WEST VIRGINIA DEPARTMENT OF COMMERCE
GEOLOGICAL & ECONOMIC SURVEY

2024 Marcellus Shale and Utica-Point Pleasant Production Summary

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This summary was prepared by the West Virginia Geological and Economic Survey (WVGES). The data summarized herein were reported by operators to the West Virginia Department of Environmental Protection (WVDEP) Office of Oil and Gas for calendar year 2024.

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Disclaimer:
These production volumes represent data posted by WV Department of Environmental Protection Office of Oil & Gas as of 7/23/2024. Data from several operators reporting Marcellus and Utica-Point Pleasant production in 2024 may not have been available at the time of this report; therefore, the values listed below may change as more data become available.

Glossary

bbl-barrel
Tcf-trillion cubic feet
Bcf-billion cubic feet
MMcf-million cubic
Mcf-thousand cubic feet
NGL-natural gas liquids
LL-completed lateral length
BOE-barrels of oil equivalent

2024 Marcellus Production Summary

Wells included in this overview were permitted as Horizontal 6A or H6A wells. In 2013, the West Virginia DEP changed the rules governing horizontal well development including the requirements for data reporting. These wells are referred to by the DEP as Horizontal 6A or H6A wells and since 2013 all Marcellus and Utica/Point-Pleasant horizontal wells were permitted as such. For H6A wells, the DEP requires much greater detail on the completion intensity and requires operators to report NGL's along with oil and gas. In 2024, there were over 63,000 total wells that reported production in West Virgina, but only 3220 or 4.8% of the total are classified as H6A. However, despite the relatively small number of wells, H6A wells accounted for 93% of the gas, 90% of the oil and 100% of the reported NGL's. Since most production and new drilling activity in West Virginia comes from H6A wells, this report will focus on H6A wells only.

Since H6A requirements were adopted, a detailed perforation record that highlights the depths of each perforation must be submitted to the state after completion. Completed lateral lengths can be calculated from these reports by subtracting the shallowest perforation from the deepest perforation. Because lateral length can vary greatly throughout a field, many operators normalize the well production by accounting for the lateral length. Most commonly this is done by dividing the volume of hydrocarbons produced (Gas, NGL, etc.) by the completed lateral length of the well in 1000's of feet. This report will include cumulative volume maps that highlight cumulative production by well and county, and maps showing normalized production per well.

Number of horizontal Marcellus H6A wells reporting production: 3096

Average Lateral Length: 14,135'

Longest lateral reported: 25,438'

Marcellus Gas

COUNTY	MARCELLUS WELLS REPORTING GAS	2024 MARCELLUS H6A CUMULATIVE GAS (Bcf)
TYLER	557	604.5
WETZEL	404	603.3
MARSHALL	478	376.2
DODDRIDGE	535	284.8
MONONGALIA	172	267.0
RITCHIE	271	184.2
LEWIS	44	144.5
HARRISON	182	143.8
OHIO	175	108.3
BROOKE	142	74.4
MARION	55	58.9
TAYLOR	44	52.3
BARBOUR	22	7.3
PLEASANTS	7	3.6
UPSHUR	4	1.0
GILMER	4	0.9

Table 1: Cumulative Marcellus H6A gas production and wells reporting gas production by county in 2024.

Annual Marcellus production and wellbore trends

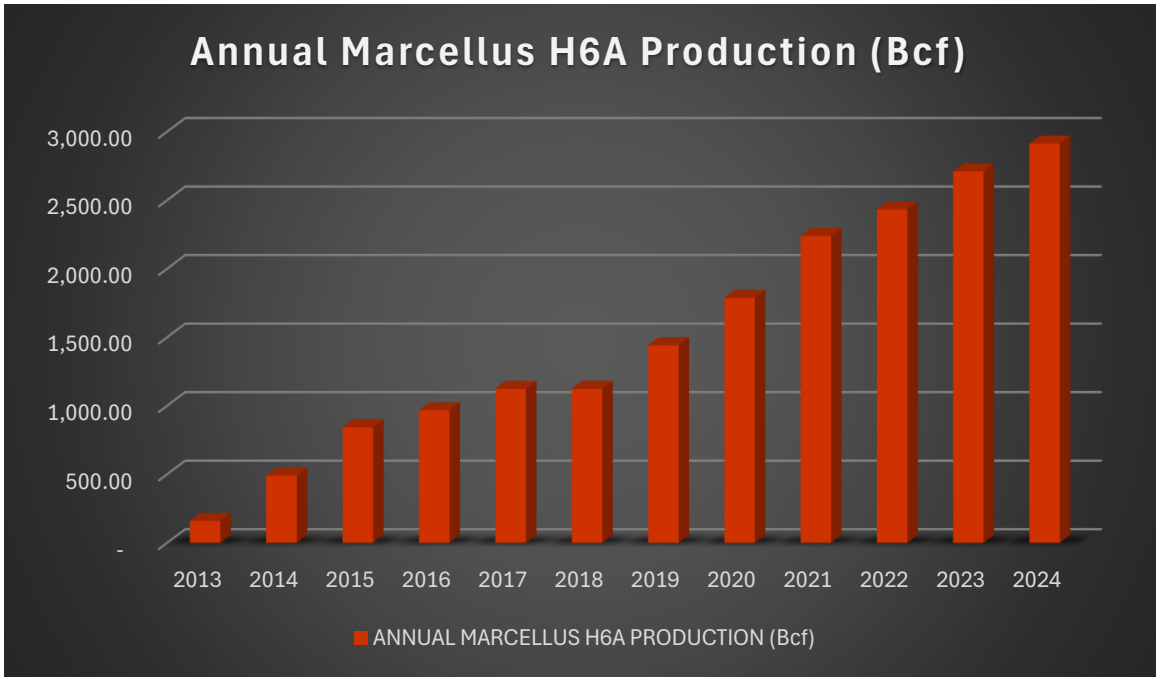

Figure 2: Chart showing the annual gas production for Marcellus H6A wells. In 2024, gas production from Marcellus H6A wells increased by nearly 200 BCF and totaled over 2.9 Tcf for the year.

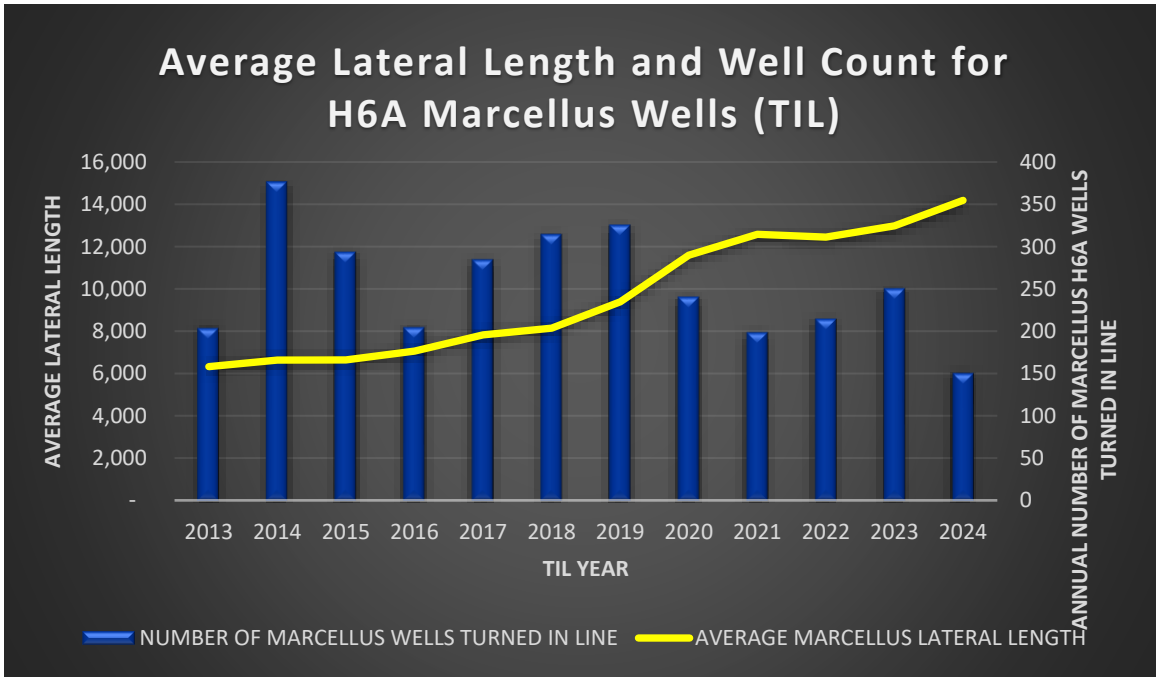

Figure 3: Chart plotting Marcellus H6A lateral lengths over the last 12 years and annual Marcellus H6A wells completed. Since 2013, the average lateral length for a Marcellus H6A well has doubled from just over 6000' in 2013 to over 14,000' in 2024. However, the number of Marcellus wells turned in line has declined since 2018.

