2. HOW TO USE THE ACS SUMMARY FILE

Basic Steps to Using the ACS Summary File

To use the American Community Survey (ACS) Summary File, data users should follow the steps outlined below.

- Locate the files that you need. ACS Summary File data are stored on the U.S. Census Bureau's file transfer protocol (FTP) server in zipped files. The desired Summary File data need to be downloaded and unzipped.

- Data users will need to download:
  ° Geography file(s).
  ° Estimate file(s).
  ° Margin of error file(s).
  ° Excel templates and Instructions on How to Read the ACS Summary File into Excel (if using Excel).
  ° SAS programs and/or SAS macro code (if using SAS).

- Identify the tables of interest. The Summary File Documentation on the ACS Web site includes a series of Excel workbooks that provide a complete list of the tables that are in the Summary File, as well as table IDs, sequence numbers, the starting and ending positions for the table data, and

any geographic restrictions.[8] Sequence numbers uniquely identify tables within a given subject. The Sequence Number/Table Number Lookup Files provide information about the relationship between sequence numbers and tables, as well as the line numbers for the individual data points. Learn more about identifying tables in Section 3.

- Identify the tool that you will use to retrieve the desired tables. The Census Bureau provides instructions on how to access tables in the Summary File using Excel and SAS. Learn more about using these tools in Section 4. Advanced data users can also write their own programs using other statistical software.

Locating the ACS Summary File

The ACS Summary File is located on the Census Bureau's file transfer protocol (FTP) server.[9] The file can be reached by navigating through the FTP site in a few different ways. The easiest way is to start at the ACS Web site.[10] Then select the desired data release. From the ACS main page, <www.census.gov/acs>, click on the "Data" tab in the left navigation, select the option for "Summary File Data," as shown in Figure 2.1.

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[8] U.S. Census Bureau, American Community Survey (ACS), Summary File Documentation, <www.census.gov/programs-surveys/acs/technical-documentation/summary-file-documentation.html>.
[9] U.S. Census Bureau, American Community Survey (ACS), Data via FTP, <www.census.gov/programs-surveys/acs/data/data-via-ftp.html>.
[10] U.S. Census Bureau, American Community Survey (ACS), <www.census.gov/programs-surveys/acs>.

Figure 2.1. **Accessing ACS Summary File Data**

Source: U.S. Census Bureau, American Community Survey (ACS), <www.census.gov/acs>.

This will take you to the ACS Summary File page. Select the desired data year and then click on "1-Year Summary File" (see Figure 2.2) or "5-Year Summary File" to go to the ACS Summary File FTP site.

Figure 2.2. **Selecting an ACS Summary File**

Source: U.S. Census Bureau, American Community Survey (ACS), Summary File Data, <www.census.gov/programs-surveys/acs/data/summary-file.html>.

Figure 2.3 shows the ACS Summary File directory for the 2017 ACS 1-year and 5-year data files. As described in the next section, each file is actually comprised of three folders, as well as templates, for each data release.

Figure 2.3. **ACS Summary File Directory for the 2017 ACS 1-Year and 5-Year Data**

Name	Last modified	Size	Description
Parent Directory		-	
1_year_by_state/	17-Aug-2018 14:41	-	
1_year_entire_sf/	17-Aug-2018 14:45	-	
1_year_seq_by_state/	17-Aug-2018 15:26	-	
5_year_by_state/	16-Nov-2018 10:16	-	
5_year_entire_sf/	29-Nov-2018 15:08	-	
5_year_seq_by_state/	15-Nov-2018 20:08	-	
2017_1yr_Summary_FileTemplates.zip	15-Nov-2018 15:22	1.9M	

Source: U.S. Census Bureau, <https://www2.census.gov/programs-surveys/acs/summary_file/2017/data/?#>.

Summary File Organization

The ACS Summary File is organized in three directories per data release. For example, data users have a choice of three ACS 1-year Summary File directories:

- 1_year_entire_sf (entire summary file).
- 1_year_by_state (summary file subdivided by state).
- 1_year_seq_by_state (summary file subdivided by state and sequence).

These three directories contain the same combination of files, and each folder can be used to access all ACS Detailed Tables; they are simply arranged differently to accommodate different user needs. Each data release also includes a corresponding zipped file for templates.

