

SAFETY AND ENVIRONMENTAL PERFORMANCE TRENDS FOR INDUSTRY BENCHMARKING – CALENDAR YEAR 2022 CHARTS

Office of Offshore Regulatory Programs

Offshore Safety Improvement Branch

OCS Performance Measures Program

July 20, 2023





ABOUT THE DATA IN THIS PRESENTATION

- Primary data source: BSEE-0131 form, required to be submitted annually to BSEE by Oil & Gas (O&G) operators with Outer Continental Shelf (OCS) activities during the prior year (30 CFR 250.1929), including:
 - Company and contact information
 - Illnesses and injuries: DART (Days Away, Restricted, Transfer) and non-DART recordables, company vs contractor, production vs drilling vs construction, by quarter
 - Hours worked: company vs contractor, production vs drilling vs construction, by quarter
 - Number of EPA NPDES (Environmental Protection Agency, National Pollutant Discharge Elimination System) non-compliances
 - Number and volume of oil spills less than one barrel each
- Other data sources used in this analysis and presentation: BSEE Technical Information Management System (TIMS) and National Consolidated Information System (NCIS) databases, including:
 - Oil spills in two additional categories: 1) between 1 and 50 barrels each, and 2) over 50 barrels each (per 30 CFR 254.46, spills greater than 50 barrels volume have additional reporting requirements)
 - O&G production
 - Platform count
 - Number of rigs and number of non-rig activities involved in drilling and related well operations
 - Wells spud
 - Losses of well control
 - Fires
 - Fatalities
 - Incidents of non-compliance (INCs)
 - Inspection metrics: numbers of inspectors, inspection visits, types of inspections performed, components inspected
- Industry may use this data to compare their individual performance to the averages for all OCS O&G work.

OVERVIEW OF CALENDAR YEAR (CY) 2022 DATA SET



- The graphs in this presentation illustrate trends in data collected for the calendar years 2010 through 2022. Data extracted from the TIMS database are valid as of the date of extraction. Because TIMS and NCIS data are updated whenever new information becomes available, the 2022 data presented here should be considered reasonable estimates. Data for the years 2010 – 2021 similarly reflect what was available in the database when they were extracted from TIMS.
- Data from calendar year 2010 forward are considered more complete than pre-2010 data because 2010 was when BSEE-0131 form submission was first required (30 CFR 250.1929). Prior to CY 2010, BSEE-0131 submission was on a voluntary basis. Thus, these charts use 2010 as the base year for comparison and depiction of post-2010 trends.
- 38 operating companies* recorded production in 2022. An additional 7 operating companies recorded work hours for various 2022 OCS activities but had no recordable production. Two companies submitted forms demonstrating no OCS activity in 2022. These 47 companies accounted for 100% of companies with documented OCS activities in 2022.
- The downward trend in number of companies active in Oil and Gas operations on the Outer Continental Shelf (OCS) appears to have leveled off. The 47 BSEE-0131 reports received in 2022 (covering 45 companies with OCS activity) reflects a significant consolidation in number of companies with operations on the OCS since 2010.

* An operating company and all its subsidiaries are counted as 1 company in this analysis



HIGHLIGHTS OF 2022 DATA

State of the OCS O&G Industry in 2022 (slides 8-12)

- Barrels of Oil Equivalent (BOE) production increased by 1.5%, led by a 1.0% increase in Oil Production
- Total work hours increased by 19%, led by a 20% increase in contractor work hours
- More work hours were spent producing each BOE, reducing BOE production per production work hour to levels last recorded in 2015
- More work hours were spent performing each drilling or well operation, but levels remained within a narrow low range first recorded in 2016

Injury/Illness/Fatality Trends in 2022 (slides 13-18)

- Fatality Rate for all O&G-related activities on the OCS remained high, though the rate for activities that BSEE oversees dropped to near the nationwide occupational fatality rate.
- The Total Recordable Injury/Illness Rate (TRIR) for all O&G activities on the OCS increased by 56%.
- DART injury rates (Days Away, Restricted-duty or job Transfer) reached historic lows after discounting COVID-19 illnesses.
- Because of an increase in non-DART recordable injuries, discounting COVID-19 was not enough to offset the impact of COVID-19 illnesses on the adjusted TRIR; i.e., the adjusted TRIR still rose by 80% in 2022.
- Increases in TRIR characterized only Production and Construction operations.
- TRIR and DART rates in Drilling and Well Operations remained near or below their historic lows.

HIGHLIGHTS OF 2022 DATA

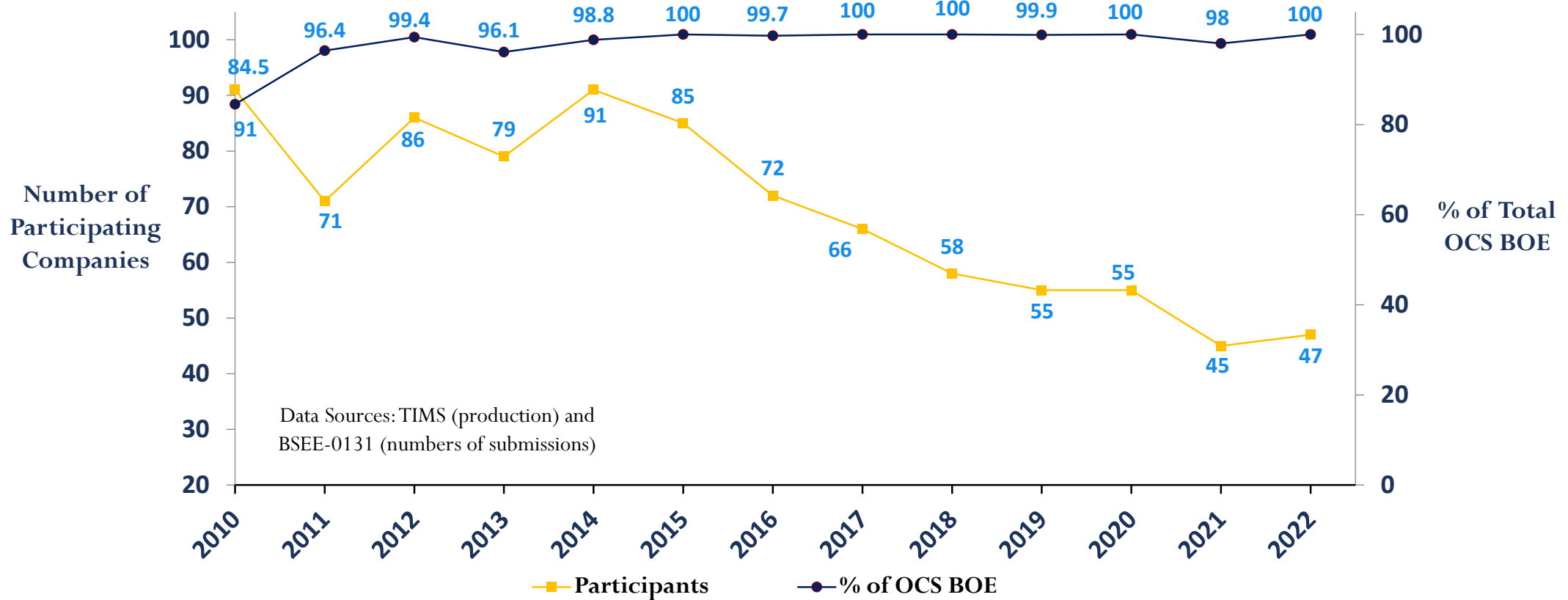


Other Incident Trends (slides 19-31)

- The **Fire Incident** rate (ratio of fires to number of platforms and active drill rigs) increased to its highest level in 2022, continuing a trend first observed in 2020. The Office of Offshore Regulatory Programs (OORP) is leading a BSEE-wide effort to identify common factors contributing to this trend.
- The **Loss of Well Control Incident** rate (number of LOWC incidents per million work hours recorded for Drilling and Well Operations) stayed near the high level first recorded in 2021. There was no environmental release associated with these incidents. The OORP is evaluating well characteristics associated with the LOWC events to identify possible common factors.
- The **Oil Spill Incident** rates (both ratio of number of spills to number of platforms and active drill rigs; and barrels spilled per million barrels of oil and condensate produced) remained near recent year levels when looking at all the data. However, when looking just at oil spills in the 1-to-50-barrel range, there is a two-year increasing trend.
- Both **Incident of Non-Compliance (INC) rates for well operations** (ratio of well operation INCs written to the number of drilling rig and non-rig inspection visits conducted, and ratio of well operation INCs written to the number of drilling rig and non-rig inspection types performed) increased into historical ranges after COVID-19 travel restrictions were eased, allowing more inspector visits to each well operation.
- Both **INC rates for production operations** (ratio of production INCs written to number of components inspected, and ratio of production INCs written to the count of production inspection types performed) decreased slightly to levels lower than had been measured prior to the COVID-19 impacts on inspection processes.



OCS PERFORMANCE DATA SURVEY PARTICIPATION*



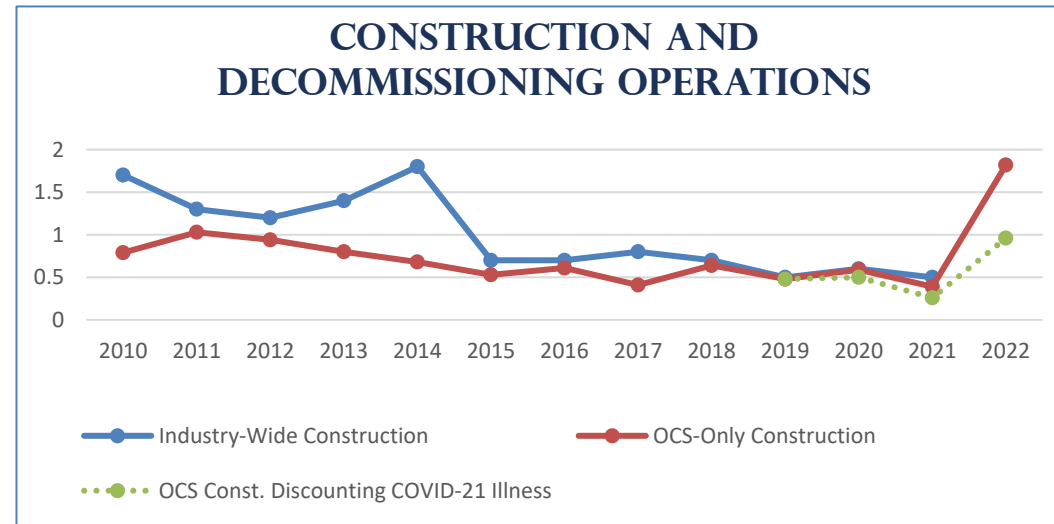
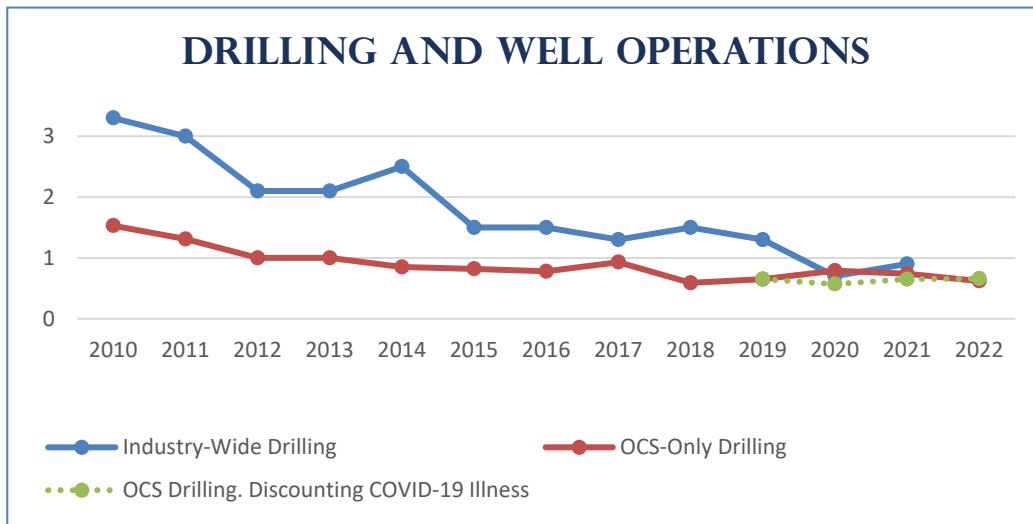
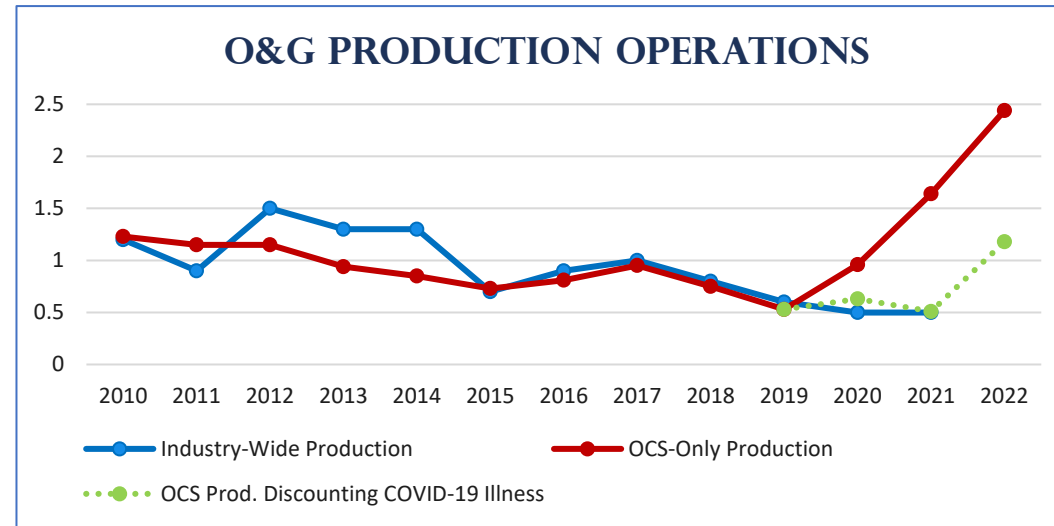
A total of 47 companies representing 100% of CY 2022 offshore production, submitted the BSEE-0131 form by or soon after the March 31, 2023 deadline, an increase of 2 reporting companies from the prior year

*2010 was the first year that OCS Performance Measure Data were required by BSEE regulation (30 CFR 250.1929).

