



USING NEURAL NETWORKS TO OPTIMIZE MIDLAND BASIN COMPLETIONS

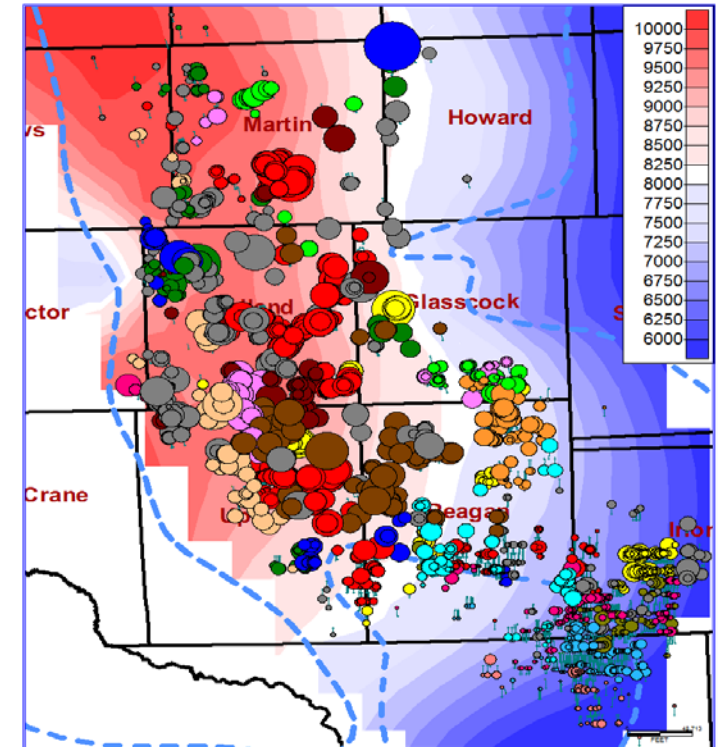
*A Tech Team Solution
by Liberty Oilfield Services*



Dataset Description

- Permian (Midland) Basin – Wolfcamp B
- ~2300 horizontal wells
- 66 completion and reservoir/geology attributes
- Response variable: Normalized 365-day oil production (bbl/ft)

