



Independent Statistics & Analysis

U.S. Energy Information
Administration

Weekly Natural Gas Storage Report: Performance Evaluation for 2014 through 2016

May 2017



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Introduction

The U.S. Energy Information Administration (EIA) submits this report under the Office of Management and Budget's (OMB) Statistical Policy Directive Number 3, which requires each agency that issues a Principal Federal Economic Indicator (PFEI) to report every three years on its performance. OMB Directive Number 3 requires that this performance evaluation address the "accuracy and reliability of the series, the effects of revisions, and performance relative of established benchmarks" ¹ as well as other standards for documentation, promptness in releasing estimates, and avoidance of premature disclosure.

EIA is the statistical and analytical agency within the U.S. Department of Energy (DOE). EIA collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of the energy industry and its interaction with the economy and the environment. EIA is the United States' premier source of energy information. EIA data, analyses, and forecasts are independent of approval by any other officer or employee of the U.S. government.

The *Weekly Natural Gas Storage Report* (WNGSR) is DOE's only report designated as a PFEI. The WNGSR collects inventories of natural gas in underground storage and was designated as a PFEI in January 2008 because it is a key source of weekly natural gas supply data to the natural gas market. Upon release of the WNGSR, the natural gas market reacts to the derived net change in inventory levels from the prior week. This information on the nature of the net changes between weekly inventory data reports is helpful in informing trading decisions that often move natural gas prices 3¢ to 5 ¢/million British thermal units (MMBtu) each week upon release of the WNGSR.

Currently, the WNGSR collects data on the amount of working natural gas² in underground storage facilities as of Friday at 9:00 a.m., CST. EIA compiles and processes these data for release on its website the following Thursday at 10:30 a.m., ET. Summary totals of working gas inventories and the derived net change from the prior week's inventory for the Lower 48 states are broken into five regions: the East, Midwest, Mountain, Pacific, and the South Central Region. Totals for the South Central Region are further divided into salt and nonsalt subregions according to facility type.

Changes to the WNGSR since 2014

Changes introduced in 2015

The WNGSR underwent significant changes since 2014. In 2015, several key changes were introduced to the WNGSR including:

- A new regional breakdown of the data in the Lower 48 states was added.

¹ Federal Register, Vol. 50, No. 186, Office of Management and Budget (September 25, 1985), pp. 38932-34, https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/omb/inforeg/statpolicy/dir_3_fr_09251985.pdf

² Working Natural Gas is natural gas in storage that is currently available to be withdrawn.

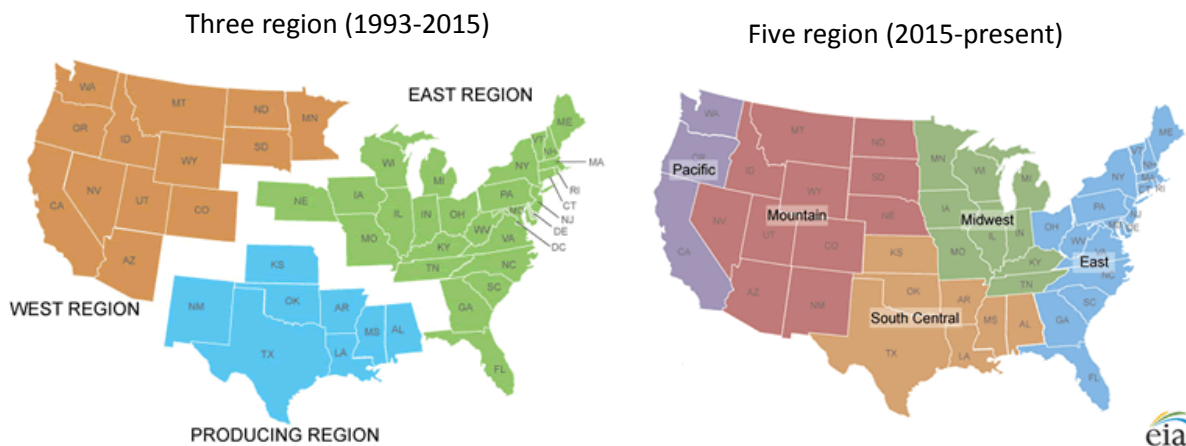
- The revision threshold was lowered from 7 billion cubic feet (Bcf) to 4 Bcf.
- The out-of-cycle revision policy was clarified.

In April 2015, the WNGSR implemented a sample design based on a new five-region format for the Lower 48 states from the three-region format that was previously in use (Figure 1). Changing characteristics of the natural gas market made the new regional groupings necessary. The old three-region format was developed more than 20 years ago when the dynamics of the natural gas market, including producing and consuming regions, were different than they are today. The new storage regions better reflect groupings of storage locations and the production and demand areas they serve. They also provide more detailed data. The new regions were initially proposed in 2014 and outlined in the Federal Register as part of the WNGSR’s Office of Management and Budget clearance process³. Public comments from this process helped EIA determine the final boundaries for the regions. Data collection for the new five-region sample began with reports for the week ending April 10, 2015.

EIA conducted internal testing and validation of the new sample design between April and November 2015 before publishing estimates on the five-region basis. The methodological changes were announced and documented in August 2015. In addition, EIA published a data history, from 2010 to 2015, for data users to familiarize themselves with the new data series. Public testing of the release procedures was conducted to ensure a smooth transition by allowing data users to practice downloading the data from the modified report tables. On November 16, 2015, EIA switched over to the five-region format with the release of the report for November 6, 2015. EIA also published a five-region data history that included data from January 2010 through November 6, 2015—the final period for three-region history. Since this release, EIA has published estimates in WNGSR on the five-region basis.

