2020 Census Geography and 2020 Census Redistricting Data

05/24/2021
James Whitehorne
Chief, Census Redistricting and Voting Rights Data Office
Census Geography
Census Geography

MAF/TIGER Database

Census Bureau's Master Address File (MAF)/Topologically Integrated Geographic Encoding and Referencing (TIGER) Database (MTDB).

Database includes the fifty states, the District of Columbia, Puerto Rico, and the Island areas (American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and the United States Virgin Islands).

Features include polygon boundaries of geographic areas and features, linear features including roads and hydrography, and point features.
### Census Geography

#### Types of Census Boundaries

### Legal

- States (and equivalents)
- Counties
- **County subdivisions** (Towns & townships)
- Places (Incorporated)
- **Tribal areas** (Reservations and trust land)

### Statistical

- Regions
- Divisions
- **County subdivisions** (Census county divisions)
- Places (Census designated)
- **Tribal areas** (Statistical areas)
- Census tracts
- Block groups
- Tabulation blocks
- Metropolitan/Micropolitan areas
- Urban areas
- ZCTAs

### Administrative

- Election Areas
  - Congressional
  - State Legislative
  - Voting Districts
- School Districts
Census Geography

Census Blocks

- The building blocks for all geographic boundaries the Census Bureau tabulates data generated every ten years.
- The smallest level of geography you can get basic demographic data for, such as total population by age, sex, and race.
- In a city, a census block looks like a city block bounded on all sides by streets.
- In suburban and rural areas, census blocks may be large, irregular, and bounded by a variety of features, such as roads, streams, and transmission lines.
- In remote areas, census blocks may encompass hundreds of square miles.
Census Blocks are not:

- Delineated based on population
  - Many census blocks do not have any population
- Permanent throughout the decade. They may be split when a change in another geographic boundary occurs, such as an incorporated place annexation
  - If a block is split in between decades, a suffix will be added to the block number. For example, block 1000 would become block 1000A and 1000B
- A boundary that can be used with American Community Survey (ACS) data
  - ACS data only go down to the block group level
Census Geography

Geographic Nesting
Hierarchy of Census Geographic Entities

- NATION
  - REGIONS
    - DIVISIONS
      - STATES
        - COUNTIES
          - Census Tracts
            - Block Groups
              - Census Blocks
  - AIANNH Areas* (American Indian, Alaska Native, Native Hawaiian Areas)
    - Urban Areas
      - Core Based Statistical Areas
      - Urban Growth Areas
      - State Legislative Districts
      - Public Use Microdata Areas

- ZIP Code Tabulation Areas
- School Districts
- Congressional Districts
- Voting Districts
- Traffic Analysis Zones
- County Subdivisions
- Subminor Civil Divisions
## Census Block Count 1990-2020

### National Census Blocks

<table>
<thead>
<tr>
<th>Decennial Census</th>
<th>Number of Census Blocks in U.S.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>8,174,955</td>
</tr>
<tr>
<td>2010</td>
<td>11,155,486</td>
</tr>
<tr>
<td>2000</td>
<td>8,262,363</td>
</tr>
<tr>
<td>1990</td>
<td>7,020,924</td>
</tr>
</tbody>
</table>

### Virginia Census Blocks

<table>
<thead>
<tr>
<th>Decennial Census</th>
<th>Number of Census Blocks in Virginia</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>163,491</td>
</tr>
<tr>
<td>2010</td>
<td>285,762</td>
</tr>
<tr>
<td>2000</td>
<td>145,399</td>
</tr>
<tr>
<td>1990</td>
<td>148,902</td>
</tr>
</tbody>
</table>

*Includes 50 states, District of Columbia, and Puerto Rico
Census Block Change 2010-2020
Census Block Change 2010-2020
Redistricting Data Program & Products
### Apportionment vs. Redistricting

