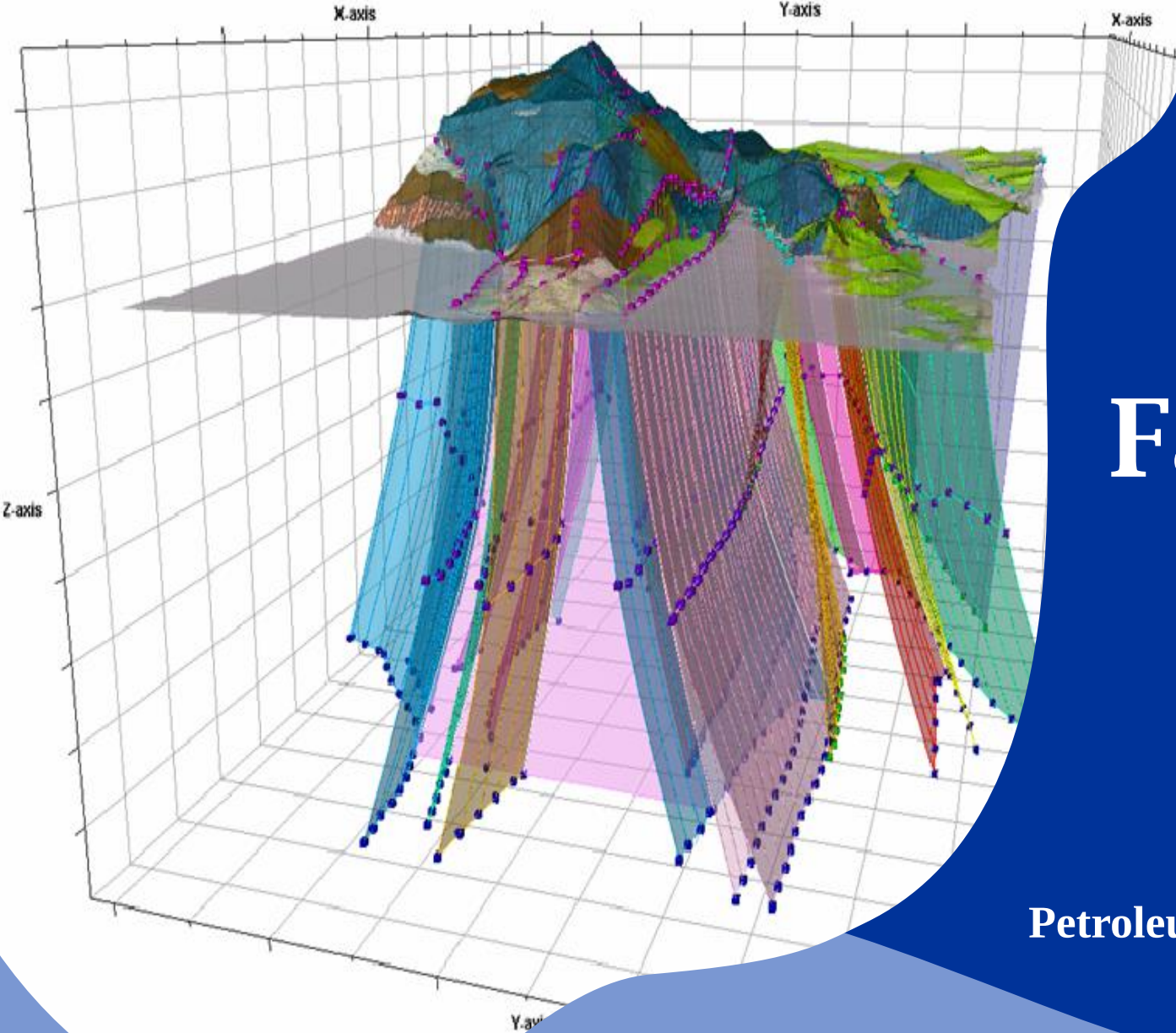




Fault and Horizon Modeling

Petroleum & Mining Engineering Collage/ Forth Year

Dr. Maha Muneeb



