ESPON

RIMAP

Design and Development of Rich Internet Online Mapping Tool

Scientific Platform and Tools Project 2013/3/8

Final Report
31/12/2013

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This report presents a more detailed overview of the analytical approach to be applied by the project. This “Scientific Platform and Tools” Project is conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

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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Executive Summary

The RIMAP Final Report covers the work done during the last period of the RIMAP project, between October and December 2013.

According to Annex III of RIMAP Subsidy Contract (dated on 29th March 2012) the Final Report includes the following results:

- Final version of the Online Mapping tool.
- Final version of the User guidelines.
- Short reporting of the activities, both planned and realised, resolution of problems and definition of delimitations.

Taking it into account, this report is divided into 3 main sections:

- ❖ Overview of the Final Report.
- ❖ Results achieved.
- ❖ Annexes.

1. Overview of the Final Report.

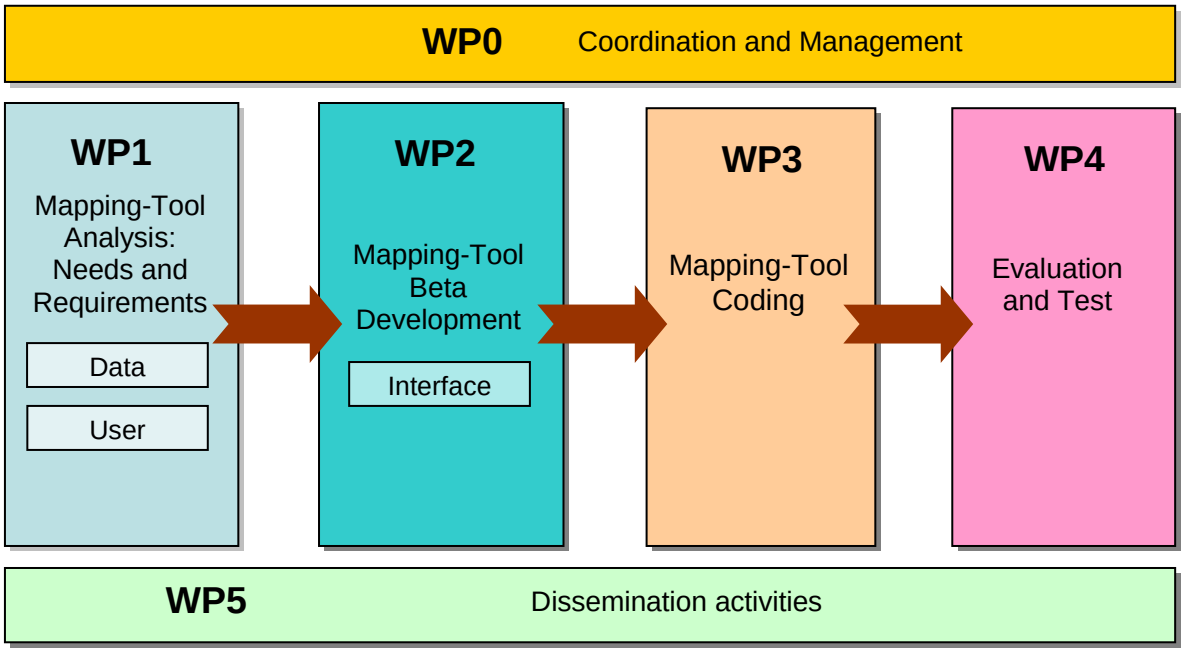
RIMAP (Rich Internet MAPping Tool) is conceived for an On-line tool development upon ESPON 2013 Database. This tool will be online, made available via ESPON website and should provide a toolbox to visualise and analyse data in maps and diagrams. The main target is to fill the gap between disseminating data in tables and disseminating data in fixed and interactive maps.

During the Inception period the main goal was to define the User and Data Requirements and the Architecture of the platform, during the Interim period the main goal was to translate these Requirements into a Prototype of the Mapping Tool and during the third period, the main goal was to code the functionalities and requirements specified obtaining a functional Mapping Tool.

In this last period, two main objectives were established:

- To finalise the Online Mapping Tool.
- To test the good working of RIMAP.

Taking a look the work plan (see figures 1 and 2), in this period RIMAP team has been working mainly in the WP3 and WP4.



Gantt Chart	YEAR 1 quarter				YEAR 2 quarter			
	1	2	3	4	1	2	3	4
WP0 - Coordination and Management								
WP1 – Mapping-Tool Analysis: Needs and Requirements								
WP2 – Mapping-Tool Beta Development								

WP3 – Mapping-Tool Coding								
WP4 – Evaluation and Test								
WP5 – Dissemination and Exploitation activities								

1.1. Work Package 0 – Coordination and Management.

The aim of this WP is to establish an effective coordination and decision structure to adequately address the following objectives:

- Assure the execution of work packages and deliverables in terms of execution time, cost and adequate quality.
- Specify project objectives to be achieved within the estimated time and cost frame.
- Ensure communication between ESPON and external.
- Organization and coordination of project start, meetings and workshops.
- Coordination of networking activities.

Regarding the Progress monitoring of RIMAP, there will be regular content deliveries, which will contain the detailed implementation of the project, the deliverables and the planning for the next reporting period:

- **Inception Report (June 2012).**
- **Interim Report (December 2012).**
- **Draft Final Report (September 2013).**
- **Final Report (July 2013).**

Furthermore, complete financial delivery (progress reports) will be submitted each six months period (according to point 5.3 of Subsidy Contract). These financial reports will be validated by the first level control (appointed by AIDICO in a decentralized system) *(see Annex A-2).*

The second progress report was delivered in January 2013 and the third progress report was delivered past in September 2013.

1.2. Work Package 1 – Mapping-Tool Analysis: Needs and Requirements.

The aim of this WP is to analyze the needs and requirements of the Mapping-Tool since different points of view:

- Data: Indicators and Geographical Info may be analyzed in order to define how must be shown.
- Users: Is very important to define user capacities in order to develop an easy and friendly tool.

This information is used to design the architecture of the Mapping-Tool through these actions:

- Selection of platforms and language development.
- Architecture design.
- Interface design.

Though this Work Package should be finished, we received some comments from other ESPON projects and we decide to update the interface design.

Deliverables

D1 User and Data Needs and Requirements Report (June 2012).
D3 Architecture Design Report (June 2012).

1.3. Work Package 2 – Mapping-Tool Beta Development.

The aim of this work package is to develop a Mapping Tool prototype which can be used to verify the understanding about user needs and requirements.

It's very important to work closely with database TPG 2013, in order to make a good connection.

Development of a Mapping-Tool functional prototype for each device (computer, tablet) was done as a limited representation of the final tool developed, allowing test real situations and explore the user experience.

Though this Work Package should be finished, we received some comments from other ESPON CU and we decide to update the table of content for the user guidelines.

Deliverables

D6 First beta-version of the Online Mapping tool (December 2012).
D7 Table of Content for the user guidelines (December 2012).

1.4. Work Package 3 – Mapping Tool Coding

The basic objective of this work package is to develop the code that implements the specifications and architecture defined in the previous tasks.

