

resource

Online Quarterly RPSEA Member Newsletter

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President's Perspective

Things continue to move along very well at RPSEA with two important milestones since the last newsletter. First, the Secretary of Energy has approved the 2010 Annual Plan. With this approval, we anticipate issuing 2010 RFPs late in the second quarter. Second, we have received and reviewed the proposals for our 2009 Program. A total of 28 selections from our industry-based advisory committees, out of 97 submissions, have been submitted to NETL for approval to begin negotiations leading to final awards. We hope that yours are among those projects selected, and that we are in touch with you soon. As always, there are many great proposals that weren't selected. If your project isn't selected, we encourage you to obtain a detailed debrief as soon as possible to assist you with possible future proposals.

More and more projects are underway or completed each week for a total of 70 as we speak. I urge you to check out our website calendar to see what activities are upcoming, where you can follow the events and projects of particular interest to you. Several notable upcoming events are our Unconventional Gas Conference in Golden in April and our Ultra-Deepwater Conference in Houston in June. In addition, you will find many other events around the Section 999 program, plus an exciting cosponsorship of the GTI Global Unconventional Gas Conference in Amsterdam in June. We especially are excited to have been selected as a Supporting Organization at OTC this year. This is a big honor and reflects the growing recognition of our public/private R&D partnership model.

Please feel free to call, come by or stop by to see us at one of our many upcoming events. Your support and participation is greatly appreciated.



C. Michael Ming
President

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OTC Board Selects RPSEA as Supporting Organization

For the first time at the Offshore Technology Conference (OTC), RPSEA will be a Supporting Organization. Following last year's honor of Invited Organization, the OTC Board voted earlier this year to name RPSEA as a Supporting Organization. RPSEA will have a booth located in the lobby of the first floor of Reliant Center with the other five Supporting Organizations.

Founded in 1969, the Offshore Technology Conference is the world's foremost event for the development of offshore resources in the fields of drilling, exploration, production and environmental protection. OTC is held annually at Reliant Center in Houston.

OTC ranks among the largest 200 trade shows held annually in the United States and is among the 10 largest meetings in terms of attendance. Attendance consistently exceeds 50,000, and more than 2,000 companies participate in the exhibition. Attendees are from around the globe, with more than 110 countries represented at recent conferences. OTC is sponsored by 12 industry organizations and societies, who work cooperatively to develop the technical program each year. OTC also has two endorsing organizations and six supporting organizations.

Visit RPSEA's booth and Member Reception at OTC!

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Join Us for the RPSEA Member Reception

Join RPSEA staff and Board members at RPSEA's Member Reception at OTC. The reception will take place Monday, May 3, from 4-7 p.m. in Reliant Stadium's Directors Club. We hope you will join us for cocktails, hors d'oeuvres and fellowship! If you are interested in sponsoring RPSEA's Member Reception, please contact James Pappas at 281-690-5511.

Look for your invitation in the mail. This event is an invitation only event for RPSEA members and invited guests. You must RSVP to attend. Please [click here](#) to register.

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RPSEA Ultra-Deepwater Conference 2010

Join RPSEA's Ultra-Deepwater team as they host a two-day conference focused on ultra-deepwater in the Gulf of Mexico on June 22-23, 2010 at The Bell Tower on 34th in Houston.

This two-day conference will combine eight Technology Advisory Committee (TAC) meetings into two, full days. RPSEA TACs serve in an advisory role to RPSEA's Ultra-Deepwater Program. The role of the TACs is to identify current technology gaps and define the specific R&D efforts needed to address these gaps. Those that serve on the TACs are subject matter experts, who study and apply ultra-deepwater technologies in real field situations. The TACs provide a bottom-up, end-user-driven program.

The eight TACs are: Geoscience, Flow Assurance, Subsea Facilities, Floating Facilities, Drilling & Completion, Reservoir Engineering, Systems Engineering and Met-Ocean.

Break-out sessions will be held both days with presentations from those who currently are working with RPSEA-funded projects. Learn where RPSEA's Ultra-Deepwater Program is and where it is going. Poster sessions will take place during breaks and lunch. A cocktail reception is planned for the evening of June 22 to enjoy fellowship and networking.

