

National and Global Petroleum Assessment

U.S. Geological Survey Assessments of Continuous (Unconventional) Oil and Gas Resources, 2000 to 2011



Digital Data Series 69—MM

Cover: Dipping beds of the Mowry Shale at the east end of Irish Canyon, Colorado. Photo by Christopher J. Schenk, June 7, 2004.

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By U.S. Geological Survey U.S. Continuous Resources Assessment Team

National and Global Petroleum Assessment

Digital Data Series 69–MM

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U.S. Geological Survey

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U.S. Geological Survey Assessments of Continuous (Unconventional) Oil and Gas Resources, 2000 to 2011

By U.S. Geological Survey U.S. Continuous Resources Assessment Team

Abstract

From 2000 to 2011, the U.S. Geological Survey conducted 139 quantitative assessments of continuous (unconventional) oil and gas accumulations within the United States. This report documents those assessments more fully than previously done by providing detailed documentation of both the assessment input and output. This report also compiles the data into spreadsheet tables that can be more readily used to provide analogs for future assessments, especially for hypothetical continuous accumulations.

These assessments were previously documented in a series of publications, the list of which is presented in Appendix 1. For some of the assessments, the only previous documentation was a summary of the results in a short USGS Fact Sheet. The present report provides more extensive documentation for those assessments than was previously available. Since 2011, the USGS has continued to assess continuous oil and gas resources in the United States and internationally. These assessments, however, used a different methodology (Charpentier and Cook, 2010) that has been modified from the methodology that was used previously. None of these newer assessments are included in this report.

Introduction

The U.S. Geological Survey (USGS) conducted 139 quantitative assessments of oil and gas potential in continuous (unconventional) accumulations from 2000 to 2011. This report provides documentation of the input and output for those assessments in one place and in a more complete fashion than previously published. All of these assessments units (AUs) were for areas within the United States, excepting one that was an extension of a coalbed methane trend into northeast Mexico. All the assessments documented in this report were conducted using the same quantitative methodology. The basic model for this methodology is explained in Schmoker (2003). The input form and operational procedure can be found in Klett and Schmoker (2003). The program itself is available and extensively documented in Crovelli (2012). Additional information is given in Klett and Charpentier (2003).

Data Resources

This report contains extensive documentation of the USGS assessments of continuous accumulations of oil and gas resources. Both the input and output information of the assessments are included. The data are in a collection of spreadsheet tables (table 1), in both Microsoft Excel format and tab-delimited format. Descriptions of the variables in each table are presented in Appendix 2. The geographic boundaries of 184 AUs are included in this report as a set of GIS (geographic information system) files. Two AUs (50310261, the Winnipeg-Icebox Continuous Gas AU, and 50640561, the Elvins Shale Gas AU) did not have geographic boundaries established and thus are not included.

Table 1. List of files included in this report.

Microsoft Excel File Name	Tab-delimited File Name	Contents
Main Input.xlsx	Main Input.tab	Data from input forms
Ecosystem Allocations.xlsx	Ecosystem Allocations.tab	Allocations to ecosystem
Federal Land Allocations.xlsx	Federal Land Allocations.tab	Allocations to Federal agency
Land Ownership Allocations.xlsx	Land Ownership Allocations.tab	Allocations to land ownership category
State Allocations.xlsx	State Allocations.tab	Allocations to state
Continuous Results.xlsx	Continuous Results.tab	Assessment results
Code List.xlsx	Code List.tab	Main code list
Ecosystem Codes.xlsx	Ecosystem Codes.tab	Code list for ecosystem names
Cloud Plots.xlsx	Cloud Plots.tab	Data for constructing cloud plots

Input Form and Calculation Program Versions

These assessments took place over the course of more than a decade, and refinements to both the input form and calculation program were made during the same period. The input form was changed more frequently than the program. In 2003, the input form was revised to accommodate the change in parameter inputs from median values to modal values. Other changes to the input form were primarily made to include additional ancillary variables.

The program for calculating the estimates is named “ACCESS,” and several versions exist (Crovelli, 2012). The unnumbered version, originally described in Crovelli (2000), was not used for any official USGS assessments. The first version actually used for assessments is herein termed “version 1,” which was used from 2000 to 2002. Version 1 differed from the previous ACCESS version in that it included a variable for “Percentage of total assessment-unit area that is untested.” Each triangular distribution (used to describe the probability distribution of an input variable) was described by the minimum, median, and maximum values. ACCESS version 2 was used from 2003 to 2008. Each triangular distribution was described by the minimum, mode, and maximum values. ACCESS version 3 was used from 2009 to 2011. An error was identified in version 2: gas-oil ratio inputs in continuous oil AUs were set as a triangle with minimum, mode, and maximum as 240, 320, and 960, and the program ignored any other input. The error correction was the only change made in version 3. Because the error only affected coproduct volumes and only in oil AUs, there was only minor effect in a few assessments.

Both the input form version and the version of the program used to run the calculations (for AUs that were quantitatively assessed) are documented in Microsoft Excel and tab-delimited files named “Main Input.” File Main Input includes all the variables for each version of the input form. Thus, some variables will not be populated in file Main Input for a specific AU because that variable was not on the input form used in that assessment.

Corrections

Corrections were made to some values in the data tables. Some of these were minor and corrected typographical errors or enforced consistency in naming conventions. The list of codes used in these assessments is included as file “Code List.” Codes in the various original files were checked and changed for consistency where necessary.

Changes were also made to the data tables to ensure that allocation percentages added up correctly. The sum of the land ownership allocations should be 100 percent, and the sum of the Federal land allocations should be the percent of Federal land in file “Land Ownership Allocations.”

A few corrections were more significant, and these are highlighted in green in the Microsoft Excel versions of the spreadsheets. The most significant corrections are for

those values on the original input forms that were different from those values actually used in the resource calculations. Almost all of these are a result of the error in version 2 of the ACCESS program, as explained above.

AUs that were defined but not quantitatively assessed are included in the “Main Input” and allocation-related files, but not in the “Continuous Results” or “Cloud Plots” files. These unassessed AUs are highlighted in purple in the Microsoft Excel versions of the spreadsheets. Although some of the original input forms for these unassessed AUs had some values filled in (such as allocation unit names and area percentages), these values were never checked as they would have been for a quantitative assessment. Therefore, these values are not included in the Main Input file. Only the header information for unassessed AUs is included in the Main Input file.

Use as Analogs

This report is not only intended to more fully document the assessments of continuous oil and gas resources, but also to provide the information in such a way as to facilitate its use as analog data for subsequent assessments. U.S. Geological Survey Oil and Gas Assessment Team (2012) documented the variability of estimated ultimate recovery (EUR) distributions from these assessments to provide a set of analogs for EURs. In that report, the data were presented in two forms: in tables and in graphs termed “cloud plots.” These two forms of data presentation are also provided herein, not only for estimated EUR distributions but also for estimated cell sizes and estimations of the percent of undrilled areas that would be both successful and in sweet spots.

Use of these data for analogs necessitates several cautionary statements. All the distributions are taken from the assessment input distributions. They represent the estimated distributions for undrilled portions of the AU in question. Generally, the distributions for undrilled portions were closely based on data for the drilled portions. Changes from the drilled to the undrilled portions could, however, result from changes in drilling/completion practice or differences in the geology between drilled and undrilled areas. The undrilled portions of the AU were estimated as if drilled using what was the current “best practice” at the time of the assessment. (Dates of the assessments can be found in the “Main Input” file.) Whereas the wells drilled prior to the assessment may have been a mixture of vertical and horizontal wells, the undrilled areas would be estimated as if drilled by either vertical or horizontal wells, whichever was the “best practice” at the time of the assessment.

The three variables most useful as analogs are EUR distributions, cell sizes, and percent of undrilled areas that would be both successful and in sweet spots. For each of these variables, the 139 AUs are divided into four groups by reservoir type (shale gas, coalbed gas, tight gas, and continuous oil). Twelve cloud plots (figs. 1 to 12) and 12 tables (tables 2 to 13) summarizing these data are provided in the next sections of this report. The data for the plots are in the Cloud Plots file in the Excel folder of the online [downloads directory](#).

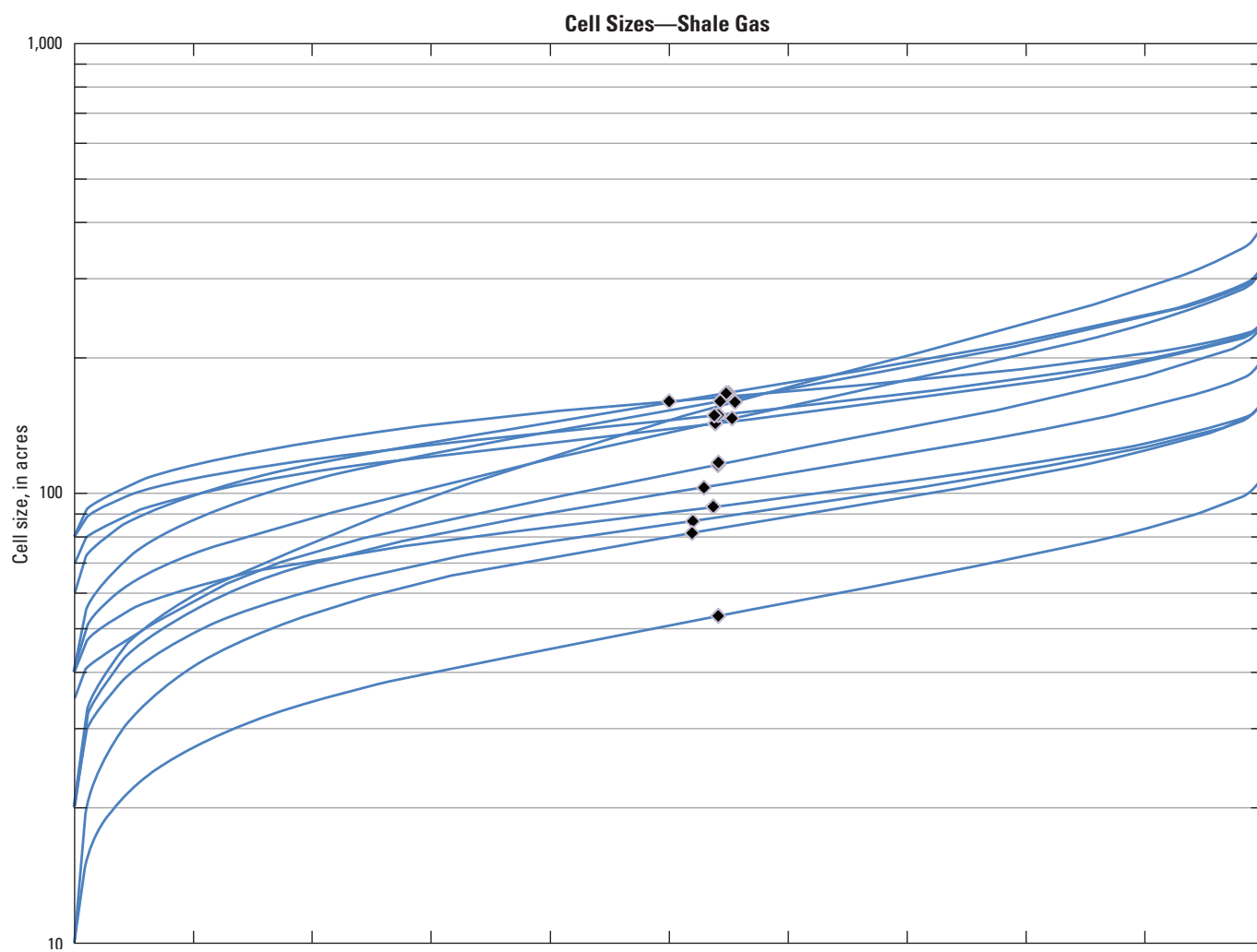


Figure 1. Cloud plot for estimated area of cells (drainage areas) in United States shale-gas assessment units. Each curve represents one assessment unit and is based on the input data in table 2. Black diamonds show the mean value for each curve.

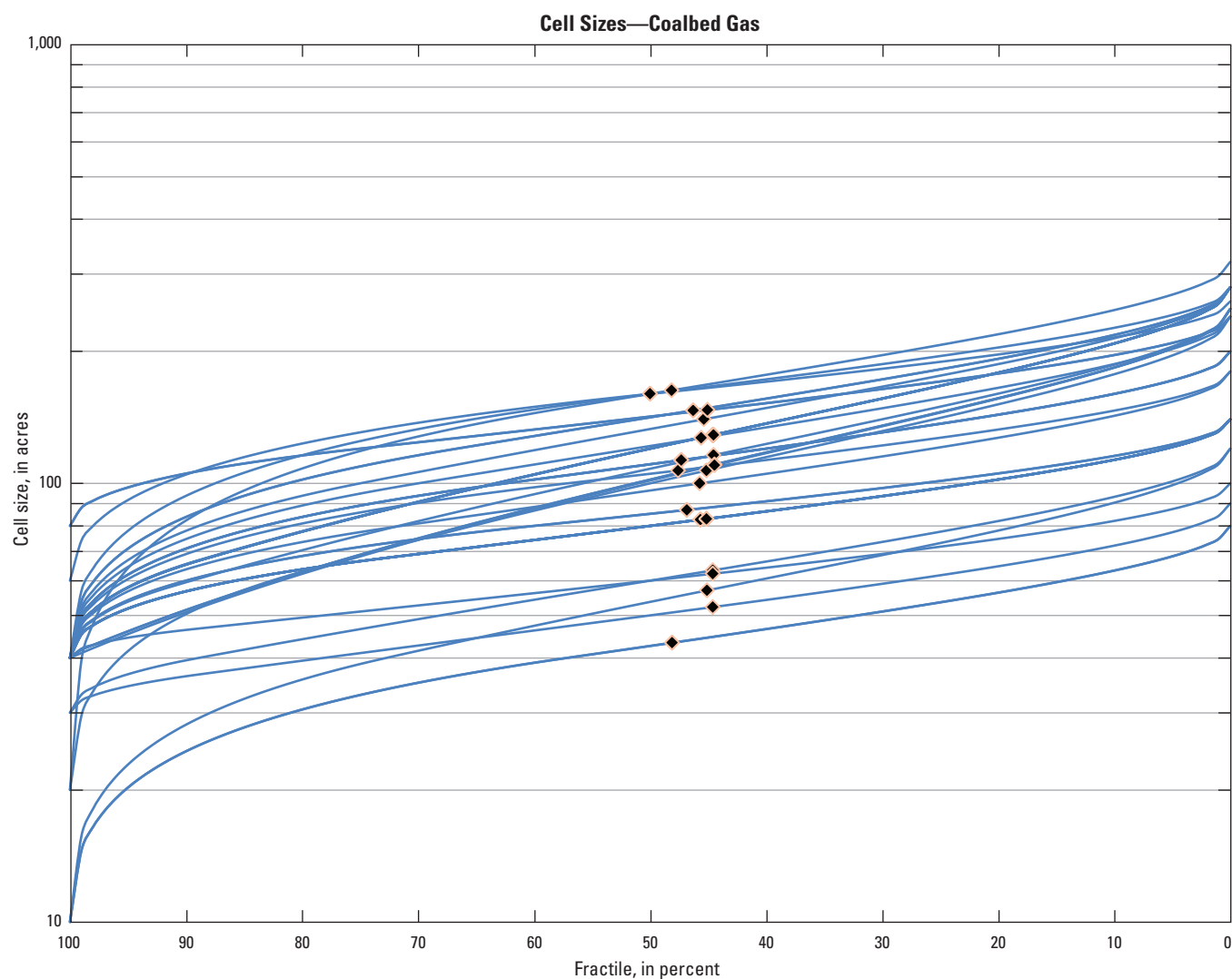


Figure 2. Cloud plot for estimated area of cells (drainage areas) in United States coalbed-gas assessment units. Each curve represents one assessment unit and is based on the input data in table 3. Black diamonds show the mean value for each curve.

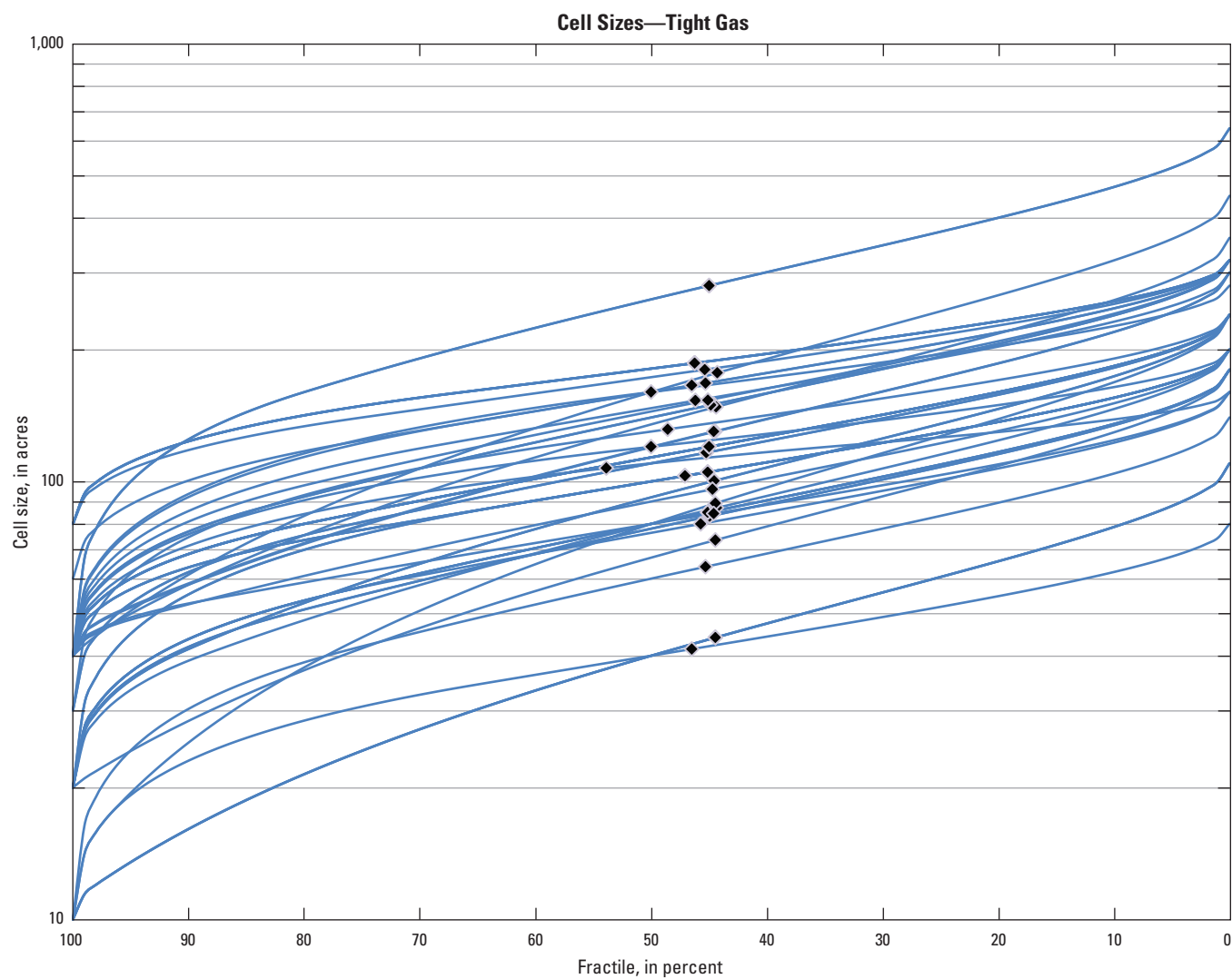


Figure 3. Cloud plot for estimated area of cells (drainage areas) in United States tight-gas assessment units. Each curve represents one assessment unit and is based on the input data in table 4. Black diamonds show the mean value for each curve.

