



Carbonate Field Seminar: Examples from the Paleozoic of west Texas and New Mexico

Dates: October 2- 6, 2023

Purpose and Goals

This seminar is an introduction to carbonate stratigraphy and sedimentology illustrated in 3 dimensions using outcrops from the Franklin, Sacramento, and Guadalupe Mountains of west Texas and New Mexico. These mountains contain world-class exposures of buildups and carbonate shelf to basin systems with little structural deformation. The porosity and permeability distribution in carbonates is commonly related to their sequence stratigraphy and depositional facies. We will examine these outcrops to learn the relationship of carbonate facies and related porosity & permeability in the subsurface from seismic features, stratal geometries, sequence stratigraphy and depositional models. To accomplish this, we will visit seismic-scale outcrops, characterize their large-scale geometries, document their facies, and show how similar systems appear in the subsurface. We will also illustrate similar carbonate reservoir facies in seismic, core, and logs. There is also the opportunity to view the results of subaerial exposure, marine diagenesis and early near-surface dolomitization. We will discuss how these processes can affect the ultimate reservoir porosity and permeability in subsurface carbonates.

Who should attend?

This course is an appropriate for geologists and geophysicists who are involved in exploration and production of hydrocarbons in carbonate environments. Engineers, reservoir modelers, petrophysicists, and managers who wish to learn more about carbonates are also encouraged to attend. These outcrops are excellent reservoir analogs for many carbonate basins in the world. Their proximity and direct correlation to the Permian Basin fields provides a long-term production record for application to new basins in the world.

Instructors

Rob Forkner - Rob earned his PhD in Geology from the University of Texas at Austin in 2007, studying cyclostratigraphy in the Dolomite Alps under Bob Goldhammer. Rob has worked for several multinational companies, including Maersk Olie og Gas (Copenhagen, DK), Shell carbonate production research (Rijswijk, NL), and Statoil/Equinor North American Exploration Research (Austin, Texas, USA). Currently, Rob works with Blackdiamond Exploration LLC as a consulting geologist, geochemist, and data scientist.

Jean Hsieh - Jean received her B.Sc. (1987) in Geology from Carleton University in Ottawa, Canada, and her PhD (1997) in Geology from the California Institute of Technology. In 1999, Jean joined Texaco which became Chevron the following year. In 2011, she began as a carbonate sedimentologist with Talisman Energy Inc. which was subsequently acquired by Repsol in 2015. She is currently working with Sedimentary Geology Consultants as a consulting geologist. During her 20+ years in industry, she has provided stratigraphic support for exploration and production projects in west Texas, West Africa, Kazakhstan, Turkey, Ukraine, Turkmenistan, the Middle East, and Southeast Asia. Her interests lie in carbonate stratigraphy and diagenesis, particularly the ability to predict the spatial distribution of different geobodies by integrating geological, geochemical, and geophysical data and visualizing this through 3-D geocellular models.

Detailed Itinerary

October 1: Arrive in El Paso, check into hotel

October 2: Morning – introductory lectures and exercises @ hotel
Afternoon – Ordovician Ellenburger section in the Franklin Mountains (Scenic Drive)
Drive to Alamogordo, NM and night in Alamogordo, NM

October 3: Pennsylvanian Carbonates of Sacramento Mountains – Dry Canyon (Wilson Mound overview, stratigraphic section at road cut, Yucca Valley off mound facies)
Night in Carlsbad, NM

October 4: Permian Ramp Carbonates of the San Andres Formation
Morning – Algerita Escarpment (Cougar Canyon overview, hike into Lawyer canyon)
Mid Afternoon – Last Chance Canyon (hike up trail for overview)
Late Afternoon – Sitting Bull Falls tourist stop if we get there before closing
Night in Carlsbad, NM

October 5: Permian Rimmed Margin carbonates of the Guadalupe Shelf and Margin
Castile Formation road cut stop (basin fill)
McKittrick Canyon – Permian Reef Trail (basin, slope, rimmed margin, and shelf crest)
Rader Slide road cut (optional)
Night in Carlsbad, NM

October 6: Diagenesis and Karst discussion
Morning – Visit to Carlsbad Caverns (pisolite beds in parking lot, walk down the path to main cavern, elevators back up)
Drive back to El Paso. TX
Flights back if available after 4 pm or night in El Paso

Cost

The fee for this seminar is \$4200 USD per person. Please contact us for a discounted fee if there are more than 3 people attending from the same company.

The fee includes:

- Local transportation by rented vehicles to/from El Paso, TX
- Lunches, water, and snacks in the field.
- Field Guidebooks and numerous handouts. Digital version will be available if desired.
- Hand lens and notebook

The fee does *not* include:

- Airfare to/from El Paso, TX
- Hotel costs (although all reservations will be made for you)
- Dinners and personal bar tabs (Breakfasts are included at all hotels)

Refund Policy

A full refund will be given upon receipt of written cancellation by September 1, 2021. No refunds will be given after September 1, 2023, but substitutions are allowed.

Late enrollment after September 1, 2023 will incur a late fee of \$300 USD and will only be available if there is space.

For more information or to register for this seminar, please contact Jean Hsieh at 403-819-0913 or jean.hsieh@sedimentarygeology.com.

Additional Information

Note: All participants should bring ID with them on this trip. Any non-USA citizen should bring their passport with evidence of their visa. We will be driving past a border patrol check point where they will ask for your status information. However, we will *not* be passing into any other country.

This field seminar requires significant hiking. We highly recommend that you prepare for the seminar by training starting several weeks before the seminar and to break in any new hiking boots.

We recommend that you arrive in El Paso on Oct 1 or even Sep 30 so that you can acclimatize to the conditions. We can return to El Paso on Oct 6 in time for 4 pm flights to Phoenix and Houston but will not be in time for the 2:25 flight to Denver nor the 3 pm flight to Dallas. If you cannot get home on Oct 6, we recommend that you stay an extra night and relax after the week in the field.