Ten Years Later, GwB a Resounding Success

Geoscientists Without Borders program aims to find humanitarian uses for geophysics.

BY RHONDA DUEY, SENIOR EDITOR, EXPLORATION

It all started with a tsunami. The literal kind. A devastating tsunami hit Sumatra in 2004, killing more than 200,000 people. It got Craig Beasley thinking about how geophysics might have helped avert this disaster. Beasley founded Geoscientists Without Borders (GwB) when he was president of the society in 2008, and this year’s meeting is honoring the 10th anniversary of its founding.

Funded by the SEG Foundation, the program has been hugely successful in awarding grants to scientists who wish to attempt to solve some of the world’s problems through geophysical studies. Over the last decade the program has funded almost 40 studies in almost 30 countries and has involved more than 500 students as well as 68 university partners and 18 industry partners.

GwB’s projects include archaeology, earthquake preparedness, volcano preparedness, pollution mitigation, tsunami preparedness, water management and habitat management.

A technical session Monday afternoon focused on case studies from some of these projects as well as hydrogeographic work. Given the conference’s emphasis this year on near-surface geophysics, it was an appropriate set of topics.

One of the talks was about a project in the Cul-de-Sac Plain in Haiti. Steeve Symithe, from the Faculté Des Sciences, Université d’État d’Haiti, Unité de Recherches en Géosciences, discussed his country’s prolificty for earthquakes. While the 2010 Port au Prince earthquake was the most powerful, the country is routinely subject to earthquakes in the magnitude 7 range.

See SUCCESS continued on page 6

The Best and Brightest

SEG’s most significant contributors will be recognized at the annual awards ceremony.

BY ALEXA WEST, ASSISTANT EDITOR

Tuesday evening’s annual Honors and Awards Ceremony was the scene of an unprecedented SEG event: The organization bestowed its highest honor, the Maurice Ewing Medal, posthumously. The recipient, Albert Tarantola, was recognized along with other impressive award winners. The awards program is dedicated to recognizing individuals and organizations for their major contributions to the advancement of geophysics and to the society.

“This is very unusual for us to recognize somebody posthumously, but this year the biggest award we are giving goes to someone posthumously because his body of work was incredible,” said Dave Monk, SEG’s honors and awards committee (HAC) chair and director of geophysics and distinguished adviser for Apache Corp.

According to Monk, Tarantola was overlooked in years’ past because the society had thought he had received everything that the committee could bestow upon him, but in actuality Tarantola had never received any awards from the society.
**SCHEDULE OF EVENTS**

All events in conjunction with SEG 2018 will be held at the Anaheim Convention Center in Anaheim, Calif., unless noted otherwise. For a complete schedule of events visit seg.org/Annual-Meeting-2018/Schedule.

**Wednesday, Oct. 17**

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<tr>
<th>Time</th>
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<tr>
<td>7:30 a.m.</td>
<td>Convention Center Main and Self-serve Badge Print Kiosk</td>
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<td>7:30 a.m.</td>
<td>SEG Book Mart</td>
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<td>8 a.m.</td>
<td>Meet, Greet and Eat: Members-only Breakfast</td>
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<td>8 a.m.</td>
<td>Google and Friends Hackathon for Data Science and Machine Learning</td>
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<td>8:30 a.m.</td>
<td>Business of Applied Geophysics Plenary Session: Impacting Society: Frontiers for Geophysicists</td>
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<td>8:30 to 11:50 a.m.</td>
<td>Technical Program Morning Sessions</td>
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<td>9 a.m.</td>
<td>SEG Near-surface Geophysics Technical Session</td>
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<td>9 a.m.</td>
<td>Global Gathering Place (Level 1, Exposition Halls ABC)</td>
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<td>9 a.m.</td>
<td>Student Lounge (Exhibit Hall)</td>
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<td>9:45 a.m.</td>
<td>Coffee Break</td>
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<td>11:30 a.m.</td>
<td>Development and Production Luncheon</td>
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<td>12 p.m.</td>
<td>Mining Luncheon</td>
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<td>12:30 to 1:50 p.m.</td>
<td>Focus on Commercial Technology&quot; Exhibitor Presentations</td>
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<tr>
<td>1:50 p.m.</td>
<td>Business of Applied Geophysics Plenary Session: Geophysical Return on Investment for Unconventionals</td>
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<tr>
<td>5:30 p.m.</td>
<td>SEG Near-surface Geophysics Technical Session Panel Discussion: Near-surface Geophysics for Groundwater Management</td>
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<tr>
<td>6 p.m.</td>
<td>Wrap-up Party</td>
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**Correction:** The article titled "Council Approves Voting Rights for Associate Members" on the front page of the Tuesday edition of the SEG Daily News contained two errors. The first error appeared in the article’s subheading, which was printed as “The proposal should ease the application process that was nixed.” The subheading should have read “Proposal to ease application process is nixed.” The second error occurred in the last sentence of the first paragraph, which was printed as “Another proposed amendment that would expand the pool of candidates for council chair also passed, while one-third proposed an amendment that would have simplified the Active Membership application process failed.” The sentence should have read “Another proposed amendment that would expand the pool of candidates for Council Chair also passed, while a third proposed amendment that would have simplified the Active Membership application process failed.”
Ready for San Antonio?

