

# ArcGIS Maps for Power BI Workshop

Robin Appleby  
Miles Gabriel



# Today's Agenda

- 11:00-13:00 ArcGIS Maps for Power BI
- 13:00-14:00 Lunch
- 14:00-15:00 ArcGIS tools for Data Analysis
- 15:00-16:00 Providing Simple Access to Information



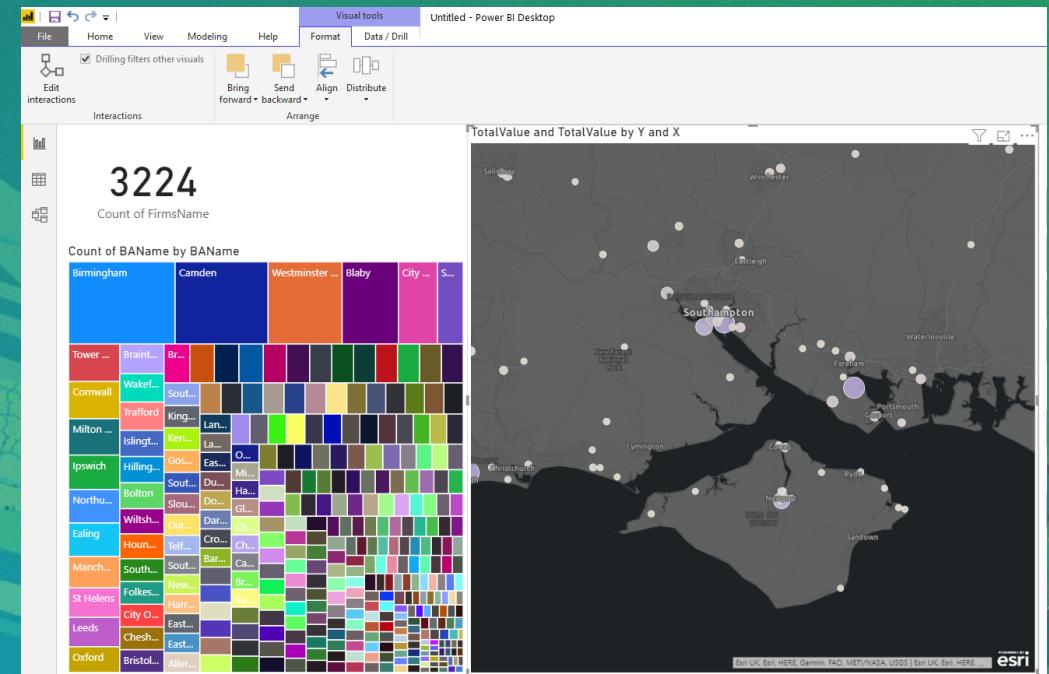
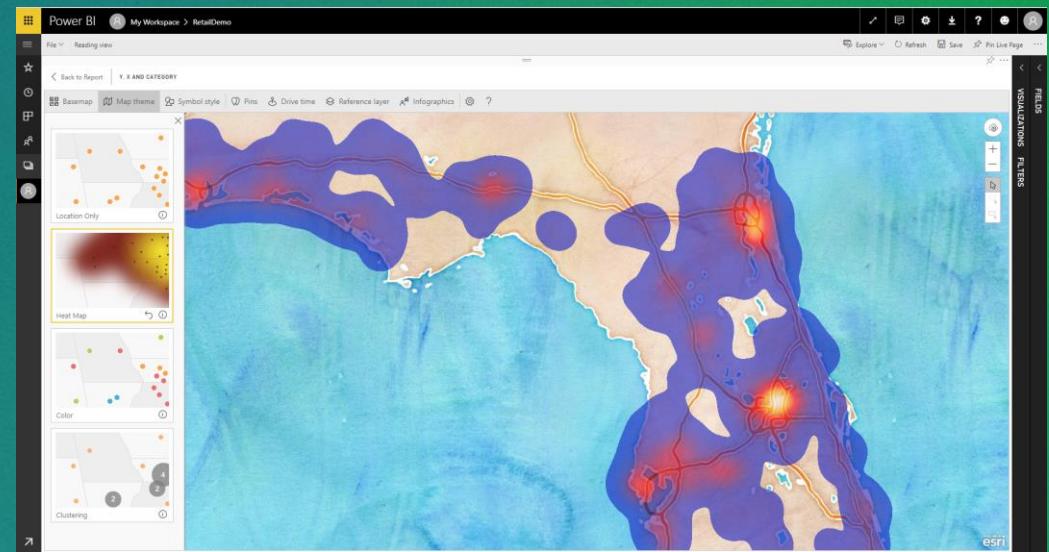
# ArcGIS Maps for Power BI

- Intro
- Demo / Exercise 1
  - Mapping VOA data
- Demo / Exercise 2
  - Performing Spatial Analysis
- Demo / Exercise 3
  - Accessing content from ArcGIS Online
- Licensing ArcGIS Maps for Power BI



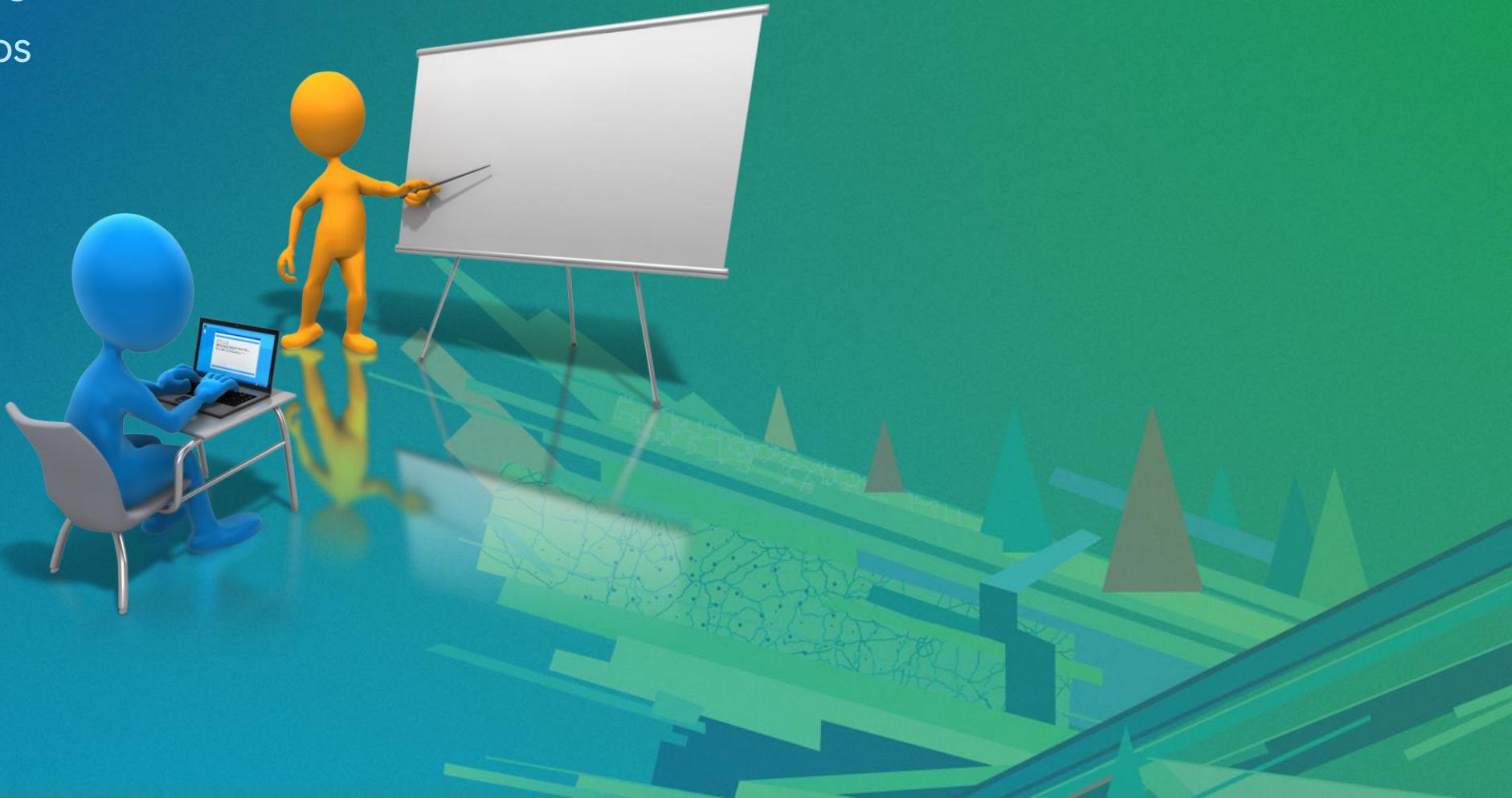
# ArcGIS Maps for Power BI

- Built-in visual in Microsoft Power BI
- What does it do?
  - Creates map visualizations
  - Gives access to ready-to-use geographic content
  - Provides accurate spatial analysis
- Who uses it?
  - Data analyst
  - Business analyst
  - Self-service BI community



# DEMO - Mapping data in Power BI

- Mapping and styling data
- Choosing basemaps



# Exercise 1 – Mapping Valuation Data

- Add Data
  - VOA\_NonDomesticRatingSummaryValuations\_2017\_06.xlsx
- Add an ArcGIS Maps for Power BI visualisation
- Map Data
  - Drag Postcode field onto Location well
- Size dots by Total Value
  - Drag TotalValue field onto Size well
- Colour dots by Billing Authority Name
  - Drag BAName field onto Color well
- Add additional fields as tooltips
  - Drag any other fields onto Tooltips well
- Explore Basemap, Map Theme and Symbol Style options
  - Edit visualisation
- Save when finished

The screenshot shows the Power BI desktop interface with the 'Visualizations' pane open. A blue arrow points from the 'Postcode' field in the 'Location' well of the visualization's settings to the 'Postcode' field in the 'Fields' pane. The 'Fields' pane lists various data fields categorized under 'VOA\_Sample'. The 'Postcode' field is checked, indicating it is selected for the visualization.

Visualizations >

Fields >

Search

VOA\_Sample

- AdoptedRV
- AssessmentRef
- BAName
- BARef
- BillingAuthori...
- Country
- FirmsName
- FromDate
- ListYear
- Locality
- Match\_type
- NameNumber
- Postcode
- PrmiaryDescri...
- RecordType
- SCATCode
- SchemeRef
- Score
- Status
- Street
- SubStreet

Location

Postcode

Latitude

Add data fields here

Longitude

Add data fields here

Size

TotalValue

Color

TotalValue

Time

Add data fields here

Tooltips

# Mapping data in Power BI

- Location Field

- Address (or part address) - Geocoded by World Geocoding Service

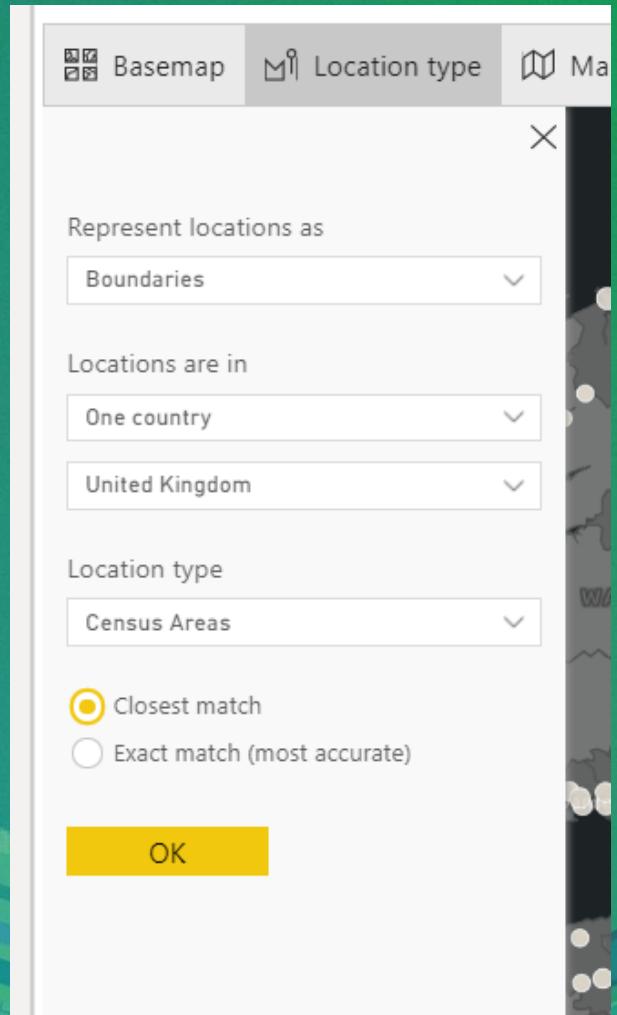
Note: Subject to limits as described in licensing section

- Standard Admin / Postal Boundaries

- Countries, Regions, Counties, Districts, Census Areas
- Postal Areas, Districts, Sectors

