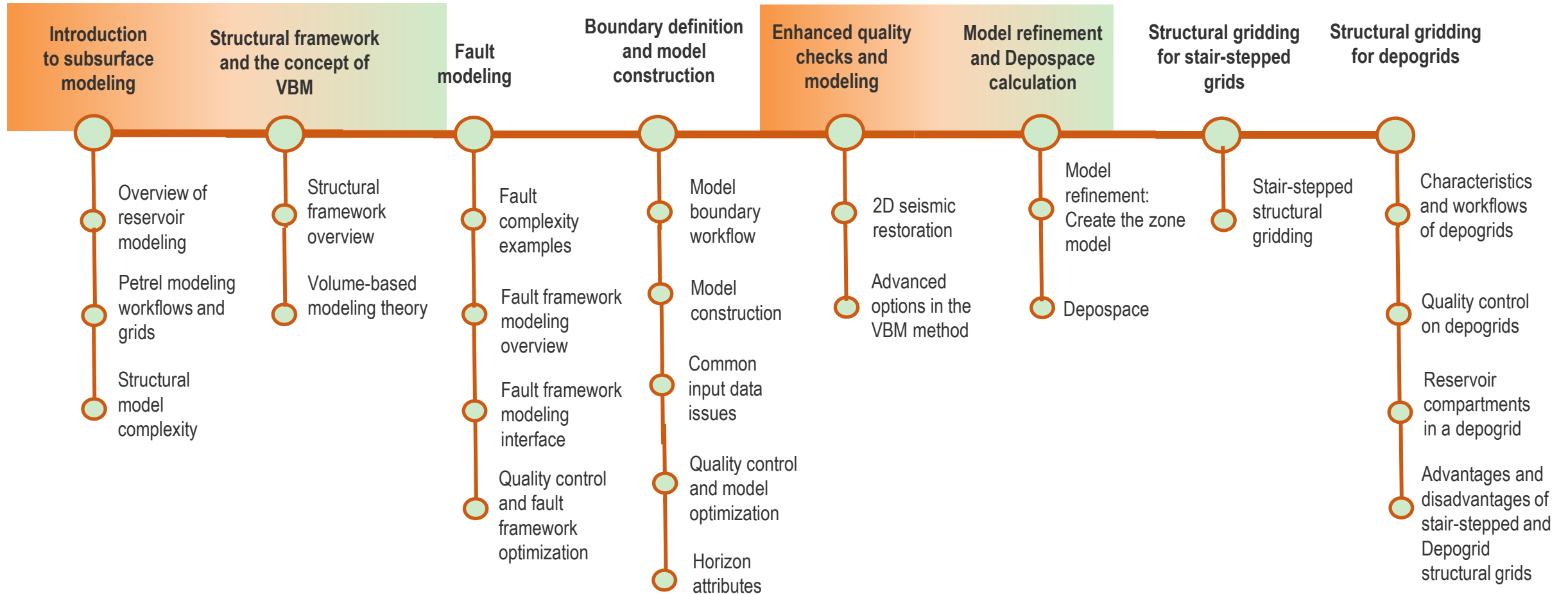


Structural Framework Workflows for Petrel 2018

Module 2: Structural framework and the concept of VBM

Structural framework with Petrel 2018 – Modeling line

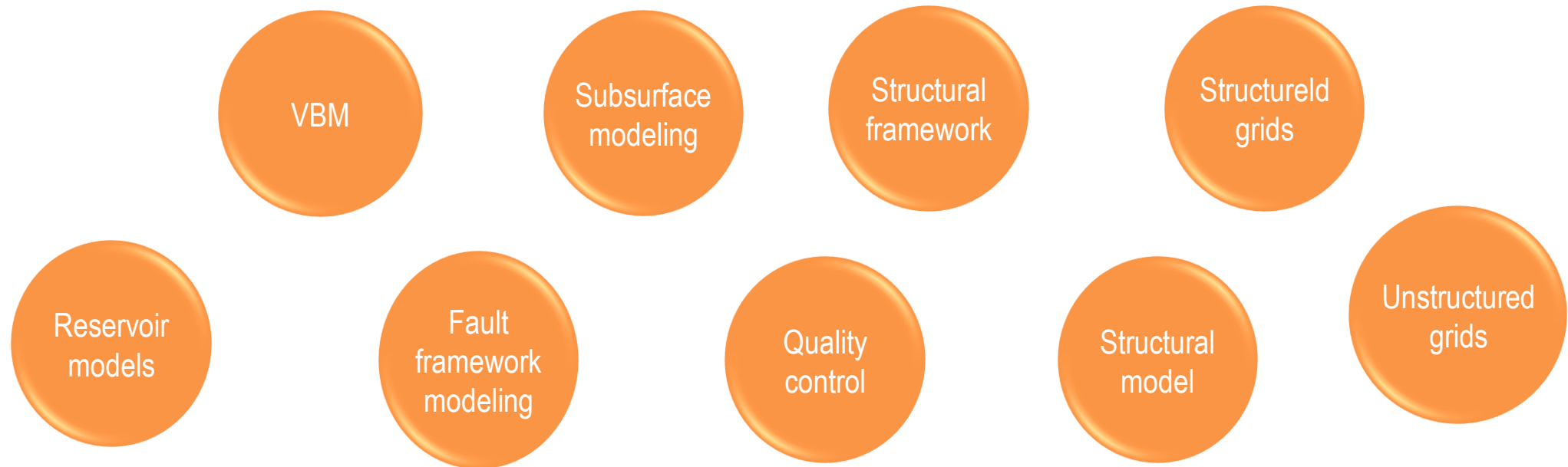


Agenda

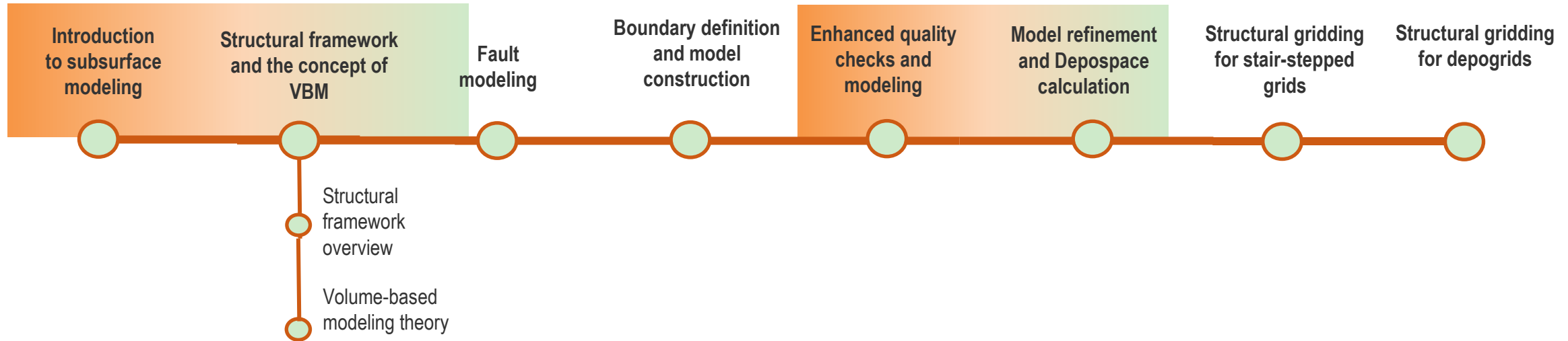
Structural framework– Day 1

9.00-12.00	12.00-12.30	12.30-14.00	14.00-16.45	16.45-17.00
Introduction to subsurface modeling	Lunch	Structural framework and the concept of VBM	Fault modeling	Review