Figure 1. Regional breakdowns of the Lower 48 states for the WNGSR

Natural gas storage regions



³ Federal Register <https://www.federalregister.gov/documents/2014/10/07/2014-23751/proposed-agency-information-collection>

In addition, EIA made two changes to the WNGSR revision policy with the switch to the five-region format. First, EIA reduced the threshold at which reclassifications and revisions to the prior week's data would be published from 7 billion cubic feet (Bcf) to 4 Bcf. This change in the revision policy resulted from a review of measures of the net changes, including confidence intervals around the net changes. Publishing the reclassifications and revisions at the lower threshold has increased the transparency of the inventory adjustments to the public and also has better distinguished net changes in inventory from flow-related activity. Second, EIA modified the out-of-cycle revision policy to provide that unscheduled releases of revisions to weekly estimates of working gas held in underground storage will occur when the cumulative sum of data changes or corrections to working gas and the net change between the two most recent report weeks is at least 10 Bcf. The previous out-of-cycle revision policy did not require that the threshold be reached for the most recent two weeks; the threshold could have been reached by an accumulation of changes or corrections that occurred over longer periods.

Changes introduced in 2017

On January 26, 2017, EIA began including estimated measures of sampling variability for weekly estimates of working natural gas stocks and the net change in working natural gas stocks as part of the WNGSR, starting with for the week ending January 20, 2017. These weekly estimates provide increased transparency into the statistical properties of the working gas figures published in the WNGSR. EIA also published a table of historical estimated measures of sampling variability starting with the week ending April 10, 2015, which was when data for the current sample based on the new five-region format was first collected.

The publication of estimated measures of sampling variability is part of EIA's initiative to increase transparency into the statistical properties of the working natural gas estimates reported in the WNGSR. On March 1, 2016, EIA published a report on the types of possible survey errors in the working gas estimates in the WNGSR. These potential statistical errors are inherent in all collected data and include sampling error, coverage error, nonresponse error, adjustment error, and processing error. That report also included a discussion of the bootstrap methodology used to estimate standard errors for the WNGSR, as well as historical estimated measures of sampling variability for weekly estimates of working gas from April 10, 2015, through November 13, 2015.

In the previous three-year WNGSR performance evaluations submitted to OMB, EIA has always included estimated measures of sampling variability for the weeks that most closely correspond to the ends of the calendar months. Including estimated measures of sampling variability in the WNGSR release provides data users with more information on a weekly basis regarding the statistical properties of the estimates published in the WNGSR. As a PFEI, WNGSR must meet OMB's Budget requirement⁴ to disseminate error estimates so that information is publicly available on the statistical properties of the published estimates. The changes to the WNGSR introduced in 2017 allow data users to obtain the most recent week's estimated measures of sampling variability with each release of the WNGSR.

⁴ https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/statpolicy/standards_stat_surveys.pdf

Accuracy and reliability of the weekly working gas inventory series

The WNGSR receives weekly survey data from a sample of operators of underground storage facilities selected with probability of selection proportional to size.⁵ The WNGSR survey form, designated Form EIA-912, collects data on the volumes of working gas in storage. The frame for the EIA-912 is the list of respondents that report on EIA's Monthly Underground Natural Gas Storage Report, Form EIA-191, which is a census of operators of underground natural gas storage fields in the United States. EIA aggregates EIA-191 data by state and storage region, and reports the data with a two-month lag in the *Natural Gas Monthly*.

Sampling error

EIA uses a bootstrap method⁶ to compute standard errors for the weekly underground storage inventory data reported on the WNGSR. EIA chose this method because of its flexibility in dealing with the EIA-912's small sampling fractions and nonsmooth estimator. EIA calculates coefficients of variation for the inventory estimates reported for the East, Midwest, Mountain, Pacific, and the South Central Regions, as well as for the Lower 48 states (Table 1A). The estimated coefficients of variation for the Lower 48 states average approximately 0.9% of average working gas volumes of 3,049 Bcf during the period. For a given region, the sample for WNGSR was designed using a threshold for the target coefficient of variation of 5% for the inventory estimate of total working gas in storage. Regionally, the EIA-912 estimated coefficients of variation generally fall below 5% in all regions, although the Pacific region has had estimated coefficients of variation that have been above 5% during March 2017. These instances of estimated coefficients of variation in the Pacific that are above 5% result from relatively low stock levels for the region during this period combined with variation in weekly stocks for the small number of operators in the region. In addition to computing estimated coefficients of variation for the weekly underground storage inventory data, EIA also computes estimated standard errors for weekly net changes in working natural gas storage levels (Table 1B). For the Lower 48 states, the estimated standard errors for weekly net changes average about 2.0 Bcf. Regionally, the estimated standard errors for weekly net changes average between 0.4 Bcf and 1.3 Bcf.

⁵ U.S. Energy Information Administration, Methodology, January 26, 2017, <http://ir.eia.gov/ngs/methodology.html>

⁶ Efron, B., and Tibshirani, R. J., *An Introduction to the Bootstrap*, (New York: Chapman & Hall, 1993).

Table 1A. Estimated coefficients of variation for the underground storage working gas inventory data reported on WNGSR, April 2015 to March 2017

