

ESPON HyperCarte Web Application

Multiscalar Territorial Analysis User's Manual



Powered by HyperCarte Research Group for ESPON

ESPON HyperCarte Web Application: Multiscalar Territorial Analysis

User's Manual: HyperCarte

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Abstract

This document provides the minimum information about how to use ESPON HyperAtlas and ESPON HyperAdmin from the ESPON HyperCarte Web Application version 1.0.2.

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Introduction

The next chapter, Overview, proposes an overview of a typical Multiscalar Territorial Analysis (MTA) session with ESPON HyperAtlas v2. Then, this document aims at providing an user's manual for the usage of the following applications:

- ESPON HyperAtlas
- ESPON HyperAdmin



First of all, please insure that you have carefully read the ESPON 2013 HyperAtlas Terms and Conditions of Use.

Both previous applications were historically available as standalone applications. They are now available from the Internet and embedded in a Web application whose main pages and use are described in the first part of this document : ESPON HyperCarte Web Application.

HyperCarte Research Group aims at providing projects and applications for interactive cartography. The projects focus on the development of an easily understood methodology that allows the analysis and visualization of spatial phenomena, taking into account its multiple possible representations.

Statistical observations of the territory are complex, and one representation, directly linked to a precise objective, is the result of a combination of different choices which are relative on one hand to the territories and their geographical scales, to the the statistical indicators on the other hand. This is of interest for researchers as well as for development policy decision-makers.

Thus, the principal innovative aspect of the HyperCarte project lies on this perspective based on the popularization of methods coming from spatial analysis such as the fitting of territorial scales, gradients, discontinuities.... This supposes an effort of multidisciplinary cooperation between geographers and computer scientists in order to create new maps in real time according to the different choices. An important effort has concerned ergonomics and time of calculus.

Main partners of the HyperCarte research group are:



RIATE [UMS 2414] <http://www.ums-riate.com>



CNRS UMR 8504 Géographie-Cités [UMR 8504]
<http://www.parisgeo.cnrs.fr>



LIG-MESCAL [UMR 5217] <http://mescal.imag.fr/>



LIG-STeamer [UMR 5217] <http://steamer.imag.fr/>

For more information, please visit HyperCarte Research Group Web site on <http://hypercarte.imag.fr>.

Chapter 1. Overview

As an introduction, this chapter proposes an overview of a typical ESPON HyperAtlas v2 session, describing possible paths of investigation.

Users of the ESPON HyperAtlas v1 may remember the *typical* path of investigation, they were supposed to follow the seven following steps:

1. Choice of area, zoning and indicator of interest (that's to say a ratio)
2. Visualization of the ratio and (eventually) visualization of numerator and denominator without transformation
3. Analysis of inequalities at large level
4. Analysis of inequalities at medium level
5. Analysis of inequalities at local level
6. Synthesis of inequalities at large, medium and local level
7. Export of results towards a report

Of course, users are free to develop their own paths of investigation, and we can imagine different types of scenarios where users do not follow steps 1 to 7, but they adopt different strategies.

Let's now consider the following examples to demonstrate the benefits of a Multiscalar Territorial Analysis approach thanks to ESPON HyperAtlas:

- **Example 1**

A stakeholder interested in the reform of structural funds after 2013 will probably use a path of investigation following the type **(1)=>(3)=>(7)** that will be repeated many times in order to test various scenario of allocation of funds. For example, what happens if:

- NUTS2 is replaced by NUTS3?
- GDP pps is replaced by GDP in Euro?
- the threshold of 75% of EU mean is replaced by 80%?
- Turkey joins EU?
- etc.

- **Example 2**

A local decision maker mainly interested in its region may use a path of investigation following the type **(1)=>(6)=>(Save map)**, if the objective is to quickly extract three figures describing the situation of the regions at European, National and Local levels for a given criteria. He/she can then decide to click on other regions in order to benchmark its situation with neighbouring areas, or to identify other regions with the same strength and weaknesses. He/she can also decide to modify the indicator and to explore the strength of weaknesses of his/her region for various criteria, GDP/inh, unemployment, accessibility, ageing, etc.

- **Example 3**

A spatial economist interested in economic convergence may decide to examine the situation of regions according to vertical contexts (e.g. belonging of region to a state, an INTERREG area) and horizontal contexts (e.g. difference between a region and its neighbours for different thresholds of

contiguity or distance). He/she will therefore follow the expected steps **(1) to (7)**, but he/she will probably introduce loops in the steps **(4)** and **(5)** in order to explore different variants of vertical and horizontal context. The loop **(1)=>(5)** will for example provide answer on question like the GDP/inh. Of course, the region of Budapest is greater than the neighbours for a distance of one hour by road, but what happens for a distance of two hours on a truck? Four hours? etc.

Having established that different users will not pay equal attention to the different functions offered by HyperAtlas, we can also suspect that expert users will expect more sophisticated functions than non-expert users, who will be on the contrary reluctant to enter into complex indicators or results.

Considering these different types of users, ESPON HyperAtlas v2 provides an **expert mode** (see ESPON HyperAtlas expert mode chapter), opened on request by the user (expert users or curious). In summary, the expert mode provides the following tools that complete the typical path of investigation:

- Equi-repartition maps, one per context, for Large, Medium and Small (local) levels
- Lorenz curve and statistical indexes (Gini index, Hoover index, coefficient of variation, ...)
- Boxplots
- Spatial autocorrelation chart

Part I. ESPON HyperCarte Web Application

This part describes the main pages of the ESPON Web Application embedding the ESPON HyperAtlas and ESPON HyperAdmin applications.



Some pages are only available to registered users, hence the following dedicated chapters:

- pages for any users are described in All users chapter;
- pages for registered users are described in Registered users chapter.

Chapter 2. All users

First access to the Web Application invites the user to read and accept the conditions and terms of use of the HyperAtlas, as shown on Figure 2.1.



On following screenshots, the `http://127.0.0.1:8080/` is the IP address of the alpha application that has been used to create this document..

The links on the top right menu bar of the page provides the main topics that are available for this ESPON HyperCarte application:

- **HyperAtlas:** when the user accepts the conditions of use (see Figure 2.1) , he/she can execute the ESPON HyperAtlas v2 applet. This applet allows then to perform a multiscalar territorial analysis on a default dataset (currently: Economy and Social Affairs). Please consult ESPON HyperAtlas part of this document for further information on how to use ESPON HyperAtlas.
- **Dataset:** for further analysis, this page provides a list of available datasets that can be loaded by the ESPON HyperAtlas v2 (Figure 2.2).
- **Log in:** as shown on Figure 2.3, this page provides a form for registered users who can log into the application in order to access advanced features. Registered users are invited to consult Registered users section.
- **Help:** displays links to the user's manual and the version of the Web Application, as shown on Figure 2.4.

All users

Figure 2.1. ESPON HyperAtlas License



The license must be read and accepted by the user before accessing the ESPON HyperAtlas applet.

Figure 2.2. Dataset Page

The list of available datasets on this page provides various thematics and study areas. Click the name of the dataset to load the associated hyp file into HyperAtlas.

All users

Figure 2.3. Log in Page



- Ⓢ "Forgotten login?" and "Not registered yet?" links are not implemented yet. Just check a "missing feature" page is returned on clicking these links.

All users

Figure 2.4. Help



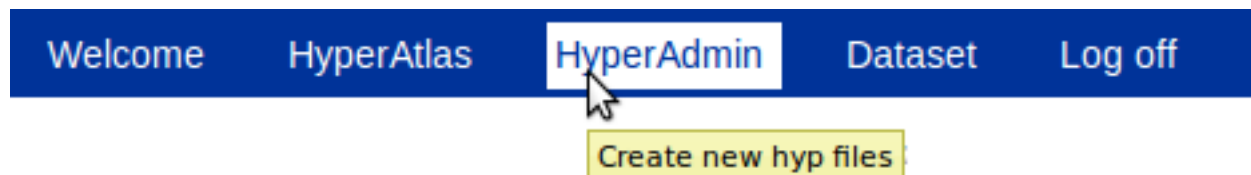
Links to the ESPON HyperCarte User's Manual and version information.

Chapter 3. Registered users

Once logged in with a valid login/password pair, available topics in the main menu bar of an authenticated session depend on the current user's status:

- a user whose status is simply **registered** can use ESPON HyperAdmin integration tool to generate new dataset .hyp files.

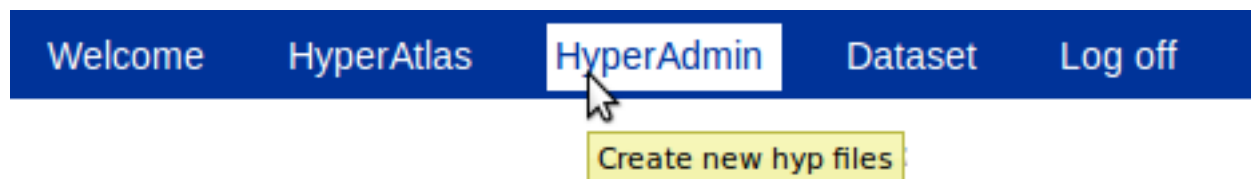
Figure 3.1. Registered status menu bar



The main menu bar of the Web application for an authenticated user whose status is "Registered".

- a user whose status is **advanced** can not only use ESPON HyperAdmin but he/she can also submit new datasets (.hyp files) in order to make them available to everybody from the "Dataset" page of the application.

Figure 3.2. Advanced status menu bar



The main menu bar of the Web application for an authenticated user whose status is "Advanced".

Of course, any available feature to all users (see All users chapter) is also available to registered users.

The tools of the authenticated session can be summarized as a typical scenario in three steps:

1. create a new dataset: as building a new dataset is quiet an advanced subject, the detailed use of ESPON HyperAdmin is further described in the ESPON HyperAdmin part of this document.
2. check your newly created dataset hyp file from ESPON HyperAtlas (see ESPON HyperAtlas part of this document)
3. submit the dataset ("advanced" status users only) as described below, How to submit new dataset hyp files? [9]

The "hyp(s)" page of the authenticated session provides a form to upload an hyp file from your disk to the server, as shown on Figure 3.3. The form requires the input of a name and of a description for your dataset. This name and this description will be displayed in the table of the "Dataset" page (see Figure 2.2), they are independant of the name and description you have entered while creating this dataset.

Figure 3.3. Hyps upload form

ESPON HyperCarte Web Application - Add a new dataset - Mozilla Firefox

http://127.0.0.1:8080/ESPON_HyperCarte/addStartHyps.action

ESPON HyperCarte Web Application > ...

Home

Welcome HyperAtlas HyperAdmin Dataset **hyps** Log off Help

Click to manage the available datasets

Upload a new dataset (hyps file) to the server, all fields are required.

Browse...

Project name

Project description

FAQ Contact Links Site Map Legal notice

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http://127.0.0.1:8080/ESPON_HyperCarte/hypsLink.action

Requires an hyps file, a name and a description for the dataset to be added.



Please test your hyps file with ESPON HyperAtlas before submitting it, as it will be available to all users. The provided management feature currently only allows to add datasets, not to remove available ones. This "remove" feature can currently only be performed by the administrator of the server.

Part II. ESPON HyperAtlas

ESPON HyperAtlas is a tool for **Multiscalar Territorial Analysis**: several indicators on the basis of the ratio of two initial geographical indexes can be derived, according to different spatial contexts.

Multiscalar Territorial Analysis is based on the assumption that it is not possible to evaluate the situation of a given territorial unit without taking into account its relative situation and localization. Regions belong to territorial and spatial systems. Indeed, from a policy point of view and in a social science perspective, contrasts and gradients are of much more interest than absolute values. Furthermore, aggregating and disaggregating territorial units allow to see how local values add up to form territorial contexts and regional positions.

Whatever the indexes used for political decisions, they have to be evaluated in relative terms. This may be done according to various territorial contexts. Thus one spatial organization may be examined from three different viewpoints that are three territorial contexts. They are differentiated according to the scale of political intervention or action they are referring to and that have a sense for the questioning: a global one, a medium one and finally a local one. Thus what is represented is the deviations to the three reference values associated to these different levels.

Let us take the example of the European union as a set of 25 countries, at the level of the region (NUTS2 for instance), and let the observed index be the wealth per resident in the regions (GDP/inh.). It is possible with ESPON HyperAtlas to consider the level of wealth of the regions relatively to three territorial contexts, and not only from an absolute point of view. The chosen contexts may be for instance respectively:

1. the whole European Union;
2. the country;
3. the neighborhood defined by contiguous regions.

ESPON HyperAtlas proposes for such an indicator a set of maps and charts that will be furthermore described in MTA parameters and Tools:

- First maps show the selected study area, both the parent distributions as disc maps (here, wealth and population) and their ratios, that is to say the chosen index's one.
- Then, three maps show the relative deviations to the three chosen contexts as choropleth maps. For the above example: the deviation of a region to the European reference area, the deviation of a region to its national reference area, and in the third place the deviation of a region to the local reference area.
- Then, two synthesis maps allow to evaluate the different combinations of the three previous relative deviation maps.
- More advanced users are also provided a set of new tools like the maps of redistribution, the Lorenz curve and a chart of spatial autocorrelation.



Here are some political justifications about the contextual and multilevel mapping, based on the European example:

- The first map where the referent context is the global one is the classical way of mapping an index when the chosen context is the studied area. The values of the indices are converted into a global index.
- The second map, corresponding to the intermediate level, here the national one, is very important to combine with the previous one. Indeed, many contradictions can appear between the two levels, with important political consequences.
- The third one is based on the local differential between one region and the neighbouring ones according to various criteria of proximity (contiguity, time-distance). According to recent research in the field of spatial economy and regional science, those local advantages/handicaps appear to be of crucial importance for the regional cohesion because they are strongly connected with the action of economic or social actors.

- The multiscalar approach proposed to evaluate the same index at various scales. In terms of territorial cohesion, it is indeed very important to evaluate the level of development of a region according to at least three levels.

Chapter 4. ESPON HyperAtlas startup



Before starting ESPON HyperAtlas:

ESPON HyperAtlas is available on-line from the ESPON HyperCarte Web Application (see Figure 2.1 in All users chapter).

Based on the Java technology applet, ESPON HyperAtlas requires a standard Web browser and a correctly installed Java Runtime Environment (JRE) plugin. This JRE is available by default on all standard Web browsers, whatever the platform is. A version 1.6 or upper of the JRE is advised, when available for your operating system. Nevertheless, on Mac OS X 32 bits platform, the user can currently (2010) not select a more advanced version than 1.5, but ESPON HyperAtlas is compatible with this version. So, please update your environment to get at least this version 1.5 of the JRE, but prefer the 1.6 when possible.

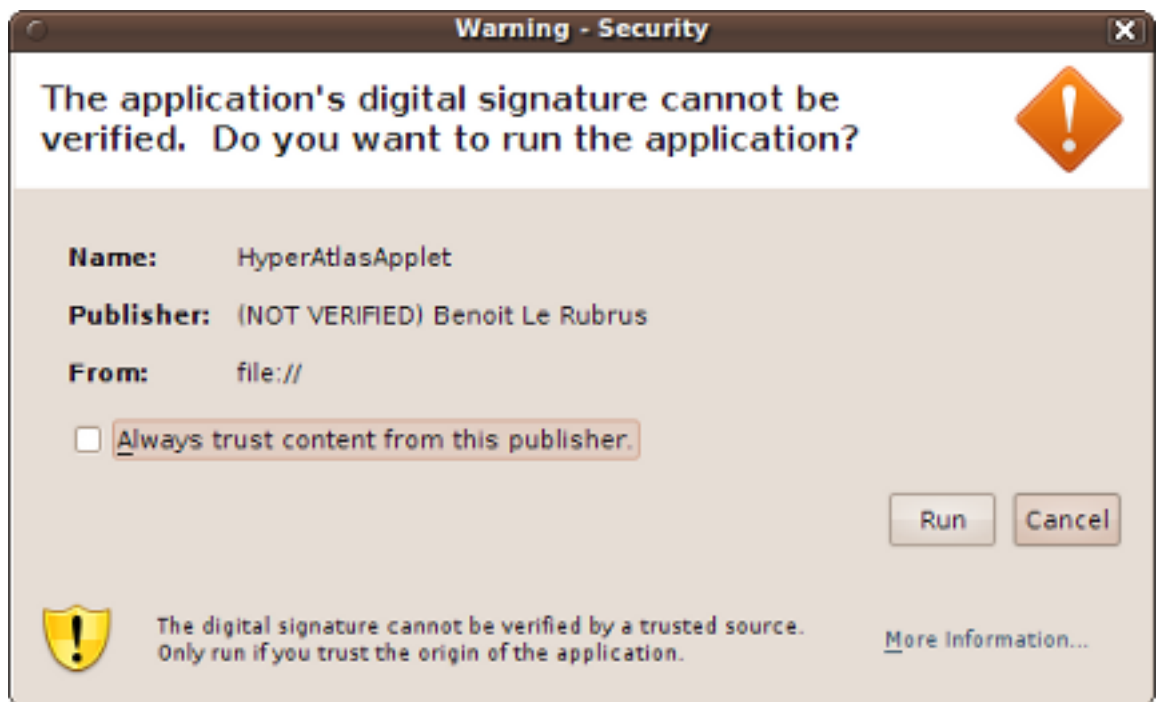
For more information about your JRE, please consult the following links (last visit: 20101228):

- Verify Java version [<http://www.java.com/en/download/installed.jsp>]
- How do I enable java in my web browser? [http://www.java.com/en/download/help/enable_browser.xml]
- Mac OS X users: Java Frequently Asked Questions [<http://developer.apple.com/java/faq/>]

Before starting the application, the user is warned that the HyperAtlas Applet is about to be run without the security restrictions that are normally provided by Java. Indeed, ESPON HyperAtlas is allowed to read-write on the user's disk to load a personal .hyp file or to write an html report for example. To overcome the default behaviour of Java Applets that are not allowed to write on the user's disk, the ESPON HyperAtlas applet has been signed with a CNRS-2 standard certificate (CNRS is an acronym for *Centre National de la Recherche Scientifique*).

Thus, the security warning window (Figure 4.1) which is opened before the startup of the application is expected. The user can insure about the content he is about to execute by opening the details of the certificate, as shown on figures Figure 4.2 and Figure 4.3.

Figure 4.1. Security Warning



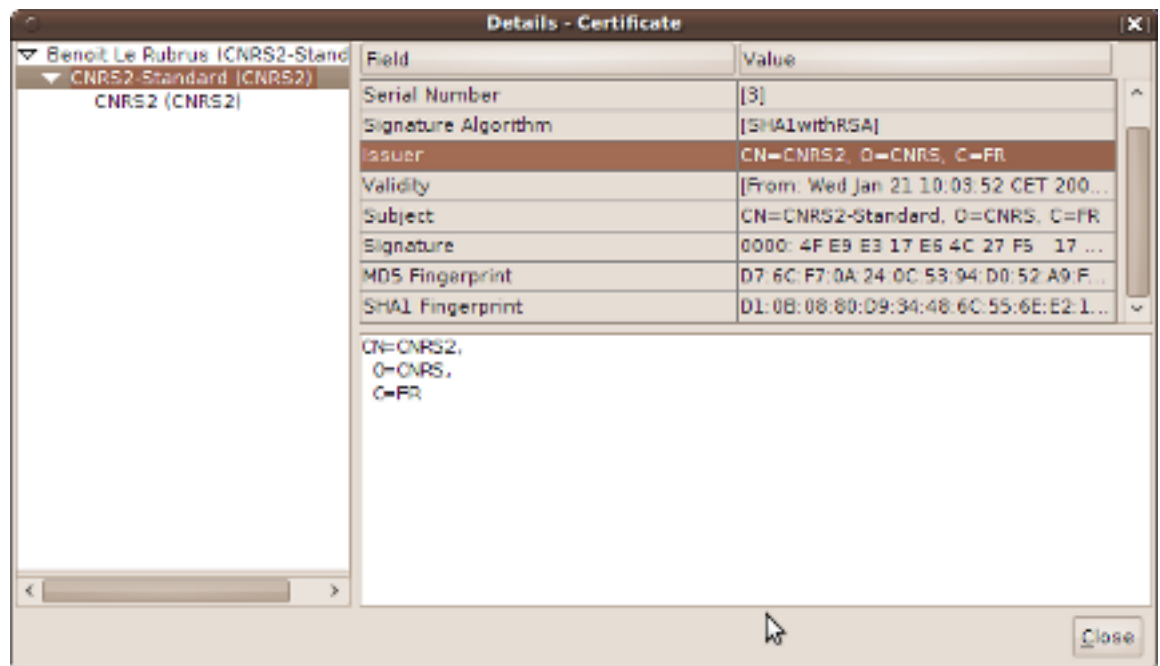
JVM Applet execution security warning displayed window before startup.

