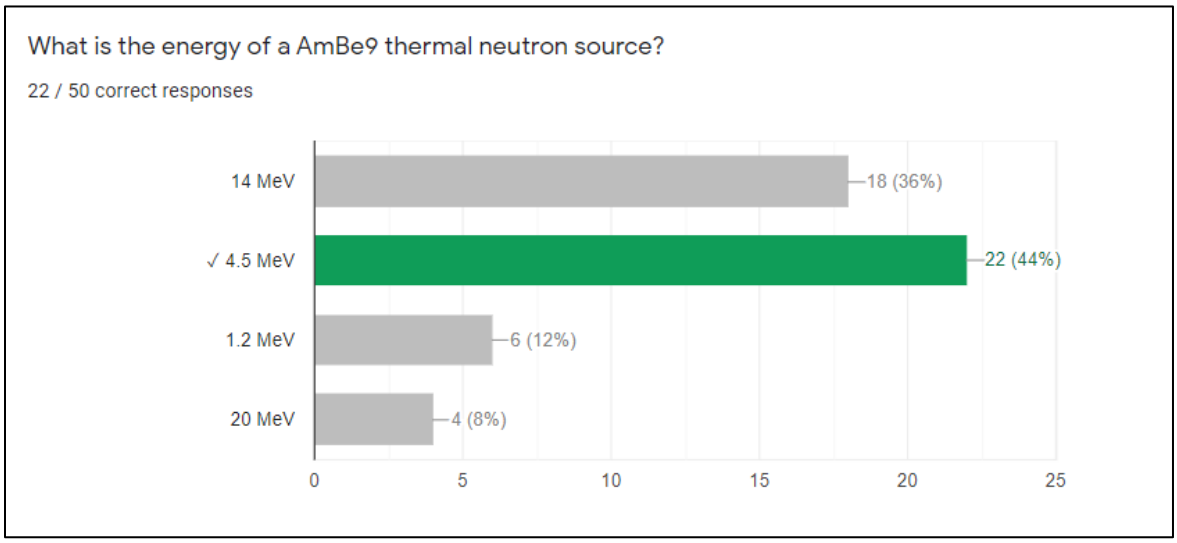
This question was a bit tricky because it required two correct answers to be correct.



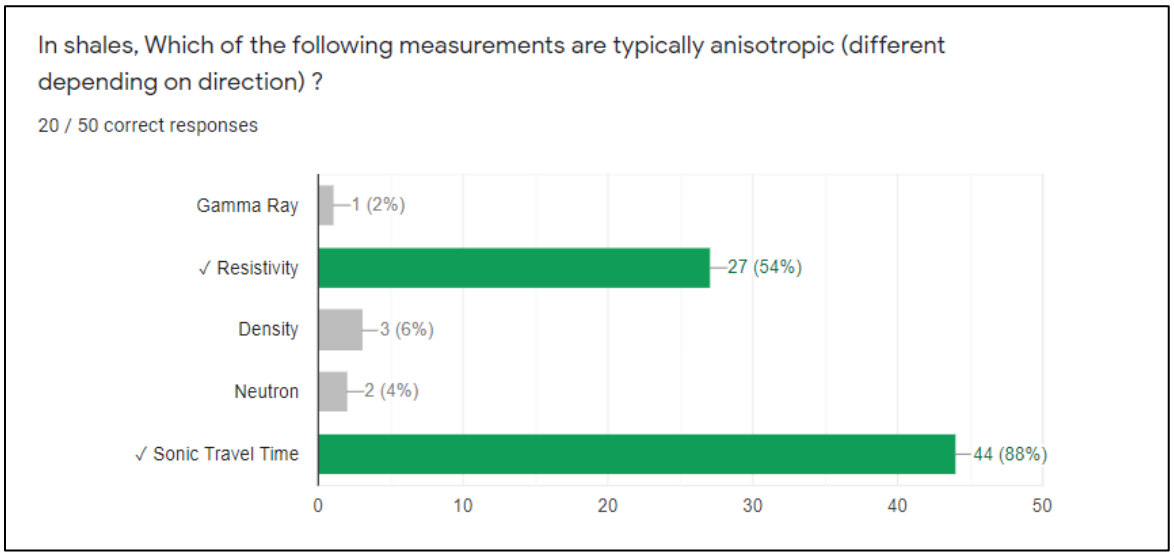




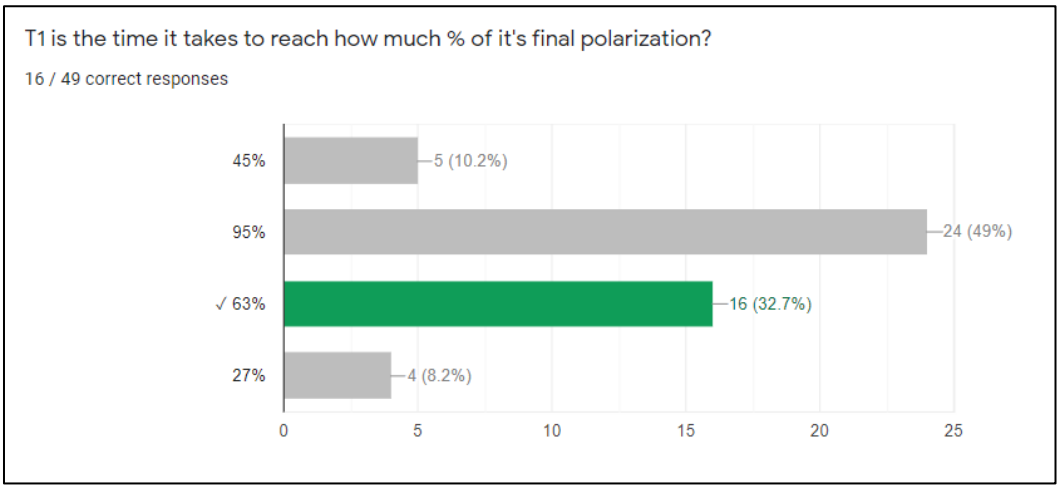
I was quite surprised by the results of this one. I thought it would be a slam dunk for most folks who had darkened the halls of the service companies. I guess most of us have been out of logging school for many years.



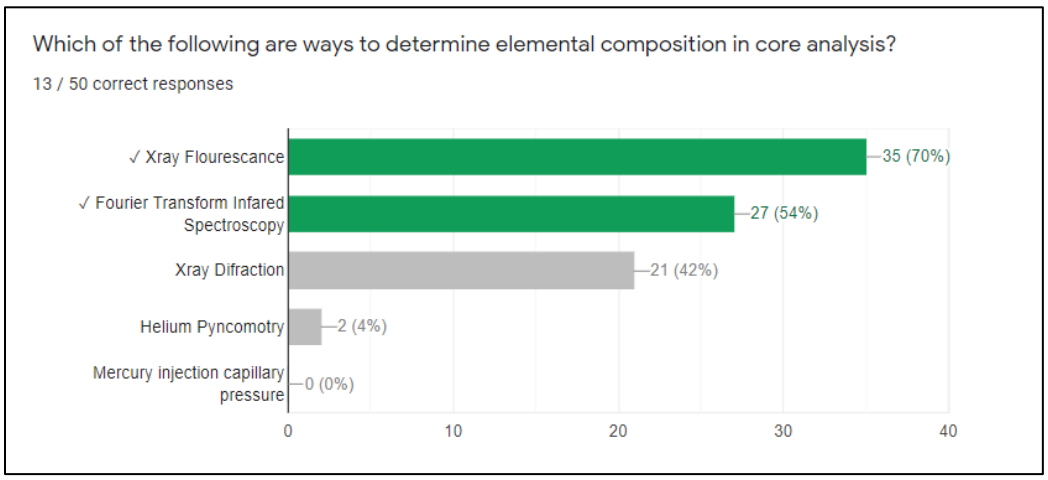
Another two-part answer where it looks like most folks got both right, but less answered on resistivity.



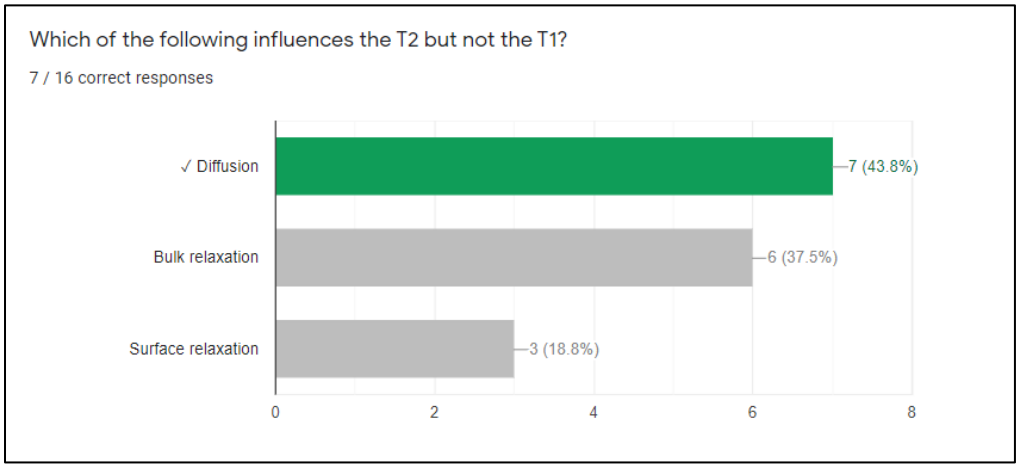
This next one was very tricky because we do in fact polarize to 95%, but the T1 is only 63% polarization.



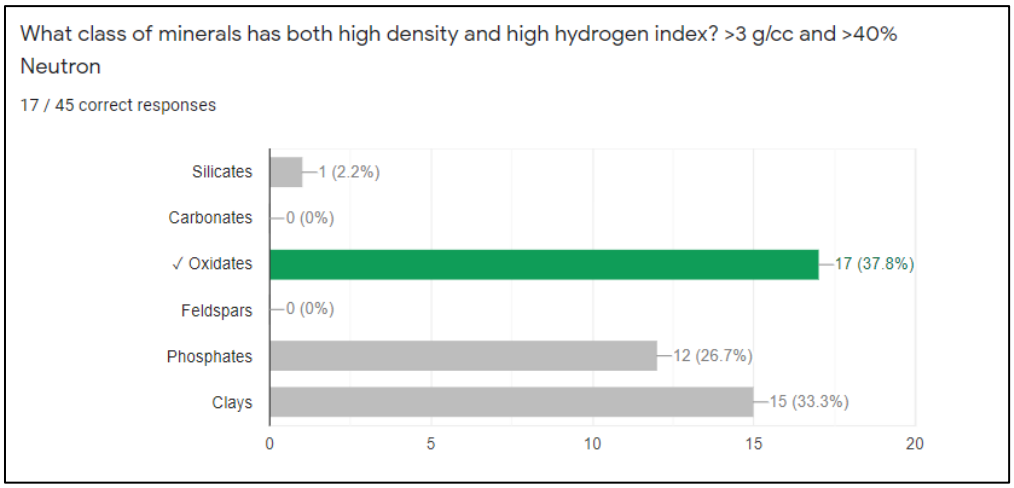
Another two-part response. FTIR is less well known in the industry as an elemental measure.



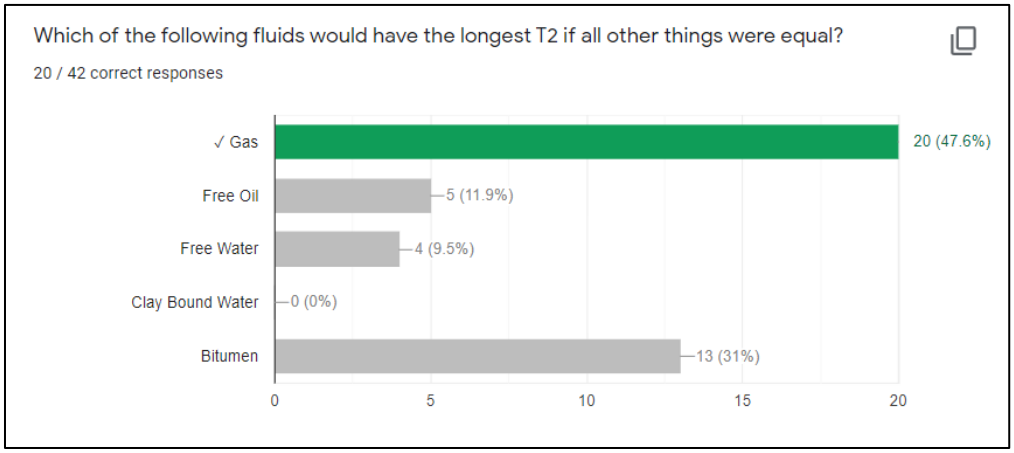
This one was near the end of the quiz, so it had fewer responses.



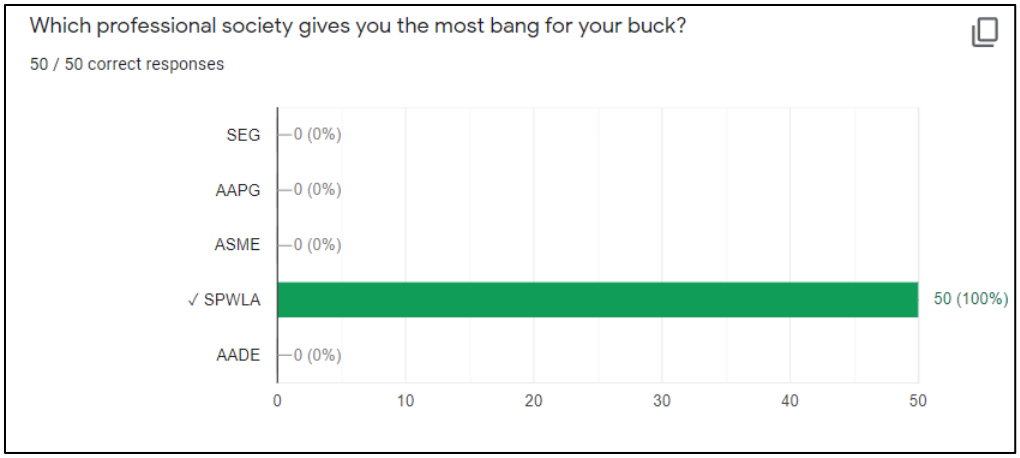
This next question was probably the trickiest question in the whole quiz if you didn't have a chartbook handy….



It's surprising how many people selected bitumen, which is actually the fastest thing on here (shortest T2). Maybe I worded the question poorly.



This question was worth 25 points because it is clearly the most important.😊 I am glad to see everyone go this one correct.



Quinn Passey was a petrophysicist for ExxonMobil from 1982 to 2015, a 33-year career! Quinn had no formal training in formation evaluation when he joined Exxon after completing his PhD degree from CalTech in planetary science studying the moons of Jupiter and Saturn. Prior to Exxon, Quinn had never heard of a "well log," and he did not know much about oil and gas extraction, but he was excited by the opportunity to merge geologic concepts with "remote sensing" physics. He used this as an advantage to develop original solutions to many important formation evaluation challenges. In his words, Quinn was a "blank canvas unencumbered by previous petrophysics dogma and accepted practices." Throughout his career, Quinn worked on a variety of research and operations issues, including source rock evaluation from well logs, shaly sand analysis, thin-bed evaluation, and high-angle and horizontal well formation evaluation. He has written many technical articles on various formation evaluation topics, has published an AAPG book on thin-bed evaluation, and has served as an SPWLA Distinguished Speaker and AAPG Distinguished Lecturer. If you are interested in learning more about Quinn's petrophysical career, you can refer to his article "Thoughts on a Petrophysical Career," which was published in the second issue of the Bridge in March 2016!

In this article, Quinn offers to teach us about one of his most well-known contribution to formation evaluation: the ∆logR *Source Rock Evaluation Method. Quinn tells us, in his own words, about the story of the* ∆logR *method and walks us through a step-by-step tutorial to apply this famous workflow.*

A Story (and Tutorial!) of the ∆logR Source Rock Evaluation Method

By Quinn R. Passey

What Is the ∆logR Technique?

Methods for evaluating organic-rich "source" rocks have evolved over the last 4-plus decades. This article describes one approach—the ∆logR method (Passey et al., 1990), which built on decades of previous methods and technology (Passey, 2019) to identify organic-rich source rocks and evaluate organic matter content. Internal development of the ∆logR method was done primarily between 1980 and 1985, although the technique was kept proprietary until details started "leaking out" at the time of layoffs and "downsizing" around 1987 to 1988 (low oil prices). Calibration of the method was later modified slightly to address high-maturity "shale gas plays" (Passey et al., 2010). The ∆logR workflow was developed slowly and methodically through observations, scientific method, collecting data, testing hypotheses; by the late 1980s, the method had been applied and tested in thousands of wells in more than 500 basins worldwide, such as the North Slope of Alaska, Gulf of Mexico, in carbonate-related rocks in the Paris Basin, and Western Canada Basin. Currently, many exploration geologists "like" the method for its simplicity in application, whereas many petrophysicists "dislike" it because it does not subscribe to accepted petrophysical dogma.

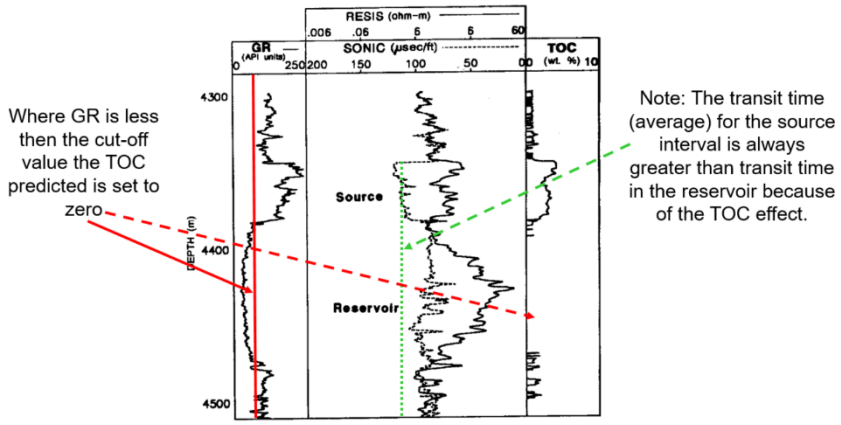
One of the key risks for dry holes worldwide was the absence of a mature and effective source rock (Rudolph and Goulding, 2017). The original ∆logR method was developed as an

exploration tool to address this source risk by identifying organic-rich intervals in deep wildcat exploration wells. Our efforts to identify source rocks began in the Kimmeridge Shale in the UK sector of the North Sea, which benefited from abundant well logs and core data. Studies revealed that the resistivity of the Kimmeridge Shale increases with thermal maturity (as indicated from Tmax from RockEval Pyrolysis), whereas all routine porosity logs (sonic/neutron/density) respond to organic matter by displaying additional porosity. In 1978, Meissner also recognized the relationship between resistivity and thermal maturity in the Bakken Formation. The ∆logR method initially involved the scaling and overlay of the sonic and deep-resistivity logs (known in industry as an "F Overlay"). The sonic curve was selected because, thanks to our geophysics colleagues wanting seismic well ties, the sonic log was run from wellhead to TD in most wells, whereas the density and neutron logs were generally only acquired over the reservoir interval. Initial calibration to organic richness was done to the S2 value (remaining generative capacity from RockEval), but the calibration was later modified to tie directly to Total Organic Carbon (TOC) weight percent. The technique was also adjusted to accommodate the use of other "porosity" logs, specifically the density and neutron logs instead of the sonic log.