If Disneyland isn’t enough, the 2019 conference will offer a fresh host of alternatives.

BY RHONDA DUEY, SENIOR EDITOR, EXPLORATION

In the throes of a major meeting like the 2018 annual convention, it’s perhaps inconceivable that people are already looking to 2019. But that’s exactly what a few stalwart SEG members are working on.

The 2019 meeting will take place in San Antonio, and General Chairman Glenn Winters is already in full swing thinking about the theme and focus of the conference and assembling his crew to make sure everything goes as planned. The theme of the convention in part will highlight the Permian, Eagle Ford and Latin America. Winters brings a rich legacy to the role, having spent much of his career working in these regions.

He also has been active in the society, working on committees and the SEG Council and giving talks through local organizations in Texas, Colorado and Oklahoma. Winters said next year’s meeting will offer several areas of focus:

- Data acquisition and the importance of artificial intelligence (AI) and Big Data. “This includes the currently ‘hot’ technology of sparse 3-D land seismic data acquisition,” he said.
- The processing of geophysical data through the combination of joint inversion and full waveform inversion, and
- Interpretation through the application of multidisciplinary integrated AI and machine learning algorithms such as neural networks in supervised and unsupervised applications.

Additionally, he said there will be a focus on Latin America, and he’s generally bullish on the outlook for working in these regions.

“There’s so much going on,” he said. “Looking forward, there are hot plays and hot economies in hot places. The 2019 conference will be a great place and not only for technical presentations!”

Of course, Winters also noted that San Antonio has much to offer, from the historic Alamo to the River Walk. It also offers up a host of more refined offerings such as the botanical garden and the San Antonio Missions National Historical Park as well as SeaWorld, Six Flags and the Natural Bridge Caverns, to name just a few.

For an exploration industry beleaguered by continued low prices, this sounds like good news indeed, and Winters is not one to rest on his laurels. While he’s called in heavy hitters to help with the planning for next year’s conference, he’s also bringing in younger people who hopefully will represent the future of the society.

As the general chairman, Winters is responsible for approving all matters of substance and policy, he said. “I will be working with my committee chairs, some of whom have agreed to the position and others whom I have recruited. This is a mixture of experience and other less seasoned professionals,” he said. “Some of the committees, like Technical, Global and Exhibits, are already positioned for working on next year’s program. And I will also be working with a talented and experienced SEG staff that oversees items such as accommodations, the location of meetings, advertising and volunteers.”

He added that it is important to get young people involved to have professionals of different ages working together. “We need to make sure that we’re all moving forward,” he said.

SEG Book Mart Open Through Friday

Located on the second level of the convention center, just outside the technical-session rooms, the SEG Book Mart remains open today from 7:30 a.m. to 6 p.m., on Thursday, Oct. 18, from 7:30 a.m. to 6 p.m., and again on Friday, Oct. 19 from 7:30 a.m. to 1 p.m. Many of the most popular titles are on sale, and all attendees pay the meeting price regardless of membership status.

Save the Date!

