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This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

Information on the ESPON Programme and projects can be found on www.espon.eu

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This basic report exists only in an electronic version.

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1 Background

This volume of the TeMo Scientific Report presents the findings of the indicator analysis of the monitoring system for the Baltic Sea Region. This presentation is the accompanying paper version of the *Presentation Tool*, i.e. the browser application where all indicators are presented in an easy-to-use, electronic manner.

Like the browser *Presentation Tool* application, this report presents the indicator one-by-one, following the five domains. Indicator definitions, indicator importance, and the main findings are documented in this report, along with the main indicator maps.

Additional maps, download links, metadata, statistics and table views, however, are only provided through the *Presentation Tool*. More specifically, the map galleries of each indicator in the *Presentation Tool* feature additional maps for alternative years, alternative spatial levels (LAU-2, grid) or related maps produced in other (ESPON) projects, which cannot be presented in this report. Consequently, the online *Presentation Tool* offers a larger number of maps for review and download than this report provides to the reader.

Results of the application and testing, which are also part of the Presentation Tool, are already presented in Volume 4 of the Scientific Report.

First, this report introduces the domains and indicators that have been selected for the Baltic Sea Region Monitoring System. This Chapter is a repetition of Chapter 2.3 of Volume 2 of the Scientific Report. After that, the indicator findings are presented, one following the other, by domain. The indicator descriptions and illustrations are similar to those used in the *Presentation Tool*. This means, the user can either read this printed report, or use the tool to access the outcomes of the simple indicator analysis.

Every indicator is presented in a standardized way: First, the indicator definition and policy importance (policy context) is explained, followed by a description of the main findings. This is the textual part of the presentation. After that, the main maps are presented, representing the visual part of the presentation.

2 Domains, Indicators and Headline Indicators

2.1 Domains and indicators

The final list of domains and indicators of the TeMo territorial monitoring system consists of 29 indicators listed in the structure of 5 thematic domains and 12 subdomains, see Table 1 for exact descriptions of these.

Table 1 Overall data availability, based on previous data releases

Indicator	Over all data availability*, based on previous data releases *) Gaps may exist for certain regions.	Spatial level
Economic performance and competitiveness		
GDP per capita	Yearly	NUTS-3/Oblast
GDP per person employed	Yearly	NUTS-3/Oblast
Unemployment rate, total	Yearly	NUTS-3/Oblast
Employment rate (20-64 years)	Yearly	NUTS-2/Oblast
Net migration rate	Yearly	NUTS-3/Oblast
Total population change	Yearly	NUTS-3/Oblast
Economic dependency ratio	Yearly	NUTS-2/Oblast
Access to services, markets and jobs		
Accessibility potential by road	Every 5 years (2001, 2006, 2011 …)	NUTS-3
Accessibility potential by rail	Every 5 years (2001, 2006, 2011 …)	NUTS-3
Accessibility potential by air	Every 5 years (2001, 2006, 2011 …)	NUTS-3
Multimodal accessibility potential	Every 5 years (2001, 2006, 2011 …)	
Functional areas: access to cities	Irregular (2011 …)	Grid, NUTS-3
Population potential within 50 km	Irregular (2008 …)	Grid, NUTS-3
Border crossings	Every 5 years (2000, 2005, 2010 …)	Border crossings
Households with internet access at home	Yearly	NUTS-2
Innovative territories		
Population with tertiary education (25-64 years)	Yearly	NUTS-2/Oblast
Employment in technology & knowledge sectors	Yearly	NUTS-2
Gross-domestic expenditures on R&D, business	Yearly	NUTS-2
Gross-domestic expenditures on R&D, total	Yearly	NUTS-2
Social inclusion and quality of life		
At-risk-of-poverty rate	Yearly	NUTS-2/Oblast
Severe material deprivation rate	Yearly	NUTS-2
Youth unemployment rate (15-24 years)	Yearly	NUTS-3/Oblast
Gender imbalances	Yearly	NUTS-3
Life expectancy at birth, in years	Yearly	NUTS-2/Oblast

Self-assessed general health status	Every 2 years (2006, 2008, 2010 …)	NUTS-2-3
Environmental qualities		
New soil sealing per capita	Irregular (2006 …)	NUTS-3
Air pollution (PM10)	Irregular (2009 …)	NUTS-3/Oblast
Eutrophication	Yearly/Irregular (2009, 2010 …)	Per sea area
Fragmentation index	Every 3-4 years/Irregular (2002, 2006, 2009 …)	NUTS-3

Domain 1: Economic performance and competitiveness

For the first domain, **Economic performance and competitiveness**, no major challenges were encountered. One reason for this may be that this issue is in measurement terms rather well covered e.g. by the EU2020 strategy.

Subdomain: Macroeconomic development

GDP per capita (in PPS) refers to the total value of all goods and services produced within a territory during a given period (here converted into purchasing power standards in order to accommodate transnational comparison). Although it is the most widely used measurement of economic activity and included as a headline indicator e.g. for the EU Sustainable Development Strategy (SDS), it has over the years been criticised for bypassing the core issues of material well-being (national income, real household income, consumption, environment, and so on)[1]. However, as it still constitutes the principal indicator for European regional policy (e.g. for confirming eligibility) it has as such to be included in any territorial monitoring system. It is included also in the INTERCO list of indicators.

GDP per person employed (in PPS) refers to the same indicator as above, but with number of employed persons as the denominator. Included on the INTERCO list it is used as an indicator for labour productivity (i.e. how much output a given number of persons are producing). For measuring regional production it alleviates the measurement problem of commuting and provided a more truthful picture of regional productivity than does GDP/capita.

Subdomain: Labour market

Unemployment rate (total) is included as an indicator in the EU SDS. It is the most widely used indicator of labour market performance but is connected with a number of measurement imperfections and should be considered as a complementary indicator to employment rate. It can be viewed both from an economic and from a social point of view, in the latter case particularly when disaggregated either by gender, age, education or at the level of the individual. Only data from Labour Force Surveys (LFSs) are comparable across countries. It is included in the EU SDS as well as in INTERCO.

Employment rate (for persons aged 20-64 years) is included as an official indicator in the EU SDS and is furthermore a headline indicator of the EU 2020 Strategy's "Smart growth" and "Inclusive growth" priorities, aiming for 75 % of the 20-64 year-olds to be employed by 2020. It is also on the INTERCO list of indicators. It refers to the number of persons aged 20-64 years that are employed as a share of all persons of that age. Concerning such normative goals, there are

[1] For a recent review of the shortcomings of GDP, see for example the Report by the Commission on the Measurement of Economic Performance and Social Progress: http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf

some measurement challenges included in that a high employment rate of e.g. persons aged 20-24 years would de facto imply that they do not attend education, which in the long run for some would be counterproductive.

Subdomain: Demography

Net migration rate and Total population change (and as their subtraction also natural population change) are traditional indicators when measuring regional polarisation and often also used as measurements of regional attractivity (or lack thereof). Net migration is included as an official indicator for the EU SDS as well as in INTERCO. Typically, regional net migration rates constitute only between 5 and 15 % of the total gross migration volumes.

Economic dependency ratio refers to the theoretical number of persons supported by the nr of persons employed. Three principal types are commonly used: total dependency ratio equalling 0-14 years plus 65+ years as a share of persons employed. Such indicator can be used to assess the (theoretical) financial burden of supporting these age groups.

Domain 2: Access to services, markets and jobs

The TA2020 acknowledges the crucial importance of service provision and accessibility for territorial connectivity and integration in a broad sense by stating that "*Fair and affordable accessibility to services of general interest, information, knowledge and mobility are essential for territorial cohesion. Providing services and minimizing infrastructure barriers can improve competitiveness and the sustainable and harmonious territorial development of the EU*". Sufficient accessibility thus helps balancing territorial development, helps diminishing territorial divides or alleviating their negative impacts. In the Baltic Sea Region context, accessibility to services, markets and jobs is key to ensure that every part of the territory is able to benefit from well-being standards, and from equal development potentials, by providing access and connectivity to transport and ICT infrastructures, facilities and services, especially for remote, isolated, sparsely populated areas and areas with harsh climatic conditions.

Eleven indicators were identified under this domain, divided into two sub-domains which are 'accessibility' and 'territorial functionality'.

Subdomain: Potential accessibility

The four indicators on accessibility potential (by road, rail, air and multi-modal) measure the market potential of regions and thus the locational advantages a region enjoys from the existing transport systems. How accessible is a region, and how many people can be reached from a region in reasonable time? The higher the accessibility potential for a region is, the higher is also its attractiveness for economic and social activities in that region. All four indicators are proposed since good accessibility by one mode does not suppose equally good accessibility for another mode. Instead, often region enjoy good accessibility by one mode but poor accessibility by another.

Subdomain: Spatial structure

Functional areas: access to cities: This indicator replaces the discarded indicators "access to cities: cities within reach" and "functional areas" (see chapter 2.5.). The new indicator is defined as the number of cities of more than 50,000 inhabitants that can be reached from any point within 60 minutes car travel time. Good

access to cities, as the spatial centers for public and private service provision, is of prime interest for people´s daily life. Fair travel times to these centers should thus be one of the political objectives of spatial policies. Establishing or maintaining a functional polycentric system of cities and towns will be of benefit for all people. The more cities that can be reached, the higher is the centrality of this place, and the more options residences have to travel to any of these cities. In other words, similar to ESPON 1.1.1 this new indicator "counts" the number of overlapping service areas; but the new definition is more easily comprehensible. Furthermore, the new indicator had been included in the ESPON TRACC project.

While the previous indicators deal with physical infrastructure and the levels of accessibility they provide, the following two indicators focus on territorial structures and functionalities. They pick up main priorities of the ESDP, TA2020 on "*polycentric and balanced territorial development of the EU [is] as key element to achieving territorial cohesion*", by promoting polycentric patterns at all spatial levels helping to reduce territorial polarization. Concentration and connection are the main challenges of polycentrism, as they help achieving a critical mass and allow surrounding areas to benefit from agglomeration effects (ESPON INTERCO, 2012, 106).

The population potential within 50km is a proxy for the demand for provision of public (and private) services, for (minimum) market potentials and for the level of polycentricity. A radius of 50 km airline distance is considered a typical distance for daily commuting trips to go to work or education, to go shopping, to visit other services or visit friends and relatives. Similarly, from the viewpoint of shops or service provides, this distance is considered a reasonable service areas for their products, customers or workers. This indicator is also able to assess the urban-rural divide for the Baltic Sea Region. Urban (or agglomerated) areas are likely to have high population potentials, while rural areas are expected to experience a lack of potential. The degree to which rural areas fall behind urban areas can be analyzed with this indicator.

For the Baltic Sea Regions, border crossings are still a major concern between the countries of the European Union on the one hand, and Russia and Belarus on the other hand. Complicated and lengthy custom clearance procedures, and long waiting times at border control points are still obstacles to free movement of goods and persons. This indicator measures the border waiting times for trucks at major border crossings, differentiated by inbound (into EU) and outbound (out of EU) traffic, and thus addresses one major issue of the East-West divide in the BSR.

Subdomain: Internet

While the previous indicators measure physical infrastructures (i.e. transport networks) in relation to certain physical destinations, the indicator households with internet access at home is looking at the digital infrastructures, i.e. access to information. Fast internet access is nowadays fundamental to all economic activities, and everyday´ s life can no longer be imagined without internet as indispensable source of information and mean of communication.

Domain 3: Innovative territories

This domain lays the heart of the EU 2020 Strategy's "smart growth" priority. It contains indicators both of an input and of an output character, enabling regional comparison of a cost-benefit type.

Subdomain: Human capital

Population with tertiary education (25-64 years) can be viewed as a crude indicator of the level of more advanced skills of the population of a region and as an input indicator of innovation. Tertiary educational attainment in the age group 30-34 years[2] is a headline indicator of the EU 2020 Strategy's "Smart growth" priority, aiming for at least 40 % of 30-34–year-olds completing third level education by 2020. In contrast, in the EU SDS indicator set, focus lays on reduction of those with the lowest level instead. Striving for a higher level of persons with tertiary education may be seen as a general normative goal, but the level reaches a vertex at an unspecified point depending on the economic structure of the region, and in many regions skilled labour could be a more critical resource. In the context of "innovative territories" it is nonetheless a justified indicator on the existing human capital endowments of a region.

Share of employment in technology & knowledge sectors is a summary indicator of employment within a selection of high-technology manufacturing and knowledge-intensive high-technology service branches. The selection of included branches focuses on the level of knowledge intensity of the economic activity of the region[3] rather than on e.g. the educational level of the population or the labour force. It may thus be viewed more as an output indicator for the innovative capacity of a region.

Subdomain: Financing and institutions

Gross domestic expenditures on R&D (as a share of GDP) in 1) business and 2) total is a headline indicator of the EU 2020 Strategy's "Smart growth" priority, aiming at combined public and private investment levels to reach 3 % of EU GDP by 2020. It is also included in the EU SDS as well as in the INTERCO list of monitoring indicators and is a typical input indicator for innovation as high investment do not automatically yield high output. It refers to the relative share of a regions' GDP generated from R&D –related activities that, in the long run, may help create new products/services and boost creation of new jobs. We have here chosen to subdivide this indicator by sector of performance into private (e.g business enterprise) sector and total, respectively.

Domain 4: Social inclusion and quality of life

The EU Sustainable Development Strategy as well as the EU 2020 Strategy, and particularly its "inclusive growth" priority, both emphasise the importance of poverty reduction and combating social exclusion. Also the "GDP and Beyond" initiative with its focus on human well-being is closely connected to this domain. All indicators in this domain stem from the monitoring systems of these strategies.

Subdomain: Social inclusion

The at-risk-of-poverty rate is included in the Laeken, the EU SDS and in the EU 2020 Strategy indicators. Within the target for "Inclusive growth", the EU 2020 headline goal is that at least 20 million people should be lifted out of the risk of poverty *or social exclusion* by the year 2020. A person is defined as being in risk

[2] Data for this age group is only available at NUTS 1 level, whereas data for the age group 25-64 years is available at NUTS level 2, whereupon the latter was chosen for this monitoring system.

[3] These include the crude branches of manufacturing of aircraft spacecraft, medical, precision and optical instruments, watches and clocks, pharmaceuticals, medicinal chemicals and botanical products, office machinery and computers as well as radio, television and communication equipment and apparatus, and within services research and development, computer and related activities, post and telecommunications as well as financial intermediation.

of poverty if his/her equivalised (by household size) income after social transfers is below 60 % of the corresponding national median. Although it is calculated per individual, its primary measurement unit is the household. The at-risk-of-poverty rate should not be confused with the AROPE[4] indicator, which partially contains the former. The at-risk-of-poverty rate is useful for comparing some distributional aspects of monetary well-being but being a relative indicator (related to the national median), it should not be utilised for cross-country comparisons of absolute levels of poverty.

Severe material deprivation rate targets persons having their living conditions severely constrained by a lack of resources. The indicator is defined as the share persons experiencing at least four out of nine following deprivations items: cannot afford: 1) to pay rent or utility bills; 2) keep home adequately warm; 3) face unexpected expenses; 4) eat meat, fish or a protein equivalent every second day; 5) a week holiday away from home; 6) a car; 7) a washing machine; 8) a colour TV; or 9) a telephone. As such this indicator allows for direct cross-country comparison of material poverty. The indicator is a headline one for the EU 2020 Strategy and it is also included in the EU SDS set of indicators.

Youth unemployment rate (15-24 years) can be viewed as an "early warning indicator" for future social exclusion. It is included in the EU SDS set of indicators and defined as unemployed persons aged 15-24 years as a share of all persons of that age group *in the labour force*. Interpretation of this indicator must be done cautiously, as a high youth unemployment rate does not necessarily imply that a large share of the total number of youth are unemployed (as they may be off the labour force, typically studying). It is therefore also at times calculated with the total population of that age as the denominator, which provides a more accurate picture of the relative volume of young unemployed persons.

Gender imbalances in a region is assessed by the ratio of male-female aged 25-39. Unbalanced gender compositions in a region hint at social problems, and are obstacles for further demographic and economic developments.

Subdomain: Health

Life expectancy at birth (in years) is one of the principal global indicators for mortality. Included in the Laeken list of indicators, it reflects improvements in living standards and the establishment and improvement in health systems. It can thus be viewed as a partial output indicator of the quality of the health care system in general also incorporating aspects of public health awareness etc. It is a theoretical indicator where general trends of mortality are transposed on a new born child. Alongside low levels of fertility the gradual increase in life expectancy is however also one of the contributing factors to the ageing of the population. The BSR shows considerable variations in life expectancy, reflecting the socioeconomic divide of the region.

Self-assessed general health status is widely utilised as an output indicator of the quality of the health care system and is included in the Laeken list of indicators. We are here utilising ESS (European Social Survey) data, where respondents are asked the question "How is your health in general? Would you say it is "Very good", "Good", "Fair", "Bad", or "Very bad"." We utilise this subjective indicator as a proxy to the objective indicators on health care personnel and expenditure, which have proven to be very difficult to measure comparatively across countries.

[4] The AROPE indicator (People at risk of poverty or social exclusion) is defined as the share of the population in at least one of the following three conditions: 1) being below the poverty threshold; 2) being in a situation of severe material deprivation; or 3) living in a household with very low work intensity.

The EU-SILC (Survey on Income and Living Conditions) will tentatively produce also regionalised data on this topic in forthcoming rounds.

Domain 5: Environmental qualities

Sustainability is essential in the Europe 2020 Strategy of smart sustainable and inclusive growth and has in recent years been emphasised within the overall concept of green economy (or green growth). Many of the thematic objectives of cohesion policy (and recently in the objectives of the common strategic framework of the EU) emphasise reduced emissions, investments in clean-tech, renewable energy, and adaptation strategies as the core of policy. A greening of the economy is aimed at decoupling growth from energy consumption and emissions, and emphasises the aspect of a clean environment as a territorial capital which is an integrated part of a placed based development. From a Baltic Sea Region perspective we have recognised in this perspective some important aspects of the domain which we have tried to cover but not always successfully. These include aspects such as a wise use of the sea space, eco-resilience (i.e. green networks, ecological corridors and preservation of areas of high ecological value), development of renewable energy resources (also on the sea) and the BSR transmission grid for energy. Within the domain of environmental qualities we have defined four indicators which focus primarily in emissions and use of land. These are indicators which captures the state of air and water as well as the quality of land and landscapes. This will combined provide a picture of the state of the environment as a territorial capital or capacity.

Subdomain: Consumption and production

New soil sealing per capita is a measure of how much land is converted to a "built" surface in a wider definition. Hence this indicator is associated with land take for economic development and is associated with settlement structures and demographic development. Since soil sealing is associated also to the resilience and buffering capacity of nature this is an important indicator, as well as indicating the quality of landscapes for recreation and human well-being.

Basic air pollution (PM10) is depicted at the NUTS 3 level since this data is available as even raster data. The indicators shows measurements on number of days PM10 exceeds norm value, i.e. the average number of days in the year where "particular matter" (PM, particulates) exceeds the norm value.

Eutrophication (HEAT index from Helcom) is an important indicator for the quality of the Baltic Sea and an indicator for how successful measures are to prevent the leakage of nutrients from agriculture and sewerage plants around the sea.

Subdomain: Natural resources

The final indicator, the fragmentation index, is our attempt to overcome the lack of data on biodiversity and landscape qualities at the NUTS 3 level and propose a "proxy" indicator for the value of landscapes and possibility for larger habitats and green areas for plants, animals and humans.

2.2 Headline indicators

The principal task of a monitoring system is its ability to provide direct policy advice. Simplicity and sensitivity to rapid changes are key features that should be strived for. If a monitoring system consists of a large number of specific indicators, then a frequent updating of these consumes considerable time and

resources. Due to resource efficiency, a limited number of variables are usually chosen to be collected more frequently than the remaining large mass of indicators in a monitoring system.

Such indicator short lists or headline indicator systems are the norm rather than the exception in most comprehensive and frequently updated policy strategies, the EU 2020 strategy, the EU Sustainable Development strategy, the Lisbon/Gothenburg strategy, OECD Green Growth strategy, and a large number of UN monitoring systems, to mention but a few.

If properly chosen, the limited set of indicators can generate warning signals much faster than the complex set of information and at the same time point out the need for more comprehensive analysis to be undertaken. In an ideal case, this limited group of indicators is not only more resource effective (i.e. easy/economic/etc.) to collect, but they are also able to provide a general picture of what the entire monitoring system is measuring. They may be missing out on some particular details or aspects, but by and large they are able to efficiently communicate the principal trends.

We feel that this would be sensible also in the context of the BSR TeMo, and hence we have introduced *suggestions* for one or a few headline indicators for each domain. We wish to stress, that this suggestion for these headline indicators is not in any way connected to the question of the so called "complex indicators", which is a totally different issue and discussed in detail in chapter 2.1.3.

An effective headline indicator should be:

a. conceptually representative for a larger group of indicators;
b. frequently updated by the provider;
c. of limited time lag with regard to data used for its construction;
d. easily available for different types of territorial units; and
e. of direct policy relevance.

The identification of these indicators is based on a comparative analysis, where aspects such as the conceptual coverage of the entire domain, the policy relevance of the indicator, data availability for entire BSR, time series availability and update frequency, data time lag, the territorial level used, availability within the European Statistical System, as well as the assessed effort for possible data modification required, are considered.

In addition to these criteria, we have also conducted a Principal Component Analysis of the available data in each domain. This analysis in practice provides us with a statistical ranking of each indicator per domain in the sense of how much each individual indictor is able to explain the variation in all other individual indicators in that domain. In other words, it provides a statistical assessment of which is the "leading" or most "overarching" indicator per each domain.[5]

Table 2 below presents the assessment criteria used in justifying our suggestions for a headline indicator per domain.

[5] In the domain "Innovative territories", the nr of variables examined is small and the PCA results should be considered indicative only.

Table 2 Assessment criteria for identification of headline indicator(s) for each domain

Domain	Suggested headline indicator	Assessment criteria									
		Conceptual coverage of entire domain	Policy relevance of indicator	PCA (Principal Component Analysis) results for domain	Full data availa-bility for entire BSR	Time series availabili ty	Data update freq-uency	Data time lag	Territorial level	Available within the European Statistical System	Require-ment for data modifi-cation
1. Economic performance and competitiveness	GDP per capita in PPS	Very high. Covers conceptually most aspects of economic performance.	Very high. Primary SF eligibility indicator, EU2020 and SD-strategy headline indicator	Highest ranking	Yes	Yes	Annual	2-3 years	NUTS 3 (SNUTS 2 for BY & RU)	Yes (except BY & RU)	None (except for inclusion of BY & RU)
2. Access to services, markets and jobs	Multi-modal accessibility potential	Very high. Covers conceptually most aspects of physical accessibility	High. Included freq. in Cohesion reports and is part of official territorial typologies	None performed (yet)	Yes (in principle)	Yes (but limited	Infre-quent, currently ca. 5 years	1-2 years	NUTS 3 (SNUTS 2 for BY & RU, but in theory could be SNUTS 3)	No	Requires high external input. Only few institutions in the EU have capacity to perform
3. Innovative territories	Gross-domestic expenditures on R&D	Fairly high, but innovation not always the result of high R&D input, and high R&D input not always resulting in concrete capitalisation.	Very high. Headline indicator for EU2020 strategy	Second highest ranking. (Tertiary education attainment highest, but gap very small). (Indicative result only)	No. (BY, NO & RU missing, NO could be esti-mated from existing data)	Yes	Annual	2-3 years (tied to national accounts/ GDP)	NUTS 2	Yes	None (apart from possible inclusion of NO, BY and RU)

Domain	Suggested headline indicator	Assessment criteria									
		Conceptual coverage of entire domain	Policy relevance of indicator	PCA (Principal Component Analysis) results for domain	Full data availa-bility for entire BSR	Time series availabili ty	Data update freq-uency	Data time lag	Territorial level	Available within the European Statistical System	Require-ment for data modifi-cation
4. Social inclusion and quality of life	At-risk-of-poverty rate	Very high in terms of social inclusion, lower (and more indirect) in terms of QoL	Very high. Headline indicator for EU2020 strategy	Ranking only 4/5. The gap to nr 1 "Subjective health" however fairly small	No (BY and RU missing, but could in theory be esti-mated)	Yes	Annual	1-2 years	NUTS 2	Yes	None (apart from possible inclusion of BY & RU)
5. Environ-mental qualities	New soil sealing per capita and/or Eutrophication	Moderate	High for both. Eutrophication 1/4 thematic segments of HELCOM Baltic Sea Action Plan, soil sealing freq. in land use policy discourse e.g. due to link to urban sprawl	None performed (not possible for technical reasons)	Eutrophicati on: yes (Soil sealing; BY, NO & RU missing, could be estim. from land use data)	Eutrophi cation: yes Soil sealing: no	Eutrophic ation: frequent Soil sealing; Infre-quent, currently ca. 10 years	2-3 years	For soil sealing: NUTS 3 For Eutrophicati on: Baltic Sea subregions	No	Both require high external input (HELCOM & EEA)

In addition to these five to six headline indicators, we also propose to utilise any or all of the proposed "Ten indicators for measuring territorial cohesion in the BSR" as macro level headline indicators for the entire BSR. The application of any or all of these on primarily GDP would most likely be the most feasible approach, since GDP would in any way be collected and no additional effort would thus be needed for this more frequent data collection.

3 Indicator Findings

3.1 Economic Performance and Competitiveness

Seven indicators in three sub-domains have been implemented and analysed under this domain. The domain looks at the economy as a whole, but also at trends in labour markets and at broader demographic phenomena.

Table 3 Economic performance and competitiveness: Indicators and sub-domains.

Macroeconomic development		
	- GDP per capita - GDP per person employed	This subdomain looks into the performance and structure of the economy as a whole, in terms of GDP and labour productivity.
Labour market		
	- Unemployment rate, total - Employment rate (20-64 years)	This subdomain looks into two major components of labour markets, which are unemployment and employment rates.
Demography		
	- Net migration rate - Total population change - Economic dependency ratio	What are the demographic driving forces for the economy? This subdomain looks into migration as indicator for the attractiveness of a region, the overall population development as well as the economic dependency ratio.

3.1.1 GDP per Capita

Indicator definition
The indicator Gross-domestic product measures the overall economic output of all economic activities in a region (measured in terms of purchasing power standards).

Findings
Two large-scale features characterize the bigger picture – east-west divide and core-periphery divide. In the ESPON area as a whole, a remarkable east-west division in GDP/cap has preserved. Majority of the regions of CEEC countries except the Czech Republic and Slovenia stay still under 50% of the EU 27 average prosperity level. Islands of relative prosperity are mostly metropolitan regions in these countries. However, in the new member states of EU, one can see as more prosperous the western belt bordering the old member states (in Poland, Czeck Republic, Slovakia) while Slovenia has wholly strongly converged with the „old" Europe. The core-periphery divide is still quite well depicted by the contrast of „blue banana" and rest of Europe. The relatively well-doing Nordic countries represent the only big deviation from that model. It can be mentioned that in the old member states of EU GDP/cap variations seem to follow not so much metropolita/non-metropolitan pattern but a more general urban/rural division.

In BSR, lying wholly outside the core Europe, the east-west divide is even more prominent because of contrast between the prosperous Nordic countries and relatively poor Baltic States, Russia, Belarus, Poland and former East Germany. Besides, different regional patterns can be seen in these sub-regions. When on the eastern and southern shore of the Baltic Sea metropolitan/nonmetropolitan dichotomy prevails, then in the northern and western shore prosperity of regions does not depend very clearly on their rurality and remoteness and regional un-equity is less in general.

The average annual change of real GDP/cap reflects impacts of financial and economic crisis. Prevailing majority of regions in BSR have succeeded to retain at least modest economic growth. No east-west divide and any other easily identifiable territorial pattern of the GDP change can be observed. Decrease of GDP has occurred obviously due to various unfavorable combinations of local economic factors. Therefore, it can be said that the crisis has had no one-directional impact on economic cohesion in BSR.

Discontinuities:
Still a strong east-west prosperity divide exists between the Nordic countries on one hand and the remaining BSR on other hand. East Germany stands in between them as a transition area. Stronger discontinuities can be observed along the Finnish-Russian border, but not any more on borders along the borders of Russia and Belarus with their Baltic and Polish neighbors. Instead, the capital regions of countries, but other metropolitan regions in Poland and Germany, too, emerge as islands of relative prosperity from their surrounding territories. In that aspect, the Nordic countries demonstrate a more homogenous development. Still a strong east-west prosperity divide exists between the Nordic countries on one hand and the remaining BSR on other hand. As the discontinuity changes are marked on land only, a decrease over 15% points between those large sub-regions has occurred along the Russian-Finnish border. Convergence along the sea borders cannot be visually assessed.

Within the Nordic sub-region, convergence over NUTS 3 borders has been weak. Instead, the divergence of Helsinki and its surrounding from remaining Finland has taken place. In the eastern and southern BSR Leningrad oblast has developed faster than its neighbors and increased discontinuity on its borders, too. Generally, no clear prevailing of divergence or convergence occurs within the larger sub-regions as well as in single countries.

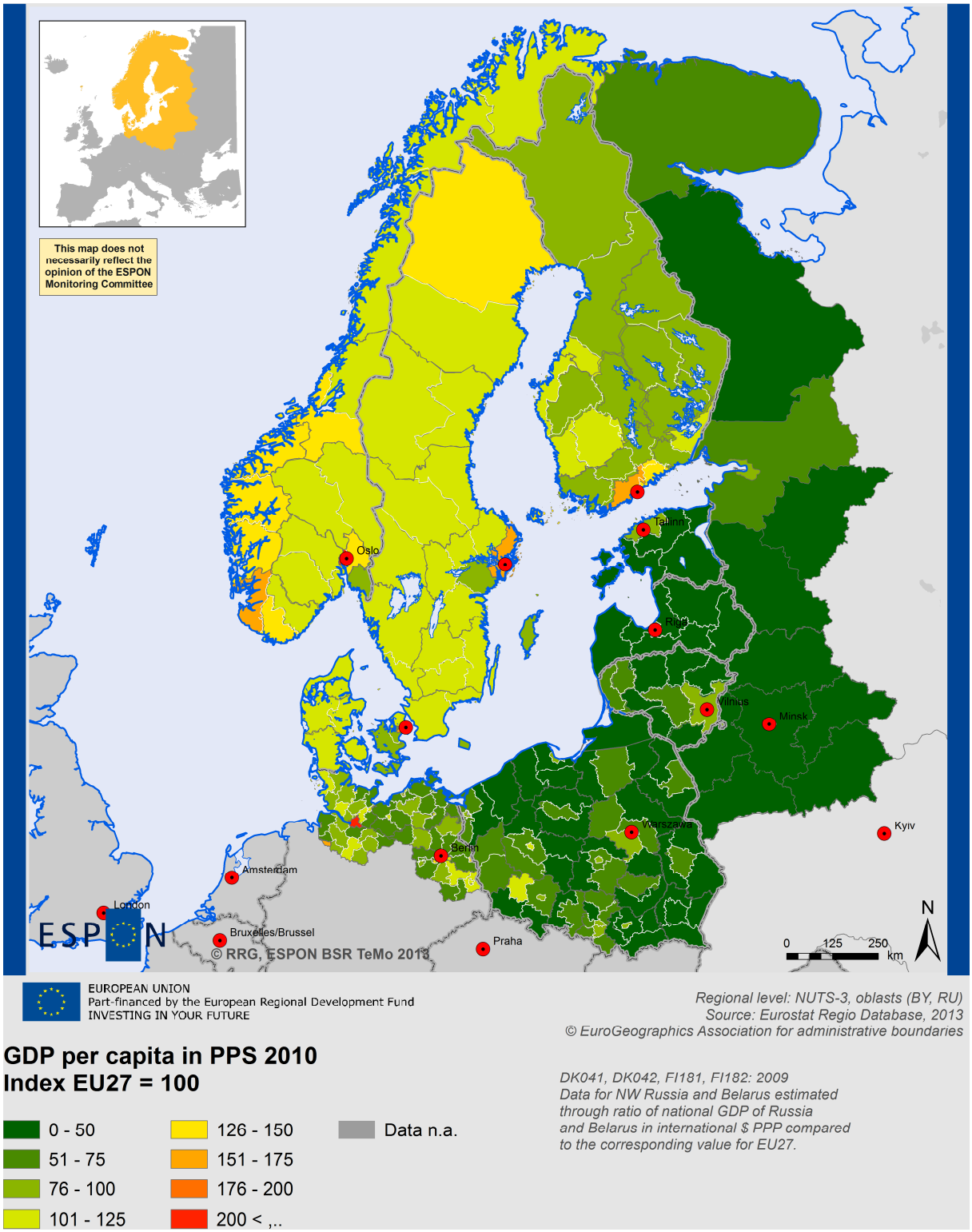


Figure 1. GDP per capita in PPS 2010, BSR.

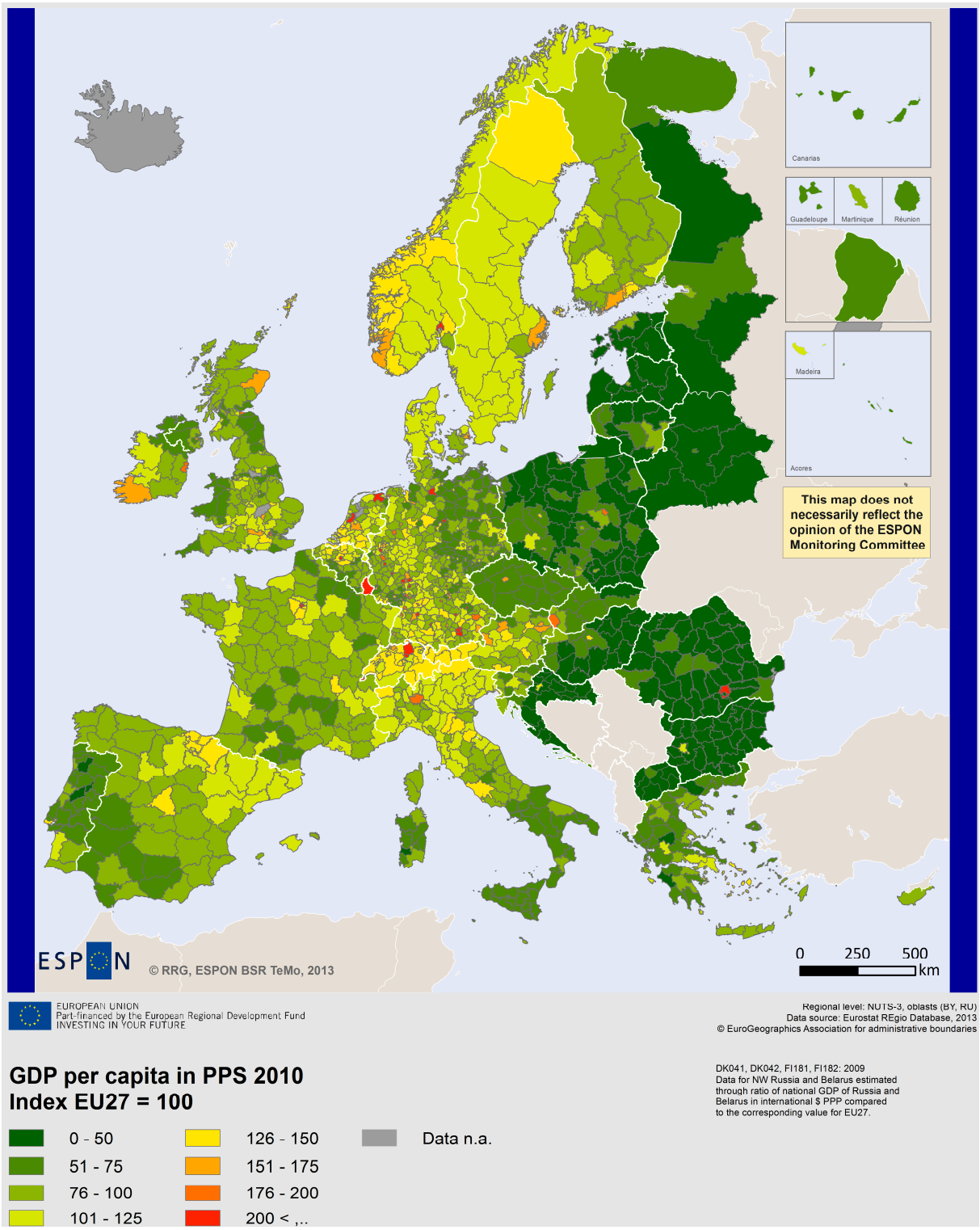


Figure 2. GDP per capita in PPS 2010, ESPON Space.

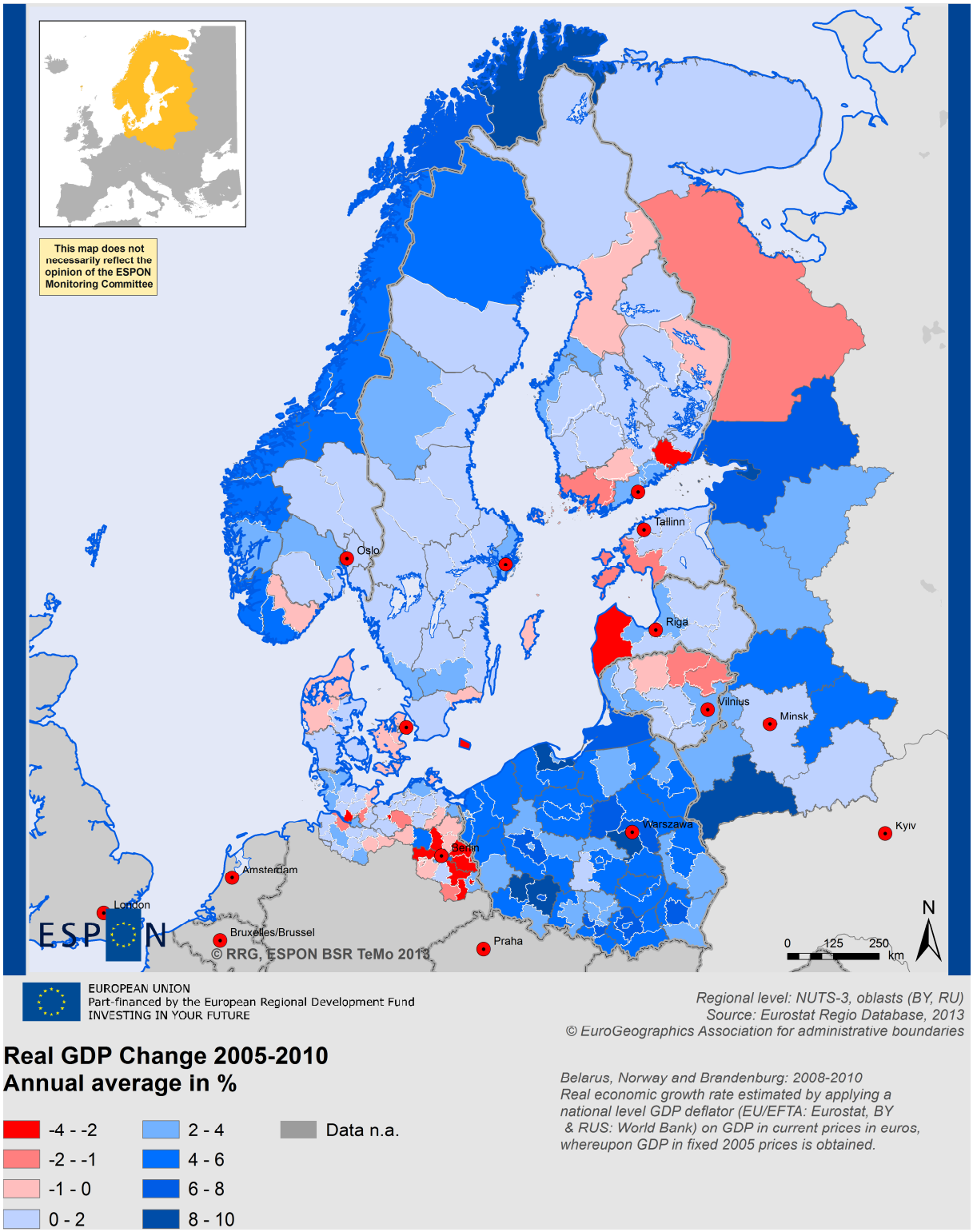


Figure 3. Real GDP change 2005-2010, BSR

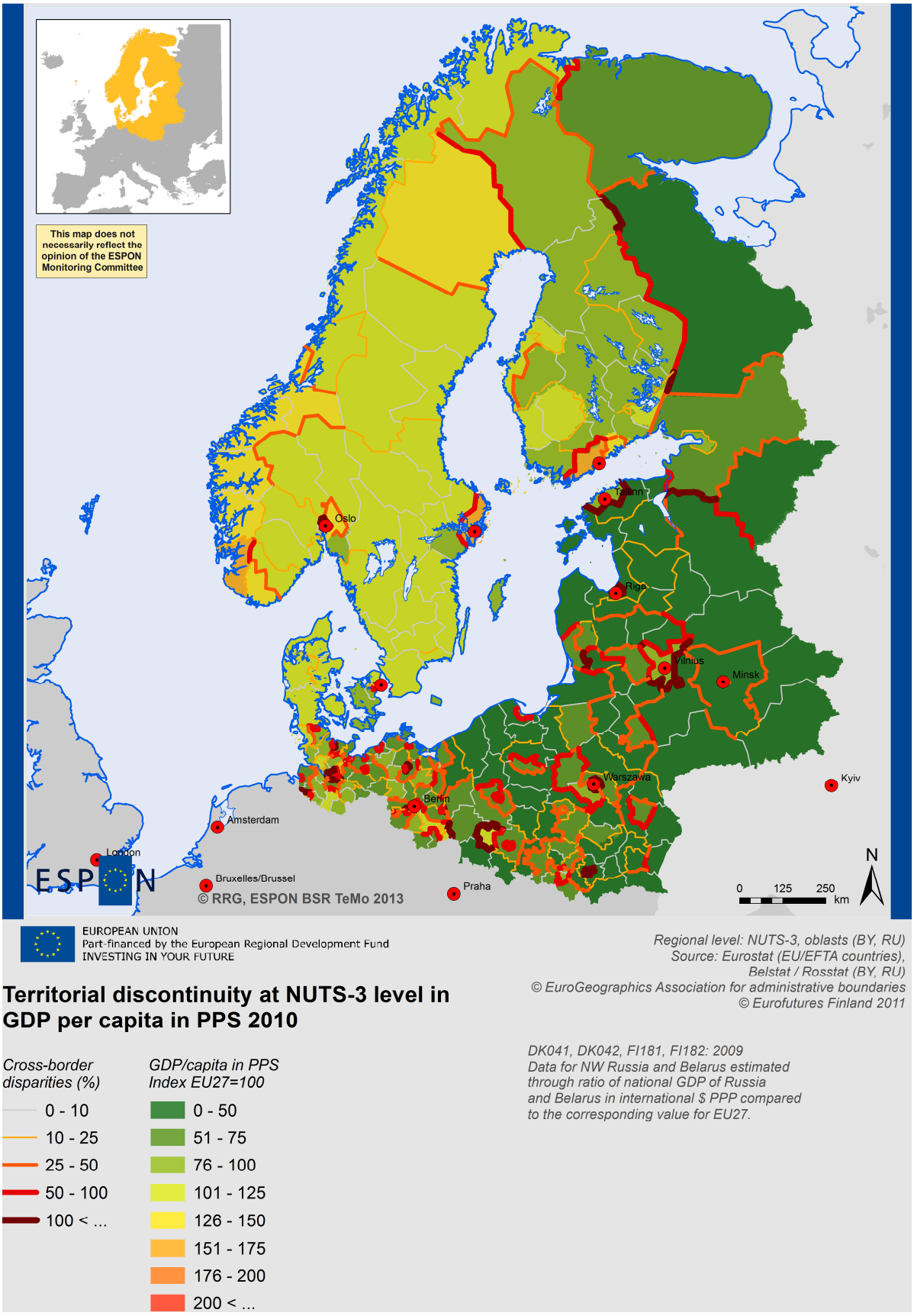


Figure 4. Territorial discontinuity at NUTS-3 level in GDP per capita in PPS, BSR

3.1.2 GDP per Person Employed

Indicator definition
This indicator is defined as the Gross Domestic Product in Purchasing Power Standards per person employed.

Indicator importance
This is an indicator of labour productivity indicating how much output a given number of employees / workers are producing. For measuring regional production, it alleviates the measurement problem of commuting of the classical indicator GDP per capita, and thus provides a more truthful picture of regional productivity than GDP per capita does.

Findings
Preservation of a large east-west divide in two aspects can be detected for this indicator:

Firstly, in Finland, Denmark, Norway and Sweden, representing the typical west, the productivity levels are generally much higher than in the Baltic States, Poland, Russia and Belarus. As a rule of thumb, the farther east a region is located, the lower its productivity is, resulting in lowest figures for Belarus and parts of Russia. For Russia, only the greater St. Petersburg area reach productivity levels similar to those in Western Poland.

Secondly, within the countries, a divide between capital regions (and some more regions including strong cities in Poland) and other regions is much larger in the east than in the west. German section of BSR, due to its former East Germany part, is not fully converged with the west yet but is already more similar to the west than to the BSR east, with Berlin and Hamburg as outstanding agglomerations.

Looking at the whole of Europe, this east-west divide observation is reinforced by the extremely low figures for Bulgaria and Romania, marking the lower end of the spectrum of GDP per employee in the European Union, while Benelux countries, France and the UK generally have high productivity levels. Czech Republic, Hungary, Slovakia and Slovenia represent countries in transition, with GDP per employees between 30 and 40,000 Euros in 2009. The Mediterranean countries (Portugal, Greece) yield a mixed picture, with some rather rich regions, contrasted by many poor regions.

