Environment Agency

ADAPTIVE INVESTMENT FOR GROWTH

Addressing environmental inequity & climate risk to deliver resilience & enable adaptive sustainable growth

An investment partnership prospectus for the East Midlands

JULY 2023

Nottinghamshire County Council

Version 1.1

This is a publication on behalf of the Equalities & Sustainable Growth Team, East Midlands, Environment Agency

Produced and published in partnership with Nottinghamshire County Council

THE TEAM'S MISSION BEING

- Make accessible the evidence of the structural environmental inequality that exists across the diversity of places and communities
- Develop an understanding of the distribution of services and investments made by the Environment Agency, providing qualified evidence of the; *what, where, with and for whom* of its Operational Delivery
- Engage, inspire, and enable colleagues, partners and environmental stakeholders to make 'Towards Equitable' changes that address both structural and operational inequity
- Provide analysis of how poor environmental quality, compounded by increasing climate risks, damages prosperity and undermines prospects for sustainable growth
- Make the case and develop partnerships that align and prioritise investments to address environmental inequality and deliver adaptive changes that will enable and stimulate equitable sustainable growth

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PREFACE

Since late 2021 the Environment Agency has sought to re-invigorate its engagement with Local Authorities across the East Midlands. This post-Covid initiative is a response to the emerging climate emergency and to evolving interest in establishing a Combined Authority for Derbyshire and Nottinghamshire.

It builds upon our prior engagement with the Local Enterprise Partnership D2N2 and expressed interest from City and County Local Authority contacts. They asked that we take a lead in enabling a better understanding of the distribution across Districts of environmental inequality and climate risks (and the likely causes and effects across the diversity of communities and their local economies) and how they impact on aspirations and the prospects of achieving sustainable economic growth.

In response to their ask we aim to:

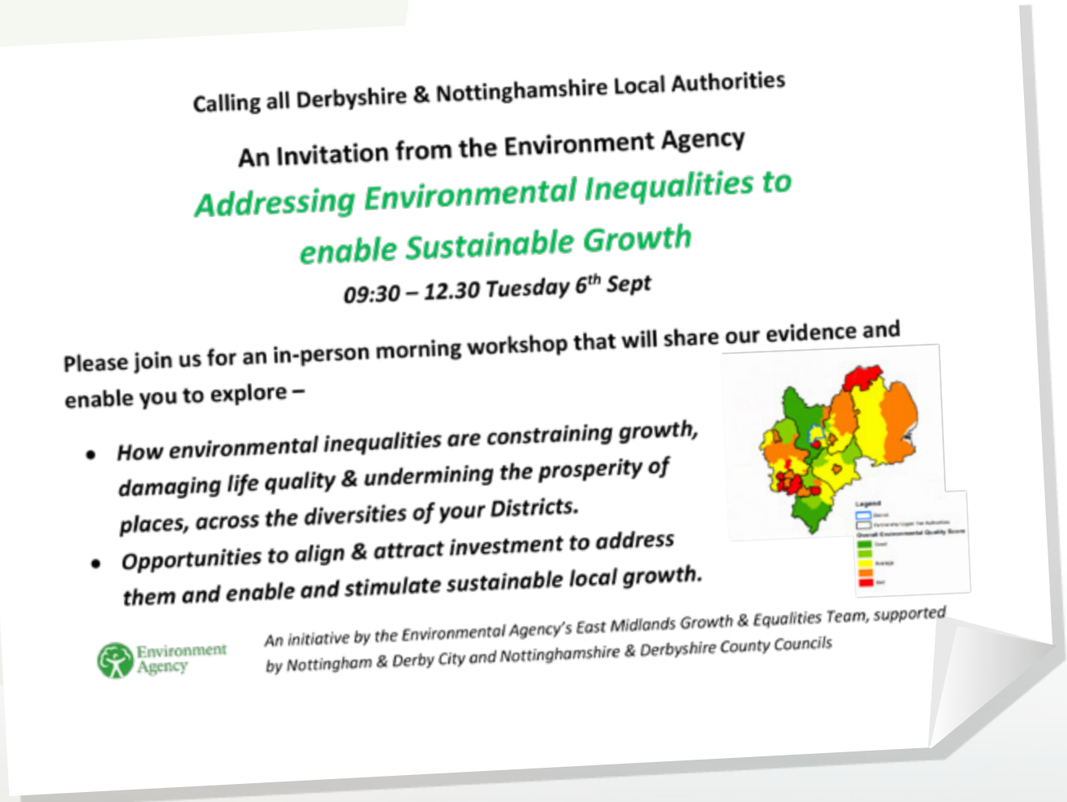
- Provide and establish a shared understanding of the environmental inequality & climate risk evidence for Districts
- Identify with Local Authority partners the main strategic environmental constraints
- Highlight the prospects of growth-stimulating sustainable economic benefits that would arise from addressing strategic environmental constraints & climate threats
- Establish this as the basis for attracting, aligning, partnering environmental and adaptive investment for sustainable growth across Derbyshire, Nottinghamshire and beyond

The *Addressing Environmental Inequalities to enable Sustainable Growth* Local Authority Workshop of September 2022 and this re-presentation of it as a prospectus, delivers a significant step forward in realising these shared ambitions.

I anticipate that you will find the District EQ Scorecards, the analysis of common causes, consequences and the constraining impacts of environmental inequity, (as well as how these are being compounded by climate change) - something of a revelation that hopefully offers fresh perspective and insight.

In setting the scene, in identifying strategic environmental interventions that can address poor quality and productivity of places, as well as highlighting adaptive needs and sustainable growth investment opportunities - I hope it stimulates further dialogues and a widening of engagement.

I am keen to receive feedback and we look forward to the prospect of working with Local Authorities and stakeholders to evolve environmental equity and adaptive investment partnership opportunities.



Calling all Derbyshire & Nottinghamshire Local Authorities

An Invitation from the Environment Agency

Addressing Environmental Inequalities to enable Sustainable Growth

09:30 – 12.30 Tuesday 6th Sept

Please join us for an in-person morning workshop that will share our evidence and enable you to explore –

- ***How environmental inequalities are constraining growth, damaging life quality & undermining the prosperity of places, across the diversities of your Districts.***
- ***Opportunities to align & attract investment to address them and enable and stimulate sustainable local growth.***

Environment Agency

An initiative by the Environmental Agency's East Midlands Growth & Equalities Team, supported by Nottingham & Derby City and Nottinghamshire & Derbyshire County Councils

RICHARD WALKER

Is an environmental regeneration, flood risk & climate change adaptation investment specialist. He is based within the Environment Agency's National Economics, Appraisal & Research Team. He commissioned the 2019 Indices of Environmental Inequality, developed the key concepts, provided the analysis, as well as presented the *Addressing Environmental Inequality to Enable Sustainable Growth* workshop. He has reproduced the content to enable this prospectus.
He has a 30-year practitioner's background in the aligning of investment into environmental (waterfront) regeneration. He develops evidence and place-analytics, enables future-visioning, evolves partnerships and builds investment cases. He has influenced, programmed and delivered £½ a billion into initiatives that adapt, help transform and revitalise marginalised places. His core expertise is the identification of the enabled sustainable economic growth, land uplift and future benefits that come from addressing environmental inequity and future risks.

KANE CUNLIFFE

Is an expert data visualiser, he prepared the workshop EQ scorecards and has been instrumental in progressing localised mapping of the Indices of Environmental Inequality and the complementary socio-economic data that is utilised throughout this prospectus.

INTRODUCTION

This prospectus reproduces a workshop presentation that was first given to representatives of the 20 Derbyshire & Nottinghamshire (D&N) Local Authorities on the 6th of September 2022.

It was developed and delivered as a substantive element of an Environment Agency programme of strategic re-engagement and exploration of opportunities for closer partnership working with Local Authorities across the River Trent catchment.

It seeks to meet the expressed requirement of Local Authority representatives during that re-engagement – by providing accessible evidence and analysis of how and where poor environmental quality and increasing climate risks damage and constrain the prospects for sustainable growth.

INITIAL FOCUS

- Explaining the distribution of indices of environmental quality/inequality and climate risks and how these relate to headline social health and economic indices across Districts
- Providing a full set of Derbyshire and Nottinghamshire District EQ & Climate Risk Scorecards – and a consideration of what they do & perhaps don't reveal

AIM

Show how this evidence, inclusive of climate risks, enables evaluation and offers insights into the distribution of:

- Damage to quality of life, public health and well-being
- Constraints on local economic viability and vitality
- Threats to renewal, inward investment & future sustainable growth aspirations

STRATEGIC VALUE

We have previously identified a spatial 'common ground' regarding the distribution across communities of; ethnic and cultural diversity (& change), socio-economic deprivation and our updated indices of Environmental Inequality.

Initial analysis, based upon this commonality, reveals not just qualitative environmental and adaptive needs, but also that being proactive about addressing them offers a set of significant and strategic transformative opportunities for the most marginalised and climate-change vulnerable urban and rural communities, and places across all D&N, Local Authority areas.

Furthermore, this is really a prospectus in that it sketches out the case that equitably driven investment in environmental interventions (that stimulate sustainable growth) and in adapting and adaptive infrastructure (that delivers 'Adaptive Futures') across diverse, deprived, disadvantaged and under-productive local economy's offers great value returns.

This is reflective of the **United Nations Sustainable Development Goals** 2030 (specifically Goal 10), and the UN's Department of Social & Economic Affairs **report** on the need to focus on the linkages between inequity, climate vulnerability and opportunities to achieve greatest sustainable development (& resilience benefits) by appropriately targeting in adaptation investment.

Sustainable Development Goals: 17 Goals to Transform our World | United Nations

New UN report: Inequalities cause and exacerbate climate impacts on poor and vulnerable people | United Nations

THE 25 YEAR PLAN INDEX OF ENVIRONMENTAL INEQUALITY (NATIONAL) 2019

The EQ indices within this prospectus were constructed using open-source (2016-19) national datasets that are all in the public domain. This was done in 2019 via a commission and in partnership with environmental GIS specialists Geofutures.

This Index of Environmental Inequalities is:

- Reflective of the spatial themes within the Government's 25 YEP (now the 2021 Environment Act)
- Relative, in that each of the D&N Districts are ranked among the set of all 326 LA Districts across England (with adjustment for differences in size or population, as most relevant)
- INDICATIVE & dependent upon the quality of local input data & won't always reflect actual local perceptions & realities
- Previously unpublished

CREATING ENVIRONMENTAL INEQUALITY INDICES DISTRICT SCORECARDS FOR DERBYSHIRE & NOTTINGHAMSHIRE

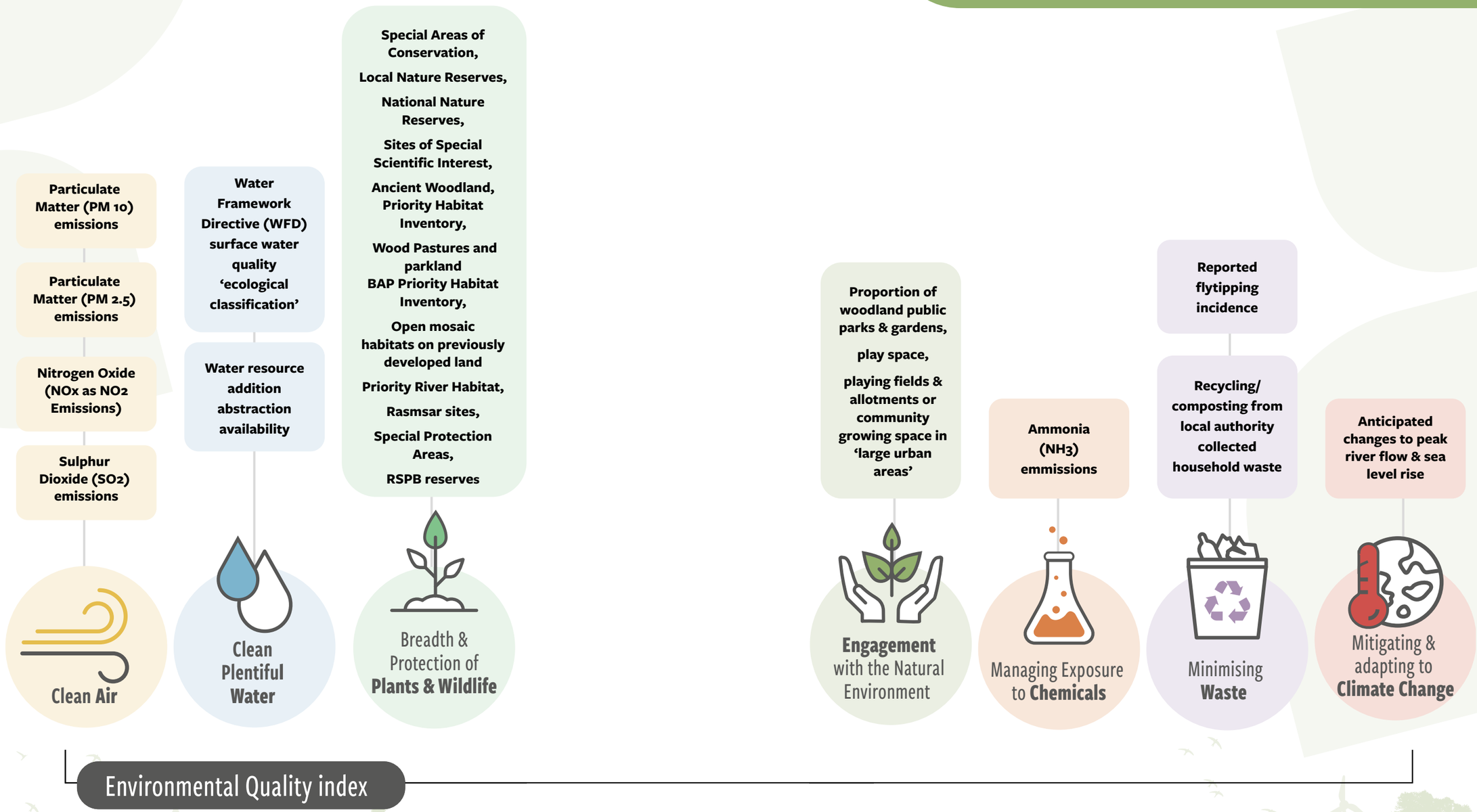
We have developed and within this prospectus provide, a set of EQ scorecards - one for each individual 2nd tier Local Authority District and Unitary Council area. Throughout this document, the term 'District' generally refers to all 2nd tier Local Authorities, inclusive of those that are Unitary Authorities.

The scorecards rank each District amongst all 326 English Districts for overall Environmental Inequality and for each of the 7 individual EQ themes (adjusted for size of population), for flood risk exposure, for Indices of Multiple Deprivation (IMD), health and disability rankings, and for Gross Value Added (GVA) per capita.

They provide a summary overview and enable comparisons of environmental effectors as well as high level measures of liveability and productivity.

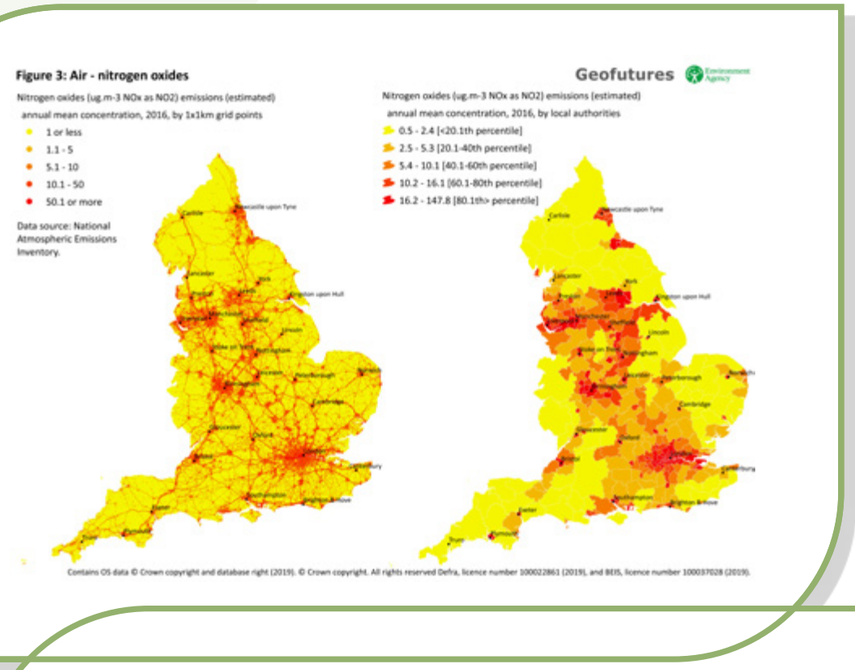
ENVIRONMENT ACT 2021 PLACE THEMES

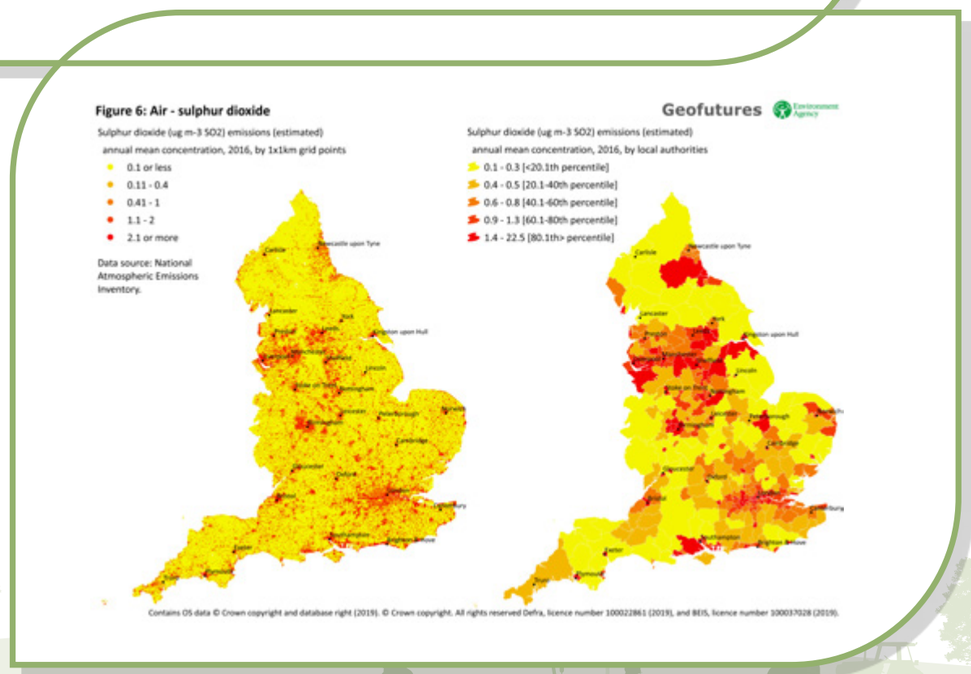
HOW 12 GEO-DATASETS 'FED' INTO SEVEN ENVIRONMENT ACT 2021 PLACE THEMES

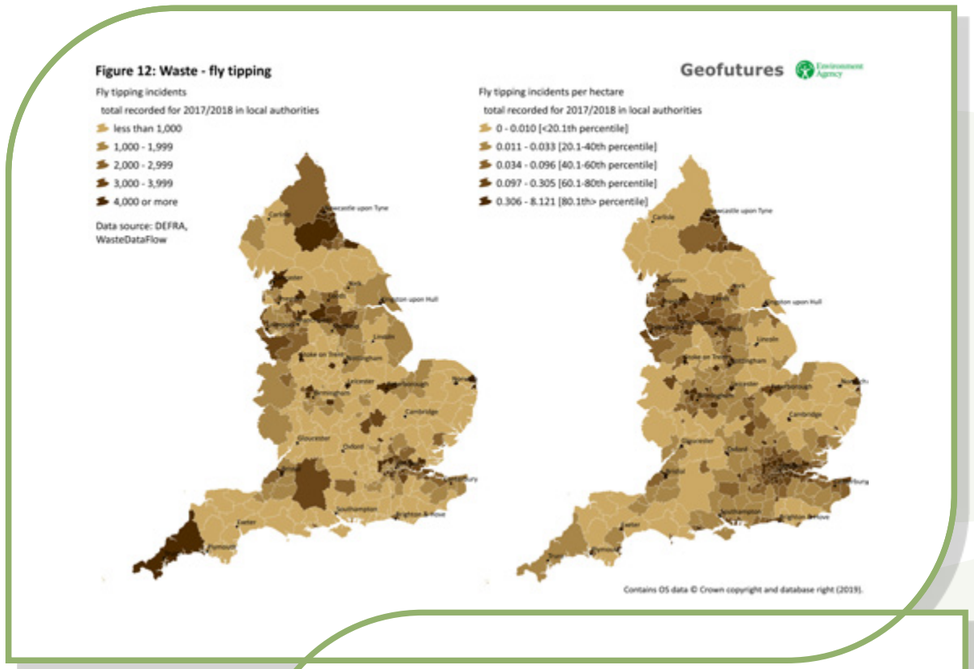


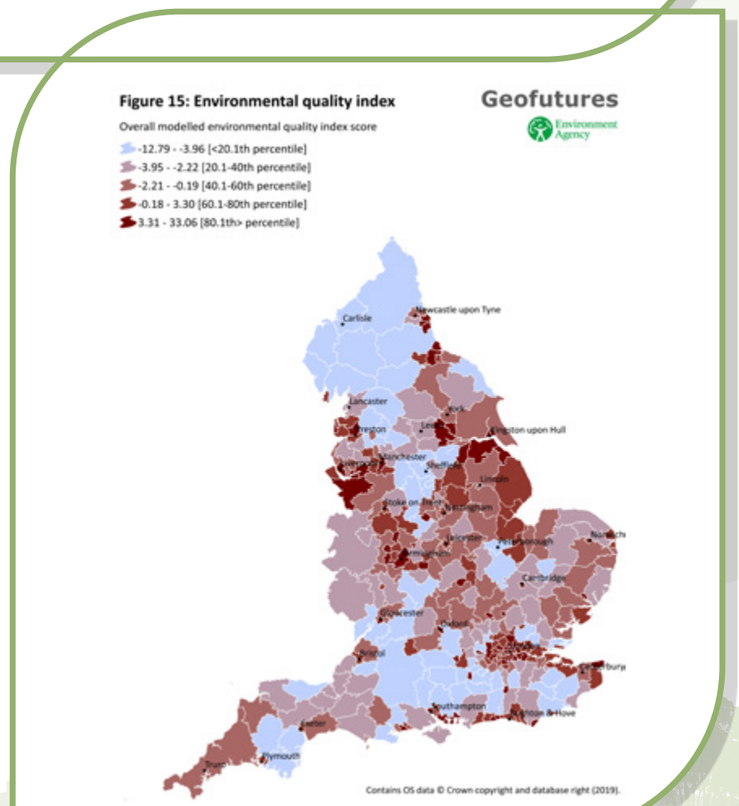
ENVIRONMENTAL INEQUALITY INDICES NATIONAL MAPS

Created an overall EQ and 12 specific indicator ‘District-Granularity’ national maps, as well as shapefiles and spreadsheets of the seven themes.









