Geomodelling for CO2 Storage (G560)

Tutor(s)

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Overview

This course provides an overview of all subsurface aspects of geomodelling relevant to CO2 storage. The course includes an introduction to the principles and practice of geomodelling; reservoir characterization for CO2 storage, including geological, geophysical and petrophysical considerations; methods used to produce 3-D geomodels; approaches to uncertainty characterization and quantification; and an overview of available software tools. The course does not provide hands-on training in these software tools, but rather provides the background understanding for software tool selection and associated training from vendor(s). The concepts and methods are illustrated using numerous practical examples of geomodelling studies.

Duration and Logistics

Classroom version: A 3-day course comprising a mix of lectures, case studies and exercises. The manual will be provided in digital format and participants will be required to bring a laptop or tablet computer to follow the lectures and exercises.

Virtual version: Five 3.5-hour interactive online sessions presented over 5 days. A digital manual and exercise materials will be distributed to participants before the course. Some reading and exercises are to be completed by participants off-line.

Level and Audience

Advanced. The course is intended for professionals with experience of, or background in, a related subsurface geoscience area and those directly working on CO2 storage projects.

Objectives

You will learn to:

1. Characterize the underlying aims and concepts of 'fit for purpose' reservoir geomodelling.
2. Prepare different types and associated applications of geomodels for CO2 storage.
3. Validate reservoir characterization data for CO2 storage, including geology, geophysics and petrophysics.
4. Assess methods for quantitative 3-D geomodel construction, including advantages and disadvantages of each.
5. Manage performance metrics for geomodels.
6. Appraise the importance of, and methods for, quantitative uncertainty assessment.
7. Rate the different software tools used for geomodelling.
8. Evaluate practical examples of geomodelling for CO2 storage.

Course Content

Course Details

Geomodels can play an important role in designing and planning CO2 storage projects, for locating and managing injection and offtake wells, and to interpret and integrate monitoring data. Geomodels for CO2 storage have different objectives and requirements from those designed for hydrocarbon production, reflecting the differing flow processes and the types and abundance of available data may also differ significantly. Approaches to model CO2 storage span the types and abundance of available data. Some modelling approaches have been inherited or ported from hydrocarbon reservoir modelling, others have roots in groundwater modelling or mineral resource modelling.

The course is divided into five sessions, with one session per day.

Session 1

Introduction to geomodelling for CO2 storage – what is 'fit for purpose'?

Session 2

Storage reservoir characterization for geomodelling – what data do you need?

Session 3

Geomodelling methods – facies and petrophysics

Session 4

Handling uncertainty – model integration with different data sources

Session 5

Software tools and practical examples