SEISQUARE

OIL & GAS

UDOMORE - DEPTH

ANNOUNCING A NEW ERA OF
TIME-TO-DEPTH CONVERSION

SEISQUARE

*UDOMORE DEPTH IS AN OCEAN PLUG-IN FOR PETREL**

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UDOMORE-DEPTH

NEAR REAL-TIME & MULTIPLE LAYERS TIME-TO-DEPTH CONVERSION INCLUDING ALL SOURCES OF UNCERTAINTY

Udomore-Depth instantly, simply and accurately applies time-to-depth conversion on multiple layers, in one single workflow, including all sources of uncertainty, to deliver multiple velocity and depth conversion scenarios in minutes, not days.
Udomore-Depth simultaneously manages the uncertainty on the TREND velocity model and the LOCAL uncertainty, defined by the uncertainty of interpreted time maps and local fluctuations of interval velocities.

INSTANTLY

Optimised stochastic algorithms compute thousands of geostatistical depth realizations for each scenario in minutes, not days.

SIMPLY

One single engineer can generate multiple scenarios in one single run, through one single workflow and easy-to-use interface.

ACCURATELY

Mathematically proven models, including and consistently propagating all sources of uncertainty to provide objective results with quantified accuracy.

MULTI-LAYERS

Perform multilayer depth conversion, taking into account all the relationships between horizons determined by the velocity model associated to each layer.

ALL UNCERTAINTIES

Integrate all sources of uncertainty (time picking, velocity law parameters, velocity residuals and well depth markers) in a consistent way, through one single probabilistic model for estimation or simulation.

MULTIPLE SCENARIOS

Generate hundreds of scenarios, including all sources of uncertainty, through one single model in minutes, not days.