The code was developed taking account that the data, the logic control and user interface must be well differentiated so that any change in one of these three components will not affect others.

To draw the regions RIMAP uses a shape file that contains the geometry stored on ESPON database.

To create this shape file RIMAP queried to database for the higher NUTS version geometry stored.

The query used was:

```
SELECT foo.code as code, MAX(name) as name, geom as geometry, versionId,
version_name as versionName
FROM (SELECT code, MAX(idstatunit) AS id,
MIN(nomenclature_level.idnomenclature_version) AS versionId
FROM spatial.statunit JOIN spatial.nomenclature_level ON
statunit.idnomenclature_level = nomenclature_level.idnomenclature_level
WHERE label =?*
GROUP BY code) AS foo
JOIN public.nuts ON foo.code = nuts.id
JOIN spatial.statunit_name ON foo.id = statunit_name.idstatunit
JOIN spatial.nomenclature_version ON versionId =
nomenclature_version.idnomenclature_version
GROUP BY code,geometry,versionId,versionName
ORDER BY code
```

* ? is NUTS level (0,1,2,3)

Almost all the geometries obtained were 2010 version, but at the moment that RIMAP created this shape file not all regions had the 2010 version geometry stored, so that some regions are under 2010 version.

The NUTS version is shown when the pointer goes over the regions.

Deliverables

D8 Draft version of the Online Mapping tool (September 2013).
D9 Draft User guidelines (September 2012).

1.5. Work Package 4 – Evaluation and Test

The objective of this WP is to validate the system through testing and application examples.

The different modules were checked and in those cases where updates were needed, the source code was modified to ensure the quality of the result.

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Deliverables

D10 User Test Plan (October 2013)
D11 Final version of the Online Mapping tool (December 2013).
D12 Final User Guide (December 2013).

D13 Rimap Help (December 2013).

D14 Rimap Video-Tutorials (December 2013).

1.6. Work Package 5 – Dissemination Activities.

To carry out activities to disseminate research results and to prepare for their take-up and use, including knowledge management and, activities directly related to the protection of foreground.

A dissemination plan was made at the beginning of the project (following the indications in Annex III of the Subsidy Contract). RIMAP project Communication and Dissemination Plan are structured in the following elements:

- Objectives and stakeholders.
- Strategy, Activities and tools selected.
- Estimated budget to put into practice these actions.
- Main expected results.
- EC and ESPON Requirements.

2. Results achieved

During the first period of the project, some tasks have been developed related to WP0, WP3, WP4 and WP5.

2.1. User and Data Needs and Requirements

Though this task was finished, after receive some MC comments, was needed to make some changes adding new features and improvements.

2.1.1. Online Mapping Tool Wireframing

Though the Wireframing was restyled in the last period, some small improvements have been developed in this period, mainly to keep the possibility to select a secondary indicator.

The following figure shows the tool with this new look and feel.

Selected Indicator Description

NUTS Level Selector

Region Selection. Select regions to visualize on the map and graph.

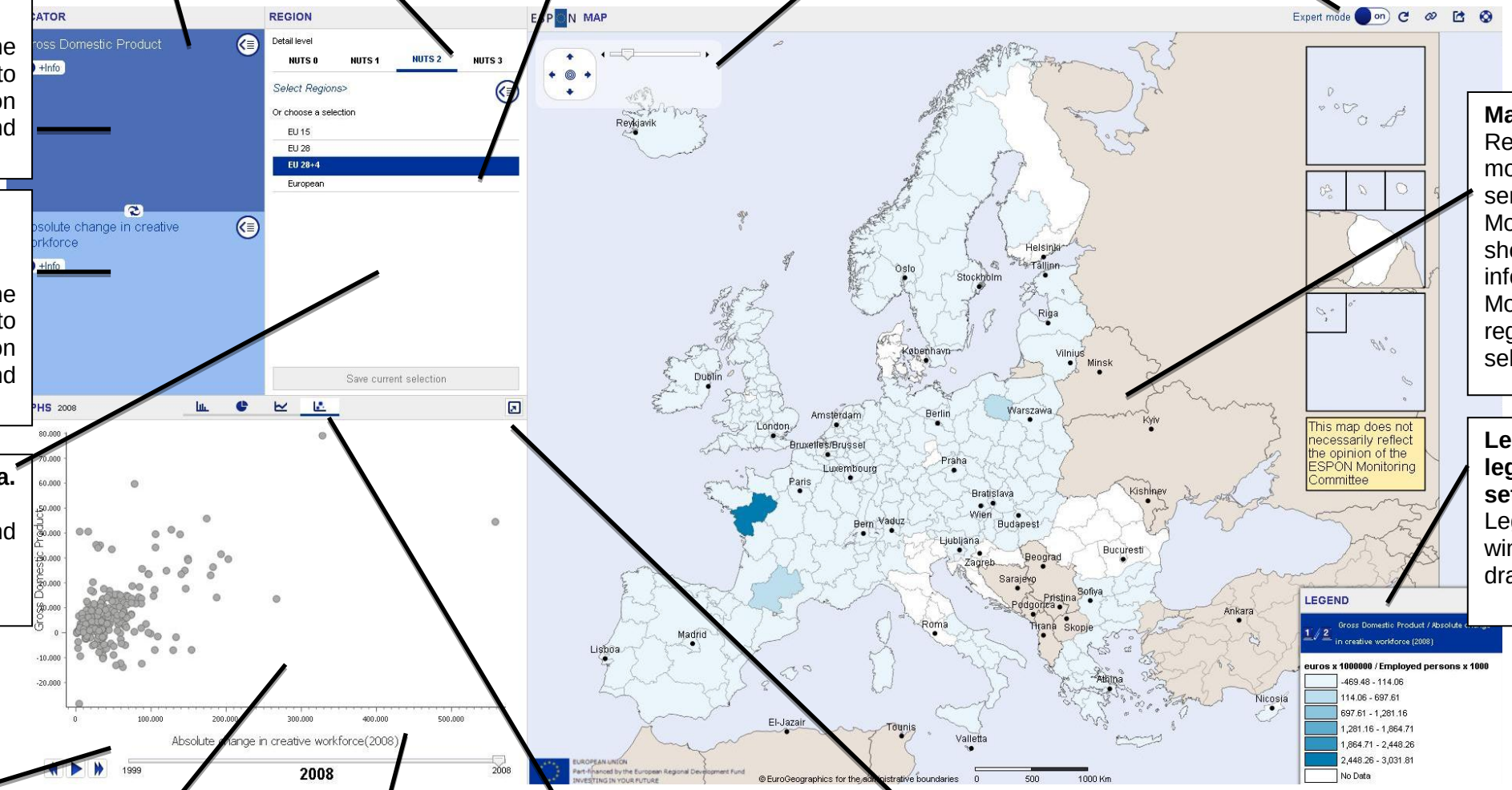
Pan and Zoom control Selector

Main Tool Bar: Profile, Restore, Share, Export, Map Settings and Help.

Main Indicator Selection. Select one indicator to visualize on the map and the graph

Secondary Indicator Selection. Select one indicator to visualize on the map and the graph

Study Area. Selection, creation and delete



Map. Regions are mouse sensitive. Mouse over: show information. Mouse click: region selection

Legend and legend settings. Legend window is draggable.