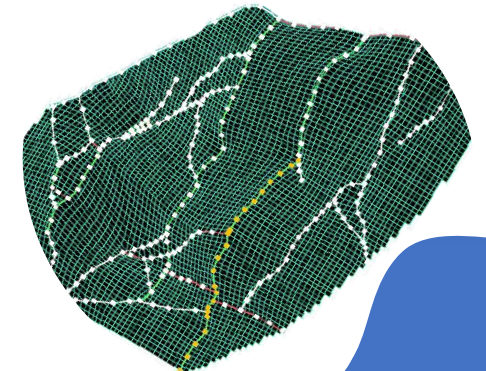
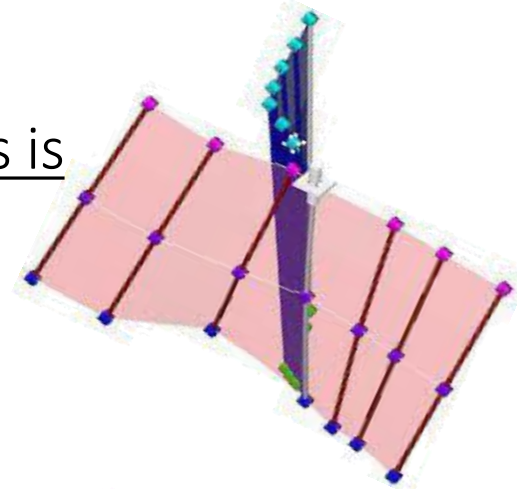
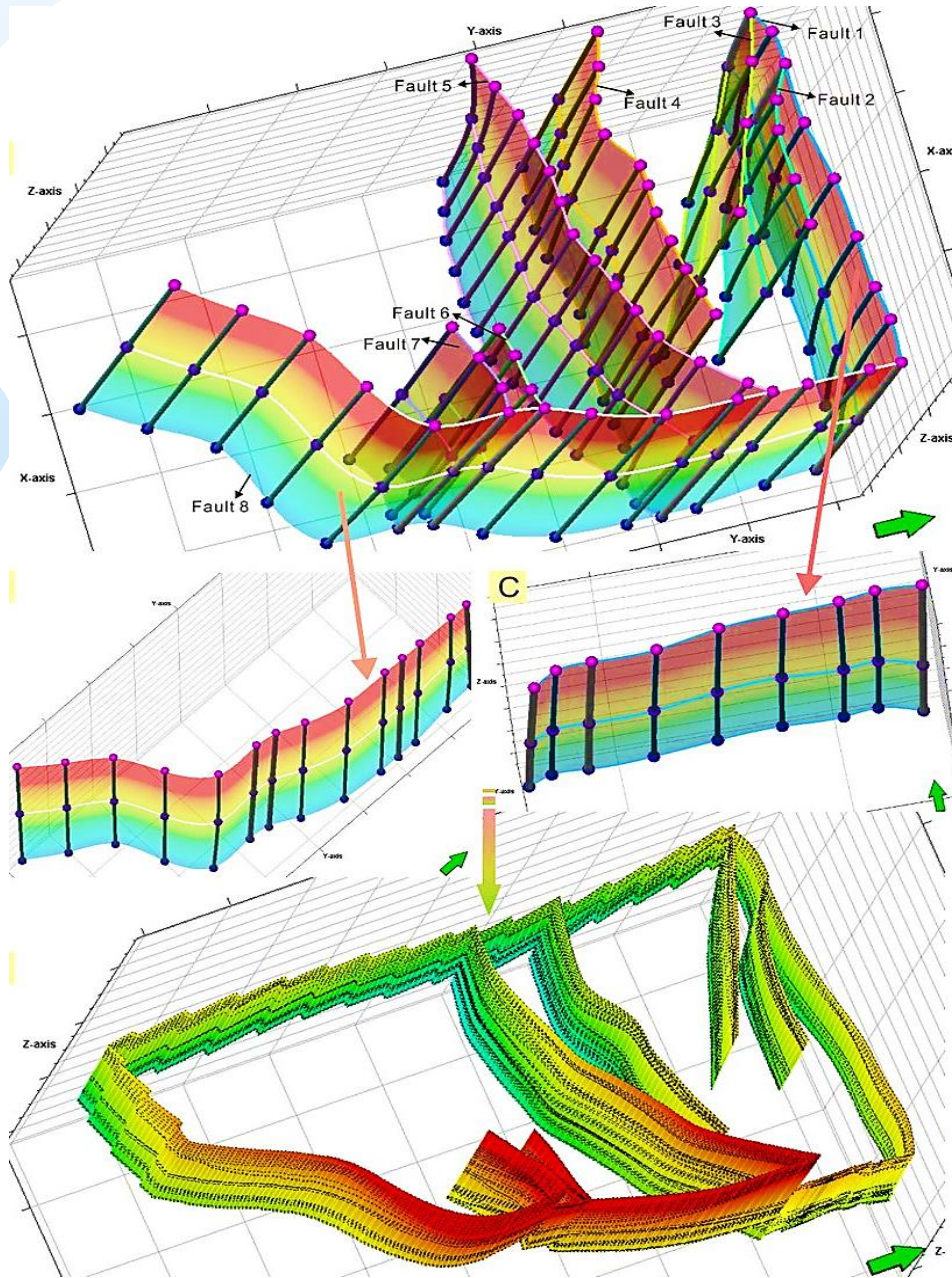
Fault Modelling