Figure 4.2. Security Warning: More Information



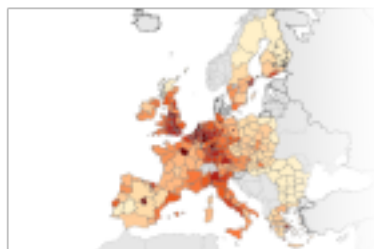
The user has clicked the `More information...` link on the bottom of the window Figure 4.1

Figure 4.3. Security Warning: Certificate Details



The user has clicked the `Certificate details...` link on the bottom of the window Figure 4.3

Once the user has clicked the Run button on the security warning popup window, the ESPON HyperAtlas applet begins to load a dataset. Depending on the speed of this loading, a splash screen icon may appear a few seconds:



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Chapter 5. ESPON HyperAtlas input dataset

The datasets provided by geographers are serialized in a convenient format for ESPON HyperAtlas to a binary file named with the `.hyp` extension (example: `Europe_2007.hyp`). As a convention, these ESPON HyperAtlas dataset input files will be now called **hyp files**.



A complete description of the ESPON HyperAtlas integration tool, named ESPON HyperAdmin, is available from the ESPON HyperAdmin part of this document.

ESPON HyperAtlas is designed so it can load any dataset serialized as an `hyp` file. From the "HyperAtlas" menu item of the HyperCarte Web Application main menu bar, once the user has accepted the terms and conditions of use (see Figure 2.1), the ESPON HyperAtlas loads a default dataset: **Economy and Social Affairs**.

The user can also load a dataset `hyp` file from his disk via the "File-Open" menu item of the application.

Customized datasets for various topics are also available from the "Datasets" page of the Web Application, see Figure 2.2.

Chapter 6. Overview

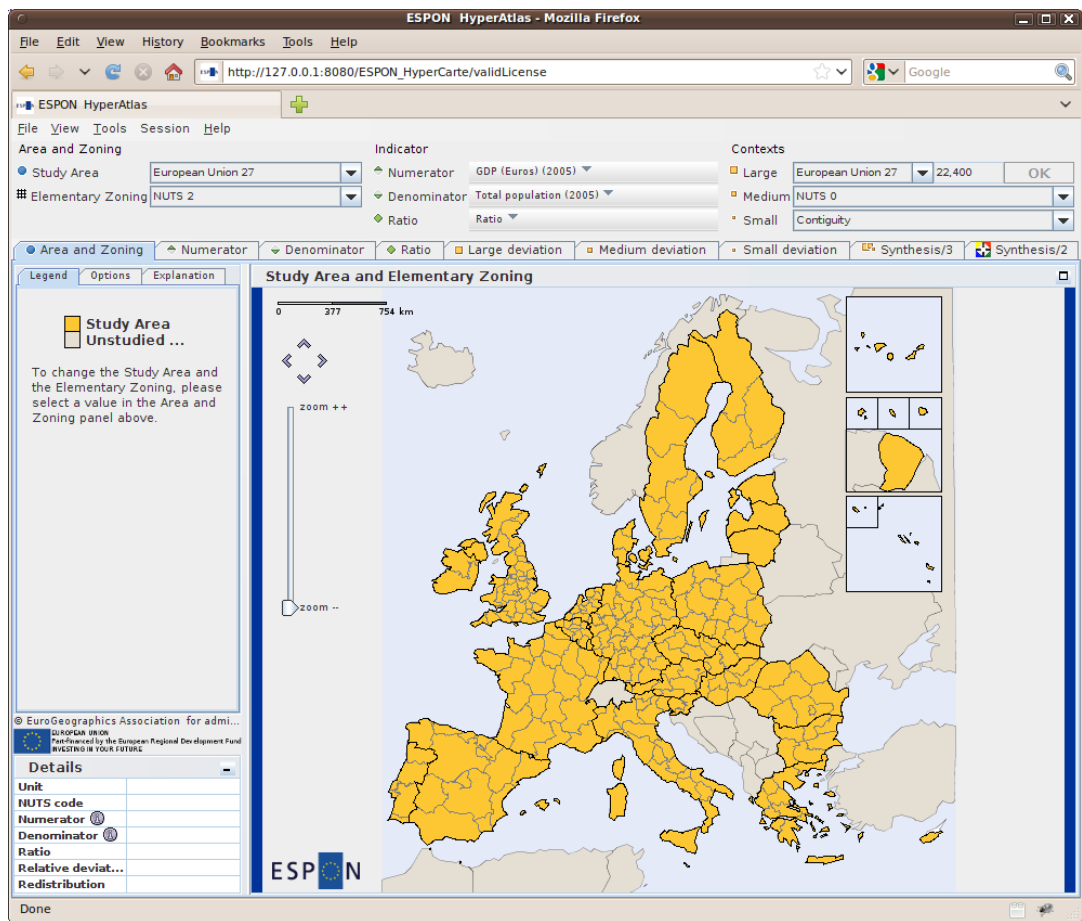
ESPON HyperAtlas is totally interactive. It works with three sets of parameters that are linked to one or more maps. At any time, the user can change the different input parameters, and the linked maps are immediately updated. The user may also individually configure each map, for instance:

- the number of equivalence classes
- statistical progression (arithmetic or geometric)
- the pallet of colors
- etc.

This set of features allow to generate a very accurate collection of maps.

As shown on Figure 6.1, ESPONHyperAtlas Applet fills the full width of the browser window. A "*Back to dataset*" link at the top of the page allows the user to be redirected to the ESPON HyperCarte Web Application "Dataset" page. The main components of the ESPON HyperAtlas frame are:

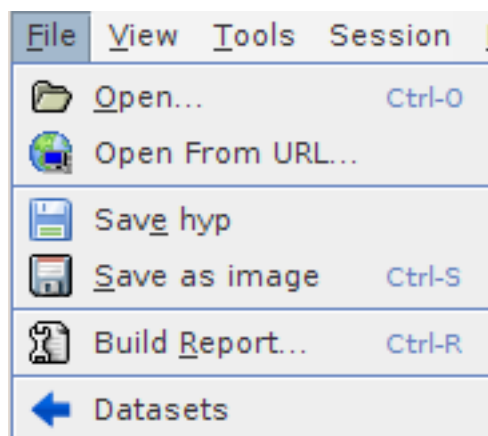
- a menu bar
- the parameters panel threefold boxes:
 - **Area and Zoning** to select the geometric parameters of the analysis;
 - **Indicator** to select stocks or pre-defined ratios;
 - **Contexts for the deviations** to select the references of computed deviations.
- a main panel composed of the generated maps

Figure 6.1. ESPON HyperAtlas frame overview

ESPON HyperAtlas at startup..

Following sections first detail each item in the menu bar of the application.

6.1. File menu

Figure 6.2. Screenshot of the File menu

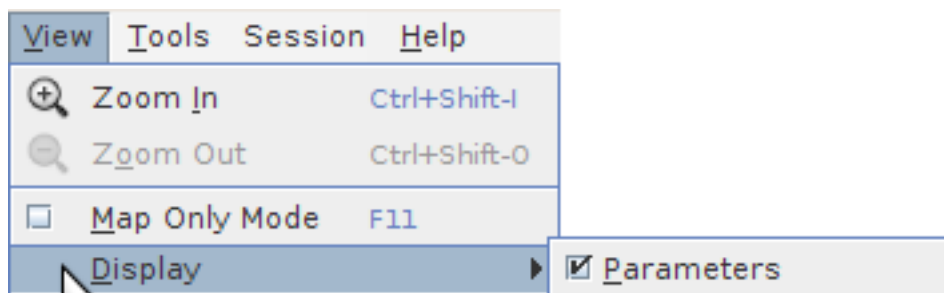
This menu allows:

- to open a new dataset hyp file from your disk or from an eventual known URL (Unified Resource Locator) to an hyp file located at a server on the Internet;

- to save the current dataset to your disk as an hyp file;
- to save the current displayed tab as an image (PNG) file to your disk;
- to generate a report in HTML format, including an image each current tab of the current analysis.
- to be redirected to the Web Application Dataset page in order to load another on-line dataset (see Figure 2.2)

6.2. View menu

Figure 6.3. Screenshot of the View menu

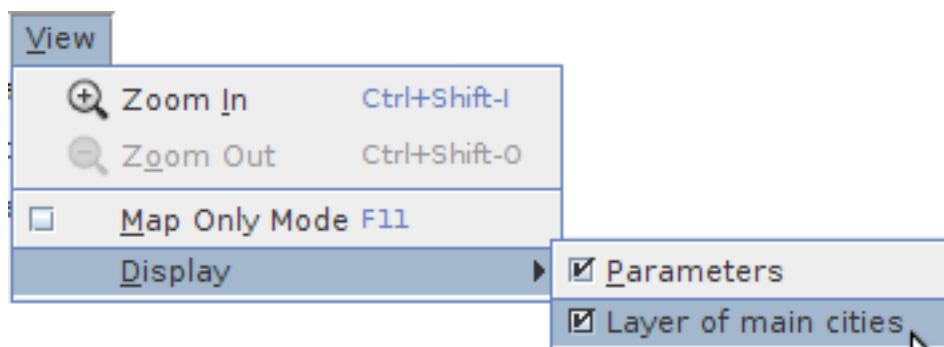


This menu concerns the appearance of the maps. It provides menu items to zoom in, zoom out and to choose the different panels that can be displayed as different parts of the window:

- the "Map only mode - F11" allows to display the map frameset as wide and high as possible;
- the "Display - Parameters" menu item makes the parameters panel visible or note.

Depending on the current loaded dataset, the "Display" submenu may also include an additional checkbox item as shown on the Figure 6.4. This checkbox allows the user to display or hide the main cities over the map. By default, if the dataset provides such a layer, it is checked.

Figure 6.4. Display submenu options: cities layer



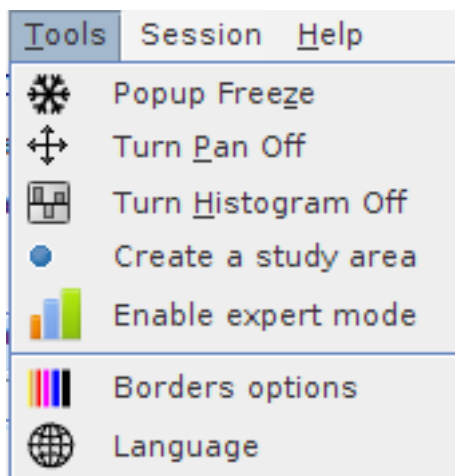
On this screenshot, the loaded dataset embeds the main cities. The "Display" menu allows to hide or display this additional layer.

When the *Display-Cities* menu item is enabled, cities are displayed over the maps as black squares, as shown on Figure 6.5. Note that for ergonomy reasons, to avoid overlapping between cities labels, the names of the cities are not displayed over the map. Nevertheless, a tooltip appears when the mouse comes over a square.

Figure 6.5. Displayed cities

Cities are represented as black squares. The name of the city appears when the mouse moves over a square.

6.3. Tools menu

Figure 6.6. Screenshot of the Tools menu

The **Popup Freeze** menu item has been available since HyperAtlas v2. This functionality is useful to compare several maps or charts: clicking on this menu item, a popup window is opened, displaying a frozen image of the current visited tab.

Two options allow to manage the behaviour of the mouse cursor:

- The **Turn Pan** menu item allows to enable the moves of the maps inside the window.
- The **Turn Histogram** menu item is only enabled for the synthesis map, it displays for each region the three contextual deviations (see synthesis as an histogram [30] paragraph)

Other tools available on this menu:

- **Create a study area** menu item is described below.
- **Enable expert mode**" menu item is described in ESPON HyperAtlas expert mode chapter of this document.
- **Borders options**: use this item to choose the colors of borders of territorial units for example.
- **Language**: this menu item opens a dialog box that provides the list of available languages for the interface of the frame. The internationalization feature is currently available in english, french and romanian. The default language at startup depends on the locale of your system, english by default.

This version 2 of ESPON HyperAtlas allows to define a new study area. On clicking this menu item, the user is invited to enter a name for his/her new study area and to select the top-levels units (as a rule, countries) that will compose this study area.

Figure 6.7 shows the example of a user who wants to define the `benelux` study area. He/she selects Belgium, Luxembourg and Netherlands units then clicks the "Submit" button. Figure 6.8 shows the information message that is displayed when the creation is successfull. The `benelux` parameter is now available from the Study Area combo box of the parameters panel. Figure 6.9 shows that interactive maps have been consequently updated on selecting this new study area.

Figure 6.7. Study area creation window

Create a study area

Please select a name and the units of the new study area.

Study area name:

Type here a name for the new study area

- ☐ AUSTRIA
- ☒ BELGIUM
- ☐ BULGARIA
- ☐ CYPRUS
- ☐ CZECH REPUBLIC
- ☐ DENMARK
- ☐ ESTONIA
- ☐ FINLAND
- ☐ FRANCE
- ☐ GERMANY (INCLUDING EX-GDR FROM 1991)
- ☐ GREECE
- ☐ HUNGARY
- ☐ ICELAND
- ☐ IRELAND
- ☐ ITALY
- ☐ LATVIA
- ☐ LIECHTENSTEIN
- ☐ LITHUANIA
- ☒ LUXEMBOURG (GRAND-DUCHÉ)
- ☐ MALTA
- ☒ NETHERLANDS

Provides the list of countries and a text field to enter a name for this new study area.

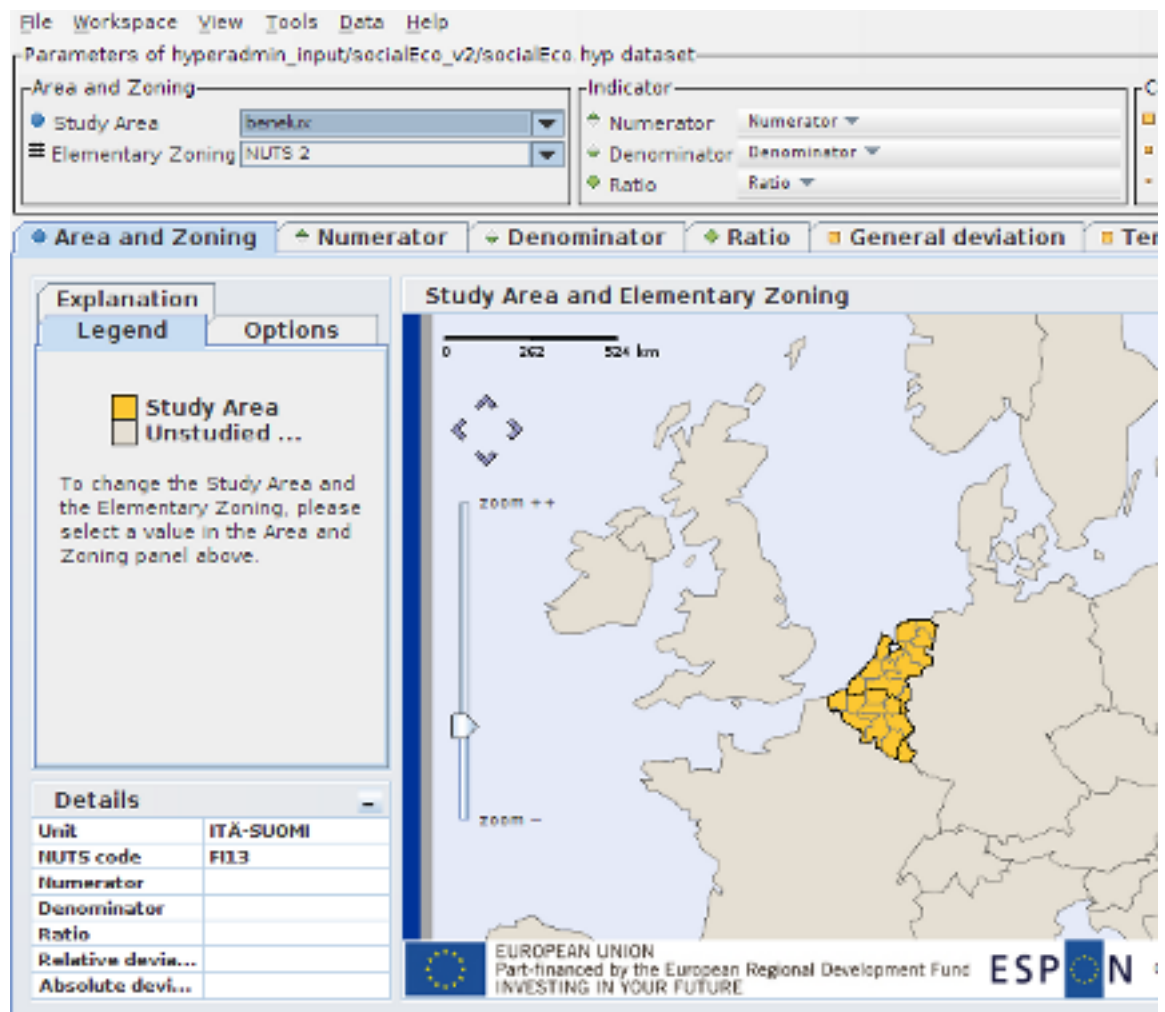
Figure 6.8. Study area creation success

Create a study area

i The study area <benelux> has been successfully created!

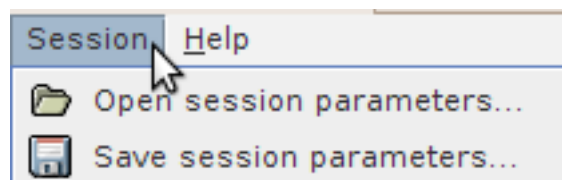
Tip: export the updated current dataset via the "File-Export hyp" menu item.

Information message.

Figure 6.9. Map of the new study area

Selected new study area.

6.4. Session menu

Figure 6.10. Screenshot of the Session menu

This menu allows to save the parameters of the current analysis to an ESPON HyperAtlas XML file on your disk.

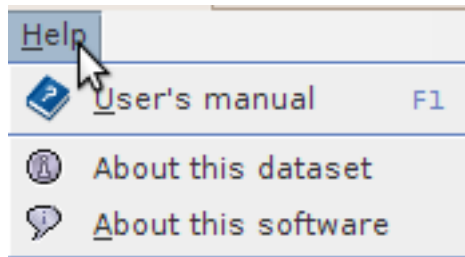
In the case when you already saved such a file, this menu allows to load your previous session parameters.



A session parameters file is specific to a dataset. An error occurs if you try to load a session parameters file that was built while using another dataset.

6.5. Help menu

Figure 6.11. Screenshot of the Help menu



This menu provides the following items:

- **Help (F1)**: opens a new browser window to the on-line user's manual (see Figure 2.4).
- **About dataset** opens a popup window displaying metadata of the current dataset (author, creation date, version).
- **About** displays the current version of the software. Please note this version when reporting an eventual bug as described in Annex: when things go wrong.

Chapter 7. MTA parameters

This section focuses on how to set the parameters for a Multiscalar Territorial Analysis (MTA [74]). As its title suggests it, the next section (An example of multiscalar typologies of regions) first describes the main concept of such an analysis. Please read it in order to efficiently benefit of the provided tools by ESPON HyperAtlas v2.



Some screenshots of this chapter were performed with a previous version of HyperAtlas. Though the graphical user interface has been updated since this version, the concepts remain the same.

7.1. An example of multiscalar typologies of regions

Taking account the European level as an example, this section focuses on the importance of considering the multiscalar typologies of regions in political decisions.

When the policymakers want to build political scenari or when they want to evaluate propositions of structural funds, they need to get a synthetic view on the situations of regions which depend on the various territorial contexts.

The question of perequation (transfer from “advanced” to “lagging” region) is very sensible and it is important to propose a complete view of the scales where those perequation processes can take place, according to the principle of subsidiary.

As an example, we analyse how the picture of “lagging” regions is modified when the previous criterion of Objective 1 (less than 75% of the mean value of GDP) is applied simultaneously at three scales: European, national and local.

Simultaneously, it is possible to propose a typology of “advanced regions” based on the symmetric criteria of more than 133% of the mean value of GDP at those three scales.

According to this methodology, it is possible to demonstrate that very few regions are “lagging at all scales” and “advanced at all scales”. Many are in more complex situations, like certain regions of Switzerland or Norway which are “advanced” at European scale, but they are “lagging” at their national or local scales.

Reversely, the metropolitan regions of candidate countries are very often “lagging at European scale” but “advanced at national and local scales”.

7.2. Setting the Study Area

The setting of the study area should be the first step of any analysis. Setting the basis of the study can be done by answering the following questions:

- which spatial extension (area) and for which geographical level?
- which division will be the elementary zoning?

As shown on Figure 7.1, these two parameters have to be selected in the two respective pop up lists. The different propositions are internal and come from the a priori implementation.

