

Using the Census Application Programming Interface (API) with the American Community Survey (ACS)

August 15, 2016

Javier Gomez
American Community Survey Office

Outline

- **ACS Basics and Content**
- Census API Basics and Datasets Available
- What an API URL Looks Like
- Use and Construct an API
- Stay in Touch
- Questions?

ACS Content

Social

Ancestry
Citizenship Status
Disability Status
Educational Attainment
Fertility
Grandparents
Language Spoken at Home
Marital Status
Migration
Place of Birth
School Enrollment
Veteran Status
Year of Entry

Demographic

Age
Hispanic Origin
Race
Relationship
Sex

Economic

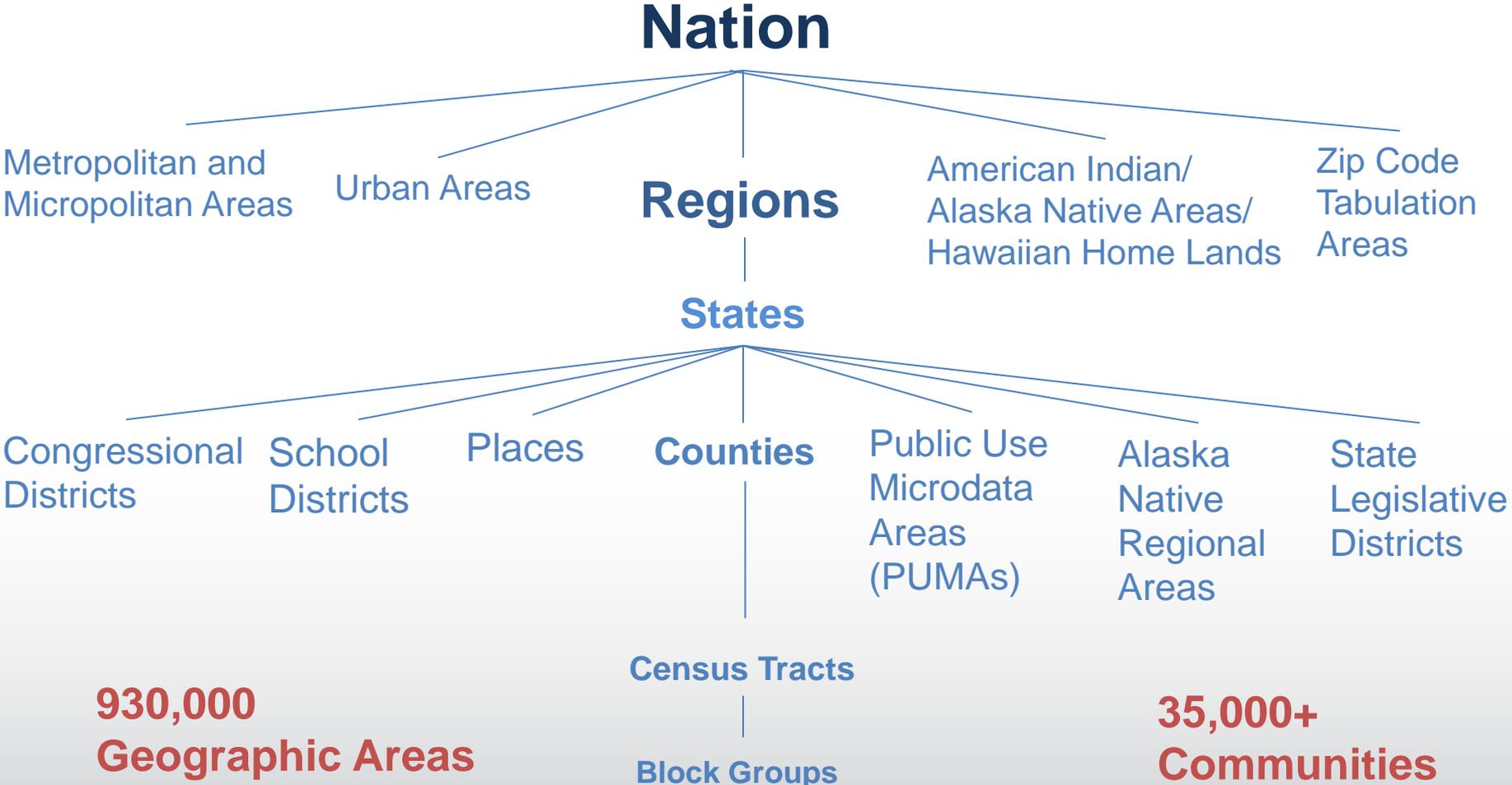
Class of Worker
Commuting to Work
Employment Status
Food Stamps (SNAP)
Health Insurance
Hours/Week, Weeks/Year
Income
Industry & Occupation