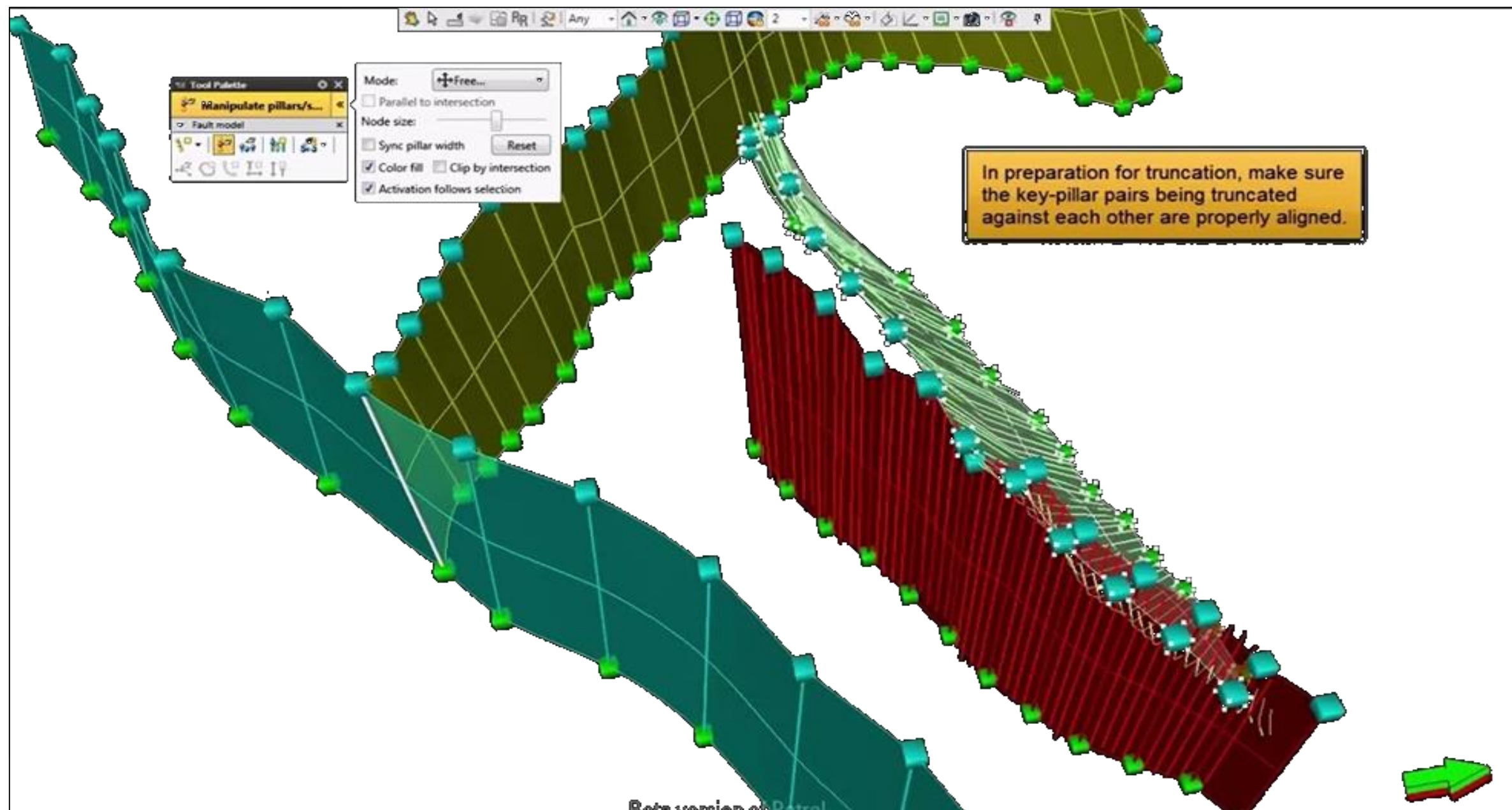
Fault modeling: is the process of mapping faults in 3D within the reservoir.

The purpose of this step
to define the shape of each of the
faults that should be modeled. This is
done by generating “*key pillars*”.

