3. ACCESSING ACS DATA

American FactFinder (AFF) is the U.S. Census Bureau's primary tool for accessing population, housing, and economic data from the American Community Survey (ACS), the decennial census, and many other Census Bureau data sets.[13] AFF provides comprehensive access to pretabulated ACS data for a wide range of geographic areas, including states, cities, counties, American Indian and Alaska Native areas, census tracts, and block groups. Data users interested in accessing data for these geographic areas are encouraged to refer to the section on "Accessing ACS Data" in the Census Bureau's handbook on *Understanding and Using American Community Survey Data: What All Data Users Need to Know*.[14]

Data users can access pretabulated data for urban/rural areas as well as metropolitan statistical areas, micropolitan statistical areas, and areas outside of metropolitan and micropolitan statistical areas through the "Geographic Components" option in AFF. A geographic component is the portion of a geographic area that meets certain criteria, such as "in a metropolitan statistical area" or "in a rural area." Geographic components are available for the nation, regions, divisions, and for each of the 50 states, the District of Columbia, and Puerto Rico.

ACS data are tabulated for 15 different geographic components, including urban, rural, in metropolitan statistical area, in micropolitan statistical area, in metropolitan or micropolitan statistical area, not in metropolitan or micropolitan statistical area, and several others.

To select a geographic component:

- Go to AFF at <https://factfinder.census.gov> and click on "Advanced Search" and then "Show Me All."

- Click on "Topics" in the left-hand navigation and select the ACS data set of interest. In the example below, we expanded "Dataset," then selected the "2016 ACS 1-year estimates" (see Figure 3.1). Then click "Close" in the top right corner of the box.

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[13] U.S. Census Bureau, American FactFinder, <https://factfinder.census.gov/>.

[14] U.S. Census Bureau, *Understanding and Using American Community Survey Data: What All Data Users Need to Know,* <www.census.gov/programs-surveys/acs/guidance/handbooks/general.html>.

Figure 3.1. **Selecting a Data set in AFF**
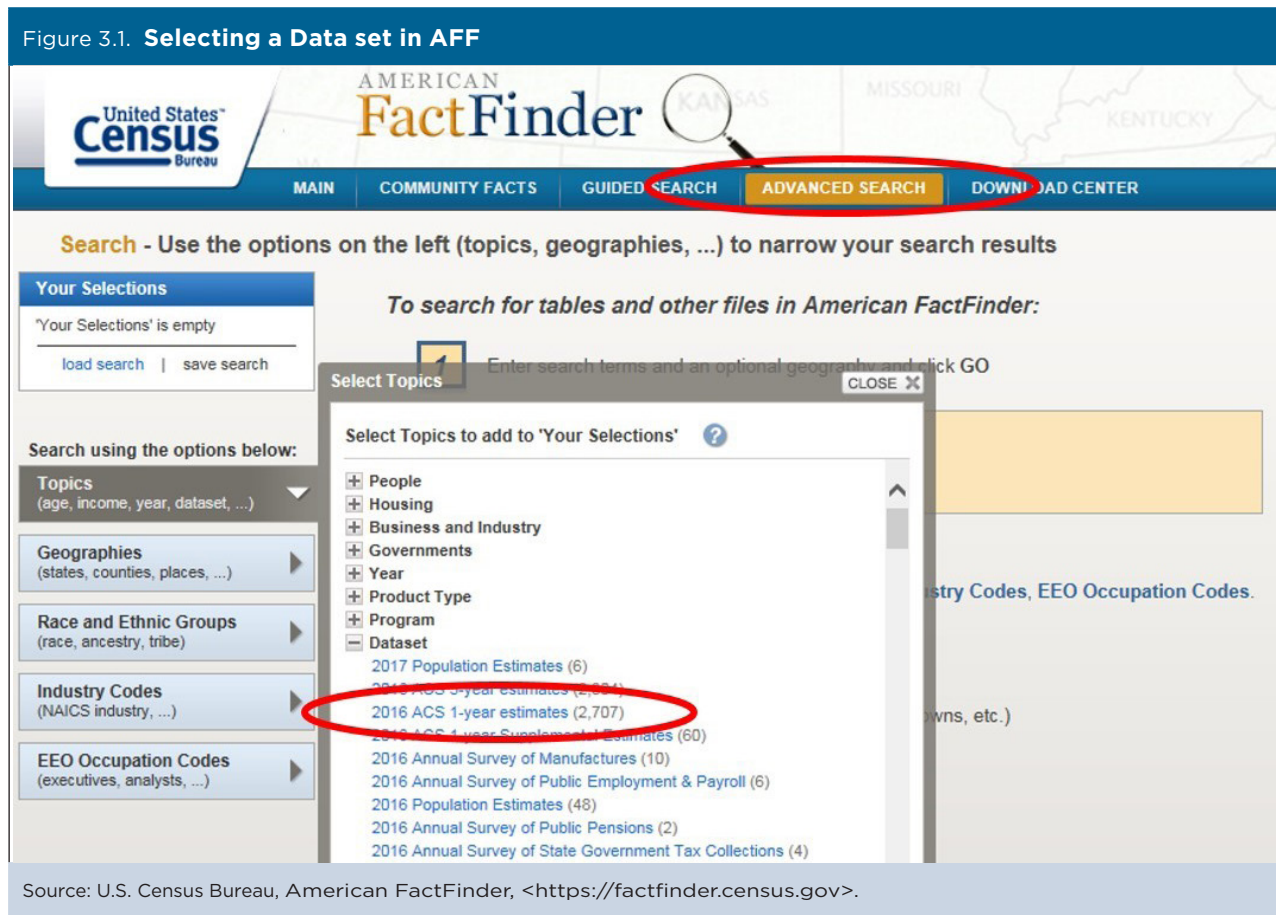
Source: U.S. Census Bureau, American FactFinder, <https://factfinder.census.gov>.

