
Appendix A. Statistical Methodology

THE SURVEY POPULATION

Sample Design

The 2023 Irrigation and Water Management target population was all U.S. operations that irrigated their agricultural crops in 2023. The 2023 Irrigation and Water Management Survey (IWMS) sampling frame was comprised of operations that reported having irrigation activity, irrigation systems or equipment on their farm or ranch in the 2022 Census of Agriculture (CoA). Institutional, research and experimental farms as well as grazing associations were not included in the 2023 IWMS sampling frame.

The 2023 IWMS sampling frame operations were grouped by state and type of crop and stratified using irrigation acreage as a measure of size. Strata with larger operations were assigned a selection probability of one. For the remaining sampling frame elements, a Neyman allocation technique was used to determine state-crop category-strata combination sample sizes before operations were selected using a Sequential Interval Poisson (SIP) methodology.

The final national sample size was 35,499 operations.

DATA COLLECTION

Method of Enumeration

The 2023 Irrigation and Water Management Survey was conducted using multiple data collection strategies. Data were collected by mail, Computer-Assisted Web Interviewing (CAWI) via the Internet, telephone enumeration, and personal enumeration. Enumeration methods used in the 2023 survey were similar to those used in the 2018 survey.

Report Form

A single 20-page report form was used for the survey, similar to the 2018 report form. The report form was mailed to a selected sample of producers that reported irrigated acres or land equipped with irrigation in the 2022 Census of Agriculture. See Appendix B for copies of the report form and instruction booklet and information regarding changes between the 2018 and 2023 report forms.

Report Form Mailings and Respondent Follow-up

In November 2023, a pre-survey pressure sealed letter was mailed out to 34,266 irrigators containing an online reporting code and information about the Irrigation and Water Management Survey. Mail packets were then mailed in January 2024 to all sampled irrigators that had not already responded online. The mail packet included a labeled report form, an instruction booklet, an instruction letter, and a return envelope. Mailout packet preparation, initial mailout, thank you/reminder letter, and one follow-up mailing to nonrespondents were handled by the U.S. Census Bureau's National Processing Center (NPC) in Jeffersonville, IN. Telephone follow-up from a NASS Data Collection Center began April 2024 to nonrespondents who were mailed a report form from NPC.

Data were collected for a select group of operations by the NASS regional field offices. To minimize the number of agency contacts, operations were included in this group if they were scheduled for contact by NASS for other agricultural surveys. Report forms were labeled at NPC and sent to the regional field offices in November 2023. Regional field office staff collected data by personal enumeration or by phone from January 2024 through May 2024. For a description of the adjustment for nonresponse, see Estimation.

REPORT FORM PROCESSING

Data Capture

All report forms returned to NPC were immediately checked in, using bar codes printed on the mailing label, and removed from follow-up mailings. All report forms were reviewed prior to data keying to identify inconsistencies and to ensure that the data could be keyed. Major inconsistencies, respondent remarks, blank report forms, and large irrigation cases were reviewed by analysts and adjusted prior to data keying as needed. All forms with any data were scanned and an image was created for each page of a report form.

Data Editing and Analysis

Data from each report form were processed through a computer edit which flagged missing or inconsistent entries. Each report with a flagged entry was reviewed by regional field office and/or headquarters statisticians. Action was required for any record with reported data that were clearly incorrect, for example, in some cases, respondents may have failed to provide all of the information requested, only indicating the presence of an item

but not the amount. These items were tagged for computer imputation. After the initial edit, an imputation program supplied missing data and made adjustments based on responses of similarly sized farms within the same geographic area. Data entries by the computer edit process were reviewed and verified by analysts. Instances where imputed data failed edit checks were referred to statisticians for corrective action. The computer edit ensured the data on a report form were internally consistent.

Prior to publication, tabulated totals were reviewed to identify and resolve remaining irregularities. Comparisons were made with 2022 Census of Agriculture data, 2018 Irrigation and Water Management Survey data, and other available check data. The data were processed through a disclosure program to prevent data from being published that could be sourced back to an individual operation.

Imputation

During data collection and editing, several variables were allowed to be flagged as missing required responses. Such variables included quantity of water applied, well and pump characteristics, energy costs of well pumps, irrigated crop yields, horticulture irrigation methods, irrigation expenses and reasons for not irrigating. After all sampled records were captured and edited, these flagged variables underwent a computer imputation process to obtain the required data.

