Technical Session Agenda
2016 SPEE Annual Meeting

Monday, June 6, 2016 **2016 SPEE Technical Session 1** **Salon I/II**

10:30 AM	**Complete to Compete (The Impact of Enhanced Completions on Well Performance, Economics and Resource Potential)**	Gibson Scott

BIOGRAPHY
Gibson Scott – RS Energy Group, CFA, Executive Director

Gibson became a member of RSEG in June 2004 after working for two years in Talisman Energy's land acquisitions and divestitures group. While at Talisman, Gibson was responsible for land contracts analysis, post-closing due diligence and systems integration. Gibson was raised in an oil services environment, having lived, studied and worked in six countries, with summers spent as an oilfield services mechanic in Nisku, Alberta. In 2002, Gibson graduated from the University of Western Ontario with a bachelor degree in administrative and commercial studies, specializing in finance and administration, and earned his CFA charter in 2009. Gibson is a frequent presenter at industry conferences and a team lead on consulting/advisory projects.

Areas of Focus: Bakken, Niobrara, Miss Lime, and company/asset valuations.

COMPLETE TO COMPETE

SPEE 2016

RS ENERGY GROUP

Gibson Scott, CFA
Executive Director

Dane Gregoris, EIT
Assistant Vice President

Justin Lepore, EIT
Associate

Kristina Repchuk
Associate

Introduction
18 Years of Trusted Energy Research

1998

Ross Smith Energy Group

Introduced independent, technically driven investment research

2011

ITG Investment Research

RSEG acquired by ITG. Solidified our position as a premier independent Energy Research and Advisory firm in North America

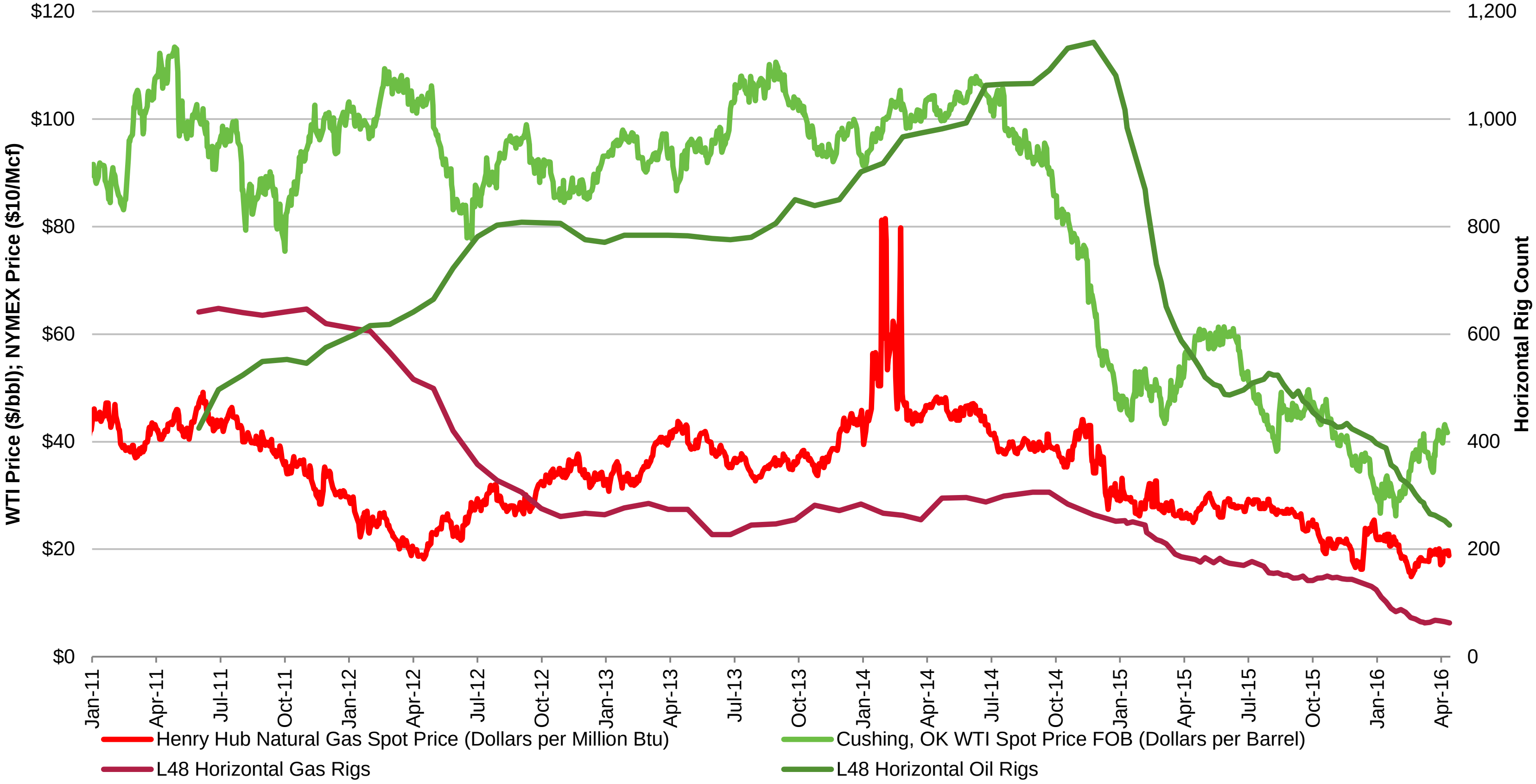
2016

RS Energy Group

The Energy Research team will again be an independent company financed by Warburg Pincus to expand the research and advisory offering

WTI Prices and Rig Activity

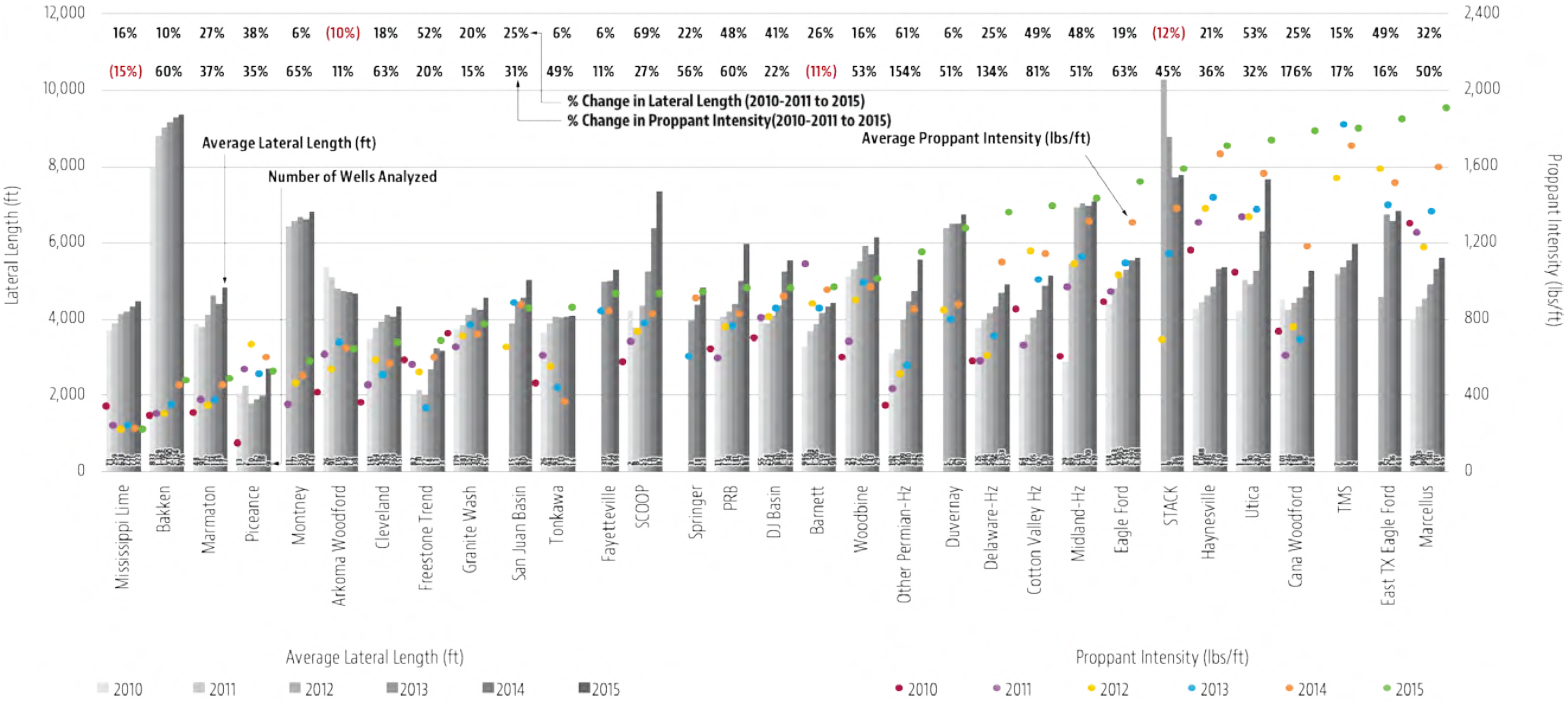
Lower Activity for Lower Prices



Source: RSEG, EIA, Rig Data

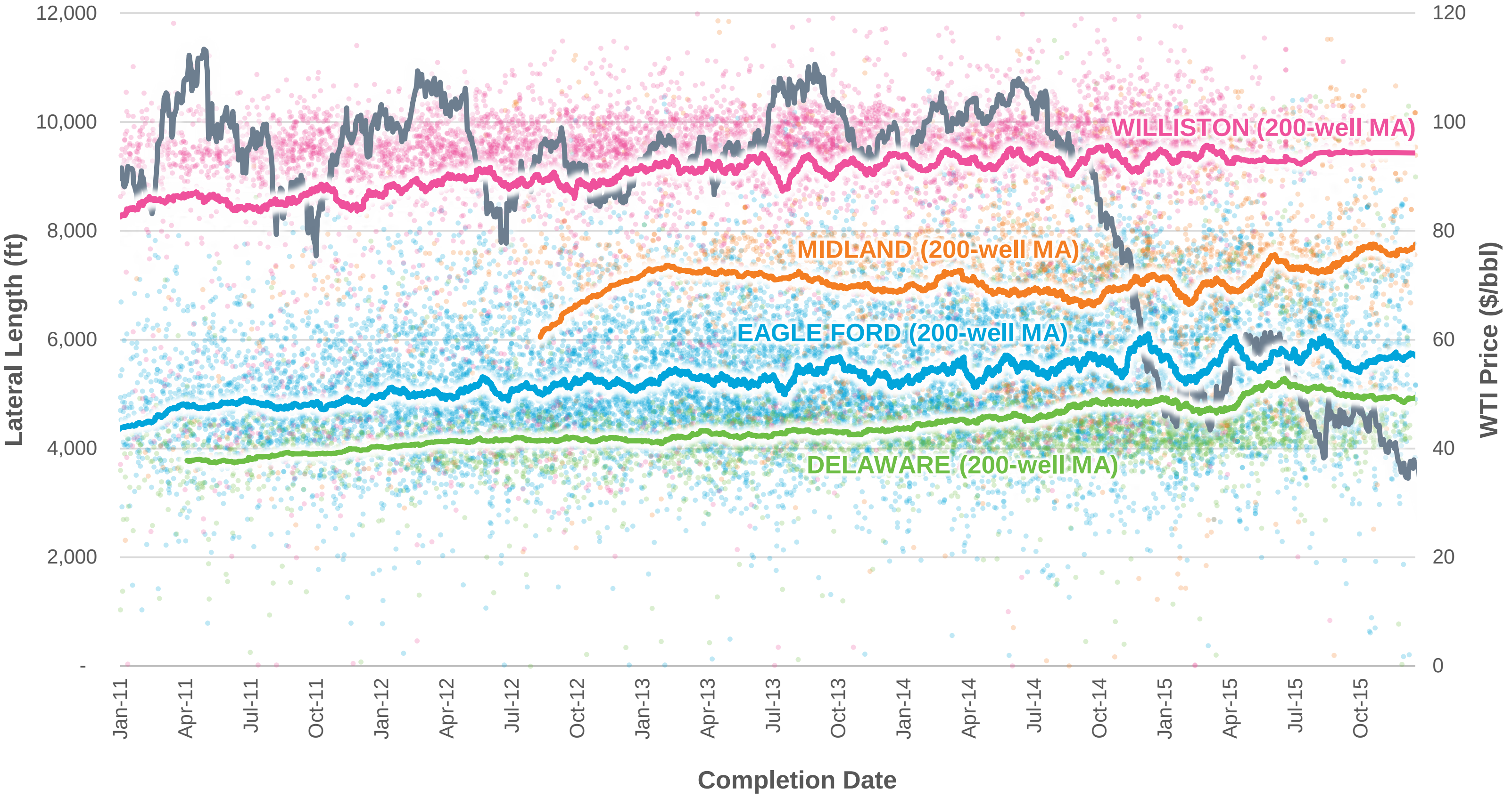
Relative Completions Intensity

Lateral Lengths and Proppant Intensities Climbing



Source: RSEG, raw data provided by Drilling Info Inc.

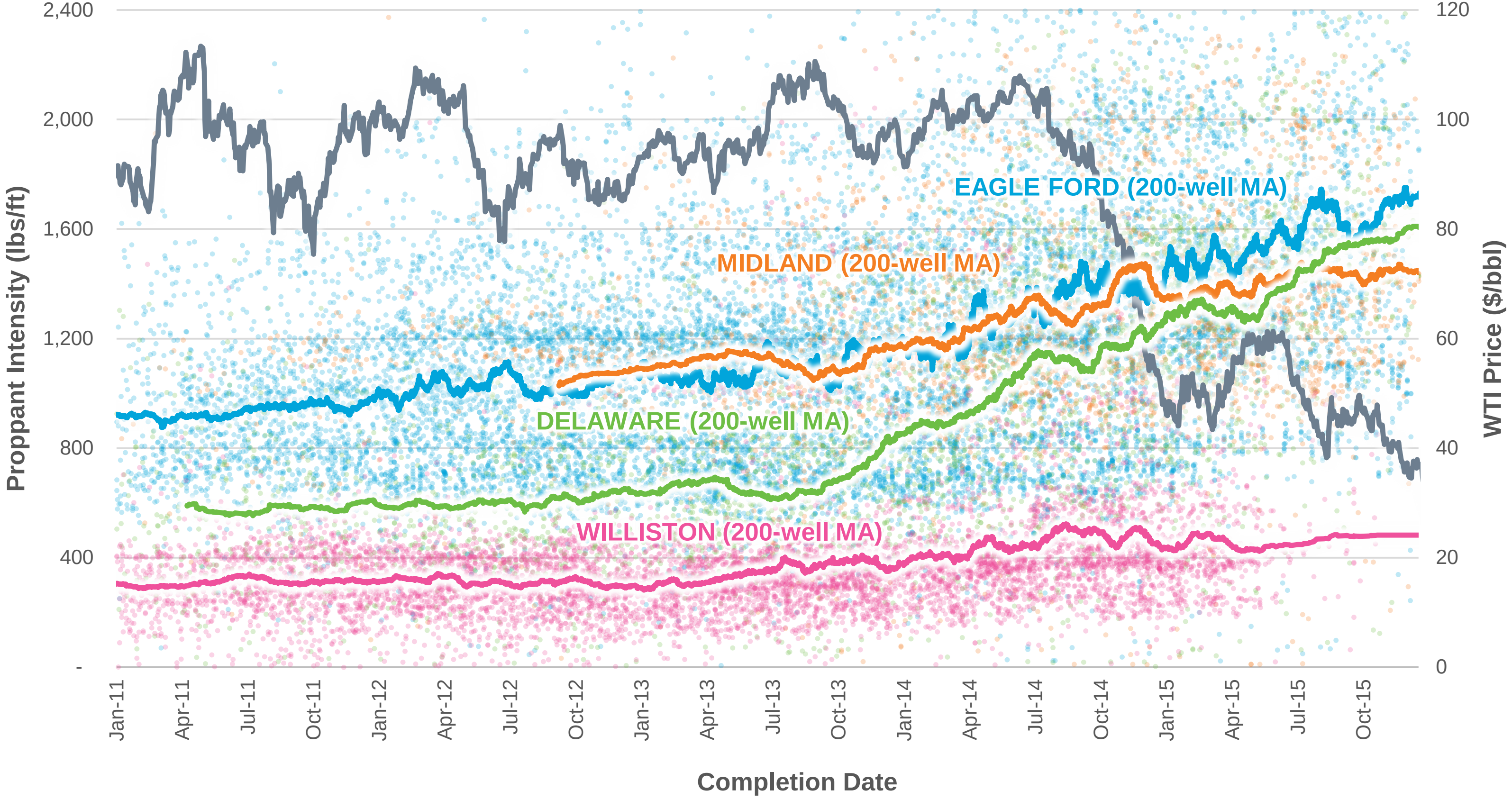
Big 4 Lateral Lengths
Longer Laterals for Lower Prices



