ArcGIS Platform For NSOs

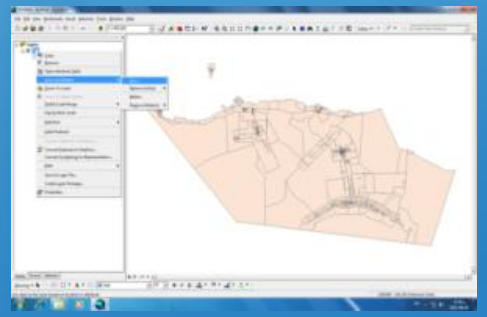
Applying GIS and Spatial Thinking to Official Statistics

Applying GIS at the NSO

Generic Statistical Business Process Model (GSBPM)

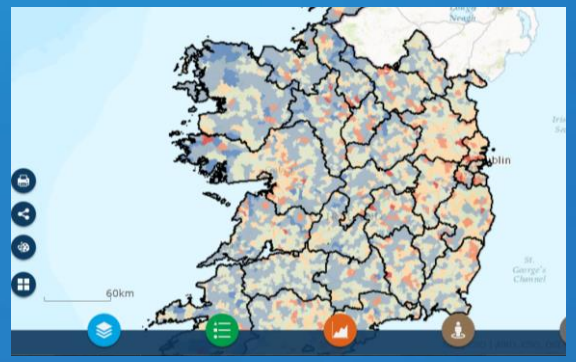
1 Specify Needs
2 Design
3 Build
4 Collect
5 Process
6 Analyse
7 Disseminate
8 Archive
9 Evaluate

Pre-enumeration | **Enumeration** | **Post-enumeration**



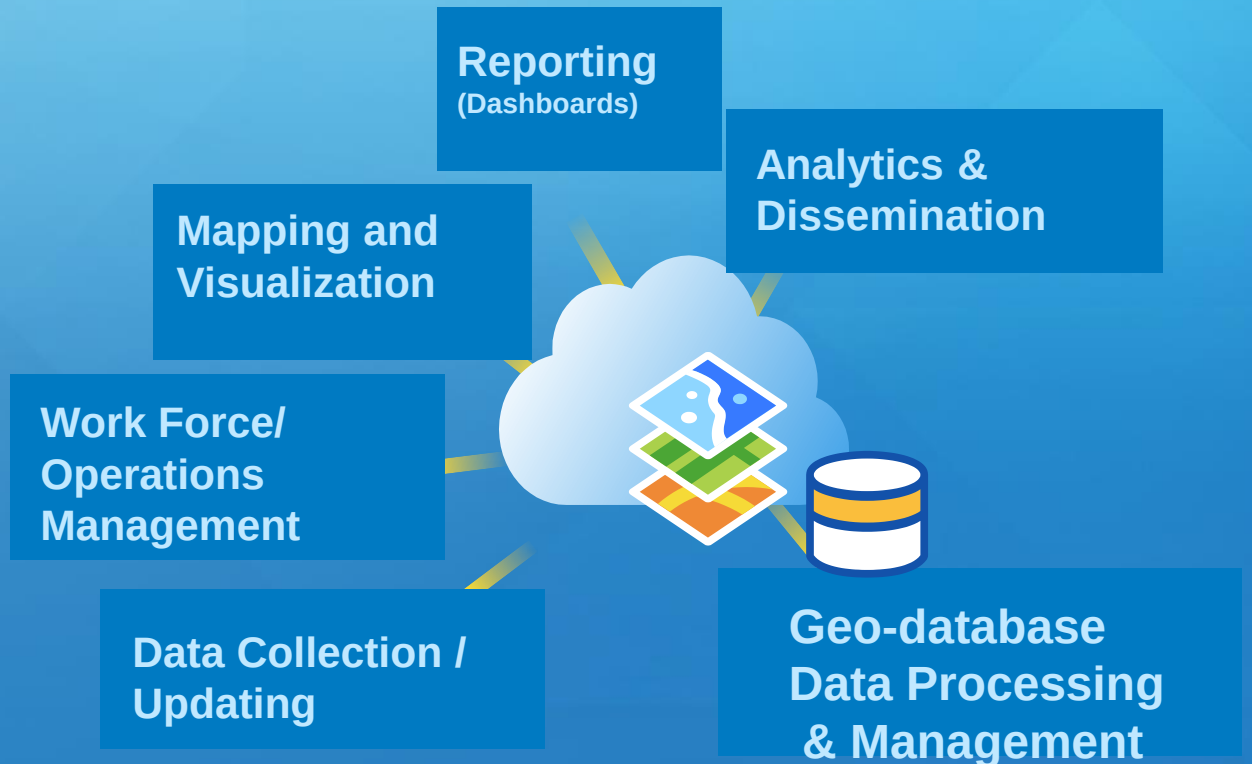
Design and production of base maps and enumeration areas

