Probabilistic Decline Curve Analysis Report

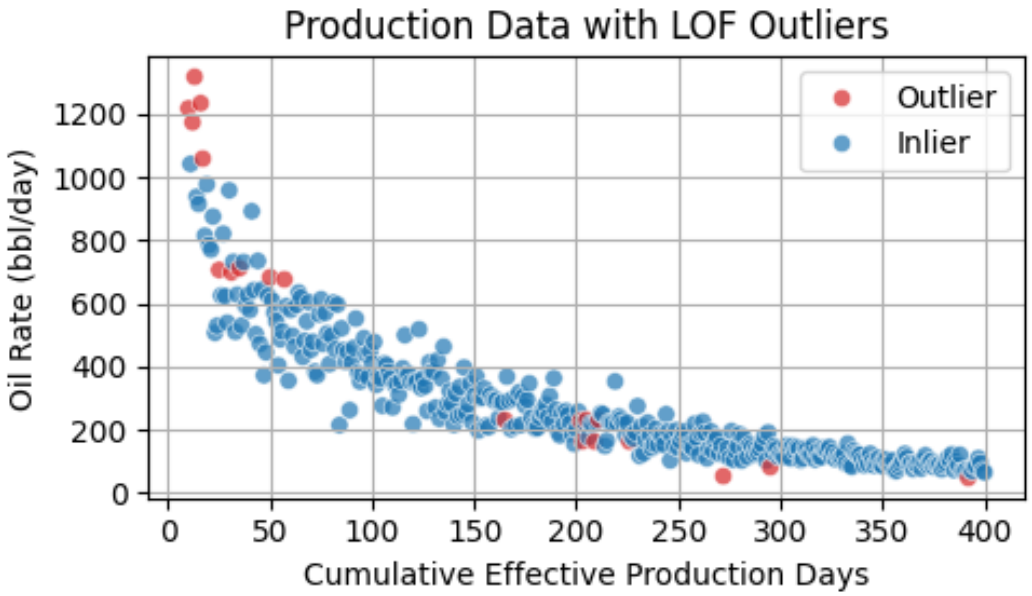
1. Overview

This report summarizes the results of the probabilistic decline curve analysis, including data cleaning, outlier detection, Monte Carlo sampling, model fitting, hindcast testing, and estimated ultimate recovery (EUR) analysis.

Four models were fit to each synthetic sample:
- **Arps** (Exponential/Hyperbolic)
- **Stretched Exponential Model (SEM)**
- **Logistic Growth Model (LGM)**
- **Capacitance-Resistance Model (CRM)**

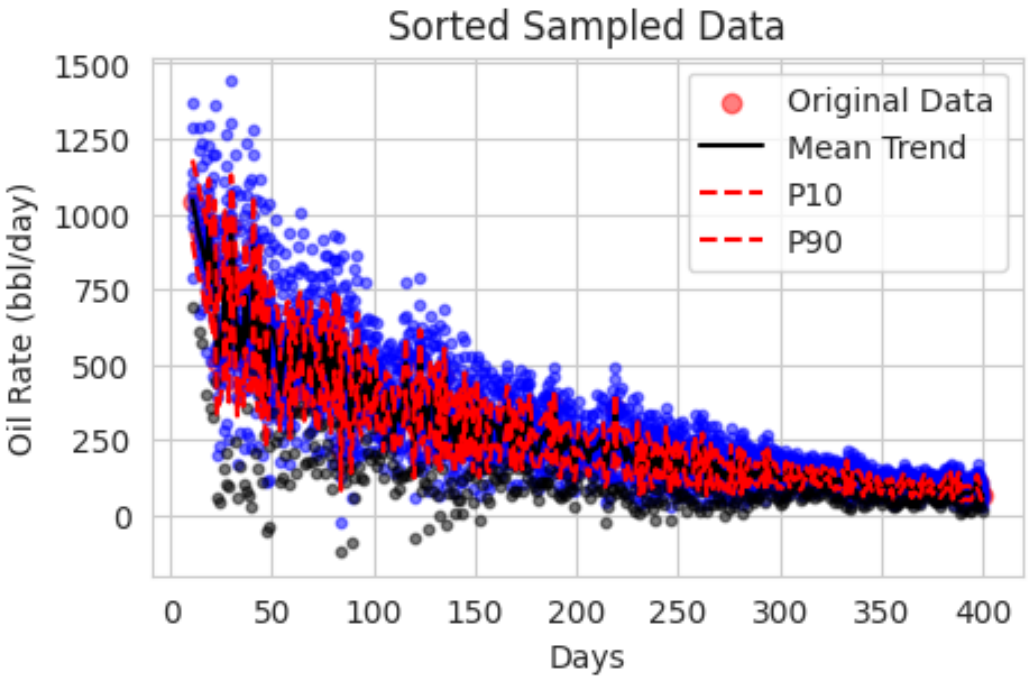
2. Initial Production Data & Outlier Detection

