Landmark Information Group – Historic Map Data and Services
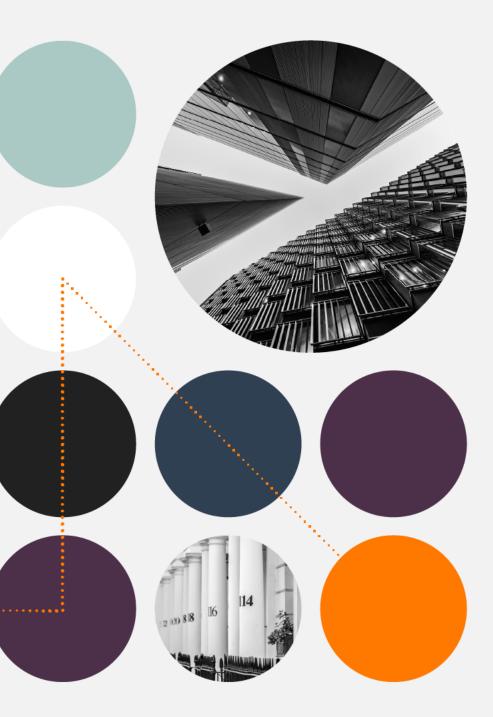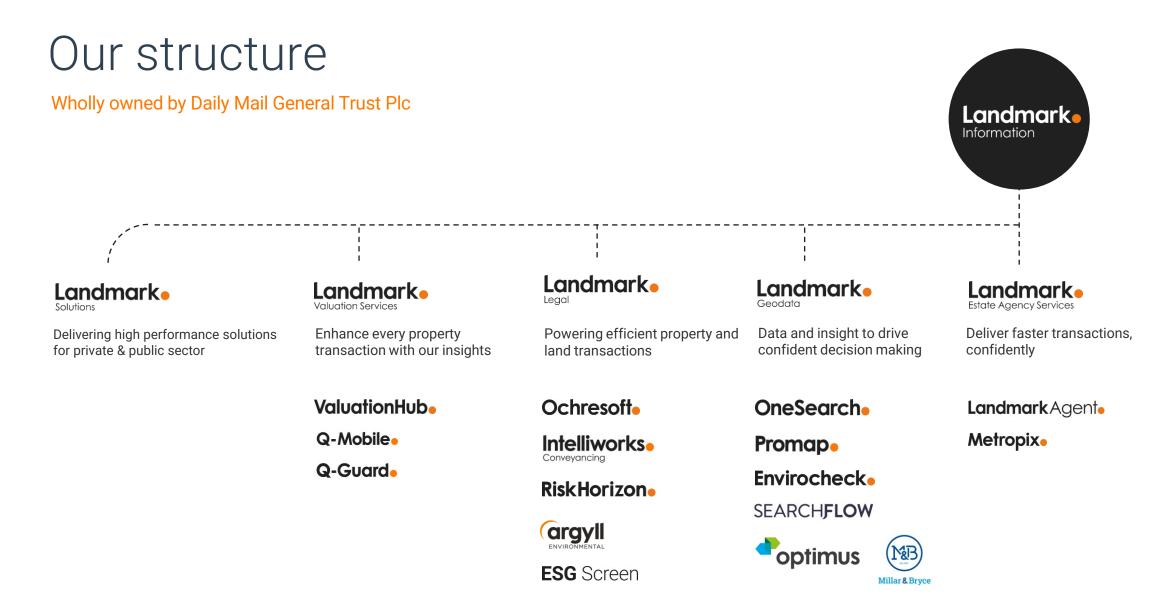
Giles Martin & Michael Sebhat
November 2024

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Who are we?

Our structure

Wholly owned by Daily Mail General Trust Plc

Landmark. Information

Landmark. Solutions

Delivering high performance solutions for private & public sector

Landmark. Valuation Services

Enhance every property transaction with our insights

ValuationHub.

Q-Mobile.

Q-Guard.

Landmark. Legal

Powering efficient property and land transactions

Ochresoft.

Intelliworks. Conveyancing

RiskHorizon.

argyll ENVIRONMENTAL

ESG Screen

Landmark. Geodata

Data and insight to drive confident decision making

OneSearch.

Promap.

Envirocheck.

SEARCH**FLOW**

optimus

M&B Millar & Bryce

Landmark. Estate Agency Services

Deliver faster transactions, confidently

Landmark Agent.

Metropix.

