

Scan QR codes to  
access resources



# Accessing ACS Data Products: Using the ACS Summary File

May 18, 2023

Charles Gamble, Survey Statistician, American Community Survey (ACS) Office

Vicki Mack, Survey Statistician, ACS Office

Bonan Ren, IT Specialist, ACS Data Products Coordination Branch

# Using the American Community Survey Summary File

## What is the ACS Summary File?

### The ACS Summary File

- A set of files containing the same data as **Detailed Tables**.
  - Flexibility allowing data users to extract only the desired data or entire datasets.
- Used by advanced users **who want entire datasets**.



[Original Database](#) by [shindoverse](#) is licensed under [CC BY-NC-SA 2.0](#).

# Using The American Community Survey Summary File

## The ACS Detailed Tables

- Most detailed ACS data and cross tabulations of variables.
- Begin with the letters "**B**" for base tables and "**C**" for collapsed tables.
  - Collapsed tables - same topics as base tables, but with fewer categories.
- All geographic areas including the **block group** level.
- Available through the ACS Summary File, Census Bureau Application Programming Interface, and [data.census.gov](https://data.census.gov)

Table ID	Table Title
B01001	SEX BY AGE
B01001A	SEX BY AGE (WHITE ALONE)
B01001B	SEX BY AGE (BLACK OR AFRICAN AMERICAN ALONE)
B01001C	SEX BY AGE (AMERICAN INDIAN AND ALASKA NATIVE ALONE)
B01001D	SEX BY AGE (ASIAN ALONE)
B01001E	SEX BY AGE (NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE)
B01001F	SEX BY AGE (SOME OTHER RACE ALONE)
B01001G	SEX BY AGE (TWO OR MORE RACES)
B01001H	SEX BY AGE (WHITE ALONE, NOT HISPANIC OR LATINO)
B01001I	SEX BY AGE (HISPANIC OR LATINO)
B01002	MEDIAN AGE BY SEX
B01002A	MEDIAN AGE BY SEX (WHITE ALONE)
B01002B	MEDIAN AGE BY SEX (BLACK OR AFRICAN AMERICAN ALONE)
B01002C	MEDIAN AGE BY SEX (AMERICAN INDIAN AND ALASKA NATIVE ALONE)
B01002D	MEDIAN AGE BY SEX (ASIAN ALONE)
B01002E	MEDIAN AGE BY SEX (NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE)
B01002F	MEDIAN AGE BY SEX (SOME OTHER RACE ALONE)
B01002G	MEDIAN AGE BY SEX (TWO OR MORE RACES)
B01002H	MEDIAN AGE BY SEX (WHITE ALONE, NOT HISPANIC OR LATINO)
B01002I	MEDIAN AGE BY SEX (HISPANIC OR LATINO)
B01003	TOTAL POPULATION
B02001	RACE
B02003	DETAILED RACE
B02008	WHITE ALONE OR IN COMBINATION WITH ONE OR MORE OTHER RACES BLACK OR AFRICAN AMERICAN ALONE OR IN COMBINATION WITH ONE OR MORE OTHER RACES
B02009	AMERICAN INDIAN AND ALASKA NATIVE ALONE OR IN COMBINATION WITH ONE OR MORE OTHER RACES
B02010	ASIAN ALONE OR IN COMBINATION WITH ONE OR MORE OTHER RACES
B02011	NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE OR IN COMBINATION WITH ONE OR MORE OTHER RACES
B02012	SOME OTHER RACE ALONE OR IN COMBINATION WITH ONE OR MORE OTHER RACES
B02013	AMERICAN INDIAN AND ALASKA NATIVE ALONE FOR SELECTED TRIBAL GROUPINGS
B02014	ASIAN ALONE BY SELECTED GROUPS

# Using the American Community Survey Summary File

## Overview of the Summary File Formats

## Two Summary File formats are currently available

- Table-based (current): 2018 – Present ACS Data
- Sequence-based (old): 2005 – 2021 ACS Data

## Table-based: Pipe-Delimited text file

## Sequence-based: Comma-Delimited text file

- First check [data.census.gov](https://data.census.gov) for data interest to easily download

[illegible]

# Using the American Community Survey Summary File

## Overview of the Sequence-Based Summary File



### The Sequence-based ACS Summary File Format

- Includes three files: estimates, margins of error, and geography files
- Large number of cells stored in a series of files (“Sequences”) containing only the estimates.
- Sequences don't include metadata like table titles, row descriptions, and names of geographic areas.
- Metadata must be merged with data files to reproduce complete tables.

