EO information as a service to citizens regarding the quality of life in cities

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From the power of information

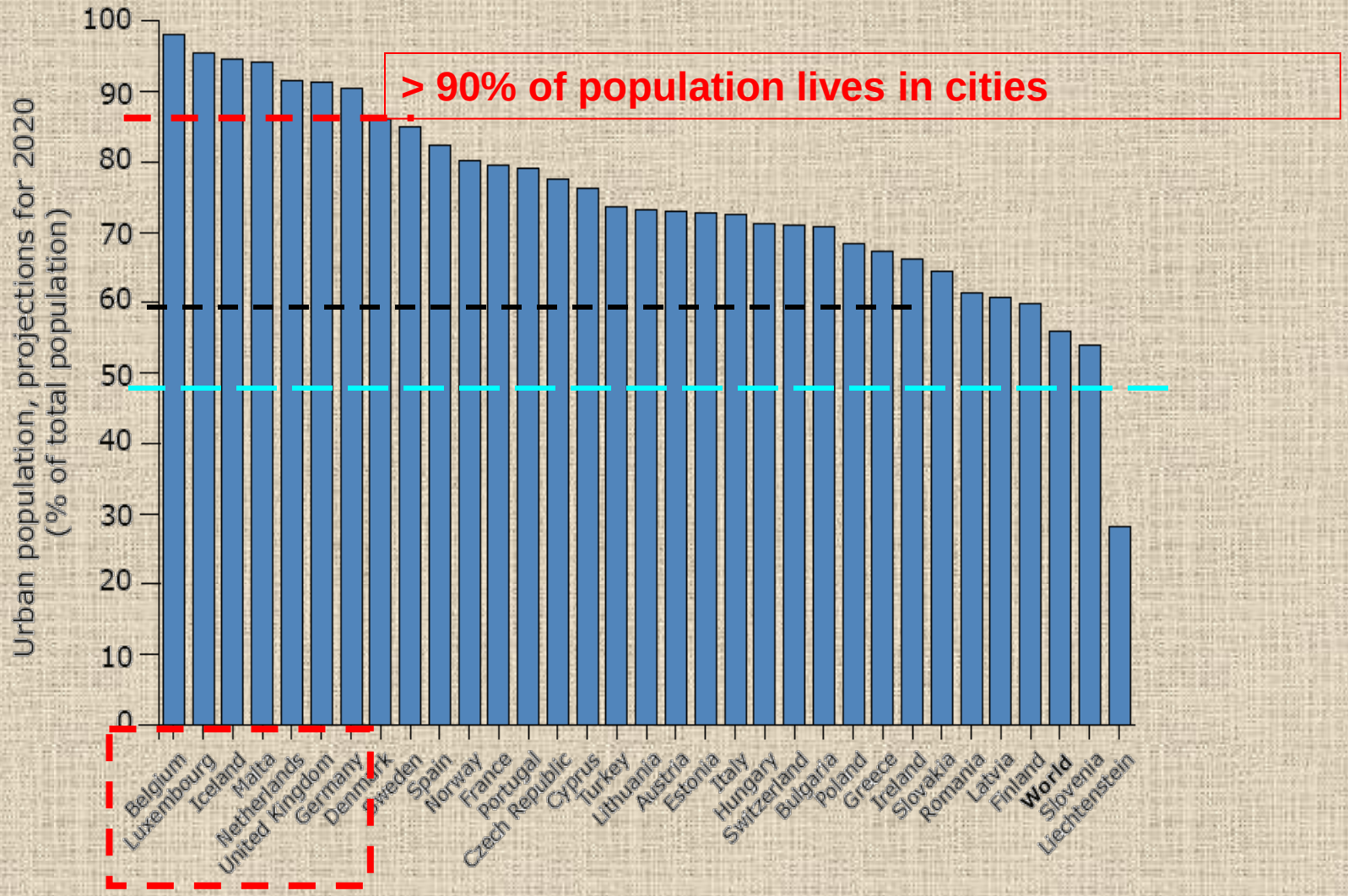
To “pollution” of information

The challenge

Handling of “big data” is crucial in transforming free and open data into **information that brings tangible benefits to environment and society**.

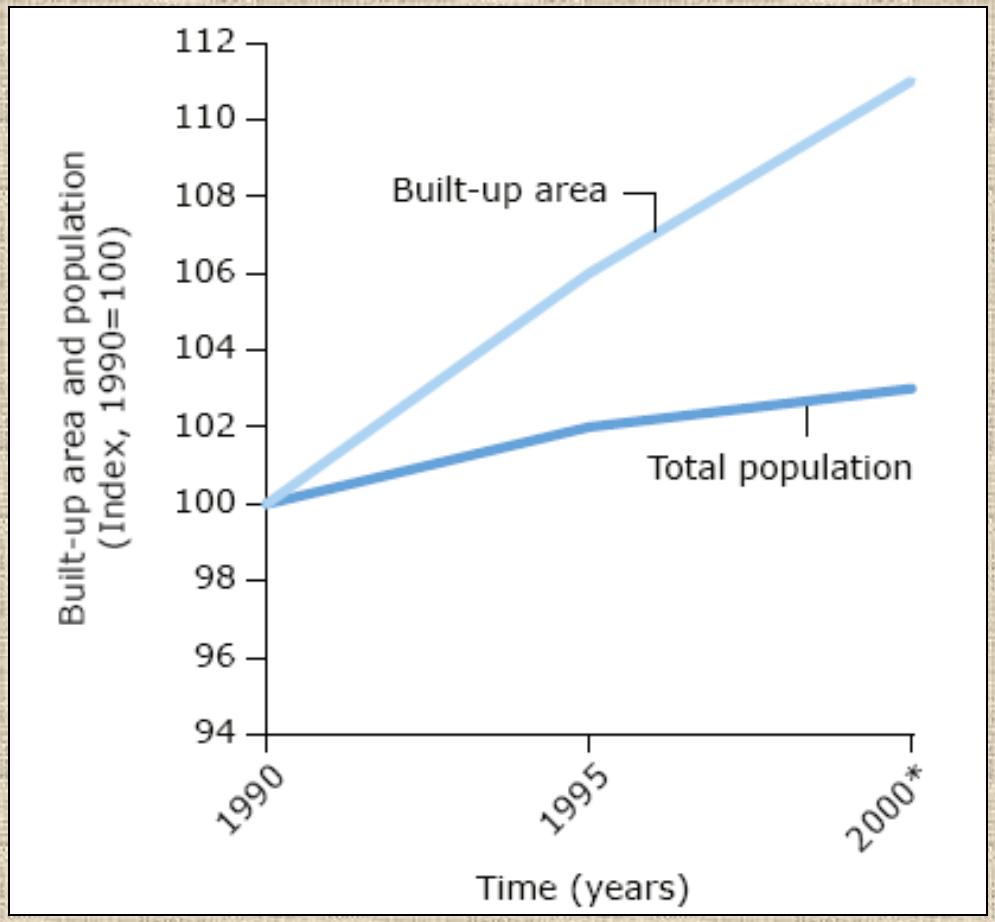
Why cities?

