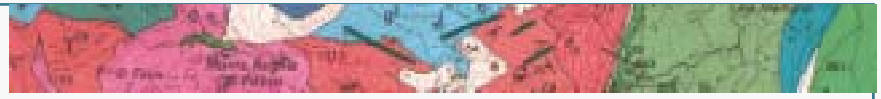
4th Meeting of the European
3D Geomodelling Community
Orléans, France, 21-23/02/2018



# How Geological Architecture Helps 3D Modelling

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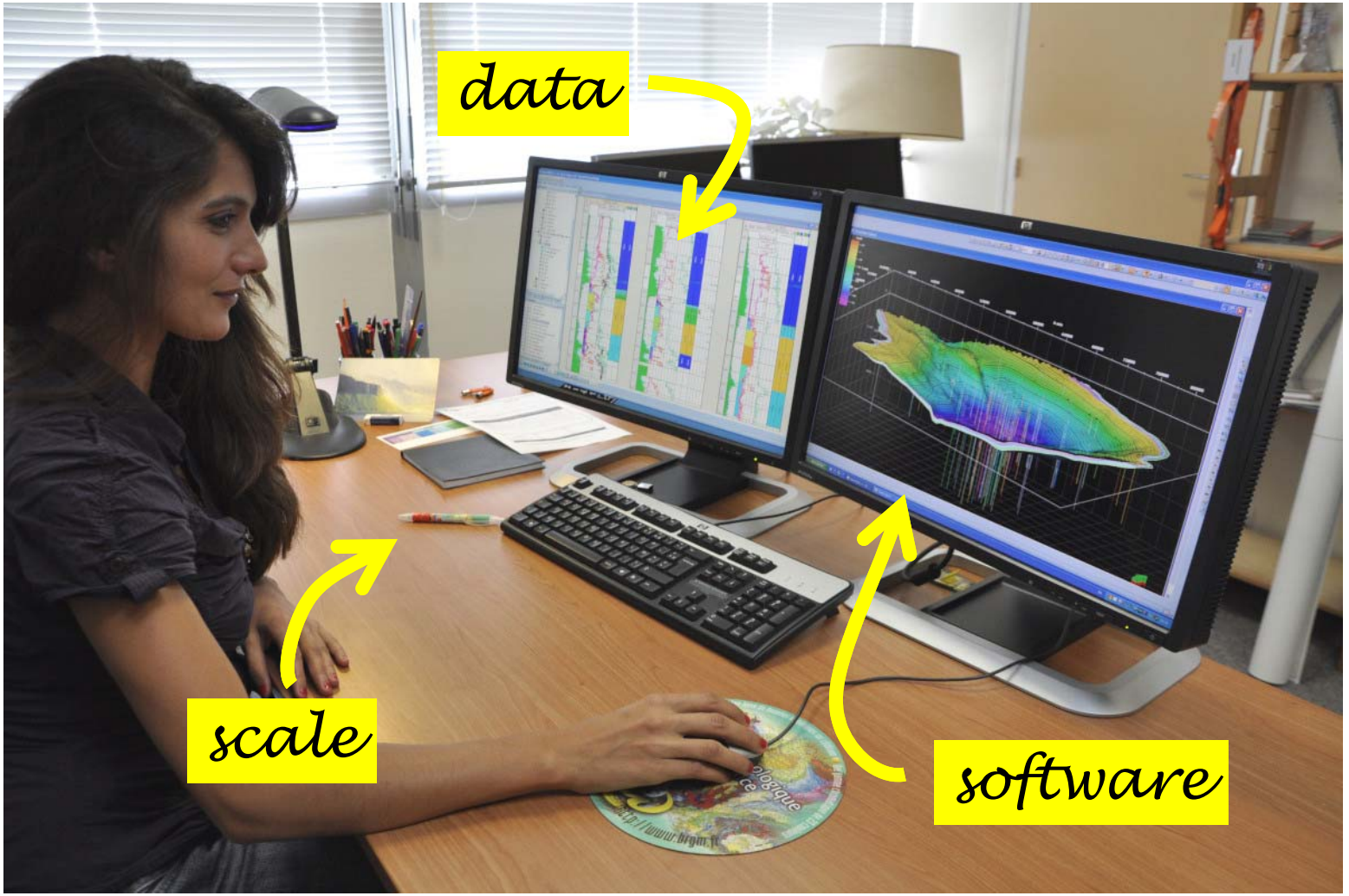
# Typical 3D Modelling outcrop

