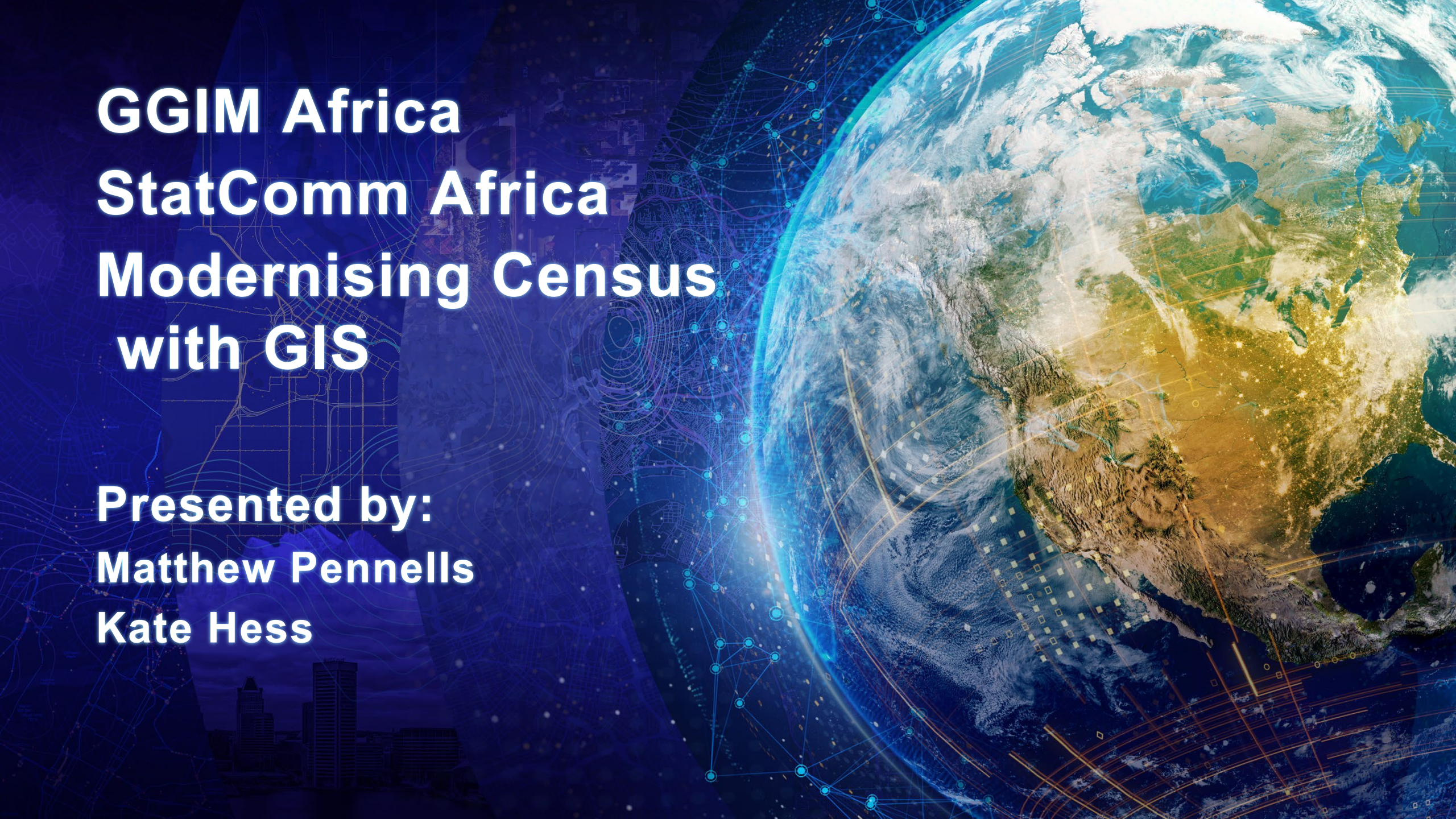


# **GGIM Africa StatComm Africa Modernising Census with GIS**

**Presented by:  
Matthew Pennells  
Kate Hess**





# VISION



## GIS

### Mapping Common Ground

Creating Agreed Upon Understanding . . .

A Foundation for Positive Action



# Our World Has Many Challenges

Humans Are Living Recklessly . . .

. . . Out of Balance with Nature

Creating Conflicts and Instability

Human Induced  
Climate Changes

Pollution

Severe  
Droughts

Wildfires

Water  
Crises

Natural  
Disasters

Ecological  
Instability

Food Shortages

Pandemics

Overpopulation

Congested  
Cities

Unconstrained  
Development

Steep Decline in  
Biodiversity

Political  
Polarization

Social  
Conflict

Challenging Our Sustainability . . .  
. . . Threatening Our Future



# Mapping Common Ground Requires We Consider All the Factors





# VISION

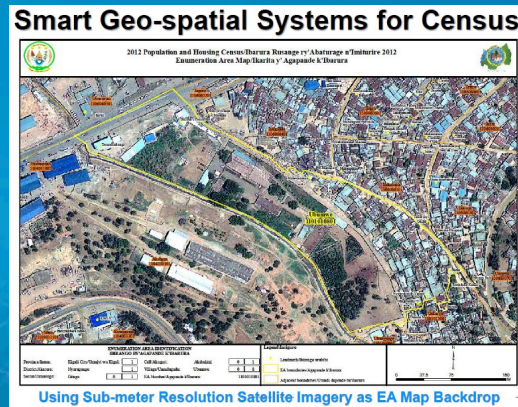
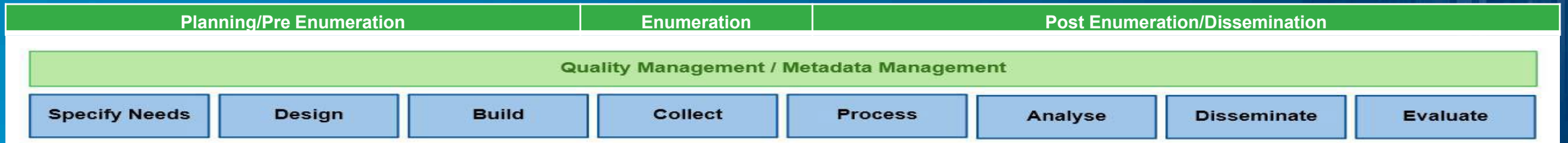
A Geospatial Platform  
for Official Statistics



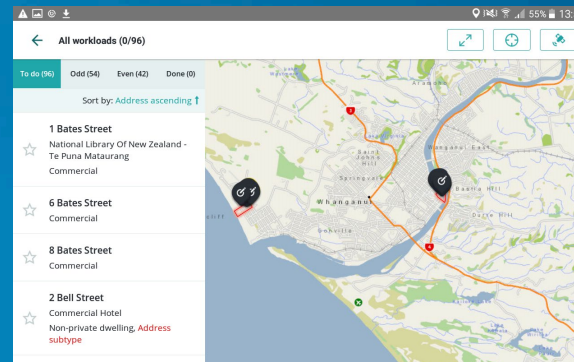


# Role of GIS in Official Statistics

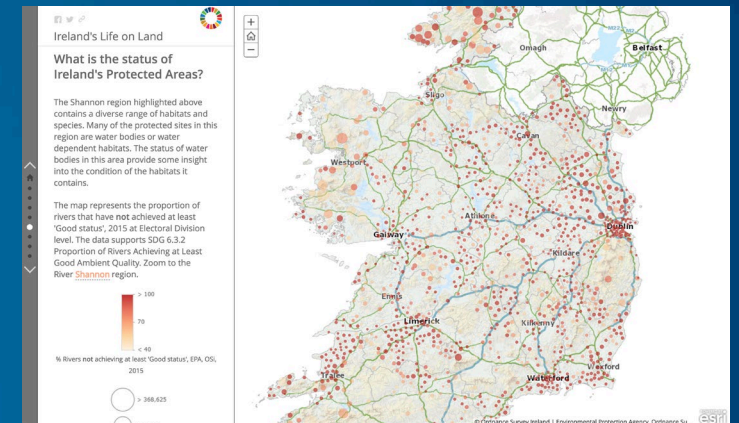
## Generic Statistical Business Process Model (GSBPM)