Marcellus H6A Gas Maps

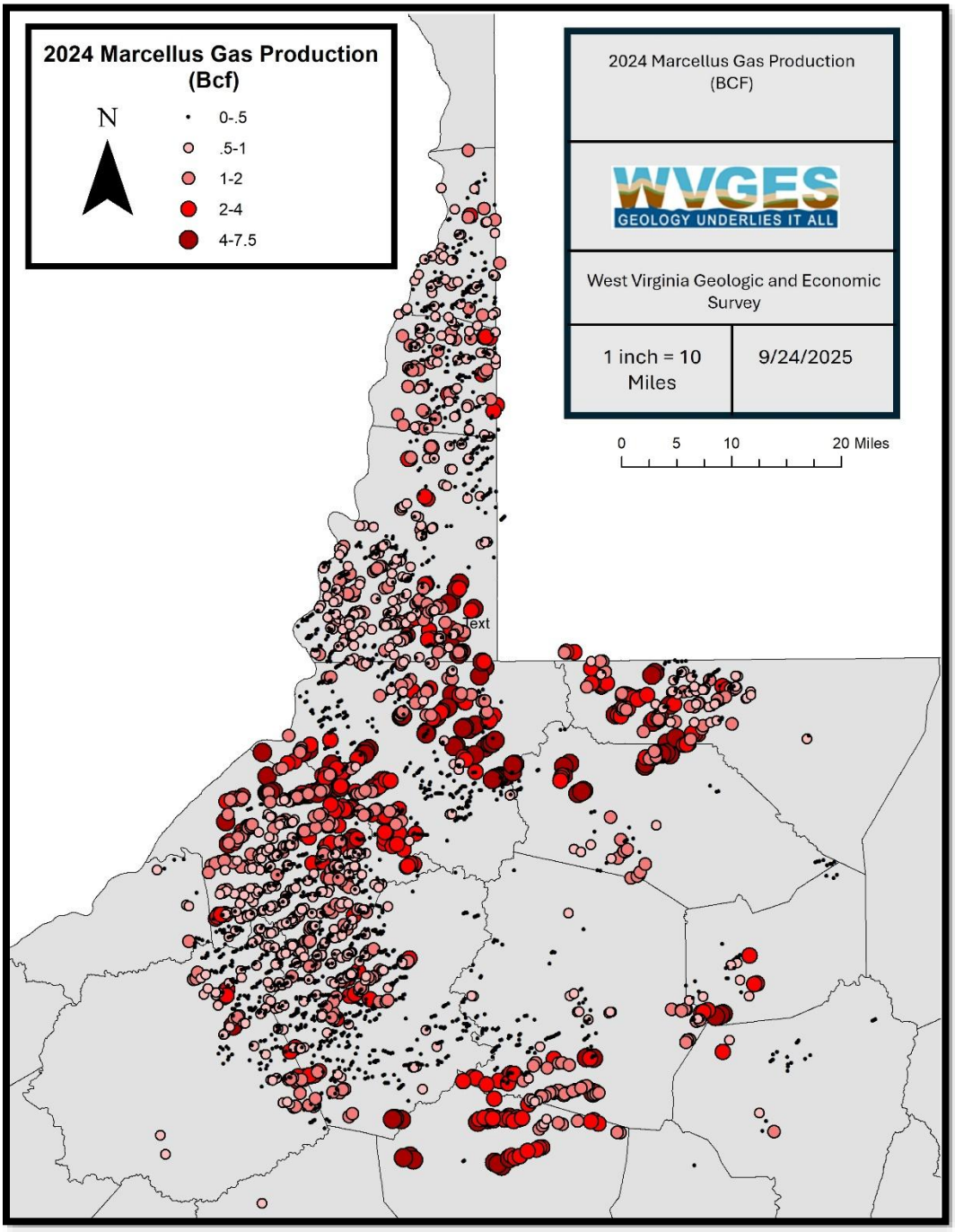

Figure 3. Map showing the reported Marcellus H6A gas production for 2024. According to the DEP, there were 3096 Marcellus H6A wells that reported production in 2024 from 16 different counties. Tyler County was the most productive with 604 Bcf of Marcellus H6A gas and had the largest number of wells with reported production (557).

Normalized Gas Production in the Marcellus

Horizontal well production is proportional to the lateral length and longer laterals often produce greater cumulative volumes of gas than wells with shorter laterals. For this report, the lateral length refers to completed lateral length and is calculated from the completion report by subtracting the shallowest perf from the deepest perf. To account for variations in lateral length, the map below was made by dividing the gas produced in 2023 by the lateral length in 1000's of feet of lateral. While this method of normalization accounts for lateral length, it does not factor in how long the well has been producing or downstream production constraints.

