



Mapping Belfast

Greening, Health, and Inequalities



Topic Paper

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Glossary

Green spaces - the World Health Organization (WHO) (2016) highlight the most common definitions of green spaces in urban areas tend to involve spaces used predominately for recreational purposes such as public parks, but may also include children's play areas, non-amenity areas such as road verges, woodlands, and riverside footpaths, alongside blue spaces which represent water elements.

Data portals - online webpages that bring together information from different sources.

Geospatial Data - information linked to areas or locations.

Geoportals - online webpages that bring together information linked to areas or locations.

Open Data - information that is free and easy to use and reuse by anyone.

Introduction

Belfast Healthy Cities (BHC) Greening the City Action Plan includes an action to 'develop a capacity building programme focused on greening interventions that have the potential to reduce inequalities'. Stakeholders working to address the environment, health, or inequalities in Belfast have continued to highlight the importance of maps linked to greening, health, and inequalities. As such, this paper has been developed to support stakeholders to:

- **Find existing maps linked to greening, health, and inequalities in Belfast.**
- **Consider areas for improvement to support better use and understanding of these maps.**

Background

Belfast Healthy Cities Strategic Plan sets out Greening the City as a key programme for the organisation during Phase VII (2020-2025) of the WHO European Healthy Cities Network, to support the themes of Place, Planet, Participation, People, Prosperity, and Peace. The overall goal of the Programme is to create mutually beneficial relationships between citizens and the urban environment for improved physical and mental wellbeing. The overall outcome of the Programme is improved knowledge on the impact and use of green spaces to inform future policies and programmes. Underpinning the overarching goal of the Greening the City Programme are four strategic objectives that BHC has committed to work towards. These are to:

1. **Promote inclusive green environments for all, increasing physical activity and mental wellbeing.**
2. **Promote the greening of public spaces to mitigate and adapt to the consequences of climate change, support bio-diversity, and increase recognition that trees and other vegetation are critical urban infrastructures.**
3. **Increase stakeholder collaboration and community engagement in the design of green spaces.**

4. Promote green space interventions that have the potential to reduce inequalities.

BHC has undertaken a scoping exercise to support the development and delivery of the Greening the City Programme. This has involved a review of evidence and relevant policies and strategies, and discussions with a range of stakeholders working to address issues across the environment, health, and inequalities in Belfast. The stakeholder discussions exercise highlighted a limited understanding of existing green spaces in Belfast (BHC, 2022). At the city scale, stakeholders suggested this could involve a greater sharing of information on city-wide green space networks which is easy to understand, access, and use (BHC, 2022). This could involve support from universities and local and regional government departments that may hold and be able to share this information; alongside additional support to visualise these maps (BHC, 2022). Stakeholders also highlighted it may be useful to view green space maps in conjunction with maps of land ownership and management responsibilities across the city (BHC, 2022).

Following the discussions with stakeholders, BHC organised an action planning workshop. A priority area to consider was work linked to maps of green spaces, the connections to health, wellbeing, and inequality, and issues such as accessibility and quality. Following the action planning workshop, BHC developed a Greening the City Action Plan informed and supported by a Greening the City Advisory Group. At the initial meeting in September 2022, participants highlighted data/mapping information exists across a number of organisations, including those represented at the meeting. The Greening the City Advisory Group highlighted there should be more of a focus on understanding what exists and how to make making better use of this. This would involve making data more open and publically accessible. Organisations with green space maps include Queen's University Belfast (QUB) Centre for Public Health and Centre for GIS and Geomatics, Belfast City Council (BCC), and Outdoor Recreation NI (ORNI). Information that should be mapped included: where local green spaces are, how they can be accessed, what facilities and activities are available, and the quality/safety of these spaces, health outcomes, deprivation, access to food or food deserts; tree canopy; heat mapping; publically owned land, and publically accessible land. Given the ongoing importance of maps linked to greening, health and inequalities in Belfast raised by stakeholders, this topic paper has been developed.

