

Update of Horizontal Plays in Wyoming*

Andrew Finley¹

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Abstract

Since the mid 2000's, the application of horizontal drilling and the development of horizontal completion technology has allowed for the significant rise in daily oil and gas production across the US. Wyoming and the Rocky Mountains have benefited from the development and application of these technologies and daily production has grown as a result. This presentation will review the recent activity, history and results of horizontal drilling and completion technologies within Wyoming on a formation/play basis.

References Cited

Lawless, P., 2013, Powder River Basin Schematic Cross Section: New Orleans, La, Internal Helis Oil and Gas Co. presentation.

Sonnenberg, S.A., and R.J. Weimer, 2006, Wattenberg Field Area, A Near Miss and Lessons Learned After 35 Years of Development History: Rocky Mountain Association of Geologists Luncheon Presentation, Denver, Colorado, Web Accessed August 5, 2017, <http://pttc.mines.edu/casestudies/Wattenberg/Wattenberg.pdf>

Wyoming Oil and Gas Conservation Commission Online Database, Web Accessed August 5, 2017, <http://wogcc.state.wy.us/legacywogcce.cfm>



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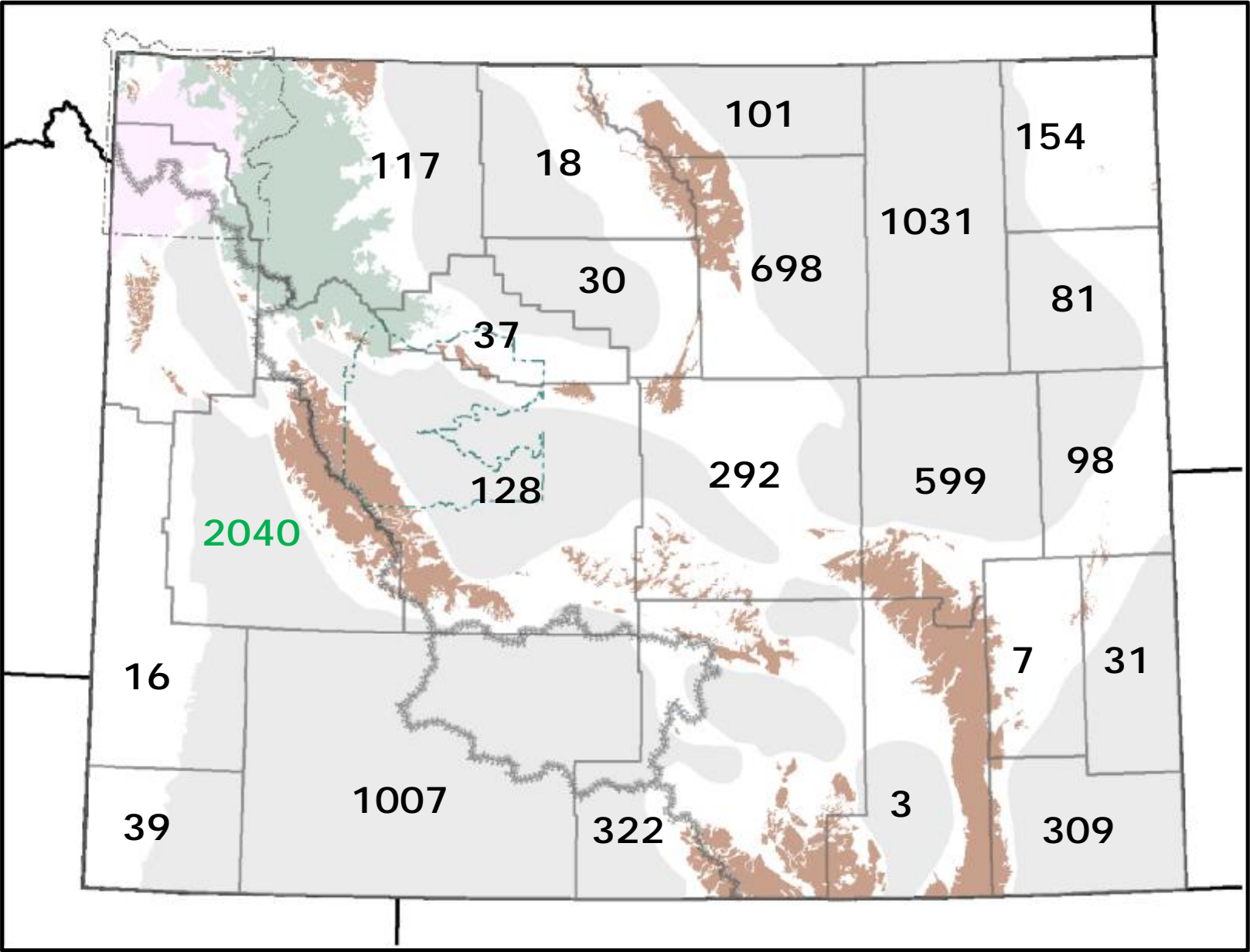
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American Association of Petroleum Geologists

Rocky Mountain Section Meeting June 27, 2017

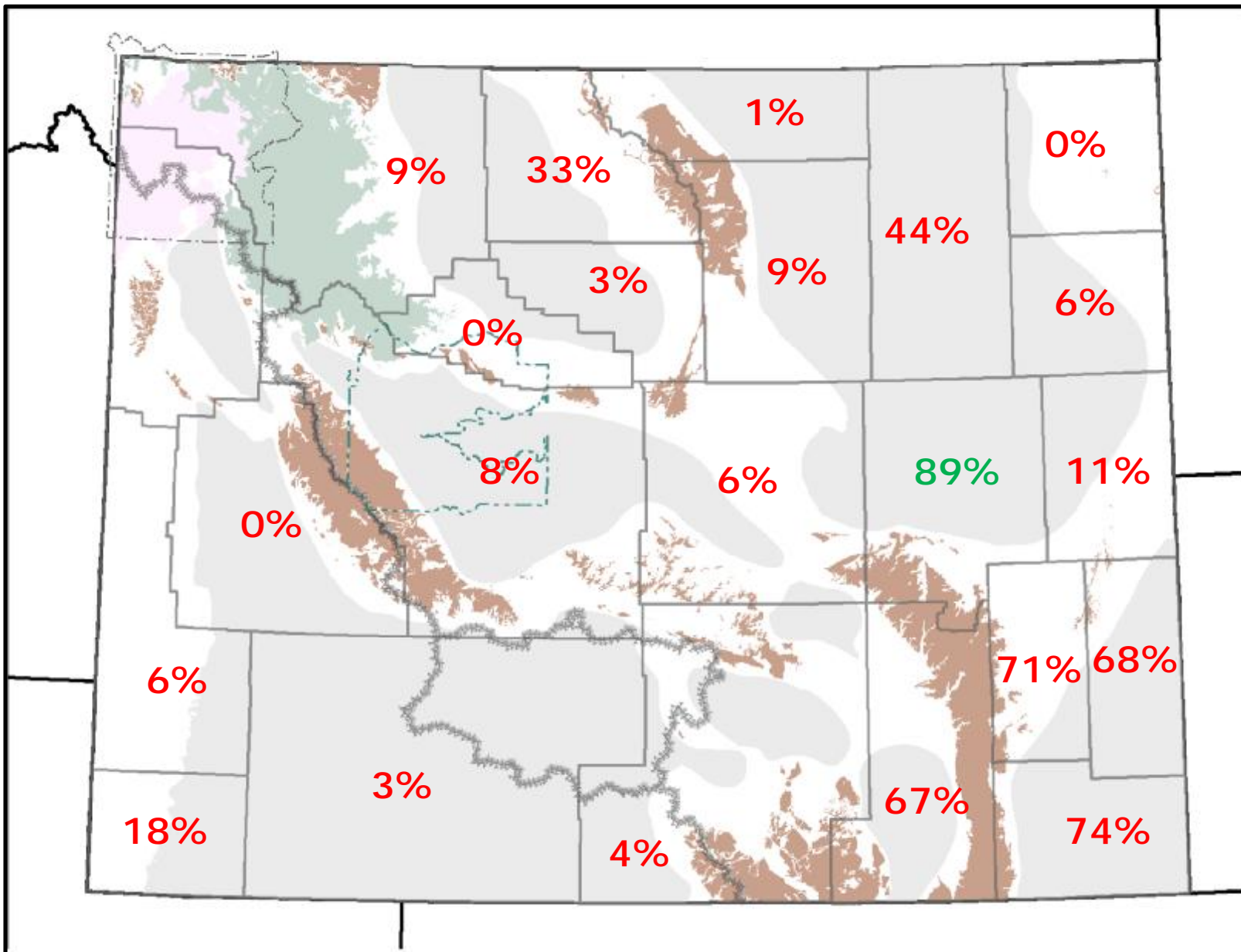
Total Wells Drilled By County 2010-2016

TD > 500'