Design and  
production of  
enumeration areas



Data collection  
using Mobile  
devices, tablets  
and laptops

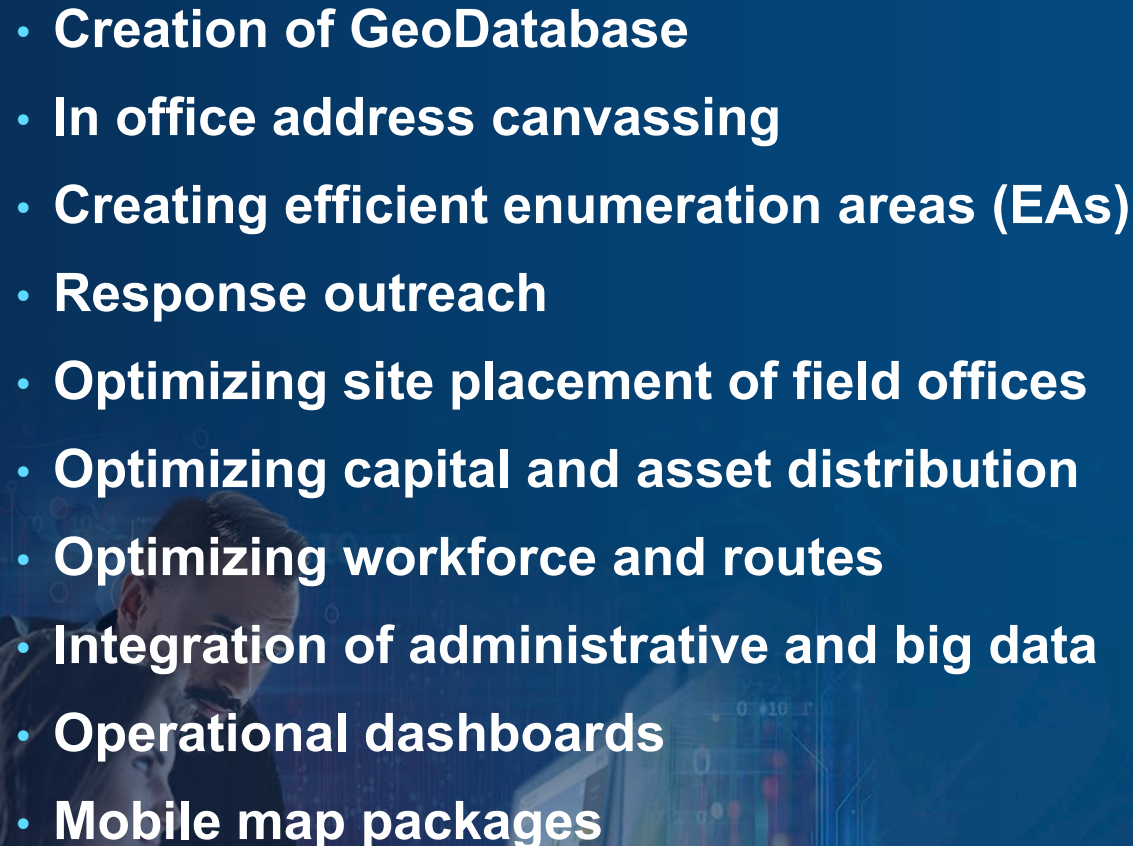


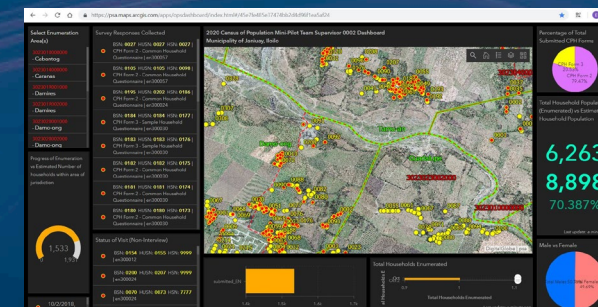
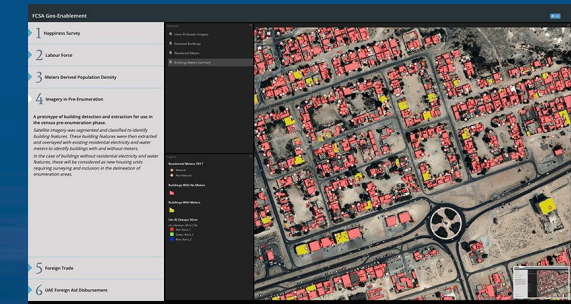
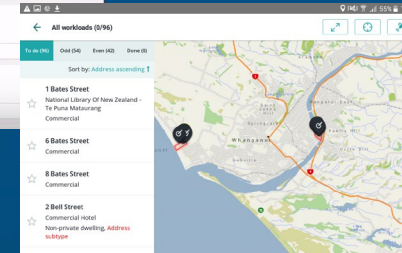
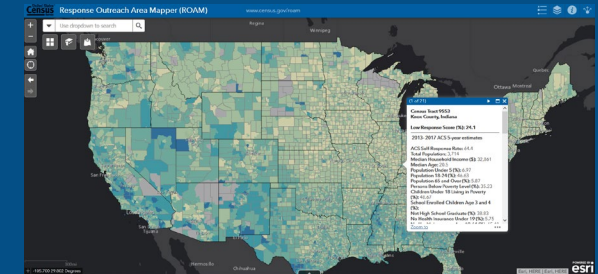
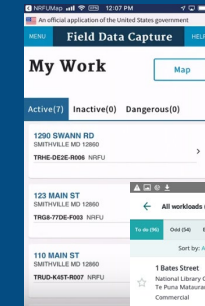
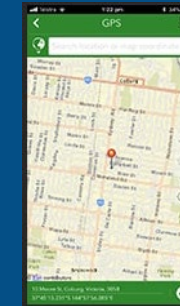
Census dissemination  
Online thematic maps  
Story Maps and more



## Use of GIS in Census Operations

**Begins in planning and extends throughout GSBPM cycle**

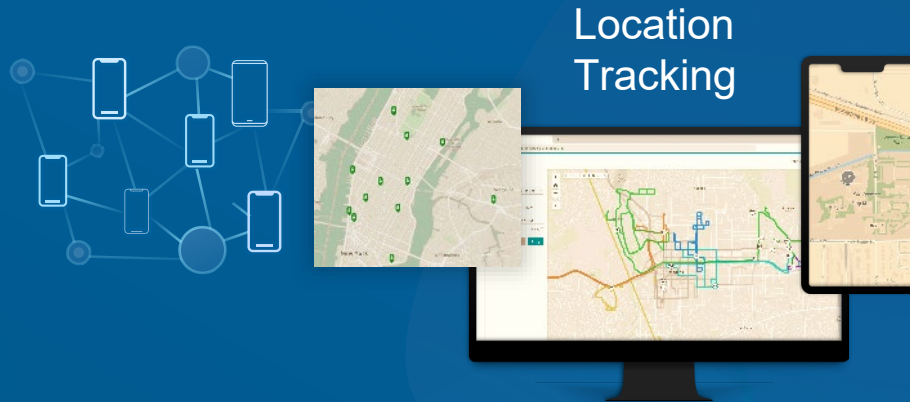
- 
- A man with a beard and short hair is looking down at a computer screen. The screen displays various data visualizations, including a map with red and blue markers, a bar chart, and a line graph. The background is dark blue with a subtle pattern of white dots and lines, suggesting a digital or network environment. The overall tone is professional and technical.
- **Creation of GeoDatabase**
  - **In office address canvassing**
  - **Creating efficient enumeration areas (EAs)**
  - **Response outreach**
  - **Optimizing site placement of field offices**
  - **Optimizing capital and asset distribution**
  - **Optimizing workforce and routes**
  - **Integration of administrative and big data**
  - **Operational dashboards**
  - **Mobile map packages**





# GIS in Field Operations Location-Enabling All Aspects of Field Work

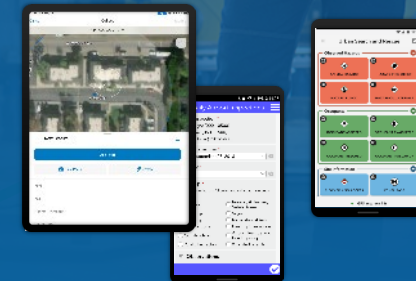
- Tracking
- Offline Workflows
- Preplanned Routes