The conference is open to RPSEA members and nonmembers. You must register to attend, and registration will be open soon. If you are interested in sponsoring RPSEA's Member Reception, please contact James Pappas at 281-690-5511. [Click here](#) for more information.

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Global Unconventional Gas 2010: Unlocking Your Potential

The potential for natural gas from shale formations is tremendous. Global Unconventional Gas 2010: Unlocking Your Potential is the world's premier international conference and workshop designed to share knowledge and best practices gained from unconventional gas development. Energy professionals and stakeholders will hear from experts about the enormous potential of gas shale and other unconventional gas resources across the globe and learn about the latest issues, approaches, processes and techniques key to unlocking the resources in their own countries.

Hosted by the Gas Technology Institute (GTI) and cosponsored by the International Gas Union (IGU), the Research Partnership to Secure Energy for America (RPSEA), and other leading energy organizations, the conference will be held June 15-17 in Amsterdam, The Netherlands. Several hundred gas professionals from around the world are expected to attend, and the conference will integrate opportunities for networking and discussing emerging development plays with speakers and attendees.

Day one offers a broad perspective of the potential for unconventional gas in a sustainable global energy mix and the environmental and production issues associated with resource development. Speakers confirmed for this day include Dr. Abdul Rahim Hashim, President of the International Gas Union; Aubrey K. McClendon, Chairman & CEO, Chesapeake Energy Corporation; Christopher Flavin, President of Worldwatch Institute; and Christopher Smith, Deputy Assistant Secretary, US Department of Energy.

Day two is focused on five technical sessions that will deliver state of the art insights into unconventional gas resource development around the world, reviewing current and developing technology with a focus on gas shales. Sessions will be presented by Vello Kuuskraa, Advanced Resources International, Inc.; Dr. Rhodri Thomas, Wood Mackenzie; Dr. Stephen Laubach, Bureau of Economic Geology, University of Texas at Austin; Steve Wolhart, Pinnacle – a Halliburton Service; Dr. Tom Hayes, Gas Technology Institute; Dr. Rich Haut, Houston Advanced Research Center; and Dr. Robert Siegfried, Gas Technology Institute.

The meeting also includes numerous networking opportunities for connecting with your colleagues and prospective partners. [Click here](#) to register.

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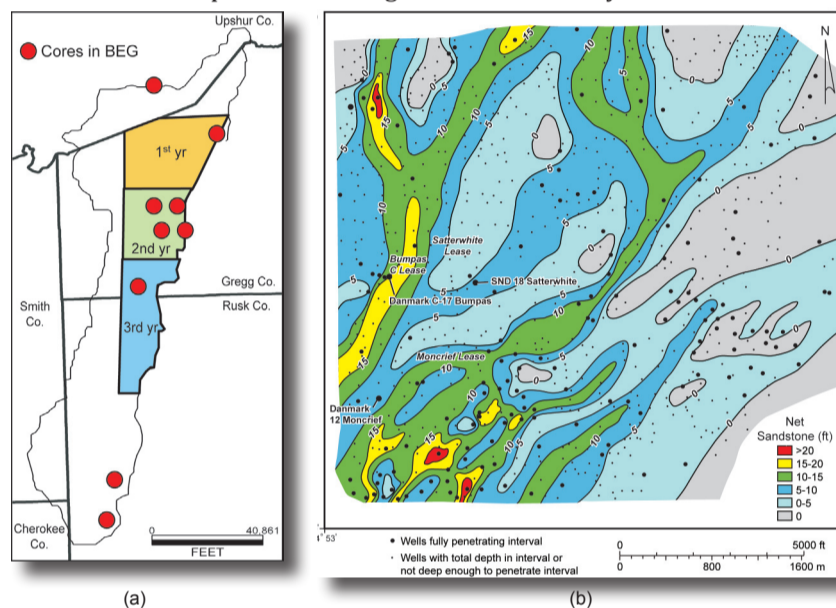
Small Producer Project Highlight