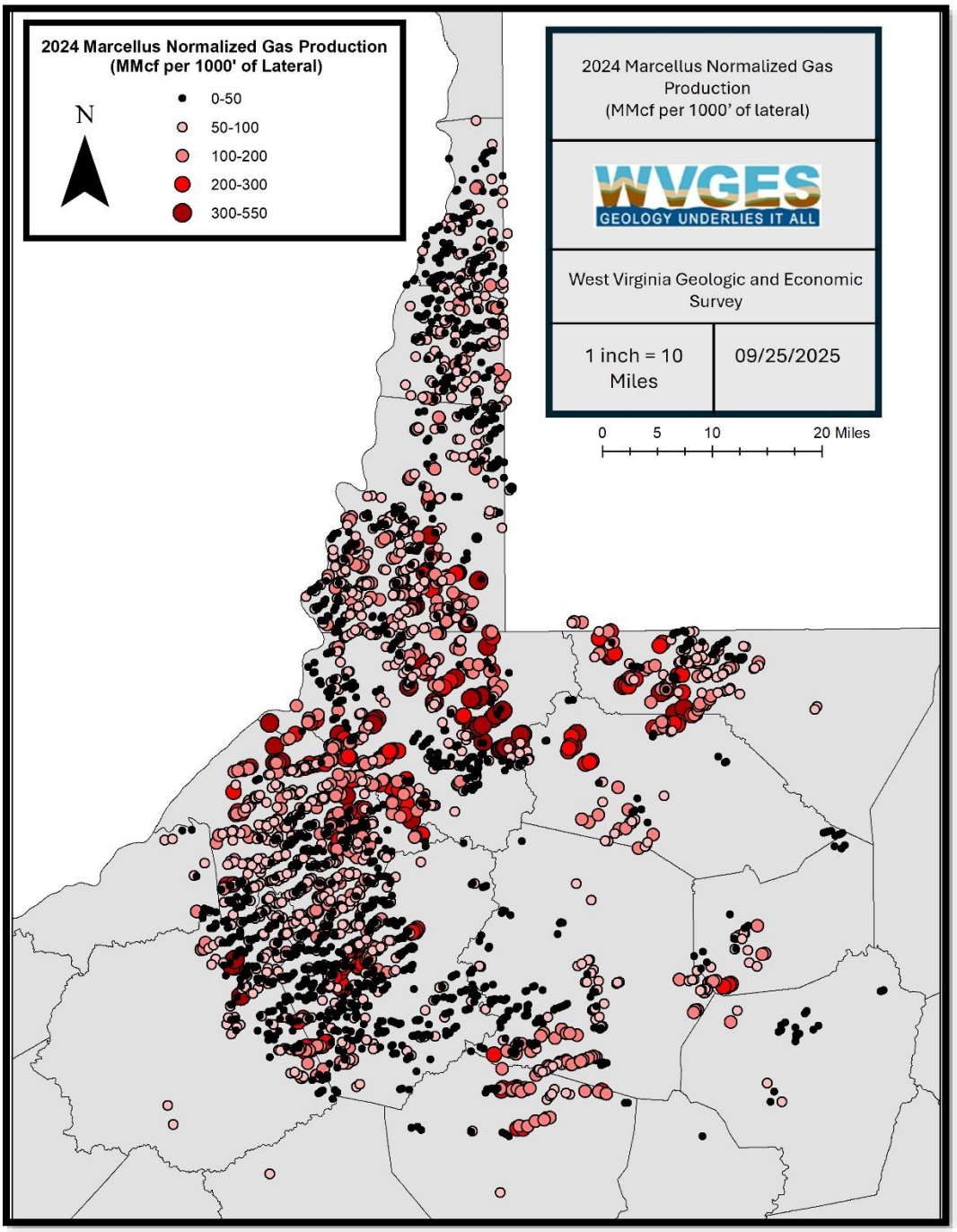

Figure 4: Map of 2024 Marcellus H6A gas production normalized by 1000' of lateral length.

Marcellus Combined Oil & Natural Gas Liquids (NGLs)

Total 2024 Combined Marcellus Oil & Natural Gas Liquids Production: **139,045,020 bbls**

HB4270 (effective for 2018 production reporting) requires that downstream natural gas liquids (NGL) accounted to a well will be reported as NGL to that well API while wellhead oil and lease condensate will be reported together as crude oil. Previously, a 2016 legislative rule change in West Virginia required that condensate (lease condensate) data rather than NGL data are to be reported to WVDEP. The volumes reported are to be liquid condensate at the wellhead, not NGL volumes extracted downstream at processing plants. For this report, oil and NGL volumes will yield a total volume of liquid hydrocarbons produced per well. Finally, some operators have different reporting practices for NGL volumes and may not have any liquids reported to the state.

2024 Annual Liquids Production Summary

COUNTY	NUMBER OF WELLS REPORTING LIQUIDS PRODUCTION IN 2024	2024 H6A MARCELLUS LIQUIDS PRODUCTION (bbls)
TYLER	556	38,963,137
WETZEL	375	28,048,511
MARSHALL	477	24,161,817
DODDRIDGE	528	13,930,732
OHIO	175	12,820,644
RITCHIE	271	11,095,207
BROOKE	141	9,198,352
LEWIS	36	524,833
PLEASANTS	7	205,819
HARRISON	21	83,419
GILMER	1	10,821

Table 2: 2024 cumulative liquids (Oil + NGL) production for Marcellus H6A wells by county. Tyler County had over 38 million barrels of produced liquids in 2024 and the largest number of wells reporting liquid production in the state at 556. Only 11 counties had wells that recorded liquids production in 2024.

Marcellus H6A Liquids Production Maps

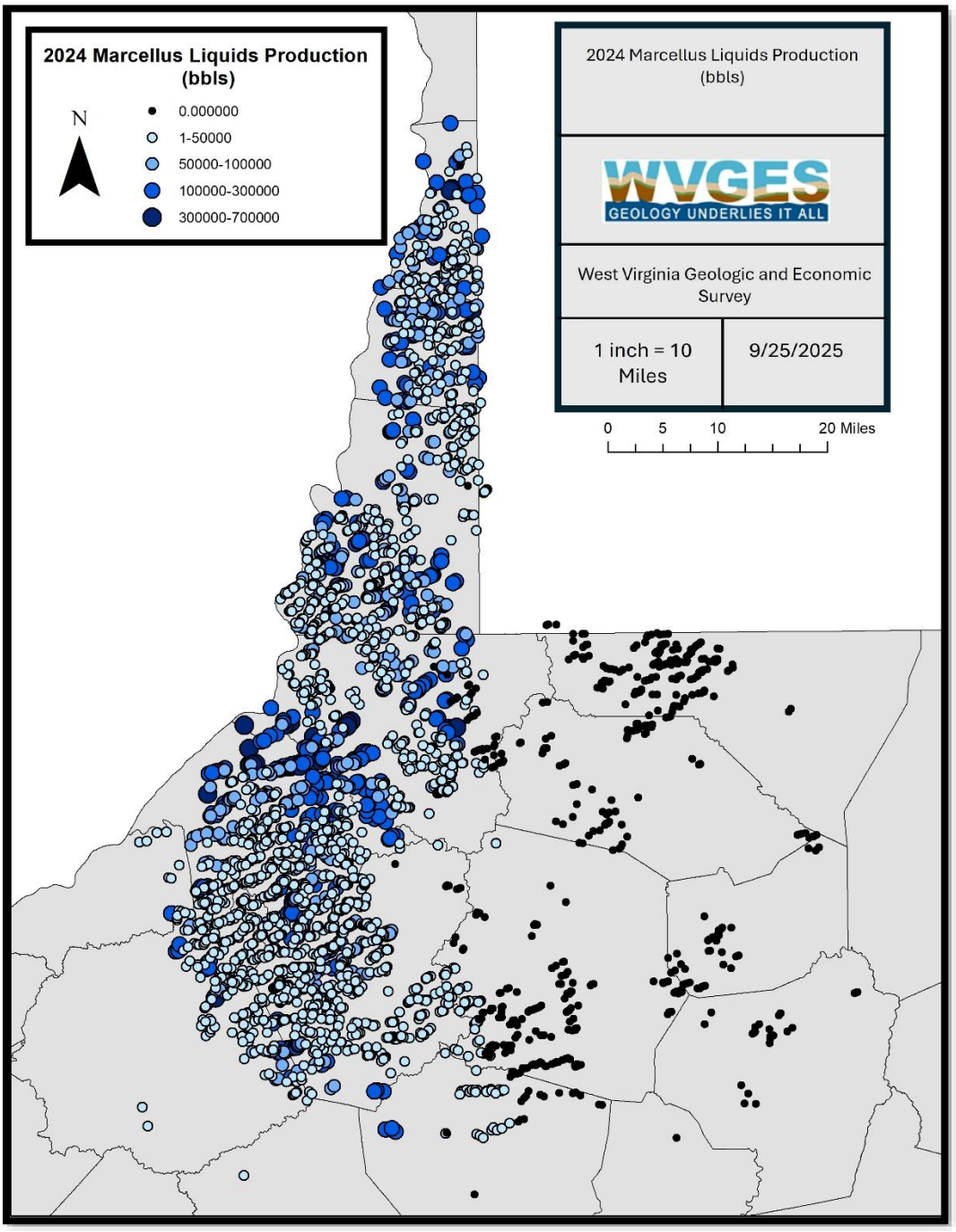

Figure 6: Bubble map showing the 2024 Marcellus H6A liquids (NGL+Oil) production by well. Nearly 66% of all liquids production comes from Marshall, Tyler and Wetzel counties.

Normalized Liquids Production

Normalized liquids production for Marcellus H6A wells was calculated much the same way that normalized gas production was. Total liquids (Oil + NGL) were divided by the lateral length in 1000's of lateral. The map below plots normalized liquids production for 2023 in barrels of liquids (bbls) per 1000' of lateral.

