Delimitation of Potential Strategic Urban Horizons (PUSHs)

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RRG

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Presentation

- **Polycentric Development and Functional Urban Areas**

- Delimitation Approach
- Isochrones, Municipalities and Settlement Structures
- Policy Relevance

2

Polycentric Development

- Promotion of a *balanced polycentric urban system* is one of the most frequently cited *policy objectives* of the ESDP.

- Although polycentricism is widely discussed, there is *no common understanding of all its meaning*.

- Polycentricism is often spatially *operationalised* by the concept of *Functional Urban Areas* (travel-to-work-areas, commuting zones etc.).

- Many countries do have *delimitations* of these areas, but all of them are using *different sets of criteria* and thresholds.

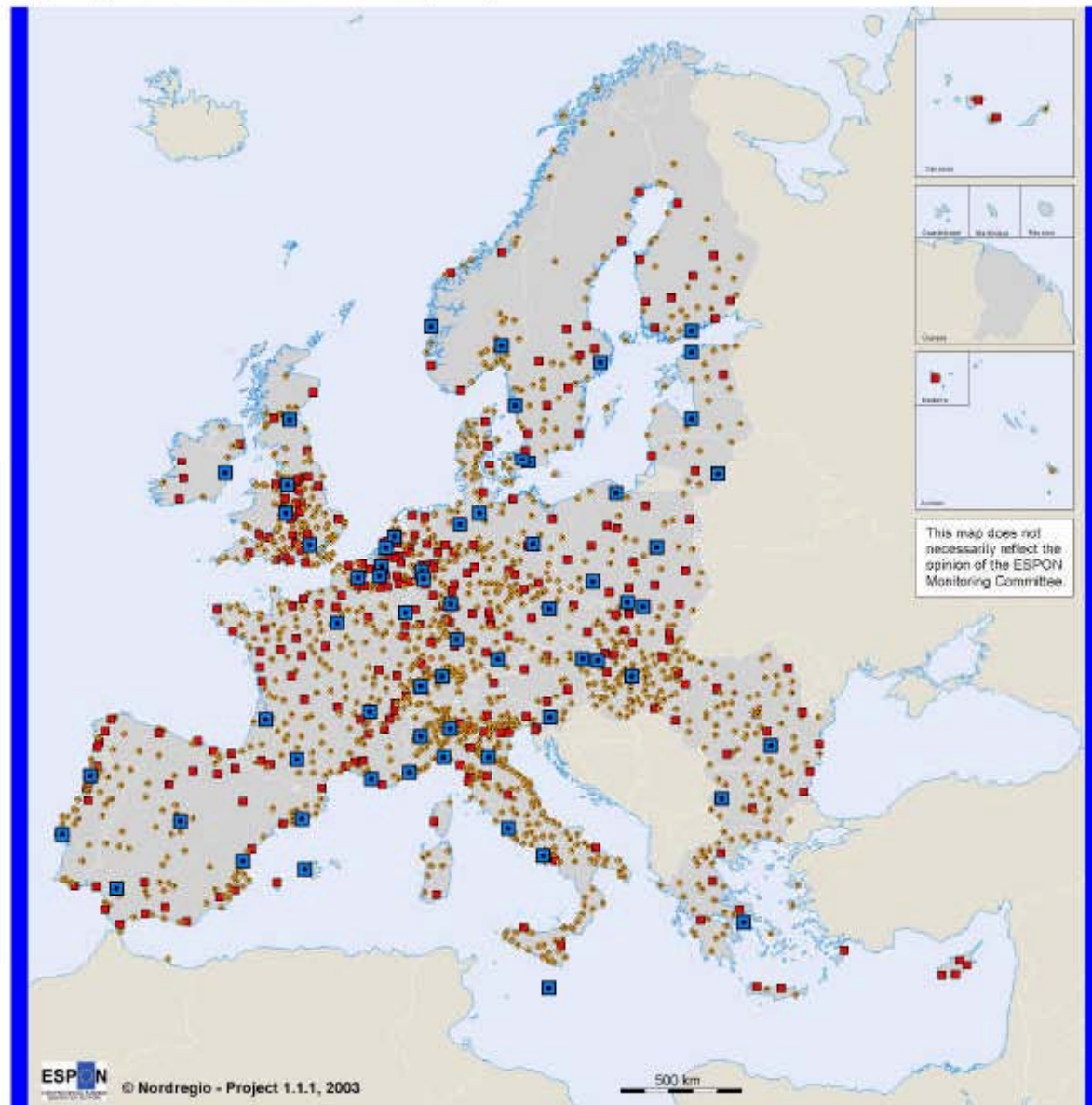- Objectives: *delimitation* (using a harmonised set of criteria) and *analysis* of the FUAs.

Functional Urban Areas: Criteria applied

- FUA **population over 50,000 inhabitants** and urban **core with more than 15,000 inhabitants**.

- FUA population more than **0.5 % of national population** and urban core with more than 15,000 inhabitants.

- Inclusion of smaller FUAs if they had at least local **importance in transport, knowledge or decision-making functions** or regional importance in **administrative, tourism or industrial functions**.

4

Typology of FUAs

5

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6

Three Step Approach

1) *Car travel times* from functional centres of FUAs, and generation of *45-minute isochrones*.

2) *Approximation of isochrones to municipality boundaries*. Each municipality whose territory was overlaid by isochrones of at least 10 % was considered part of the PUSH.

3) Overlay of the PUSH with **settlement areas** (CORINE) to analyse internal settlement patterns (*monocentric vs. polycentric settlement structures*).

