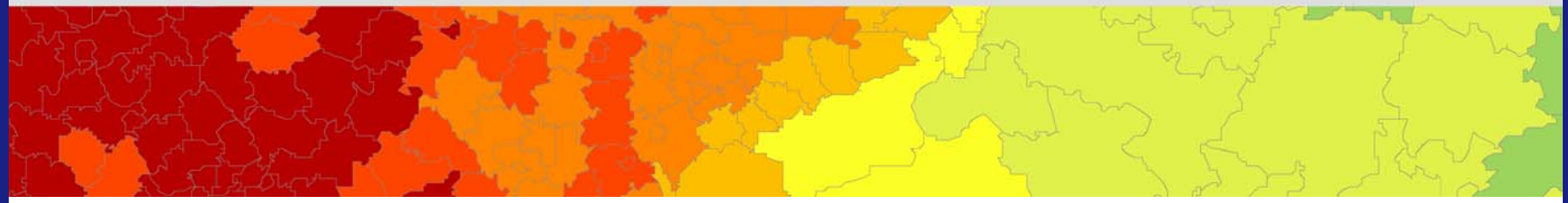
ESPON



Challenges for the ESPON Database Development

Project ESPON DB 2013 (Priority 3)

Espon Seminar, Praha, 2009 June 3-4th

EUROPEAN UNION
Part-financed by the European Regional Development Fund
INVESTING IN YOUR FUTURE

Introduction - The information cube

Scale dimension:

- Local (1 to 10 km)
- Medium (10 to 1000 km)
- Global (1000 to 10 000 km)

Time dimension:

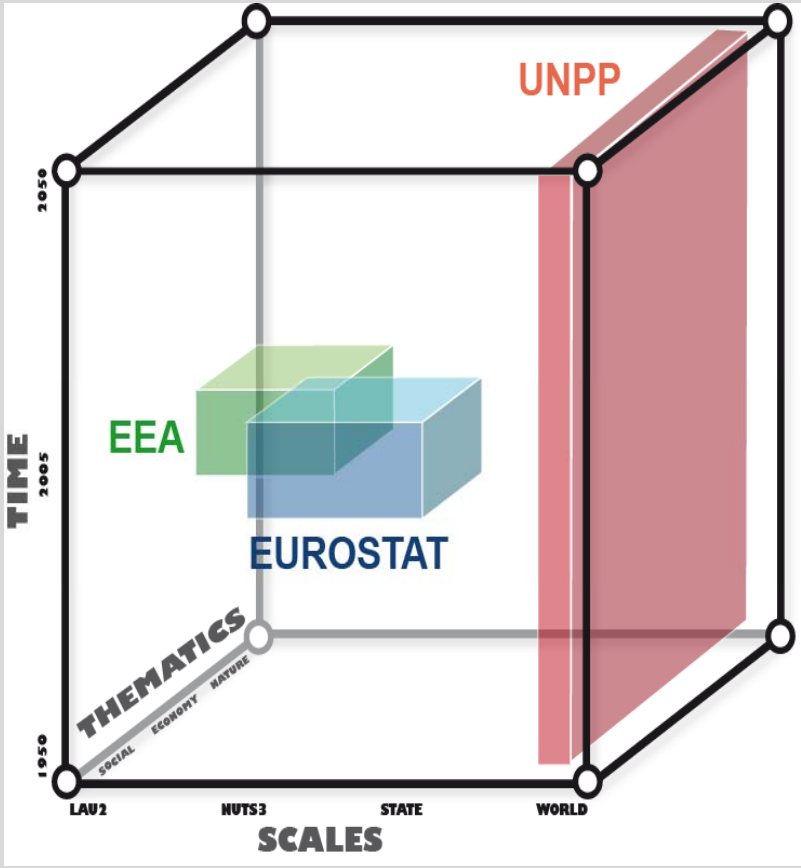
- Short term (1995-2015)
- Medium term (1980-2020)
- Long Term (1950 – 2050)

Thematic dimension :

- Economic competitiveness
- Sustainable environment
- Social cohesion

Geographical object :

- *Administrative units*
- *Grids*
- *Cities & Networks*



Introduction - The information cube of ESPON Database 2006

Scale dimension:

- Local (Zooms)
- **Medium (Nuts2 / Nuts3)**
- Global (Europe in the WOrld)

Time dimension:

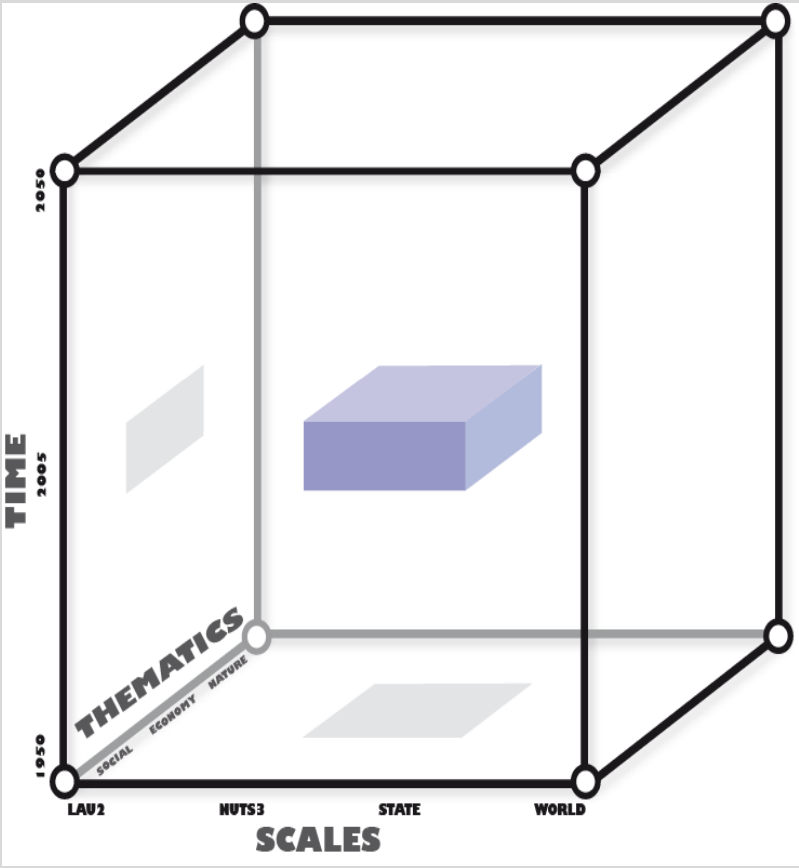
- **Short term (1995-2003)**
- Medium term (demography)
- Long term (Europe in the World)

Thematic dimension :

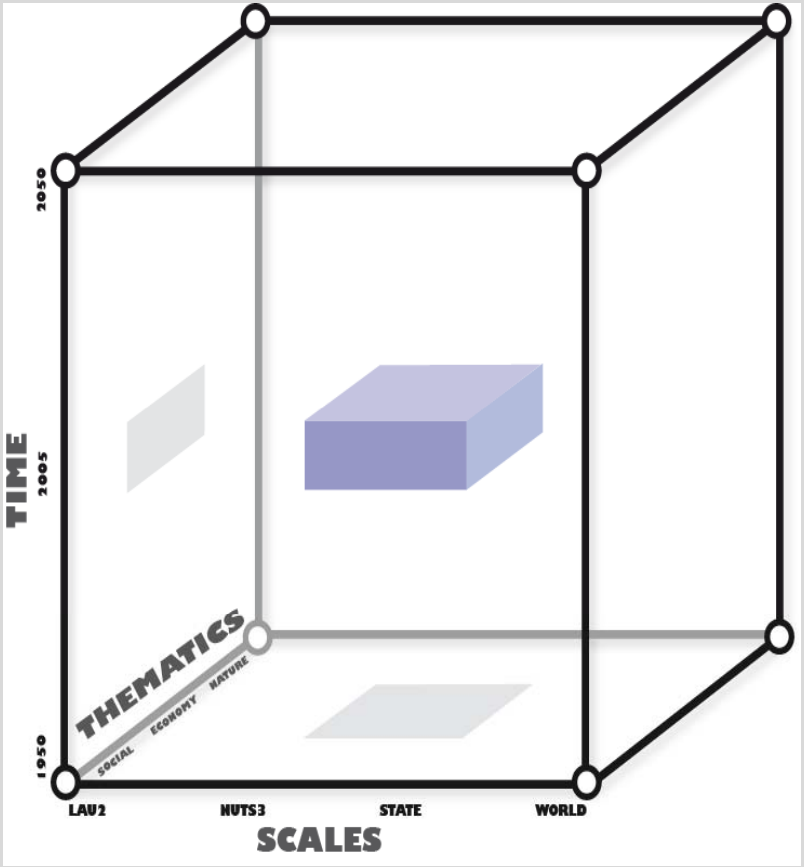
- **Economic competitiveness**
- Sustainable environment
- Social cohesion

Geographical object :

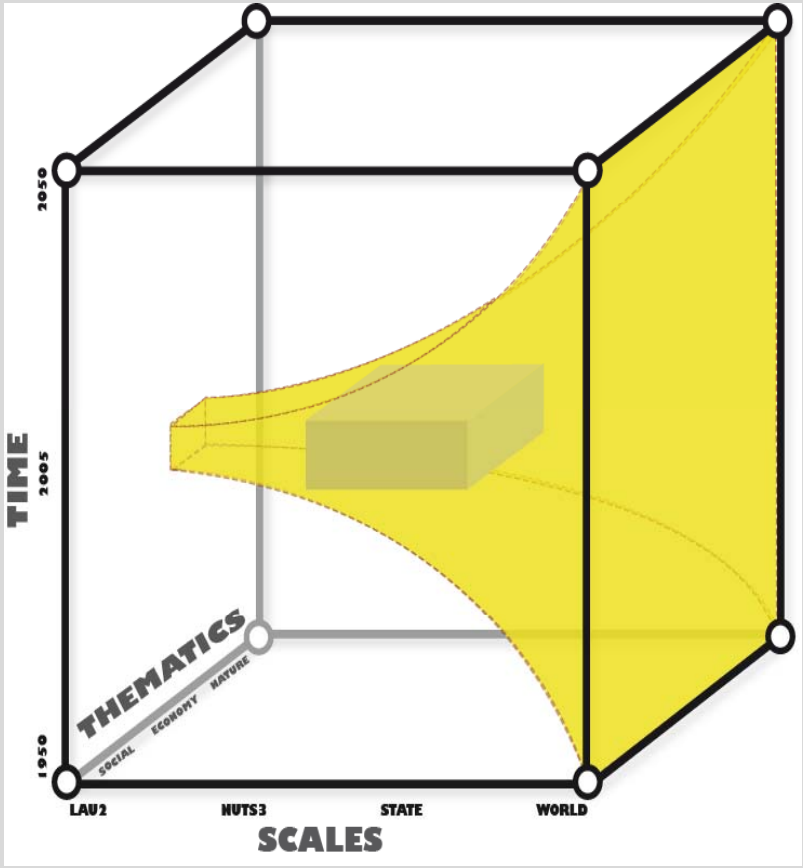
- **Administrative units**
- Cities & Networks
- Grids