Urbanization trends

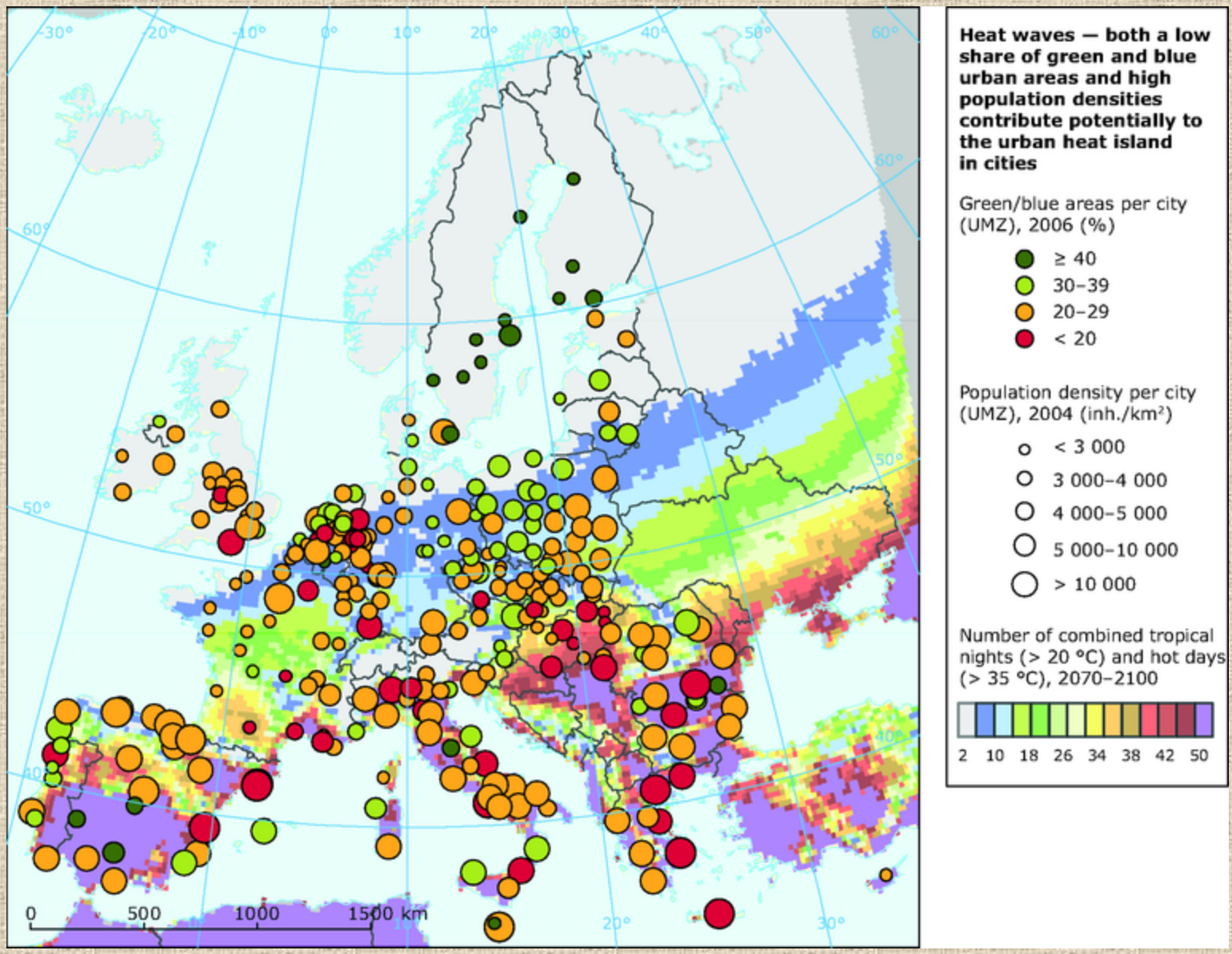


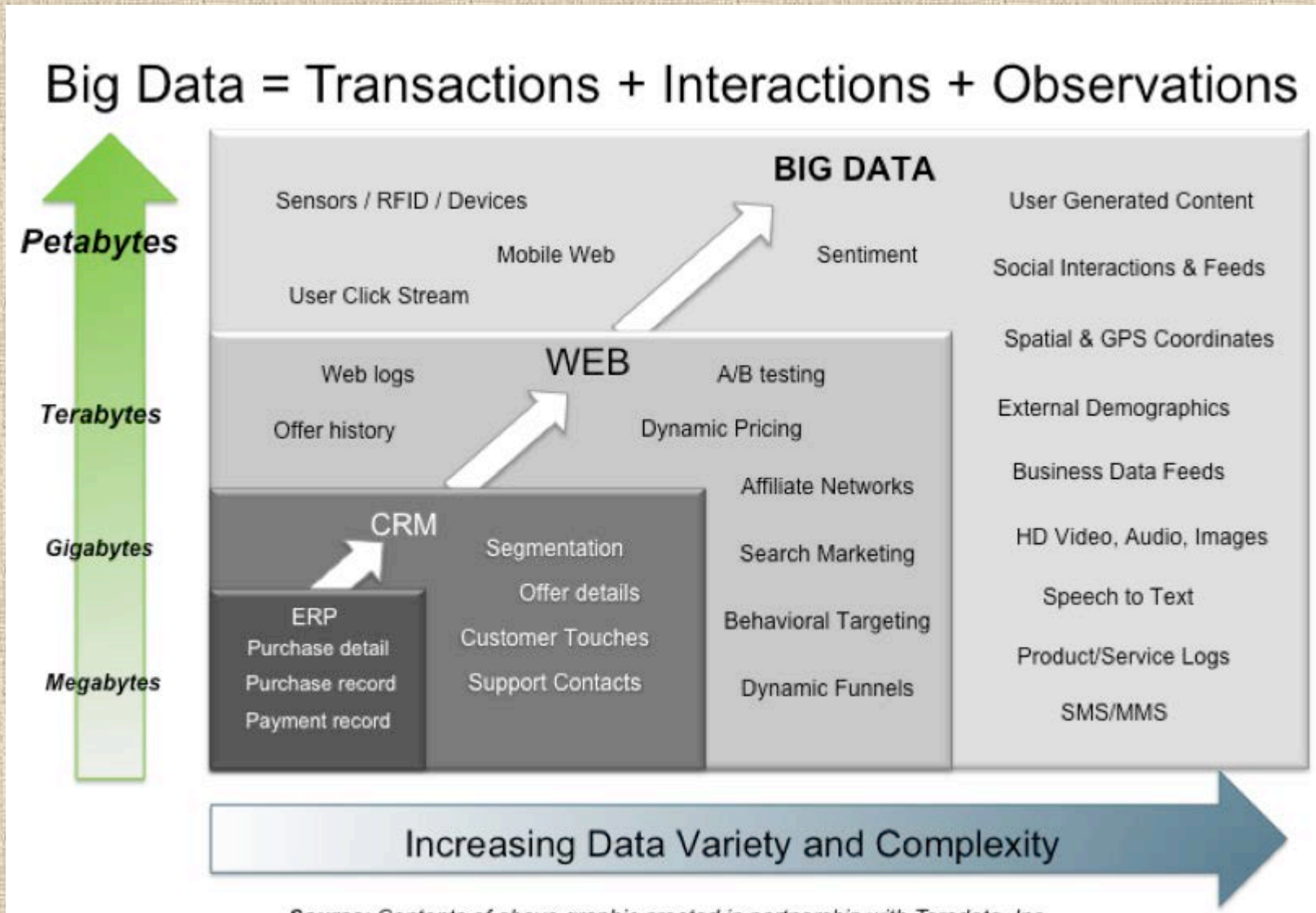
Source: EEA Signals

Urbanization trends

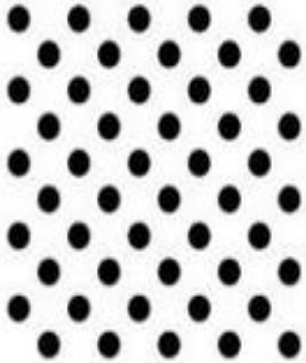
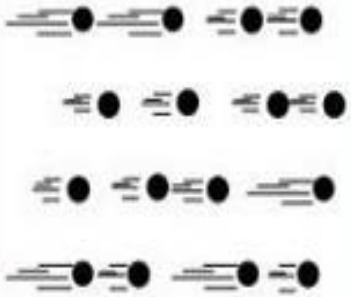
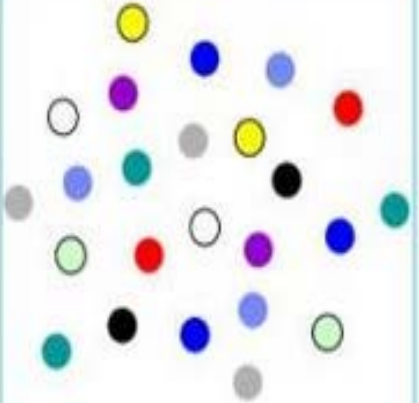


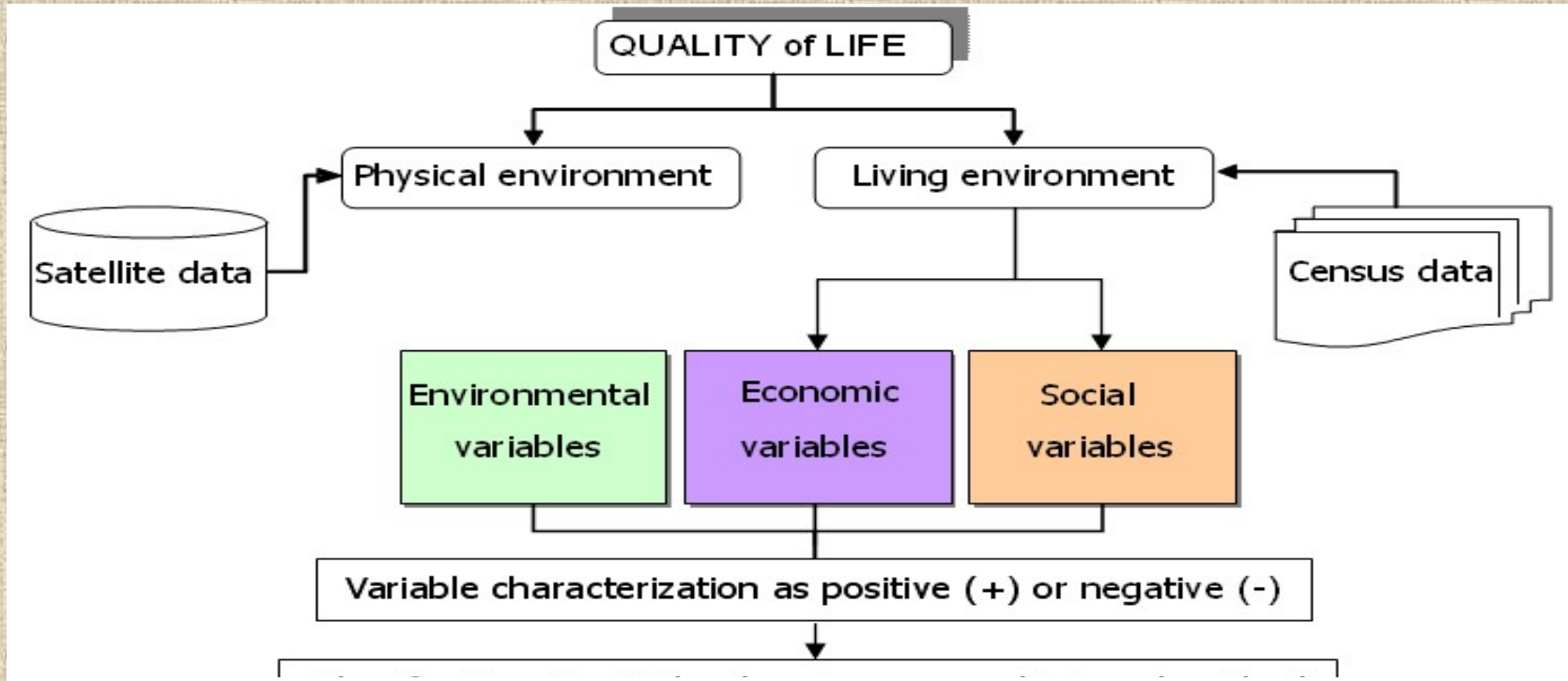
Source: EEA Signals 2004


-30°
-20°
-10°
0°
10°
20°
30°
40°
50°
60°
60°
50°
40°
20°
30°
0
500
1000
1500 km
Heat waves — both a low share of green and blue urban areas and high population densities contribute potentially to the urban heat island in cities
Green/blue areas per city (UMZ), 2006 (%)
≥ 40
30–39
20–29
< 20
Population density per city (UMZ), 2004 (inh./km²)
< 3 000
3 000–4 000
4 000–5 000
5 000–10 000
> 10 000
Number of combined tropical nights (> 20 °C) and hot days (> 35 °C), 2070–2100
2 10 18 26 34 38 42 50