- Next, click on "Geographies" in the left-hand navigation and then click on the "Name" tab to display a detailed list of "Geography Filter Options." Mark the check box near the bottom labeled "Show Geographic Components (e.g., urban, rural)." Then type "Texas" into the search box to bring up a list of geographic areas of interest. In this example, we are interested in:
    - o Texas
    - o Texas – Urban
    - o Texas – Rural

- Verify that your geography selections (for example, Texas, Texas—Rural, Texas—Urban) appear in the "Your Selections" box in the upper left corner of AFF (see Figure 3.2). Then click "Close" in the top right corner of the box.

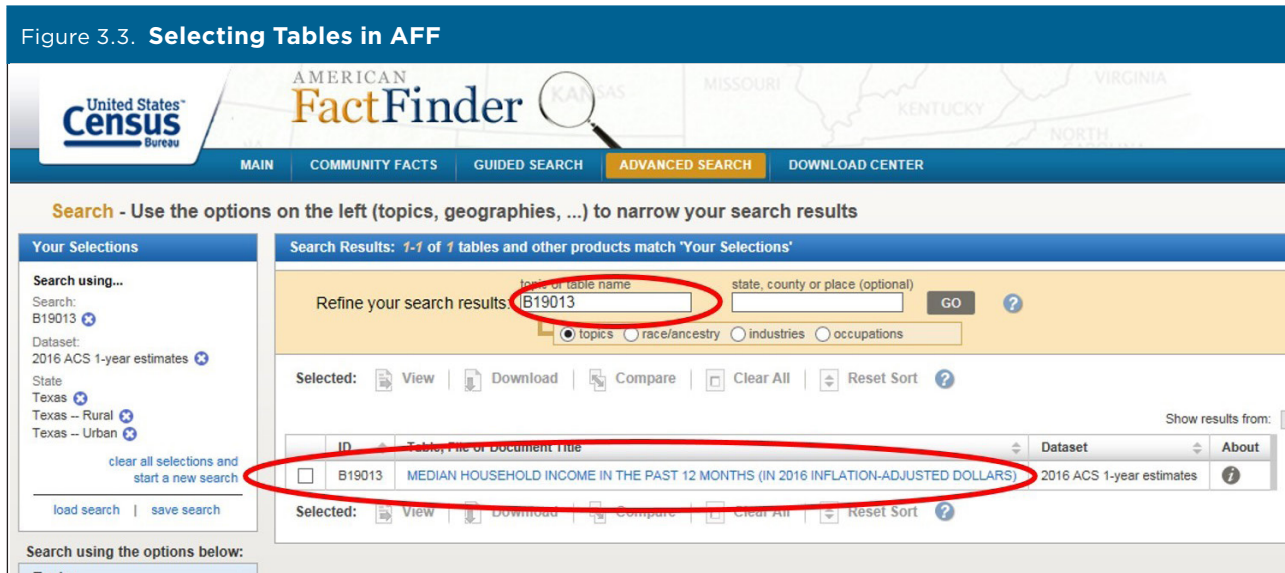Figure 3.2. **Selecting Geographic Components in AFF**

Source: U.S. Census Bureau, American FactFinder, <https://factfinder.census.gov>.