Mark your calendars to attend SEG19 in San Antonio. The SEG International Exposition and 89th Annual Meeting will take place Sept. 15-20, 2019, at the Henry B. Gonzalez Convention Center. Visit seg.org to learn more about upcoming SEG annual meetings.

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- Indicate which part of this fracture network is contributing to short and long-term production
- Improve the productivity of every stage on-the-spot and without having to wait months for data

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Data from surveys demonstrated that the current play fairways are generally underexplored and structural and stratigraphic traps remain to be fully exploited.

**Contributed by PGS**

**Data Show Further Reservoir Potential along Brazil’s Equatorial Margin**

Data from surveys demonstrated that the current play fairways are generally underexplored along Brazil’s Equatorial Margin.

**Improved structural imaging of current discoveries and more confident mapping of reservoir distribution and variability are available with PGS fast-track prestack time migration output from the latest Potiguar-Aracatu 3-D GeoStreamer survey. Current discoveries in the area exhibit elements of both structural and stratigraphic trapping, and the data indicate a number of undrilled analogous features on trend with the established discoveries. The amplitude versus offset fidelity and compliance delivered by GeoStreamer enables confident de-risking of stratigraphic plays and prospects.**

Industry attention in the last few years has been directed at the Santos and Campos basin areas on Brazil’s east coast, where Cretaceous carbonate reservoirs in large subsalt structural traps have proved prolific. Analogues of this play have subsequently been chased on the conjugate margin equivalents of these basins in West Africa.

Further north, the extrapolation of trends from one side of the Atlantic Margin to its conjugate pair has been in the opposite direction. Success in post-salt Cretaceous reservoirs along the conjugate margin in West Africa, for instance Jubilee, have precipitated a move by explorers to examine the equivalent equatorial margin of Brazil and neighboring Guyana from a new perspective. Zaedyus in French Guiana was an early geologic success and Exxon’s Liza and associated fields in Guyana have become the poster child for economic success in these play fairways on the South American Equatorial Margin.

The Equatorial Margin of Brazil has four potential hydrocarbon sources capable of supporting exploration prospects and play fairways, including the Aptian/Barremian oil-prone source rock that has charged the majority of current production offshore Brazil, the Albian/Cenomanian/Turonian marine black shales, which are a major source for the oils in the West African salt basins, and the Late Aptian and Tertiary candidates. Regional shales from the Cretaceous to the Tertiary form effective seals, except where mass wasting events in the Upper Tertiary may have caused seal failure for younger stratigraphic intervals.

To date, few deepwater exploration wells have been drilled in the Equatorial Margin extending from the Amazonas Cone to the Potiguar Basin. The Ceará and Potiguar basins at the eastern end of the Brazilian Equatorial Margin are two underexplored basins that have both yielded recent exploration successes, indicating working petroleum systems and potential reservoirs.

The Cretaceous reservoir play fairway has been successfully established by two prominent deepwater discoveries, Pitu and Pecem, in the Ceará and Potiguar basins, respectively. The 2012 Pecem discovery well in the Ceará Basin, found a 290-m column of oil-bearing sands in the Aptian age Paracuru Formation, while the Pitu discovery well in the Potiguar Basin found an 186-m column of 28 degree API oil in Alagamar Formation sands of Albian age at depths of 3,690 m to 3,875 m. With quoted 2P reserves of 475 MMbbl oil and almost 1 Tcf gas, Pitu is being appraised.

PGS conducted a succession of multiclient broadband multicomponent GeoStreamer 3-D surveys to enhance exploration understanding and de-risk play elements in the Potiguar and Ceará basins. Between 2015 and 2017, almost 20,000 sq km of 3-D GeoStreamer data have been acquired with further expansion of this regional dataset being permitted and scheduled for acquisition in 2019.

Seismic stratigraphy integrating recent well results with prestack seismic attributes from high-quality GeoStreamer 3-D data have demonstrated that the current play fairways are generally underexplored on the Brazilian Equatorial Margin, and structural and stratigraphic traps remain to be fully exploited.

