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Census Sense

part 3

Enabling an Annual Census

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Census Sense, PART 3

Enabling an Annual Census

Nancy Torrieri and Jennifer Holland

Gorged on Census 2000 information from the first two courses in this three part series? Don't leave the table. The delectable details about ACS and AFF are now before you. Enjoy!

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You've read about the process of collecting data for Census 2000 in the first part of this series (for an update on final response rates, see "Higher Returns" sidebar), and you delved into the specifics about geographic products available from this census in the second part. But what if census data were collected every year instead of every 10 years? What if those yearly data were made easily accessible on the Internet in a timely fashion? Would you think you were dreaming? Well, fantasize no longer. The Census Bureau's newest data collection program, the ACS, and data dissemination tool, the AFF, will revolutionize the way you think about and use Census Bureau data.

New data every year

You may be interested in opening a business, determining the market for new housing, or planning a bus route. You may be a policy analyst in the federal government, an educator in state government, or a GIS manager developing technologies to assess the need for new services. Perhaps you need to design new development strategies to manage growth in a rapidly changing rural area. Or you are an urban planner needing timely, accurate information about your city's population trends. If you fit any of these profiles, you can benefit from the ACS, which every year will collect the detailed economic, demographic, and housing data now amassed every ten years.

The ACS arose from the need for measures of change over more, and more current data than that produced by the decennial census long form. The Census Bureau presented a detailed plan for implementing a continuous measurement system to an annual meeting of the Population Association of America in 1993. After instituting comments received from that and other professional organizations and data user groups, the bureau decided to inaugurate continuous measurement in 1996 as the ACS. Initially conducted in four sites in that year to determine its operational feasibility, the ACS expanded to eight sites in 1997 to evaluate costs, procedures, and new ways to use data derived from the project. By 1998, the bureau had expanded the ACS to include two counties in South Carolina that overlapped with counties in the Census 2000 Dress Rehearsal, and, in 1999, it

increased the number of ACS sites to 31. These sites represented diverse combinations of characteristics relating to enumeration challenges; population counts; growth rates; the presence of unique population groups, such as elderly or migrant workers; improving or worsening economic conditions; and predominant occupation or industry types. Data from households in these sites will be used to make tract-by-tract comparisons between ACS-cumulated data and Census 2000–long-form estimates. The Census Bureau will use information from these comparisons to evaluate the effectiveness of the different methods and operations used for each program.

During Census 2000 data collection phase, the ACS questionnaire and methodology were also used to conduct a larger scale test called the Census 2000 Supplementary Survey. This mandatory, nationwide ancillary survey of approximately 700,000 households was designed to demonstrate the operational feasibility of collecting long-form data during the same time frame but in a process separate from the census. If Congress approves funding, this survey will continue in 2001 and 2002 to aid in the decisions needed to make a transition from data collection using the decennial census long form to the ACS. By 2003, the Census Bureau hopes to implement the ACS throughout the United States, in every American Indian and Alaska Native area, and in Puerto Rico, with a total annual sample of 3 million housing units.

How will it differ?

In terms of statistical design and operations, ACS has and will have important differences in comparison with how we handle decennial long-form data. As with any census, ACS will use the most current version of the Census Bureau's MAF, a complete listing of all residential addresses and group quarters in the country, for sample selection. We will determine the sampling rate annually and allow for the oversampling of small governmental units, such as American Indian

Glossary

ACS: American Community Survey

AFF: American FactFinder

ALMI: Automated listing and mapping instrument

CATI: Computer-assisted telephone interviewing

MAF: Master Address File

TIGER: Topologically Integrated Geographic Encoding and Referencing

Reservations and small towns in rural areas. Then, we will randomly select addresses each month to receive the ACS. Importantly, no addresses will receive the ACS questionnaire more than once in any five-year period.

For each monthly sample, we plan to complete the data collection within a three-month cycle. During the first month of the cycle, the Census Bureau will mail a pre-notice letter, an initial ACS questionnaire, a reminder card, and a replacement questionnaire. Follow-up procedures will include CATI, which starts approximately six weeks after the initial questionnaire is mailed. During the third month of the cycle, the Census Bureau will implement the in-person interview process by selecting a one-in-three sample of housing units from which it has not received a mail or CATI response.