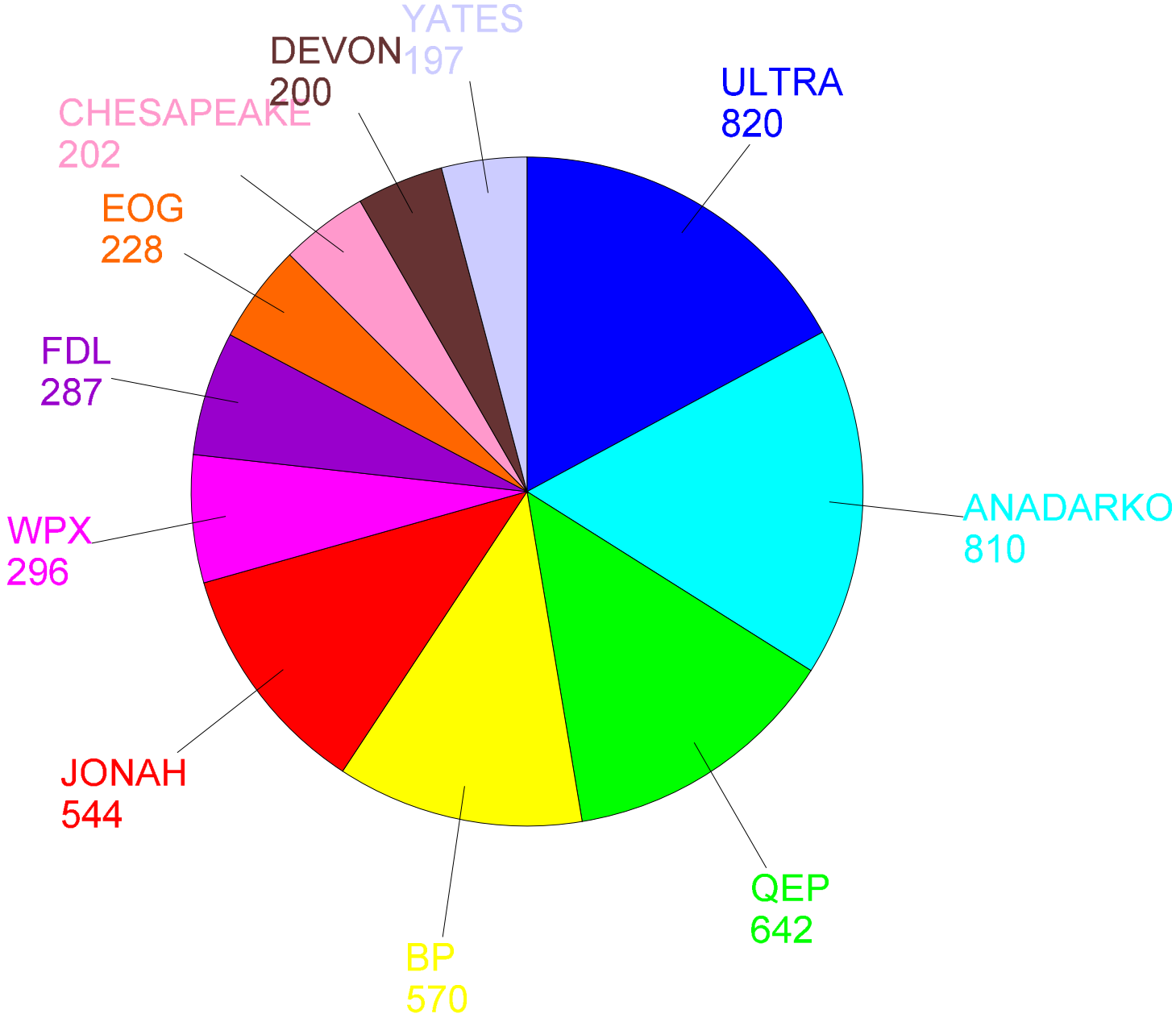


Percentage of Horizontal Wells Drilled By County 2010-2016

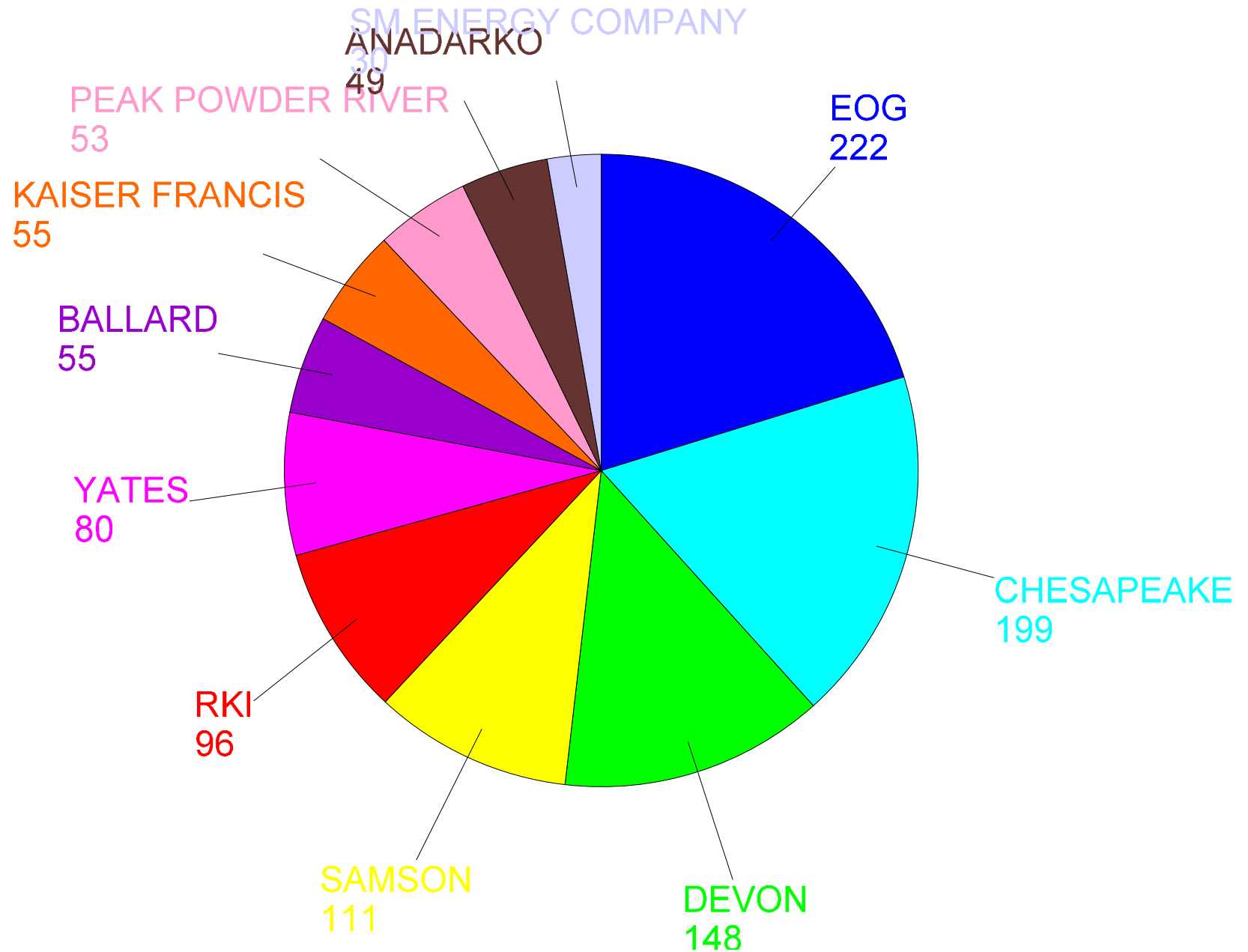
TD > 500'



