How to Make a Good Reservoir Model: It's Not the Software, It's the Design (G036)

Tutor(s)

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Overview

How can you tell the difference between a 'good' reservoir model and a 'bad' one? This short, focused class is designed to draw out the common reasons for 'good' and 'bad' outcomes, under the premise that models add value only when they add clear value to business decisions. The theme throughout the event will be the overriding issue of model design and the five areas of common error: model purpose; selection of elements; use of determinism and probability; model scale; and uncertainty handling. Advice will be given on how to review models, what questions to ask the model builders, and how to determine whether the output from models can be relied upon and used to support decisions. The course will close with a set of questions to ask yourself and others, suitable for reference in peer reviews or assists.

Duration and Logistics

Classroom version: A 1-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: Two 4-hour interactive online sessions presented over 2 days. A digital manual and exercise materials will be distributed to participants before the course. Some reading and several exercises are to be completed by participants off-line.

Level and Audience

Fundamental. Designed for people who want an update or refresh on working with reservoir models without having to spend a week out of the office. The class will provide an opportunity for learning, inspiration and discussion with other modelers.

Objectives

You will learn to:

1. Explain the common causative factors for modelling 'disappointments'.
2. Define model purpose and explain the use of framing.
3. Understand the fluid sensitivity to selection of model elements.
4. Describe techniques for handling small-scale detail in large models.
5. Be able to select between techniques for quantifying uncertainty.
6. Implement QC tips to evaluate your (and other people's) models.

Course Content

Course Details

The five reasons why many models fail, and how to avoid them:

1. Model purpose
    - Why model at all? What do we understand by ‘fit for purpose’?
2. Elements and architecture
    - Getting the building blocks right
3. Determinism and probability
    - Concept-driven (intuitive) geostatistics
    - Balancing probabilistic and deterministic tools
    - The importance of trends
4. Scaling
    - Beyond upscaling – pitching the models at the correct scale
    - Multi-scale modelling
    - The REV
5. Uncertainty
    - Overcoming heuristics
    - Modelling – what you don’t know