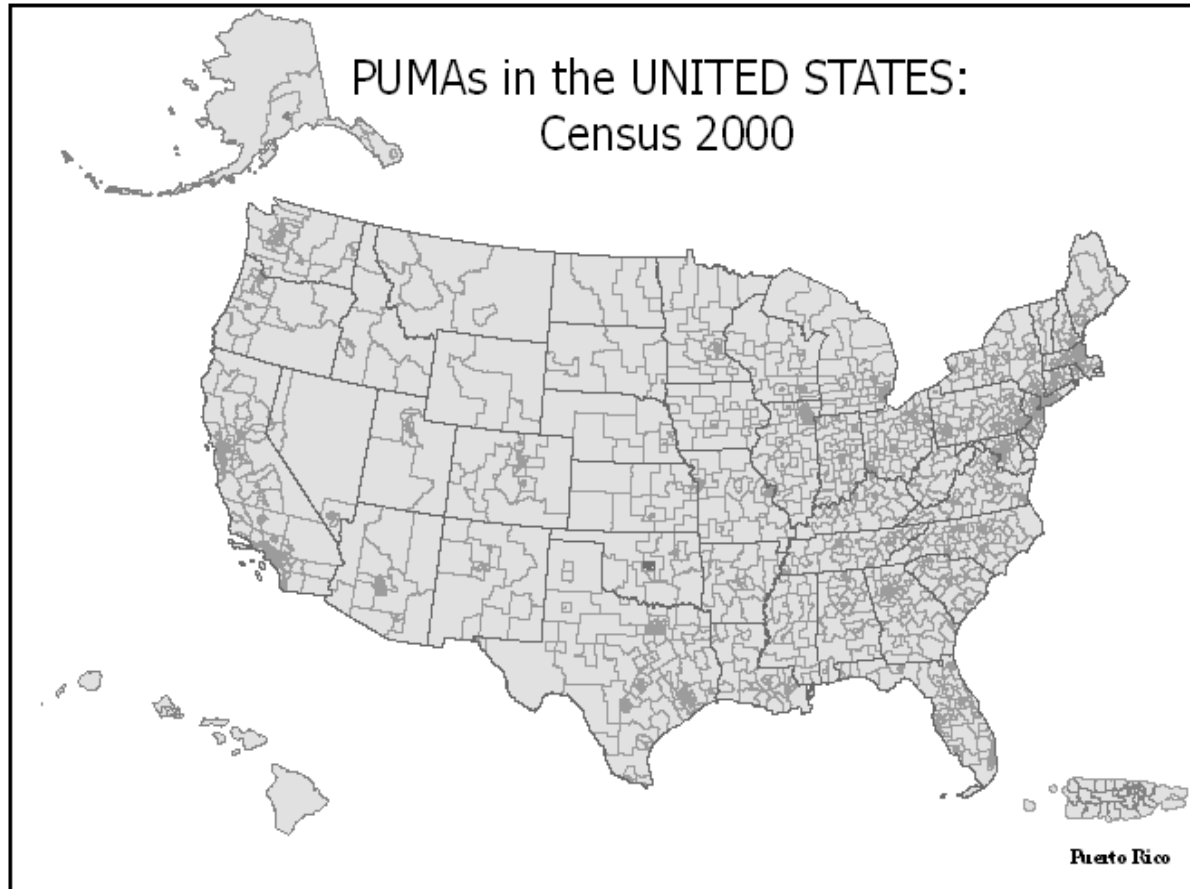# 2010 Public Use Microdata Areas (PUMAs) and Characteristics of Microdata

State maps of Census 2000 PUMAs can be found at
http://www.census.gov/geo/www/maps/CP_MapProducts.htm

Overview

- What is a PUMA?

- Characteristics of Microdata

- History of PUMAs and Microdata: 1960-2000

- New Challenges Since 2000

- PUMA Criteria – Changes for 2010

- PUMA Guidelines

What is a PUMA?

- ❏ **PUMAs are statistical geographic areas** that have been defined for the tabulation and dissemination of Public Use Microdata Sample (PUMS).

- ❏ PUMAs are used in PUMS publications for the **decennial census** as well as for the **American Community Survey (ACS).** PUMAs are also used for the publication of **ACS estimates**.

- ❏ **PUMA boundaries are updated for every decennial census**. The next update will follow the 2010 Census, based upon **2010 geography, population counts, and new criteria.**

- ❏ **PUMAs that experience major population decline** may be combined with another PUMA to publish ACS PUMS.

- ❏ PUMAs are delineated by **State Data Centers** and local participants.

Characteristics of Microdata

❑ **Microdata provides sample information associated with a specific housing unit or individual** without personal identifying information. Data are are published by the census as Public Use Microdata Sample (PUMS). http://www.census.gov/main/www/pums.html

❑ Published microdata are subject to **strict confidentiality measures** and **do not include names, addresses, or other potentially identifying information.**

❑ **Microdata records identify no geographic areas with fewer than 100,000.** Microdata are published for PUMAs that are defined with a population of 100,000 or greater.