Introduction - The expected information cube of ESPON Database 2013

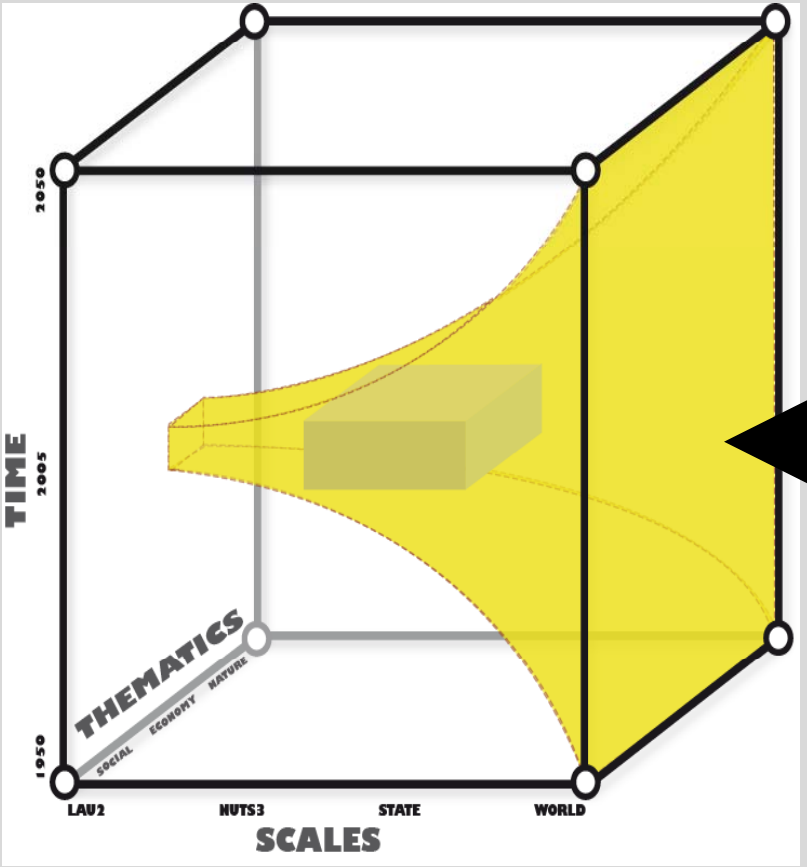


ESPON DB 2006

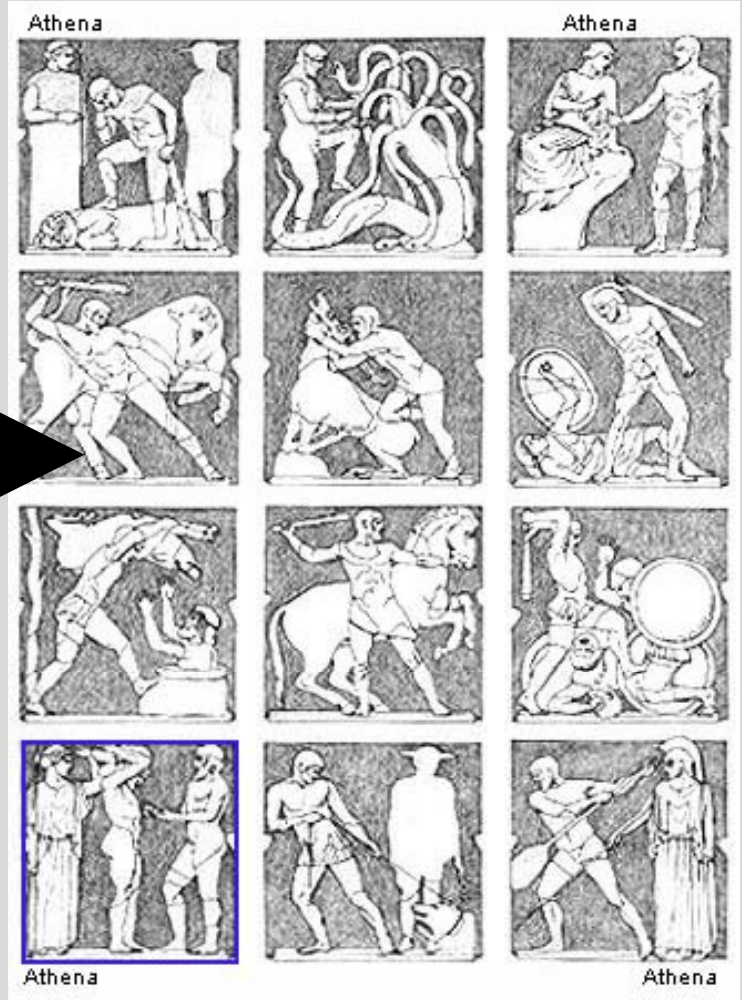


ESPON DB 2013 (!?)

Introduction – Information cube and challenges



Each improvement of ESPON DB should be considered as « a challenge »



Metopes of the Temple of Zeus at Olympia

Challenge 1 : Collection of basic regional data

Objectives : Collection of basic indicators in new NUTS 2006 territorial division derived from EUROSTAT & EEA

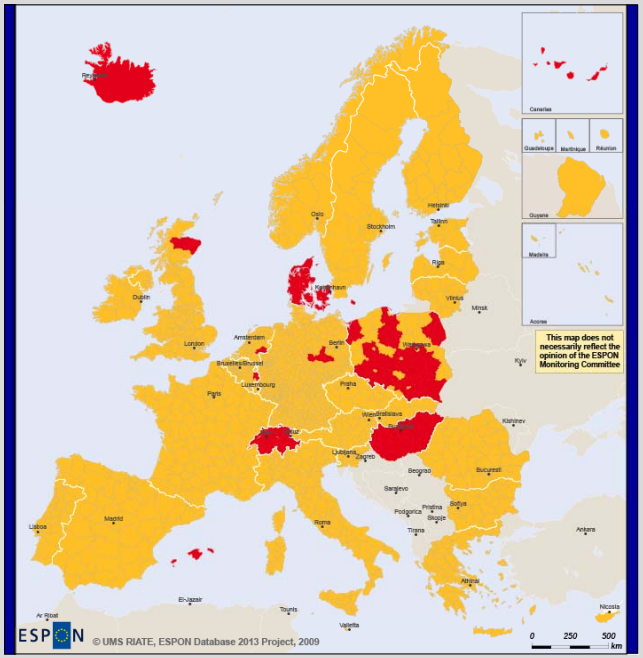
Situation : Estimations and computations of data sources are necessary to have complete datasets. Some datasets are now available, builded by ESPON DB 2013 project

Next steps : Enlarging the integration to other geographical objects (cities, world, grids); integrate into the ESPON DB the datasets of TPG's.

Coord : RIATE

1.1 Total population

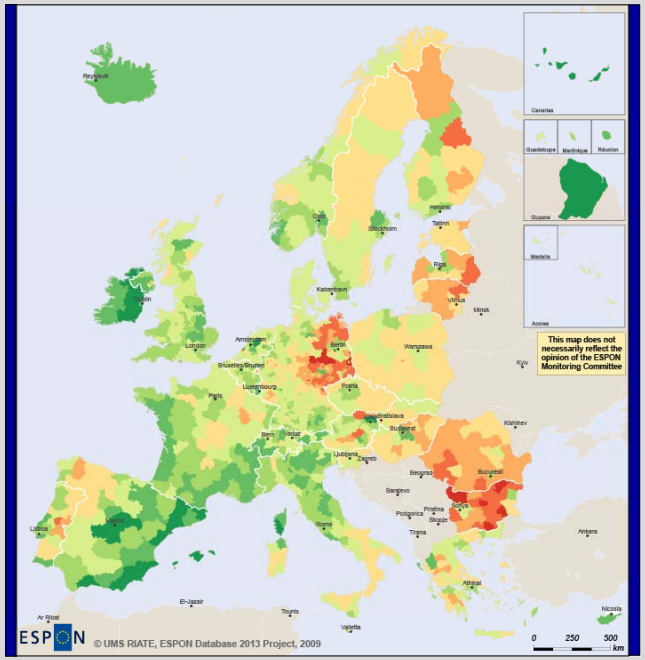
Data availability on Eurostat for total population 2000 and 2006 (NUTS3)



Data available
Missing value

After Estimations

Population growth 2000-2006

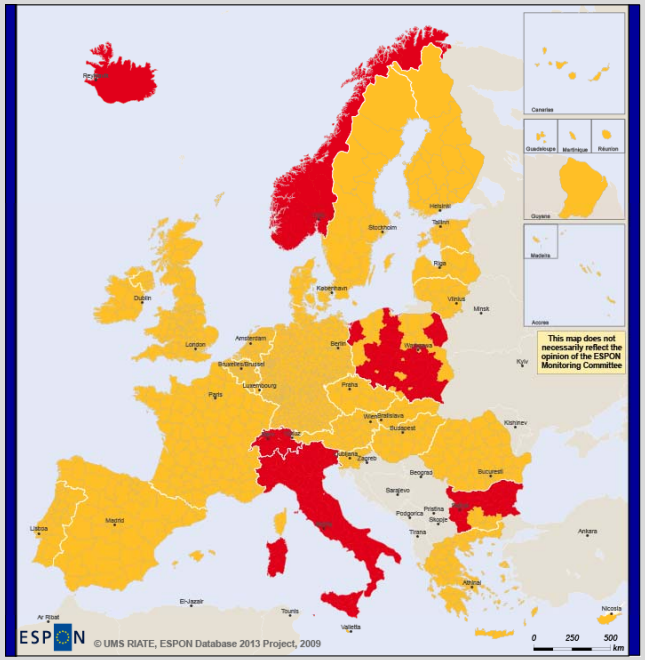


Annual growth rate (%)
4
2
1
0.5
0
-0.5
-1
-2
-4

Full datasets available for NUTS0, 1, 2 and 3 from 2000 to 2006

1.2 GDP (euros and PPS)

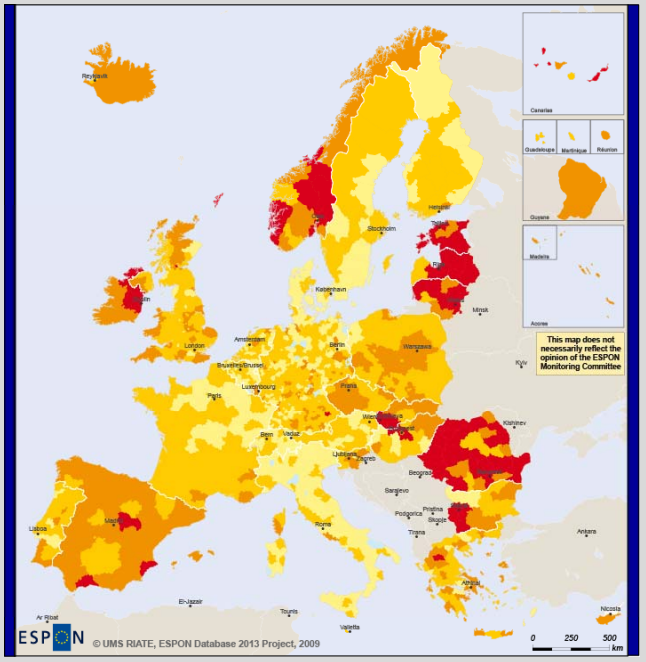
Data availability on Eurostat for GDP (pps) 2000 and 2005 (NUTS3)



