Innovations in Gridded and Subnational Population Mapping

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European Forum for Geography and Statistics Conference
Helsinki, October 2018
U.S. Census Bureau International Mapping

1. Global data and mapping
2. Demobase gridded population mapping
3. Current Demobase project: South Sudan
Global Population Mapping

Subnational administrative areas: tens of thousands of polygons

Large Scale International Boundary Dataset (U.S. State Department)

Populations controlled to Census Bureau International Data Base national estimates
Subnational Data

All countries: total population, age, sex, population change

Other variables such as: ethnicity, language, education, housing
DEMOBASE
Haiti, Pakistan, Rwanda
100 meter gridded population
DEMOBASE

South Sudan

Last census: 2008 (pre-independence)
South Sudan

Rural Settlement Patterns
Seasonal variation
Workflow (same for both years)

1. Obtain source data (imagery, demographic, ancillary)

2. Image processing and gridded mapping
   - Image preprocessing
   - Supervised and unsupervised classification, reclassification
   - Final built-up layer and validation
   - Random Forest process to disaggregate census data
   - Incorporate UN IDP data (2017 only)
   - Gridded population map and validation

3. Comparison of 2008 and 2017 layers

Demobase South Sudan

Goal: gridded population layers for 2008 and 2017
South Sudan Example 1

Low Built-Up Density

High resolution
(from ArcGIS Basemap)
South Sudan Example 1

Low Built-Up Density

Sentinel true color 10m
South Sudan Example 1

Low Built-Up Density

Sentinel false color 10m

With training sites
South Sudan Example 1

Low Built-Up Density

Landsat true color 30m
South Sudan Example 1

Low Built-Up Density

Landsat false color 30m
South Sudan Example 2

Medium Built-Up Density

High resolution (from Digital Globe)

Sentinel false color 10m with training sites
Other data and layers

IDP camp data from UN

Land cover, roads

Elevation, slope, hydrology

Nighttime lights

Points of interest, e.g., schools
Questions or comments?

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On Census.gov, search for Global Mapping,

or go to: Census.gov/programs-surveys/international-programs/about/global-mapping.html