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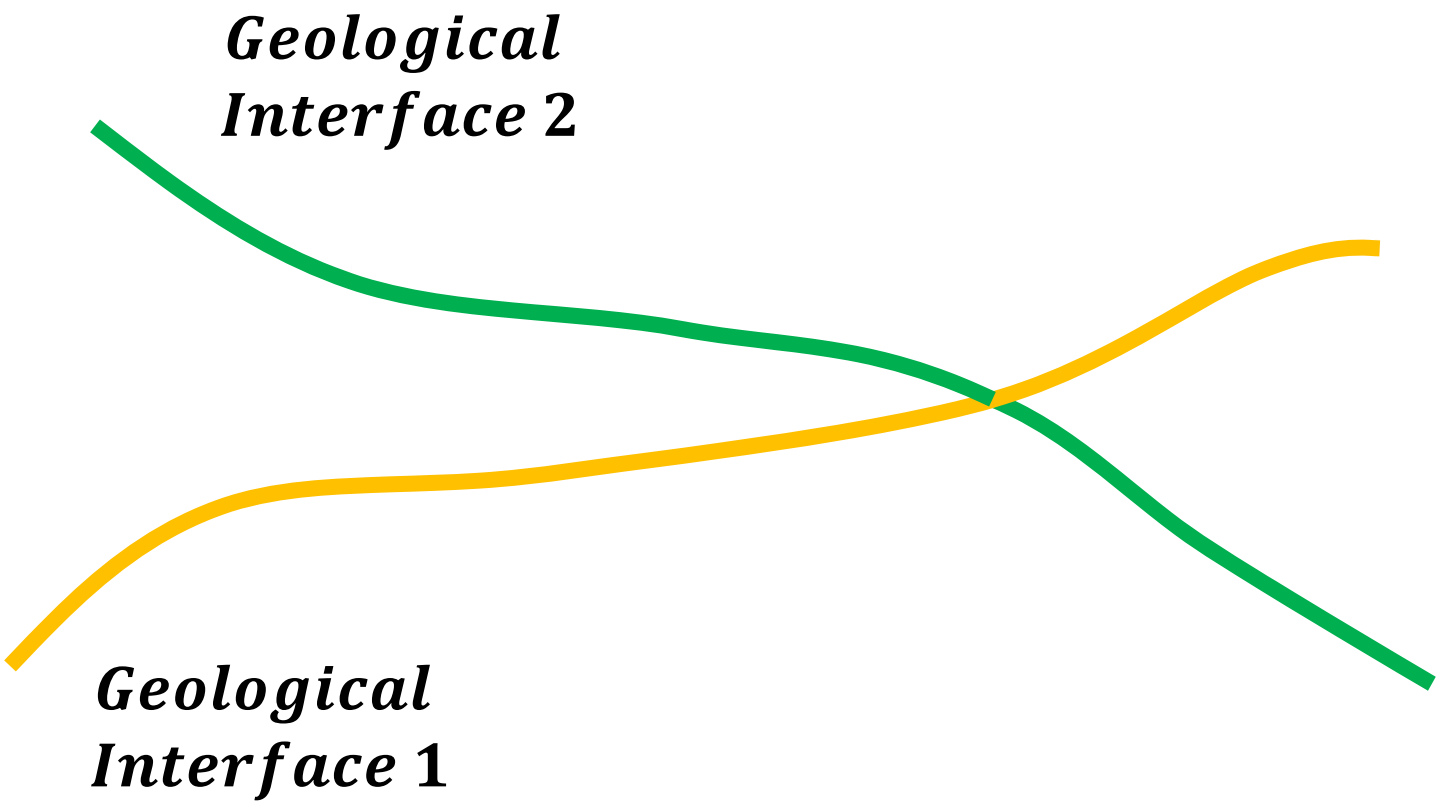
# Geological Model Recipe?