Figure 7.1. Study area fields

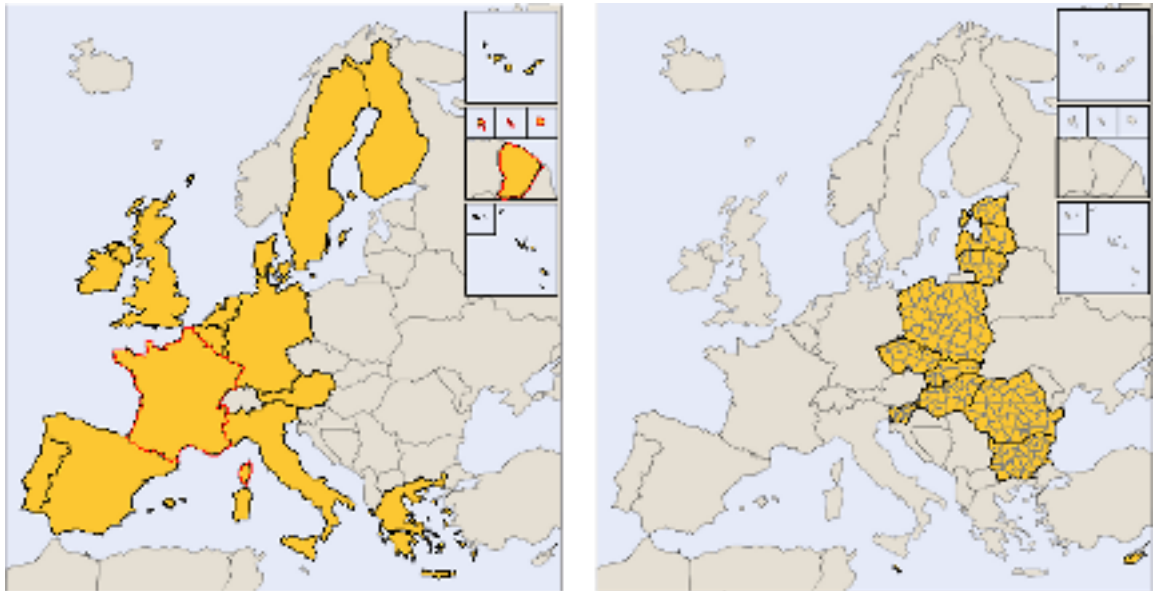
● Area and Zoning

Study Area: European Union 15 ▼

Elementary Zoning: Nuts_0 ▼

- **Study Area** shows the spatial extension that will be mapped.
- **Elementary zoning** shows the set of elementary units that will be studied.

Figure 7.2 illustrates two possible combinations. The selected area is mapped when the chosen elementary zoning is drawn.

Figure 7.2. Combination of study area and elementary zoning

These two maps were extracted from the "Area and Zoning" tab of the application with following settings:

	Study Area	Elementary Zoning
Map on the left	European Union 15	NUTS 0
Map on the right	New member states 12	NUTS 3

7.3. Setting the indicators

ESPON HyperAtlas only works with size variables (that is to say that only variables that may be aggregated at upper level by sum), and proposes a multiscalar cartography of the ratio for two size variables in order to set the studied ratio. The user can combine every couple of these types of variables in the "Indicators" box, by choosing each of them in the associated select boxes as shown on Figure 7.3.

Figure 7.3. Indicators box

The 'Indicator' box is a light gray rectangular window. At the top left is a green diamond icon followed by the text 'Indicator'. Below this are three rows, each with a label and a dropdown menu. The first row is 'Numerator:' followed by a dropdown menu showing 'Population in Thousands (2003)'. The second row is 'Denominator:' followed by a dropdown menu showing 'area in km2 (2003)'. The third row is 'Ratio:' followed by a dropdown menu showing 'Density'.

This box provides three select boxes to choose indicators. The user selected the **Density** item in the **Ratio** select box:

- **Numerator** is set to Population in 2003
- **Denominator** is set to Area in km²
- **Ratio**: depending on the chosen dataset (the hyp file), selecting a ratio may imply the auto-selection of the numerator and denominator fields values.

Three maps are respectively linked to these choices, under three different tabs (see Figure 7.4). The maps for the numerator and for the denominator (size variables) are represented with proportional circles. The ratio map is shown with colored units, according to the ratio value. The number of classes and their associated colors (the *pallet* tool) can be set in the "Option" tab of the ratio map.

Figure 7.4. Numerator, denominator and ratio tabs

The three associated tabs to the chosen indicators are represented here for the study area EU 15 (15 countries in Europe) with the NUTS 0 value (countries) for the elementary zoning:

- the image on the left shows the **Numerator** map within its associated tab, here, the population in 2003
- the image in the center shows the **Denominator** map within its associated tab, here, the area in km²
- the image on the right shows the **Ratio** map within its associated tab, here, the density.

7.4. Setting the contexts for deviations

As described in various contexts [11] paragraph, the user has to define the three territorial contexts which respectively set three different levels of spatial observation: global, medium and local. Figure 7.5 shows the select boxes to set these parameters.



The names of the references have been updated since the previous versions of ESPON Hyper-Atlas:

- *Global* has been renamed **General**;
- *Medium* has been renamed **Territorial**;
- *Local* has been renamed **Spatial**.

Figure 7.5. Contexts box

The "Contexts" box allows to set three references for their associated deviations: general, territorial and spatial contexts.

The **general context** may be the whole chosen study area. In such a case, the associated map will be the same as the associated map to the ratio itself. So, the user may choose another general context or a reference value. For instance, in the example of the EU, even if the study area is the 29 potential countries, it may be of interest to observe the spatial differentiations according to another global reference, for instance the global value associated to EU15. For this level, the user may also exogenously enter a value. By default, this value has first been set to the value of the global area.

The **territorial context**, on the other hand, has to be a geographical zoning that is an aggregation of the “elementary zoning” that was previously chosen.

The **spatial context** shows which proximity relation will be the basis of the neighborhood’s definition for each elementary unit. That is usually “contiguity”, but it may also be a relationship based on distances since they have been introduced in the hyp file (units that are less than X kilometers far from), or time-distances. Then, each elementary unit value will be compared to the value of its neighborhood.

A set of three maps are linked to these choices (Figure 7.6). The values of the deviations are transformed into global indexes 100. Thus, values may be interpreted in terms of percentage to the reference value. The maps are drawn with double progression frame centered on 100, in order to highlight the regions that are under the reference value (100), and the ones that have upper values.

Figure 7.6. Deviations maps tabs



These screenshots show the three deviations maps tabs for chosen contexts: general deviation on the left, territorial deviation in the center and spatial deviation on the right.

7.5. The synthesis maps

One synthesis map was already available in the previous version of ESPON HyperAtlas, based on three levels and one threshold, it is described in Ternary synthesis map. A new synthesis map has been added to the application since the version 2.0: see Dual synthesis map.

7.5.1. Ternary synthesis map

The three relative positions about contexts are summarized in one synthetic map. The elementary units are classified in eight classes according to their three relative positions.

In order to reduce the whole combinatory of possible cases, from the "Options" tab close to the synthesis map (Figure 7.7), the user must specify which point of view he wants to focus on: the first "Criterion" parameter shows whether the point of view is to underline the regions whose ratio is **greater than**, or to underline the contextual values, by selecting **less than**. This choice depends on the studied indicator (see An example of multiscalar typologies of regions section). For instance high values of unemployment rates point out different types of regions than high values of an indicator of resources. According to which regions have to be differentiated (lagging ones or winning ones), the user must choose the point of view of the synthesis. Then, the user can choose the threshold percentage.

Figure 7.7. Synthesis map options

Explanation Legend Options

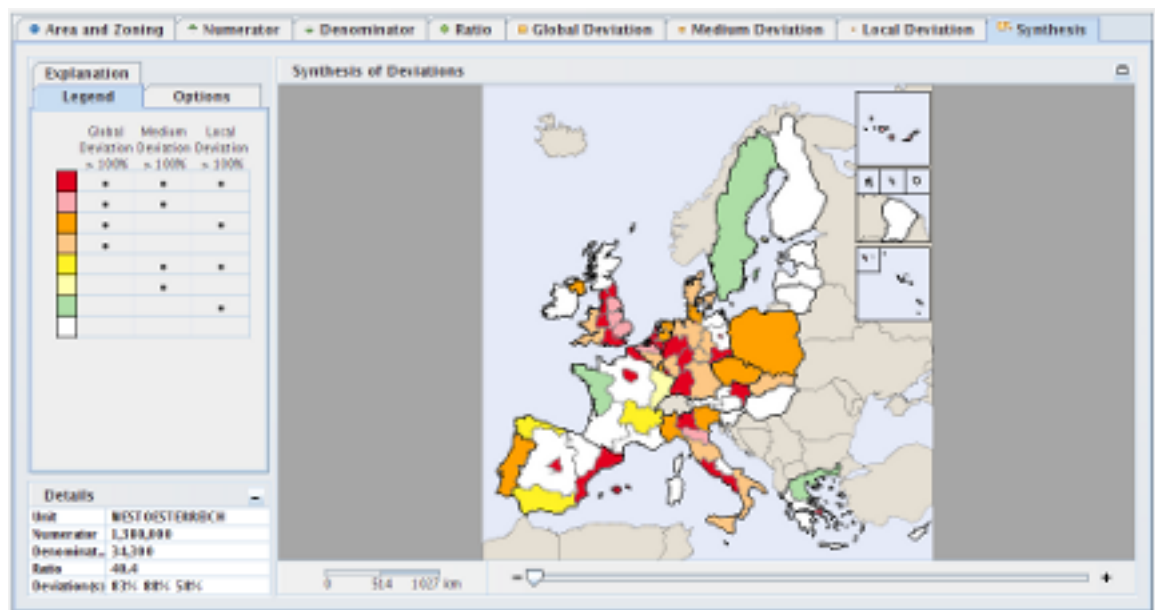
Threshold value must be greater than 100% when criterion is 'Greater than'. It must be lower than 100% when selecting 'Lower than'.

Criterion: Greater than ▼

Threshold Value: 100 %

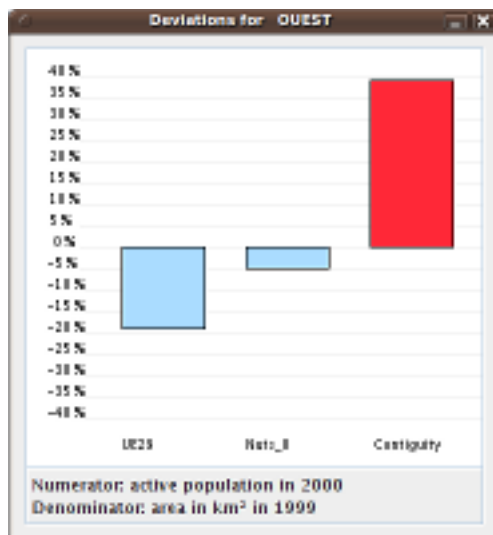
OK

The map on Figure 7.8 illustrates the eight different configurations of relative position, according to the three previously chosen contexts and parameters. The legend tab gives for each class the descriptions of the contextual positions. The last class (in white) gather the regions that are not concerned by the chosen comparative criterion whatever the contexts are.

Figure 7.8. Synthesis map tab

This screenshot shows the synthesis map tab for the contexts that were chosen in the previous example shown on Figure 7.6.

When “Histogram” is enabled (see Section 6.3 section), the user may represent the three contextual deviations of a selected (clicked) region as an histogram as shown on Figure 7.9.

Figure 7.9. A deviations synthesis histogram for a region

This screenshot shows the synthesis histogram of the clicked region named OUEST (West of France). The general deviation of this region is relative to the UE29 general context. The territorial deviation is relative to the NUTS 2 hierarchical context, the spatial deviation considers the contiguity, e.g. the neighborhood of this region.

7.5.2. Dual synthesis map

The dual synthesis map is a new cartographic tool that has been introduced in the version 2.0 of ESPON HyperAtlas. It aims at showing via a chromatic legend the status of territorial units on taking

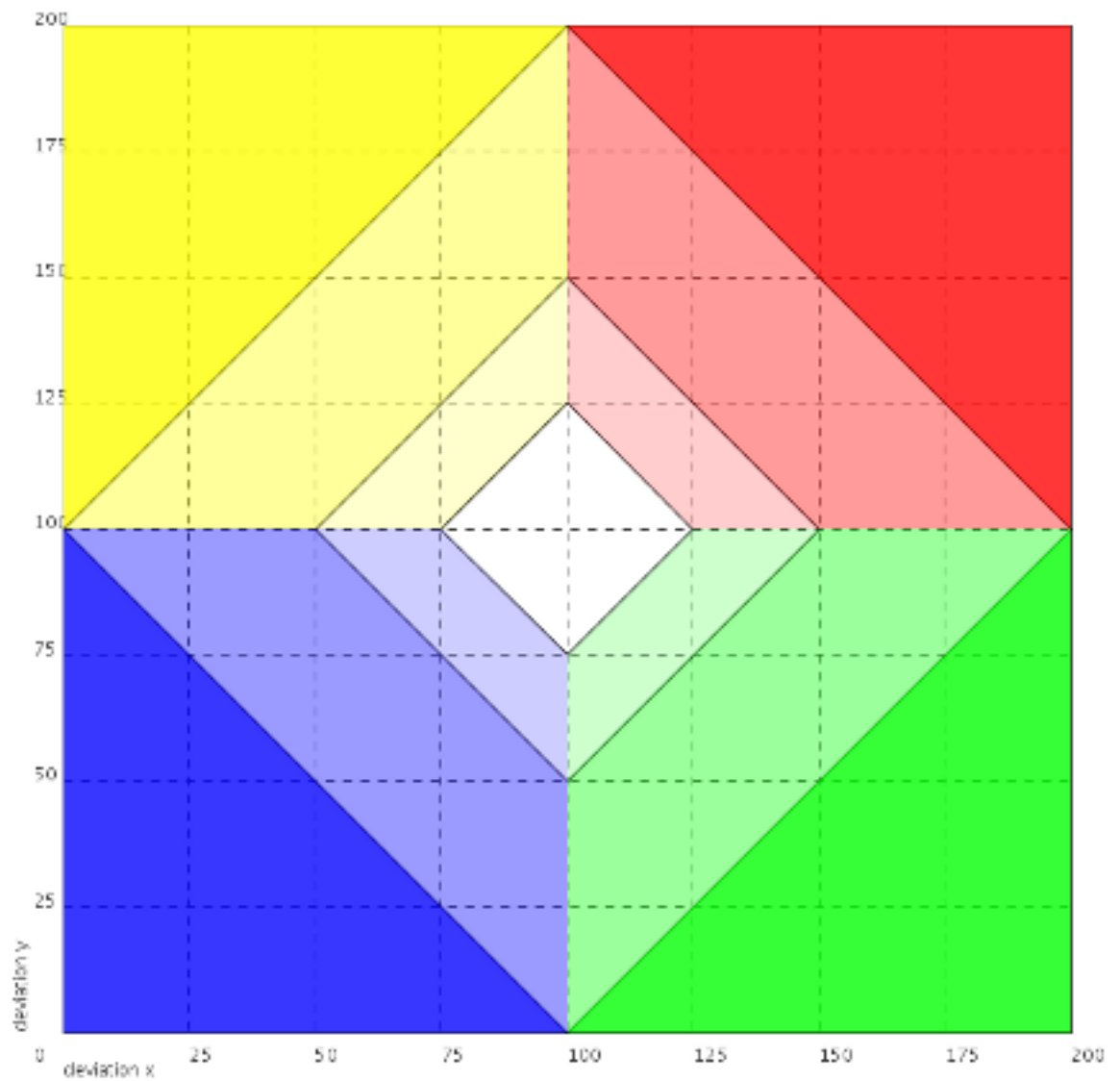
into account two chosen deviations. This section describes the synthetis opportunity that is offered to analysts thanks to this tool.

The legend of the dual synthesis map shown on Figure 7.10 is composed of four main quarters. The values on both axis range from 0 to 200% and they represent the percentages of a deviation of a territorial unit relatively to a context of reference. The user is invited to select in an options tab the contexts of deviations to be considered for both axis (among the general, the territorial or the spatial context).

Let's consider the following example: the general deviation has been chosen for the horizontal axis and the spatial deviation for the vertical axis. The four main colors of the legend represent the following cases:

- **yellow**: the global deviation (X axis) is lower than 100% (the average pivot value) and the spatial deviation (Y axis) is upper 100%
- **red**: both deviations are upper 100%
- **blue**: both deviations are lower than 100%
- **green**: the global deviation (X axis) is upper than 100% and the spatial deviation is lower than 100%

Note that the more far from the value 100 the current deviation is, the more intense the color is. Hence a white square in the middle of the legend: this range of values show the territorial units whose both deviations are around the average, 100.

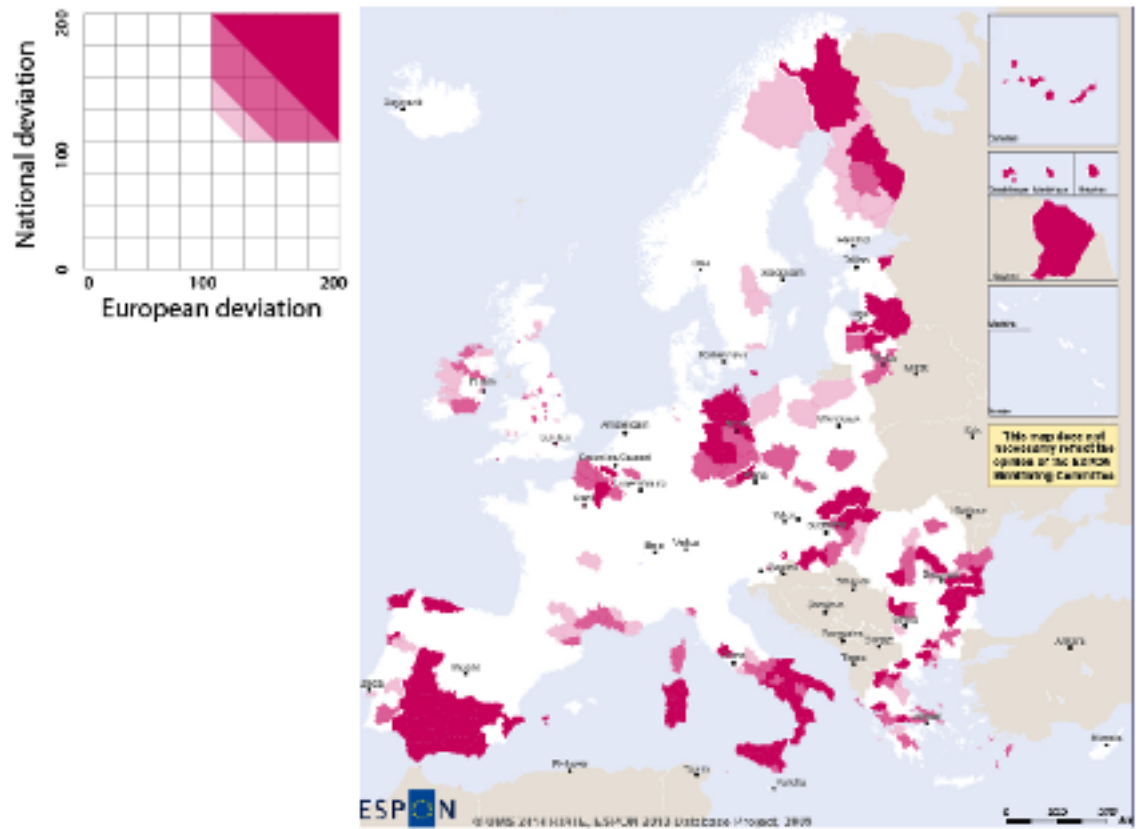
Figure 7.10. Legend of the dual synthesis map

Graduations and quarters of the dual deviation synthesis map legend.