Turnaround of ACS data will also be quicker. Unlike the decennial long-form survey for which we publish results approximately two years after data collection, the ACS data tabulations for a given year will be posted on the Census Bureau's Web site beginning in July of the following year, with CD-ROMs available by approximately December. As well, ACS data will be combined on a monthly basis to produce an annual average estimate. Furthermore, the program will release results as updated 1-, 3-, or 5-year averages.

Benefits galore

GIS users will see many benefits from the ACS methodology and its accurate, demographic information updates. The ACS program will result in a powerful new tool for community decision making, marketing, policy analysis, and numerous other geographic applications that take advantage of census data. It will help improve the Census
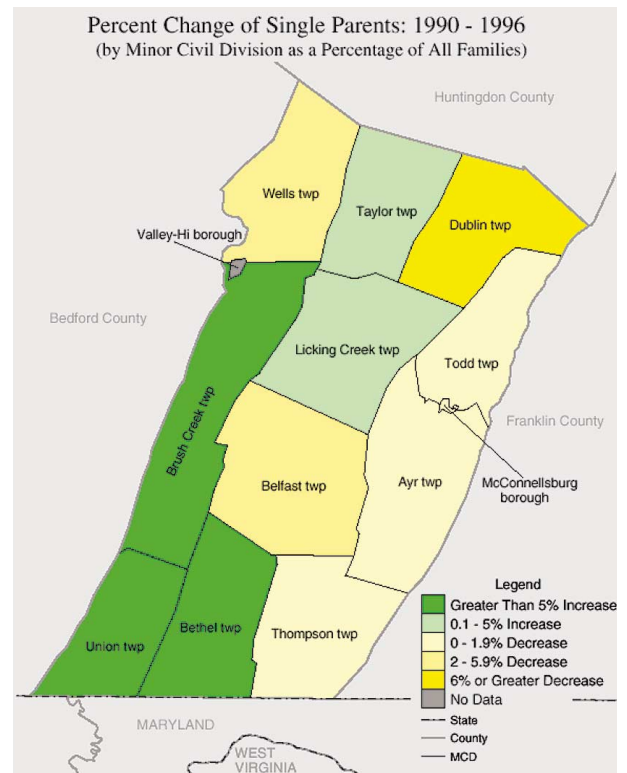

Percent Change of Single Parents: 1990 - 1996
(by Minor Civil Division as a Percentage of All Families)

Legend
Greater Than 5% Increase
0.1 - 5% Increase
0 - 1.9% Decrease
2 - 5.9% Decrease
6% or Greater Decrease
No Data
State
County
MCD

FIGURE 1 The ACS will help communities understand trends and changes in demographic, economic, and household characteristics. This map illustrates household changes in the ACS test site of Fulton County, Pennsylvania.

Bureau's estimates program, and, because the ACS can screen for households with specific characteristics, it can help establish robust sampling frames for other surveys.

ACS data are, in fact, already being used for local applications to benefit communities. For example, Fulton County, Pennsylvania (an ACS test site), is using ACS data to understand how its demographics changed during the 1990s (see Figure 1). Likewise, in Multnomah County, Oregon (another ACS site), developers responding to a state-mandated housing program sponsored by the Oregon Housing and Community Services Department used 1996 ACS data and a market assessment tool developed by Portland State University's Population Research Center to demonstrate the need for additional affordable housing in a Portland census tract. The currency and diversity of information provided by the ACS was critical to identifying this housing need.

Better addresses. In addition to regularly updated demographic data, GIS users will

see many other benefits from the ACS, not the least of which will be the Census Bureau's ability to keep its MAF up-to-date and accurate from year to year. This is because we are implementing a coverage program to make address improvements to support the ACS. As part of that program, field representatives will be working to update the MAF — especially in areas where mail delivery is primarily non-city style. Non-city-style addresses present a challenge because they cannot be geocoded using automated methods. These addresses generally require a field visit to verify the location of the new housing unit and assign the appropriate geocodes. Special or unique operations will be used in small or remote areas, such as American Indian Reservations, to ensure that address information is updated.