Animation buttons.

Data Graph.

Timeline

Graph Type selection: bar, chart, time series and scatter.

Graph tool bar. Settings and Maximize.

2.1.2. User Modes definition

Taking account the scenarios and user cases included in the deliverable **D1 - User and Data Needs and Requirements Report**, two well differentiated User profiles have been defined:

- Basic Mode. This mode should be quite simple, offering the most important functionalities.
- Expert Mode. This mode will integrate all the possibilities, integrating some analysis functionalities.

The following table summarizes the functionalities in each Mode taking account the different Domains (Visualization, Analysis, Output, Support):

Domain		Basic Mode	Expert Mode
Data	Indicators	Only core indicators from ESPON Database will be accessible.	All the ESPON Database indicators will be accessible
Data	Indicators Selection	Selection will be by theme in two steps: 1. Theme selection. 2. Indicator selection. A keywords search will be integrated too.	Selection will be by theme, policy or project (theme by default) in three steps: 1. Selection between Theme, Policy or Project; 2. Theme/Policy/Project Selection. 3. Indicator Selection. A keywords search will be integrated too.
Data visualization	Study Area	Predefined study areas, such as EU28+4, EU28, EU15 and European will be available for the user.	A keywords search has been integrated Predefined study areas, such as the EU28+4, EU28, EU15, European, Alpine Space, Atlantic Coast, Baltic Sea Region, Central Europe, Mediterranean (MED), North Sea, North West Europe, South East Europe and South West Europe, are available for the user. The user also is able to define a study area based on a group of countries and/or regions (NUTS 0, 1, 2, 3). This can be done by selecting them from a list or from the map using the mouse right-button. A button to save the selection is available. A button to delete user study areas will be available
Data visualization	Remark Area	Areas can be remarked (increasing its bright in the map and the graph) by hovering over them.	
Data visualization	Geometry Levels	Concerning the geometries and layers are included in the Mapping tool NUTS0 to NUTS3 geometries and the capital layer.	

Data visualization	Time evolution	When an indicator is available for a time series the user will have the possibility to view the changes over time in the map and the graph with some time controls: play, next, back, stop.	
Data visualization	Maximize	A maximize button will be included in the graph window.	
Data visualization	Map Zoom	Map Zoom in/out is available through buttons or mouse.	
Data visualization	Map Pan	Map Pan is available through buttons or mouse.	
Data visualization	Map Settings	No available	Map settings will be automatically saved using the browser cookies. On the other hand, a Restore button will initialize the map settings.
Data visualization	Indicators type	Each type of data must be painted in the map in a different way: • Absolute data: A dot with a size proportional to the value. Two colours (positive and negative) will be used. • Relative data: The region will be painted with a variation of colours (from light to dark). • Typology data. The region will be painted with an assigned colour (one by typology).	Each type of data must be painted in the map in a different way: • Absolute data: A dot with a size proportional to the value. Two colours (positive and negative) will be used. • Relative data: The region will be painted with a variation of colours (from light to dark). • Typology data. The region will be painted with an assigned colour (one by typology).
Data visualization	Relative Data. Ranges	6 lineal Ranges are defined. If positive and negative values are available, then 0 should be used as a break value.	By default, 6 lineal Ranges are defined. If positive and negative values are available, then 0 should be used as a break value. User will have the opportunity to change the minimum and/or maximum value, the number of Ranges and the type of classification (equal, quantiles, Jenks and

			manual intervals) and if 0 is a break value. Quantiles distribution would be: • 10, 50, 90. • 25, 50, 75. • 5, 25, 50, 75, 95.
Data visualization	Maps Colours Scheme	A default colour scheme will be available. • Absolute data: Positive values in blue and negative values in red. • Relative data: A green colour scheme. • Typology data. A multi-colour scheme.	A default colour scheme will be available. User will have the opportunity to change the colour scheme (see Interim Report Annex II) or to create another new.
Data visualization	Map Capitals	As a default the capitals will be indicated in the map displayed by their names and a symbol (•).User will have the opportunity to select if they are displayed or not.	As a default the capitals will be indicated in the map displayed by their names and a symbol (•). User will have the opportunity to make some changes in this in the font type, font size, colour, symbol, and if they are displayed or not.
Data visualization	Map Borders	As a default the borders should have a fixed setting on thickness and colour of the lines.	As a default the borders have a fixed setting on thickness and colour of the lines. The user has the opportunity to change the visualization of the borders regions (to each level) changing the thickness and colour of the border line and if they are displayed or not.
Data visualization	Map Contextual Information	The user also is able to retrieve information from the map by hovering over it, to retrieve information about the values in the map. The information that is displayed is the name and code of the region and the value of the data displayed.	
Geographical Comparison	Bar Chart	Some possibilities will be available: • 1 Indicator selected, Study Area Selected, 1 Year Selected. • 1 Indicator selected, Study Area Selected, 2 or 3 Years Selected.	

		• 2 Indicators selected, Study Area Selected, 1 Year Selected. The bar chart diagram works as frequency diagram in case of the Indicator was not numerical
Geographical Comparison	Bar Chart Sort	In a Bar Chart, data will be available to be sorted by: • Alphabetic. • Ascending. • Descending.
Geographical Comparison	Bar Chart Average	A line with average value will be able to be shown or not.
Geographical Comparison	Pie Chart	Some possibilities will be available: • 1 Indicator selected, Study Area Selected, 1 Year Selected. • 1 Indicator selected, Study Area Selected, 2 or 3 Years Selected. 2 or 3 pies will be shown in this case. • 2 Indicators selected, Study Area Selected, 1 Year Selected. The number of regions shown in the pie would be defined.
Time Evolution	Line Graph	This graph will be used to show information about 1 or 2 indicators in the Study Area Selected for several years.
Data Comparison	Scatter Diagram	This graph will be able to compare only one couple of Main Indicators.

