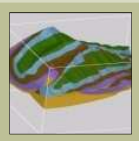
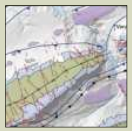
10th SWISS GEOSCIENCE MEETING 2012 BERN

# 3D Modelling and Visualisation of the Structures within the Préalpine Nappe Stack

UNIVERSITAS FRIBURGENSIS

FACULTY OF SCIENCE
BIOLOGY
CHEMISTRY
GEOSCIENCES
INFORMATICS
MATHEMATICS
MEDICINE
PHYSICS

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19 November 2013

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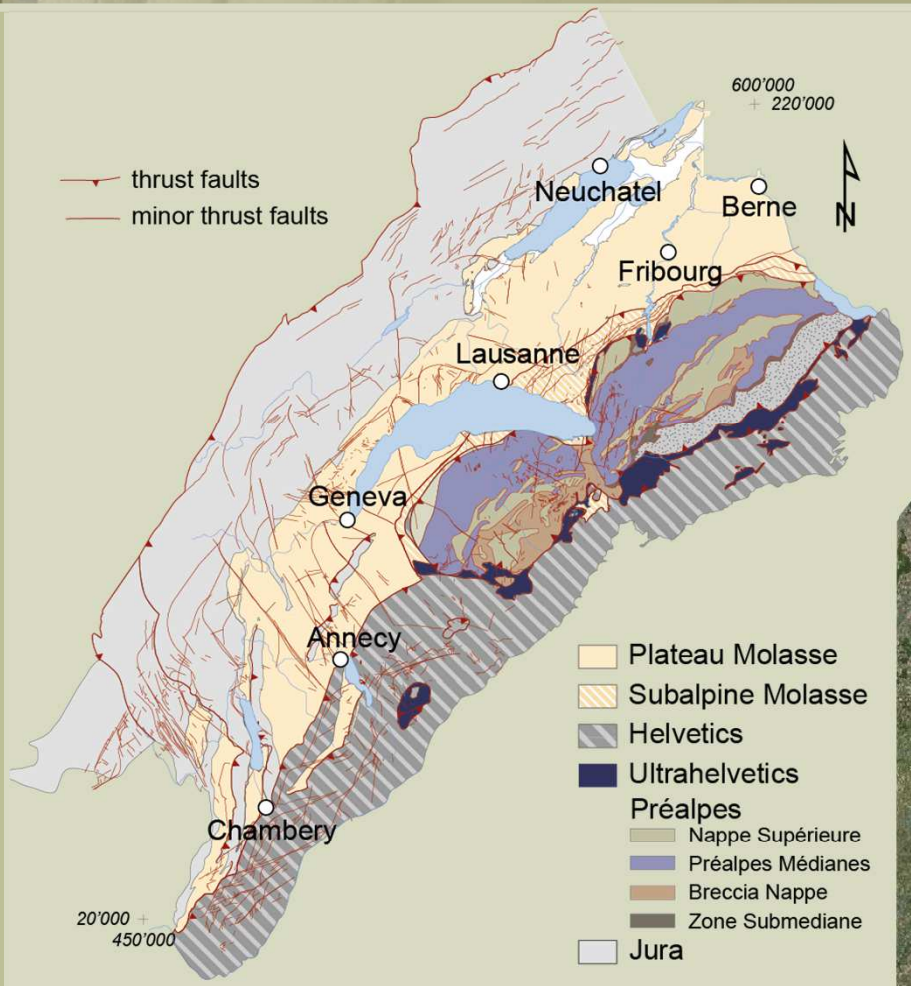
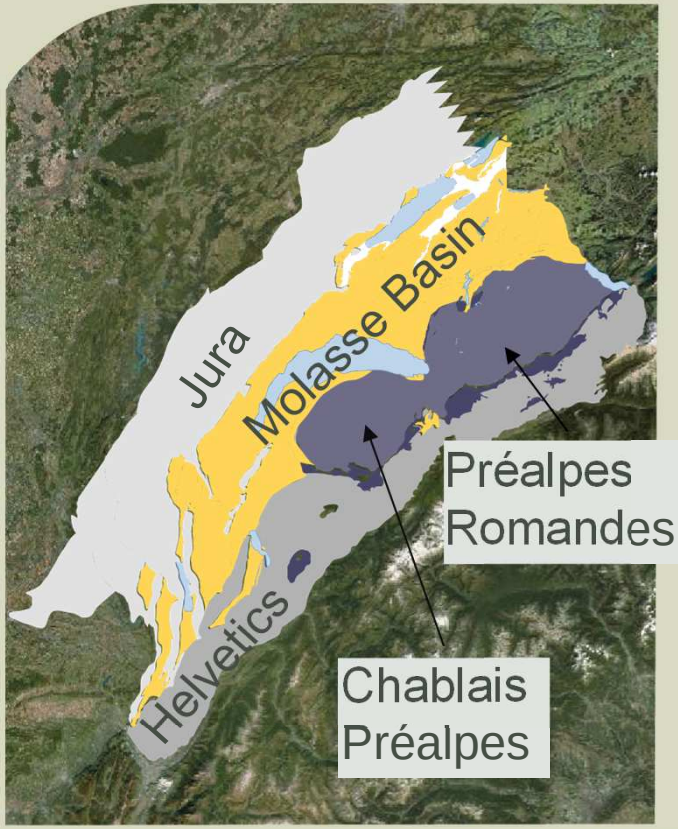
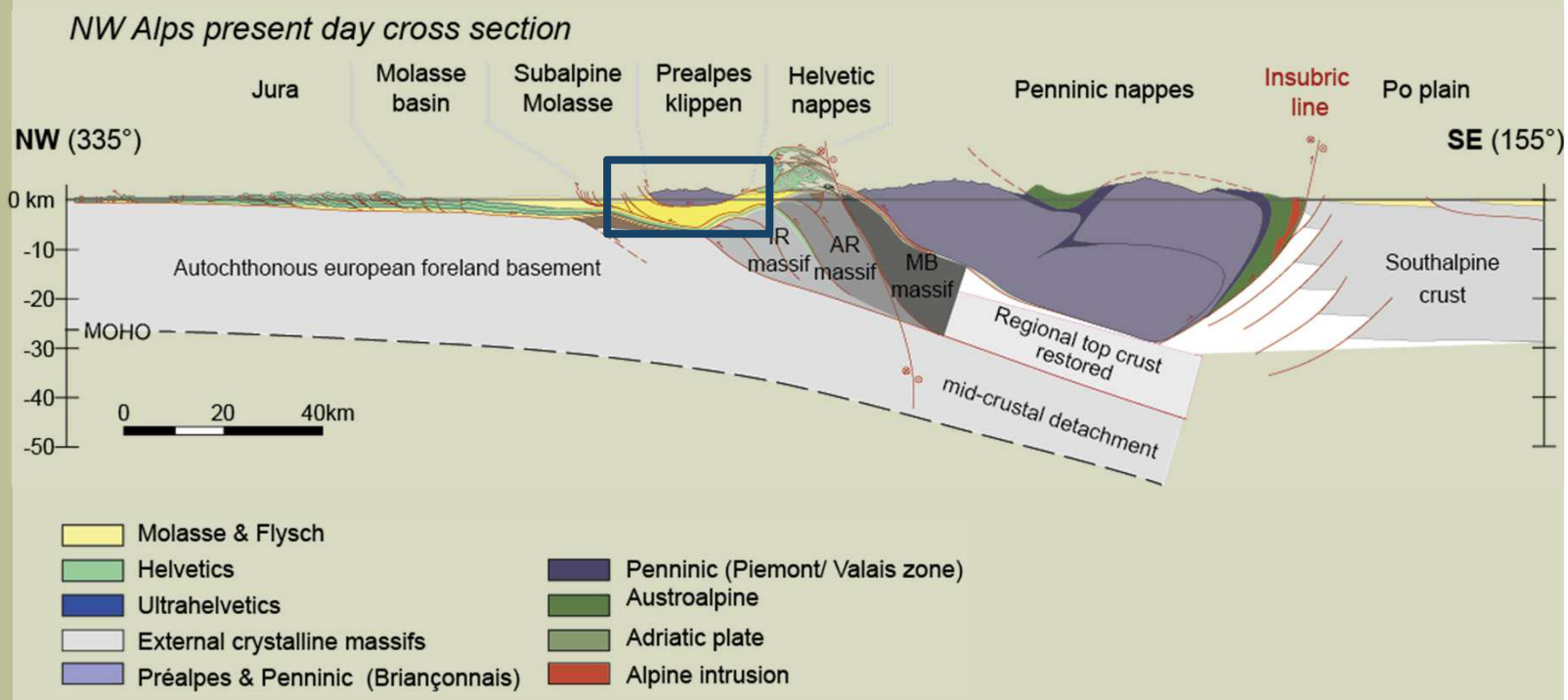
# localisation of the Préalpes