## Navigation



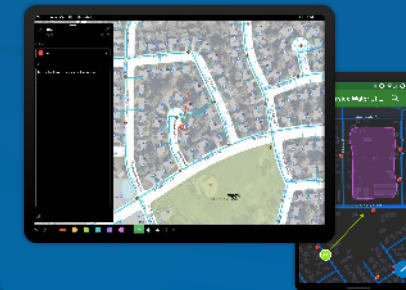
## Data Capture



## Planning and Management

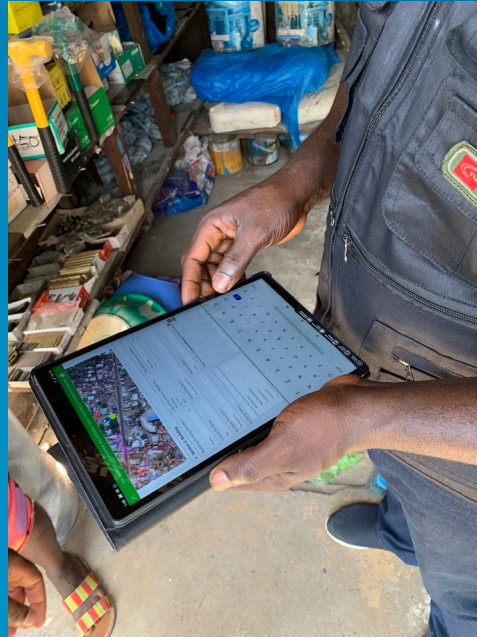
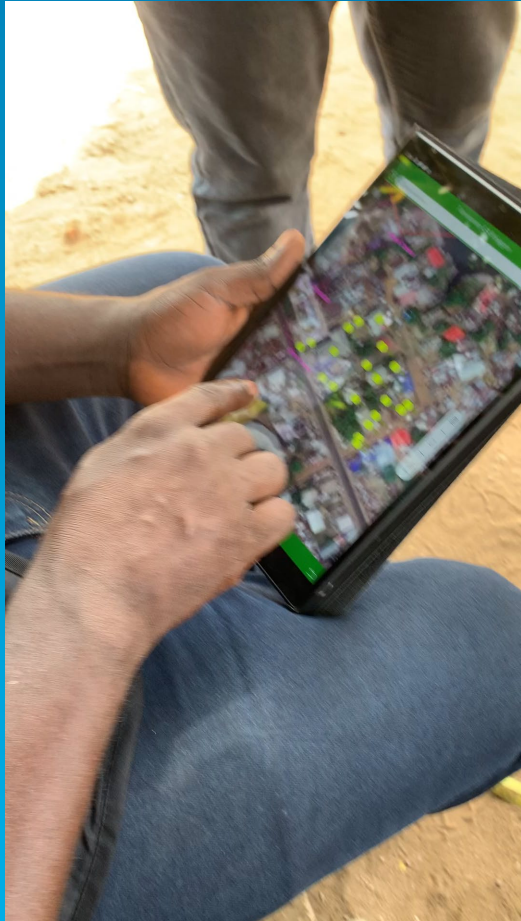


## Maps & Mark Up





# Examples of Applications used in the field



Form\_2\_EN\_CPH2020\_Pilot

**Mode of Collection \***

- ☒ COMPUTER-ASSISTED PERSONAL INTERVIEW
- ☐ PAPER AND PENCIL PERSONAL INTERVIEW
- ☐ SELF-ADMINISTERED PAPER QUESTIONNAIRE

**Status of Visit \***

- ☒ INTERVIEW
- ☐ NO RESPONDENT AROUND
- ☐ HOUSEHOLD IS AWAY FOR EXTENDED PERIOD OF TIME
- ☐ REFUSAL
- ☐ OTHERS

**Name of the Household Head \***  
(Last name, First name)

DELA CRUZ, JUAN

**Name of Respondent \***  
(Last name, First name)

DELA CRUZ, JUAN

**Address \***

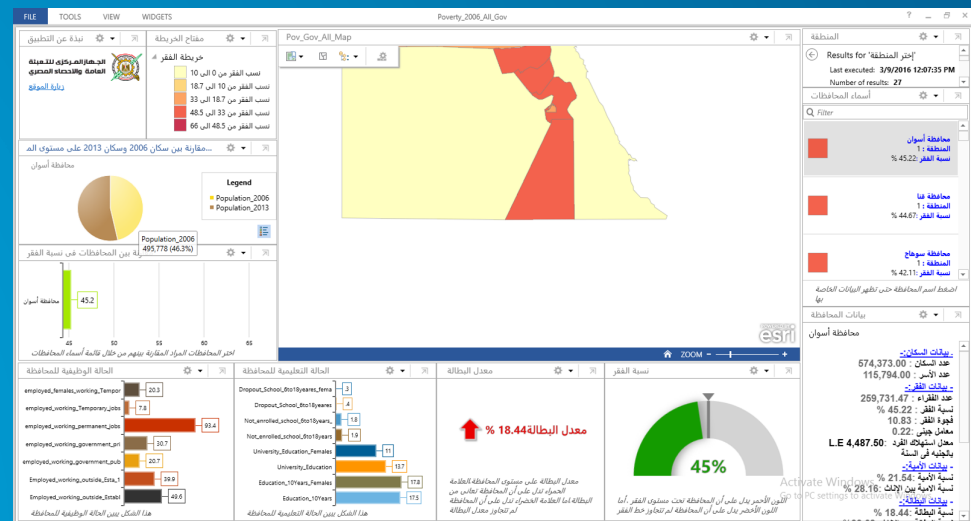
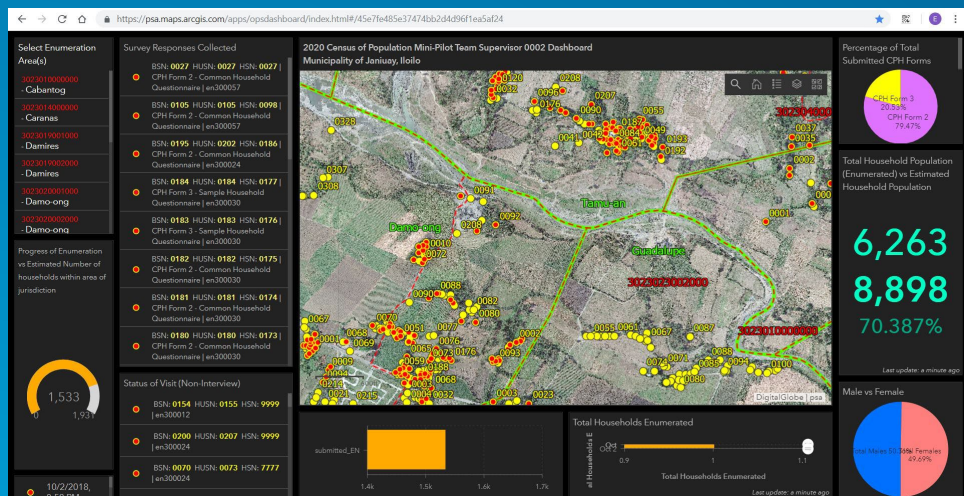
PHILIPPINES

3 of 5



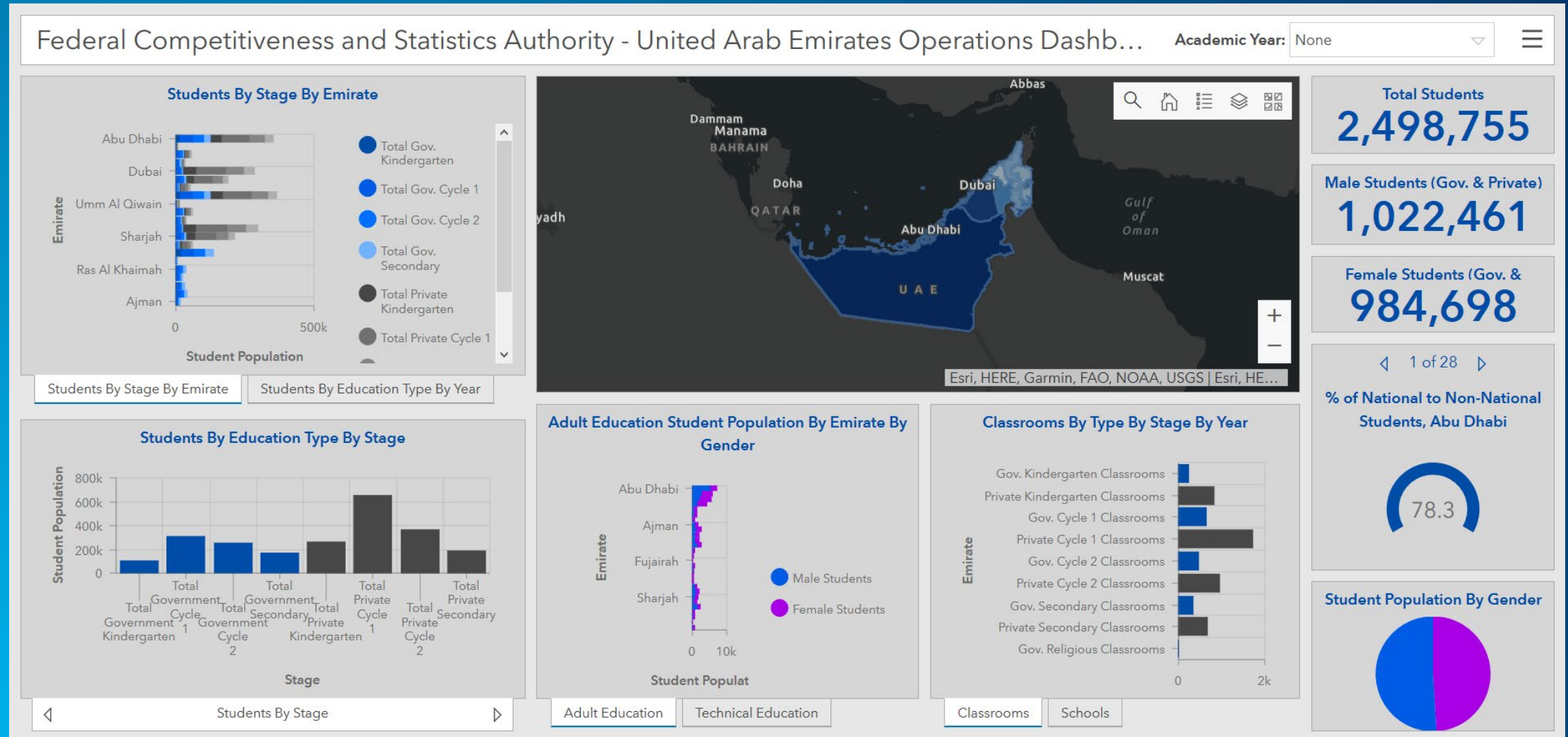


# Dashboards





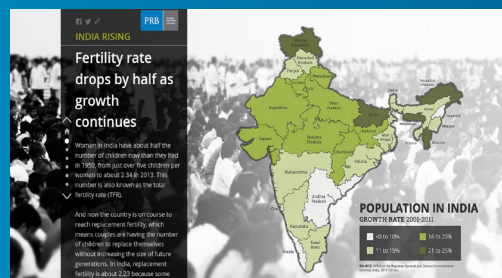
# Dashboards can be used in operations or dissemination