$$\boldsymbol{Data + Modelling\ Tool \Longrightarrow Geological\ Model\ ?}$$



# Not only data…

**2 kinds of knowledge are needed to complete geological models**

> **Data**

- Observation location. Geometry (explicit)

> **Geological Architecture**

- History and rules to manage the behavior between geological bodies. Topology (mostly implicit)

$$\boldsymbol{Data + Geological\ Architecture + Modelling\ Tool \Longrightarrow Geological\ Model}$$

# Framework

- **Static structural modelling**
- **Polarized surfaces model geological contacts, faults, events …**
- **In that framework a geological model is a collection of polarized 3D surfaces assembled according to geological rules**

# Geological Architecture has to manage…

- **Chronology**

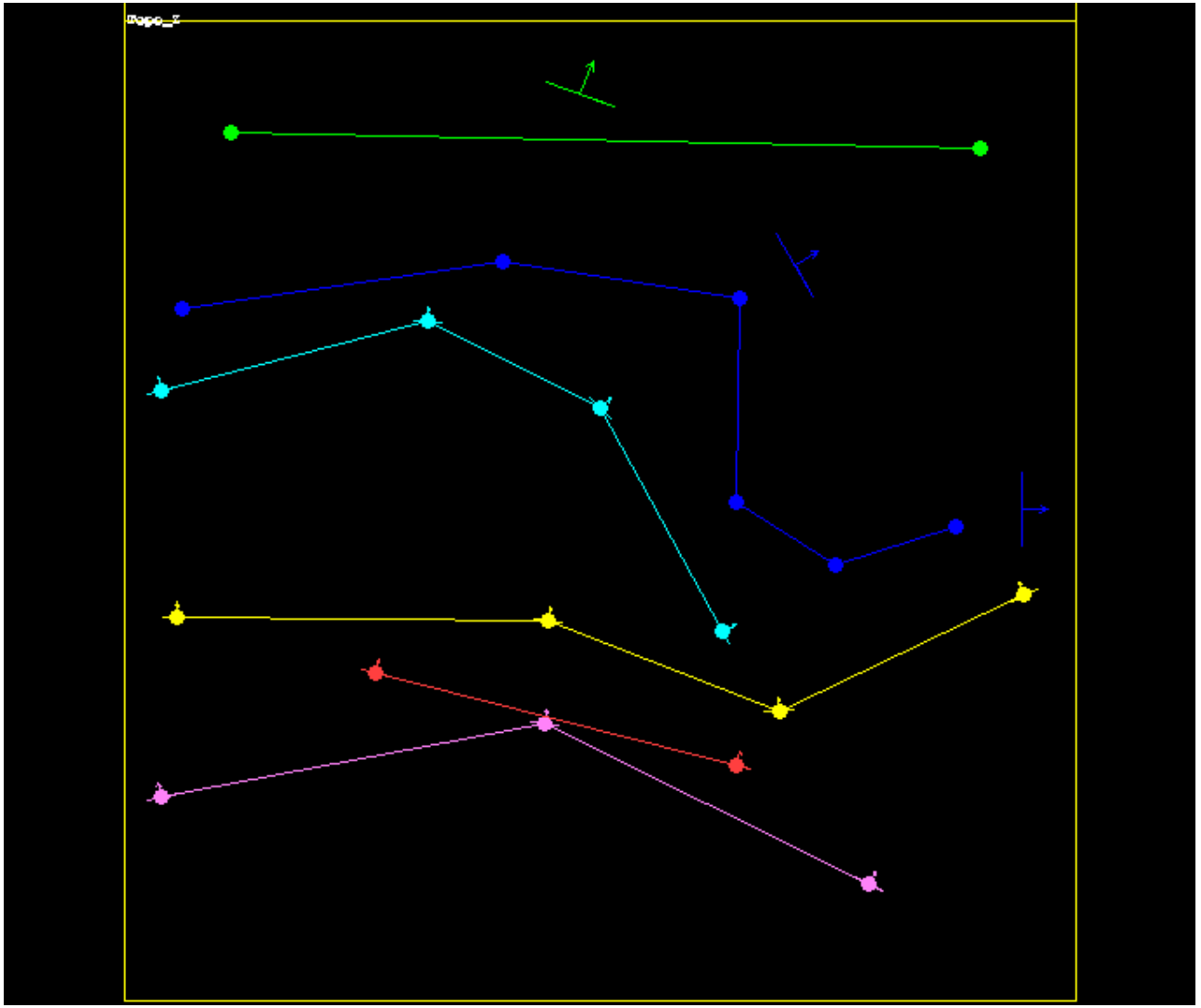
**… and relations between**

- **Geological contacts**
- **Contacts and faults**
- **Faults and faults**

# Geological Architecture helps for

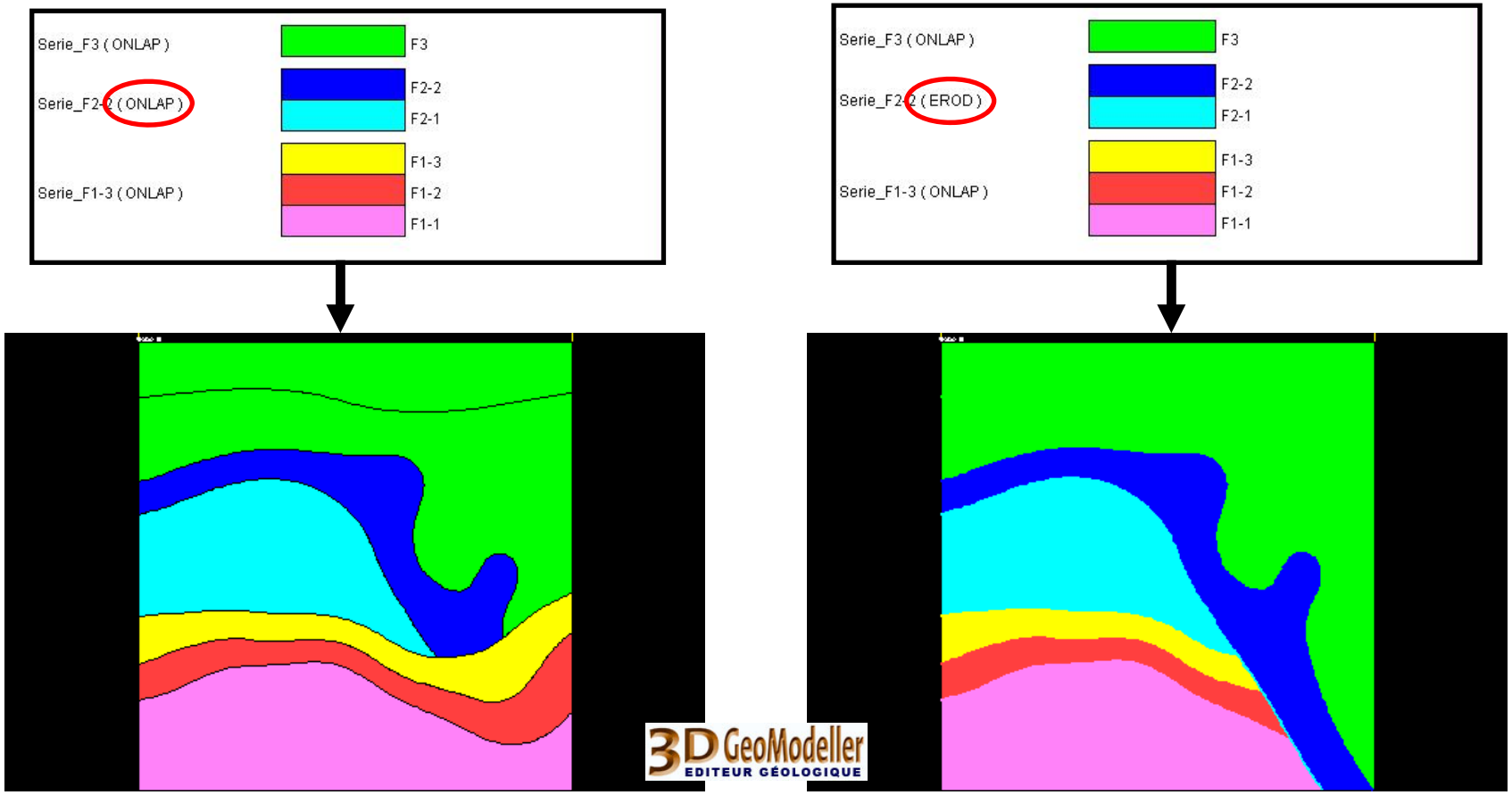
- **Building automatically a geological model**
  - GA manages the Interaction between geological events
- **Testing various geological interpretations**
  - By changing the Geological Architecture
- **Assembling surface coming from various software to build a 3D model coherent with the Geological Architecture**

