Forecasting new wells’ supply of oil & natural gas

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Motivation

• To improve long term estimates of oil and natural gas supply forecast
• To identify trends of production by producing pools and technology
• Flexibility in developing elasticity-based scenarios in forecast
• To build a geological knowledge-base for non-geologist scholars
Methodology

Data retrieval
- Production data
- Pools’ data
- Wells’ data

Data Validation
- No data
- Mismatching date
- Abnormal values

Disaggregation
- By completion date
- Producing pool
- Trajectory

Curve fitting
\[
\min \sum_t e_t^2 = (Q_t - \hat{Q}_t)^2
\]
\[
\hat{Q}_t = \frac{Q_i}{(1 + b \cdot D_i \cdot t)^b}
\]
Characteristics of NM Permian & San Juan Basins

- Total off 26 plays

- 6 have produced neither natural gas nor crude oil since 2001 (Artesia, Barnett, Entrada, Leonardian, Lewis & Woodford)

Either vertical technology or both vertical and horizontal are present (no play uses horizontal as a sole production technology)
Crude Oil Production by 3 plays

- **WOLFCAMP**
- **BONE SPRING**
- **DELAWARE**
Natural Gas Production by 3 plays

- BONE SPRNG
- DELAWARE
- WOLFCAMP

MCF Natural Gas Production

- Millions

Date Range: Jan-01 to Jun-17
Aggregated Crude Oil Production

- ESTIMATED
- SMOOTHED
- ACTUAL
Forecast of future supply

Production data  Wells’ data  Pools data

Type curve parameters

Type curve parameters forecast

Well count forecast

New wells’ play

New wells’ supply forecast

well count

elasticity
Questions and comments