Let's consider now a concrete example on how the dual deviation map can help analysts: the following screenshots decompose as four steps the synthesis about the situation in 2010 according to the European and National averages of unemployment:

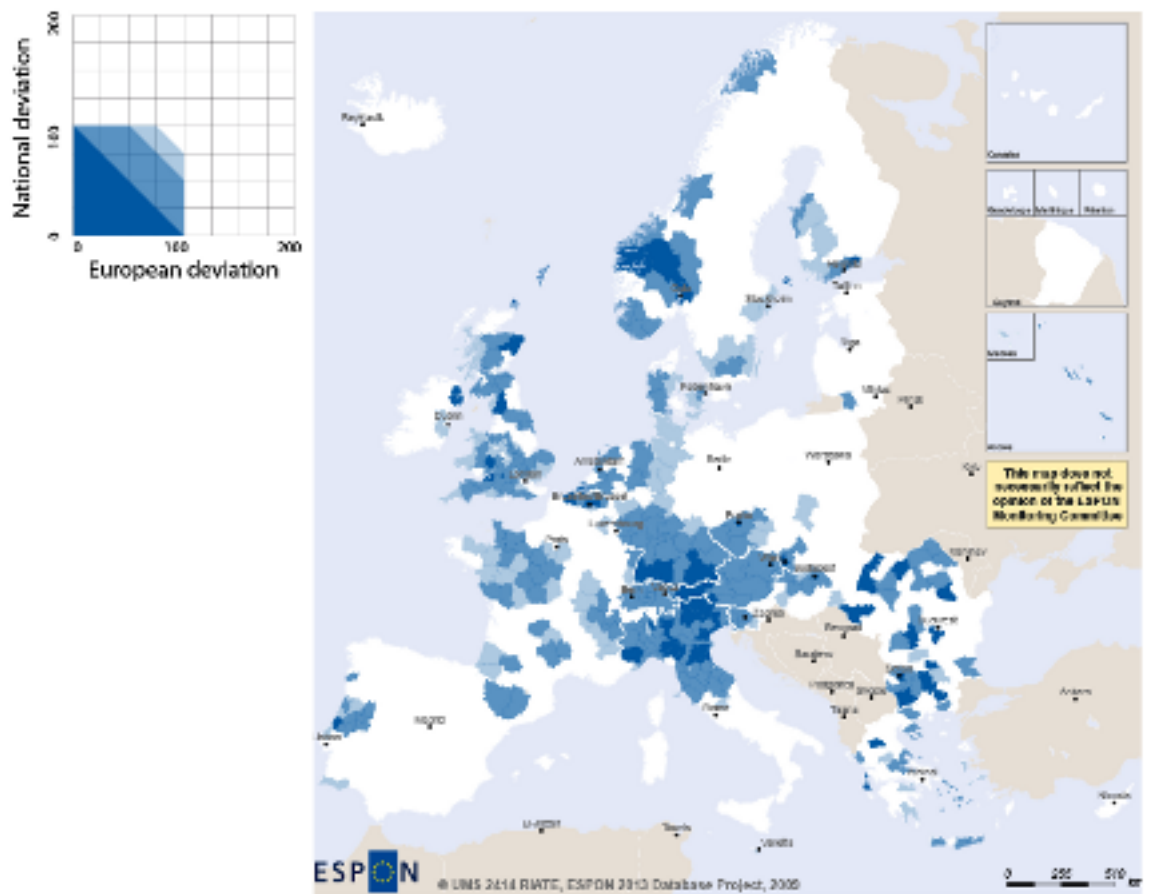
- Figure 7.11 shows in red the territorial units whose unemployment rate is above average both at European and National levels:

Figure 7.11. Dual synthesis map: red units



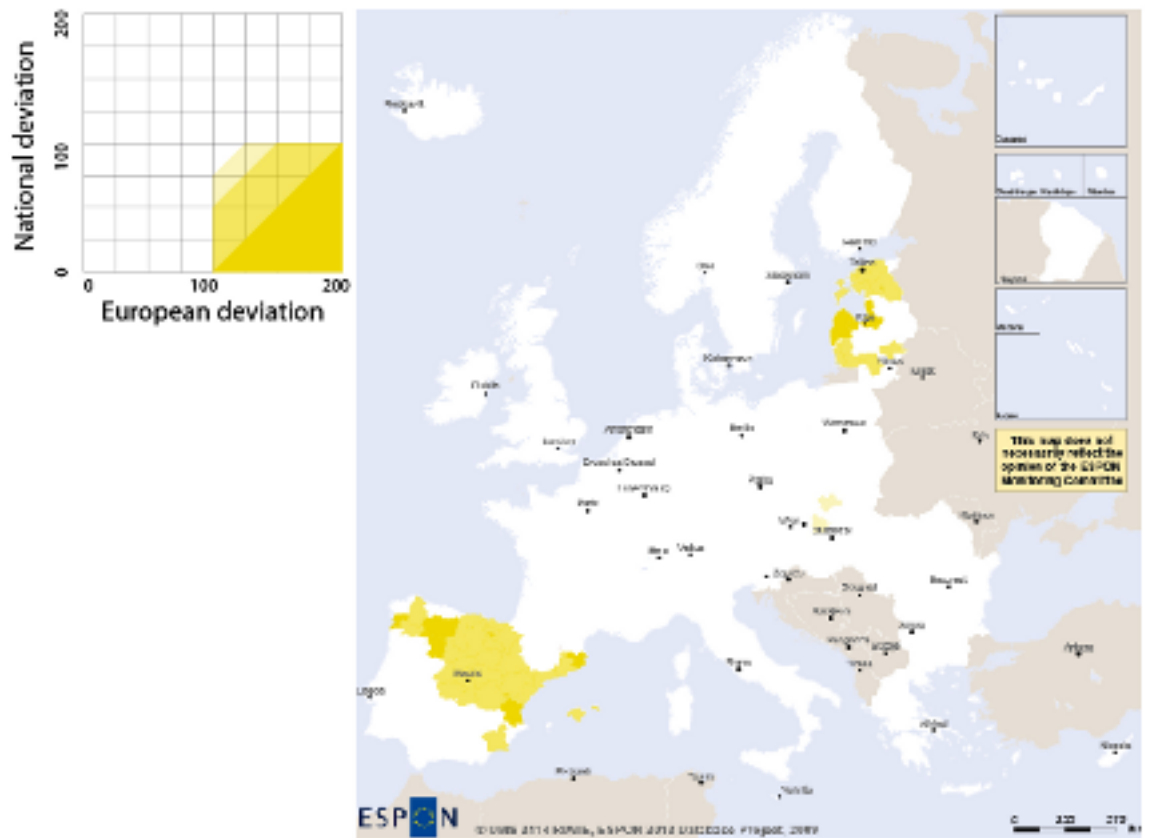
- Figure 7.12 shows in blue the territorial units whose unemployment rate is under average both at European and National levels:

Figure 7.12. Dual synthesis map: blue units



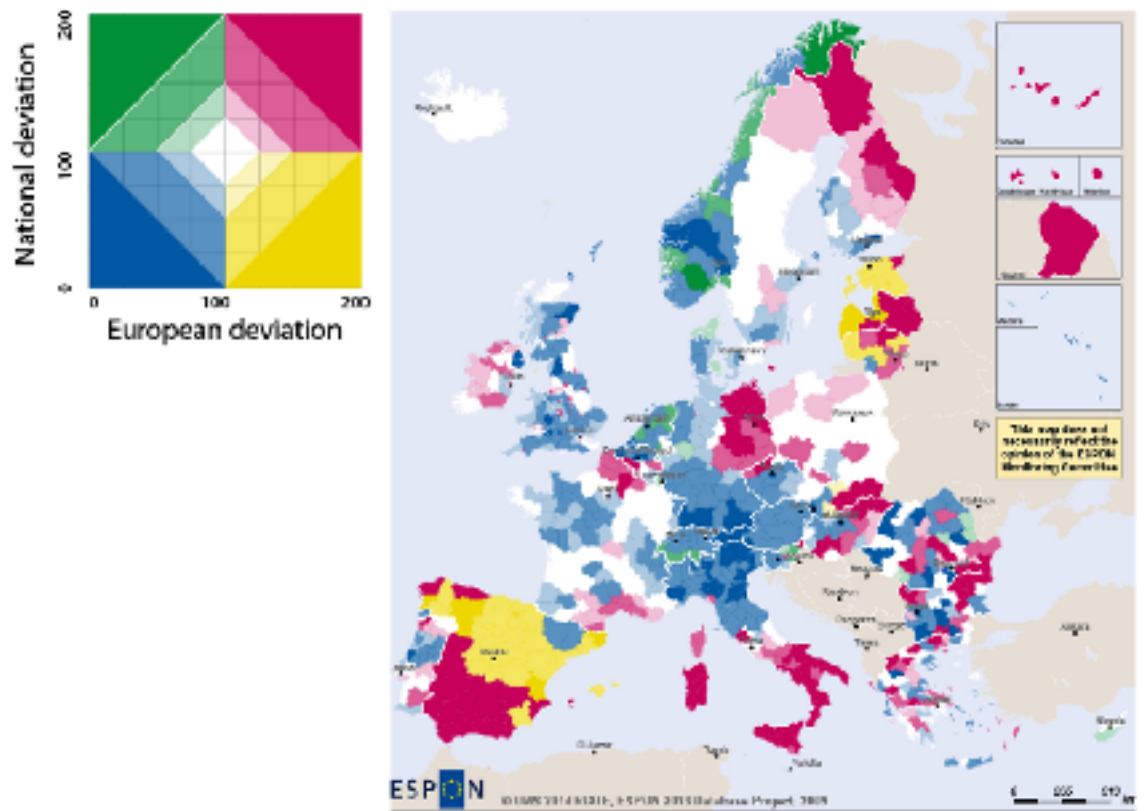
- Figure 7.13 shows in yellow the territorial units whose unemployment rate is above average at European level and under at National level:

Figure 7.13. Dual synthesis map: yellow units



- Figure 7.14 shows the final typology on the complete synthesis map:

Figure 7.14. Dual synthesis map: final typology











Chapter 8. Tools

This section deals with the available tools in the application to work with the maps.

8.1. Review of available maps tabs

First of all, let's review the available maps tabs and their main focuses:

 Area and zoning	This map shows the chosen study area and elementary zoning.
 Numerator	This map shows the chosen study area and elementary zoning.
 Denominator	This map shows the value of the chosen denominator indicator for each unit of the elementary zoning.
 Ratio	This map shows the distribution of the ratio (numerator/denominator) over the units of the elementary zoning.
 General deviation	This map proposes the relative perspective of the distribution of the ratio over the units of the elementary zoning: each absolute measure is put in relation with a reference value. The reference value is common for the whole area. The index value is 100 when an elementary unit has exactly the same value than the reference value or area. It is 200 when the elementary unit measure is twice the measure of the reference area, it is 50 when this is half the measure of the reference area.
 Territorial deviation	This map proposes the relative perspective of the distribution of the ratio over the units of the elementary zoning: each absolute measure is put in relation with the value of its upper unit in the reference zoning. The index value is 100 when an elementary unit has exactly the same value than its reference unit. It is 200 when the elementary unit measure is twice the measure of the reference unit, it is 50 when it is half the measure of the reference unit.
 Spatial deviation	This map proposes the relative perspective of the distribution of the ratio over the units of the elementary zoning: each absolute measure is put in relation with the value of its neighborhood, as defined by the local reference. The index value is 100 when an elementary unit has exactly the same value than its neighborhood. It is 200 when the elementary unit measure is twice the measure of its neighborhood, it is 50 when it is half the measure of its neighborhood.
 Synthesis	This map proposes a synthesis of the different perspectives by considering the three different contexts. The synthesis is based on a deviation threshold, either by upper values or by lower value. These parameters depend on the meaning of the ration and they must be chosen by the user. Then, a typology of the regions which check the condition for at least one context is performed.

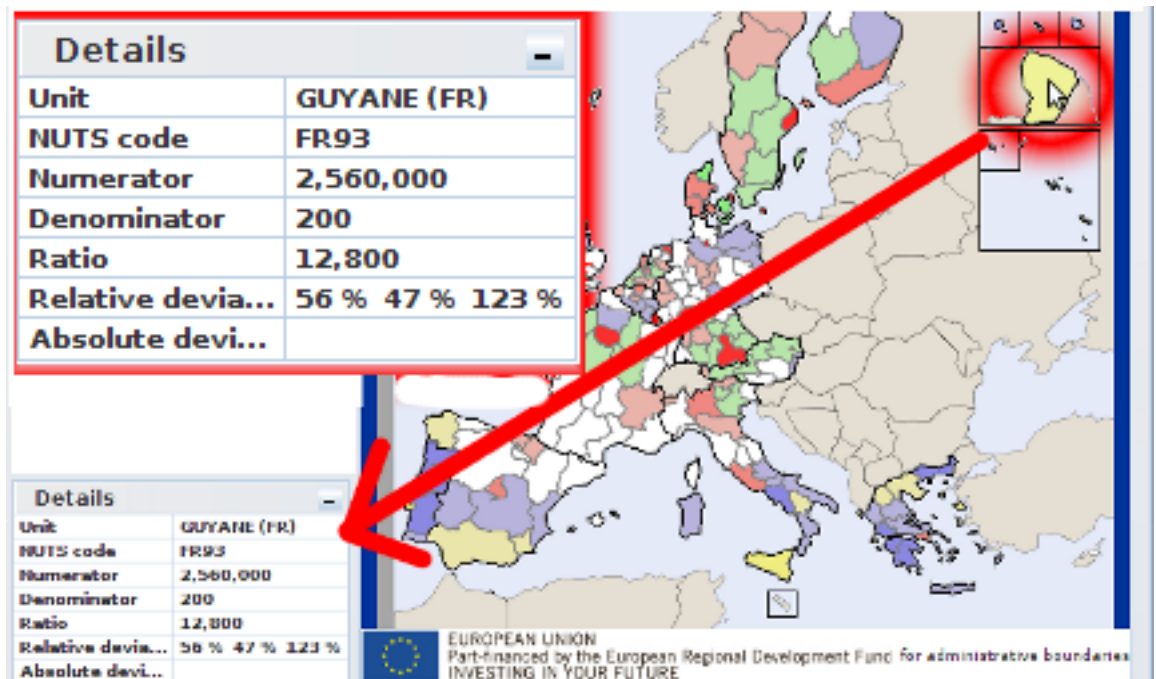
8.2. Appearances and functions of the mouse cursor



At any moment, the position of the mouse cursor on the map provides information about the elementary unit that it points. The content of the table depends on the current map, Figure 8.1 shows the case of the synthesis map where are displayed:

- the name of the territorial unit
- the code of this unit
- numerator stock value
- denominator stock value
- ratio (numerator/denominator) value
- relative deviations values based on the selected references
- the absolute deviation values are only available in expert mode

Figure 8.1. Details box for the synthesis map



This screenshot shows the "Details" box on the left bottom corner of the application. The user's mouse is over the Guyane. Associated computed values to this unit are displayed in the box.



Except for the synthesis map, a left click anywhere on the map changes the function of the cursor to "Pan", as long as this option is on (see Section 6.3).

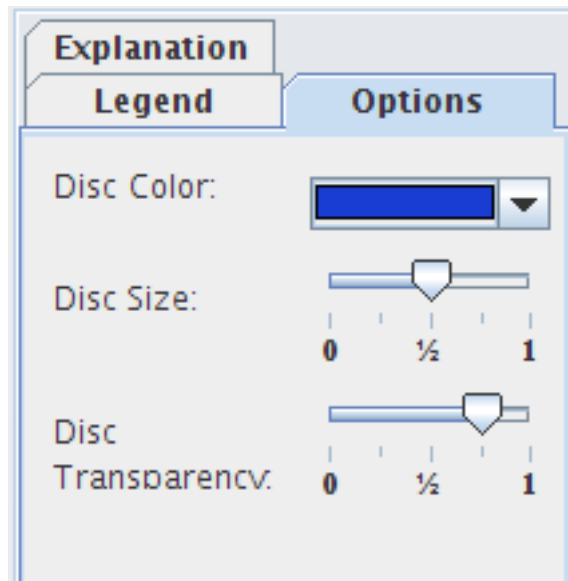


On the synthesis map, the "hand" mouse pointer shows that the histogram function is on. A right click on a region opens its histogram synthesis view (see synthesis as an histogram [30]).

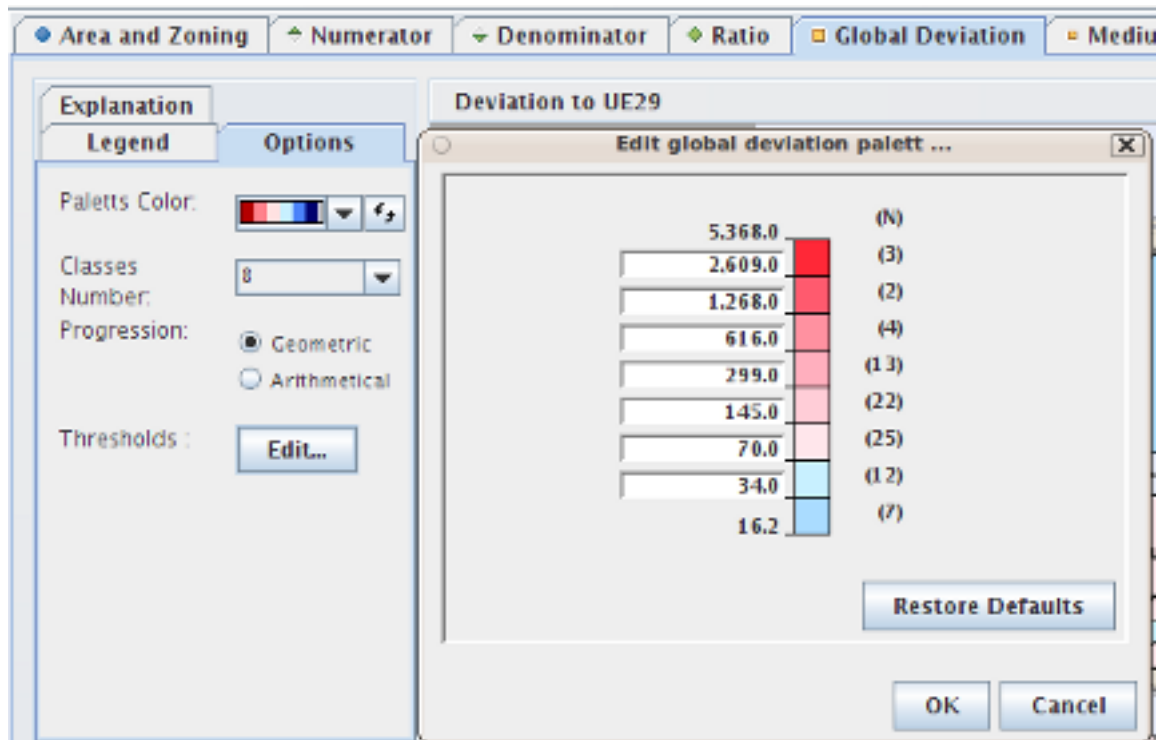
8.3. Legends, options and explanation tabs

Each map is associated to a set of three tabs that provide tools to control and to understand the cartography. The choices are valid for the current map. Figure 8.2 displays each the "Options" tabs for an indicator map (that shows proportional circles) while Figure 8.3 displays the available options on a deviation map (palett of colors). The user may also set the thresholds for each class. The "Legend" tab displays the bounds of the classes (left), the number of items for each of them (right), and the associated color. The "Explanation" tab displays some general notes about the goal of the current map.

Figure 8.2. Options for proportional circles



The "Options" tab of the numerator or denominator maps aims at setting the representation of the indicator values by selecting a color, the size and transparency of proportional circles.

Figure 8.3. Options for deviation maps

The "Options" tab of the deviation maps aims at setting the representation of the deviation by selecting:

- **the palett of colors**, that can be reversed
- **the number of classes**, between two and ten classes
- **the progression**:
 - **arithmetical** for classes with an equal amplitude, better choice when the distribution is symmetric around 100.
 - **geometric** for classes with an increasing amplitude
- **the thresholds**, that can be edited for each class

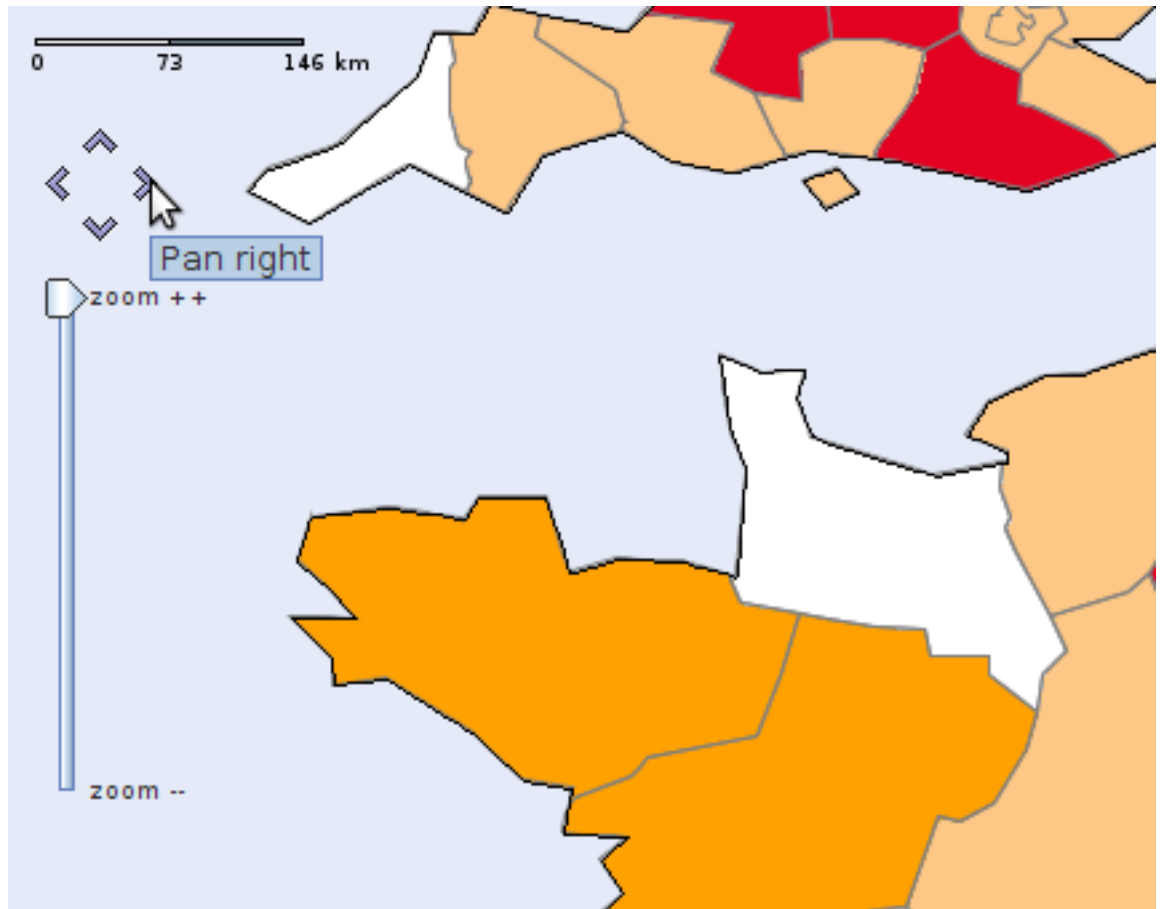
8.4. Zoom

It is possible to zoom in/out a map, either on clicking the "View - Zoom" menu items, by using the cursor on the left side of the map or by moving the mouse scroller over the map.