As a key component of the address update process, the Census Bureau is rolling out automated listing and mapping software developed to capture new addresses and address updates to the MAF as well as corrections to the TIGER database. This software is the basis of an ALMI that operates on a laptop computer. The ALMI allows field representatives to take an extract of the MAF and TIGER database to the field with them. They can then capture all updates and corrections in an electronic format, making the transfer of this information more efficient and cost effective. The ALMI is being designed and tested in several areas across the country through 2001 in preparation for a large-scale implementation in 2002.

The skinny on ACS data

Once the ACS is in full operation, data will be available every year for areas and population groups of more than 65,000 people, beginning in 2004. Data for areas of 20,000–65,000 people will be available starting in 2006 as three-year average estimates. Smaller population groups of less than 20,000 will have 5-year estimates starting in 2008.

All multiyear estimates will be updated annually, so that eventually, communities will be able to see their demographic trends over time. The quality of the multiyear estimates, as measured by standard errors and 90 percent confidence intervals, as well as the need to maintain the confidentiality of individuals, will determine what data are

released for which areas. The Census Bureau will not publish estimates for such small numbers of people if there is a high probability that an individual can be identified. For example, if the boundaries for two geographic entities are nearly identical, the Census Bureau might not publish data in two successive years for the area representing the difference between the two entities. A decision to publish data in this case would depend on whether the confidentiality of the information could be ensured for the affected area.

Quicker dissemination

Critical to the success of the ACS program will be faster delivery of data to users. The ACS will provide summarized data on CD-ROM for population and housing estimates — cross-tabulated by various characteristics — down to the block-group level. That data will include information on the statistical uncertainty for each estimate at every level of geography.

In addition, as with all past and current census data, users can contact the Census Bureau for customized ACS data tabulations and information that best serve their needs (see "3 Steps for Easy Access to Census Data" sidebar). But, for quicker data access and dissemination, users will be able to obtain ACS data on their own at the AFF Web site (http://factfinder.census.gov) months before they will be available on CD-ROM. At that site, as well as through the ACS home page (www.census.gov/acs/www), visitors can download microdata files, tabulated files, and all associated documentation directly into their GIS software.

Just the facts

In addition to serving as a portal for past and future ACS data, the AFF site will be a vital link to Census 2000 data. Currently, the site is undergoing revisions in preparation for adding Census 2000 results beginning in Spring 2001. At the present time, users can access data from the 1990 census, the 1997 Economic Census, and the 1996–1999 ACSs.

To find the data they're looking for, visitors can conduct an overall site search to obtain all the information available about a particular subject or geographic area of interest. As well, one can browse a list of areas, search for a specific geographic location by name or address (available with the release of the Census 2000 data), and select from a map. Visitors can then generate a variety of different types of tables and maps for online viewing of their selected data.

Tally ho! The site offers four types of tables: quick, detailed, geographic comparison, and economic quick reports. Quick tables are a snapshot of predefined data for a single area. An example of a quick table is one that displays sex by age for the total population in Arkansas (see Figure 2a). If you want to view data for several subjects or geographic areas, the quick table function will generate one table for each entity. For example, if you choose a table displaying sex by age and another table of the occupancy and vacancy status for Arkansas, Georgia, and Wyoming, the result will be six tables. You will get a table of sex by age and a table of the occupancy and vacancy status for each state.

3 Steps for Easy Access to Census Data

1 Log on to *www.census.gov/www/censtore.html* and browse the product catalog of available CD-ROMS, diskettes, tapes, printed maps, and other publications;

2 Print and fill out an order form available at the site; and

3 Fax the form to 888/249-7295.

Having trouble finding the specific data that are right for you? Contact the Census Bureau Customer Service Center at 301/457-4100 from 8:30 to 4:30 (Eastern Standard Time) Monday through Friday. Or you can call the Census Bureau's Geography Staff at 301/457-1128 with details about your geographic content and format requirements, and they can help you pinpoint the product you need.

