

**United Nations Expert Group on the Integration of
Statistical and Geospatial Information**
First Meeting
New York, 30 October - 1 November 2013

Agenda: Item 8

Geographic Classifications and Boundaries: A U.S. Perspective ¹

Prepared by
U.S. Census Bureau

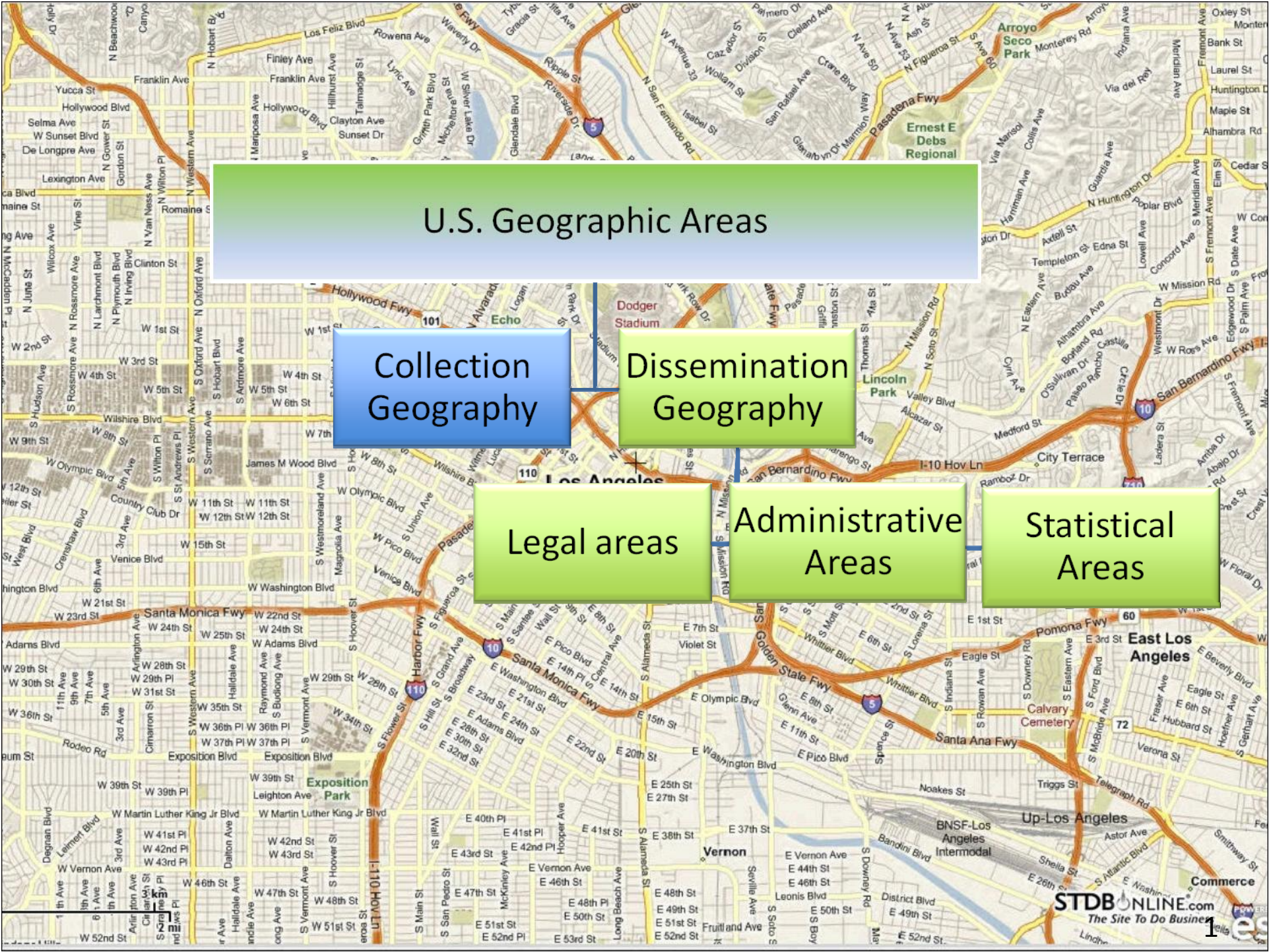
¹ This document is being produced without formal editing