2019 D2N2 SUB-REGIONAL ENVIRONMENTAL INEQUALITY SUMMARY MAPS

WATER QUALITY

GREEN SPACE

AIR QUALITY

BIODIVERSITY

WASTE

CHEMICALS

WATER SCARCITY

CLIMATE CHANGE (WATER)

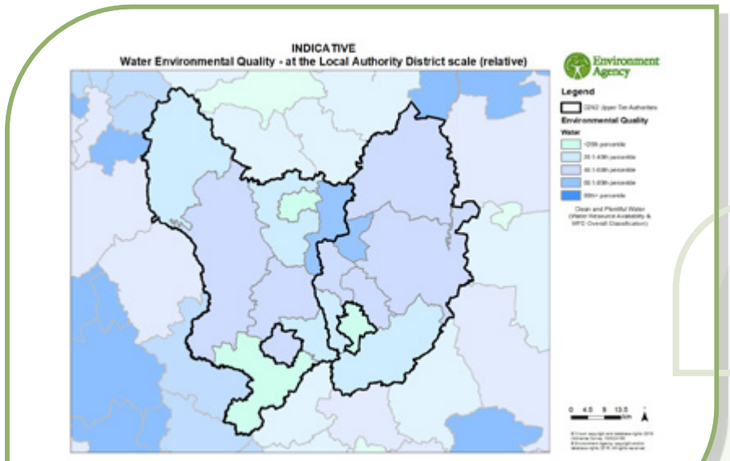
OVERALL EQ

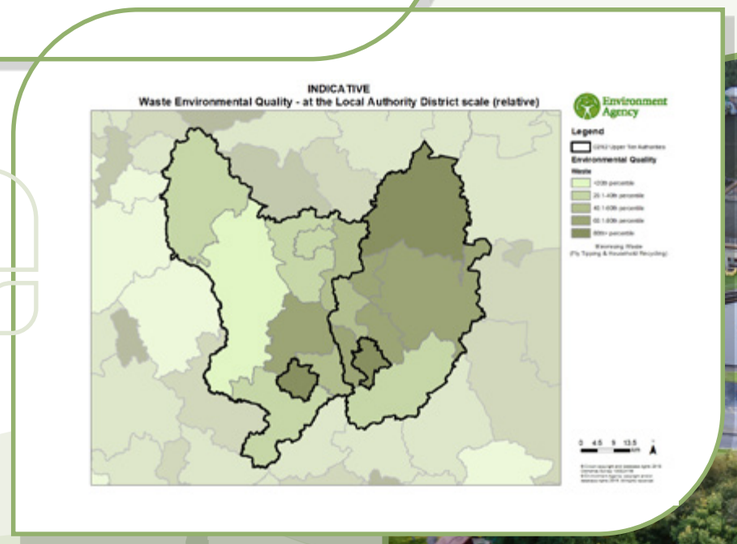
Cuts of the 2019 National datasets to Derbyshire and Nottinghamshire (as the area of the Local Enterprise Partnership) were created and offered to D2N2 in 2019.

They recognised that they provided some basic analysis of the distribution of environmental quality and the potential linkage to delivery of growth aspirations and inward investment. They were included as background evidence in their 2020 Growth Plan.

During 2021 Environment Agency initial re-engagement identified interest and an appetite for developing a shared understanding among Local Authorities of the distribution of indices of environmental inequality and climate risks, as well as how these might impact on life quality and constrain future economic prospects.

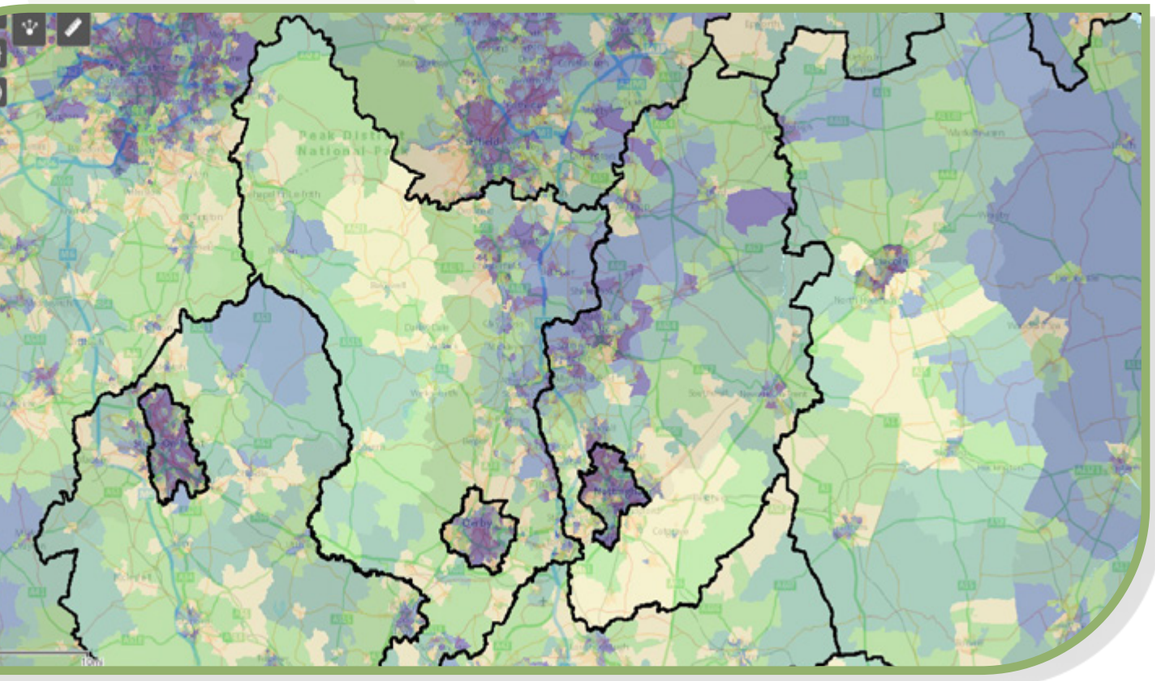
This was seen as particularly relevant to the Derbyshire and Nottinghamshire contexts and the development of a devolution deal and prospective combined authority arrangement.





2022 ENVIRONMENTAL INEQUALITY INDEX MAPPING TOOL DEVELOPED

This included the interim development of predictive overall environmental inequality mapping at a much finer Super Output Area scale (SOAs). This is based on the strong relationship between EQ and Indices of Multiple Deprivation (IMD). In common, with IMD, mapping at this granularity reveals a high degree of variance in overall EQ within, as well as between, different Districts – i.e. there are areas of high environmental quality (and relative affluence) within the more deprived and poorer EQ Districts, and vice versa.



Predictive EQ @ SOA scale, overlaying District Indices of Multiple Deprivation

2022 ENVIRONMENTAL INEQUALITY & CLIMATE RISK (INDICES) LOCAL AUTHORITY (AREA) SCORECARDS

These are provided as a full set for all Derbyshire and Nottinghamshire Local Authority Areas.

It is important to recognise that these are District-scale indices of 'structural' Environmental Inequality. They do not represent, measure or rank the performance of authorities and their services.

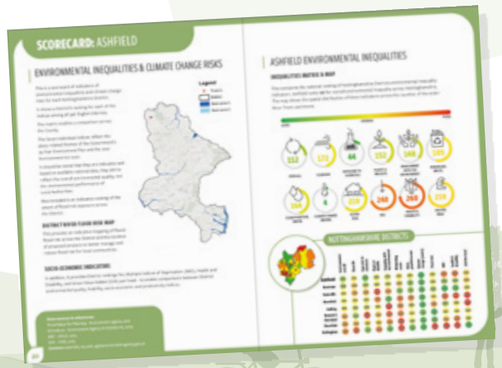
The (current) limitation is that the distributions of the specific indices, reflective of the measurements of factors that affect them, will vary as much within Districts as between Districts and the scorecards can only provide a summary overview, at least at this point in time.

Although the individual and overall EQ indices are averaged for the differences in the area (or where more relevant, population) size of Districts, the mix and make-up of denser urban and less-dense rural areas and particularly variations in the 'compactness' of the boundaries of some Districts around large urban settlements cannot be fully equalised. These are essential aspects of their geographies and their characteristics. In a similar sense the indices measure impacts on place, and do not attempt to identify any differences in the distribution of by whom or from where they were caused.

The construction of the indices and the accuracy of what they show is inevitably limited by the relevance and accuracy of the raw input data. The indices reflect the spatial environmental data, collected, collated and published by Government Departments and agencies.

As to be expected, there are some near-consistent differences in EQ indices across predominantly urban Districts when compared to predominantly rural ones.

Major infrastructure, and use of it, such as the Strategic Roads Network, may have significant direct and indirect impacts on EQ indices across some Districts. It is probable that a complex web of 'displacements' occurs across and between different areas and Districts (e.g. from traffic emissions & waste treatment etc.). The scorecards cannot 'qualify' the results in this regard, they can only reflect the distribution of environmental inequality and climate risk impacts on recipient places.



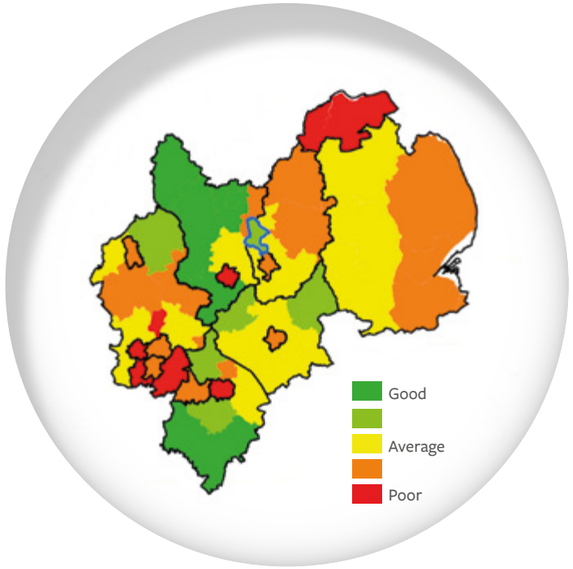
SCORECARD: NOTTINGHAMSHIRE

COUNTY OVERVIEW

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISK MATRIX TRENT CATCHMENT SUMMARY EQ INFOMAPIC

The County EQ Matrix presents a comparison of the national ranking of Nottinghamshire Districts (out of 326) by environmental and socio-economic indicators.

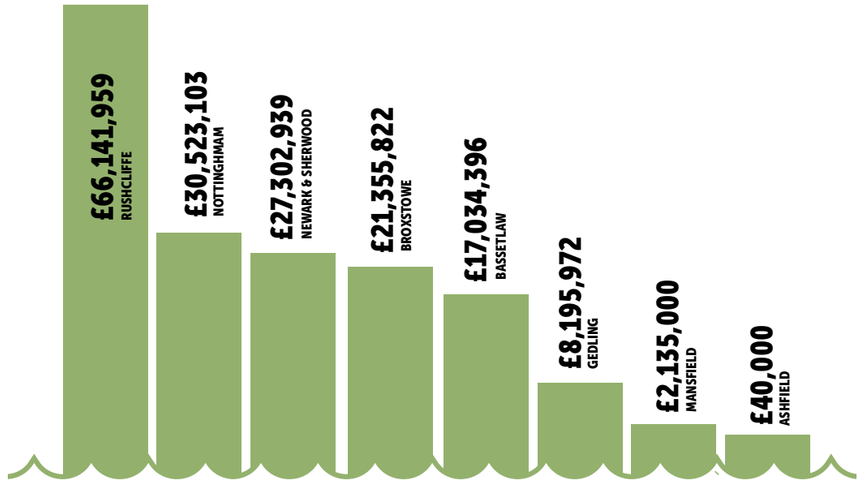
The Trent Catchment Summary EQ Infomapic provides a simple visualisation of the wider distribution of overall environmental inequality at a District scale across all the Counties and Districts of the River Trent Catchment.



	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
Ashfield	112	172	44	152	148	189	164	4	84	248	260	259
Broxtowe	138	200	139	183	168	200	91	18	221	109	130	261
Rushcliffe	174	219	220	295	229	78	89	32	251	8	33	233
Mansfield	179	171	159	240	37	255	243	20	63	271	285	313
Gedling	182	153	156	174	310	236	156	19	210	124	169	322
Newark & Sherwood	222	109	306	209	264	245	175	52	212	174	180	236
Bassetlaw	233	206	193	172	234	288	167	26	169	213	247	237
Nottingham	238	274	78	246	51	307	51	7	300	319	308	75

GOOD — AVERAGE — POOR

NOTTINGHAMSHIRE - PLANNED INVESTMENT IN FLOOD RISK MANAGEMENT ACROSS DISTRICTS



NOTTINGHAMSHIRE £7.4 MILLION

NOTTINGHAMSHIRE £172 MILLION

Revenue funded flood defence asset maintenance 2022-2023 - AIMS Revenue Programme, Environment Agency 2022

Planned current capital investment in schemes to reduce flood risk to communities (indicative) - The 2022-2028 FCERM Consented Capital Programme, Environment Agency 2022

Data Referenced:

Flood Map for Planning, Environment Agency, 2022, Environment Inequality, Geofutures, 2019 Multiple Indices of Deprivation, Ministry of Housing and Local Government, 2015, GVA per Head, Office of National Statistics, 2015, Consented (original) 2022 –2028 FCERM Capital Programme, Environment Agency, 2021.
Flood Risk – represents the total number of properties at risk from Rivers & Sea, Surface Water & Drainage 2018 (unadjusted for population size)

Contact Us:
eastmids_eq_and_sg@environment-agency.gov.uk
Produced April 2022 by the Sustainable Growth team

Environment Agency

SCORECARD: ASHFIELD

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Nottinghamshire District.

It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The Seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.

DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

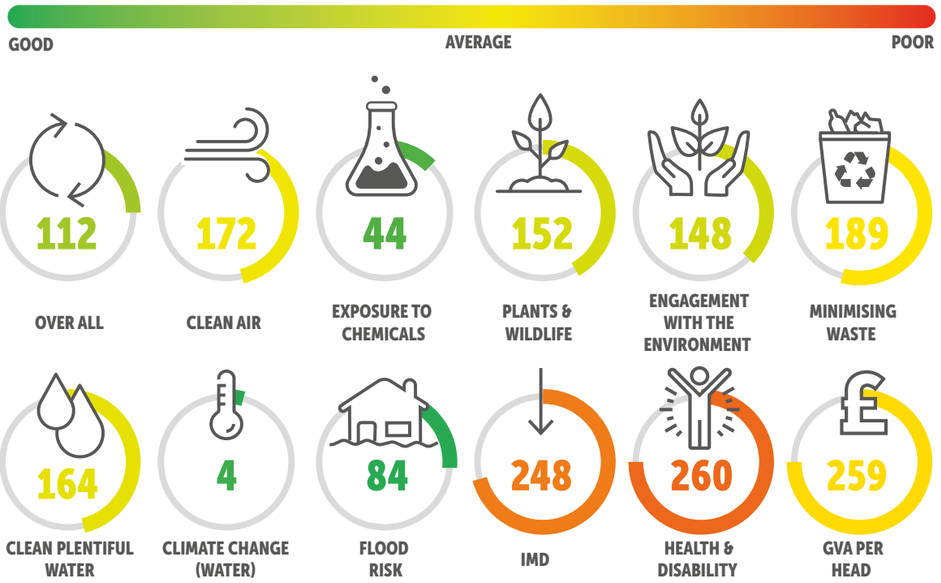
In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

Data sources & references:
Flood Maps for Planning - Environment Agency 2021
EQ Indices - Environment Agency & Geofutures, 2019
IMD – DHLG, 2015
GVA – ONS, 2015
contact - eastmids_eq_and_sg@environment-agency.gov.uk

ASHFIELD ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Nottinghamshire Districts environmental inequality indicators. Ashfield ranks **1st** for overall environmental inequality across Nottinghamshire. The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.



NOTTINGHAMSHIRE DISTRICTS

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SCORECARD: BROXTOWE

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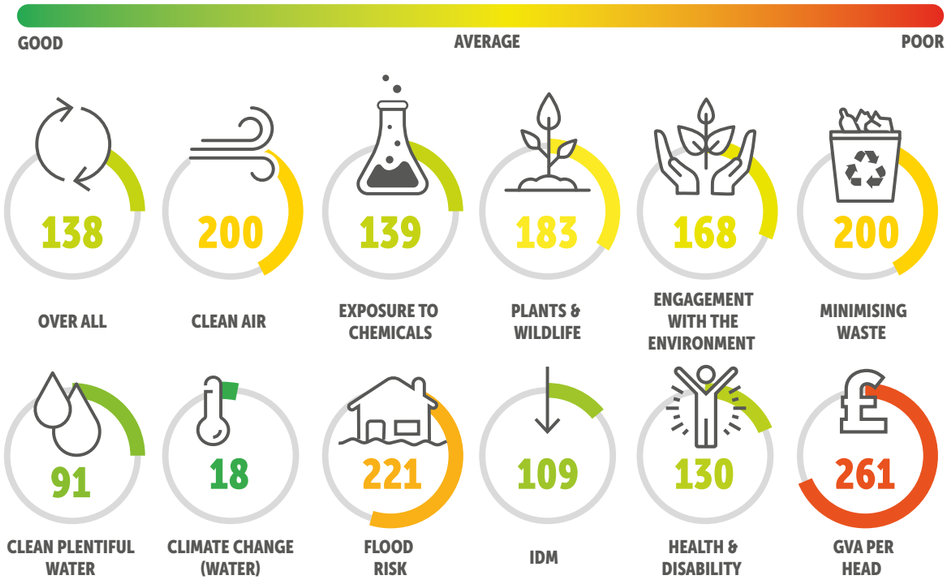
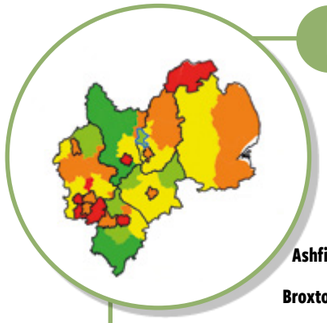
BROXTOWE ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Nottinghamshire Districts environmental inequality indicators. Broxtowe ranks **2nd** for overall environmental inequality across Nottinghamshire. The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.