Initial Production Data with LOF Outlier Detection



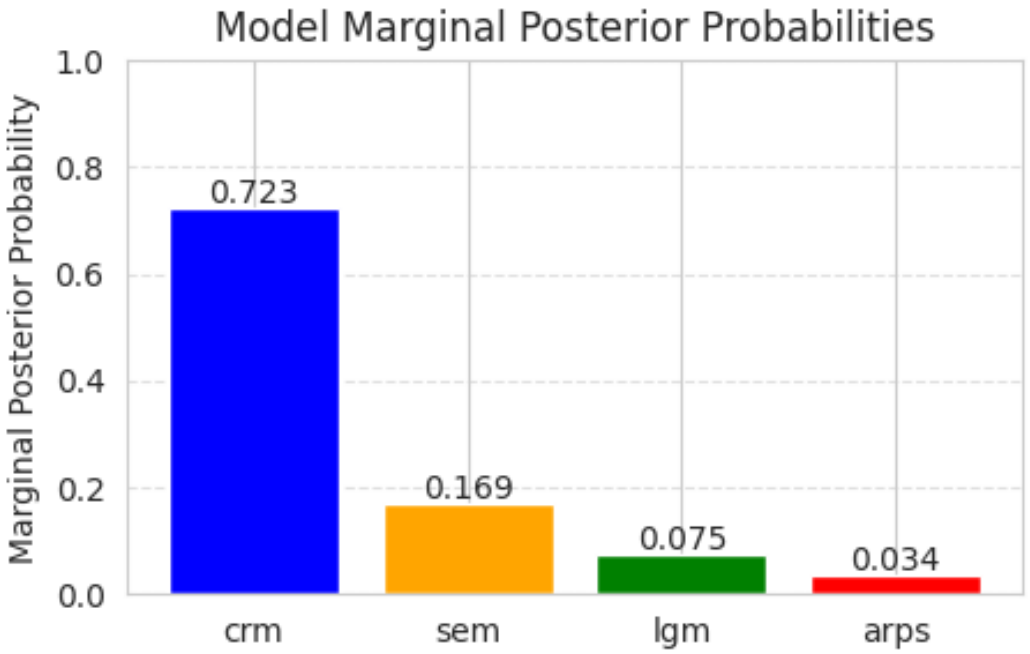
2a. Monte Carlo Sampling

Sampled N Sorted Data Sets



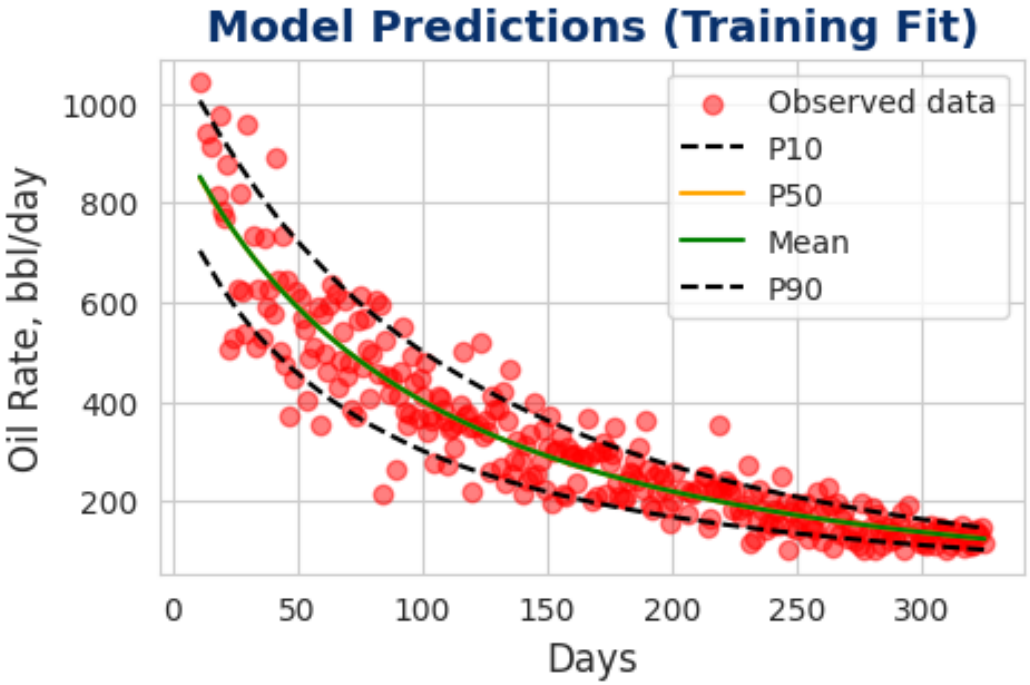
3. Marginal Posterior Probabilities of Models