## Dynamic and Data-driven Smart Maps

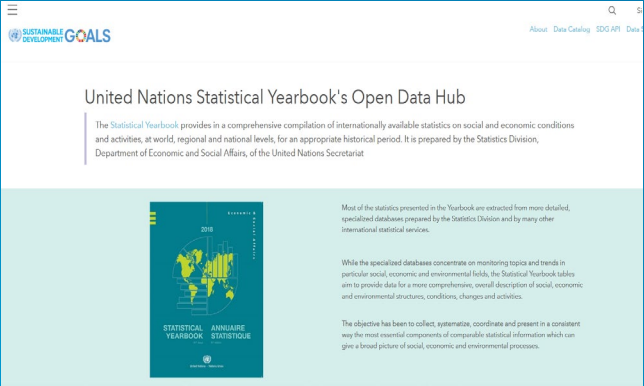
- 



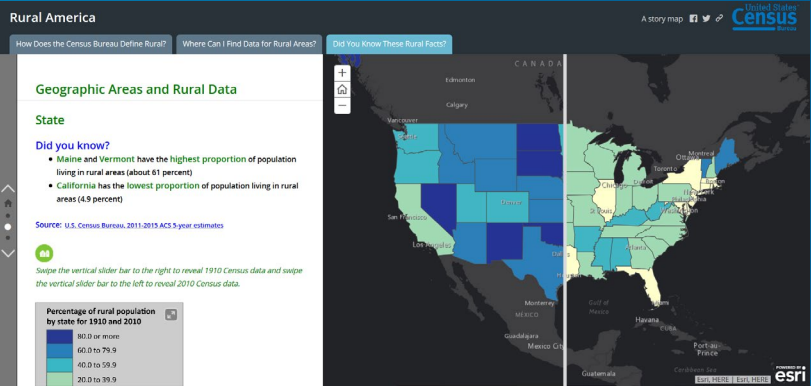


# Dissemination of data is a fundamental part of mission

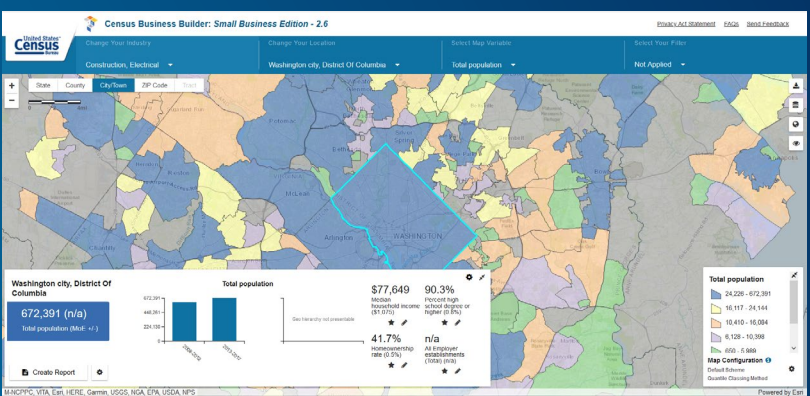
## Statistical Yearbook



## Applications



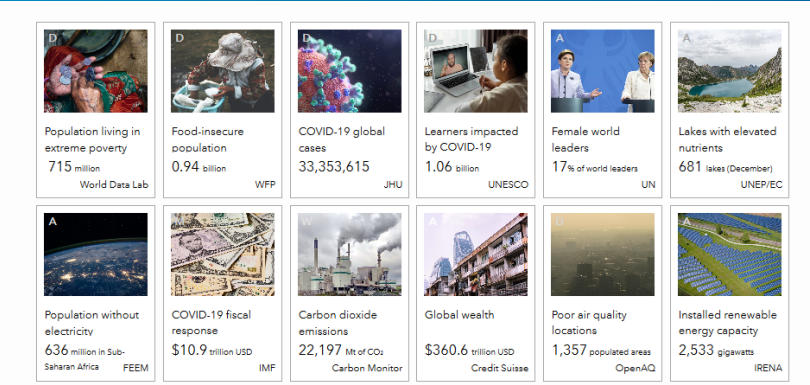
## Applications



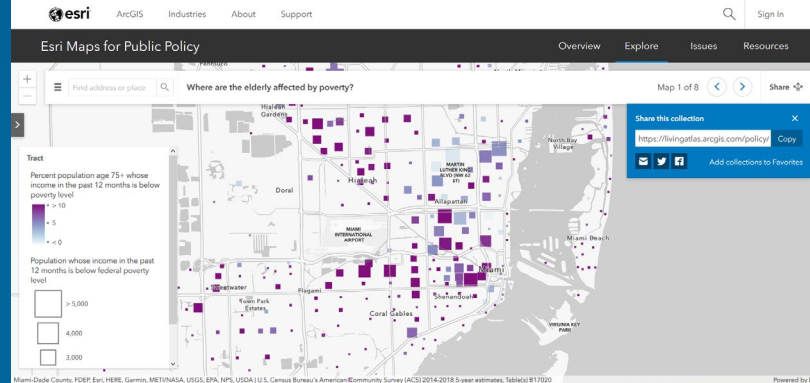
## SDG Reporting



## SDG Reporting




## Maps for Public Policy





# INEGI Mexico Data Are Now Available Through Living Atlas




Censo INEGI 2020 Informacion Migracion Municipa...

📍 Feature Layer By [dlagunes\\_SIGSAMKT](#)

Censo de población y vivienda del año 2020 realizado por INEGI, y que contiene la información de Migración. 2020 Census of population and housing with information about Migration by Municipality.

📍 ☆ ...




Censo INEGI 2020 Informacion Situación Conyugal ...

📍 Feature Layer By [dlagunes\\_SIGSAMKT](#)

Censo de población y vivienda del año 2020 realizado por INEGI, y que contiene la información Situación Conyugal. 2020 population and housing census carried out by INEGI and containing information about Marital Status

📍 ☆ ...




Censo INEGI 2010 Informacion Salud Municipal /IN...

📍 Feature Layer By [dlagunes\\_SIGSAMKT](#)

Información del Censo de Población y Vivienda del 2010 de INEGI Contiene información de Salud por municipio. Information from the INEGI 2010 Population and Housing Census Contains Health Insurance information by a municipality entity.

📍 ☆ ...



Censo INEGI 2010 Religión Municipal /INEGI Cens...

📍 Feature Layer By [dlagunes\\_SIGSAMKT](#)

Información del Censo de Población y Vivienda del 2010 de INEGI Contiene información de Religión por municipio. Information from the INEGI 2010 Population and Housing Census Contains Religion information by a municipality entity.

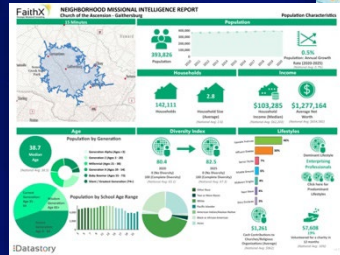
📍 ☆ ...



