



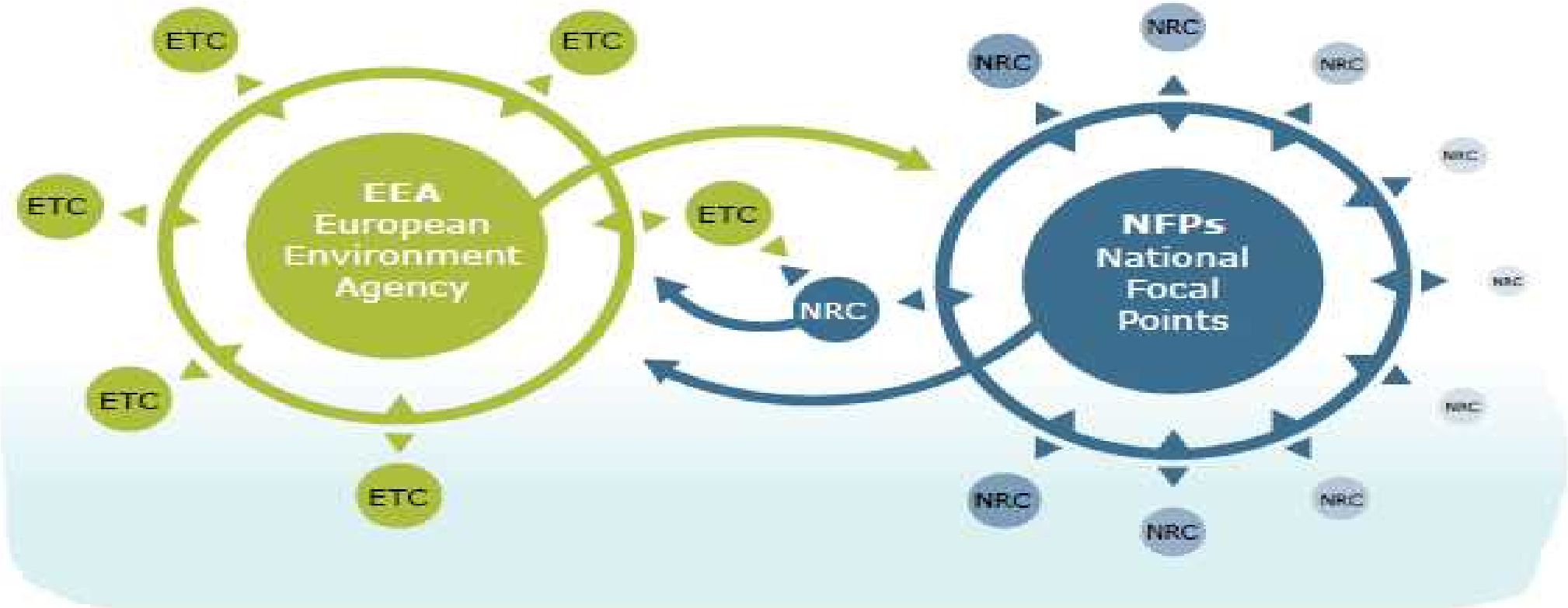
NBS conference

16.-18.05.2018

EEA and ETC /ULS activities related to land monitoring indicators

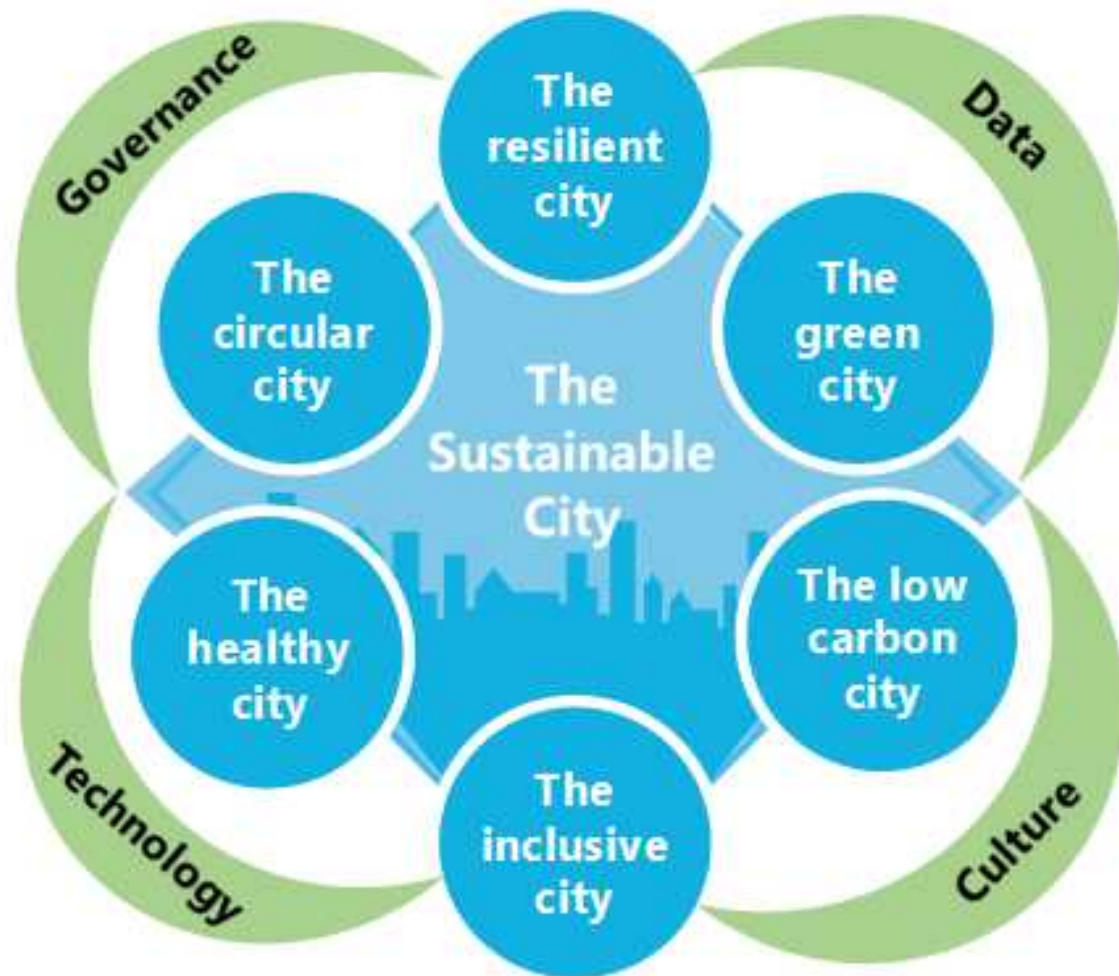


Collaboration structure



Source: EEA

The understanding

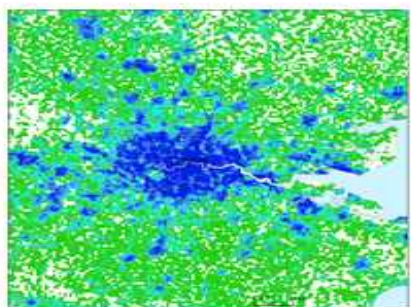


- ETC deals since 2007 with urban aspects as main actor in EEA
- IUME, Eionet NRC LUSP
- Indicator development regarding land monitoring and contributes to
- SOER



Urban Sprawl Indicator

Urban Sprawl indicator components:



UP - Urban Permeation

Amount of built-up area

Built-up area presence based on Copernicus HRL Imperviousness



DIS - Urban Dispersion

Dispersion of built-up area

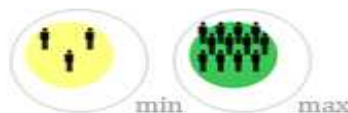
Built-up area patterns based on Copernicus HRL Imperviousness