Geographic Classifications and Boundaries: A U.S. Perspective

Tim Trainor
Chief , Geography Division
U.S. Census Bureau



U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU



U.S. Geographic Areas

Collection Geography

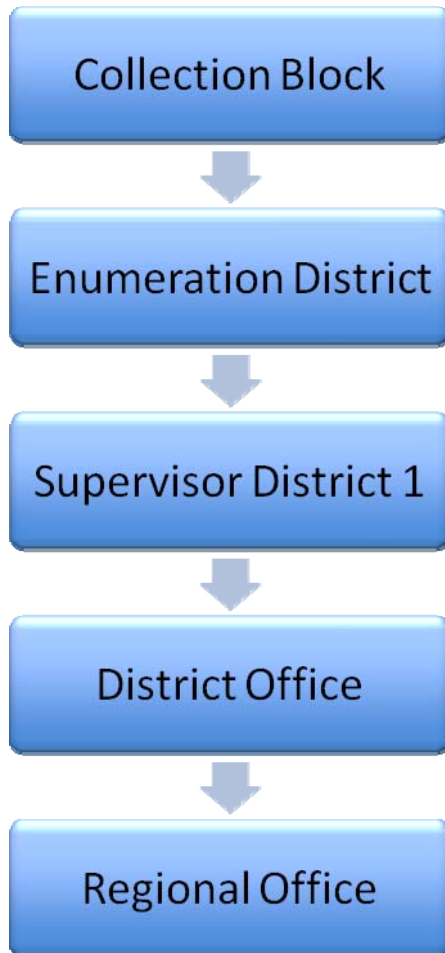
Dissemination Geography

Legal areas

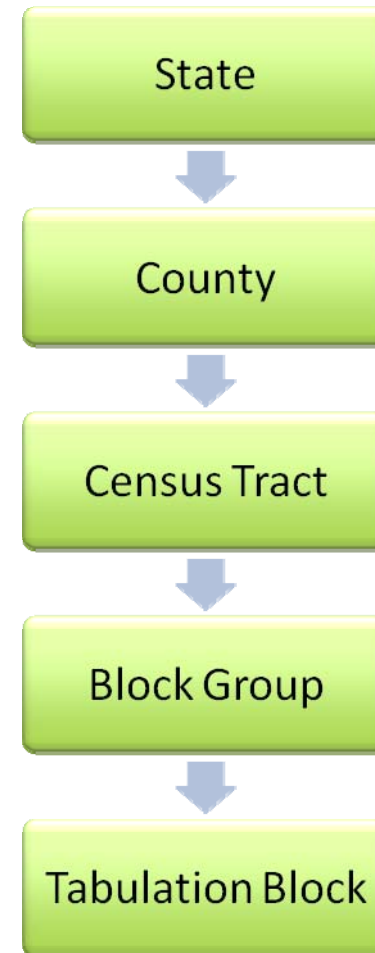
Administrative Areas

Statistical Areas

Collection Geography



Dissemination Geography



2010 Collection Geography

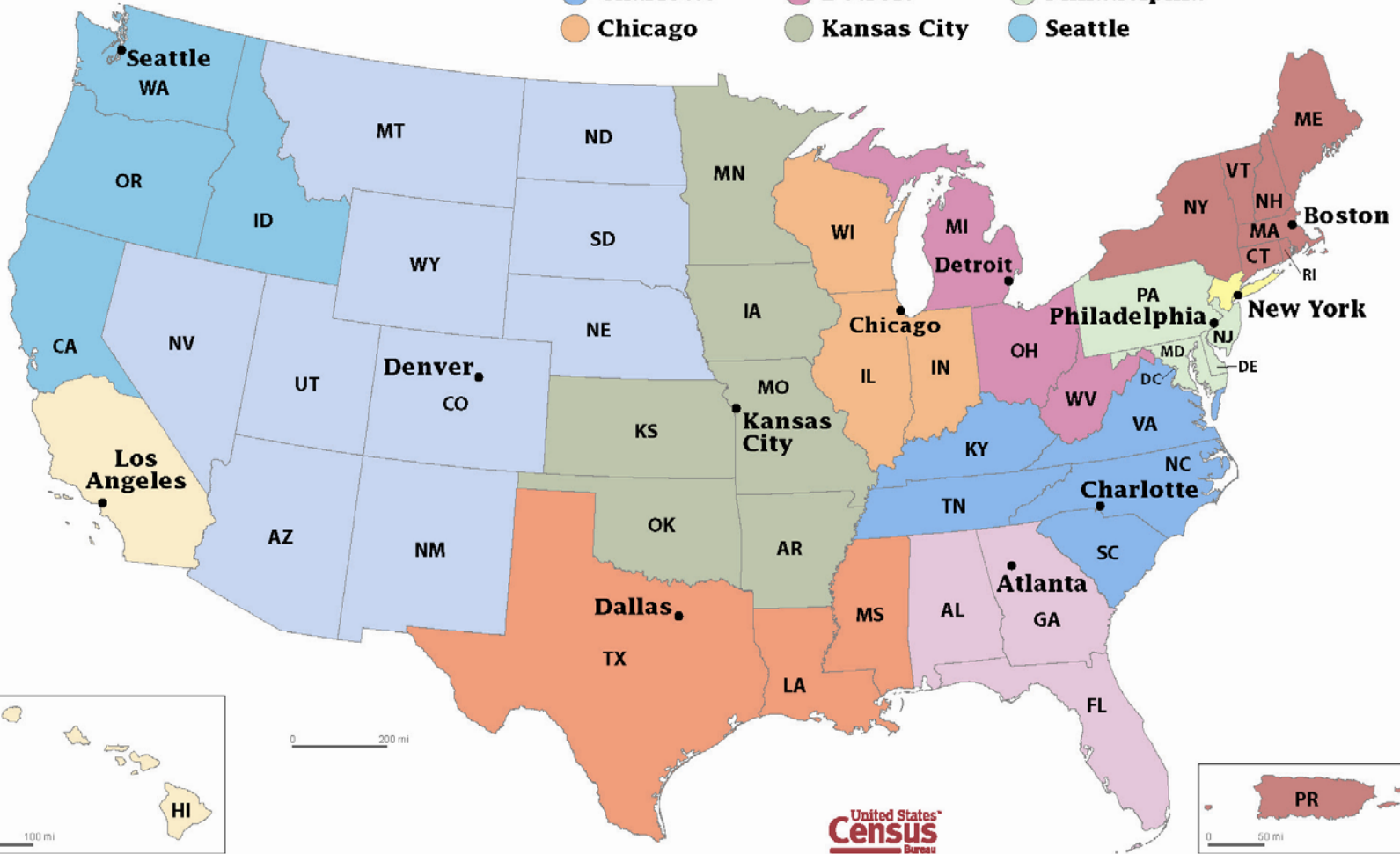
- Regional Offices (12)
- District Offices (490)
- Supervisor 2 Districts (4,000)*
- Supervisor 1 Districts (32,000)*
- Enumeration Districts (3,800,000)*
- Collection Blocks (6,700,000)

* = number dependent on field operation

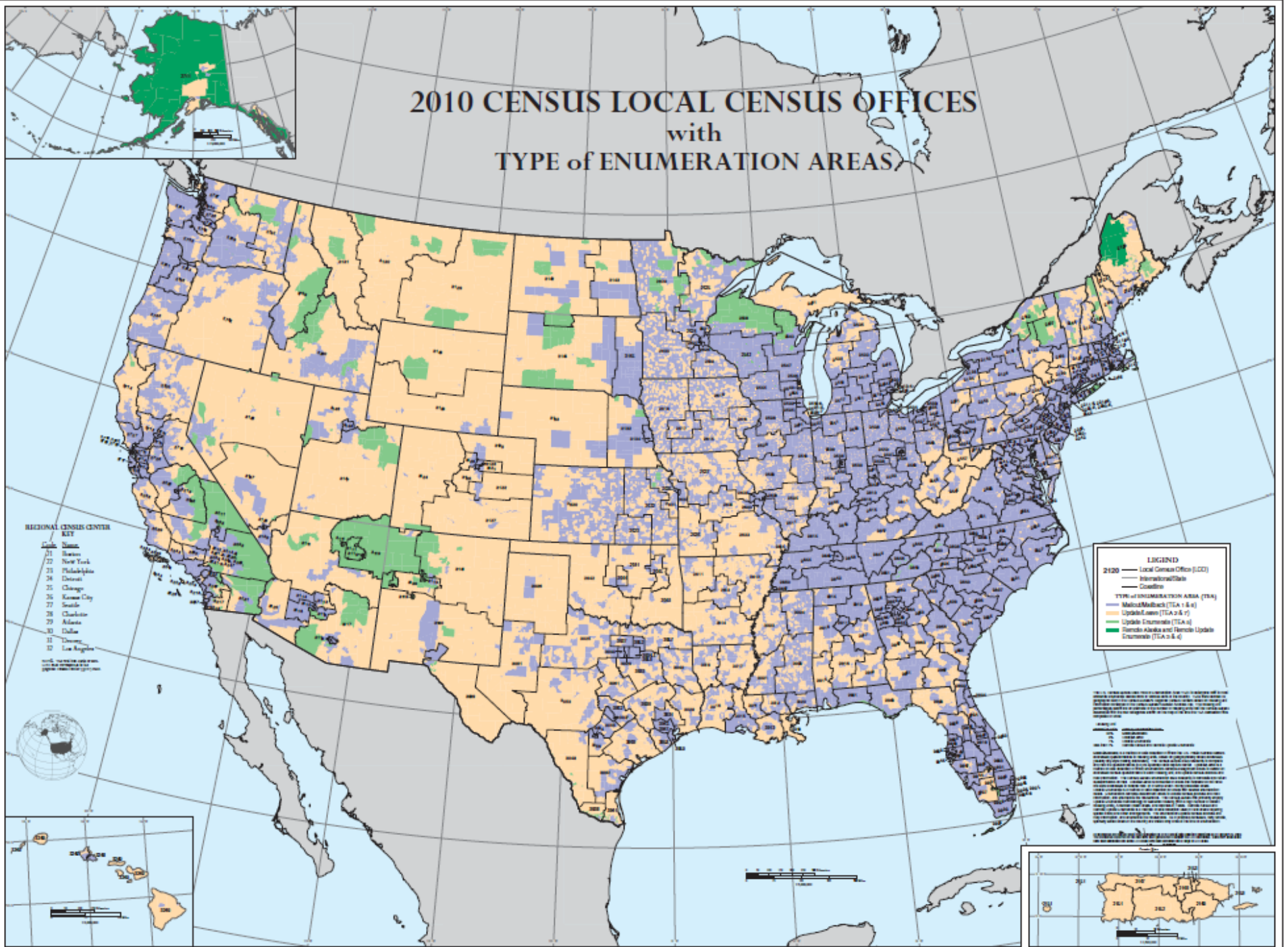
Census Bureau Regional Office Boundaries