Pillar gridding

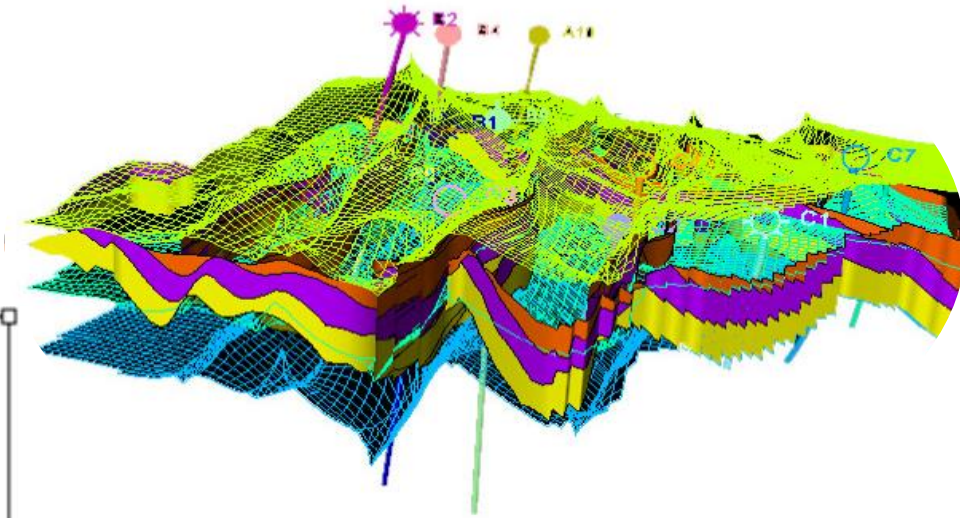
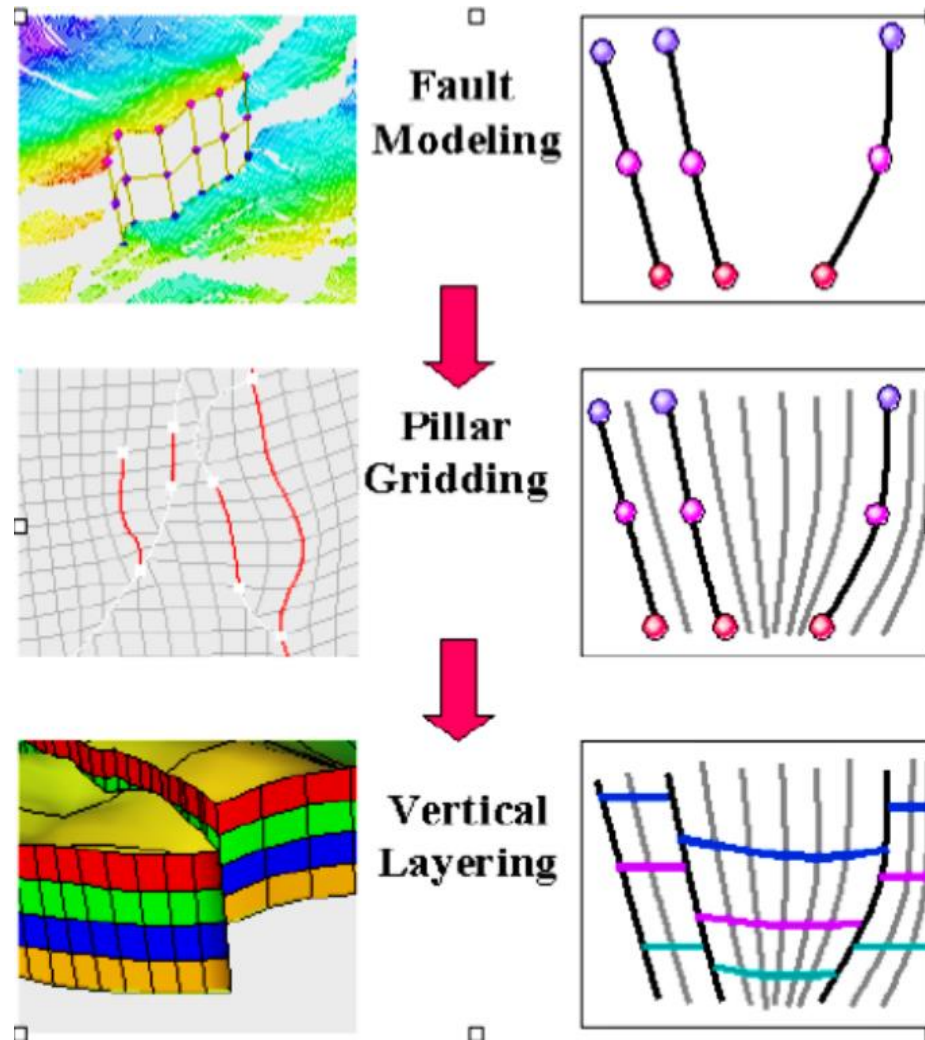
process, where a set of pillars will be inserted in the entire project area. The result of the pillar gridding process is a “*skeleton grid*”, defined by *all of the faults and all of the pillars*.