Each of the three directories is further subdivided into three types of files: geography, estimate, and margin of error files, which are available for each of the 50 states, the District of Columbia, Puerto Rico, and cross-state geographies such as metropolitan statistical areas. The geography files start with "g," the estimate files start with "e," and the margin of error files start with "m." Lastly, the estimate and margin of error files are segmented by "sequence." Each sequence contains the data points for a single table or multiple tables within the same subject area. This means that the Summary File is actually a set of over 10,000 files. Learn more about sequences in Section 3.

- **All-in-one directory** (1_year_entire_sf, 5_year_entire_sf)
  This directory contains a single zipped file, which includes all the geography, estimate, and margin of error files (over 10,000 files in all). This zipped file is ideal to download if you want estimates and margins of error for all geographies throughout the nation. The file is very large and should only be used by those who can easily process a very large file.

- **State table directory** (1_year_by_state, 5_year_by_state)
  This directory contains a zipped file for each state, the District of Columbia, Puerto Rico, and cross-state geographies such as metropolitan statistical areas. Each zipped file contains a geography file and an estimate and margin of error file for each sequence. Downloading files from these state-level folders is ideal if you want all the tables for a particular geography.

- **Topic table directory** (1_year_seq_by_state, 5_year_seq_by_state)
  Like the state table directory, the topic table directory contains a folder for each state, state-level equivalent (District of Columbia and Puerto Rico), and cross-state geography. Within each folder, there is a geography file and a zipped file for each sequence, containing the estimate and margin of error files for that sequence. Downloading from these folders is ideal if you only want a few tables for a particular geography.

Table 2.1 shows the naming convention used for a selected zipped file in the "1_year_seq_by_state" directory. In the file name, "ak" refers to the State of Alaska.

Table 2.1. **Naming Convention for Zipped Topic Tables**		
20171ak0001000.zip		
Example	**Name**	**Range or Type**
2017	Reference Year	ACS data year (last year of the period for multiyear periods).
1	Period Covered	1=1-year, 5=5-year.
ak	State Level	US or abbreviations for state, District of Columbia, and Puerto Rico.
0001	Sequence Number	0001 to 9999 (uniquely identifies a table within a given subject).
000	IterationID	Iteration ID for Selected Population Tables and American Indian and Alaska Native Tables. Note: Iteration ID is always "000" for the standard 1-year and 5-year products.
Source: U.S. Census Bureau.		

- **Templates** (1yr_Summary_FileTemplates.zip, 5yr_SummaryFileTemplates.zip)
  These zipped files contain Excel file templates for each sequence (for example, Seq1.xls, Seq2.xls), as well as the geography file (for example, 2017_SFGeoFileTemplate.xls). These files include two rows of metadata containing the variable names and their descriptions for every column. The templates are meant to be used with the comma-delimited versions of the geography, estimate, and margin of error files and can be used to import the ACS Summary File into Excel. ACS Summary File templates are located in the same directory as the 1-year and 5-year data files (See Figure 2.4).

- **5-year Summary File organization**
  The ACS 5-year Summary File has an additional layer within the directories. The file is divided into two groups, one that contains the data for all geographic levels other than census tracts and block groups, called "All_Geographies_Not_Tracts_Block_Groups" and another that includes only census tracts and block groups, called "Tracts_Block_Groups_Only."

Figure 2.4. **ACS Summary File Templates for the 2017 ACS 1-Year and 5-Year Data**

Name	Last modified	Size	Description
Parent Directory		-	
1_year_by_state/	17-Aug-2018 14:41	-	
1_year_entire_sf/	17-Aug-2018 14:45	-	
1_year_seq_by_state/	17-Aug-2018 15:26	-	
5_year_by_state/	16-Nov-2018 10:16	-	
5_year_entire_sf/	29-Nov-2018 15:08	-	
5_year_seq_by_state/	15-Nov-2018 20:08	-	
2017_1yr_Summary_FileTemplates.zip	15-Nov-2018 15:22	1.9M	
2017_5yr_Summary_FileTemplates.zip	06-Dec-2018 03:15	1.5M	
computer_internet_tables/	19-Feb-2019 08:16	-	

Source: U.S. Census Bureau, <https://www2.census.gov/programs-surveys/acs/summary_file/2017/data/?#>.

Geography Files

The ACS Summary File is organized so there is a set of files for each state or state-level equivalent (District of Columbia and Puerto Rico). Each state-level file contains the data for the geographic levels that are always entirely within a state, such as counties and places. There is also a file called "United States," which includes the data for the geographic areas that cross state boundaries such as the nation, regions, divisions, metropolitan statistical areas, Zip Code Tabulation Areas (ZCTAs), and tribal areas. The U.S. level does not contain tables for geographies that are entirely within a state.