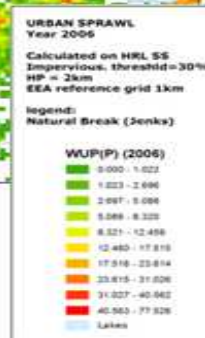
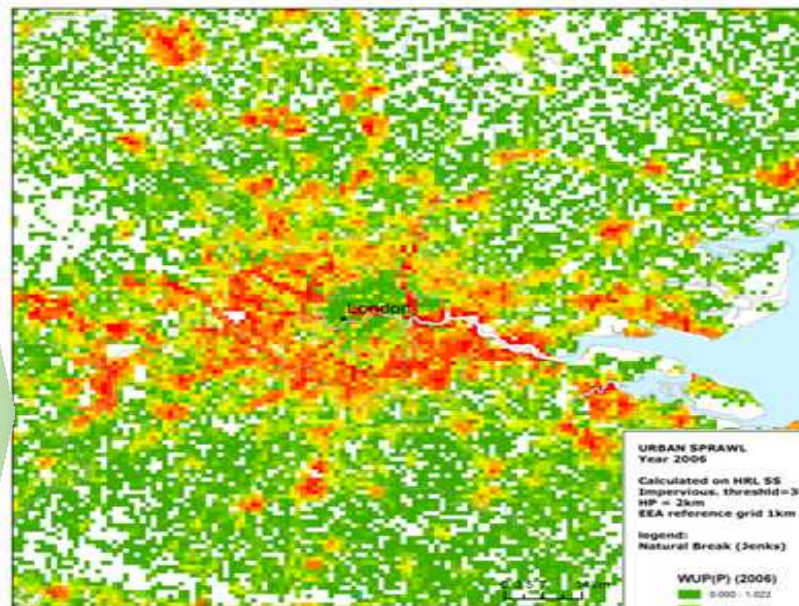
UD - Utilization Density

Utilization of built-up area

Population, Employment/Jobs based on ESTAT GEOSTAT GRID & EU LFS



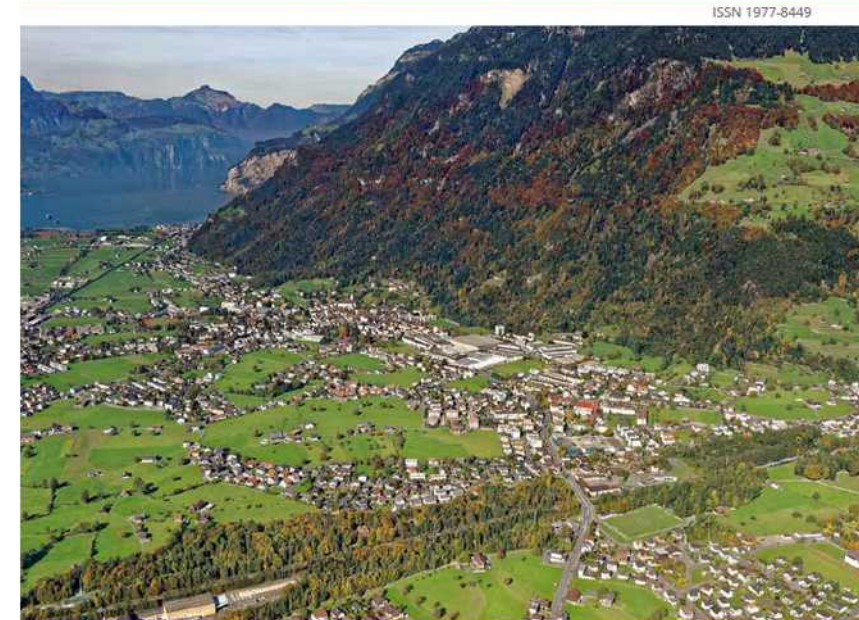
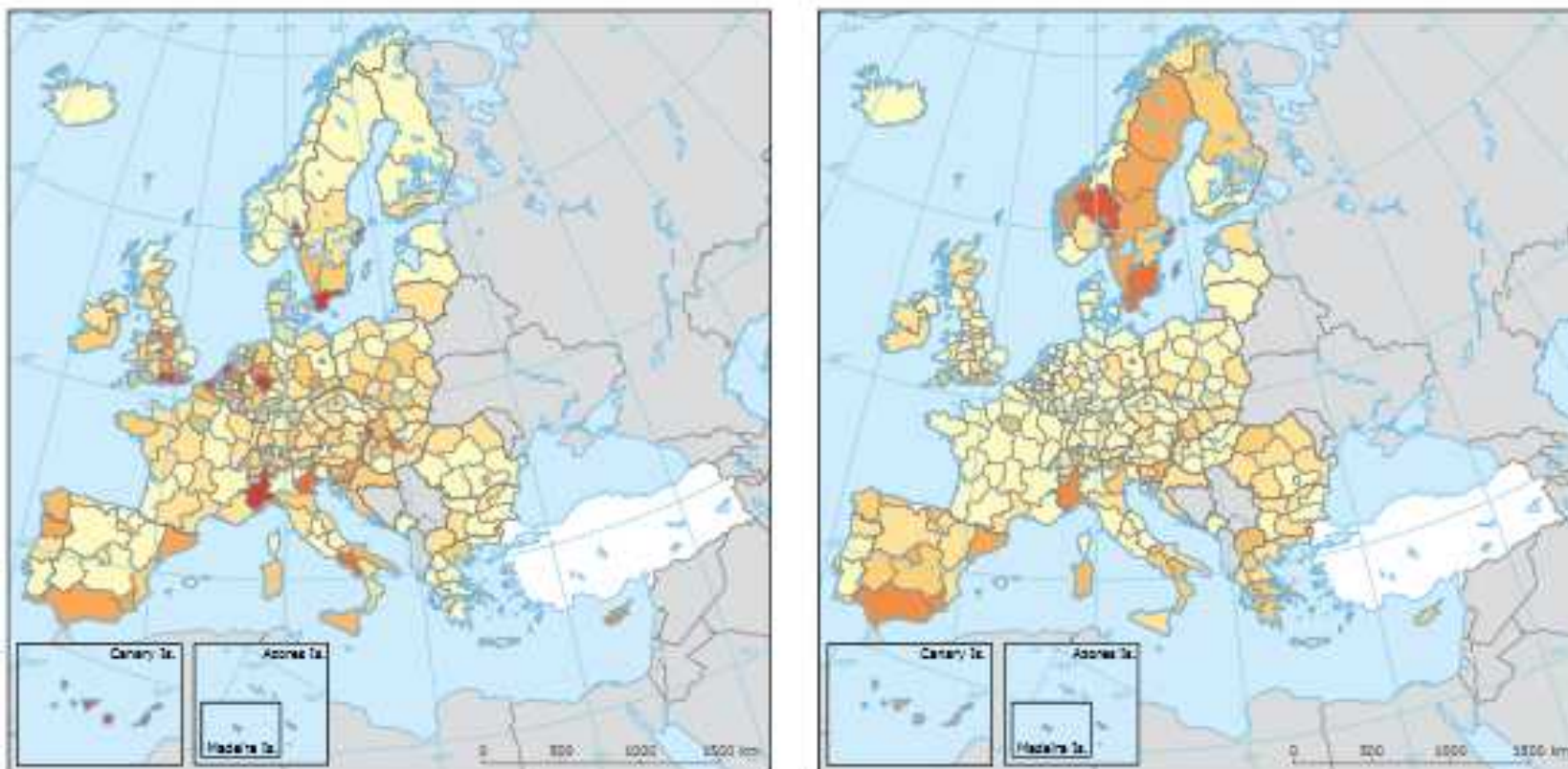
WUP - Weighted Urban Sprawl



Urban sprawl

Urban sprawl in Europe
Joint EEA-FOEN report

Map 3.6 Changes in *WUP* values at the NUTS-2 region level between 2006 and 2009 (both absolute (left) and relative (right) changes are shown)



ISSN 1977-8449

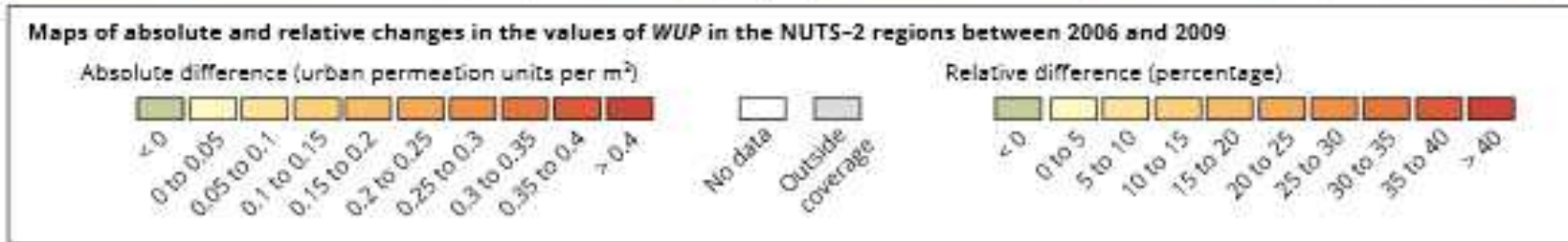


Schweizerische Eidgenossenschaft
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Swiss Confederation
Federal Office for the Environment FOEN