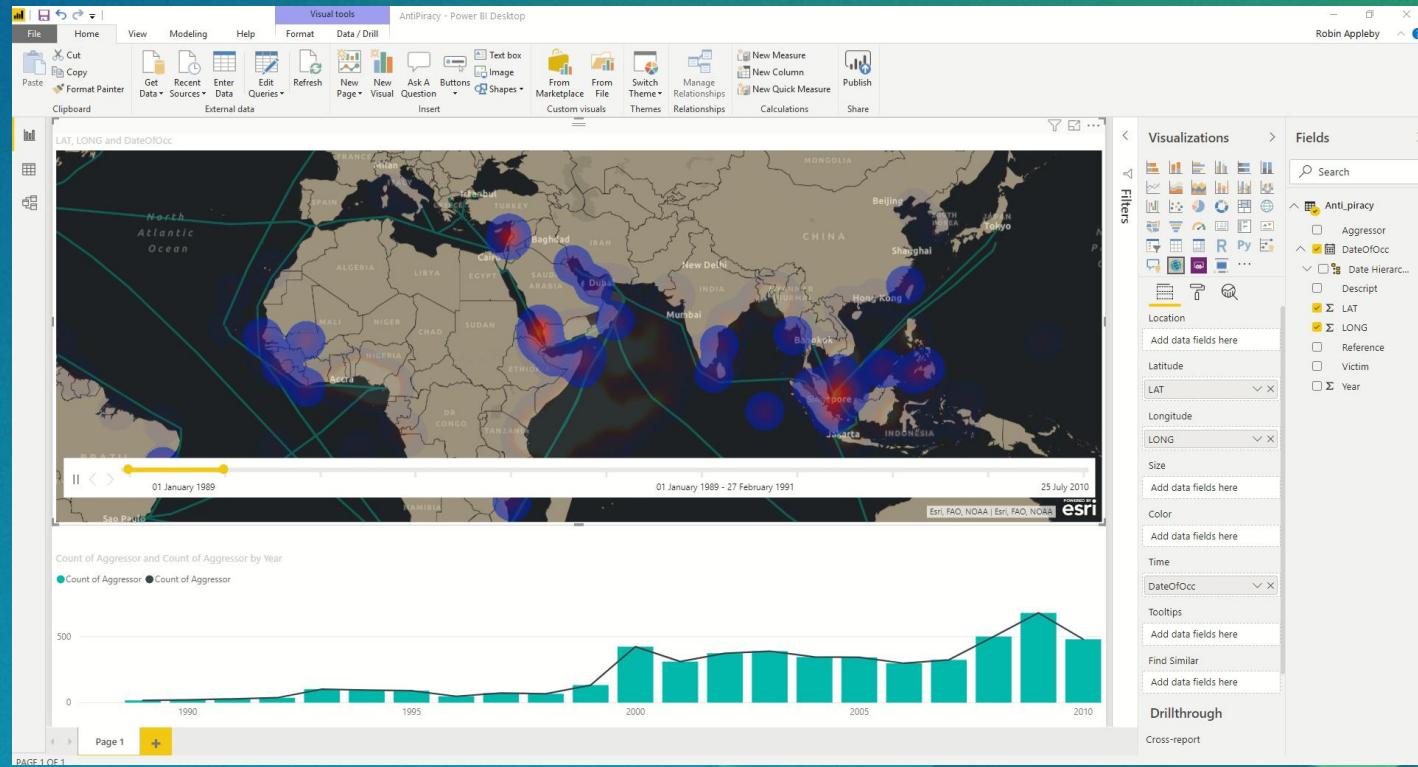
- Lat / Long fields

- X and Y values in World Geodetic System 1984 (WGS84) coordinate system



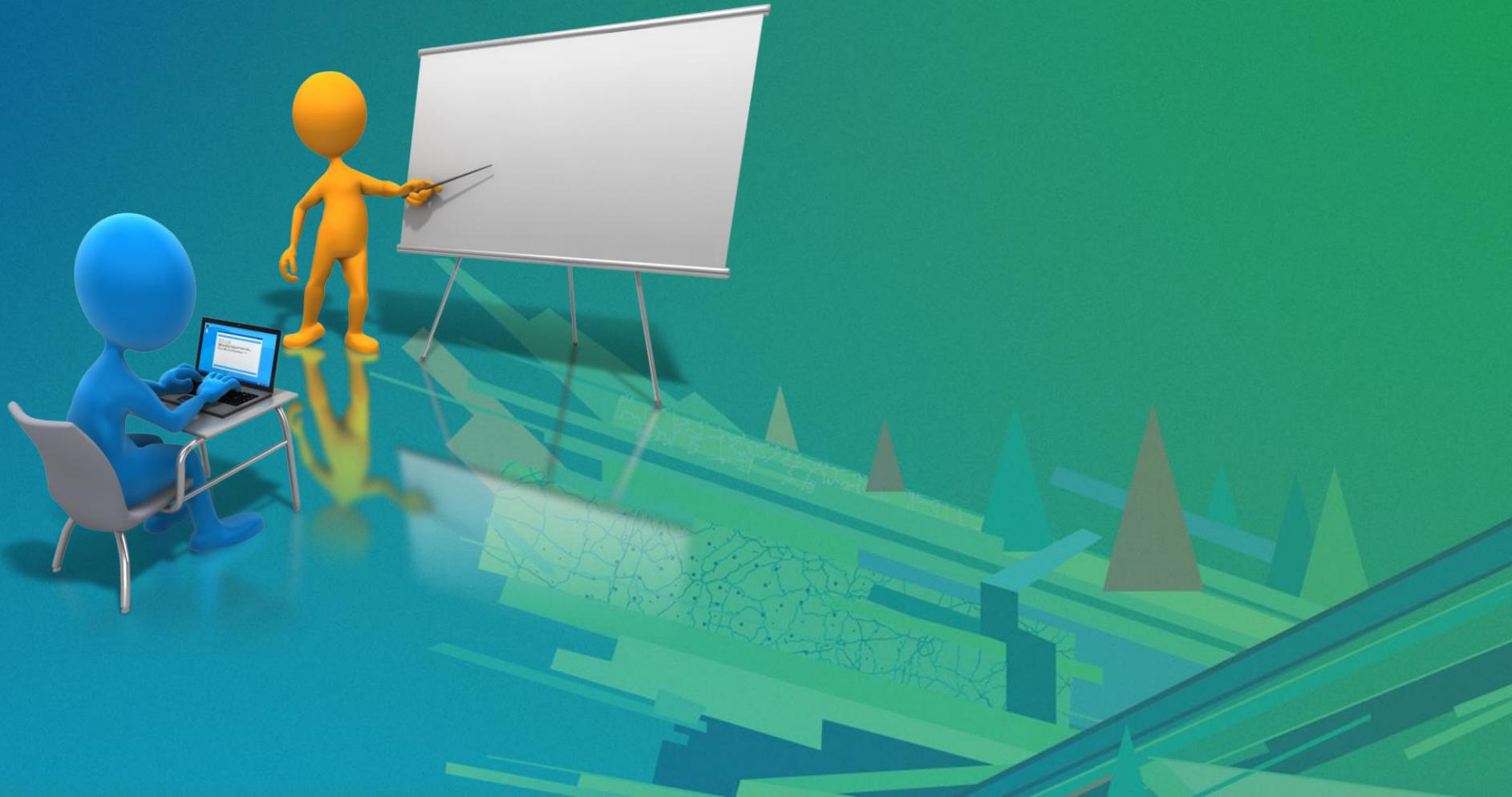
# Mapping data in Power BI

- Time Field
  - Data must be formatted as Date or Date/Time using the Power BI modelling tools.



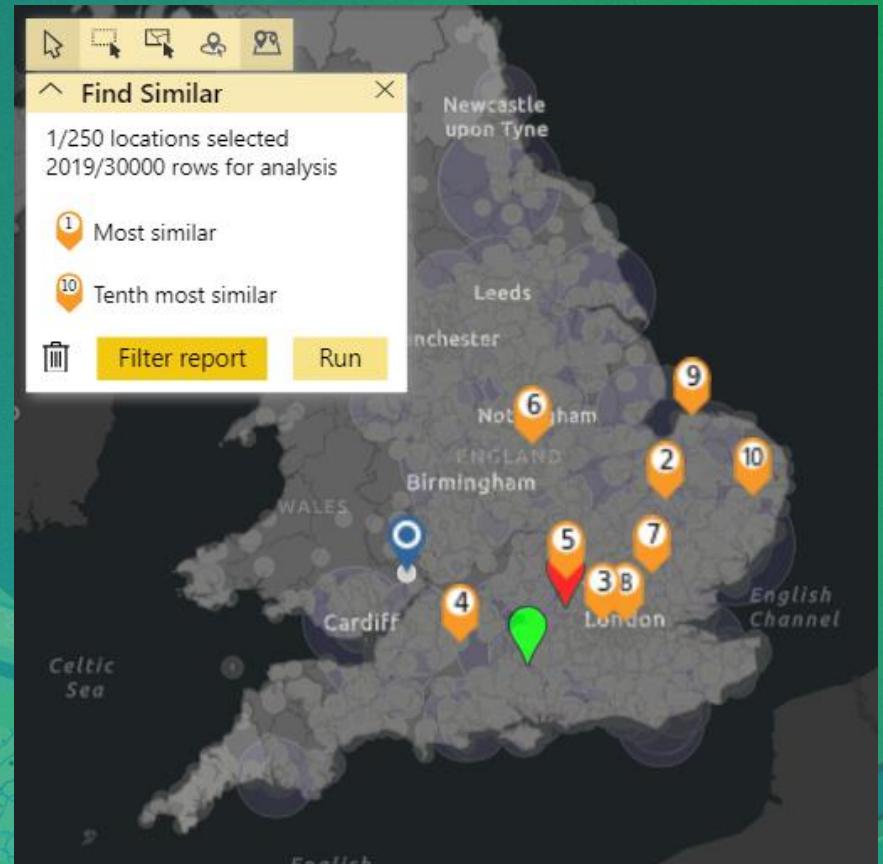
## DEMO - Mapping data in Power BI

- Mapping data by boundaries



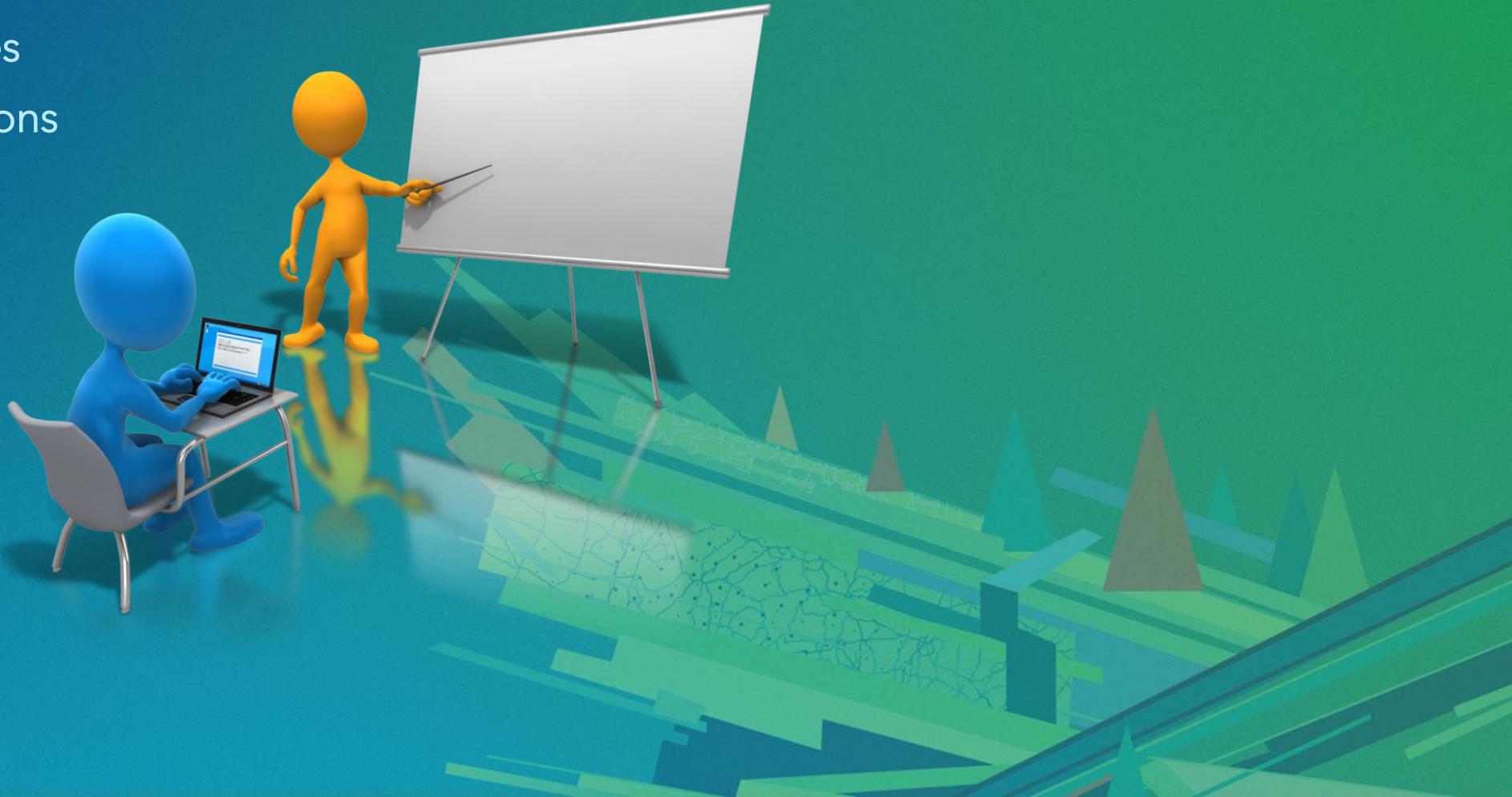
# Find Similar Locations

- The Find Similar feature lets you quickly identify locations with attributes comparable to those of locations currently selected on the map
- How it works
  - Drag up to five numerical fields into the Find Similar well
  - Select location(s) from the map using the Find Similar
  - Find Similar ranks the top 10 search locations by how closely they match your reference locations, highlighting them on the map with numbered pins.



# DEMO - Performing Spatial Analysis in Power BI

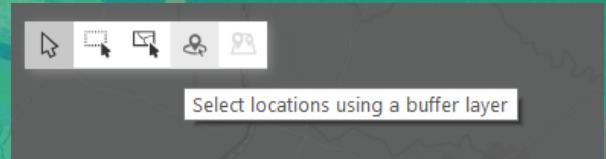
- Adding pins
- Creating Drivetimes
- Performing Selections



## Exercise 2 – Performing Spatial Analysis

- Add another visualisation to your dashboard (e.g. Treemap of Primary Description)
- Test selections from Charts to Map and vice-versa
- Adding Pins
  - Edit visualisation > Pins > Search for Location
  - Add a pin for home and work (Change names and colours as desired)
- Drivetimes
  - Drivetimes > Select both pins added (use Shift-click to select more than one point)
  - Set search area to 15 minutes > Go > Alter resulting symbology as desired > Back to Report
- Selections using Drivetimes
  - Choose the Select locations using a buffer layer tool
  - Select a drivetime to identify intersecting points
- Find Similar
  - Add TotalArea and TotalValue to the Find Similar well
  - Select a location on the map and run Find Similar

Save & Close when finished.