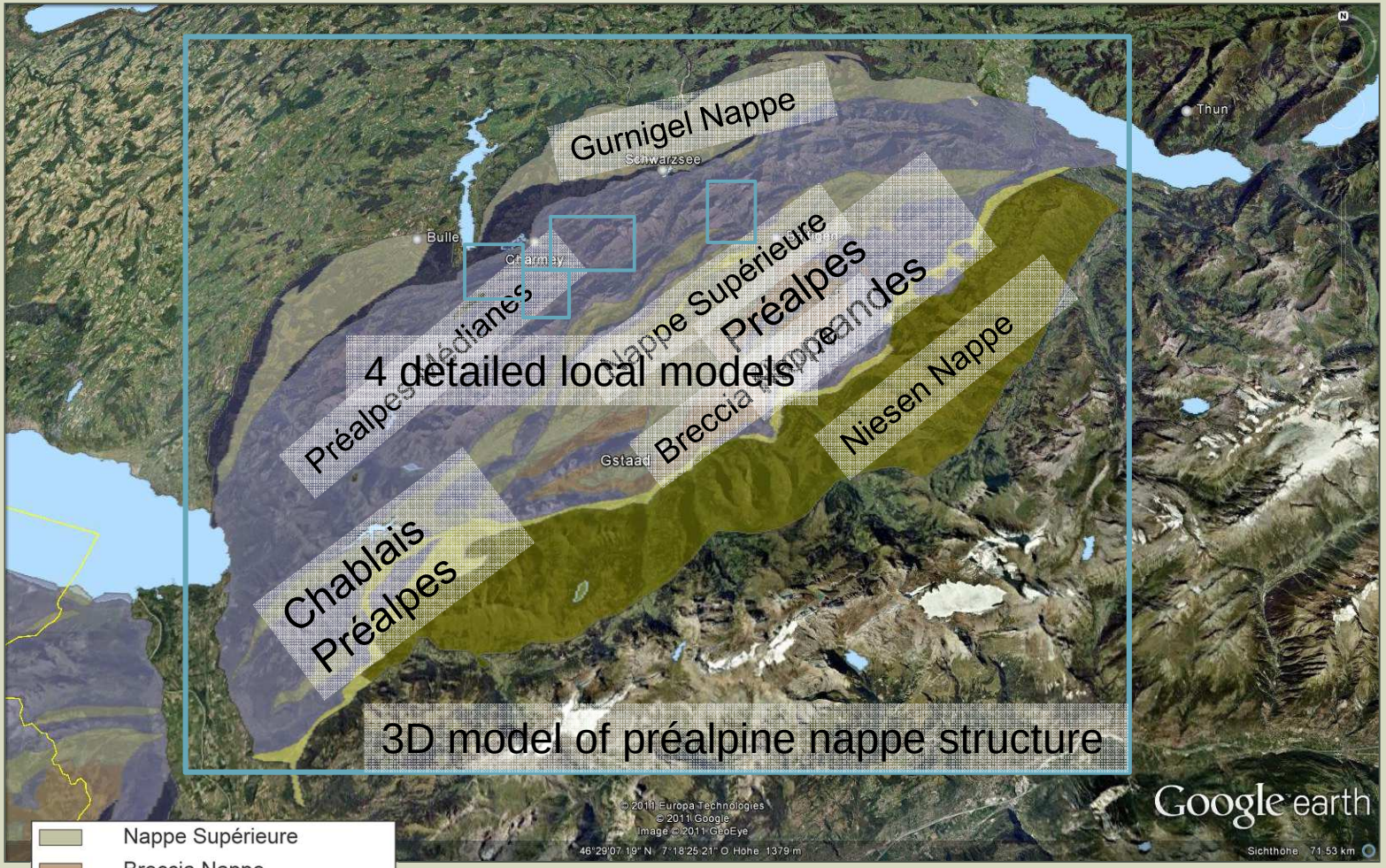






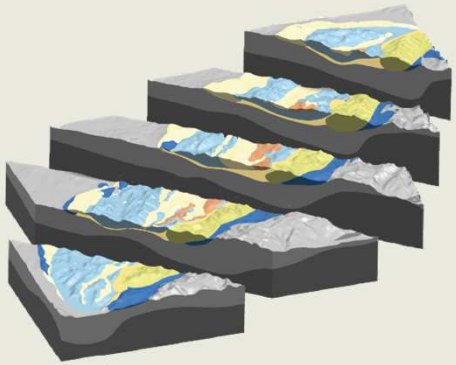

*modified after Schlunegger and Mosar, 2010*



**overview of the structural history of the Préalpes Klippen**

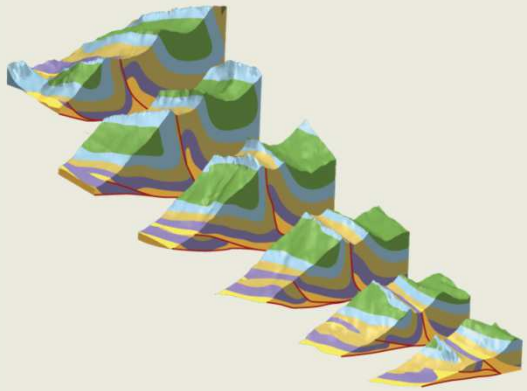
different approaches:
- field analyses
- paleostress analyses
- 3D modelling