<table>
<thead>
<tr>
<th></th>
<th>APPORTIONMENT</th>
<th>REDISTRICTING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Geography</strong></td>
<td>Largest State</td>
<td>State</td>
</tr>
<tr>
<td></td>
<td>Smallest State</td>
<td>Census Block</td>
</tr>
<tr>
<td><strong>Who is counted</strong></td>
<td>Resident Population + Federally</td>
<td>Resident Population Only</td>
</tr>
<tr>
<td></td>
<td>Affiliated Count Overseas</td>
<td></td>
</tr>
<tr>
<td><strong>What is reported</strong></td>
<td>Total Population only</td>
<td>Race, ethnicity, and select</td>
</tr>
<tr>
<td></td>
<td></td>
<td>housing characteristics</td>
</tr>
<tr>
<td><strong>Disclosure Avoidance</strong></td>
<td>None</td>
<td>Differentially Private (TopDown Algorithm)</td>
</tr>
<tr>
<td><strong>Current Timeline</strong></td>
<td>By April 30, 2021</td>
<td>Legacy Format – by August 16, 2021</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DVDs/Flash Drives &amp; data.census.gov by September 30, 2021</td>
</tr>
</tbody>
</table>
2020 Census Redistricting Data Program

Public Law 94-171

Program Mission: Provide states an opportunity to identify the geographic areas for which specific tabulations of population are needed for legislative redistricting and to deliver high quality data for those areas in a timely manner

Identified “geographic areas desired”:
• Census Tabulation Blocks
• Voting Districts (e.g. precincts, wards, etc.)
• Legislative and Congressional Districts

Requirements:
• Conduct the program in a non-partisan manner
• Establish program criteria
• Identify required tabulations
• Deliver the tabulations to the governor and the officers or public bodies having initial responsibility for the legislative apportionment or districting of each State no later than 1 year from Census Day*

*Delayed until Sept 30, 2021
2020 Census Redistricting Data Program
The Five Phases of the Program

- **Phase 1: Block Boundary Suggestion Project (BBSP)**
- **Phase 2: Voting District Project (VTD)**
- **Phase 3: Data Delivery**
  - P.L. 94-171 Geographic Support Products
  - P.L. 94-171 Redistricting Data Tabulations
- **Phase 4: Collection of Post-2020 Census Redistricting Plans**
  - 118th Congressional District Plans
  - New State Legislative District Plans
- **Phase 5: Evaluation of the 2020 RDP (View from the States)**
  - Recommendations from the States
  - Design for the 2030 Census Redistricting Data Program
2020 Census Redistricting Data Program
Phase 1 – Block Boundary Suggestion Project

Review & Submission Cycles:
• Initial Delineation (Dec 2015 – May 2016)
• Verification (Dec 2016 – May 2017)

Activities:
• States had opportunity to influence 2020 tab blocks.
• States also had the opportunity to update other geographic features:
  • Block Boundary Flagging (must holds and do not holds).
  • Boundary corrections and annexations.
  • Add, delete, or modify linear features (i.e. roads, railroads).
  • Add, delete, or modify area features (i.e. parks, college campuses, prison areas).
2020 Census Redistricting Data Program
Phase 2 – The Voting District Project

Review & Submission Cycles:
• Initial Delineation (Jan 2018 – May 2018).
• Verification I (Jan 2019 – May 2019).
• Verification 2 (Jan 2020 – March 2020).

Activities:
• States provided their Election Districts/Precincts/Wards.
• States also had the opportunity to update other geographic features:
  • Block Boundary Flagging (must holds and do not holds).
  • Boundary corrections and annexations.
  • Add, delete, or modify linear features (i.e. roads, railroads).
  • Add, delete, or modify area features (i.e. parks, college campuses, prison areas).
Redistricting Data Program  
**Phase 3 – P.L. 94-171 Redistricting Data Geographic Support Products**

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Census Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block Assignment Files</td>
<td><a href="https://www.census.gov/geographies/reference-files.html">https://www.census.gov/geographies/reference-files.html</a></td>
</tr>
<tr>
<td>Name Lookup Tables</td>
<td><a href="https://www.census.gov/geographies/reference-files/time-series/geo/name-lookup-tables.html">https://www.census.gov/geographies/reference-files/time-series/geo/name-lookup-tables.html</a></td>
</tr>
<tr>
<td>Block to Block Relationship Files</td>
<td><a href="https://www.census.gov/geographies/reference-files/time-series/geo/relationship-files.html">https://www.census.gov/geographies/reference-files/time-series/geo/relationship-files.html</a></td>
</tr>
</tbody>
</table>