Development Strategies for Maximizing East Texas Oil Field Production

Principal Investigator: Dr. Fred P. Wang, The University of Texas at Austin/Bureau of Economic Geology

Partners: The University of Texas at Austin/Bureau of Economic Geology, Danmark Energy L.P., John Linder Operating Co., LLC

Development Strategies for Maximizing East Texas Oil Field Production is a three-year research project at the Bureau of Economic Geology (BEG), Jackson School of Geosciences at The University of Texas at Austin, funded by RPSEA in October 2009. The study is divided into three phases involving three areas of analysis in an East Texas field (Figure 1a). The total area is approximately 20 miles by 5 miles and contains less than 6,000 wells. More than 3,000 feet of cores from the field that are available at BEG's core repository will allow us to conduct a feasibility study of enhanced oil recovery methods in the field through laboratory coreflood tests.



(a) Location map of East Texas oil field showing areas for three study phases and core locations, and (b) net-sandstone map showing the depositional trends of lower Woodbine ("stringer") sandstone.

The primary objective of the project is to develop production strategies to help the 114 small producers in the East Texas oil field (ETOF) improve their oil production. It is a field-demonstration project with two industrial partners, Danmark Energy L.P. and John Linder Operating Co., LLC, that aims to locate well-deepening and waterflooding targets guided by depositional trends through the detailed mapping of reservoir architecture (Figure 1b). The project also addresses economically viable technologies that are needed in numerous mature and marginal fields (large and small) in the U.S.

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Unconventional Resources Project Highlight

Reservoir Connectivity and Stimulated Gas Flow in Tight Sands

Principal Investigator: Dr. Dag Nummedal, Colorado School of Mines

Partners: Colorado School of Mines, The University of Colorado, Mesa State University, iReservoir, Bill Barrett Corporation, Noble Energy Inc., Whiting Petroleum Corporation and ConocoPhillips Company

The Project has two primary objectives: one is to develop a comprehensive scientific understanding of the distribution of natural gas in the Cretaceous sedimentary section of the Piceance basin, Colorado. The other is to develop the technologies that optimize the production of this gas.

To achieve these objectives, Colorado School of Mines and its partners at five affiliated institutions have put together one of the most comprehensive teams ever to ensure that all relevant skills and knowledge are included. To ensure open, frequent and accurate communication among the team members, a web-based communications and data exchange tool, iProject, will be provided as a cost-share by one of the project partners (iReservoir).

Geological, geophysical and engineering tasks are also closely linked to the point of having project members performing data analysis and interpretation jointly with team members of different disciplinary backgrounds and at different locations.

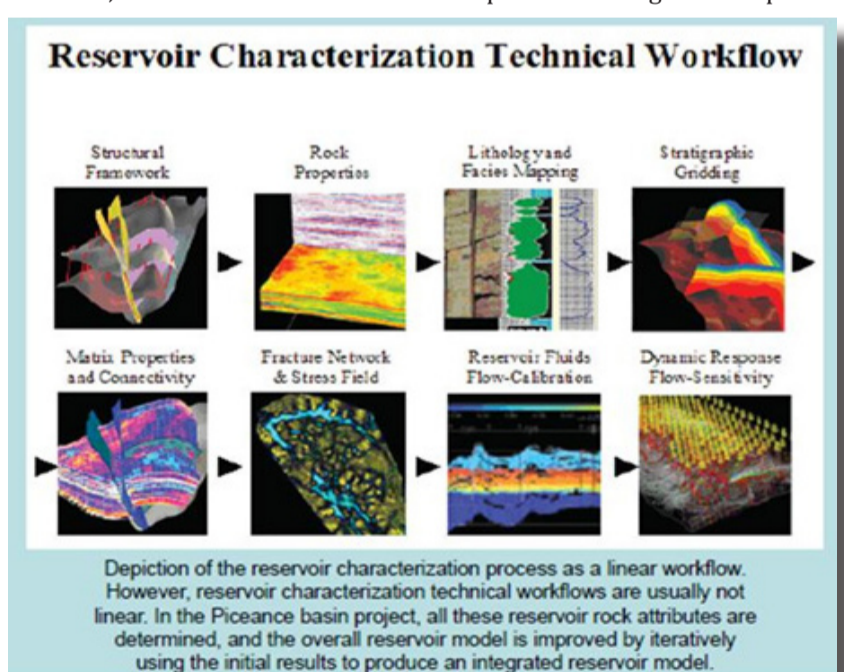
The technical tasks include identification of the major geological controls on "sweet spots" in tight gas sandstones, the role of stratigraphy and diagenesis in forming gas compartments with different degrees of connectivity, and the influence of geologic structures on basin-scale distribution of facies and fracture networks. This is the first attempt at understanding the physical containment of gas on such scales.