Housing

Computer & Internet Use
Costs (Mortgage, Taxes, Insurance)
Heating Fuel
Home Value
Occupancy Status
Plumbing/Kitchen Facilities
Structure Type
Tenure (Own/Rent)
Utilities
Vehicles
Year Built/ Year Moved In

35+ Topics → 1000+ Tables → 11 Billion Estimates

Census Geographic Concepts



Availability of ACS Data Products

Estimated Population of Geographic Area	1-Year Estimates	5-Year Estimates
65,000 or more	X	X
Less than 65,000		X
Release Date	September	December

Outline

- ACS Basics and Content
- **Census API Basics and Datasets Available**
- What an API URL Looks Like
- Use and Construct an API
- Stay in Touch
- Questions?

API Basics

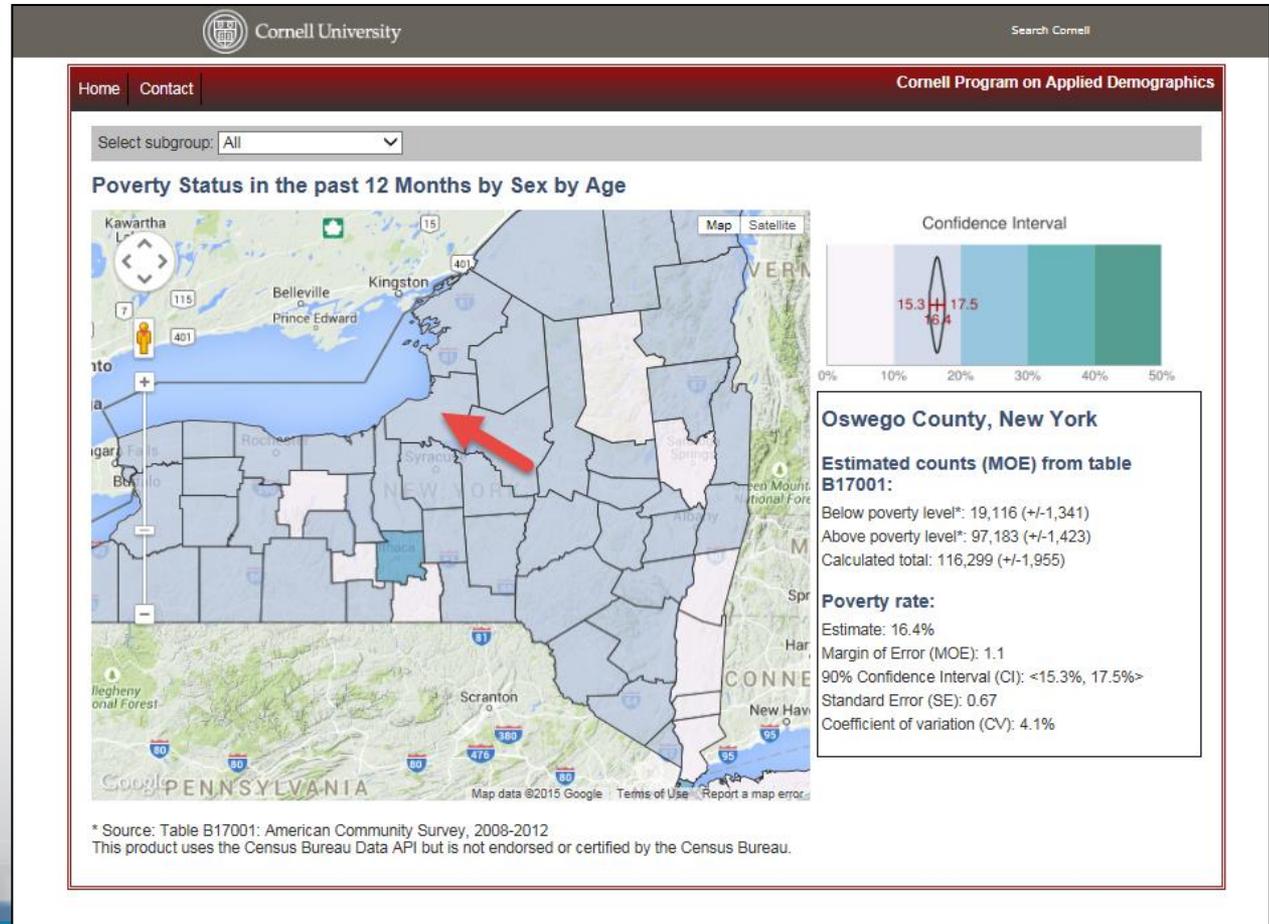
- API stands for Application Programming Interface
- The API is a service that exposes data in a standardized way
- This allows developers to reduce the learning curve by standardizing the API query language across multiple datasets
- An efficient way to query data directly from Census servers without software
- Used to build mobile and Web applications
- Alternative to File Transfer Protocol (FTP) - Download only the variables and geographies you need

