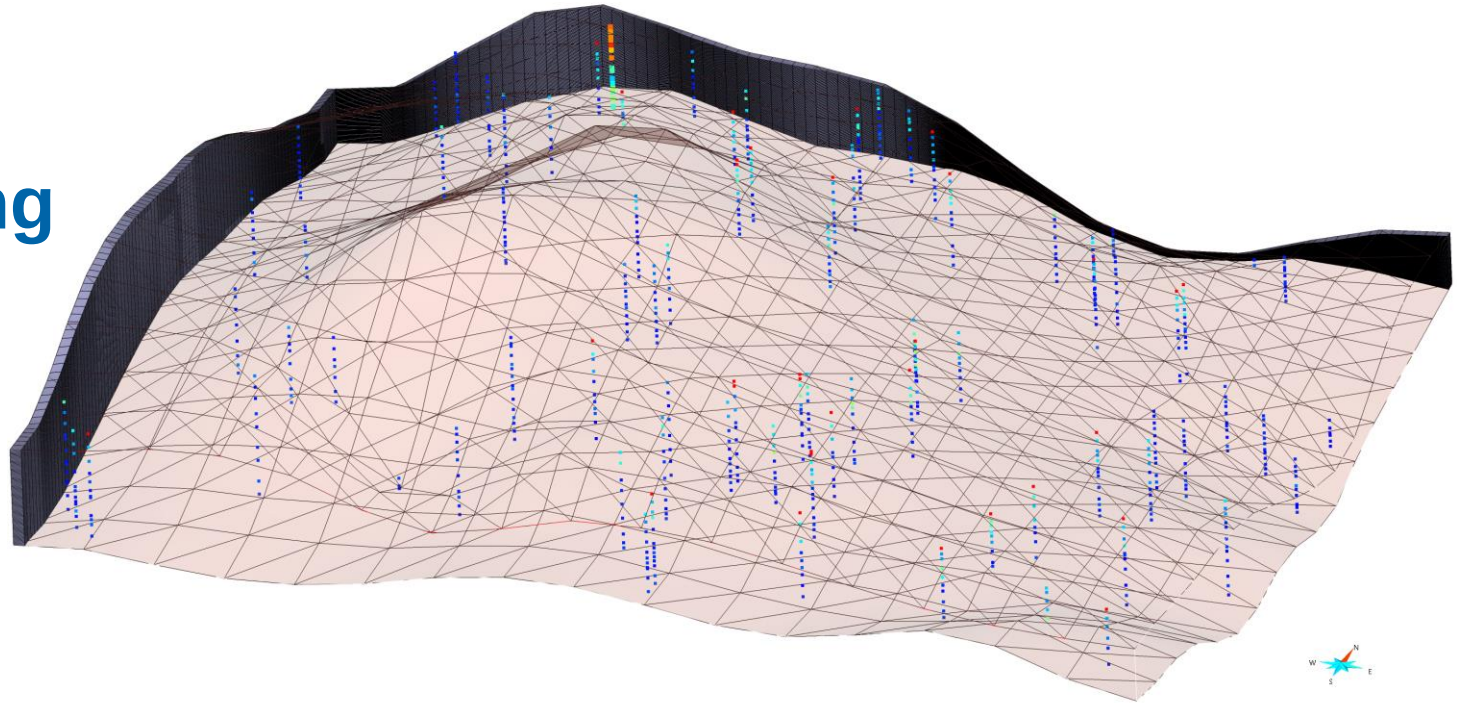
TECHNISCHE UNIVERSITÄT
BERGAKADEMIE FREIBERG
Die Ressourcenuniversität. Seit

