

# NExT

A Schlumberger Company

## Petrel 2017 Property Modeling Module 14: Petrophysical modeling workflow overview



Schlumberger-Private

# Petrel 2017 Property modeling

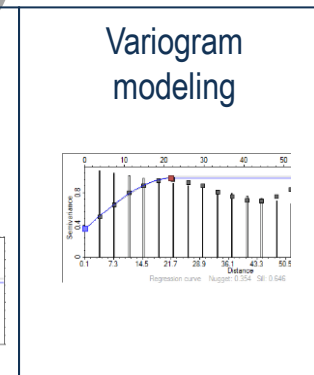
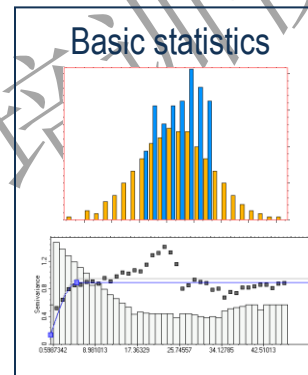
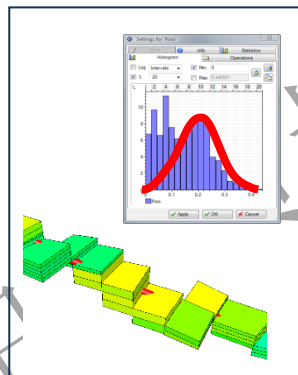
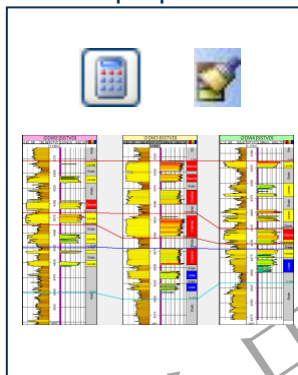
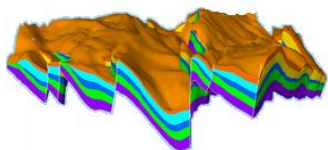
Intro

Property modeling  
data preparation

Scale up well logs

Univariate and bivariate geostatistics

Petrel Property Modeling  
objective and workflow

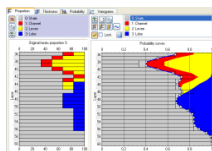


Facies modeling

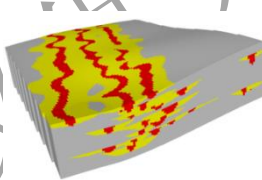
Petrophysical modeling

Volume calculation and  
Uncertainty analysis

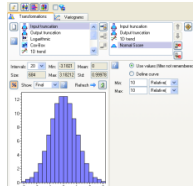
Discrete  
data analysis



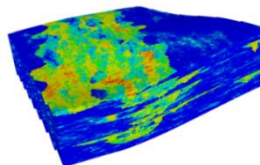
Stochastic facies  
modeling



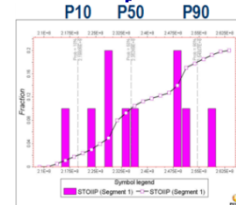
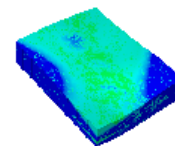
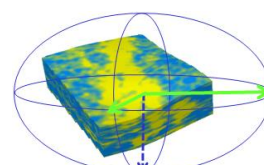
Continuous  
data analysis