Data collection using Mobile devices, tablets and laptops



Census dissemination
Online thematic maps

GIS for Official Statistics



System of Record

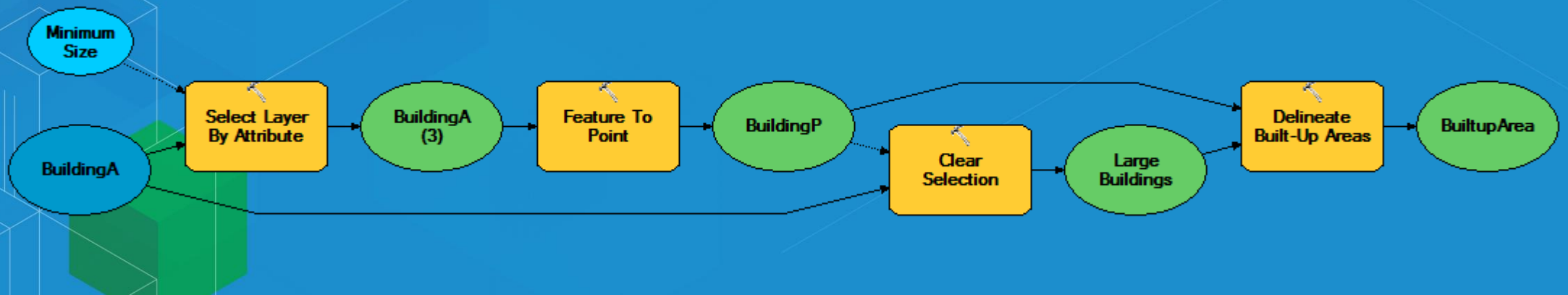
System of Insight

System of Engagement

System of Record

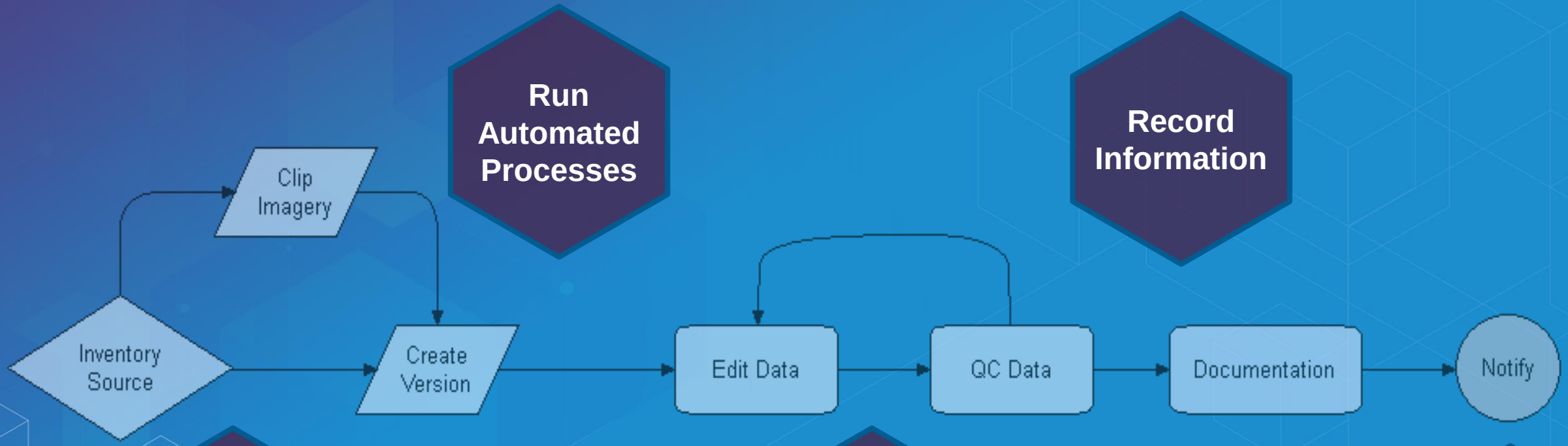
Planning

Automate process



Enhance workflows

Sequence of steps and paths



Run Automated Processes

Record Information

Ask Questions

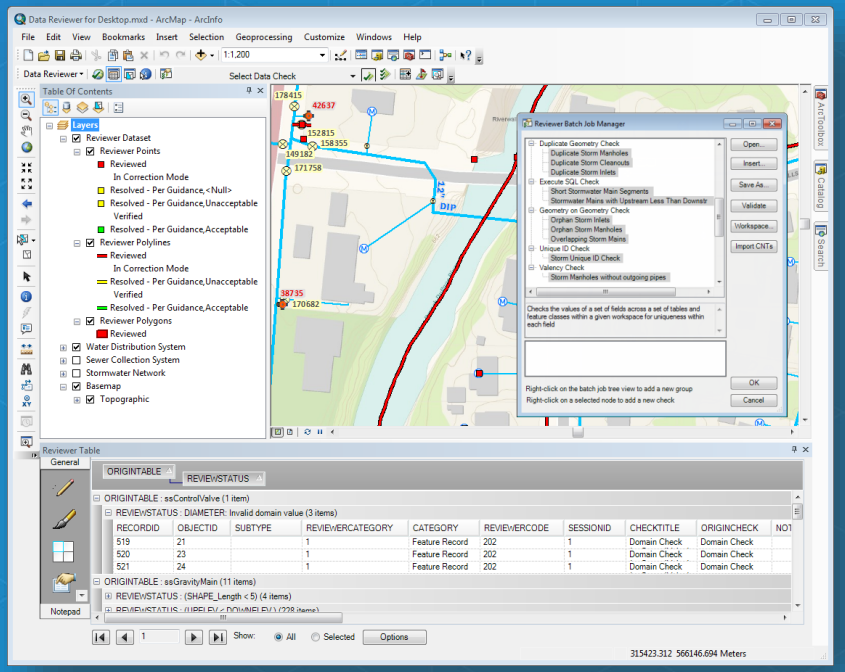
Launch Applications

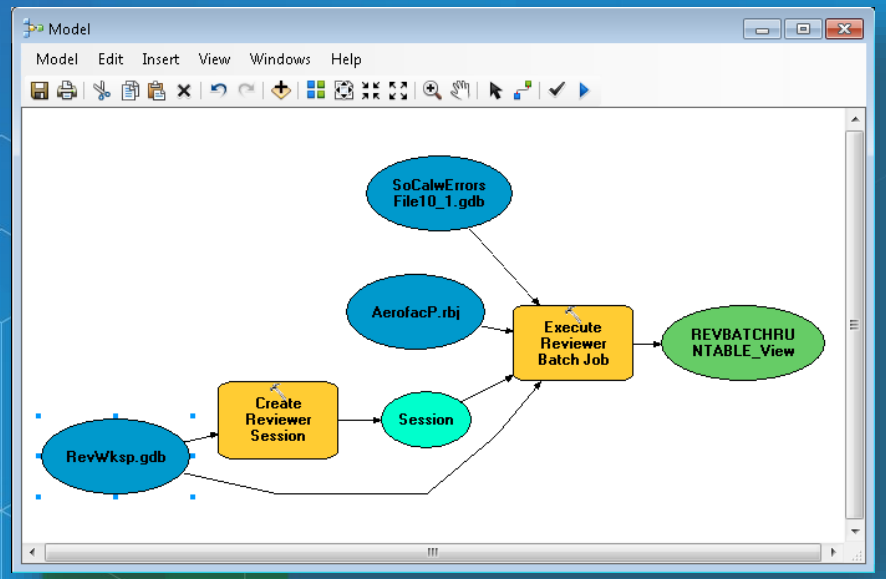
Send Emails

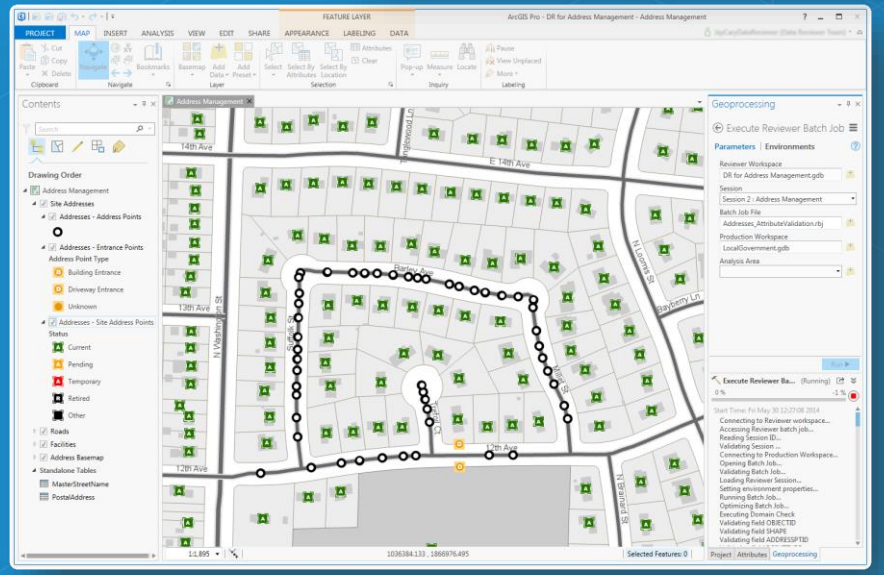
Run Automated Models

Execute data validation using