For more information, visit PGS booth 1841.
Emerson has released Paradigm 18, the latest version of its subsurface solution suite. Paradigm 18 includes new applications for advanced automation using machine learning, enhanced integration across the full range of its multidisciplinary solutions, effective collaboration with support for applications running on the cloud, and optimization of processes and workflows that improve image and earth model accuracy.

**Interpretation workflows**
Paradigm 18 uses machine learning as a data integrator and process automation tool, and introduces new solutions for the unsupervised classification of prestack and post-stack seismic data. Geobody detection has been integrated into the SeisEarth interpretation suite and can be applied to the results of the seismic facies classification. A new parameter sensitivity analysis facilitates user understanding of the impact of parameter changes on several interpretation workflows.

Integration between interpretation and modeling applications has been extended in Paradigm 18. The main interpretation windows now share a common user interface with the StratEarth geologic interpretation solution and the SKUA-GOCAD modeling solution for more efficient integrated workflow and improved experience for seismic interpreters and geologists working in the Epos environment. Time-based production data loaded in Epos may now be accessed by StratEarth and SKUA-GOCAD, enabling a more comprehensive analysis of these data within the interpretation framework.

Paradigm Quantitative Seismic Interpretation now includes automatic parameter optimization at all well locations for seismic inversion and AV(A) activities.

**Modeling workflows**
SKUA-GOCAD modeling workflows have been optimized to handle large numbers of wells. Additional functionality for unflattening interpretation data and seismic volumes has been added to better benefit from SKUA-GOCAD paleospace enhancing attribute calculations and seismic interpretation workflows. Gridless geostatistics have been introduced for stratigraphically constrained property modeling on unstructured grids and any type of meshless object. The release upgrades its support for geomechanical workflows with grids that combine the benefits of structured and unstructured grids, in support of both flow simulation and geomechanical simulation workflows to capture the true geometry of the reservoir without unwarranted simplification.

**Tomography updates**
For GeoDepth velocity model building users, tomography updates include support for large datasets in conjunction with high-resolution tomographic update grids. This leads to a substantial reduction in memory consumption and project run times, while resulting in more accurate velocity models.

The integration between GeoDepth and SKUA has been further strengthened by enhancements to GeoDepth 3-D structural model-based tomography, made to support geologically constrained velocity models that honor faults and multivalued surfaces. Additionally, a time-preserving tomography workflow supports complex models, facilitating the minimization of mis-ties between well markers and the structural model in depth.

GeoDepth users will enjoy productivity improvements when performing velocity model updating and imaging of multi-line 2-D projects, including a new 2-D Kirchhoff depth migration and 2-D illumination studies. A new orthorhombic workflow is now available for output from EarthStudy 360 Imager, enabling more accurate estimation of fracture orientation and stress.

New features for users of Echos seismic processing include a method for model-based ground roll modeling and attenuation, new residual statics applications and an alternative method for 5-D data reconstruction based on Radon Transform data modeling. New tools leverage modern workstations for the display, analysis, quality control and manipulation of seismic survey geometry information. And new seismic file parallel input/output

See **NEW DIMENSIONS** continued on page 8
Haiti is at the epicenter of two plates, the North American Plate and the Caribbean Plate. The former is undergoing subduction underneath the latter. It’s a slow process—about 2 cm per year—but it raises the possibility of a collision event in the future.

The study was meant to study two faults, the Enriquillo Fault and the Ganthier Fault, both of which underlie the Cul-de-Sac Plain. Past studies of these two faults have been unable to explain the compression of the faults, Szymath said. This study turned up new understanding across their organization:

• Knowledge is easily lost for a variety of reasons, be it the dynamic nature and movement of teams across life cycles of a given asset or more significant moments in the market, which lead to great crew changes with little advanced warning. If an effective knowledge management system is not in place prior to these changes in and around teams, critical subsurface knowledge commonly disappears as well. In the worst case, this may result in losing highly valued and hard-earned lessons, which can compromise vital investment decision-making.
• Knowledge is difficult to locate even when some form of knowledge management is in place. Often extensive subsurface wellbore information resides in disparate spreadsheets or individual work files, which greatly impedes the generation of new insights because the manual effort required to make sense of that information is highly inefficient. This leads to the geoscientists spending more time locating and understanding data than interpreting data and making important life-cycle decisions about exploration, drilling and field development; and
• Knowledge is underutilized thanks to the above challenges, among others. Simply stated a geoscientist cannot use the information that they do not know exists.