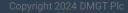# Information Management: the enabler of future value

Landmark Information Group are OSGB's largest commercial partner operating since 1994

Landmark Solutions as a division provide data, bespoke solutions and services

Market leader in the field of digital mapping and property related risk information

Content Providers

Climate Change

Disaster Zone & Crisis Management

IoT

Electric Vehicles

Data Management intelligence

Networked Economy

Smart Cities

Digital Transformation

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Historic Maps

Historic Maps ✓

History

- Joint Venture with the Ordnance Survey
- Scanned the paper maps
- Cut of the Marginalia
- Georeferencing information provided by an academic – Brian Adams
- Original Projection:
  - Pre WWII – Cassini County
  - Post WWII – National Grid (BNG)

Historic Maps ✓

Landmark publish a secured set of Historic Map feeds as OGC WMS web services.

Scanning, edge-matching & georectifying the entire OS Historical Archive.
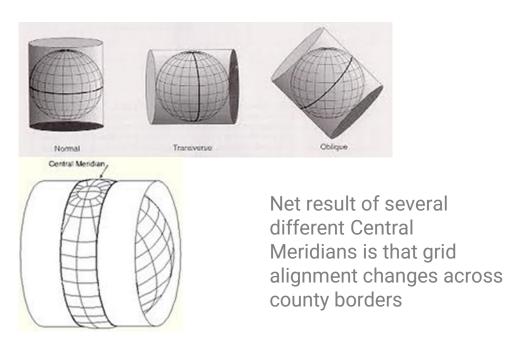
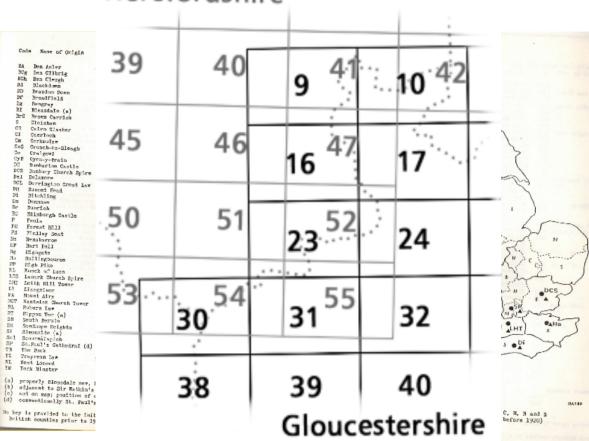The archive currently contains over 1,000,000 map images at a variety of scales:

- Town Plans: 1:500, 1:528 & 1:1056 scale from c.1850 to c.1910/1940 - One to Four Epochs - 15,594 map tiles

- County Series: 1:2500 & 1:10 560 scale from c.1841 to c.1948 – Four Epochs – 192,330 map tiles

- National Grid Series: 1:1250, 1:2500 & 1:10 000 scale from c.1950 to c.1995 – Three to Five Epochs – 334,906 map tiles

- SIM, SUSI and Superplan: 1:1250, 1:2500 & 1:10 000 scale from c.1947 to c.1997 - Various Epochs - 400,000 map tiles

Historic Maps – Cassini Projection

- Transverse Mercator Projection

- Each County has its own "Central Meridian" and Origin based on local landmarks E.G. For Devon it is Ripon Tor on Dartmoor

- Many Counties "share" projections with neighbouring counties

- Surveyed a sheet at a time
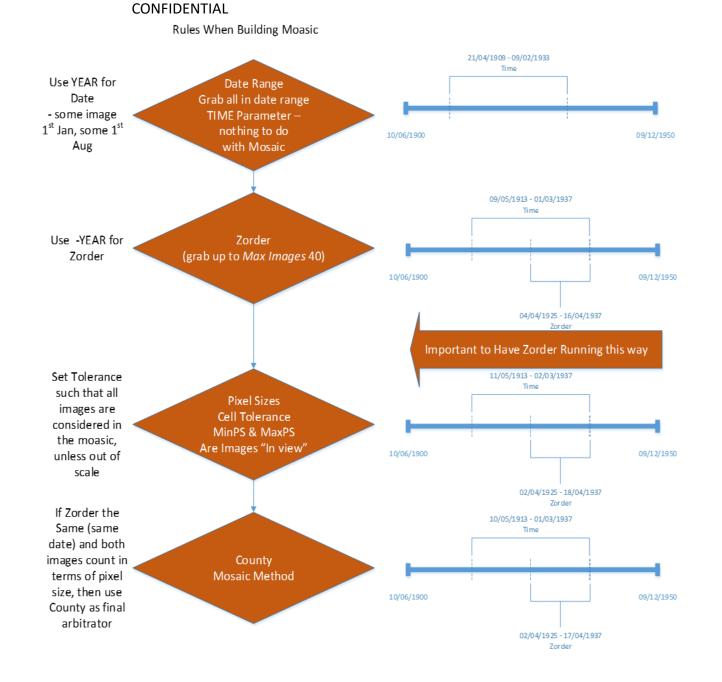
- Sheets were engraved onto large copper plates