❑ **Why use PUMS?** *"Microdata are for those users who want to create do-it-yourself tabulations, to be able to further draw on the richness of detail recorded in the ACS"*

http://www.census.gov/acs/www/data_documentation/public_use_microdata_sample/

PUMAs and PUMS:
1960-1980

❑ **PUMS were first created for the 1960 Census and were published for state geography (i.e., one PUMS per state).**

❑ **For the '60, '70, and '80 censuses, the following existing geographies were used for the publication of PUMS data:**
  - ✓ Divisions
  - ✓ States
  - ✓ Metropolitan areas/Non-metropolitan areas
  - ✓ Urban/rural/central cities/urban fringe
 - ✓ County groupings

PUMAs and PUMS: 1990

❑ PUMAs were **first defined for the 1990 Census**

- **5%, 3%, and 1%** PUMS were provided for corresponding PUMAs with a **minimum population threshold of 100,000**.

- **5% and 3%** PUMS were published for the same PUMA geography:
  - nested within states
  - built on **counties, places, and tracts.**

- **1%** PUMAs:
  - could **cross state boundaries**
  - built on **metropolitan areas/non-metropolitan areas and central cities/non-central cities.**

PUMAs and PUMS: 2000

- **5% and 1% PUMS** were provided for corresponding PUMAs that nested within states.

- **5%** PUMAs were primarily aggregations of **counties, MCDs** (in New England states), and **census tracts**. **Incorporated places** of 100,000 or greater could be defined as a PUMA.

- **5%** PUMAs had a **minimum population threshold of 100,000**.

- **1%** PUMAs, "super PUMAs", were aggregations of 5% PUMAs, with a **minimum population threshold of 400,000.**

(at right) **Maryland Super-PUMA 24300** (1% sample); This map example and others from Census 2000 can be found online at:
http://www.census.gov/geo/www/maps/CP_MapProducts.htm
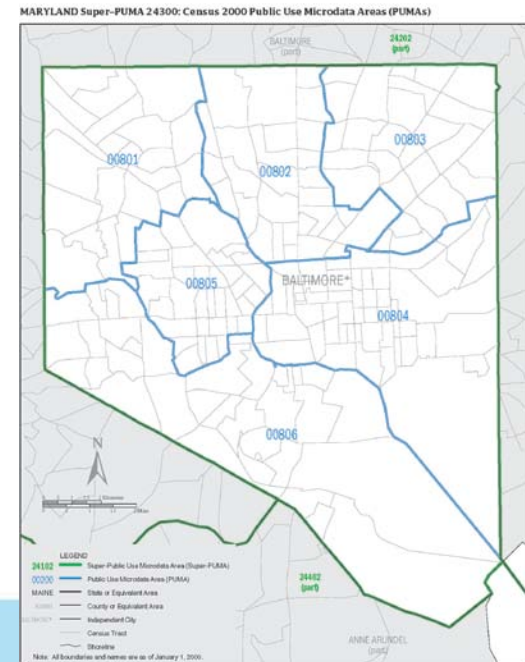
PUMA and PUMS usage today

Currently, 2010 PUMAs will be used in the publication of:

- 2010 Census **decennial PUMS** files
- **ACS** 1-year, 3-year, and 5-year **PUMS files**
- **ACS** 1-year, 3-year, and 5-year **estimates***

***Note:** PUMAs were adopted by ACS because this sub-state wall-to-wall geography was **best suited for the one- year estimates with a 65,000 population minimum.** Three- and five-year estimates are based on multiple years of ACS data. Three-year estimates are published for geographic areas with a population of 20,000 or more. Five-year estimates will be published for all geographic areas down to the census block group level.

For more information about PUMS, see ***A Compass for Understanding and Using American Community Survey Data: What PUMS Data Users Need to Know*** (Feb. 2009)
http://www.census.gov/acs/www/Downloads/handbooks/ACSPUMS.pdf

New Challenges for 2010 PUMAs

- **Annual publication of data for 2000 PUMAs** has been implemented for ACS PUMS and ACS estimates. **Stable boundaries over time** help to alleviate disclosure concerns**.**

- 2000 PUMAs have experienced **population decline** from natural disasters or ongoing population trends.

- 2000 PUMAs have been built on entities whose **boundaries change frequently over time** (especially incorporated place boundaries).

Overview:
PUMA Criteria
for 2010

* Standard PUMAs (one level only, 5% sample)

• State-based

• POW PUMAs and MIG PUMAs (county-based)

* Minimum population threshold of 100,000 throughout decade

* Counties and census tracts as building blocks

• Contiguity

* Avoid splitting the more substantially populated areas of American Indian reservations and off-reservation trust lands (AIR/ORTL)

An asterisk (*) indicates there is a proposed change to the 2000 criteria

PUMA Types

- Only **one** level of "standard" PUMAs (**5%** from Census 2000)

- **Place of work** PUMAs (POW PUMAs) and **migration** PUMAs (MIG PUMAs) are proposed to be **county-based**, consisting of:

  - a single PUMA for county-based PUMAs.

  - a combination of adjacent tract based-PUMAs so that together the PUMAs compose one or more complete counties (*see example from Ohio on slide 12*).

  *Note: POW PUMAs are used for Place of work PUMS data and Migration PUMAs for Migration PUMS data.

