N533: Deepwater Depositional Systems *(Virtual Outcrops)*

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Format and Duration

Classroom - 3 Days
Virtual - 5 Sessions

Summary

This course is designed to address the fundamentals of deepwater systems at an appraisal and development scale within a regional context. Systematic, practical workflows will be used to guide interpretation procedures, mapping of stratigraphic architectures, and prediction of lithologies and reservoir heterogeneities. The workflows can also be used to indicate key points for assurance/audit reviews. The course will consist of short lectures and focussed hands-on experience with seismic, well logs, core/outcrop photos, and 3D outcrop imagery.

Business Impact: Participation in this course will enable a good **understanding** of **deepwater systems within a sequence stratigraphic and tectonic framework**.

Learning Outcomes

Participants will learn to:

1. Develop a systematic approach to mapping and interpreting deep-water depositional systems at scales from basin to individual reservoirs.
2. Evaluate seismic facies to create depositional models and predict reservoir presence, distribution, and quality.
3. Assess implications of interpretations on lithology, net-to-gross, and reservoir architecture.

Training Method

A classroom or virtual classroom course comprising practical exercises interspersed with short lectures.

Who Should Attend

Geoscientists working on deepwater sediments, whether in exploration, appraisal, development, or production.

Course Content

1. Deepwater depositional systems

A review of the fundamentals.

- Depositional processes and facies
- Sequence stratigraphic setting
- Submarine fan types and controls
- Slope types and key depositional elements (Channels, MTC's, Sheets)
- An overview of slope types based on degree of structuration and confinement of depositional systems
- Exercise: Deepwater facies through core and outcrop photos
- Exercise: Regional seismic lines to examine facies types and distribution

2. Application of workflow for channel systems

We will investigate downdip changes in channel style and associated internal stratigraphic and facies architectures. Channels are very variable but we will develop a simple but effective workflow for systematic analysis of channel systems on slopes and basin floors.

- Mapping methodologies and stratigraphic architecture
- Facies prediction and reservoir quality
- Exercise: Outcrop imagery of channels facies
- Exercise: Seismic examples demonstrating interpretation process, architecture, and facies

3. Application of workflow for sheet systems

Sheet sands occur in a wide variety of settings including ponded basins, stepped slopes, and basin floors; We will generate an analytical approach and workflow that is applicable in all of these settings.

- Mapping methodologies and stratigraphic architecture
- Controls of slope topography
- Facies prediction, reservoir architecture and reservoir quality
- Exercise: Outcrop imagery of sheet sands
- Exercise: Seismic lines to demonstrate location, geometry, and facies of sheet sands

4. Application of workflow for Mass Transport Complexes (MTCs)

Mass transport complexes only very rarely form reservoirs with sustainable production rates. However, we can recognise a number of ways in which they can be critical in controlling the distribution and character of reservoirs and act as potential seals.

- Mapping methodologies and stratigraphic architecture
- Impact on reservoir distribution
- Exercise: Outcrop imagery and seismic lines to demonstrate the range of impacts MTCs have on reservoir distribution and facies

5. Stratigraphic traps and review of course

Understanding the mechanism of stratigraphic trapping in deep water is critical to defining prospect risks and lateral changes in facies and reservoir properties associated with trapping geometries.

- Stratigraphic traps in deep water: mechanisms and examples.
- Exercise: Seismic lines demonstrating a range of stratigraphic trapping mechanisms
- Exercise: Seismic example interpretation demonstrating key points of the course
- Course summary: key points