Net result of several different Central Meridians is that grid alignment changes across county borders

Historic Maps – Image Mosaic Technology

- Flexible system of managing large amounts of raster data

- Seamless imagery, attribute driven, dynamic functions

- Tools to manage Overlapping Maps, Variable Dates, Mixed Scales, and Mixed Projections

- All can be delivered out of a single map service

  - Overviews & pyramids

  - Orthorectification, image enhancing, colour correction

  - On the fly re-projection

  - Temporal management

  - Multiple source types

  - Improve accuracy
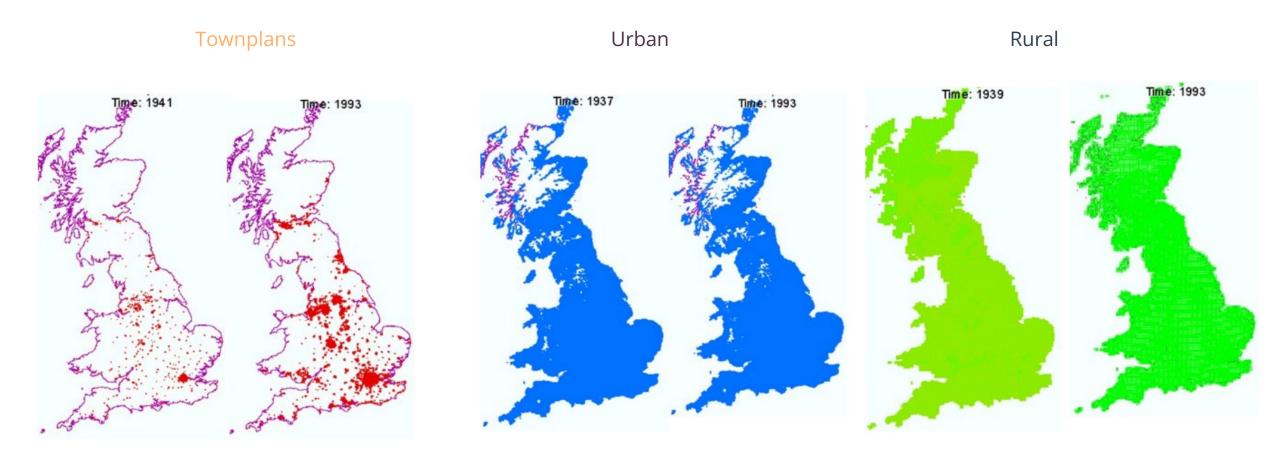
  - Enhanced visualisation

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Mosaic Rules

Rules When Building Moasic

Use YEAR for Date
- some image 1st Jan, some 1st Aug

Date Range
Grab all in date range
TIME Parameter – nothing to do with Mosaic

21/04/1909 - 09/02/1933
Time

10/06/1900   09/12/1950

Use -YEAR for Zorder

Zorder
(grab up to *Max Images* 40)

09/05/1913 - 01/03/1937
Time

10/06/1900   09/12/1950

04/04/1925 - 16/04/1937
Zorder

Important to Have Zorder Running this way

Set Tolerance such that all images are considered in the moasic, unless out of scale

Pixel Sizes
Cell Tolerance
MinPS & MaxPS
Are Images "In view"

11/05/1913 - 02/03/1937
Time

10/06/1900   09/12/1950

02/04/1925 - 18/04/1937
Zorder

If Zorder the Same (same date) and both images count in terms of pixel size, then use County as final arbitrator