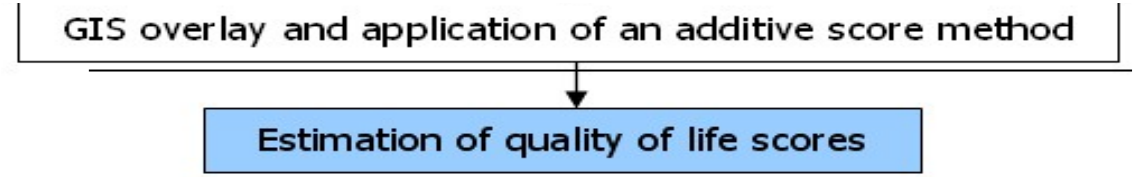


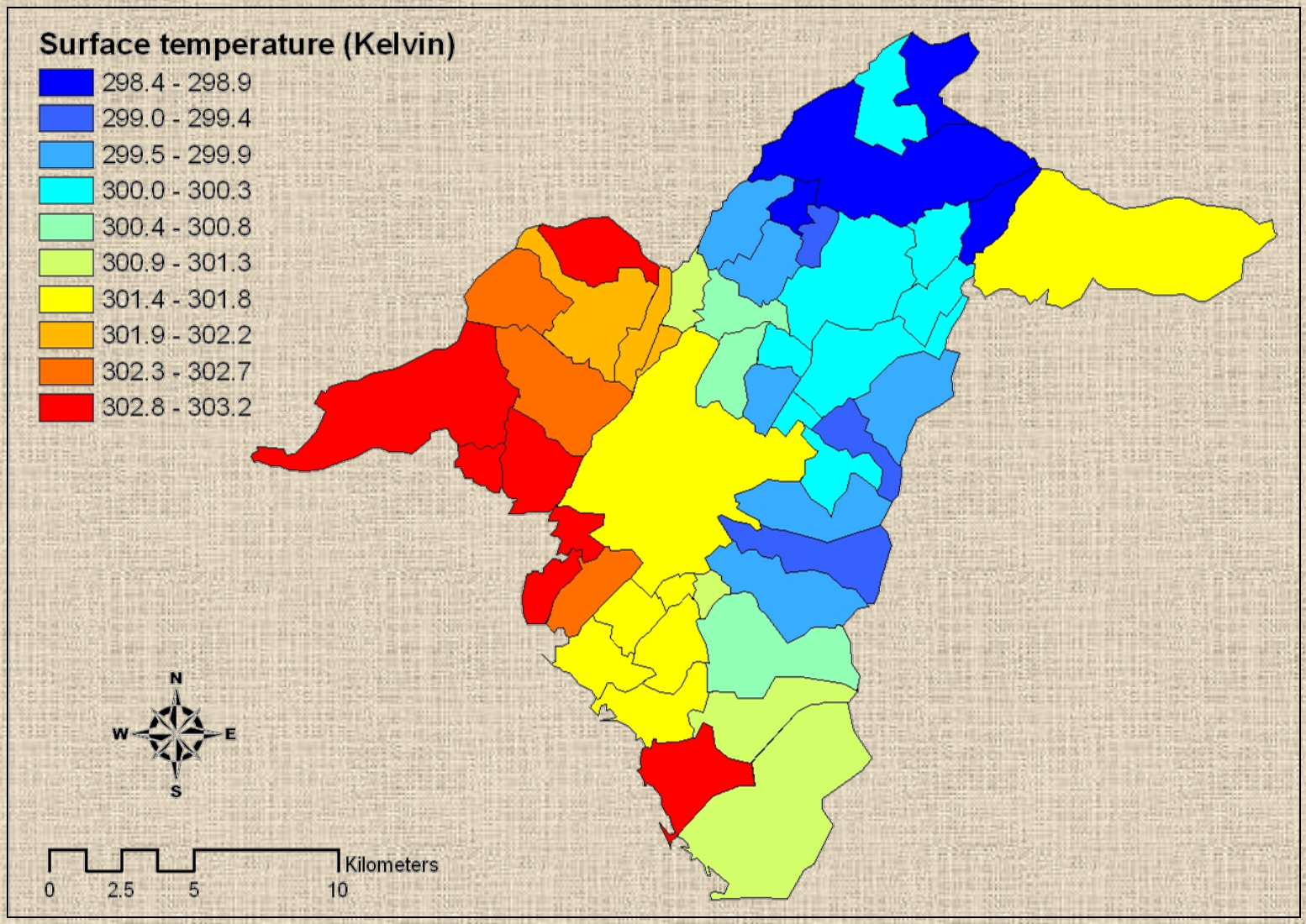
***Source**: Contents of above graphic created in partnership with Teradata, Inc.*

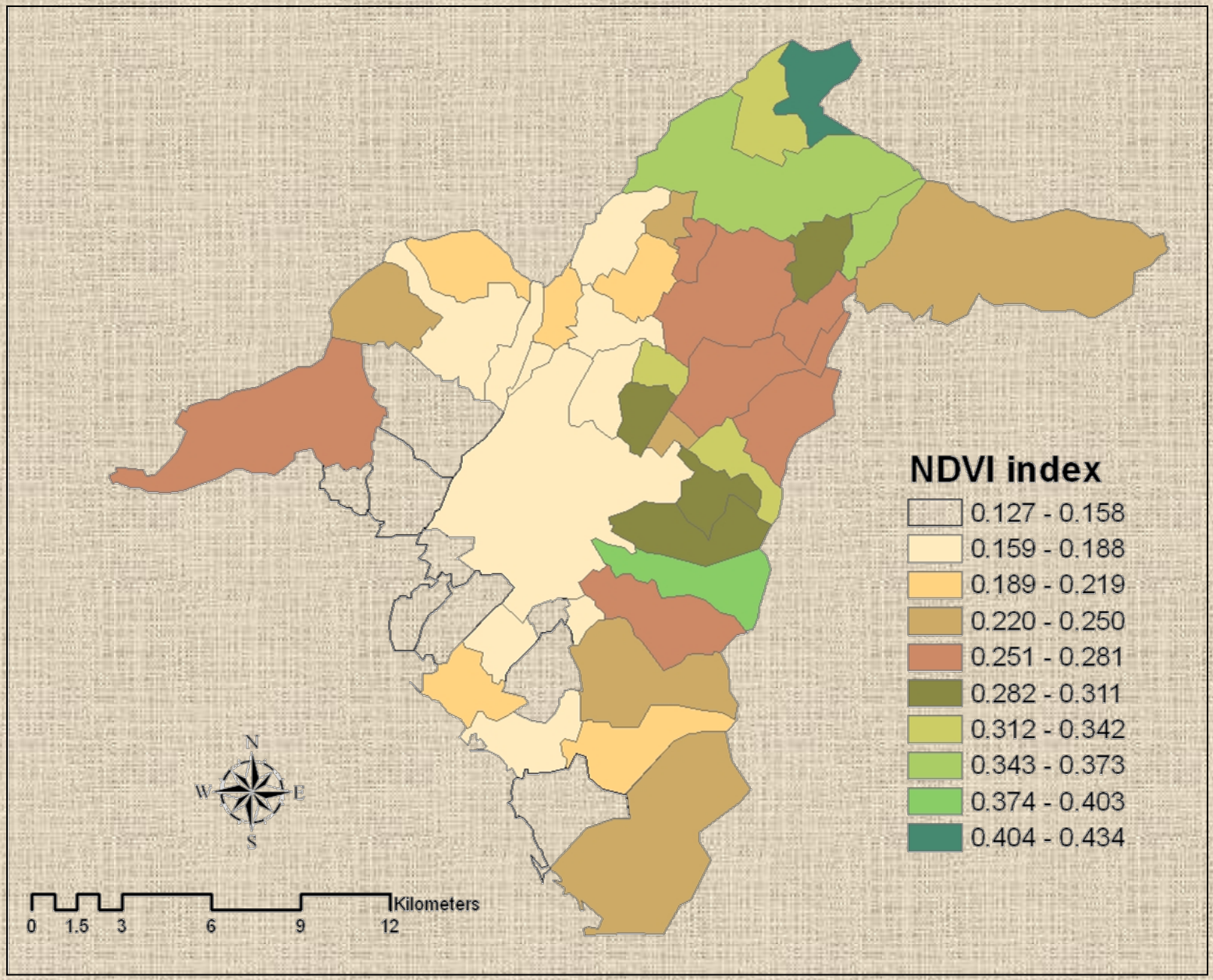
Volume	Velocity	Variety	Veracity*
			
Data at Rest	**Data in Motion**	**Data in Many Forms**	**Data in Doubt**
Terabytes to exabytes of existing data to process	Streaming data, milliseconds to seconds to respond	Structured, unstructured, text, multimedia	Uncertainty due to data inconsistency & incompleteness, ambiguities, latency, deception, model approximations