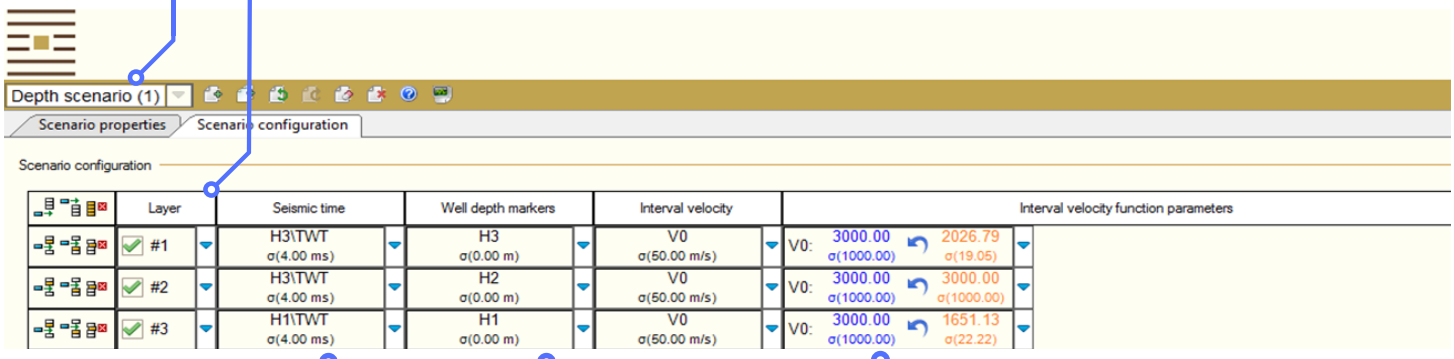
MULTIPLE APPLICATIONS

	DESCRIPTION	BENEFITS
EXPLORATION	GENERATE MULTIPLE DEPTH CONVERSION SCENARIOS ON MULTIPLE LAYERS, INCLUDING ALL SOURCE OF UNCERTAINTY, IN DAYS, NOT MONTHS	SAVE MONTHS IN PROSPECT EVALUATION PROJECTS
BEFORE DRILLING	FAST, SIMPLE & ACCURATE DEPTH ESTIMATIONS TO BENCHMARK OR COMPARE YOUR EMPIRICAL DEPTH MODELS	IMPROVE CONFIDENCE IN COSTLY DRILLING DECISION-MAKINGS THROUGH OBJECTIVE RESULTS WITH QUANTIFIED ACCURACY
WHILE DRILLING	ANTICIPATE GEOHAZARD & RE-ASSESS YOUR DEPTH MODELS IN MINUTES WHEN REACHING A NEW HORIZON	SAVE MILLIONS IN RE-ASSESSING YOUR DRILLING DECISION & OPTIMIZING YOUR DRILLING PLAN IN REAL-TIME
AFTER DRILLING	FREQUENTLY, QUICKLY & SIMPLY UPDATE MULTIPLE RESERVOIR ESTIMATIONS IN ONE SINGLE RUN, AND IN MINUTES, NOT DAYS	MAXIMIZE PRODUCTION & MONITOR YOUR ENTIRE E&P PORTFOLIO IN REAL-TIME