Top 10 Active Operator By Total Wells Drilled 2010-2016



Top 10 Active Operator By Horizontal Wells Drilled 2010-2016

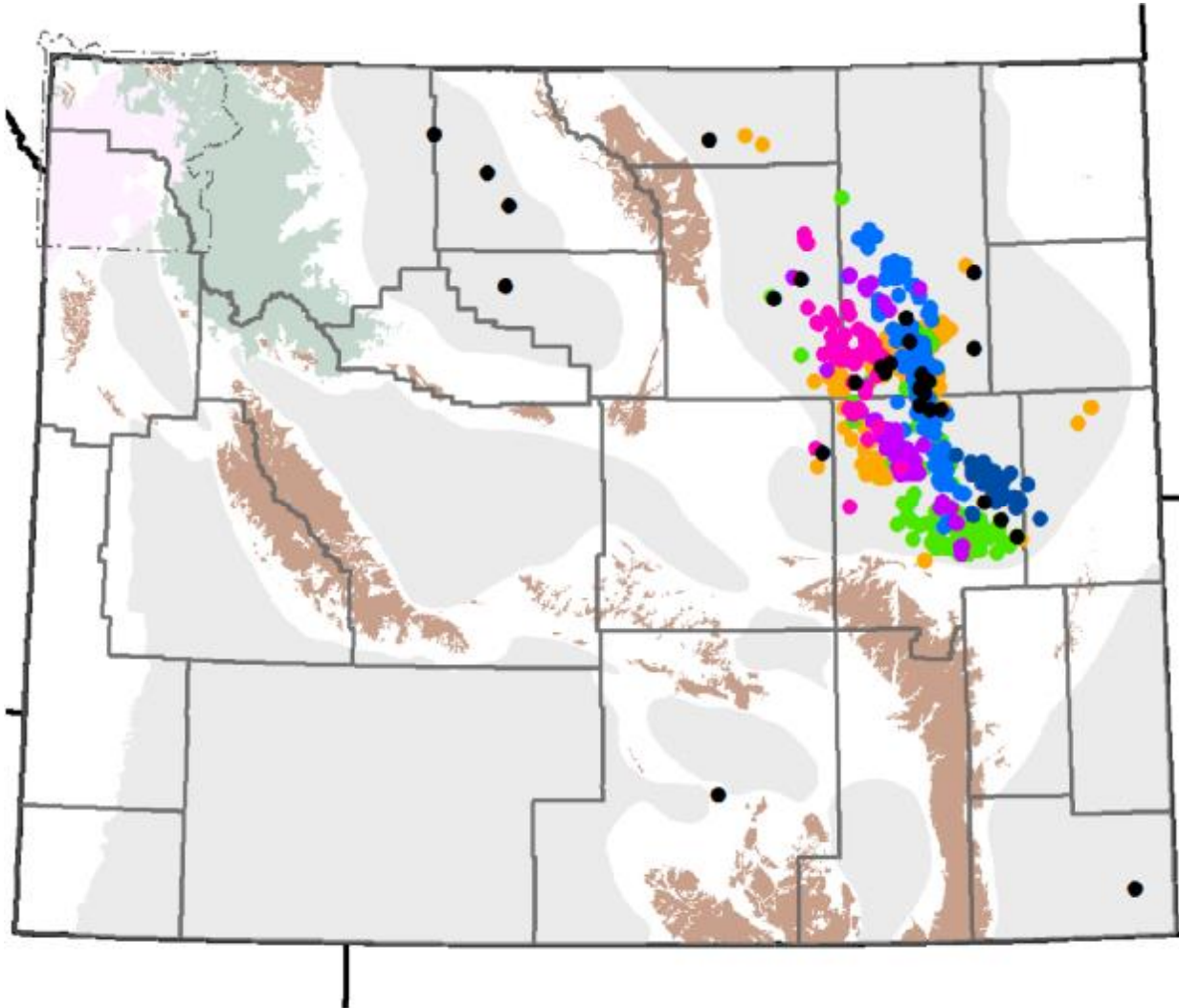


Powder River Basin

Teapot
3.6 MMBO
2.5 BCFG
47 Wells

Parkman
20 MMBO
14.5 BCFG
192 Wells

Sussex
8.7 MMBO
12.8 BCFG
78 Wells



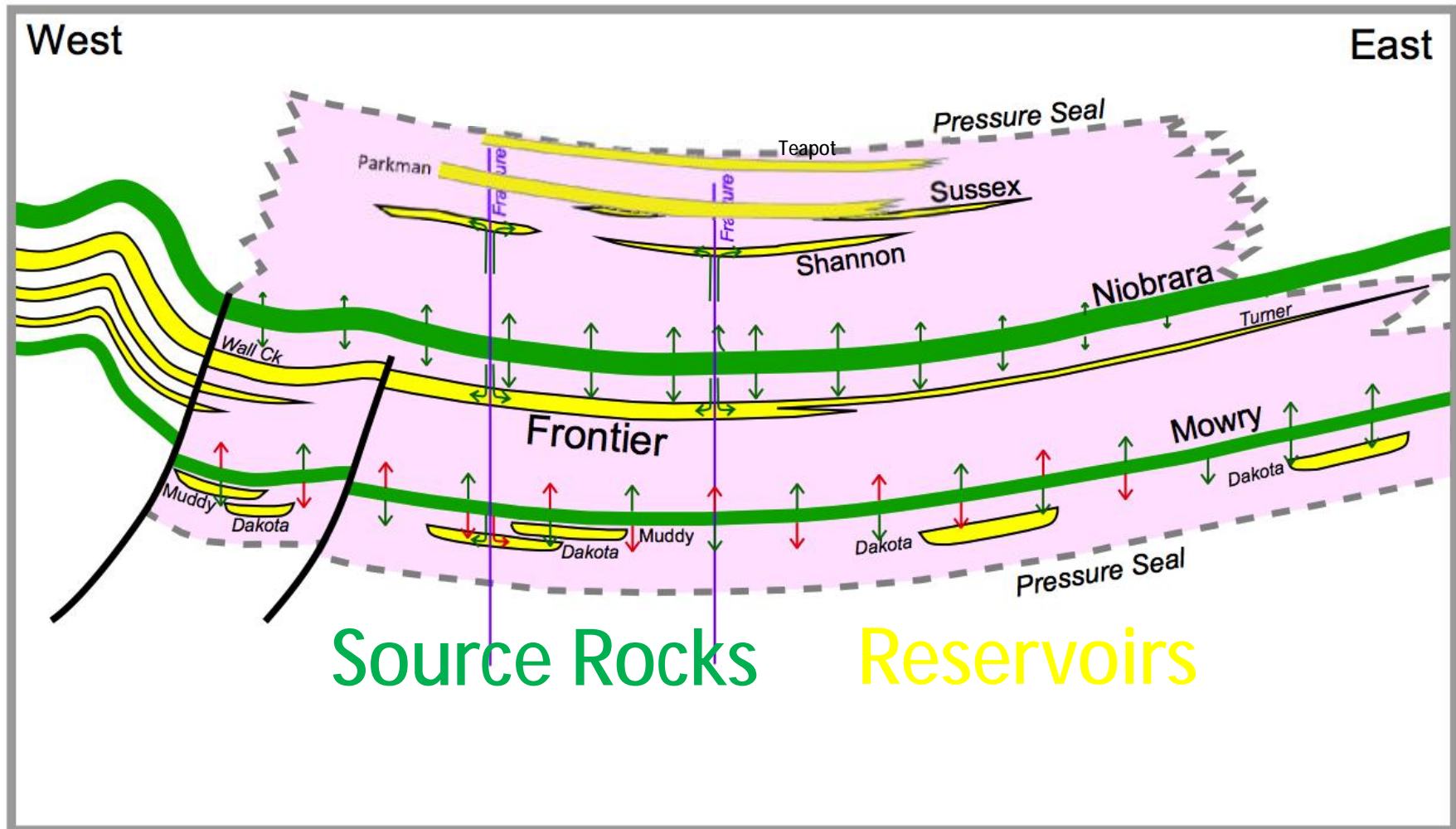
Shannon
8.2 MMBO
5.7 BCFG
83 Wells

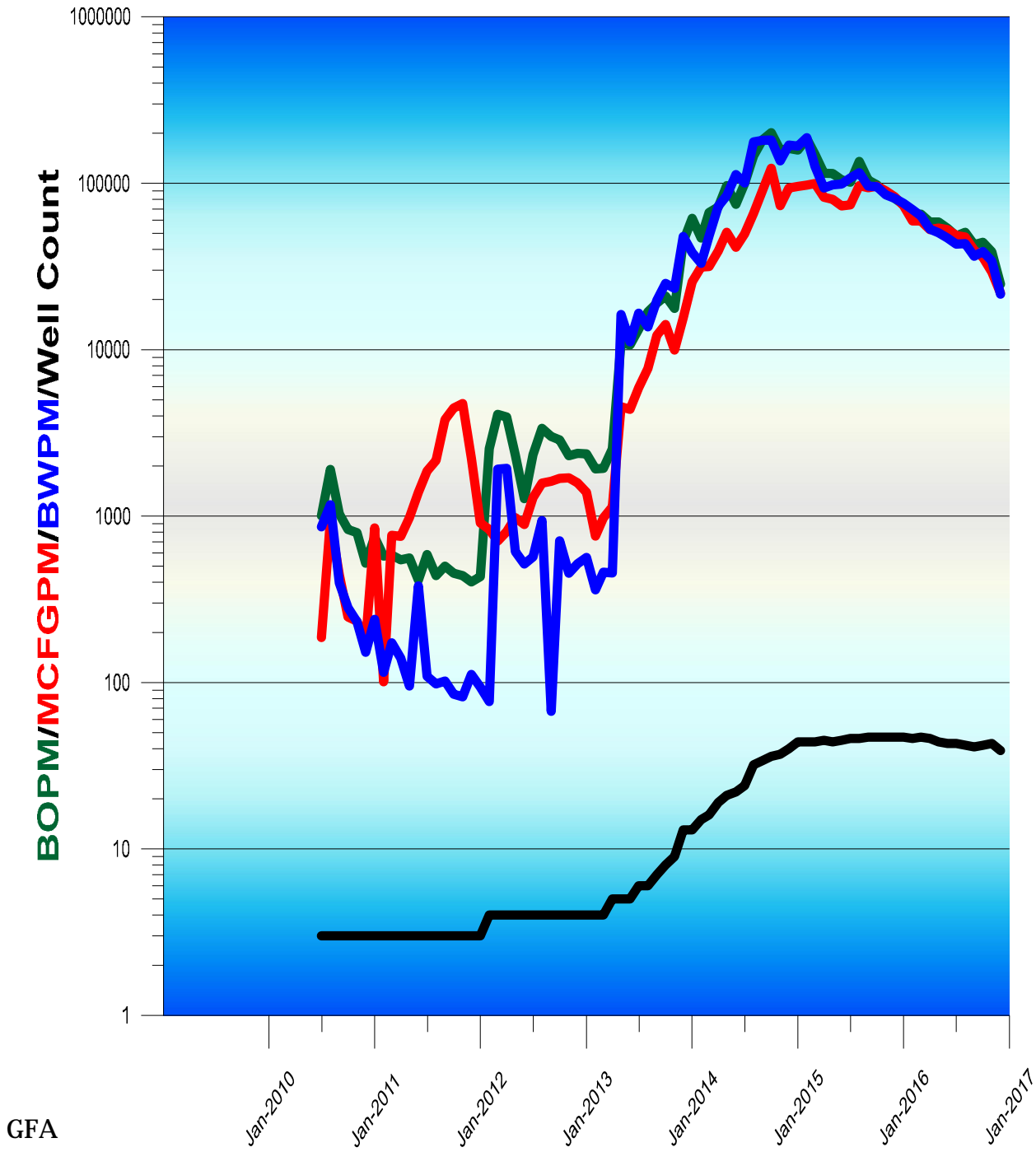
Niobrara
14.2 MMBO
78.8 BCFG