For the 2010 Census

- | | | |
|---|---|--|
|  Atlanta |  Dallas |  Los Angeles |
|  Boston |  Denver |  New York |
|  Charlotte |  Detroit |  Philadelphia |
|  Chicago |  Kansas City |  Seattle |



2010 CENSUS LOCAL CENSUS OFFICES with TYPE of ENUMERATION AREAS



	Field Operation Supervisor District	Crew Leader District	Assignment Area
Address Canvassing	748	5,668	730,920
Group Quarters Validation	151	1,273	732,402
Update/Leave	523	3,323	202,890
Update/Enumerate	178	1,037	32,574
Non-Response Follow Up	4,062	32,481	39,405
Remote Update/Enumerate	2	13	224
Remote Alaska	6	48	1,258
Census Coverage Measurement	n/a	n/a	3,892,985
Group Quarters Enumeration	494	1,579	732,402
Field Verification	494	494	6,710,413

2010 Collection Geography

- Collection Blocks

Criteria:

- 1) Bounded by roads, shorelines, county boundaries, American Indian reservation & trust land boundaries, military installation boundaries, and/or minor civil divisions in some states.
- 2) Contiguous

Guidelines:

- 1) Compactness
- 2) Size of Area

- Remained consistent through all census operations.
- No housing unit count requirement for collection blocks.



2010 Collection Geography

- Assignment Areas (AAs)

Criteria:

- 1) Built from one or more 2010 collection blocks
- 2) Cannot cross county boundaries, American Indian reservation & trust land boundaries, military installation boundaries, and/or minor civil divisions in some states.
- 3) Contiguous

Guidelines:

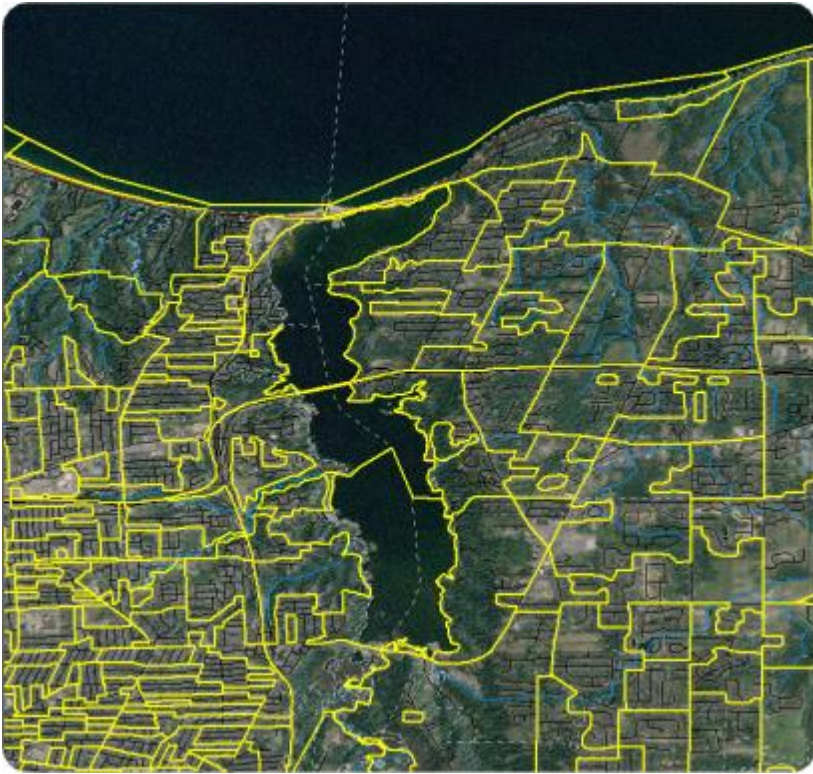
- 1) Compactness
- 2) Land Area

–A small geographic area consisting of a collection block or group of blocks established by the Census Bureau as a basic unit for data collection by a single enumerator for a single operation.



2010 Collection Geography

- Assignment Areas different by field operation



Address Canvassing



Census Coverage Measurement

The Basic Collection Unit (BCU)

A Proposal for the 2020 Census

- Replaces the collection block and assignment area concepts
- Incorporates new homogeneity requirements based on research
- Creates a single, stable, nationwide set of “basic collection units” to be used for all census and survey field operations
- Updated throughout the decade leading up to the 2020 Census, but will maintain comparability (splitting, merging, small boundary corrections)
- Provides a basic framework for 2020 Census planning
- Designed to meet the needs of statistical modeling for cost management (homogeneity and stability), and the needs of different field operations (navigability and manageable size)

Dissemination Geography

Legal

- States (50)
- Counties (3,000)
- County subdivisions
(Towns & townships) (31,000)
- Places (Incorporated) (19,000)
- Indigenous areas (Reservations
and trust land) (400)