KEYWORDS



Module 2: Structural framework and the concept of VBM

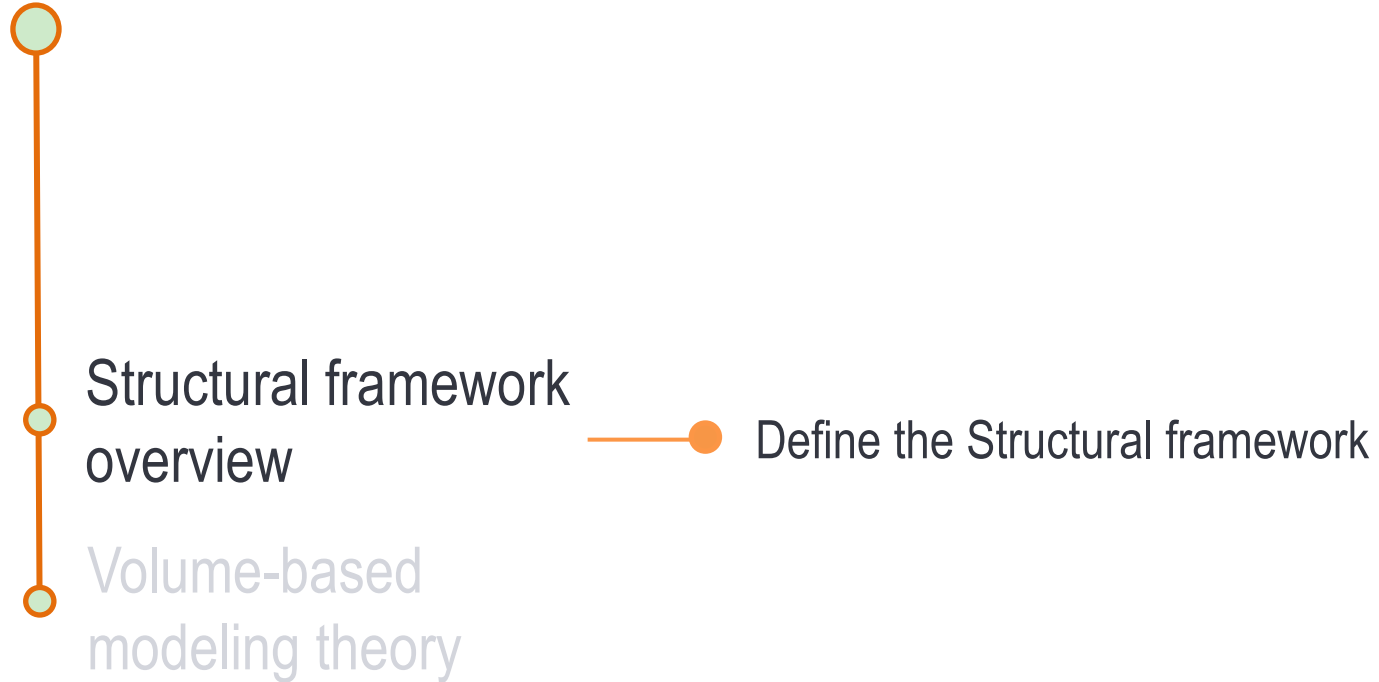


Learning objectives

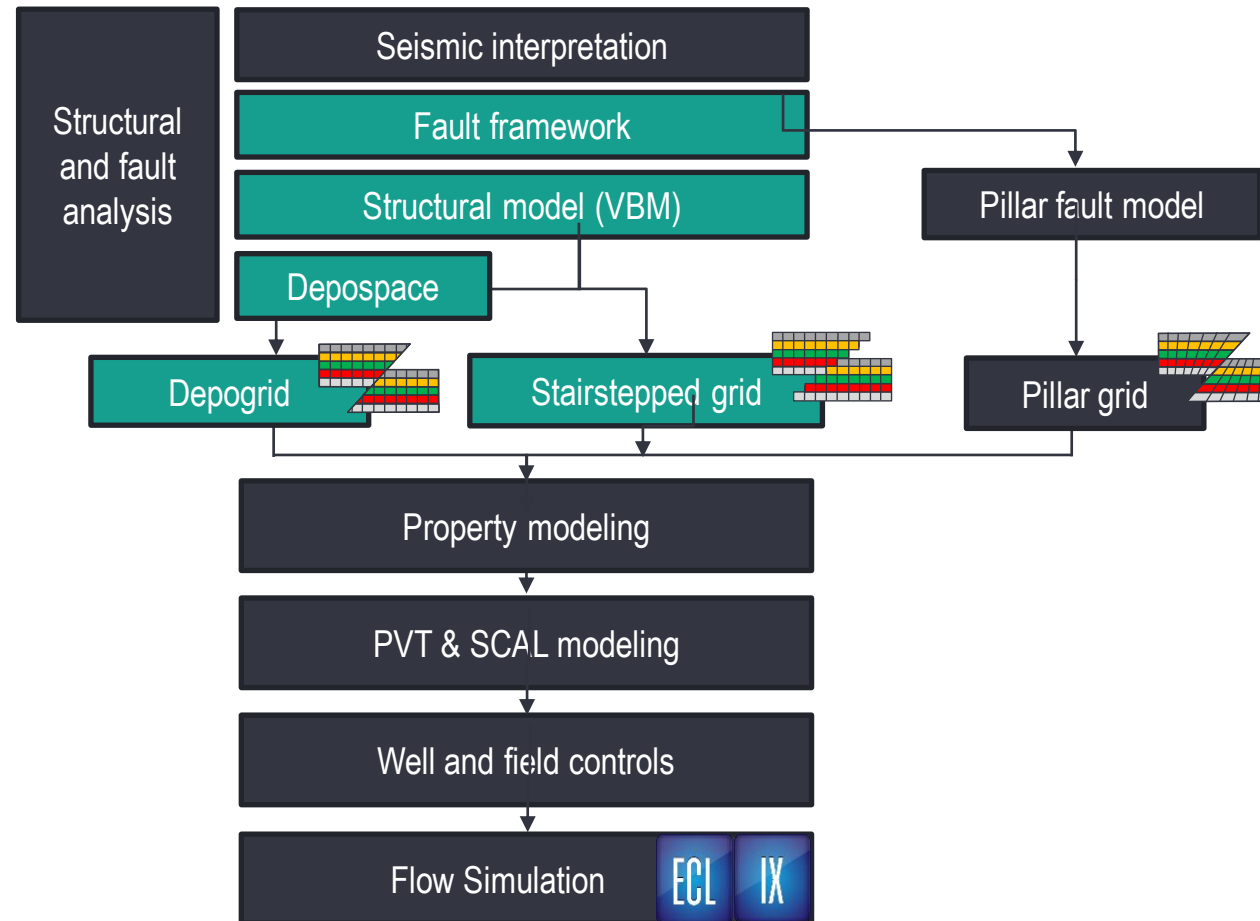
When you complete this module, you will understand:

- the Structural framework workflow in **Petrel**
- the concept of Volume-based modeling

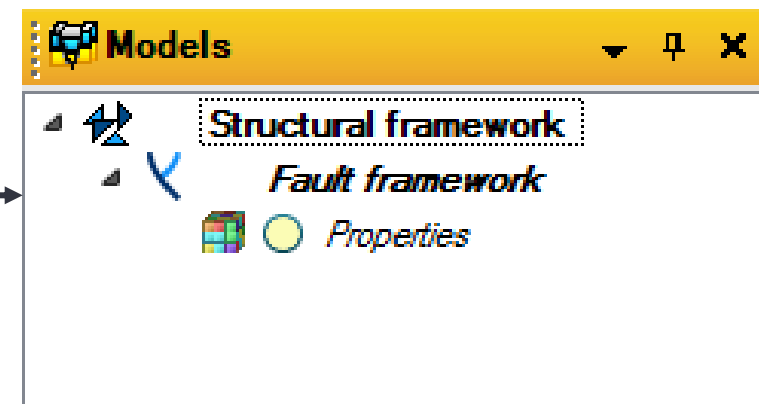
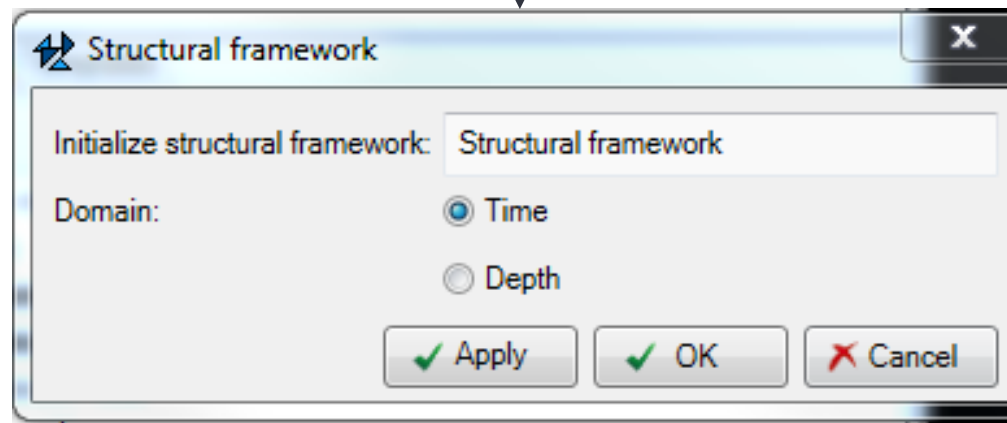
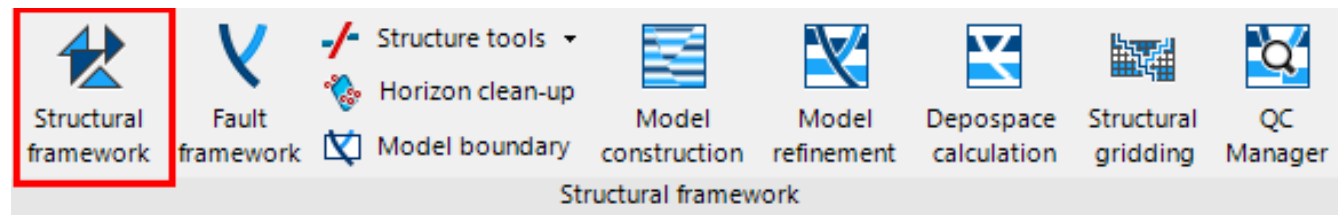
Structural framework and the concept of VBM



