

- Background and context
- NLS Case Studies 1 - GDAL/
MapTiler/Georeferencer
- NLS Case Studies 2 - Geoserver /
OpenLayers
- Other technologies - IIPImage for
JP2 / Omeka.org
- Opportunities for libraries



Maps of Scotland website – 44,000 online maps

The screenshot shows the homepage of the National Library of Scotland's Maps of Scotland website. At the top left is the NLS logo and the text 'National Library of Scotland'. To the right is a search bar labeled 'Search Maps of Scotland:' with a 'go' button and a link to 'View search options'. Below the search bar is a navigation menu with links for 'Home', 'Using the Library', 'Digital resources', 'Catalogues', 'News + events', and 'Contact'. The main heading is 'Maps of Scotland' with a sub-heading 'Access high-resolution zoomable images of over 44,000 maps of Scotland.' On the left is a sidebar with 'Browse by metadata' and links for 'Georeferenced maps', 'About this resource', 'Recent additions', 'Access early maps', 'Essential staff tools', 'About maps at NLS', 'Copyright', and 'Contact image info'. The main content area is titled 'Browse by category:' and lists various map categories with sub-links, such as 'Maps of the whole of Scotland, 1589-1928', 'County maps of Scotland, 1520-1991', 'Town plans/views, 1580-1919', 'Military maps of Scotland, 18th century', and 'Estate maps of Scotland, 1772-1970'. A collage of historical maps is shown on the right.

<http://maps.nls.uk>

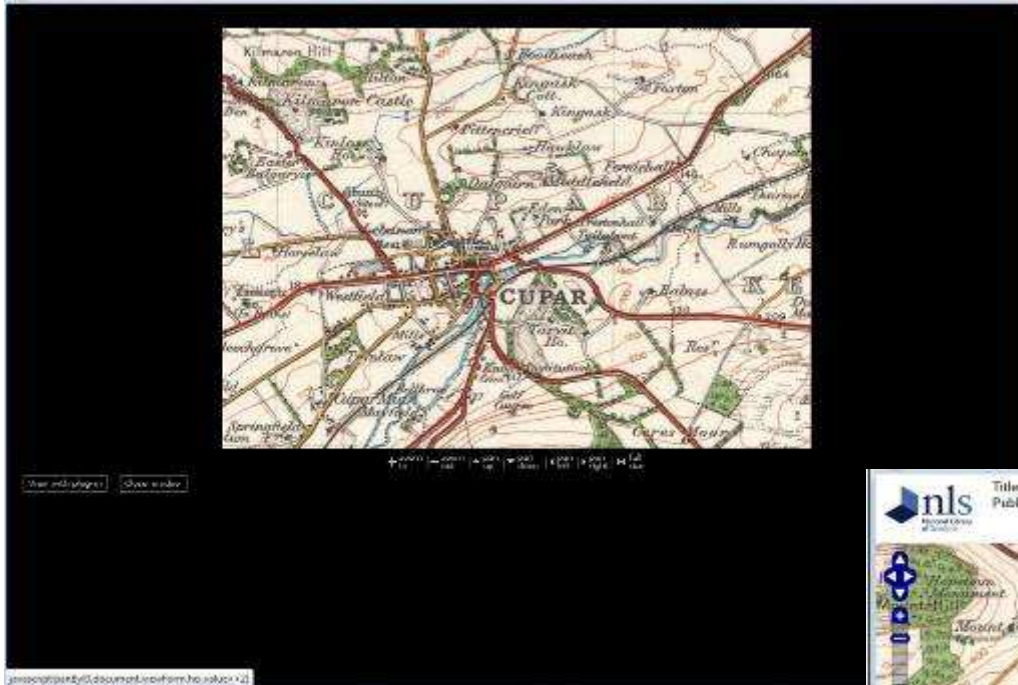
The screenshot shows the 'Georeferenced maps and applications' page. At the top left is the NLS logo and the text 'Georeferenced maps and applications'. Below this is a navigation menu with 'Home page'. The main heading is 'Georeferenced maps and applications'. Below this is a sub-heading 'Access over 3,000 georeferenced historical maps through [search applications](#), [search](#), [georeference](#), [Ordnance Survey Maps API](#), and the [Ordnance Survey Georeference](#) website.' The page is divided into several sections: 'APPLICATIONS' (with a search bar and a list of map types like 'Ordnance Survey Maps - [Search](#)' and 'Ordnance Survey Maps - [2d map](#)'), 'OVERLAYS' (with a search bar and a list of map types like 'Ordnance Survey large-scale [town plans](#)' and 'Ordnance Survey [air photo mosaics](#)'), 'GEOREFERENCER' (with a search bar and a list of map types like 'maps of Scotland, 1580-1928' and 'county maps, 1520-1928'), and 'HISTORIC MAPS API' (with a search bar and a list of map types like 'maps of Scotland, 1580-1928' and 'county maps, 1520-1928'). Each section includes a small image of a map or a mobile device.

<http://geo.nls.uk>

- Background and context
- **NLS Case Studies 1 - GDAL/MapTiler/Georeferencer**
- NLS Case Studies 2 - Geoserver / OpenLayers
- Other technologies - IIPImage for JP2 / Omeka.org
- Opportunities for libraries

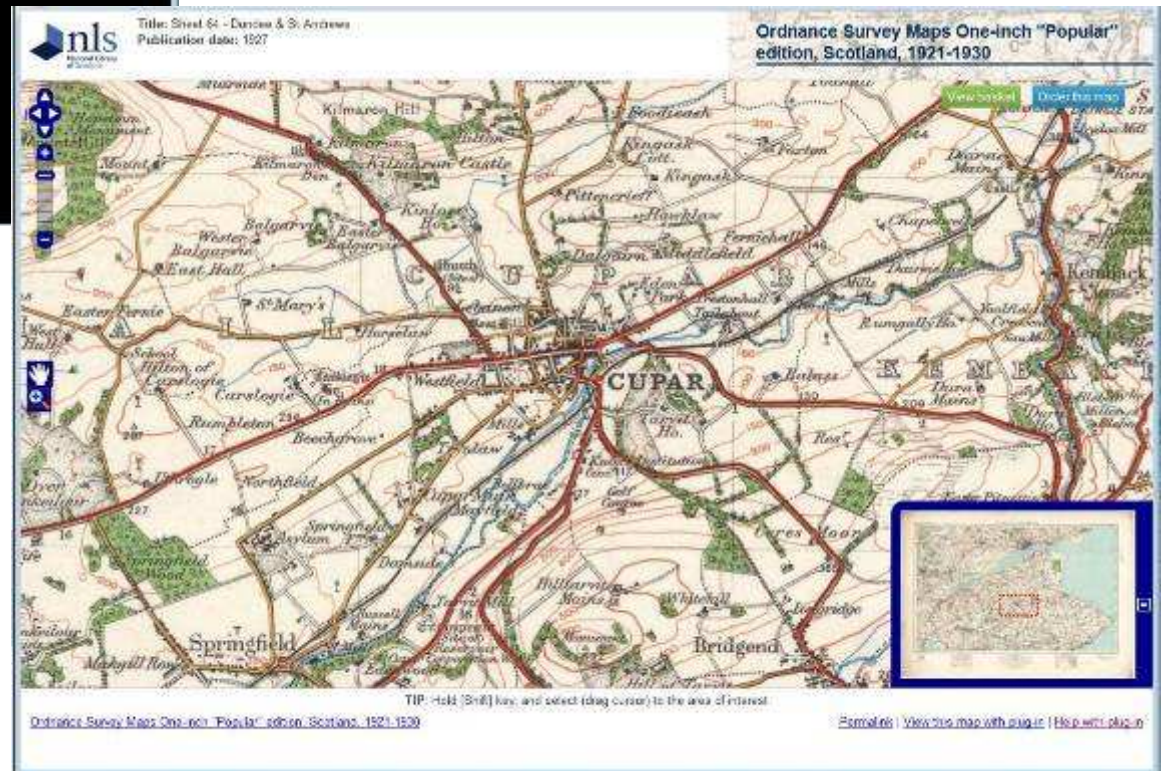


New MrSID OpenLayers Viewer - 2009



LizardTech Express Viewer problems:

- Fixed image extents on screen
- Non-Ajax based viewing
- Limited ability to display image in wrapper
- Printing and downloading limitations
- No Permalink



New customised OpenLayers viewer addresses these problems and uses other open-source Javascript programs including, Prototype, Gears, and XMLHttpRequest

GDAL / OGR open source commands

gdalinfo	information about raster image
gdaltindex	create shapefile of raster image extents
gdal_translate	convert raster images between formats
gdaltransform	convert raster images between projections
ogrinfo	information about vector file
ogr2ogr	convert vector files between formats

GDAL: using gdaltindex to create a clickable graphic index



Using QGIS to create and edit shapefiles

Quantum GIS 1.7.3-Wroclaw

File Edit View Layer Settings Plugins Raster Vector Help

Layers

7edLimits

Attribute table - 7edLimits :: 1 / 202 feature(s) selected

	SHEET	SURVEY	PUBLIC	IMAGE	IMAGETHUMB	DATES	IMAGEURL
35	Strathpeffer	1955	1957	91549096	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
36	Inverness	1955	1961	91549099	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
37	Elgin	1955	1959	91549102	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
38	Banff	1955	1959	91549105	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
39	Peterhead	1955	1958	91549108	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
40	Barra	1956	1959	91549111	http://digital.nl...	Surveyed: 1956...	http://maps.nls...
41	Rhum and Part ...	1955	1957	91549114	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
42	South Skye and...	1945	1957	91549117	http://digital.nl...	Surveyed: 1945...	http://maps.nls...
43	Loch Arkaig	1954	1961	91549120	http://digital.nl...	Surveyed: 1954...	http://maps.nls...
44	Fort Augustus	1954	1961	91549123	http://digital.nl...	Surveyed: 1954...	http://maps.nls...
45	Kingussie	1955	1957	91553640	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
46	Granton and Ca...	1955	1957	91553643	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
47	Strathdon	1955	1958	91553646	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
48	Aberdeen	1955	1959	91553649	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
49	Braemar	1955	1957	91553652	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
50	Ballater	1955	1958	91553655	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
51	Stonehaven	1955	1958	91553658	http://digital.nl...	Surveyed: 1955...	http://maps.nls...
52	Coll and Tiree	1954	1955	91553661	http://digital.nl...	Surveyed: 1954...	http://maps.nls...
53	Sound of Mull	1954	1956	91553664	http://digital.nl...	Surveyed: 1954...	http://maps.nls...
54	Loch Linnhe	1954	1960	91553667	http://digital.nl...	Surveyed: 1954...	http://maps.nls...
55	Glencoe	1954	1960	91553670	http://digital.nl...	Surveyed: 1954...	http://maps.nls...
56	Loch Tay	1954	1956	91553673	http://digital.nl...	Surveyed: 1954...	http://maps.nls...
57	Blairstown	0	1961	91553676	http://digital.nl...	Surveyed: 0 < br...	http://maps.nls...
58	Forfar	1954	1961	91553679	http://digital.nl...	Surveyed: 1954...	http://maps.nls...