## one 3D model of regional structures



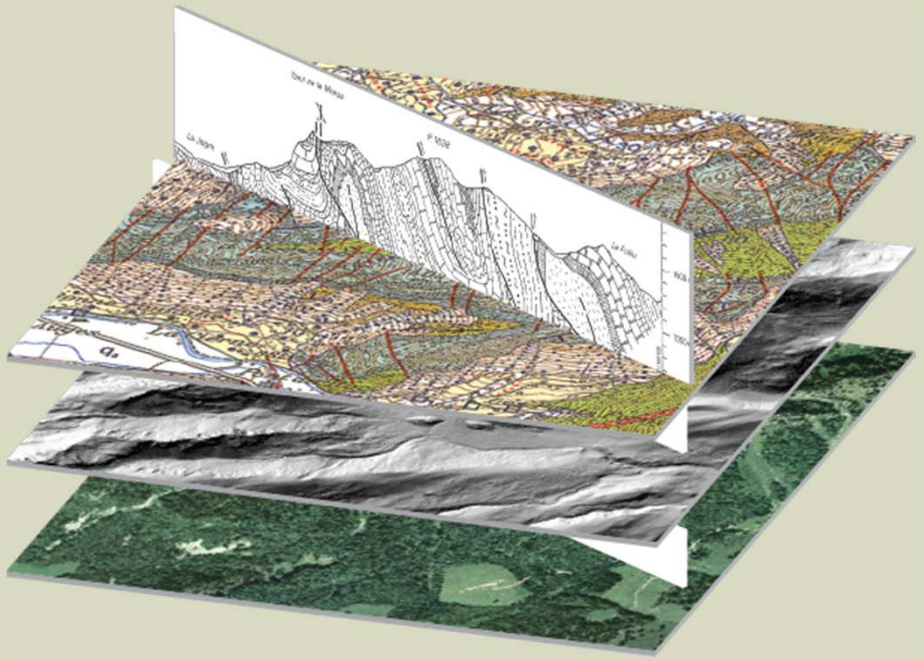
overview over the préalpine nappe structure

## four 3D models of local structures



visualisation of the structures in areas of major structural interest

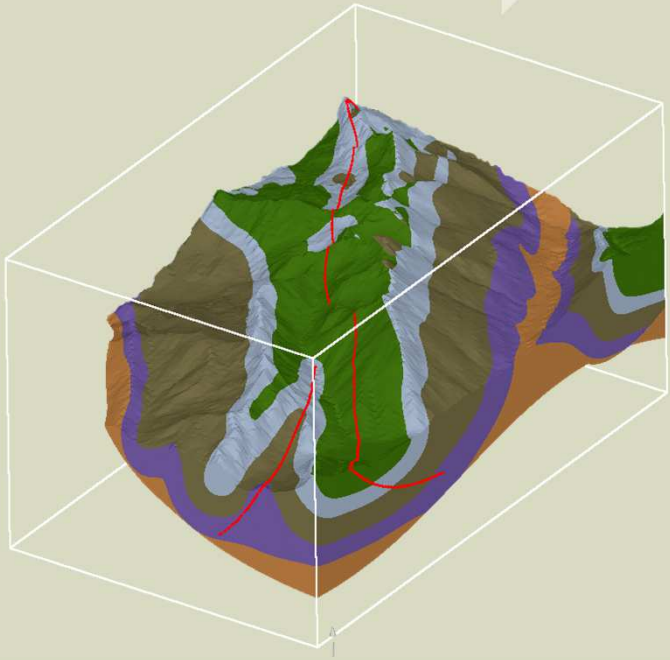
data collection | 3D modelling | data processing | visualisation | final 3D model