- ArcGIS Pro
- Model/Python script



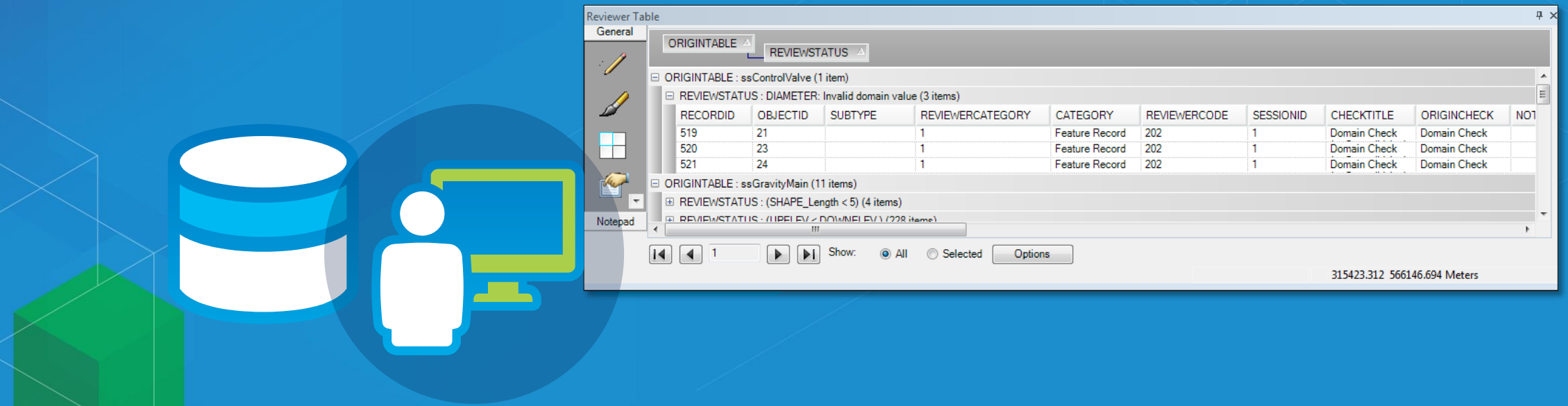




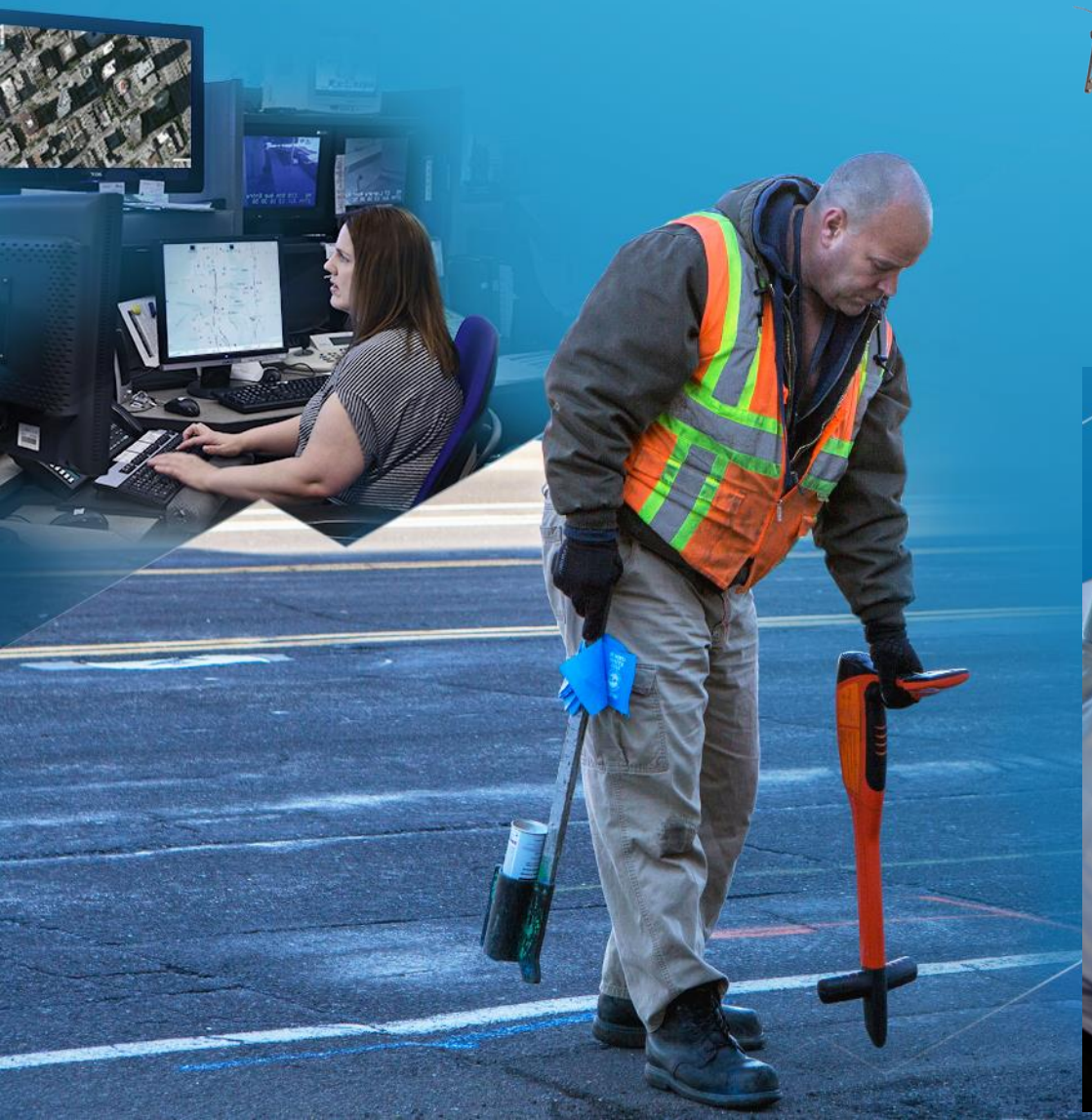
Centralize Issue Tracking

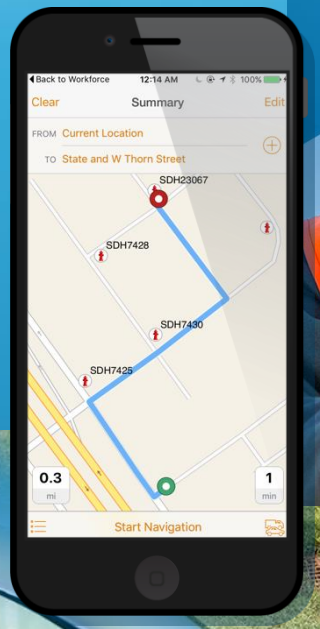
Lifecycle Management

Review → **Correct** → **Verify**

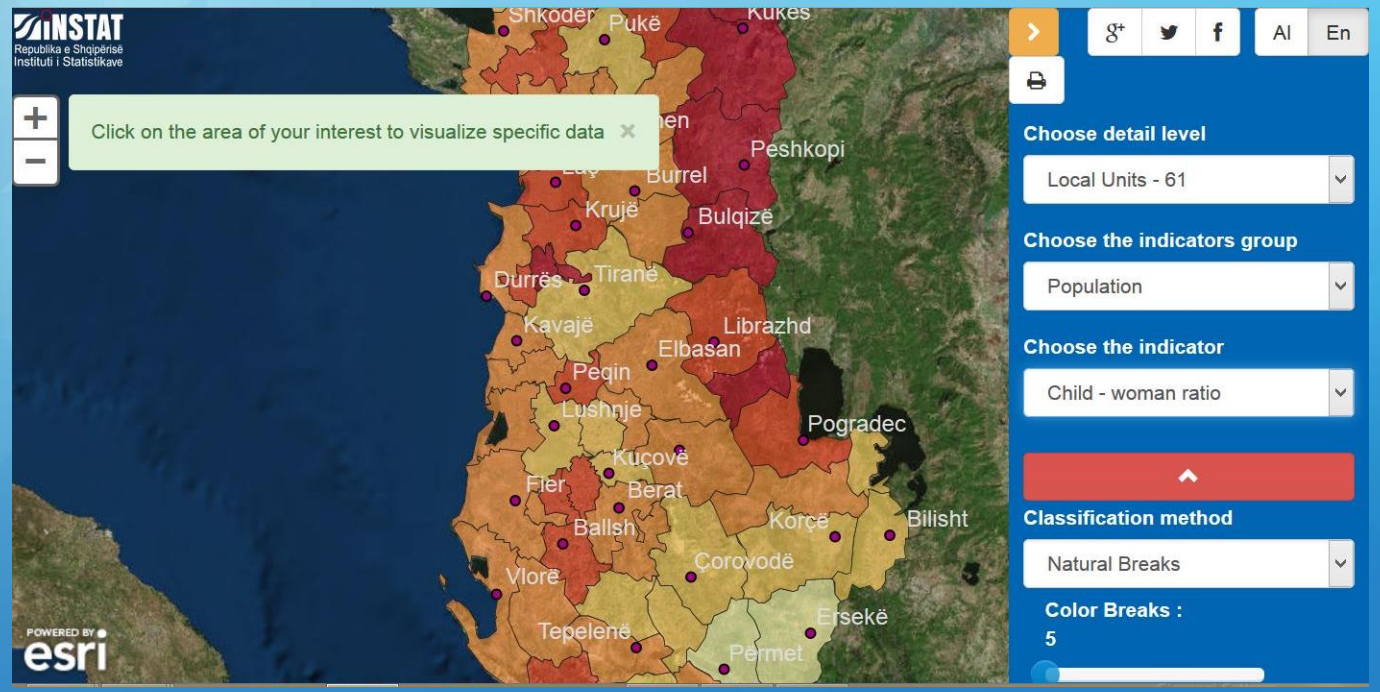


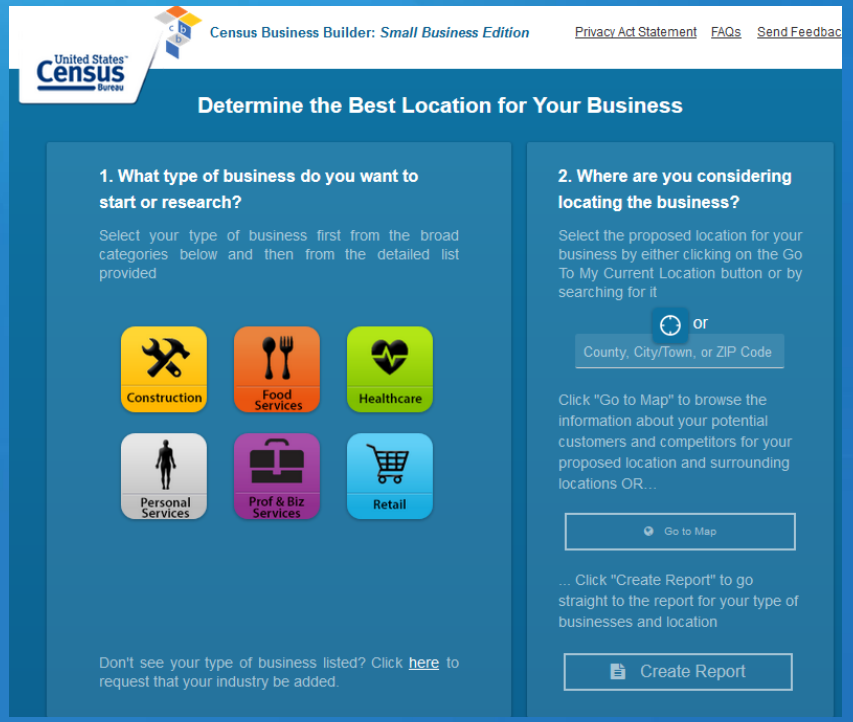
Data Collection





Data Dissemination

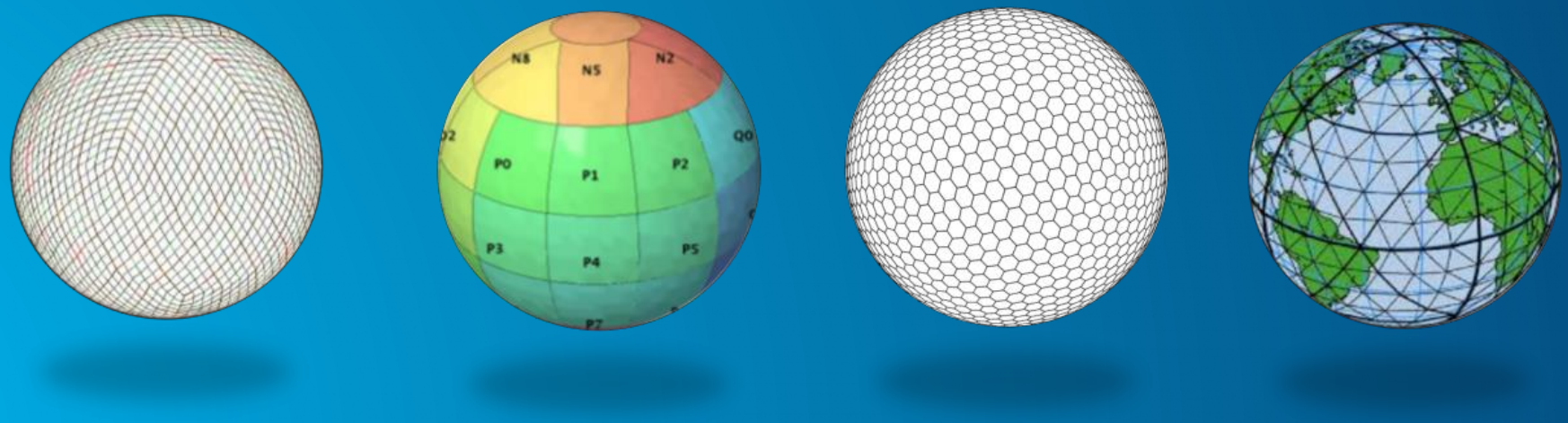




System of Insight

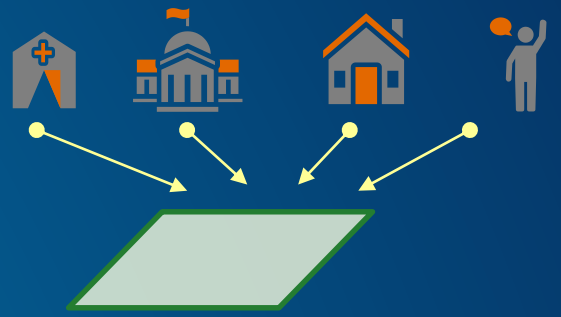
Discrete Global Grids

"..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…"

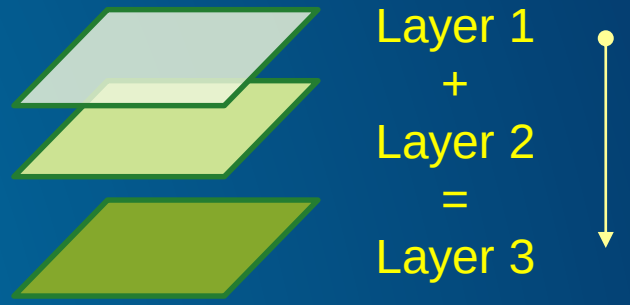


What can a discrete grid system do for you?