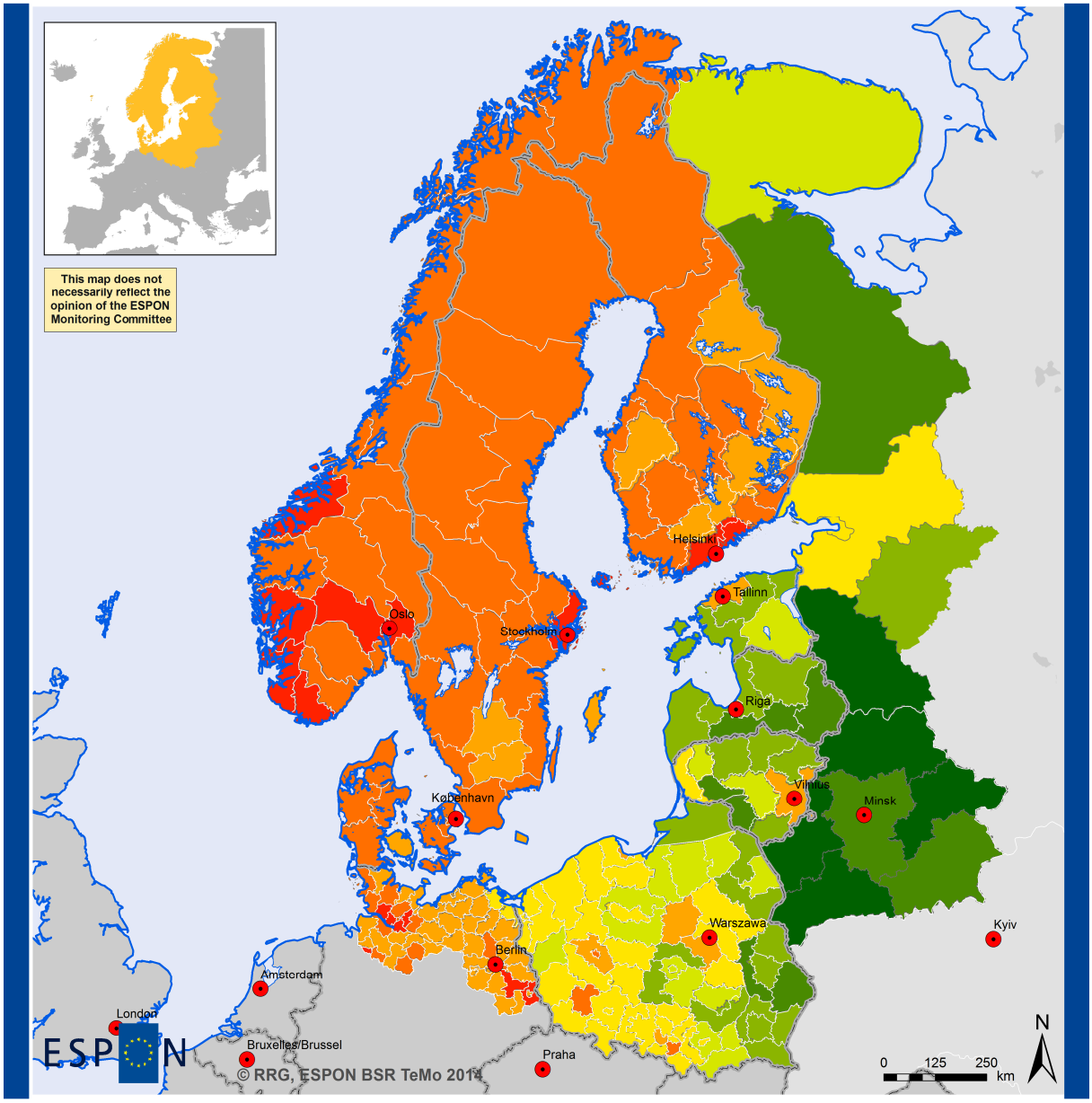


Figure 5. GDP per employee, 2009, BSR

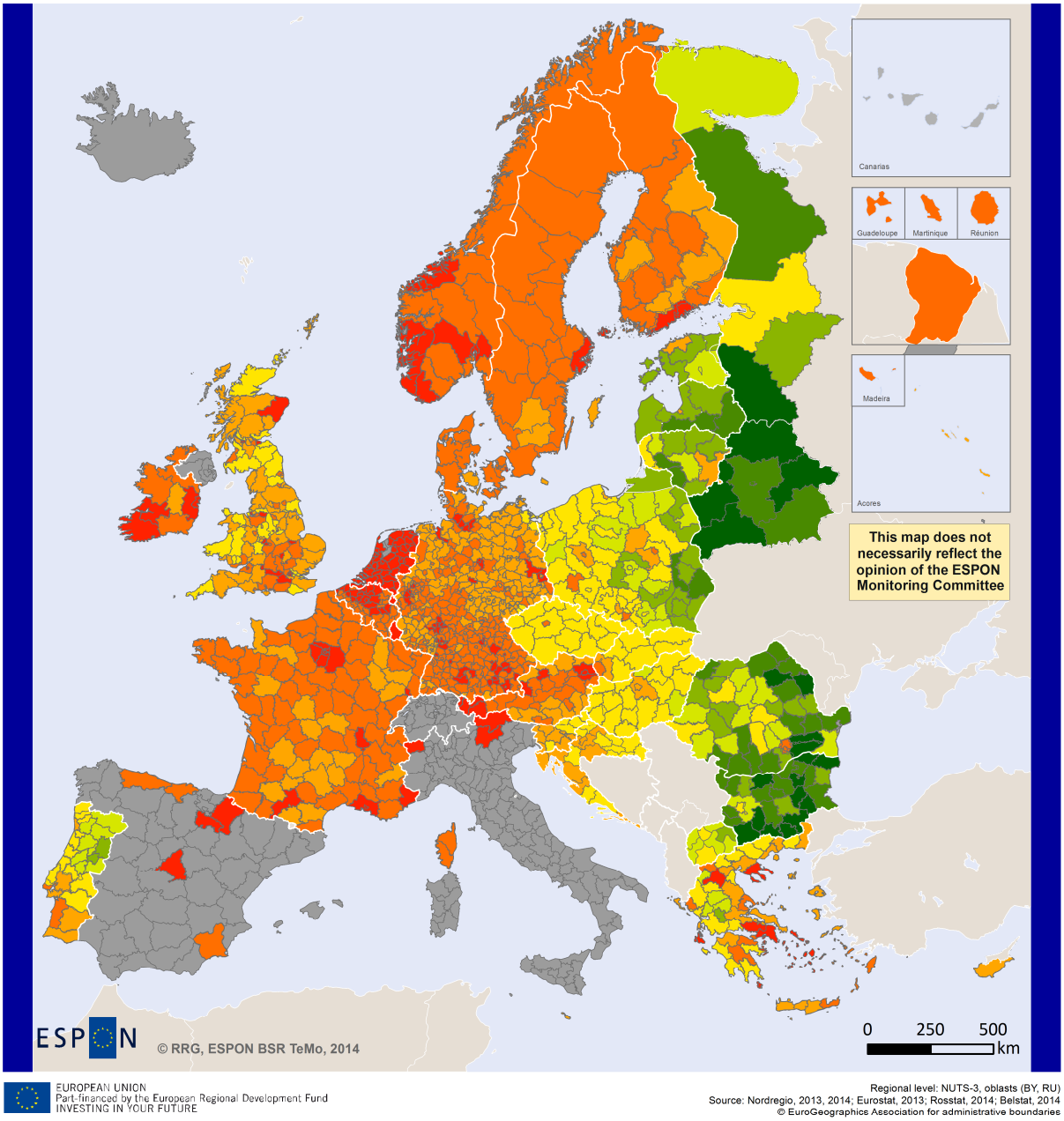


Figure 6. GDP per employee, 2009, ESPON Space

3.1.3 Total Unemployment Rate

Indicator definition
The unemployment rate represents the ratio between unemployed workers in relation to the total labour force. This indicator gives the overall unemployment rate

Indicator importance
This indicator measures the quality and performance of regional labour markets. It constitutes a contextual indicator important to assess regional flexibility as well as sustainability of local economic activities.

Findings
In 2005, serious unemployment could be found first of all in Poland, Slovakia and East-Germany. Over 10% unemployment was also in Southern Spain, southern Italy, Finnish periphery, Bulgaria and Greece. 2006-2007 the employment situation improved all over the ESPON area, except East Germany and Spain. Especially the situation in Poland improved. High unemployment started to spread to the north in Spain from 2008. In 2009, Spain, Ireland, the Baltic States were hit severely, the situation worsened in Turkey, too.

In BSR, the biggest change in unemployment pattern has been improving in Poland and worsening in the Baltic States. Finnish periphery and East Germany have remained areas of remarkable unemployment through all the period.

Discontinuities:
A difference of 100% and more existed along the Norwegian and Belarus external borders, but also in a few sections around prosperous metropolitan regions of Warszawa and Copenhagen. Elsewhere the differences have been less. However, unemployment was spread more evenly in the Nordic countries, but the situation was more mosaic in the Baltic States, Poland and Germany

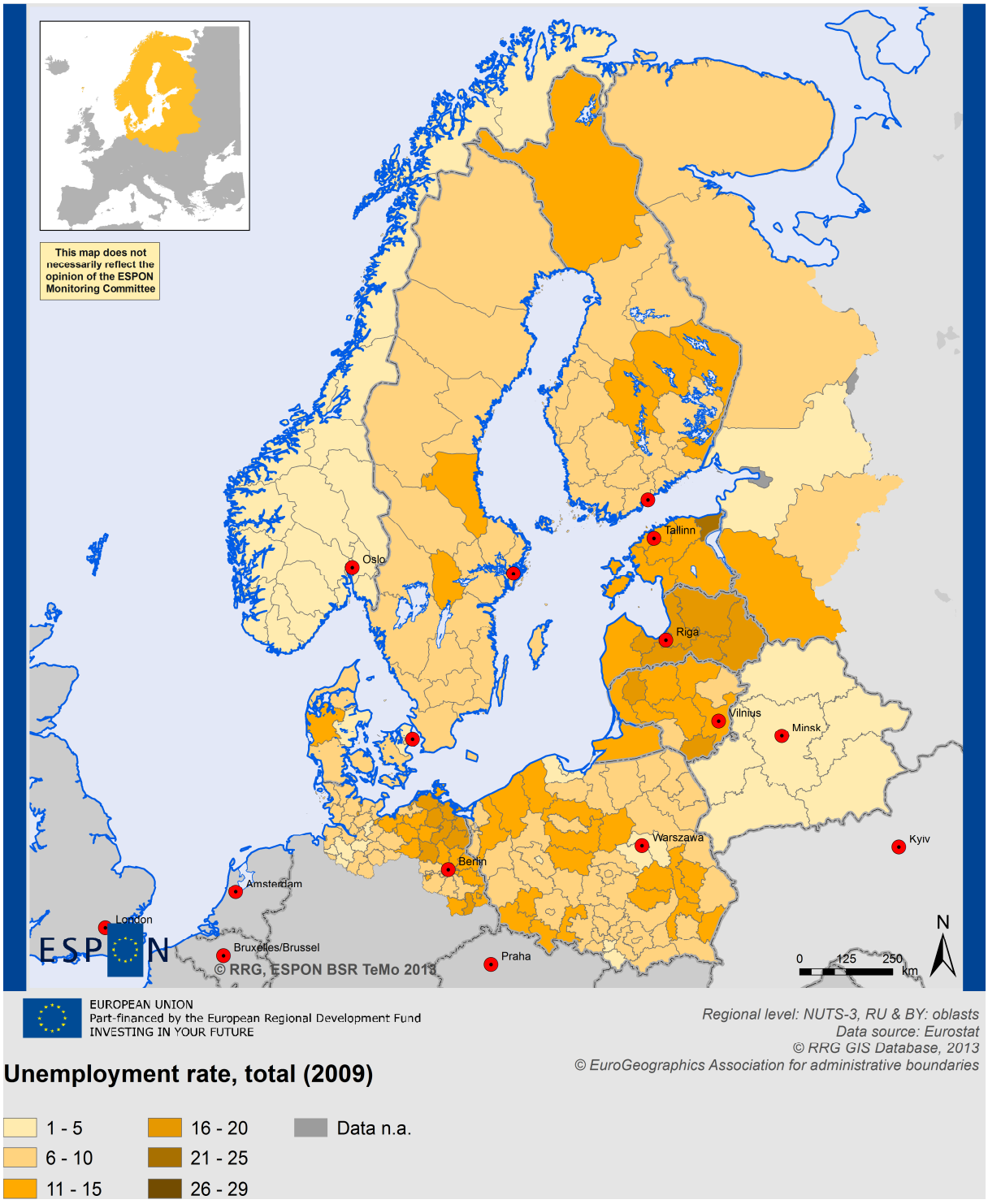


Figure 7. Total unemployment rate 2009, BSR.

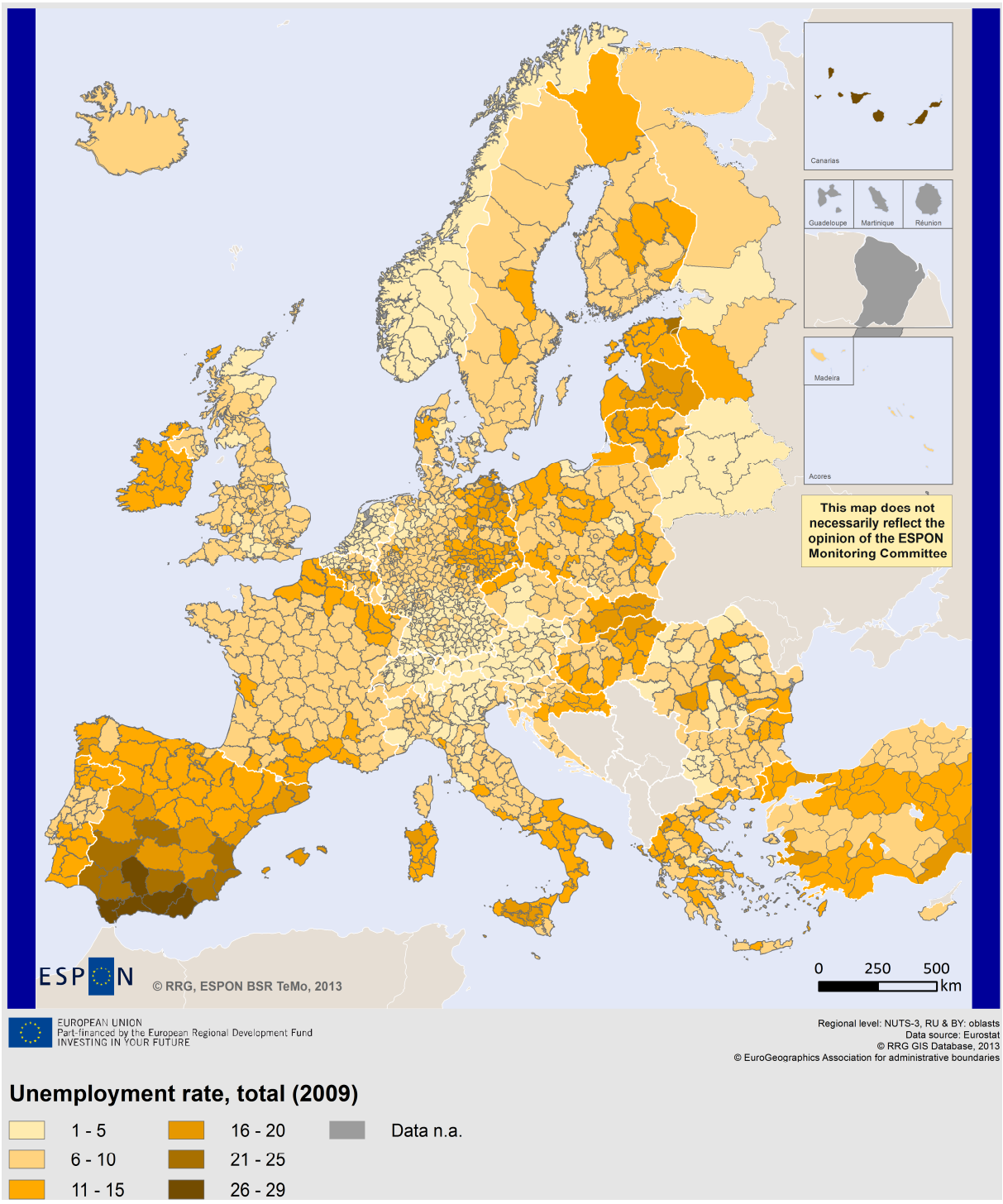


Figure 8. Total unemployment rate 2009, ESPON Space.

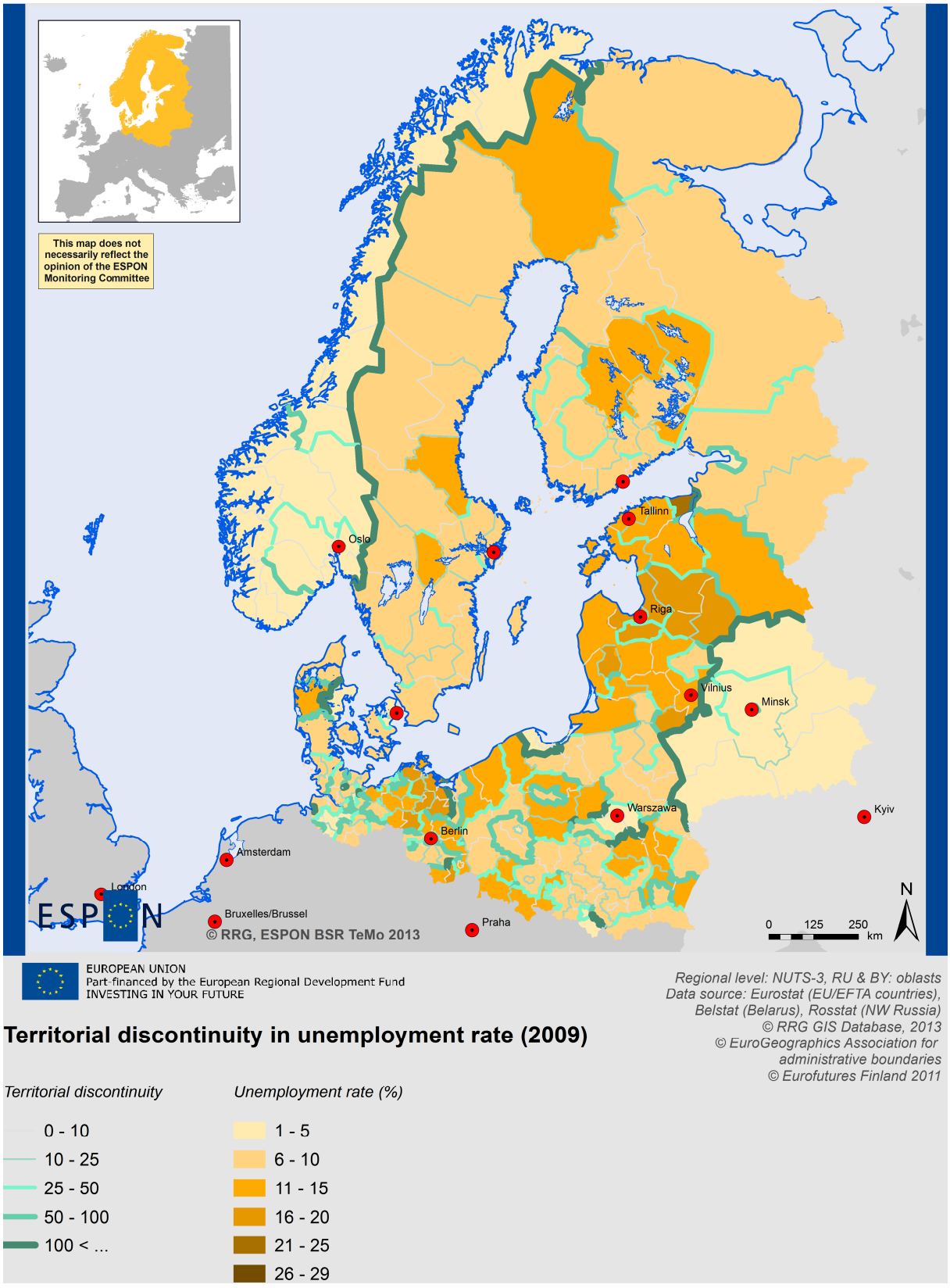


Figure 9. Territorial discontinuity in unemployment rate 2009, BSR.

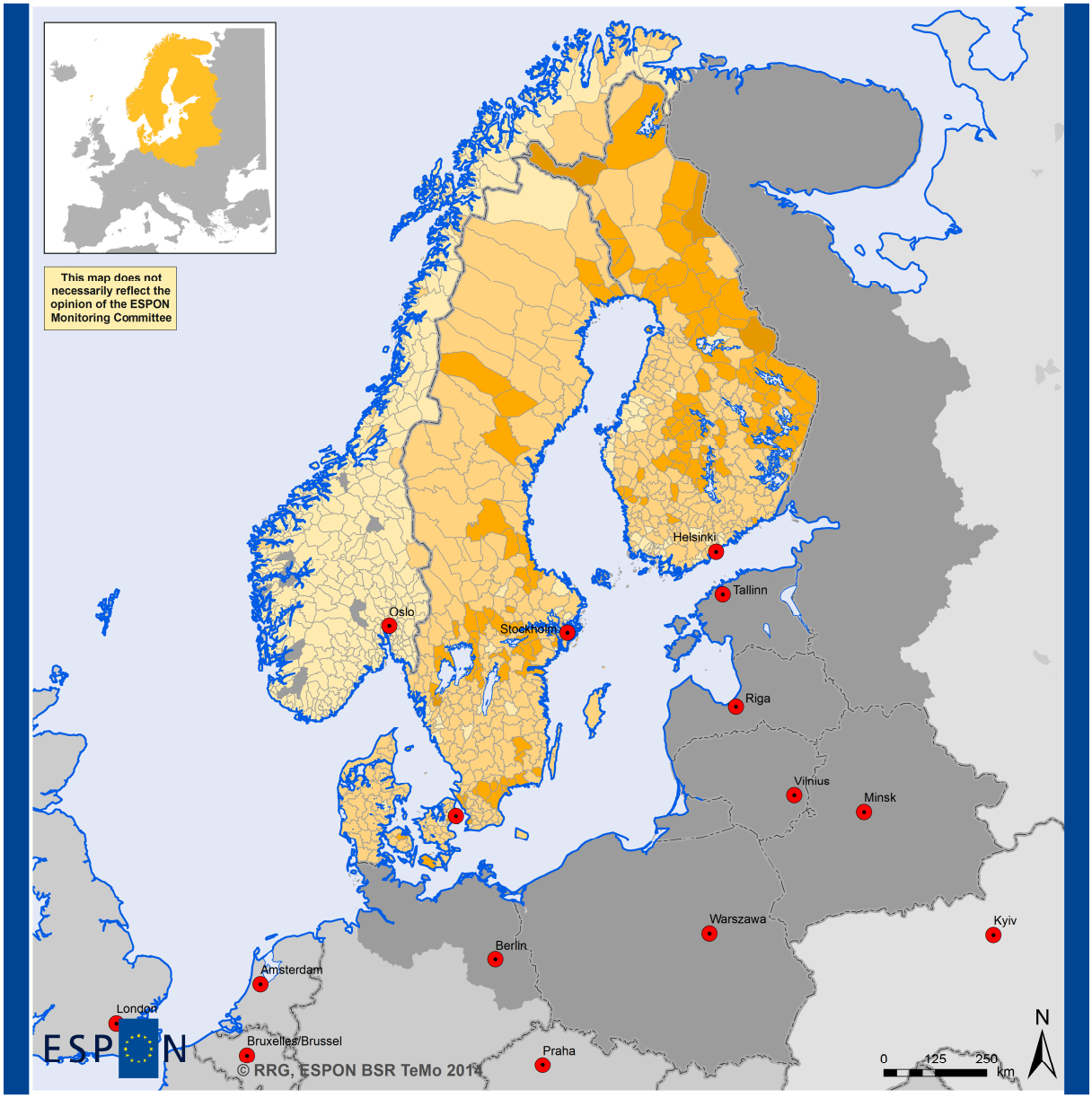


Figure 10. Total unemployment rate 2012, Nordic countries, municipalities.

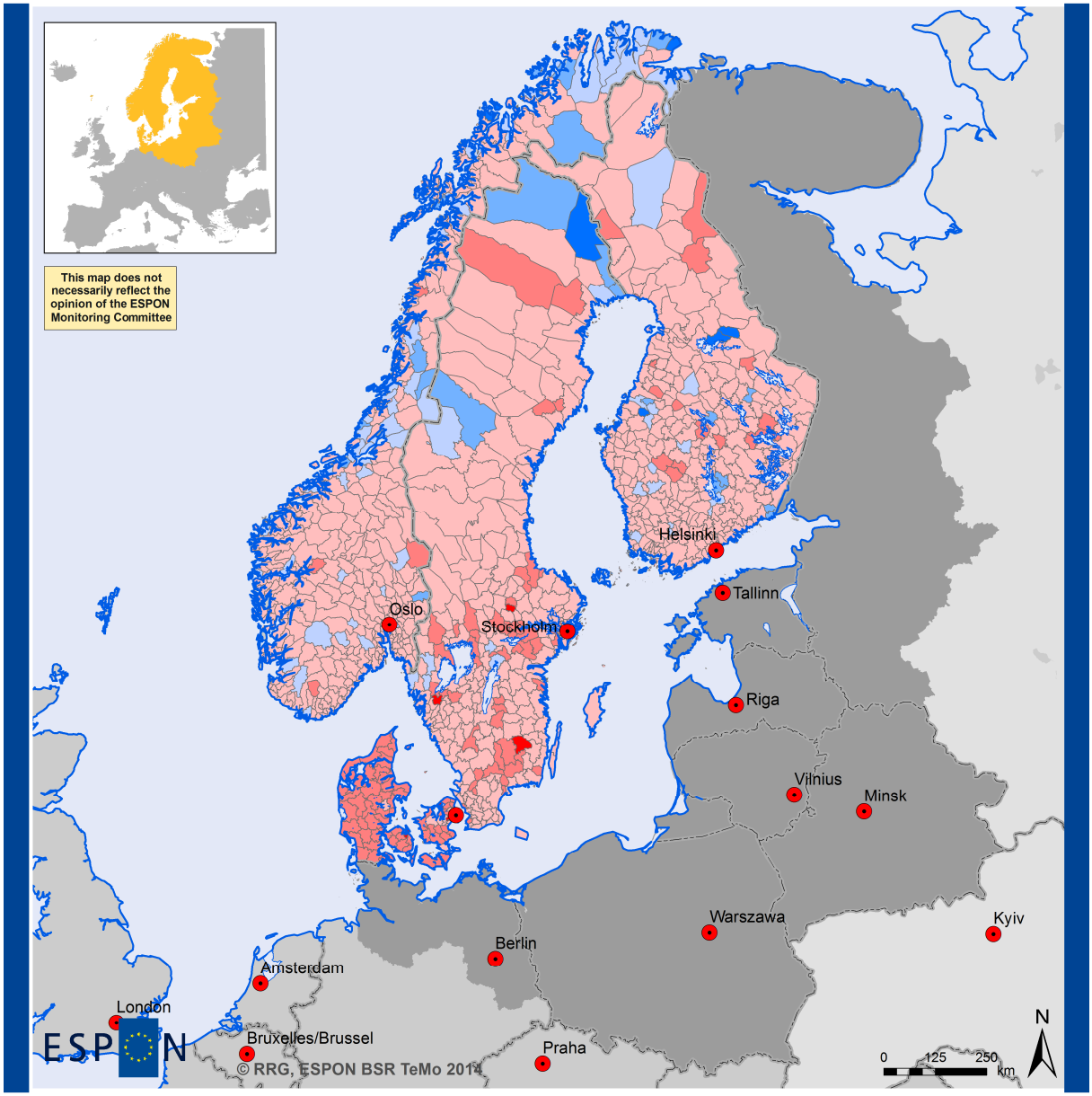


Figure 11. Total unemployment rate, change in percentage points 2008-2012, Nordic countries, municipalities.

3.1.4 Employment Rate

Indicator definition
This indicator, sometimes also called employment-to-population ratio, is defined as the number of employed persons aged 20 to 64 in relation to overall working age population aged 20 to 64.

Indicator importance
This indicator is used to describe the labour market performance. For many economist´s it is the best indicator to describe dynamics within the labour market, as it accounts not only for full-time positions but accounts for any employed person that at least worked one hour "gainful" in a week. Consequently, this is an official indicator in the EU SDS and is furthermore headline indicator of EU2020 strategy for Smart Growth, aiming at a rate of 75% employment in working age population.

Findings
BSR employment rates in 2012 are mostly lower (not higher 70%) in Poland, Latvia Lithuania but also in Pohjois-Suomi. In the remaining BSR, incl. the Russian oblasts and Belarus the rates are higher exceeding the highest levels (over 80%) in Norway, Sweden and Russia (St Petersburg).

In the ESPON area, decrease of employment from 2005 to 2012 has occurred on a large part of their territory: Baltic States, Hungary, Romania and Bulgaria, Spain, Portugal and Ireland.

In remaining countries the picture is mixed. Italy, Macedonia and Poland have succeeded to increase employment remarkably in several regions. For the BSR, the overall picture in terms of employment rate changes is mixed. Belarus, but also mostly Denmark, Finland and Germany have avoided decrease of employment despite of the crisis. The Baltic States have been hit most seriously. At the same time, Poland has succeeded to increase employment remarkably in several regions.

The map of regional employment rate typology is very difficult for visual interpreting. The situation can be easily assessed outside the EU where the only 75% threshold plays, but inside the EU the same green color scale is related not to 75% (EU) target but national targets. The latter is set with the different ambitiousness in various countries from 71 to 80%. Trying to generalize, despite the difficulties:

- Outside EU (Norway, Russia, Belarus) most regions have already reached or are likely to reach 75%, except for Leningrad oblast and eastern Belarus.
- In the EU, most countries have more difficulties to reach targets (whatever the level of their ambitiousness is) in their periphery.
- The EU target will, if the extrapolation of the trend holds, not met in the Baltic States, most of Poland, periphery Finland and Denmark

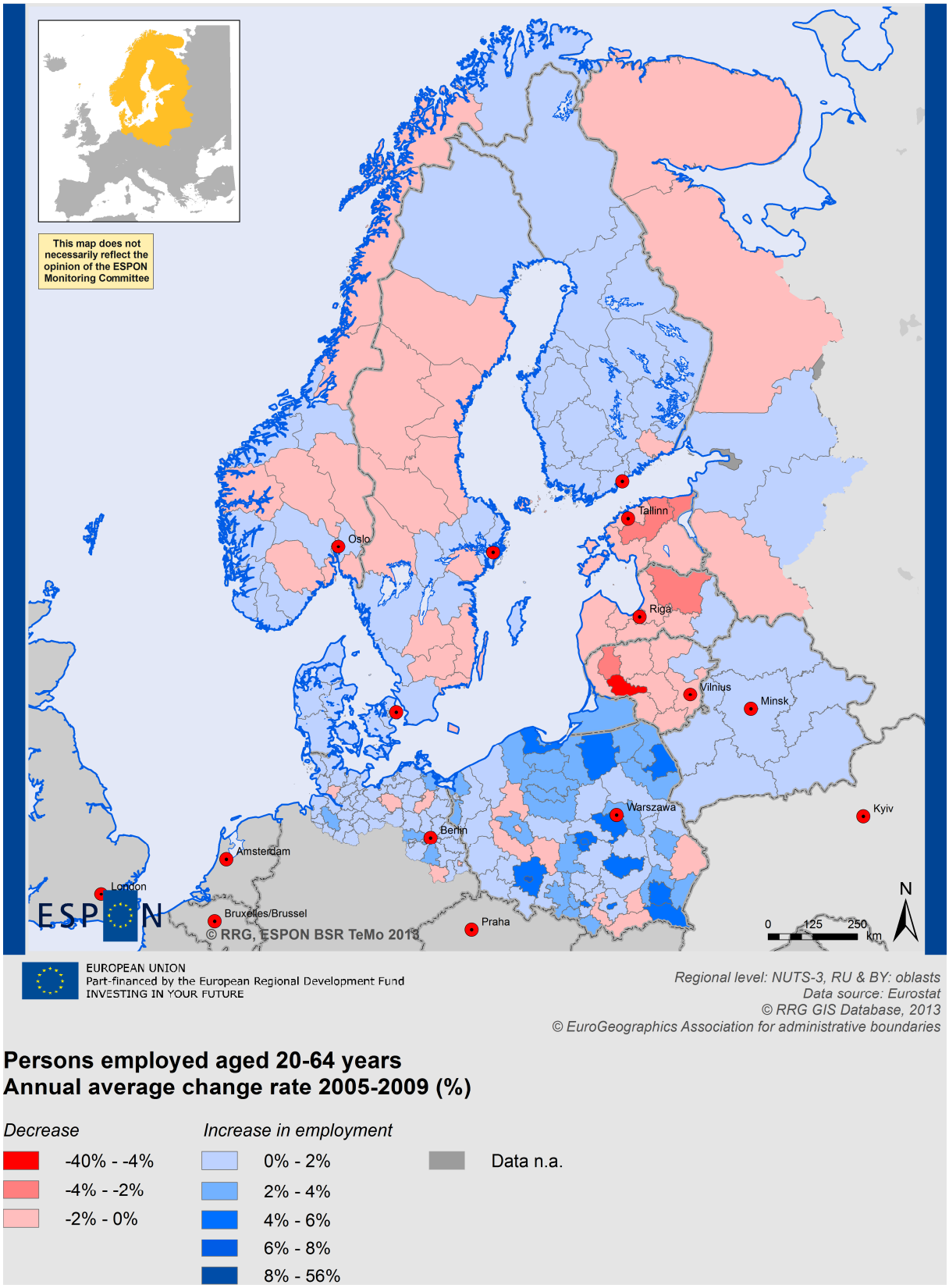


Figure 12. Persons employed aged 20-64 years, annual average change rate 2005-2009, BSR.

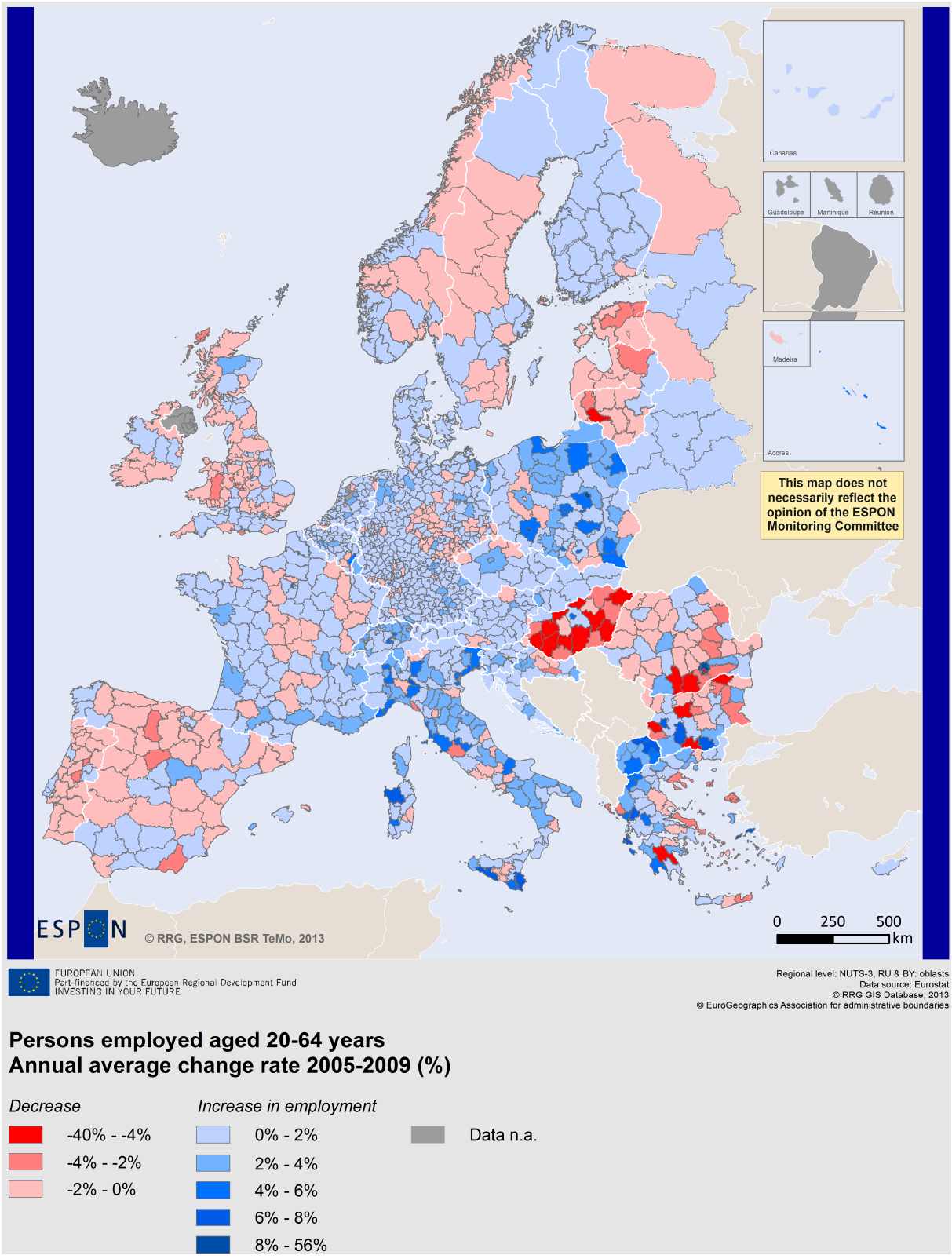


Figure 13. Persons employed aged 20-64 years, annual average change rate 2005-2009, ESPON Space.

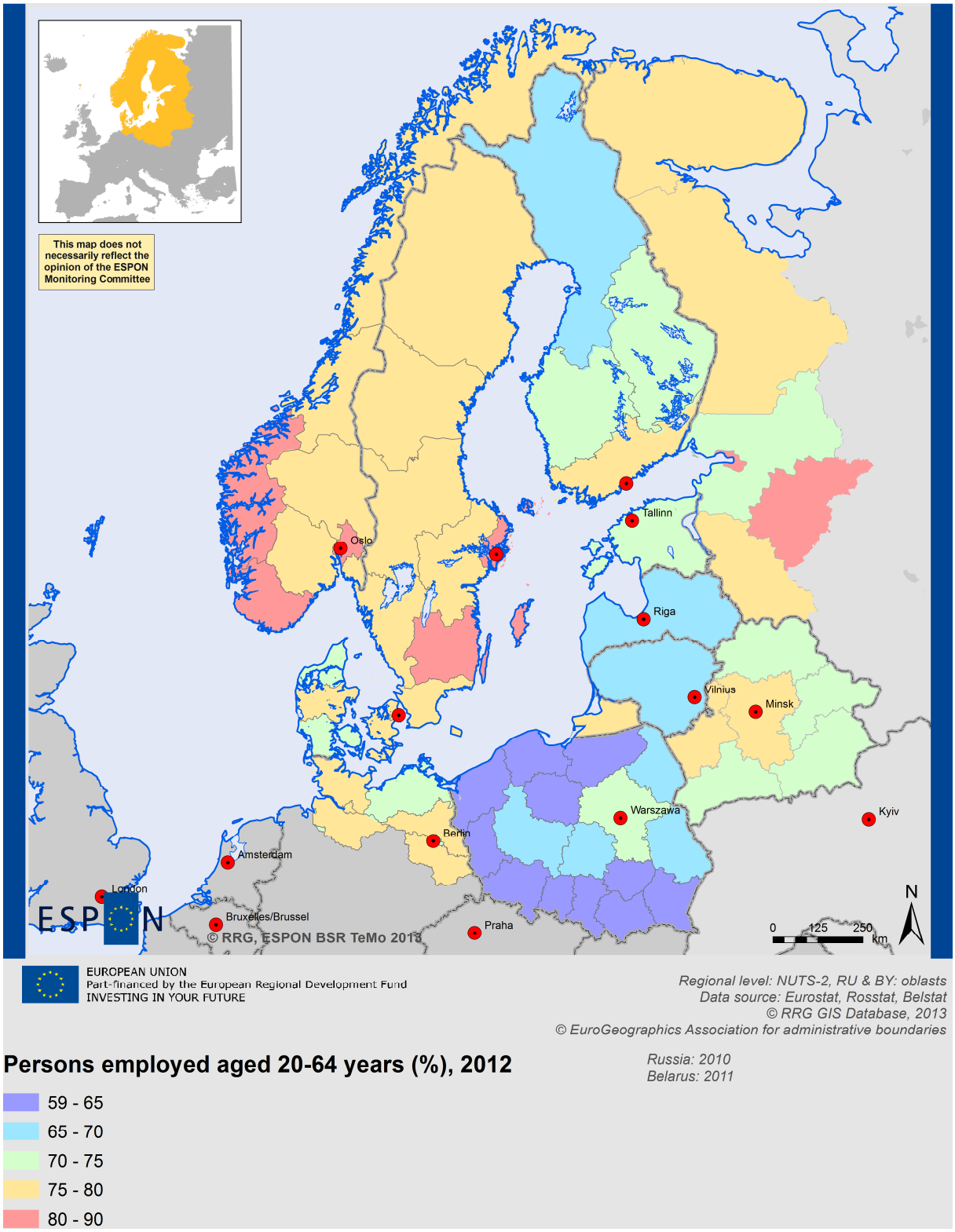
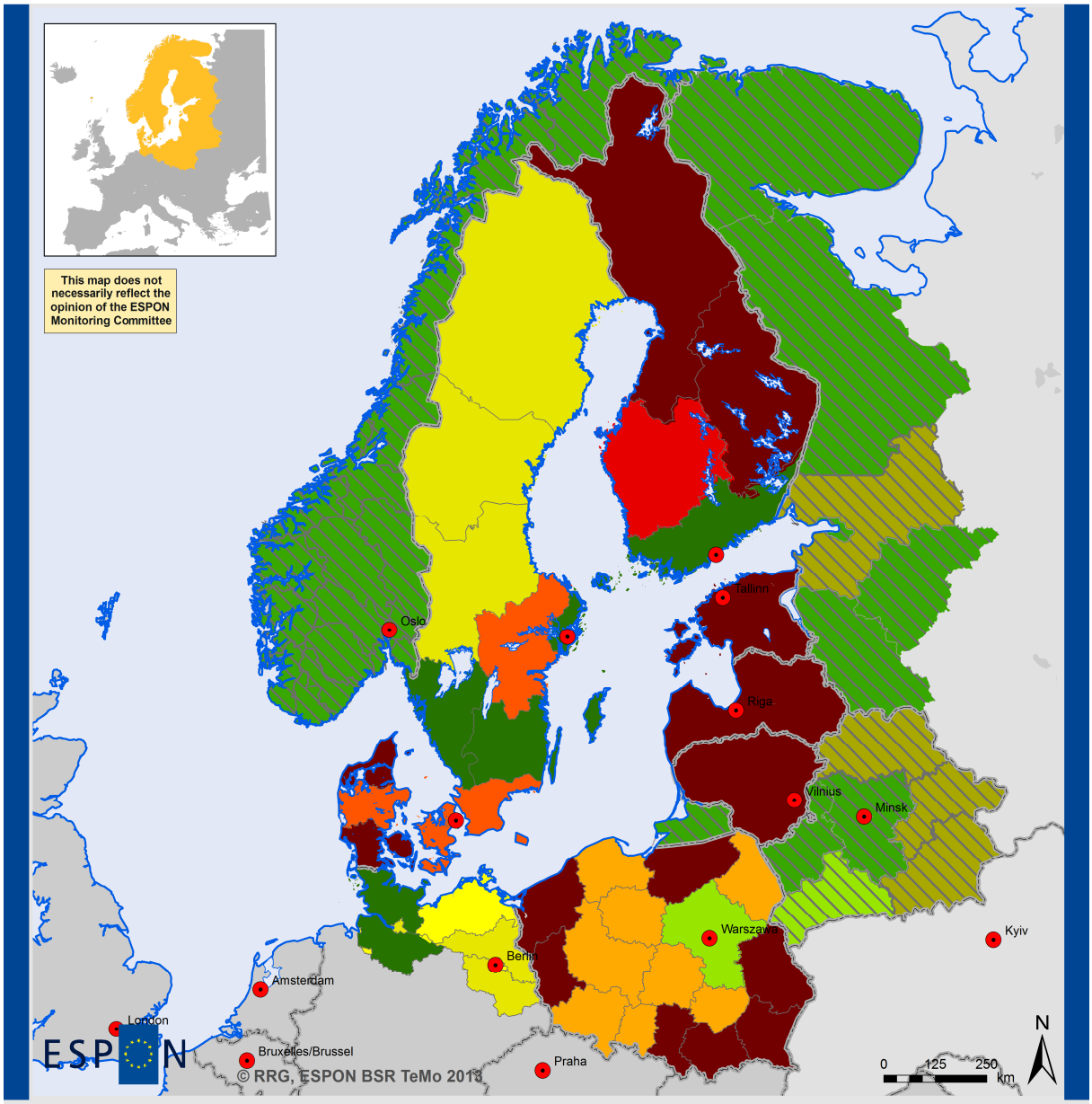


Figure 14. Persons employed aged 20-64 years in 2012, BSR.



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EU2020 strategy employment rate targets (age group 20-64 years)
Typology of regions according to the average trend 2005-2012

G	H	I
D	E	F
A	B	C

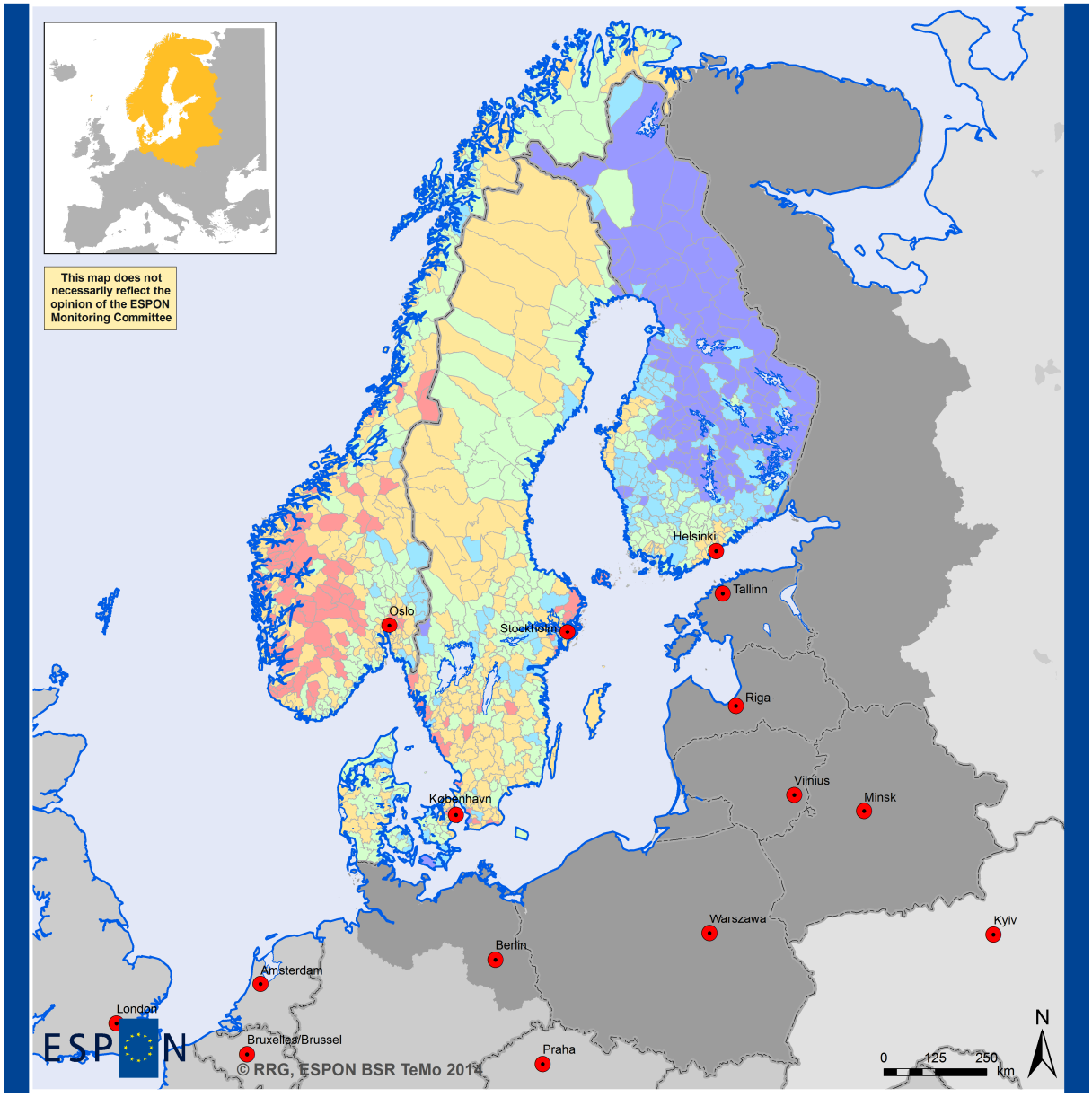
Ax	Bx	Cx

Legend:
Ceteris paribus, if the development continues according to the average trend 2005-2012, then:
A Both EU and national targets reached already
B National target reached already, EU target will be reached by 2020
C National target reached already, EU target will not be reached by 2020 (no such in the BSR)
D EU target reached already, national target will be reached by 2020
E Both EU and national targets will be reached by 2020
F National target will be reached by 2020, EU target will not be reached by 2020
G EU target reached already, national target will not be reached by 2020
H EU target will be reached by 2020, national target will not be reached by 2020
I Neither EU nor national targets will be reached by 2020

Ax 75% target level reached already, no national target level
Bx 75 % target level will be reached by 2020, no national target level
Cx 75 % target level will not be reached by 2020, no national target level

Denmark & Finland: based on trend for 2007-2012, Brandenburg: 2009-2012, Norway: 2006-2012
NW Russia: based on trend for 2005-2010. Employed persons aged 15-72 years; population denominator 16-59 years for males, 6-54 years for females
Belarus: based on trend 2005-2011. Employed persons all age groups; same population denominator20-64 years throughout (from population census 2009)
Itä-Suomi and Pohjois-Suomi: disaggregated from NUTS 2010

Figure 15. EU2020 strategy employment rate targets – Typology of regions, BSR.