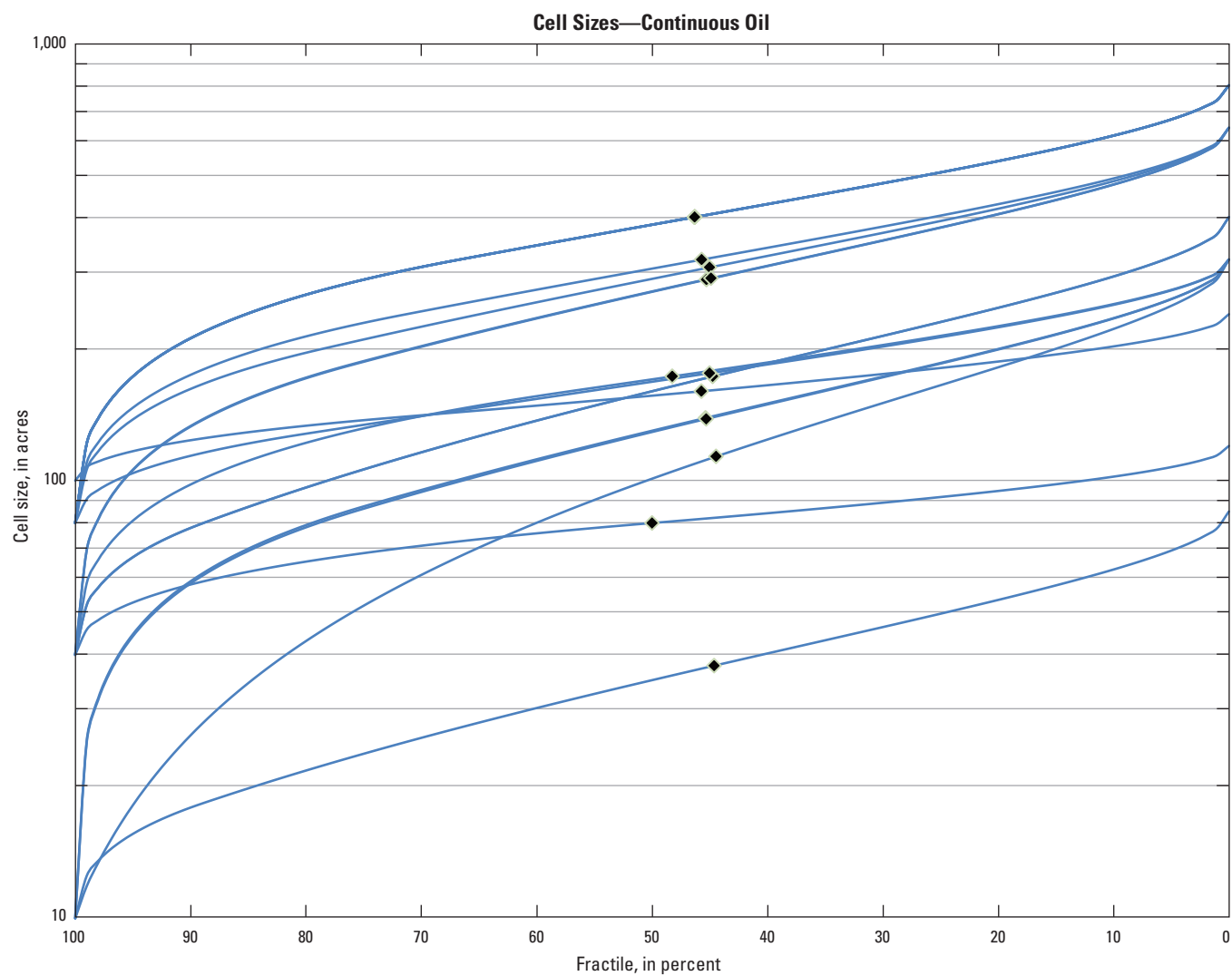


Figure 4. Cloud plot for estimated area of cells (drainage areas) in United States continuous-oil assessment units. Each curve represents one assessment unit and is based on the input data in table 5. Black diamonds show the mean value for each curve.

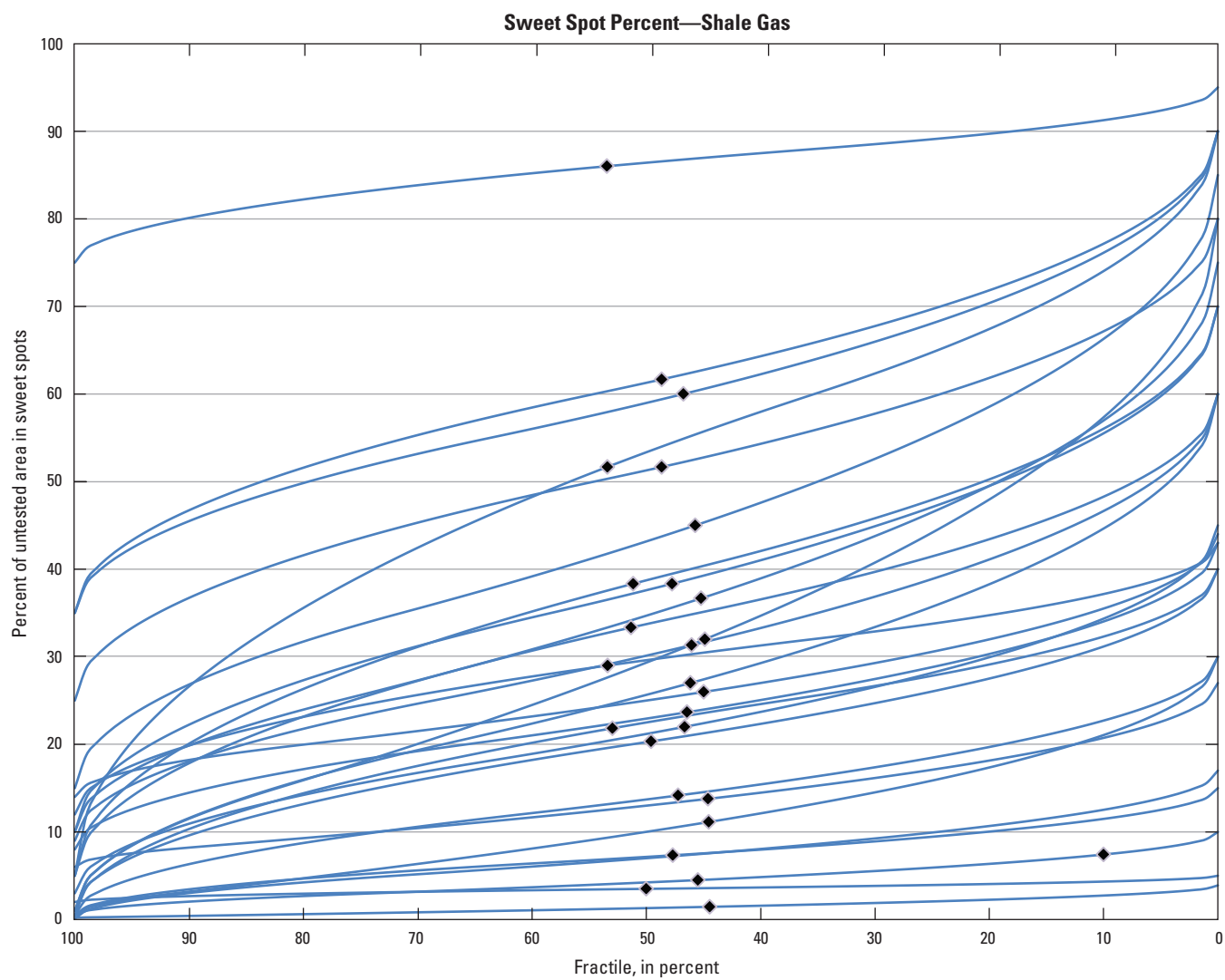


Figure 5. Cloud plot for estimated percent of untested area in sweet spots in United States shale-gas assessment units. Each curve represents one assessment unit and is based on the input data in table 6. Black diamonds show the mean value for each curve.

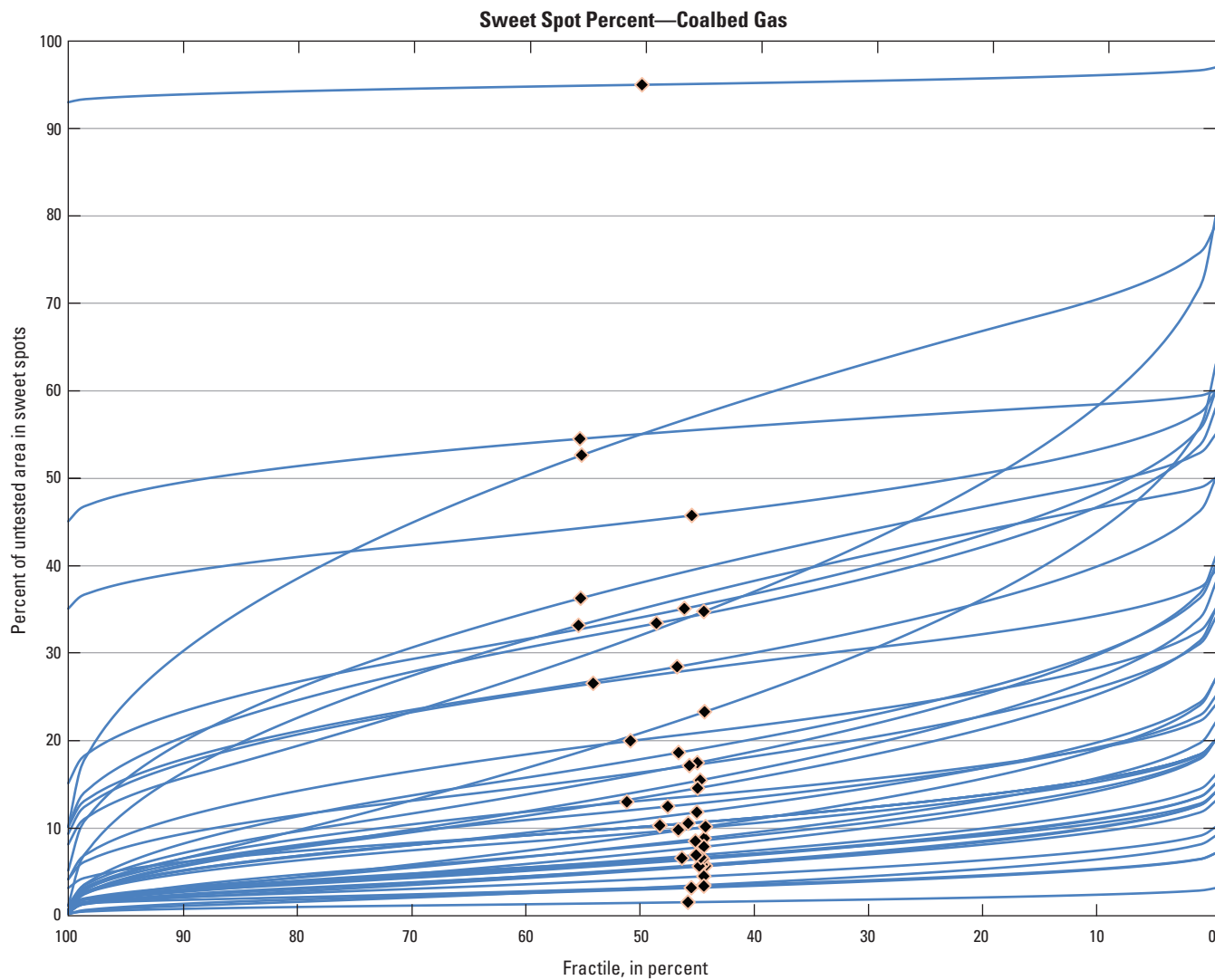


Figure 6. Cloud plot for estimated percent of untested area in sweet spots in United States coalbed-gas assessment units. Each curve represents one assessment unit and is based on the input data in table 7. Black diamonds show the mean value for each curve.

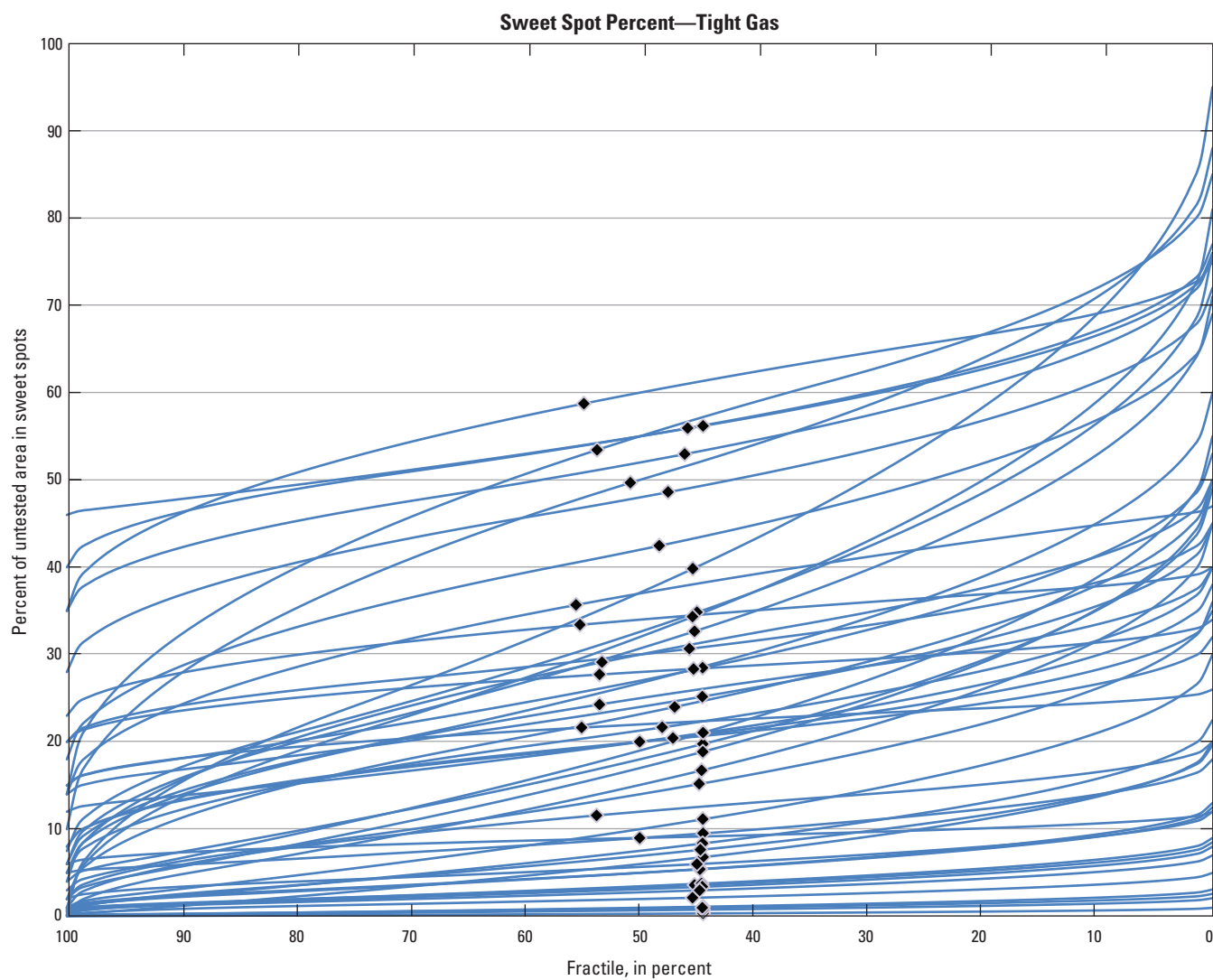


Figure 7. Cloud plot for estimated percent of untested area in sweet spots in United States tight-gas assessment units. Each curve represents one assessment unit and is based on the input data in table 8. Black diamonds show the mean value for each curve.

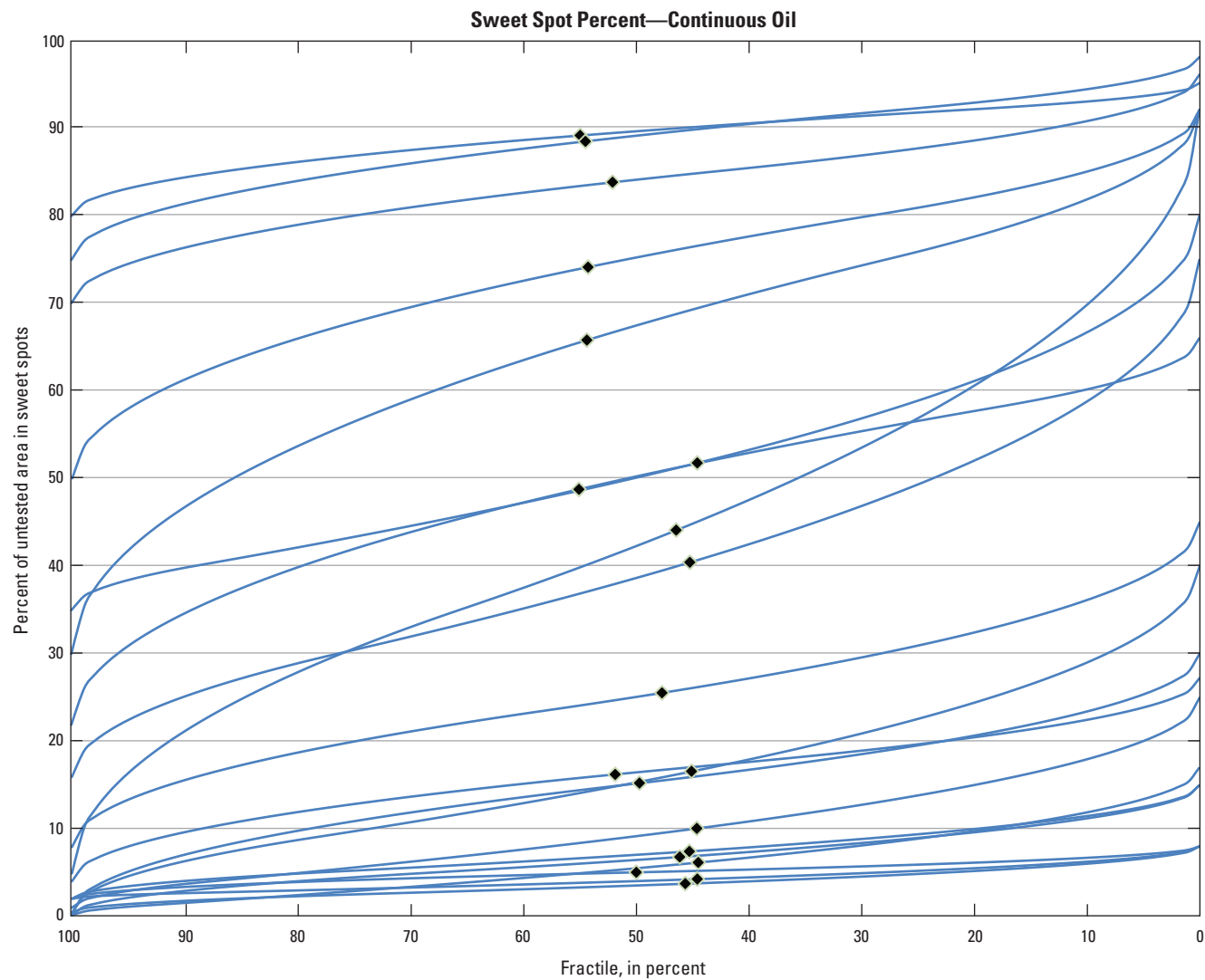


Figure 8. Cloud plot for estimated percent of untested area in sweet spots in United States continuous-oil assessment units. Each curve represents one assessment unit and is based on the input data in table 9. Black diamonds show the mean value for each curve.