Data available
Missing value

After Estimations

GDP (pps) growth 2000-2005

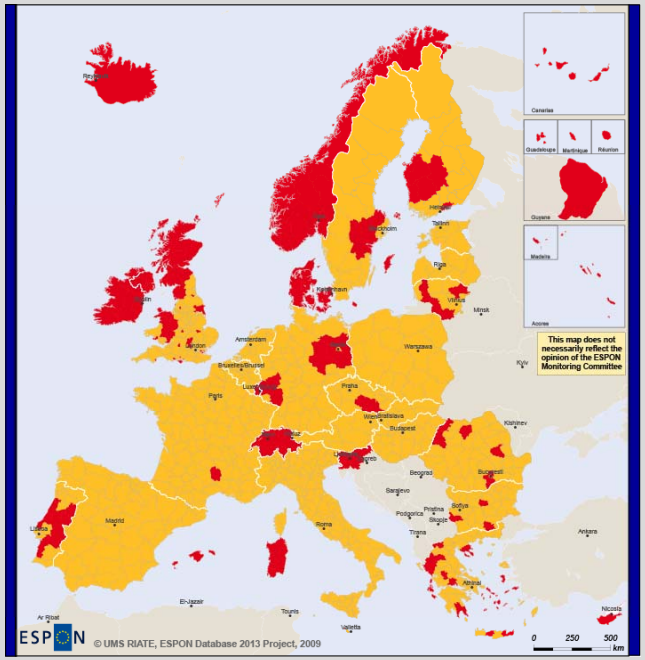


Annual growth rate (%)
13.5
7.5
5
2.5
0
-2.2

Full datasets available for NUTS0, 1, 2 and 3 from 2000 to 2005

1.3 Active population and unemployed persons

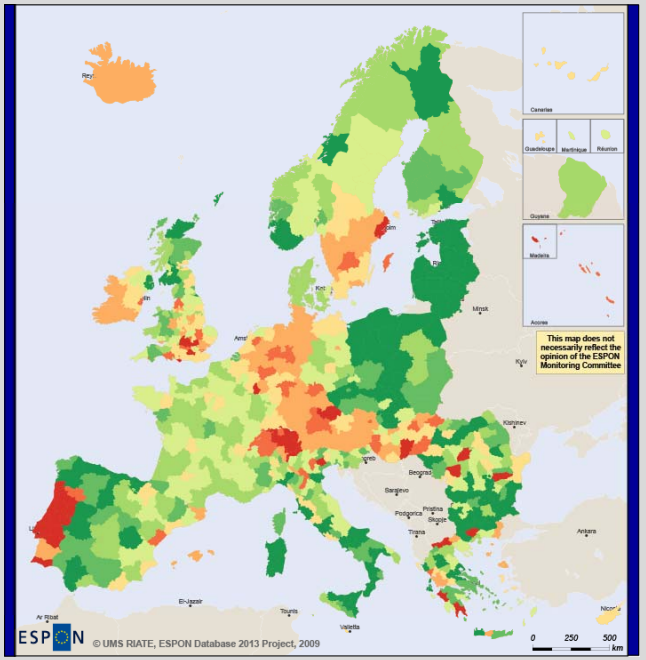
Data availability on Eurostat for unemployed persons 2000 and 2007 (NUTS2-3)



Data available
Missing value

After Estimations

Unemployed persons growth 2000-2007



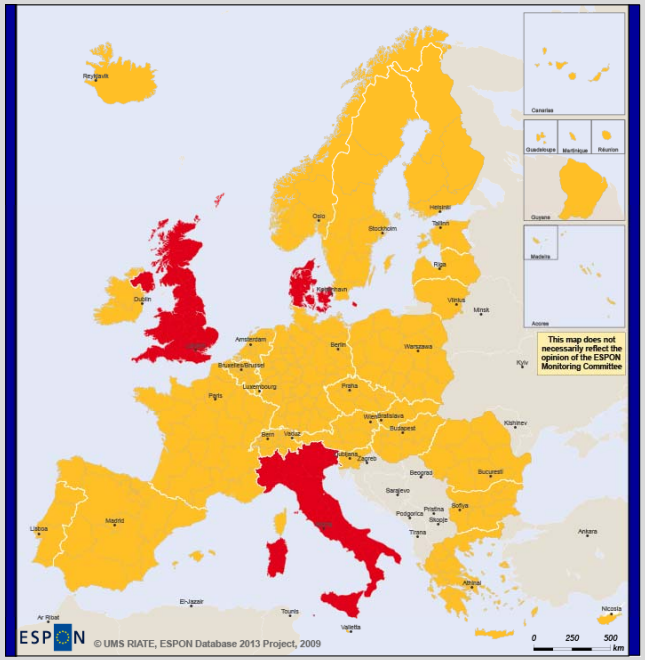
Annual growth rate (%)

7.5
5
2.5
0
-2.2
-5
-7.5

Full datasets available for NUTS0, 1, 2 and 2-3 from 2000 to 2007

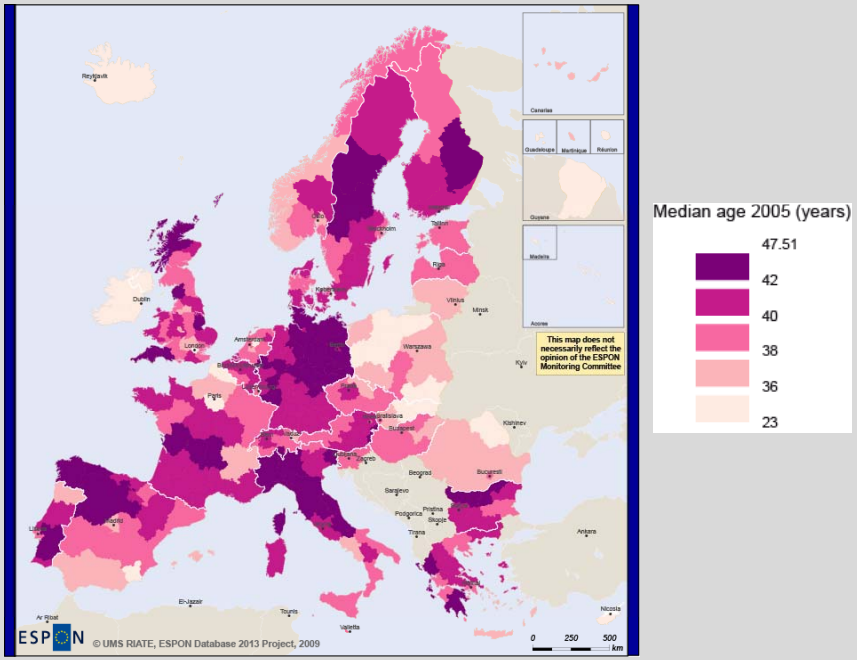
1.4 Age pyramid

Data availability on Eurostat for the all age pyramid 2005 on Eurostat



After Estimations

Median age derived from the age pyramid 2005



Full dataset available for NUTS0, 1, 2 in 2005

1.5 How downloading these datasets ?

- By using the ESPON Database
- By contacting directly the ESPON DB Manager: manager@espondb.eu

Challenge 2 : Harmonisation of time series

Objectives : Harmonisation of time series for the period 1995-2006

Situation : non compatibility of NUTS1995, NUTS1999, NUTS2003, and NUTS2006 …

Strategy : Collection of data at each period « as they are » and elaboration of harmonisation procedures.

Coord : IGEAT

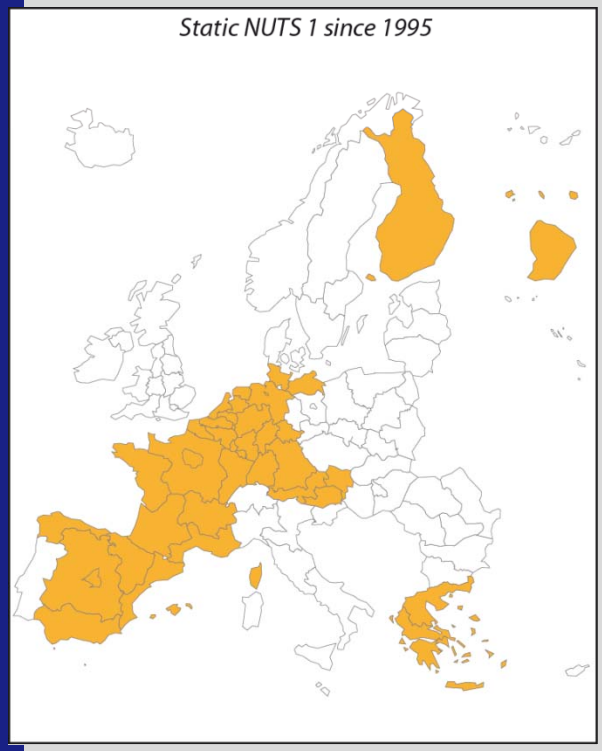
ULB IGEAT

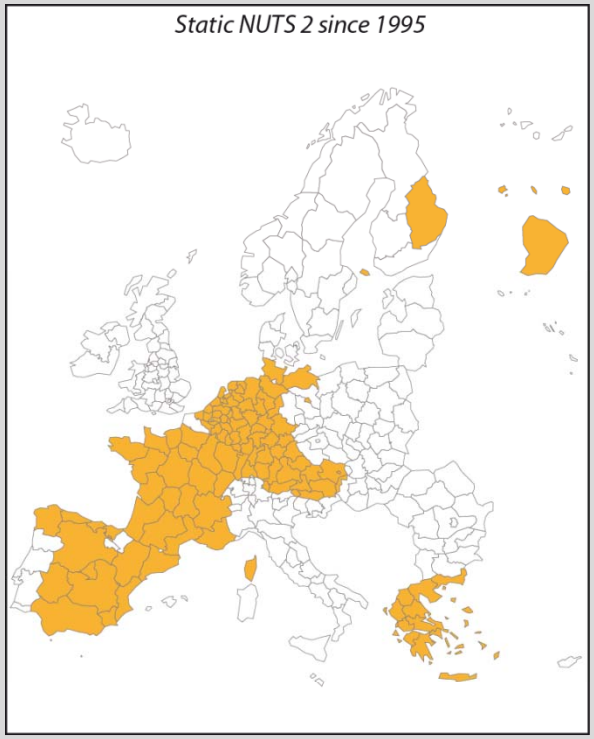
1 Semantic expertise of NUTS Changes : how nuts can change?

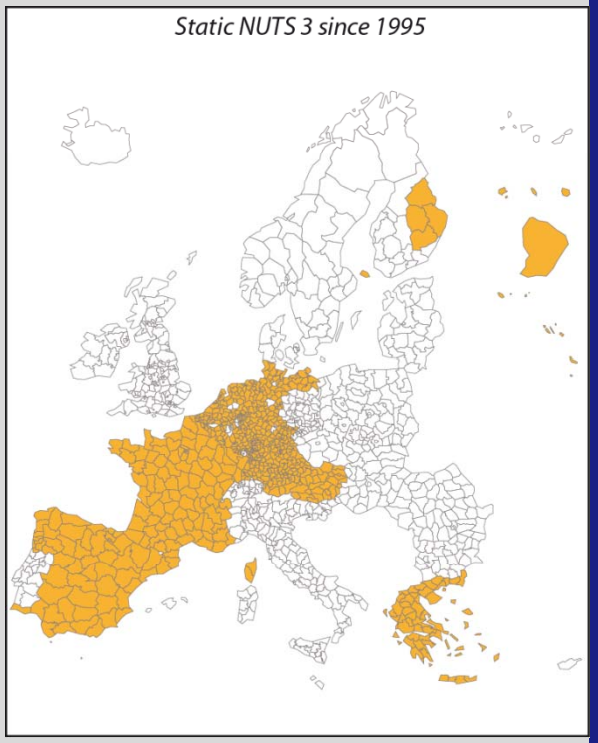
- As defined by the regulation (CE) N° 1059/2003 of 26 th , NUTS is composed by :
- Name, code, geometry and hierarchical level which can change over time.
- The evolution of NUTS is very complex : several changes can happen in the same time and at different level (systemic conception)