European Environment Agency



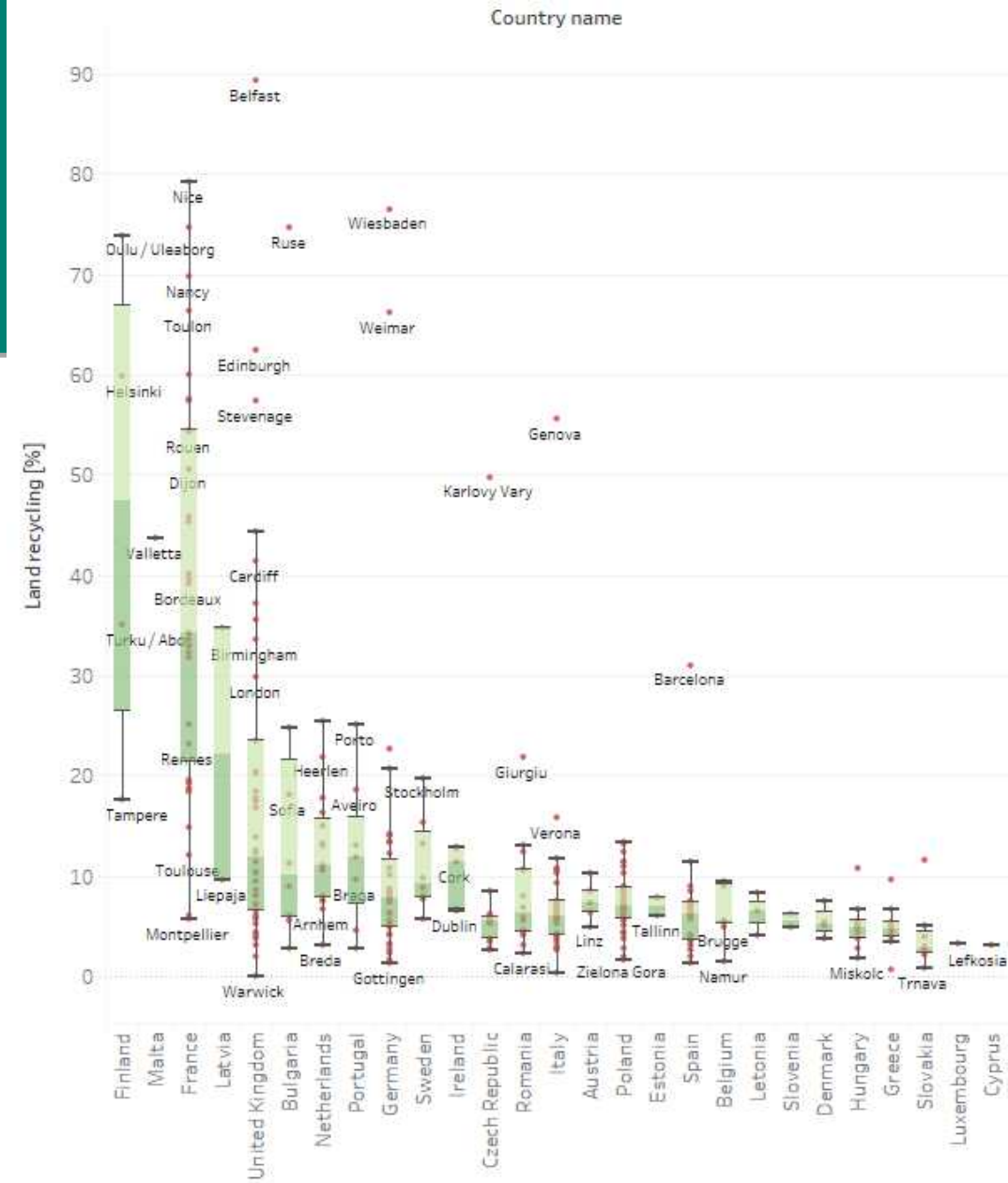
European Environment Agency
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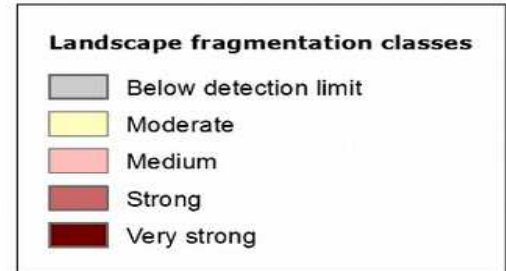
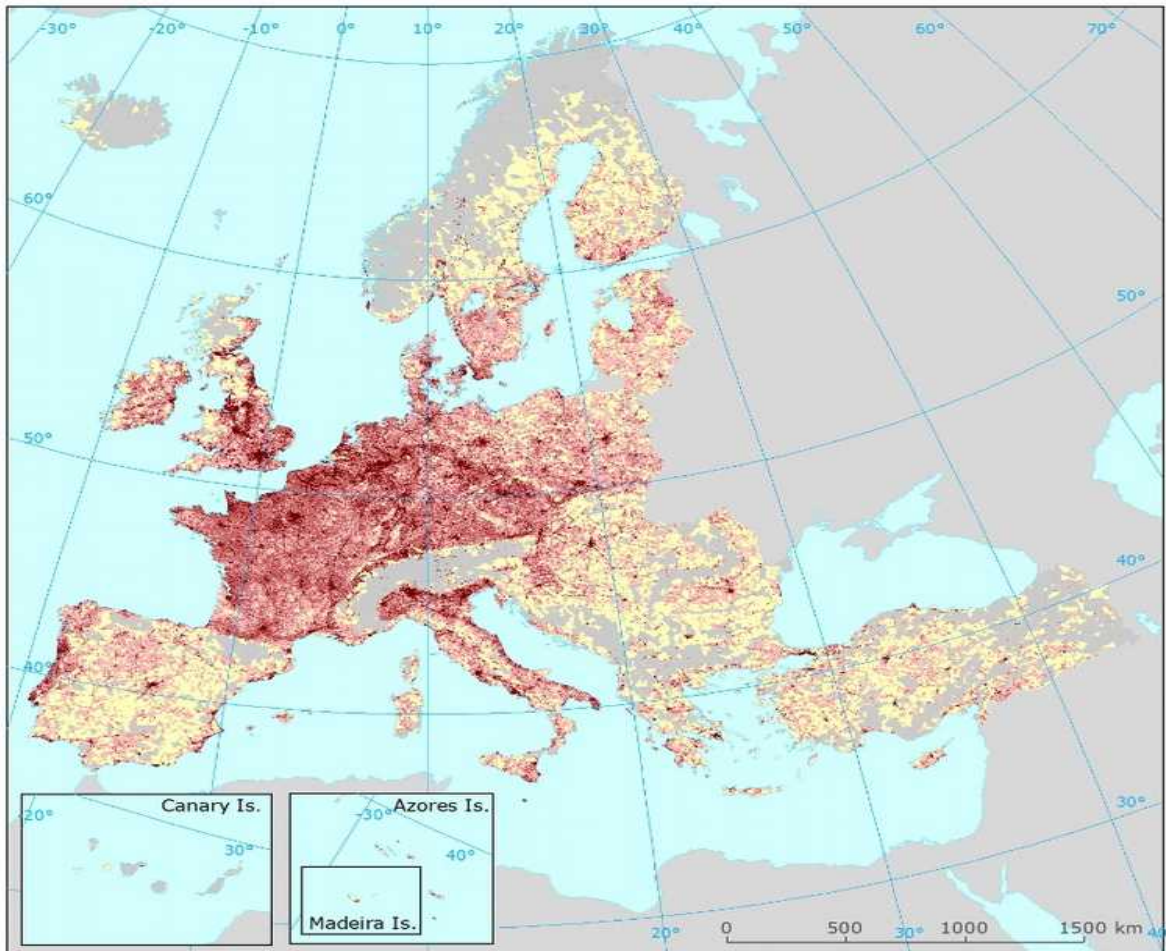
Land recycling



Land recycling boxplot, by FUAs and country: land recycling as percentage of total land management for the period 2006-2012.