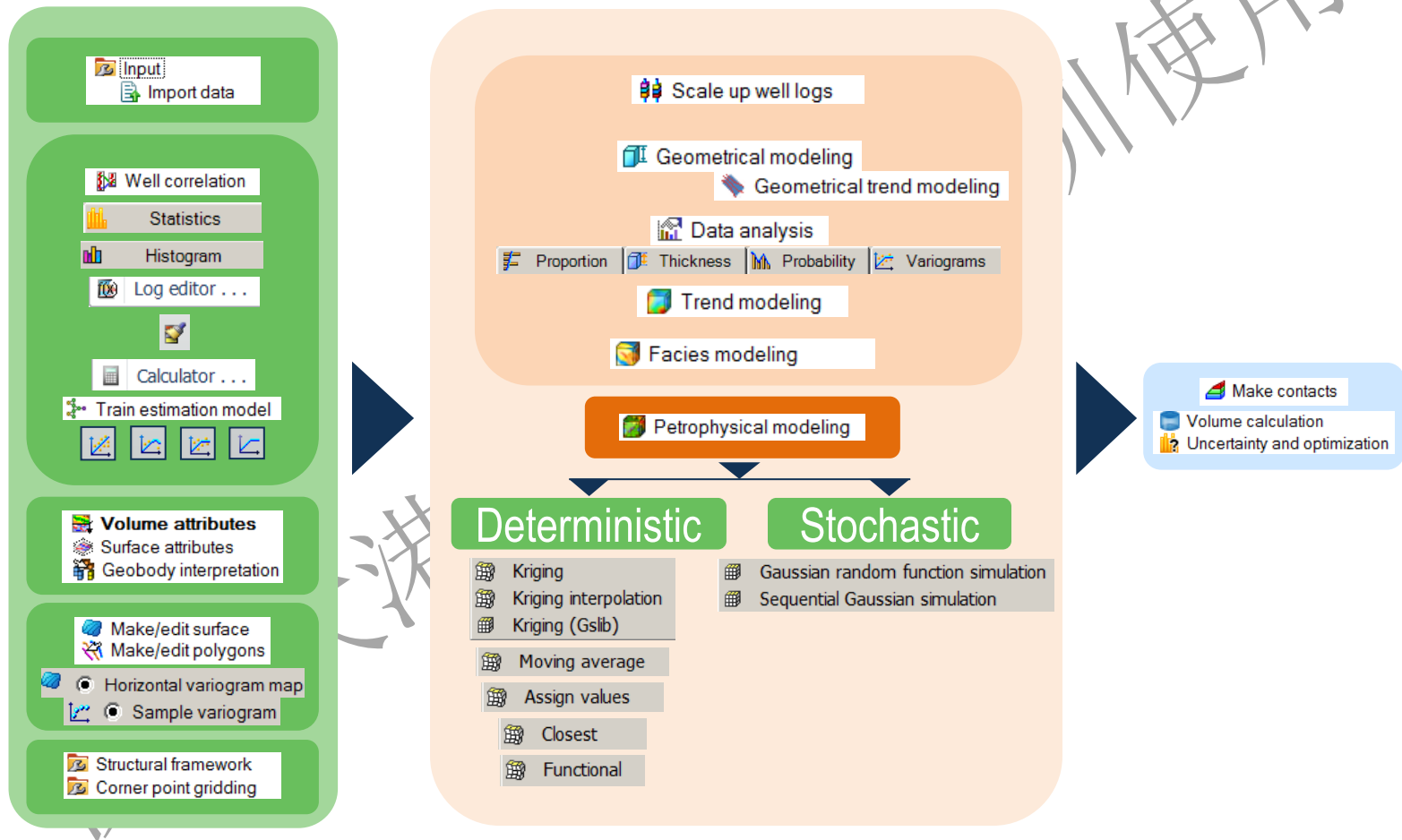
Stochastic and  
deterministic  
petrophysical modeling