181 Wells

Frontier/Turner
37.7 MMBO
125.9 BCFG
290 Wells

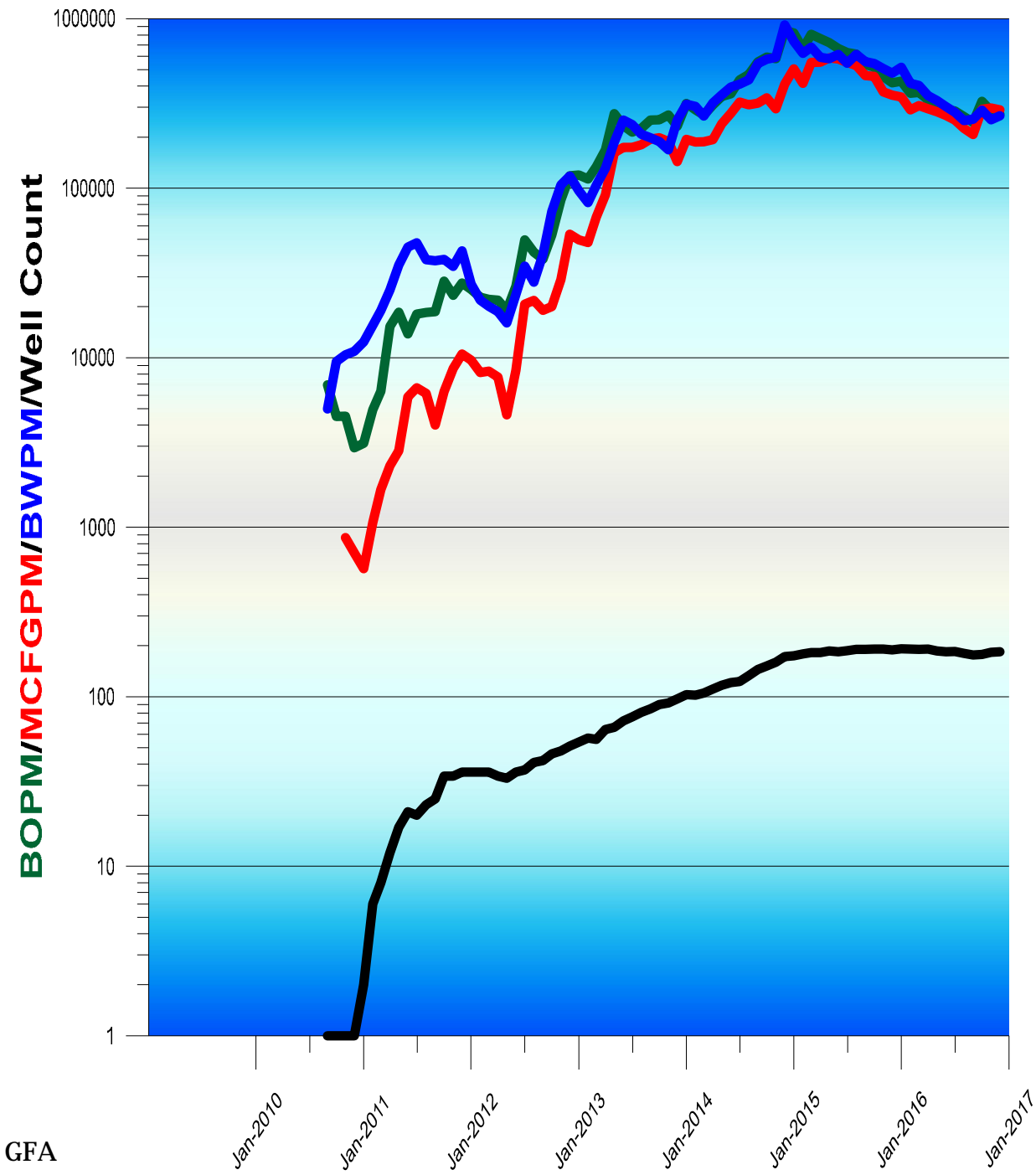
Mowry
1 MMBO
9.3 BCFG
18 Wells

Powder River Basin Cross Section

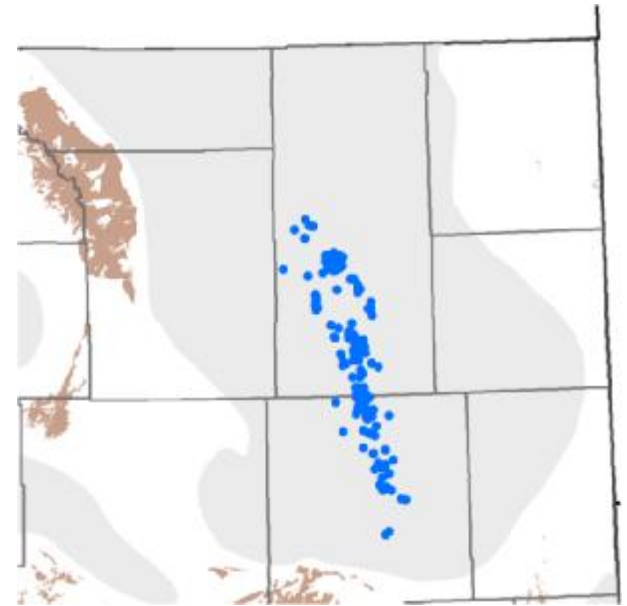




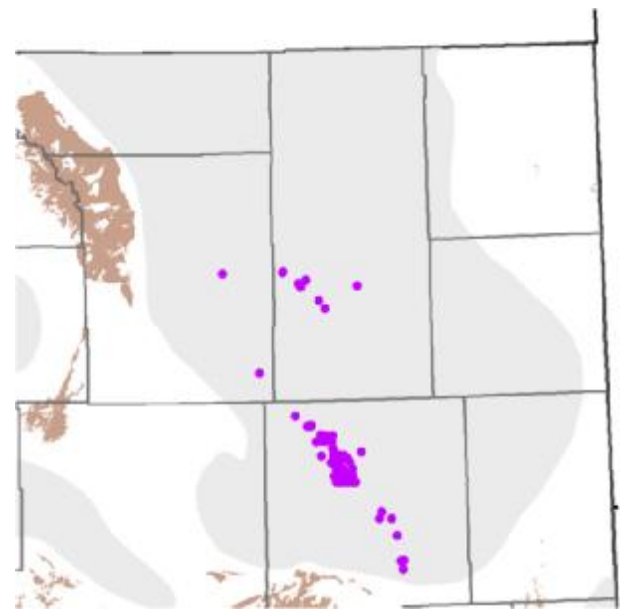
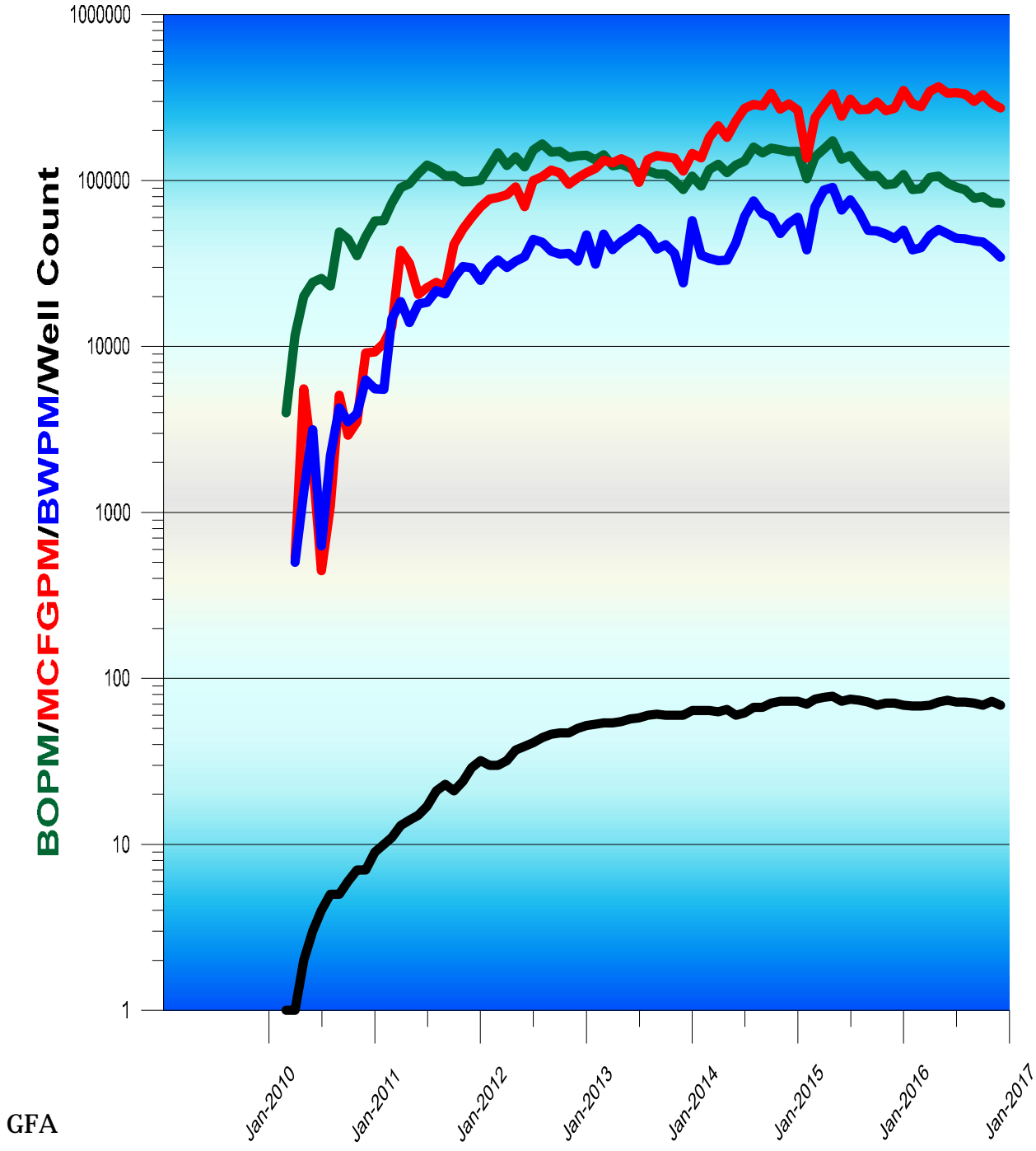
Teapot
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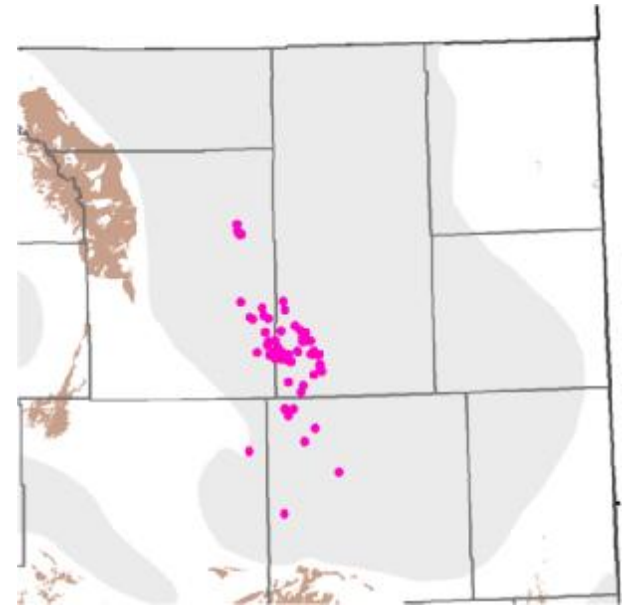
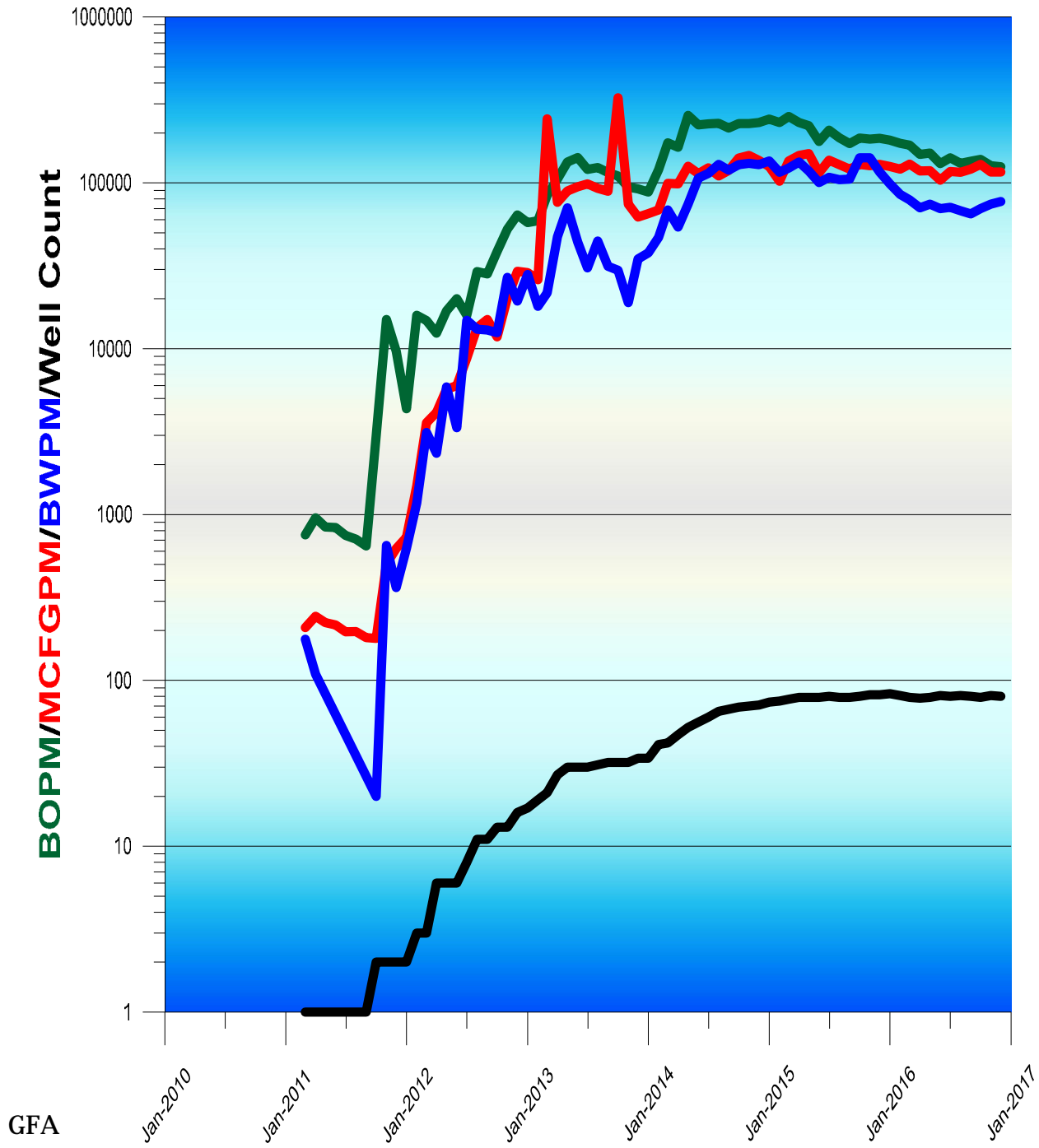
GFA