# ArcGIS Apps



## Desktop-based



ArcGIS Pro



ArcMap

## Web-based



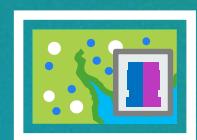
Community Analyst



ArcGIS Maps  
for Power BI



Story Maps



Insights

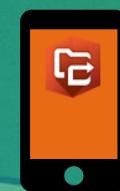
## Mobile-based



Collector



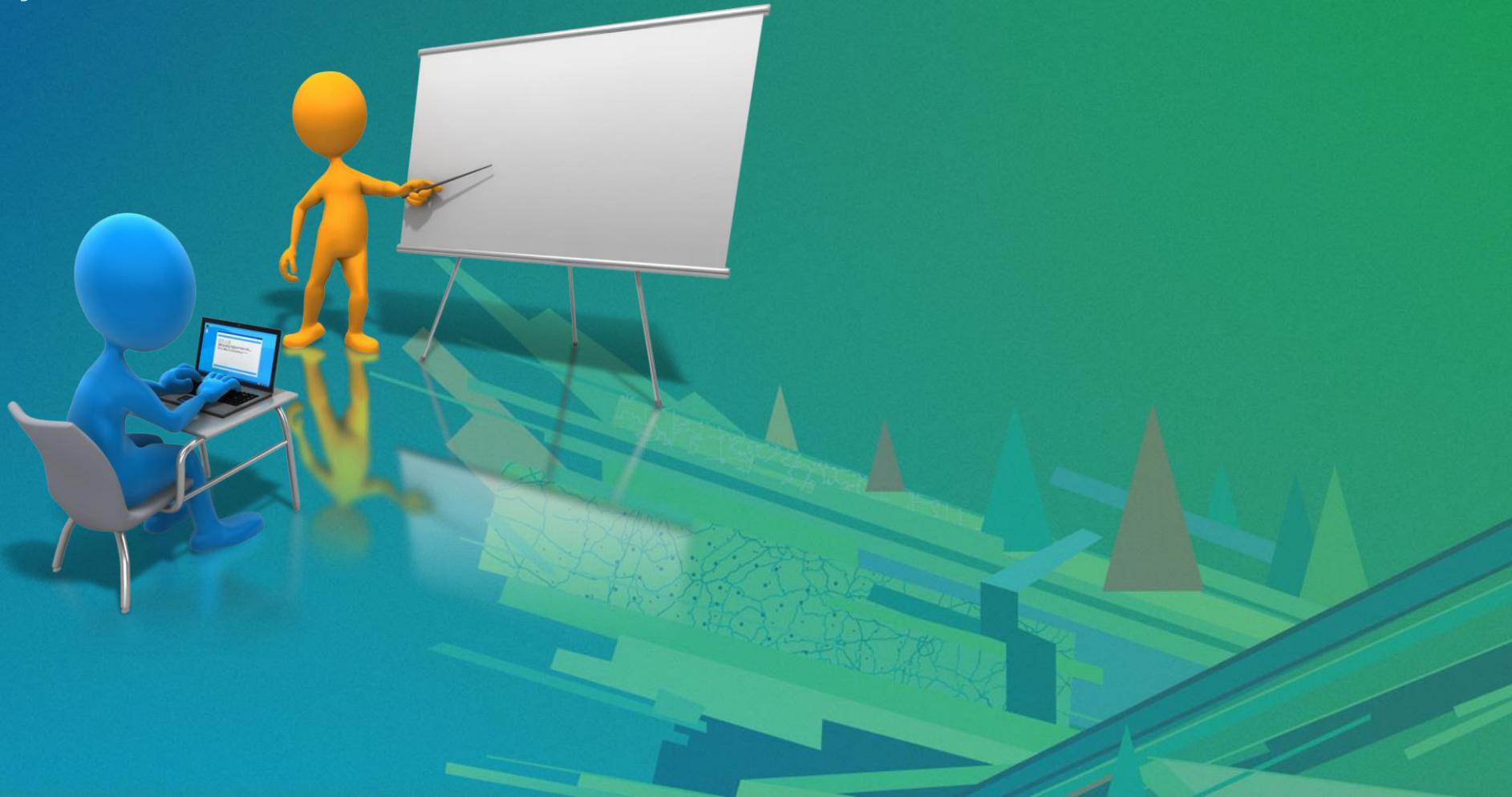
Survey123



Workforce

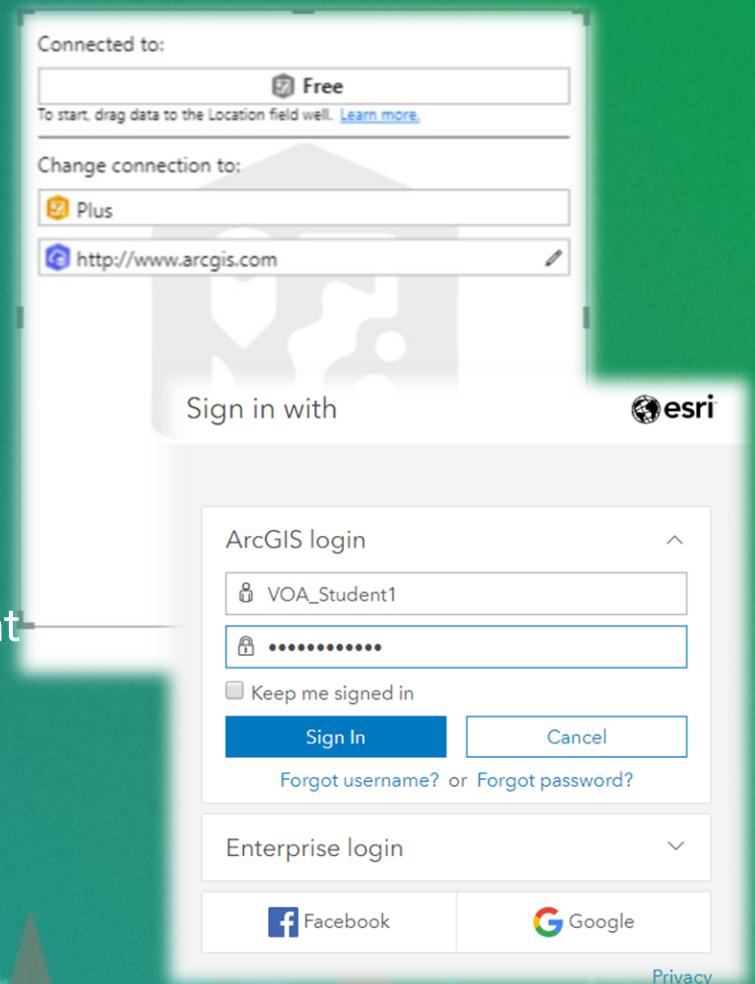
# DEMO - Accessing ArcGIS Online content in Power BI

- Adding reference layers
- Infographics



# Exercise 3 – Accessing content from ArcGIS Online

- Open a new dashboard and add an ArcGIS Maps visualisation
  - Change connection to <http://www.arcgis.com>
- Map the Geocoded VOA data using Lat/Long
  - X = Long, Y = Lat
- Add Local Authority Districts to the map
  - Edit visualisation > Reference Layers > Search ArcGIS / Public Content
  - LADs 2017 - use LAD Boundaries 2017 (PowerBI Version)
- Add Infographics to the map
  - World Demographics > United Kingdom
  - Total Population, Total Households, Purchasing Power
- Infographics for LA boundary
  - Use default map selection tool
- Select Points within LA Boundary
  - Use Select Locations using Reference Layer tool



# Licensing ArcGIS Maps for Power BI

ArcGIS Maps for Power BI	Included	ArcGIS Online	ArcGIS Enterprise
Basemaps			
Basic basemaps (4)	✓	✓	✓
Esri standard basemaps (12)		✓	✓
Custom basemaps from your GIS dept		✓	✓
Geocoding			
Small (3.5k per map/100k per month)	✓		
Medium (5k per map/1M per month)			
Large (10k per map/no monthly limit)		✓	✓
Reference Layers			
US demographics	✓	✓	✓
Public feature layer search	✓	✓	✓
Living Atlas maps and layers		✓	✓
Private maps and layers from your GIS dept		✓	✓
Infographics			
United States	✓	✓	✓
Global		✓	✓
Access to ArcGIS			
Inside Power BI	✓	✓	✓
Outside Power BI (apps, ArcGIS Online, etc.)		✓	✓

# Known Limits with ArcGIS Maps for Power BI

- Geocoding
  - Free - 3,500 points per map, 10,000 per month
  - With ArcGIS - 10,000 points per map, 1,000,000 per month
- Mapping lat/long data
  - Chrome, Firefox, Edge - 30,000 locations
  - Internet Explorer 11 - 10,000 locations
- Mapping boundary data
  - Chrome, Firefox, Edge - 15,000 polygons per map
  - Internet Explorer 11 - 5,000 polygons per map
- Selections
  - A maximum of 250 locations can be selected on the map

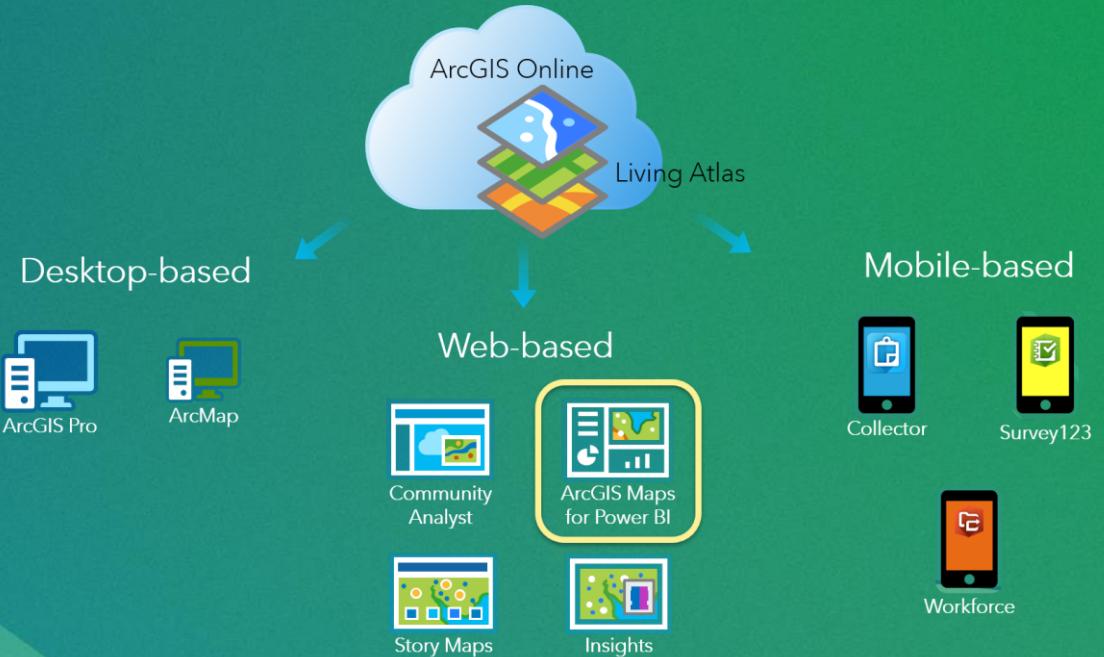


# Today's Agenda

- 11:00-13:00 ArcGIS Maps for Power BI
- 13:00-14:00 Lunch
- 14:00-15:00 ArcGIS tools for Data Analysis
- 15:00-16:00 Providing Simple Access to Information

# ArcGIS tools for Data Analysis

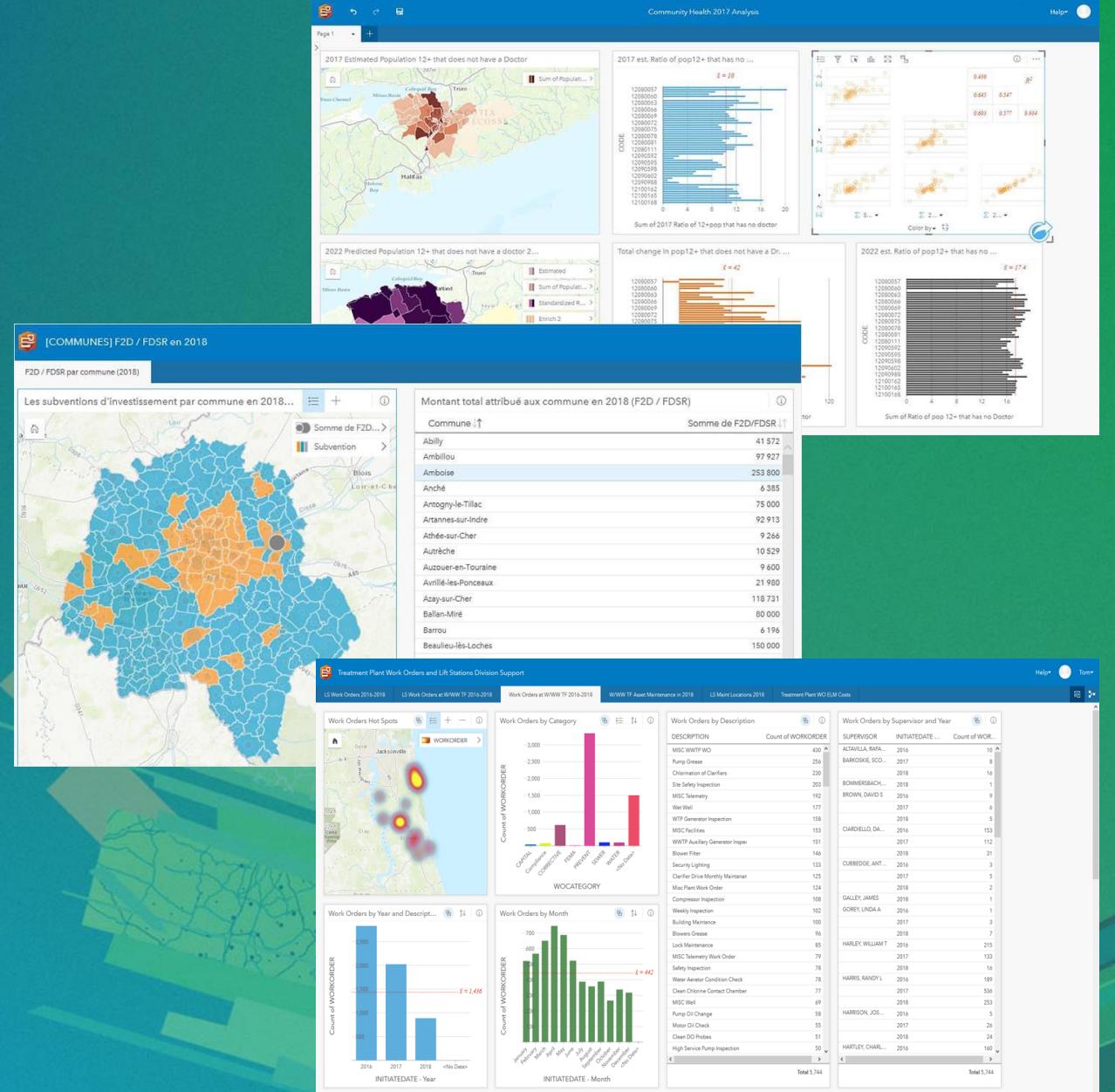
- ArcGIS Insights
  - data analytics workbench for combining spatial and non spatial data
- Community Analyst
  - a cloud-based mapping solution that provides simple analysis and reporting
- Other ArcGIS capabilities
  - ArcGIS Pro
  - Jupiter Notebooks / Notebook Server
  - R-bridge
  - Developer APIs