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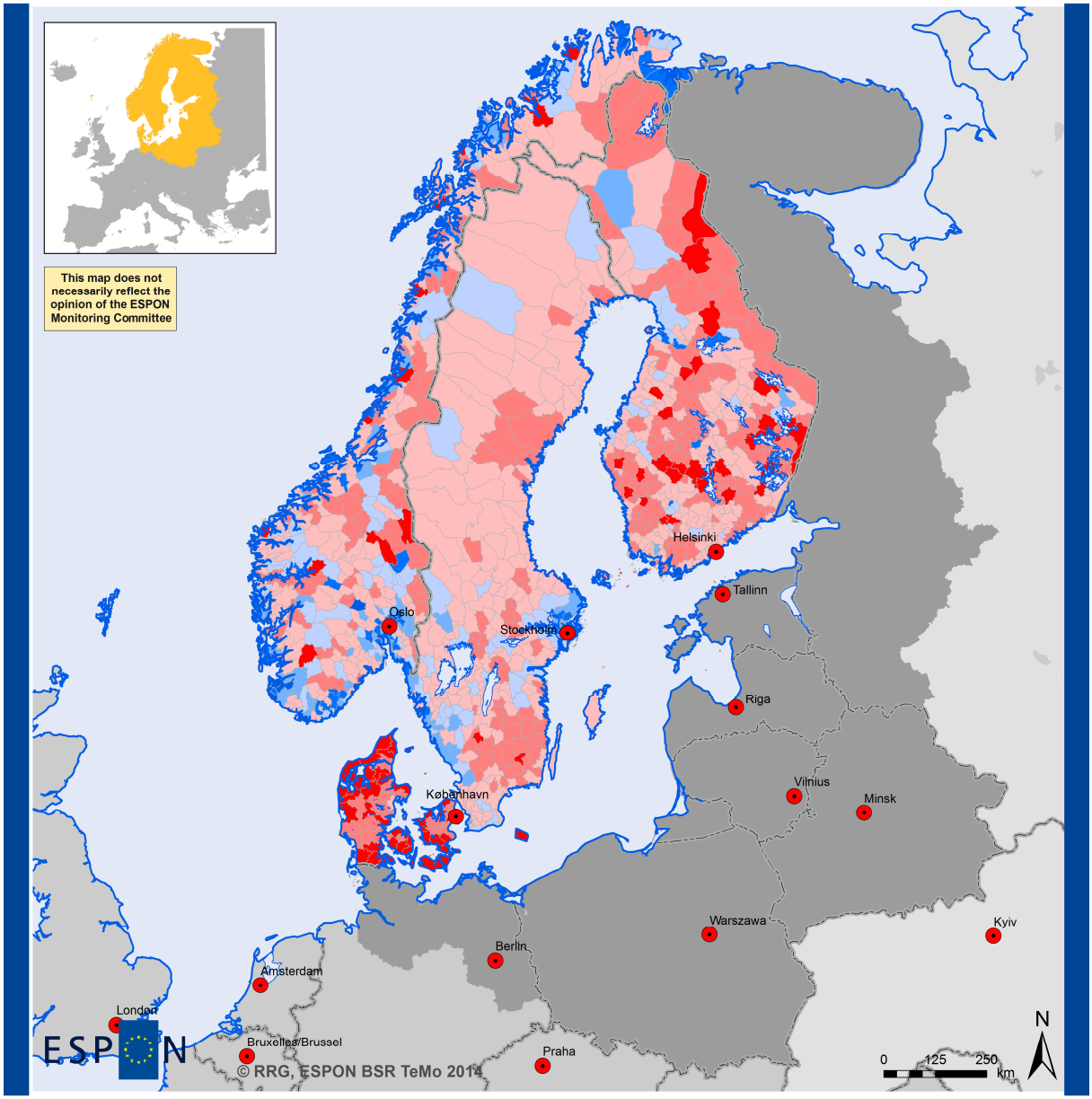
Persons employed aged 20-64 years (%), 2012
Nordic countries, municipalities

- 53 - 65
- 65 - 70
- 70 - 75
- 75 - 80
- 80 - 90

Figure 16. Persons employed aged 20-64 years in 2012, Nordic countries, municipalities.



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Regional level: LAU-2 (DK: LAU-1)
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Persons employed aged 20-64 years
Annual average change rate 2008-2012 (%)
Nordic countries, municipalities

Decrease	*Increase in employment*	
-6.0% - -2.0%	0.0% - 0.5%	BSR territory
-2.0% - -1.0%	0.5% - 1.0%	
-1.0% - 0.0%	1.0% - 2.0%	
	2.0% - 4.0%	
	4.0% - 10.0%	

Figure 17. Persons employed aged 20-64 years, annual average change rate 2008-2012, Nordic countries, municipalities.

3.1.5 Net Migration Rate

Indicator definition
Net migration rate is defined as the difference between immigrants and emigrants of a region, divided by region population. A positive value means that more people enter a region than leaving it, while negative values mean that more people leave the region than entering into it.

Indicator importance
This indicator is considered as a proxy for the overall attractiveness of a region in terms of labour markets, education, job opportunities, quality of life, welfare state and others. Positive net migration rates might counteract negative natural demographic trends such as lack of births or overaging population. Net migration is an official indicator of the EU SDS.

Findings
In absolute numbers, the most attractive destinations for migrants in 2010 in the ESPON Space are certain metropolises: Roma, Milano, Stockholm, Brussels, Munich, Budapest, Manchester etc. But some metropolises have become the sources of intense net outmigration, too: for example, Dublin and all biggest Lithuanian cities. In the BSR, the biggest net outmigration was from Lithuanian cities, while Stockholm, Berlin, Minsk and Hamburg gained most net migrants.

On average 2005-2010, net migration includes both rural-urban moving within a country and moving between countries: urbanization and moving to richer countries prevail. Outmigration has been dominating in most regions of the new EU member states (Czech Republic and Slovenia being exceptions). People are moving out of the most peripheral Nordic regions of Russia, Finland, Norway and Sweden, but also of Pskovskaya oblast and Belarus. On the other hand, outmigration dominates in many German regions – not only East Germany where it is very intense, but other too. In the old member states northeastern France and eastern Austria are also characterized by prevailing outmigration. Spain, Southern France, Italy and Ireland have gained relatively most in-migrants. The eastern and southern shore of the Baltic Sea is characterized by prevailing outmigration. The same holds for the northernmost periphery. The highest average rates of net outmigration can be found in East Germany, Lithuania and Murmanskaya oblast. Southern regions of Sweden, Norway and Finland, Denmark, Berlin, St Petersburg, and surrounding it oblasts attract migrants. Remarkable net in-migration can be seen around certain cities in Poland and Baltic States, too.

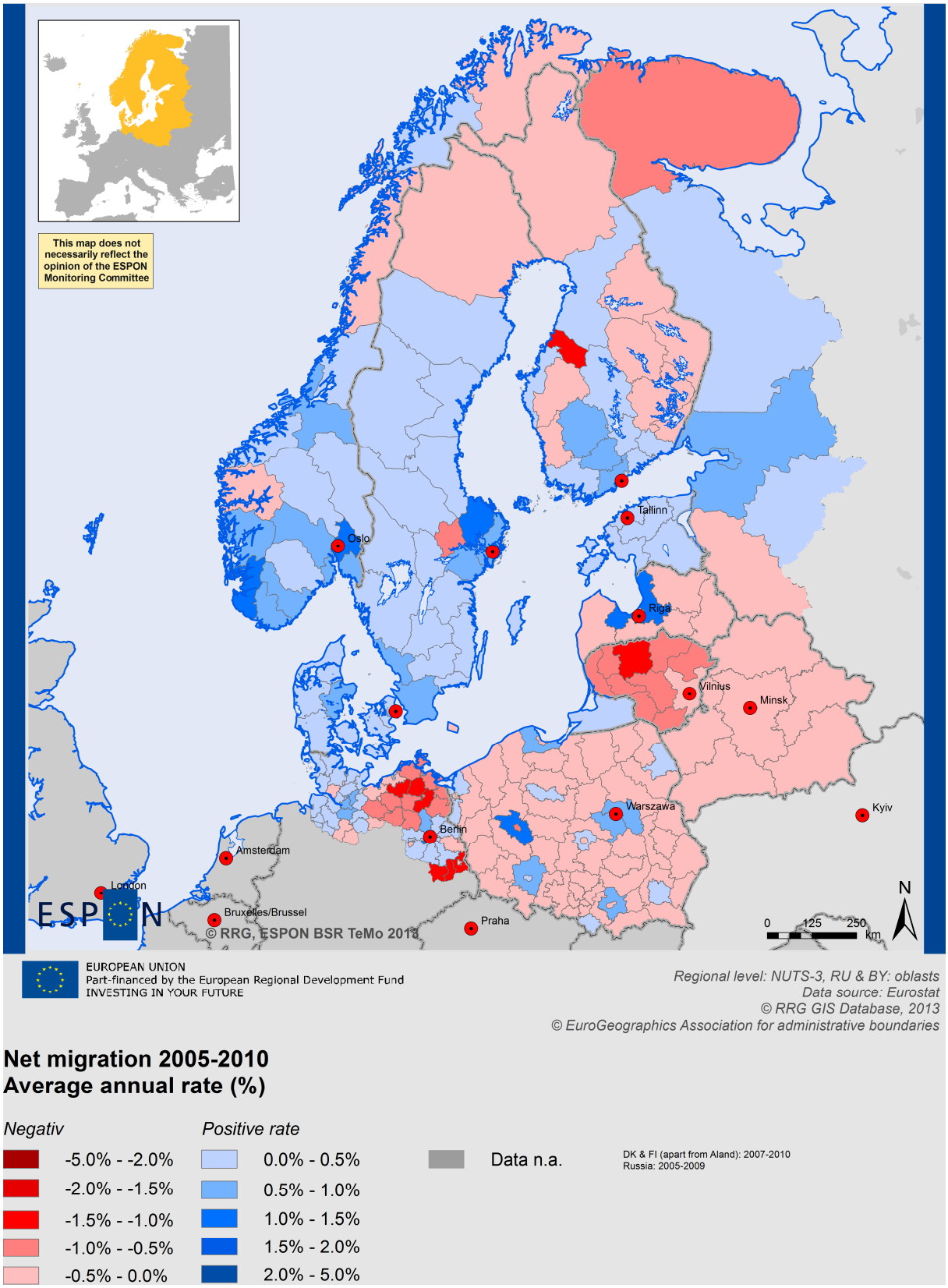


Figure 18. Net migration average annual rate 2005-2010, BSR.

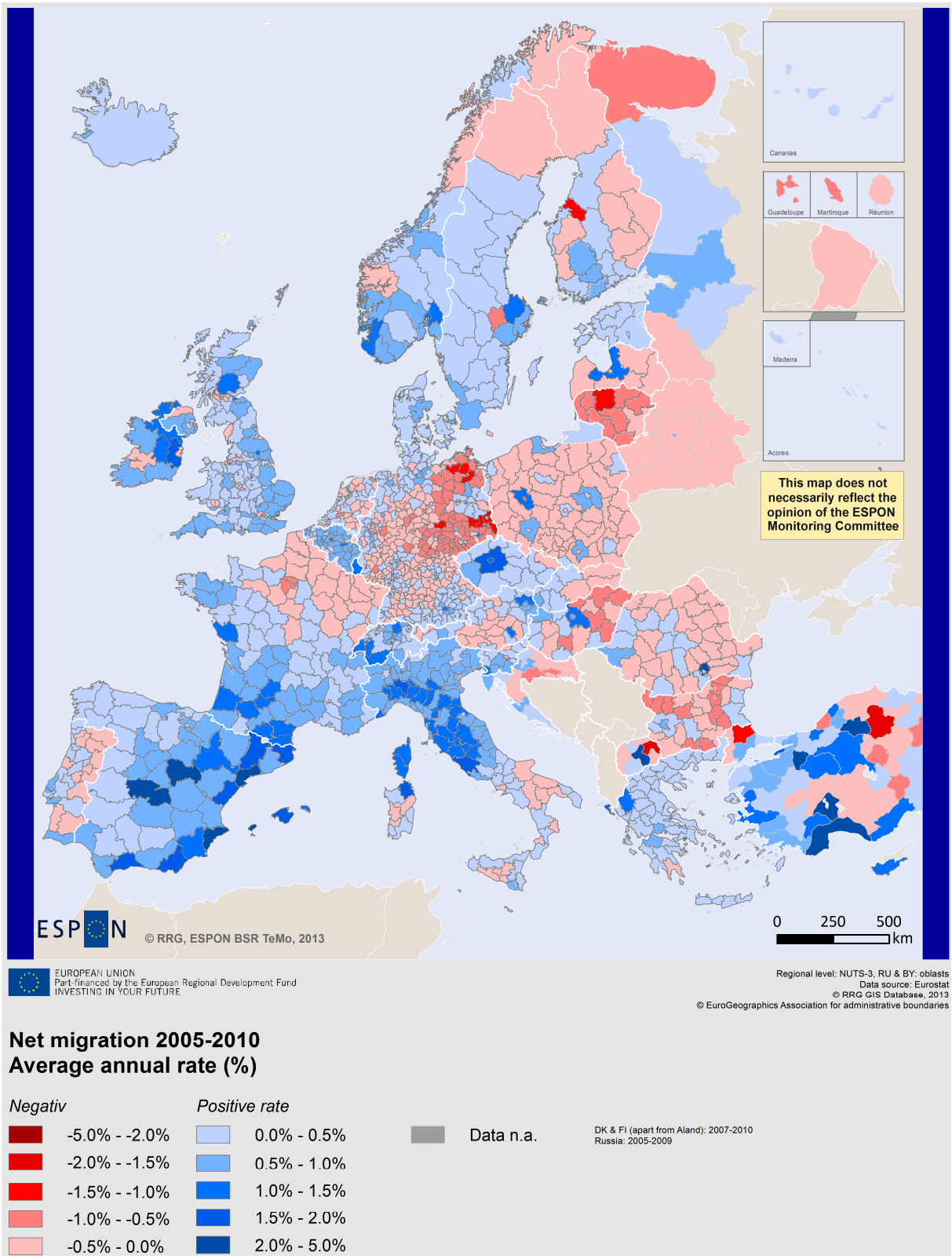


Figure 19. Net migration average annual rate 2005-2010, ESPON Space.

3.1.6 Total Population Change

Indicator definition
Total population change is defined as the netto change in residence population due to natural demographic (births, deaths) and migration (immigration, emigration) processes. A positive population change means a growing population number of a region, while negative population change means decreasing population.

Indicator importance
The overall population stock is the main variable for provision and maintenance of public and private facilities. Increasing population requires to extend number and capacities of public and private services, while decreasing population may lead to reduced demands for such services.

Findings
At European scale, we can point out a division between the old member states of EU on one hand and the new member states, Russia and Belarus on the other hand. When in the first category population typically increases, then in the latter category population numbers typically decrease, growth can be observed in the capital regions and other metropolitan regions. However, the model is not clear-cut. Many German regions have population decreasing (the East Germany regions having weakest performance) when Slovenian and Czech regions behave like old Europe. At the same time, Greece behaves similar to the CEEC countries. Turkey falls out of the general pattern being the only country lying outside the "old" Europe but having generally good population increase.

The only countries in BSR having an increasing population in all regions are Norway and (with the exception of Bornholm) - Denmark. All other countries have both decreasing and increasing regions. Generally, regions around stronger cities are growing, periphery empties. The worst decreases occur in northwestern Russia, Lithuania and East Germany.

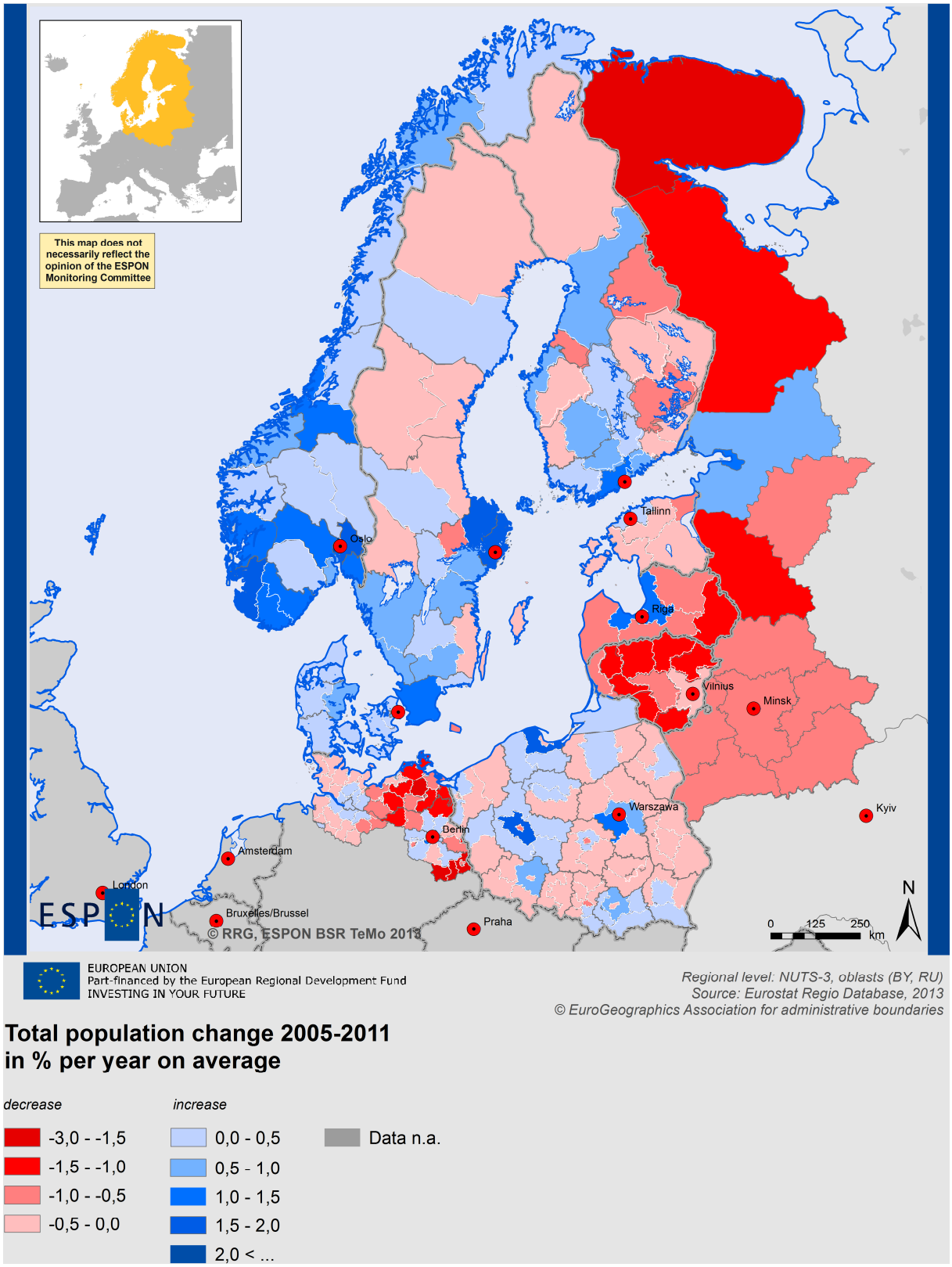


Figure 20. Total population change 2005-2011 per year on average, BSR.

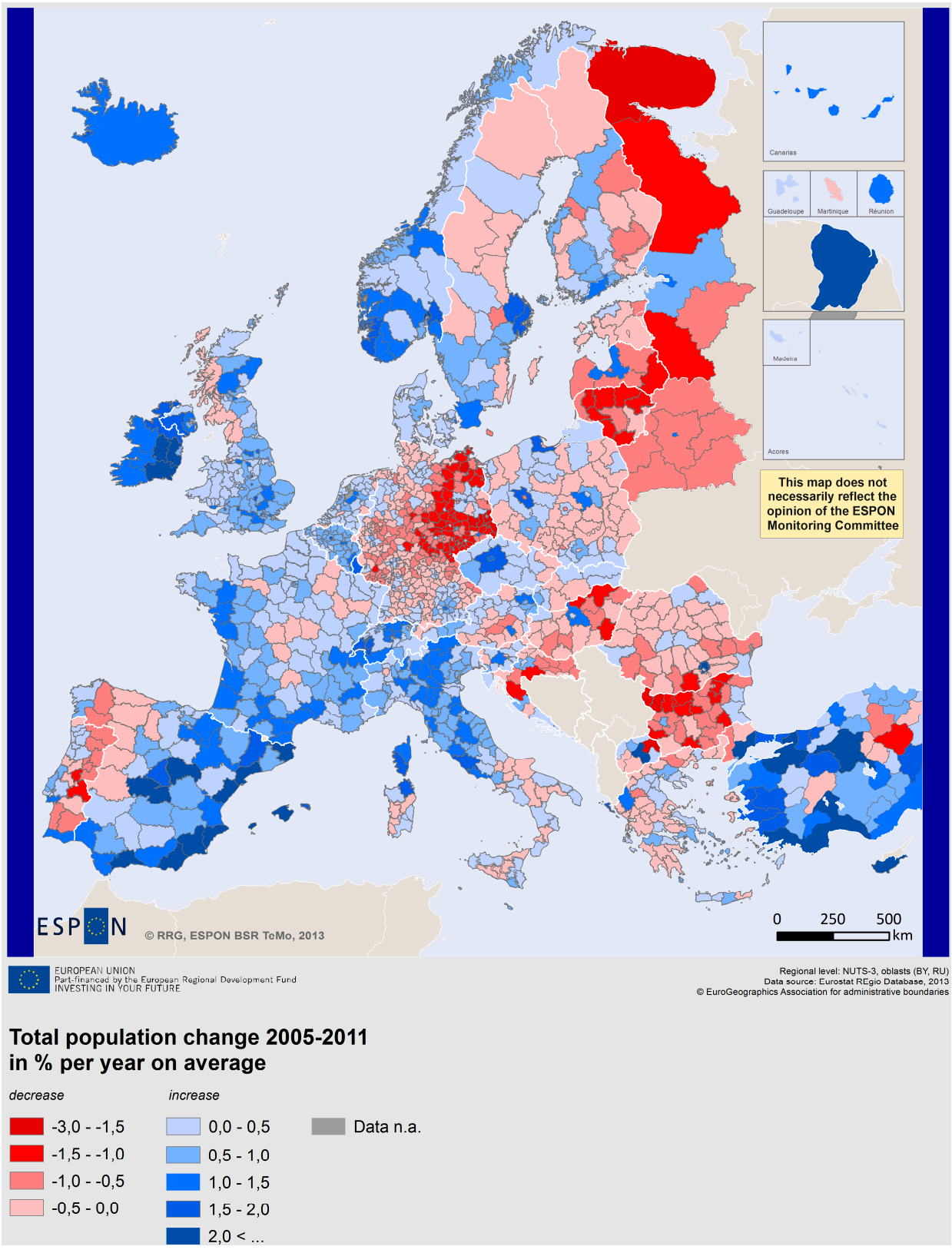
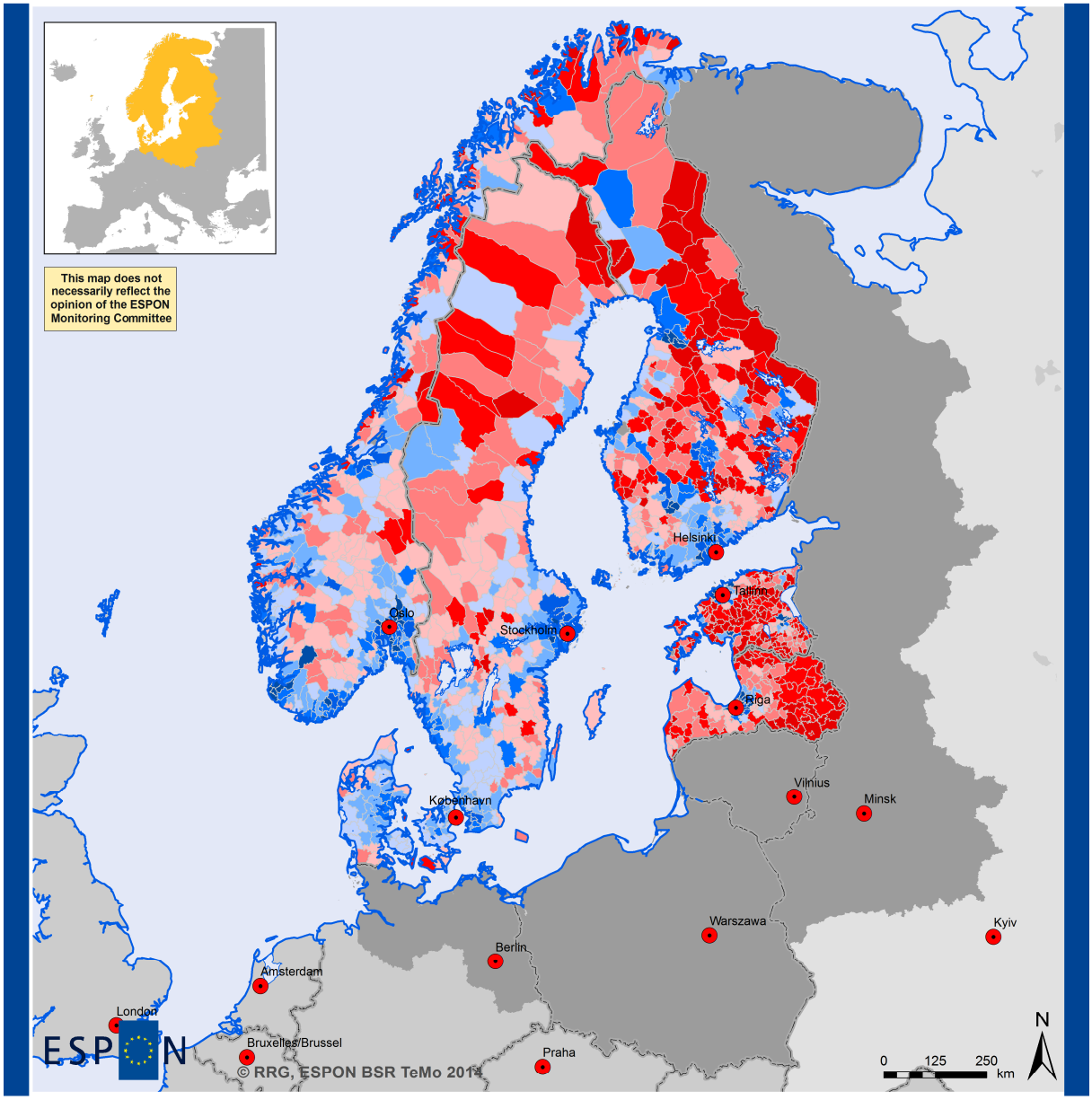


Figure 21. Total population change 2005-2011 per year in average, ESPON Space.



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Total population change 2006-2011
in % per year on average
Nordic countries, Estonia, Latvia, municipalities

decrease	*increase*	
-3,0 - -1,5	0,0 - 0,5	BSR territory
-1,5 - -1,0	0,5 - 1,0	
-1,0 - -0,5	1,0 - 1,5	
-0,5 - 0,0	1,5 - 2,0	
	2,0 < ...	

Figure 22. Total population change 2006-2011 per year on average, Nordic countries, Estonia, Latvia, municipalities.

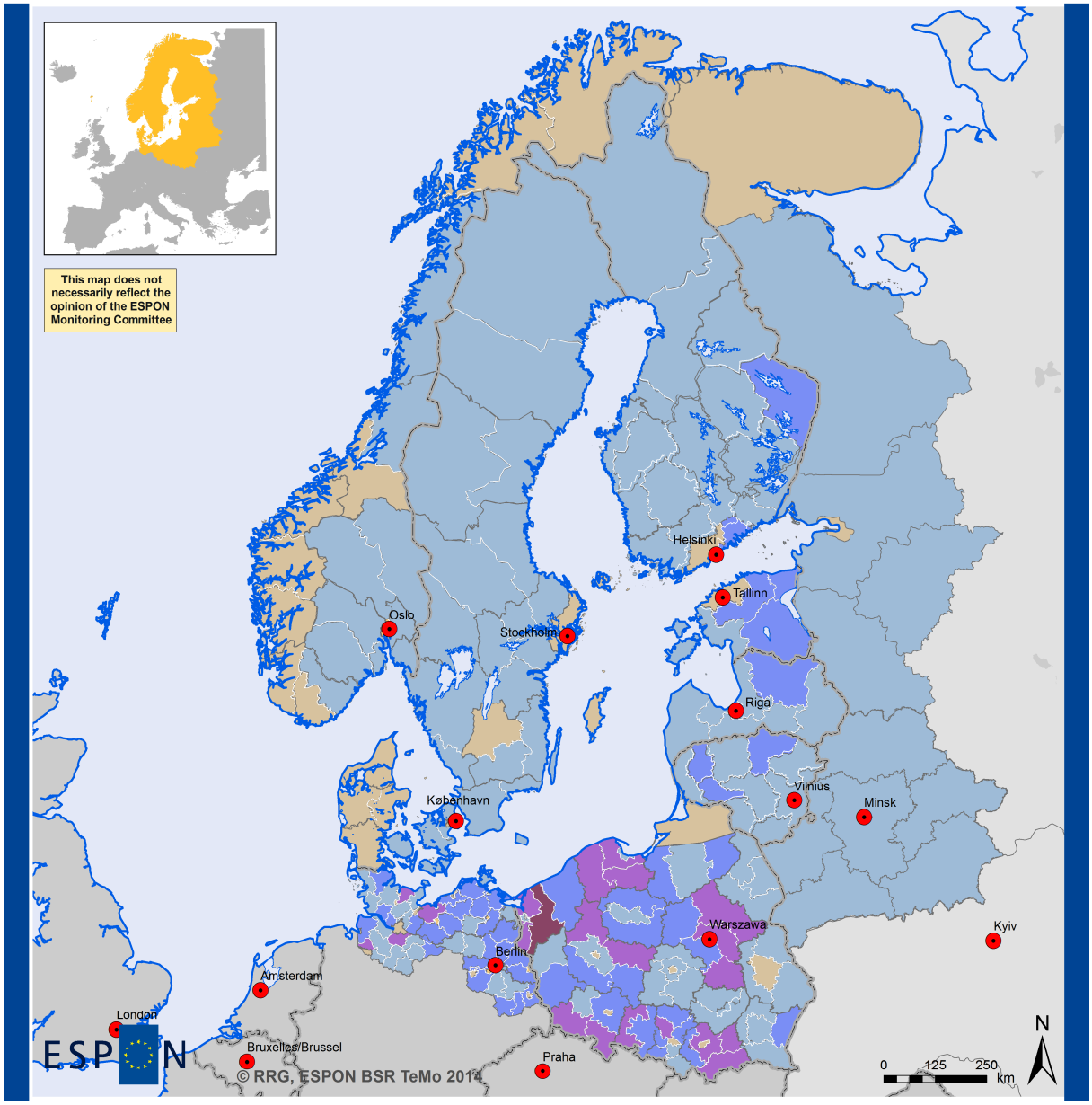
3.1.7 Economic Dependency Ratio

Indicator definition
The economic dependency rate measures the ratio of the non-employed persons divided by employed persons (all ages).

Indicator importance
Since in public pension systems employed persons is responsible for financing the pension systems, imbalances in the relation between workers and retired persons may lead to additional burdens to the workers when additional levies are raised to the pension systems.

Findings
Dependency rate as good as below 1.0 is rather exceptional in BSR, in Jylland, but also in some capital/highly urbanised regions – Länsi-Uusimaa, Murmansk oblast, St Petersburg, Põhja-Eesti, Kaliningrad oblast, Hamburg, Bremen, and in Jylland. Levels between 1.0 - 2.0 prevail, in most parts of the Nordic countries, Russia, Belarus and the Baltic States. The worst dependency levels with a dependency rate of more than 2.0 occur in rural periphery of Poland, and in some rural regions of BSR Germany.

Switching to the overall European view shows that besides Poland, Hungary, Croatia and Macedonia are those countries with worst dependency levels. On the other end of the spectrum, Ireland, the Eastern parts of Austria, Luxembourg, North of Scotland, and some regions in Western Germany experience the best dependency rates. The largest parts of France, Spain, Czech Republic and the UK, but also Greece, yield on average dependency rates.



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Regional level: NUTS-3, oblasts (BY, RU)
Source: Nordregio, 2013, 2014; Eurostat, 2013
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Economic dependency ratio 2009
Ratio non-employed persons / persons employed

0,0 - 0,5
0,5 - 1,0
1,0 - 1,5
1,5 - 2,0
2,0 - 2,5
2,5 < ...
Data n.a.

Calculation based upon data on
(1) total population at end of year, and
(2) persons employed (all age groups), except
Russia: persons employed age group 15-72 years

Figure 23. Economic dependency ratio, 2009, BSR

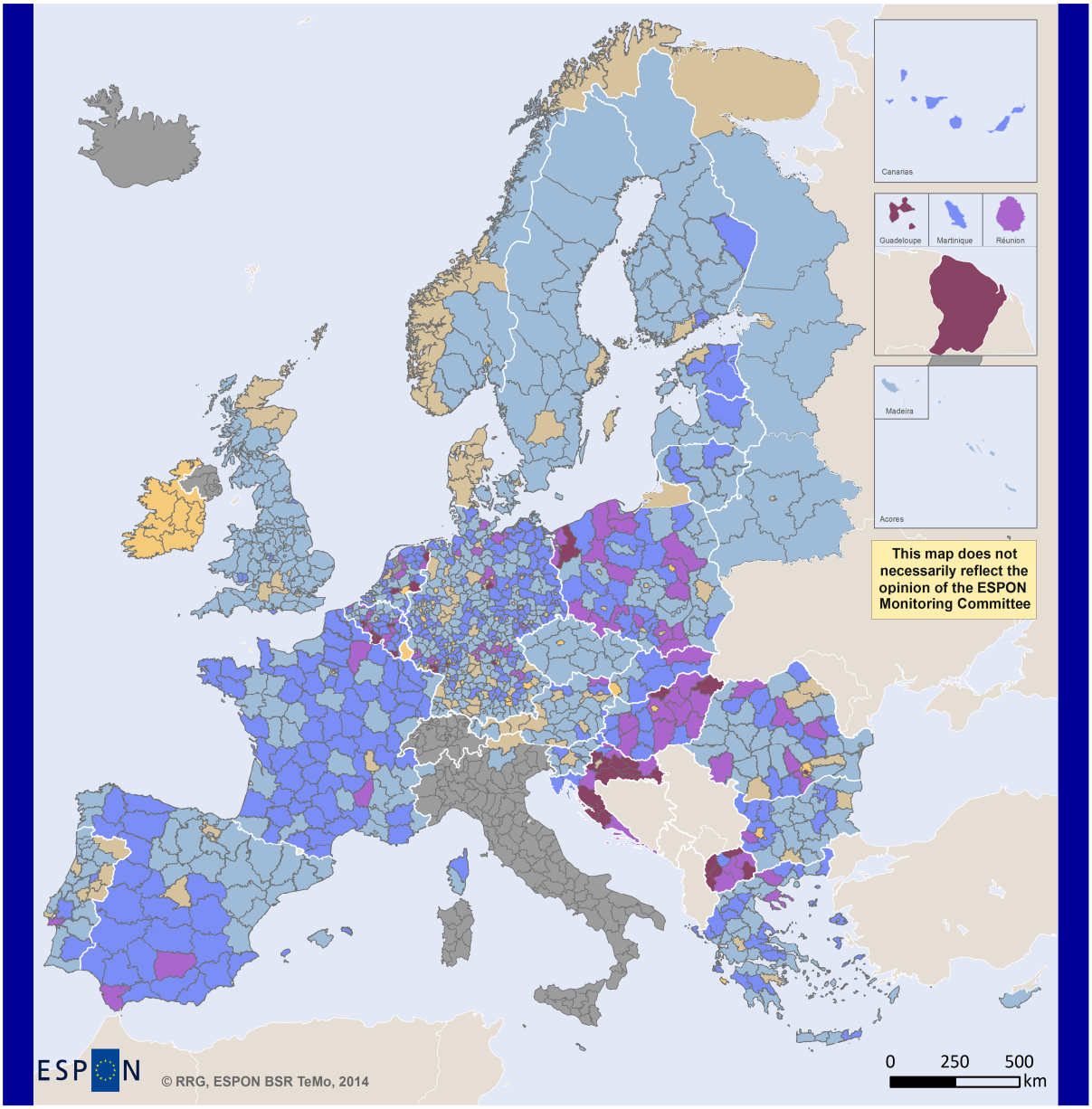
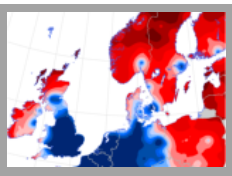
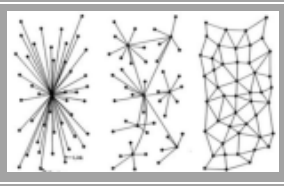


Figure 24. Economic dependency ratio, 2009, ESPON Space

3.2 Access to Services, Markets and Jobs

Eight indicators in three sub-domains have been implemented and analysed under this domain. The domain analyses the quality of infrastructures, enabling people to take part in economic, social and leisure activities.

Table 4 Access to services, markets and jobs: Indicators and sub-domains.

Potential accessibility		
	- Accessibility potential by road - Accessibility potential by rail - Accessibility potential by air - Multimodal accessibility potential	Accessibility potential is a measure for the locational advantage and attractiveness of cities and regions for economic and social activities, as well as proxy for market size.
Spatial structure		
	- Functional areas: access to cities - Population potential within 50 km - Border crossings	The hierarchy of urban systems and their spatial configurations determine to a large degree opportunities of actors.
Internet		
	- Households with internet access at home	For modern industries and societies, good internet access is crucial; often, internet access may compensate for peripheral geographical position, offering new potentials for social or economic activities.

3.2.1 Accessibility Potential by Road

Indicator definition
This indicator is defined as the number of people that can be reached by car, where the attractiveness of destinations is defined by their population size, subject to the car travel time to reach them.

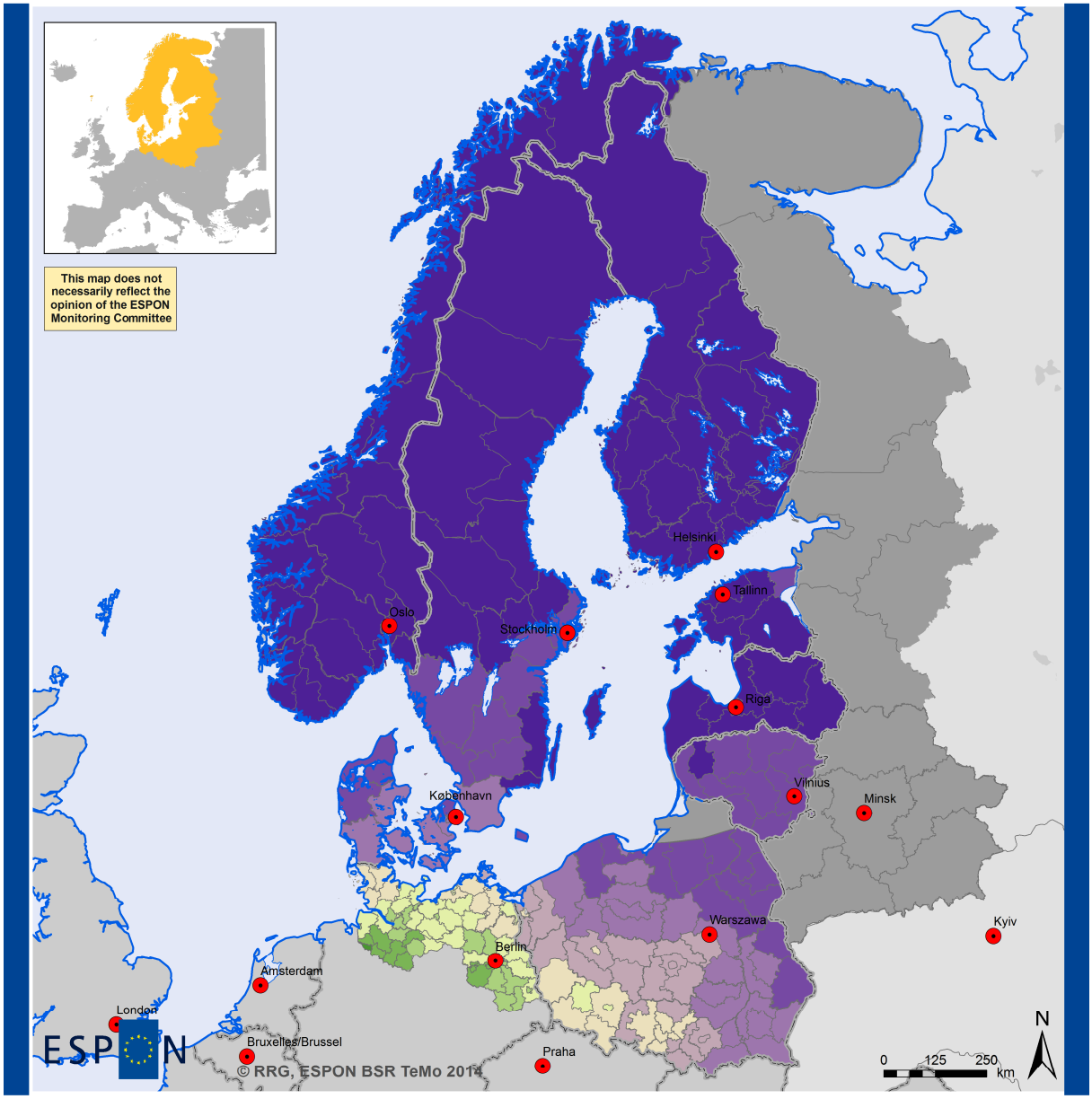
Indicator importance
This indicator measures the market potential and locational advantage of a city or region.

Findings
In Europe, regions in Belgium, the Netherlands and in the western parts of Germany have the highest accessibility values, partly at a level more than twice the European average. Also regions in northern and eastern parts of France, in the south-east of England, in Switzerland, the western parts of Austria and the northern parts of Italy have very good accessibility by road. In all these regions, the combination of good road infrastructure in form of dense motorways and trunk rods, and high concentration of population leads to these favorite positions. Accessibility by road decreases towards regions located outside the European core. Lowest accessibility by road is found in the northernmost regions of the Nordic countries. In addition, most regions of the Baltic States, Bulgaria, Romania and Greece have very low potential accessibility.

The disparities within countries are remarkable, and are highest in France, Germany, Italy and the UK. Even for those countries with generally high accessibility, there are regions with below-average (Austria, Czech Republic, Germany, Italy, Slovakia, and the UK).

For the BSR, the accessibility levels gradually decrease from the Southwest (Berlin, very central and central) to the Northeast (Kirkenes, very peripheral).

In the period 2001-2011, disparities in potential accessibility by road slightly decreased for entire Europe,so as peripheral regions in Ireland, Spain, or Greece, so as regions in Poland, Czech Republic and in the Nordic countries caught up; however, when differentiating by type of regions, the situation is not that clear: first, remote regions (intermediate regions and predominantly rural regions) have by far higher disparities compared to urban regions or regions located close to a city. Moreover, while disparities for urban regions stagnated between 2001 and 2011, disparities even increased for remote rural regions, i.e. these regions gained real losses in the relative accessibility potential.



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Source: Spiekermann and Wegener Urban and Regional Research (S&W), 2013
Origin of data: S&W Accessibility Model, 2013
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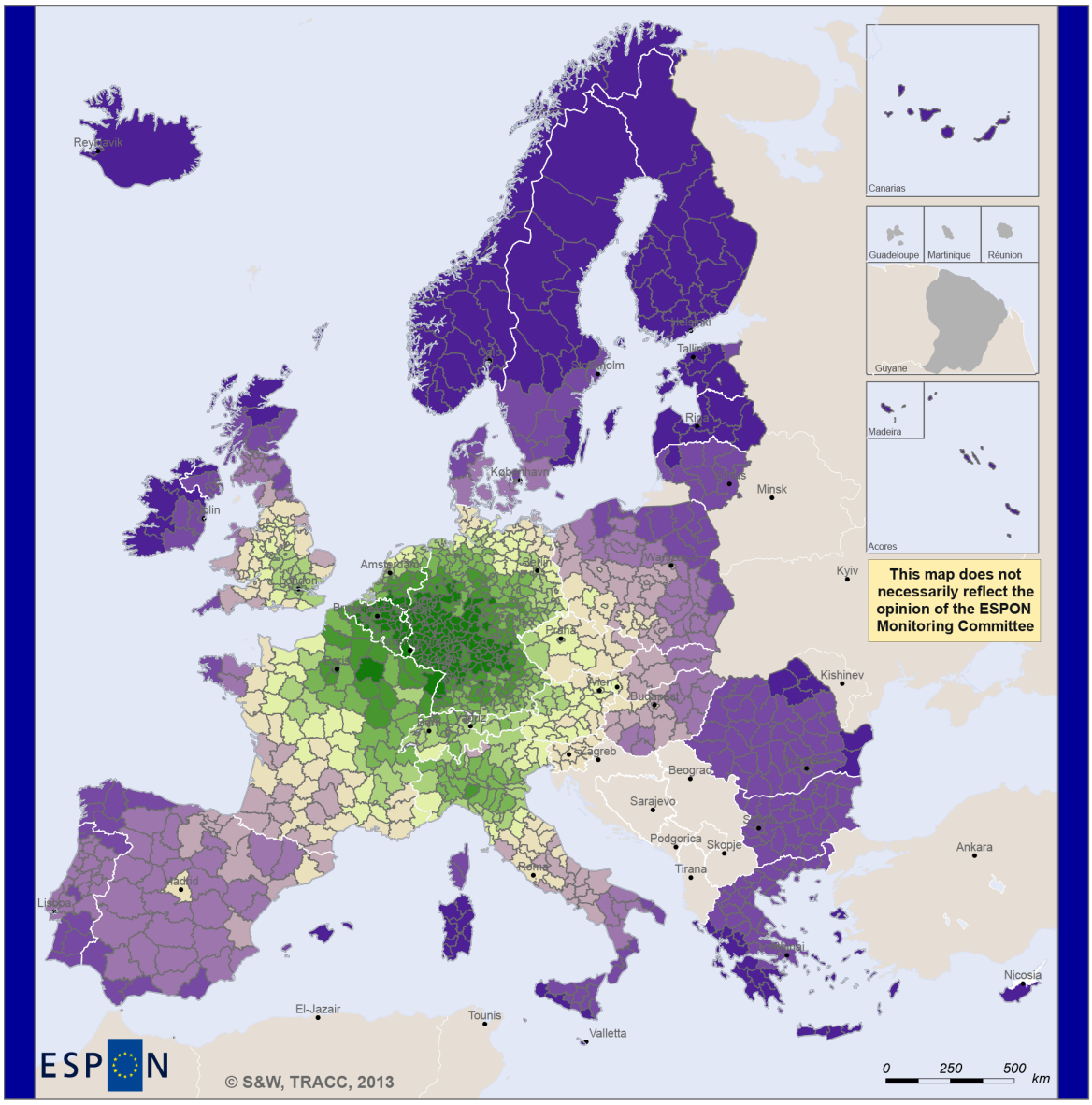
Accessibility potential by road 2011 (ESPON = 100)

0 - 20	*very peripheral*	101 - 120	*intermediate*	Data n.a.	
21 - 40		121 - 140	*central*		
41 - 60	*peripheral*	141 - 160			
61 - 80		161 - 180	*very central*		
81 - 100	*intermediate*	181 - ...			