United States Census Bureau

PUMA Types: *2000 Standard, POW, and MIG PUMA Example*
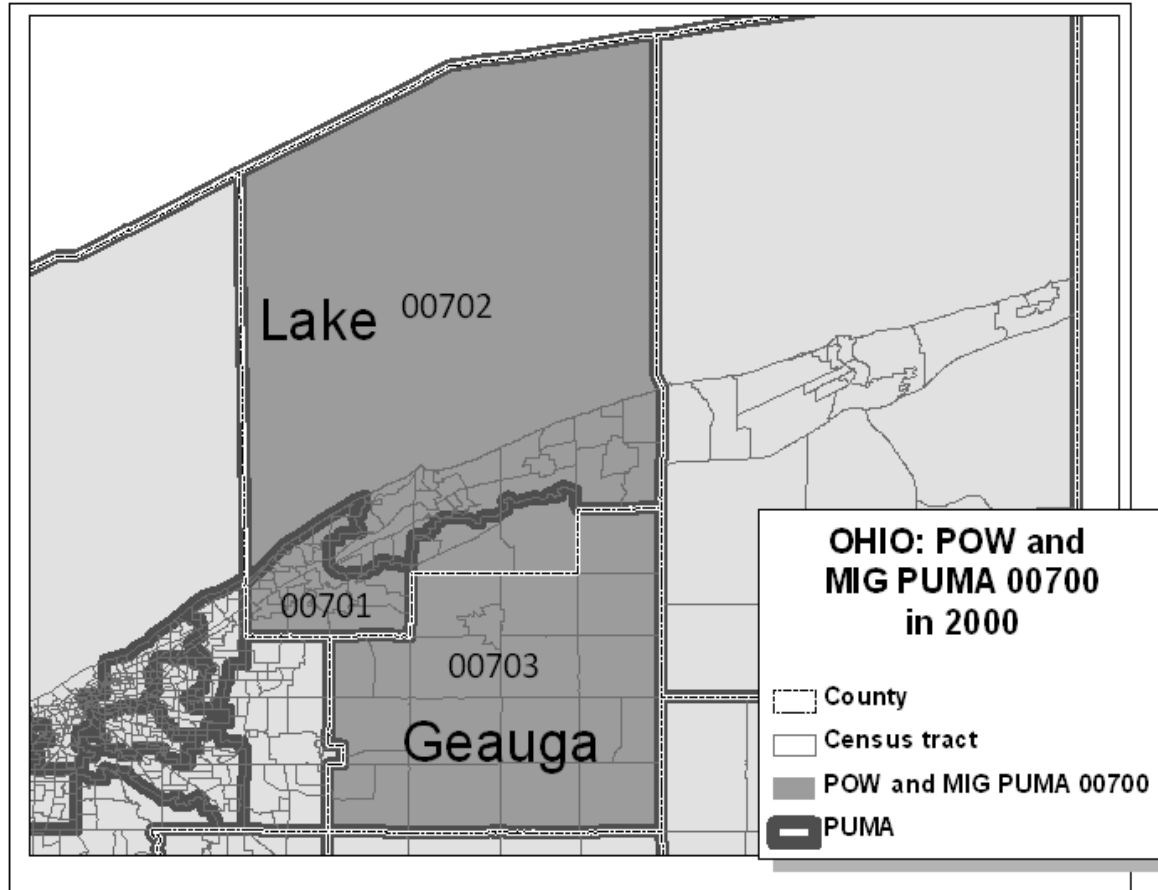
POW and MIG PUMA 00700 in Ohio in 2000
POW and MIG PUMA 00700 is comprised of three standard PUMAs (00701, 00702, 00703) within two counties (Lake County and Geauga County) in northeastern Ohio.

Population Thresholds

- **Each PUMA must have a population of 100,000 or more.**

- Each PUMA must contain a **minimum population of 100,000 at the time of delineation**. To maintain this threshold, participants should:
  - Identify each area currently experiencing or expected to experience population decline.
  - Delineate PUMAs to encompass a population substantially higher than 100,000 persons such that the population will remain above 100,000 throughout the decade.

- If a PUMAs falls substantially below the minimum population threshold of 100,000 through the decade, the Census Bureau may combine the PUMA with one or more adjacent PUMAs for ACS data publication to ensure confidentiality.

# PUMA Composition: *2010 Building Blocks*

- All PUMA types (standard, POW, and MIG) must **nest within states.**

- PUMAs will be based on aggregations of **counties and 2010 census tracts only.**

- **Places, MCDs, and American Indian/Alaska Native/Native Hawaiian Areas (AIANNH) may <u>not</u> be used** as building blocks for 2010 PUMAs.
  - Census tracts may be aggregated to approximate these areas

PUMA Composition:
Use of Counties and Census Tracts as Building Blocks

If the PUMA meets the **minimum population** threshold:

- **One county** may be designated as a PUMA.

- **Two or more contiguous counties** may be aggregated to create a PUMA.

- **Contiguous census tracts** may be aggregated to create a PUMA.