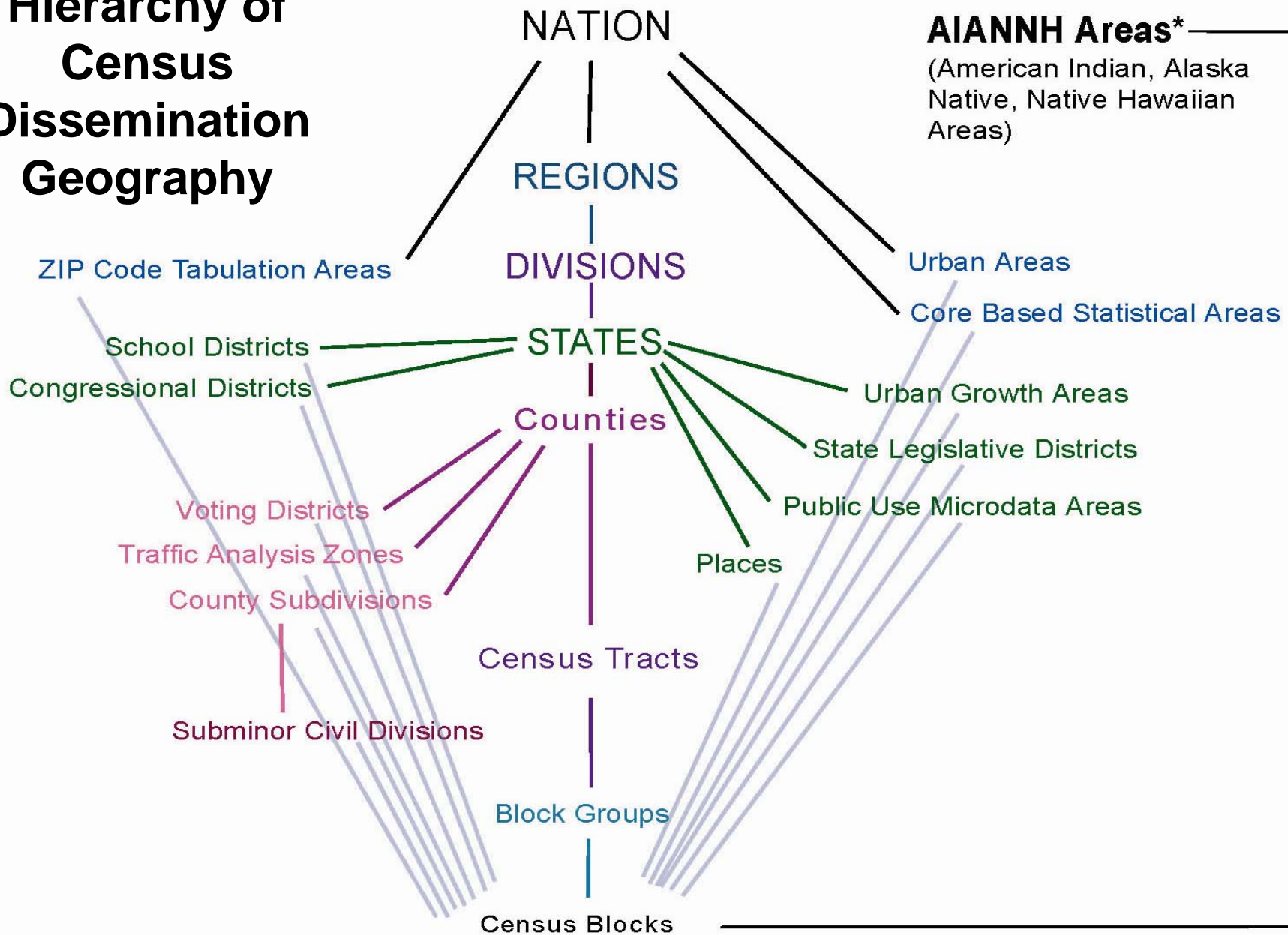
Administrative

- Election areas (186,000)
- School areas (13,000)
- Postal areas (33,000)

Statistical

- Regions (5)
- Divisions (10)
- County subdivisions
(Census county divisions) (5,000)
- Places (Census designated) (10,000)
- Indigenous areas (Statistical areas) (280)
- Census tracts (74,000)
- Block groups (220,000)
- Tabulation blocks (11 million)
- Metropolitan/Micropolitan areas (1,000)
- Urban areas (3,000)
- Traffic analysis areas (228,000)

Hierarchy of Census Dissemination Geography



Geographic Area Update Programs

- Boundary and Annexation Survey (BAS)
- Redistricting Data Program (RDP)
- School District Review Program (SDRP)

- Participant Statistical Areas Update (PSAP)
- Tribal Statistical Areas Update (TSAP)
- Public Use Microdata Area (PUMA) Program
- Traffic Analysis Zone (TAZ) Program

Boundary and Annexation Survey (BAS)

- A voluntary survey of local, county, and tribal governments
- Conducted annually to collect information about legal geographic areas
- Primary source of information for:
 - Legal boundary
 - Names of government
 - Functional status (active or inactive)
 - Type of governmental unit
 - New government
 - Dissolved government
 - Boundary change
 - Legal geographic relationship
 - e.g., incorporated place annexes into a new county

Participant Statistical Areas Program (PSAP)

- Allows **local participants**, following Census Bureau criteria and guidelines, to review and suggest modifications to the boundaries and names for statistical geographic areas
- Includes:
 - Census Tracts
 - Block Groups
 - Census Designated Places (CDPs)
 - Census County Divisions (CCDs)

County Subdivisions

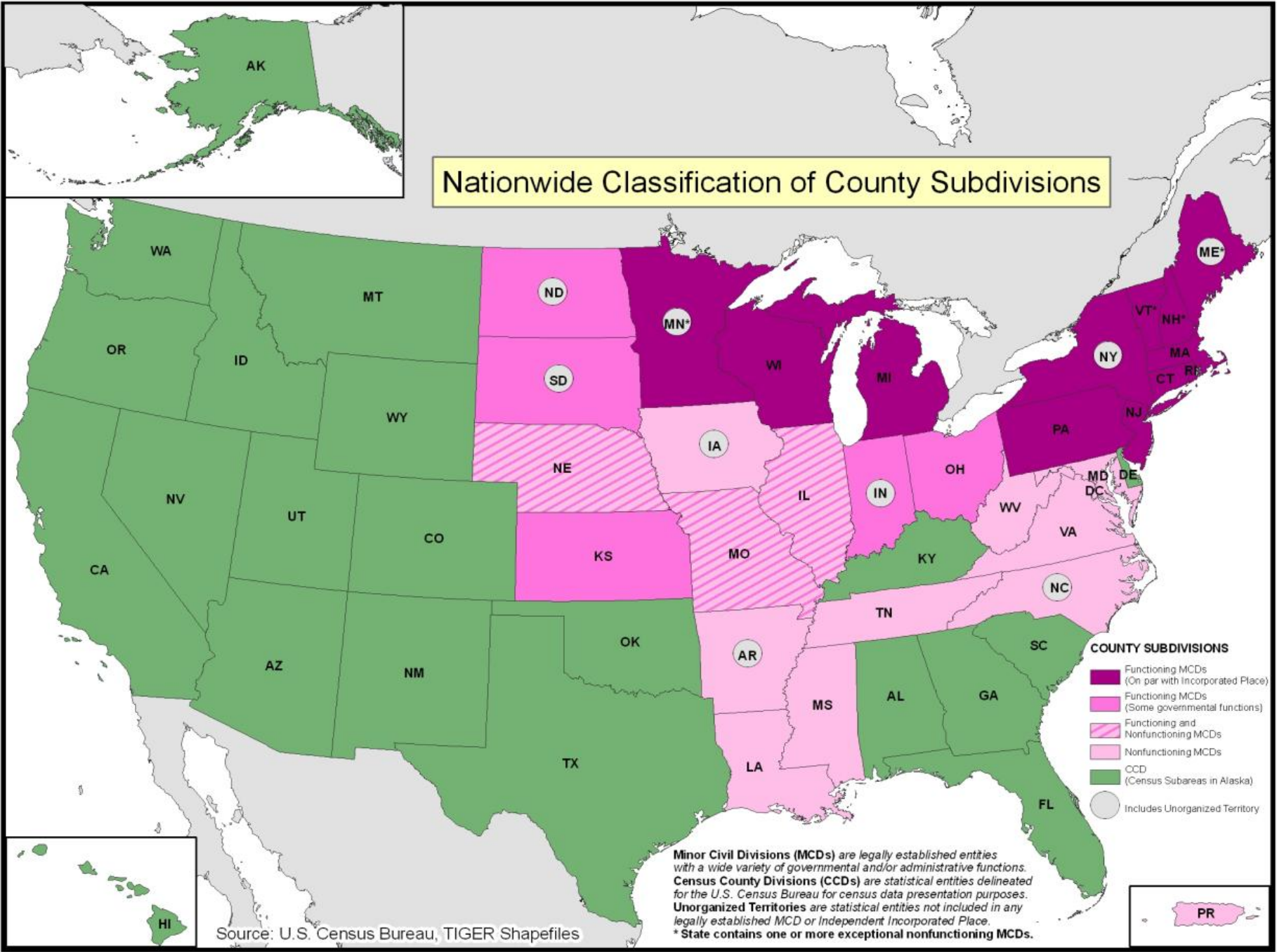
Minor Civil Divisions (legal)