API Basics

- Benefits of using the Census API include:
 - Query data directly from Census Servers
 - Download only the variables and geographies you need
 - Connects to statistical analysis software like R
 - No need to host data on another server
 - Drives interactive data visualizations

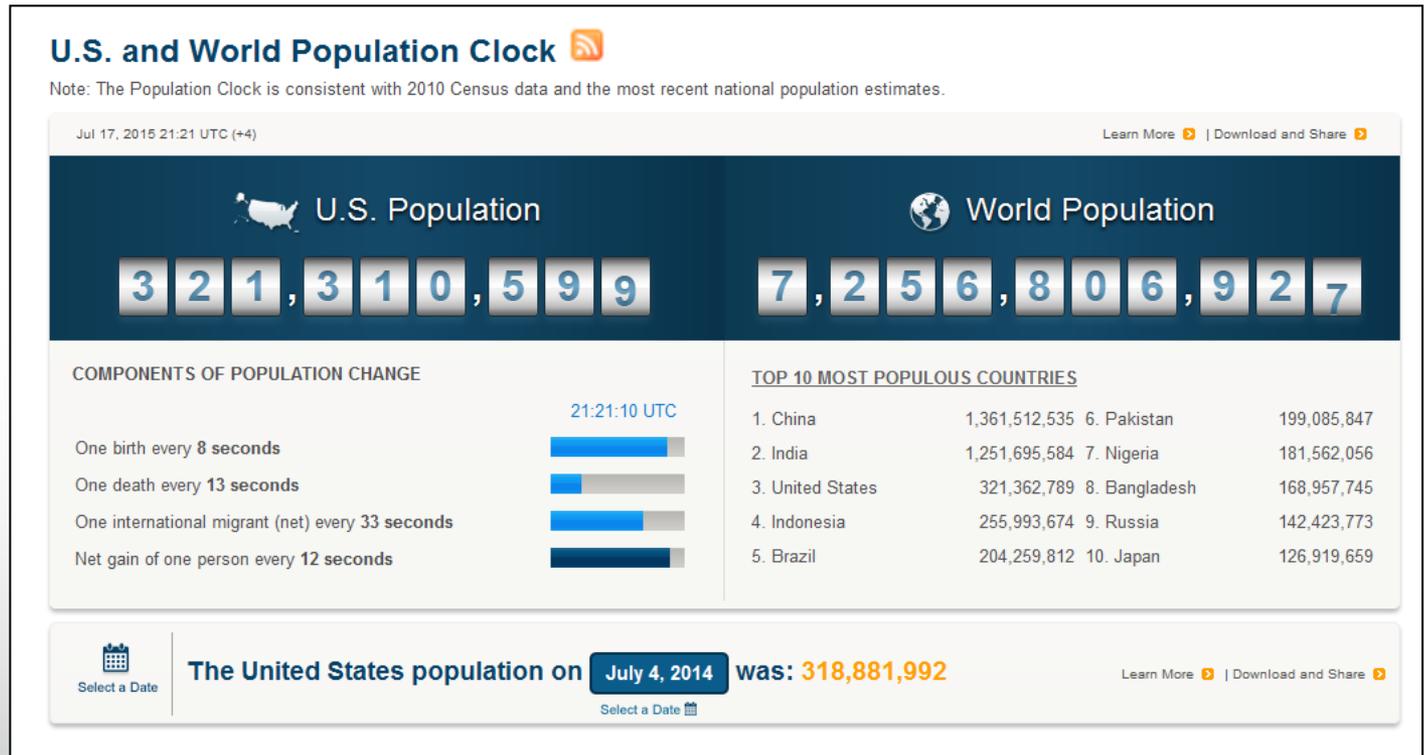
Examples of Apps that Use the Census Data API