Imputed data for most variables were selected using multiple imputation. For continuous data, records were classified into non-overlapping imputation groups based on non-imputable response data and auxiliary data for each variable. The average value from multiple value draws in the imputation group was used as the imputed value. For binary data and multinomial data, multiple imputed categories were randomly selected for each record from state or county distributions. The category selected in most imputation runs became the imputed category value.

Hot-deck imputation was used when the value of the imputed variable is directly related to the value of another variable. Records were sorted by state and other variables in ascending order and the imputed values were selected from the “nearest” respondent record that had smaller sorting variable values.

Mean imputation was used for variables where the number of respondents is expected to be small or if the variable can be directly related to the geography of the respondent. County, state or national mean values were calculated based on the availability of respondents and the mean values were imputed.

Imputed values were processed through the edit to ensure no inconsistencies were found and analysts reviewed the output for accuracy.

ESTIMATION

Data were summarized for the Nation as a whole, for each of the 50 States, and for the geographic domains known as Water Resource Regions (WRR) (see Appendix B for a detailed description). The estimation methodology consisted of two

weighting components that made up the total survey weight. The first component was the fully adjusted weight pulled in from the 2022 Census of Agriculture. This weight accounted for any list incompleteness and undercoverage from the 2022 Census of Agriculture. The second component was the sampling rate used for the 2023 Irrigation and Water Management Survey. This expansion factor was the inverse of the selection probability for the sample farms in a stratum. This expansion factor was reweighted at the stratum level to account for whole-farm nonresponse. The nonresponse adjustment factor used to reweight the expansion factor was the ratio of the number of sample farms in a stratum to the number of sample farms that responded to the survey in that stratum. The assumption underlying this weighting approach to survey nonresponse was that survey respondents and nonrespondents within a stratum constitute a homogeneous population, thus allowing respondents to represent nonrespondents. An expanded data value for a sample record was obtained by multiplying the data value by the total 2023 Irrigation and Water Management Survey weight. State totals for a characteristic were estimated by summing the expanded data values from all responding sample records across all strata within the State. National estimates were obtained by summing across all States. The WRR estimates were obtained by summing the expanded data values for the portion of the sample falling into the WRR.

RESPONDENT CONFIDENTIALITY

In keeping with the provisions of Title 7 of the United States Code, no data are published that would disclose information about the operations of an individual farm or ranch. All tabulated data are subjected to an extensive disclosure review prior to publication. Any tabulated item that identifies data reported by a respondent or allows a respondent’s data to be accurately estimated or derived, was suppressed and coded with a ‘(D)’. However, the number of farms reporting an item is not considered confidential information and is provided even though other information is withheld.

DATA COMPARABILITY

The 2022 Census of Agriculture introduced a new question collecting the acres equipped for irrigation, which replaces the five-year irrigation history question aimed at helping account for all irrigators in 2022 and 2023. Due to this change, there are many references to equipped acres in the 2023 Irrigation and Water Management survey publication that do not have any direct comparisons to 2018 data or prior.

Direct comparisons for Land in Vegetables and Horticulture in the Open are not directly comparable due to vegetable seeds being reported under land in vegetables in 2023 when it was reported under horticulture in the open in 2018, impacting tables 16, 38, 39, 40, 41, 43, 44, 45, 47, and 48. Table 42’s data covering surge flow, cablegation, and mulch are not comparable since the original question from 2018 was split into three questions for the 2023 survey. The non-comparability also extends to the total acres with any water management practices used on Table 42. The updated hydroponics data item no longer includes subirrigation, which overlapped with other methods,

and thus hydroponic data on Table 45 and 46 are not comparable to the old subirrigation including hydroponic definition. All other data items on all tables, including tables 42, 45, and 46 remain comparable if the item existed in both 2018 and 2023. For example, records which utilized water seepage would have indicated the area as both gravity irrigated and sub-irrigated in 2018, but for 2023 it is just gravity irrigated. All other new items added to the 2023 have no impact on data comparability between 2018 and 2023.

