

TOGA 2022

Sustainable and Responsible Development of Resources Remaining in Appalachia

October 3, 2022

Wright & Company, Inc.

Petroleum Consultants

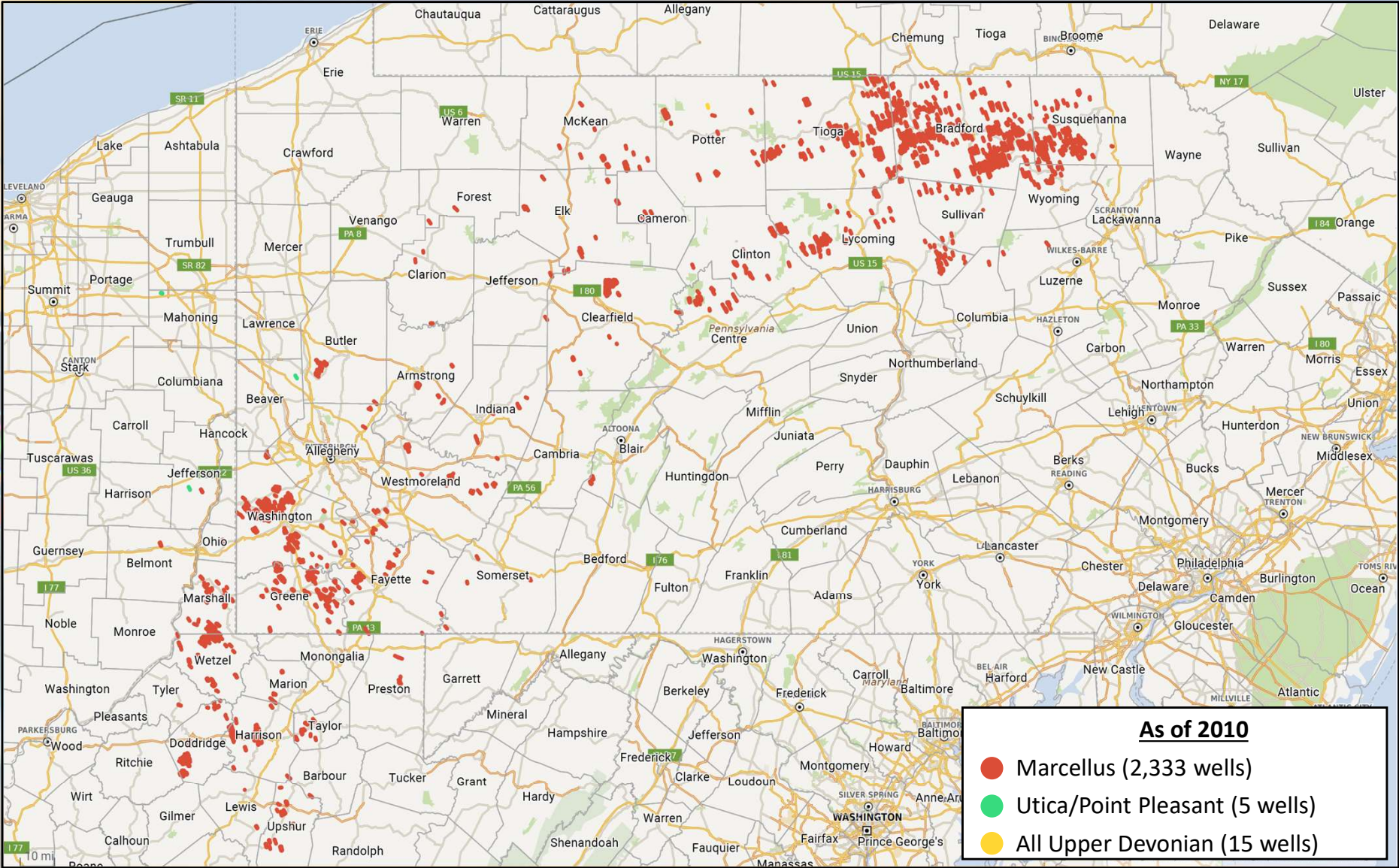
Wright Energy Advisors

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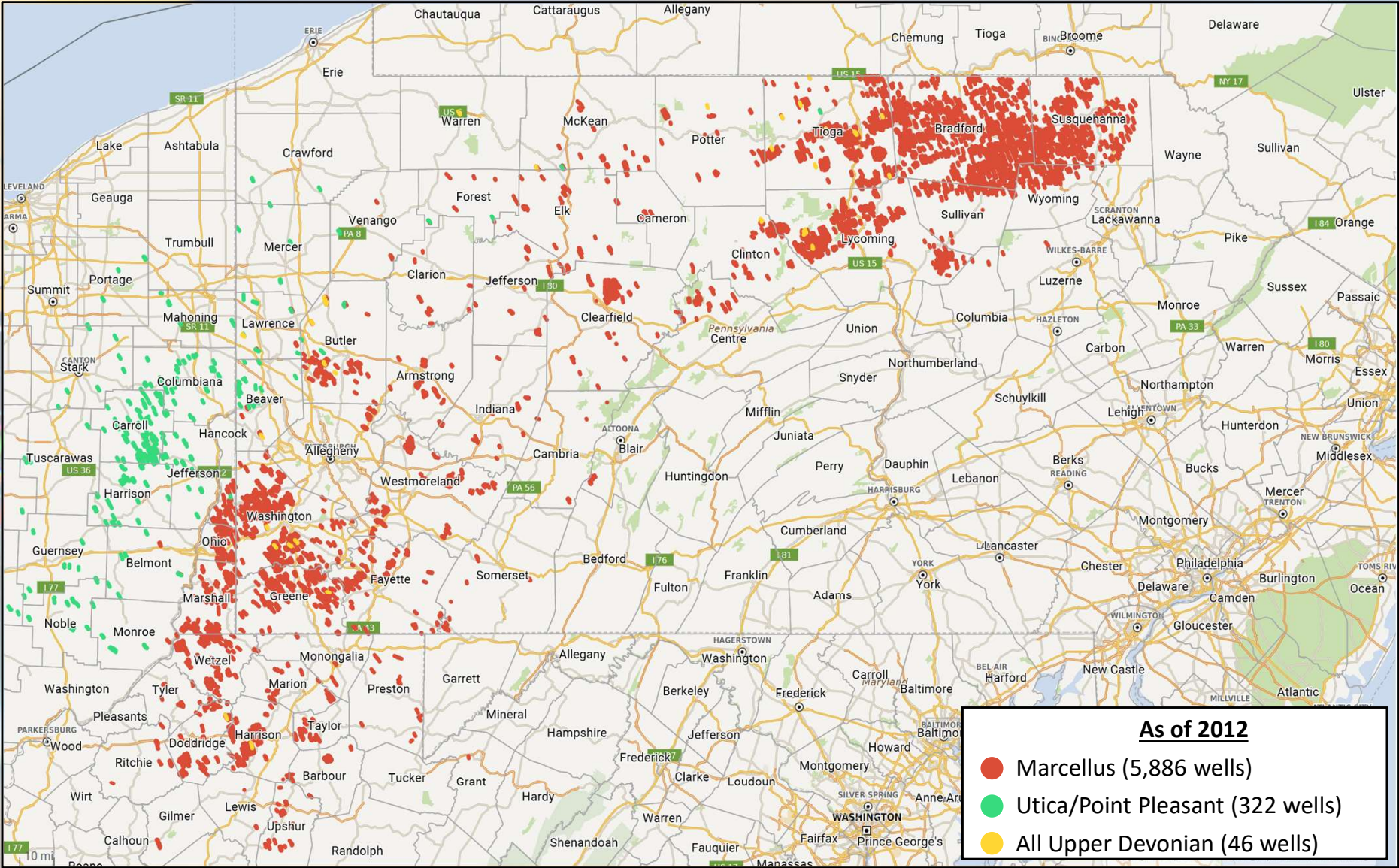
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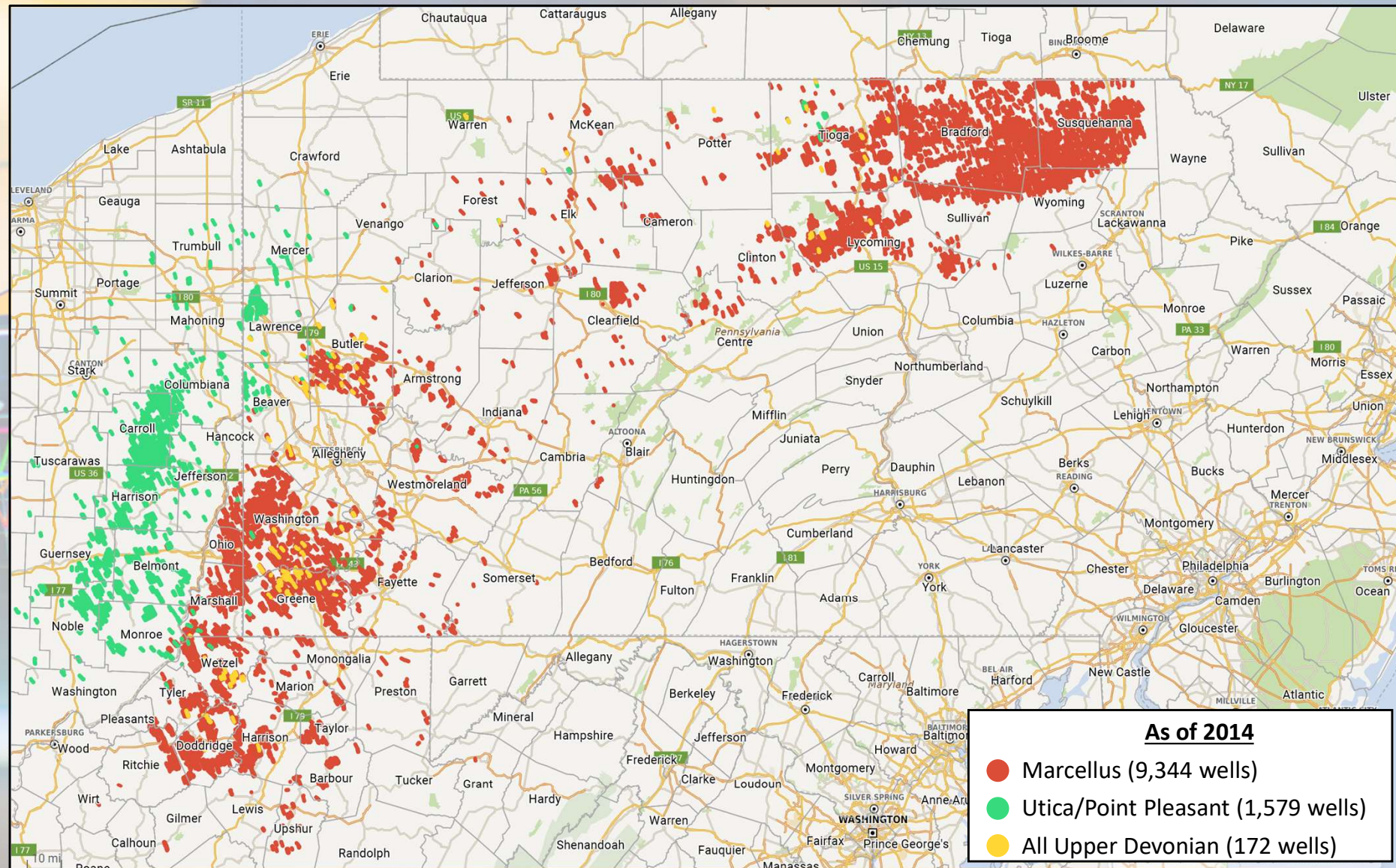
MARCELLUS, UTICA/POINT PLEASANT, AND UPPER DEVONIAN