Figure 25. Accessibility potential by road 2011, BSR.



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Regional level: NUTS 3
Source: Spiekermann and Wegener
Urban and Regional Research (S&W), 2013
Origin of data: S&W Accessibility Model, 2013
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Accessibility potential, road (ESPON = 100)
2011

0 - 20	very peripheral
21 - 40	
41 - 60	peripheral
61 - 80	
81 - 100	intermediate
101 - 120	
121 - 140	central
141 - 160	
161 - 180	very central
181 - ...	

Figure 26. Accessibility potential by road 2011, ESPON Space.

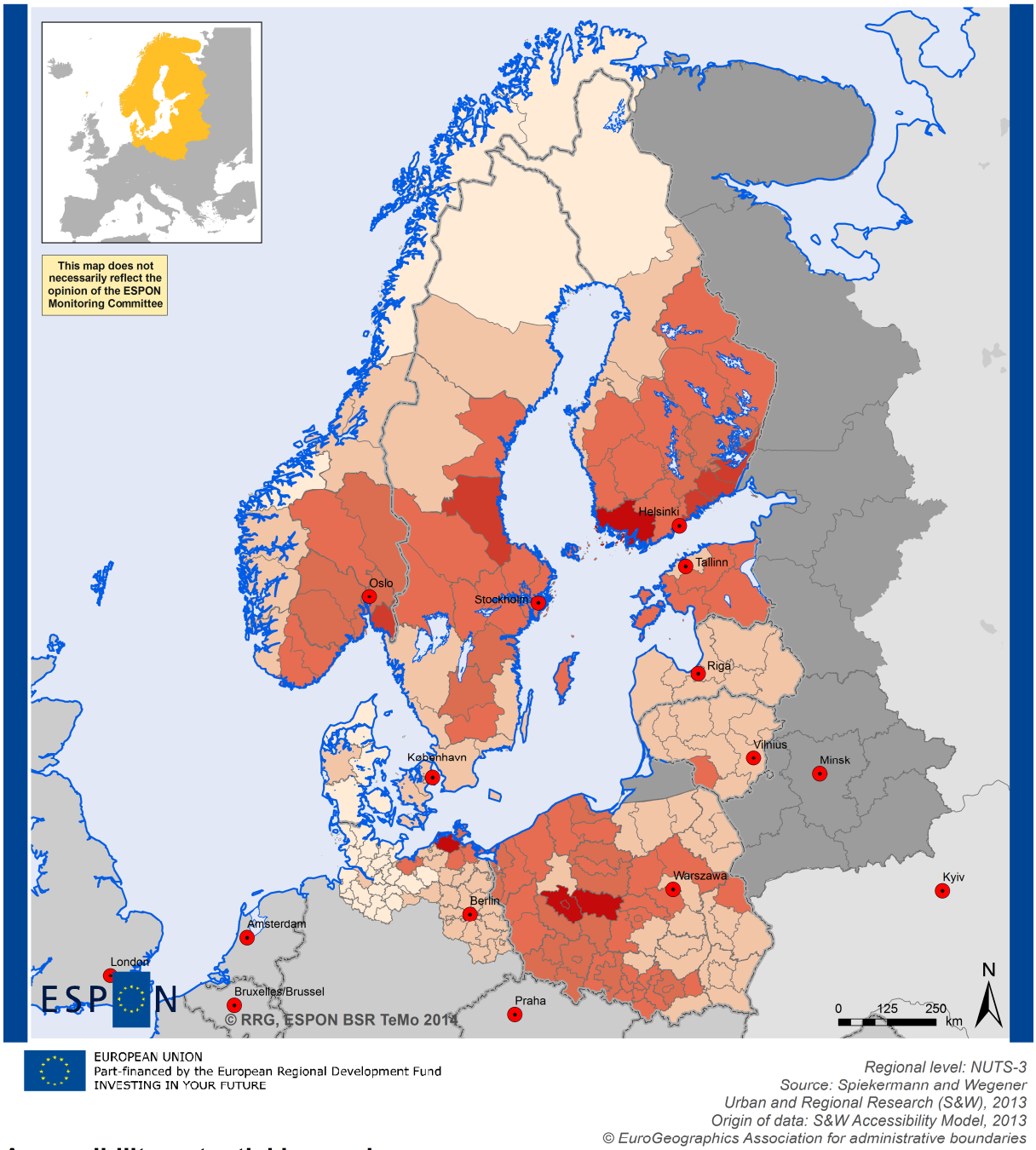


Figure 27. Accessibility potential by road 2011, change 2001-2011, BSR.

3.2.2 Accessibility Potential by Rail

Indicator definition
This indicator is defined as the number of people that can be reached by train, where the attractiveness of destinations is defined by their population size, subject to the rail travel time to reach them.

Indicator importance
This indicator measures the market potential and locational advantage of a city or region.

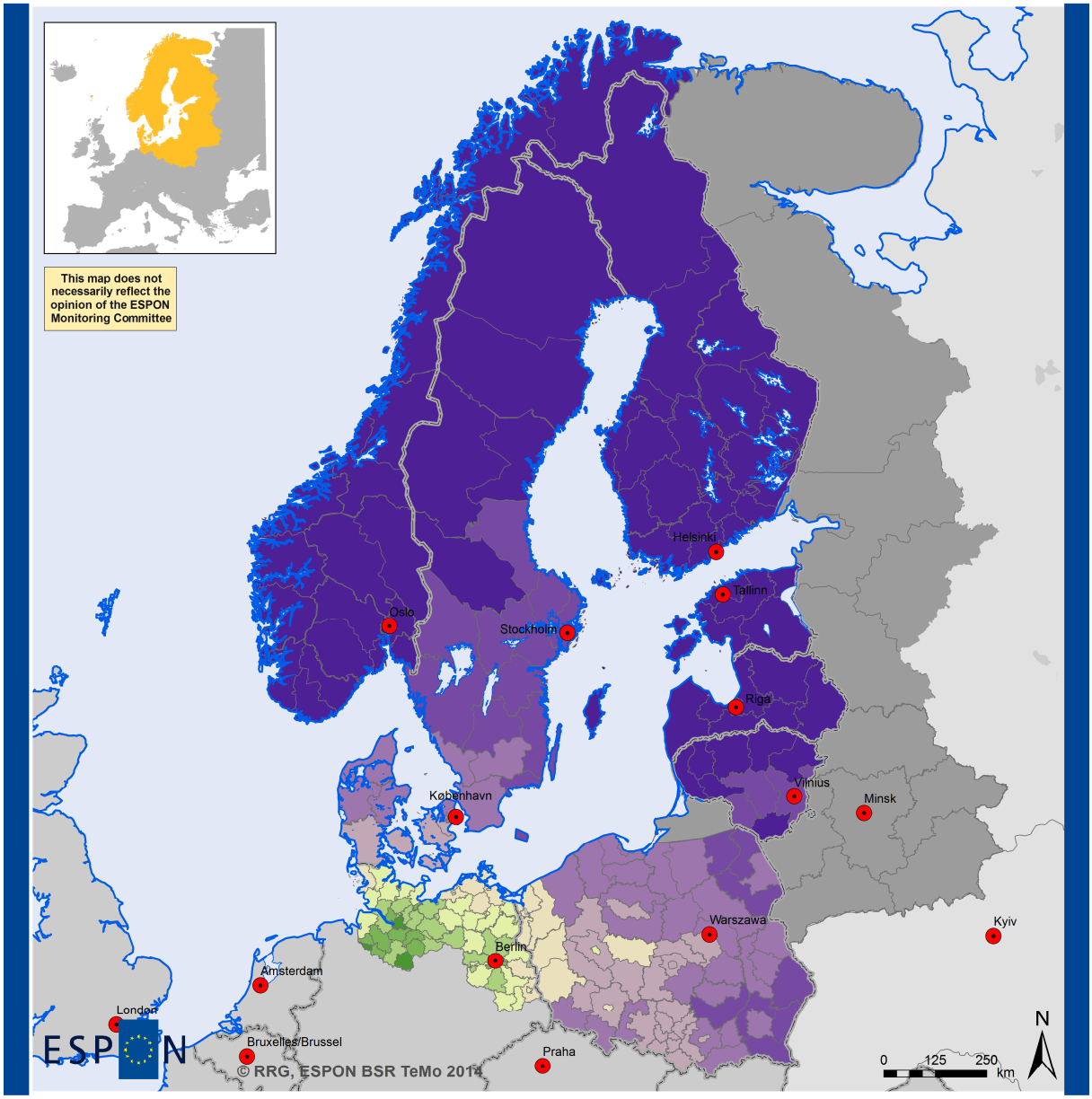
Findings
Generally, regions in the European core have the highest values. However, instead of forming a plateau of high accessibility like for roads, regions with top accessibility for rail are forming corridors along high-speed rail links. High-speed rail also brings very high accessibility to regions outside the European core, for instance in France to Tours and Lyon and Marseille, or in Germany to Berlin. Below average accessibility by rail can be found in Ireland, Spain, Portugal, southern Italy and most regions of the new member states. Lowest accessibility by rail is located in the northernmost parts of the Nordic countries, the Baltic States and most regions of Romania, Bulgaria and Greece. Even more pronounced compared to road accessibilities, there are significant disparities within countries, in particular for those countries which have high-speed train services (Germany, France, Belgium, and Italy).

For many countries such as Slovakia, Slovenia, Hungary, Ireland, or East European countries, even the most central regions are clearly below the European average, often even clearly below 50% of the European average (Bulgaria, Baltic States, Norway, Portugal, Greece, or Finland).

In the BSR only East Germany and Western regions of Poland yield above-average accessibilities. In this respect, all other BSR regions must be considered peripheral or even very peripheral, since train travel times to major European agglomerations are too long.

Significant increases to accessibility by rail in the period 2001 to 2011 took place in almost all regions in Europe, except for East European regions. Regions in southern France and southern Italy, and regions in Spain and Portugal benefit from improved high-speed rail networks, so as regions in Ireland and Greece from general improvements. In the BSR, regions north of Stockholm made the biggest jumps in accessibility through improvements to the northernbound railway link.

For all regions in Europe, disparities remained stable between 2001 and 2011. An analysis by type of region, however, revealed interesting details: while disparities for urban regions and for predominantly rural regions close to a city increased, there was a clear trend towards convergence for intermediate remote regions and for predominantly rural remote regions, but of course disparities for remote regions remained highest compared to the other types of regions. Increases in disparities for urban regions may be counter-intuitive at a first glance; however, recalling that not all urban regions were connected to the high-speed rail networks at the same time, the accessibility of urban regions without high-speed services falls behind those urban regions with high-speed services.



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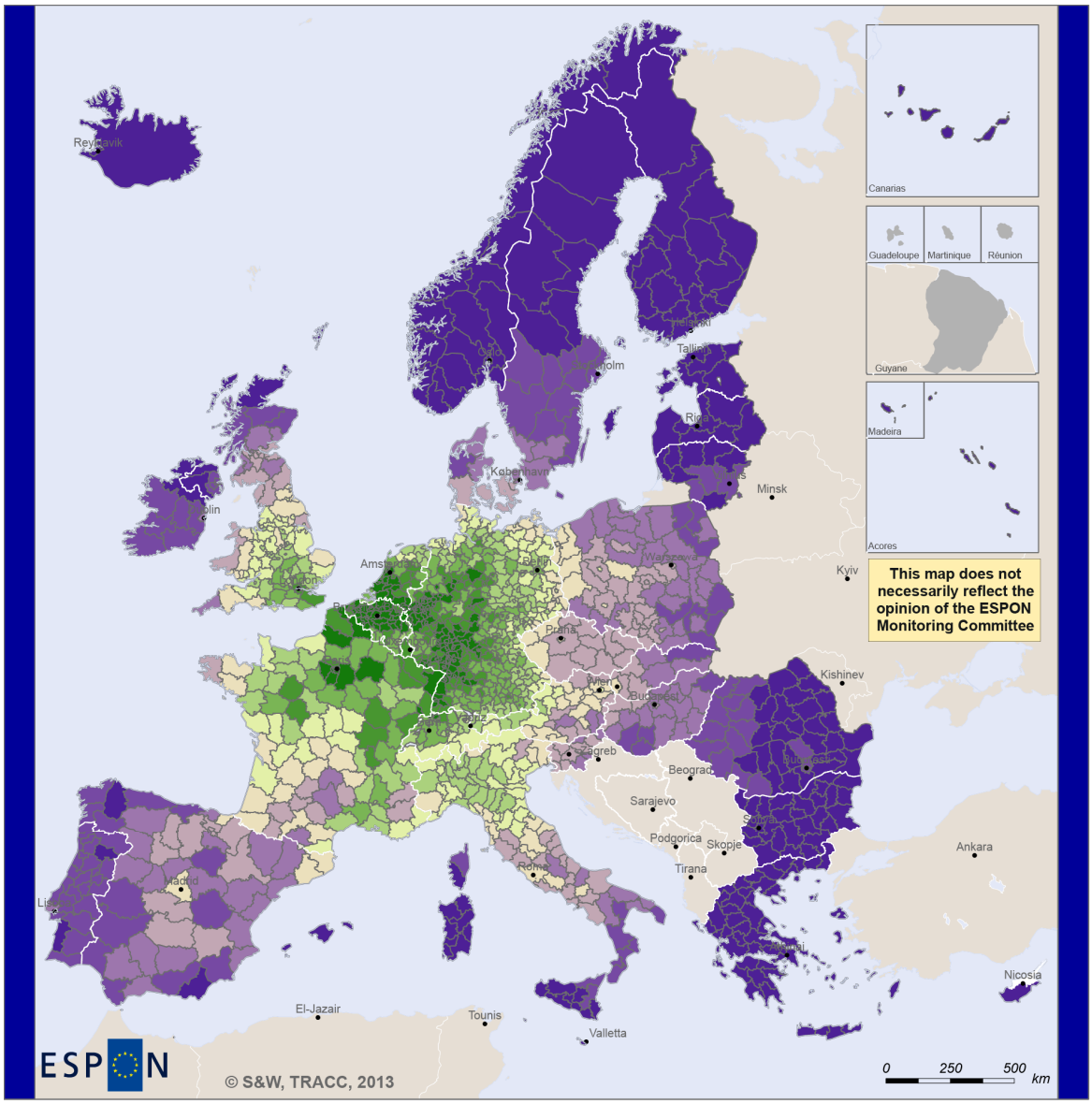
Accessibility potential by rail 2011 (ESPON = 100)

0 - 20	*very peripheral*	101 - 120	*intermediate*	Data n.a.	
21 - 40		121 - 140	*central*		
41 - 60	*peripheral*	141 - 160			
61 - 80		161 - 180	*very central*		
81 - 100	*intermediate*	181 - ...			

Figure 28. Accessibility potential by rail 2011, BSR.



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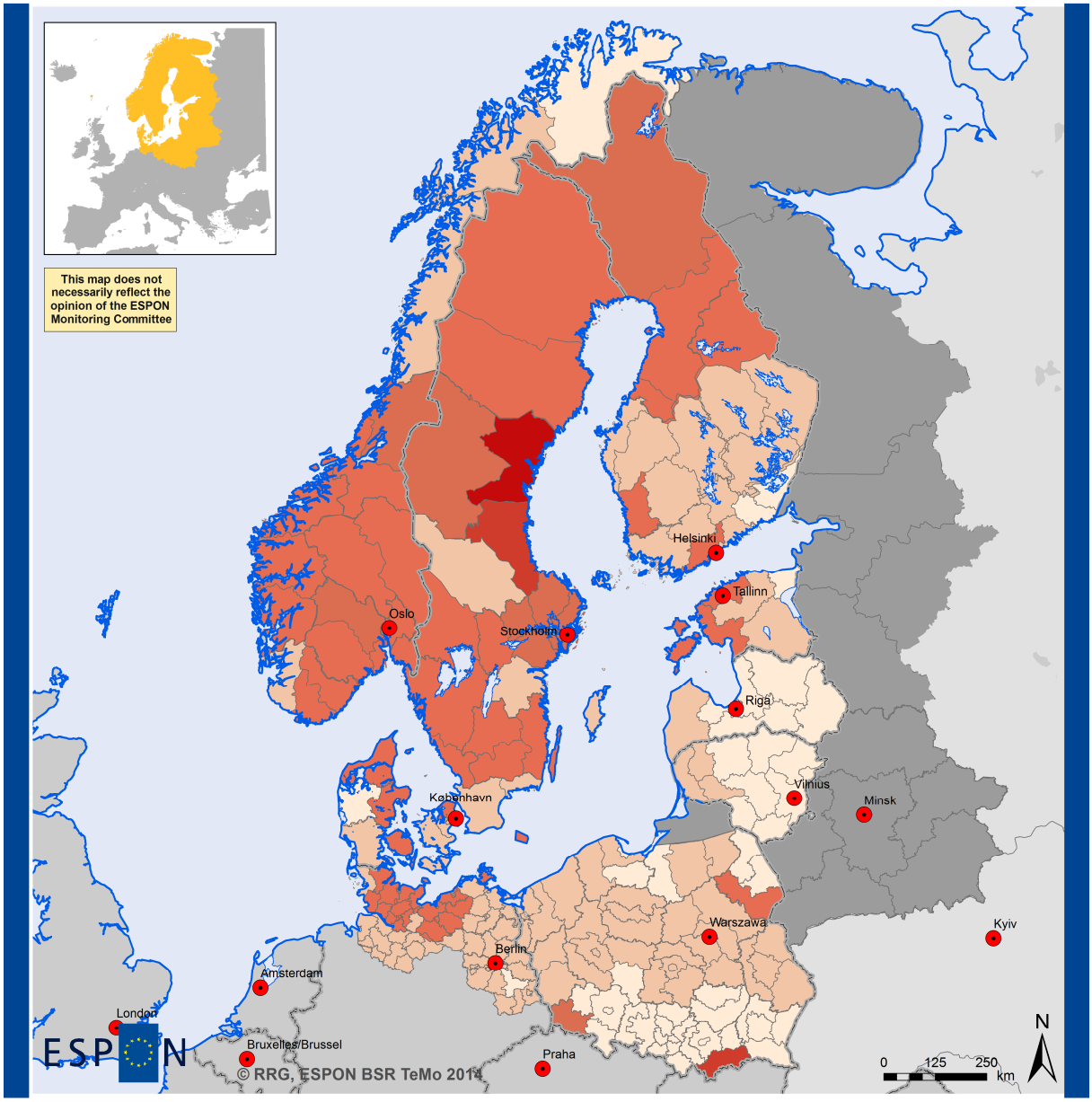
Accessibility potential, rail (ESPON = 100)
2011

0 - 20	very peripheral
21 - 40	
41 - 60	peripheral
61 - 80	
81 - 100	intermediate
101 - 120	
121 - 140	central
141 - 160	
161 - 180	very central
181 - ...	

Figure 29. Accessibility potential by rail 2011, ESPON Space.



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Accessibility potential by rail
Change 2001 - 2011 (%)

< 10	30 - 40	Data n.a.
10 - 20	40 - 50	
20 - 30	50 < ...	

Figure 30. Accessibility potential by rail, change 2001-2011, BSR.

3.2.3 Accessibility Potential by Air

Indicator definition
This indicator is defined as the number of people that can be reached by plane, where the attractiveness of destinations is defined by their population size, subject to the flight travel time to reach them.

Indicator importance
This indicator measures the market potential and locational advantage of a city or region.

Findings
Regions with major airport hubs and their surroundings clearly appear as those central regions with highest air accessibilities in Europe. In most cases, these are the capital city regions, plus selected other agglomerations. The immediate fall in accessibility towards surrounding and towards the other regions is remarkable in all countries, so that the biggest visible divide is between agglomerations/urban areas and rural areas. Consequently, the variations within all countries are rather high, with regions clearly above EU27 average and also regions clearly below. The disparities between the countries are in any case smaller than those within the countries.

Due to their good flight connections, capital regions in the BSR (Copenhagen, Stockholm, Warsaw, also Riga and Vilnius) compete with other regions in Europe in terms of accessibility potential; in most cases, also their surrounding regions benefit from these high accessibility levels; however, some distance away from these hubs the fall in accessibility is then even higher as in other parts of Europe, due to missing flight connections and lower population densities. For air, the northernmost regions of Norway, Sweden and Finland are not so peripheral, compared to the other modes, due to their good flight connections to the capital cities; indeed, accessibility levels of some northernmost regions are in the same range, or even better, as regions in Spain or Portugal.

Since flight networks for most global and European flight hubs did not change substantially from 2001 to 2011, significant improvements to air accessibility can only be found in some East European countries, namely Bulgaria and Romania, the south of Poland, and the Baltic States.

Between 2001 and 2006, disparities for all types of regions in Europe decreased for potential accessibility by air. While for urban regions disparities were already lowest, they dropped even more, but also for intermediate and rural regions, both close to a city and remotely, disparities decreased significantly.

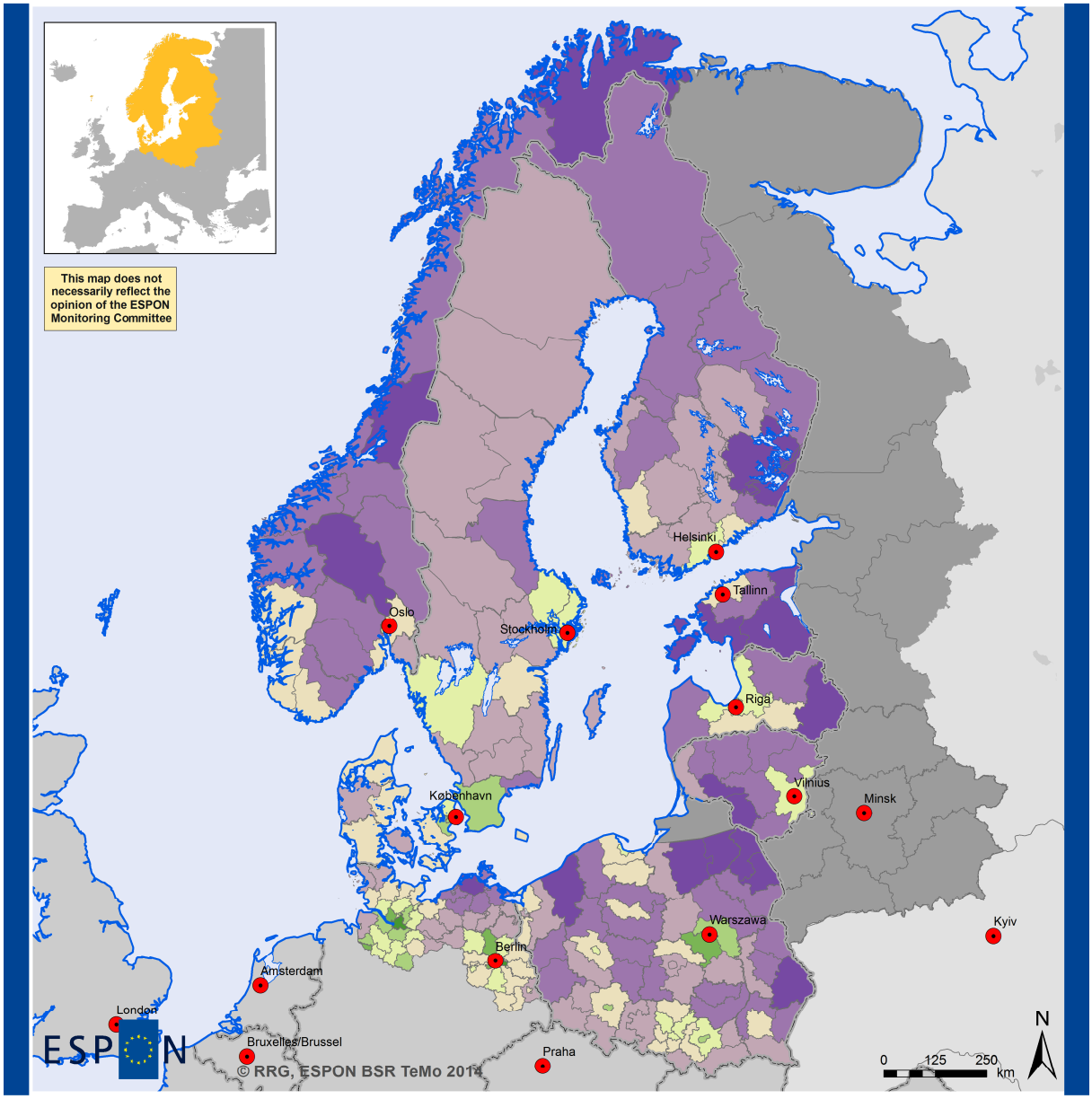
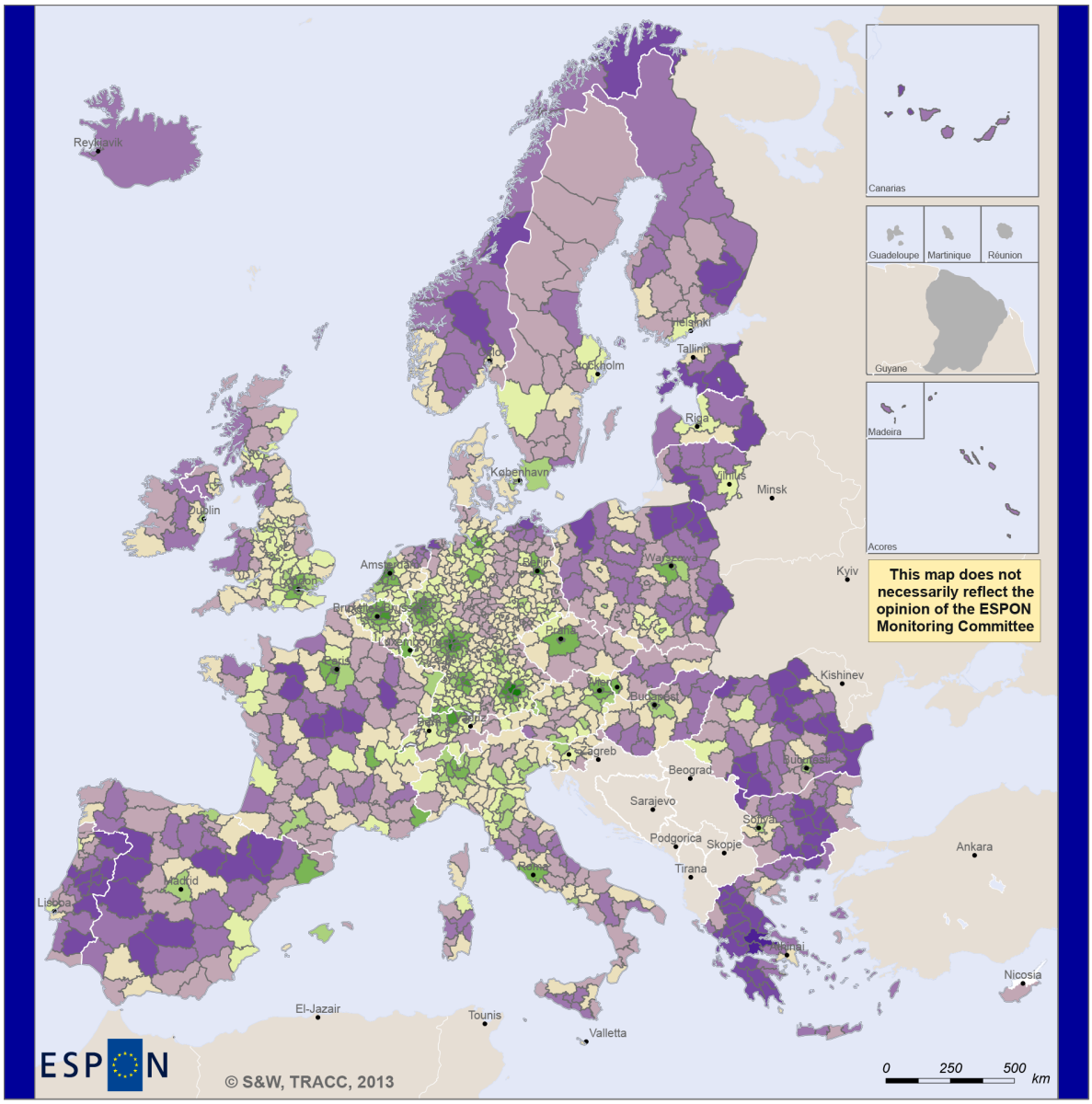


Figure 31. Accessibility potential by air 2011, BSR.



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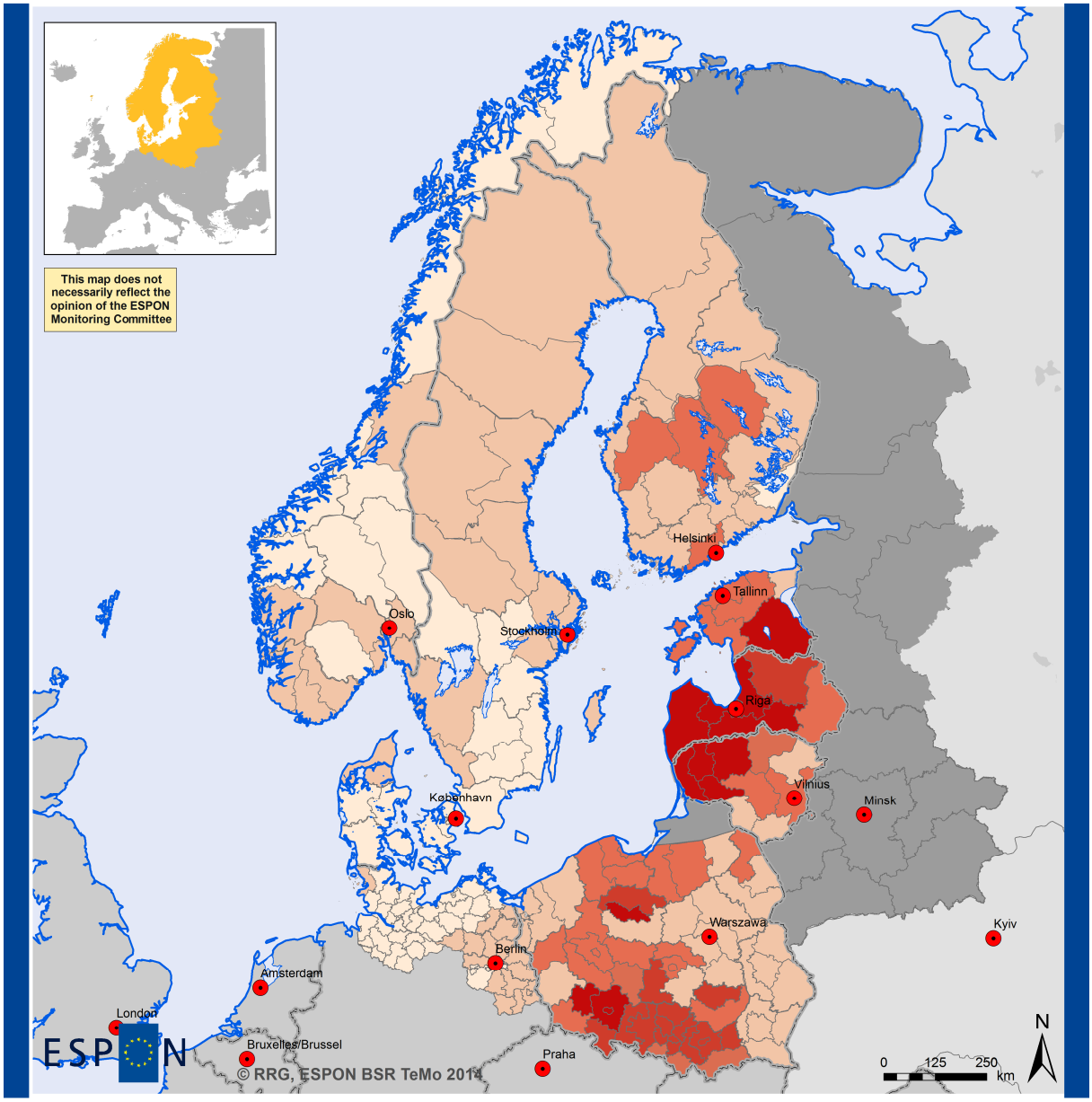
Accessibility potential, air (ESPON = 100)
2011

0 - 20	very peripheral
21 - 40	
41 - 60	peripheral
61 - 80	
81 - 100	intermediate
101 - 120	
121 - 140	central
141 - 160	
161 - 180	very central
181 - ...	

Figure 32. Accessibility potential by air 2011, ESPON Space.



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Regional level: NUTS-3
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Accessibility potential by air
Change 2001 - 2011 (%)

< 10	30 - 40	Data n.a.
10 - 20	40 - 50	
20 - 30	50 < ...	

Figure 33. Accessibility potential by air, change 2011-2011, BSR.

3.2.4 Multi-modal Accessibility Potential

Indicator definition
This indicator is defined as the number of people that can be reached by all modes (road, rail, flight), where the attractiveness of destinations is defined by their population size, subject to the travel time to reach them. The individual car, train and plane travel times are summed up as logsum, to derive the overall multimodal accessibility potential.

Indicator importance
This indicator measures the market potential and locational advantage of a city or region.

Findings
Results for Europe are quite interesting: besides regions in the 'blue banana' enjoying high accessibility levels, confirming high accessibilities by road and rail, airport hub regions outside the blue banana (for instance, Madrid, Barcelona, Vienna, Budapest, Prague) also experience accessibility levels way above the European average, due to their favorable flight connections. Among them are also regions in the BSR, such as Berlin, Warsaw, or Copenhagen/Skane. Still, the results of this indicator are very much driven by air accessibility, resulting in significant differences in accessibility levels between neighboring regions, from extremely poor levels to medium or very high levels (examples inter alias to be found in Baltic States, or Poland).

Another interesting observation is that accessibility levels in East European countries (Bulgaria, Romania, and Greece) and in Portugal and Spain are generally lower than in the BSR, even in their northernmost territories. The reason for this is that Finland, Norway and Sweden maintain a dense flight network even to peripheral cities, with several daily connections at least to the capital city, while in Eastern Europe rural regions are not served at all with minimum flight connections.

Looking at the changes in multimodal potential accessibility in the ten-year period from 2001 to 2011, apart from few exceptions only regions in East European countries such as Greece, Romania, Bulgaria, southern Poland and the Baltic States experienced significant performance increases, mainly due to improvements to the flight networks. Most of the other European regions improved their accessibility potential, however, only at smaller proportions.

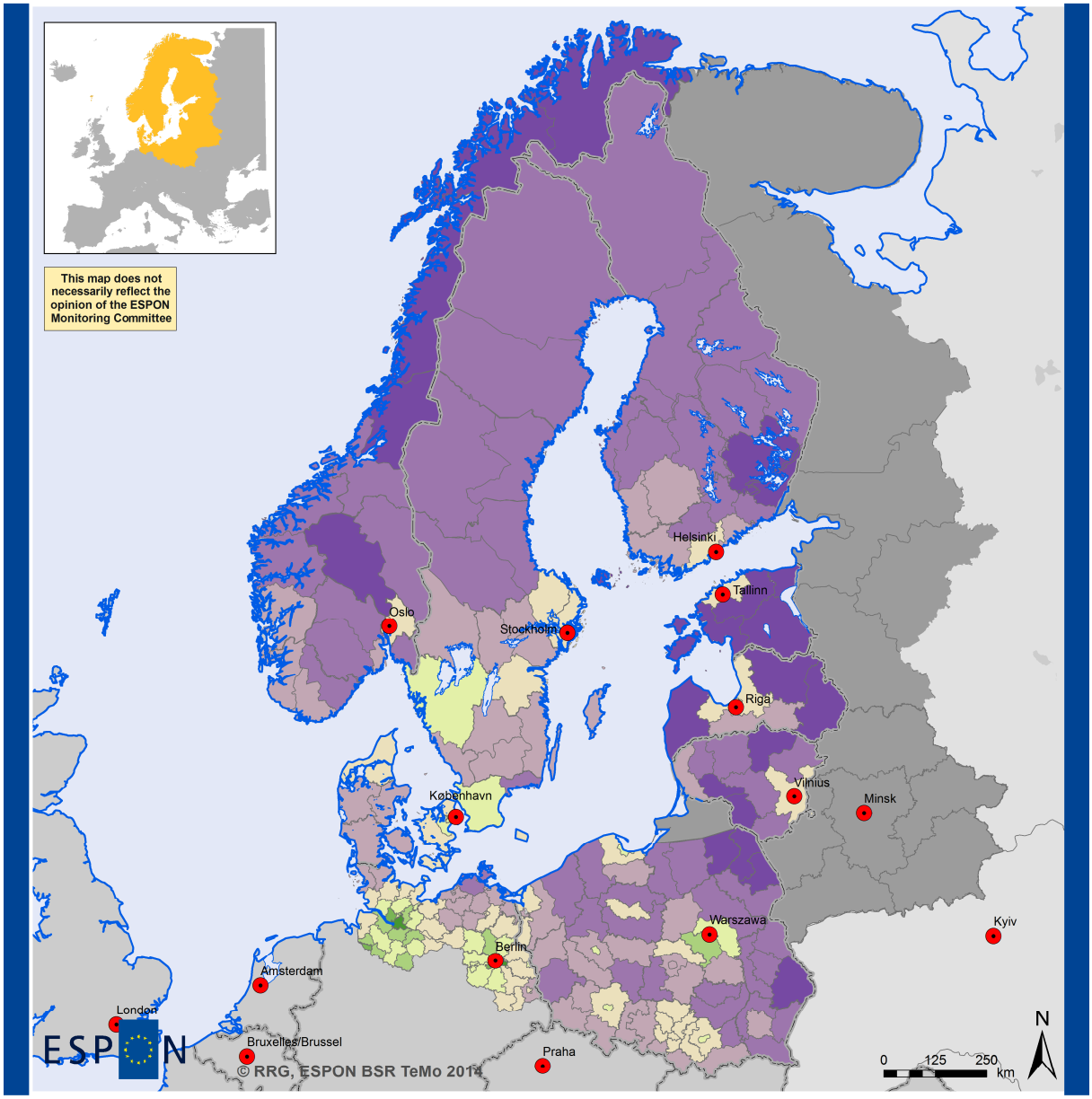
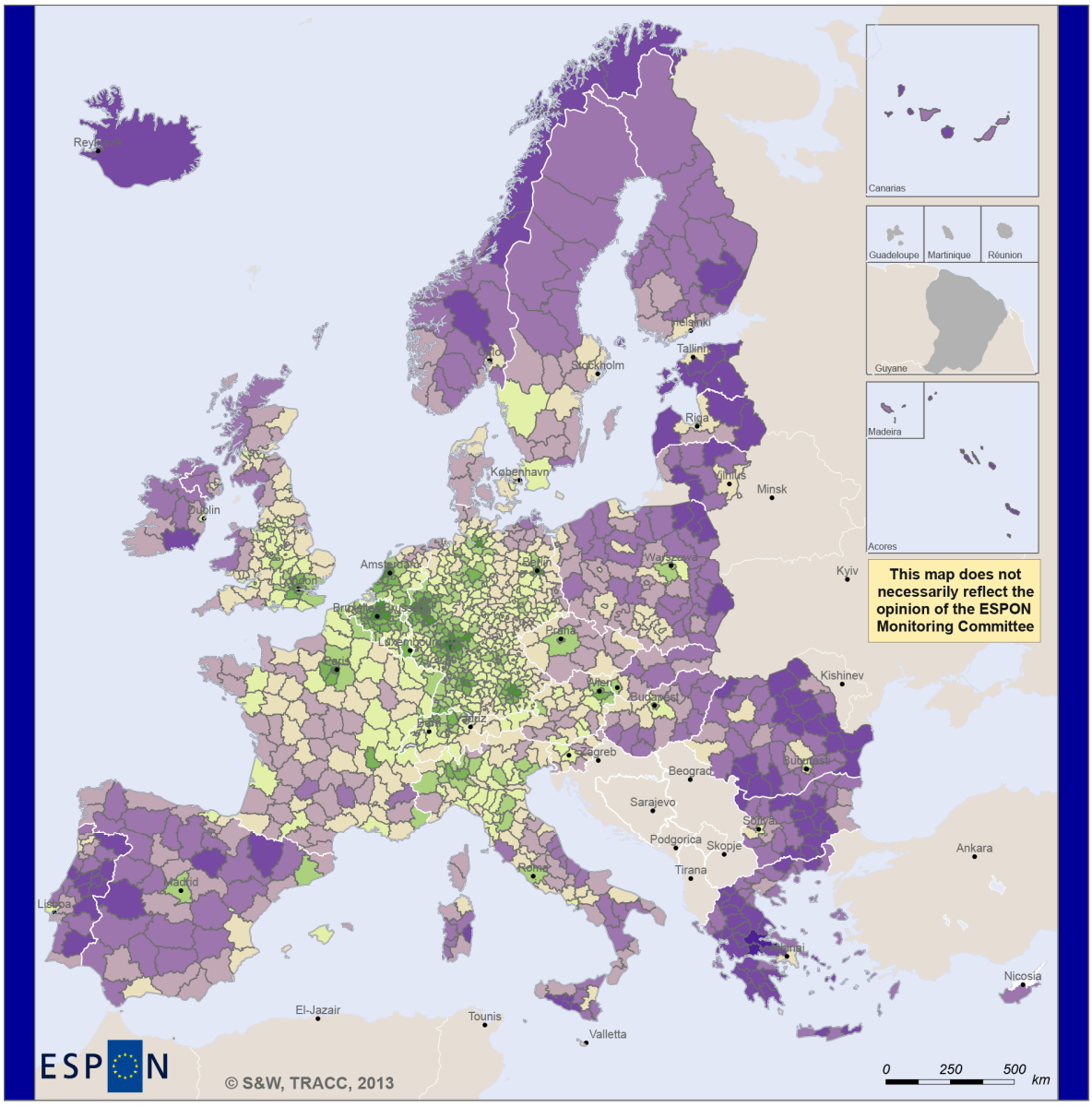


Figure 34. Multimodal accessibility potential 2011, BSR.



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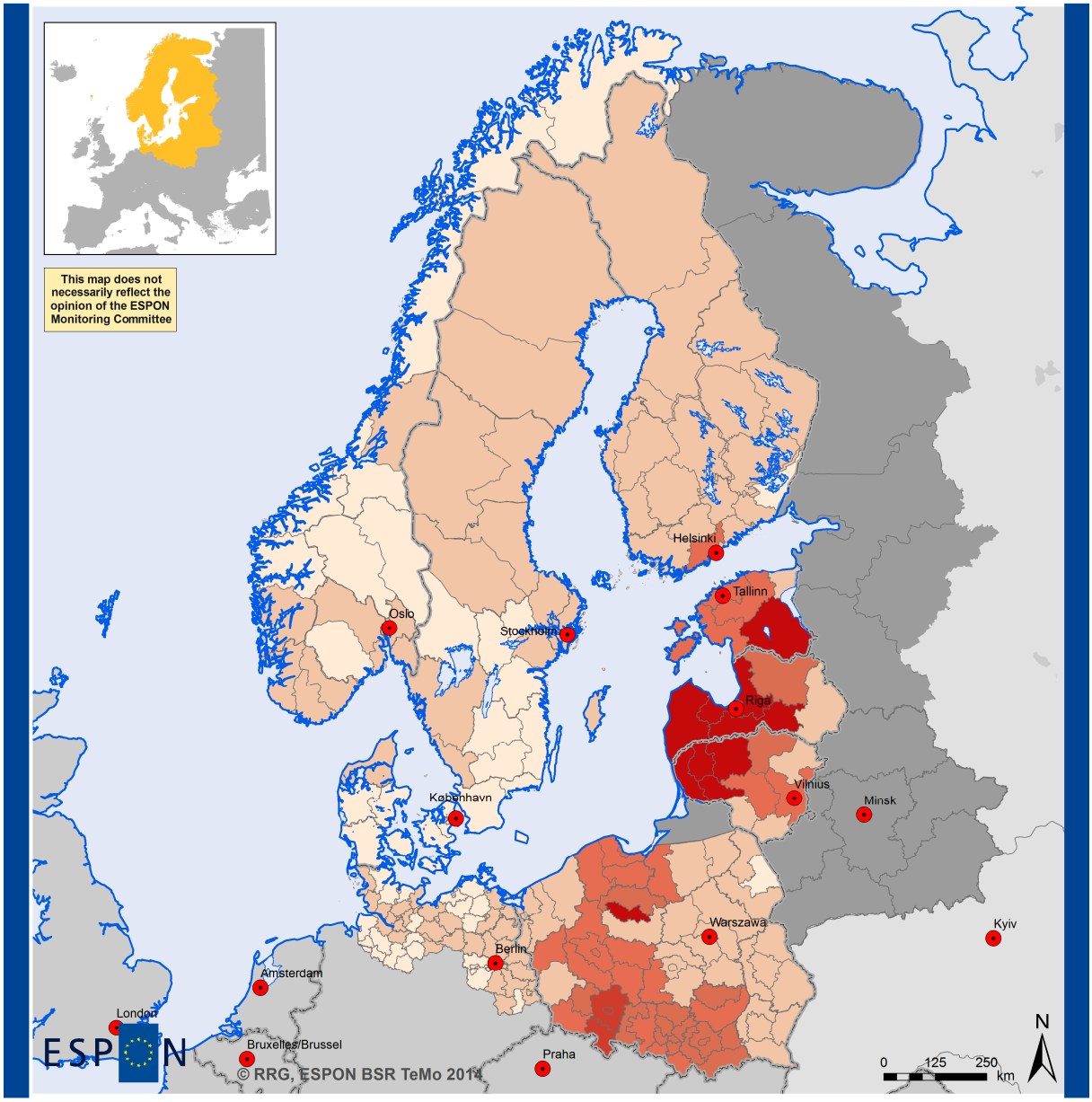
Accessibility potential, multimodal (ESPON = 100)
2011

0 - 20	very peripheral
21 - 40	
41 - 60	peripheral
61 - 80	
81 - 100	intermediate
101 - 120	
121 - 140	central
141 - 160	
161 - 180	very central
181 - ...	