County
Mosaic Method

10/05/1913 - 01/03/1937
Time

10/06/1900   09/12/1950

02/04/1925 - 17/04/1937
Zorder

Historic Map Scales ✓

From	To	Scale	Number	Notes
1840	1911	1.500	12,223	Town Centres
1851	1895	1.528	452	Twon Centres (Different Towns)
1848	1939	1:1,056	2,406	Built up Areas - London and Midland Cities
1943	1993	1:1,250	108,066	All Urban areas POST WAR
1854	1949	1:2,500	148, 651	Whole country except a few upland areas. County Series
1943	1995	1:2,500	198,790	Whole country except a few upland areas. National Grid Series ("upland" grows post war)
1846	1982	1:10,560	54,831	Whole Country
1958	1996	1:10,000	16,890	Whole Country

Townplans , Urban & Rural

Historic Maps Coverage

Available coverage:

Townplans   Urban   Rural

Historic Maps – Build Service – Data Process

- Raw Data Directory

- 1Tb File Data

- 6.5 million files

- 5,412 Directories

Uncompressed TIFF Volumes

- 1:2500 Pre-war   33Tb

- 1:2500 Post-war   26Tb

- 1:1250   85Tb

- Town Plans (1:500& 1:528)   242Tb

Typical Run Times

- **Fix Tiffs**   ~ 3 weeks

- Extract GeoInformation   ~ 1 week

- Build Catalogs   ~72 hours per catalogue

- Build Mosaics   ~24 hours per mosaic

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Historic Maps – Build Service

Build a referenced Raster Catalogue for each combination of:

• County

• Epoch (Date)

• Scale

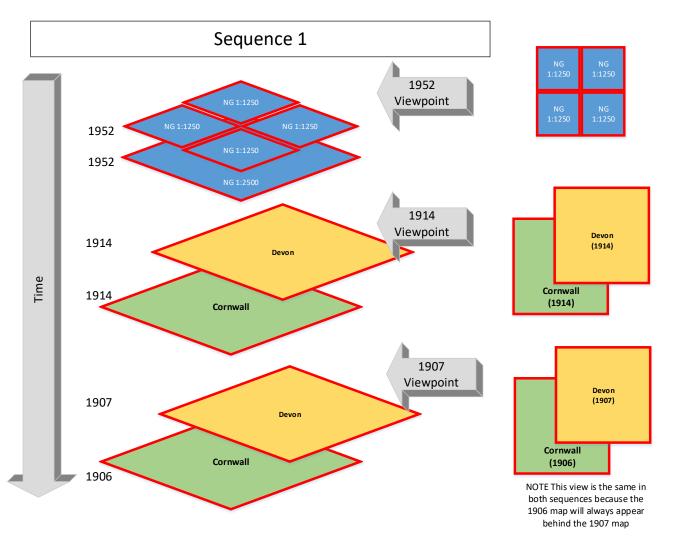Catalogues have extra columns for

• Date

• Year

• County

These are used in mosaicking rules

Build referenced Mosaics from combinations of each of these catalogues.

Map Service Option 1: All Scales, Time sequenced.
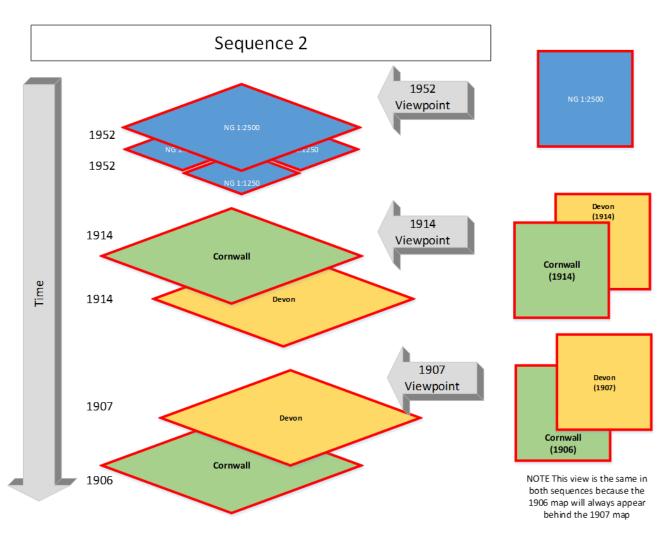Map Service Option 2: Maps split into 3 broad scales & then Time sequenced

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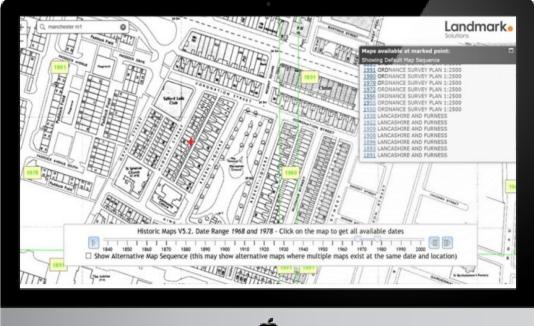# Historic Maps – Build Service – Sequencing Overlaps