2 Overview of the extent of NUTS changes:

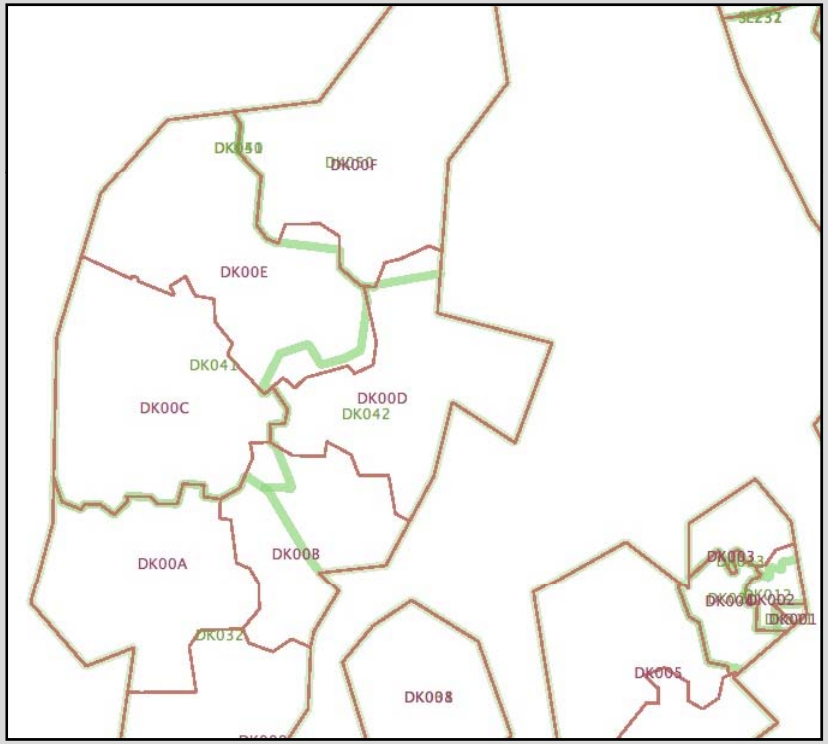
Static Nuts according to all criterion (name, code, geometry and hierarchical level) between 1995-2006







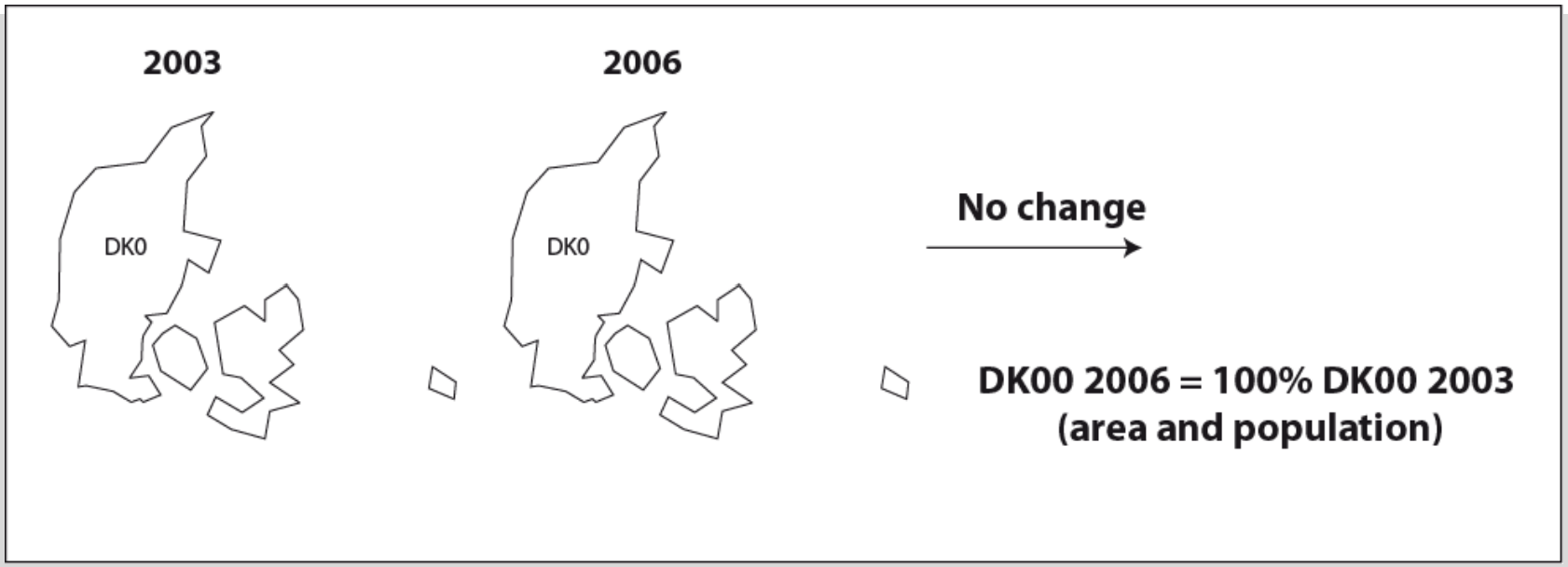
3 Example of case stady analysis: the danish Nuts 2003-2006



Lines in red show the nuts3 in 2003, lines in green show the nuts3 in 2006

ESPON

NUTS1


2003
2006
DK0
DK0
No change
DK00 2006 = 100% DK00 2003
(area and population)

NUTS2

2003

Hierarchy : 2003 : NUTS0= NUTS1= NUTS2 # NUTS3

2006 : NUTS0 = NUTS1 # NUTS2 # NUTS3

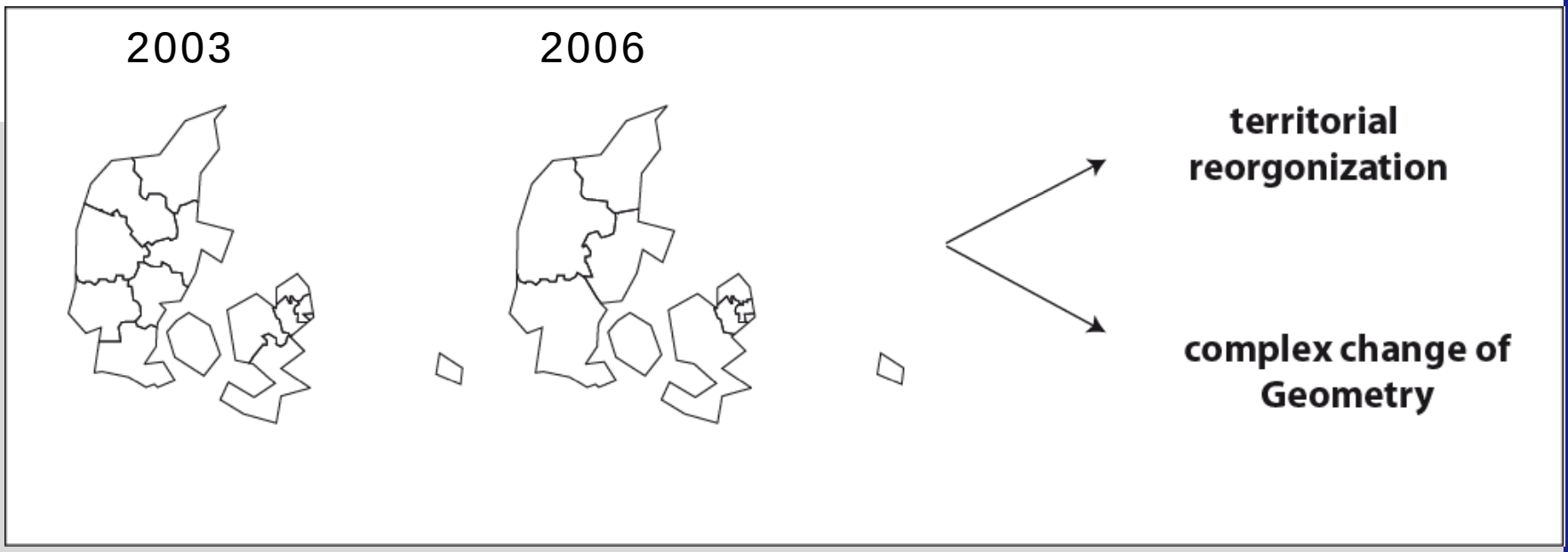
Geometry : Split of DK00

2006

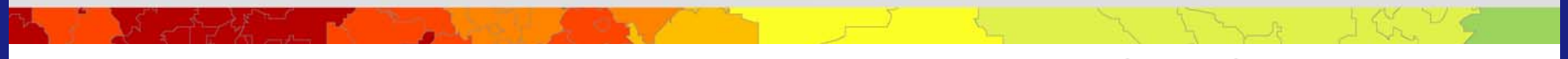
Geonalogy

Semantic expertise

				Type of changes			*entities life*
code 2006	*% Geom*	**code 2003**	**NAME**	*2006-2003*	*2003-1999*	*1999-1995*	*2006-2003*
0		DK00	Danmark	*Split*	*no*	*no*	*broken*
DK01	*4,2*	DK00	Hovedstaden	*Split*	*0*	*0*	*created*
DK02	*18,2*	DK00	Sjælland	*Split*	*0*	*0*	*created*
DK03	*26,9*	DK00	Syddanmark	*Split*	*0*	*0*	*created*
DK04	*36,3*	DK00	Midtjylland	*Split*	*0*	*0*	*created*
DK05	*14,4*	DK00	Nordjylland	*Split*	*0*	*0*	*created*


2003
2006
territorial reorgonization
complex change of Geometry

ESPON



Geonalogy

Semantic expertise

					Type of changes			entities life	
code 2006	% Geom	code 2003		NAME	2006-2003	2003-1999	1999-1995	2006-2003	
		DK001	100	Københavns og Frederiksberg Kommuner	territorial reorgonization	no	no	broken	stable	stable
		DK002	100	Københavns Amt	territorial reorgonization	no	no	broken	stable	stable
		DK003	100	Frederiksborg Amt	territorial reorgonization	no	no	broken	stable	stable
		DK004	100	Roskilde Amt	territorial reorgonization	no	no	broken	stable	stable
		DK005	100	Vestsjællands Amt	territorial reorgonization	no	no	broken	stable	stable
		DK006	100	Storstrøms Amt	territorial reorgonization	no	no	broken	stable	stable
		DK007	100	Bornholms Amt	territorial reorgonization	no	no	broken	stable	stable
		DK008	100	Fyns Amt	territorial reorgonization	no	no	broken	stable	stable
		DK009	100	Sønderjyllands Amt	territorial reorgonization	no	no	broken	stable	stable
		DK00A	100	Ribe Amt	territorial reorgonization	no	no	broken	stable	stable
		DK00B	100	Vejle Amt	territorial reorgonization	no	no	broken	stable	stable
		DK00C	100	Ringkøbing Amt	territorial reorgonization	no	no	broken	stable	stable
		DK00D	100	Århus Amt	territorial reorgonization	no	no	broken	stable	stable
		DK00E	100	Viborg Amt	territorial reorgonization	no	no	broken	stable	stable
		DK00F	100	Nordjyllands Amt	territorial reorgonization	no	no	broken	stable	stable
DK011	100	DK001	100	Byen København	territorial reorgonization	0	0	created	not exist	not exist
DK011	7,7	DK002	7,7	Byen København	territorial reorgonization	0	0	created	not exist	not exist
DK012	75,5	DK002	75,5	Københavns omegn	territorial reorgonization	0	0	created	not exist	not exist
DK013	16,8	DK002	16,8	Nordsjælland	territorial reorgonization	0	0	created	not exist	not exist
DK013	100	DK003	100	Nordsjælland	territorial reorgonization	0	0	created	not exist	not exist
DK014	100	DK007	100	Bornholm	territorial reorgonization	0	0	created	not exist	not exist
DK021	98,9	DK004	98,9	Østsjælland	territorial reorgonization	0	0	created	not exist	not exist
DK022	1,7	DK004	1,7	Vest- og Sydsjælland	territorial reorgonization	0	0	created	not exist	not exist
DK022	100	DK005	100	Vest- og Sydsjælland	territorial reorgonization	0	0	created	not exist	not exist
DK022	100	DK006	100	Vest- og Sydsjælland	territorial reorgonization	0	0	created	not exist	not exist
DK031	100	DK008	100	Fyn	territorial reorgonization	0	0	created	not exist	not exist
DK032	40	DK00B	40	Fyn	territorial reorgonization	0	0	created	not exist	not exist
DK032	100	DK00A	100	Fyn	territorial reorgonization	0	0	created	not exist	not exist
DK032	100	DK009	100	Sydjylland	territorial reorgonization	0	0	created	not exist	not exist
DK041	11,1	DK00B	11,1	Vestjylland	territorial reorgonization	0	0	created	not exist	not exist
DK041	100	DK00C	100	Vestjylland	territorial reorgonization	0	0	created	not exist	not exist
DK041	91	DK00E	91	Vestjylland	territorial reorgonization	0	0	created	not exist	not exist
DK042	48,9	DK00B	48,9	Østjylland	territorial reorgonization	0	0	created	not exist	not exist
DK042	6,3	DK00E	6,3	Østjylland	territorial reorgonization	0	0	created	not exist	not exist
DK042	95,6	DK00D	95,6	Østjylland	territorial reorgonization	0	0	created	not exist	not exist
DK050	4,4	DK00D	4,4	Nordjylland	territorial reorgonization	0	0	created	not exist	not exist
DK050	2,8	DK00E	2,8	Nordjylland	territorial reorgonization	0	0	created	not exist	not exist
DK050	100	DK00F	100							