OCS VS INDUSTRY-WIDE INJURY/ILLNESS RATES



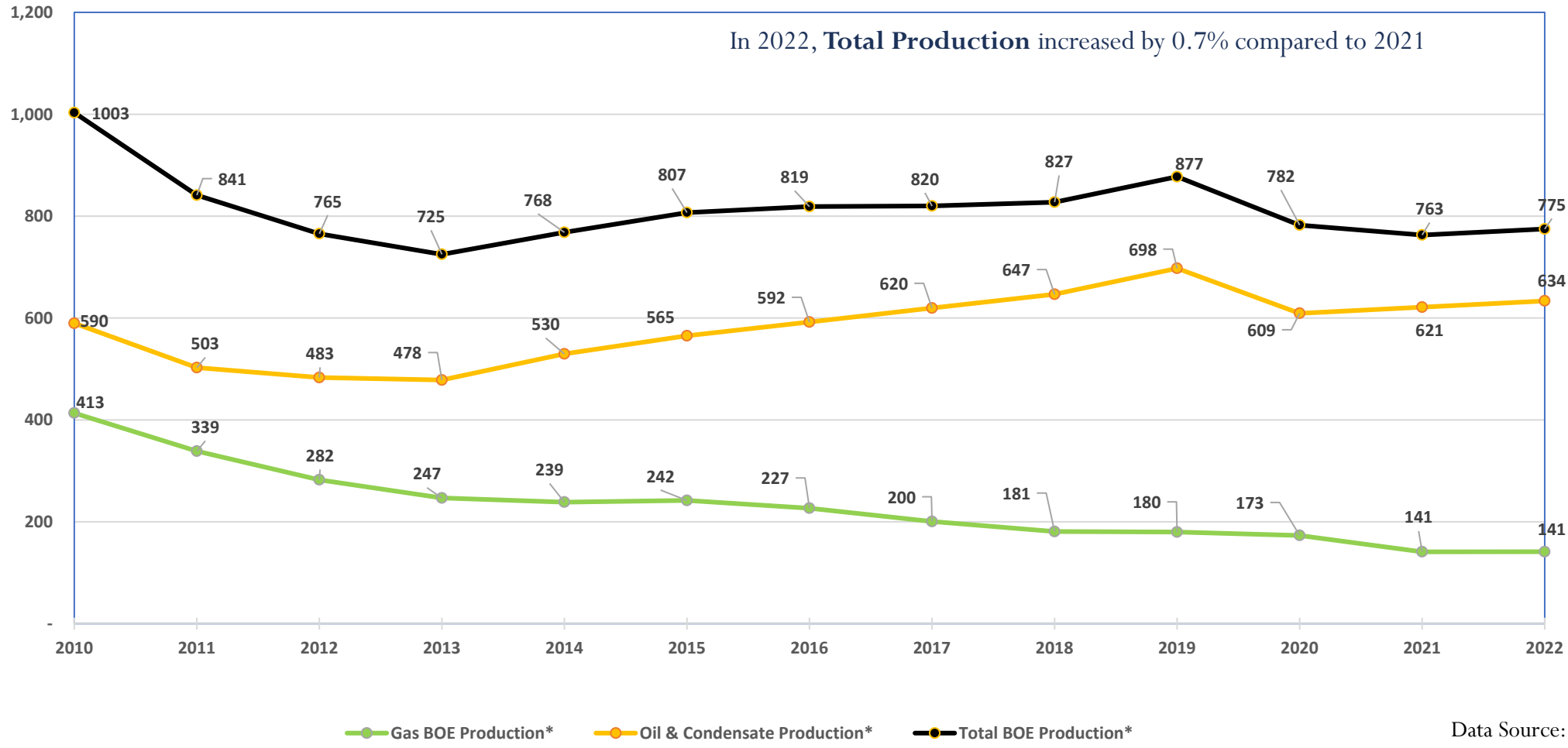
- The total injury/illness rates (TRIR)* for all oil and gas (O&G) categories (production, drilling and construction) on the OCS were historically lower than the rates for the United States O&G industry overall, until 2020.
- COVID-19 illnesses contributed to a 2020 - 2022 uptick in OCS production and construction TRIR.
- Even after discounting COVID-19 impacts on TRIR, the OCS TRIR in 2022 for production and construction, appears higher than the historical industry-wide norms.



* Sources of data: OCS Total Recordables: BSEE-0131. Industry Wide: for and Bureau of Labor Statistics (BLS) "TABLE 1. Incidence rates of nonfatal occupational injuries and illnesses by industry and case types, (various years)." The industry-wide illness/injury equivalent categories: O&G Production - NAICS Code 211; Drilling and Well Operations - NAICS code 213111; Construction and Decommissioning - NAICS code 23712. All TRIR use the formula [DART + non-DART recordables] / [total number of work hours] * 200,000. (DART = Days Away from work, job Restricted, and job Transfer). * BLS is expected to release industry-wide 2022 data in Nov. 2023)



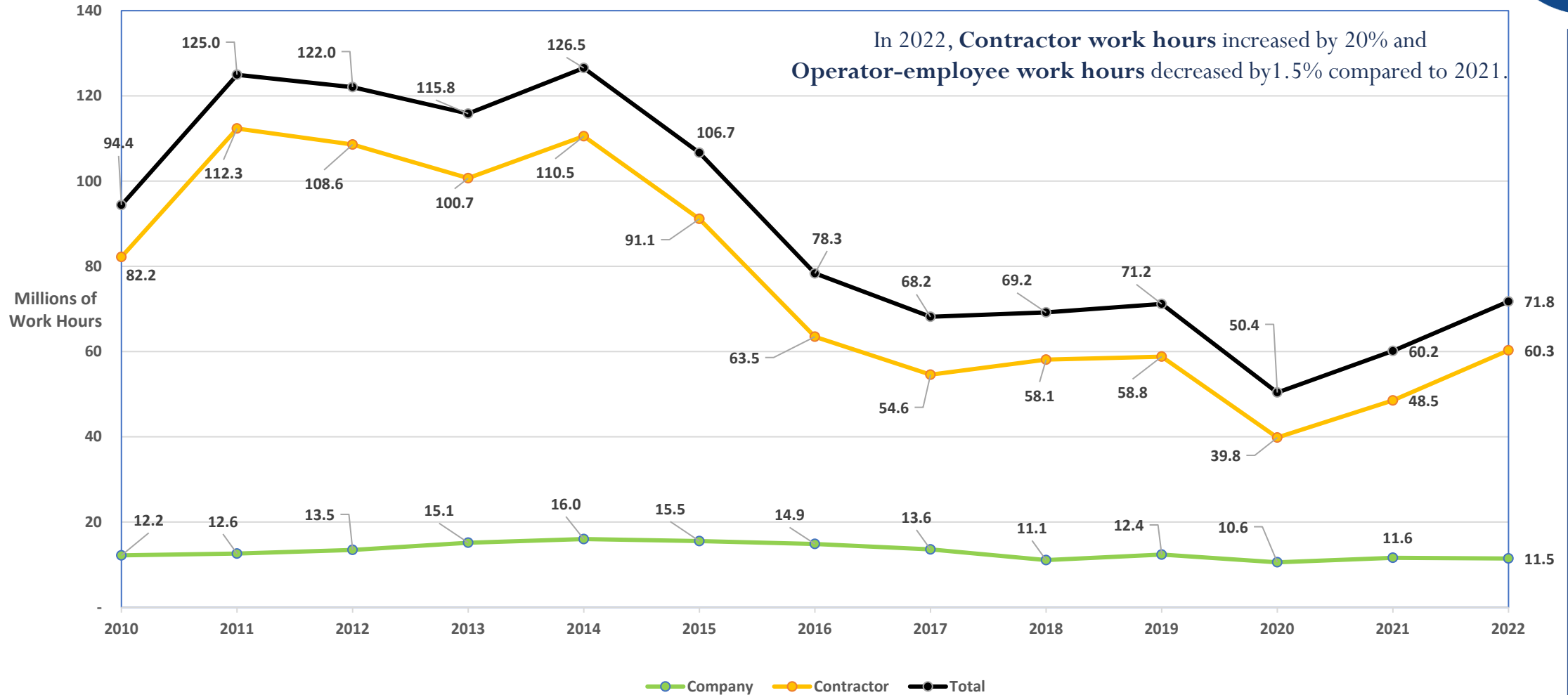
TOTAL OCS OIL AND GAS PRODUCTION



* BOE = Barrels of Oil Equivalent. Gas production is converted into BOE so that it can be compared to actual barrels of oil. In 2019, 2020 and 2021, the conversion factor used was 5.8 MCF per BOE. In 2021 and 2022, the conversion factor used was 5.6 MCF per BOE.