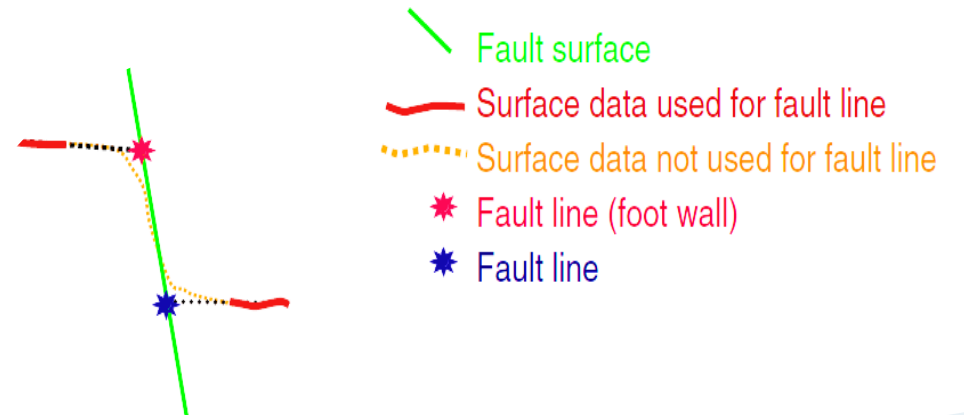
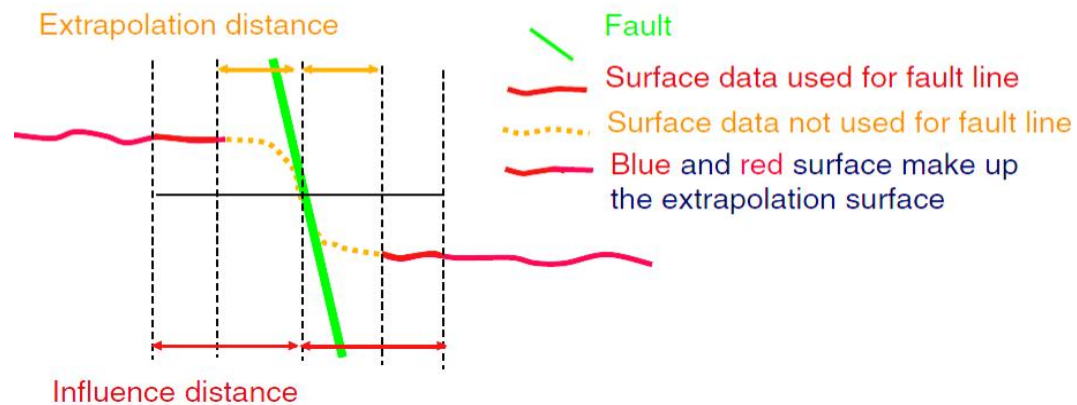
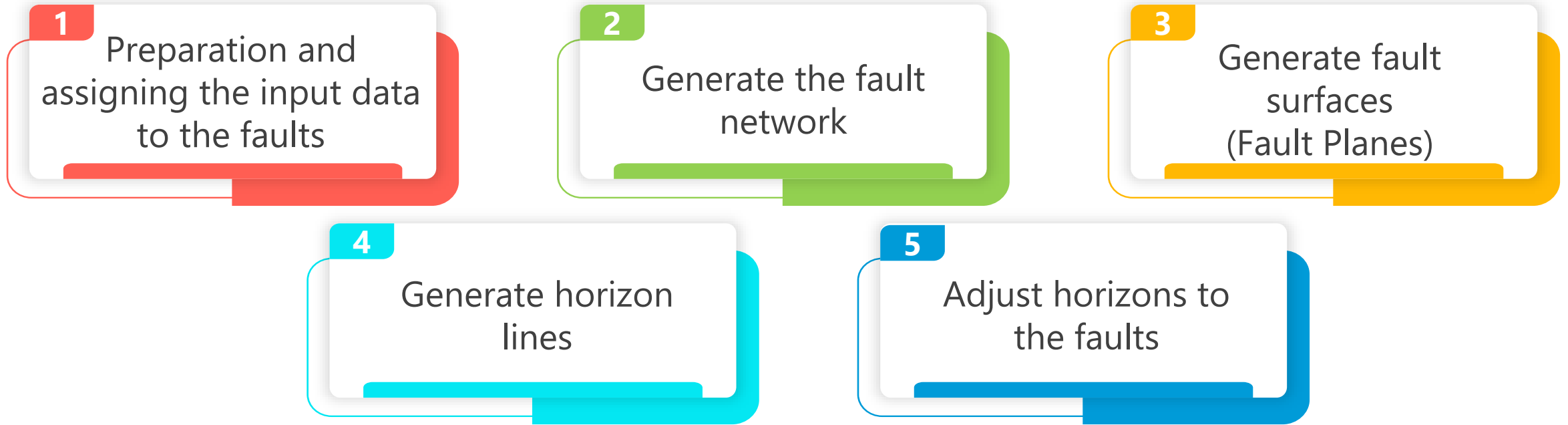


Layering:

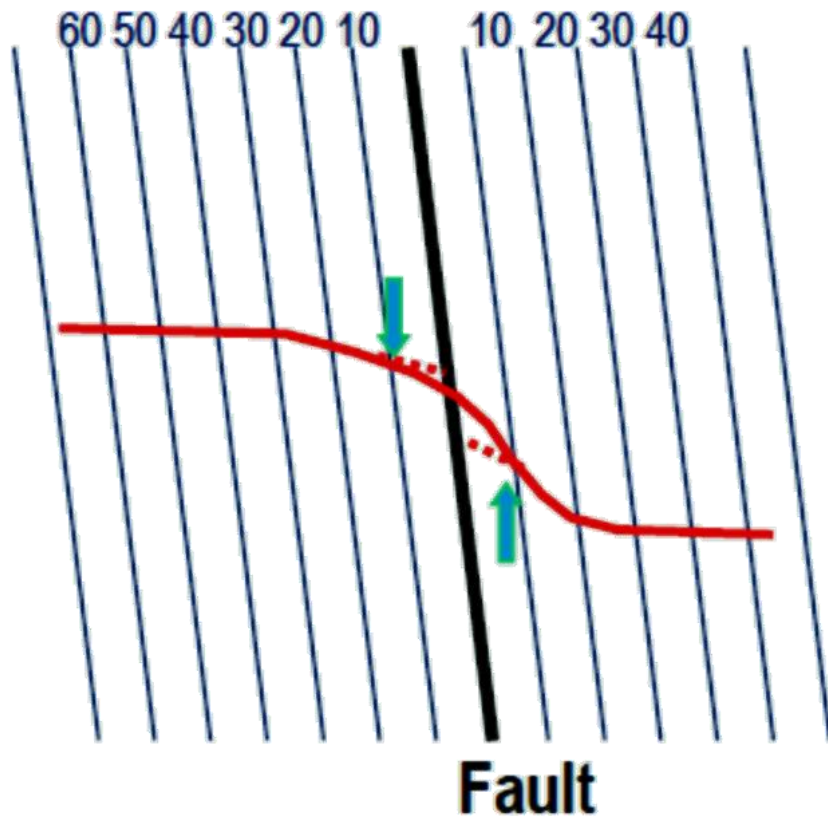
The final step is to insert the horizons into the faulted 3D grid