8. Übung



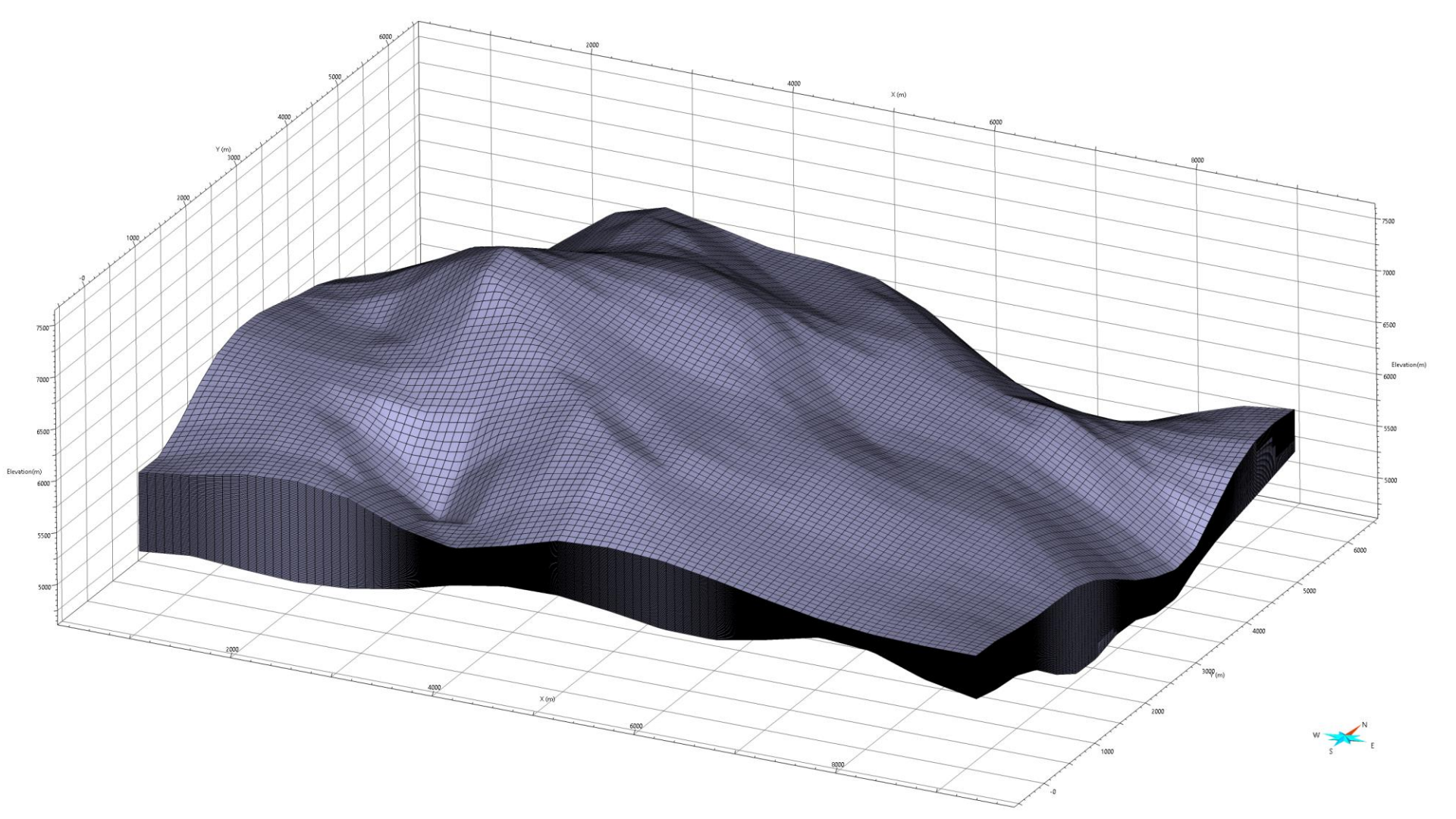
Geostatistik

SGrids und erweiterte räumliche Auswertung / Geostatistik. (Kapitel 12 im Tutorial)

- Laden Sie die Datei *wellPoints.zip* aus dem OPAL
- Starten Sie das Projekt *wellPoints_start.sprj*

Zur Wiederholung …

1. Erstellen Sie die top- und bottom-Begrenzungsflächen der Punktdaten über DSI.
2. Erstellen Sie zwischen den beiden Flächen ein SGrid mit u = 100, v = 100, w = 100.