Although the ∆logR method was not initially intended for evaluating unconventional organic-rich "source rock" formations, it is applicable to evaluate organic matter content in all but very high maturity (e.g., vitritnite reflectance Ro > 2) shale gas reservoirs. In high-maturity (Ro > 2) unconventional, the ∆logR method does not work because the development of graphite (Passey et al., 2010; Walters et al., 2014) introduces an additional electrical conductivity path, so the formation is no longer an "Archie Rock," where resistivity primarily responds to the amount of bound and free water in the formation. The ∆logR method is based on the idea that both porosity and resistivity logs respond predictably to water-filled porosity (i.e., the "F-overlay"), and this water-filled porosity generally represents 95% of the sedimentary cover on earth. In organic-rich mudstones, the porosity/resistivity overlay shows separation in both immature and mature intervals. When mature hydrocarbons are present, the resistivity increases, thus increasing the separation between curves (which we scale in Log_{10} Resistivity Cycle Units—∆logR). Separation also occurs across reservoir intervals, but a shale indicator (e.g., gamma ray log) and appropriate cutoffs can be used to avoid predicting TOC in reservoir rocks. One advantage of the porosity/resistivity curve scaling and overlaying (i.e., "baselining") is that it reduces the number of unknown variables required to estimate TOC content because the overlain logs are "normalized" in the interval of interest. Thus, "baselining" covers "a multitude of sins," including not needing to explicitly know lithology, mineralogy, actual porosity, Archie exponents "m" and "n," Rw, formation temperature, etc. As such, ∆logR is an empirical technique that is easily applied to a wide range of organic-rich mudrocks.

Overview of ΔLogR Technique

A GR Cutoff eliminates the effect of hydrocarbon-bearing reservoirs from Predicted TOC



(After Passev et al., 1990)

Step-by-Step Tutorial—Enough With the Ancient History

Step 1–Scale the porosity and resistivity logs.

For the sonic log, the appropriate scaling is 1 Log_{10} Resistivity Cycle is equivalent to –50 μsec/ft; it is negative because sonic DT is typically plotted increasing to the left.

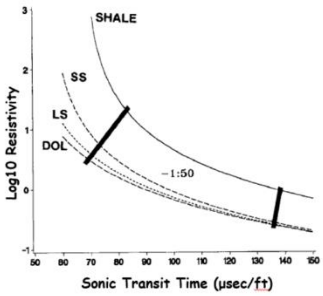
For the density log, the scaling would be 1 Log_{10} Resistivity Cycle = 0.4 g/cc.

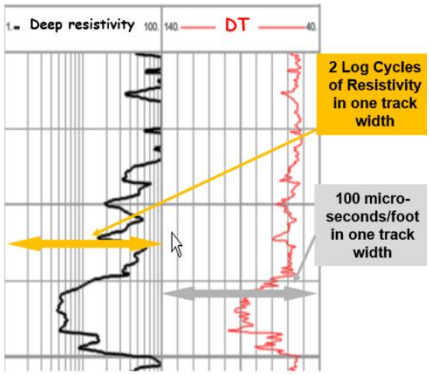
For the neutron porosity log, the scaling would be 1 Log_{10} Resistivity Cycle = 0.25 p.u.

Step 1 - Log Scaling for ΔLogR Technique (using Sonic log)

Because this technique is empirical it is necessary that the two logs to be overlain are appropriately scaled so that the resulting separation conforms to the original calibration.

The scaling shown to the right is commonly used for log prints but does need to be checked if using paper copies.





(After Passey et al., 1990)

For more information and examples, see Passey et al., 1990.

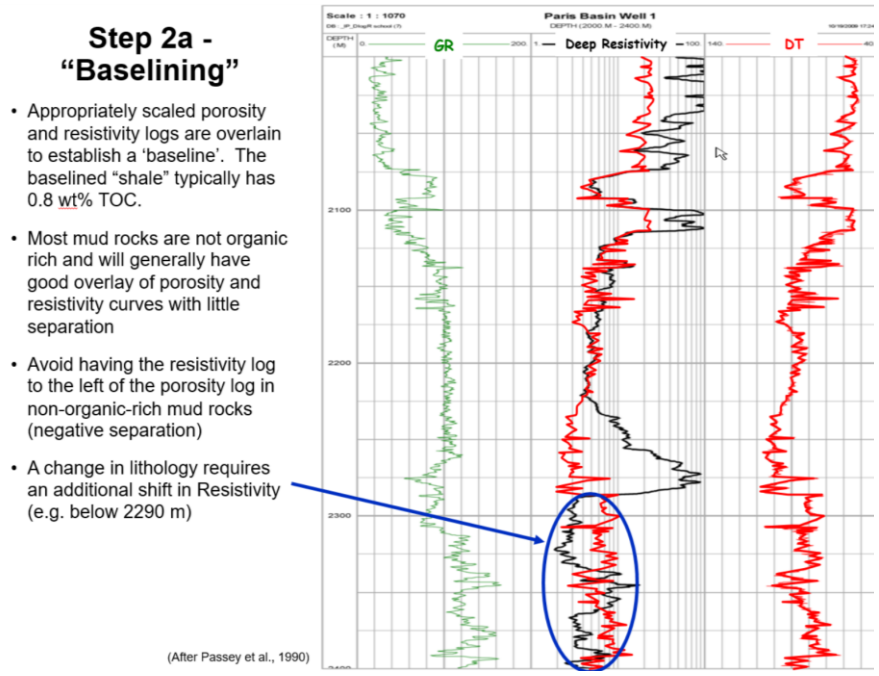
Step 2–Identify appropriate baselines starting from the top of the well and work down.

a) Locate a water-filled mudstone interval and move the resistivity or sonic curve so that the two curves lie on top of each other; when base-lined, the two curves will overlay or “track” each other.

b) Baselines will need to be revised as one goes deeper and/or encounters additional lithologies.

In practice, we generally shift the resistivity curve to maintain the sonic curve as a continuous “compaction” curve.

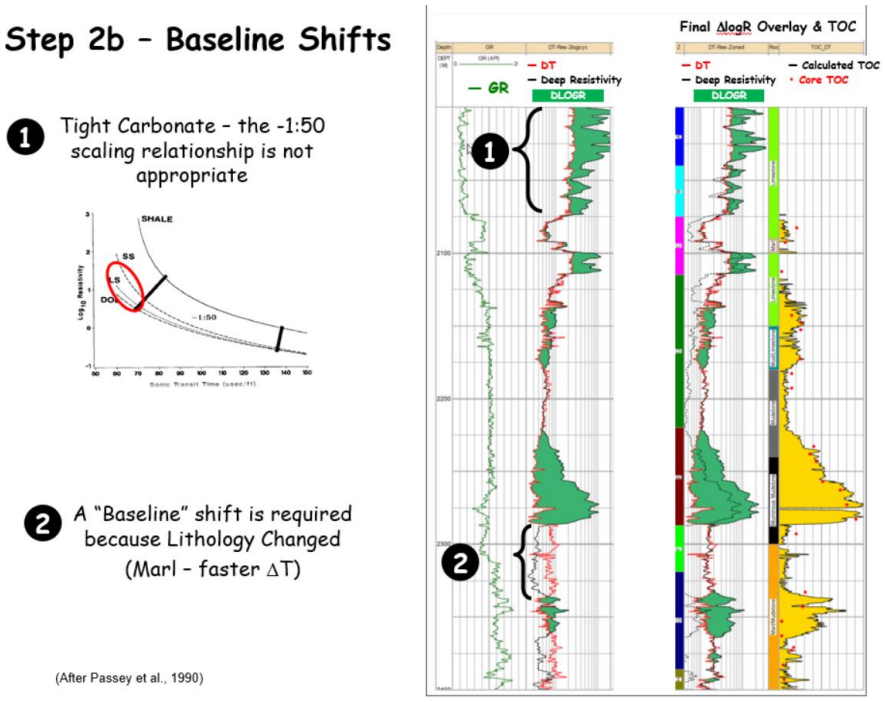
For tight (i.e., low-porosity) intervals, the appropriate scaling of



–1:50 for the sonic log is not accurate (see small inset crossplot □ and refer to the Appendix in Passey et al., 1990).

□ The tight carbonate exhibits high resistivity and, thus, a large ΔlogR separation, but the GR is low, so it is not likely a potential organic-rich mudstone. Moreover, the very short DT (~55 μsec/ft) indicates a "tight" or low-porosity interval and not organic rich.

□ The resistivity and porosity curves again separate with resistivity to the left of the sonic, and after rebaselining for the lower marl, the curve again tracks well, and allows the organic-rich intervals to be recognized.

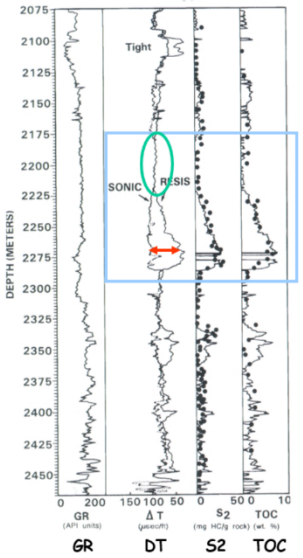


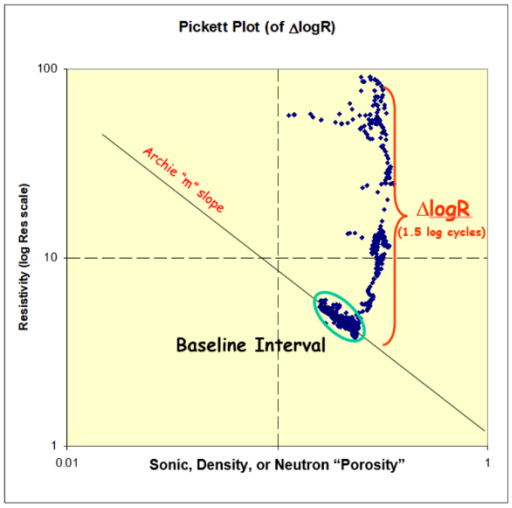
c) Viewed as a crossplot, ΔlogR simply represents the difference (in Log_{10} resistivity cycles) above the "baseline interval" (as shown on the right). The selection of $\Delta T_{baseline}$ and $R_{baseline}$ used in Step 3 can be the value from any

ordered pair (e.g., X, Y) from any of the points in the "Baseline Interval."

Step 2c - ΔlogR Source Rock Analysis – Pickett Plot

What does ΔlogR look like in **"Real" Petrophysical terms** (i.e., a cross-plot)?





(After Passey et al., 1990)

Step 3–Compute ΔlogR separation for each baseline increment.

Potential organic-rich intervals are recognized where the resistivity and porosity curves separate. The equations for calculating ΔlogR using the sonic, density, and neutron logs, respectively, are:

$$\Delta\log R_{Dt} = \log_{10}(R/R_{baseline}) + 0.02 \times (\Delta t - \Delta t_{baseline})$$

$$\Delta\log R_{Den} = \log_{10}(R/R_{baseline}) - 2.50 \times (r_b - r_{baseline})$$

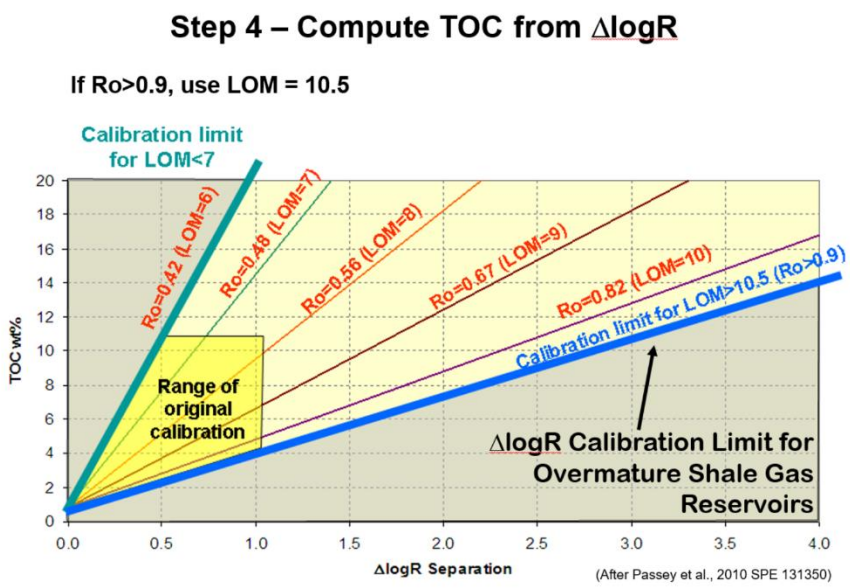
$$\Delta\log R_{Neu} = \log_{10}(R/R_{baseline}) + 4.0 \times (fN - fN_{baseline})$$

Step 4–Apply appropriate thermal maturity to compute TOC.

The most accurate thermal maturity values come from sample measurements but can also be estimated from basin modeling.

LOM stands for Level of Organic Metamorphism defined by Hood et al., (1975), which was used during the development of ΔlogR. Most of industry now use vitrinite reflectance (Ro) to determine maturity, but the RockEval Tmax value is also very useful to identify immature and oil-mature source rocks. The calibration graph on the right shows the correspondence of LOM to Ro value.

If no thermal maturity information is available, use a default value of LOM = 9; it may not be accurate, but will be a good first estimate.



In general, once calibrated to data, the computed TOC *averaged* by the well-log resolution will generally be accurate to +/- 1 to 2 wt% TOC. Because of differing vertical resolutions (sidewall cores, cuttings, well logs), the individual sample TOC values may not exactly agree with the log-predicted TOC.

The empirical equation to calculate $TOC_{wt\%}$ from ΔlogR and LOM value is:

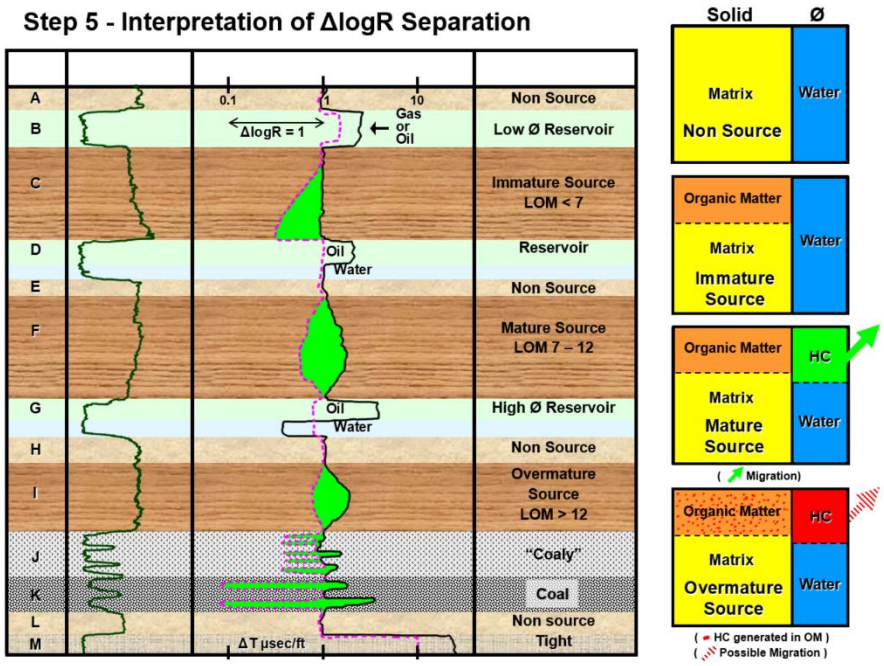
$$TOC_{wt\%} = 0.8 + (\Delta\log R) \times 10^{(2.297 - 0.1688 \times LOM)}$$

IMPORTANT NOTE–The "baseline intervals" in shales generally average 0.8 wt% TOC, so this value should be added back in to replicate the intercept shown in the above calibration chart. Although this was discussed in the text of Passey at al. (1990), many people forget this step because it was not explicitly included in the TOC equation.

Step 5–Interpret the results.

Although predicted TOC values often are desired, much can be interpreted just from the porosity/ resistivity ΔlogR overlay.

The shape of the overlay (and thus any predicted TOC values) can indicate parasequence-scale depositional units, and can be related to sequence stratigraphy an depositional environment and is helpful for mapping the lateral distribution of organic-rich intervals (see Creaney and Passey, 1993).



The Power of Collaboration and Integration

The development of the current ΔlogR approach was not the effort of a single person and benefited greatly from close collaboration with many petroleum geochemists, inorganic geochemists, stratigraphers, reservoir quality specialists, petroleum engineers, SEM and XRD experts, and management. Together, we took some basic observations and over time developed (some say "weaponized") a robust technique to address evaluation of organic-rich mudstones. Sometimes, I am amazed that this approach continues to be in application after almost 40 years. We were fortunate to be involved with the right people at the right time—a technical "tipping point."

In a Nutshell

- Total organic carbon (TOC) can be determined using a variety of well logs. If abundant core-measured TOC is available, log-specific calibrations can be derived using any of the standard porosity logs. Empirical relationships between uranium and TOC can also be used but are generally only applicable to marine source rocks.

- The ∆logR approach is simple and robust and involves routine well logs (sonic/resistivity), (density/res) or (neutron/res).
- Mature source rocks can be detected by an increase in resistivity.
- The ∆logR technique has been applied to both siliciclastic and marl (carbonate) organic-rich mudstones

- The ∆logR technique is applicable to "shale gas" reservoirs, noting that original calibration was only in the oil window (Ro = 0.5 – 1.0); for higher maturity values, the Ro = 0.9 calibration line should be used (LOM 10.5).

- For high-maturity shale gas (Ro > 2), the ∆logR technique is not applicable because of the presence of additional electrically conducting phase (graphite).

- Coals are readily identifiable, but calculated TOC values will be too low because the calibration was developed for organic-rich mudstones, with TOC values up to about 30 wt%.

- The ∆logR technique also allows for identification of conventional reservoirs, tight zones, over pressure, and changes in lithology.

- Well-log recognition of organic-rich intervals often is critical for detailed sampling and assessment of source potential.

