



OAC Maps


A World of Opportunity with WMS Integration!

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A close-up photograph of an espresso machine's spout pouring a stream of dark brown coffee into a clear glass cup. The coffee is captured mid-pour, creating a dynamic sense of movement. The machine's body is dark and metallic, with a black handle visible. The background is dark and out of focus.

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11 Years in Analytics 

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About Rittman Mead

Rittman Mead is a **data and analytics company** who specialise in data visualisation, predictive analytics, enterprise reporting and data engineering.

We use our skill, experience and know-how to work with organisations across the world to interpret their data. We enable the business, the consumers, the data providers and IT to work towards a common goal, **delivering innovative and cost-effective solutions** based on our core values of thought leadership, hard work and honesty.

We work across **multiple verticals** on projects that range from mature, large scale implementations to proofs of concept and can provide skills in **development, architecture, delivery, training and support**.

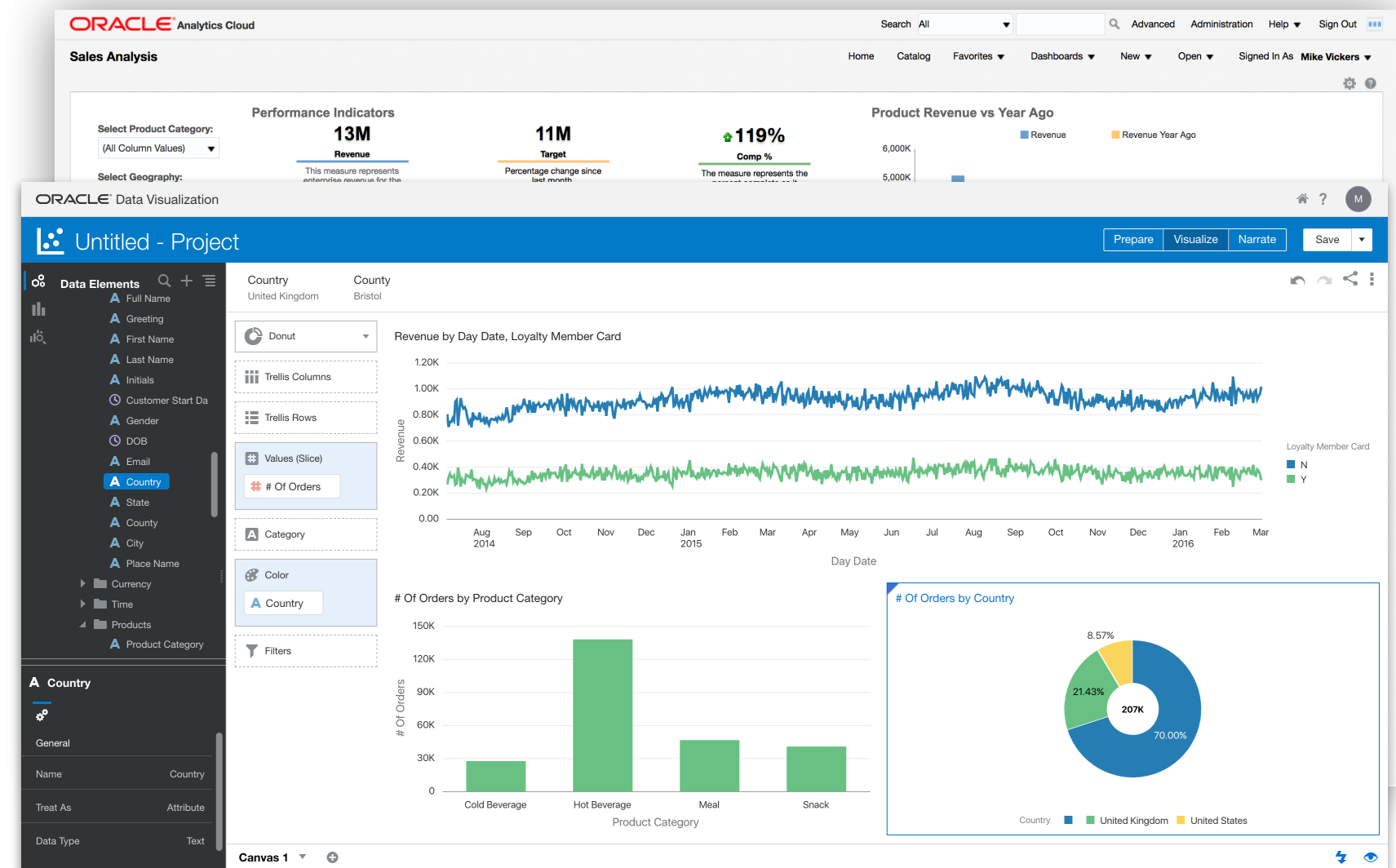
Oracle Analytics Cloud

- Oracle's complete suite of Platform Services (PaaS) for unified analytics in the cloud
- Delivered entirely in the cloud:
 - ▶ No infrastructure footprint
 - ▶ Flexibility to scale up or down based on your immediate needs
 - ▶ Simplified, metered licensing
- Several options to suit your needs:
 - ▶ Oracle or customer/partner managed services
 - ▶ Functionality bundled into 3 editions