The project will also break new ground in terms of its approach to multi-scale geological input into reservoir modeling. Gamma-log-based classification of sand bodies based on cores and outcrops will be combined with an approach to modeling based on discrete fracture networks calibrated against image logs and cores to develop an advanced static reservoir model. This will be followed by a dynamic flow simulation on the dual porosity model (matrix and fractures). New work on advanced algorithms for anisotropy mapping will further help identify fracture patterns and make the reservoir-scale static models even more reliable.

Issues of great interest in the Rocky Mountain gas community include the controls of the top of the gas column and the abnormal pressure. The project includes two new ways of examining the issue: one geochemical and the other based on ionic diffusion and steaming potentials, which might govern the migration of fluids in basin-centered gas accumulations.

Although the project is strongly focused on tight sandstone gas, the potential for shale gas production from the deep basin Mancos Shale will also be examined. The emerging knowledge about both the Mancos and the overlying Mesaverde Group will be integrated into a first-ever basin-wide petroleum systems model for the gas in the Piceance basin. This latter task will be the validation for the value of the many other tasks. In the end, although the research is specific to the Piceance basin, the main purpose of this large project is to help advance our understanding of the fundamentals behind unconventional gas migration, trapping and production.

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Fellowship/Scholarship Program Recipient Spotlight

RPSEA created the Fellowship/Scholarship Program to establish long-term, industry/education partnerships. RPSEA members Schlumberger and Strata Production Company designate financial resources through RPSEA to award multiple scholarships to the following member universities: Colorado School of Mines, Louisiana State University, New Mexico Institute of Mining and Technology, Stanford University, Texas A&M University, The University of Texas at Austin, The University of Oklahoma and West Virginia University. The most promising students with studies relevant to the oil and gas industry are awarded fellowships to help with their education and/or research activities. Through private funding from these two members, \$240,000 is established for these member universities to provide much needed support for 16 students per year for three years.



Texas A&M University graduate Dr. Yunan Wei was awarded a fellowship through the Fellowship/Scholarship Program for the 2007-08, 2008-09 and 2009-10 school years. RPSEA spotlights Dr. Wei this quarter in the following interview, while wishing him success in his career.

1. What was the title of your dissertation?

Developing a computer program that we call the *Unconventional Gas Reservoir (UGR) Advisor*

2. Where did your project take place?

College Station, Texas

3. What school were you attending during the fellowship?

Department of Petroleum Engineering at Texas A&M University

4. What was your degree and major while working on the fellowship?

PhD in Petroleum Engineering; Graduated May 2009

5. What was the time frame spent on the entire project?

(RPSEA is proud to have Dr. Yunan Wei as a fellowship recipient three years in a row.)

- In 2005, the project was created.
- In 2006, a team was created for the development of the software (Pilot).
- In 2007, the prototype of the most important component, TGS Advisor was built.
- In 2008, improved, modified and tested the TGS Advisor.
- In 2009, the TGS Advisor was built.

6. Why did you pick this focus for your project?

In the United States, more than 40% of the natural gas used today comes from unconventional reservoirs to include tight gas sands, coalbed methane reservoirs and gas shales in several basins that have been highly characterized. This gas production is coming from reservoirs that have been described in the literature and have been evaluated in numerous studies of unconventional reservoirs.

All the information and best practices, which have been published in literature, are valuable for the development of tight gas fields outside of North America. In addition, the production from conventional reservoirs in these same basins is well documented and can be quantified. There have been thousands of papers published on how to drill, complete and stimulate tight gas reservoirs. Thus, we have the data in North America to quantify best completion and stimulation practices as a function of the basin and formation characteristics.