Week ending	East Region	Midwest Region	Mountain Region	Pacific Region	South Central Region	Salt	NonSalt	Total Lower 48
10-Apr-15	2.20%	1.70%	3.20%	4.10%	1.80%	3.30%	2.10%	1.20%
17-Apr-15	2.10%	1.70%	3.10%	4.00%	1.70%	3.00%	2.10%	1.10%
24-Apr-15	2.10%	1.70%	3.10%	3.60%	1.70%	2.90%	2.00%	1.10%
1-May-15	2.10%	1.60%	2.90%	3.60%	1.60%	2.70%	2.00%	1.00%
8-May-15	1.90%	1.60%	2.80%	3.40%	1.60%	2.80%	2.00%	1.00%
15-May-15	1.90%	1.60%	2.70%	3.40%	1.60%	2.70%	2.00%	1.00%
22-May-15	1.90%	1.50%	2.60%	3.30%	1.60%	2.60%	2.00%	1.00%
29-May-15	1.90%	1.50%	2.40%	3.20%	1.70%	2.60%	2.10%	1.00%
5-Jun-15	2.00%	1.50%	2.30%	3.20%	1.70%	2.70%	2.10%	1.00%
12-Jun-15	2.00%	1.50%	2.20%	3.30%	1.70%	2.90%	2.10%	1.00%
19-Jun-15	1.90%	1.50%	2.20%	3.20%	1.60%	2.80%	2.00%	0.90%
26-Jun-15	1.90%	1.50%	2.10%	3.20%	1.60%	2.80%	2.00%	0.90%
3-Jul-15	1.90%	1.50%	2.00%	3.20%	1.60%	2.90%	2.00%	0.90%
10-Jul-15	1.90%	1.50%	1.90%	3.30%	1.70%	3.20%	1.90%	0.90%
17-Jul-15	1.80%	1.50%	1.80%	3.30%	1.60%	3.20%	1.90%	0.90%
24-Jul-15	1.70%	1.60%	1.80%	3.20%	1.60%	3.30%	1.90%	0.90%
31-Jul-15	1.70%	1.60%	1.80%	3.20%	1.60%	3.40%	1.90%	0.90%
7-Aug-15	1.60%	1.60%	1.80%	3.00%	1.70%	3.50%	1.90%	0.90%
14-Aug-15	1.60%	1.60%	1.90%	2.90%	1.70%	3.70%	1.90%	0.90%
21-Aug-15	1.50%	1.70%	2.10%	2.80%	1.70%	3.80%	1.80%	0.90%
28-Aug-15	1.40%	1.70%	2.20%	2.70%	1.70%	3.90%	1.80%	0.90%
4-Sep-15	1.40%	1.80%	2.30%	2.60%	1.70%	4.00%	1.80%	0.90%
11-Sep-15	1.40%	1.80%	2.30%	2.70%	1.70%	4.00%	1.70%	0.90%
18-Sep-15	1.40%	1.80%	2.30%	2.60%	1.60%	3.90%	1.70%	0.90%
25-Sep-15	1.40%	1.80%	2.30%	2.70%	1.60%	3.90%	1.70%	0.90%
2-Oct-15	1.40%	1.80%	2.20%	2.90%	1.60%	3.90%	1.70%	0.90%
9-Oct-15	1.40%	1.80%	2.10%	2.80%	1.60%	3.80%	1.60%	0.90%
16-Oct-15	1.40%	1.80%	2.00%	2.90%	1.50%	3.50%	1.60%	0.80%
23-Oct-15	1.40%	1.80%	1.90%	2.90%	1.50%	3.50%	1.60%	0.80%
30-Oct-15	1.40%	1.90%	1.90%	2.80%	1.50%	3.30%	1.60%	0.80%
6-Nov-15	1.40%	1.90%	1.90%	2.80%	1.50%	3.30%	1.60%	0.80%
13-Nov-15	1.40%	1.90%	1.60%	2.70%	1.50%	3.40%	1.60%	0.80%
20-Nov-15	1.40%	1.90%	1.60%	2.70%	1.50%	3.40%	1.60%	0.90%
27-Nov-15	1.40%	1.90%	1.50%	2.90%	1.50%	3.40%	1.60%	0.90%
4-Dec-15	1.40%	1.90%	1.50%	2.80%	1.50%	3.50%	1.60%	0.90%
11-Dec-15	1.50%	1.90%	1.50%	3.00%	1.60%	3.70%	1.60%	0.90%
18-Dec-15	1.50%	1.90%	1.50%	3.10%	1.60%	3.70%	1.60%	0.90%

Table 1A. Estimated coefficients of variation for the underground storage working gas inventory data reported on WNGSR, April 2015 to March 2017 (continued)