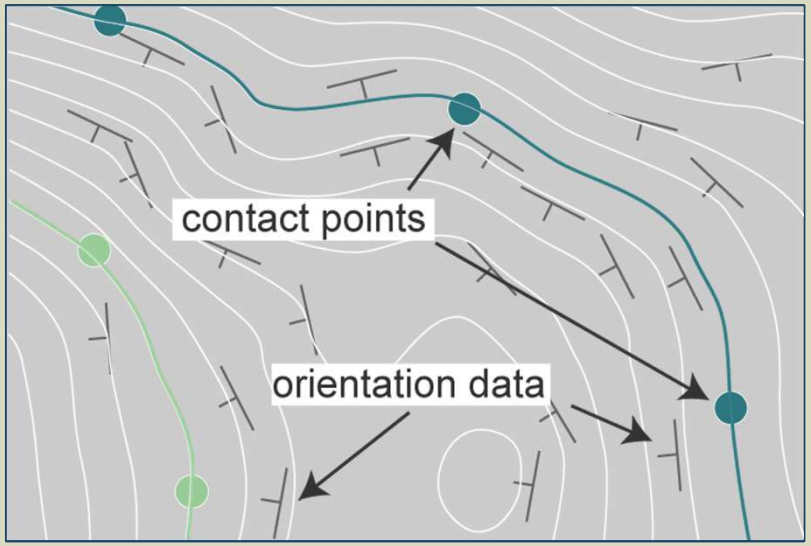


## Data collection

- geological maps
- cross-sections
- DTMs
- field measurements
- boreholes
- seismic lines
- contour lines
- geologist's interpretation

data collection | 3D modelling | data processing | visualisation | final 3D model



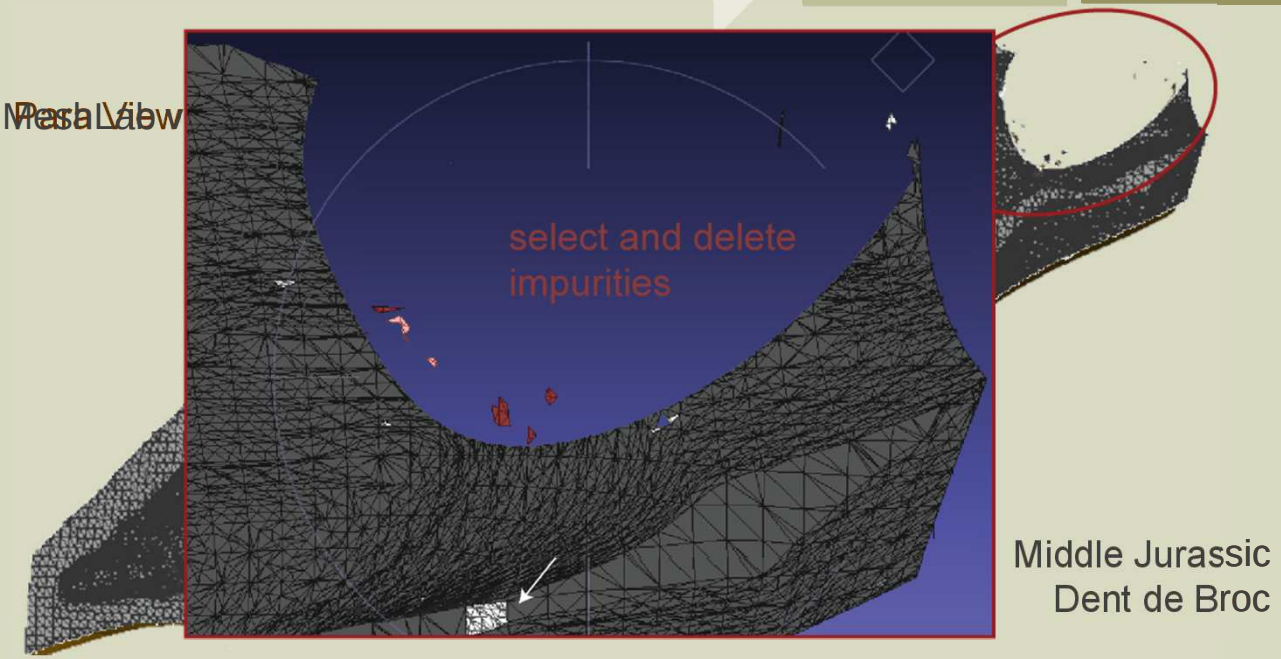



## 3D modelling

3D GeoModeller EDITEUR GÉOLOGIQUE

- fast and easy handling program
- focus on geological data
- potential field method
- resolution of 3D models: regional model 200m/ local models 30m
- amount of triangular shapes: regional model 4M/ local models 1.5 - 5.5M

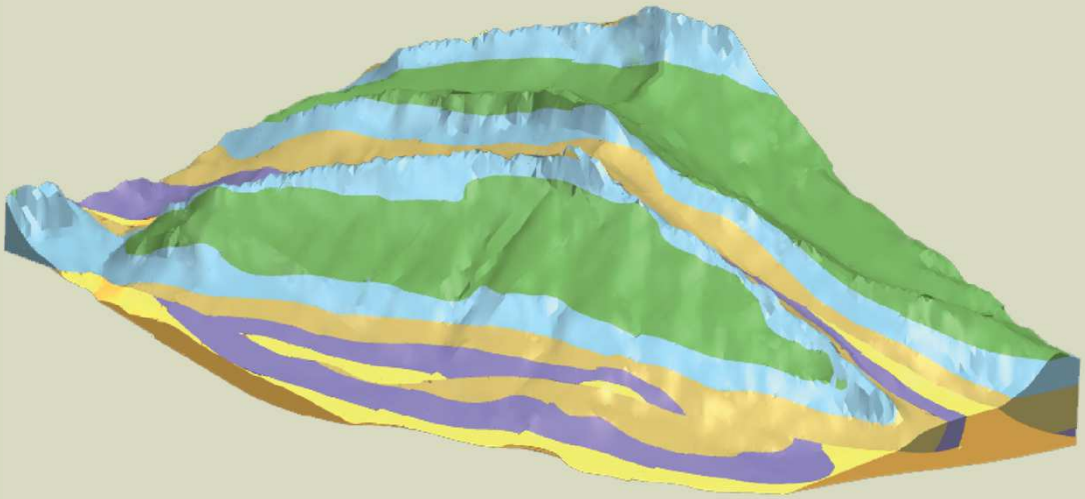
data collection | 3D modelling | data processing | visualisation | final 3D model