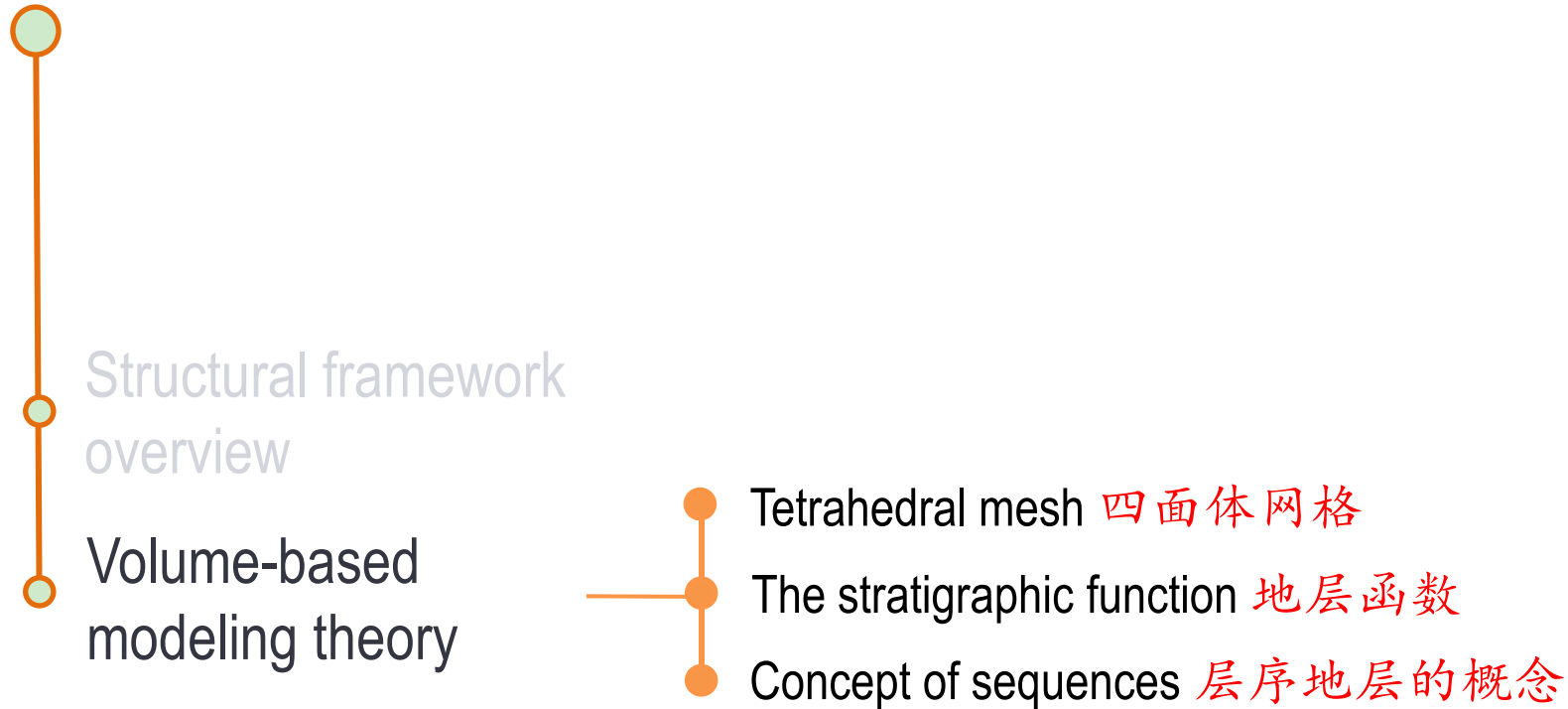
Structural framework workflow



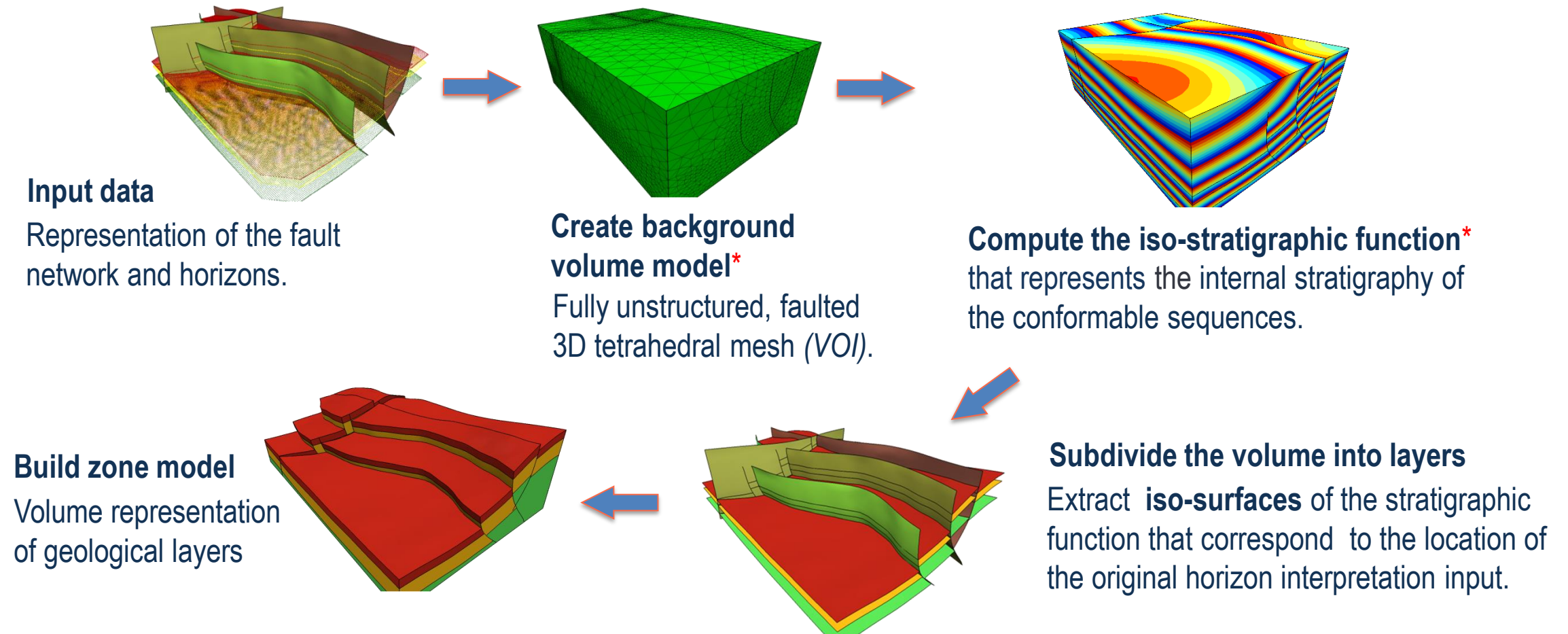
Define the structural framework



Structural framework and the concept of VBM

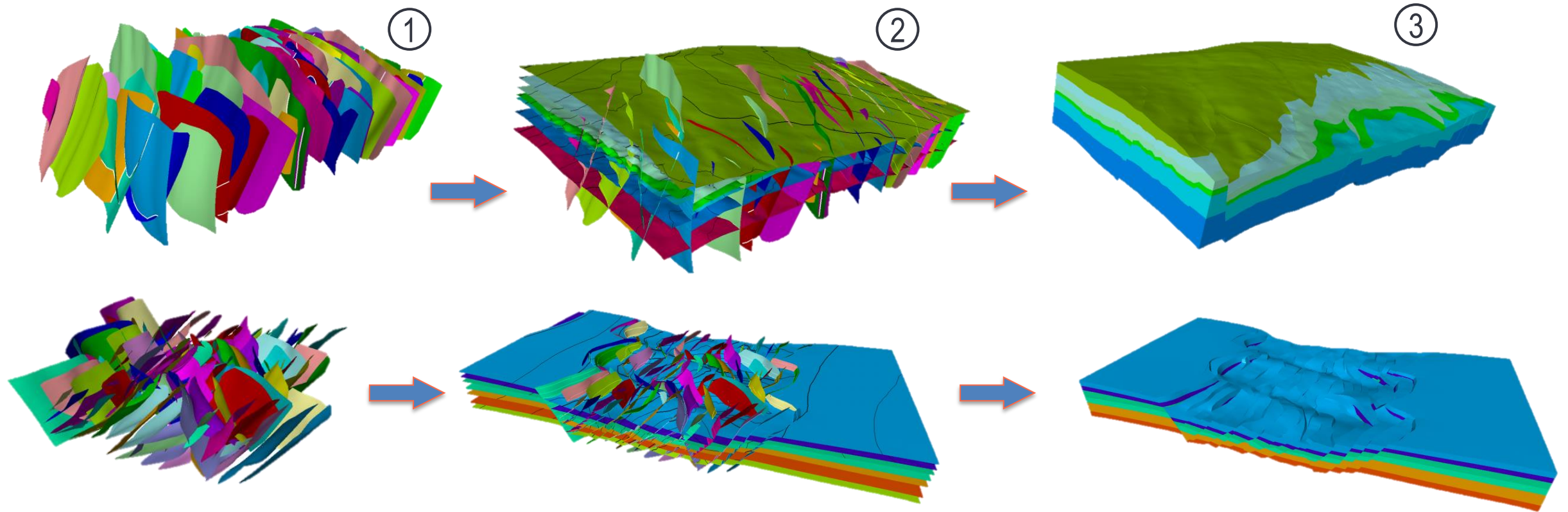


Volume-based modeling



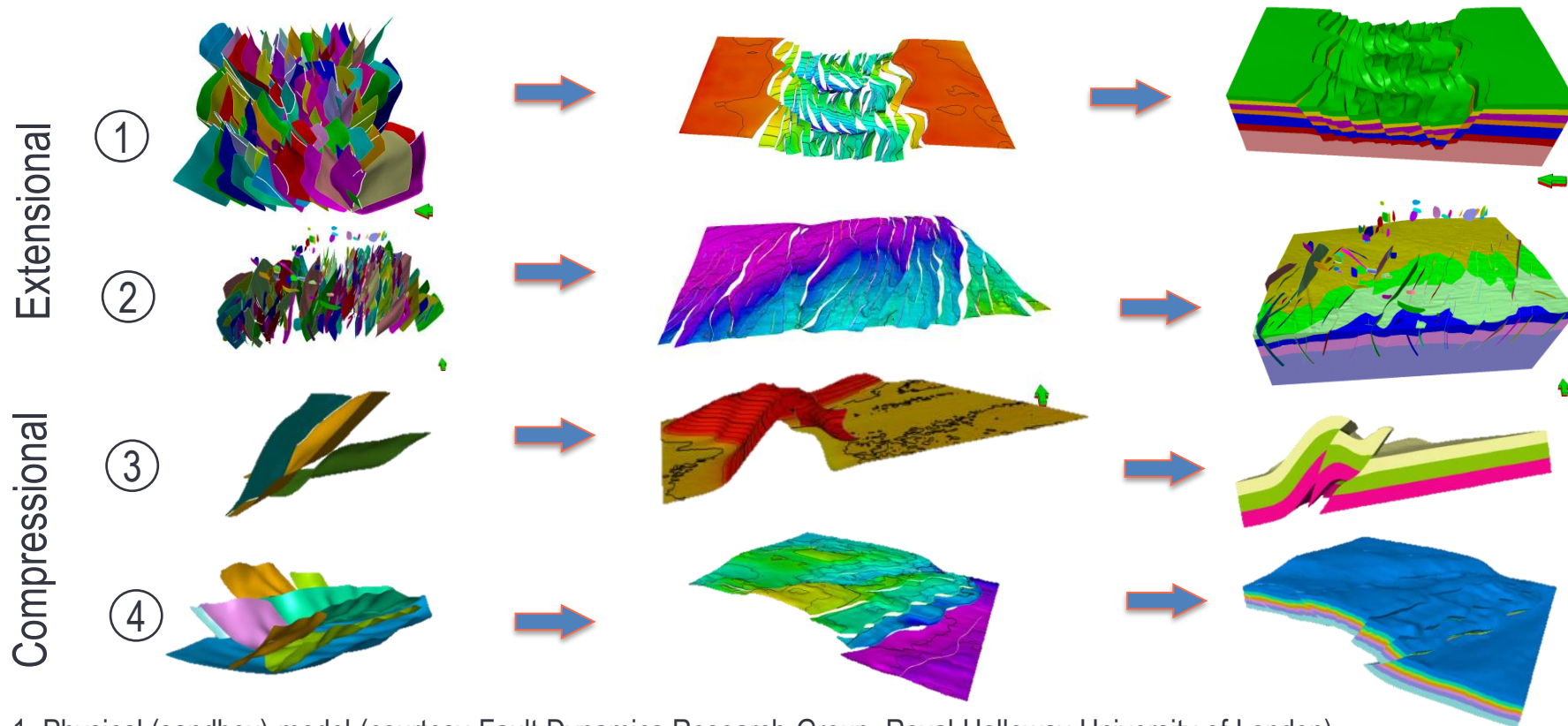
* Conceptual models