Source: RSEG, EIA, Texas RRC, NDIC

Big 4 Proppant Intensities

Larger Completions for Lower Prices

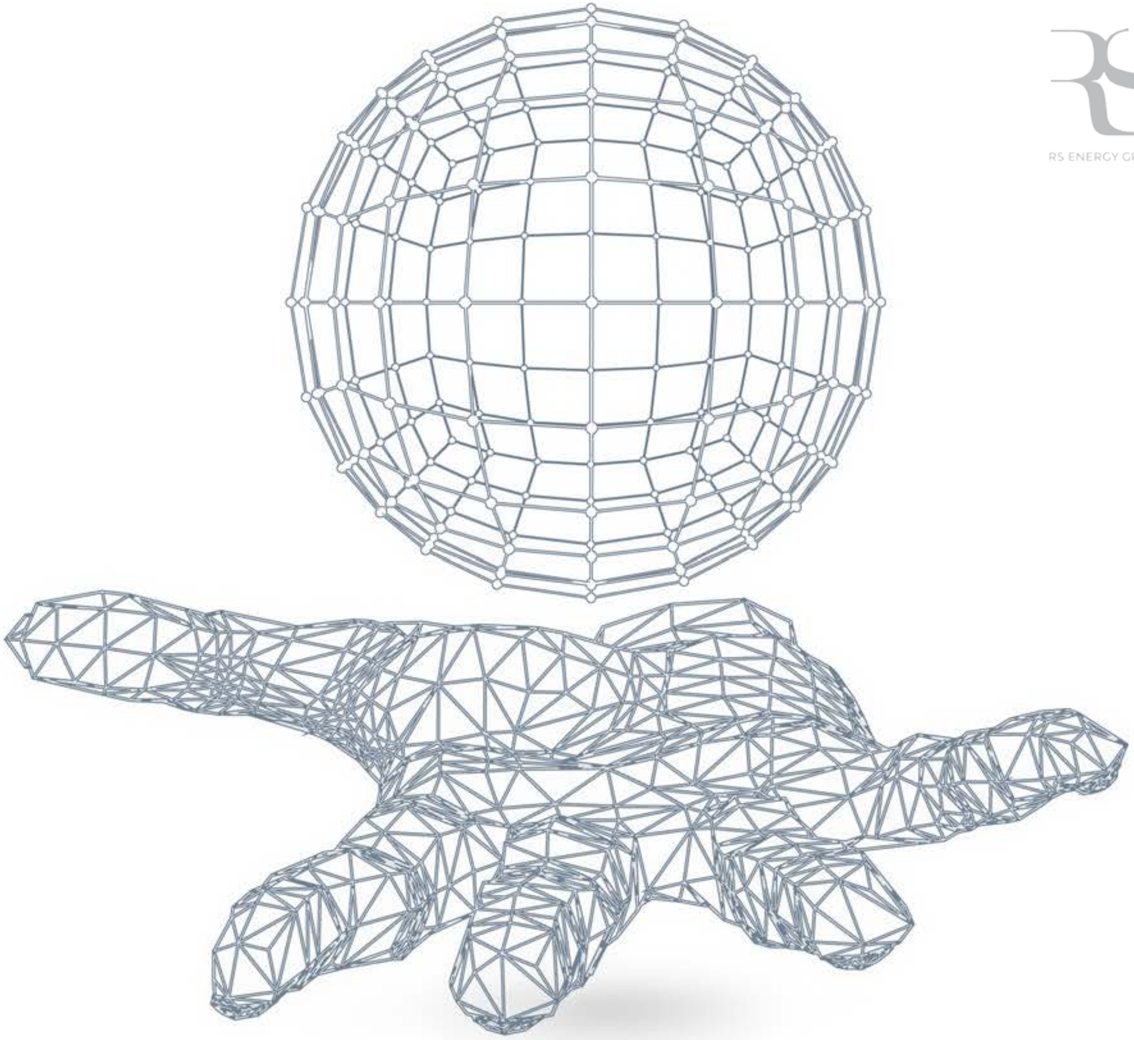


Source: RSEG, EIA, Texas RRC, NDIC

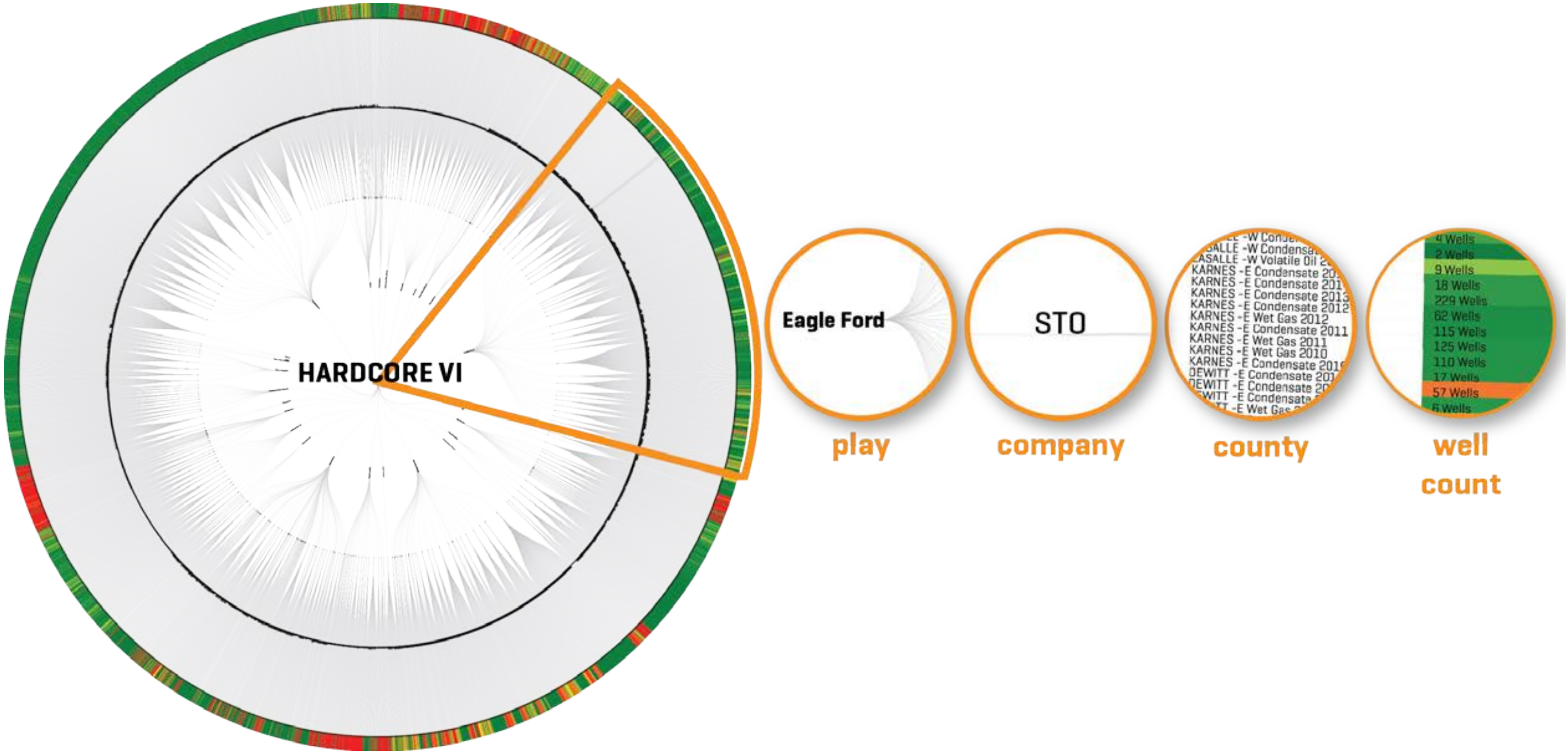
Key Performance Inputs
What Drives Change?