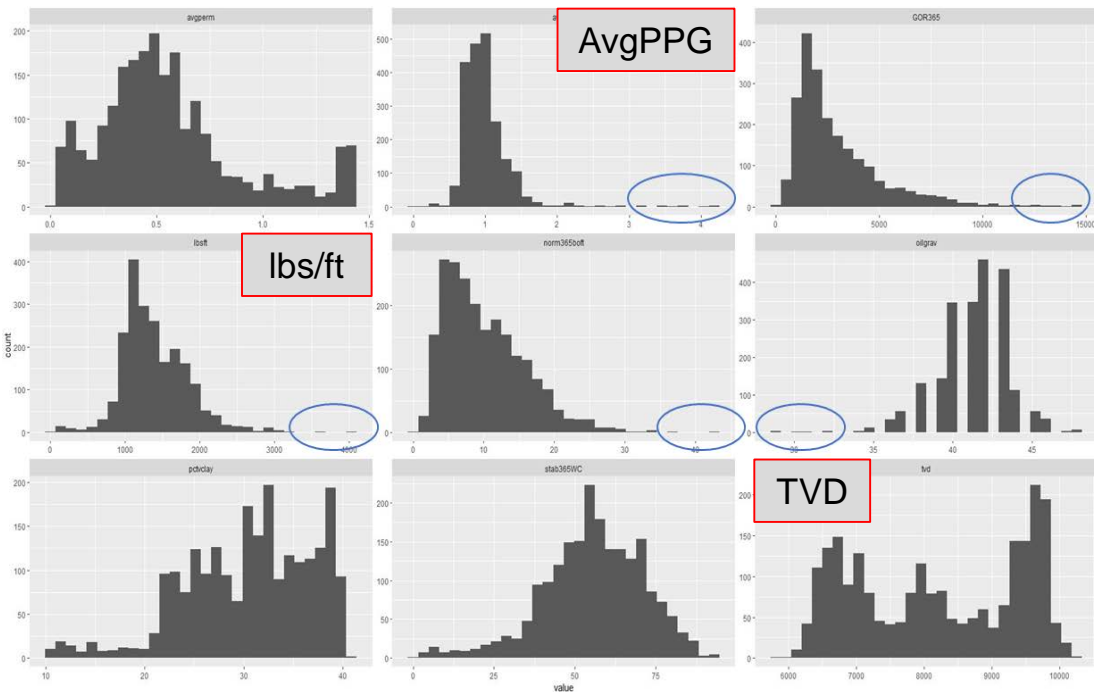
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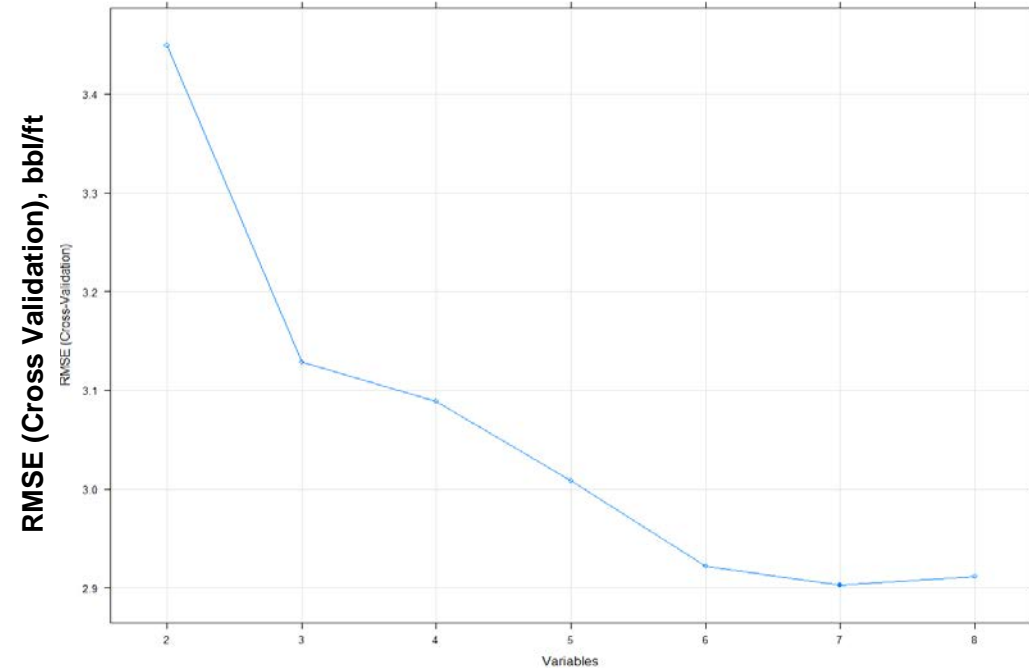
Midland (Wolfcamp B) Basin with TVD contours