U.S. Census Bureau — American FactFinder

Main | Search | Feedback | FAQs | Help

Quick Tables Change Selections | Print / Download | Related Items... Current Selections **2a**

QT-P1. Age and Sex: 1990 Universe: Total Population
Geographic Area: **Arkansas**

NOTE TO ALL DATA USERS: All survey and census results contain measurement error and may contain sampling error. Information about these potential errors is provided or referenced with the data or the source of the data. The Census Bureau recommends that data users incorporate this information into their analyses as these errors could impact inferences. Researchers analyzing data to create their own estimates are responsible for the validity of those estimates and should not cite the Census Bureau as the source of the estimates but only as the source of the core data.

We have modified some data to protect individuals' privacy, but in a way that preserves the usefulness of the data.

	Number			Percent		
Age	Both sexes	Male	Female	Both sexes	Male	Female
Total population	2,350,725	1,133,076	1,217,649	100.0	100.0	100.0
Under 5 years	164,667	84,299	80,368	7.0	7.4	6.6
Under 1 year	28,539	14,482	14,057	1.2	1.3	1.2
1 and 2 years	69,231	35,571	33,660	2.9	3.1	2.8

P002. FAMILIES - Universe: Families **2b**
Data Set: 1990 Census Detailed Tables - 100% Data (STF1)

	Arkansas	Cayuga County, New York	Tract 101, Maricopa County, Arizona
Total	651,555	20,927	518

U.S. Bureau of the Census
1990 Census of Population and Housing

GCT-Pa. Age, Sex, and Group Quarters: 1990 **2c**
Geographic Area: **Georgia State -- County**
We have modified some data to protect individuals' privacy, but in a way that preserves the usefulness of the data.

		Percent of population			18 years and over: males per 100 females	Group quarters population	
Geographic Area	Total population	Under 18 years	18 to 64 years	65 years and over		Number	Percent of total population
Georgia	6,478,216	26.7	63.2	10.1	90.8	173,633	2.7
County							
Appling County	15,744	29.1	58.6	12.2	89.5	164	1.0
Atkinson County	6,213	30.0	58.2	11.9	90.1	4	0.0

Land subdivision & land development
NAICS: 23311 **2d**
Selected Industry Statistics by State: 1997
[Excludes data for auxiliaries. For Manufacturing industries,only states with 100 employees or more are shown.]

Geography	Number of Establishments	Number of Employees	Annual Payroll ($1,000)	Shpmts/Sales/Recpts ($1,000)	Population Estimate
Alabama	99	254	9,412	110,608	4,322,113
Alaska	27	145	3,322	18,314	609,655
Arizona	228	1,540	52,918	645,438	4,553,249
Arkansas	85	546	15,065	140,767	2,523,186
California	796	4,764	213,735	1,985,683	32,182,118

FIGURE 2a–2d At the AFF Web site, users can generate quick tables (2a), detailed tables (2b), geographic comparison tables (2c), and economic quick reports (2d).

FIGURE 3a AND 3b Users can display geographic boundaries using the reference map (3a) feature on the AFF site, as well as generate thematic maps (3b) based on census demographic and economic data.

U.S. Census Bureau — American FactFinder
Main | Search | Feedback | FAQs | Help
Reference Maps Options | Change Selections | Print / Download **3a**

Select an option, then click on the map ◯ Recenter ◉ Recenter and zoom in Quick Tips

Legend
Boundaries
'98 ACS Am Ind Res
'98 ACS Am Ind Res
State
'98 ACS Site
'98 ACS Census Trac
'98 ACS Place
Features
Major Road
Stream/Waterbody
Stream/Waterbody
Military Inst
Items in gray text are not visible at this zoom level

Mescalero
White Sands Missile Testing Ct
White Sands Missile Testing Ct
Cloudcroft
Alamogordo
Holloman Air Force Base
Boles Acres Sacramento Peak Upper Air Rese
White Sands Missile Testing Ct
Otero NM
Fort Bliss Military Res
Fort Bliss Military Res
Approx.145 miles across.
Prepared with American FactFinder

Percent of Persons Who Live in Urban Areas, United States by State
Source: 1990 Decennial Census **3b**
Prepared with American FactFinder.

Visitors can also create detailed tables, which can show demographic characteristics for geographies as small as a block. Detailed tables, however, do not include totals, subtotals, or derived measures. Figure 2b is an example of a detailed table, displaying the total count of families for Arkansas; Cayuga County, New York; and census tract 101 (Maricopa County, Arizona).

