

Evolving the Future Workforce

A virtual internship for students and early career professionals where everybody contributes and everybody learns. **MIKE FORREST, Technical Advisor, SEG EVOLVE**

The E&P industry is facing major changes due to the departure of many experienced professionals, resulting in limited or non-existent access to mentors for new hires and early career staff transitioning from the academic to the business world. Universities rightly focus on theoretical foundations and principles, but have limited time to teach the practical exploration technical and business workflows used by oil companies.

The Society of Exploration Geophysicists (SEG) is addressing this challenge with the multidisciplinary EVOLVE student program to 'Develop the Fearless Explorers of the Future'. This program has the important attributes shown in the box (right).

EVOLVE's ultimate objective is to prepare students for jobs in the energy industry. Each 'Fearless Explorer' team of four to six students with backgrounds in geology, geophysics, petrophysics and reservoir engineering work together reviewing a technical dataset to recommend the best investment opportunity in their assigned area. EVOLVE is non-competitive and as a result everybody contributes and everybody learns. The program is coordinated technically by Allen Bertagne, from the SEG EVOLVE office in Houston, reporting to Tom Agnew, SEG Associate Director, Programs. Technical support is provided by Jesus Nevarez, a University of Houston graduate, advisors Mike Forrest and Jennifer Thompson, as well as many other experienced mentors.

SEG EVOLVE started in 2015 with a pilot program. Halliburton is the founding sponsor and continues to strongly support the program, including providing access to the Halliburton Landmark DecisionSpace Platform, delivered via the Cloud. Ten university teams from US, Canada, Europe and Latin America participated in 2018 and the program was expanded to 20 international teams this year, with the

E &P;
V alue Creation: align with company's strategies and goals;
O nline Collaboration: team members, teams, mentors, and EVOLVE leaders;
L eading Edge Technologies: 3D datasets and key wells;
V irtual Internships: use of the cloud and video technology;
E xtensive Mentoring: key strength of EVOLVE.

activities being undertaken from mid-January to the end of May to conform to college semesters.

Technical Workflow

In early January, EVOLVE teams are assigned one of several public domain datasets, currently from the Gulf of Mexico, Dutch North Sea and New Zealand. Software is provided either via the Halliburton Cloud, including the Decision Space software, or local installation of Schlumberger's Petrel or IHS Markit's Kingdom. Key tutorials are provided by IHRDC and delivered via Landmark's iEnergy platform, and Rose & Associates teaches a half-day risk analysis course.

Following an individual Project Kickoff meeting in January, each team conducts a literature review and gathers data, with the goal of understanding the petroleum geology of their assigned area in order to prepare a detailed plan to allow them to identify the best investment opportunity within the area. This is followed by the mid-project presentation in March to review seismic regional and prospect mapping, integrate regional geology studies and well data into their interpretation, and to propose a detailed work plan for the second phase. The final presentations are made in May to an 'Executive Committee' focusing on the recommended best

investment opportunity, supported by key technical and economic data.

The program has no prepared answers: the emphasis for students is not the 'right answer' but on using available data to think carefully and ask the right questions. Students are encouraged to gather and integrate any and all data they can find for their project area.

Collaboration is important. The E&P work force has changed from experts working in silos to geologists, geophysicists and reservoir engineers working together as subsurface teams to share knowledge and learning across technical and business boundaries, considering the entire E&P life cycle to ensure optimal execution. EVOLVE training is an introduction to collaborating in teams to maximize learning.

The Technical Coordinator continues working with the teams over the summer in preparation for two half-day sessions at the SEG Annual Meeting where participants present their investment opportunity and also discuss their learnings from the year. Each team makes a 15-minute prospect presentation to an international audience during the oral sessions and hosts a poster session to discuss their detailed work and conclusions with other professionals. They also participate in a student panel discussion to answer questions from the audience and give industry leaders recommendations for the future.

The Value of Mentors

Mentors play a key role in EVOLVE in every phase of the program. The Technical Coordinator holds bi-weekly virtual sessions with every team in a global team meeting, where progress is reviewed and suggestions made. Students often make impromptu informal presentations at that time, exchange ideas among themselves, and share sources of useful data.

Students are free to ask the mentors and other teams questions on most topics via the SEG Basecamp website, except anything related to their specific prospect. Mentors send the teams technical papers about geology/geophysical technical issues and case histories and make personal visits to some universities for discussions with the teams and their faculty advisors. Finally, up to 15 mentors attend the mid-project and final team presentations either in person at the EVOLVE Houston office or via video communication.

Many of the EVOLVE mentors are proficient in the use of the software being used and so are able to give specific workflow suggestions, or on certain occasions even "grab the mouse, and drive."

Mentors do not 'know the answers' in advance, so observing how they think and develop their own approach is invaluable to the students.

EVOLVE is more than just technical activities and learning. It also strives to develop the human traits required to be a successful explorer, while having fun along the way. Personal meetings allow for customized exchanges and allow the mentors to gain an understanding of student competencies and remaining gaps.