Pan-European data used

- ESPON 1.1.1 Functional Urban Areas (centres)

- ESPON 1.1.1 NUTS-5 layer (municipalities)

- RRG GIS Database: Road network

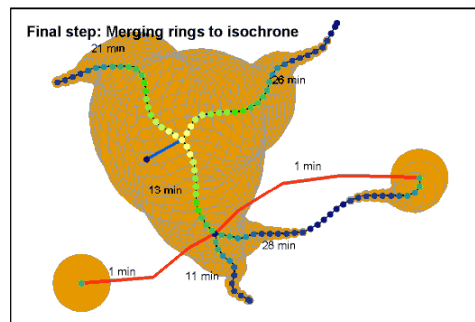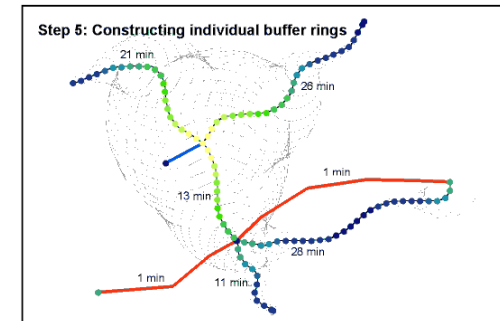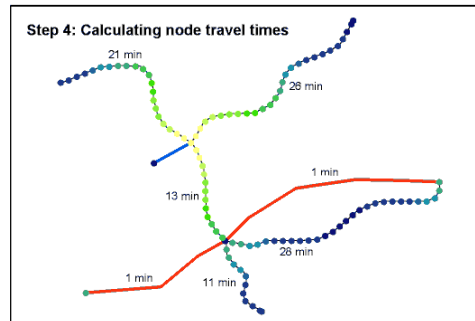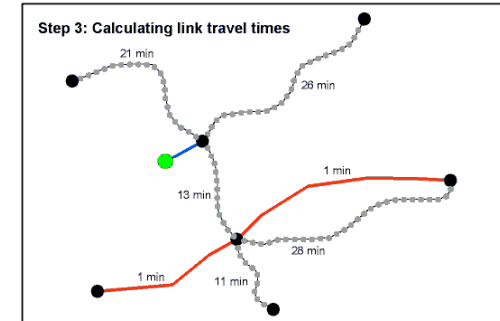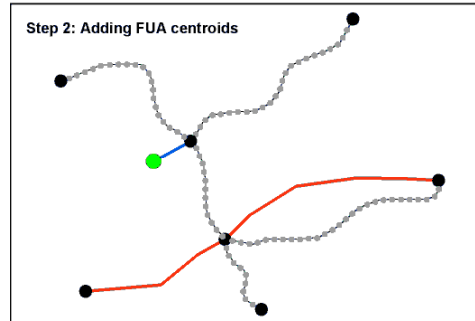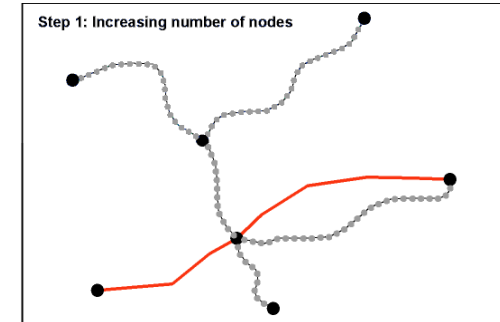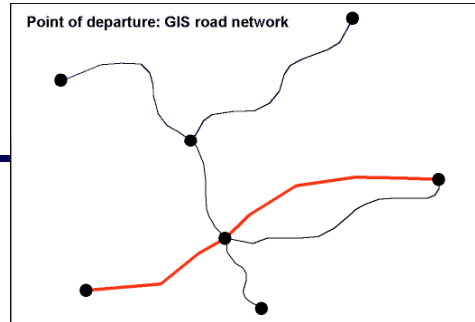- CORINE land cover and land use (settlement areas)