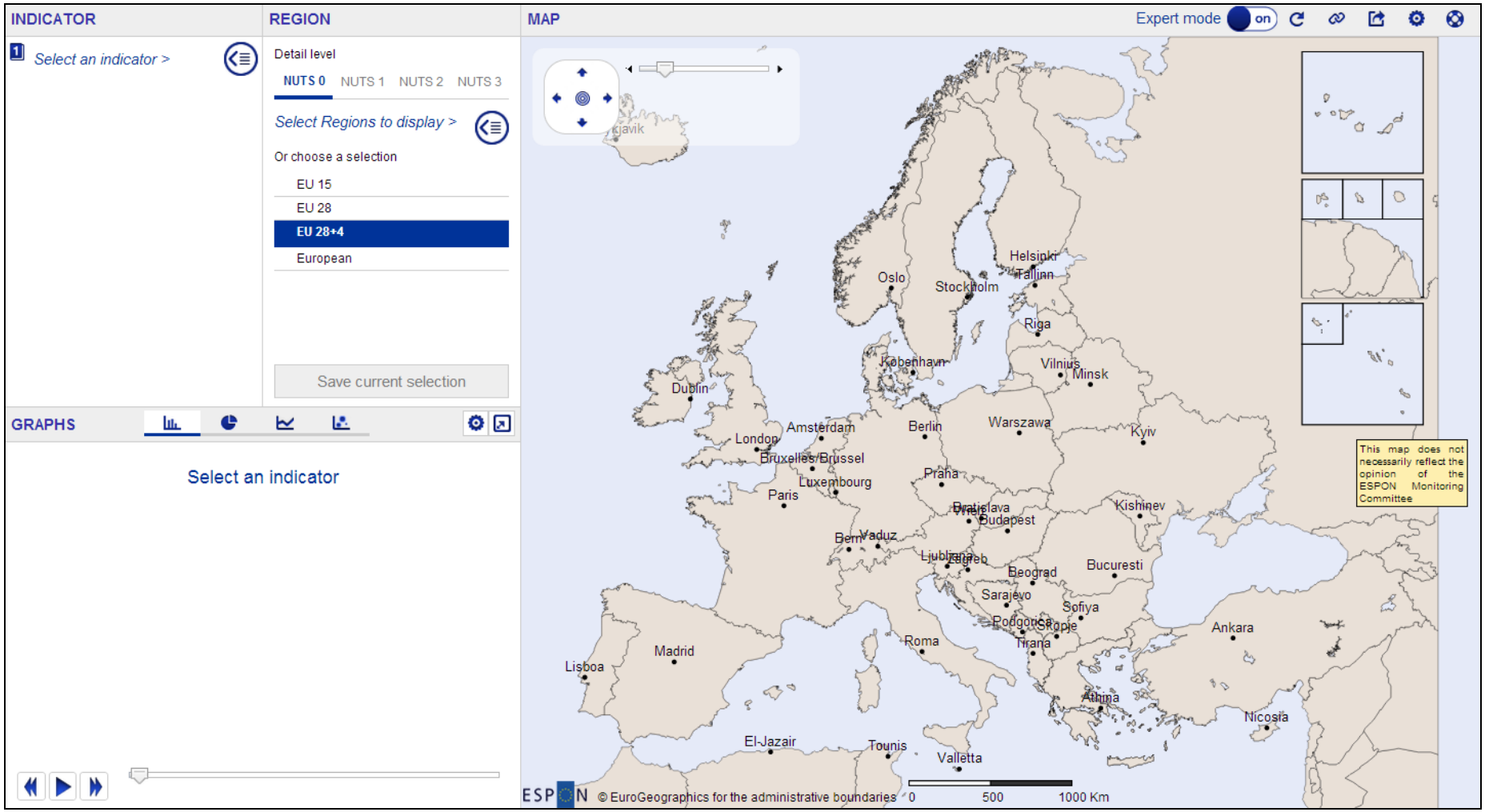
<table>
<tr><td>Data Comparison</td><td>Map</td><td>With this utility, two indicators will be shown in the map at the same time by different ways.
<table>
<tr><th>Indicator 2:
Indicator 1:</th><th>Absolute (A)</th><th>Relative (R)</th><th>Typology (T)</th></tr>
<tr><td>Absolute (A)</td><td>Ratio 1A/2A: area + col.var. based on ratio</td><td>1A: dot + size prop.
2R: area + col.var.</td><td>1A: dot + size prop.
2T: area + col.diff.</td></tr>
<tr><td>Relative (R)</td><td>1R: area + col.var.
2A: dot + size prop.</td><td>1R: area + col.var.
2R: area texture</td><td>1R: area + col.var.
2T: area texture</td></tr>
<tr><td>Typology (T) (qual. data)</td><td>1T: area + col.diff.
2A: dot + size prop.</td><td>1T: area texture
2R: area + col.var.</td><td>1T: area + col.var.
2T: area texture</td></tr>
</table></td></tr>
<tr><td>Output</td><td>Share</td><td>User will be able to share the map with a link through email or social networks.</td></tr>
<tr><td>Output</td><td>Export</td><td>User will be able to export the map made as a file in various formats such as pdf, jpg, png, xls.</td></tr>
<tr><td>Help</td><td></td><td>A Help menu will be available describing the main functionalities. Some videos will be integrated to clarify how to use RIMAP.</td></tr>
</table>

2.2. Final Version of the Online Mapping Tool

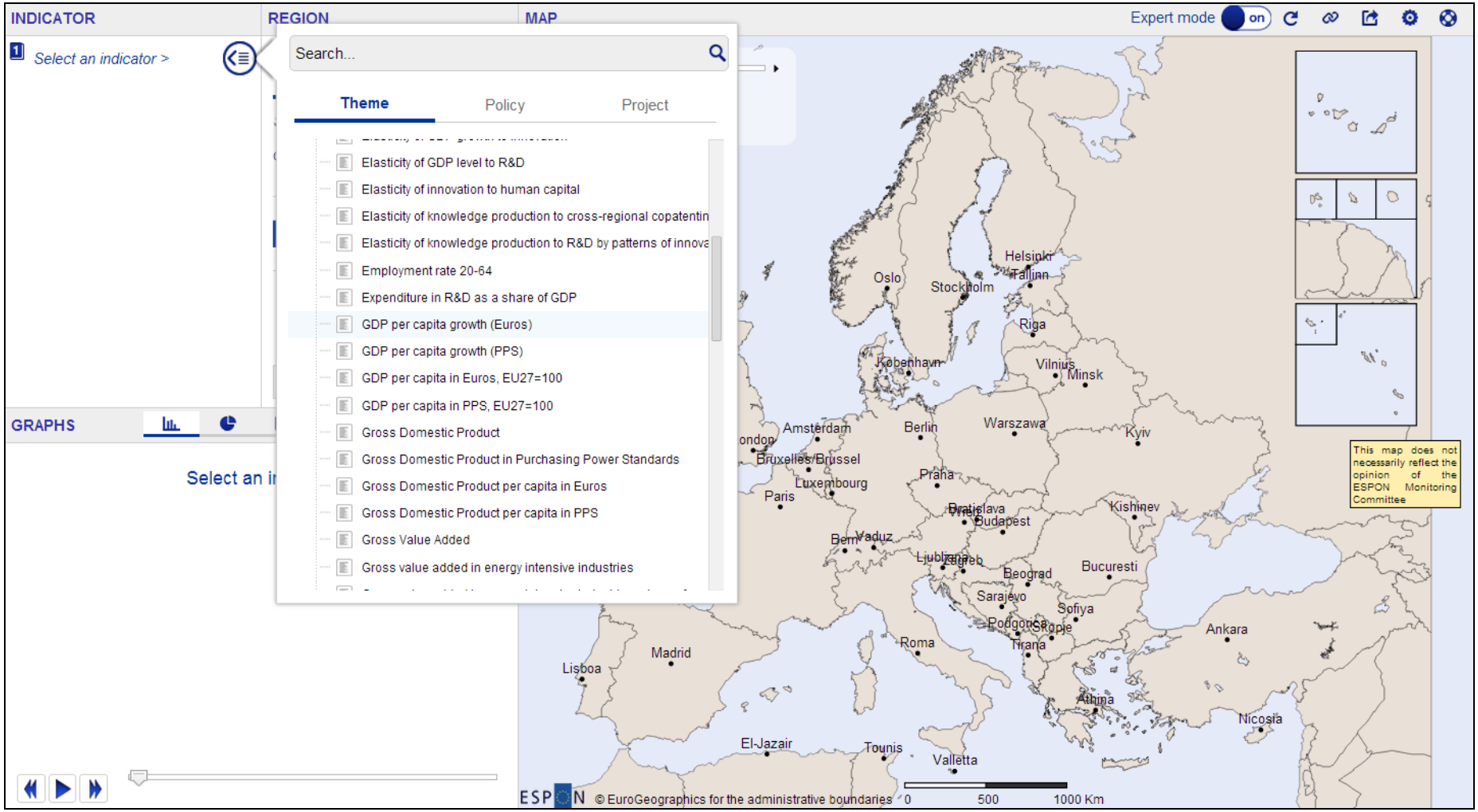
The Online Mapping Tool has been developed taking account the User and Data Requirements.