- Tract-based PUMAs may **cross county boundaries**, provided that each PUMA-county part meets a minimum population of **2,400** *(see example from Maine on right).*
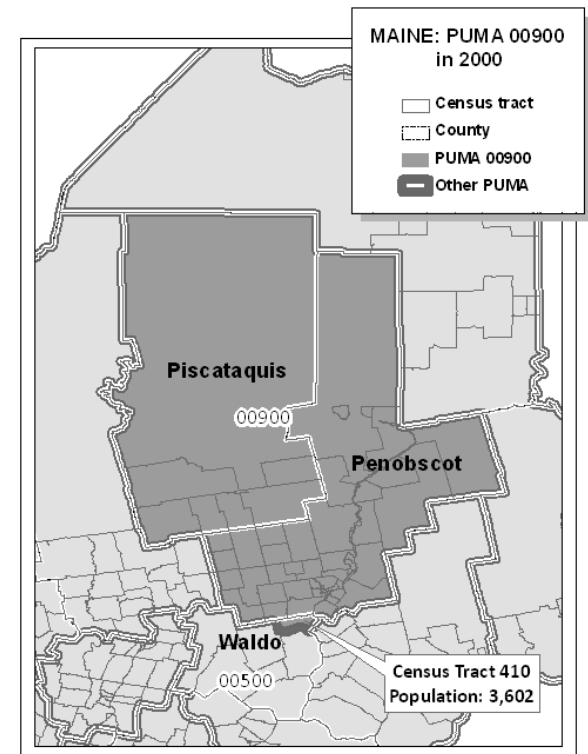
PUMA 00900 in Piscataquis County, Penobscot County, and Census Tract 410 in Waldo County, Maine in 2000
The single PUMA county part in Waldo County (Census Tract 410) has a population of 3,602 persons.

PUMA Composition:
Why are incorporated Places <u>not</u> used as Building Blocks?

*   Incorporated places are not used as building blocks for 2010 PUMAs because:

–   Change frequently over time: **annexations/deannexations**

- **2000 PUMAs are <u>not</u> updated** as incorporated places change.