# Example 1/2



> **Data**

# Example 2/2




Calcagno & al., 2008

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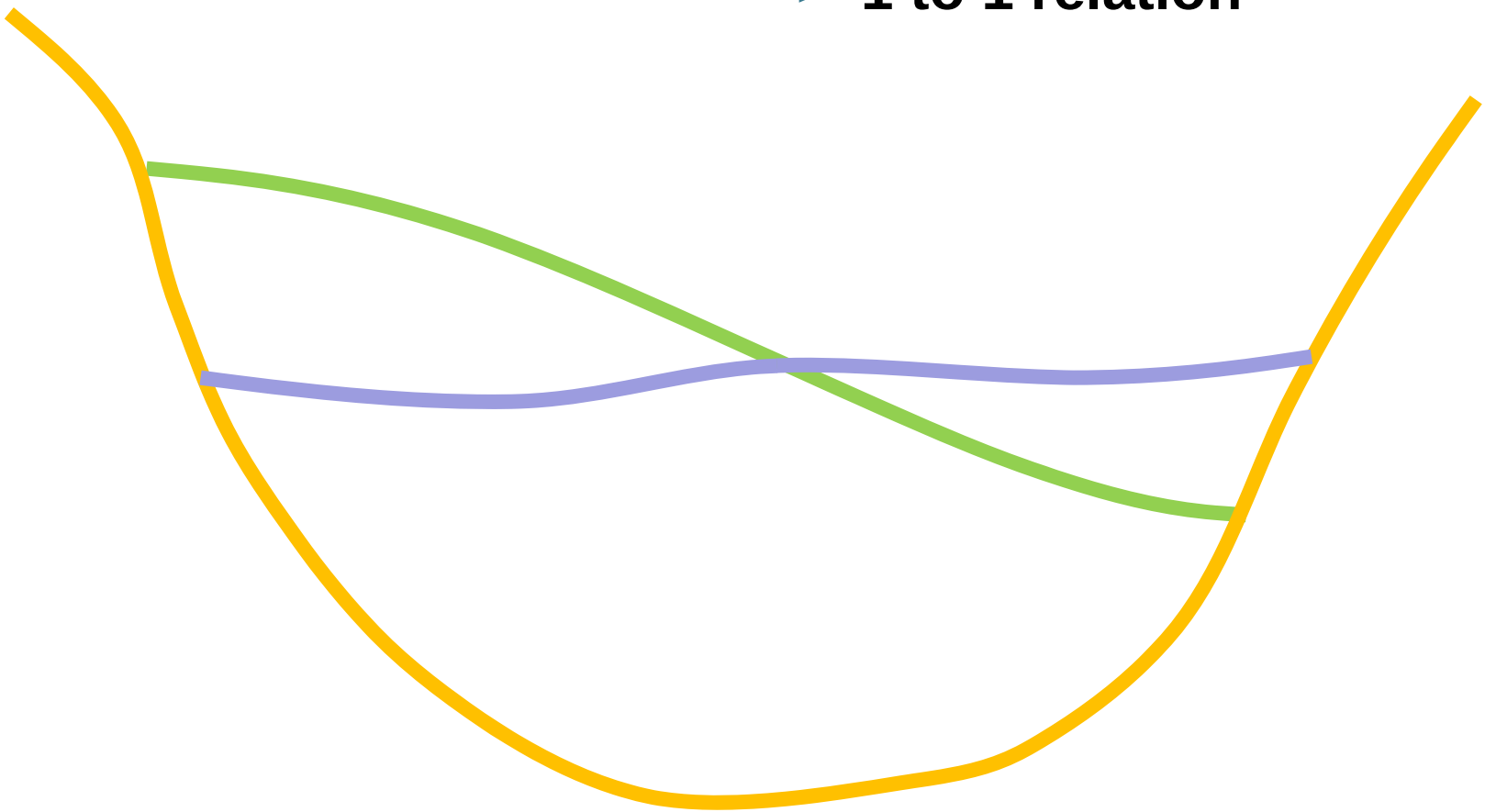
# Complex - but geological - relation #1