Findings

Northern Ireland

On a Northern Ireland level, a number of departments and organisations provide maps and geospatial data linked to greening. These tend to focus on mapping environmental features such as protected areas, priority habitats, rivers, lakes, parks, nature reserves, and flood risk. Departments and organisations include Department for Agriculture, Environment and Rural Affairs (DAERA), Department for Infrastructure (DfI), and Outdoor Recreation NI (ORNI). The geospatial data shown in these maps include spaces supported by policy, such as protected areas and habitats, the location of publically accessible green and blue spaces and access point, and information linked to changes in the environment or climate, such as flood risk and air quality.

In contrast, there are fewer departments or organisations focused on providing maps linked to health, wellbeing, and inequalities. The main provider is the Northern Ireland Statistics and Research Agency (NISRA), an agency of the Department of Finance (DoF). The

geospatial data shown in these maps range from a city-wide area to the more useful smaller areas, such as wards or super output areas. Geospatial data available on the ward or super output area level includes NI Multiple Deprivation Measures (2017) covering topics of health and disability, income, and living environment indicators. Deaths, including causes of death such as respiratory or circulatory diseases. Population estimates, anti-social behaviour incidents, and police recorded crime.

Further details on the maps provided by Departments and organisations operating at a Northern Ireland level are shown in Table 1.






























Table Key			
	Web map viewer is available to view geospatial data.		Geospatial data available to download to use in other maps/software
	Provides geospatial data or maps on health or inequalities.		Provides geospatial data or maps on the environment.
		Maps available that link together geospatial data or maps on greening, health, and inequalities.	

Table 1: Maps, Northern Ireland

Department/ Organisation	Title	Description	Maps/geospatial data layers	Notes
DAERA	Northern Ireland Environment Agency (NIEA) Natural Environment Map Viewer https://www.daera-ni.gov.uk/services/natural-environment-map-viewer	Location of natural environment areas of interest in Northern Ireland	Geospatial data layers include: protected areas; priority habitats; priority species; landscape and seascape areas; agricultural boundaries.	  
	NIEA Catchment Data Map Viewer https://gis.daera-ni.gov.uk/arcgis/apps/webappviewer/index.html?id=16fddc459bd04d64b9e8f084f3a8e14a	Information about the water environment in Northern Ireland	Geospatial data layers include: lakes; rivers; marine; groundwater; protected areas.	  
	Air Quality in Northern Ireland https://www.airqualityni.co.uk/	Data relating to air quality in Northern Ireland	Geospatial data layers include: number of monitoring sites in each pollution band across Northern Ireland.	  

Department/ Organisation	Title	Description	Maps/geospatial data layers	Notes
DfI	Flood Maps (NI) https://dfi-ni.maps.arcgis.com/apps/webappviewer/index.html?id=fd6c0a01b07840269a50a2f596b3daf6	Highlights the areas throughout Northern Ireland that are prone to flooding and its potential adverse impacts.	Geospatial data layers include: flood directives 1st cycle and 2nd cycle; present day floodplain rivers and floodplain sea; climate change floodplain rivers and floodplain sea; historical flooding; flood hazards; flood risk.	 
NISRA (DoF)	NIMDM 2017 Interactive Map https://datavis.nisra.gov.uk/Deprivation/Deprivation%202017/SOA_Deprivation_Map/atlas.html	Allows users to view deprivation domain ranks visually on a map at super output area and ward level.	The following geospatial data layers are available at either super output area or ward levels: multiple deprivation measure 2017; income domain rank; employment domain rank; health deprivation and domain disability rank; access to services domain rank; living environment domain rank; crime and disorder domain rank.	  
NISRA (DoF)	Making Life Better https://www.ninis2.nisra.gov.uk/public/InteractiveMapTheme.aspx?themeNumber=-4&themeName=Making+Life+Better	Provides access to data on the high level key indicators used for monitoring the progress of the Making Life Better strategic framework.	The following geospatial data layers are available at either super output area or ward levels: Population estimates; attendance by pupil residence; births and fertility (including teenage births); dental and GP registrations; cancer incidents; deaths (including causes of death); multiple disability benefit; income support; anti-social behaviour incidents; police recorded crime.	  
ORNI	GreenspaceNI Map https://www.outdoorrecreationni.com/news/greenspace-map/	A digital map showing all publicly accessible green and blue spaces and trails across Northern Ireland.	Geospatial data layers include: NI greenspace layer; NI greenspace access points; NI off-road trails; 1km proximity to greenspace (super output area); 400m proximity to greenspace (super output area); health deprivation and disability rank (super output area).	  
	Outmore NI https://outmoreni.com/map/	Information on outdoor trails and places across Northern Ireland.	Geospatial data layers include: trails for walking, cycling, mountain biking, and canoeing; outdoor places including parks, forests, beaches, and nature reserves.	 
Trees for Cities; Brillianto; Woodland Trust; Forest Research	Ward Canopy Cover Map for the UK https://forestry.maps.arcgis.com/apps/webappviewer/index.html?id=d8c253ab17e1412586d9774d1a09fa07	Assesses tree canopy cover in each ward of England, Scotland, Wales, and Northern Ireland.	Geospatial data layer includes: average ward canopy cover (%).	 