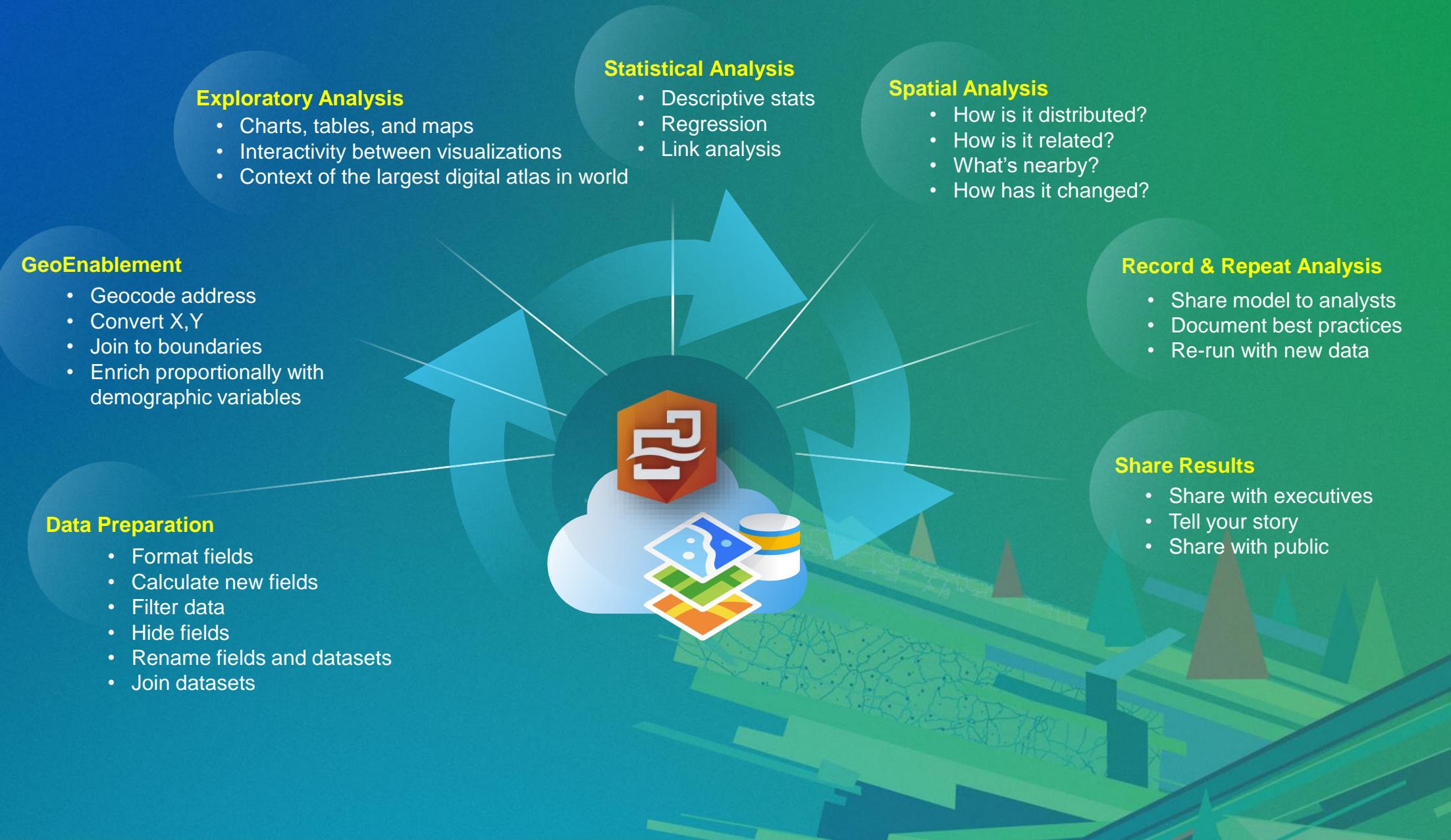


# ArcGIS Insights

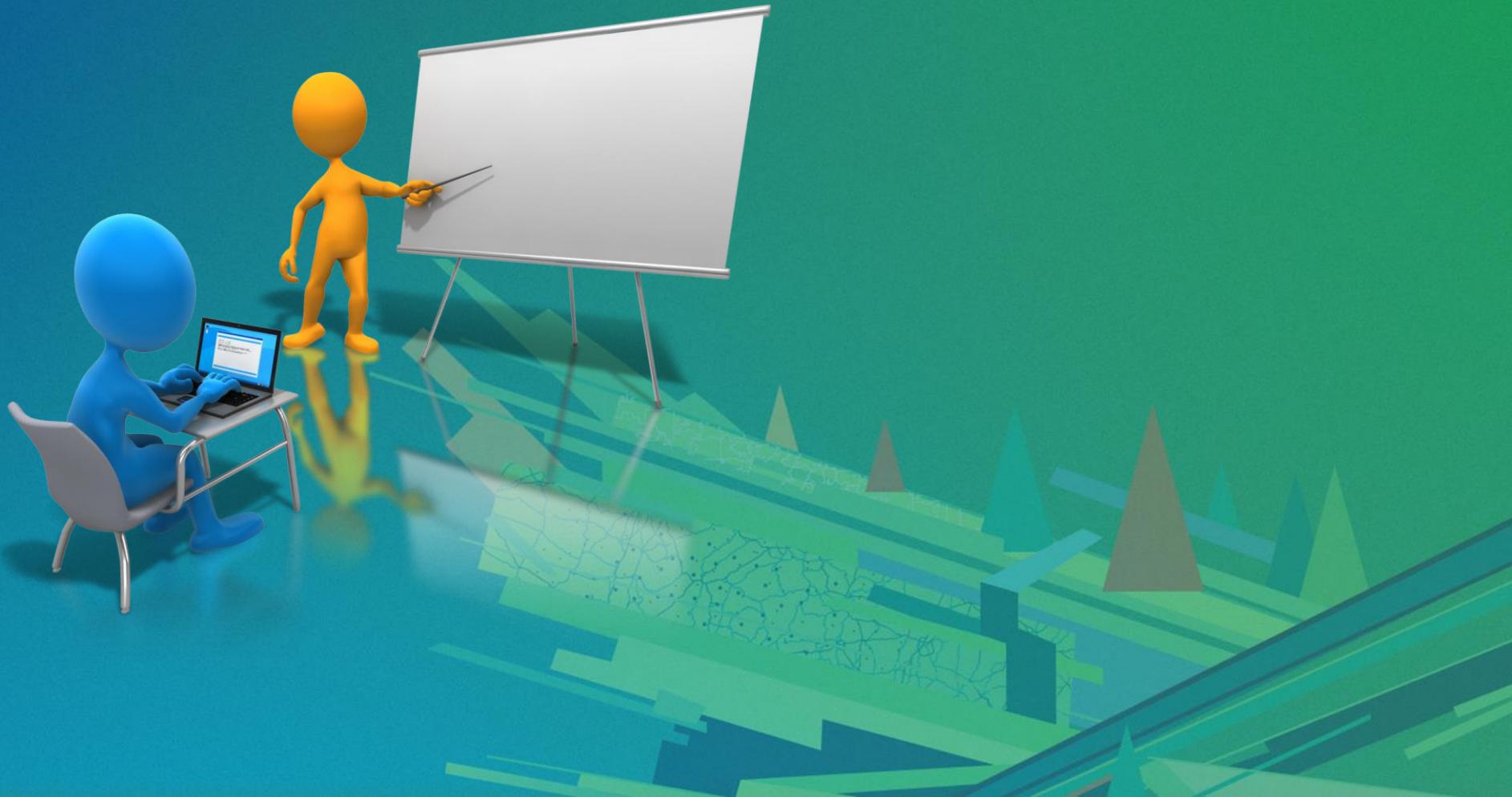


- Combine all data in one place
  - Business Data and Spatial data together in one place
- Simple visualisation of data
- Powerful analysis made simple
  - Spatial Analysis
  - Statistical Analysis



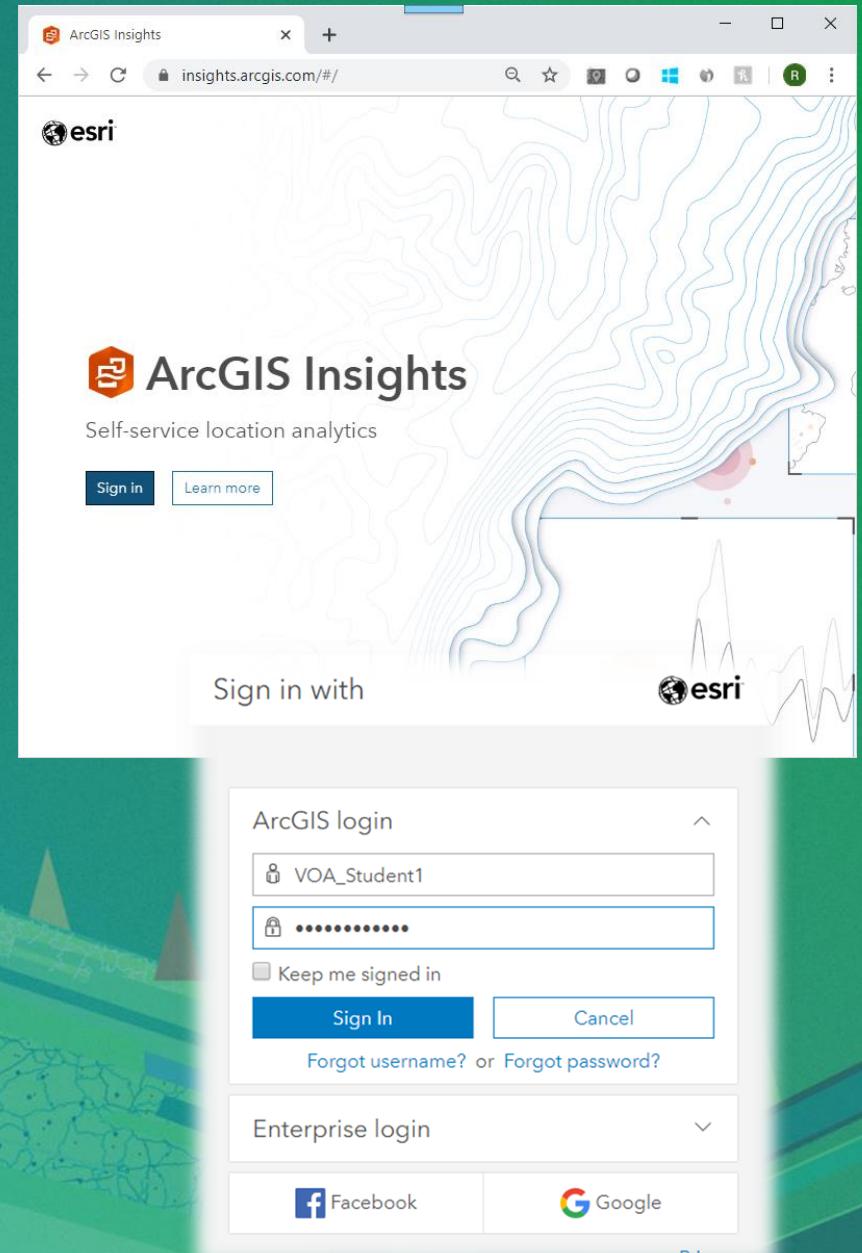


# DEMO - ArcGIS Insights



# ArcGIS Insights - Exercise 4

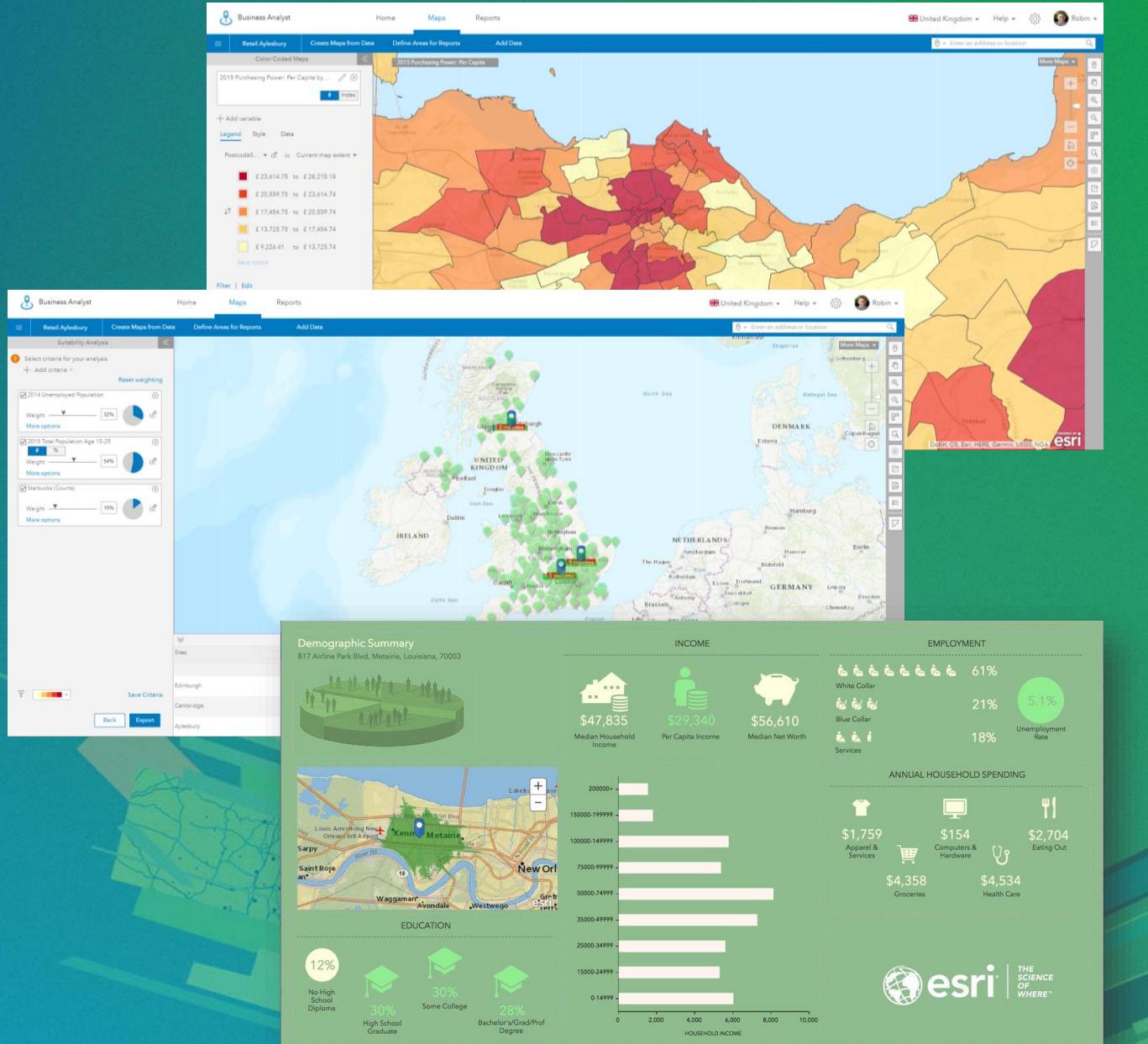
- Create Workbook
- Add data - Organisation > LADs & Geocoded\_VOA\_Data
- Enable Location on VOA Data
- Drag points onto LAD map, change symbology
- Create BubbleChart - Primary Description v Total Value
- Aggregate data by Layer - Average Total Value
- Create TreeMap/Other - LADName v Average Total Value
- Enrich - households/population and purchasing power
- Create New Field - Density (Popn/Area)
- Create Scatter Plots
  - Density v Av Value
  - Purchasing Power v Av Value
- Examine Model



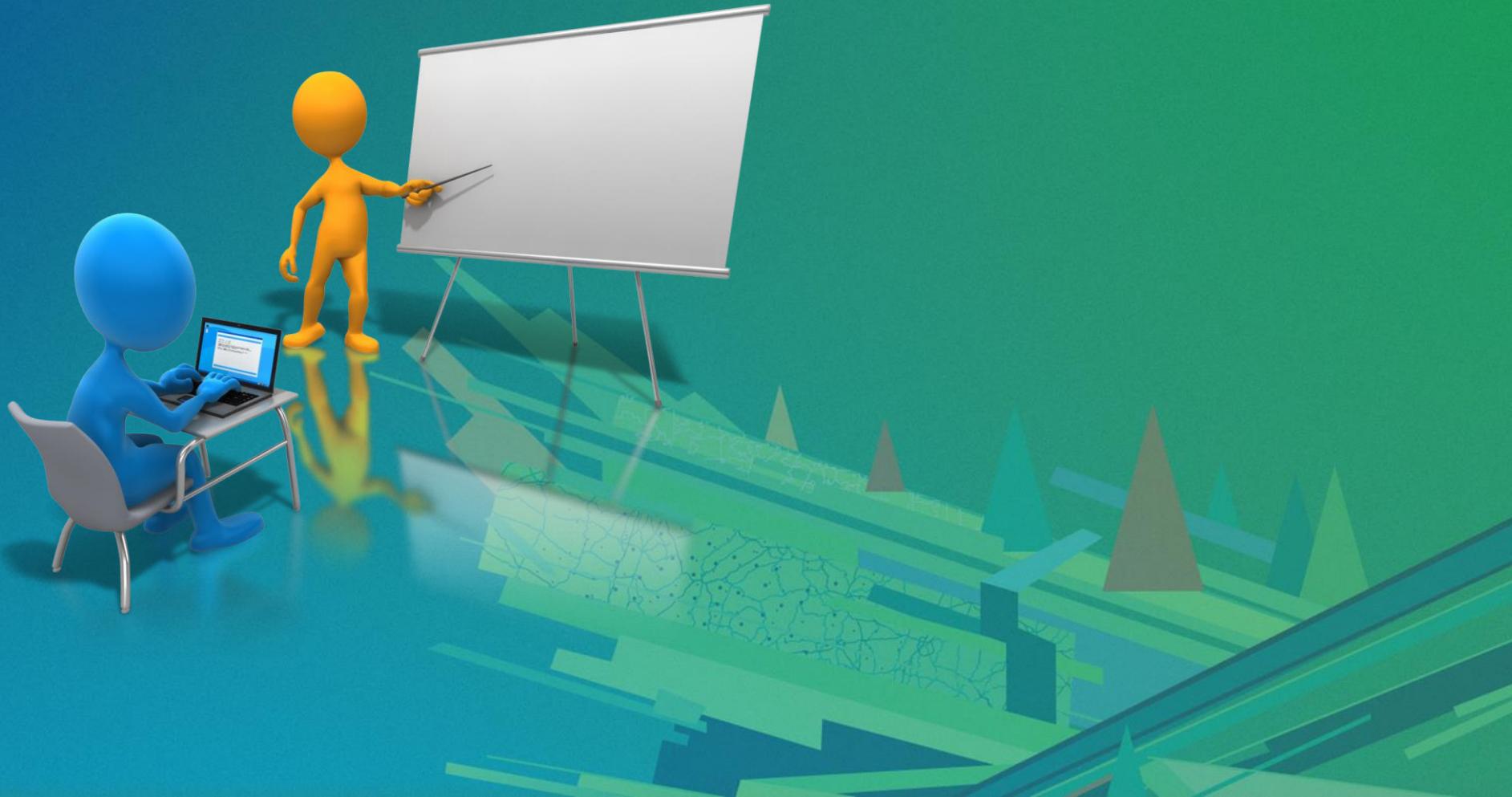
# Community Analyst



- Site Analysis
  - Allows you to combine your data with demographic, lifestyle and spending data from Esri.
- Reporting
  - Lets you understand locations using smart mapping, analytics and beautiful infographics and reports.