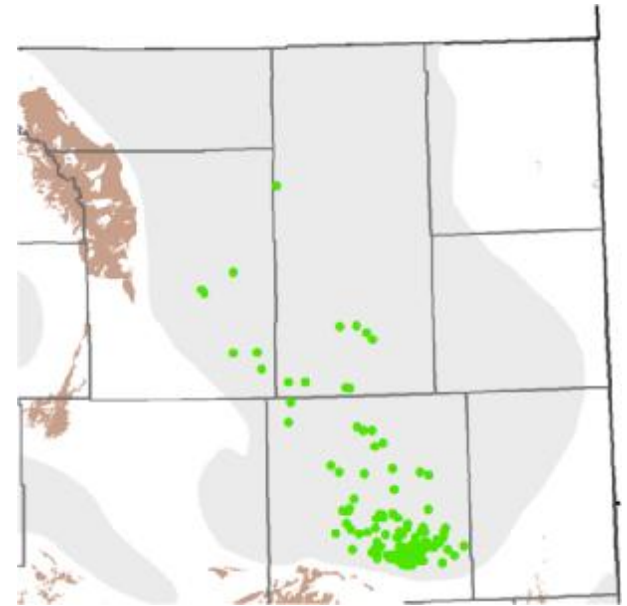
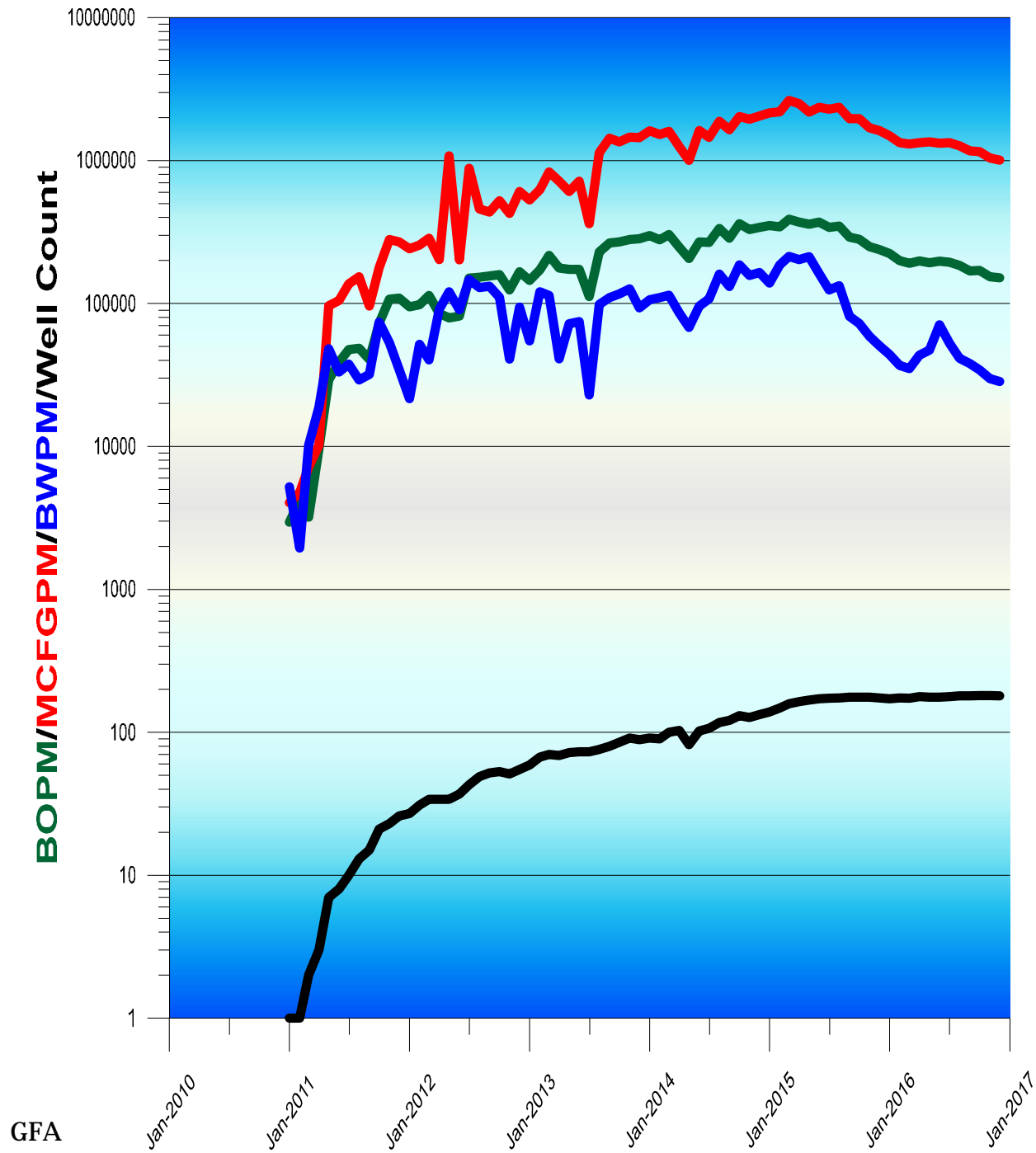
Parkman
 20 MMBO
 14.5 BCFG
 192 Wells



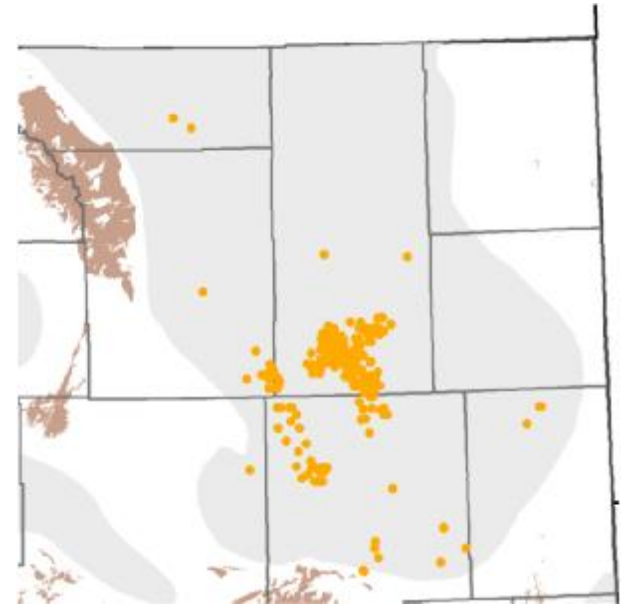
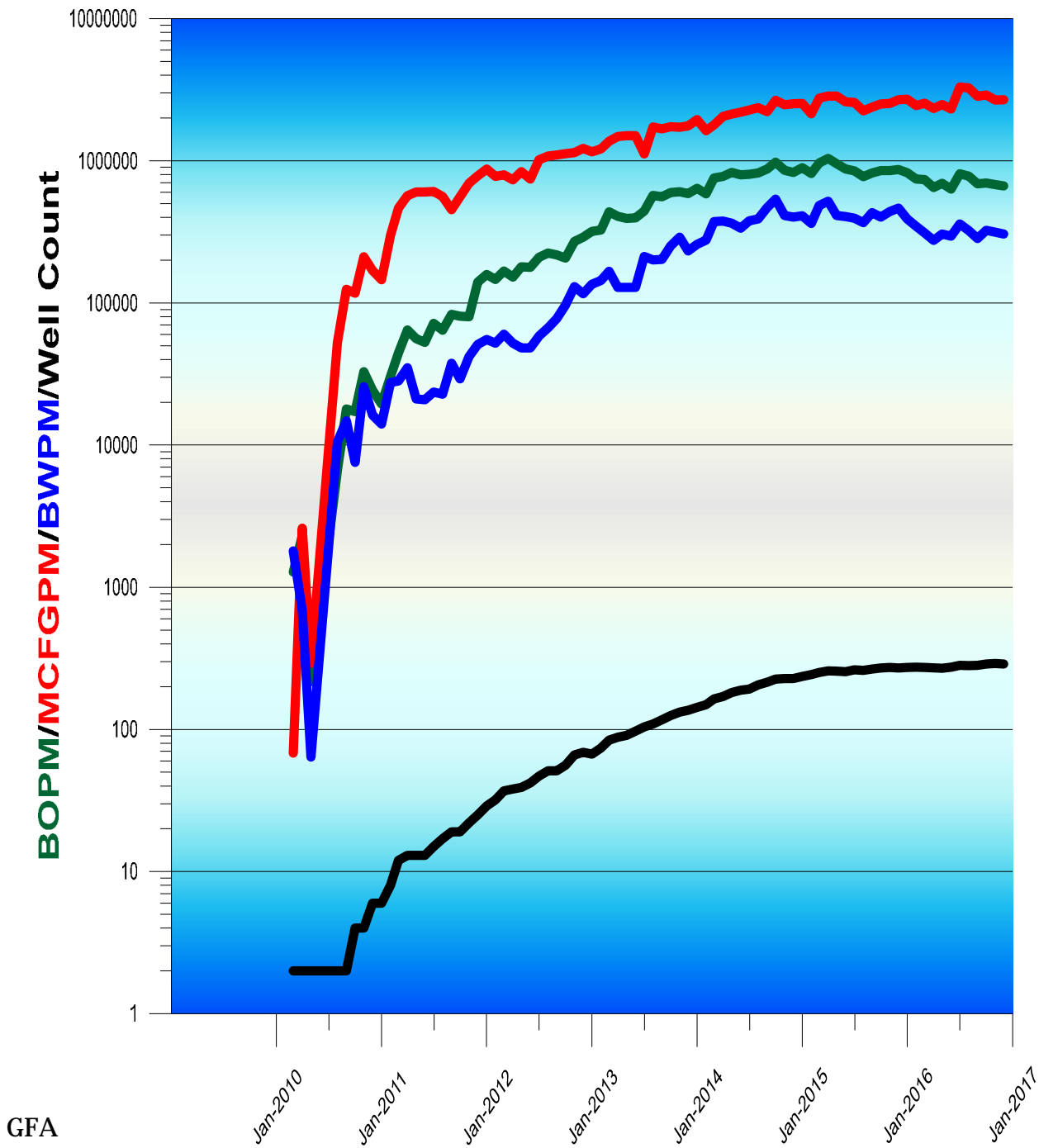
Sussex
 8.7 MMBO
 12.8 BCFG
 78 Wells



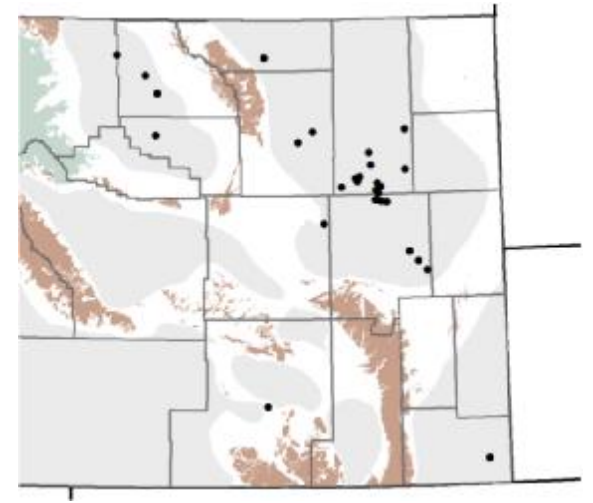
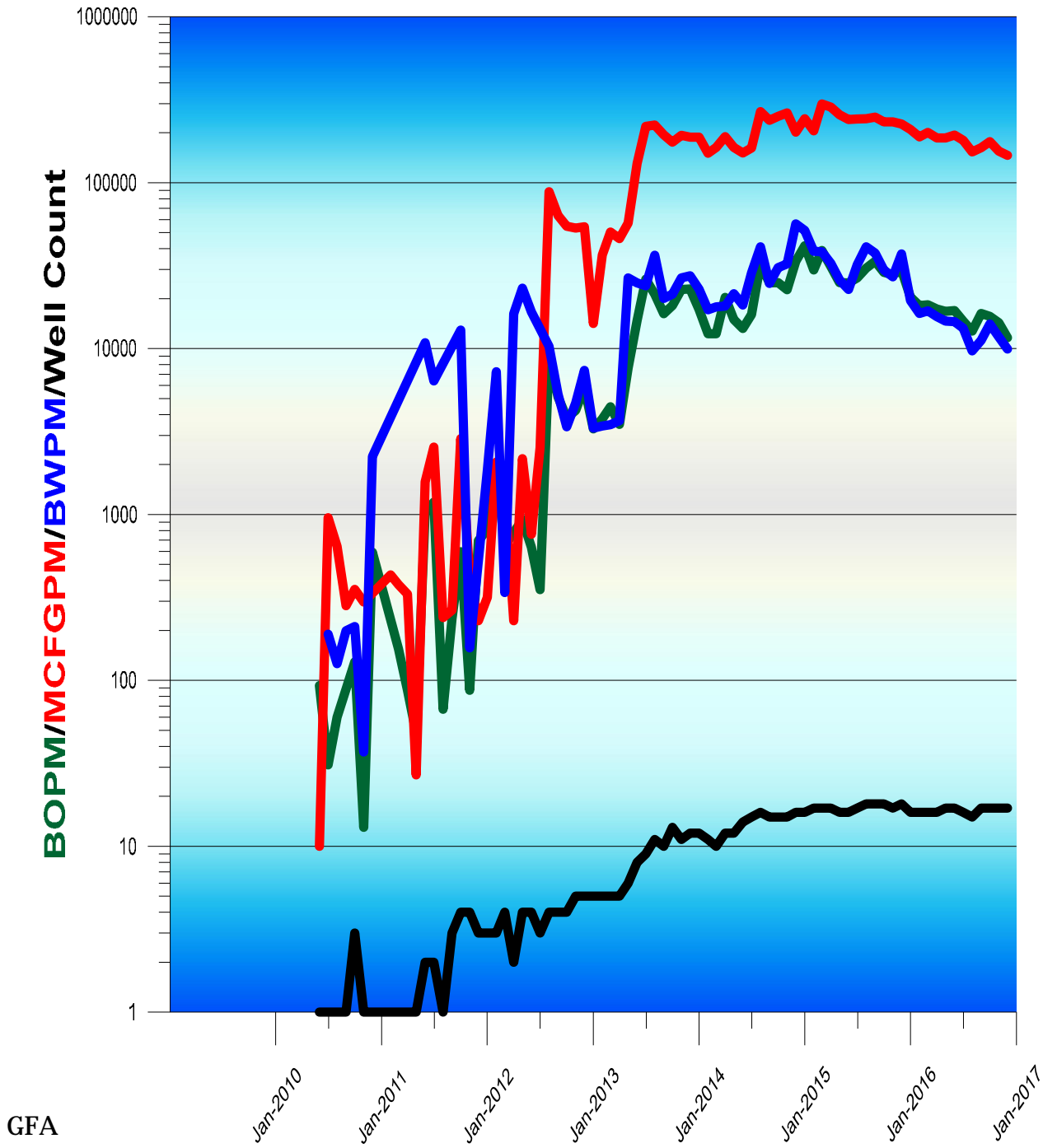
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Niobrara
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78.8 BCFG
181 Wells