Source: RSEG

Methodology



L48 Breakdown
Organizing the Data



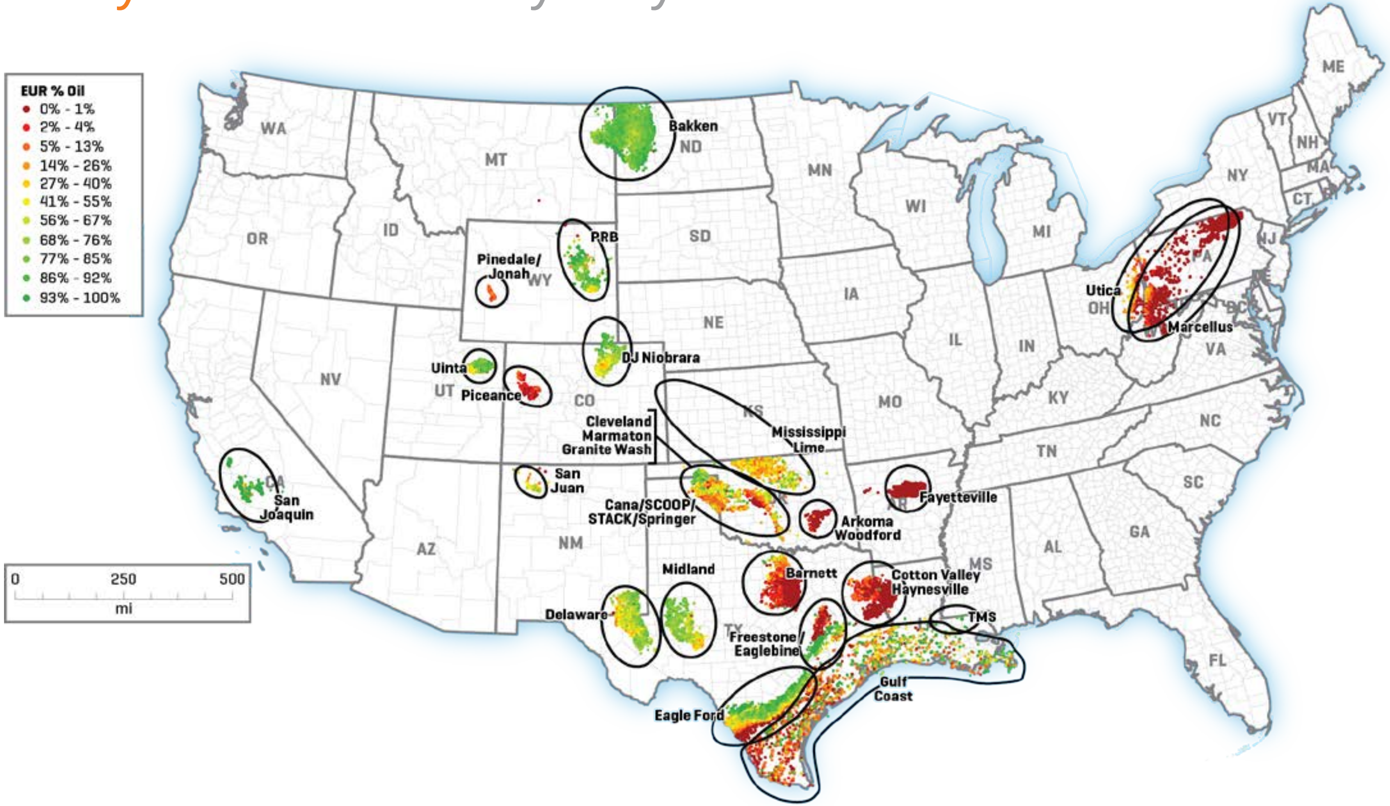
Source: RSEG

L48 Landscape

Wells and Plays Analyzed

L48 Landscape

Hydrocarbon Mix by Play

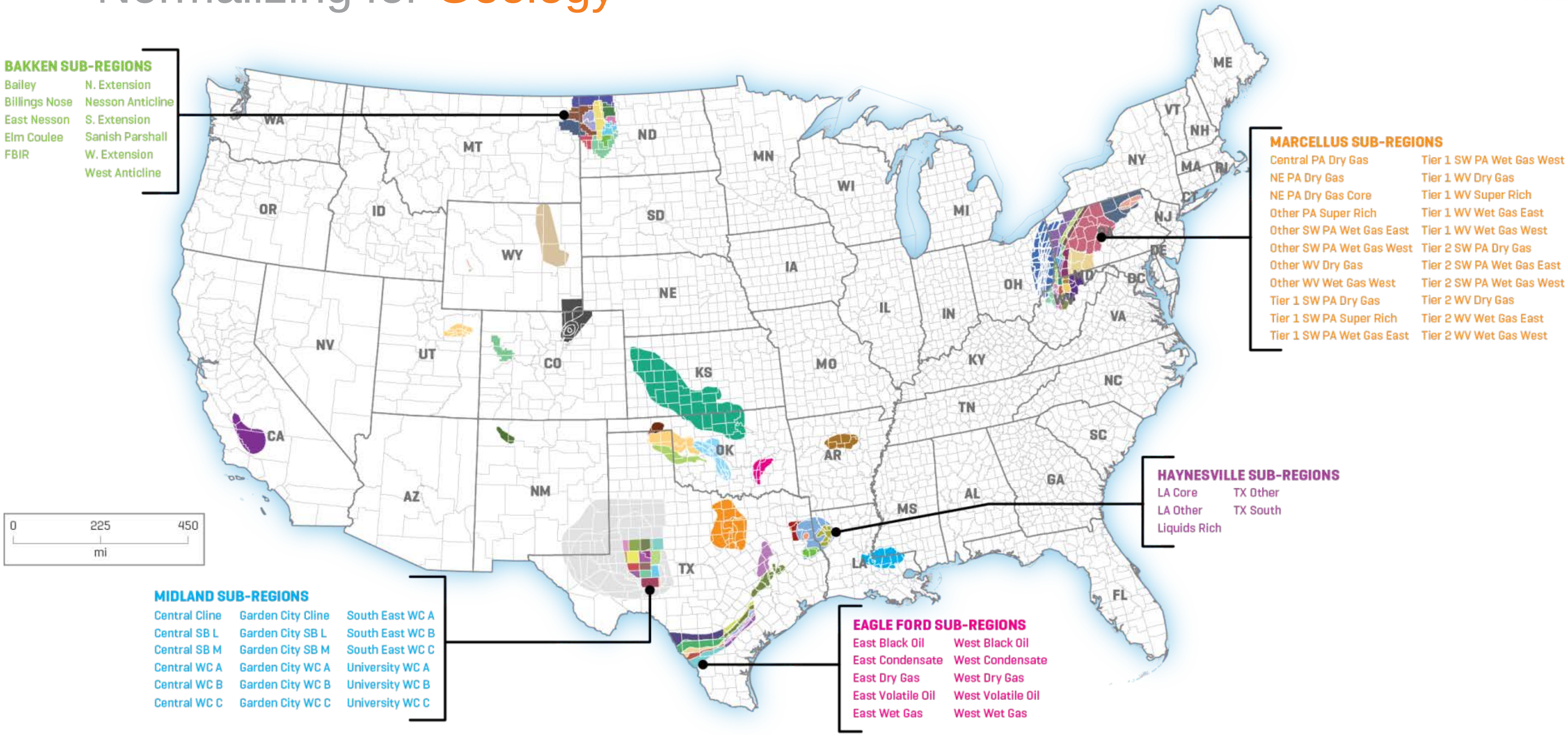


Source: RSEG

Performance

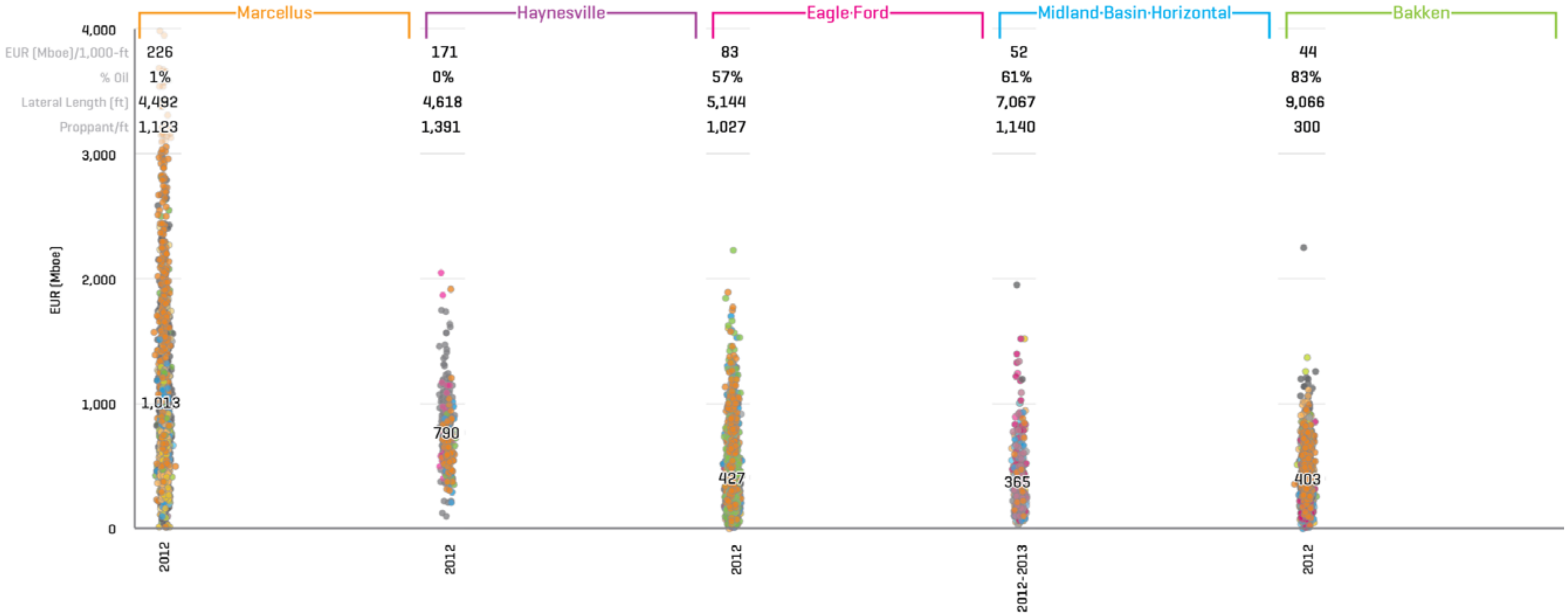
L48 Landscape

Normalizing for Geology



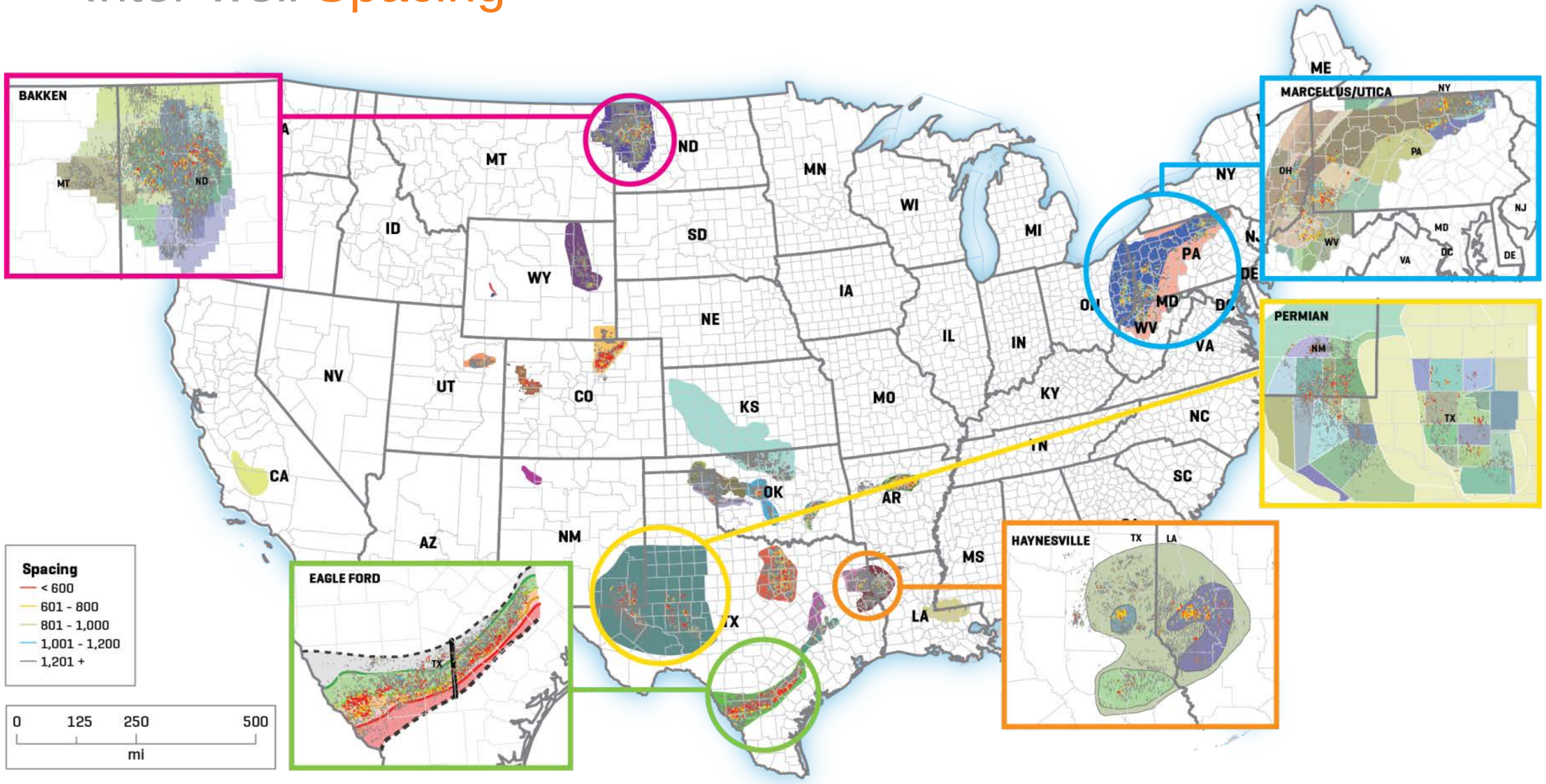
Source: RSEG

EURs – 2012
The Way Things Were



Source: RSEG

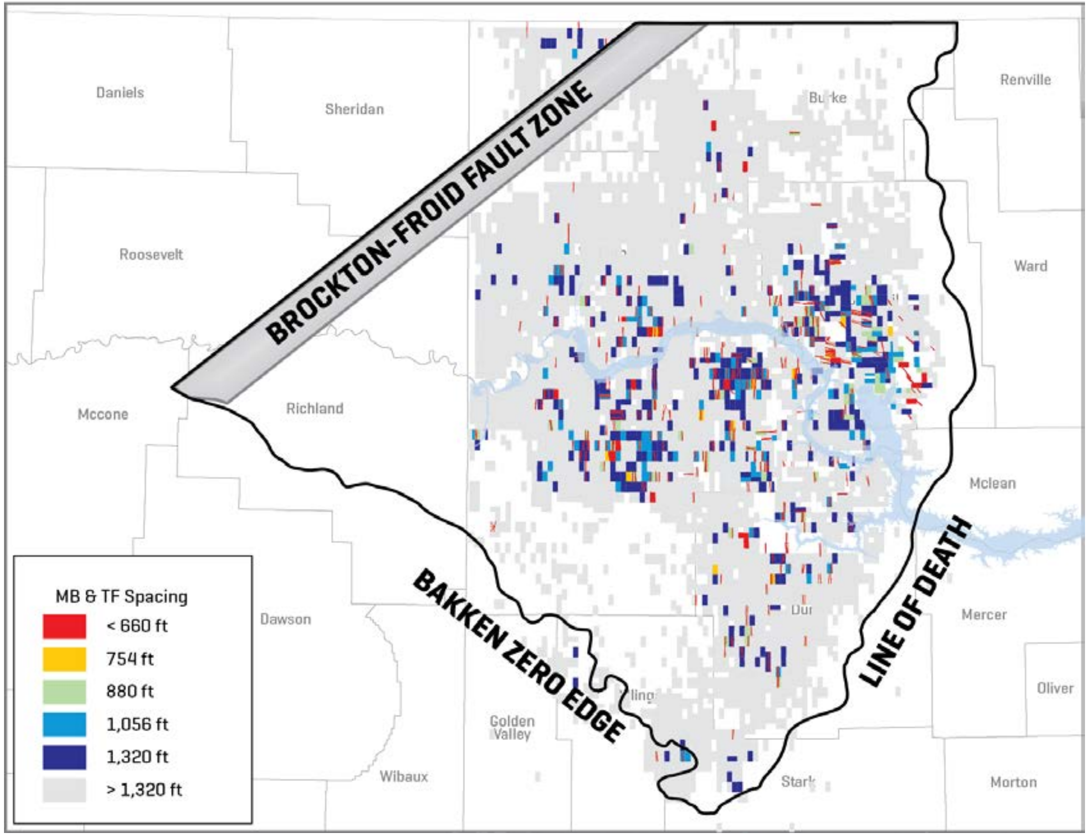
L48 Landscape
Inter-well Spacing



Source: : RSEG, raw data provided by Drilling Info, Inc. and state agencies

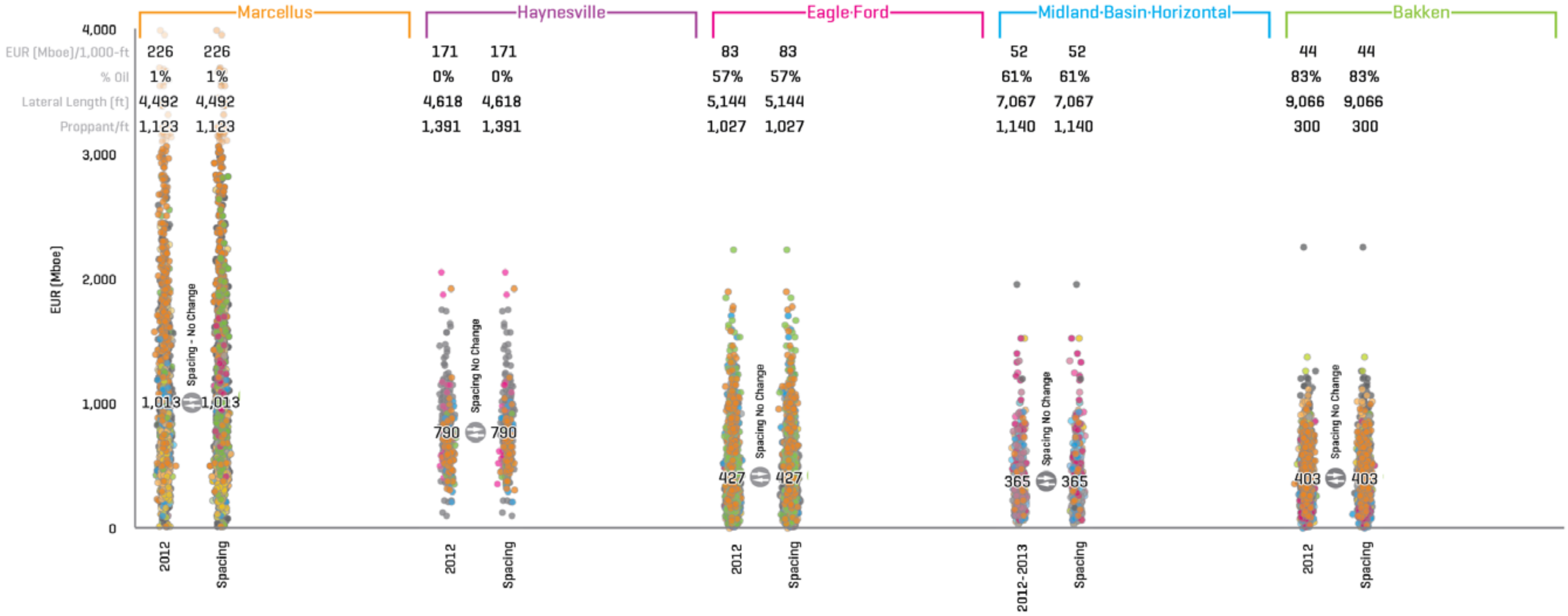
Williston Basin Density Pilots

Even Mature Basins Have A Lot of Running Room



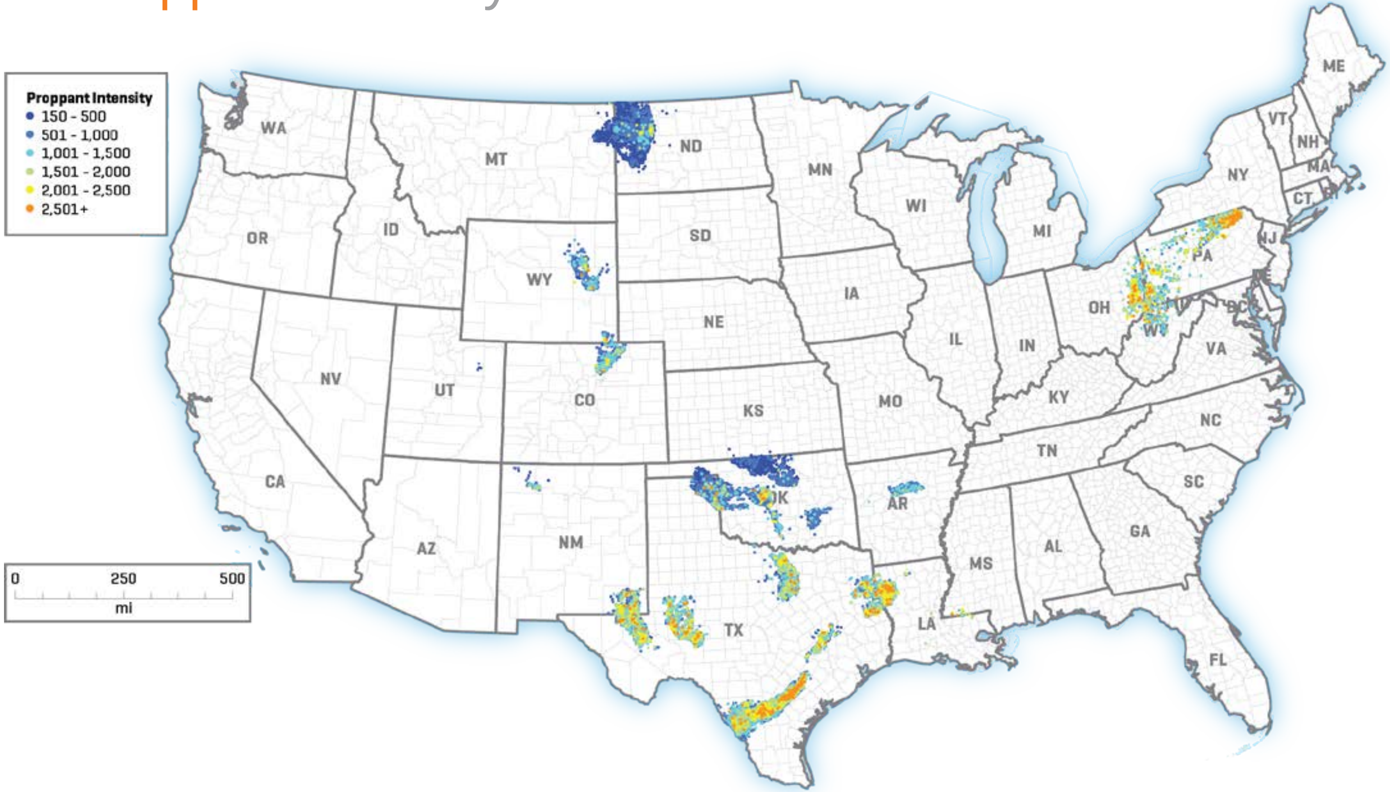
Source: : RSEG, NDIC