Belfast

Belfast City Council (BCC) is the main provider of maps related to green spaces specifically for Belfast. The Belfast Local Development Plan Map Viewer provides maps of designations such as local landscape policy areas, landscape wedges, local nature reserves, and community greenways. This is supported by Belfast Open Spaces Strategy (BCC, 2020b) which includes PDF maps showing the location of parks, playing fields, play areas, growing spaces, cemeteries, waterways, and waterbodies, and surrounding significant open spaces; the accessibility of parks and play areas; and, opportunities for improving connectivity. The Green and Blue Infrastructure Plan 2020 (BCC, 2020a) provides maps of green spaces such as environmental designations, and environmental change, such as flood risk, and Air Quality Management Areas (AQMA). The Belfast Draft Trees Strategy (BCC, 2023) also provides maps showing Belfast’s existing canopy cover (ward) and pollution of particulate matter (<2.5 microns) concentration across Belfast.

Maps linked to green spaces are also provided by organisations such as 9ft in Common, Belfast Hills Partnership, and EastSide Greenways. These include maps of alleyways, and trails available in the Belfast Hills or along the Connswater Community Greenway (CCG).

In relation to maps bringing together greening, health, and inequalities specific to Belfast, these are available in the Belfast Open Spaces Strategy (BCC, 2020b). This includes maps that show health deprivation and disability, and overlay areas of highest deprivation and low accessibility to parks and play areas, to show areas for improving health and wellbeing. In addition, the Urban Heat Risk in Belfast Story Map also provides maps that bring together greening, health, and inequalities. It includes maps on urban heating, health of the population, and deprivation to highlight who, and where in the city is most vulnerable to extreme heat under current and future climate change.

Further details on the maps provided by Belfast City Council and organisations focused on Belfast are shown in Table 2.



































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Table 2: Maps, Belfast

Council/ Organisation	Title	Description	Maps/geospatial data layers	Notes
Belfast City Council	Belfast Local Development Plan Map Viewer https://belfastcc.maps.arcgis.com/apps/MapJournal/index.html?appid=7f80b357f1764fa799e9dfe32ad1947f	Existing zonings and designations of relevance to the Belfast Local Development Plan.	Includes geospatial data layers showing: areas of high scenic value; areas of outstanding natural beauty; Belfast Hills access points; community greenways; landscape wedges; local landscape policy areas; local nature reserves; sites of local nature conservation importance.	 
	Draft Belfast Tree Strategy (2023) https://www.belfastcity.gov.uk/documents/belfast-tree-strategy	Strategy to help manage and improve tree-scape in Belfast.	Includes maps showing: Belfast's existing canopy cover (ward); tree canopy cover across Belfast from sentinel data; indices of multiple deprivation ranking (ward); pollution of particulate matter <2.5 microns concentration across Belfast. Contains action to review current relevant web maps in use in Belfast with a view to combine geospatial data layers in a single open access site or commission a new bespoke web map for the city.	 (only available as images)  
	Belfast Open Spaces Strategy (2020b) https://www.pacni.gov.uk/sites/pacni/files/media-files/MA001.A.pdf	Sets out a vision with strategic principles for protecting, connecting, and enhancing existing and new open space.	Includes maps showing: location of parks, playing fields, play areas, growing spaces, cemeteries, waterways and waterbodies, and surrounding significant open spaces; accessibility of parks and play areas; accessibility hot spots; opportunities for improving connectivity; health deprivation and disability; areas for improving health and wellbeing; opportunities to support place making in Belfast City Centre; flood risk and open spaces in Belfast; environmental designations.	 (only available as images)   
	Belfast Green and Blue Infrastructure Plan 2020 (2020a) https://www.pacni.gov.uk/sites/pacni/files/media-files/BCC-AD-GBIP_0.pdf	Sets the strategic geospatial framework, vision, and principles for the future delivery, management, and enhancement of the whole green and blue infrastructure network.	Includes maps showing: environmental designations; green and blue infrastructure strategic framework; Belfast greenway routes; flood risk, waterways, and waterbodies; Air Quality Management Areas (AQMAs).	 (only available as images) 

