What are GEOIDs?

The Census Bureau and other state and federal agencies are responsible for assigning geographic identifiers, or GEOIDs, to geographic entities to facilitate the organization, presentation, and exchange of geographic and statistical data. GEOIDs are numeric codes that uniquely identify all administrative/legal and statistical geographic areas for which the Census Bureau tabulates data. From Alaska, the largest state, to the smallest census block in New York City, every geographic area has a unique GEOID. Some of the most common administrative/legal and statistical geographic entities with unique GEOIDs include states, counties, congressional districts, core based statistical areas (metropolitan and micropolitan areas), census tracts, block groups and census blocks.

Why Are GEOIDs Important?

GEOIDs are very important for understanding and interpreting geographic and demographic data and their relationship to one another. Data users rely on GEOIDs to join the appropriate demographic data from censuses and surveys, such as the American Community Survey (ACS), to various levels of geography for data analysis, interpretation and mapping. Without a common identifier among geographic and demographic datasets, data users would have a difficult time pairing the appropriate demographic data with the appropriate geographic data, thus considerably increasing data processing times and the likelihood of data inaccuracy.

Types of GEOID Codes

The American National Standards Institute (ANSI), US Census Bureau, US Department of Education, US Geological Survey (USGS) and individual states all maintain GEOIDs contained in census products. The ANSI, in particular, is responsible for maintaining Federal Information Processing Series (FIPS) codes

and Geographic Names Information System (GNIS) codes. A wide audience uses FIPS codes and GNIS codes across many private and public datasets to uniquely identify geographic features.

FIPS Codes

The Census Bureau has published FIPS codes in census products for more than 30 years. FIPS codes are assigned alphabetically by geographic name for states, counties, core based statistical areas, places, county subdivisions, consolidated cities and all types of American Indian, Alaska Native, and Native Hawaiian (AIANNH) areas. Lists of geographic FIPS codes in census products can be found on the ANSI/FIPS Codes page.

FIPS codes for smaller geographic entities are usually unique within larger geographic entities. For example, FIPS state codes are unique within nation and FIPS county codes are unique within state. Since counties nest within states, a full county FIPS code identifies both the state and the nesting county. For example, there are 49 counties in the 50 states ending in the digits "001". To make these county FIPS codes unique, the state FIPS codes are added to the front of each county (01001, 02001, 04001, etc), where the first two digits refer to the state the county is in and the last three digits refer specifically to the county.

GNIS Codes

Geographic features in the GNIS do not have nesting relationships, as they do in the FIPS database. Instead, GNIS codes are assigned sequentially, in chronological order, based on date of entry in the database. Many cultural and physical geographic features are codified in the GNIS, including airports, beaches, cemeteries, churches, hospitals, islands, lakes, populated places, post offices, rivers, schools, streams and swamps. The table below illustrates how FIPS codes and GNIS codes are codified and how the databases differ from one another.

Topic	FIPS	GNIS
Creator	Various organizations including the US Census Bureau	United States Geological Survey (USGS)

Types of Codified Features	States, counties, congressional districts, core based statistical areas, places, county subdivisions, consolidated cities and all types of American Indian, Alaska Native, and Native Hawaiian (AIANNH) areas	Most types of physical and cultural geographic features, both current and historical. Does not include road and highway features.
Codification Methodology	Numeric codes are assigned alphabetically.	Numeric codes are assigned sequentially, based on date of entry in the database.
Codification of Historical Data	There are no historical data entries in the database.	Historical data are labeled "historical" and remain in the database.
Changes to Entries/Codes	Existing entries are updated to reflect changes. Code changes based on alphabetical position of the name change in the dataset. Codes for other entities are changed to maintain alphabetical sort.	When a geographic name changes, the GNIS code stays the same. Geographic names that no longer exist are marked as "historical" and remain in the database.
New Names & Codes	New entries are added to the database. Codes for other entities may be changed to maintain alphabetical sort.	New entries are added to the database. There is no effect on existing codes.
Geographic Hierarchy of Data	Smaller geographic areas are codified to include codes for larger geographic areas within which they nest.	There is no geographic hierarchy reflected in the codes.
Number of Characters	Varies depending on level of geography (ie states have 2-digit codes, counties have 5-digit codes and places have 7-digit codes).	Allows for codes up to 10-digits in length.
TIGER/Line Shapefile designations	"FP"	"NS"

Census Bureau Codes

The Census Bureau creates and maintains geographic codes for many statistical geographic areas that are not covered by FIPS codes and GNIS codes. These geographic areas include census divisions, census regions, census tracts, block groups, census blocks and urban areas. The full GEOID for many levels of geography combines both the FIPS codes and Census Bureau codes. For example,

census tracts, block groups and census blocks nest within state and county; therefore, the GEOIDs for each of these geographic areas contains both the state and county FIPS codes, in which they nest.