Landscape fragmentation

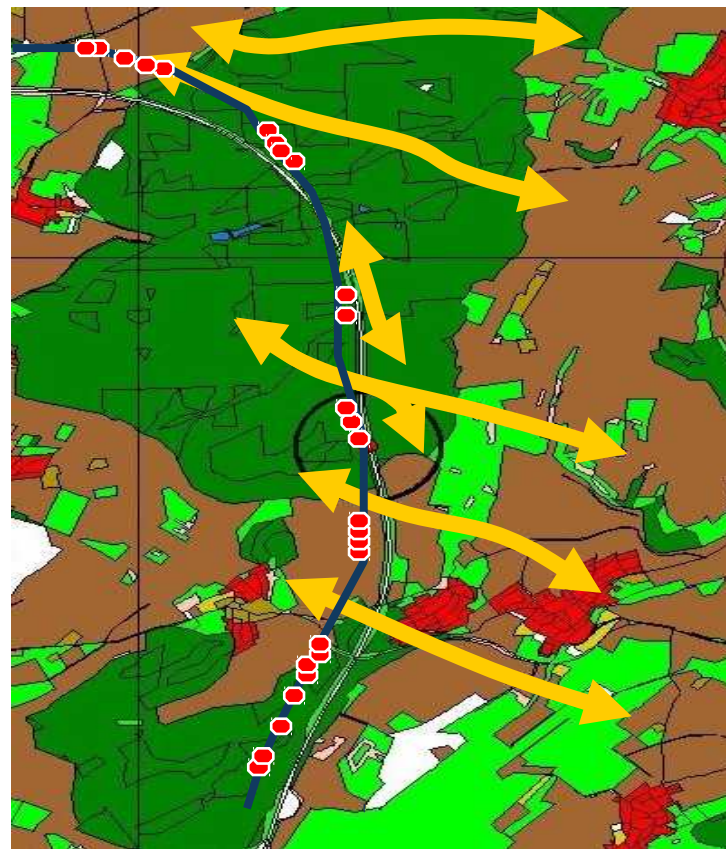
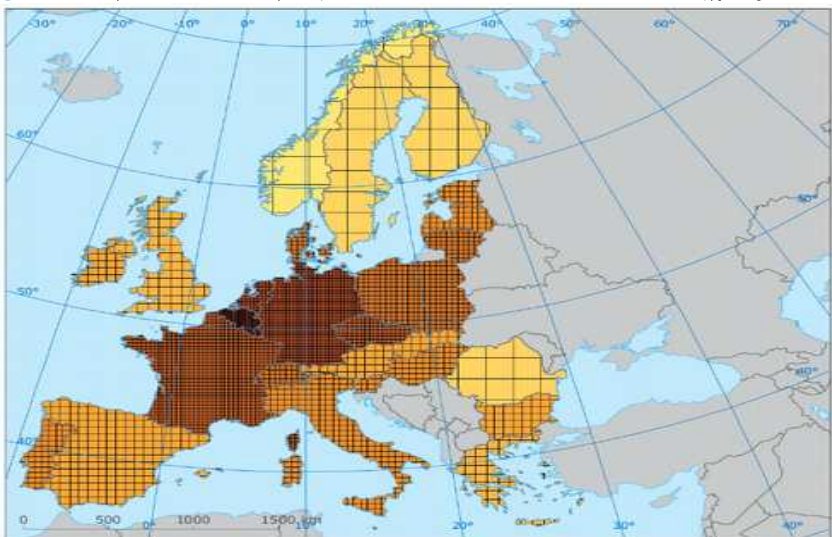
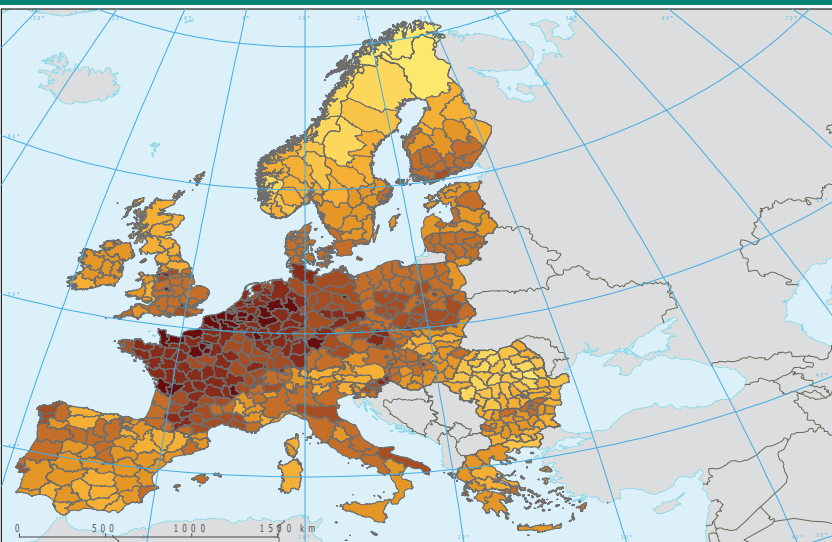


Map of landscape fragmentation classes caused anthropogenic fragmentation

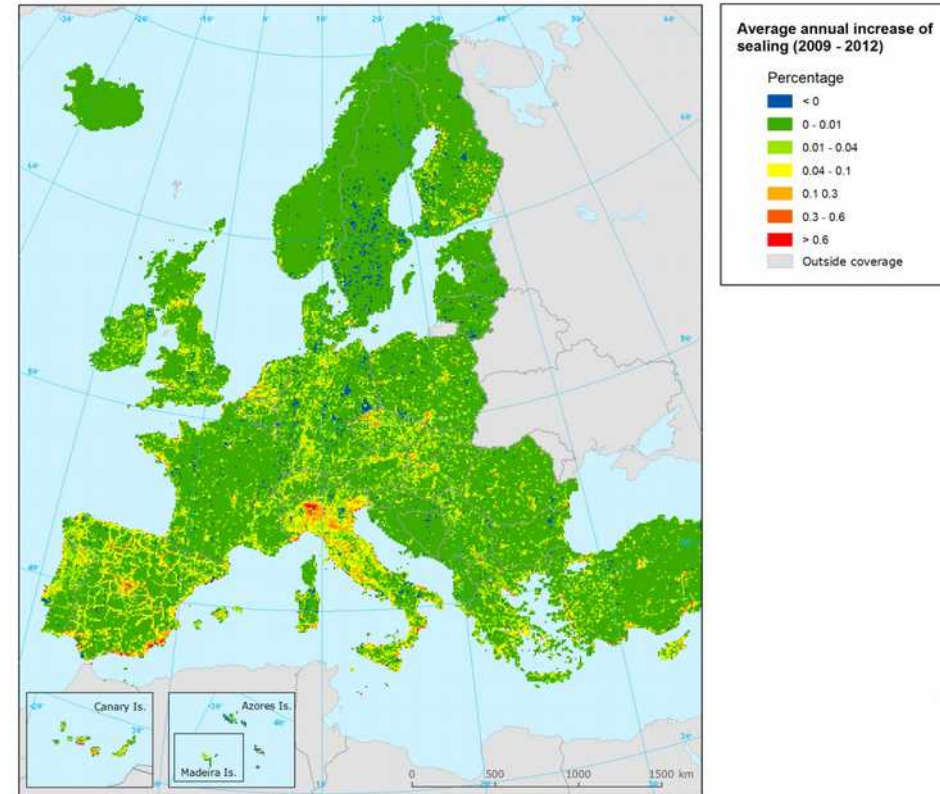
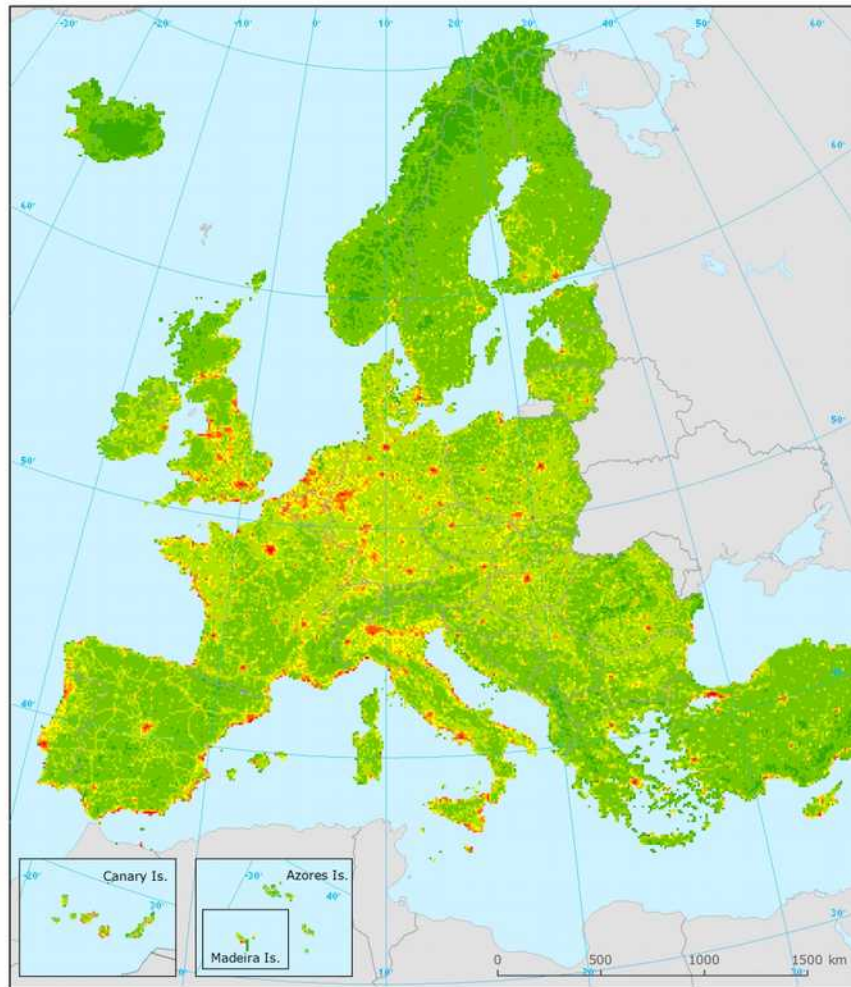


