Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Office of Topography swisstopo
Geological data

wissen wohin
savoir où
sapere dove
knowing where

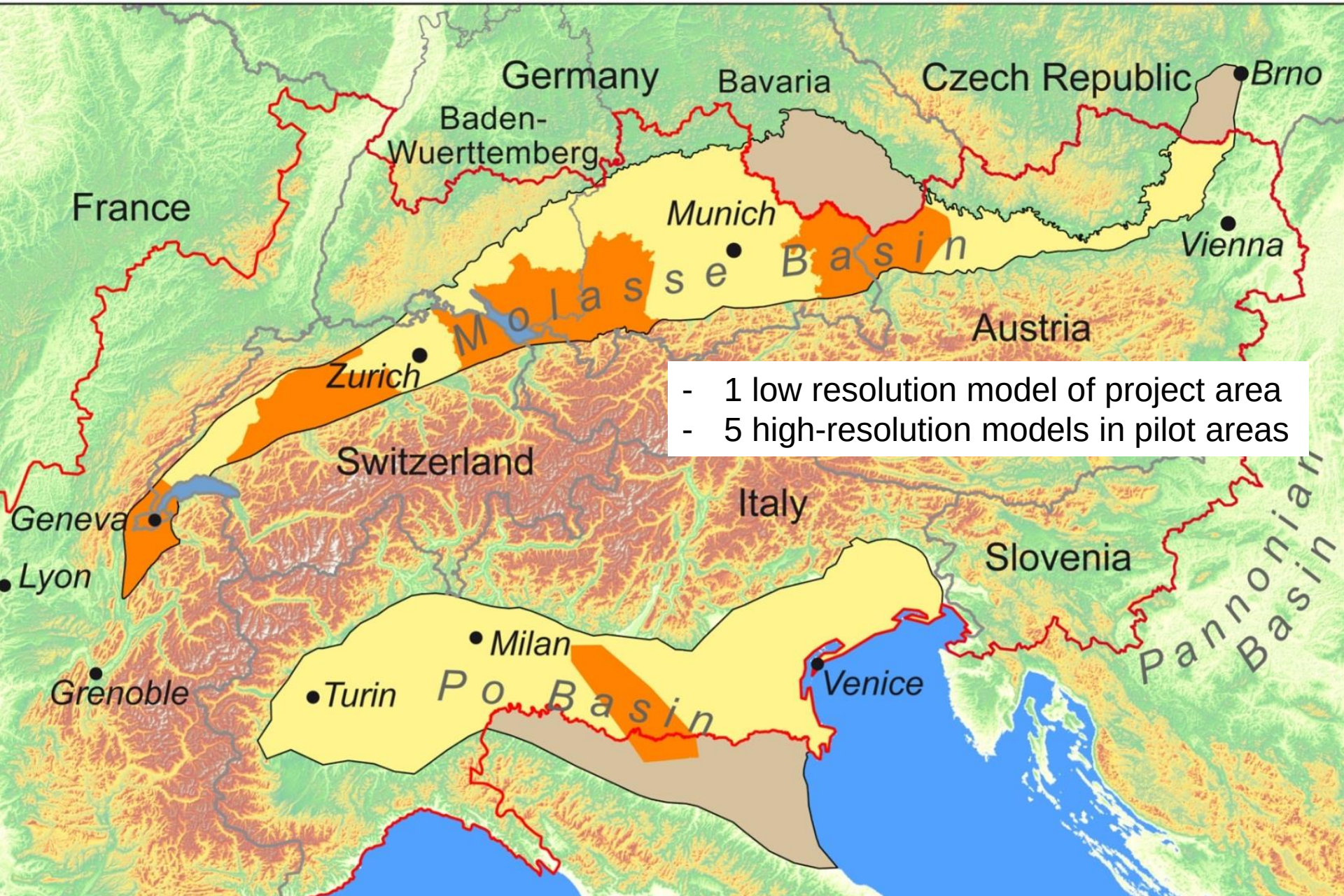
swisstopo

Collaborative 3D geological modelling – A review from Switzerland

3rd European meeting on 3D geological modelling

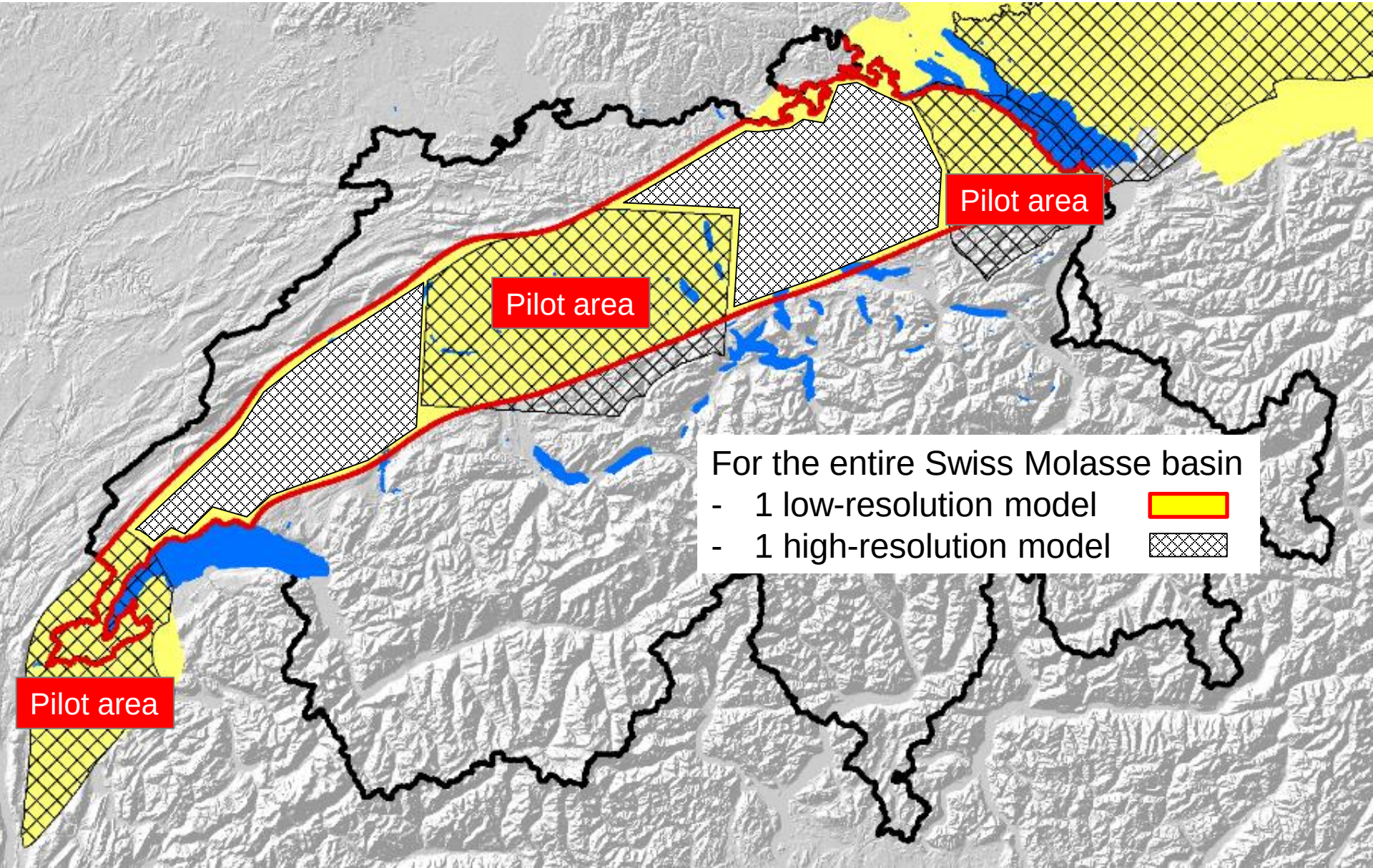
June, 16th 2016 – Robin Allenbach, Roland Baumberger