Table 2.2 lists the geographic levels available in the state- and U.S.-level files.

Table 2.2. **Examples of Geographic Levels Available in the State- and U.S.-Level Files**	
State	Nation
County	Region
County Subdivision	Division
Place	Metropolitan or Micropolitan Statistical Areas
Congressional District	New England City and Town Areas (NECTA)
Public Use Microdata Area (PUMA)	American Indian/Alaska Native/Hawaiian Home Land areas
School District	Urban areas
Alaska Native Regional Corporation	Zip Code Tabulation Areas (ZCTAs)
Source: U.S. Census Bureau.	

Each geography has a single geography file associated with it, regardless of how the ACS Summary File is accessed. The geography files are used to link the geographic information for an area to the data in the estimate and margin of error files. To link the files together, merge the geography file with the estimate and margin of error files using the variable, LOGRECNO, the logical record number. Geography files begin with a "g" and are ASCII files using either a position-based format (.txt) or comma-delimited format (.csv).

Geography files follow a specific naming convention. Table 2.3 shows the naming convention used for the 1-year geography ("g") file for Alaska ("ak").

Table 2.3. **Naming Convention for a Geography File**		
g20171ak.txt or.csv		
Example	**Name**	**Range or Type**
g	File Type	g=geography
2017	Reference Year	ACS data year (last year of the period for multiyear periods)
1	Period Covered	1=1-year, 5=5-year
ak	State Level	U.S. or abbreviations for state, District of Columbia, and Puerto Rico
Source: U.S. Census Bureau.		

Table 2.4 shows the contents of the geography file, which is available in both .csv and .txt formats. Each row represents a different geographic area, and the first five fields contain metadata, such as the state postal abbreviation and logical record number.

Following those fields are the different geographic levels available for a particular data release. The fields in the table are blank if the geographic level is not available for a particular data release.

Table 2.4. Contents of Geography File

Variable Name	Description	Field Size	Starting Position	Code Type
FILEID	Always equal to ACS Summary File identification	6	1	Record
STUSAB	State Postal Abbreviation	2	7	Record
SUMLEVEL	Summary Level	3	9	Record
COMPONENT	Geographic Component	2	12	Record
LOGRECNO	Logical Record Number	7	14	Record
US	US	1	21	Geographic
REGION	Census Region	1	22	Geographic
DIVISION	Census Division	1	23	Geographic
STATECE	State (Census Code)	2	24	Geographic
STATE	State (FIPS Code)	2	26	Geographic
COUNTY	County of current residence	3	28	Geographic
COUSUB	County Subdivision (FIPS)	5	31	Geographic
PLACE	Place (FIPS Code)	5	36	Geographic
TRACT	Census Tract	6	41	Geographic
BLKGRP	Block Group	1	47	Geographic
CONCIT	Consolidated City	5	48	Geographic
AIANHH	American Indian Area/Alaska Native Area/ Hawaiian Home Land (Census)	4	53	Geographic
AIANHHFP	American Indian Area/Alaska Native Area/ Hawaiian Home Land (FIPS)	5	57	Geographic
AIHHTLI	American Indian Trust Land/ Hawaiian Home Land Indicator	1	62	Geographic
AITSCE	American Indian Tribal Subdivision (Census)	3	63	Geographic
AITS	American Indian Tribal Subdivision (FIPS)	5	66	Geographic
ANRC	Alaska Native Regional Corporation (FIPS)	5	71	Geographic
CBSA	Metropolitan and Micropolitan Statistical Area	5	76	Geographic
CSA	Combined Statistical Area	3	81	Geographic
METDIV	Metropolitan Statistical Area- Metropolitan Division	5	84	Geographic
MACC	Metropolitan Area Central City	1	89	Geographic
MEMI	Metropolitan/Micropolitan Indicator Flag	1	90	Geographic
NECTA	New England City and Town Area	5	91	Geographic
CNECTA	New England City and Town Combined Statistical Area	3	96	Geographic
NECTADIV	New England City and Town Area Division	5	99	Geographic
UA	Urban Area	5	104	Geographic
BLANK		5	109	Geographic
CDCURR	Current Congressional District ***	2	114	Geographic
SLDU	State Legislative District Upper	3	116	Geographic
SLDL	State Legislative District Lower	3	119	Geographic
BLANK		6	122	Geographic
BLANK		3	128	Geographic
ZCTA5	5-digit ZIP Code Tabulation Area	5	131	Geographic
SUBMCD	Subminor Civil Division (FIPS)	5	136	Geographic
SDELM	State-School District (Elementary)	5	141	Geographic
SDSEC	State-School District (Secondary)	5	146	Geographic
SDUNI	State-School District (Unified)	5	151	Geographic
UR	Urban/Rural	1	156	Geographic
PCI	Principal City Indicator	1	157	Geographic
BLANK		6	158	Geographic
BLANK		5	164	Geographic
PUMA5	Public Use Microdata Area – 5% File	5	169	Geographic
BLANK		5	174	Geographic
GEOID	Geographic Identifier	40	179	Geographic
NAME	Area Name	1000	219	Geographic
BTTR	Tribal Tract	6	1219	Geographic
BTBG	Tribal Block Group	1	1225	Geographic
BLANK		44	1226	Geographic