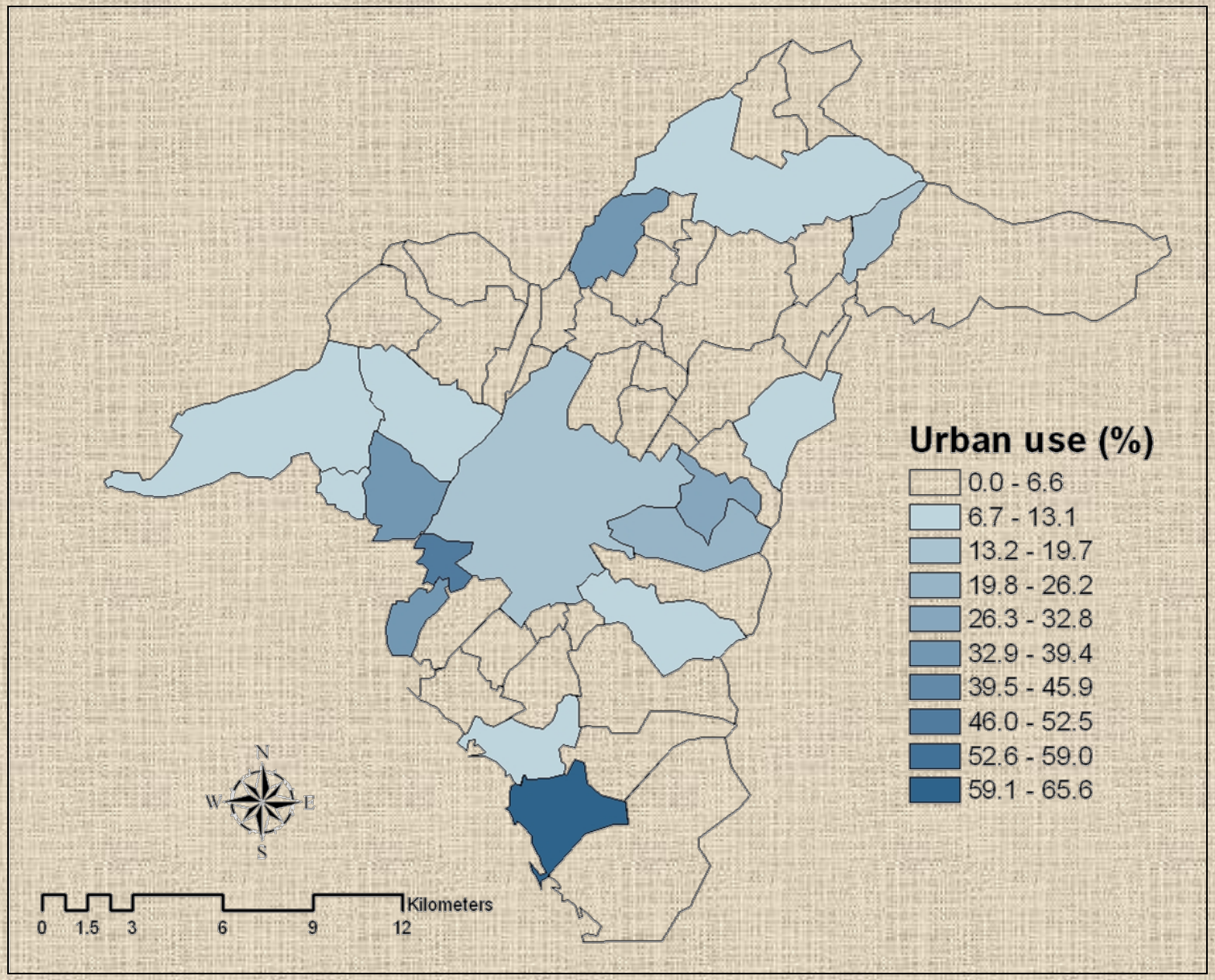


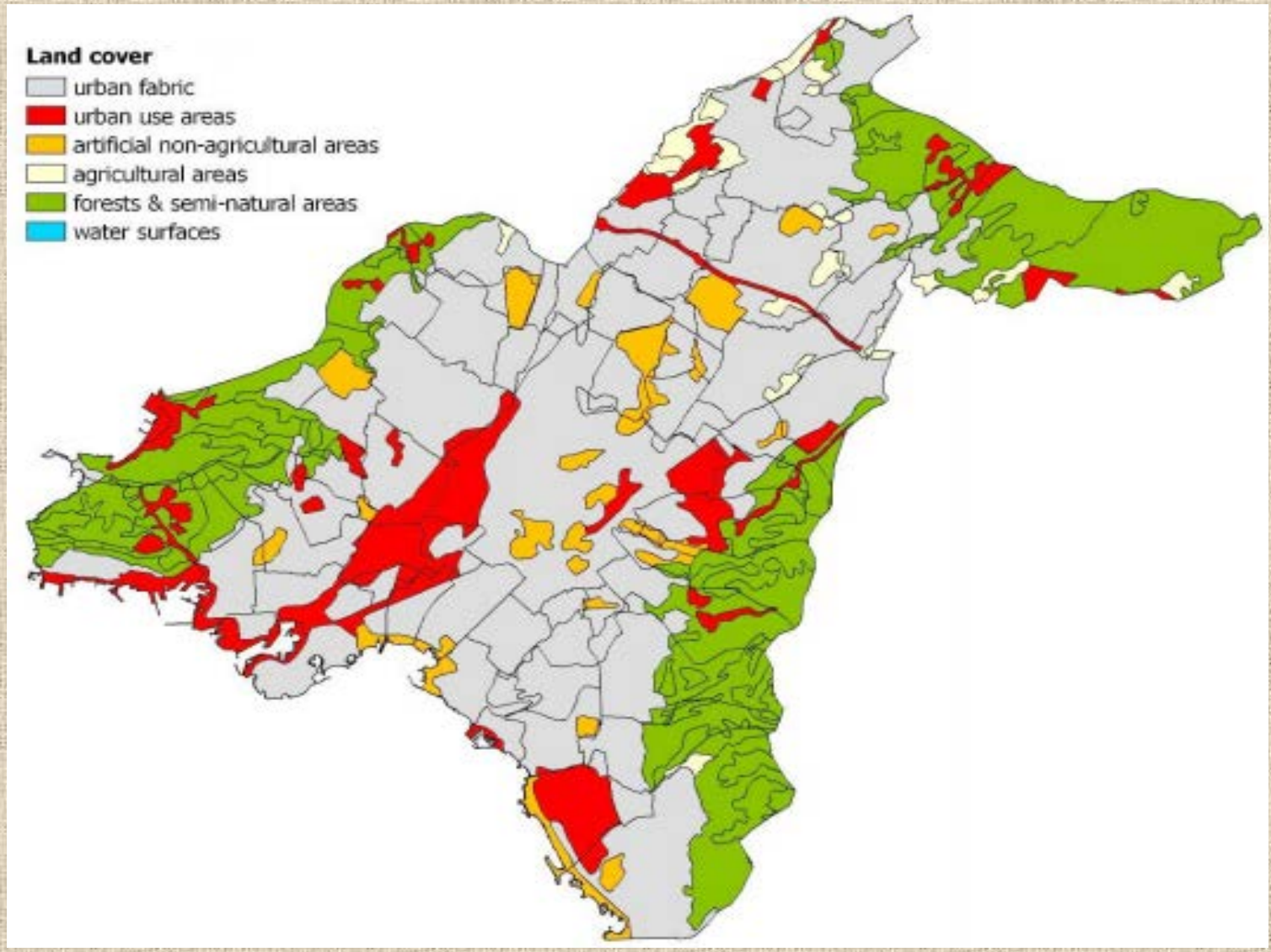
Each variable data are standardized resulting to z-scores, which are in turn added or subtracted according to the variable characterization. In this way, quality of life scores are estimated at municipality level.



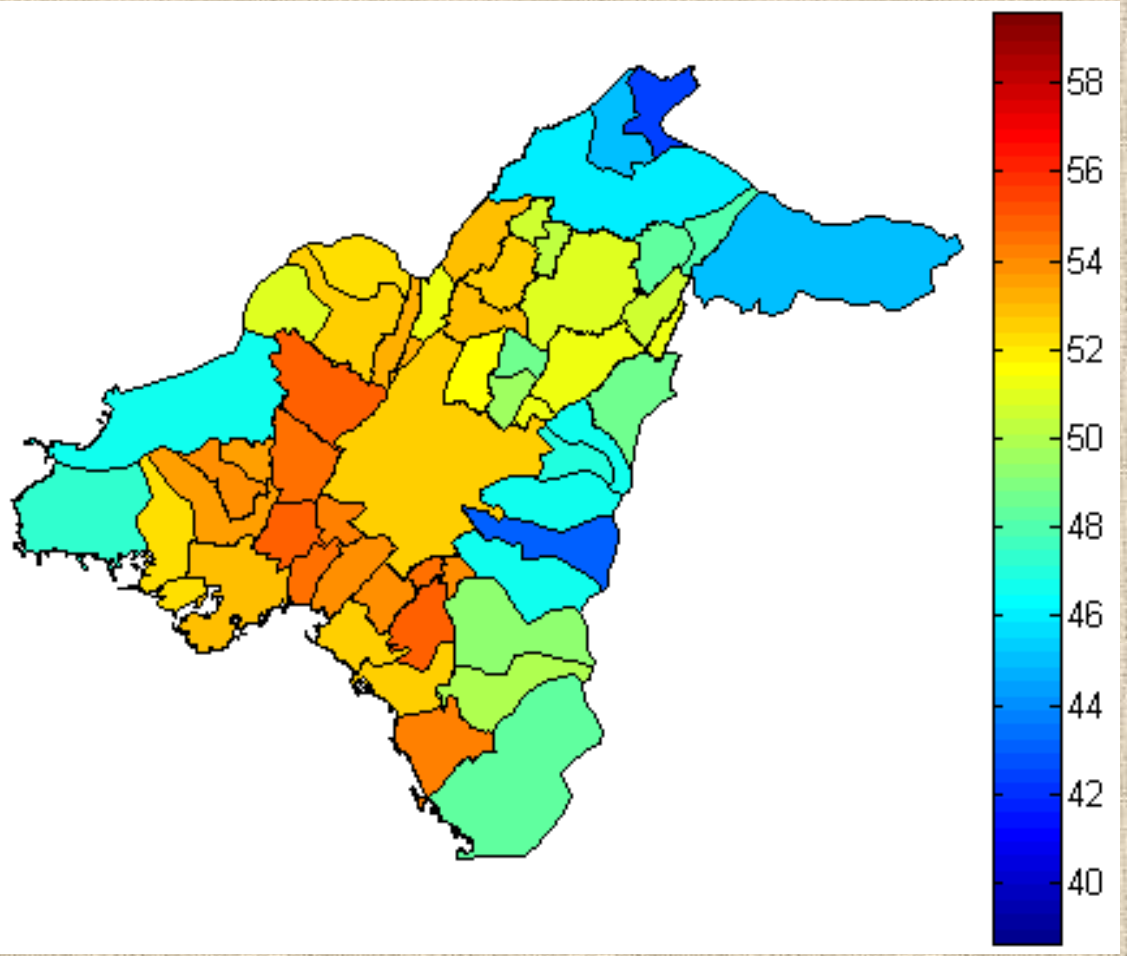

Surface temperature (Kelvin)
298.4 - 298.9
299.0 - 299.4
299.5 - 299.9
300.0 - 300.3
300.4 - 300.8
300.9 - 301.3
301.4 - 301.8
301.9 - 302.2
302.3 - 302.7
302.8 - 303.2
N
W
E
S
0
2.5
5
10
Kilometers


NDVI index
0.127 - 0.158
0.159 - 0.188
0.189 - 0.219
0.220 - 0.250
0.251 - 0.281
0.282 - 0.311
0.312 - 0.342
0.343 - 0.373
0.374 - 0.403
0.404 - 0.434
N
W
E
S
0 1.5 3 6 9 12
Kilometers