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An Interview with James Fross: Past SPWLA Scholarship Recipient

James Fross

James Fross is a production engineer with Occidental Petroleum Corporation. He oversees production in the Delaware Basin, where he started work with Anadarko Petroleum Corporation in June 2019. Prior to that, he attended the University of Oklahoma (OU), where he spent five years in a combined PE/MBA program, earning his BS in petroleum engineering from the Mewbourne College of Earth and Energy and MBA from the Price College of Business. He had two internships with Anadarko during his time at OU, wherein he evaluated international offshore exploration prospects and helped optimize development in the Wolfcamp shale with the aid of data analytics. James has lived in Texas, Oklahoma, Colorado, Wyoming, Montana, Alberta, and England. He is currently based in Houston, Texas.

When did you receive your SPWLA scholarship, how did you learn about it, how was the process applying for it, and how did that help you or influence your career?

I was honored to receive the SPWLA scholarship during my 2015 to 2016 and 2017 to 2018 academic years at the University of Oklahoma. I learned about the opportunity from the faculty, staff, and students of the Mewbourne College of Earth and Energy. Frances Freeman, Dr. Chandra Rai, and Dr. Carl Sondergeld were among the most vocal advocates of the scholarship to us undergraduates. The application process was relatively straightforward, though it did require letters of recommendation from faculty members. I was able to access the application and requirements at spwla.org. The scholarship encouraged my continued involvement with SPWLA, helped inspire my employment as an undergraduate research assistant at the Integrated Core Characterization Center at OU, and gave me an enduring interest in formation evaluation that aided me, especially during my internships. My first internship involved evaluating international offshore exploration prospects at Anadarko. My second internship concerned optimizing Anadarko's development of the Wolfcamp shale in the Delaware Basin. At the heart of both internships lay the fundamental rock properties that underlie all major capital investments made by E&P companies. My understanding and interest of these rock properties was shaped by early exposure to SPWLA. As a production engineer at Oxy (previously Anadarko) in the Delaware Basin, I rarely need to dive into petrophysics or well logs during my

daily tasks, but I still harbor a passion for formation evaluation that lends me a wider perspective and willingness to cooperate with data-collection efforts (even when they don't directly or immediately enhance our production volumes). I hope to reconnect more with SPWLA material when/if I can serve as a reservoir or completions engineer.

What do you think was the main reason SPWLA approved your scholarship?

Though it is impossible for me to say for sure, I would think that my academic track record, my involvement with the SPWLA chapter at OU, and my desire to learn and apply petrophysical knowledge in my studies and career all contributed to SPWLA's approval of my scholarship.

Did the SPWLA scholarship have some influence on the path you took during your professional life and being a member?

The SPWLA scholarship encouraged me to work in the Integrated Core Characterization Center at OU and probably influenced Anadarko's assignment of my internships. Thus, the scholarship exposed me to exploration, data analytics, and field development strategies. I built some skills in these areas that remain with me today, and a wider awareness and appreciation for corporate functions outside production engineering than I would otherwise possess. Furthermore, earning the scholarship encouraged my continued participation and support at OU's SPWLA chapter.

What do you remember from those times as a student and SPWLA scholarship recipient?

I remember being saturated with classwork, lab work, tech talks, and networking events. Still, though I spent many Saturdays catching up on homework and projects, I am eternally grateful for my time as a student and SPWLA scholarship recipient. Our industry has a lot of niche knowledge and jargon, and every SPWLA tech talk helped bring me a bit more up to speed. Since my freshman fall, WTI crude prices have disappointed more often than not, making it difficult for students to find internships and full-time offers. SPWLA helped set me apart, for which I am continually grateful.

Was there an SPWLA professional or student chapter in your school? Were you a regular at SPWLA events, if any?

As I have alluded to, there was an SPWLA student chapter at my school. I attended almost every event I was able to. We held tech talks several times a semester. I helped serve for a year as a public relations officer for our student chapter.

What was your biggest challenge during graduate school and how did you overcome it?

The University of Oklahoma offered a 4+1 bachelor's in petroleum engineering and MBA degree program. During my senior and fifth year, my greatest challenge was simply juggling engineering classes (all in Norman, Oklahoma), business classes (which were mostly held in Oklahoma City), technical club memberships, service organization commitments, work in OU's laboratories, career building, and some approximation of a social life. I learned more about my limitations with respect to time and energy and of the importance of delivering quality work and being truly present at those events that I committed to. In the end, I had to make tough prioritizations that involved taking fewer active roles in organizations I had previously had more time for in return for offering my best to my studies and my career.

Is there a mistake you made in school that you want to share with others to avoid?

Per my previous response, I would say my greatest mistake was probably attempting to hold onto too many commitments for too long. It is good to explore different ways to constructively spend your time and energy, but you will ultimately be unable to do everything and be everywhere at once, so it is essential to strike a balance between comfort and discomfort with respect to your time, energy, and commitments. Stretch yourself, but don't burn out. In my experience, I'm getting too close to the latter if I find myself booked out every weeknight with a planned meeting/activity.

Who was your role model at school and when you started your career? You can name more than one.

At school, I had many role models. My father, a petroleum engineer for his whole professional career, always inspired me to push forward in my studies and work. My professors often showcased technical passion and a desire to share their knowledge and experience with us students. Fellow students who pushed themselves to master their classes and improve themselves outside the classroom helped keep me focused. My mentors and team members during my internships all encouraged me to strive through my mistakes and doubts to learn, grow, and achieve more. Most people in life model something worth emulating, and I was lucky enough to have many around me who had much worth emulating.

How did you start your career in petrophysics and formation evaluation?

I started my career in petrophysics and formation evaluation during my two internships with Anadarko. As mentioned above, these involved international offshore exploration and data analytics-driven optimization of Wolfcamp development in the Delaware Basin. I hope to pick up the thread of that technical journey someday with a reservoir or completions engineering role.

How do you convey the importance of petrophysics/formation evaluation to your colleagues from other disciplines when collaborating on a project?

As a production engineer, I am usually on the receiving end of this conversation. It is often geologists and reservoir engineers who have a more active role in promoting petrophysics/formation evaluation. That being said, I readily acknowledge the importance of characterizing the subsurface and contribute to related conversations as best I am able in the hopes of my company pursuing optimal development of our acreage. I also try to stay receptive to data-collection efforts that may have no obvious benefit to myself or my existing wells but are vital for future development.

Where do you see yourself in five years?

A year ago, I would have easily answered that I saw myself in a reservoir or completions engineering role. I still have an affinity for these roles and hope to experience them, though I have also found to my surprise and pleasure that I very much enjoy production engineering as well. In truth, I still have much to learn and experience. I will endeavor to increase my skills and perform as efficiently as possible wherever the company needs me in these trying economic conditions. Hopefully, my path will cross again sometime in the not-too-distant future with a development role, where my confluence of business knowledge and passion for rock properties and analytics will serve me well.

Any personal activities or background you want to share?

I enjoy sporting clay shooting, running, camping, reading, writing, drawing, and video games. I consider my faith and family to be my core values, and I intend to live my life to continuously learn, serve others, and improve the world.

What do you recommend to current students in petroleum engineering and geosciences, especially with work/research in the field of petrophysics/formation evaluation?

Follow your passion. Be wary of embracing a position, field of knowledge, or activity due to expediency. Give what you're doing your all. If you can't, consider whether you should be doing it in the first place. Learn to work with others, both leading and being led, as that will increase your own abilities and prove vital in everything you do professionally. Be curious. Avoid arrogance. Even when you think you're the best qualified person in the room, you have plenty to learn. Do not be discouraged by the highly technical nature of petrophysics/formation evaluation and our industry in general. You will know virtually nothing at first. After years, you will know some. Whatever your level of knowledge, you will be able to contribute if you listen, have the courage to inquire, and seek the truth rather than comfort. People are everything. Know yourself, try to learn more about others, seek advice, and don't betray your word. Many things become obsolete in time, but your character will always be relevant.

How do you see the future of SPWLA and what do you think we need to do to keep our society current?

Embrace unconventionals. I'm biased as my career has been mostly tied to the Wolfcamp thus far, but there is plenty of room for innovation in the characterization of unconventional resources. There is room for data analytics and sound technical interpretation of our target formations.

Anything else you want to add?

Thank you to SPWLA for investing in me and many other students. Thank you for the opportunity to share my experience and knowledge, limited as both may be thus far in my career! Good luck to all in the midst of challenging prices and Covid-19.

An Interview with Julie Bloxson: Past SPWLA Scholarship Recipient

Julie Bloxson

Julie received her BS degree in geology from The University of Akron in 2008, where she focused her undergraduate research on core analysis of tidal rhythmite deposits associated with Pennsylvanian coal seams within the Appalachian Basin. She received her MS degree in geology from Kent State University in 2012, studying the Grimbsy Sandstone/"Clinton Sands" in Eastern Ohio. This project focused on using a combination of core and well-log analysis to extrapolate porosity and permeability across a county and determined the controlling factors of porosity/permeability in these tight gas sands. She received her PhD degree from Case Western Reserve University in 2017, focusing on the Utica Shale and controls on deposition. Julie continued this work at the Ohio Geological Survey, working within the Energy Group on various subsurface mapping projects that focused on salt deposits, carbon sequestration, and unconventional resources for two years.

She is currently an assistant professor at Stephen F. Austin State University since 2018 and heads the East Texas Core Repository at the Science Research Center, where she is creating the Black Shale Research Facility. This facility will help to expand nondestructive core analysis and continue to correlate core data to well-log data for better subsurface analysis for natural resources and energy-related issues. Her goal for the facility is to allow students to gain the necessary skills for industry and research and to facilitate a connection between local industry and academia for future research.

When did you receive your SPWLA scholarship, how did you learn about it, how was the process applying for it, and how did that help you or influence your career?

I applied for the SPWLA scholarship during my PhD studies in 2013. A flyer for the scholarship was posted on a bulletin board in our department after I believe it was sent out by SPWLA. The

process of applying for it was straightforward: Fill out the application, ask for two letters of recommendation, mail it in. This scholarship made it possible to conduct my research. While I was supported by scholarships and a stipend from the department, my research was relatively unique and unfunded by a faculty member. This scholarship made it possible to conduct the core research by funding travel, fees associated with core viewing and sampling, and measuring XRD. These were then compared to publicly available well-log data, creating a more accurate model of the subsurface. This work also further cemented my interest in subsurface core and well-log research. The amount of information that can be gathered from such an abundant data source is staggering, especially once coupled with core data. Not always straightforward, this coupling of petrophysical and core data can be challenging, yet the results can better represent the subsurface. This challenging and fascinating work is what draws me back every day to the lab. Every time I look at a new set of cores, or even revisit a set I've seen dozens of times, something new is always seen in the core, and the well-log data can surprise me even more.

What do you think was the main reason SPWLA approved your scholarship?

SPWLA has high standards for the recipients of their scholarships. Heading our department scholarship committee here at SFASU, I have a general idea of what should be expected. I believe it was approved mainly because of the unique and well-thought out nature of the research. It was presented in a clear, concise manner that also provided a thorough picture of the goals of the study, which aligned with the vision of the Society. Also, the application was complete in nature, with strong letters of recommendation.

Did the SPWLA scholarship have some influence on the path you took during your professional life and being a member?

Being awarded the scholarship made me realize that my research was important and worth studying. I was able to create a more in-depth study, developing a deeper appreciation for subsurface energy work.

What do you remember from those times as a student and SPWLA scholarship recipient?

I remember our small group of graduate students in the department and the bonds we created during our time spent together. There were six to ten of us at a given point in time, so our bonds were strong. To this day, I still talk to my office mates, both professional and personal.

Was there an SPWLA professional or student chapter in your school? Were you a regular at SPWLA events, if any?

No, there was not a chapter at CWRU.

What was your biggest challenge during graduate school and how did you overcome it?

Keeping on task. Graduate school requires you to create a schedule and stick to it to complete on time. Balancing academic, professional, and personal aspects can be challenging, and graduate school will help you learn how to manage research, learning, work, and personal relationships.

Is there a mistake you made in school that you want to share with others to avoid?

Explore. Explore when at conferences, explore on the weekends, explore different topics that you are interested in. Just get out and explore what is available, both what can help you in a future career but also personally. Graduate school may not seem like an ideal time to have a hobby, but it is a part of a balanced life.

Who was your role model at school and when you started your career? You can name more than one.

My advisor, Beverly Saylor. She taught me to be a strong woman in science. She is intelligent, well spoken, and all-around a lovely person.

How did you start your career in petrophysics and formation evaluation?

By taking a class. During my master's program, there was a course on core and well logging, which started me down this path of formation evaluation. I tend to stick more to formation evaluation, rather than true petrophysics, combining physical properties measured in core with the well-log information to extrapolate across a region. Once I had the basics down, I continued with these methods into my PhD, and still continue today, mostly because of the abundance of information you can obtain publicly and the challenge it presents.

How do you convey the importance of petrophysics/formation evaluation to your colleagues from other disciplines when collaborating on a project?

Mostly because of the vast data sets that can be obtained, many are onboard. Many already know the basic necessity of borehole data because there is a lack of core data on the subsurface. Once we can obtain a large enough data set, particularly with adequate well logs, combined with core and statistical techniques, most colleagues are excited with what can be done to tell the story of the subsurface.

Where do you see yourself in five years?

Tenured and as an associate professor here at SFASU.

Any personal activities or background you want to share?

I currently live in deep east Texas with my daughter and husband, enjoying all the outdoor activities that are offered year-round down here. I am excited to share my love of learning about the world with her and hope to convey the excitement to others as well.

What do you recommend to current students in petroleum engineering and geosciences, especially with work/research in the field of petrophysics/formation evaluation?

Become well rounded, and don't ignore math and the other sciences. Statistics, computer programing, and integrating vast amounts of data are the future of the geosciences. Knowing other areas of expertise will help.

How do you see the future of SPWLA and what do you think we need to do to keep our society current?

Continue to update with current trends in data analytics, integrating data from all fields. Workshops and seminars to help learn skills.

Anything else you want to add?

Thank you to SPWLA for their continued support of young researchers and helping to create a fostering atmosphere for new geoscientists.

An Interview with Edwyn Bougre: Past SPWLA Scholarship Recipient

Edwyn Bougre

Edwyn Bougre is currently a graduate student pursuing an Msc degree in petroleum engineering and data science from Texas Tech University (TTU). He holds a BSc degree in petroleum engineering from Kwame Nkrumah University of Science and Technology in Ghana where he hails from. He currently works part time as a graduate assistant in the Petroleum Engineering Department. He worked as a production engineer with Ghana National Petroleum Corporation from 2017 to 2018 before deciding to pursue further education in the United States. He also worked as a frac valve technician with Encore Wellhead Systems in summer 2018.

When did you receive your SPWLA scholarship, how did you learn about it, how was the process applying for it, and how did that help you or influence your career?

I received my SPWLA scholarship during the 2019 to 2020 academic year while I was pursuing my master's degree in petroleum engineering at Texas Tech. I was informed of the opportunity by Ibe Ezisi who was pursuing his PhD degree in petroleum engineering and Daniel Owusu Ansah who was pursuing his master's degree in petroleum engineering and was then the president of SPWLA for the Texas Tech Chapter. I applied through the SPWLA website and had to get recommendations from some professors in the department.

What do you think was the main reason SPWLA approved your scholarship?

I believed SPWLA approved my scholarship because of my active involvement and volunteering in the activities that TTU SPWLA organized and also for my participation in the annual SPWLA student paper contest from which I gained the opportunity to present my research in the main event in Houston, Texas later that year.

Did the SPWLA scholarship have some influence on the path you took during your professional life and being a member?

I became more involved in SPWLA activities and later served as vice president for the TTU SPWLA Chapter and have maintained continuous involvement and an active membership since I first joined in school.

What do you remember from your time as SPWLA scholarship recipient?

I remember attending a variety of events organized by school, such as a well-logging truck visit from Baker Hughes to show us how well-logging operations were conducted on field, participating in the organization of the Annual SPWLA Industry Short Course that TTU SPWLA hosts every year and also attending the SPWLA Symposium in The Woodlands, Texas, where I had the opportunity of meeting a lot of industry professionals.

Was there an SPWLA professional or student chapter in your school? Were you a regular at SPWLA events, if any?

Yes, there was an SPWLA student chapter in my school that I joined in my first semester of pursuing my master's degree in TTU. I regularly attended events and also volunteered in a number of activities.

What was your biggest challenge during graduate school and how did you overcome it?

My biggest challenge was working on my thesis. It was an experiment involving gas injection into shale samples. I had to spend a lot of time in the laboratory working on my research while working part time and taking classes. However, with a lot of hard work and diligence, I was successfully able to finish my experiment and ace all my classes.

Is there a mistake you made in school that you want to share with others to avoid?

As a graduate student, I was mostly focused on my research work and my classes and had little time to network with people from other departments or fields of study. I would advise all incoming students, especially those in the graduate program, to make time for networking, even with people from different fields of study.

Who was your role model at school and when you started your career? You can name more than one.

My role models at school were Ibe Ezisi, Doyin Kolawole, and Wigwe Marshal, all three of whom are PhD students in the petroleum engineering department. I would associate a lot of my success to these three as I got tons of advice and help from them.

How do you convey the importance of petrophysics/formation evaluation to your colleagues from other disciplines when collaborating on a project?

I have not yet started a career in petrophysics, but I hope to do so upon graduation from school. However, I have learned a lot from the research I worked on for the student paper contest and also from the classes I took at school. I emphasize the need for having high-quality data for our analysis. There is great uncertainty in petrophysical evaluations. As a result of this, it is very imperative that we gather high-quality data to improve our evaluations and assessments

Where do you see yourself in five years?

I see myself working in the intersection of the energy sector and technology, particularly with regards to the field of data science, working with the latest advancements in machine learning, cloud computing, and big data as applicable to the oil and gas industry to develop our insights in predictive analytics.

Any personal activities or background you want to share?

I love swimming and traveling a lot. I usually plan a trip to a new city with every opportunity I get and plan on visiting every state in the United States.

What do you recommend to current students in petroleum engineering and geosciences, especially with work/research in the field of petrophysics/formation evaluation?

I would say that the area of data science/data analytics is a very good area to get into right now. It is a very fascinating area of study and largely applicable to petrophysics and formation evaluation with a lot of research and projects that one can undertake.

How do you see the future of SPWLA and what do you think we need to do to keep our society current?

I strongly believe that SPWLA has a very large capacity for growth. I think a very strong emphasis should be placed on the student chapters in the various schools, especially ones where a student chapter may be very small or nonexistent. This would greatly help in growing SPWLA to an even larger body.

Anything else you want to add?

Being a part of SPWLA has been a very great experience, and I am very grateful for all the networks I have made because of being part of this organization.