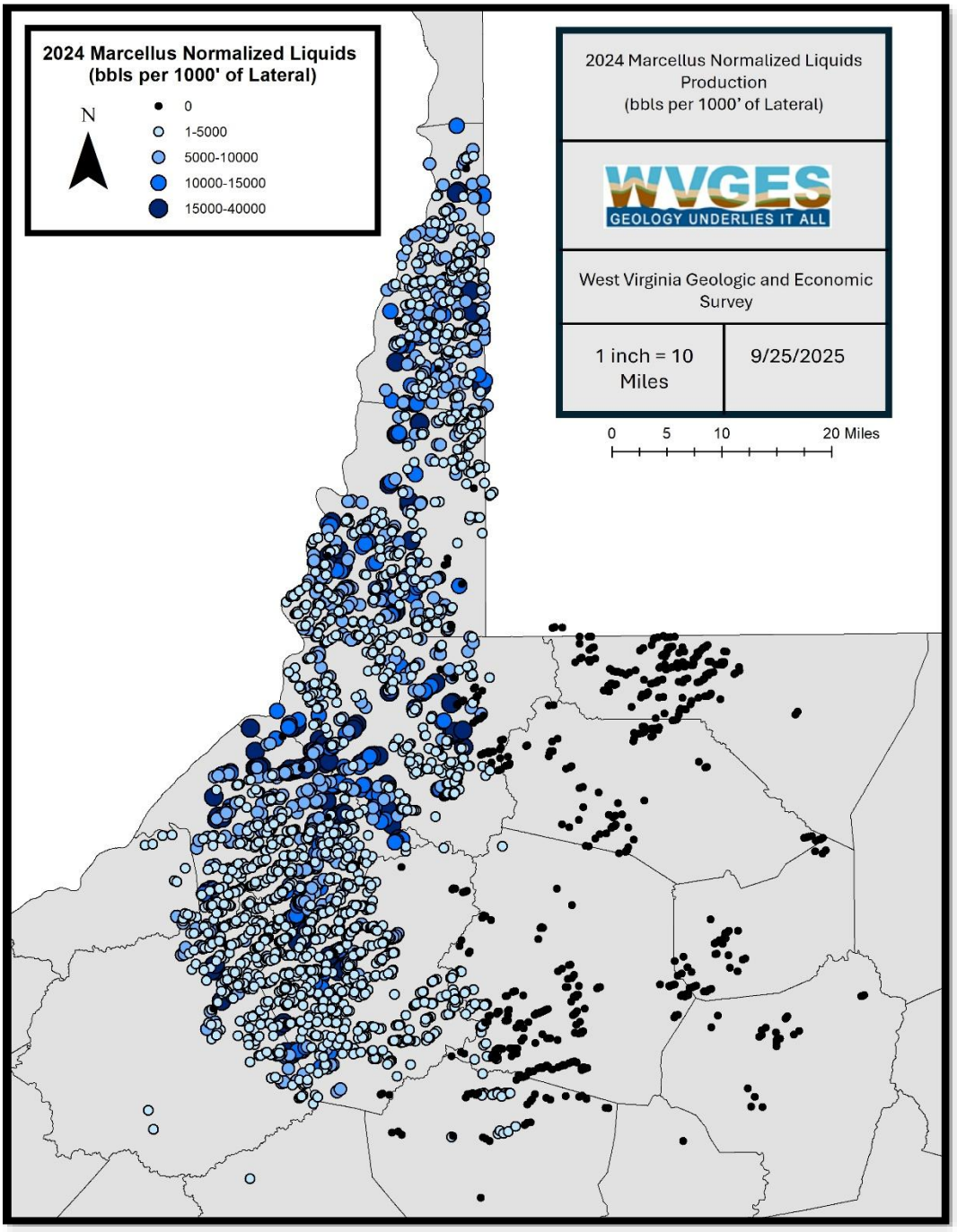

Figure 7: Normalized Marcellus H6A Liquids production in barrels (bbls). Ohio County had the only well that produced over 30,000 bbls per 1000' of lateral in 2024.

Annual Liquids Production Charts

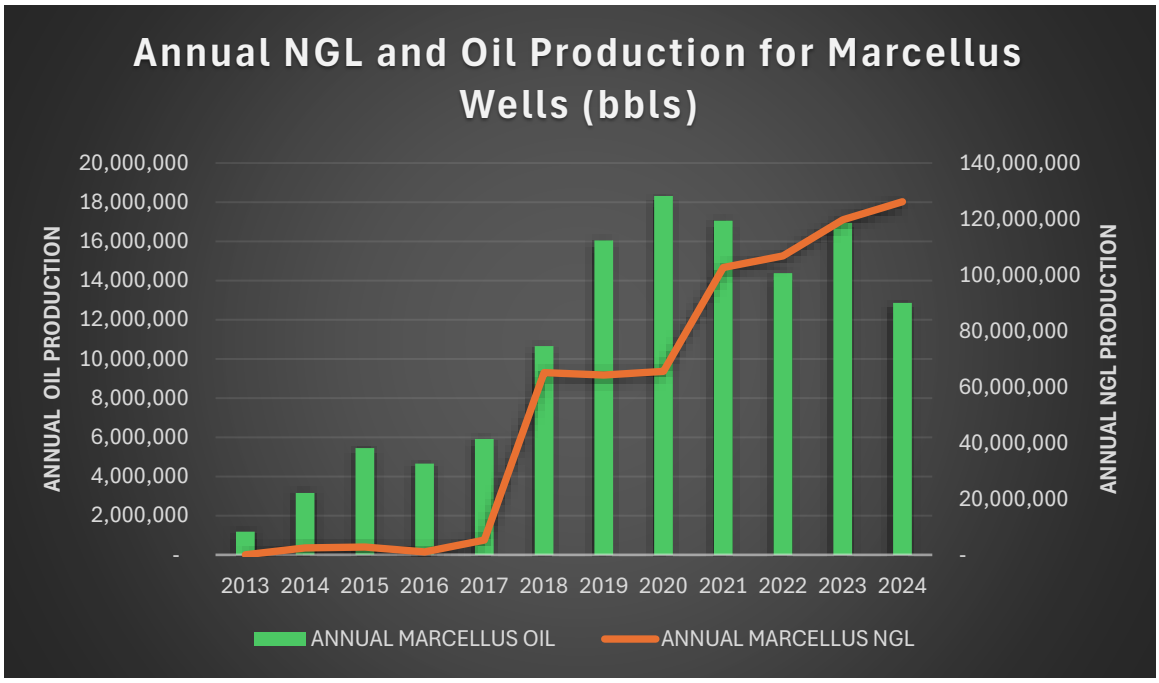

Figure 8: Combo chart showing the Marcellus H6A annual liquids production (Oil + NGL) in barrels (bbls). Note the increase in NGL production in 2018 when reporting regulations changed. NGL production continued to increase in 2024, but oil production dropped for only the second time since 2017.

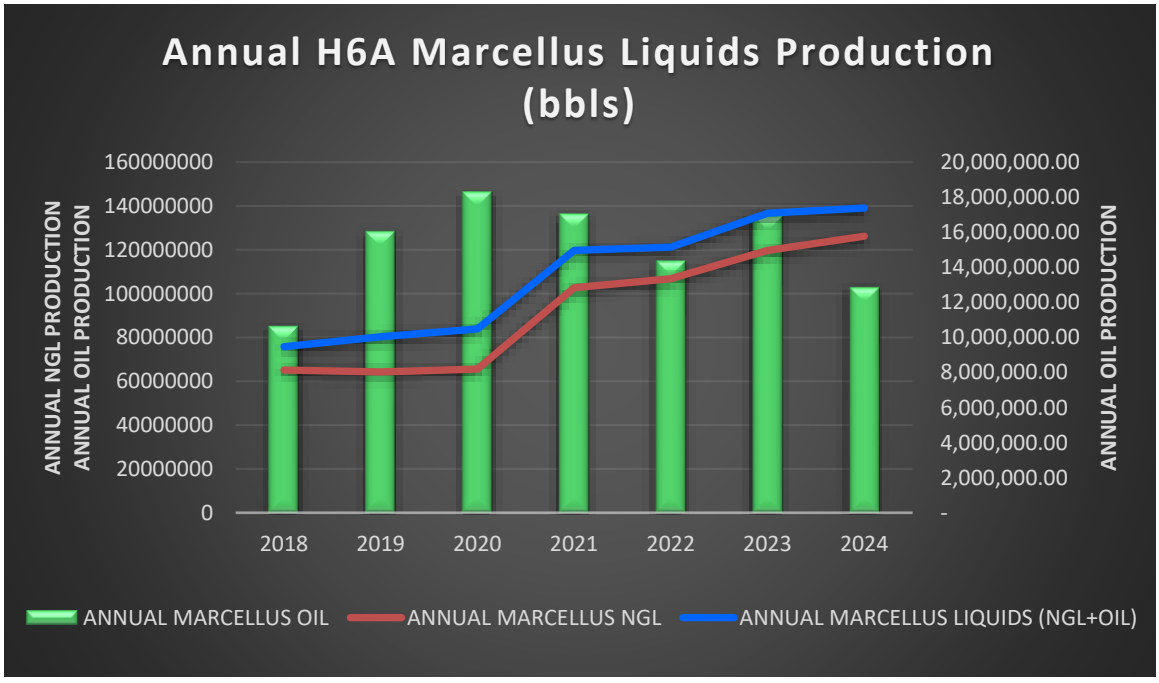

Figure 9: Combo chart detailing the Marcellus H6A liquids production. Oil production decreased by more than 4,000,000 bbls and NGL production increased by nearly 7,000,000 bbls in 2024.