From the European GeoMol project …



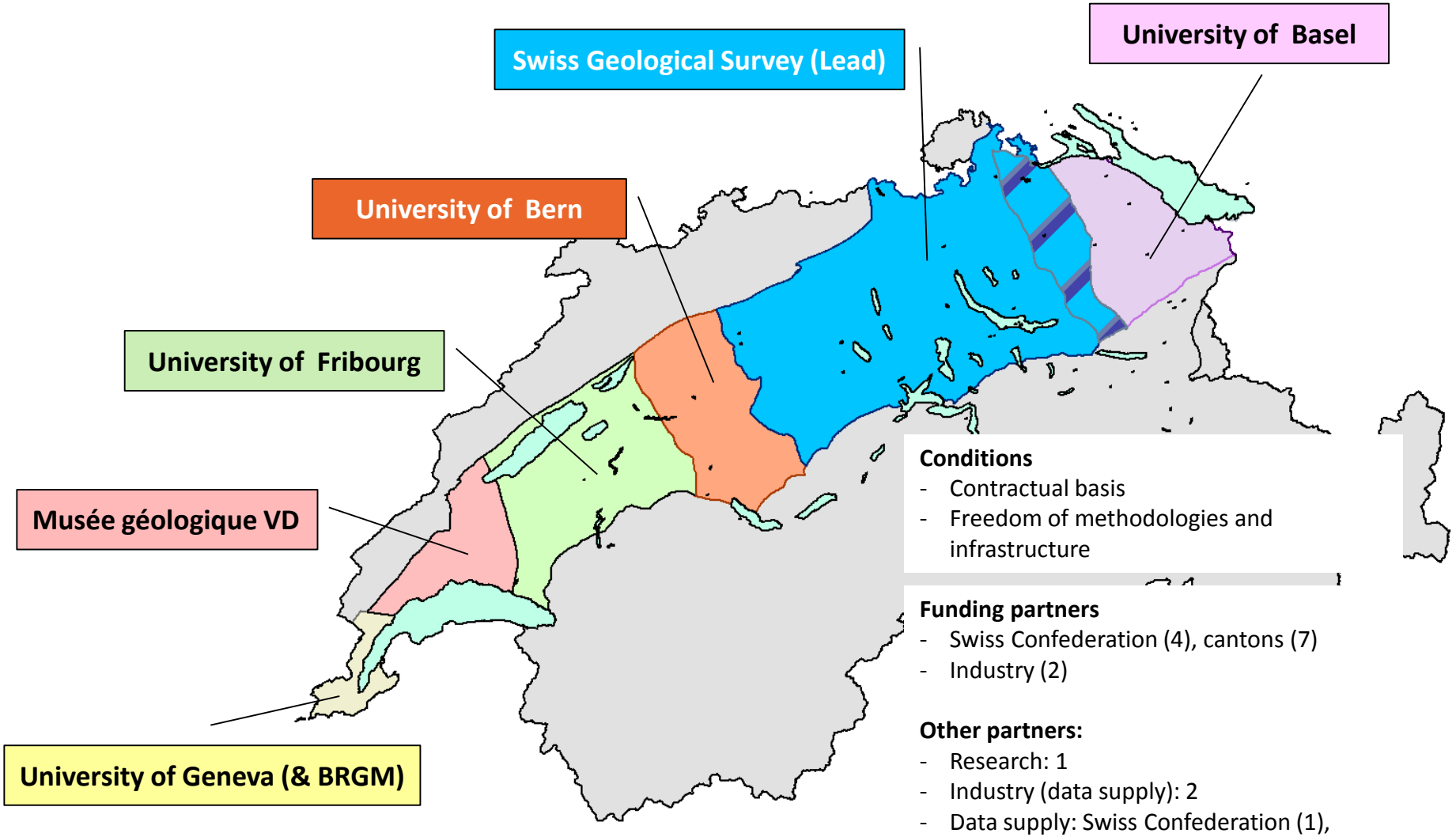
- 1 low resolution model of project area
- 5 high-resolution models in pilot areas

… to the Swiss GeoMol project




The German Plan
Radical, efficient, unstoppable… (ball's speed may reach 297 km/h)

Collaboration framework



Conditions
- Contractual basis
- Freedom of methodologies and infrastructure

Funding partners
- Swiss Confederation (4), cantons (7)
- Industry (2)

Other partners:
- Research: 1
- Industry (data supply): 2
- Data supply: Swiss Confederation (1), cantons (9), Swiss Federal Railways

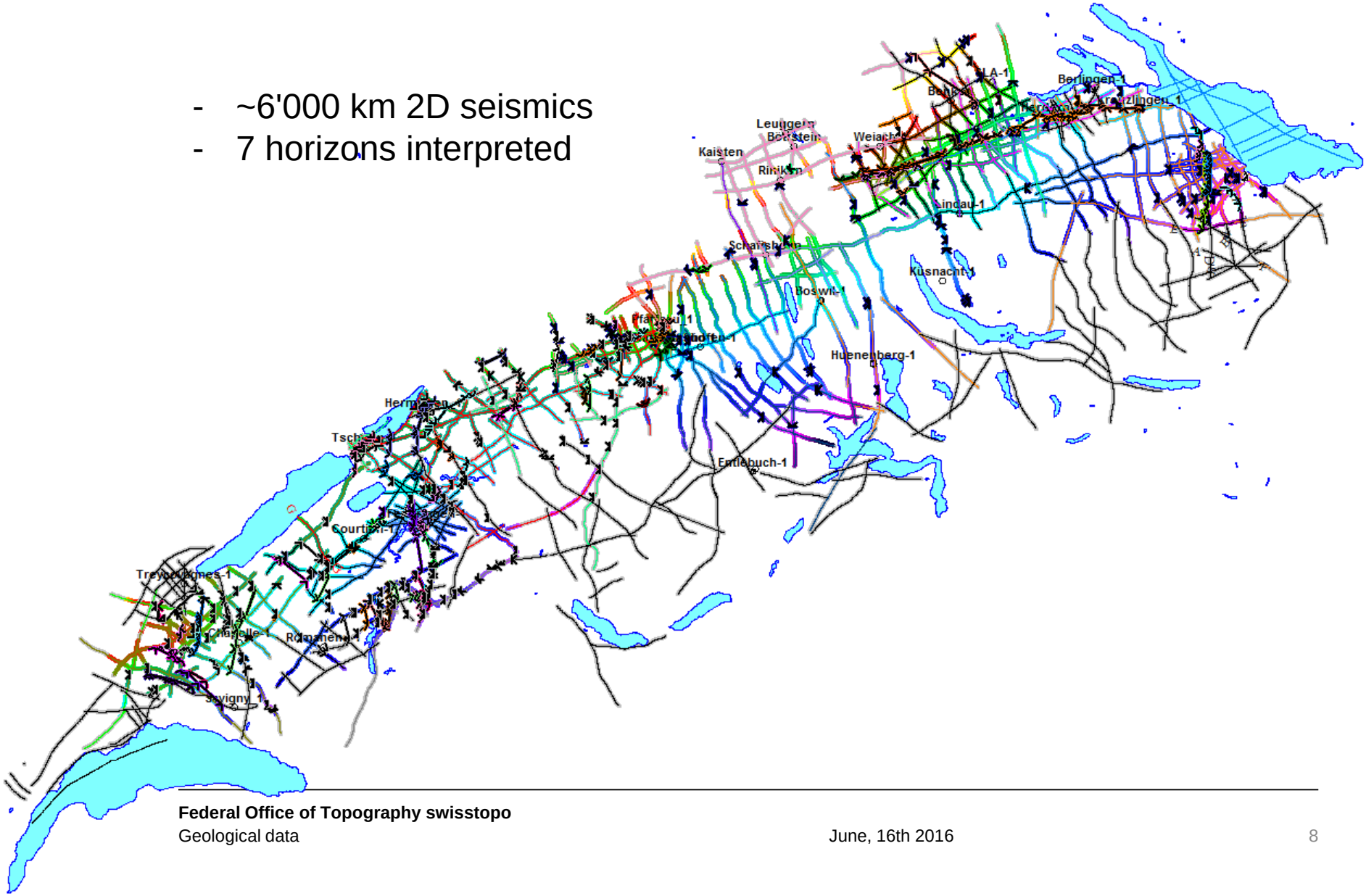
The Brasilian Plan

… no comments!