Source: U.S. Census Bureau.

The Census Bureau also provides data users with an Excel template for each geography file. These templates include two rows containing the variable names and their descriptions for each column in the geography file. The Excel files are meant to be used with the comma-delimited versions of the geography files. They are available in the zipped template files in the main Summary File directory and on the Summary File data page.[11] Figure 2.5 shows a screenshot of the Excel template for 2017 (named "2017_SFGeoFileTemplate. xls," which can be found in either 2017_1yr_Summary_ FileTemplates.zip or 2017_5yr_Summary_FileTemplates. zip).

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[11] U.S. Census Bureau, American Community Survey (ACS), Summary File Documentation, <www.census.gov/programs-surveys /acs/data/summary-file.html>.

Figure 2.5. Excerpt of 2017 Geography File Template

	A	B	C	D	E	F	G	H	I	J	K	L	M	TR/
1	FILEID	STUSAB	SUMLEVEL	COMPONENT	LOGRECNO	US	REGION	DIVISION	STATECE	STATE	COUNTY	COUSUB	PLACE	TR/
2	Always equal to ACS Summary File identification	State Postal Abbreviation	Summary Level	Geographic Component	Logical Record Number	US	Census Region	Census Division	State (Census Code)	State (FIPS Code)	County of current residence	County Subdivision (FIPS)	Place (FIPS Code)	Cer Tra
3														
4														

Source: U.S. Census Bureau, 2017 ACS Summary File, Geography File Template, <https://www2.census.gov/programs-surveys/acs /summary_file/2017/data/>.

Figure 2.6 shows the first few rows of the text-file version of the geography file for Maryland, though not all columns are shown here. Each row in the file represents a geographic area. The first row corresponds with the state of Maryland, the 12th row with

Anne Arundel County, and the 13th row with Baltimore County. The logical record numbers for these geographies are circled below: for the state of Maryland it is "0000001," for Anne Arundel County it is "0000012," and for Baltimore County it is "0000013."

Figure 2.6. Excerpt of Geography File for the State of Maryland

File   Edit   Format   View   Help

```
ACSSF    MD040000000001    24      04000US24      Maryland
ACSSF    MD040010000002    24      04001US24      Maryland -- Urban
ACSSF    MD040430000003    24      04043US24      Maryland -- Rural
ACSSF    MD040A00000004    24      040A0US24      Maryland -- In metropolitan or micropolitan statistical area
ACSSF    MD040C00000005    24      040C0US24      Maryland -- In metropolitan statistical area
ACSSF    MD040C10000006    24      040C1US24      Maryland -- In metropolitan statistical area -- in principal city
ACSSF    MD040C20000007    24      040C2US24      Maryland -- In metropolitan statistical area -- not in principal city
ACSSF    MD040E00000008    24      040E0US24      Maryland -- In micropolitan statistical area
ACSSF    MD040G00000009    24      040G0US24      Maryland -- Not in metropolitan or micropolitan statistical area
ACSSF    MD040H00000010    24      040H0US24      Maryland -- Not in metropolitan statistical area
ACSSF    MD050000000011    24001   05000US24001   Allegany County, Maryland
ACSSF    MD050000000012    24003   05000US24003   Anne Arundel County, Maryland
ACSSF    MD050000000013    24005   05000US24005   Baltimore County, Maryland
```

Note: Excess spaces in the pictured geography file have been removed for illustrative purposes.
Source: U.S. Census Bureau, 2017 ACS Summary File, g20171md.txt, <https://www2.census.gov/programs-surveys/acs/summary _file/2017/data/1_year_seq_by_state/Maryland/>.