Structural models built with VBM (1)



- 1. Fault network
- 2. Horizons
- 3. Zones

Structural models built with VBM (2)



1 Physical (sandbox) model (courtesy Fault Dynamics Research Group, Royal Holloway University of London)

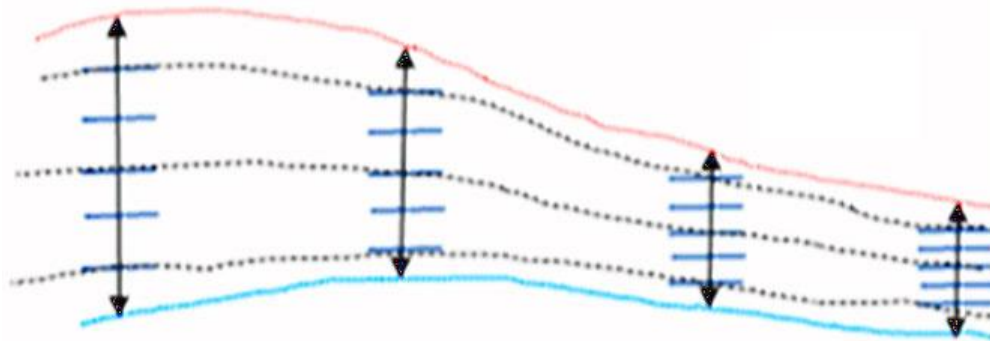
2 Seismic data courtesy Geosciences Australia

3 SEG-EAGE 3D Overthrust Model (Aminzadeh et al., 1997)