## Data processing

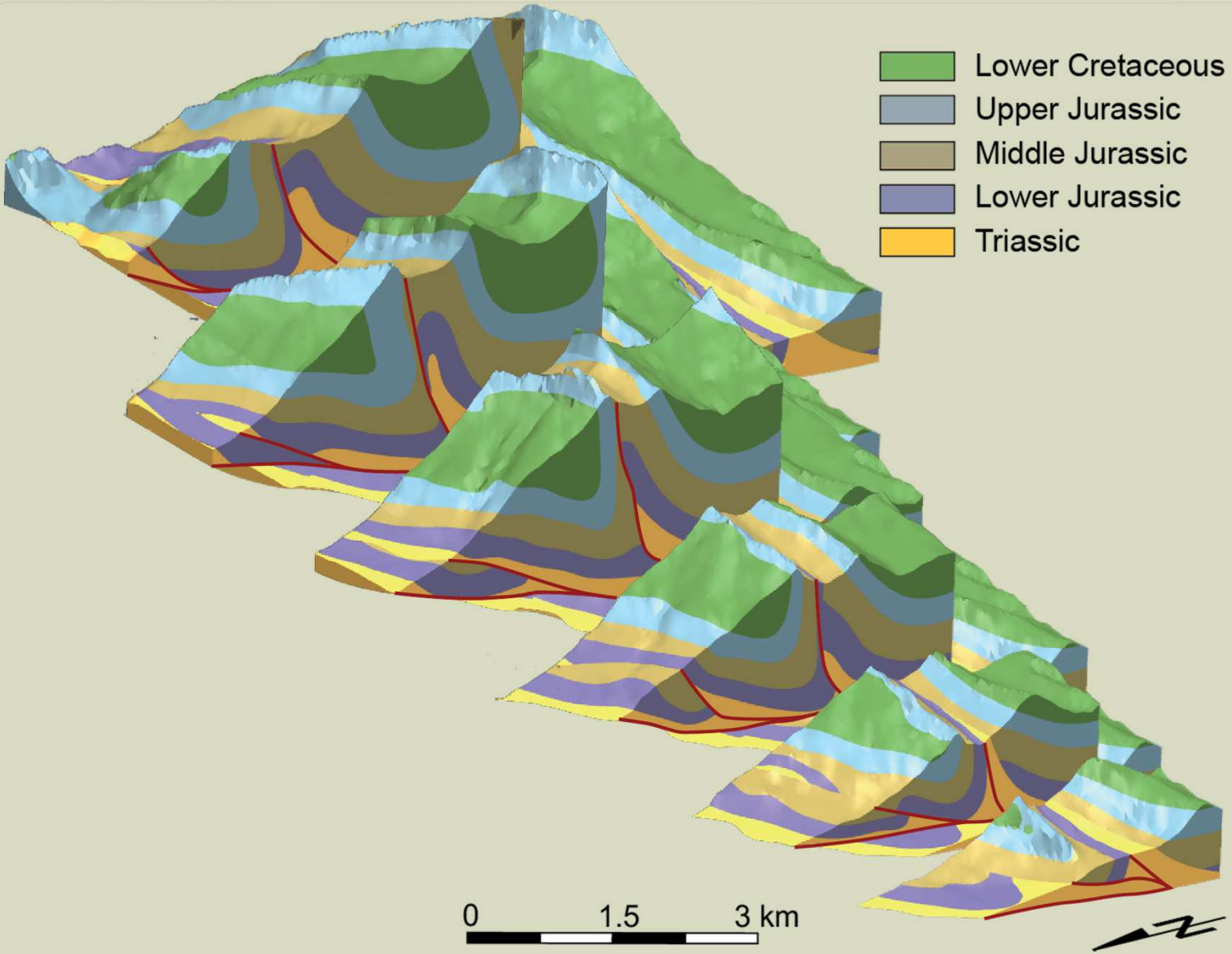
- export 3D model as TSurf file format (*.ts)
- Mirarco Para ViewGeo 1.4.14
  - viewer of the 3D model / converting to .vrml/.wrl file format
- MeshLab v1.3.0 erasing impurities impurities of the model

data collection | 3D modelling | data processing | visualisation | final 3D model