INTUITIVE INTERFACE

MULTIPLE SCENARIOS

MULTIPLE LAYERS



SEISMIC TIME

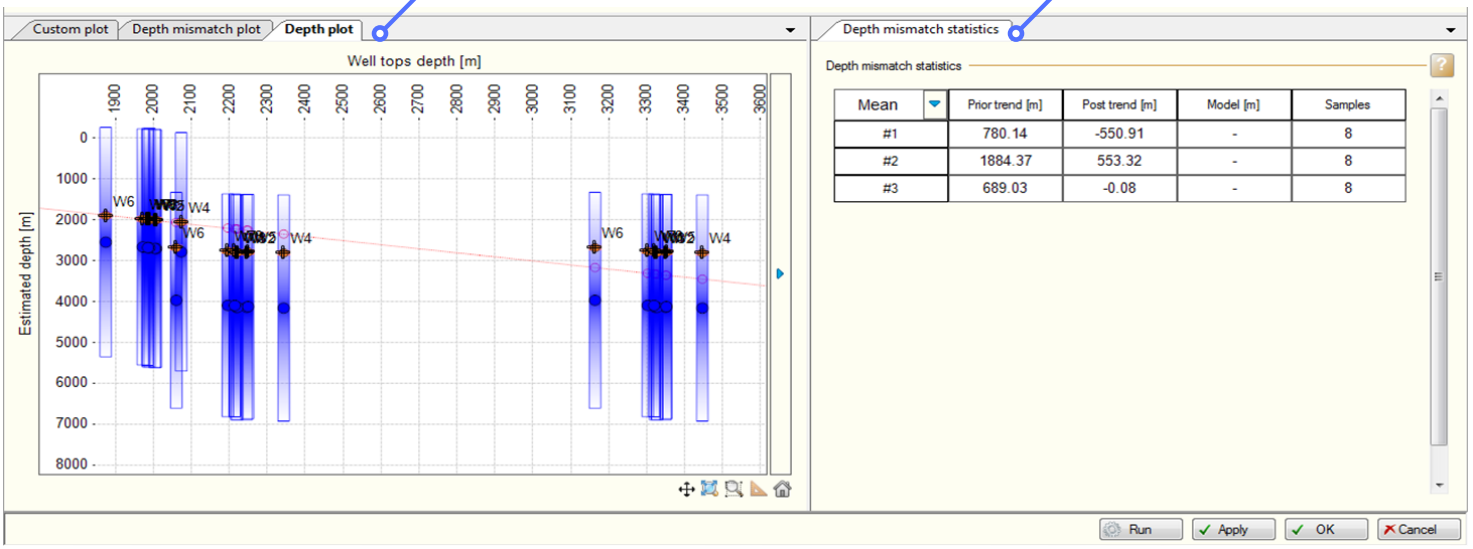
WELL DEPTH MARKERS

INTERVAL VELOCITY LAW PARAMETERS AND RESIDUALS

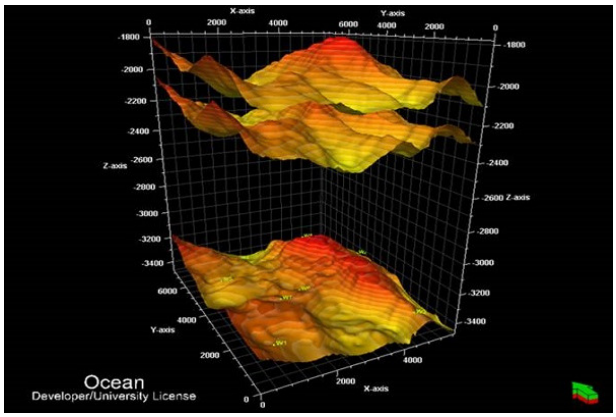
The converted depth and associated uncertainty are estimated using the Bayesian Kriging (BK).

DEPTH PLOT

DEPTH MISMATCH STATISTICS



OUTSTANDING OUTCOMES

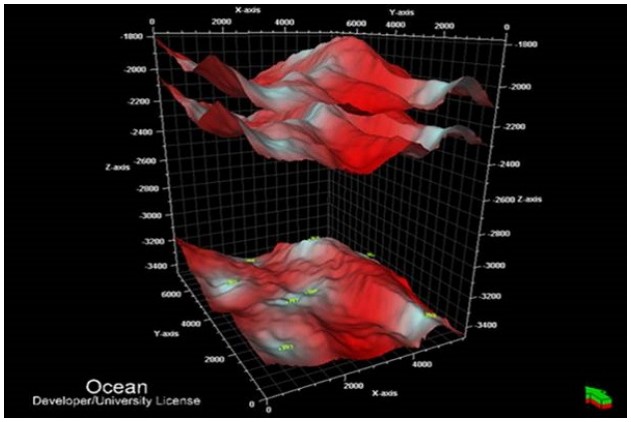


ESTIMATED DEPTH MAPS

define the depth base case as the most accurate estimation of the depth horizon at any location in space. It is a reference map for the depth conversion scenario, integrating all sources of uncertainty (time picking, velocity law parameters, velocity residuals and well depth markers) in a consistent way.

Characteristics

- Near real-time
- Multilayer
- Tied to the wells

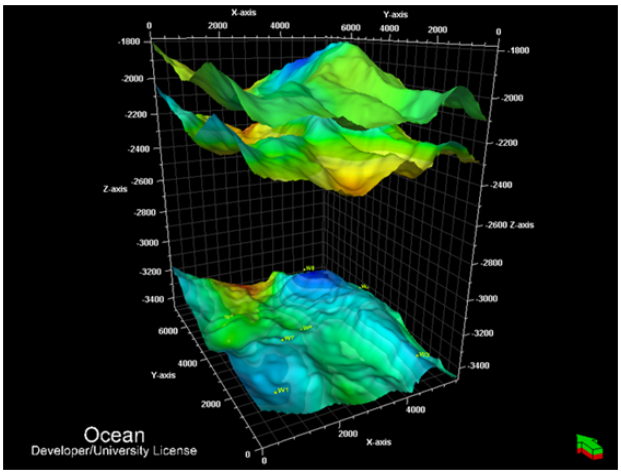


ESTIMATED DEPTH UNCERTAINTY MAPS

quantify the accuracy of the estimated depth map at any location in space. The lower the standard deviation value, the higher your confidence in the estimated depth map. Standard deviation map is a cornerstone to depth realization computations. Most of the depth realisations (95.5% on a Gaussian assumption) are computed between estimated depth and +/- 2 times the standard deviation.