### Challenges:

- Confusing for data users
- Technical documentation needed to find files that contain the data table of interest
- Combining 3 files to create complete tables
- Large haul for ACS Staff – split data into 40,000 files

## ACS Summary File Sequence-Based Format (2005-2021)


Share [Facebook](#) [Twitter](#) [LinkedIn](#)

The American Community Survey (ACS) Summary File Sequence-Based Format is a set of comma-delimited text files that contain all of the Detailed Tables for the ACS data releases. Summary File data in the sequence-based format are only available for data years 2005-2021. The sequence-based format is divided into three file types: estimates, margin of error, and geography files for each release.

In the sequence-based format, Detailed Tables are stored in a series of files with only the data from the tables and without such information as the table title, description of the rows, or geographic identifiers. That information is located in other files that the user must merge with the data files to reproduce complete tables.

The handbook, *Using the ACS Summary File: What Data Users Need to Know*, provides an overview and more about working with the sequence-based format. Data, instructions, guides, and example SAS programs are provided below for each year.

[2021](#) [2020](#) [2019](#) [2018](#) [2017](#) [More](#) ▾



[Download Using the American Community Survey Summary File: What Data Users Need to Know \[PDF - 6.5 MB\]](#)

### Related Information

[ACS Summary File Table-Based Format](#)

[MAPPING FILE](#)  
[TIGER/Line with Selected Demographic and Economic Data](#)

# Using the American Community Survey Summary File

## Overview of the Table-Based Summary File



### The Table-Based ACS Summary File Format

- Streamlines production by delivering only one file.
- Files split by table ID (no longer split by state and sequence number).
- Each file (by Table ID) contains estimates and MOEs for all geographies.
- Reduces complexity to roughly 2,000 files rather than 140k files.

### Benefits:

- Estimates and MOEs for tables are combined into one file
- Geography identifiers and labels combined into one file
- Simplified documentation for Census Bureau staff - saving time and resources
- Can use Excel, SAS, or Python to work with the SF

Within Data

Congressional and State Legislative Districts

Custom Tables

Data Tables

Data Tools

Data via API

Data via FTP

Equal Employment Opportunity (EEO)




Experimental Data

Race/Ethnicity and American Indian & Alaska Native

Summary File

Variance Replicate Estimate Tables

## ACS Summary File

Share   

The American Community Survey (ACS) Summary File is a unique data product that includes all estimates and margins of error (MOE) from the [Detailed Tables](#) for all geographies published for the ACS. The ACS Summary File allows data users to download statistics for a large number of tables and geographic areas. Currently, there are two methods for downloading the summary file: the new Table-Based Format and original Sequence-Based Format.

### Table-Based Format

For the 2018 data release, the Census Bureau tested a new, Table-Based Format for the ACS Summary File. This format groups the estimates and MOE by table ID, removing the need to merge these files. That is, a file is posted for each table containing both the estimates and MOE for all available geographies. Data users only need to merge in geography labels to create complete tables.


*The Table-Based Format is the recommended format for the 2021 data release, and it will be the only format starting with the 2022 data release.* Check out the [Getting Started](#) and data year tabs below for information and resources. The resources include instructions for merging the geography labels with each table via Excel or programs like SAS and Python.

To share feedback on the Table-Based Format, please send your comments to [acs.users.support@census.gov](mailto:acs.users.support@census.gov) and title your message "ACS Summary File Feedback." We appreciate hearing about what you like or what we can improve.

### Changes for the 2021 Data Release

The 2021 data release is the final release of the original Sequence-Based Format; it is available for years 2005 through 2021. More information, including data, instructions and example programs are located on the [ACS Summary File Sequence-Based Format](#) page. Starting with the 2022 data release, the Table-Based Format will be the only format available.

[Getting Started](#) [2021](#) [2020](#) [2019](#) [2018](#) [2017 To 2005](#)



Join the ACS  
Data Users Group

#### Related Information

[ACS Summary File Sequence-Based Format](#)



# Using the American Community Survey Summary File

## Accessing Summary File from the ACS Webpage

Within Our Surveys & Programs

About the ACS

Respond to the ACS

News & Updates

Data

Microdata

Guidance for Data Users

Geography & ACS

Technical Documentation

Methodology

Information For...