To produce low permeability (tight) gas reservoirs, technology must always be improved. There are ample case histories containing best practices on how to drill, complete and stimulate tight gas reservoirs. We hypothesize that the best practices developed in North America can be applied to analogous basins and formations worldwide. We can use this data to develop an advisory system on how to complete and stimulate a reservoir on the basis of the basin and formation characteristics, using analogies with North America.

7. What were the major accomplishments of your project?

From our objective, the Drilling & Completion Advisor takes into consideration the complicated aspects of drilling, completing, stimulating and producing of an UGR reservoir. The UGR Advisor will be eventually set up to evaluate Tight Gas Sands (TGS), Coalbed Methane (CBM) reservoirs and Shale Gas (SG) reservoirs. I have designed, programmed, tested and evaluated the TGS Advisor and the CBM Advisor. Upon finishing these Advisor programs, all programs including Basin, Prise, TGS Advisor, CBM Advisor, SG Advisor and the Utility programs would be incorporated into the UGR Advisor system.

8. How did RPSEA help you achieve your project goals?

RPSEA helped me to solve so many problems to achieve my goal, including living expenses, educational fees for my children and solving my financial problems. Without RPSEA, I could not have achieved this goal. More importantly, I would not have been able to get my degree without RPSEA support.

9. How have you grown both personally and professionally from your fellowship with RPSEA?

By working on this project, I received my PhD degree in petroleum engineering. I became an academic professional engineer in the petroleum engineering field. Personally, I love this field more and more.

10. What is your role today?

Currently, I am working as a development engineer for C&C Reservoirs, Inc. since December 2009. The main responsibilities include:

- Research on oil and gas field development and production practices of existing and new field analogs in DAKS (Data Analysis Knowledge System) and REPAX (Reservoir Performance Analog Knowledge System)
- Improve the engineering analysis standards and procedure of Field Analog and REPAX
- Design and implement the searching and analytical tools in DAKs for both Field Analog and REPAX
- Design and implement best reservoir and production practices
- Optimizing, selecting and populating REPAX static and dynamic parameters
- Instructing and monitoring a dynamic database built by other team members
- Designing new REPAX dynamic analysis tools and continually improving them
- Improving the REPAX application based on client feedback opinions
- Cooperating with team members to complete any urgent tasks, including project study, client's requirement feedback, etc.

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Calendar of Events

4/8	Piceance Basin - Tight Gas Research Review, Denver, CO
4/11-14	AAPG 2010 Annual Convention & Exhibition, New Orleans, LA
4/20-21	2010 Alliance Expo and Annual Meeting, Wichita Falls, TX
4/30	2010 Oklahoma State University Energy Conference, Oklahoma City, OK
5/3-6	2010 Offshore Technology Conference, Houston, TX
5/3	RPSEA Member Reception, Houston, TX
5/17-21	2010 Coalbed and Shale Gas Symposium, Tuscaloosa, AL
5/20	IADC Drilling Onshore Conference & Exhibition, Houston, TX
5/27-29	SPE 2010 Western Regional Meeting, Anaheim, CA
6/2-3	FACA Meetings, Washington, D.C.
6/13-16	2010 AAPG Rocky Mountain Section Meeting, Durango, CO
6/15-17	Global Unconventional Gas 2010: Unlocking Your Potential, Amsterdam
6/21-25	Clean Technology Conference & Expo 2010, Anaheim, CA
6/22-23	RPSEA Ultra-Deepwater Conference 2010, Houston, TX

Click here for more information, to register and view the [complete calendar](#).

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Geophysical Modeling for Studying Acquisition and Processing Methods in the Deepwater Gulf of Mexico

Principal Investigator: Peter Pangman, SEAM Corporation, subsidiary of SEG

Partners: SEAM Corporation, 3DGeo Development, Inc., Anadarko Petroleum Corporation, BHP Billiton, CGGV Veritas Services (USA), Chevron Corporation, ConocoPhillips Company, Devon Energy Corporation, EMGS ASA, Eni S.p.A., ExxonMobil Upstream Research, Geotrace Technologies, Hess Corporation, ION, Landmark Graphics Corporation, Maersk Oil America, Marathon Oil Company, Petrobras America, Inc., PGS Americas, Repsol Services, Inc., Rock Solid Images, Inc., Statoil, TOTAL Exploration Production USA, WesternGeco and Nexen Petroleum USA, Inc.