Model Posterior Probabilities

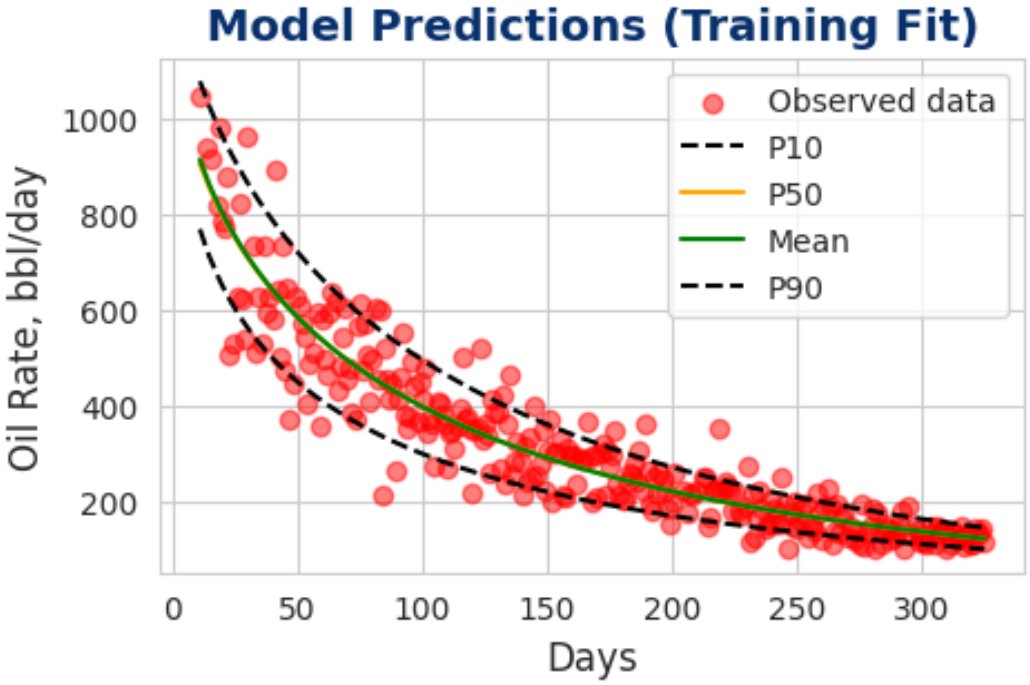


3a. Training Fit per Model

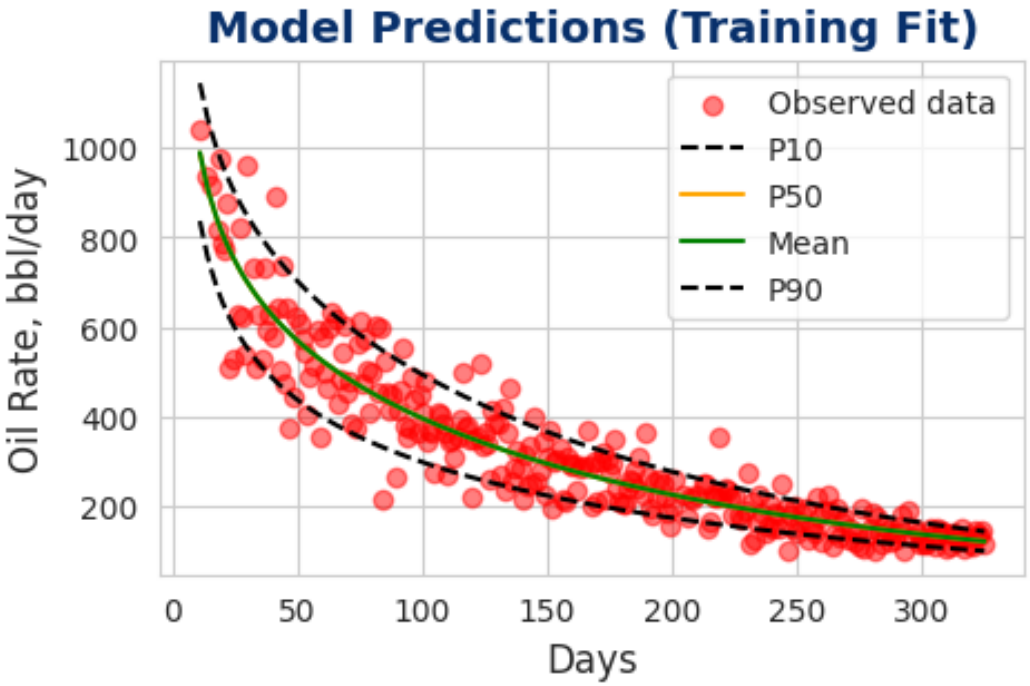
Training Fit — ARPS



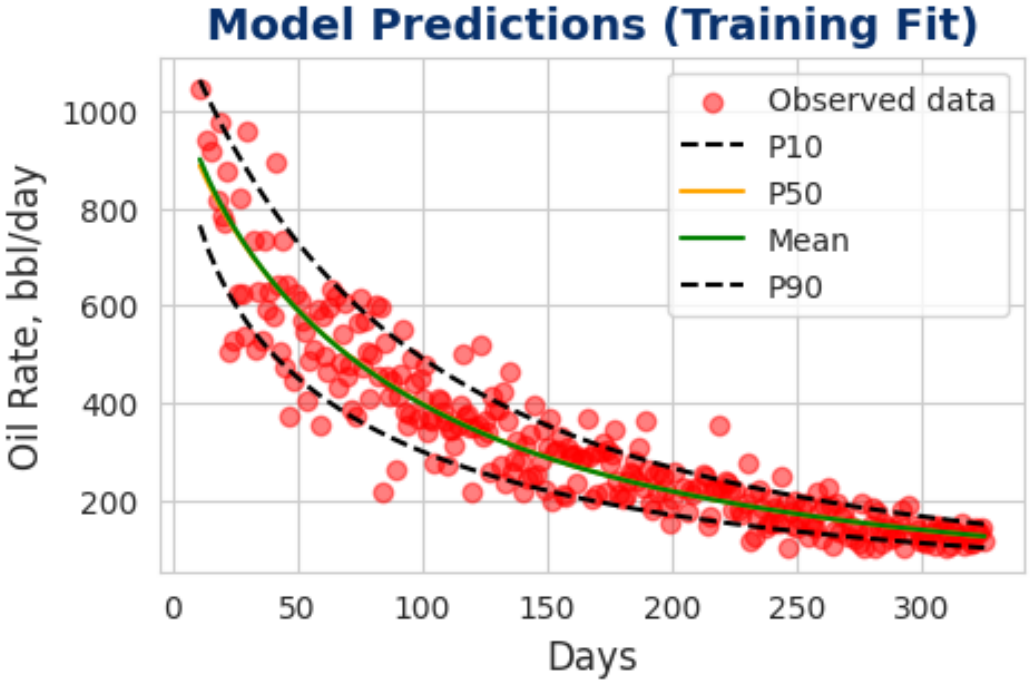
Training Fit — SEM



Training Fit — CRM

