Applying GIS at the NSO

Generic Statistical Business Process Model (GSBPM)

1. Specify Needs
2. Design
3. Build
4. Collect
5. Process
6. Analyse
7. Disseminate
8. Archive
9. Evaluate

Pre-Enumeration

- Design and production of base maps and enumeration areas

Enumeration

- Data collection using Mobile devices, tablets and laptops

Post-Enumeration

- Census dissemination
  - Online thematic maps
GIS for Official Statistics

- System of Record
- System of Insight
- System of Engagement

- Reporting (Dashboards)
- Mapping and Visualization
- Work Force/Operations Management
- Data Collection/Updating
- Analytics & Dissemination
- Geo-database Data Processing & Management
Planning

Automate process
Enhance workflows
Sequence of steps and paths

1. Ask Questions
2. Inventory Source
3. Create Version
4. Clip Imagery
5. Run Automated Processes
6. Edit Data
7. QC Data
8. Launch Applications
9. Record Information
10. Documentation
11. Notify
12. Send Emails
Run Automated Models

Execute data validation using
- ArcGIS Pro
- Model/Python script
Centralize Issue Tracking
Lifecycle Management

Review → Correct → Verify
Data Collection
Data Dissemination
Discrete Global Grids

“...A DGGS is a **spatial reference system** that uses a hierarchy of **equal area tessellations** to partition the surface of the Earth into grid cells or their analogous lattice points...”
What can a discrete grid system do for you?

- Information recorded about phenomena at a location can be easily referenced to the explicit area of the associated cell
- Integrated with other cell values, and provides statistically valid summaries based on any chosen selection of cells
- Spatial analysis can be replicated consistently anywhere on the Earth independent of resolution or scale
An example of a discrete grid system - GGRs

Introduces a unique horizontal definition / identification of a quadrant and centroid down to any level on the globe

100.000 km  N32A4D
20.000 km    N32A4DZ
 5.000 km    N32A4DZP
 1.000 km    N32A4DZPB
 0.200 km    N32A4DZPBBA
 0.500 km    N32A4DZPBAG
 0.010 km    N32A4DZPBAGA
 0.002 km    N32A4DZPBAGAA
.....        Etc.

<table>
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<tr>
<th>Hemisphere</th>
<th>UTM zone</th>
<th>Band</th>
<th>Quadrant</th>
<th>100 km block</th>
<th>20 km block</th>
<th>5 km block</th>
<th>1 km block</th>
<th>0.2 km block</th>
<th>0.05 km block</th>
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<td><strong>B</strong></td>
<td><strong>A</strong></td>
<td><strong>G</strong></td>
<td><strong>A</strong></td>
<td><strong>A</strong></td>
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</table>
World Population Estimate

Welcome to the R – ArcGIS Community

Combine the power of ArcGIS and R to solve your spatial problems

The R – ArcGIS Community is a community driven collection of free, open source projects making it easier and faster for R users to work with ArcGIS data, and ArcGIS users to leverage the analytic capabilities of R.

Need the R Statistical Software? Download it now.

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r-bridge-install

Python

Install the R ArcGIS Tools

8 24

r-bridge

C++

Bridge library to connect ArcGIS and R, including arcgisbinding R library

3 17

r-sample-tools

R

Sample tools illustrating R usage in geoprocessing scripts

3 20

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BROWSE ON GITHUB
IBM DBMS, and SPSS statistics software that integrates Esri software libraries and uses the ArcGIS platform.
IBM has four extensions available:

- **Web Heatmaps**: Create interactive heatmaps using different Esri Basemaps.
- **Reverse Geocoding**: Code a point location (latitude, longitude) to a readable address or place name.
- **Publish to ArcGIS**: Map your IBM SPSS data in Esri® ArcGIS Online. Export, transfer, load, your data for map visualization and deeper geospatial analytics.
- **Geocoding (Get Coordinates)**: Get the latitude and the longitude of a location in IBM SPSS Modeler using Esri services.

System of Engagement
Open Data

Share
Map and feature services as complete services or individual layers.
Image services.
Non-spatial data like spreadsheets, tables and CSVs.
Web maps, apps, documents, PDFs, web links, and more.

Your data will be available via:
Download - Download all of the data or a filtered subset directly from the source in multiple formats
API - Access data directly as GeoJSON or GeoServices.
DCAT - Federate your data simply by sharing a standards compliant catalog
Open Data

Modernization of Statistics: Dissemination using GIS
Success Stories

RWANDA
National Institute of Statistics of Rwanda

GIS Tools for Monitoring Support of National Development Indicators

“GIS is a very important tool in our daily work, as you can analyze statistical data in a spatial manner. Almost anybody can be an end user and can benefit from the system. Therefore, we are committed to increase the transparency and the dimensions of our existing data, as well as of the new data we will collect from the census and other important statistical activities. Maps showing the statistical data will facilitate dissemination, accessibility, and planning and decision making tremendously.”

- Florent Bigirimana, Head of the GIS section of the National Institute of Statistics of Rwanda.

Read more on how GIS Supported Rwanda’s 2012 Statistics here.

IRELAND
Census 2016 Preliminary Results

All Island Atlas Observatory
Smart Mapping
The subjectivity of visual pattern analysis

Natural Breaks

Quantile

Where are the hot spots? Where is the variation greater?
Minimizing the subjectivity
Turning the map into information
“…everything is related to everything else, but near things are more related than distant things.”
Understanding the SDGs
Location Platform Can Support the NSO Enterprise

ArcGIS

Making Mapping and Spatial Analysis available across the NSO

GIS Analysts, Cartographers, Statisticians and Business Analysts

Public Communications

Research & Analysis

Communities & Partners

Directorate Operations

Field Management

Enumerators

Operations

Communities & Partners

Field Management

GIS Analysts, Cartographers, Statisticians and Business Analysts
GIS Empowers Everyone

Expanding Impact Across the Organization

Providing Everyone the Geographic Advantage
GIS Transforms Organizations
Creating Shared Information and Facilitating Collaboration

Opening Access and Engaging Everyone

Shared Geographic Understanding
An Integrated System…
Requires More Than Data and Technology

- Vision and Leadership
- Understanding How GIS Contributes
- Planning and Governance
- Apps That Are Relevant
- Good People

A Culture of Sharing and Collaboration
VISION

A Geographic Platform for Official Statistics