

An Introduction to Clastic and Carbonate Depositional Systems (G064)



Tutor(s)

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Overview

The aim of this course is to provide an overview of clastic and carbonate depositional settings. Different systems will be analysed in terms of their sedimentary structures, architecture and subsurface character. The first section will focus on clastic settings including aeolian, fluvial and shallow marine and especially the nature of the preserved sand bodies in the subsurface. The second section will explore the diverse topic of carbonate depositional settings, including the ranges of carbonate textures and facies that can be preserved and the different types of porosity. Each section will incorporate case studies, exercises and core examples.

Duration and Logistics

Classroom version: 3 days including a mix of lectures and exercises. The course manual will be provided in digital format and participants will be required to bring along a laptop or tablet to follow the lectures and exercises.

Virtual version: Three, 3.5 hour online sessions presented over 3 days. Digital course notes and exercises will be distributed to participants before the course.

Level and Audience

Fundamental. The course is largely aimed at geoscientists who are working on subsurface projects where a wide-ranging understanding of both clastic and carbonate depositional systems is required.

Objectives

You will learn to:

1. Recognise different clastic environments of deposition including fluvial, aeolian deltaic and shallow marine.
2. Recognise different sedimentary structures and sedimentary architectures.
3. Understand the types of sand bodies and associated stacking patterns that are preserved in clastic depositional settings.
4. Describe the heterogeneities in subsurface clastic reservoirs that can impact fluid flow.
5. Appreciate how carbonates are classified and different carbonate settings are identified.
6. Frame the main types of carbonate platform types and corresponding deposits.
7. Understand the wide range of carbonate textures and facies that make up carbonate reservoirs.
8. Recognise the different types of porosity and the impact of these on reservoir quality.

Course Content

Section 1: Clastic depositional settings

- Introduction
- Alluvial fans
- Fluvial systems
- Palaeosols
- Aeolian systems
- Lacustrine settings
- Estuarine deposits
- Deltas
- Beaches and shoreface systems
- Depositional processes
- Sequence stratigraphy and correlation
- Summary

Section 2: Carbonate depositional settings

- Introduction
- Depositional settings
- Components
- Textures and porosity types
- Diagenesis
- Sequence stratigraphy
- Summary