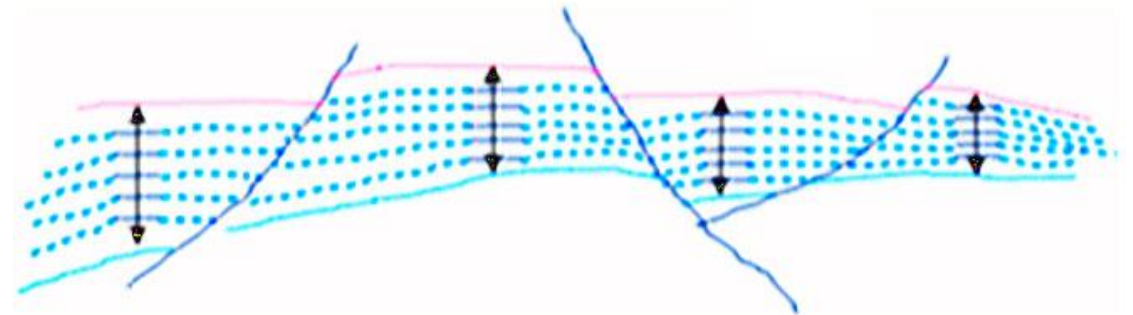
4 Thrust belt model (synthetic)

Volume-based modeling: Proportional layering capabilities

The stratigraphic function is designed to be discontinuous across faults. It guarantees that the fault throw and stratigraphic thickness on either side of the faults are consistent.