EURs – Normalized for Geology and Lateral Length
No Change from Spacing



Source: RSEG

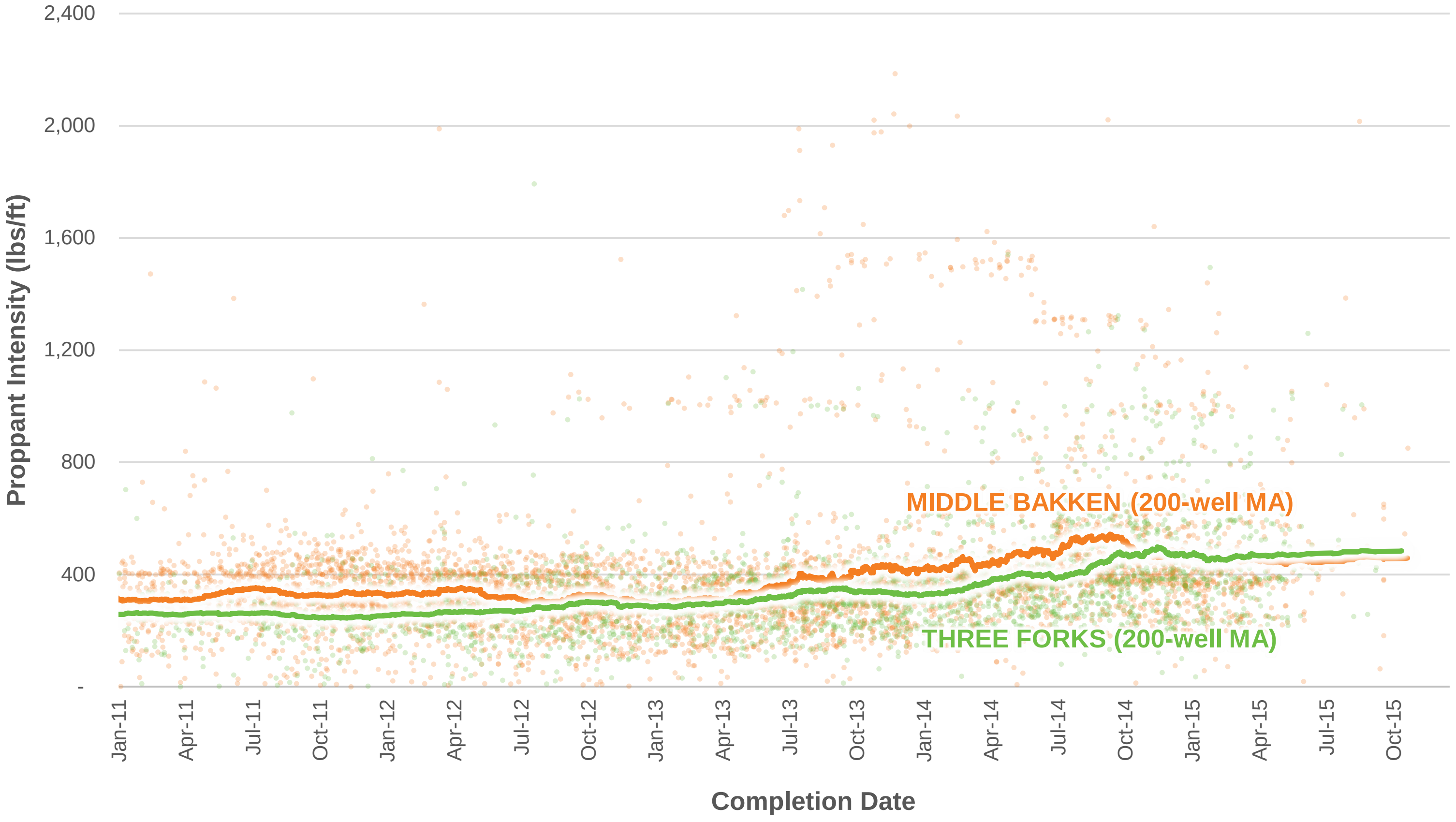
L48 Landscape
Proppant Intensity



Source: : RSEG, raw data provided by Drilling Info, Inc. and state agencies

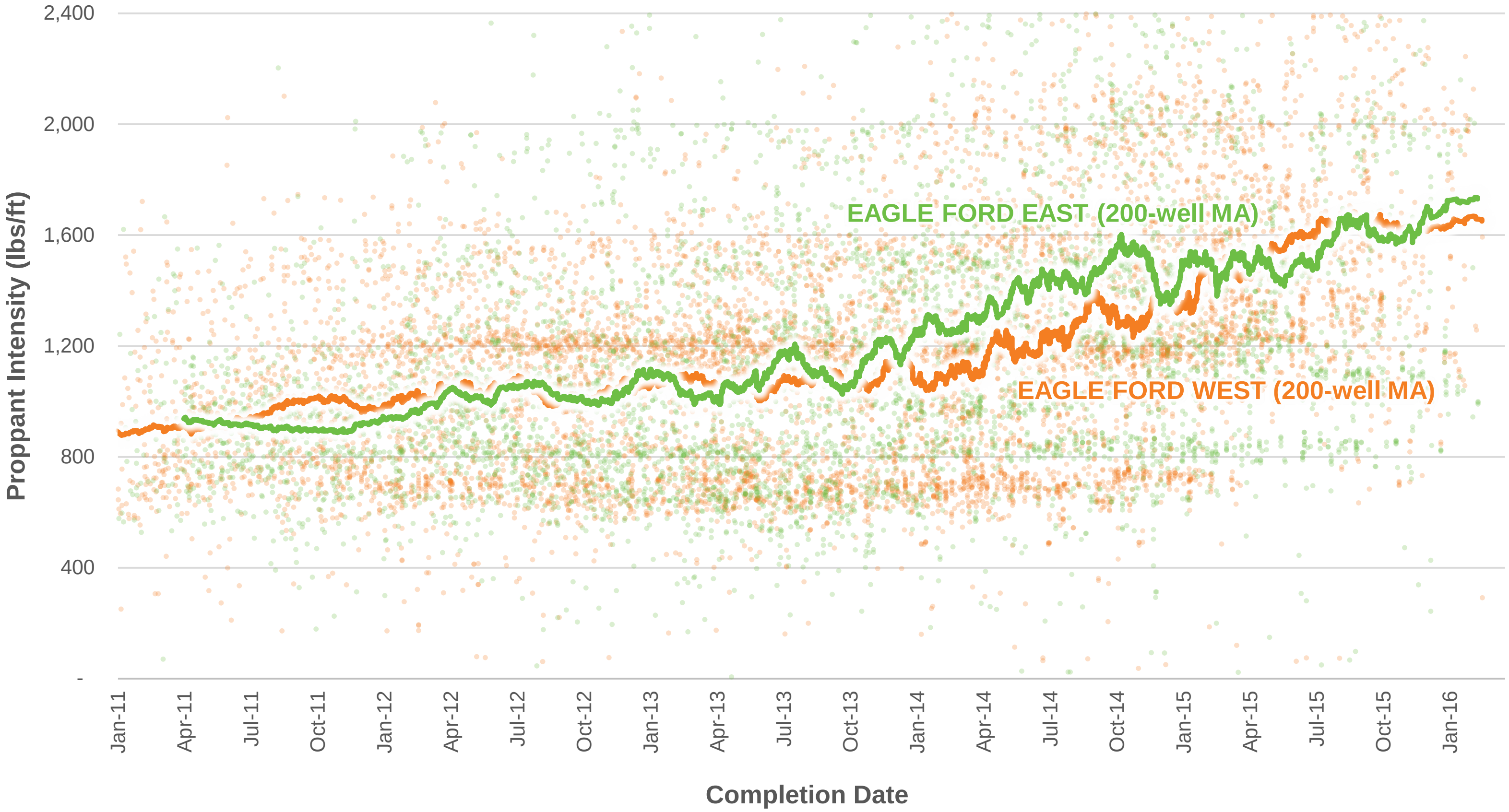
Williston Basin Proppant Intensity

Ramping Up … Slowly



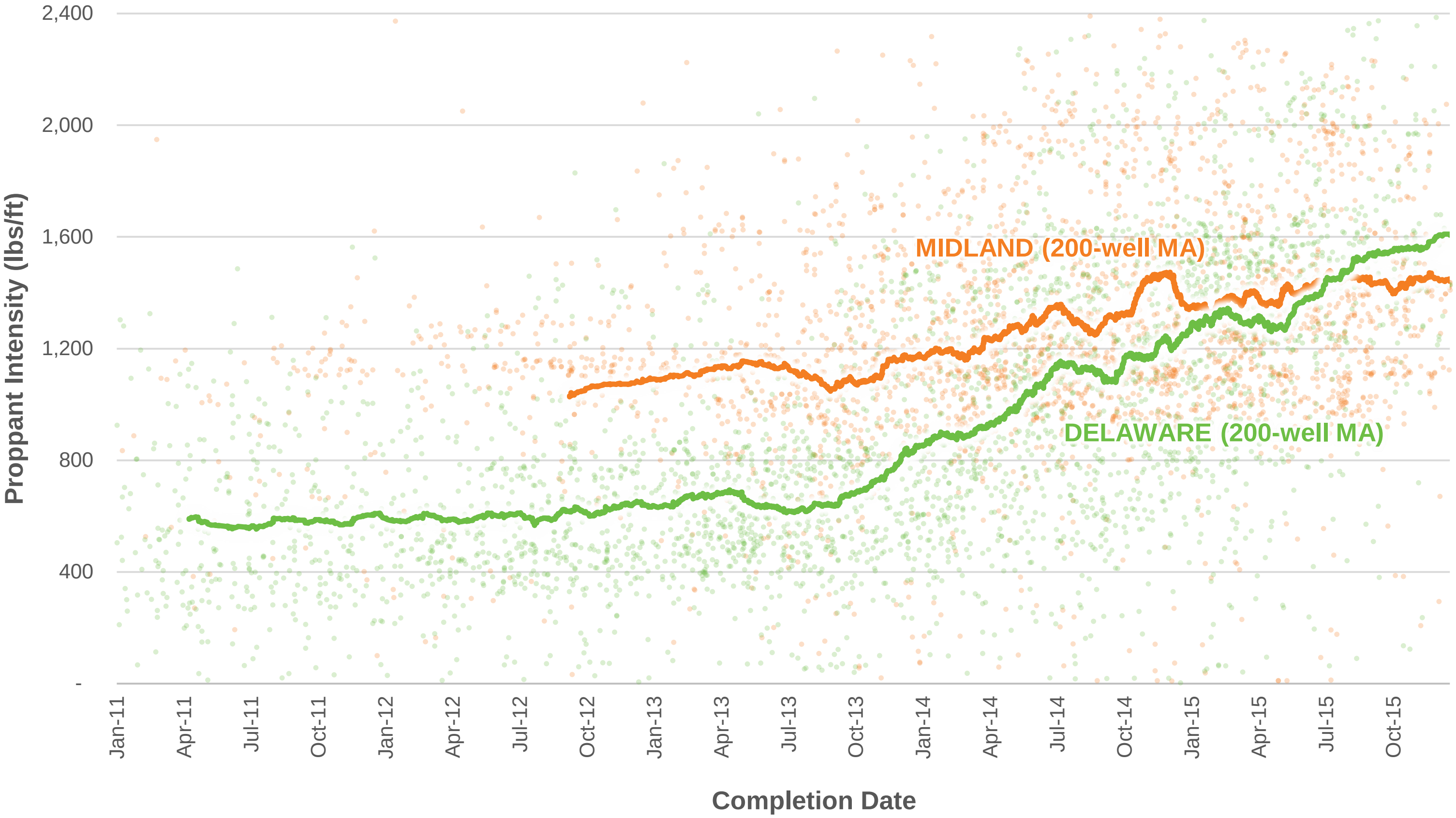
Source: RSEG, EIA, Texas RRC, NDIC

Eagle Ford Proppant Intensity
Stabilizing Around 1,700 lbs/ft



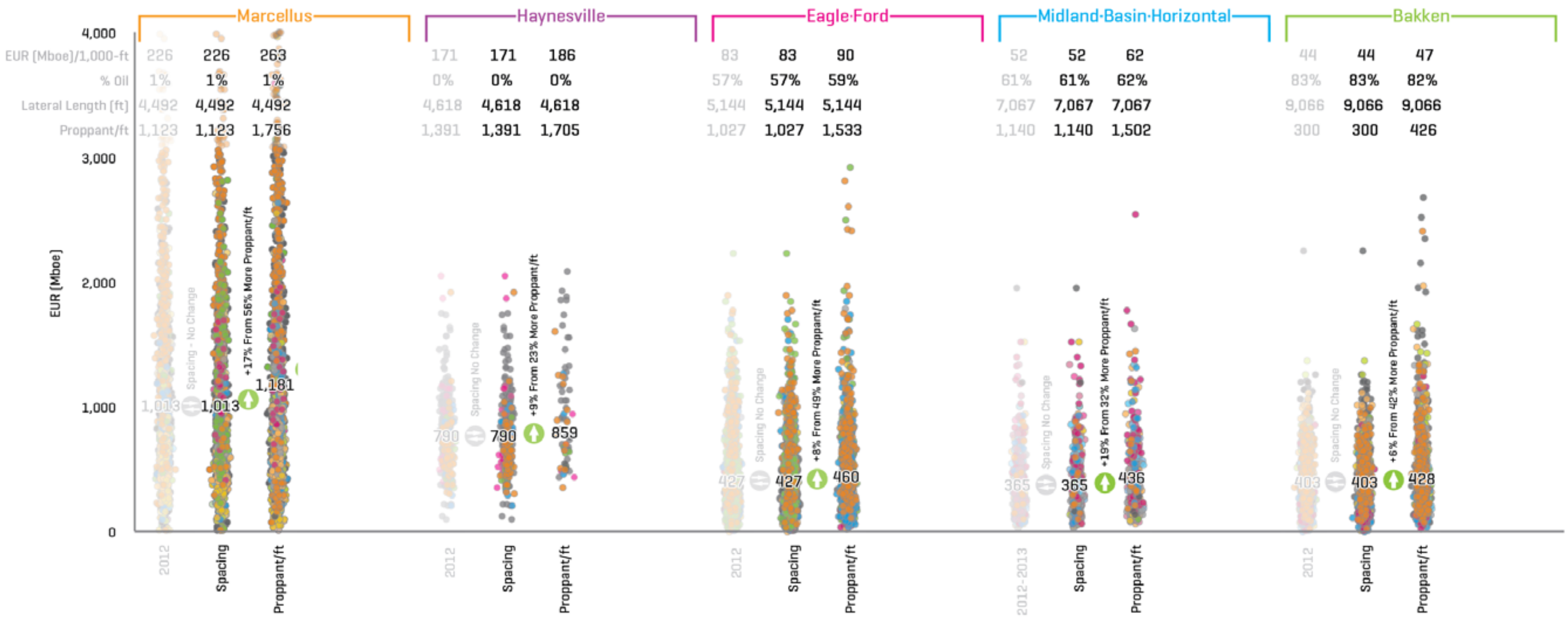
Source: RSEG, EIA, Texas RRC, NDIC

Permian Proppant Intensity
Delaware Overtaking Midland



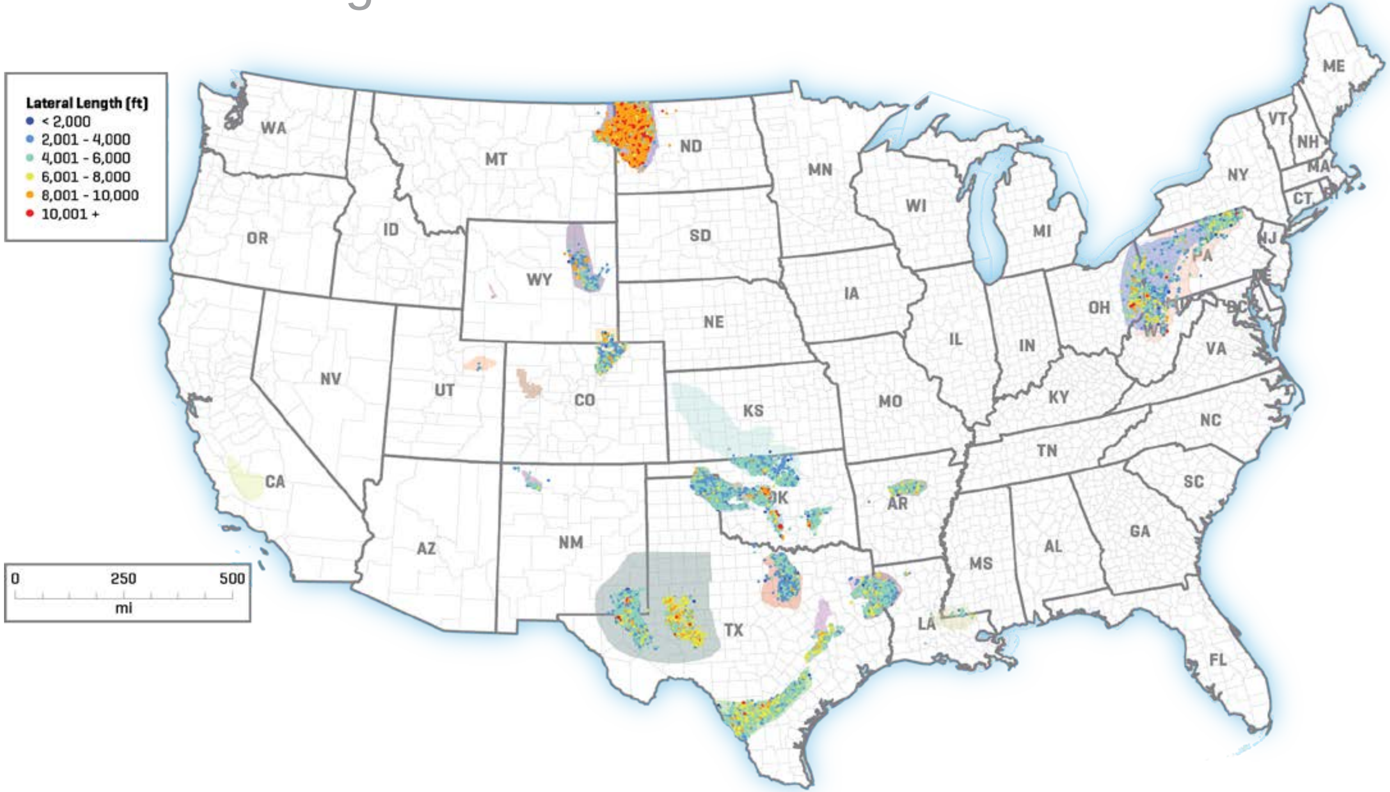
Source: RSEG, EIA, Texas RRC, NDIC

EURs – Normalized for Geology and Lateral Length
Change Due to Proppant Intensity