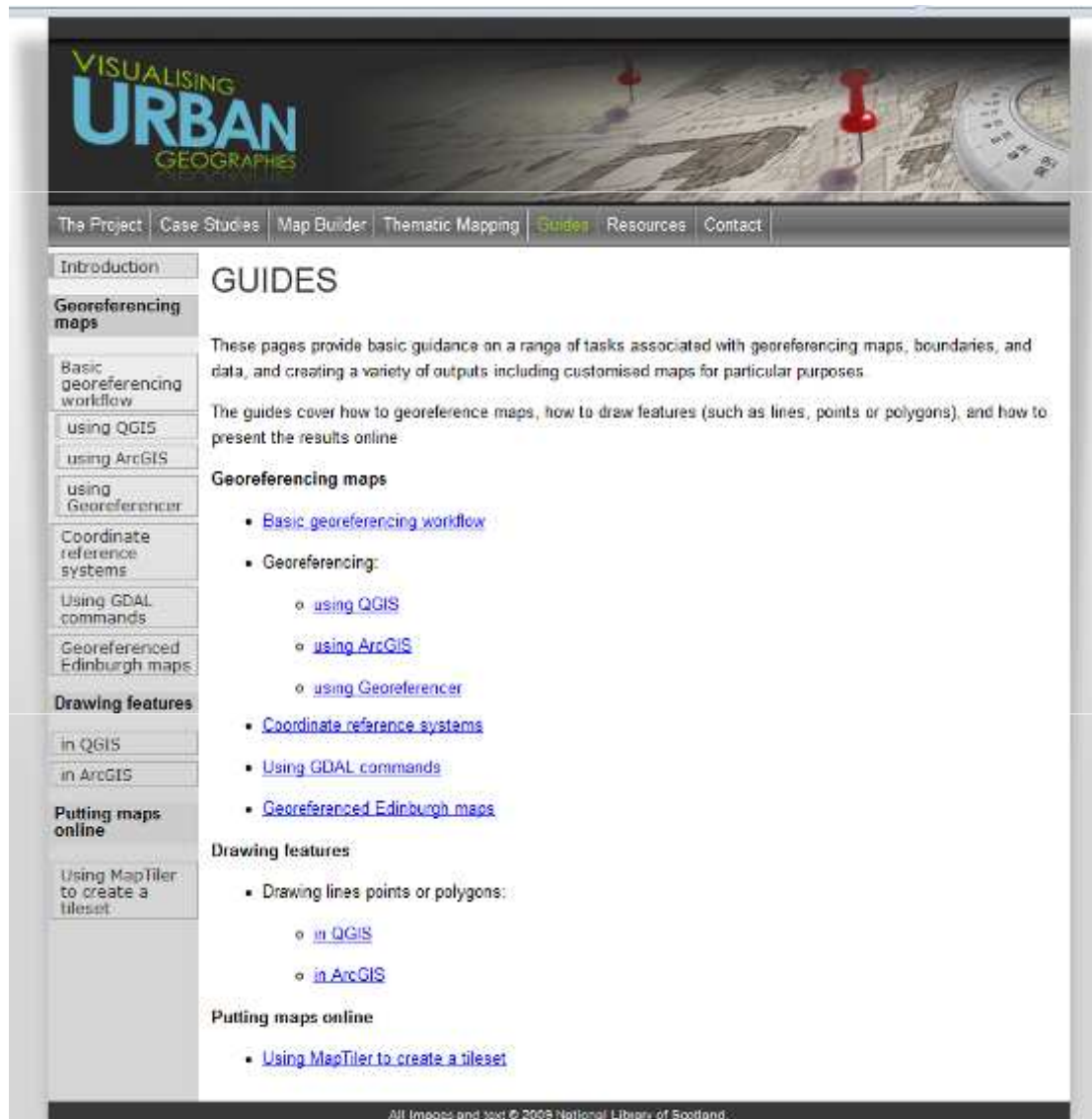
Look for: _____ in _____ Search

Show selected only Search selected only Case sensitive ?

1 feature(s) selected on layer 7edLimits.

Coordinate: 100499,807616 Scale: 1:46147256463 Render EPSG:4326

Visualising Urban Geographies - guides to georeferencing workflows using open-source QGIS and MapTiler



VISUALISING URBAN GEOGRAPHIES

The Project | Case Studies | Map Builder | Thematic Mapping | **Guides** | Resources | Contact

GUIDES

These pages provide basic guidance on a range of tasks associated with georeferencing maps, boundaries, and data, and creating a variety of outputs including customised maps for particular purposes.

The guides cover how to georeference maps, how to draw features (such as lines, points or polygons), and how to present the results online.

Georeferencing maps

- [Basic georeferencing workflow](#)
- Georeferencing:
 - [using QGIS](#)
 - [using ArcGIS](#)
 - [using Georeferencer](#)
- [Coordinate reference systems](#)
- [Using GDAL commands](#)
- [Georeferenced Edinburgh maps](#)

Drawing features

- [in QGIS](#)
- [in ArcGIS](#)

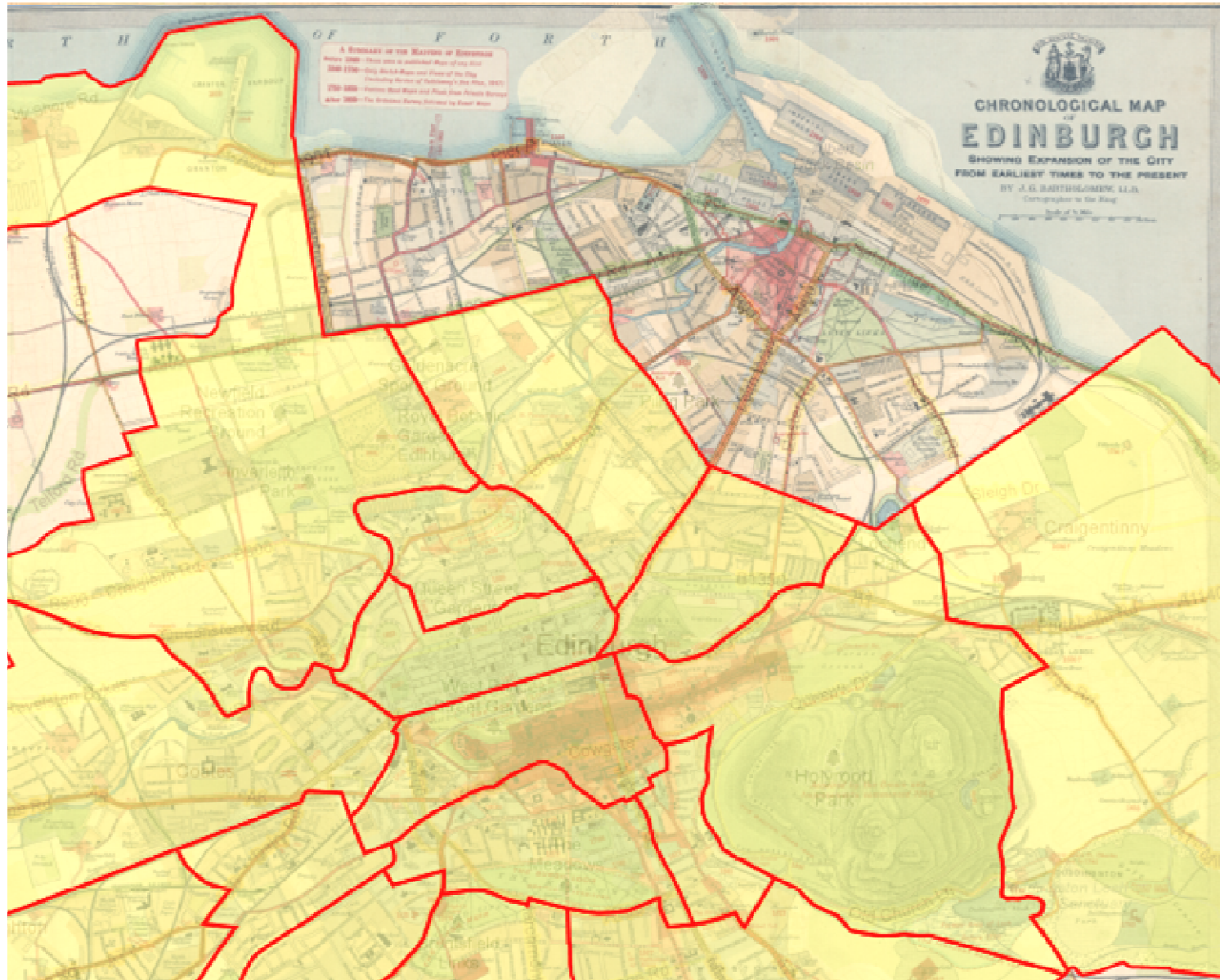
Putting maps online

- [Using MapTiler to create a tileset](#)

All images and text © 2008 National Library of Scotland

geo.nls.uk/urbhist/guides.html

Using GDAL ogr2ogr - to convert shapefiles (in British National Grid) into KML (in WGS84) for Google Earth





- OLD & MEDIEVAL EDINBURGH
- BEFORE 1450
- 1450 to 1515
- 1515 - 1622
- 1622 - 1750
- RENAISSANCE EDINBURGH
- 1750 - 1800
- 1800 - 1825
- 1825 - 1850
- MODERN EDINBURGH
- 1850 - 1875
- 1875 - 1900
- 1900 - 1919

 From J. G. Bartholomew's Chronological map of Edinburgh (1919).