Figure 35. Multimodal accessibility potential 2011, ESPON Space.



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Regional level: NUTS-3
Source: Spiekermann and Wegener Urban and Regional Research (S&W), 2013
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Multimodal accessibility potential
Change 2001 - 2011 (%)

< 10	30 - 40	Data n.a.
10 - 20	40 - 50	
20 - 30	50 < ...	

Figure 36. Multimodal accessibility potential, change 2001-2011, BSR.

3.2.5 Functional Areas: Access to Cities

Indicator definition
The indicator on functional urban areas is defined as the number of cities with more than 50,000 inhabitants within 60 minutes road travel time from each region. In ESPON TRACC this indicator is called Availability of urban function, while in ESPON 1.1.1 the indicator was defined in a similar manner as the number of functional urban areas (FUAs) overlapping at each municipality.

Indicator importance
This indicator is a morphological, or structural, indicator, based on the assumption that people honor a situation with a freedom of choice to choose between different cities to travel to for various activities (work, leisure, shopping, administrative affairs etc.). Not all of such urban functions can and need to be offered in small towns and villages, so access to cities becomes important asset. The more cities that are within reach from a certain location, i.e. the more FUAs overlapping, the higher the freedom of choice is.

Findings
This indicator highlights the agglomerated areas in Europe. Accessibility is highest in the Ruhr area, England, Paris, in the Benelux countries and in Northern Italy. Some capital city regions in other countries (for instance, Stockholm, Madrid, Budapest or Athens) also stand out, so as other selected regions such as Oslo-Gothenburg-Malmö-Copenhagen, Barcelona-Valencia-Murcia, Lyon, Saxony, Naples, Upper Silesia with city systems. From most locations in Western and Central Europe, at least one regional city can be reached by road within 60 minutes, from many places even more than ten. In Eastern Europe, mostly only one or two cities are within reach. Locations from where only one city can be reached provide basic urban services. Usually, people from there do not have any option to go to one or the other cities to enjoy certain facilities, but they are bound to just one closest city. Locations from where more than one city can be reached, offer options to visit different cities offering a wider range of services, i.e. these locations provide more freedom of choice and thus more opportunities.

What the BSR NUTS-3 level results hides, becomes obvious when looking at grid results: From most locations in the Nordic countries and in the Baltic States, no single one city can be reached within 60 minutes. The situation in Denmark, Germany and Poland is somewhat better, with areas of basic and good availability of urban functions, opposed to areas with no availability. This indicator pretty much reflects the Urban-Rural-Divide in the BSR.

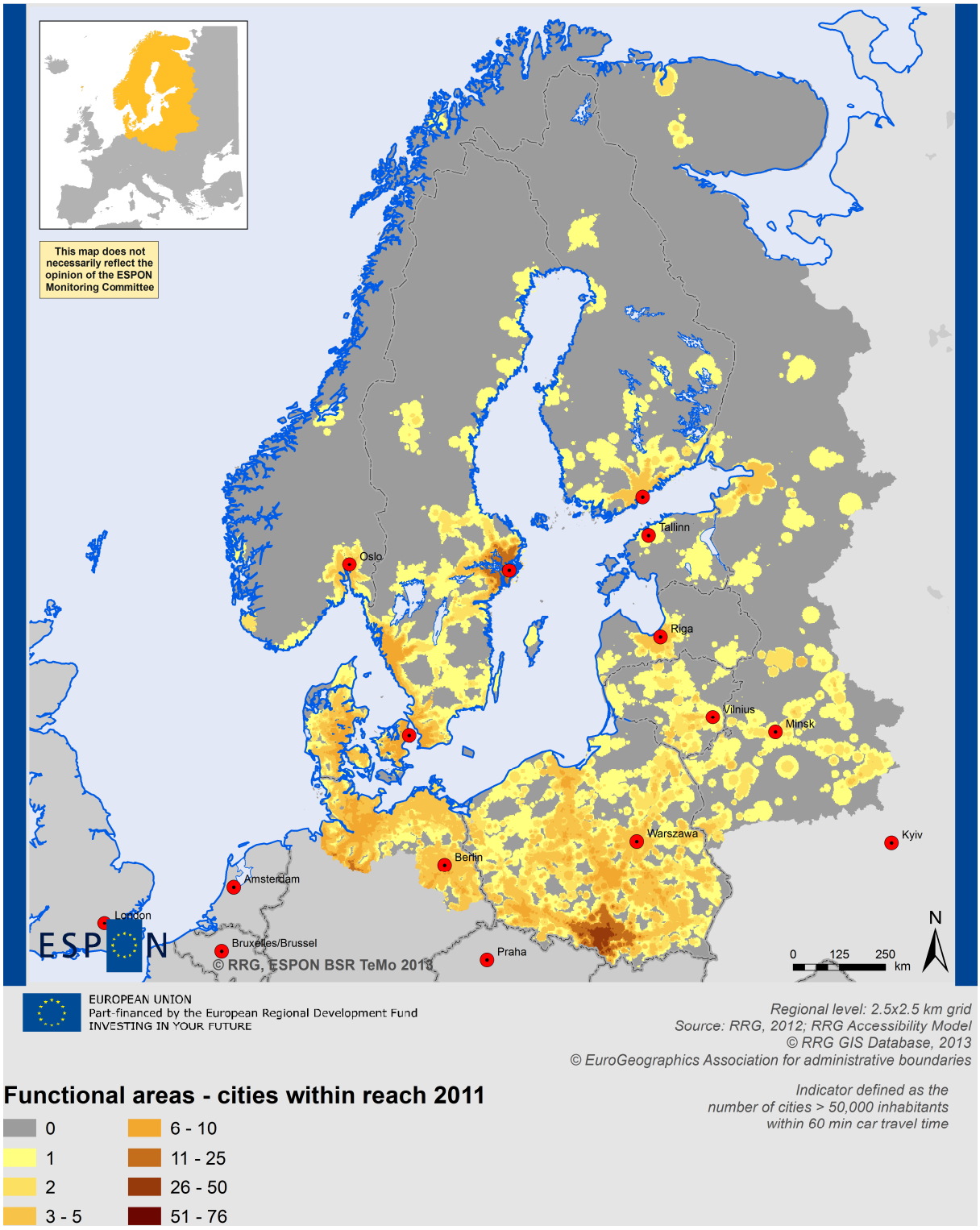


Figure 37. Functional areas: Cities within reach 2011, grid level BSR.

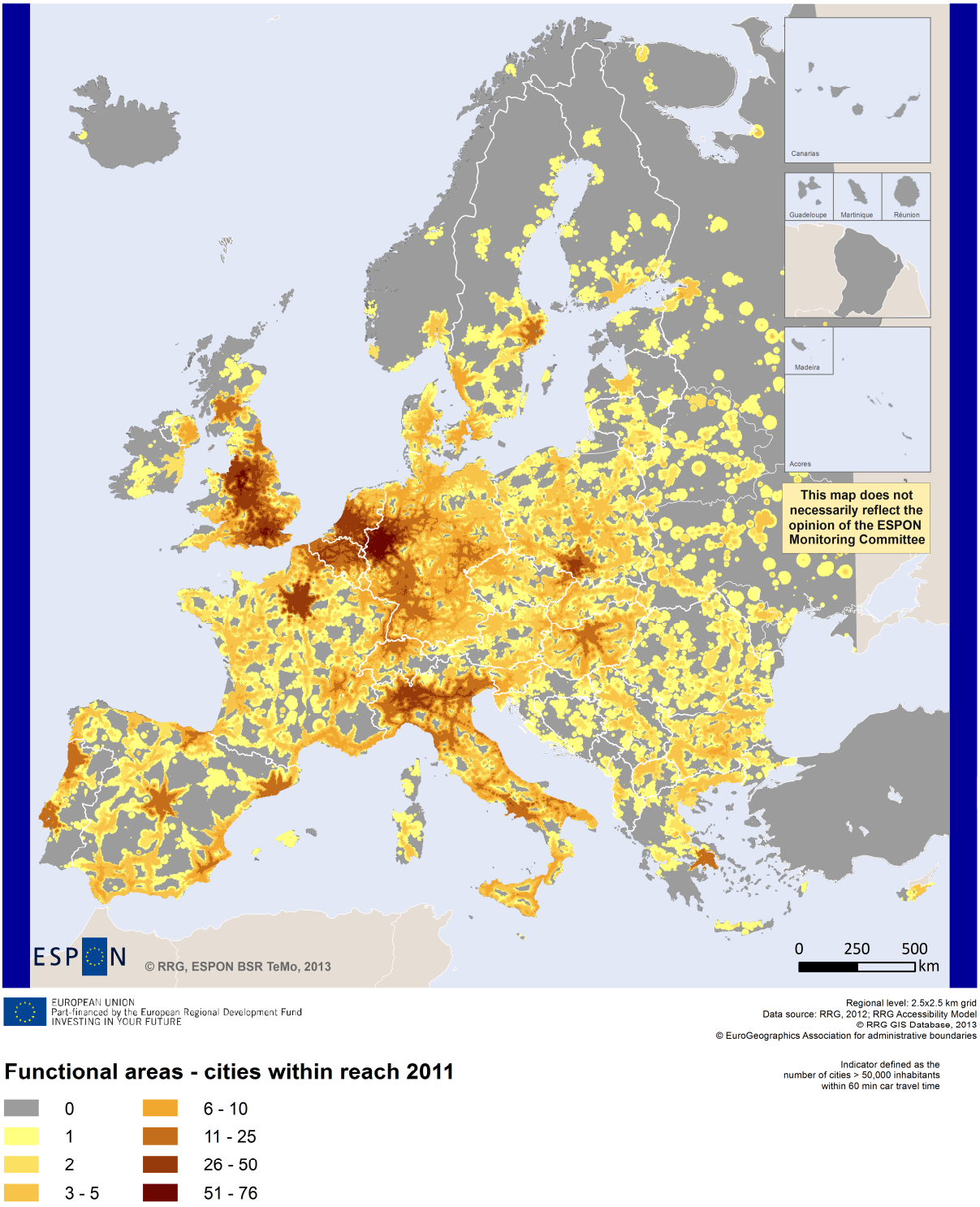


Figure 38. Functional areas: Cities within reach 2011, grid level ESPON Space.

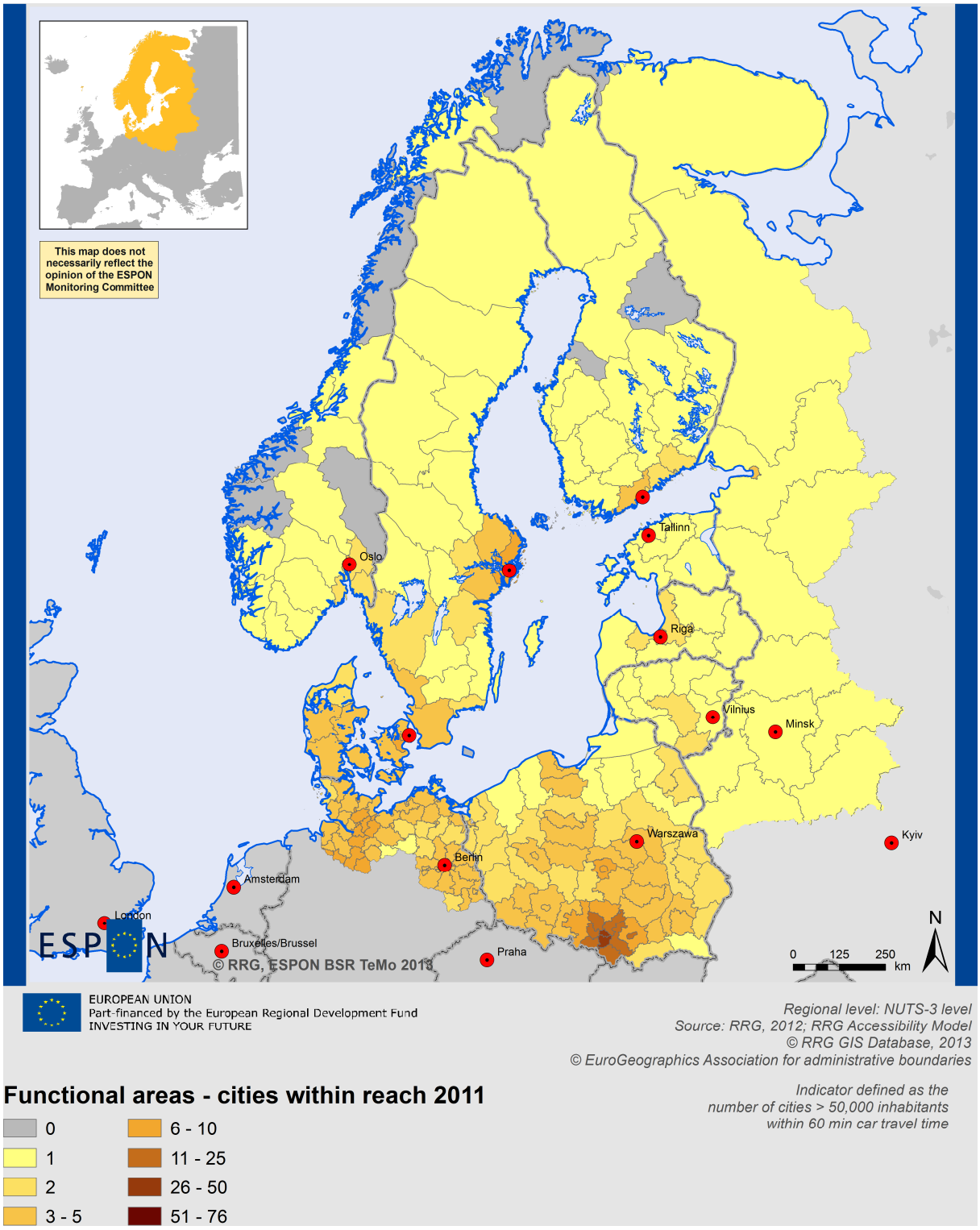


Figure 39. Functional areas: Cities within reach 2011, NUTS-3 level BSR.

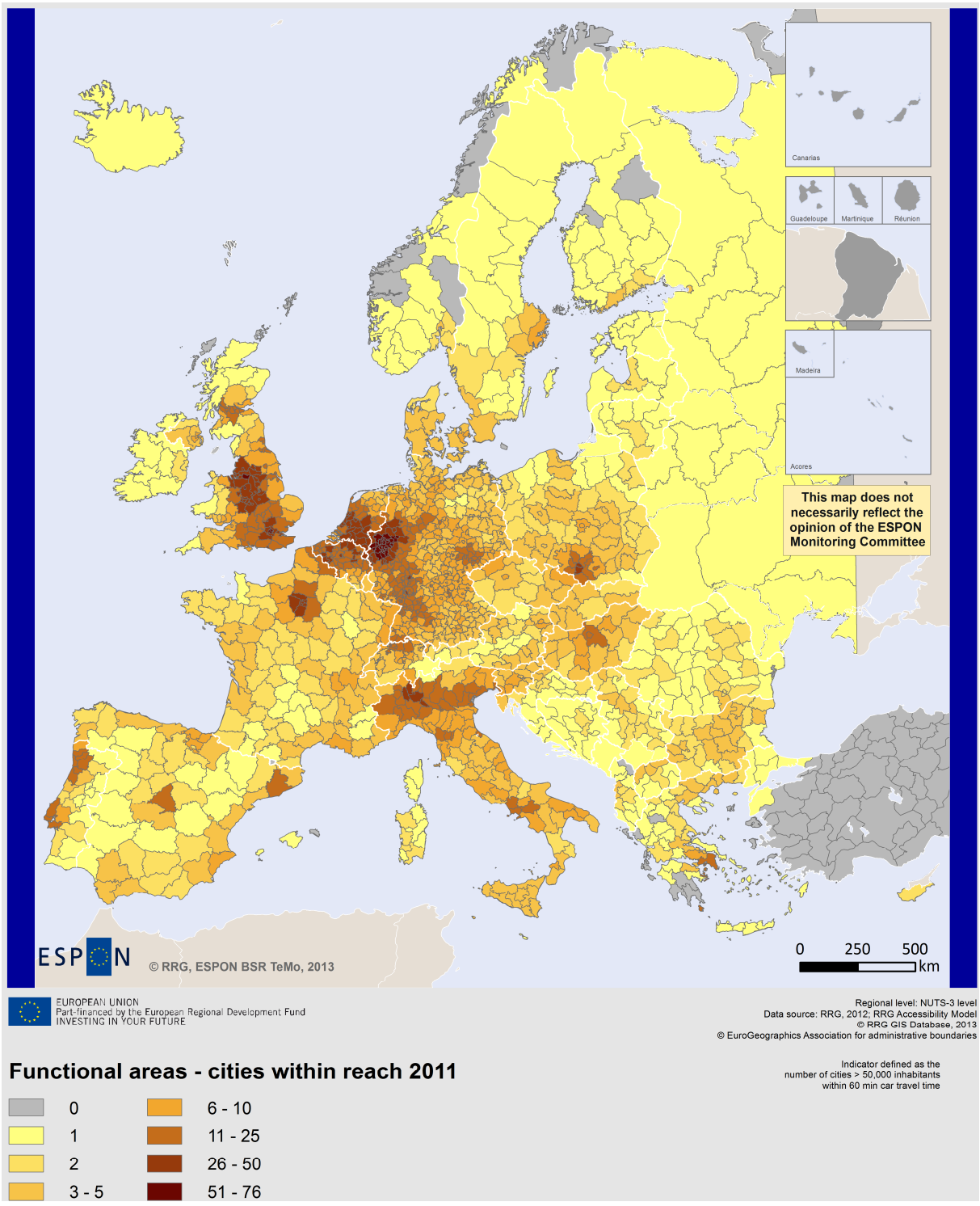


Figure 40. Functional areas: Cities within reach 2011, NUTS-3 level ESPON Space.

3.2.6 Population Potential within 50 km

Indicator definition
The indicator population potential within 50 km is defined as the number of population located within 50 km airline distance from any place. It characterizes the spatial structure of European territories in terms of the market potential and population density. Indicator results are standardized at the EU27 average, indicating regions below and region above the average.

Indicator importance
The provision of public and private services is one of the key factors for regional spatial development. The number, size and quality of such services, and the willingness of public and private actors for their maintenance, often depends on the available population that potentially can use these facilities. The potential represents not only the population number at the place of service, but also covers the service area around - which is measured by this indicator. The higher the population potential, the bigger is the market and thus the higher the potential is for economic activities.

Findings
The European map clearly highlights the main dichotomy between the European core area ('blue banana') and the peripheral areas. In areas outside the European core area only selected urban regions show above-average population potentials, while the other regions perform significantly below European average. A change in these patterns in rather unlikely to occur in the short run, even though some of the peripheral regions, such as regions in Spain, Greece or Ireland, experiences considerable population gains through migration processes. Since the main economic centers in Europe also experienced positive net migrations, it is rather unlikely that areas outside the blue banana can significantly catch up. Zooming into the BSR revealed that apart from the capital city regions, only the southernmost regions in Poland and Germany show above average potentials, illustrating the general North-South divide in the BSR. The farther North a region is located, the poorer the indicator performance is. Beyond these very genera patterns, there is also evidence that poor indicator performance is not only a matter of disadvantaged geographical location. Regions in Mecklenburg-Vorpommern, in Poland and also in Denmark, for instance, also yield values below the European average at the level of disadvantage compared to regions in Sweden or Finland, surrounded by regions with high population potential. These areas can be considered as 'inner peripheries' of low population potentials and thus with low attractiveness for economic and social activities.

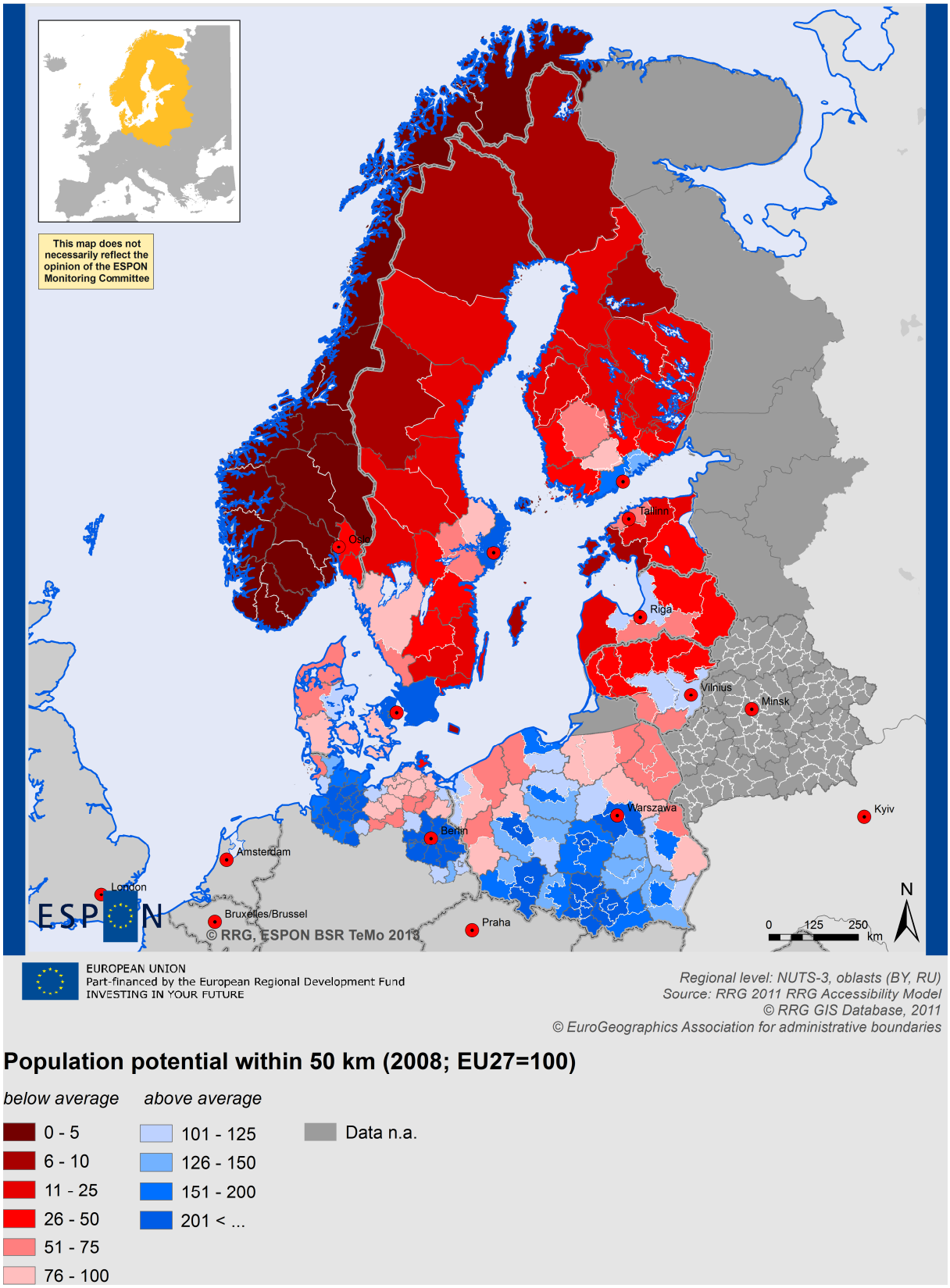


Figure 41. Population potential within 50 km 2008, BSR.

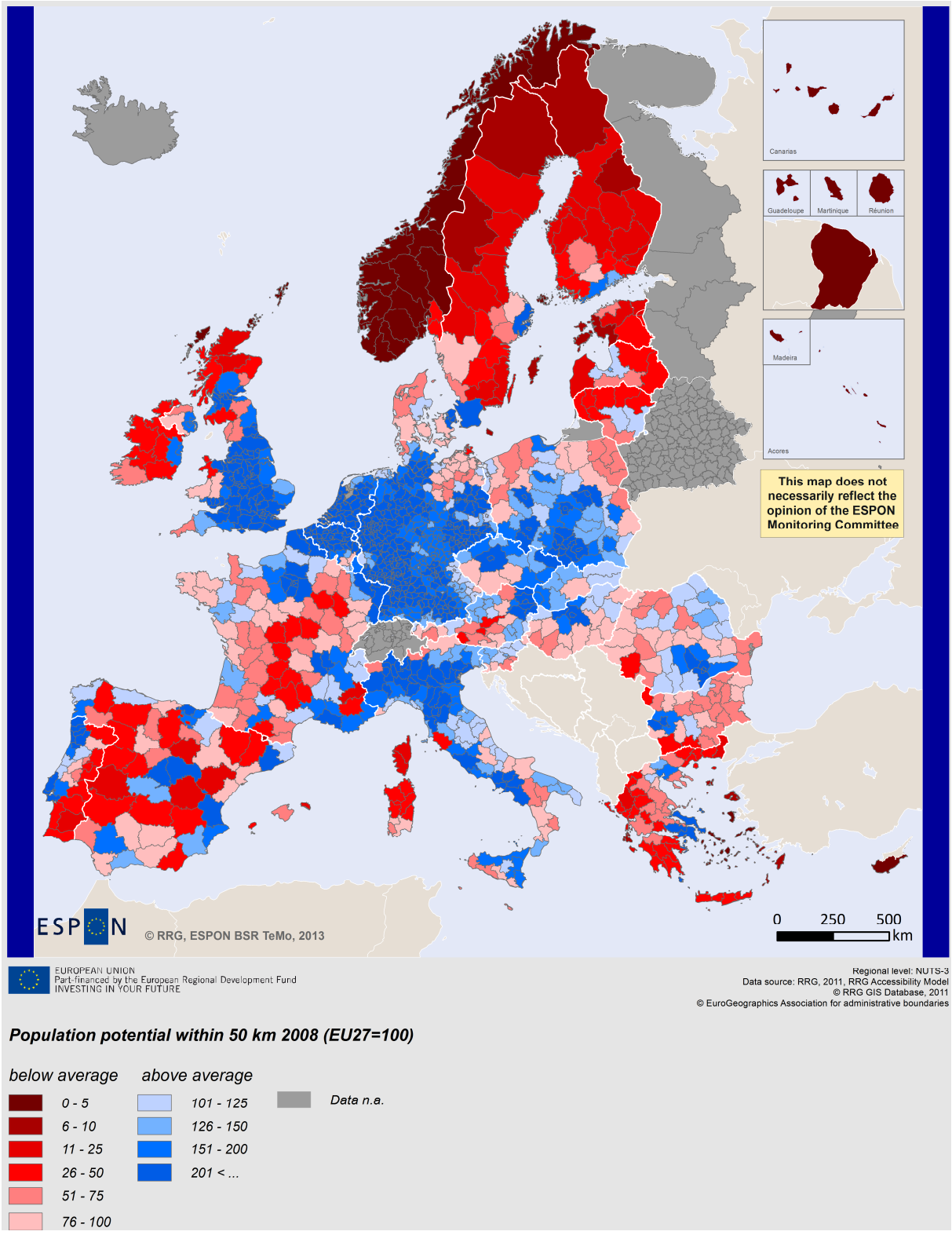


Figure 42. Population potential within 50 km 2008, ESPON Space.

3.2.7 Border Crossings

Indicator definition
Two definitions are applied for this indicator: First, the number of vehicles passing the border as a function of the average annual daily traffic (AADT) approach the border control point; second, the average truck waiting times for border control procedures, differentiated by direction.

Indicator importance
Border crossings are still a major concern in the BSR region, in particular between EU countries on the one hand, and Russia and Belarus on the other hand. Complicated and lengthy custom clearance procedures, resulting in long waiting times at border control points, in particular for trucks, are still obstacles to free movements of goods and persons. Between two EU countries of the Shengen area, there are no customer clearance procedures anymore; however, here the number of vehicles passing the border is of main interest.

Findings
In terms of number of vehicles crossing a border, the two borders Denmark-Germany and Germany-Poland are the most important ones in the BSR region, followed by the border Belarus-Lithuania. There is also significant border crossing traffic between Poland and the Czech Republic, Poland and Slovakia as well as Poland and Ukraine. Between the Nordic countries, only the two southern border crossings between Norway and Sweden (E6 - Svinesundbrøn, and E18) and the Øresundbridge between Malmö and Copenhagen yield significant traffic flows. The importance of these borders remained stable since 1995; the importance of the borders towards Russia (Poland to Kaliningrad enclave, and Narva border point between Estonia and Russia) declined somewhat in the period 2000-2005.

Custom clearance at border crossings at external EU-borders is still a major concern. In December 2013, average waiting times for trucks yield between one hour (border Poland and Ukraine) and 16 hours (border Poland and Belarus). Waiting times for outbound EU traffic are generally longer compared to inbound EU traffic, which offer only accounts for half of the waiting time.

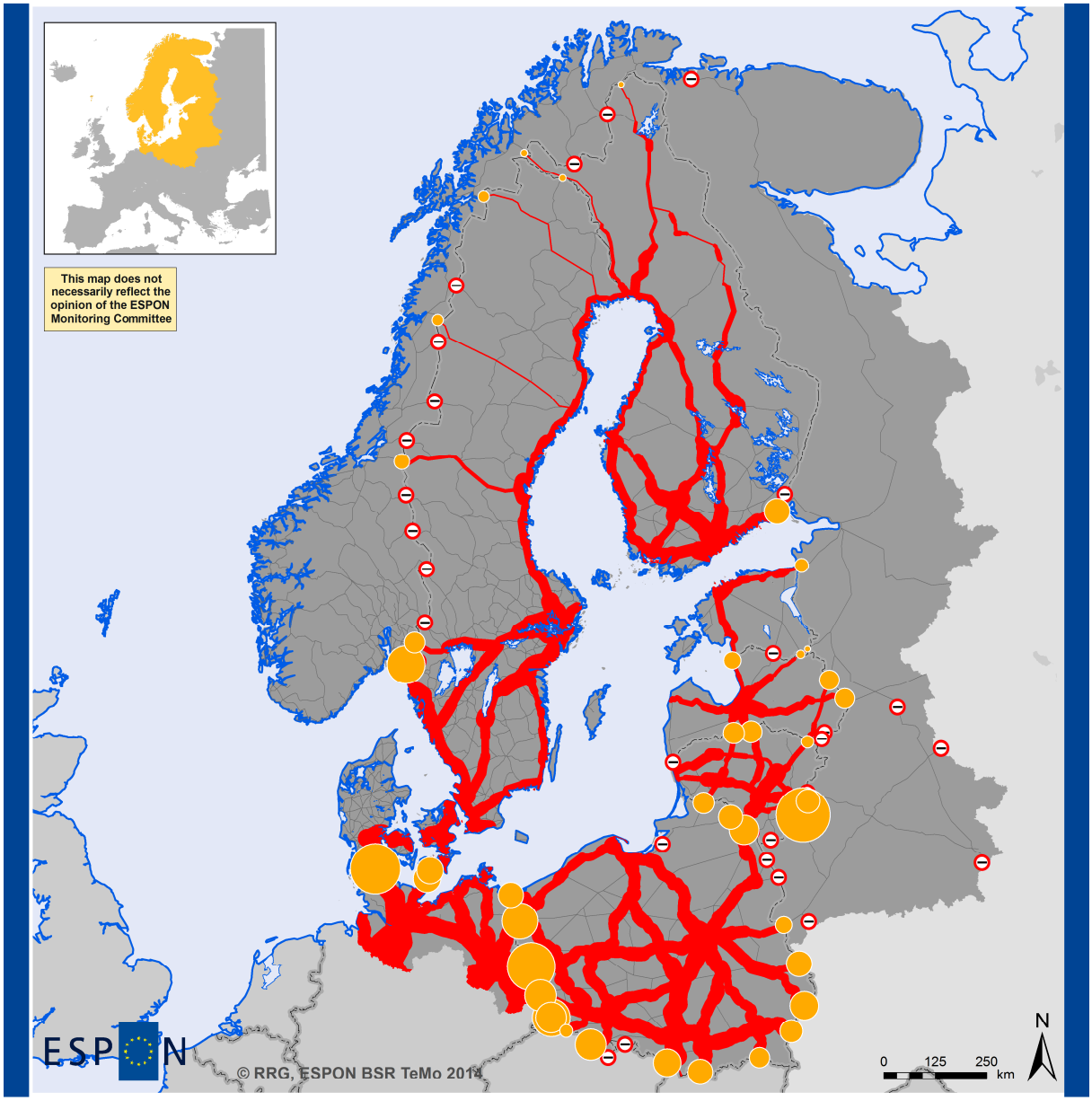


Figure 43. Border crossings and E-roads, AADT 2005, BSR.

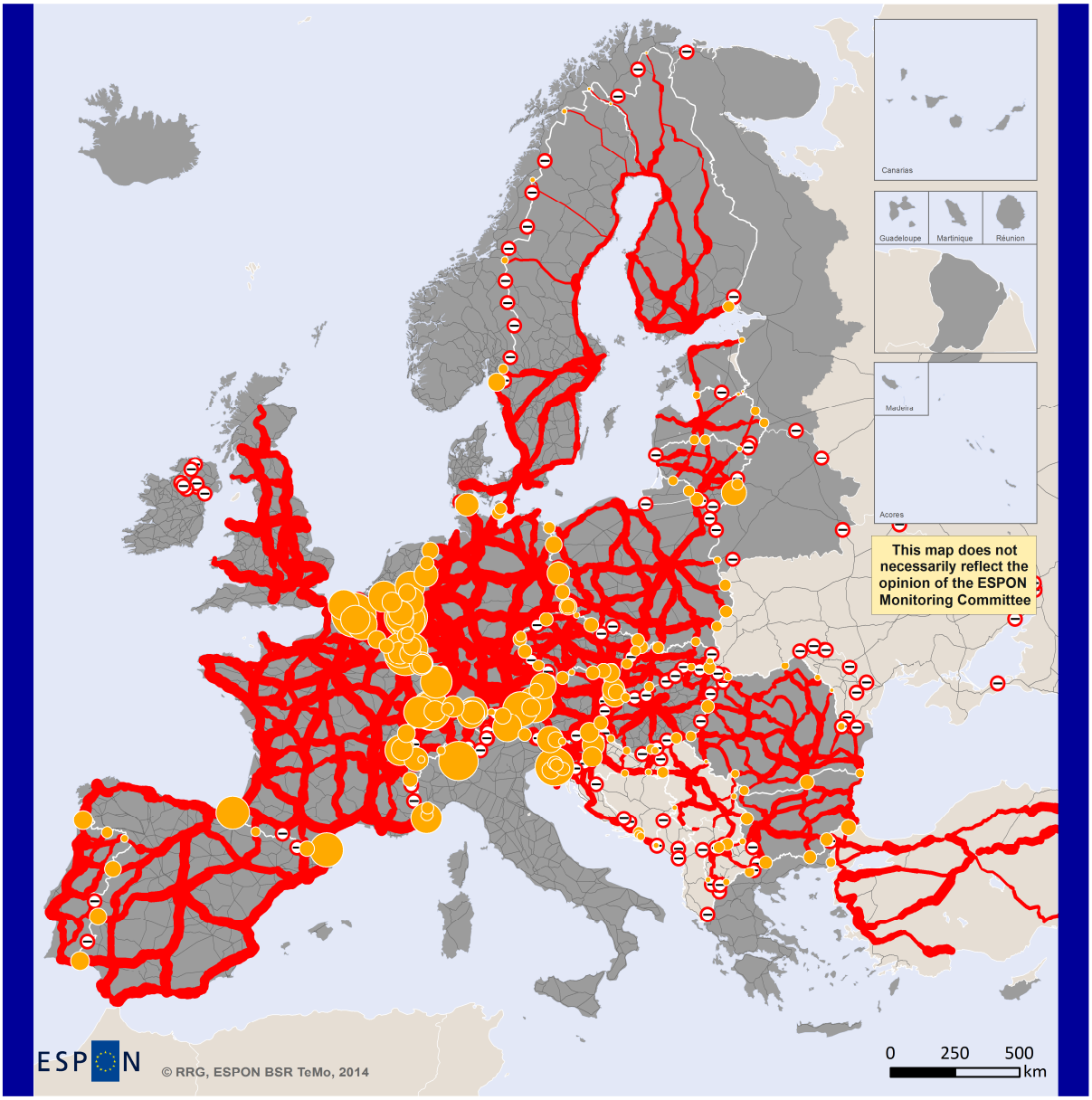


Figure 44. Border crossings and E-roads, AADT 2005, ESPON Space.

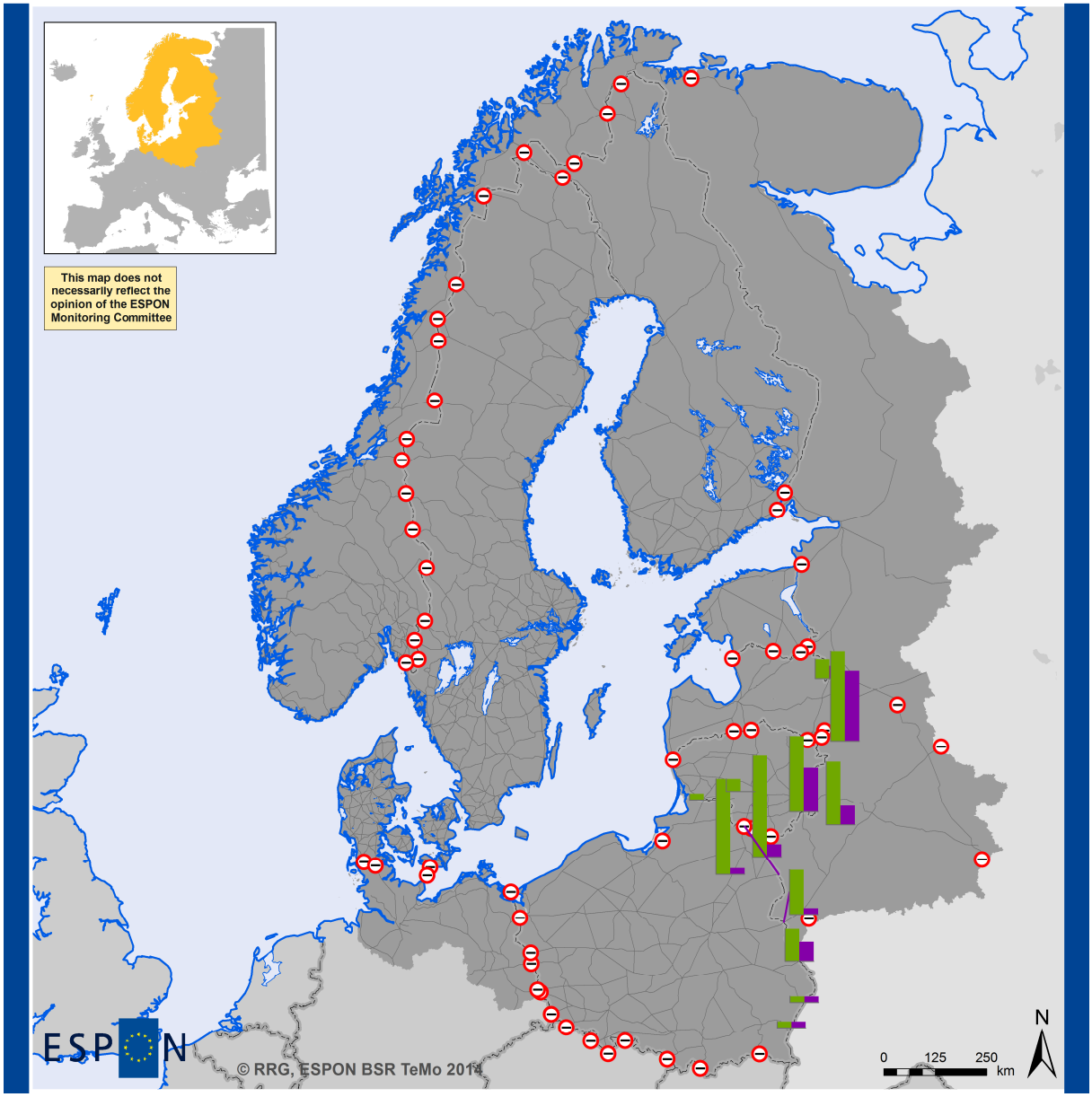


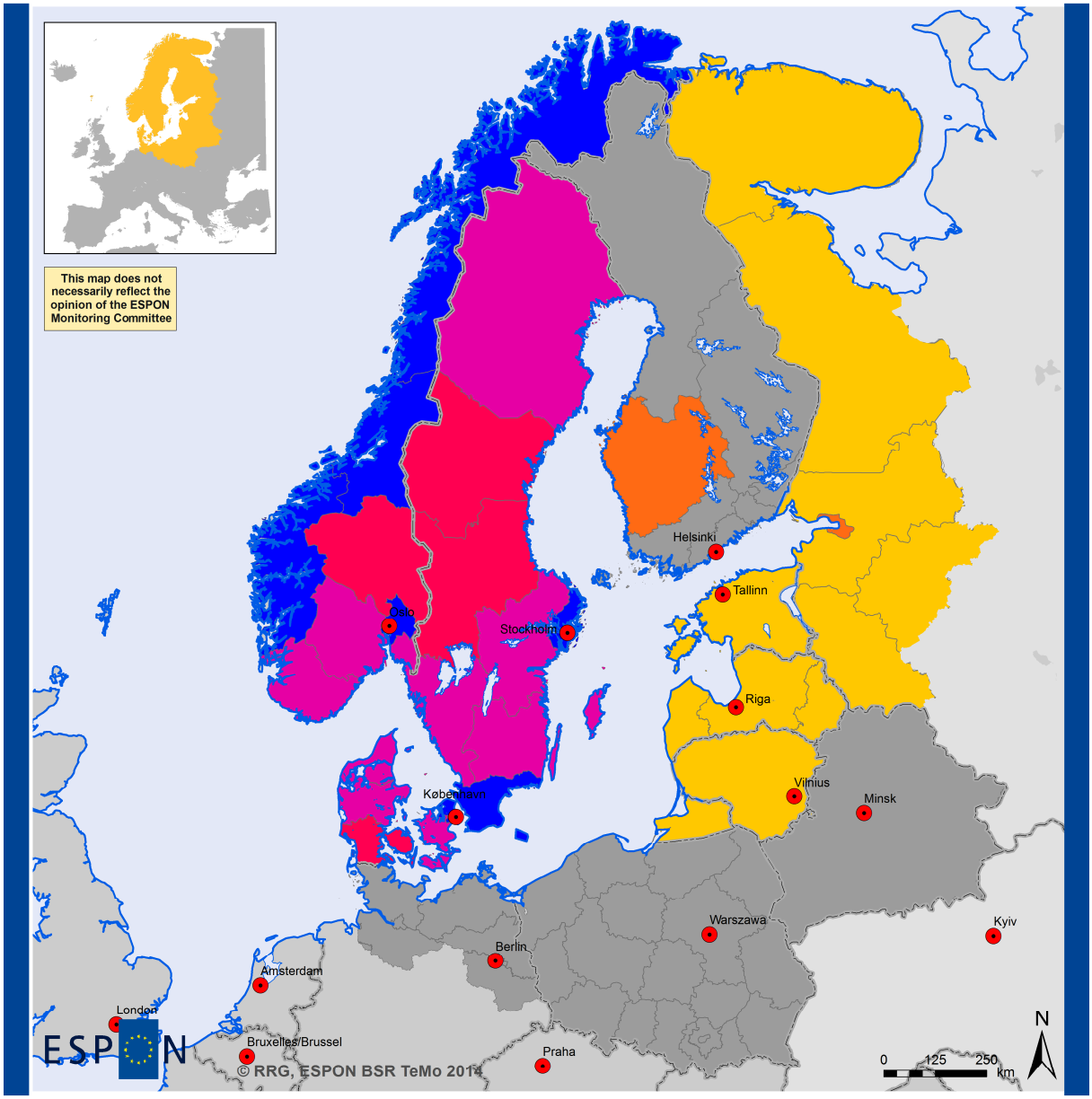
Figure 45. Average truck waiting times at external EU borders, Dec. 2013, BSR.

3.2.8 Households with Internet Access at Home

Indicator definition
The indicator households with internet access at home is defined as the number of households with internet access in percent of the total number of households.

Findings
Unfortunately, no regional data are available about several large EU member states - Germany, France, UK and Poland, also Russia and Belarus. Because of that the spatial pattern of the indicator is fragmentary. The highest percentage of households with internet can be found in the Scandinavian and Benelux countries' regions (72-98%). Portugal, most of Spain, southern Italy, Romania and Bulgaria form a southern belt of lower home internet access. Because of very fragmentary data no general pattern can be observed for the BSR. Only the difference between very high Scandinavian access rate and medium access rate in the Baltic States (62-71%) can be pointed out.

Related to this, the alternative indicator on broadband access does not reveal any definite geographical pattern. Generally, the access rate is quite good – typically 86% at least. No clear west-east or north-south divide exists. Remarkably lower rates can be found mostly in Romania and Bulgaria.



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Regional level: NUTS-2; Russia: oblasts
Data source: Eurostat, 2013; Rosstat, 2014
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Data not available for Germany, Poland, Belarus and for some regions in Finland.

Households with access to internet (2011)
Proportion of all households (%)

- 62 - 71
- 72 - 83
- 84 - 87
- 88 - 91
- 92 - 100
- Data n.a.

Figure 46. Households with access to internet 2011, BSR.

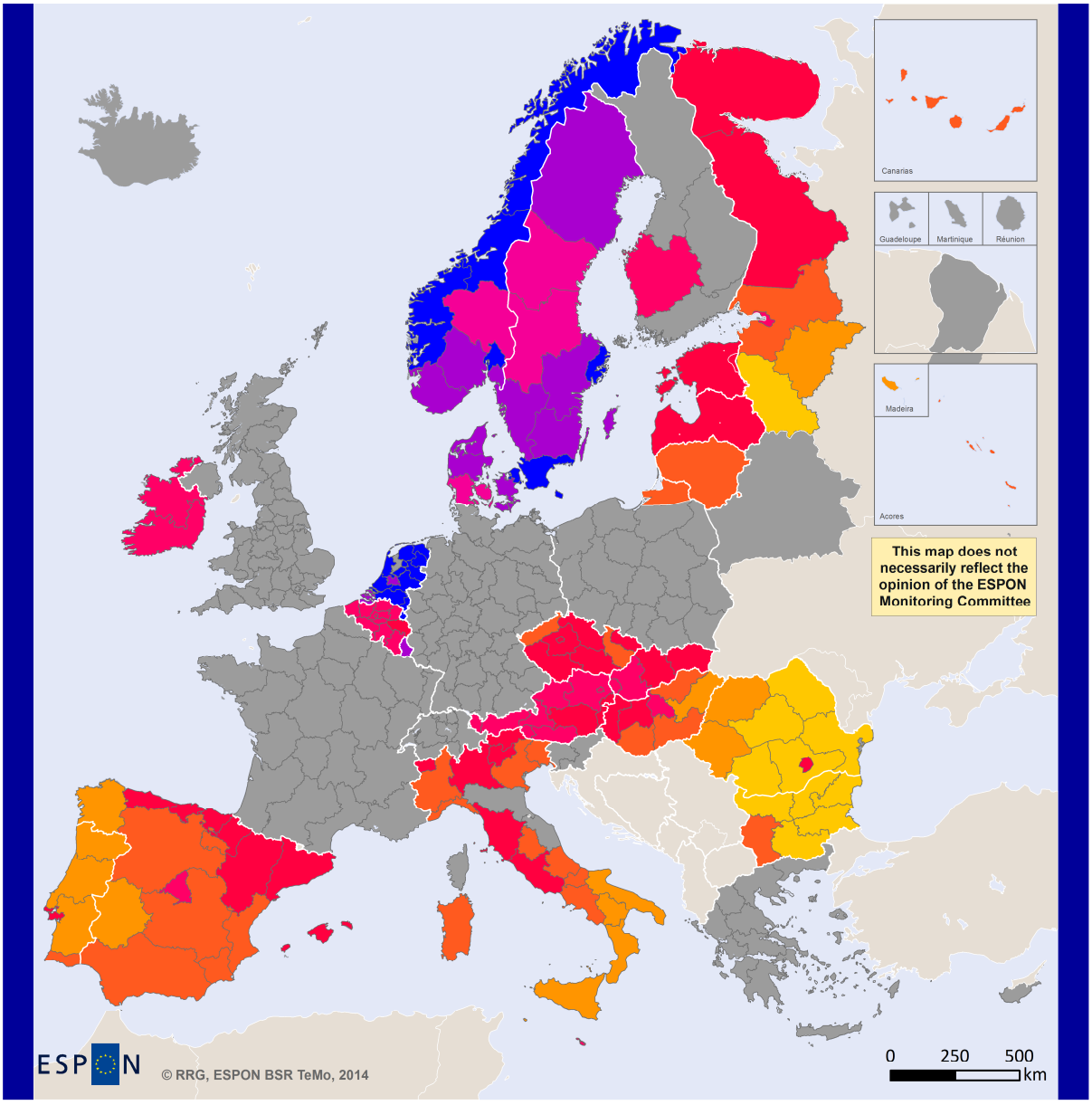


Figure 47. Households with access to internet 2011, ESPON Space.