Cornell University Poverty Example



Examples of Apps that Use the Census Data API

Pop Clock



Census Web Applications

Population Clock

U.S. Population
3 2 1, 7 6 5, 5 7 1

World Population
7, 2 7 3, 3 2 8, 2 5 5

Sep 17, 2015 17:25 UTC (+4) [Learn More >>](#)

QuickFacts

Quick, easy access to facts about people, business, and geography.

Alabama



My Congressional District
114th Congress POWERED BY The American Community Survey

1 Select a State

2

People Jobs Housing Economic Education

Datasets Available

- Census Bureau's most popular aggregate datasets:
 - ACS Estimates
 - 1, 3, 5-Year Products, Supplemental Tables, Summary Files, Data Profiles
 - Economic Indicators Time Series
 - Decennial Census (SF1/SF3) 1990, 2000, 2010
 - Economic Census 2007, 2012
 - CBP and Nonemployer Statistics 2011-13
 - Population Estimates 2013, 2014 and Projections 2012-2060
 - Business Dynamics Statistics 1972-2012
- Complete list located: <http://api.census.gov/data.html>

Outline

- ACS Basics and Content
- Census API Basics and Datasets Available
- **What an API URL Looks Like**
- Use and Construct an API
- Stay in Touch
- Questions?

What an API URL Looks Like

http://api.census.gov/data/2014/acs1?get=NAME,B01001_001E&for=state:*

B01001 SEX BY AGE
Universe: Total population ⓘ
2014 American Community Survey 1-Year Estimates

Table View

Actions: [Modify Table](#) | [Add/Remove Geographies](#) | [Bookmark/Save](#) | [Print](#) | [Download](#) | [Create a Map](#)

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that provides estimates for states and counties.

Versions of this table are available for the following years:
2014 ▶
2013
2012
2011

<< 1 - 18 of 104 >>

	Alabama		Alaska		Arizona		Arkansas	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total:	4,849,377	***	736,732	****	6,731,484	****	2,966,369	****
Male:	2,347,969	+/-5,243	385,582	+/-1,999	3,342,946	+/-2,452	1,456,778	+/-2,452
Under 5 years	150,471	+/-2,593	26,766	+/-1,056	221,202	+/-1,437	98,017	+/-1,437
5 to 9 years	156,723	+/-4,818	27,517	+/-1,814	235,196	+/-5,581	102,369	+/-5,581
10 to 14 years	162,239	+/-5,576	25,859	+/-1,966	231,019	+/-5,535	98,679	+/-5,535

Build the URL

1) Identify the dataset you want to use

- <http://www.census.gov/data/developers/data-sets.html>

2) Identify items needed

- Variables names /variables.html
- Geography codes (usually FIPS)

3) Build the query

- ?get=variable,names,separated,by,commas
- &for=geography level:code

4) Put it all together

http://api.census.gov/data/2014/acs1?get=NAME,B01001_001E&for=state:*

API Data Sets

Available APIs

We plan on adding more of our publicly available datasets. Here you'll find which of our many data sets are currently available via API. To make specific requests for the release of datasets, please sign up and submit your requests on our [Developer Forum](#).

NEW: We now have a machine-readable dataset discovery service available in beta release. Visit our [Discovery Tool](#) page to learn more.

Page 1 of 2 >

American Community Survey 1 Year Data (2014, 2013, 2012, 2011)

September 17, 2015

Areas with populations of 65,000+. Covers a broad range of topics about social, economic, demographic, and housing characteristics of the U.S. population.

American Community Survey 3 Year Data (2013, 2012)

October 01, 2012

Areas with populations of 20,000+. Covers a broad range of topics about social, economic, demographic, and housing characteristics of the U.S. population.

American Community Survey 5-Year Data (2005-2009 to 2010-2014)

February 24, 2016

Data available down to the block-group level. Covers a range of topics about social, economic, demographic, and housing characteristics of the U.S. population.