NOTTINGHAMSHIRE DISTRICTS



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SCORECARD: RUSHCLIFFE

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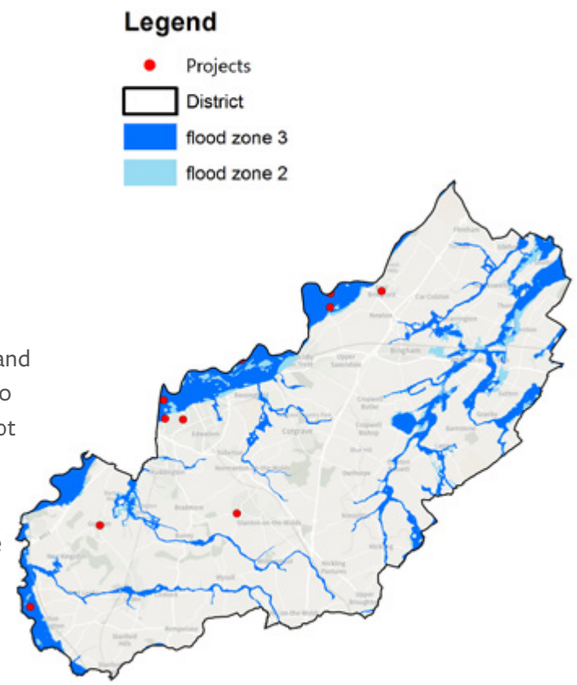

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IMD – DHLG, 2015
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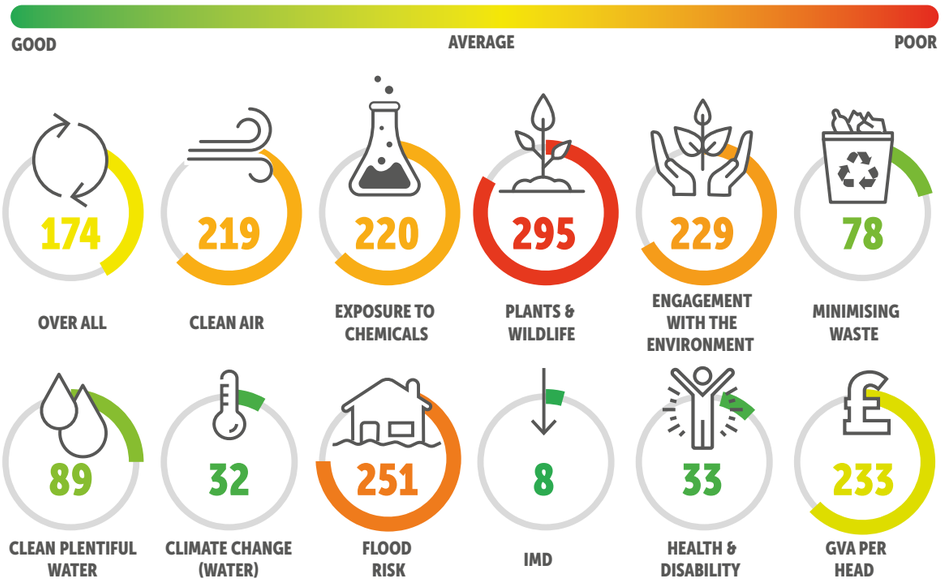
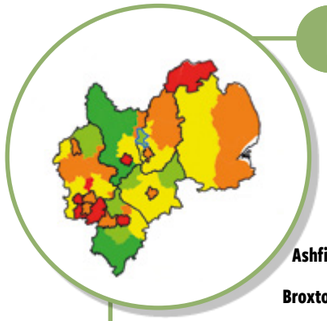
RUSHCLIFFE ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Nottinghamshire Districts environmental inequality indicators. Rushcliffe ranks **3rd** for overall environmental inequality across Nottinghamshire. The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.



NOTTINGHAMSHIRE DISTRICTS



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Rushcliffe	174	219	220	295	229	78	89	32	251	8	33	233
Mansfield	179	171	159	240	37	255	243	20	63	271	285	313
Gedling	182	153	156	174	310	236	156	19	210	124	169	322
Newark & Sherwood	222	109	306	209	264	245	175	52	212	174	180	236
Bassetlaw	233	206	193	172	234	288	167	26	169	213	247	237
Nottingham	238	274	78	246	51	307	51	7	300	319	308	75

SCORECARD: MANSFIELD

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Nottinghamshire District.

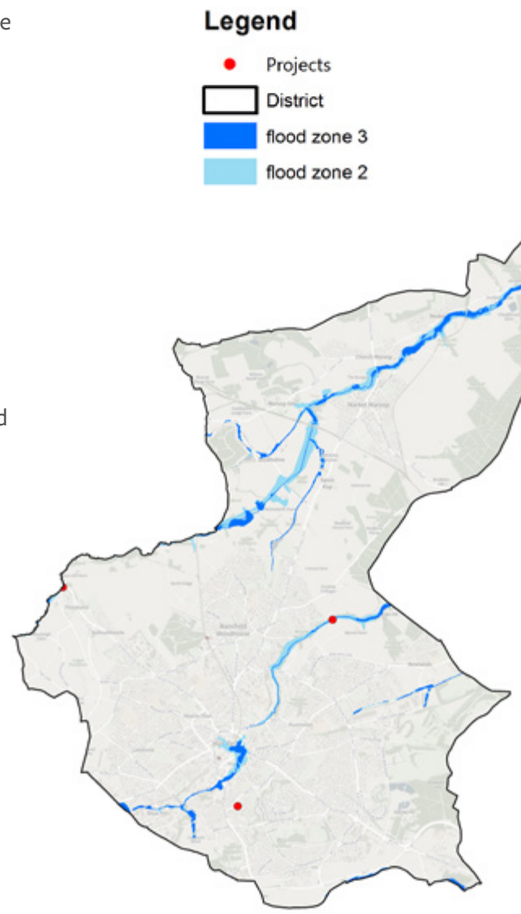
It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The Seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.



DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

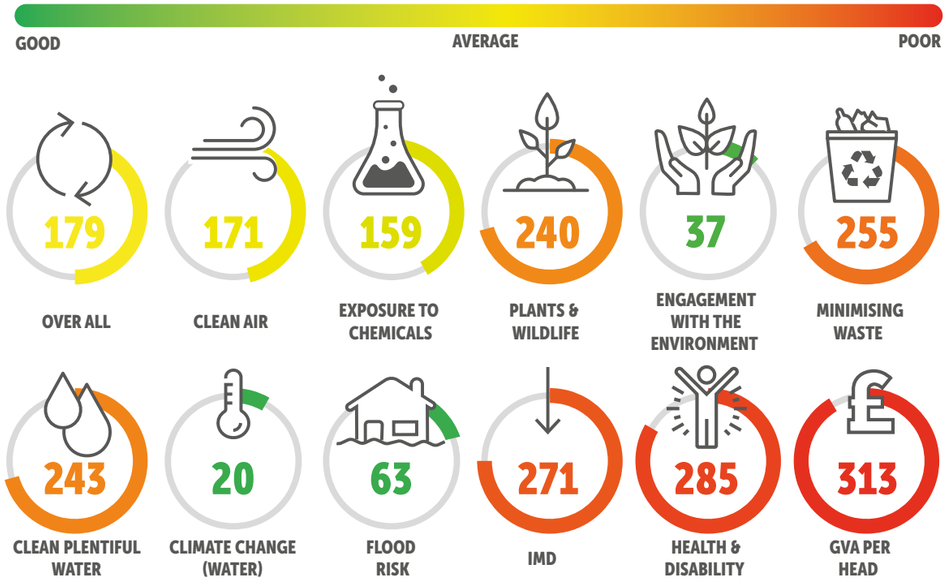
In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

Data sources & references:
Flood Maps for Planning - Environment Agency 2021
EQ Indices - Environment Agency & Geofutures, 2019
IMD – DHLG, 2015
GVA – ONS, 2015
Contract eastmids_eq_and_sg@environment-agency.gov.uk

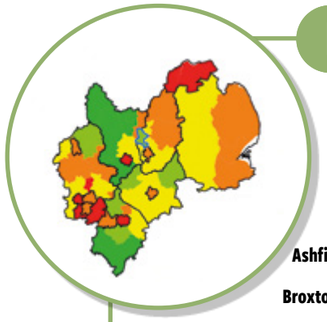
MANSFIELD ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Nottinghamshire Districts environmental inequality indicators. Mansfield ranks **4th** for overall environmental inequality across Nottinghamshire. The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.



NOTTINGHAMSHIRE DISTRICTS



	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
Ashfield	112	172	44	152	148	189	164	4	84	248	260	259
Broxtowe	138	200	139	183	168	200	91	18	221	109	130	261
Rushcliffe	174	219	220	295	229	78	89	32	251	8	33	233
Mansfield	179	171	159	240	37	255	243	20	63	271	285	313
Gedling	182	153	156	174	310	236	156	19	210	124	169	322
Newark & Sherwood	222	109	306	209	264	245	175	52	212	174	180	236
Bassetlaw	233	206	193	172	234	288	167	26	169	213	247	237
Nottingham	238	274	78	246	51	307	51	7	300	319	308	75

SCORECARD: GEDLING

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Nottinghamshire District.

It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The Seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.

DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

Data sources & references:

Flood Maps for Planning - Environment Agency 2021

EQ Indices - Environment Agency & Geofutures, 2019

IMD – DHLG, 2015

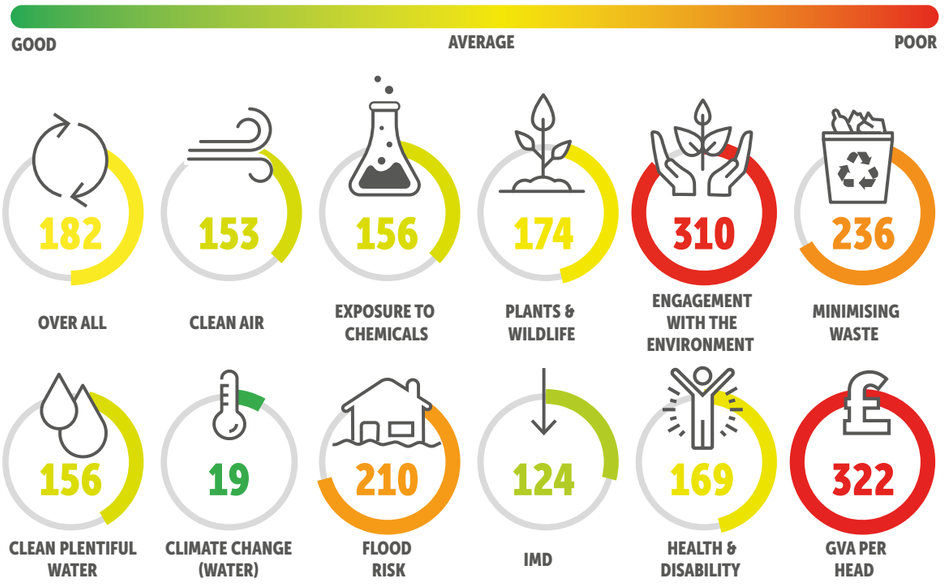
GVA – ONS, 2015

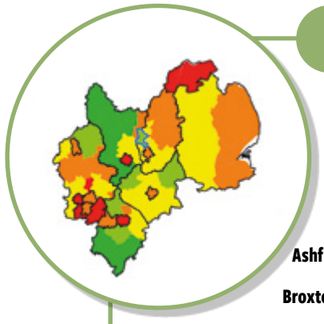
contact - eastmids_eq_and_sg@environment-agency.gov.uk

GEDLING ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Nottinghamshire Districts environmental inequality indicators. Gedling ranks **5th** for overall environmental inequality across Nottinghamshire. The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





NOTTINGHAMSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
Ashfield	112	172	44	152	148	189	164	4	84	248	260	259
Broxtowe	138	200	139	183	168	200	91	18	221	109	130	261
Rushcliffe	174	219	220	295	229	78	89	32	251	8	33	233
Mansfield	179	171	159	240	37	255	243	20	63	271	285	313
Gedling	182	153	156	174	310	236	156	19	210	124	169	322
Newark & Sherwood	222	109	306	209	264	245	175	52	212	174	180	236
Bassetlaw	233	206	193	172	234	288	167	26	169	213	247	237
Nottingham	238	274	78	246	51	307	51	7	300	319	308	75

SCORECARD: NEWARK & SHERWOOD

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Nottinghamshire District.

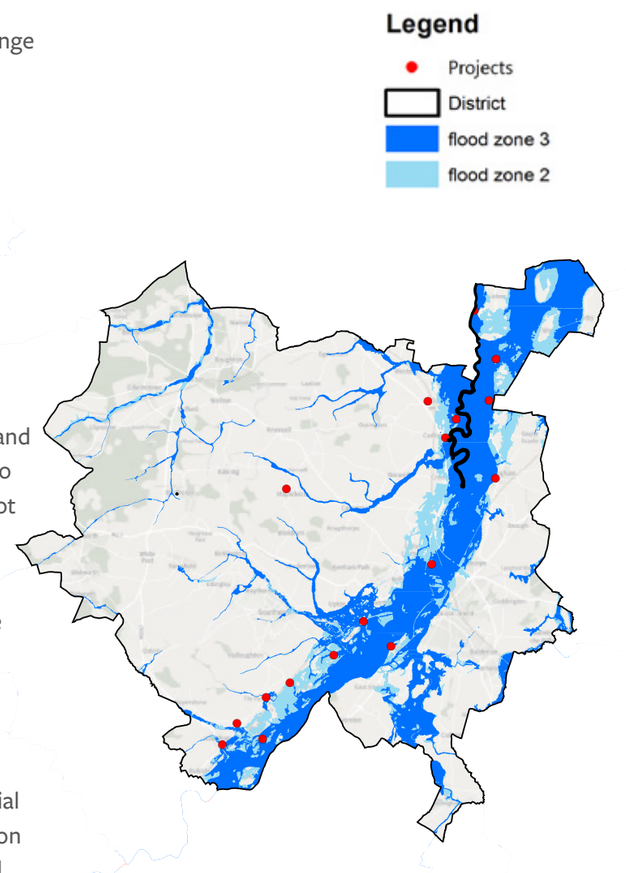
It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The Seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.



DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

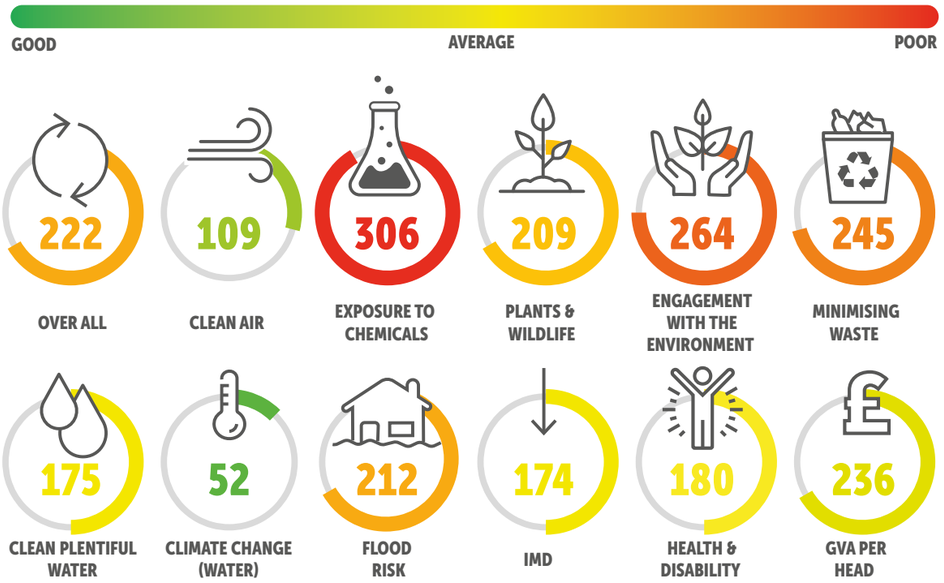
In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

Data sources & references:
Flood Maps for Planning - Environment Agency 2021
EQ Indices - Environment Agency & Geofutures, 2019
IMD – DHLG, 2015
GVA – ONS, 2015
contact - eastmids_eq_and_sg@environment-agency.gov.uk

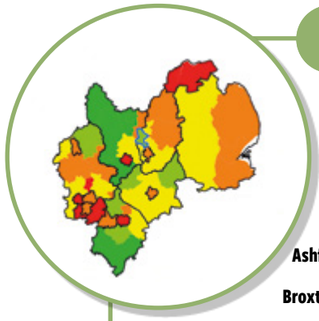
NEWARK & SHERWOOD ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Nottinghamshire Districts environmental inequality indicators. Newark & Sherwood ranks **6th** for overall environmental inequality across Nottinghamshire. The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.



NOTTINGHAMSHIRE DISTRICTS



	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
Ashfield	112	172	44	152	148	189	164	4	84	248	260	259
Broxtowe	138	200	139	183	168	200	91	18	221	109	130	261
Rushcliffe	174	219	220	295	229	78	89	32	251	8	33	233
Mansfield	179	171	159	240	37	255	243	20	63	271	285	313
Gedling	182	153	156	174	310	236	156	19	210	124	169	322
Newark & Sherwood	222	109	306	209	264	245	175	52	212	174	180	236
Bassetlaw	233	206	193	172	234	288	167	26	169	213	247	237
Nottingham	238	274	78	246	51	307	51	7	300	319	308	75

SCORECARD: BASSETLAW

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Nottinghamshire District.

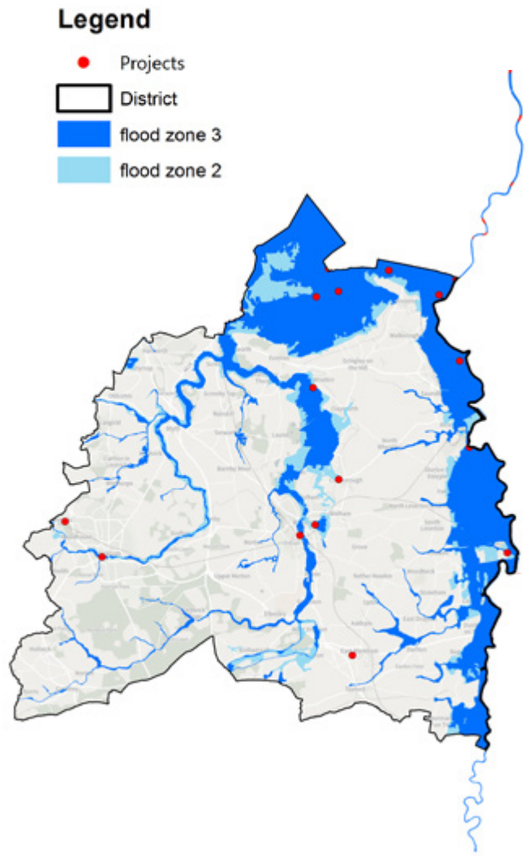
It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The Seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.



DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

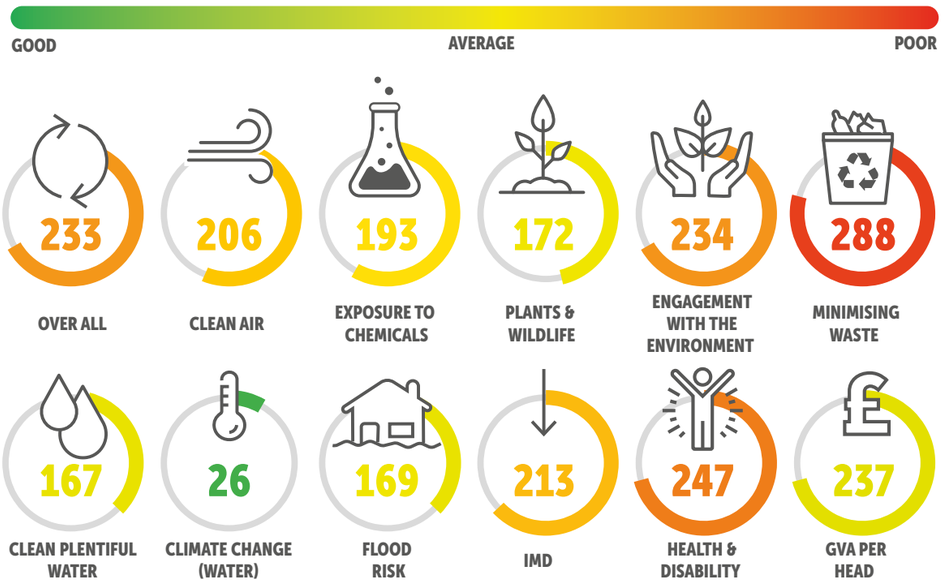
In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

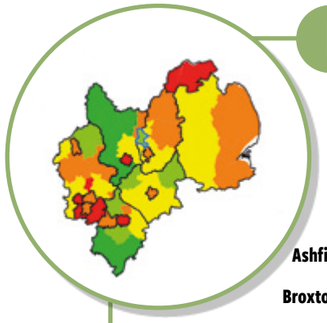
Data sources & references:
Flood Maps for Planning - Environment Agency 2021
EQ Indices - Environment Agency & Geofutures, 2019
IMD – DHLG, 2015
GVA – ONS, 2015
contact - eastmids_eq_and_sg@environment-agency.gov.uk

BASSETLAW ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Nottinghamshire Districts environmental inequality indicators. Bassetlaw ranks **7th** for overall environmental inequality across Nottinghamshire. The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





NOTTINGHAMSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
Ashfield	112	172	44	152	148	189	164	4	84	248	260	259
Broxtowe	138	200	139	183	168	200	91	18	221	109	130	261
Rushcliffe	174	219	220	295	229	78	89	32	251	8	33	233
Mansfield	179	171	159	240	37	255	243	20	63	271	285	313
Gedling	182	153	156	174	310	236	156	19	210	124	169	322
Newark & Sherwood	222	109	306	209	264	245	175	52	212	174	180	236
Bassetlaw	233	206	193	172	234	288	167	26	169	213	247	237
Nottingham	238	274	78	246	51	307	51	7	300	319	308	75

SCORECARD: NOTTINGHAM

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Nottinghamshire District.