Landscape Fragmentation – update from 2009

Conflicts between transportation corridors and wildlife movement



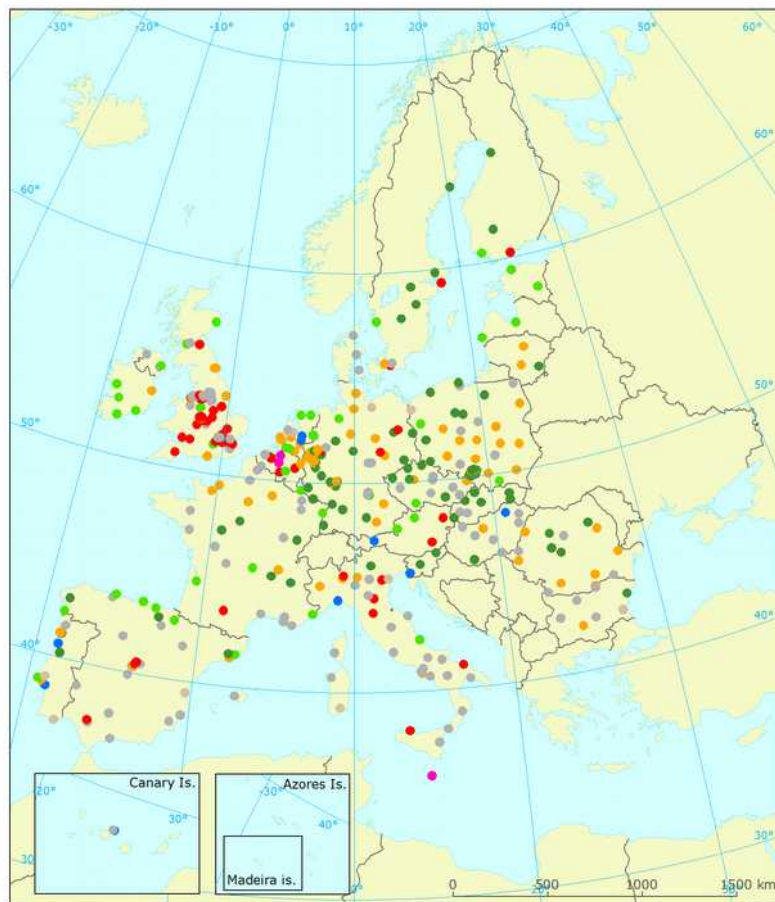
Imperviousness 2012 and change in 06-12



Indicators for Urban green infrastructure

Basic statistics of all clusters

Parameter code	Parameter alias	Mean
S01_02	Share of green urban areas	58.97
S01_04	Degree of soil sealing	24.94
S01_03	Distribution of green urban areas	19.87
S01_08	Effective green infrastructure (urban hinterland)	38.97
S01_09	Hotspot ratio (hinterland)	4.01
S01_10	Terrestrial urban blue areas	3.01
S02_03	Low density areas	5.96
S01_11	Share of urban forest	14.33
S01_12	Share of Natura 2000 sites	7.62



Urban GI cluster	cluster4	cluster5	cluster6	cluster7	cluster8
1	-1.72523	0.788129	-0.87675	0.611276	-0.8
2	0.325906	-0.59768	0.367082	-0.19948	-0.42177
3	1.594463	-0.7618	1.096244	-0.49961	-0.50794
4	-1.03814	-0.24268	-0.44097	0.488393	0.09529
5	6.610568	-0.43778	0.171291	-0.27776	0.090589
6	0.583347	-0.21691	-0.13087	-0.02384	4.447779
7	-0.67791	-0.27242	-0.57148	1.535039	-0.6086
8	0.117695	-0.01611	-0.42531	0.056422	2.44041
	0.74635	-0.17782	-0.45422	-0.50055	-0.63176





Interactive map - Green infrastructure indicators [↗](#)

GIS Map Application — Published 24 Mar 2017 — Last modified 18 Jul 2017

Indicators to characterise green infrastructure at the city level and in the peri-urban area

1 Share of Green Urban Areas

The map shows green urban areas as a proportion of total area inside the core cities. It is defined as the proportion of all vegetated areas within the city boundaries in relation to the total area.