- **2000 POW PUMAs <u>are</u> updated** as incorporated places change *in practice*, as the place of work data are coded to the *current* incorporated place, and not the incorporated place on which the PUMA was built.

–   Incorporated places often contain numerous **enclaves** (holes) and **exclaves** (noncontiguous pieces). *See examples from Michigan and California on slides 17 and 18.*
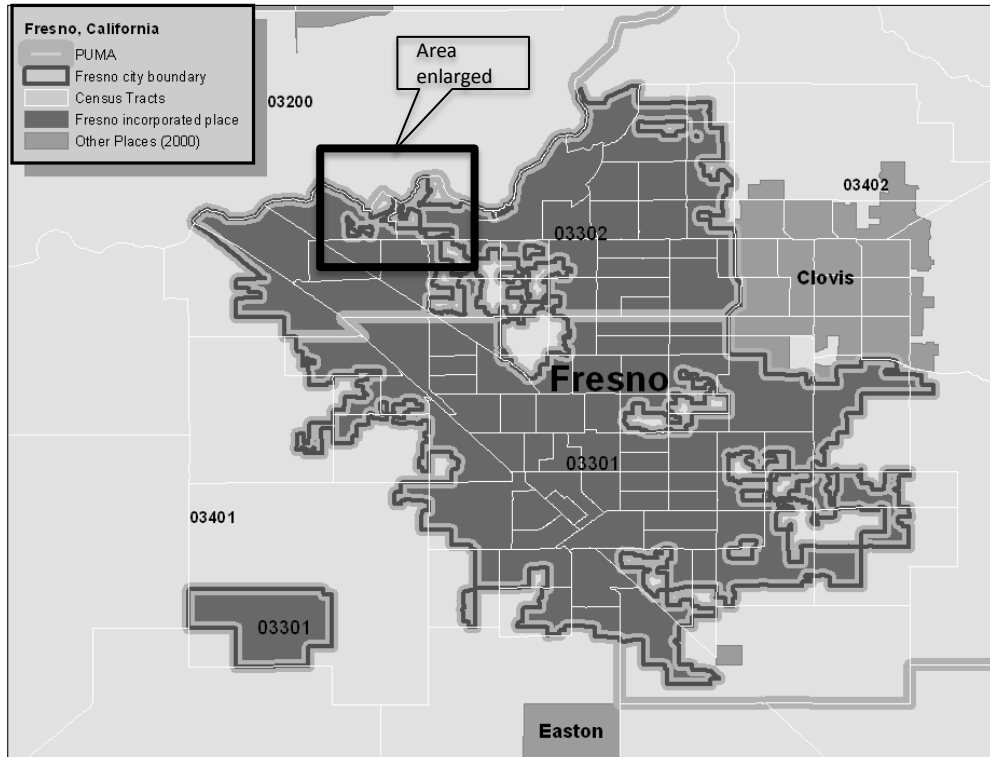
PUMA Composition:
Ann Arbor, Michigan
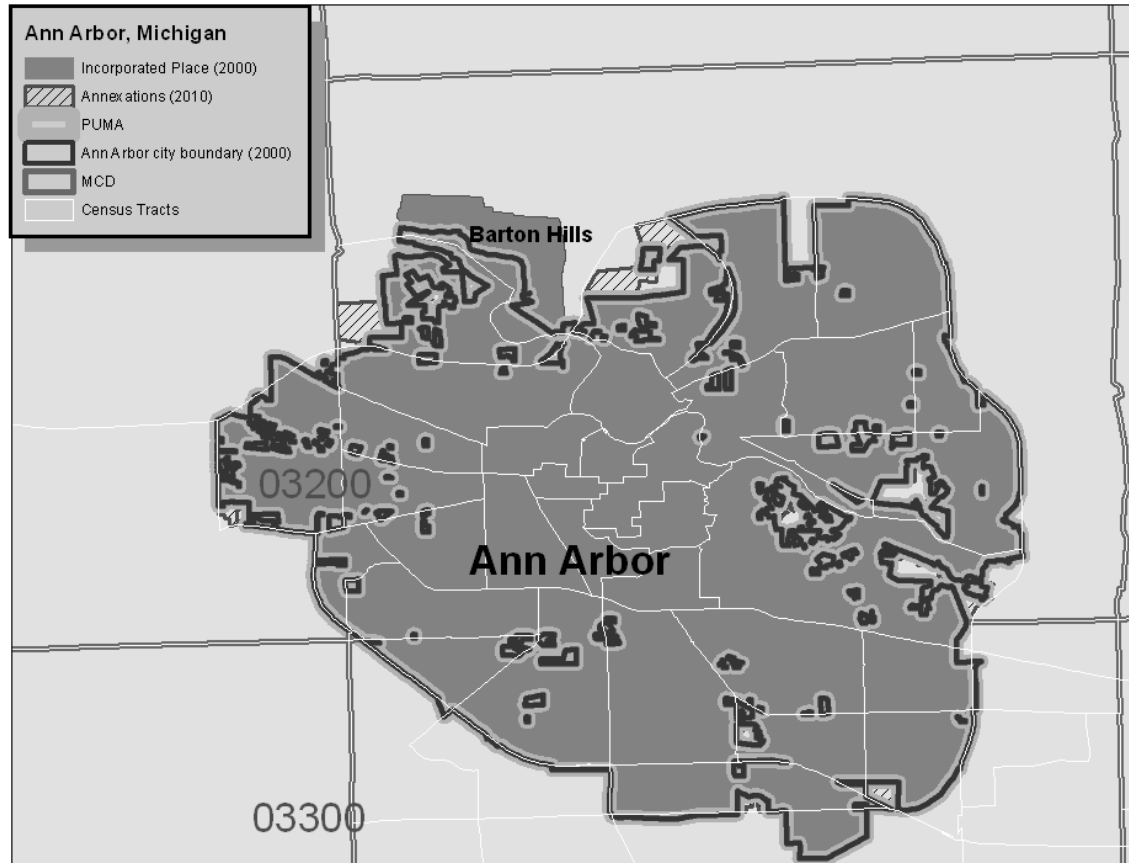
City limits of Ann Arbor (area outlined with dark gray line, PUMA 03200) are complex including four exclaves of city territory and 86 enclaves. Ann Arbor city reported 194 separate annexations from January 1, 2000 through January 1, 2010.