# Census, Demographics and GIS

## Maps for Census Enumeration

### Neighborhood Demographic Profile

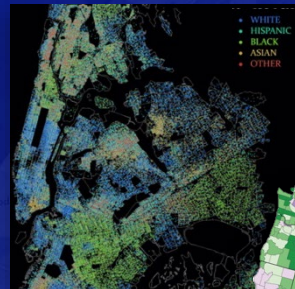


FaithX Project  
Gaithersburg, Maryland



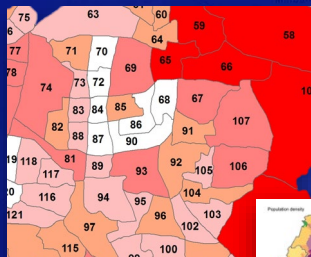
UNFPA | LISGIS  
Liberia

## Distribution of Races

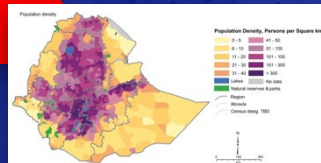


Saturn Power  
New York City, New York

## Population Density

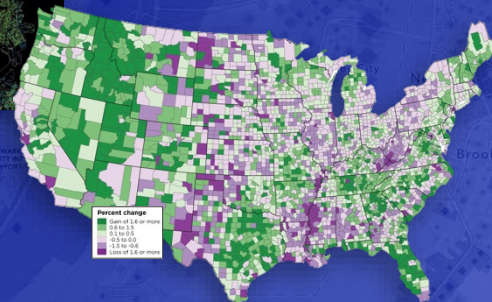


Shrabanti datta  
Kolkata, West Bengal,  
India



Central Statistical Agency  
Ethiopia

## Percent Change in Population



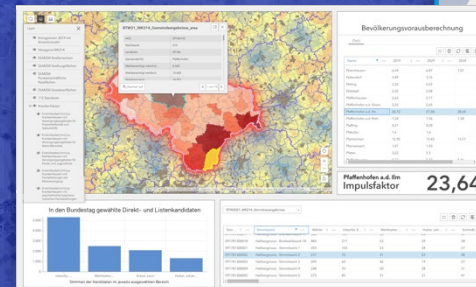
US Census Bureau  
US

## Mean Center of Population



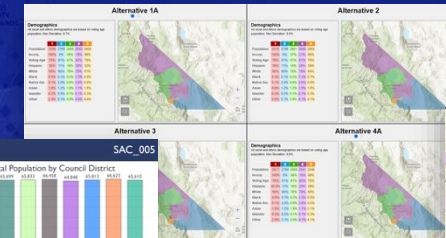
US Census Bureau  
US

## Elections Monitoring



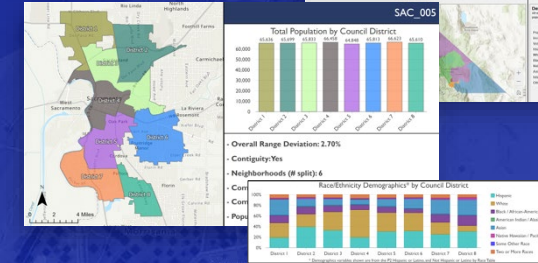
takatoa  
Germany

## Redistricting



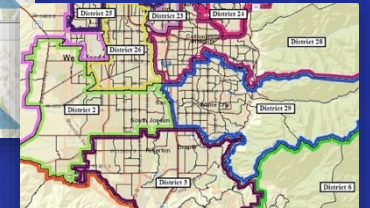
Mono County  
California

## Managing Council Districts



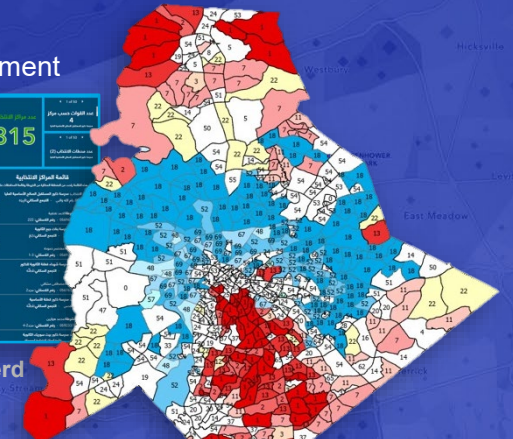
City of Sacramento  
California

## Redistricting



State of Utah


## Political Affiliation



Marcelino Pena  
Charlotte, North Carolina



# International Census Example: Poland



Przestrzenne  
Dane Statystyczne

O portaluAktualnościINSPIREDaneAplikacja mobilnaGrantyF.A.Q.Kontakt

Unia Europejska



**Wyświetl gotowe wizualizacje danych na mapach**  
Katalog zasobów

W katalogu zasobów możesz łatwo wyszukiwać dostępne dane pod kątem tematu czy instytucji.



**Przygotuj wizualizację na podstawie danych GUS**  
Portal mapowy – dane GUS


Narzędzie do przygotowania własnej wizualizacji danych statystycznych na mapach. Możesz samemu



**Przygotuj własną wizualizację danych na mapie**  
Portal mapowy – dane własne

Znajdziesz tu pełny zestaw narzędzi, które umożliwią Ci przygotowanie wizualizacji Twoich danych na





Geostatistics  
Portal

Map portal – GUS data

**Add statistical layer**

Data store

BDL data

Search

> PRICES

> FINANCES OF ENTERPRISES (QUARTERLY DATA)

> PUBLIC FINANCE

> EUROPEAN FUNDS (HALF YEAR DATA)

> HOUSING ECONOMY AND MUNICIPAL INFRASTRUCTURE

> SOCIAL ECONOMY

> TRADE AND CATERING

> INVESTMENTS AND FIXED ASSETS

> CULTURE

> PHYSICAL EDUCATION, SPORT AND RECREATION

> FORESTRY AND HUNTING

> POPULATION

> PRIVATE HOUSEHOLDS

> MARRIAGES, DIVORCES AND SEPARATIONS

> INTERNAL AND FOREIGN MIGRATIONS



# International Census Example: Ireland

Census 2016 Open Data Site

## Open Data for Census 2016 Ireland

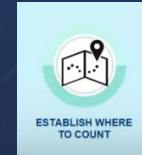
Bringing Geography and Statistics Together

On this site Census 2016 datasets have been combined with Ordnance Survey Ireland's (OSi) official boundary data as part of a collaborative project between the Central Statistics Office (CSO) and OSi to link geography and statistics.



### About

Small Area Population Statistics (SAPS) are Census statistics produced by the Central Statistics Office (CSO) for a range of geographical levels including 31 Administrative Counties, 95 Municipal districts, 3,409 Electoral Divisions and 18,641 Small Areas.



ESTABLISH WHERE TO COUNT



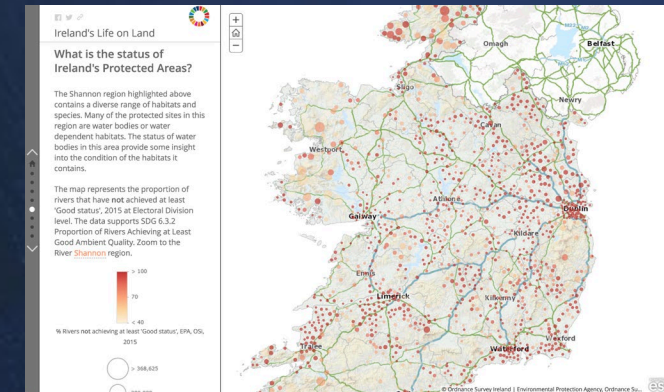
MOTIVATE PEOPLE TO RESPOND



COUNT THE PEOPLE



TABULATE DATA AND RELEASE CENSUS RESULTS



COVID-19 Ireland Vaccinations ICU Hospital & Testing Detailed Profile of Cases Detailed County & LEA Statistics More\*



## Ireland's COVID-19 Data Hub

### National Statistics, Information & Data

The information presented in this site is based on official figures provided by the Health Protection Surveillance Centre (HPSC) and the Health Service Executive (HSE). Datasets, charts and maps will be updated on an on-going basis and in line with newly published data. This site is built using the GeoHive platform, Ireland's Geospatial Data Hub.

**Change to Frequency of Updates:** From the week of 16th May 2022 onwards, data on COVID-19 cases (PCR and positive antigen results) and deaths will be updated once per week, each Wednesday. The weekly update will include data for each date since the previous weekly update and will not result in any gap in the time series.

Please see FAQ for latest information on COVID-19 Data Hub Data Flows.

<https://covid-19.geohive.ie/pages/helpfaqs>

### Confirmed Headline Figures

[Click for more information](#)

## 17 Goals to Transform our World

Highlighting Ireland's progress towards achieving the United Nations Sustainable Development Goals