American Community Survey Migration Flows

June 22, 2016

Migration flows between counties, minor civil divisions, and metropolitan areas using ACS 5-year data. Flows are crossed by selected characteristics.

American Community Survey Supplemental Data (2014)

July 21, 2016

58 high-level detailed tables tabulated on the 1-year microdata for geographies with populations of 20,000 or more.

API Data Sets

2014

Summary File:

- **API Call:** http://api.census.gov/data/2014/acs1?get=NAME,B01001_001E&for=state:*&key=...
- [2014 ACS Summary File Variables \[html | xml | json \]](#)
- [ACS Technical Documentation](#)
- [Examples and Supported Geography](#)

Data Profile:

- **Example Call:** http://api.census.gov/data/2014/acs1/profile?get=DP02_0001PE&for=state:*&key=...
- [2014 ACS Data Profile Variables \[html | xml | json \]](#)
- [ACS Technical Documentation](#)
- [Examples and Supported Geography](#)

2013

Summary File:

- **API Call:** http://api.census.gov/data/2013/acs1?get=NAME,B01001_001E&for=state:*&key=...
- [2013 ACS Summary File Variables \[html | xml | json \]](#)
- [ACS Technical Documentation](#)
- [Examples and Supported Geography](#)

Data Profile:

- **Example Call:** http://api.census.gov/data/2013/acs1/profile?get=DP02_0001PE&for=state:*&key=...
- [2013 ACS Data Profile Variables \[html | xml | json \]](#)
- [ACS Technical Documentation](#)
- [Examples and Supported Geography](#)

ACS Variables

Census Data API: Variables in /data/2014/acs1/variables

Name	Label	Concept
AIANHH	American Indian Area/Alaska Native Area/Hawaiian Home Land (Census)	Selectable Geographies
AIANHHFP	American Indian Area/Alaska Native Area/Hawaiian Home Land (FIPS)	Selectable Geographies
AIHHTLI	American Indian Trust Land/Hawaiian Home Land Indicator	Selectable Geographies
AITS	American Indian Tribal Subdivision (FIPS)	Selectable Geographies
AITSCE	American Indian Tribal Subdivision (Census)	Selectable Geographies
ANRC	Alaska Native Regional Corporation	Selectable Geographies
B00001_001E	Total	B00001. Unweighted Sample Count of the Population
B00002_001E	Total	B00002. Unweighted Sample Housing Units
B01001_001E	Total:	B01001. Sex by Age
B01001_001M	Margin of Error for!!Total:	B01001. Sex by Age
B01001_002E	Male:	B01001. Sex by Age
B01001_002M	Margin of Error for!!Male:	B01001. Sex by Age
B01001_003E	Male:!!Under 5 years	B01001. Sex by Age
B01001_003M	Margin of Error for!!Male:!!Under 5 years	B01001. Sex by Age
B01001_004E	Male:!!5 to 9 years	B01001. Sex by Age
B01001_004M	Margin of Error for!!Male:!!5 to 9 years	B01001. Sex by Age
B01001_005E	Male:!!10 to 14 years	B01001. Sex by Age
B01001_005M	Margin of Error for!!Male:!!10 to 14 years	B01001. Sex by Age

Outline

- ACS Basics and Content
- Census API Basics and Datasets Available
- What an API URL Looks Like
- **Use and Construct an API**
- Stay in Touch
- Questions?

How To Do a Query

http://api.census.gov/data/2014/acs1?get=NAME,B01001_001E&for=state:*

1. Start your query with:
<http://api.census.gov/data>

How To Do a Query

http://api.census.gov/data/2014/acs1?get=NAME,B01001_001E&for=state:*

2. Add the data year to the URL. This is usually the year the data were collected.

Skip this step for Time Series datasets.

How To Do a Query

http://api.census.gov/data/2014/acs1?get=NAME,B01001_001E&for=state:*

3. Add the dataset name.

A full list is available here: <http://api.census.gov/data.html>

How To Do a Query

http://api.census.gov/data/2014/acs1?get=NAME,B01001_001E&for=state:*

4. Start your query with a ?

How To Do a Query

http://api.census.gov/data/2014/acs1?get=NAME,B01001_001E&for=state:*

5. Add variables.

A full list is available here:

<http://api.census.gov/data/2014/acs1/variables.html>

How To Do a Query

http://api.census.gov/data/2014/acs1?get=NAME,B01001_001E&for=state:*

6. Add geography.

A full list is available here:

<http://api.census.gov/data/2014/acs1/geography.html>

Output

Returns data in json format that looks like this:

```
[["NAME","B01001_001E","state"],  
["Alabama","4849377","01"],  
["Alaska","736732","02"],  
["Arizona","6731484","04"],  
["Arkansas","2966369","05"],  
["California","38802500","06"]...]
```

The response for all queries is formatted as a two dimensional JSON array where the first row provides column names and subsequent rows provide data values.