Source: RSEG

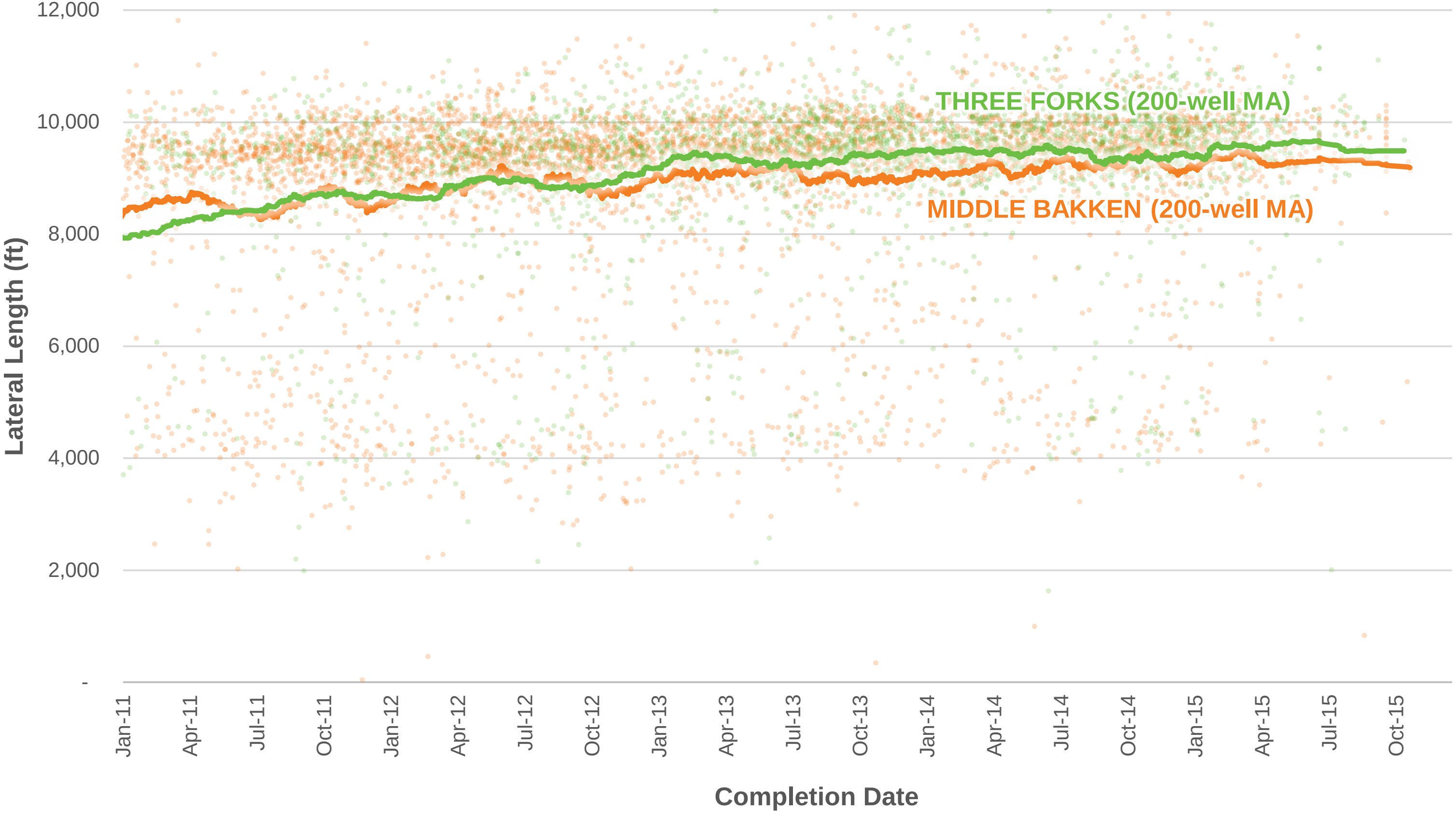
L48 Landscape
Lateral Length



Source: : RSEG, raw data provided by Drilling Info, Inc. and state agencies

Williston Basin Lateral Lengths

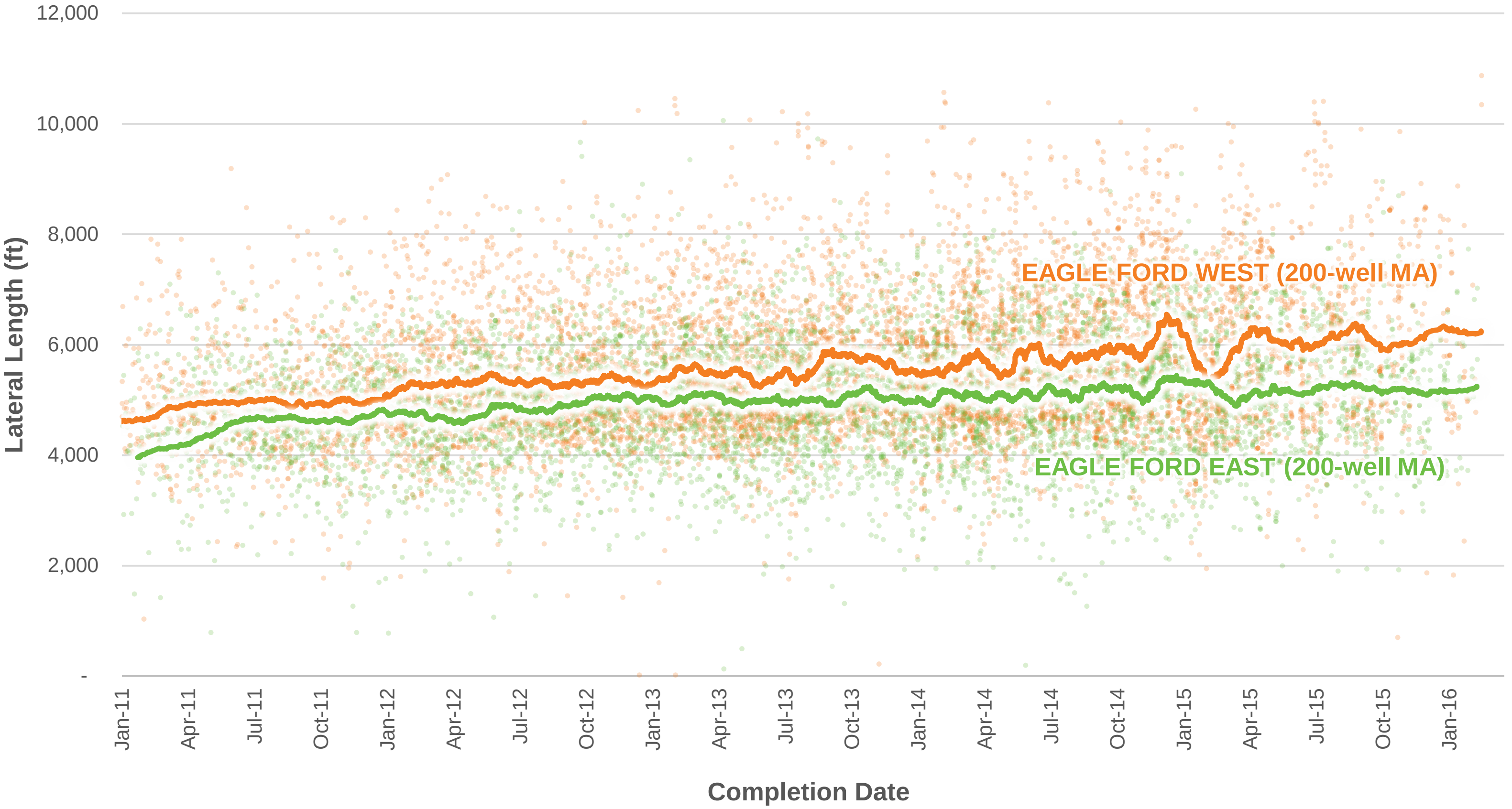
Steady Since 2013



Source: RSEG, NDIC

Eagle Ford Lateral Lengths

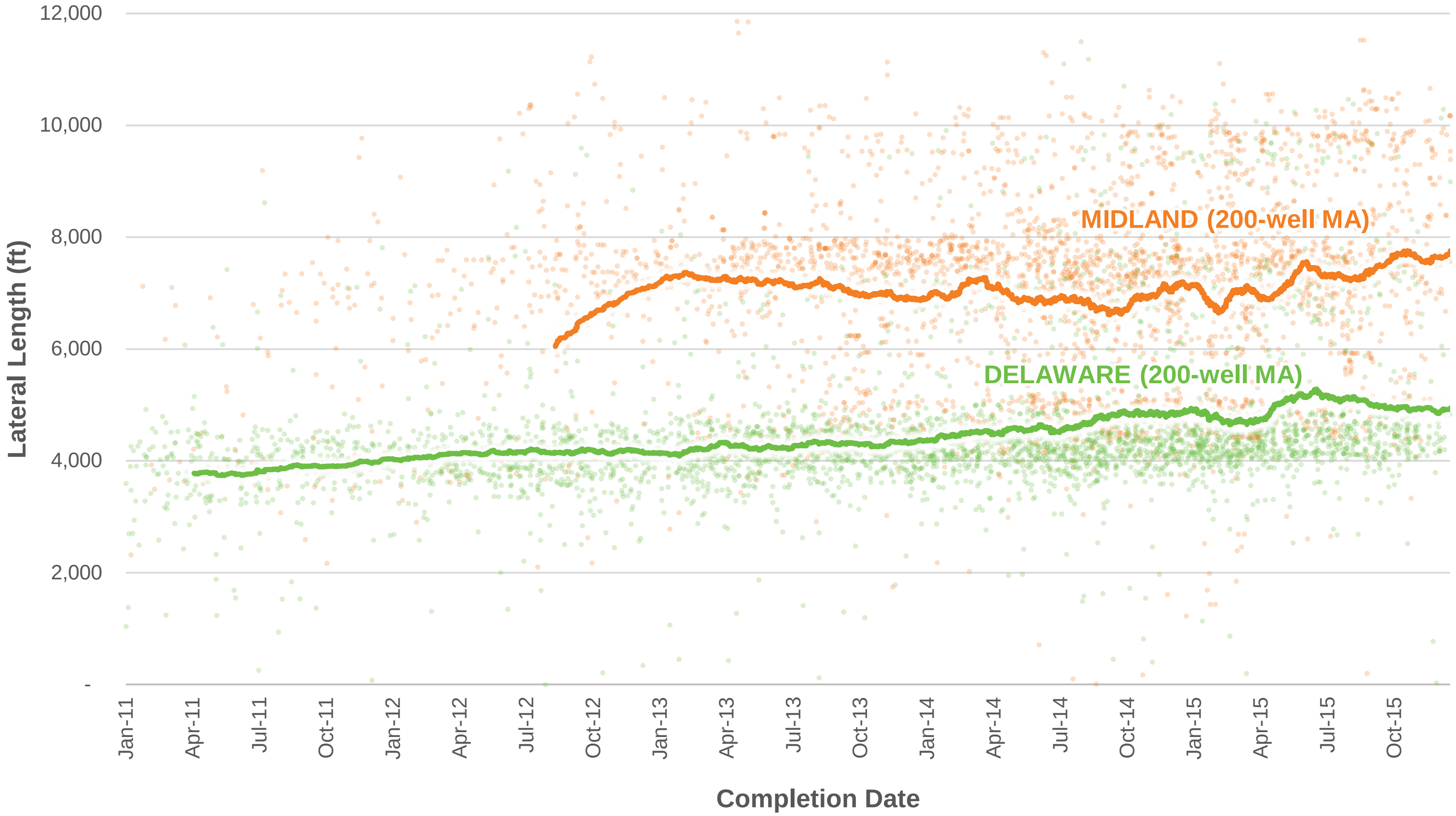
Steady in the East; Growing in the West



Source: RSEG, EIA, Texas RRC, NDIC

Permian Lateral Lengths

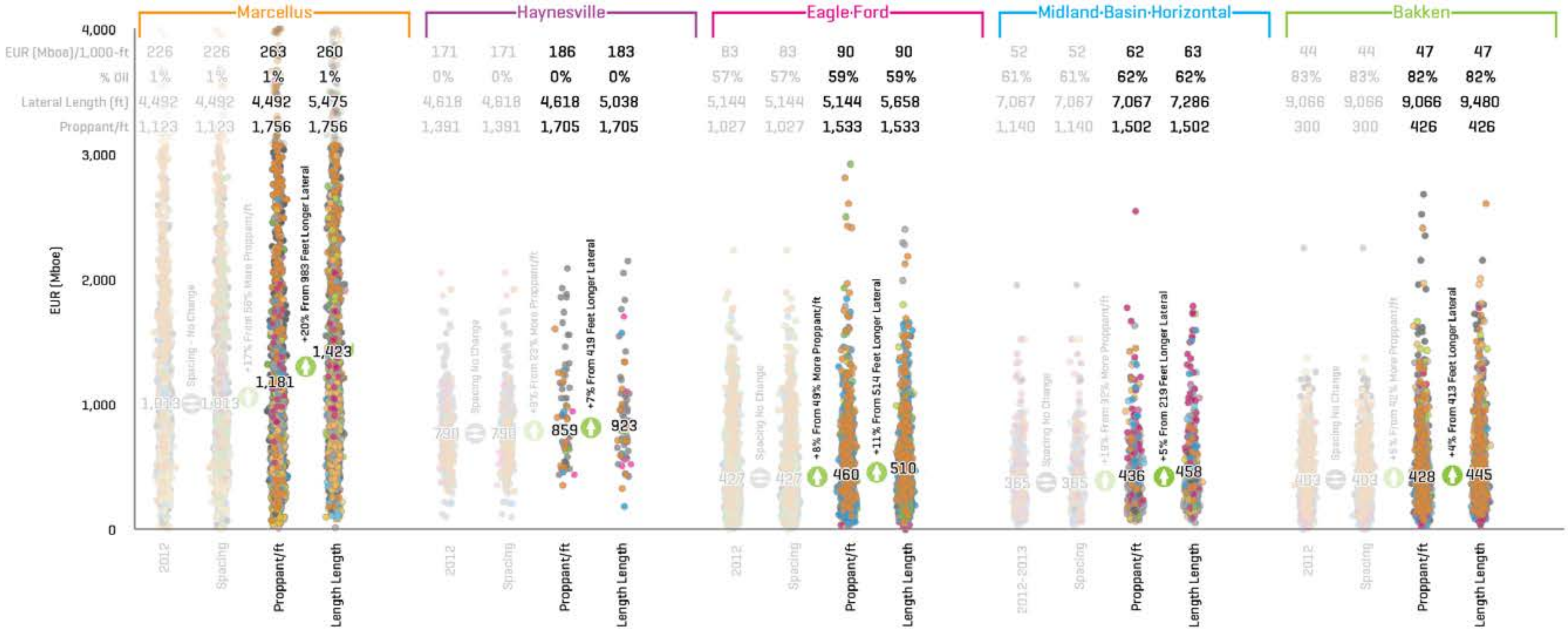
Midland Laterals Outpacing Delaware



Source: RSEG, NDIC

EURs – Normalized for Geology and Lateral Length

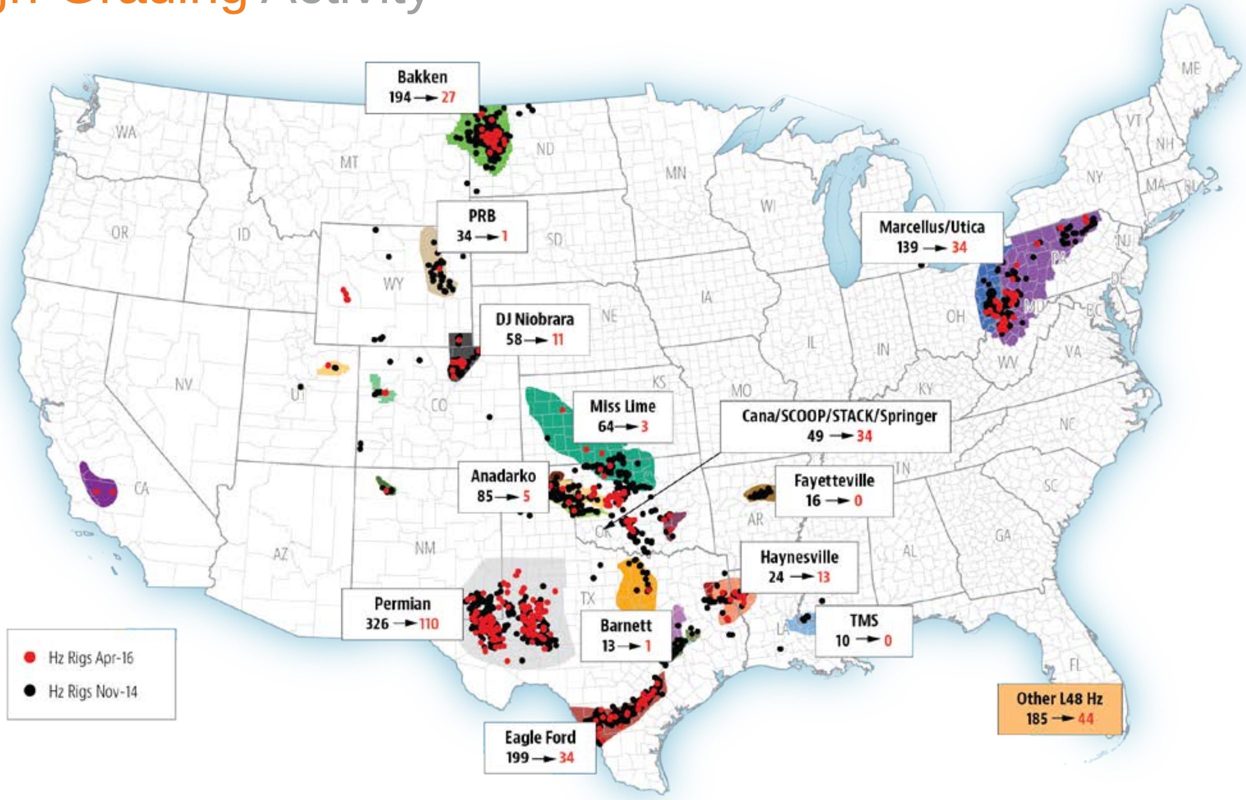
Change Due to Lateral Length



Source: RSEG

L48 Landscape

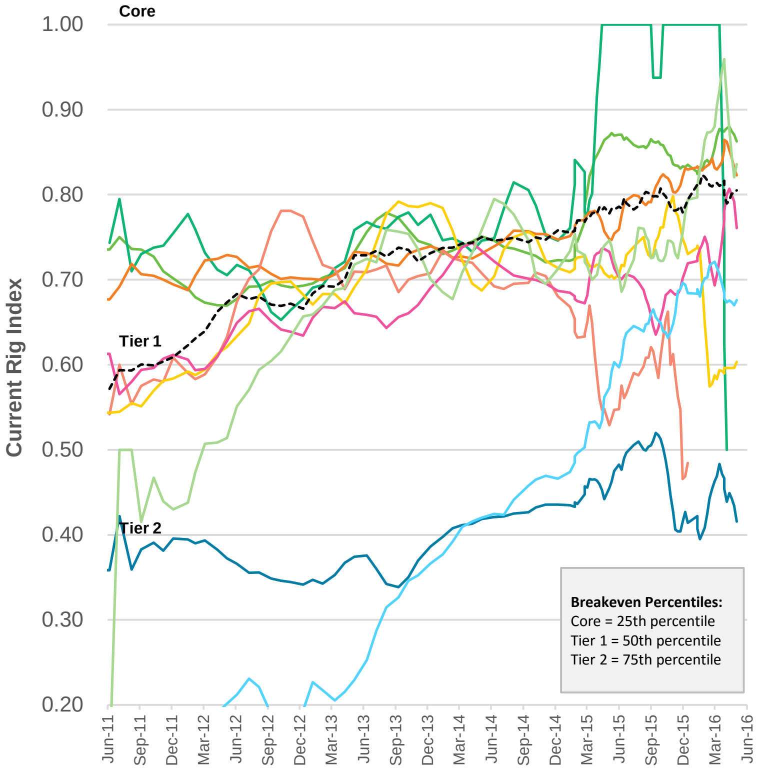
High-Grading Activity

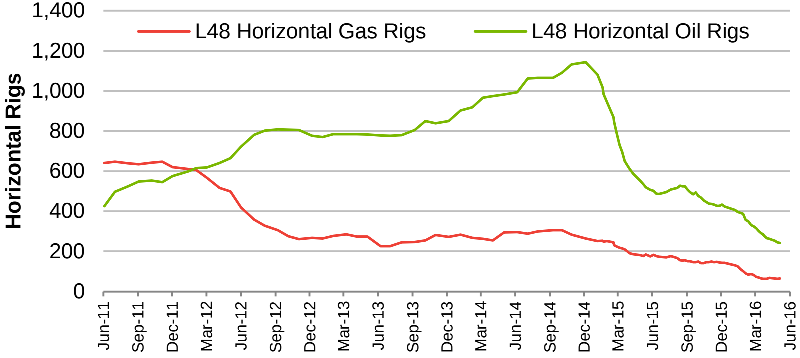


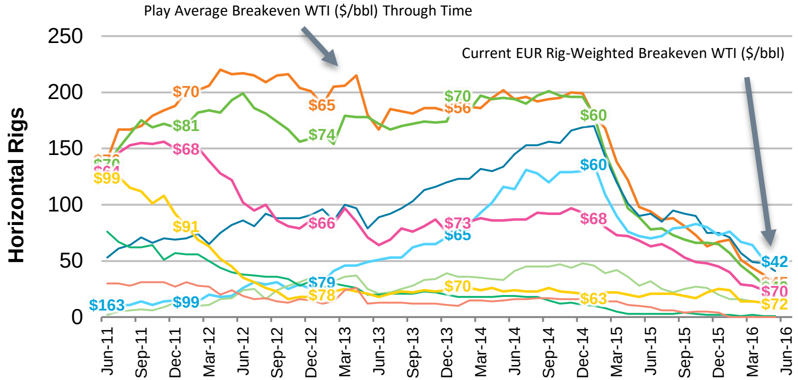
Source: : RSEG, raw data provided by Drilling Info, Inc. and state agencies

Core Horizontal Rig Index

Industry Retreating to Core in Every Basin



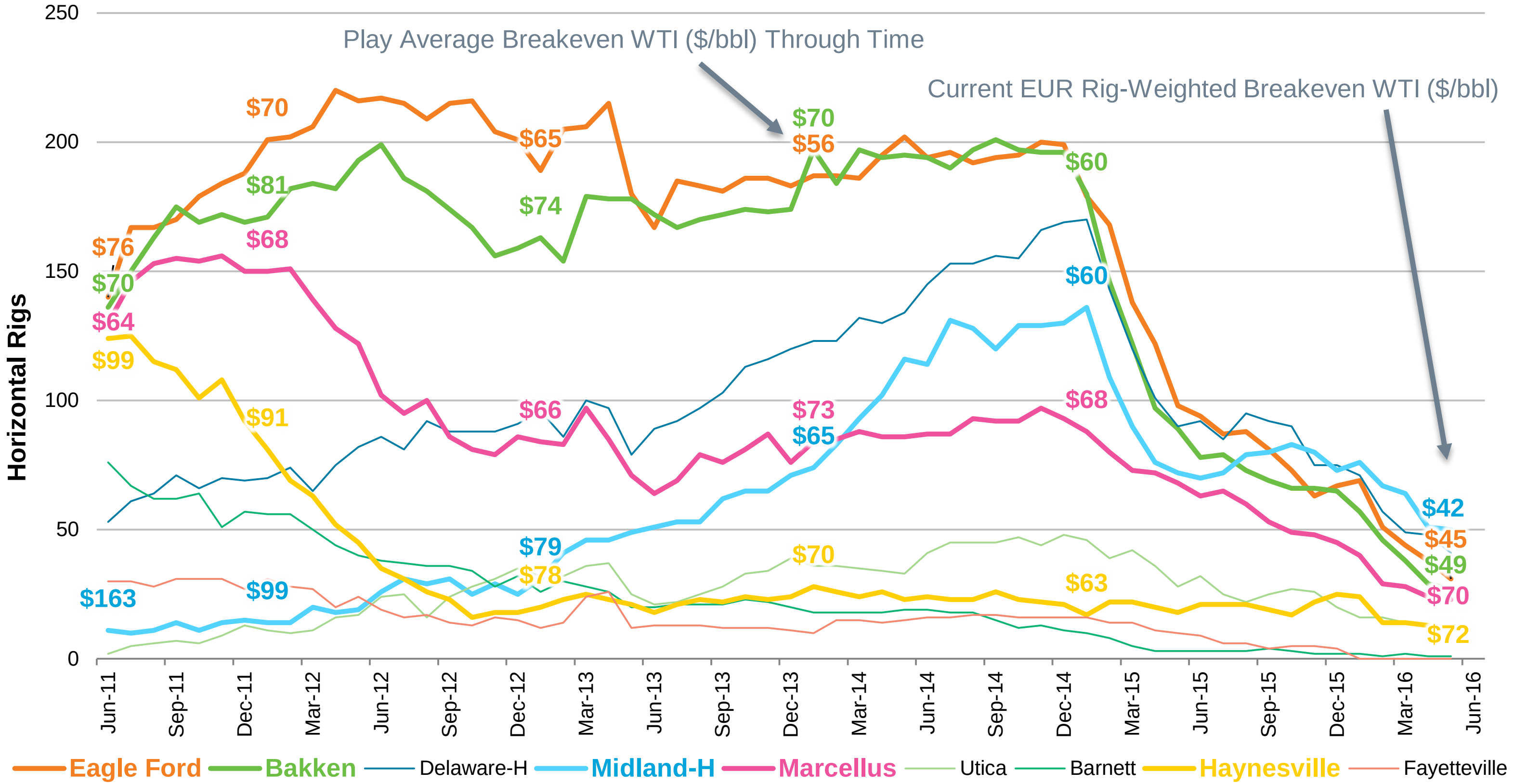




Eagle Ford — Bakken — Delaware-H — Midland-H — Marcellus — Utica — Barnett — Haynesville — Fayetteville

Rig-Weighted Average Breakevens

High-Grading and Deflation Driving Better Economics



Source: RSEG

EURs – Normalized for Geology and Lateral Length

Change Due to High-Grading

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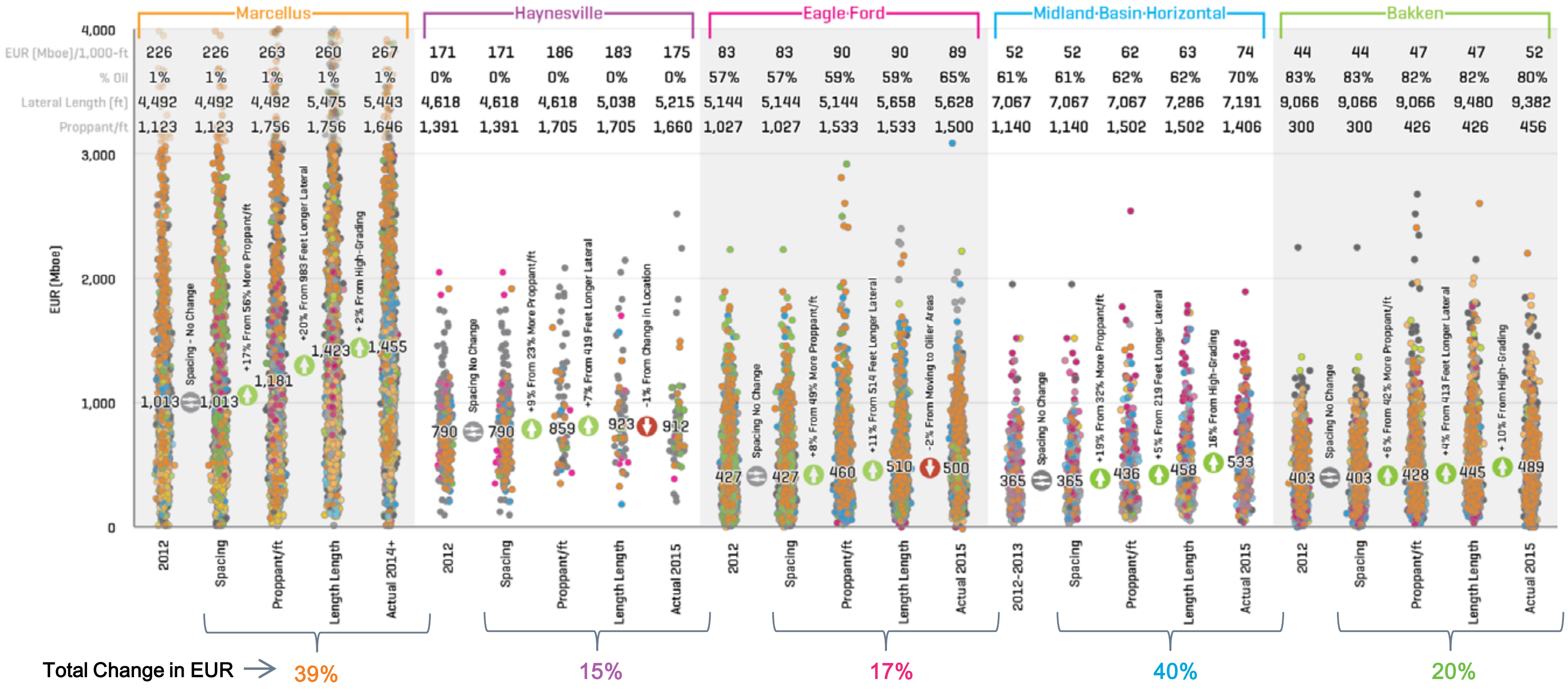
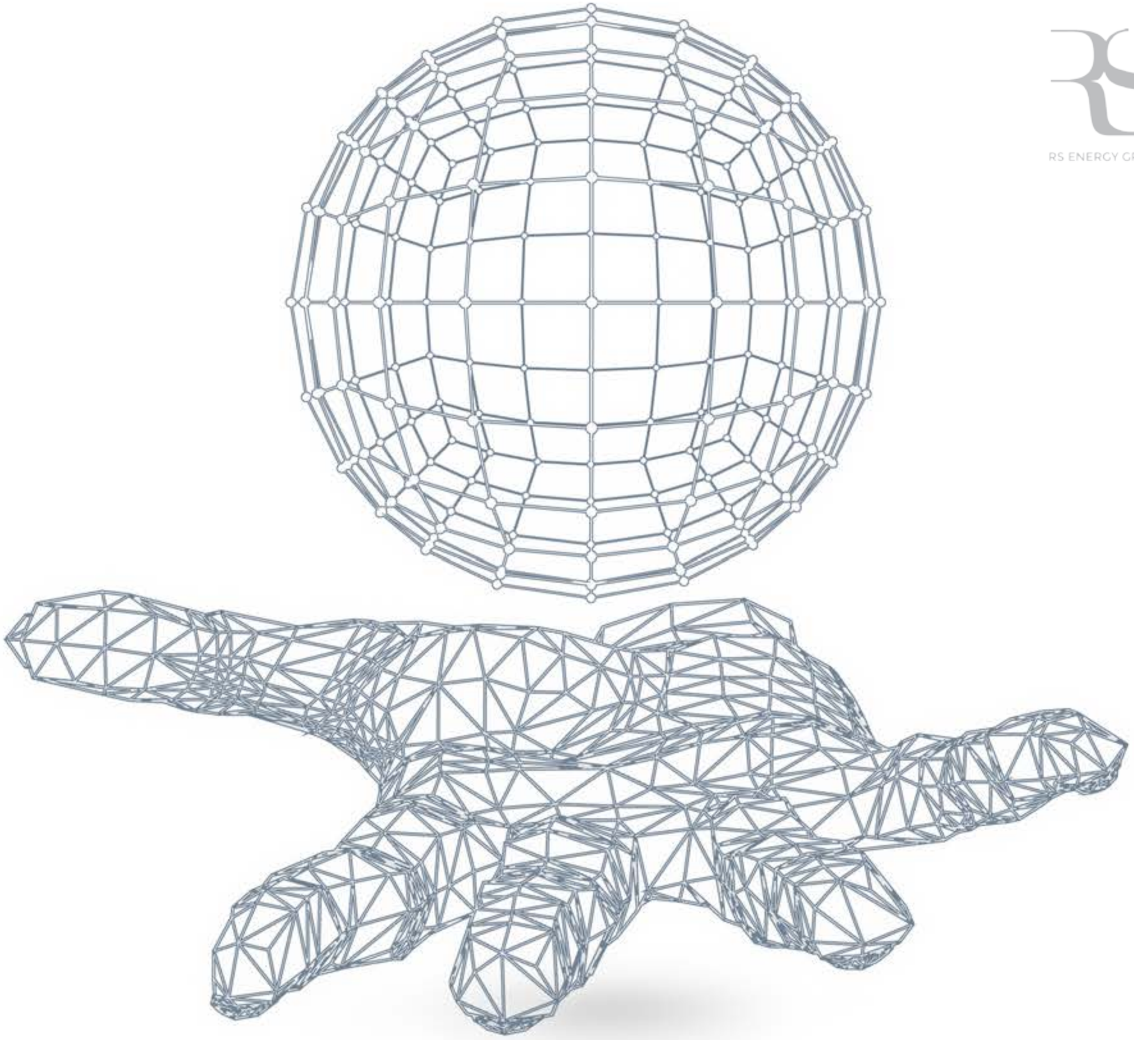