Week ending	East Region	Midwest Region	Mountain Region	Pacific Region	South	Salt	NonSalt	Total Lower 48
					Central Region			
25-Dec-15	1.50%	1.90%	1.50%	3.30%	1.60%	3.60%	1.60%	0.90%
1-Jan-16	1.60%	1.80%	1.60%	3.40%	1.60%	3.70%	1.70%	0.90%
8-Jan-16	1.60%	1.80%	1.60%	3.30%	1.60%	3.60%	1.70%	0.90%
15-Jan-16	1.70%	1.70%	1.70%	3.30%	1.60%	3.60%	1.70%	0.90%
22-Jan-16	1.70%	1.70%	1.70%	3.40%	1.60%	3.40%	1.70%	0.90%
29-Jan-16	1.80%	1.60%	1.70%	3.70%	1.60%	3.40%	1.70%	0.90%
5-Feb-16	1.80%	1.60%	1.80%	3.80%	1.60%	3.40%	1.70%	0.90%
12-Feb-16	1.90%	1.80%	1.90%	4.20%	1.60%	3.40%	1.80%	0.90%
19-Feb-16	1.90%	1.90%	1.90%	4.20%	1.60%	3.40%	1.80%	1.00%
26-Feb-16	1.90%	1.90%	2.00%	4.30%	1.60%	3.60%	1.80%	1.00%
4-Mar-16	2.00%	1.90%	2.10%	4.20%	1.70%	3.60%	1.80%	1.00%
11-Mar-16	2.10%	2.00%	2.20%	4.40%	1.70%	3.70%	1.80%	1.00%
18-Mar-16	2.20%	2.00%	2.30%	4.60%	1.70%	3.70%	1.80%	1.10%
25-Mar-16	2.40%	2.00%	2.40%	4.80%	1.70%	3.80%	1.90%	1.10%
1-Apr-16	2.50%	2.10%	2.40%	4.60%	1.70%	3.80%	1.90%	1.10%
8-Apr-16	2.60%	1.90%	2.50%	4.60%	1.70%	3.80%	1.90%	1.10%
15-Apr-16	2.70%	1.80%	2.60%	4.60%	1.70%	3.70%	1.90%	1.10%
22-Apr-16	2.60%	1.60%	2.50%	4.50%	1.70%	3.70%	1.90%	1.10%
29-Apr-16	2.60%	1.40%	2.50%	4.60%	1.70%	3.60%	1.90%	1.10%
6-May-16	2.60%	1.40%	2.40%	4.60%	1.70%	3.50%	1.90%	1.10%
13-May-16	2.50%	1.40%	2.30%	4.60%	1.70%	3.50%	1.80%	1.00%
20-May-16	2.40%	1.40%	2.30%	4.60%	1.60%	3.50%	1.80%	1.00%
27-May-16	2.30%	1.50%	2.20%	4.40%	1.60%	3.40%	1.80%	1.00%
3-Jun-16	2.20%	1.50%	2.10%	4.40%	1.60%	3.30%	1.80%	1.00%
10-Jun-16	2.10%	1.50%	2.00%	4.20%	1.60%	3.30%	1.70%	1.00%
17-Jun-16	2.00%	1.60%	1.90%	4.20%	1.50%	3.20%	1.70%	0.90%
24-Jun-16	2.00%	1.60%	1.80%	4.20%	1.50%	3.10%	1.70%	0.90%
1-Jul-16	1.90%	1.60%	1.80%	4.20%	1.50%	3.00%	1.70%	0.90%
8-Jul-16	1.90%	1.50%	1.70%	4.30%	1.50%	3.00%	1.70%	0.90%
15-Jul-16	1.90%	1.50%	1.70%	4.20%	1.50%	3.10%	1.70%	0.90%
22-Jul-16	1.80%	1.40%	1.70%	4.30%	1.50%	2.90%	1.70%	0.90%
29-Jul-16	1.80%	1.40%	1.60%	4.10%	1.50%	2.80%	1.70%	0.90%
5-Aug-16	1.80%	1.40%	1.60%	4.10%	1.50%	2.80%	1.70%	0.90%
12-Aug-16	1.70%	1.50%	1.70%	4.00%	1.50%	2.80%	1.70%	0.90%
19-Aug-16	1.70%	1.50%	1.80%	3.80%	1.40%	2.70%	1.70%	0.80%
26-Aug-16	1.70%	1.50%	1.90%	3.80%	1.40%	2.60%	1.70%	0.80%

Table 1A. Estimated coefficients of variation for the underground storage working gas inventory data reported on WNGSR, April 2015 to March 2017 (continued)

Week ending	East Region	Midwest Region	Mountain Region	Pacific Region	South	Salt	NonSalt	Total Lower 48
					Central Region			
2-Sep-16	1.60%	1.50%	2.00%	3.70%	1.40%	2.60%	1.70%	0.80%
9-Sep-16	1.60%	1.50%	2.00%	3.60%	1.40%	2.50%	1.70%	0.80%
16-Sep-16	1.60%	1.60%	2.00%	3.70%	1.50%	2.70%	1.70%	0.80%
23-Sep-16	1.50%	1.60%	2.00%	3.70%	1.40%	2.70%	1.70%	0.80%
30-Sep-16	1.50%	1.60%	2.00%	3.70%	1.40%	2.60%	1.70%	0.80%
7-Oct-16	1.50%	1.70%	1.90%	3.70%	1.40%	2.60%	1.70%	0.80%
14-Oct-16	1.50%	1.70%	1.80%	3.70%	1.40%	2.80%	1.70%	0.80%
21-Oct-16	1.50%	1.70%	1.70%	3.70%	1.50%	3.00%	1.70%	0.80%
28-Oct-16	1.50%	1.80%	1.70%	3.60%	1.50%	3.00%	1.60%	0.80%
4-Nov-16	1.50%	1.80%	1.60%	3.60%	1.50%	3.10%	1.60%	0.80%
11-Nov-16	1.50%	1.70%	1.50%	3.60%	1.50%	3.00%	1.70%	0.80%
18-Nov-16	1.50%	1.70%	1.50%	3.60%	1.50%	3.10%	1.70%	0.80%
25-Nov-16	1.50%	1.60%	1.60%	3.60%	1.50%	3.10%	1.70%	0.80%
2-Dec-16	1.50%	1.60%	1.70%	3.60%	1.60%	3.20%	1.80%	0.80%
9-Dec-16	1.50%	1.60%	1.70%	3.50%	1.60%	3.10%	1.80%	0.80%
16-Dec-16	1.60%	1.60%	1.60%	3.30%	1.60%	3.10%	1.80%	0.80%
23-Dec-16	1.60%	1.60%	1.60%	3.10%	1.60%	3.00%	1.90%	0.80%
30-Dec-16	1.70%	1.60%	1.60%	3.00%	1.60%	2.90%	1.90%	0.80%
6-Jan-17	1.70%	1.60%	1.60%	3.10%	1.60%	3.10%	1.90%	0.90%
13-Jan-17	1.70%	1.60%	1.60%	3.30%	1.70%	3.10%	1.90%	0.90%
20-Jan-17	1.70%	1.50%	1.60%	3.60%	1.70%	3.20%	2.00%	0.90%
27-Jan-17	1.70%	1.50%	1.60%	4.00%	1.70%	3.30%	2.00%	0.90%
3-Feb-17	1.70%	1.40%	1.70%	3.00%	1.80%	3.30%	2.00%	0.90%
10-Feb-17	1.70%	1.30%	1.90%	3.10%	1.80%	3.60%	2.10%	0.90%
17-Feb-17	1.80%	1.40%	2.10%	3.30%	1.90%	3.80%	2.10%	1.00%
24-Feb-17	1.80%	1.50%	2.40%	3.90%	1.90%	3.90%	2.20%	1.00%
3-Mar-17	1.90%	1.50%	2.80%	4.40%	2.00%	3.90%	2.20%	1.10%
10-Mar-17	2.00%	1.50%	3.20%	5.20%	2.00%	4.00%	2.20%	1.10%
17-Mar-17	2.20%	1.40%	3.40%	5.50%	2.00%	4.00%	2.20%	1.20%
24-Mar-17	2.50%	1.20%	3.50%	5.80%	2.00%	4.10%	2.20%	1.20%
31-Mar-17	2.40%	1.20%	3.70%	6.00%	2.10%	4.20%	2.30%	1.20%