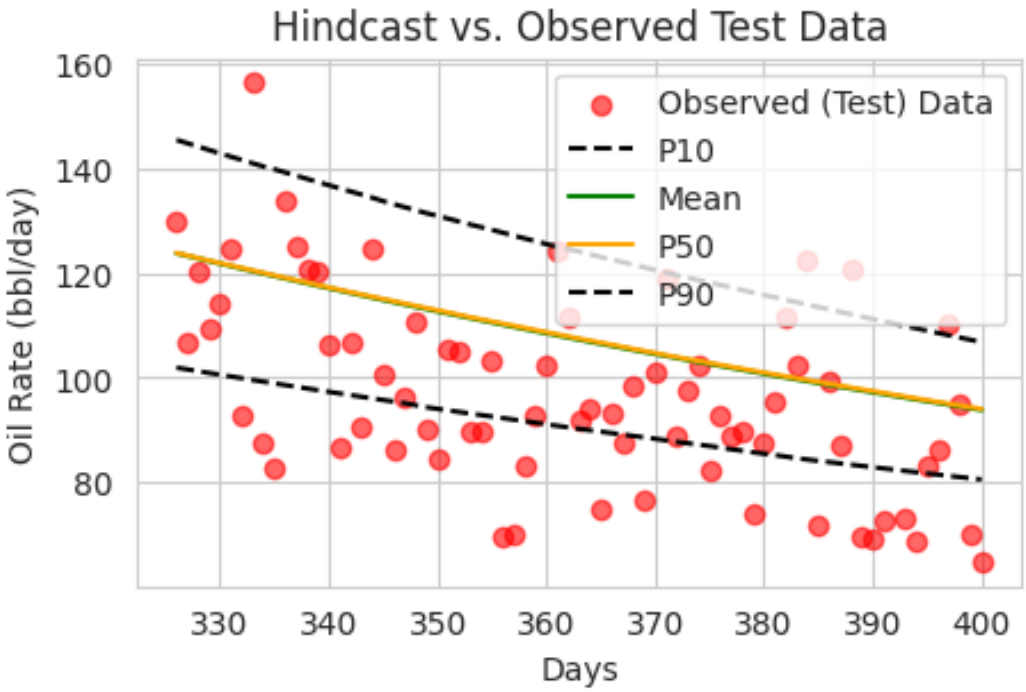


Training Fit — LGM

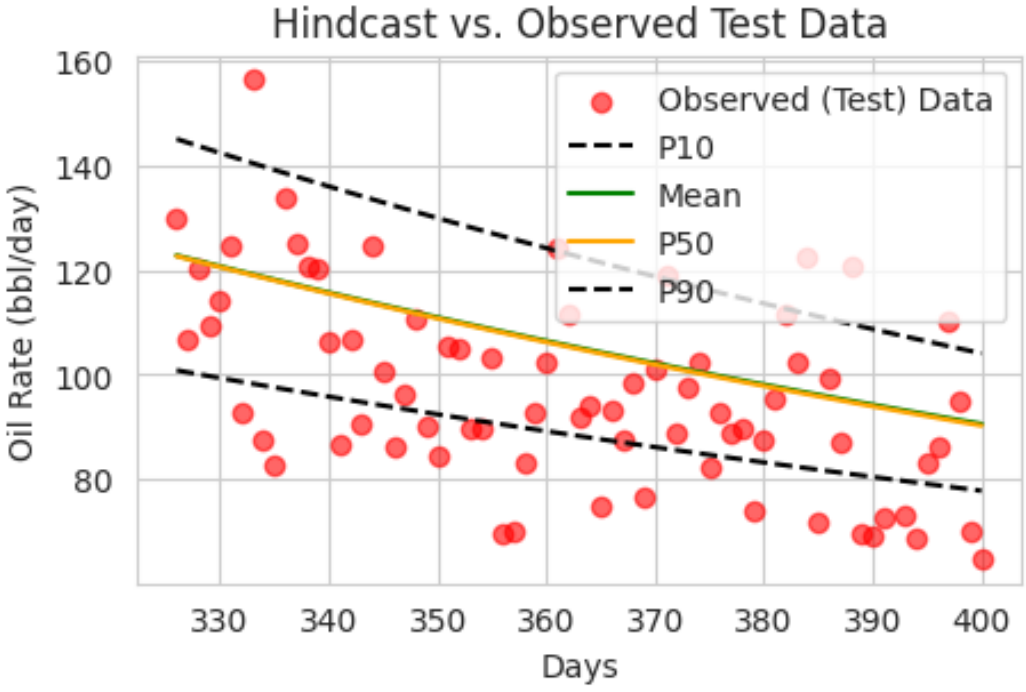


3b. Hindcast Test per Model

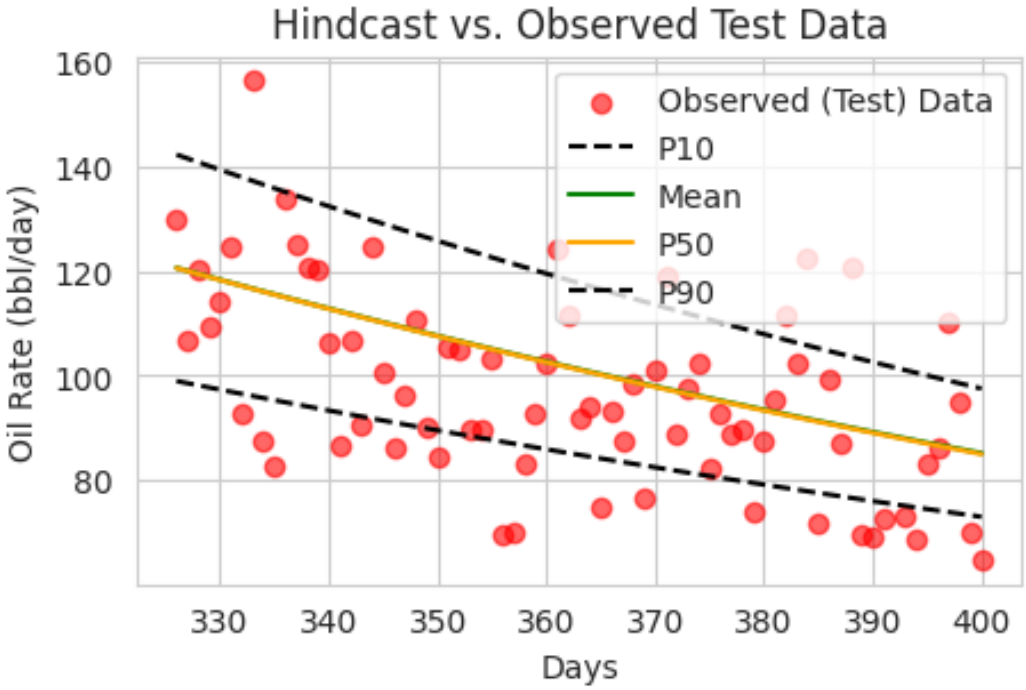
Hindcast Test — ARPS



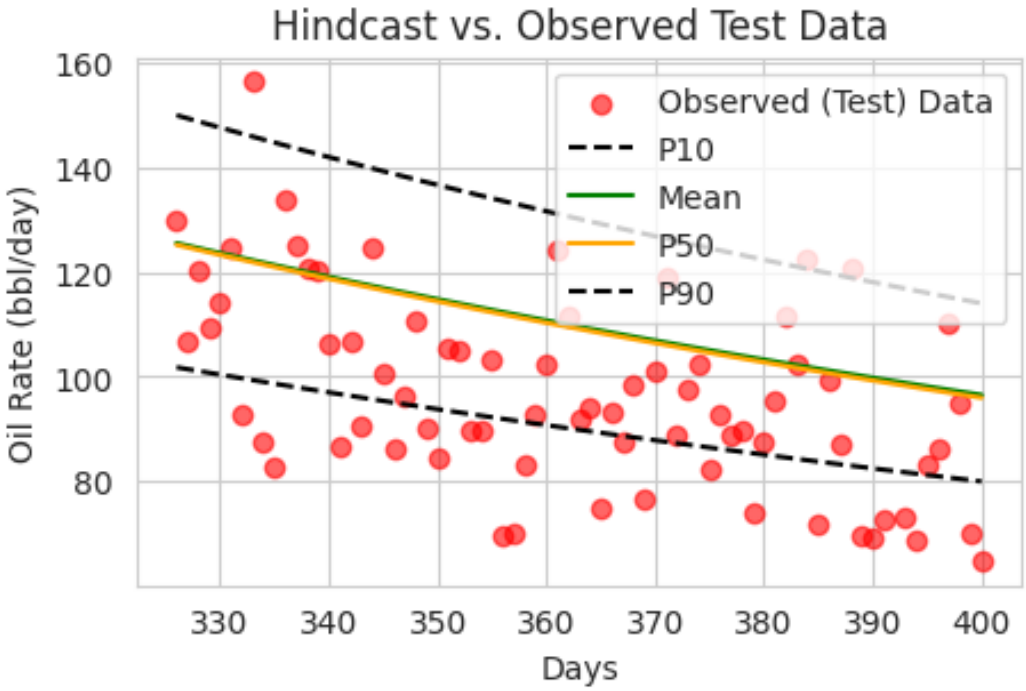
Hindcast Test — SEM



Hindcast Test — CRM