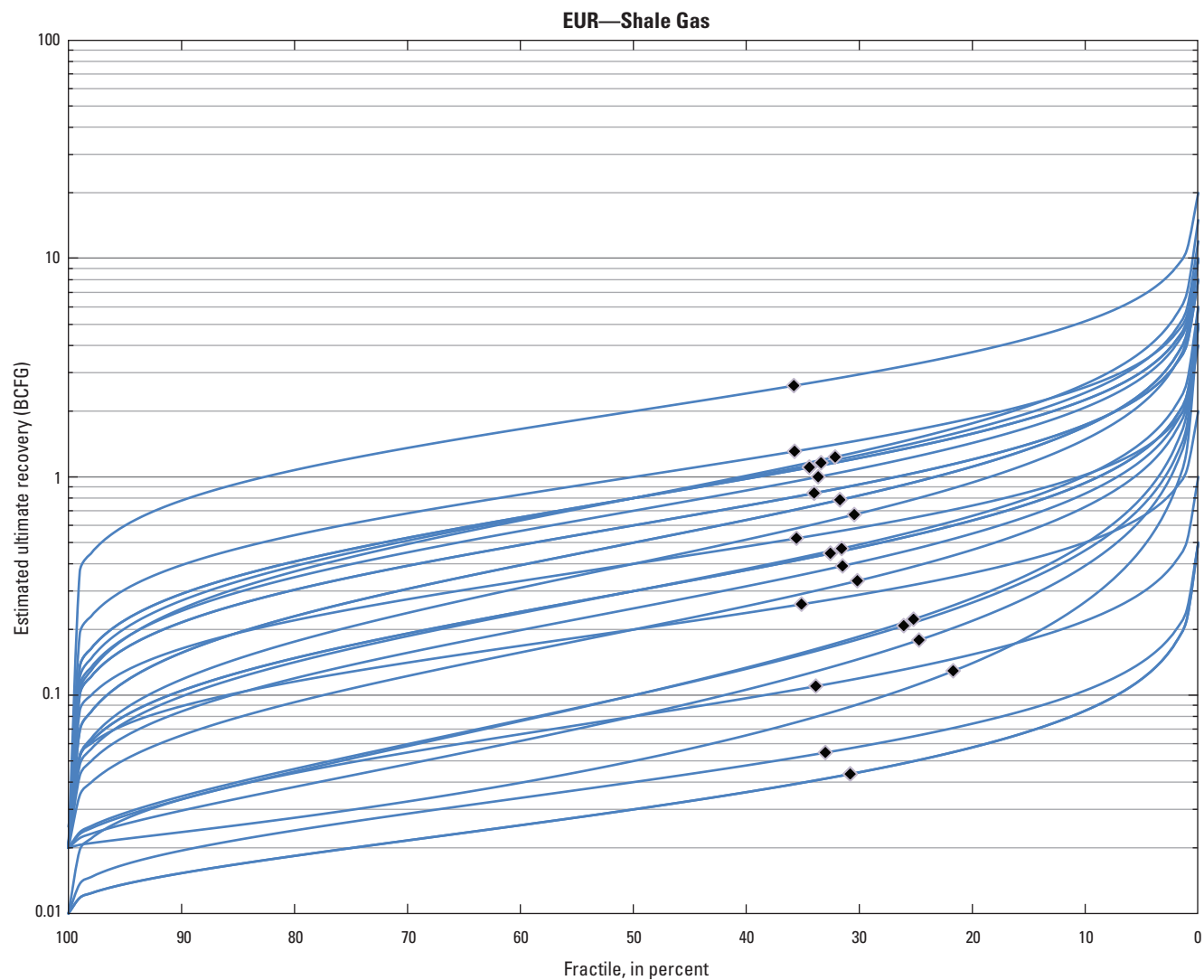


Figure 9. Cloud plot for EURs in United States shale-gas assessment units. Each curve represents one assessment unit and is based on the input data in table 10. Black diamonds show the mean value for each curve. [EUR, estimated ultimate recovery; BCFG, billions of cubic feet of gas]

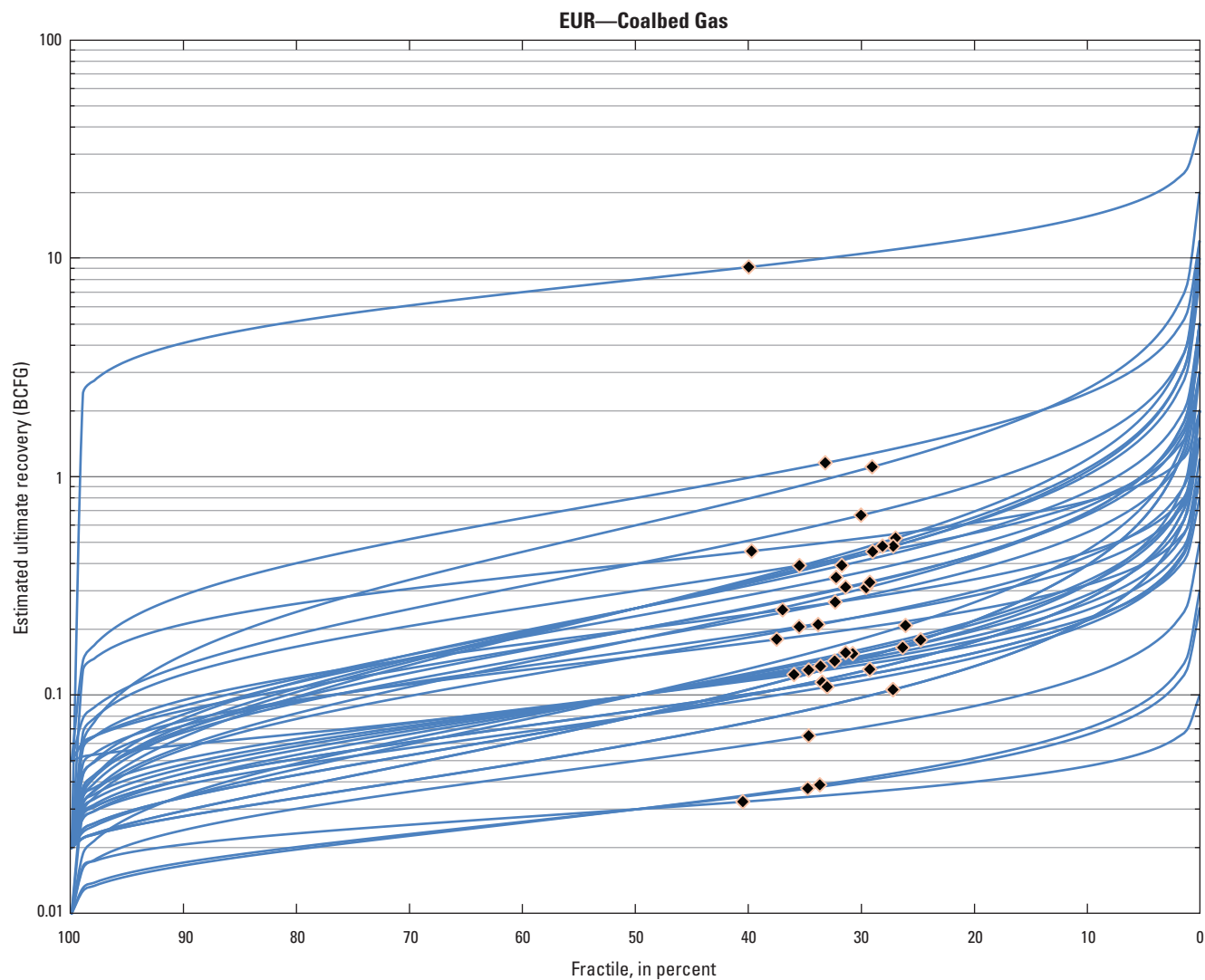


Figure 10. Cloud plot for EURs in United States coalbed-gas assessment units. Each curve represents one assessment unit and is based on the input data in table 11. Black diamonds show the mean value for each curve. [EUR, estimated ultimate recovery; BCFG, billions of cubic feet of gas]

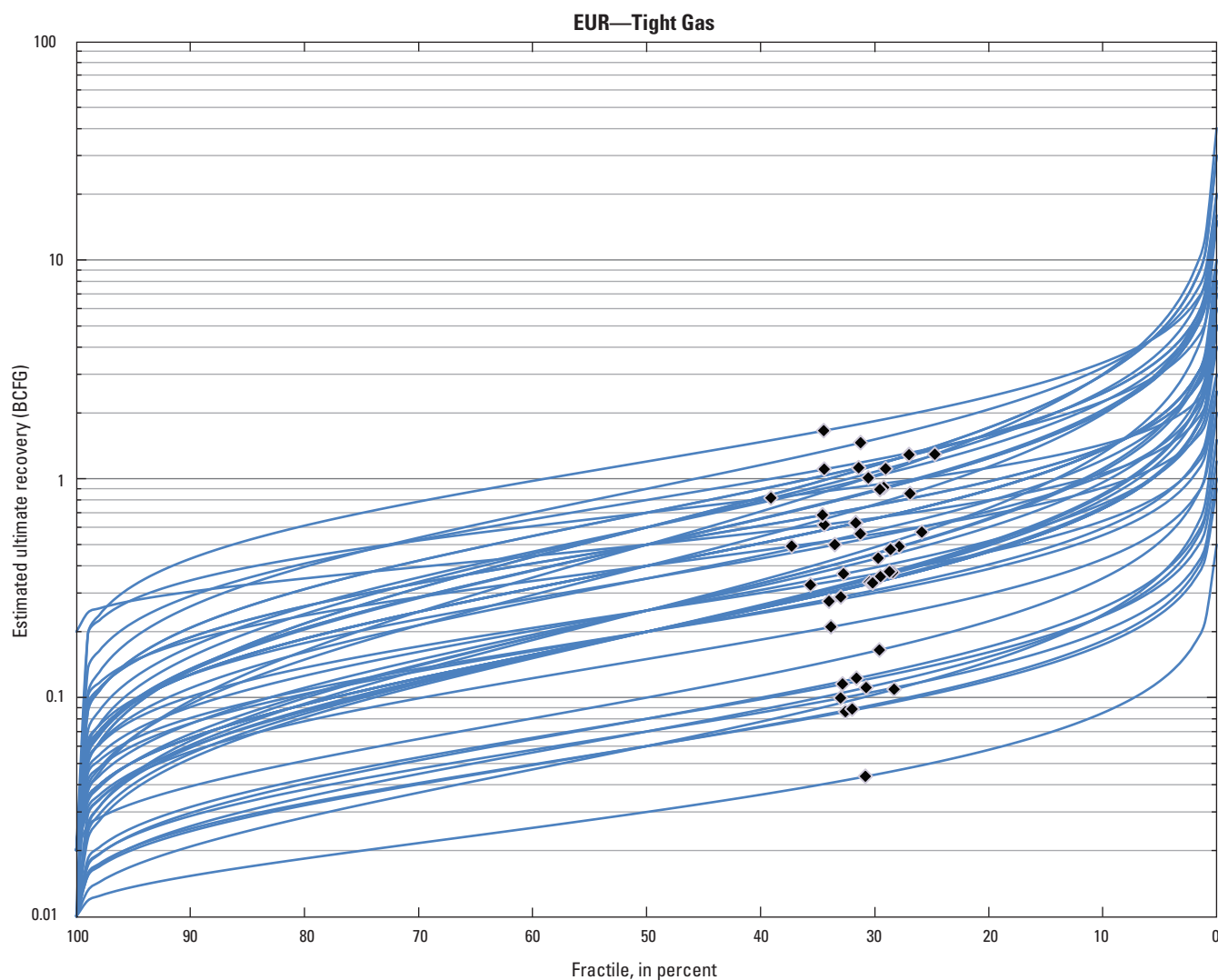


Figure 11. Cloud plot for EURs in United States tight-gas assessment units. Each curve represents one assessment unit and is based on the input data in table 12. Black diamonds show the mean value for each curve. [EUR, estimated ultimate recovery; BCFG, billions of cubic feet of gas]

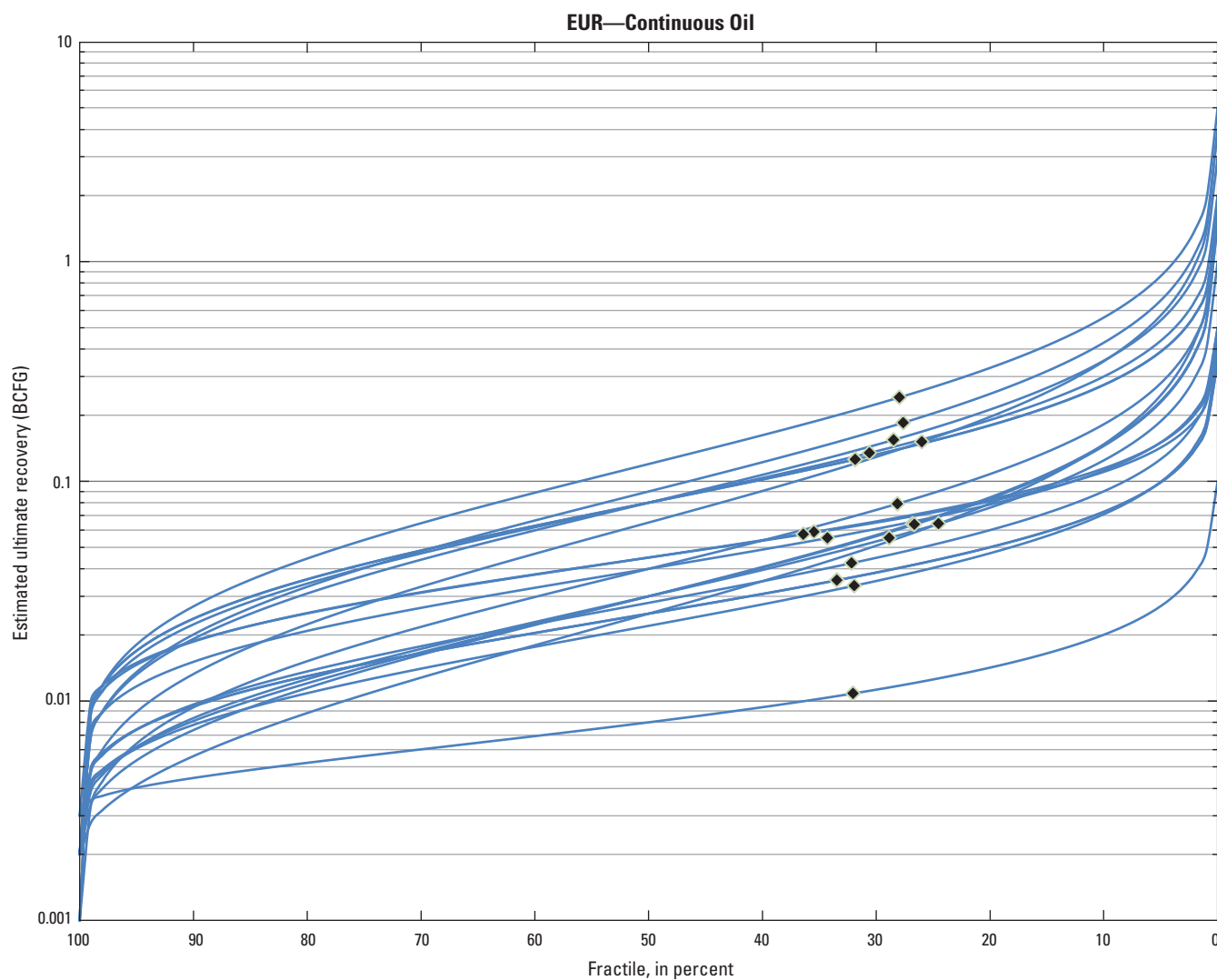


Figure 12. Cloud plot for EURs in United States continuous-oil assessment units. Each curve represents one assessment unit and is based on the input data in table 13. Black diamonds show the mean value for each curve. [EUR, estimated ultimate recovery; MMBO, millions of barrels of oil]

Table 2. Input data for estimated area of cells (drainage areas) for United States shale-gas assessment units, values in acres.

[AU, assessment unit]

AU number	AU name	Province	Year assessed	Minimum cell area	Mode of cell area	Maximum cell area	Mean cell area
50580161	Woodford Shale Gas	Anadarko Basin	2010	60	120	320	166.67
50580261	Thirteen Finger Limestone-Atoka Shale Gas	Anadarko Basin	2010	60	120	320	166.67
50620261	Woodford Shale Gas	Arkoma Basin	2010	60	120	320	166.67
50620262	Chattanooga Shale Gas	Arkoma Basin	2010	60	120	320	166.67
50620364	Caney Shale Gas	Arkoma Basin	2010	40	120	320	160.00
50640361	Devonian to Mississippian New Albany Continuous Gas	Illinois Basin	2007	80	160	240	160.00
50390761	Niobrara Chalk	Denver Basin	2001	35	43.70	400	159.57
50490161	Haynesville Sabine Platform Shale Gas	Gulf Coast Mesozoic	2010	80	128	240	149.33
50490163	Mid-Bossier Sabine Platform Shale Gas	Gulf Coast Mesozoic	2010	80	128	240	149.33
50490165	Maverick Basin Pearsall Shale Gas	Gulf Coast Mesozoic	2010	80	128	240	149.33
50490167	Eagle Ford Shale Gas	Gulf Coast Mesozoic	2010	80	128	240	149.33
50670467	Foldbelt Marcellus	Appalachian Basin	2011	80	128	240	149.33
50670468	Interior Marcellus	Appalachian Basin	2011	80	128	240	149.33
50620362	Fayetteville Shale Gas-High Gamma-Ray Depocenter	Arkoma Basin	2010	40	80	320	146.67
50620363	Fayetteville Shale Gas-Western Arkansas Basin Margin	Arkoma Basin	2010	40	80	320	146.67
50210362	Cane Creek Shale Gas	Paradox Basin	2011	70	120	240	143.33
50210364	Gothic, Chimney Rock, Hovenweep Shale Gas	Paradox Basin	2011	70	120	240	143.33
50670469	Western Margin Marcellus	Appalachian Basin	2011	20	90	240	116.67
50670463	Devonian Siltstone and Shale	Appalachian Basin	2002	20	86.36	240	115.45
50670464	Marcellus Shale	Appalachian Basin	2002	20	88.89	200	102.96
50440161	Delaware/Pecos Basins Woodford Continuous Shale Gas	Permian Basin	2007	40	80	160	93.33
50440162	Delaware/Pecos Basins Barnett Continuous Shale Gas	Permian Basin	2007	40	80	160	93.33
50440163	Midland Basin Woodford/Barnett Continuous Gas	Permian Basin	2007	40	80	160	93.33
50630561	Devonian Antrim Continuous Gas	Michigan Basin	2004	20	80	160	86.67
50670462	Northwestern Ohio Shale	Appalachian Basin	2002	10	74.67	160	81.56
50450161	Greater Newark East Frac-Barrier Continuous Barnett Shale Gas	Bend Arch-Fort Worth Basin	2003	10	40	110	53.33
50450162	Extended Continuous Barnett Shale Gas	Bend Arch-Fort Worth Basin	2003	10	40	110	53.33

Table 3. Input data for estimated area of cells (drainage areas) for United States coalbed-gas assessment units, values in acres.

[AU, assessment unit]

AU number	AU name	Province	Year assessed	Minimum cell area	Mode of cell area	Maximum cell area	Mean cell area
50220181	Fruitland Fairway Coalbed Gas	San Juan Basin	2002	20	149.33	320	163.11
50620481	Arkoma Coalbed Gas	Arkoma Basin	2010	40	160	280	160.00
50640481	Desmoinesian-Virgilian Coalbed Gas	Illinois Basin	2007	60	160	260	160.00
50350281	Mesaverde Coalbed Gas	Wind River Basin	2005	40	120	280	146.67
50350282	Meeteetse Coalbed Gas	Wind River Basin	2005	40	120	280	146.67
50410181	Raton Coalbed Gas	Raton Basin-	2004	80	120	240	146.67
		Sierra Grande Uplift					
50410182	Vermejo Coalbed Gas	Raton Basin-	2004	80	120	240	146.67
		Sierra Grande Uplift					
50010181	Nanushuk Formation Coalbed Gas	Northern Alaska	2006	40	100	280	140.00
50210581	Kaiparowits Plateau	Paradox Basin	2011	40	67	280	129.00
50200181	Northern Coal Fairway/Drunkards Wash	Uinta-Piceance	2000	40	66.67	280	128.89
50200281	Uinta Basin Blackhawk Coalbed Gas	Uinta-Piceance	2000	40	66.67	280	128.89
50200282	Mesaverde Group Coalbed Gas	Uinta-Piceance	2000	40	66.67	280	128.89
50220381	Menefee Coalbed Gas	San Juan Basin	2002	40	66.67	280	128.89
50370581	Mesaverde Coalbed Gas	Southwestern Wyoming	2002	40	66.67	280	128.89
50370681	Mesaverde Coalbed Gas	Southwestern Wyoming	2002	40	66.67	280	128.89
50340281	Mesaverde-Meeteetse Formation Coalbed Gas	Big Horn Basin	2008	40	100	240	126.67
50200183	Southern Coal Fairway	Uinta-Piceance	2000	40	57.96	250	115.99
50010182	Prince Creek-Tuluvak Formations Coalbed Gas	Northern Alaska	2006	40	100	200	113.33
50010183	Sagavanirktok Formation Coalbed Gas	Northern Alaska	2006	40	100	200	113.33
50340282	Fort Union Formation Coalbed Gas	Big Horn Basin	2008	40	100	200	113.33
50200182	Central Coal Fairway/Buzzards Bench	Uinta-Piceance	2000	40	41.39	250	110.46
50200185	Southern Coal Outcrop	Uinta-Piceance	2001	40	41.39	250	110.46
50360281	Frontier-Adaville-Evanston Coalbed Gas	Wyoming Thrust Belt	2003	40	40	250	110.00
50220182	Basin Fruitland Coalbed Gas	San Juan Basin	2002	20	61.82	240	107.27
50311081	Fort Union Coalbed Gas	Williston Basin	2008	40	100	180	106.67
50040381	Eocene Coalbed Gas	Western Oregon-	2009	40	80	180	100.00
		Washington					
50030281	Cook Inlet Coalbed Gas	Southern Alaska	2011	40	80	140	86.67
50350283	Fort Union Coalbed Gas	Wind River Basin	2005	40	80	140	86.67
50330181	Wasatch Formation	Powder River Basin	2000	40	68	140	82.67
50330182	Upper Fort Union Formation	Powder River Basin	2000	40	68	140	82.67
50330183	Lower Fort Union-Lance Formations	Powder River Basin	2000	40	68	140	82.67
50370682	Fort Union Coalbed Gas	Southwestern Wyoming	2002	40	68	140	82.67
50370881	Lance Coalbed Gas	Southwestern Wyoming	2002	40	68	140	82.67
50370882	Fort Union Coalbed Gas	Southwestern Wyoming	2002	40	68	140	82.67
50370981	Wasatch-Green River Coalbed Gas	Southwestern Wyoming	2002	40	68	140	82.67
50650281	Warrior Basin	Warrior Basin	2002	30	40	120	63.33
50670581	Pocahontas Basin	Appalachian Basin	2002	40	46.67	100	62.22
50470381	Wilcox Coalbed Gas	Gulf Coast Cenozoic	2007	10	40	120	56.67
50670582	Eastern Dunkard Basin	Appalachian Basin	2002	30	36.67	90	52.22
50470281	Cretaceous Olmos Coalbed Gas	Gulf Coast Cenozoic	2007	10	40	80	43.33
53000281	Rio Escondido Basin Olmos Coalbed Gas	Burgos Basin	2007	10	40	80	43.33

Table 4. Input data for estimated area of cells (drainage areas) for United States tight-gas assessment units, values in acres.