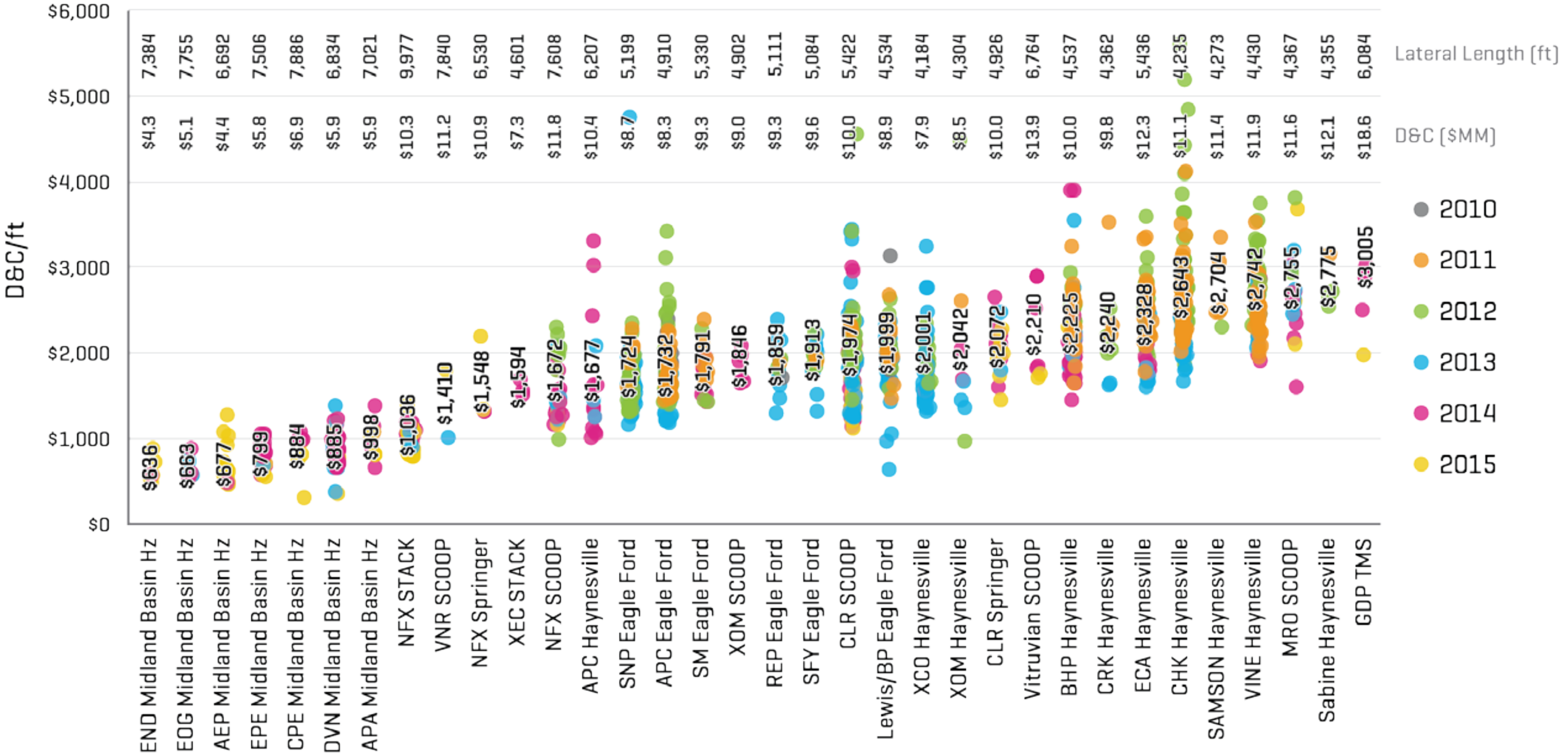
Source: RSEG

Costs



AFE Cost Analysis

Available AFEs Indicate Declining Costs

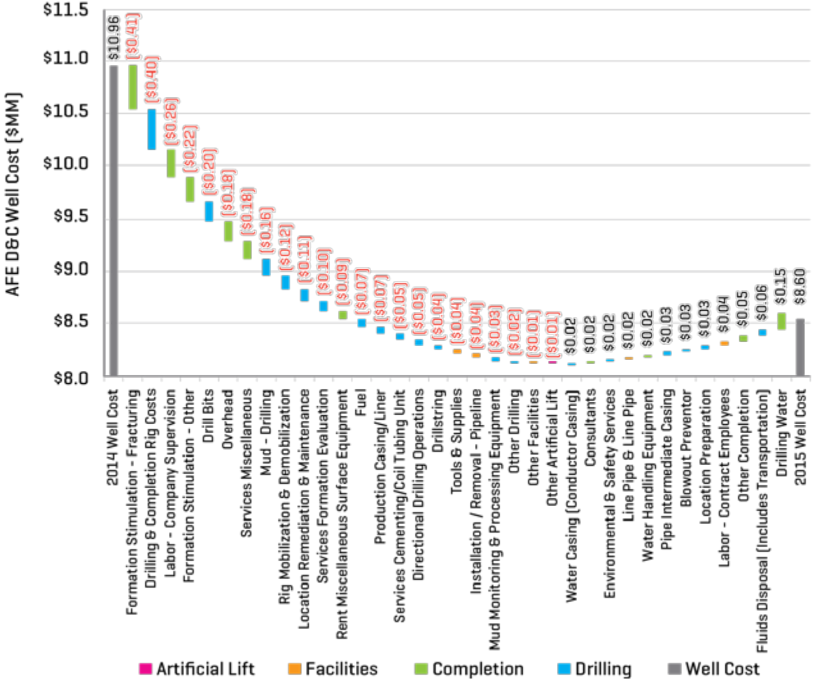


Source: RSEG, raw data provided by Drilling Info Inc.

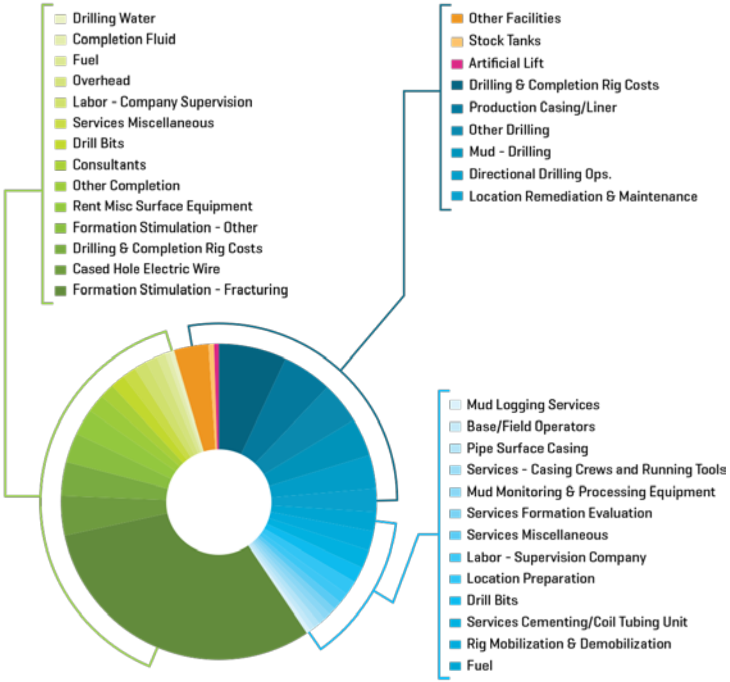
NFX STACK AFEs (2014-2015)

Drill Costs Down 30%; Completion Costs Down 18%

Change in NFX STACK AFE Well Costs from 2014 to 2015



Average NFX STACK AFE Well Cost



Source: RSEG, raw data provided by Drilling Info Inc.

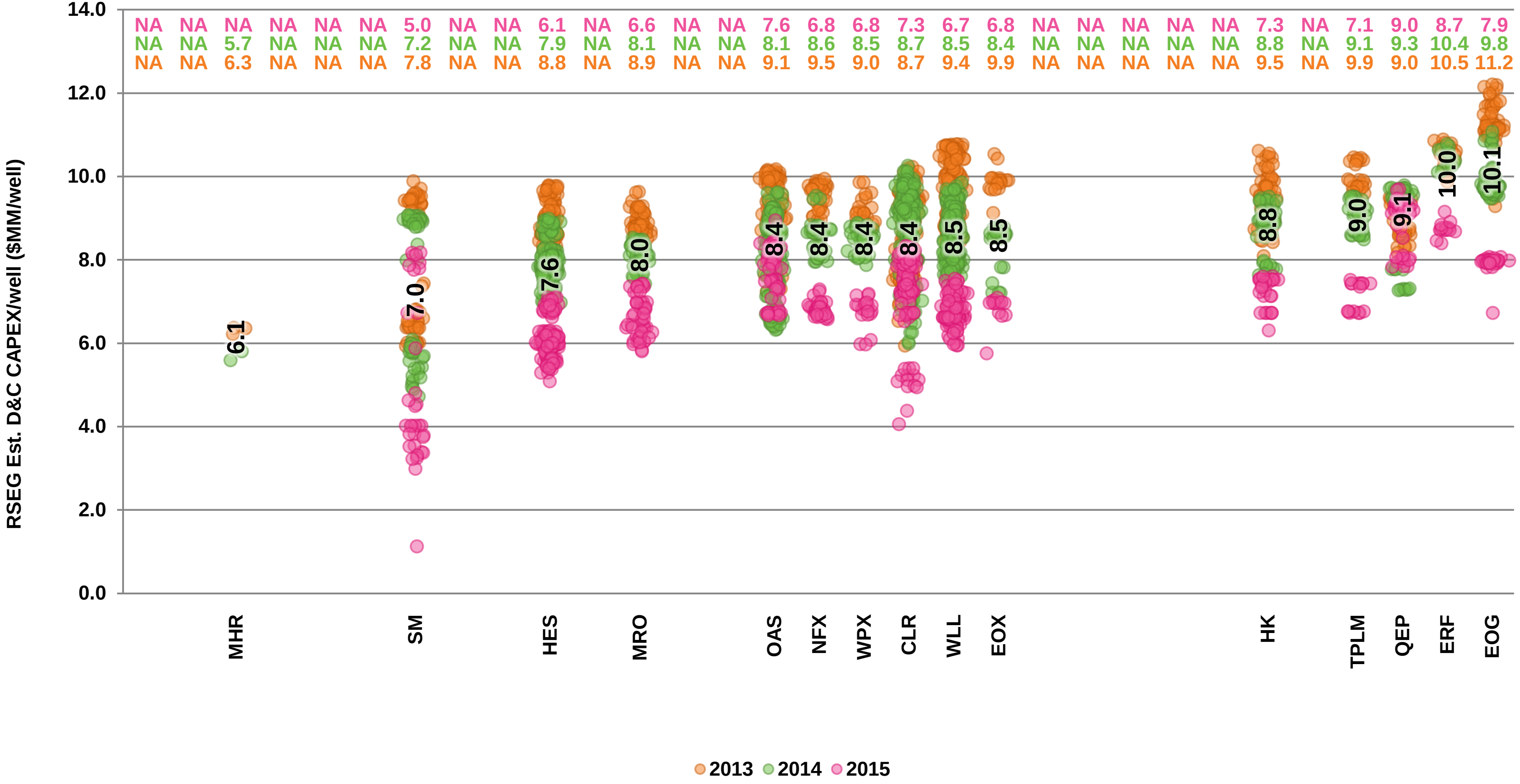
Williston Basin Guided Well Costs

Expecting Further Reductions

Source: RSEG, raw data provided by Drilling Info Inc.

Williston Basin MVR Analysis

Variability Around Each Mean Figure



Source: RSEG, raw data provided by Drilling Info Inc.

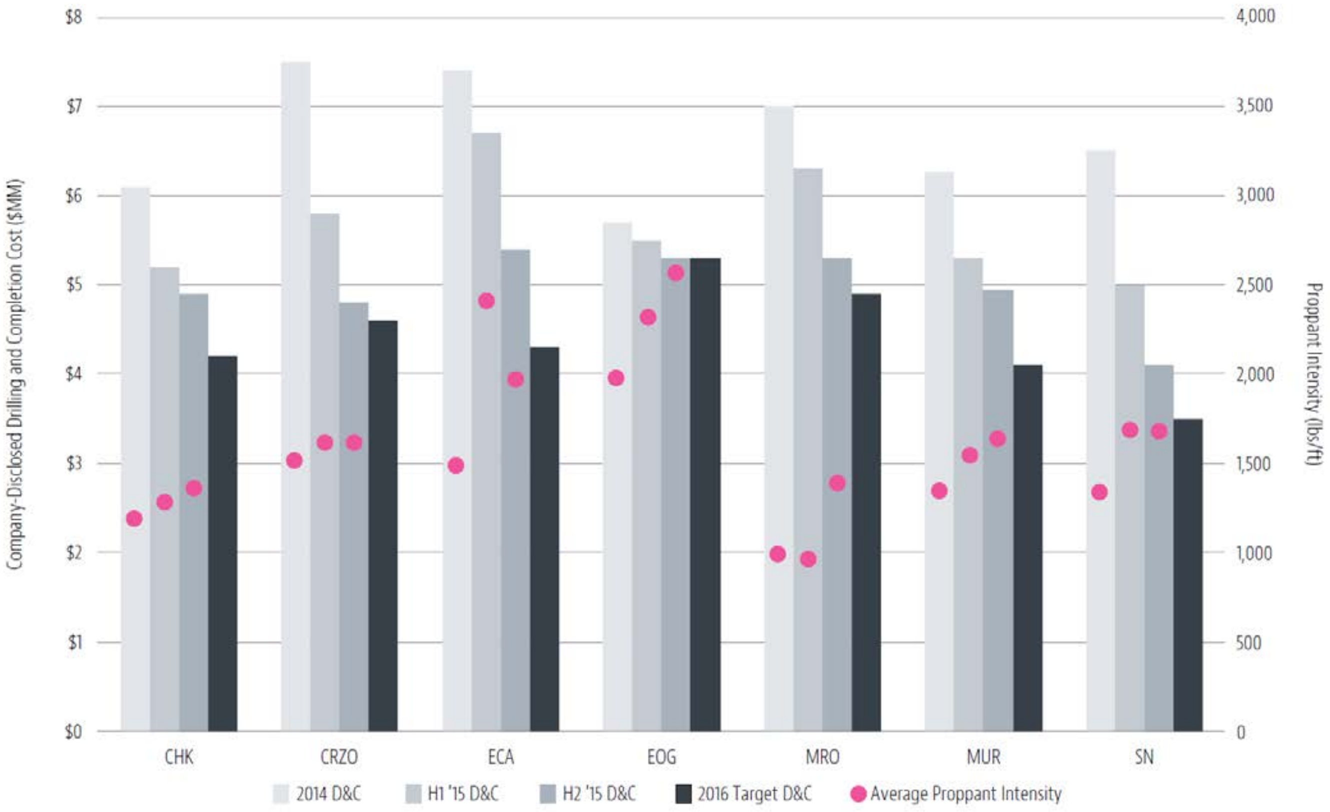
Williston Basin MVR Analysis

Lower Well Costs for Every Operator

Source: RSEG, raw data provided by Drilling Info Inc.

Eagle Ford Well Costs

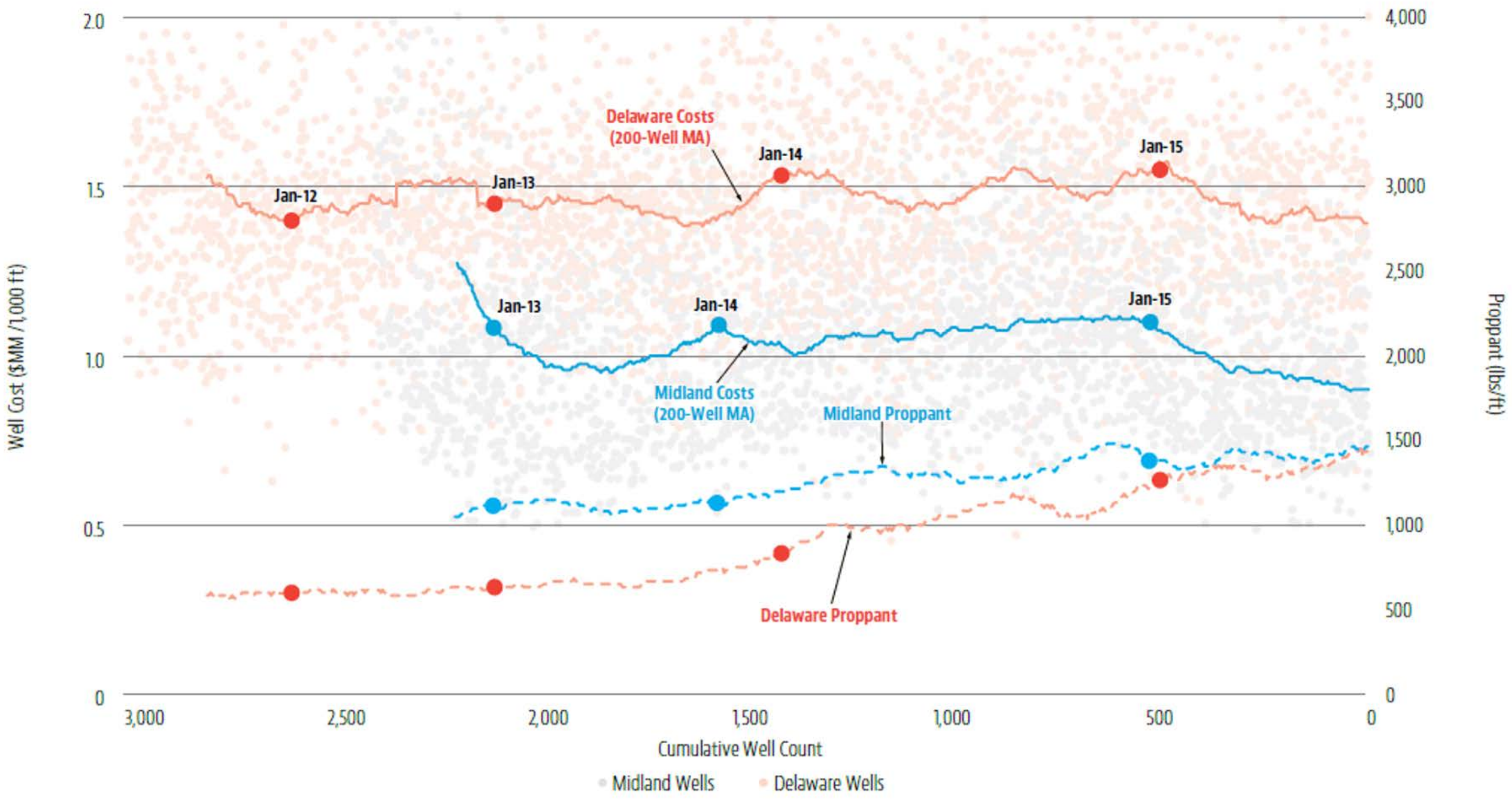
Costs Falling Even as Intensity Rises



Source: RSEG, raw data provided by company reports, state agencies, Drilling Info Inc.