Source: U.S. Energy Information Administration, Form EIA-912, *Weekly Underground Natural Gas Storage Report*, 2015-17

Table 1B. Estimated standard errors in billion cubic feet for the weekly net changes in underground storage working gas inventory data reported on WNGSR, April 2015 to March 2017

Week ending	East Region	Midwest Region	Mountain Region	Pacific Region	South Central Region	Salt	NonSalt	Total Lower 48
17-Apr-15	0.2	0.4	0.1	0.6	1.2	0.9	0.8	1.4
24-Apr-15	0.6	0.4	0.1	1.2	1.3	0.9	1	1.9
1-May-15	0.4	0.4	0.3	0.3	1.1	0.7	0.9	1.3
8-May-15	0.4	0.5	0.2	0.4	1.8	1.4	1.2	1.9
15-May-15	0.3	0.4	0.3	0.4	1.6	0.5	1.5	1.7
22-May-15	0.7	0.2	0.2	0.9	1.6	0.4	1.5	2
29-May-15	1.3	0.5	0.2	1	1.6	0.5	1.5	2.4
5-Jun-15	1	0.5	0.1	0.5	1.2	1	0.7	1.7
12-Jun-15	0.8	0.6	0.1	0.6	1.1	0.8	0.7	1.6
19-Jun-15	0.3	0.5	0.1	0.2	1.2	0.7	0.9	1.3
26-Jun-15	0.4	0.5	0.1	0.6	1.1	0.9	0.7	1.5
3-Jul-15	0.7	0.8	0.2	0.5	1.2	1.1	0.5	1.7
10-Jul-15	0.3	0.4	0.3	0.6	1.6	1.5	0.6	1.9
17-Jul-15	0.3	0.4	0.4	0.5	0.9	0.2	0.9	1.2
24-Jul-15	0.4	0.5	0.2	0.3	1	0.2	0.9	1.2
31-Jul-15	0.5	0.7	0.4	1.2	1.2	0.6	1	1.9
7-Aug-15	0.5	0.7	0.5	1.3	0.9	0.6	0.7	1.8
14-Aug-15	0.3	0.7	0.5	1.1	0.8	0.5	0.6	1.6
21-Aug-15	0.5	0.7	0.8	1.5	0.8	0.4	0.7	2
28-Aug-15	0.6	1.1	0.5	1.2	0.7	0.5	0.6	2
4-Sep-15	0.4	1.1	0.4	1.6	0.7	0.5	0.4	2.1
11-Sep-15	0.4	1.1	0.1	1.2	0.8	0.5	0.6	1.8
18-Sep-15	0.6	0.8	0.2	0.9	1	0.9	0.4	1.7
25-Sep-15	0.6	0.8	0.2	0.5	1.1	0.9	0.6	1.6
2-Oct-15	0.7	0.6	0.3	1.3	1.9	1.8	0.6	2.5
9-Oct-15	0.4	0.5	0.3	0.7	1.4	1.2	0.8	1.7
16-Oct-15	0.4	0.6	0.5	0.9	1.5	1.3	0.8	1.9
23-Oct-15	0.4	0.7	0.4	0.3	0.9	0.5	0.7	1.2
30-Oct-15	0.6	1.2	0.1	0.8	1.7	1.5	0.8	2.3
6-Nov-15	0.2	0.5	0.3	1.5	1.7	1.6	0.4	2.3
13-Nov-15	0.3	0.2	1.8	0.3	0.7	0.6	0.4	2
20-Nov-15	0.4	0.2	0.3	0.3	0.8	0.6	0.5	1
27-Nov-15	0.5	0.7	0.5	1.1	1.4	1.2	0.7	2
4-Dec-15	0.8	0.4	0.4	1.6	0.8	0.6	0.5	2
11-Dec-15	0.6	0.4	0.2	1.3	1.9	1.8	0.7	2.4
18-Dec-15	0.2	0.6	0.2	0.7	0.7	0.5	0.4	1.2
25-Dec-15	0.4	1.2	0.3	0.4	0.8	0.7	0.3	1.5

Table 1B. Estimated standard errors in billion cubic feet for the weekly net changes in underground storage working gas inventory data reported on WNGSR, April 2015 to March 2017 (continued)