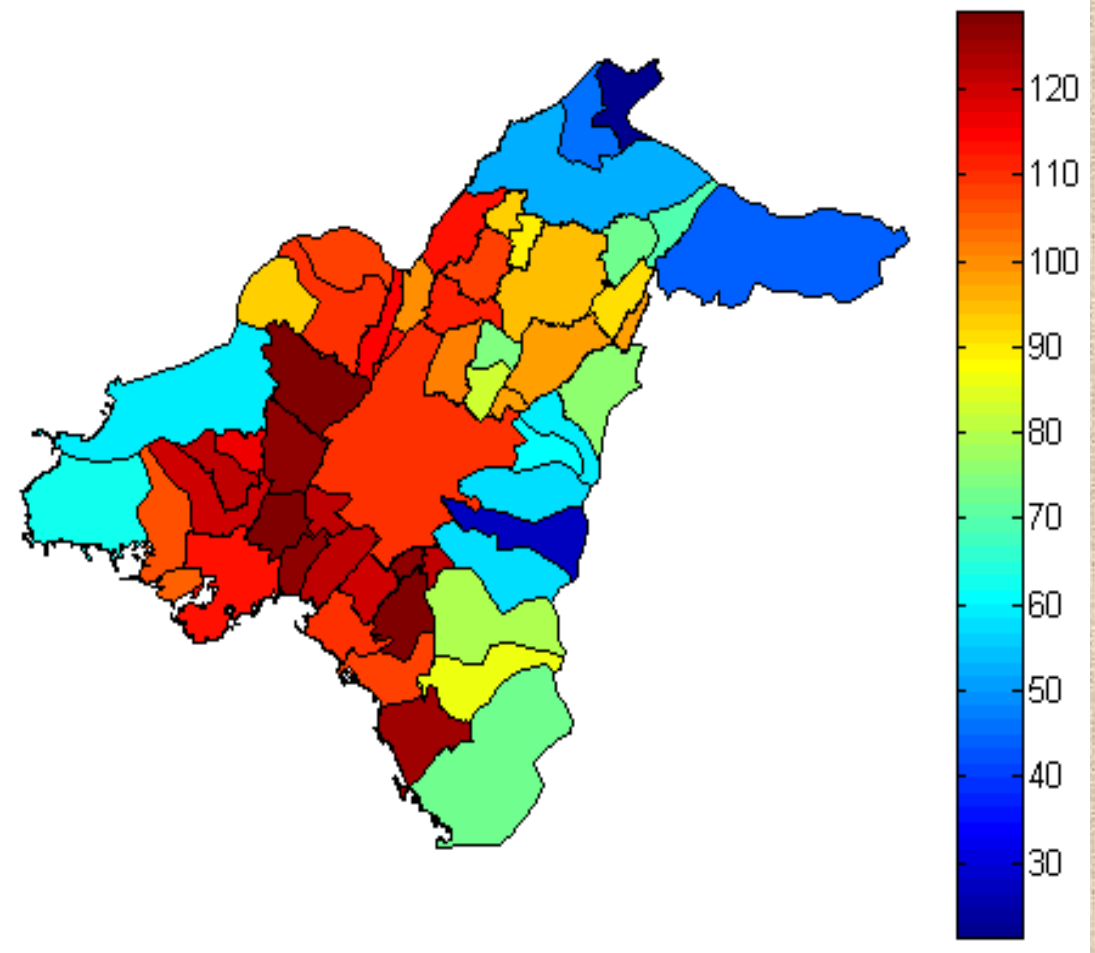

Urban use (%)
0.0 - 6.6
6.7 - 13.1
13.2 - 19.7
19.8 - 26.2
26.3 - 32.8
32.9 - 39.4
39.5 - 45.9
46.0 - 52.5
52.6 - 59.0
59.1 - 65.6
N
W
E
S
0 1.5 3 6 9 12
Kilometers

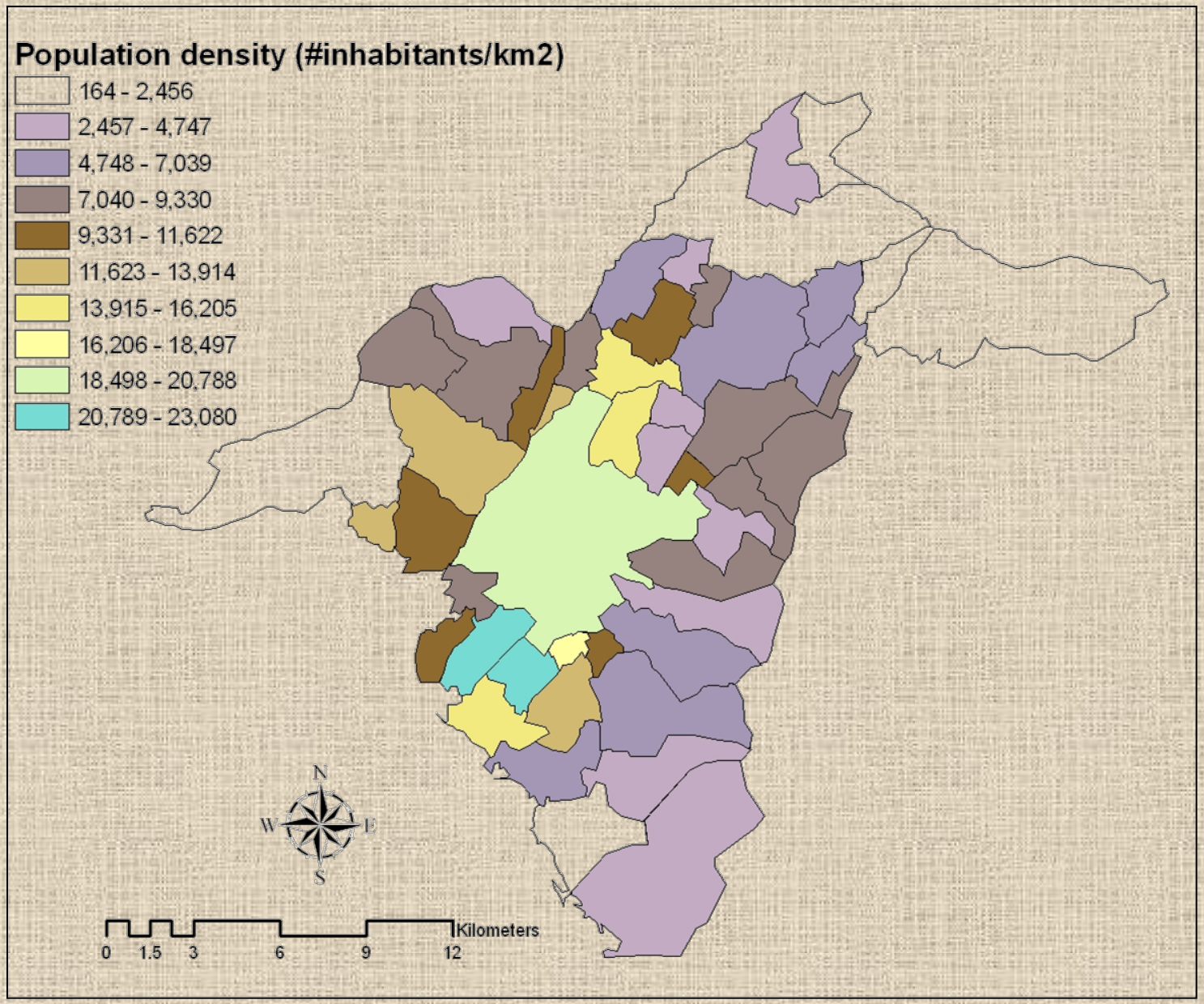

Land cover
urban fabric
urban use areas
artificial non-agricultural areas
agricultural areas
forests & semi-natural areas
water surfaces

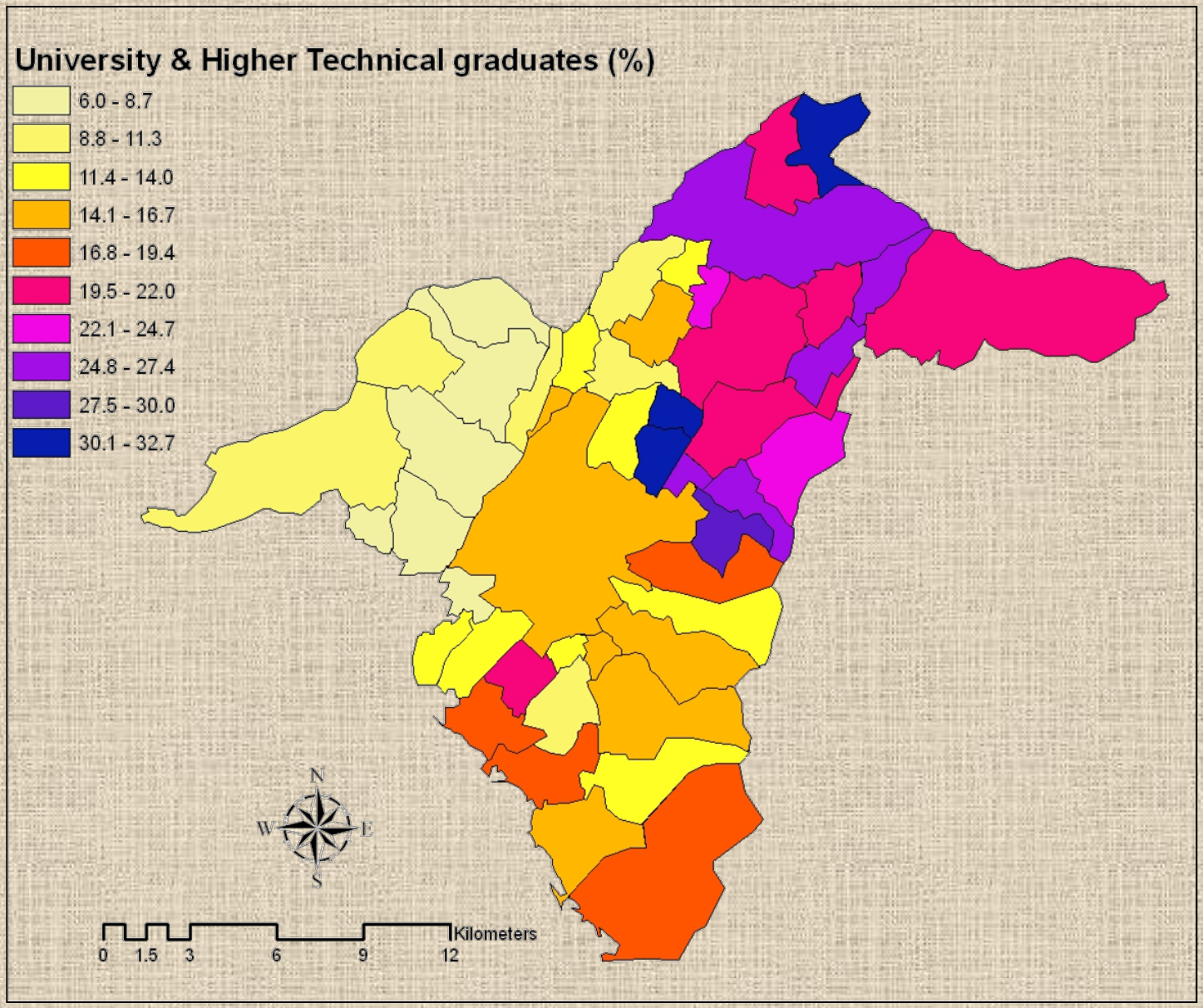
Suspended particles (μgr/m³)