The purpose of this project is to conduct realistic simulations of geophysical data that will contribute towards the development of the next generation of imaging and acquisition approaches, lead to a higher rate of success in identifying petroleum resources in the Gulf of Mexico and improve reservoir characterization so that production can be maximized.

SEAM Corporation, whose sole owner is the 33,000 member Society of Exploration Geophysicist (SEG), was incorporated as a not-for-profit for the purpose of fiduciary, policy, and management oversight of specific SEG projects. SEAM is an industrial consortia dedicated to large-scale, leading-edge, geophysical numerical modeling. The SEAM projects provide the geophysical exploration community with geophysical model data for subsurface geological models at a level of complexity and size that cannot be practicably computed by any single company or small number of companies. The SEAM mission is to advance the science and technology of applied geophysics through a cooperative industry effort focused on subsurface model construction and generation of synthetic datasets for geophysical problems of importance to the resource extraction industry. SEAM is well aligned with the RPSEA mission, and RPSEA is proud to be partnering with SEAM to accomplish mutual objectives.

The objectives of the work are to contribute to the evolution of geophysical imaging technology by providing a realistic benchmark geological model containing multiple geophysical attributes along with two synthetic seismic data sets and three synthetic non-seismic datasets that will allow industry to assess individual, as well as, joint geophysical acquisition and processing techniques for generating images of hydrocarbon reservoirs beneath and surrounding massive, complex salt bodies. SEAM is developing requirements for hosting and distributing these datasets for their useful lifetime, which could be one or more decades.

SEAM is conducting its work by (a) engaging SEAM member companies in the development of acquisition plans for each geophysical simulation, (b) critical evaluation of numerical algorithms to ensure robust simulation results, (c) competitive contracting with qualified vendors to conduct the simulations, (d) implementing a detailed quality procedure to ensure the integrity of the data, (e) storing and distributing the data to potential users, and (f) communicating to a broad range of potential users in industry, government research laboratories and academia about the work.

An important design goal for the SEAM Earth model is internal consistency across the domains of rock properties (e.g., fundamental parameters like V_{shale} , porosity, and pore fluid type), the intermediate level elastic and electromagnetic parameters, and the output simulations for seismic, electromagnetic and gravity fields. By rooting the ultimate simulation back to the rock properties, any changes in the latter are guaranteed to change all the elastic and other parameters automatically, consistently and with the appropriate correlations.

A model founded on rock properties provides a test bed, not just for the inversion of seismic data for reflectivity, but also for the inversion of one or a combination of seismic, gravity, EM or reflectivity data for reservoir properties. Thus, it challenges not just processors, tomographers and imagers, but also the reservoir characterization and monitoring interests. For this purpose, it was crucial to choose a set of geological property "basis functions" that are largely independent of each other, and in combination, span all pertinent elastic properties.

Various reservoirs are included throughout the SEAM model to add more realism and to provide interesting targets for acquisition/VSP design, noise suppression, seismic imaging, EM discrimination, inversion and interpretation. The imaging challenge presented by these reservoirs ranges from mild to severe. A reservoir might be difficult to image because it is in a seismic shadow or because its impedance contrast is small; but away from salt, the seismic imaging or EM detection of shallow oil reservoirs should not present a problem. The three reservoir types employed represent localized turbidite fans, widespread and superposed turbidite sheets and highly channelized complexes and contain oil, gas and brine.

This usd \$2.5 million project is moving ahead of schedule for a July 2011 completion date. For more details see an in-depth article featured in the Society's latest issue of *The Leading Edge*.



SEAM Project Manager Peter Pangman, right, presents RPSEA Project Manager Art Schroeder with a copy of SEG's *The Leading Edge*, which features as a cover story the RPSEA project.

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