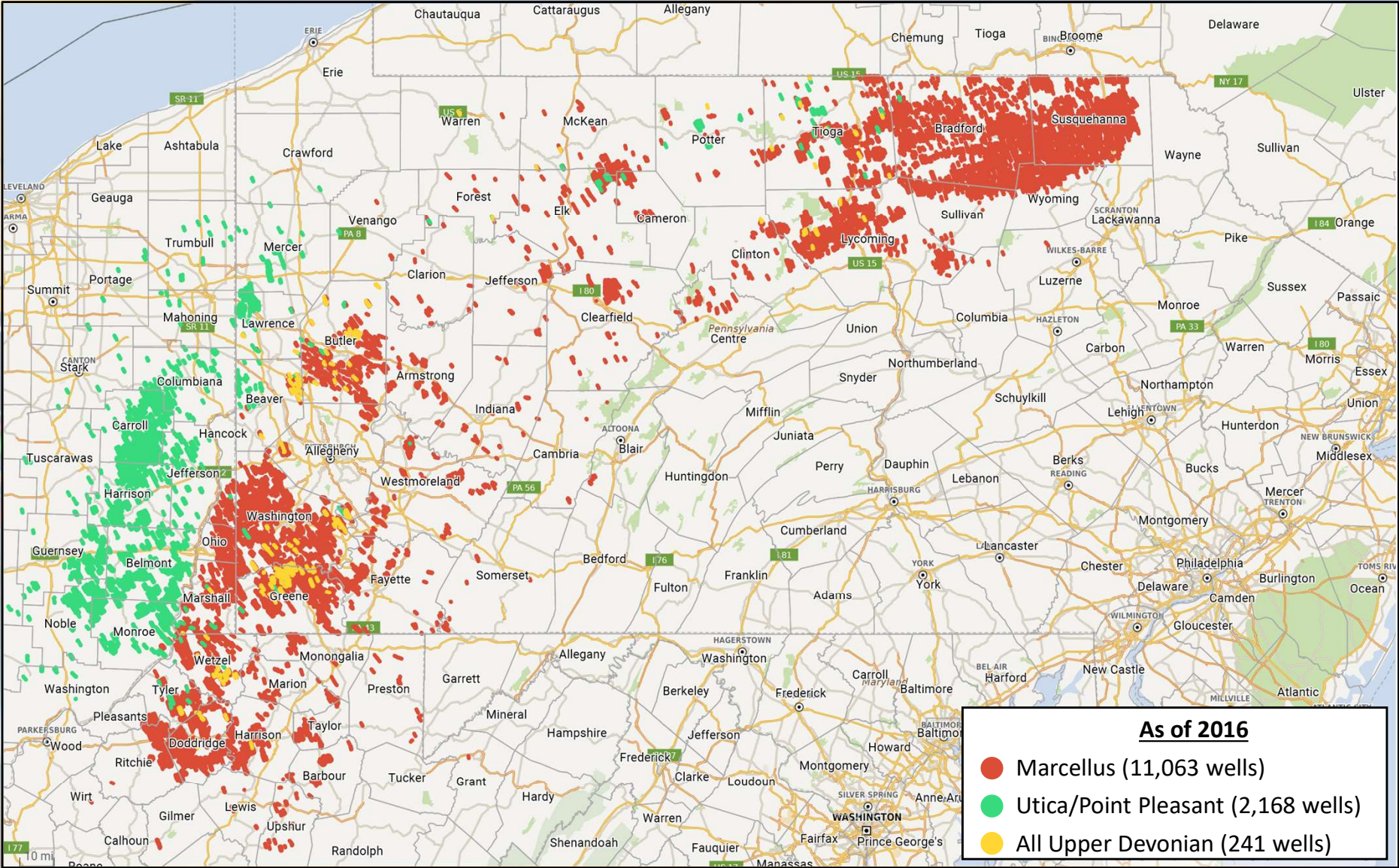
MARCELLUS, UTICA/POINT PLEASANT, AND UPPER DEVONIAN



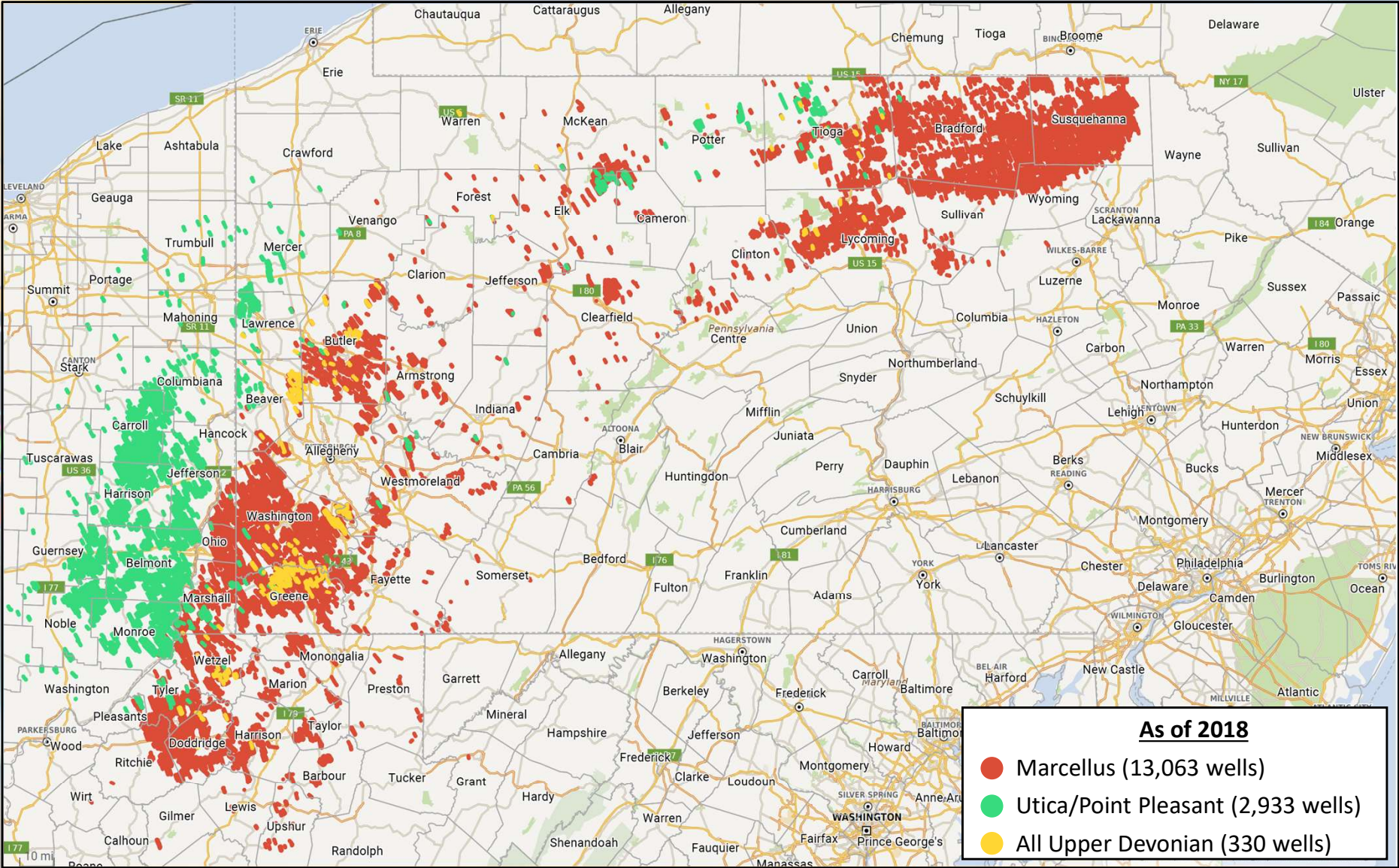
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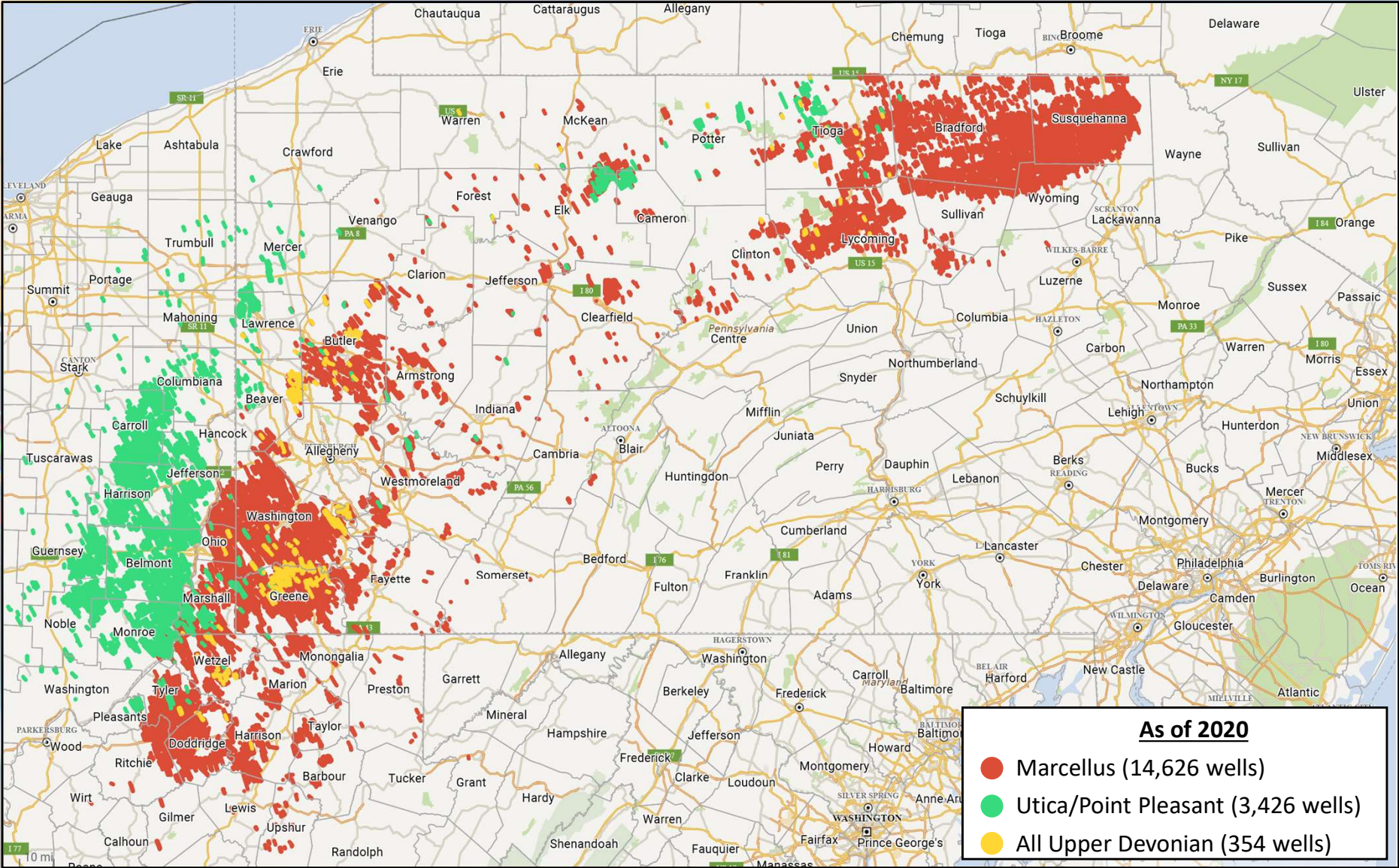
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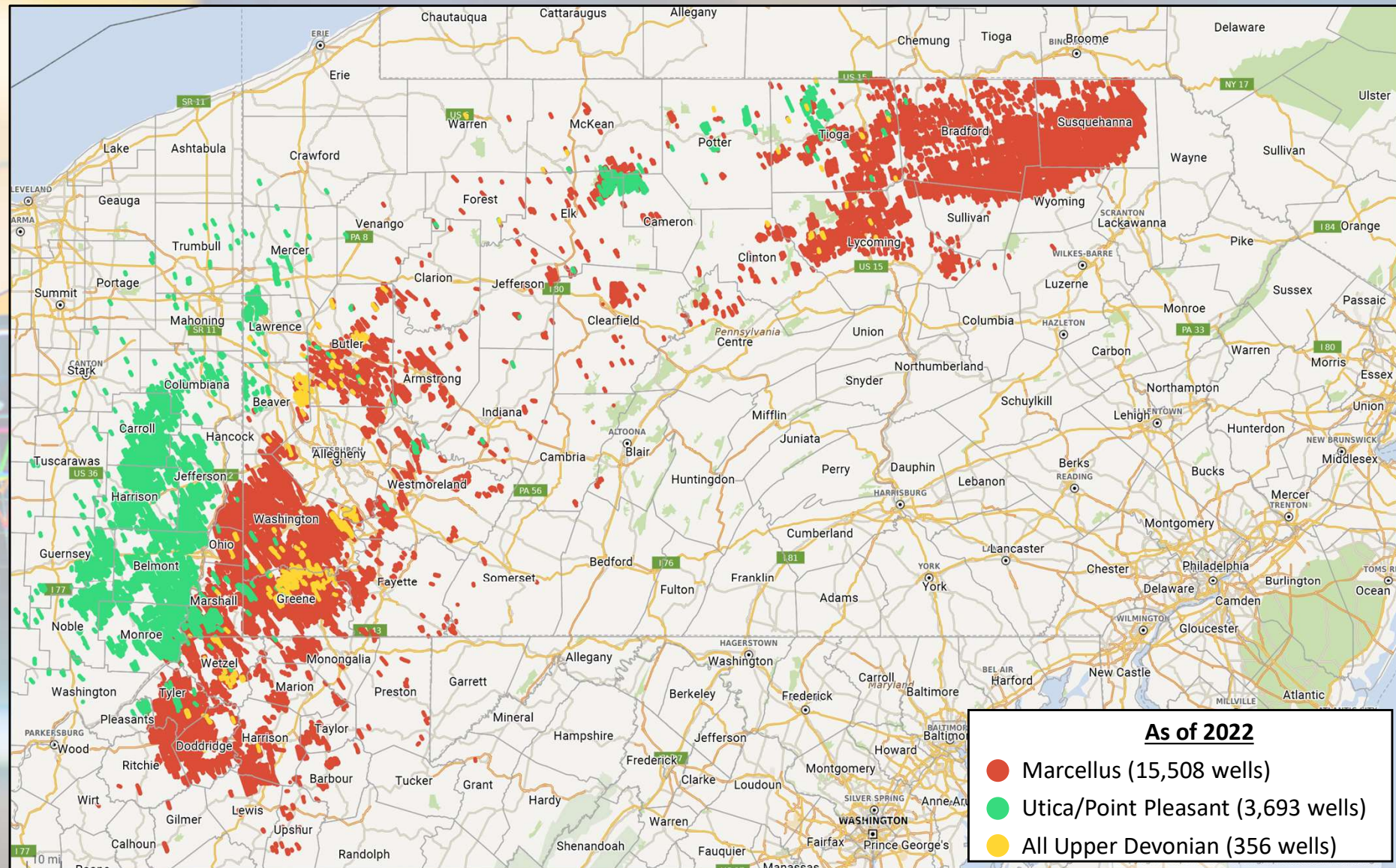
MARCELLUS, UTICA/POINT PLEASANT, AND UPPER DEVONIAN