8

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Construction

Point of departure: GIS road network

Step 1: Increasing number of nodes

Step 2: Adding FUA centroids

Step 3: Calculating link travel times

21 min
26 min
1 min
13 min
1 min
28 min
1 min
11 min

Step 4: Calculating node travel times

21 min
26 min
1 min
13 min
1 min
28 min
1 min
11 min

Step 5: Constructing individual buffer rings

21 min
26 min
1 min
13 min
1 min
28 min
1 min
11 min

Final step: Merging rings to isochrone

21 min
26 min
1 min
13 min
1 min
28 min
1 min
11 min

Key

— Motorway, dual-carriageway
— Other roads
— Access link
   Individual buffer rings around nodes
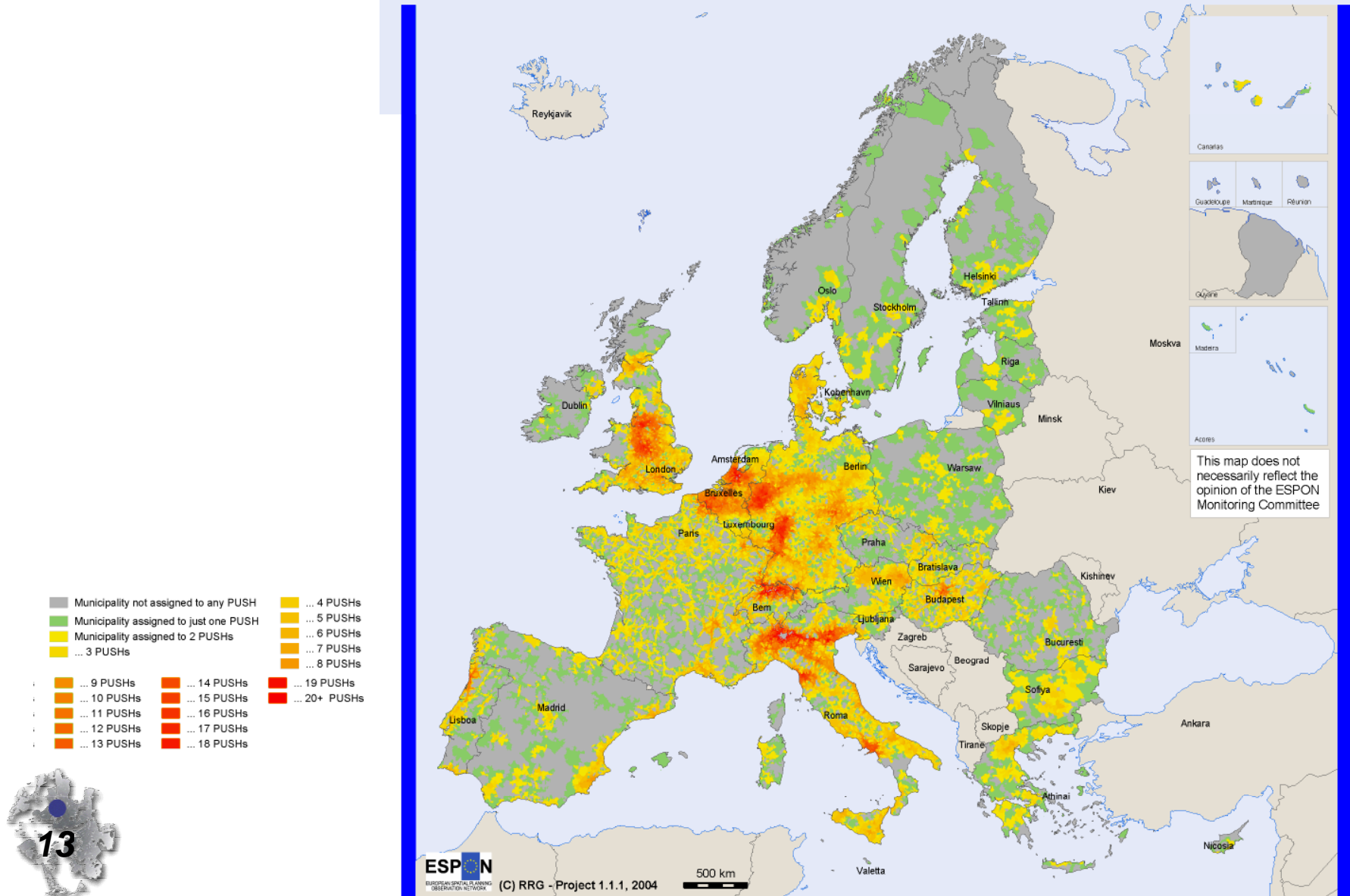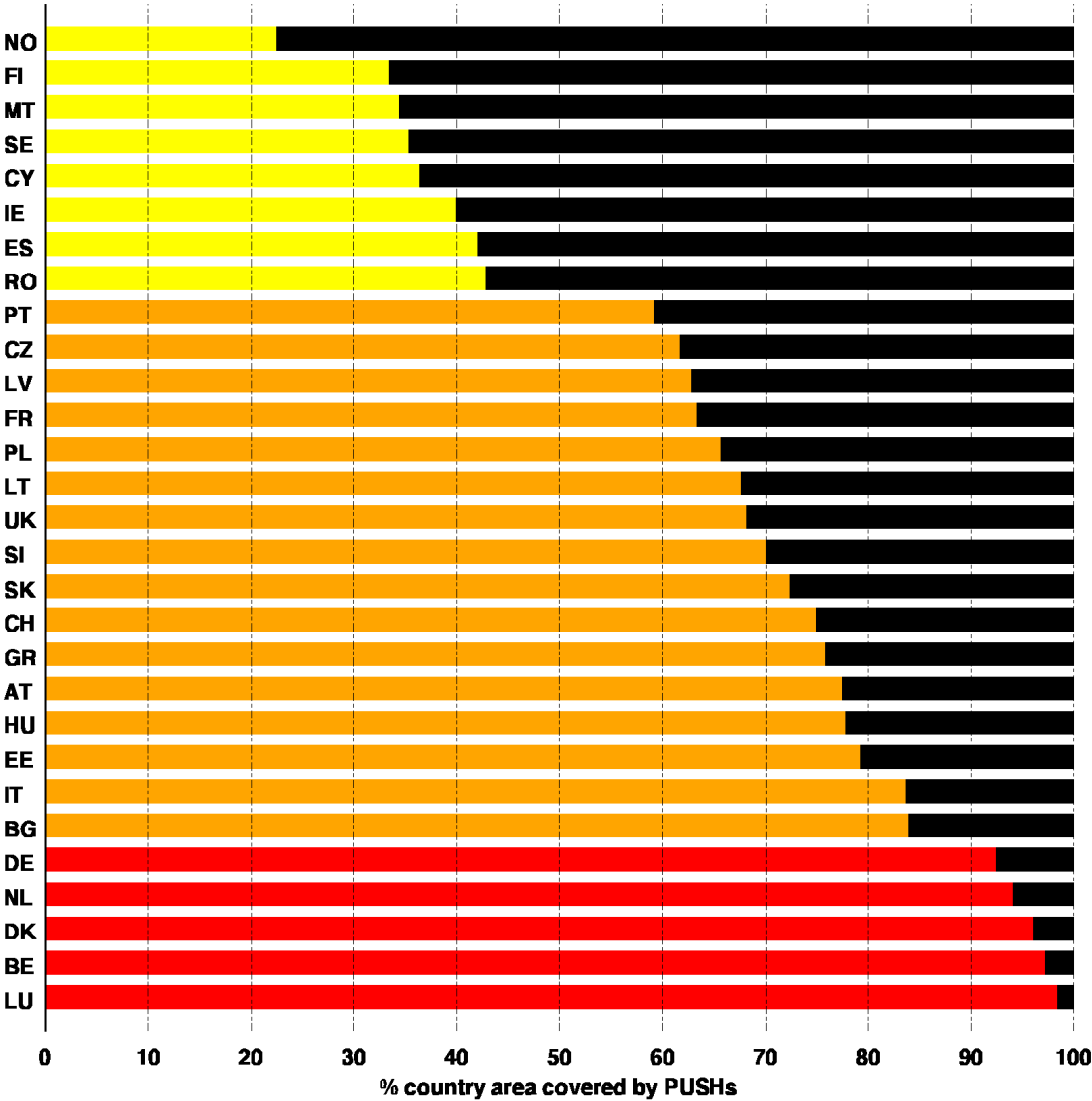▪ Travel time isochrone