Un-faulted conformable sequence

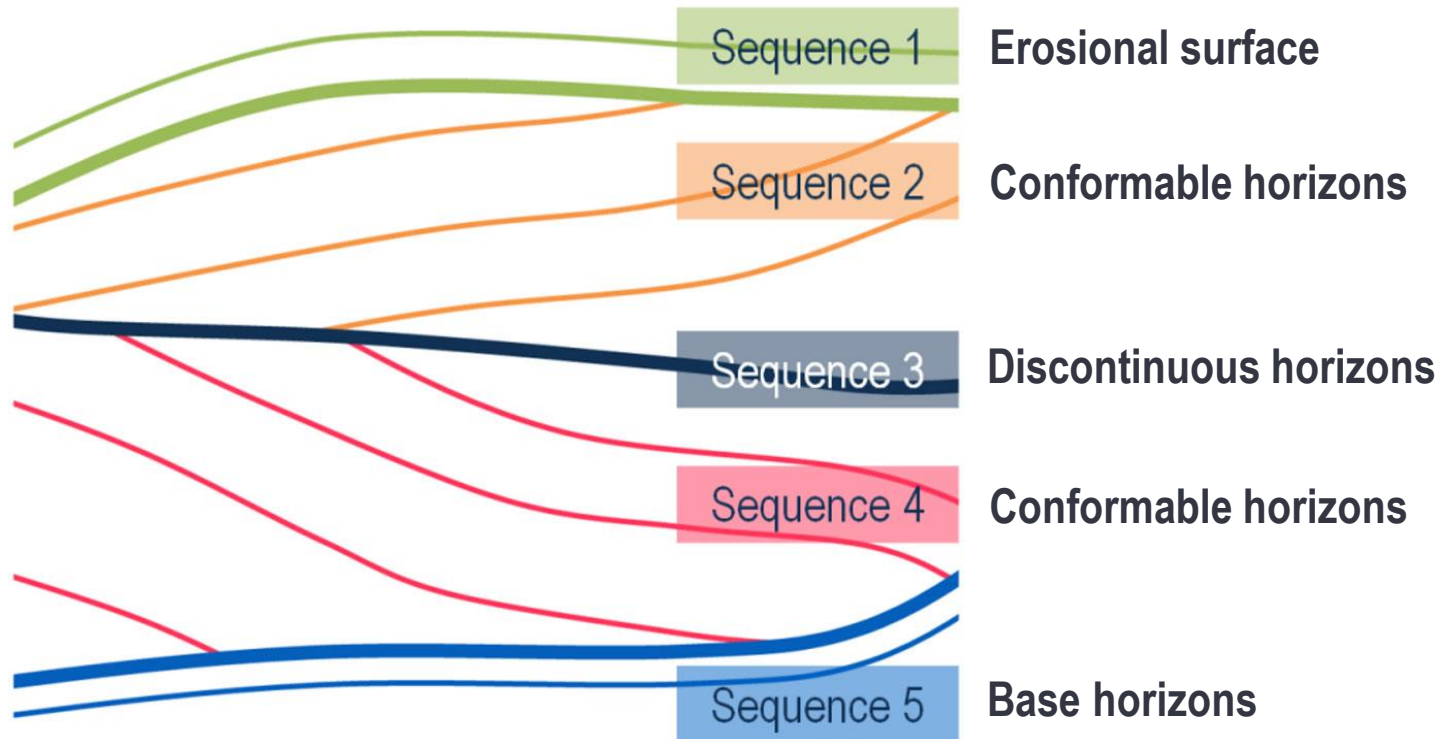


Faulted conformable sequence

Proportional layering capabilities of VBM in un-faulted and faulted zones.

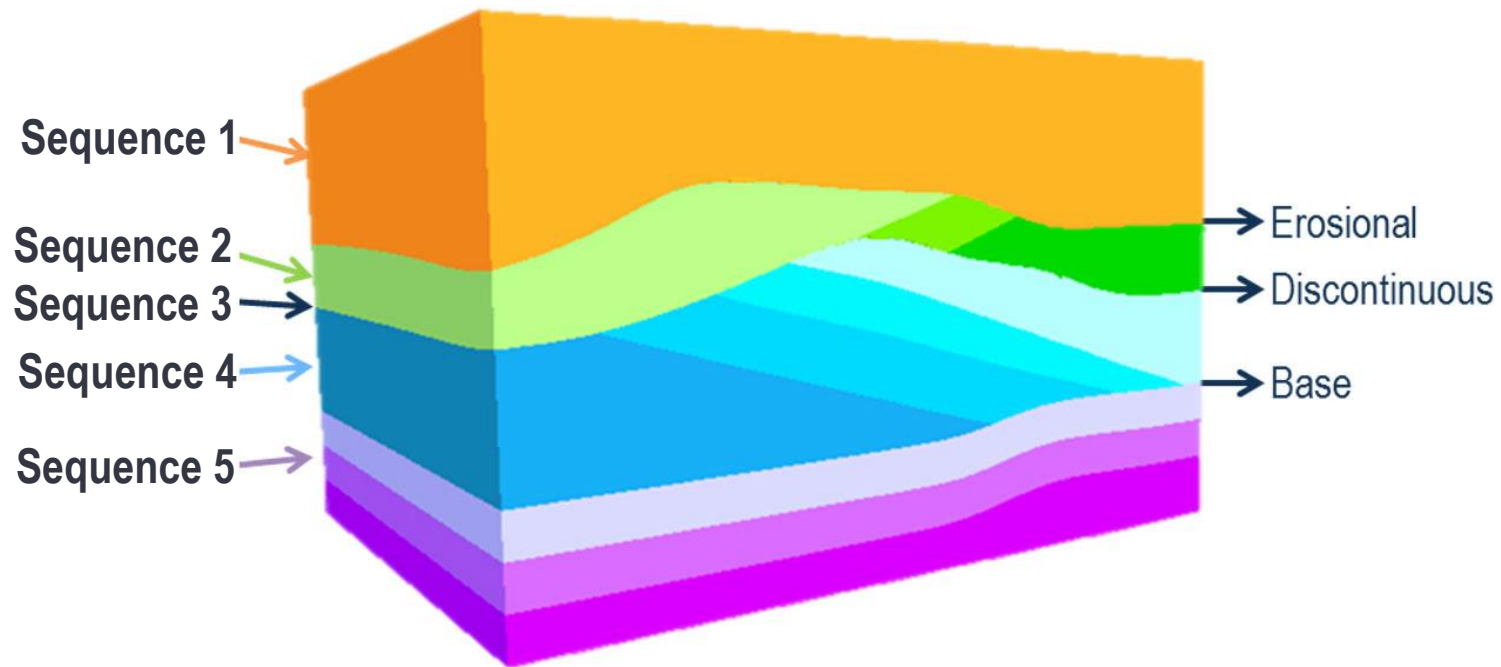
Concept of sequences (1)