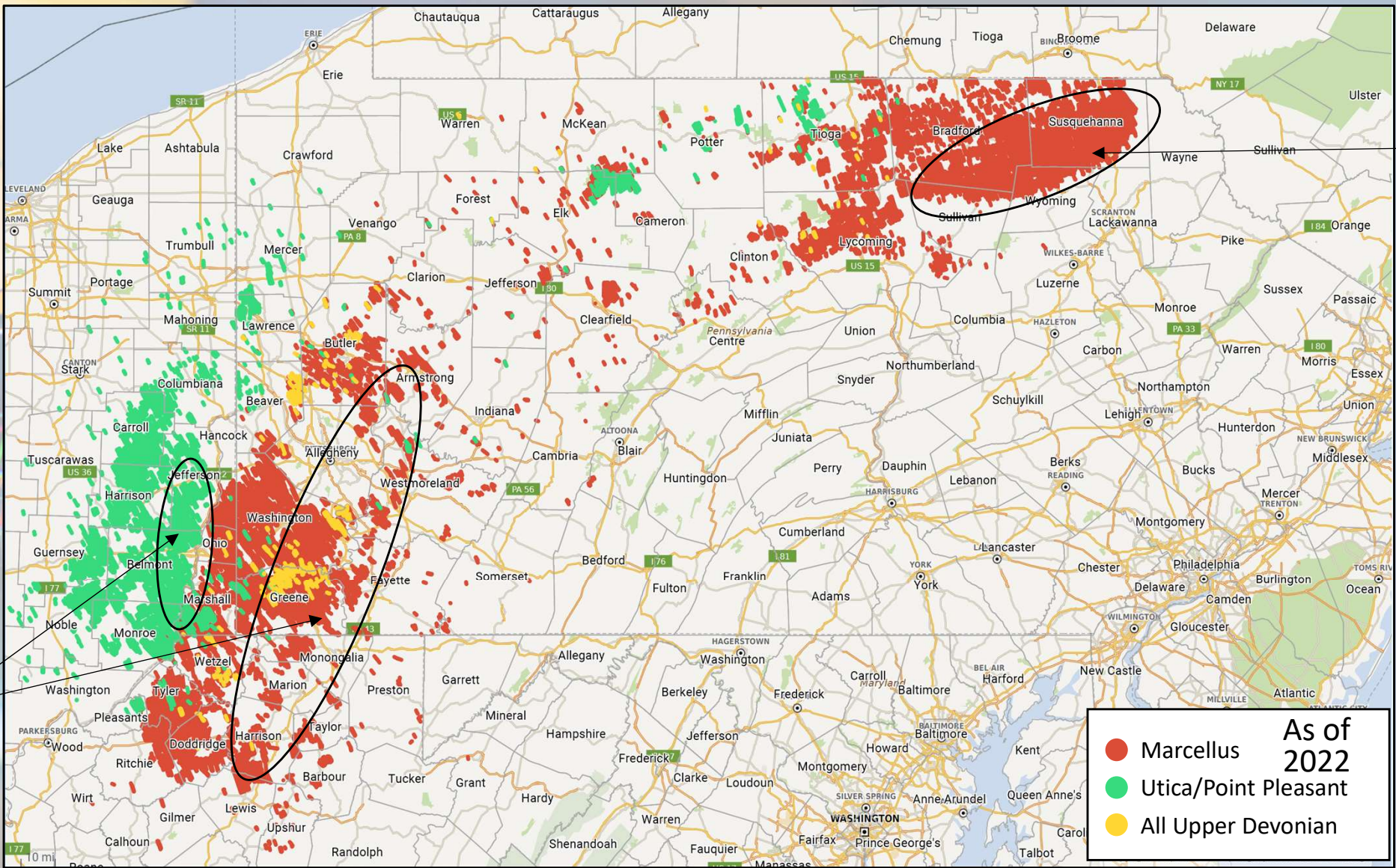
MARCELLUS, UTICA/POINT PLEASANT, AND UPPER DEVONIAN



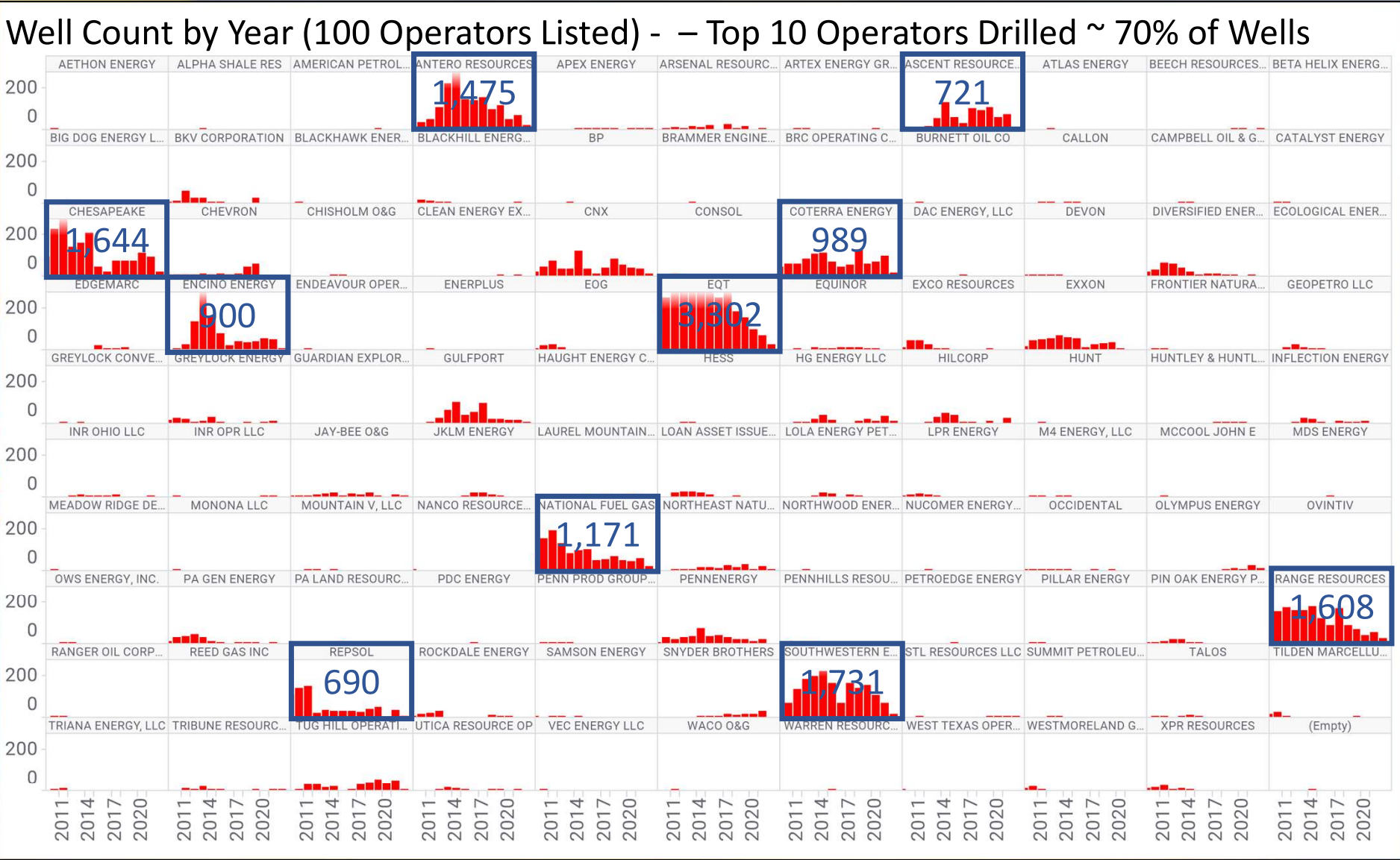
MARCELLUS, UTICA/POINT PLEASANT, AND UPPER DEVONIAN



EXAMPLES OF DENSELY DRILLED AREAS – DRY GAS



WHAT WILL DEVELOPMENT LOOK LIKE?



EQT, SOUTHWESTERN ENERGY, CHESAPEAKE, RANGE RESOURCES, ANTERO RESOURCES, NATIONAL FUEL GAS,
COTERRA ENERGY, ENCINO ENERGY, ASCENT RESOURCES LLC, REPSOL

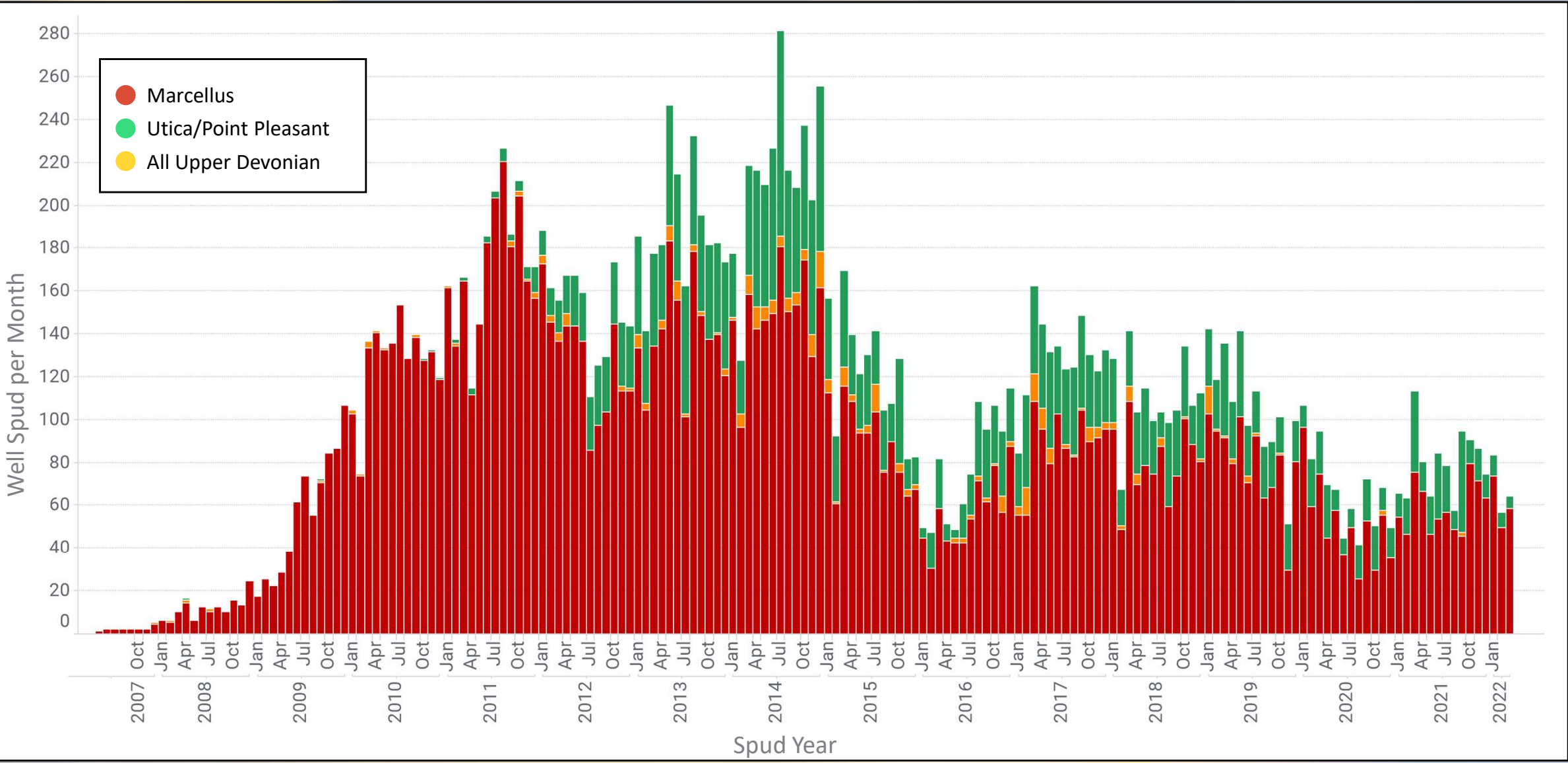
Well Count by Year (100 Operators Listed) - – Top 10 Operators Drilled ~ 70% of Wells