Functions

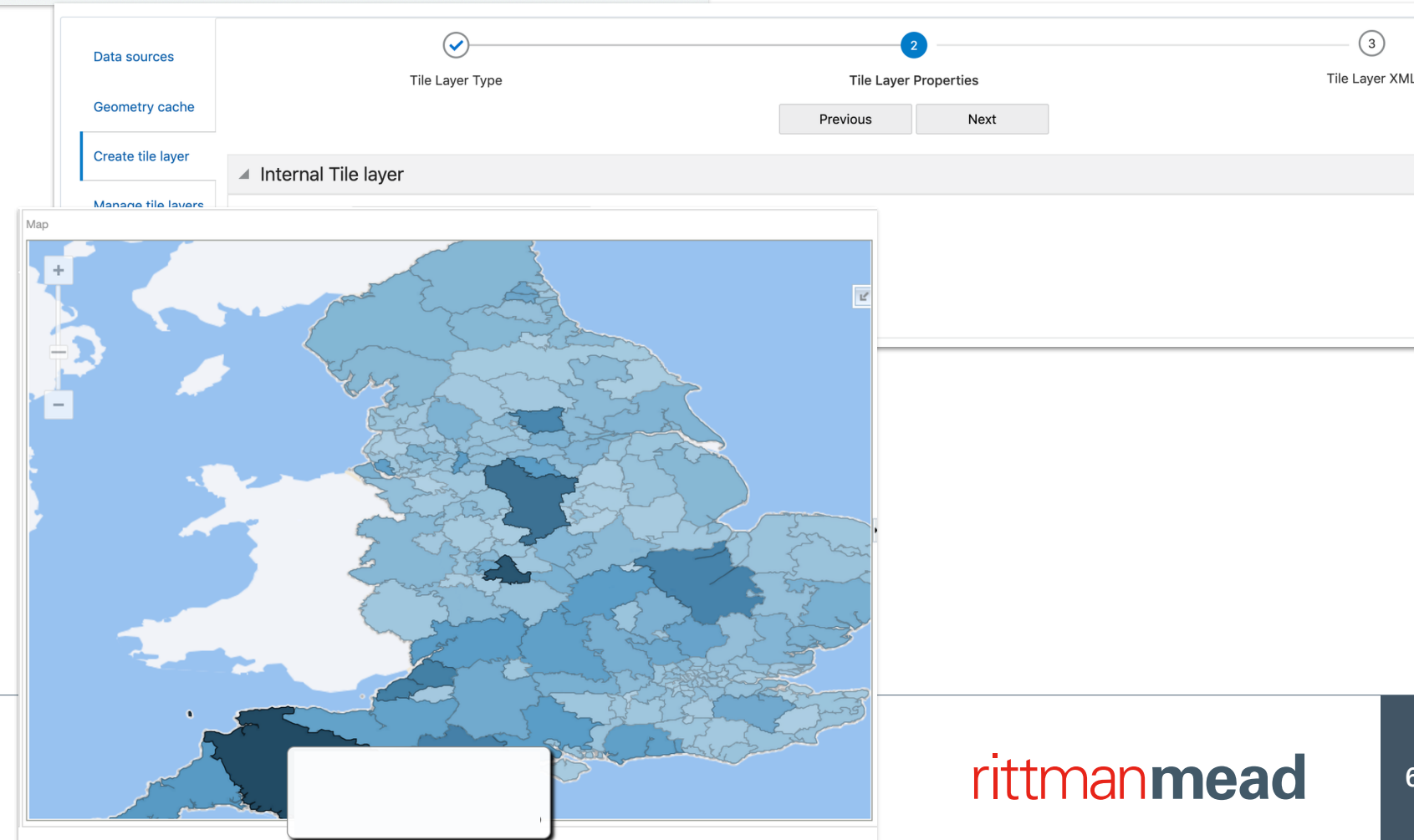
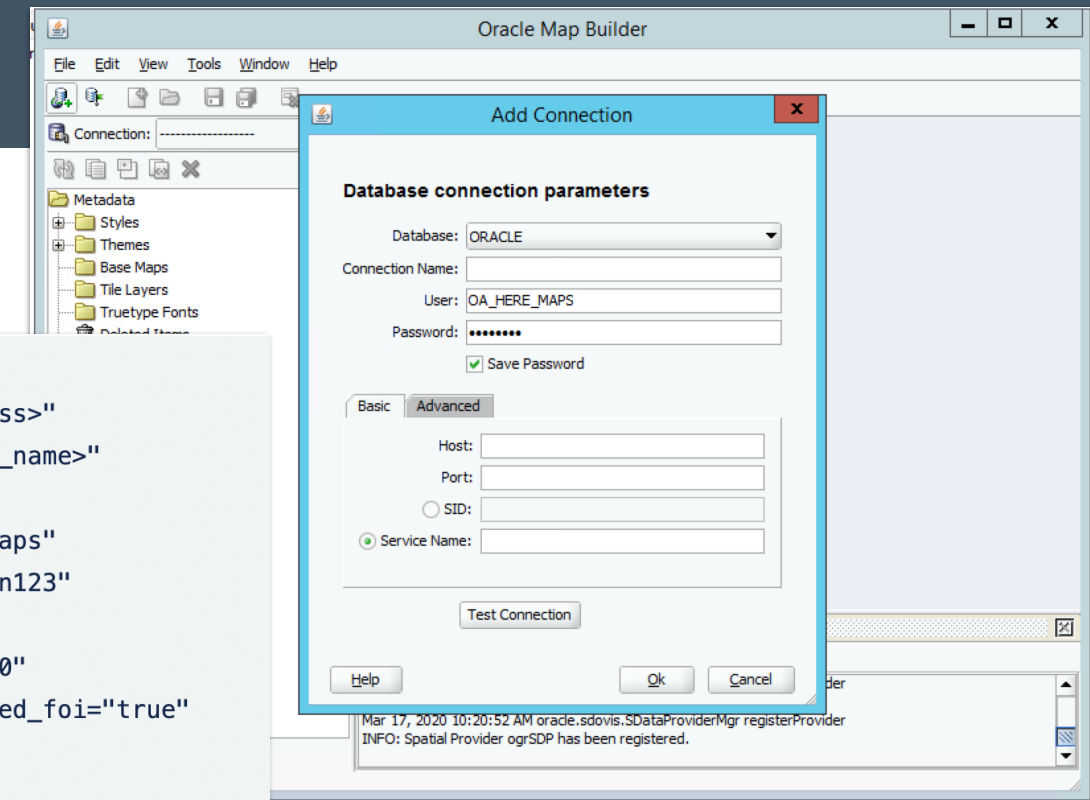
- OAC supports **every** type of analytics workload across your organisation
- *Classic* enterprise BI:
 - ▶ Analysis & dashboarding
 - ▶ Published reporting
 - ▶ Enterprise Performance Management
- *Modern* departmental/personal discovery:
 - ▶ Extended data mashup & modelling
 - ▶ Data preparation, exploration & visualisation
 - ▶ Data science & machine learning



Mapping in OAC - The Old Way

- The ability to plot data on maps is not new...
 - ▶ Achievable since OBIEE 11g
 - ▶ Remains available as a *Classic* feature
- ...but never simple to implement...
 - ▶ Based on SDO_GEOMETRY
 - ▶ Maps constructed through MapBuilder
 - ▶ Layers configured in MapViewer
 - ▶ Integrated through OBIEE Administration
- ...and often hit performance challenges
 - ▶ Multiple database calls
 - ▶ Limited ability to cache layers

```
1 <map_data_source name="OA_HERE_MAPS"  
2 jdbc_host="<ip_Address>"  
3 jdbc_sid="//<service_name>"  
4 jdbc_port="1521"  
5 jdbc_user="oa_here_maps"  
6 jdbc_password="!Admin123"  
7 jdbc_mode="thin"  
8 number_of_mappers="10"  
9 allow_jdbc_theme_based_foi="true"  
10  
11 />
```