PUMA Composition:
Fresno, California

Fresno, CA incorporated place makes up two PUMAs (03301 & 03302). The close-up map shows exclaves of PUMA 03402 within Fresno's northern PUMA (ie. PUMA 03302). These enclaves/exclaves within Fresno present challenges for ACS data publications.

PUMA Composition:
Why are MCDs <u>not</u> used as building blocks?

Minor civil divisions (MCDs) are not used as building blocks for 2010 PUMAs because:

- **Some change over time**, especially where MCDs are defined coextensive with an incorporated place.

- In strong MCD states, MCD boundaries are stable, and **census tract boundaries almost always follow the MCD boundaries** (*see example from Vermont on slide 20*).

- In other states where MCDs are coextensive with incorporated place boundaries and **census tract boundaries do not coincide** (*see example from Michigan on slide 21*).

2000 MCDs, Places, and Census Tracts in Vermont
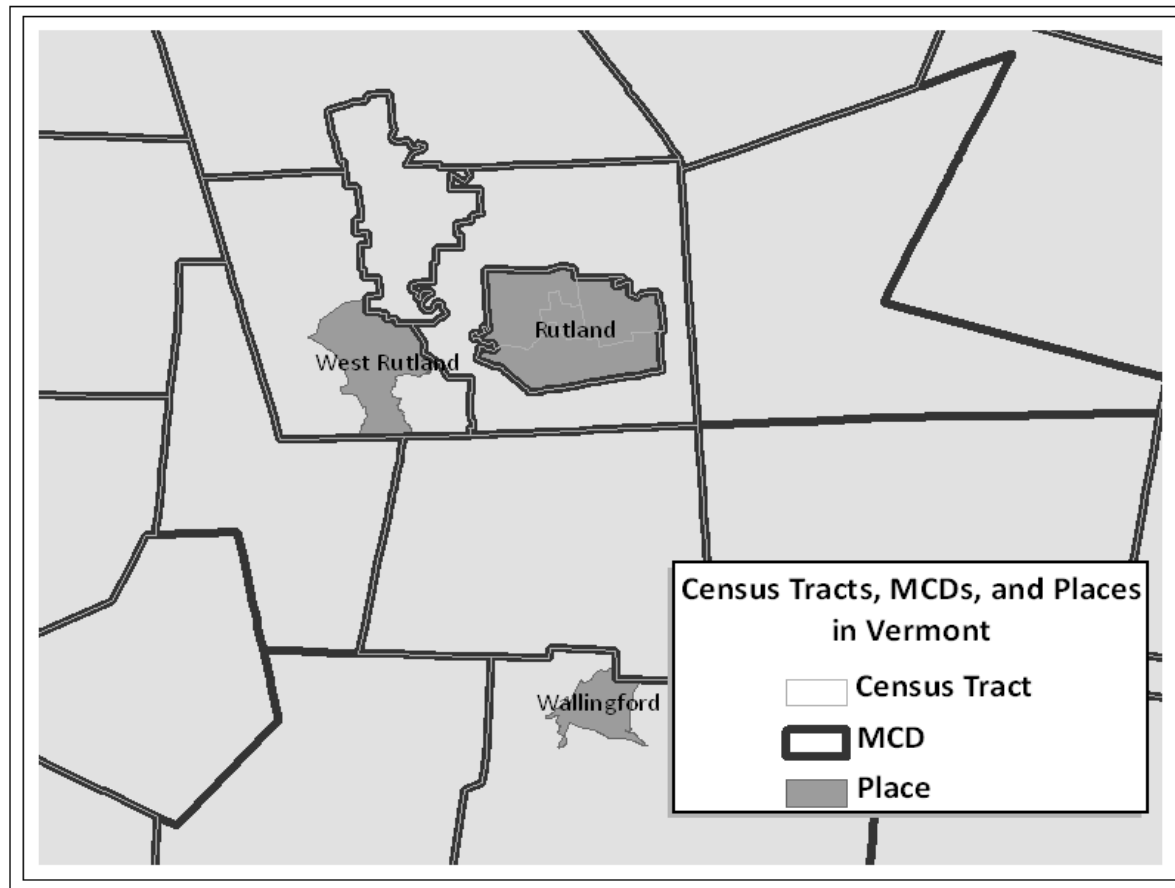
2000 MCDs, Places, and Census Tracts near Rutland, Vermont: During the 2000 PUMA delineation the New England MCD states defined metropolitan areas (cities and towns) by MCDs. In a strong MCD state, MCD boundaries are stable, and census tract boundaries typically follow the MCD boundaries. Other strong New England MCD states are ME, NH, VT, CT, RI, MA.