Library

## American Community Survey (ACS)

The American Community Survey (ACS) helps local officials, community leaders, and businesses understand the changes taking place in their communities. It is the premier source for detailed population and housing information about our nation.

### Featured

#### Respond to the ACS

Learn the different ways to respond to the American Community Survey – online, by phone, by email. Read our FAQs or call us for more help with the survey.

#### American Community Survey Data

## American Community Survey Data

Share

The American Community Survey (ACS) releases new data every year through a variety of data tables that you can access with different data tools. Learn more about the different types of tables and profiles powered by ACS data. We also have information about other special datasets, such as the ACS Experimental Data, ACS Summary File, and ACS Public Use Microdata Sample (PUMS) files.

### Get Started Accessing ACS Data

Check out data.census.gov, the Census Bureau's main data dissemination tool. Here, you can access tables and maps with ACS data. You can also view data.census.gov Resources for step-by-step guidance, video tutorials, FAQs, and more.

[GO TO DATA.CENSUS.GOV](#)

data.census.gov Resources

Within American Community Survey (ACS)

Custom Tables

Data Tables

Data Tools

Data via API

Data via FTP

Equal Employment Opportunity (EEO)

Experimental Data

Race/Ethnicity and American Indian & Alaska Native

Summary File

Variance Replicate Estimate Tables

Within Data

Congressional and State Legislative Districts

Custom Tables

Data Tables

Data Tools

Data via API

Data via FTP

Equal Employment Opportunity (EEO)

Experimental Data

Race/Ethnicity and American Indian & Alaska Native

Summary File

Variance Replicate Estimate Tables

## ACS Summary File

Share

The American Community Survey (ACS) Summary File is a unique data product that includes all estimates and margins of error (MOE) from the Detailed Tables for all geographies published for the ACS. The ACS Summary File allows data users to download statistics for a large number of tables and geographic areas. Currently, there are two methods for downloading the summary file: the new Table-Based Format and original Sequence-Based Format.

### Table-Based Format

For the 2018 data release, the Census Bureau tested a new, Table-Based Format for the ACS Summary File. This format groups the estimates and MOE by table ID, removing the need to merge these files. That is, a file is posted for each table containing both the estimates and MOE for all available geographies. Data users only need to merge in geography labels to create complete tables.

**The Table-Based Format is the recommended format for the 2021 data release, and it will be the only format starting with the 2022 data release.** Check out the Getting Started and data year tabs below for information and resources. The resources include instructions for merging the geography labels with each table via Excel or programs like SAS and Python.

To share feedback on the Table-Based Format, please send your comments to [acso.users.support@census.gov](mailto:acso.users.support@census.gov) and title your message "ACS Summary File Feedback." We appreciate hearing about what you like or what we can improve.


### Changes for the 2021 Data Release

The 2021 data release is the final release of the original Sequence-Based Format; it is available for years 2005 through 2021. More information, including data, instructions and example programs are located on the [ACS Summary File Sequence-Based Format](#) page. Starting with the 2022 data release, the Table-Based Format will be the only format available.

Getting Started 2021 2020 2019 2018 2017 To 2005

#### Related Information

[ACS Summary File Sequence-Based Format](#)



# Using the American Community Survey Summary File

## Demo: Access the Table-Based Summary File Tables



### Accessing the Summary File Tables and Geography File from the FTP:

#### Getting Started

The Table-Based ACS Summary File contains three file types:

- Table Labels** - Description of each line item in a table  
Example File Name: ACS2019\_Table\_Shells.csv  
Example: B01001\_003 = "SEX BY AGE - Total Males Under 18"
- Geography Labels** - All geography labels for a 1-year or 5-year release  
Example File Name: 20191YRGeos.csv, 20195YRGeos.csv  
Example: 0400000US06 = "California"
- Data Files** - Data (including estimates, margins of error, and confidence intervals) organized by table ID for 1-year or 5-year release  
Folder: 1YRData, 5YRData  
Example: The file acsdt1y2019-b01001.dat, variable B01001\_003 for 0400000US06 = 1,215,418

There are a variety of resources available for understanding the table-based format. Linked below are webinars related to the table-based format, the FTP site to access data and documentation, instructions with the summary file, and links to the ACS Summary File further guidance on the table-based format as well as examples in R and Python.