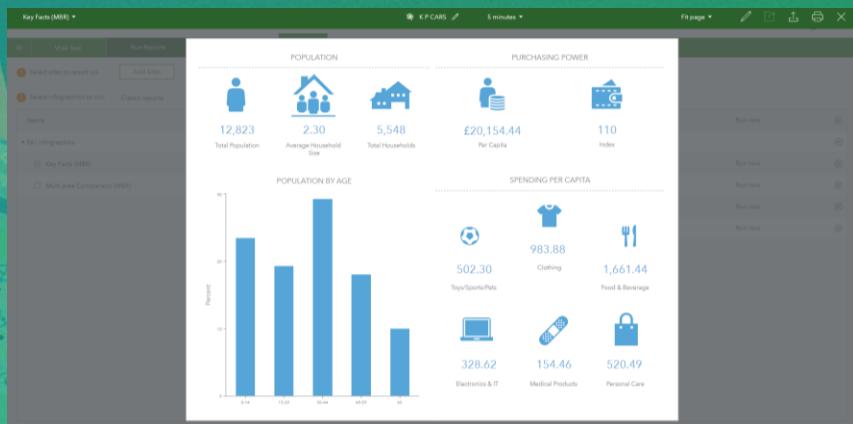
# DEMO - Community Analyst



# Community Analyst - Exercise 5

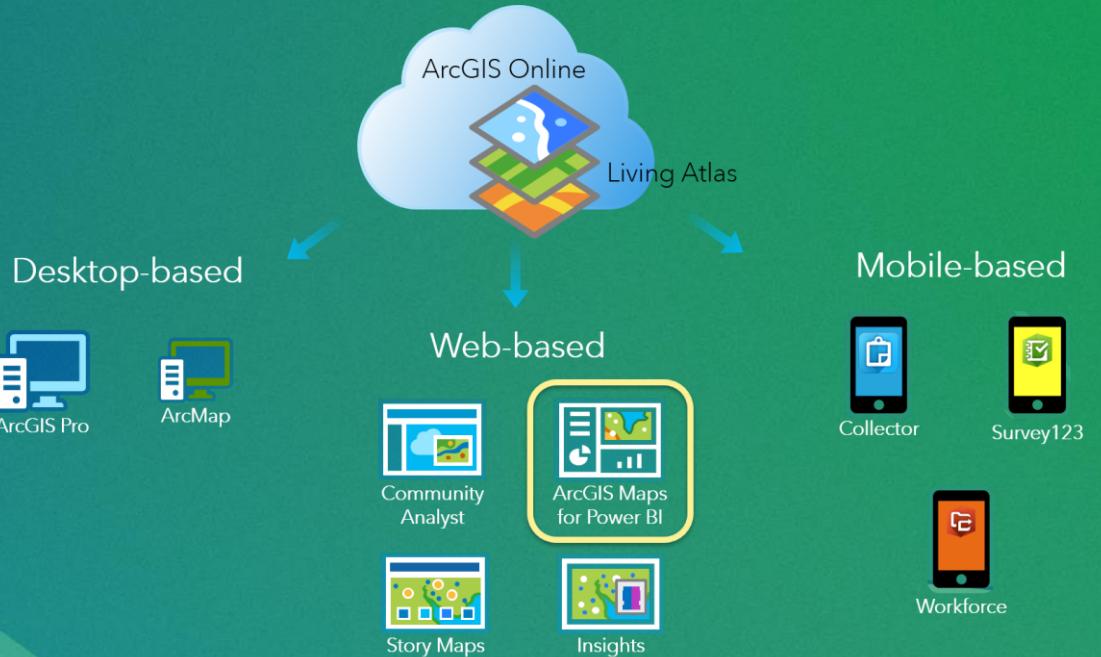
- Create Project
- Add Data > Import File > Sites\_to\_Analyse.xlsx
- Create Sites > 5, 10 mins Drivetime
- Create Maps > Color-Coded Maps > Total Households
  - Zoom / Pan to see how Legend changes
  - Add Variable > Purchasing Power
- Reports > Comparison Reports >Add Variables
  - Household Totals, Purchasing Power
  - View as Chart and Table > Export to Excel
- Reports > Run Reports
  - Classic Reports > Site Map > Choose a Location > Run Now
  - Infographics > Key Facts (MBR) > Choose Location > Run Now

<https://communityanalyst.arcgis.com/>



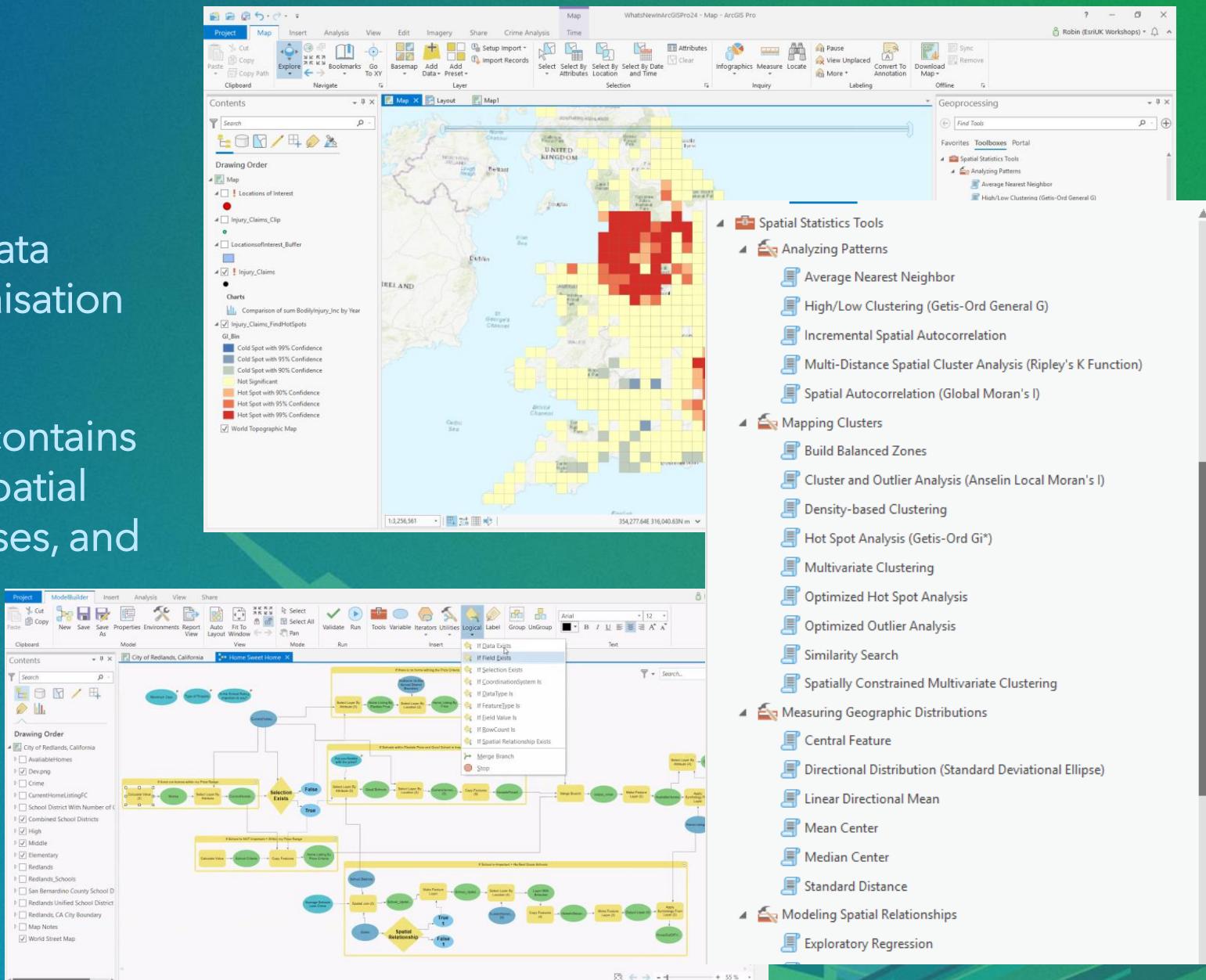
# Other ArcGIS Capabilities for Data Analysis

- ArcGIS Pro
- R-bridge
- Jupiter Notebooks / Notebook Server
- Developer APIs



# ArcGIS Pro

- Professional tools for spatial data processing, analysis and visualisation
- The Spatial Statistics toolbox contains statistical tools for analysing spatial distributions, patterns, processes, and relationships.
- Model Builder
- Python scripting



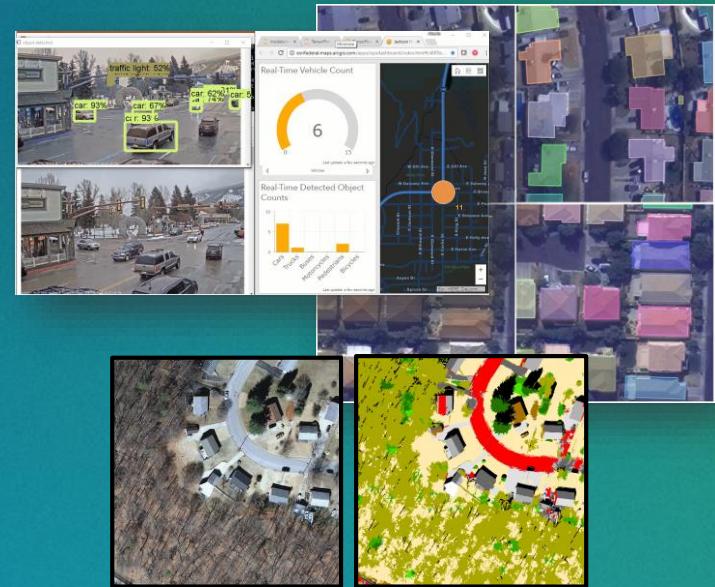
# Machine Learning in ArcGIS Pro

## Clustering



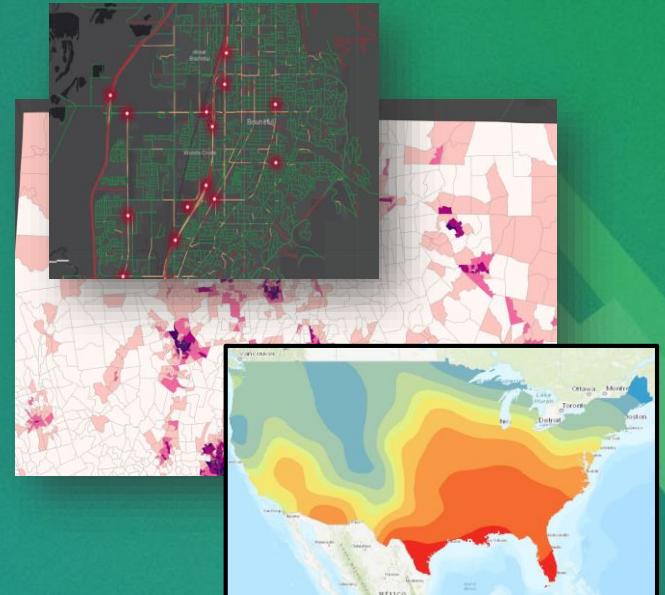
*High Risk Areas, Emerging Hotspots of 911 Calls, Disease Clusters, and more*

## Classification



*Buildings, Road Segments, Swimming Pools, Blight, Graffiti, Overgrowth, Road Signs, Vehicles from CCTVs, and more*