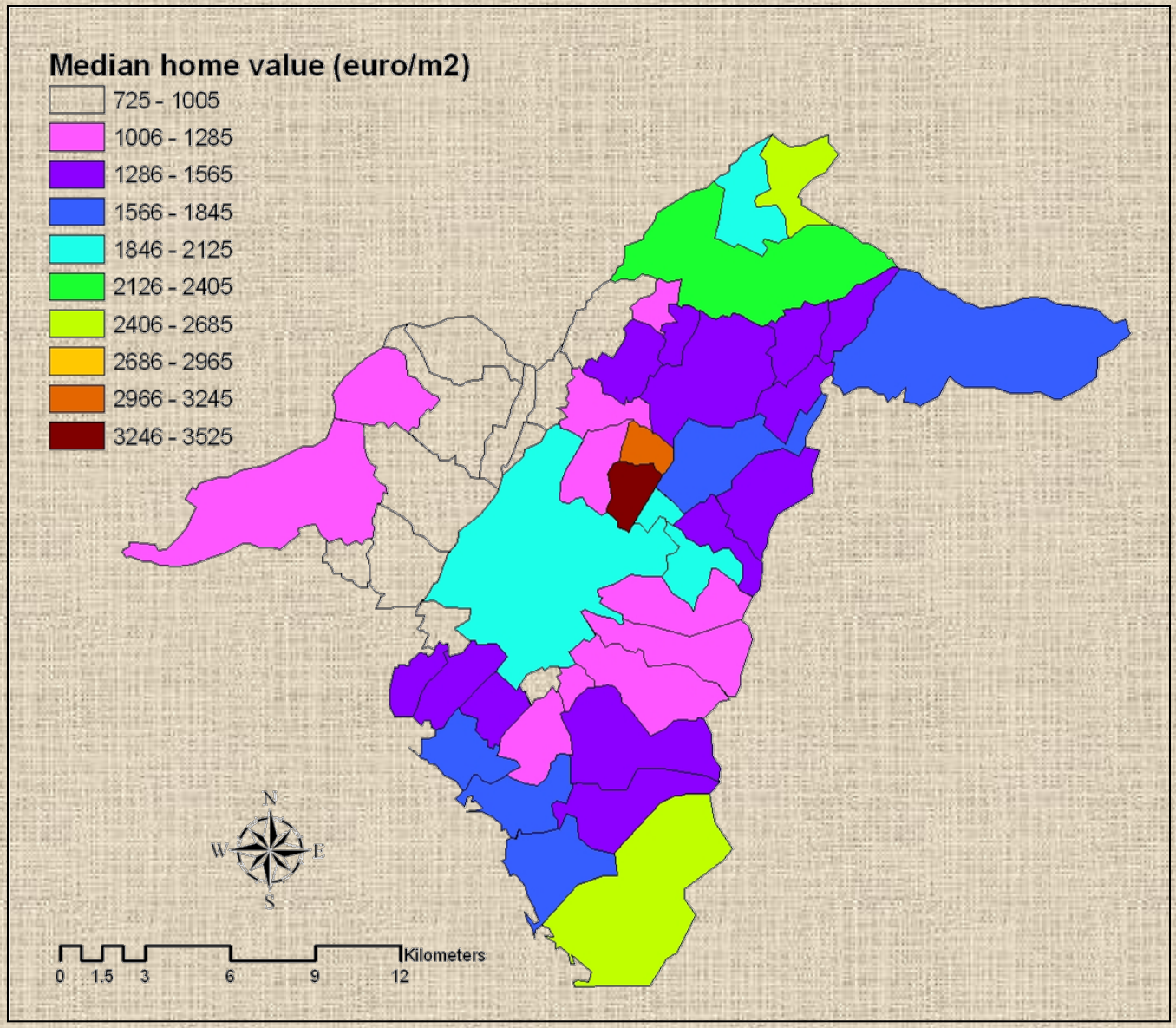


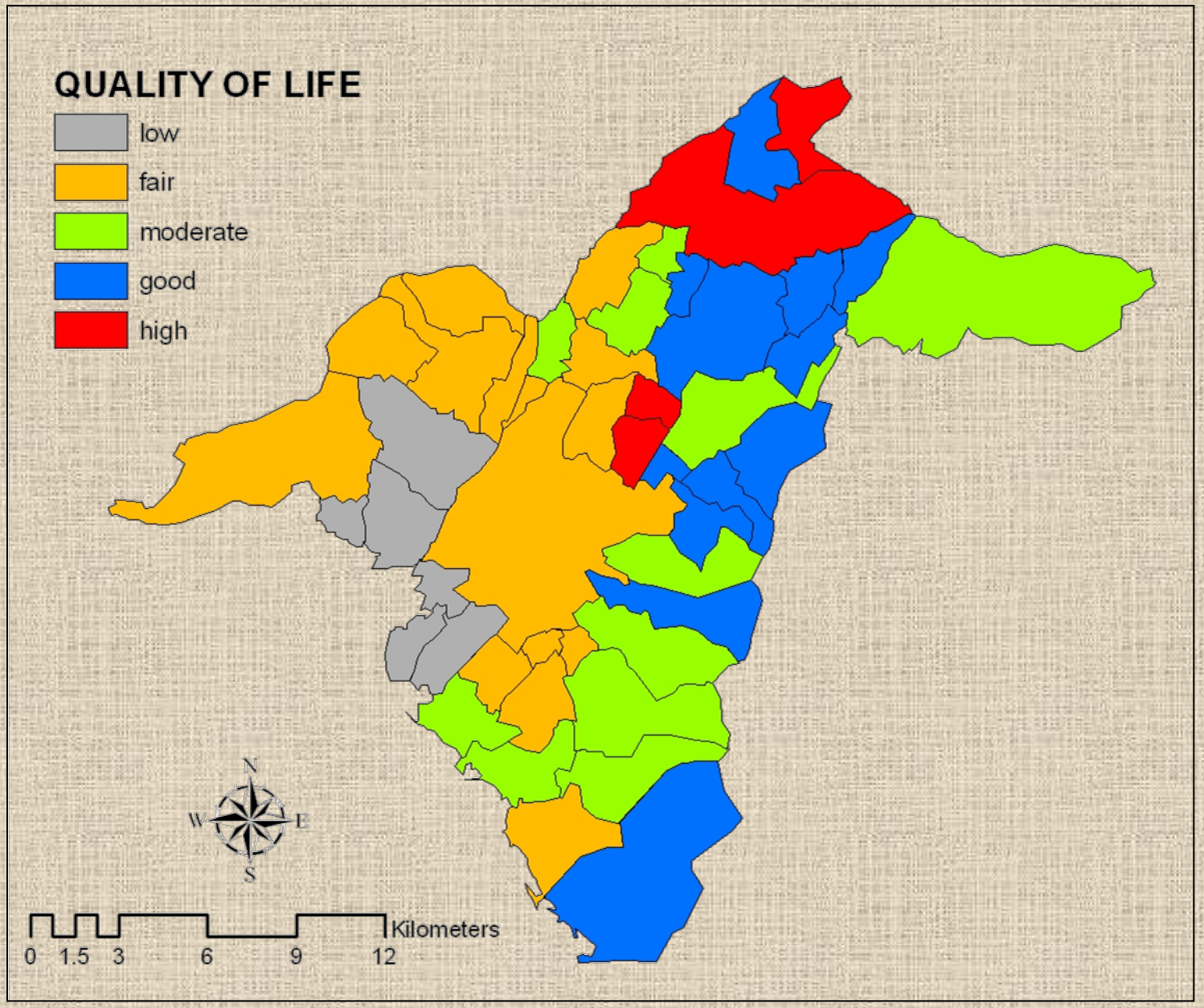
Mortality (per 10,000 inhabitants)