- Legal sub-county entities in 29 states, the District of Columbia, Puerto Rico, and the Island Areas
- May have a formal government with elected officials

Census County Divisions (statistical)

- Statistical sub-county entities that have stable boundaries and recognizable names in 21 states
- No minimum or maximum population guidelines

Nationwide Classification of County Subdivisions



Places

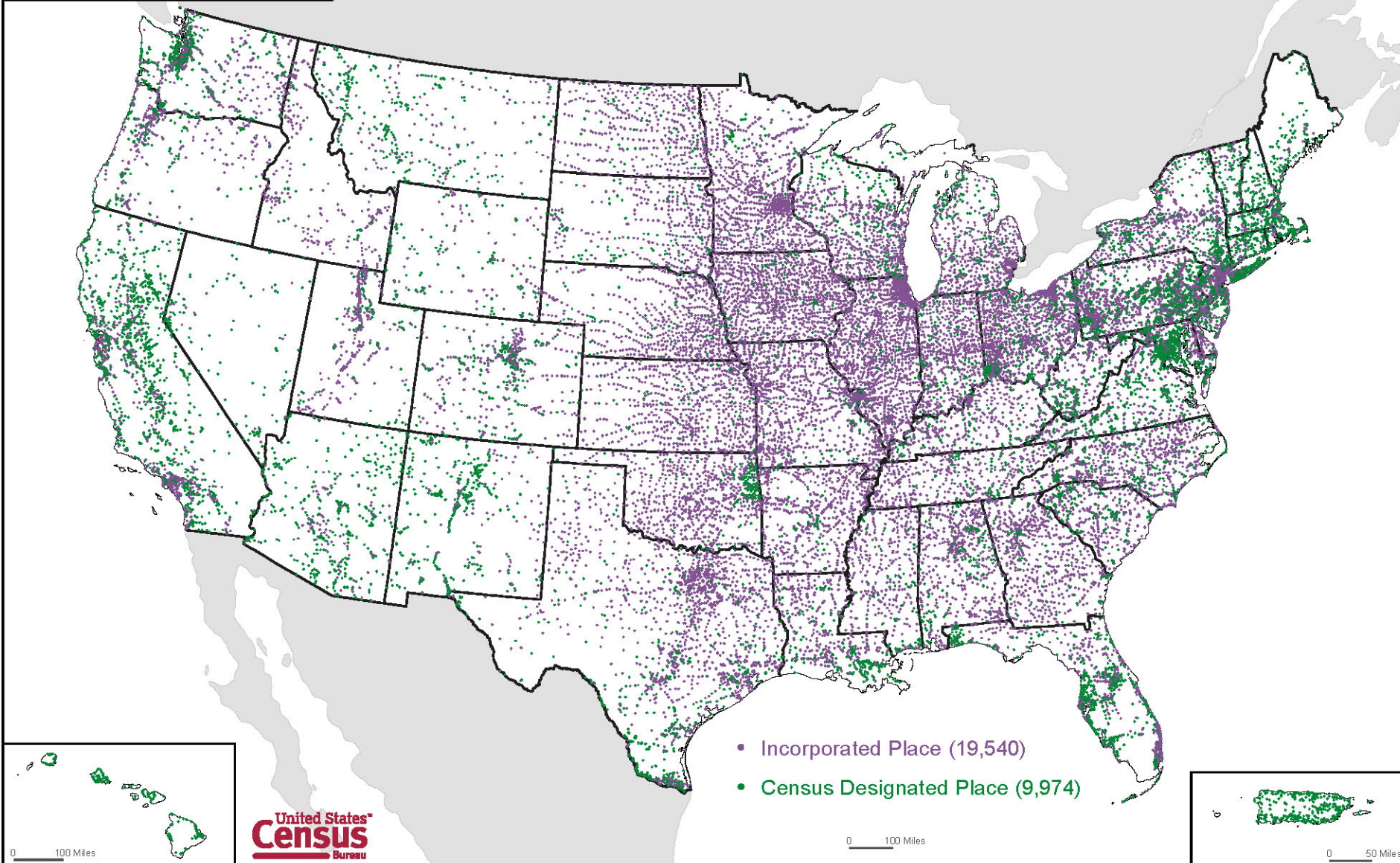
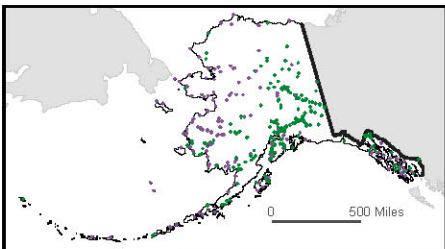
Incorporated Places (legal)

- Referred to as cities, boroughs, towns, or villages, depending on the state
- Some form of local governance (city council, mayor, etc) recognized by the state
- Boundaries maintained through annual BAS program

Census Designated Places (statistical)

- Area with a concentration of population, housing, and commercial structures identifiable by name; not within an incorporated place

2010 Census Distribution of Places

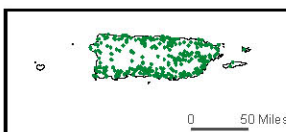


- Incorporated Place (19,540)
- Census Designated Place (9,974)



United States
Census
Bureau

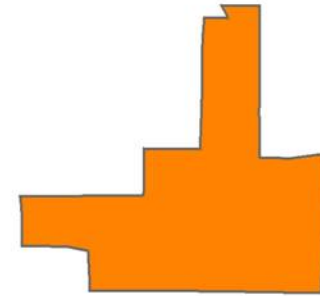
0 100 Miles



Blount County, Alabama 2009



Smoke Rise
CDP



Hayden Town

Blount County, Alabama 2009



Smoke Rise CDP, 2010



Census Tracts




- Small, relatively permanent statistical subdivisions of a county
- Relatively consistent boundaries over time, partner changes once per decade
- Increased importance over time for data analysis
- Optimally 4,000 people; range between 1,200 and 8,000
- About 74,000 for 2010 Census, 65,000 for Census 2000, and 50,690 for the 1990 Census
- Defined nationwide for the first time for the 1990 Census