Estimate and Margin of Error Files

In the ACS Summary File, published estimates and their associated margins of error are available in separate files. Individual files also follow a specific naming convention. Table 2.5 shows the naming convention used for a selected estimate ("e") file for Alaska ("ak").

Table 2.5. **Naming Convention for Estimate File**		
e20171ak0001000.txt		
Example	**Name**	**Range or Type**
e	File Type	e=estimate, m=margin of error
2017	Reference Year	ACS data year (last year of the period for multiyear periods)
1	Period Covered	1=1-year, 5=5-year
ak	State Level	U.S. or abbreviations for state, District of Columbia and Puerto Rico
0001	Sequence Number	0001 to 9999
000	Reserved for future use	Iteration value for future use
Source: U.S. Census Bureau.		

The estimates and margins of error for Detailed Tables are grouped together by sequence numbers. There is an estimate and margin of error file for each sequence number.

The formats of the estimate and margin of error files are identical; they are strings of comma-delimited ASCII text. Each row represents a different geographic area and the first six fields contain metadata such as the geographic area and the sequence number.

Following those fields are the estimates or margins of error for the Detailed Tables. Starting and ending positions of the fields associated with each Detailed Table can be found using the Sequence Number and Table Number Lookup file, which is described in Section 3. The estimates or margins of error for one Detailed Table span several fields within a row.

Table 2.6 shows the record layout of the estimates and the margin of error files:

Table 2.6. **Contents of Estimates and Margin of Error File**		
Field Name	**Description**	**Field Size**
FILEID	File Identification	6 Characters
FILETYPE	File Type	6 Characters
STUSAB	State/U.S.-Abbreviation (USPS)	2 Characters
CHARITER	Character Iteration	3 Characters
SEQUENCE	Sequence Number	4 Characters
LOGRECNO	Logical Record Number	7 Characters
Field 7 and up	Estimates (or Margins of Error)	Various
Source: U.S. Census Bureau.		

Figure 2.7 shows the first few rows from a 2017 ACS 1-year Summary File estimate file for the State of Maryland. The sequence number is "0038," which corresponds to Table B08406: "Sex of Workers by Means of Transportation to Work for Workplace Geography." Data are shown for all geographies for the State of Maryland except census tracts and block groups. The logical record numbers corresponding to Maryland, Anne Arundel County, and Baltimore County are circled. The ACS estimates for these geographies can be found within their respective rows at field 7 and continuing for 50 additional fields.

With SAS or another statistical software program, you can use the logical record number (LOGRECNO) variable to merge the geography file with the estimate and margin of error files. An Excel-based tool can also be used. See Section 4 for more details.

Figure 2.7. **Excerpt of Estimate File for the State of Maryland**

```
ACSSF,2017e1,md,000,0038,0000001,2804022,2389014,2135024,253990,192590,33311,28089,153222,
ACSSF,2017e1,md,000,0038,0000002,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
ACSSF,2017e1,md,000,0038,0000003,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
ACSSF,2017e1,md,000,0038,0000004,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
ACSSF,2017e1,md,000,0038,0000005,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
ACSSF,2017e1,md,000,0038,0000006,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
ACSSF,2017e1,md,000,0038,0000007,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
ACSSF,2017e1,md,000,0038,0000008,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
ACSSF,2017e1,md,000,0038,0000009,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
ACSSF,2017e1,md,000,0038,0000010,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
ACSSF,2017e1,md,000,0038,0000011,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,31785,705,4331,5034,6434,4416,22
ACSSF,2017e1,md,000,0038,0000012,291454,264734,240994,23740,17901,3456,2383,4263,3555,288,8
ACSSF,2017e1,md,000,0038,0000013,368593,319033,286262,32771,27160,3310,2301,19414,17889,0,1
ACSSF,2017e1,md,000,0038,0000014,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,22253,389,2457,4225,3781,3494,74
ACSSF,2017e1,md,000,0038,0000015,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,55677,1577,5974,8536,8636,7698,4
ACSSF,2017e1,md,000,0038,0000016,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,33645,1616,2924,5013,4548,6590,2
ACSSF,2017e1,md,000,0038,0000017,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,41962,352,2464,7056,5652,5320,32
```

Source: U.S. Census Bureau, 2017 ACS Summary File, e20171md0038000.txt, <https://www2.census.gov/programs-surveys/acs/summary_file/2017/data/1_year_seq_by_state/Maryland/>.