- Shapefiles – Geographic information system geometry files.
- Reference Maps (PDF only) – County Block; State Legislative with Voting District; Census Tract; School District.
- Block Assignment Files – Tables identifying the blocks used to build different geographic entities.
- Name Lookup Tables – Contain names and codes for geographic areas within a state.
- Block to Block Relationship Files – Crosswalk of 2010 blocks to 2020 blocks.
Redistricting Data Program

Phase 3 – P.L. 94-171 Redistricting Data Tabulation Product

### 2020 Census P.L. 94-171 Redistricting Data Tabulations

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table P1</td>
<td>Race</td>
</tr>
<tr>
<td>Table P2</td>
<td>Hispanic or Latino, and not Hispanic or Latino by Race</td>
</tr>
<tr>
<td>Table P3</td>
<td>Race for the Population 18 Years and Over</td>
</tr>
<tr>
<td>Table P4</td>
<td>Hispanic or Latino, and not Hispanic or Latino by Race for the Population 18 Years and Over</td>
</tr>
<tr>
<td>Table H1</td>
<td>Occupancy Status (Housing)</td>
</tr>
</tbody>
</table>

**New Table**

| Table P5 | Group Quarters Population by Group Quarters Type                  |

- All tables produced at multiple geographies including census block
- Group Quarter types: Correctional Institutions for Adults, Juvenile Facilities, Nursing Facilities/Skilled Nursing, Other Institutional, College/University Student Housing, Military quarters, and other non-institutional
- Group quarters is total population only, no demographic breakdown
### Table P1 – Race
**Universe:** Total Population

### Table P3 – Race for the Population 18 Years and Over
**Universe:** Total population 18 years and over

<table>
<thead>
<tr>
<th>Race Configuration</th>
<th>Population Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>White alone</td>
<td></td>
</tr>
<tr>
<td>Black or African American alone</td>
<td></td>
</tr>
<tr>
<td>American Indian and Alaska Native alone</td>
<td></td>
</tr>
<tr>
<td>Asian alone</td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander alone</td>
<td></td>
</tr>
<tr>
<td>Some Other Race alone</td>
<td></td>
</tr>
<tr>
<td>Two or More Races:</td>
<td></td>
</tr>
<tr>
<td>White; Black or African American</td>
<td></td>
</tr>
<tr>
<td>White; American Indian and Alaska Native</td>
<td></td>
</tr>
<tr>
<td>White; Asian</td>
<td></td>
</tr>
<tr>
<td>White; Native Hawaiian and Other Pacific Islander</td>
<td></td>
</tr>
<tr>
<td>White; Some Other Race</td>
<td></td>
</tr>
<tr>
<td>Black or African American; American Indian and Alaska Native</td>
<td></td>
</tr>
<tr>
<td>Black or African American; Asian</td>
<td></td>
</tr>
<tr>
<td>Black or African American; Native Hawaiian and Other Pacific Islander</td>
<td></td>
</tr>
<tr>
<td>Black or African American; Some Other Race</td>
<td></td>
</tr>
<tr>
<td>American Indian and Alaska Native; Asian</td>
<td></td>
</tr>
<tr>
<td>American Indian and Alaska Native; Native Hawaiian and Other Pacific Islander</td>
<td></td>
</tr>
<tr>
<td>American Indian and Alaska Native; Some Other Race</td>
<td></td>
</tr>
<tr>
<td>Asian; Native Hawaiian and Other Pacific Islander</td>
<td></td>
</tr>
<tr>
<td>Asian; Some Other Race</td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander; Some Other Race</td>
<td></td>
</tr>
<tr>
<td>Population of six races:</td>
<td></td>
</tr>
</tbody>
</table>
| White; Black or African American; American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; Some Other Race | }
**Table P2** – Hispanic or Latino, and Not Hispanic or Latino by Race

