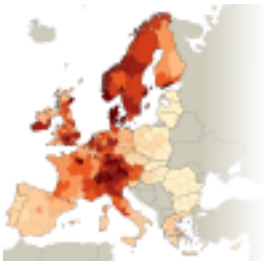
HyperCarte Web Application

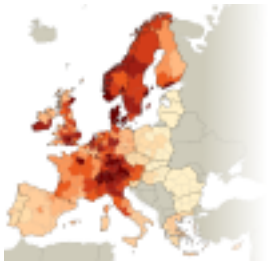
HyperAtlas and HyperAdmin User's Manual



HyperCarte

HyperCarte Research Group

HyperCarte Web Application: HyperAtlas and HyperAdmin User's Manual:



HyperCarte

HyperCarte Research Group

Abstract

This document provides the minimum information about how to use HyperAtlas and HyperAdmin from the 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 Standard HyperAtlas v2. Then, this document aims at providing an user's manual for the usage of the following applications:

- Standard HyperAtlas
- HyperAdmin

First of all, please insure that you have carefully read the HyperAtlas Application 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 : Standard 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 Standard HyperAtlas v2 session, describing possible paths of investigation.

Users of the Standard 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 Standard 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, Standard HyperAtlas v2 provides an **expert mode** (see Standard 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. Standard HyperCarte Web Application

This part describes the main pages of the Standard Web Application embedding the Standard HyperAtlas and Standard 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..

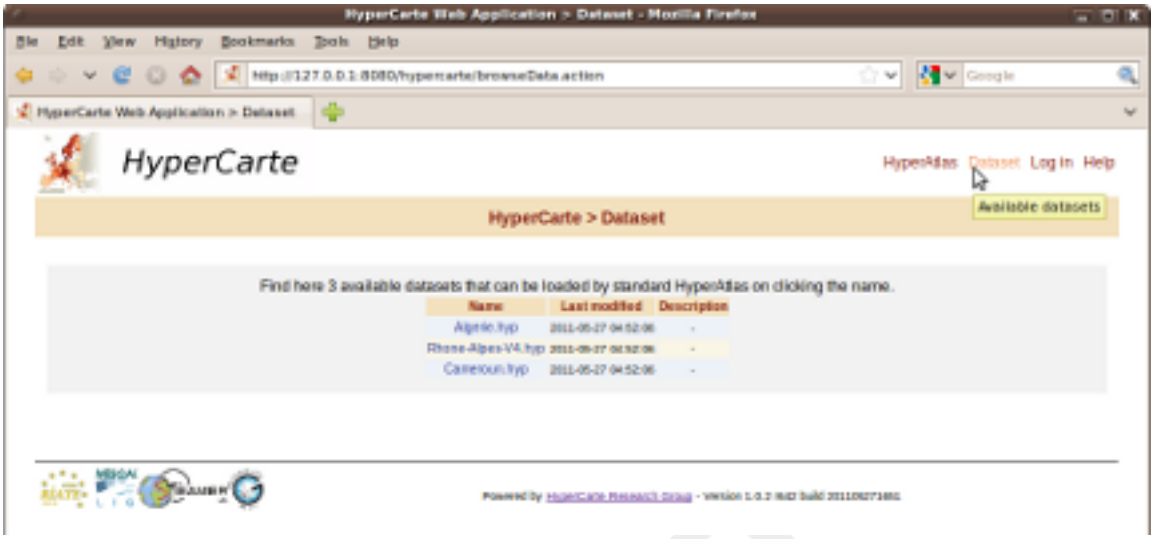
The links on the top right menu bar of the page provides the main topics that are available for this Standard HyperCarte application:

- **HyperAtlas**: when the user accepts the conditions of use (see Figure 2.1) , he/she can execute the Standard HyperAtlas v2 applet. This applet allows then to perform a multiscalar territorial analysis on a default dataset (currently: Economy and Social Affairs). Please consult Standard HyperAtlas part of this document for further information on how to use Standard HyperAtlas.
- **Dataset**: for further analysis, this page provides a list of available datasets that can be loaded by the Standard 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.

Figure 2.1. Standard HyperAtlas License

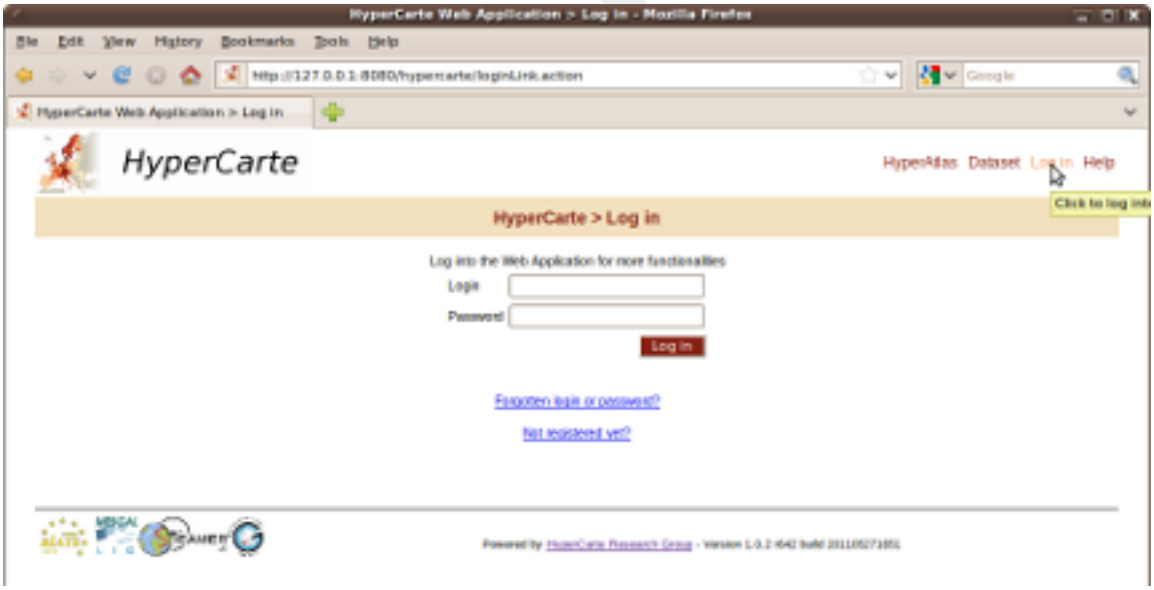
The license must be read and accepted by the user before accessing the Standard HyperAtlas applet.

Figure 2.2. Dataset Page



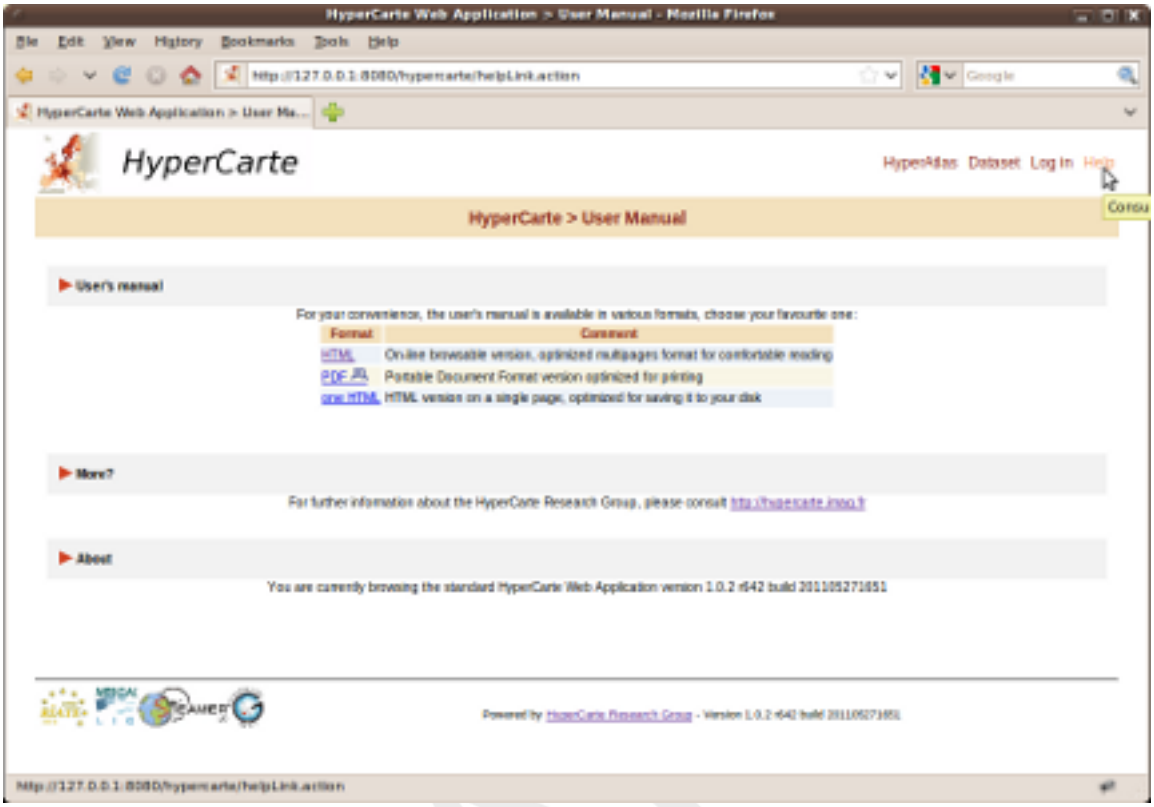
The list of available datasets on this page provides various thematics and study areas. Click the name of the dataset to load the associated hyp file into HyperAtlas.

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.

Figure 2.4. Help



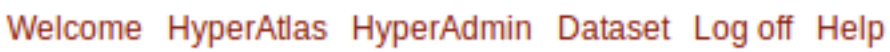
Links to the Standard HyperCarte User's Manual and version information.

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 Standard HyperAdmin integration tool to generate new dataset `.hyp` files.

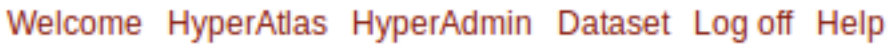
Figure 3.1. Registered status menu bar



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 Standard 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 Standard HyperAdmin is further described in the HyperAdmin part of this document.

2. check your newly created dataset hyp file from Standard HyperAtlas (see Standard HyperAtlas part of this document)

3. submit the dataset ("advanced" status users only) as described below, How to submit new dataset hyp files? [7]

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

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

Please test your `hyp` file with Standard 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. Standard HyperAtlas

Standard 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 Standard 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.

Standard 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, her 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. Standard HyperAtlas startup

Before starting Standard HyperAtlas:

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

Based on the Java technology applet, Standard 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 Standard 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.

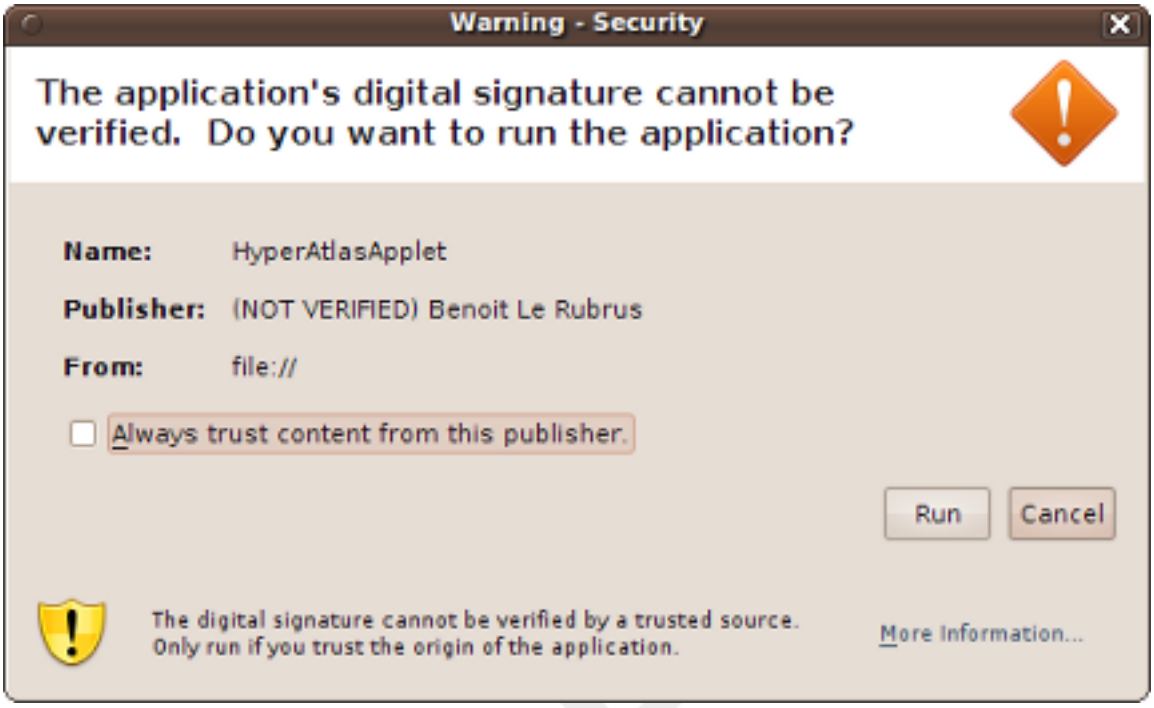
For more information about your JRE, please consult the following links (last visit: 20101228):

- 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, Standard 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 Standard 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

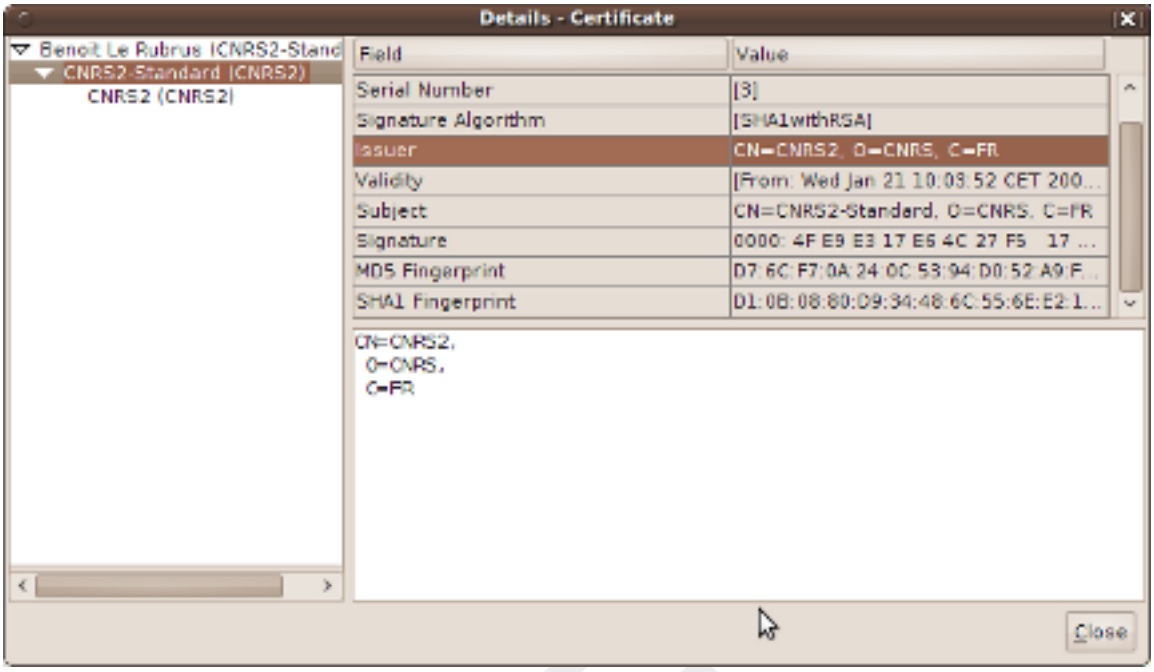


JVM Applet execution security warning displayed window before startup.