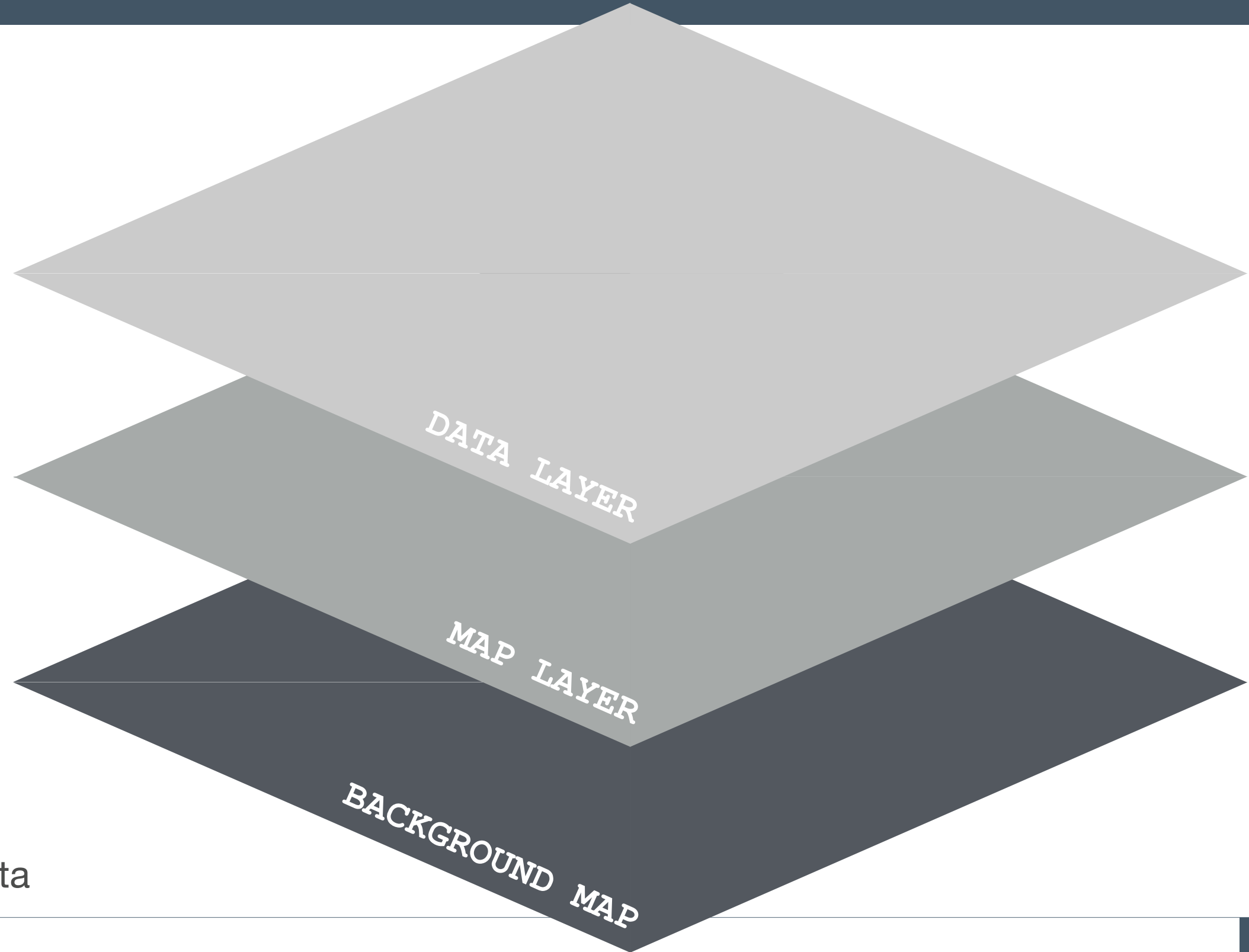
Mapping in OAC - The New Way

- Data Visualisation (DV) introduced a new approach
 - ▶ **System** maps & layers available
 - ▶ Ability to create **custom** maps & layers
 - ▶ Quick and simple joining to **data sets**
 - requires no manual intervention
 - but *default* preferences can be set
- Visually impactful
 - ▶ Draw out hidden geographical insights
 - ▶ Interact with data
 - lasso data points
 - keep/remove selected, drill, zoom etc.
- Better performance

The image is a collage of screenshots from the Google Maps API documentation, illustrating the process of adding a custom map layer. The top left shows the 'Backgrounds' and 'Map Layers' tabs. The top right shows a JSON snippet for a 'FeatureCollection' representing town boundaries. The middle left shows the 'Custom Map Layers' section with a red box highlighting the 'Add Custom Layer' button. The middle right shows a 'Map Layer' dialog box with fields for 'Name' (filled with 'Towns_and_Cities_England_Wales') and 'Description', and a 'Layer Keys' section with 'TCITY15CD' checked. The bottom left shows a 'Location Details: Code' table with columns for 'Your Data', 'Auto', 'Match', and 'Match Quality'. The bottom right shows a map of the United Kingdom with numerous colored circles of varying sizes representing population data points, with a title 'Population of Major Towns & Cities in England & Wales (2009)'.

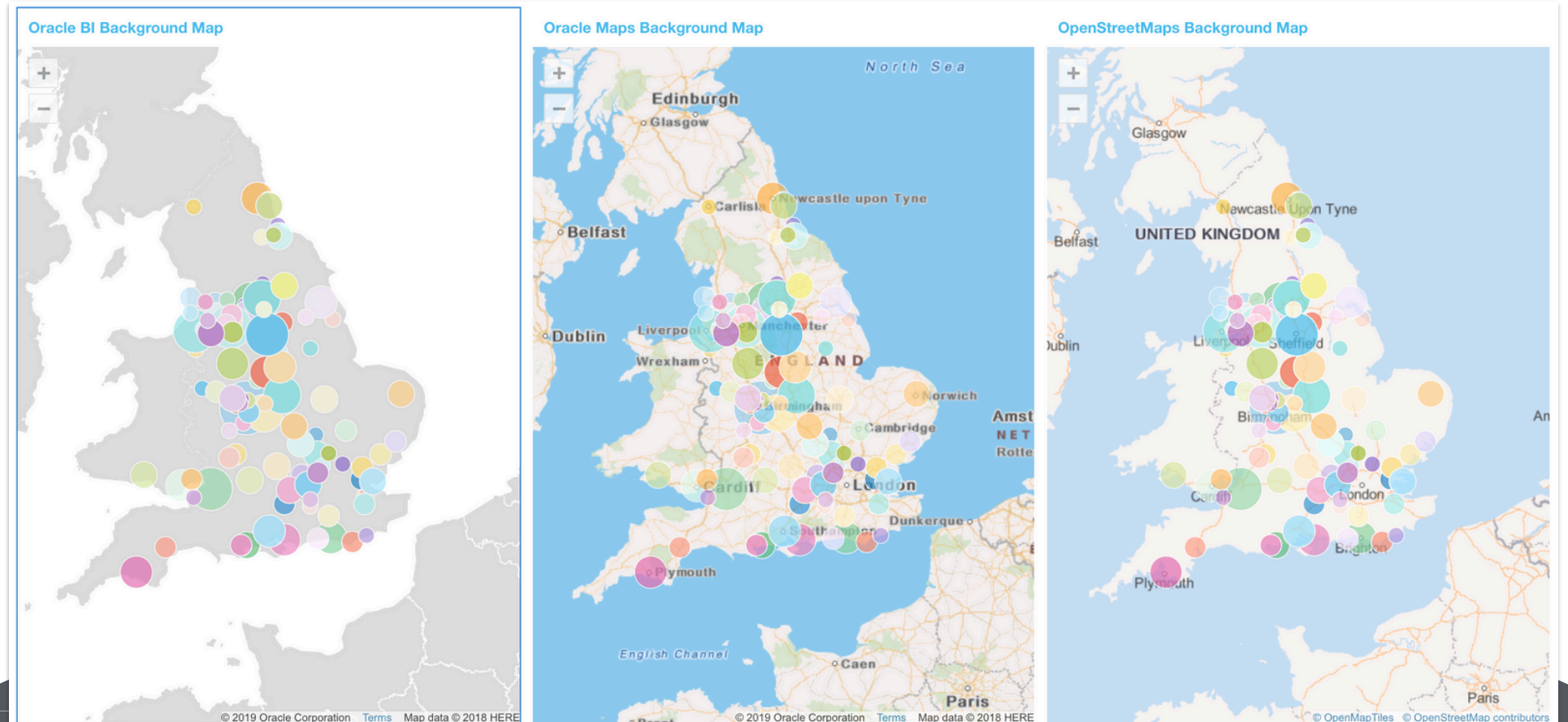
Map Components

- Maps have 3 main components
 - ▶ Background Map
 - *canvas* for the visualisation
 - image or service based
 - includes relevant feature layers
 - ▶ Map Layer
 - defines the geometry of the data
 - array of coordinates
 - polygons or points
 - ▶ Data
 - measures to be visualised
 - key attribute that joins to layer data