Week ending	East Region	Midwest Region	Mountain Region	Pacific Region	South Central Region	Salt	NonSalt	Total Lower 48
1-Jan-16	0.3	1.9	0.3	0.9	1.5	1.3	0.7	2.6
8-Jan-16	0.7	0.4	0.4	1.2	1.6	1.5	0.5	2.2
15-Jan-16	0.5	1.7	0.3	1.1	1.5	0.9	1.1	2.5
22-Jan-16	0.7	1.6	0.1	1.1	2.5	1.8	1.8	3.3
29-Jan-16	0.8	1.3	0.1	1.1	1.9	1.7	0.8	2.7
5-Feb-16	0.4	0.8	0.2	1.8	1.1	0.9	0.7	2.3
12-Feb-16	0.5	5	0.2	1.5	1.5	1	1.1	5.5
19-Feb-16	1.1	1.9	0.2	0.8	0.8	0.4	0.6	2.5
26-Feb-16	0.3	0.9	0.2	2.3	1.1	1	0.6	2.7
4-Mar-16	0.4	0.9	0.3	1.4	1	0.8	0.7	2
11-Mar-16	0.4	0.6	0.4	1.2	1.4	0.7	1.2	2
18-Mar-16	0.5	0.6	0.3	0.6	1	0.9	0.4	1.5
25-Mar-16	1.2	0.6	0.3	1.2	0.9	0.7	0.5	2
1-Apr-16	0.7	0.5	0.2	0.7	1.3	0.7	1.1	1.7
8-Apr-16	0.7	1.5	0.3	0.3	0.7	0.6	0.4	1.9
15-Apr-16	0.5	1.1	0.2	0.3	0.8	0.5	0.7	1.6
22-Apr-16	0.4	0.6	0.2	1	1.7	1	1.4	2.1
29-Apr-16	0.8	0.9	0.1	0.9	0.8	0.8	0.3	1.7
6-May-16	0.6	0.4	0.3	0.5	0.8	0.7	0.3	1.2
13-May-16	0.4	0.6	0.1	0.6	0.9	0.5	0.7	1.3
20-May-16	0.3	0.6	0.1	0.3	0.6	0.3	0.5	1
27-May-16	0.5	1.1	0.1	0.7	1	0.8	0.5	1.7
3-Jun-16	0.4	1.1	0.1	0.6	0.6	0.6	0.2	1.4
10-Jun-16	0.4	0.8	0.2	0.8	0.7	0.6	0.5	1.4
17-Jun-16	0.4	0.9	0.2	0.9	1	0.9	0.5	1.7
24-Jun-16	0.4	0.6	0.5	0.1	0.7	0.5	0.5	1.1
1-Jul-16	0.4	0.9	0.5	0.5	2.2	0.8	2.1	2.5
8-Jul-16	0.4	0.9	0.3	0.8	0.7	0.6	0.4	1.5
15-Jul-16	0.3	0.9	0.5	0.5	0.6	0.5	0.2	1.4
22-Jul-16	0.3	0.8	0.5	0.3	1.1	1.1	0.3	1.5
29-Jul-16	0.3	1.4	1.1	1.8	1.9	1.7	0.9	3.2
5-Aug-16	0.4	0.9	0.7	0.3	0.8	0.6	0.4	1.5
12-Aug-16	0.4	1	0.5	0.4	0.8	0.6	0.5	1.5
19-Aug-16	0.5	0.7	0.5	1.3	1.5	1.4	0.5	2.2
26-Aug-16	0.4	1.2	0.4	0.3	0.5	0.4	0.3	1.5
2-Sep-16	0.4	1.1	0.5	0.6	1.1	1	0.4	1.8
9-Sep-16	0.2	0.7	0.2	0.3	0.7	0.7	0.3	1.1

Table 1B. Estimated standard errors in billion cubic feet for the weekly net changes in underground storage working gas inventory data reported on WNGSR, April 2015 to March 2017 (continued)

Week ending	East Region	Midwest Region	Mountain Region	Pacific Region	South Central Region	Salt	NonSalt	Total Lower 48
16-Sep-16	0.2	1.1	0.1	0.4	1	0.8	0.5	1.5
23-Sep-16	0.2	0.8	0.2	0.5	1.1	0.5	1	1.5
30-Sep-16	0.4	1.1	0.2	0.7	0.7	0.5	0.4	1.5
7-Oct-16	0.2	1	0.3	0.4	1.3	1	0.8	1.7
14-Oct-16	0.4	0.9	0.4	0.3	2.1	1.8	1.1	2.4
21-Oct-16	0.3	0.9	0.5	0.5	2.1	1.9	0.8	2.4
28-Oct-16	0.3	1	0.5	0.2	1.8	1.5	0.9	2.1
4-Nov-16	0.2	0.8	0.7	0.2	1.6	1.4	0.8	2
11-Nov-16	0.2	1.2	0.4	0.1	2.4	1.7	1.7	2.7
18-Nov-16	0.2	1.4	0.6	0.2	1.3	0.9	0.8	2
25-Nov-16	0.3	1.7	0.7	0.3	1	0.5	0.9	2.1
2-Dec-16	0.4	1.3	0.8	0.3	1.8	1.7	0.6	2.4
9-Dec-16	0.5	1.4	0.3	1	1.5	1.4	0.5	2.4
16-Dec-16	0.7	1.4	0.4	0.8	2.4	2.1	1.2	3
23-Dec-16	0.6	1.4	0.4	1.2	2.8	2.2	1.7	3.4
30-Dec-16	0.6	1	0.7	2.4	1.3	1.1	0.7	3
6-Jan-17	1.1	1.1	0.2	0.5	1.5	1.3	0.8	2.3
13-Jan-17	1.1	1.2	0.3	2	2.1	1.7	1.1	3.3
20-Jan-17	1.1	2.4	0.2	0.3	1.1	1	0.6	2.9
27-Jan-17	0.7	1.2	0.3	1.1	1.7	1.2	1.2	2.4
3-Feb-17	1	1.6	0.3	3.5	0.8	0.4	0.7	4.1
10-Feb-17	1.1	1.3	0.3	1.2	0.9	0.7	0.6	2.3
17-Feb-17	0.6	0.6	0.5	0.5	1.5	1	1.2	1.9
24-Feb-17	0.4	0.8	0.6	1.4	1.5	0.9	1.1	2.3
3-Mar-17	0.5	0.8	0.7	1.9	1.2	0.9	0.8	2.5
10-Mar-17	0.7	0.7	0.7	2.6	1	0.4	0.9	3.1
17-Mar-17	1.4	1.8	0.4	1	2	1.9	0.6	3.2
24-Mar-17	0.8	1.3	0.3	0.9	1	0.4	0.9	2
31-Mar-17	0.9	0.8	0.4	0.8	1.7	1.2	1.3	2.3

Source: U.S. Energy Information Administration, Form EIA-912, *Weekly Underground Natural Gas Storage Report*, 2015-17

Differences between monthly and interpolated weekly values

Comparing the WNGSR series (EIA-912) with monthly working gas inventories reported in the *Natural Gas Monthly* (EIA-191) provides an additional benchmark to evaluate the performance of the WNGSR. As a census survey, rather than a sample survey, the monthly data are generally considered more accurate than the weekly data because it has no sampling error. In addition, because more time is available for respondents to report their data and for EIA to review it, the incidence of error in measurement is reduced. To perform the weekly-to-monthly comparison, a simple average daily interpolation is used to transform the weekly series into a monthly series that coincides with the last calendar day of the month.