3.3 Innovative Territories

Four indicators in two sub-domains have been implemented and analysed under this domain. The domain analyses the quality of infrastructures, enabling people to take part in economic, social and leisure activities.

Table 5 Innovative territories: Indicators and sub-domains.

Human capital		
	- Population with tertiary education (25-64 years) - Employment in technology and knowledge intensive sectors	Human capital is probably the greatest asset of Europe´s economy. This subdomain looks into education levels, and into employment in highly qualified jobs.
Financing and institutions		
	- Gross-domestic expenditures on R&D, business - Gross-domestic expenditures on R&D, total	Only continuous investments and expenditures into R&D will secure future competitiveness of Europe´s economy. This subdomain assesses the private and public R&D expenditures.

3.3.1 Population with Tertiary Education

Indicator definition
The indicator is defined as the share of persons aged 25-64 with tertiary educational attainment on the overall population aged 25-64.

Indicator importance
Education is one of the key policy fields in Europe. Tertiary educational attainment in the age group 30-34 years is one of the headline indicators of the EU2020 Strategy "Smart Growth" with the objective of at least 40% of people should complete third level education by 2020. This indicator measures the highly-qualified labor force as basis for current and future R&D activities in Europe, and as basis for high-qualified jobs.

Findings
In 2011 in Europe there is a strong divide in tertiary education share between more developed north and less developed southern countries. According to this indicator, the south includes the Balkan countries (except Slovenia), Turkey, Czech Republic, Slovakia, Italy and Portugal where the indicator is generally below 20%. In the north, it is generally at least 20%. In the background of BSR as a whole, only the Polish and Schleswig-Holstein regions have shares lower than 25%.

The share of population with tertiary education has increased all over the ESPON area from 2005 to 2011, typically 3% or more. Lithuania, Latvia and Poland are among the best performers. Decreases of the indicator or its increases smaller than 3% are rather exceptional. BSR as a whole has performed well. Low increases can be met only in a few regions of East Germany and Denmark.

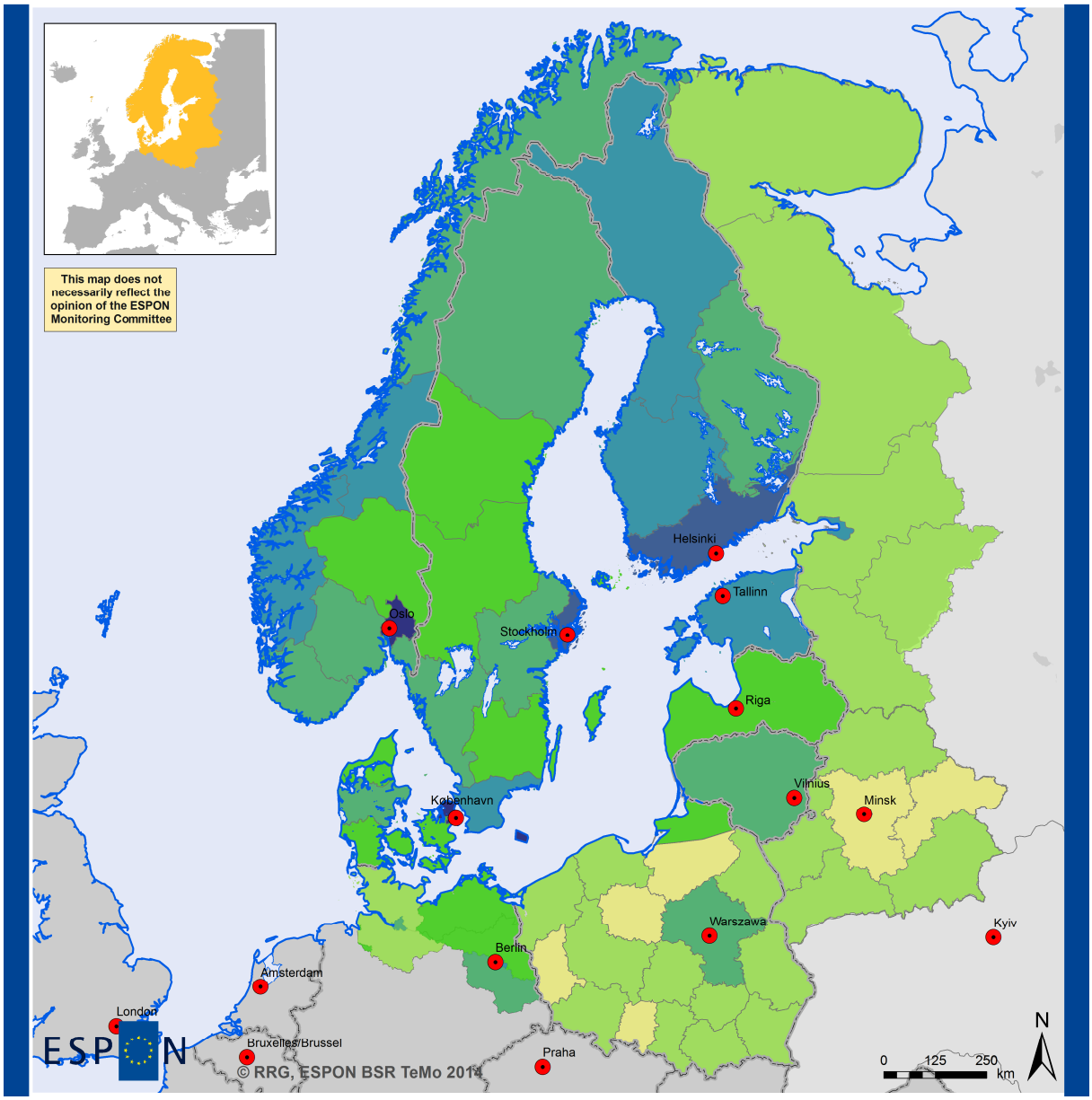


Figure 48. Population with tertiary education 2011, BSR.

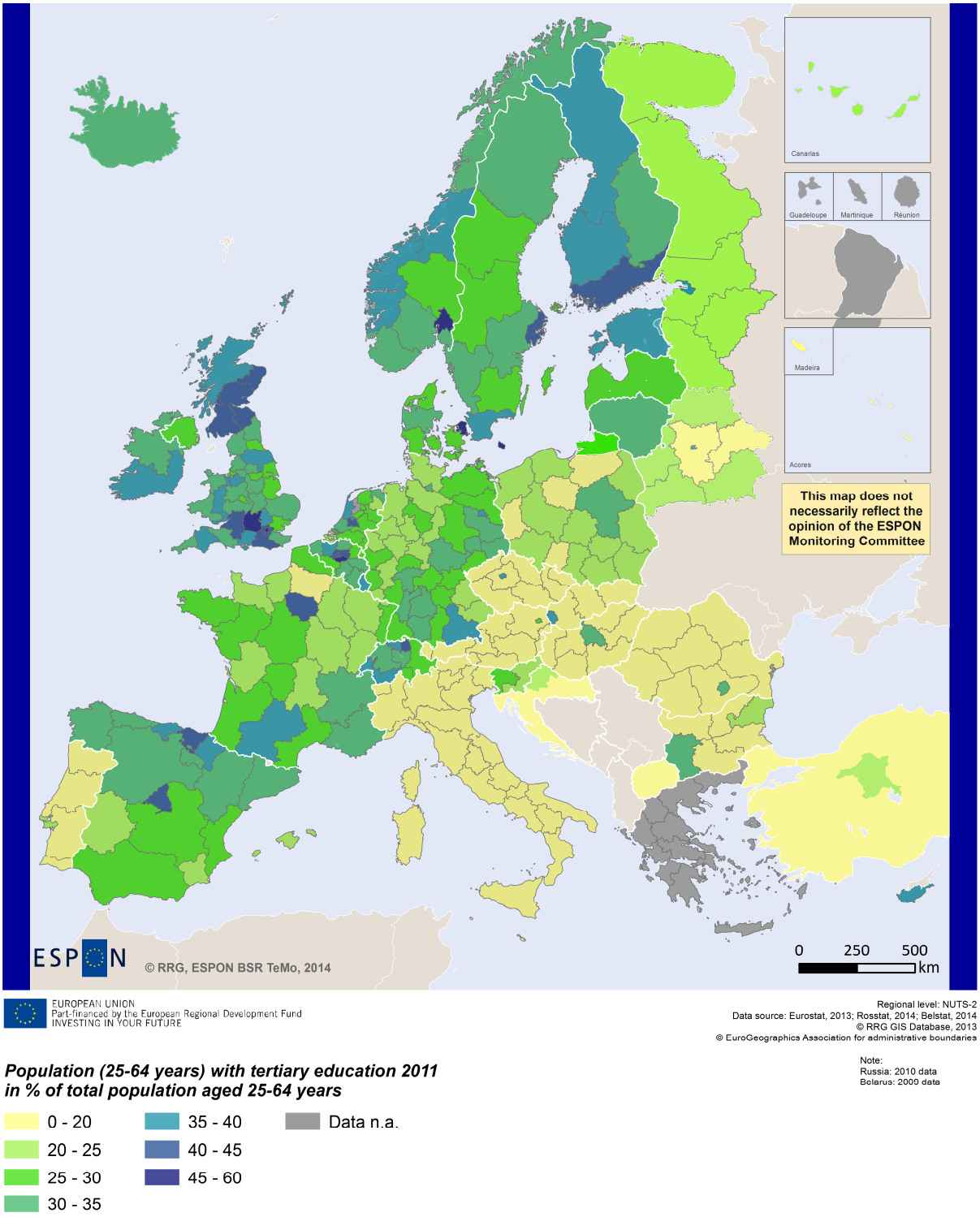


Figure 49. Population with tertiary education 2011, ESPON Space.

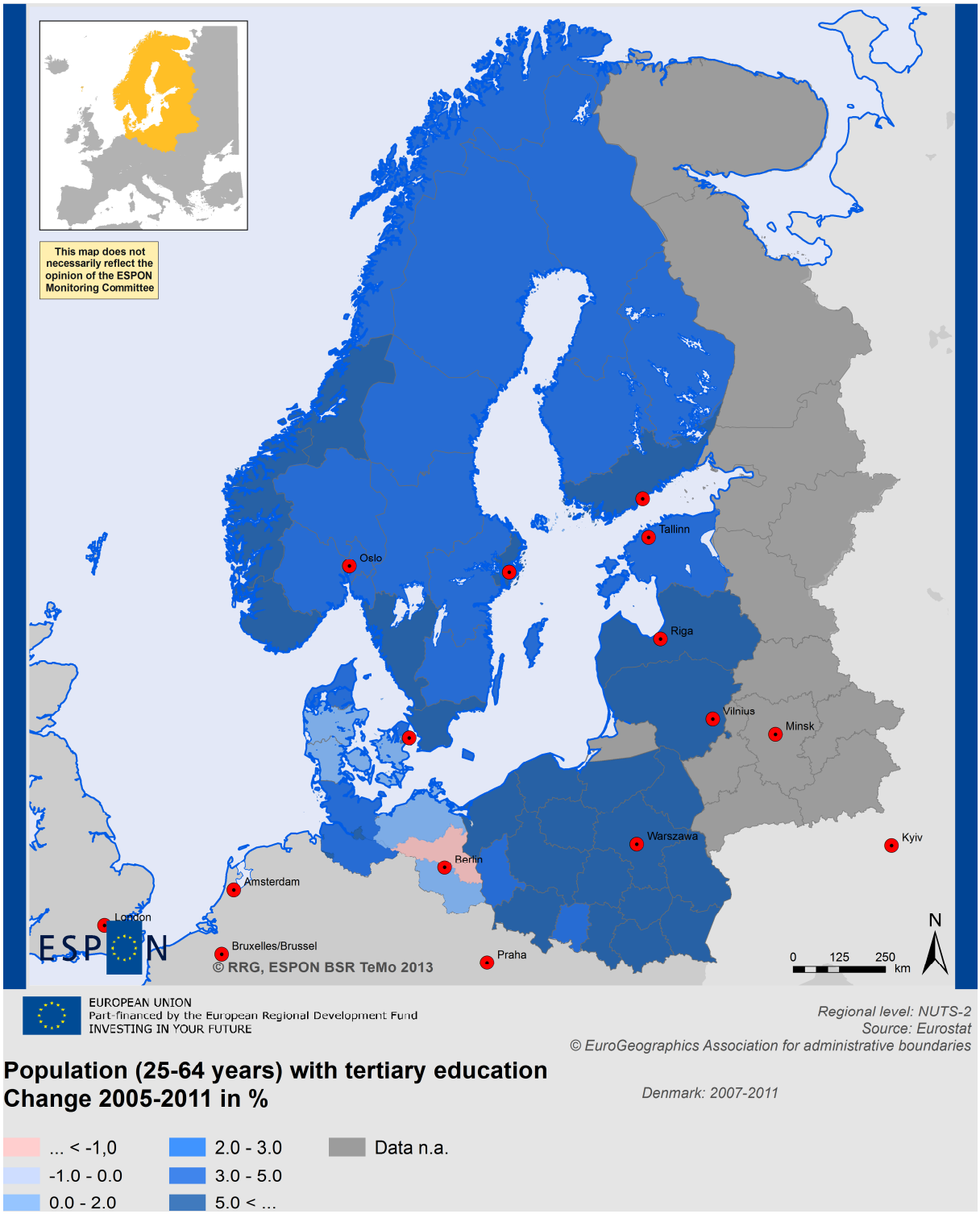


Figure 50. Population with tertiary education, change 2005-2011, BSR.

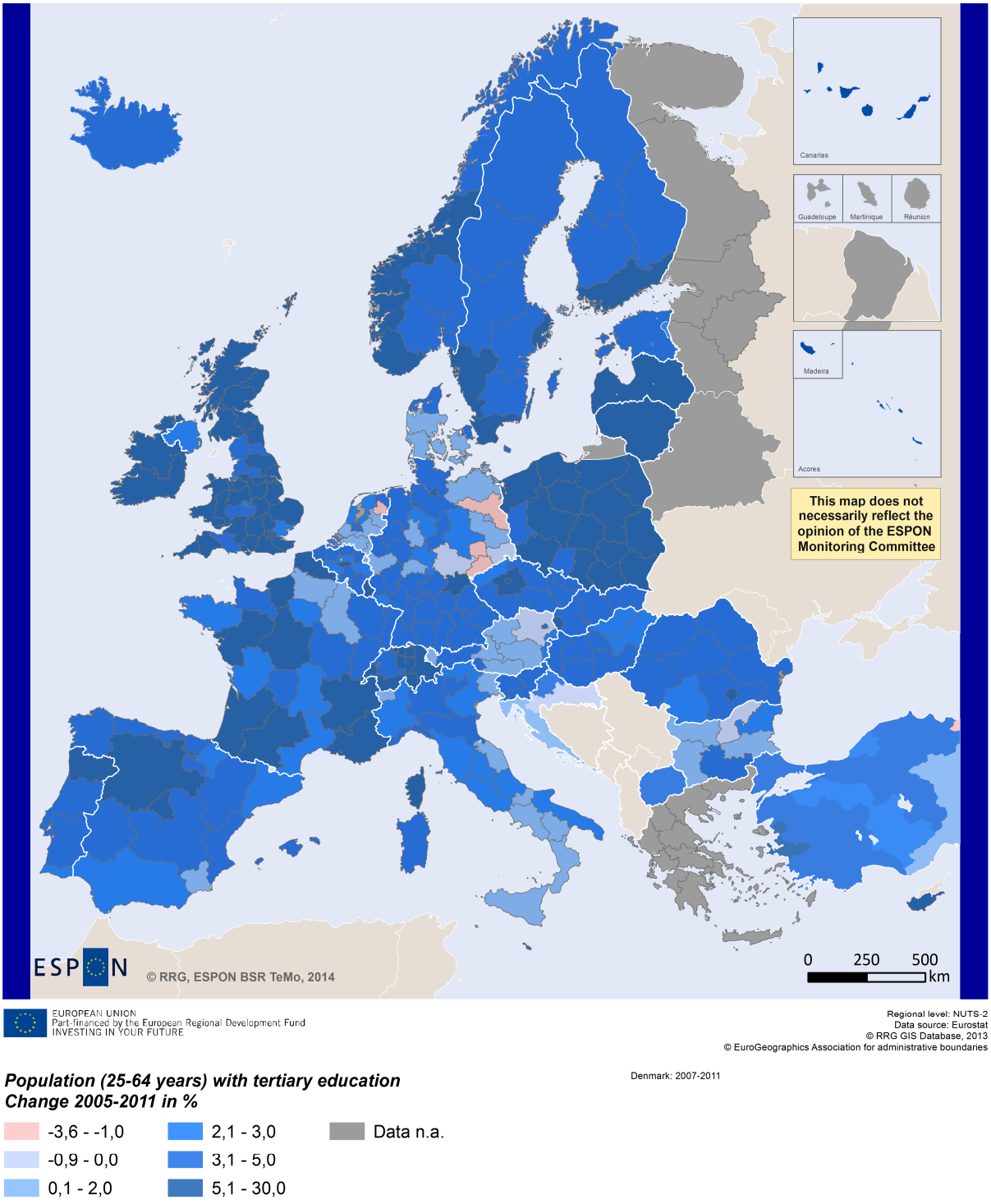


Figure 51. Population with tertiary education, change 2005-2011, ESPON Space.

3.3.2 Employment in Technology and Knowledge-intensive Sectors

Indicator definition
The indicator is defined as the share of employees in technology and knowledge-intensive sectors on all employees.

Indicator importance
Whereas the indicator on tertiary education provides an outlook on the future highly-qualified labor force in Europe (input indicator), this indicator analyses the proportion of people actually working in technological fields and in knowledge-intensive branches (output indicator).

Findings
Despite of poor regional coverage of data a general pattern emerges with both the eastern (CEEC countries, Turkey) and western periphery (Portugal, Spain) lagging behind. Only some regions exceed the 30% share there in the periphery when in the remaining ESPON area levels of 30% represent the minimum.

Coverage of data is poor for BSR as well. Only the difference between the Nordic countries (strong performers) on one hand and the Baltic States and East Germany (weak performers) on the other hand can be pointed out.

The development trend in the period 2005-2010 in terms of employment in technology is positive over all countries with no clear regional pattern. However, due to divide in starting positions of countries and regions, it seems not to lead to convergence of knowledge-intensity of economies in the near future. In BSR, the overall trend is positive, too. Norway as a whole, but also some peripheral regions in Poland, and Latvia and Lithuania in addition, increase their knowledge-intensity faster than most regions.

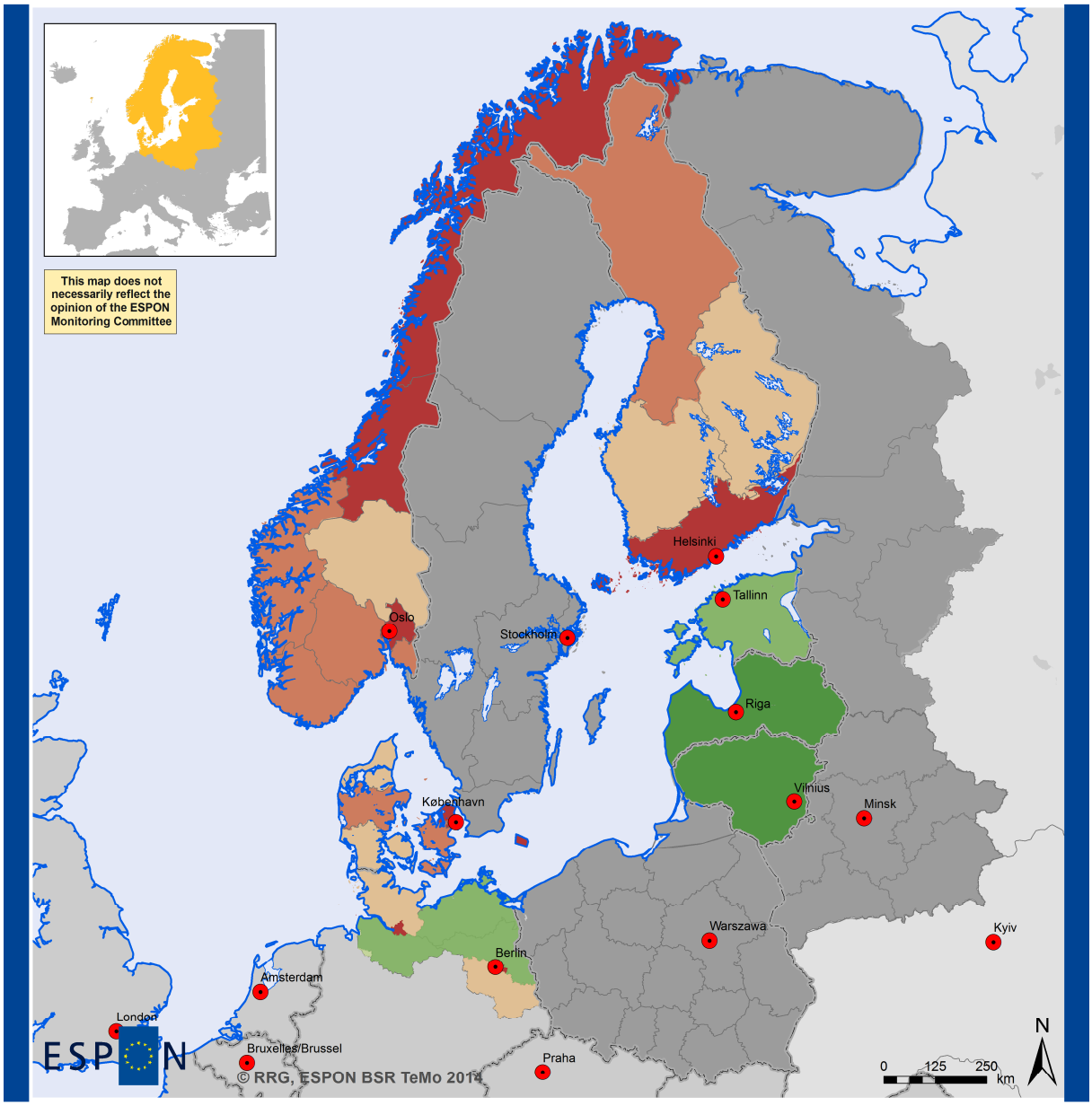


Figure 52. Employment in technology and knowledge-intensive sectors 2008, BSR.

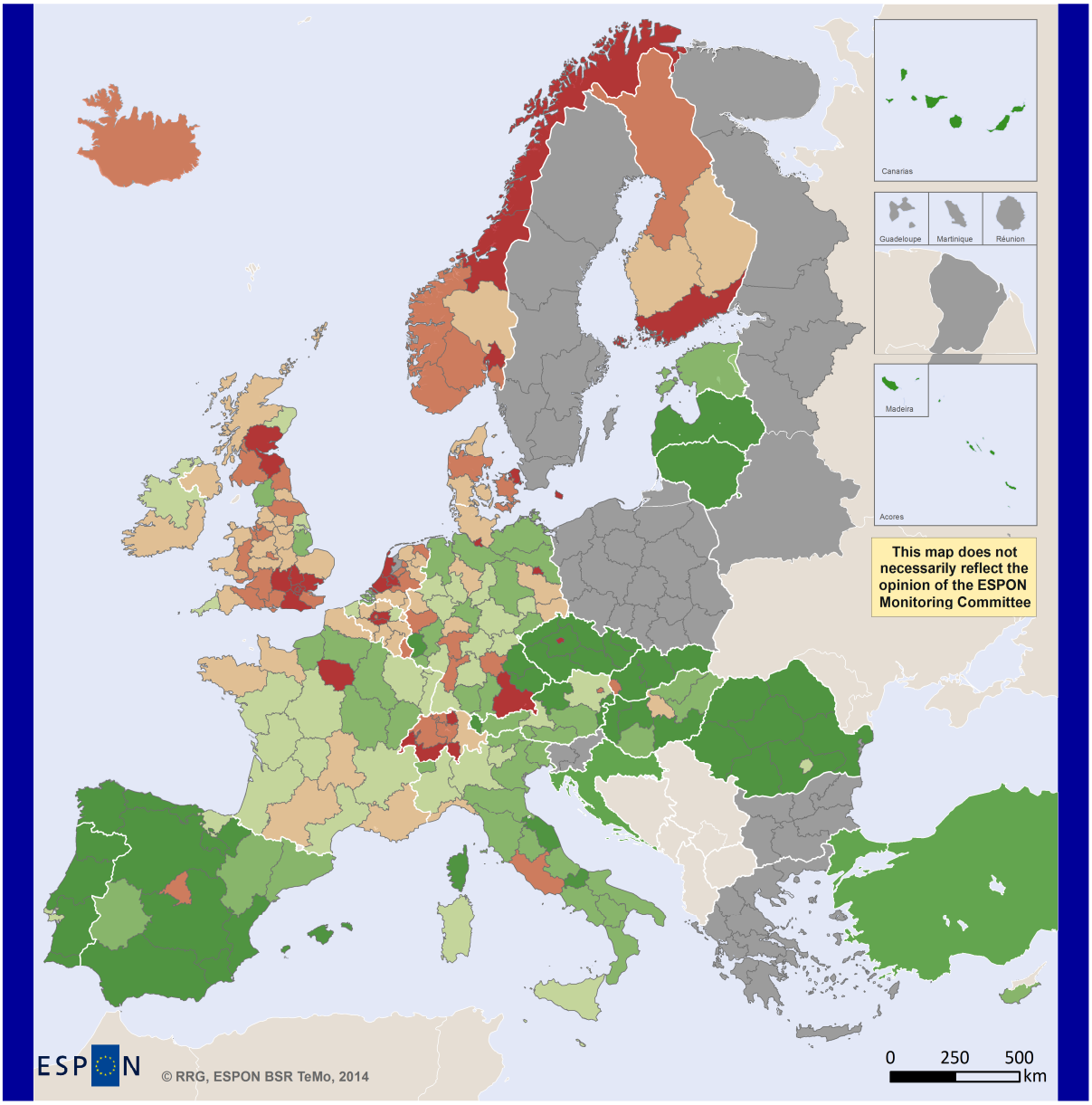


Figure 53. Employment in technology and knowledge-intensive sectors 2008, ESPON Space.

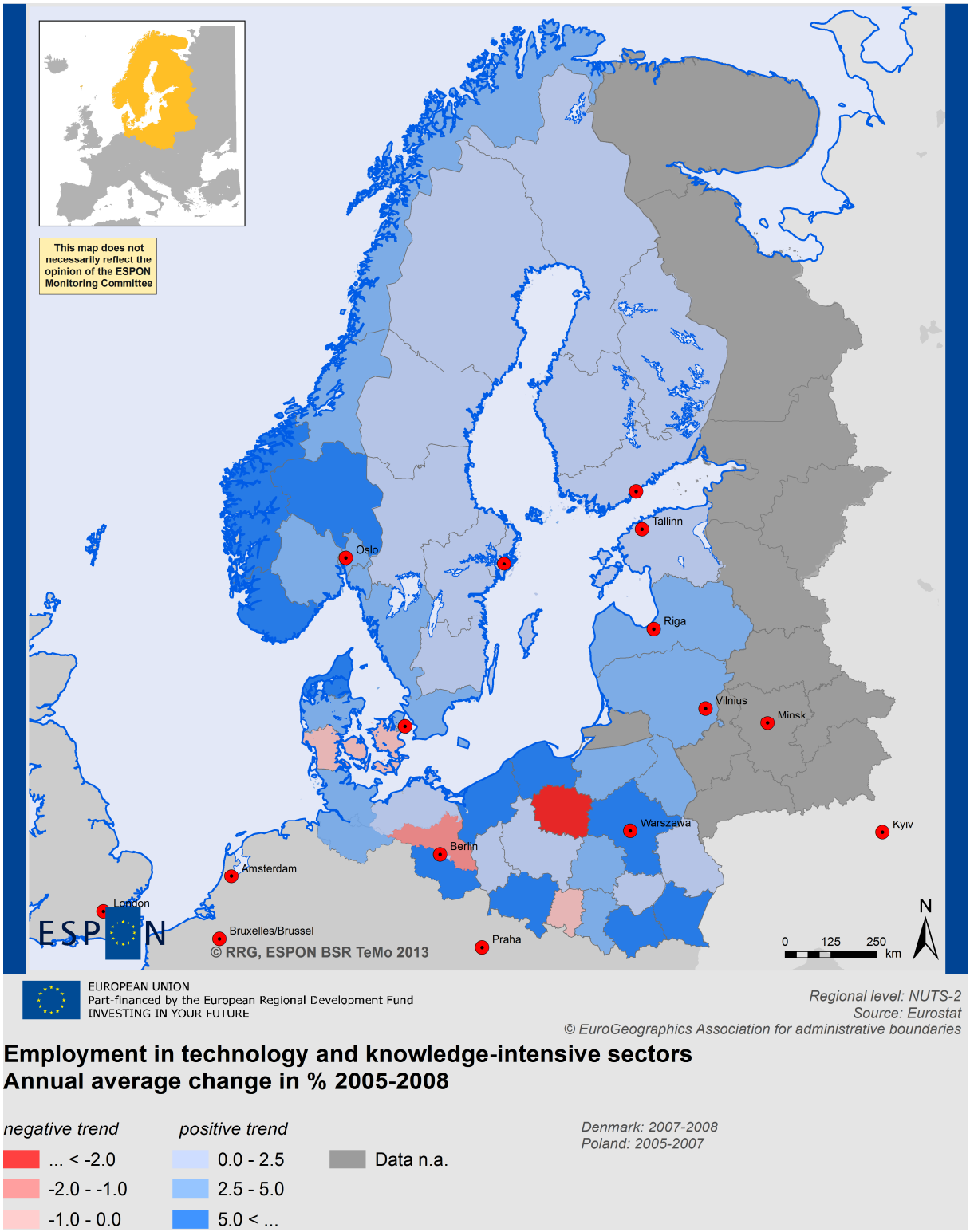


Figure 54. Employment in technology and knowledge-intensive sectors. Annual average change 2005-2008, BSR.

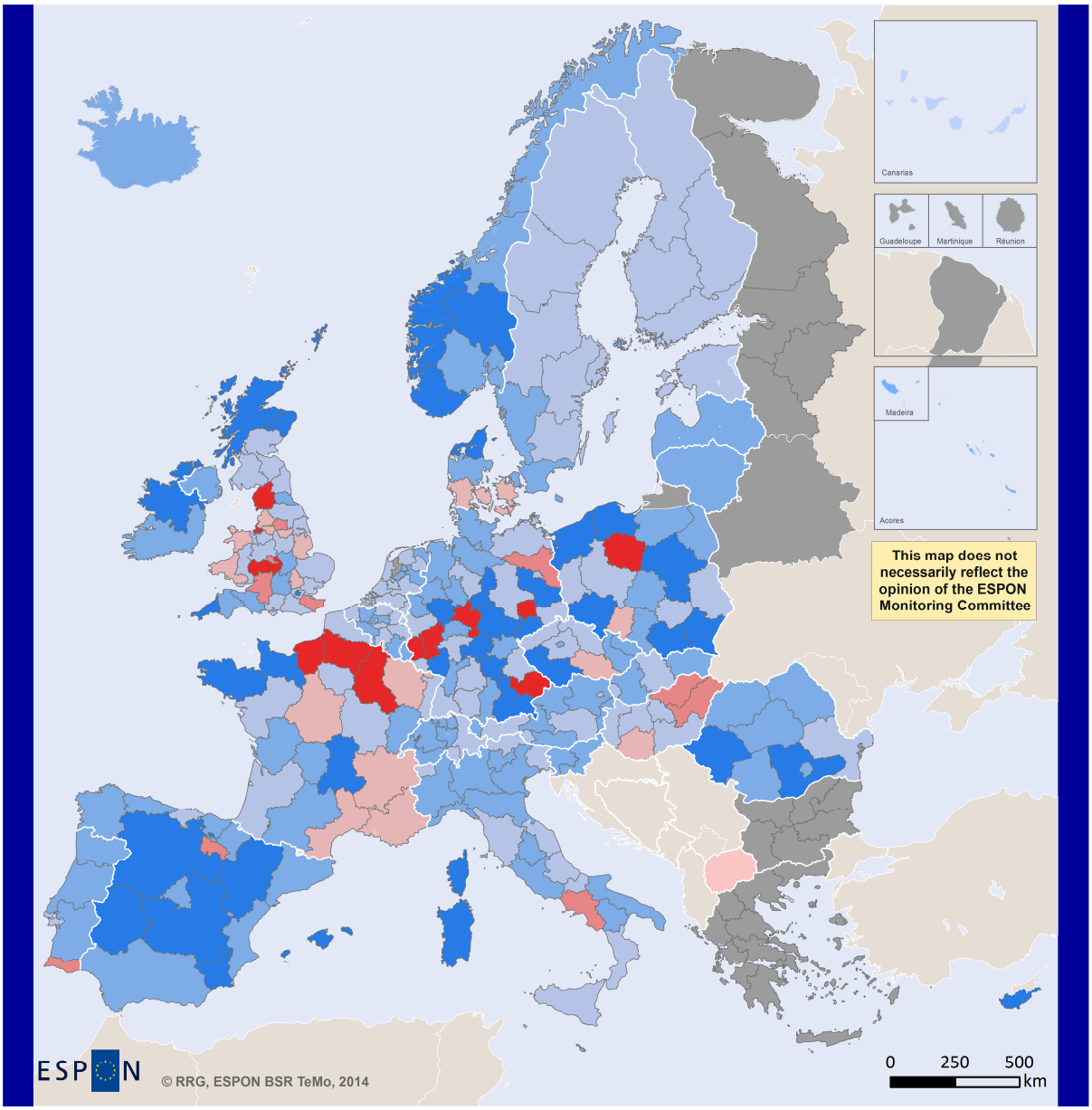


Figure 55. Employment in technology and knowledge-intensive sectors. Annual average change 2005-2008, ESPON Space.

3.3.3 Business Gross-domestic Expenditures on R&D

Indicator definition
This indicator is defined as the Gross Domestic Expenditure on Research and Development by business enterprises (GERD), expressed as a share of regional GDP.

Indicator importance
The GERD indicator is one of the headline indicators of EU2020 Strategy´s "Smart Growth" with the objective of reaching a level of public and private R&D expenditures of 3% of EU GDP by 2020. R&D activities are seen as specific assets of European economy, and only continuous future R&D activities will keep Europe´s economy competitive with USA, China and other countries.

Findings
The business sector R&D expenditure level reflecting knowledge intensity of the economy is at low levels in eastern and southern periphery of the area, but also in several regions of the UK. Among the new EU member states Czech Republic and Slovenia have converged with the central part of the EU and Estonia performs relatively well, too.

The business sector's share of R&D expenditure reveals the east-west divide in BSR. The business sector of regions of the Nordic countries typically invests at least 0.5% of GDP into R&D, but in many cases much more. The R&D performance of the business in former East-German regions resembles less the Nordic pattern than that of the Baltic States and Poland. In the east, only Berlin and Estonia demonstrate higher than common levels of the indicator.

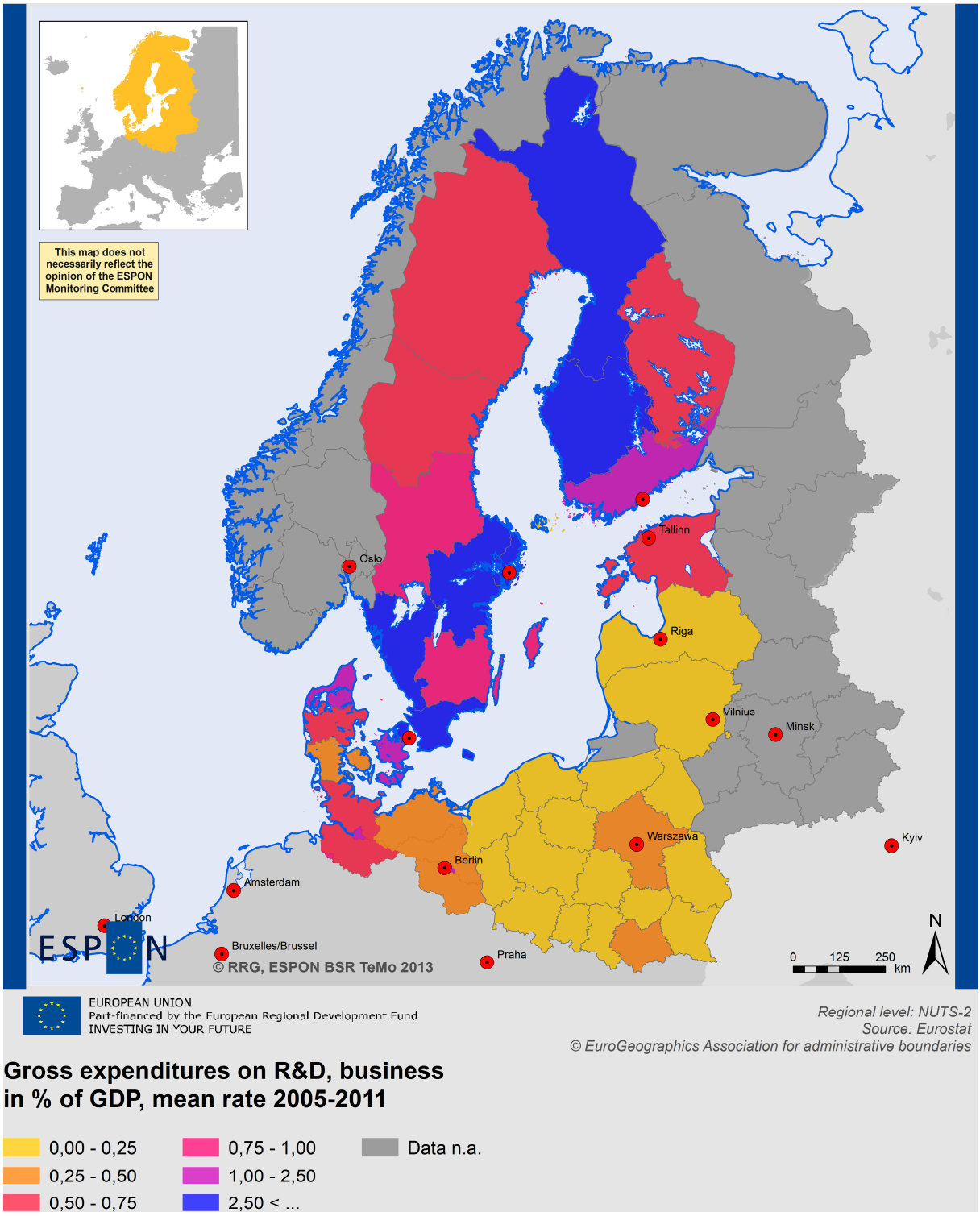


Figure 56. Business gross expenditures on R&D, mean rate 2005-2011, BSR.

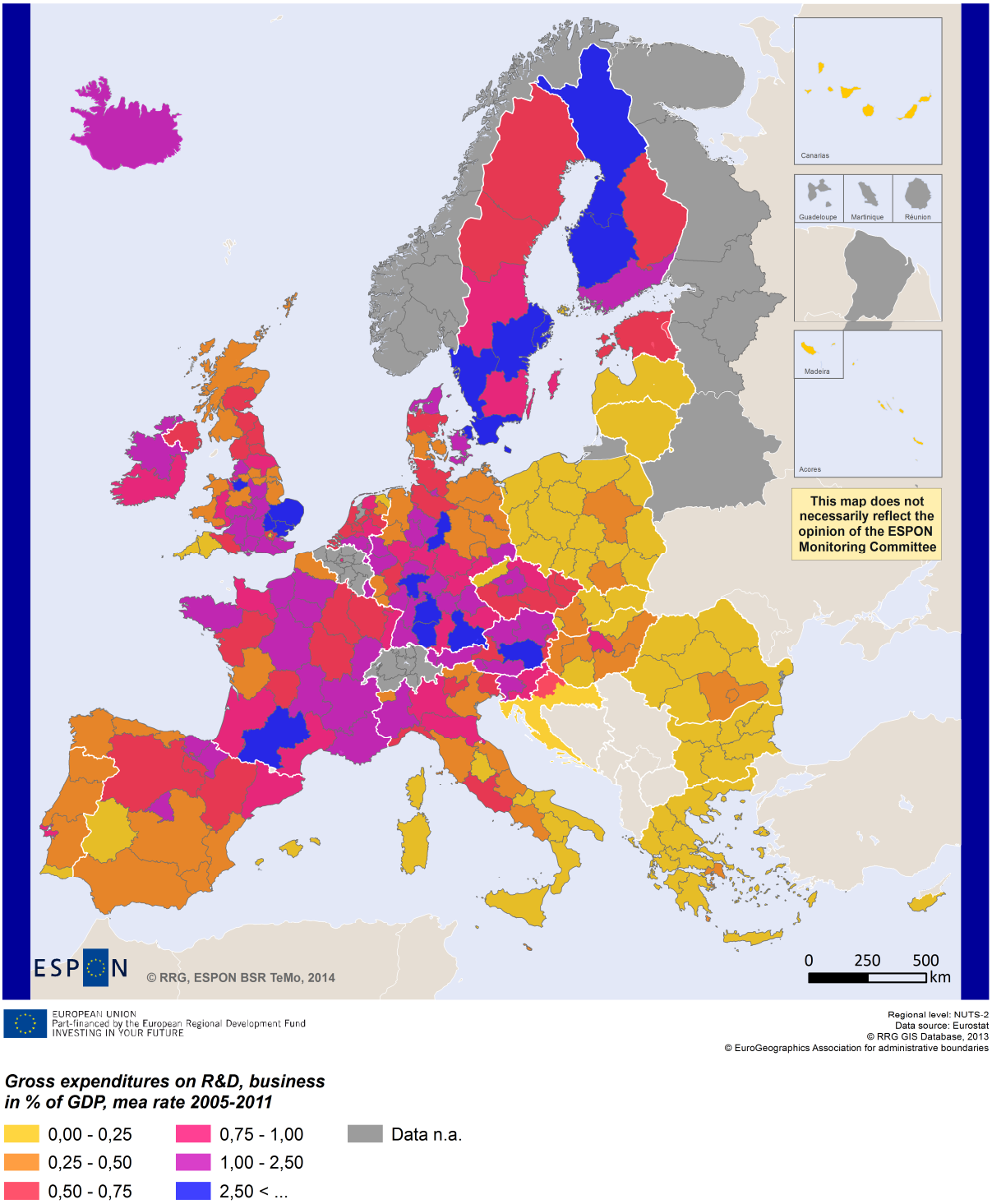


Figure 57. Business gross expenditures on R&D, mean rate 2005-2011, ESPON Space.

3.3.4 Total Gross-domestic Expenditures on R&D

Indicator definition
This indicator is defined as the total Gross Domestic Expenditure on Research and Development (GERD), expressed as a share of regional GDP.

Indicator importance
The GERD indicator is one of the headline indicators of EU2020 Strategy´s "Smart Growth" with the objective of reaching a level of public and private R&D expenditures of 3% of EU GDP by 2020. R&D activities are seen as specific assets of European economy, and only continuous future R&D activities will keep Europe´s economy competitive with USA, China and other countries.

Findings
In the ESPON space, the pattern of the share of R&D expenditure reveals the east-west divide. But here the east, where R&D intensity level is typically rather low, includes not only the new CEEC member states of the EU but also Greece, Croatia, southernmost mainland regions of Italy and several Mediterranean islands. At the same time, the Czech Republic and Slovenia have reached the typical western level. In the west, R&D expenditure is typically spread quite evenly within the countries. In the east, typically only the regions including capitals have R&D shares running at 1% or more of the regional GDP.

The share of R&D expenditure reveals the east-west divide in BSR. The regions of the Nordic countries and Germany typically invest at least 1% of GDP into R&D, but many 2.5% and much more. In the east, only the Mazowieckie region (incl. Warszawa) and Estonia have passed the 1% milestone.