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 Standard HyperAtlas applet begins to load a dataset. Depending on the speed of this loading, a splash screen icon may appear a few seconds:

Chapter 5. Standard HyperAtlas input dataset

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

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

Standard 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 Standard HyperAtlas loads a default dataset: **Rhône-Alpes**.

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

Standard 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:

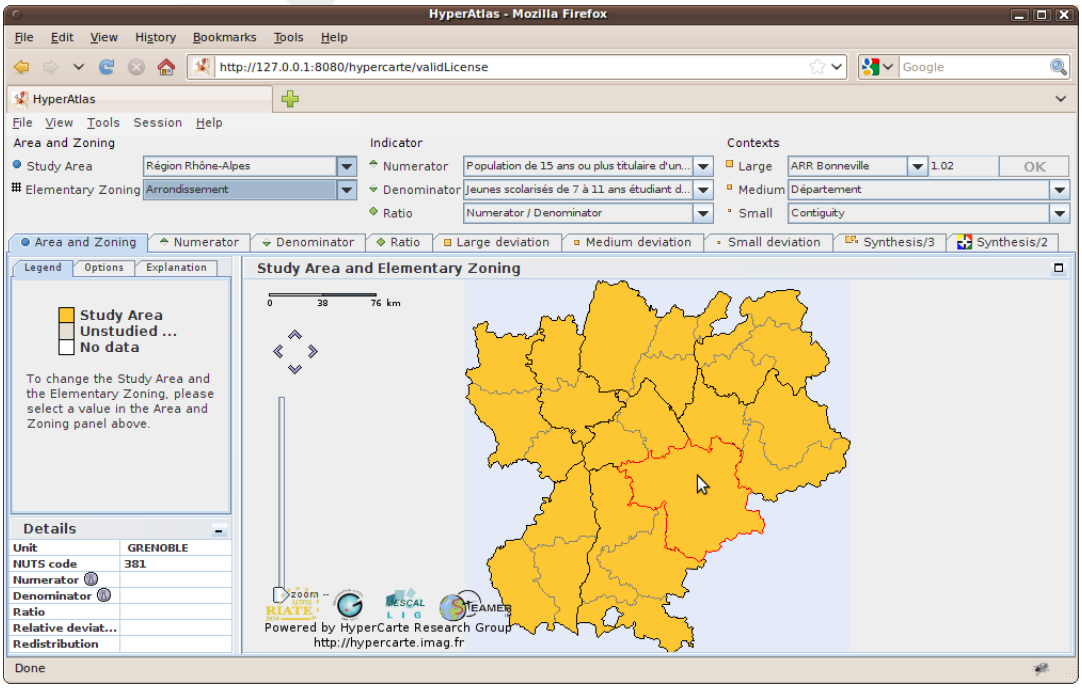
- the number of equivalence classes
- statistical progression (arithmetic or geometric)
- the pallet of colors
- etc.

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

As shown on Figure 6.1, StandardHyperAtlas 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 Standard HyperCarte Web Application "Dataset" page. The main components of the Standard 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. Standard HyperAtlas frame overview

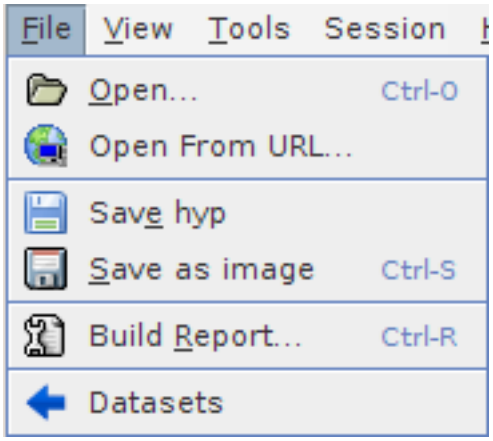


Standard HyperAtlas at startup..

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



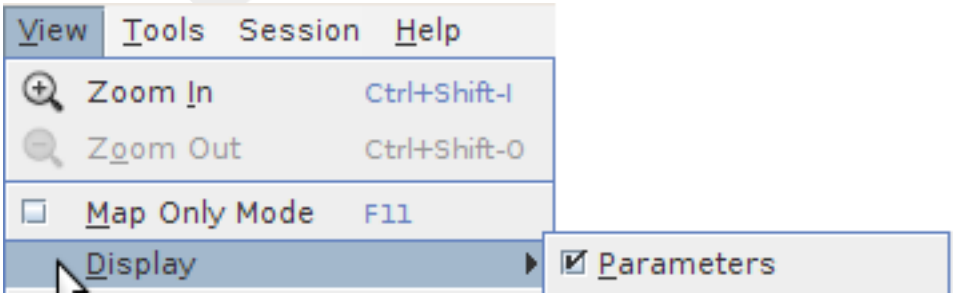
This menu allows:

- 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

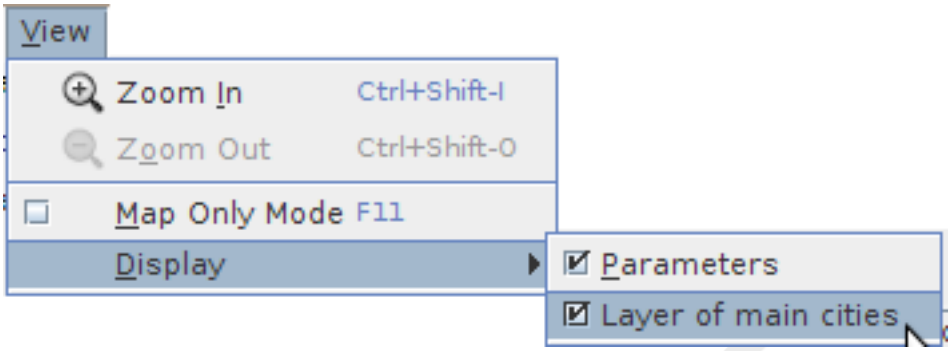


This menu concerns the appearance of the maps. It provides menu items to zoom in, zoom out and to choose the different panels that can be displayed as different parts of the window:

- 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 check-box 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.

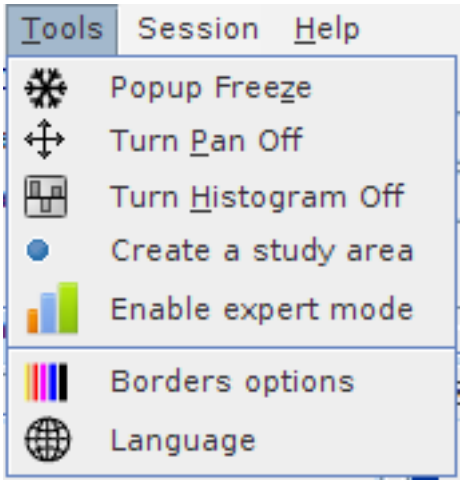
When the *Display-Cities* menu item is enabled, cities are displayed over the maps as black squares, as shown on Figure 6.5. Note that for ergonomy reasons, to avoid overlapping between cities labels, the names of the cities are not displayed over the map. Nevertheless, a tooltip appears when the mouse 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 functionnalitiy is usefull to compare several maps or charts: clicking on this menu item, a popup window is opened, displaying a frozen image of the current visisted tab.

Two options allow to manage the behavious 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 [27] paragraph)

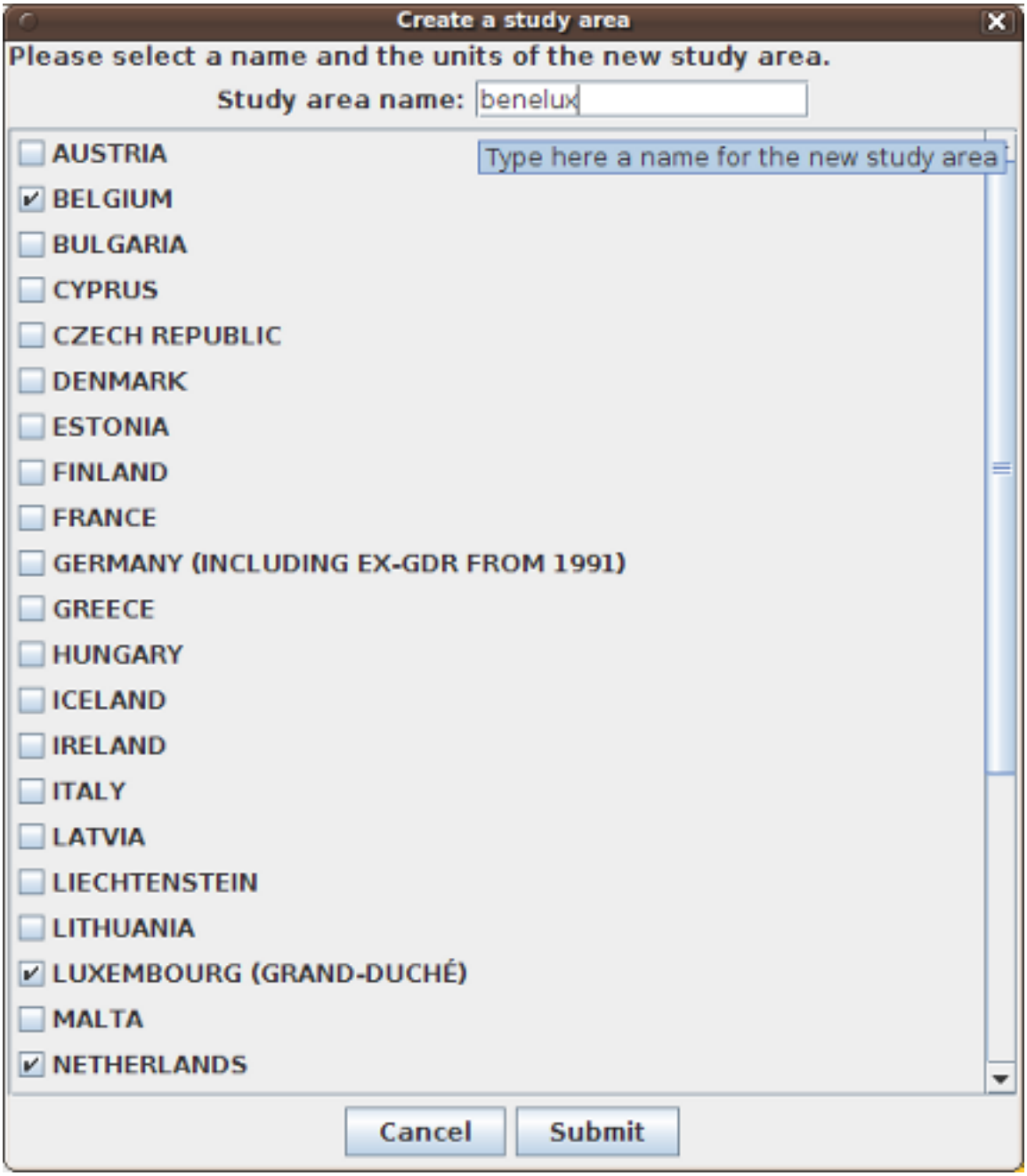
Other tools available on this menu:

- **Create a study area** menu item is described below.
- **Enable expert mode**" menu item is described in Standard 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 Standard 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.

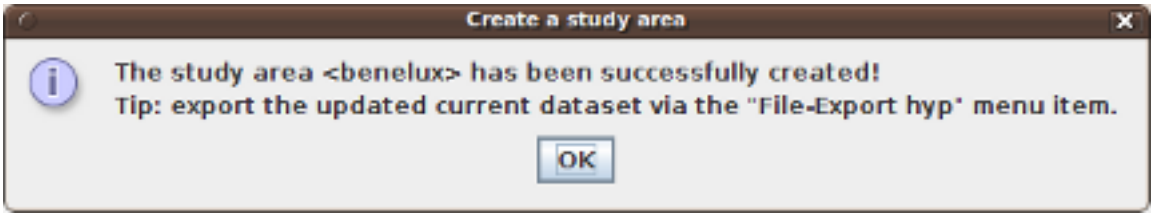
Figure 6.7 shows the example of a user who wants to define the `benelux` study area. He/she selects `Belgium`, `Luxembourg` and `Nederlands` units then clicks the "Submit" button. Figure 6.8 shows the information message that is displayed when the creation is successfull. The `benelux` parameter is now 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



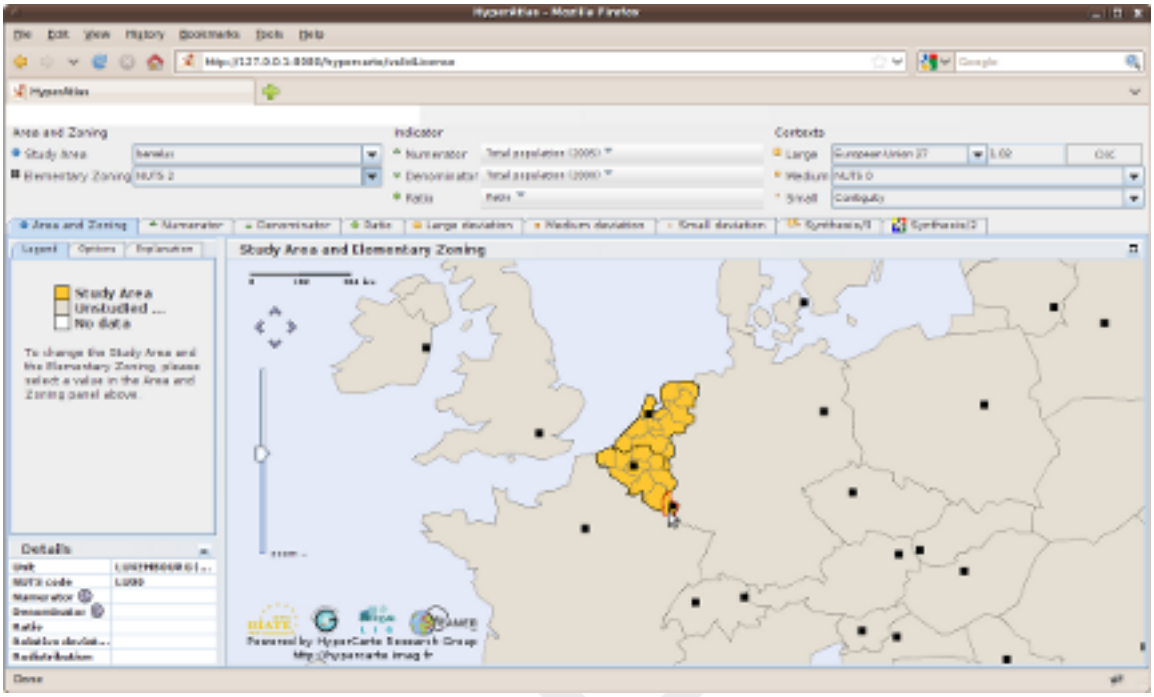
Provides the list of countries and a text field to enter a name for this new study area.

Figure 6.8. Study area creation success



Infomation message.