SPWLA FIRST BOARD OF DIRECTORS MEETING

REMOTE (DUE TO COVID, IN PERSON CANCELED)

JUNE 23, 2020

President James "Jim" Hemingway called the meeting to order at 8:00 a.m. In attendance, President-Elect Katerina Yared, Vice President Finance, Secretary and Admin Doug Patterson, Vice President Technology Tegwyn Perkins, Vice President Education Fransiska Goenawan, Vice President Publications Mayank Malik, Vice President Information Technology Lin Liang, Regional Director N. America 1 Robin Slocombe, Regional Director N. America 2 Kelly Skuce, Regional Director Asia/Australia Jennifer Market, Regional Director Europe Craig Lindsay, Regional Director Middle East/ Africa Nelson Suarez, and Executive Director Sharon Johnson. Absent: Regional Director Latin America Fernando Maia, Jr.

Visitor, Boston Symposium Chairman Paul Craddock, gave a brief report on hosting the 2021 Annual Symposium.

A motion made by Jennifer Market to waive the reading of the May meeting minutes was seconded by Doug Patterson. All approved, and the motion passed.

Scheduled board meeting dates

June 23, 2020, SPWLA Business Office Houston and Teleconference

August 25, 2020, SPWLA Business Office Houston and Teleconference

October 20, 2020, SPWLA Business Office Houston and Teleconference

December 15, 2020, SPWLA Business Office Houston and Teleconference

February 16, 2021, SPWLA Business Office Houston and Teleconference

April 20, 2021, SPWLA Business Office Houston and Teleconference

A motion made by Kelly Skuce to adjourn the meeting was seconded by Robin Slocombe. All approved, and the motion passed. Meeting adjourned at 11:30 a.m.

Respectively Submitted by
Sharon Johnson
Executive Director

Next BOD meeting: August 25, 2020, SPWLA Business Office Houston

SPWLA SECOND BOARD OF DIRECTORS MEETING

REMOTE (DUE TO COVID IN PERSON CANCELLED)

AUGUST 25, 2020

President James “Jim” Hemingway called the meeting to order at 8:02 a.m. In attendance, Vice President Finance, Secretary and Admin Doug Patterson, Vice President Technology Tegwyn Perkins, Vice President Education Fransiska Goenawan, Vice President Publications Mayank Malik, Vice President Information Technology Lin Liang, Regional Director N. America 1 Robin Slocombe, Regional Director Asia/Australia Jennifer Market, Regional Director Middle East/Africa Nelson Suarez, and Executive Director Sharon Johnson. Absent: President-Elect Katerina Yared, Regional Director N. America 1 Kelly Skuce, Regional Director Latin America Fernando Maia, Jr., and Regional Director Europe Craig Lindsay

Action Item: All board members submit budget items to Doug Patterson by August 31.

Action Item: Sharon Johnson research venues in Houston to possibly host the 2021 symposium.

Action Item: Jim Hemingway to immediately reach out to Michael O’Keefe to get an update on the progress of the 2020 Symposium best paper results.

Action Item: Lin Liang will reach out to Knowledgette to discuss the renewal of our partnership contract.

Action Item: Lin Liang will check plans and pricing for communications platforms, such as Webex and/or Zoom, for chapters’ use and make recommendations to the board.

Meeting adjourned at 10:40 a.m.

Respectively Submitted by
Sharon Johnson
Executive Director

Next BOD meeting: October 20, 2020, SPWLA Business Office Houston

ABERDEEN FORMATION EVALUATION SOCIETY

Recent Events

18 August 2020—AFES planned to host a field trip to the Ythan Estuary, Newburgh, around 15 minutes north of Aberdeen. However, due to local CV19 restrictions in place at the time, the AFES Committee felt it was prudent to cancel the event. We will try to reschedule for Spring 2021.

2 and 9 September 2020—AFES held their first web-based full-day seminar. The theme was Cores and Coring:

The free event was very well attended with delegates present from both the local Aberdeen area, UK wide, and from around the globe. As we come to terms with the new normal, we at AFES are realizing significant advantages to hosting web-based events.

SESSION 1 - Wednesday 2nd September				
13:00	13:15	AFES		Opening slides
13:15	14:00	Keynote: Iulian Hulea	Shell Gloal Solutions BV	Understanding fundamental controls of hydrocarbon saturation: from stress corrections to perched water contacts
14:00	14:30	Craig Lindsay	Core Specialist Services	Big Data From Core – Multi-Sensor Core Logging Case Study
14:30	15:00	Adam Moss	AKM Geoconsulting	Successful Core Analysis – A Lab & Opco Perspective
15:00	15:30	Quentin Fisher	University of Leeds	Core analysis as part of the fault property prediction workflow
15:30	16:00	Izaskun Zubizarreta	Indar Solutions	Core wettability - can we get it right?
SESSION 2 - Wednesday 9th September				
09:00	09:30	Colin McPhee	Mercat Energy	SCAL Data Quality Control for Static & Dynamic Reservoir Modelling: A Case Study
09:30	10:00	Philippe Rabiller	Rabiller Geoconsulting	Capillary Pressure - An Integrated Flow Chart For Carbonate Reservoir Characterization From Resource Assessment To Field Development And EOR
10:00	10:30	Alan Swanson	Core Laboratories	Dual Energy CT Scanning – Millimeter-Scale Log for Cored Intervals
10:30	11:00	Henk Kombrink	North Sea Core	The Second and Not So Secret Life of Core with the North Sea Core Initiative
11:00	11:30	Chris Reed	Mercat Energy	Integration of Continuous Core Strength Measurements and Rock Mechanics Tests for Optimised Strength Models in Geomechanics Applications
11:30	11:35	AFES		Closing remarks

Details and also the presentations are available for download via the “archives” section of the AFES website (www.afes.org.uk).

21 September 2020—This year, DEVEX was a week-long program of free digital events focusing on the full cycle of reservoir discovery, evaluation, development, and recovery. DEVEX is jointly hosted by PESGB, SPE, and AFES. www.devex-conference.org. As with many online events, this event was well subscribed, with delegates tuning in from both UK and global locations.

7 October 2020—AGES hosted a web-based Annual General Meeting (AGM). This was also followed by a Technical Talk by Probe Oil Tools (*Multi-String Isolation Logging–A Cost-Effective Solution for P&A*).

The AGM included:

- Review of last year's AFES activities, including Technical Talks, social events, Christmas quiz, Devex 2020, etc.
- Best Petrophysics Student (2019/2020) from the University of Aberdeen
- Review of AFES Student grants and charitable donations
- AFES finances (August 2019 to July 2020)
- Committee positions:
  - Greg Blower is delighted to be staying as President for another year at least. The current Committee requested Greg remain, and Greg is very honored to have this vote of confidence by the AFES Committee.
  - AFES would like to welcome in Girvani (Secretary), Alex (Media), Chris (Sub Committee), and also Daniel (Student Rep). We're looking forward to working with Girvani, Chris, and Daniel, who are new to AFES, and also Alex, who has stepped into the Media Officer role from the Sub Committee.
  - We'd also like to say a big "Thank You" to Kostas for his work as our Secretary in the last 12 months.
  - Jeremy Titjen is stepping down from Media, but we're relieved to say he'll be on the Sub Committee for the foreseeable future.

More details http://www.afes.org.uk/committee/

Position	Current 2019-20	Proposed 2020-21
Executive Committee		
President	Greg Blower	Greg Blower
VP Technology (Lectures)	Chee Kong Chen	
VP Seminars	Stephen Morris	Stephen Morris
Secretary	Kostas Christou	Girvani Ganeshalingam *
Treasurer	Neil Cardy	Neil Cardy
Student Rep	Alistair Swan	Daniel Ronald
Past President & Devex Rep	Ed Downer	
Technical Sub Committee		
Communications/Media Officer	Jeremy Titjen	Alex Kaye*
University Liaison Officer	Ebrahim Heydari	
Sponsorship	John Banks	
Additional Technical Sub Committee	Craig Lindsay (SPWLA Representative) Damien Dennison Chris Blair* Tegwyn Perkins Jeremy Titjen	

Upcoming Events

AFES has a series of web-based Technical Talks as we enter the winter periods. Unfortunately, due to ongoing CV19 issues, we have decided to cancel this year's November Pub Quiz.

11 November 2020—TECHNICAL TALK: NIXAN SAXENA / MATTHIAS APPEL, SHELL (SPWLA DISTINGUISHED SPEAKER)

18 November 2020—TECHNICAL TALK: READ CASED HOLE

9 December 2020—TECHNICAL TALK: VASSILIOS KELESSIDIS (SPE DISTINGUISHED LECTURER)

13 January 2021—TECHNICAL TALK: PAUL CRADDOCK, SLB (SPWLA DISTINGUISHED SPEAKER)

10 February 2021—TECHNICAL TALK: ALBERTO ORTIZ, YPF S.A. ARGENTINA (SPWLA DISTINGUISHED SPEAKER)

21 April 2021—FULL DAY SEMINAR: Theme to be confirmed but likely to be Porosity/Permeability. The event is potentially a blend of real and virtual attendance

Please check our website (www.afes.org.uk), or contact Greg (greg.blower@gaia-earth.co.uk) for details. We are also available on Facebook and Linkedin.

Finally, AFES would like to extend thanks to our sustaining annual sponsors:

ARGENTINA CHAPTER

General News

The new board for Argentina Chapter was updated on 1 June 2020, and it is shown in the following table:

FUNCTION	NAME	COMPANY	EMAIL
President	Marta D'Angiola	Weatherford Arg.	marta.dangiola@weatherford.com
Past-President	Angel Lopez	Baker Hughes	angel.lopez@bakerhughes.com
Secretary	M. Lorena Caviglia	Pan American Energy	mcaviglia@pan-energy.com
Technology	Paula Bedini Claudio Naides Pablo Pateti Pablo Saldungaray	YPF-Tecnología Pampa Energía Wintershall DEA Schlumberger	paula.c.bedini@ypftecnologia.com claudio.naides@pampaenergia.com pablo.pateti@wintershalldea.com PSaldungaray1@slb.com
Events	Luz Rodriguez	Total Austral	luz.rodriguez@total.com
C. Rivadavia Delegation	Eduardo Breda	Consultant	bredaedu@hotmail.com
Neuquen Delegation	Nicolas Carrizo	YPF S.A.	nicolas.carrizopaez@ypf.com
Mendoza Delegation	Ariel Buchini	YPF S.A.	ariel.r.buchini@ypf.com
Buenos Aires Delegation	Guillermo López Peze	Pan American Energy	GLopezPeze@pan-energy.com
Web page:	Pablo Uzzo	Tecpetrol S.A.	uzzito@hotmail.com

New board for Argentina Chapter since 1 June 2020.

Technology/Innovation Team will have the responsibility of promoting and keeping our community informed of new technological advances and innovation. They are high-level senior professionals who work daily with these issues. For this reason, they will contribute novel themes and ideas to be developed and disseminated through the different activities proposed.

The **regional delegates** will be responsible for obtaining visibility of our chapter at the different bases of the interior of the country and for achieving a close approach in general with the educational and university communities. They will receive and transmit concerns, uncertainties, ideas, and proposals of those professionals from all over the country, and on that, we will work.

The importance of the **support team,** including Secretary, Events Agent, and Webpage and Diffusion Agents, is immense. They will ensure all the activities and technical events that arise in the chapter are organized successfully.

Due to the global pandemic, we are designing different formats of activities. We must be creative and take this situation as a great opportunity for professional and personal growth.

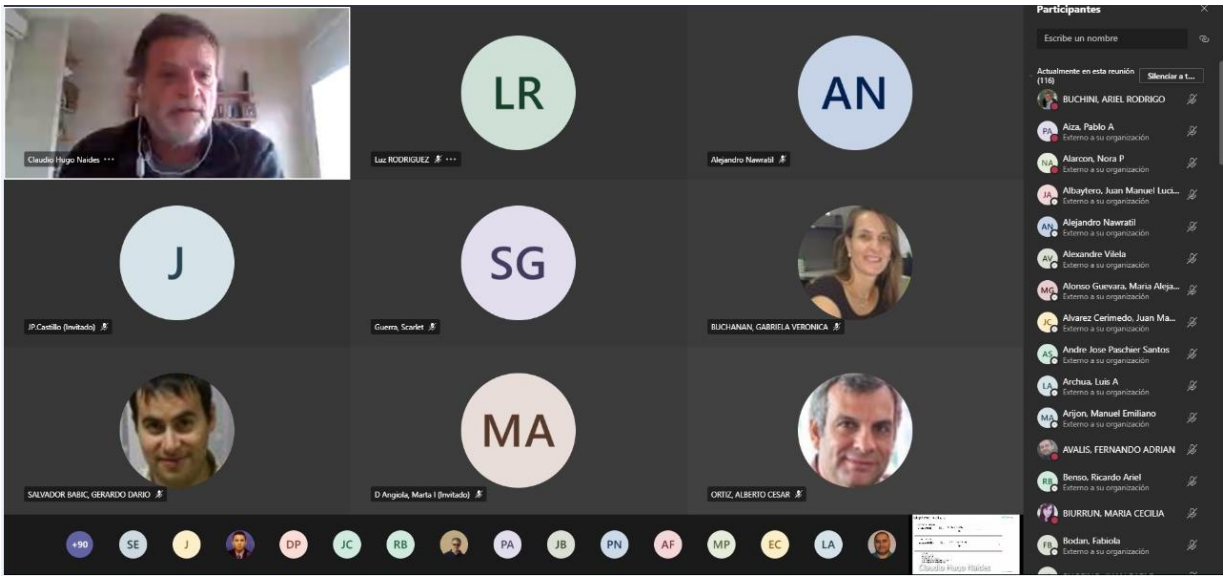
Recent Events

Open Talks Cycle

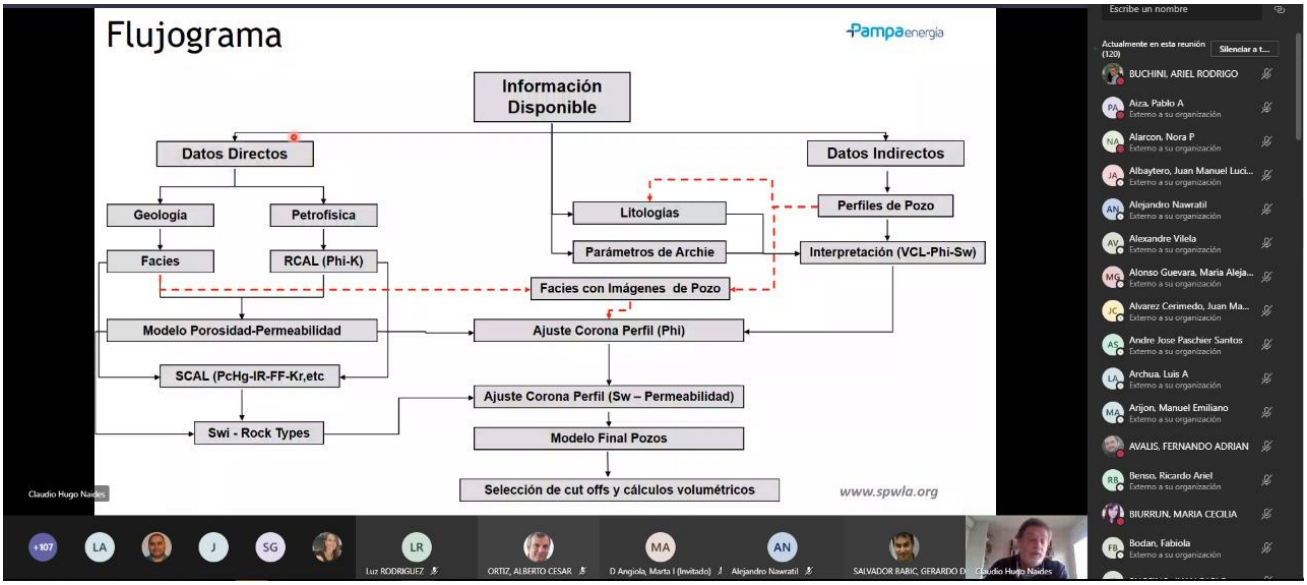
Eary September 2020—We invited Claudio Naides to present this talk. For this event, we used our database of more than 300 contact emails in order to reach each of them and promote this activity. The event was attended by more than 140 professionals who listened carefully to Claudio and showed deep interest in posting many related comments.

Distinguished Speaker Claudio Naides.

Unfortunately, due to the pandemic, these are the only pictures we can share. The chairmen were Alberto Ortiz (YPF S.A.) and Luz Mery Rodríguez (Total Austral). Although we are not able to give applause, we are able to thank our Distinguished Speakers.



Screenshot waiting for Claudio to start his talk.



A view during the presentation. Note the list to the right showing that the number of attendees was about 120 at that moment.

The video of the event was uploaded to a private YouTube Channel and shared with our members through the following link: https://youtu.be/Kgmzqh6FtVk

Distinguished Speakers Program

Our candidates Alberto Ortiz and Pablo Saldungaray have been selected and are now part of the Global Distinguished Speaker Program for 2020–2021. See the image below for their name and paper presentations.

2020-2021 SPWLA GLOBAL DISTINGUISHED SPEAKER					
No	**Name**	**Title**	**Affiliation**	**Email Address**	**Location**
1	Alberto Ortiz	WHAT WE HAVE LEARNED FROM THE PETROPHYSICAL EVALUATION OF THE VACA MUERTA FORMATION IN THE LAST 5 YEARS OF UNCONVENTIONAL SHALE PLAY DEVELOPMENT	YPF	Alberto_ortiz@hotmail.com	South America
2	Ali Ousseini Tinni	ELECTRICAL PROPERTIES OF SHALES	University of Oklahoma	alitinni@ou.edu	North America
3	Iulian Hulea	FROM HOMOGENEOUS TO HETEROGENEOUS ROCKS- UNDERSTANDING FUNDAMENTAL CONTROLS OF HYDROCARBON SATURATION: PERCHING EFFECTS	Shell	Iulian.Hulea@shell.com	Europe
4	Paul Craddock	THERMAL MATURITY-ADJUSTED LOG INTERPRETATION (TMALI) IN ORGANIC SHALES	Schlumberger	PCraddock@slb.com	North America
5	Muhammad A. Gibrata	AN INTEGRATED PETROPHYSICAL EVALUATION FOR RESERVOIR CHARACTERIZATION AND MODELING IN FIELD DEVELOPMENT	Dragon Oil	mgibrata@dragonoil.com	Middle East
6	Pablo Saldungaray	CASED HOLE FORMATION EVALUATION: AN ALTERNATIVE TO OPTIMIZE DATA ACQUISITION AND REDUCE OVERALL COSTS IN MATURE FIELDS	Schlumberger	psaldungaray1@slb.com	Middle East/ South America
7	Luis Quintero	RESERVOIR PRESSURE IN TIGHT GAS FORMATIONS FROM A PRESSURIZED CORE SYSTEM	Halliburton	Luis.Quintero@halliburton.com	North America

List of the SPWLA GDS selected for 2020–2021.