Tabulation Blocks

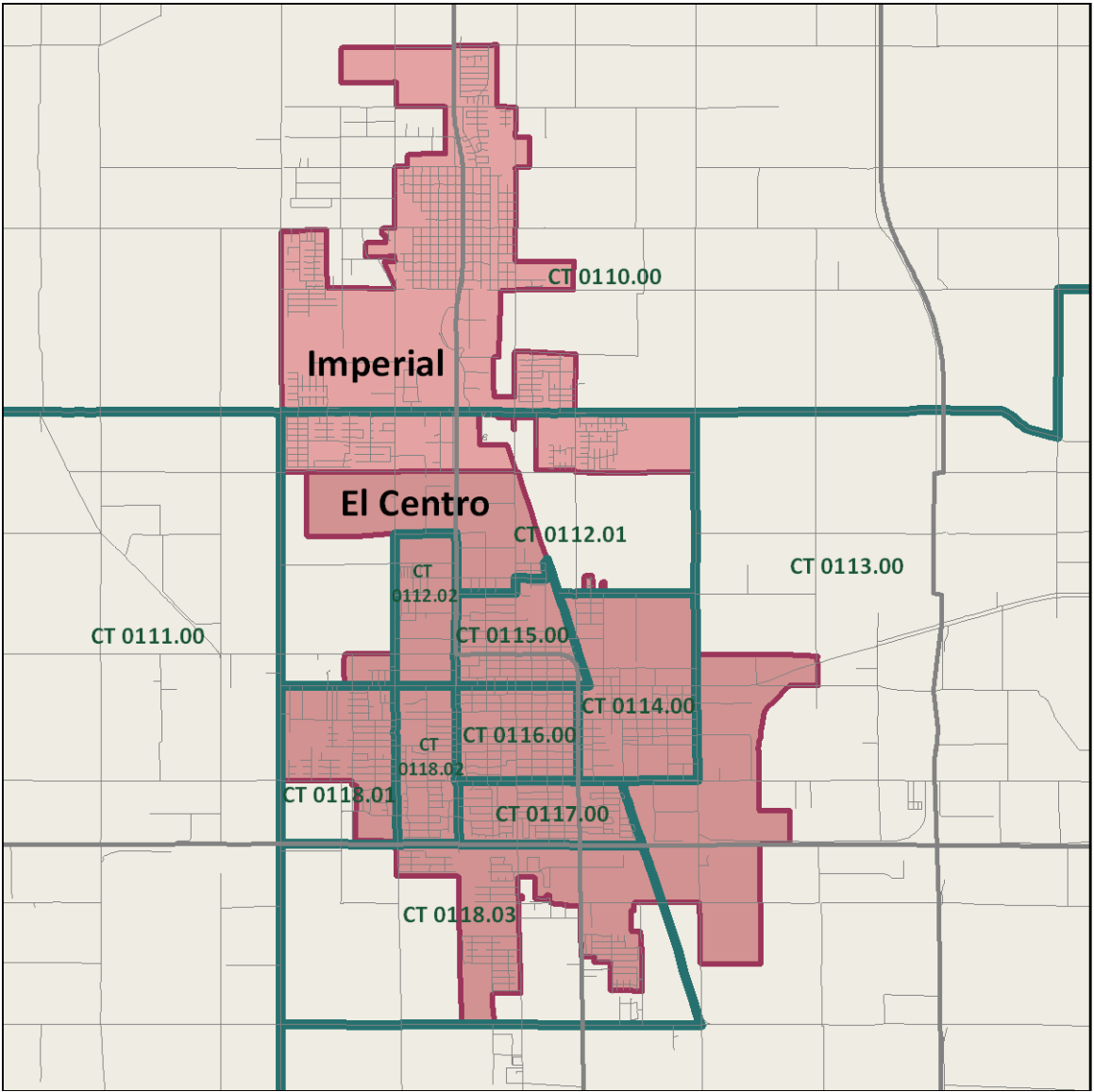

- Smallest units for 100% data tabulation
- Cover entire nation
- Nest within all other types of geographic areas
- Generally bounded by visible features or boundaries
- Batch delineation algorithm
- Last geographic area delineated for the census

