N467: Seismic Stratigraphy of the Permian Basin *(W Texas & SE New Mexico, USA)*

Instructor(s): Vitor Abreu

5 Days	Competence Level: Foundation
Field Course	
Classroom Elements	

Summary

This field course is designed for geoscientists and engineers exploring and developing plays in mixed carbonate-siliciclastic systems and has relevance to those working in the Permian Basin. At the en

This is a six-day field course in west Texas and SE New Mexico, USA. There will be field activities in the mornings and classroom lectures and exercises in the afternoons, with long days (typically 10 hours).

Learning Outcomes

Participants will learn to:

1. Analyze exposures of carbonate shelf and ramp to siliciclastic basinal systems in order to relate depositional facies to seismic scale geometries and sequence stratigraphy.
2. Examine seismic scale outcrop geometries, document outcrop facies, and demonstrate similarities to productive intervals in the Permian Basin.
3. Understand how subaerial exposure, marine diagenesis, and early near-surface dolomitization can affect ultimate reservoir porosity and permeability and overall reservoir geometry in subsurface.
4. Assess changes in carbonate facies and relate these changes to depositional environments.
5. Apply Walter's Law and chronostratigraphic principles in core, well-log and seismic interpretation, and relate to prediction of play elements and best productive intervals for unconventional resources.
6. Analyze sequence stratigraphy for carbonates and mixed carbonate-clastic depositional systems.
7. Interpret carbonate sequence stratigraphic patterns from outcrop, well log, and seismic data.

Physical Demand

The physical demands for this class are MODERATE/HIGH according to the Nautilus Training Alliance field course grading system. Fieldwork is in western Texas and southeastern New Mexico where the weather is arid and usually hot, although cold and wet weather is possible in the spring and fall. The course requires moderate to long walks, frequently over very steep and uneven ground. The walks most days are up to 0.0 km (0 miles) with the longest walk being approximately 0.0 km (0.0 miles) with an ascent of 000 m (0000 ft). In order to gain the full benefit of this class, participants should be fit enough to complete these hikes under these conditions.
Transport on the course will be by SUVs. Most of the driving is on black-top roads, with some driving on graded dirt roads

Who Should Attend

This course is intended for geoscientists, petrophysicists, engineers, and managers who are seeking a comprehensive introduction to the seismic stratigraphy of the Permian Basin.

Prerequisites and Linking Courses

There are no prerequisites for this course.

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Complementary classes at Basic Application level include N080 (Geophysics for Subsurface Professionals), N085 (Introduction to Seismic Interpretation), N020 (Carbonate Depositional Systems: Reservoir Sedimentology and Diagenesis), and N251 (Well Log Sequence Stratigraphy: Applications to Exploration and Production).

Courses that provide additional insight at Skilled level include N385 (Workflows for Seismic Reservoir Characterization), N091 (Carbonate Reservoir Architecture and Applied Carbonate Sequence Stratigraphy, West Texas and SE New Mexico, USA), and N381 (Influence of Tectonics and Mechanical Stratigraphy on Natural Deformation in the Permian Basin, Texas, USA) and N302 (Deepwater Reservoir Presence and Architecture: Permian Basin Brushy Canyon Formation, Guadalupe and Delaware Mountains, West Texas, USA).

Course Content

Travel Day

- Arrive in El Paso, Texas. Meet and greet session at the hotel conference at 4:00 PM.
- Discussion of safety procedures and basics of Sequence Stratigraphy.

Day 1

- 8:00 AM – Meet at conference room to discuss about safety procedures for the day and discussion about Permian Basin. 10:00 AM leave for Carlsbad from El Paso.
- First stop at Salt Flat Graben to provide overview of Guadalupe Mountains.
- Lunch at El Capitan followed by a sequence stratigraphy exercise.
- Arrive no later than 6:00 PM in Carlsbad.

Day 2

- 8:00 AM - Meet at conference room to discuss safety procedures for the day.
- 10:00 AM - Leave for McKittric Canyon from El Paso.
- Lunch at the park.
- 2:00 PM - Leave the park to arrive at the hotel in Carlsbad.
- 4 PM - Meet at the conference room at for lectures and exercises on seismic stratigraphy.

Day 3

- 8:00 AM – Meet at conference room to discuss about safety procedures for the day and discussion of field visit.
- Stop at the Walnut Canyon for an overview of the Permian reef builders and main depositional facies of the platform.
- 4 PM - Meet at the conference room for lectures and exercises on stratigraphic hierarchy.

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Day 4

- 8:00 AM – Meet at conference room to discuss safety procedures for the day and discussion of field visit.
- Outcrop and a sequence stratigraphy exercise at Last Chance Canyon.
- 4:00 PM - Arrive at the hotel to discuss the Guadalupe Mountains impact for unconventional resources.

Day 5

- 8:30 AM - Check out from the hotel ready to leave. Leave for Slaughter Canyon.
- Sequence Stratigraphy exercise, and a core-log correlation exercise.
- Arrive at West Face – to conclude the field course with a sequence stratigraphy exercise of the Guadalupe Mountains. A reservoir engineer will accompany the group to provide enhanced insights between outcrop-scale depositional facies and production performance.
- 1:00 PM - Leave for El Paso