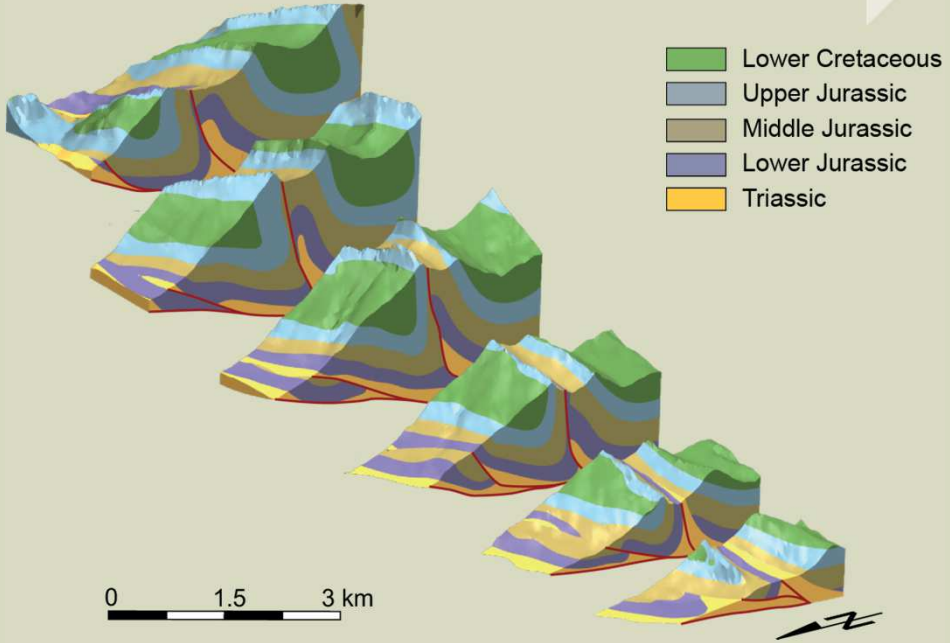
## Visualisation

- final visualisation of the 3D model with a powerful CAD software, normally used for engineering purposes (NX7.5)
- sophisticated visualisation tools allowing smoothing of the triangular mesh, dynamic cross-sections, exploded views and fly-through views