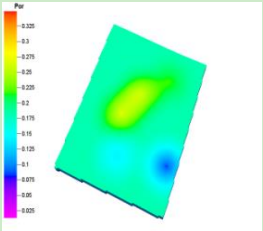
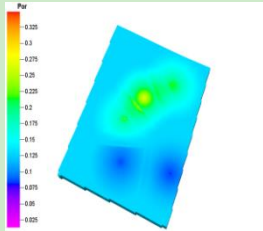
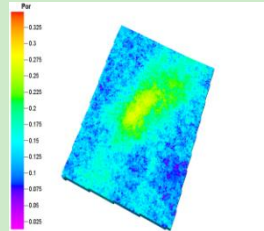
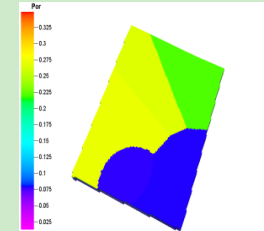
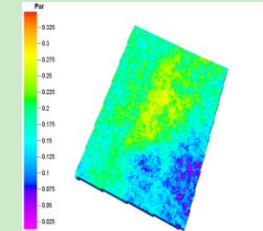
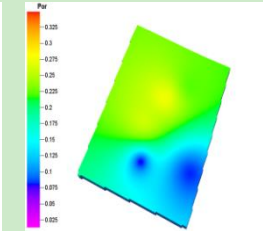
Use of secondary  
information for  
property modeling



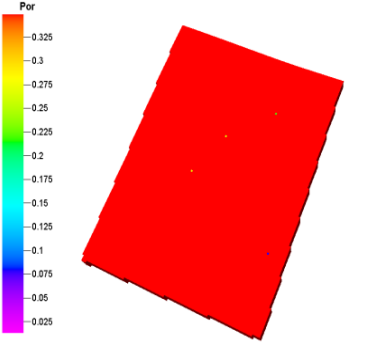
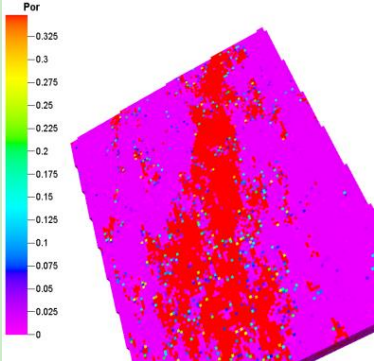
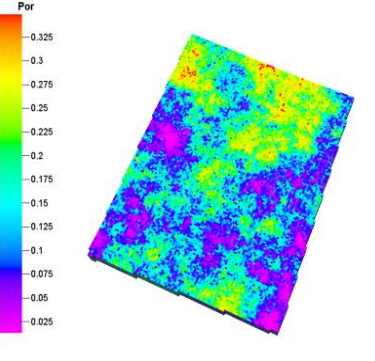
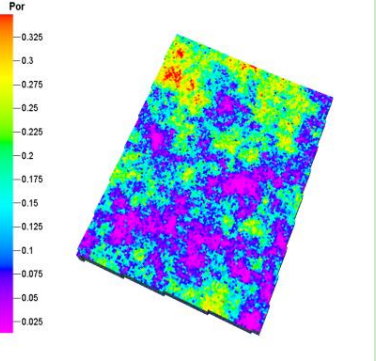
# 3D petrophysical modeling: Workflow tools



# 3D property modeling: Petrophysical modeling methods in Petrel (1)

Deterministic					
Estimation				Interpolation	
Kriging interpolation	Kriging	Kriging by GSLIB	Closest	Functional	Moving average
					
Honors well data, input distributions, variograms, and trends. Can work in real coordinates (X,Y,Z) and is fast.	Handles large datasets and works in real coordinates (X,Y,Z) and grid coordinates (I,J,K). Fast collocated co-kriging.	Standard GSLIB method with option of collocated co-kriging. Works only in grid coordinates (I,J,K).	Uses the closest well data input for each unsampled location.	Honors well and trend data using a 3D function for the interpolation.	Gives an average value based on input data and calculates weights according to distance from wells.

# 3D property modeling: Petrophysical modeling methods in Petrel (2)

Deterministic	Learning system	Stochastic	
Direct addressing	Artificial	Pixel-based	
Assign values	Neural net	Sequential Gaussian Simulation (GSLib)	Gaussian Random Function Simulation
			
Options to assign cells an undefined value, a constant value, or values from another property, surface, or vertical function.	Uses the estimation model made in the <i>Train estimation model</i> process.	Honors well data, input distributions, variograms, and trends. Can create local variations away from input data using variogram and distribution.	Faster than SGS and provides better variogram reproduction. Offers a fast collocated co-simulation option.