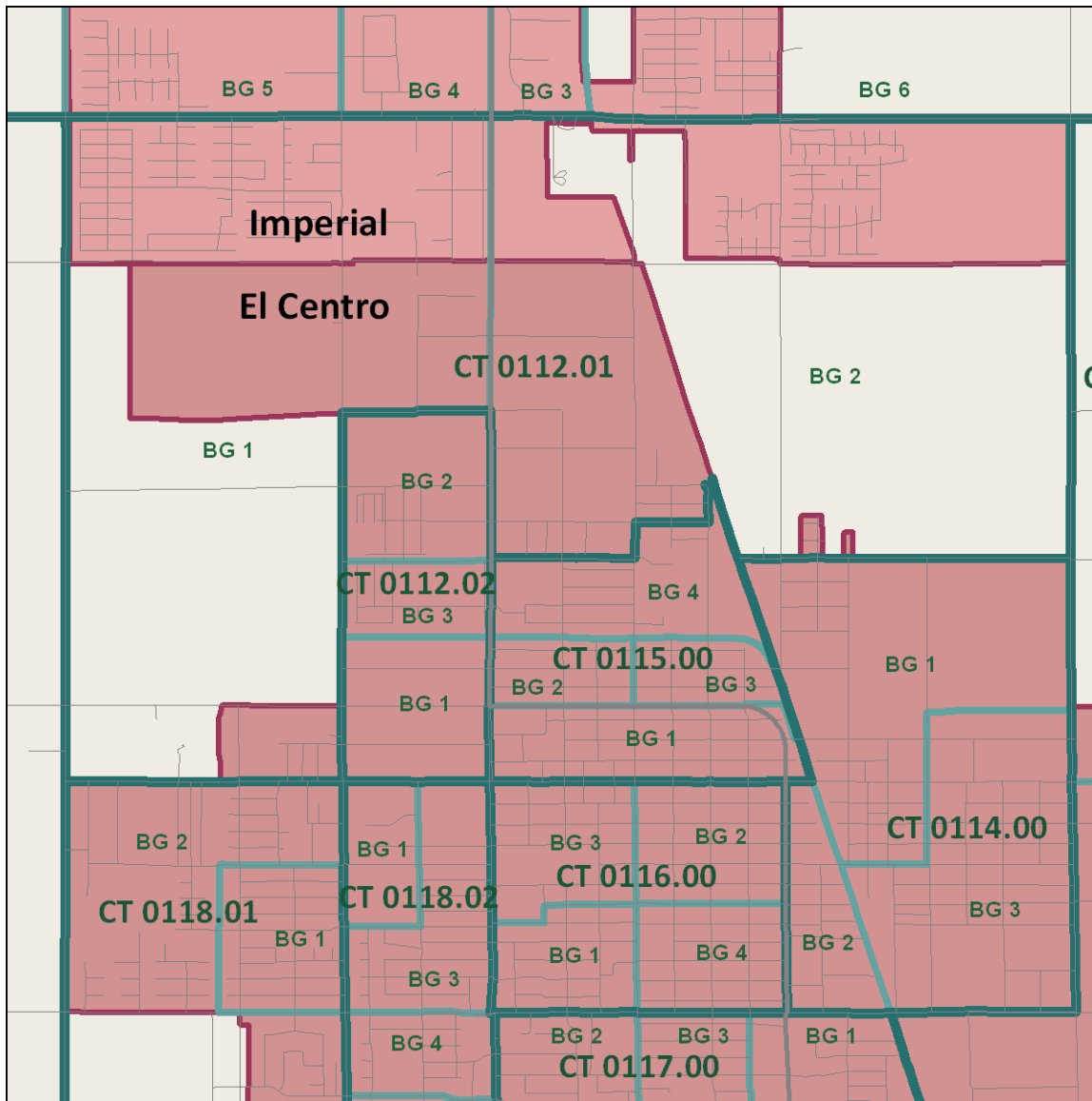
Census Tract

Imperial and El Centro, CA

-  Census tracts
-  Imperial city
-  El Centro city





0 0.5 1 Miles






Census Tract
 ↳ Block Group

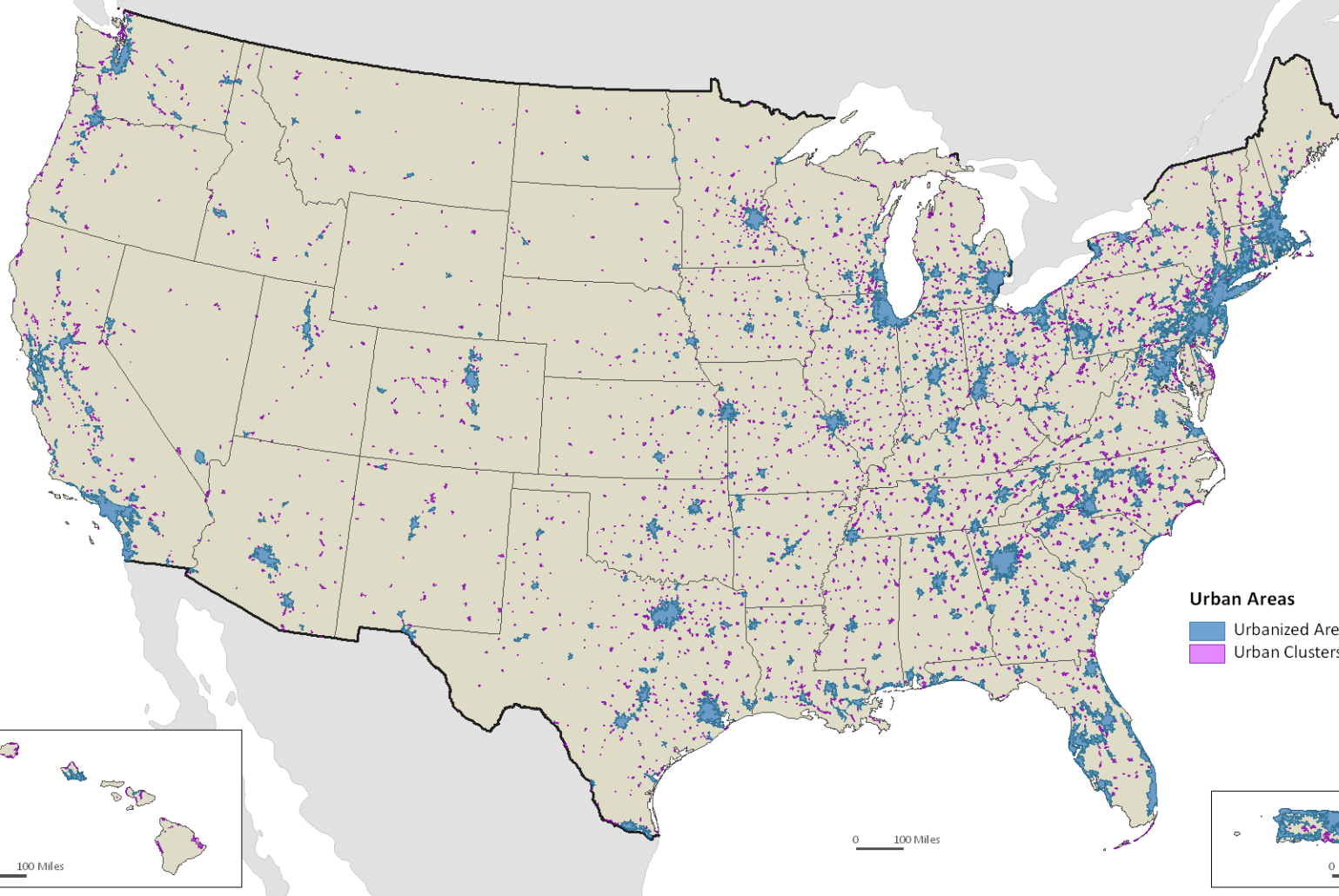
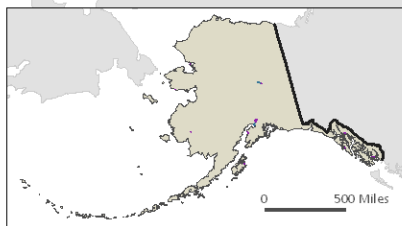
Imperial and El Centro, CA