Standardized equipment

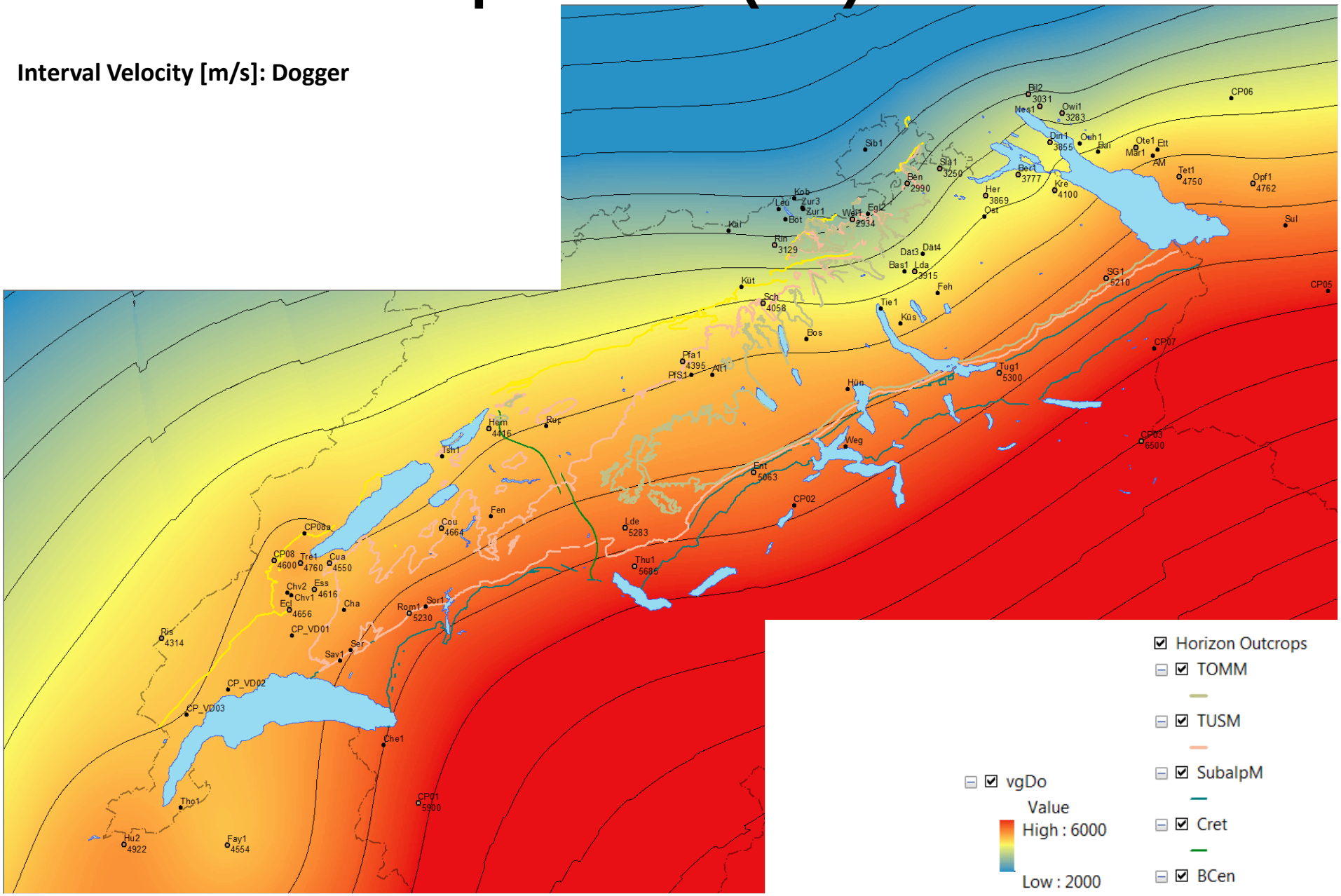
Data sets provided (1/5): Seismics

- ~6'000 km 2D seismics
- 7 horizons interpreted

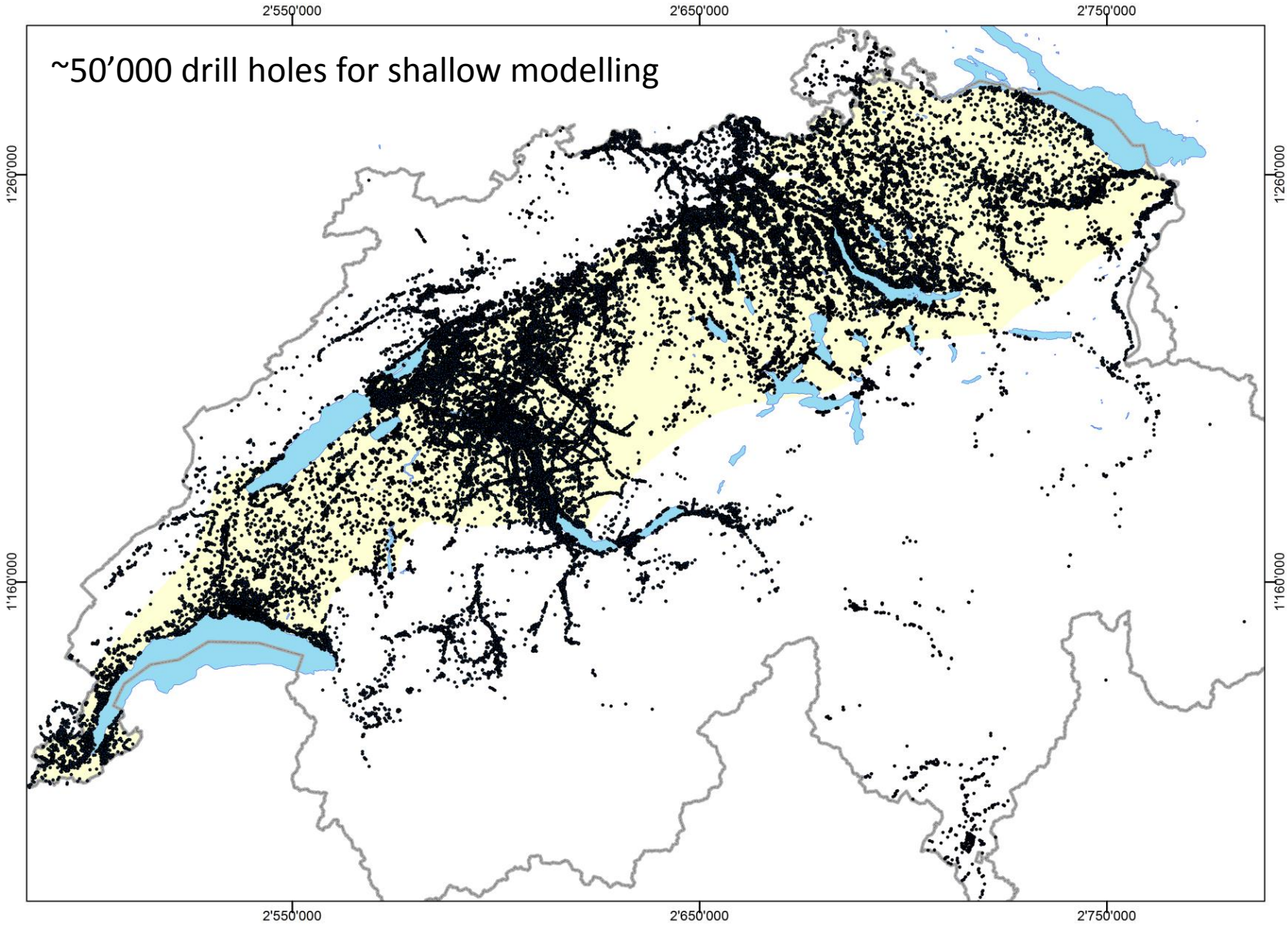


Data sets provided (2/5): vint

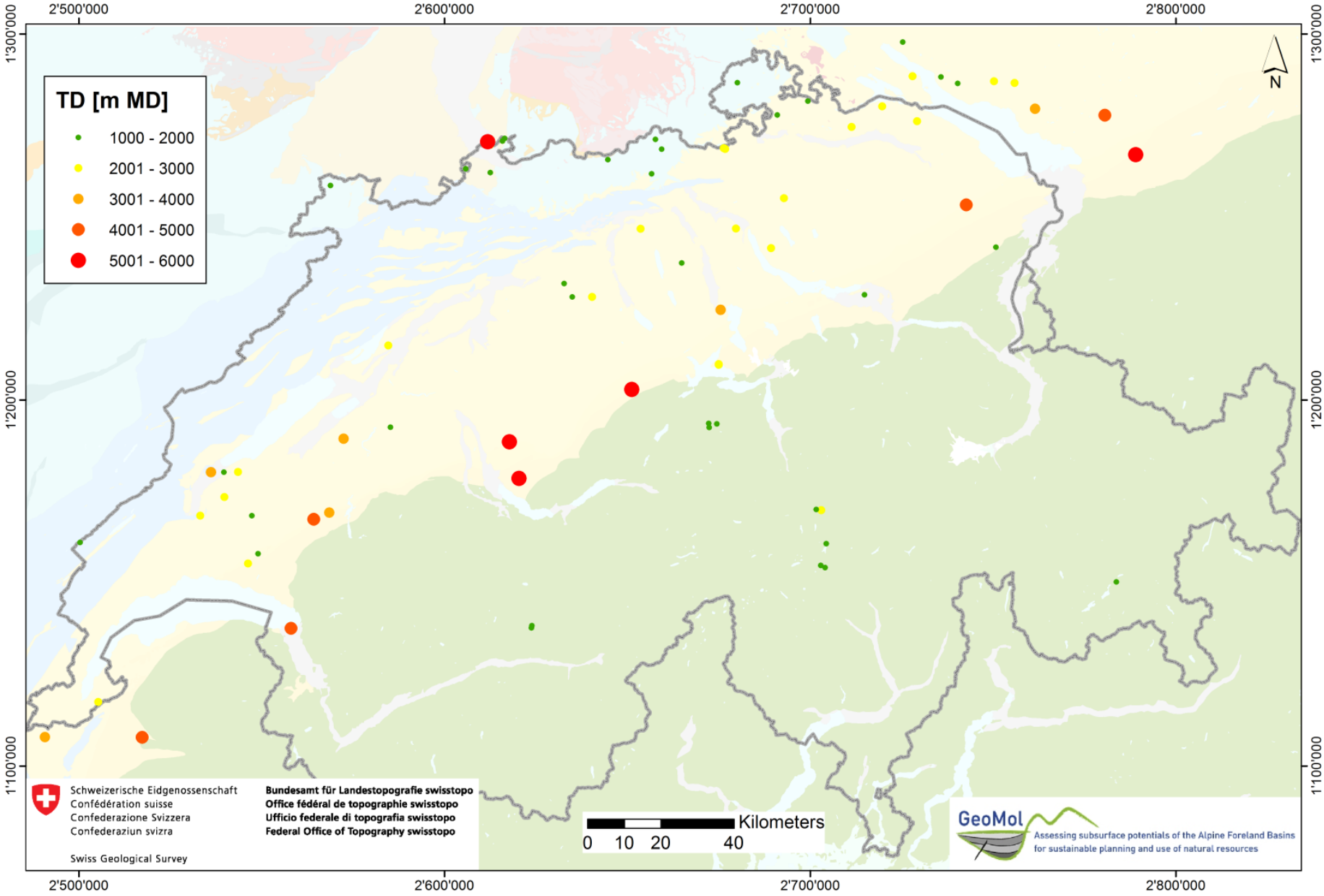
Interval Velocity [m/s]: Dogger