Differences exist between the expanded results of the 2023 Irrigation and Water Management Survey and the published data from the 2022 Census of Agriculture. Some of these are as follows:

1. The survey includes data only for operations that irrigated or had land equipped for irrigation in both 2022 and 2023. Operations in some areas, especially the eastern States, may irrigate only when moisture is needed. Operations with irrigation capabilities may not irrigate depending on the amount of rainfall for a particular year or geographic area. The number of operations that irrigated in 2022 but discontinued irrigation in 2023 is tabulated in Table 30 for all farms and in Table 47 for horticultural operations by reason of discontinuance.
2. Some producers reported that they had been misclassified as irrigators and did not irrigate or have land equipped for irrigation in either 2022 or 2023. In addition to errors in processing census data, some producers misreported or misinterpreted the questions. Most of the producers misreporting irrigation in the 2022 census reported irrigation of small acreages of vegetables, fruits and nuts, tobacco, field crops, or berries.
3. Some respondents indicated they had retired, moved, sold, or rented the land, etc., since 2022. These operations were dropped from processing because they were no longer farming. Special care was taken with large operations to ensure that they were not erroneously dropped due to reorganization or name change rather than discontinuing agricultural operations.
4. New irrigators in 2023 (not included in the 2022 census) did not have a chance for selection in the sample and, therefore, were excluded from the survey.

Table A shows acres irrigated in the 2023 Irrigation and Water Management Survey (expanded) compared with U.S. totals from the 2022 Census of Agriculture. The expanded survey accounts for 96.7 percent of all land reported as irrigated in the 2022 census and all irrigation characteristics associated with that land.

Measures of Survey Quality

The statistics in this report are estimates derived from a sample survey. There are two types of errors possible in an estimate-based sample survey: sampling and nonsampling. Sampling errors are caused by observing only a piece of the population instead of the entire population. These errors are subject to sample-to-sample variation. Nonsampling errors include all other errors and can arise from many different sources. These

sources may include respondent error, enumerator error, or incorrect data keying, editing, or imputing for missing data. Nonsampling error due to mail list incompleteness and duplication, as well as misclassification of records on the mail list, is referred to as coverage error.

Undercoverage existed in the frame population to the extent that there were irrigated farms that either erroneously reported they were not irrigating on the 2022 Census of Agriculture, started irrigating in 2023, or had succeeding irrigators in 2023 (i.e., a producer who, since 2022, took control of an existing irrigating farm through sale, rental, or other arrangement).

Overcoverage also existed in the frame because some operations were misclassified as irrigators and did not irrigate in 2022 or had either stopped farming or irrigating in 2023. Farms in the sample that fell into these groups were identified during the survey and estimates are provided covering their number and acres irrigated in the Data Comparability section, items 2 and 3.

Survey Response Rate

The response rate is an indicator of the quality of data collection. It is generally assumed that if a response rate was close to 100 percent, the potential for nonresponse bias is small. Because this survey contains both farm and nonfarm records, the response rate is an indicator of replying to the survey data collection effort, but does not reflect whether those responding met the farm definition or had the items of interest for the survey. The response rate for the 2023 Irrigation and Water Management Survey is 61.4 percent. This compares to 64.4 percent for the 2018 Farm and Ranch Irrigation Survey.

MEASURES OF PRECISION

Under the guidance of the Statistical Policy Office of the Office of Management and Budget (OMB), the U.S. Department of Agriculture's National Agricultural Statistics Service (NASS) provides data users with quality metrics for its published data series. The accuracy of data products may be evaluated through sampling and nonsampling error. The measurement of error due to sampling in the current period is evaluated by the coefficient of variation (CV) for each estimated item. Nonsampling error is evaluated by response rates and the percent of the estimate from respondents.

Coefficient of variation is a measure of the relative amount of error associated with a sample estimate. Specifically, it is the standard error of a point estimate divided by that estimate, generally multiplied times 100 so that it can be reported as a percentage. This relative measure allows the reliability of a range of estimates to be compared. For example, the standard error is often larger for large population estimates than for small population estimates, but the large population estimates may have a smaller CV, indicating a more reliable estimate. Every estimate for the 2023 Irrigation and Water Management Survey has a corresponding CV published with it. NASS has identified the following index to use when evaluating coefficient of variation for the 2023 Irrigation and Water Management Survey. The coefficient of variation is used as an indicator of

the precision in the survey estimates and is reported for major survey items in Table C and Table D.

- **Low Reliability Estimate.** Coefficient of Variation (CV) 30 percent or higher. Caution should be used when using this estimate in any form. Please consult NASS for more information or guidance.

- **Medium Reliability Estimate.** Coefficient of Variation (CV) between 15 percent and 29.9 percent
- **High Reliability Estimate.** Coefficient of Variation (CV) less than 15 percent.