Background Maps

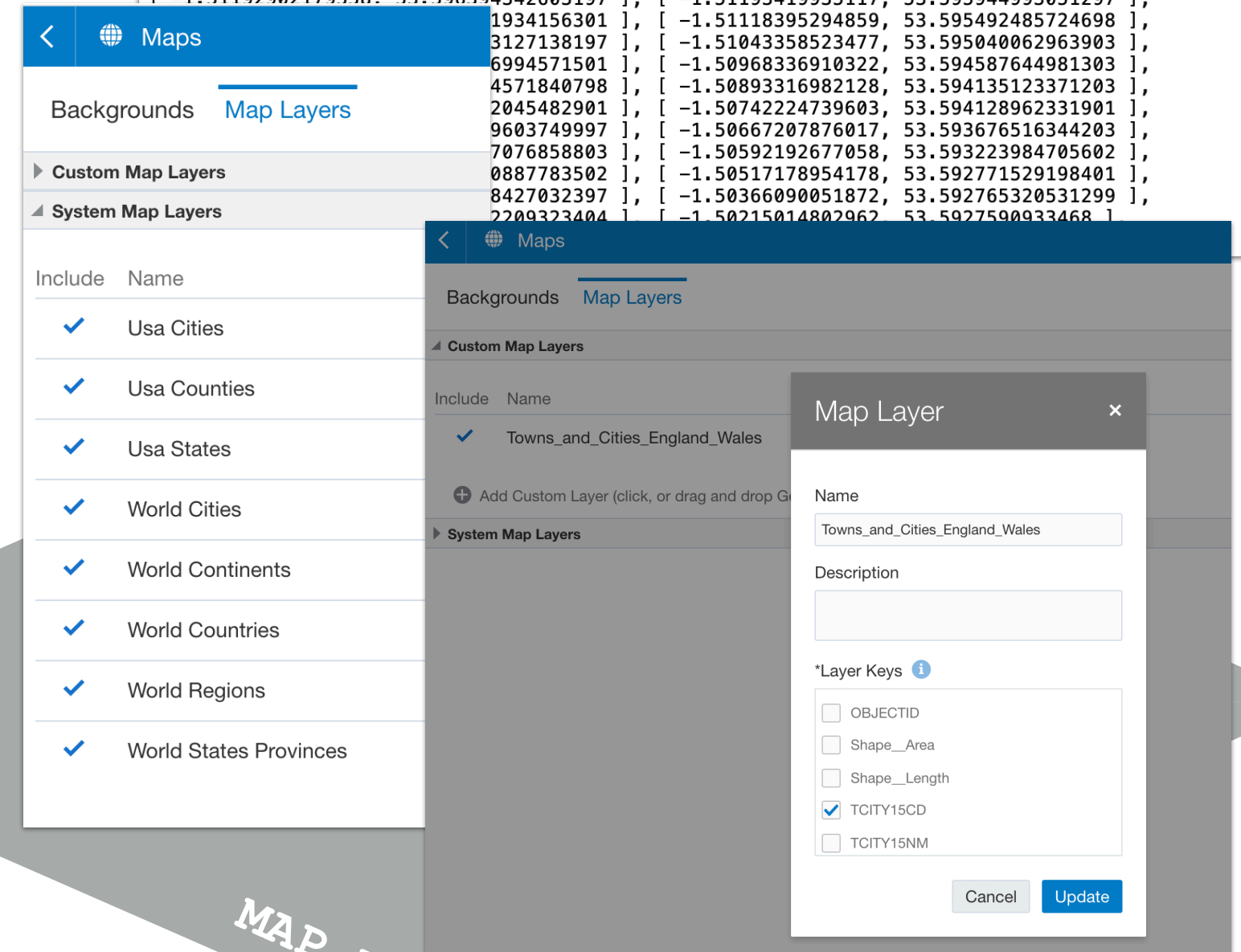
- Provides the context for the visualisation
 - ▶ World map
 - ▶ Store layout etc.
- Grain set by adding detailed layers
 - ▶ Country boundaries
 - ▶ Road networks
 - ▶ Green spaces etc.
- 3 **system** maps provided
 - ▶ Oracle BI
 - ▶ Oracle Maps
 - ▶ OpenStreetMaps



Map Layers

- Specifies the boundaries or points of interest
 - ▶ Defined in `geojson` format
 - `feature` properties must include a key value
 - `geometry` array defines the polygon or point
- System layers are available
 - ▶ US boundaries
 - ▶ World boundaries
- Custom layers can be uploaded
 - ▶ Source or create `geojson` input
 - ▶ Specify the **layer key**
 - ▶ Note: 25MB limit

```
{
  "type": "FeatureCollection",
  "name": "Major_Towns_and_Cities__December_2015__Boundaries",
  "crs": { "type": "name", "properties": { "name": "urn:ogc:def:crs:OGC:1.3:CRS84" } },
  "features": [
    { "type": "Feature", "properties": { "OBJECTID": 1, "TCITY15CD": "J01000001", "TCITY15NM": "Barnsley", "Shape__Area": 25682473.450256299, "Shape__Length": 115099.859999992 }, "geometry": {
      "type": "Polygon", "coordinates": [ [ [ -1.51419534462036, 53.596403490734602 ],
        [ -1.51343990354121, 53.5964004461269 ], [ -1.51344506539145, 53.595951096533298 ],
        [ -1.51268963230247, 53.595948047176996 ], [ -1.51268446259955, 53.596397396749801 ],
        [ -1.51192902179558, 53.596394342603197 ], [ -1.51193419935117, 53.595944993051297 ],
        [ -1.51118395294859, 53.595492485724698 ], [ -1.51043358523477, 53.595040062963903 ],
        [ -1.50968336910322, 53.594587644981303 ], [ -1.50893316982128, 53.594135123371203 ],
        [ -1.50742224739603, 53.594128962331901 ], [ -1.50667207876017, 53.593676516344203 ],
        [ -1.50592192677058, 53.593223984705602 ], [ -1.50517178954178, 53.592771529198401 ],
        [ -1.50366090051872, 53.592765320531299 ], [ -1.50215014802962, 53.5927590933468 ],
        [ -1.51419534462036, 53.596403490734602 ] ] ] ]
    }
  ]
}
```



Data

- Your data set must include
 - ▶ The measures that you wish to view
 - ▶ The **layer key** value
- Configure the map
 - ▶ Set the **Background Map**
 - ▶ Select the **Map Layer**
 - on the fly or in advance
 - set presentation options
- Set visual grammar **Assignments**
 - ▶ Colour
 - ▶ Size
 - ▶ Tooltips



Available from OAC 5.9

- Ability to create new custom background maps types, based on

- ▶ Web Map Service (WMS)
- ▶ Tiles Web Map (XYZ)