10

Isochrones in Europe
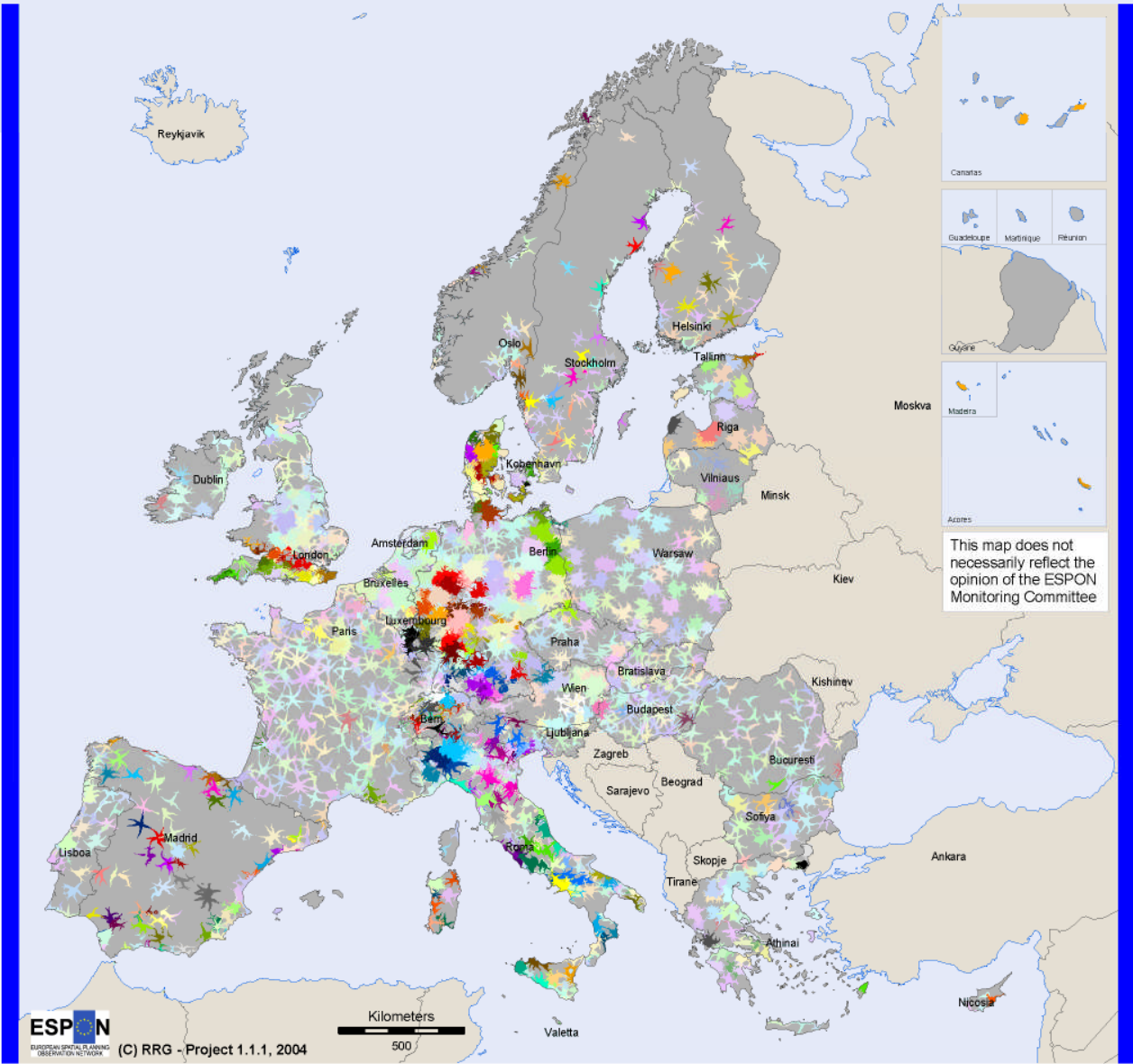
45-minute isochrones around MEGAs
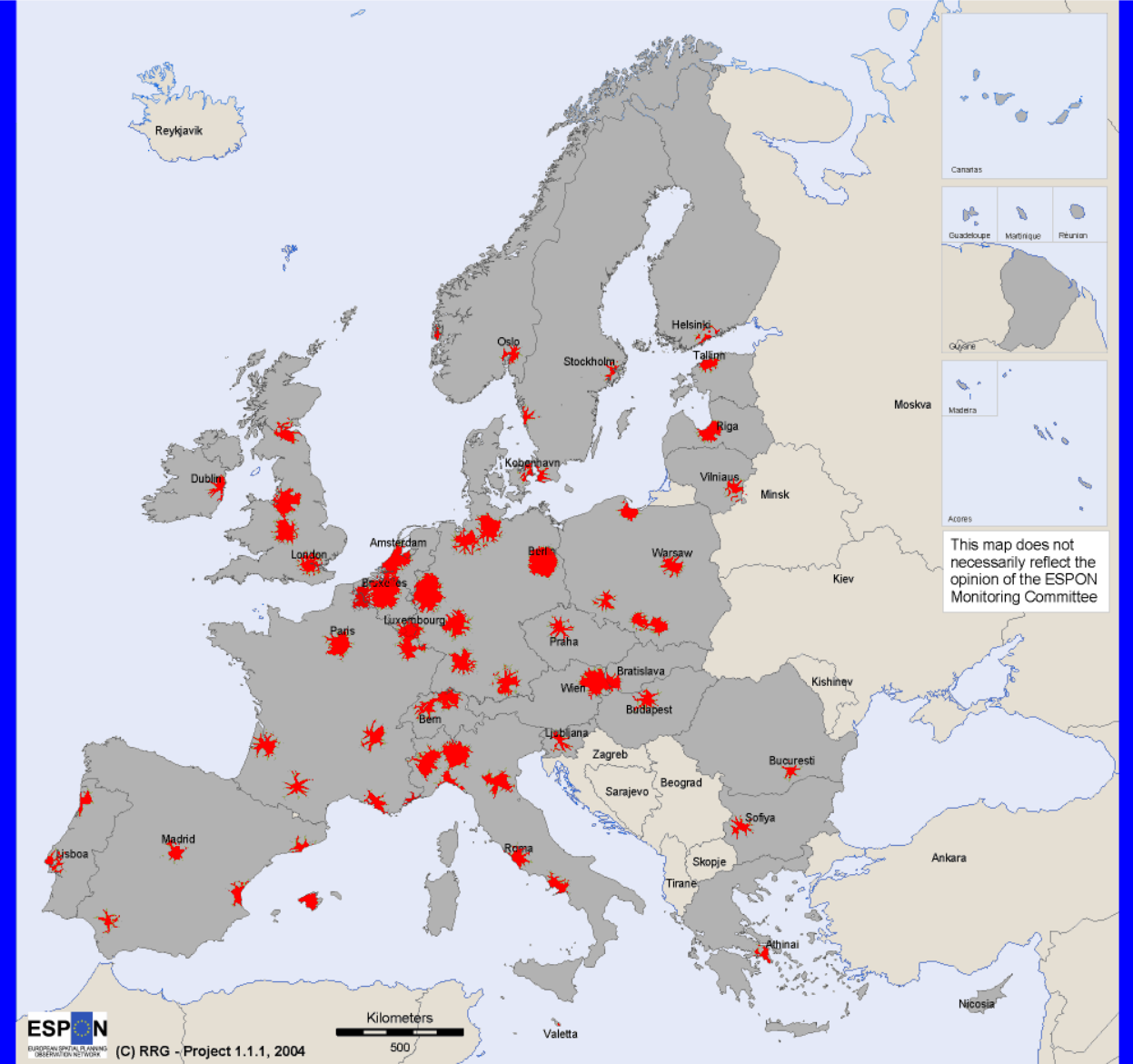
Municipalities assigned to PUSHs