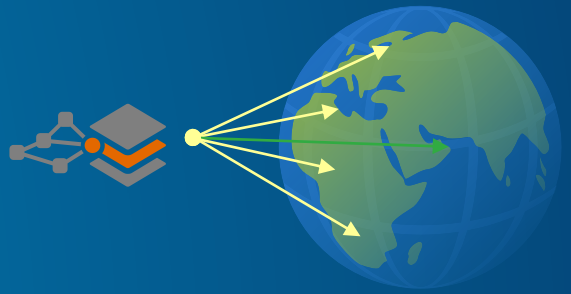
- Information recorded about phenomena at a location can be easily referenced to the explicit area of the associated cell



- Integrated with other cell values, and provides statistically valid summaries based on any chosen selection of cells



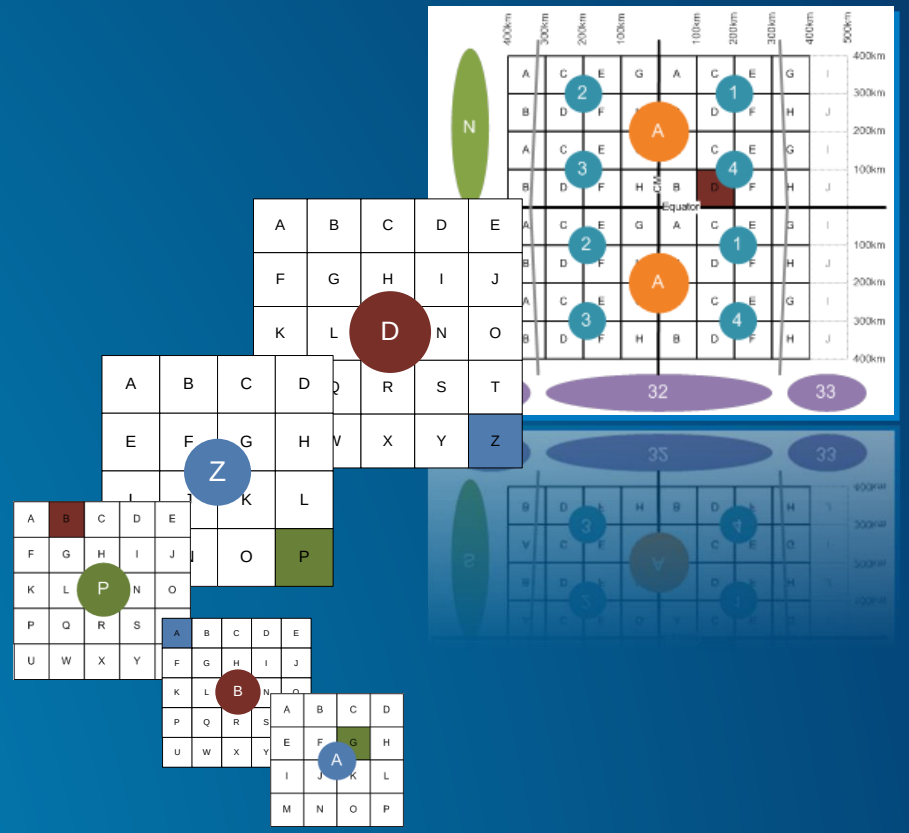
- Spatial analysis can be replicated consistently anywhere on the Earth independent of resolution or scale



An example of a discrete grid system - GGRs

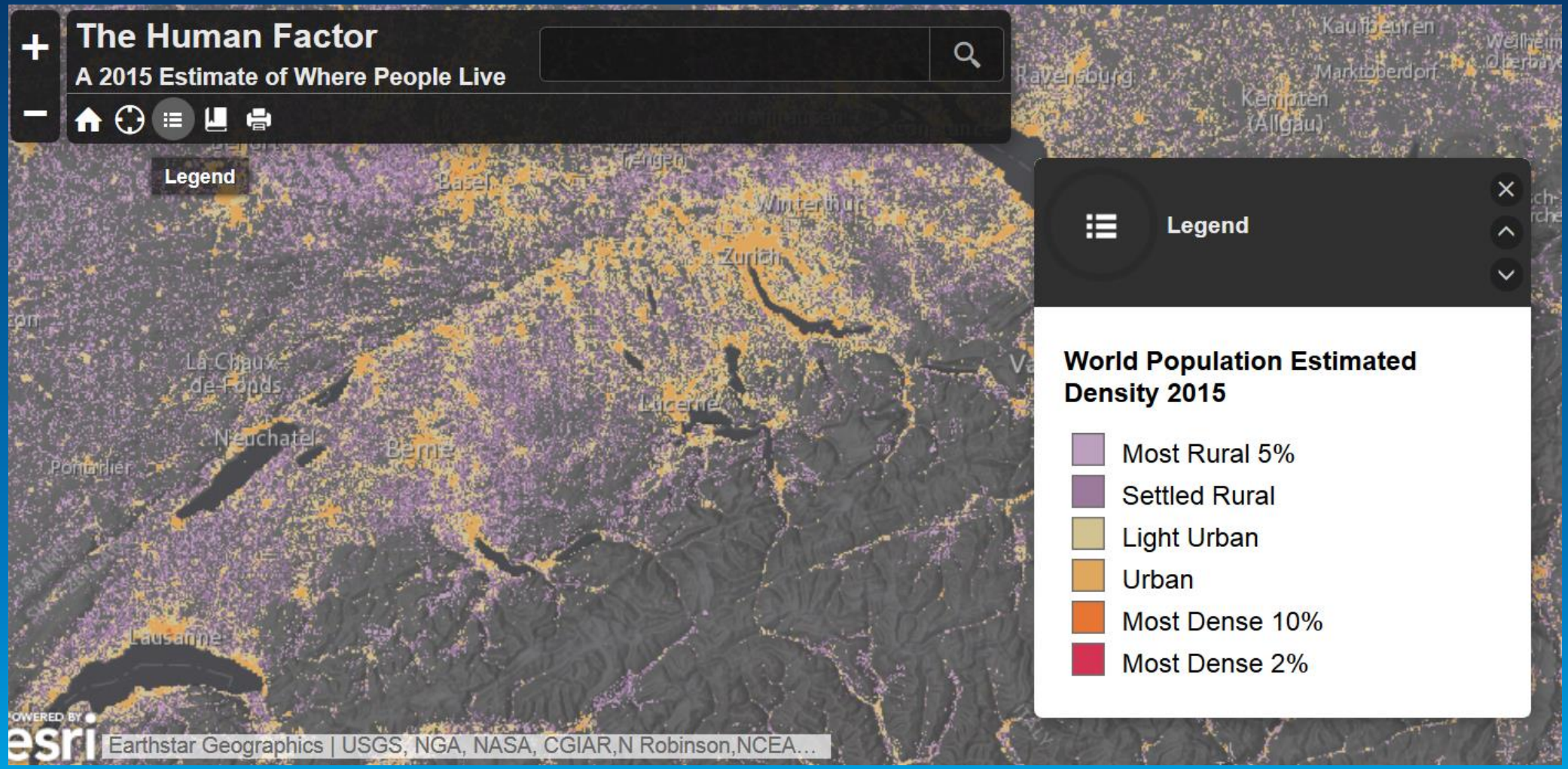
Introduces a unique horizontal definition / identification of a quadrant and centroid down to any level on the globe

100.000 km	N32A4D
20.000 km	N32A4DZ
5.000 km	N32A4DZP
1.000 km	N32A4DZPB
0.200 km	N32A4DZPBA
0.500 km	N32A4DZPBAG
0.010 km	N32A4DZPBAGA
0.002 km	N32A4DZPBAGAA
…..	Etc.



Hemisphere	UTM zone	Band	Quadrant	100 km block	20 km block	5 km block	1 km block	0.2 km block	0.05 km block	0.01 km block	0.002 km block
N	32	A	4	D	Z	P	B	A	G	A	A

World Population Estimate



https://blogs.esri.com/esri/esri-insider/2016/03/30/updated-population-dataset-sharpens-focus-on-the-human-footprint/

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 analysis capabilities of R.

Need the R Statistical Software? Download it now.

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

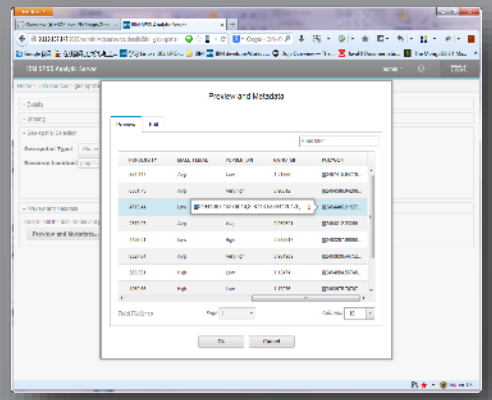
3 ★20

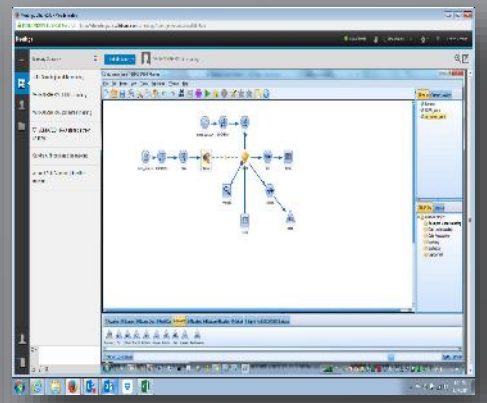
BROWSE ON GITHUB

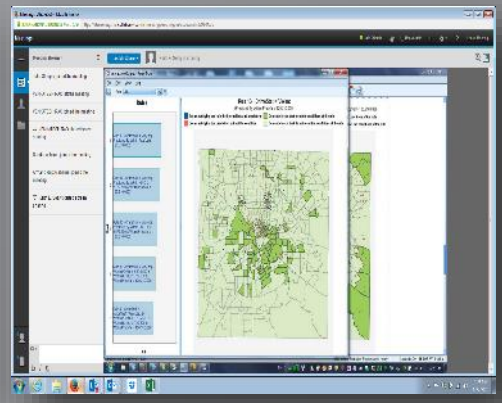
IBM Alignment with the Esri Platform

IBM DBMS, and SPSS statistics software that integrates Esri software libraries and uses the ArcGIS platform

