



Sediment Inclusions vs. Seismic Artifacts

Back in January I attended a Deepwater Conference here in Houston sponsored by the AAPG. The reason for attending was to get an update on new seismic imaging technology and seek how to impact deepwater strategies that may be developing as we as an industry move to foreign frontier deep waters. It was time well spent. The short 2-day conference was well attended. Time was allotted to have open discussion after each presentation. There were two name-brand seismic processing houses that presented state-of-art imaging of GOM salt canopies & domes. The imaging technology presented brought to the table the concept of sediment inclusions lying within the salt volume, which brought lively discussion on inclusions vs. seismic-processing artifacts.

The question of a sediment inclusion came across my desk again today. It rattled my memory beads. Some eight years ago I was asked to model a salt mass; seismic could not determine if it was a rooted diapir or a thick salt canopy. I was asked to assist in refining the salt/sediment interface. I set out to give my second opinion to the volume of salt as outlined by the seismic non-reflector (NR) zone. Quickly I discovered the calculated gravity effect due to the seismically-based salt volume was significantly more than observed gravity minimum; the calculated response was 30% higher than the observed anomaly. In addition was the fact that nothing was centering over anything!

I discussed the possibility of there being faint, granted very faint reflectors (remember this is 2005) about 5,000 feet within the salt. I estimated this could be the base of a canopy & inserted a wedge of sediments overlaying and flanking the diapir. The gravity minimum was modeled but the client & I agreed to disagree simply because all these modeled sediments were well within the NR zone.

This brings me to today's discussion on the possibility of sediment inclusions. The question of inclusion vs. seismic artifact more than likely could be resolved with a little 3D gravity based structural modeling. Given proper gravity data coverage, seismic that can deliver the top-of-salt, a well or two to calibrate the density volume and that the sediment inclusion has some thickness, a gravity based structural model will provide a complementary second science to resolve complicated salt geometries

Take Aways

There are several sciences that make up geophysics. If we use them all, deciphering Mother Earth is less daunting.



In Closing

Thank you for joining our global community of informed explorationists!

If you have any questions, please contact [me](#). I return all email and phone messages.

Have a great summer

A handwritten signature in black ink that reads 'Corine'.

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