The figure displays a grid of 100 bar charts, each representing the well count for a specific operator over the years 2010 to 2019. The y-axis for each chart is labeled 'Well Count' and ranges from 0 to 200. The x-axis is labeled 'Year of First Production' and shows the years 2010, 2013, 2016, and 2019. The operators are listed in the header of the grid. The operators are: AMERICAN PETROLEUM, ANTERO RESOURCES, APEX ENERGY, ARSENAL RESOURCES, ARTEX ENERGY GROUP, ASCENT RESOURCES, BEECH RESOURCES, BETA HELIX ENERGY, BIG DOG ENERGY LLC, BKV CORPORATION, BLACKHAWK ENERGY, BLACKHILL ENERGY, BP, BRAMMER ENGINEERING, BURNETT OIL CO, CAMERON BROTHERS, CAMPBELL OIL & GAS, CATALYST ENERGY, CHESAPEAKE, CHEVRON, CLEAN ENERGY EXPLORATION, CNX, CONSOL, COTERRA ENERGY, DIVERSIFIED ENERGY, DOMINION ENERGY, ECOLOGICAL ENERGY, EDGEMARC ENERGY, ENCINO ENERGY, EOG, EQT, EQUINOR, EXCO RESOURCES, EXXON, FRONTIER NATURAL, GEOPETRO LLC, GREYLOCK ENERGY, GULFPORT, HG ENERGY LLC, HILCORP, HOPEWELL OIL & GAS, INFLECTION ENERGY, INR OHIO LLC, INR OPR LLC, JAY-BEE O&G, JKLM ENERGY, LAUREL MOUNTAIN PETROLEUM, LOAN ASSET ISSUERS, LOLA ENERGY PETROLEUM, LPR ENERGY, M4 ENERGY, LLC, MCCOOL JOHN E, MDS ENERGY, MEADOW RIDGE DEVELOPMENT, MONONA LLC, MOUNTAIN VIEW, LLC, NANCO RESOURCES, NATIONAL FUEL GAS, NORTHEAST NATURAL, NORTHWOOD ENERGY, NUCOMER ENERGY, OCCIDENTAL, OLYMPUS ENERGY, OWS ENERGY, INC., PA GEN ENERGY, PENN PROD GROUP LLC, PENNERGY, PENNHILLS RESOURCES, PILLAR ENERGY, PIN OAK ENERGY PARTNERS, RANGE RESOURCES, RANGER OIL CORPORATION, REPSOL, RHDK OIL & GAS LLC, ROCKDALE ENERGY, ROSS AND WHARTON, SAMSON ENERGY, SNYDER BROTHERS, SOUTHWESTERN ENERGY, STL RESOURCES LLC, SUMMIT PETROLEUM, TALOS, TILDEN MARCELLUS, TRIANA ENERGY, LLC, TRIBUNE RESOURCES, TUG HILL OPERATING, UTICA RESOURCE OPERATIONS, VEC ENERGY LLC, WACO O&G, WEST TEXAS OPERATIONS, WESTMORELAND GAS, and XPR RESOURCES. The charts show that well counts generally peaked in the early 2010s and then declined. The top 10 operators, highlighted with blue boxes, are APEX ENERGY, ARSENAL RESOURCES, GREYLOCK ENERGY, and NORTHEAST NATURAL.

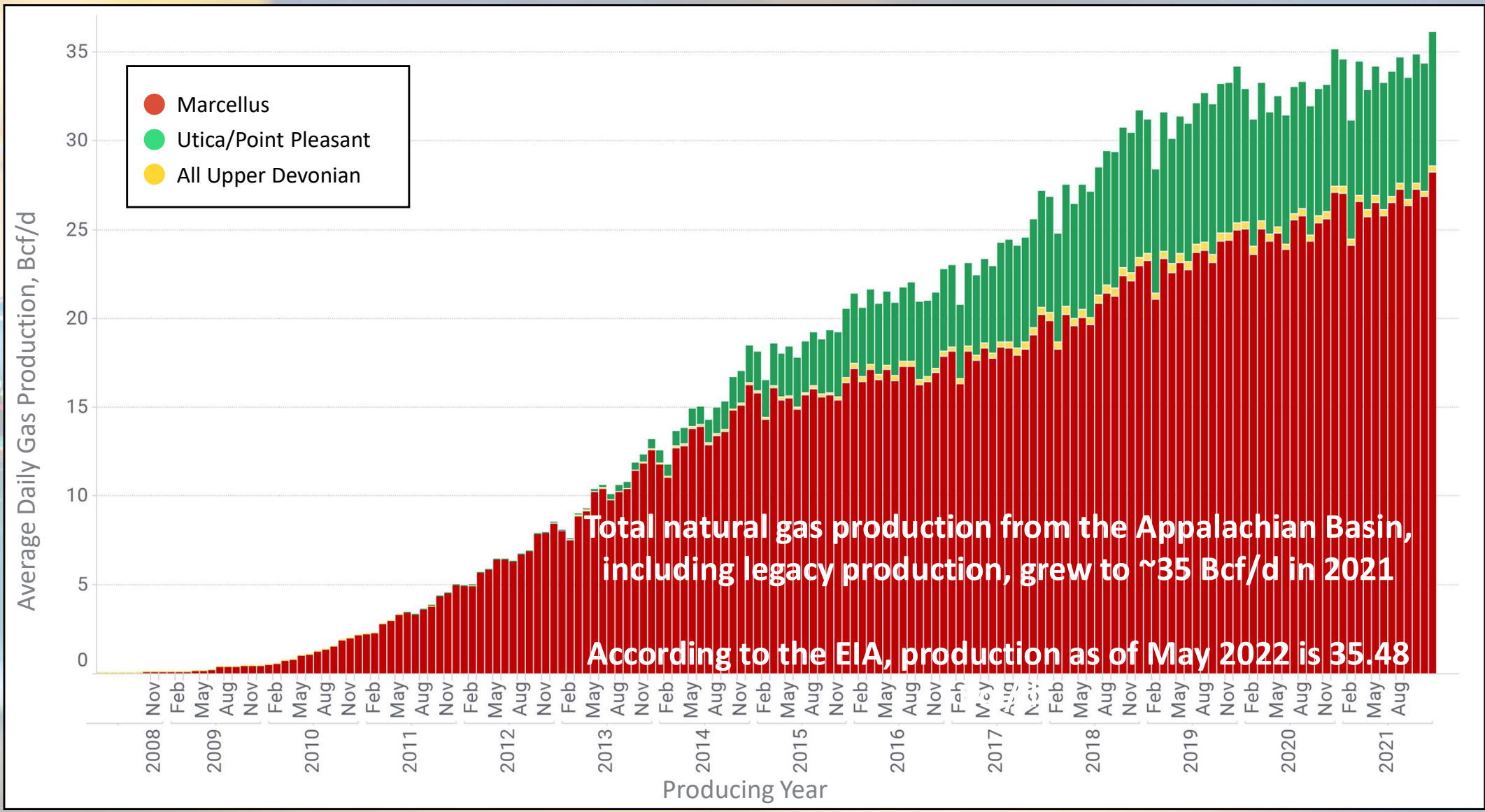
Operator	2010	2013	2016	2019
AMERICAN PETROLEUM	10	10	10	10
ANTERO RESOURCES	10	10	10	10
APEX ENERGY	10	10	10	10
ARSENAL RESOURCES	10	10	10	10
ARTEX ENERGY GROUP	10	10	10	10
ASCENT RESOURCES	10	10	10	10
BEECH RESOURCES	10	10	10	10
BETA HELIX ENERGY	10	10	10	10
BIG DOG ENERGY LLC	10	10	10	10
BKV CORPORATION	10	10	10	10
BLACKHAWK ENERGY	10	10	10	10
BLACKHILL ENERGY	10	10	10	10
BP	10	10	10	10
BRAMMER ENGINEERING	10	10	10	10
BURNETT OIL CO	10	10	10	10
CAMERON BROTHERS	10	10	10	10
CAMPBELL OIL & GAS	10	10	10	10
CATALYST ENERGY	10	10	10	10
CHESAPEAKE	10	10	10	10
CHEVRON	10	10	10	10
CLEAN ENERGY EXPLORATION	10	10	10	10
CNX	10	10	10	10
CONSOL	10	10	10	10
COTERRA ENERGY	10	10	10	10
DIVERSIFIED ENERGY	10	10	10	10
DOMINION ENERGY	10	10	10	10
ECOLOGICAL ENERGY	10	10	10	10
EDGEMARC ENERGY	10	10	10	10
ENCINO ENERGY	10	10	10	10
EOG	10	10	10	10
EQT	10	10	10	10
EQUINOR	10	10	10	10
EXCO RESOURCES	10	10	10	10
EXXON	10	10	10	10
FRONTIER NATURAL	10	10	10	10
GEOPETRO LLC	10	10	10	10
GREYLOCK ENERGY	10	10	10	10
GULFPORT	10	10	10	10
HG ENERGY LLC	10	10	10	10
HILCORP	10	10	10	10
HOPEWELL OIL & GAS	10	10	10	10
INFLECTION ENERGY	10	10	10	10
INR OHIO LLC	10	10	10	10
INR OPR LLC	10	10	10	10
JAY-BEE O&G	10	10	10	10
JKLM ENERGY	10	10	10	10
LAUREL MOUNTAIN PETROLEUM	10	10	10	10
LOAN ASSET ISSUERS	10	10	10	10
LOLA ENERGY PETROLEUM	10	10	10	10
LPR ENERGY	10	10	10	10
M4 ENERGY, LLC	10	10	10	10
MCCOOL JOHN E	10	10	10	10
MDS ENERGY	10	10	10	10
MEADOW RIDGE DEVELOPMENT	10	10	10	10
MONONA LLC	10	10	10	10
MOUNTAIN VIEW, LLC	10	10	10	10
NANCO RESOURCES	10	10	10	10
NATIONAL FUEL GAS	10	10	10	10
NORTHEAST NATURAL	10	10	10	10
NORTHWOOD ENERGY	10	10	10	10
NUCOMER ENERGY	10	10	10	10
OCCIDENTAL	10	10	10	10
OLYMPUS ENERGY	10	10	10	10
OWS ENERGY, INC.	10	10	10	10
PA GEN ENERGY	10	10	10	10
PENN PROD GROUP LLC	10	10	10	10
PENNERGY	10	10	10	10
PENNHILLS RESOURCES	10	10	10	10
PILLAR ENERGY	10	10	10	10
PIN OAK ENERGY PARTNERS	10	10	10	10
RANGE RESOURCES	10	10	10	10
RANGER OIL CORPORATION	10	10	10	10
REPSOL	10	10	10	10
RHDK OIL & GAS LLC	10	10	10	10
ROCKDALE ENERGY	10	10	10	10
ROSS AND WHARTON	10	10	10	10
SAMSON ENERGY	10	10	10	10
SNYDER BROTHERS	10	10	10	10

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APPALACHIAN BASIN WELLS SPUD PER YEAR