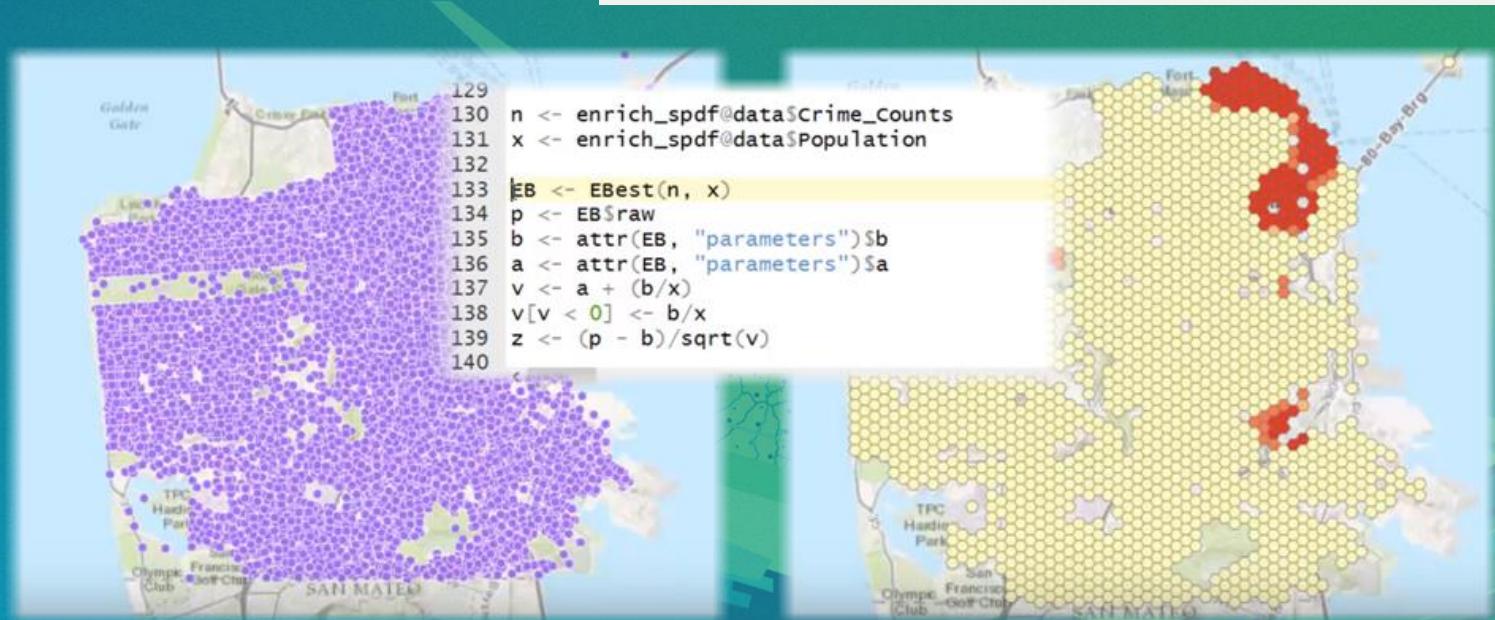
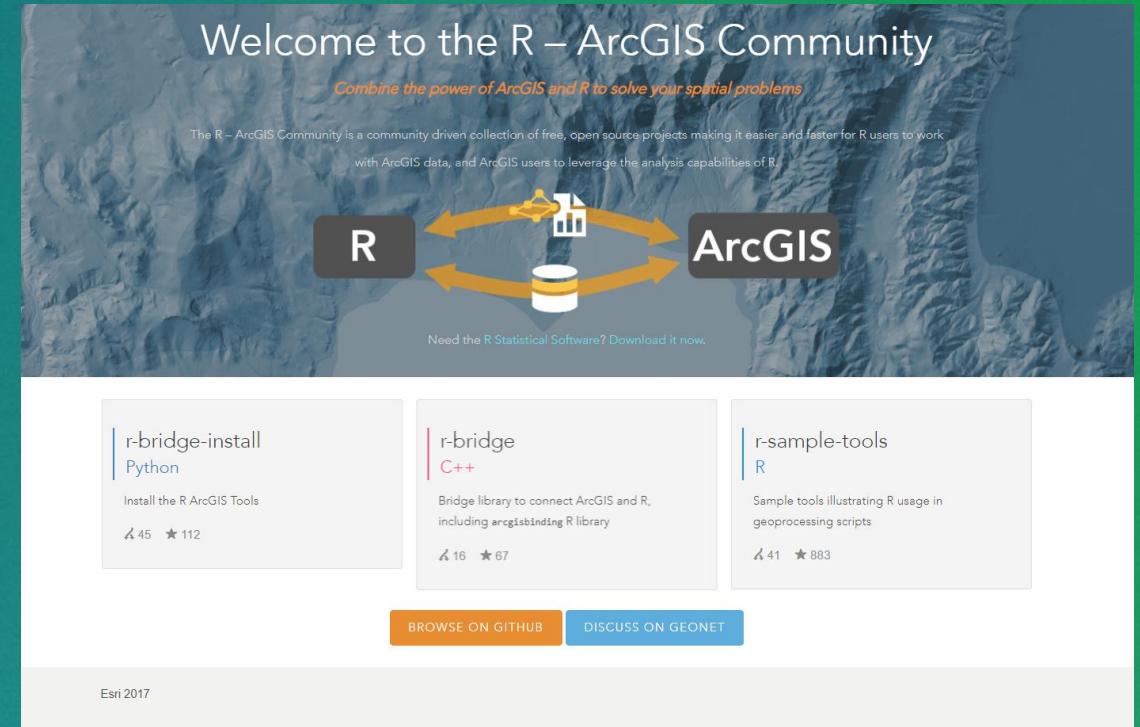
## Prediction



*Water Pipe Breaks, Diseases, Crimes, Crashes, Incidents, Fires, Congestion, 911 Calls,*

# R Bridge

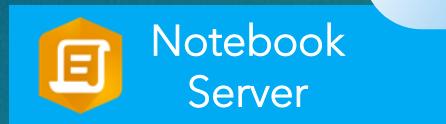
- Open Source GitHub Community
  - The R ArcGIS Bridge Github Repository is a community driven collection of free, open source projects making it easier and faster for R users to work with ArcGIS data, and ArcGIS users to leverage the analysis capabilities of R.



# Hosted Python Notebooks | For Integration, Modeling, and Automation Scripting



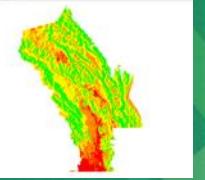
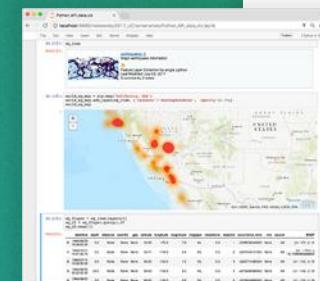
Interactive Computing



Data Stores/Lakes



ArcGIS Enterprise

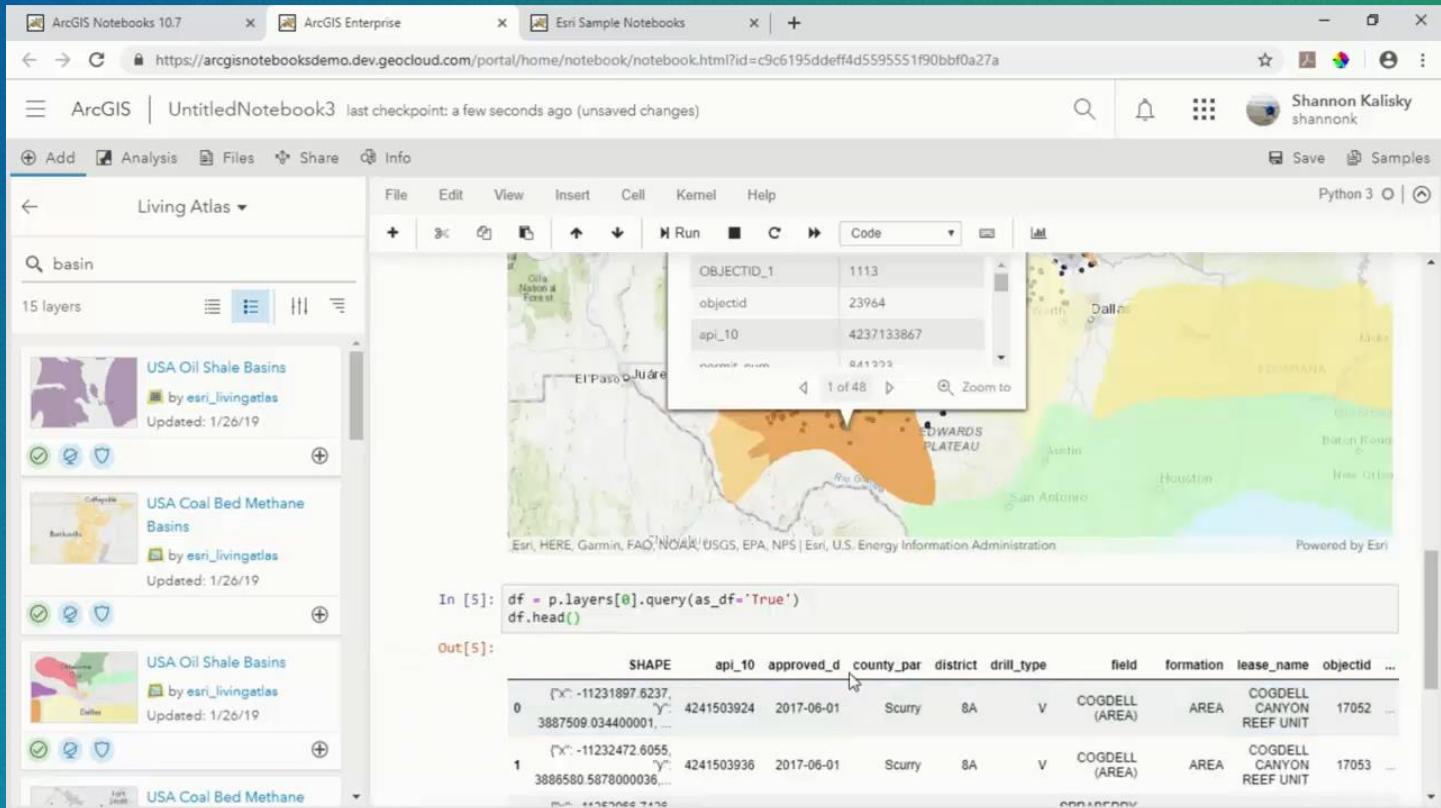


Organizes

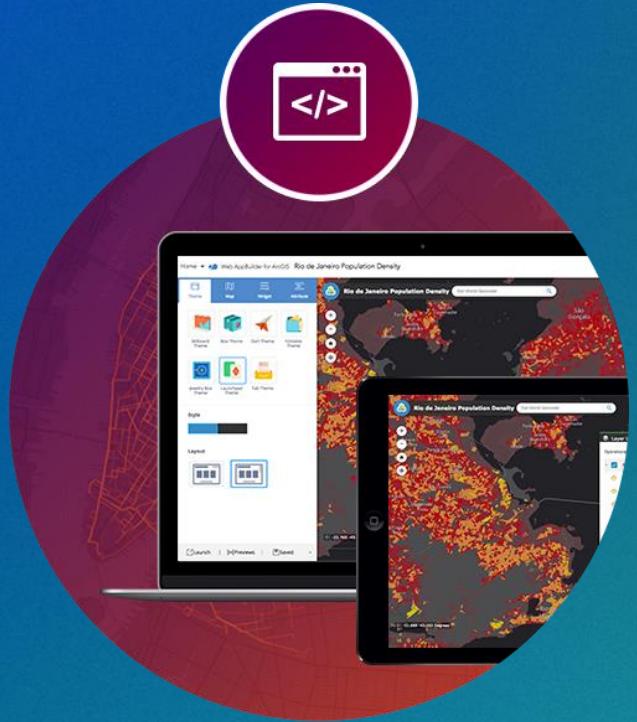
- Code
- Data
- Visualization
- Documentation

*Integrates ArcGIS with the World of Open Science*

# Hosted Python Notebooks | For Integration, Modeling, and Automation Scripting



# Developing with ArcGIS



## Build Apps

Javascript API  
Android SDK  
iOS SDK  
Java SDK  
macOS SDK  
.NET SDK  
Qt SDK



## Extend the Platform

Desktop  
Model Builder  
Python Scripting  
SDK for .NET  
ArcObjects

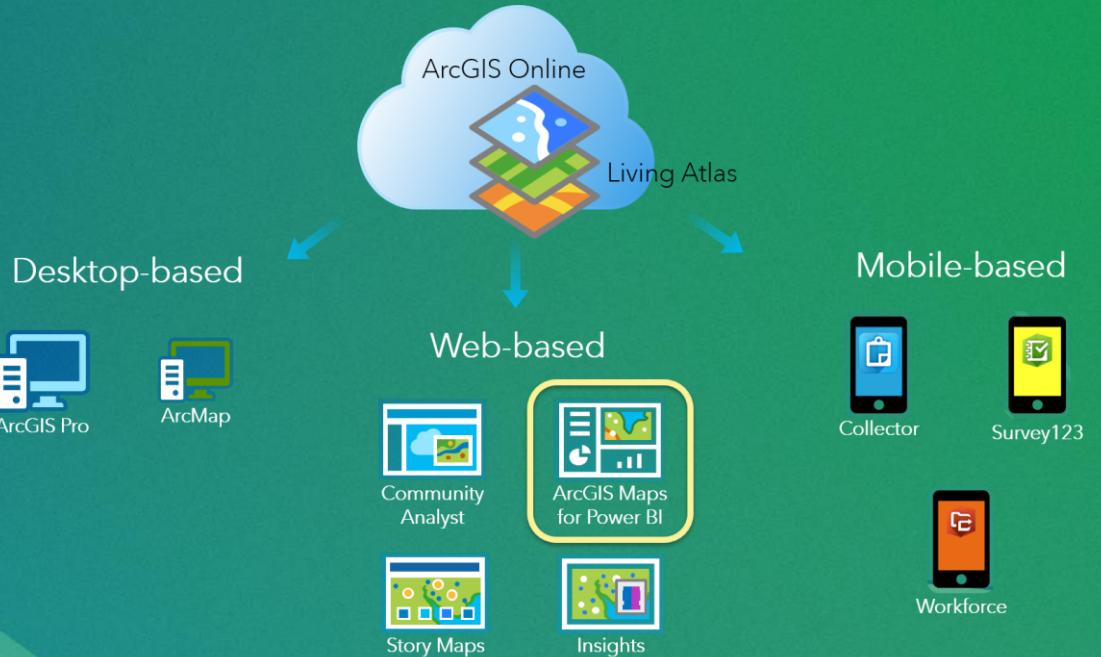


## Access Content & Services

Basemaps  
Geocoding  
Routing & Directions  
Traffic Maps  
Demographic Maps & Data  
Living Atlas Layers  
Open Data

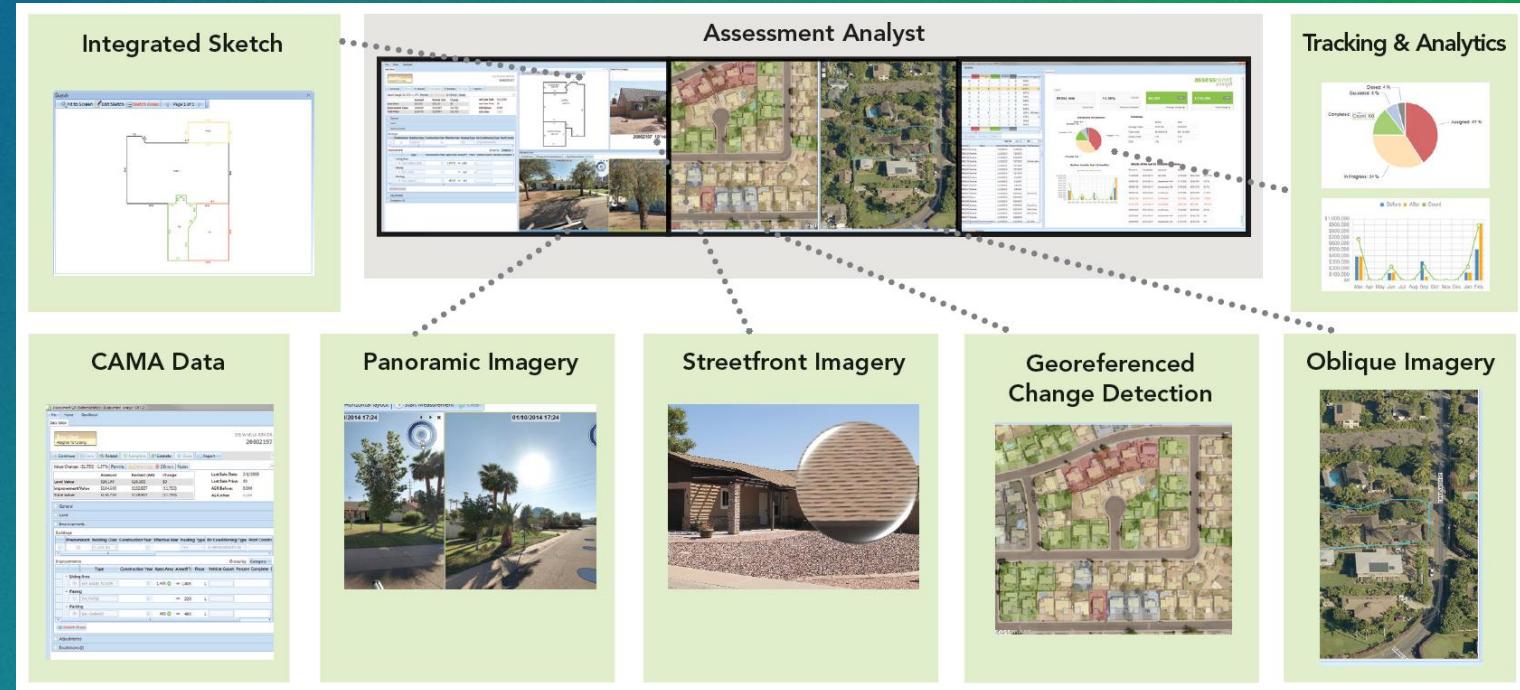
# Providing Simple Access to Information