2000 MCDs, Places, and Census Tracts in Michigan
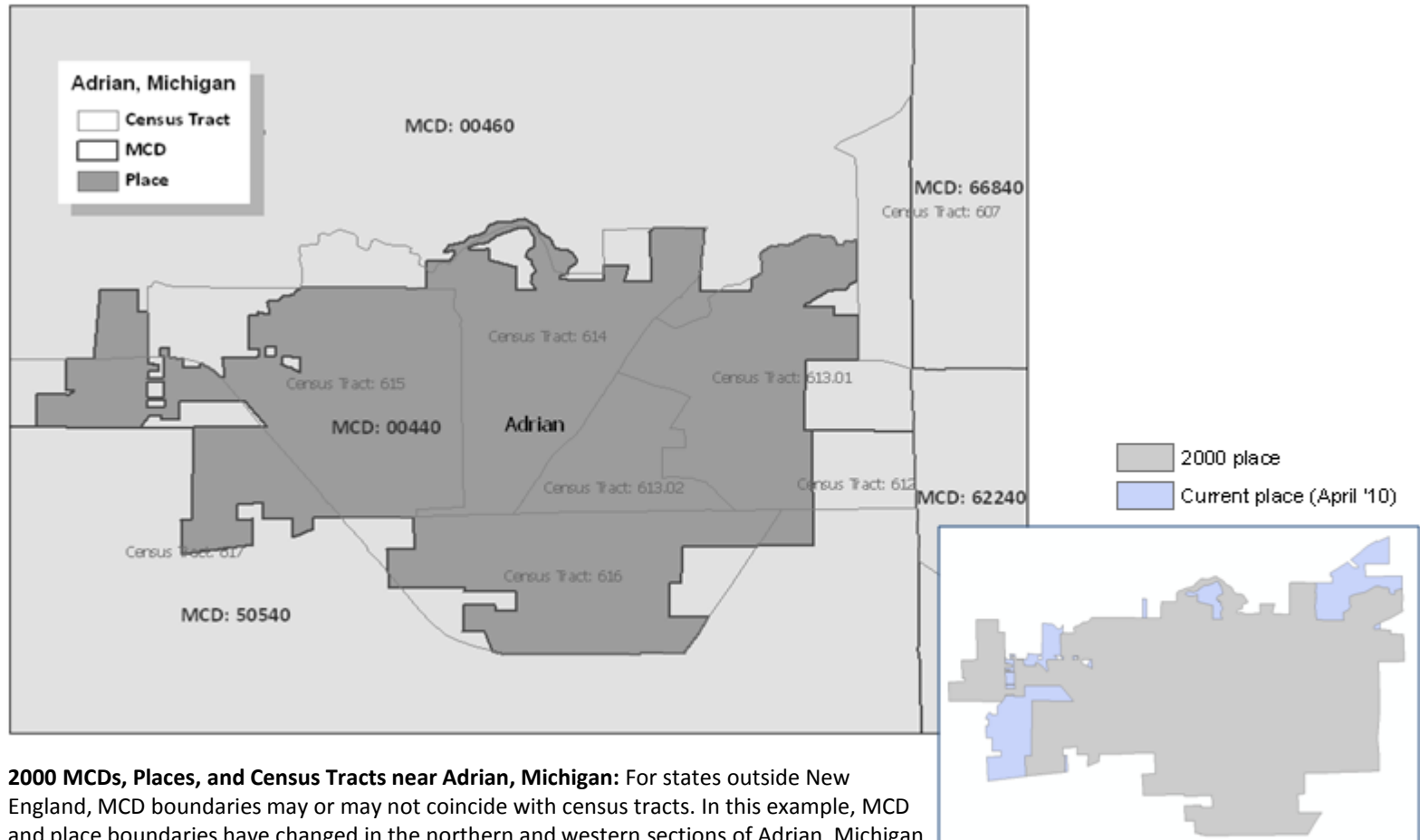
2000 MCDs, Places, and Census Tracts near Adrian, Michigan: For states outside New England, MCD boundaries may or may not coincide with census tracts. In this example, MCD and place boundaries have changed in the northern and western sections of Adrian, Michigan for 2010. **These changes do not coincide with the census tract boundaries** in Michigan that have remained more stable throughout the decade.
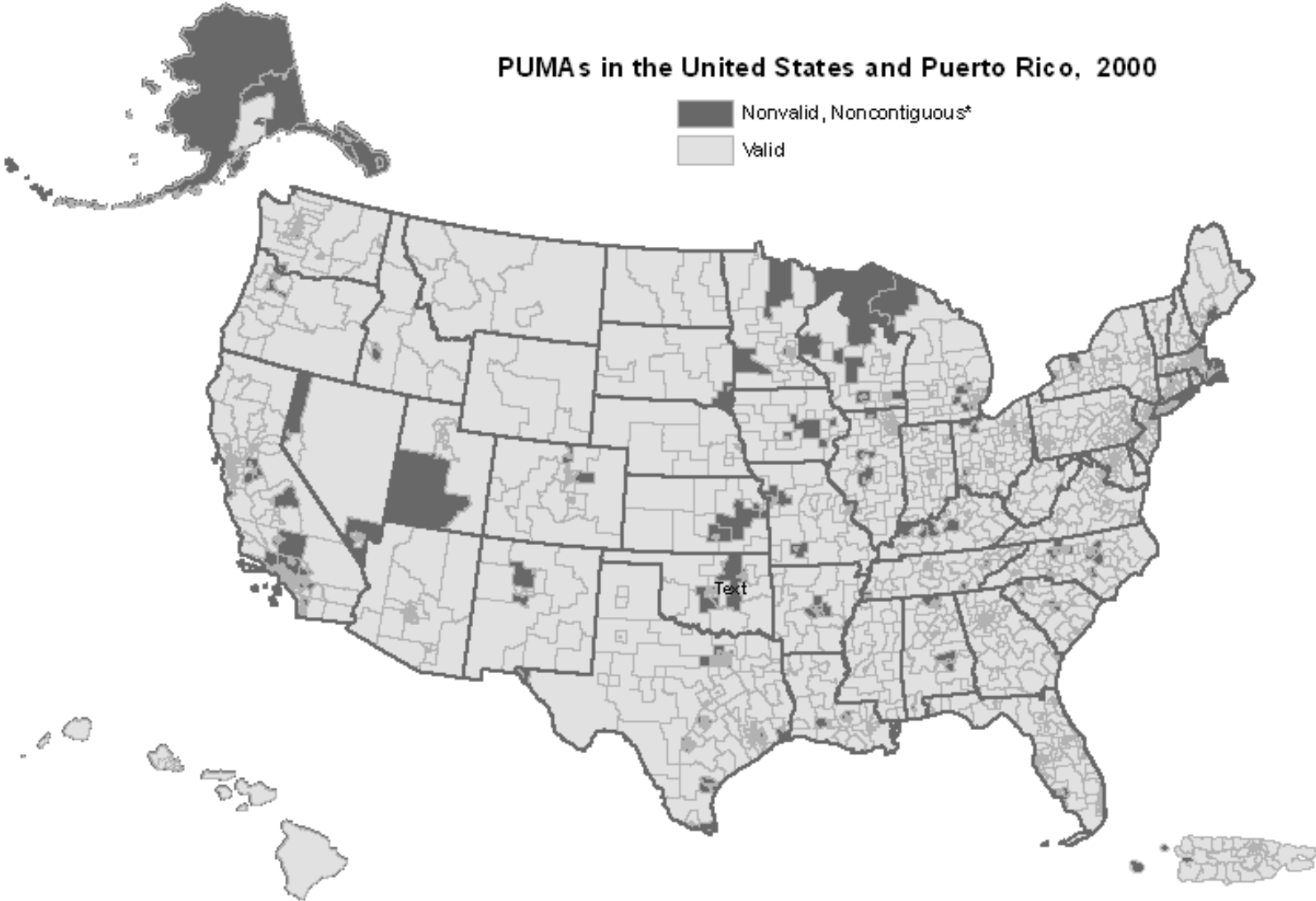
PUMA Contiguity