Register for a Key

U.S. Department of Commerce | Blogs | Index A-Z | Glossary | FAQs

United States[™] Census Bureau

Topics: Population, Economy | Geography: Maps, Geographic Data | Library: Infographics, Publications | Data: Tools, Developers | About the Bureau: Research, Surveys | Newsroom: News, Events, Blogs

Developers

API Forum | About this Section | App Gallery | Available APIs | Geography | News | Terms of Service | Updates

The Census Bureau has been selling out our datasets APIs. Check out our Discovery Tool for the newest dataset and data via our forum. [Read More](#)

Available APIs

Latest Available APIs

Population Estimates (October 1, 2014) Both programs use Estimates are past

Economic Indicators Time Series (various years – present) April 01, 2013 Fourteen national, monthly and quarterly surveys cover construction, housing, international trade, retail and wholesale trade, services, manufacturing and more.

Business Dynamics Statistics (1976-2012) February 01, 2013 An annual series tracking changes in employment, including openings, closings, startups, job creation and destruction by firm size, age, sector, state and more.

[View All Available APIs](#)

Key Signup - Internet Explorer

Request A Key

Organization Name:

Email Address:

I agree to the [terms of service](#)

Resources

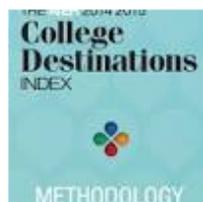
- Dataset Discovery tool:
 - <http://api.census.gov/data.html>
 - <http://api.census.gov/data.xml>
 - <http://api.census.gov/data.json>
- Census developer page:
 - <http://www.census.gov/developers/>
- Convert JSON to CSV data:
 - <http://www.convertcsv.com/json-to-csv.htm>

Outline

- ACS Basics and Content
- Census API Basics and Datasets Available
- What an API URL Looks Like
- Use and Construct an API
- **Stay in Touch**
- Questions?

Source Us!

U.S. Census Bureau's [YYYY-YYYY] American Community Survey [1/3/5]-year [estimates/statistics/data release]



College Destinations: How We Rank Them
American Institute for Economic Research - Apr 7, 2014
Sources: U.S. Census Bureau; American Community Survey, 2011
American Community Survey 1-Year Estimates, Table B01003;
using ...



NMSU Valencia County Extension providing youth develo...
New Mexico State University NewsCenter - Apr 14, 2015
... Mexico and \$53,046 for the United States, according to the U.S.
Census Bureau's 2009-2013 American Community Survey 5-Year
Estimate.



Census Estimates Show Progress Toward ACA Coverag...
Health Affairs (blog) - Sep 28, 2015
Source: U.S. Census Bureau, 2013 and 2014 American
Community Survey 1-year estimates from Table S2701 in American
Fact Finder.

Continue the Conversation #ACSDATA



Sign up for and manage alerts at
<https://public.govdelivery.com/accounts/USCENSUS/subscriber/new>



facebook.com/uscensusbureau



More information on the American
Community Survey:
<http://www.census.gov/acs>



twitter.com/uscensusbureau



(800) 923-8282 or
(301) 763-1405



youtube.com/user/uscensusbureau



acso.users.support@census.gov



instagram.com/uscensusbureau



pinterest.com/uscensusbureau



AMERICAN COMMUNITY SURVEY DATA USERS GROUP

- Purpose:
 - Improve understanding of the value and utility of ACS data.
 - Promote information sharing among data users about key ACS data issues and applications
- Membership is free and open to all interested ACS data users
- Webinars and special sessions at professional meetings planned
- Users group website and online community
- API Group at:
<https://acsdatacommunity.prb.org/acs-data-products--resources/api/f/15/t/158>

<http://www.acsdatausers.org/>

Outline

- ACS Basics and Content
- Census API Basics and Datasets Available
- What an API URL Looks Like
- Use and Construct an API
- Stay in Touch
- **Questions?**