Preparing for the 2020 Round of Censuses
Framework of National Geospatial Statistical Data Office

DESIGN
National Statistical Agencies Survey Lifecycle
Data Collection, Tabulation, Dissemination, and Analysis Programs

EVALUATION
Standards and Best Practices
Lessons Learned

ANALYSIS
Use in Case Studies
Create Narratives for governing bodies at all levels

PRODUCTION
Statistical data
Object attributes in time

Geospatial data
Object features in space and time

Integrated Datasets
Produced for all levels of public authority from local to global

Public Access to Information
Dissemination to decision-makers

Establishing a National Geospatial Framework

- **Initial data assessment**
  - Assess current data on hand
  - Establish current baseline of data [i.e., types, quality, amounts, geography, including census areas]

- **Identify operational capacity**
  - Assess data gathering capacity
  - Establish census/survey schedule
  - Evaluate processing capabilities and capacity
  - Design data dissemination tools and methods

- **Determine future data goals**

- **Continue to gather data and monitor progress**

- **Regularly assess status against baseline and goals**
It begins with data...

3 basic types of geospatial data are needed to support census and survey operations and to produce relevant statistics.

- Addresses
- Features
- Boundaries
What are Geographical Data Files?

• Files that contain the coordinates describing the geographic features

• Examples:
  – Streets and roads
  – Legal, statistical and administrative area boundaries and associated geographic codes
    • City limits
    • Census tracts
    • Health districts
  – Rivers, lakes, and bodies of water
Data Types

• Forms
  • Electronic
  • Paper

• Spatial data
  – National Mapping Agency produced spatial files
  – Digitized maps
  – Imagery
  – Local GIS files

• Address list data
  – Field updates
  – Paper listings
  – Digital files
Stakeholder Participation

Government (National/Regional/Local)
- Data partner
- Data source

Public/NGOs
- Demographic data source
- Consumer of data
- Research and academia

Private Industry
- Requirements, requests
- Provide technical expertise
Collection Geographic Areas

Administer and manage field operations in the U.S., Puerto Rico, and the Island Areas:

- Local Census Offices (499)
- Field Office Supervisor Districts (numbers vary by operation)
- Crew Leader Districts (numbers vary by operation)
- Assignment Areas (numbers vary by operation)
- Collection Tracts (66,440)
- Collection Blocks (6.7 million)
Collection Geographic Area Hierarchies

Local Census Office
  ↓
Field Operations Supervisor District
  ↓
Crew Leader District
  ↓
Assignment Area
  ↓
Collection Block

Nation
  ↓
1ST Level
  ↓
2nd Level
  ↓
Enumeration District
Pros and Cons of Using Collection Geography

Advantages
- Ability to limit non-visible boundaries as collection boundaries
- Ability to balance the work load

Disadvantages
- Delineation
- Requires comparison between collection and tabulation geography
- Maintenance
- Storage
Geographic frame design

10,000 km window/100 km grids (Global scale)

1 km window/10 m grids (Urban neighborhoods)

100 m window/1 m grids (Urban blocks)

NATION

REGIONS

DIVISIONS

STATES

Counties

ZIP Code Tabulation Areas

School Districts

Congressional Districts

Voting Districts

Traffic Analysis Zones

County Subdivisions

Subminor Civil Divisions

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

Places
Census Small-Area Geography

Understanding the Relationships Among U.S. Census Bureau Geographic Entities

<table>
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<th>County</th>
<th>Minor Civil Division (MCD) or Census County Division (CCD)</th>
<th>Place</th>
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<td>Green City</td>
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</table>
Geographic Framework – France

- France
- 18 régions
- 102 départements
- 342 arrondissements
- 2 054 cantons
- 36 658 communes
Geospatial Framework for Africa
Geospatial Framework for Ethiopia

Administrative Boundaries

Level 3: Wereda

NB: White boundaries indicate level used in gridding.
Update Methodologies

- Spatial files of a nation’s geographic extent
- Transaction files that only include additions, deletions, and changes
- Paper maps with or without annotations
Types of Boundary Updates