Challenge 3 : World / Regional data

Objectives : combine datasets at world level (by states) and datasets at European level (by NUTS regions)

Situation :

1) No direct compatibility between world data by states (UN) and EU data by Region (e.g. Eurostat)
2) No direct compatibility between world databases

Strategy :

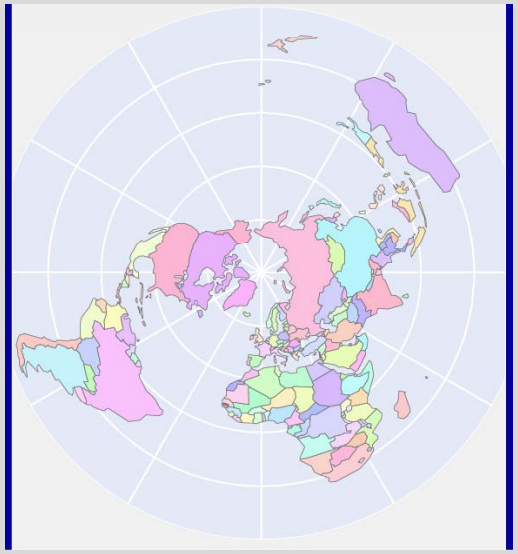
1) Elaboration of tools for compatibility between NUTS and WUTS data (key question of state : NUTS0=WUTS5 ?)
2) Elaboration of tools to ensure comparibility between world databases

Coord : RIATE & UNEP

3.1 Heterogeneous world databases

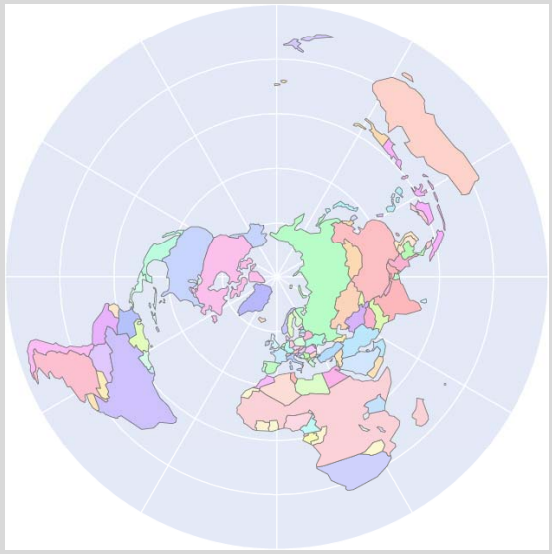
ESPON Europe in the World

168 units



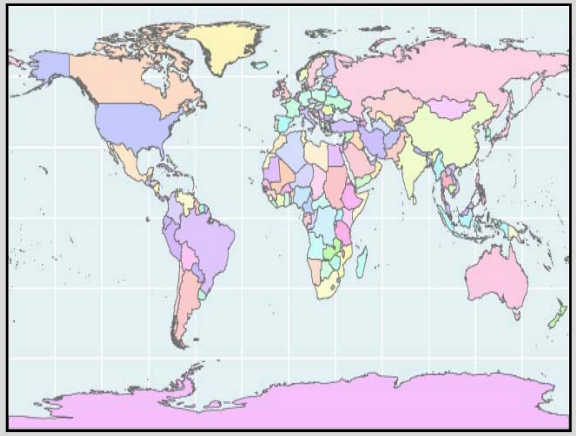
CHELEM

96 units



UNEP

237 units



?

3.2 Example of new structural data (IMF GDP estimations)

IMF World Economic Outlook

- 200 units (countries or territories)
- published 2 times / year (with forecast at t+5)
- Population, GDP, Balance, ...

Example : Prevision of GDP for year 2009 (in pps)

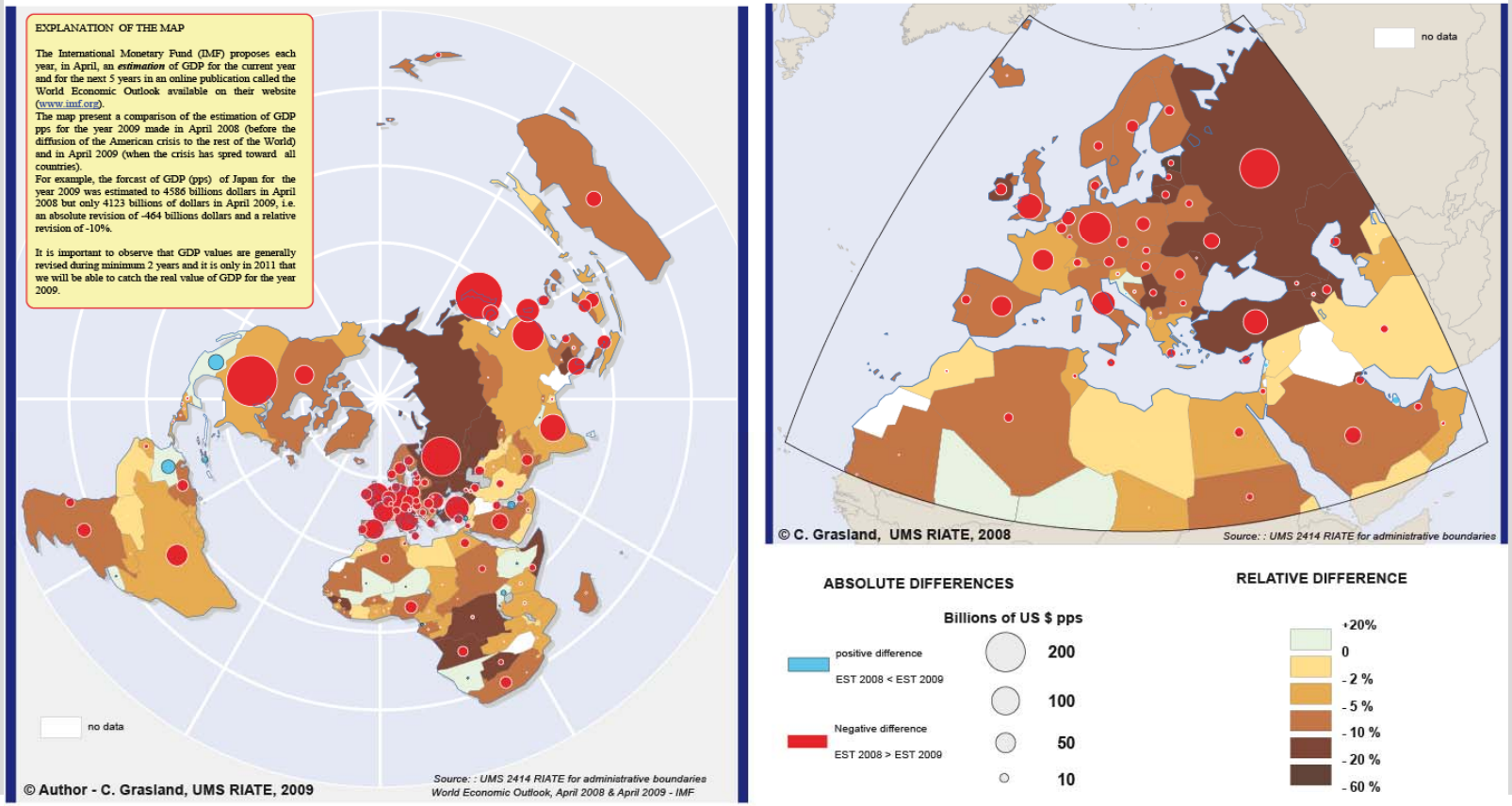
Country	Apr. 2008	Apr.2009	DIFABS	DIFREL
Malta	24	10	-14	-59%
Cyprus	41	23	-18	-43%
Estonia	31	25	-7	-21%
Latvia	43	34	-9	-20%
Lithuania	70	58	-12	-17%
Ireland	203	175	-28	-14%
Iceland	13	11	-1	-10%
Luxembourg	43	38	-4	-10%
Czech Republic	282	255	-27	-9%
Finland	201	183	-19	-9%

3.2 Example of new structural data (IMF GDP estimations)

4 000 BILLIONS DOLLARS, BABY !

DIFFERENCE BETWEEN ESTIMATION OF GDP FOR YEAR 2009 MADE BY IMF IN APRIL 2008 AND APRIL 2009

Source : World Economic Outlook, Apr. 2008 & Apr. 2009

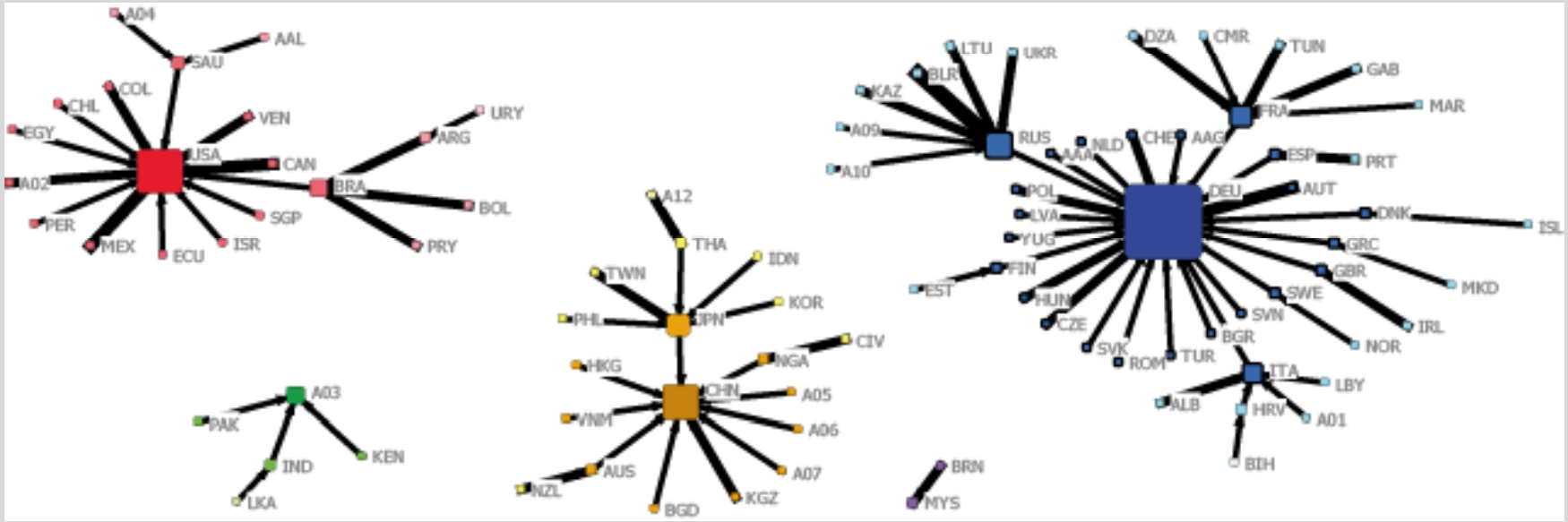


3.3 Example of new flow data (CHELEM)

CHELEM Database

- 92 units (countries or group)
- 41 years (1967 to present)
- 150 products (oil, machine, cereals)