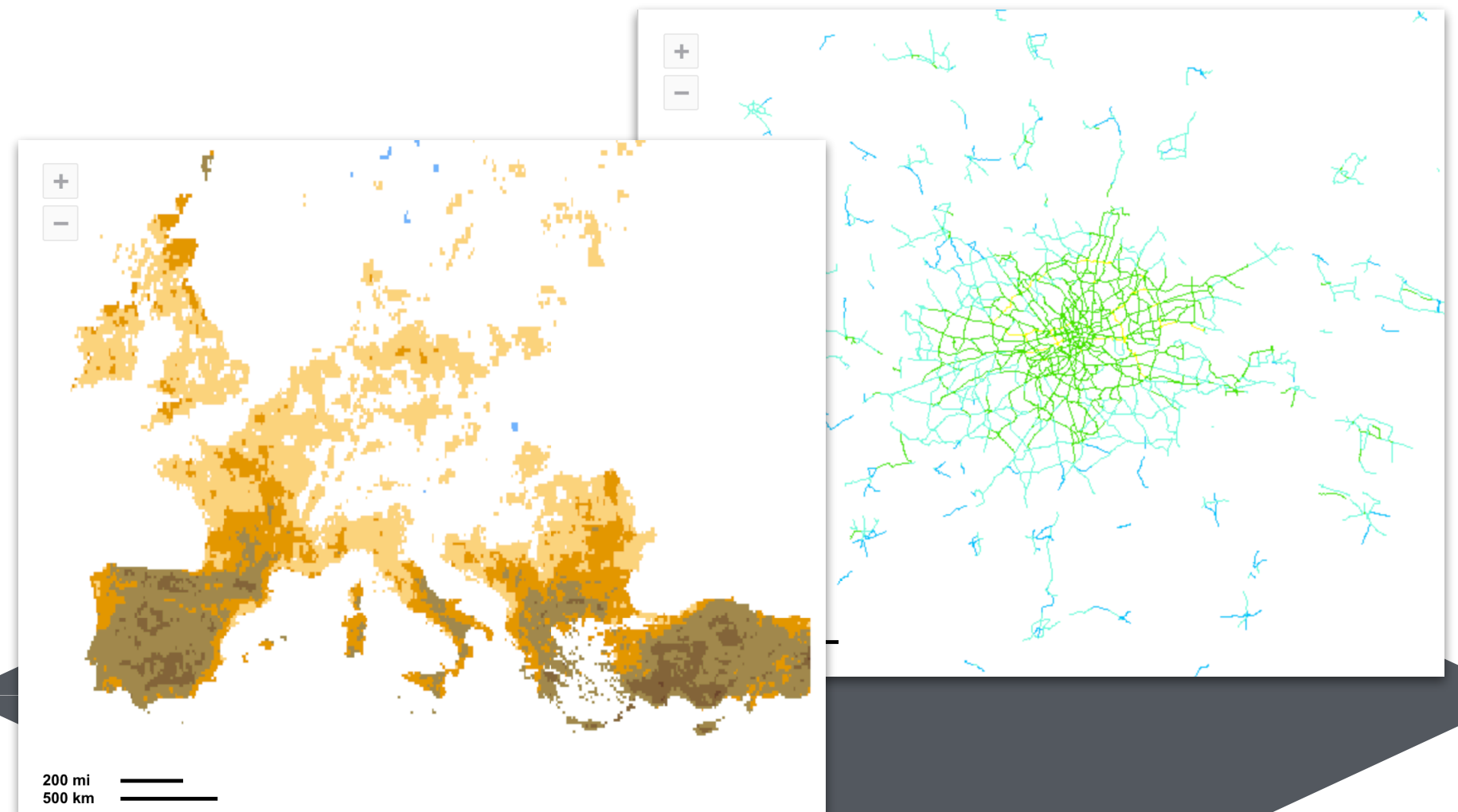
- Massively increases mapping options

- ▶ Many maps openly available

- Enables otherwise impossible analysis

- ▶ None-infrastructure based layers

- climate
- demography
- air quality etc.



BACKGROUND

Web Map Services

- A universal map protocol introduced by the **Open Geospatial Consortium (OGC)**
 - ▶ Simple HTML interface
 - ▶ Distributed geospatial databases
 - ▶ Based on map images (JPEG, PNG etc.)
- Simple to subscribe to the service and issue requests for required maps



WMS - GetCapabilities

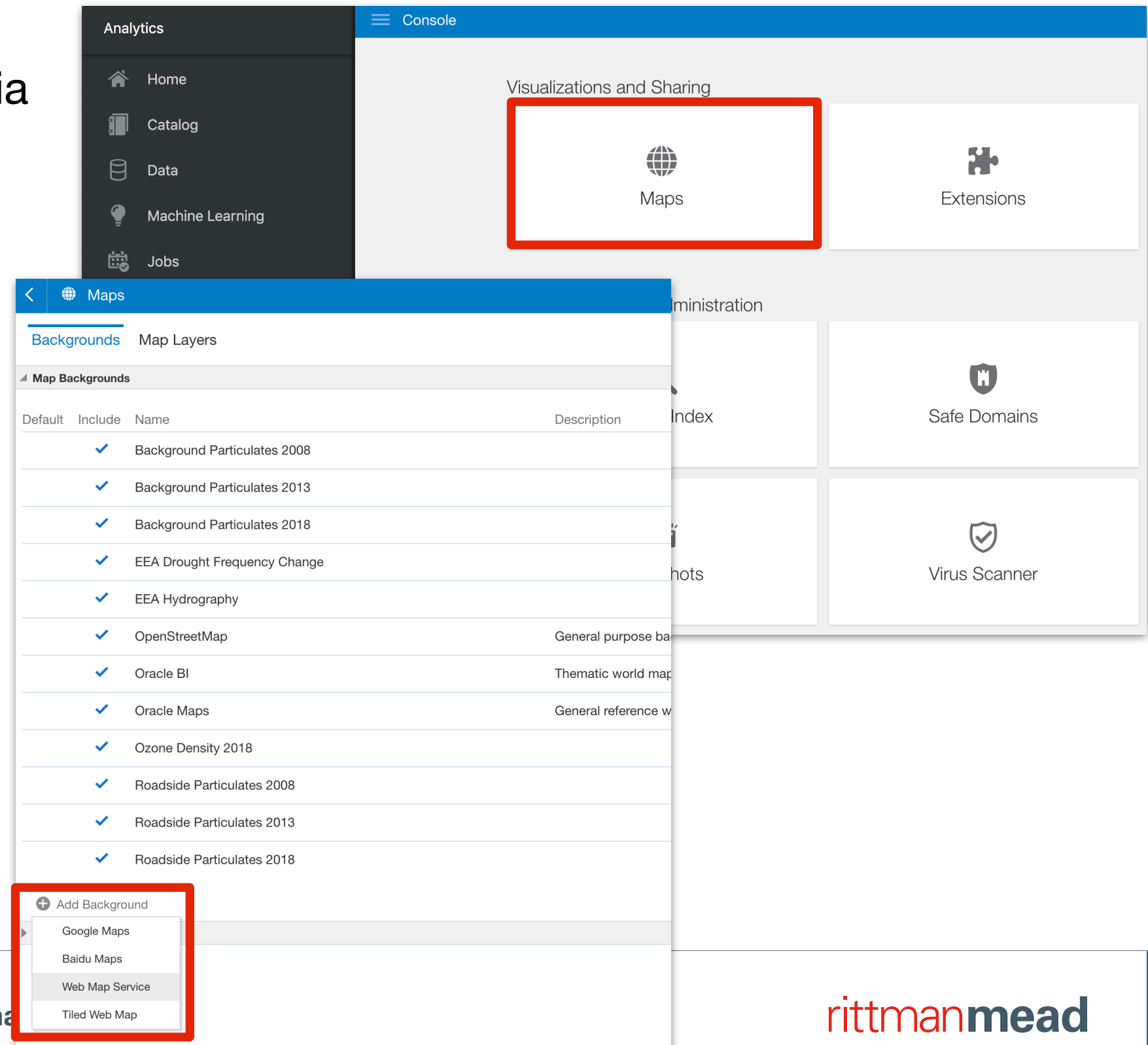
- The WMS definition can be found by referencing the GetCapabilities request
 - ▶ Available on most sites offering WMS
 - ▶ Access via the WMS Server URL
 - pass the `request=GetCapabilities` variable
- The definition includes everything needed
 - ▶ URL
 - ▶ WMS Version (e.g. 1.3.0)
 - ▶ Available Formats (e.g. PNG, JPG etc.)
 - ▶ Layer definitions