Y (m)
X (m)
Elevation(m)
7500
7000
6500
6000
5500
5000
W
N
S
E

Explorative Datenanalyse

Show Crossplot / Crossplot 2D 

- Räumliche Verteilung: Crossplot X-Koordinate / Y-Koordinate
- Tiefenverteilung der Properties: Crossplot Z-Koordinate / Property
- Abhängigkeiten der Properties untereinander
  - Auffälligkeiten?
  - Regressionsgraden …

Multivariate Statistics 2D (0)

Object: WellPoints

Category: XY Properties

Region: everywhere

Data sampling

X-Axis Property: X

X Property options

Y-Axis Property: Y

Y Property options

Color Property: None Selected

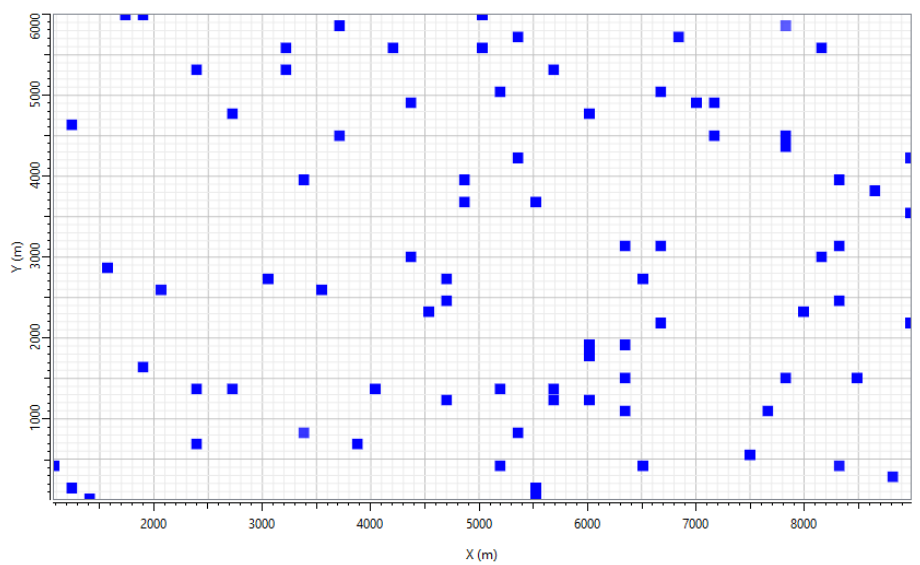
Color Property options

Regression lines

- Y on X
- X on Y
- RMA
- Weight using color property
- Custom line

Slope: 1 Y intercept: 0

Auto Apply | Apply Changes | Help



X Statistics

Object name:	WellP
Property name:	X (m)
Mean:	5353

Y Statistics

Object name:	WellP
Property name:	Y (m)
Mean:	3015

Joint Statistics

Number of samples:	
Sampling percentage:	
Correlation coefficient:	
Y on X linear regressio	
Y on X linear regressio	
X on Y linear regressio	

Nothing Selected

Multivariate Statistics 2D (1)

Object: WellPoints

Category: XY Properties

Region: everywhere

Data sampling

X-Axis Property: Z

X Property options

Y-Axis Property: permeability

Y Property options

Color Property: None Selected

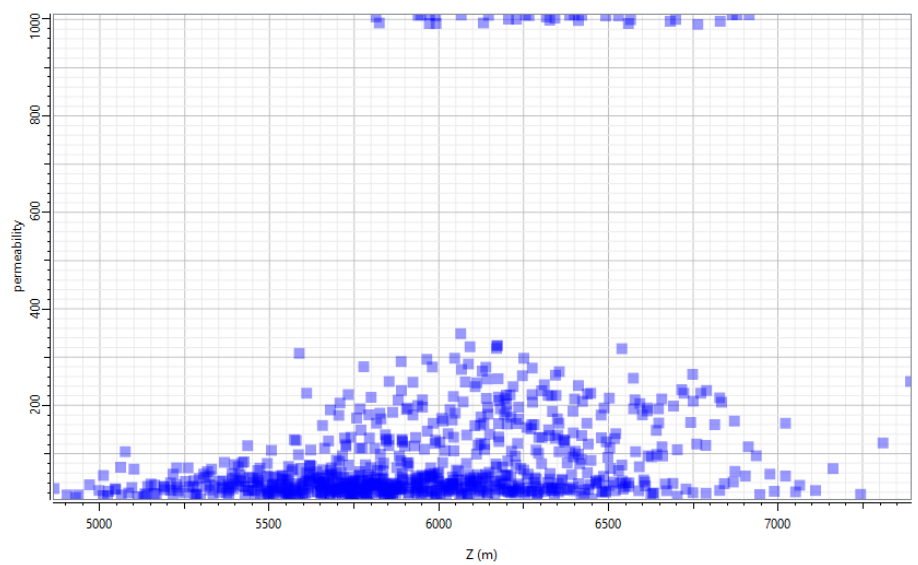
Color Property options

Regression lines

- Y on X
- X on Y
- RMA
- Weight using color property
- Custom line

Slope: 1 Y intercept: 0

Auto Apply | Apply Changes | Help



X Statistics

Object name: WellP

Property name: Z (m)