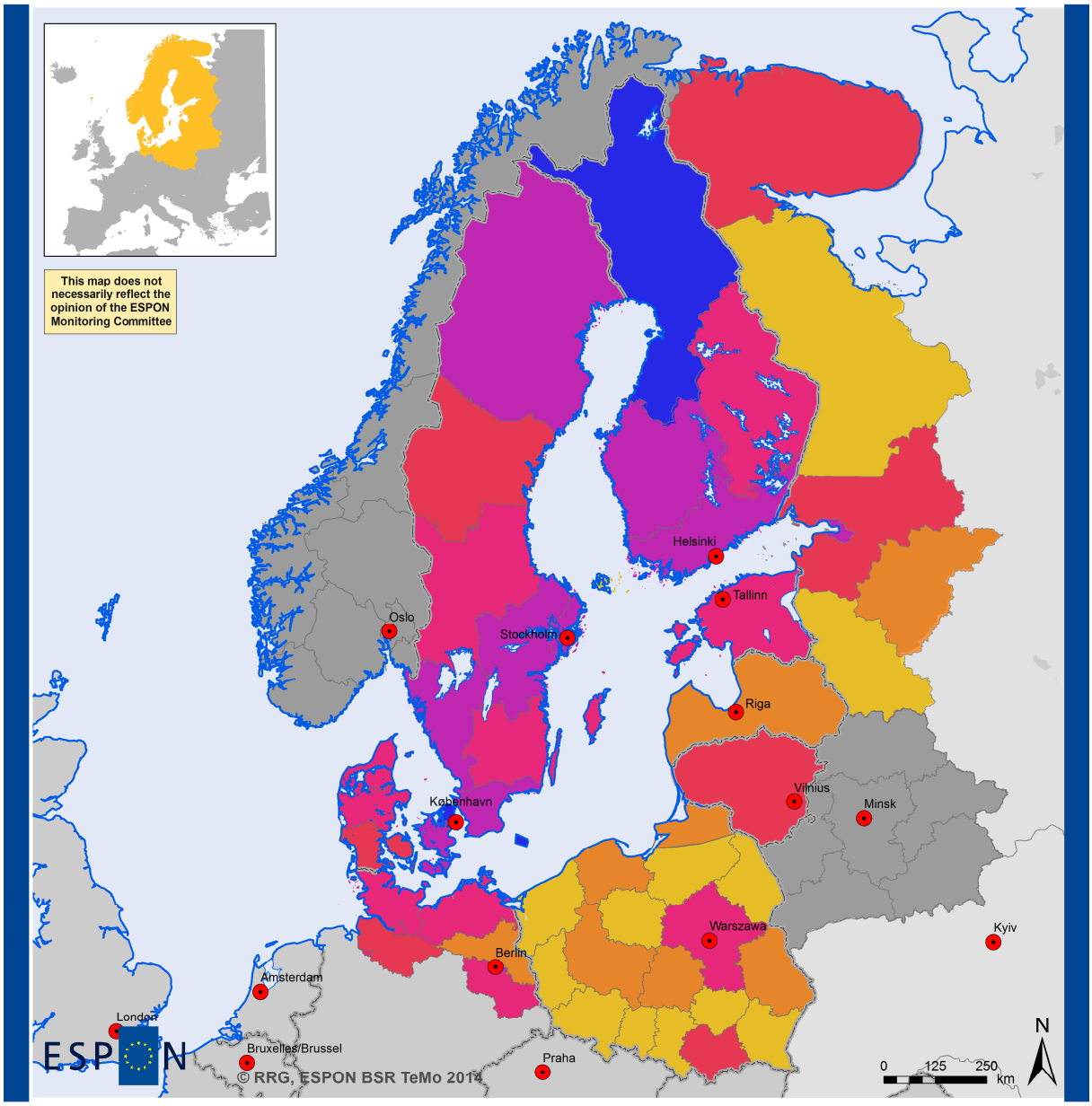


Figure 58. Total gross expenditures on R&D, mean rate 2005-2011, BSR.

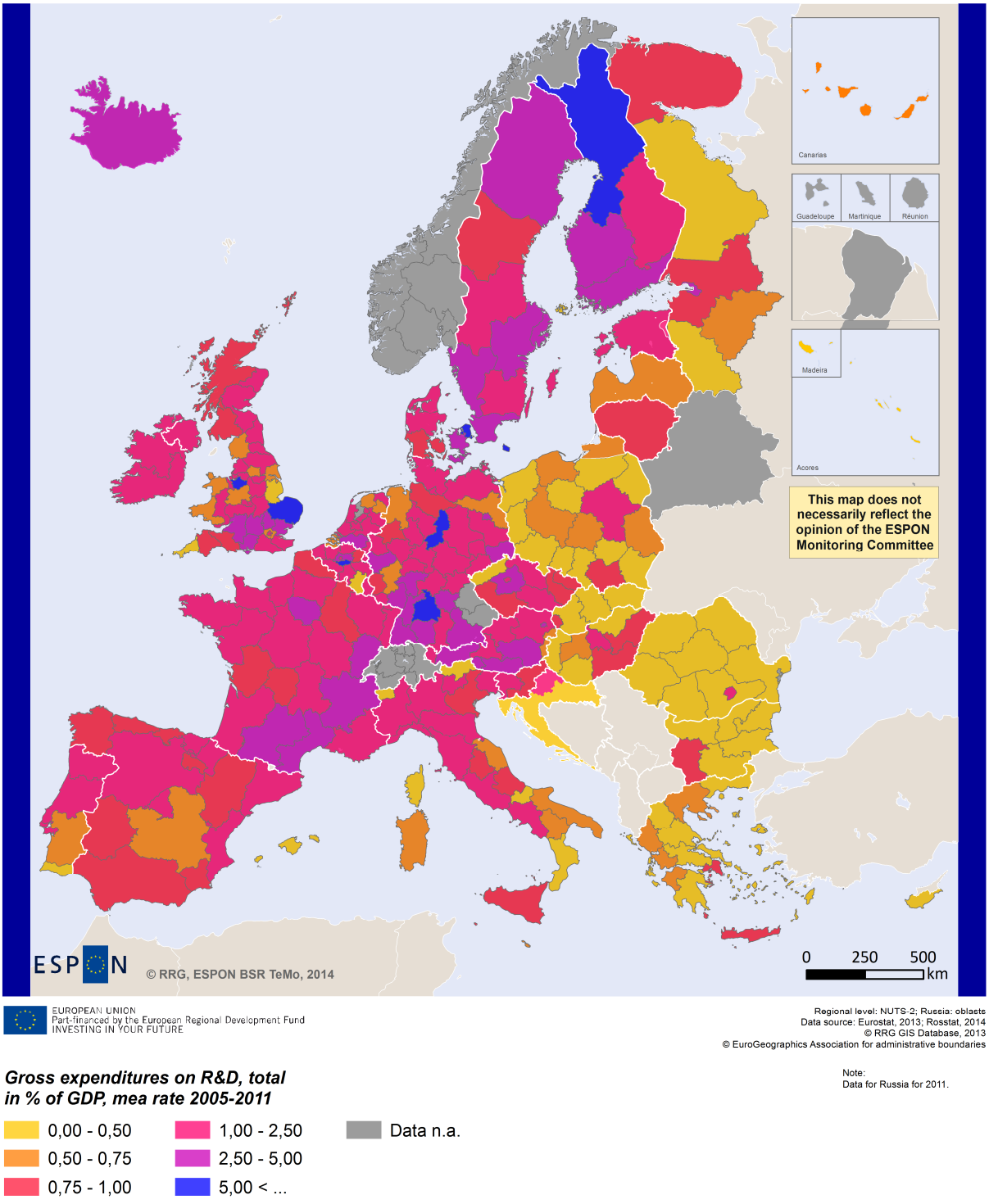


Figure 59. Total gross expenditures on R&D, mean rate 2005-2011, ESPON Space.

3.4 Social Inclusion and Quality of Life

Six indicators in two sub-domains have been implemented and analysed under this domain. Growth and prosperity should be equally distributed across the society.

Table 6 Social inclusion and quality of life: Indicators and sub-domains.

Social inclusion		
	- At-risk of poverty rate - Severe material deprivation rate - Youth unemployment rate - Gender imbalances	Poverty, material deprivation, unemployment or imbalances in demographic structures may lead to social upheavals, and to severe disruptions of individual life plans.
Health		
	- Life expectancy at birth - Self-assessed general health status	A good health is main requisite for everybody to take part in labour markets and social life. The quality of the health care systems is assessed in this subdomain..

3.4.1 At-risk-of-poverty Rate

Indicator definition
The indicator is defined as the share of population living at risk of poverty. A person is defined as being in risk of poverty if his/her equivalised (by household size) income after social transfers is below 60 % of the corresponding national median. Although it is calculated per individual, its primary measurement unit is the household

Indicator importance
The indicator At-risk-of-poverty-rate is included in the Laeken, the EU SDS and in the EU2020 Strategy indicators, with the objective being to lift out at least 20 Mio people from poverty by 2020.

Findings
As this measure characterizes relative poverty in relation to national average disposable income, the map does not reflect divide in the prosperity level of countries. NUTS-2 level mapping hides correlation of the relative poverty with peripherality at a national scale in the small Baltic States represented as one region. In bigger countries the territorial pattern reveals a quite common income divide between relatively small area of the capital with its closest surrounding and the remaining territory of the country. A weak divide between the Nordic countries and remaining BSR can be seen, too. In the Nordic countries, risk of poverty is quite evenly spread but one can observe more striking variations of relative poverty risk in the former East Germany, Poland, Latvia and Lithuania.

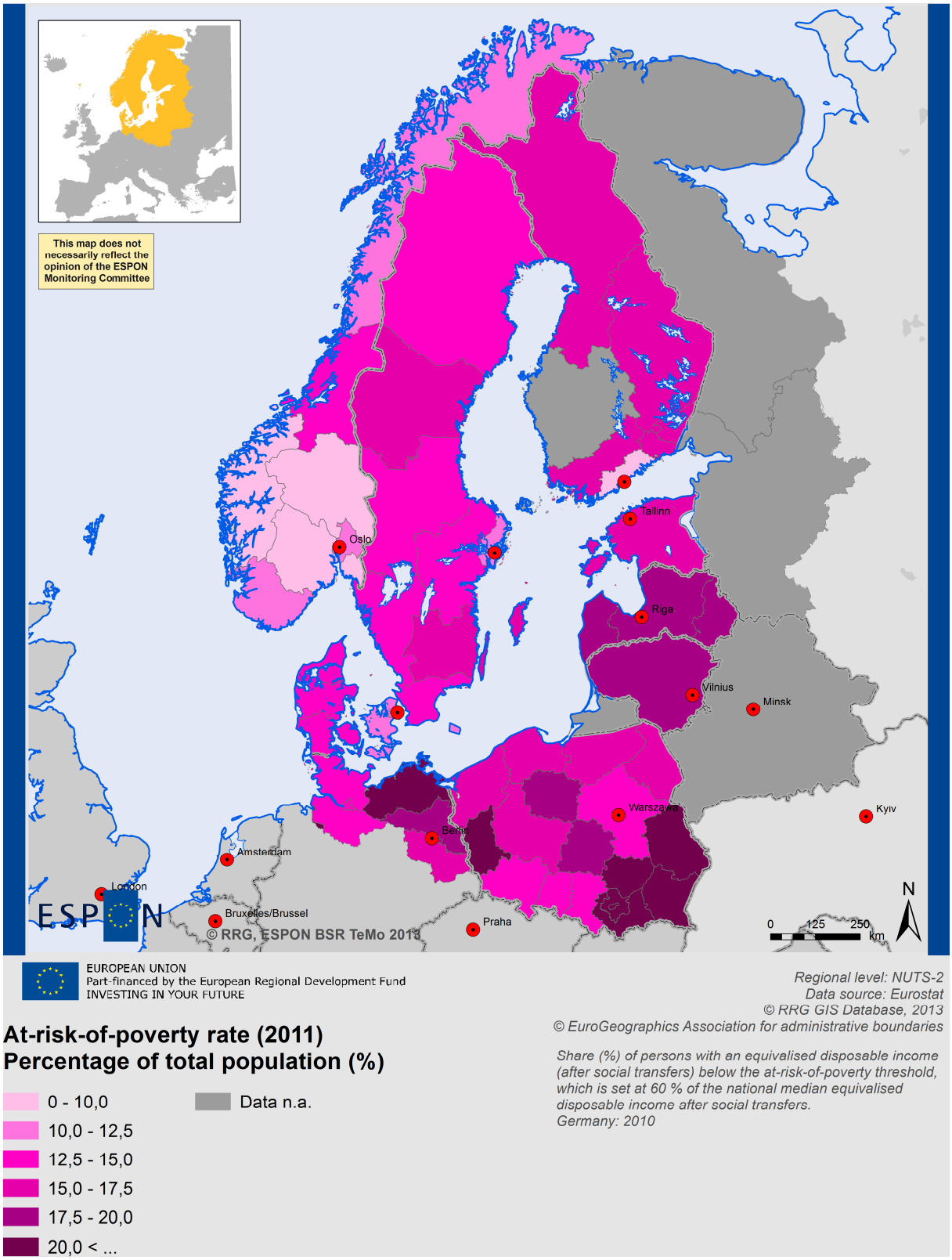


Figure 60. At-risk-of-poverty rate 2011, BSR.

3.4.2 Severe Material Deprivation Rate

Indicator definition
The indicator severe material deprivation targets persons having their living conditions severely constrained by a lack of resources. The indicator is defined as the share persons experiencing at least four out of nine following deprivations items: cannot afford: 1) to pay rent or utility bills; 2) keep home adequately warm; 3) face unexpected expenses; 4) eat meat, fish or a protein equivalent every second day; 5) a week holiday away from home; 6) a car; 7) a washing machine; 8) a colour TV; or 9) a telephone.

Indicator importance
Fair and equal access to and provision of services and goods is one of the fundamental cornerstones of European social policies. This indicator reflecting the percent of population lacking any of such fundamental resources is a headline indicator for the EU2020 strategy, and is also included in the EU SDS set of indicators.

Findings
Measuring of poverty using deprivation rate allows comparison of regions independently of national milestones. Having no data about the former East Germany, a divide between the Nordic countries and the remaining BSR can be mentioned, with a remarkably higher typical rate of severe deprivation in the latter. When in the Nordic countries' regions typical rates of severe deprivation stay below 2.5% of the population in the remaining BSR typical rates are higher than 5%. In addition, the BSR worst deprivation regions with over 15% of severely deprived population can be found only on the eastern and southern shore of the Baltic Sea.

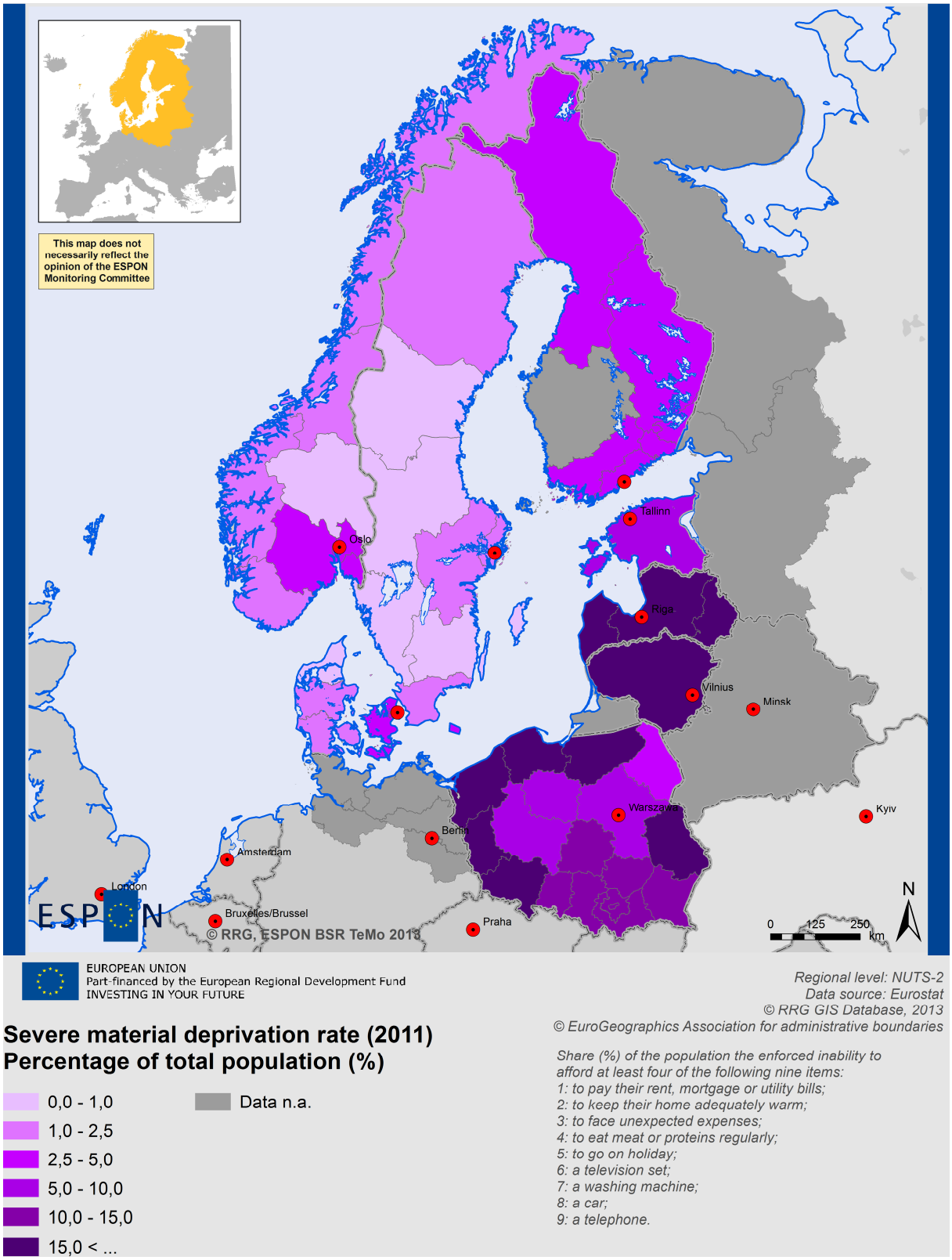


Figure 61. Severe material deprivation rate 2011, BSR.

3.4.3 Youth Unemployment Rate

Indicator definition
The indicator is defined as the share of unemployed persons aged 15-24 years of all persons of that age group in the labour force.

Indicator importance
This indicator should be viewed to as an "early warning indicator" for potential future social exclusion, and as such is included in the EU SDS set of indicators.

Findings
In 2006, some capital/metropolitan regions had the worst youth unemployment levels (Barcelona, Madrid, London, Rome, Athens, Berlin, Stockholm etc.). Only in Poland, Spain and UK youth unemployment was spread more largely. Two years later the situation was much worsened in Spain and improved in Poland.

In BSR, only Berlin, Stockholm and Västsverige (surrounding Gothenburg) regions had 26% or higher indicator value both in 2006 and 2008. The only remarkable change is decreasing of the indicator for a number of Polish regions.

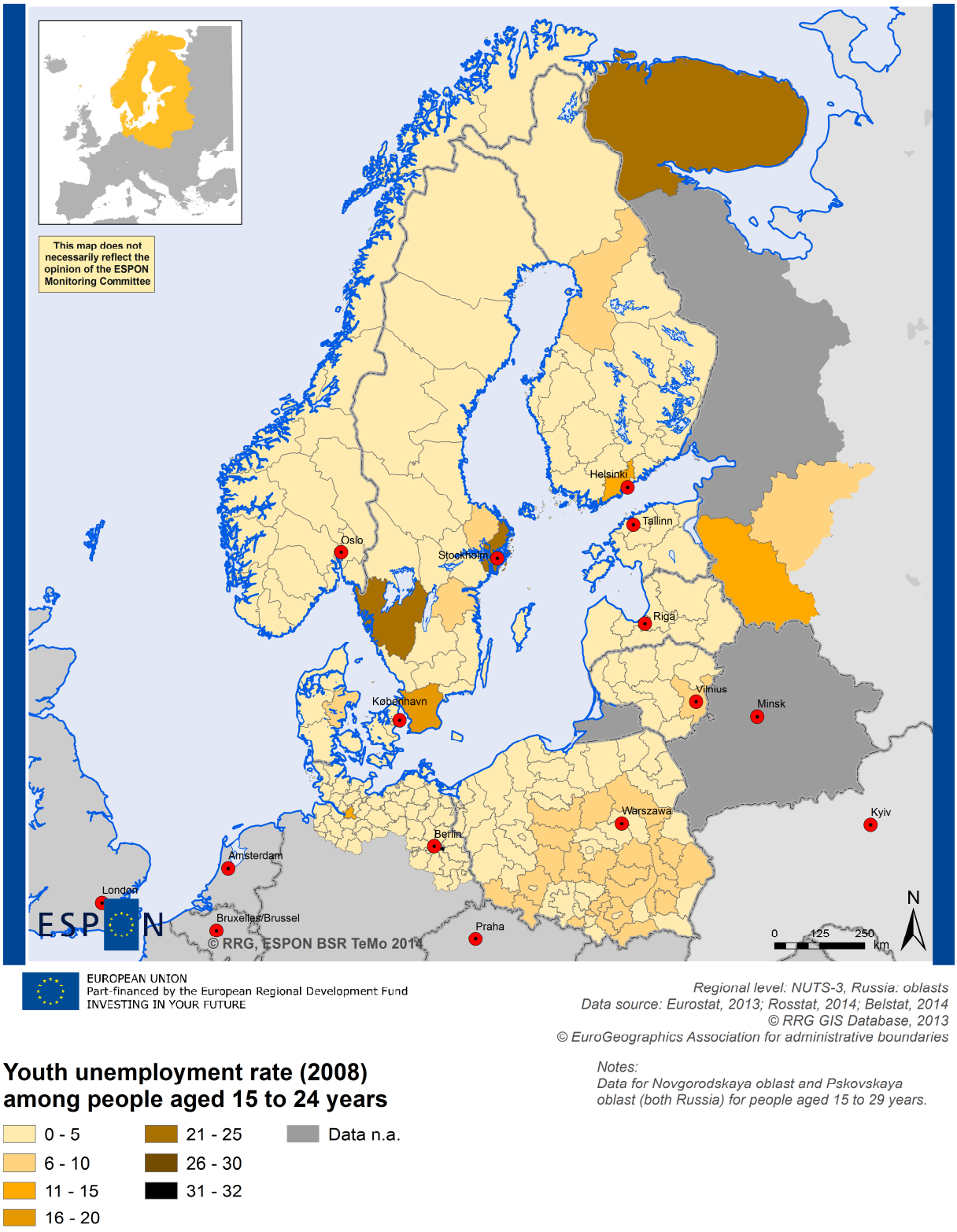


Figure 62. Youth unemployment rate 2008, BSR.

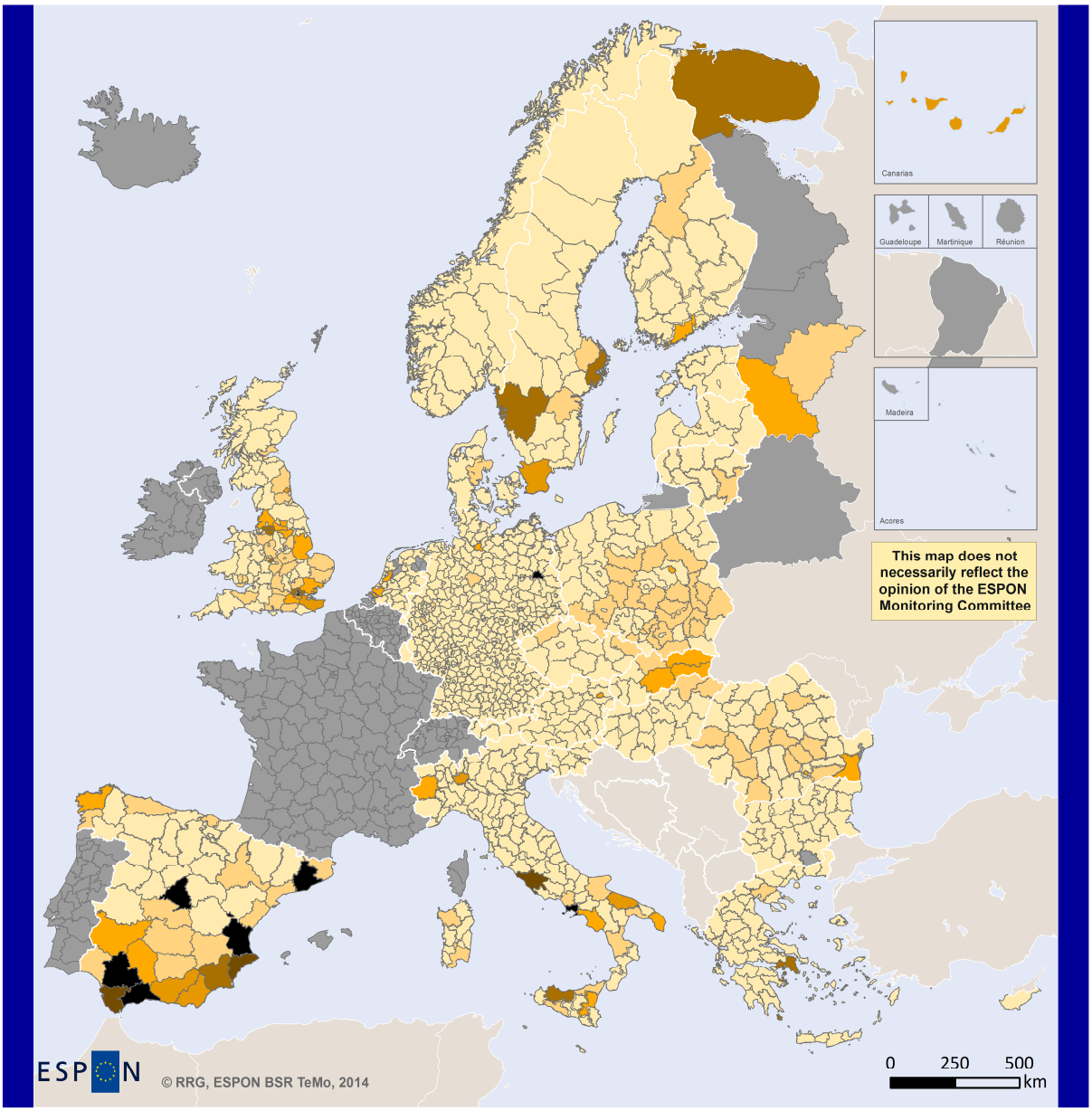


Figure 63. Youth unemployment rate 2008, ESPON Space.

3.4.4 Gender Imbalances

Indicator definition
The indicator is defined as the ratio between male and female population aged 25 to 39. Due to lack of data, the average ratio in time period 2007-2011 has been calculated.

Indicator importance
Ideally, there should be a balance between male and female population in a region; great imbalances hint at social problems, and are obstacles for further social, demographic and economic developments.

Findings
The map depicts regional gender imbalance in the age bracket of 25-34 years where the total national population of any country is usually close to the gender balance, but at the same time people are very mobile. In BSR as a whole, there is a trend that young women are more than men biased to migrate to urban centres or abroad.

In every country, regions with deficit of women largely prevail. The higher levels of overrepresentation of women can be observed in the Baltic States, Germany and Denmark. In Germany and Denmark women favour the cities of Copenhagen, Hamburg and Bremen or their adjacent areas. In the Baltic States, the metropolitan areas of Riga, Vilnius, Kaunas and Tartu are most attractive for them. The worst deficit of women can be met in East Germany, northern Finland and Sweden.

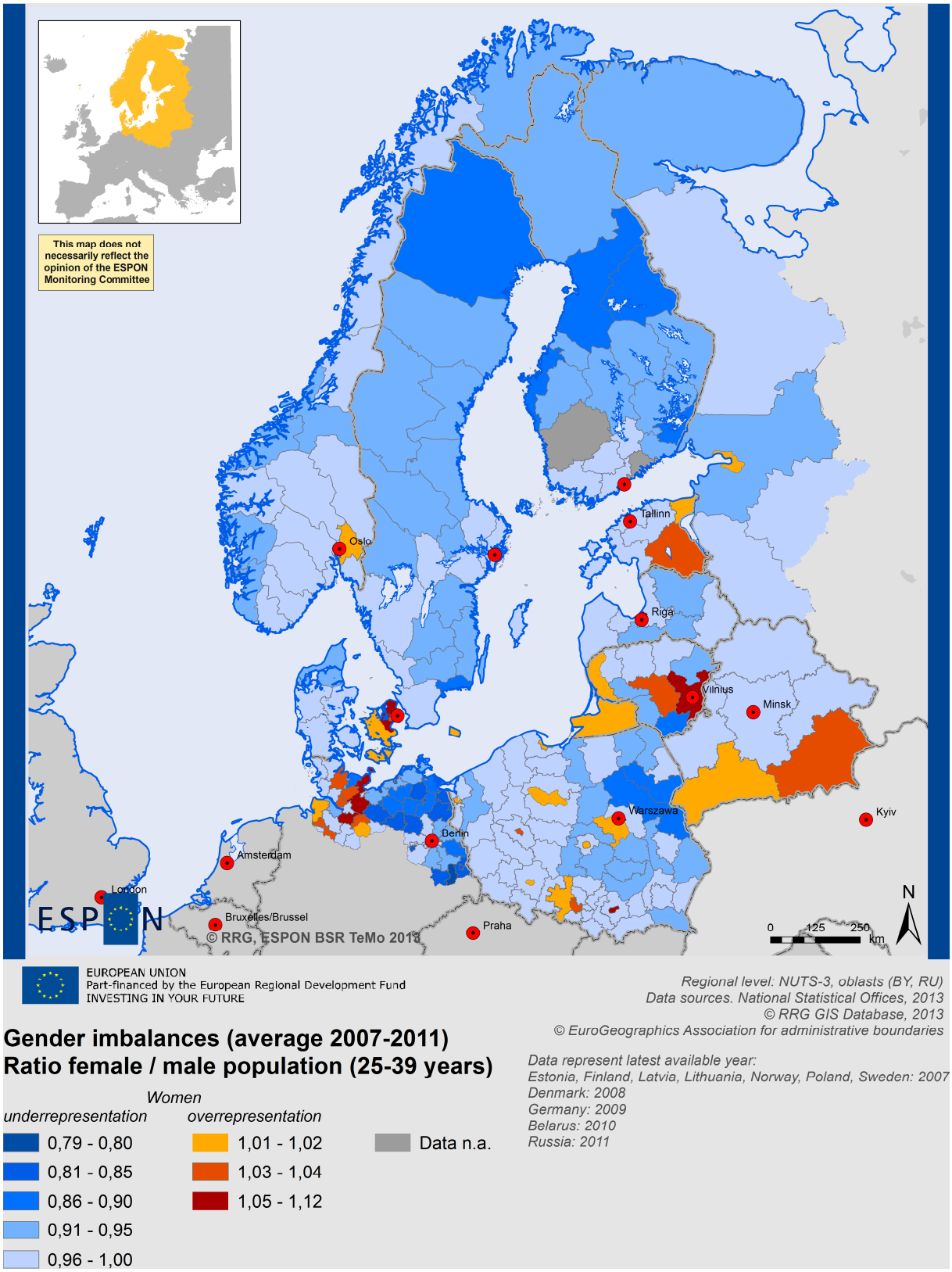
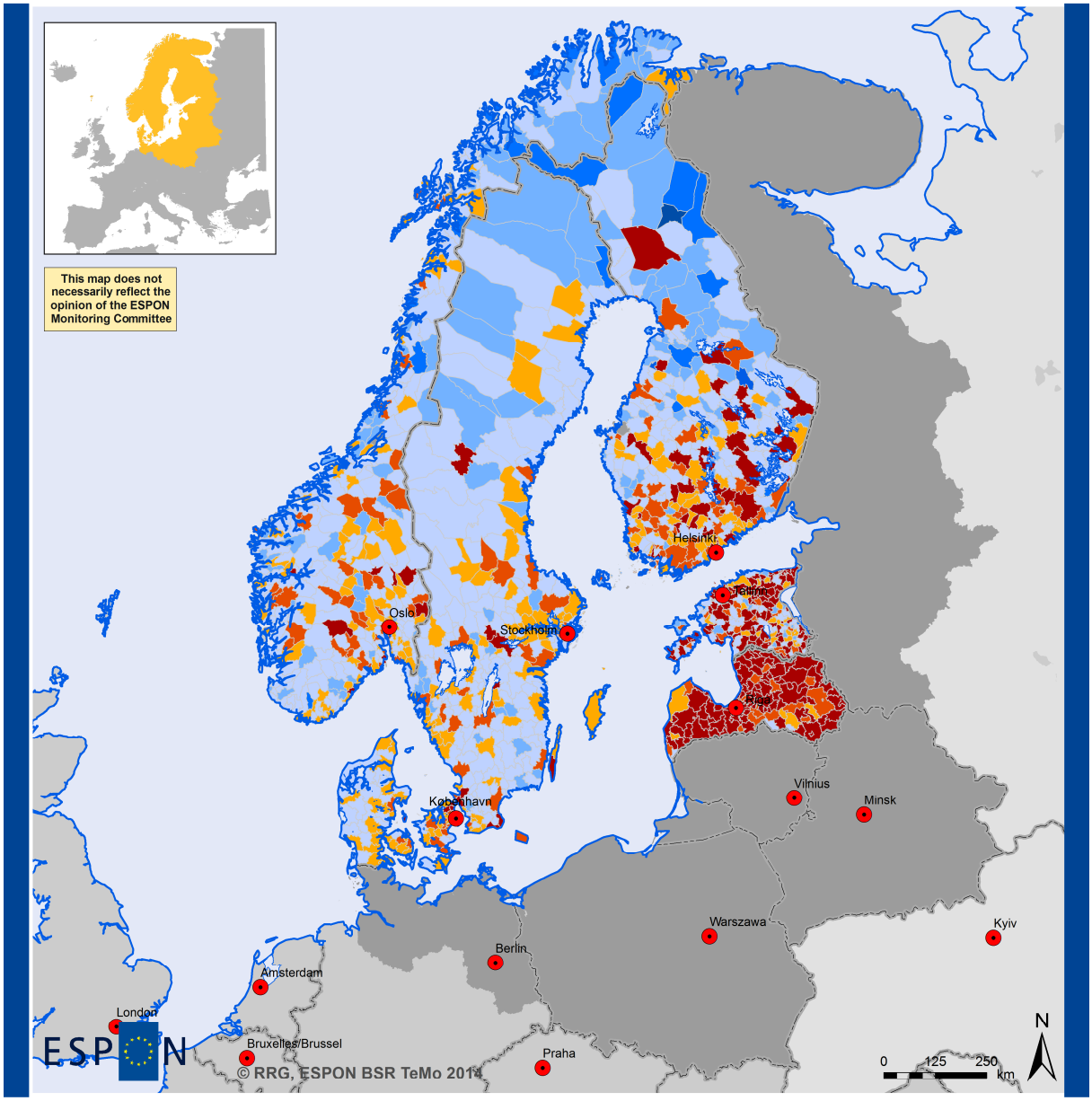


Figure 64. Gender imbalances average 2007-2011, BSR.



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Regional level: LAU-2 (DK: LAU-1)
Data sources. Nordgeio & NSIs, 2013
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Gender imbalances (2011)
Ratio female / male population (25-39 years)
Nordic countries, Estonia, Latvia, municipalities

Women

underrepresentation
- 0,79 - 0,80
- 0,81 - 0,85
- 0,86 - 0,90
- 0,91 - 0,95
- 0,96 - 1,00

overrepresentation
- 1,01 - 1,02
- 1,03 - 1,04
- 1,05 - 1,12

- BSR territory

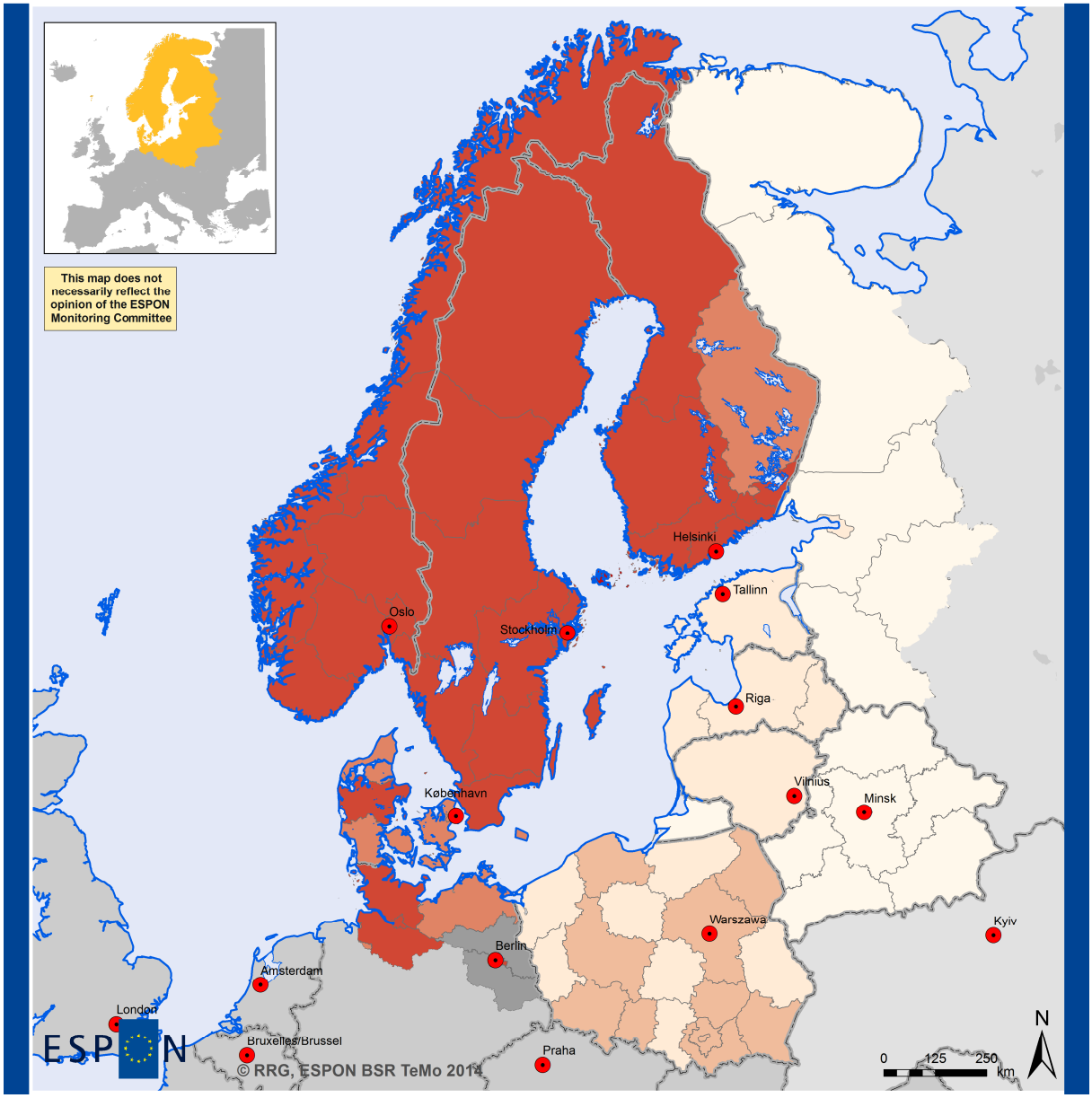
Figure 65. Gender imbalances 2011, Nordic countries, Estonia, Latvia, municipalities.

3.4.5 Life Expectancy at Birth

Indicator definition
This indicator is measured as the number of years a person can expect to live at his birthday.

Indicator importance
Life expectancy at birth is one of the principal global indicators for mortality, reflecting improvements in living standards and the establishment and improvement in health systems and in medical care. It can thus be viewed as a partial output indicator of the quality of the health care system in general. It is a theoretical indicator where general mortality trends are transposed on a new born child.

Findings
The European pattern in 2008 reveals a quite clear east-west divide. When in the majority of old EU member states' regions the average life expectancy at birth exceed 81 years, in the new CEEC member states only very few regions (in Slovenia and Czech Republic), have reached 80. For the new member states´ regions it is typical to have a life expectancy between 72 and 79 years. In BSR (2010), there is a striking divide between east and west. In the east, the regions of Russia and Belarus have mostly life expectancy below 70 years, the Baltic States – up to 76 and only in Poland some regions have reached 76-78 years. In the west, the regions have an average life expectancy of at least close to 80 years but in majority over 80, including in many at least 82 years. Generally, convergence occurs between east and west. Regions with the lowest life expectancies – in Russia, Belarus and Baltic States are closing the gap. Their indicator level has improved most, typically 0.4 years at least but much more for several Russian regions. At the same time, increases around 0.1-0.2 years are typical for the west.



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Regional level: NUTS-2; Russia, Belaurs: oblasts
Data source: Eurostat, 2013; Rosstat, 2013; Belstat, 2013
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Life expectancy at birth in years (2010)
Average expectancy in years for both women and men

- 60 - 70
- 70 - 76
- 76 - 78
- 78 - 80
- 80 - 82
- 82 < ...
- Data n.a.

Figure 66. Life expectancy at birth 2010, BSR.

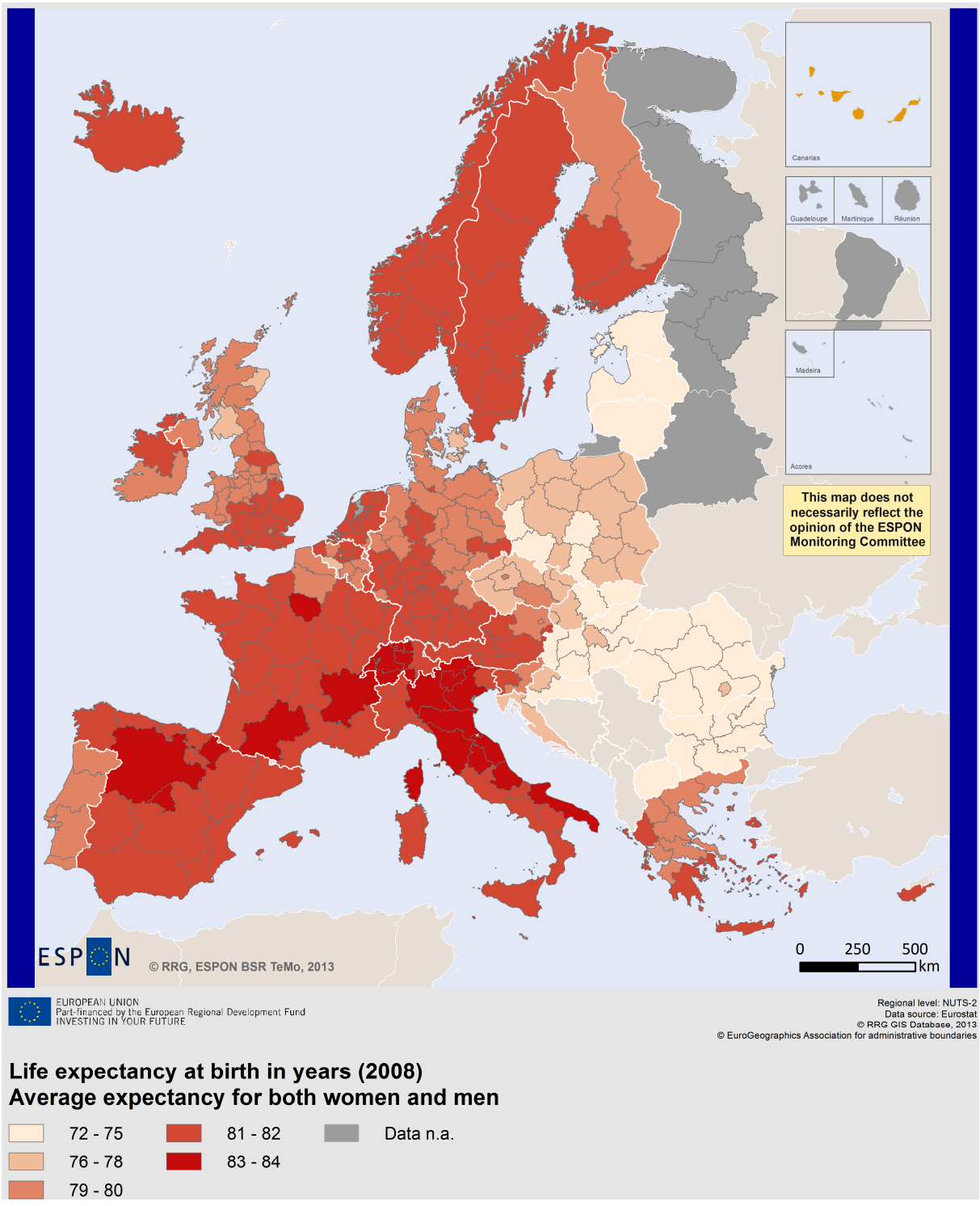


Figure 67. Life expectancy at birth 2008, ESPON Space.

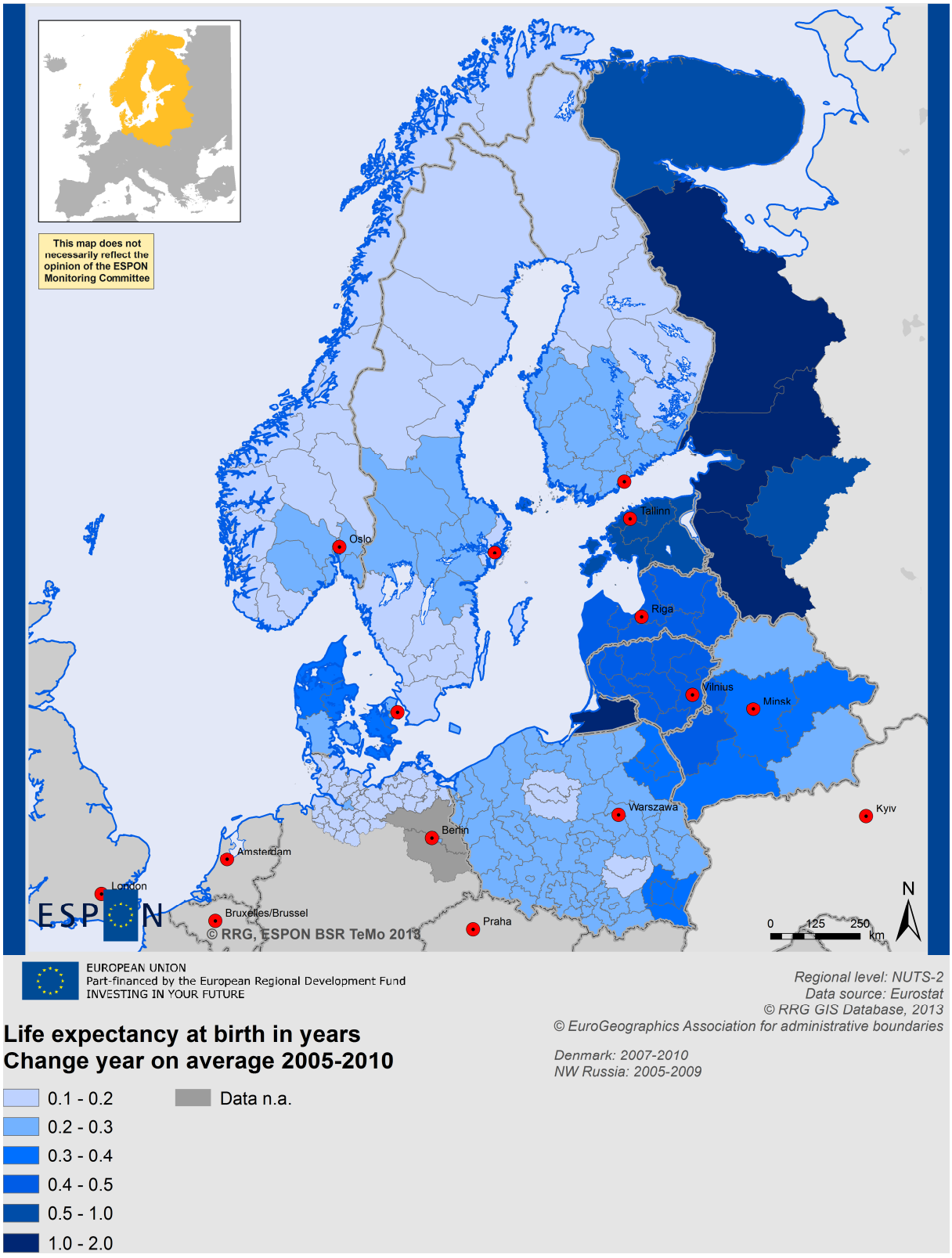


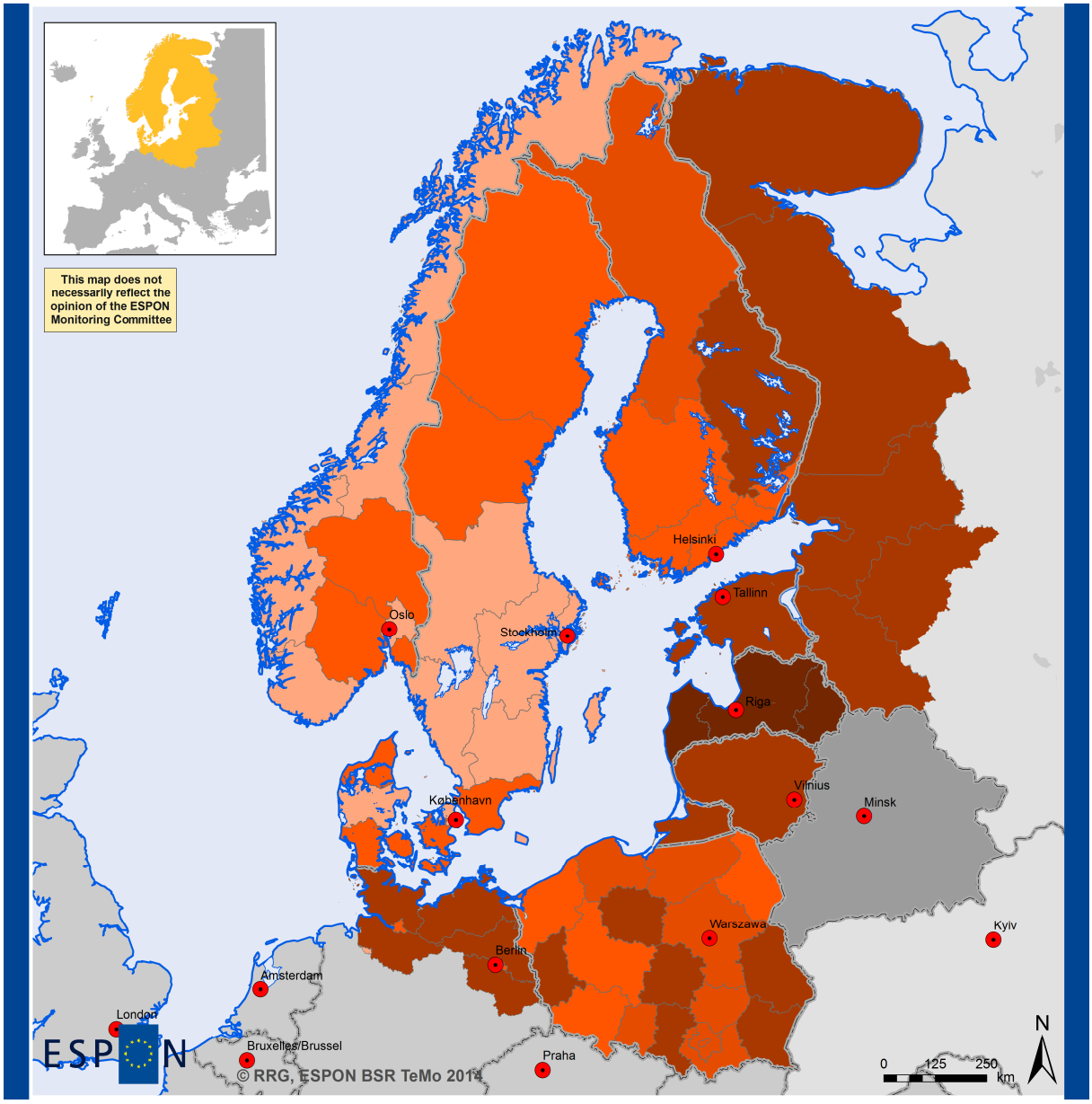
Figure 68. Life expectancy at birth, change year on average 2005-2010, BSR.