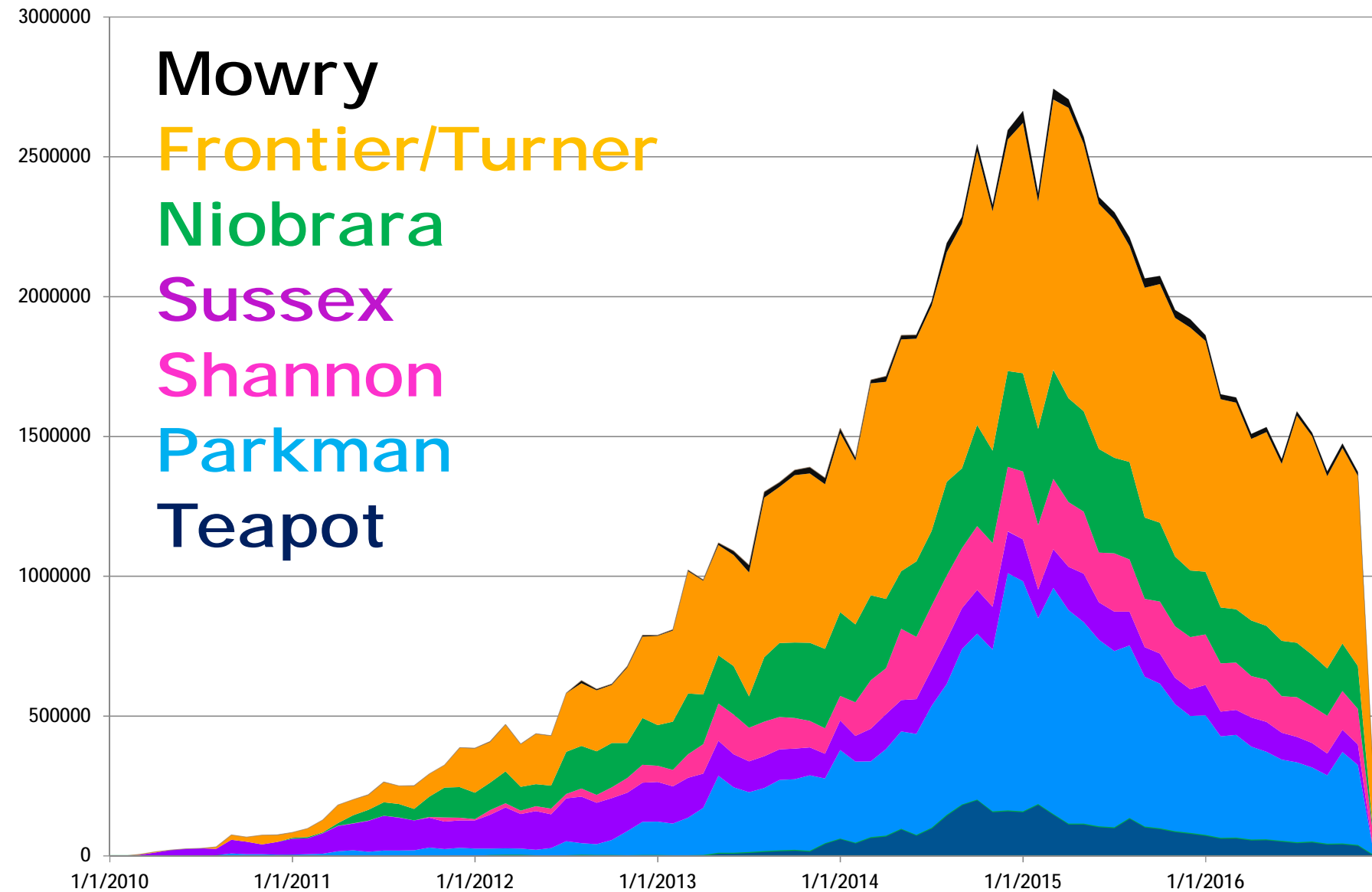


Frontier/Turner
 37.7 MMBO
 126 BCFG
 290 Wells



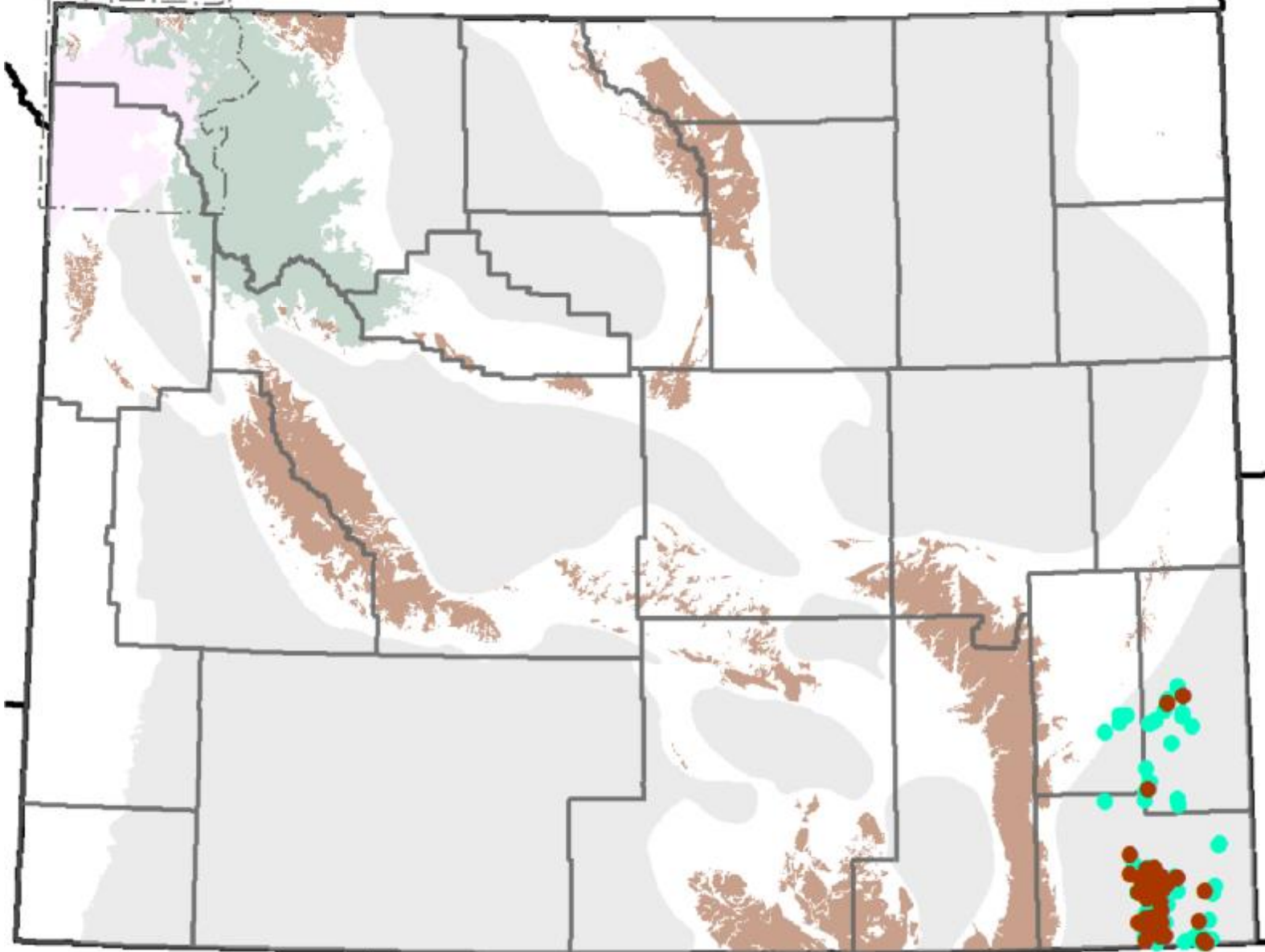
Mowry
 1 MMBO
 9.3 BCFG
 18 Wells

PRB Horizontal Production



GFA

DJ Basin

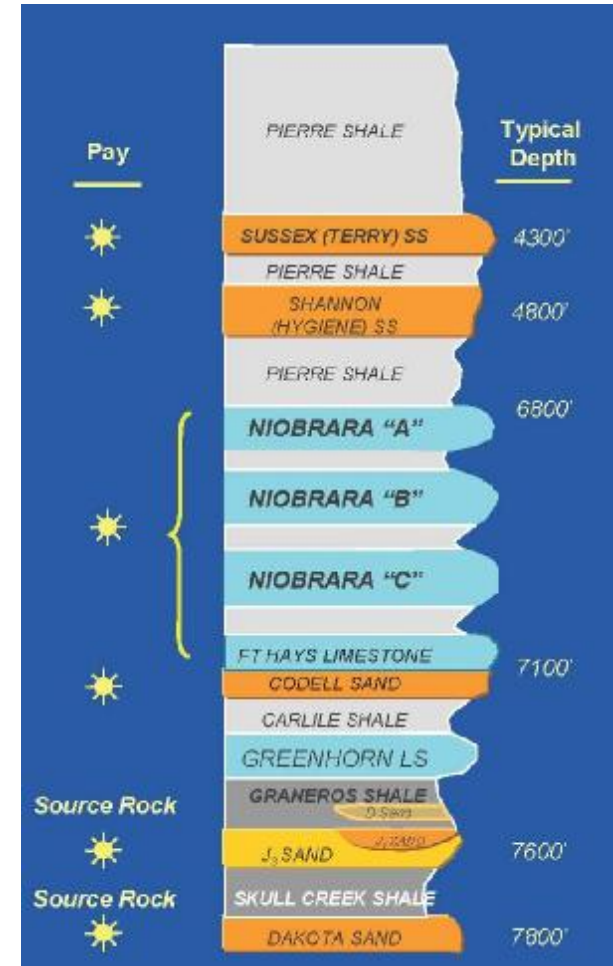


Niobrara