	<p>Open and Linked Data webpage</p> <p>https://www.belfastcity.gov.uk/open-and-linked-data</p>	<p>Aims to open up non-personal data held by the government and making it freely available.</p>	<p>Open and linked data webpage provides geospatial data layers for: air quality monitoring stations; bowling pavilions; cemeteries; city parks; civic amenity sites; community centres; playgrounds; public toilets; trees.</p>	 
	<p>BCC Website</p> <p>https://www.belfastcity.gov.uk/parks</p>	<p>Pages on BCC website that contain information on parks.</p>	<p>Pages provide geospatial data on Belfast parks including opening times and activities (mainly park runs).</p> <p>Via a link to Walk NI's website: walking routes in some parks; details of facilities available; a grade of accessibility for routes.</p>	
<p>Met Office in partnership with BCC and Climate Northern Ireland</p>	<p>Urban Heat Risk in Belfast</p> <p>https://storymaps.arcgis.com/stories/d7e3520bf0e4b23ae06eb665288d2ca</p>	<p>Story Map to understand who, and where in the city is most vulnerable to extreme heat under current and future climate change.</p>	<p>Includes maps showing: hazard exposure (ward); sensitivity to heat (ward); adaptive capacity (ward); heat risk for 2021-2039 (~2°C world) and for 2061-2079 (~4.5°C world).</p>	     
<p>9 ft in Common</p>	<p>Belfast Alleyways Map</p> <p>https://9ftincommon.com/belfastalleywaymap/</p>	<p>Shows alleys in neighbourhoods across the city.</p>	<p>Includes geospatial data layers showing: location of alleyways that are unadopted; adopted (ungated); those gated by BCC (also adopted).</p>	 
<p>Belfast Hills Partnership</p>	<p>Belfast Hills Recreation Guide – 2nd edition</p> <p>https://belfasthills.org/news/publications/</p>	<p>Provides information/resources containing maps and trails of the Belfast Hills.</p>	<p>Shows maps of Belfast Hills including walking routes.</p> <p>Ordnance Survey map of Belfast Hills also available for purchase.</p>	 <p>(only available as images)</p> 
<p>EastSide Greenways</p>	<p>EastSide Greenways website</p> <p>https://www.eastsiddegreenways.com/greenway-trails-and-books/</p> <p>https://www.eastsiddegreenways.com/interactive-map/</p>	<p>Provides information/resources containing maps and trails of the CCG.</p>	<p>Shows CCG trails and green walking maps.</p>	 
<p>Take Back the City Coalition</p>	<p>The State of Belfast</p> <p>https://www.takebackthecity.ie/map</p>	<p>A visualisation of data linked to challenges such as climate change, inequality, and homelessness.</p>	<p>Includes maps showing: unused public land; government land assets; interfaces; religious backgrounds; GP practices; hospitals; street trees; flood risk; noise pollution; parks and gardens; areas of outstanding natural beauty; deprivation measures.</p>	  

Data portals and geoportals

Data portals are online platforms that aim to act as a one stop shop for information being provided by multiple organisations and sharing these in downloadable and useable formats. Geoportals are very similar to data portals but have a focus on bringing together geospatial data.