Data sets provided (3/5): Drill holes



Data sets provided (4/5): Wells

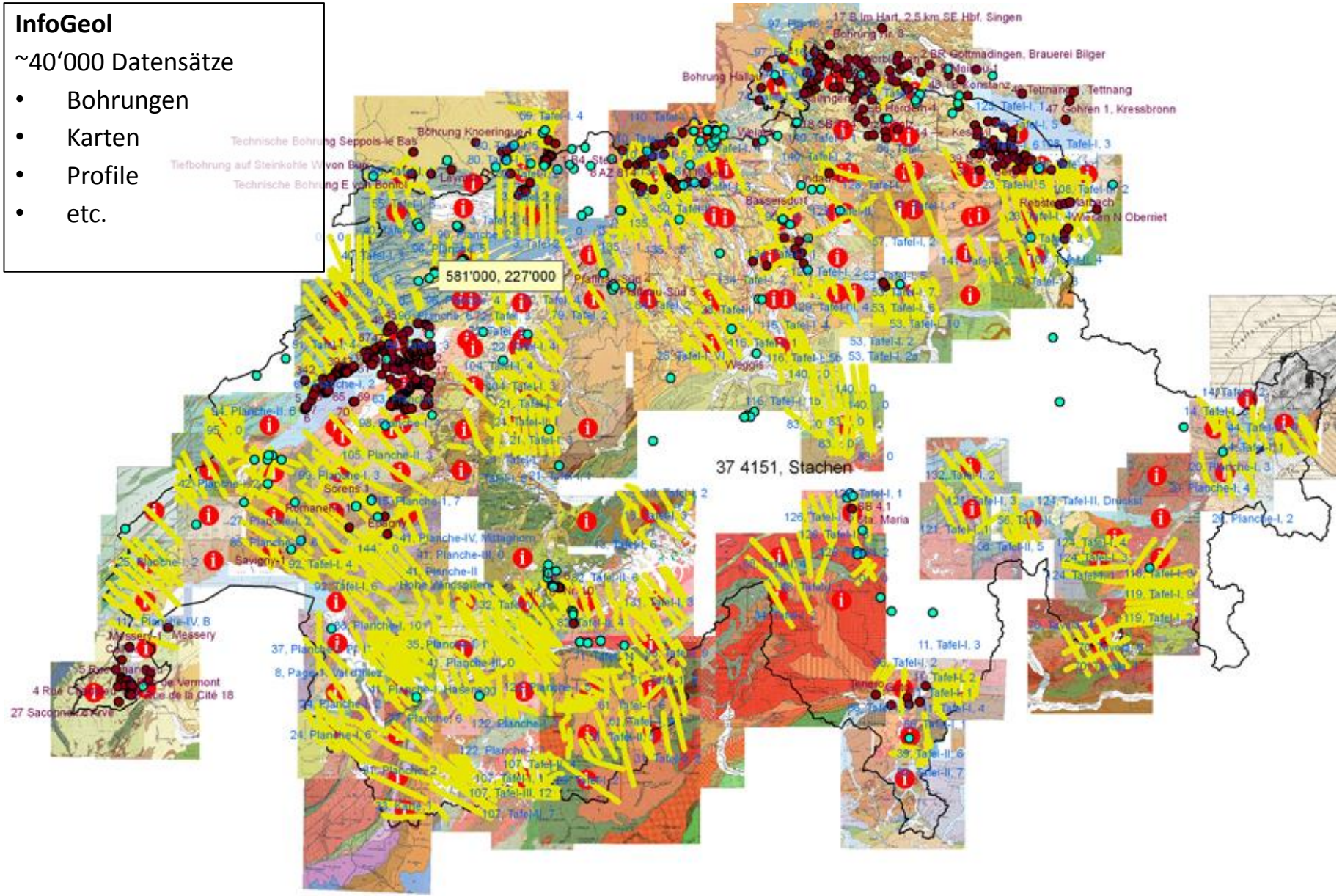


Data sets provided (5/5): Misc. data

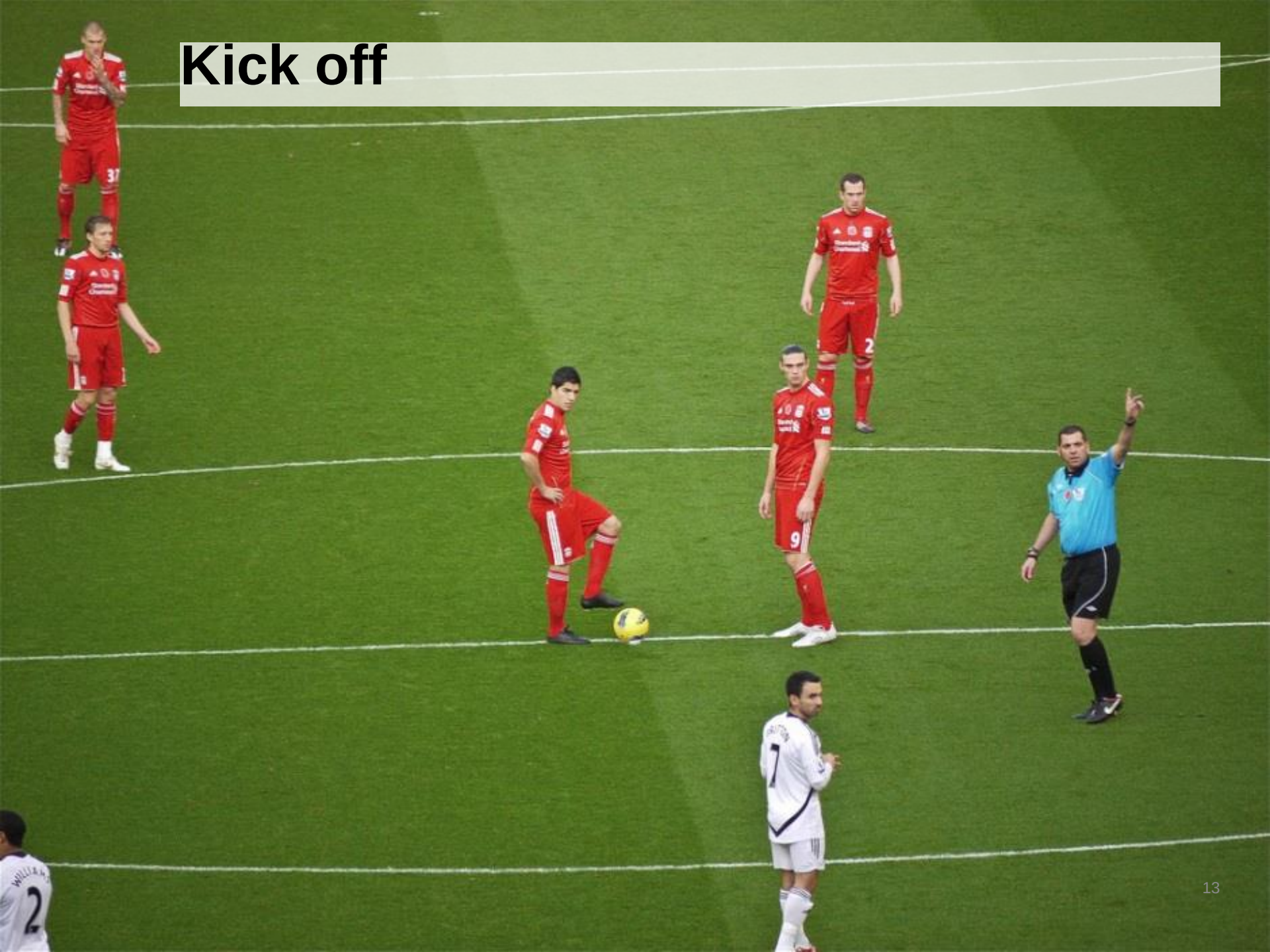
InfoGeol

~40‘000 Datensätze

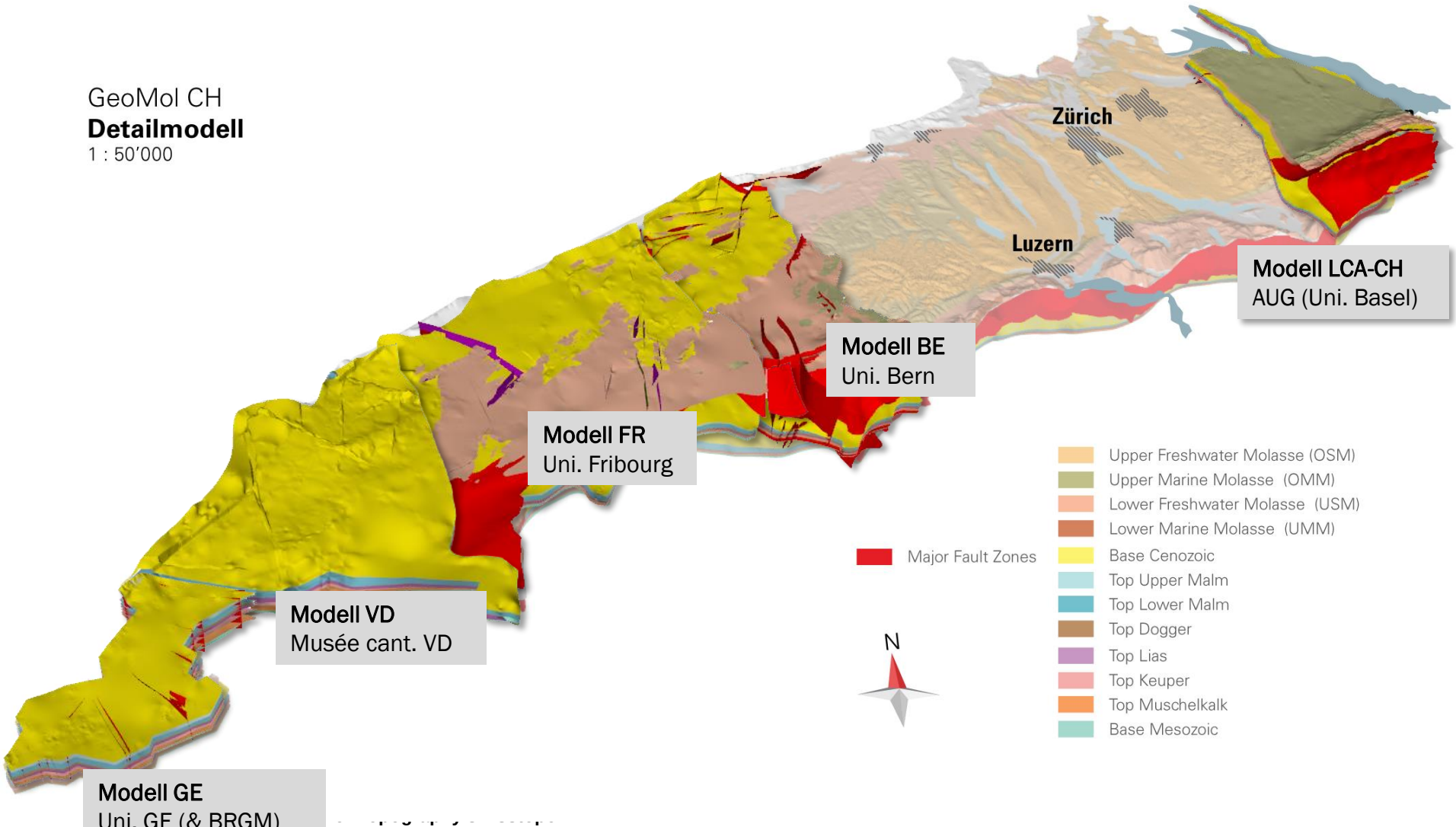
- Bohrungen
- Karten
- Profile
- etc.



