

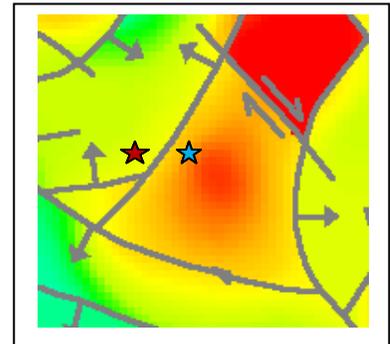
Basement & Discoveries

No matter how successful you are, you must have a system in place that overrides the idea that only one way works. In exploration, evaluating a new area using techniques proven in another area doesn't necessarily lead to good results.

As scientists we have ground truth we must adhere to and rely on. I like to say we are in the pattern recognition business. We build memory databases of waveforms that turn out to be prospective and those that failed. We gather these statistics in our minds and carry them forward in our decisions.

Historically, regional low areas become the sites for increased sediment deposition with a preferred content of oil/gas source beds (depocenters). Regional highs become the sites for reservoir development, especially on the flanks of regional highs where sand units pinch out against existing topographic and structural highs. In time, oil and gas that is thermally generated in regional structural lows migrates updip to regional structural highs.

The recent deep water Gulf of Mexico discoveries have only verified that the basement structure has influenced oil & gas migration. Shell announced (July 3, 2013) its deep-water Mississippi Canyon Block 393 (★) Vicksburg discovery encountered more than 500ft of pay at a depth 26,385 feet; water depth is at 7,446 feet.



The Vicksburg discovery was a follow-up to the Shell/Nexen Appomattox discovery (February 2012) (★) which encountered approximately 150 feet of oil pay at a total depth of 25,851 feet.

The press release stated a contingent recoverable resource of 215 million bbl of oil equivalent was identified in the Jurassic Norphlet formation in the northeast fault block of the Appomattox structure. The well is located in Mississippi Canyon block 348 with a water depth of 7,257 feet.

I have not been privy to the seismic interpretation and can only describe the basement environment from an interpretation based on 1x1 mile high resolution aeromagnetic survey and refraction velocity data. The complexity of the basement structure in the immediate area surrounding the wells is shown on the inset. The basement depth at the Vicksburg well location is 33,000 feet. The depth at the Appomattox structure on the down thrown side of the fault is 40,000 feet. The depth ranges shown on the inset are 30,000ft (red) to 50,000 ft (green).

Both of these recent deep-water Shell discoveries lie on significant basement structural elements; the structures lay relatively 7,000 feet deeper than the discovery depths. There are many more examples, such as the ExxonMobil Hadrian discoveries in Keathley Canyon, which

add to the statistics that IGC has gathered since 2000. Davy Jones discovery on the Louisiana shelf lies on what I interpret as a basement embayment as are the Lower Tertiary discoveries in Alaminos Canyon. Over 78% of the GOM discoveries/reserves can be shown to be associated with basement structures.

Take Aways

No matter how deep the basement is relative to the targeted oil depth sought, its influence is proving to be evident.

Not only are the structural highs important in the Gulf of Mexico but interest should lead to the resultant fairways.

The underlying basement features have significant predictive value in assessing the viability of future exploration sites.

All the Best



Corine Prieto
Integrated Geophysics Corporation
corine.prieto@igcworld.com

You can access past IGC publications [here](#).