- For this example, enter "B19013" into the yellow "Refine your search results" box and click "GO" (see Figure 3.3). B19013 is the Table ID for MEDIAN HOUSEHOLD INCOME IN THE PAST 12 MONTHS (IN 2016 INFLATION-ADJUSTED DOLLARS).

Figure 3.3. **Selecting Tables in AFF**

Source: U.S. Census Bureau, American FactFinder, <https://factfinder.census.gov>.

- Click on the table title corresponding to Table B19013 and select it to view the results.

- The results suggest that in Texas, median household income in 2016 was higher in rural areas ($60,424) than urban areas ($55,971) (see Figure 3.4).

Figure 3.4. **Viewing Results in AFF**

MEDIAN HOUSEHOLD INCOME IN THE PAST 12 MONTHS (IN 2016 INFLATION-ADJUSTED DOLLARS)
Universe: Households
2016 American Community Survey 1-Year Estimates

	Texas		Texas -- Urban		Texas -- Rural	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Median household income in the past 12 months (in 2016 inflation-adjusted dollars)	56,565	+/-300	55,971	+/-304	60,424	+/-657
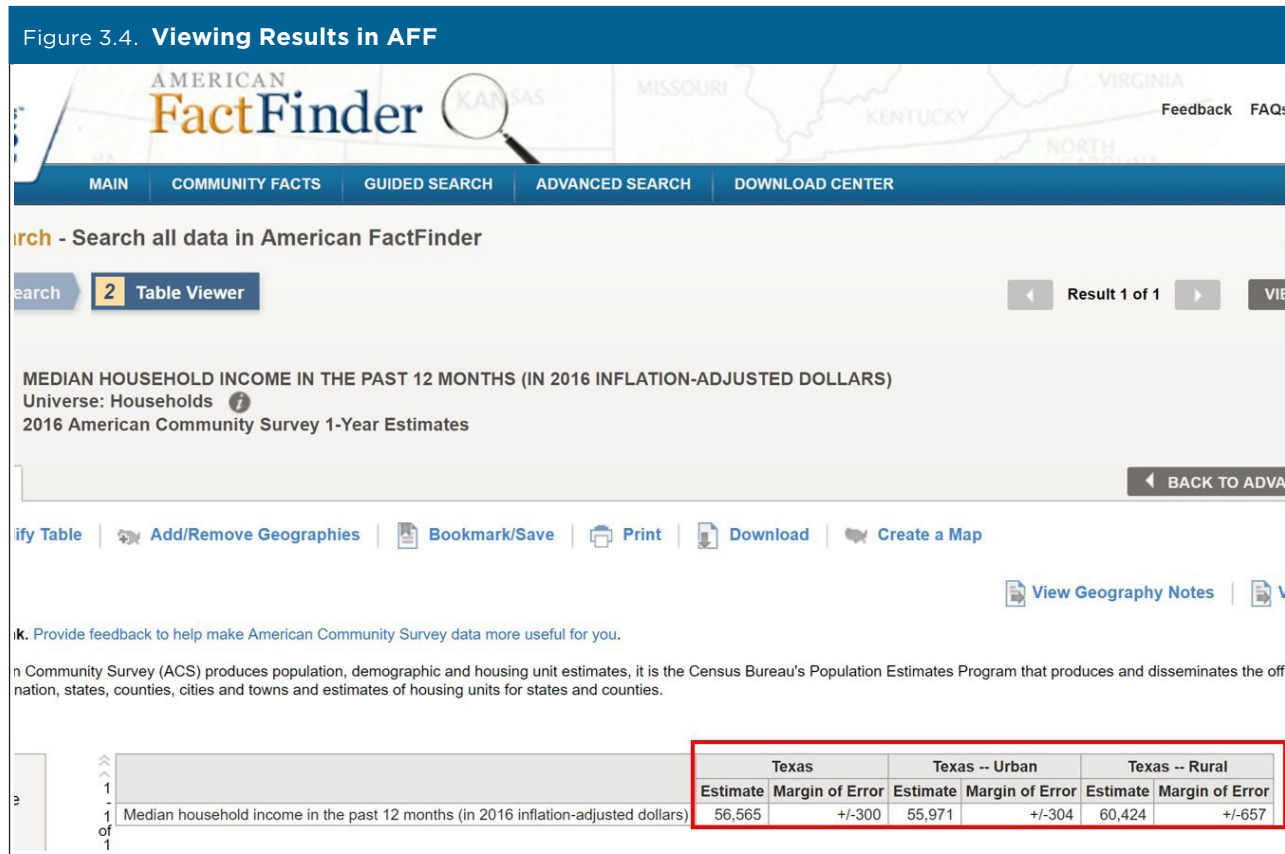
Source: U.S. Census Bureau, American FactFinder, <https://factfinder.census.gov>.