Robust solutions for interpreting and understanding subsurface information have been developed in close collaboration with key industry leaders and are designed to effectively manage quality data with the advantage of easy accessibility for geoscientists, data scientists and other important consumers of subsurface data as needed. The technology is built to allow organizations to drive immediate efficiencies in harnessing related legacy work to devise new patterns and relationships to further quantify data-driven insights into subsurface interpretation and predictions.

SUCCESS
(continued from page 1)

FWI data and comparing those to the existing data. The existing tracer data, to test the theory, simulating GPR-Krauthausen Field in Germany, which already had truth the methodology. So they studied data from the place in North America, researchers wanted to ground-to detect tracer plumes. While the GwB study will take (GPR) in conjunction with full waveform inversion (FWI) ability to better impact construction decisions. The goal is not only earthquake preparedness but also the some of the test sites four times since 2017. Ultimately through the use of a dense GPS network to test more

SUCCESS
(continued from page 1)

Another study hopes to use ground-penetrating radar (GPR) in conjunction with full waveform inversion (FWI) to detect tracer plumes. While the GwB study will take place in North America, researchers wanted to ground-truth the methodology. So they studied data from the Krauthausen Field in Germany, which already had existing tracer data, to test the theory, simulating GPR-FWI data and comparing those to the existing data. ■

NEW THIS YEAR!
Business of Applied Geophysics (BAG) Plenary Sessions. Included with your full-delegate registration.

Don’t miss today’s BAG Sessions!

Impacting Society: Frontiers for Geophysicists
8:30 AM-11:30 AM
Applied Geophysics continues to enable startling rates of economic development for billions via identification and delineation of reliable and affordable energy reserves. What has our community already done to help provide water, identify and mitigate natural disasters, and help design more efficient cities, and how can we do it better?

Geophysical Return on Investment for Unconventionals
1:50 PM-5:50 PM
This plenary session brings together leaders from large and small operating companies, service providers, and consultants who will discuss the business opportunities and challenges of the economic application of geophysics to unconventional development.

BAG sessions are held on Level 3, Ballroom B.

CONTRIBUTED BY IKON SCIENCE

The emergence of machine learning offers innovative opportunities for the oil and gas industry to achieve insights and maximize value from vast amounts of data previously underutilized. Running calculations on immense datasets that previously required months or even years of time can now be achieved in a matter of hours or days. One critical success factor in these efforts is the availability of centrally aggregated, reliable data. As a result, a question likely on the mind of any operator who wishes to utilize these Big Data applications is how to access all relevant data across disciplines to support data scientists in this new endeavor.

Ikon Science has developed a system to help teams manage, locate, share and exchange subsurface data. This technology has been specifically designed to address the following key obstacles faced by operators tasked with managing subsurface knowledge across their organizations:

• Knowledge is underutilized thanks to the above challenges, among others. Simply stated a geoscientist cannot use the information that they do not know exists.

Robust solutions for interpreting and understanding subsurface information have been developed in close collaboration with key industry leaders and are designed to effectively manage quality data with the advantage of easy accessibility for geoscientists, data scientists and other important consumers of subsurface data as needed. The technology is built to allow organizations to drive immediate efficiencies in harnessing related legacy work to devise new patterns and relationships to further quantify data-driven insights into subsurface interpretation and predictions.

SUCCESS
(continued from page 1)
This year that changed. The Maurice Ewing Medal, an honor established in 1978, is awarded to a person deserving of special recognition for major contributions to the advancement of exploration geophysics. Tarantola has received the honor for being the first to recognize the close relationship between seismic migration and seismic inversion by proving that a seismic migration is the first step in an iterative attempt to solve a full wavefield seismic.

He and all the award recipients were selected from nominations that were submitted from the membership and from outside of the society. Each year nominees are evaluated, researched and discussed by the society and then are presented to SEG’s board for approval.