Lateral Normalized Permian Well Costs

Costs Coming Down Despite Bigger Completions

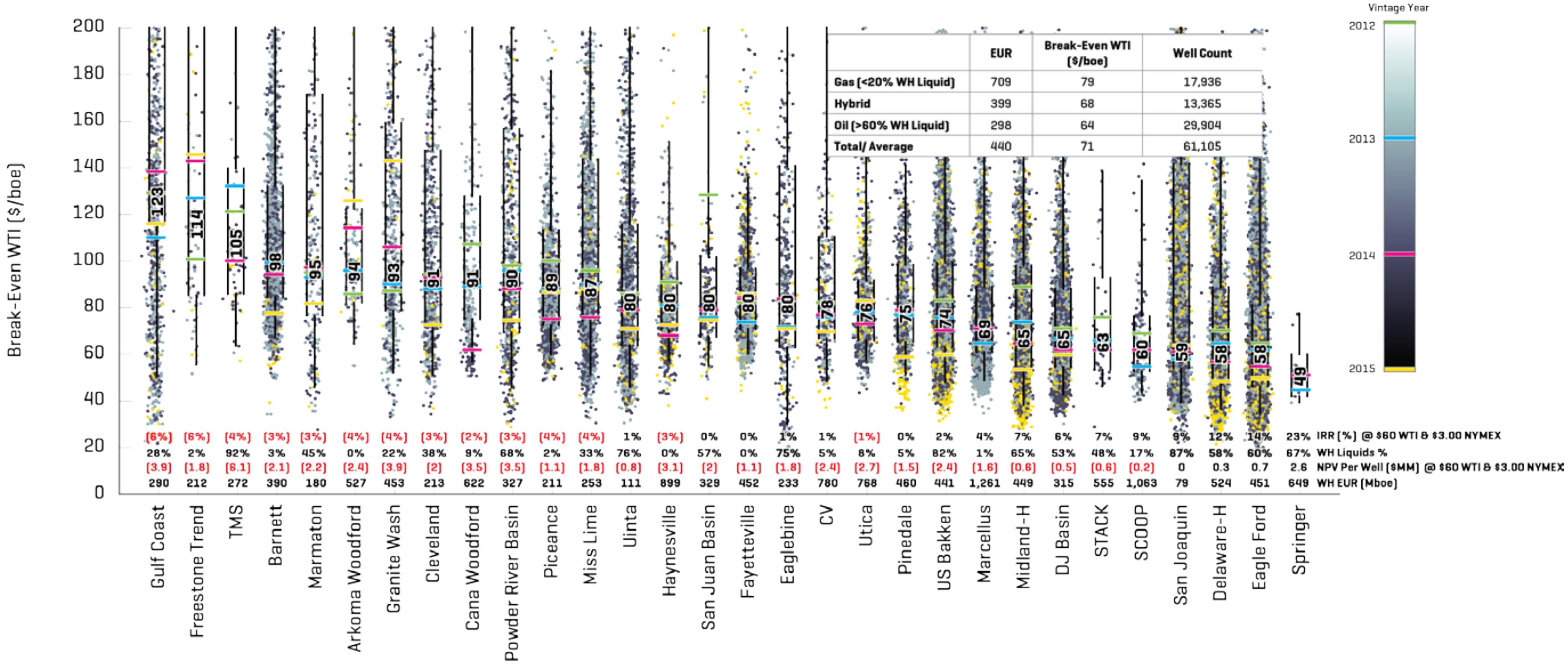


Source: RSEG, raw data provided by company reports, state agencies, Drilling Info Inc.

Economics

L48 Breakevens

Supply Cost Falling

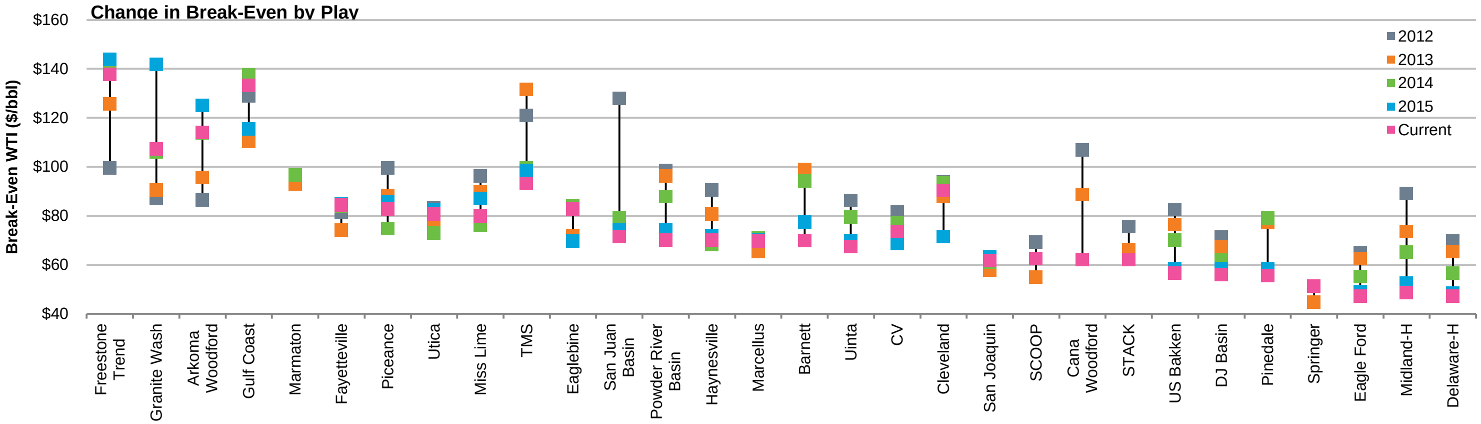


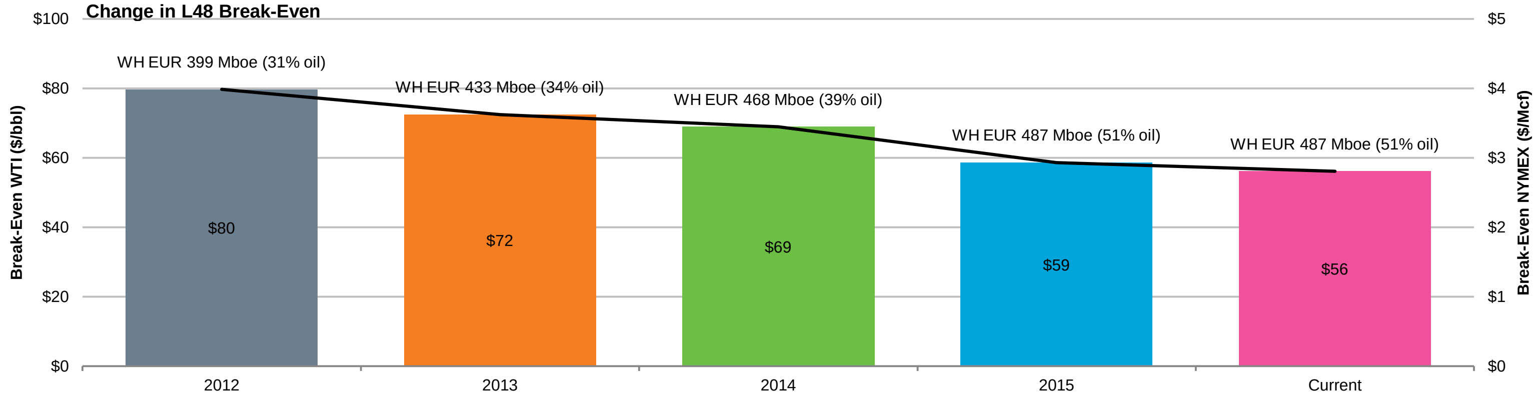
	EUR	Break-Even WTI ($/boe)	Well Count
Gas (<20% WH Liquid)	709	79	17,936
Hybrid	399	68	13,365
Oil (>60% WH Liquid)	298	64	29,904
Total/ Average	440	71	61,105

Source: RSEG, raw data provided by company reports, state agencies, Drilling Info Inc.

L48 Breakevens

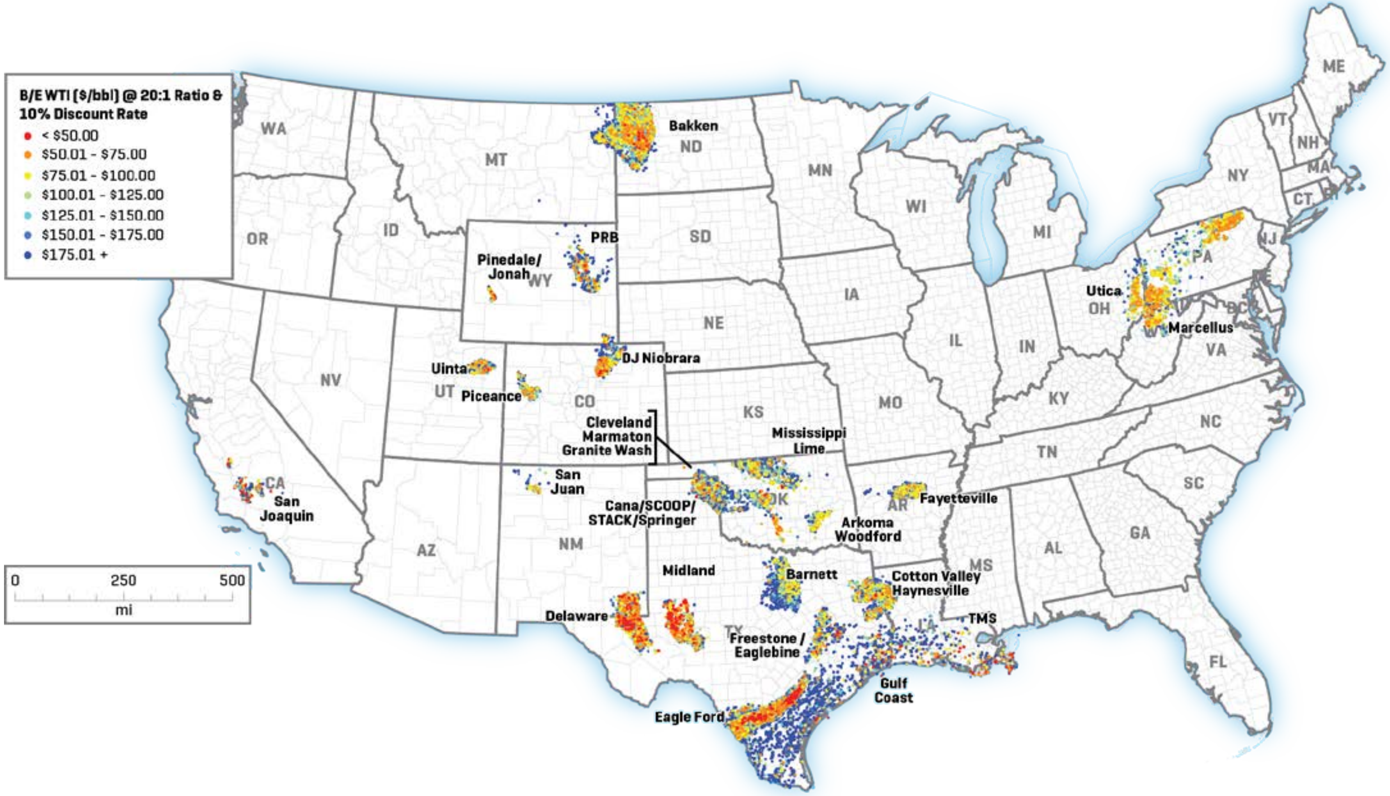
Supply Cost Falling





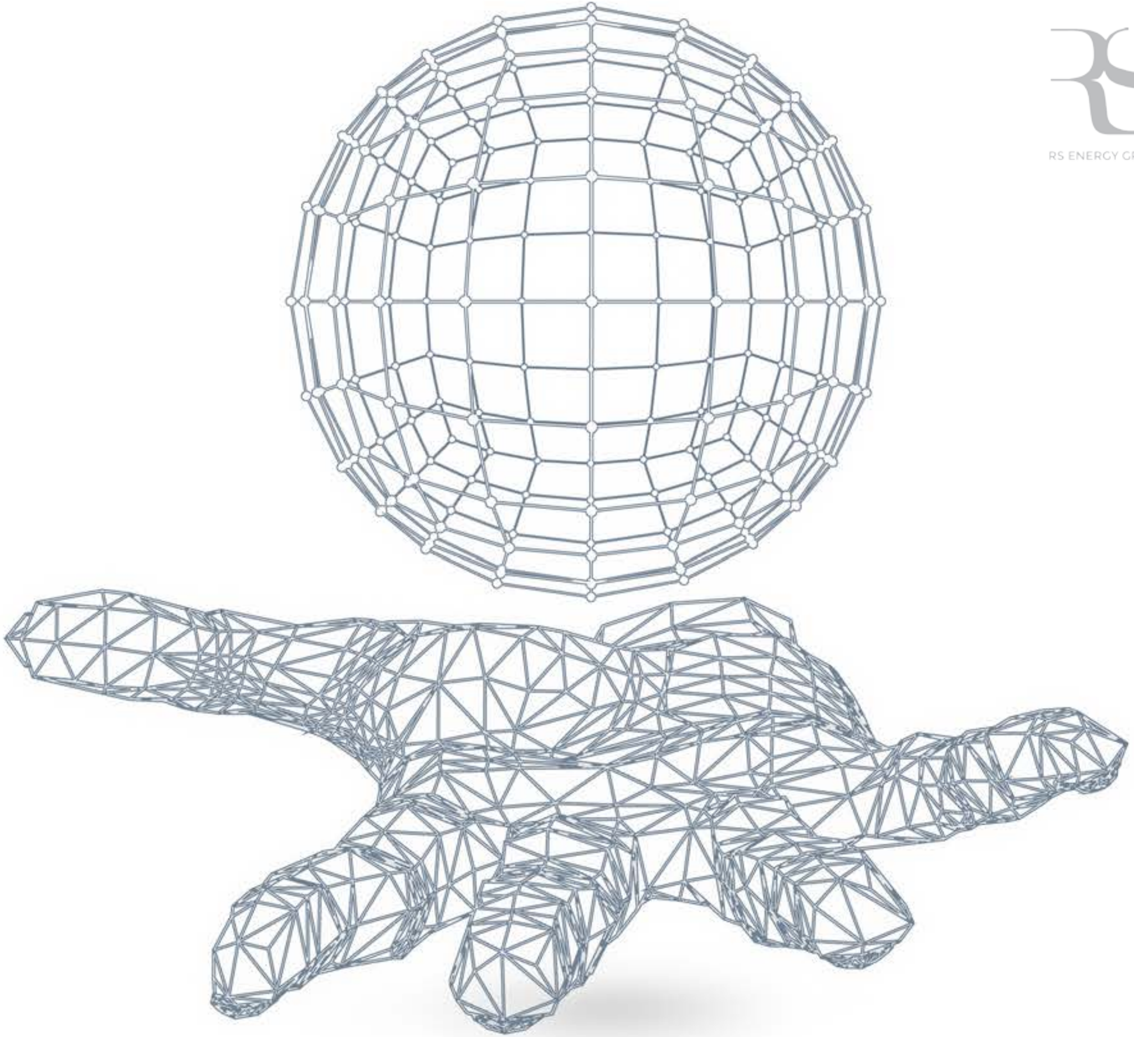
Source: RSEG, raw data provided by company reports, state agencies, Drilling Info Inc.

L48 Landscape
Breakeven Prices

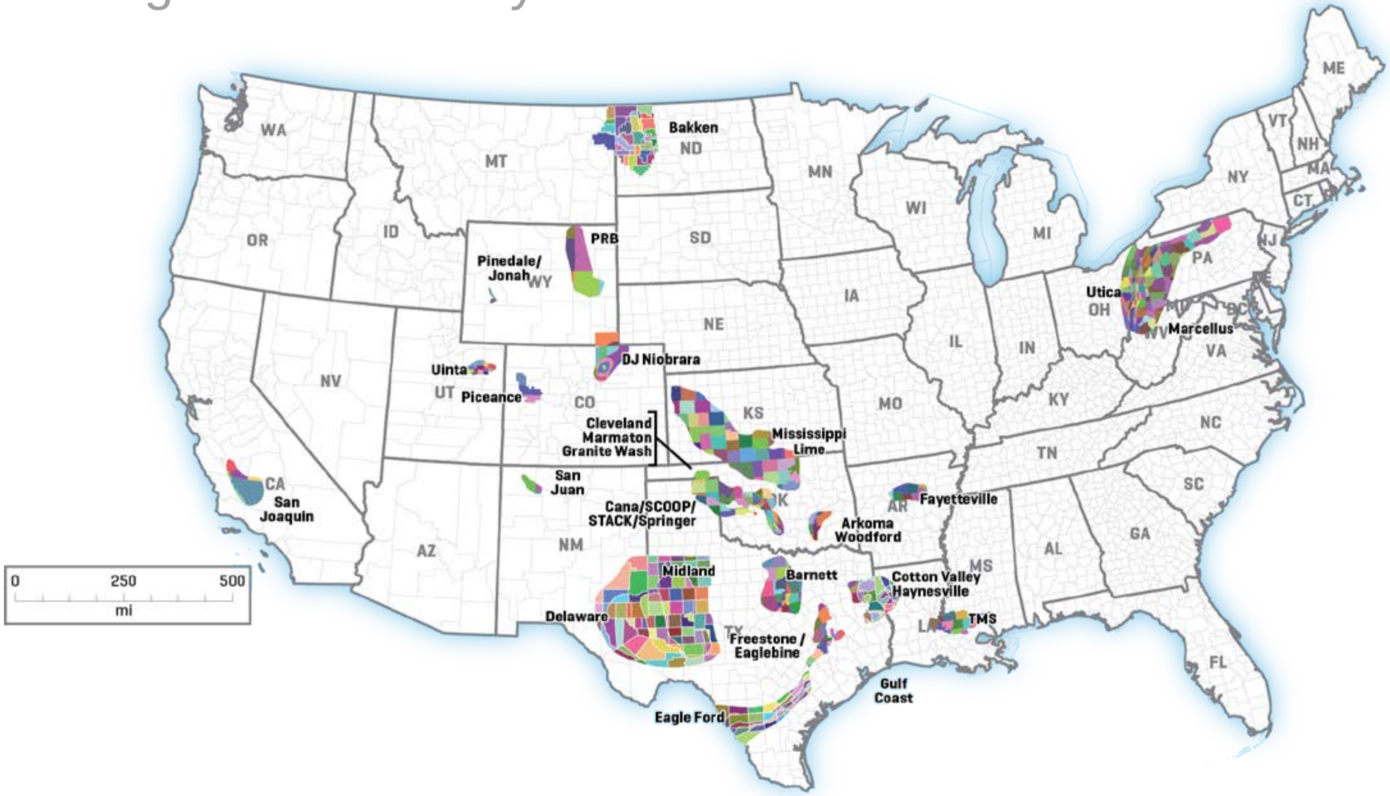


Source: RSEG, raw data provided by company reports, state agencies, Drilling Info Inc.