However, data users need to conduct a test to determine whether this difference is statistically significant. The Census Bureau's Statistical Testing Tool consists of an Excel spreadsheet that will automatically calculate statistical significance when data users are comparing two ACS estimates or multiple estimates. The results are calculated automatically. In this example, the result "Yes" indicates that the median household income estimates are statistically different (see Figure 3.5).

Figure 3.5. **Results From Statistical Test**

Source: U.S. Census Bureau, American Community Survey (ACS), Statistical Testing Tool, <www.census.gov/programs-surveys/acs/guidance/statistical-testing-tool.html>.

Public Use Microdata Areas

Data users interested in custom ACS estimates for rural areas often use the Census Bureau's Public Use Microdata Sample (PUMS) files, which contain a sample of individual records of people and households that responded to the survey (stripped of all identifying information). In general, the PUMS files are more difficult to work with than published tables from AFF because data users need to use a statistical package to access the data. Also, the responsibility for producing estimates from PUMS and judging their statistical significance is up to the user.

The main advantage of the PUMS files is that they permit analysis of specific population groups and custom variables that are not available through AFF. For example, PUMS data users could compare the poverty status of veterans and nonveterans, by level of education, which is not available in the Census Bureau's published tables.

PUMS data are available for regions, divisions, states, and Public Use Microdata Areas, or PUMAs—geographic areas with a minimum population of 100,000. In addition to the 100,000-population threshold, PUMAs are constructed based on census tract or county boundaries.[15] PUMAs do not cross state lines. PUMAs are updated after each decennial census.

> TIP: PUMAs are especially useful for looking at characteristics in rural areas because, unlike many of the geographic units in these areas (such as small towns), PUMAs all surpass the 65,000-population threshold that is needed to provide ACS 1-year estimates.

Counties with populations greater than 200,000 are generally subdivided into multiple PUMAs, while less populous counties are grouped with adjacent counties to form PUMAs. On the other hand, because of the requirement that each PUMA encompass at least 100,000 people, few are predominantly rural. (For more information about ACS population thresholds, see the section on "Considerations When Working with ACS Data").

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[15] U.S. Census Bureau, Geography, "Glossary," <www.census.gov/programs-surveys/geography/about/glossary.html>.

Figure 3.6 shows an example of a PUMA consisting of five adjacent counties in eastern Kentucky that comprise the Big Sandy Area Development District (Kentucky PUMA 01100). In this case, all of the counties making up the PUMA are outside of metropolitan and micropolitan statistical areas, but other PUMAs may be located entirely within metropolitan statistical areas, or include combinations of metropolitan counties, micropolitan counties, and counties outside of metropolitan and micropolitan statistical areas.