Characteristics

- Near real-time
- Multilayer
- Standard deviation = 0 at well locations



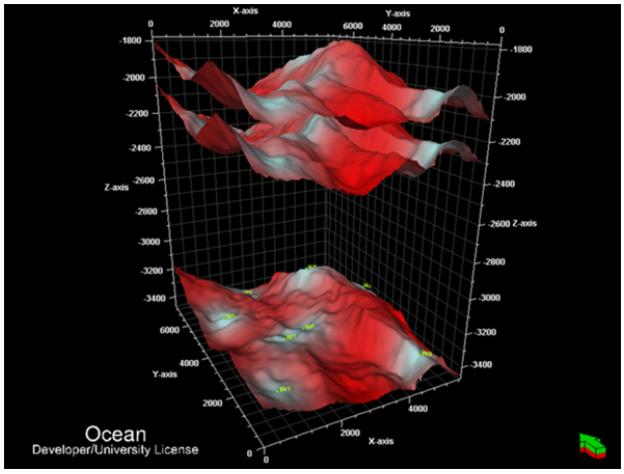
ESTIMATED INTERVAL VELOCITY MAPS

are resulting interval velocity maps, corresponding to estimated thickness maps divided by the seismic time isopach. They present a consistent input to your 3D velocity model.

Characteristics

- Near real-time
- Multilayer
- Tied to the wells

OUTSTANDING OUTCOMES

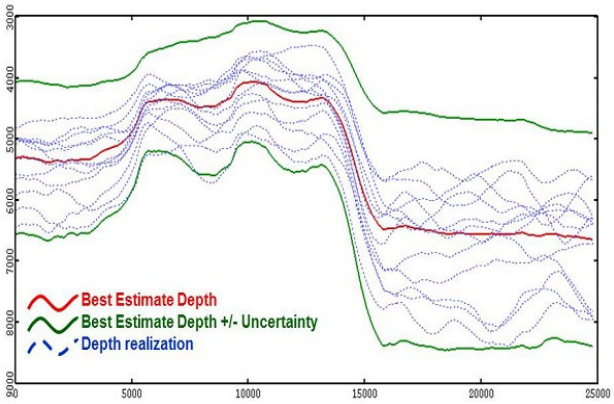


ESTIMATED INTERVAL VELOCITY UNCERTAINTY MAPS

provide accuracy on the resulting interval velocity map, expressing the standard deviation around resulting interval velocity map.

Characteristics

- Near real-time
- Multilayer

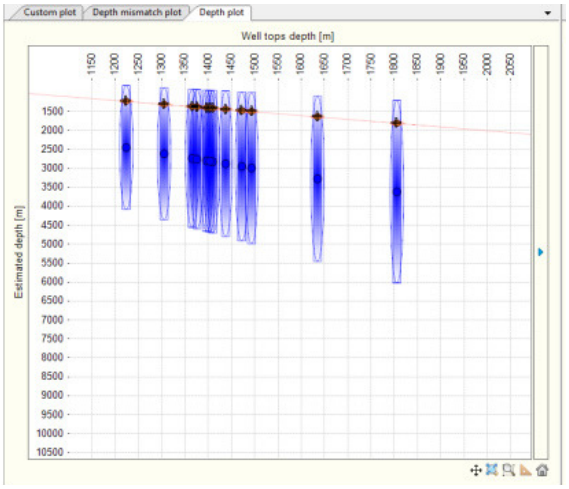


DEPTH SURFACE REALIZATIONS

allow you to perform volumetric computations for the field evaluation. Studying simulated depth surfaces P10/P50/P90 is essential to understand the possible reservoir geometry and connection between reservoirs for multiple targets. Simulated Depth surfaces are computed using an advanced stochastic Bayesian simulation algorithm.

Characteristics

- Thousands realizations in minutes
- Computed on selected layer
- Tied to the well



CONTROL ON VELOCITY MODELING

gives a possibility to optimize the interval velocity model interactively. It visualises mismatches between the estimated depth trend values and the well depth marker values in one click, before performing any computation.