Make use of the "By Attribute" Mosaic method to prioritise the map on top when there is a "tie" based on date.
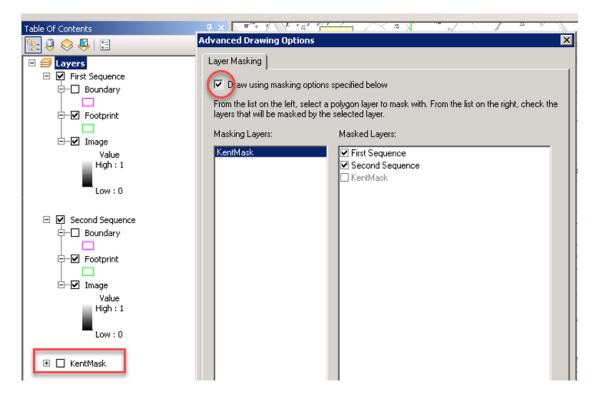
NOTE This view is the same in both sequences because the 1906 map will always appear behind the 1907 map

Historic Maps − Build Service − Sequencing Overlaps

Historic Maps – Build Service - Masking

Create a Mask (polygon)

This allows views within the mask perimeters.

Historic Maps – Consuming Services

GIS Desktop

Web Application

OGC WMS

Historic Maps – Consuming Services

Web application using authorized user

Desktop GIS using URL with encrypted token authentication based on named organization

Typical GIS Desktops:
ArcGIS Desktop & ArcGIS Pro
QGIS (with temporal plugins)
MapInfo

Historic Maps Examples ✓

Maps available at marked point:
Showing Default Map Sequence

Current Mapping
1994 ORDNANCE SURVEY PLAN 1:2500
1988 ORDNANCE SURVEY PLAN 1:2500
1980 ORDNANCE SURVEY PLAN 1:2500
1973 ORDNANCE SURVEY PLAN 1:2500
1972 ORDNANCE SURVEY PLAN 1:2500
1965 ORDNANCE SURVEY PLAN 1:2500
1956 ORDNANCE SURVEY PLAN 1:2500
1956 ORDNANCE SURVEY PLAN 1:2500
1951 ORDNANCE SURVEY PLAN 1:2500
1950 ORDNANCE SURVEY PLAN 1:2500
1948 ORDNANCE SURVEY PLAN 1:2500
1938 LANCASHIRE AND FURNESS

Historic Maps V5.2. Date Range *1984 and 1994* - Click on the map to get all available dates

1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000

☐ Show Alternative Map Sequence (this may show alternative maps where multiple maps exist at the same date and location)

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Service Provision Case Studies

CASE STUDY
National Highways

National Highways added a significant datastore to enhance these digital platforms by making historical spatial information more widely accessible throughout the organisation; **Landmark Information Group's OS Historical Mapping Web Map Service**

Landmark's Historical WMS gives National Highways immediate access to over 32,000 historical Ordnance Survey map images ranging from 1855-1993.

Landmark provide a secure weblink for users who are less familiar with GI technology. This link allows users to set the time period of interest via a unique Time Slider which builds a mosaic of historical layers showing the user the map picture exactly as Ordnance Survey would have perceived the landscape at the time.

MAGIC

Multi-Agency Geographic Information for the Countryside

We provide Natural England with a popular interactive mapping service providing over 380 natural environment management geospatial datasets via an integrated platform and application that delivers over 4 million maps a month. We have provided this service to Natural England since 2012, and its popularity is still very high. In the earlier days before core base maps were redirected to OS Data Hub, the system was providing an average of 14 million maps a month.

CASE STUDY
National Trust

National Trust have been using the **Landmark OS Historical Mapping Web Map** Service to enhance their digital platforms and make spatial information more widely accessible throughout the Trust.

Landmark's Historical WMS gives National Trust immediate access to over 32,000 historical Ordnance Survey map images ranging from 1855-1993.

