Women in Energy Field Experience: The Role of Salt in Hydrocarbon Exploitation, Energy Storage and Carbon-reduction Mechanisms, Paradox Basin, Utah and Colorado (G084)

Tutor(s)

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Overview

This course is aimed exclusively at women working in the energy industry, particularly in the geoscience, geotechnical and engineering fields. The primary technical goal is to provide a widely applicable introduction to the interrelationship between sedimentation and structural geology with a particular focus on salt tectonics and salt-sediment interaction. The geology is examined with reference to energy production, including hydrocarbon exploration and production, along with discussions around energy transition topics (CCUS, geothermal, hydrogen and energy storage). While the technical aspects are paramount, the course is also designed to provide networking and professional development opportunities. Evening discussions and activities will allow for exchange of ideas and experiences in a supportive and open atmosphere.

Duration and Logistics

A 5-day field course starting and finishing in Grand Junction, Colorado, comprising a mixture of field exercises, activities and networking.

Level and Audience

Fundamental. This course requires a basic understanding of geoscience and will suit those working in the geoscience, geotechnical and engineering fields. The aim is to facilitate knowledge and experience exchange among the participants, so is open to women from a very wide range of experience levels.

Exertion Level

This course requires a **MODERATE** exertion level. There will be hikes to outcrops of up to 6.5km (4 miles) round trip. Some of these will encounter uneven and rocky ground with some short, steep inclines. The climate in southern Utah is typically warm to hot and dry with temperatures up to 37.5°C (100°F) and the elevation is between 1,250–1,500m (4,000–5,000 ft).

Objectives

You will learn to:

1. Describe the regional stratigraphy and principal structural features of the Paradox Basin, Utah.
2. Characterize and interpret controls on Paradox Basin salt-related structures and key features of passive diapiric systems, including halokinetic sequences, caprock development, non-evaporite

stringers / inclusions, welds, megaflaps, counter-regional faults, radial faults and burial wedges.
3. Examine stratal geometries and halokinetic sequences and how these relate to intervals of salt inflation / evacuation and sediment flux.
4. Assess the controls on basin fill architecture, fluid flow and deformation within the Paradox Basin and compare this to analogous salt basins worldwide.
5. Understand the importance of salt basins to the energy industry for hydrocarbon production.

Course Content

Course Details

This course is principally an introduction to the interrelationship between sedimentation and structural geology with a particular focus on salt tectonics and salt-sediment interaction. However, the structure of the trip is designed to allow women to connect and develop a network of female colleagues from all experience levels and wide backgrounds within the energy industry. Participants will build confidence, advance professional development and learn from others in a supportive and inclusive environment.

Day 1: Arrival into Grand Junction

Classroom:

- Course introduction and safety briefing

Fieldwork:

- Seeing the Bigger Picture; Castle Valley localities
    - Stratigraphy and halokinetic sequences
    - Secondary weld traverse and weld characteristics
    - Halokinetic tilted oil / water contact in Permian eolian dune reservoir
    - Discussion of counter-regional fault / weld

Overnight in Moab.

Day 2: Onion Creek

Fieldwork:

- Challenging Dogma; Fisher Valley Salt Wall and Stinkin’ Spring localities
    - Non-evaporite inclusions and stringers
    - Burial wedges and halokinetic sequences
    - Caprock shear zones
    - Salt shoulder, gravitational, syndepositional chevron folds and radial faults

Overnight in Moab.

Day 3: Paradox Valley and Big Gypsum Valley Salt Wall

Fieldwork:

- Expecting the Unexpected; Paradox Valley and Big Gypsum Valley Salt Wall localities
    - Observe the relationships that give the area its name
    - Detailed examination of 3-D exposure of a megaflap and mini-basin tectonostratigraphic sequences
    - Fracture networks and radial faults
    - Review and discussion – case study on the evolution of the U.S. Gulf of Mexico deepwater basin

Overnight in Moab.

Day 4: Little Gypsum Valley Salt Wall

Fieldwork:

- Transitions; Gypsum Valley Bridge Canyon and Dolores River localities
    - Examination of diapir caprock (gypsum and carbonate)
    - Non-evaporite inclusions / stringers
    - Halokinetic sequences and Chinle burial wedge

Overnight in Moab.

Day 5: Sinbad Valley and return to Grand Junction

Fieldwork:

- Sinbad Valley Salt Wall
    - Vista view of megaflap
    - Counter-regional faulting and stratal geometry
    - Examine non-evaporite inclusions within the diapir and oil seep at diapir margin

Return to Grand Junction for travel home.