

Sea of Plenty

*Deep action continues
in the Gulf of Mexico.*

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GCAGS 2015: Deepwater Projects Abound in GOM

By LOUISE S. DURHAM, EXPLORER Correspondent

When it comes to staying power in the U.S. oil game, the Gulf of Mexico takes the prize after producing copious volumes of hydrocarbons for decades, beginning with wells drilled in only a few feet of water.

Today, it's increasingly common to see drill holes punched in water depths of several thousands of feet.

Onshore, the myriad and comparatively inexpensive shale-focused wells have many operators struggling for their financial lives as oil prices continue to fall.

Yet the pricey action in the many



MOORE

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challenging GOM deepwater fields goes on unabated, for the most part.

The timeline for these usually huge finds can easily stretch out for almost a decade from prospect status to

production. This means these efforts aren't based on the “high today/low tomorrow” commodity price cycles. Plus, the long-term projects ordinarily have the huge reserves base needed for years-

long production, once they come online.

Ongoing advances in technology to increase efficiency while lowering costs also play a key role in this region's activity.

It's only fitting, then, that an entire day at the upcoming 2015 annual convention of the Gulf Coast Association of Geological Societies in Houston will focus on the deepwater Gulf action.

The morning and afternoon sessions together feature a stellar array of 11 deepwater projects, including such heavy hitters as Shell's Appomattox development, Chevron's Tahiti, BP's Mad Dog and Petrobras' activity in the Chinook and Cascade fields.

The All-Convention Luncheon presentation is a not-to-be-missed opportunity to get up to speed on the deepwater environment.

Dubbed “Chevron's Key Discoveries and Development in the Deepwater Gulf of Mexico, A Story of Steady Growth,” it promises to provide an intriguing tale of the company's numerous successful efforts in this locale.

The presentation will be delivered by Ken Eisenmenger, deepwater general manager of Chevron North America Exploration and Production Company.

Among Chevron's other Gulf success stories, he will highlight the recent Jack/St. Malo development as an example of overcoming the challenges and delivering a world-class project in the subsalt Lower Tertiary Trend.

Worth Its Salt

Sub-salt is essentially synonymous with deepwater GOM activity today.

It wasn't always this way.

“During the first 40 years of offshore GOM industry exploration, all petroleum reservoir objectives were suprasalt, or above all sheets or beds of salt,” said AAPG member Clint Moore, vice president at GulfSlope Energy.

Moore conceived and developed the daylong event for GCAGS and will represent his company on the program, discussing potential oil and gas fields for deepwater slope sands and reservoirs.

As Gulf exploration and research evolved over time, the region's many massive horizontal, allochthonous salt sheets originating from Jurassic salt were determined to cover thick, untested sedimentary sections containing reservoir quality sand bodies and effective sealing shales, Moore explained.

Drilling through these salt sheets is sometimes a big challenge, particularly when it comes to subsalt pressures. Obtaining and interpreting clear seismic data is a story on its own.

The potential for tapping into huge reserves trapped in the underlying sediments makes these areas worth the risk and the price, though.

“Explorers have always known the Gulf of Mexico to be a world class exploration basin,” Moore said, “with tremendous potential.”

Dead Wrong About the ‘Dead Sea’

In times of industry downturns and well mishaps, the Gulf was often derided as the “dead sea.”



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Not so, Moore insists. "In its latest report on future GOM petroleum potential, BOEM reported that the GOM has tremendous recoverable petroleum resources, with over 50 billion boe yet to be discovered," he said. "Much of it will be sub-salt and found in slope-basin floor sand reservoirs. "The Gulf of Mexico has never been a 'dead sea,'" he exclaimed. When queried as to why he would take on the huge task of assembling such a profound group of speakers and presentations scheduled for the GCAGS, his enthusiasm was palpable. "My primary goal in proposing this GOM deepwater fields session in the

first place was to create the biggest session ever attempted in GCAGS or AAPG history on what makes offshore GOM deepwater productive fields geologically successful," Moore said. He emphasized that it's a unique opportunity to spend a day totally immersed in better understanding and comparing the premier deepwater GOM fields of today. "This will likely be a historic session and benefit everyone that attends it with key geological understandings of how and why the GOM continues to be one of the world's premier oil and gas producing basins," Moore noted. "By better understanding how and what's been discovered so far," he said, "we can then more successfully explore and discover new giant fields tomorrow." 

Qilian Mountain
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founding father of Chinese paleontology) began collaborating with Yang's team. They studied the fossils of Qilian Mountain to establish formation ages. "The survey areas were vast and deep into the mountains. The work became hard. Down in the valleys, the weather was dry and hot, but up in the mountaintops, the weather was windy and chilly to the bone," Ma wrote. "They even climbed to the main peak of Qilian Mountain to observe ice bridges." Studying fossils opened up a natural affinity for paleontology for Yang, who quickly became adept at identifying fossils. Her career began to segue into the fields of stratigraphy and paleontology. In 1948,

Yang was sent to Nanjing – the capital of China at the time – to identify large amounts of fossil specimens gathered by her exploration team over the years. Yet in 1949, the Chinese Civil War interrupted her work, and she was sent to Lanzhou for safety reasons, but not before protecting the team's data and property.

Breaking More Ground

In 1950, Yang was assigned to teach paleontology at Tsinghua University, a comprehensive institute of science and engineering – similar to the Massachusetts Institute of Technology – that was founded in Beijing. The following year, her former exploration department moved from Lanzhou to Beijing under the Petroleum Administration Bureau of the State Council.

Although Yang was in Beijing, her husband remained in northwest China to continue his exploration efforts. By this time, they had a daughter, whom Yang raised temporarily by herself.

For the first time in China's history, a petroleum engineering department was formed at Tsinghua University in 1952 to help meet the nation's needs for hydrocarbons. A year later, the Beijing Petroleum Institute was founded. A well-known geologist, Zhang Geng, was appointed chair of the institute's Geology Department, and Yang was appointed deputy chair.

"Few women made it to the position of department chair in the extremely hierarchical Chinese academic world," Ma wrote. "In the male-dominated field of geology, what Yang Yi achieved can only be described as groundbreaking."

In 1995, Yang's husband joined her at the Petroleum Institute as a lecturer of physical geology. Having been married 10 years and starting off married life together in a tent, the two finally moved into a house in the nation's capital.

"What did not change was their pursuit of geology. Yang Yi worked tirelessly like a machine every day," Ma wrote, explaining that she helped launch the geology department by compiling teaching materials and conducting scientific research.


End of an Era

Just when the future looked brighter than ever for Yang, China was on the brink of becoming a victim of additional political turmoil with the arrival of the Anti-Rightist Movement in 1957. Along with roughly 300,000 Chinese intellectuals, Yang was convicted as a rightist and prosecuted under Chairman Mao Zedong's Anti-Rightist Movement.

Her scientific career cut short, Yang was relegated to less meaningful work, and her home was raided numerous times. The maps and reports she worked so arduously to compile throughout her career were confiscated.

Although her conviction was overturned in 1979, she was at the age of retirement. However, she still managed to compile and co-author two publications: the "English-Chinese Geology Dictionary" and "English-Chinese Petroleum Dictionary."

Today at 93, she has lost most of her memory to Alzheimer's disease. In an effort to save as many pieces of Yang's life and work as possible, her family and friends rummaged through an old warehouse of confiscated goods from the Cultural Revolution and managed to find a few photos of China's first female geologist.

Unfortunately, none of her scholarly papers remain. 

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