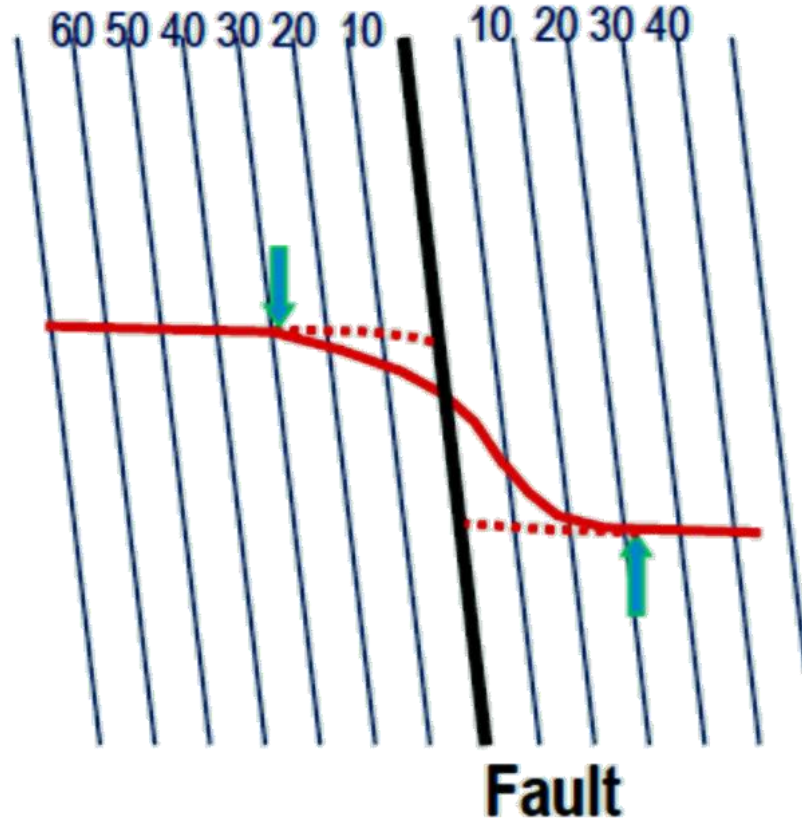
Fault Modelling Workflow



Distance from fault = 10



Distance from fault = 30



Horizon extrapolation - Distance to fault

Fault Types Definitions

Vertical faults

Consist of 2 shape points

1

Linear faults

Consist of 2 shape points

2

Listric faults:

