



N071: Workshop in Geological Seismic Interpretation: Salt Tectonics

Instructor(s): Mark Rowan, Elive Menyoli and Carl Fiduk

4 Days

Competence Level:
Skilled



Classroom Course

Summary

This workshop focuses on the geology and geophysics of salt basins and salt-related deformation. The content is centered around exercises interpreting a variety of seismic data illustrating some of the characteristic structural styles of salt basins. The exercises are supplemented by relevant lectures on salt tectonics and seismic imaging in salt basins. The class will help geoscientists to better develop and assess plays and prospects and to reduce costs by improving seismic interpretation skills.

Learning Outcomes

Participants will learn to:

1. Assess the limitations of seismic imaging for interpreting various salt-related geometries, including minibasin salt flanks and sub-salt targets.
2. Analyse internal reflectors in salt bodies and their implications.
3. Understand the relationships between crustal extension and evaporite deposition.
4. Evaluate extensional salt geometries in both thin- and thick-skinned provinces.
5. Assess the impact of salt on contractional deformation.
6. Understand the different styles of salt evacuation and associated diapirism.
7. Predict and interpret near-diapir deformation and how it influences three-way truncation traps against diapirs and welds.
8. Evaluate the relative merits of different seismic migration techniques.
9. Analyse and interpret complex allochthonous salt geometries and subsalt deformation.

Duration and Training Method

A four-day seismic-interpretation workshop which will include a mixture of lectures and seismic interpretation exercises.

Who Should Attend

Geoscientists working in salt tectonic provinces, whether at the exploration, appraisal, development or production stage, as well as engineers with a decent understanding of structure and tectonics.

Prerequisites and Linking Courses

A basic working knowledge of structural geology (as offered in N016) and seismic interpretation (as offered in N085 or N040) is required.

Related Nautilus Training Alliance classroom courses include N043 (Gulf of Mexico Petroleum Systems) which includes one day on salt tectonics of that region, N217 (Seismic Imaging and Velocity Model-Building Techniques: Concepts, Examples and Pitfalls) which focuses on accurate subsurface imaging and N232 (Salt Tectonics: Global Styles, Spanish Outcrops; Basque-Cantabrian Pyrenees, Spain) which covers global salt tectonics and its practical application to petroleum exploration and production.



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Course Content

The primary focus of the class is on the geology of salt basins and the geological interpretation of seismic data. Since an understanding of the geophysical aspects is also critical, the course also includes geophysical concepts and workflows and their practical implications for interpretation of migrated seismic data. The best practitioners, of course, combine a solid grounding in salt tectonics with a good understanding of the geophysical aspects.

1. Geophysics 1 – The perils of imaging under the influence of salt
2. Exercise 1 - Internal deformation of layered evaporite sequences (Santos Basin, Brazil, and Southern North Sea)
3. Exercise 2 – Rifted crust and salt distribution (Gulf of Mexico)
4. Exercise 3 – Thin-skinned extension (Espírito Santo Basin, Brazil)
5. Exercise 4 – Thick-skinned extension (Central North Sea)
6. Exercise 5 – Deepwater foldbelts (Espírito Santo Basin, Brazil)
7. Exercise 6 – Salt evacuation and diapirism (Gulf of Mexico)
8. Exercise 7 – Near-diapir deformation (Gulf of Mexico)
9. Geophysics 2 – Imaging workflows and advanced solutions
10. Exercise 8 – Building a salt model
11. Exercise 9 – Allochthonous salt (Gulf of Mexico)