The image shows a screenshot of a web browser displaying an XML document from the URL `uk-air.defra.gov.uk/view/services/PCM/PM10Roads/MapServer/WMSServer?request=GetCapabilities`. The XML content is expanded, showing the following structure:

- URL:** The browser's address bar shows the full URL.
- Version:** The `version="1.3.0"` attribute in the `<WMS_Capabilities>` root element is highlighted.
- Formats:** A list of supported image formats is shown under the `<GetCapabilities>` section, including `image/bmp`, `image/jpeg`, `image/tiff`, `image/png`, `image/png8`, `image/png24`, `image/png32`, `image/gif`, and `image/svg+xml`.
- Layers:** A specific layer definition is shown, including its name (`18`), title (`2018`), abstract, CRS (`CRS:84`, `EPSG:4326`, `EPSG:27700`), and a detailed bounding box.

Create a Custom WMS Map

- Background Maps & Layers are configured via the **Console**
 - ▶ Navigate to the Console
 - ▶ Select **Maps**
- WMS Maps are added on the **Backgrounds** tab
 - ▶ Navigate to the Background Maps
 - ▶ Click on **Add Background**
 - ▶ Select **Web Map Service**



Configure the WMS Map

- Configure the WMS map, providing:
 - ▶ Name
 - the identifier visible within DV
 - ▶ Description
 - an optional descriptive for the map
 - ▶ URL
 - the location of the WMS service
 - specified upto `/MapServer/WMSServer`
 - ▶ Version
 - the version referenced by the WMS service
 - ▶ Layers
 - one (or more) layers defined in the WMS service
 - ▶ Format
 - a valid format defined in the WMS service

The screenshot shows a configuration window titled "EEA Drought Frequency Change" with a subtitle "EEA Drought Frequency Change". It has "Save" and "Close" buttons in the top right. On the left is a sidebar with three tabs: "General" (selected), "Parameters", and "Preview". The main area contains the following fields:

- Name:** EEA Drought Frequency Change
- Description:** (empty text box)
- URL:** https://climate.discomap.eea.europa.e
- Trust:** ☒ I agree to trust this external host. [More Details](#)
- Version:** 1.3.0 (dropdown menu)
- Coordinate Reference System:** EPSG:3857 (dropdown menu with an info icon)
- Layers:** 1 x (text box with a clear button)
- Format:** PNG (dropdown menu)

At the bottom, there is a link: [Setup Details and Troubleshooting Tips](#).

Create Safe Domain Entry

- In order for OAC to be able to reference the WMS service, the URL must be added to the *Safe Domain* listing
 - ▶ Click on the check box to create an entry
 - ▶ Configure domains via the **Safe Domains** option on the **Console**

EEA Drought Frequency Change

EEA Drought Frequency Change

Save Close

General

Parameters

Preview

Name EEA Drought Frequency Change

Description

URL https://climate.discomap.eea.europa.e

☒ I agree to trust this external host. [More Details](#)