**Universe**: Total population

**Table P4** – Hispanic or Latino, and Not Hispanic or Latino by Race for the Population 18 Years and Over

**Universe**: Total population 18 years and over
Table H1 – Occupancy Status

Universe: Housing Units
- Total
  - Occupied
  - Vacant

Table P5 - Group Quarters Population by Group Quarters Type

Universe: Total Population in Group Quarters
- Total
  - Institutionalized population
    - Correctional facilities for adults
    - Juvenile facilities
    - Nursing facilities/Skilled-nursing facilities
    - Other institutional facilities
  - Noninstitutionalized population
    - College/University student housing
    - Military quarters
    - Other non-institutional facilities
Ensure all records are coded to their most detailed level of geography.

Conduct characteristic editing and imputation that ensures each record has valid values for major characteristics.

Apply differential privacy to ensure confidentiality of responses.

Tabulate and review all redistricting data in multiple formats.

Create physical media, load and test web-based systems.

Deliver data to the states and public by September 30.
Redistricting Data Program

Public Law 94-171 official tools and materials

The user-friendly tools and materials we intend to deliver in September are the DVDs and Flash Drive and our Data.census.gov Data Explorer platform.

• DVDs and Flash Drives – These are what we deliver to the official recipients with an integrated software browsing tool that allows intuitive browsing of the data. They also contain a custom extraction menu that allows for the extraction of large datasets from the device. Those extractions can then be imported easily into a Geographic Information System or database.

• Data Explorer web tool – The data.census.gov Data Explorer is our online data browsing tool for both the official recipients and the public. Users of the Data Explorer platform can access many different census datasets, including the redistricting data. It has custom filters that allow the user to filter on those geographic and characteristic data for which they are interested. For example, a State could filter the data and easily identify the number of voting-age residents by race or ethnicity in each and every block within a census tract, county, or even for the entire state. They can then view, map, and download these datasets once they have set the filters with their choices.
Ensure all records are coded to their most detailed level of geography.

Conduct characteristic editing and imputation that ensures each record has valid values for major characteristics.

Apply differential privacy to ensure confidentiality of responses.

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Redistricting Data Program

Public Law 94-171 Legacy Format Summary Files

Legacy Format Summary Files

• Product was always part of the 2020 Census product plan
• Format produced and provided to the states since at least Census 2000
• Requires additional handling to properly extract data from this format
• Fully reviewed and cleared for publication by August 16, 2021
• The same data as what will be released in more user-friendly forms by September 30, 2021
  • Used as the source files for the DVD/Flash Drive creation
• Prototype data from the 2018 End-to-End Census Test is available for designing and testing redistricting systems
  • Only for Providence County, Rhode Island
Redistricting Data Program

Public Law 94-171 Legacy Format Summary Files

Physical description

• 2020 formatting is four pipe delimited text files per state contained in a single .ZIP file
  • Geoheader – contains all the geographic codes for the geography include in the redistricting dataset
    • Now contains a GEOCODE field so data can be easily joined to geography
  • Data Segment 1 – Table P1: Race & Table P2: Hispanic or Latino, and not Hispanic or Latino by Race
  • Data Segment 2 – Table P3: Race for the Population 18 Years and Over & Table P4: Hispanic or Latino, and not Hispanic or Latino by Race for the Population 18 and Over & Table H1 – Housing Status (Occupancy)
  • Data Segment 3 – Table P5: Group Quarters Population by Group Quarters Type
  • The geoheader must be used together with the data segments in order to access the data

• 2010 formatting was different
  • 3 files in total: 1 geoheader and 2 data segments
  • Geoheader was a fixed width format
  • Data segments were comma delimited
Redistricting Data Program

Public Law 94-171 Legacy Format Summary Files

Processing and Extracting Data

Screenshot of portion of geoheader

Screenshot of portion of data segment 1

Link the tables on the common field
Q: I want total population for my townships in RI.

Township identifier is in Summary Level field as 060

Total Population field is in data segment 1 as field P0010001
Q: I want total population For my townships in RI.