TOTAL OCS WORK HOURS

In 2022, total work hours increased by 19% compared to 2021

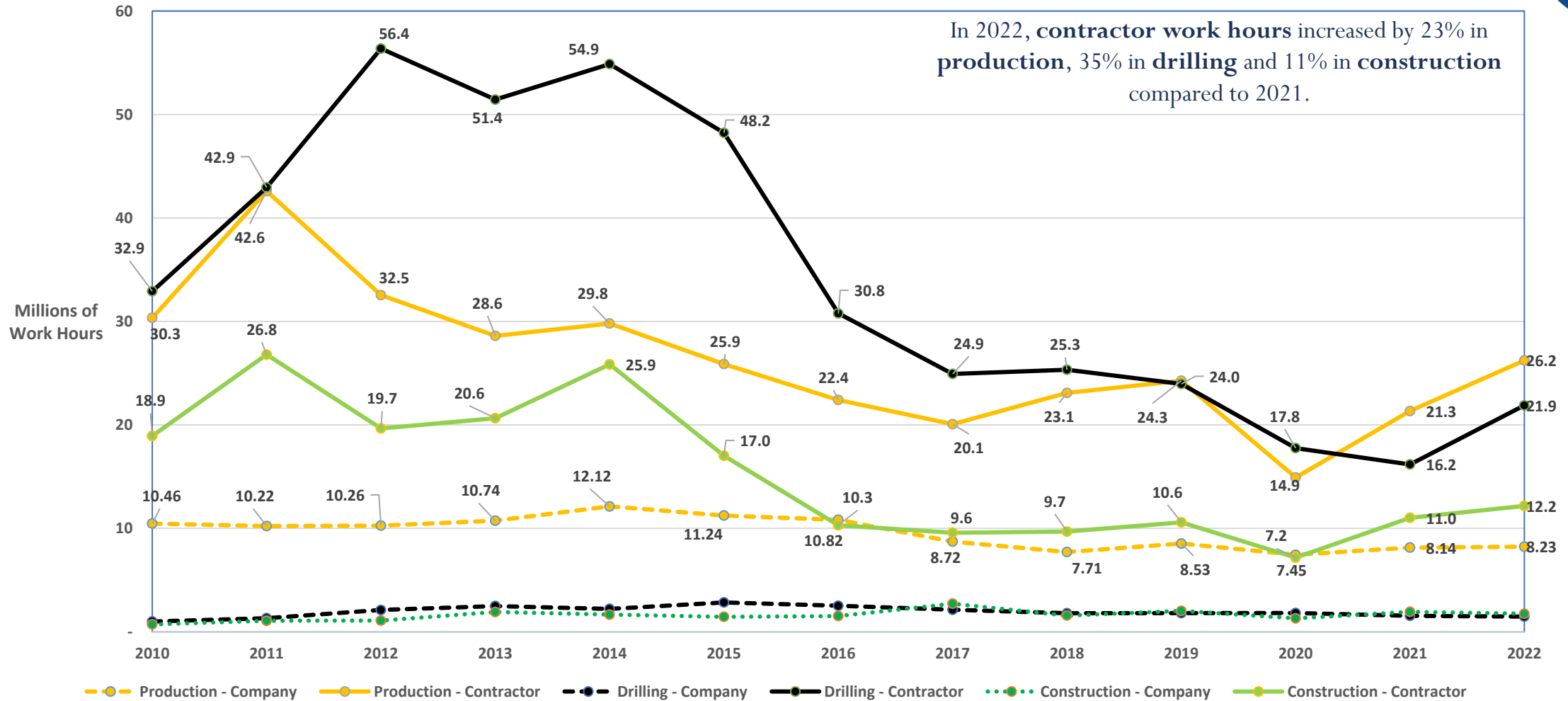


Data Source: BSEE-0131

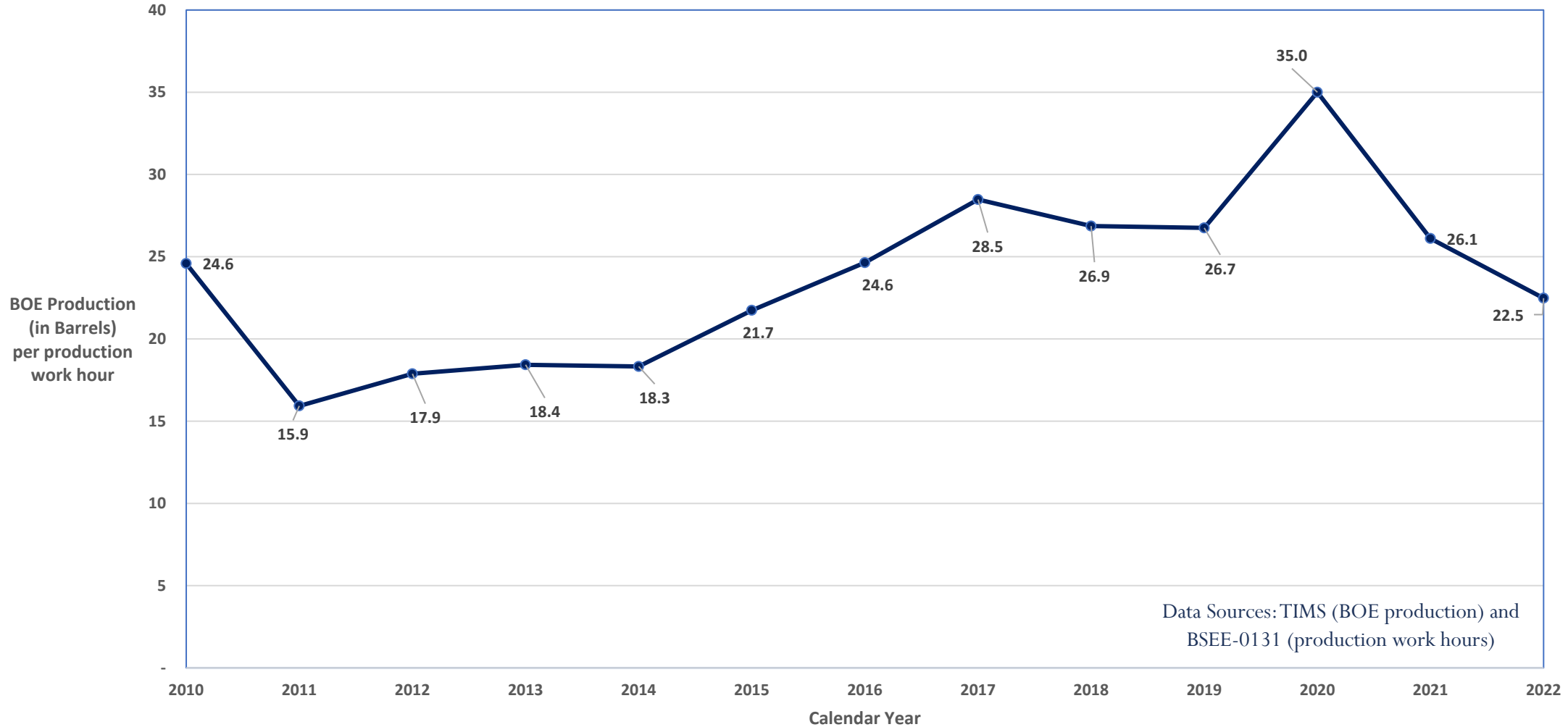


TOTAL OCS WORK HOURS

Company vs Contractor



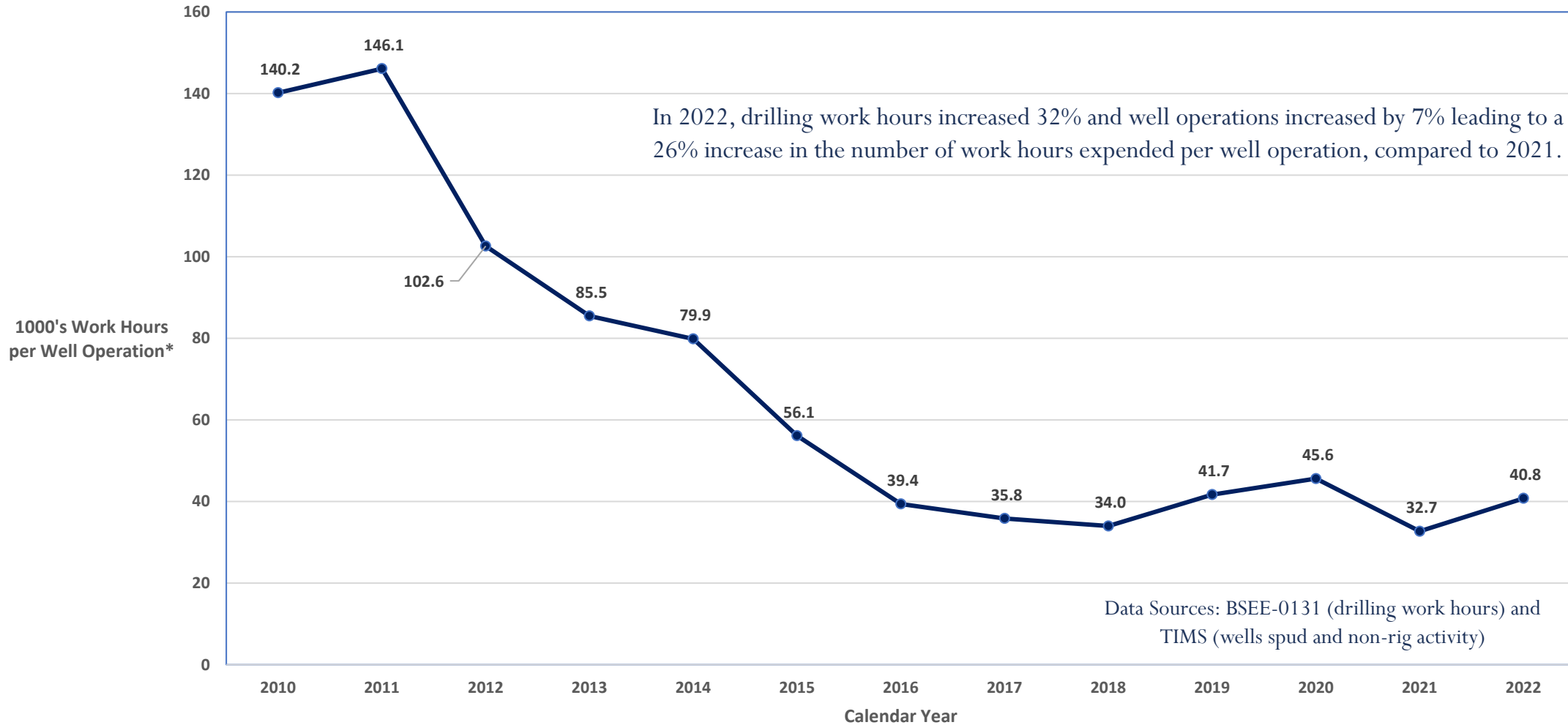
BOE PRODUCTION PER PRODUCTION WORK HOUR



In 2022, the **Barrels of Oil Equivalent** (BOE) produced per production work-hour decreased by 14% compared to 2021



WORK HOURS PER WELL OPERATION*

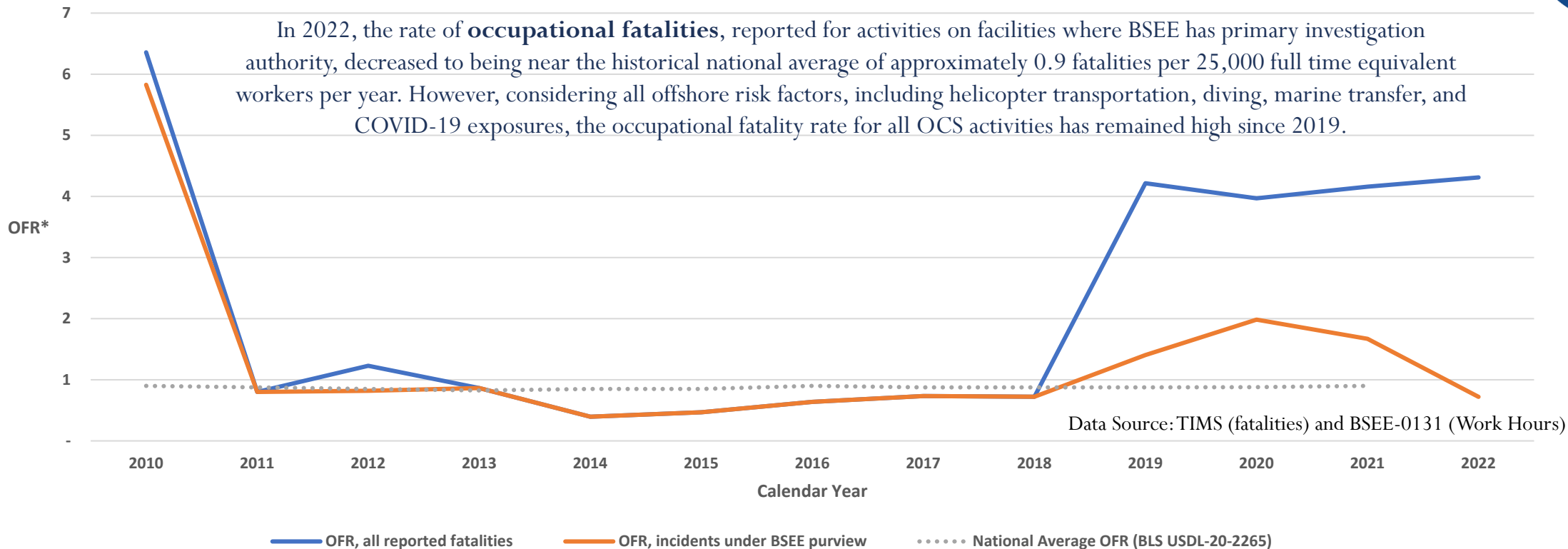


* Work Hours reported for drilling and related well activities, divided by (# Participant Wells Spud + # Non-rig activities)



OCCUPATIONAL FATALITY RATE (OFR)**,**

In 2022, the rate of **occupational fatalities**, reported for activities on facilities where BSEE has primary investigation authority, decreased to being near the historical national average of approximately 0.9 fatalities per 25,000 full time equivalent workers per year. However, considering all offshore risk factors, including helicopter transportation, diving, marine transfer, and COVID-19 exposures, the occupational fatality rate for all OCS activities has remained high since 2019.



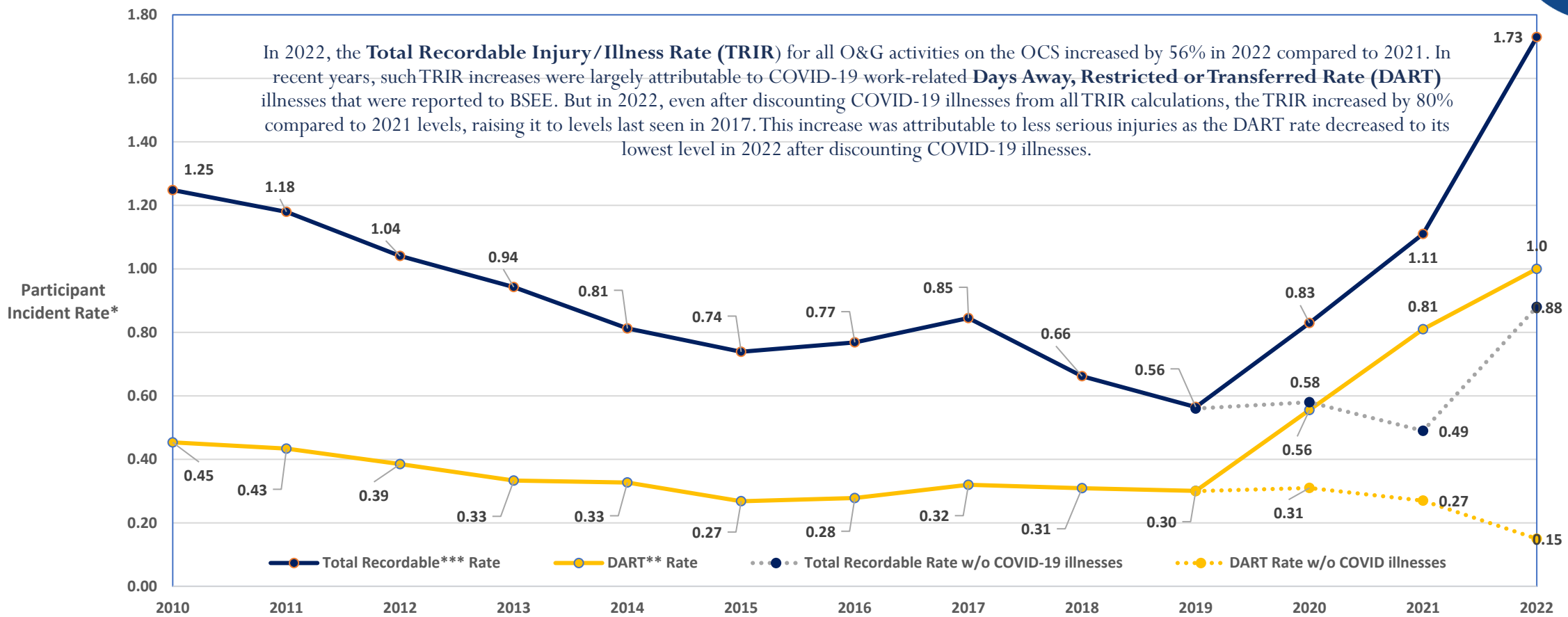
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Operational Fatalities under BSEE purview:	11	2	2	2	1	1	1	1	1	2	4	5	5
Additional Occupational Fatalities in OCS operations:	1	0	1	0	0	0	0	0	0	4	2	2	1

*Reported Occupational Fatalities per 25,000 FTE workers (or 50,000,000 work hours).