Marcellus Normalized BOE per 1,000’ Lateral Length

Since 2020, a new metric for comparing results across the state has been used. The metric is barrels of oil equivalent (BOE) per completed 1000’ of lateral length, and is calculated by dividing the gas volume in Mcf by 5.8. These equivalent barrels (bbls) are then added to the previously reported oil and NGL barrels to generate a total BOE value. The BOE value is then divided by the lateral length in 1000’s of feet of lateral to get a normalized production in bbls per 1000’ of lateral.

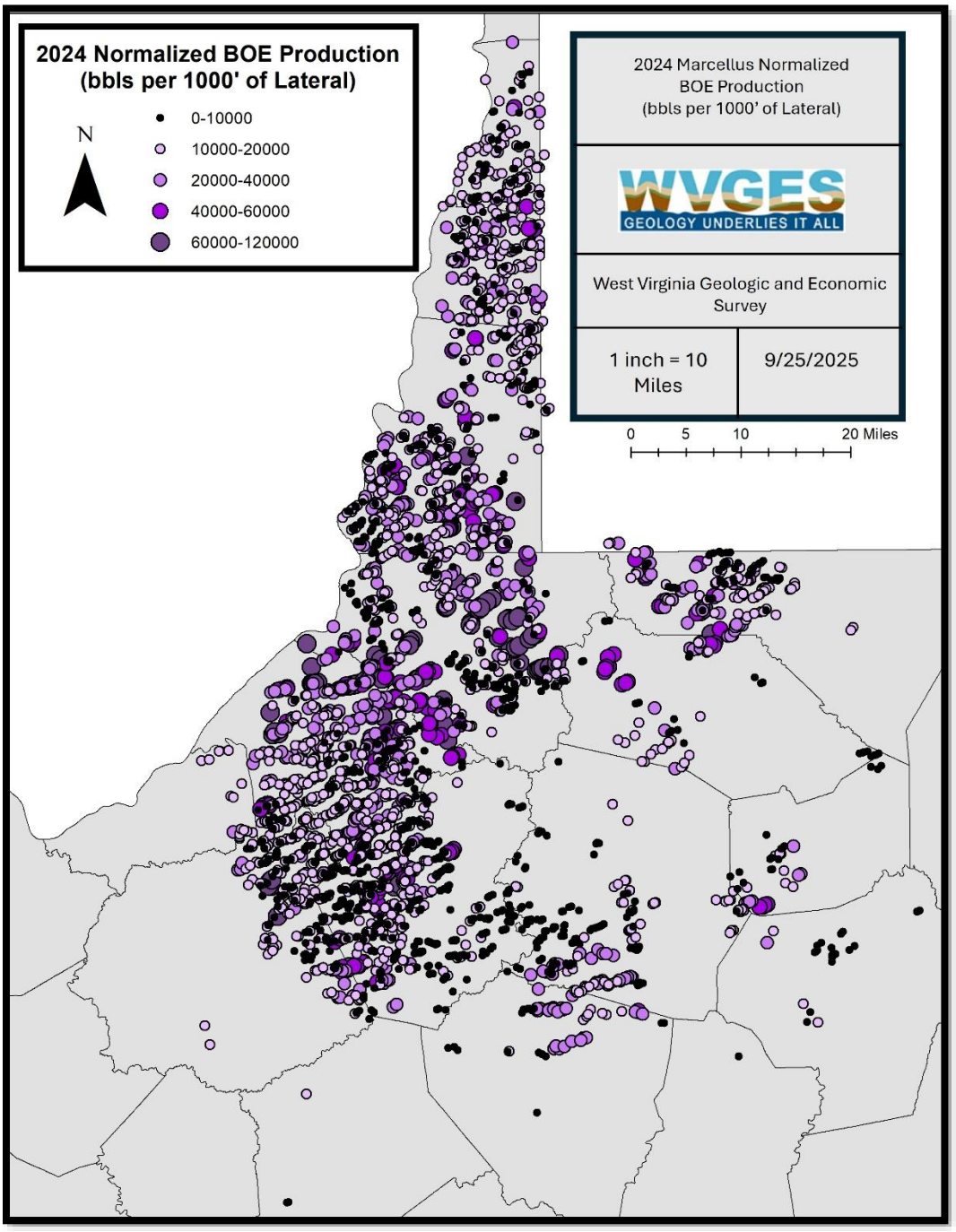

Figure 10: Normalized Marcellus H6A production in BOE. The calculated BOE for 2024 for each well was then divided by the lateral length to normalize production to BOE/1000’ of lateral.

2024 Activity in Utica-Point Pleasant Play

Development of the Utica-Point Pleasant natural gas play in West Virginia continues to grow. Records currently on file with WVDEP and/or WVGES indicate that 123 wells have reported 2024 production which is an increase from 2023. The Utica-Point Pleasant play is predominantly dry gas, with relatively very small amounts of oil or NGL reported. This report focuses on the gas only on Utica Gas production. Lastly, for this report, a "Utica" well is any well that has targeted and drilled in either the Utica or Point Pleasant.

Total 2023 Utica-Point Pleasant Gas Production: 126 Bcf

Average lateral length: 12,925

Longest lateral length: 20,920

COUNTY	UTICA WELLS REPORTING PRODUCTION	2024 UTICA GAS PRODUCTION (Bcf)
MARSHALL	88	100.71
WETZEL	9	14.64
PLEASANTS	16	8.89
TYLER	9	1.68
MONONGALIA	1	0.22

Table 3: Table showing the total number of Utica H6A wells producing in each county and the total gas produced by Utica wells in that county. Marshall County leads all other counties in terms of Utica producers and total production.

Utica annual gas production and wellbore trends

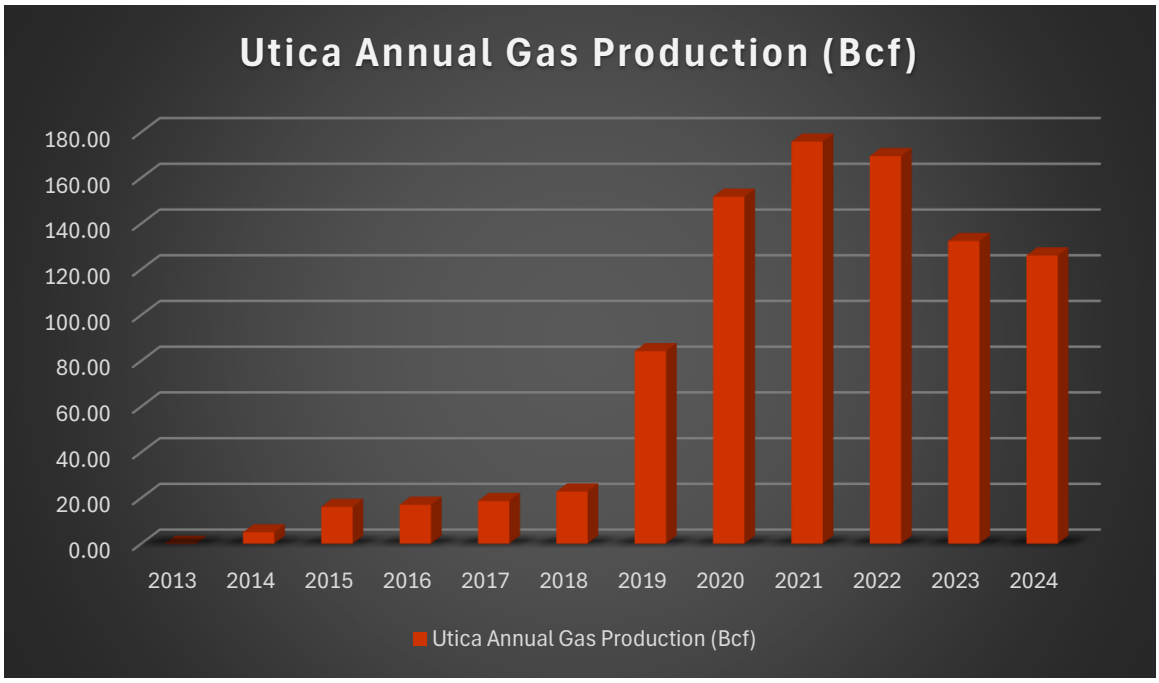

Figure 11: Annual Utica H6A gas production in the state of West Virginia. For the third year in a row, production declined from 175 Bcf in 2021 to 126 Bcf in 2024.

