# NORDREGIO
### Nordic Centre for Spatial Development

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| Author(s): | Erik Gløersen |
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**Technical note**

## Levels of polycentricity and preconditions for polycentric development in DEFRIS regions

### Introduction

The present note presents some statistical results based on the application of methods developed within ESPON project 1.1.1 ("The role, specific situation and potentials of urban areas as nodes in polycentric development") to the five regions participating in the DEFRIS project, co-financed by the INTERREG III B BSR programme.

The final report of the ESPON 1.1.1 project provides a complete review of the methodologies applied, and can be downloaded from the ESPON website (www.espon.lu). Readers may also refer to a similar exercise concerning the cities of Oslo, Stockholm and Copenhagen, and published in the journal of Nordregio 2005:1 (see www.nordregio.se).

To facilitate the reading of the present note, we would like to specify some central definitions:
- **FUA – Functional Urban Area**: Agglomerations of municipalities that are grouped together according to their functional orientation in order to reflect the actual daily operational conditions of people, enterprises, and community organisations. ESPON 1.1.1 has been using national definitions of FUAs, and only considered those with at least 20 000 inhabitants.
- 45-minute **Isochrone**: Area which can be reached in 45 minutes, by individual car, from a FUA centre. 45 minutes has been identified empirically as a threshold level above which the number of daily commuter trips drops significantly.
- **PUSH - Polycentric Urban Strategic Horizon**: Isochrone, approximated to municipal boundaries, by considering that each municipality with at least 10% of its area covered by an Isochrone, should belong to the corresponding PUSH area. Commuter trips and other types of daily, economic and social interaction can be developed within all of this area, if the right preconditions prevail. It is therefore the area within which potentials resources for an urban development strategy can be identified.
- **PIA – Polycentric Integration Area**: PUSH areas of neighbouring cities will normally overlap. If this overlap is significant, these cities will have an interest in or in designing a common development strategy, or at least in coordinating their development strategies. In order to explore the pattern of these overlaps across Europe, PIAs were defined as groups of PUSH areas which overlap by over one third. This is meant as an illustration of the methodology for identifying extended strategic urban territories.

Figure 1:Isochrone areas around main cities in the Baltic Sea Region



Isochrones areas
around main cities
in the Baltic Sea Region
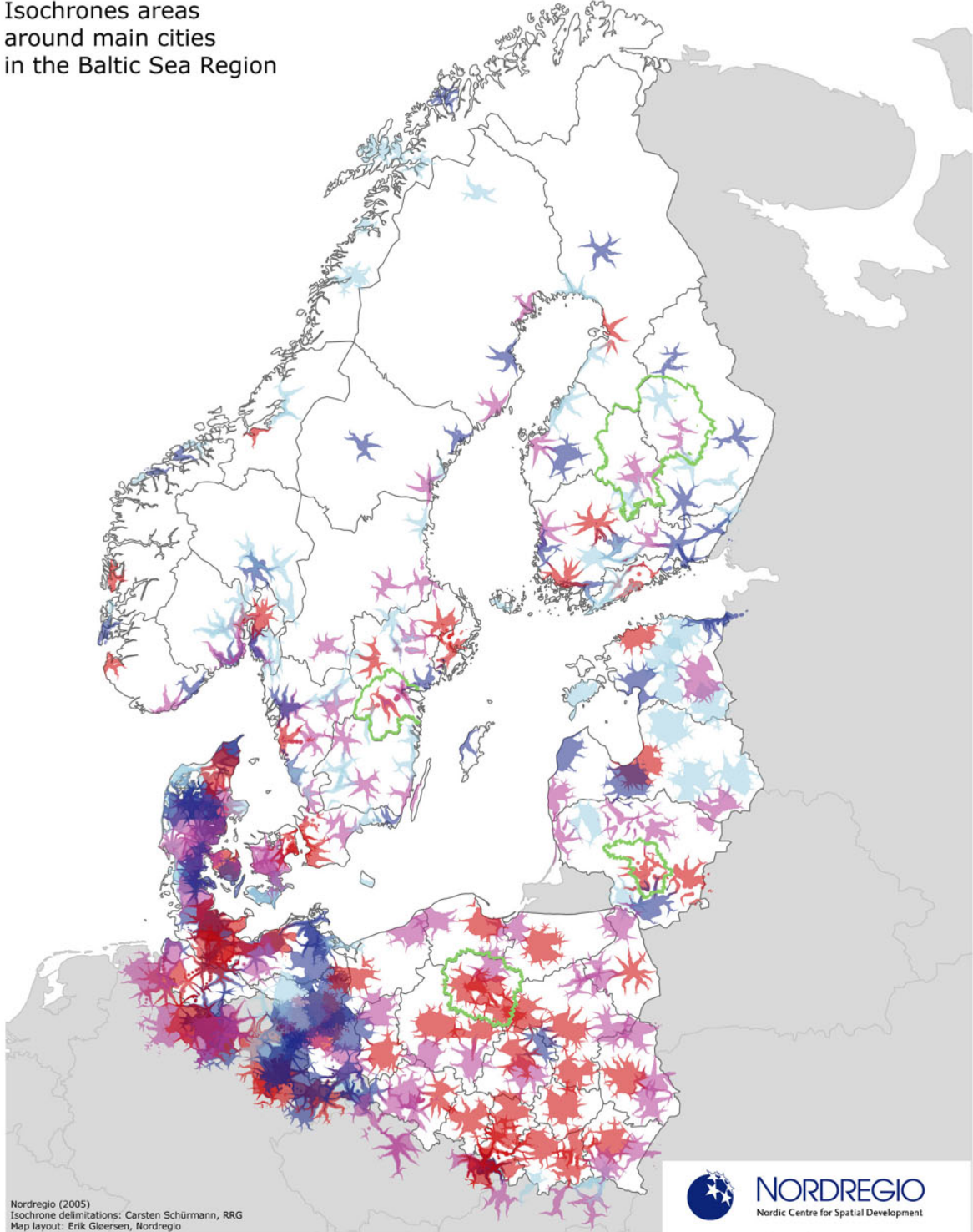
Nordregio (2005)
Isochrone delimitations: Carsten Schürmann, RRG
Map layout: Erik Gløersen, Nordregio