Kick off

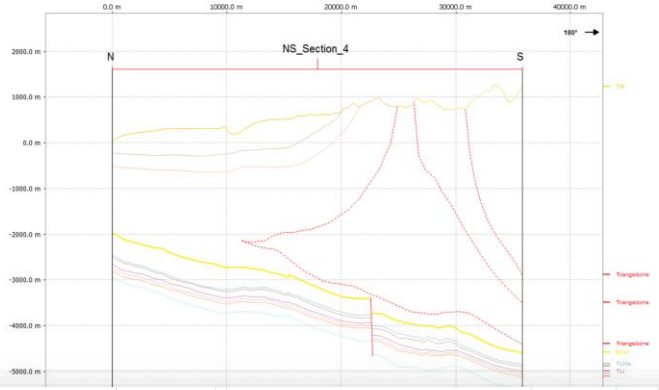


Deliverables received

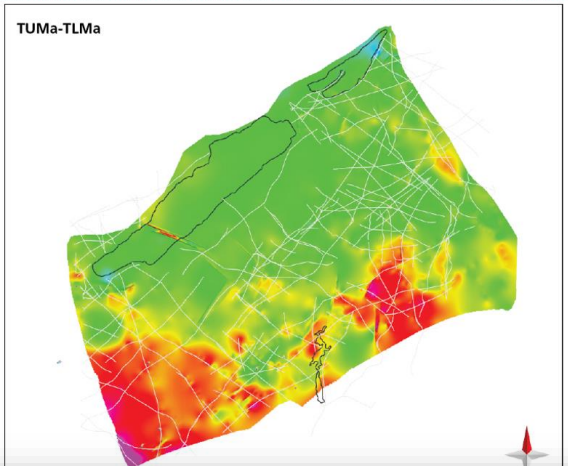


Quality check

Profiles



Thickness maps



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Eidgenössisches Departement für Verteidigung, Bevölkerungsschutz und Sport VBS
Bundesamt für Landestopografie swisstopo

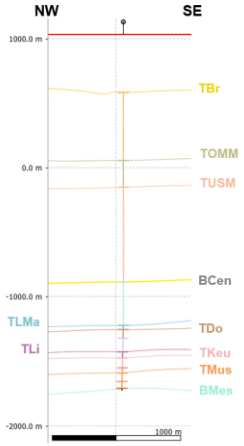
Quality Check Partner Models

Model name
Date
Responsible for quality check
Link to .pptx mit printscreens

CRITERIA		FORM	COMMENT	REQUIREMENT ITEM (No)	TO DO by partners	TO DO by swisstopo
DATA DELIVERY						
1	Modelling journal					
1.1	Date	yyyymmdd				
1.2	Report	to fill in link to pdf				
1.3	Autor	to fill in author				
1.4	Contact	to fill in adress				
1.5	Format	to fill in				
1.6	Version	to fill in				
	Figures					
1.7	Figures delivered seperately	to fill in				
1.7.1	Format	to fill in				
1.8	Additional figures (Annex)	to fill in				
CONTENT						
2.1	Structure of the report is	to fill in				
2.2	Chapter database	to fill in				
2.3	Chapter data validation and preparation	to fill in				
2.4	Chapter modelling workflow	to fill in				
2.5	Chapter boundary adjustment	to fill in				
2.6	Chapter References	to fill in				
2.7	Content of report is	to fill in				
FIGURES						
3	Quality of figures					
3.1	Resolution of figure	to fill in				
3.2	Size of figure	to fill in				
3.3	Legend	to fill in				
3.4	Localisation (base map)	to fill in				
3.5	Orientation (north arrow)	to fill in				
3.6	Vertical and horizontal scales	to fill in				
3.7	Level of detail	to fill in				
3.8	Fonts in figures	to fill in				
3.9	Colour-code according to GeoMol Stratigraphy (horizons)	to fill in				
3.1	Colouring of seismic sections according to guide line	to fill in				
3.11	Indication of exageration	to fill in				
DATABASE						
4	Surface data					
4.1	List of geological maps	to fill in				
4.2	Scale of surface data	to fill in				

Well-tie

Berlingen-1 (vertical section along well trace)



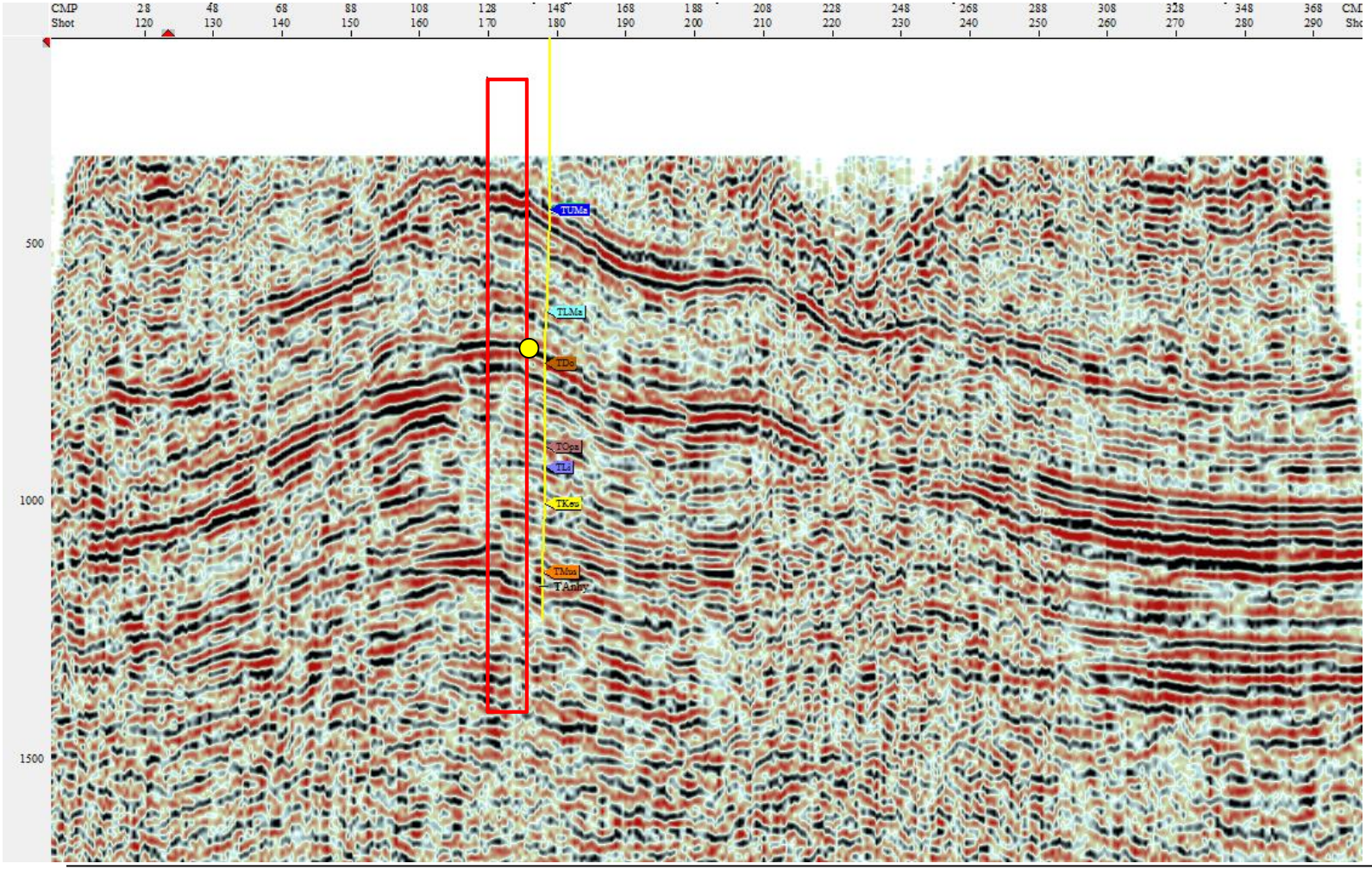
Horizon	dZ [m]	Pass	Comment
TOMM	< ± 0.1	✓	-
TUSM	< ± 0.1	✓	-
BCen	< ± 0.1	✓	-
TLMa	< ± 0.1	✓	-
TDo	< ± 0.1	✓	-
TLi	< ± 0.1	✓	-
TKeu	< ± 0.1	✓	-
TMus	< ± 0.1	✓	-
BMes	< ± 0.1	✓	-