Reaching across the globe
Monk noted an inaugural award in the 2018 lineup: the Craig J. Beasley Award for Social Contribution, which is named after the driving force behind the founding of SEG’s Geoscientists Without Borders, a program that provides grants supporting humanitarian applications of geosciences around the world.

The 2018 award has been conferred on Paul D. Bauer for his social contribution in the area, which includes spending more than 10 years doing humanitarian geophysical work in Uganda, Indonesia and Malawi. Bauer also completed Geoscientists Without Borders projects in Kakuma and Uganda.

According to Monk, new awards are not the only way the honors and awards program has evolved through the years. The program also has grown in diversity.

“When the SEG started it was a pretty parochial society and U.S.-centric,” he said. “Now the awards that we give out are world-wide. The recipients come from all over the world and from all classes of people and nationalities.”

Mirrall Kanti Sen, professor and Jackson Chair at the Institute for Geophysics at the University of Texas at Austin, is the recipient of the Virgil Kauffman Gold Medal, which is awarded to those who have made an outstanding contribution, either of a technical or professional nature, to the advancement of geophysical exploration. Sen has been awarded this honor for his significant contributions in applied seismology on elastic anisotropic wave propagation, computational seismology, full waveform inversion (FWI), and inversion of seismic data for fracture analysis, fluid content, rock properties and improved resolution, reservoir characterization, and CO2 sequestration.

Fred Aminzadeh has received this year’s Honorary Membership for his significant contributions to the field of exploration geophysics and seismic signal processing through his numerous books, patents and publications with a focus on technical advances in discipline boundaries applied geophysics, petroleum engineering, computer science and electrical engineering. John Burg and Necati Gulinay have received this year’s Reginald Fessenden Award. Burg has made many contributions to exploration geophysics in the field of signal processing, and Gulinay’s work in methods for seismic data denoising and interpolation have been adopted worldwide and are central to workflows for seismic data pre-conditioning.

Advancing technology and knowledge
The 2018 Cecil Green Enterprise Award has been presented to Parallel Geoscience Corp. (PGC), including Daniel Herold, Robin Herold and Peter W. Flanagan. The 2018 award has been granted to PGC developed personal computer seismic processing software, with Seismic Processing Workshop (SPW) as its main product. Originally running on Macintosh computers using coprocessors for speed, a subsequent rewrite of the system allowed portability across Windows, Linux and Mac operating systems. There are more than 1,000 SPW installations in more than 70 countries.

Another organization that is being recognized is the Bureau of Economic Geology, which has earned the 2018 SEG Distinguished Achievement Award, an award given to a company, institution or other organization for specific technical contributions that have substantially advanced the science of exploration geophysics. Some of the bureau’s contributions include the early development of reflection seismology and seismic stratigraphy and the transfer of 3-D seismic technology to independents in Texas and surrounding states.

The SEG Special Commendation Award was established to recognize deserving persons for meritorious service to the public, the scientific community or the profession of applied geophysics. Maria Angela Capello has received the award for her distinguished record of service to the scientific community and the profession, including her leadership in the empowerment of women and the development of talent for the oil industry in different regions of the world.

SEG confers life membership on people who have voluntarily rendered exceptionally meritorious service to the society that, in the unanimous opinion of HAC and the SEG Board of Directors, warrants recognition. This year, the society has granted life membership Awards to Huasheng Zheng and Xianhuai Zhu.

Other award recipients include Yosemite Elita Li, Mat-teo Ravasi and Tieyuan Zhu to whom the 2018 J. Clarence Karcher Award has been granted. The award is given in recognition of significant contributions to the science and technology of exploration geophysics by young geophysicists.

Haritatsu Ali and Kristina Keating are the recipients of the 2018 SEG Outstanding Educator Award. Ali is associate professor of geosciences at Fort Hays State University where she has developed 10 new courses. Keating is associate professor of earth and environmental sciences at Rutgers University, has been honored for being an outstanding mentor to Ph.D. near-surface geophysics students.