[AU, assessment unit]

AU number	AU name	Province	Year assessed	Minimum cell area	Mode of cell area	Maximum cell area	Mean cell area
50340263	Cody Sandstone Continuous Gas	Big Horn Basin	2008	40	160	640	280.00
50350262	Cody Sandstones Continuous Gas	Wind River Basin	2005	40	160	640	280.00
50280162	Eagle Sandstone and Claggett Shale East	North-Central Montana	2000	80	158.99	320	186.33
50280163	Eagle Sandstone and Claggett Shale West	North-Central Montana	2000	80	158.99	320	186.33
50280165	Greenhorn-Lower Belle Fourche	North-Central Montana	2000	80	158.99	320	186.33
50280166	Greenhorn-Upper Belle Fourche	North-Central Montana	2000	80	158.99	320	186.33
50030161	Tuxedni-Naknek Continuous Gas	Southern Alaska	2011	80	140	320	180.00
50370561	Almond Continuous Gas	Southwestern Wyoming	2002	40	40.58	449	176.53
50200161	Deep (6,000 feet plus) Coal and Sandstone Gas	Uinta-Piceance	2000	60	123.08	320	167.69
50330461	Shallow Continuous Biogenic Gas	Powder River Basin	2002	40	137.14	320	165.71
50280161	Judith River Formation	North-Central Montana	2000	40	160	280	160.00
50350261	Frontier-Muddy Continuous Gas	Wind River Basin	2005	40	120	300	153.33
50620161	Arkoma-Ouachita Foredeep Continuous	Arkoma Basin	2010	40	100	320	153.33
50220361	Mesaverde Central-Basin Continuous Gas	San Juan Basin	2002	40	88.57	320	149.52
50280164	Niobrara-Carlile	North-Central Montana	2000	40	88.57	320	149.52
50220363	Dakota-Greenhorn Continuous Gas	San Juan Basin	2002	40	43.59	360	147.86
50200363	Uinta-Piceance Transitional and Migrated Gas	Uinta-Piceance	2000	30	124.76	240	131.59
50370261	Mowry Continuous Gas	Southwestern Wyoming	2002	40	50.77	300	130.26
50340261	Muddy-Frontier Sandstone and Mowry Fractured Shale Continuous Gas	Big Horn Basin	2008	40	50	300	130.00
50050161	Columbia Basin Continuous Gas	Eastern Oregon-Washington	2006	40	120	200	120.00
50700161	Taylorsville Basin Continuous Gas	Atlantic Coastal Plain	2011	40	80	240	120.00
50700261	Richmond Basin Continuous Gas	Atlantic Coastal Plain	2011	40	80	240	120.00
50700361	South Newark Basin Continuous Gas	Atlantic Coastal Plain	2011	40	80	240	120.00
50700461	Deep River Basin Continuous Gas	Atlantic Coastal Plain	2011	40	80	240	120.00
50701061	Dan River-Danville Basin Continuous Gas	Atlantic Coastal Plain	2011	40	80	240	120.00
50200361	Piceance Basin Continuous Gas	Uinta-Piceance	2000	30	79.05	240	116.35
50200362	Uinta Basin Continuous Gas	Uinta-Piceance	2000	30	79.05	240	116.35
50280167	Bowdoin Dome	North-Central Montana	2000	40	121.67	160	107.22
50220261	Lewis Continuous Gas	San Juan Basin	2002	40	75	200	105.00
50220362	Mancos Sandstones Continuous Gas	San Juan Basin	2002	40	75	200	105.00
50370661	Mesaverde-Lance-Fort Union Continuous Gas	Southwestern Wyoming	2002	40	75	200	105.00
50370761	Lewis Continuous Gas	Southwestern Wyoming	2002	20	88.89	200	102.96
50670461	Greater Big Sandy	Appalachian Basin	2002	20	88.89	200	102.96
50200261	Uinta Basin Continuous Gas	Uinta-Piceance	2000	20	40.87	240	100.29
50200262	Uinta Basin Transitional Gas	Uinta-Piceance	2000	20	40.87	240	100.29
50220161	Pictured Cliffs Continuous Gas	San Juan Basin	2002	40	48.75	200	96.25
50390662	Dakota Group Basin-Center Gas	Denver Basin	2001	10	17.39	240	89.13
50370861	Lance-Fort Union Continuous Gas	Southwestern Wyoming	2002	20	40	200	86.67
50200264	Piceance Basin Transitional Gas	Uinta-Piceance	2000	20	55	180	85.00
50370461	Hilliard-Baxter-Mancos Continuous Gas	Southwestern Wyoming	2002	20	55	180	85.00
50370562	Rock Springs-Ericson Continuous Gas	Southwestern Wyoming	2002	20	55	180	85.00
50670364	Tuscarora Basin Center	Appalachian Basin	2002	40	53.33	160	84.44
50340264	Mesaverde Sandstone Continuous Gas	Big Horn Basin	2008	20	50	180	83.33
50350264	Mesaverde-Meeteetse Sandstone Gas	Wind River Basin	2005	20	50	180	83.33
50350265	Lance-Fort Union Sandstone Gas	Wind River Basin	2005	20	60	160	80.00
50200263	Piceance Basin Continuous Gas	Uinta-Piceance	2000	20	20.39	180	73.46
50670465	Catskill Sandstones and Siltstones	Appalachian Basin	2002	10	41.54	140	63.85
50670361	Clinton-Medina Basin Center	Appalachian Basin	2002	10	12	110	44.00
50670362	Clinton-Medina Transitional Northeast	Appalachian Basin	2002	10	12	110	44.00
50670363	Clinton-Medina Transitional	Appalachian Basin	2002	10	12	110	44.00
50670466	Berea Sandstone	Appalachian Basin	2002	10	34.29	80	41.43

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Table 5. Input data for estimated area of cells (drainage areas) for United States continuous-oil assessment units, values in acres.

[AU, assessment unit]

AU number	AU name	Province	Year assessed	Minimum cell area	Mode of cell area	Maximum cell area	Mean cell area
50210361	Cane Creek Shale Oil	Paradox Basin	2011	80	320	800	400.00
50210363	Gothic, Chimney Rock, Hovenweep Shale Oil	Paradox Basin	2011	80	320	800	400.00
50310161	Elm Coulee-Billings Nose	Williston Basin	2008	80	320	800	400.00
50310163	Nesson-Little Knife Structural	Williston Basin	2008	80	320	800	400.00
50310164	Eastern Expulsion Threshold	Williston Basin	2008	80	320	800	400.00
50310165	Northwest Expulsion Threshold	Williston Basin	2008	80	320	800	400.00
50200561	Deep Uinta Overpressured Continuous Oil	Uinta-Piceance	2000	80	239.20	640	319.73
50310162	Central Basin-Poplar Dome	Williston Basin	2008	80	200	640	306.67
50340262	Mowry Fractured Shale Continuous Oil	Big Horn Basin	2008	40	185	640	288.33
50330261	Mowry Continuous Oil	Powder River Basin	2002	40	183.67	640	287.89
50490170	Eagle Ford Shale Oil	Gulf Coast Mesozoic	2010	80	128	320	176.00
50270561	Marias River Shale Continuous Oil	Montana Thrust Belt	2002	40	80	400	173.33
50300361	Niobrara Continuous Oil	Hanna, Laramie, Shirley Basins	2005	40	160	320	173.33
50370361	Niobrara Continuous Oil	Southwestern Wyoming	2002	40	80	400	173.33
50490168	Austin Pearsall-Giddings Area Oil	Gulf Coast Mesozoic	2010	100	140	240	160.00
50330361	Niobrara Continuous Oil	Powder River Basin	2002	10	87.10	320	139.03
50580162	Woodford Shale Oil	Anadarko Basin	2010	10	85	320	138.33
50390261	Fractured Niobrara Limestone (Silo Field Area)	Denver Basin	2001	10	10.57	320	113.52
50440165	Spraberry Continuous Oil	Permian Basin	2007	40	80	120	80.00
50390661	Niobrara-Codell (Wattenberg Area)	Denver Basin	2001	10	18.33	85	37.78

Table 6. Input data for estimated percent of untested area in sweet spots for United States shale-gas assessment units.

[AU, assessment unit; %, percent]

AU number	AU name	Province	Year assessed	Minimum sweet spot %	Mode of sweet spot %	Maximum sweet spot %	Mean sweet spot %
50450161	Greater Newark East Frac-Barrier Continuous Barnett Shale Gas	Bend Arch-Fort Worth Basin	2003	75	88	95	86.00
50490161	Haynesville Sabine Platform Shale Gas	Gulf Coast Mesozoic	2010	35	60	90	61.67
50450162	Extended Continuous Barnett Shale Gas	Bend Arch-Fort Worth Basin	2003	35	55	90	60.00
50210362	Cane Creek Shale Gas	Paradox Basin	2011	5	60	90	51.67
50620362	Fayetteville Shale Gas-High Gamma-Ray Depocenter	Arkoma Basin	2010	25	50	80	51.67
50490163	Mid-Bossier Sabine Platform Shale Gas	Gulf Coast Mesozoic	2010	15	35	85	45.00
50620261	Woodford Shale Gas	Arkoma Basin	2010	10	35	70	38.33
50620363	Fayetteville Shale Gas-Western Arkansas Basin Margin	Arkoma Basin	2010	5	40	70	38.33
50670468	Interior Marcellus	Appalachian Basin	2011	10	25	75	36.67
50580161	Woodford Shale Gas	Anadarko Basin	2010	5	35	60	33.33
50490165	Maverick Basin Pearsall Shale Gas	Gulf Coast Mesozoic	2010	1	15	80	32.00
50440163	Midland Basin Woodford/Barnett Continuous Gas	Permian Basin	2007	9	25	60	31.33
50440161	Delaware/Pecos Basins Woodford Continuous Shale Gas	Permian Basin	2007	12	32	43	29.00
50580261	Thirteen Finger Limestone-Atoka Shale Gas	Anadarko Basin	2010	1	20	60	27.00
50670463	Devonian Siltstone and Shale	Appalachian Basin	2002	14	19.93	44	25.98
50440162	Delaware/Pecos Basins Barnett Continuous Shale Gas	Permian Basin	2007	8	20	43	23.67
50620262	Chattanooga Shale Gas	Arkoma Basin	2010	3	18	45	22.00
50210364	Gothic, Chimney Rock, Hovenweep Shale Gas	Paradox Basin	2011	0.5	25	40	21.83
50620364	Caney Shale Gas	Arkoma Basin	2010	1	20	40	20.33
50490167	Eagle Ford Shale Gas	Gulf Coast Mesozoic	2010	0.5	12	30	14.17
50670462	Northwestern Ohio Shale	Appalachian Basin	2002	6	8.33	27	13.78
50640361	Devonian to Mississippian New Albany Continuous Gas	Illinois Basin	2007	0.4	3	30	11.13
50670464	Marcellus Shale	Appalachian Basin	2002	0.1	5.17	17	7.42
50670469	Western Margin Marcellus	Appalachian Basin	2011	0.5	6.5	15	7.33
50670467	Foldbelt Marcellus	Appalachian Basin	2011	0.5	3	10	4.50
50630561	Devonian Antrim Continuous Gas	Michigan Basin	2004	2	3.5	5	3.50
50390761	Niobrara Chalk	Denver Basin	2001	0.2	0.25	3.9	1.45

Table 7. Input data for estimated percent of untested area in sweet spots for United States coalbed-gas assessment units.

[AU, assessment unit; %, percent]

AU number	AU name	Province	Year assessed	Minimum sweet spot %	Mode of sweet spot %	Maximum sweet spot %	Mean sweet spot %
50220181	Fruitland Fairway Coalbed Gas	San Juan Basin	2002	93	95	97	95.00
50220182	Basin Fruitland Coalbed Gas	San Juan Basin	2002	45	58.33	60	54.44
50200181	Northern Coal Fairway/Drunkards Wash	Uinta-Piceance	2000	10	68.70	79	52.57
50670581	Pocahontas Basin	Appalachian Basin	2002	35	42	60	45.67
50200182	Central Coal Fairway/Buzzards Bench	Uinta-Piceance	2000	5	48.56	55	36.19
50620481	Arkoma Coalbed Gas	Arkoma Basin	2010	15	30	60	35.00
50200185	Southern Coal Outcrop	Uinta-Piceance	2001	8	16	80	34.67
50330182	Upper Fort Union Formation	Powder River Basin	2000	10	31.96	58	33.32
50200183	Southern Coal Fairway	Uinta-Piceance	2000	1	48.18	50	33.06
50410182	Vermejo Coalbed Gas	Raton Basin-	2004	10	25	50	28.33
		Sierra Grande Uplift					
50650281	Warrior Basin	Warrior Basin	2002	9.2	30.66	39.4	26.42
50030281	Cook Inlet Coalbed Gas	Southern Alaska	2011	0.5	6	63	23.17
50670582	Eastern Dunkard Basin	Appalachian Basin	2002	4	20.52	35	19.84
50210581	Kaiparowits Plateau	Paradox Basin	2011	0.5	15	40	18.50
50360281	Frontier-Adaville-Evanston Coalbed Gas	Wyoming Thrust Belt	2003	1	10	41	17.33
50410181	Raton Coalbed Gas	Raton Basin-	2004	4	13	34	17.00
		Sierra Grande Uplift					
50010181	Nanushuk Formation Coalbed Gas	Northern Alaska	2006	0.5	7.5	38	15.33
50010183	Sagavanirktok Formation Coalbed Gas	Northern Alaska	2006	0.3	8	35	14.43
50330181	Wasatch Formation	Powder River Basin	2000	1	13.52	24	12.84
53000281	Rio Escondido Basin Olmos Coalbed Gas	Burgos Basin	2007	1	11	25	12.33
50350281	Mesaverde Coalbed Gas	Wind River Basin	2005	1	7	27	11.67
50370882	Fort Union Coalbed Gas	Southwestern Wyoming	2002	3	8.24	20	10.41
50370581	Mesaverde Coalbed Gas	Southwestern Wyoming	2002	1	9.47	20	10.16
50370681	Mesaverde Coalbed Gas	Southwestern Wyoming	2002	1	9.47	20	10.16
50220381	Menefee Coalbed Gas	San Juan Basin	2002	1	2.08	27	10.03
50470281	Cretaceous Olmos Coalbed Gas	Gulf Coast Cenozoic	2007	1	8	20	9.67
50040381	Eocene Coalbed Gas	Western Oregon-	2009	1	3.10	22	8.70
		Washington					
50470381	Wilcox Coalbed Gas	Gulf Coast Cenozoic	2007	0.1	5	20	8.37
50200281	Uinta Basin Blackhawk Coalbed Gas	Uinta-Piceance	2000	0.5	2.67	20	7.72
50640481	Desmoinesian-Virgilian Coalbed Gas	Illinois Basin	2007	0.25	4	16	6.75
50370981	Wasatch-Green River Coalbed Gas	Southwestern Wyoming	2002	1	3.43	15	6.48
50010182	Prince Creek-Tuluva Formations Coalbed Gas	Northern Alaska	2006	0.2	5	14	6.40
50350282	Meeteetse Coalbed Gas	Wind River Basin	2005	1	3	15	6.33
50340281	Mesaverde-Meeteetse Formation Coalbed Gas	Big Horn Basin	2008	0.5	2.50	14	5.67
50200282	Mesaverde Group Coalbed Gas	Uinta-Piceance	2000	1	1.54	14	5.51
50350283	Fort Union Coalbed Gas	Wind River Basin	2005	0.5	3	13	5.50
50370682	Fort Union Coalbed Gas	Southwestern Wyoming	2002	1	2	10	4.33
50330183	Lower Fort Union-Lance Formations	Powder River Basin	2000	0.002	1.00	9	3.33
50370881	Lance Coalbed Gas	Southwestern Wyoming	2002	1	1.67	7	3.22
50311081	Fort Union Coalbed Gas	Williston Basin	2008	0.01	2	7	3.00
50340282	Fort Union Formation Coalbed Gas	Big Horn Basin	2008	0.1	1	3	1.37

Table 8. Input data for estimated percent of untested area in sweet spots for United States tight-gas assessment units.