Membership Campaign for Argentina Chapter

We started a campaign in order to normalize Argentina Chapter memberships. We encouraged professionals who were interested in our activities to enroll in one of the categories SPWLA offers. The results were amazing, and today, we have 19 Members and 12 new Argentina Chapter Affiliates. We will go on “recovering” members!

Upcoming Events

Open Talks Cycle

October–November 2020—We are planning to invite our new GDS Pablo Saldungaray to give an online talk in our Cycle of Open Talks. The topic of the talk will be about his paper, “Cased Hole Formation Evaluation: An Alternative to Optimize Data Acquisition and Reduce Overall Costs in Mature Fields.”

In our monthly meetings, we proposed different formats for upcoming activities, which have been adapted to the current situation. We have organized them, taking into consideration the timing required.

Short Term: Talk Format

Topic 1: Electron Spectroscopy

Topic 2: Organic Petrology

They will be performed by Y-Tec specialists, and they will be coordinated by Paula Bedini. They may be scheduled for Q4 2020, depending on the availability of speakers.

Medium Term: Workshop or Debate Format

Data Analytic Topic: Uses and Abuses

We proposed Alberto Ortiz (GDS 2020–2021) as moderator of the meeting; the event may include two to three speakers, and it will be coordinated by Pablo Saldungaray. Its duration will be 1.5 hours to allow time for questions. This event will be organized for Q4 2020 or Q1 2021.

Long Term: Roundtable Format

Geonavigation Topic

We propose to do this event from two perspectives: operators and service companies. The idea is that this event serves the needs of operators and the rest of the audience who participate. It is not a space that service companies use to market their tools. The oil companies will define the contents: problems and challenges, what happens in volcanic areas, in organic areas, in fractured areas, etc. (YPF, Pluspetrol, and Chevron are happy to participate). Participating service companies may include Schlumberger, Baker Hughes, Weatherford, and Rogii. This event is planned for 2021, and it will be coordinated by Marta D’Angiola and the support of the rest of the team.

BANGKOK CHAPTER

General News

2019 Chapter Committee Members:

President ……..…..Andrew Cox
Technical Coord ..……...……Numan Phettongkam
Treasurer ……...Sirinya Maykho
Web Coordinator……..……..……Alexander Beviss
Secretary……...Ronald Ford
Sponsorship ……..……..……Ryan Lafferty
Student Liaison ……..……..Kruawun Jankaew
Member at Large ……..Greg Heath

Please visit https://www.spwla.org/SPWLA/Chapters_SIGs/Chapters/Asia/Bangkok/Bangkok.aspx for meeting information. Email: bangkok.chapter@spwla.org

Recent Events

September 2020—Webinar: LQC…Easy as 1,2,3! was presented by Martin Storey (Well Data Quality Assurance, Asia Pacific and Distinguished Speaker for SPWLA). Martin outlined the common shortcomings seen in LQC and presented a framework to formalize and simplify log quality control in operating companies and other data-user organizations.

Martin Storey, Well Data Quality Assurance

October 2020—Meeting: An integrated petrophysical evaluation to address low-contrast pay in the GoT, presented by Ryan Lafferty (consulting petrophysicist). Ryan presented a case study illustrating the workflow used to assess potential causes of unexpected resistivity profiles in the Bualuang Field using both conventional petrophysical models and more advanced resistivity-inversion modeling and the implications for field volumetric evaluation.

Ryan Lafferty, consulting petrophysicist.

Please check the local website for details on upcoming meetings:
https://www.spwla.org/SPWLA/Chapters_SIGs/Chapters/Asia/Bangkok/Bangkok.aspx

Upcoming Events

November 2020—Wireline Conveyance–Insights and Technologies. November will see dual presentations on wireline conveyance, with insights and exciting new technologies from two of the leading consultants in this field (Regis Vincent of Petromac Ltd. and Ronald Ford of Gaia Earth Group).

December 2020—Christmas break.

March 2021—SPWLA Bangkok Asia Pacific Regional Conference 2021: The SPWLA Regional Conference AP-2020 is now tentatively scheduled (subject to Thailand opening the borders for travel). Please contact us at ap2020@spwla.org for the updates or if you have any questions on the SPWLA Bangkok Asia Pacific Regional Conference 2020.

BOSTON CHAPTER

General News

We continue to prepare for the 62nd SPWLA Annual Symposium to be hosted by Boston in 2021. The Boston Chapter and the symposium organizing committees are in frequent contact, despite the disruptions from the COVID-19 pandemic, and we are laying the groundwork for the next symposium.

Several members of the Boston chapter have been honored as Distinguished Speakers for the 2020–21 series. They are:

- **Julie Kowan**, for the presentation of CONCLUSIVE PROOF OF WEAK BEDDING PLANES IN THE MARCELLUS SHALE AND PROPOSED MITIGATION STRATEGIES; by Julie Kowan, Baker Hughes; Luke Schanken, EQT Corporation and Robert Jacobi, Geoscience Consulting and University at Buffalo (SPWLA-5050).
- **Nikita Seleznev**, for the presentation of DETERMINING WATER-FILLED POROSITY OF TIGHT OIL RESERVOIRS WITH A NEW INTERPRETATION METHOD FOR DIELECTRIC DISPERSION MEASUREMENTS; by Nikita Seleznev, Tarek M. Habashy, Michel Claverie, Schlumberger; Hanming Wang and Haijing Wang, Chevron U.S.A Inc; Amir Hermes, Jason Gendur, Ling Feng and MaryEllen Loan, Schlumberger (SPWLA-5044).
- **Jeffrey Miles**, for the presentation of FORMATION CHLORINE MEASUREMENT FROM SPECTROSCOPY ENABLES WATER SALINITY INTERPRETATION: THEORY, MODELING,

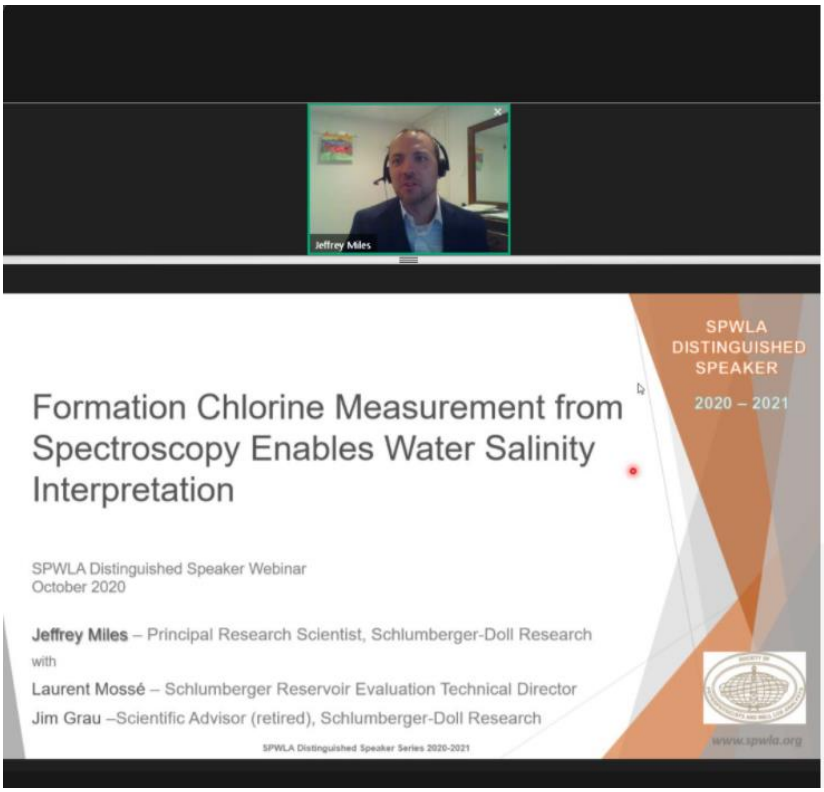
AND APPLICATIONS; by Jeffrey Miles, Laurent Mossé, and Jim Grau, Schlumberger (SPWLA-5009).

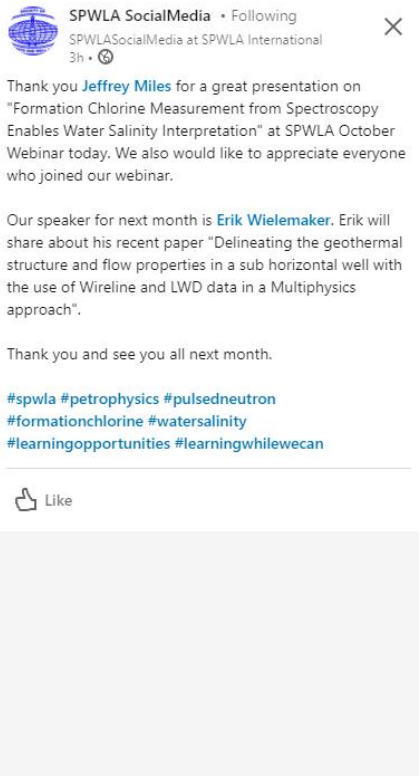
Additionally, we have another member continuing as part of the “Global” Distinguished Speaker group:

- **Paul Craddock**, for the presentation of THERMAL MATURITY-ADJUSTED LOG INTERPRETATION (TMALI) IN ORGANIC SHALES; by Paul Craddock, Rick Lewis, Jeffrey Miles, Andrew Pomerantz; *Petrophysics*, **60**(5) (October 2019).

Recent News

8 October 2020—Jeff Miles kicked off the new season of Distinguished Speakers with two webinars hosted by SPWLA International. Pictured, Jeff presented “Formation Chlorine Measurement From Spectroscopy Enables Water Salinity Interpretation” to a global audience of 80 virtual attendees.





SPWLA general members and Boston-affiliate members are invited to browse our chapter website http://boston.spwla.org for up-to-date information on our mission and events, including event details and registration.

BRAZIL CHAPTER

General News

The actual board was elected in late 2019 and will serve the chapter in the years 2020 and 2021.

President……...Gabriel do Nascimento Freitas (Petrobras)
Vice President……..Giovanna Carneiro (Schlumberger)
Secretary……..Jesus Salazar (Baker Hughes)
Treasurer……..André Bertolini (Sclumberger)
Relations with students……..Lucas Abreu Blanes de Oliveira (Petrobras)
Publications……..Lenita Fioriti (Petrobras)

We also have Mateus Barroso (Halliburton, former treasurer) as an advisor and Rafael Cremonini (Baker Hughes) as a volunteer. We also have the great support of Fernando Maia (Petrobras), recently elected as the Director of the Latin America section of SPWLA.

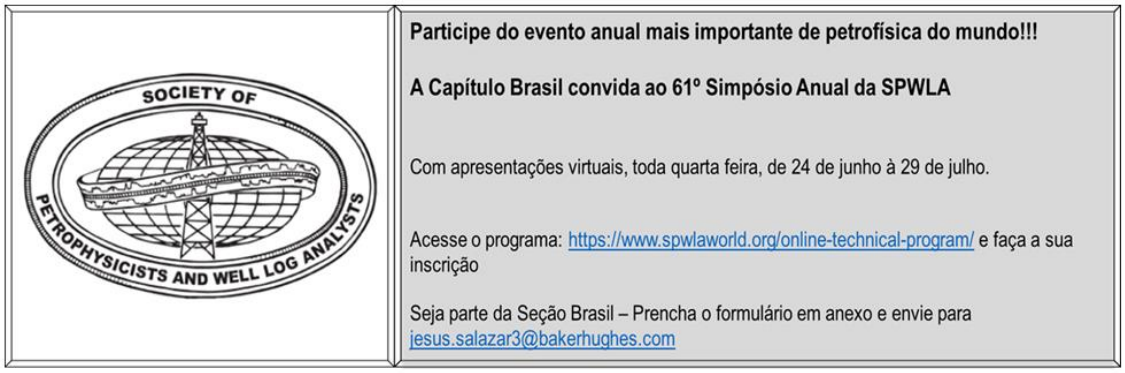
At the beginning of this year, the Brazil SPWLA Chapter update was made at the registry office and the bank.

This pre-COVID-19 photo* is a record of our last face-to-face meeting in December 2019, when the election of the board was held. (From left to right) Rafael, Lenita, André, Gabriel, Jesus, Giovanna, and Fernando.

Our monthly meetings started in August. Before this, our board has been meeting and organized a new presentation format due to COVID. Nowadays, our monthly meeting occurs every third Tuesday of the month, at 4 p.m. (Brazil), in online format (Teams platform). Anyone wishing to participate or receive information about the chapter can contact our Secretary, Jesus Salazar (Jesus.Salazar3@bakerhughes.com). We also post chapter updates on our Facebook page (fb.me/SPWLABrazil) and our LinkedIn page. Check us out!

Recent Events

June—We encouraged the Brazil SPWLA Chapter members to participate in the SPWLA 61st Annual Symposium. The virtual presentations could be accessed through the link https://www.spwlaworld.org/online-technical-program/



For this event, board chapter members published the following articles:

Souza, A. de L., Rocha, P.P. de J., Fioriti, L. de S., Junior, F.J.P.M., 2020, **High-Resolution Electrofacies Analysis Applied to Deep-Water Siliciclastic Reservoir Economic Evaluation, Northeast of Brazil**, Publication at the SPWLA 61th Annual Symposium.

Herlinger, R. Jr., Freitas, G.N., Anjos, C.D.W., and De Ros, L.F., 2020, **Petrological and Petrophysical Implications of Magnesian Clays in Brazilian Pre-Salt Deposits**, Publication at the SPWLA 61th Annual Symposium.

Ronaldo Herlinger, Jr. has been selected as one of the 2021–2021 SPWLA Distinguished Speakers. The Distinguished Speakers are chosen from the top papers presented at the SPWLA International Symposium and from speakers who are considered prominent contributors in the industry. This is a pleasure for us. The SPWLA Brazil Chapter will invite him to present at one of our monthly meetings.

18 August 2020—We had the first meeting of the year: François Xavier Dubost (Schlumberger) talked about "Ora Deep Transient Testing."

Invitation to the first monthly meeting of SPWLA Brazil Chapter, which occurred in August.

15 September 2020—Yaro Parisek (geologist, Petrobras) talked about “Avanços na caracterização de mineralogia e porosidade em rochas do pré-sal a partir de mapeamento automatizado de lâminas petrográficas.” The meeting occurred on the Teams platform, through the link https://lnkd.in/d9CN3GC

Invitation to the second monthly meeting of SPWLA Brazil Chapter, which occurred in September.

CHINA UNIVERSITY OF PETROLEUM (BEIJING) STUDENT CHAPTER

General News

On December 19, 2019, with the support of the Logging Department of the College of Geophysics of China University of Petroleum (Beijing) and the headquarters of the SPWLA Association, the SPWLA Student Branch of the China University of Petroleum (Beijing) successfully hosted the 61st SPWLA Student Paper Preliminary Competition.

On January 3, 2020, sponsored by the Logging Department of the College of Geophysics of Beijing Key Laboratory of Earth Exploration and Information Technology, and CNPC China University of Petroleum (Beijing) Key Laboratory of Well Logging, the China University of Petroleum (Beijing) SPWLA Student Paper Contest organized the 61st SPWLA Student Paper Competition Final.

Recent Events

The preliminary round of the SPWLA Student Paper Competition was held in the conference room in Cuigong Hotel. More than 40 teachers and students and experts from the School of Geophysics, the School of Earth Sciences, and the Western Drilling International Logging Company attended the meeting. The competition was dominated by student academic reports. Three PhD students and seven master’s degree students participated in the preliminary competition of the SPWLA Student Thesis Competition. Since Dr. Jia Jiang was studying abroad and could not report on the spot, he used remote reporting. Professor Ke Shizhen, Associate Professor Zhang Yuanzhong, who are from the Logging Department of the School of Geophysics, and Mr. Yangyang Yun, a technical expert from Western Drilling International Logging Company, acted as judges for the student paper competition. Ten master’s degree and postgraduate students from the two colleges showed wonderful academic reports in both Chinese and English. The content covered petrophysics, electrical logging, geological modeling, sonic logging, and

petroleum geology. According to the judges' scores, six outstanding presenters, including three doctors and three masters, were selected in this competition.

The list of winners is as follows:

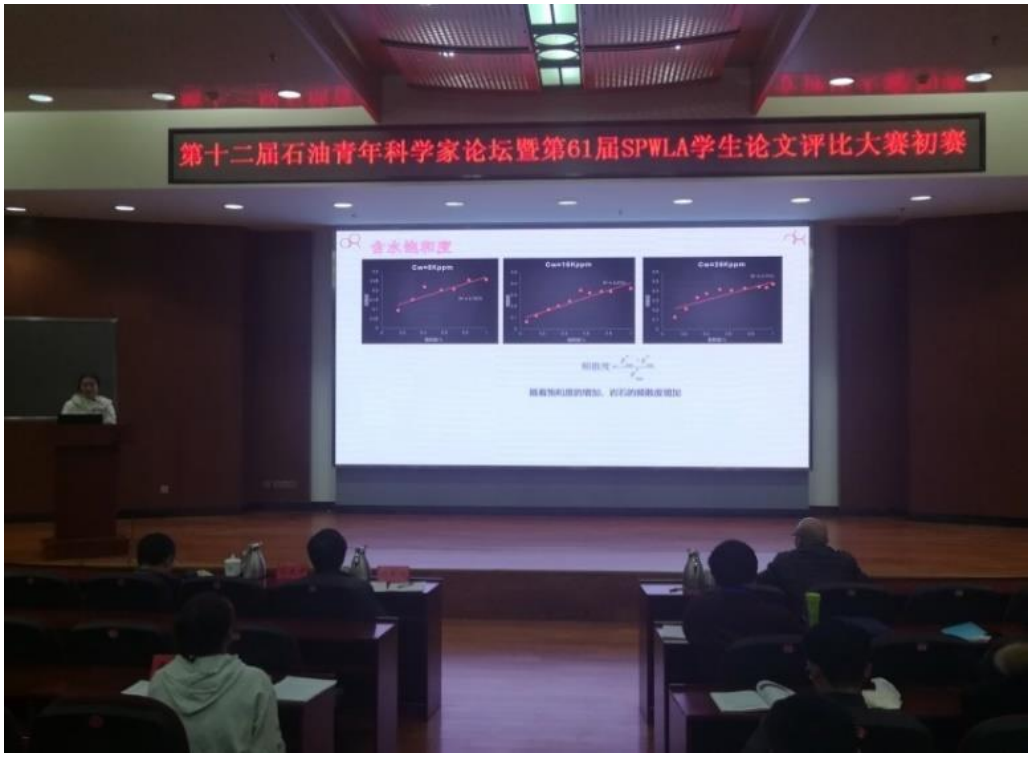
- Doctoral group: Jia Jiang, Zhang Liangchen, and Chen Shichang;
- Master group: Wang Hao, Xiong Yujie, and Zhang Yumeng.