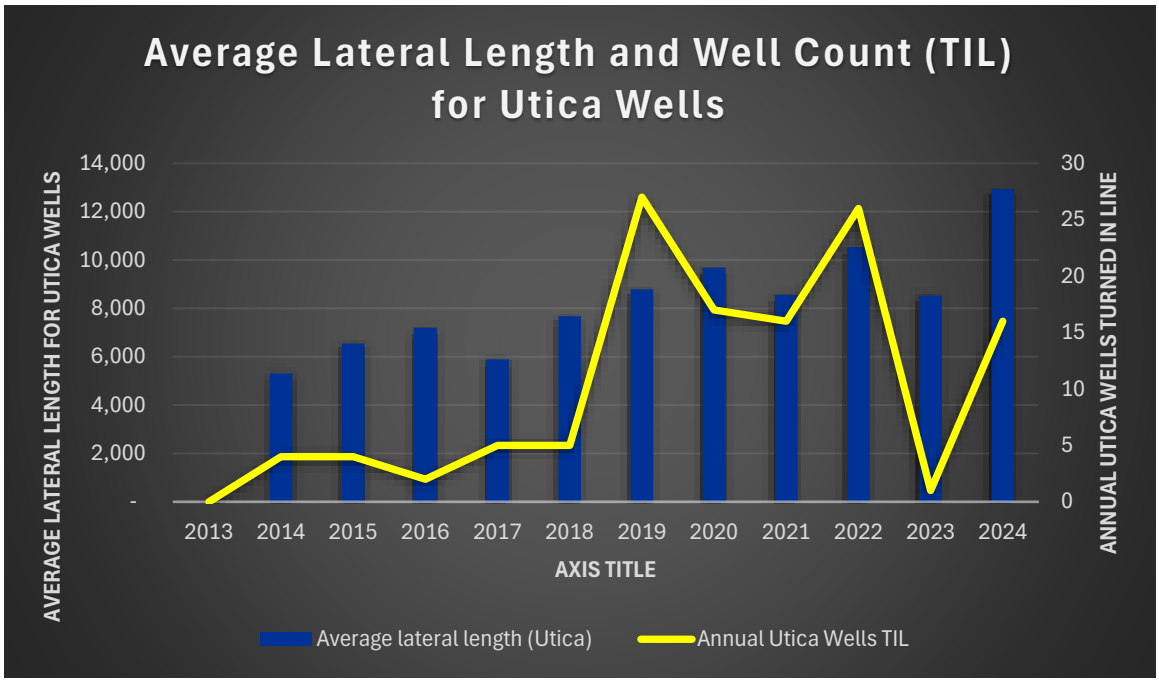

Figure 12: Average lateral length for Utica H6A wells and the annual number of Utica wells completed. 16 new Utica were turned in line in 2024.

Utica Gas Maps

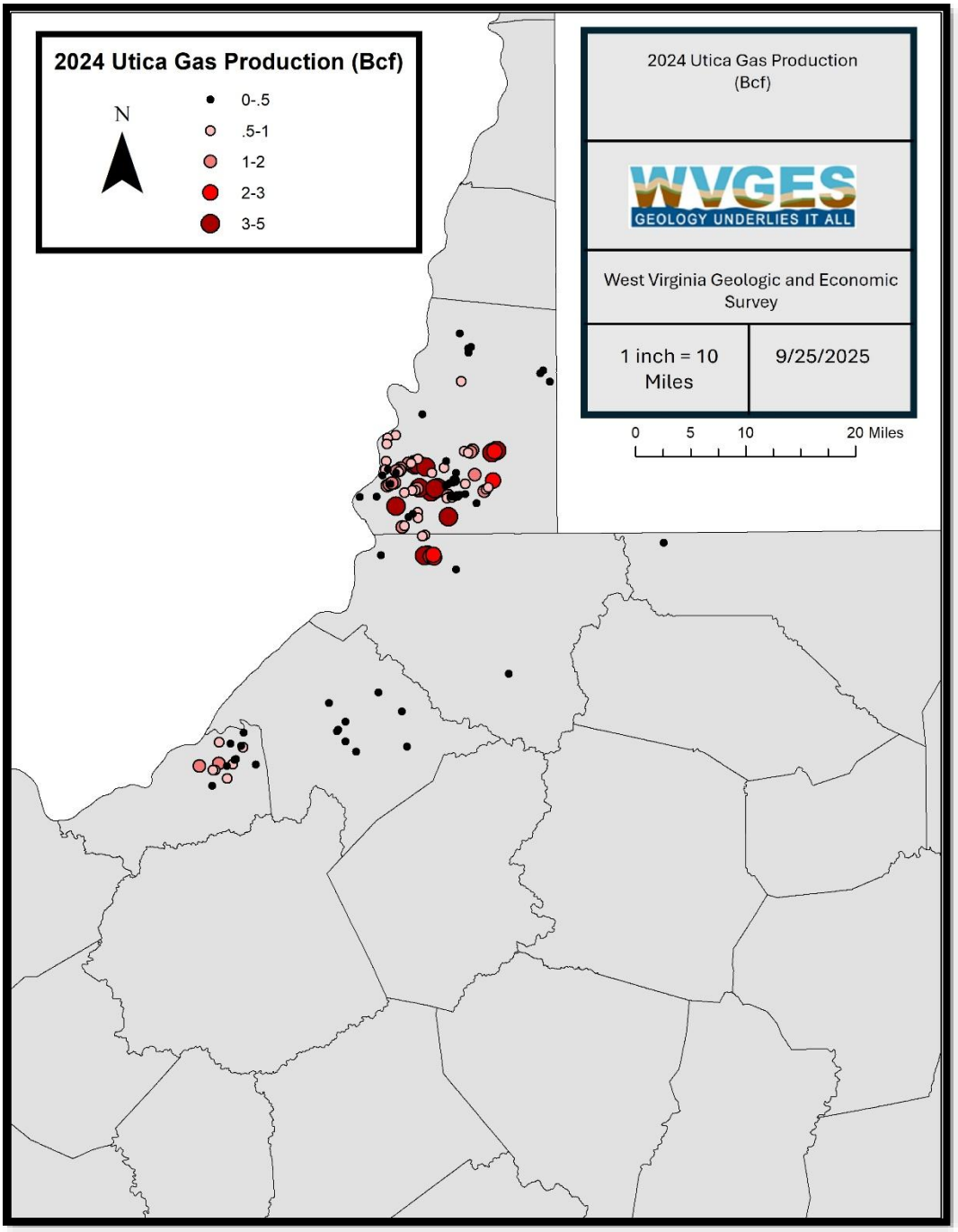

Figure 13: Map of Utica H6A gas production by county with the 2024 gas production reported as bubbles.