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Population in the functional urban area
of the isochrone centre.

over 200 000 inh.

100 000 - 200 000 inh.

50 000 - 100 000 inh.

less than 50 000 inh.

Darker colours correspond to isochrone
overlaps.

BSR regions within the ESPON study area

DEFRIS First Division regions

Other regions

500 km

Figure 2:Polycentric Integration Areas in the Baltic Sea Region



Polycentric Integration Areas
in the Baltic Sea Region

Nordregio (2005)
Isochrone delimitations: Carsten Schürmann, RRG
PIA calculation and map layout: Alexandre Dubois
and Erik Gløersen, Nordregio

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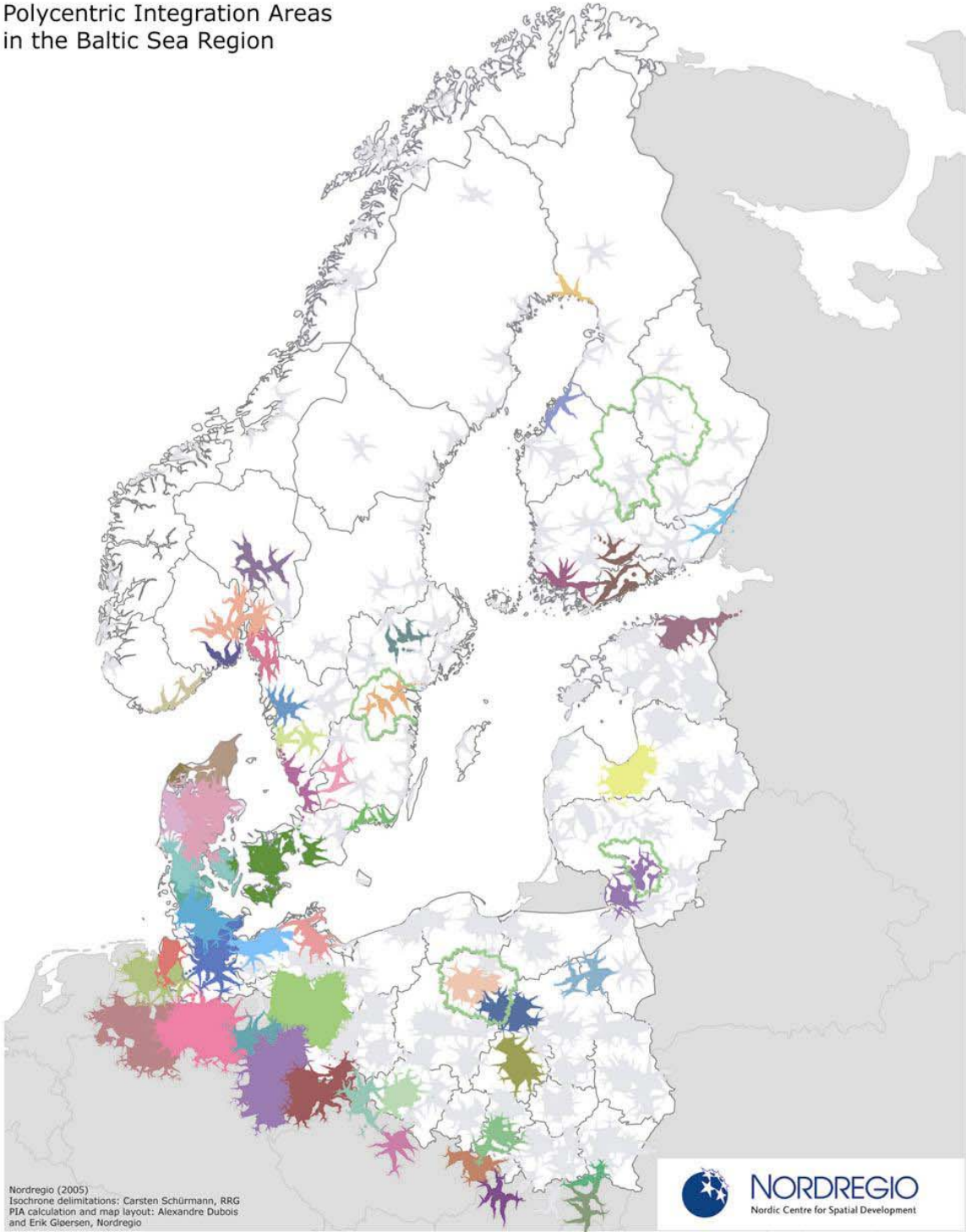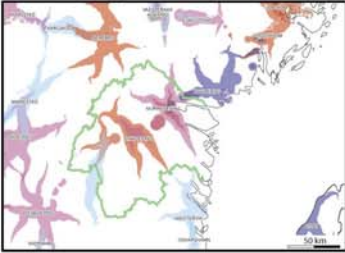
Polycentric integration areas (PIAs):
Isochrones overlapping