Mean: 5961

Y Statistics

Object name: WellP

Property name: perm

Mean: 108.6

Joint Statistics

Number of samples:

Sampling percentage:

Correlation coefficient:

Y on X linear regressio

Y on X linear regressio

X on Y linear regressio

Nothing Selected

Multivariate Statistics 2D (2)

Object: WellPoints

Category: XY Properties

Region: everywhere

Data sampling

X-Axis Property: log_porosity

X Property options

Y-Axis Property: permeability

Y Property options

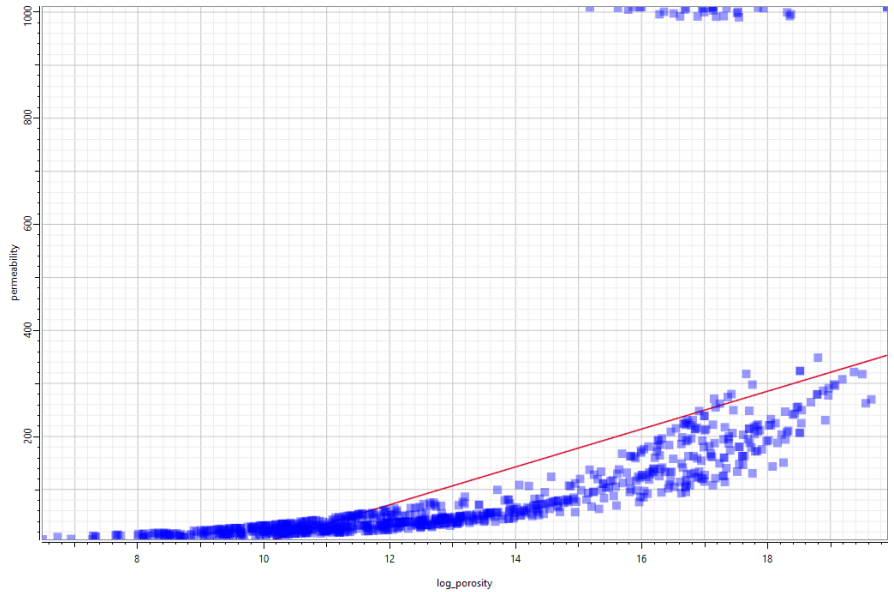
Color Property: None Selected

Color Property options

Regression lines

- [x] Y on X
- [ ] X on Y
- [ ] RMA
- [ ] Weight using color property
- [ ] Custom line

Slope: 1 Y intercept: 0



X Statistics

Object name:	WellPoints
Property name:	log_porosity
Mean:	13.04837815
Std. deviation:	2.998637605
Variance:	8.991827490
# no data values:	0

Y Statistics

Object name:	WellPoints
Property name:	permeability
Mean:	108.6012130
Std. deviation:	191.5120881
Variance:	36676.87990
# no data values:	0

Joint Statistics

Number of samples:	
Sampling percentage:	
Correlation coefficient:	
Y on X linear regression slope:	
Y on X linear regression interc	
X on Y linear regression slope:	
X on Y linear regression interc	
RMA linear regression slope:	
RMA linear regression interce	

Auto Apply | Apply Changes | Help

Nothing Selected

Explorative Datenanalyse

Histogram 

- Histogramme der Properties
  - Modalität?
  - Skale?

Variographie

Variogram Analyzer / Spatial Data Analyst 

- 1D Variogram (vertikal) eines einzelnen Wells
  - Objekt *Well1*, Property *Permeability*
- 1D Variogram (vertikal) mehrerer Wells
  - Objekt *WellPoints*, Property *Permeability*
  - XYZ Space oder UVW Space?
  - *Coordinate Transformation > Following Grid stratigraphy > „Name des erzeugten SGrids“*