Consist of 3 shape points

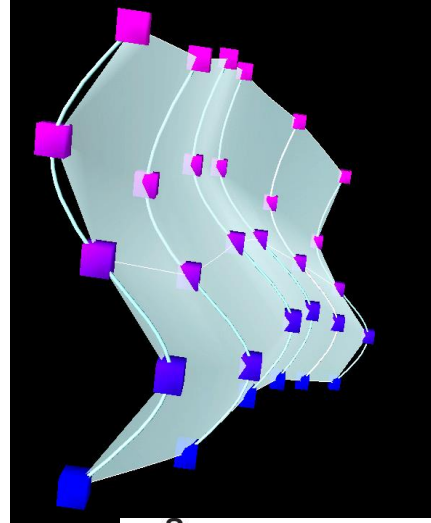
3

Curved faults

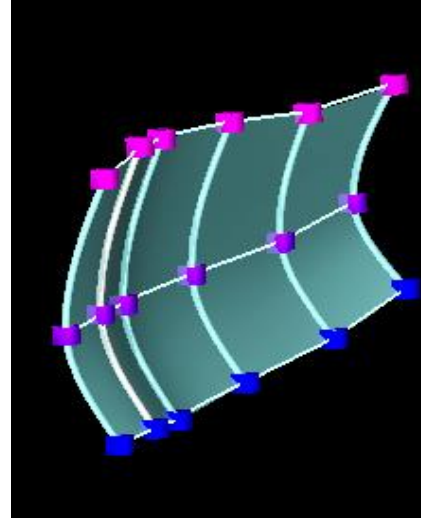
Consist of 5 shape points

4

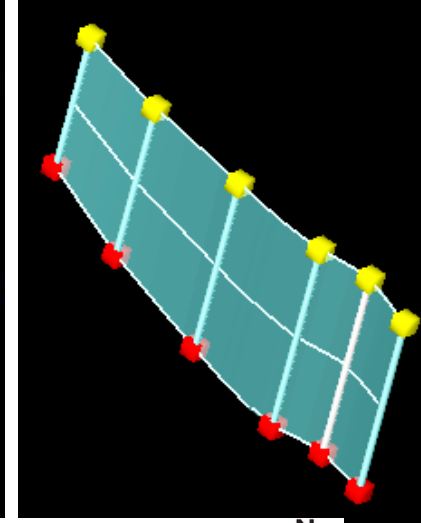
Curved fault



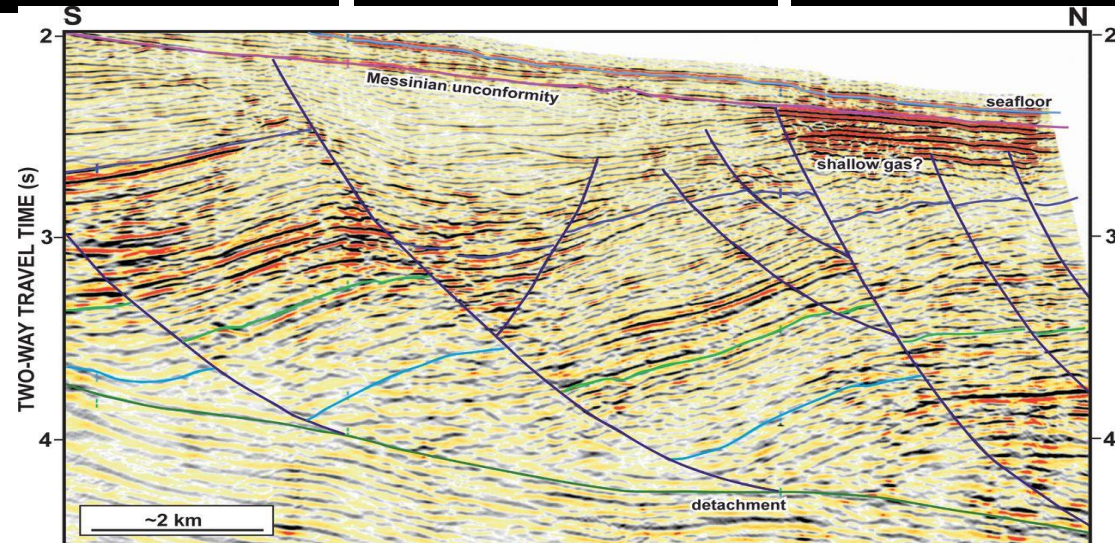
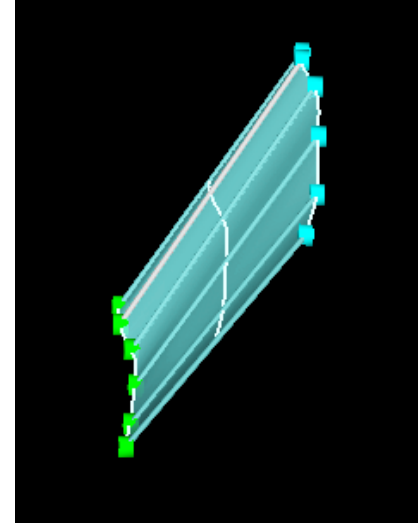
Listric fault