On a national level, the average absolute difference between the weekly and the monthly series for the period from April 2015 to January 2017 was 0.2% of monthly working gas levels (7 billion cubic feet (Bcf)), and the root mean square error was 9 Bcf (Table 2).

- Factors contributing to the difference between the weekly and monthly working gas series include:
- Limitations of the weekly-to-monthly interpolation method, which does not take into account daily variability of storage activity
- Revisions or resubmissions of data on the EIA-912 below the WNGSR publication threshold of 4 Bcf
- Reclassifications between base gas⁷ and working gas, or other inventory adjustments, during the two-month lag between collecting the two series
- Volume estimates for the nonsampled weekly operators that differ from actual values
- Preliminary weekly estimates reported by respondents on the EIA-912 compared with finalized data reported on the EIA-191

⁷ Base gas is the volume of gas needed to maintain adequate reservoir pressures and deliverability rates. Base gas is not typically available for withdrawal.

Table 2. Monthly—weekly differences in underground storage estimates
(billion cubic feet)

Month end	Natural Gas Monthly (Bcf)						Differences (Bcf)					
	East	Midwest	Mountain	Pacific	Total		East	Midwest	Mountain	Pacific	Total	
					South Central	Lower 48					South Central	Lower 48
15-Apr	312	309	116	293	750	1,780	-4	0	3	-7	3	-6
15-May	455	438	135	322	920	2,271	-6	2	3	-4	0	-6
15-Jun	570	567	157	331	1,004	2,629	1	-2	-3	5	-2	0
15-Jul	658	683	174	341	1,054	2,910	3	1	-3	3	-4	0
15-Aug	759	829	189	347	1,097	3,221	7	2	-2	1	-2	6
15-Sep	856	975	205	358	1,213	3,606	3	-1	-2	1	-7	-4
15-Oct	919	1,094	215	378	1,321	3,927	-1	6	-1	0	6	12
15-Nov	914	1,091	207	369	1,332	3,913	1	7	1	0	2	10
15-Dec	856	987	186	320	1,304	3,653	4	2	0	-3	3	6
16-Jan	632	764	156	276	1,098	2,926	3	-5	1	-9	-2	-12
16-Feb	483	607	144	263	1,024	2,520	-1	-1	1	-7	-2	-8
16-Mar	436	542	145	266	1,079	2,467	-1	7	4	-1	2	11
16-Apr	463	565	152	287	1,158	2,626	-7	3	6	-2	9	7
16-May	557	671	176	306	1,237	2,947	-7	-2	5	0	2	-3
16-Jun	655	763	197	316	1,236	3,166	-4	-2	4	-3	11	7
16-Jul	735	834	209	316	1,202	3,297	-1	-3	5	-2	2	-1
16-Aug	805	921	221	315	1,158	3,419	2	0	2	-3	5	8
16-Sep	899	1,042	234	321	1,185	3,681	0	3	3	-3	-4	-1
16-Oct	940	1,134	250	331	1,334	3,989	3	4	1	-5	-5	-3
16-Nov	899	1,112	253	328	1,359	3,952	4	5	4	-4	5	13
16-Dec	721	906	204	271	1,170	3,274	10	7	2	2	-4	15
17-Jan	528	699	159	210	1,006	2,602	13	5	0	4	0	22

Source: U.S. Energy Information Administration, Form EIA-912, Natural Gas Monthly 2015-17

Revisions

EIA publishes revisions to the WNGSR when respondents submit revised data for the previous week, resulting in a difference of 4 Bcf or greater at the regional or national level. WNGSR's revision posting policy was announced in a November 2002 Federal Register Notice and subsequently updated in an August 2015 announcement.⁸ Respondents' EIA-912 resubmissions after the WNGSR release are entered into EIA's database for editing, imputation, and other analytical purposes, but the changes only

⁸ *Federal Register*, Vol. 67, No. 218, U.S. Energy Information Administration (November 12, 2002), pp. 68581-83, (<http://www.eia.gov/survey/frn/naturalgas/WNGSR-Revision-Policy-Nov12-2002.pdf>); and *Federal Register*, Vol. 70, No. 79, U.S. Energy Information Administration (April 26, 2005), pp 21406-08, <http://www.eia.gov/survey/frn/naturalgas/WNGSR-Unscheduled-Release-Policy-Final-April2005.pdf>. *Notice of Changes to the Weekly Natural Gas Storage Report* http://ir.eia.gov/ngs/notice_08_31_2015.html

lead to a published revision when they affect working gas storage levels by a net total of at least 4 Bcf at either a regional or national level.

Once the 4 Bcf revision publication threshold is met in any region, all resubmissions of data for any region during the report week are reported, regardless of size. Consequently, published revisions for the Lower 48 states may net less than 4 Bcf as a result of potential offsetting revisions in other region(s).