[AU, assessment unit; %, percent]

AU number	AU name	Province	Year assessed	Minimum sweet spot %	Mode of sweet spot %	Maximum sweet spot %	Mean sweet spot %
50220362	Mancos Sandstones Continuous Gas	San Juan Basin	2002	35	66.25	75	58.75
50220363	Dakota-Greenhorn Continuous Gas	San Juan Basin	2002	46	46.6	76	56.20
50670363	Clinton-Medina Transitional	Appalachian Basin	2002	40	50.84	77	55.95
50670461	Greater Big Sandy	Appalachian Basin	2002	14	61.35	85	53.45
50370561	Almond Continuous Gas	Southwestern Wyoming	2002	35	47.90	76	52.97
50670361	Clinton-Medina Basin Center	Appalachian Basin	2002	10	51.03	88	49.68
50370562	Rock Springs-Ericson Continuous Gas	Southwestern Wyoming	2002	28	45.82	72	48.61
50370761	Lewis Continuous Gas	Southwestern Wyoming	2002	18	40.41	69	42.47
50030161	Tuxedni-Naknek Continuous Gas	Southern Alaska	2011	0.5	24	95	39.83
50220161	Pictured Cliffs Continuous Gas	San Juan Basin	2002	14	46.06	47	35.69
50700261	Richmond Basin Continuous Gas	Atlantic Coastal Plain	2011	7.5	21	76	34.83
50700361	South Newark Basin Continuous Gas	Atlantic Coastal Plain	2011	1	21	81	34.33
50220261	Lewis Continuous Gas	San Juan Basin	2002	23	37.24	40	33.41
50700461	Deep River Basin Continuous Gas	Atlantic Coastal Plain	2011	6	21	71	32.67
50390662	Dakota Group Basin-Center Gas	Denver Basin	2001	20	27	45	30.67
50200261	Uinta Basin Continuous Gas	Uinta-Piceance	2000	4	33.39	50	29.13
50670465	Catskill Sandstones and Siltstones	Appalachian Basin	2002	15	17.42	53	28.47
50700161	Taylorville Basin Continuous Gas	Atlantic Coastal Plain	2011	6	19	60	28.33
50200363	Uinta-Piceance Transitional and Migrated Gas	Uinta-Piceance	2000	20	29.14	34	27.71
50370661	Mesaverde-Lance-Fort Union Continuous Gas	Southwestern Wyoming	2002	14	16.55	45	25.18
50370861	Lance-Fort Union Continuous Gas	Southwestern Wyoming	2002	5	27.86	40	24.29
50620161	Arkoma-Ouachita Foredeep Continuous	Arkoma Basin	2010	2	20	50	24.00
50050161	Columbia Basin Continuous Gas	Eastern Oregon-Washington	2006	5	20	40	21.67
50220361	Mesaverde Central-Basin Continuous Gas	San Juan Basin	2002	15	23.91	26	21.64
50670466	Berea Sandstone	Appalachian Basin	2002	3	5.15	55	21.05
50200262	Uinta Basin Transitional Gas	Uinta-Piceance	2000	12	13.08	38	21.03
50200263	Piceance Basin Continuous Gas	Uinta-Piceance	2000	8	18.33	35	20.44
50280167	Bowdoin Dome	North-Central Montana	2000	8	20	32	20.00
50200361	Piceance Basin Continuous Gas	Uinta-Piceance	2000	4	6.29	49	19.76
50670362	Clinton-Medina Transitional Northeast	Appalachian Basin	2002	2	4.63	50	18.88
50701061	Dan River-Danville Basin Continuous Gas	Atlantic Coastal Plain	2011	0.2	5	45	16.73
50370461	Hilliard-Baxter-Mancos Continuous Gas	Southwestern Wyoming	2002	2	7.53	36	15.18
50200264	Piceance Basin Transitional Gas	Uinta-Piceance	2000	1	13.74	20	11.58
50200161	Deep (6,000 feet plus) Coal and Sandstone Gas	Uinta-Piceance	2000	1	2.41	30	11.14
50200362	Uinta Basin Continuous Gas	Uinta-Piceance	2000	5	5.54	18	9.51
50370261	Mowry Continuous Gas	Southwestern Wyoming	2002	6	9	12	9.00
50340261	Muddy-Frontier Sandstone and Mowry Fractured Shale Continuous Gas	Big Horn Basin	2008	0.6	2	22.5	8.37
50340263	Cody Sandstone Continuous Gas	Big Horn Basin	2008	0.3	3	19.6	7.63
50280161	Judith River Formation	North-Central Montana	2000	0.1	0.30	20	6.80
50350265	Lance-Fort Union Sandstone Gas	Wind River Basin	2005	2	4	12	6.00
50280163	Eagle Sandstone and Claggett Shale West	North-Central Montana	2000	0.8	2.51	13	5.44
50330461	Shallow Continuous Biogenic Gas	Powder River Basin	2002	1	2.72	12.5	5.41
50350261	Frontier-Muddy Continuous Gas	Wind River Basin	2005	0.7	1.6	9	3.77
50340264	Mesaverde Sandstone Continuous Gas	Big Horn Basin	2008	0.2	2.1	8.5	3.60
50350262	Cody Sandstones Continuous Gas	Wind River Basin	2005	0.8	1.4	8	3.40
50350264	Mesaverde-Meeteetse Sandstone Gas	Wind River Basin	2005	0.5	1.5	7	3.00
50280162	Eagle Sandstone and Claggett Shale East	North-Central Montana	2000	0.1	1.33	5	2.14
50280166	Greenhorn-Upper Belle Fourche	North-Central Montana	2000	0.1	0.16	3.1	1.12
50670364	Tuscarora Basin Center	Appalachian Basin	2002	0.1	0.29	2.6	1.00
50280165	Greenhorn-Lower Belle Fourche	North-Central Montana	2000	0.1	0.14	2.1	0.78
50280164	Niobrara-Carlile	North-Central Montana	2000	0.01	0.04	1	0.35

Table 9. Input data for estimated percent of untested area in sweet spots for United States continuous-oil assessment units.

[AU, assessment unit; %, percent]

AU number	AU name	Province	Year assessed	Minimum sweet spot %	Mode of sweet spot %	Maximum sweet spot %	Mean sweet spot %
50310161	Elm Coulee-Billings Nose	Williston Basin	2008	80	92	95	89.00
50310163	Nesson-Little Knife Structural	Williston Basin	2008	75	92	98	88.33
50310164	Eastern Expulsion Threshold	Williston Basin	2008	70	85	96	83.67
50310162	Central Basin-Poplar Dome	Williston Basin	2008	50	80	92	74.00
50310165	Northwest Expulsion Threshold	Williston Basin	2008	30	75	92	65.67
50200561	Deep Uinta Overpressured Continuous Oil	Uinta-Piceance	2000	35	40	80	51.67
50440165	Spraberry Continuous Oil	Permian Basin	2007	22	58	66	48.67
50210361	Cane Creek Shale Oil	Paradox Basin	2011	5	35	92	44.00
50490168	Austin Pearsall-Giddings Area Oil	Gulf Coast Mesozoic	2010	16	30	75	40.33
50330261	Mowry Continuous Oil	Powder River Basin	2002	8	23.38	45	25.46
50490170	Eagle Ford Shale Oil	Gulf Coast Mesozoic	2010	0.5	9	40	16.50
50330361	Niobrara Continuous Oil	Powder River Basin	2002	4.1	17.20	27.2	16.17
50210363	Gothic, Chimney Rock, Hovenweep Shale Oil	Paradox Basin	2011	0.5	15	30	15.17
50300361	Niobrara Continuous Oil	Hanna, Laramie, Shirley Basins	2005	1	4	25	10.00
50390661	Niobrara-Codell (Wattenberg Area)	Denver Basin	2001	2	5.15	15	7.38
50580162	Woodford Shale Oil	Anadarko Basin	2010	0.25	5	15	6.75
50340262	Mowry Fractured Shale Continuous Oil	Big Horn Basin	2008	0.1	1.25	17	6.12
50370361	Niobrara Continuous Oil	Southwestern Wyoming	2002	2	5	8	5.00
50390261	Fractured Niobrara Limestone (Silo Field Area)	Denver Basin	2001	2	2.67	8	4.22
50270561	Marias River Shale Continuous Oil	Montana Thrust Belt	2002	0.5	2.6	8	3.70

Table 10. Input data for estimated ultimate recovery distributions for United States shale-gas assessment units, values in billions of cubic feet of natural gas.

[AU, assessment unit; EUR, estimated ultimate recovery]

AU number	AU name	Province	Year assessed	Minimum EUR	Median EUR	Maximum EUR	Mean EUR
50490161	Haynesville Sabine Platform Shale Gas	Gulf Coast Mesozoic	2010	0.02	2	20	2.617
50490163	Mid-Bossier Sabine Platform Shale Gas	Gulf Coast Mesozoic	2010	0.02	1	10	1.308
50580161	Woodford Shale Gas	Anadarko Basin	2010	0.02	0.8	15	1.233
50670468	Interior Marcellus	Appalachian Basin	2011	0.02	0.8	12	1.158
50490167	Eagle Ford Shale Gas	Gulf Coast Mesozoic	2010	0.02	0.8	10	1.104
50620362	Fayetteville Shale Gas-High Gamma-Ray Depocenter	Arkoma Basin	2010	0.02	0.8	10	1.104
50450161	Greater Newark East Frac-Barrier Continuous Barnett Shale Gas	Bend Arch-Fort Worth Basin	2003	0.02	0.7	10	1.000
50440161	Delaware/Pecos Basins Woodford Continuous Shale Gas	Permian Basin	2007	0.02	0.6	8	0.842
50440162	Delaware/Pecos Basins Barnett Continuous Shale Gas	Permian Basin	2007	0.02	0.6	8	0.842
50580261	Thirteen Finger Limestone-Atoka Shale Gas	Anadarko Basin	2010	0.02	0.5	10	0.785
50620261	Woodford Shale Gas	Arkoma Basin	2010	0.02	0.5	10	0.785
50210364	Gothic, Chimney Rock, Hovenweep Shale Gas	Paradox Basin	2011	0.02	0.4	10	0.672
50630561	Devonian Antrim Continuous Gas	Michigan Basin	2004	0.02	0.4	4	0.523
50620363	Fayetteville Shale Gas - Western Arkansas Basin Margin	Arkoma Basin	2010	0.02	0.3	6	0.470
50210362	Cane Creek Shale Gas	Paradox Basin	2011	0.02	0.3	5	0.446
50440163	Midland Basin Woodford/Barnett Continuous Gas	Permian Basin	2007	0.02	0.3	5	0.446
50490165	Maverick Basin Pearsall Shale Gas	Gulf Coast Mesozoic	2010	0.02	0.25	5	0.391
50450162	Extended Continuous Barnett Shale Gas	Bend Arch-Fort Worth Basin	2003	0.02	0.2	5	0.334
50390761	Niobrara Chalk	Denver Basin	2001	0.025	0.2	2	0.261
50620262	Chattanooga Shale Gas	Arkoma Basin	2010	0.02	0.1	6	0.223
50670467	Foldbelt Marcellus	Appalachian Basin	2011	0.02	0.1	5	0.208
50620364	Caney Shale Gas	Arkoma Basin	2010	0.02	0.08	5	0.179
50670469	Western Margin Marcellus	Appalachian Basin	2011	0.02	0.05	5	0.129
50640361	Devonian to Mississippian New Albany Continuous Gas	Illinois Basin	2007	0.01	0.08	1	0.110
50670462	Northwestern Ohio Shale	Appalachian Basin	2002	0.01	0.04	0.5	0.055
50670463	Devonian Siltstone and Shale	Appalachian Basin	2002	0.01	0.03	0.5	0.044
50670464	Marcellus Shale	Appalachian Basin	2002	0.01	0.03	0.5	0.044

Table 11. Input data for estimated ultimate recovery distributions for United States coalbed-gas assessment units, values in billions of cubic feet of natural gas.

[AU, assessment unit; EUR, estimated ultimate recovery]

AU number	AU name	Province	Year assessed	Minimum EUR	Median EUR	Maximum EUR	Mean EUR
50220181	Fruitland Fairway Coalbed Gas	San Juan Basin	2002	0.02	8	40	9.125
50200181	Northern Coal Fairway/Drunkards Wash	Uinta-Piceance	2000	0.05	0.8	12	1.156
50220182	Basin Fruitland Coalbed Gas	San Juan Basin	2002	0.02	0.6	20	1.110
50200182	Central Coal Fairway/Buzzards Bench	Uinta-Piceance	2000	0.05	0.4	10	0.666
50010181	Nanushuk Formation Coalbed Gas	Northern Alaska	2006	0.02	0.25	12	0.524
50410182	Vermejo Coalbed Gas	Raton Basin-Sierra Grande Uplift	2004	0.02	0.25	9.5	0.481
50200281	Uinta Basin Blackhawk Coalbed Gas	Uinta-Piceance	2000	0.05	0.25	10	0.480
50360281	Frontier-Adaville-Evanston Coalbed Gas	Wyoming Thrust Belt	2003	0.02	0.4	2	0.456
50410181	Raton Coalbed Gas	Raton Basin-Sierra Grande Uplift	2004	0.02	0.25	8	0.453
50650281	Warrior Basin	Warrior Basin	2002	0.01	0.25	5	0.392
50620481	Arkoma Coalbed Gas	Arkoma Basin	2010	0.02	0.3	3	0.392
50330182	Upper Fort Union Formation	Powder River Basin	2000	0.02	0.23	4	0.345
50200183	Southern Coal Fairway	Uinta-Piceance	2000	0.05	0.2	5	0.328
50210581	Kaiparowits Plateau	Paradox Basin	2011	0.02	0.2	4	0.312
50010183	Sagavanirktok Formation Coalbed Gas	Northern Alaska	2006	0.02	0.18	5	0.310
50330181	Wasatch Formation	Powder River Basin	2000	0.02	0.18	3	0.267
50370882	Fort Union Coalbed Gas	Southwestern Wyoming	2002	0.02	0.2	1.5	0.246
50670581	Pocahontas Basin	Appalachian Basin	2002	0.01	0.15	2	0.210
50350281	Mesaverde Coalbed Gas	Wind River Basin	2005	0.02	0.1	5	0.208
50030281	Cook Inlet Coalbed Gas	Southern Alaska	2011	0.02	0.16	1.5	0.206
50370881	Lance Coalbed Gas	Southwestern Wyoming	2002	0.02	0.15	1	0.180
50200282	Mesaverde Group Coalbed Gas	Uinta-Piceance	2000	0.02	0.08	5	0.179
50220381	Menefee Coalbed Gas	San Juan Basin	2002	0.02	0.08	5	0.179
50200185	Southern Coal Outcrop	Uinta-Piceance	2001	0.05	0.1	3	0.165
50670582	Eastern Dunkard Basin	Appalachian Basin	2002	0.01	0.1	2	0.156
50040381	Eocene Coalbed Gas	Western Oregon-Washington	2009	0.02	0.1	2	0.155
50010182	Prince Creek-Tuluvak Formations Coalbed Gas	Northern Alaska	2006	0.02	0.1	1.5	0.143
50340281	Mesaverde-Meeteetse Formation Coalbed Gas	Big Horn Basin	2008	0.02	0.1	1.2	0.136
50350282	Meeteetse Coalbed Gas	Wind River Basin	2005	0.02	0.08	2	0.131
50350283	Fort Union Coalbed Gas	Wind River Basin	2005	0.02	0.08	2	0.131
50370682	Fort Union Coalbed Gas	Southwestern Wyoming	2002	0.02	0.1	1	0.130
50370981	Wasatch-Green River Coalbed Gas	Southwestern Wyoming	2002	0.02	0.1	0.8	0.124
50311081	Fort Union Coalbed Gas	Williston Basin	2008	0.02	0.085	1	0.114
50330183	Lower Fort Union-Lance Formations	Powder River Basin	2000	0.02	0.085	1	0.114
50340282	Fort Union Formation Coalbed Gas	Big Horn Basin	2008	0.02	0.08	1	0.109
50370581	Mesaverde Coalbed Gas	Southwestern Wyoming	2002	0.02	0.06	2	0.106
50370681	Mesaverde Coalbed Gas	Southwestern Wyoming	2002	0.02	0.06	2	0.106
50470381	Wilcox Coalbed Gas	Gulf Coast Cenozoic	2007	0.01	0.05	0.5	0.065
53000281	Rio Escondido Basin Olmos Coalbed Gas	Burgos Basin	2007	0.01	0.03	0.3	0.039
50640481	Desmoinesian-Virgilian Coalbed Gas	Illinois Basin	2007	0.01	0.03	0.25	0.037
50470281	Cretaceous Olmos Coalbed Gas	Gulf Coast Cenozoic	2007	0.01	0.03	0.1	0.032

Table 12. Input data for estimated ultimate recovery distributions for United States tight-gas assessment units, values in billions of cubic feet of natural gas.

[AU, assessment unit; EUR, estimated ultimate recovery]

AU number	AU name	Province	Year assessed	Minimum EUR	Median EUR	Maximum EUR	Mean EUR
50370661	Mesaverde-Lance-Fort Union Continuous Gas	Southwestern Wyoming	2002	0.02	1.2	15	1.657
50370561	Almond Continuous Gas	Southwestern Wyoming	2002	0.02	0.9	20	1.460
50200261	Uinta Basin Continuous Gas	Uinta-Piceance	2000	0.02	0.5	40	1.293
50030161	Tuxedni-Naknek Continuous Gas	Southern Alaska	2011	0.02	0.6	30	1.286
50620161	Arkoma-Ouachita Foredeep Continuous	Arkoma Basin	2010	0.02	0.6	30	1.286
50350261	Frontier-Muddy Continuous Gas	Wind River Basin	2005	0.02	0.7	15	1.123
50370261	Mowry Continuous Gas	Southwestern Wyoming	2002	0.02	0.7	15	1.123
50350265	Lance-Fort Union Sandstone Gas	Wind River Basin	2005	0.02	0.6	20	1.110
50370861	Lance-Fort Union Continuous Gas	Southwestern Wyoming	2002	0.02	0.8	10	1.104
50370761	Lewis Continuous Gas	Southwestern Wyoming	2002	0.02	0.6	15	1.009
50200362	Uinta Basin Continuous Gas	Uinta-Piceance	2000	0.02	0.5	16	0.911
50200263	Piceance Basin Continuous Gas	Uinta-Piceance	2000	0.02	0.5	15	0.892
50350264	Mesaverde-Meeteetse Sandstone Gas	Wind River Basin	2005	0.02	0.5	15	0.892
50350262	Cody Sandstones Continuous Gas	Wind River Basin	2005	0.02	0.4	20	0.855
50670364	Tuscarora Basin Center	Appalachian Basin	2002	0.01	0.7	4	0.817
50220261	Lewis Continuous Gas	San Juan Basin	2002	0.02	0.5	6	0.683
50220361	Mesaverde Central-Basin Continuous Gas	San Juan Basin	2002	0.02	0.5	6	0.683
50220363	Dakota-Greenhorn Continuous Gas	San Juan Basin	2002	0.02	0.4	8	0.627
50370461	Hilliard-Baxter-Mancos Continuous Gas	Southwestern Wyoming	2002	0.02	0.4	8	0.627
50700261	Richmond Basin Continuous Gas	Atlantic Coastal Plain	2011	0.02	0.4	8	0.627
50700461	Deep River Basin Continuous Gas	Atlantic Coastal Plain	2011	0.02	0.4	8	0.627
50200161	Deep (6,000 feet plus) Coal and Sandstone Gas	Uinta-Piceance	2000	0.2	0.5	4	0.617
50200262	Uinta Basin Transitional Gas	Uinta-Piceance	2000	0.02	0.25	15	0.570
50340261	Muddy-Frontier Sandstone and Mowry Fractured Shale Continuous Gas	Big Horn Basin	2008	0.02	0.35	7.5	0.560
50220362	Mancos Sandstones Continuous Gas	San Juan Basin	2002	0.02	0.35	5	0.499
50370562	Rock Springs-Ericson Continuous Gas	Southwestern Wyoming	2002	0.02	0.4	3	0.491
50200361	Piceance Basin Continuous Gas	Uinta-Piceance	2000	0.02	0.25	10	0.490
50280163	Eagle Sandstone and Claggett Shale West	North-Central Montana	2000	0.01	0.25	9	0.475
50220161	Pictured Cliffs Continuous Gas	San Juan Basin	2002	0.02	0.25	7	0.434
50280162	Eagle Sandstone and Claggett Shale East	North-Central Montana	2000	0.01	0.2	7	0.375
50200363	Uinta-Piceance Transitional and Migrated Gas	Uinta-Piceance	2000	0.02	0.2	7	0.373
50200264	Piceance Basin Transitional Gas	Uinta-Piceance	2000	0.02	0.25	4	0.367
50280166	Greenhorn-Upper Belle Fourche	North-Central Montana	2000	0.01	0.2	6	0.356
50280167	Bowdoin Dome	North-Central Montana	2000	0.01	0.2	5	0.336
50340263	Cody Sandstone Continuous Gas	Big Horn Basin	2008	0.02	0.2	5	0.334
50340264	Mesaverde Sandstone Continuous Gas	Big Horn Basin	2008	0.02	0.2	5	0.334
50700161	Taylorville Basin Continuous Gas	Atlantic Coastal Plain	2011	0.02	0.2	5	0.334
50700361	South Newark Basin Continuous Gas	Atlantic Coastal Plain	2011	0.02	0.2	5	0.334
50280165	Greenhorn-Lower Belle Fourche	North-Central Montana	2000	0.01	0.25	2.5	0.327
50050161	Columbia Basin Continuous Gas	Eastern Oregon-Washington	2006	0.02	0.2	3	0.288
50390662	Dakota Group Basin-Center Gas	Denver Basin	2001	0.02	0.2	2.5	0.275
50670461	Greater Big Sandy	Appalachian Basin	2002	0.01	0.15	2	0.210
50701061	Dan River-Danville Basin Continuous Gas	Atlantic Coastal Plain	2011	0.02	0.1	2.5	0.165
50330461	Shallow Continuous Biogenic Gas	Powder River Basin	2002	0.01	0.08	1.5	0.122
50670361	Clinton-Medina Basin Center	Appalachian Basin	2002	0.01	0.08	1.2	0.115
50670465	Catskill Sandstones and Siltstones	Appalachian Basin	2002	0.01	0.07	1.5	0.111
50280161	Judith River Formation	North-Central Montana	2000	0.01	0.06	2	0.109
50280164	Niobrara-Carlile	North-Central Montana	2000	0.01	0.07	1	0.099
50670363	Clinton-Medina Transitional	Appalachian Basin	2002	0.01	0.06	1	0.089
50670362	Clinton-Medina Transitional Northeast	Appalachian Basin	2002	0.01	0.06	0.9	0.086
50670466	Berea Sandstone	Appalachian Basin	2002	0.01	0.03	0.5	0.044

Table 13. Input data for estimated ultimate recovery distributions for United States continuous-oil assessment units, values in millions of barrels of oil.