Hindcast Test — LGM



4. Model-Specific EUR Statistics

Per Model EUR Summary

Model	p10	p50	mean	p90
arps	151,596	160,734	162,664	177,200
sem	139,413	140,735	141,913	145,638
crm	131,511	131,795	132,188	132,811
lgm	162,863	164,999	166,458	172,448

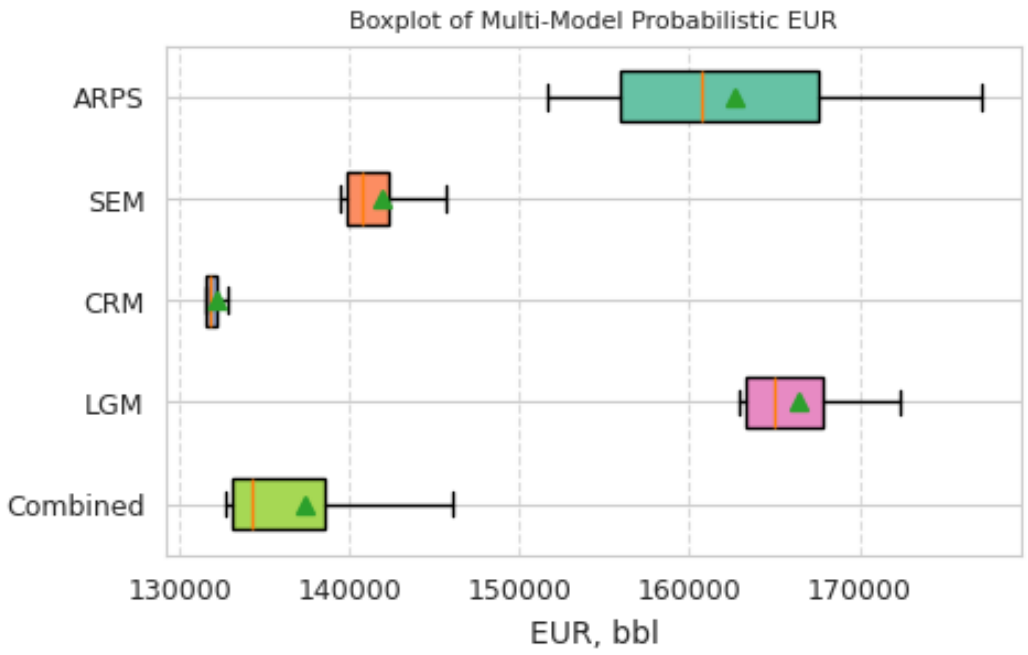
5. Combined EUR Statistics

Combined Model EUR Summary

p10	p50	mean	p90
132,749	134,315	137,355	146,059

5a. Multi-Model EUR Boxplot

Boxplot of Multimodel Probabilistic EUR



Note: Expected 15-yr cumulative oil production from Pan-CRM model (synthetic data): ~130,000 bbl.

6. Conclusion

The analysis demonstrates the range of production forecasts and uncertainties associated with the selected decline curve models. Multi-model probabilistic forecasts provide a robust outlook for future production.