** All occupational fatalities that are reported to BSEE are reflected in the "All Reported Fatalities" line. Fatalities associated with diving, helicopter, and lifeboat incidents are investigated by other federal agencies and therefore excluded from "incidents under BSEE purview," as are the three fatalities in 2021 associated with COVID 19 exposures. This chart excludes non occupational fatalities reported to BSEE, such as from activities conducted during non-work shift times or from chronic, preexisting conditions.



COMBINED OCS OPERATIONS: TOTAL AND DART RECORDABLE INCIDENT RATES



* Number of injury/illness incidents per 200,000 man-hours worked for operators that submitted BSEE-0131 forms.

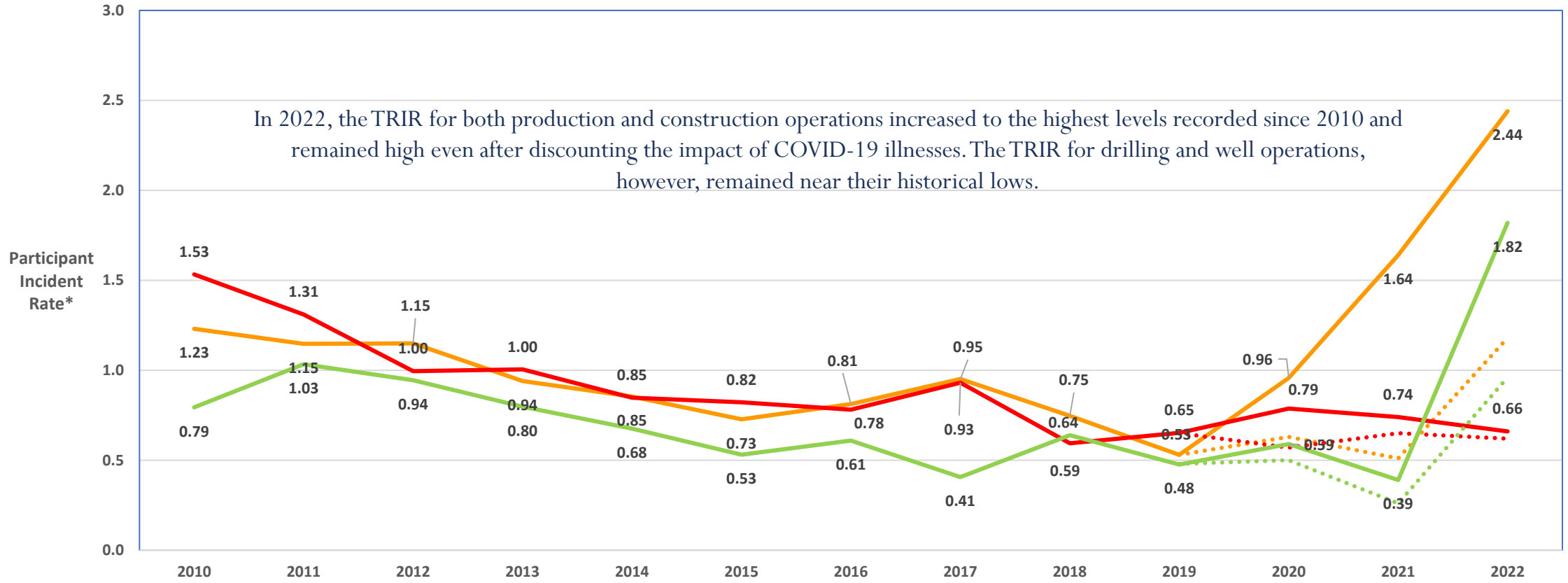
** DART = injury or illness leading to Days Away, Restricted duty or job Transfer

*** Total Recordable Incidents = the sum of DART and non-DART recordable injuries/illnesses. Beginning 2018 and finalized with a revised form in 2019, BSEE clarified that non-DART recordable injuries should be reported separately from DART recordable injuries. In the past some operators interpreted the "Recordables" line on BSEE-0131 as a request for "Total Recordables" and some interpreted it as a request for "Non-DART Recordables" since there was already a separate line for DART Recordable data (the form never specified which to enter).

Data Source: BSEE-0131 (Non-DART and DART injuries/illnesses, and work hours)



TOTAL RECORDABLE INCIDENT RATES (TRIRS) BY OCS OPERATION

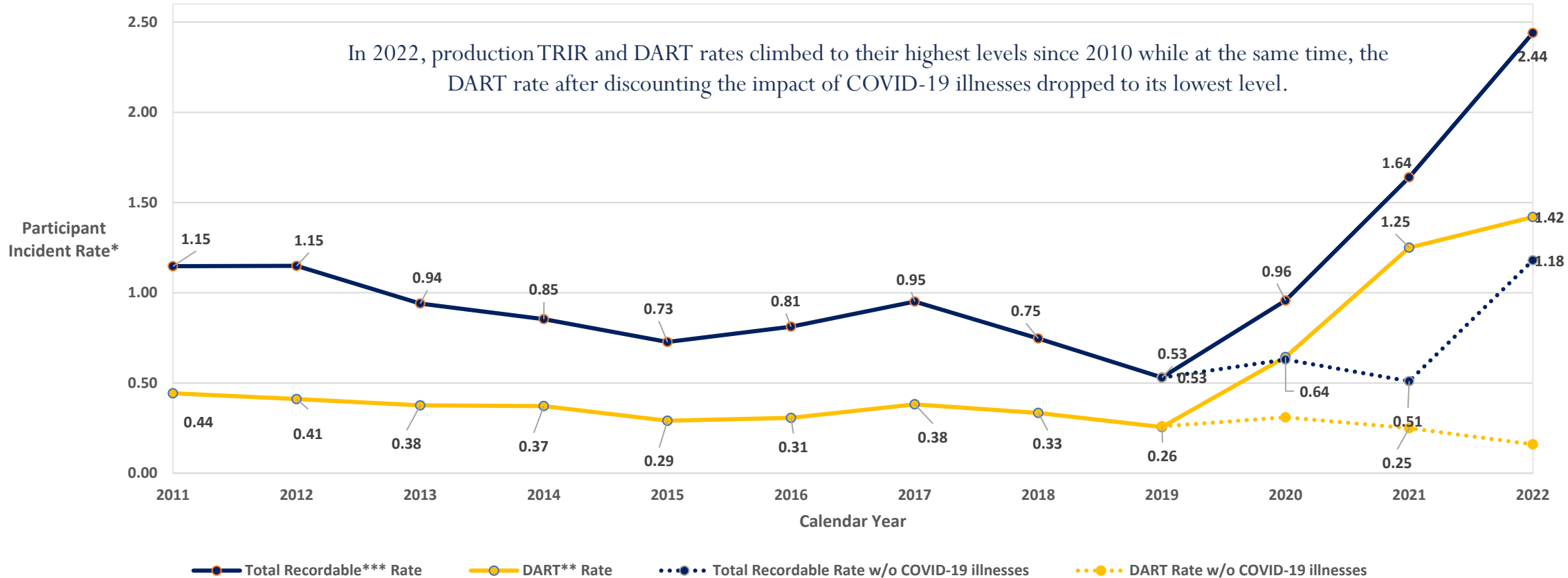


Data Source: BSEE-0131 (Non-DART and DART injuries/illnesses, and work hours)

- Production TRIR
- ⋯ Production TRIR w/o COVID-19 illnesses
- Drilling TRIR
- ⋯ Drilling TRIR w/o COVID-19 illnesses
- Construction TRIR
- ⋯ Construction TRIR w/o COVID-19 illnesses

* Number of injury/illness incidents per 200,000 man-hours worked for operators that submitted BSEE-0131 forms.

PRODUCTION OPERATIONS: TOTAL AND DART RECORDABLE INCIDENT RATES



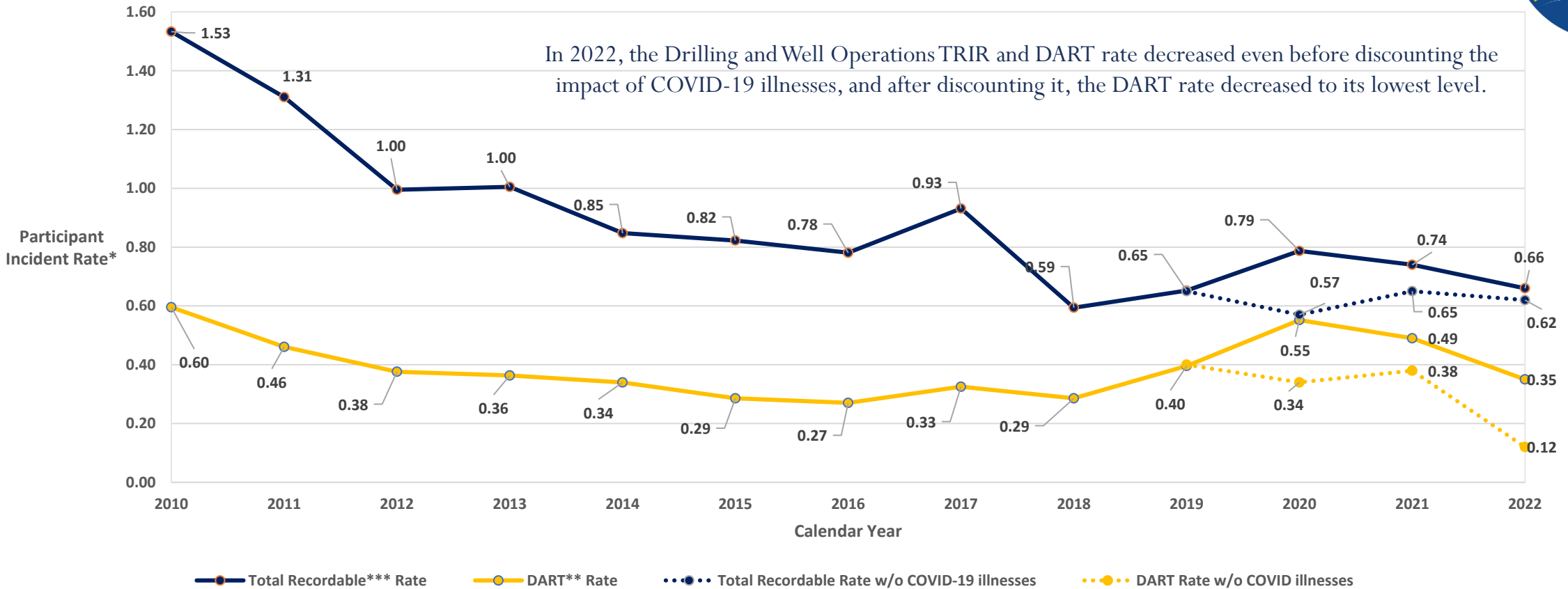
* Number of injury/illness incidents per 200,000 man-hours worked for operators that submitted BSEE-0131 forms.

** DART = injury or illness leading to Days Away, Restricted duty or job Transfer

*** Total Recordable Incidents = the sum of DART and non-DART recordable injuries/illnesses. Beginning 2018 and finalized with a revised form in 2019, BSEE clarified that non-DART recordable injuries should be reported separately from DART recordable injuries. In the past some operators interpreted the "Recordables" line on BSEE-0131 as a request for "Total Recordables" and some interpreted it as a request for "Non-DART Recordables" since there was already a separate line for DART Recordable data (the form never specified which to enter).

Data Source: BSEE-0131 (Production non-DART and DART injuries/illnesses, and production work hours)

DRILLING AND WELL OPERATIONS: TOTAL AND DART RECORDABLE INCIDENT RATES



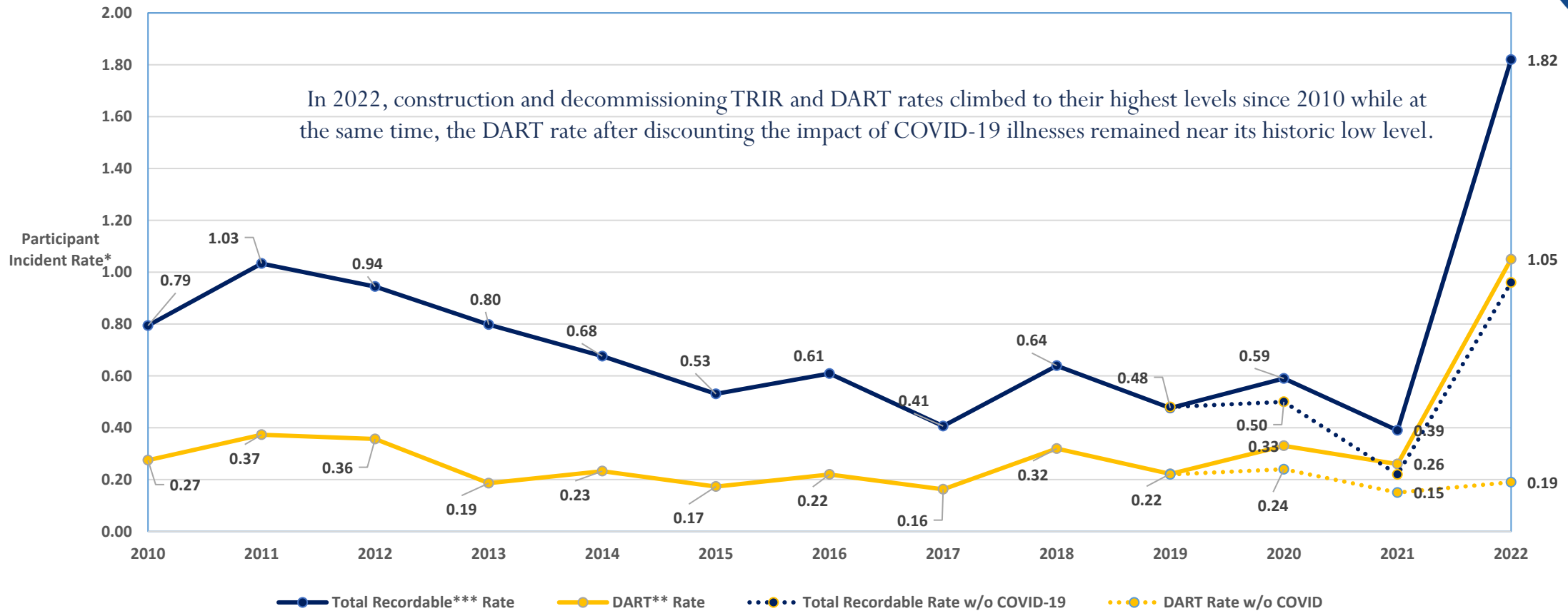
* Number of injury/illness incidents per 200,000 man-hours worked for operators that submitted BSEE-0131 forms.