- 3D pdfs created in Adobe Acrobat 9 Pro Extended/ Tetra4 Plug-in for Adobe Acrobat X Pro



# 3D model of the Dent de Broc area

data collection | 3D modelling | data processing | visualisation | final 3D model

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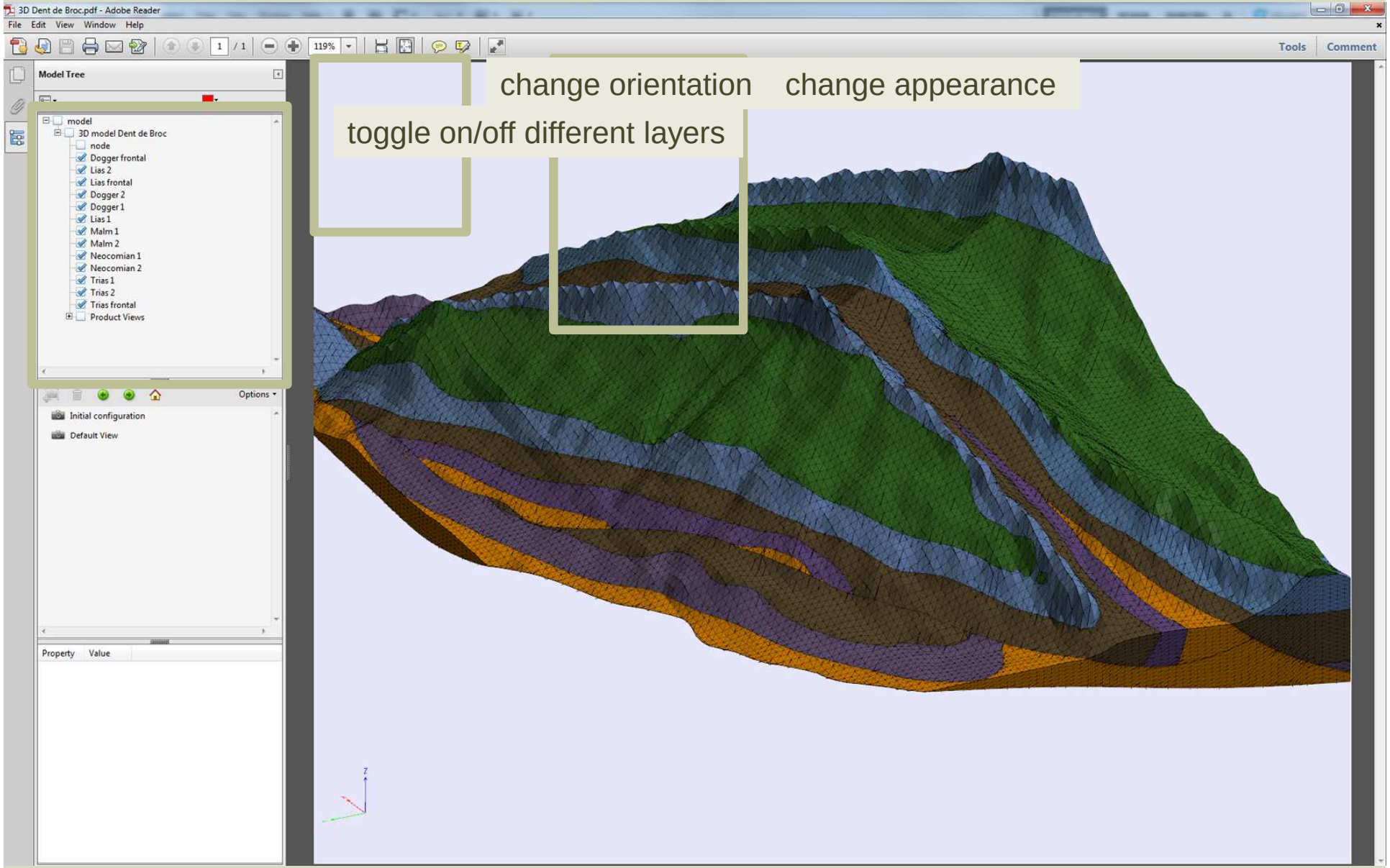
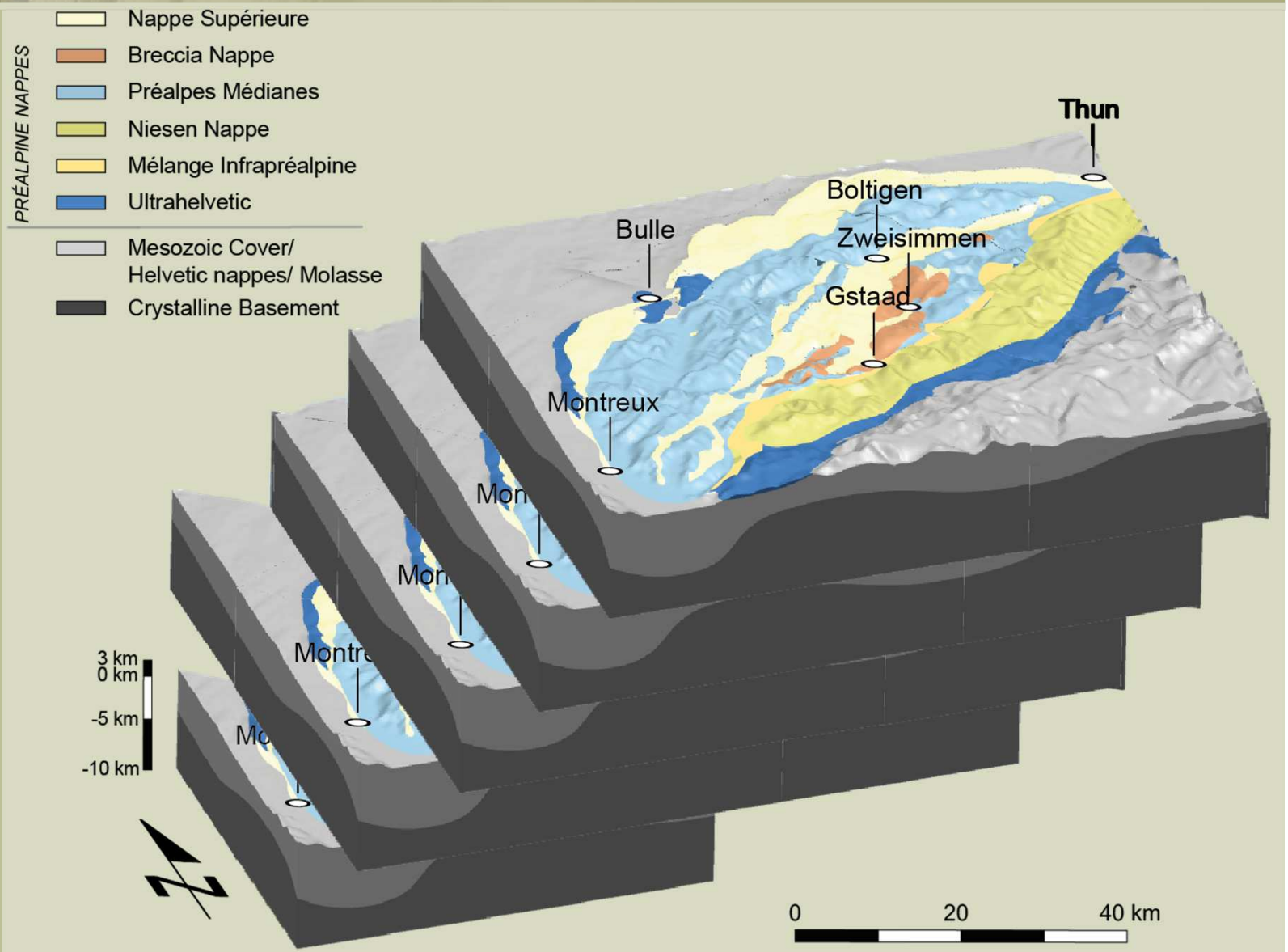