Proportion of country area covered by PUSHs
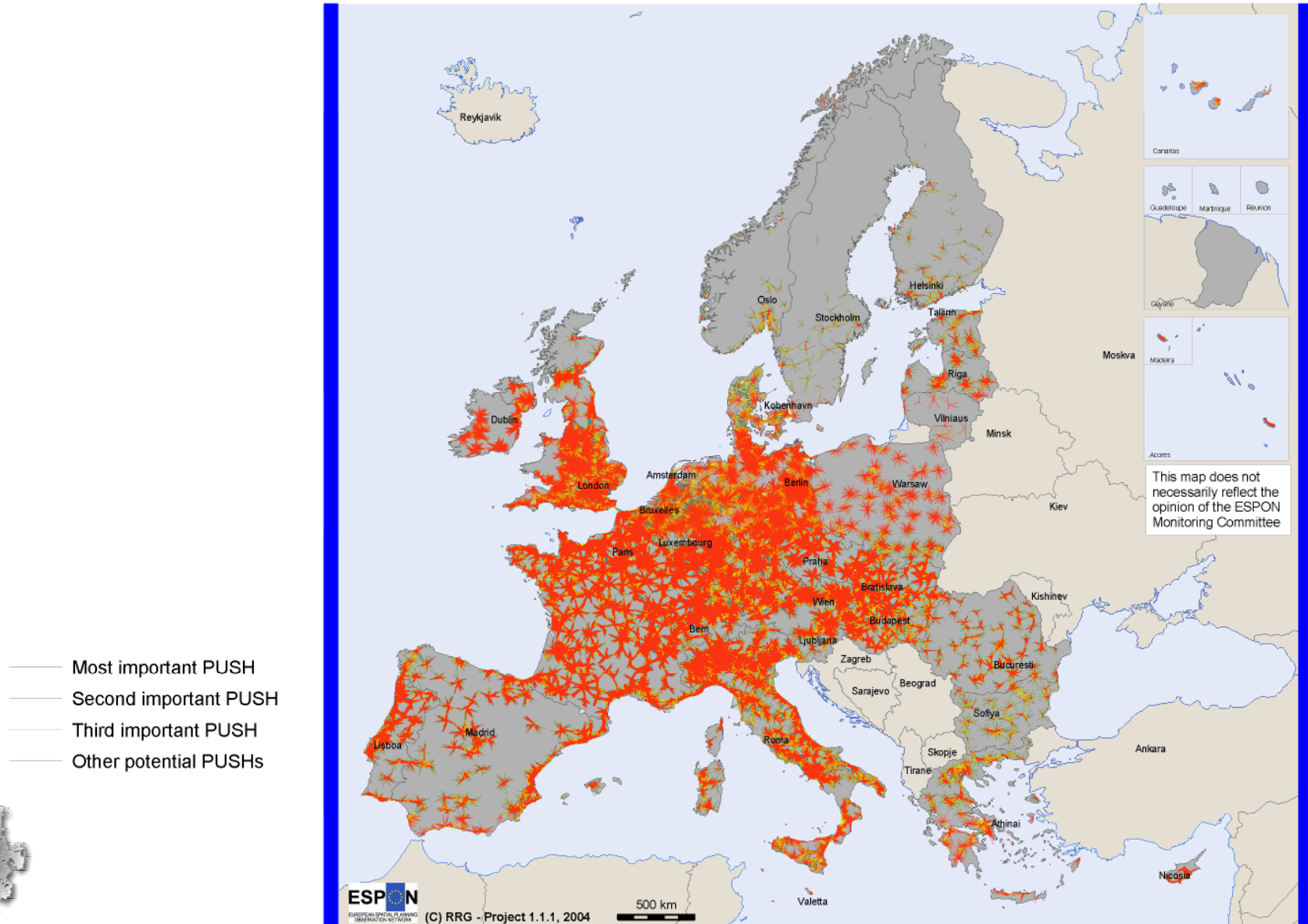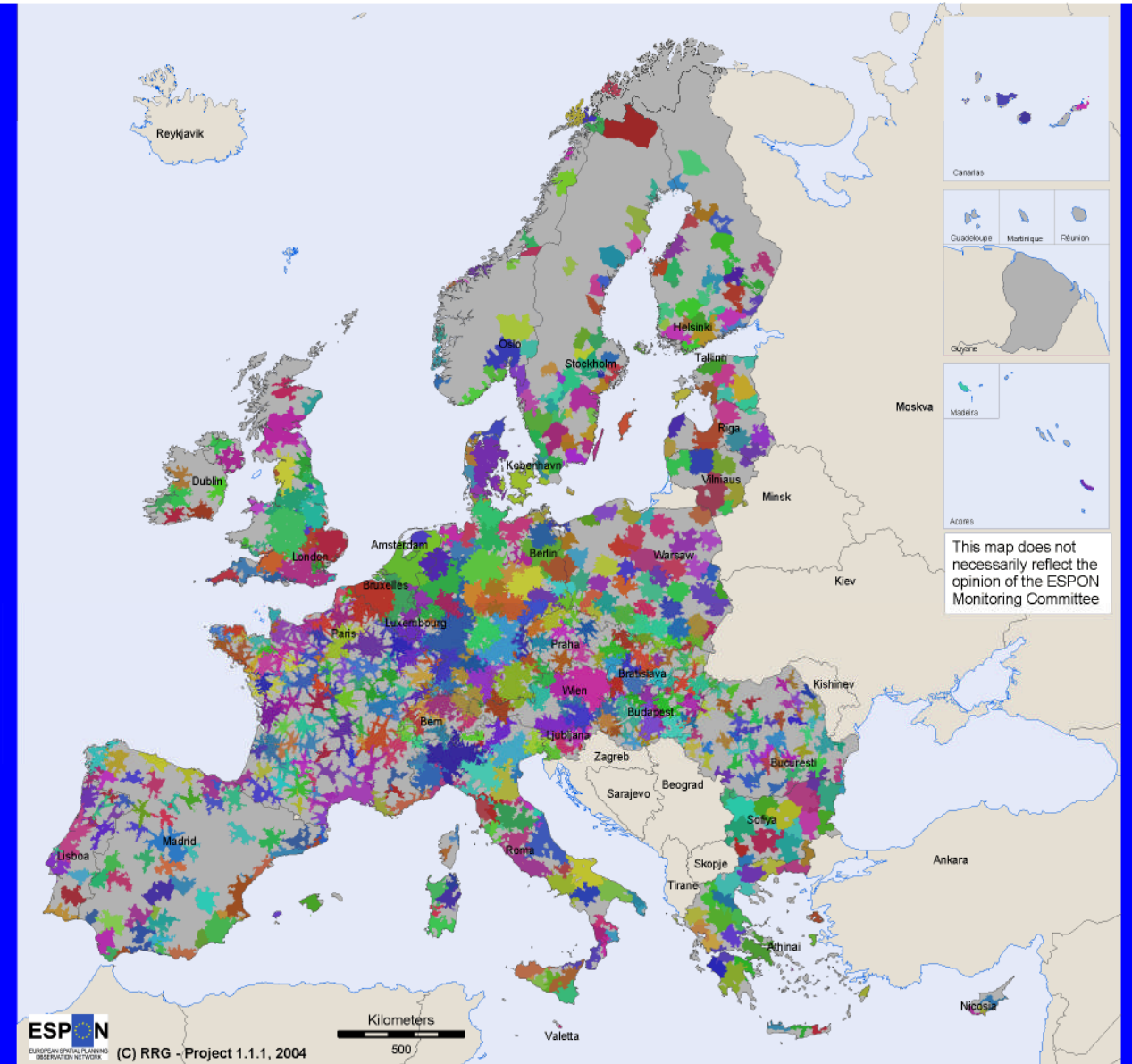