It has been installed into the ESPON Servers and it's available in http://rimap.espon.eu

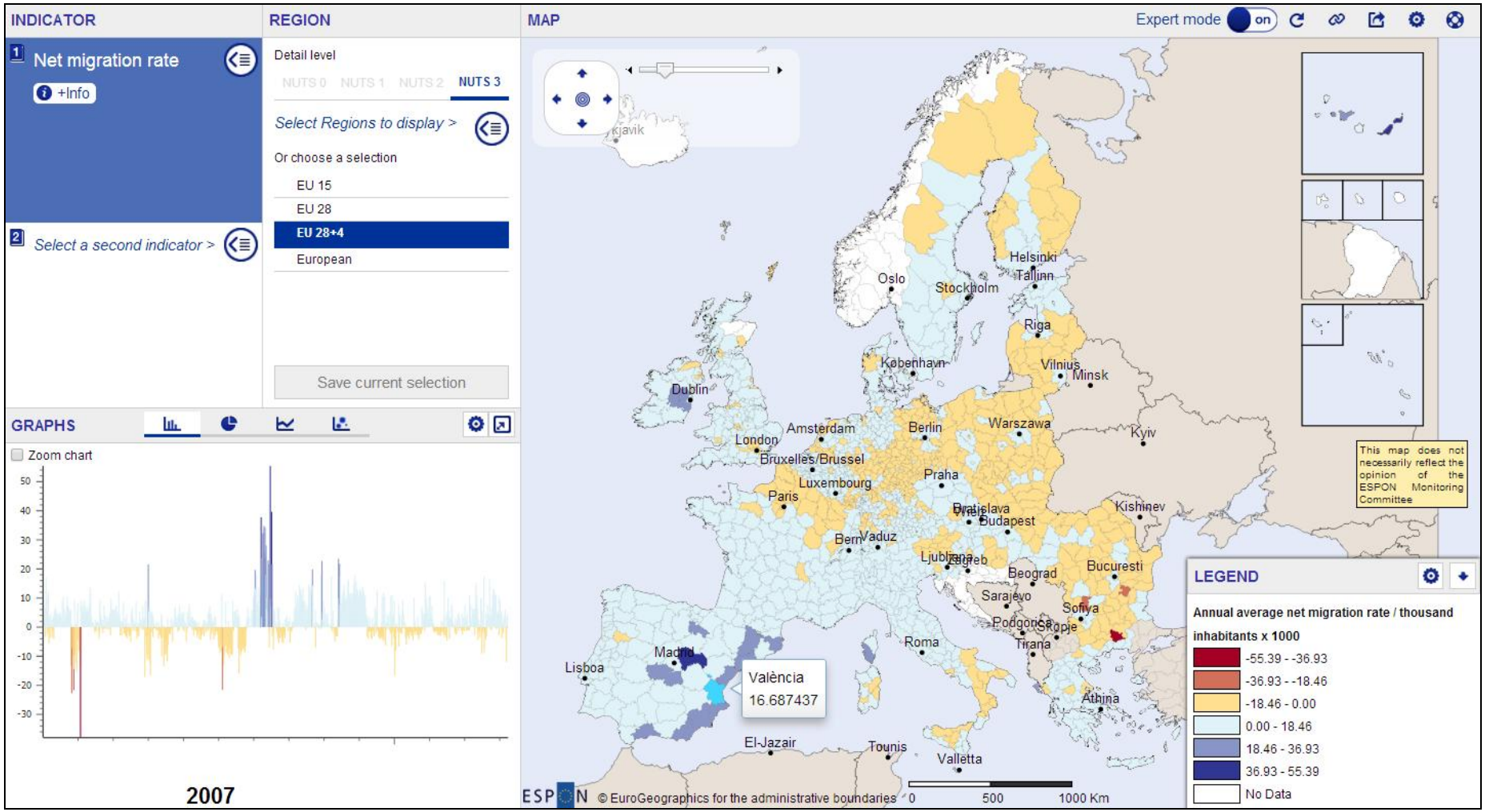
Some screenshots and a video tour (annexed) are included in this Report in order to be analyzed by ESPON Committee.


INDICATOR
REGION
MAP
Expert mode
on
Select an indicator >
Detail level
NUTS 0
NUTS 1
NUTS 2
NUTS 3
Select Regions to display >
Or choose a selection
EU 15
EU 28
EU 28+4
European
Save current selection
GRAPHS
Select an indicator
Reykjavik
Oslo
Helsinki
Tallinn
Stockholm
Riga
København
Vilnius
Minsk
Dublin
London
Amsterdam
Berlin
Warszawa
Kyiv
Bruxelles/Brussel
Luxembourg
Paris
Praha
Bratislava
Budapest
Kishinev
Bern
Vaduz
Ljubljana
Zagreb
Beograd
Bucuresti
Sarajevo
Sofiya
Podgorica
Skopje
Tirana
Roma
Madrid
Lisboa
Ankara
Athina
Nicosia
El-Jazair
Tounis
Valletta
This map does not necessarily reflect the opinion of the ESPON Monitoring Committee
ESPON
© EuroGeographics for the administrative boundaries
0
500
1000 Km