At 1:30 p.m. on January 3, 2020, the final of the SPWLA Student Paper Competition was held in Meeting Room 525 of the Geological Building. The finals were in English. The content of the report mainly includes 3D geological modeling, rock physics, electromagnetic logging while drilling, electromagnetic logging experimental research, and other fields. After the report, the judges gave pertinent suggestions to the content of each student's report so that the students could have the opportunity to better display the style of Chinese students of well logging on the international stage.

Upcoming Events

Because of COVID-19, all teachers and students are still staying at home and are not allowed to go to the university. So, upcoming events have not been arranged yet. Once the impact of the virus can be eliminated, we will make the next work plan.

Zhao Jian hosting the opening ceremony in the Cuigong Hotel conference room.



Zhang Yumeng, a competitor in this competition, is reporting in the Cuigong Hotel conference room.

Professor Ke is a giving prize to Zhang Yumeng in the Cuigong Hotel conference room.

Group photo in the Cuigong Hotel conference room.

The judge, Liao Guangzhi, gives a prize to an outstanding speaker, Xiong Yujei, in Meeting Room 525 of the Geological Building.

DENVER WELL LOGGING SOCIETY

General News

New Board Members are listed below. Contact information can be found http://dwls.spwla.org/Board.htm

Yulia Faulkner…….President
Jenny LaGesse……...Vice President – Technology
Rich Whittington……..Vice President – Membership
Peter Kaufman……Treasurer
Celina Will……Secretary
Patricia Rodrigues……..Past President
Tyler Izykowski……...Director – Social Events/Speaker Gifts
Amanda Waller……...Director – Editor for Petrophysics
Evan Gragg…….Director – LinkedIn/Social Media
Max Peeters……Director at Large
Dominic Holmes……Editor
Tony Holmes……..Webmaster

Lunch meetings are continuing to be virtual for the time being at no cost to attend; however, you must register prior to attending. Typically, the lunches are every third Tuesday of the month; however, please check the calendar at http://dwls.spwla.org. We are working on adding the webinar reservation link to our website. Please continue to check the website for registration and upcoming talks. In the meantime, the DWLS monthly newsletters will include the webinar reservation link. If you are currently not receiving the monthly newsletter, please email vp_membership@dwls.spwla.org to get added to the monthly newsletter email distribution.

Recent Events

15 September 2020—Dan Krygowski (The Discovery Group) presented “Pattern Recognition in a Digital Age: A Gameboard Approach to Determining Petrophysical Parameters” through our virtual webinar lunch meeting. The talk was well attended.

Dan Krygowski (The Discovery Group)

15 October 2020—SPWLA Distinguished Speaker Melanie Durand (Shell) presented “Crushed Rock Analysis Workflow Basin on Advanced Fluid Characterization for Improved Interpretation of Core Data” through our virtual webinar lunch meeting. The talk was well attended.

27 October 2020—The DWLS-RMAG Fall Symposium “Maximizing Value of Core and Fluid Analysis” was held online with nine outstanding speakers.

Upcoming Events

5 November 2020—RMAG is offering an online class featuring the renowned Andrew Pepper (Nautilus), titled “Introduction to Fluid Saturations and Properties in Unconventional Shale Reservoirs.” DWLS members will receive a discounted rate for this class. Details and registration will be available on the RMAG website www.rmag.org.

17 November 2020—The next virtual lunch meeting features SPWLA Distinguished Speaker Julie Kowan (Baker Hughes) presenting “Conclusive Proof of Weak Bedding Planes in the Marcellus Shale and Proposed Mitigation Strategies.” In order to attend the talk, you must register prior. The DWLS monthly newsletters will include the webinar reservation link. If you are currently not receiving the monthly newsletter, please email vp_membership@dwls.spwla.org to get added to the monthly newsletter email distribution. We are working on adding the webinar reservation link to our website. Please continue to check the website for registration and upcoming talks http://dwls.spwla.org.

Julia Kowan (Baker Hughes)

DUTCH PETROPHYSICAL SOCIETY (DPS)

Recent Events

24 September 2020—The DPS held its regular quarterly meeting online. Virginie Schroepf (Openfield Technology) presented a talk on “Flow Regime Diagnostic in Producers and Injectors Using Ultrasonic Doppler Sensors,” which was enthusiastically received by the assembled online attendees.

Upcoming Events

3 December 2020—The next meeting of the DPS will be held virtually because of the current COVID-19 situation in the Netherlands. Hopefully, we will be able to resume our in-person meetings in 2021. For updates on future meetings and for more information about the DPS, visit the DPS website at

www.dps-nl.org. If you would like to be informed of upcoming meetings and events, subscribe to the DPS mailing list at www.dps-nl.org/phplist or by emailing info@dps-nl.org.

FORMATION EVALUATION SOCIETY OF AUSTRALIA (FESAus)

General News

FESAus, the Australian Chapter of the SPWLA, combines the formation evaluation societies from around Australia, predominantly Western Australia, as well as FESQ, New South Wales, Victoria, and South Australia. Due to COVID-19, our Technical Meetings are now held via webinar, sponsored by Halliburton, on the second Tuesday of each month. This has led to greater inclusivity with "live" participation with our members across Australia and those who may have had to repatriate outside of Australia due to the ongoing situation. The new format has been received enthusiastically by our membership and offers the opportunity for some to further polish their webinar presenting skills. Webcasts of the presentations are also available soon after for members to review as they wish. Please visit www.fesaus.org for meeting information.

Leanne (Potter) Brennan

Our committee meetings are now held via Zoom as we all work in our various home offices. We are still looking for people for the positions of Vice President, Company Secretary, and Sponsorship Coordinator. This month, our long-term Committee Secretary Leanne (Potter) Brennan has decided to resign from FESAus as she has accepted a full-time position in the industry. Leanne has offered to be available to help the committee if needed. She will be greatly missed, and we wish her all the best in her new position and for the future.

Hugh Crocker–RIP

We must announce with great sadness that Hugh Crocker passed away on the morning of 23 September 2020. Hugh Crocker was one of the founding members of the FESAus Society some 35 years ago and was a great and tireless contributor to the petrophysical community worldwide for 60 to 70 years. Some of Hugh's achievements are:

- In 1983, Hugh co-founded Formation Evaluation of WA–FESWA with Gerry McCann, which expanded to Formation Evaluation of Australia–FESAus in 2007.
- Each year, FESAus awarded the Hugh Crocker Award to an undergraduate, postgraduate, master's, or doctoral candidates for the best technical paper related to formation evaluation and or petrophysics that Hugh and other members would judge.
- Hugh became the first SPWLA SE Asia-Australasian Regional Director
- Hugh was the first-ever FESWA/FESAus member to receive the SPWLA Distinguished Service Award.
- In 2010, Hugh received the FESAus Medal of Honour for Career Service.
- In 1997, Hugh received the prestigious The APPEA Gold Medal–the Lewis G. Weeks Award in recognition of lifetime service to the industry.

A more detailed tribute to Hugh's career is being prepared by those that knew him well and will be shared in the next FESAus newsletter.

Recent Events

8 September 2020—FESAus hosted its last Technical Meeting Luncheon, presented by Avrami Grader (Halliburton).

"Integrated Core Analysis Defining Resistivity-Water Saturation Models in Tight Gas Sands"

Avrami Grader

Abstract: Focusing on low resistivity in tight gas sands, the balance between pore-filling clays, remaining open porosity, grain contacts, and clay modality are discussed. The structure of the rock is explored using various imaging methods, including X-ray CT and scanning electron microscopy in 2D and 3D. Each of the elements of the rock is defined in space, and its conductive properties are evaluated for various capillary pressures that define water saturations. In addition, the results from individual elements are integrated and upscaled to provide a plug-scale conductivity model to be coupled with various wireline resistivity logs to provide estimates of water saturation logs. This presentation focuses on the integration of physical and digital core analysis methods in developing new resistivity-saturation transformations in a practical and systematic workflow

13 October 2020—FESAus hosted its last Technical Meeting luncheon presented by Fahad Khan (Schlumberger).

"Machine-Learning-Assisted Seismic Fault Interpretation**"**

Fahad Khan

Abstract: The machine-learning-assisted fault interpretation workflow has been able to identify a higher proportion of the structures in the seismic survey within a given timeframe. Input seismic is optimized through ingestion in an OSDU-compatible data ecosystem. The fault-detection process is discussed that provides prediction cubes as well as segmentation and extraction of fault planes to be analyzed by the interpreter for subsequent construction of a fault framework and structural model. The process assists exploration-scale seismic interpretation as well as in field appraisal and development through the building of multiple structural scenarios that feed into the Agile Reservoir Modeling

process where the generation of multiple uncertainty realizations for various scenarios is enabled through parallel HPC processes.

(From left to right) Fahad Khan (Schlumberger) and Wesley Emery (President FESAus).

Upcoming Events

10 November 2020—November Technical Presentation and Webinar: Olga Filiptsova, “Petrophysics in Hydrogeology.”

8 December 20—December Technical Presentation and Webinar: Michael Wilson, Xmas Function Talk– “The Story of Fossils and Artefacts to Homosapiens.”

2020 Committee Members

Wesley Emery…….President
Vacant……..Vice President
Vacant……..Company Secretary
Jean-Baptiste Peynaud….Treasurer / Monthly Meeting Coordinator
Vacant……..Assistant Treasurer
Diego Vasquez……...Website Coordinator/ Data Standards Focal Point
Vacant…….Secretary/Inter-Society Liaison/Social Coordinator/Special Events and Awards
Siobhan Lemmey……..Membership Coordinator
Vacant…….New Technology Forum Coordinator
Vacant…….New Technology Forum Coordinator
Vacant…….Education Group Leader
Nigel Deeks……...Audio Visual Coordinator
Vacant……Sponsorship Coordinator
Yang Xingwang……Audio Visual Coordinator
Bronwyn Djefel……Newsletter Coordinator
Marcel Croon……Queensland Representative
Ashish Datey…….Victoria Representative
Harris Khan……...NSW Representative
Matthew Pfahl……..South Australian Representative

FORMATION TESTING SIG

Recent Events

October 2020—We held our third and fourth webinars of the 2020 webinars series. Each webinar had two presentations. Thanks to G. Schlachter, M. Azari, M. Berkane, M. Malik, and their coauthors for the presentations.

Upcoming Events

11 and 18 November 2020—We are pleased to announce the fifth and sixth webinars for the year. There will be two presentations per webinar. Presenters will be Dr. L. Guoqing (University of Houston), Dr. O. Mullins (Schlumberger), Dr. L. Quintero (Halliburton), and A. Banerjee (Baker Hughes). With these, we will conclude the 2020 webinar series that replaced our annual Technical Meeting this year due to COVID-19. Registration is free for SPWLA members.

SPWLA FRANCE CHAPTER

Recent Events

11 September 2020—SPWLA France Chapter organized its second virtual event, focusing on geothermal energy. Erik Wielemaker (Schlumberger) talked about “Delineating the Geothermal Structure and Flow Properties in a Sub-Horizontal Well With the Use of Wireline and LWD Data in a Multiphysics Approach,” based on paper SPWLA-5065. The paper was presented at the last Annual Logging Symposium. The case study described the drilling of a doublet (one producer and one injector) and showed how the LWD and wireline logs could reduce the risks associated with the development of geothermal plays. NMR was used in combination with oriented density and sonic to interpret the lateral heterogeneity and determine the optimal flow units for further stimulation. In addition, the dipole sonic was explored to determine the continuity of the layers, mapping reflectors up to 40 m away from the wellbore. The new doublet led to a significant increase in production, compared to the two doublets that were drilled previously. The session nicely complemented a previous half-day technical session on geothermic, held in Paris in 2018. That is a good example showing how the O&G technology can benefit geothermal energy, and the SPWLA France Chapter is pleased to see the interest that the chapter members have demonstrated in these two sessions.

JAPAN CHAPTER (JAPAN FORMATION EVALUATION SOCIETY, JFES)

General News

New Committee Members
Masahiro Nishi (INPEX), Director
Shinichi Takaoka (MOECO), Director

Leave
Hideo Komatsu (INPEX), Director

Recent Events

16 June 2020—JFES provided a JFES 2020 Distinguished Lecture as a webinar. “Conventional Sand Counting Workflow Using Borehole Images for Thin Beds Reservoir Characterization” was presented by Mr. Yuki Maehara (Schlumberger and JFES Vice President).

17 June 2020—“Estimating Net Sand from Borehole Images in Laminated Deepwater Reservoirs With a Neural Network” was presented by Dr. Bo Gong (Chevron).

13 Jul 2020—The 111th Chapter Meeting was held online. “Valuation for Paleo Environment and TOC by X-ray Fluorescence (XRF) Analysis in Eagle Ford” was presented by Mr. Sota Nagase (INPEX), and “Bundle Tube Model–Is It Real?” was presented by Mr. Hideo Komatsu (INPEX).

Upcoming Events

4 to 5 November 2020—JFES will host the virtual seminar over two days.

4 November 2020, 15:00 to 17:00 (JST), 17:00 to 17:30 (networking time)—Three talks on the theme of Porosity and Fracturing. There will be networking time after the seminar for an interactive discussion with the speakers.

5 November 2020, 15:00 to 17:00 (JST), 17:00 to 17:30 (networking time)—Three talks on the theme of Machine-Learning Application for Reservoir Characterization. There will be networking time after the seminar for an interactive discussion with the speakers.

The lectures will be provided in English/Japanese.

Visit our JFES website “Events” at http://jfes-spwla.org/.

OKLAHOMA CITY CHAPTER

General News

The Oklahoma City Chapter will continue to hold virtual meetings on the second Tuesday of the month through the remainder of 2020, after which we will evaluate if we continue with virtual events or return to in-person meetings.

Recent Events

8 September 2020—Z. Harry Xie (Core Lab)–Investigation of Physical Properties of Hydrocarbons in Unconventional Mudstones Using Two-Dimensional NMR Relaxometry

13 October 2020—Mohammad “Wahid” Rahman, PhD (Geoscience and Petroleum Research, Inc)–Geochemistry for Unconventional: Production Allocation, Reservoir Monitoring, and Hydrocarbon Phase (e.g., API Gravity, GOR) Prediction.

Upcoming Events

10 November 2020—Jeffery Miles (Schlumberger)–Formation Chlorine Measurement from Spectroscopy Enables Water Salinity Interpretation: Theory, Modeling, and Applications

PERMIAN BASIN CHAPTER

General News

Due to the coronavirus outbreak earlier this year, we had postponed several talks to the summer months but were still able to find new board members. We are grateful for Veronica Montoya for taking over the Social Media Chair from Zach Mueller, who had been a long-standing board member and made a move to Houston. We appreciate the time and energy Zach gave to help make the PB-SPWLA community fun, educational, and, most importantly, preserve the legacy of our existence in the Permian.

Recent Events

PB-SPWLA has transitioned successfully into using a virtual platform for our luncheons, and we are proud to say we have reached a larger audience throughout Texas, New Mexico, Colorado, and Montana. Amine Chenaf researched and selected GoToMeeting as our virtual venue, and from there, we quickly adjusted to the virtual societal organization lifestyle. Although we miss the faces, the camaraderie, and the networking, we value how our members feel in remaining safe for their families and workplace. Our June talk was our first time using the GoToMeeting virtual platform, and it was a fair success. Dr. Mohammad “Wahid” Rahman presented “Geochemistry for Unconventional: Production Allocation, Reservoir Monitoring, and Hydrocarbon Phase (e.g., API Gravity, GOR) Prediction,” and it was the first time we realized how many people we could reach outside the Permian. We took a “summer break” for the month of July, did a look back on the GoToMeeting to learn from technological errors, and how to continue expanding our reach to include university students and professors. In August, Paul Craddock presented “Thermal Maturity-Adjusted Log Interpretation (TMALI) in Organic Shales,” and in September, Harry Xie presented “The Role of Organic Matter in Characterizing Unconventional Tight Rocks Using Laboratory NMR.” For both, we were again happy with our turnout. We have closed out this year with our final talk in October, with Linda Abbassi discussing “Flow Regime Diagnostic in Producers and Injectors Using Ultrasonic Doppler Sensors,” which was an excellent way to complete the fall luncheon series.

Upcoming Events

From the Permian, we wish all a Happy Holiday season. For the upcoming 2021 year, we will return in January for the spring luncheon series. Please check out our website or LinkedIn page, Permian Basin Chapter of SPWLA, to learn more about our speakers and obtain access to our link to watch. Our luncheon series is free for all to watch and participate in.

SAUDI ARABIA CHAPTER (SAC)

Recent Events

28 September and 5 October 2020—The SPWLA Saudi Arabia Chapter (SCA) conducted its 8th Topical Workshop, the first virtually, on “Acoustic Petrophysics and its Applications in Reservoir Description.” This two-day workshop was opened by three keynote speakers, Mr. Khalid Zainalabedin (Manager of the Reservoir Description and Simulation Department at Saudi Aramco), Dr. Jack Dvorkin (Program Leader of Rock Science and a Research Fellow at KFUPM on behalf of Dr. Abdulaziz Kaabi, Dean of College of Petroleum Engineering and Geoscience, KFUPM), and Mr. Tammam Achrafi (Baker Hughes Reservoir Technical Services Manager). All stressed the importance of maximizing values of acoustic logs in petrophysical applications and

highlighted the importance of continuing knowledge sharing through virtual tools to highlight regional technical challenges. It was the first virtual technical event among the professional societies in the region.

Attended globally by more than 180 participants from different O&G operating and service companies and also students from the university, the first day of the workshop was on September 28, with five talks ranging from fundamentals and history to the current status of acoustic logging, covering a range of methods and applications in petrophysics and reservoir characterization. Borehole acoustics methods, quality controls, porosity typing and modeling, mobility estimation, organic-rich formation evaluation, deep imaging for improved reservoir characterization, and geosteering while drilling applications were discussed in depth through case studies by subject matter experts from the area, the region, and globally.

A week later, with more than 140 participants, the second day of the event started with a summary of the first day by Dr. Mark Ma, prior to starting the technical session in which more advanced acoustics data processing and applications were covered in another five talks. The topics covered were more specific to reservoir lithology and applications, such as carbonates Archie cementation exponent characterization, rock typing, high-resolution acoustic logging through advanced data processing for thin-bed analysis and fractured reservoir characterization, rock mechanics with artificial intelligence, applications of effective media theory in acoustic petrophysics, and advancement in acoustic logging and its applications in petrophysics, geophysics, rock/geomechanics, and reservoir characterization.

A workshop summary followed by general Q&A at the end of the second-day technical session was carried out with good participation from the audience.

This two-day event was opened and closed by Dr. Faisal Enezi, SPWLA SAC President. It was considered a great success, and the team has moved forward with planning the next topical workshop on the subject of Coring and Core Analysis–Challenges and Best Practices. Stay tuned and visit the SPWLA SAC website.