Geodatabase







IBM DB2, Informix

Built with Esri PE and Spatial Libraries

SPSS Analytic Server

Built with Esri PE and Spatial Libraries, Java API

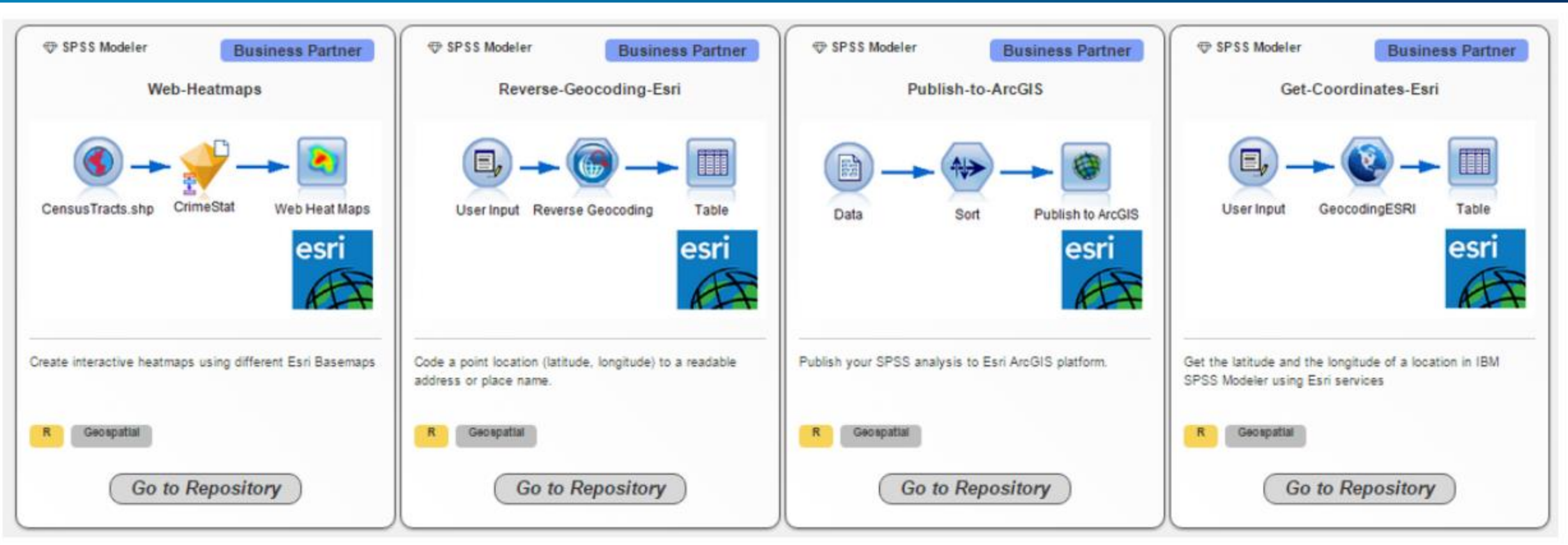
SPSS Modeler

Built on SPSS Analytic Server

SPSS Statistics

Built on SPSS Analytic Server

IBM has four extensions available:



http://ibmpredictiveanalytics.github.io/

System of Engagement

Open Data

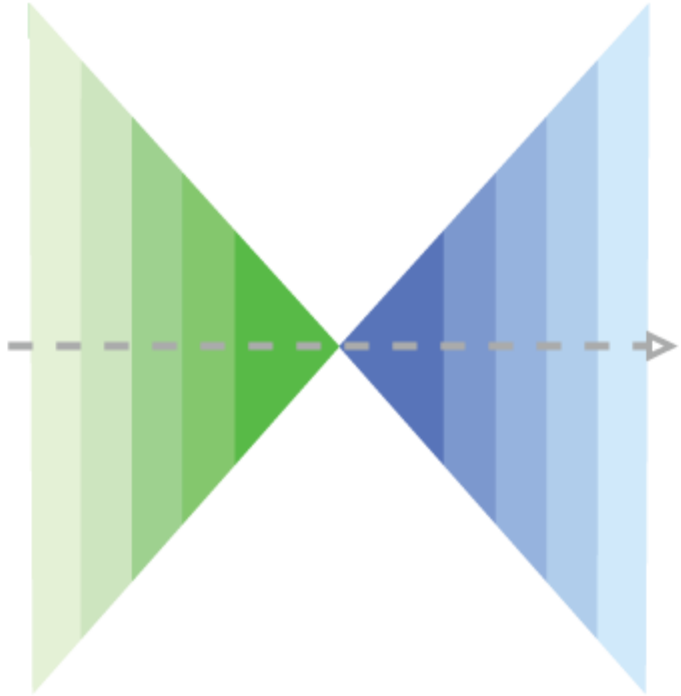
Share

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

A story map

esri

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."

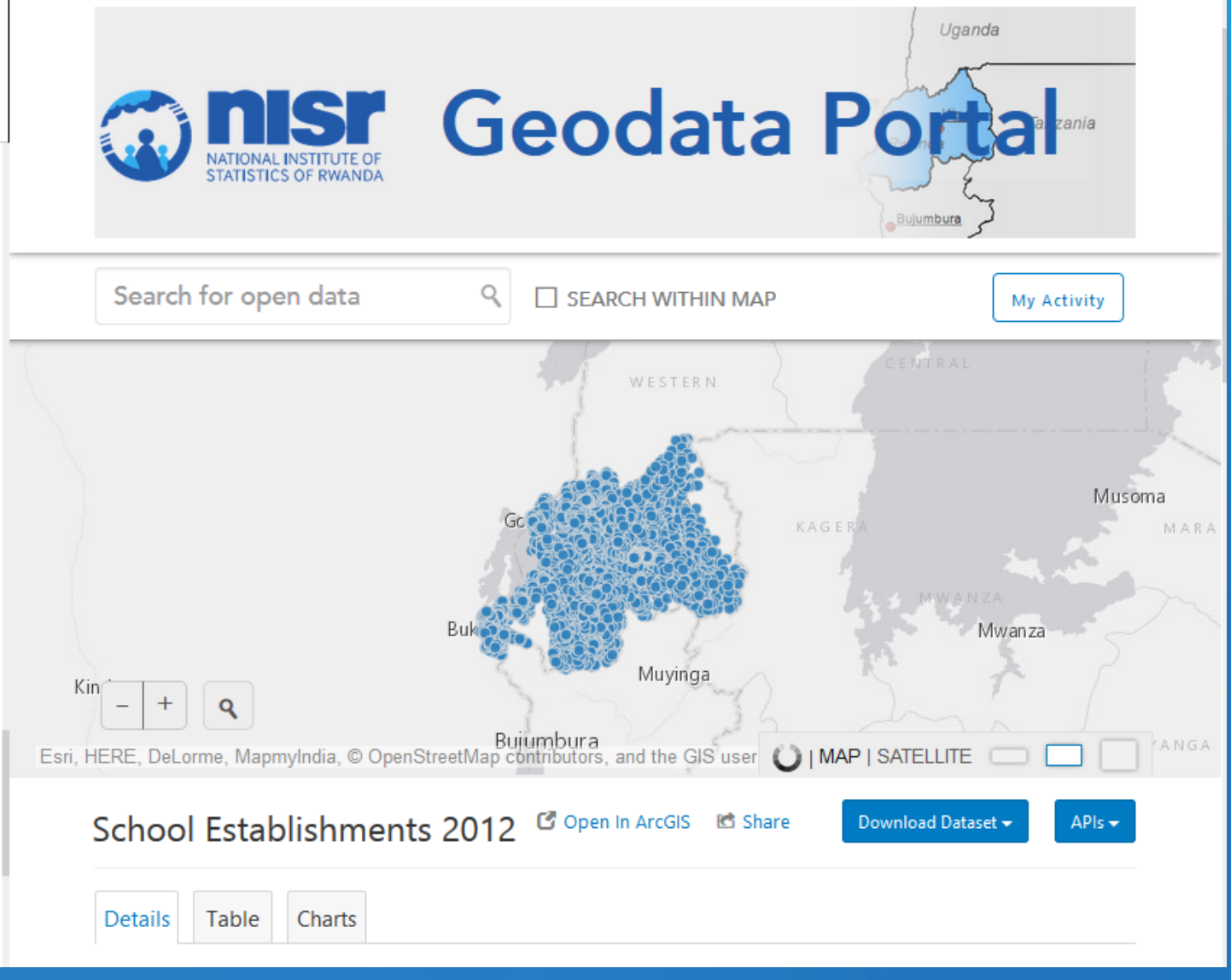
- Florent Bigirimana, Head of the GIS section of the National Institute of Statistics of Rwanda.