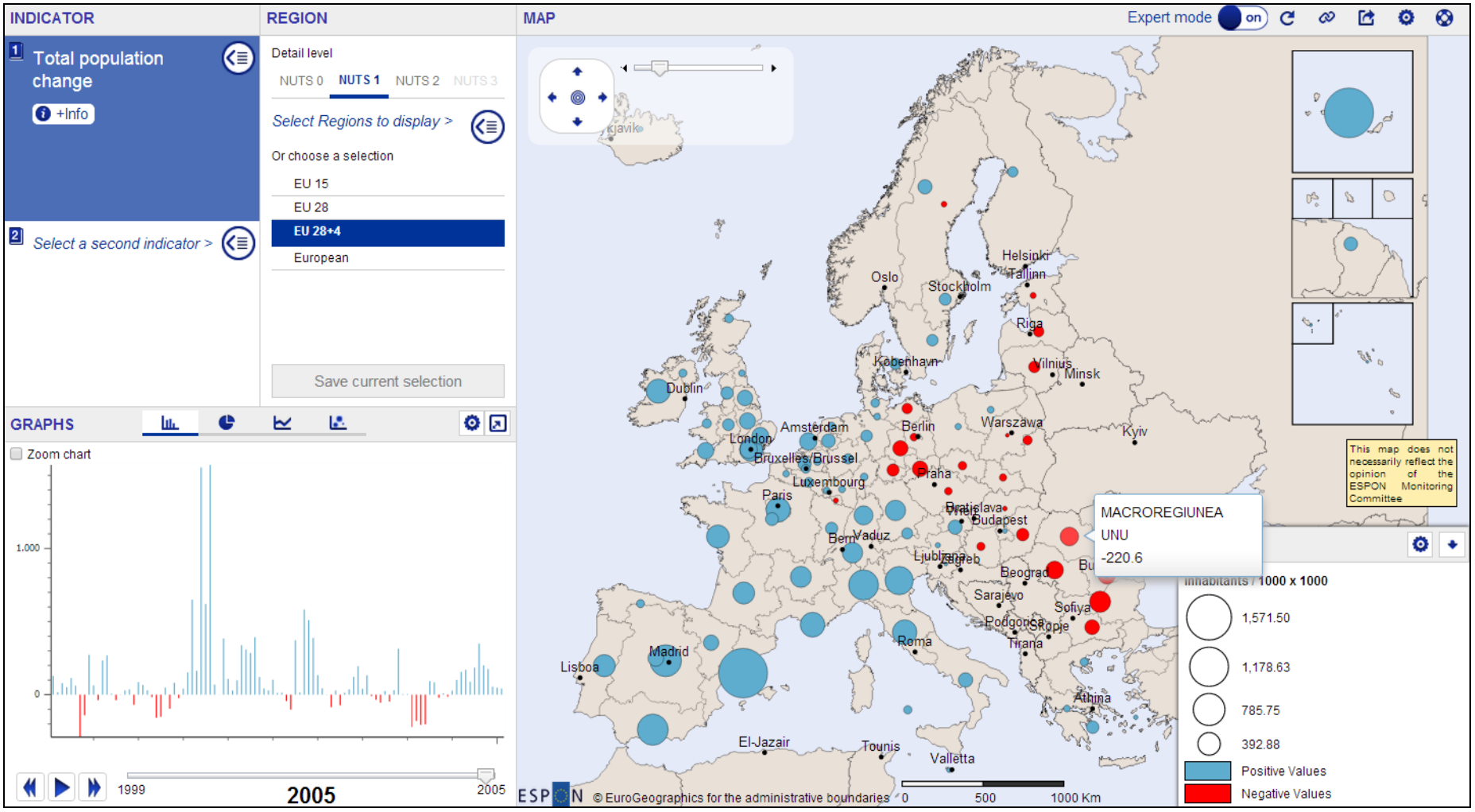
Homepage



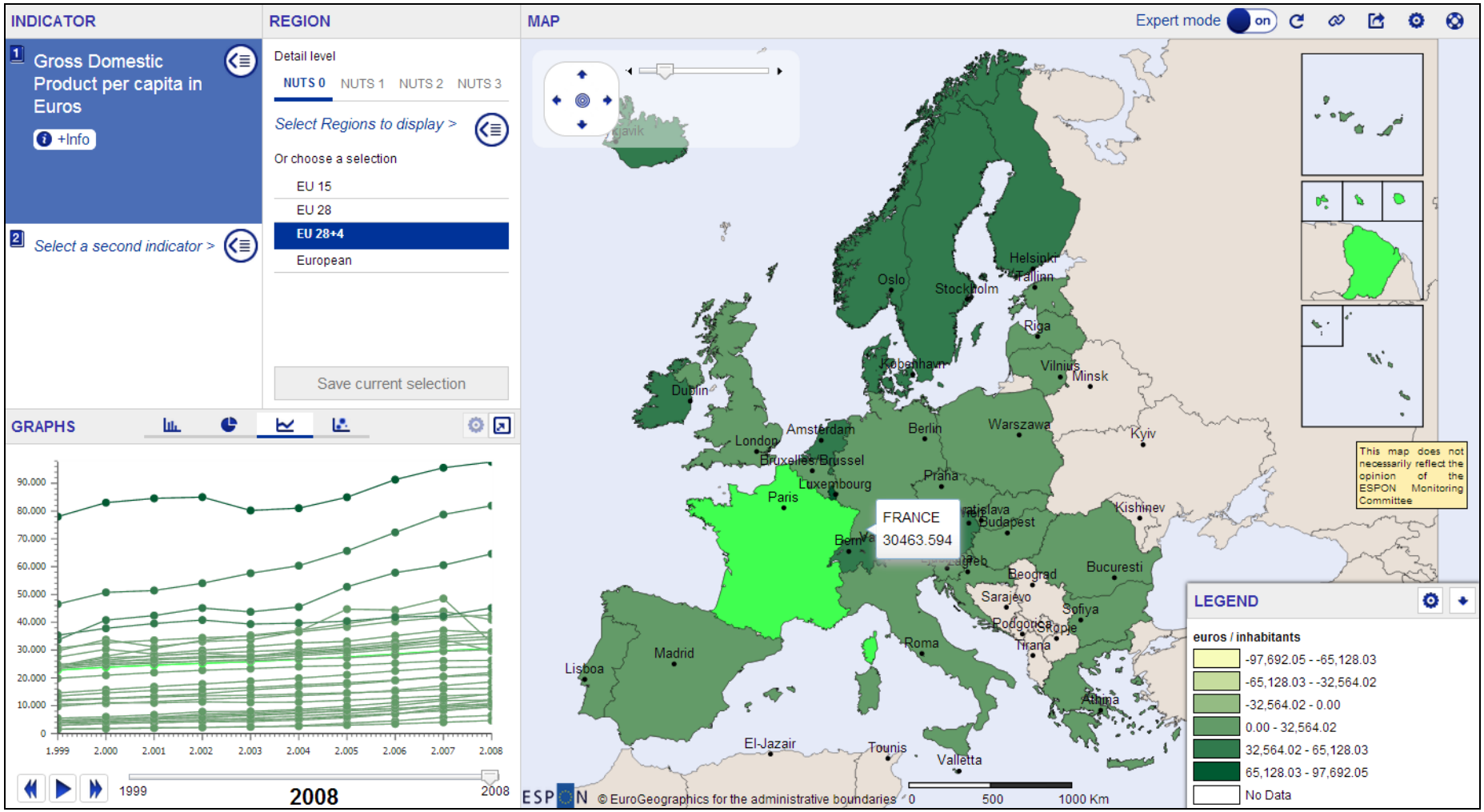
Indicator Selection



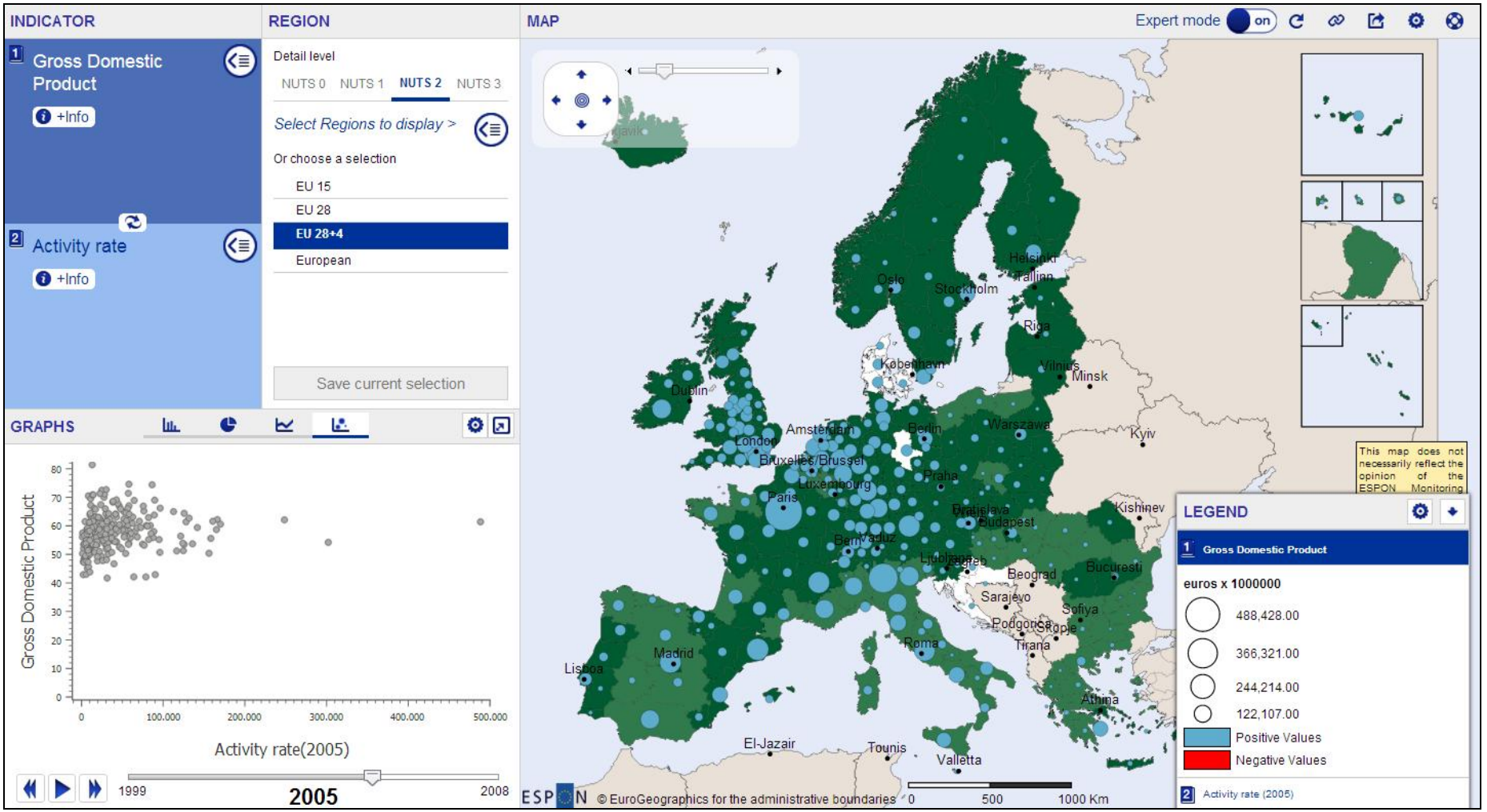