Version 1.3.0

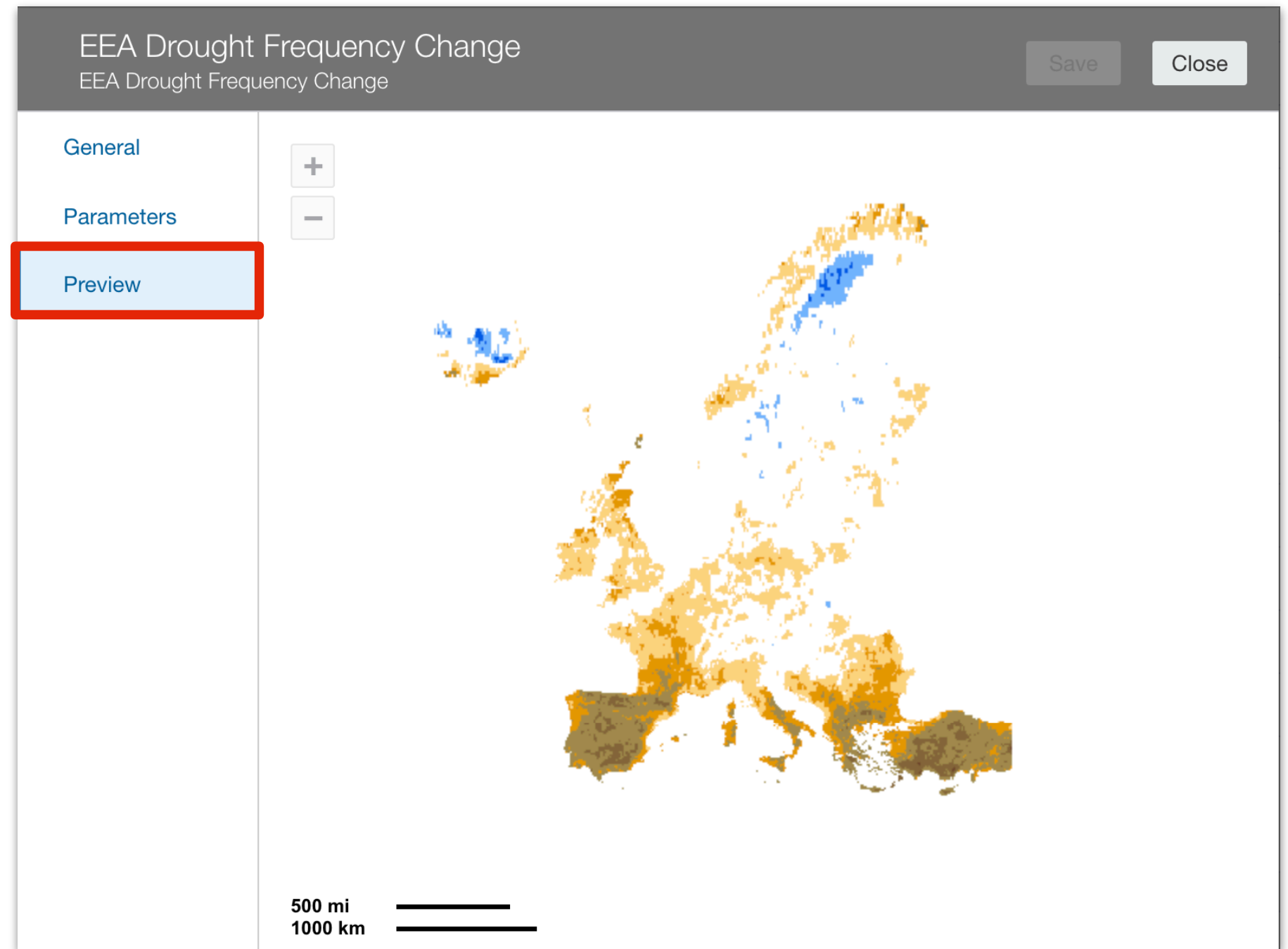
Coordinate Reference System EPSG:3857

< Safe Domains

Domain Name	Image	Allow Frames	Script	Font	Style	Media	Connect	Embedding
All domains	✓						✓	
map.bgs.ac.uk	✓					✓	✓	
ons-inspire.esriuk.com	✓					✓	✓	
ons-in	✓					✓	✓	
ukairmaps.ricardo-aea.com	✓					✓	✓	
uk-air.defra.gov.uk	✓					✓	✓	
www.bgs.ac.uk	✓					✓	✓	
inspire.misoportal.com	✓					✓	✓	
maps.communities.gov.uk	✓					✓	✓	
climate.discomap.eea.europa.eu	✓						✓	
maratlas.discomap.eea.europa.eu	✓						✓	
+ add domain								

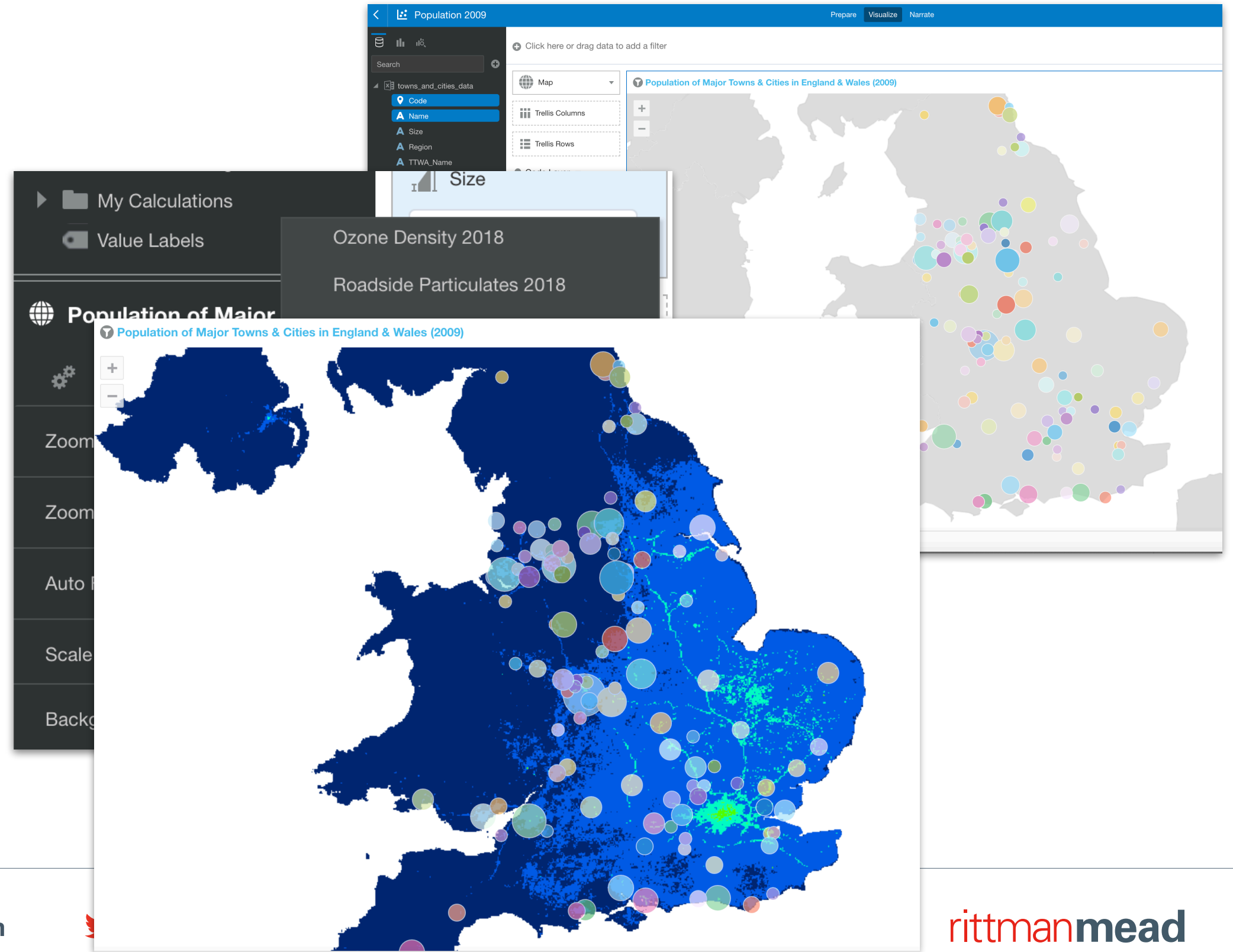
Confirm the WMS Map Configuration

- Preview the WMS Map
 - ▶ Click on **Save**
 - ▶ Refresh your OAC session
 - ▶ Open the new WMS entry
 - access the **Options** menu
 - click on **Inspect**
 - ▶ Navigate to the **Preview** tab
 - confirm the map is rendered