Please note:

- the available zoom levels depend on the selected elementary zoning parameter: reduced zoom factor for high levels, maximized at lowest level;
- any zoom factor update or pan move are applied to every map;
- the scale of the map is consequently updated.

Figure 8.4. Spatial zoom slider

This screenshot shows the scale, the pan buttons and the zoom slider.

8.5. Report

The user can save his current whole collection of maps with the associated rough data and deviations by selecting the "File - Build Report" menu item from the menu bar.

By selecting this menu item, the user is invited to select a directory on his/her disk where the report will be generated as a set of HTML page (`index.html` and eight PNG image files (one image per map: `map0.png`, `map1.png`, to `map7.png`).

For example, if the user selected his `/home/toto/my_hyberatlas_report/` directory as target directory, he/she may open the saved report from a web browser by selecting the `/home/toto/my_hyberatlas_report/index.html` file.

The generated report may be divided in the three-fold:

- the introduction shows the space area, chosen indicators and contexts
- the list of maps for these parameters as images files
- the table of generated results for these parameters



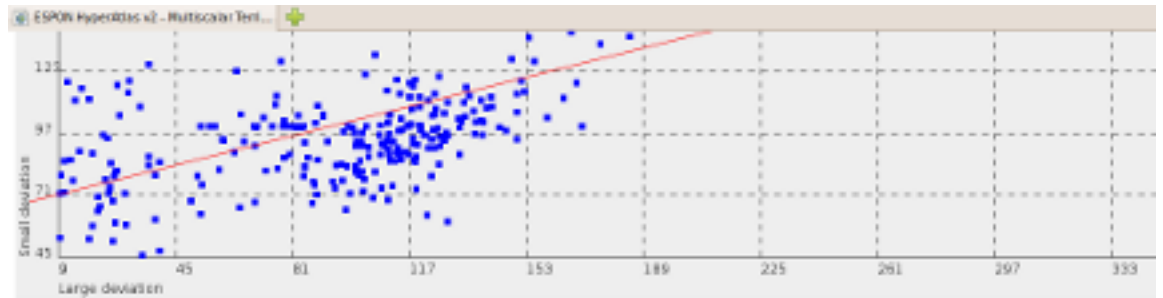
In expert mode, the generated report also includes expert tabs as images:

- the three equi-repartition maps
- the tab showing the Lorenz curve and the main statistical indexes

- the boxplots chart
- the spatial autocorrelation chart

Figure 8.5 shows an extract of the generated table of results, including all values for all units as they can be seen on the "Details" box (see Figure 8.1)

Figure 8.5. Screenshot of a generated report



Workspace data

Territorial unit		Numerator	Denominator	Ratio	Large deviation	Medium deviation	Small deviation
Code	Name	GDP_eur_2005	pop_t_2005	GDP_eur_2005/pop_t_2005	European Union 27	NUTS 0	Contiguity
AT11	BURGENLAND (A)	5573285.0	278.8	19,990	88.91	67.35	108.73
AT12	NIEDERÖSTERREICH	3.7739832E7	1575.5	23,950	106.54	80.71	129.73
AT13	WIEN	6.6179016E7	1638.9	40,380	179.60	136.05	168.57
AT21	KÄRNTEN	1.3957078E7	560.1	24,910	110.83	83.96	96.72
AT22	STEIERMARK	3.0523754E7	1199.8	25,440	113.15	85.72	119.45

This screenshot shows an extract of the generated report `index.html` file that has been opened by in web browser. This image shows the last map (synthesis) and the start of the table that includes all results.

Chapter 9. ESPON HyperAtlas Expert Mode

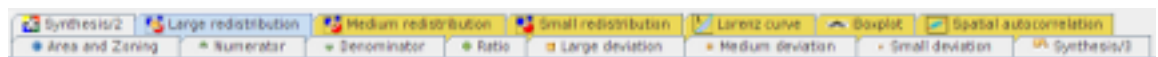
This chapter describes a set of tools that have been integrated since the version 2 of ESPON HyperAtlas. As this set of cartographic and statistic tools are mainly designed for more advanced users, they are not available by default at the startup of the application. In order to keep the application easy to use for *not so advanced users*, this set of tools must be enabled on clicking the **Enable expert mode** menu item of the "Tools" menu, shown on Figure 6.6.

Graphically speaking, enabling the expert mode adds six new tabs to the eight available tabs in default standard mode:

- three tabs for equi-repartition maps (respectively for large/medium/small contexts of reference), they are described in Section 9.2 section.
- a tab showing a Lorenz curve and a table computing relevant statistical indexes. This feature is described in Section 9.1 section.
- a tab showing a chart of boxplots, described in Section 9.3 section.
- a tab showing a spatial autocorrelation chart, described in Section 9.4 section.

In order to distinguish the default mode tabs and the expert mode tabs, expert tools tabs titles backgrounds are displayed with a golden colour. Enabling the expert mode automatically enables and displays the "equi-repartition" map for the large context, the list of tabs is shown on Figure 9.1.

Figure 9.1. Expert mode enabled



Default mode set of tabs is added six new tabs when enabling the expert mode.



Depending on the operating system, the Java Runtime Environment version (1.5 or upper is required) and the user's browser, the display may differ. For example, under the Mac OS X.5 operating system with a JRE 1.5, the tabs are embedded in a scrollable list.

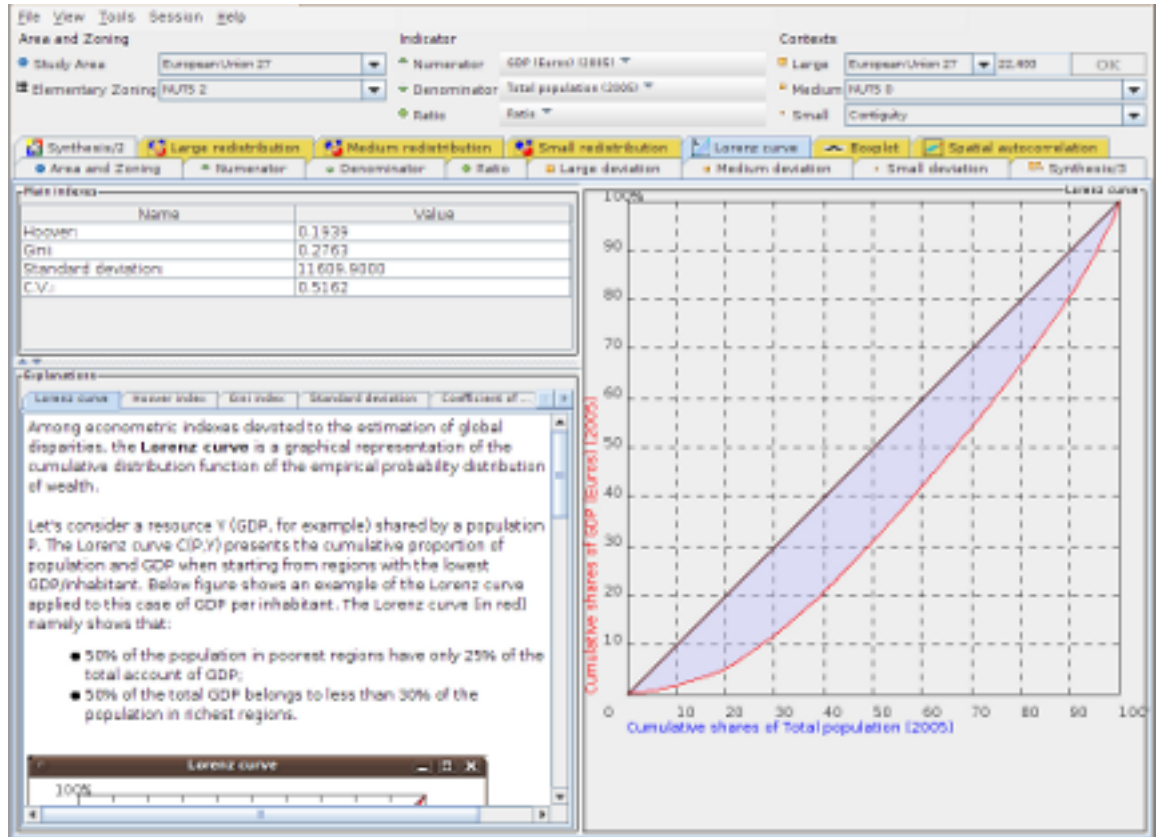
9.1. Lorenz curve and statistical indexes

The map of large deviation provided by ESPON HyperAtlas is a general measure of disparities for a given variable Z which is the ratio between two stocks X and Y . This estimation of general disparities can be further analysed using various econometric indexes that have been added in ESPON HyperAtlas v2 expert mode:

- the Lorenz curve typically presents the cumulative proportion of population and resource when starting from regions with lowest resource per inhabitant.
- the Gini Coefficient is a summary of the Lorenz curve measuring the global amount of disparities: it is equal to the area located between the Lorenz Curve and the diagonal (perfect-equality)..
- the Hoover index, also called Disparity index, is another summary of the Lorenz Curve, as it is equal to the maximum distance between Lorenz Curve and diagonale.
- The Coefficient of Variation is simply equal to the ratio between standard deviation and average of the considered ratio Z .

- ☞ A complete description of the Lorenz curve and of the main statistical indexes is directly available in a dedicated "Explanation" panel of the statistical box, close to the curve panel, as shown on Figure 9.2.

Figure 9.2. Lorenz curve, statistical indexes and explanations



This tab shows the Lorenz curve, a table of main statistical indexes, and an "Explanations" titled panel providing some information for each feature.

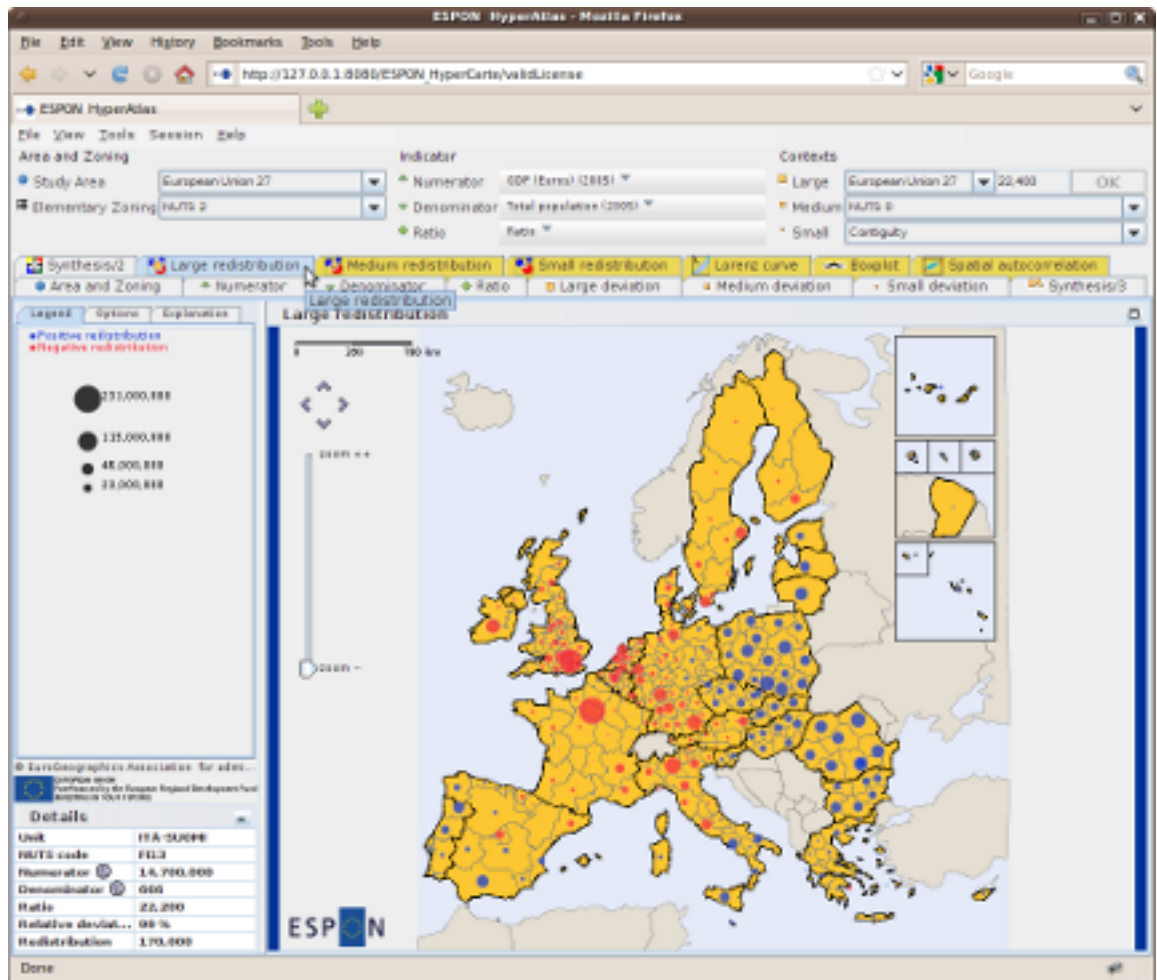
9.2. Equi-repartition map

The equi-repartition maps indicate which process of redistribution should be realized in absolute terms in order to achieve convergence, at European, national or local levels.

The equi-repartition map is a bi-color discs map showing an absolute deviation. It examines how much amount of the numerator should be moved in order to reach equi-repartition, for each territorial unit, taking into account as a reference the selected deviation context value.

Thus, three equi-repartition maps are available in expert mode for respectively the large, medium and local deviations tabs. As an example, Figure 9.3 shows the equi-repartition map (also called "Redistribution" map) for the large context.

Figure 9.3. Equi-repartition map



Bicolor discs map.

9.3. Boxplots chart

For each unit in the chosen medium context (NUTS 0 for example in Figure 9.4), this chart shows the dispersion of the medium deviation for the territorial units at sub-levels (NUTS 2 level in Figure 9.4).

A boxplot typically provides the following information:

- two lines show the values between:
 - the minimum and first quarter Q1
 - the third quarter and maximum Q3
- a box shows the interquartile Q1-Q3
- a line shows the median value
-

The ESPON HyperAtlas boxplots chart may be displayed horizontally or vertically, the colors may be adapted to the user's convenience.

Figure 9.4. Boxplots chart



Available in expert mode.

9.4. Spatial autocorrelation chart

The spatial autocorrelation chart is only available when the expert mode is enabled.

For each territorial unit of the study area, this chart crosses the values of the spatial deviation on abscissa axis with the values of the territorial deviation on ordinates axis.

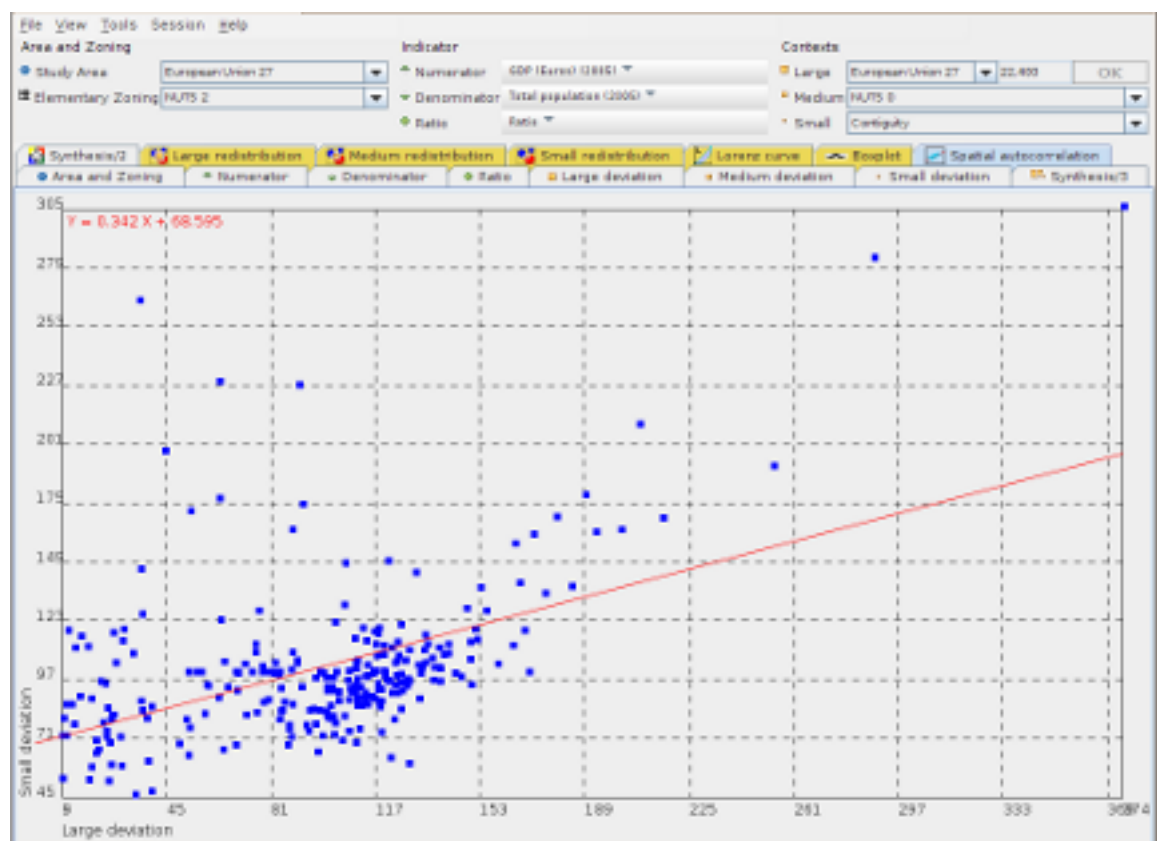
This chart is very interesting for expert users as it reveals spatial dependency, e.g. spatial organization of a phenomena.

More empirically, the chart can also be used to examine the situation of outliers and exceptional units out of the cloud of points.

The compute of this chart is based on a Moran's coefficient of spatial autocorrelation variant. The regression line is drawn in red on the chart, its equation, computed by the least squares method, is displayed on the left corner of the frame, as shown on Figure 9.5.

Each unit is drawn as a blue square, its name is displayed in a tooltip when the mouse comes over the square.

Figure 9.5. Spatial autocorrelation chart



Available in expert mode.

Part III. ESPON HyperAdmin

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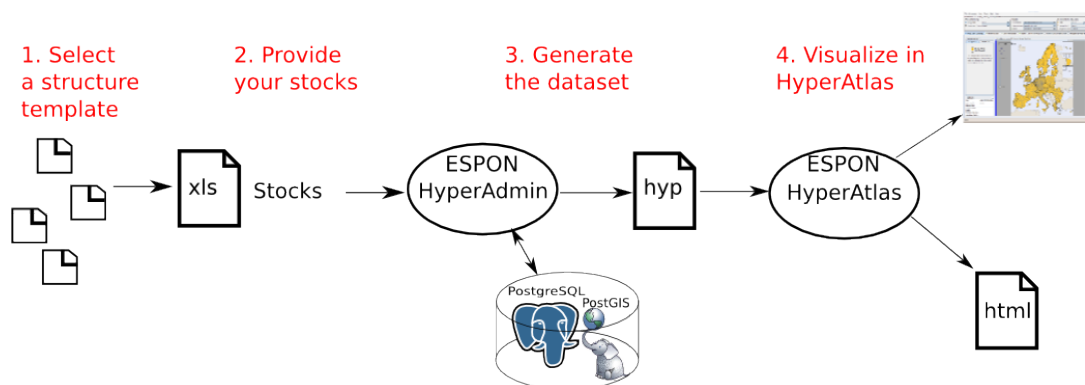
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Chapter 10. ESPON HyperAdmin Overview

In order to perform Multiscalar Territorial Analysis with ESPON HyperAtlas, the datasets provided by geographers are serialized in a convenient format into a binary file named with the `.hyp` extension. As a convention, a ESPON HyperAtlas dataset input file is called an **hyp file** (example: `demography.hyp`).