Table A. Farms with Irrigation by Acres Irrigated: 2023 Irrigation and Water Management Survey compared with 2022 Census of Agriculture

Item	2022 Census of Agriculture United States totals	2023 Irrigation and Water Management Survey		Item	2022 Census of Agriculture United States totals	2023 Irrigation and Water Management Survey	
		United States total (expanded)	Percent of 2022 Census of Agriculture totals			United States total (expanded)	Percent of 2022 Census of Agriculture totals
Farms .....number	284,598	212,714	74.7	200 to 499 acres farms	24,279	21,059	86.7
.....acres	54,930,363	53,135,170	96.7	.....acres	7,580,583	6,742,615	88.9
1 to 49 acres .....farms	188,797	127,975	67.8	500 to 999 acres farms	13,434	12,661	94.2
.....acres	1,717,530	1,336,140	77.8	.....acres	9,305,541	8,792,402	94.5
50 to 99 acres .....farms	21,964	17,867	81.3	1,000 to 1,999 acres farms	8,351	7,565	90.6
.....acres	1,525,822	1,250,694	82.0	.....acres	11,409,101	10,347,675	90.7
100 to 199 acres .....farms	22,408	20,156	90.0	2,000 acres or more farms	5,365	5,431	101.2
.....acres	3,082,649	2,761,643	89.6	.....acres	20,309,137	21,904,001	107.9

Table B. Coefficient of Variation (percent) for Selected General Irrigation Data: 2023

[Excludes institutional, research, and experimental farms and farms with horticulture. For meaning of abbreviations and symbols, see introductory text.]