Query: From the GEOHEADER file give me records where SUMLEV = 060. Output the corresponding GEOCODE, NAME (not shown on slide) and P0010001
Query Results: From the GEOHEADER file give me records where `SUMLEV = 060` and output the corresponding `GEOCODE`, `NAME` and `P0010001`
Redistricting Data Program

Public Law 94-171 Legacy Format Summary Files

Support

- Consultations with major software vendors, NCSL, and individual states to ensure they understand the August format
- 2020 Census State Redistricting (P.L. 94-171) Summary File Technical Documentation
- Prototype P.L. 94-171 Redistricting Data Summary File
  - Content from the 2018 End-to-End Census Test in Providence County, RI
  - In the format planned for the 2020 Census Legacy Format Summary Files
- Header File – Excel Format
  - Tabs for the header of each file which can be imported into other software or used within Excel
  - Tabs with plain English definition for the headers
- Microsoft Access database shell
  - Tables shells for each file
  - Example queries to demonstrate query logic and provide practice
  - Illustrated step-by-step guide on how to use the Microsoft Access database shell
- SAS script for import of the Legacy Format Summary File
Redistricting Related Census Data

Official 2020 Census redistricting geographic support products
• Includes shapefiles, maps, and tabular data
• Geographic products available for all states, D.C., and Puerto Rico as of 2/12/2021
• [https://www.census.gov/programs-surveys/decennial-census/about/rdo/summary-files.html#P2](https://www.census.gov/programs-surveys/decennial-census/about/rdo/summary-files.html#P2)

Prototype redistricting data
• From the 2018 End-to-End Census Test in Providence Rhode Island
• Includes geography files and counts
• [https://www.census.gov/programs-surveys/decennial-census/about/rdo/program-management.html#P3](https://www.census.gov/programs-surveys/decennial-census/about/rdo/program-management.html#P3)

Census geocoding service
• Updated with 2020 Census geography and address ranges
• Available to the public for geocoding 10,000 or fewer addresses per submission
• Special provision for state redistricting officials to submit larger lists of addresses if needed
• [https://www.census.gov/programs-surveys/decennial-census/about/rdo/summary-files/2020/GQAssistance_CensusGeocoder.html](https://www.census.gov/programs-surveys/decennial-census/about/rdo/summary-files/2020/GQAssistance_CensusGeocoder.html)
Redistricting Data Program

P.L. 94-171 Redistricting Data Delivery

Legacy Format Summary Files
- Release files to states and public on Public File Transfer Protocol (Public FTP) site by August 16, 2021.

User-Friendly Format Summary Files
- Mail files to official state recipients on physical media (DVD/Flash Drive) by September 30, 2021 (Confirm Receipt).
- Release to states and public via the Data Explorer web tool <data.census.gov> by September 30, 2021.

Official State Recipients of the Data
- Governors
- Majority and Minority Legislative Leadership
- Redistricting Commissions (if established)
- Non-partisan State Liaisons
Redistricting Data Program

Where to get the data.

WWW.CENSUS.GOV/RDO

Voting Rights Data
(Section 203 & CVAP)

Decennial Census of Population and Housing

Redistricting Data Program

Redistricting & VOTING RIGHTS DATA OFFICE (RDO@CENSUS.GOV OR 301-763-4039)

MAY 05, 2017

Redistricting Data Program Congressional Districts
Guidance and access to information about congressional districts and congressional district products.

MAY 08, 2017

Redistricting Data Program State Legislative Districts
Guidance and access to information about state legislative districts and state legislative district products.

MAY 08, 2017

Decennial Census P.L. 94-171 Redistricting Data Summary Files
Guidance and documentation to assist in accessing P.L. 94-171 Redistricting data.

Redistricting Data Program Management

Guidance about and for participation in the Redistricting Data Program for the current and past Decennial Censuses.

Prototype Data & Legacy format summary file support materials

Official Data in 2021
Thank You

James Whitehorne
Chief - Census Redistricting & Voting Rights Data Office
Email: rdo@census.gov
Phone: 1-301-763-4039
Web: www.census.gov/rdo