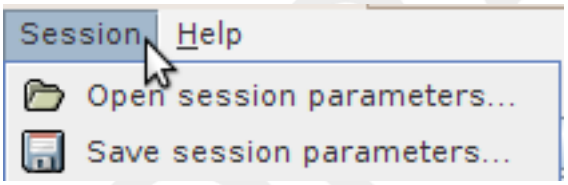
Figure 6.9. Map of the new study area



Selected new study area.

6.4. Session menu

Figure 6.10. Screenshot of the Session menu



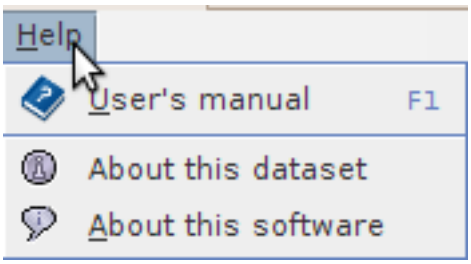
This menu allows to save the parameters of the current analysis to an Standard HyperAtlas XML file on your disk.

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 occurres 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 [73]). 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 Standard 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?

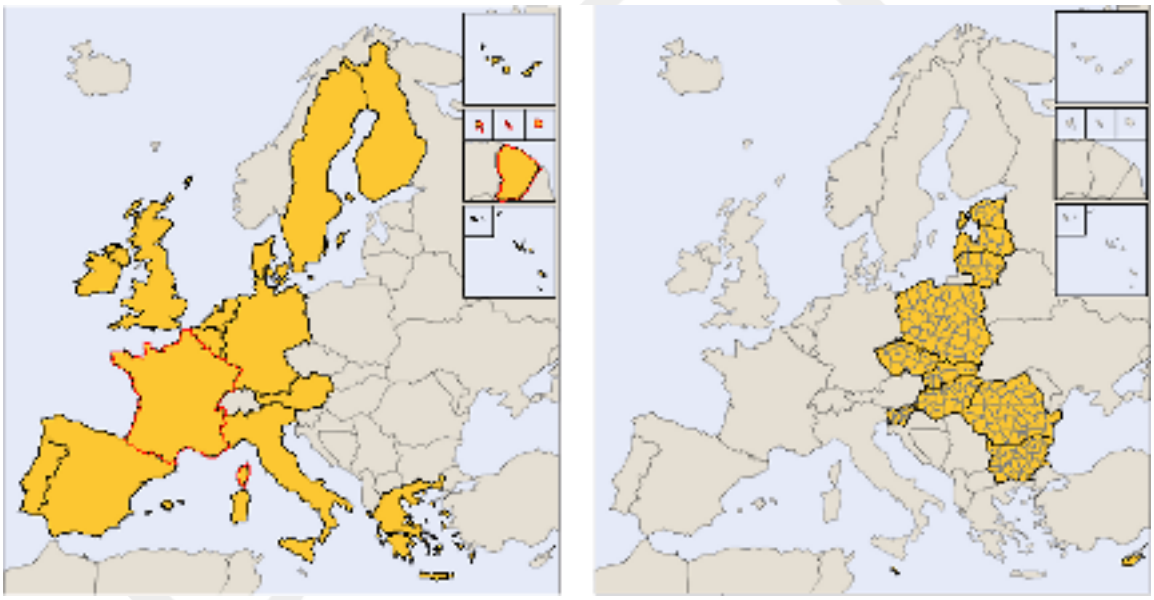
As shown on Figure 7.1, these two parameters have to be selected in the two respective pop up lists. The different propositions are internal and come from the a priori implementation.

Figure 7.1. Study area fields

- **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



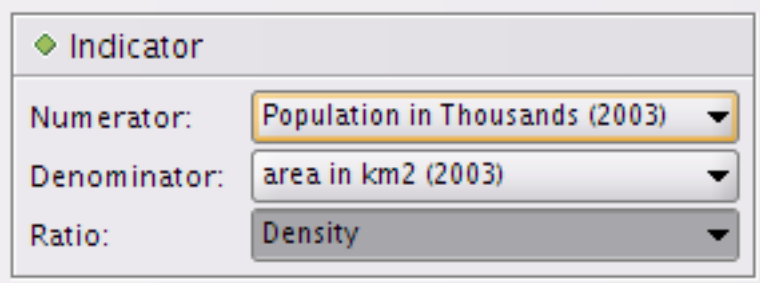
These two maps were extracted from the "Area and Zoning" tab of the application with following settings:

	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

Standard 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



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 km`^{2}
- **Ratio**: depending on the chosen dataset (the hyp file), selecting a ratio may implie 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 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 elemetary 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 km`^{2}
- the image on the right shows the **Ratio** map within its associated tab, here, the density.

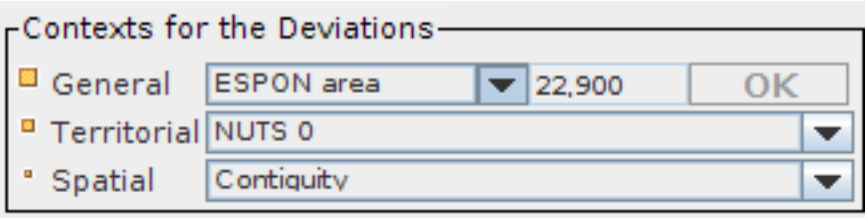
7.4. Setting the contexts for deviations

As described in various contexts [9] 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 Standard HyperAtlas:

- *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

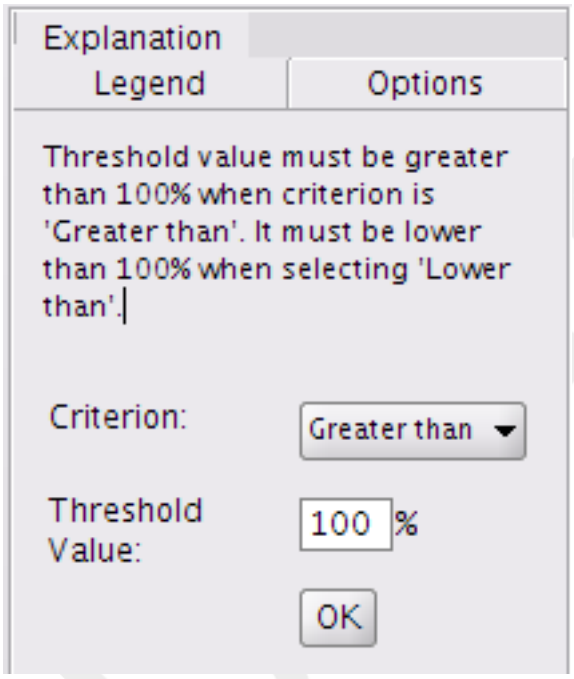
One synthesis map was already available in the previous version of Standard HyperAtlas, based on three levels and one treshold, it is described in Ternary synthesis map. A new synthesis map has been added to the application since the version 2.0: see Dual synthesis map.

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.

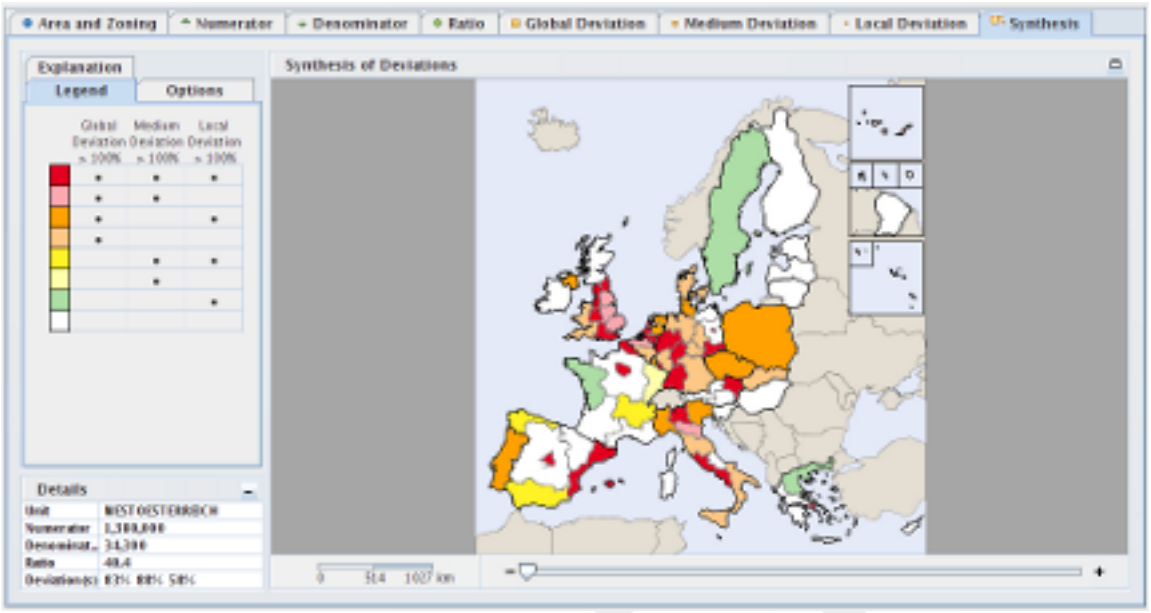
In order to reduce the whole combinatory of possible cases, from the "Options" tab close to the synthesis map (Figure 7.7), the user must specify which point of view he wants to focus on: the first "Criterion" parameter shows whether the point of view is to underline the regions whose ratio is **greater 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 wining ones), the user must chosse the point of view of the synthesis. Then, the user can choose the threshold percentage.

Figure 7.7. Synthesis map options



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.

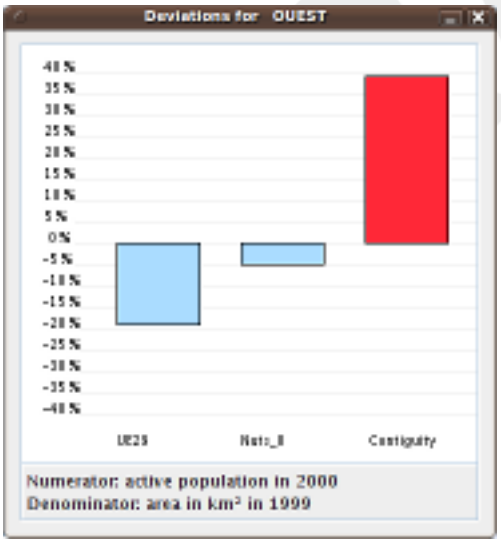
Figure 7.8. Synthesis map tab



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 regiion



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 0` 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 Standard 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.

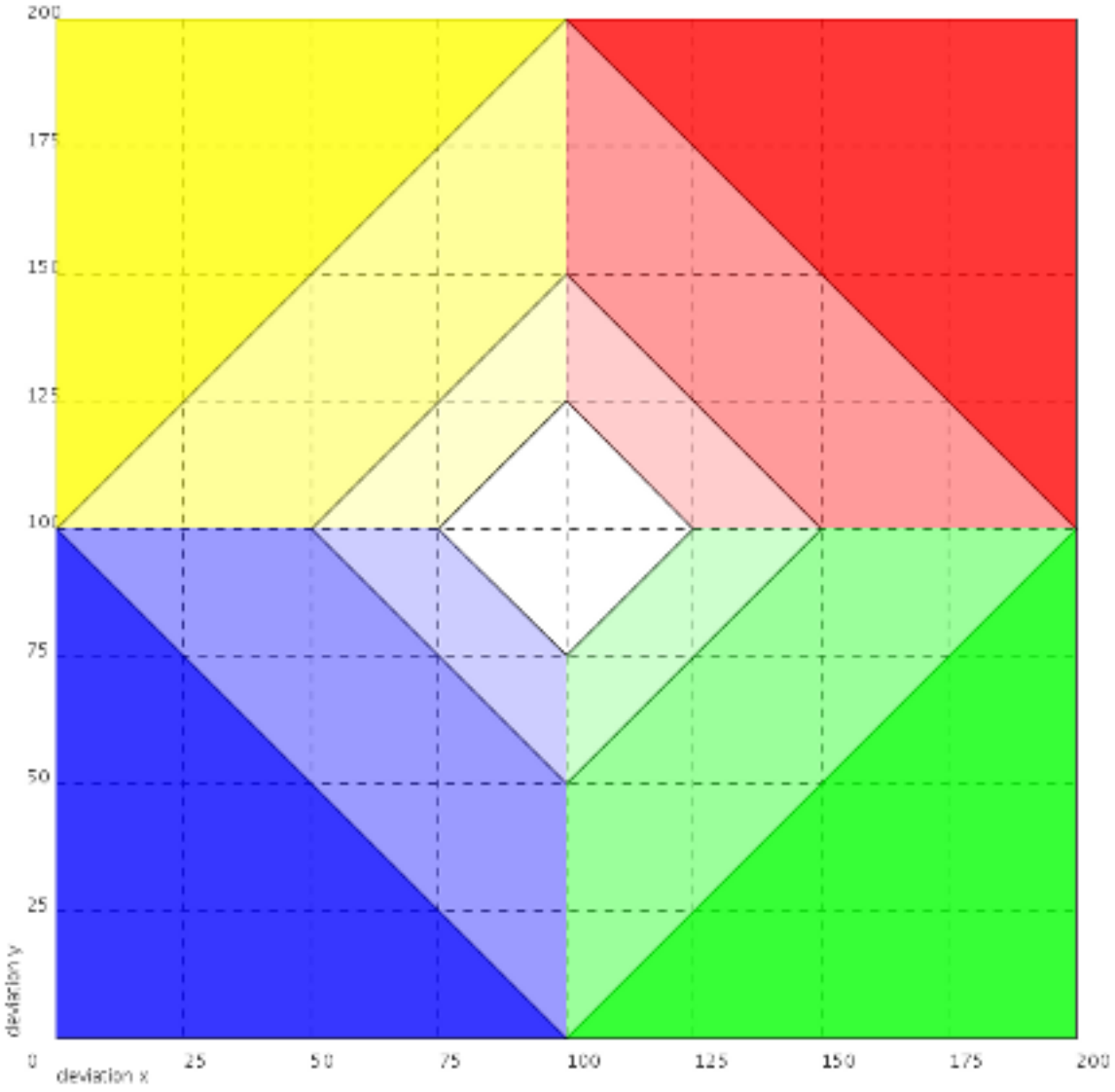
The legend of the dual synthesis map shown on Figure 7.10 is composed of four main quarters. The values on both axis range range from 0 to 200% and they represent the percentages of a deviation of a territorial unit relatively to a context of reference. The user is invited to select in an options tab 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

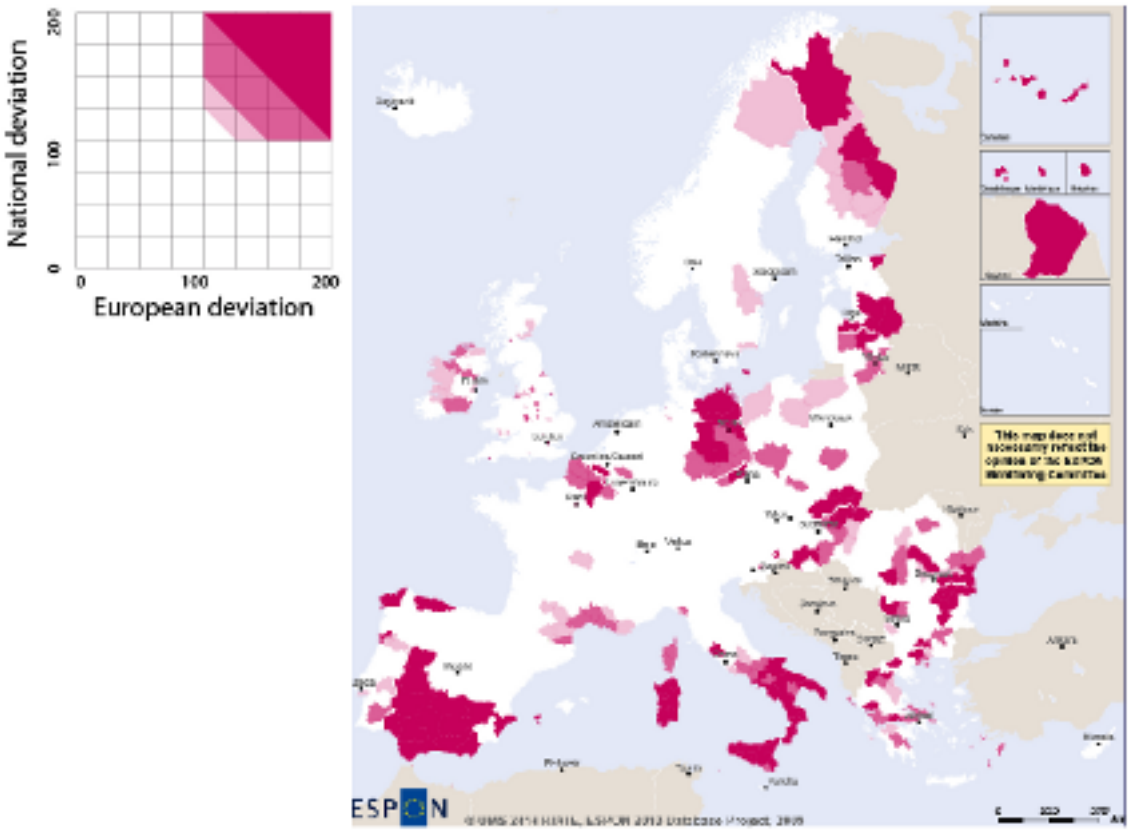


Graduations and quarters of the dual deviation synthesis map legend.