Geographic area	Irrigated farms	Land in farms	Acres irrigated		Acre-feet applied	Energy expense for pumps	Infrastructure expenses	Pumps, all types	Well pumps
			Total	Cropland harvested in the open					
United States	0.8	7.6	1.6	1.5	1.6	2.3	11.2	1.6	2.0
Alabama	13.7	13.4	9.6	8.8	14.9	17.8	41.3	17.9	18.5
Alaska	9.4	88.1	29.8	(D)	45.1	27.3	34.8	20.0	(D)
Arizona	6.6	91.5	7.3	7.8	9.5	31.9	40.9	12.8	13.6
Arkansas	2.5	4.6	5.5	(D)	6.6	7.9	24.2	5.4	4.9
California	0.9	10.7	3.9	4.2	3.8	5.8	10.7	3.4	5.5
Colorado	2.8	12.2	5.2	4.9	6.1	8.9	18.4	5.0	7.8
Connecticut	11.2	14.2	30.2	33.4	35.4	27.9	72.8	12.3	12.1
Delaware	7.2	10.2	13.3	13.3	12.1	34.4	29.1	6.8	(D)
Florida	5.4	11.3	13.9	14.4	14.2	14.8	28.9	10.3	10.4
Georgia	3.6	13.0	11.6	11.4	19.0	8.7	68.0	10.7	14.4
Hawaii	4.2	40.2	25.5	31.4	26.3	29.8	56.9	30.8	37.0
Idaho	2.2	7.7	5.1	4.9	4.7	6.3	14.2	3.6	7.6
Illinois	4.7	7.6	8.8	8.8	9.1	6.4	24.1	15.5	16.3
Indiana	4.2	11.6	9.1	9.0	13.3	15.5	27.9	9.2	9.7
Iowa	9.6	17.0	15.0	15.0	16.2	20.9	29.3	20.4	21.7
Kansas	3.9	9.6	7.9	8.3	9.4	10.9	21.8	8.7	9.1
Kentucky	6.5	22.9	21.1	21.5	26.3	17.2	106.8	9.5	11.2
Louisiana	6.6	6.2	6.5	6.5	8.6	10.0	18.9	8.4	9.5
Maine	14.2	31.9	32.9	46.6	37.3	46.0	48.9	27.4	15.7
Maryland	7.2	7.5	6.6	6.6	10.5	17.2	27.1	13.1	12.0
Massachusetts	7.4	13.7	11.9	12.7	16.0	17.5	23.4	13.8	24.4
Michigan	4.9	10.0	10.4	10.4	14.5	14.3	27.3	9.7	11.5
Minnesota	4.4	9.2	8.0	8.1	8.4	10.5	19.3	6.6	7.1
Mississippi	2.2	7.2	7.9	7.9	9.1	8.1	16.4	6.6	6.8
Missouri	4.5	8.5	5.7	5.7	7.4	9.5	26.3	5.8	6.9
Montana	1.5	9.9	5.6	5.7	7.8	13.6	25.9	7.9	15.6
Nebraska	1.9	9.6	2.4	2.4	2.9	3.7	9.0	2.7	3.0
Nevada	7.6	24.5	12.7	13.4	14.1	23.5	47.1	15.6	14.8
New Hampshire	7.2	22.4	41.5	48.7	46.4	25.9	52.3	11.8	13.0
New Jersey	10.2	20.7	15.4	13.8	22.7	21.9	25.1	9.2	10.2
New Mexico	3.5	26.4	14.1	18.8	15.2	17.4	30.5	9.1	11.8
New York	7.1	17.3	22.6	23.8	15.7	25.5	90.0	7.9	14.0
North Carolina	5.7	10.5	10.3	10.3	16.8	13.6	32.9	11.2	15.8
North Dakota	5.5	10.3	12.2	12.1	13.9	21.4	21.5	22.2	25.6
Ohio	5.4	12.6	10.5	11.2	16.0	21.5	97.7	13.1	11.0
Oklahoma	8.9	13.6	14.2	15.2	20.5	29.5	22.6	15.6	16.7
Oregon	2.1	11.1	5.8	6.2	7.4	6.6	44.2	4.1	4.5
Pennsylvania	7.6	14.9	10.3	11.6	14.6	25.9	22.4	10.8	11.5
Rhode Island	8.3	30.3	25.1	27.9	28.4	24.0	77.3	14.5	17.2
South Carolina	10.0	16.8	11.7	12.3	11.5	12.5	32.3	20.4	15.7
South Dakota	8.7	33.1	10.1	10.8	9.4	16.1	47.4	12.8	14.2
Tennessee	11.3	16.8	13.7	13.8	18.9	15.6	81.6	9.8	10.5
Texas	3.6	19.0	7.9	6.5	7.5	9.6	21.9	6.5	6.4
Utah	2.1	15.7	6.9	5.3	7.1	12.1	51.0	5.2	17.9
Vermont	7.5	13.9	50.8	54.4	89.0	19.0	27.1	16.5	15.2
Virginia	6.0	12.7	12.2	13.1	15.0	15.3	45.0	15.2	11.4
Washington	1.8	47.8	5.8	6.3	7.6	6.9	24.6	7.7	7.5
West Virginia	14.7	55.3	21.5	26.6	25.7	16.4	88.0	19.0	23.7
Wisconsin	4.5	11.0	3.9	3.8	13.2	9.7	30.9	4.4	5.2
Wyoming	4.0	10.3	5.8	6.2	7.9	9.8	21.1	8.1	22.8
Water Resource Regions									
Region 01 New England	4.8	18.8	12.0	18.0	18.8	13.1	22.5	9.0	8.4
Region 02 Mid-Atlantic	4.1	4.8	4.1	4.2	5.7	9.5	37.2	5.0	3.9
Region 03 South Atlantic-Gulf	2.7	5.4	8.0	8.4	9.0	8.6	43.0	4.8	6.4
Region 04 Great Lakes	4.0	7.3	8.9	8.9	12.2	11.6	25.3	7.0	9.0
Region 05 Ohio	2.5	10.0	9.7	9.8	11.6	15.5	72.3	8.0	7.6
Region 06 Tennessee	15.6	21.9	21.0	(D)	38.1	29.1	73.2	13.4	(D)
Region 07 Upper Mississippi	2.5	4.7	4.8	4.8	6.5	4.5	12.8	4.8	4.9
Region 08 Lower Mississippi	2.5	3.0	3.6	3.6	4.8	6.1	13.9	3.4	3.3
Region 09 Souris-Red-Rainy	13.3	13.0	12.6	12.6	14.6	19.0	50.2	23.8	25.9
Region 10 Missouri	2.2	5.9	2.5	2.5	3.3	4.1	7.2	2.9	3.4
Region 11 Arkansas-White-Red	4.8	5.4	3.9	3.9	5.0	9.4	9.3	7.9	8.2
Region 12 Texas-Gulf	2.6	8.9	9.0	6.9	8.9	13.0	14.5	6.5	6.7
Region 13 Rio Grande	5.2	47.9	12.0	9.5	13.4	15.3	37.1	8.6	9.4
Region 14 Upper Colorado	4.4	15.4	8.8	10.7	12.3	15.2	34.8	7.3	27.0
Region 15 Lower Colorado	6.7	87.6	11.4	12.1	14.3	30.4	37.7	11.5	11.4
Region 16 Great Basin	2.4	12.1	8.0	9.5	9.0	13.9	31.7	4.8	13.3
Region 17 Pacific Northwest	1.5	13.8	4.2	4.1	4.4	5.4	20.1	2.9	3.7
Region 18 California	1.0	10.4	3.9	4.3	4.1	5.8	10.9	3.5	5.6
Region 19 Alaska	9.4	88.1	29.8	(D)	45.1	27.3	34.8	20.0	(D)
Region 20 Hawaii	4.2	40.2	25.5	31.4	26.3	29.8	56.9	30.8	37.0