# International Census Example: Germany

Geoinformationen statistik.hessen.de

## Geoinformationen

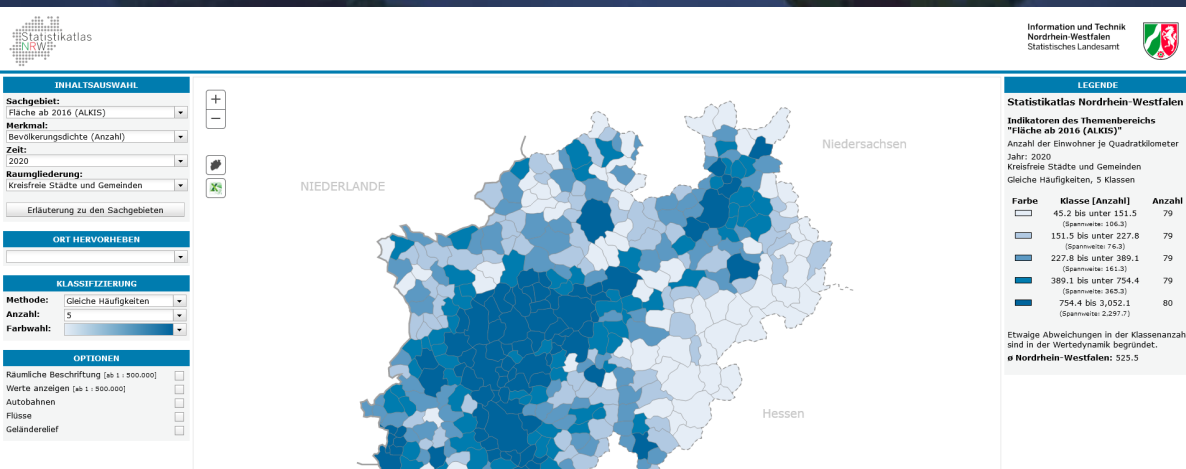
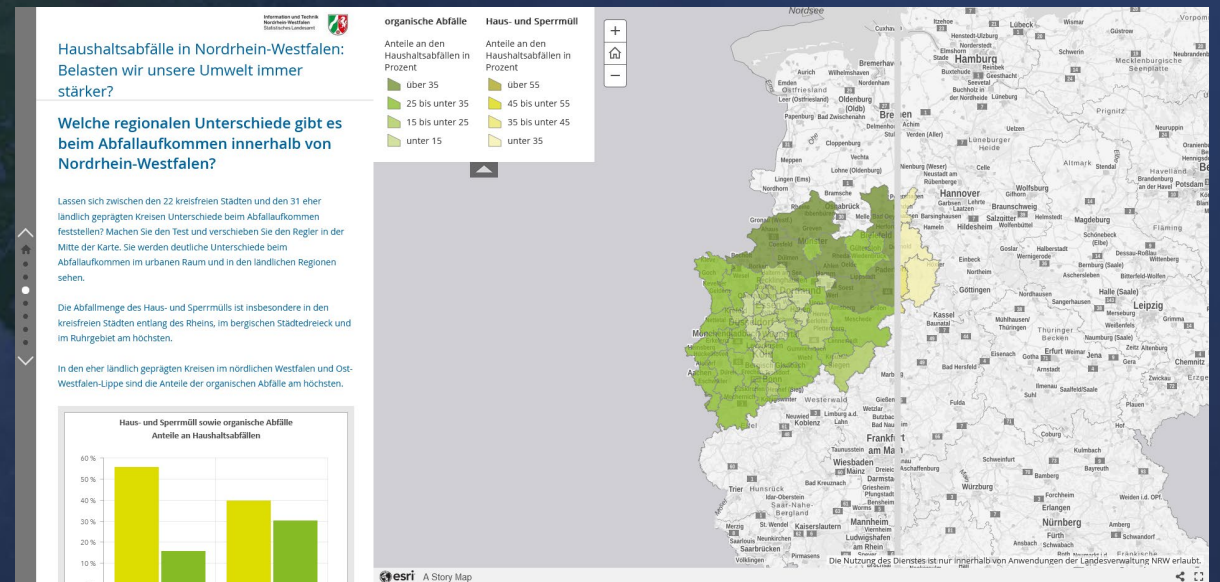
Hessisches Statistisches Landesamt

Die Plattform für **Geoinformationen** des **Hessischen Statistischen Landesamts**. Entdecken Sie alle unsere Story Maps, Dashboards und Web-Apps. Laden Sie Datentabellen ganz einfach herunter oder binden Sie Kartendienste in Ihre Produkte ein.

Erfahren Sie mehr über die Welt der Geoinformation von Statistik Hessen.

### Applikationen

Entdecken Sie Statistik neu. Erkunden Sie unsere Story Maps, Dashboards und Web-Apps.



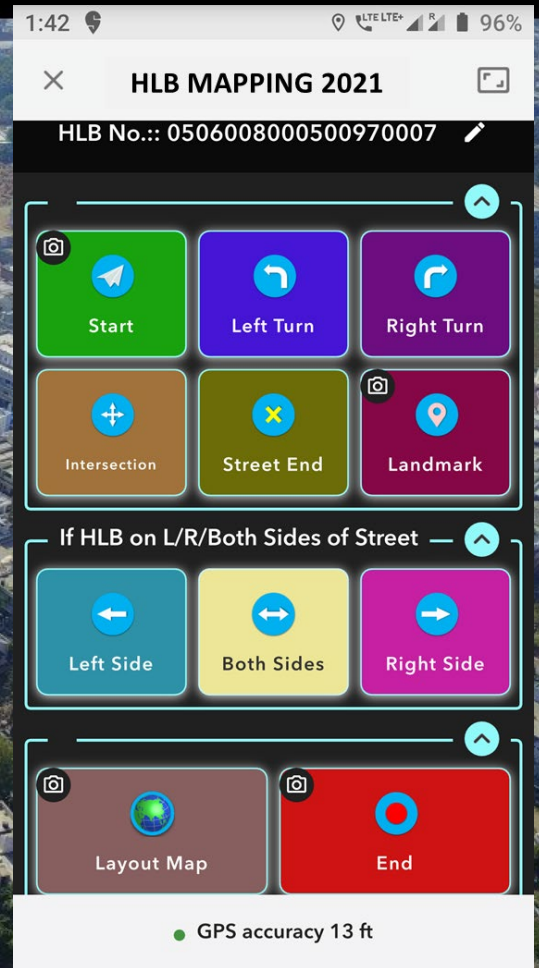
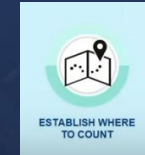
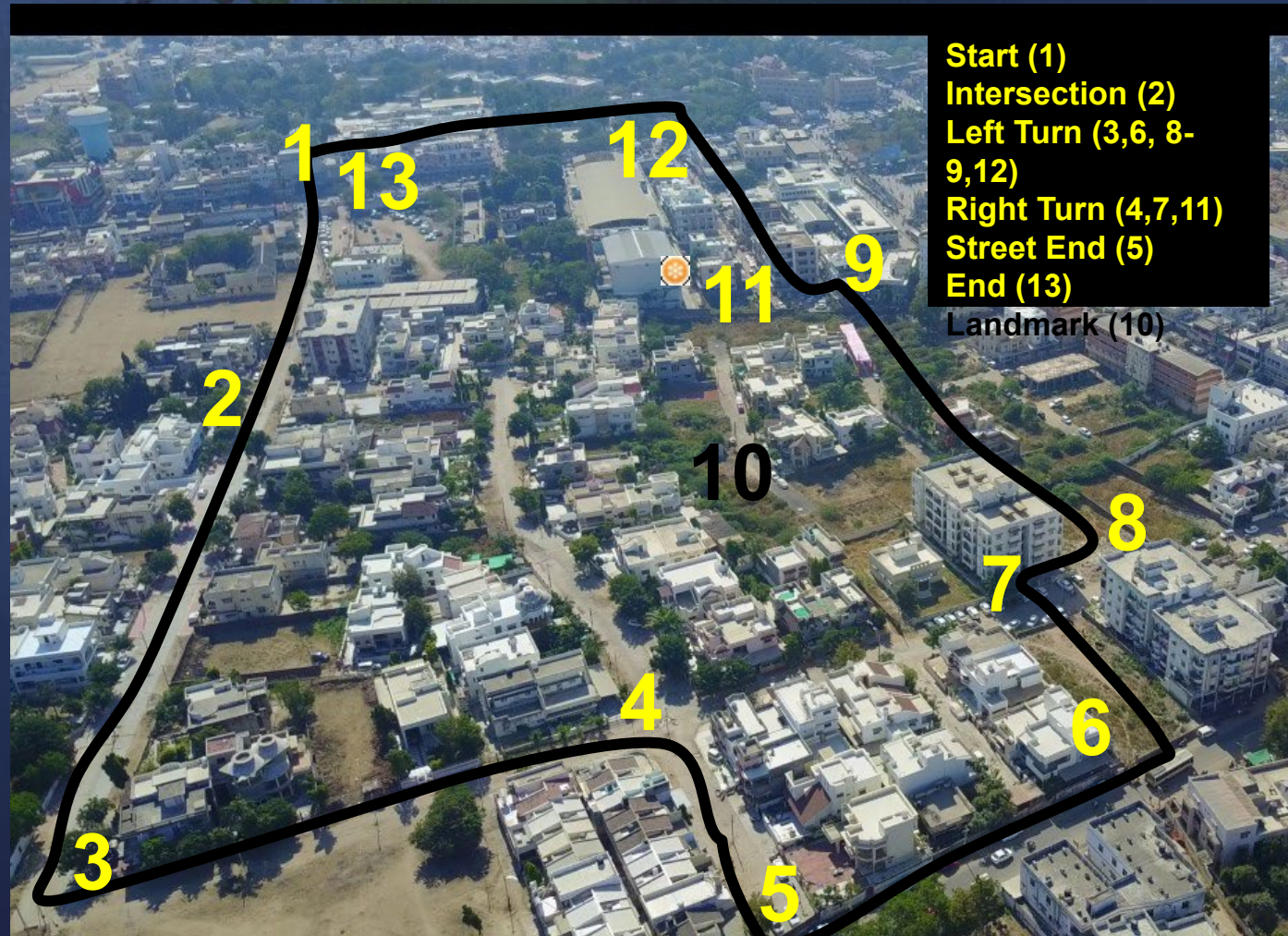
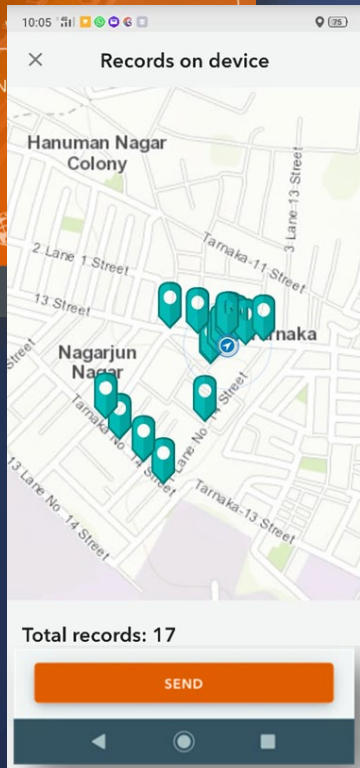
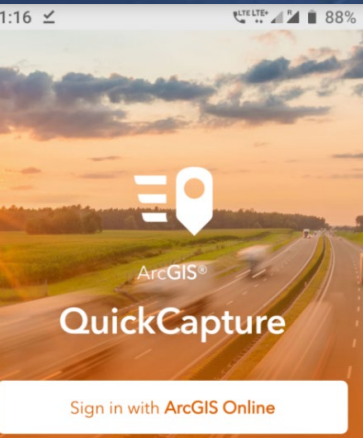
### Indikatoren zu den Zielen für nachhaltige Entwicklung