Northern Ireland

There are two well developed data portals/geoportals for Northern Ireland. Open Data NI is a data portal that brings together datasets available from across the public sector in Northern Ireland. Departments and organisations include Department for Communities (DfC); Department for Infrastructure (DfI); Department for the Economy (DfE); Department of Agriculture, Environment and Rural Affairs (DAERA); Department of Finance (DoF), including NISRA; Department of Health (DoH); and, Belfast City Council (BCC). The information available includes much of the geospatial data highlighted in the tables for Northern Ireland and Belfast. However, the Open Data NI website does not provide a web map viewer to combine or link these geospatial data sets.

Similarly, Spatial NI is a geoportal providing geospatial data relating to Northern Ireland. Spatial NI provides links to maps such as Flood Maps NI (DfI), NIEA Natural Environment Map viewer (DAERA), and has a web map viewer to map some of the available geospatial data, such as multiple deprivation measure rank (ward); economic activity (male and female); designated sites (ramsar sites).

As part of the SPACE Project, the Centre for Public Health and the Centre for GIS and Geomatics, Queen’s University Belfast (QUB), are developing a geoportal that will collate and make publicly available a range of environmental data across Northern Ireland. The aim is to provide an open, online, secure, dynamic urban environment geoportal to support and facilitate future collaborative working with policymakers, industry, research, and communities.

















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Table 3: Data portals and geoportals, Northern Ireland

Organisation	Title	Description	Maps/geospatial data layers	Notes
Department of Finance (DoF)	<p>OPEN DATA NI</p> <p>https://www.opendatani.gov.uk/</p>	This data portal has been developed by the Open Data team as part of the Digital NI initiative. There are datasets available from across the public sector in Northern Ireland.	Organisations and the number of data sets published include; Belfast Community Planning Partnership (1); DfC (32); DfI (105); DfE (29); DAERA (119); DE (16); DoF (163); DoH (50); BCC (50).	  
Ordnance Survey of Northern Ireland (OSNI)	<p>Spatial NI</p> <p>https://maps.spatialni.gov.uk/</p> <p>https://www.spatialni.gov.uk/gallery.html</p> <p>https://www.nidirect.gov.uk/information-and-services/product-range/digital-products</p>	This geoportal aims to act as a one-stop-shop for finding and using geospatial data relating to Northern Ireland. Includes a web accessible mapping application that can bring together information on a map.	<p>Flood Maps NI (DfI); NIEA Natural Environment Division Map Viewer (DAERA); Outmore NI (Outdoor Recreation Northern Ireland); OSNI Spatial NI.</p> <p>Map viewer layers include: multiple deprivation measure rank (ward); economic activity (male and female); designated sites - ramsar sites.</p>	    (requires additional access)
Queen's University Belfast (QUB) and Land and Property Services	SPACE Geo-Portal	As part of the SPACE Project, the Centre for Public Health and the Centre for GIS and Geomatics, QUB, are developing a geoportal that will collate and make publicly available a range of environmental data across Northern Ireland. The aim is to provide an open, online, secure, dynamic urban environment geoportal to support and facilitate future collaborative working with policymakers, industry, research, and communities.	Environmental data covers: air, noise, and light pollution; soil toxins; green/blue space; climate data; proximity to services; walkability.	   

Belfast

There are no established data portals or geoportals for Belfast. However, the Belfast City Council GeoNode is currently being developed between the Centre of Geographical Information Science and Geomatics (QUB) and Belfast City Council. The Belfast City Council GeoNode aims to be an online portal for sharing open geospatial datasets, satellite imagery, and maps. Layers include Belfast Open Spaces Strategy sites; air quality total (ward); Belfast normalized difference vegetation index. Emerging maps include 'inclusive growth', which highlights the range of deprivation (ward) and employment (ward), and a test map which overlays air quality, employment deprivation, and inclusive growth.