Data Pre-Processing and Exploratory Data Analysis

Out of 66 variables, 8 variables selected for modeling

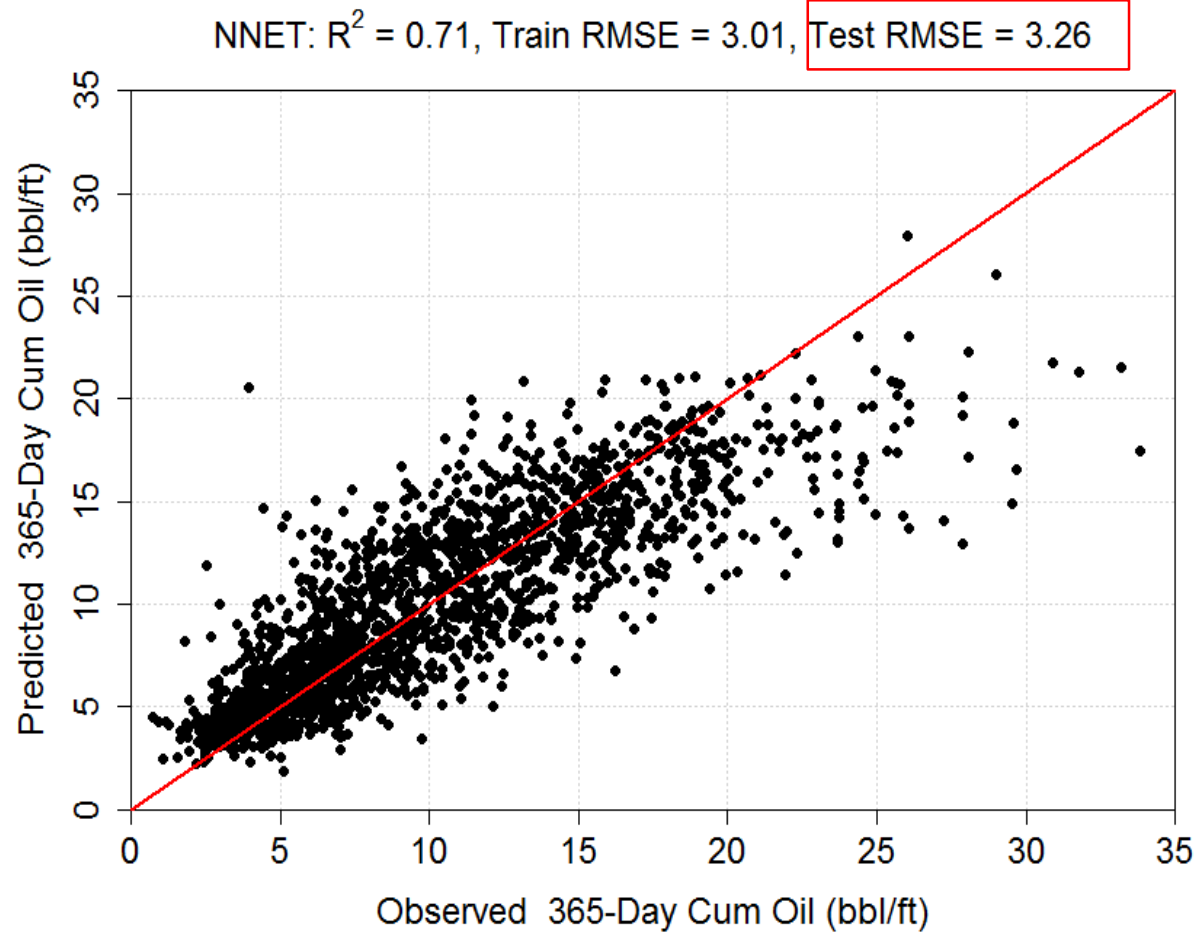


Identification of Influential Points using Histograms

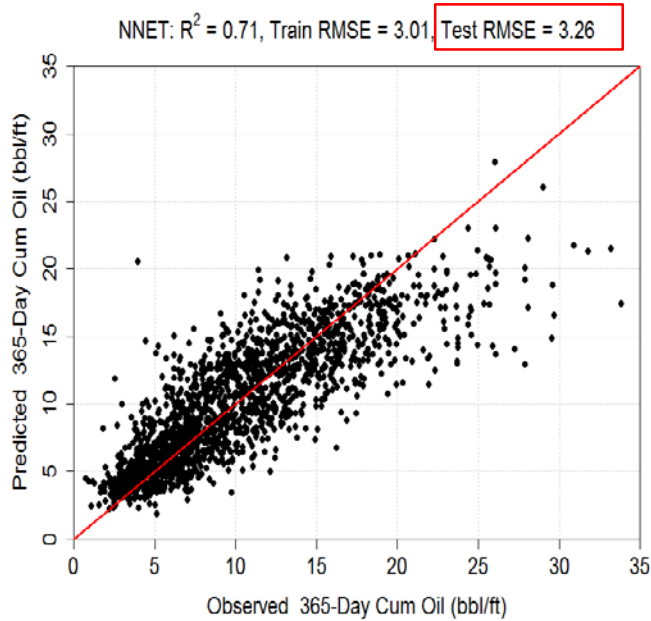


Recursive Feature Elimination