3.9 MMBO
3.5 BCFG
95 Wells

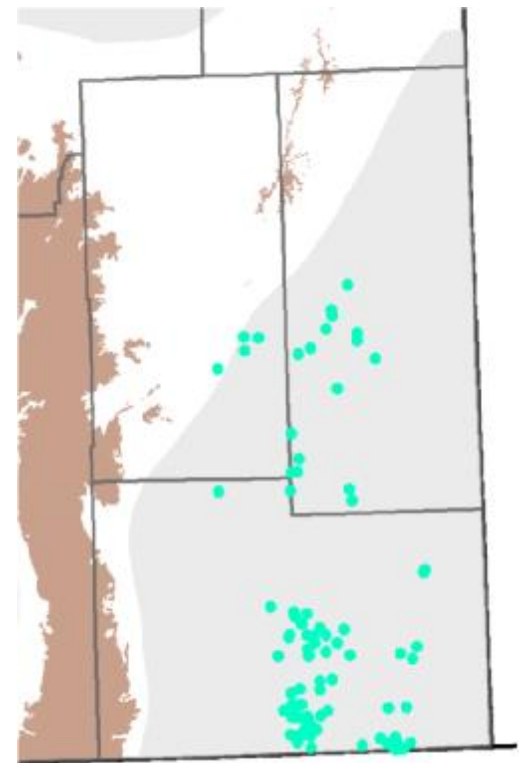
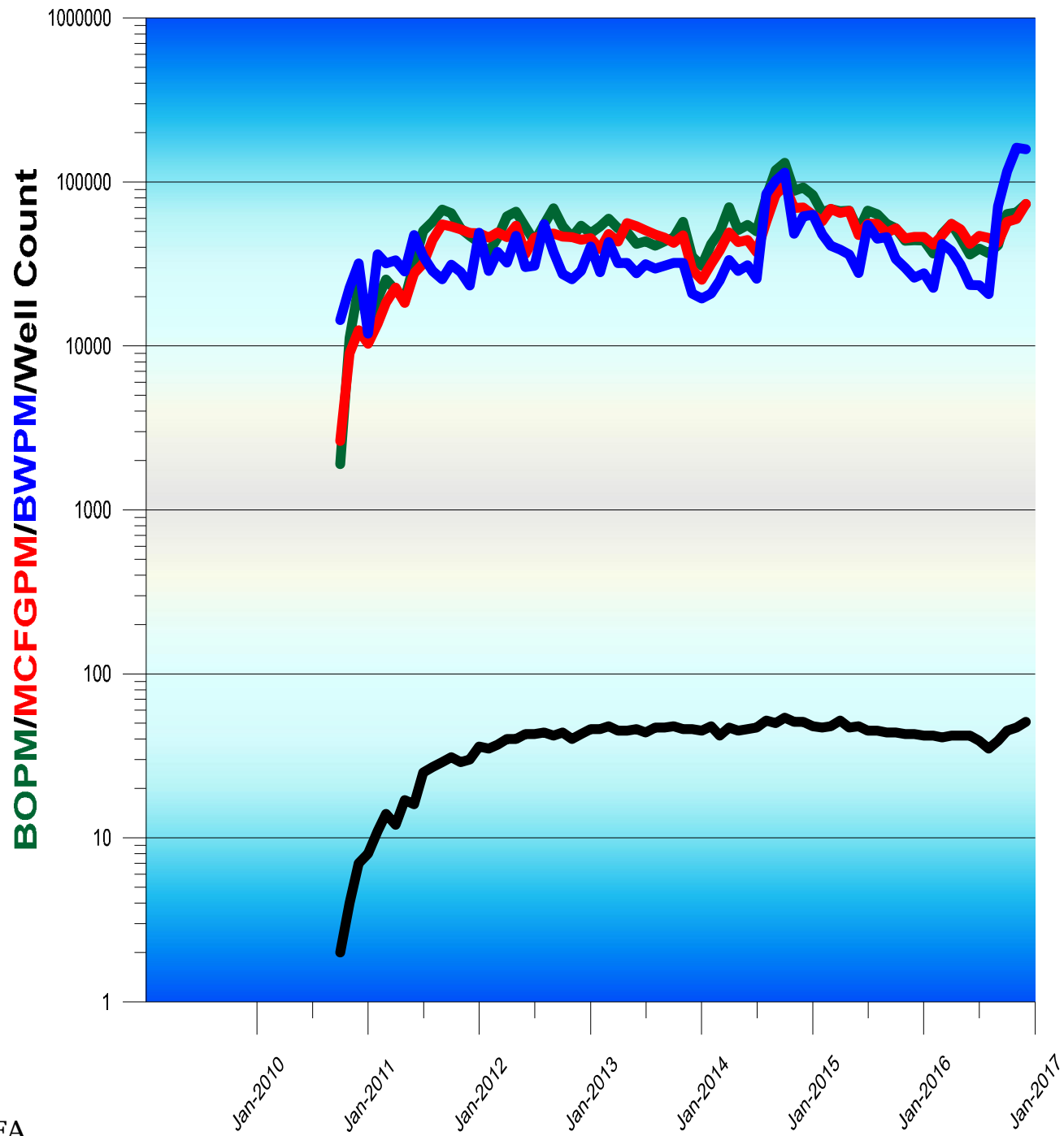
Codell
8.3 MMBO
6.5 BCFG
89 Wells

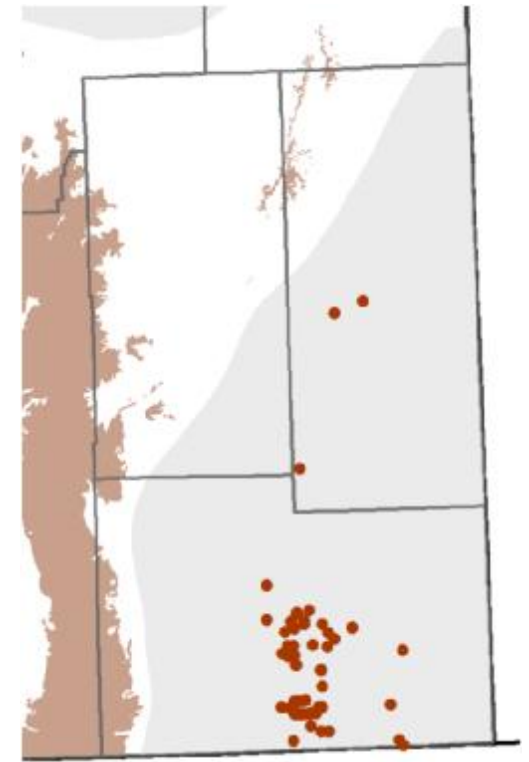
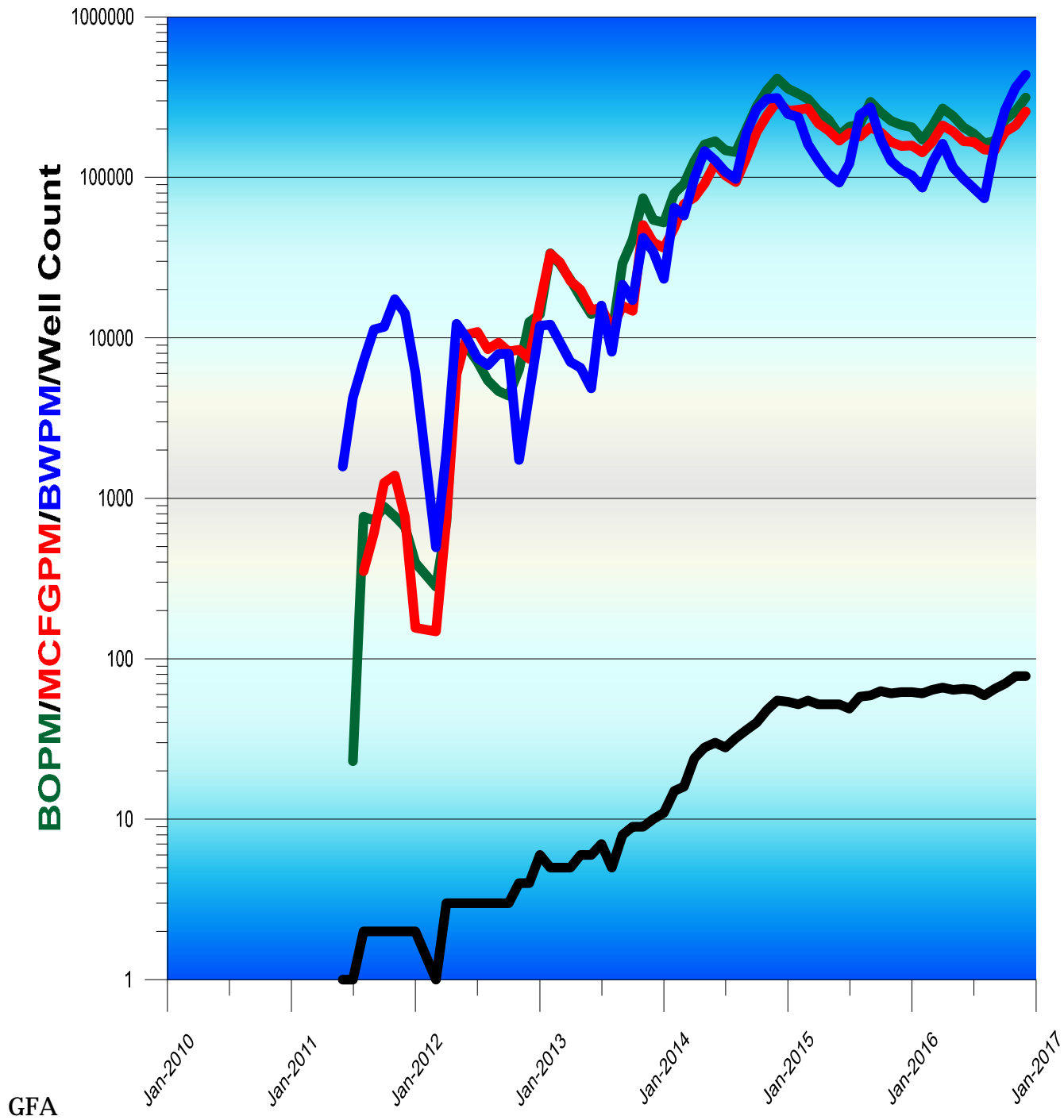
DJ Basin Stratigraphic column