Figure 3.6. **Big Sandy Area Development District (Kentucky PUMA 01100)**
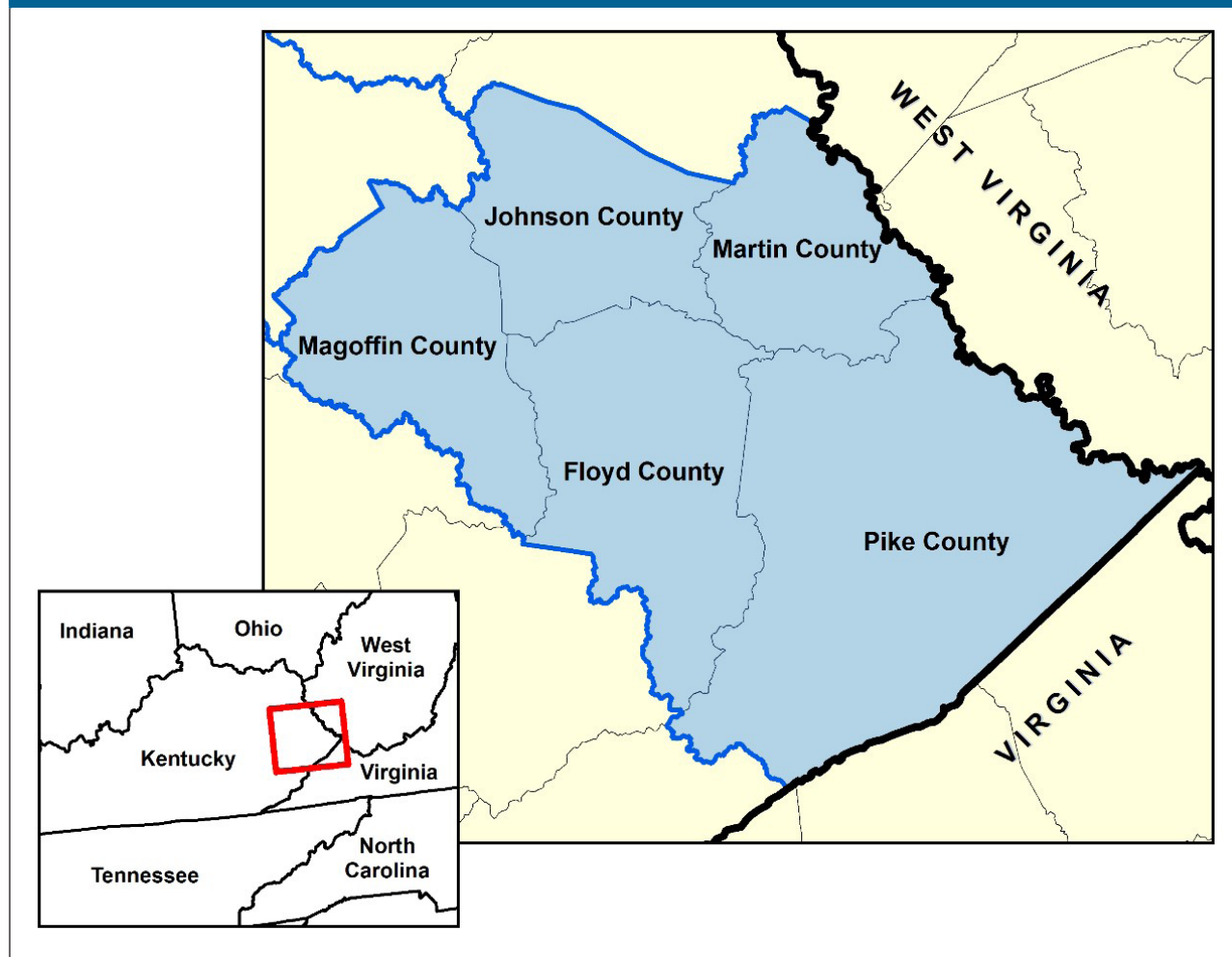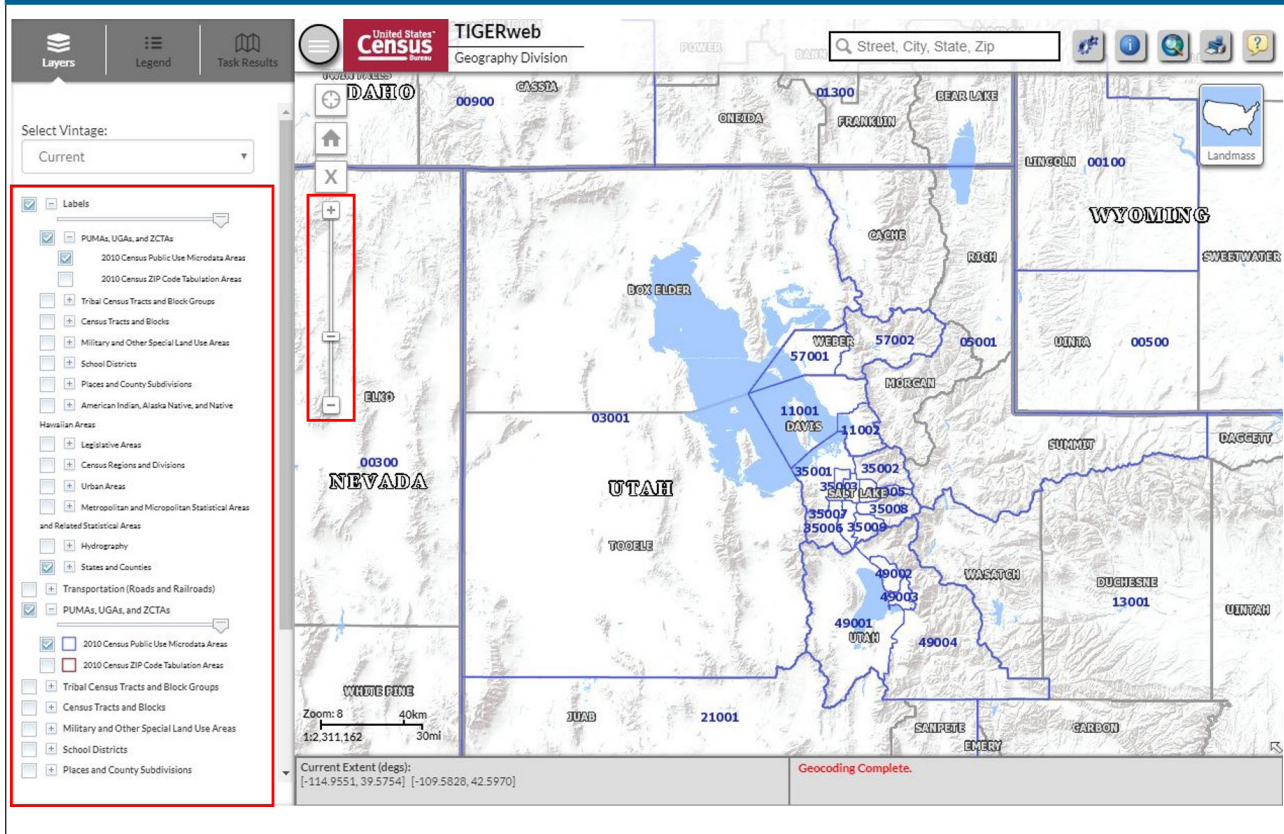