> **1 to 1 relation**



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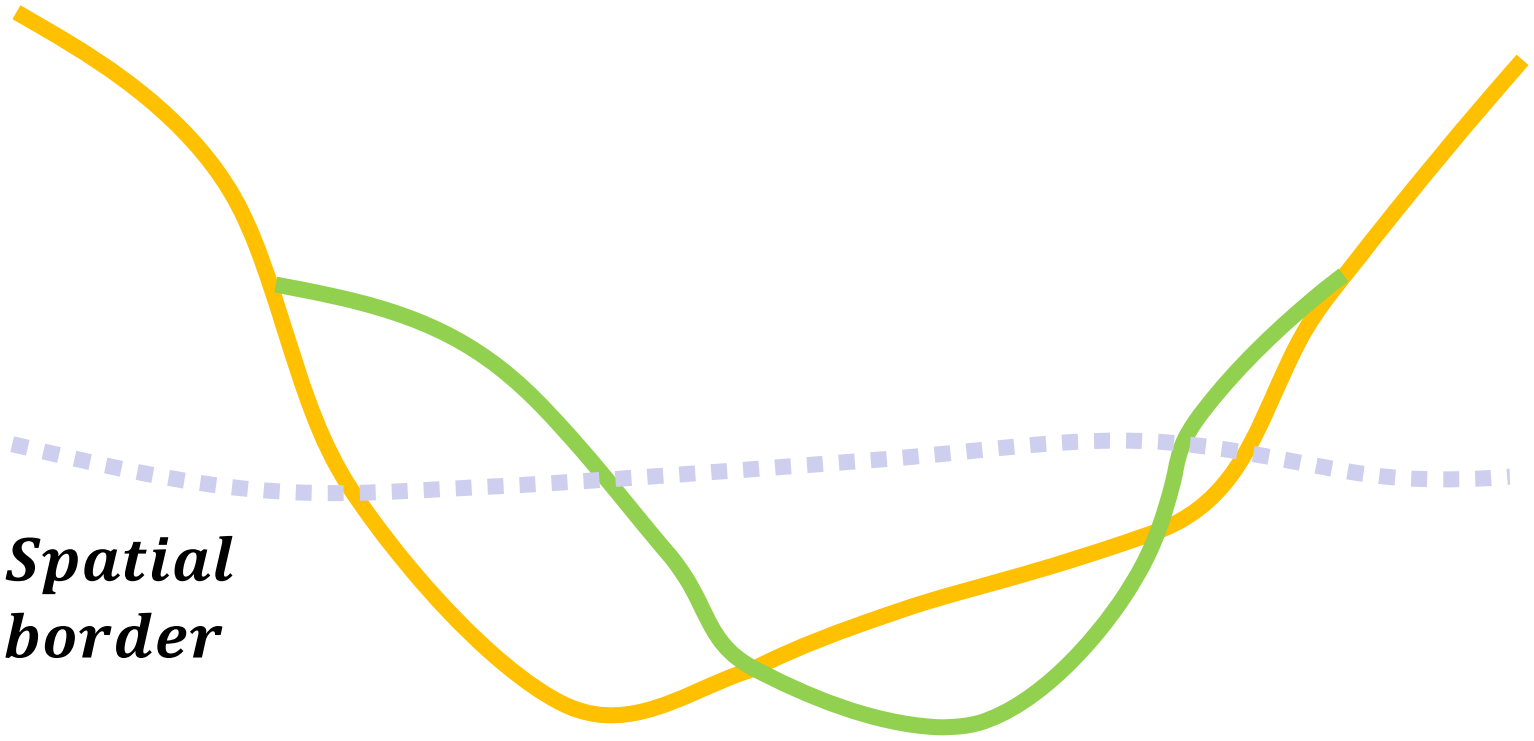
# Complex - but geological - relation #2