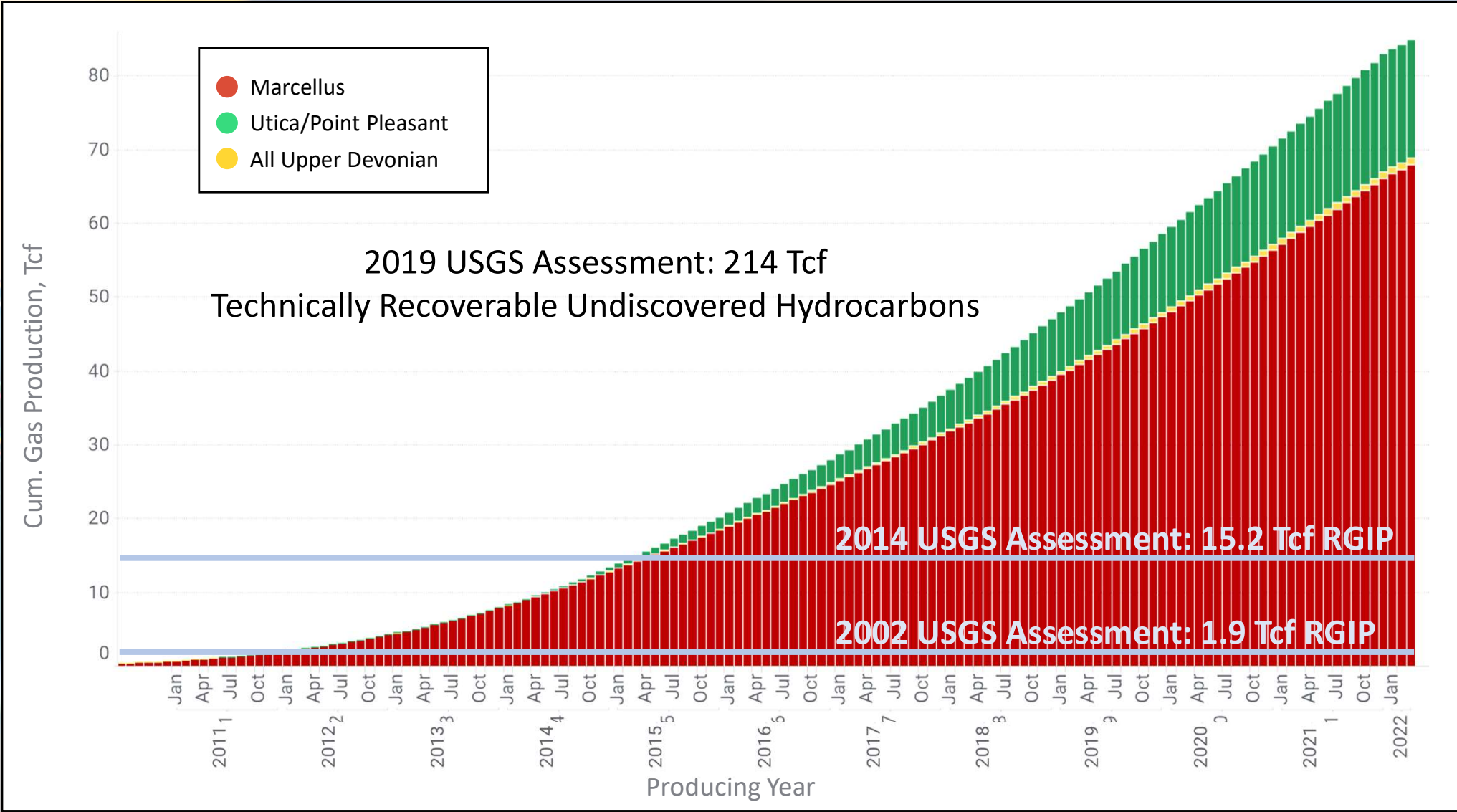


APPALACHIAN BASIN - AVERAGE DAILY GAS PRODUCTION BY MONTH



Source Data: Enverus May 2022

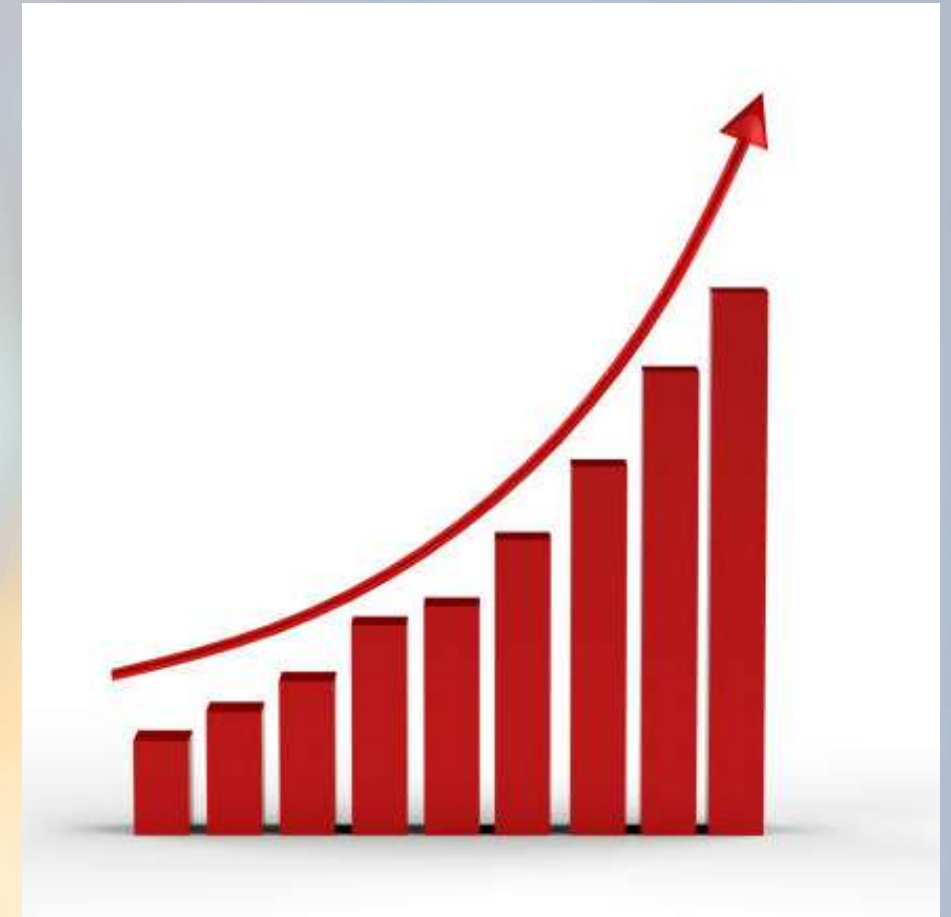
APPALACHIAN BASIN - CUMULATIVE PRODUCTION OVER TIME



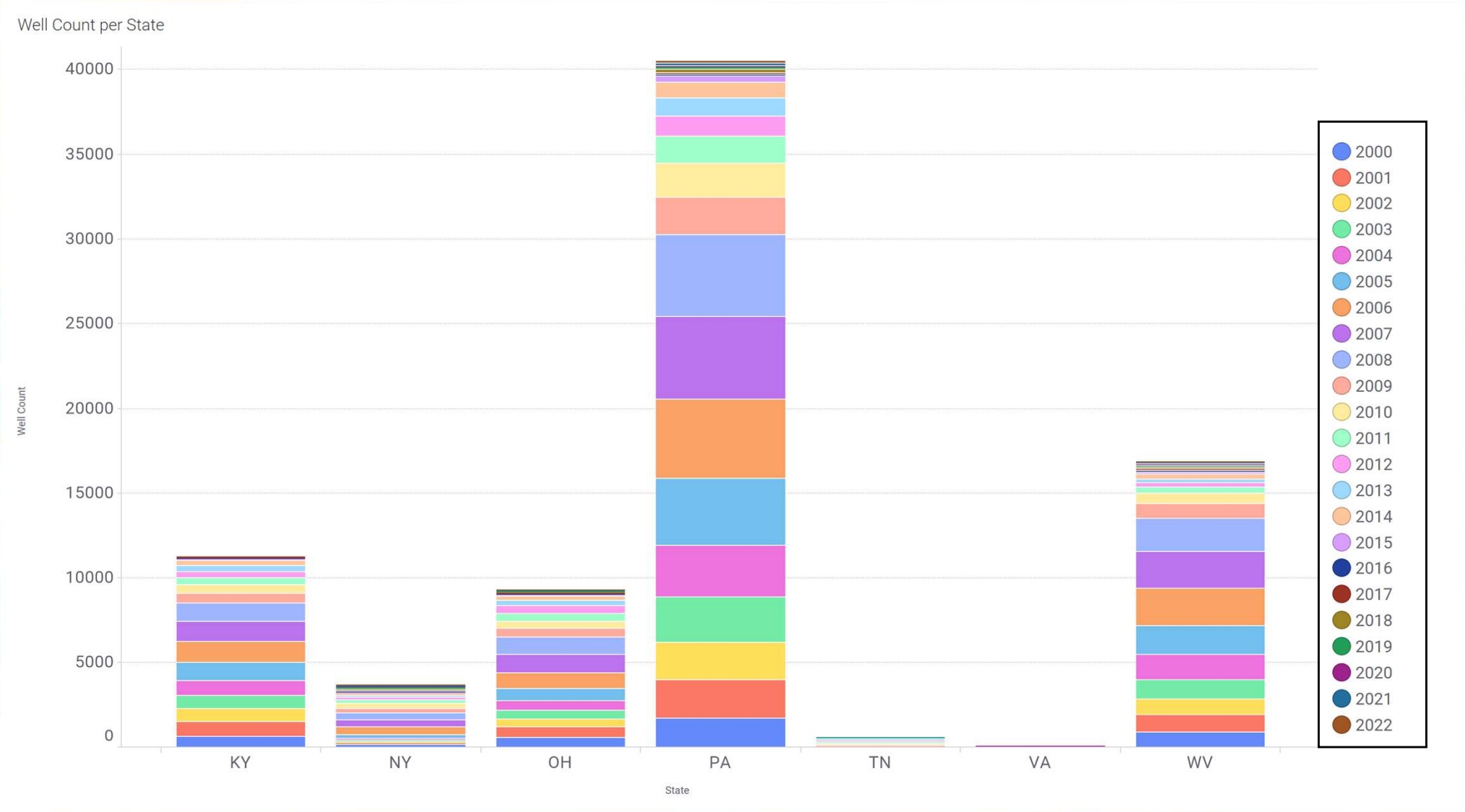
Source Data: Enverus May 2022

CONTINUED GROWTH POTENTIAL

- In February of 2022 the EIA reported: “We estimate that production from the Appalachian region will grow by 0.3 Bcf/d in 2022 and 0.7 Bcf/d in 2023.”
- It appears that production growth is on trend to meet that projection
- In order to accomplish this, operators in the region may need to add approximately 850 wells in 2022 and 850-900 wells in 2023
- Based on data available as of June 6, 2022, 362 wells have been spud in the region this year
- Based on this rate of development, in Wright’s opinion there is ample acreage to add this many wells per year - many still in “core/sweet spots”



APPALACHIAN BASIN - VERTICAL WELL COUNT BY STATE BY YEAR



Source Data: Enverus September 2022

APPALACHIAN BASIN ACTIVE WELL COUNTS AND OPERATORS

Well Count per ENVWellStatus

Vertical, Deviated Wells - Active Only

(None)	
ENVWellStatus	Well Count
PRODUCING	181421
Grand total	181421

ENVWellStatus

Data table:
env_csv-Wells-d32...

Colors:
All values

ENVOperator per StateProvince

Vertical, Deviated Wells - Active Only

(None)	
StateProvince	UniqueCount...
PA	700
OH	675
NY	645
WV	595
KY	273
VA	16
Grand total	2808

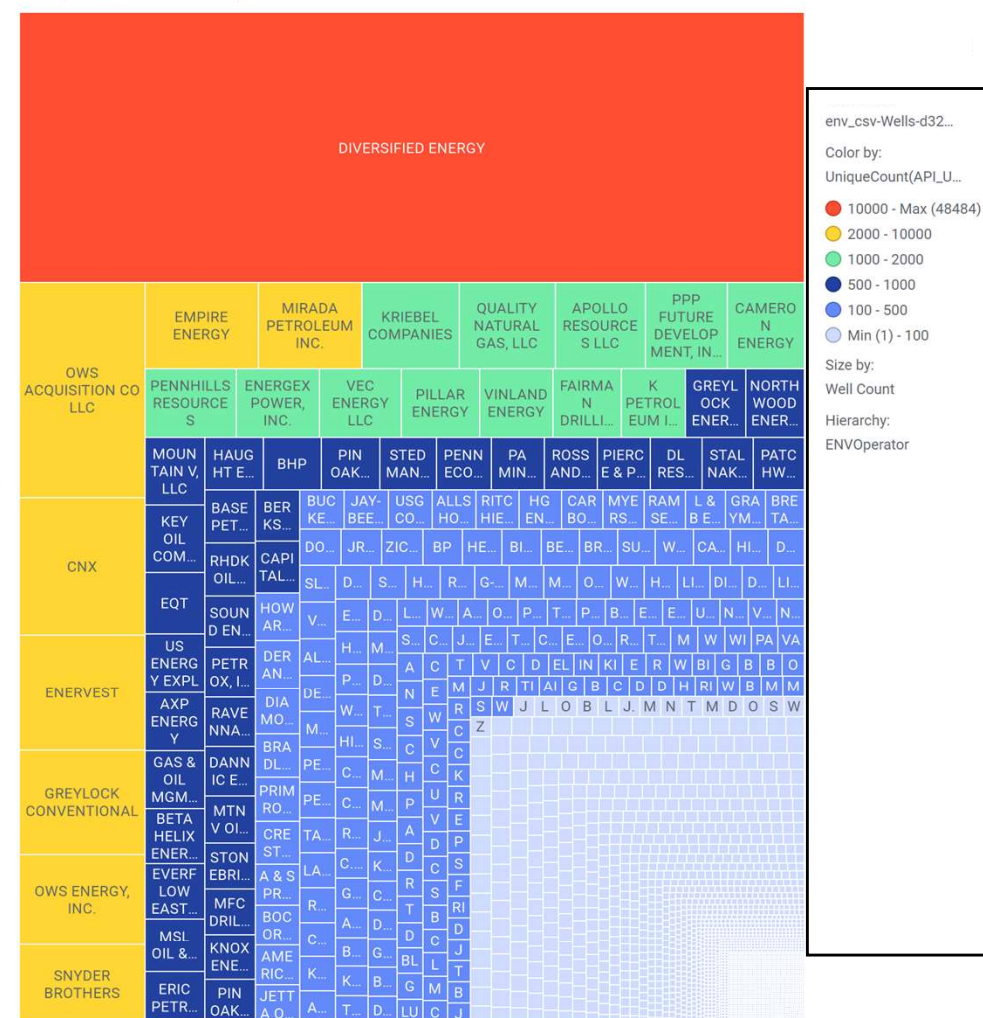
StateProvince

Data table:
env_csv-Wells-d32...