3D Dent de Broc.pdf - Adobe Reader
File Edit View Window Help
Tools Comment
Model Tree
model
3D model Dent de Broc
node
Dogger frontal
Lias 2
Lias frontal
Dogger 2
Dogger 1
Lias 1
Malm 1
Malm 2
Neocomian 1
Neocomian 2
Trias 1
Trias 2
Trias frontal
Product Views
Options
Initial configuration
Default View
Property
Value
change orientation
change appearance
toggle on/off different layers

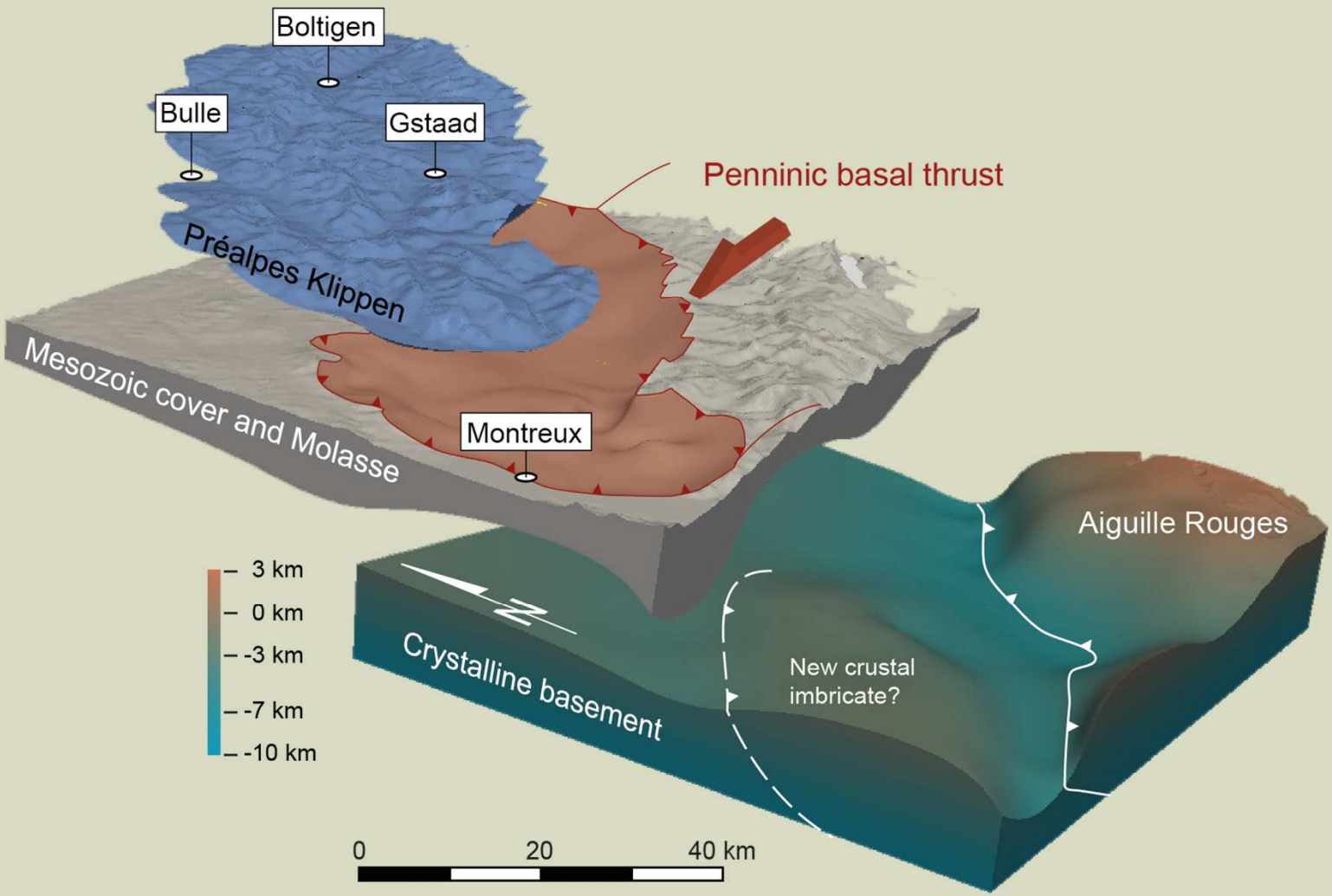
# 3D model of the préalpine nappes





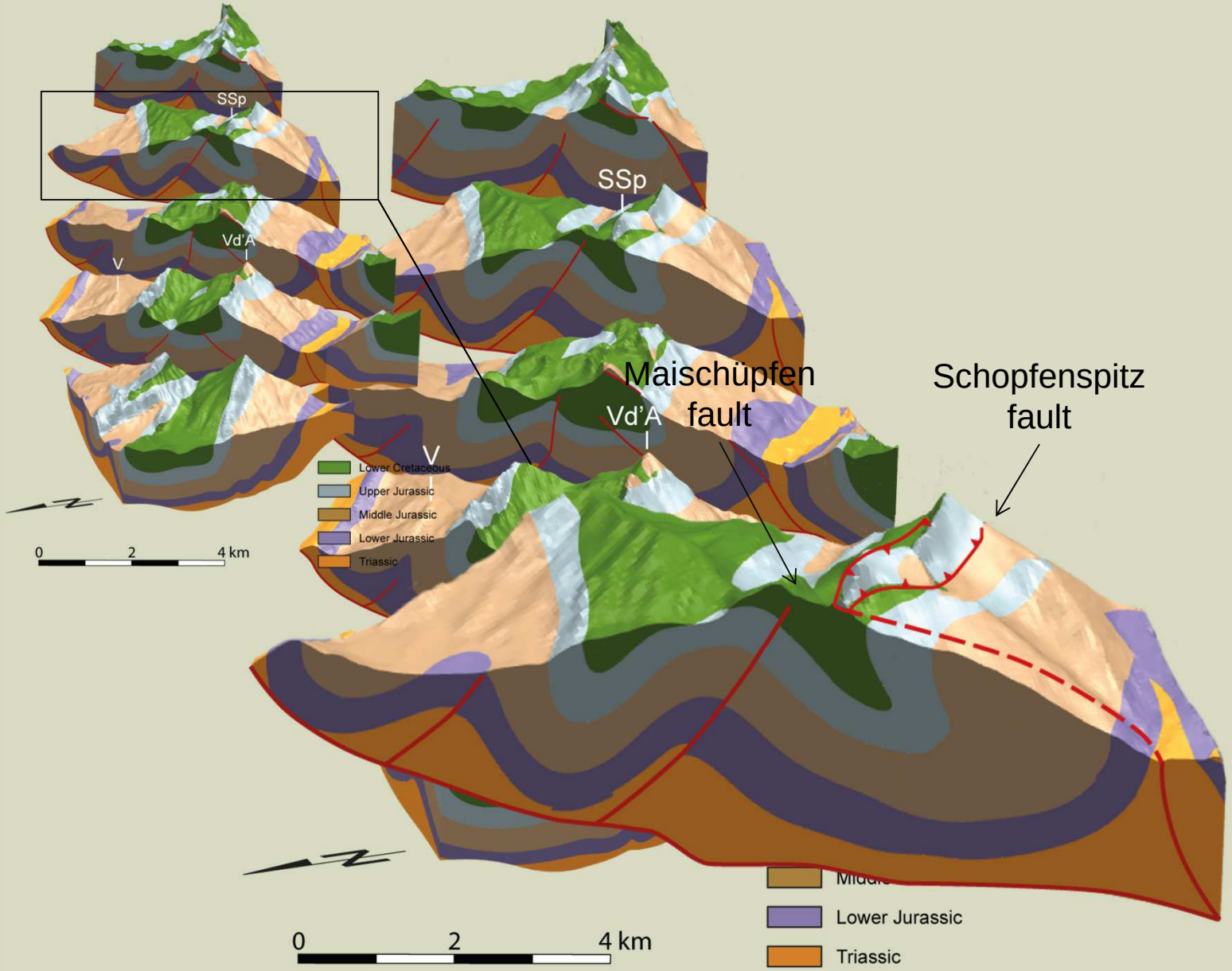
# 3D model of the préalpine nappes





# 3D model of the Schopfenspitz area





different methods to achieve the final visualisation: combination and flexibility

importance of visualisation for a better communication of the resulting 3D model

provide an easy access to examine the 3D model via 3D-pdf or 3D viewer

attractive and easy understandable graphics are useful for professional and didactical purposes

Thank you for your attention