[AU, assessment unit; EUR, estimated ultimate recovery]

AU number	AU name	Province	Year assessed	Minimum EUR	Median EUR	Maximum EUR	Mean EUR
50310164	Eastern Expulsion Threshold	Williston Basin	2008	0.002	0.12	5	0.241
50310163	Nesson-Little Knife Structural	Williston Basin	2008	0.002	0.09	4	0.185
50210361	Cane Creek Shale Oil	Paradox Basin	2011	0.002	0.08	3	0.154
50310165	Northwest Expulsion Threshold	Williston Basin	2008	0.002	0.065	4	0.151
50310161	Elm Coulee-Billings Nose	Williston Basin	2008	0.002	0.08	2	0.135
50270561	Marias River Shale Continuous Oil	Montana Thrust Belt	2002	0.001	0.08	1.6	0.126
50370361	Niobrara Continuous Oil	Southwestern Wyoming	2002	0.001	0.08	1.6	0.126
50300361	Niobrara Continuous Oil	Hanna, Laramie, Shirley Basins	2005	0.001	0.04	1.6	0.079
50310162	Central Basin-Poplar Dome	Williston Basin	2008	0.002	0.025	2	0.064
50210363	Gothic, Chimney Rock, Hovenweep Shale Oil	Paradox Basin	2011	0.002	0.03	1.5	0.064
50580162	Woodford Shale Oil	Anadarko Basin	2010	0.003	0.03	1.5	0.064
50200561	Deep Uinta Overpressured Continuous Oil	Uinta-Piceance	2000	0.003	0.045	0.45	0.059
50440165	Spraberry Continuous Oil	Permian Basin	2007	0.001	0.045	0.4	0.057
50490170	Eagle Ford Shale Oil	Gulf Coast Mesozoic	2010	0.002	0.03	1	0.055
50490168	Austin Pearsall-Giddings Area Oil	Gulf Coast Mesozoic	2010	0.002	0.04	0.5	0.055
50330361	Niobrara Continuous Oil	Powder River Basin	2002	0.002	0.028	0.5	0.042
50330261	Mowry Continuous Oil	Powder River Basin	2002	0.002	0.025	0.35	0.035
50340262	Mowry Fractured Shale Continuous Oil	Big Horn Basin	2008	0.002	0.025	0.35	0.035
50390261	Fractured Niobrara Limestone (Silo Field Area)	Denver Basin	2001	0.002	0.022	0.4	0.033
50390661	Niobrara-Codell (Wattenberg Area)	Denver Basin	2001	0.003	0.008	0.1	0.011

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Appendix 1. Publications Presenting Results of Assessments Used in this Report

CD-ROMs

- Higley, D.K., compiler, 2007, Petroleum systems and assessment of undiscovered oil and gas in the Raton Basin—Sierra Grande Uplift Province, Colorado and New Mexico—USGS Province 41: U.S. Geological Survey Digital Data Series DDS-69-N, 141 p., 1 CD-ROM, <http://pubs.usgs.gov/dds/dds-069/dds-069-n/>.
- Higley, D.K., compiler, 2007, Petroleum systems and assessment of undiscovered oil and gas in the Denver Basin Province, Colorado, Kansas, Nebraska, South Dakota, and Wyoming—USGS Province 39: U.S. Geological Survey Digital Data Series DDS-69-P, 1 CD-ROM, <http://pubs.usgs.gov/dds/dds-069/dds-069-p/>.
- Roberts, S.B., compiler, 2008, Geologic assessment of undiscovered, technically recoverable coalbed-gas resources in Cretaceous and Tertiary rocks, North Slope and adjacent State waters, Alaska: U.S. Geological Survey Digital Data Series DDS-69-S, 4 chapters, 1 CD-ROM, <http://pubs.usgs.gov/dds/dds-069/dds-069-s/>.
- U.S. Geological Survey Bighorn Basin Assessment Team, 2010, Petroleum systems and geologic assessment of oil and gas in the Bighorn Basin Province, Wyoming and Montana: U.S. Geological Survey Digital Data Series DDS-69-V, 8 chapters, pages variable, 1 CD-ROM, <http://pubs.usgs.gov/dds/dds-069/dds-069-v/>.
- U.S. Geological Survey Black Warrior Basin Province Assessment Team, 2007, Geologic assessment of undiscovered oil and gas resources of the Black Warrior Basin Province, Alabama and Mississippi: U.S. Geological Survey Digital Data Series DDS-69-I, 5 chapters, 76 pages, 1 CD-ROM, <http://pubs.usgs.gov/dds/dds-069/dds-069-i/>.
- U.S. Geological Survey Eastern Oregon and Washington Province Assessment Team, 2008, Geologic assessment of undiscovered gas resources of the Eastern Oregon and Washington Province: U.S. Geological Survey Digital Data Series DDS-69-O, 5 chapters, 1 CD-ROM, <http://pubs.usgs.gov/dds/dds-069/dds-069-o/>.
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- U.S. Geological Survey Powder River Basin Assessment Team., 2009, Total petroleum systems and geologic assessment of oil and gas resources in the Powder River Basin Province, Wyoming and Montana: U.S. Geological Survey Digital Data Series DDS-69-U, 3 chapters, 1 CD-ROM, <http://pubs.usgs.gov/dds/dds-069/dds-069-u/>. [Revised April 2010]
- U.S. Geological Survey Powder River Basin Province Assessment Team, 2004, Total petroleum system and assessment of coalbed gas in the Powder River Basin Province, Wyoming and Montana: U.S. Geological Survey Digital Data Series DDS-69-C, 1 CD-ROM, <http://pubs.usgs.gov/dds/dds-069/dds-069-c/>.
- U.S. Geological Survey San Juan Basin Assessment Team, 2013, Total petroleum systems and geologic assessment of undiscovered oil and gas resources in the San Juan Basin Province, exclusive of Paleozoic rocks, New Mexico and Colorado: U.S. Geological Survey Digital Data Series 69-F, 7 chapters, variously paged, 1 CD-ROM, <http://pubs.usgs.gov/dds/dds-069/dds-069-f/>.
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- U.S. Geological Survey Western Gulf Province Assessment Team, 2006, Petroleum systems and geologic assessment of undiscovered oil and gas, Navarro and Taylor Groups, Western Gulf Province, Texas: U.S. Geological Survey Digital Data Series DDS-69-H, 4 chapters, 1 CD-ROM, <http://pubs.usgs.gov/dds/dds-069/dds-069-h/>.
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Appendix 2. Structure of the Files Presented in this Report

The **Main Input** file contains input data from the FORSPAN Assessment Model for Continuous Accumulations: Basic Input Data Form used in this assessment. There are records for 186 Assessment Units (AUs), 139 of which were quantitatively assessed. In the Microsoft Excel version of this file, AUs that were not quantitatively assessed are colored purple; green cells mark major changes from previously published versions, as noted in the main text of this report. Blank cells represent no data. The Main Input file is designed to incorporate data from several versions of the input form. Many of the triangular distributions were originally described using a median as input. This later changed to a mode as input. For comparison across these differences, calculated values of the median, mode, and mean are given for many of the distributions. These calculated values would be either the variable value as entered on the input form (if given in that version) or a value calculated using the other parameters. This table contains 147 columns. Data columns are as follows:

1. AU Number: assessment unit code number.
2. AU: assessment unit name.
3. Version: version of assessment input form.
4. Reservoir Type: shale gas, coalbed gas, tight gas, or continuous oil.
5. Assessment Geologist: assessing geologist's name.
6. Date: date of assessment.
7. Region Number: region code number.
8. Region: region name.
9. Province Number: province code number.
10. Province: province name.
11. TPS Number: total petroleum system (TPS) code number.
12. TPS: total petroleum system name.
13. Based on Data 1: data sources used to aid in completing the data-input form.
14. Based on Data 2: data sources used to aid in completing the data-input form.
15. Notes from Assessor 1: additional explanatory notes. Two references cited in this column are:
Jorjorian, Thomas, Liro, L.M., and Katz, B.J., 1989, Geochemical and well-log investigation of an actively generating source rock sequence—Waltman Shale, Wind River Basin, Wyoming [abs.]: American Association of Petroleum Geologists Bulletin, v. 73, no. 9, p. 1162.
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16. Notes from Assessor 2: additional explanatory notes.
17. AU Type: assessment unit type, the primary commodity type in the assessment unit, based on the gas-to-oil ratio (GOR) of the petroleum endowment, which includes both the discovered and undiscovered petroleum. An assessment unit is characterized as being oil prone if the GOR is less than 20,000 cubic feet of gas per barrel of oil; otherwise, it is gas prone.
18. Minimum Total Recovery: minimum total recovery per cell considered for assessment, in million barrels of oil (MMBO) for oil assessment units or billion cubic feet of gas (BCFG) for gas assessment units.
19. Number of Tested Cells: number of tested cells in the assessment unit.
20. Number of Tested Cells > Minimum: number of tested cells in the assessment unit that have total recoveries equal to or larger than the specified minimum total recovery per cell.
21. Established: assessment unit maturity, the exploration maturity of the assessment unit. Assessment unit maturity is classified as “established” if more than 24 cells exceed the minimum total recovery.
22. Frontier: assessment unit maturity, the exploration maturity of the assessment unit. Assessment unit maturity is classified as “frontier” if 1 to 24 cells exceed the minimum total recovery.
23. Hypothetical: assessment-unit maturity, the exploration maturity of the assessment unit. Assessment-unit maturity is classified as “hypothetical” if no cells exceed the minimum total recovery.
24. Exploration Maturity: assessment-unit maturity from columns 21 to 23.
25. Median of First Third: median total recovery per cell of the set of tested cells equal to or greater than the minimum total recovery that constitute the first third of the total number of cells ranked according to date of discovery within the assessment unit, in million barrels of oil (MMBO) for oil assessment units or billion cubic feet of gas (BCFG) for gas assessment units.

26. Median of Second Third: median total recovery per cell of the set of tested cells equal to or greater than the minimum total recovery that constitute the second third of the total number of cells ranked according to date of discovery within the assessment unit, in million barrels of oil (MMBO) for oil assessment units or billion cubic feet of gas (BCFG) for gas assessment units.
27. Median of Third Third: median total recovery per cell of the set of tested cells equal to or greater than the minimum total recovery that constitute the third third of the total number of cells ranked according to date of discovery within the assessment unit, in million barrels of oil (MMBO) for oil assessment units or billion cubic feet of gas (BCFG) for gas assessment units.
28. Charge: charge probability, the probability for adequate petroleum charge for at least one untested cell equal to or larger than the minimum total recovery, somewhere in the assessment unit, having the potential to be added to reserves. Charge probability is given as a fractional value from 0 to 1.0.
29. Rocks: rocks probability, the probability for adequate reservoirs, traps, and seals for at least one untested cell equal to or larger than the minimum total recovery, somewhere in the assessment unit, having the potential to be added to reserves. Rocks probability is given as a fractional value from 0 to 1.0.
30. Timing: timing probability, the probability for favorable geologic timing for at least one untested cell equal to or larger than the minimum total recovery, somewhere in the assessment unit, having the potential to be added to reserves. Timing probability is given as a fractional value from 0 to 1.0.
31. AU Probability: geologic probability, the product of charge, rocks, and timing probabilities. Geologic probability is given as a fractional value from 0 to 1.0.
32. Access: accessibility probability, the probability for adequate location for necessary petroleum-related activities to discover at least one untested cell equal to or larger than the minimum total recovery, somewhere in the assessment unit, having the potential to be added to reserves. Accessibility probability is given as a fractional value from 0 to 1.0.
33. AU Area-minimum: the estimated minimum (F100) area of the assessment unit. The area is given in acres.
34. AU Area-median: the estimated median (F50) area of the assessment unit, as written on the input form. The area is given in acres.
35. AU Area-calculated median: the estimated median (F50) area of the assessment unit, as calculated from the parameters on the input form. The area is given in acres.
36. AU Area-mode: the estimated mode (most likely value) of the area of the assessment unit, as written on the input form. The area is given in acres.
37. AU Area-calculated mode: the estimated mode (most likely value) of the area of the assessment unit, as calculated from the parameters on the input form. The area is given in acres.
38. AU Area-maximum: the estimated maximum (F0) area of the assessment unit. The area is given in acres.
39. AU Area-mean: the estimated mean area of the assessment unit, as written on the input form. The area is given in acres.
40. AU Area-calculated mean: the estimated mean area of the assessment unit, as calculated from the parameters on the input form. The area is given in acres.
41. Cell Area-minimum: minimum area per cell of untested cells with potential, the estimated minimum (F100) area per cell of untested cells having the potential for additions to reserves in the assessment unit. This area is equivalent to the drainage area of wells. This area is given in acres.
42. Cell Area-median: the estimated median (F50) area per cell of untested cells having the potential for additions to reserves in the assessment unit, as written on the input form. This area is equivalent to the drainage area of wells. This area is given in acres.
43. Cell Area-calculated median: the estimated median (F50) area per cell of untested cells having the potential for additions to reserves in the assessment unit, as calculated from the parameters on the input form. This area is equivalent to the drainage area of wells. This area is given in acres.
44. Cell Area-mode: the estimated mode (most likely value) of the area per cell of untested cells with potential for additions to reserves in the assessment unit, as written on the input form. This area is equivalent to the drainage area of wells. This area is given in acres.
45. Cell Area-calculated mode: the estimated mode (most likely value) of the area per cell of untested cells with potential for additions to reserves in the assessment unit, as calculated from the parameters on the input form. This area is equivalent to the drainage area of wells. This area is given in acres.
46. Cell Area-maximum: maximum area per cell of untested cells with potential; the estimated maximum (F0) area per cell of untested cells having the potential for additions to reserves in the assessment unit. This area is equivalent to the drainage area of wells. This area is given in acres.
47. Cell Area-mean: the estimated mean area per cell of untested cells having the potential for additions to reserves in the assessment unit, as written on the input form. This area is equivalent to the drainage area of wells. This area is given in acres.

48. Cell Area-calculated mean: the estimated mean area per cell of untested cells having the potential for additions to reserves in the assessment unit, as calculated from the parameters on the input form. This area is equivalent to the drainage area of wells. This area is given in acres.
49. Cell Area-minimum of mean: the estimated minimum value of the distribution of uncertainty of the mean area per cell of untested cells having the potential for additions to reserves in the assessment unit. This area is equivalent to the drainage area of wells. This area is given in acres.
50. Cell Area-maximum of mean: the estimated maximum value of the distribution of uncertainty of the mean area per cell of untested cells having the potential for additions to reserves in the assessment unit. This area is equivalent to the drainage area of wells. This area is given in acres.
51. Untested %-minimum: estimated minimum (F100) percentage of the total assessment-unit area that is untested.
52. Untested %-median: estimated median (F50) percentage of the total assessment-unit area that is untested, as written on the input form.
53. Untested %-calculated median: estimated median (F50) percentage of the total assessment-unit area that is untested, as calculated from the parameters on the input form.
54. Untested %-mode: estimated mode (most likely value) of the percentage of the total assessment-unit area that is untested, as written on the input form.
55. Untested %-calculated mode: estimated mode (most likely value) of the percentage of the total assessment-unit area that is untested, as calculated from the parameters on the input form.
56. Untested %-maximum: estimated maximum (F0) percentage of the total assessment-unit area that is untested.
57. Untested %-mean: estimated mean percentage of the total assessment-unit area that is untested, as written on the input form.
58. Untested %-calculated mean: estimated mean percentage of the total assessment-unit area that is untested, as calculated from the parameters on the input form.
59. Sweet Spot %-minimum: estimated minimum (F100) percentage of the untested area in the assessment unit having the potential for additions to reserves.
60. Sweet Spot %-median: estimated median (F50) percentage of the untested area in the assessment unit having the potential for additions to reserves, as written on the input form.
61. Sweet Spot %-calculated median: estimated median (F50) percentage of the untested area in the assessment unit having the potential for additions to reserves, as calculated from the parameters on the input form.
62. Sweet Spot %-mode: estimated mode (most likely value) of the percentage of the untested area in the assessment unit having the potential for additions to reserves, as written on the input form.
63. Sweet Spot %-calculated mode: estimated mode (most likely value) of the percentage of the untested area in the assessment unit having the potential for additions to reserves, as calculated from the parameters on the input form.
64. Sweet Spot %-maximum: estimated maximum (F0) percentage of the untested area in the assessment unit having the potential for additions to reserves.
65. Sweet Spot %-mean: estimated mean percentage of the untested area in the assessment unit having the potential for additions to reserves, as written on the input form.
66. Sweet Spot %-calculated mean: estimated mean percentage of the untested area in the assessment unit having the potential for additions to reserves, as calculated from the parameters on the input form.
67. Geologic Evidence: geologic rationale for distribution estimated for sweet spot percent.
68. Total Recovery per Cell-minimum: estimated minimum (F100) total recovery per cell for untested cells in the assessment unit having the potential for additions to reserves. This volume is given as million barrels of oil (MMBO) for oil assessment units and billion cubic feet of gas (BCFG) for gas assessment units.
69. Total Recovery per Cell-median: estimated median (F50) total recovery per cell for untested cells in the assessment unit having the potential for additions to reserves. This volume is given as million barrels of oil (MMBO) for oil assessment units and billion cubic feet of gas (BCFG) for gas assessment units.
70. Total Recovery per Cell-maximum: estimated maximum (F0) total recovery per cell for untested cells in the assessment unit having the potential for additions to reserves. This volume is given as million barrels of oil (MMBO) for oil assessment units and billion cubic feet of gas (BCFG) for gas assessment units.
71. Total Recovery per Cell-mean: estimated mean total recovery per cell for untested cells in the assessment unit having the potential for additions to reserves. This volume is given as million barrels of oil (MMBO) for oil assessment units and billion cubic feet of gas (BCFG) for gas assessment units.

72. GOR-minimum: estimated minimum (F100) gas to oil ratio (GOR), in cubic feet of gas per barrel of oil (CFG/BO), of untested cells equal to or larger than the minimum total recovery in oil assessment units.
73. GOR-median: estimated median (F50) gas to oil ratio (GOR), in cubic feet of gas per barrel of oil (CFG/BO), of untested cells equal to or larger than the minimum total recovery in oil assessment units, as written on the input form.
74. GOR-calculated median: estimated median (F50) gas to oil ratio (GOR), in cubic feet of gas per barrel of oil (CFG/BO), of untested cells equal to or larger than the minimum total recovery in oil assessment units, as calculated from the parameters on the input form.
75. GOR-mode: estimated mode (most likely value) of the gas to oil ratio (GOR), in cubic feet of gas per barrel of oil (CFG/BO), of untested cells equal to or larger than the minimum total recovery in oil assessment units, as written on the input form.
76. GOR-calculated mode: estimated mode (most likely value) of the gas to oil ratio (GOR), in cubic feet of gas per barrel of oil (CFG/BO), of untested cells equal to or larger than the minimum total recovery in oil assessment units, as calculated from the parameters on the input form.
77. GOR-maximum: estimated maximum (F0) gas to oil ratio (GOR), in cubic feet of gas per barrel of oil (CFG/BO), of untested cells equal to or larger than the minimum total recovery in oil assessment units.
78. NGLGR-minimum: estimated minimum (F100) natural gas liquids (NGL) to gas ratio (NGLGR), in barrels of natural gas liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in oil assessment units.
79. NGLGR-median: estimated median (F50) natural gas liquids (NGL) to gas ratio (NGLGR), in barrels of natural gas liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in oil assessment units, as written on the input form.
80. NGLGR-calculated median: estimated median (F50) natural gas liquids (NGL) to gas ratio (NGLGR), in barrels of natural gas liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in oil assessment units, as calculated from the parameters on the input form.
81. NGLGR-mode: estimated mode (most likely value) of the natural gas liquids (NGL) to gas ratio (NGLGR), in barrels of natural gas liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in oil assessment units, as written on the input form.
82. NGLGR-calculated mode: estimated mode (most likely value) of the natural gas liquids (NGL) to gas ratio (NGLGR), in barrels of natural gas liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in oil assessment units, as calculated from the parameters on the input form.
83. NGLGR-maximum: estimated maximum (F0) natural gas liquids (NGL) to gas ratio (NGLGR), in barrels of natural gas liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in oil assessment units.
84. LGR-minimum: estimated minimum (F100) liquids (oil plus natural gas liquids) to gas ratio (LGR), in barrels of liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in gas assessment units.
85. LGR-median: estimated median (F50) liquids (oil plus natural gas liquids) to gas ratio (LGR), in barrels of liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in gas assessment units, as written on the input form.
86. LGR-calculated median: estimated median (F50) liquids (oil plus natural gas liquids) to gas ratio (LGR), in barrels of liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in gas assessment units, as calculated from the parameters on the input form.
87. LGR-mode: estimated mode (most likely value) of the liquids (oil plus natural gas liquids) to gas ratio (LGR), in barrels of liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in gas assessment units, as written on the input form.
88. LGR-calculated mode: estimated mode (most likely value) of the liquids (oil plus natural gas liquids) to gas ratio (LGR), in barrels of liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in gas assessment units, as calculated from the parameters on the input form.
89. LGR-maximum: estimated maximum (F0) liquids (oil plus natural gas liquids) to gas ratio (LGR), in barrels of liquids per million cubic feet of gas (BNGL/MMCFG), of untested cells equal to or larger than the minimum total recovery in gas assessment units.
90. API-minimum: estimated minimum (F100) API (American Petroleum Institute) gravity, in degrees, of oil in untested cells in oil assessment units.
91. API-median: estimated median (F50) API (American Petroleum Institute) gravity, in degrees, of oil in untested cells in oil assessment units.