Source: U.S. Census Bureau.

Data users can visualize PUMAs online using the Census Bureau's TIGERweb application.[16]

- Go to the TIGERweb Web site at <https://tigerweb.geo.census.gov/tigerweb/>.

- Use the Zoom In feature on the map—by clicking on the individual plus sign or using the slide bar—to display a geographic area of interest.

- Then use the "Layers" menu to select "2010 Census Public Use Microdata Areas." Figure 3.7 shows a TIGERweb map of PUMA boundaries in portions of Utah and other states in the Mountain West.

Figure 3.7. **Map of PUMAs in Portions of Utah, Nevada, Idaho, and Wyoming**

Source: U.S. Census Bureau, TIGERweb, <https://tigerweb.geo.census.gov/tigerweb/>.

For more information about using TIGERweb, see the Census Bureau's TIGERweb User Guide.[17]

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[16] U.S. Census Bureau, Geography Division, TIGERweb, <https://tigerweb.geo.census.gov/tigerweb/>.
[17] U.S. Census Bureau, TIGERweb User Guide, <https://tigerweb.geo.census.gov/tigerwebmain/TIGERweb_User_Guide.pdf>.

User-Defined Areas

Beyond the standard legal and statistical geographic entities created by the Census Bureau, there are instances where analysts might want to show data for a custom, user-defined geographic area. For example, many states have regional planning commissions designed to foster cooperation among contiguous counties with similar needs. Figure 3.8 shows an image of the Eastern Upper Peninsula Regional Planning and Development Commission,
1 of 14 regional agencies in Michigan that serves the needs of the three easternmost counties of the state's Upper Peninsula (Luce, Chippewa, and Mackinac Counties).

Examples of multistate agencies with similar aims are the Appalachian Regional Commission, consisting of more than 400 counties in 13 states, and the Delta Regional Authority, which serves the needs of residents of 252

Figure 3.8. **Eastern Upper Peninsula Regional Planning and Development Commission, Michigan**

Source: Eastern Upper Peninsula Regional Planning and Development Commission.

counties in 8 states.[18]

When aggregating ACS estimates across different geographic areas or population subgroups, data users should avoid combining ACS single-year estimates with ACS 5-year estimates. That is, 1-year estimates should only be combined with other 1-year estimates, and 5-year estimates should only be combined with other 5-year estimates. When such derived estimates are generated, the user must also calculate the associated margins of error. For more information about creating ACS estimates for custom geographic areas, see the section on "Calculating Measures of Error for Derived Estimates" in the Census Bureau's handbook on *Understanding and Using American Community Survey Data: What All Data Users Need to Know*.[19]

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[18] Appalachian Regional Commission, <http://arc.gov>; and Delta Regional Authority, <http://dra.gov>.
[19] U.S. Census Bureau, *Understanding and Using American Community Survey Data: What All Data Users Need to Know,* <www.census.gov /programs-surveys/acs/guidance/handbooks/general.html>.