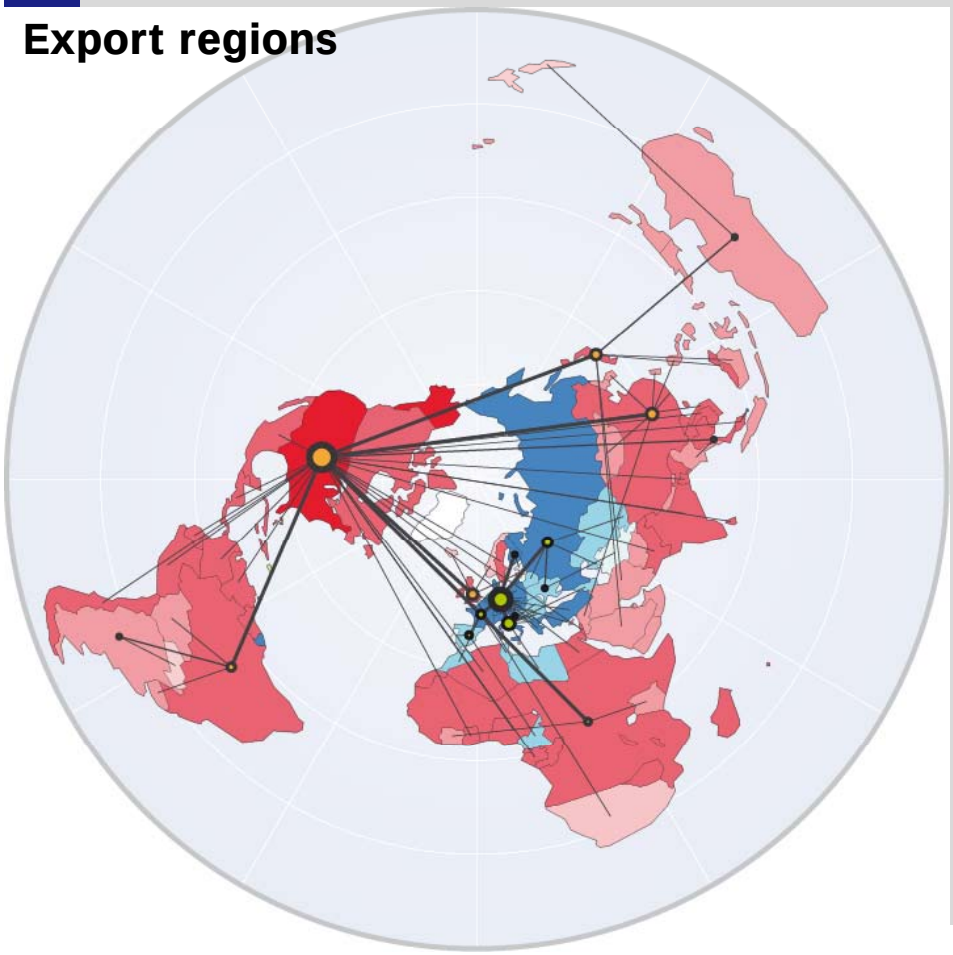
Example : Dominant trade flows 2004-2006



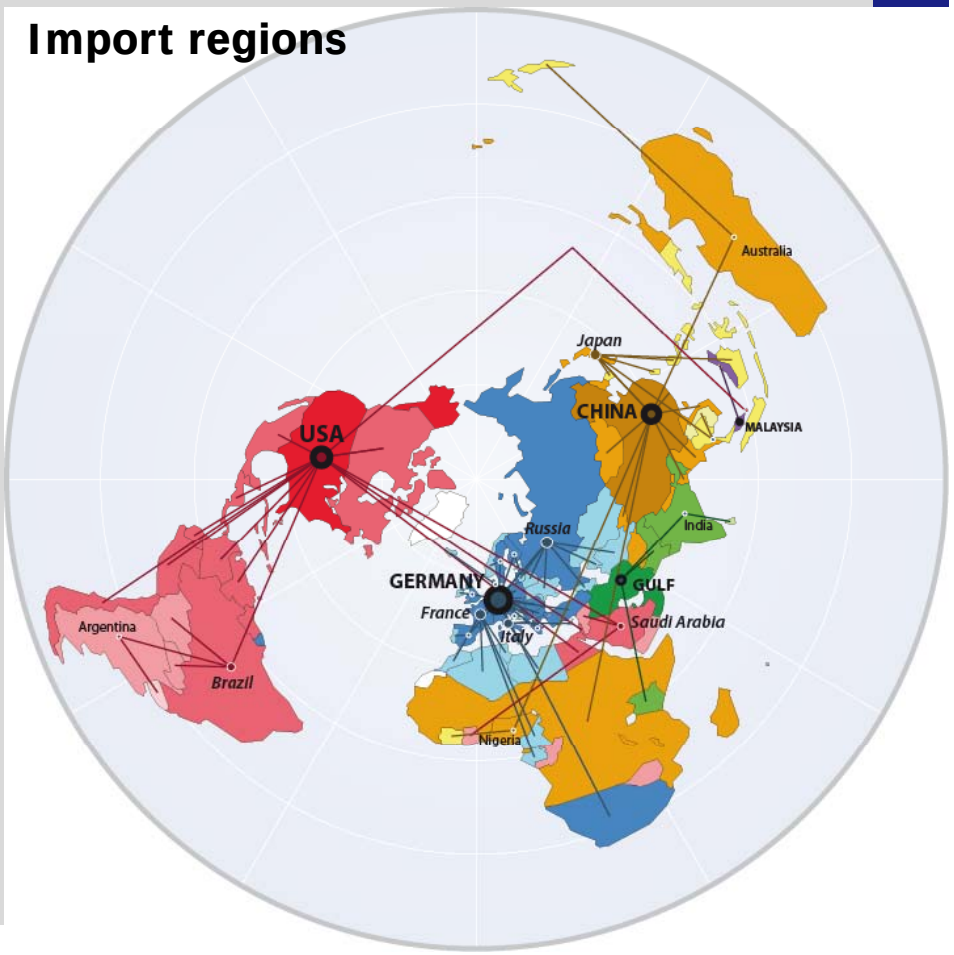
3.3 Example of new flow data (CHELEM)

Example : Dominant trade flows 2004-2006

Export regions



Import regions



Challenge 4 : Regional / Local data

Objectives : Develop case studies providing zoom on specific territories at local level (rural areas, cross border areas, intra-urban differentiation, …).

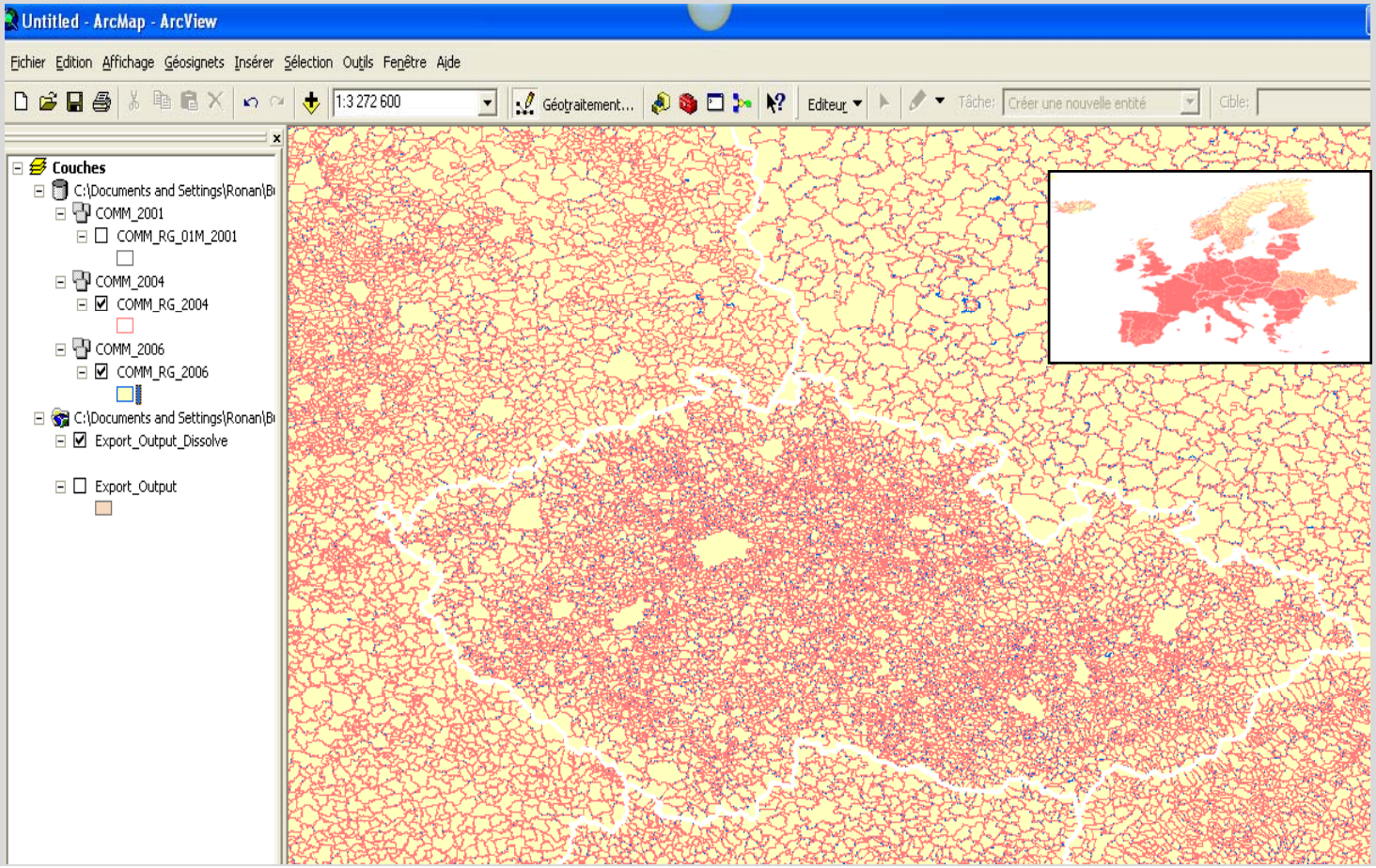
Situation : no complete data +geometry available at LAU1 or LAU2 level.