Characteristics

-Depth Plot (Estimated Depth (m) vs Well tops depth (m))
-Depth Mismatch Statistics (RMSD, Mean, Max, Min)

REAL CASE STUDY

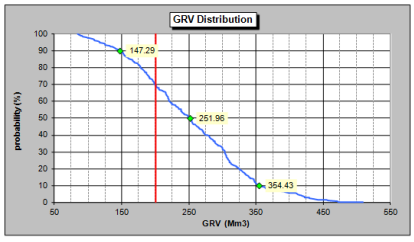
11 LAYERS WITH 7 SIMULATED - 5 WELLS BY LAYER

GRID SIZE : 1161*1027= 1 192 347 NODES

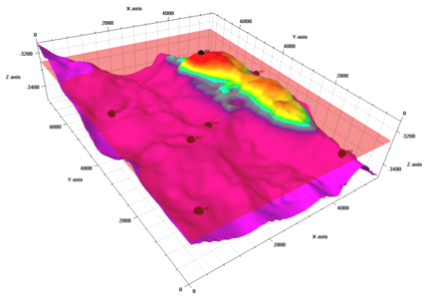
300 SIMULATIONS PER SIMULATED LAYER

2h45 COMPUTATION TIME* FOR 2100 SIMULATIONS

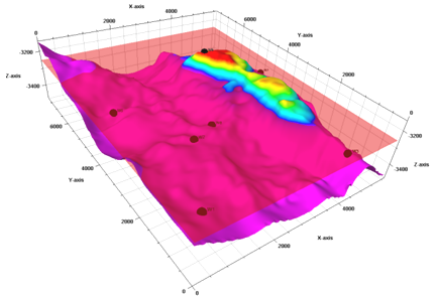
(*) wih basic computer, i7-4890 CPU@3.60GHz, 4 Cores



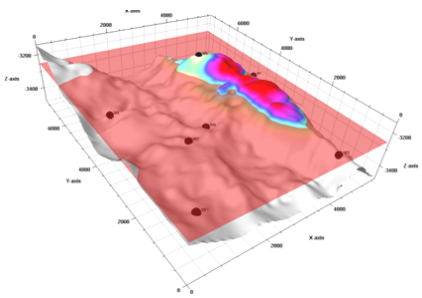
GRV Distribution graph shows the total estimated volume of reservoir between the top and the base reservoir surface, and above oil water/gas contact, and corresponding to all Simulated Depth Maps vs. probability of occurence.



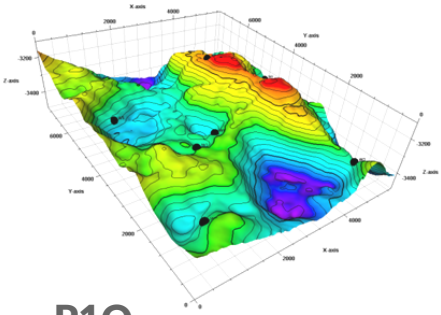
1) Probability to hit the target above the spill point



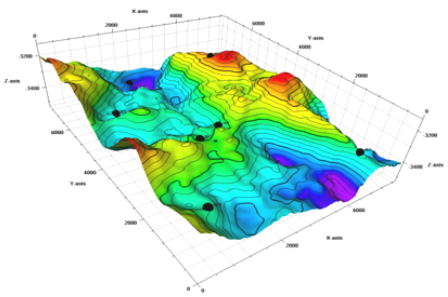
2) Hydrocarbon column



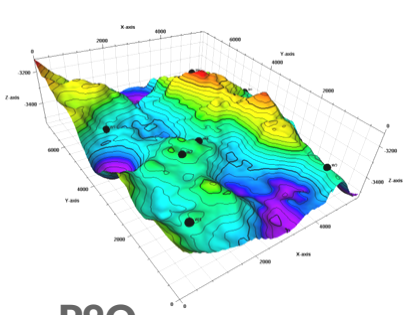
3) Uncertainty on Hydrocarbon column maps, including all sources of uncertainty



P1O



P5O



P9O

UDM-Depth P10, P50, P90 Simulated Depth Maps, derived from the GRV curve, illustrate the impact of uncertainty attached to depth scenario for multiple layers, for a target in one single click.

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GLOBAL HEADQUARTER

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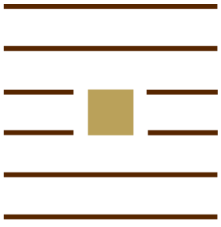

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