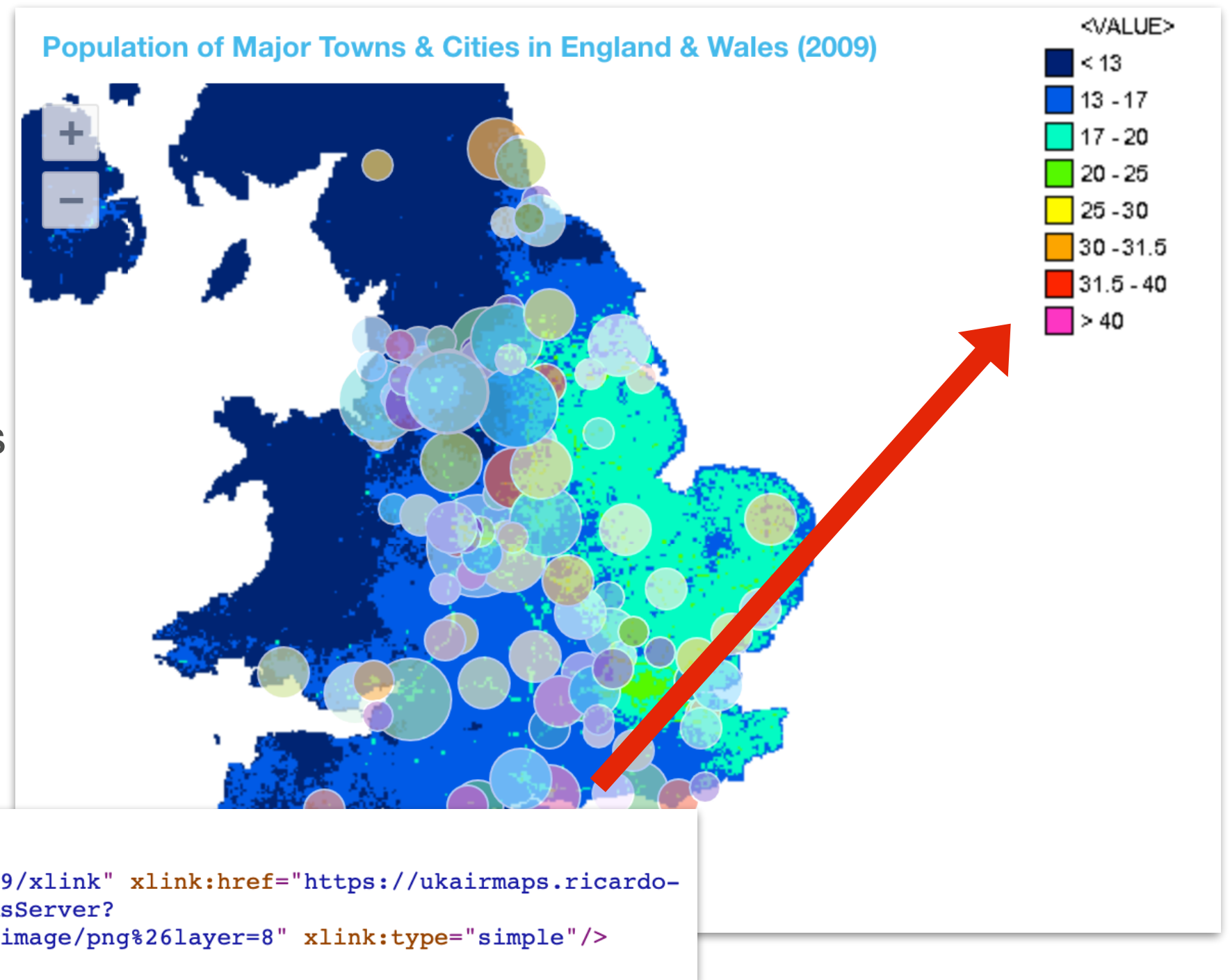
Use the WMS Map

- Create a Project
 - ▶ Add a **Map** to the Canvas
 - ▶ Configure the Map
 - open the **Properties**
 - navigate to the **Maps** tab
 - expand the **Background Map** options
 - select the newly added map



Add Context

- As the map layers may not be limited to infrastructure features, it is important to make clear what the background is showing
 - ▶ Check the `GetCapabilities` request
 - ▶ The service *should* include legend details
 - search for `<LegendURL>` tag
 - ▶ Add an **Image** visualisation to the DV Canvas
 - specify the `LegendURL`

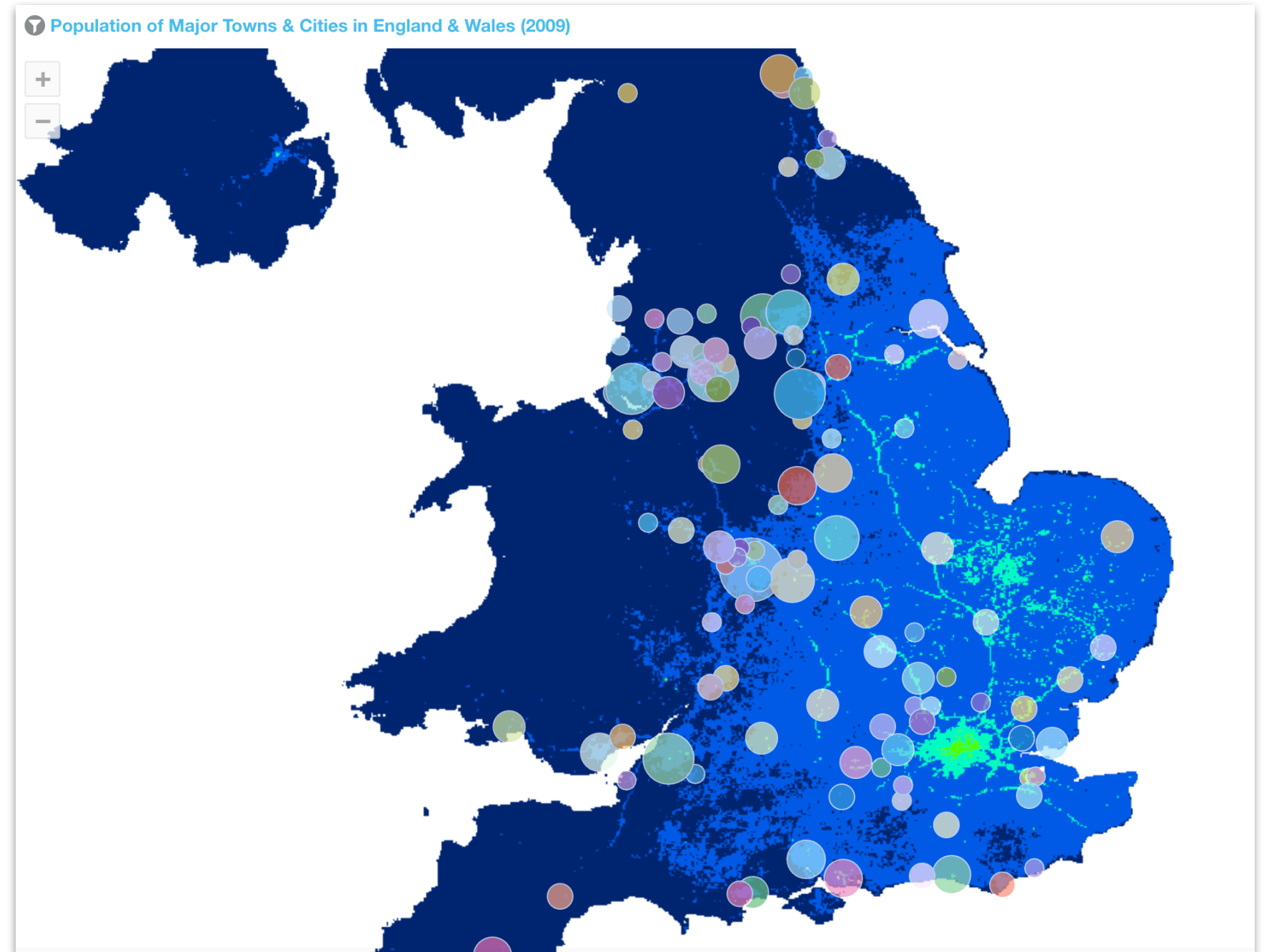




Demonstration

Summary

- Integrating Web Map Services opens up new and innovative ways in which our enterprise data sets can be analysed
- Helping us to gain a better understanding and identify insights that would otherwise be missed
- WMS services can be integrated into your OAC environment quickly and very easily, opening up a world of opportunities!





Any Questions?



OAC Maps

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