> **Spatial relation**



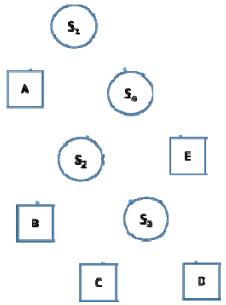
# Conclusion & perspectives 1/2

- **Standardizing the Geological Architecture would help to share it independently from any modelling packages**

- **Sharing the Geological Architecture along with the geological model provides a complementary knowledge**

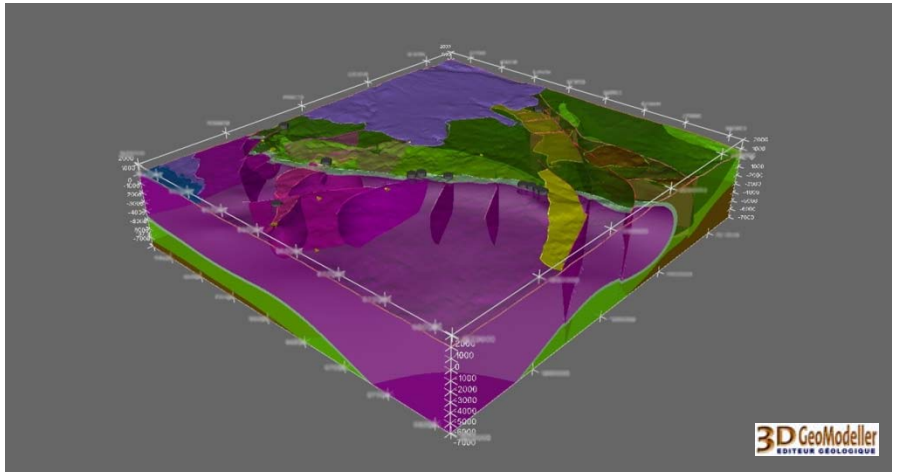
# Conclusion & perspectives 2/2

> **Sharing the Geological Architecture along with the data would be sufficient to construct or re-construct the geological model**




***Geological Architecture***

***Data***




***Geological Model***