ESPON HyperAdmin is the tool to generate hyp files from your a set of input well-formed files. The steps to generate an hyp file and the workflow between ESPON HyperAdmin and ESPON HyperAtlas is summarized in the Figure 10.1.

Figure 10.1. ESPON HyperCarte Workflow



ESPON HyperAdmin and ESPON HyperAtlas data flow.

To sum up, the main expected input files are:

- the **geometry** of the dataset, in MapInfo MIF/MID formats:
 - the MIF file
 - the MID file
- the **structure** of the dataset, as an `xls` (Excel/OpenOffice) file
- the **stocks** of the dataset, as an `xls` (Excel/OpenOffice) file

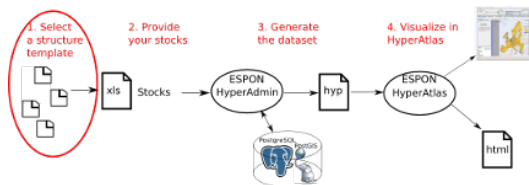
As shown on Figure 10.1, creating a dataset hyp file consists in:

1. preparing your dataset geometry as a MIF/MID files pair (MapInfo format);
2. preparing your dataset structure as a spreadsheet `structure.xls` file;
3. optionally, preparing a distance-time matrix as an `xls` file for custom contiguities;
4. preparing your dataset stocks as a spreadsheet (Excel/OpenOffice) `data.xls` file;
5. generating the dataset hyp file with ESPON HyperAdmin.

Following chapters describe each above step for integrating your data into an hyp file.

Chapter 11. ESPON HyperAdmin templates

Figure 11.1. First step: select a template



When starting the creation of a new dataset with ESPON HyperAdmin, the user is first invited to choose the model of structure on which he/she wants to add stocks.

As shown on Figure 11.2, the choice simply consists in clicking the name of the template among the ones that are listed and described in the table of this page.

Figure 11.2. HyperAdmin templates list

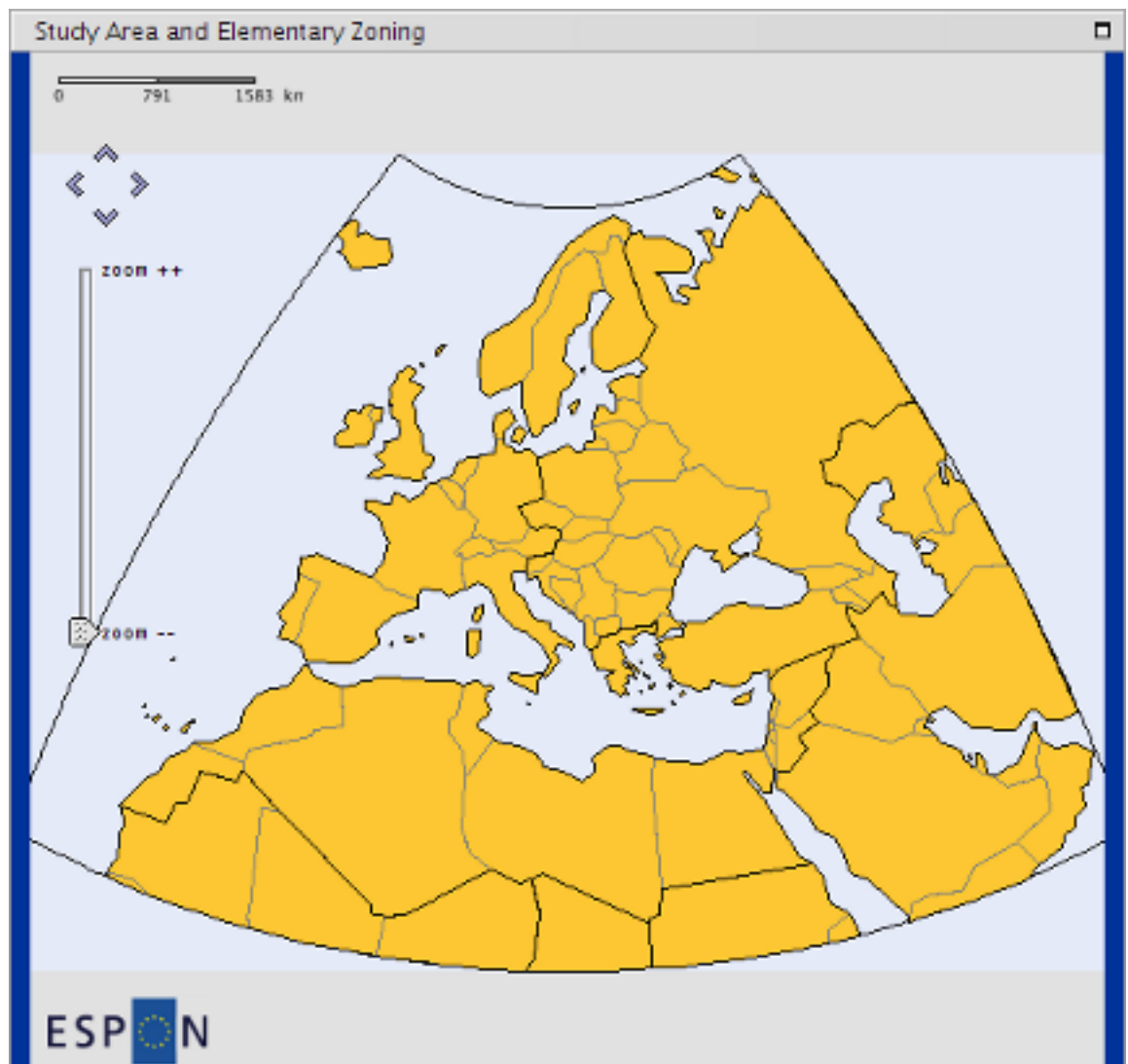


The table lists the available templates of structure/geometry ESPON HyperAdmin input. Note that all available templates are not listed on this screenshot, see below.

Find below a description of each available template:

- **euromed**: this template considers the WUTS at ranks 3-4-5 (countries) delineations on the EU-ROMED area, as shown on Figure 11.3.

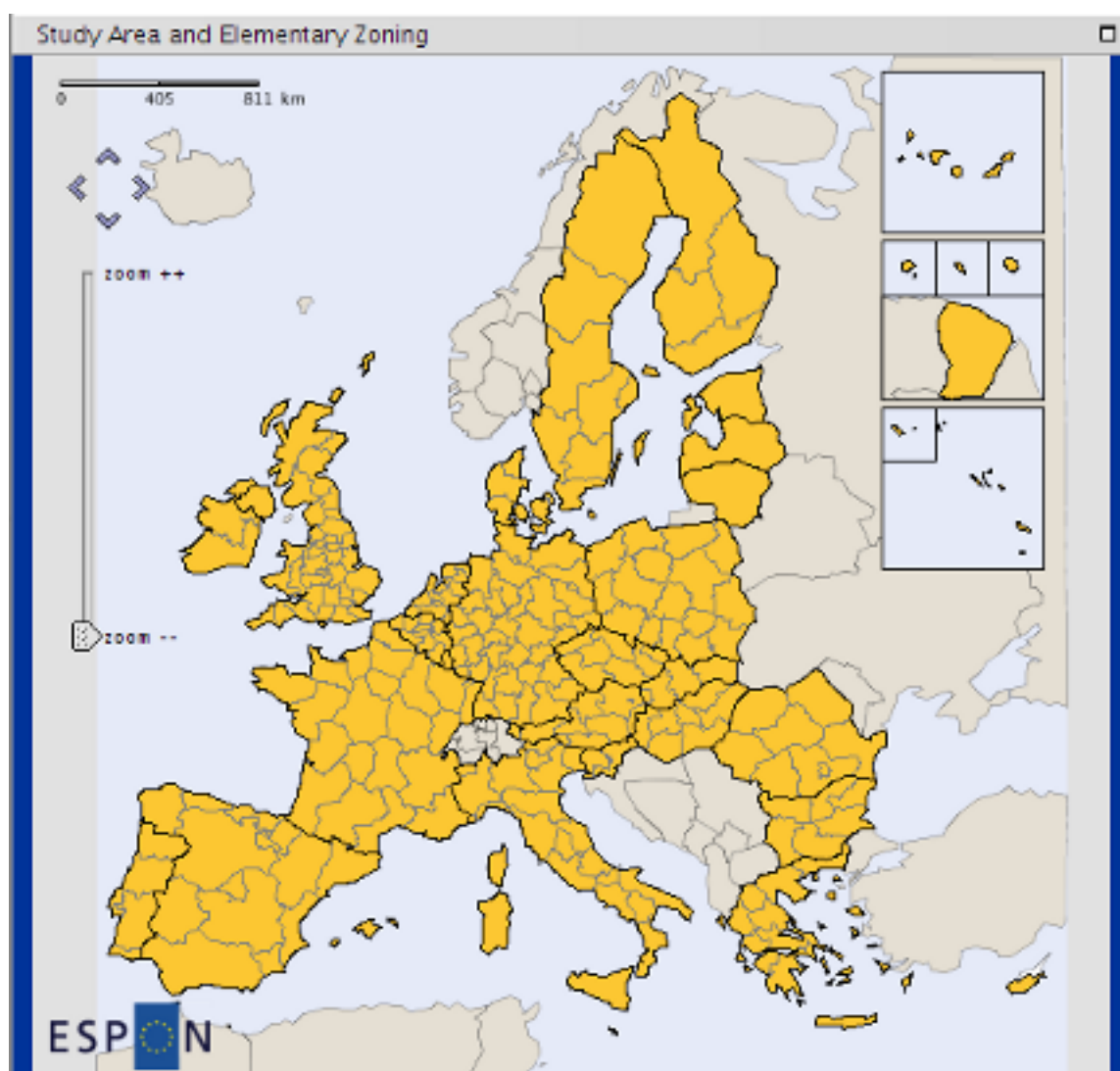
Figure 11.3. EUROMED study area geometry template overview



Delineation of the EUROMED geometry template at WUTS 5.

- **eu27nuts2**: this template considers 27 European states, the delineation is based on the NUTS 2006 revision, at NUTS 2 lowest mesh level. The Figure 11.4 provides a screenshot of the maximal available study area:

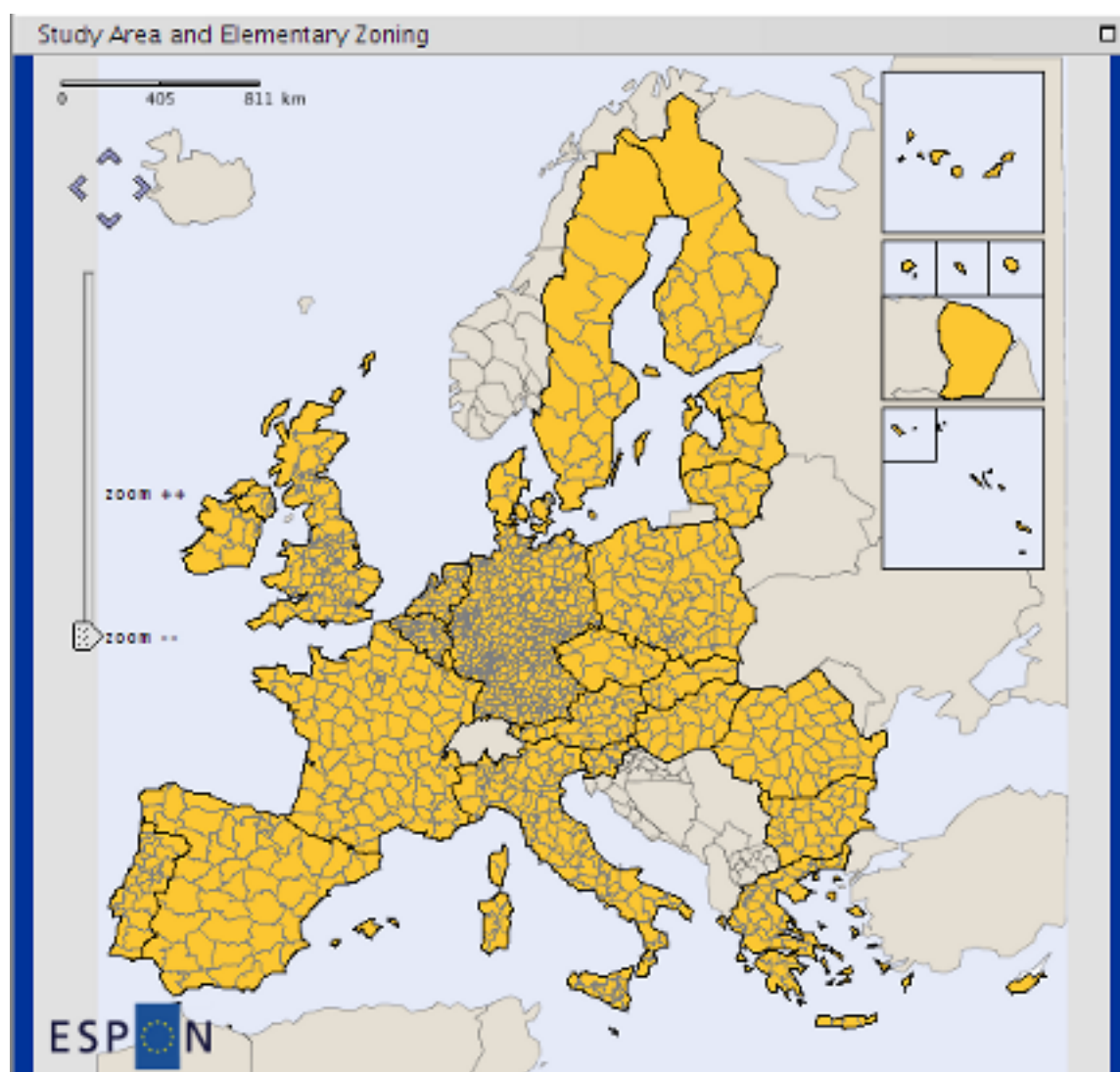
Figure 11.4. EU 27 NUTS 2 study area geometry template overview



Delineation of the EU 27 NUTS 2 geometry template.

- **eu27nuts3**: similar to previous template, but the lowest mesh level considers NUTS 3. The Figure 11.5 provides a screenshot of the maximal available study area:

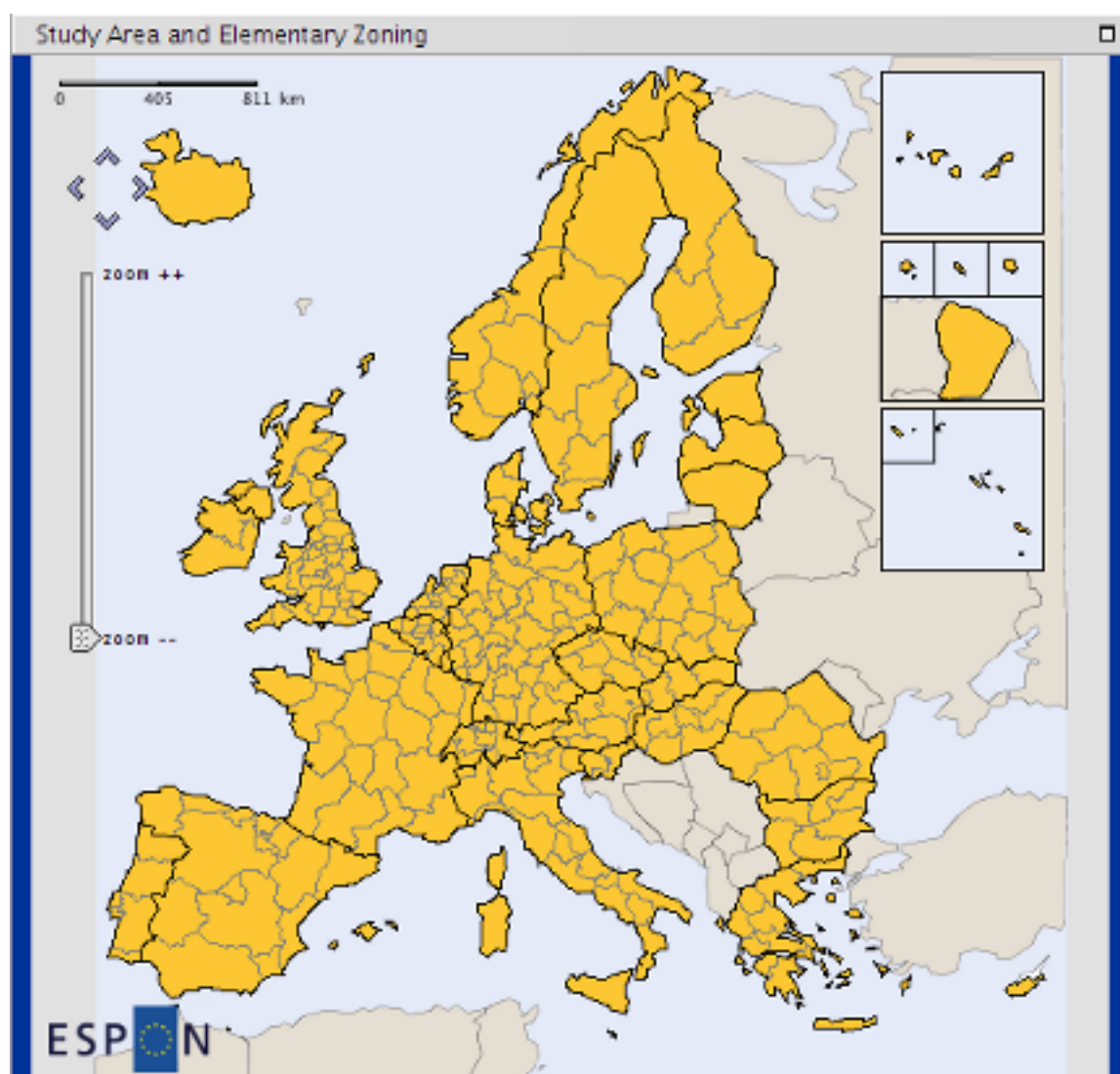
Figure 11.5. EU 27 NUTS 3 study area geometry template overview



Delineation of the EU 27 NUTS 3 geometry template.

- **eu31nuts2**: this template considers the typical ESPON Area with 31 countries, the lowest mesh level is NUTS 2 in its revision 2006 delineation, as shown on Figure 11.6.

Figure 11.6. EU 31 NUTS 2 study area geometry template overview



Delineation of the EU 31 NUTS 2 geometry template.

- ⦿ Since version 1.0.2 of the application, the **eu27nuts2**, **eu27nuts3** and **eu31nuts2** templates embed a layer that allows to display the main cities over the maps. See Section 6.2 for more details about this service.

On clicking the name of the chosen template, the user is redirected to the "Input data" page described in Stocks input next chapter.

- ⦿ For your information, the list of units names is given in the appendix Annex: templates units names

Chapter 12. Stocks input

Figure 12.1. Step2: provide your data



Once the user has chosen a structure template, he/she is invited to submit his stocks for the study area. Figure 12.2 shows the form page where he/she can:

- download the data template example for the selected structure;
- upload his/her own statistics and relevant ratios as described in Section 12.1

Figure 12.2. Upload data page



On this page, the user can both download an example and upload his/her own spreadsheet file providing the stocks values for the dataset he/she wants to generate.

Clicking the "Parse data" button triggers the upload of the input data file to the server then its parsing.

⚠ Depending on the size of the uploaded file and the number of stocks and ratios to parse, this step may take a while. Please do not click again the submit button as long as the page has not reloaded and displayed any success or failure message.

In the case when the input data file has been successfully parsed, the user is redirected to the "Build" page, see Build page.

If the input spreadsheet file does not respect the expected format, an error message is displayed at the top of the page.

12.1. ESPON HyperAdmin input data file format

This section describes the stocks (statistical data) file that ESPON HyperAdmin expects as input.