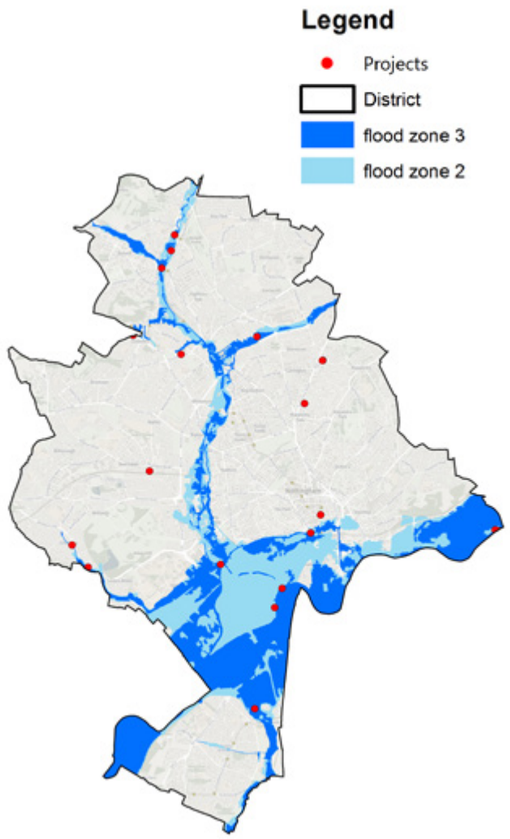
It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The Seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.



DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

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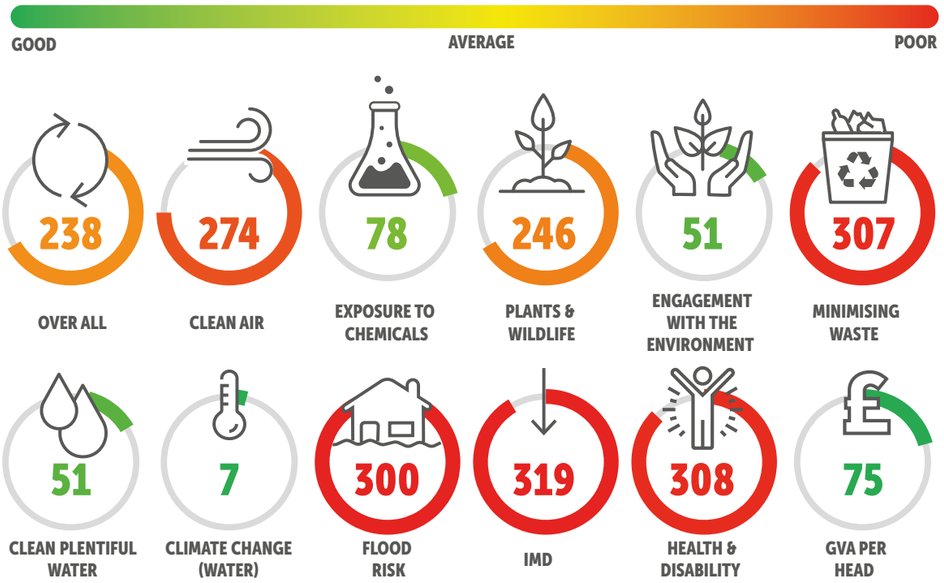
EQ Indices - Environment Agency & Geofutures, 2019
IMD – DHLG, 2015
GVA – ONS, 2015
contact - eastmids_eq_and_sg@environment-agency.gov.uk

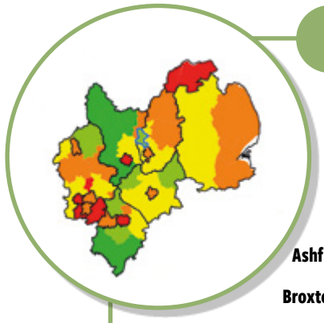
NOTTINGHAM ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Nottinghamshire Districts environmental inequality indicators. Nottingham ranks **8th** for overall environmental inequality across Nottinghamshire. The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.



NOTTINGHAMSHIRE DISTRICTS



	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
Ashfield	112	172	44	152	148	189	164	4	84	248	260	259
Broxtowe	138	200	139	183	168	200	91	18	221	109	130	261
Rushcliffe	174	219	220	295	229	78	89	32	251	8	33	233
Mansfield	179	171	159	240	37	255	243	20	63	271	285	313
Gedling	182	153	156	174	310	236	156	19	210	124	169	322
Newark & Sherwood	222	109	306	209	264	245	175	52	212	174	180	236
Bassetlaw	233	206	193	172	234	288	167	26	169	213	247	237
Nottingham	238	274	78	246	51	307	51	7	300	319	308	75

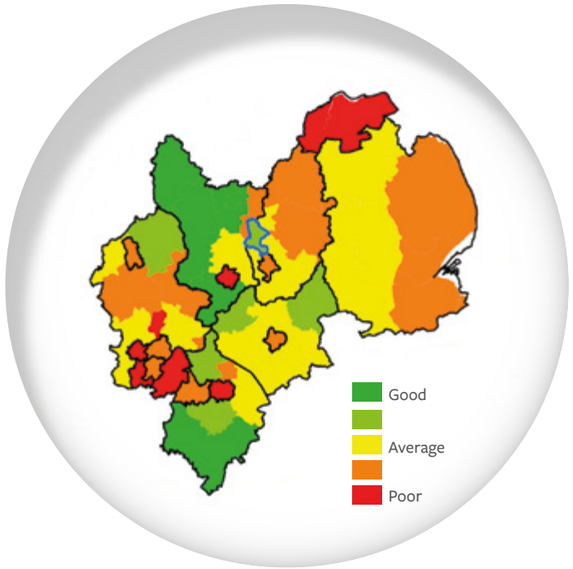
SCORECARD: DERBYSHIRE

COUNTY OVERVIEW

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISK MATRIX AND TRENT CATCHMENT EQ INFOMAPIC

The County EQ Matrix presents a comparison of the national ranking of Nottinghamshire Districts (out of 326) by environmental and socio-economic indicators.

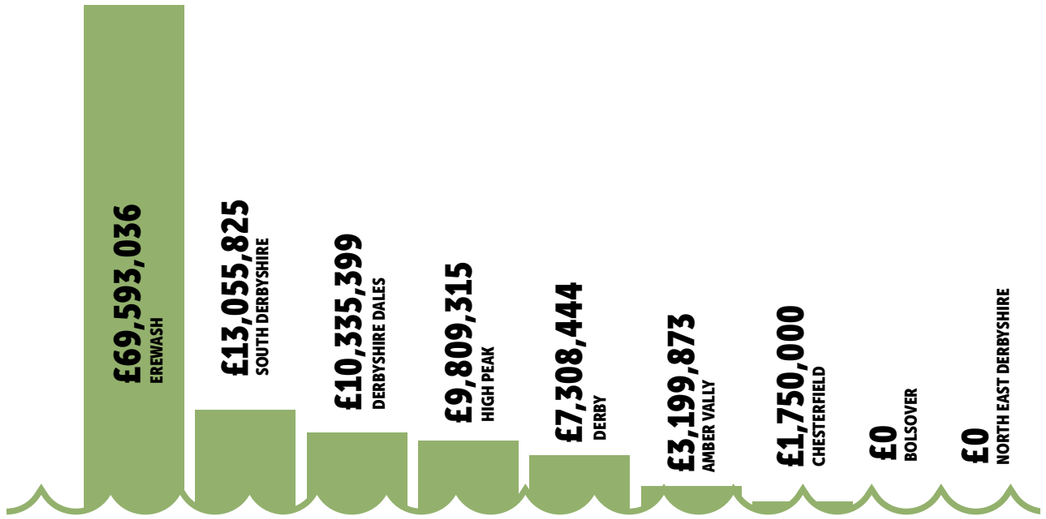
The Trent Catchment EQ Infomapic provides a simple visualisation of the wider distribution of overall environmental inequality at a District scale across all the Counties and Districts of the River Trent Catchment.

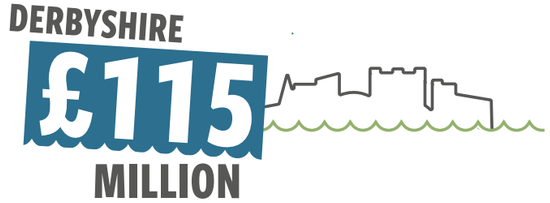


	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Derby	283	296	135	267	197	276	148	16	291	272	258	80

GOOD — AVERAGE — POOR

DERBYSHIRE - PLANNED INVESTMENT IN FLOOD RISK MANAGEMENT ACROSS DISTRICTS





Revenue funded flood defence asset maintenance 2022-2023 - AIMS Revenue Programme, Environment Agency 2022

Planned current capital investment in schemes to reduce flood risk to communities (indicative) - The 2022-2028 FCERM Consented Capital Programme, Environment Agency 2022

Data Referenced:

Flood Map for Planning, Environment Agency, 2022, Environment Inequality, Geofutures, 2019 Multiple Indices of Deprivation, Ministry of Housing and Local Government, 2015, GVA per Head, Office of National Statistics, 2015, Consented (original) 2022 –2028 FCERM Capital Programme, Environment Agency, 2021.
Flood Risk – represents the total number of properties at risk from Rivers & Sea, Surface Water & Drainage 2018 (unadjusted for population size)

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eastmids_eq_and_sg@environment-agency.gov.uk
Produced April 2022 by the Sustainable Growth team

Environment Agency

SCORECARD: HIGH PEAK

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Derbyshire District.

It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.

DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

Data sources & references:
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EQ Indices - Environment Agency & Geofutures, 2019
IMD – DHLG, 2015
GVA – ONS, 2015
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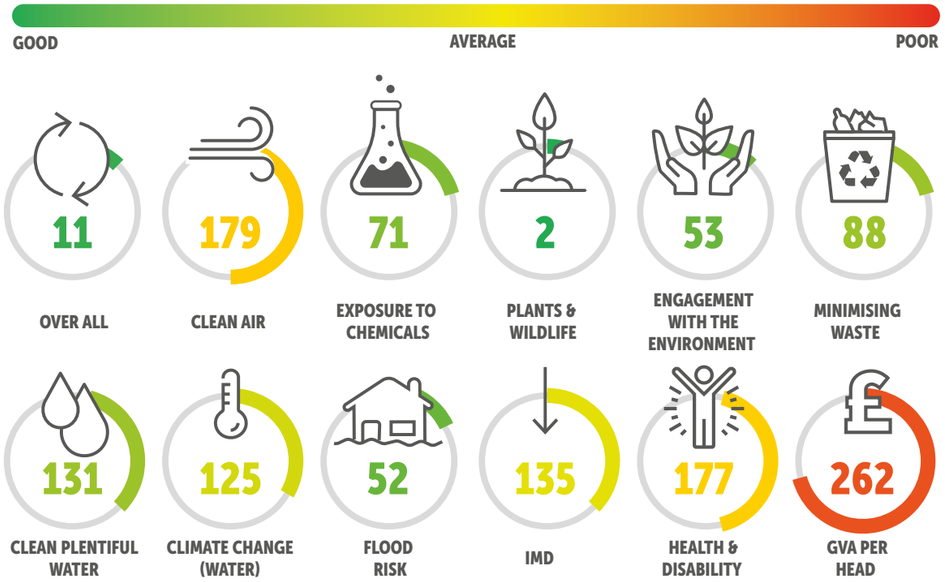
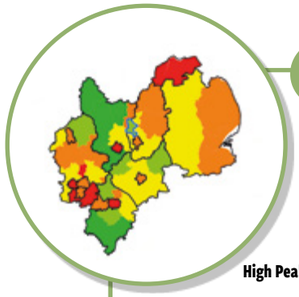
HIGH PEAK ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Derbyshire Districts environmental inequality indicators. High Peak ranks **1st** for overall environmental inequality across Derbyshire.

The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





DERBYSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Derby	283	296	135	267	197	276	148	16	291	272	258	80

SCORECARD: DERBYSHIRE DALES

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Derbyshire District.

It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.

DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

Data sources & references:

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EQ Indices - Environment Agency & Geofutures, 2019

IMD – DHLG, 2015

GVA – ONS, 2015

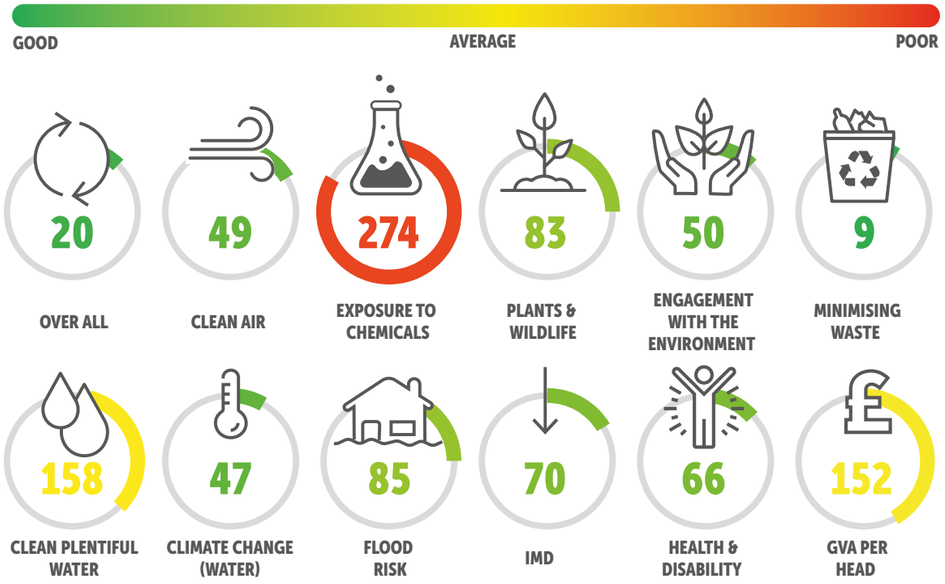
contact - eastmids_eq_and_sg@environment-agency.gov.uk

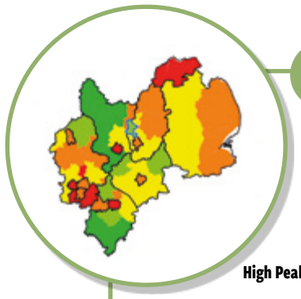
DERBYSHIRE DALES ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Derbyshire Districts environmental inequality indicators. Derbyshire Dales ranks **2nd** for overall environmental inequality across Derbyshire.

The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





DERBYSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Derby	283	296	135	267	197	276	148	16	291	272	258	80

SCORECARD: NORTH EAST DERBYSHIRE

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Derbyshire District.

It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.

DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

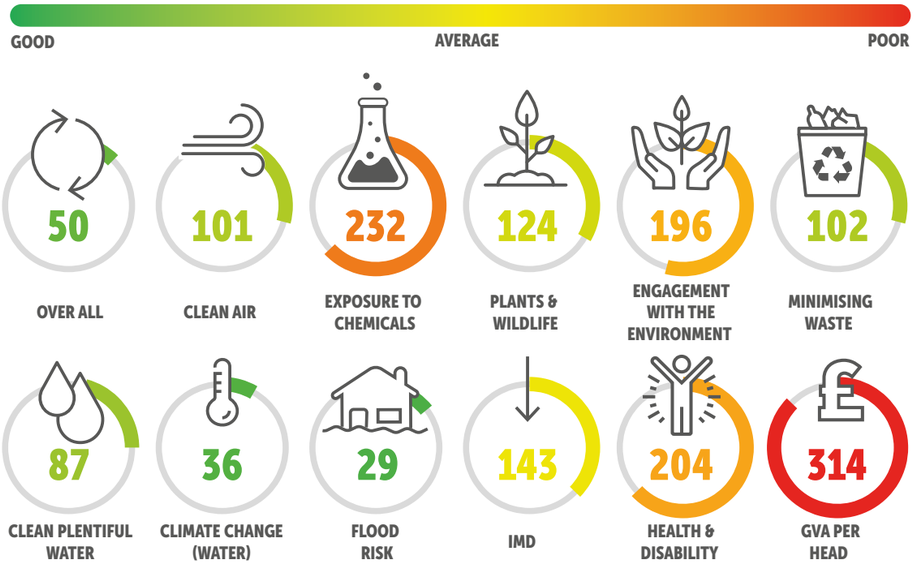
Data sources & references:
Flood Maps for Planning - Environment Agency 2021
EQ Indices - Environment Agency & Geofutures, 2019
IMD – DHLG, 2015
GVA – ONS, 2015
contact - eastmids_eq_and_sg@environment-agency.gov.uk

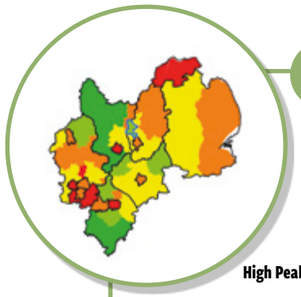
NORTH EAST DERBYSHIRE ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Derbyshire Districts environmental inequality indicators. North East Derbyshire ranks **3rd** for overall environmental inequality across Derbyshire.

The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





DERBYSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Derby	283	296	135	267	197	276	148	16	291	272	258	80

SCORECARD: SOUTH DERBYSHIRE

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Derbyshire District.

It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.

DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

Data sources & references:
Flood Maps for Planning - Environment Agency 2021
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IMD – DHLG, 2015
GVA – ONS, 2015
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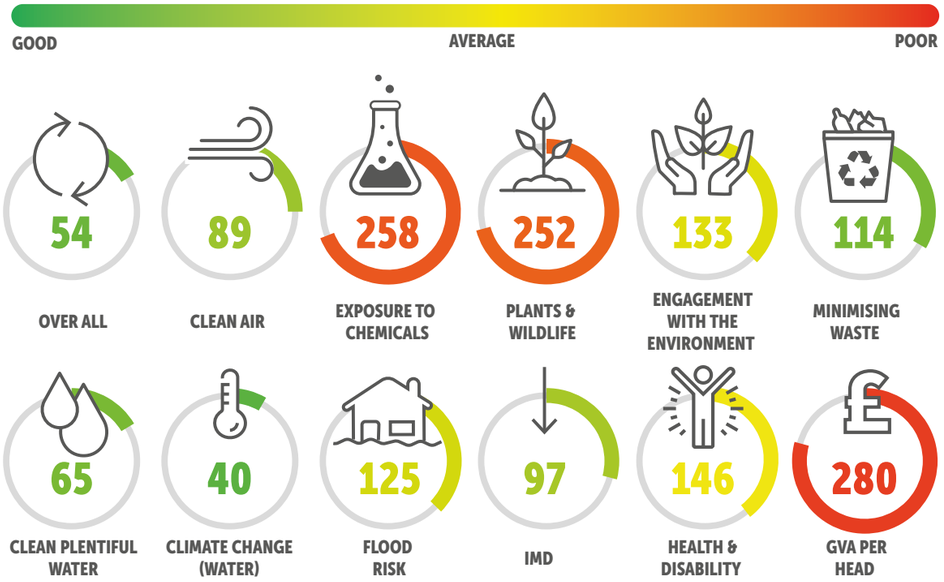
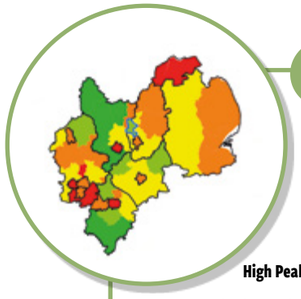
SOUTH DERBYSHIRE ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Derbyshire Districts environmental inequality indicators. South Derbyshire ranks **4th** for overall environmental inequality across Derbyshire.