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 unemployement:

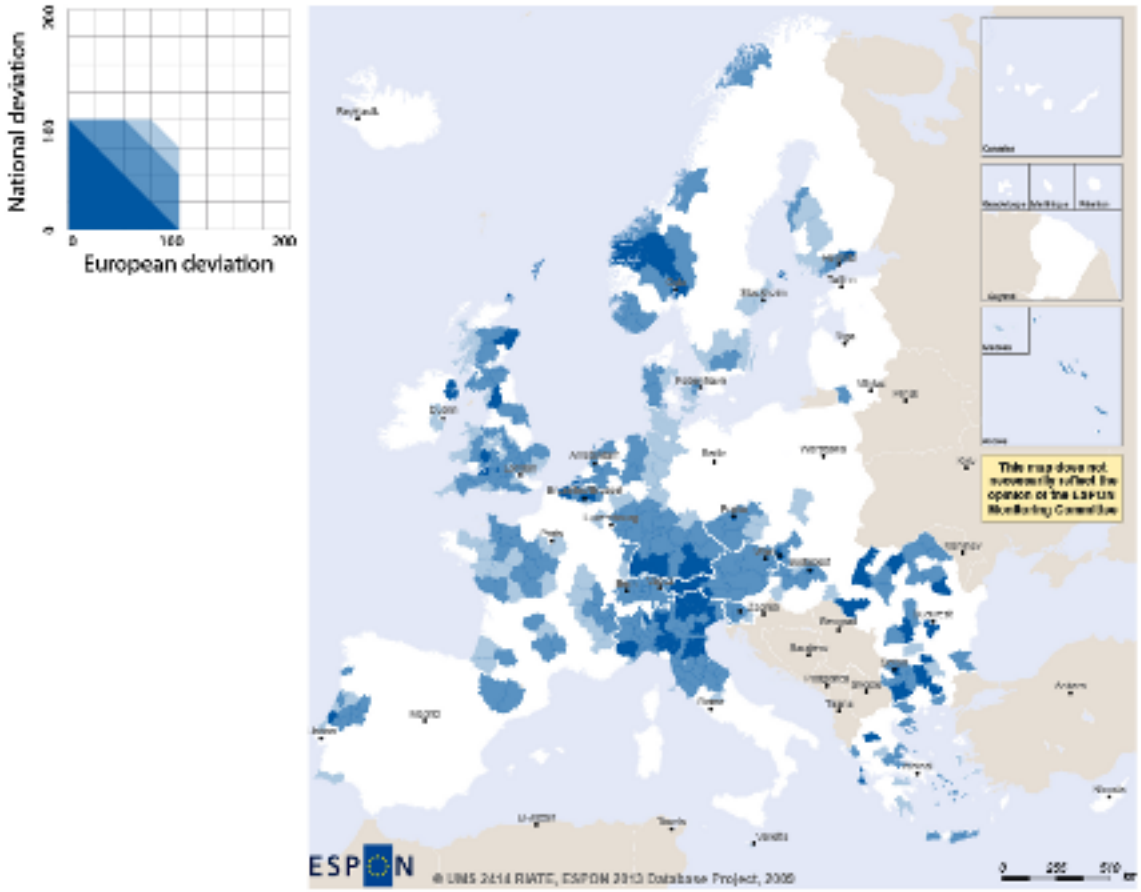
- Figure 7.11 shows in red the territorial units whose unemployement rate is above average both at European and National levels:

Figure 7.11. Dual synthesis map: red units



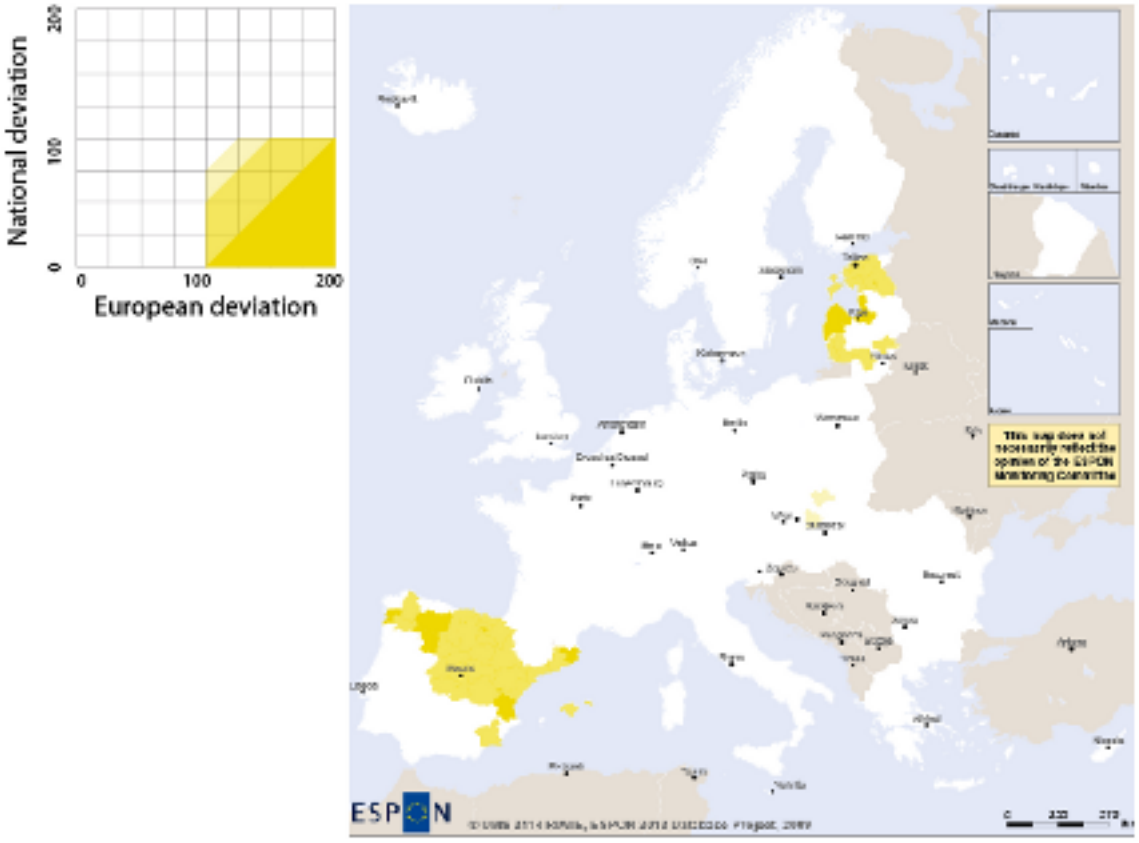
- Figure 7.12 shows in blue the territorial units whose unemployement rate is under average both at European and National levels:

Figure 7.12. Dual synthesis map: blue units



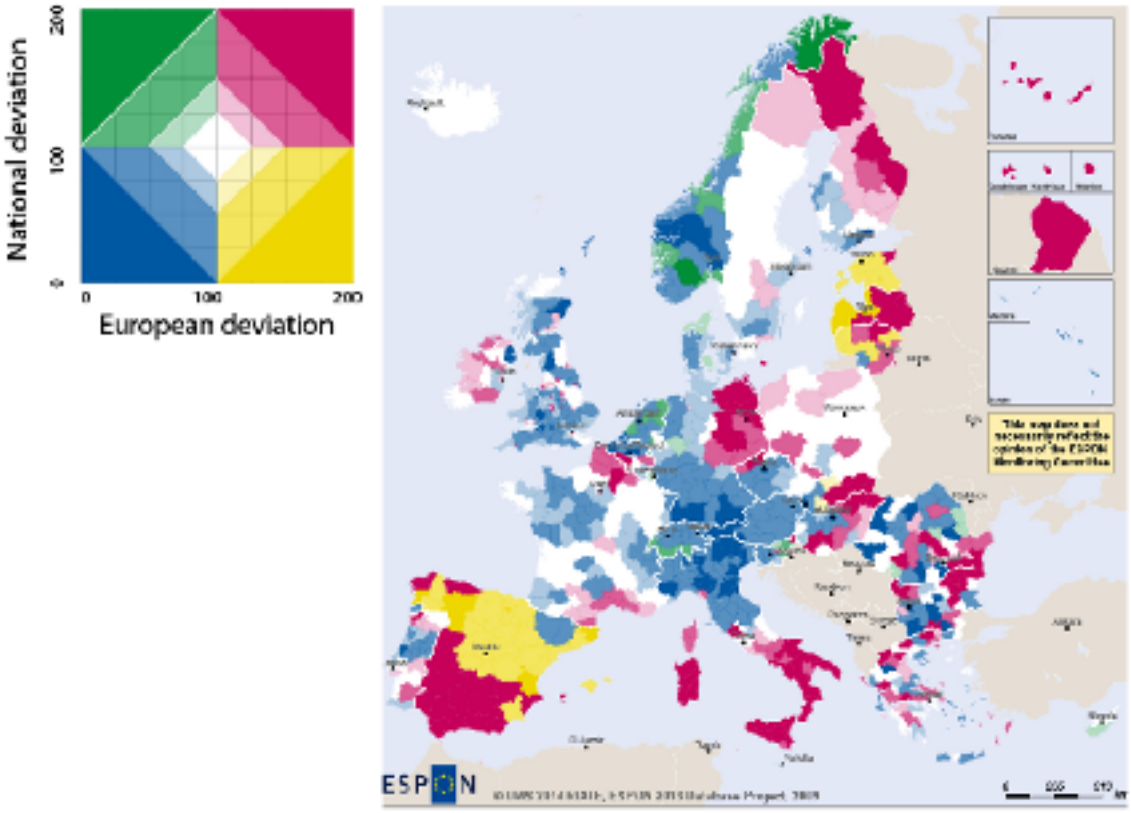
- Figure 7.13 shows in yellow the territorial units whose unemployement rate is above average at European level and under at National level:

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:

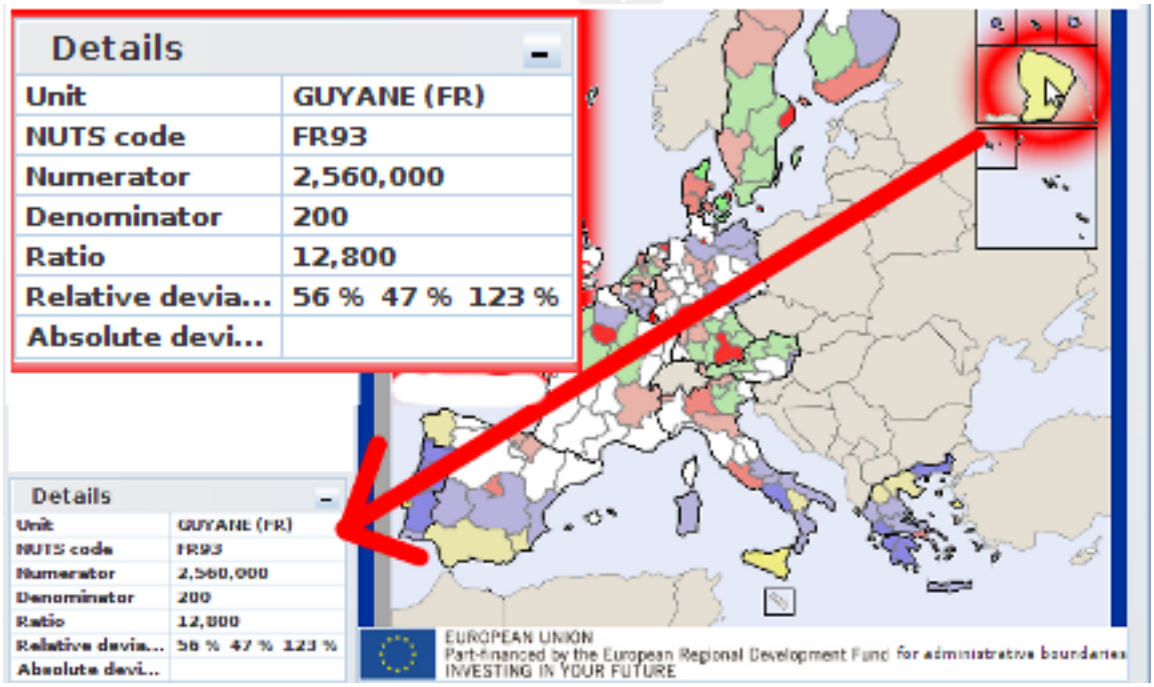
Area and zoning	This map shows the chosen study area and elementary zoning.
Numerator	This map shows the chosen study area and elementary zoning.
Denominator	This map shows the value of the chosen denominator indicator for each unit of the elementary zoning.
Ratio	This map shows the distribution of the 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.

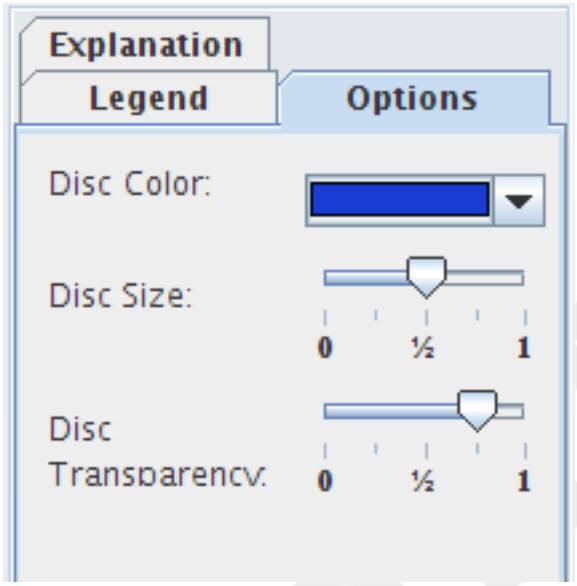

Except for the synthesis map, a left click anywhere on the map changes the function of the cursor to “Pan”, as long as this option is on (see Section 6.3).