** DART = injury or illness leading to Days Away, Restricted duty or job Transfer

*** Total Recordable Incidents = the sum of DART and non-DART recordable injuries/illnesses. Beginning 2018 and finalized with a revised form in 2019, BSEE clarified that non-DART recordable injuries should be reported separately from DART recordable injuries. In the past some operators interpreted the "Recordables" line on BSEE-0131 as a request for "Total Recordables" and some interpreted it as a request for "Non-DART Recordables" since there was already a separate line for DART Recordable data (the form never specified which to enter).

Data Source: BSEE-0131 (Drilling non-DART and DART injuries/illnesses, and drilling work hours)

CONSTRUCTION AND DECOMMISSIONING OPERATIONS: TOTAL AND DART RECORDABLE INCIDENT RATES



Data Source: BSEE-0131 (Construction non-DART and DART injuries/illnesses, and construction work hours)

* Number of injury/illness incidents per 200,000 man-hours worked for operators that submitted BSEE-0131 forms.

** DART = injury or illness leading to Days Away, Restricted duty or job Transfer

*** Total Recordable Incidents = the sum of DART and non-DART recordable injuries/illnesses. Beginning 2018 and finalized with a revised form in 2019, BSEE clarified that non-DART recordable injuries should be reported separately from DART recordable injuries. In the past some operators interpreted the "Recordables" line on BSEE-0131 as a request for "Total Recordables" and some interpreted it as a request for "Non-DART Recordables" since there was already a separate line for DART Recordable data (the form never specified which to enter).

FIRE INCIDENT RATE



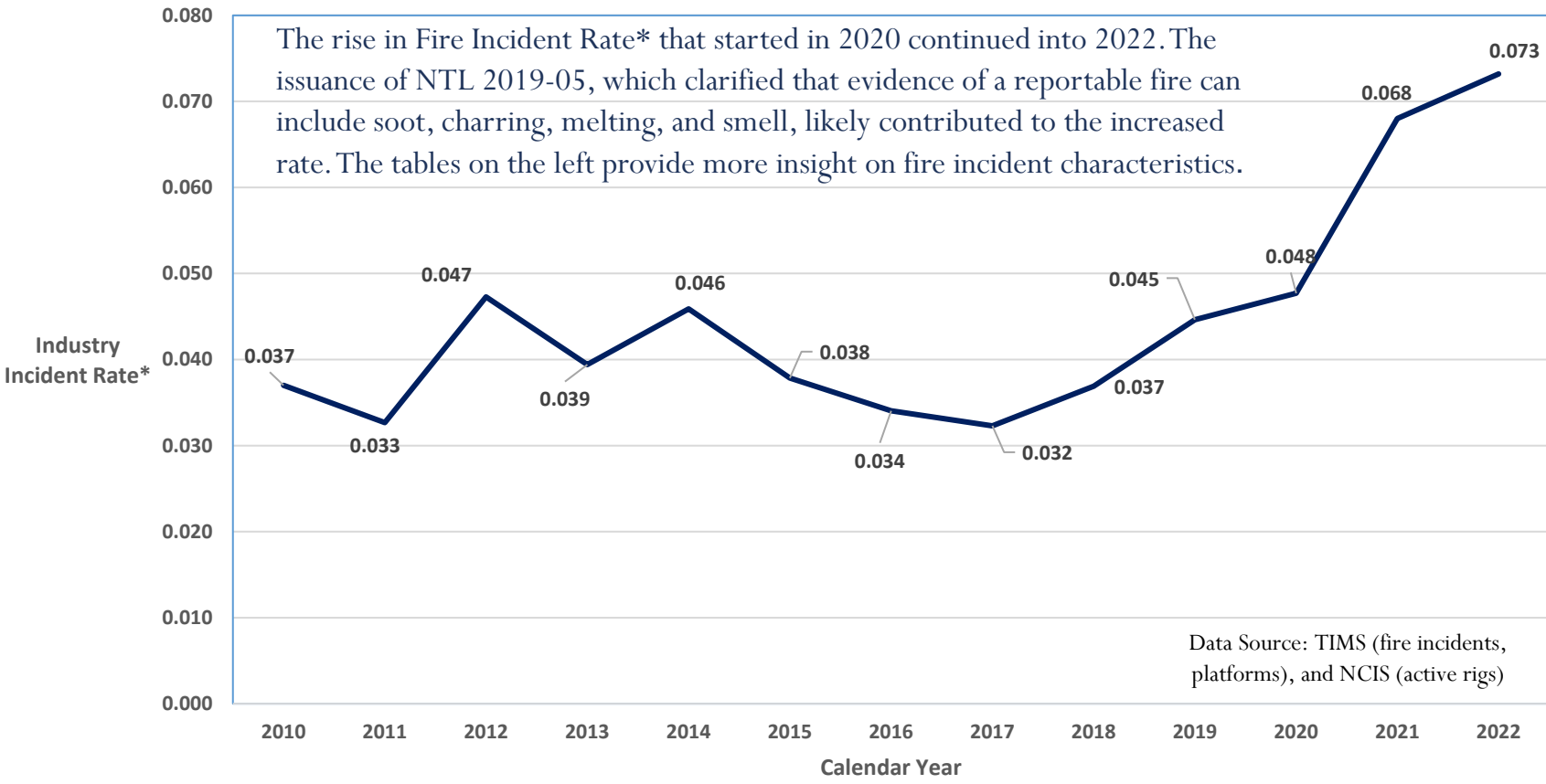
Percentage of Reported Fires on drill ships and well operation vessels

2018 Fires	12%
2019 Fires	11%
2020 Fires	20%
2021 Fires	7%
2022 Fires	7%

Percentage of Reported Fires with no obvious flame or arc flash

2018 Fires	34%
2019 Fires	43%
2020 Fires	48%
2021 Fires	17%
2022 Fires	14%

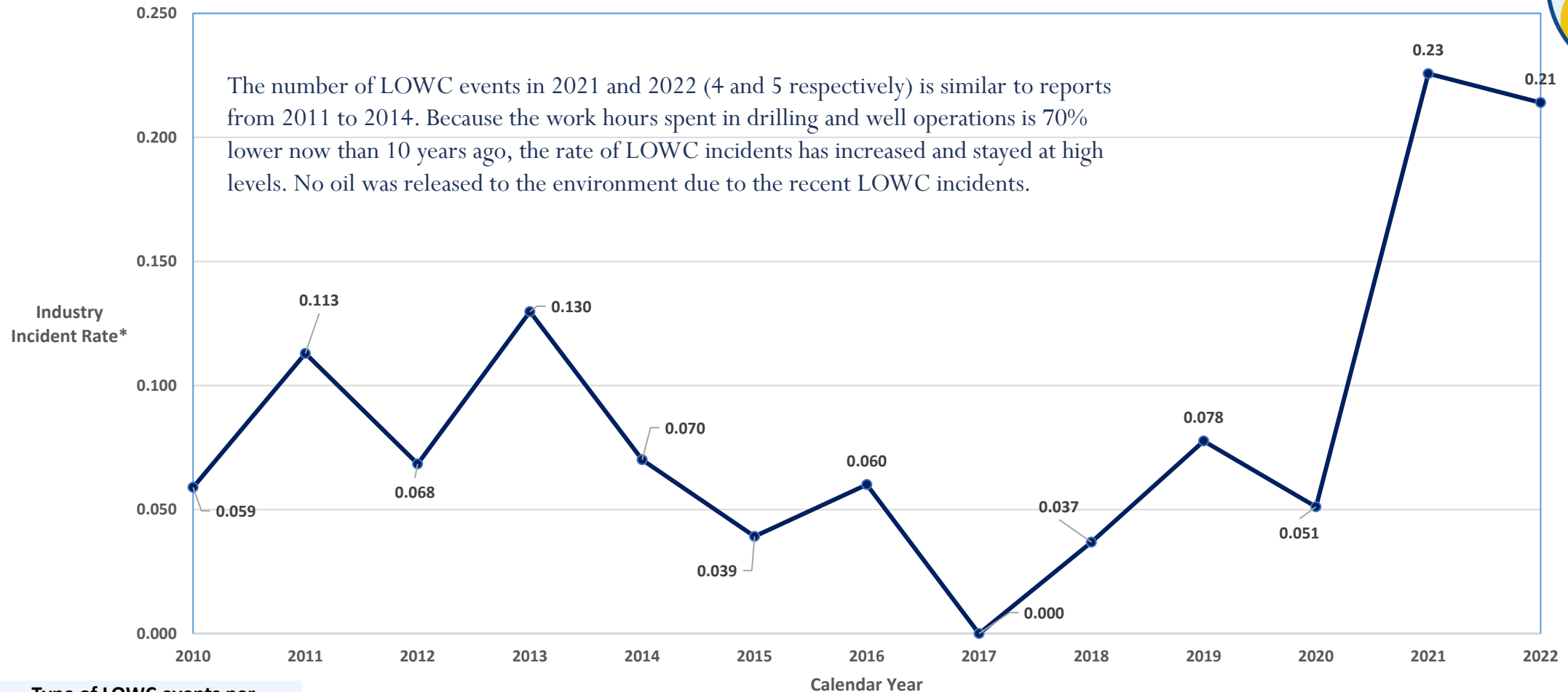
Severity Level	2021	2022
1	34%	45%
2	46%	32%
3	14%	14%
4	6%	9%



In 2022, 9% of the reported fires qualified as Severity Level 4 (large fire or one with a potential to be uncontrolled), a 3% increase from 2021.

***Ratio of fires to number of platforms and active drill rigs for entire OCS. All fire incidents are counted independent of their impacts.**
**** Severity of 1 is described as no flame but evidence of a fire as listed above. Severity level 2- small flame immediately extinguished. Severity level 3 = medium potential fire but was witness and extinguished easily. Severity level 4 = large fire, or in an area without people in the area, or had potential to be uncontrolled.**

LOSS OF WELL CONTROL (LOWC) INCIDENT RATE



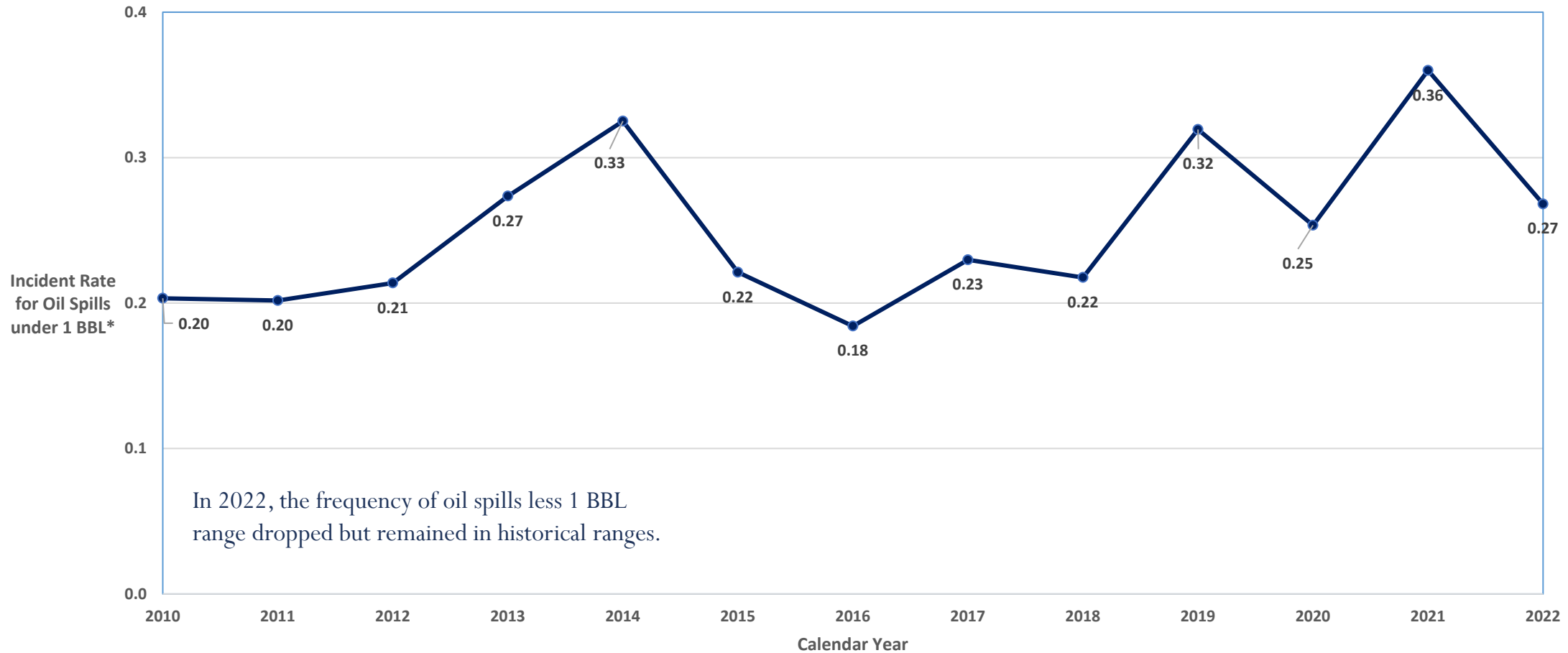
Type of LOWC events per 30 CFR 250.188		
	2021	2022
Underground	3	1
Surface	1	3
Equipment	0	1
Diverter	0	0

Data Sources: TIMS (LOWC) and BSEE-0131 (drilling work hours)

*Number of LOWC incidents per million work hours recorded for Drilling and Well Operations for entire OCS. The above data reflects all reported losses of well control; this was formerly called “Blowout Rate”.