This real-world experience includes learning the basic technology beyond a student's primary college major,

"Students gain exposure to real world data, top class mentors, industry leading software and critique and direction that no other industry/academia program can provide. This phenomenal learning experience is unmatched in any earth sciences industry program."

Dean Mento, P.G.
 Senior Petroleum Geophysicist;
 EVOLVE Mentor



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ACTIVE PROJECTS

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 (Onshore exploration)

DENMARK
 (Offshore exploration)

GABON
 (Offshore exploration)

GHANA
 (Offshore exploration)

KAZAKHSTAN
 (Onshore appraisal/development)

NAMIBIA
 (Offshore exploration)

SOUTH AFRICA
 (Offshore exploration)

UK: NORTH SEA
 (Offshore exploration)

UKRAINE
 (Onshore appraisal/development)

ZIMBABWE
 (Onshore exploration)

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Allen Bertagne guiding the team from Perugia University.



Mentors exchanging ideas on student prospects during the final project presentation. Mike Forrest with members of the team from Cambridge University.



building teamwork and dividing job tasks, and making timelines to accomplish team goals in the assigned timeframe. Collaborative learning with real technical data provides a lasting impression and learning experience for the students. Perhaps most importantly, lifelong bonds are formed.

EVOLVE Long-Term Vision

SEG plans for 20 university teams to participate in 2020. Application information will be available in early October, 2019 and teams will be selected in early November. The focus is on geology, geophysics, rock physics and engineering masters students, but PhD students and 3rd and 4th year undergraduate students can apply. Active participation of the university faculty advisor is essential. Universities and students interested in participating should visit the SEG website.

SEG intends increasing EVOLVE to 40 multidisciplinary university teams from around the world during the next two to three years, and is also encouraging universities to award course credits to participants. It wants to add additional comprehensive datasets from several areas worldwide and

increase technology application learning from enhanced datasets.

The organization is also keen to train oil and service company young professionals through this scheme by introducing an Early Career Professional (ECP) EVOLVE in 2020, aimed at employees with less than ten years' experience. This program will use the datasets and training processes described above, over a six-month period, with participants spending about 25% of their worktime on the project.

The SEG and SEG Foundation are seeking additional industry partners and sponsors, including individuals, to financially support EVOLVE, guide it, and ensure the program continues to succeed (details available on SEG website).

The training and practical experience that EVOLVE offers both students and young professionals will be essential if the industry is to meet the major energy challenges that lie ahead. These future professionals will be well prepared for a successful career involving complex subsurface, economic and human elements and, over time, they will indeed become the fearless explorers of the future! ■

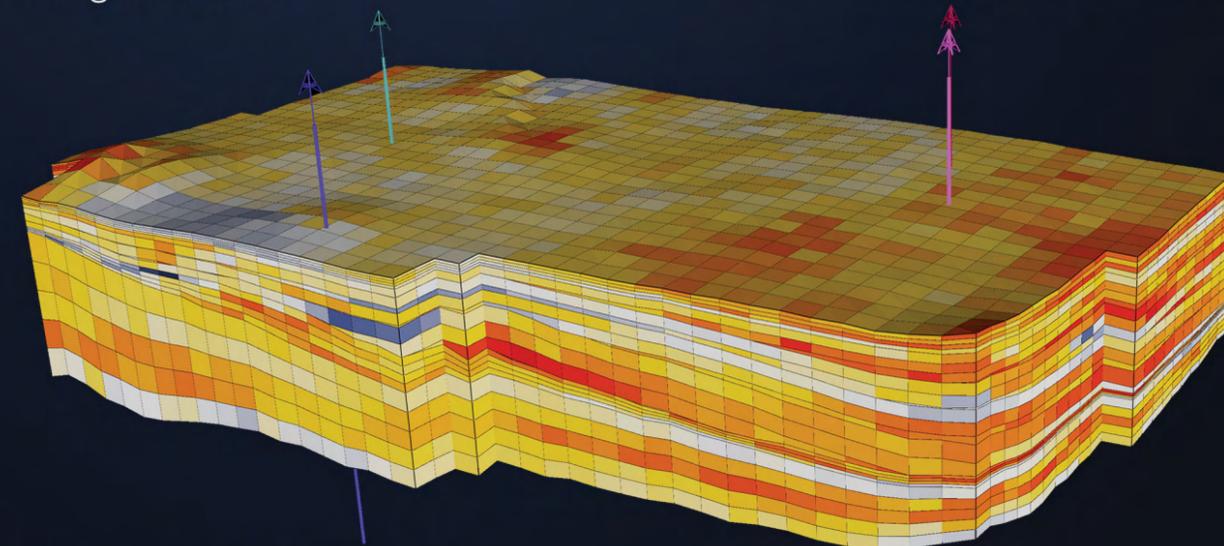
'Ask the Students': a panel discussion where teams field questions from an audience of professionals.



Static Geological Model

Use RGT model to drive the geometries

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