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 [27]).

8.3. Legends, options and explanation tabs

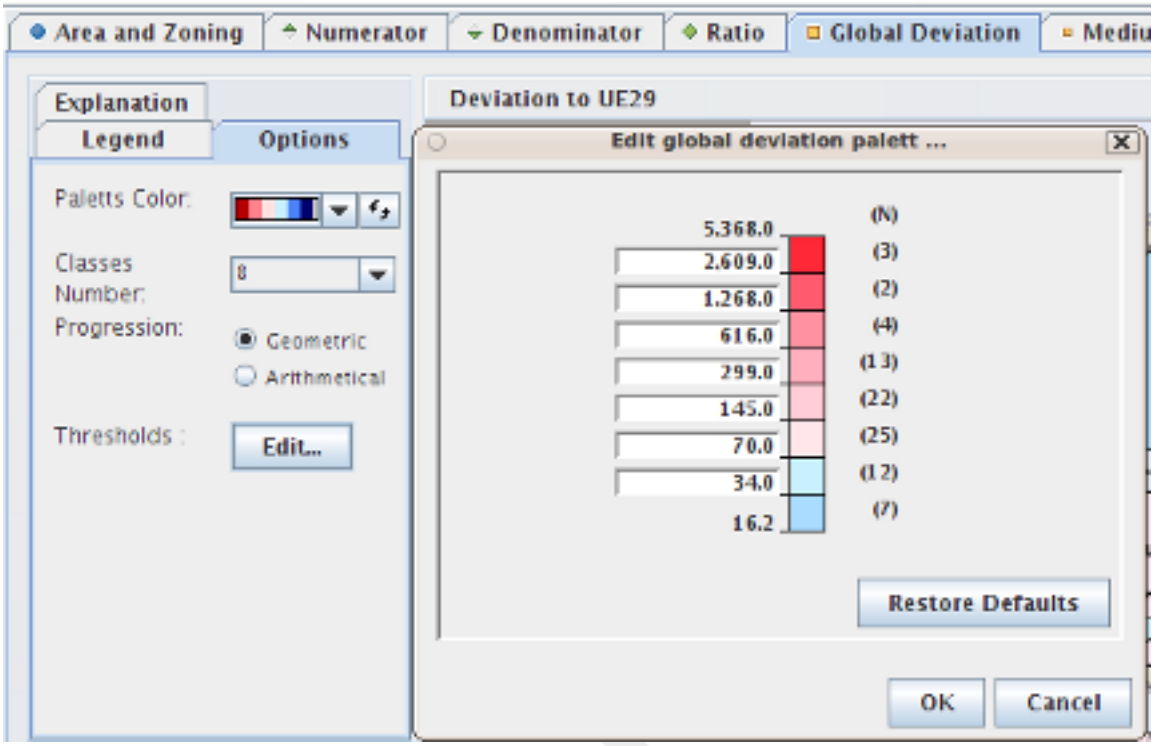
Each map is associated to a set of three tabs that provide tools to control and to understand the cartography. The choices are valid for the current map. Figure 8.2 displays each the "Options" tabs for an indicator map (that shows proportional circles) while Figure 8.3 displays the available options 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**:
  - **arithmetic** 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

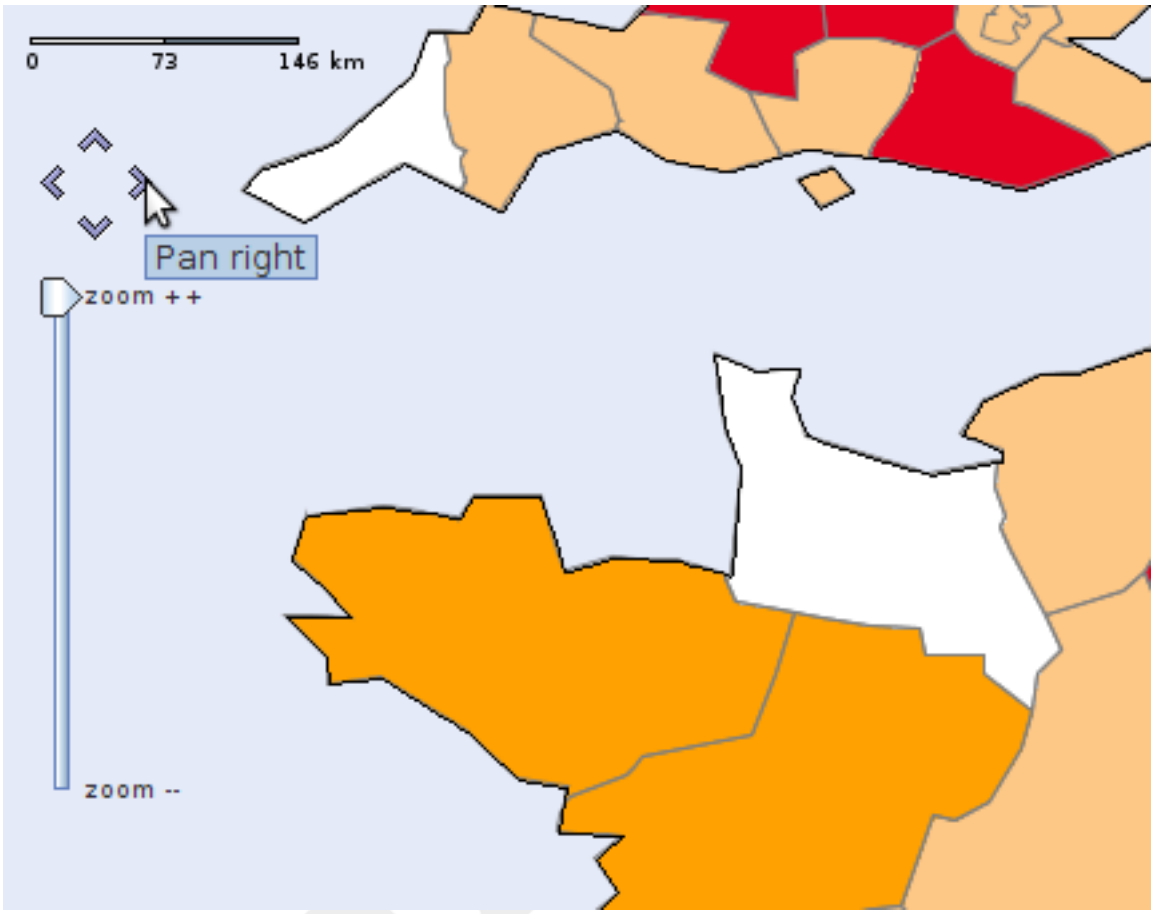
8.4. Zoom

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_hyperatlas_report/` directory as target directory, he/she may open the saved report from a web browser by selecting the `/home/toto/my_hyperatlas_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

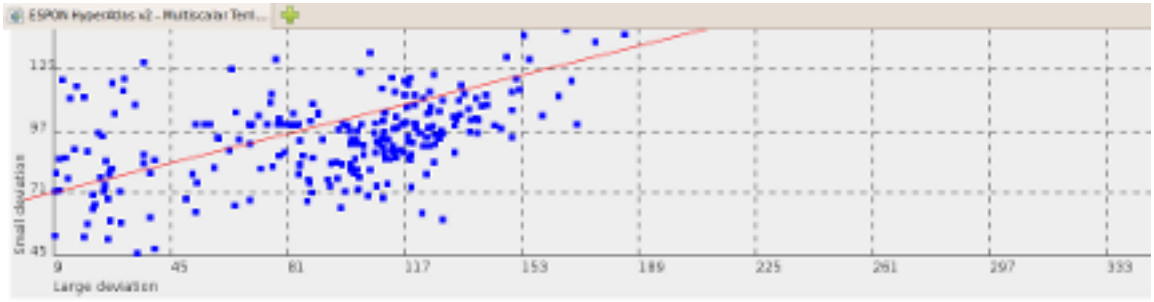
In expert mode, the generated report also includes expert tabs as images:

- 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. Standard HyperAtlas Expert Mode

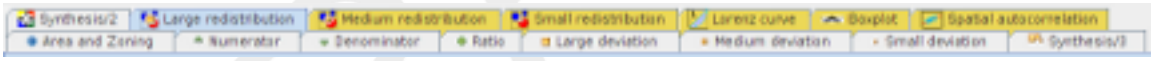
This chapter describes a set of tools that have been integrated since the version 2 of Standard HyperAtlas. As this set of cartographic and statistic tools are mainly designed for more advanced users, they are not available by default at the startup of the application. In order to keep the application 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.

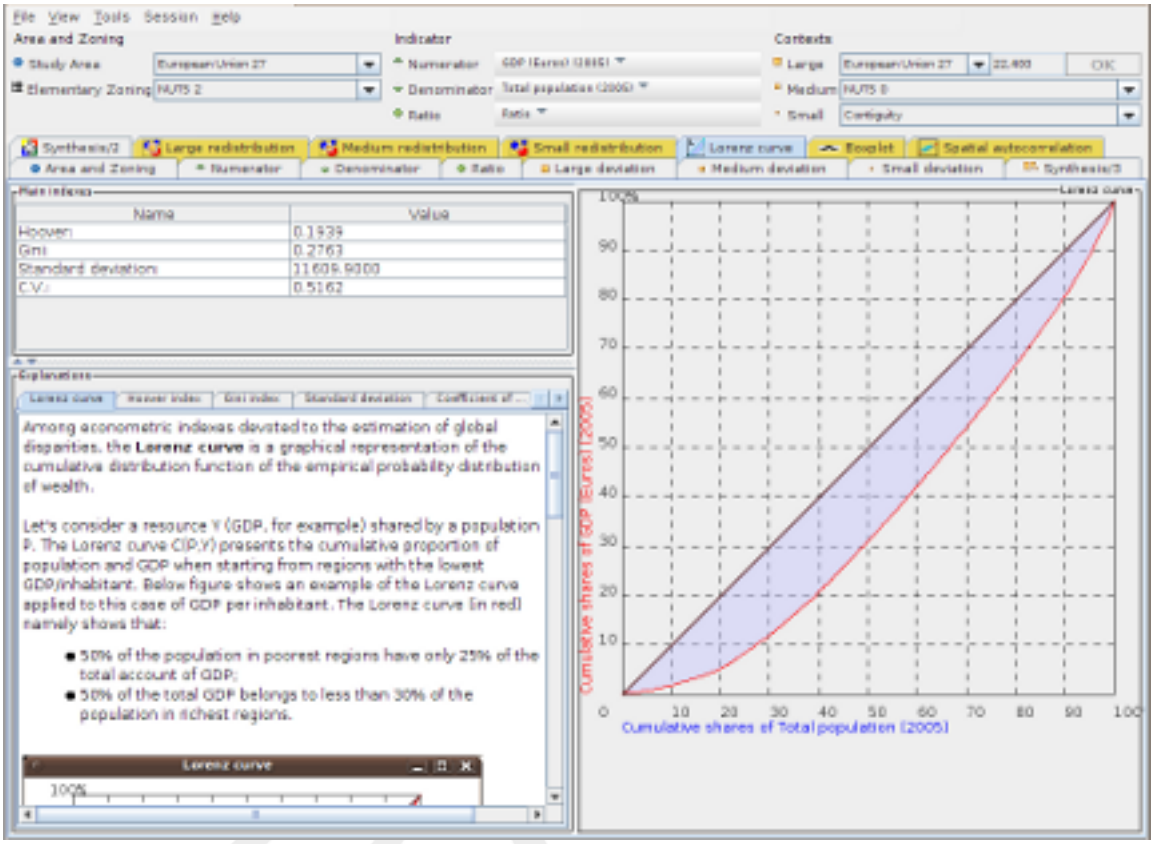
9.1. Lorenz curve and statistical indexes

The map of large deviation provided by Standard 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 Standard 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.

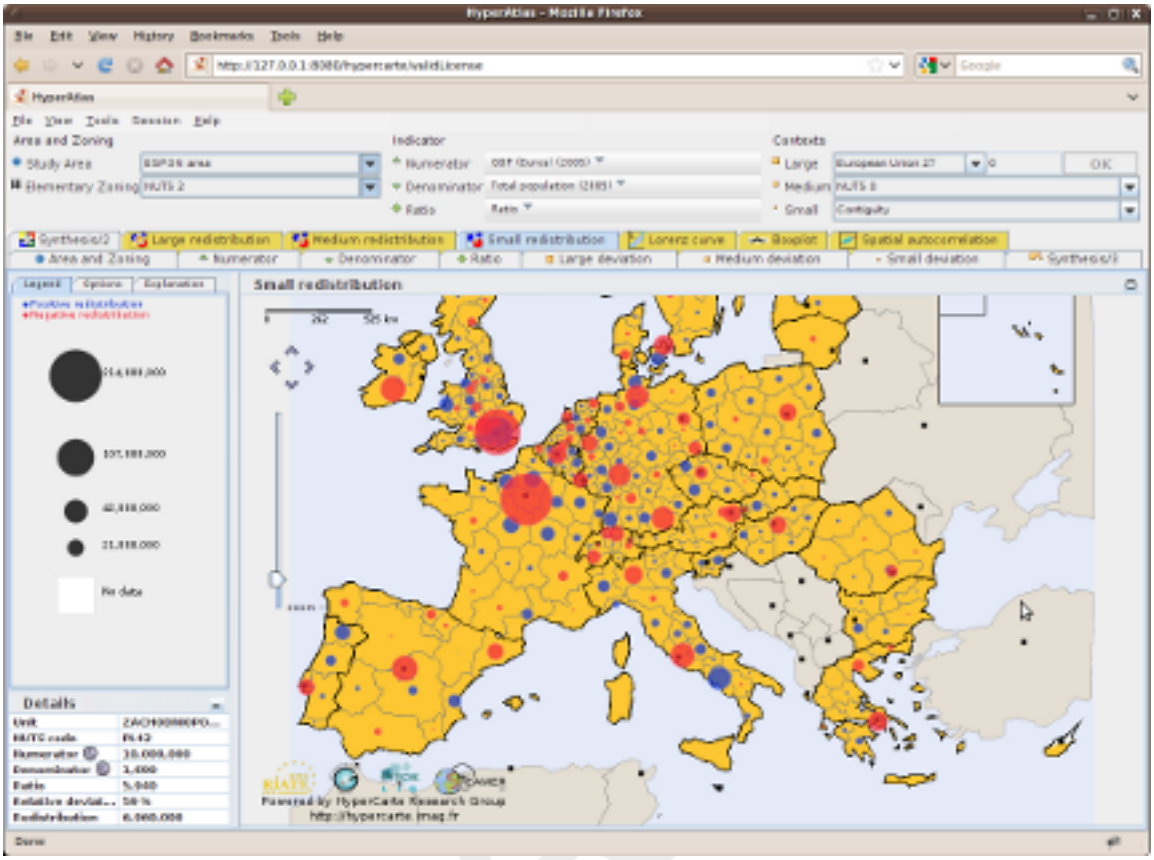
9.2. Equi-repartition map

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 equirepartition 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