dZ = Well marker elevation – grid elevation

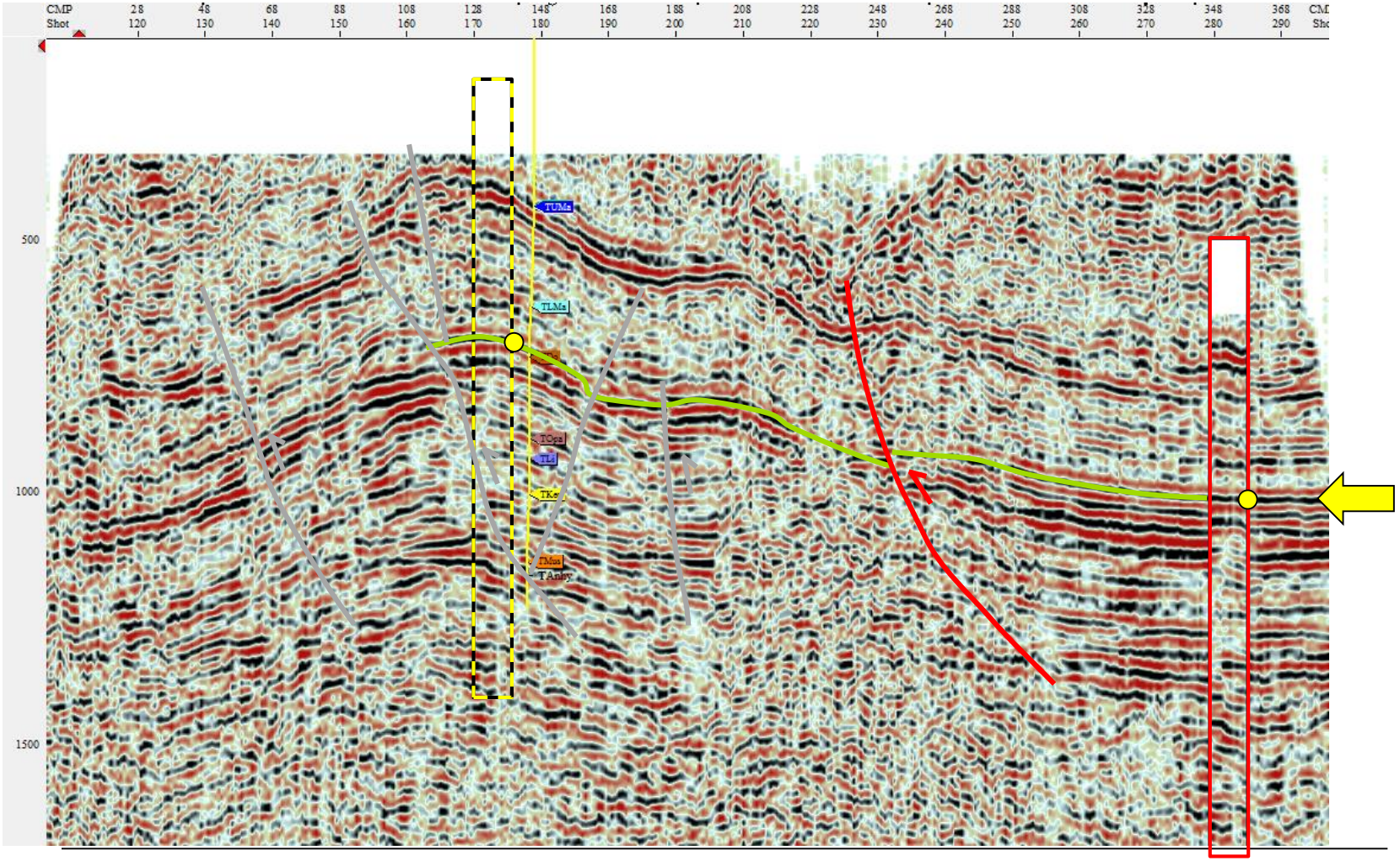
Federal Office of Topography swisstopo
Swiss Geological Survey
3D Model Evaluation
GeoMol-CH, AUG Region
31 March 2016
8

Quality check

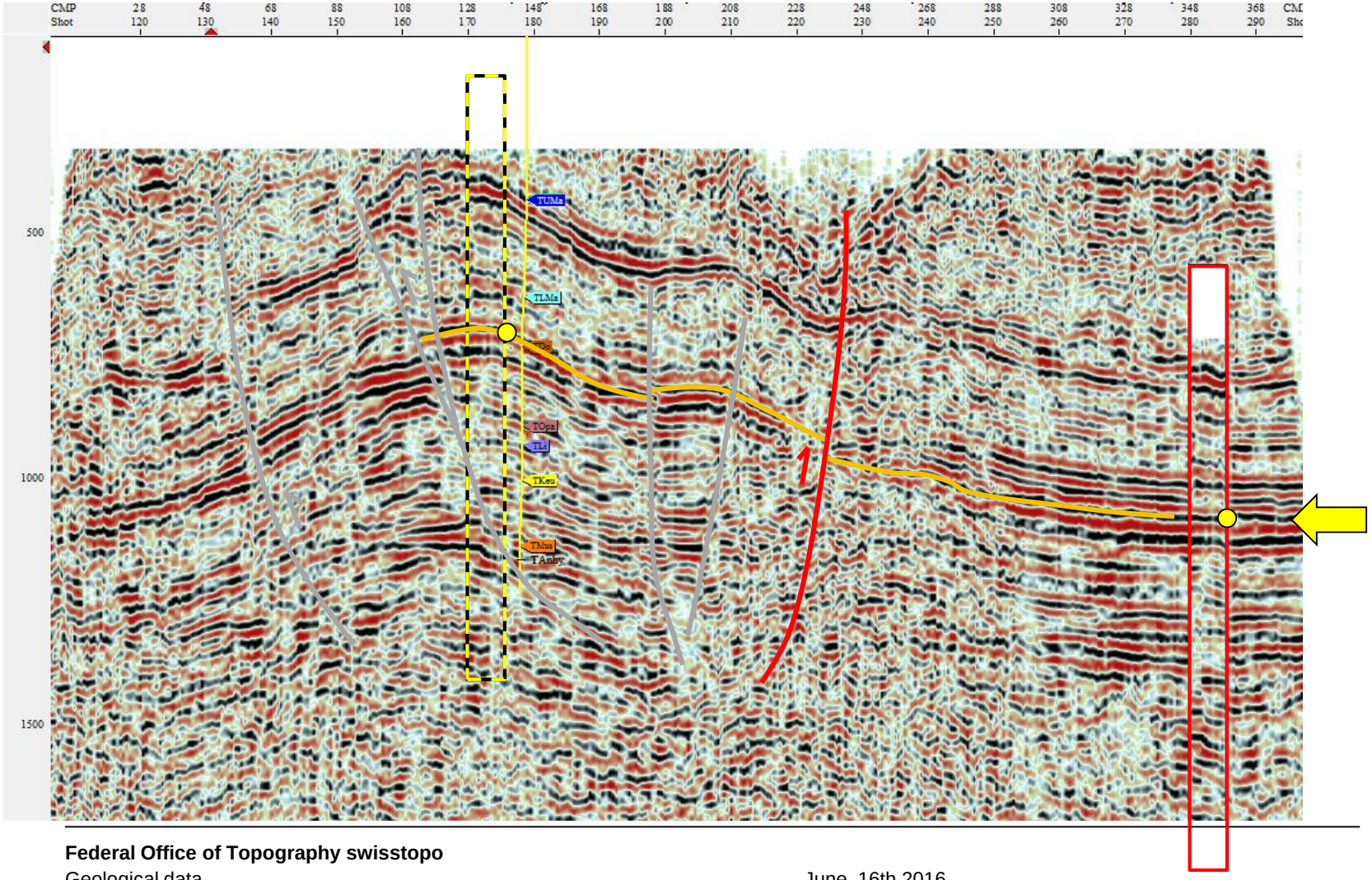
Boundary Example 1
Seismic facies correlation