Landmark provide a **password protected weblink** for users who are less familiar with GI technology. This link allows users to set the time period of interest via a unique Time Slider which builds a mosaic of historical layers showing the user the map picture exactly as Ordnance Survey would have perceived the landscape at the time.
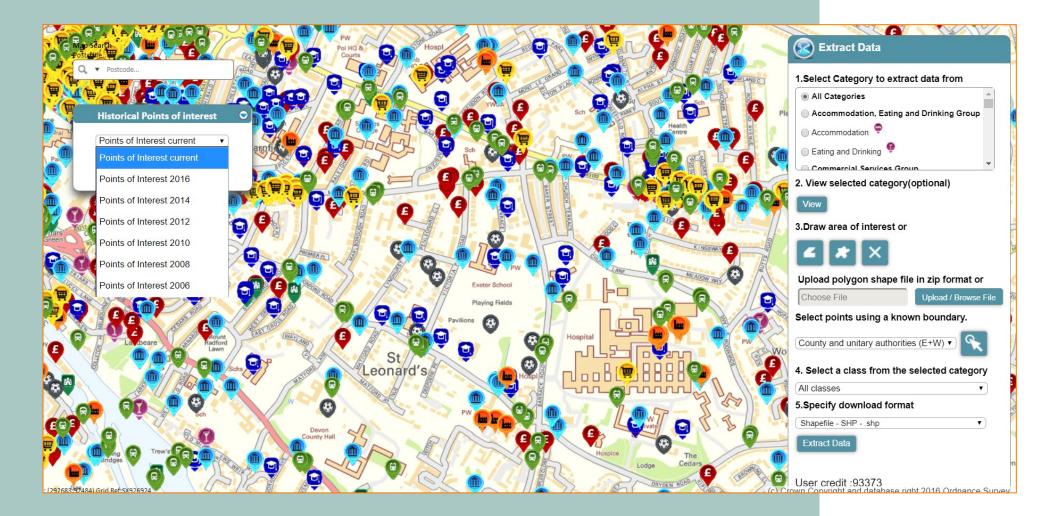
4
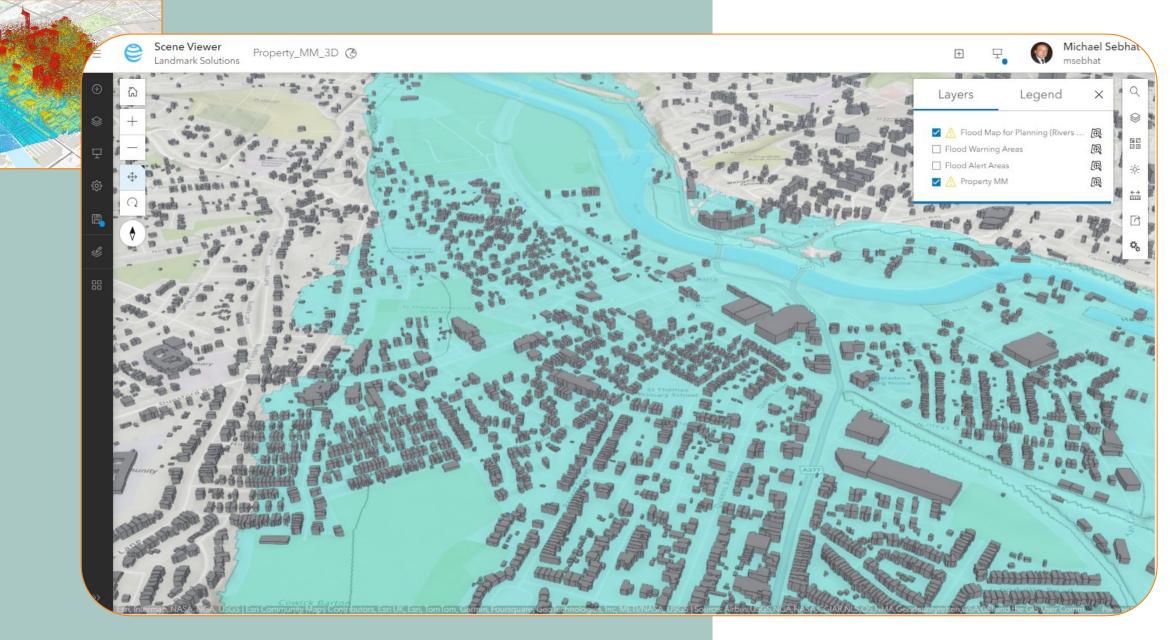
Geospatial Proof of Concepts

Enhanced PointX – Point of Interest

3D Flood Visualisation

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Questions and Discussion

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Get in touch

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