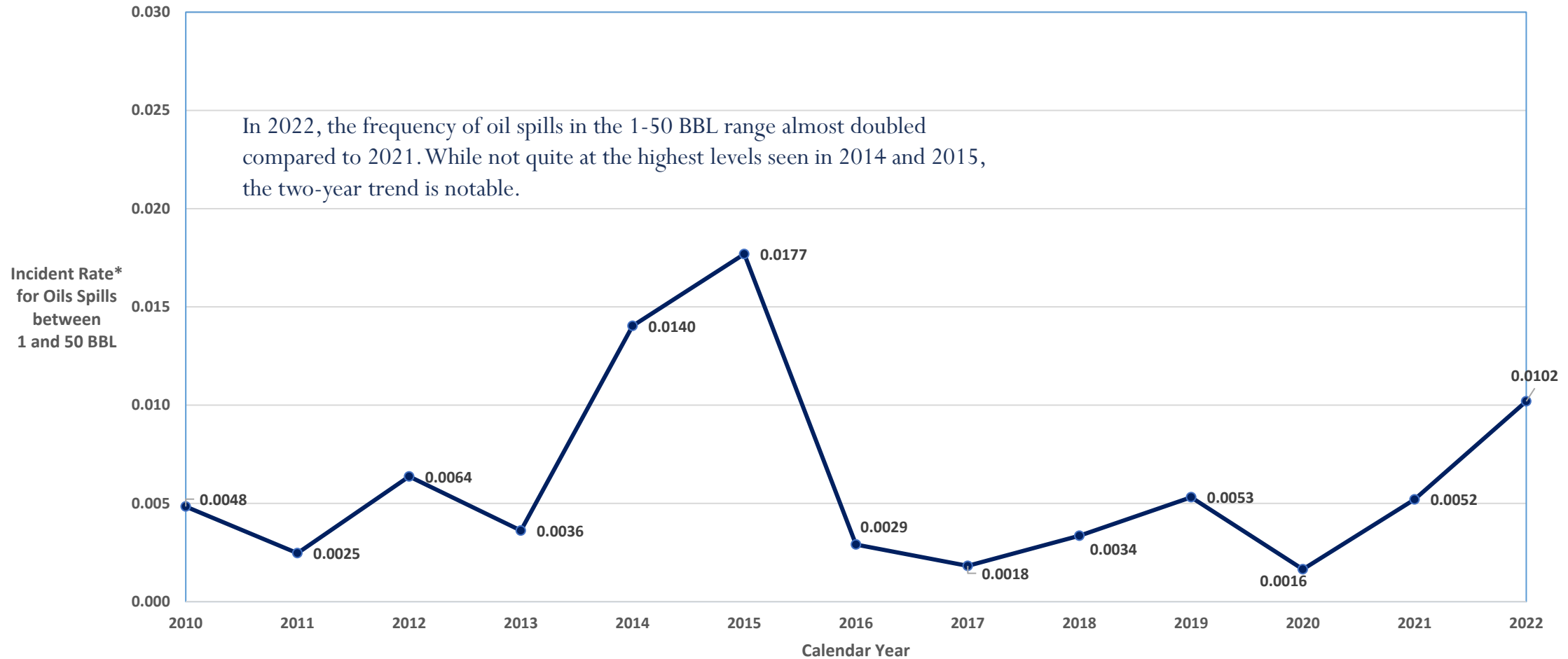
INCIDENT RATE FOR OIL SPILLS < 1 BBL



Data Sources: BSEE-0131 (Oil Spills under 1 BBL), TIMS (platforms), and NCIS (active rigs)

*Ratio of number of spills < 1 BBL to number of platforms for operators that submitted BSEE-0131 forms plus the number of active drill rigs. Data does not distinguish between the types of operations from which the oil was spilled.

INCIDENT RATE FOR OIL SPILLS ≥ 1 BBL AND < 50 BBL

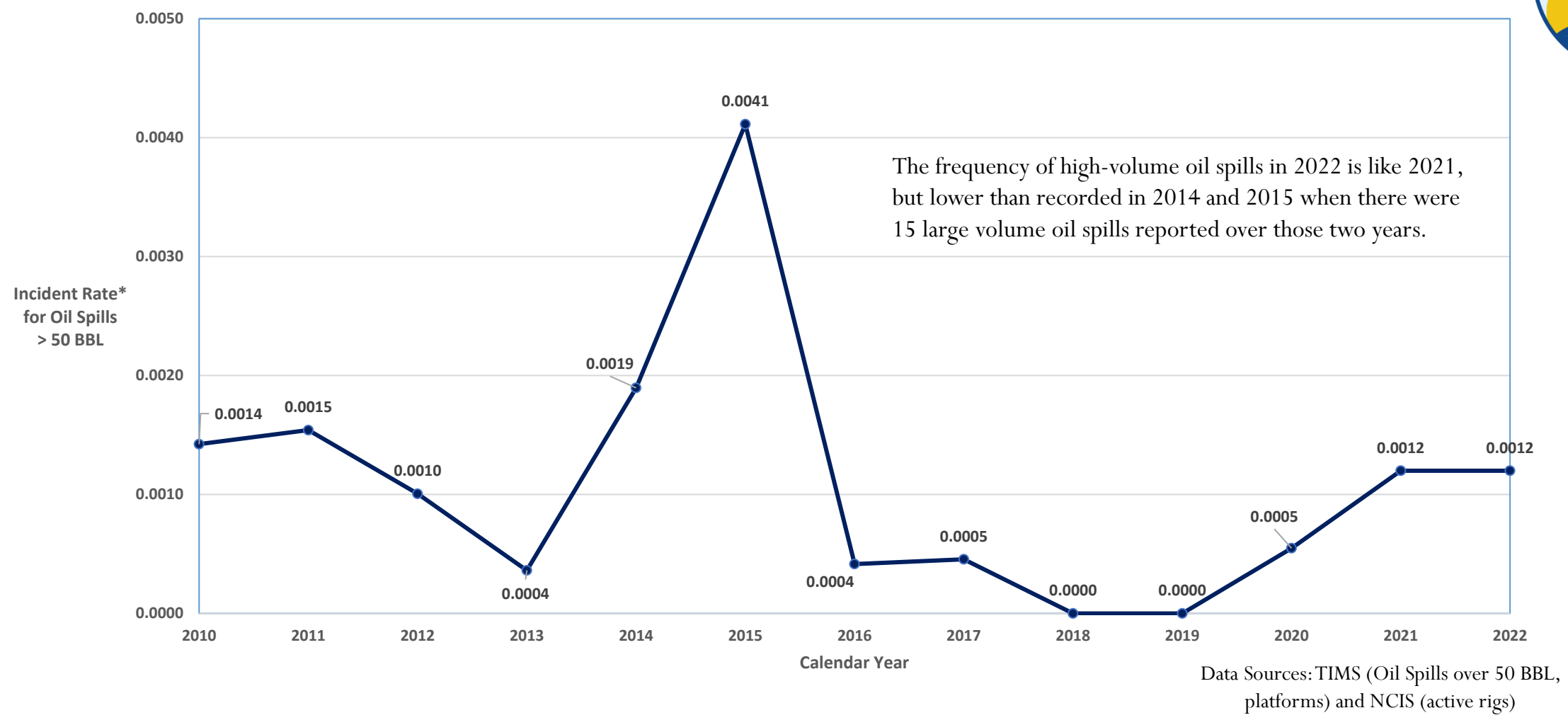


Data Sources: TIMS (Oil Spills over 1 BBL, platforms) and NCIS (active rigs)

*Ratio of number of spills between 1 and 49.99 BBL to number of platforms and active drill rigs for entire OCS. Data does not distinguish between the types of operations from which the oil was spilled.

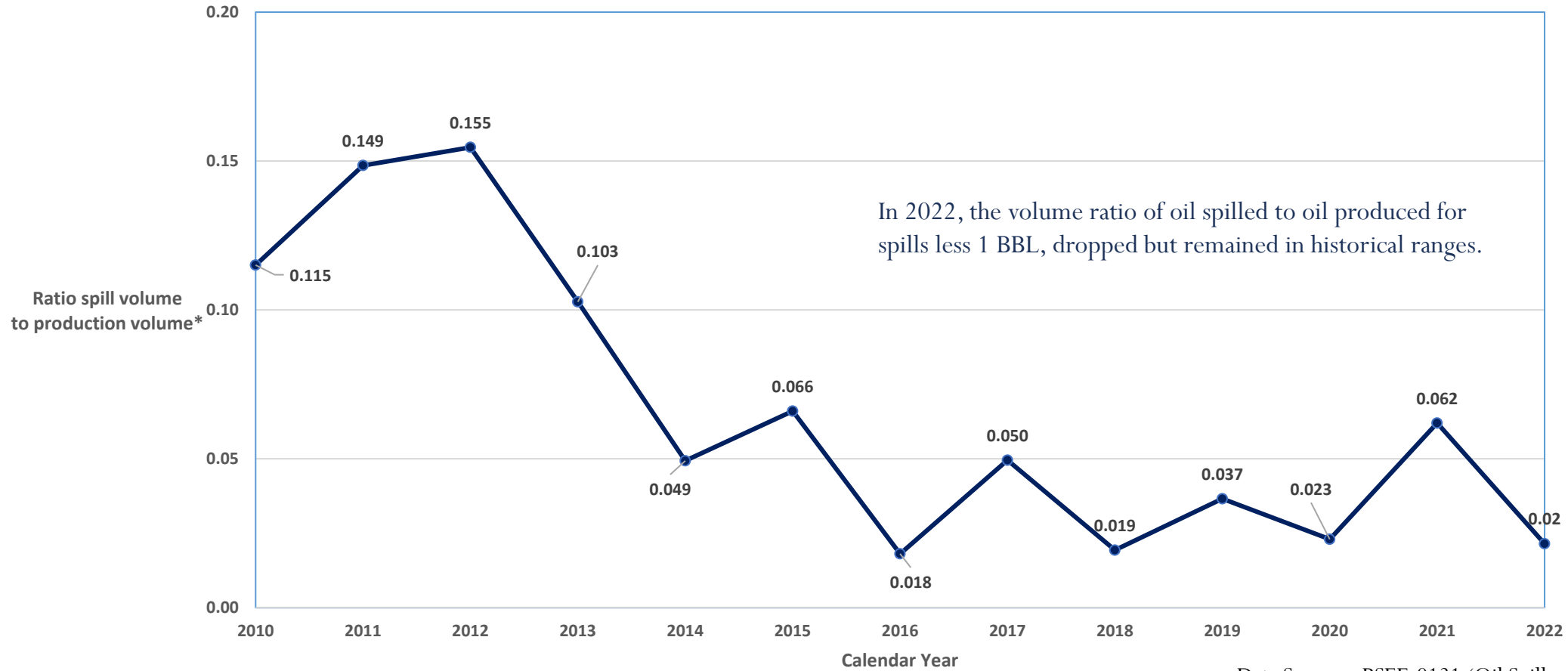


INCIDENT RATE FOR OIL SPILLS \geq 50 BBL



*Ratio of number of spills of 50 BBL or more to number of platforms and active drill rigs for entire OCS. Data does not distinguish between the types of operations from which the oil was spilled. The reason for a separate chart for oil spills > 50 BBL is that per 30 CFR 254.46, they have additional reporting requirements

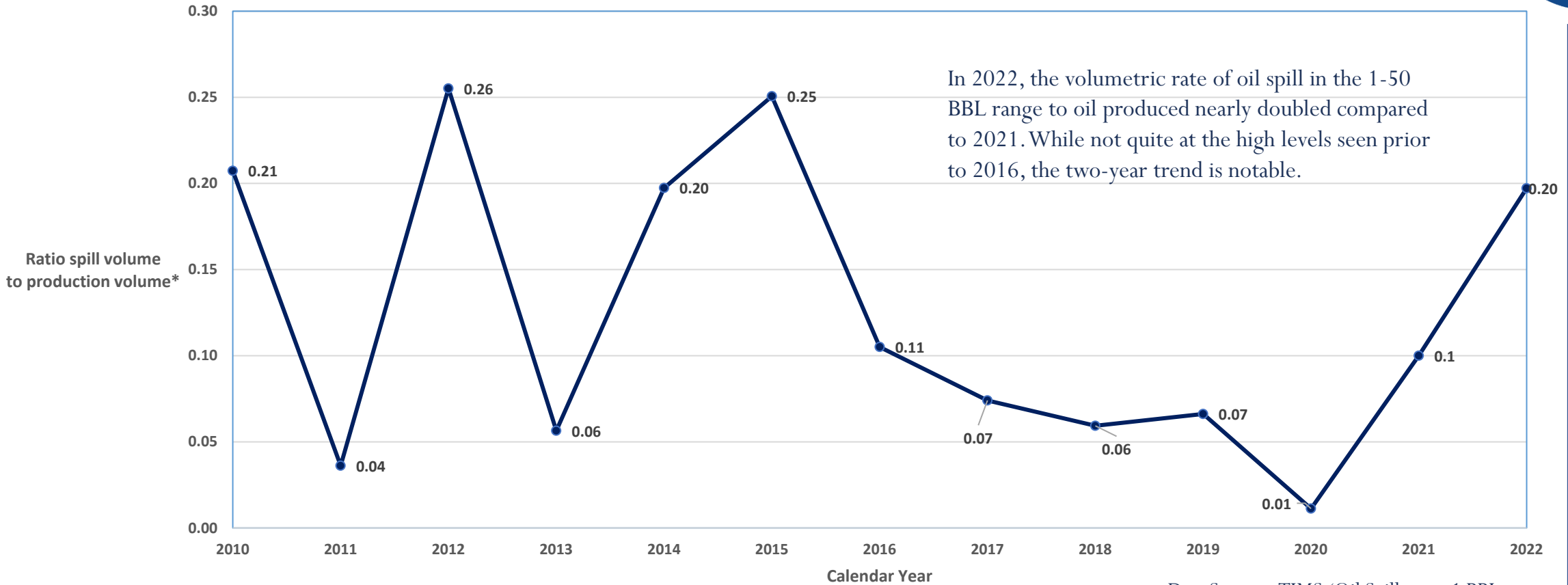
RATIO OF OIL SPILL VOLUMES TO PRODUCTION VOLUMES FOR OIL SPILLS <1 BBL



Data Sources: BSEE-0131 (Oil Spills under 1 BBL) and TIMS (oil and condensate production)

*BBL spilled per 1,000,000 BBL of oil and condensate produced for operators that submitted BSEE-0131 forms. Data does not distinguish between the types of operations from which the oil was spilled.