Colors:
All values

Well Count per ENVOperator

Vertical, Deviated Wells - Active Only



Source Data: Enverus September 2022

ALL HISTORICAL APPALACHIAN BASIN WELL COUNTS AND OPERATORS

Well Count per ENVWellStatus

All Historical Activity - Vertical, Deviated Wells

(None)	
ENVWellStatus	Well Count
P & A	220192
PRODUCING	181421
UNREPORTED	135530
INACTIVE PRODUCER	89550
INACTIVE COMPLETED	64422
PERMIT EXPIRED	45746
ABANDONED	26438
PERMIT CANCELLED	25297
DRILLED	13785
COMPLETED	12259
PERMITTED	612
DUC	71
TA	10
PERMIT PENDING APPROVAL	7
DRILLING	2
Grand total	815342

Well Count

ENVOperator per StateProvince

All Historical Activity - Vertical, Deviated Wells

(None)	
StateProvince	UniqueCount...
PA	8815
OH	8318
KY	6571
WV	6039
NY	2163
TN	2158
VA	208
MD	28
Grand total	32703

UniqueCount(ENVOperator)

Data table:
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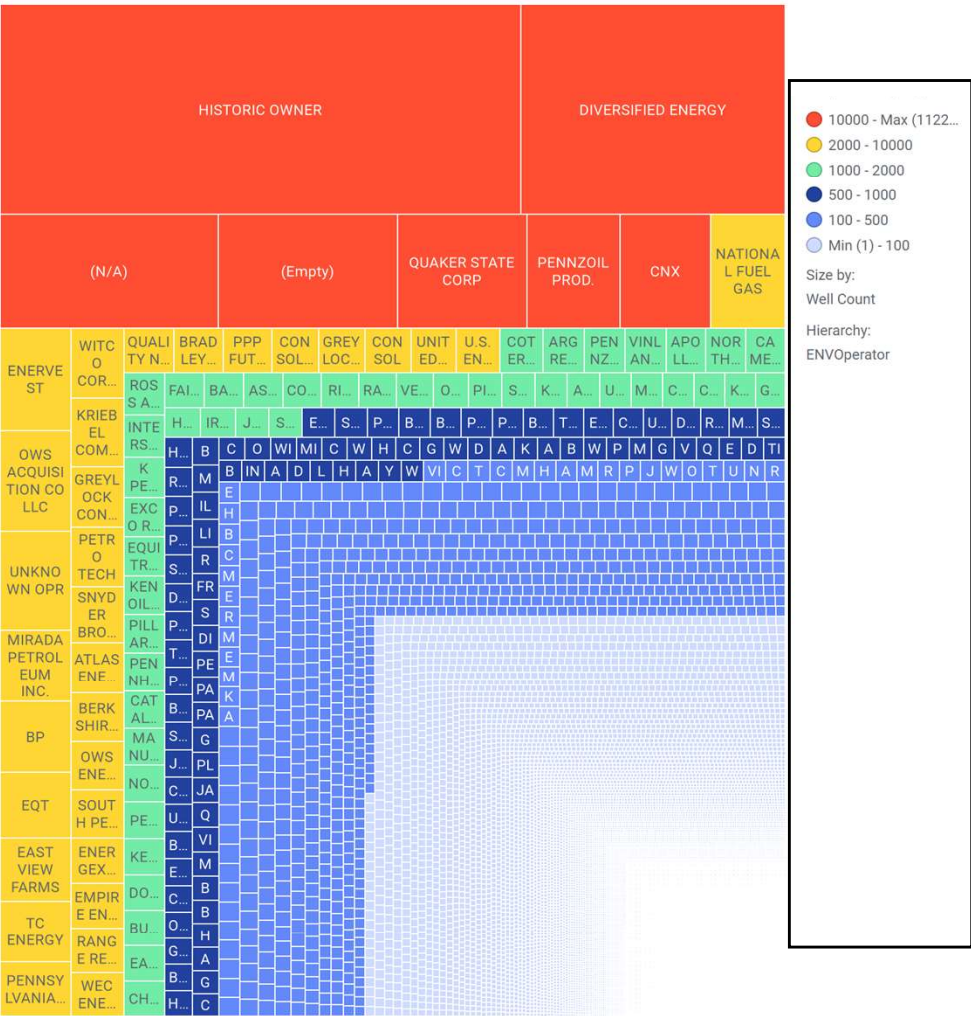
Colors:
All values

Data table:
env_csv-Wells-d32...