The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





DERBYSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Derby	283	296	135	267	197	276	148	16	291	272	258	80

SCORECARD: CHESTERFIELD

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Derbyshire District.

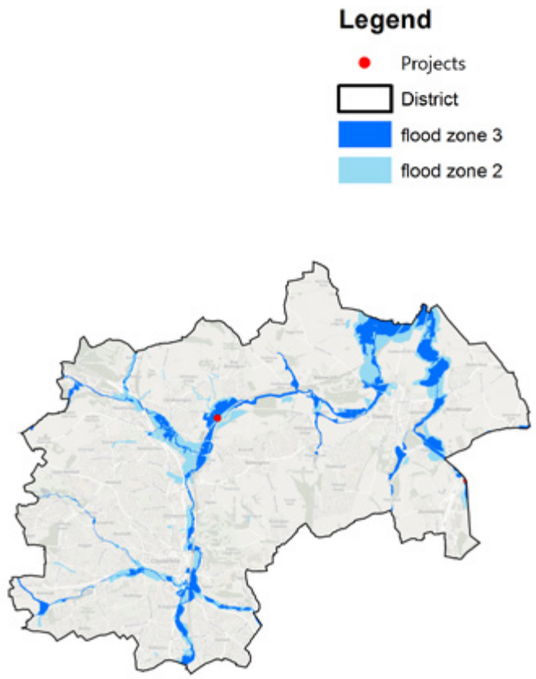
It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.



DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

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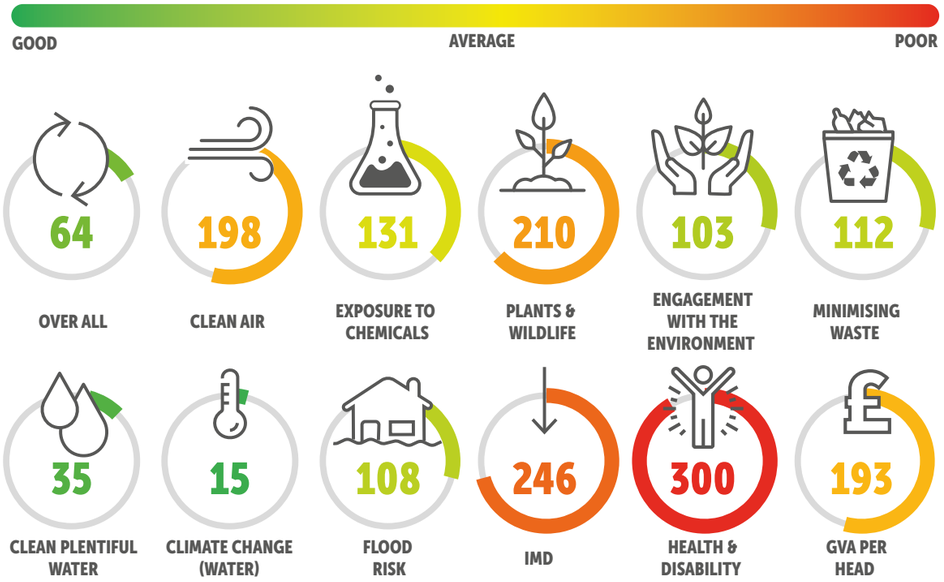
GVA – ONS, 2015
contact - eastmids_eq_and_sg@environment-agency.gov.uk

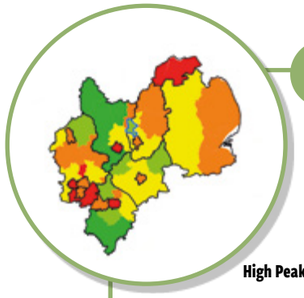
CHESTERFIELD ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Derbyshire Districts environmental inequality indicators. Chesterfield ranks **5th** for overall environmental inequality across Derbyshire.

The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





DERBYSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Derby	283	296	135	267	197	276	148	16	291	272	258	80

SCORECARD: AMBER VALLEY

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Derbyshire District.

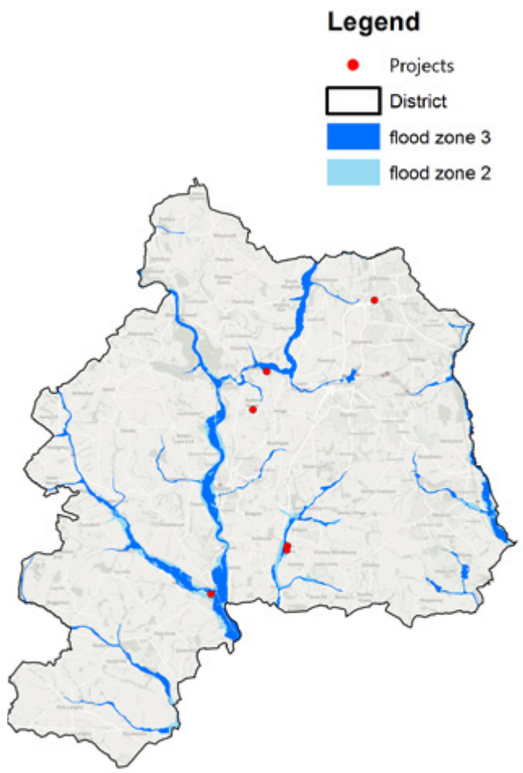
It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.



DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

Data sources & references:

Flood Maps for Planning - Environment Agency 2021

EQ Indices - Environment Agency & Geofutures, 2019

IMD – DHLG, 2015

GVA – ONS, 2015

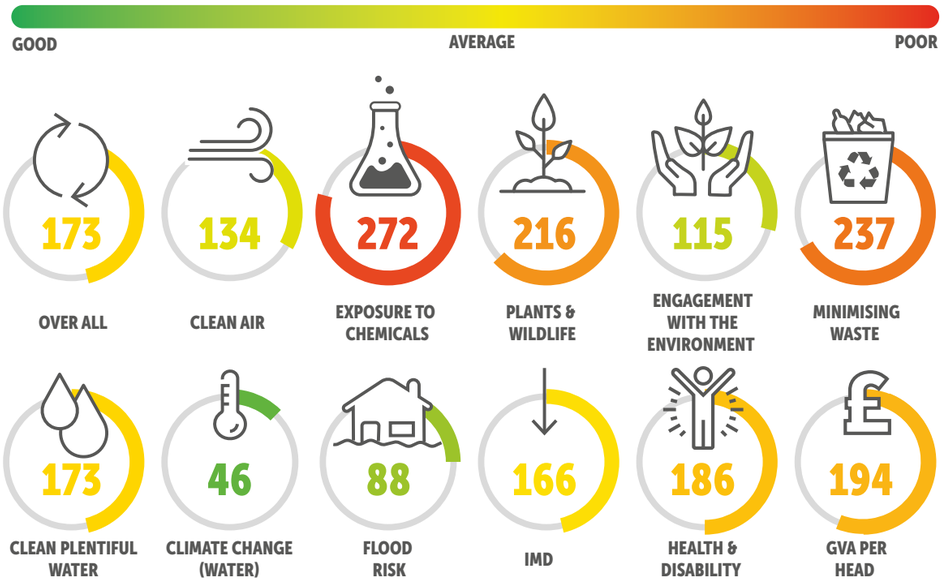
contact - eastmids_eq_and_sg@environment-agency.gov.uk

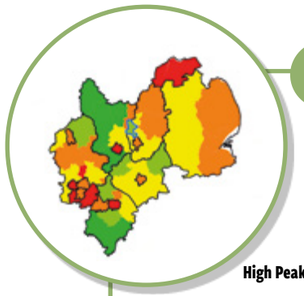
AMBER VALLEY ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Derbyshire Districts environmental inequality indicators. Amber Valley ranks **6th** for overall environmental inequality across Derbyshire.

The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





DERBYSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Derby	283	296	135	267	197	276	148	16	291	272	258	80

SCORECARD: EREWASH

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Derbyshire District.

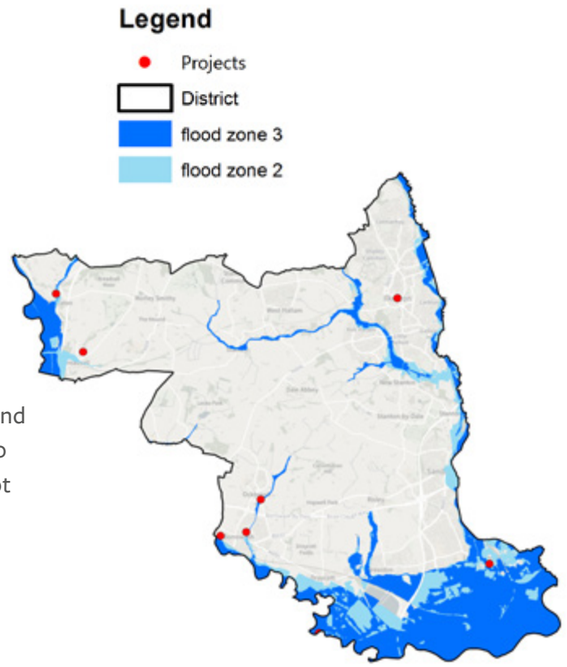
It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.



DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

Data sources & references:

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IMD – DHLG, 2015

GVA – ONS, 2015

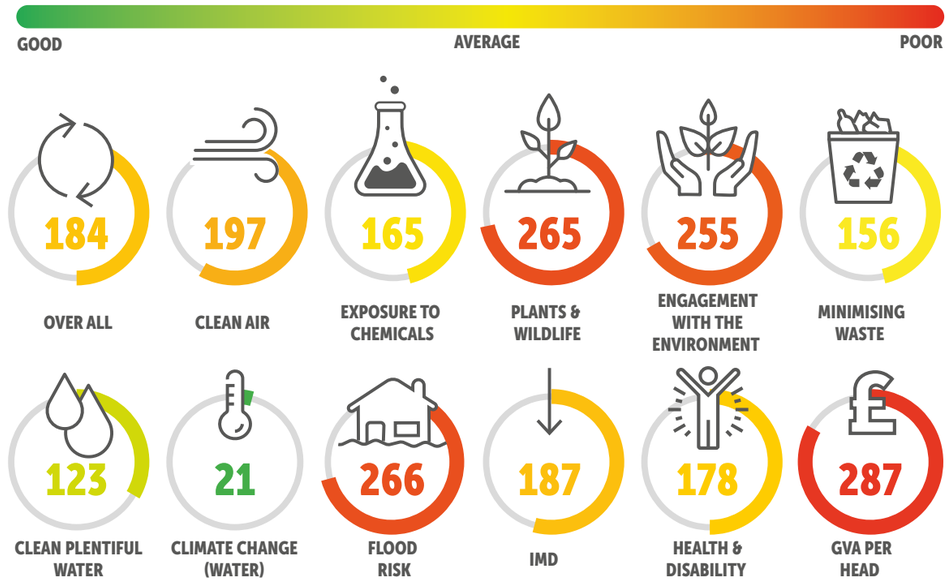
contact - eastmids_eq_and_sg@environment-agency.gov.uk

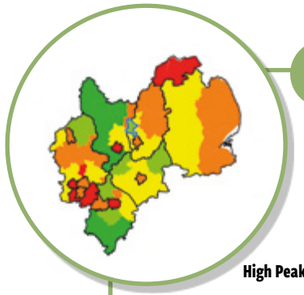
EREWASH ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Derbyshire Districts environmental inequality indicators. Erewash ranks **7th** for overall environmental inequality across Derbyshire.

The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





DERBYSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Derby	283	296	135	267	197	276	148	16	291	272	258	80

SCORECARD: BOLSOVER

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Derbyshire District.

It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.

DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

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EQ Indices - Environment Agency & Geofutures, 2019

IMD – DHLG, 2015

GVA – ONS, 2015

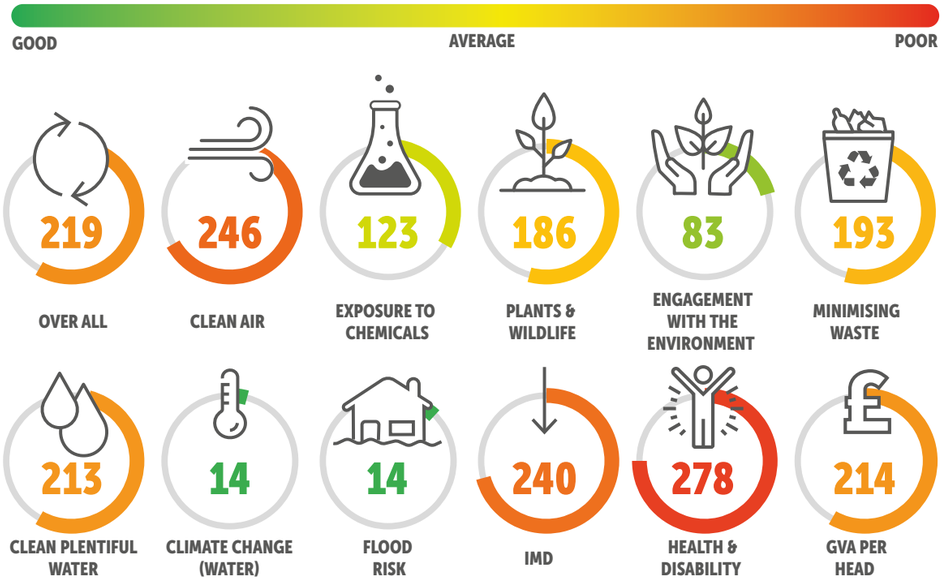
contact - eastmids_eq_and_sg@environment-agency.gov.uk

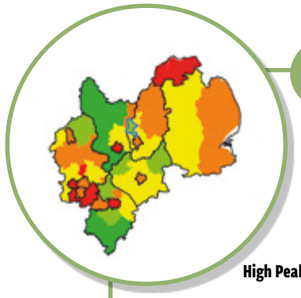
BOLSOVER ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Derbyshire Districts environmental inequality indicators. Bolsover ranks **8th** for overall environmental inequality across Derbyshire.

The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





DERBYSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Derby	283	296	135	267	197	276	148	16	291	272	258	80

SCORECARD: DERBY

ENVIRONMENTAL INEQUALITIES & CLIMATE CHANGE RISKS

This is a scorecard of indicators of environmental inequalities and climate change risks for each Derbyshire District.

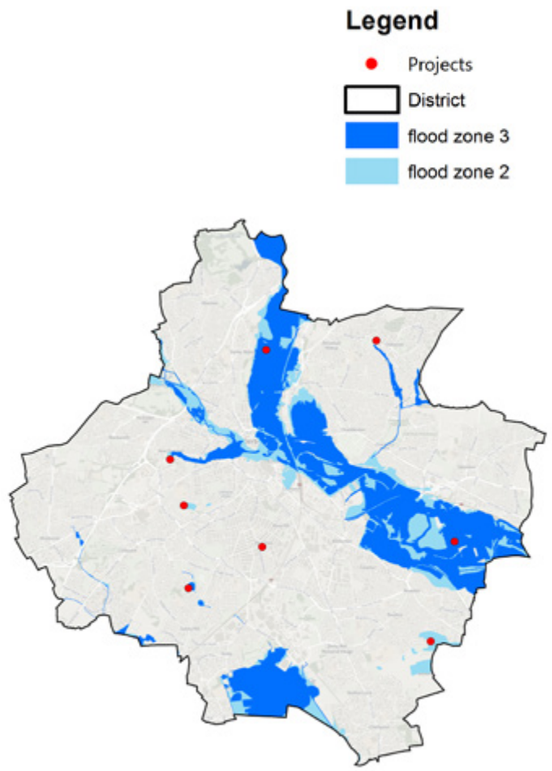
It shows a District's ranking for each of the indices among all 326 English Districts.

The matrix enables a comparison across the County.

The seven individual indices reflect the place-related themes of the Government's 25 Year Environment Plan and the 2021 Environment Act 2021.

It should be noted that they are indicative and based on available national data, they aim to reflect the overall environmental quality, not the environmental performance of Local Authorities.

Also included is an indicative ranking of the extent of flood risk exposure across the District.



DISTRICT RIVER FLOOD RISK MAP

This provides an indicative mapping of fluvial flood risk across the District and the location of proposed projects to better manage and reduce flood risk for local communities.

SOCIO-ECONOMIC INDICATORS

In addition, it provides District rankings for; Multiple Indices of Deprivation (IMD), Health and Disability, and Gross Value Added (GVA) per head - to enable comparisons between District environmental quality, livability, socio-economic and productivity indices.

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GVA – ONS, 2015

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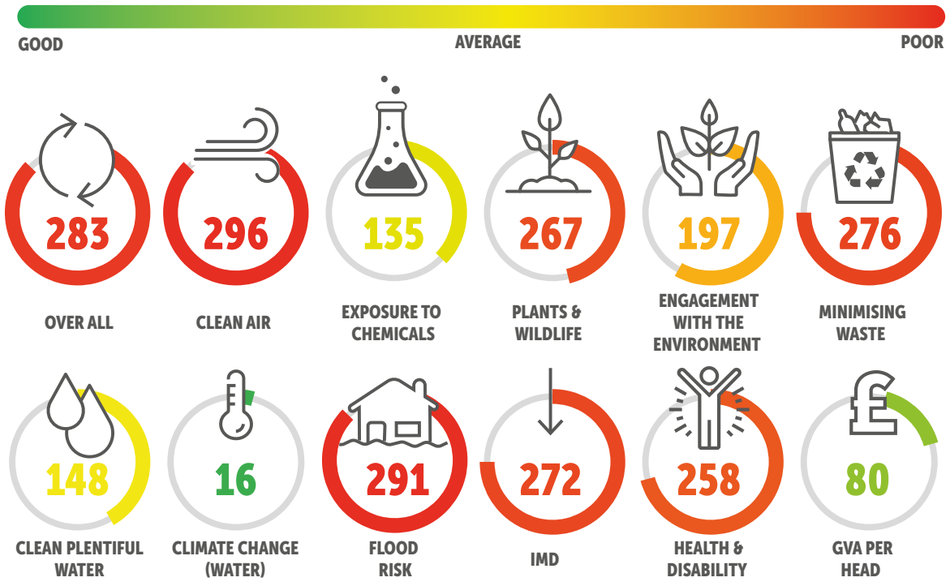
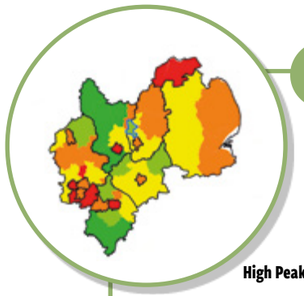
DERBY ENVIRONMENTAL INEQUALITIES

INEQUALITIES MATRIX & MAP

This compares the national ranking of Derbyshire Districts environmental inequality indicators. Derby ranks **9th** for overall environmental inequality across Derbyshire.

The map shows the spatial distribution of these indicators across the counties of the wider River Trent catchment.