Horizons are separated into sequences that are determined by the horizon type, based on geological events.

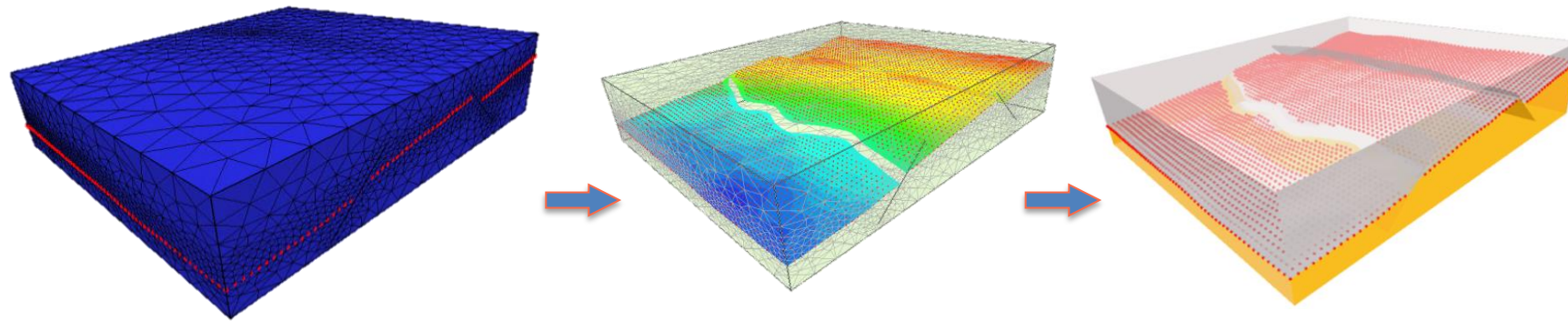


Concept of sequences (2)

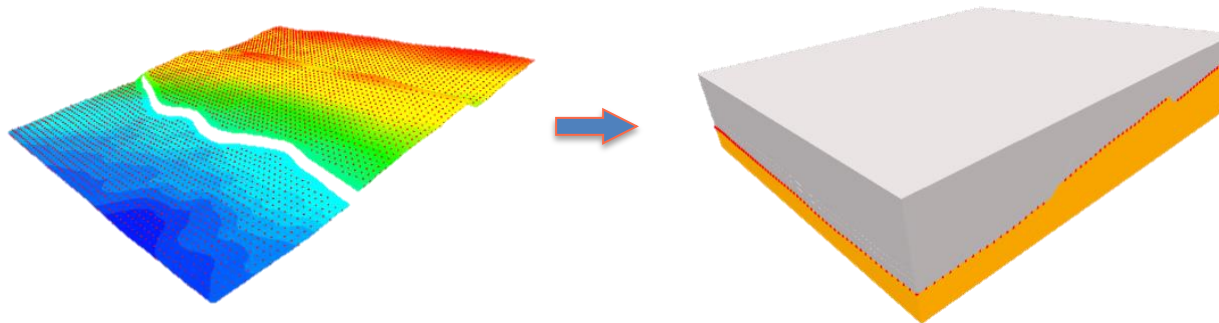
All conformable horizons that belong to a single conformable sequence are modeled simultaneously by the VBM algorithm as several iso-values of the unique stratigraphic function.



VBM vs. Surface-based modeling



Volume-based modeling: Interdependent horizons built from the inputs inside the volume (VOI)



Surface-based modeling: Interdependent horizons built from the input surface by surface

Summary

In this module, you learned about:

- the Structural framework workflow
- the concept of Volume-based modeling

Learning game: Structural framework and the concept of VBM (1)



Instructions:
There are several questions. Select the correct answers.

Learning game: Structural framework and the concept of VBM (2)

Which of the following characteristics of a stratigraphic function is correct?

- a. It represent the relative age of the horizons
- b. It is defined across the whole model extent
- c. It is discontinuous at faults
- d. It preserves thickness between horizons
- e. All the answers above are correct

Learning game: Structural framework and the concept of VBM (3)

What are sequence boundaries?

- a. Conformable, Erosional, Top, Continuous
- b. Erosional, Base, Continuous
- c. Erosional, Base, Discontinuous
- d. Conformable, Base, Discontinuous

Learning game: Structural framework and the concept of VBM (4)

In which parameters listed below does the resolution of the tetrahedral mesh directly control?

- a. The resolution of the stratigraphic function
- b. The accuracy of the horizon/fault intersection lines
- c. The accuracy of the horizon/horizon intersection lines
- d. All the answers above are correct