Die Arbeitsgruppe "Nachhaltige Entwicklung" stellt Indikatoren zur nachhaltigen Entwicklung auf Ebene der Bundesländer dar.

AG Nachhaltige Entwicklung  
August 2, 2021



# International Census Example: India

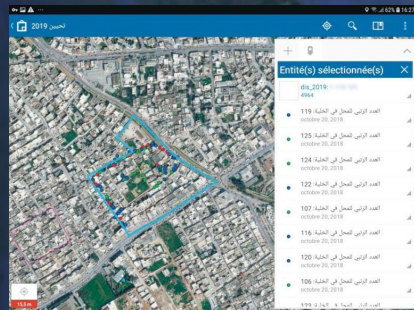
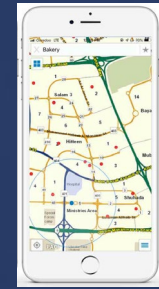




# International Census Examples



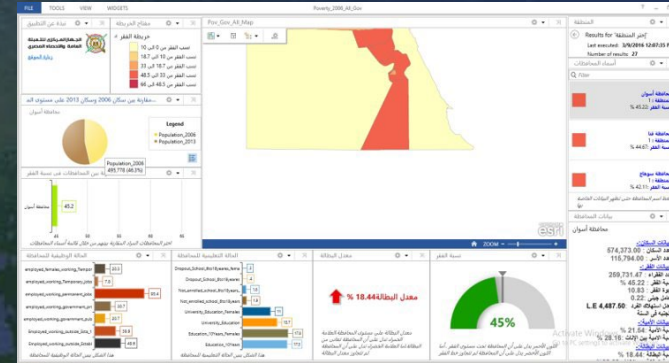
PACI  
Kuwait



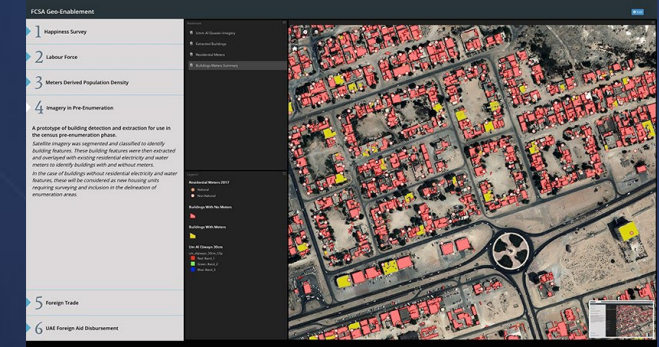
NSI Tunisia



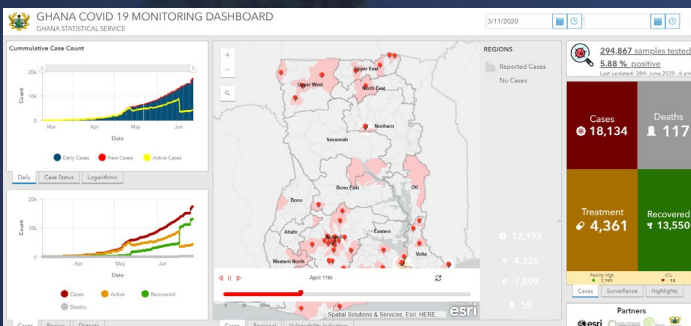
DOS Jordan



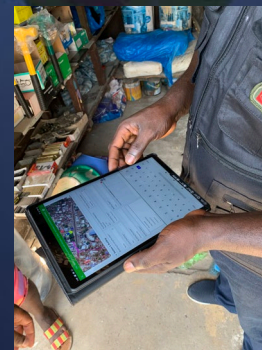
CAPMAS Egypt



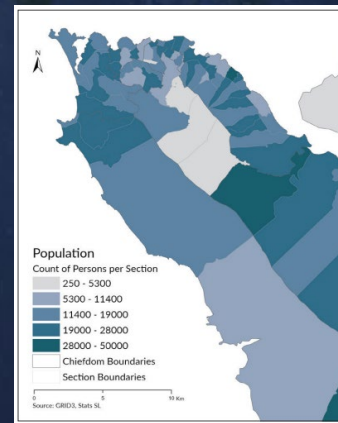
FCSA UAE



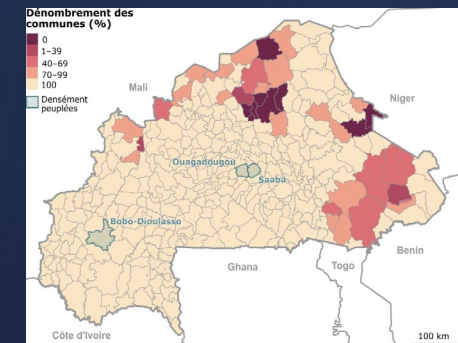
Ghana GSS



Liberia LISGIS



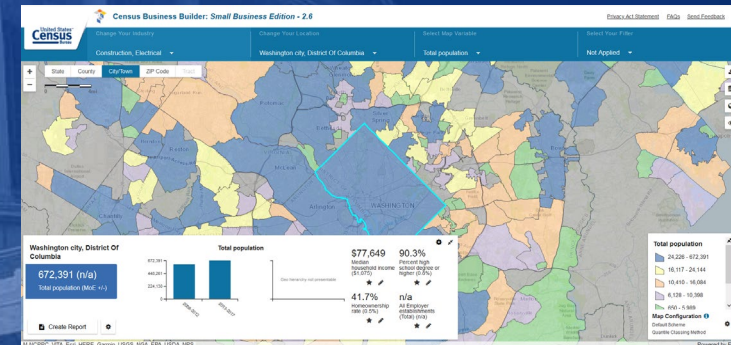
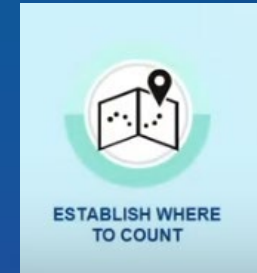
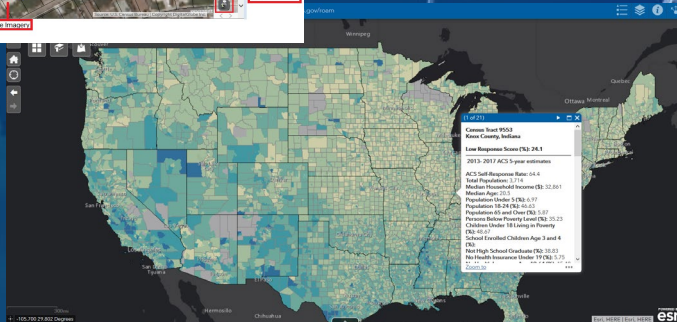
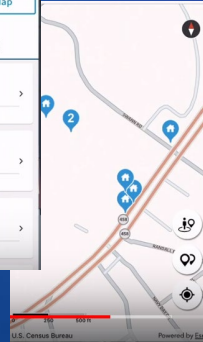
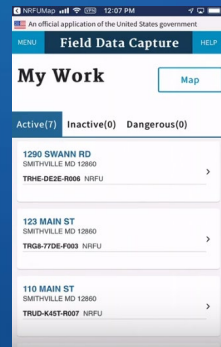
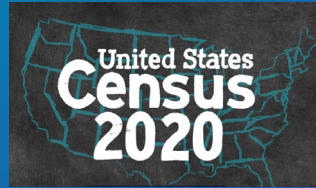
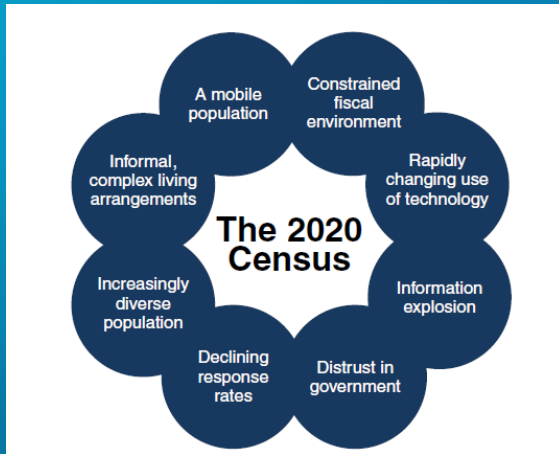
Sierra Leone Central  
Statistics Office