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Table 4: Geoportals, Belfast

Organisation	Title	Description	Maps/geospatial data layers	Notes
Belfast City Council / Queen's University Belfast	Belfast City Council GeoNode https://geonode.gis.qub.ac.uk/	Demonstrator project between the Centre of Geographical Information Science and Geomatics, QUB, and Belfast City Council. Online geoportal for sharing open geospatial datasets, satellite imagery and maps important to city stakeholders and citizens. Should be able to view, share or download geospatial data and create custom maps covering Belfast.	Features are still being developed and tested. Geospatial data includes: Belfast Open Spaces Strategy sites; air quality total (ward); Belfast normalized difference vegetation index. Maps include geospatial layers overlaying air quality, employment deprivation, and inclusive growth. Inclusive growth map with geospatial data for a range of deprivation, and employment.	    

Areas for improvement

As shown above, the availability of geospatial data and maps linked to greening, health, and inequalities in Belfast is good. However, there are areas for improvement that can be addressed to improve the use and understanding of these maps to strengthen the connections between greening, health, and inequalities in Belfast. An analysis of these areas for improvement is provided below, alongside examples of good practice. Stakeholders providing existing and new geospatial data are encouraged to consider these opportunities moving forward, to support those working in the environment, health, and inequalities sector to better use these maps moving forward.

Improving access

The majority of the geospatial data that is available tends to have restrictions on who can use it. The geospatial data tends to be available for personal use, and organisations are required to purchase the geospatial data for commercial use or be part of a specific network/membership to access it. This includes the use of the Flood Maps NI (DfI) and maps accessed via Spatial NI (OSNI).

The principle of providing more open data is being increasingly adopted by public sector organisations, such as Belfast City Council and Open Data NI. Belfast City Council (n.d.) defines Open Data as information that:

- **is free to use for any legal purpose under the Open Government Licence**
- **contains no personal data and meets Data Protection Act legislation**
- **is published in a form that makes it easy to manipulate in software like mobile apps.**

This is helping to address the issue of limited access to geospatial data linked to greening, health, and inequalities, but there is still room for improvement in the extent to which the geospatial data that is available is made free to use by anyone for any purpose.

Easier to re-use

There are maps that contain good information linking greening, health, and inequalities in Belfast. However, the use and future application by other individuals and organisations is severely limited because the geospatial data contained within some of the maps are not available to download in formats, such as shapefiles, that are easy to reuse in mapping software. This applies to geospatial data that is available in web maps viewers, such as the Belfast Local Development Plan Map Viewer (BCC), Urban Heat Risk in Belfast (Met Office), Belfast Alleyways Map (9ft in Common), Flood Maps NI (DfI), and Outmore NI (ORNI). Similarly, this also applies to geospatial data that is provided in maps that are only available as PDFs. This includes maps contained within the Belfast Open Spaces Strategy (BCC, 2020b), and Belfast Green and Blue Infrastructure Plan 2020 (BCC, 2020a). As such, providing more of the existing geospatial data in formats appropriate for mapping software will help strengthen stakeholders' ability to reuse and build on these maps.

Easier to find

As highlighted previously, there are geospatial data and maps which link to greening, health, and inequalities. However, many of these are spread across multiple departments, organisations and websites. Open data and geospatial data platforms such as Open Data NI, Spatial NI, and the QUB Space Geoportal are helping to address this issue, by bringing together geospatial data across the themes of environment, health, and inequalities. However, these maps tend to cover all of Northern Ireland. This makes it difficult to locate and focus on the geospatial data and maps most relevant to Belfast, and the themes of greening, health, and inequalities.

The most promising contribution to address this issue seems to be the Belfast City Council GeoNode. The platform, which is still being developed, shows promising signs of collecting the geospatial data most relevant to Belfast and covers the themes of greening, health, and inequalities. An example of a similar geoportal is MappingGM. This is a geoportal for Greater Manchester, visualising information on a series of maps focused on planning, housing, environmental, social, economic, and demographic data. The resource is for planners within Greater Manchester's local authorities and other relevant partners. Details of the sources of information are also made available for others to find and download. Available at:

<https://mappinggm.org.uk/gmodin>.