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

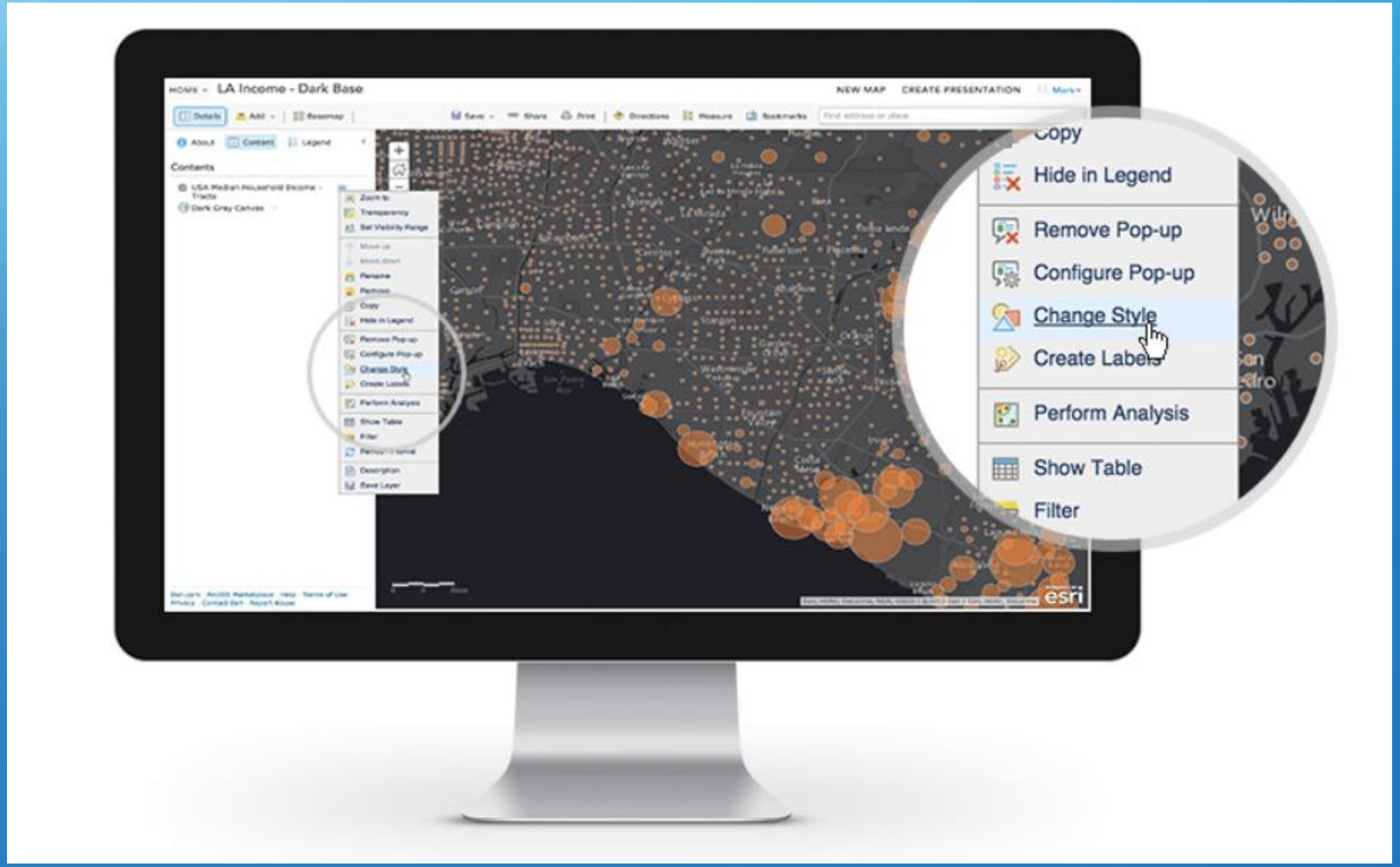
IRELAND

Census 2016 Preliminary Results

All Island Atlas Observatory

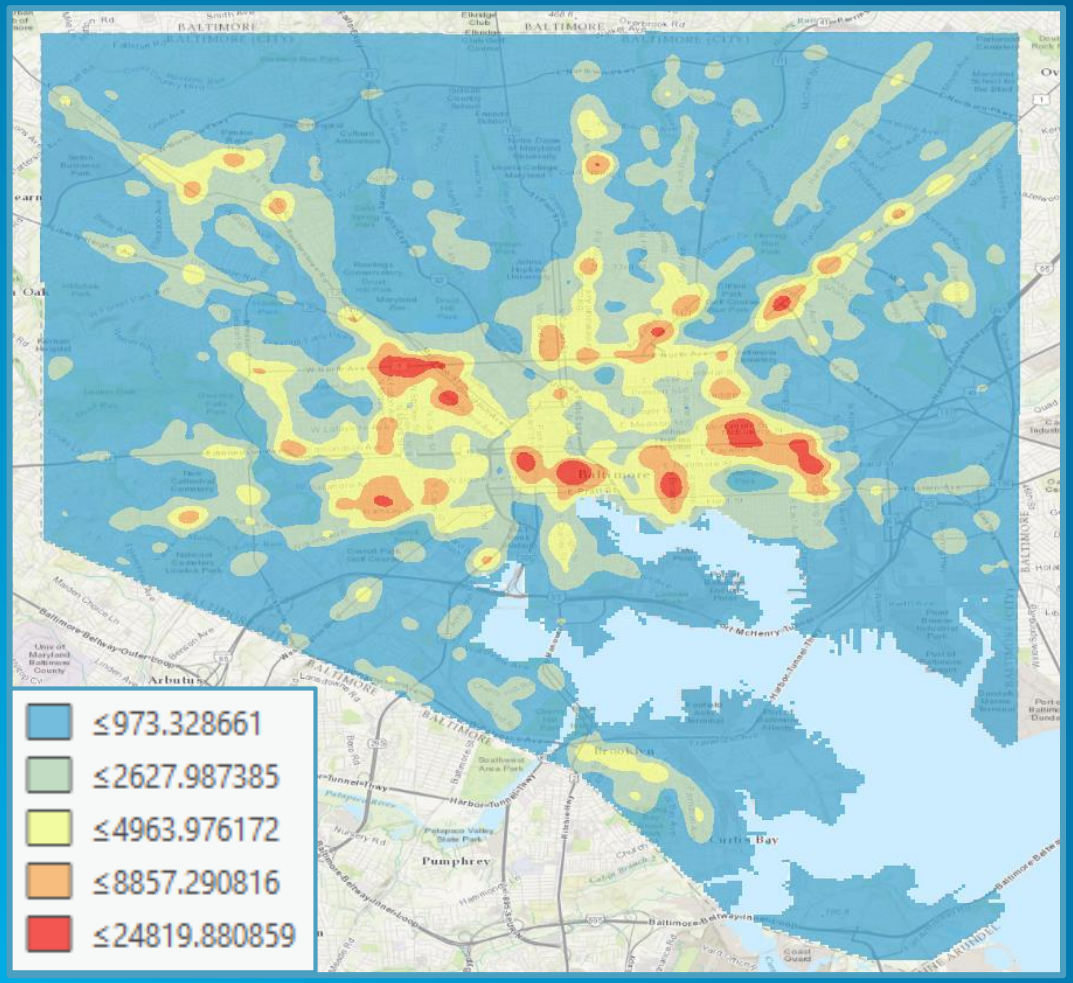


Smart Mapping