by at least one third

Other isochrones

BSR regions within the ESPON study area
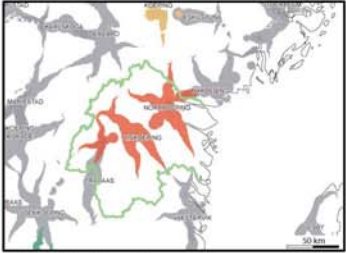
DEFRIS First Division regions

Other regions

500 km

# Figure 3: Isochrones and PIAs in DEFRIS

## Östsam region



Isochrone areas
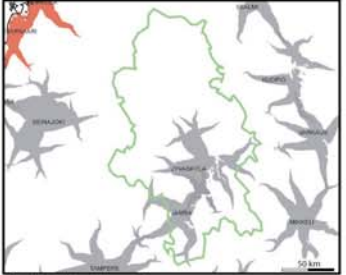(overlaps in darker colours)



Polycentric integration areas
(isolated isochrones in grey)
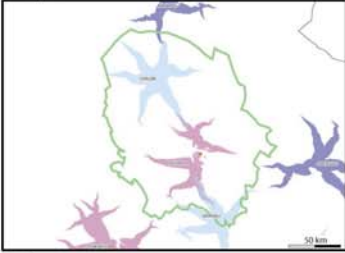
## Keski Suomi region



Isochrone areas
(overlaps in darker colours)



Polycentric integration areas
(isolated isochrones in grey)
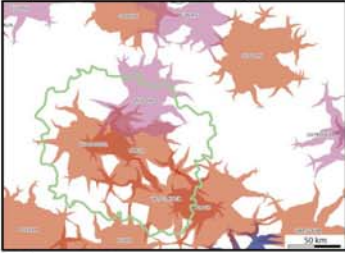
## Pohjois Savo region



Isochrone areas
(overlaps in darker colours)



Polycentric integration areas
(isolated isochrones in grey)
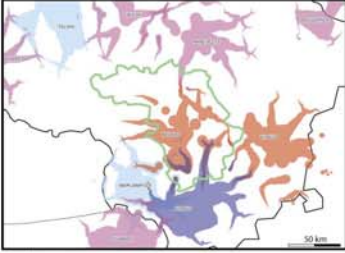
## Kujawsko Pomorskie region