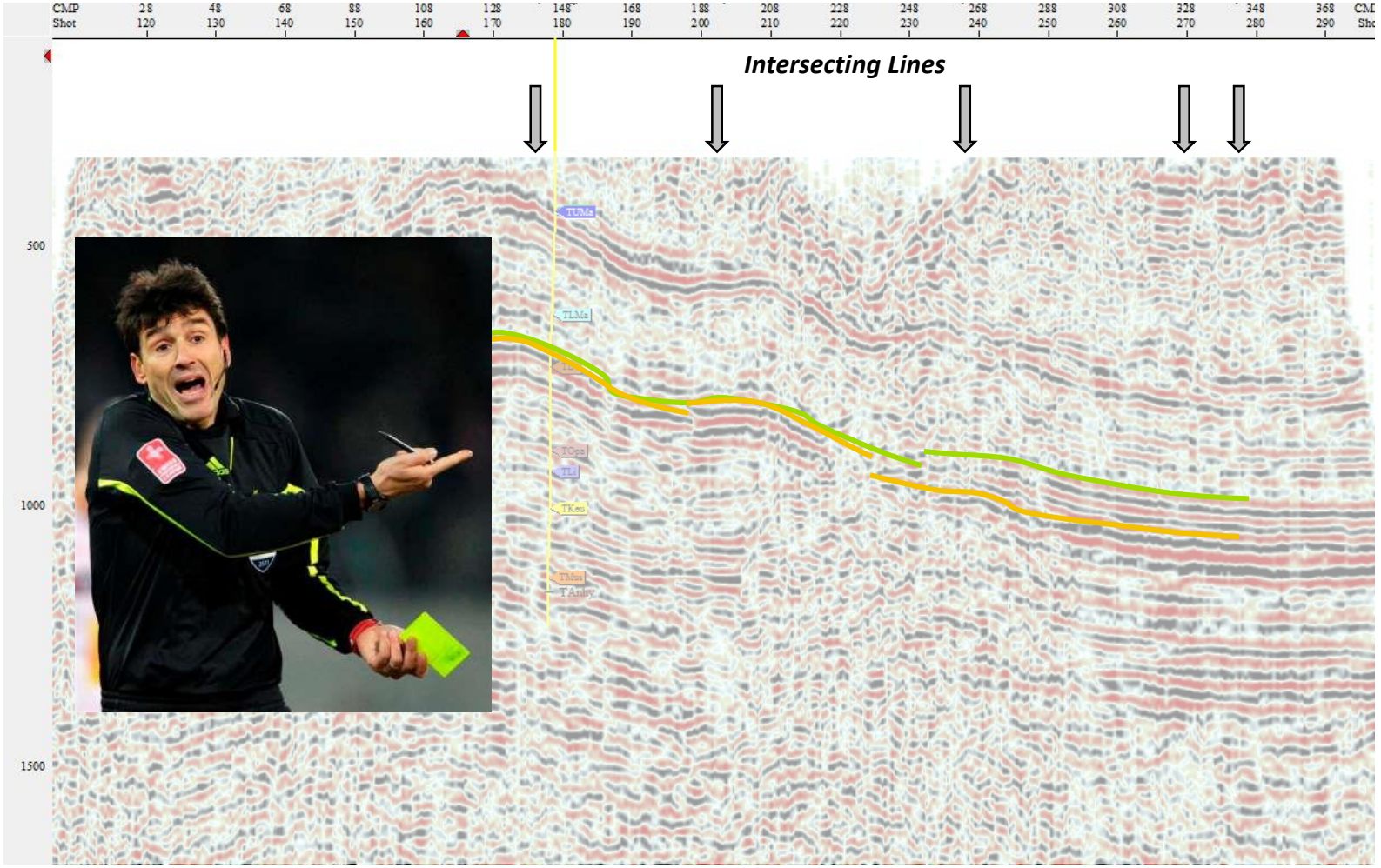
Seismic facies correlation A



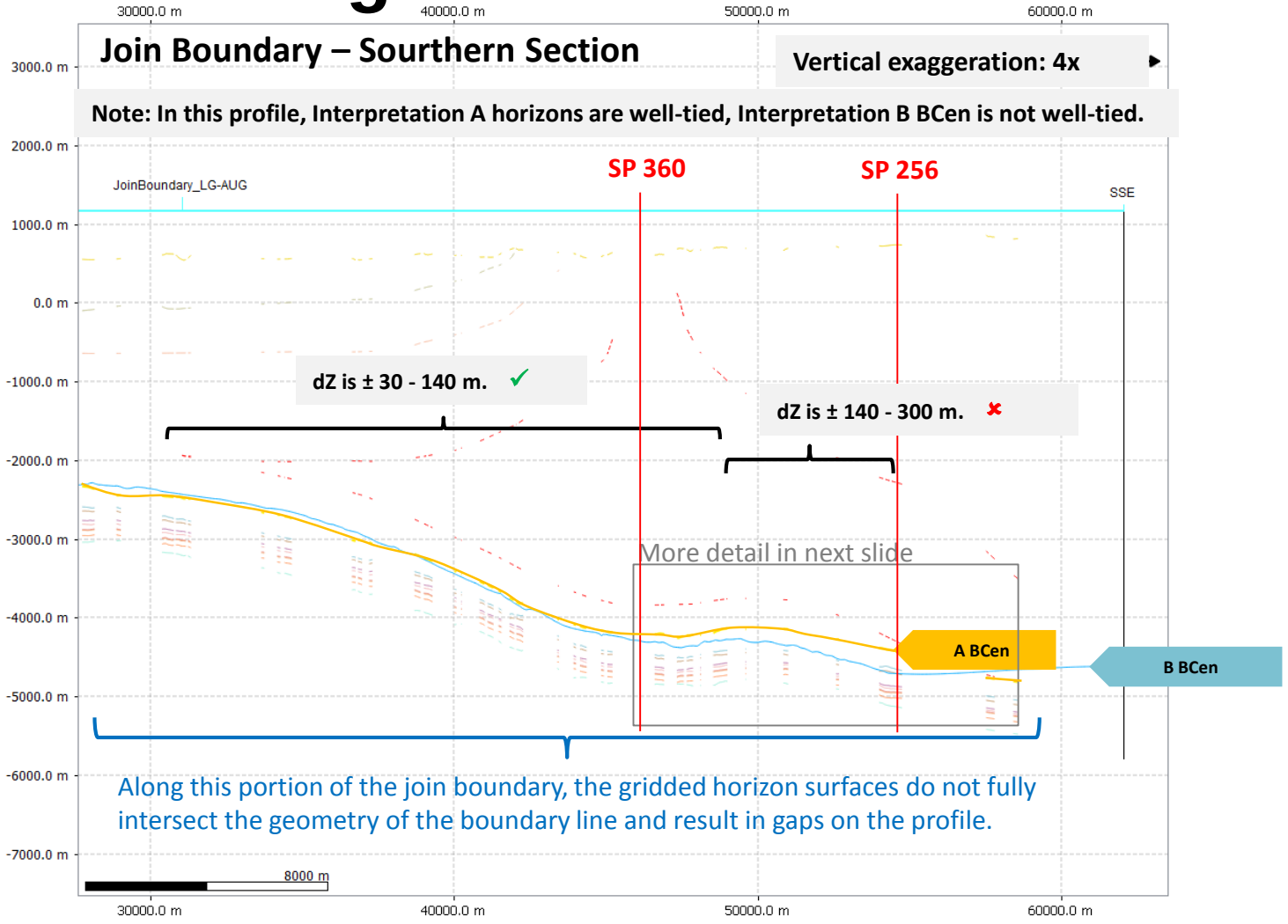
Seismic facies correlation B



Boundary:
Interpreted Line & Intersections

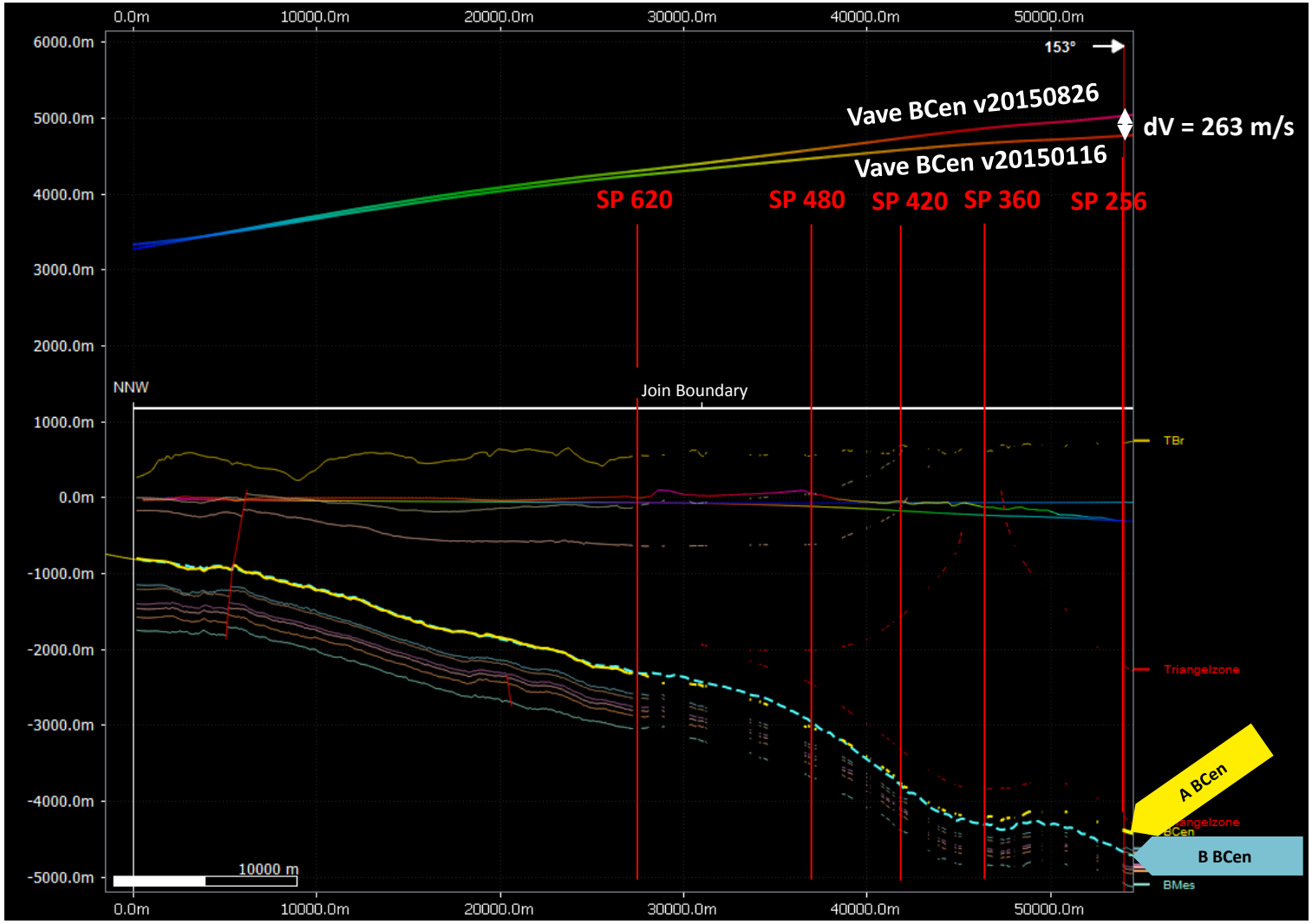


Boundary Example 2
Misfit along seismic line

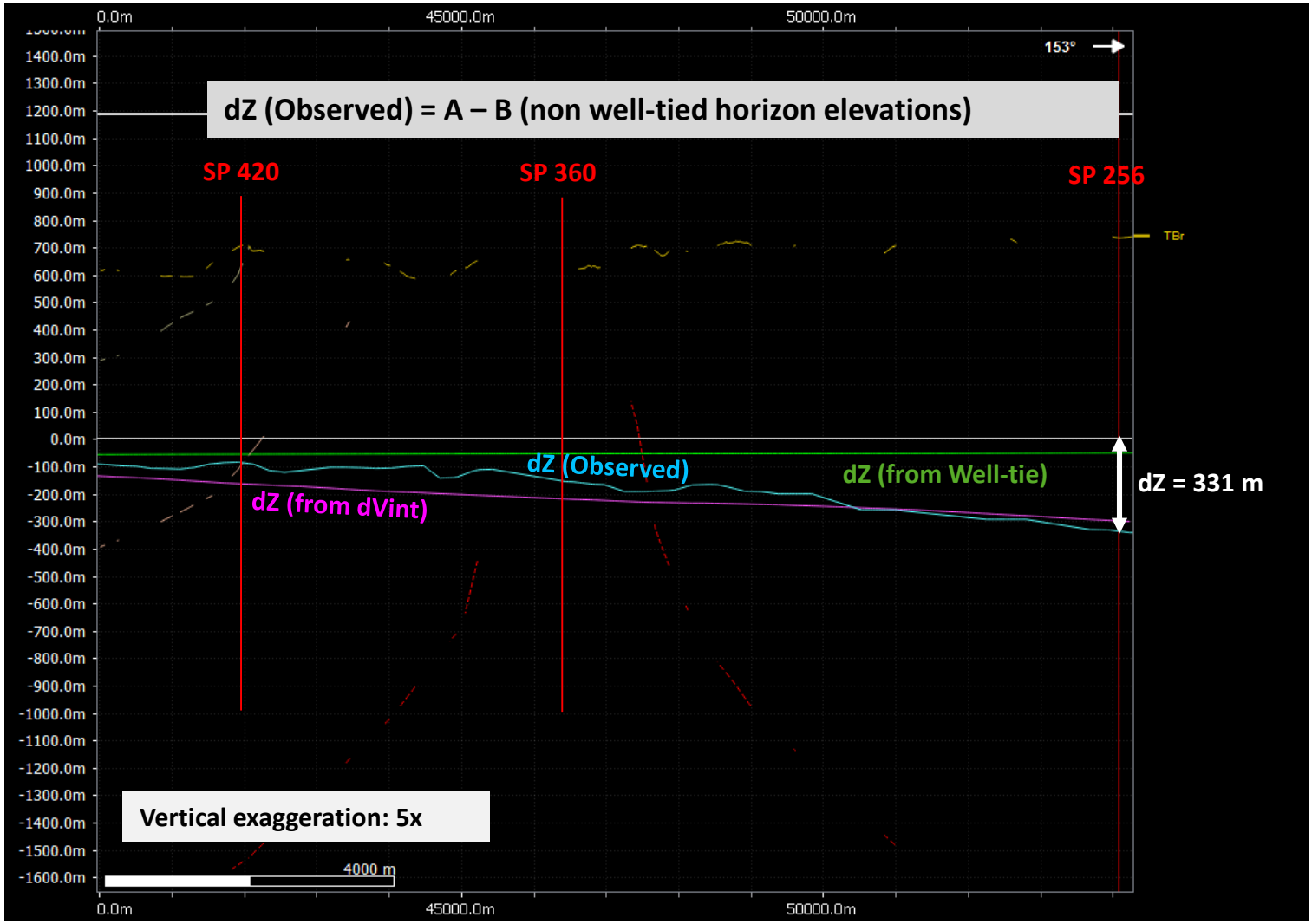


BCen Velocity Grid Difference (dV)

Lines 83SE01R & SEAG750004 (gridded horizon surfaces, Vave on boundary line)

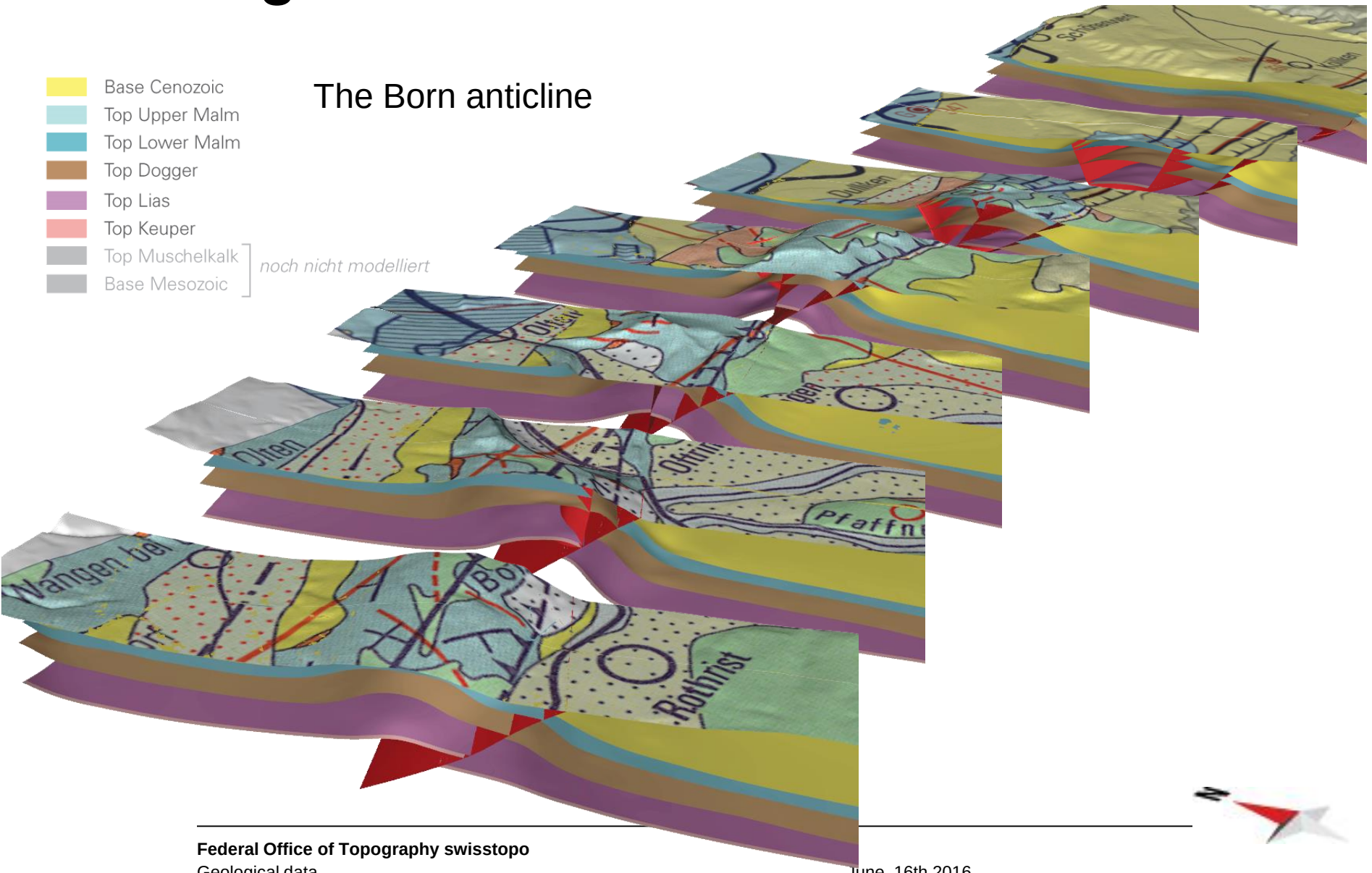


Velocity dZ Contributions



Goooooaaaaaaaal!