-  Census tracts
-  Census block groups
-  Imperial city
-  El Centro city

0 0.25 0.5 Miles

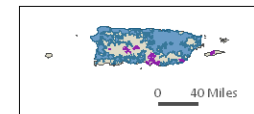


Urban Areas of the United States

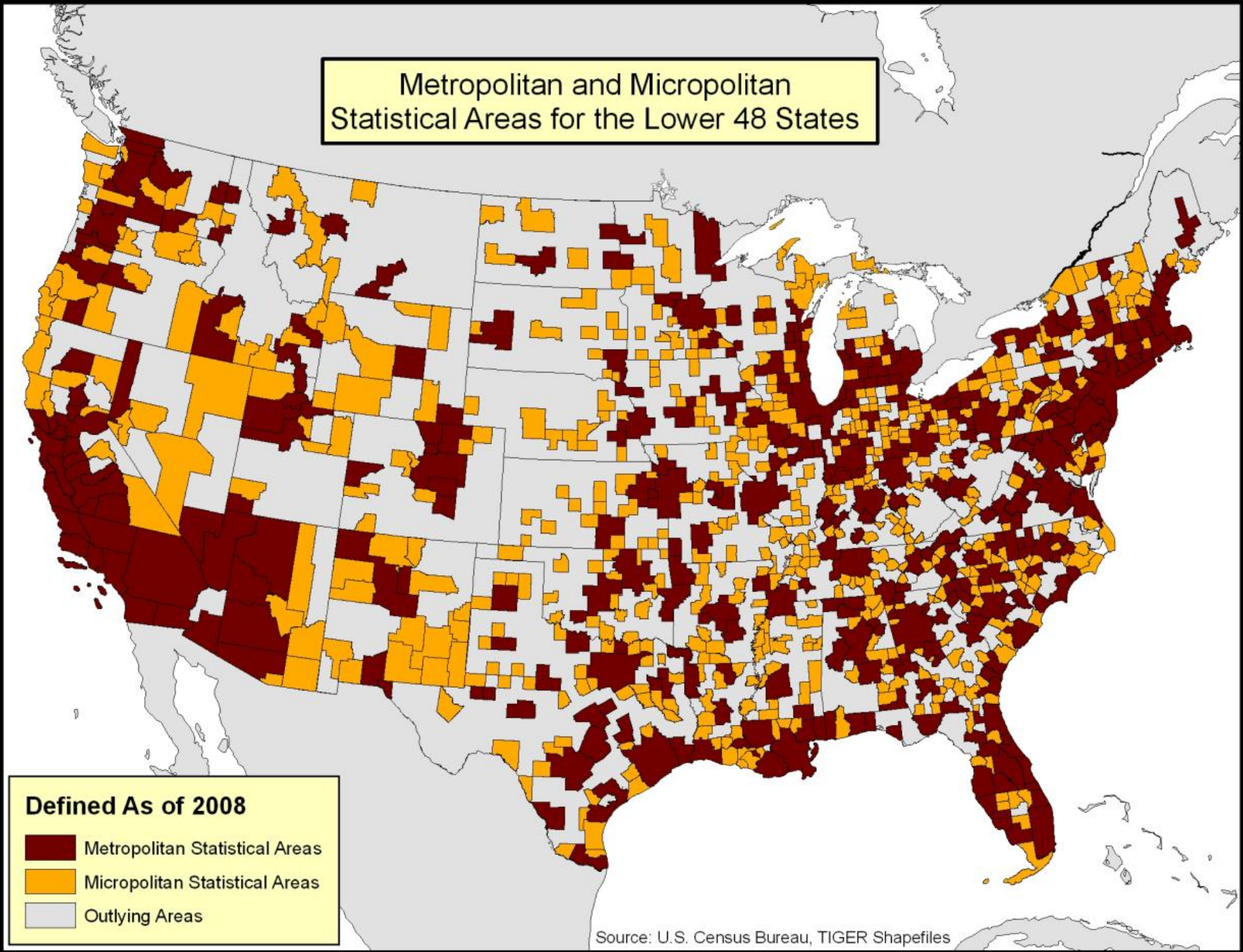


Urban Areas

- Urbanized Areas
- Urban Clusters



Metropolitan and Micropolitan
Statistical Areas for the Lower 48 States



Defined As of 2008

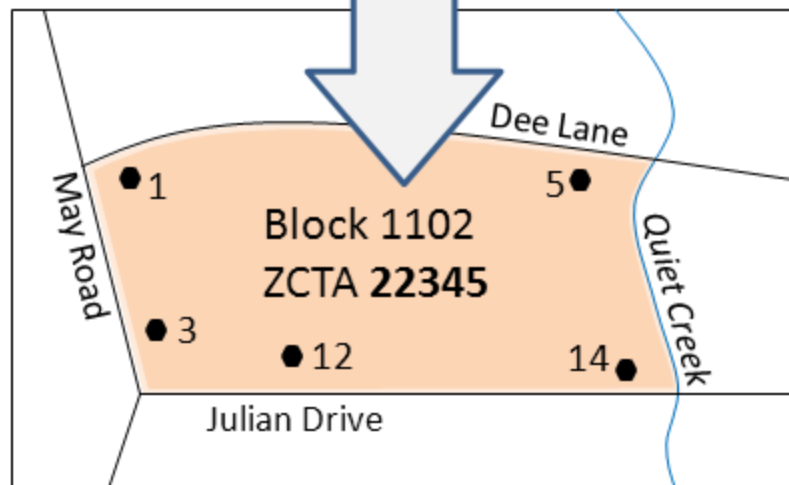
- Metropolitan Statistical Areas
- Micropolitan Statistical Areas
- Outlying Areas

Source: U.S. Census Bureau, TIGER Shapefiles

Census Tract 12, Block 1102

<u>Street Address</u>	<u>ZIP Code</u>
1 May Road	22345
12 Julian Drive	22345
3 May Road	22345
14 Julian Drive	22345
5 Dee Lane	22346

Most frequently occurring ZIP Code:
22345



ZIP Code Tabulation Areas (ZCTAs)

- Approximate USPS ZIP Code distribution for housing units
- Represent the most frequently occurring ZIP Code within an area
- A calculated geography
- Composed of whole blocks
- ZCTAs do not nest cleanly within other geography
- 2010 ZCTAs exclude large water bodies and unpopulated areas

Major Considerations for Geographic Areas

- 100% Counts vs. Sample
- Relationship to Other Geographic Areas
- Changing Boundaries – comparability over time
- Unintended Uses
- Products
- Schedule
- Maintenance
- Resources

Specific Considerations for Geographic Areas

- Disclosure avoidance
 - Data swapping
 - Data suppression
- Data reliability
- Sample size
- Response rates
- Response options
- Response quality
- Detailed characteristics / microdata
- Weighting
- Sample frame
- Density measures
- Frequency of censuses / surveys
- Frequency of data releases
- Frequency of boundary changes
- Type of boundary changes
- Field verification
- Use of non-visible boundaries
- Spatial accuracy of data
- Imagery verification
- Authoritative sources
- Nesting relationship with other geographic areas
- Sliver geography / subtraction geography
- Access to technology (GIS, GPS, etc.)
- Number of geographic areas
- Relationship to and accuracy of base data (roads, water, and buildings)
- Contiguity
- Compactness
- Cartographic considerations / generalization of boundaries

Data availability

	Decennial Census	American Community Survey	Population Estimates Program	Economic Census (2012)
Incorporated Places	All	All in 5-year estimates, >20,000 in 3-year, >65,000 in 1-year	All	2,500 or more persons/jobs
Census Designated Places	All	All in 5-year estimates, >20,000 in 3-year, >65,000 in 1-year	Not included	2,500 or more persons/jobs
Minor Civil Divisions (MCDs)	All	All in 5-year estimates, >20,000 in 3-year, >65,000 in 1-year	20 states only	12 states only
Census County Divisions (CCDs)	All	All in 5-year estimates, >20,000 in 3-year, >65,000 in 1-year	Not included	Not included

Geographic Stability/Maintenance

	Boundary	Update Programs
Incorporated Places	Annual update	Annual Boundary and Annexation Survey (BAS)
Census Designated Places	Decennial (10 year) update	Participant Statistical Areas Program (PSAP)
Minor Civil Divisions (MCDs)	Annual update	Annual Boundary and Annexation Survey (BAS)
Census County Divisions (CCDs)	Decennial (10 year) update	Participant Statistical Areas Program (PSAP)

Wrap up

- Diverse legal/statistical framework
- Mixed hierarchical infrastructure
- Multiple components and relationships
 - All units relate to blocks, but not all units relate to each other directly
- Flexible, multi-purpose entities
 - Tracts, blocks
- Targeted, focused purpose entities
 - School districts, election districts
- Cultivation of engaged internal and external user base
- Public/private, internal/external customers
- Various avenues pursued for consultation and exchange at all stages
- Constant, active solicitation of input

Wrap up, continued

- Interrelation between statistical and legal
 - Legal areas create basic frame
 - Statistical areas used to support and “fill in gaps” where necessary
 - Interoperation creates diverse, robust framework
- Flexible geographic architecture
 - Implementation of statistical and legal entities provides opportunities to strengthen collection and dissemination capacities
 - Adapt to geographic change quickly
 - Address new dissemination requirements
 - Support unexpected collection needs

Recommendations

- For world-wide comparable statistical data:
 - Determine a set of standard geographies
 - Ensure definitions of areas are consistent
- Suggest:
 - Block
 - Tract
 - Urban/Rural