Isochrone areas
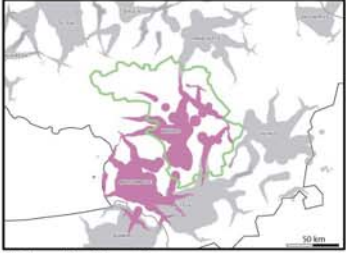(overlaps in darker colours)



Polycentric integration areas
(isolated isochrones in grey)

## Kaunas region



Isochrone areas
(overlaps in darker colours)



Polycentric integration areas
(isolated isochrones in grey)

**Situation of DEFRIS regions within the BSR area**

Figure 1 illustrates how all DEFRIS regions comprise major functional agglomerations (with at least 100 000 inhabitants within their Functional Urban Area), which are in the vicinity of the capital region. However, there is no significant overlap between the isochrone of these major agglomeration, and that of the capital city in any of the five regions. In other words, these regions are neither likely to have nor to develop commuting patterns to and from the capital city.

As shown by Figure 2, most DEFRIS regions correspond to significant Polycentric Integration Areas (PIA) at the national scale:
- Kaunas regions: The Kaunas-Marijampole corresponds to the only PIA identified in Lithuania;
- Östsam: Norrköping-Linköping is one of the two PIAs around Stockholm, together with Västerås-Köping;
- Kujawsko-Pomorskie region: While the Bydgoszcz-Torun PIA is almost entirely within the region, a second PIA (Wloclawek-Plock) is halfway between Kujowska-Pomorskie and the capital city region (Mazowiecke).

The two Finnish DEFRIS regions (Keski Suomi and Pohjois Savo) have no PIAs, as distances between the major centres are too wide. This however does not imply that polycentric development is not possible in these regions. On the one hand, a polycentric potential may emerge at a more narrow scale, by looking at towns and cities with less than 20 000 inhabitants in their functional area. On the other hand, one can focus on polycentric development perspectives that are not based on proximity and shared potential commuting areas.


**Urban endowment of the DEFRIS regions**

Table 1 shows major differences of scale in the urban endowment between the different DEFRIS regions. While the Kujawsko-Pomorskie and Kaunas regions PIAs reach or approach 1 million inhabitants, the Östsam PIA is less than half that size, and the Finnish regions considerably smaller.

However, across all DEFRIS regions, considerable gains in demographic potential can be observed, when going from the traditional labour market (FUAs) to the PUSH perspective. In other words, the potential area in which these cities can look for professional capacities or markets for their development strategy is considerably larger than that in which dominant commuting trends are currently occurring.

As the cities which belong to PIAs are mostly of comparable sizes, the gain of PIA integration is also very significant. This is especially the case in the Lithuanian and Polish DEFRIS regions, as cities multiply their demographic mass by 2 to 4 through polycentric integration.

Table 1: FUA, PUSH and PIA populations of DEFRIS region cities (including cities belonging to the same PIA as a DEFRIS region city)

Kujawsko-Pomorskie region

| ID | NAME | FUA Population | PUSH Population | PIA population |
|---|---|---|---|---|
| PL176 | TORUN | 289 308 | 1 139 829 | 1 336 218 |
| PL017 | BYDGOSZCZ | 471 518 | 1 089 721 | 1 336 218 |
| PL186 | WLOCLAWEK | 210 516 | 625 575 | 922 113 |
| PL128 | PLOCK | 238283 | 723679 | 922 113 |

Östsam region

| ID | NAME | FUA Population | PUSH Population | PIA population |
|---|---|---|---|---|
| SE023 | LINKOEPING | 241 265 | 341 535 | 384 970 |
| SE028 | NORRKOEPING | 165 949 | 300 370 | 384 970 |

Keski Suomi region

| ID | NAME | FUA Population | PUSH Population | PIA population |
|---|---|---|---|---|
| FI010 | JYVASKYLA | 150 441 | 178 640 | |
| FIX01 | JAMSA | 23 226 | 120 679 | |

Pohjois Savo region

| ID | NAME | FUA Population | PUSH Population | PIA population |
|---|---|---|---|---|
| FI006 | IISALMI | 32 746 | 50 298 | |
| FI017 | KUOPIO | 115 903 | 118 552 | |
| FI040 | VARKAUS | 41 855 | 60 620 | |

Kaunas region

| ID | NAME | FUA Population | PUSH Population | PIA population |
|---|---|---|---|---|
| LT002 | KAUNAS | 376 656 | 690 685 | 973 200 |
| LT007 | MARIJAMPOLE | 48 674 | 735 920 | 973 200 |