RATIO OF OIL SPILL VOLUMES TO PRODUCTION VOLUMES FOR OIL SPILLS ≥ 1 BBL AND < 50 BBL



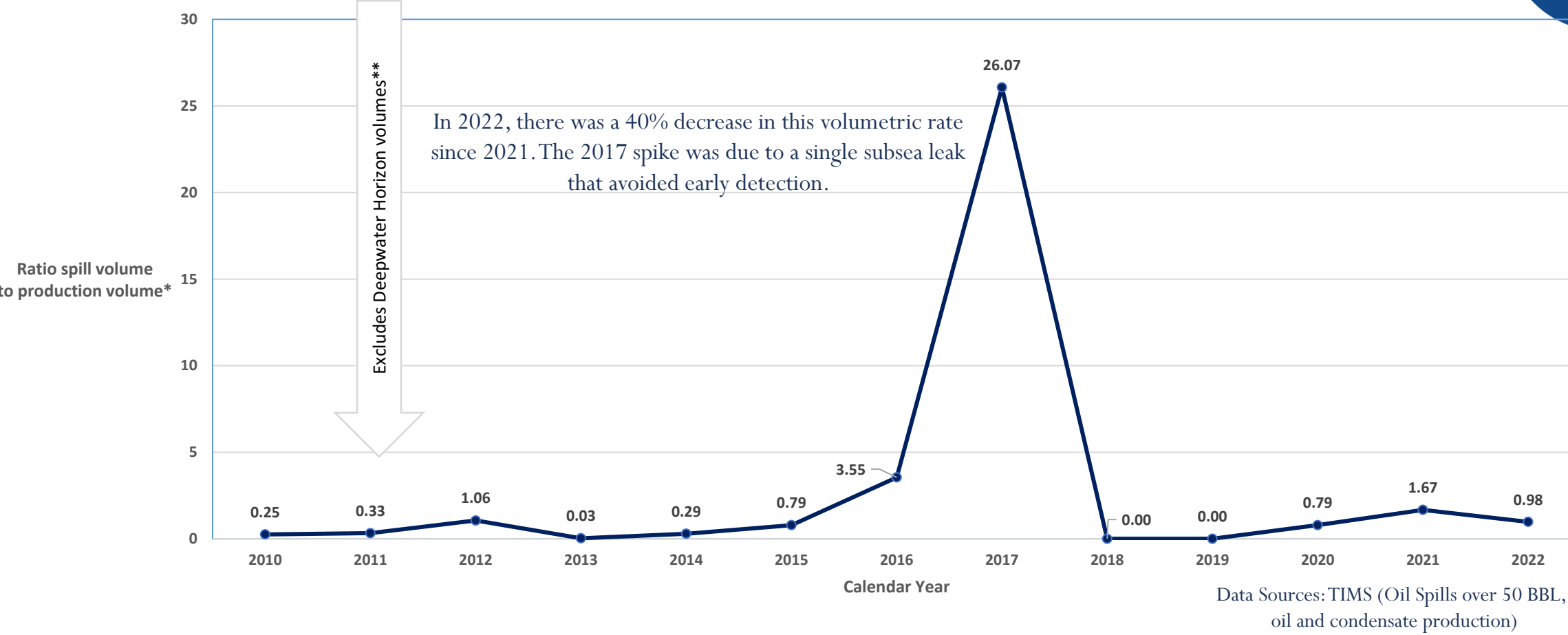
In 2022, the volumetric rate of oil spill in the 1-50 BBL range to oil produced nearly doubled compared to 2021. While not quite at the high levels seen prior to 2016, the two-year trend is notable.

Data Sources: TIMS (Oil Spills over 1 BBL, oil and condensate production)

*BBL spilled per 1,000,000 BBL of oil and condensate produced for entire OCS.
Data does not distinguish between the types of operations from which the oil was spilled.

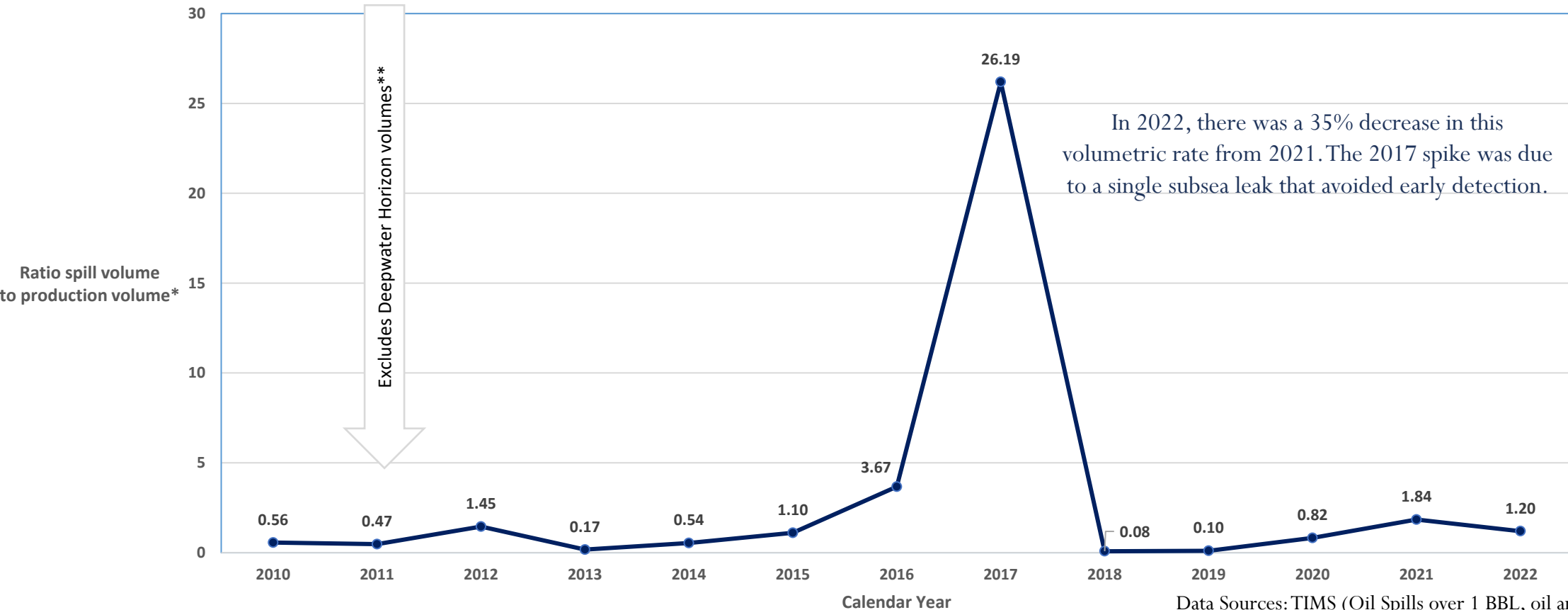


RATIO OF OIL SPILL VOLUMES TO PRODUCTION VOLUMES FOR OIL SPILLS ≥ 50 BBL



*BBL spilled per 1,000,000 BBL of oil and condensate produced for entire OCS. Data does not distinguish between the types of operations from which the oil was spilled.
**The CY 2010 oil spill rate excludes the volume released from the Deepwater Horizon incident, estimated by the U.S Coast Guard in an Incident-Specific Preparedness Review at 4,928,100 BBL. If it were included, this would increase the high-volume oil spill rate for CY 2010 to 8,358 BBL spilled per 1,000,000 BBL oil produced.

RATIO OF OIL SPILL VOLUMES TO OIL PRODUCTION VOLUMES FOR ALL OIL SPILLS INDEPENDENT OF THEIR VOLUME

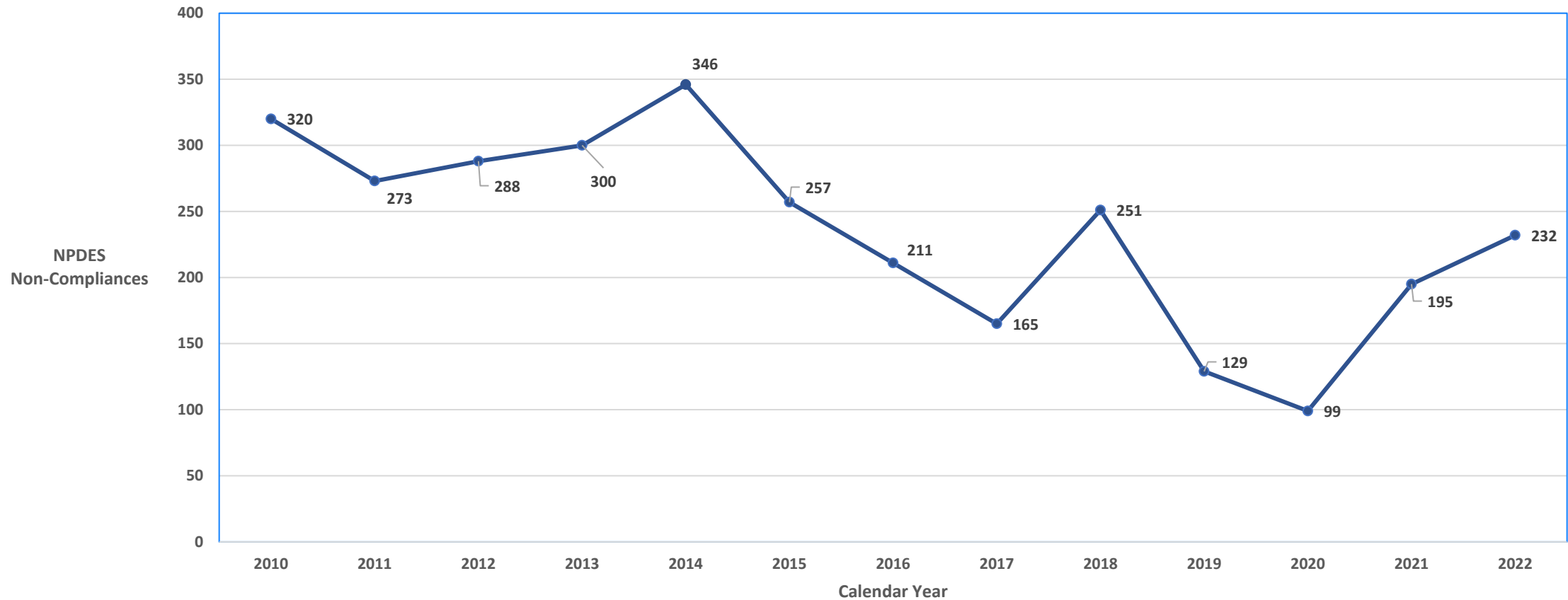


In 2022, there was a 35% decrease in this volumetric rate from 2021. The 2017 spike was due to a single subsea leak that avoided early detection.