3.4.6 Self-assessed General Health Status

Indicator definition
The indicator "self assessed health" status is based upon ESS (European Social Survey) data, where respondents are asked the question "How is your health in general? Would you say it is "1. Very good", "2. Good", "3. Fair", "4. Bad", "5. Very bad", "/. Refusal", "8. Don´t know", or "9. No answer". Indicator defined as the regional arithmetic average of all response categories 1 through 5 (hence omitting categories 7 through 9), summarized per regional unit. Individual raw frequency data weighted by design weight which adjusts the sample bias and selection probability to match that of each country. N.b. The data are unweighted by population whereupon summarizing data for several countries is not feasible.

Indicator importance
While the indicator on life expectancy at birth represents a theoretical approach, the indicator on self-assessed health is aiming at monitoring the personal opinions / perception of people towards the quality of the health care system in place.

Findings
Subjective health status mapped at NUTS 2 level can be described by the divide between the Nordic countries and remaining BSR. In the Nordic countries the average self-rated health status is (with the only exception - Itä-Suomi) 1.8-2.2 point level. In the remaining regions of BSR, the typical regional average tends to be 2.4-2.6. In fact, the same divide can be called an east-west one where the former East Germany belongs firmly to the east. NUTS 2 level mapping hides correlation of health ratings with peripherality at a national scale in the small Baltic States represented as one region. But in some larger countries a weak trend that in periphery the health status is rated lower can be seen.



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Regional level: NUTS-2; Russia: oblasts
Data source: European Social Survey
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Self-assessed general health status (2010)
Regional average of all respondents

- 1,8 - 2,0 (average regional health status assessed as rather good)
- 2,0 - 2,2
- 2,2 - 2,4
- 2,4 - 2,6
- 2,6 < ... (average regional health status assessed as rather poor)
- Data n.a.

Self-assessed general health status on a scale of 1-5, where 1="very good"; 5="very bad". Åland and Latvia: 2008, NW Russia: Data for entire Northwest Federal District

Figure 69. Self-assessed general health status 2010, BSR.

3.5 Environmental Qualities

Four indicators in two sub-domains have been implemented and analysed under this domain. No economic growth without good environment. Ecological sustainability must be ensured.

Table 7 Environmental qualities: Indicators and sub-domains.

Consumption and production		
	- New soil sealing per capita - Air pollution (PM10) - Eutrophication	Human consumption and production rates may have severe impacts on the natural environment. Thus, key indicators are used to monitor such impacts of human behavior.
Natural resources		
	- Fragmentation index	In light of sustainable development, preservation of natural resources should be one of the main political objectives.

3.5.1 New Soil Sealing per Capita

Indicator definition
This indicator is defined as the amount of annual new soil sealing per inhabitant in a region through land take (in square meters).

Indicator importance
New soil sealing/capita is a measure of how much land is converted to a "built" surface in a wider definition. Hence this indicator is associated with land take for economic development and is associated with settlement structures and demographic development. Since soil sealing is associated also to the resilience and buffering capacity of nature this is an important indicator, as well as indicating the quality of landscapes for recreation and human well-being

Findings
The annual new soil sealing per capita tends to be more intense in fast developing but sparsely populated regions. No regular pattern can be found. Higher relative rates of change exist in regions in Finland, Sweden, Baltic States, East Germany, and Hungary, but also in western France and Portugal. BSR as a whole is an area of relatively high annual new soil sealing when measured per capita. Still, no regular pattern can be found. The reason for these rather high rates is a combination of low population density with extremely long distances, which lead to unfavorable soil sealing rates per capita, for instance, when transport infrastructure projects are concerned. Eastern Finland, southern Sweden and whole Poland differ from the common level by lower values of the indicator.

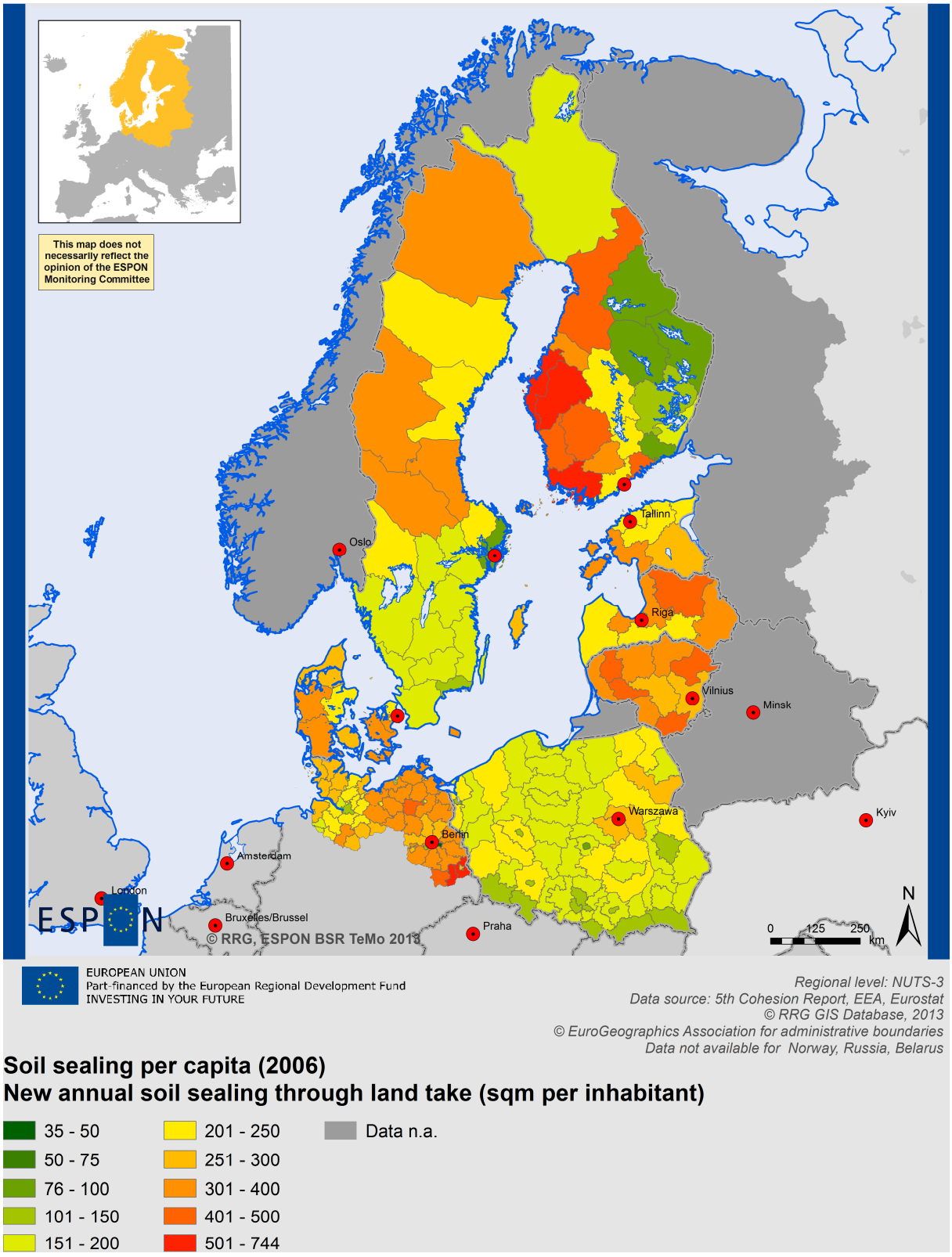


Figure 70. New annual soil sealing per capita 2006, BSR.

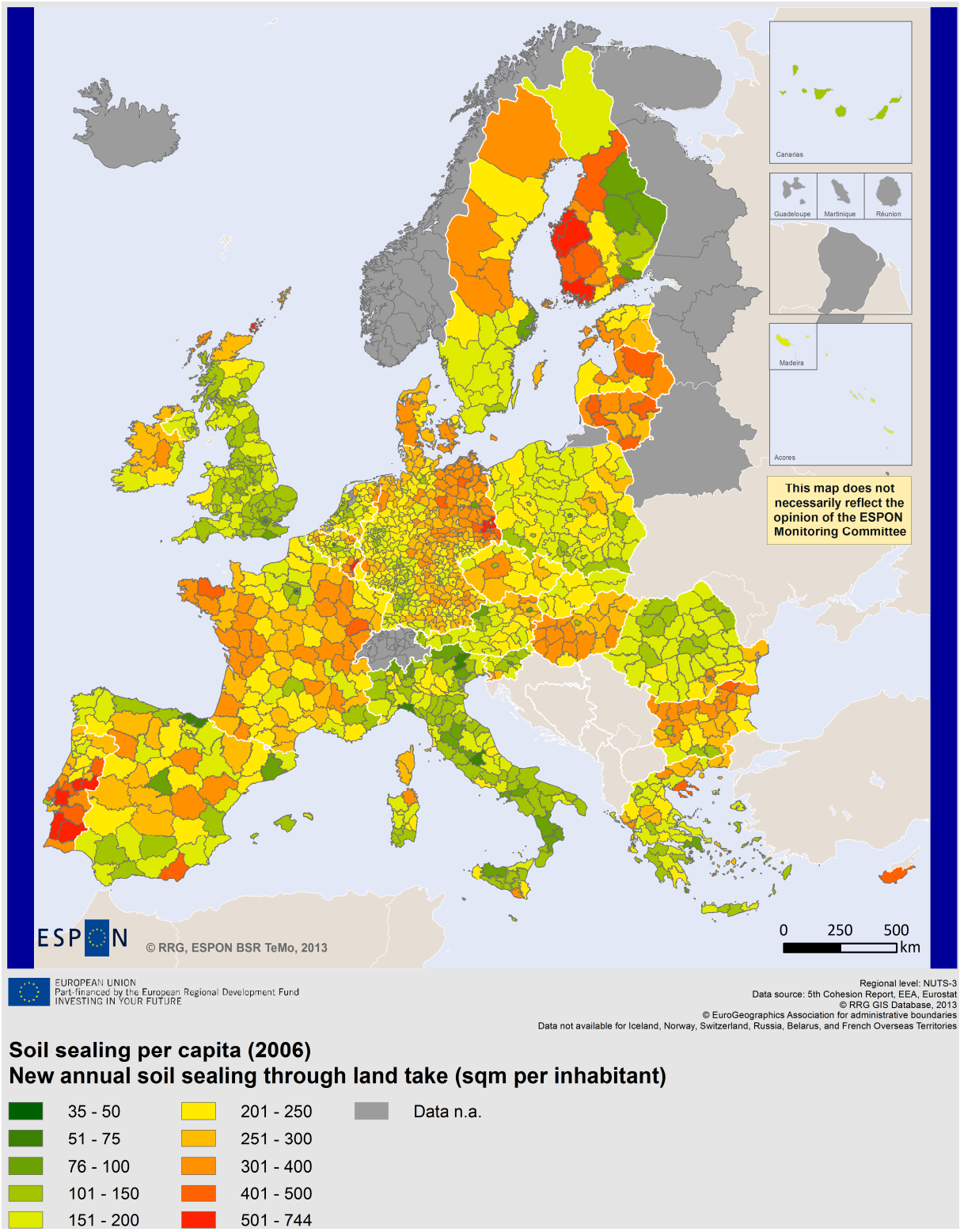


Figure 71. New annual soil sealing per capita 2006, ESPON Space.

3.5.2 Air Pollution (PM10)

Indicator definition
This indicator is defined as the number of days where PM10 concentration in yg/m3 at ground level exceeds the norm values.

Indicator importance
This indicator monitors global warming and climate change processes. A reduction of greenhouse gas emission, ozone concentration and PM10 levels is of high political priority.

Findings
Air pollution by small particles is related to urbanization and industrialization. Areas where the PM10 concentration exceeds norm values most frequently can be found In Belgium, the Netherlands, Germany, Poland, Romania, northern Italy and France. Generally, a zone of higher pollution extends from northeast France through Germany and Poland to the western coast of the Black Sea. In an all-European comparison, BSR is mostly a region of modest and medium air pollution by PM10. However, the level of pollution increases gradually from north to south extending to the highest levels for all Europe in the south of Poland.

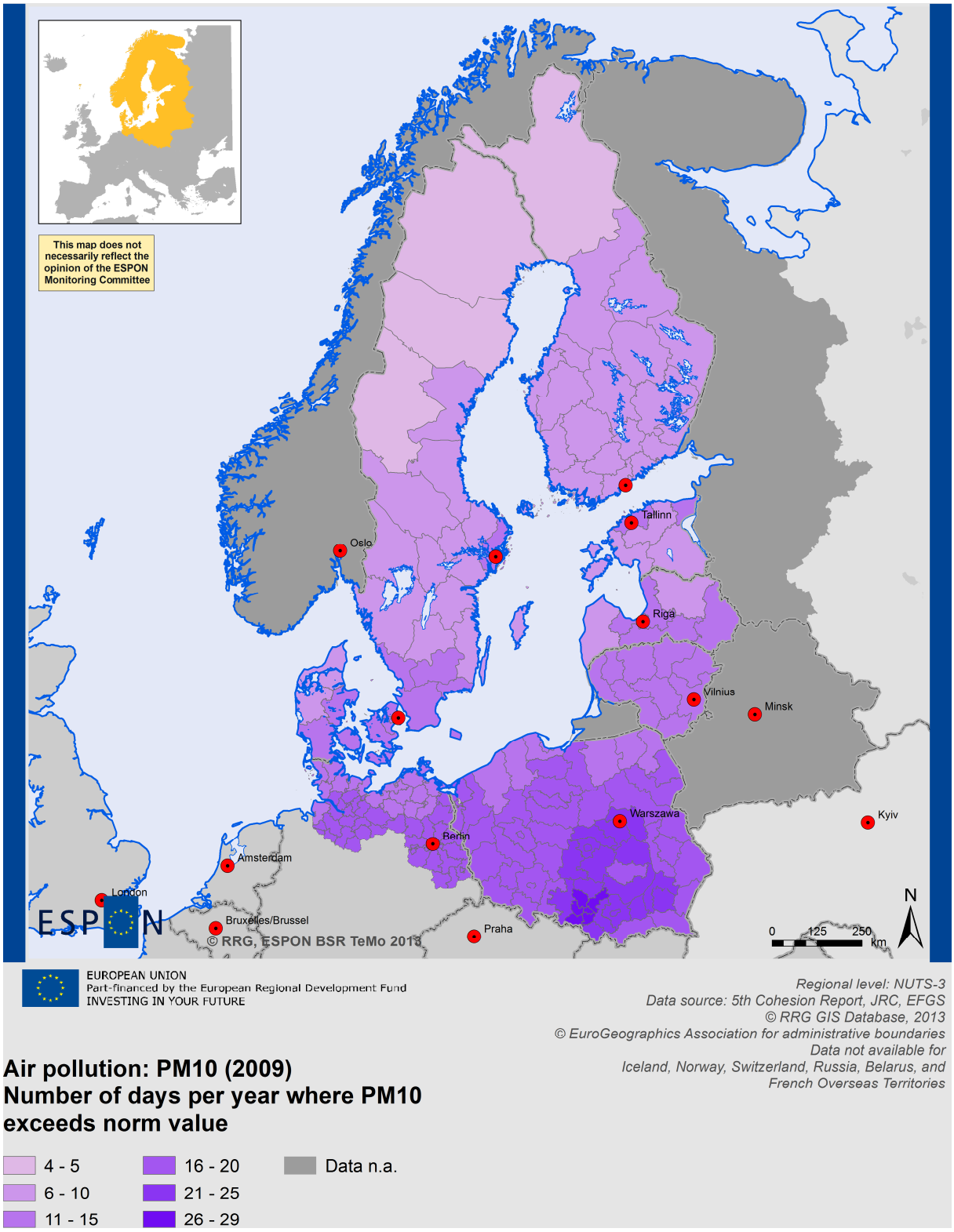


Figure 72. Air pollution: PM10 (2009), BSR.

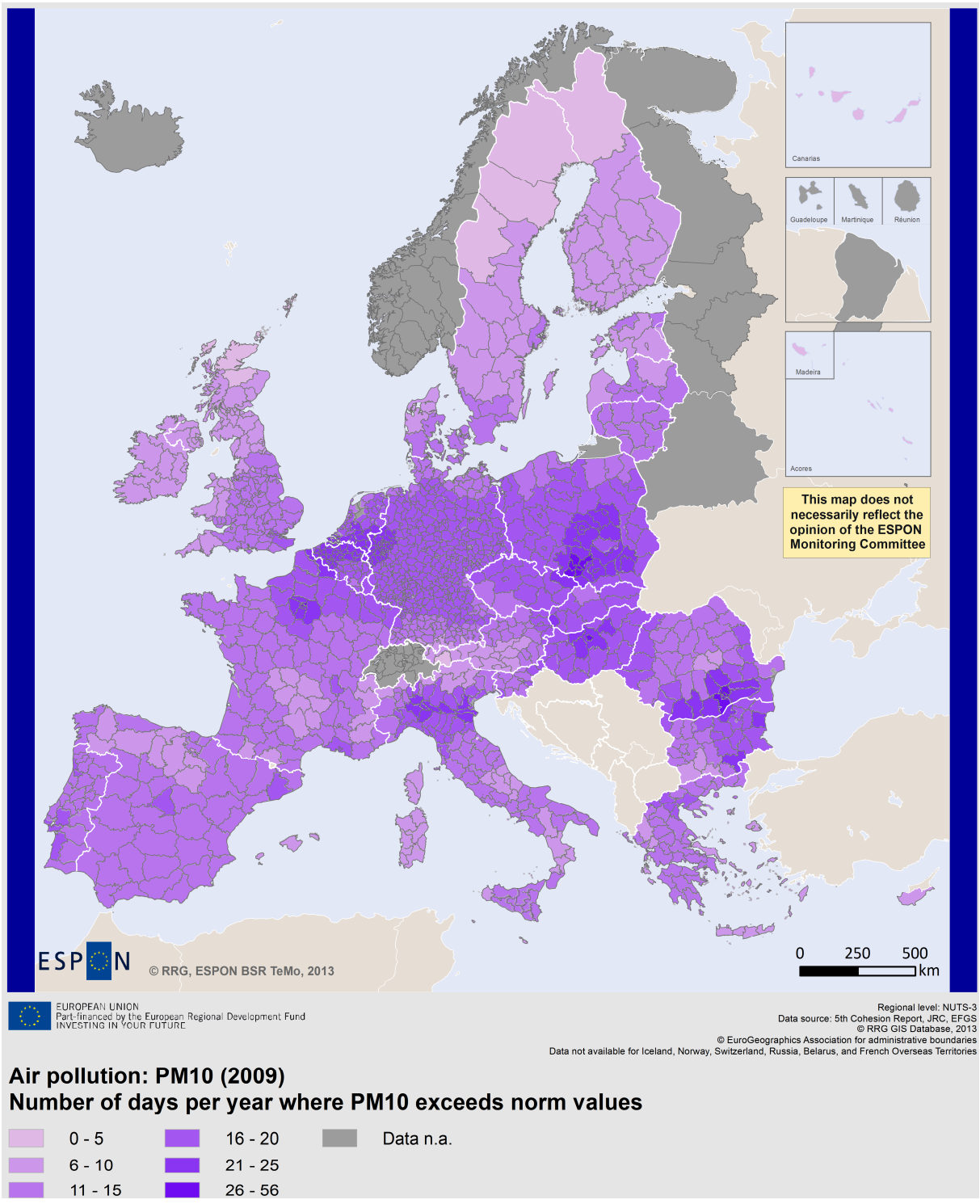


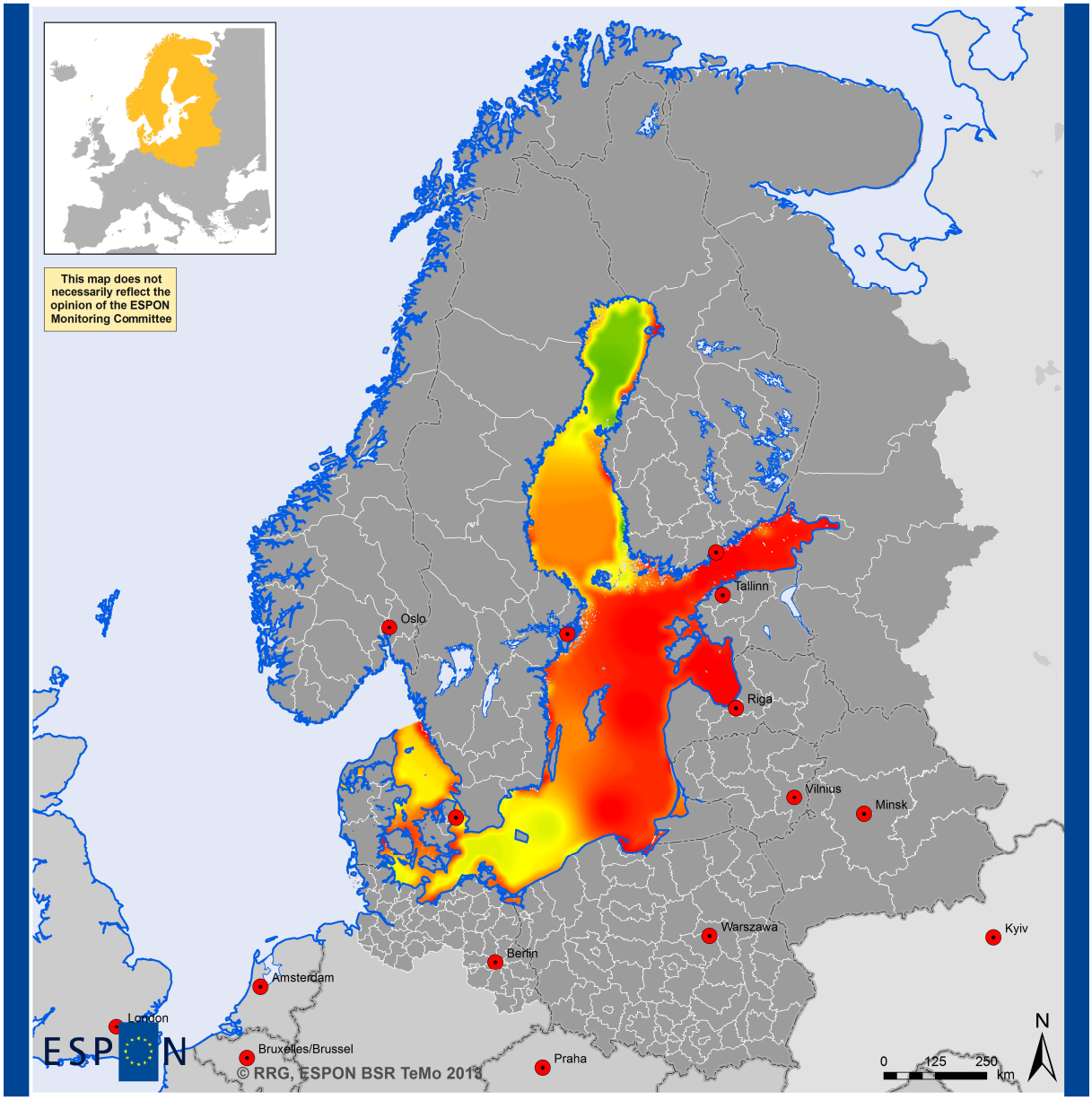
Figure 73. Air pollution: PM10 (2009), ESPON Space.

3.5.3 Eutrophication

Indicator definition
Unlike other indicators of this monitoring system, this indicator is mapped for the Baltic Sea, not at regional level for BSR regions. The indicator is generated by using the HELCOM Eutrophication Assessment Tool (HEAT), where a total of 189 measurement stations are classified regarding the level of their vulnerability against eutrophication. The assessment ranges from moderate, poor and bad status (=affected) towards good and high status (=not affected)

Indicator importance
Eutrophication is an important indicator for the quality of the Baltic Sea and an indicator for how successful measures are to prevent the leakage of nutrients from agriculture and sewerage plants around the sea.

Findings
Most of the Central part of the Baltic Sea, Gulf of Finland and Gulf of Riga are in bad condition. Medium conditions prevail in the Bornholm basin and westwards and in the Bothnia Sea. Only the Bay of Bothnia is in good condition.



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Regional level: n.a.
Data source: HELCOM 2013
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Eutrophication in the Baltic Sea (2010)
HEAT Integrated Classification

Good
Moderate
Poor
Bad

HEAT = HELCOM Eutrophication Assessment Tool. A total of 189 stations, sites and bassins have been classified as either affected by eutrophication (moderate, poor or bad status), or not affected by eutrophication (good status).

Figure 74. Eutrophication in the Baltic Sea 2010.

3.5.4 Fragmentation Index

Indicator definition
Two different indicator definitions were developed by the EEA for the landscape fragmentation index: (i) the effective mesh size (MEFF) for fragmentation geometry gives the average mesh size in km2 per unit. The higher this number, the less fragmentation is a region. (ii) the effective mesh density (SEFF) for fragmentation geometry gives the number of meshes per 1,0000 km2. The higher this number, the more fragmented a region is.

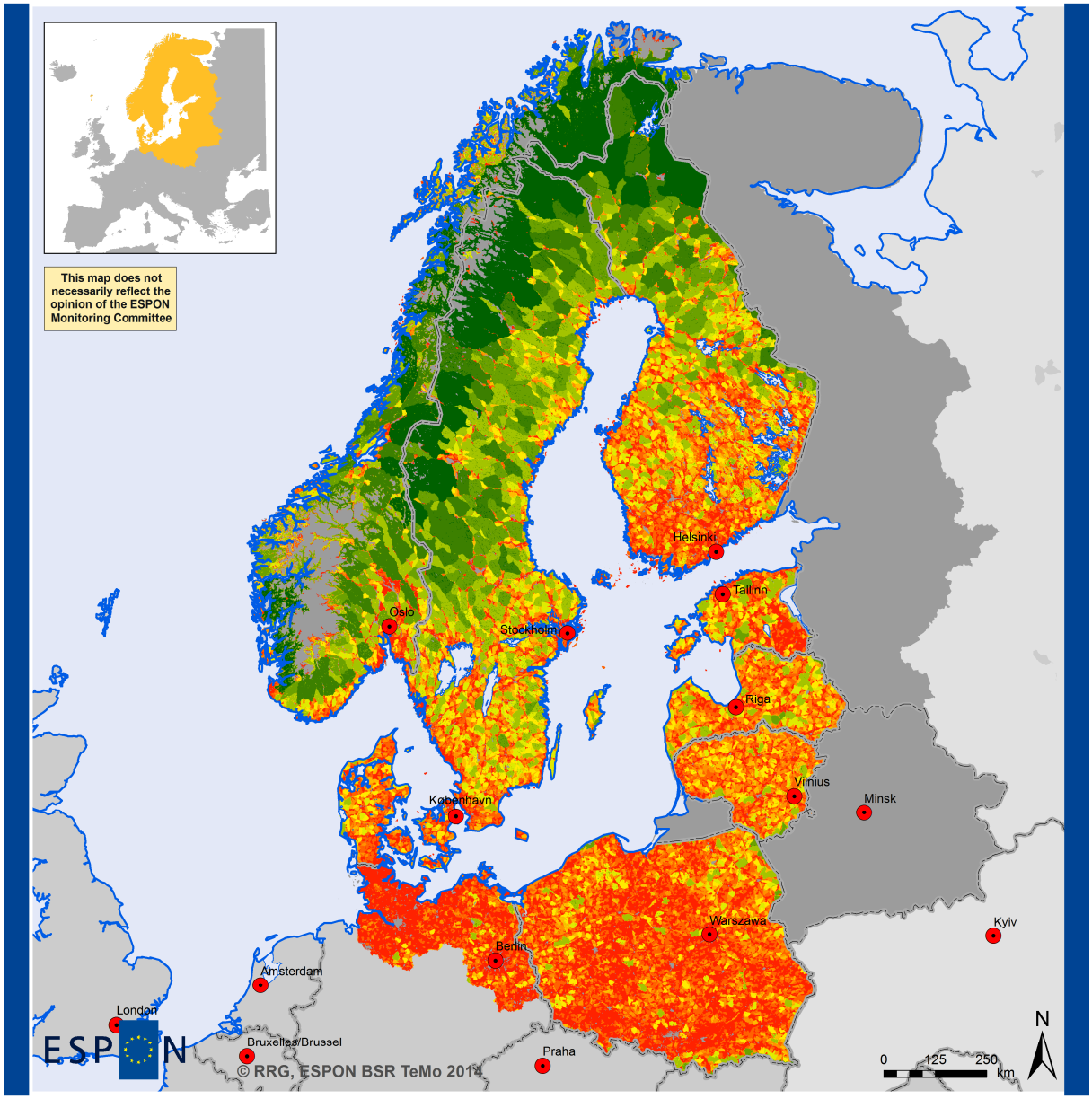
Beyond this definition, the EEA offers three levels of fragmentation computations, differing in the extent as to which fragmenting elements are included. In TeMo, the fragmentation index accounting for all antrophogenic and natural fragmentation elements (EEA code: FG-B2) has been selected as the most suitable one.

Indicator importance
While excessive land take can be considered per se as negative burden for the environment and for the wildlife, the situation becomes even more complex when looking at the connectivity and size of the remaining habitat patches. For many wild animals, not only the reduction of habitat size is problematic, but also all the more the loss in connectivity of habitats causes additional stress. The fragmentation index tries to assess the size and fragmentation of open space.

Findings
The landscape fragmentation in the BSR is highest in Germany and large parts of Poland, followed by the south of Finland, Denmark and Lithuania. Generally, the farther north a region is located, the less fragmented it is, with the largest unfragmented areas being situated in the north of Norway, Sweden and Finland. However, the south and east of Poland, and Latvia and Estonia show low fragmentation levels as well.

The general fragmentation patterns have not changed in the (rather short) time period of 2002-2009, however, a slight increase in fragmentation even in parts of northern Sweden and in Finland can be observed.

While the indicator at NUTS-3 level indicates generally a smooth increase of fragmentation from the North to the South in the BSR, the same indicator at grid level illustrates that fragmentation is an issue even in the northernmost areas, and that one can observe unfragmented areas even in Poland and Germany - though rather small in size.



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Regional level: NUTS-3 (Germany NUTS-2)
Data source: European Environment Agency (EEA)
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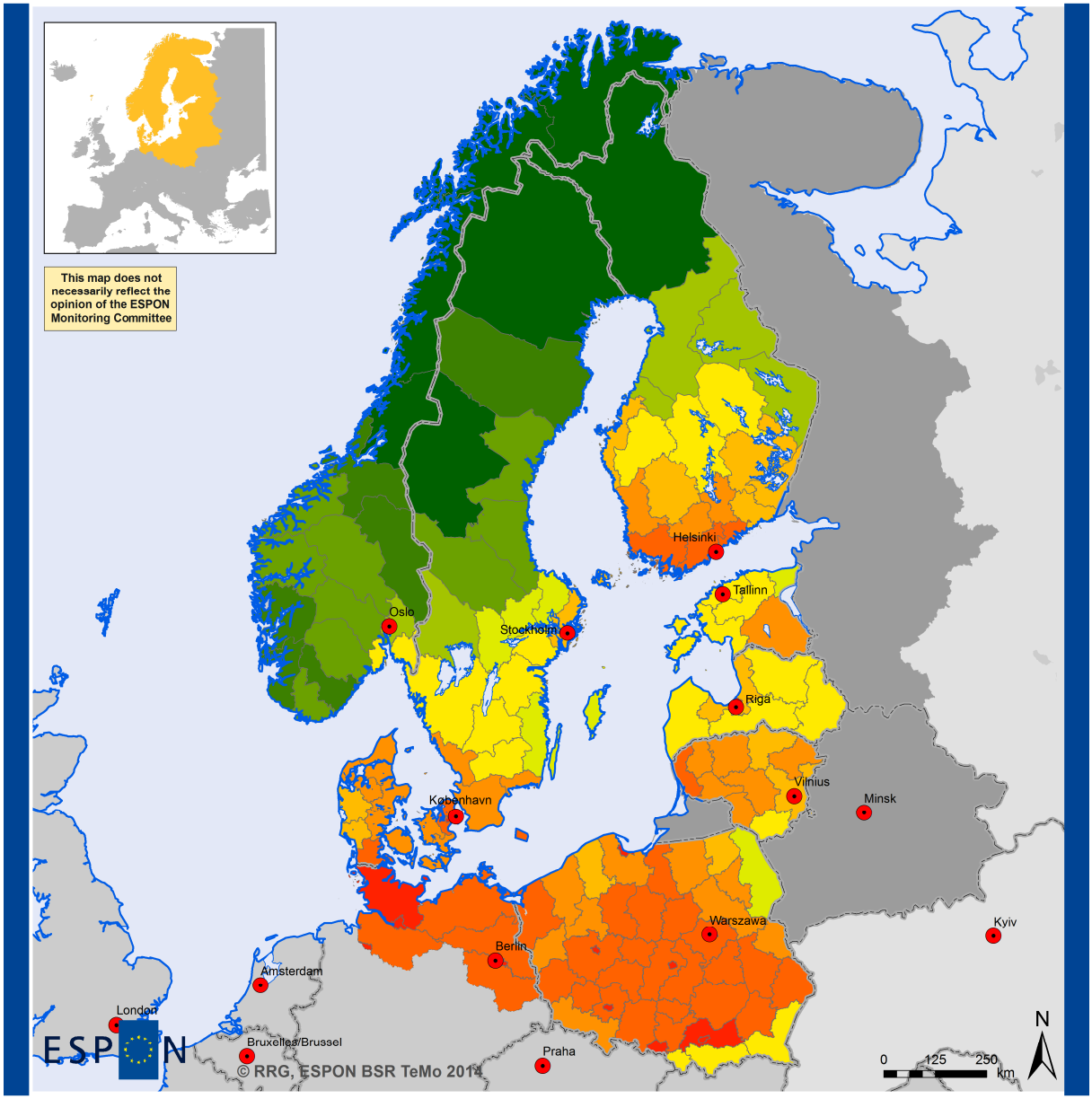
Data not available for Russia, Belarus
Publication:
Jaeger, J.A.E.; Soukup, T.; Madriñán, L.F.; Schwick, Chr.; Kienast, F. (2011): Landscape fragmentation in Europe. EEA-FOEN Report. ISBN 978-92-9213-215-6

Fragmentation Index (2009)
Effective mesh size (Meff) (in km2)

1 - 25	150 - 200	Data n.a.
25 - 50	200 - 500	
50 - 75	500 - 1,000	
75 - 100	1,000 - 3,000	
100 - 150	3,000 - 6,250	

Notes:
The EEA offers three levels of fragmentation computations, differing in the extent as to which fragmenting elements are included. In TeMo, the fragmentation index accounting for all antrophogenic and natural fragmentation elements (EEA code: FG-B2) has been selected as the most suitable one.

Figure 75. Fragmentation index, effective mesh size, grid 2009, BSR.



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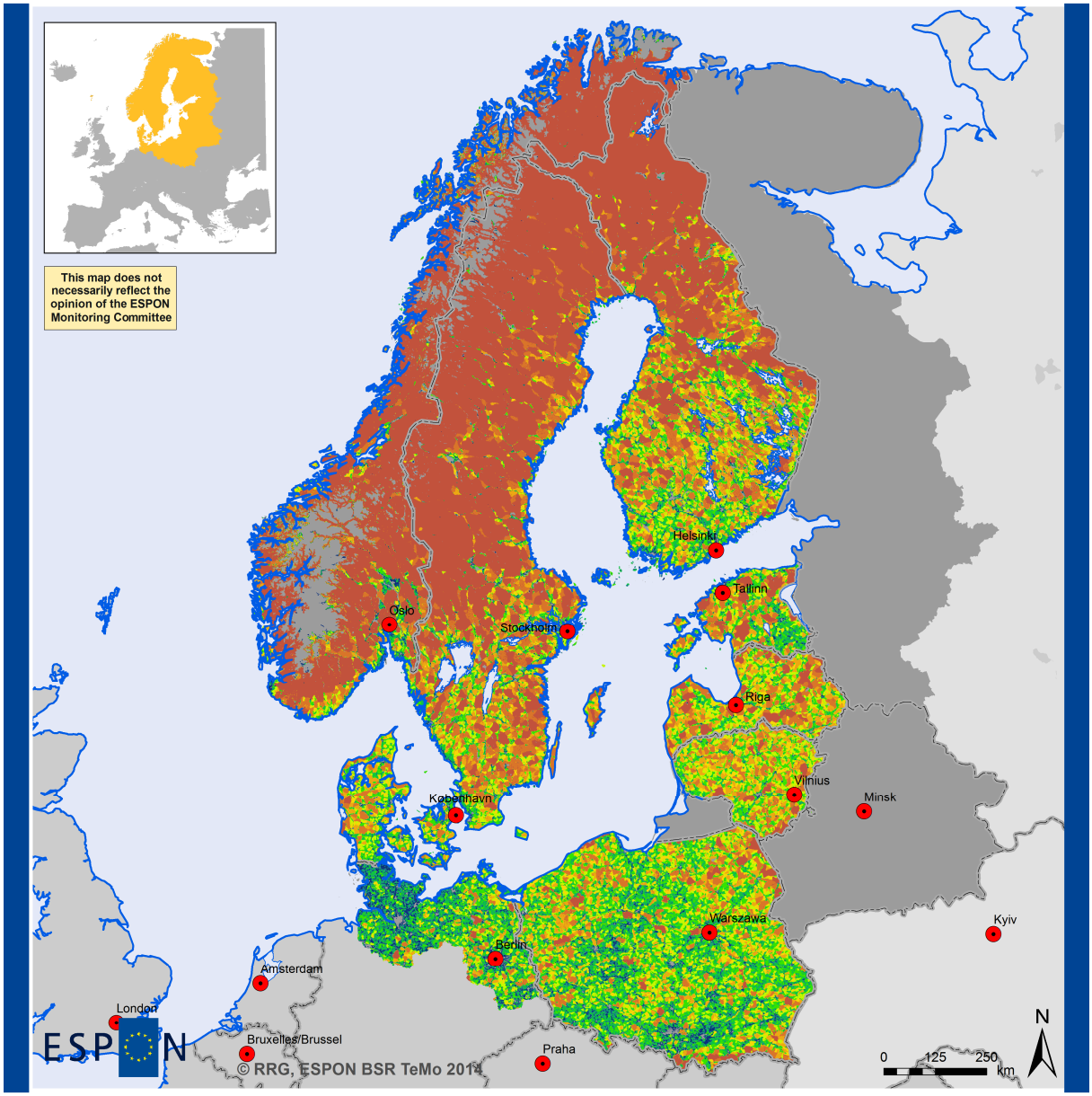
Fragmentation Index (2009)
Effective mesh size (Meff) (in km2)

- 1 - 25
- 25 - 50
- 50 - 75
- 75 - 100
- 100 - 150
- 150 - 200
- 200 - 500
- 500 - 1,000
- 1,000 - 3,000
- 3,000 - 6,250
- Data n.a.

Notes:
The EEA offers three levels of fragmentation computations, differing in the extent as to which fragmenting elements are included. In TeMo, the fragmentation index accounting for all antrophogenic and natural fragmentation elements (EEA code: FG-B2) has been selected as the most suitable one.

Figure 76. Fragmentation index, effective mesh size, NUTS-3 2009, BSR.



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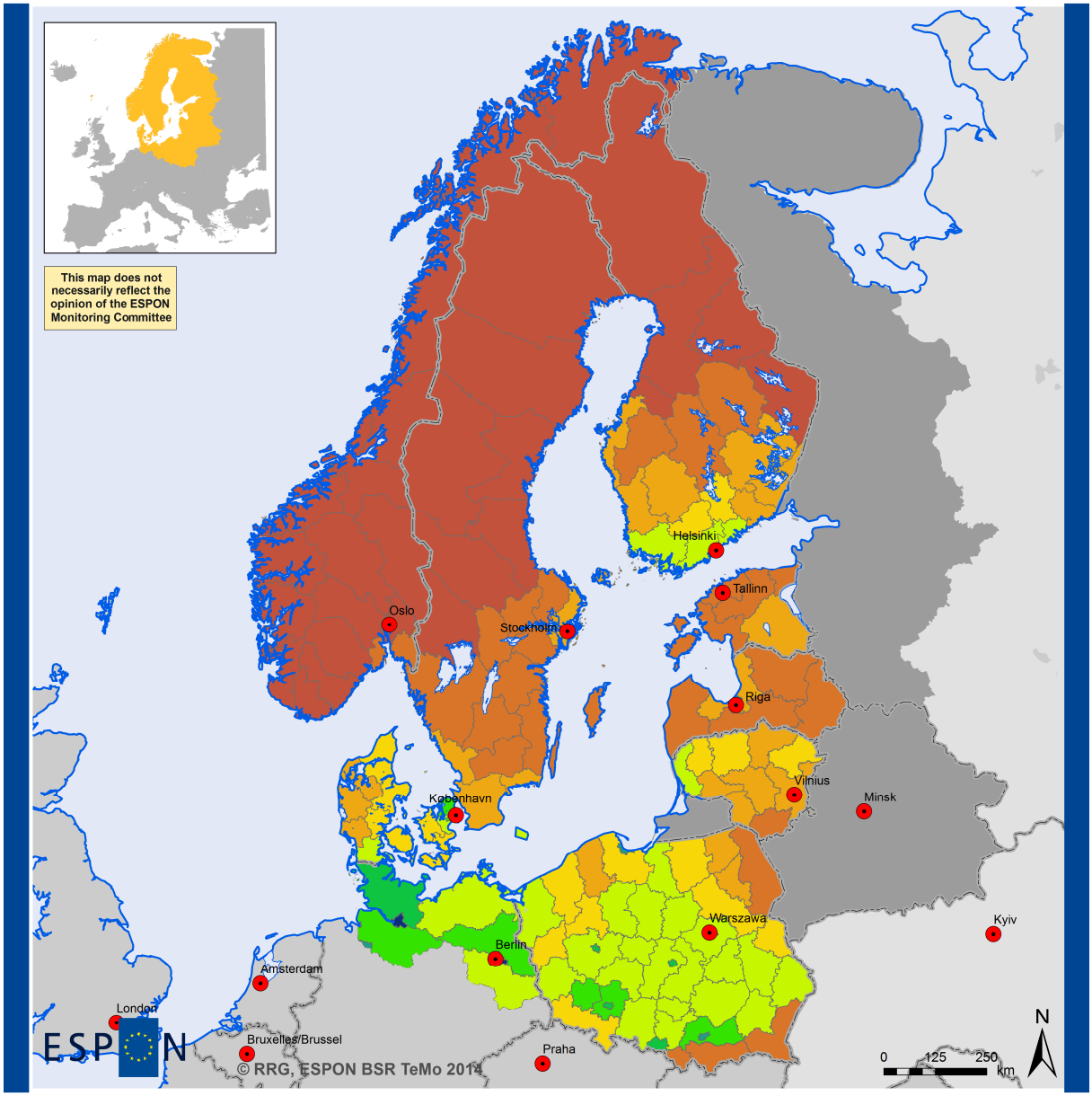
Fragmentation Index (2009)
Effective mesh density (Seff)
(number of patches per 1,000 km2)

- 1 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 30
- 30 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- 200 - 1,000
- Data n.a.

Notes:
The EEA offers three levels of fragmentation computations, differing in the extent as to which fragmenting elements are included. In TeMo, the fragmentation index accounting for all antrophogenic and natural fragmentation elements (EEA code: FG-B2) has been selected as the most suitable one.

Figure 77. Fragmentation index, effective mesh density, grid 2009, BSR.



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Fragmentation Index (2009)
Effective mesh density (Seff)
(number of patches per 1,000 km2)

- 1 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 30
- 30 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- 200 - 1,000
- Data n.a.

Notes:
The EEA offers three levels of fragmentation computations, differing in the extent as to which fragmenting elements are included. In TeMo, the fragmentation index accounting for all antrophogenic and natural fragmentation elements (EEA code: FG-B2) has been selected as the most suitable one.

Figure 78. Fragmentation index, effective mesh density, NUTS-3 2009, BSR.

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