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
 Image © 2011 Getmapping plc
 Image © 2011 TerraMetrics
 © 2011 Infoterra Ltd & Bluesky

©2010 Google



- BEFORE 1450
- 1450 to 1515
- 1515 - 1622
- 1622 - 1750
- 1750 - 1800
- 1800 - 1825
- 1825 - 1850
- 1850 - 1875
- 1875 - 1900
- 1900 - 1919



From J. G. Bartholomew's Chronological map of Edinburgh (1919)

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2011 Getmapping plc
Image © 2011 TerraMetrics
© 2011 Infoterra Ltd & Bluesky
56°07'26.85" N 2°53'48.50" W elev. -4 m





- BEFORE 1450
- 1450 to 1515
- 1515 - 1622
- 1622 - 1750
- 1750 - 1800
- 1800 - 1825
- 1825 - 1850
- 1850 - 1875
- 1875 - 1900
- 1900 - 1919



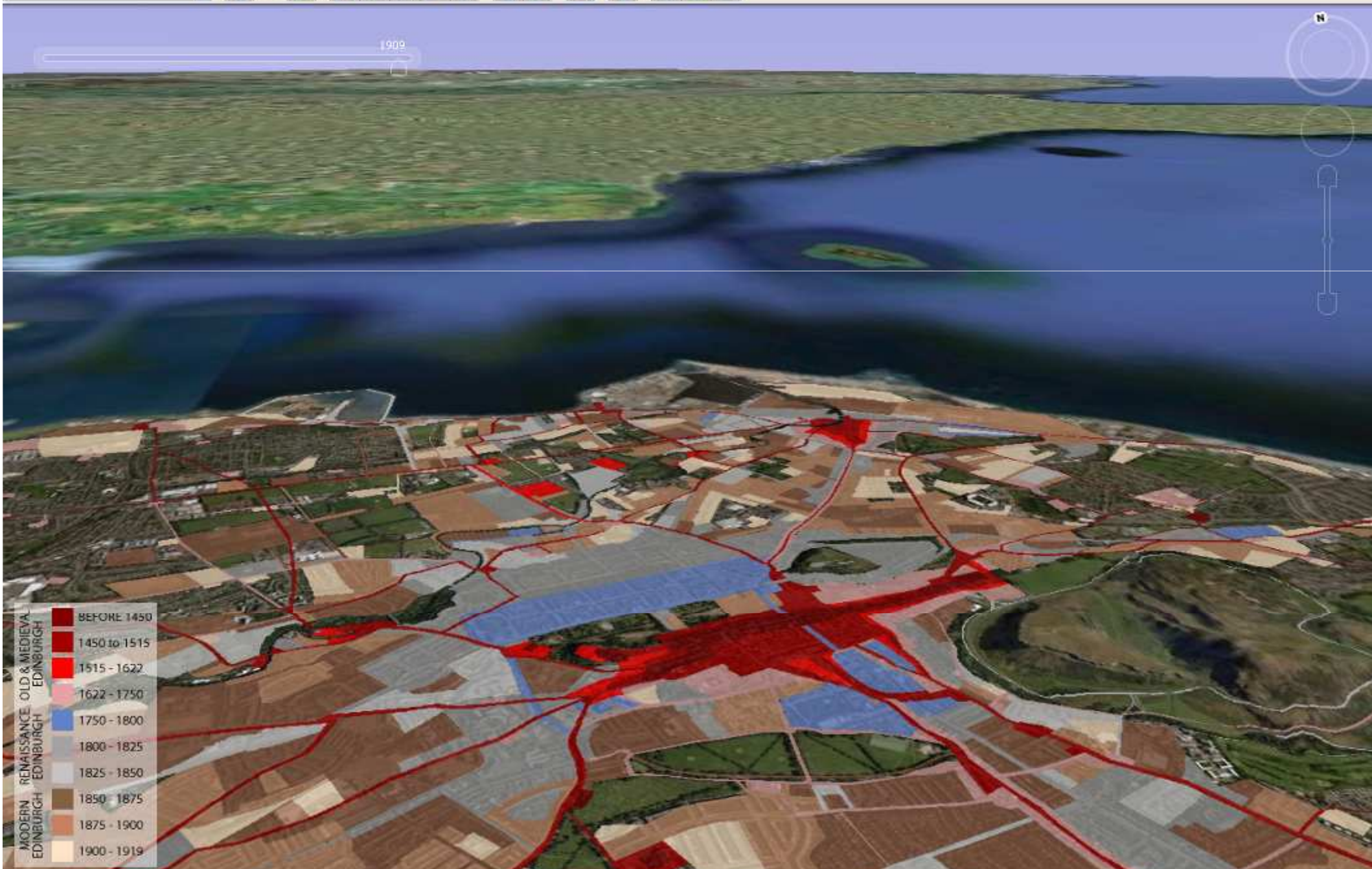
From J. G. Bartholomew's Chronological map of Edinburgh (1919).

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2011 Getmapping plc
Image © 2011 TerraMetrics
© 2011 Infoterra Ltd & Bluesky



56°13'41.78" N 2°57'28.09" W elev 85 m

Eye alt 2.43 km



MODERN RENAISSANCE OLD & MEDIEVAL EDINBURGH EDINBURGH	BEFORE 1450
	1450 to 1515
	1515 - 1622
	1622 - 1750
	1750 - 1800
	1800 - 1825
	1825 - 1850
	1850 - 1875
	1875 - 1900
	1900 - 1919



From J. G. Bartholomew's Chronological map of Edinburgh (1919).

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2011 Getmapping plc
Image © 2011 TerraMetrics
© 2011 Infoterra Ltd & Bluesky
55°56'45.24" N 3°04'49.41" W elev. -7 m



Eye alt. 2.43 km

NLS Map Georeferencer



Map Georeferencer home page

Online map georeferencing pilot programme

[Help](#) | [Log in or register](#)

[Georeferenced maps and applications home](#) > Georeferencer home

[Applications](#) | [Overlays](#) | [Georeferencer](#) | [API](#) | [Maps of Scotland home](#)

Please select a map you would like to georeference from the groups below:

- [Maps of Scotland, 1560-1928](#)
- [County Maps of Scotland, 1580-1928](#)
 - [Blaeu Atlas of Scotland, 1654](#)
 - [Manuscript maps by John Adair, 1680s](#)
 - [Herman Moll's County Maps of Scotland, 1745](#)
 - [John Thomson's Atlas of Scotland, 1832](#)
- [Town Plans / Views, 1580-1919](#)
 - [Great Reform Act Plans, 1832](#)
- [Coasts of Scotland on marine charts, 1580-1850](#)
 - [Admiralty Charts of Scotland, 1795-1904](#)
- [Sutherland estate mapping, 1770s](#)


[Why georeference maps?](#) | [About georeferencer](#)



[More web mapping projects](#) | [Historical map overlays](#) | [NLS Maps homepage](#)

Developed by [Klokant Technologies GmbH](#) and [Moravian Library Brno](#) (project [OldMapsOnline.org](#)).

NLS Map Georeferencer

 **Map Georeferencer**
County Maps of Scotland, 1580-1928 [Help](#) | [Log in or register](#)

[Georeferenced maps and applications home](#) > [georeferencer home](#) > counties


[Applications](#) | [Overlays](#) | [Georeferencer](#) | [API](#) | [Maps of Scotland home](#)

[Why georeference maps?](#) | [About georeferencer](#)

The [Georeferencer](#) application is a new, easy and enjoyable way of georeferencing historical maps, so that they can be displayed as an overlay in [Google Earth](#) and the [Google Earth browser plug-in](#).


Ungeoreferenced

Please select a map below to start georeferencing:




Georeferenced

Please select a map below to view it in Google Earth or improve on the georeferencing:



NLS Map Georeferencer – selecting a map

 **Map Georeferencer**
County Maps of Scotland, 1580-1928 [Help](#) | [Log in or register](#)

[Georeferenced maps and applications home](#) > [georeferencer home](#) > counties


[Applications](#) | [Overlays](#) | [Georeferencer](#) | [API](#) | [Maps of Scotland home](#)

[Why georeference maps?](#) | [About georeferencer](#)

The [Georeferencer](#) application is a new, easy and enjoyable way of georeferencing historical maps, so that they can be displayed as an overlay in [Google Earth](#) and the [Google Earth browser plug-in](#).


Ungeoreferenced

Please select a map below to start georeferencing:



Georeferenced

Please select a map below to view it in Google Earth or improve on the georeferencing:



NLS Map Georeferencer – split-screen for georeferencing

The screenshot displays the NLS Georeferencer web application. At the top left is the NLS logo (National Library of Scotland). The main title is "Georeferencer: Online Georeferencing Tool" with the instruction "Click on three or more equivalent places on both maps". In the top right corner, the user name "ChrisFleet" and links for "Help" and "Log out" are visible. Below the title bar is a "Control points" section with a search input field and buttons for "Find a place", "Cancel", and "SAVE & EXIT". The interface is split into two main map panes. The left pane shows a historical map of Scotland, and the right pane shows a modern, color-coded map of Scotland. Both maps have a grid overlay. On the left side of the left map, there are navigation controls including arrows for panning and a vertical zoom slider. At the bottom of the interface, there is a footer with the text "Developed by [Kilian Technologies GmbH](#) and [British Library Birm](#) (project [DigiMapsOnline.org](#))" and "Data © 2010 [Ordnance Survey](#), [Review © 2010 \[MapInfo Technology\]\(#\)](#)". On the right side of the footer, it says "Geocoding via [EDINA Unlocked](#)".


NLS Map Georeferencer – adding control points

The screenshot displays the NLS Georeferencer interface. At the top left is the NLS logo (National Library of Scotland) and the title "Georeferencer: Online Georeferencing Tool" with the instruction "Click on three or more equivalent places on both maps". The top right shows the user name "ChrisFleet" and links for "Help" and "Log out". Below the title bar is a "Control points" tab and a search bar with "Find a place", "Cancel", and "SAVE & EXIT" buttons.

The main interface is split into two panels. The left panel shows a historical map with contour lines and labels such as "Inch Garvie", "Newhall Inn", "Bank head", and "New Garden". A red circle on the map indicates a selected control point. The right panel shows a modern satellite map of the same area, with labels for "Pier", "MHWS", and "Inch Garvie". A yellow line connects the selected point on the historical map to a corresponding point on the satellite map. A vertical scale bar is visible between the two maps.


At the bottom of the interface, there is a footer with the following text: "Data © 2010 Ordnance Survey. Rendering © 2010 Hoken Technologies. Geocoding via EDINA, Unlocked. Developed by Klokken Technologies GmbH and Moravian Library Brno (project OldMapsOnline.org)." The NLS logo is also present in the bottom left corner of the map area.


NLS Map Georeferencer – saving...