Please note the following requirements for the input data file:

- the input data file must be a spreadsheet xls file (editable by Microsoft Excel and Open Office) named "`*data*.xls`": the filename must include the "data" characters sequence and the .xls extension is required.
- the values of stocks must be provided for the lowest level of territorial units. This list is available in the example data template that depends on the selected structure/geometry model at previous step. For your information, the list of units names is given in the appendix Annex: templates units names.
- all values for all units must be filled;

Following sections describe the expected format (sheets, columns and possible values) for the version 2 of this `data.xls` file.

12.1.1. About

Table 12.1 provides an example for this mandatory sheet in the data v2 input xls file.

Table 12.1. V2 sample About sheet

VERSION	TIME_ENABLED
2	TRUE

This sheet aims at identifying the version of the format of this data file. Currently (2010-2011), only the value **2** is possible for the VERSION column.

The expected value for the TIME_ENABLED column is a boolean: only **TRUE** or **FALSE** values are possible:

- The **TRUE** value shows that values are available for the same labels of indicators at several dates: for example, the population in 2000, the population in 2002.
- The **FALSE** value shows that each indicator is given for a single date.

12.1.2. Data

Table 12.2 provides an example for this mandatory sheet in the data v2 input xls file.

Table 12.2. V2 sample Data sheet

UT_ID	pop2000	pop2002	area2000	gdp2000	gdp2002
AT111	1	15	2	7	10
AT112	3	16	4	8	11
AT113	5	17	6	9	12

This sheet must provide at least three columns: `UT_ID` then at least two indicators identifiers (in HyperAtlas, there must be at least one numerator stock and one denominator stock). The Table 12.2 shows five indicators identifiers: `pop2000`, `pop2002`, `area2000`, `gdp2000` and `gdp2002`. These identifiers must be described in the **StockInfo** sheet (see Section 12.1.8).

The `UT_ID` column must provide the list of territorial units at the lowest rank (example, at NUTS 3 level) of the dataset. The units are referenced by their identifiers that must match the given values in the associated `structure.xls` input file.

Then, each other cell provides a value for the given indicator column at the given unit row. For example in Table 12.2, 17 is the value for `pop2002` indicator in AT113 territorial unit.



Each cell must be valuated. Missing values are not accepted here.

12.1.3. Default

Table 12.3 provides an example for this optional sheet in the data v2 input xls file.

Table 12.3. V2 sample Default sheet

DEFAULT_NUM	DEFAULT_DEN
pop	area

This sheet aims at providing a default indicator to be selected in HyperAtlas at startup for the denominator and for the numerator combo boxes. Expected values for both columns are valid indicators identifiers that must match two of those defined in the **StockInfo** sheet (see Section 12.1.8).

12.1.4. Label

Table 12.4 provides an example for this mandatory sheet in the data v2 input xls file.

Table 12.4. V2 sample Label sheet

LABEL_ID	LANG_CODE	NAME	DESC
1	EN	Total population	Total population in thousands
1	FR	Population totale	Population totale en milliers
2	EN	Area	Total area
2	FR	Superficie	Superficie totale
3	EN	GDP	Gross domestic product
3	FR	PIB	Produit intérieur brut
4	EN	GDP/Inhabitant	Gross domestic product per inhabitant
4	FR	PIB/Hab	PIB par habitant
5	EN	Density	Density of population
5	FR	Densité	Densité de population

This sheet aims at providing the internationalized names and descriptions for the indicators and pre-defined ratios. The `LABEL_ID` and `LANG_CODE` provides indexes for this table: for a given label identifier there may be several available translations. Thus, the `LABEL_ID = 1` is available in english (`LANG_CODE = EN`) and french (`LANG_CODE = FR`) languages. In the **StockInfo** sheet, each indicator reference a label identifier. As several indicators may be similarly named and described (when an indicator is valuated for several dates), these labels have been exported here.



The language identifier code must be a valid ISO Language Code. These codes are the lower-case, two-letter codes as defined by ISO-639. Nevertheless, the parser supports upper-cases. You can find a full list of these codes at a number of sites, such as: <http://www.ics.uci.edu/pub/ietf/http/related/iso639.txt> (2011-03-16).

Note that values in the **LABEL_ID** column may be referenced from the **StockInfo** sheet (see Section 12.1.8) and from the **RatioStock** sheet (see Section 12.1.7).

12.1.5. Metadata

Table 12.5 provides an example for this optional sheet in the data v2 input xls file.

Table 12.5. V2 sample Metadata sheet

UT_ID	STOCK_ID	PROVIDER_ID
AT111	pop2000	1
AT112	pop2000	2
	area	2
	pop2002	1

This draft sheet aims at providing some basic metadata information for an indicator relatively or not to a territorial unit. Currently, only the source of data may be given as metadata.

For example in Table 12.5, the values of the pop2000 indicator identifier were retrieved from different sources for regions AT111 and AT112. On the contrary, all values for the area indicator, whatever the unit is, were provided by the same source. Idem for the pop2002 indicator.

The values in the **PROVIDER_ID** column must match the identifiers that are given in the **Provider** sheet (see Table 12.6). Likewise, the values in the **STOCK_ID** column must match the identifiers that are defined in the **StockInfo** sheet (see Table 12.8).

12.1.6. Provider

Table 12.6 provides an example for this optional sheet in the data v2 input xls file.

Table 12.6. V2 sample Provider sheet

PROVIDER_ID	NAME	CONTACT	URL
1	Eurostat	toto@eurostat.eu	http://www.eurostat.eu
2	INSEE	tata@insee.fr	http://www.insee.fr

This sheet aims at providing the list of data providers. Their different ids are referenced from the **Metadata** sheet.

12.1.7. RatioStock

Table 12.7 provides an example for this optional sheet in the data v2 input xls file.

Table 12.7. V2 sample RatioStock sheet

RATIO_ID	LABEL_ID	NUM_ID	DEN_ID	VALIDITY_START	VALIDITY_END
1	4	gdp2000	pop2000	2000	2000
2	4	gdp2002	pop2002	2002	2002
3	5	pop2000	area2000	2000	2000
4	5	pop2002	area2000	2002	2002

This sheet aims at defining relevant ratios for the HyperAtlas "ratio" combo box parameter. Table 12.7 shows the example of two such predefined ratios, each of them for two different dates:


- the GDP/Inhabitant:
 - in 2000 (second line)
 - in 2002 (third line)
- The density of population:
 - in 2000 (fourth line)
 - in 2002 (fifth line)

Each value in the `RATIO_ID` column must be unique. Doublons will overwrite the previous found value.

Note that the `LABEL_ID` references the same labels for the given pairs of numerator/denominator at different dates (4 for lines 2 and 3, 5 for lines 4 and 5). These labels identifiers must be set in the **Label** sheet (see Section 12.1.4).

The values in the `NUM_ID` column and the values in the `DEN_ID` column must match the identifiers of indicators that are defined in the **StockInfo** sheet (see Section 12.1.8).

The values in the `VALIDITY_START` column will only be considered if the value of the `TIME_ENABLED` column in the **About** sheet is `TRUE` (see Section 12.1.1). Then, one relevant ratio can be chosen in HyperAtlas for different dates. Identically for the values in the `VALIDITY_END` column. Though `VALIDITY_START` and `VALIDITY_END` columns are designed to handle time intervals, setting the same value in both columns makes the ratio associated to a timestamp.

 The expected format for both validity start/end date fields is currently a year in the `yyyy` pattern. An input like `2010-12-31` is possible but this version of the application will only take into account the year, that is to say 2010 for this example.

12.1.8. StockInfo

Table 12.8 provides an example for this mandatory sheet in the data v2 input xls file.

Table 12.8. V2 sample StockInfo sheet

STOCK_ID	LABEL_ID	MEASURE_UNIT	VALIDITY_START	VALIDITY_END	VISIBLE_FLAG
pop2000	1	*1000	2000	2000	TRUE
pop2002	1	*1000	2002	2002	TRUE
area2000	2	km2	2000	2000	TRUE
gdp2000	3	euros	2000	2000	TRUE
gdp2002	3	euros	2002	2002	TRUE

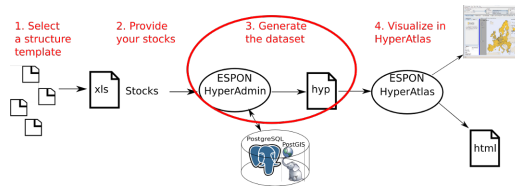
This sheet mainly aims at providing the identifiers of the indicators of the dataset. Here are a short description for each column of this sheet:

- `STOCK_ID`: each value in this column must be unique. Any doublon will overwrite the previous found identical value. This column lists the identifiers of the indicators that are referenced in the other sheets. Note that several indicators may be associated to the same label (lines 2 and 3 for example), though they exist to distinguish the values of the population in 2000 and 2002.
- `LABEL_ID`: each value in this column must reference an identifier defined in the **Label** sheet (see Section 12.1.4).

Stocks input

- **MEASURE_UNIT**: simply provides the unit of measure for this indicator.
- **VALIDITY_START**: shows the start date of validity for this indicator. This field will only be considered if the value of the **TIME_ENABLED** column in the **About** sheet is **TRUE** (see Section 12.1.1 and Important note about expected date format).
- **VALIDITY_END**: shows the end date of validity for this indicator. **VALIDITY_START** and **VALIDITY_END** fields are able to manage time intervals, but they can be used to associate a time-stamp to the current stock: just write the same value in both cells (please see Important note about expected date format).
- **VISIBLE**: this field acts like a flag, a boolean is expected for the values of this column. A **TRUE** value shows that this indicator will be available in the numerator and in the denominator combo boxes of HyperAtlas parameters panel. A **FALSE** value may be useful to define relevant ratios whose indicators have no reason to be available in the numerator and denominator combo boxes. For example, the life expectancy pre-defined ratio considers indicators that have no sense out of this compute.

Chapter 13. ESPON HyperAdmin build



Once the user has submitted a well-formed spreadsheet file including his/her stocks for the chosen geometry at step 1, he/she is redirected to the "Build" page, see Figure 13.1. He/she is invited here to enter a name and a description for the dataset hyp file he/she is about to generate. These fields are mandatory.

Figure 13.1. Dataset information form

The screenshot shows the 'Generate' page of the ESPON HyperAdmin web application. The page has a blue header with the ESPON logo and a navigation bar with links: Home, Welcome, HyperAtlas, HyperAdmin, Dataset, Log off, and Help. The main content area displays a message: 'Your input data file is well formed. Please fill the following form before HyperAdmin generates your dataset.' Below this message are two input fields: 'Project name' (containing 'leqqidf') and 'Description' (containing 'My description for this test'). A 'Generate' button is positioned below the description field. A yellow tooltip with the text 'Please fill a description of the dataset.' is visible near the description field. The footer of the page includes a row of European Union member state flags, links for FAQ, Contact, Links, Site Map, and Legal Notice, the European Union logo with the text 'EUROPEAN UNION Part-financed by the European Regional Development Fund INVESTING IN YOUR FUTURE', and a footer note: 'Powered by HyperCarte Research Group for ESPON - Version 0.1.450 build 200312091830'.

The stock data file is well-formed. Enter a name and a description for the dataset.

- ⚠ Depending on the wideness of the dataset (number of stocks/geometries/zonings, etc.), this step may take a while. While building the dataset, a progress bar appears after a few seconds in the foreground of the window, the background page fonctionnalités are disabled:



Please do not click the submit button as long as the page has not completely reloaded and displayed a success or failure message.

If the generation of the hyp file is successful, the user is redirected to a success page where he/she can download his/her new dataset. Else, an error message is displayed on this "build" page.

In case of success (Figure 13.2), the output build logs are summarized and displayed on the page. In order to avoid overwriting, note that the generated hyp filename follows a date pattern: `YYYYMMd-dhhmss` (year month date hour minutes seconds). On clicking the link showing the name of the generated dataset, the user is invited to save the file to his/her disk, of course he/she can rename the hyp file at his/her convenience.



The use of Microsoft Internet Explorer browser may disturb users when clicking the link by opening an ununderstandable page showing the content of the binary hyp file: to download the generated dataset, right-click the link and choose "Save target as" in the displayed contextual menu.

Figure 13.2. Successfull build



Clicking the link at the bottom of the page invites the user to download his/her generated dataset as an hyp file.

Appendix A. Annex: when things go wrong...

This section deals with the problems that may occur when using the described tools in this document.

Below Known bugs section proposes a non-exhaustive list of problems that can be worked around when using the ESPON HyperAtlas software.

Like most of Java applets, the ESPON HyperAtlas software displays logs messages to the "Java Console". This window is not enabled by default on most of standard browsers. If ESPON HyperAtlas does not behave as expected and described in this user's manual, first enable this Java Console. Note that the display of the Java console depends on your operating system and on your Web browser. Please consult the following links (last visit: 20101228):

- Windows users: How do I enable and view the Java Console? [<http://www.java.com/en/download/help/javaconsole.xml>];
- Mac OS X users: Java Frequently Asked Questions [<http://developer.apple.com/java/faq/>]
- RedHat and Suse Linux users: How do I enable and view the Java Console for Linux? [<http://www.java.com/en/download/help/5000021200.xml>].

For problems that might happen when browsing the pages of the ESPON HyperCarte Web Application, a custom page has been created in order to trace some information. Please copy paste the page and send it to the administrator with as many details on how it happened as possible.



In order to improve the application, thanks in advance for your cooperation, please report bugs!

As far as possible, complete your message with eventual output logs, information about your environment, the version of the application, etc.

For any comment question or suggestion, please contact the manager.

A.1. Known bugs

A.1.1. HyperAtlas is frozen

ESPON HyperAtlas sometimes seems frozen as nothing happens when changing a parameter. Most of the time, your java console will display the log message shown on Figure A.1.

A simple action allows to workaround this bug: simply resize your window!

Figure A.1. Java console: stroke shape error



Displayed log message when the maps of HyperAtlas seem frozen.

A.1.2. Deviations maps update

The deviations maps may sometimes appear "all in grey"... Just click the deviation context combo box in the parameters panel in order that HyperAtlas takes into account the changes of references.

A.1.3. Multiple boxes appear

After several analysis with several datasets, multiple messages boxes may appear. As a Java Applet is loaded in memory for a whole browser session, multiple instances may cause this problem.

The simplest thing to workaround this disturbing behaviour is to close your browser, then restart it.

This bug should be fixed in a next iteration.

Appendix B. Annex: templates units names

For both available ESPON HyperAdmin templates (see Stocks input), this appendix provides the list of names for all units at lowest level of the zoning hierarchy.

B.1. EU 31 NUTS 2 template units

"UT_ID", "Language_ID", "UT_NAME"

"AT11", "DE", "BURGENLAND (A)"
"AT12", "DE", "NIEDERÖSTERREICH"
"AT13", "DE", "WIEN"
"AT21", "DE", "KÄRNTEN"
"AT22", "DE", "STEIERMARK"
"AT31", "DE", "OBERÖSTERREICH"
"AT32", "DE", "SALZBURG"
"AT33", "DE", "TIROL"
"AT34", "DE", "VORARLBERG"
"BE10", "FR", "RÉGION DE BRUXELLES-CAPITALE/BRUSSELS HOOFDSTEDELIJK GEWEST"
"BE21", "FR", "PROV, ANTWERPEN"
"BE22", "FR", "PROV, LIMBURG (B)"
"BE23", "FR", "PROV, OOST-VLAANDEREN"
"BE24", "FR", "PROV, VLAAMS BRABANT"
"BE25", "FR", "PROV, WEST-VLAANDEREN"
"BE31", "FR", "PROV, BRABANT WALLON"
"BE32", "FR", "PROV, HAINAUT"
"BE33", "FR", "PROV, LIÈGE"
"BE34", "FR", "PROV, LUXEMBOURG (B)"
"BE35", "FR", "PROV, NAMUR"
"BG31", "EN", "SEVEROZAPADEN"
"BG32", "EN", "SEVEREN TSENTRALEN"
"BG33", "EN", "SEVEROIZTOCHEN"
"BG34", "EN", "YUGOIZTOCHEN"
"BG41", "EN", "YUGOZAPADEN"
"BG42", "EN", "YUZHEN TSENTRALEN"
"CH01", "FR", "RÉGION LÉMANIQUE"
"CH02", "FR", "ESPACE MITTELLAND"
"CH03", "FR", "NORDWESTSCHWEIZ"
"CH04", "FR", "ZÜRICH"
"CH05", "FR", "OSTSCHWEIZ"
"CH06", "FR", "ZENTRALSCHWEIZ"
"CH07", "FR", "TICINO"
"CY00", "EN", "CYPRUS"
"CZ01", "CS", "PRAHA"
"CZ02", "CS", "STREDNÍ CECY"
"CZ03", "CS", "JIHOZÁPAD"
"CZ04", "CS", "SEVEROZÁPAD"
"CZ05", "CS", "SEVEROVÝCHOD"
"CZ06", "CS", "JIHOVÝCHOD"
"CZ07", "CS", "STREDNÍ MORAVA"
"CZ08", "CS", "MORAVSKOSLEZSKO"
"DE11", "DE", "STUTTGART"
"DE12", "DE", "KARLSRUHE"

"DE13", "DE", "FREIBURG"
 "DE14", "DE", "TÜBINGEN"
 "DE21", "DE", "OBERBAYERN"
 "DE22", "DE", "NIEDERBAYERN"
 "DE23", "DE", "OBERPFALZ"
 "DE24", "DE", "OBERFRANKEN"
 "DE25", "DE", "MITTELFRANKEN"
 "DE26", "DE", "UNTERFRANKEN"
 "DE27", "DE", "SCHWABEN"
 "DE30", "DE", "BERLIN"
 "DE41", "DE", "BRANDENBURG - NORDOST"
 "DE42", "DE", "BRANDENBURG - SÜDWEST"
 "DE50", "DE", "BREMEN"
 "DE60", "DE", "HAMBURG"
 "DE71", "DE", "DARMSTADT"
 "DE72", "DE", "GIESSEN"
 "DE73", "DE", "KASSEL"
 "DE80", "DE", "MECKLENBURG-VORPOMMERN"
 "DE91", "DE", "BRAUNSCHWEIG"
 "DE92", "DE", "HANNOVER"
 "DE93", "DE", "LÜNEBURG"
 "DE94", "DE", "WESER-EMS"
 "DEA1", "DE", "DÜSSELDORF"
 "DEA2", "DE", "KÖLN"
 "DEA3", "DE", "MÜNSTER"
 "DEA4", "DE", "DETMOLD"
 "DEA5", "DE", "ARNSBERG"
 "DEB1", "DE", "KOBLENZ"
 "DEB2", "DE", "TRIER"
 "DEB3", "DE", "RHEINHESSEN-PFALZ"
 "DEC0", "DE", "SAARLAND"
 "DED1", "DE", "CHEMNITZ"
 "DED2", "DE", "DRESDEN"
 "DED3", "DE", "LEIPZIG"
 "DEE0", "DE", "SACHSEN-ANHALT"
 "DEF0", "DE", "SCHLESWIG-HOLSTEIN"
 "DEG0", "DE", "THÜRINGEN"
 "DK01", "DA", "HOVEDSTADEN"
 "DK02", "DA", "SJÆLLAND"
 "DK03", "DA", "SYDDANMARK"
 "DK04", "DA", "MIDTJYLLAND"
 "DK05", "DA", "NORDJYLLAND"
 "EE00", "ET", "ESTONIA"
 "ES11", "ES", "GALICIA"
 "ES12", "ES", "PRINCIPADO DE ASTURIAS"
 "ES13", "ES", "CANTABRIA"
 "ES21", "ES", "PAIS VASCO"
 "ES22", "ES", "COMUNIDAD FORAL DE NAVARRA"
 "ES23", "ES", "LA RIOJA"
 "ES24", "ES", "ARAGÓN"
 "ES30", "ES", "COMUNIDAD DE MADRID"
 "ES41", "ES", "CASTILLA Y LEÓN"
 "ES42", "ES", "CASTILLA-LA MANCHA"
 "ES43", "ES", "EXTREMADURA"
 "ES51", "ES", "CATALUÑA"
 "ES52", "ES", "COMUNIDAD VALENCIANA"
 "ES53", "ES", "ILLES BALEARS"
 "ES61", "ES", "ANDALUCIA"