Example of a data portal on a city wide scale is the London Data Store. This was created by the Greater London Authority (GLA) and is a free and open data-sharing portal. It collates and provides information useful for the development of maps from approximately 130

organisations largely in the public sector. It covers themes such as environment, demographics, health, and poverty. Available at: <https://data.london.gov.uk/>.

Easier to understand

Geospatial data linked to greening tend to be available as addresses, points of interest, or physical boundaries, such as the boundary of a park. In contrast, maps related to health or inequalities use statistical or political boundaries, such as super output or ward areas. As a result, even when viewing and overlaying these different types of geospatial data in interactive web map viewers, or viewing maps on greening and health side by side, it is difficult to draw out key findings between greening, health and inequalities. As such, being able to make the connections between geospatial data on greening, health, and inequalities in Belfast tends to rely on individuals with mapping skills and software (which also costs) limiting who can utilise these maps and the findings from them.

Mapping tools

Tools have also been developed to better link and show maps connecting greening, health, and inequalities. These mapping tools allow those with limited mapping skills or software to use and make sense of the geospatial data across environmental and socio-economic themes.

The Green Infrastructure Mapping Tool developed by Natural England, provides geospatial data showing accessible natural green space inequality and deprivation. This defines and maps areas on a scale of least favourable (high deprivation and low access to nature) to most favourable (low deprivation and high access to nature). Similarly, the Nature Close 2 Home layer assesses locations by the percentage of children and young people under 16 and people 65 and over who probably live within 300m of a natural greenspace. In addition, the Climate Just Map Tool shows the geography of vulnerability to climate change at a neighbourhood scale. Geospatial data layers include social flood risk index showing where social vulnerability and exposure to flooding coincide, neighbourhood flood vulnerability, and heat socio-spatial vulnerability.

The Green Infrastructure Mapping Tool is aimed at policy makers, such as local planning authorities, and seeks to support stakeholders to assess green infrastructure provision against the emerging green infrastructure standards for England. Available at: <https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Map.aspx>.

The Climate Just Map Tool is aimed at local authorities and their partners in social care, health, housing, and the voluntary and community sector, and is designed to help with the delivery of equitable responses to climate change at the local level. Its purpose is to support local planning and responses to a changing climate and includes the latest flood vulnerability and disadvantage geospatial data for Great Britain in addition to existing heat geospatial data for England. Available at <https://www.climatejust.org.uk/map>.

Story Maps

Story Maps can also be a useful way to support stakeholders, particularly those with very limited mapping skills, to understand the connections between maps and key messages connecting greening, health, and inequalities. Story Maps show maps and link these to a narration, in the form of text, images, and videos, that provides an explanation of the themes being considered and key messages.

Examples include:

- Urban Heat Risk in Belfast developed by the Met Office in partnership with Belfast City Council and Climate Northern Ireland. It invites users to explore the Story Map to understand who, and where in the city is most vulnerable to extreme heat under current and future climate change. Available at: <https://storymaps.arcgis.com/stories/d7e3520fbf0e4b23ae06eb665288d2ca>
- Green Spaces and Human Health created by Cole Wesselman (Fellow) at the Center for Disease Control and Prevention (US). It shows how communities can use green spaces to improve human health, encourage active transportation, and adapt to climate change. Available at: <https://storymaps.arcgis.com/stories/a9dab1f292be48a89d18b433fa3cbb6>
- Greenspace Inequality provides an analysis of the importance of green spaces and the links to inequalities in Baltimore (US). Available at: <https://storymaps.arcgis.com/stories/5ca38273e1154da29c7e0c015647ba60>

Some Story Maps can be limited, as the information is embedded within the map, and not available to download. However, if users can download the information contained within a Story Map, or are provided with links to the geospatial data sources, then Story Maps can provide a useful way to allow people to understand and integrate maps linking greening, health, and inequalities.