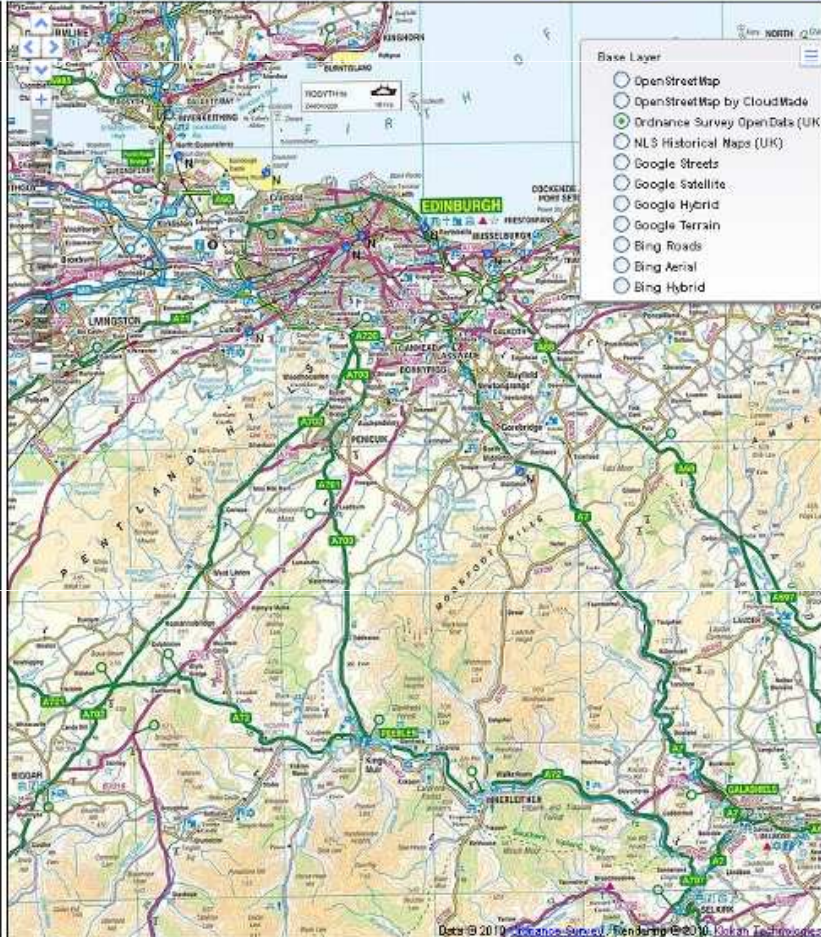
 **Georeferencer: Online Georeferencing Tool**
Click on three or more equivalent places on both maps

ChrisFleet | [Help](#) | [Log out](#)

[Control points](#) | |








Base Layer


- OpenStreetMap
- OpenStreetMap by CloudMade
- Ordnance Survey OpenData (UK)
- NLS Historical Maps (UK)
- Google Streets
- Google Satellite
- Google Hybrid
- Google Terrain
- Bing Roads
- Bing Aerial
- Bing Hybrid




Developed by [Kolan Technologies GmbH](#) and [Moravian Library Brno](#) (project [QidMapsOnline.org](#))

Geocoding via [EDINA Unleash](#)

NLS Map Georeferencer – viewing results in Google Earth browser plugin

 **Georeferencer: 3D Visualization**
Visualization of the map <http://maps.nls.uk/counties/de...> ChrisFleet | [Help](#) | [Log out](#)

[Open in Google Earth Application](#) Original image: <http://maps.nls.uk/counties/de...> 100% 100%



© 2010 Tele Atlas
Image © 2010 Getmapping plc
Image © 2010 TerraMetrics
© 2010 Europa Technologies

Google

Developed by Klukan Technologies GmbH and Moravian Library Brno (project OutMapsOnline.org)

Tools: MapTiler and Tileserver



MapTiler - Map Tile Cutter

Map Overlay Generator for Google Maps and Google Earth

Simple way how to publish your maps...

[Download Beta Version](#)
(Windows / Mac OS X / Linux)

[Screenshots](#)

Look at [MapTiler Help Center](#) or join [MapTiler User Group](#)
[Source Code Repository](#)

<http://www.maptiler.org/>



Klokantech Technologies GmbH

www.klokantech.com

Contact:

Bahnhofstrasse 9, Baar 6340, Switzerland

email: info@klokantech.com

tel: +41 41 511 26 12

Tile Server

TileServer is a hosting technology for fast web 2.0 interactive online maps, derived from geospatial data, ortophotos or scanned maps. The maps are distributed from multiple servers, the service is much faster and more reliable than the traditional forms of online publishing of maps and the system is able to handle large number of visitors.

Live demo



[The Historical Map of Great Britain](#)

Try the Tile Server on the [Maps API](#) service of the National Library of Scotland.

Viewers

<http://www.tileservers.com/>

MapTiler – Tile Map Service mosaics

The screenshot displays a web map interface for Edinburgh, 1893. The interface includes the following elements:

- Top Left:** The logo for the National Library of Scotland (nls).
- Top Center:** The title "Edinburgh, 1893".
- Top Right:** The text "OS Town Plans" with "Home" and "Help" links below it.
- Map Area:** A central mosaic of map tiles. The central tiles are historical OS Town Plans from 1893, overlaid on a modern satellite or aerial base layer. The surrounding tiles are modern satellite/aerial imagery.
- Left Side:** A vertical navigation bar with a compass, a zoom-in (+) button, a zoom-out (-) button, and a zoom slider.
- Right Side:** A dark blue control panel with a close button (X) in the top right corner.
 - Base Layer:** A list of map styles with radio buttons:
 - Google Streets
 - Google Satellite
 - Google Hybrid
 - Google Terrain
 - Virtual Earth Roads
 - Virtual Earth Aerial
 - Virtual Earth Hybrid
 - Overlays:** A list of overlays with checkboxes:
 - Edinburgh, 1893
- Bottom Left:** A small "Microsoft Virtual Earth" logo.
- Bottom Right:** A small "Esri" logo.

MapTiler – Tile Map Service mosaics

The screenshot displays a web map interface for Edinburgh, 1893. The main map area shows a mosaic of historical maps overlaid on a modern satellite base layer. The interface includes a navigation control on the left with a compass and a vertical scale bar. A legend on the right lists the available layers and overlays.

nls
National Library of Scotland

Edinburgh, 1893

OS Town Plans
Home | Help

Base Layer

- Google Streets
- Google Satellite
- Google Hybrid
- Google Terrain
- Virtual Earth Roads
- Virtual Earth Aerial
- Virtual Earth Hybrid

Overlays

- Edinburgh, 1893

© 2011 Virtual Earth

[Permalink](#)

© 2011 Virtual Earth

MapTiler – Tile Map Service mosaics




MapTiler – Tile Map Service mosaics









- Background and context
- NLS Case Studies 1 - GDAL/
MapTiler/Georeferencer
- **NLS Case Studies 2 - Geoserver /
OpenLayers**
- Other technologies - IIPImage for
JP2 / Omeka.org
- Opportunities for libraries

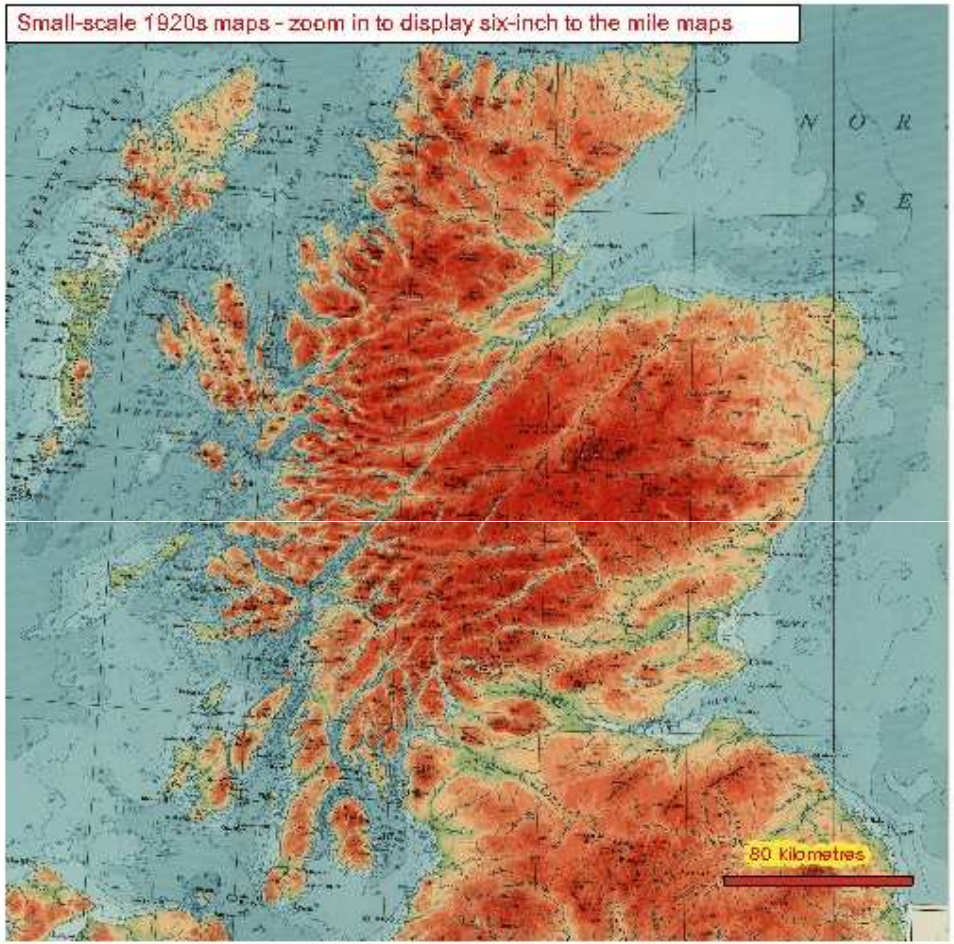


ESRI ArcIMS applications – 2004-2011

 **OS 6-inch to the mile maps, 1840s - 1880s**

[Six-inch home](#)       [Enquiries & Copies](#) **Select six-inch map:** [Help](#)

Small-scale 1920s maps - zoom in to display six-inch to the mile maps



1. Locate your area (use map or search methods below).

2. Keep zooming in on map to display seamless layer of six-inch 1840s-1880s maps, or


3. Select using buttons above to display original map sheets.

County:




Parish:

Gazetteer: Please Enter Place Name:


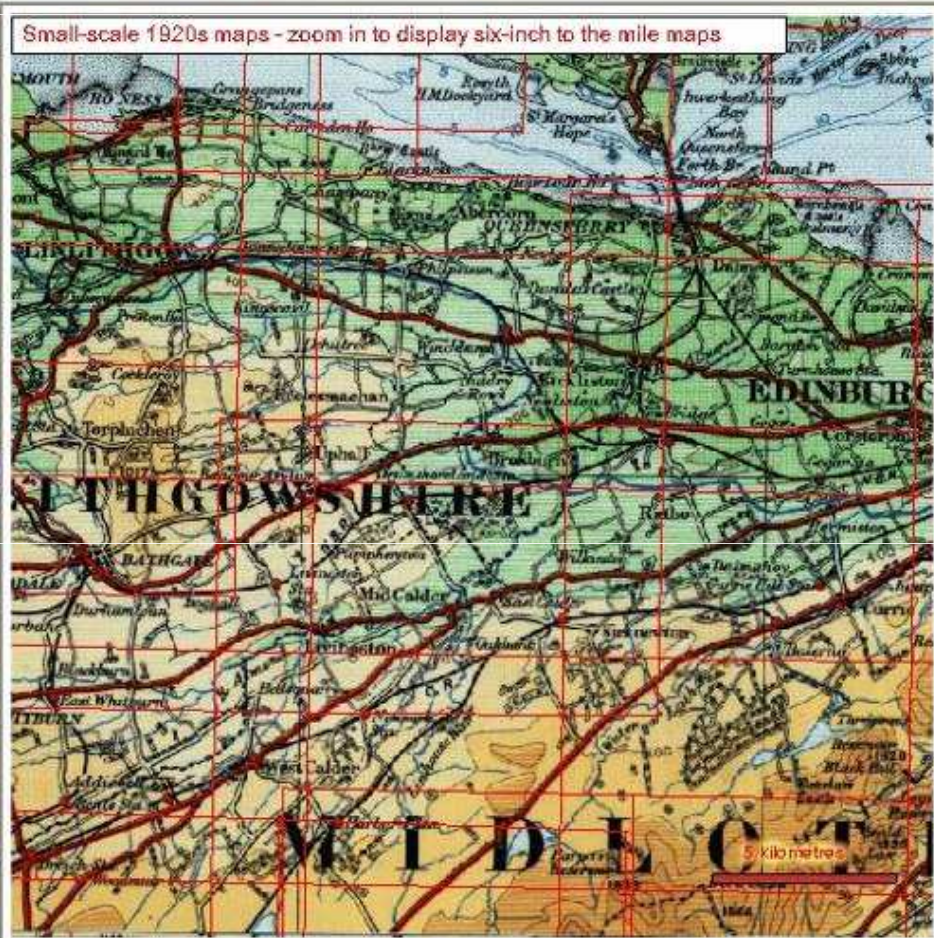
ESRI ArcIMS applications – 2004-2011



OS 6-inch to the mile maps, 1840s - 1880s

[Six-inch home](#)       [Enquiries & Copies](#) [Select six-inch map:](#) [Help](#)

Small-scale 1920s maps - zoom in to display six-inch to the mile maps



1. Locate your area (use map or search methods below).
2. Keep zooming in on map to display seamless layer of six-inch 1840s-1880s maps, or
3. Select using buttons above to display original map sheets.


County:








Parish:

Gazetteer: Please Enter Place Name:

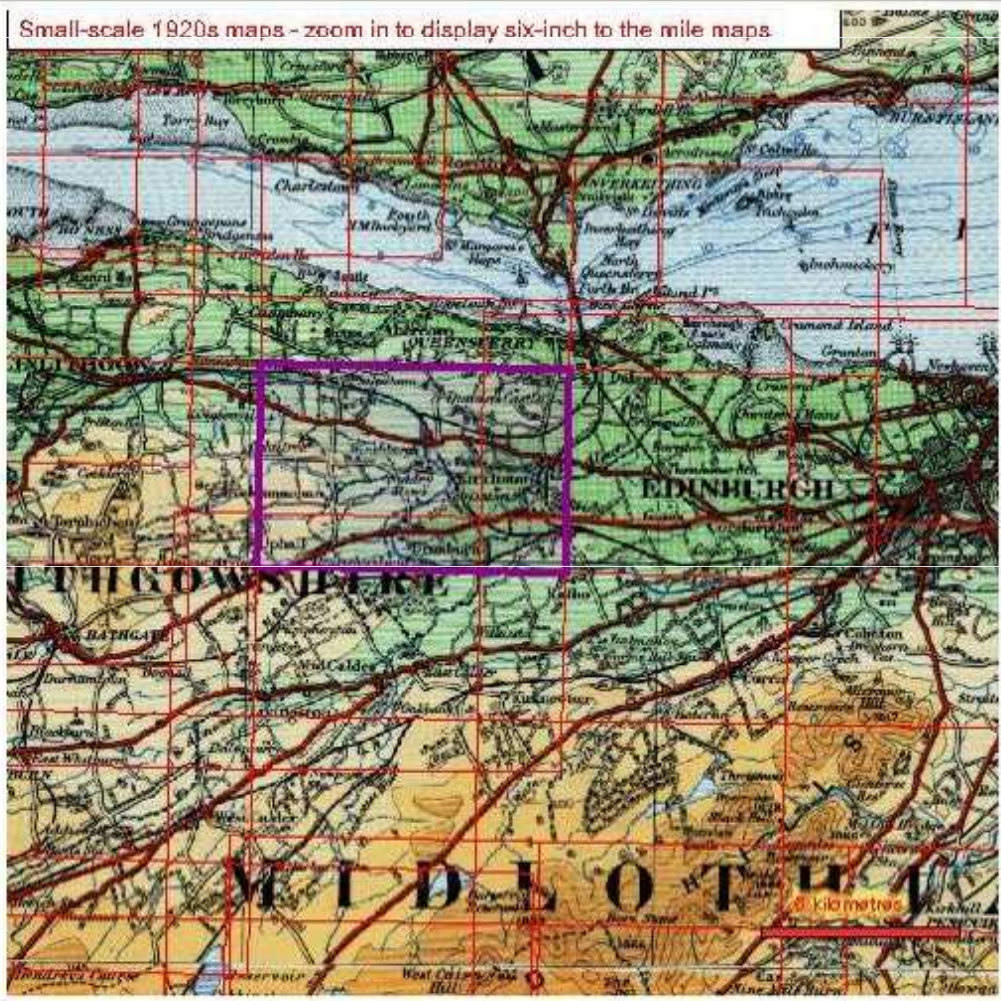
5 kilo metres

ESRI ArcIMS applications – 2004-2011

 **OS 6-inch to the mile maps, 1840s - 1880s**

[Six-inch home](#)        [Enquiries & Copies](#) **Select six-inch map:** [Help](#)

Small-scale 1920s maps - zoom in to display six-inch to the mile maps



Records 1 to 1 of 1

Sheet	Survey Publication
Ordnance Survey Map - Linlithgowshire - 1:10,560 Sheet 6	1854- 5 1856

[Clear Selection](#)
[Search again](#)

ESRI ArcIMS applications – 2004-2011

The image displays two overlapping web browser windows from the National Library of Scotland. The left window, titled 'National Library of Scotland - Windows Internet Explorer', shows a map interface with a purple box highlighting a specific area. The right window, titled 'National Library of Scotland - Resource Information - Windows Internet Explorer', shows a 'Sheet Information' page with a detailed map and a table of metadata.

Sheet Information

Title:	Ordnance Survey Map - Linlithgowshire - 1:10,560
Sheet:	Sheet 6
Date of Survey:	1854-5
Date of Publication:	1856
Zoom into map:	Click on the map to view in greater detail

Please email maps@nls.uk for further assistance, or advice.

[Close Window](#)

Problems of ArcIMS

- Expense – annual licensing costs of ca £5,000 - £6,000
- Limited web-mapping functionality
- Instability – difficulty in handling high usage spikes
- Fixed screen for map interface (500 x 500 px)
- Basis on British National Grid rather than Spherical Mercator

GeoServer – adding shapefiles as layers

The screenshot shows the GeoServer web interface in a Firefox browser. The page title is "GeoServer: Layers" and the URL is "http://geoserver.nls.uk/geoserver/web/?wicket:bookmarkablePage=:org.geoserver.web.data.layer.LayerPage". The user is logged in as "admin" and has a "Logout" button.

The main content area is titled "Layers" and contains the following text:

Manage the layers being published by GeoServer

- [Add a new resource](#)
- [Remove selected resources](#)

Navigation: << < 1 2 > >> Results 1 to 25 (out of 41 items) Search

<input type="checkbox"/>	Type	Workspace	Store	Layer Name	Enabled?	Native SRS
<input type="checkbox"/>	Shapefile	nls	25_inch_GB	shp_25_inch_GB	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	Blaeu_Maps	Blaeu_Maps	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	County_Maps	County_Maps	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	Gordon	Gordon	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	Great_Britain_coasts	greatbritaincoasts	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	Moll	Moll	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	OS_One_Inch_7th_series	catalog_one_inch_7th_series	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	Pont	Pont	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	Roy_Dissections	catalog_roy	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	Thomson_generalised	Thomson	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	catalog_1_25000	catalog_1_25000_great_britain	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	catalog_25_inch_2nd_later	catalog_25_inch_2nd_later	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	catalog_OS_6inch_2nd_4th	catalog_six_inch_2nd_4th	✓	EPSG:27700
<input type="checkbox"/>	Shapefile	nls	catalog_iberian_peninsula_250000	catalog_iberian_peninsula_250000	✓	EPSG:4326
<input type="checkbox"/>	Shapefile	nls	ecw_OS_6inch_Edinburgh	6inch_edinburgh	✓	EPSG:27700

The left sidebar contains the following sections:

- About & Status**
 - Server Status
 - GeoServer Logs
 - Contact Information
 - About GeoServer
- Data**
 - Layer Preview
 - Workspaces
 - Stores
 - Layers
 - Layer Groups
 - Styles
- Services**
 - WCS
 - WFS
 - WMS
- Settings**
 - Global
 - GeoWebCache
 - JAI
 - Coverage Access
- Security**
 - Users
 - Data security
 - Service security
 - Catalog security

GeoWebCache – for rapid display



Layer name:

nls:6inch_edinburgh

[Seed this layer](#)

Enabled: Grids Sets:

true

EPSG:900913

EPSG:4326

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)]

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)] KML: [[png](#), [gif](#), [png8](#), [jpeg](#), [kml](#)]

nls:6inch_edinburgh_pyr

[Seed this layer](#)

true

EPSG:900913

EPSG:4326

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)]

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)] KML: [[png](#), [gif](#), [png8](#), [jpeg](#), [kml](#)]

nls:Blaeu_Maps

[Seed this layer](#)

true

EPSG:900913

EPSG:4326

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)]

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)] KML: [[png](#), [gif](#), [png8](#), [jpeg](#), [kml](#)]

nls:County_Maps

[Seed this layer](#)

true

EPSG:900913

EPSG:4326

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)]

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)] KML: [[png](#), [gif](#), [png8](#), [jpeg](#), [kml](#)]

nls:Dmu_2004_region

[Seed this layer](#)

true

EPSG:900913

EPSG:4326

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)]

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)] KML: [[png](#), [gif](#), [png8](#), [jpeg](#), [kml](#)]

nls:Gordon

[Seed this layer](#)

true

EPSG:900913

EPSG:4326

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)]