- Assessment Analyst
- Tailored Web Applications
- Mobile Applications
- Storymaps

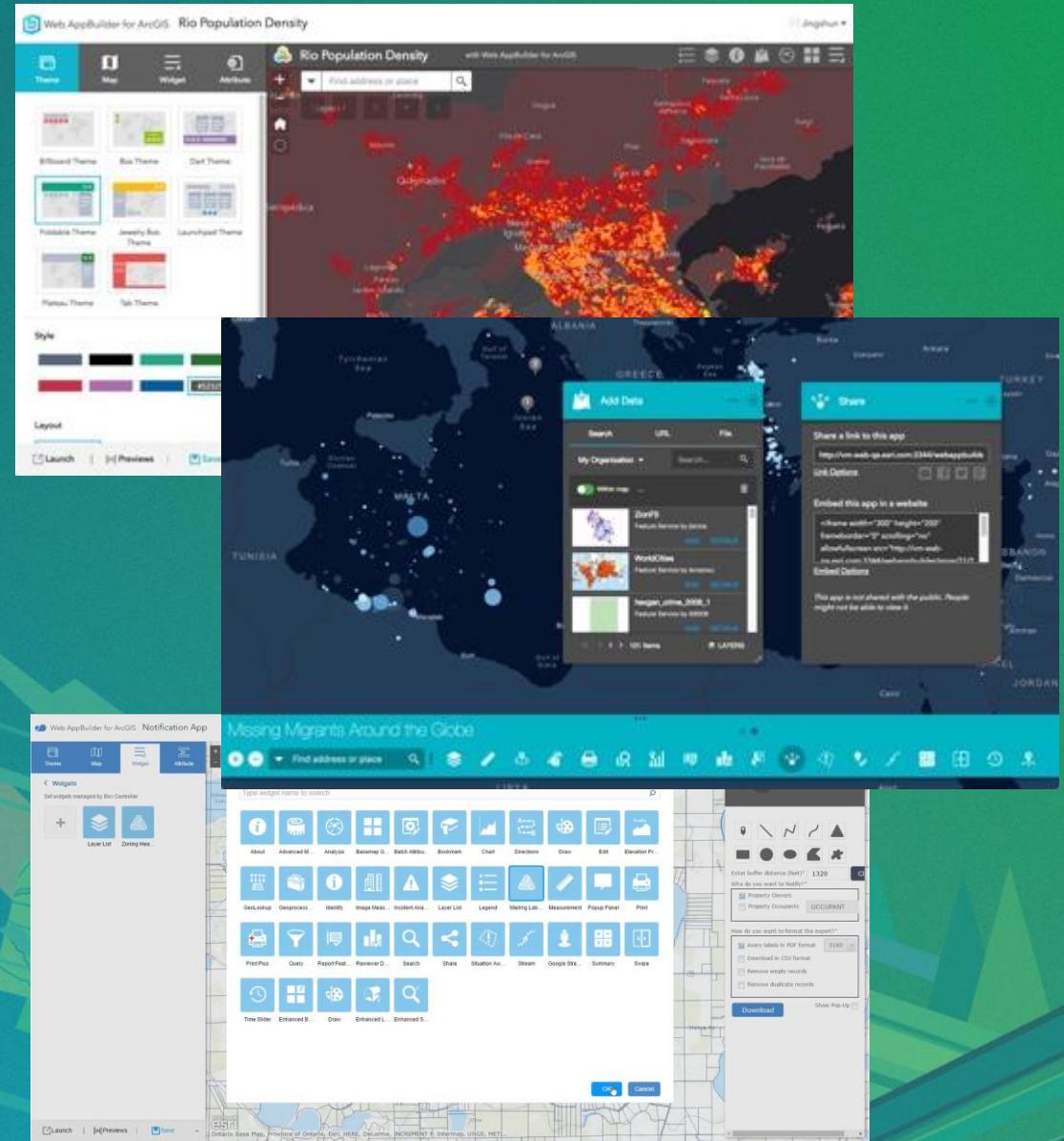
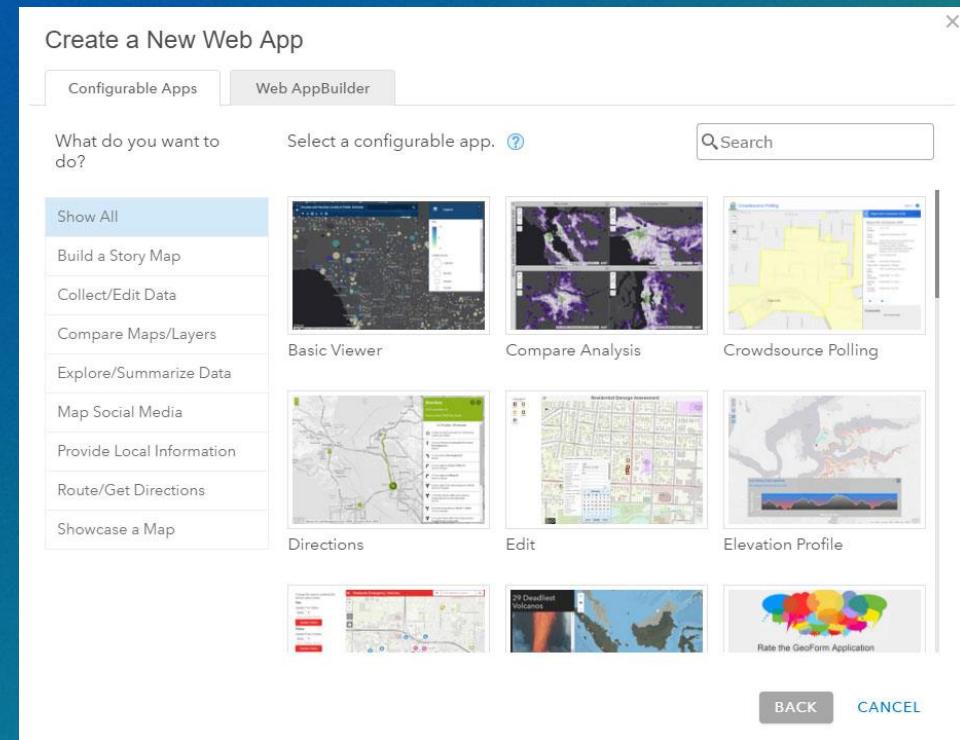


# Assessment Analyst

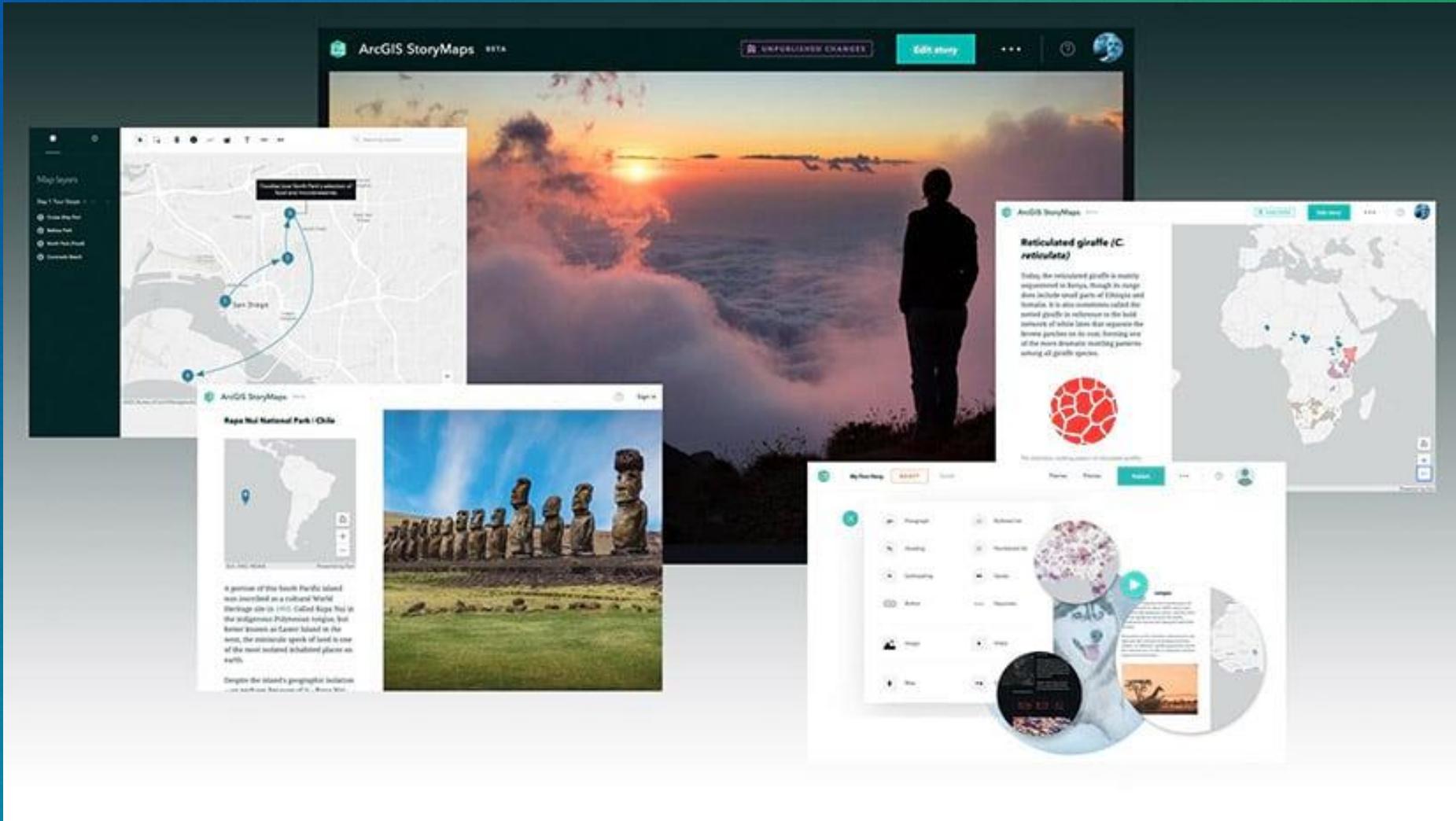
- Perform CAMA data validation checks
- Combine multiple sources of imagery into a single interface
- Optimise project management by assigning work on the fly
- Track progress
- Create property review reports
- Create, maintain and resolve issues using one complete solution
- Extensions include GeoSketch and Mobile