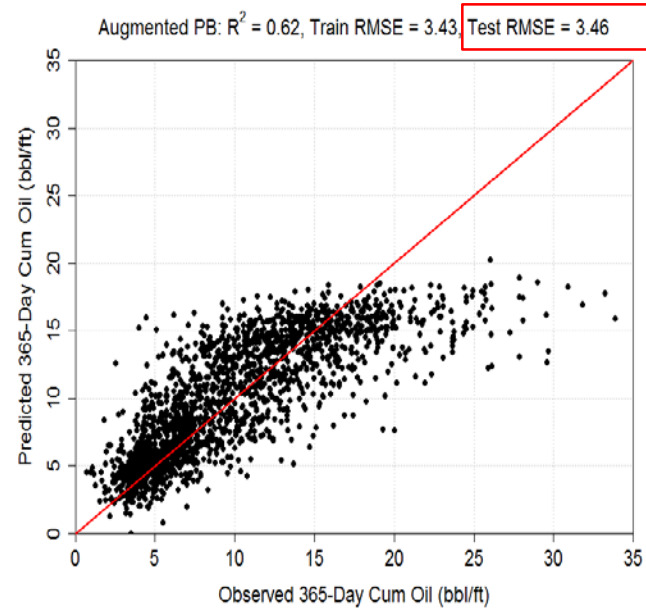
Neural Network Training and Testing



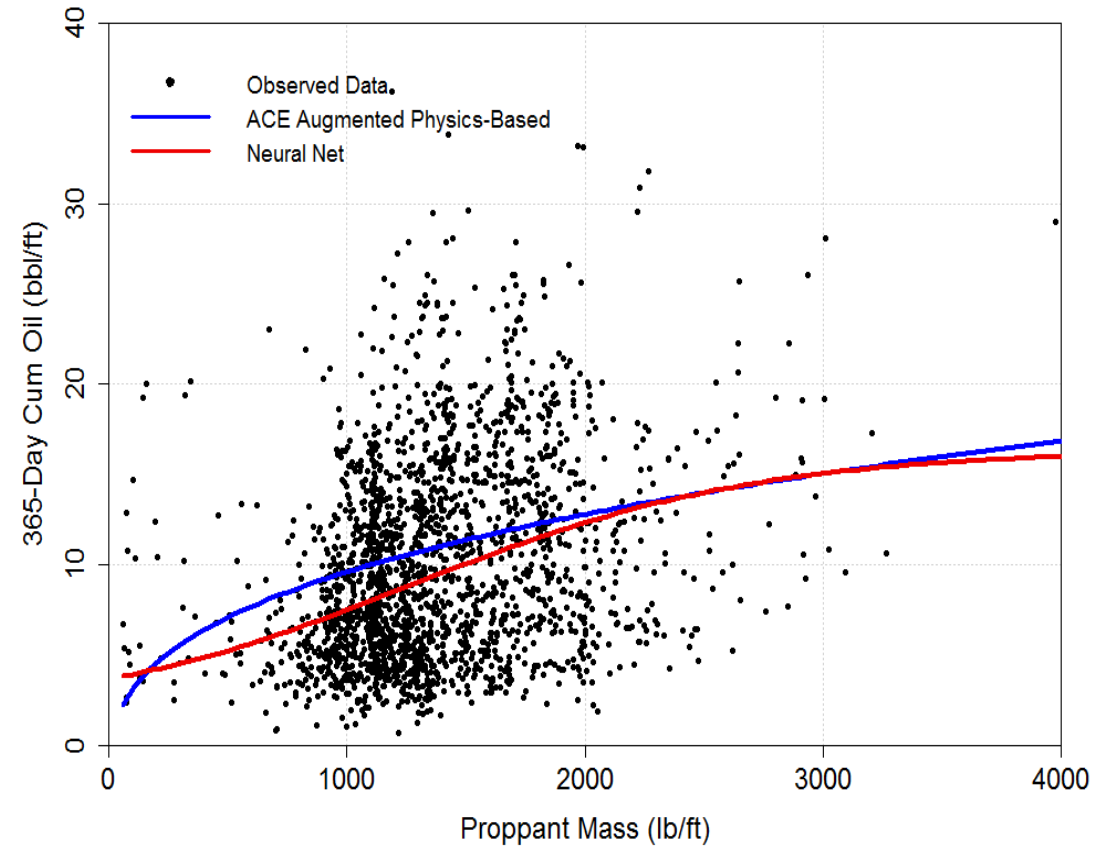
Training and Prediction Comparison



5 **Neural Network**



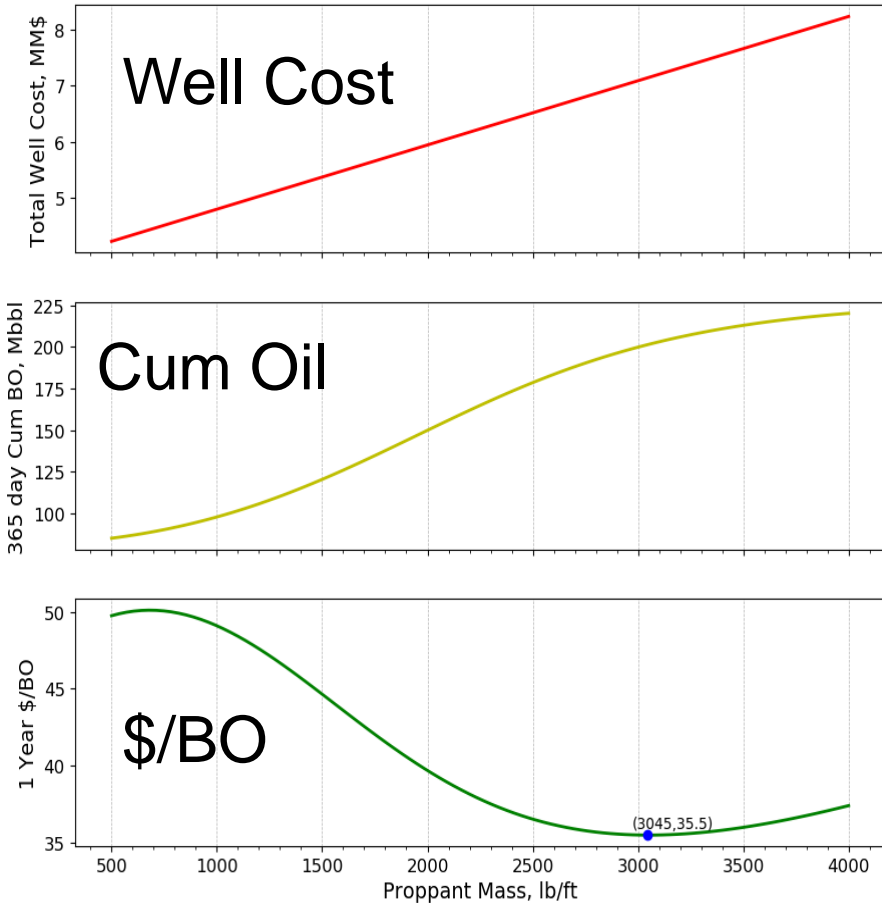
ACE Physics-Based