Vertical fault



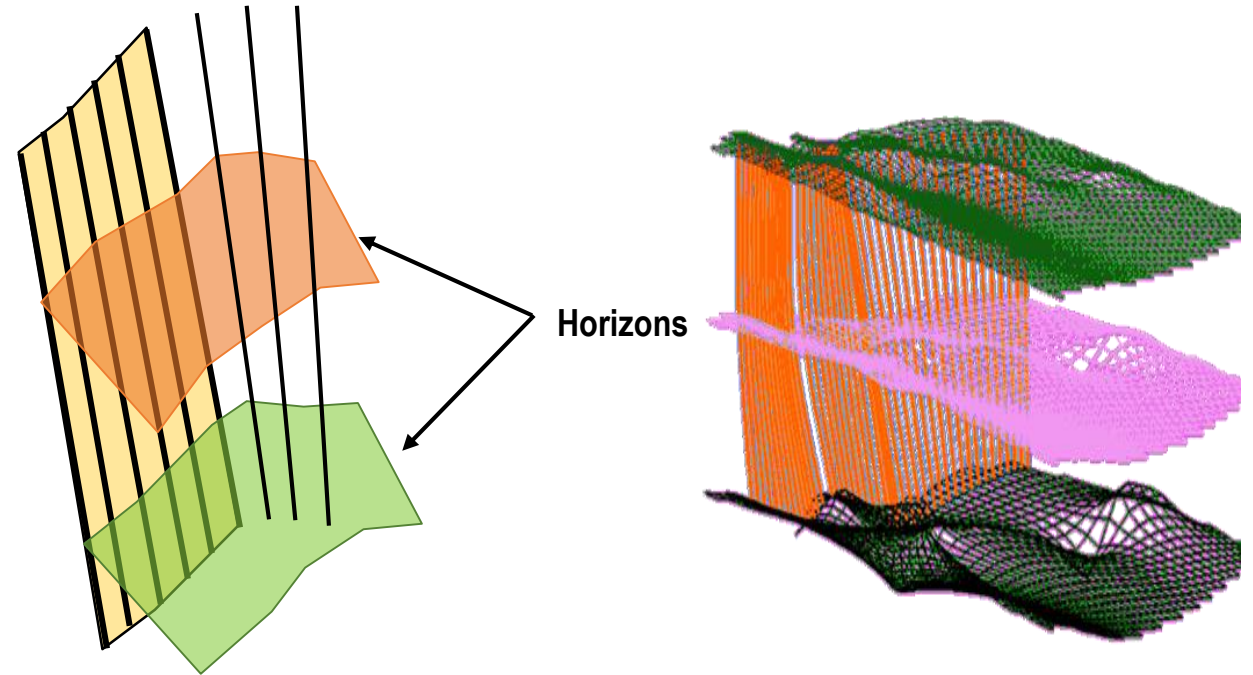
Linear fault



Horizon Modelling

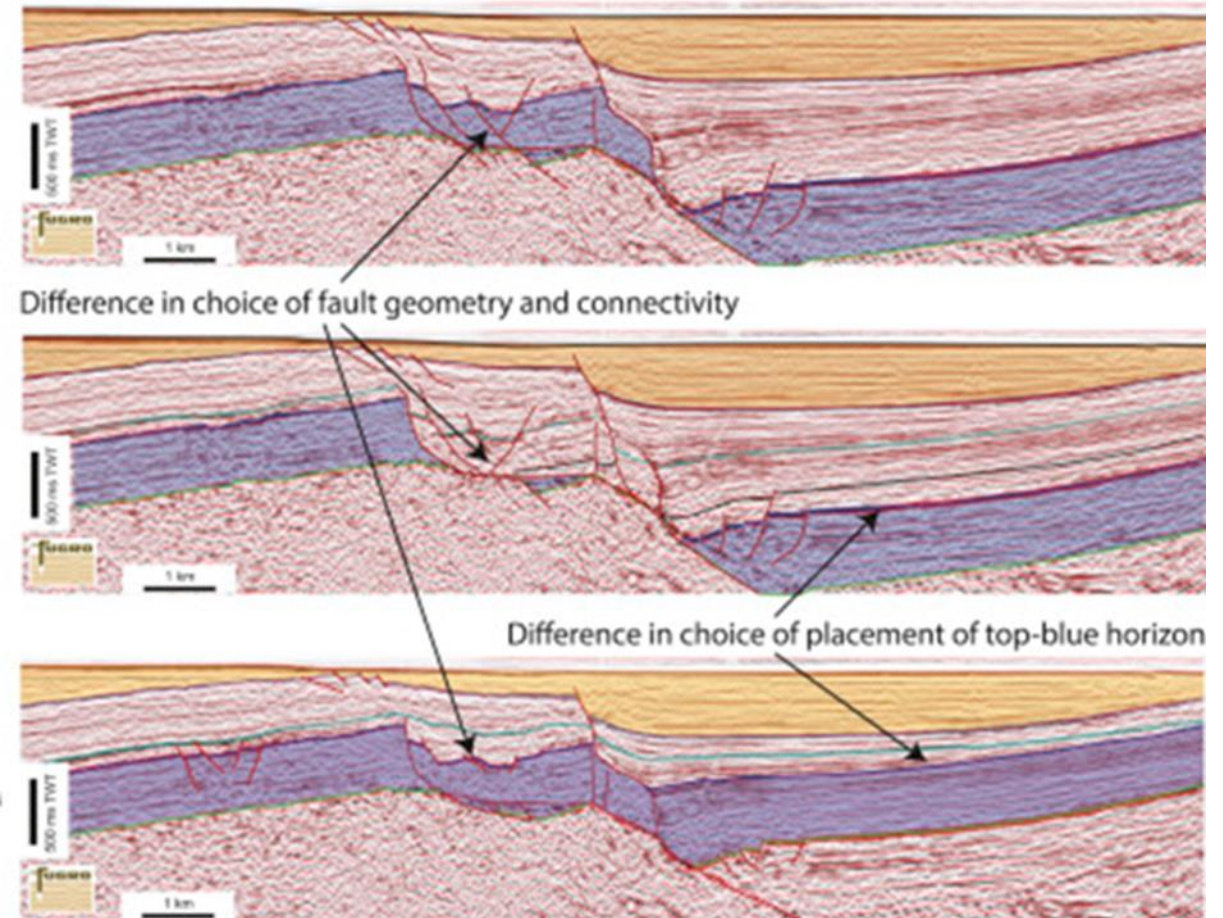
Horizon modeling leads directly to the ***Stratigraphic Modeling***

Horizons in a reservoir model are used to capture the large-scale geological relationship represented by the seismic interpretation; they can *represent the base of a sequence, an erosional event or a discontinuous surface*



Structural Uncertainty

Uncertainty in the structural model comes from the seismic interpretation and subsequent depth conversion: horizon picking, the well-tie and velocity model introduce errors into the reservoir framework.





Thank
you!