U.S. Department of Education and State-Defined Codes

The US Department of Education is responsible for issuing and maintaining geographic codes for elementary, secondary and unified school districts throughout the nation. Also, individual states use state-defined standards to establish geographic codes for voting districts and state legislative upper (senate) and lower (house) districts. Voting districts nest within counties and consequently, voting district GEOIDs contain both state and county FIPS codes. Similarly, state FIPS codes comprise a portion of school district and state legislative district GEOIDs, as they share a nesting relationship within states.

GEOID Structure for Geographic Areas

The Standard Hierarchy of Census Geographic Entities diagram illustrates the hierarchal relationship of different geographic areas to one another. This diagram is a great tool for understanding how GEOIDs are concatenated for geographic areas that nest within other geographic areas. The table below shows the GEOID structure in TIGER/Line Shapefiles for some of the most common legal and statistical geographies, as well as example GEOIDs for different geographic areas.

Area Type	GEOID Structure	Number of Digits	Example Geographic Area	Example GEOID
State	STATE	2	Texas	48
County	STATE+COUNTY	2+3=5	Harris County, TX	48201
County Subdivision	STATE+COUNTY+COUSUB	2+3+5=10	Pasadena CCD, Harris County, TX	4820192975
Places	STATE+PLACE	2+5=7	Houston, TX	4835000
Census Tract	STATE+COUNTY+TRACT	2+3+6=11	Census Tract 2231 in Harris County, TX	48201223100
Block Group	STATE+COUNTY+TRACT+BLOCK GROUP	2+3+6+1=12	Block Group 1 in Census Tract 2231 in Harris County, TX	482012231001

Block*	STATE+COUNTY+TRACT+BLOCK	2+3+6+4=15 (Note – some blocks also contain a one character suffix (A, B, C, ect.)	Block 1050 in Census Tract 2231 in Harris County, TX	482012231001050
Congressional District (113th Congress)	STATE+CD	2+2=4	Connecticut District 2	0902
State Legislative District (Upper Chamber)	STATE+SLDU	2+3=5	Connecticut State Senate District 33	09033
State Legislative District (Lower Chamber)	STATE+SLDL	2+3=5	Connecticut State House District 147	09147
ZCTA **	ZCTA	5	Suitland, MD ZCTA	20746

* The block group code is not included in the census block GEOID code because the first digit of a census block code represents the block group code.

** ZIP Code Tabulation Areas (ZCTAs) are generalized areal representations of United States Postal Service (USPS) ZIP Code service areas.

GEOIDS in Downloads from data.census.gov

Data downloaded from data.census.gov contains two fields of GEOID information, "GEO.id" and "Name". The table below shows the fields as they appear in a file downloaded from the data.census.gov search results page. The first row in the table contains data field names. The second row contains table descriptions. Rows 3-5 contain GEOID information for three counties in the state of Delaware.

GEO.ID	NAME
id	Geographic Area Name
0500000US10001	Kent County, Delaware
0500000US10003	New Castle County, Delaware
0500000US10005	Sussex County, Delaware

The "GEO.ID" field contains 14-digit codes that identify the summary level of data, the geographic component of the data and FIPS codes that uniquely identify the data. For example, the 14-digit "GEO.ID" for Harris County, TX is "0500000US48201" where "050" represents the summary level of the data, "0000"

represents the 2-digit geographic variant and the 2-digit geographic component, "US" represents the United States, "48" represents the state of Texas and "201" represents Harris County.

To join data downloaded from data.census.gov to TIGER/Line Shapefiles you will need to remove the first nine characters of "GEO.ID". For a step-by-step guide to completing this process using Excel, please see https://ask.census.gov/prweb/PRServletCustom?pyActivity=pyMobileSnapStart&ArticleID=KCP-5651.