Normalized Utica Gas Production

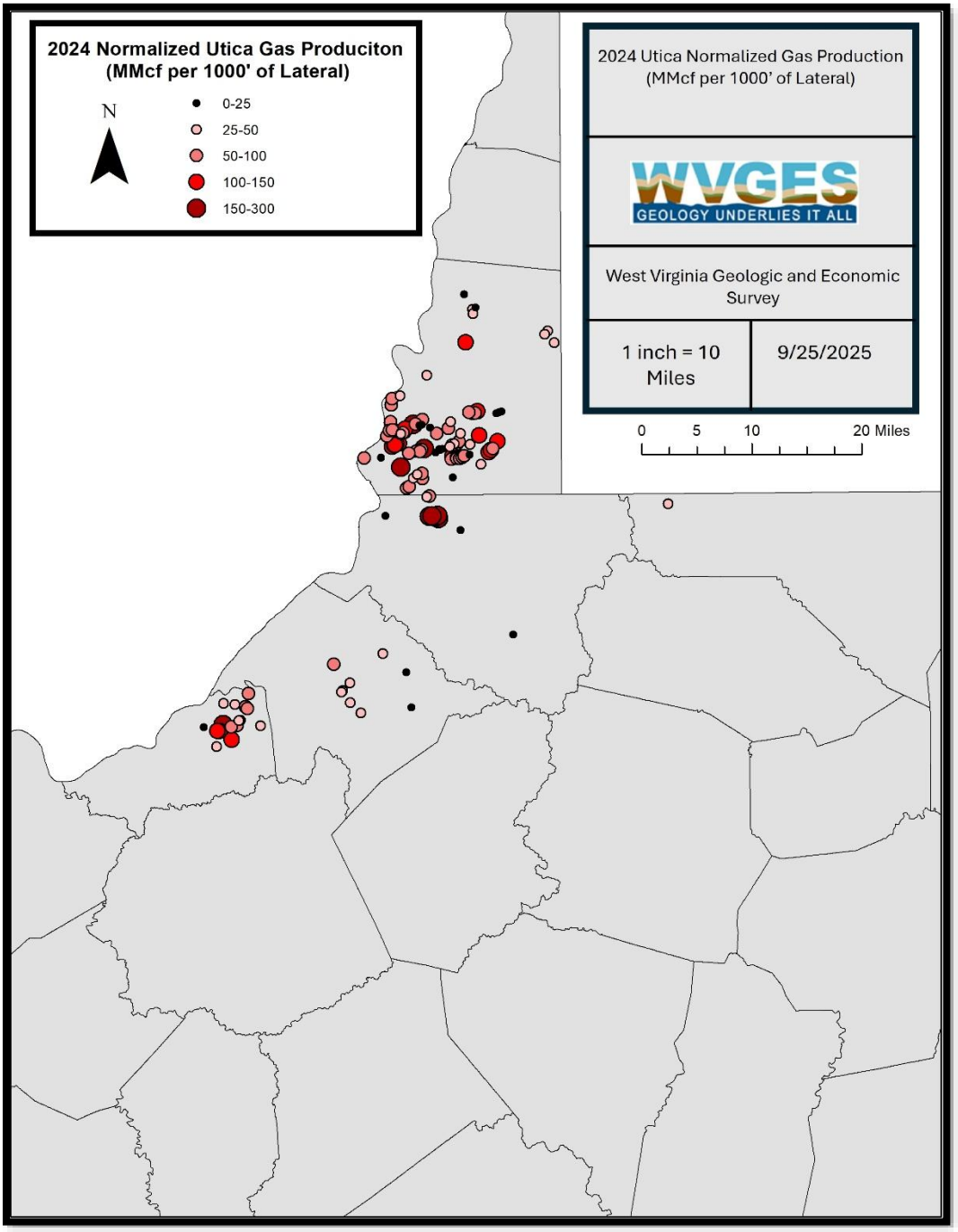

Figure 14: Map of Utica H6A gas production normalized by lateral length and represented by bubbling the production in MMcf/1000' of lateral.

Marcellus & Utica Production 2013-2024

This section of the report will focus on cumulative hydrocarbon volumes for H6A wells since 2013 for H6A Marcellus and Utica wells.

Cumulative Marcellus Gas Production

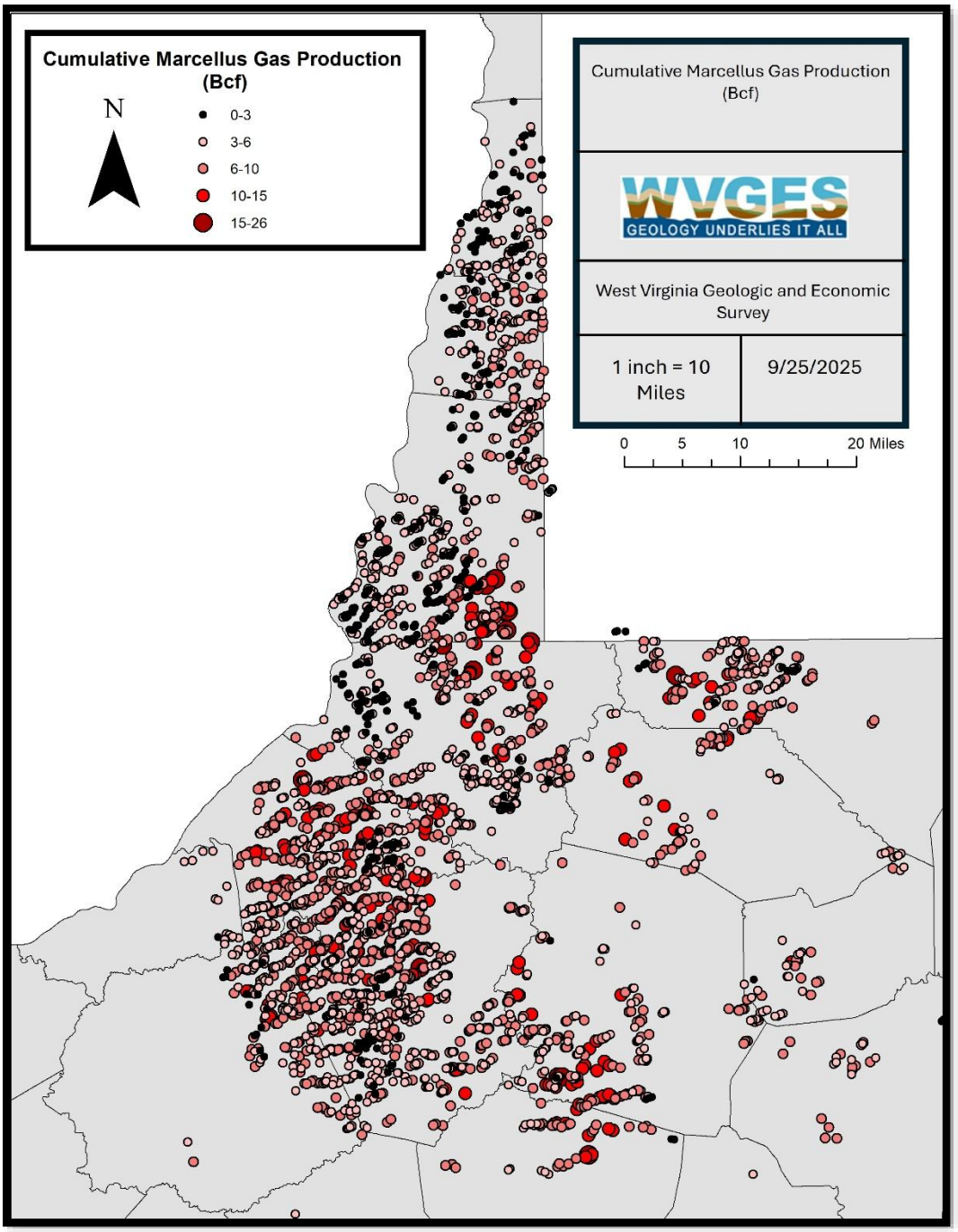

Figure 15: Cumulative gas production map for all Marcellus H6A wells. Well 47-103-3308 in Wetzel County has been the most productive Marcellus H6A well and has made over 25 BCF since being completed in 2020.