92. API-mode: estimated mode (most likely value) of the API (American Petroleum Institute) gravity, in degrees, of oil in untested cells in oil assessment units.
93. API-maximum: estimated maximum (F0) API (American Petroleum Institute) gravity, in degrees, of oil in untested cells in oil assessment units.
94. Sulfur %-minimum: estimated minimum (F100) sulfur content, in percent, of oil in untested cells in oil assessment units.
95. Sulfur %-median: estimated median (F50) sulfur content, in percent, of oil in untested cells in oil assessment units.
96. Sulfur %-mode: estimated mode (most likely value) of the sulfur content, in percent, of oil in untested cells in oil assessment units.
97. Sulfur %-maximum: estimated maximum (F0) sulfur content, in percent, of oil in untested cells in oil assessment units.
98. (Oil) Water Depth-minimum: estimated minimum (F100) water depth, in meters, of oil in untested cells in oil assessment units (ocean, bays, or lakes; if applicable).
99. (Oil) Water Depth-median: estimated median (F50) water depth, in meters, of oil in untested cells in oil assessment units (ocean, bays, or lakes; if applicable).
100. (Oil) Water Depth-mode: estimated mode (most likely value) of the water depth, in meters, of oil in untested cells in oil assessment units (ocean, bays, or lakes; if applicable).
101. (Oil) Water Depth-maximum: estimated maximum (F0) water depth, in meters, of oil in untested cells in oil assessment units (ocean, bays, or lakes; if applicable).
102. (Oil) Drilling Depth-minimum: estimated minimum (F100) drilling depth, in meters, of oil in untested cells in oil assessment units.
103. (Oil) Drilling Depth-F75: estimated F75 drilling depth, in meters, of oil in untested cells in oil assessment units. An estimated 75 percent of the wells will be deeper than this value.
104. (Oil) Drilling Depth-median: estimated median (F50) drilling depth, in meters, of oil in untested cells in oil assessment units.
105. (Oil) Drilling Depth-mode: estimated mode (most likely value) of the drilling depth, in meters, of oil in untested cells in oil assessment units.
106. (Oil) Drilling Depth-F25: estimated F25 drilling depth, in meters, of oil in untested cells in oil assessment units. An estimated 25 percent of the wells will be deeper than this value.
107. (Oil) Drilling Depth-maximum: estimated maximum (F0) drilling depth, in meters, of oil in untested cells in oil assessment units.
108. Inert Gas %-minimum: estimated minimum (F100) inert gas content, in percent, of gas in untested cells in gas assessment units (nitrogen and helium, and so forth).
109. Inert Gas %-median: estimated median (F50) inert gas content, in percent, of gas in untested cells in gas assessment units (nitrogen and helium, and so forth).
110. Inert Gas %-mode: estimated mode (most likely value) of the inert gas content, in percent, of gas in untested cells in gas assessment units (nitrogen and helium, and so forth).
111. Inert Gas %-maximum: estimated maximum (F0) inert gas content, in percent, of gas in untested cells in gas assessment units (nitrogen and helium, and so forth).
112. CO₂ %-minimum: estimated minimum (F100) carbon dioxide content, in percent, of gas in untested cells in gas assessment units.
113. CO₂ %-median: estimated median (F50) carbon dioxide content, in percent, of gas in untested cells in gas assessment units.
114. CO₂ %-mode: estimated mode (most likely value) of the carbon dioxide content, in percent, of gas in untested cells in gas assessment units.
115. CO₂ %-maximum: estimated maximum (F0) carbon dioxide content, in percent, of gas in untested cells in gas assessment units.
116. H₂S %-minimum: estimated minimum (F100) hydrogen sulfide content, in percent, of gas in untested cells in gas assessment units.
117. H₂S %-median: estimated median (F50) hydrogen sulfide content, in percent, of gas in untested cells in gas assessment units.
118. H₂S %-mode: estimated mode (most likely value) of the hydrogen sulfide content, in percent, of gas in untested cells in gas assessment units.
119. H₂S %-maximum: estimated maximum (F0) hydrogen sulfide content, in percent, of gas in untested cells in gas assessment units.
120. BTU-minimum: estimated minimum (F100) heating value of gas, in BTU, of gas in untested cells in gas assessment units.
121. BTU-median: estimated median (F50) heating value of gas, in BTU, of gas in untested cells in gas assessment units.

122. BTU-mode: estimated mode (most likely value) of the heating value of gas, in BTU, of gas in untested cells in gas assessment units.
123. BTU-maximum: estimated maximum (F0) heating value of gas, in BTU, of gas in untested cells in gas assessment units.
124. (Gas) Water Depth-minimum: estimated minimum (F100) water depth, in meters, of gas in untested cells in gas assessment units (ocean, bays, or lakes; if applicable)
125. (Gas) Water Depth-median: estimated median (F50) water depth, in meters, of gas in untested cells in gas assessment units (ocean, bays, or lakes; if applicable).
126. (Gas) Water Depth-mode: estimated mode (most likely value) of the water depth, in meters, of gas in untested cells in gas assessment units (ocean, bays, or lakes; if applicable).
127. (Gas) Water Depth-maximum: estimated maximum (F0) water depth, in meters, of gas in untested cells in gas assessment units (ocean, bays, or lakes; if applicable).
128. (Gas) Drilling Depth-minimum: estimated minimum (F100) drilling depth, in meters, of gas in untested cells in gas assessment units.
129. (Gas) Drilling Depth-F75: estimated F75 drilling depth, in meters, of gas in untested cells in gas assessment units. An estimated 75 percent of the wells will be deeper than this value.
130. (Gas) Drilling Depth-median: estimated median (F50) drilling depth, in meters, of gas in untested cells in gas assessment units.
131. (Gas) Drilling Depth-mode: estimated mode (most likely value) of the drilling depth, in meters, of gas in untested cells in gas assessment units.
132. (Gas) Drilling Depth-F25: estimated F25 drilling depth, in meters, of gas in untested cells in gas assessment units. An estimated 25 percent of the wells will be deeper than this value.
133. (Gas) Drilling Depth-maximum: estimated maximum (F0) drilling depth, in meters, of gas in untested cells in gas assessment units.
134. Future Success Ratio-minimum: estimated minimum (F100) future success ratio, as percent.
135. Future Success Ratio-median: estimated median (F50) future success ratio, as percent, as written on the input form.
136. Future Success Ratio-calculated median: estimated median (F50) future success ratio, as percent, as calculated from the parameters on the input form.
137. Future Success Ratio-mode: estimated mode (most likely value) of the future success ratio, as percent, as written on the input form.
138. Future Success Ratio-calculated mode: estimated mode (most likely value) of the future success ratio, as percent, as calculated from the parameters on the input form.
139. Future Success Ratio-maximum: estimated maximum (F100) future success ratio, as percent.
140. Future Success Ratio-mean: estimated mean future success ratio, as percent, as written on the input form.
141. Future Success Ratio-calculated mean: estimated mean future success ratio, as percent, as calculated from the parameters on the input form.
142. Historic Success Ratio: historical success ratio, as percent.
143. Completion 1: typical well-completion practices (conventional, open hole, open cavity, other).
144. Completion 2: fraction of wells drilled that are typically stimulated.
145. Completion 3: predominant type of stimulation (none, frac, acid, other).
146. Completion 4: fraction of wells drilled that are horizontal.
147. Program Version: which version of the ACCESS program (version 1, 2, or 3) was used to perform the calculations.

The Ecosystem Allocations, Federal Land Allocations, Land Ownership Allocations, and State Allocations files contain volume-percent data of undiscovered petroleum allocated to ecosystem regions, Federal lands, general land-ownership parcels, and States. Cells are left blank if data are unavailable. Ecosystem allocation is based on the Bailey ecosystems (<http://www.fs.fed.us/rm/ecoregions/products/map-ecoregions-united-states/>). The land ownership (including Federal ownership) information has come from several sources over the period in which these assessments were conducted. Currently the U.S. Geological Survey (USGS) Protected Areas Database of the United States (PADUS) is used (http://gis1.usgs.gov/arcgis/rest/services/gap/PADUS_Owner/MapServer), but previously land-ownership data came primarily from Bureau of Land Management state offices.

The **Ecosystem Allocations** file contains 65 columns. There are records for 186 AUs, 139 of which were quantitatively assessed. In the Microsoft Excel version of this file, AUs that were not quantitatively assessed are colored purple; green cells mark major changes from previously published versions, as noted in the main text of this report. The sum of the percentages should equal those for the total area (excluding offshore) in the Land Ownership Allocations file. Data columns for these files are as follows:

1. AU Number: assessment-unit code number.
2. AU: assessment-unit name.
3. Province Number: province code number.
4. Province: province name.
5. Area: area of the assessment unit in square kilometers.
6. Ecosystem 1 Name: name of first ecosystem that occupies all or part of the assessment-unit area.
7. Ecosystem 1 Area %: percentage of assessment-unit area that is occupied by ecosystem 1.
8. Ecosystem 1 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 1.
9. Ecosystem 1 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 1.
10. Ecosystem 2 Name: name of second ecosystem that occupies part of the assessment-unit area.
11. Ecosystem 2 Area %: percentage of assessment-unit area that is occupied by ecosystem 2.
12. Ecosystem 2 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 2.
13. Ecosystem 2 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 2.
14. Ecosystem 3 Name: name of third ecosystem that occupies part of the assessment-unit area.
15. Ecosystem 3 Area %: percentage of assessment-unit area that is occupied by ecosystem 3.
16. Ecosystem 3 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 3.
17. Ecosystem 3 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 3.
18. Ecosystem 4 Name: name of fourth ecosystem that occupies part of the assessment-unit area.
19. Ecosystem 4 Area %: percentage of assessment-unit area that is occupied by ecosystem 4.
20. Ecosystem 4 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 4.
21. Ecosystem 4 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 4.
22. Ecosystem 5 Name: name of fifth ecosystem that occupies part of the assessment-unit area.
23. Ecosystem 5 Area %: percentage of assessment-unit area that is occupied by ecosystem 5.
24. Ecosystem 5 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 5.
25. Ecosystem 5 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 5.
26. Ecosystem 6 Name: name of sixth ecosystem that occupies part of the assessment-unit area.
27. Ecosystem 6 Area %: percentage of assessment-unit area that is occupied by ecosystem 6.
28. Ecosystem 6 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 6.
29. Ecosystem 6 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 6.
30. Ecosystem 7 Name: name of seventh ecosystem that occupies part of the assessment-unit area.
31. Ecosystem 7 Area %: percentage of assessment-unit area that is occupied by ecosystem 7.
32. Ecosystem 7 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 7.
33. Ecosystem 7 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 7.
34. Ecosystem 8 Name: name of eighth ecosystem that occupies part of the assessment-unit area.
35. Ecosystem 8 Area %: percentage of assessment-unit area that is occupied by ecosystem 8.
36. Ecosystem 8 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 8.
37. Ecosystem 8 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 8.
38. Ecosystem 9 Name: name of ninth ecosystem that occupies part of the assessment-unit area.
39. Ecosystem 9 Area %: percentage of assessment-unit area that is occupied by ecosystem 9.
40. Ecosystem 9 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 9.
41. Ecosystem 9 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 9.
42. Ecosystem 10 Name: name of tenth ecosystem that occupies part of the assessment-unit area.
43. Ecosystem 10 Area %: percentage of assessment-unit area that is occupied by ecosystem 10.
44. Ecosystem 10 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 10.

45. Ecosystem 10 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 10.
46. Ecosystem 11 Name: name of eleventh ecosystem that occupies part of the assessment-unit area.
47. Ecosystem 11 Area %: percentage of assessment-unit area that is occupied by ecosystem 11.
48. Ecosystem 11 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 11.
49. Ecosystem 11 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 11.
50. Ecosystem 12 Name: name of twelfth ecosystem that occupies part of the assessment-unit area.
51. Ecosystem 12 Area %: percentage of assessment-unit area that is occupied by ecosystem 12.
52. Ecosystem 12 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 12.
53. Ecosystem 12 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 12.
54. Ecosystem 13 Name: name of thirteenth ecosystem that occupies part of the assessment-unit area.
55. Ecosystem 13 Area %: percentage of assessment-unit area that is occupied by ecosystem 13.
56. Ecosystem 13 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 13.
57. Ecosystem 13 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 13.
58. Ecosystem 14 Name: name of fourteenth ecosystem that occupies part of the assessment-unit area.
59. Ecosystem 14 Area %: percentage of assessment-unit area that is occupied by ecosystem 14.
60. Ecosystem 14 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 14.
61. Ecosystem 14 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 14.
62. Ecosystem 15 Name: name of fifteenth ecosystem that occupies part of the assessment-unit area.
63. Ecosystem 15 Area %: percentage of assessment-unit area that is occupied by ecosystem 15.
64. Ecosystem 15 Oil Volume %: estimated percentage of undiscovered oil volume allocated to ecosystem 15.
65. Ecosystem 15 Gas Volume %: estimated percentage of undiscovered gas volume allocated to ecosystem 15.

The **Federal Land Allocations** file contains 85 columns. There are records for 186 AUs, 139 of which were quantitatively assessed. In the Microsoft Excel version of this file, AUs that were not quantitatively assessed are colored purple; green cells mark major changes from previously published versions, as noted in the main text of this report. The sum of the percentages should equal those for Federal lands in the Land Ownership Allocations file. Data columns for these files are:

1. AU Number: assessment-unit code number.
2. AU: assessment-unit name.
3. Province Number: province code number.
4. Province: province name.
5. Area: area of the assessment unit in square kilometers.
6. BLM: "Bureau of Land Management (BLM)," name of Federal land that occupies all or part of the assessment-unit area.
7. BLM Area %: percentage of assessment-unit area that is occupied by Bureau of Land Management lands.
8. BLM Oil Volume %: estimated percentage of undiscovered oil volume allocated to Bureau of Land Management lands.
9. BLM Gas Volume %: estimated percentage of undiscovered gas volume allocated to Bureau of Land Management lands.
10. BLMW: "BLM Wilderness Areas (BLMW)," name of Federal land that occupies all or part of the assessment-unit area.
11. BLMW Area %: percentage of assessment-unit area that is occupied by Bureau of Land Management Wilderness Areas.
12. BLMW Oil Volume %: estimated percentage of undiscovered oil volume allocated to Bureau of Land Management Wilderness Areas.
13. BLMW Gas Volume %: estimated percentage of undiscovered gas volume allocated to Bureau of Land Management Wilderness Areas.
14. BLMR: "BLM Roadless Areas (BLMR)," name of Federal land that occupies all or part of the assessment-unit area.
15. BLMR Area %: percentage of assessment-unit area that is occupied by Bureau of Land Management Roadless Areas.
16. BLMR Oil Volume %: estimated percentage of undiscovered oil volume allocated to Bureau of Land Management Roadless Areas.

17. BLMR Gas Volume %: estimated percentage of undiscovered gas volume allocated to Bureau of Land Management Roadless Areas.
18. NPS: "National Park Service (NPS)," name of Federal land that occupies all or part of the assessment-unit area.
19. NPS Area %: percentage of assessment-unit area that is occupied by National Park Service lands.
20. NPS Oil Volume %: estimated percentage of undiscovered oil volume allocated to National Park Service lands.
21. NPS Gas Volume %: estimated percentage of undiscovered gas volume allocated to National Park Service lands.
22. NPSW: "NPS Wilderness Areas (NPSW)," name of Federal land that occupies all or part of the assessment-unit area.
23. NPSW Area %: percentage of assessment-unit area that is occupied by National Park Service Wilderness Areas.
24. NPSW Oil Volume %: estimated percentage of undiscovered oil volume allocated to National Park Service Wilderness Areas.
25. NPSW Gas Volume %: estimated percentage of undiscovered gas volume allocated to National Park Service Wilderness Areas.
26. NPSP: "NPS Withdrawals (NPSP)," name of Federal land that occupies all or part of the assessment-unit area.
27. NPSP Area %: percentage of assessment-unit area that is occupied by National Park Service Withdrawals.
28. NPSP Oil Volume %: estimated percentage of undiscovered oil volume allocated to National Park Service Withdrawals.
29. NPSP Gas Volume %: estimated percentage of undiscovered gas volume allocated to National Park Service Withdrawals.
30. FS: "Forest Service (FS)," name of Federal land that occupies all or part of the assessment-unit area.
31. FS Area %: percentage of assessment-unit area that is occupied by USDA Forest Service lands.
32. FS Oil Volume %: estimated percentage of undiscovered oil volume allocated to USDA Forest Service lands.
33. FS Gas Volume %: estimated percentage of undiscovered gas volume allocated to USDA Forest Service lands.
34. FSW: "FS Wilderness Areas (FSW)," name of Federal land that occupies all or part of the assessment-unit area.
35. FSW Area %: percentage of assessment-unit area that is occupied by USDA Forest Service Wilderness Areas.
36. FSW Oil Volume %: estimated percentage of undiscovered oil volume allocated to USDA Forest Service Wilderness Areas.
37. FSW Gas Volume %: estimated percentage of undiscovered gas volume allocated to USDA Forest Service Wilderness Areas.
38. FSR: "FS Roadless Areas (FSR)," name of Federal land that occupies all or part of the assessment-unit area.
39. FSR Area %: percentage of assessment-unit area that is occupied by USDA Forest Service Roadless Areas.
40. FSR Oil Volume %: estimated percentage of undiscovered oil volume allocated to USDA Forest Service Roadless Areas.
41. FSR Gas Volume %: estimated percentage of undiscovered gas volume allocated to USDA Forest Service Roadless Areas.
42. FSP: "FS Protected Withdrawals (FSP)," name of Federal land that occupies all or part of the assessment-unit area.
43. FSP Area %: percentage of assessment-unit area that is occupied by USDA Forest Service Protected Withdrawals.
44. FSP Oil Volume %: estimated percentage of undiscovered oil volume allocated to USDA Forest Service Protected Withdrawals.
45. FSP Gas Volume %: estimated percentage of undiscovered gas volume allocated to USDA Forest Service Protected Withdrawals.
46. FWS: "U.S. Fish and Wildlife Service (USFWS)," name of Federal land that occupies all or part of the assessment-unit area.
47. FWS Area %: percentage of assessment-unit area that is occupied by U.S. Fish and Wildlife Service lands.
48. FWS Oil Volume %: estimated percentage of undiscovered oil volume allocated to U.S. Fish and Wildlife Service lands.
49. FWS Gas Volume %: estimated percentage of undiscovered gas volume allocated to U.S. Fish and Wildlife Service lands.
50. FWSW: "USFWS Wilderness Areas (USFWSW)," name of Federal land that occupies all or part of the assessment-unit area.
51. FWSW Area %: percentage of assessment-unit area that is occupied by U.S. Fish and Wildlife Service Wilderness Areas.