Strategy : Elaboration of coherent local sources (data
+ geometry) with Eurostat, Eurogeographics and national statistical institutes

Coord : TIGRIS

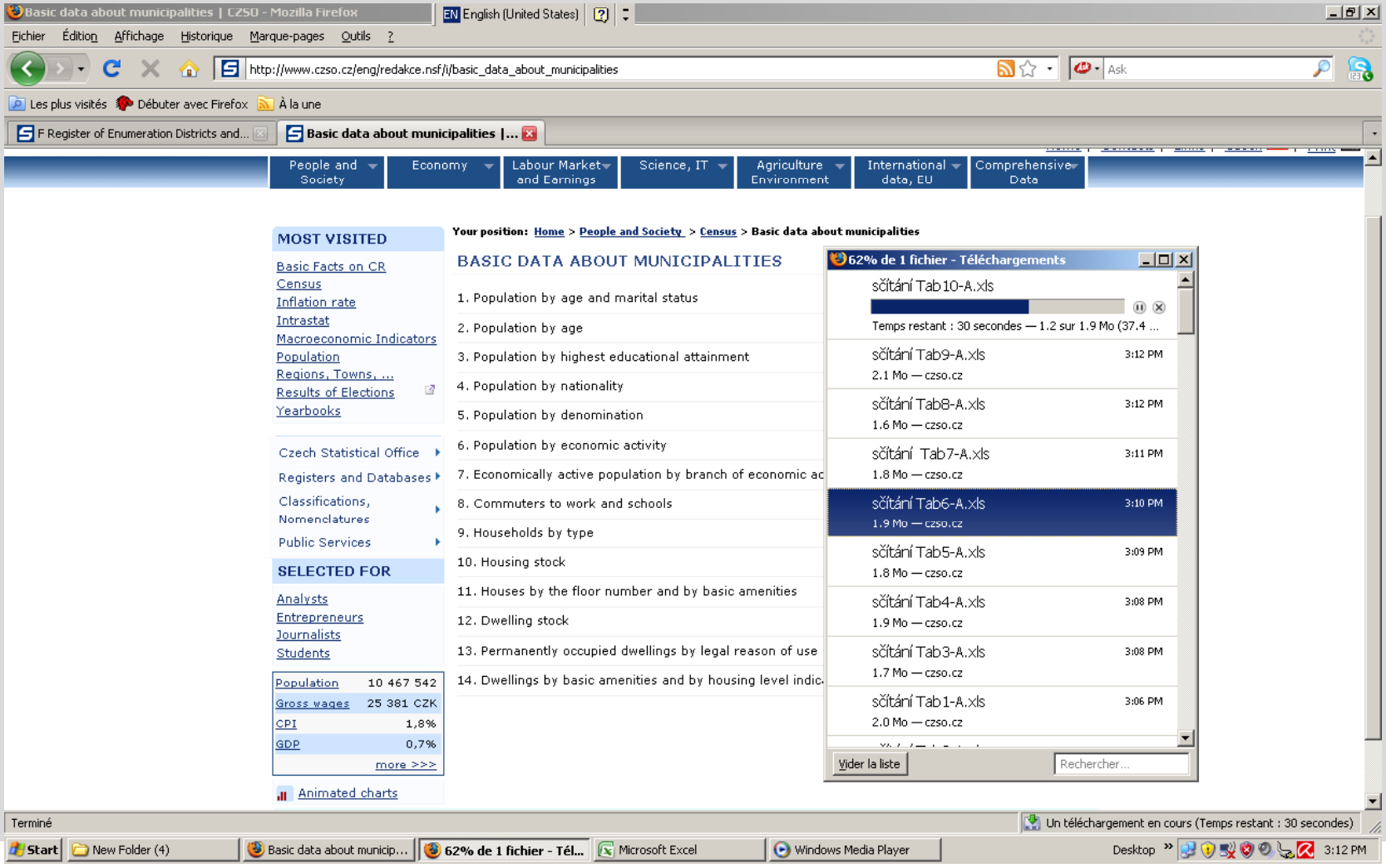
4.1. Harmonisation of geometries

Eurostat / GISCO: Administrative boundaries for municipalities in 2001, 2004 and 2006 for ESPON space + Ukraine, Moldavia, Croatia and Kosovo



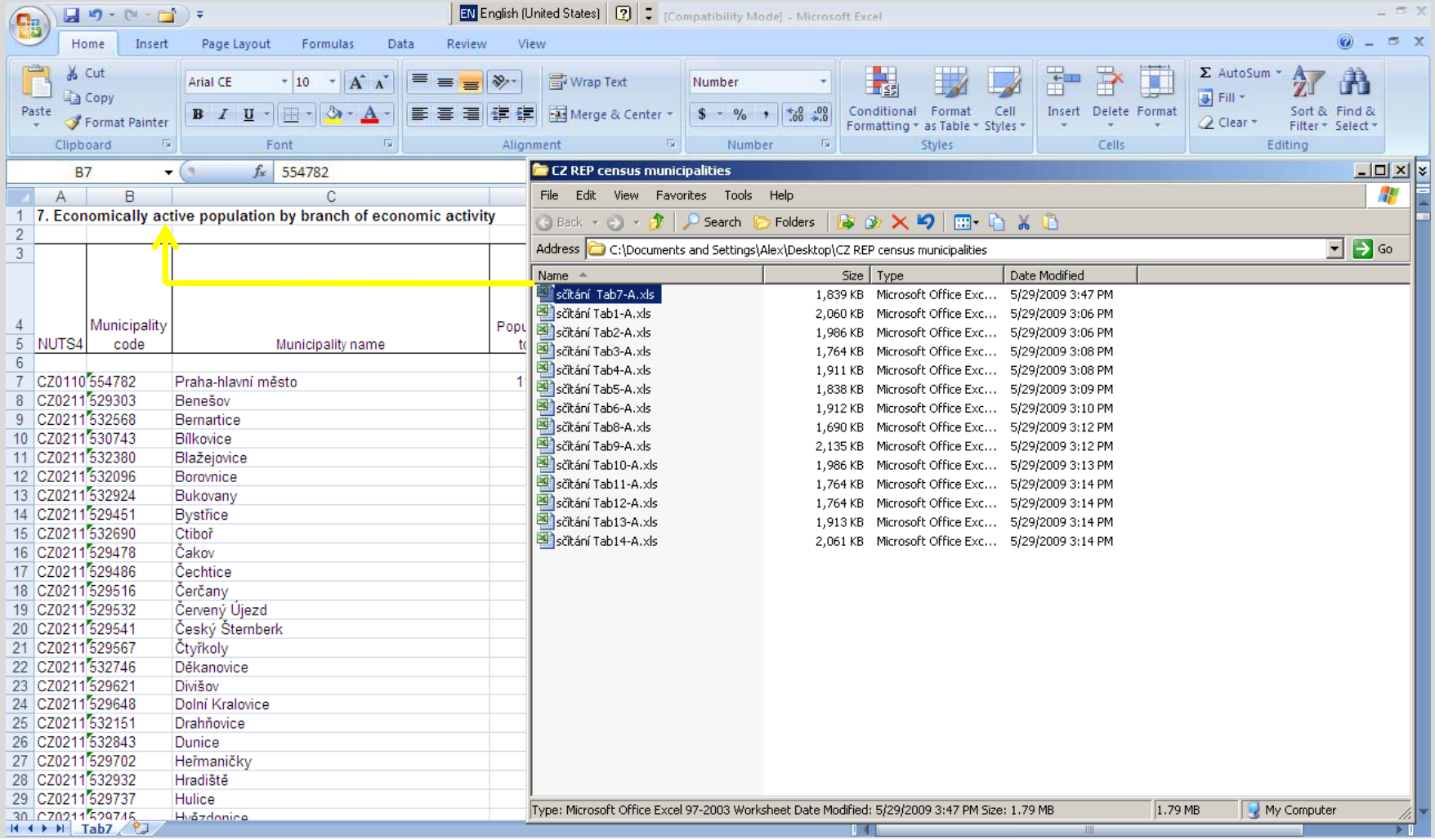
4.2. Analysis of data availability

National Statistical Offices : example of the Czech Republic



4.3. Download of statistical tables

National Statistical Offices : example of the Czech Republic



7. Economically active population by branch of economic activity

NUTS4	Municipality code	Municipality name	Popu to
CZ0110	554782	Praha-hlavní město	1
CZ0211	529303	Benešov	
CZ0211	532568	Bernartice	
CZ0211	530743	Bílkovice	
CZ0211	532380	Blažejovice	
CZ0211	532096	Borovnice	
CZ0211	532924	Bukovany	
CZ0211	529451	Bystřice	
CZ0211	532690	Ctiboř	
CZ0211	529478	Čakov	
CZ0211	529486	Čechtice	
CZ0211	529516	Čerčany	
CZ0211	529532	Červený Újezd	
CZ0211	529541	Český Šternberk	
CZ0211	529567	Čtyřkoly	
CZ0211	532746	Děkanovice	
CZ0211	529621	Divišov	
CZ0211	529648	Dolní Kralovice	
CZ0211	532151	Drahňovice	
CZ0211	532843	Dunice	
CZ0211	529702	Heřmaničky	
CZ0211	532932	Hradiště	
CZ0211	529737	Hulice	
CZ0211	529745	Hvězdonice	

CZ REP census municipalities

Name	Size	Type	Date Modified
sčítání Tab7-A.xls	1,839 KB	Microsoft Office Exc...	5/29/2009 3:47 PM
sčítání Tab1-A.xls	2,060 KB	Microsoft Office Exc...	5/29/2009 3:06 PM
sčítání Tab2-A.xls	1,986 KB	Microsoft Office Exc...	5/29/2009 3:06 PM
sčítání Tab3-A.xls	1,764 KB	Microsoft Office Exc...	5/29/2009 3:08 PM
sčítání Tab4-A.xls	1,911 KB	Microsoft Office Exc...	5/29/2009 3:08 PM
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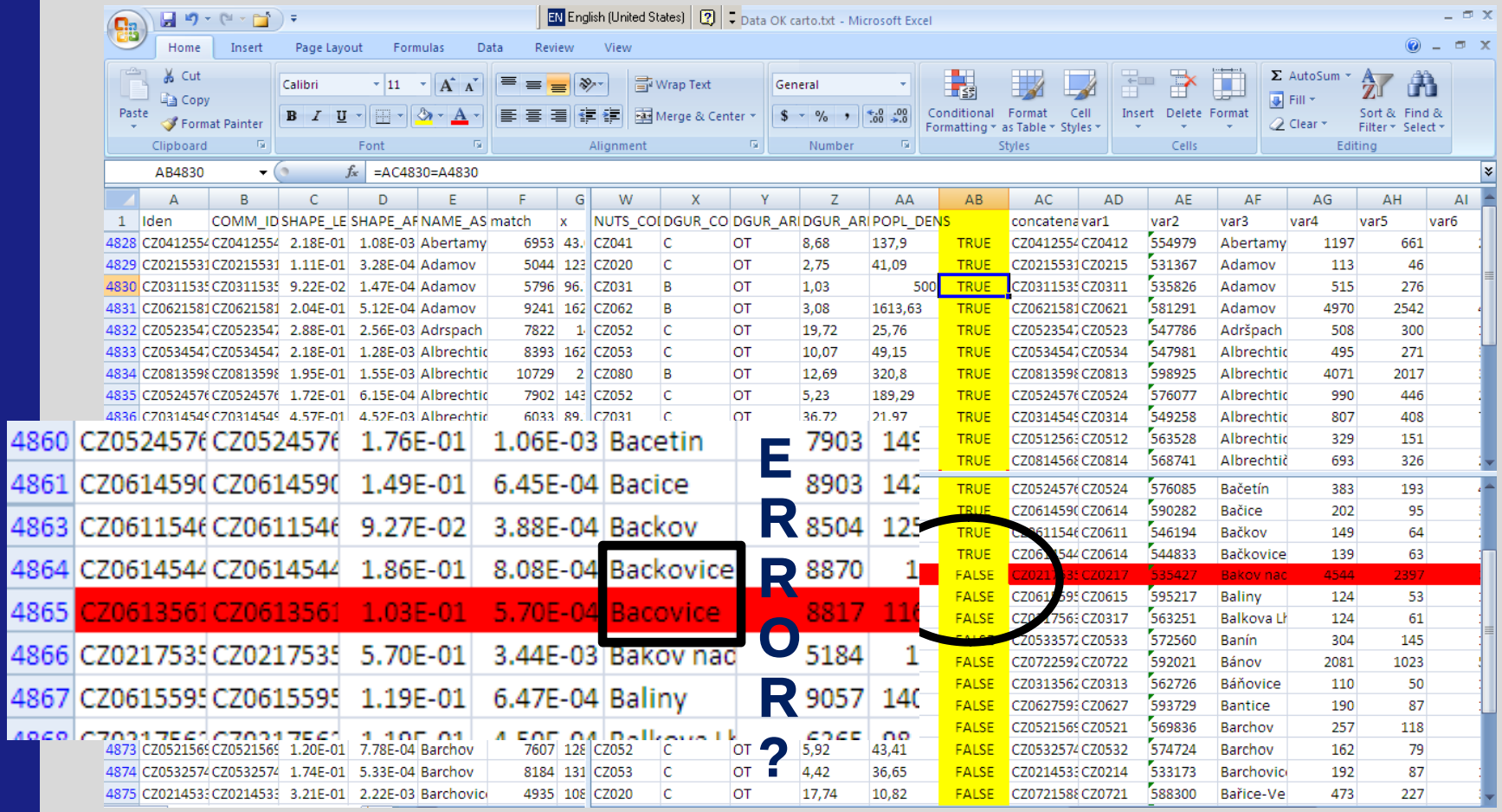
sčítání Tab9-A.xls	2,135 KB	Microsoft Office Exc...	5/29/2009 3:12 PM
sčítání Tab10-A.xls	1,986 KB	Microsoft Office Exc...	5/29/2009 3:13 PM
sčítání Tab11-A.xls	1,764 KB	Microsoft Office Exc...	5/29/2009 3:14 PM
sčítání Tab12-A.xls	1,764 KB	Microsoft Office Exc...	5/29/2009 3:14 PM
sčítání Tab13-A.xls	1,913 KB	Microsoft Office Exc...	5/29/2009 3:14 PM
sčítání Tab14-A.xls	2,061 KB	Microsoft Office Exc...	5/29/2009 3:14 PM