Sharing more geospatial data

Some geospatial data that stakeholders raised as areas of interest that do not seem to be available or mapped are:

- **Details of ownership and management responsibility of land in Belfast.**
- **Quality of green spaces, including details such as safety, facilities, and activities.**
- **Users and non-users of green spaces.**
- **The accessibility of green spaces in terms of how to walk or wheel to these locations.**
- **Health outcomes or inequality indicators at small scales such as neighbourhood or wards, such as Childhood BMI.**
- **Biodiversity/nature recovery networks.**
- **Access to food or food deserts.**
- **Detailed tree canopy cover.**
- **Transport poverty.**

Summary

Overall, a number of organisations focused on either Northern Ireland or Belfast provide maps linked to greening, health, and inequalities. As such, the availability of geospatial data and maps linked to greening, health, and inequalities in Belfast is good. Departments and organisations include Department for Agriculture, Environment and Rural Affairs (DAERA), Department for Infrastructure (DfI), Outdoor Recreation NI (ORNI), Ordnance Survey of Northern Ireland, Belfast City Council, Queen's University Belfast, 9 ft in Common, Belfast Hills Partnership, and EastSide Greenways. Additional information on these maps and a web

link have been provided, to support stakeholders working in the environment, health, and inequality sectors to access these maps.

An analysis of the areas for improving the use and understanding of these maps, including examples of good practice, has also been provided. This suggests:

- **Improving access by sharing more maps and geospatial data as open data.**
- **Making existing maps and geospatial data available in formats appropriate for mapping software.**
- **Improving how easy it is to find maps and geospatial data, such as supporting the development of a Belfast focused geoportal.**
- **Strengthen stakeholders' ability to understand maps linking greening, health, and inequalities in Belfast, through the use of mapping tools and Story Maps.**
- **Providing geospatial data and maps that stakeholders have raised as areas of interest that do not seem to be available or mapped, such as details of ownership and management responsibility of land in Belfast.**

Stakeholders providing existing and new geospatial data linked to greening, health, and inequalities in Belfast are encouraged to consider these opportunities for further improvement. This will support those working in the environment, health, and inequalities sectors to better use these maps moving forward.

References and web links

9 ft in Common **Belfast Alleyways Map**. Available at: <https://9ftincommon.com/belfastalleymap/>

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Belfast City Council (n.d.) **Open and Linked Data webpage**. Available at: <https://www.belfastcity.gov.uk/open-and-linked-data>

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- Department of Agriculture, Environment and Rural Affairs **NIEA Catchment Data Map Viewer**. Available at: <https://gis.daera-ni.gov.uk/arcgis/apps/webappviewer/index.html?id=16fddc459bd04d64b9e8f084f3a8e14a>
- Department of Agriculture, Environment and Rural Affairs **Northern Ireland Environment Agency (NIEA) Natural Environment Map Viewer**. Available at: <https://www.daera-ni.gov.uk/services/natural-environment-map-viewer>
- Department of Finance **Open Data NI**. Available at: <https://www.opendatani.gov.uk/>
- Department of Finance, Northern Ireland Statistics and Research Agency **NIMDM 2017 Interactive Map**. Available at: https://datavis.nisra.gov.uk/Deprivation/Deprivation%202017/SOA_Deprivation_Map/atlas.html
- Department of Finance, Northern Ireland Statistics and Research Agency **Making Life Better**. Available at: <https://www.ninis2.nisra.gov.uk/public/InteractiveMapTheme.aspx?themeNumber=-4&themeName=Making+Life+Better>
- Department of Finance, **OPEN DATA NI**. Available at: <https://www.opendatani.gov.uk/>
- EastSide Greenways **EastSide Greenways website**. Available at: <https://www.eastsidegreenways.com/greenway-trails-and-books/> and <https://www.eastsidegreenways.com/interactive-map/>
- Greater London Authority **London Data Store**. Available at: <https://data.london.gov.uk/>
- Greater Manchester Combined Authority **MappingGM**. Available at: <https://mappinggm.org.uk/gmodin>
- Met Office; Belfast City Council; and Climate Northern Ireland **Urban Heat Risk in Belfast**. Available at: <https://storymaps.arcgis.com/stories/d7e3520fbf0e4b23ae06eb665288d2ca>
- Natural England **Green Infrastructure Mapping Tool**. Available at: <https://designatedsites.naturalengland.org.uk/GreenInfrastructure/Map.aspx>
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