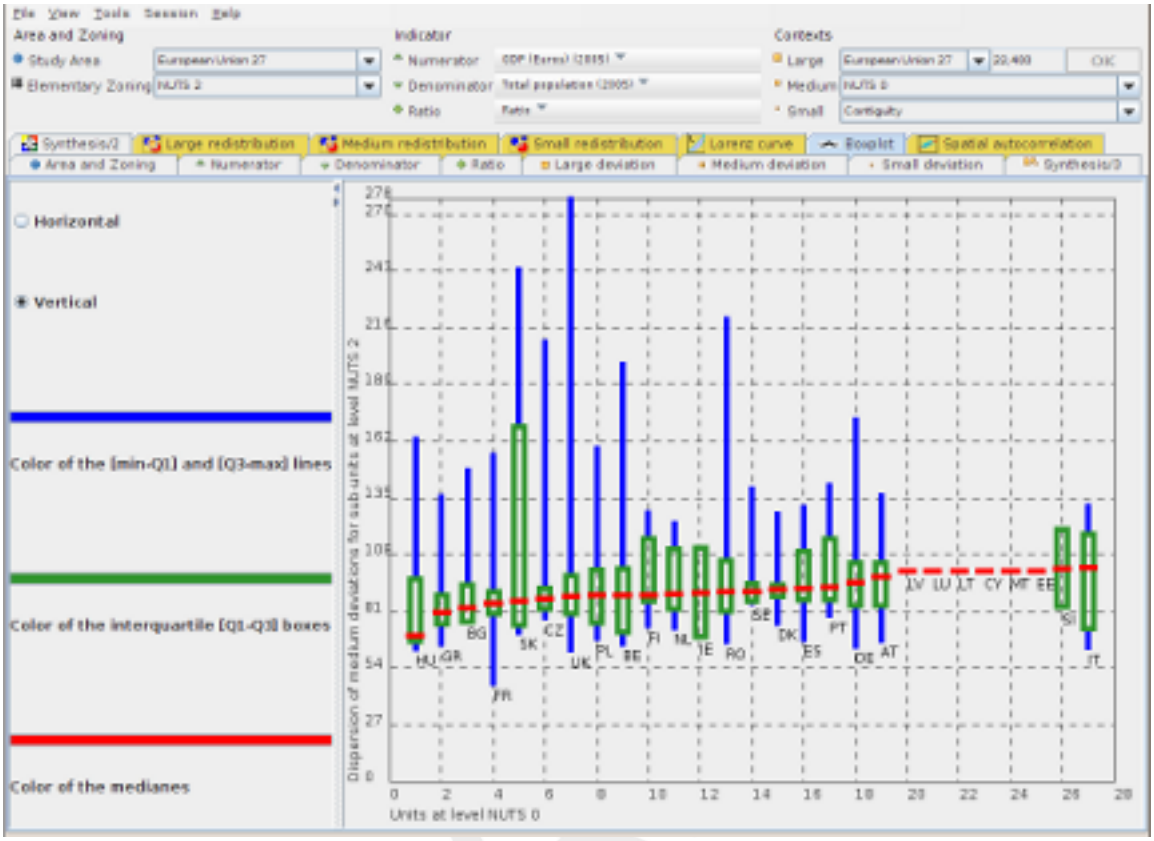
For each unit in the chosen medium context (NUTS 0 for example in Figure 9.4), this chart shows the dispersion of the medium deviation for the territorial units at sub-levels (NUTS 2 level in Figure 9.4).

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 mediane value
-

The Standard HyperAtlas boxplots chart may be displayed horizontally or vertically, the colors may be adapated to the user's conveniance.

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 absissa axis with the values of the territorial deviation on ordinates axis.

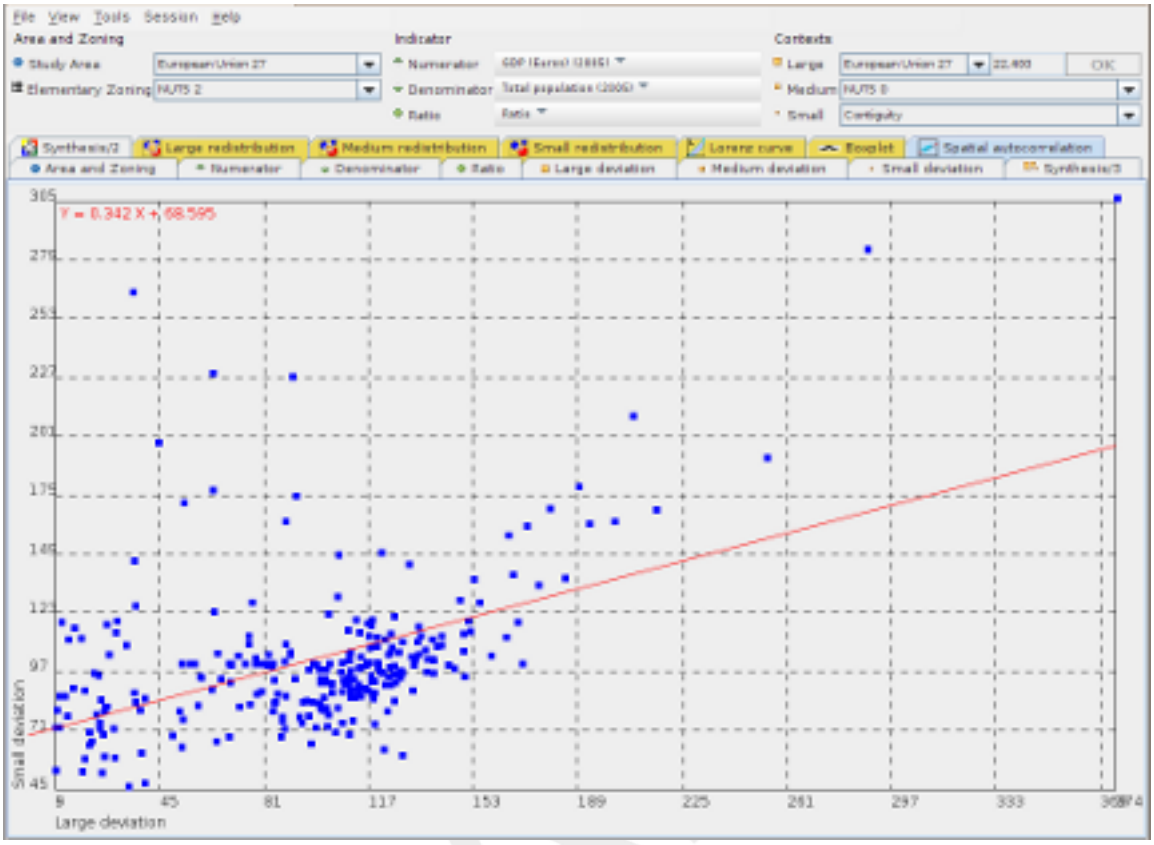
This chart is very interesting for expert users as it reveals spatial dependancy, e.g. spatial organization of a phenomena.

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. HyperAdmin

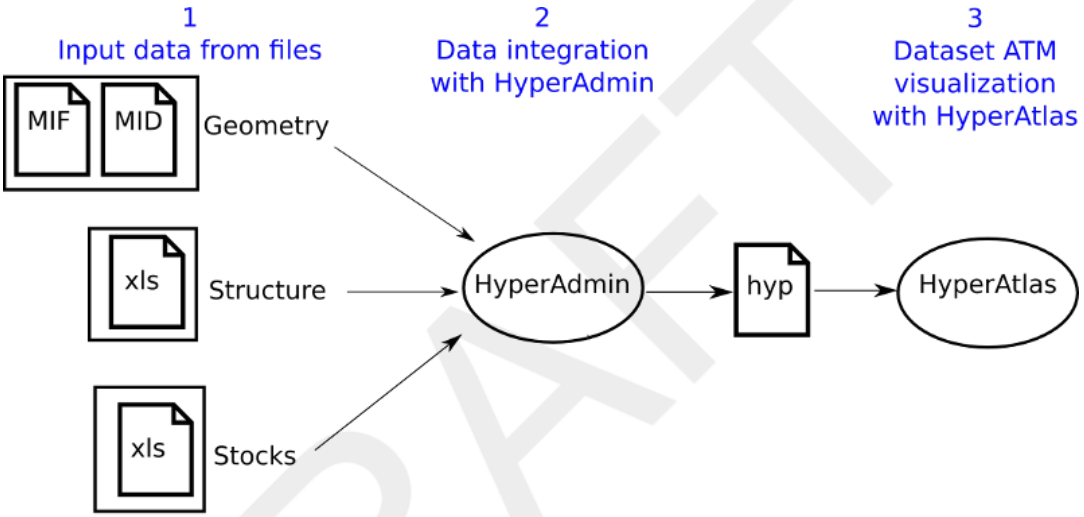
Table of Contents

Chapter 10. Standard HyperAdmin Overview

In order to perform Multiscalar Territorial Analysis with Standard 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 Standard HyperAtlas dataset input file is called an **hyp file** (example: `demography.hyp`).

Standard 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 Standard HyperAdmin and Standard HyperAtlas is summarized in the Figure 10.1.

Figure 10.1. Standard HyperCarte Workflow



Standard HyperAdmin and Standard HyperAtlas data flow.

To sum up, the main expected input files are:

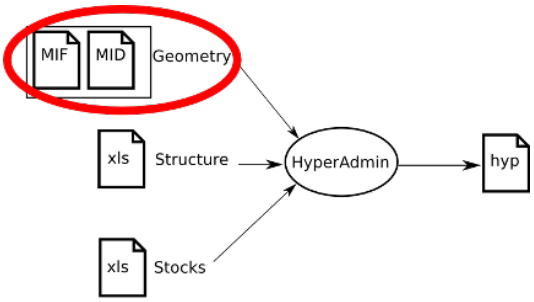
- the **geometry** of the dataset, in MapInfo MIF/MID formats:
  - the `MIF` file
  - the `MID` file
- the **structure** of the dataset, as an `xls` (Excel/OpenOffice) file
- the **stocks** of the dataset, as an `xls` (Excel/OpenOffice) file

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 speadsheet `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 Standard HyperAdmin.

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

Chapter 11. Geometry input



This section describes the expected geometry input for Standard HyperAdmin.

The maps are computed using the geometric information from the lowest level of territorial units, then aggregating this information to build the upper levels. So, the user must provide data without any hole, and territorial units at lowest level must be contiguous.

Expected geographical information must be provided by the user in the **MIF/MID** format (MapInfo format). For more information on this software and its format, please consult http://www.pbmapinfo.eu/ (last visit: 13rd may 2010).

11.1. The MID file

The `MID` file must be made of only one column where territorial units identifiers are listed, one per line, without any doublon. Example:

```
"AT111"
"AT112"
"AT125"
"AT126"
"AT127"
"AT13"
"AT211"
```

The given order of TU identifiers in the `MID` file must match the order of provided regions in the `MIF` file, see Data section of the MIF file [50]

Based on a naming convention of the identifiers for these territorial units, following exceptions are handled by HyperAtlas for particular display options. Please take into account the following exceptions when designing your dataset:

- **FR**, **ES**, **PT**, **MT** is the list of units identifiers for countries that own overseas units: France (Martinique, ...), Spain (Canarias, ...) and Portugal (Madeire). For example for European datasets, In HyperAtlas, the islands will be drawn in squares over the Russia.
- **SUR** and **BRA** (Surinam and Brazil) are examples of units identifiers that are treated differently when drawing them on the maps by HyperAtlas.
- Integer identifiers from **0** to **9** correspond to squares that must be drawn on the map, they are used for overseas in Europe dataset.
- A territorial unit with the identifier **no data** will be painted in white on the maps that are drawn by HyperAtlas. This exception is used for North Cyprus in Europe datasets.
- The **chypre** identifier is used to handle the particular case of the display of Cyprus island in the ESPON datasets.

11.2. The MIF file

The information in this section is essentially based on the MapInfo Data Interchange Format document [2].

Geographical units are described in an ASCII file by their X and Y coordinates. The `.MIF` file is made of an header section then a data section.

Figure 11.1. MIF file header

```
VERSION n
Charset "characterSetName"
[ DELIMITER "<c>" ]
[ UNIQUE n,n.. ]
[ INDEX   n,n.. ]
[ COORDSYS...]
[ TRANSFORM...]
COLUMNS n
  <name> <type>
  <name> <type>

  etc.
```

As shown on Figure 11.1, the header can contain the following information:

- **VERSION**: the version of the MapInfo software;
- **CHARSET** clause specifies which character set was used to create text in the table (examples: `WindowsLatin1`, `MacRoman` or `Neutral`;
- **DELIMITER** shows the character that is used to separate columns values (if not specified, tabulation is the default delimiter);
- **UNIQUE** parameter must be a number that refers to a database column, this parameter is used to create related tables;
- **INDEX** parameter (a number or a comma-separated list of numbers) that shows the number(s) of the indexed column(s);
- the **COORDSYS** parameter sets the used coordinate system.

  This parameter is essential, in particular to compute the scale of the map. By default (when no `COORDSYS` clause is specified) data is assumed to be stored in longitude/latitude forms. All coordinates are stored with respect to the northeast quadrant. The coordinates for points in the West of Greenwich have a negative X while coordinates for points in the East of Greenwich have a positive X. Coordinates for points in the Northern hemisphere have a positive Y while coordinates for points in the Southern hemisphere have a negative Y. Examples:

  - The following example represents a map of Europe centered on 50°N 15°E with a Lamber Azimutal projection that can be associated to the following bounds pair: (X_{min}, Y_{min}) (X_{max}, Y_{max}). The `"m"` option stands for "meters" as the unit:

    ```
    CoordSys NonEarth Units "m" Bounds (-2217175, -1723801) (1783333, 2518193)
    ```

  - Another setting for a map of Rhône-Alpes may be:

    ```
    CoordSys NonEarth Units "m" Bounds (691594, 1893320) (993392, 2185448)
    ```

- **TRANSFORM** parameter can be used to convert coordinates which are given in a different quadrant than the default northeast one.

- **COLUMNS** parameter describes the data in the table of the associated `MID` file. The `n` parameter specifies the number of columns. Example:

```
Columns 1
   unit  Char(100)
```

  specifies one column named `unit`, each value will be made of characters string type whose length is not longer than 100.

HyperAdmin is quite sensible on the format of the header of the MIF file (one information by line). Here are some examples of the expected formats for the header of the more frequently recent and used MIF files:

- European datasets (used for ESPON HyperAdmin maps with the EPSG 3035 Coordinates system and projection):

```
Version 300
Charset "Neutral"
Delimiter ","
CoordSys NonEarth Units "m" Bounds (2600301.93555, 1249109.375) (6593124.
Columns 1
  ID Char(50)
Data

(...)
```

- EUROMED dataset:

```
Version 300
Charset "WindowsLatin1"
Delimiter ","
CoordSys NonEarth Units "m" Bounds (-4487557.26071, -3722255.38453) (4487
Columns 1
  ID Char(10)
Data

(...)
```

- Metroborder dataset:

```
VERSION 300
Charset "WindowsLatin1"
DELIMITER ";"
COORDSYS NonEarth Units "m" Bounds (-743051.308162917,-145654.445989655)
COLUMNS 1
     SHN Char(14)
DATA

(...)
```

The **DATA** keyword specifies both the end of the header of the `MIF` file and the start of the enumeration of outlines.