Colors:
All values

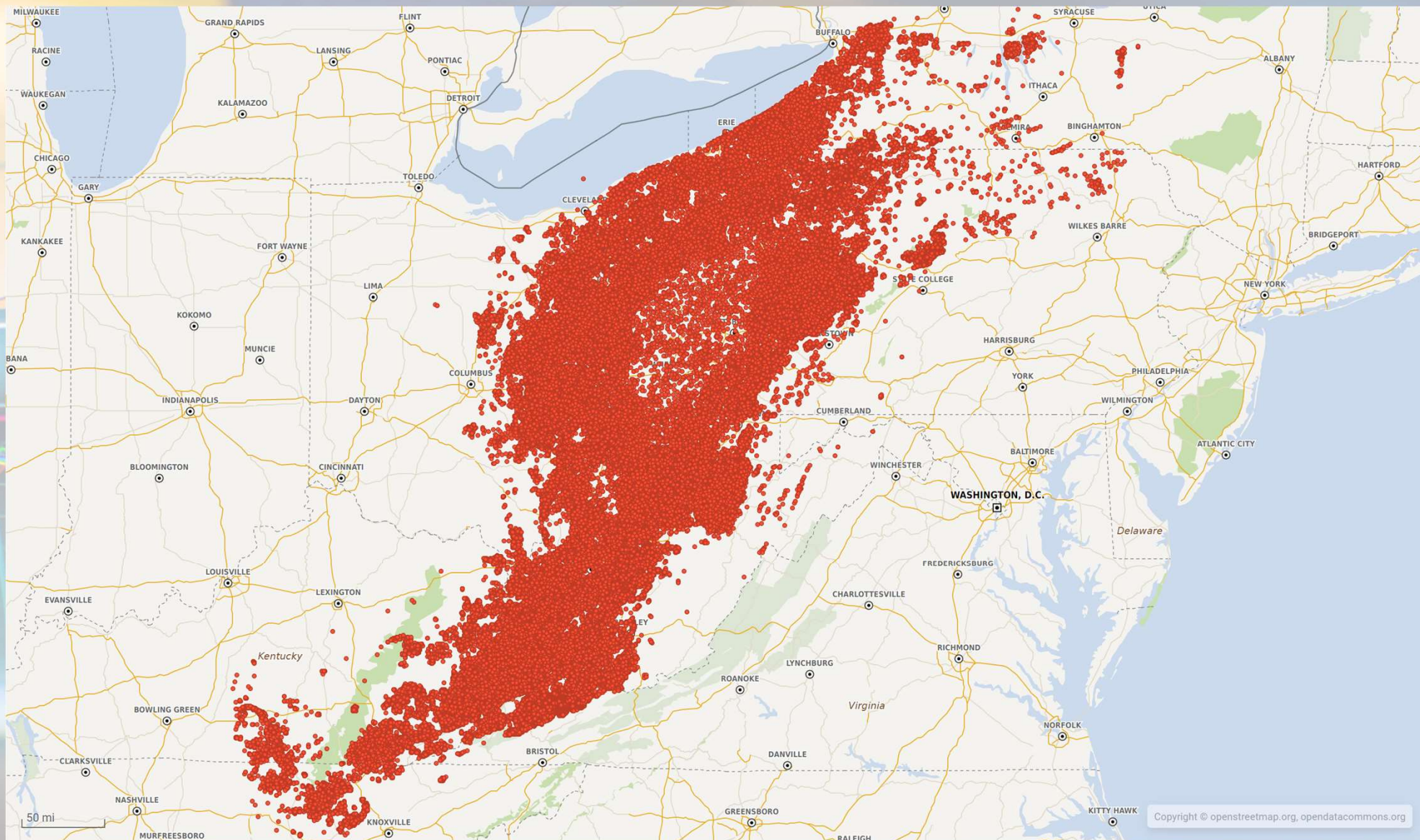
Well Count per ENVOperator

All Historical Activity - Vertical, Deviated Wells

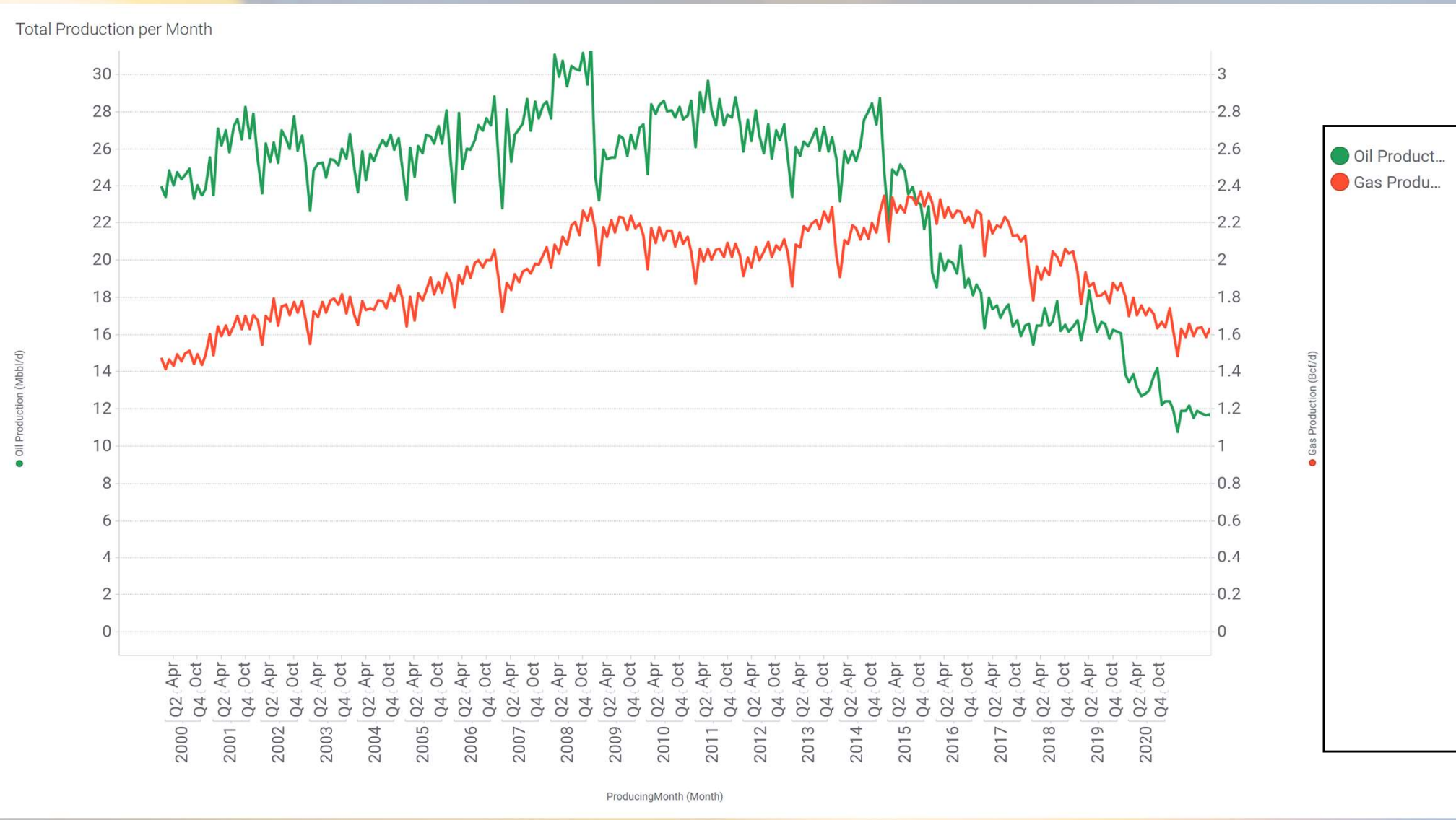


Source Data: Enverus September 2022

APPALACHIAN BASIN VERTICAL WELLS

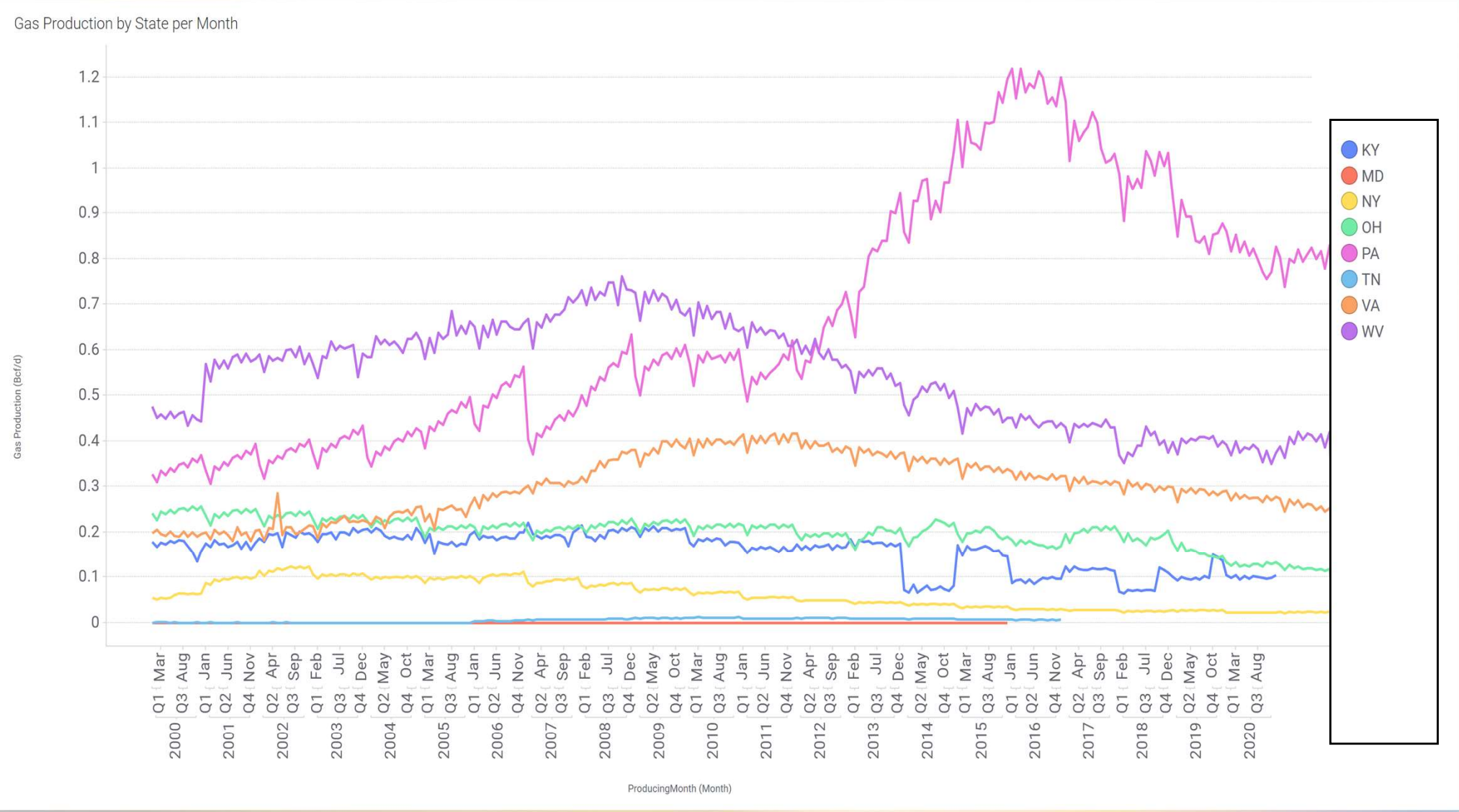


APPALACHIAN BASIN TOTAL VERTICAL WELL OIL AND GAS PRODUCTION



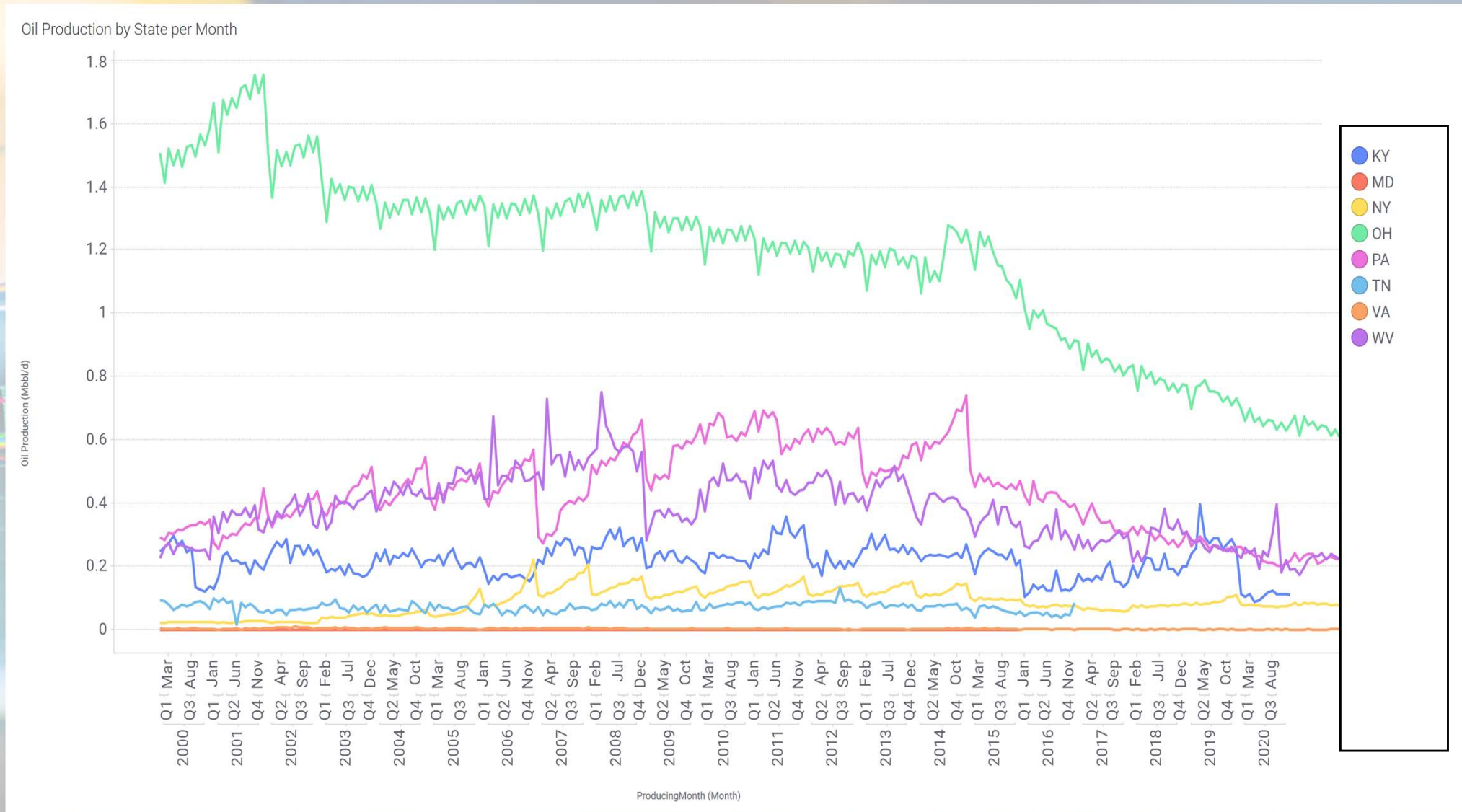
Source Data: Enverus September 2022

APPALACHIAN BASIN VERTICAL WELL GAS PRODUCTION BY STATE



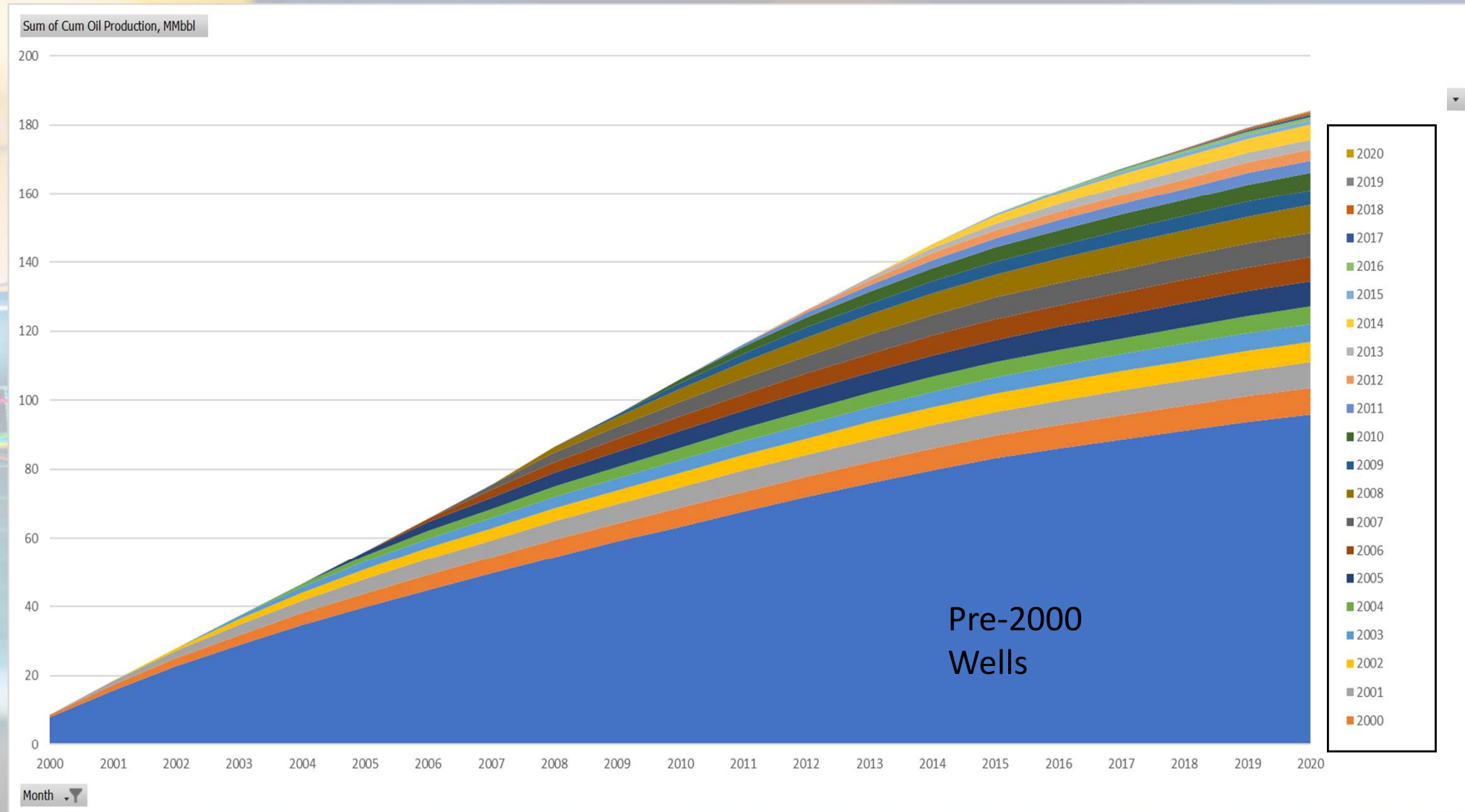
Source Data: Enverus September 2022

APPALACHIAN BASIN VERTICAL WELL OIL PRODUCTION BY STATE



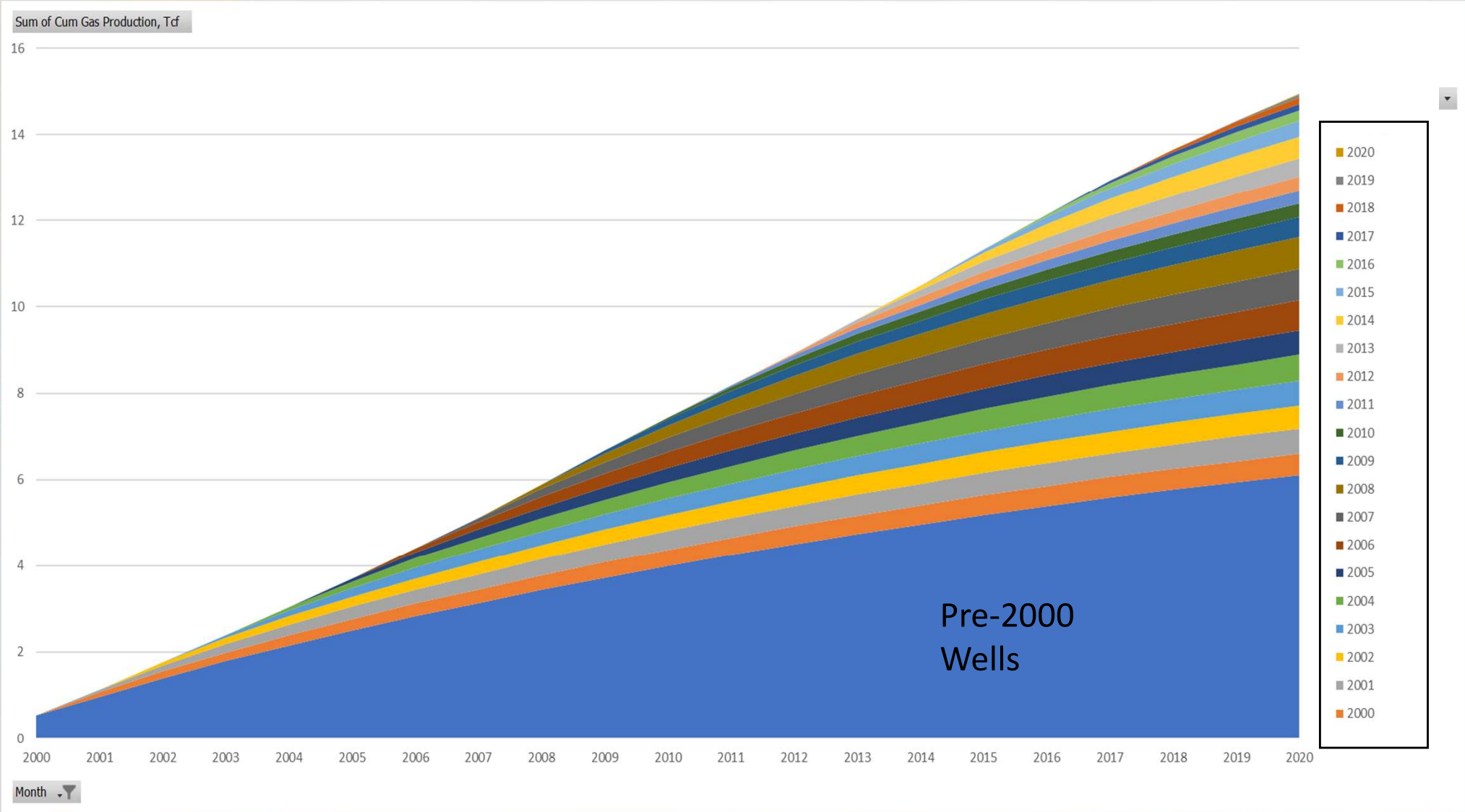
Source Data: Enverus September 2022

APPALACHIAN BASIN CUMULATIVE VERTICAL WELL OIL PRODUCTION SINCE 2000



Source Data: Enverus September 2022

APPALACHIAN BASIN CUMULATIVE VERTICAL WELL GAS PRODUCTION SINCE 2000



Source Data: Enverus September 2022

NATURAL GAS IS RAPIDLY BECOMING A GLOBAL COMMODITY



INFRASTRUCTURE

Necessary for a truly global commodity – and it's being developed



ENERGY SECURITY

Less resource-rich countries will be looking for clean energy sources



NEW QUESTIONS ASKED BY ENERGY LENDERS

- Do you have a written environmental, social, governance (ESG) policy?
- Do you plan to reduce emissions over the next 24 months?
- Do you plan to increase recycled water over the next 24 months?
- Are you actively monitoring gas emissions?
- Do you have a spill response plan?

NEW GUIDELINES/REGULATIONS COMING

- SEC proposes new guidelines for ESG investing with new disclosure rules
- ESG investing is controversial
 - Variety of investing styles and strategies
- As energy prices hit near-record levels, will ESG gain or lose momentum?
- Some banks, private equity firms, and investment groups decreased their fossil fuel financing
- Some banks, private equity firms, and ESG funds have been more aggressive defending their fossil fuel related investments

SUSTAINABLE AND RESPONSIBLE DEVELOPMENT

- What do we mean by sustainable and responsible development?
 - Multiple meanings, especially after 2020
 - Can we develop responsibly from an ESG perspective
 - o Reduce carbon emissions
 - o Some social issues are not applicable in the US, but may be applicable in the supply chain
- Activity has been dictated by prices as long as the industry has been around
 - Can we develop at a pace that prices are fair to producers and consumers
- Now there is new pressure on all industries to understand their impact on the world – ESG
- There is uncertainty around the future of regulations and the pace at which ESG will be implemented

ESG – A GROWING EMPHASIS

Not Really New to Appalachia

Environmental

- Resource Efficiency
- Waste Pollution
- Greenhouse Gas Emission

Social

- Local Communities
- Health & Safety
- Diversity

Governance

- Diversity & Structure
- Corporate Ethics
- Compliance

WHAT IF YOUR STORY DOES NOT LOOK GOOD?

Tell It Anyway – Focus on How to Improve



BE SURE TO INCLUDE WHAT YOU ARE DOING WELL
WITH FOCUS ON CONTINUOUS IMPROVEMENT “GROWTH”

HOW IS YOUR COMPANY HANDLING ESG?

Probably Better Than You Realize

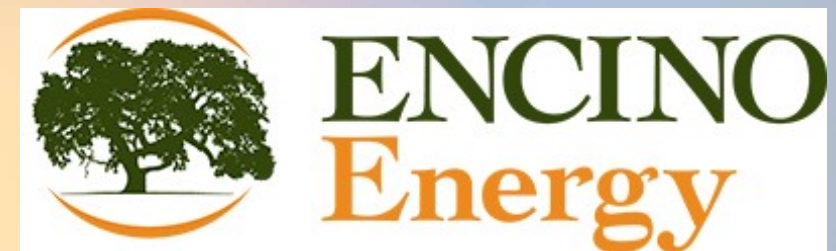
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A PROBLEM FOR THOSE WHO IGNORE IT – AN OPPORTUNITY FOR THOSE WHO EMBRACE IT



- The industry's attitude is changing – this is largely driven capital providers, who are driven in large part by fund investors and public opinion