SPWLA SAC–Two-day Virtual Acoustic Workshop.

21 October 2020—Saudi Arabia Chapter conducted a monthly online knowledge-sharing event on "Formation Chlorine Measurement from Spectroscopy Enables Water Salinity Interpretation: Theory, Modeling, and Applications." The presentation was delivered by Dr. Laurent Mosse (Technical Director of Petrophysics at Schlumberger Reservoir Evaluation). In his talk, Laurent introduced a new measurement of formation chlorine from nuclear spectroscopy, enabling a continuous log of water salinity. Application, limitations, and future works were also discussed during the talk and the post-talk Q&A session. With over 80 participants from the region and

globally, the event was closed with summary remarks from Mr. Khalid Zainalabedin (Saudi Aramco RDSD manager) about the importance of formation water salinity characterization for formation evaluation and reservoir surveillance.

SOUTHWEST CHINA CHAPTER

General News

In the past several months, several board meetings were held through both an online conference system and onsite. Several invited talks were given to local members using online conference software. A new book on acoustic logging, coauthored by a chapter member, was published by Springer. A group, led by Mr. Xinyun Zhang, the General Secretary of the Petroleum Well Logging Commission (PWLC) of the Chinese Petroleum Society, visited the chapter.

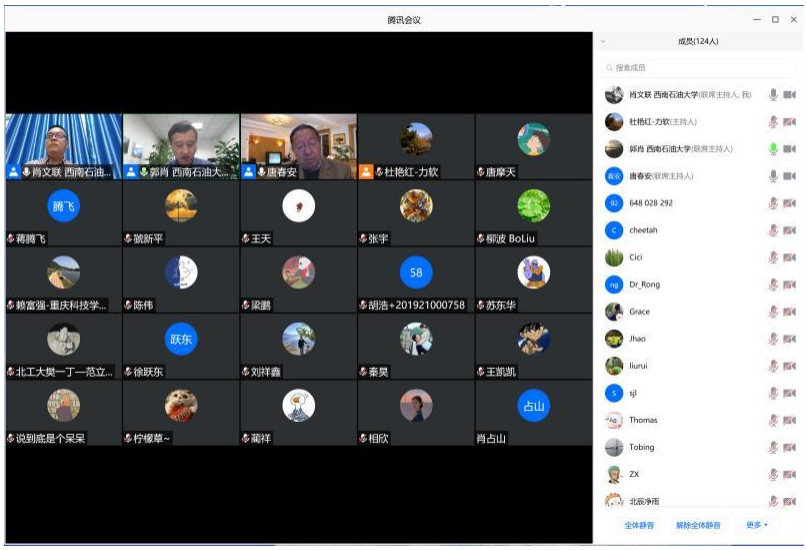
Recent Events

31 May 2020—Chengdu, Online Board Meeting of the Southwest China Chapter: After several months of self-isolation due to the COVID-19 pandemic, normal life came back to Chengdu. Board members gathered together via an online conference system to discuss plans for 2020. Several assignments were decided. The chapter will help students to set up a student chapter this year. Several invited talks will be presented. We also plan to host a theme conference either onsite or online this year or early next year.

Online board meeting of the Southwest China Chapter.

11 June 2020—Chengdu, Online Talk: An invited talk, “Numerical Test: The Third Scientific Research Method–Analysis of the Rupture Propagation in Materials Based on the Modeling From the CT

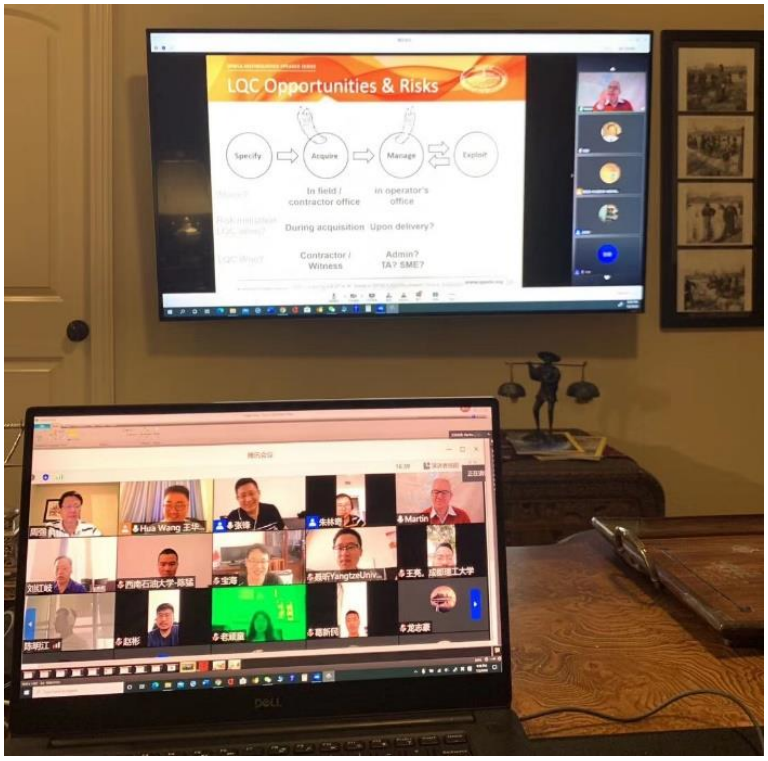
Scanner," was given by Professor Chunan Tang from the Dalian Institute of Technology of China. There were more than 120 attendees. The talk was jointly hosted by the SPWLA Southwest China Chapter and the SPE Chengdu Section. The talk is related to the geomechanics during the fracture rapture in the rock samples using numerical simulation based on CT scanner results.



Online invited talk on fracture rapture in the rock samples.

2 and 3 July 2020—Chengdu, SPWLA Distinguished Talk: Two talks about "Log Quality Control, Easy as 1-2-3!" were given at different times by Mr. Martin Storey (Well Data Quality Assurance). More than 200 persons attended the talks. The talks were jointly hosted by the Southwest China and East China chapters. Professor Hua Wang (UESTC) and Feng Zhang (UPC) co-chaired the talks.

Attendees of the July Distinguished Talk.



Attendees of the Distinguished Talk (photo borrowed from Dr. John Zhou).

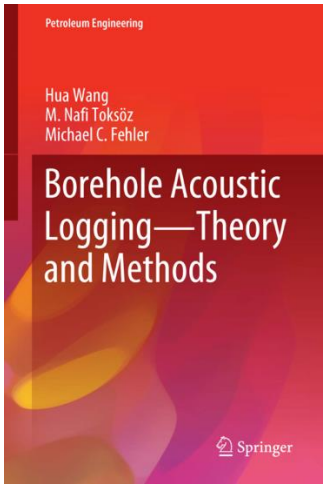
26 and 28 August 2020—Chengdu, 2020 National Technology Activity Week: To promote the influence of the SPWLA, the Southwest China Chapter co-hosted an academic forum about scientific and technological innovation of the oil and gas industry with the State Key Laboratory of Oil/Gas Reservoir Geology & Exploitation during the 2020 National Technology Activity Week. Professors Shouwei Zhou and Pingya Luo, who are the Academicians of the Chinese Academy of Engineering, were invited to give talks on “Science & Technology Development of Offshore Oil

Industry in New Era” and “Several Opinions Related to Domestic Coalbed Methane Development” through an online conference system, respectively. More than 500 persons joined the talks. Professor Shouwei Zhou discussed three topics: (1) Analysis of energy supply and demand in China after epidemic disease; (2) The great opportunity as well as a challenge throughout 100 years; and (3) The future development of offshore oil technology. Professor Pingya Luo mentioned in his talk that breaking the technology bottleneck of the effective development of coalbed methane depends on the change of our exploitation concept. Furthermore, new theories about coalbed methane development and compatible development technology are of great significance to benefit the effective production of coalbed methane in China.

Invited talk by Professor Shouwei Zhou.

Invited talk by Professor Pingya Luo.

28 August 2020—A new book on borehole acoustics was published by Springer: A new book, *Borehole Acoustic Logging—Theory and Methods*, written by Hua Wang, M. Nafi Toksöz, and Michael C. Fehler, was recently published by Springer. This book belongs to the Petroleum Engineering book series. The book covers the history, development, and application of various acoustic logging methods, including wireline, casedhole, logging while drilling, and peripheral imaging around a borehole. The book uses a 3D finite difference method and analytical method to help readers understand the propagation in complicated borehole environments. And, then some potential solutions for logging data acquisition and data processing methods are proposed. Professor Wang, the Chapter President, was invited to begin writing the book in 2016 by Springer. He invited Professor M. Nafi Toksöz and Dr. Michael C. Fehler as the coauthors of the book. The book not only covers Professor Wang's recent research but also greatly benefits from the research and knowledge generated over four decades at the Earth Resources Laboratory (ERL) of the Massachusetts Institute of Technology (MIT) under its acoustic logging program. There are 329 pages, seven chapters, and nearly 500 figures in the book. The ISBN of the e-book is 978-3-030-51423-5, and the ISBN of the hardcover is 978-3-030-51422-8. The link to the book is https://link.springer.com/book/10.1007/978-3-030-51423-5.



The cover of *Borehole Acoustic Logging—Theory and Methods*.

9 September 2020—Chengdu, visitor group from the *Journal of Well Logging Technology*: A group from the *Well Logging Technology* journal led by the Vice Editor-In-Chief, General Secretary of the Petroleum Well Logging Commission (PWLC) of the Chinese Petroleum Society, Mr. Xinyun Zhang, visited the Southwest China Chapter, at the Southwest Petroleum University. The Editorial Director, Mrs. Lei Zhang, and the former Deputy Manager, Mrs. Huan Wang, were in the group. A three-hour discussion on the future of the journal was held between the journal and the Southwest China Chapter. Nearly 20 local members of the chapter participated, including Chapter President Professor Hua Wang from UESTC, Professor Jun Zhao from SWPU, and Professor Jianbin Zhou from the Chengdu University of Technology, and so on. Mr. Xinyun Zhang, on behalf of the Petroleum Well Logging Commission (PWLC) of the Chinese Petroleum Society and the *Well Logging Technology* journal, gave a detailed introduction of the history, status, and challenges of the journal. Mrs. Lei Zhang introduced the expectation of the journal for the next 5 years. Professor Hua Wang introduced the chapter, offering several constructive suggestions for the journal, and hopes the chapter can work more closely with the journal. Comments and

suggestions from the local members of the chapter were given to promote the influence of the journal.

Group photo for the visitor group from the *Well Logging Technology* journal and chapter members.

17 to 20 October 2020—The 2020 Annual Meeting of the Chinese Geoscience Union (CGU) was held in Chongqing. Several members of the Southwest China Chapter gave invited talks during the annual meeting, and a board meeting and social activity of the chapter took place during the event.

TULSA CHAPTER

General News

Tulsa chapter continues to hold virtual meetings during the pandemic on the regular monthly schedule.

Recent Events

10 September 2020—Chelsea Newgord (University of Texas-Austin/ExxonMobil) presented her Distinguished Lecture on “A New Workflow for Joint Interpretation of Electrical Resistivity and NMR Measurements to Simultaneously Estimate Wettability and Water Saturation.” This talk was initially scheduled for March. Chelsea made it as far as Tulsa before the shutdown of our in-person venue.

14 October 2020—Dick Merkel (Denver Petrophysics) presented an update of his Nuggets of Wisdom video on the SPWLA website with an online presentation of “Electrical Properties of Clays.”

Both presentations will well-attended and included viewers from outside the Tulsa Chapter.

Upcoming Events

12 November 2020—Dr. Yulun Wang (Oklahoma State University) will give an online presentation of the "Characterization of the Caney Shale, Southern Oklahoma." This talk will provide an introduction to an ongoing project led by OSU researchers on the geology and geomechanical properties that influence production in this shale reservoir. Registration information for this presentation will be sent out in the next few weeks. Check the chapter's website at SPWLA.org for details.

UIS STUDENT CHAPTER–COLOMBIA

General News

June 2020—The SPWLA UIS Student Chapter settled the new Board of Directors for the 2020–2021 management period as follows:

Board of Directors

President……..Dana Marcela Ramirez, danamarcelaramirez@gmail.

Vice President……..Luis Alberto Chinomes, luisalberto191296@gmail.com

Fiscal…….Angela Stefany Tarazona, angelstefany196@gmail.com

Secretary……..Diego Alberto Rangel Niño, diegorangeln97@gmail.com

Treasurer…….Tanya Mercedes Garavito Luque, tanyagalu0197@gmail.com

Memberships……..Cristian Ferney Aceros Florez, crisfer970319@gmail.com

Recent Events

"SPWLA TALKS" live transmissions on the SPWLA UIS YouTube channel
https://www.youtube.com/c/SPWLAUIS

7 August 2020—**SPWLA TALKS** Conference: "Reservoir Characterization; Venezuela the Largest Reserves in the World" by Roberto Sole (Reservoir Engineer, PDVSA).

13 August 2020—**SPWLA TALKS** Conference: "Reservoir Characterization; Maximizing the Profitability of Low-Production Wells Through Integrated Reservoir Management" by Mabel Guilarte (Oil and Gas Coordinator, Escuela Latinoamericana de Ingenieros, Tecnólogos y Empresarios-ELITE, Colombia).

18 August 2020—**SPWLA TALKS** Conference: "Geophysical Characterization of Unconventional Reservoirs" by Roderick Perez, PhD (President of ScientiaGROUP).

28 August 2020—**SPWLA TALKS** Conference: “PLT Well Log: Production Logging Test” by Raul Villamizar Duran (Senior Production Engineer).

4 September 2020—**SPWLA TALKS** Conference: “Fluid distribution in the Reservoir” by Cesar Aguilar, Integrated Petrophysical Studies (PDVSA).

11 September 2020—**SPWLA TALKS** Conference: “Generation of Porosity Profiles and Visualization of Fluid Displacement in Rock Samples Using X-ray Tomography” by Hagee Olaya, MSc, (Universidad Industrial de Santander–UIS, Colombia).

July to September 2020—**Portuñol SPWLA UIS-UFRJ** (Spanish-Portuguese) “Language Interchange Between Student Chapters”: The chapters held virtual meetings where they shared knowledge of their culture and native language, and also exchanged knowledge of petrophysics, geology, and petroleum engineering sciences.

21 to 25 September 2020—The Colombia Student Chapter SPWLA UIS hosted an online event using the YouTube platform (http://www.youtube.com/c/SPWLAUIS) with the Geology student chapters of our university (AAPG, ACGGP, EAGE, SEG, UIS-ACH) called the “First GEOLOGY AND OIL SYMPOSIUM.” The main topics were Caribbean offshore basins in Colombia and machine learning applied to geosciences. National and international Distinguished Speakers presented, and the public reception was very high.

YouTube Channel: https://youtube.com/channel/UC-6do8xJB3cDR7fL1wvpO7w

October 2020—SPWLA UIS participated in inviting people to be a part of the SPWLA UIS TEAM. The selection process was started for the applicants to become new members of the student chapter.

6, 8, and 14 October 2020—"Well Logs and Petrophysics course" was presented by Geologist Ulises Bustos (Wireline Petrophysics Domain, Formation Evaluation Advisor, Schlumberger).

- 1° Session–Introduction to basic electric well logging
- 2° Session–Introduction to advanced well logging. Physical principles and applications
- 3° Session–Formation evaluation in nonconventional reservoirs (organic shales)

Upcoming Events

The last week of November 2020—The Student Chapter Colombia SPWLA UIS will organize a technical week of webinars and conferences together with the faculty of the petroleum engineering UIS and the Student Chapters SPE UIS and Acipet UIS: “Petroweek.”

SPWLA UIS/ Social Networks

Linkedin: https://www.linkedin.com/company/spwla-uis-student-chapter/

Instagram: https://www.instagram.com/spwlauis/?hl=es-la

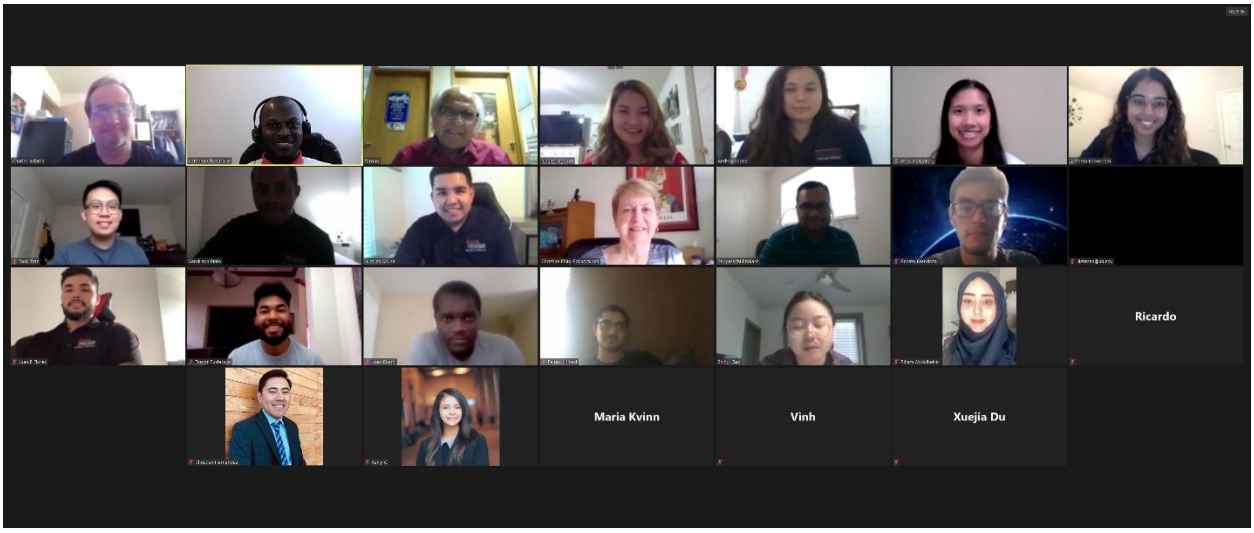
YouTube: https://www.youtube.com/c/SPWLAUIS

