Data Sheet: DCA Autocast Engine™

The DCA Autocast Engine™ performs decline curve fitting and forecasting against all wells in your production database, using 10 state-of-the-art decline curve models. The configurable engine can be scheduled to run at your convenience, resulting in 10 EUR estimates for each of your wells.

OVERVIEW

For years, Modified Arps has been used too frequently as the "holy grail" approach most shops rely on and it isn't necessarily the best application to every situation, at least not by itself. For example, operators started introducing a productivity index (PI) approach that incorporated pressure drawdown to introduce an eventual "roll-over" in the forecast as simple Arps was over-projecting over time. There are a lot of technical reasons for this occurring, but it wasn't an isolated incident – it was basin-wide. So, just blindly using Arps without any other consideration is poor form. O&G is technically complex and variable – no one should assume there is a one size fits all approach to projecting well recoveries. It's prudent to have a suite of approaches so you at least have a range of outcomes to pick from, versus putting all your eggs on one discrete outcome.

The DCA Autocast Engine™ will provide the ability to batch forecast all wells in the US. This executable engine, performs automated fitting of production records for any and all wells in a company's database, using any or all of the 10 available decline models. This fitting engine populates the database with best fit parameters for each model, as well as EUR, CUM, and quality-of-fit values. Time and rate pairs (monthly values for 40 years) for each best fit curve are also stored in the database. This data may be accessed for use and further analysis in any tool available to the client (e.g. Excel, Spotfire, Tableau, PowerBI) or any other application that can connect to an SQL Server database. Ability to select a subset of wells in your database, by State, County, Basin, and Field. Wells can be further sub-selected by marking on a map.

The product ships with the Blue River Spotfire **DCA Autocast Viewer™:**
- For all selected wells, time normalized production data is plotted on log scale as points in a scatterplot. Resulting decline curves are superimposed against the production data for all 9 available decline models. Chart can be trellised to show multiple wells / fitting results at a time by selecting multiple / all / single wells from dialog.