Cumulative Marcellus Liquids Production

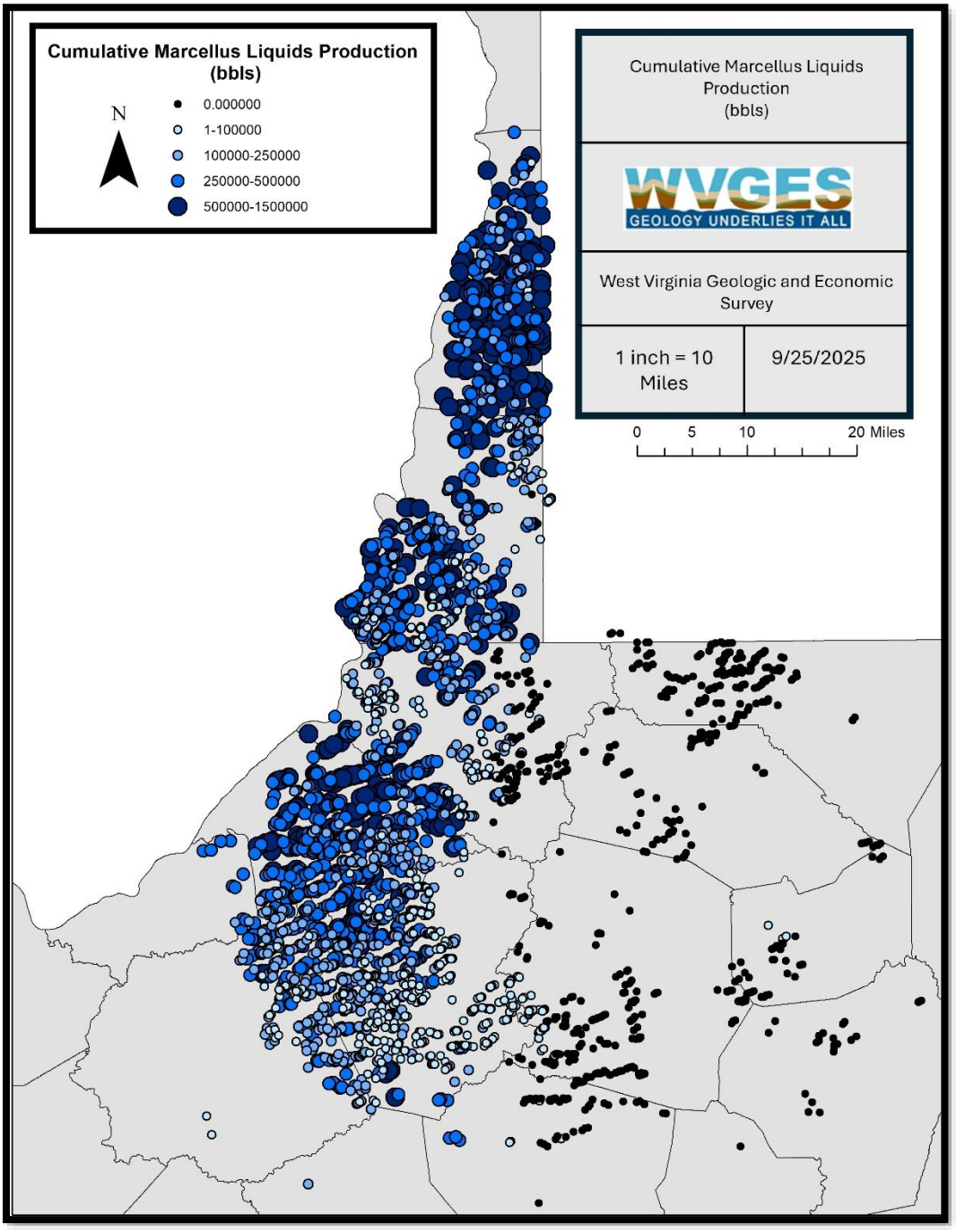

Figure 16: Cumulative liquids production (Oil+NGL) for all Marcellus H6A wells from 2013 to 2024. Well 47-069-275 in Ohio County has produced over 1.3 million bbls of liquid since being completed in 2019. Specifically, it is over 233,000 bbls of oil and 1,000,000 bbls of NGL.

Cumulative Utica Gas Production

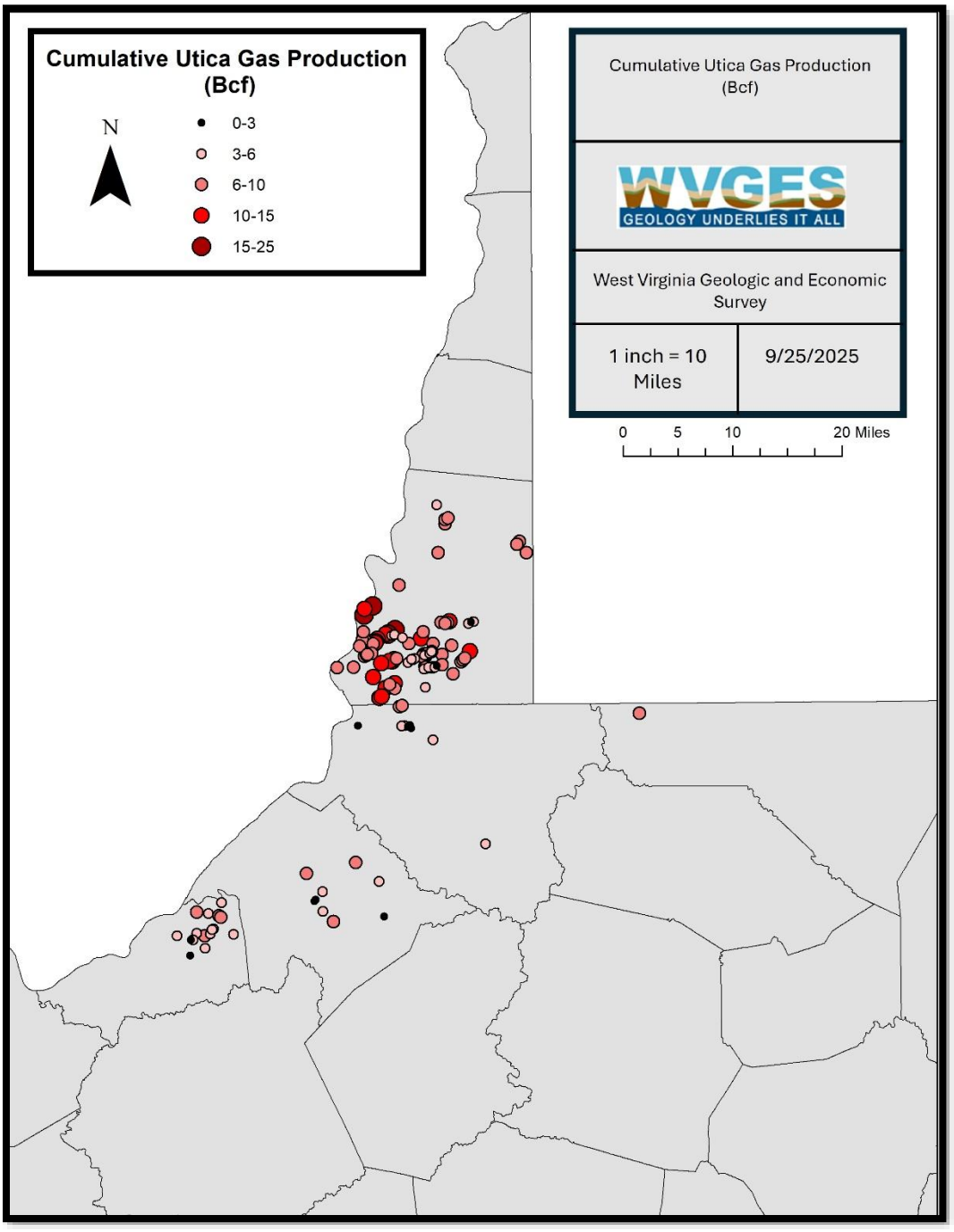

Figure 17: Cumulative gas production for all Utica H6A wells from 2013-2024. The overwhelming majority of gas production from the Utica has come from Marshall County and 47-051-2405 is the most productive well having produced nearly 23.4 Bcf since 2019.