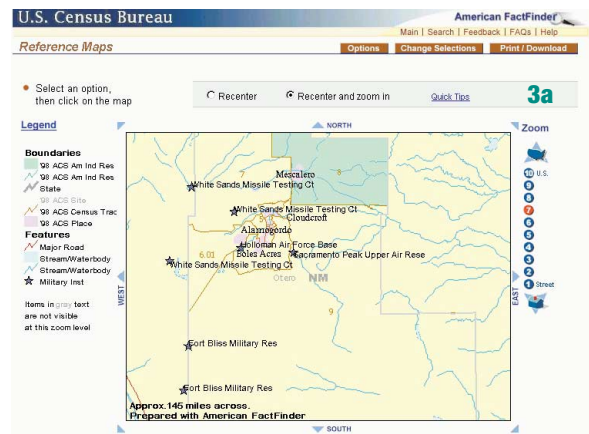Geographic comparison tables provide a way to compare population and housing information for related geographic areas, such as a state and its counties. Figure 2c is a geographic comparison table showing general population statistics for Georgia and its counties.

To display data across specific industries or between geographic areas, visitors can generate economic quick reports. Figure 2d demonstrates an economic quick report for comparing industry information between states, such as total number of employees or establishments.

At the AFF site, Census 2000 data will be available in quick table, detailed table, and geographic comparison table format. The 1996–1999 ACS data are available in detailed table format.

Map it. In addition to tables, users can employ two different mapping capabilities at the AFF site based on their needs. The first type is reference mapping, which enables a site visitor to make a map showing geographic boundaries and features with no statistical data (see Figure 3a). One can use a reference map to locate census tract 9 in Otero County, New Mexico, for instance, or to show the major roads in the

Northeast United States. A visitor can also locate the boundaries of ACS areas, congressional districts, places, economic places, census tracts, block groups, blocks, and (for Census 2000) ZIP Code Tabulation Areas. The features that can be viewed include major roads, streets, waterways, national parks, hospitals, and military installations, among other things.

At the AFF Web site, you can also create thematic maps (see Figure 3b). More than 200 themes from the 1990 decennial census and the 1997 Economic Census are available at the site, including statistical themes for population density, rental vacancy rates, percentage of persons of various ancestries, and number of establishments per 1,000 persons for the various economic sectors. We plan to make more themes available for mapping on the AFF site as Census 2000 data are released.

All thematic maps are choropleth maps. The initial map uses a quantile classing method — generally with five data classes. Classes are displayed using a green color scheme. Users can change the classing method to either equal interval or user-defined classes and change the number of classes to as few as two or as many as seven. Visitors can also modify a thematic map's color scheme to blue or red as well as add boundaries and features to provide further orientation.

Data download. For further analysis, users can input any data on the AFF site directly into their own GIS and combine them with other layers. Tables can be downloaded in comma or tab delimited formats, and maps can be saved in GIF format. If you need large chunks of census data, the AFF contains a link to a file transfer protocol tool to make download faster.

It all makes census

With the release of the first results of Census 2000 data on the horizon for late December, GIS users will surely benefit from the improved data collection and dissemination tools the Census Bureau has to offer. The AFF promises to be an important tool for obtain census results and, as we continue to test and implement the ACS, geospatial professionals nationwide may soon benefit from continually updated data.

Hopefully, through this series of articles on Census 2000 and affiliated programs, readers and GIS users are better prepared for employing Census Bureau data products to their fullest potential now and in the future.

Manufacturers

AFF is a joint project created by **ESRI** (www.esri.com), **IBM** (www.ibm.com), **Oracle** (www.oracle.com), and the U.S. Census Bureau. The site use ArcIMS 3 and ArcSDE 8 from ESRI for maps and spatial data display. IBM provides the server technology and Oracle supplies the database capabilities. ⊕

Direct questions on the ACS to 1-888-456-7215 or acs@census.gov.
For additional information, visit the ACS web site, http://www.census.gov/acs/www.
Direct questions on the AFF to factfinder@census.gov.
For additional information, visit the AFF web site, http://factfinder.census.gov.