If the MapInfo `MIF` file may set different types of graphical primitives (point, line, polyline, etc.), the HyperAdmin software only expects the polygon type in order to describe the outlines of territorial units. Eeach TU whose identifier is given in the `MID` file (see Section 11.1) must be associated to a new entry in the `MIF` file under the **data** section, IN THE SAME ORDER, as a **Region** entry. In

MapInfo, a `Region` object consists of one or more polygons. Let us describe an expected **Region** entry using the definition example shown on Figure 11.2.

Figure 11.2. Example of two "Region" entries in the MIF file Data section

```
Data
Region  2 ❶
  7 ❷
108071.871 -293320.749
96339.456 -282096.297
102833.097 -261179.193
106485.534 -258631.56
123883.98 -262981.491
122621.886 -282959.13
108071.871 -293320.749
    Pen (1,2,0) ❸
    Brush (0,1)
    Center 110111.718 -275976.153
  5 ❹
-407753.01 -311500.065
-417000.993 -311417.496
-411718.965 -289228.641
-406514.985 -302217.573
-407753.01 -311500.065
    Pen (1,2,0)
    Brush (0,1)
    Center -411757.989 -300364.353
Region  1 ❺
  11 ❻
2186917.593 -1518464.703
2186829.009 -1692861.786
2129979.423 -1729141.275
1933829.46 -1729141.275
1928265.747 -1699690.677
1922979.324 -1671615.192
1928499.903 -1666190.274
1941660.768 -1656068.01
2005909.794 -1679948.187
2047505.1 -1676110.68
2186917.593 -1518464.703
    Pen (1,2,0)
    Brush (0,1)
    Center 2140313.457 -1623802.989
```

❶ Start of the entry for the first territorial unit in our data section. This region definition will be associated to the identifier on the firts entry of the `MID` file. The `2` parameter near `Region` shows that this region is made of two polyogons (example, France may be considered as a region made of two polygons: metropol and Corse island).

❷ The first polygon of this region is set with seven points whose coordinates in X Y forms are given on following lines.

❸ **Pen(a, b, c)**, **Brush(a, b)** and **Center x y** specifications are optional and they will not be read by HyperAdmin.

❹ The second polygon of this region is defined with five points whose coordinates are given on the five following lines.

❺ Here is the start of a new `Region` definition. As the second entry of the data section, this region definition will be associated to the identifier on the second line of the `MID` file. `Region 1` indicates that this region is made of one polygon.

❻ This line shows the number of points that compose the polygon: 11 points, whose coordinates are successively given on 11 folloging lines.

11.3. Layer of main cities

HyperAtlas can handle additional layers of information that can be displayed over the maps. Currently (May 2011), only a layer showing the main cities has been tested and can currently be supported.

The expected format for this "cities" layer incorporation into the dataset to be built is a **.csv** file. This file is only composed of three fields, these fields are separated by a comma character:

- the name of the city
- the X coodinate of this city, based on the MIF/MID projection and coordinates system
- the Y coodinate of this city, based on the MIF/MID projection and coordinates system

The following listing provides an example of the main cities layer definition csv file that has been used for European datasets (EPSG 3035):

```
Vilnius,5295673.924,3612560.328
Minsk,5460580.445,3560616.774
Dublin,3253284.971,3480193.09
Berlin,4547186.818,3272495.918
Amsterdam,3975886.565,3263689.867
Warszawa,5068508.328,3293815.926
London,3620060.313,3202333.12
Bruxelles/Brussel,3927032.583,3095975.903
Kyiv,5751996.553,3239855.146
Praha,4639737.703,3008973.669
Paris,3769691.587,2891825.057
Wien,4790135.661,2807741.98
Budapest,5003603.404,2753261.228
Bern,4128054.027,2651781.399
Beograd,5142183.84,2467117.484
Bucuresti,5593724.067,2506886.924
Sofiya,5408445.047,2274434.026
Tirana,5143864.946,2078891.927
Madrid,3164690.758,2032301.915
Ankara,6248076.399,2163898.451
Helsinki,5144699.201,4208069.911
Zagreb,4784474.809,2540154.601
Nicosia,6434072.209,1668719.112
Luxembourg,4054388.133,2965578.225
Bratislava,4859375.987,2822228.019
Tallinn,5154761.636,4105585.175
Sarajevo,4997878.051,2344715.534
Skopje,5274194.7,2172377.111
Athina,5518075.047,1777730.958
Kishinev,5733746.751,2835203.886
Copenhagen,4481880.455,3626362.309
Lisboa,2671218.026,1947183.08
Oslo,4362362.69,4091266.484
Reykjavik,2843090.801,4908517.82
Riga,5170116.607,3836021.74
Roma,4531433.066,2089563.772
Stockholm,4781578.636,4041161.089
```

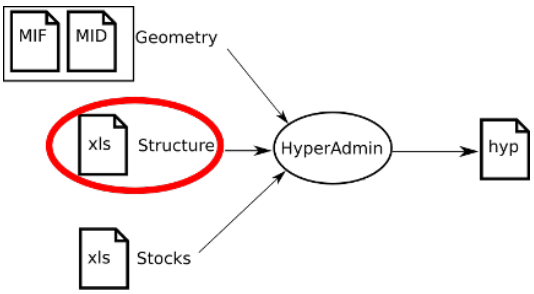
```
Valletta,4737055.11,1442089.281
Ljubljana,4670851.053,2559186.916
El-Jazair,3696198.974,1536632.051
Tounis,4344016.475,1511814.733
Podgorica,5085720.438,2197200.507
Vaduz,4287807.431,2668956.206
```

Chapter 12. Structure/Contiguity input

The Section 12.1 presents the expectations of the Standard HyperAdmin about the structure input file, e.g. the information about the territorial units hierarchy and their relationships.

The Section 12.2 presents the optional steps that consists in creating a distance-time contiguity matrix input data for custom neighbourhood definitions (example: distance time, 2 hours by car, etc.).

12.1. Structure input



In the the input `structure.xls` Excel file, ten sheets must mandatory be provided in a unique `.xls` file.

Optionnally, complex contiguities must be defined as a set of seven sheets in an unique other xls file. Thus the input data may be composed of:

- `some_structure.xls`: to describe the structure;
- `some_contiguity.xls`: to optionally describe the contiguities (see Section 12.2).

Table 12.1 provides the list of these sheets names and a short description for each of them, as they are expected in the `structure` input definition. The expected columns and an example for each of them is described below this table.

The names of sheets is case-unsensitive. For example, the mandatory `UnitArea.txt` file can be named `unitarea.txt` or `UNITAREA.txt`. Suffixes and prefixes around the file basename are also possible while choosing the plain text option: thus, `my_UnitArea.txt` will be considered as a `UnitArea.txt` file, e.g. the input file that contains the information about the relationships between areas and territorial units.

Table 12.1. Overview of expected sheets for data structure input

Excel Sheet Name	Description
unit	Identifiers for the set of territorial units. See Content of unit.
Area	Identifiers for the set of study areas. See Content of area.
Zoning	Identifiers for the set of meshes. See Content of zoning.
UnitSup	Hierarchy between units: an `UTSup_ID` parent unit owns at least one child `UT_ID` unit. See Content of unitsup.
UnitArea	An UT belongs to one or several study areas. See Content of unitarea.
UnitZoning	An UT belongs to one or several meshes. See Content of unitzoning.
language	Provides a human readable name for used languages codes. See Content of language.
UnitLanguage	Names of UT in different languages. A translation may be missing. See Content of unitlanguage.
AreaLanguage	Names of the study areas in different languages. A translation may be missing. See Content of arealanguage.
ZoningLanguage	Names of the meshes in different languages. A translation may be missing. See Content of zoninglanguage.

Expected content for each of these sheets is following:

Unit This file/sheet must contain one column whose header cell must be `UT_ID`. Example:

Table 12.2. Sample input Unit sheet

UT_ID
AT11
AT12
AT13
AT21
etc...

Area This file/sheet must contain one column whose header cell must be `Area_ID`. Example:

Table 12.3. Sample input Area sheet

Area_ID
UE15
UE25
PECO
Arc_Atlantique
Nouveaux_UE
UE27
UE29

Zoning

This file/sheet must contain one column whose header cell must be `Zoning_ID`. An additional column named `Rank` may order given zonings. Example:

Table 12.4. Sample input Zoning sheet

Zoning_ID	Rank
Nuts_0	1
Nuts_1	2
Nuts_2	3
Nuts_3	5
Nuts_2_3	4

UnitSup

This file/sheet must contain two columns whose header cells must be named `UTSup_ID` and `UT_ID`. Example:

Table 12.5. Sample input UnitSup sheet

UT_ID	UTSup_ID
AT1	AT
AT2	AT
AT3	AT
BE1	BE
BE2	BE

UnitArea

This file/sheet must contain two columns whose header cells must be named `UT_ID` and `Area_ID`. Example:

Table 12.6. Sample input UnitArea sheet

UT_ID	Area_ID
AT	UE15
BE	UE15
DE	UE15
DK	UE15
ES	UE15

UnitZoning This file/sheet must contain two columns whose header cells must be `UT_ID` and `Zoning_ID`. Example:

Table 12.7. Sample input UnitZoning sheet

UT_ID	Zoning_ID
AT	Nuts_0
BE	Nuts_0
BG	Nuts_0
CH	Nuts_0

Language This file/sheet must contain two columns whose header cell are `Language_ID` and `Language_NAME`. Example:

Table 12.8. Sample input Language sheet

Language_ID	Language_NAME
DE	**allemand**
CS	tchèque
DA	danois
ET	estonien
EN	anglais
ES	espagnol

UnitLanguage This file/sheet must contain three columns whose header cells must be `UT_ID`, `UT_NAME` and `Language_ID`. Example:

Table 12.9. Sample input UnitLanguage sheet

UT_ID	Language_ID	UT_NAME
AT11	DE	BURGENLAND
AT34	DE	VORARLBERG
BE24	NL	VLAAMS BRABANT
BE25	NL	WEST-VLAANDEREN
BE31	FR	BRABANT WALLON
BE32	FR	HAINAUT

AreaLanguage This file/sheet must contain three columns whose header cells must be `Area_ID`, `Language_ID` and `Area_NAME`. Example:

Table 12.10. Sample input AreaLanguage sheet

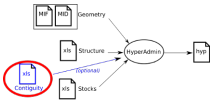
Area_ID	Language_ID	Area_NAME
UE15	FR	Union européenne des 15
UE25	FR	Union européenne des 25
PECO	FR	Pays d'Europe Centrale et Orientale

ZoningLanguage This file/sheet must contain three columns whose header cells must be `zoning_ID`, `Language_ID` and `zoning_NAME`. Example:

Table 12.11. Sample input ZoningLanguage sheet

Zoning_ID	Language_ID	Zoning_NAME
Nuts_0	FR	Nomenclature des unités territoriales de niveau 0
Nuts_1	FR	Nomenclature des unités territoriales de niveau 1
Nuts_2	FR	Nomenclature des unités territoriales de niveau 2
Nuts_3	FR	Nomenclature des unités territoriales de niveau 3
Nuts_2_3	FR	Nomenclature des unités territoriales de niveau 2-3

12.2. Contiguity input (optional)



This section presents the optional contiguity definition input data file.

Table 12.12. Overview of expected sheets for contiguity input

Excel Sheet Name	Description
Contiguity	List of identifiers for contiguities.
ContiguityLanguage	Names of the contiguities in different languages. A translation may be missing. See Content of contiguitylanguage.
Neighbourhood	Unique code for a neighbourhood that is associated to a contiguity, a threshold and a comparator. The comparator shows if two UT are neighbours or not. See Content of neighbourhood.
Neighbourhood	Names of neighbourhoods for each language. A translation may be missing. See Content of neighbourhoodlanguage.
ContiguityZoning	A distance matrix is available for one or several meshes. See Content of ContiguityZoning.
ContiguityArea	A distance matrix is available for one or several study areas. See Content of ContiguityArea.
UnitContiguity$_i$	Each line provides the code of two UT, following columns show the distance for `Contiguity_ID`$_i$, the header cell of each contiguity column providing the identifier of this contiguity. See Content of UnitContiguity.

Following listing provides an example for each expected sheet describing a contiguity definition:

Contiguity.txt / Contiguity

This sheet must contain one column whose header cell is `ID`. Example: the following sample sets two possible computations for contiguity, distance-time matrixes will be available for a car and for a lorry.

Table 12.13. Sample input Contiguity sheet

ID
CAR
TRUCK

ContiguityLanguage.txt / ContiguityLanguage

This sheet must contain four columns whose header cells are `CONTIGUITY_ID`, `Language_ID` (see Note about expected languages identifiers), `Contiguity_NAME` (e.g. the name of this contiguity in this locale) and `Contiguity_DESC` (a description of this contiguity). Example:

Table 12.14. Sample input ContiguityLanguage sheet

Contiguity_ID	Language_ID	Contiguity_NAME	Contiguity_DESC
CAR	EN	car time	Time between units by car (in minutes)
TRUCK	EN	truck time	Time between units on a truck (minutes)
CAR	FR	temps voiture	Temps entre les unités en voiture (minutes)
TRUCK	FR	temps camion	Temps entre les unités en camion (minutes)

Neighbourhood.txt / Neighbourhood

This sheet must contain four columns whose header cells are `Neighbourhood_ID` (see Note about expected languages identifiers), `Contiguity_ID`, `Distance` and `Comparator`. Possible values for the `Comparator` cells are:

- `<`
- `<=`
- `==`
- `>=`
- `>`

Example:

Table 12.15. Sample input Neighbourhood sheet

Neighbourhood_ID	Contiguity_ID	distance	comparator
CAR <= 360	CAR	360	<=
TRUCK <= 360	TRUCK	360	<=
CAR <= 540	CAR	540	<=
TRUCK <= 540	TRUCK	540	<=
CAR <= 180	CAR	180	<=
TRUCK <= 180	TRUCK	180	<=

NeighbourhoodLanguage.txt / NeighbourhoodLanguage

This sheet must contain four columns whose header cells are `Neighbourhood_ID`, `Language_ID` (ISO-639 language in 2 digits, `Neighbourhood_NAME` (e.g the name of this neighbourhood) and `Neighbourhood_DESC` (e.g. a description of this neighbourhood). In the following example, neighbourhoods are translated in english (`EN`) and french (`FR`):

Table 12.16. Sample input NeighbourhoodLanguage sheet

Neighbourhood_ID	Language_ID	Neighbourhood_NAME	Neighbourhood_DESC
CAR <= 360	EN	6h car	Units at less than 6 hours by car
TRUCK <= 360	EN	6h truck	Units at less than 6 hours on a truck
CAR <= 540	EN	9h car	Units at less than 9 hours by car
TRUCK <= 540	EN	9h truck	Units at less than 9 hours on a truck
CAR <= 180	EN	3h car	Units at less than 3 hours by car
TRUCK <= 180	EN	3h truck	Units at less than 3 hours on a truck
CAR <= 360	FR	6h de voiture	Unités à moins de 6 heures en voiture
TRUCK <= 360	FR	6h de camion	Unités à moins de 6 heures en camion
CAR <= 540	FR	9h voiture	Unités à moins de 9 heures en voiture
TRUCK <= 540	FR	9h de camion	Unités à moins de 9 heures en camion
CAR <= 180	FR	3h de voiture	Unités à moins de 3 heures en voiture
TRUCK <= 180	FR	3h de camion	Unités à moins de 3 heures en voiture

ContiguityZoning.txt / ContiguityZoning

This sheet must contain two columns whose header cells are `Contiguity_ID` and `Zoning_ID`. In the following example, the distance-time by car and distance-time by lorry are available for `NUTS_2` zoning only:

Table 12.17. Sample input ContiguityZoning sheet

Contiguity_ID	Zoning_ID
CAR	Nuts_2
TRUCK	Nuts_2

The identifiers that are given in the `Zoning_ID` column must be coherent with the identifiers that have been given in the `Zoning` sheet of the structure input, see Content of zoning.