ANN shows more incremental oil from 1,000 to 2,000 lb/ft

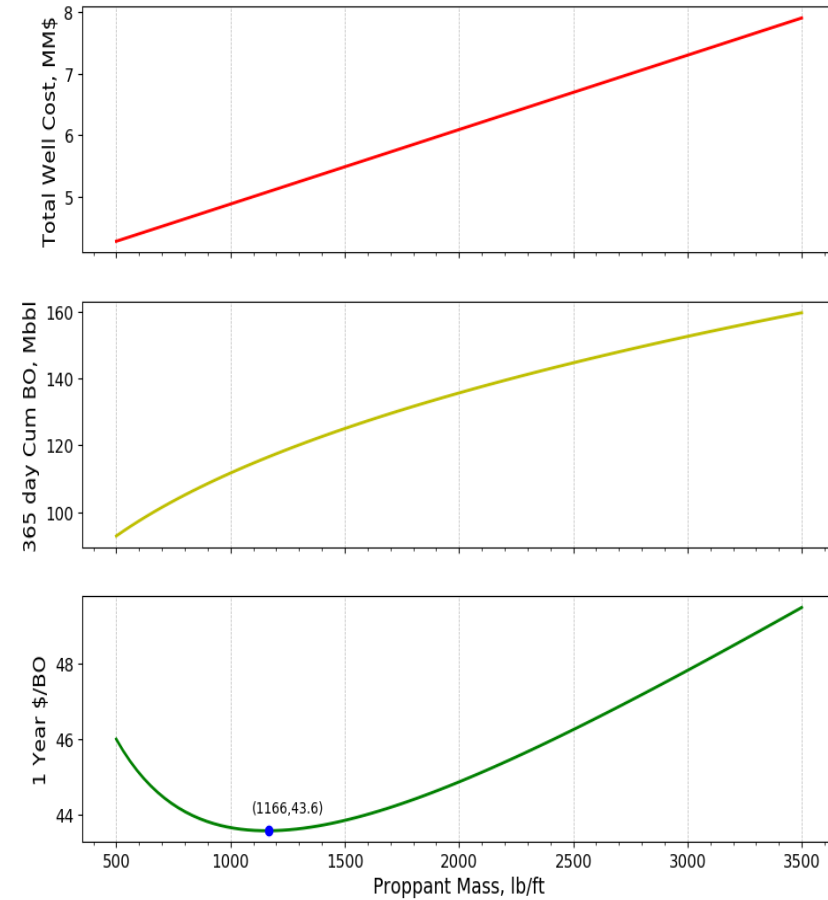
Economic Optimization

Neural Network Optimization



Optimal Point: 3,045 lb/ft SW with \$35.5/BO

ACE Physics-Based Optimization



Optimal Point: 1,166 lb/ft SW with \$43.6/BO