#### Summary File Data

2021-Present: select the Data folder to find table-based data. 2018-2020: select the Prototype folder to find table-based data.

[ACS Summary File Data](#)

	Name	Last modified
Parent Directory		
2005/	2015-04-29 14:18	
2006/	2015-04-29 14:22	
2007/	2015-04-29 14:26	
2008/	2015-04-29 15:14	
2009/	2015-05-01 16:42	
2010/	2015-05-13 09:50	
2011/	2015-05-13 16:07	
2012/		
2013/		
2014/		
2015/		
2016/		
2017/		
2018/		
2019/		
2020/		
2021/		

	Name	Last modified
Parent Directory		
sequence-based-SF/	2022-09-13 10:00	
table-based-SF/	2022-09-13 10:00	

	Name	Last modified
Parent Directory		
data/	2022-12-01 10:00	
documentation/	2022-12-01 10:00	

	Name	Last modified
Parent Directory		
1YRData/	2022-08-29 15:24	
5YRData/	2022-11-29 13:20	

	Name	Last modified	Size	Description
Parent Directory				
1YRData.zip	2022-08-22 14:36	515M		
acsdt1y2021-b01001.dat	2022-08-22 14:33	3.7M		
acsdt1y2021-b01001a.dat	2022-08-22 14:33	2.3M		
acsdt1y2021-b01001b.dat	2022-08-22 14:33	1.2M		
acsdt1y2021-b01001c.dat	2022-08-22 14:33	259K		



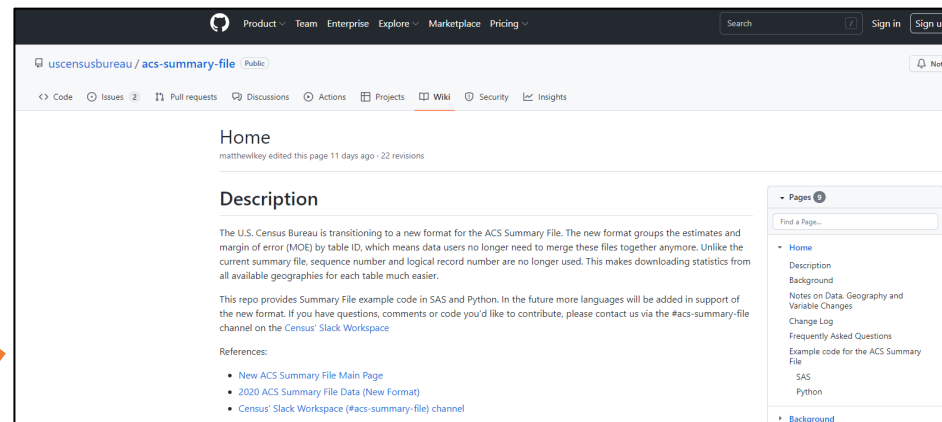
# Using the American Community Survey Summary File

## Overview of the Table-Based Summary File



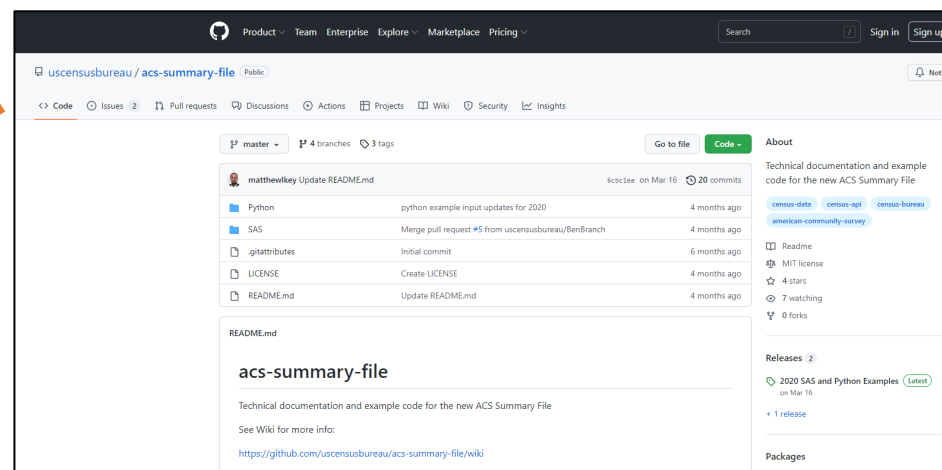
### Resources/Guides for the ACS Table-Based Summary File Format:

- [ACS Summary File GitHub wiki page](#)
- [ACS Summary File GitHub repository](#)



### Data Analysis Examples Provided in GitHub:

- SAS
- Python



# Using the American Community Survey Summary File

## Resources for Using the Summary File: Table-Based



## Resources/Guides for the Table-Based Summary File

- Handbook- **Coming Soon!**
- Webinars
- Example SAS and Python Programs
- Excel Instructions on How to Import Geography into the Table-Based Summary File Table

### Summary File Data


2021-Present: select the Data folder to find table-based format. 2018-2020: select the Prototype folder to find table-based format.

 [ACS Summary File Data](#)

### Webinars About the Summary File Format Change

 [September 2022- Using the American Community Survey Summary File](#)

 [June 2022- Understanding the New ACS Summary File Format](#)

 [October 2020- Proposed Format Change to Simplify the ACS Summary File](#)

### Release Notes and Supporting Materials

Visit the ACS Summary File GitHub wiki page for notes on data, geography, variable changes, example code, and other important general information about the table-based format.

 [GitHub Wiki Page](#)

### Example Programs

Visit the ACS Summary File GitHub repository for examples using SAS and Python. Additionally, there are instructions for using the ACS Summary File with Excel.

 [SAS-How to Retrieve ACS 1-Year Table Data for All Geographies in a State](#)

 [SAS-How to Retrieve All ACS 5-Year Table Data for All Tracts in the United States](#)

 [Python-Get ACS 1-Year Table Data for All Geographies in a State](#)

 [Python-Get All ACS 5-Year Table Data for All Tracts in the United States](#)

 [Excel Instructions on How to Import Geography into Table-Based Summary File Tables](#)

# Using the American Community Survey Summary File

## Resources for Using the Summary File: Sequence-Based



### Resources/Guides for the Sequence-based Summary File

- Handbook- Using the American Community Survey Summary File hat Data Users Need to Know
- Instructions on How to Read the ACS Summary File into Excel
- Instructions on Joining the ACS Summary File to the TIGER/Line Shapefiles
- SAS programs for each sequence per state
- Example of Creating a Table Using SAS

### ACS Summary File Sequence-Based Format (2005-2021)

Share   

The American Community Survey (ACS) Summary File Sequence-Based Format is a set of comma-delimited text files that contain all of the Detailed Tables for the ACS data releases. Summary File data in the sequence-based format are only available for data years 2005-2021. The sequence-based format is divided into three file types: estimates, margin of error, and geography files for each release.

In the sequence-based format, Detailed Tables are stored in a series of files with only the data from the tables and without such information as the table title, description of the rows, or geographic identifiers. That information is located in other files that the user must merge with the data files to reproduce complete tables.

The handbook, Using the ACS Summary File: What Data Users Need to Know, provides an overview and more about working with the sequence-based format. Data, instructions, guides, and example SAS programs are provided below for each year.

[Download Using the American Community Survey Summary File: What Data Users Need to Know \[PDF - 6.5 MB\]](#)

**Related Information**

[ACS Summary File Table-Based Format](#)

[MAPPING FILE](#)

[TIGER/Line with Selected Demographic and Economic Data](#)

2021 2020 2019 2018 2017 [More](#)