- New geographic areas
- Geographic area changes (annexations & deannexations)
- Boundary Corrections
Boundary Annexation Example
Geospatial System Development Lifecycle

- Requirement Analysis
- Design
- Implementation
- Testing
- Evolution

United States Census Bureau
U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU
census.gov
Two Different Approaches
Data Management Lifecycle

Quality Assurance
- Established, published metadata

Quality Control
- Regular auditing of data
- Rigorous adherence to established criteria

Open access to data and metadata

Challenging milestones
- Realistic initial assessment of data (coverage, quality, completeness)
- Establish timelines of future milestones with increasingly challenging goals

Data quality is an ongoing process, not a destination!
Update Steps

Data Evaluation
Data Preparation
Data Insertion
Data Editing
Data Acceptance
### Statistical Data

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### Geospatial Data

#### Ohio - 2010 Census Results

Percent Change in Population by County: 2000 to 2010

[Map of Ohio with population data](image)

#### 2010 Census: Ohio Profile

Population Density by Census Tract

[Map showing population density](image)
Why Integrate Statistical and Geospatial Data?

- Map statistical data to geographic space
- Analyze statistical data using geospatial processes (spatial analysis)
- Discover spatial trends
Integration of Statistical and Geospatial Data

• Statistical data corresponds with geographic data

• **Geographic codes** link statistical and geographic data

• Geocoding (assigning information to a location)
Geocode

• Any alphanumeric or numeric-only designator that will uniquely identify one and only one geographical entity within the set of all similar entities

• Examples:
  – Mailing address
  – First and second level administrative areas with their name or number
  – Census statistical area numbers, e.g., census tract codes, block groups
  – Health district number
  – Watershed ID
GOAL 15: Protect, Restore, and Promote Sustainable Use of Terrestrial Ecosystems; NASA analysis + Census population statistics

NASA land degradation analysis

Countries with land degradation monitoring

CENSUS Gridded Population Distribution: RWANDA

Trends in land degradation and impacted populations in Sub-Saharan Africa
The Decennial Census

Mission of the U.S. Census Bureau:

- To serve as the leading source of quality data about the nation’s people and economy. We honor privacy, protect confidentiality, share our expertise globally, and conduct our work openly

Purpose of the 2020 Census:

- To conduct a census of population and housing and disseminate the results to the President, the States, and the American People
The Decennial Census

Primary Uses of Decennial Census Data:

- Apportion the U.S. House of Representatives
- Draw congressional and state legislative districts, school districts and voting precincts
- Enforce voting rights and civil rights legislation
- Provide funds to states and tribal governments
- Inform federal, tribal, state, and local government planning decisions
- Inform business and nonprofit organization decisions (e.g., where to locate, size of market)
- Provide population benchmarks for nearly every other United States survey
The 2020 Census: A New Design for the 21st Century

Motivate People to Respond
- Conduct a nation-wide communications and partnership campaign
- Maximize outreach using traditional and new media
- Target ads to specific audiences
- Work with trusted sources to inspire participation

Establish Where to Count
- Identify all addresses where people could live
- Conduct a 100% review and update of the nation’s address list
- Minimize field work with in-office updating
- Use multiple data sources to identify areas with address changes
- Get local government input

Count the Population
- Collect data from all households, including group and unique living arrangements
- Make it easy for people to respond anytime, anywhere
- Encourage people to use the new online response option
- Use the most cost-effective strategy to contact and count nonrespondents
- Knock on doors only when necessary
- Streamline in-field census-taking

Release Census Results
- Process and Provide Census Data
- Deliver apportionment counts to the President by December 31, 2020
- Release counts for redistricting by April 1, 2021
- Make it easier for the public to get data

Count Everyone Once In the Right Place

United States Census Bureau
U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU
census.gov
Achieving the 2030 Agenda
Achieving the 2030 Agenda

- Good Land Governance
- National Statistical Offices
- National Mapping Agencies
  - National Geospatial Data Infrastructure
- International Data Partnership Framework
- Contributing to the SDGs through the 2020 Round of Censuses
Questions?