DERBYSHIRE DISTRICTS

	Environmental overall	Clean Air	Exposure to chemicals	Plants & Wildlife	Engaging with the environment	Minimising waste	Clean plentiful water	Climate change (water)	Flood risk	IMD	health & disability	GVA Per head
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Derby	283	296	135	267	197	276	148	16	291	272	258	80

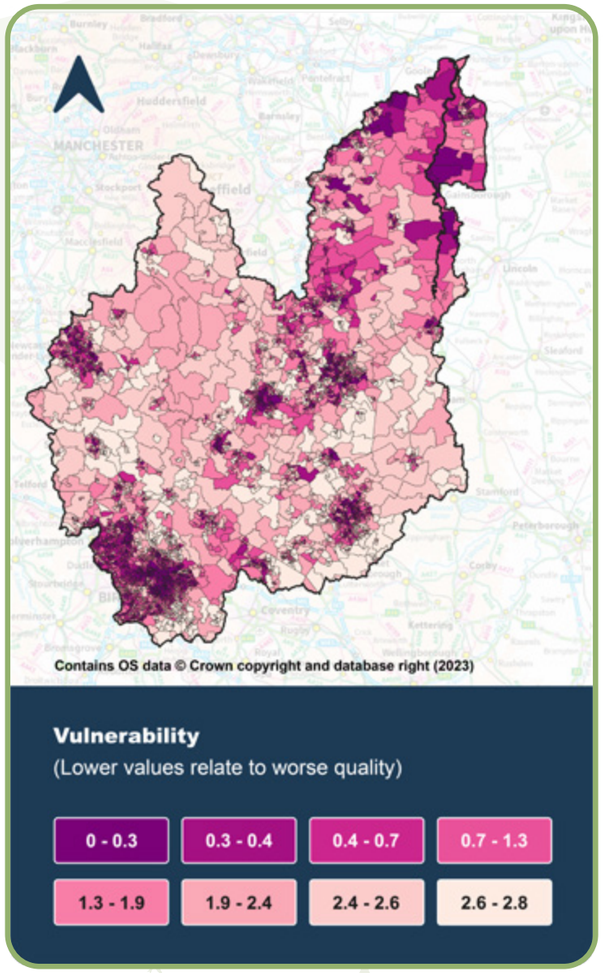
DERBYSHIRE AND NOTTINGHAMSHIRE DISTRICT EQ SCORES AND ISSUES MATRIX – used for analysis

GOOD — AVERAGE — POOR

	Environmental Overall	Clean Air	Exposure to Chemicals	Plants & Wildlife	Engaging with the Environment	Minimising Waste	Clean Plentiful Water	Climate Change (water)	Flood Risk	IMD	Health & Disability	GVA Per head
Amber Valley	173	134	272	216	115	237	173	46	88	166	186	194
Ashfield	112	172	44	152	148	189	164	4	84	248	260	259
Bassetlaw	233	206	193	172	234	288	167	26	169	213	247	237
Bolsover	219	246	123	186	83	193	213	14	14	240	278	214
Broxtowe	138	200	139	183	168	200	91	18	221	109	130	261
Chesterfield	64	198	131	210	103	112	35	15	108	246	300	193
Derby	283	296	135	267	197	276	148	16	291	272	258	80
Derbyshire Dales	20	49	274	83	50	9	158	47	85	70	66	152
Erewash	184	197	165	265	255	156	123	21	266	187	178	287
Gedling	182	153	156	174	310	236	156	19	210	124	169	322
High Peak	11	179	71	2	53	88	131	125	52	135	177	262
Mansfield	179	171	159	240	37	255	243	20	63	271	285	313
Newark & Sherwood	222	109	306	209	264	245	175	52	212	174	180	236
North East Derbyshire	50	101	232	124	196	102	87	36	29	143	204	314
Nottingham	283	274	78	246	51	307	51	7	300	319	308	75
Rushcliffe	174	219	220	295	229	78	89	32	251	8	33	233
South Derbyshire	54	89	258	252	133	114	65	40	125	97	146	280

2023 ENVIRONMENTAL INEQUALITY AND CLIMATE CHANGE RISK MAPPING - DEVELOPMENTS IN PROGRESS

Modelling and mapping specialists JBA are providing an update to the individual indices of Environmental Inequality, delivering them at Lower Super Output Area (LSOA) granularity. They will also be providing Neighbourhood Flood (& Climate Change) Vulnerability mapping, as previously developed by Paul Sayer and provided to the Trent Regional Flood & Coastal Committee (RFCC).



Flood vulnerability mapping highlights inequality across exposed deprived urban communities but also across low-lying estuarial rural areas to the south of the Humber.

JBA consulting

For further information please contact
john.wilcock@jbaconsulting.com

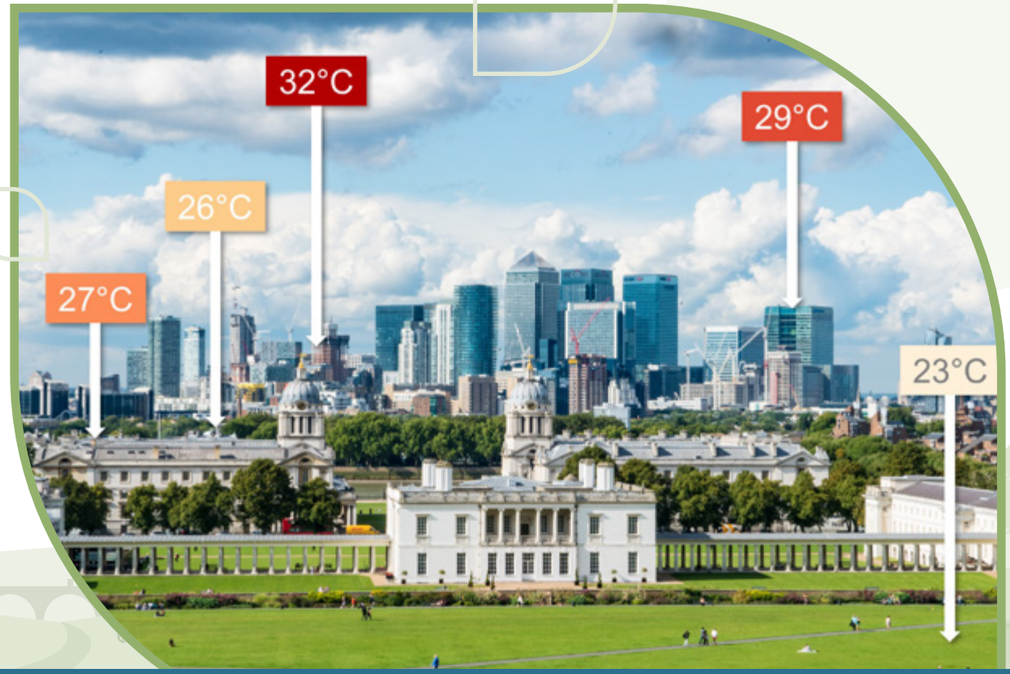
EXTREME HEAT RISK SATELLITE INTELLIGENCE

Derived from satellite imagery and created using 4EI's automated algorithms, the data identifies hot spots within urban areas where temperatures get higher, forming an Urban Heat Island (UHI).

Jonathan Hendry, 4EI's Chief Technology Officer states that "Satellite heat data is consistent, transparent and robust in showing Extreme Heat Vulnerabilities". It has no spatial limits and uses peer-reviewed scientific approaches to visualise geospatial actionable intelligence. It is the ideal input to be used in synergy with GIS/Geospatial data such as Digital Twins. Together these knowledge layers, combined with choice Machine Learning, applied to the processing and analysis of a freely available 50 year global satellite image bank, enables us to utilise past records to predict differences in future impacts.

Research funded by the Department of Health in the UK indicates that over 7,000 people could die from the direct effects of urban heat waves per year by the 2050's*. The UHI effect can also impact air and water quality, and demands for energy, with implications for carbon neutral targets, public health, strategic planning and city resilience.

Heat, created by energy from people, cars, transport and buildings' heating, cooling and ventilation systems, interacts with materials used to construct city infrastructure that are good at insulating and retaining heat to create a 'perfect storm' of elevated temperatures. This can result in urban temperatures that are 3-6 degrees hotter than the surrounding non-urbanised areas. This intelligence can be applied to and optimise master planning of urban expansion.



ENVIRONMENTAL INEQUALITIES 'COMMON GROUND' ANALYSIS

Analysis of the **District Scorecards** and Matrix of EQ 'issues' enables evidence-based identification of

The **Common Causes** of poor environmental quality

Identifying - which Districts share having red/amber rankings for each specific EQ indicator and what they have in common in terms of known effectors and causes.

The probable **Common Consequences** of the shared specific causes of poor environmental quality

Outlining - the shared damaging impacts on livability, health, wellbeing, productivity, local economies and wider environmental sustainability that arise from specific causes of poor EQ.

The **Common Constraints** on sustaining, and enabling growth across diverse local economies

Suggesting - how specific in-common environmental limitations, especially where these may be compounded by or exacerbate the effects of climate change, pose threats to the future viability of different local economies.

The **Common Characteristics** of the economies of places

A summary assessment across and between the diverse environmental and economic characteristics of places and local economies of Derbyshire and Nottinghamshire. This provides a simple identification of a set of common (economy of place) shared profiles.

Common Climate Risks & Compounding Threats

Through the prism of these characterisations and informed by the cause, consequence and constraint analysis, an attempt has been made to identify the distribution of some key climate risks and compounding impacts likely to increase in the near and medium-term future.

These are focused on identifying potential multiplier and/or additional effects, arising from a warming and more volatile climate, that link to the identified current causes of poor EQ and environmental risk and constraints. It also considers of how these represent compounding threats to key sectors and industries that are common across a range of local economies.

They help set the scene and enables us to make a start on identifying -

Adaptive Needs & Future Opportunities across the range of identified common contexts

Strategic Interventions that can address the range of common constraints, climate risks and compounding threats

The collective **cases for prioritising Investment in the addressing of Environmental Inequality & Climate Risks for Sustainable Growth** across Derbyshire and Nottinghamshire.

It should be noted that the commonalities identified are general and that they are offered observationally as a contribution towards further dialogues and development of investment priorities and partnerships.

AIR QUALITY

A major environmental and perhaps the most significant direct (and indirect) environmental inequality issue.

It is impactful upon communities to a variable degree across all Districts, not just in major towns and cities.

As identified, the Air Quality indicator includes estimated mean concentrations of emissions data from the National Atmospheric Inventory for; Particulate Matter PM10 & PM 2.5, as well as Nitrogen Oxide (NOx as NO_2) and Sulphur Dioxide (SO_2).

The main **Common Causes** (and variable factor) are the concentration of traffic (vehicle) emissions, especially but not exclusively from diesels.

More localised specific contributory factors being; air traffic (although service & customer road traffic around major airports tends to make a greater localised contribution than actual aviation), diesel trains, industrial processes, and heat and power generation from fossil fuels as well as from biomass and waste (again, the concentration impacts of service vehicles can outweigh emissions from facilities).

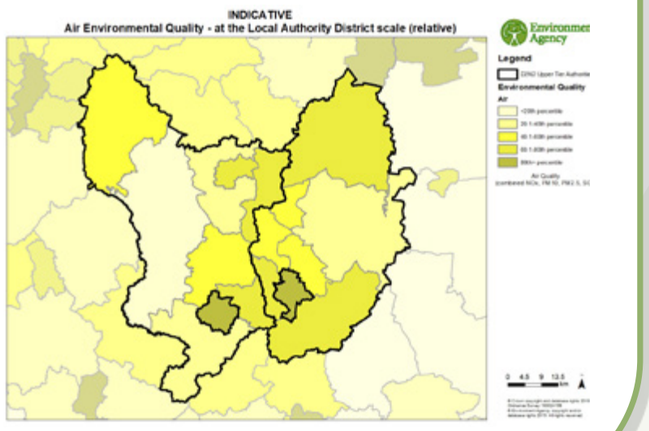
The **Common Consequences**
Directly - significant respiratory damage and illness and a range of wider health, childhood developmental and life quality impacts. 26k+ estimated premature deaths p.a. in the UK.

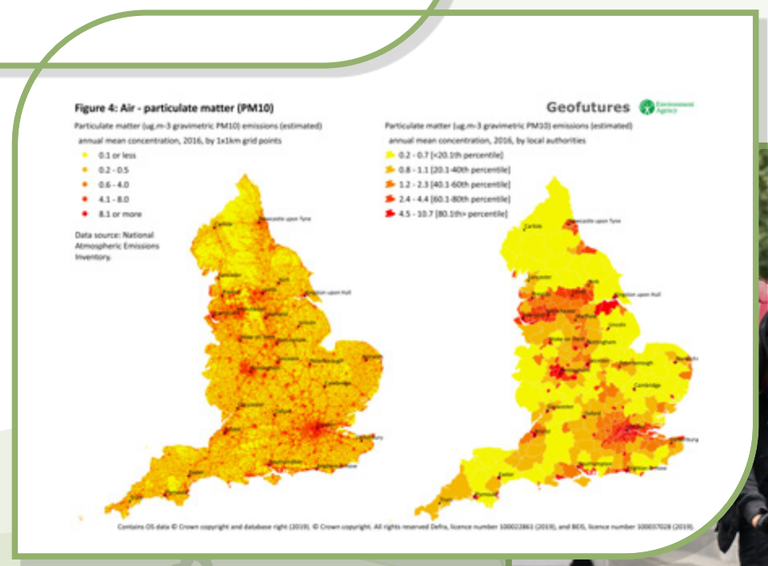
Indirectly – traffic impacts negatively, substantially and inequitably on; risks to life, quality of life, life chances and life prospects across whole communities and especially for the most vulnerable who are disproportionately affected.

In addition to the direct environmental effects, traffic dangers (and avoidance/protective behaviours) damage freedoms of movement and constrain mobility. These impacts fall disproportionately on communities and individuals who contribute the least to vehicle movements and congestion. However, it should be noted that vehicle drivers and passengers especially of older vehicles, as well as all non-vehicular road users are also exposed to concentrated cocktails of tailpipe emission pollutants as well as constrictions on their freedom of movement.

The **Common Constraints**
Generally, those who can afford to, won't/don't choose to; live, spend money, raise families, develop businesses and make sustainable investments in local areas or along road corridors with high traffic volumes, big impacts and the worst air quality.

Even in such contexts where there is an apparently strong economy, there is a danger that increasingly people will choose to move out and commute in, thus adding to the congestion, poor air quality and the inequity and marginalising impacts on left behind places. Eventually this will fundamentally damage economic vitality as footfall, expenditure, investment, enterprise, social cohesion and retention of skills fall away.





Clean Air

Derby	296
Nottingham	274
Bolsover	246
Rushcliffe	219
Broxtowe	200
Chesterfield	198
Erewash	197
High Peak	179
Ashfield	172

GOOD AVERAGE POOR

EXPOSURE TO CHEMICALS

A substantive issue, airborne Ammonia (NH_3) was a specific measure defined by the Government's 25 Year Environment Plan 2018. It, in common with Phosphates (identified as a target in the Government's 2023 Environmental Improvement Plan) provides an indicator for more general exposures via both air and water and associated environmental impacts especially from agriculture, as well as food processing and human effluent/ wastewater treatment.

The data source is the National Atmospheric Emissions Inventory (NAEI), the dataset being annual mean estimated air concentration of ammonia (NH_3) at 1x1 km grid squares for the year 2016, which have been averaged over each local authority area.

The red and amber ranked Districts are those with the highest concentrations of intensive agriculture and food processing industries.

The ranking of Districts for chemical exposure appear to be in a broadly inverse relationship with those that have the worst exposures to (other) sources of air pollution.

Although the data source is airborne, it also provides a generalised proxy for agricultural (food processing and human effluent) impacts on watercourses.

The **Common Causes**

The main sources of Ammonia (NH_3) are nitrate fertilizers and agricultural waste, as well as food, bio-processing and human sewage treatment/under-treatment.

The **Common Consequences**

Directly - the breakdown of ammonia produces methane, which is a significant source of Greenhouse Gas emissions (30-100 times as climate change potent as CO_2). Airborne concentrations are indicative of waterborne concentrations of ammonia and of wider nutrient impacts from agricultural run-off, animal effluent and of wastewater under-treatment on water quality. It provides an indicator of the likelihood of specific deterioration in water quality through the stimulation of algae and the corresponding threat to freshwater biodiversity from de-oxygenation.

Indirectly – high rankings also indicate the likely wider envelope of methane emissions from intensive agriculture, primarily from ruminating livestock but also from the uncontrolled breakdown of bio-wastes. In some contexts, knock-on detrimental impacts risk damaging wider life-quality, undermine opportunities to diversify and adversely impact perceptions of and reputation of places, and the provenance of their produce.

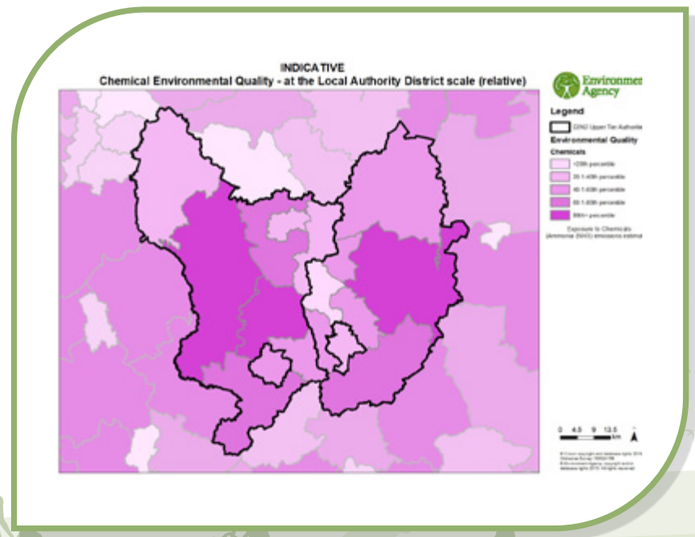
Common Constraints

Ammonia (NH_3) provides an indicator of the unsustainable impacts that have likely risen from the development of and relatively weak regulation of intensive agriculture and food/ bio-processing.

The primary threats, from ammonia beyond its increased global warming potential is to freshwater biodiversity and by extension to wider eco-systems, upon which agriculture is so fundamentally dependant.

These industries make up a significant and culturally important part of many local economies across the rural hinterland of Derbyshire & Nottinghamshire.

The collective challenge is how improvements in regulation and changes in working practice can be coupled so that they help avoid/reduce the risk of ecosystem collapse and greenhouse gas emissions , and implemented without undermining competitiveness and viability, causing disinvestment and significant economic contraction.



	Clean Air	Exposure to Chemicals
Newark and Sherwood	109	306
Derbyshire Dales	49	274
Amber Valley	134	272
South Derbyshire	89	258
North East Derbyshire	101	232
Rushcliffe	219	220
Bassetlaw	206	193
Erewash	197	165
Mansfield	171	159
Gedling	153	156
Broxtowe	200	139
Derby	296	135
Chesterfield	198	131
Bolsover	246	123
Nottingham	274	78
High Peak	179	71
Ashfield	172	44

GOOD AVERAGE POOR

ACCESS TO GREENSPACE

Greenspace in local proximity has an important and qualitative impact on health, well-being, life-quality and, sense of place and has a range of local economic effects. The reverse of this is the case for places and communities that are deficient and where the quality of and access to Greenspace is compromised.

The **Open Greenspace (urban) Indicator** is a measure of the percentage of 'urban areas' as defined by OS Strategic that is woodland, public park and gardens, playing fields, play space and allotments or community growing space within local authority districts. Golf courses for example were purposefully omitted, as these areas are often private or limited access spaces covering large areas. It does not include blue space, i.e. rivers and canals or lakes and ponds except where these are elements within public parks.

The measure can be considered a generalised proxy for greenspace provision, specific to those living in built-up areas (84% of the population). This is in reference to the focus of the Government 25 Year Plan on access to urban greenspace.

The index does not reflect the situation for rural communities, who may (or may not) have limited access to public greenspace, despite the surrounding (apparently) natural environment.

The complementary Plants and Wildlife (biodiversity) Indicator measures the percentage of local authority Districts that are locally or nationally designated habitat/wildlife sites and reserves. It does not include National Parks and AONBs.

The **Common Cause**

The variance in the proportion of urban Greenspace, and to an extent its quality and accessibility, arises from a complex interplay of historic factors that are interwoven with the development and identity of each urban settlement. Its value is also dependent on the degree of severance of local access by roads and traffic, the extent to which they have sustained cultural significance and have been protected from cuts, misuse, development pressure and encroachment.

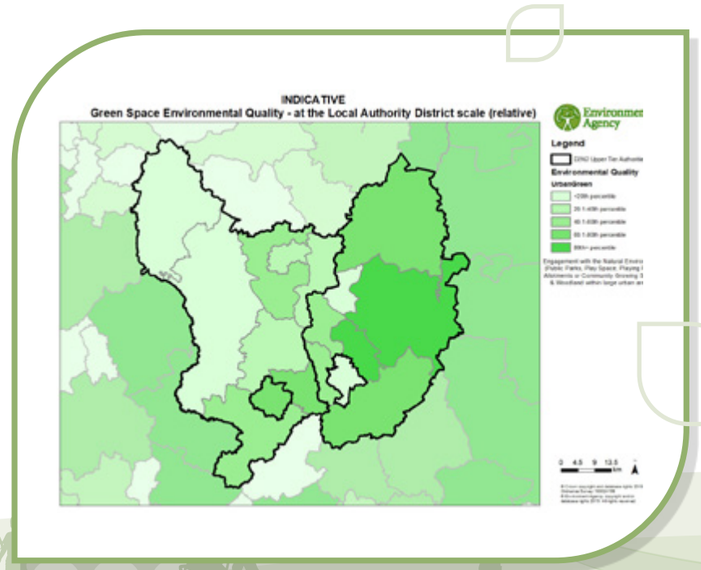
The **Common Consequences**

The range of benifits from locally accessible Greenspace, which are forgone for communites in places that lack them, are fairly extensively researched and documented **The benefits of green space (thelandtrust.org.uk)** provides a useful overview based on some examples as well as estimations of value. It identifies, lifelong health, happiness and social cohesion, as well as attractiveness, identity, 'locational pull' and investment confidence benefits in surrounding areas. Furthermore, they also provide adaptive eco-system services such as surface water and urban heat risk management benefits.

Social and community disconnection reinforces inactivity and undermines use, which it turn degrades care, maintenance and the attractiveness of green spaces. This impacts on wider neighbourhoods and urban centres, reduces locational pull and local investment confidence in places.