% country area covered by PUSHs

14

Analysing polycentricity of PUSHs

- Number of PUSHs overlapping in each municipality

- Number of FUA centroids located within a PUSHs

- Proportion of PUSH area overlapped by other PUSHs

15

Assignment of municipalities to PUSHs

Most important PUSH
Second important PUSH
Third important PUSH
Other potential PUSHs

16

Polycentric Integration Areas (PIAs)

Settlement Structure: Area Concentration Index

Development of the so-called *Area Concentration Index C* taking into account the area, number and distance of settlement areas within a PUSH:

Settlement area

$$C_j = \frac{\sum_k A_k f(d_{jk})}{\sum_j \sum_k A_k f(d_{jk})}$$

Distance function: $f(d_{jk}) = \dfrac{1}{d_{jk}}$

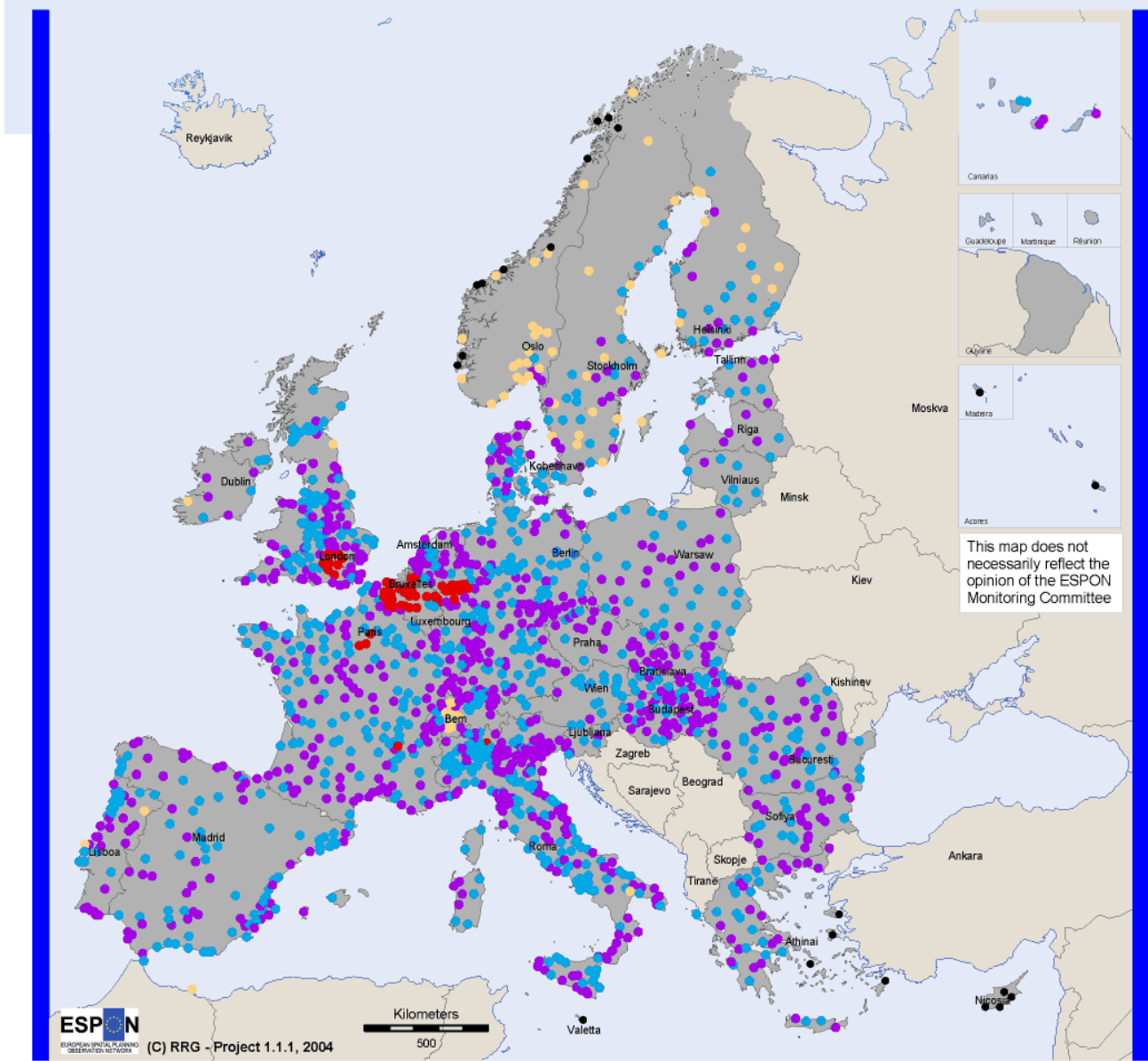0 = no spatial concentration
1 = extreme concentration