Table 3. Published revisions to the *Weekly Natural Gas Storage Report*, 2014-17

Publication date of revision	Affected reporting period	Regions affected/amount of revision (Bcf)	Total reported revision (Bcf)	Percent difference from original publication working gas estimate
30-Jan-14	24-Jan-14	Producing Region salt (-8)	-8	-0.36%
13-Feb-14	7-Feb-14	Producing Region nonsalt (-7)	-7	0.42%
18-Feb-16	12-Feb-16	East Region (-5)	-5	-0.18%

Note: Revisions reported prior to April 2015 are reported in the prior three-region format in use at the time of publication.
Source: U.S. Energy Information Administration, Form EIA-912, *Weekly Underground Natural Gas Storage Report*, 2017

From 2014 to 2017, EIA revised published working gas stock data for three report periods as a result of data resubmissions. These revisions were reported to the public on separate publication dates noted in Table 3. The revised estimates of working gas stocks differed by less than 1% of the original published estimates. Only one revision has been published since lowering the revision threshold in November 2015.

According to EIA published policies, EIA must issue an unscheduled release of revisions to the weekly estimates when the cumulative sum of data changes or corrections to working gas and the net change between the two most recent report weeks is at least 10 Bcf. At 1:00 p.m., EST the public is notified of an impending release, and the revised report is disseminated on a federal workday at 2:00 p.m., ET. EIA has never issued an out-of-cycle revision.

EIA also occasionally receives small revisions that do not meet the publication threshold. These revisions are entered into the EIA-912 database for analytical and record-keeping purposes, but they are not reflected in published weekly data. Between 2014 and 2016, EIA received 72 such revisions, with an absolute average of 835 million cubic feet (MMcf). EIA received 63 unpublished revisions between 0 and 1,999 MMcf, 7 between 2,000 and 3,999 MMcf, and 2 between 4,000 and 6,999 MMcf.

Table 4. Unpublished revisions to the *Weekly Natural Gas Storage Report*, 2014-16

Range (MMcf)	Count	Average absolute difference (MMcf)
0 to 1,999	63	412
2,000 to 3,999	7	2,983
4,000 to 6,999	2	6,229

Source: U.S. Energy Information Administration, Form EIA-912, *Weekly Underground Natural Gas Storage Report*, 2014-16

Response rates

EIA-912 response rates, measured as a percentage of the total number of sampled companies, never fell below 90% for any week and exceeded 97% for almost three-fourths of the weeks between 2014 and 2016 (Table 5). EIA has never needed to publish a revision to WNGSR as a result of nonresponse.

Table 5. Response rates for the Form EIA-912 Survey, 2014-16

Response rate (Percentage of total number of sample companies)	Frequency count
0 — 89%	0
90 — 93%	43
94 — 97%	2
98 — 100%	112

Source: U.S. Energy Information Administration, Form EIA-912, *Weekly Underground Natural Gas Storage Report*, 2014-16

Accuracy, completeness, and accessibility of documentation

The methodological documentation for the WNGSR is available on the [EIA website](#).⁹ This document contains information about the WNGSR's processing, sampling, estimation, imputation for nonresponse, computation of estimated measures of sampling variability and summary statistics, and derivation of historical estimates that predate the collection of the Form EIA-912.

Release schedule performance and avoidance of early disclosure

Use of storage estimates prior to official release

The WNGSR is released each Thursday at 10:30 a.m. ET with exceptions for federal holidays or other preapproved purposes. Specific release times and dates for each calendar year are published in advance and have consistently been met. EIA has never had an unauthorized release of the WNGSR data prior to the scheduled release time.

⁹ U.S. Energy Information Administration, *Methodology*, January 26, 2017, <http://ir.eia.gov/ngs/methodology.html>.

Access to the estimates prior to release of the WNGSR is limited to project managers and analysts who work on the WNGSR project team, and the information is only made available to employees outside the WNGSR project team with the approval of the survey manager and as specified by OMB in their Statistical Policy Directive: Compilation, Release, and Evaluation of Principal Federal Economic Indicators.¹⁰

Beginning with data submitted for the first report period after April 1, 2004, the information related to Form EIA-912 has been used for statistical purposes only, in accordance with the *Confidential Information Protection and Statistical Efficiency Act of 2002* (Title 5 of Public Law 107-347) and other applicable federal laws. No other use of the estimates has established approval. Any other use is strictly prohibited. Data are not disclosed in identifiable form without the respondent's consent. By law, every EIA employee, as well as every agent, is subject to a jail term, a fine, or both if they make public any identifiable information reported through the EIA-912.

Timing of data release

WNGSR data are released at 10:30 a.m. ET, each Thursday, with the exception of federal holidays or with the exception of certain extenuating circumstances, such as extreme weather or inability to access the DOE Forrestal building. During the period covering 2014—16, the WNGSR was released every week according to the established schedule.

Protection of market sensitive information

The EIA-912 system is located at the Forrestal Building, 1000 Independence Avenue SW, Washington, DC 20585. To gain access to the Forrestal Building, one must have a DOE employee badge or must receive a visitor's badge from the DOE security office. DOE security controls access to and from the Forrestal Building.

The EIA-912 processing and estimation occur in a dedicated secure room in the Forrestal Building. The processing system in the secure room is only accessible to designated EIA employees and contractors who work on the WNGSR team. EIA is reviewing ways to upgrade the WNGSR security and processing environment to better leverage technologies that have been developed since the WNGSR began. For instance, a secure web-based portal for submission of the data, as well as processing system controls that can better track specific activities performed by WNGSR personnel, are under consideration. The current WNGSR processing system is not connected to any other system or to the Internet. All removable system components (hard drives and laptops), media (thumb drives), and printed documents are stored when not in use in a GSA-approved safe located within the secure room.

Authorized staff members hold an estimation and data validation meeting with recorded attendance in the secure room, typically the day before the scheduled release. WNGSR staff review the data

¹⁰ Office of Management and Budget, *Statistical Policy Directive on Compilation, Release, and Evaluation of Principal Federal Economic Indicators*, https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/omb/inforeg/statpolicy/dir_3_fr_09251985.pdf

submissions and other validating information and then run the software to generate the final report. The final report is first verified by several staff members and then verified before it is delivered for posting on the day of release.