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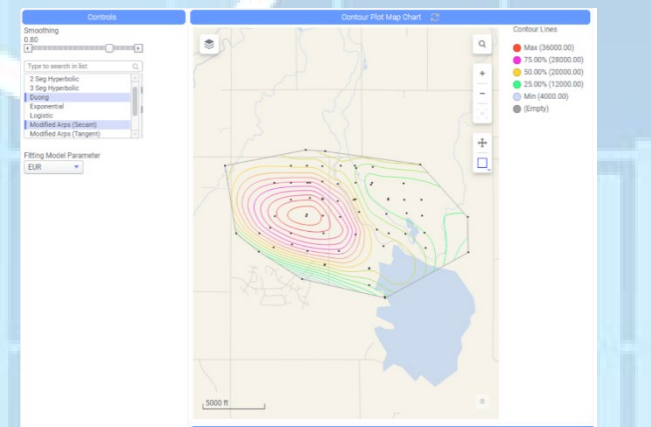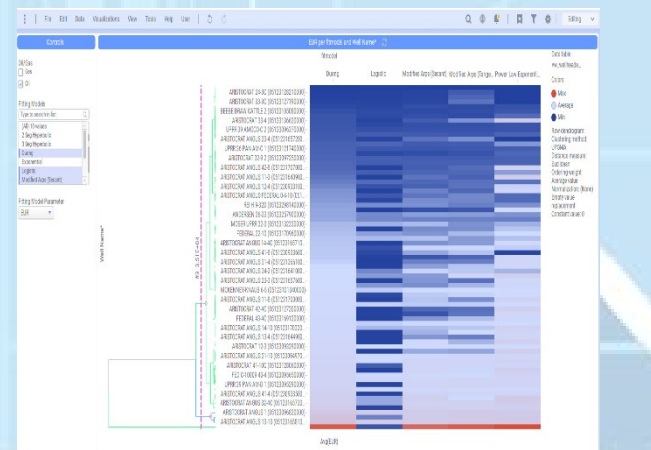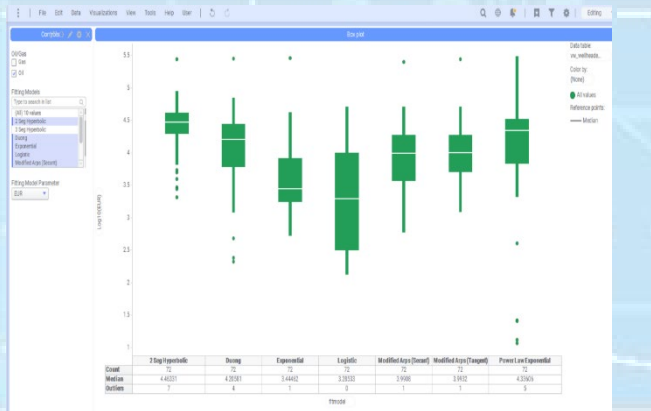
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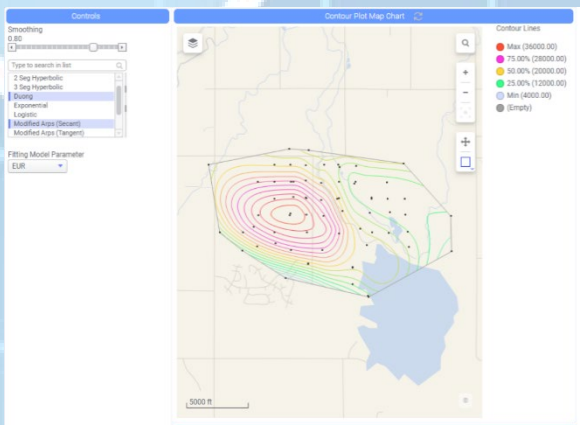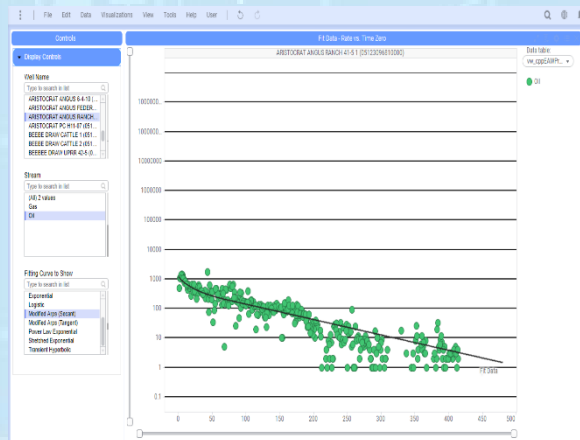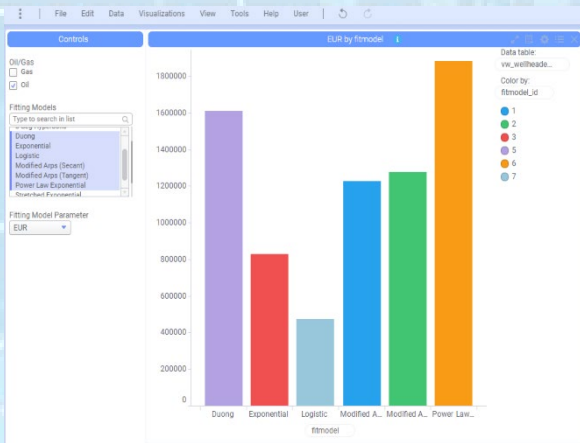
- Box plot shows distribution of fitting result parameters (e.g. EUR, goodness of fit, IP) as a function of the different decline models. This chart can be used to observe which decline models characterize the data best, as well as identify fitting outliers, and determine which decline models represent up-side and down-side (bounding) cases for EUR.

- Bar chart shows similar information as Box Plot, but in a simpler format where each bar represents the fitting result parameter of interest, compared across the different decline models.

- Dendrogram chart shows clustering of wells according to chosen fitting model parameter like EUR, and against chosen decline model. After looking at Box Plot to determine which decline model(s) best characterize the chosen wells, dendrogram can be used to analyze similarities and differences between the wells in that group for a chosen decline model. This can enable further analysis like: what do wells in the highest (or lowest) EUR cluster have in common with respect to operator, completion technique, lateral length, geographic location?

- Contour maps that allow you to develop map views of any of the fitting result parameters spatially. Eur, IP, fitting error could all be charted spatially for relationships and trend analysis.

KEY ATTRIBUTES

Below are the Decline Models available:

1. Modified Arps (Secant)
2. Modified Arps (Tangent)
3. Exponential
4. Stretched Exponential
5. Duong
6. Power Law Exponential
7. Logistic
8. Transient Hyperbolic
9. 2 Segment Hyperbolic
10. DCA Scan Stochastic

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