18

Settlement Structures

- *Sprawl*: high area concentration index and high proportion of settlement areas (58)

- *Rural*: Small concentration index (61)

- *Monocentric*: Medium to high concentration index, and size of second greatest settlement is less than half of the size of the greatest settlement (716)

- *Polycentric*: Medium to high concentration index, and size of the second greatest settlement is more than one half of the size of the greatest settlement (739)
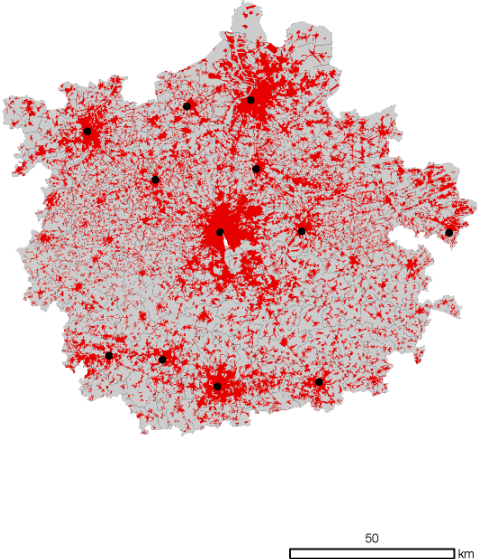
PUSHs: Classification by settlement structure

Legend:
- Sprawl (red)
- Monocentric (blue)
- Polycentric (purple)
- Sparsely populated (yellow)
- n.a. (black)

This map does not necessarily reflect the opinion of the ESPON Monitoring Committee

ESPON
EUROPEAN SPATIAL PLANNING OBSERVATION NETWORK
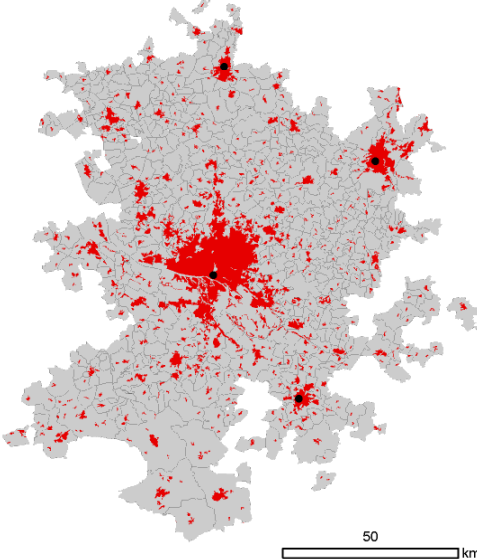(C) RRG - Project 1.1.1, 2004

20

Sample PUSHs

Sprawl: The Brussels PUSH

50 km

Monocentric: The Hamburg PUSH

50 km

Polycentric: The Rotterdam PUSH

50 km
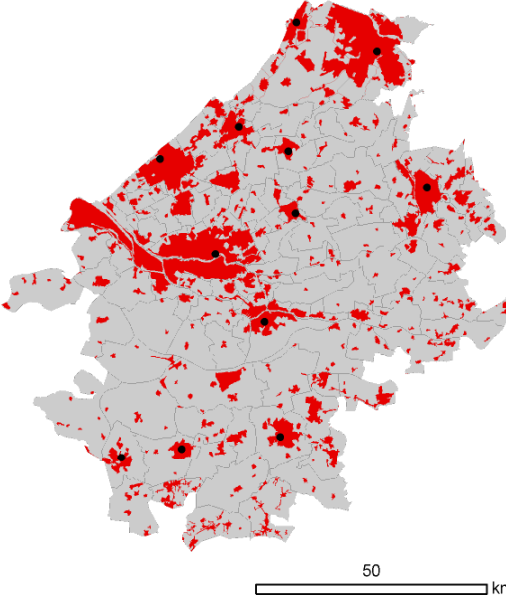
Sparsely populated: The Gjovik PUSH
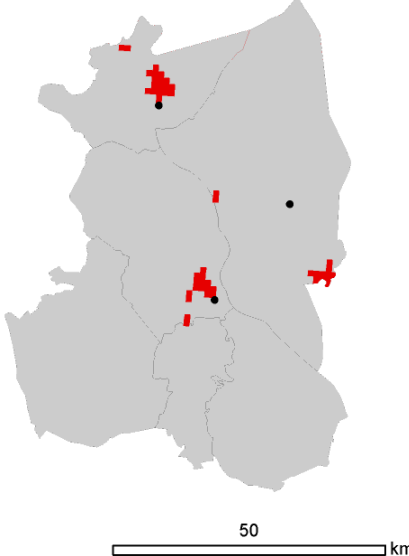
50 km

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22

Policy relevance

- Delimitation of PUSHs is *first step* into a more *fundamental analysis* of polycentric development.

- It allows for *further quantitative statistical analysis* (population development, GDP, jobs, cross-border relationships, functional linkages).

- Identification and analysis of *areas outside PUSHs* (potentials for specific targeted policies).

- *PUSHs* should not be seen as *deterministic constraints* for the development of regional polycentric initiatives, but are useful to *guide initiatives* and to *identify opportunities and challenges* for a new *balance between cities* of different levels of the urban hierarchy.

Further Information

ESPON Homepage: Project 1.1.1 (study download)
www.espon.lu

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www.brrg.de

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