The **Common Constraints**

Where there is a lack of quality and accessible green/blue space, that is an integral element weaved into and through the urban fabric, its absence undermines the value of a place – for both its residents and for those passing through. This can lead to further degrading of the wider environmental quality and a stigmatising downward spiral of; diminishing footfalls, under-investment and degeneration of its capital stock and increasing crime and anti-social behaviour. This makes it challenging to sustain public and public realm services, all of which contribute to falling levels of productivity and employment among residents and the fueling of 'suburban flight'.



	Plants & Wildlife	Engagement with the Environment
Gedling	174	310
Newark and Sherwood	209	264
Erewash	265	255
Bassetlaw	172	234
Rushcliffe	295	229
Derby	267	196
North East Derbyshire	124	167
Broxtowe	183	168
Ashfield	152	148
South Derbyshire	252	133
Amber Valley	216	115
Chesterfield	210	103
Bolsover	186	83
High Peak	2	53
Nottingham	246	51
Derbyshire Dales	83	50
Mansfield	240	37

GOOD AVERAGE POOR

FLOOD RISK

Flood risk to properties and communities across Derbyshire and Nottinghamshire is generally from rivers and from surface water and drainage. Coastal, groundwater and risks from reservoirs (with some notable exceptions) being minimal.

Flood risk rankings included on the District EQ scorecards are based on an estimation of the total numbers of properties at fluvial and coastal, as well as surface water and drainage flood risk across each District (they have not been adjusted for area or population size).

The **Common Causes**

Primarily it results from major and sustained heavy rainfall occurring across substantive areas of the Trent (& Derwent) catchments or more localised 'flash' storms especially when such events coincide with the ground already being saturated or compacted. This results in significant and widespread excess surface water running off (gravity-fed) from open land, roofs and streets that overload drainage systems and downstream river capacities.

The IPCC estimate that the 1% rise in temperature the UK is already close to experiencing an average 7% increase in the volume of water resulting from extreme rainfall events. This only partially explains why numerous at-risk communities, particularly in upper and middle parts of catchments, have in recent years seen far greater frequency of rivers exceeding their capacity and bursting their banks, as well as considerable increases in the numbers of properties we now understand are at risk of flooding from surface water and drainage system overloads.

Changes in agricultural, land management and drainage practices, plus lack of extra drainage capacity to accommodate development and increases in non-porous surfacing are key likely exacerbators. The effects are cumulative in that they all speed-up and synchronise heavy rainfall run-off into tributaries and main rivers.

Common Consequences

The combination of these effectors has increased flood risks throughout catchments. More generally the risks to homes, businesses, infrastructure and life have been concentrated in major downstream urban areas. In the past 20 years a lot of extra investment has gone into improving river flood defences to manage these concentrations of at-risk properties.

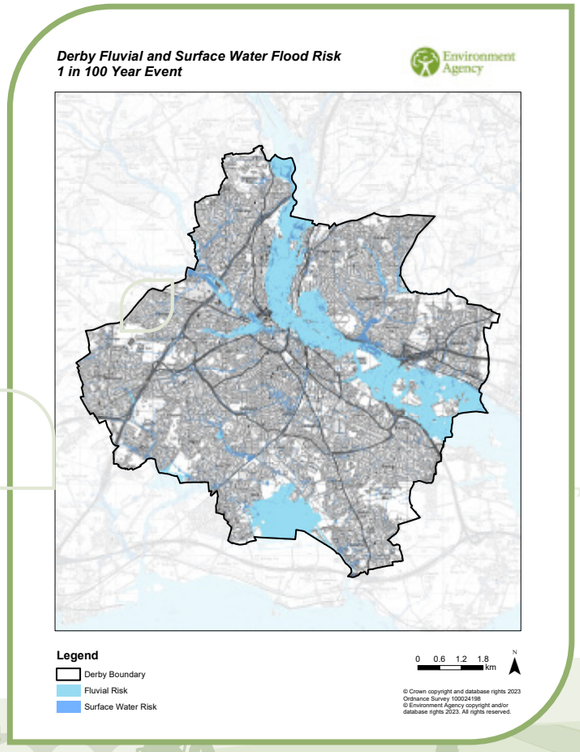
Delivering investment in measures that reduce flood risk to increasing (but more widely dispersed) numbers of properties that are at risk from surface water, drainage systems and also from the overloading of smaller rivers and streams, is far more challenging, but offers opportunties to deliver wider adaptive benefits.

It's essential to all our 'adaptive futures' that we invest consistently to maintain and sustain these flood risk management asset systems.

Common Constraints

Flood risk constrains the types of appropriate use that can be made of at-risk land (its economic utility). This has a significant impact on the potential of land and existing properties and is generally reflected in current and projected market/financial values. Risk (such as flood risk) is a significant consideration in investment choice. In addition to constraints through the planning system investors, lenders and insurers will generally prefer not to invest in higher risk locations. This constraining impact can be both direct and indirect and can significantly limit regenerative investment.

Flood risk can also undermine investment in maintaining fixed capital stock (existing buildings) which in turn damages productivity and the economic vitality, viability and sustainability.



	Flood Risk	IMD
Nottingham	300	319
Derby	291	272
Erewash	266	187
Rushcliffe	251	8
Broxtowe	221	109
Newark and Sherwood	212	174
Gedling	210	124
Bassetlaw	169	213
South Derbyshire	125	97
Chesterfield	108	246
Amber Valley	88	166
Derbyshire Dales	85	70
Ashfield	84	248
Mansfield	63	271
High Peak	52	135
North East Derbyshire	29	143
Bolsover	14	240

GOOD AVERAGE POOR

COMMON CHARACTERISATIONS OF PLACES

These general socio-economic and environmental characterisations of places overlap and cut across District boundaries. They are based on various sources of information as well as general perceptions.

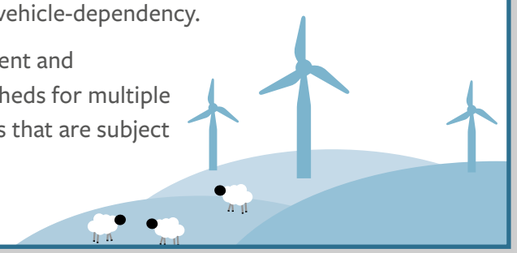
The aim is to provide a simple way to relate the identified EQ issues as the basis for evolving analysis of common climate risks and compounding threats – considering them collectively across all the effected places. This enables a dispersed distribution of localised EQ problems, constraints and emerging climate change threats to be presented, understood and potentially addressed as common strategic issues.

UPLANDS

In particular; the peak's, pastures, peats, moorlands and reservoirs of the National Park & their surrounding areas.

These are largely protected landscapes, much of it being large estates and smaller livestock farms, interspersed with market towns and smaller settlements, many of which also function (at least in part) as satellite settlements of adjacent cities (Manchester, Sheffield Derby, Stoke). Generally they are of high environmental quality and with overall relative affluence, despite the apparent low levels of productivity. However, there are pockets of poverty and of poor EQ and some inevitable negative impacts from quarrying and visitor traffic from through-routes and local vehicle-dependency.

Land management and grazing pressures, the extent and vulnerability of stored carbon, and role as watersheds for multiple catchments are key environmental characteristics that are subject to potential climate change impacts.



RURAL HEARTLANDS

Largely rural land use with a dispersal of towns, cut through with significant transport infrastructure and watercourses.

Overall residential density is greater, general affluence lower and productivity higher than the Uplands.

Agriculture, both livestock & arable is coupled with food processing, while logistics, power generation & manufacturing are the other main industries. Proximity to larger towns and major cities, accessible via the Strategic Road Network, enables high levels of commuting.

Intensive farming and food processing, as with much of the rest of their local economies have significant environmental and carbon footprints. There is strong dependence on fossil fuels and water supplies, sensitivity to global market fluctuations and potential vulnerability to a range of climate impacts, changes in environmental regulation and net zero transitional requirements.

INDUSTRIAL TRANSITIONING

Across a number of Districts there are numerous towns and communities with strong industrial pasts and related socio-economic, health and environmental legacies. Many have retained a manufacturing base, while in parallel they and others, especially those with strong connections to transport, have accommodated and provide the workforce for significant expansion in distribution centres and logistics.
Many of these towns and their communities suffer from concentrations of low skilled, low income, low security employment & limited disposable incomes.
This stifles potentials for personal and local economic growth.

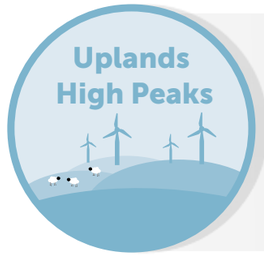
COMMUTING SATELLITES

These are not just the outskirts and suburban neighbourhoods of cities and major towns, but woven into the rural heartlands of both counties and uplands of the Peak District. There are a network of attractive small commuter (as well as retiree and visitor) towns where relative wealth has concentrated and where disposable incomes circulate via local independent retail and services and these local economies are heavily dependent upon expenditure from income's earned elsewhere and upon car-based commuting and the transfer to others of negative environmental impacts.

CORE CITIES

Much of the central ring of city neighbourhoods, and their retail and cultural centres, have suffered from a gradual exodus over many decades of highly skilled and people in well-paid employment. These employees and those who establish and run SMEs have taken flight to the leafy suburbs and beyond to put down their roots. They have taken 'out of town' much of their footfall, expenditure and sense of place. This has resulted in the socio-economic and environmental marginalisation of many big city urban neighbourhoods. These core cities are nationally important high productivity GVA hubs, although its main industries are increasingly located in extensions to their urban footprint.

DISTRICTS SHARING COMMON CHARACTERISTICS



- High Peaks
- Derbyshire Dales
- NE Derbyshire

- Amber Valley
- Derbyshire Dales
- NE Derbyshire
- Ashfield
- Bassetlaw
- Bolsover
- Broxtowe
- Erewash
- Newark & Sherwood
- South Derbyshire
- Rushcliffe

- Amber Valley
- Chesterfield
- NE Derbyshire
- Ashfield
- Bassetlaw
- Bolsover
- Broxtowe
- Erewash
- South Derbyshire
- Gedling

- High Peaks
- Derbyshire Dales
- Derby
- NE Derbyshire
- Chesterfield
- Ashfield
- Broxtowe
- South Derbyshire
- Gedling
- Rushcliffe
- Nottingham

- Derby
- Nottingham

CLIMATE RISKS & COMPOUNDING THREATS

CORE CITIES

EXTREME HEATWAVES

Projected increases in global temperatures and the increasing frequency, longevity and extremity of heatwaves that are ocurring, and are further anticipated under all climate change scenarios, are not distributed equally across the planet, across continents or even countries.

While this may be understood, perhaps much less recognised is the significant local variance in extremity/intensity of heatwave temperatures that are (increasingly) being experienced in different places with different local contextual 'natural and built' environmental factors.

Furthermore, as global warming progresses and heatwaves become more frequent and intense, the temperature differences between those places with 'hot' characteristics, compared to those places with 'cool' characteristic, increases exponentially.

This local variance in extreme temperatures experienced during heatwaves is sometimes referred to as the **Urban Heat Island Effect.**

The key **'natural' environmental factors** that drive this variance are; the proportion and proximity of water spaces, green spaces and mature tree cover that is weaved into the (urban) fabric, and their resilience to drought (dry bare earth absorbs and reflects heat much like concrete).

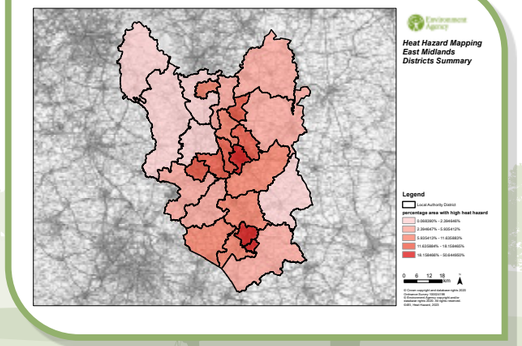
The key 'built' environmental factors being; localised development densities, extents of hard surfacing, building form, layout and the heat absorbing, retaining and reflecting qualities of external materials. Additional to this are the human heat-generating activities such as from use of combustion engine vehicles, heat exchangers, air conditioners and cooling systems.

Extreme heatwaves and their impacts, as an increasing climate change risk, are far from exclusively an urban threat. However, communities that live and work in the most densely developed neighbourhoods, with the least blue/green local space will be at disproportionate and increasingly great risk.

Why it matters

A heatwave across Europe during August 2003 (comparable to June 2022) was attributable for over 52,000 premature excess deaths.

Setting the Record Straight: More than 52,000 Europeans Died from Heat in Summer 2003 | Earth Policy Institute (**earth-policy.org**)



The further compounding threat from extreme heatwave events is that contributory metrological conditions such as a static high-pressure system, as experienced by the East Midlands in June 2022, also tends to trap and concentrate airborne particulates.

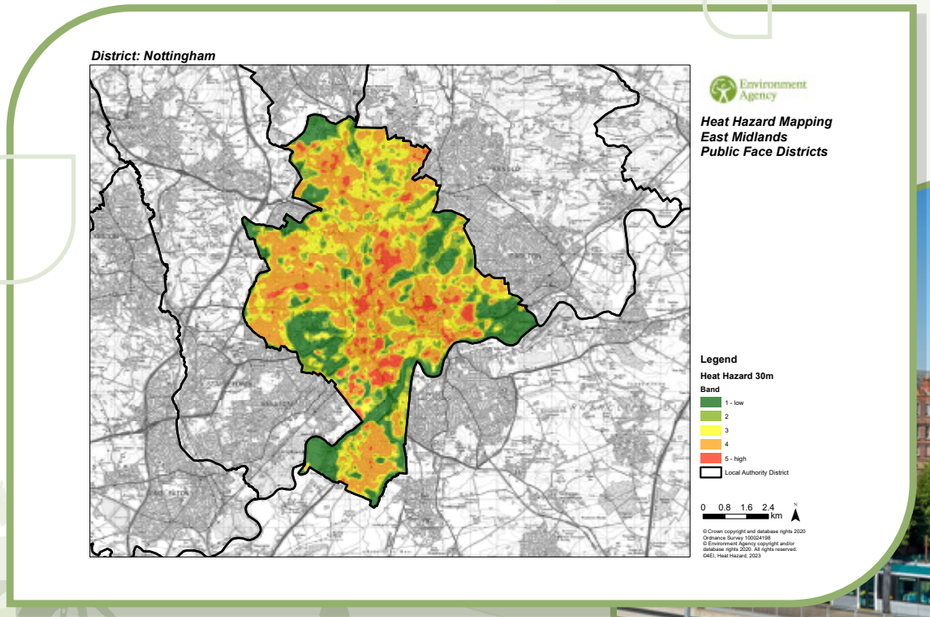
When extreme heat and poor air quality occur at the same time in the same densely developed and traffic-impacted places those with recognised underlying (health) vulnerabilities will be at greatest risk from extreme poor air quality events.

The potential impact of these significant risks coinciding is further compounded by the evidence that those people with such health vulnerabilities are concentrated in areas with the greatest socio-economic deprivation (and highest ethnic diversity), which are predominantly the most densely developed, least blue/green and most heavily seen traffic congested neighbourhoods - **Health Profile for England 2021 (phe.org.uk)**

Drought impacts Direct water scarcity impacts on people and the economies of Derby & Nottingham arising from climate change don't (as-yet) pose an obvious significant threat.

However, the increasing uncertainty and risk of drought could damage the functioning and the dependent biodiversity of and around urban watercourses, as well as undermine the contribution they make to the moderation of urban heat and the provision of respite spaces.

The big adaptive need, in common with all contexts, is the incorporation of measures that improve their climate resilience as aspects of, or alongside, measures that help to manage flood risks, improve local blue/green amenity and enhance and connect habitat for wildlife.



INCREASING FLOOD RISKS

Heatwaves and droughts can exacerbate urban flood risk because they directly affect rates and overall water absorption capacities across all forms of 'natural' spaces and landscapes, including urban parks, public realms and private gardens.

This can exacerbate the effects of increased use of impervious surfacing, demands on drainage systems and lack or loss of space within and around river tributaries that can take excess volumes of rainwater run-off.

It is often the case that periods of drought/ heatwaves end with significant rainfall events. When that happens, the combined impacts of these factors, that will keep increasing with climate change, can result in a speeding up, the synchronisation and an increase in the volumes of rainwater run-off – resulting in increased surface water and drainage flooding.

Heatwave and drought can have similar effects across more rural areas of catchments and may also compound the effects of compaction of soils and any other degradations that reduce water absorption and retention.

The increases in speed, synchronisation and volumes of run-off, exacerbated by climate change, can have significant localised increased flood (In addition to increased sediment/nutrient transfer) impacts, but also feed down the catchment, creating additional peak flow volumes and increased riparian risk to areas of urban settlements further downstream.

Core cities are at climate change drought-exacerbated flood risk from widespread upstream catchment-scale effectors of surface water run-off.

Increased frequency and extremity of winter rainfall events, This may only average around a 7% increase in actual extreme volumes of rainfall, as a direct impact from 1 degree of climate change. However, compounding factors, identified as probable contributory causes, which arise throughout both rural and urban areas of catchments, will cumulatively increase flood risk from major rivers to major downstream cities and settlements.

KEY CLIMATE RISKS AND COMPOUNDING THREATS

RURAL HEARTLANDS & TRANSITIONING TOWNS

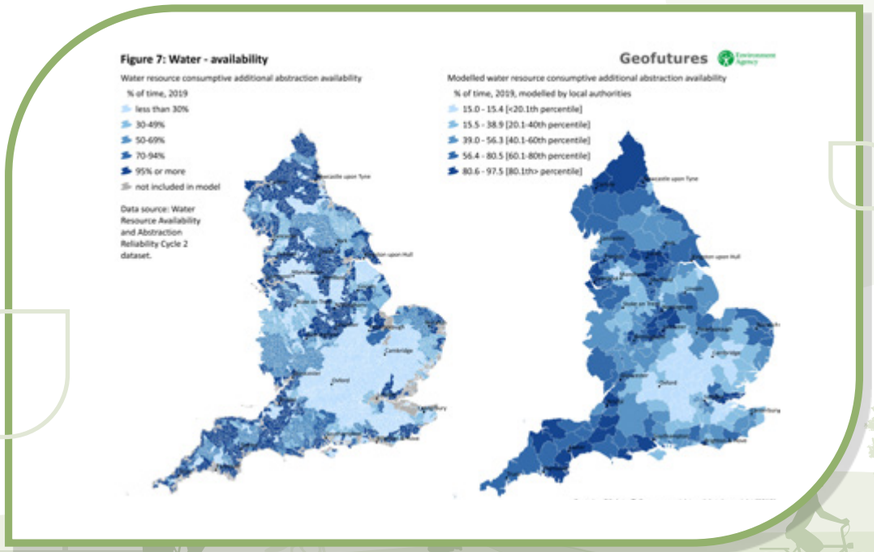
Water scarcity, Varience in rainfall arising from climate change is crudely assessed (in the EQ indicators) based on the current measure of the percentage of times in which there is additional abstractive capacity within sub-catchments, and some consideration of potential increases in agricultural and industrial demands that could coincide with drought conditions.

Areas most susceptible to increasing risk of water scarcity are on the western side of Derbyshire and eastern side of Nottinghamshire – Bolsover and Mansfield being Districts at (marginally) greatest risk.

Climate change exacerbated drought frequency and extremity, especially in areas with least baseline available abstractive capacity and highest commercial water demands, pose an increasing potential direct threat to the competitiveness and viability of intensive agriculture and food processing through increased uncertainties and effects on yields.

These increased risks are compounded by two other potential indirect but interactive water scarcity/drought effects:

- the accelerating threat to water-dependent biodiversity, the sustainability of ecosystems and the health of soils, all of which are fundamental to agriculture and food production
- the increase in rates of surface water run-off, which can take with them greater volumes of nutrients and sediments into watercourses



INCREASING FLOOD RISK

The compounding run-off effects of drought and heatwaves on compacted and depleted soil, as previously described, is obviously greater in predominantly rural areas that support intensive food production. This not only exacerbates run-off in the immediate aftermath of droughts but longer term and through reductions in soil moisture retention.

These add up to produce the overall increases in volumes of run-off that can contribute to flood risk to local settlements, including satellite and transition towns and villages as well as downstream cities.

However, unlike in urban areas, where much surface water run-off quickly enters the (underground) drainage system, it is agriculturally productive land and especially its margins that perhaps offers the best prospects for integrating adaptive drought resilience measures - that better protect critical eco-systems, sustain agro-industrial competitiveness, and desynchronize extreme rainwater run-off and its localised and downstream flood risk impacts.

The historic patterns of rapid expansions of Transitioning Towns, coupled with half a century of under-investment, add to the challenges of overcoming their climate change exacerbated vulnerabilities to surface water, drainage and river flooding.