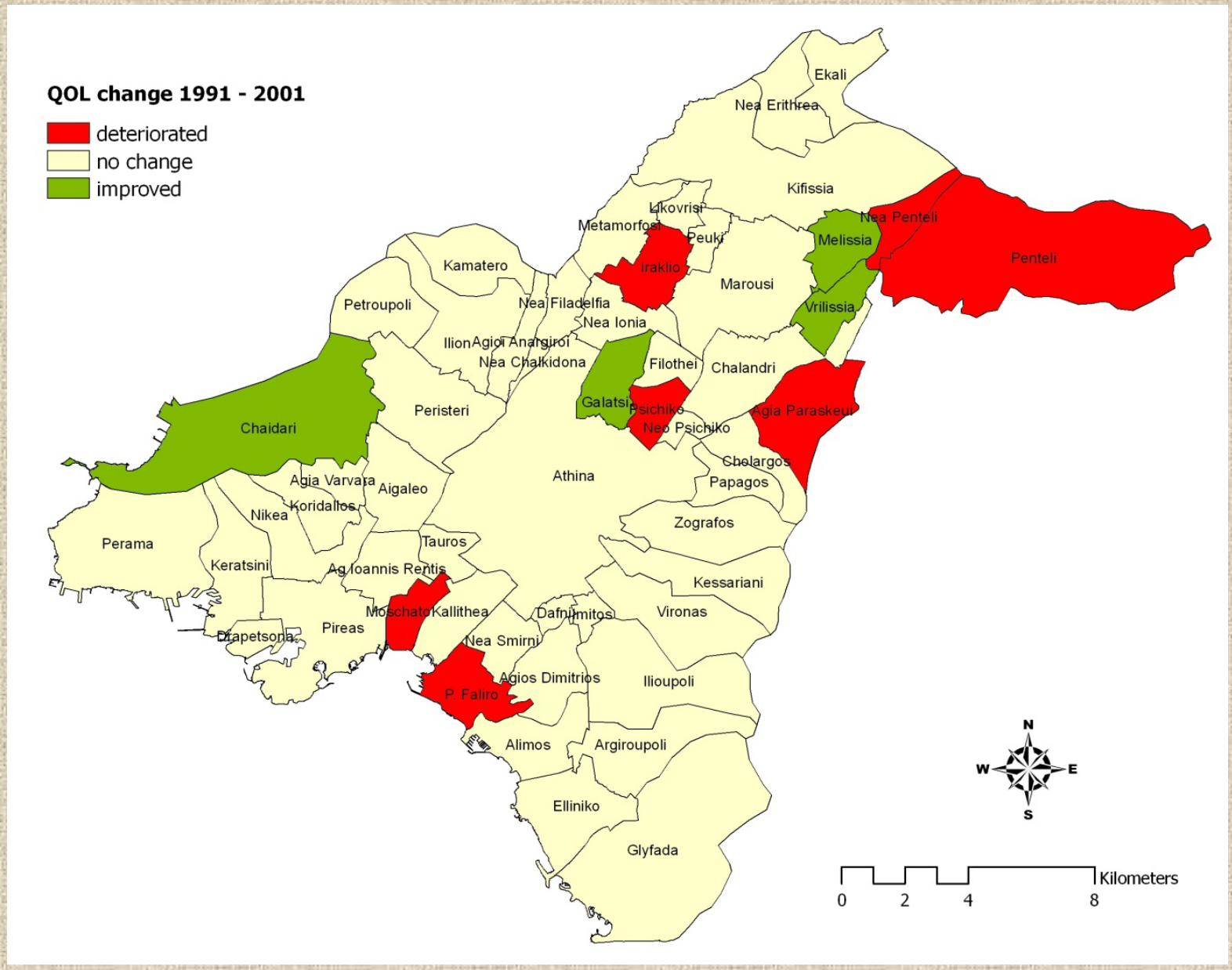



Population density (#inhabitants/km2)
164 - 2,456
2,457 - 4,747
4,748 - 7,039
7,040 - 9,330
9,331 - 11,622
11,623 - 13,914
13,915 - 16,205
16,206 - 18,497
18,498 - 20,788
20,789 - 23,080
N
W
E
S
0 1.5 3 6 9 12
Kilometers

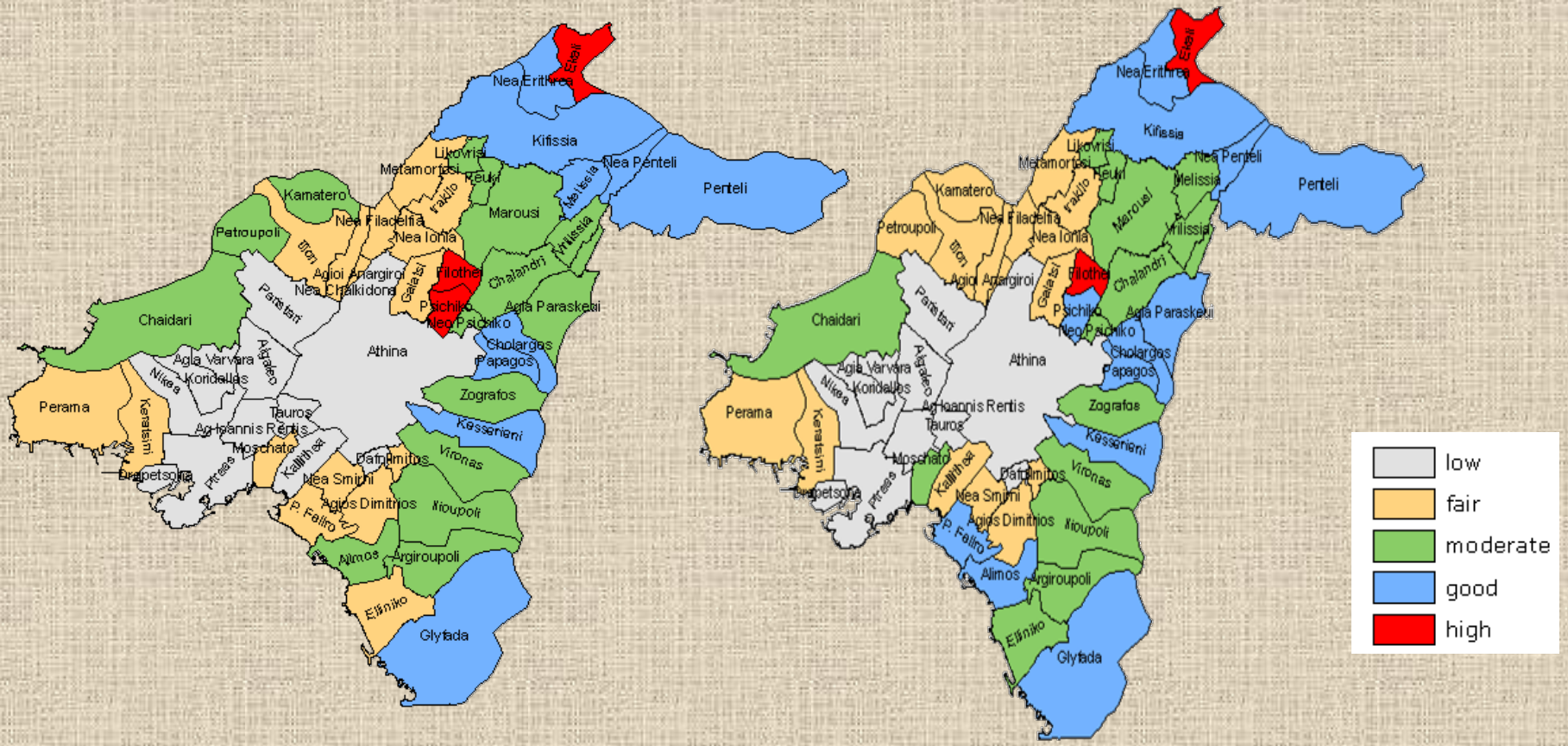

University & Higher Technical graduates (%)
6.0 - 8.7
8.8 - 11.3
11.4 - 14.0
14.1 - 16.7
16.8 - 19.4
19.5 - 22.0
22.1 - 24.7
24.8 - 27.4
27.5 - 30.0
30.1 - 32.7
N
W
E
S
0 1.5 3 6 9 12
Kilometers


Median home value (euro/m2)
725 - 1005
1006 - 1285
1286 - 1565
1566 - 1845
1846 - 2125
2126 - 2405
2406 - 2685
2686 - 2965
2966 - 3245
3246 - 3525
N
W
E
S
0 1.5 3 6 9 12
Kilometers


QUALITY OF LIFE
low
fair
moderate
good
high
N
W
E
S
0 1.5 3 6 9 12
Kilometers


QOL change 1991 - 2001
deteriorated
no change
improved
Ekali
Nea Erithrea
Kifissia
Likovrisi
Metamorfosi
Peuki
Nea Penteli
Melissia
Penteli
Iraklio
Marousi
Kamatero
Petroupoli
Nea Filadelfia
Nea Ionia
Vrilissia
Ilion
Agioi Anargiroi
Nea Chalkidona
Filothei
Chalandri
Galatsi
Psichiko
Agia Paraskevi
Neo Psichiko
Peristeri
Chaidari
Cholargos
Athina
Papagos
Agia Varvara
Aigaleo
Koridallos
Nikea
Zografos
Perama
Tauros
Keratsini
Ag Ioannis Rentis
Kessariani
Moschato
Kallithea
Dafni
Imitos
Vironas
Drapetsona
Pireas
Nea Smirni
Agios Dimitrios
Ilioupoli
P. Faliro
Alimos
Argiroupoli
Elliniko
Glyfada
N
W
E
S
Kilometers
0
2
4
8

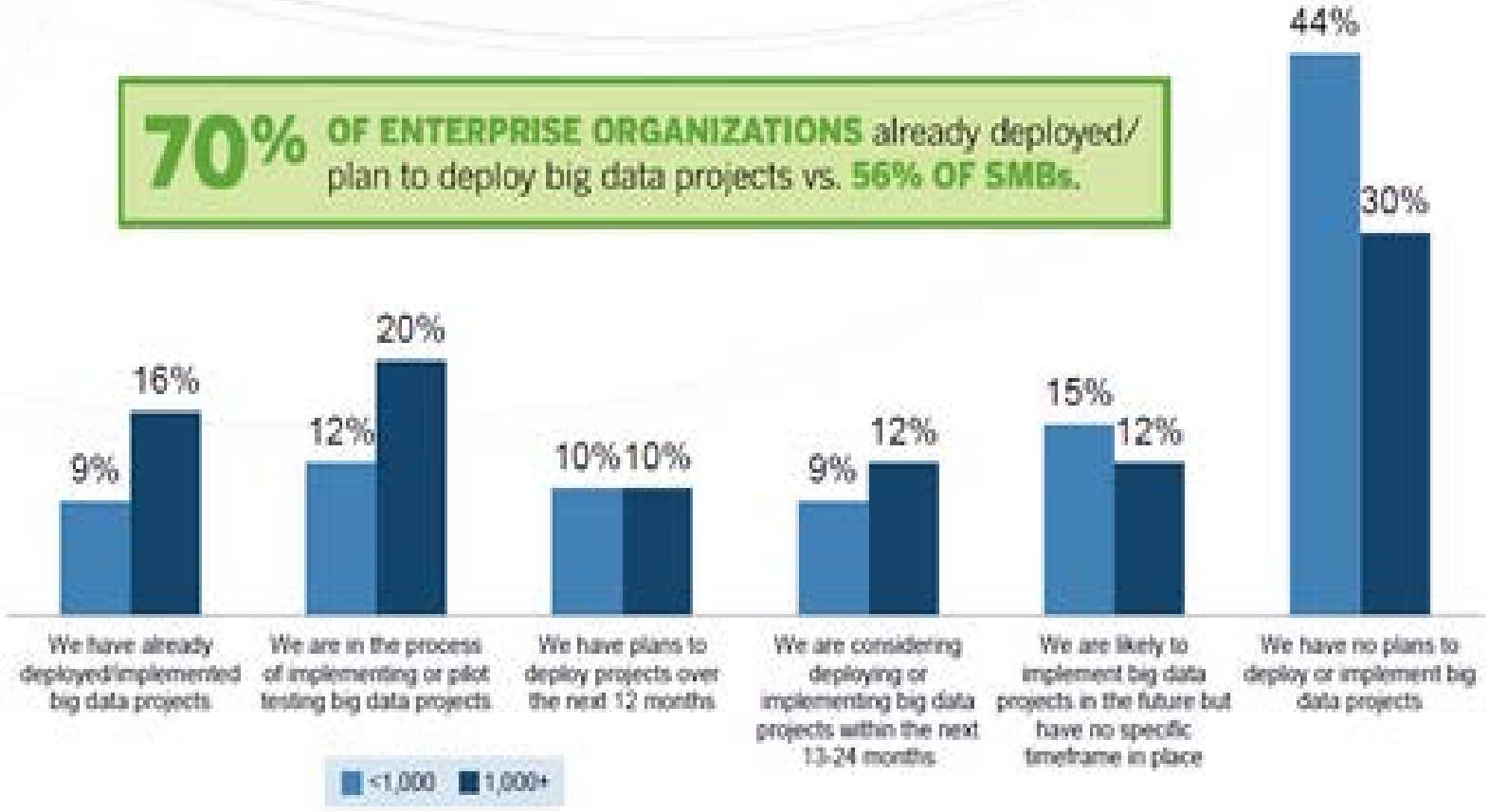
QOL change (2003-2005)