Burkina Faso



# US Census Bureau





# Web GIS Is the Modern GIS Architecture

Helping Everyone Do Their Work Better





# ArcGIS for Official Statistics:



- Geodatabase
- Base map updates
- Map of enumeration areas
- Optimize, edit and validate EAs
- Earth Observation data integration
- Optimize assignments
- Census data model and web apps
- Survey design and testing
- Integration of Admin and Big Data
- Field data collection
- Field editing
- Workforce management
- Operations management
- Project management
- Data dissemination
- Thematic maps
- Online atlas
- Open Data
- Story maps
- Smart maps
- Other map information products
- SDG alignment and reporting



# Demonstrations

Kate Hess



# Esri Modernization Program for Official Statistics

lpeters@esri.com



esri®

THE  
SCIENCE  
OF  
WHERE™

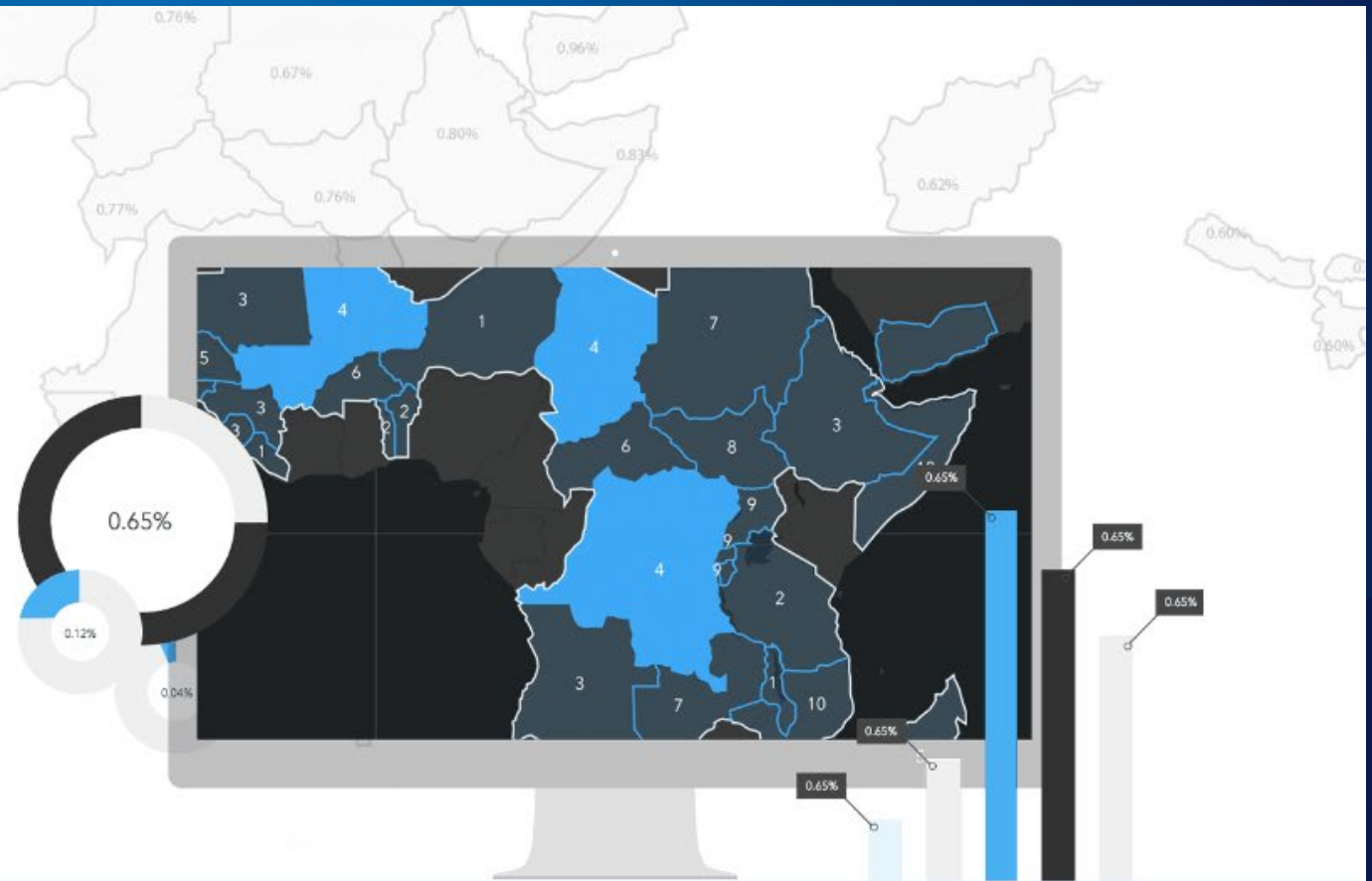


## Official Statistics

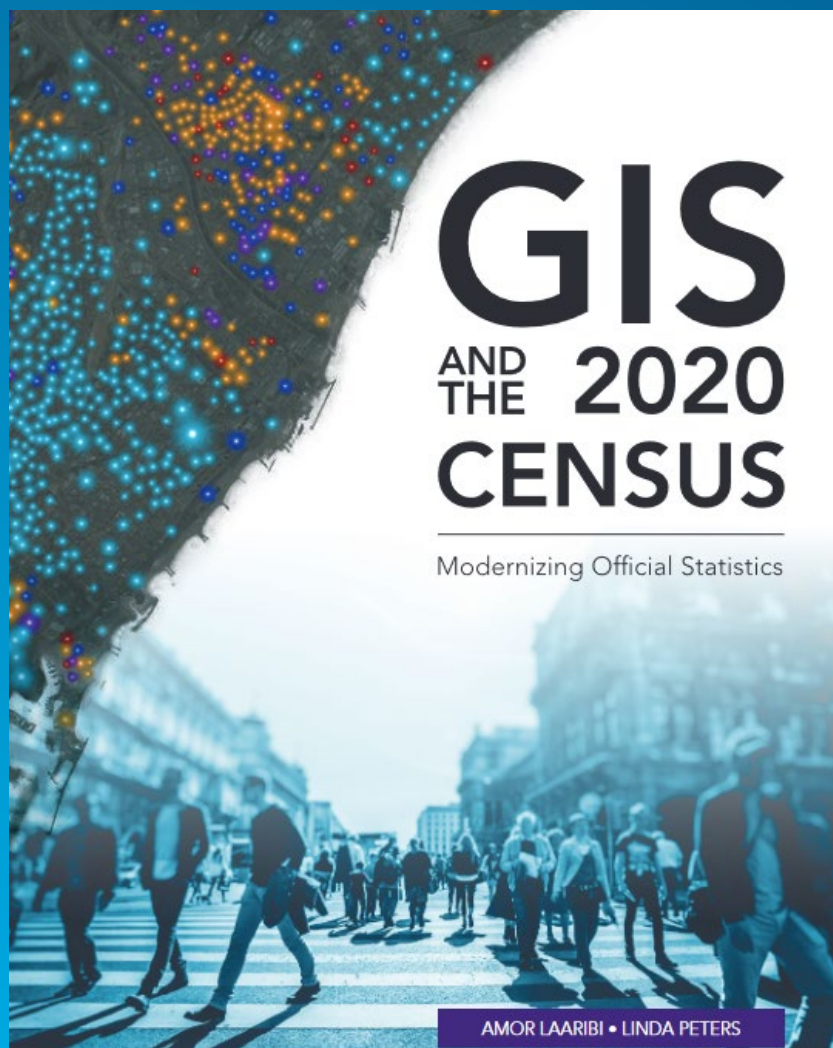
### Modernization Program

Providing GIS tools & training for resource constrained countries

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GIS and the 2020 Census:  
Modernizing Official Statistics  
provides statistical organizations with  
the most recent GIS methodologies  
and technological tools to support  
census workers' needs at all the  
stages of a census.

[Preview the book](#)



**Coming soon in French and Spanish!**





# Official Statistics Modernization

GIS CURRICULUM

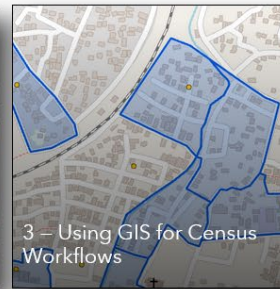
[A Learn ArcGIS Project](#)

This site contains hands-on tutorials to help official statistics agencies modernize their population and housing census workflows. Covering every stage of the census process, these tutorials teach you how to plan your work, conduct field data collection, monitor your operations, and disseminate your authoritative data, all using ArcGIS. The tutorials also explain fundamental GIS concepts and cover multiple ArcGIS software products.

We look forward to receiving your [feedback and suggestions](#) as we continue to develop this project.

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