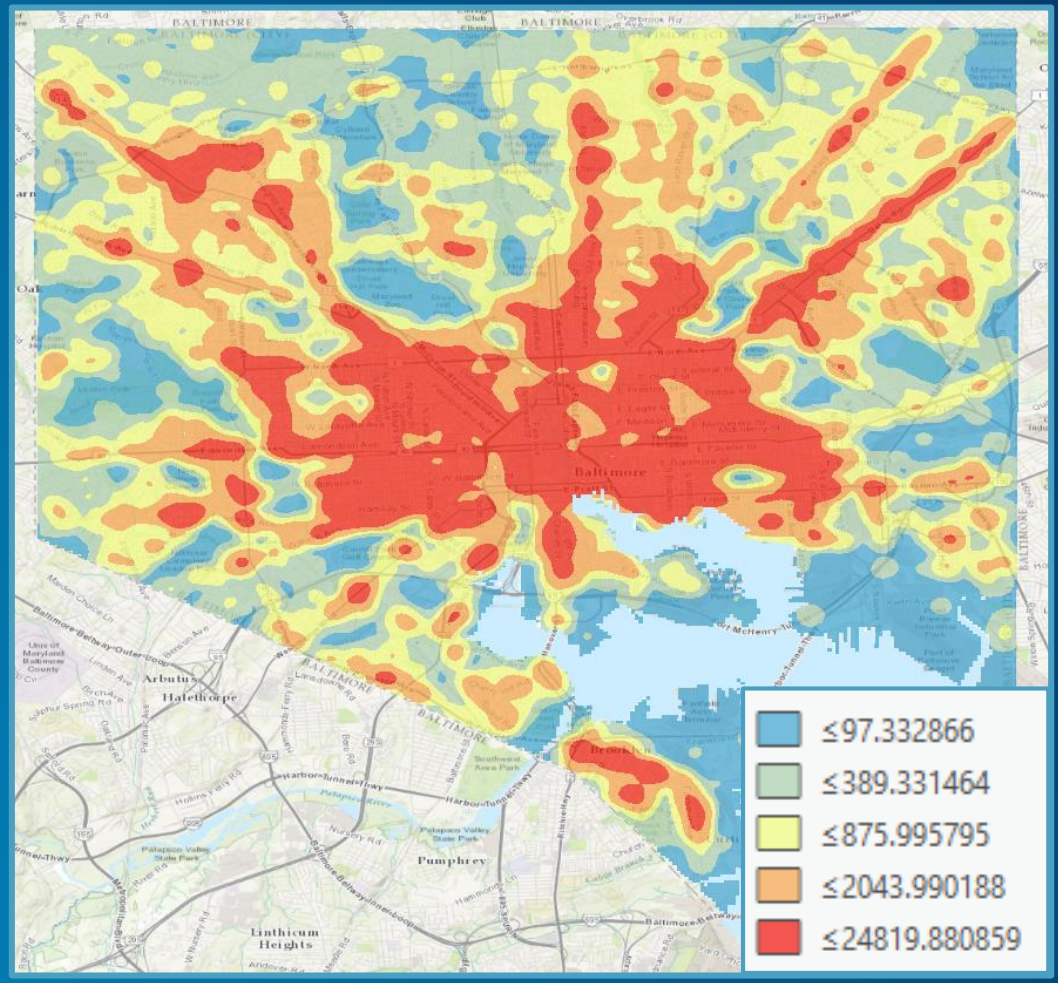


The subjectivity of visual pattern analysis

Natural Breaks



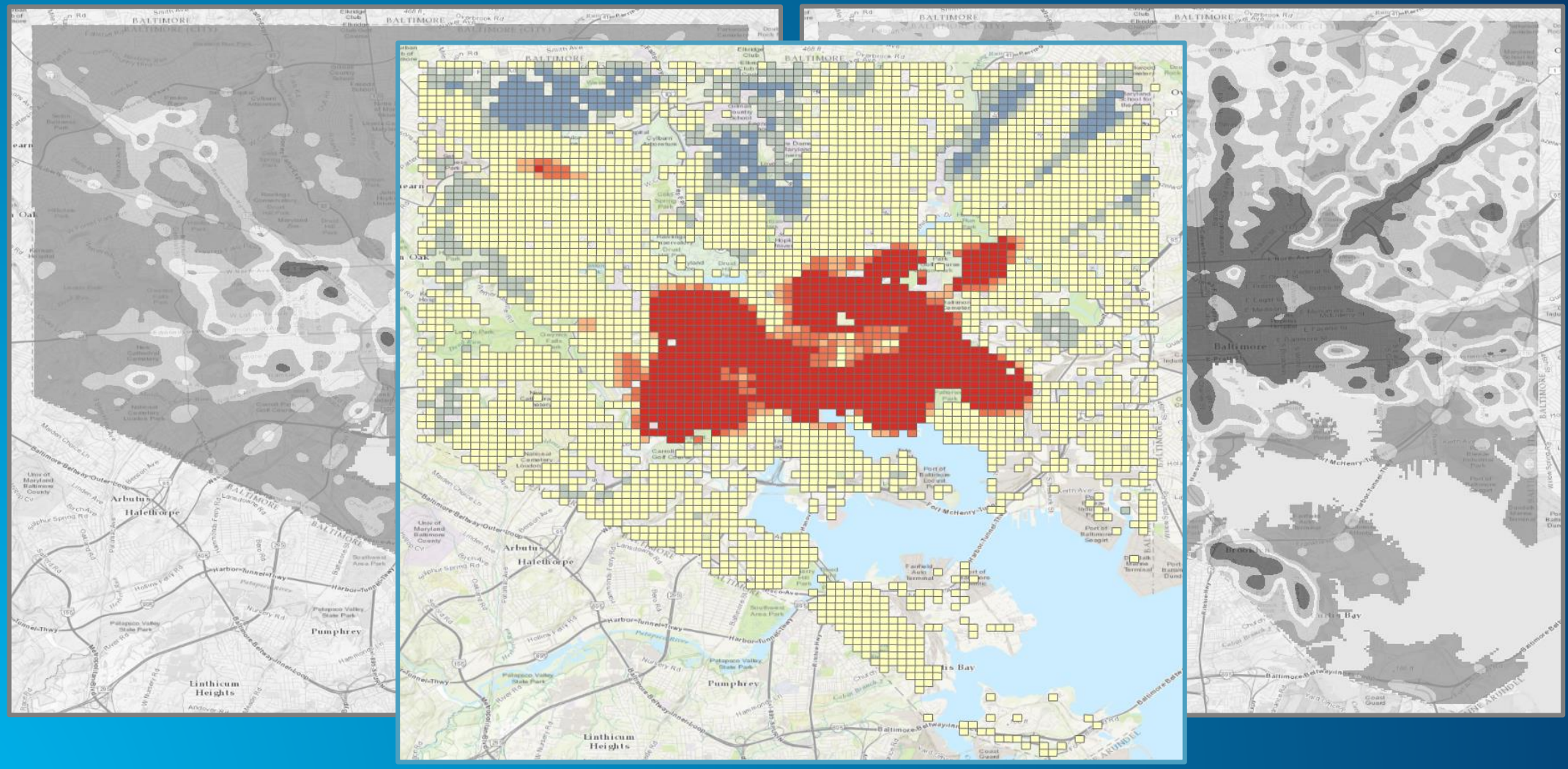
Quantile



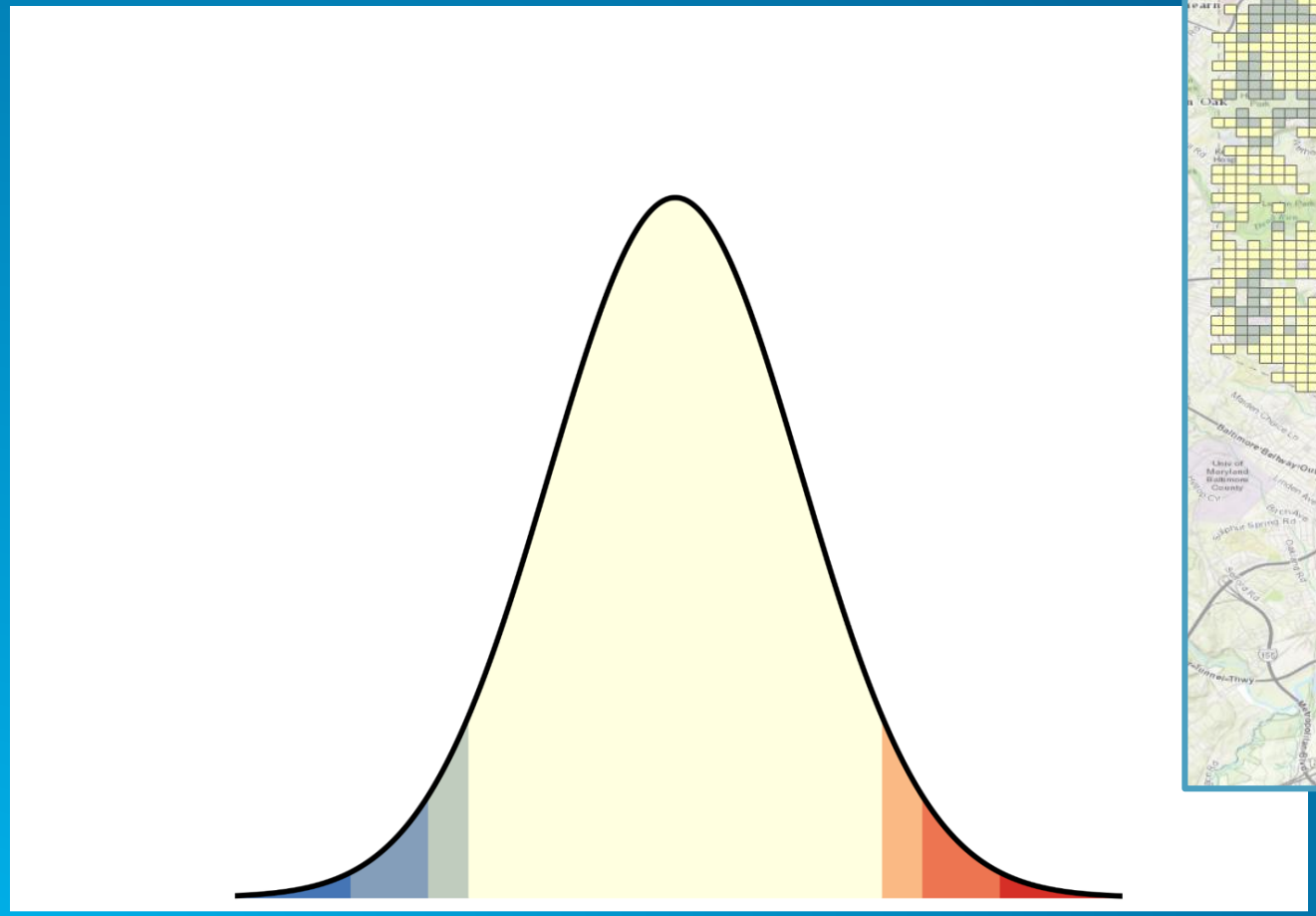
Where are the hot spots? Where is the variation greater?