2 Distribution of Green Urban Areas

3 Effective Green Infrastructure

4 Competition for space at the urban-rural interface

5 Green Infrastructure typology of cities

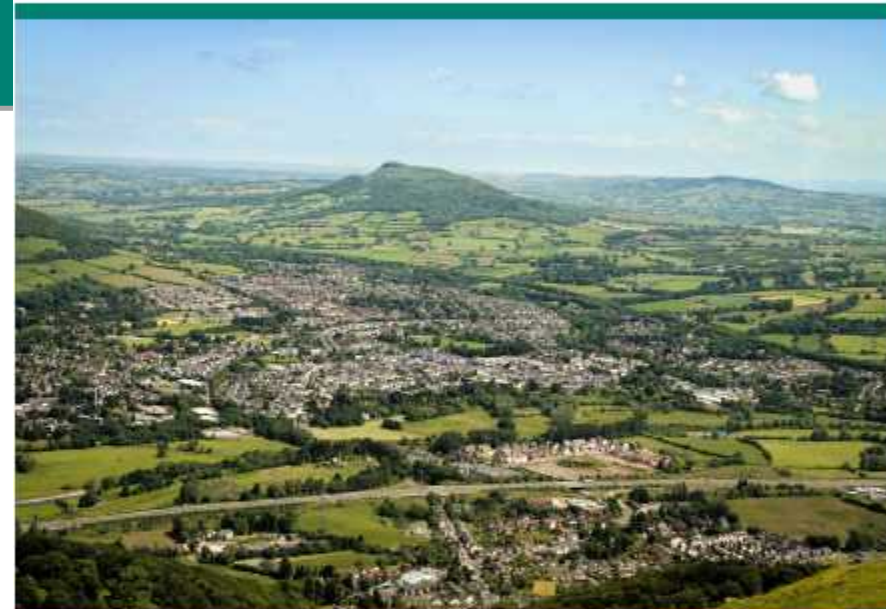
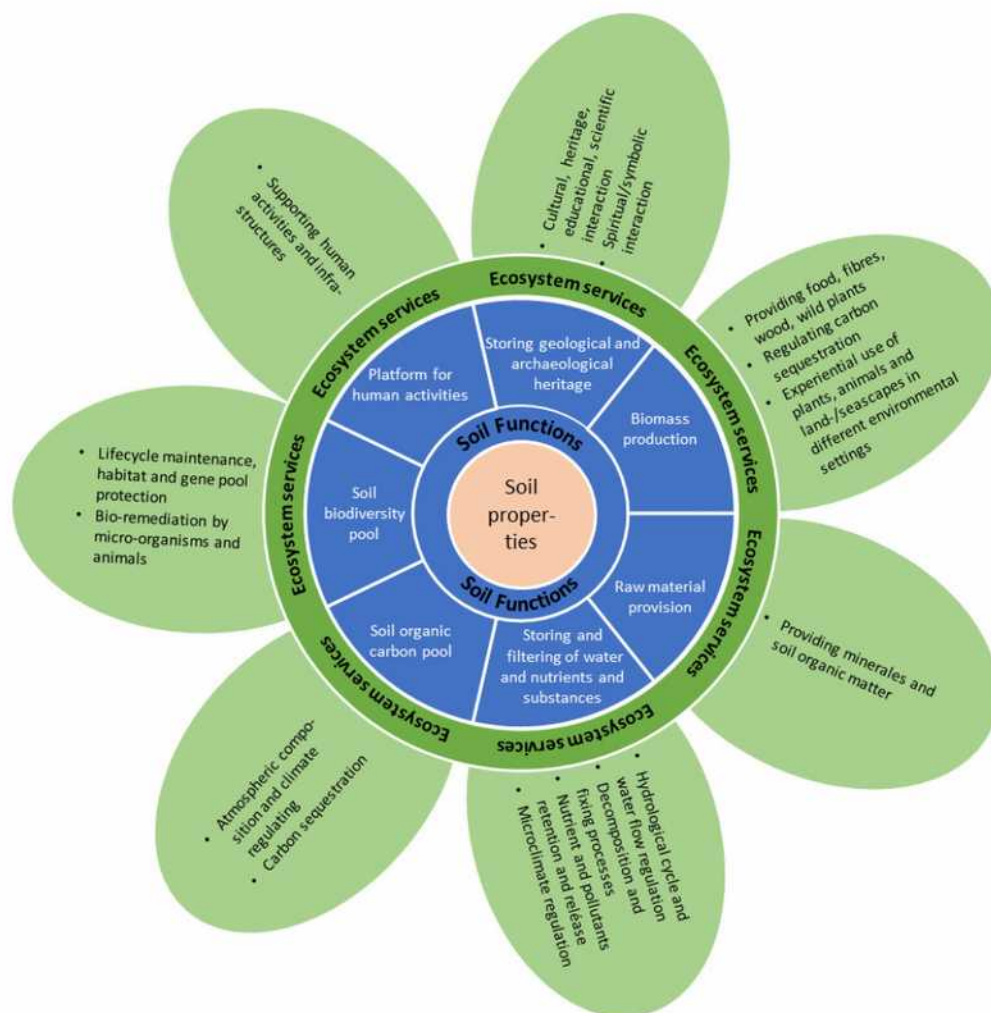
6 GI factsheet of cities



Ecosystem services approach

Land cover changes and soil functions

An approach for integrated accounting



Authors:
 Mirko Gregor, Manuel Löhnertz, Christoph Schröder, Ece Aksoy, Gundula Prokop, Geertrui Louwagie

ETC/ULS consortium partners: Environment Agency Austria, ALTIERRA Research Institute, The Institute of Geodesy, Cartography and Remote Sensing (IGI), spacio4environment, GISAT, The International Council for Local Environmental Initiatives (ICLEI), Universitat de Barcelona (UAB), Universidad de Málaga (UMA)

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Urban vulnerability map book



The screenshot shows the top section of the website. On the left is the logo for the European Climate Adaptation Platform, featuring the European Union flag and the text "Climate-ADAPT - Sharing adaptation information across Europe". To the right of the logo is the text "European Climate Adaptation Platform" and a search bar with the placeholder "Search: Search...". Below this is a green navigation bar with the following menu items: "About", "Database", "EU policy", "Countries, regions, cities", "Knowledge", "Network", and "Help". Below the navigation bar is a breadcrumb trail: "You are here: Home / Knowledge / Tools / Urban vulnerability Map book / Introduction". At the bottom of the screenshot are four green buttons with the following text: "Introduction", "Maps per climatic threat", "Explore further", and "Site overview".

<https://climate-adapt.eea.europa.eu/knowledge/tool/s/urban-adaptation/introduction>

Urban vulnerability to climate change in Europe - an interactive map book



Cities affected by climate change

Climate change is happening, and is projected to continue, posing serious



Options to use the maps ...

As a starting point, the indicated vulnerabilities will encourage stakeholders at

European Environment Agency
European Topic Centre on Urban,
Land and Soil Systems





You are here: [Home](#) / [Local](#) / Urban Atlas

Urban Atlas

[Print](#)

User corner



[Urban Atlas 2006](#)



[Urban Atlas 2012](#)



[Change 2006-2012](#)



[Street Tree Layer \(STL\)](#)



[Building Height 2012](#)

OID	UATL_ID	Pop. 0 14
0	00-UK001L2	8
1	01-UK001L2	2
2	02-UK001L2	5
3	03-UK001L2	42
4	04-UK001L2	10
5	05-UK001L2	11

[Population estimates by Urban Atlas polygons](#)

The Urban Atlas provides pan-European comparable land use and land cover data for Functional Urban Areas (FUA). The Urban Atlas is a joint initiative of the European Commission Directorate-General for Regional and Urban Policy and the Directorate-General for Enterprise and Industry in the frame of the EU Copernicus programme with the support of the European Space Agency and the European Environment Agency.

Urban Atlas 2006:

- FUAs with more than 100.000 inhabitants as defined by the Urban Audit. The GIS data can be downloaded together with a map for each urban area covered and a report with the metadata.

Urban Atlas 2012:

- 693 FUAs (includes 319 existing Urban Atlas 2006 FUAs and 374 new FUAs) altogether covering EU28 + EFTA
- The Urban Atlas 2012 was extended with 107 FUAs covering Turkey (EEA member country) and West Balkans (EEA cooperating countries)
- The nomenclature includes 17 urban classes with MMU 0.25 ha (minor nomenclature changes compared to urban atlas 2006) and 10 Rural Classes with MMU 1ha
- Street Tree Layer (STL) within selected FUAs (depending on availability of suitable satellite imagery)
- Building Height for core urban areas of selected cities (capitals in EU28 + EFTA)