ContiguityArea.txt / ContiguityArea

This sheet must contain two columns whose header cells are `Contiguity_ID` and `Area_ID`. In the following example, distance-time matrixes by car are available for `UE15` and `UE25`, distance-time matrixes by lorry are available for `UE27` and `UE29`:

Table 12.18. Sample input ContiguityArea sheet

Contiguity_ID	Area_ID
CAR	UE15
CAR	UE25
TRUCK	UE27
TRUCK	UE29

The identifiers that are given in the `Area_ID` column must be coherent with the identifiers that have been given in the `Area` sheet of the structure input, see Content of area.

UnitContiguity.txt / UnitContiguity$_i$

This sheet must contain at least three columns whose header cells are `UT_ID1`, `UT_ID2`, then the identifier of a contiguity.. In the following example, contiguities between units are performed for `CAR` contiguity and `TRUCK` contiguity:

Table 12.19. Sample input UnitContiguity sheet

UT_ID1	UT_ID2	CAR	TRUCK
ES12	UKC1	1265.11	1820.5
ES13	UKC1	1138.85	1649.5
ES21	UKC1	1058.92	1529.9

In Excel mode, each `UnitContiguity` can only contain 2^{16} rows, e.g. 65536. Several sheets can be created to import more results: just name your sheets `UnitContiguity1`, `UnitContiguity2`, etc. Note that only 30 `UnitContiguity`$_i$ sheets can be created. Nevertheless, on considering a symetric relationship for a distance between two units (e.g. distance between UT1 and UT2 equals the distance between UT2 and UT1), the number of needed rows can quasi be reduced by half. Thus, the number `S` of needed sheets for `n` units

can be found by executing the formula which is shown on Figure 12.1:

Figure 12.1. Number S of needed sheets for n units

$$S = \frac{1 + \frac{n \cdot (n-1)}{2}}{65536}$$

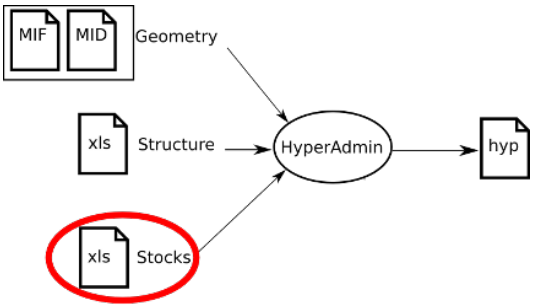
`S` is the number of needed sheets, `n` is the number of units. On the numerator, "`1 +`" stands for the header row that must be included on each sheet.

Note that **contiguities are not aggregable**: a distance matrix is set for a given level of mesh. For its upper level, the associated distance matrix must also be given. Table 12.20 provides an example of the number of needed sheets for different levels with several numbers of units.

Table 12.20. Example of needed sheets number

Mesh	Number of UT (n)	Number of sheets (S)
NUTS_0	29	1
NUTS_1	92	1
NUTS_2	280	2
NUTS_2_3	727	5
NUTS_3	1329	14
	Total	23

Chapter 13. Stocks input



The **stock** file mainly aims at describing the statistics of the dataset.

13.1. HyperAdmin input data file format

This section describes the stocks (statistical data) file that Standard 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.
- 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` "stocks" file.

13.1.1. About

Table 13.1 provides an example for this mandatory sheet in the data v2 input xls file.

Table 13.1. 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 sames 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.

13.1.2. Data

Table 13.2 provides an example for this mandatory sheet in the data v2 input xls file.

Table 13.2. 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 13.2 shows five indicators identifiers: `pop2000`, `pop2002`, `area2000`, `gdp2000` and `gdp2002`. These identifiers must be described in the **StockInfo** sheet (see Section 13.1.8).

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 13.2, 17 is the value for `pop2002` indicator in `AT113` territorial unit.

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

13.1.3. Default

Table 13.3 provides an example for this optional sheet in the data v2 input xls file.

Table 13.3. 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 13.1.8).

13.1.4. Label

Table 13.4 provides an example for this mandatory sheet in the data v2 input xls file.

Table 13.4. 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 predefined 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 13.1.8) and from the **RatioStock** sheet (see Section 13.1.7).

13.1.5. Metadata

Table 13.5 provides an example for this optional sheet in the data v2 input xls file.

Table 13.5. 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 13.5, 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 13.6). Likewise, the values in the `STOCK_ID` column must match the identifiers that are defined in the **StockInfo** sheet (see Table 13.8).

13.1.6. Provider

Table 13.6 provides an example for this optional sheet in the data v2 input xls file.

Table 13.6. 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.

13.1.7. RatioStock

Table 13.7 provides an example for this optional sheet in the data v2 input xls file.

Table 13.7. 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 13.7 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 sames 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 13.1.4).

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 13.1.8).

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 13.1.1). 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 valididy 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.

13.1.8. StockInfo

Table 13.8 provides an example for this mandatory sheet in the data v2 input xls file.

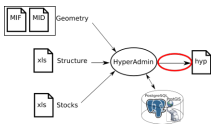
Table 13.8. V2 sample StockInfo sheet

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:

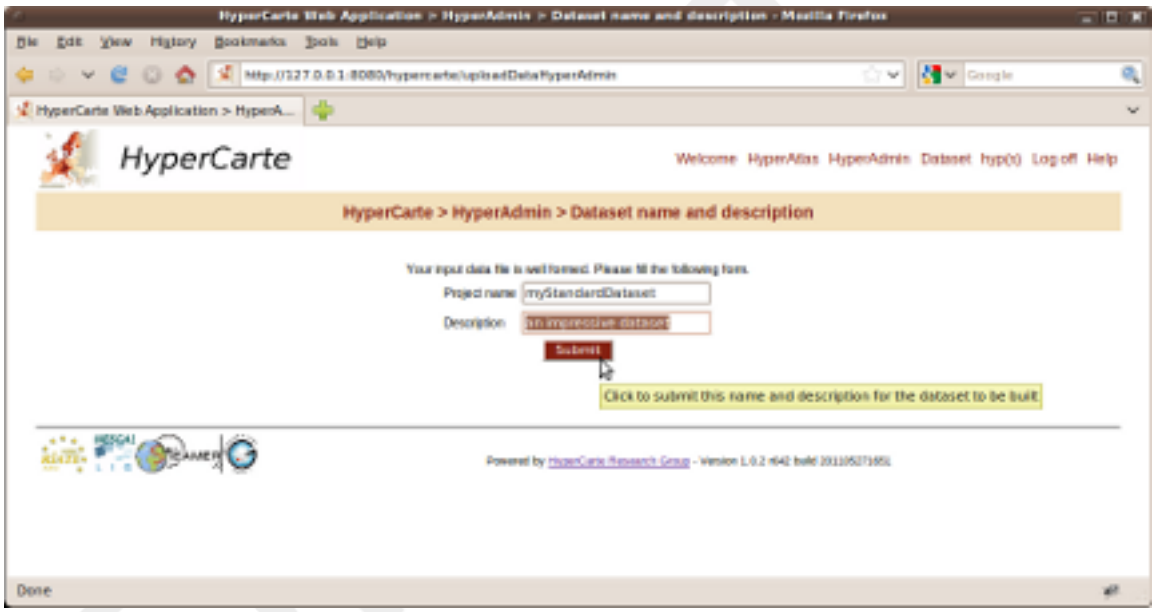
- `STOCK_ID`: each value in this column must be unique. Any doublon will overwrite the previous found identical value. This column lists the identifiers of the indicators that are referenced in the other sheets. Note that several indicators may be associated to the same label (lines 2 and 3 for example), 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 13.1.4).
- `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 considerated if the value of the `TIME_ENABLED` column in the **About** sheet is `TRUE` (see Section 13.1.1 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 timestamp 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 usefull 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 14. Standard HyperAdmin build



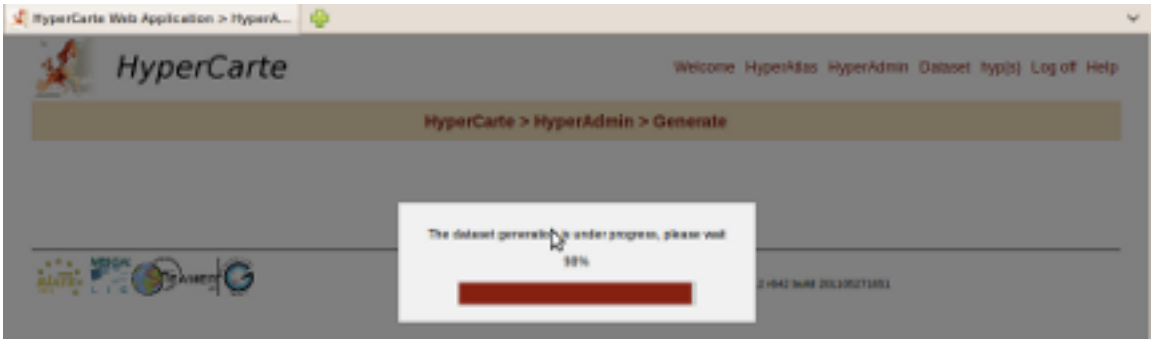
Once the user has submitted a well-formed spreadhseet file including his/her stocks for the chosen geometry at step 1, he/she is redirected to the "Build" page, see Figure 14.1. He/she is invited here to enter a name and a description for the dataset hyp file he/she is about to generate. These fields are mandatory.

Figure 14.1. Dataset information form



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 backgound page functionnalities are disabed:



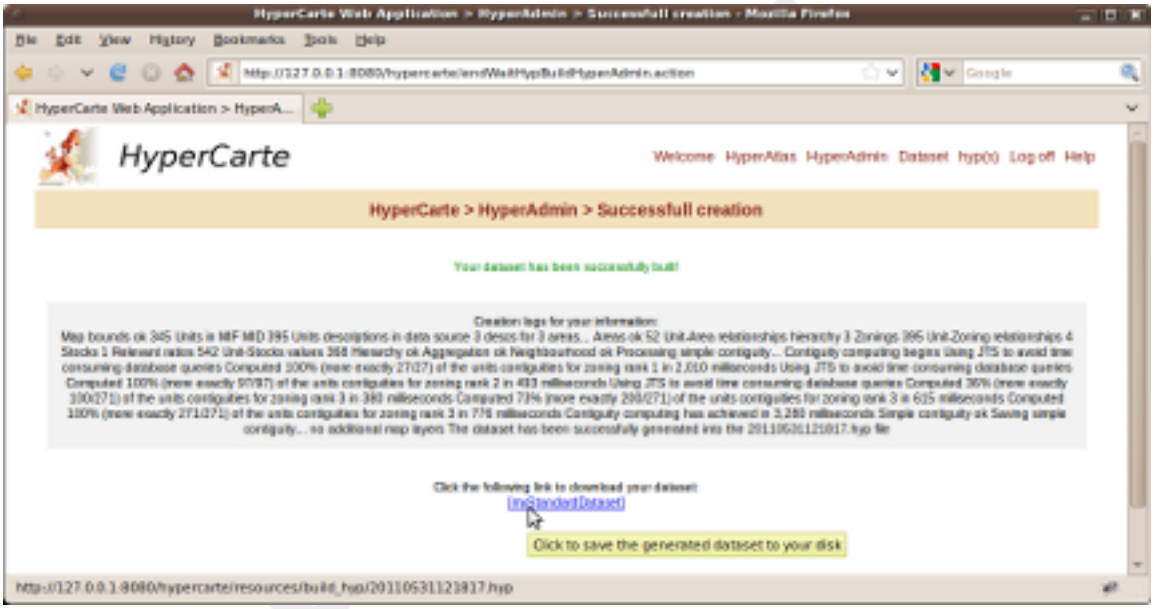
Please do not click the submit button as long as the page has not completly reloaded and displayed a success or failure message.

If the generation of the hyp file is successfull, 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 14.2), the ouput build logs are summarized and displayed on the page. In order to avoid overwriting, note that the generated hyp filename follows a date pattern: `yyyyMMdd-dhhmmss` (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 ununderstanble 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 14.2. 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 occurre 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 Standard HyperAtlas software.

Like most of Java applets, the Standard HyperAtlas software displays logs messages to the "Java Console". This window is not enabled by default on most of standard browsers. If Standard 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 Standard 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

Standard 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: 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 C. Annex: glossary

Some definitions

Deviation	The relative deviation of a given region (i) to a context is defined by equation Figure C.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 C.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 (Locii=0) but it is possible to choose the solution where a region is part of its own neighbourhood (Locii=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:

  - `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, Provincie 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 C.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 D. 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).

Appendix E. HyperAtlas Application Terms and Conditions of Use

TODO

Appendix F. About

This document is part of the HyperCarte Research Group projects. It has been generated at the following date, 2013-07-05 15:25:58, from the svn rev 1088 sources of the `docbench` project.

This document has been written by the LIG STeamer team.

For any comment question or suggestion, please please visit http://hypercarte.imag.fr or contact Jérôme Gensel `<Jerome.Gensel@imag.fr>`.

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Colophon

Based on DocBook technology [1], this document is written in XML format, sources are validated with DocBook DTD 4.5CR3, then sources are transformed to HTML and PDF formats by using DocBook xslt 1.73.2 stylesheets. The generation of the documents is automatized thanks to the `docbench` LIG STeamer project that is based on Ant [2], java [3], processors Xalan[4] and FOP [5]. Note that 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.

[1] [on line] *DocBook.org* [http://www.docbook.org] (last visit: July 2011)
[2] [on line] *Apache Ant - Welcome.* Version 1.7.1 [http://ant.apache.org] (last visit: July 2011)
[3] [on line] *Developer Resources For Java Technology* [http://java.sun.com] (last visit: July 2011). Version 1.6.0_03-b05.
[4] [on line] *Xalan-Java Version 2.7.1* [http://xml.apache.org/xalan-j/] (last visit: 18 november 2009). Version 2.7.1.
[5] [on line] *Apache FOP* [http://xmlgraphics.apache.org/fop/download.html] (last visit: July 2011). Version 0.94.

Colophon

This document was generated 2013-07-05 15:25:58 (year-month-date hour:minutes:seconds) from the svn rev 1088 of the docbench project.

Based on DocBook technology [6], this document is written in XML format, sources are validated with DocBook DTD 4.5CR3, then sources are transformed to HTML and PDF formats by using DocBook xslt 1.73.2 stylesheets.

Documents generations were automatized with ant [7], java[8], processors Xalan[9] and FOP [10].

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.

[6][on line] *DocBook.org* [http://www.docbook.org] (last visit: november 2009)
[7][on line] *Apache Ant - Welcome.* Version 1.7.0. [http://ant.apache.org] (last visit: 18 november 2009)
[8][on line] *Developer Resources For Java Technology* [http://java.sun.com] (last visit: 18 november 2009). Version 1.6.0_03-b05.
[9][on line] *Xalan-Java Version 2.7.1* [http://xml.apache.org/xalan-j/] (last visit: 18 november 2009). Version 2.7.1.
[10][on line] *Apache FOP* [http://xmlgraphics.apache.org/fop/download.html] (last visit: 18 november 2009). Version 0.94.