Choropleth Map (contextual information) and Bar Chart



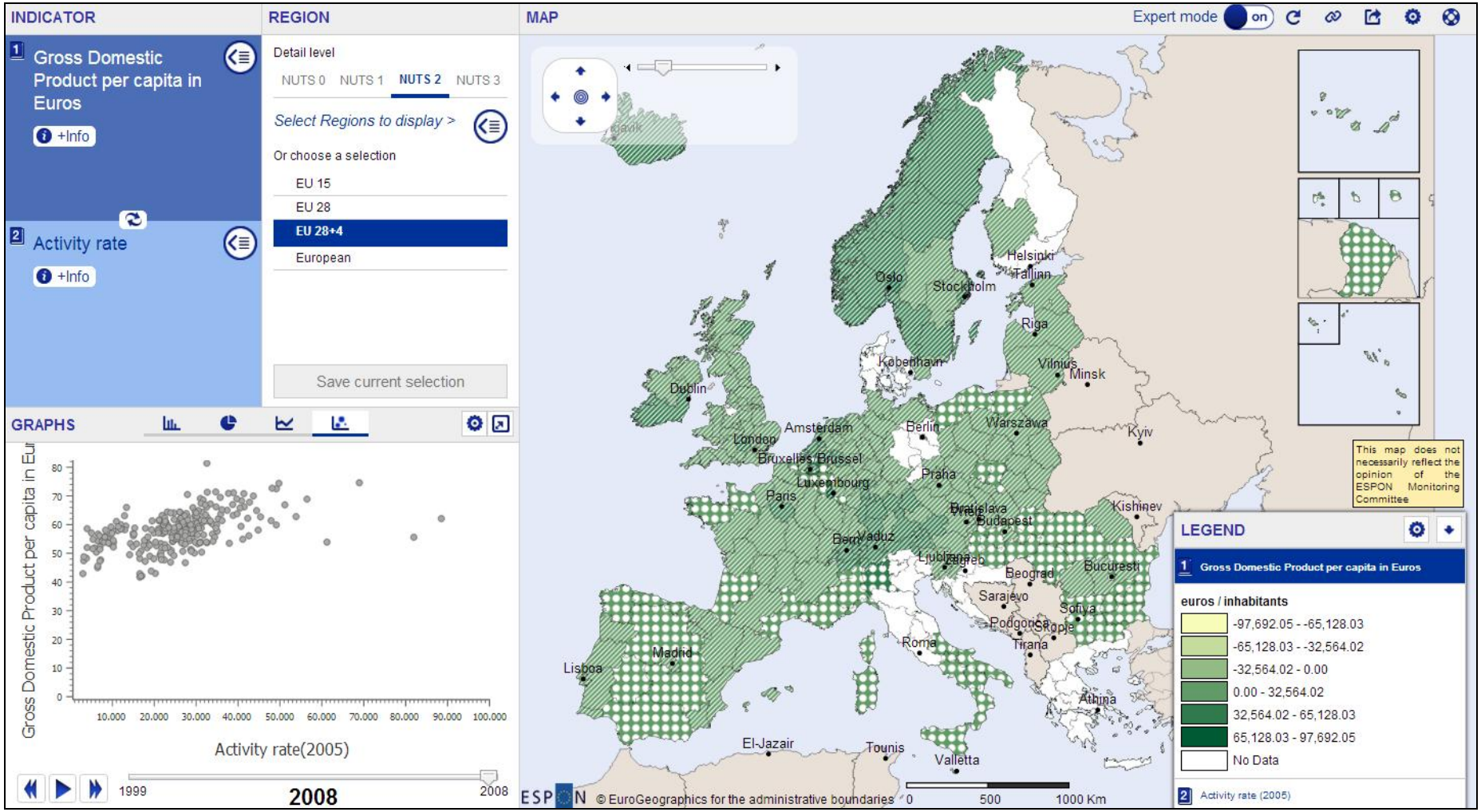
Dot Map (contextual information) and Bar Chart