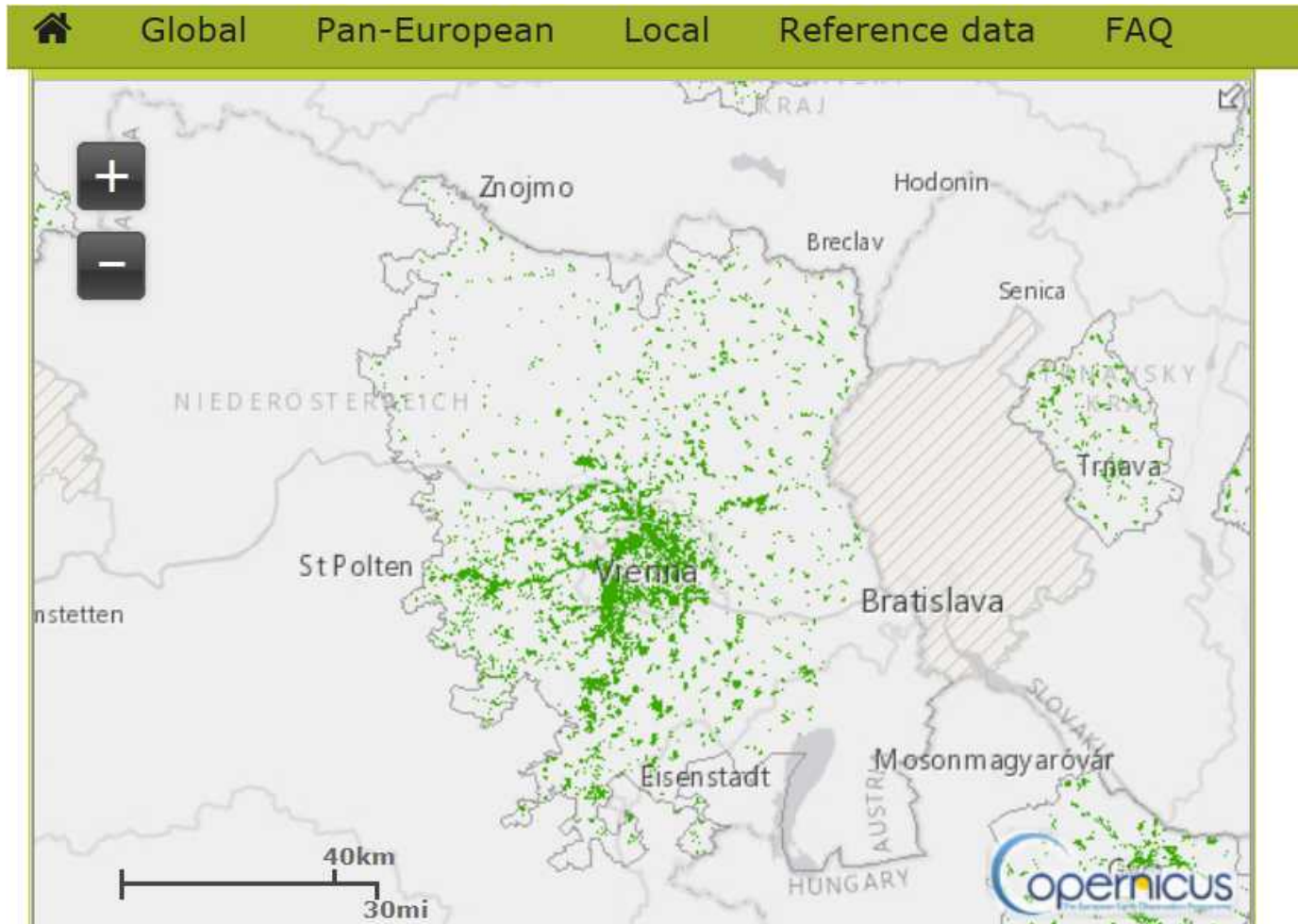
[Read more](#)

Discover the Copernicus Services:

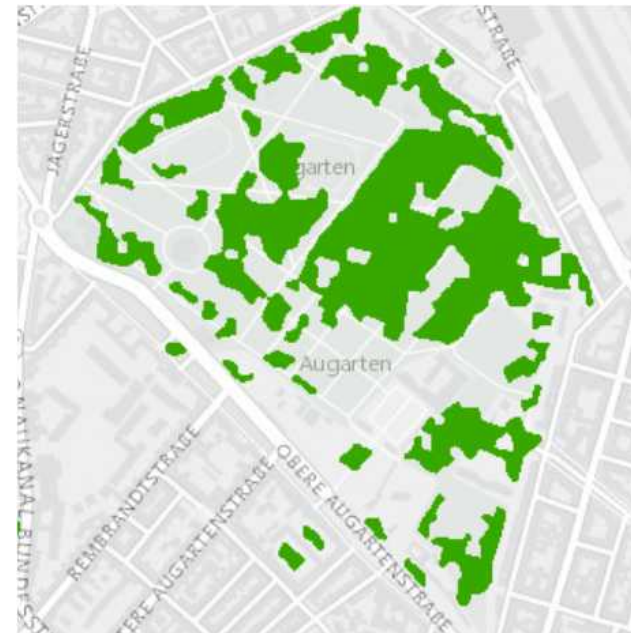


more about our partners

European monitoring of urban areas (FUAs), street tree layer (STL)



- For 700 cities finished
- For cities >100.000 STL
- >500m² and width of 10m



ETC/ULS supported EEA publications

Ensuring quality of life in Europe's cities and towns

Tackling the environmental challenges driven by European and global change

ISSN 1725-9177



EEA Technical report | No 23/2015

Urban sustainability issues —
What is a resource-efficient city?

ISSN 1725-2237

EEA Report |

Urban adaptation to climate change in Europe

Transforming cities in a changing

EEA Report | No 11/2016

Urban sprawl in Europe
Joint EEA-FOEN report

EEA Report | No 7/2016

Soil resource efficiency in urbanised areas
Analytical framework and implications for governance

ISSN 1977-8449

EEA Report | No 10/2017

Landscapes in transition
An account of 25 years of land cover change in Europe

ISSN 1977-8449

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Monitoring in support of LULUCF

TABLE 4 SECTORAL REPORT FOR LAND USE, LAND-USE CHANGE AND FORESTRY							Inventory 2014
(Sheet 1 of 1)							Submission 2016 v3
							EUROPEAN UNION
GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO ₂	CH ₄ ⁽²⁾	N ₂ O ⁽²⁾	NO _x	CO	NM VOC	
	emissions/removals ^{(1), (2)}						
(kt)							
4. Total LULUCF	-324866.44	203.18	39.48	35.55	1181.55	1239.14	
A. Forest land	-439058.06	93.32	12.47	13.74	683.18	60.04	
1. Forest land remaining forest land	-386102.63	37.67	1.29	13.69	650.64	58.75	
2. Land converted to forest land	-53410.28	1.37	0.36	0.05	32.54	1.29	
B. Cropland	71113.60	27.76	12.71	2.16	76.29	0.16	
1. Cropland remaining cropland	24062.81	2.54	0.14	1.63	57.57	0.09	
2. Land converted to cropland	45348.91	2.13	12.58	0.53	18.71	0.07	
C. Grassland	2567.39	49.25	1.26	18.96	397.45	6.30	
1. Grassland remaining grassland	26501.87	15.78	0.87	18.00	369.56	6.27	
2. Land converted to grassland	-24433.88	1.85	0.39	0.96	27.89	0.03	
D. Wetlands⁽³⁾	17626.30	19.95	0.83	0.09	3.22	NE,NO	
1. Wetlands remaining wetlands	15404.69	2.45	0.11	IE,NE,NO	IE,NE,NO	NE,NO	
2. Land converted to wetlands	1023.46	0.37	0.24	0.09	3.22	NE,NO	
E. Settlements	50175.22	2.35	7.15	0.60	21.28	NE,NO	
1. Settlements remaining settlements	3229.58	NO	0.43	IE,NE,NO	IE,NE,NO	NE,NO	
2. Land converted to settlements	46928.00	NO	6.71	0.60	21.28	NE,NO	
F. Other land⁽⁴⁾	245.28	0.02	3.92	0.00	0.13	0.02	
1. Other land remaining other land							
2. Land converted to other land	245.28	NO	0.01	0.00	0.13	0.02	
G. Harvested wood products⁽⁵⁾	-27626.67						
H. Other (please specify)	90.49	10.53	0.63	NE,NO	NE,NO	1172.61	



Accounting by numerical valuation

Landesamt für Natur,
Umwelt und Verbraucherschutz
Nordrhein-Westfalen



Numerische Bewertung von Biototypen für die Eingriffsregelung in NRW

Recklinghausen
September 2008

http://www.lanuv.nrw.de/natur/lebensr/Num_Bew_Biotyp_Sept2008.pdf

- German example
- Numerical Valuation of biotope types (ecosystems?)
- Compensation measures
- Supporting land management