PUMAs must constitute a geographically **contiguous** area, except:

- A PUMA may be noncontiguous if a **county is noncontiguous**.

- A PUMA may be noncontiguous if a **census tract is noncontiguous.**

*NOTE: In 2010, new criteria does not include incorporated places as building block for PUMAs. Therefore, many PUMAs whose boundaries were delineated as noncontiguous incorporated places in 2000 Census will be newly delineated in 2010 to be contiguous. *See map of nonvalid, noncontiguous PUMAs (based upon 2010 PUMA criteria) within the United States and Puerto Rico on slide 23.*

PUMAs in the United States and Puerto Rico, 2000

*Nonvalid, noncontiguous PUMAs are based upon 2010 PUMA criteria for contiguity.

PUMAs and AIR/ORTL

- PUMAs should be defined to **avoid unnecessarily splitting** substantially populated areas of American Indian reservations and/or off-reservation trust lands, and separating American Indian populations, particularly if large numbers of American Indians are included within all parts of the split AIRs/ORTLs.

  – If the AIR/ORTL has a population of <100,000, it should be contained within one PUMA.
  – If the AIR/ORTL has a population of <200,000, it should be contained within no more than two PUMAs.

  Note: Since an AIR/ORTL can cross state boundaries this applies to the portion of an AIR/ORTL within a state (*see example from Lake Traverse Reservation on slide 25*).

AIR/ORTL, State and
2000 PUMA Boundaries
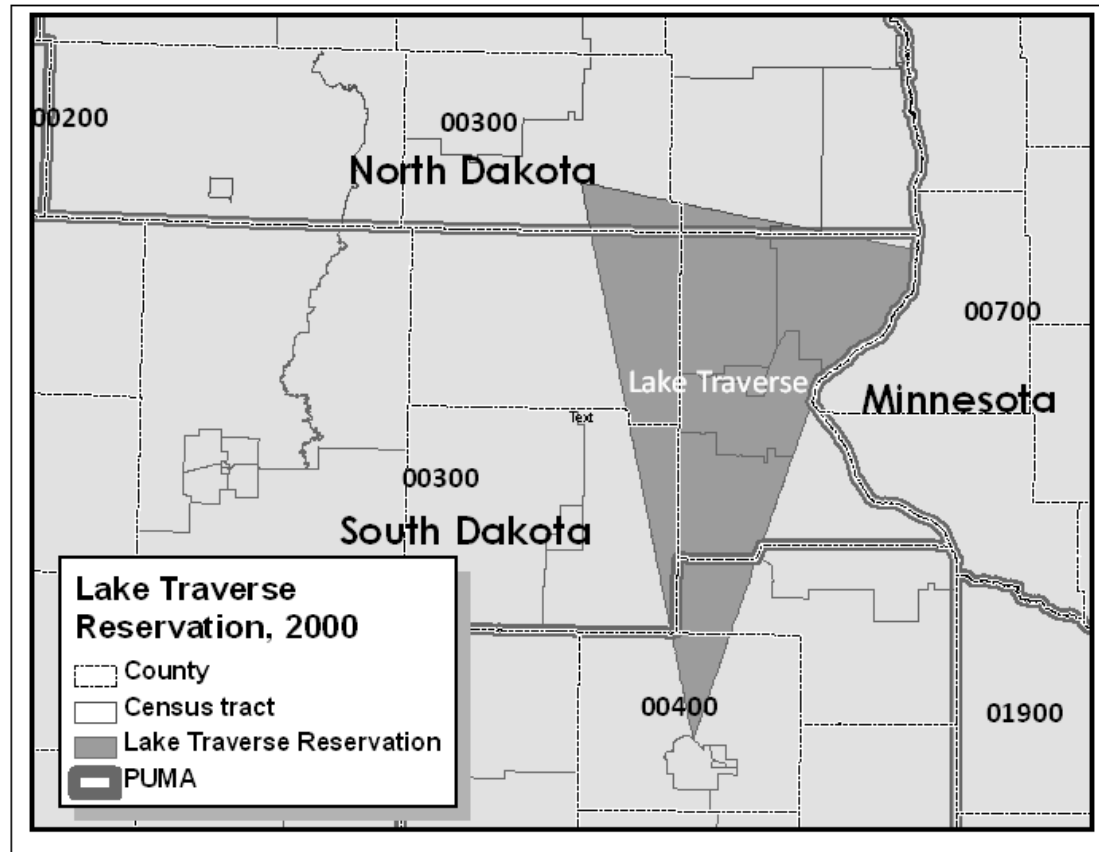
Lake Traverse Reservation in 2000 (population 10,408)
The Lake Traverse Reservation boundaries cross North Dakota and South Dakota state boundaries and are contained within three separate PUMAs --00300 (ND), 00300 (SD), and 00400 (SD). **The portion of Lake Traverse Reservation within PUMA 00400 contained a population of 1,924 persons in Census 2000**. For 2010, PUMAs should avoid unnecessarily splitting AIR/ORTL.

PUMA Guidelines

- Wherever possible, each PUMA should comprise an area that is either entirely inside or entirely outside a current **Core Based Statistical Area.**

- Use 2010 place definitions, 2000 urban/rural definitions, as well as **local knowledge** to inform PUMA delineation.

- PUMAs may be **named** by local participants. **NEW**

- The number of PUMAs should be maximized, so PUMAs **should not contain more than 200,000** people, unless the PUMA is defined for an area that is or will likely be experiencing population decline.

Draft Schedule

- **Summer 2011:** Final PUMA delineation criteria and guidelines distributed

- **September 2011:** Materials sent to SDCs for PUMA delineation

- **September-October 2011:** PUMA delineation software training

- **Late December 2011/early January 2012:** Return deadline for submissions

- **Fall 2011-Spring 2012:** Review of PUMA submissions and insertion into TIGER database

- **Spring-Summer 2012:** Creation of geographic products containing PUMAs for use in 2010 Census PUMS and ACS

Questions?

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