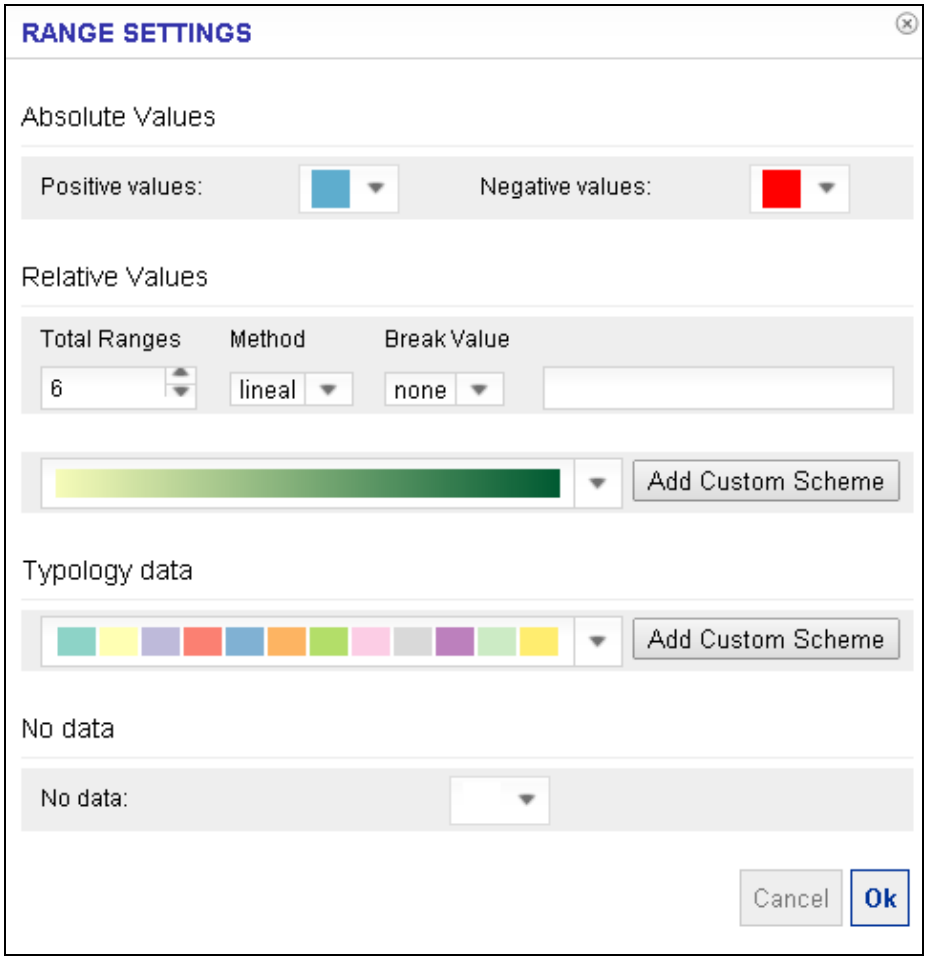
Choropleth Map and Time Graph



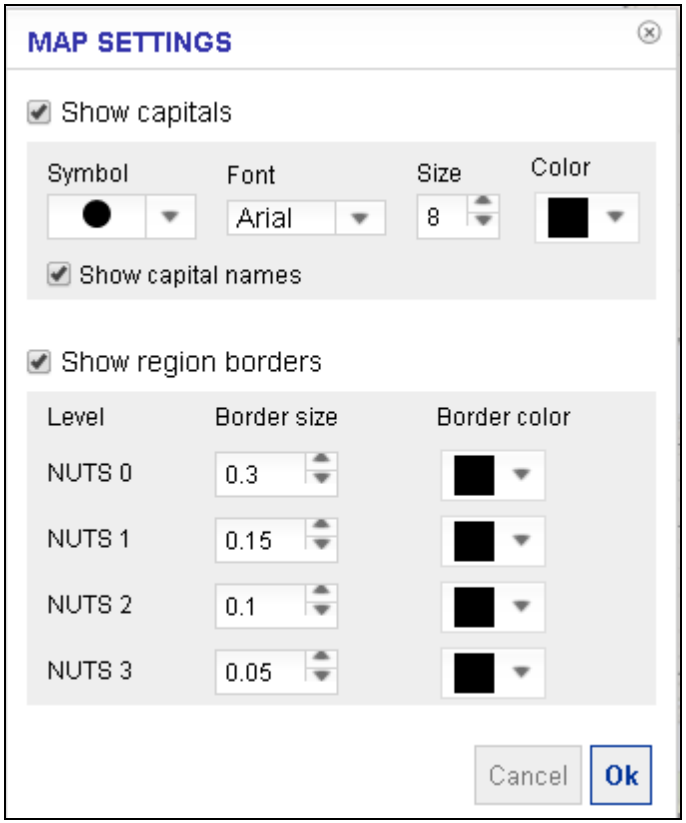
Absolute and Relative indicators: Choropleth and dots map



Two Relative indicators: Choropleth with textures



Legend Settings Window



Map Settings Window

2.3. User Guide

We have taken into account the comments and recommendations given by the Managing Authority and the Coordination Unit in order to provide some useful Help elements:

- User Guide. It's a document which describes in a detailed way how RIMAP works and all its functionalities. D12.
- RIMAP Help. It's a web document shown when user clicks on the Help button. It summarizes the main features and functionalities of RIMAP. It contains a link to the User Guide and to some Videos with examples. D13.
- Videos. Some videos have been recorded with examples about select an indicator, create a Study Area or change the different settings. D14.

2.4. Evaluation and test

The objective of the WP4 has been to validate the system through testing and application examples.

The different modules have been checked using a User Test Plan, D11.

In those cases where updates were needed, the source code has been modified to ensure the quality of the result.

2.5. Dissemination Activities

RIMAP website has been updated with a new video clip of the Online Mapping Tool.

RIMAP project was presented at Brussels, Belgium, 19th November 2013, in an Info Session organized by the Belgium Contact Points for the local stakeholders. A presentation and a Video were done.

RIMAP project was presented at Vilnius, Lithuania, 5th and 6th December 2013 in the ESPON Internal Seminar.

On the other hand, contacts between RIMAP and M4D teams have been established during this period.

Annex I. User Test Plan, Table of Contents (document provided as separate)

1. Introduction
2. User Mode
3. Indicators Selection
4. Study Area
5. Map Visualization
6. Graph Visualization
7. Indicators Comparison
8. Output
9. Bug Report Form

Annex II. User Guide, Table of Contents (document provided separately)

Annex III. RIMAP Help, Table of Contents (document provided separately)

Annex IV. RIMAP Video-Tutorials

Some video-tutorials have been developed and integrated into RIMAP to show how to use the main RIMAP functionalities:

- How to Create a Map.
- How to Create a Study Area.
- Charts.
- Indicators Comparison.
- How to configure the settings.
- How to export and share a Map

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