Bearbeiter: Ulrike Biedermann
Jutta Werking-Radtke
Dr. Martin Woike

unter Mitarbeit von: Heinrich König

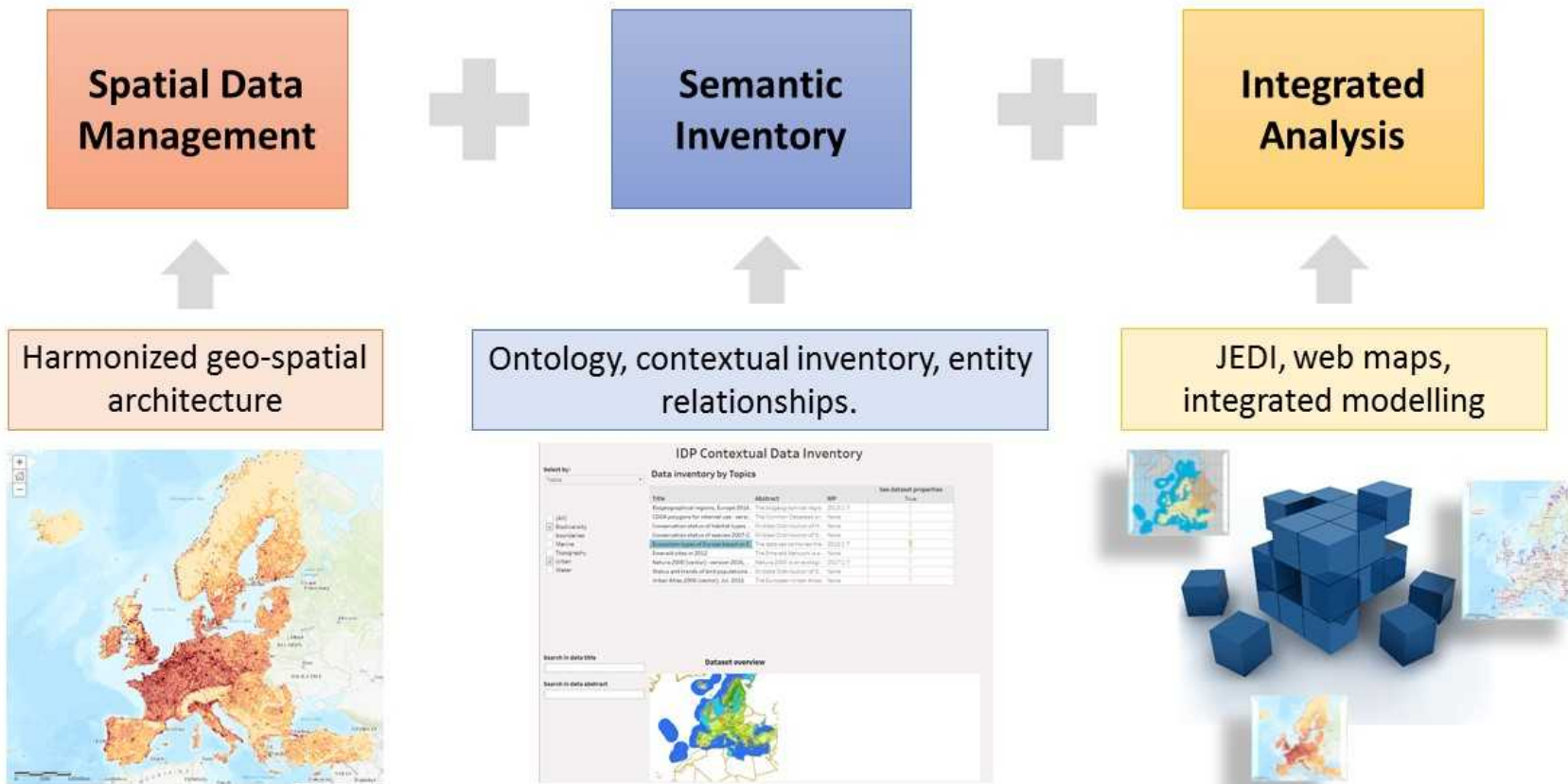
Landesbetrieb Wald und Holz
Dieter Jünemann
Carola Marckmann

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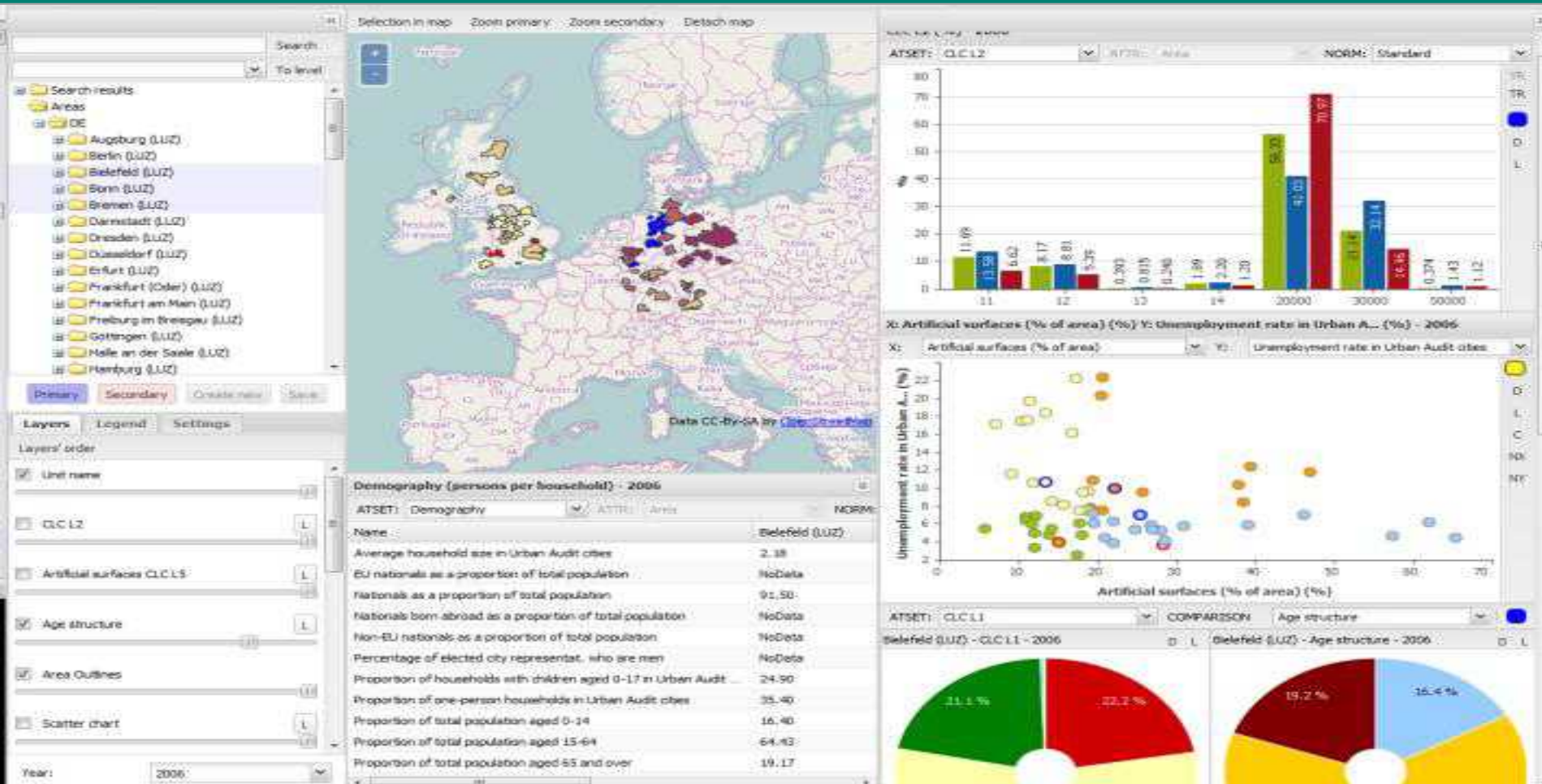


EEA is promoting data integration...

Integrated Data Platform



... and vizualisation



Summary

- A high number of data and indicators are available for different scales
- The challenge will be the comparability of indicators across the scales and biogeographical regions
- European (land monitoring) indicators can guide the development of NBS indicators
- National reporting obligations (existing and new) should be considered as well (MAES, LULUCF)
- Current discussion is important to close the gap between scientific and governmental communities



Thank you