➢ Finden Sie optimale Parameter für Anzahl der Lags und Lag-Distanz

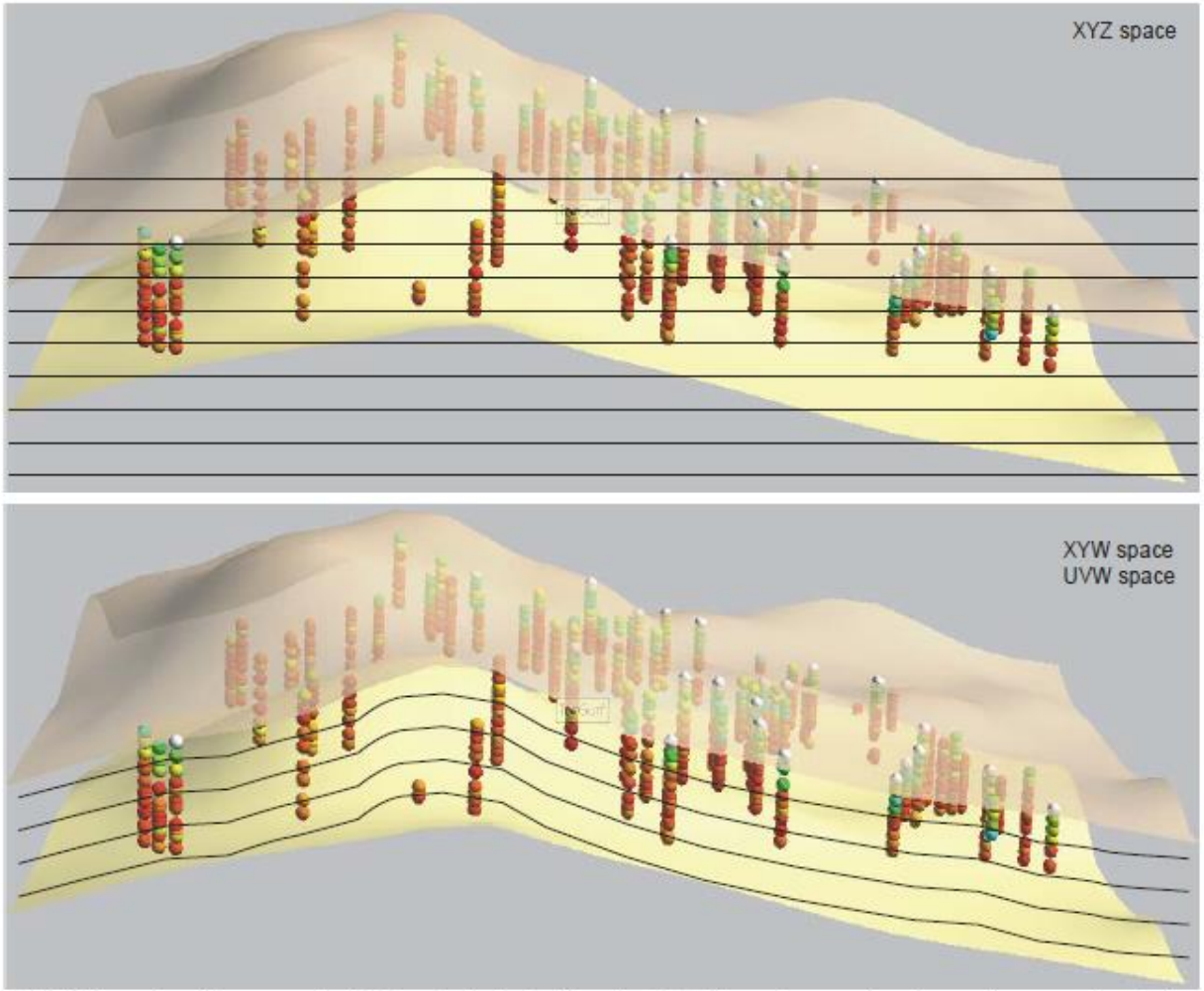


Fig. 12. g. Subdivition of a data space in 100 levels indicated by the black lines for areal variography according to the specified working space

Variographie

Variogram Analyzer / Spatial Data Analyst 

- Flächenvariogram XYZ
  - Objekt *WellPoints*, Property *Permeability*

  ➢ Finden Sie optimale Parameter für Anzahl der Lags, Lag-Distanz, Richtungsabhängigkeit (Azimuth)!
  ➢ Schätzen Sie ein Variogram-Modell und speichern Sie es Gocad-Ressource!

Kriging vs DSI

Interpolieren Sie die Property *Permeability* sowohl über Kriging und DSI und vergleichen Sie die Ergebnisse optisch und über explorative Datenanalyse. (Siehe Übung 7)

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