High-resolution model – Details

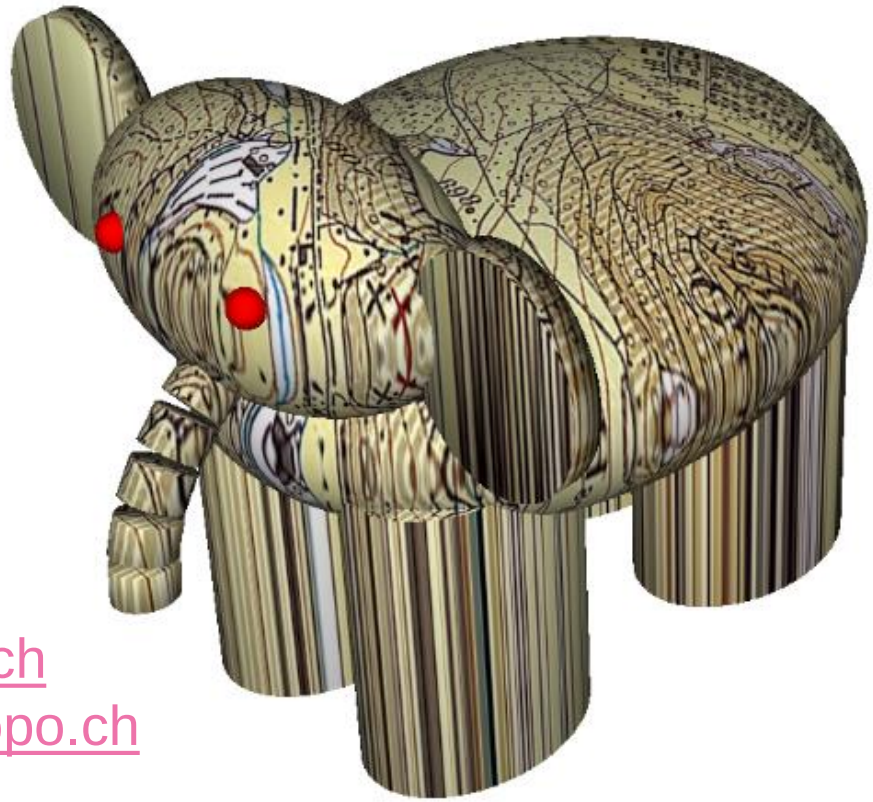


Conclusions

- Collaborative 3D modelling can work
- It’s a matter of definitions and prescribed workflows
- QA and QC must be defined well in advance
- Deliverables & formats must be defined well in advance
- Inexperience of all partners sometimes hindered adequate solutions
- **The referee should not be part of a team!**

Keep on modelling – and have fun!

Questions and answers



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