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)] KML: [[png](#), [gif](#), [png8](#), [jpeg](#), [kml](#)]

nls:Moll

[Seed this layer](#)

true

EPSG:900913

EPSG:4326

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)]

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)] KML: [[png](#), [gif](#), [png8](#), [jpeg](#), [kml](#)]

nls:Pont

[Seed this layer](#)

true

EPSG:900913

EPSG:4326

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)]

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)] KML: [[png](#), [gif](#), [png8](#), [jpeg](#), [kml](#)]

nls:Roy_Highlands

[Seed this layer](#)

true

EPSG:900913

EPSG:4326

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)]

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)] KML: [[png](#), [gif](#), [png8](#), [jpeg](#), [kml](#)]

nls:Roy_Lowlands

[Seed this layer](#)

true


EPSG:900913

EPSG:4326

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)]

OpenLayers: [[png](#), [gif](#), [png8](#), [jpeg](#)] KML: [[png](#), [gif](#), [png8](#), [jpeg](#), [kml](#)]

GeoServer / OpenLayers Sheet Viewer



Maps of Scotland - Sheet Viewer / [Mosaic Viewer](#)

[Geo maps home](#) [Maps of Scotland home](#)

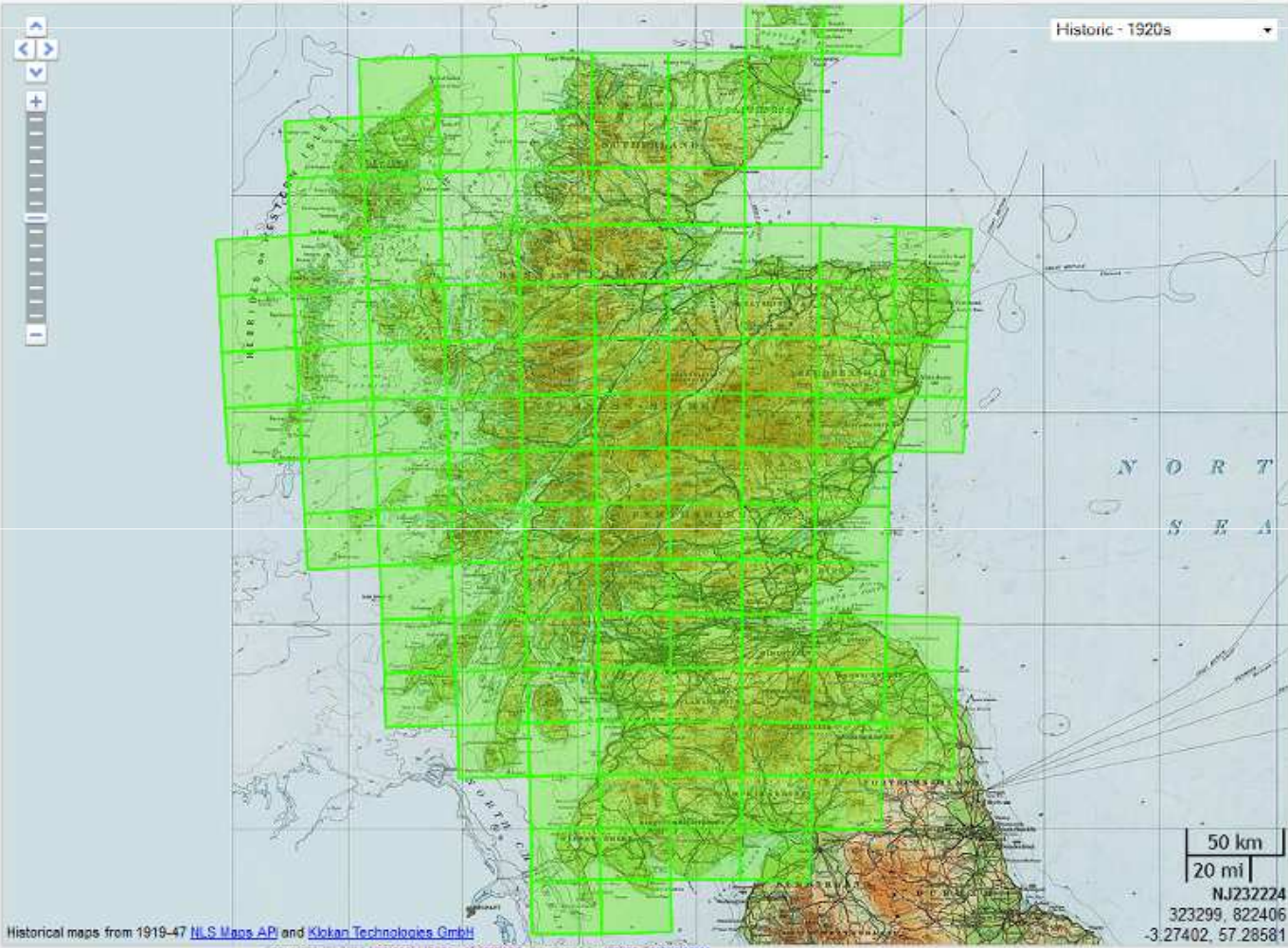
Gazetteer / NG Ref: Find a place ... or County: Choose...

Please choose a map series below, and then using the gazetteer or map, zoom in and **click on the map** to view the sheet that covers your area of interest. [Help](#)

1. Choose a map series:

- OS 1 Inch - 1856-1912
- OS 1 inch Popular - 1921-1930
- OS 1 inch Popular (NG) - 1945-48
- OS 1 inch 7th series - 1952-1961
- OS 6 inch - 1843-1882
- OS 6 inch - 1892-1960
- OS 25 inch - 1855-1882
- OS 25 inch - 1890-1960
- OS Town Plans - 1847-1895
- Bathymetrical Survey - 1897-1909
- OS Air Photo Mosaics - 1944-1950

[Click on a sheet](#)




Historic - 1920s

50 km
20 mi
NJ232224
323299, 822406
-3.27402, 57.28581

Historical maps from 1919-47 [NLS Maps API](#) and [Wikian Technologies GmbH](#)
©2019 NLS National Library of Scotland. Developed by Wikian Technologies

GeoServer / OpenLayers Sheet Viewer

 **Maps of Scotland - Sheet Viewer / [Mosaic Viewer](#)**

[Geo maps home](#) [Maps of Scotland home](#)

Gazetteer / NG Ref: Find a place... or County: Choose...

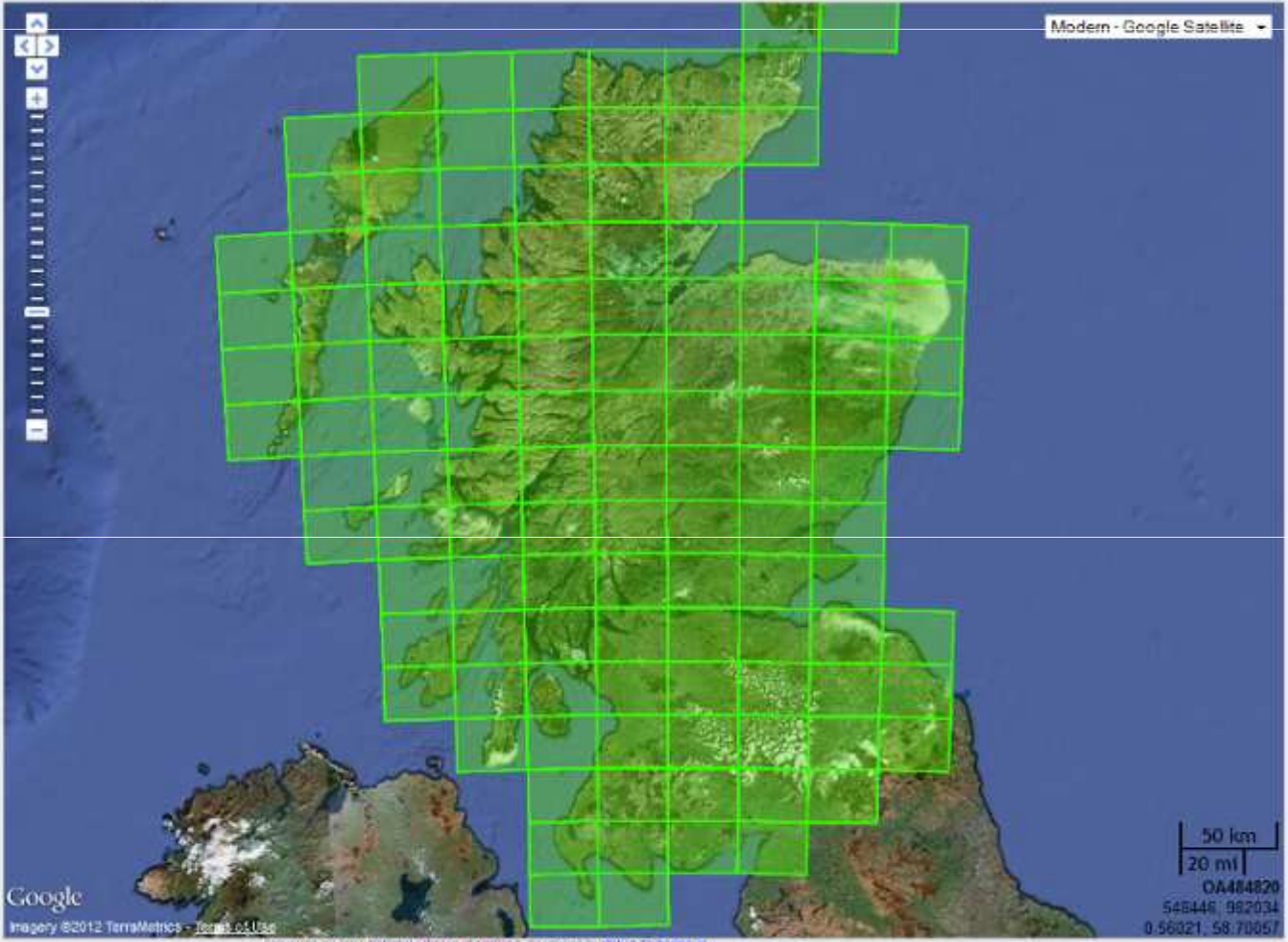
Please choose a map series below, and then using the gazetteer or map, zoom in and click on the map to view the sheet that covers your area of interest. [Help](#)

1. Choose a map series:

- OS 1 inch - 1856-1912
- OS 1 inch Popular - 1921-1930
- OS 1 inch Popular (NG) - 1945-48
- OS 1 inch 7th series - 1952-1961
- OS 6 inch - 1843-1882
- OS 6 inch - 1892-1960
- OS 25 inch - 1855-1882
- OS 25 inch - 1890-1960
- OS Town Plans - 1847-1895
- Bathymetrical Survey - 1897-1909
- OS Air Photo Mosaics - 1944-1950