Table C. Coefficient of Variation (percent) for Selected Horticultural Irrigation Data: 2023

Geographic area	Irrigated horticultural operations	Irrigated area	
		Acres in the open	Square feet under protection
United States	1.3	8.6	9.0
Alabama	24.0	39.8	35.9
Alaska	10.6	29.0	26.1
Arizona	21.3	30.0	40.3
Arkansas	9.1	35.4	49.4
California	5.6	17.9	16.6
Colorado	11.5	26.4	16.5
Connecticut	14.3	58.4	49.6
Delaware	23.4	80.9	48.0
Florida	13.2	26.4	18.8
Georgia	8.4	27.5	25.5
Hawaii	9.2	(D)	22.9
Idaho	10.1	35.7	13.0
Illinois	7.9	43.5	23.2
Indiana	7.7	59.9	37.1
Iowa	21.4	46.9	68.0
Kansas	11.8	41.5	28.1
Kentucky	9.0	34.2	24.7
Louisiana	7.0	19.9	16.9
Maine	18.4	48.8	86.5
Maryland	15.0	46.2	38.3
Massachusetts	12.9	34.0	31.0
Michigan	5.4	40.1	21.2
Minnesota	13.5	56.1	23.1
Mississippi	12.1	39.2	57.5
Missouri	7.3	36.4	15.9
Montana	12.9	36.2	23.6
Nebraska	9.7	42.9	34.5
Nevada	28.6	(D)	36.1
New Hampshire	8.9	87.4	20.1
New Jersey	7.3	30.3	29.8
New Mexico	13.5	(D)	40.4
New York	8.4	39.0	32.9
North Carolina	13.1	34.4	35.1
North Dakota	23.5	(D)	55.3
Ohio	9.4	33.0	20.0
Oklahoma	15.8	55.0	27.8
Oregon	4.0	23.4	16.9
Pennsylvania	8.9	58.8	16.2
Rhode Island	14.9	35.2	39.1
South Carolina	20.4	35.2	76.2
South Dakota	9.7	(D)	74.6
Tennessee	15.5	24.2	22.8
Texas	8.9	18.5	54.5
Utah	11.1	35.5	37.0
Vermont	10.6	42.0	23.3
Virginia	8.5	30.7	30.4
Washington	8.5	31.9	24.5
West Virginia	15.7	(D)	35.2
Wisconsin	8.3	25.5	21.9
Wyoming	26.8	67.0	30.3
Water Resource Regions			
Region 01 New England	7.0	16.6	18.9
Region 02 Mid-Atlantic	6.4	18.8	16.6
Region 03 South Atlantic-Gulf	7.6	16.1	16.6
Region 04 Great Lakes	4.9	32.0	16.1
Region 05 Ohio	3.7	25.7	20.9
Region 06 Tennessee	21.7	23.7	32.3
Region 07 Upper Mississippi	7.0	15.6	14.2
Region 08 Lower Mississippi	12.4	30.9	16.0
Region 09 Souris-Red-Rainy	49.2	(D)	60.0
Region 10 Missouri	7.8	15.0	28.6
Region 11 Arkansas-White-Red	8.3	31.0	20.1
Region 12 Texas-Gulf	8.8	18.5	59.9
Region 13 Rio Grande	18.2	(D)	82.6
Region 14 Upper Colorado	17.0	98.2	43.0
Region 15 Lower Colorado	22.4	28.6	38.9
Region 16 Great Basin	10.0	33.1	39.6
Region 17 Pacific Northwest	3.7	21.3	16.8
Region 18 California	5.1	17.9	16.6
Region 19 Alaska	10.6	29.0	26.1
Region 20 Hawaii	9.2	(D)	22.9