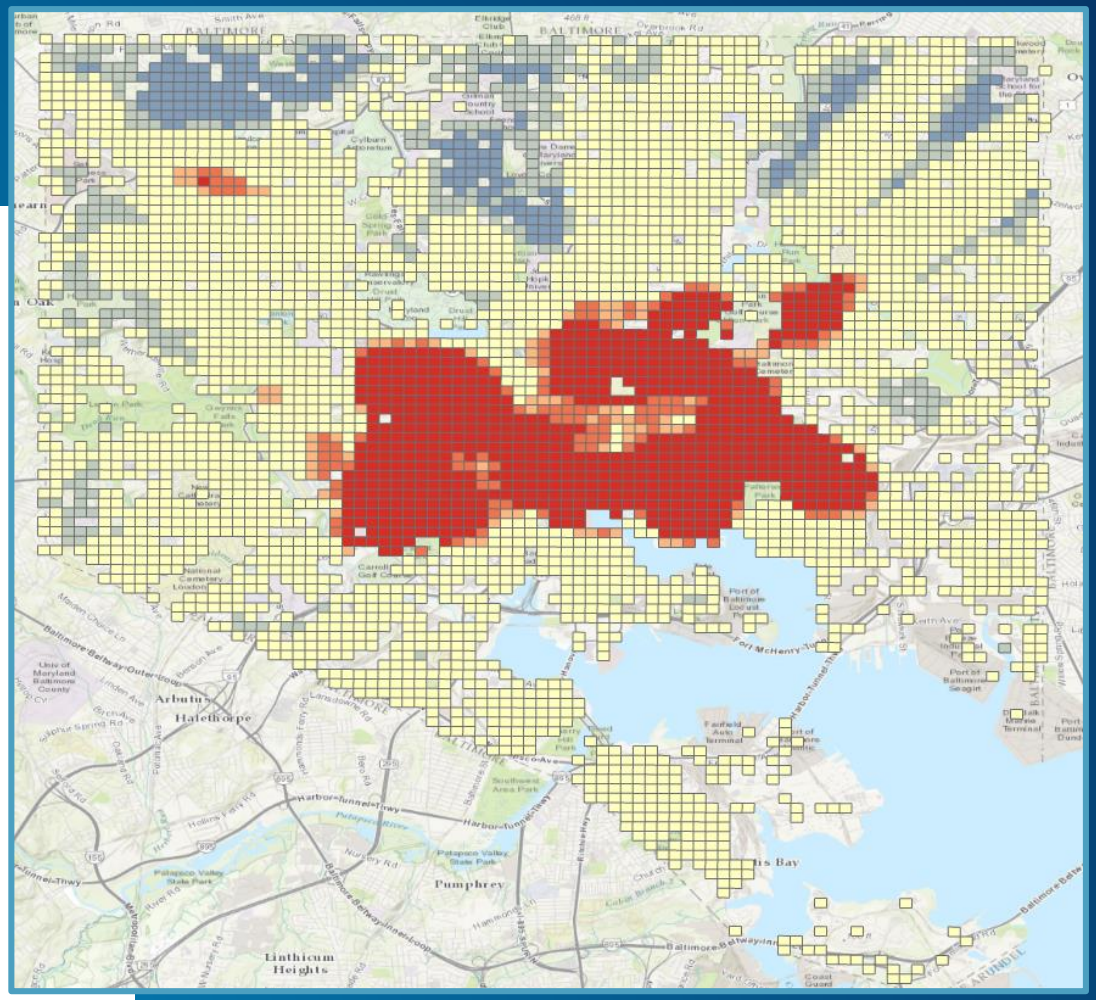
Minimizing the subjectivity

Turning the map into information



“…everything is related to everything else, but near things are more related than distant things.”


z-scores ...-2.58 -1.96 -1.65 0 1.65 1.96 2.58...
p-values ...0.01 0.05 0.10 0 0.10 0.05 0.01...


BALTIMORE
Arbutus
Halethorpe
Pumphrey
Linthicum Heights

New Hot Spot

Consecutive Hot Spot

Intensifying Hot Spot

Persistent Hot Spot

Diminishing Hot Spot

Sporadic Hot Spot

Oscillating Hot Spot

Historical Hot Spot

New Cold Spot

Consecutive Cold Spot

Intensifying Cold Spot

Persistent Cold Spot

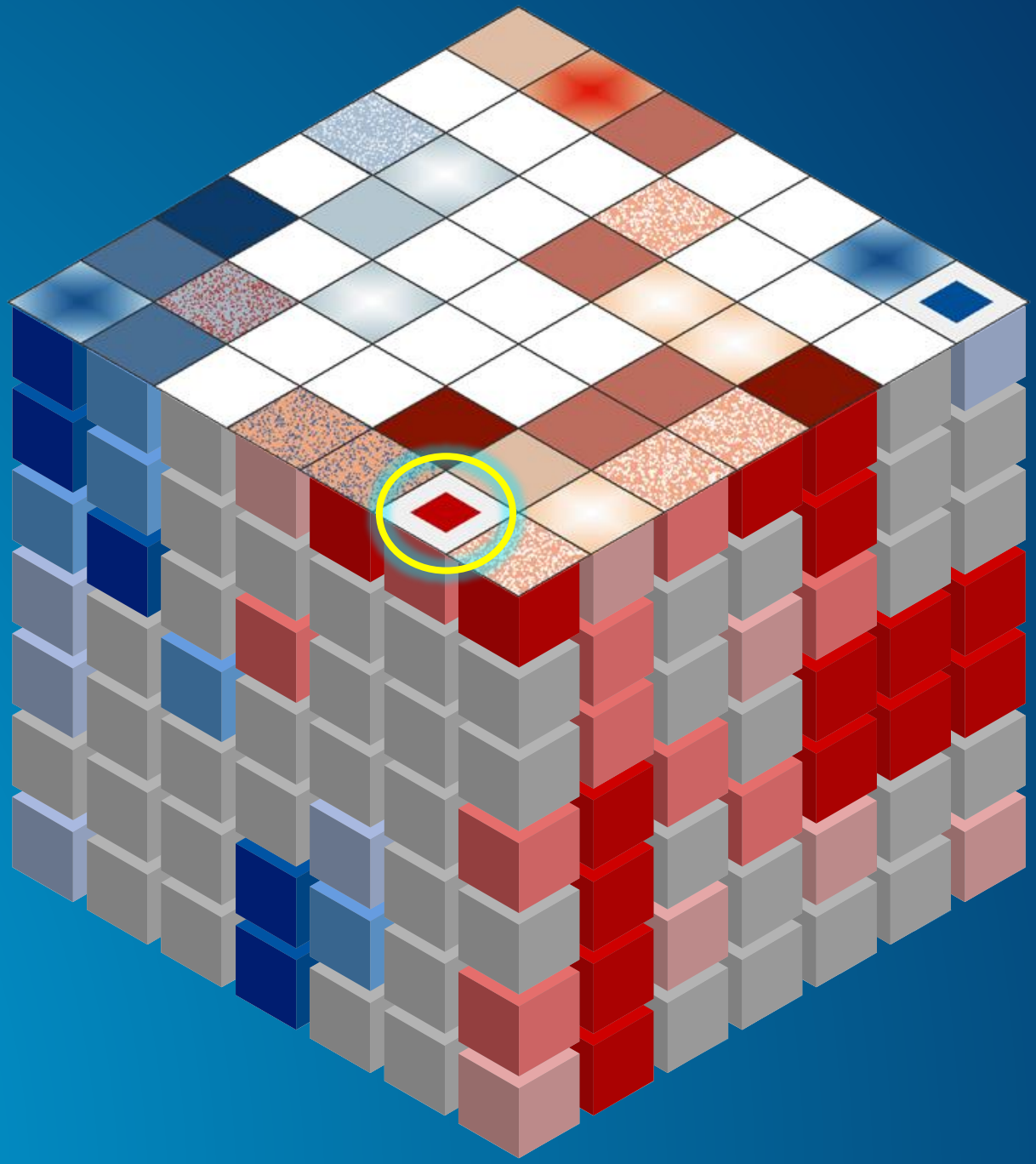
Diminishing Cold Spot

Sporadic Cold Spot

Oscillating Cold Spot

Historical Cold Spot

No trend detected



Understanding the SDGs

Location Platform Can Support the NSO Enterprise

Making Mapping and Spatial Analysis available across the NSO

GIS Empowers Everyone

Expanding Impact Across the Organization

Providing Everyone the Geographic Advantage

GIS Transforms Organizations

Creating Shared Information and Facilitating Collaboration

Networked

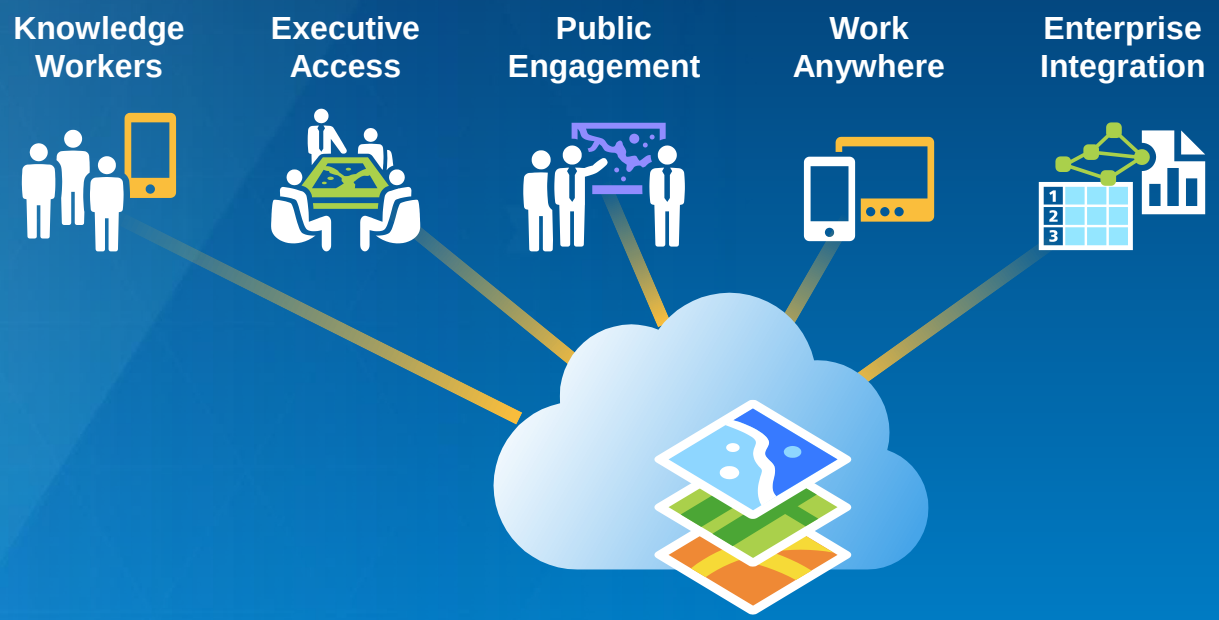
Shared Geographic Understanding

Opening Access and Engaging Everyone

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