[Click on a sheet](#)

Modern - Google Satellite



50 km
20 mi
OA484820
548448, 982034
0.56921, 58.70957

Google
Imagery ©2012 TerraMetrics - [Terms of Use](#)

GeoServer / OpenLayers Sheet Viewer

nls National Library of Scotland
Maps of Scotland - Sheet Viewer / [Mosaic Viewer](#)

Gazetteer / NG Ref: or County:

Please choose a map series and then using the gazetteer, zoom in and click on the map to view the sheet that covers the area of interest. [Help](#)

1. Choose a map series:

- OS 1 inch - 1856-1914
- OS 1 inch Popular - 1906-1923
- OS 1 inch Popular (New Series) - 1924-1962
- OS 1 inch 7th series - 1963-1990
- OS 1:25,000 - 1937-1962
- OS 6 inch - 1843-1886
- OS 6 inch - 1892-1962
- OS 25 inch - 1855-1886
- OS 25 inch - 1890-1962
- OS Town Plans - 1843-1962
- Bathymetrical Surveys - 1843-1962
- OS Air Photo Mosaic - 1946-1962

Click on a sheet

Fenwick Rd, Giffnock, Glasgow, East
Renfrewshire G46, UK

Fenwick Rd, Kilmaurs, Kilmarnock, East
Ayrshire KA3 2TD, UK

Fenwick Rd, London Borough of Southwark,
London SE15 4HW, UK

Fenwick Rd, Waterside, Kilmarnock, East
Ayrshire KA3 6JW, UK

Fenwick Rd, Grimsby, North East Lincolnshire
DN33 3SJ, UK

Fenwick Rd, Great Sutton, Ellesmere Port,
Cheshire CH66 4UE, UK

Fenwick Rd, Oadby, Leicester, Leicestershire
LE2 4UF, UK

Fenwick Rd, Houghton Regis, Dunstable,
Central Bedfordshire LU5, UK

Modern - Google Satellite


50 km
20 mi

Google
Imagery ©2012 TerraMetrics - Terms of Use

74360, 1026869
10, 23936, 58, 86570

Copyright © 2011 National Library of Scotland. Digitized by AONAN Technology

GeoServer / OpenLayers Sheet Viewer

 **Maps of Scotland - Sheet Viewer / [Mosaic Viewer](#)**

[Geo maps home](#) [Maps of Scotland home](#)

Gazetteer / NG Ref: or County:

Please **choose a map series** below, and then using the gazetteer or map, zoom in and **click on the map** to view the sheet that covers your area of interest. [Help](#)

1. Choose a map series:


- OS 1 inch - 1856-1912
- OS 1 inch Popular - 1921-1930
- OS 1 inch Popular (NG) - 1945-48
- OS 1 inch 7th series - 1952-1961
- OS 1:25,000 - 1937-1961
- OS 6 inch - 1843-1882
- OS 6 inch - 1892-1960
- OS 25 inch - 1855-1882
- OS 25 inch - 1890-1960
- OS Town Plans - 1847-1895
- Bathymetrical Survey - 1897-1909
- OS Air Photo Mosaics - 1944-1950

[Glasgow \(30\)](#)
Surveyed/Revised: 1855-1861,
Published: 1890

[Glasgow \(30\)](#)
Surveyed/Revised: 1895, Published:
1898

[Glasgow \(30\)](#)
Surveyed/Revised: 1902, Published:
1905

[Glasgow \(30\) - with coloured parishes](#)
Surveyed/Revised: 1895, Published:
1898



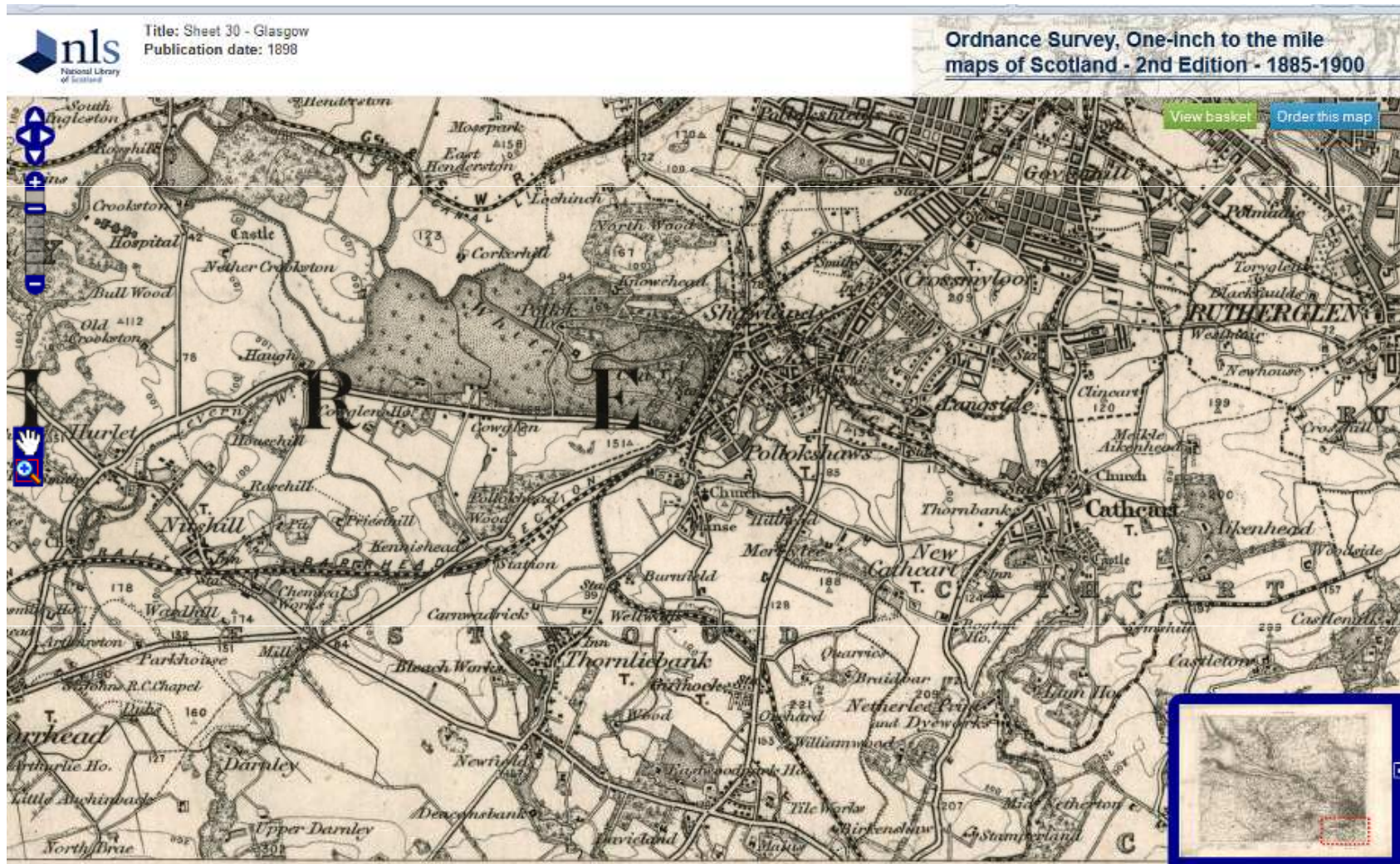
Modern - Google Satellite

5 km
2 mi
NS477458
247747 645869
4 42315 65 65234


Google
Imagery ©2012 TerraMetrics - Terms of Use

Copyright © 2011 National Library of Scotland. Developed by Alkann Technologies

OpenLayers MrSID Viewer



GeoServer / OpenLayers Sheet Viewer

 **Maps of Scotland - Sheet Viewer / [Mosaic Viewer](#)**

[Geo maps home](#) [Maps of Scotland home](#)

Gazetteer / NG Ref: Find a place... or County: Choose...

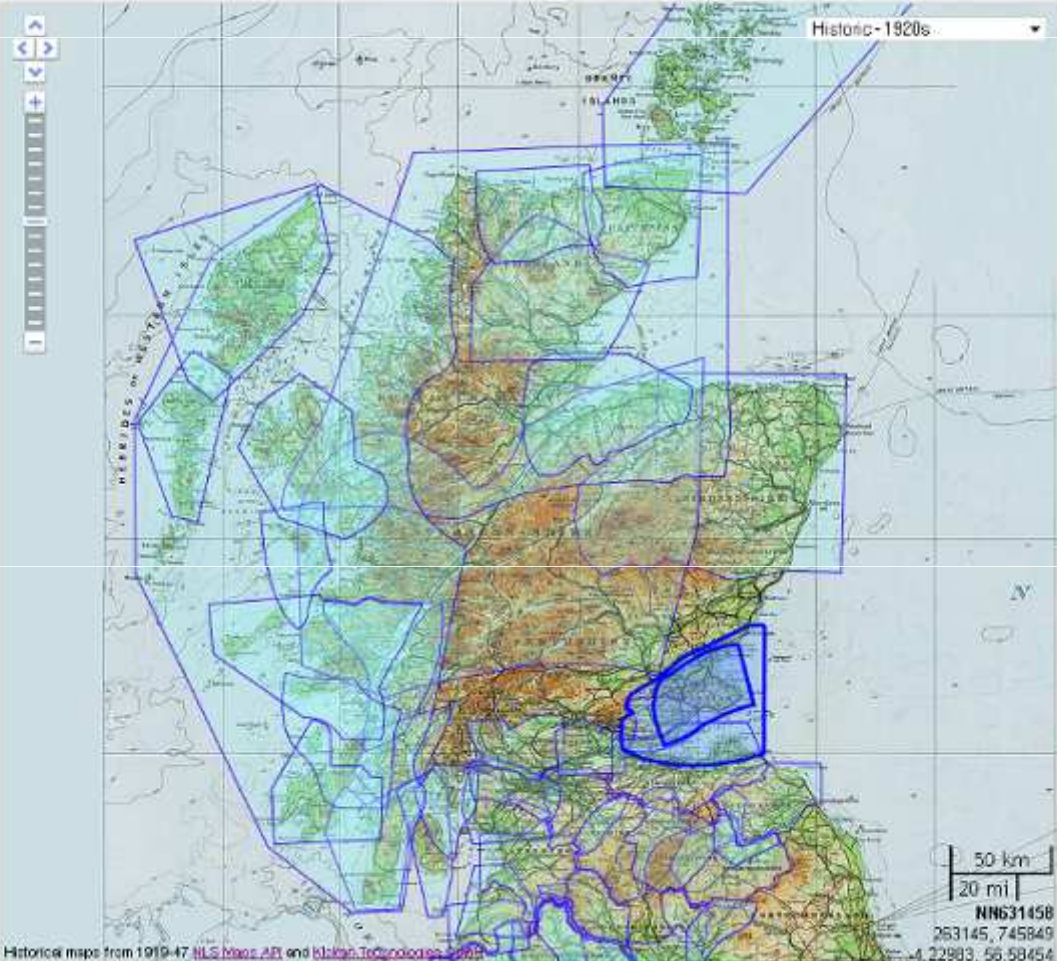
Please choose a map series below, and then using the gazetteer or map, zoom in and click on the map to view the sheet that covers your area of interest. [Help](#)