- In some cases, sustainability reporting, and implementation of ESG related policies and procedures may be costly, but the cost of not acting will be higher, especially once regulatory guidance on reporting is in place

CORPORATE GOVERNANCE RESPONSIBILITY

- There is a lot we cannot even begin to cover here
- Requires buy in from the highest levels of your company
- May require company culture changes
- Not just within your company, but must engage stakeholders as well

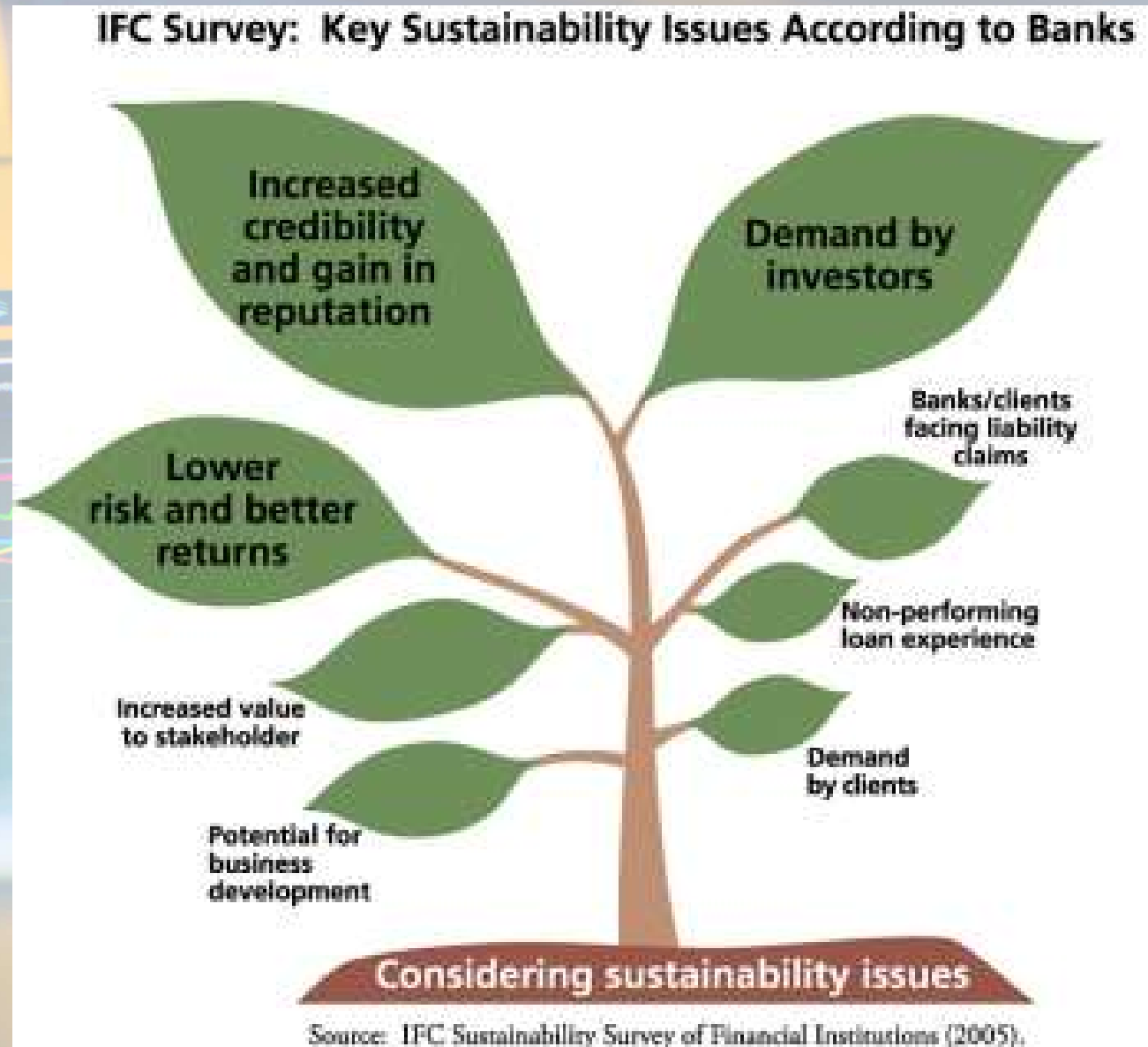
Governance encompasses all of ESG – ESG can't be implemented without corporate governance. It's an ongoing process – and new results will be compared on old reports – requires monitoring and accountability – channeling your resources appropriately.



Ethical standards and values – and Disclosure and transparency – ESG is in focus in much of the world – in some countries, for example, some issues will be much more prevalent

GOOD ESG STRATEGY WILL BE REWARDED BY INVESTORS

- There is some controversy in the industry around ESG, but let's focus on what's good and provides for our mutual interests
- Our industry has a checkered past around the environment and sustainability, but let's all step up, as many of you already have



- Lower interest rates
- Premium gas prices
 - Having wells certified
- Focus on returns, good for investor
- Focus on public education around the industry and in general
- Engage stakeholders

MONETIZE YOUR SUSTAINABILITY INITIATIVES



- Tax credits for carbon capture
- Mine bitcoin/cryptocurrency with gas that would have been flared
- Utilize leased/surface land that goes unused for much of the life of the lease – possible solar onsite
- Reduce overall costs

Wright Energy Advisors

A Division of Wright & Company, Inc.

Carbon Capture

Gas Certification

M & A
Due Diligence

ESG

Litigation
Support

Database
Quality Control

Global Reporting Initiative (GRI)

Certified Sustainability Professional

**Ron Summers, Sr. Petroleum Consultant with
Wright & Company, Inc. for over 13 years**

CONCLUSIONS

- Current production in Appalachia is approximately 35.48 Bcf/d
- Thousands of locations for years of future development
- EIA estimates that production will grow by 0.3 Bcf/d in 2022 and 0.7 Bcf/d in 2023
This may require approximately 850 wells in 2022 and 850-900 wells in 2023
- Based on this rate of development, in Wright's opinion there is ample acreage to add this many wells per year - many still in core areas
- Natural gas is a worldwide commodity and a clean energy source

CONCLUSIONS

- Tell your ESG story – what you are doing and how you intend to grow
- Oil and gas industry will develop the energy necessary and will be around for decades to come
- Different companies of different sizes, in different locales, with different funding sources will implement at different rates, but there will be pressure from different sources on all
- Pricing is providing the incentive that producers need to invest in America's energy security, energy reliability, and energy sustainability

A photograph of a small American flag, a fountain pen, and a business card for Wright & Company, Inc. on a dark blue textured surface. The flag is positioned diagonally across the upper left. A fountain pen with a brown barrel and gold accents lies horizontally across the middle. A gold business card with the company name is in the lower left. The background is dark and out of focus, showing some green foliage.

THANK YOU!

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Wright & Company, Inc.
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