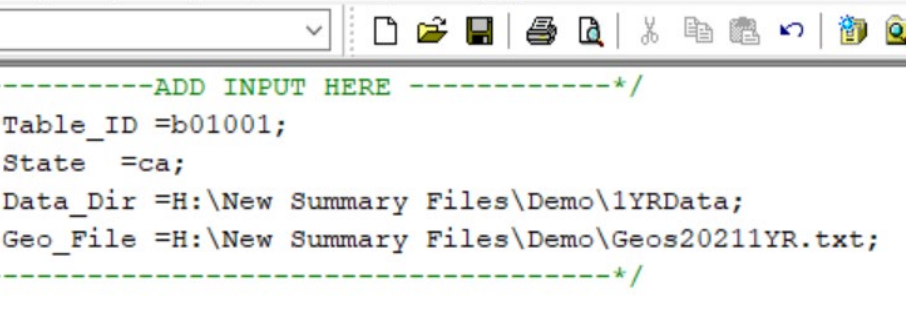
**2021**

<b>2021 ACS 1-year Estimates</b>	<b>2017-2021 ACS 5-year Estimates</b>
<b>1-Year Summary File (Sequence-Based)</b>	<b>5-Year Summary File (Sequence-Based)</b>

# Using the American Community Survey Summary File Table-Based Summary File Demonstration | Geography Names

- SAS Code Example (Bonan Ren)
- Excel “VLOOKUP” Example (Vicki Mack)

## SAS Example



The screenshot shows the SAS IDE with the following code in the editor:

```

/*-----ADD INPUT HERE -----*/
%let Table_ID =b01001;
%let State =ca;
%let Data_Dir =H:\New Summary Files\Demo\1YRData;
%let Geo_File =H:\New Summary Files\Demo\Geos20211YR.txt;
/*-----*/

libname out ".";

/** Import Data **/
proc import datafile = "&Data_Dir./acsdtly2021-&Table_ID..dat"
    out = out.&Table_ID
    dbms = dlm
    replace;
    getnames = yes;
    delimiter = '|';
    GUESSINGROWS=10000;
run;

```

Output - (Untitled) | Log - (Untitled) | Example01 \*



# Using the American Community Survey Summary File

## All Data from the State of California in Table B01001

	NAME	GEO_ID	B01001_E001	B01001_M001	B01001_E002	B01001_M002	B01001_E003	B01001_M003	B01001_E004	B01001_M004
1	California	0400000US06	39237836	-555555555	19618934	6432	1129355	3475	1210580	14702
2	California -- Urban	0400001US06	37039607	40644	18459965	24696	1060499	5939	1148785	14470
3	California -- Rural	0400043US06	2198229	40644	1158969	23831	68856	5217	61795	4717
4	California -- In metropolitan or micropolitan statistical area	04000A0US06	38956998	-555555555	19474623	6175	1122822	3435	1204457	14791
5	California -- In metropolitan statistical area	04000C0US06	38374563	-555555555	19179376	5102	1110028	3000	1188541	14611
6	California -- In metropolitan statistical area -- in principal city	04000C1US06	17768429	3337	8873501	24723	501178	11127	531411	11901
7	California -- In metropolitan statistical area -- not in principal city	04000C2US06	20606134	3337	10305875	23993	608850	11461	657130	12638
8	California -- In micropolitan statistical area	04000E0US06	582435	-555555555	295247	3170	12794	1392	15916	2011
9	California -- In micropolitan statistical area -- in principal city	04000E1US06	157703	8859	80663	5977	2809	1234	3447	1304
10	California -- In micropolitan statistical area -- not in principal city	04000E2US06	424732	8859	214584	7107	9985	1412	12469	1881
11	California -- Not in metropolitan or micropolitan statistical area	04000G0US06	280838	-555555555	144311	1596	6533	990	6123	1259
12	California -- Not in metropolitan statistical area	04000H0US06	863273	-555555555	439558	3400	19327	1505	22039	2011
13	Alameda County, California	0500000US06001	1648556	-555555555	816792	301	44662	199	46548	2478
14	Butte County, California	0500000US06007	208309	-555555555	103229	826	5124	303	5783	1049
15	Contra Costa County, California	0500000US06013	1161413	-555555555	570719	716	31081	2	32812	2867
16	El Dorado County, California	0500000US06017	193221	-555555555	96068	849	4295	522	4050	1006

# Using the American Community Survey Summary File

## Additional support

### U.S. Census Bureau Slack Channel

- Developer's forum to help improve access to public datasets from the U.S. Census Bureau
- [Join U.S. Census Bureau Slack Channel](#)

### ACS User Support

- [acso.users.support@census.gov](mailto:acso.users.support@census.gov)

### GitHub

- All programming languages are welcome!
- If you are interested in submitting code to the ACS GitHub, please submit an email to [acso.users.support@census.gov](mailto:acso.users.support@census.gov).