[New Layers - April 2012](#)

1. Choose a map series:

- Port maps - ca. 1583-1614
- Gordon maps - 1630-1650s
- Blaeu maps - 1654
- Woll maps - 1746
- Thomson maps - 1820s
- Other county maps - 1630-1928
- OS 1 inch - 1856-1912
- OS 1 inch Popular - 1921-1930
- OS 1 inch Popular (NG) - 1945-48
- OS 1 inch 7th series - 1952-1961
- OS 1:25,000 - 1937-1961
- OS 6 inch - 1843-1882
- OS 6 inch - 1892-1960
- OS 25 inch - 1855-1882
- OS 25 inch - 1890-1960
- OS Town Plans - 1847-1895
- Bathymetrical Survey - 1897-1909
- OS Air Photo Mosaics - 1944-1950

Historic - 1820s



Results:

[Joan Blaeu, Fifae Vicecomitatus...](#)
Surveyed/Revised: undefined,
Published: undefined

[Joan Blaeu, Fifae pars orientalis...](#)
Surveyed/Revised: undefined,
Published: undefined

Historical maps from 1919-47. [NLS Maps API](#) and [Historic Topographic Survey](#)
Copyright (c) 2011 National Library of Scotland. Developed by [Eikon Technology](#)

GeoServer / OpenLayers Mosaic Viewer

nls National Library of Scotland

Maps of Scotland - Mosaic Viewer / [Sheet Viewer](#)

[Geo maps home](#) [Maps of Scotland home](#)

Gazetteer / NG Ref: or County:

Please **choose an historic map overlay below**, and then using the gazetteer or map, zoom in or **Zoom to this historic overlay** to view the overlay. Different **modern base map layers** (upper right) can also be viewed by sliding the **Transparency Slider** (upper left of map) [Help](#)

1. Choose an historic overlay:

Scotland - OS Six Inch, 1843-1882

2. [Zoom to this historic overlay](#)

Modern - Google Satellite


100 km
50 mi

Google
Imagery ©2012 TerraMetrics - [Terms of Use](#)

Overlay: [NLS Ordnance Survey OS Grid 1843-1882 map](#)

Copyright (c) 2011 [National Library of Scotland](#). Developed by [elizen Technologies](#)

GeoServer / OpenLayers Mosaic Viewer

 **Maps of Scotland - Mosaic Viewer / [Sheet Viewer](#)**

[Geo maps home](#) [Maps of Scotland home](#)

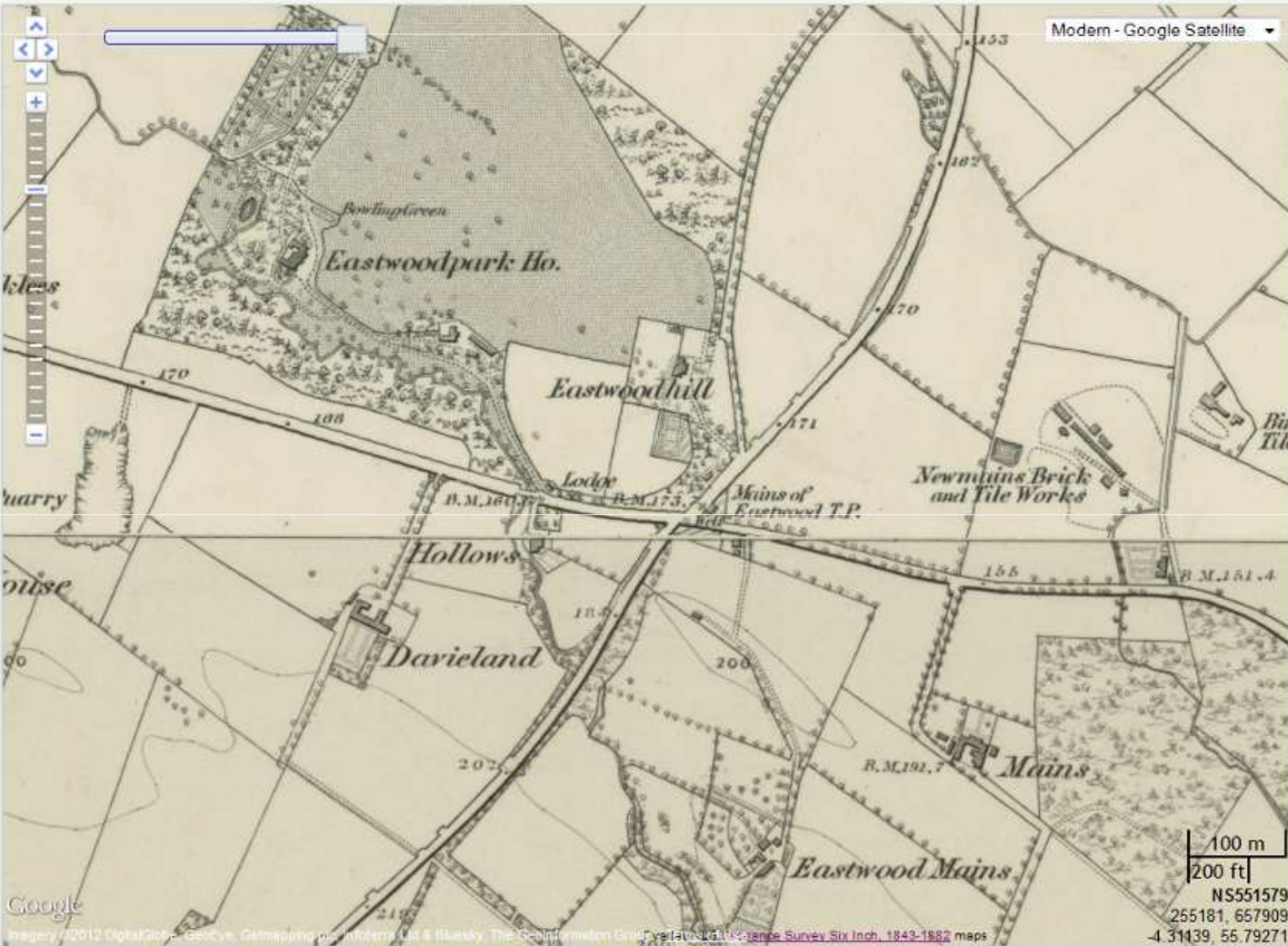
Gazetteer / NG Ref: or County:

Please choose an historic map overlay below, and then using the gazetteer or map, zoom in or Zoom to this historic overlay to view the overlay. Different modern base map layers (upper right) can also be viewed by sliding the Transparency Slider (upper left of map) [Help](#)

1. Choose an historic overlay:

2. [Zoom to this historic overlay](#)


Modern - Google Satellite



100 m
200 ft
NS551579
255181, 657909
-4.31139, 55.79271

Copyright (c) 2011 National Library of Scotland. Developed by Niskan Technologies

GeoServer / OpenLayers Mosaic Viewer

 **Maps of Scotland - Mosaic Viewer / [Sheet Viewer](#)**

[Geo maps home](#) [Maps of Scotland home](#)


Gazetteer / NG Ref: Find a place ... or **County:** Choose...

Please **choose an historic map overlay below**, and then using the gazetteer or map, zoom in or **Zoom to this historic overlay** to view the overlay. Different **modern base map layers** (upper right) can also be viewed by sliding the **Transparency Slider** (upper left of map) [Help](#)

1. Choose an historic overlay:
Scotland · OS Six Inch, 1843-1882 ▾

2. [Zoom to this historic overlay](#)


Modern - Google Satellite ▾



100 m
200 ft
NS552586
255205 658609

© 2012 Google. All rights reserved. Google, the Google logo, and Google Maps are trademarks of Google Inc. All other marks are the property of their respective owners. National Library of Scotland. Developed by Niskan Technologies.

GeoServer / OpenLayers Mosaic Viewer

 **Maps of Scotland - Mosaic Viewer / [Sheet Viewer](#)**

[Geo maps home](#) [Maps of Scotland home](#)

Gazetteer / NG Ref: Find a place... or **County:** Choose...


Please **choose an historic map overlay below**, and then using the gazetteer or map, zoom in or **Zoom to this historic overlay** to view the overlay. Different **modern base map layers** (upper right) can also be viewed by sliding the **Transparency Slider** (upper left of map) [Help](#)

1. **Choose an historic overlay:**

Scotland - OS Six Inch, 1843-1882

2. [Zoom to this historic overlay](#)

Modern - Google Satellite




Google

Map data ©2012 Data Scribe, GeoEye, GeoMapping, IGN, Intra 2i, S. Basler, The GeoInformation Group, Terms of Use

COVRSITE SLI 2011 NATIONAL LIBRARY OF SCOTLAND. DEVELOPED BY KLOKAN TECHNOLOGIES

0 100m
200ft
N55°25'8"
084°26'350188
3 10 19 55 30 181

GeoServer / OpenLayers Mosaic Viewer




Historical maps of Elgin and Lossiemouth (1747-1938)

[Great Escapes of Moray home page](#) [Browse other georeferenced maps](#) [Maps of Scotland homepage](#)

Please choose a seamless historic map overlay below, and then zoom in on the map to view the overlay. Different modern base map layers (upper right) can also be viewed by sliding the Transparency Slider (upper left on map)

1. Please choose an historic overlay:

- Roy Military Survey, 1747-52
- Robert Ray's Plan, 1838
- Ordnance Survey, 1868-70
- Ordnance Survey, 1904
- Ordnance Survey, 1938
- Geological, 1876
- Land Utilisation, 1935



Modern - Google Satellite

200 m
1000 ft
NJ241620
324176, 662041
-3 27204, 57 64908

Google
Imagery ©2012 DigitalGlobe, GeoEye, Getmapping plc - Terms of Use

Copyright © 2012 National Library of Scotland. Developed by Hoban Technologies

Conclusions

Advantages of open-source software:

- cheaper, more open standards-compliant
- delegated development and customisation
- greater opportunities for collaboration
- improvements in functionality and aesthetics of applications

Disadvantages of open-source software:

- greater need for programming knowledge
- fewer bespoke applications, and more need for development
- more time-consuming to develop and support
- possible need for paying for external development