Resource



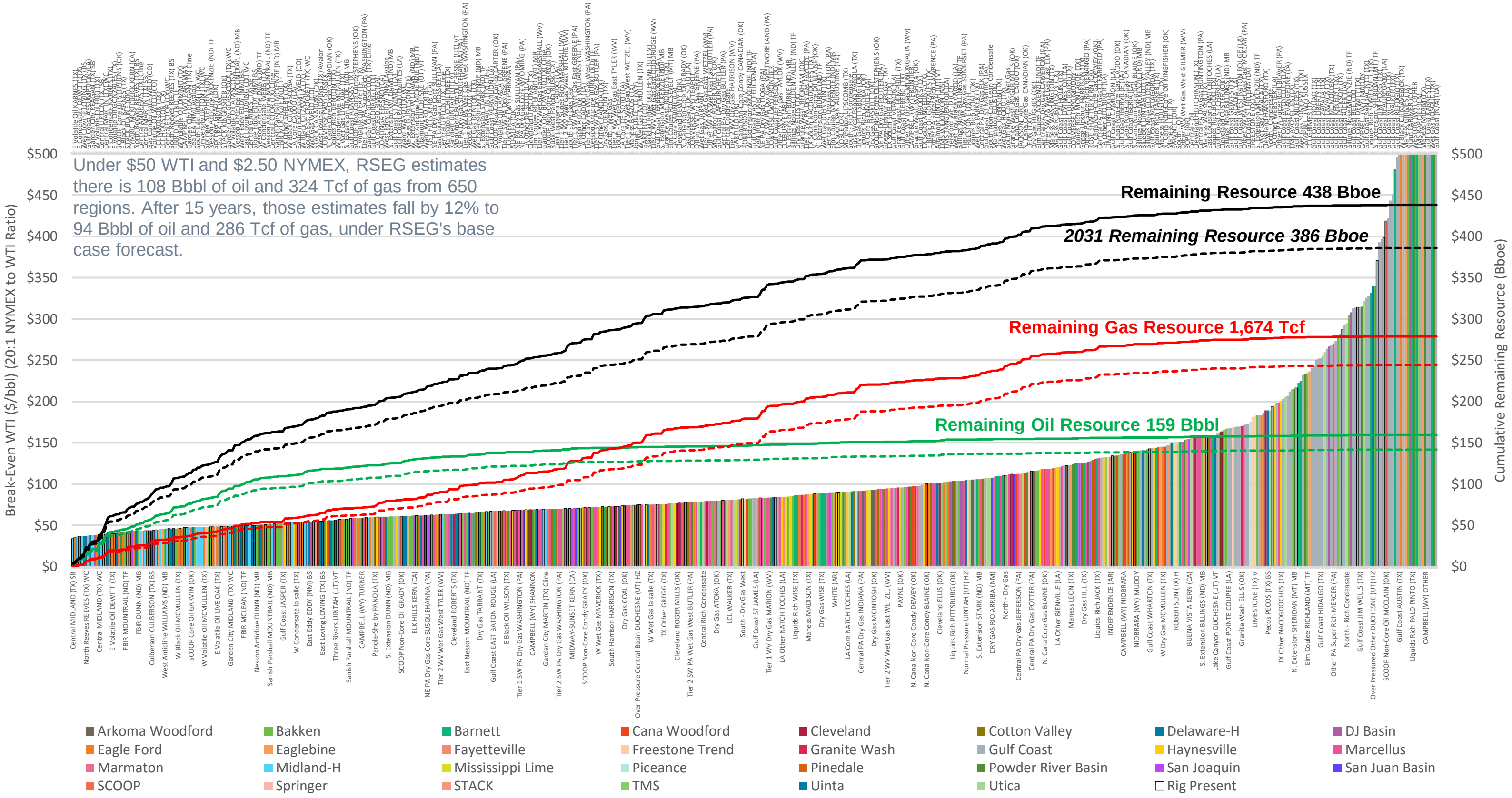
L48 Landscape
Region and County Breakout



Source: RSEG, raw data provided by company reports, state agencies, Drilling Info Inc.

L48 Dispatch Curve

Rolling Up the Regions



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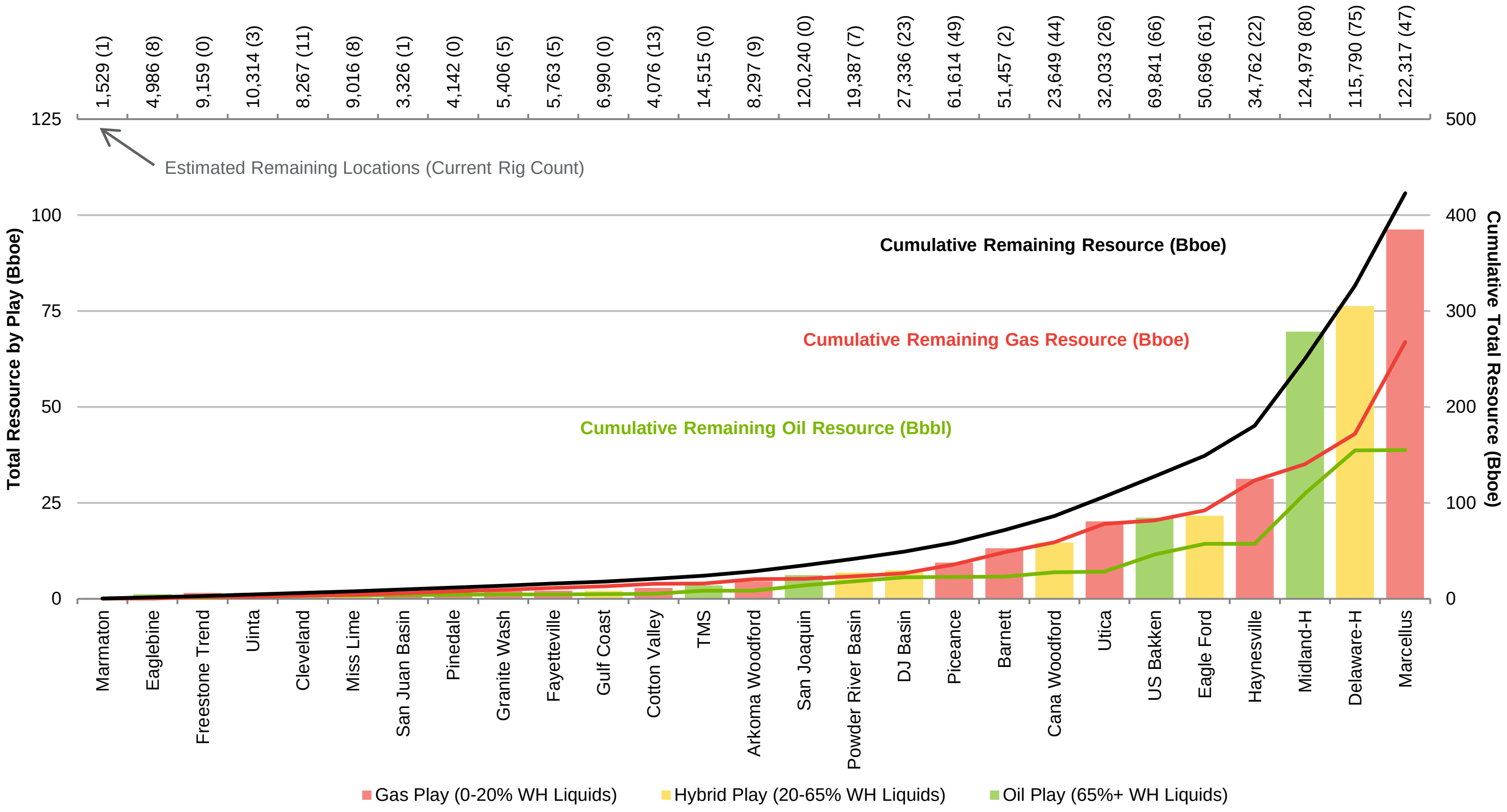
Source: RSEG, raw data provided by state agencies, Drilling Info Inc.

L48 Dispatch Curve

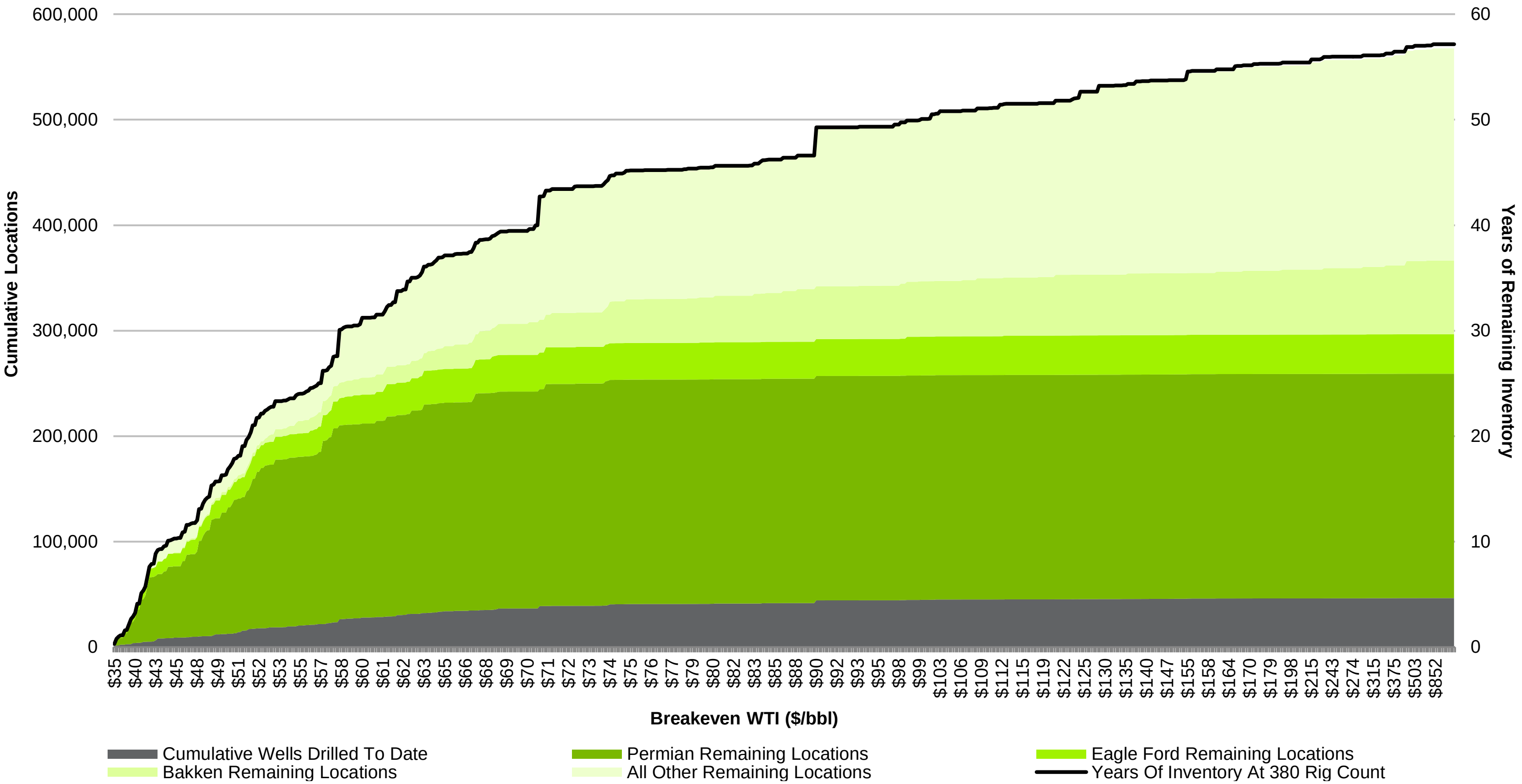
Rolling Up the Plays



Source: RSEG, raw data provided by state agencies, Drilling Info Inc.

Cumulative Remaining Locations

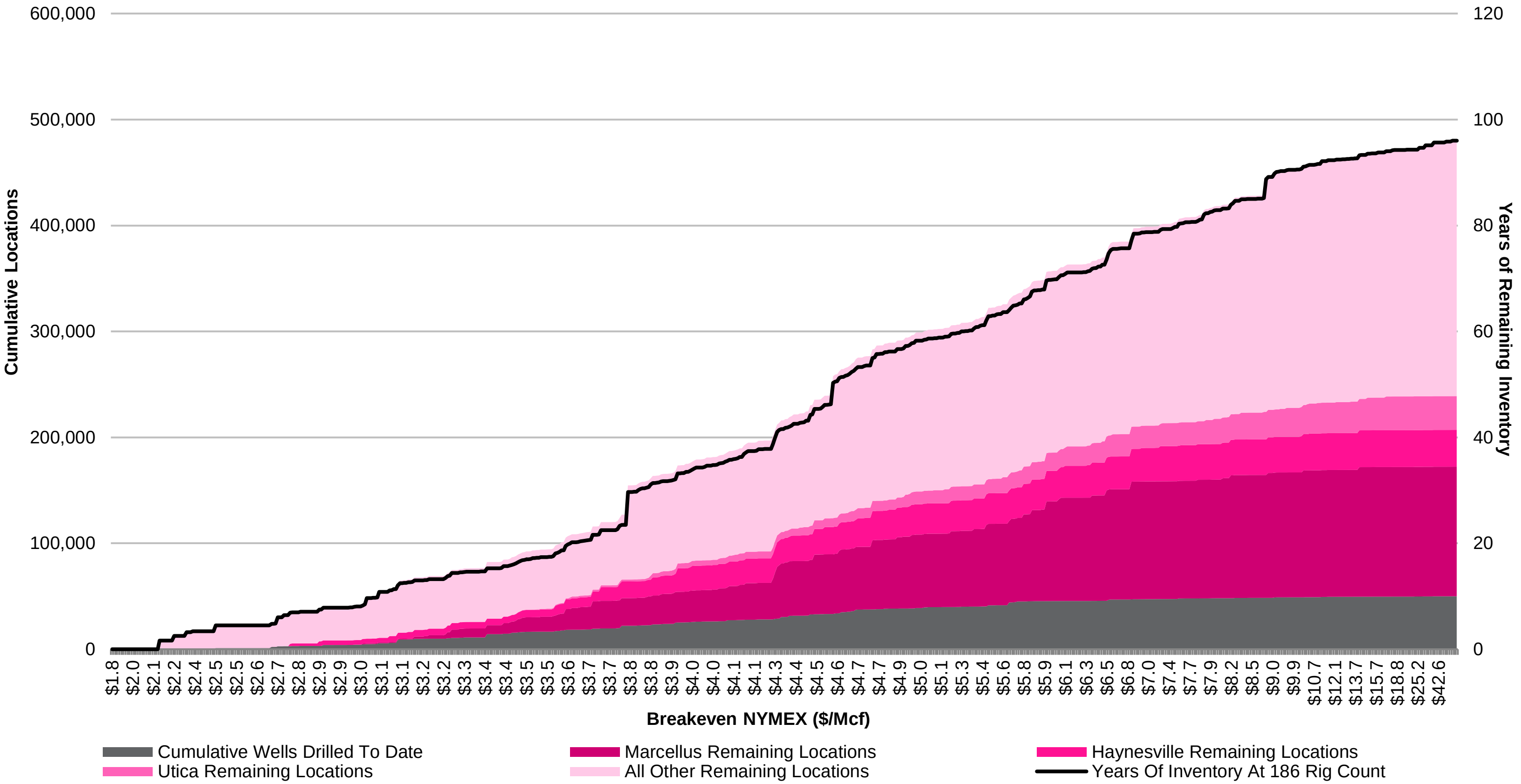
Oily Regions



Source: RSEG, raw data provided by state agencies, Drilling Info Inc.

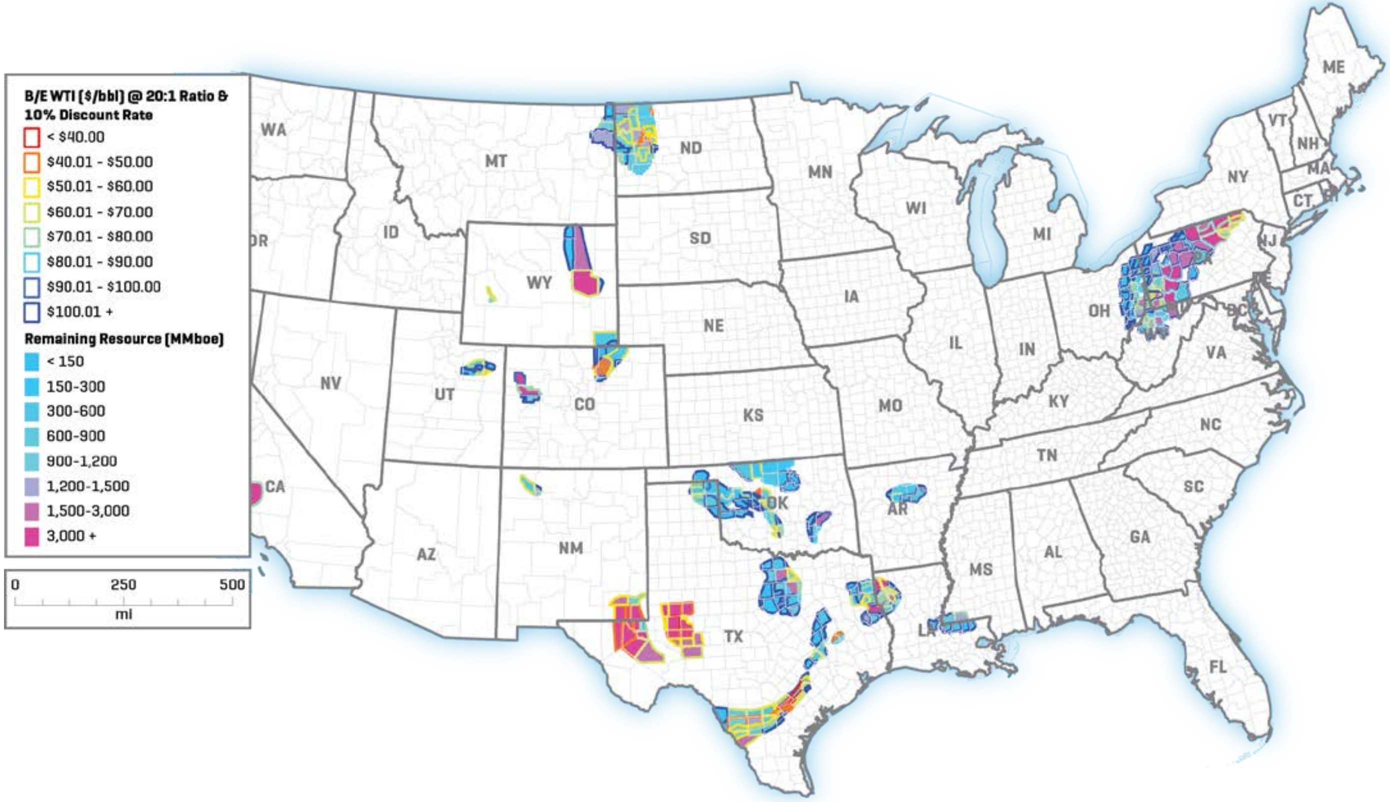
Cumulative Remaining Locations

Gassy Regions



Source: RSEG, raw data provided by state agencies, Drilling Info Inc.

L48 Landscape
Resource Estimates and Breakevens



Source: RSEG, raw data provided by company reports, state agencies, Drilling Info Inc.

Disclosures - Companies Mentioned

Company Name	Ticker	Exchange
Newfield Exploration	NFX	NYSE

Disclosures

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Disclosures

Valuation and Methodology

RSEG valuations are based primarily on calculations of net asset value (NAV), which are derived using discounted cash flow (DCF) models. The NAV model begins with an evaluation of a company's proved developed reserves using industry-standard decline analysis. RSEG then assesses the company's land holdings using a variety of technical data sources (geology, completion, historical production, etc.) to estimate the viability of the acreage for future drilling. Each well has an associated capital and operating cost structure that is incorporated into RSEG's model, which also accounts for hedges, debt, taxes, general and administrative costs, and other corporate-level financial inputs. RSEG typically runs a number of sensitivities around key variables, such as well cost, reserves and commodity prices, to show the range of possible outcomes.