52. FWSW Oil Volume %: estimated percentage of undiscovered oil volume allocated to U.S. Fish and Wildlife Service Wilderness Areas.
53. FWSW Gas Volume %: estimated percentage of undiscovered gas volume allocated to U.S. Fish and Wildlife Service Wilderness Areas.
54. FWSP: “USFWS Protected Withdrawals (USFWSP),” name of Federal land that occupies all or part of the assessment-unit area.
55. FWSP Area %: percentage of assessment-unit area that is occupied by U.S. Fish and Wildlife Service Protected Withdrawals.
56. FWSP Oil Volume %: estimated percentage of undiscovered oil volume allocated to U.S. Fish and Wildlife Service Protected Withdrawals.
57. FWSP Gas Volume %: estimated percentage of undiscovered gas volume allocated to U.S. Fish and Wildlife Service Protected Withdrawals.
58. WS: “Wilderness Study Areas (WS),” name of Federal land that occupies all or part of the assessment-unit area.
59. WS Area %: percentage of assessment-unit area that is occupied by Wilderness Study Areas.
60. WS Oil Volume %: estimated percentage of undiscovered oil volume allocated to Wilderness Study Areas.
61. WS Gas Volume %: estimated percentage of undiscovered gas volume allocated to Wilderness Study Areas.
62. DOE: “Department of Energy (DOE),” name of Federal land that occupies all or part of the assessment-unit area.
63. DOE Area %: percentage of assessment-unit area that is occupied by Department of Energy lands.
64. DOE Oil Volume %: estimated percentage of undiscovered oil volume allocated to Department of Energy lands.
65. DOE Gas Volume %: estimated percentage of undiscovered gas volume allocated to Department of Energy lands.
66. DOD: “Department of Defense (DOD),” name of Federal land that occupies all or part of the assessment-unit area.
67. DOD Area %: percentage of assessment-unit area that is occupied by Department of Defense lands.
68. DOD Oil Volume %: estimated percentage of undiscovered oil volume allocated to Department of Defense lands.
69. DOD Gas Volume %: estimated percentage of undiscovered gas volume allocated to Department of Defense lands.
70. BOR: “Bureau of Reclamation (BOR),” name of Federal land that occupies all or part of the assessment-unit area.
71. BOR Area %: percentage of assessment-unit area that is occupied by Bureau of Reclamation lands.
72. BOR Oil Volume %: estimated percentage of undiscovered oil volume allocated to Bureau of Reclamation lands.
73. BOR Gas Volume %: estimated percentage of undiscovered gas volume allocated to Bureau of Reclamation lands.
74. TVA: “Tennessee Valley Authority (TVA),” name of Federal land that occupies all or part of the assessment-unit area.
75. TVA Area %: percentage of assessment-unit area that is occupied by Tennessee Valley Authority lands.
76. TVA Oil Volume %: estimated percentage of undiscovered oil volume allocated to Tennessee Valley Authority lands.
77. TVA Gas Volume %: estimated percentage of undiscovered gas volume allocated to Tennessee Valley Authority lands.
78. Other: “Other Federal,” other unspecified Federal lands that occupy all part of the assessment-unit area.
79. Other Area %: percentage of assessment-unit area that is occupied by other unspecified Federal lands.
80. Other Oil Volume %: estimated percentage of undiscovered oil volume allocated to other unspecified Federal lands.
81. Other Gas Volume %: estimated percentage of undiscovered gas volume allocated to other unspecified Federal lands.
82. Fed 20: name of additional specified Federal lands that occupy all or part of the assessment-unit area.
83. Fed 20 Area %: percentage of assessment-unit area that is occupied by additional specified Federal lands.
84. Fed 20 Oil Volume %: estimated percentage of undiscovered oil volume allocated to additional specified Federal lands.
85. Fed 20 Gas Volume %: estimated percentage of undiscovered gas volume allocated to additional specified Federal lands.

The **Land Ownership Allocations** file contains 57 columns. There are records for 186 AUs, 139 of which were quantitatively assessed. In the Microsoft Excel version of this file, AUs that were not quantitatively assessed are colored purple; green cells mark major changes from previously published versions, as noted in the main text of this report. The sum of the percentages should equal 100. Data columns for these files are as follows:

1. AU Number: assessment-unit code number.
2. AU: assessment-unit name.
3. Province Number: province code number.
4. Province: province name.
5. Area: area of the assessment unit in square kilometers.
6. Federal: "Federal Lands," all Federal lands that occupy all or part of the assessment-unit area.
7. Federal Area %: percentage of assessment-unit area that is occupied by Federal lands.
8. Federal Oil Volume %: estimated percentage of undiscovered oil volume allocated to Federal lands.
9. Federal Gas Volume %: estimated percentage of undiscovered gas volume allocated to Federal lands.
10. Private: "Private Lands," all private lands that occupy all or part of the assessment-unit area.
11. Private Area %: percentage of assessment-unit area that is occupied by private lands.
12. Private Oil Volume %: estimated percentage of undiscovered oil volume allocated to private lands.
13. Private Gas Volume %: estimated percentage of undiscovered gas volume allocated to private lands.
14. Tribal: "Tribal Lands," all tribal lands that occupy all or part of the assessment-unit area.
15. Tribal Area %: percentage of assessment-unit area that is occupied by tribal lands.
16. Tribal Oil Volume %: estimated percentage of undiscovered oil volume allocated to tribal lands.
17. Tribal Gas Volume %: estimated percentage of undiscovered gas volume allocated to tribal lands.
18. Other: name of other unspecified lands or offshore areas that occupy all or part of the assessment-unit area.
19. Other Area %: percentage of assessment-unit area that is occupied by other unspecified lands or offshore areas.
20. Other Oil Volume %: estimated percentage of undiscovered oil volume allocated to other unspecified lands or offshore areas.
21. Other Gas Volume %: estimated percentage of undiscovered gas volume allocated to other unspecified lands or offshore areas.
22. State 1: name of first State category which State-owned lands or waters occupy all or part of the assessment-unit area.
23. State 1 Area %: percentage of assessment-unit area that is occupied by State 1-owned lands or waters.
24. State 1 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 1-owned lands or waters.
25. State 1 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 1-owned lands or waters.
26. State 2: name of second State category which State-owned lands or waters occupy all or part of the assessment-unit area.
27. State 2 Area %: percentage of assessment-unit area that is occupied by State 2-owned lands or waters.
28. State 2 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 2-owned lands or waters.
29. State 2 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 2-owned lands or waters.
30. State 3: name of third State category which State-owned lands or waters occupy all or part of the assessment-unit area.
31. State 3 Area %: percentage of assessment-unit area that is occupied by State 3-owned lands or waters.
32. State 3 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 3-owned lands or waters.
33. State 3 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 3-owned lands or waters.
34. State 4: name of fourth State category which State-owned lands or waters occupy all or part of the assessment-unit area.
35. State 4 Area %: percentage of assessment-unit area that is occupied by State 4-owned lands or waters.
36. State 4 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 4-owned lands or waters.
37. State 4 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 4-owned lands or waters.
38. State 5: name of fifth State category which State-owned lands or waters occupy all or part of the assessment-unit area.

39. State 5 Area %: percentage of assessment-unit area that is occupied by State 5-owned lands or waters.
40. State 5 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 5-owned lands or waters.
41. State 5 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 5-owned lands or waters.
42. State 6: name of sixth State category which State-owned lands or waters occupy all or part of the assessment-unit area.
43. State 6 Area %: percentage of assessment-unit area that is occupied by State 6-owned lands or waters.
44. State 6 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 6-owned lands or waters.
45. State 6 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 6-owned lands or waters.
46. State 7: name of seventh State category which State-owned lands or waters occupy all or part of the assessment-unit area.
47. State 7 Area %: percentage of assessment-unit area that is occupied by State 7-owned lands or waters.
48. State 7 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 7-owned lands or waters.
49. State 7 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 7-owned lands or waters.
50. State 8: name of eighth State category which State-owned lands or waters occupy all or part of the assessment-unit area.
51. State 8 Area %: percentage of assessment-unit area that is occupied by State 8-owned lands or waters.
52. State 8 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 8-owned lands or waters.
53. State 8 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 8-owned lands or waters.
54. State 9: name of ninth State category which State-owned lands or waters occupy all or part of the assessment-unit area.

55. State 9 Area %: percentage of assessment-unit area that is occupied by State 9-owned lands or waters.
56. State 9 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 9-owned lands or waters.
57. State 9 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 9-owned lands or waters.

The **State Allocations** file contains 53 columns. There are records for 186 AUs, 139 of which were quantitatively assessed. In the Microsoft Excel version of this file, AUs that were not quantitatively assessed are colored purple; green cells mark major changes from previously published versions, as noted in the main text of this report. The sum of the percentages should equal 100. Data columns for these files are as follows:

1. AU Number: assessment-unit code number.
2. AU: assessment-unit name.
3. Province Number: province code number.
4. Province: province name.
5. Area: area of the assessment unit in square kilometers.
6. State 1 Name: name of first State (onshore and offshore) that occupies all or part of the assessment-unit area.
7. State 1 Area %: percentage of assessment-unit area that is occupied by State 1.
8. State 1 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 1.
9. State 1 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 1.
10. State 2 Name: name of second State (onshore and offshore) that occupies part of the assessment-unit area.
11. State 2 Area %: percentage of assessment-unit area that is occupied by State 2.
12. State 2 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 2.
13. State 2 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 2.
14. State 3 Name: name of third State (onshore and offshore) that occupies part of the assessment-unit area.
15. State 3 Area %: percentage of assessment-unit area that is occupied by State 3.
16. State 3 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 3.
17. State 3 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 3.

18. State 4 Name: name of fourth State (onshore and offshore) that occupies part of the assessment-unit area.
 19. State 4 Area %: percentage of assessment-unit area that is occupied by State 4.
 20. State 4 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 4.
 21. State 4 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 4.
 22. State 5 Name: name of fifth State (onshore and offshore) that occupies part of the assessment-unit area.
 23. State 5 Area %: percentage of assessment-unit area that is occupied by State 5.
 24. State 5 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 5.
 25. State 5 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 5.
 26. State 6 Name: name of sixth State (onshore and offshore) that occupies part of the assessment-unit area.
 27. State 6 Area %: percentage of assessment-unit area that is occupied by State 6.
 28. State 6 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 6.
 29. State 6 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 6.
 30. State 7 Name: name of seventh State (onshore and offshore) that occupies part of the assessment-unit area.
 31. State 7 Area %: percentage of assessment-unit area that is occupied by State 7.
 32. State 7 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 7.
 33. State 7 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 7.
 34. State 8 Name: name of eighth State (onshore and offshore) that occupies part of the assessment-unit area.
 35. State 8 Area %: percentage of assessment-unit area that is occupied by State 8.
 36. State 8 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 8.
 37. State 8 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 8.
 38. State 9 Name: name of ninth State (onshore and offshore) that occupies part of the assessment-unit area.
 39. State 9 Area %: percentage of assessment-unit area that is occupied by State 9.
 40. State 9 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 9.
 41. State 9 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 9.
 42. State 10 Name: name of tenth State (onshore and offshore) that occupies part of the assessment-unit area.
 43. State 10 Area %: percentage of assessment-unit area that is occupied by State 10.
 44. State 10 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 10.
 45. State 10 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 10.
 46. State 11 Name: name of eleventh State (onshore and offshore) that occupies part of the assessment-unit area.
 47. State 11 Area %: percentage of assessment-unit area that is occupied by State 11.
 48. State 11 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 11.
 49. State 11 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 11.
 50. State 12 Name: name of twelfth State (onshore and offshore) that occupies part of the assessment-unit area.
 51. State 12 Area %: percentage of assessment-unit area that is occupied by State 12.
 52. State 12 Oil Volume %: estimated percentage of undiscovered oil volume allocated to State 12.
 53. State 12 Gas Volume %: estimated percentage of undiscovered gas volume allocated to State 12.
- The **Continuous Results** file contains 49 columns. There are records for the 139 AUs that were quantitatively assessed. Data columns for these files are as follows:
1. AU Number: USGS assessment-unit code number.
 2. AU: USGS assessment unit name
 3. Province Number: province code number.
 4. Province: province name.
 5. AU Type: assessment unit type, the primary commodity type in the assessment unit, based on the gas-to-oil ratio (GOR) of the petroleum endowment, which includes both the discovered and undiscovered petroleum. An assessment unit is characterized as being oil prone if the gas-to-oil ratio (GOR) is less than 20,000 cubic feet of gas per barrel of oil; otherwise, it is gas prone.

6. Date: date of assessment.
7. AU Probability: the probability that there exists the potential for at least one well equal to or larger than the minimum well size somewhere in the assessment unit. Assessment unit probability is given as a fractional value from 0 to 1.0.
8. Oil in Oil Deposit (MMBO), Mean: the estimated mean (average) value of undrilled oil in the assessment unit. The volume is given in millions of barrels of oil (MMBO).
9. Oil in Oil Deposit (MMBO), Std. Dev.: the estimated standard deviation of the distribution of undrilled oil in the assessment unit. The volume is given in millions of barrels of oil (MMBO).
10. Oil in Oil Deposit (MMBO), F95: the estimated value of undrilled oil such that there is a 95 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of oil (MMBO).
11. Oil in Oil Deposit (MMBO), F75: the estimated value of undrilled oil such that there is a 75 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of oil (MMBO).
12. Oil in Oil Deposit (MMBO), F50: the estimated value of undrilled oil such that there is a 50 percent probability that this amount or more exists in the assessment unit. This is the median value. The volume is given in millions of barrels of oil (MMBO).
13. Oil in Oil Deposit (MMBO), F25: the estimated value of undrilled oil such that there is a 25 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of oil (MMBO).
14. Oil in Oil Deposit (MMBO), F5: the estimated value of undrilled oil such that there is a 5 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of oil (MMBO).
15. Gas in Oil Deposit (BCFG), Mean: the estimated mean (average) value of undrilled associated/dissolved gas in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
16. Gas in Oil Deposit (BCFG), Std. Dev.: the estimated standard deviation of the distribution of undrilled associated/dissolved gas in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
17. Gas in Oil Deposit (BCFG), F95: the estimated value of undrilled associated/dissolved gas such that there is a 95 percent probability that this amount or more exists in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
18. Gas in Oil Deposit (BCFG), F75: the estimated value of undrilled associated/dissolved gas such that there is a 75 percent probability that this amount or more exists in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
19. Gas in Oil Deposit (BCFG), F50: the estimated value of undrilled associated/dissolved gas such that there is a 50 percent probability that this amount or more exists in the assessment unit. This is the median value. The volume is given in billions of cubic feet of gas (BCFG).
20. Gas in Oil Deposit (BCFG), F25: the estimated value of undrilled associated/dissolved gas such that there is a 25 percent probability that this amount or more exists in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
21. Gas in Oil Deposit (BCFG), F5: the estimated value of undrilled associated/dissolved gas such that there is a 5 percent probability that this amount or more exists in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
22. NGL in Oil Deposit (MMBNGL), Mean: the estimated mean (average) value of undrilled NGL in the assessment unit. The volume is given in millions of barrels of NGL (MMBNGL).
23. NGL in Oil Deposit (MMBNGL), Std. Dev.: the estimated standard deviation of the distribution of undrilled NGL in the assessment unit. The volume is given in millions of barrels of NGL (MMBNGL).
24. NGL in Oil Deposit (MMBNGL), F95: the estimated value of undrilled NGL such that there is a 95 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of NGL (MMBNGL).
25. NGL in Oil Deposit (MMBNGL), F75: the estimated value of undrilled NGL such that there is a 75 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of NGL (MMBNGL).
26. NGL in Oil Deposit (MMBNGL), F50: the estimated value of undrilled NGL such that there is a 50 percent probability that this amount or more exists in the assessment unit. This is the median value. The volume is given in millions of barrels of NGL (MMBNGL).
27. NGL in Oil Deposit (MMBNGL), F25: the estimated value of undrilled NGL such that there is a 25 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of NGL (MMBNGL).

28. NGL in Oil Deposit (MMBNGL), F5: the estimated value of undrilled NGL such that there is a 5 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of NGL (MMBNGL).
29. Gas in Gas Deposit (BCFG), Mean: the estimated mean (average) value of undrilled nonassociated gas in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
30. Gas in Gas Deposit (BCFG), Std. Dev.: the estimated standard deviation of the distribution of undrilled nonassociated gas in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
31. Gas in Gas Deposit (BCFG), F95: the estimated value of undrilled nonassociated gas such that there is a 95 percent probability that this amount or more exists in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
32. Gas in Gas Deposit (BCFG), F75: the estimated value of undrilled nonassociated gas such that there is a 75 percent probability that this amount or more exists in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
33. Gas in Gas Deposit (BCFG), F50: the estimated value of undrilled nonassociated gas such that there is a 50 percent probability that this amount or more exists in the assessment unit. This is the median value. The volume is given in billions of cubic feet of gas (BCFG).
34. Gas in Gas Deposit (BCFG), F25: the estimated value of undrilled nonassociated gas such that there is a 25 percent probability that this amount or more exists in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
35. Gas in Gas Deposit (BCFG), F5: the estimated value of undrilled nonassociated gas such that there is a 5 percent probability that this amount or more exists in the assessment unit. The volume is given in billions of cubic feet of gas (BCFG).
36. Liquids in Gas Deposit (MMBL), Mean: the estimated mean (average) value of undrilled liquids in the assessment unit. The volume is given in millions of barrels of liquids (MMBL).
37. Liquids in Gas Deposit (MMBL), Std. Dev.: the estimated standard deviation of the distribution of undrilled liquids in the assessment unit. The volume is given in millions of barrels of liquids (MMBL).
38. Liquids in Gas Deposit (MMBL), F95: the estimated value of undrilled liquids such that there is a 95 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of liquids (MMBL).
39. Liquids in Gas Deposit (MMBL), F75: the estimated value of undrilled liquids such that there is a 75 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of liquids (MMBL).
40. Liquids in Gas Deposit (MMBL), F50: the estimated value of undrilled liquids such that there is a 50 percent probability that this amount or more exists in the assessment unit. This is the median value. The volume is given in millions of barrels of liquids (MMBL).
41. Liquids in Gas Deposit (MMBL), F25: the estimated value of undrilled liquids such that there is a 25 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of liquids (MMBL).
42. Liquids in Gas Deposit (MMBL), F5: the estimated value of undrilled liquids such that there is a 5 percent probability that this amount or more exists in the assessment unit. The volume is given in millions of barrels of liquids (MMBL).
43. Number of Cells, Mean: the estimated mean (average) value of number of untested cells with resource potential in the assessment unit.
44. Number of Cells, Std. Dev.: the estimated standard deviation of the distribution of number of untested cells with resource potential in the assessment unit.
45. Number of Cells, F95: the estimated value of number of untested cells with resource potential such that there is a 95 percent probability that this amount or more exists in the assessment unit.
46. Number of Cells, F75: the estimated value of number of untested cells with resource potential such that there is a 75 percent probability that this amount or more exists in the assessment unit.
47. Number of Cells, F50: the estimated value of number of untested cells with resource potential such that there is a 50 percent probability that this amount or more exists in the assessment unit. This is the median value.
48. Number of Cells, F25: the estimated value of number of untested cells with resource potential such that there is a 25 percent probability that this amount or more exists in the assessment unit.
49. Number of Cells, F5: the estimated value of number of untested cells with resource potential such that there is a 5 percent probability that this amount or more exists in the assessment unit.

The **Code List** file contains the USGS numeric codes for provinces (4 digits), total petroleum systems (6 digits), and assessment units (8 digits). Codes for ecosystem names are in the Ecosystem Codes file. This table contains 3 columns. Data columns are as follows:

1. Code: USGS code number
2. Name: USGS area name
3. Name, Unit, and Code: the USGS area name, comma, space, the hierarchical unit name (province, total petroleum system, or assessment unit), and the USGS code number

The **Ecosystem Codes** file contains the USGS codes for ecosystem names. This table contains 3 columns. Data columns are as follows:

1. Ecosystem Code: USGS four-letter code
2. Ecosystem Name: ecosystem name
3. Ecosystem Name and Code: the ecosystem name followed by the USGS code in parentheses

The **Cloud Plots** file contains 110 columns. There are three records for each of the 139 AUs that were quantitatively assessed (one record for each of three variables: cell size, estimated ultimate recovery, and sweet spot percent). The .tab

file includes the data variables described below. The Microsoft Excel version includes not only a worksheet with the variables described below but also separate worksheets and plots for the 12 combinations of reservoir type and variable. In the plots, each blue line represents the distribution for a single assessment unit and the black diamond represents the mean of the distribution. Data columns for these files are as follows:

1. AU Number: USGS assessment-unit code number.
2. AU: USGS assessment unit name
3. Province Number: province code number.
4. Province: province name.
5. Reservoir Type: shale gas, coalbed gas, tight gas, or continuous oil.
6. Date: date of assessment.
7. Variable: cell size, EUR (estimated ultimate recovery), or sweet spot percent.
8. Fractile for Mean: the fractile that corresponds to the mean value of the distribution.
9. Mean: the mean value of the distribution.
- 10–110. F100 to F0: fractiles of the distribution. F95 represents a 95 percent chance of at least the amount tabulated. Other fractiles are defined similarly.

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