Sonnenberg and Weimer



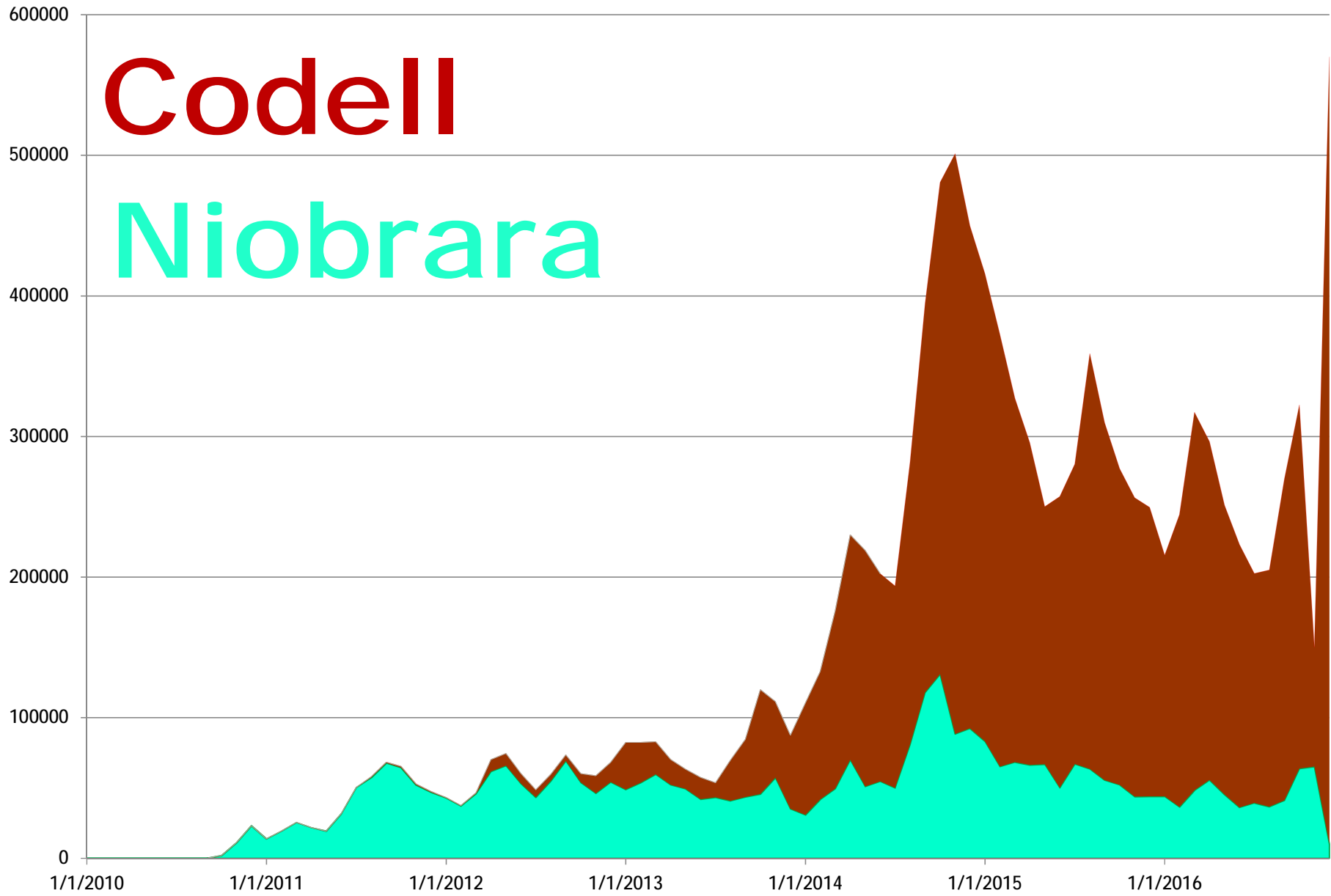
GFA





Codell
8.3 MMBO
6.5 BCFG
89 Wells

DJ Basin Horizontal Production



CodeII

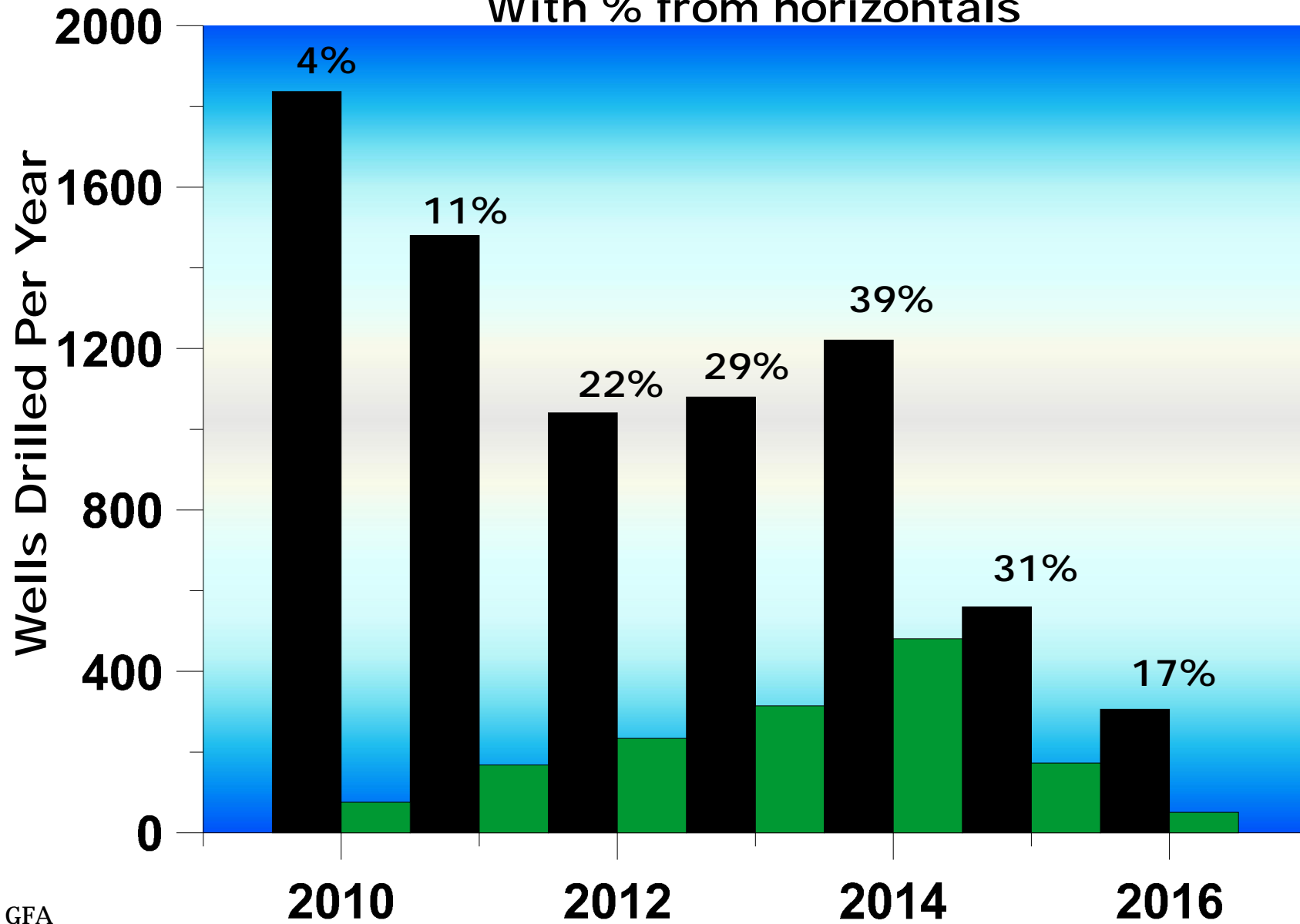
Niobrara

■ Wyoming Wells Drilled

Vs

■ Horizontal Wells Drilled 2010-2016

With % from horizontals

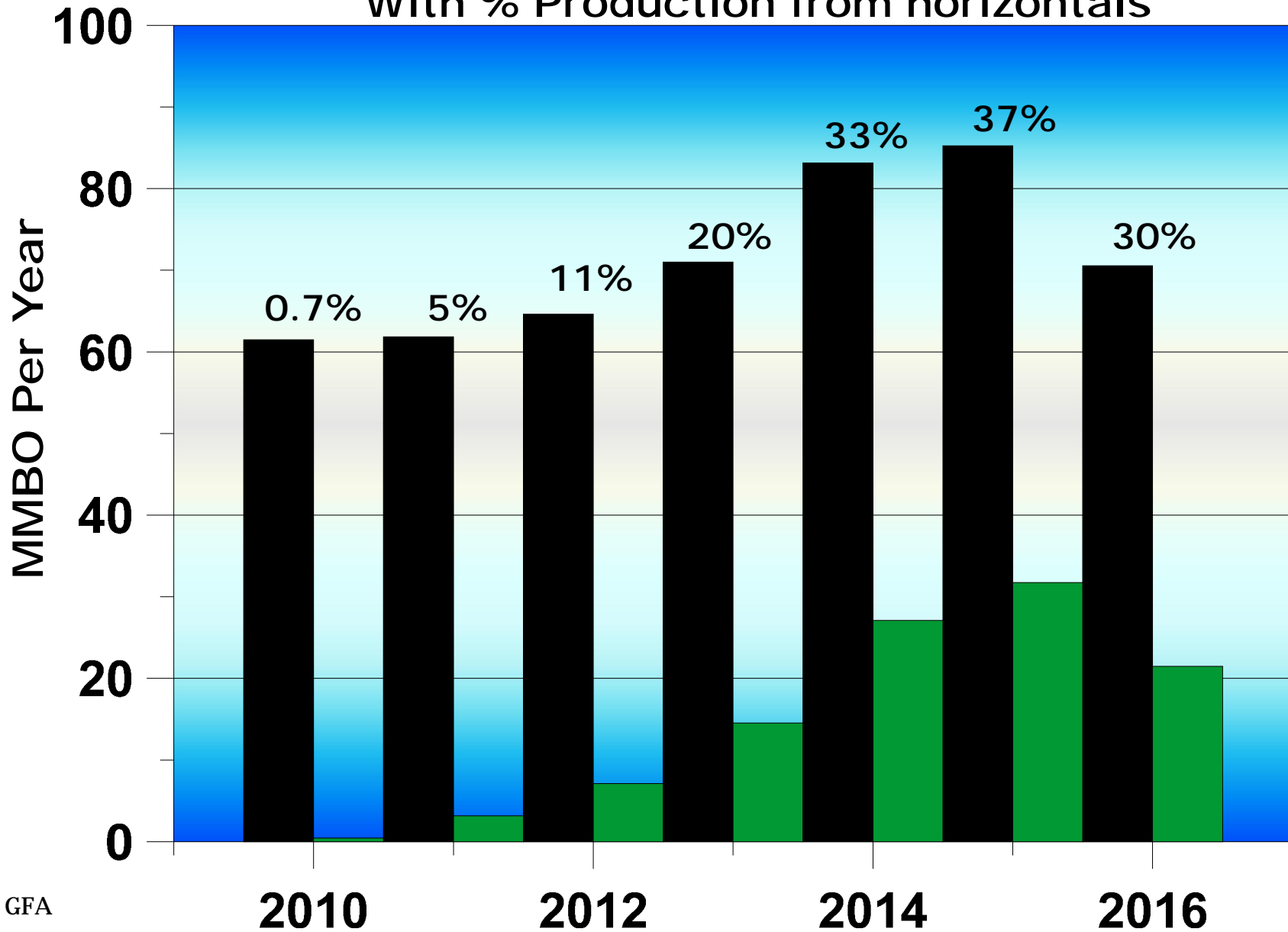


■ Wyoming Cumulative Oil Production

Vs

■ Horizontal Oil Production 2010-2016

With % Production from horizontals



Observations 2010-2016

Converse County has been most active county for horizontal development (oil)

Sublette County has been most active county for vertical development (gas)

Horizontal drilling peaked in 2014 at 481 wells (prices)

Horizontal production peaked in 2015 at 31.7 MMBO (completion lag time)

Growth in oil production has been dominated by horizontal wells

Horizontal production has declined sharply due to higher decline rates in horizontal wells and drop in price

Higher decline rates mean growth in production depends on active drilling programs to replace production

These plays typically don't go cash positive until drilling has stopped-beware of price collapse

Wyoming produced 497 MMBO total and 106 MMBO from horizontal wells (20%)

Approximately 7,525 total wells and 1,500 horizontal wells were drilled (20%)

Acknowledgements

Conference attendees

AAPG-RMS

Paul Lawless, Helis Oil and Gas

Anne Marquard, GFA

WOGCC