Enterprises Ahead in Big Data Initiatives

IDG Enterprise
An IDG Communications Company

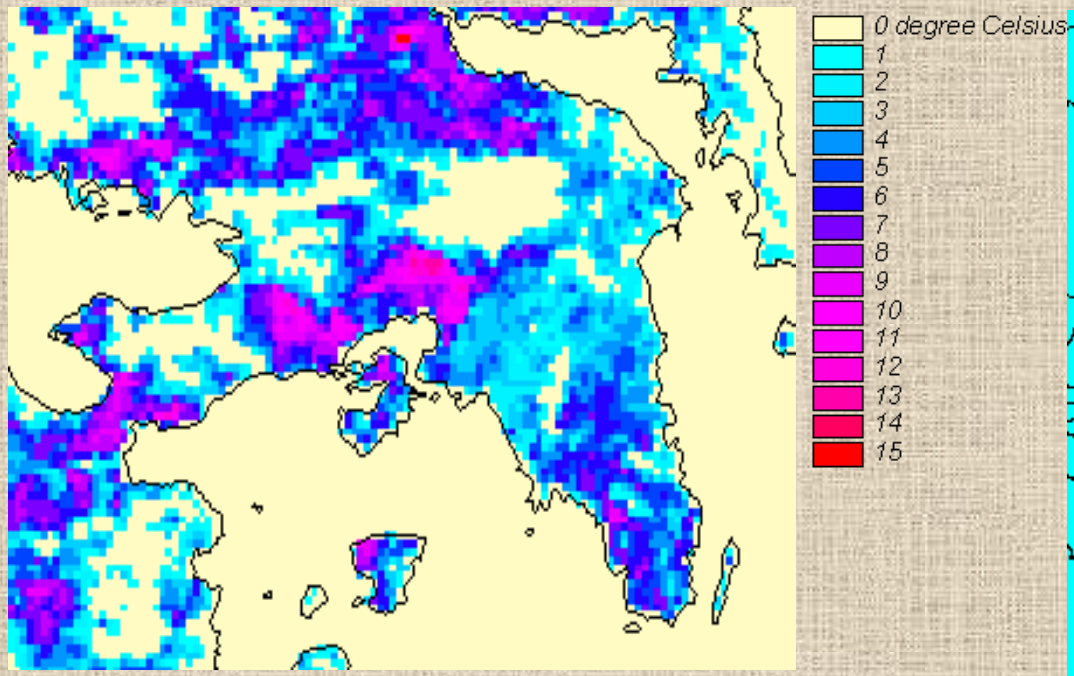
70% **OF ENTERPRISE ORGANIZATIONS** already deployed/ plan to deploy big data projects vs. **56% OF SMBs.**



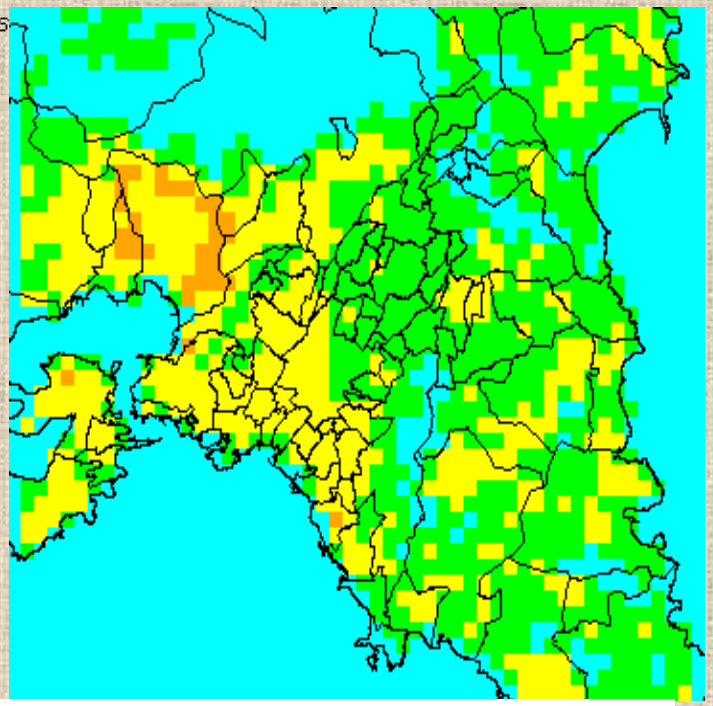
Q Is your company currently implementing, planning or considering projects (i.e. devising strategies and projects to generate more value from existing data)?

Next phase

Cooling degree days



Thermal discomfort



DI classification

Class_Names

- No discomfort
- Under 50% population feels discomfort
- Over 50% population feels discomfort
- Most of population suffers discomfort
- Everyone feels severe discomfort
- State of medical emergency

Free, open and full internet-based access to Sentinel data provides the necessary foundation for EO based **services to citizens** and will increasingly enable service providers to optimize such services through composite indicators and easy to follow visualization.

Services may support citizens' involvement through the provision – by the citizens – of localised information supportive for the estimation and/or validation of the composite indicator.

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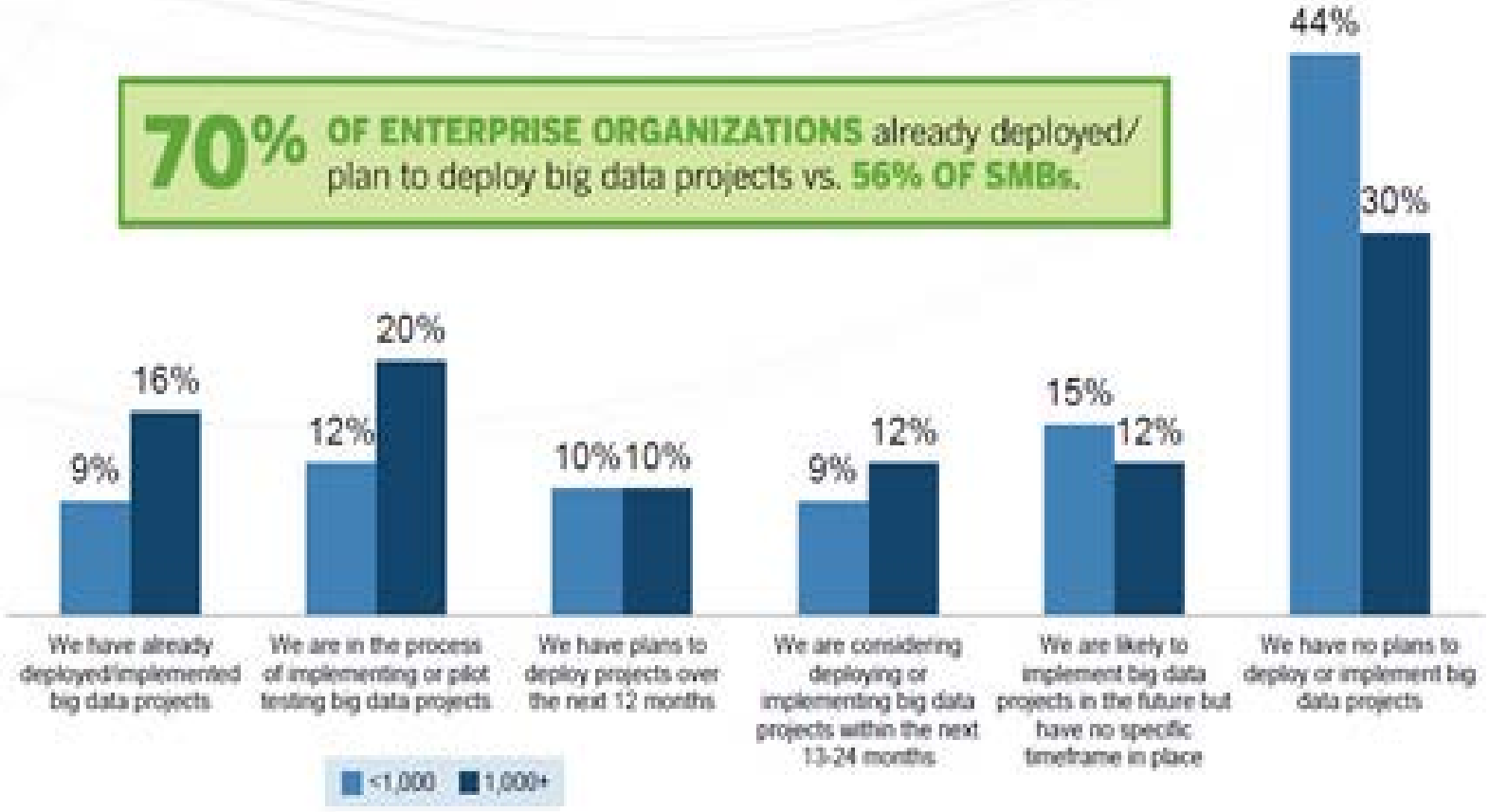

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