Other awards and recognitions include:


Awards of Merit (Best Student Poster Paper, 2017 Annual Meeting): “Automatic Noise Exploration in Urban Areas” by Faneile Hout; “Hydraulic-fracture Geometry Characterization Using Low-frequency DAS Signal” by Ge Li and Baishali Roy; and “4D DAS VSP as a Tool for Frequent Seismic Monitoring in Deep Water” by Albenza Matrovec, Jorge Lopez, David Chaitenski, Maria Tatarauna, Paul Zwarteveen, Zhaozhi Yang, Sudhirsh Babu, Kiko de Vis and Hans Potters.
Mastering AI and Analytics Tools

Technologies that people have grown accustomed to in smartphones and social media will drive major innovations in how key decisions will be made in the upstream industry.

BY BARRY ZHANG, QUANTICO ENERGY SOLUTIONS

The modern smartphone is for all intents and purposes an inseparable part of everyone’s lives now. Google Maps provides a well understood example of consumer intelligence. When directions are pulled up in Google Maps, it doesn’t just give directions to the destination, but it gives three alternative routes, each with a corresponding estimate of drive time. And 90% of the time, the driver will take the fastest route, but 10% of the time the driver may decide to take a different route. Google is acknowledging that it doesn’t know whether the situation is a leisurely weekend drive or someone late for a meeting, so it hands over the final decision to the driver, but it has armed them with the decision intelligence to make the right decision with a few finger strokes.

The upstream industry stands at the brink of similar innovations in decision intelligence. What is happening now to unlock this potential? A combination of artificial intelligence (AI) and analytics-ready datasets will deliver lower cycle times, more accurate results and, perhaps most importantly, enable new learnings from the integration of different aspects from field appraisal to production.

For example, a standard part of developing shale plays is examining public and private datasets to see where nearby wells have been drilled, what direction the laterals were oriented and how much proppant went into the fracturing job. If this workflow may be called traditional data analytics for Business Intelligence 1.0, however, the latest AI tools deliver important enhancements. Previously, public datasets were fragmented across multiples states with difficult to navigate websites and databases. Thus, oil companies pay hefty subscription fees to access cleaned data from a handful of large data vendors.

In Business Intelligence 2.0, the novel tools provide the public datasets in a clean, standardized basis and at minimal cost. In other words, the public datasets in themselves are important, but the true value lies in proprietary data and AI driven insights. A reservoir or fracturing engineer no longer needs to spend hours or days looking for trends in Spotfire and guessing whether a certain dot that doesn’t fit a trend line is simply an outlier or an important insight that can save the company millions. By selecting the treatment design and inputting well location, AI services deliver accurate production decline curves customized to that individual well. With a few clicks in a web portal, an engineer can run design and cost sensitivities. A business development professional can appraise an asset with well specific production, rather than fieldwide average decline curves that are divorced from the reality that treatment parameters and geology can cause variable production.

Analytics-ready, cost-effective datasets are a key attribute of Business Intelligence 2.0 services. Moreover, once production, earth models and fracturing data are available across basins, different types of data can be associated to draw additional insights. Previously, it has been difficult to identify the relationship to production of pressure pumping schedules or flowback data in isolation. Going forward, Business Intelligence 2.0 companies will help producers associate the operational data across thousands of wells to production and geologic models. How does a particular choke schedule impact the decline curve? How does stage spacing and perforation cluster counts impact production and well spacing? These are examples of insights that are uniquely enabled by coupling one proprietary dataset with another.

The winners in this digital race are working hard in the industry to embed lessons learned from everyday consumer applications with structured datasets and AI services that allow users to spend time making better decisions rather than performing data conditioning. Oil companies that proactively foster such AI technologies will be in a position to harvest previously unattainable operational efficiencies.

NEW DIMENSIONS

(capabilities provide improved throughput for seismic processing and imaging workflows.

New for petrophysicists

A significant upgrade to Geolog 18 is the generalization of petrophysical uncertainty, which enables most Geolog modules and Loglans to run in Monte Carlo mode. Other updates include a new customized reporting module, a formation testing methodology and major updates to the geomechanics, engineering and production modules, including a new cement evaluation functionality. Python programming support is enabled inside of Geolog Loglan.

Improved data sharing, connectors

Paradigm customers can now use cloud hosting to access Emerson’s products, allowing remote teams to work together more efficiently. Access to web-based open source and GIS data sources has been extended.