HIGH FOSSIL FUEL DEPENDENCIES & CLIMATE CHANGE EXACERBATED SHOCK-VULNERABILITIES

Intensive agriculture and food processing, logistics and retail distribution, as well as the relatively strong manufacturing industrial base, the extent of commuting and domination of road as the main transport infrastructure, are all highly dependent upon fossil fuels, at least for the foreseeable future.

The carbon (plus equivalents) and global ecological footprint from the main sectors that underpin local economies make significant and unsustainable contributions to global warming and its effects.

As demonstrated during the past few years, in addition to being an unsustainable contributory driver of climate change, high dependance on fossil fuels, complex international supply chains and high level of exposure to global markets, creates a range of vulnerabilities to global shocks and impacts. Such dependencies especially when coupled with climate change-driven increasing market uncertainties. How to locate production to minimise exposure to them them are rapidly becoming important risk criteria for multi-national investment decisioning.

The over-arching need is to pro-actively and rapidly transition away from carbon-dependencies and from polluting air, land and especially water.

As the indicators of poor EQ and summary analysis of causes and effects have outlined, as well as revelations and media commentary about the state of our rivers, we clearly have a collective problem with the polluting impacts arising from the management of human and agricultural effluent, nutrients and waterborne waste.

It is clear this needs to change rapidly, and in at-least part, that has to come through improvements in the regulatory framework and by the water industry.

The **COP 27 Methane** Agreement is indicative of future requirements for change and risks to food production from the need to rapidly address and curtail greenhouse gas emissions. This will be especially impactful on those that have strong inter-dependencies with US & EU regulated markets.

However, it also offers the potential to seed, trigger and nurture investment that can provide competitive advantage to those who can embrace methane's capture and productive use.

What is of perhaps the greatest potential arises from the linkage between these issues – the prospect of widespread generation and capture from the anaerobic treatment of agricultural (and human waste) and its use as a source, as a supply of gas.

It's challenging, but without a pro-active approach, that enables such a transition, there is presumably a risk to competitiveness and this could triggering disinvestment and 'flight' of production to alternative less regulated and thus lower investment-cost locations.

CLIMATE RISKS & COMPOUNDING THREATS

UPLANDS

Heatwaves and increased rainfall frequency and intensity and run off pose a compounding impact on otherwise increased local and downstream flood risks. The causes are inter-active with and accelerating of, ecological damage and degradation from grazing and land management practices.

This combination, the increasing dry-out & then extreme rainfall events causes increasing damage to peat moorlands, increases sedimentary suspensions which may also cause aquatic damage. This is additional to how rapid warming has increasing detrimental effects on upland biodiversity.

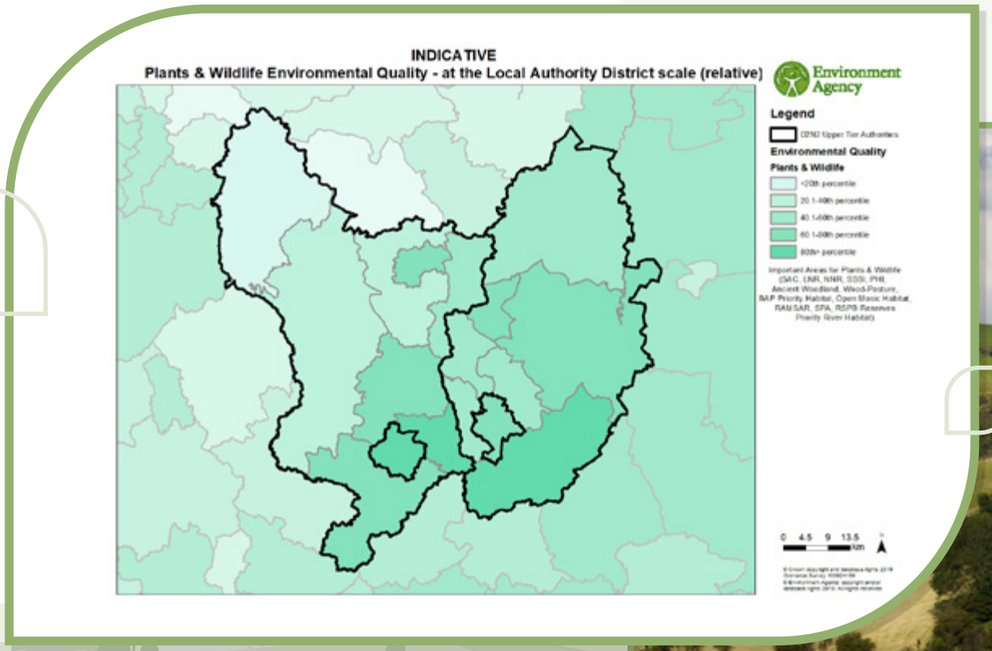
Increasing heat and drought risk, possibly exacerbated by visitor impacts, increases the risks of major heathland fires, including deep peat fires with very substantial air quality and public health impacts as well as supra-regional-scale GhG emissions. Underground “zombie” peat fires release 100 times the carbon of wildfires - **Bulletin of the Atomic Scientists (thebulletin.org)**

In common with rural heartlands and more generally, species abundance indicators (such as for birds and pollinator insects) suggest a climate change exacerbated steep decline in biodiversity, in habitats and in the capacity and sustainability of ecosystems and the services upon which food production, economies and by extension human life relies.

Increasing risks and incidents of wildfires across grasslands, broadleaf woodland and heathland and the continued use of fire as a land management practice – driven by increasing periods of soil moisture deficits is also exacerbating the degradation of ecosystems and biodiversity loss.

Increasing tourism, displacement and commuter and retiree relocation away from heat-intensive surrounding cities is exacerbating localised traffic congestion in and through parts of many upland settlements. These impacts are to such localised extents that poor air quality and negative impacts on liveability, business viability and investment, can be observed in EQ and economic data indices, even at the District scale.

Upland areas can expect to experience a continuation of above UK average temperature increases, – currently running at 0.75c a decade (2013 – 2022). The direct and indirect (displacement) effects will increase with extended summer-time temperatures and changing rainfall patterns.



ADAPTIVE OPPORTUNITIES – UPLANDS

EXTENDING PEATLAND RESTORATION

The most obvious and significant inter-regional adaptive opportunity is the potential to accelerate and extend the restoration and recovery of upland peats and moorlands.

The Moors for the Future Partnership (**HOME | Moors for the Future**) have been driving, demonstrating and delivering moorland conservation and the benefits of repair for the past 20 years, investing over £30m to restore at least 30km².

Their primary focus being on the restoration of blanket bogs – to enhance habitat, improves water quality, slow rainwater run-off, retain and store carbon, reduce wildfire risk and sustain recreational use (incorporating the multiple health, social and economic benefits). They, supported by contributing partners, have developed and made accessible an extensive library of research, analysis and emerging evidence of the adaptive and mitigating benefits of their work.

However, the fundamental (adaptive) challenge remains: How to align significant investment to further enhance and extend upland landscape restoration and spread the multi-faceted benefits that come from it more widely across the moors, but also downwards through the interface with surrounding farmlands and downstream settlements.

Probably the most feasible and beneficial approach (with the strongest potential to attract the greater scale of investment that is required) would be to extend through a strategic focus on; water run-off routes, which form the network of tributaries, and the subsequent riparian corridors that run down from the peaks and moorlands. These form a web across the surrounding rural landscape.

It is across this 'wet water web' that space can best be found for a range of landscape recovery, for rewilding, and habitat regeneration, that would complement and extend the environmental and adaptive benefits of upland blanket bog and peatland restoration.

This could offer more extensive carbon and nitrogen fixing, reduce extreme rainfall run off as well as downstream flood-risk and sediment impacts. Such riparian corridor rewilding and recovery also offers an effective mechanism by which to provide enhanced habitat and wildlife corridors at-scale.

In addition to continued and expanded investment in peat bog and moorland restoration, a complementary downstream 'wet water-side web' restorative programme offers the strongest prospect of an integrated and balanced approach, especially if future environmental land management (ELMs) payments evolve such that they are effective as incentives and reward actions that deliver multiple environmental and adaptive benefits.

Any such approach would need to be additional and complementary to the range of other rewilding initiatives, such as those by the **| Derbyshire Wildlife Trust.**

In 2021/22 the Government announced over £700m of Nature for Climate funding for the period 2021-2024. It's unclear as to exactly how much of this has been committed and what investment potential remains. It does include a £50m sum earmarked specific to peatlands. The third round for applications, which includes a Paludiculture Exploration Fund, can be accessed at - Nature for Climate Peatland Grant Scheme - GOV.UK (**www.gov.uk**).

A wealth of national (England) nature, biodiversity and environmental land management policies, plans and strategies have or are planned to be rolled out in 2023. These will need to be translated into delivery and implementation in real contexts.

The most recent Environmental Land Management update: how government will pay for land-based environment and climate goods and services - GOV.UK (**www.gov.uk**) identifies climate adaptation as an overarching objective. However, there remains some uncertainty about the extent to which payments will make-viable the implementation by landowners of the required environmental, climate-adaptive and mitigating actions.

SUSTAINABLE ACCESS AND TOURISM

The close proximity, the ring of cities around the Peak District, from which so many car visits arise, is both a driver of traffic congestion and its negative impact, but also ought to offer opportunities to sustain and enhance recreational access, while transitioning to sustainable means and modes.

The National Park and its wider surrounds is ringed by railway lines that run out of and between Manchester, Chesterfield, Sheffield Derby and Stoke. These are complemented by the Buxton, Glossop and Hope Valley lines and the remaining Derwent line to Matlock.

The area is also pretty well served within itself by a number of (otherwise) excellent and popular recreational cycle routes. However, as is common elsewhere in the UK, they are poorly joined up and don't connect well to cities, towns and public transport hubs. Instead, routes tend to stop/start in inaccessible out-of-town car parks. As a result, visitors wanting to cycle are disproportionately obligated into travelling in and out of the area by car.

Access to information, exemplified by the lack of coherent online maps of rail or cycle routes and/or how visitors from those surrounding cities might combine the two modes to make their visit car-free, is itself telling of the opportunities being missed and extent to which the visitor economy is failing to transition away from excessive car and carbon dependency.

This seems at odds with the perception that the Peak District is something of a cultural centre, a mecca for both road and off-road cyclists (and great bike shops) and also with the emergence and increasing familiarity with affordable and wide-ranging e-bikes that offer greater accessibility via providing the assistance needed to overcome steep hill climbs.

Yes the poorest and most dangerous physical miss-connections need addressing. It may require the progressive development of better cycle/train infrastructure, responsive as demand increases. However, fundamentally much of the potential could be stimulated and realised by simply promoting and profiling the rail and cycle routes the connections and timetable information in a coherent positive manner. This would need to enable flexible route planning and the promotion of the viability and the benefits of visiting the Peak District and surrounds by such a combination of sustainable individual and public transport services.

Railway Line Guides -
Visit the Peak District by train

ADAPTIVE OPPORTUNITIES – RURAL HEARTLANDS

RE-NATURALISED 'WATER-WEB'

In similarity with neighbouring uplands, re-naturalising marginal space for nature recovery across a 'water-web' network of linear watercourse and their riverside corridors. Ideally as a co-ordinated 'stewardship' programme, but also extending into suburban and urban contexts wherever possible. It could de-synchronise excessive rainwater run-off and help sustain soil moisture and nutrients across farmland. It would also help to address the accelerating threats to water-dependent grassland and woodland biodiversity, deliver carbon sequestration, sustain agriculture and secure food.

In some circumstances complementary surface water retention, storage and use may need to be integrated, but generally such a riparian web of re-naturalised water-side space would also lessen the wider threat from increasing drought frequency and heatwave extremities.

REDUCING FLOOD RISK

As previously described, the combination of changes to extreme rainfall, land use and management and heatwave effects on surface water run-off add up to an overall increases in volumes of run-off. This may exacerbate localised flood risk to local settlements, including satellite and transition towns and villages as well as downstream cities.

Unlike in urban areas, where much surface water run-off quickly enters the (underground) combined drainage system, it is agricultural land and especially its riparian margins that perhaps offers the greater potential viability and prospects for integrating catchment-scale nature-based adaptive flood risk management measures.

DECARBONISING & INSULATING FROM CLIMATE CHANGE (EXACERBATED) SHOCKS

The assessment of climate risks and compounding threats identified high fossil fuel dependencies and climate change shock vulnerabilities. It's not limited to not just to intensive agriculture and food processing but also to; logistic and retail distribution, manufacturing industry and across the extent to which local economies are dependent on commuting, road transport, complex international supply chains, and exposure to volatile global markets.

This is additional to the carbon (equivalents) and global ecological footprint of local economies, that are making significant contributions to global warming and its effects. Unsustainability is itself becoming a key economic vulnerability.

It's a lot to address, especially when issues such as the need to rapidly transition towards better environmental regulation and also meet challenging COP emission targets are factored into the mix.

EXPANDING ANAEROBIC DIGESTION

An area of strong potential, that offers opportunities to address all these issues and that can attract the required investment is anaerobic digestion.

It has significant potential to redirect to market and harness as feed stock the polluting production and arising wastes that are causing a significant proportion of environmental and climate damage (that are also a threat to local economies).

It can capture methane and produce natural carbon positive gas from across a combination of agriculture, council household kitchen and garden waste composting collections and from across food processing and bio-manufacturing businesses (and maybe even the management of Environment Agency flood defence assets).

It can only provide a proportion of decarbonised energy needs but its potential is estimated as being equivalent to about a quarter of all our current natural gas consumption (including that currently used for electricity generation). The prospect is that from 2035, as natural gas stops being used for electricity generation, maximised anaerobically generated carbon neutral gas could provide for most residual domestic cooking and heating demand, and do so via the existing infrastructure network.

Kick-starting such an expansion has challenges in terms of technical and regulatory complexity (consistent with other waste treatment and energy generation technologies) but perhaps the greatest limitation to date has been the difficulties of identifying locations that offer a localised critical mass and appropriate mix of feedstock, as well as the proximity of heat and power consumers. Price increases over the past 18 months have incentivised the case for identifying optimal anaerobic investment opportunities.

These opportunities could be realised across the East Midlands if:

- They were eligible for capital investment from ELMS and other post-brexit rural development and green transition funds
- The range and volumes of compatible and complementary feedstocks and arisings where mapped
- Regulatory expertise could be provided to overcome barriers to combined uses of bio-waste streams

This could attract renewable energy entrepreneurs to the delivery of an expansion in anaerobic digestion.

This offers a significant low carbon, high environmental quality and economic competitive advantage to Local economies with significant carbon-intense agricultural, food processing and energy sectors.

The complementary opportunity that arises from the regulatory assured and cost-incentivised diversion of slurry, poultry waste and ammonia, nitrate and phosphate sources of effluent – into sustainable energy production and away from watercourse pollution - is the development of an associated environmentally sustainable farming assurance scheme, product labelling and premium pricing opportunities. Enabling and supporting such a circular approach - connecting better management of effluent and waste with green energy production and decarbonisation - linked to the environmental assurance of food products, adds up to competitive advantage and insulation from global (climate) shocks and 'flight' pressures.

ADAPTIVE OPPORTUNITIES – CITIES

EXTREME HEAT

Local variance in extreme temperatures (the Urban Heat Island effect) appears to increase exponentially as the world continues to warm. The natural and built environmental factors that drive this differential are concentrated in high density urban areas.

The complement to realising these blue green corridor, big city river opportunities, is to adaptively transition and make fit for the future other 20th century infrastructure.

As already described, extreme heat tends to coincide with meteorological conditions that result in poor air quality and both, especially in combination, threaten those with the same underlying respiratory health conditions. Furthermore, we tend to get higher concentrations of people with such susceptibilities in high density urban areas with the poorest air quality and greatest urban heat island effects.

FLOOD RISK

This increases from both heat/drought impacts and from increasing frequency and intensity of extreme rainfall events arising from climate change. Increased peak volumes of rainwater flow into watercourses from catchment-wide surface water run-off, all of which gets concentrated in downstream core cities.

Within urban contexts there is also increasing flood risk from surface water run-off overloading inadequate drainage systems. This is compounded by comparatively weak modelling and prioritisation of resources to address increasing surface water and drainage flood risk in urban areas.

Policies and practices don't require and don't effectively enable the incorporation of adaptive measures into developments.

GREENSPACE

Urban wildlife and habitat (often far more diverse than can survive around intensive agriculture) is under-recognised, valued or protected, a situation further threatened by inherent bias in impending Biodiversity Net Gain provision.

Places that suffer the worst combinations of climate change factors are also being subjected to increasing development pressures and intensification. There is an apparent continuing loss of urban green spaces and a lack of commitment or resources to realise opportunities and deliver urban blue/green infrastructure. It seems that 'nature-based solutions' and funding to deliver them, are largely the preserve of rural contexts. This despite opportunities to create or enhance 'Biodiverse Greenspace, in neighbourhoods that are deficient offering higher potential adaptive returns on investment.

Key policy levers lie with Government, while in practice addressing these inter-related issues (and/or dealing with the consequences) falls heavily onto (urban) local authorities. Without resources and a broadening of responsibilities, it isn't realistic to expect city councils to unilaterally and disproportionately deliver measures that achieve adaptive change for at-risk communities and their local economy's.

Across Derbyshire and Nottinghamshire flood risk from major rivers continues to be addressed through investment in upgrading and adapting mid-20th century flood defence assets. It's essential that investment to maintain and enhance protection from these adaptive assets is sustained.

The key current adaptive city opportunities relate to the completion of major flood defence schemes along the Trent through Nottingham, and the River Derwent through Derby. There is strong potential to integrate their completions with the realisation of far wider socio-economic, well-being and economic re-vitalisation benefits which come from creating city-scale blue-green corridors and connections.

The required adaptive complement to realising these (real and now, but potentially foregone) blue green corridor big city river opportunities is the need, and the specific and strongest opportunities being the addressing of the damaging impacts of inner-city ring roads and major road connections that are weaved into and around city centres. This must be done without severing or obstruction, instead reconnecting urban, suburban and satellite neighbourhoods and their communities with their city, can provide enhanced accessibility and mobility in, out and around the centre of cities. It offers a way to make space for re-invigortion of their core.

It cannot realistically be about getting rid of cars, but needs to be about a combination of integrating space for other complementary modes and routeways, making them more accessible and attractive. This must be coupled with measures that mitigate the dangers and especially the polluting damage that blights urban living (UK annual fatalities 2022 - road accidents 1,600, extreme heat 3,000, air pollution over 26,000).

The combination of these adaptive city measures can address all sources of increasing flood risk, poor air quality, and urban heat, while also delivering inclusive economic and cultural re-vitalisation – making cities accessible and attractive places where people want to live, visit, move around and invest in - confident about the sustainability of its future.

CLOSING

These are your indices of environmental inequalities, exacerbating climate change risks and the consequences that are already impacting across the diversity of your communities and local economies. It's yours, theirs and our climate-adaptive needs that we have sought to identify.

The prospectus provides local evidence scorecards, some analysis of causes and effects, and have highlighted some investment opportunities that could help deliver everyone's adaptive futures.

It invites a better understanding of systemic inequalities in the distribution of a range of environmental factors, as well as how climate change accelerates and exacerbates many of the worst impacts on; public health, the future livabilty of neighbourhoods, local economic productivity, and, the increasing constraints, shocks and threats (if unaddressed) that they pose to future prosperity.

The issues highlighted and the climate change links identified are not exhaustive, the suggestions made are only outlined, so they will need refinement and progression, complementing with other ideas and/or replacing with better ones.

It's really a 'prospectus' in that it makes a call for action, first and foremost to Derbyshire and Nottinghamshire local authorities (and wider business and institutional stakeholders) regarding the growing imperative, the need to incorporate Environmental and Climate Change Adaptive Investment (essential to the sustainability and future growth of local economies), as a top-level strategic objective for a new Combined Authority and as a priority theme for its future devolved funding programme.

The 'stitch in time' adaptive opportunities that are identified need not be expensive, – that is if they are seeded soon-enough to ensure they can be adopted, integrated, and implemented in time. They will be considerably less costly than the future price of not adapting to manage the consequences of a rapidly warming world.

For our part the Environment Agency in East Midlands will strive to engage and work with others to resource and further progress localised Environmental Inequality Indices and evidence of the distribution and future impacts of compounding Climate Change Risks.

We will do more to equitably target, match-fund and align our investment and programmes that deliver Flood Risk Management, Climate Resilience and Environment Improvements for the most vulnerable people, places and wildlife.

We will evolve our delivery of regulatory services to help ensure better protection from the effects of pollutants, while positively supporting transitional change across industries.

Finally, we remain strongly committed to further engagement, to working with all local authorities, wider stakeholders and communities to progress adaptive opportunities and equitably target investment into the shaping and delivery of Adaptive Futures, for us all.

Environment Agency

Nottinghamshire County Council