Annex: templates units names

"ES62", "ES", "REGIÓN DE MURCIA"
 "ES63", "ES", "CIUDAD AUTÓNOMA DE CEUTA (ES)"
 "ES64", "ES", "CIUDAD AUTÓNOMA DE MELILLA (ES)"
 "ES70", "ES", "CANARIAS (ES)"
 "FI13", "FI", "ITÄ-SUOMI"
 "FI18", "FI", "ETELÄ-SUOMI"
 "FI19", "FI", "LÄNSI-SUOMI"
 "FI1A", "FI", "POHJOIS-SUOMI"
 "FI20", "FI", "ÅLAND"
 "FR10", "FR", "ÎLE DE FRANCE"
 "FR21", "FR", "CHAMPAGNE-ARDENNE"
 "FR22", "FR", "PICARDIE"
 "FR23", "FR", "HAUTE-NORMANDIE"
 "FR24", "FR", "CENTRE"
 "FR25", "FR", "BASSE-NORMANDIE"
 "FR26", "FR", "BOURGOGNE"
 "FR30", "FR", "NORD - PAS-DE-CALAIS"
 "FR41", "FR", "LORRAINE"
 "FR42", "FR", "ALSACE"
 "FR43", "FR", "FRANCHE-COMTÉ"
 "FR51", "FR", "PAYS DE LA LOIRE"
 "FR52", "FR", "BRETAGNE"
 "FR53", "FR", "POITOU-CHARENTES"
 "FR61", "FR", "AQUITAINE"
 "FR62", "FR", "MIDI-PYRÉNÉES"
 "FR63", "FR", "LIMOUSIN"
 "FR71", "FR", "RHÔNE-ALPES"
 "FR72", "FR", "AUVERGNE"
 "FR81", "FR", "LANGUEDOC-ROUSSILLON"
 "FR82", "FR", "PROVENCE-ALPES-CÔTE D'AZUR"
 "FR83", "FR", "CORSE"
 "FR91", "FR", "GUADELOUPE (FR)"
 "FR92", "FR", "MARTINIQUE (FR)"
 "FR93", "FR", "GUYANE (FR)"
 "FR94", "FR", "REUNION (FR)"
 "GR11", "EL", "ANATOLIKI MAKEDONIA, THRAKI"
 "GR12", "EL", "KENTRIKI MAKEDONIA"
 "GR13", "EL", "DYTIKI MAKEDONIA"
 "GR14", "EL", "THESSALIA"
 "GR21", "EL", "IPEIROS"
 "GR22", "EL", "IONIA NISIA"
 "GR23", "EL", "DYTIKI ELLADA"
 "GR24", "EL", "STEREA ELLADA"
 "GR25", "EL", "PELOPONNISOS"
 "GR30", "EL", "ATTIKI"
 "GR41", "EL", "VOREIO AIGAIO"
 "GR42", "EL", "NOTIO AIGAIO"
 "GR43", "EL", "KRITI"
 "HU10", "HU", "KÖZÉP-MAGYARORSZÁG"
 "HU21", "HU", "KÖZÉP-DUNÁNTÚL"
 "HU22", "HU", "NYUGAT-DUNÁNTÚL"
 "HU23", "HU", "DÉL-DUNÁNTÚL"
 "HU31", "HU", "ÉSZAK-MAGYARORSZÁG"
 "HU32", "HU", "ÉSZAK-ALFÖLD"
 "HU33", "HU", "DÉL-ALFÖLD"
 "IE01", "EN", "BORDER, MIDLANDS AND WESTERN"
 "IE02", "EN", "SOUTHERN AND EASTERN"
 "IS00", "EN", "ICELAND"

Annex: templates units names

"ITC1", "IT", "PIEMONTE"
 "ITC2", "IT", "VALLE D'AOSTA/VALLÉE D'AOSTE"
 "ITC3", "IT", "LIGURIA"
 "ITC4", "IT", "LOMBARDIA"
 "ITD1", "IT", "PROVINCIA AUTONOMA BOLZANO-BOZEN"
 "ITD2", "IT", "PROVINCIA AUTONOMA TRENTO"
 "ITD3", "IT", "VENETO"
 "ITD4", "IT", "FRIULI-VENEZIA GIULIA"
 "ITD5", "IT", "EMILIA-ROMAGNA"
 "ITE1", "IT", "TOSCANA"
 "ITE2", "IT", "UMBRIA"
 "ITE3", "IT", "MARCHE"
 "ITE4", "IT", "LAZIO"
 "ITF1", "IT", "ABRUZZO"
 "ITF2", "IT", "MOLISE"
 "ITF3", "IT", "CAMPANIA"
 "ITF4", "IT", "PUGLIA"
 "ITF5", "IT", "BASILICATA"
 "ITF6", "IT", "CALABRIA"
 "ITG1", "IT", "SICILIA"
 "ITG2", "IT", "SARDEGNA"
 "LI00", "EN", "LIECHTENSTEIN"
 "LT00", "LT", "LITHUANIA"
 "LU00", "EN", "LUXEMBOURG (GRAND-DUCHÉ)"
 "LV00", "LV", "LATVIA"
 "MT00", "EN", "MALTA"
 "NL11", "NL", "GRONINGEN"
 "NL12", "NL", "FRIESLAND (NL)"
 "NL13", "NL", "DRENTHE"
 "NL21", "NL", "OVERIJSSSEL"
 "NL22", "NL", "GELDERLAND"
 "NL23", "NL", "FLEVOLAND"
 "NL31", "NL", "UTRECHT"
 "NL32", "NL", "NOORD-HOLLAND"
 "NL33", "NL", "ZUID-HOLLAND"
 "NL34", "NL", "ZEELAND"
 "NL41", "NL", "NOORD-BRABANT"
 "NL42", "NL", "LIMBURG (NL)"
 "NO01", "NO", "OSLO OG AKERSHUS"
 "NO02", "NO", "HEDMARK OG OPPLAND"
 "NO03", "NO", "SØR-ØSTLANDET"
 "NO04", "NO", "AGDER OG ROGALAND"
 "NO05", "NO", "VESTLANDET"
 "NO06", "NO", "TRØNDELAG"
 "NO07", "NO", "NORD-NORGE"
 "PL11", "PL", "ŁÓDZKIE"
 "PL12", "PL", "MAZOWIECKIE"
 "PL21", "PL", "MAŁOPOLSKIE"
 "PL22", "PL", "ŚLĄSKIE"
 "PL31", "PL", "LUBELSKIE"
 "PL32", "PL", "PODKARPACKIE"
 "PL33", "PL", "ŚWIĘTOKRZYSKIE"
 "PL34", "PL", "PODLASKIE"
 "PL41", "PL", "WIELKOPOLSKIE"
 "PL42", "PL", "ZACHODNIOPOMORSKIE"
 "PL43", "PL", "LUBUSKIE"
 "PL51", "PL", "DOLNOŚLĄSKIE"
 "PL52", "PL", "OPOLSKIE"

Annex: templates units names

"PL61", "PL", "KUJAWSKO-POMORSKIE"
 "PL62", "PL", "WARMINSKO-MAZURSKIE"
 "PL63", "PL", "POMORSKIE"
 "PT11", "PT", "NORTE"
 "PT15", "PT", "ALGARVE"
 "PT16", "PT", "CENTRO (PT)"
 "PT17", "PT", "LISBOA"
 "PT18", "PT", "ALENTEJO"
 "PT20", "PT", "REGIÃO AUTÓNOMA DOS AÇORES (PT)"
 "PT30", "PT", "REGIÃO AUTÓNOMA DA MADEIRA (PT)"
 "RO11", "EN", "NORD-VEST"
 "RO12", "EN", "CENTRU"
 "RO21", "EN", "NORD-EST"
 "RO22", "EN", "SUD-EST"
 "RO31", "EN", "SUD - MUNTENIA"
 "RO32", "EN", "BUCURESTI - ILFOV"
 "RO41", "EN", "SUD-VEST OLTENIA"
 "RO42", "EN", "VEST"
 "SE11", "SV", "STOCKHOLM"
 "SE12", "SV", "ÖSTRA MELLANSVERIGE"
 "SE21", "SV", "SMÅLAND MED ÖARNA"
 "SE22", "SV", "SYDSVERIGE"
 "SE23", "SV", "VÄSTSVERIGE"
 "SE31", "SV", "NORRA MELLANSVERIGE"
 "SE32", "SV", "MELLERSTA NORRLAND"
 "SE33", "SV", "ÖVRE NORRLAND"
 "SI01", "EN", "VZHODNA SLOVENIJA"
 "SI02", "EN", "ZAHODNA SLOVENIJA"
 "SK01", "SK", "BRATISLAVSKÝ KRAJ"
 "SK02", "SK", "ZÁPADNÉ SLOVENSKO"
 "SK03", "SK", "STREDNÉ SLOVENSKO"
 "SK04", "SK", "VÝCHODNÉ SLOVENSKO"
 "UKC1", "EN", "TEES VALLEY AND DURHAM"
 "UKC2", "EN", "NORTHUMBERLAND, TYNE AND WEAR"
 "UKD1", "EN", "CUMBRIA"
 "UKD2", "EN", "CHESHIRE"
 "UKD3", "EN", "GREATER MANCHESTER"
 "UKD4", "EN", "LANCASHIRE"
 "UKD5", "EN", "MERSEYSIDE"
 "UKE1", "EN", "EAST YORKSHIRE AND NORTHERN LINCOLNSHIRE"
 "UKE2", "EN", "NORTH YORKSHIRE"
 "UKE3", "EN", "SOUTH YORKSHIRE"
 "UKE4", "EN", "WEST YORKSHIRE"
 "UKF1", "EN", "DERBYSHIRE AND NOTTINGHAMSHIRE"
 "UKF2", "EN", "LEICESTERSHIRE, RUTLAND AND NORTHANTS"
 "UKF3", "EN", "LINCOLNSHIRE"
 "UKG1", "EN", "HEREFORDSHIRE, WORCESTERSHIRE AND WARKS"
 "UKG2", "EN", "SHROPSHIRE AND STAFFORDSHIRE"
 "UKG3", "EN", "WEST MIDLANDS"
 "UKH1", "EN", "EAST ANGLIA"
 "UKH2", "EN", "BEDFORDSHIRE, HERTFORDSHIRE"
 "UKH3", "EN", "ESSEX"
 "UKI1", "EN", "INNER LONDON"
 "UKI2", "EN", "OUTER LONDON"
 "UKJ1", "EN", "BERKSHIRE, BUCKS AND OXFORDSHIRE"
 "UKJ2", "EN", "SURREY, EAST AND WEST SUSSEX"
 "UKJ3", "EN", "HAMPSHIRE AND ISLE OF WIGHT"
 "UKJ4", "EN", "KENT"

"UKK1","EN","GLOUCESTERSHIRE, WILTSHIRE AND BRISTOL/BATH AREA"
 "UKK2","EN","DORSET AND SOMERSET"
 "UKK3","EN","CORNWALL AND ISLES OF SCILLY"
 "UKK4","EN","DEVON"
 "UKL1","EN","WEST WALES AND THE VALLEYS"
 "UKL2","EN","EAST WALES"
 "UKM2","EN","EASTERN SCOTLAND"
 "UKM3","EN","SOUTH WESTERN SCOTLAND"
 "UKM5","EN","NORTH EASTERN SCOTLAND"
 "UKM6","EN","HIGHLANDS AND ISLANDS"
 "UKN0","EN","NORTHERN IRELAND"

B.2. EUROMED template units

"UT_ID","Language_ID","UT_NAME"

"W11111","EN","Denmark"
 "W11112","EN","Finland"
 "W11113","EN","United Kingdom"
 "W11115","EN","Ireland"
 "W11116","EN","Iceland"
 "W11117","EN","Norway"
 "W11118","EN","Sweden"
 "W11121","EN","Austria"
 "W11122","EN","Belgium"
 "W11123","EN","Switzerland"
 "W11124","EN","Germany"
 "W11125","EN","France"
 "W11126","EN","Luxembourg"
 "W11127","EN","Netherlands"
 "W11131","EN","Spain"
 "W11132","EN","Greece"
 "W11133","EN","Italy"
 "W11134","EN","Portugal"
 "W11135","EN","Cyprus"
 "W11136","EN","Malta"
 "W11211","EN","Czech Republic"
 "W11212","EN","Estonia"
 "W11213","EN","Hungary"
 "W11214","EN","Lithuania"
 "W11215","EN","Latvia"
 "W11216","EN","Poland"
 "W11217","EN","Slovakia"
 "W11218","EN","Slovenia"
 "W11221","EN","Albania"
 "W11222","EN","Bulgaria"
 "W11223","EN","Croatia"
 "W11224","EN","Macedonia, TFYR"
 "W11225","EN","Romania"
 "W11226","EN","Serbia/Montenegro"
 "W11227","EN","Bosnia and Herzegovina"
 "W11228","EN","Turkey"
 "W11231","EN","Armenia"
 "W11232","EN","Azerbaijan"
 "W11233","EN","Belarus"
 "W11234","EN","Georgia"

Annex: templates units names

"W11235","EN","Moldova, Rep. of"
"W11236","EN","Ukraine"
"W11240","EN","Russian Federation"
"W12111","EN","Algeria"
"W12112","EN","Western Sahara"
"W12113","EN","Libyan Arab Jamahiriya"
"W12114","EN","Morocco"
"W12115","EN","Tunisia"
"W12121","EN","Egypt"
"W12122","EN","Israel"
"W12123","EN","Jordan"
"W12124","EN","Lebanon"
"W12125","EN","Syrian Arab Republic"
"W12126","EN","Occupied Palestinian Territories"
"W12211","EN","Kazakhstan"
"W12214","EN","Turkmenistan"
"W12215","EN","Uzbekistan"
"W12221","EN","United Arab Emirates"
"W12222","EN","Bahrain"
"W12223","EN","Iran, Islamic Rep. of"
"W12224","EN","Iraq"
"W12225","EN","Kuwait"
"W12226","EN","Oman"
"W12227","EN","Qatar"
"W12228","EN","Saudi Arabia"
"W12229","EN","Yemen"
"W13126","EN","Chad"
"W13213","EN","Eritrea"
"W13217","EN","Sudan"
"W13329","EN","Mali"
"W1332A","EN","Mauritania"
"W1332B","EN","Niger"
"W1332C","EN","Senegal"

Appendix C. Annex: acronyms

Find here an alphabetical arrangement of most often used acronyms in this document:

- **DBMS**: DataBase Management System.
- **ESPON**: European Observation Network for Territorial Development and Cohesion [1].
- **GDP**: Gross Domestic Product.
- **HTML**: HyperText Markup Language.
- **JRE**: Java Runtime Environment.
- **MTA**: Multiscalar Territorial Analysis.
- **NUTS**: Nomenclature of territorial units for statistics (see also a definition of NUTS in the glossary).
- **XML**: Extensible Markup Language.

Appendix D. Annex: glossary

Some definitions

Deviation

The relative deviation of a given region (i) to a context is defined by equation Figure D.1. The relative deviation depends on the chosen context (general, medium or local), it shows the gap between the value of the unit and the average value of the context. The deviation is expressed in a percentage of the context average value (100 is the pivot).

Figure D.1. Mathematical formula of the relative deviation

$$RD_i^{Context} = 100 \cdot \frac{\frac{Num_i}{Den_i}}{\frac{\sum_j C_{i,j} \cdot Num_j}{\sum_j C_{i,j} \cdot Den_j}}$$

This figure shows a general formula to compute the relative deviation RD of a territorial unit i for the chosen context Context. Needed variables are:

- Num_x is the value of the indicator chosen as the Numerator parameter for the territorial unit x .
- Den_x is the value of the indicator chosen as the Denominator parameter for the territorial unit x .
- C_i^j is a boolean whose value depends on the chosen context:
 - **General context:** $C_i^j=1$ if the current territorial unit j is included in the reference area, $C_i^j=0$ in other cases. For example, if the reference area is EU-15, C_i^j takes the value 1 for regions of EU-15 and the value 0 for regions of the candidate countries.
 - **Territorial context:** C_i^j shows if two regions i and j belong or not to the same area. In the case when the medium context considers the state level, C_i^j takes the value 1 for regions belonging to the same state and the value 0 for regions belonging to different states.
 - **Spatial context:** C_i^j shows the potential level of local interactions between two regions i and j . The local interaction may be for example defined by a boolean variable which takes the value 1 for contiguous regions and the value 0 for non-contiguous regions. Currently, we have decided that a region is not neighbour to itself ($Loc_{ii}=0$) but it is possible to choose the solution where a region is part of its own neighbourhood ($Loc_{ii}=1$). Many alternative solutions are possible according to the definition of the neighbourhood criterion (kilometres time, cost, length of common boundary, ...) and to the measure of the potential level of interaction. This parameter may not be a boolean but a continuous probabilistic function between 0 and 1.

See Also General deviation, Spatial deviation, Territorial deviation.

Elementary unit

The set of elementary units compose (cover) the whole area, and constitute the elementary zoning.
See Also Elementary zoning.

Elementary zoning

Smallest division of the studied area. Each unit of this zoning is called elementary unit.
See Also Elementary unit.

General deviation	Deviation when the context of reference is the general area. The reference can be an available study area or a any value chosen by the user. See Also Deviation.
Spatial deviation	Deviation when the context of an unit is defined by the set of units that belongs to its neighbourhood (for instance adjacent units), contiguous regions by default. See Also Deviation.
Territorial deviation	Deviation when the context is defined by a territorial unit that belongs to a chosen higher zoning level which contains the considered unit. See Also Deviation.
NUTS (Nomenclature of territorial units for statistics)	Established by EUROSTAT for over 30 years, NUTS is a territorial subdivision system used in Europe "in order to provide a single uniform breakdown of territorial units for the production of regional statistics in the European Union" [1]. The NUTS zoning nomenclature for Europe organizes all units in a hierarchy of levels: <ul style="list-style-type: none"> • NUTS 0 groups administrative units at country level : France, Germany, Spain, Italy, etc. • NUTS 1 groups administrative units at great region level : ILE DE FRANCE, BASSIN PARISIEN, EST, CENTRE-EST, etc. • NUTS 2 groups administrative units at region level (Région in France - Länder in Germany - Comunidades autonomas in Spain, regioni in Italy) : ILE DE FRANCE, RHONE-ALPES, PACA, etc. • NUTS 3 groups administrative units at departement level (Département in France - Kreise in Germany - Provincias in Spain, Provincia in Italy): Essone, Isère, Savoie, etc. • NUTS 4 and NUTS 5 are now deprecated levels that are respectively replaced by LAU 1 and LAU 2. LAU acronym stands for Local Administrative Unit.
Report	HTML document that lists the set of parameters used for analysis (study area, zoning, context for deviation, indicators for numerator and denominator) and the maps which are generated by the application.
Stock	Social-economic count, like number of deaths on 1999 year, number of births on 1999 year, total population in thousand on 1999 year. Stocks should be valued on each elementary unit. There are also called indicators .
Study Area	Territorial space on which we will base the analysis. It can be Europe, Cameroun, or France by example. Only one study area can be loaded in the same time by the application.
Ratio	A ratio between two stocks which are defined and available on the same set of territorial units.

Figure D.2. Ratio

$$Ratio = \frac{stock_{numerator}}{stock_{denominator}}$$

Workspace

Context of analysis and selected options in the application when working on a study area: zoom level, map mode, etc. It can be exported to an XML file.

Appendix E. Annex: references

Some usefull links

[1] ESPON Coordination Unit. *ESPON*. [on line]. <http://www.espon.eu/> (last visit: 1.st december 2009).

[2] Pitney Bowes MapInfo. *Appendix J: MapInfo Data Interchange Format*. [on line]. http://resource.mapinfo.com/static/files/document/1074660800077/interchange_file.pdf (last visit: 18.th may 2010).

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Appendix G. About

This document is part of the ESPON HyperCarte Web Application.

This document is expected to be available from the HyperCarte Web Application Help menu item in HTML and PDF formats.

Credits:

- Images were retouched with The Gimp ¹ ;
- Formulas were generated to PNG format from LaTeX instructions with Tex2PNG ².

For any comment question or suggestion, please visit <http://www.espon.eu> or contact <manager@espon.eu>.

¹[on line] *GIMP - The GNU Image Manipulation Program* [<http://www.gimp.org/>] (last visit: 2.nd april 2009).

²[on line] *TEX2PNG Conversion d'une formule LaTeX en image PNG* [<http://www.nawouak.net/?cat=informatics.tex2png+lang=fr>] (last visit: 25.th may 2010).

Colophon

This document was generated 2013-07-05 15:23:32 (year-month-date hour:minutes:seconds) from the svn rev 1088 of the docbench project.

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Documents generations were automatized with ant⁴, java⁵, processors Xalan⁶ and FOP⁷.



Xslt standard stylesheets are customized in order to get a better image resolution in PDF generated output for admonitions icons: the generated sizes of these icons were turned from 30 to 12 pt.

³[on line] *DocBook.org* [<http://www.docbook.org>] (last visit: november 2009)

⁴[on line] *Apache Ant - Welcome*. Version 1.7.0. [<http://ant.apache.org>] (last visit: 18 november 2009)

⁵[on line] *Developer Resources For Java Technology* [<http://java.sun.com>] (last visit: 18 november 2009). Version 1.6.0_03-b05.

⁶[on line] *Xalan-Java Version 2.7.1* [<http://xml.apache.org/xalan-j/>] (last visit: 18 november 2009). Version 2.7.1.

⁷[on line] *Apache FOP* [<http://xmlgraphics.apache.org/fop/download.html>] (last visit: 18 november 2009). Version 0.94.