Data Sources: TIMS (Oil Spills over 1 BBL, oil and condensate production) and BSEE-0131 (Oil Spills under 1 BBL)

*BBL spilled per 1,000,000 BBL of oil and condensate produced. Less than one barrel category data derives from operators who submitted BSEE-0131 forms, whereas the 1 to 50 and over 50-barrel categories derive from other incident reports (entire OCS). Data does not distinguish between the types of operations from which the oil was spilled.
 **The CY 2010 oil spill rate excludes the volume released from the Deepwater Horizon incident, estimated by the U.S Coast Guard in an Incident-Specific Preparedness Review at 4,928,100 BBL. If it were included, this would increase the total oil spill rate for CY 2010 to 8,359 BBL spilled per 1,000,000 BBL oil produced.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) NON-COMPLIANCE INCIDENT RATE

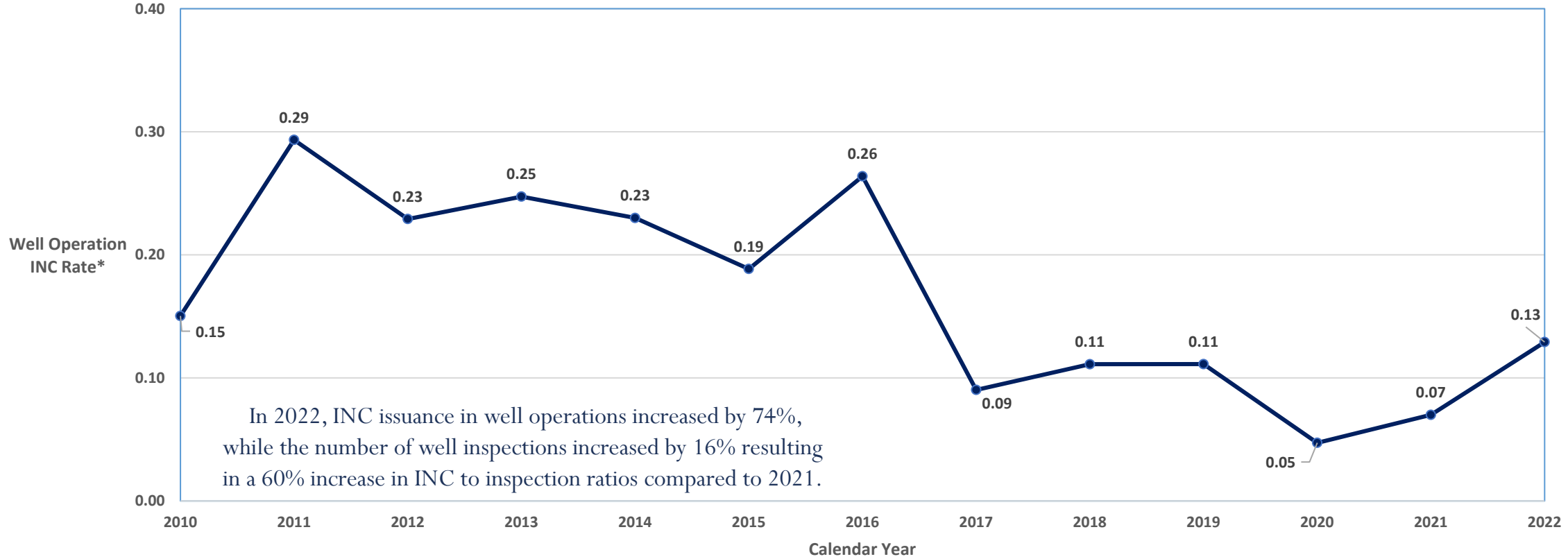


Data Source: BSEE-0131 (NPDES Non-compliance),
TIMS (production platform) and NCIS (active rigs)

*Ratio of non-compliance to number of platforms and active drills rigs for entire OCS. NPDES – National Pollutant Discharge Elimination System. Starting CY 2019, EPA NPDES Non-compliance were obtained from the EPA ECHO database and entered by BSEE into the BSEE 0131 form.



WELL OPERATIONS INCIDENT OF NONCOMPLIANCE (INC) RATE (BASED ON INSPECTION VISITS)

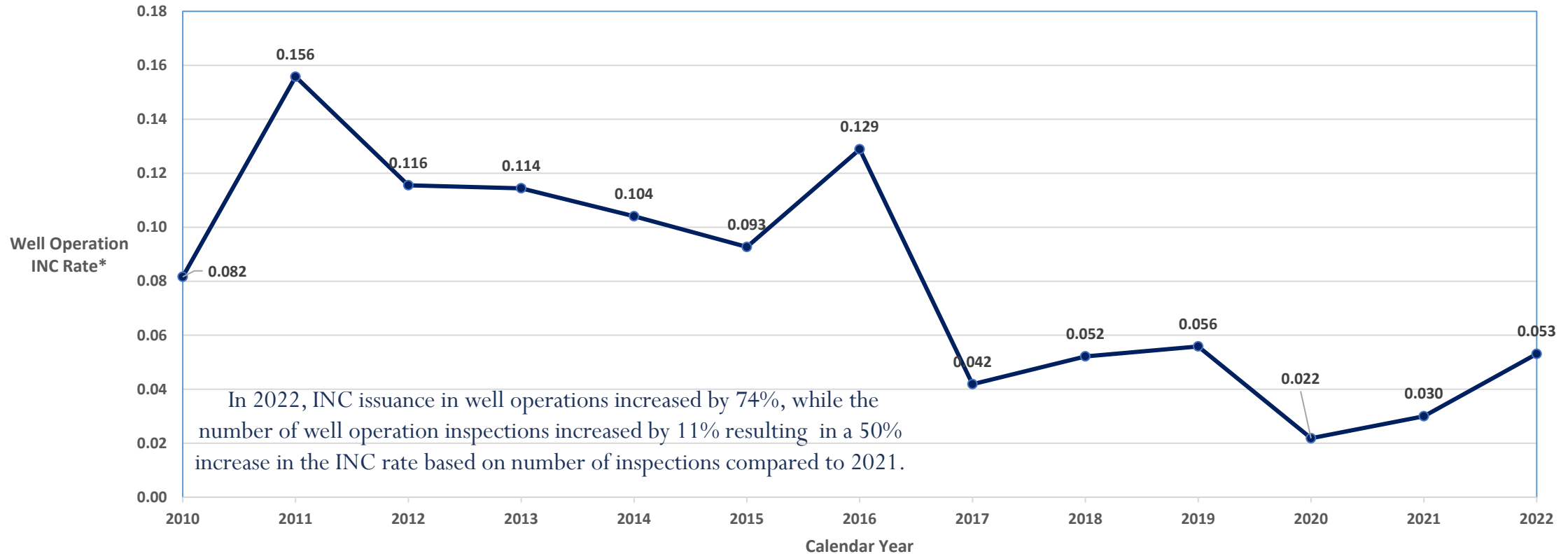


Data Source: TIMS (INCs and Inspection Visits)

*Ratio of well operation INCs written to the number of drilling rig and non-rig inspection visits conducted for entire OCS.
**Towards the end of 2021, COVID-19 travel restrictions were eased, inspectors to visit more facilities, which returned the ratios to historical ranges especially in 2022.



WELL OPERATIONS INCIDENT OF NONCOMPLIANCE (INC) RATE (BASED ON INSPECTIONS PERFORMED)

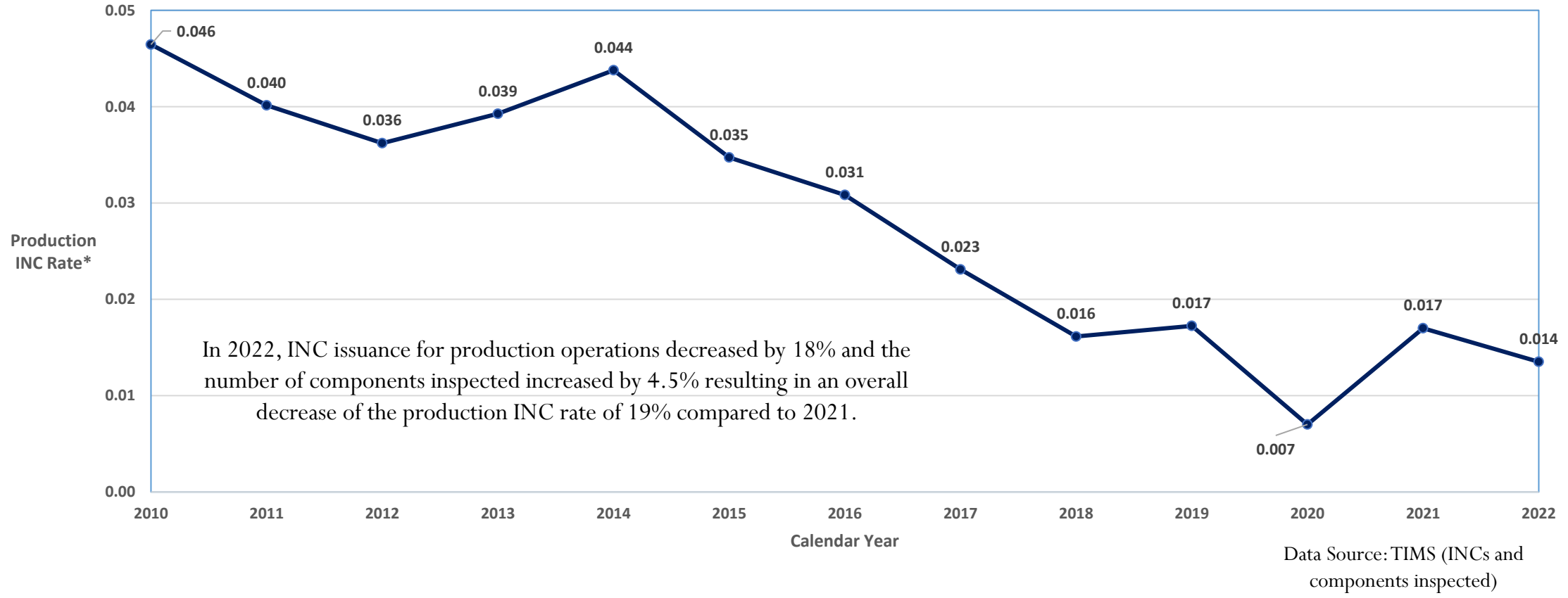


Data Source: TIMS (INCs and types of Inspections performed)

*Ratio of well operation INCs written to the number of drilling rig and non-rig inspection types performed on the entire OCS. Each inspection visit may incorporate multiple inspection types, e.g., a wireline and a BOP inspection.
** Towards the end of 2021, COVID-19 travel restrictions were eased, inspectors to visit more facilities, which returned the ratios to historical ranges especially in 2022.



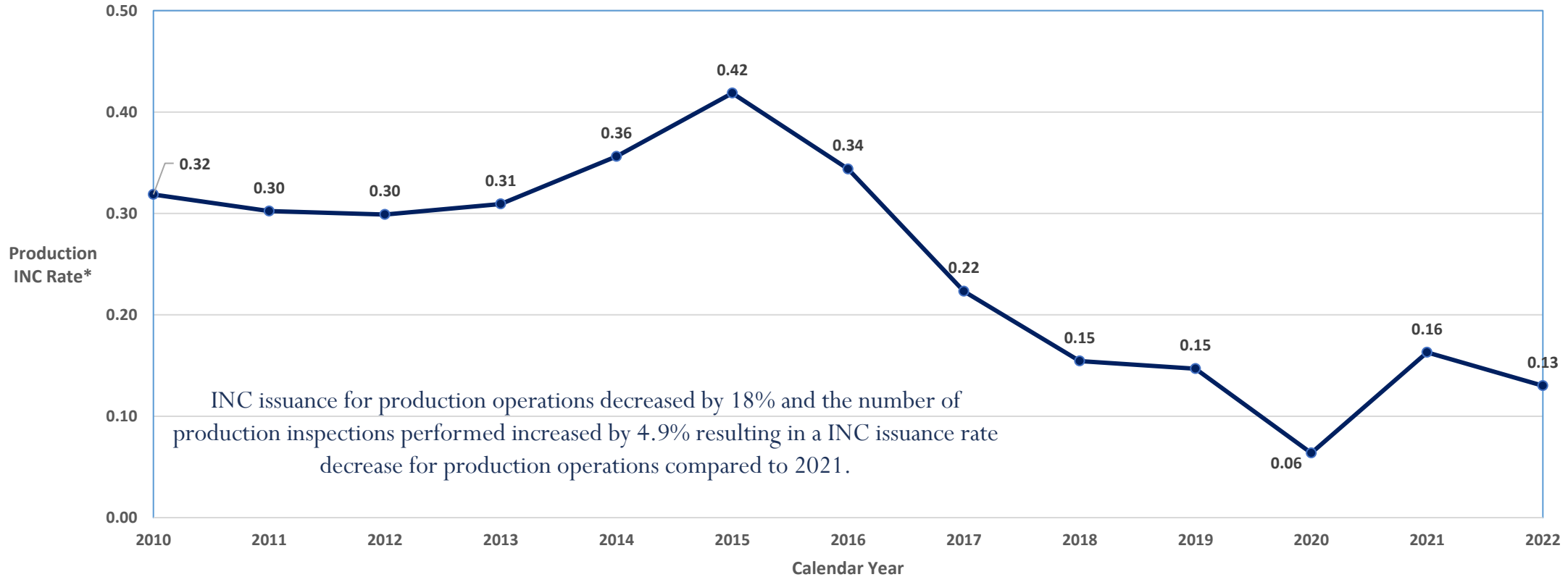
PRODUCTION INCIDENT OF NONCOMPLIANCE (INC) RATE (BASED ON COMPONENTS INSPECTED)



*Ratio of production INCs written to number of components inspected for entire OCS. The method used to count components changed starting 2018; complex equipment began to be counted not as one component but as the sum of several components. Pressure monitors, temperature monitors, and high-level alarm or shutoff switches, are examples of safety system components.

** Towards the end of 2021, COVID-19 travel restrictions were eased, inspectors to visit more facilities, which returned the ratios to historical ranges especially in 2022.

PRODUCTION INCIDENT OF NONCOMPLIANCE (INC) RATE (BASED ON INSPECTIONS PERFORMED)



Data Source: TIMS (INCs and types of Inspections performed)

*Ratio of production INCs written to the total count of types of production inspections performed for entire OCS. Each inspection visit may involve multiple inspection types, e.g., a Production Complete and an Environmental inspection.

** Towards the end of 2021, COVID-19 travel restrictions were eased, inspectors to visit more facilities, which returned the ratios to historical ranges especially in 2022.



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