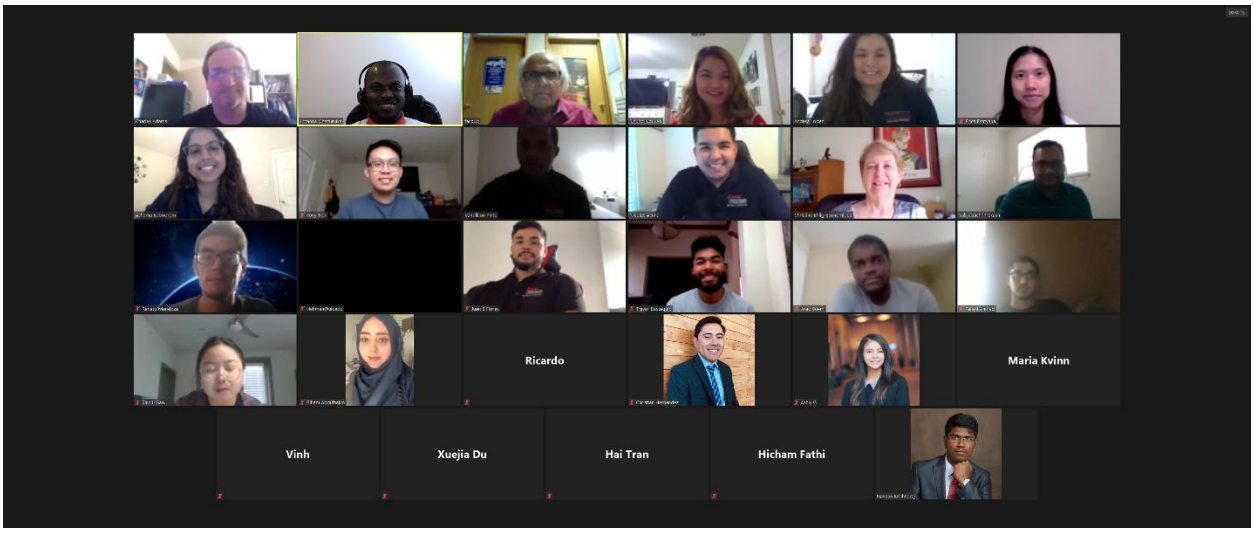
Facebook: https://es-la.facebook.com/SPWLAUIS/

UNIVERSITY OF HOUSTON STUDENT CHAPTER

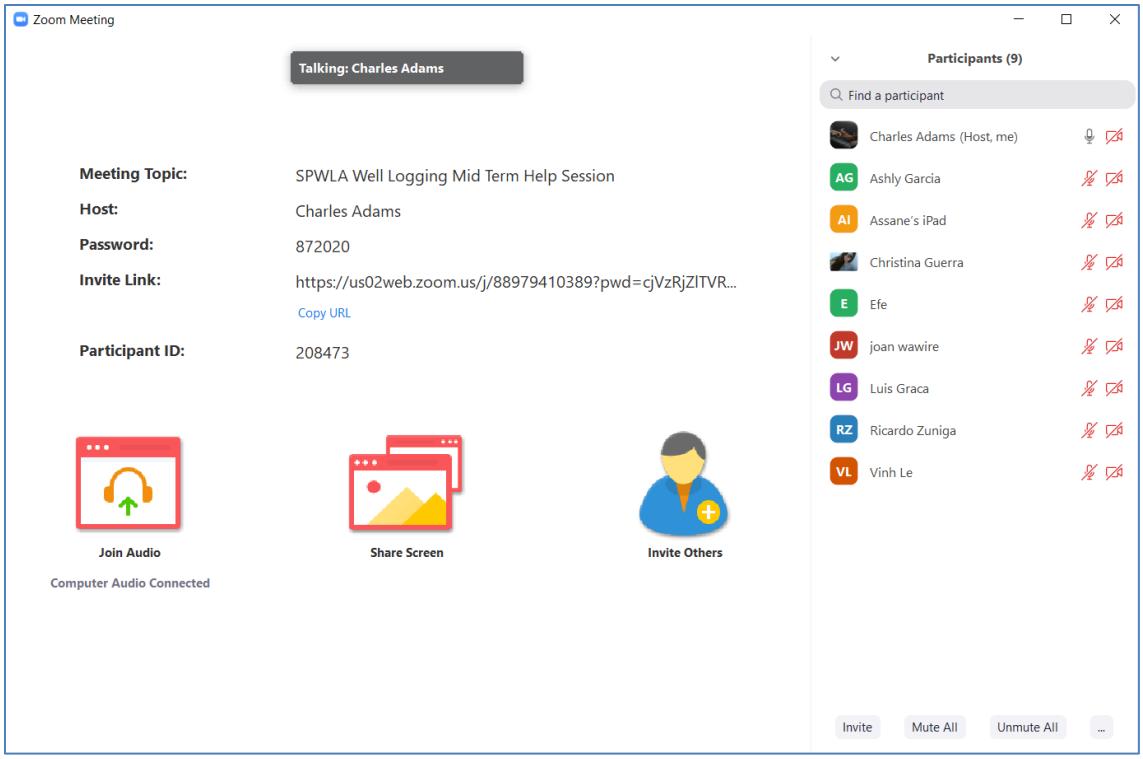
Recent Events

26 August 2020—The UH petroleum organizations held a “Meet and Greet” for our engineering college students to provide chapter information and the benefits they’d experience by volunteering and/or becoming an officer. The four presidents each gave a slideshow presentation outlining both the past year and the months to come.

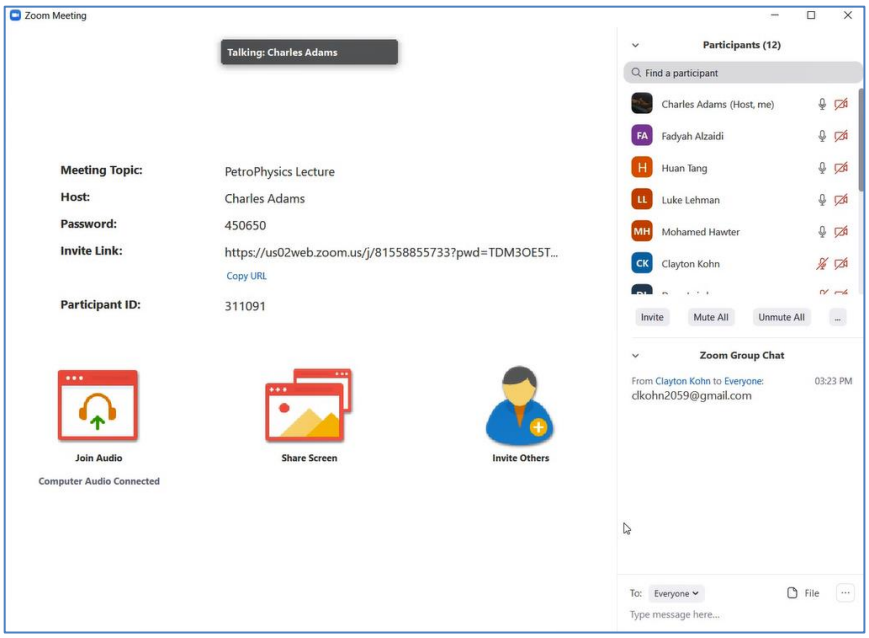




9 October 2020—A two-hour midterm help session was conducted for Professor Lori Hathon's undergraduate well-logging class. Topics included Archie's equation, tornado charts, Pickett plots, Hingle plots, crossplots, and determining zones of interest.



13 October 2020—A two-hour midterm help session was conducted for Professor Mike Myers' undergraduate Petrophysics class. Topics included their practice exam questions along with a saturation from capillary pressure exercise.



Upcoming Events

Houston Food Bank Food Drive, SPWLA Distinguished Lecturer, and possible TechLog and/or PHDWin training.

UNIVERSITY OF OKLAHOMA STUDENT CHAPTER

General News

Due to complexities generated by the ongoing COVID-19 situation, all OU student societies' events were moved to online. To enhance the connection with students in this new atmosphere, a temporary coalition was formed connecting SPWLA, SPE, and AADE into a larger group named MSC (Mewbourne Students Coalition). All petroleum-related events in OU in 2020 are being and will be held through the MSC.

New OU Mewbourne Students Coalition (MSC), connecting SPWLA, SPE, and AADE into a larger group as a strategy to overcome the difficulties associated with online events.

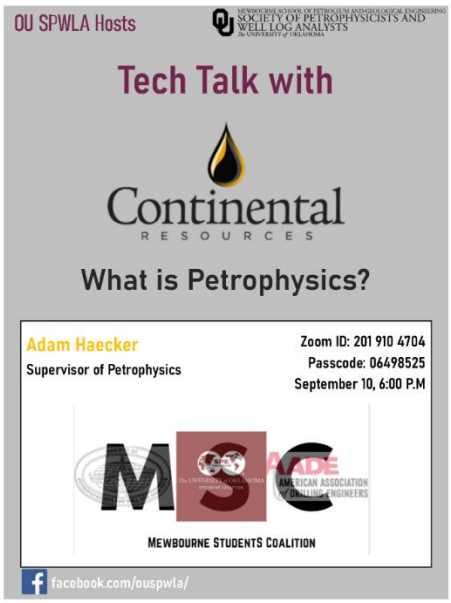
List of Contacts

Felipe Cruz (President)–felipecruz@ou.edu
Judah Odiachi (Vice President)–jodiachi@ou.edu
Francisco Sebastian (Secretary)–fsebastian@ou.edu
Tobenna Anyaezu (Treasurer)–tobennaanyaezu@ou.edu

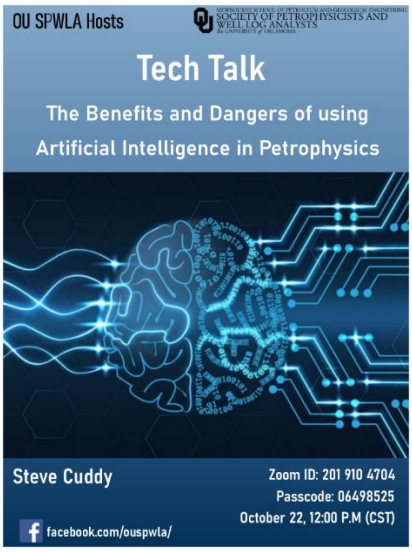
Recent Events

During the fall semester, the OU SPWLA Student Chapter promoted an interesting online Tech Talk presented by Adam Haecker (Senior Petrophysicist and Supervisor of Petrophysics at Continental Resources) in Oklahoma City, OK. In this talk, various aspects of petrophysical science were discussed, including formation evaluation, core analysis, what we actually measure, and applications. As our first online event, it had a significant attendance of 35 attendees.

Our second Tech Talk was presented by Dr. Steve Cuddy, a Consultant Petrophysicist with 45 years of industry experience in petrophysics. In this talk, the benefits and dangers of using artificial intelligence in petrophysics were discussed. Using case studies, this presentation described several successful applications; however, it also showed their potentially grave dangers. This event also had great attendance and confirms the possibility of organizing more learning online events as well.



Banner of the Tech Talk presented on September 10 by guest speaker Adam Haecker (Senior Petrophysicist at Continental Resources).



Banner of the tech talk presented on October 22 by guest speaker Dr. Steve Cuddy, a Consultant Petrophysicist with 45 years of industry experience in petrophysics.

Universidade Federal do Rio de Janeiro Student Chapter

General News

The SPWLA Student Chapter from the Federal University of Rio de Janeiro (UFRJ) has just admitted five new members to its team. The UFRJ SPWLA Student Chapter is now structured as follows:

Student Chapter Members

Marketing Team: Caio Guedes, Iago da Costa, Lucas Nogueira, and Shirlene Barros.

Logistic and Events: Team: Bruno Valle, Gabriel Ferraz, Isabelle Freitas, and Vinicius Jorge

The Student Chapter Board is also gaining a new configuration this month. The management of the UFRJ SPWLA Student Chapter next year will be:

Board Members

President……..Rodrigo Azambuja (rodrigo.gentil.azambuja@gmail.com)
Vice President…….Amanda Mendes (mendesamanda@ufrj.br)
Treasurer……Sofia D'Orsi (sgdorsi@gmail.com)
Secretary……Maria Eduarda Verbicário (duda.verbicario@gmail.com)

Recent News

August and September 2020—For the last two months, our Student Chapter has provided webinars to contribute to the dissemination of knowledge to the public. Our latest one (September 10) was presented by speaker Michele Celestino, who is part of the group, Women Sharing Excellence (from Halliburton), entitled "Life on Board, Women in Charge." The main objective of this webinar was to provide a space for valuing women's work in this area of activity that is still largely dominated by men. We also had two other webinars recently: "Underreamer: Well-Widening Tool"

by Felipe Oliveira (Halliburton). In this event, we tried to offer a subject more related to petrophysics and well logging. It took place on August 26. And finally, we also had a webinar that spoke of career planning. It was presented by Sabina Augras (CMOV). Our intention in providing this kind of webinar was to help undergraduate students to guide their professional careers. This event happened on August 18.

Upcoming Events

For the next two months, UFRJ SPWLA plans to organize a weeklong event together with our colleagues from the UFRJ AAPG Student Chapter. In this event, we intend to approach different topics about environmental challenges in the geology scenario.

UNIVERSITY OF TEXAS AT AUSTIN STUDENT CHAPTER

General News

The UT Austin Student Chapter hopes everyone in our community stays safe and healthy during these challenging times. School is back in session at UT Austin, and the student chapter of SPWLA has recruited new officers for the 2020–2021 academic year. The new officers are Gabriel Gallardo Giozza (Secretary) and Sabyasachi Dash (Social Media Manager). As new officers were recruited, previous officers have stepped down to focus on finishing their degrees. We would like to thank Tianqi Deng (former President) and Mohammed Bennis (former Vice President) for their hard work and commitment during the last academic year. The officers who have been elected to occupy the vacant positions are Andres Gonzalez (President) and Daria Olszowska (Vice President).

We have started to plan the events for the academic year 2020–2021. We have confirmed our first technical seminar for this year. Additionally, we have been exploring new ideas to increase the attendance of the technical seminar during these challenging times. One of the ideas we have shared with the SPWLA is holding joint events with other student chapters, taking advantage of the technical seminar online format, and optimizing the time of the Distinguished Speakers.

Recent Events

22 October 2020—We hosted a technical seminar by Alberto Ortiz (2019–2020/2020–2021) SPWLA Global Distinguished Speaker from YPF) entitled “What We Have Learned From the Petrophysical Evaluation of the Vaca Muerta Formation in the Last 5 Years of Unconventional Shale Play Development.” We would like to thank Alberto and YPF for his presentation.

In Memoriam of Mr. Dawei Lu (1944–2020), the Former Director of the Petroleum Well Logging Commission of Chinese Petroleum Society

It is with great sorrow that we announce that Mr. Dawei Lu passed away following a serious disease on October 4, 2020, at age 76. Lu was a professor of petroleum geophysical logging. He served in numerous leadership positions in both industry and academia, such as the former Vice Chief Engineer of the Exploration & Production Subsidiary of PetroChina, an Executive Member of Chinese Petroleum Society (CPS), a former Director of Petroleum Well Logging Commission of CPS, the former President of the Beijing Chapter of SPWLA, a Member of the Chinese Standardization Technology Committee for Petroleum Industry, the former Director of the Petroleum Well Logging Specialty Standardization Committee, and the Director of the Academic Board of the CNPC Key Laboratory for Well Logging. From 1999 to 2004, he served as a peer-review expert for the National Prize for Progress in Science and Technology. From 2007, he served as the Editor-in-Chief of the *Well Logging Technology* journal.

In 1944, Professor Lu was born in Chongqing, China. After obtaining his bachelor's degree in well logging from the Beijing Petroleum Institute (now the China University of Petroleum) in 1965, he had an internship as a logging engineer in the Daqing Oilfield Drilling Headquarters for 15 months. Then, he was transferred to the Exploration Department of the former Ministry of Petroleum

Industry of the People's Republic of China in January 1967. In March 1983, he became the Deputy Division Chief of the Logging Division of the Exploration Department.

During his service in the logging technology industry in China for the past 55 years, Professor Lu actively promoted the development of logging technology. He initiated the design and compilation of the medium- and long-term programs in China multiple times. He was in charge of the importation of major logging technologies and equipment from overseas, especially for the importation of computerized logging equipment, such as DA-3600 (DresserAtlas), CLS-3700/ ECLIPS-5700 (WesternAtlas), EXCELL-2000 (Halliburton), and CSU-D (Schlumberger). He was the founding member of China National Offshore Oil Logging Company. Since 1985, he had participated in the Petroleum Well Logging Specialty Standardization Committee and directed the establishment of a logging instrument calibration center. He was in charge of the formulation and revision of more than 200 logging standard systems and served as Editor-in-Chief for several logging books under the Petroleum Industry Press. During the Tarim Oil Exploration Campaign from 1989 to 1992, he conducted the development of the logging depth calibration wells of the Tarim Oil Exploration Campaign Headquarters and set a standard system for logging depth calibration. This system is still followed by the industry today. In the 1990s, to solve the problem of inconsistent perforation penetration depth due to different perforation charges applied in each oil field, he set a standard for the penetration depth made by each manufacturer, based on which he formed another five industry-standard systems. In 2000, he initiated the China-Russia Workshop on Well Logging, which is alternately held by China and Russia every two years.

Professor Lu had always been a strong proponent for the application and development of new logging technologies, was keen about advertising new logging technologies, such as imaging logging, nuclear magnetic resonance logging, and formation dynamic testing, and organized the promotion and application of achievements in new logging technology. Owing to his effort, new logging technology in China achieved great advancement. He won many awards, including the second prize of the Science and Technology of CNPC in 2002, the second prize of Excellent Science and Technology Book Award of the State Publishing Administration in 2003, and the first prize of the Science and Technology of CNPC in 2006.

During the days when he was in charge of the Petroleum Well Logging Commission of CPS, the Petroleum Logging Standards Committee, and the Academic Board of the CNPC Key Laboratory for Well Logging, Professor Lu made the best of all initiatives, including the industry and academia in the well-logging community to promote logging technology application and development, and was highly commended by competent authorities. He has achieved a tremendous reputation in both the domestic and international geophysical logging industries. The Russian Eurasian Geophysical Society awarded Professor Lu for his outstanding contributions to the exchange of geophysical logging technology between China and Russia in 2000 and in 2004, respectively.

Welcome New Members: August 17, 2020–October 15, 2020

Abbassi, Linda, Openfield Technology, Katy, TX, United States

Al Habsi, Yumna, Schlumberger, Seeb, Muscat, Oman

Anderson, Louise, Total E&P Ltd, Westhill, Aberdeenshire, United Kingdom

Banerjee, Anirban, Baker Hughes, Mumbai, India

Brito, Richard, Ovintiv Inc., Spring, TX, United States

Dahan, Dror, Schlumberger, Montpellier, France

De Castro, Natalia, Weatherford, Bogota, Colombia

Jankowski, Philip, Ryder Scott Company, Houston, TX, United States

Molla, Shahnawaz, Schlumberger, Cambridge, MA, United States

Randall, Kelli, Chevron, Houston, TX, United States

Santos, Nicolas, Universidad Industrial de Santander, Bucaramanga, Colombia

Sen, Deepthi, Texas A&M University, Bryan, TX, United States

Sucahyo, Gunawan, Baker Hughes, Bandung, West Java, Indonesia

Tolioe, William, Petronas, KLCC, Kuala Lumpur, Malaysia