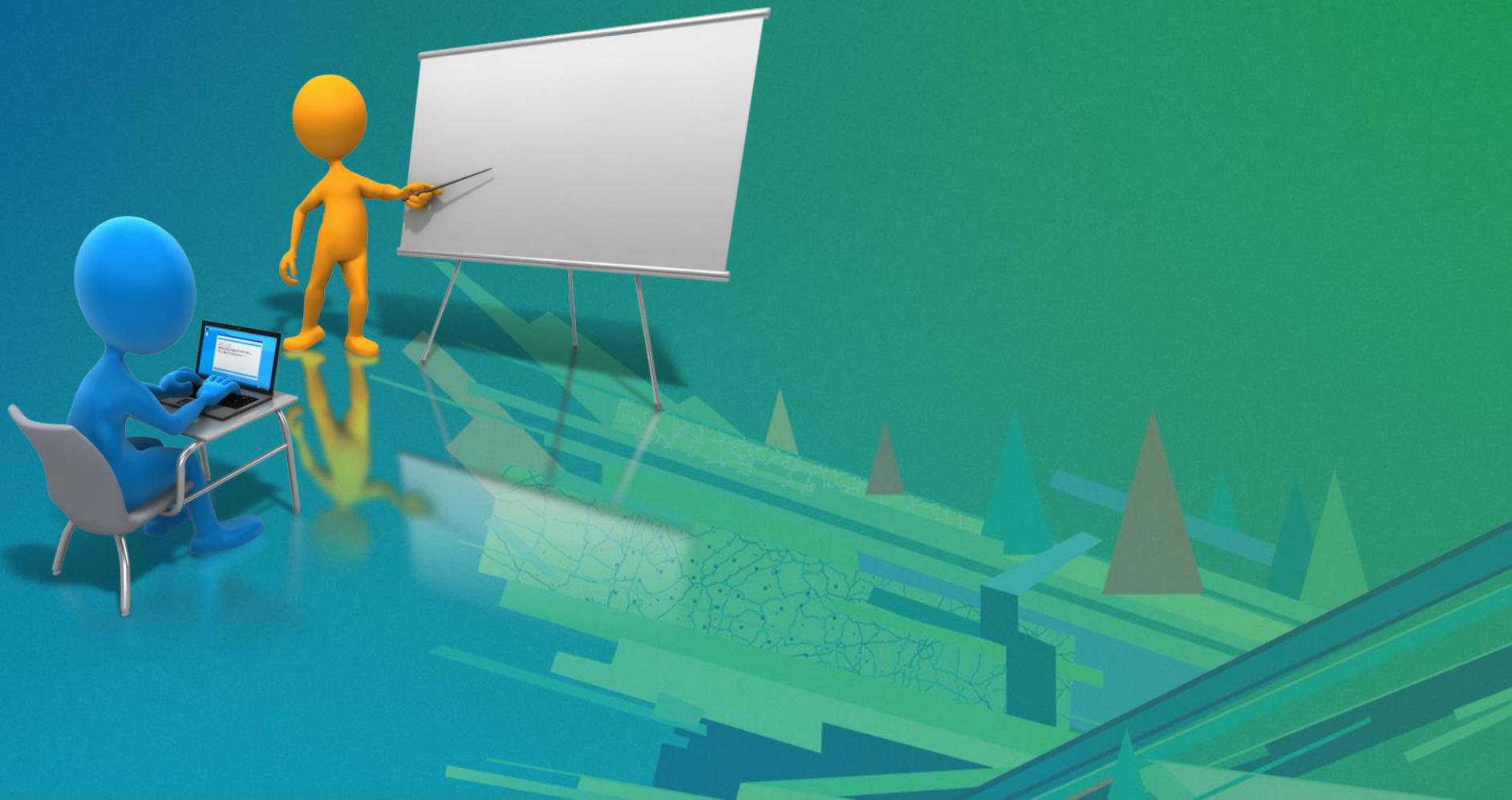
# Configurable Web Applications



# Storymaps

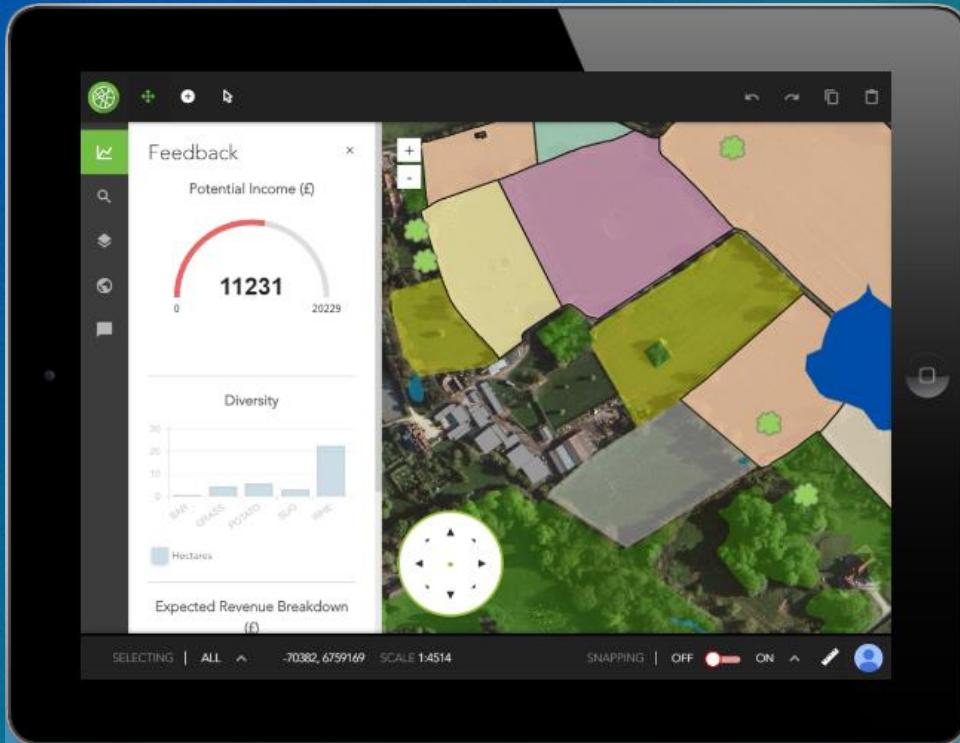


# DEMO - Web Applications and Storymaps



# Mobile Applications

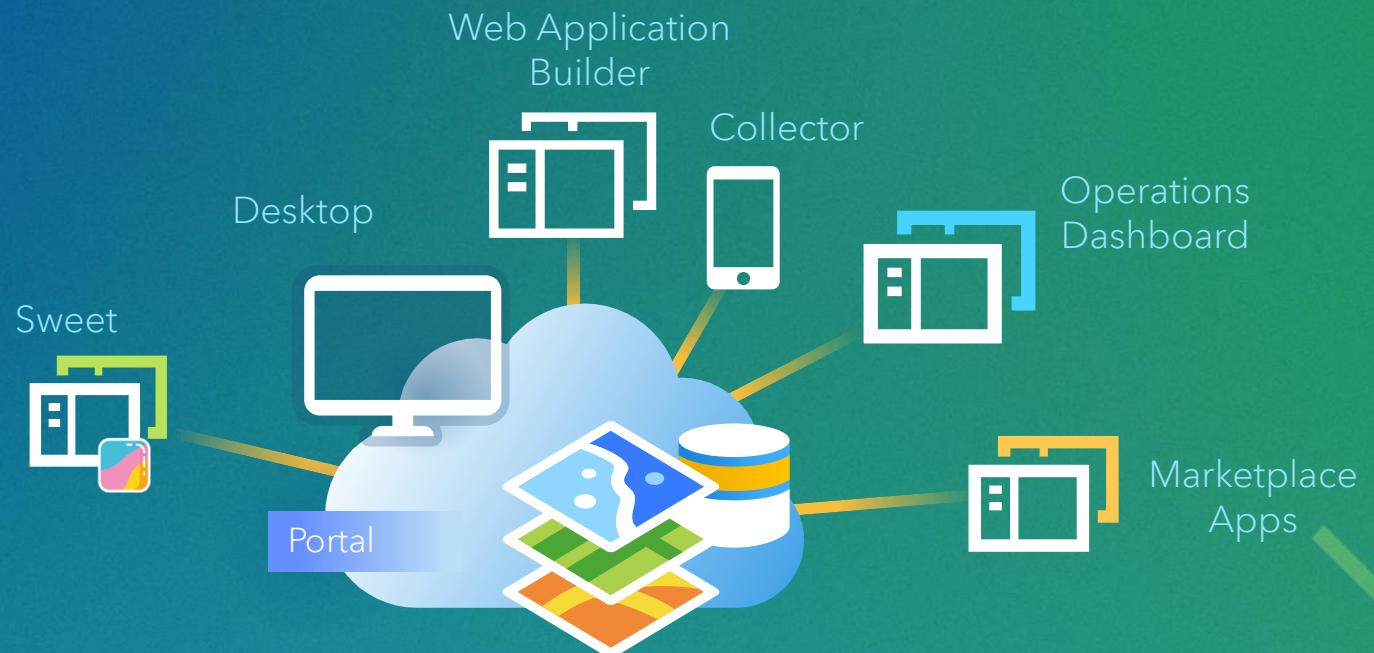
	Browse Data	Edit Data	Track Location	Job Management	Generate Reports	Perform Routing	Administer Portal
Web Applications / Storymaps	✓	✓					
Explorer	✓						
Collector	✓	✓	✓				
Survey123		✓					
Quick Capture		✓					
Workforce			✓	✓			
Tracker			✓				
Business Analyst Mobile	✓	✓			✓		
Navigator						✓	
ArcGIS Companion							✓



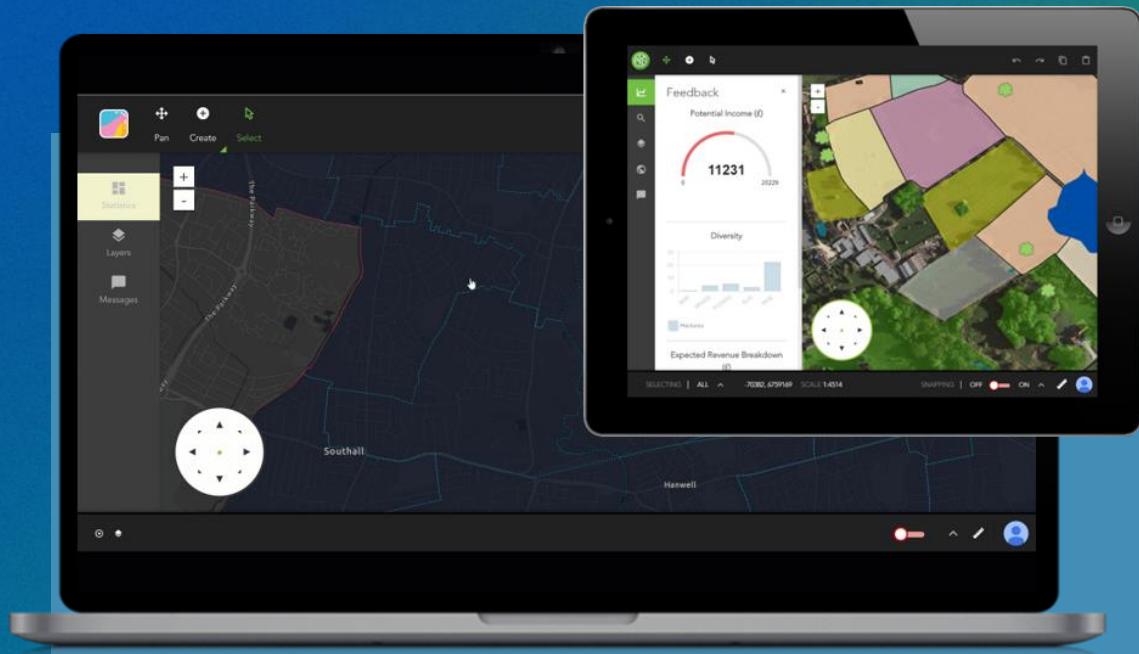
# What is Sweet?

Sweet is a configurable web and mobile application that facilitates smarter and better-informed decision making, whilst ensuring the consistency in the quality of the data.

# Sweet and the ArcGIS Platform



- An Esri UK Product built on the ArcGIS Platform
- Uses ArcGIS Portal/Online, User Model and Services
- App Builder creates instances of Sweet

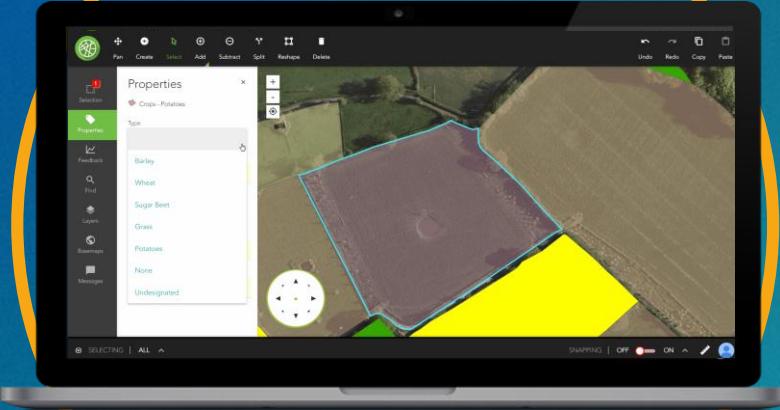


# Why did we make Sweet?

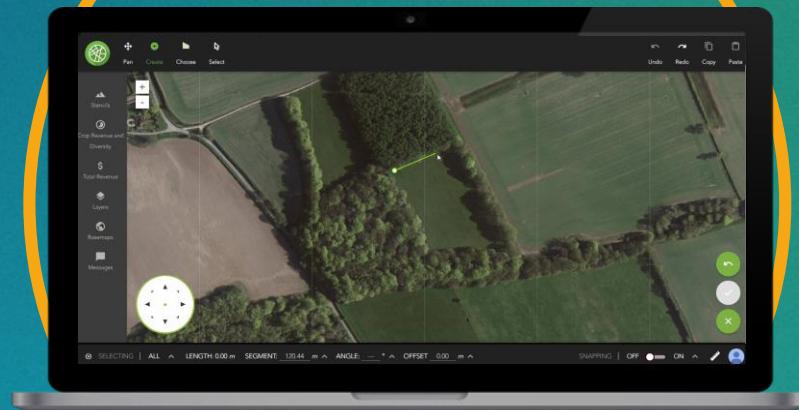
- Make GIS easier
- Save time
- Remove any scope for error
- Provide a better quality output for analysis and decision making

# How?

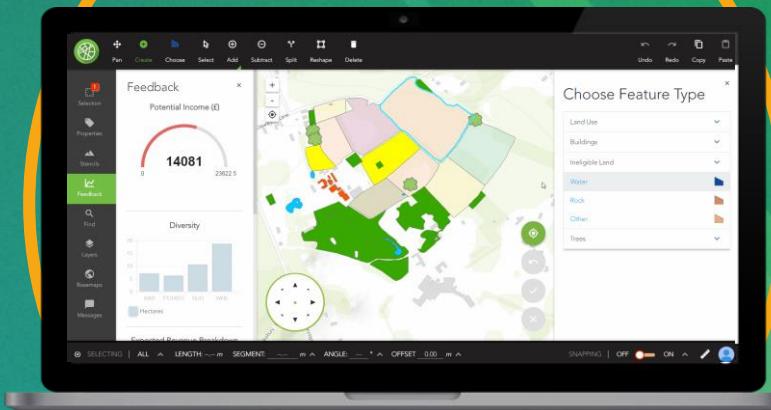
Sweet automates the technically difficult and the mundane through spatial and attribute rules defined by your business. By giving access to multiple relevant datasets in intelligent feedback methods helps to guide and inform decision making.



Spatial

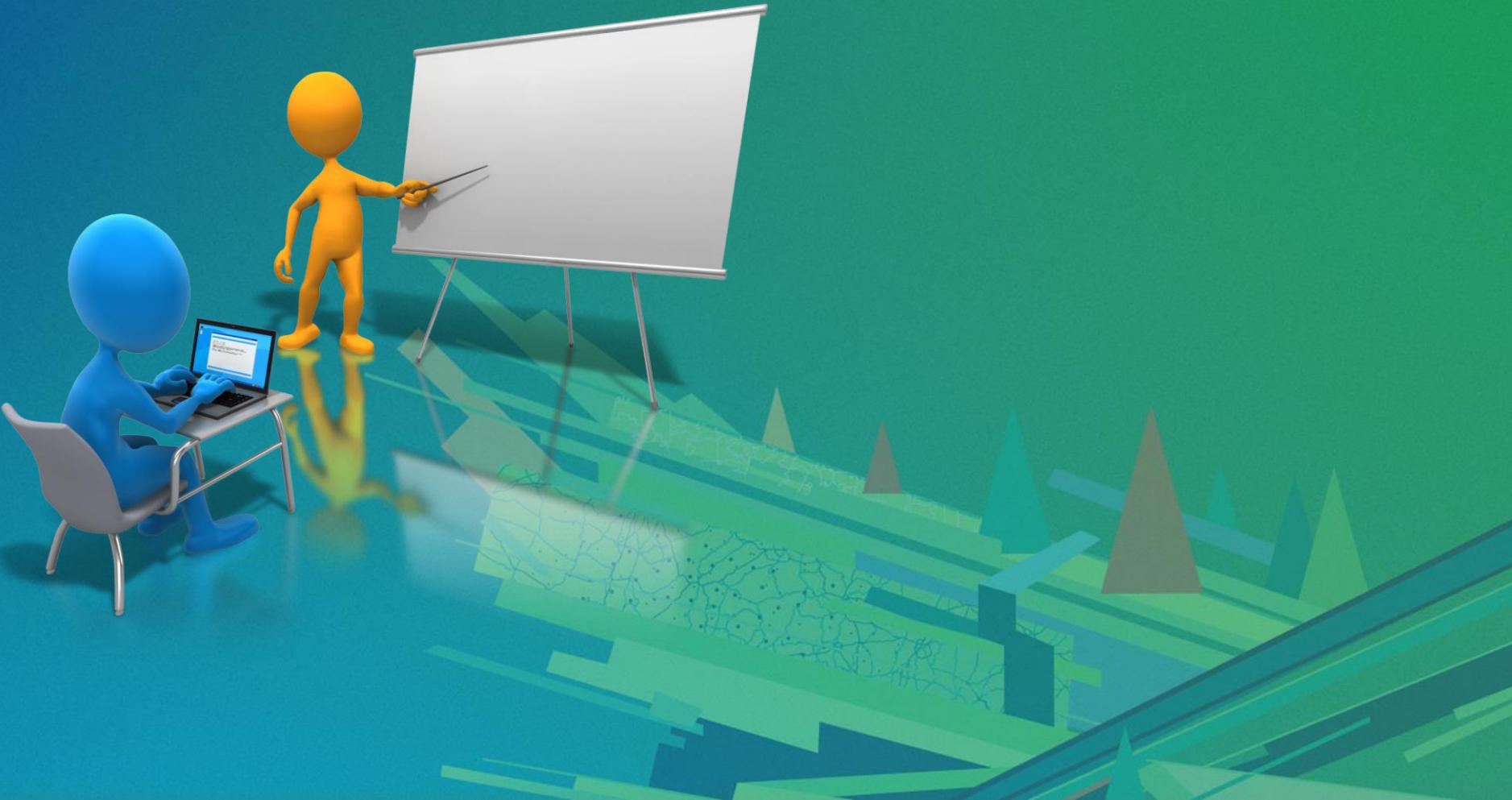


Attribute



Feedback

# DEMO - Sweet



That's it!

- 11:00-13:00 ArcGIS Maps for Power BI
- 13:00-14:00 Lunch
- 14:00-15:00 ArcGIS tools for Data Analysis
- 15:00-16:00 Providing Simple Access to Information



**esri**™ UK

**THE SCIENCE OF WHERE™**