Type: Microsoft Office Excel 97-2003 Worksheet Date Modified: 5/29/2009 3:47 PM Size: 1.79 MB | 1.79 MB | My Computer

4.4. Check of data/geometry compatibility



Challenge 5 : Social / Environmental data

Objectives : Making easier the combination of socio-economic data (EUROSTAT) and environmental data (EEA)

Situation : Initiatives for grid harmonisation. Development of GRID<-> NUTS tools

Strategy : Implementation of data exchange tools in ESPON DB. Networking with Eurostat/EEA/JRC on this topic (in the framework of INSPIRE).

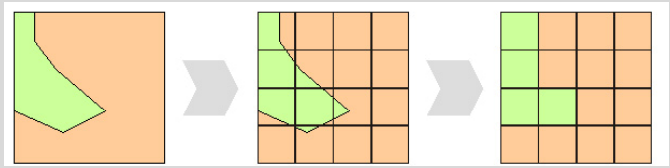
Coord : UAB (ETC-LUSI)

Universitat Autònoma de Barcelona

5.1 Description of challenge 5

Combining socio-economic data measured for administrative areas (NUTS level) and environmental data defined on a regular grid (CORINE Land Cover). Integration of data based on the 1km reference grid

1. Maximum area criteria:

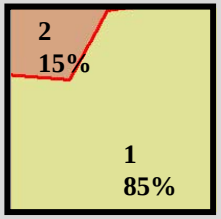


2. Proportional calculation

Cell value = Σ (V_i * $Share_i$)

V_i = Value of unit i

$Share_i$ = Share of unit i within the cell



V1 * 0.85 + V2 * 0.15

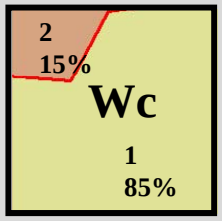
3. Proportional and weighted calculation

Cell value = Wc Σ (V_i * $Share_i$)

V_i = Value of unit i

$Share_i$ = Share of unit i within the cell

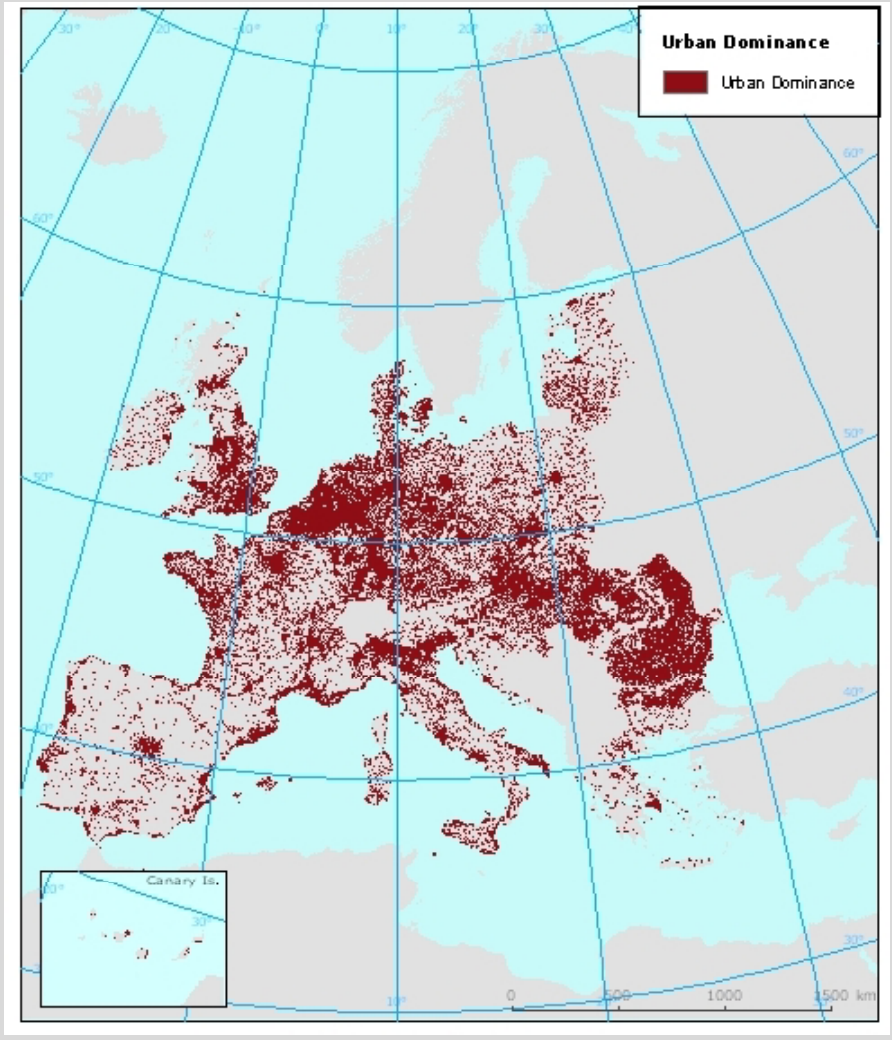
Wc = weight assigned to cell



Wc(V1 * 0.85 + V2 * 0.15)

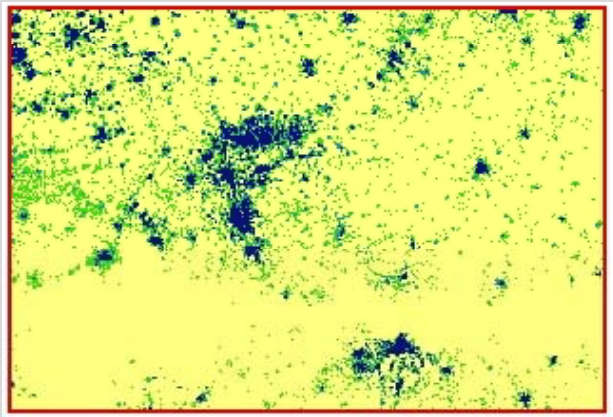
5.2 Corine Land Cover to GRID

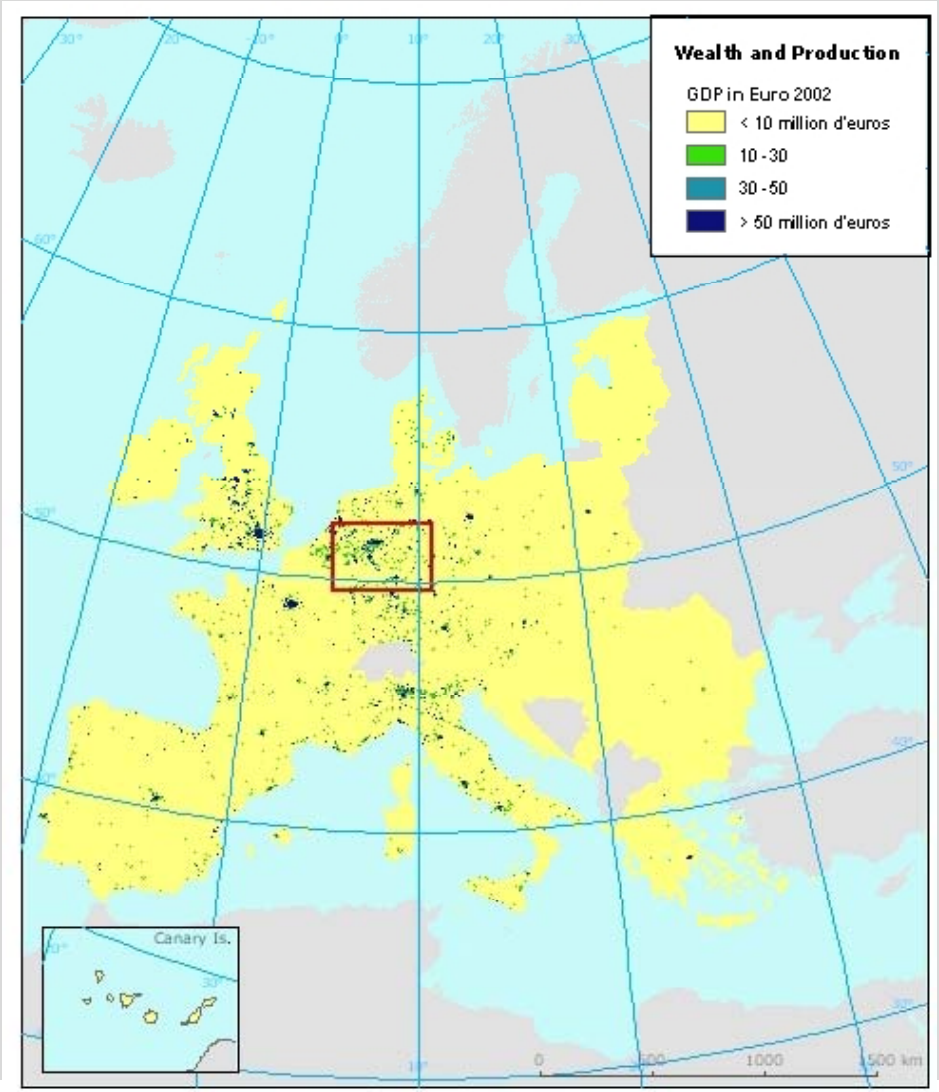
- Urban Dominance: when the area of urban zones covers most of the cell area of the grid.
- Data Source: Urban Morphological Zones 2000 (EEA)



5.3 NUTS to GRID

- GDP in euro 2002 weighted by Population 2001
- Data sources: Wealth and Production NUTS level 3 (version 2003) (Eurostat), Population density 2001 (JRC)





Challenge 6 : Urban Data

Objectives :

Insure compatibility between the different definitions of cities and urban areas currently available

Situation:

Great diversity of definitions, difficulty to combine data from different sources

Strategy:

Storage of metadata, dictionary of cities with common codification, conceptual clarification (technical reports)

1 – Semantic expertise

- Urban objects are complex geographical objects
  - **They are evolving through time in a geometric way implying an evolution of delineation**
  - **They are evolving through time in a semantic way implying to take into account a multiscalar perspective in their definition (agglomeration, commuting)**
    - **➔evolving sources for "measuring" the city**

➔ Multiplicity of possible databases
➔ Heterogeneity of international databases
➔ Possible incoherence of temporal data bases

- An illustration: Urban Audit LUZ (Larger Urban Zones)
  - 2 reference years (UA 2001 and UA 2004): temporal coherence?
  - Spatial heterogeneity of the national definitions: spatial coherence?