

# PX-Map User's Guide - version 1.0, April 2001

This documentation describes PX-Map 1.0 of April 30 2001.

All examples in this User's Guide are run under a Norwegian version of Windows NT.

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# 1. What is PX-Map

PX-Map is a map-module in the PC-Axis software family and this module can be launched from PC-Axis. PX-Map is a tool for presenting statistical data on a map.

It is simple to make a map. But to make a good map is a challenge. A good map must be true to the data it present, it must be easy to read and has a nice looking. Be aware that to make a valid statistical map, you must meet the same requirements to exactness as for making graphs and tables.

When using PX-Map in a sensible way, you will get higher value of your data.

PX-Map is developed by Statistics Norway with contribution from Geodata AS.

## 2. Getting started

### 2.1 Requirements to Px-files

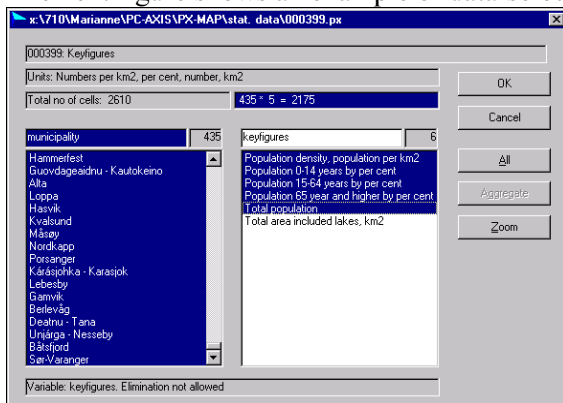
In this relation, it is assumed that the user knows the usage of PC-Axis. If not, please refer to the PX-Map Producer's Guide or to the online help in PC-Axis.

A px-file can represent a data-table of up to 16 dimensions, but PX-Map has, for the time being, a limit of 2 dimensions for map-presentation. One of these dimensions must be a regional variable, for instance municipality or country.

### 2.2 Selecting data in PC-Axis


When selecting data in PC-Axis for PX-Map usage, remember not to pick out more than one varying variable in addition to your regional variable (Refer to chapter 2.1 for further information).

The next figure shows an example of data-selection that is valid for presentation in PX-Map.




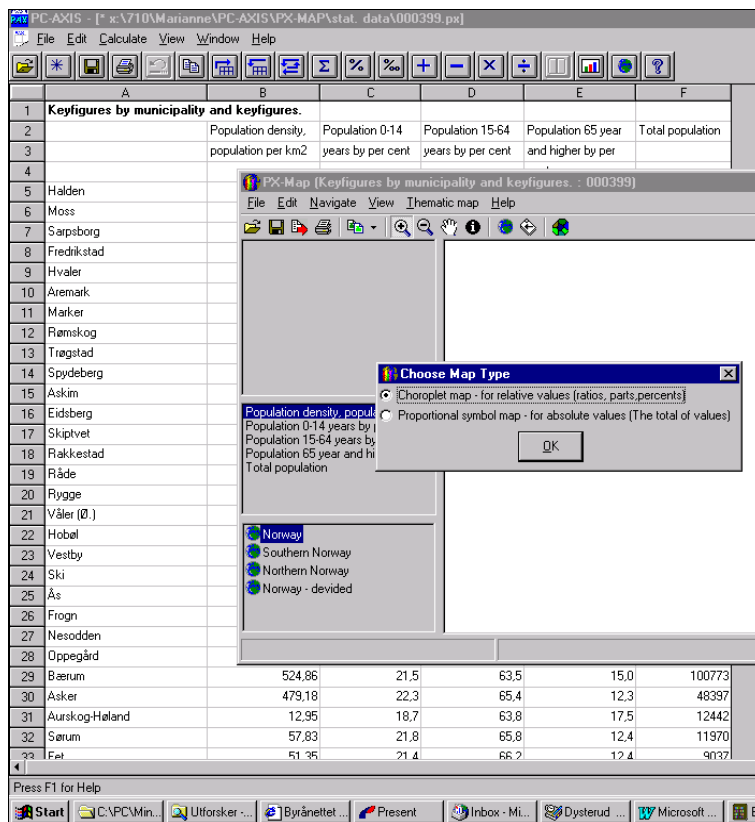
Press the OK-button and your table of selected data is displayed:

	Population density, population per km2	Population 0-14 years by per cent	Population 15-64 years by per cent	Population 65 year and higher by per cent	Total population
5 Halden	41.38	18.4	62.8	18.8	26523
6 Moss	416.54	17.6	65.8	16.6	26242
7 Sarpsborg	115.78	18.0	65.2	16.8	47122
8 Fredrikstad	232.47	18.1	64.7	17.2	67415
9 Hvaler	39.62	18.2	66.3	15.5	3487
10 Asermark	4.54	18.9	61.3	19.8	1458
11 Marker	7.97	17.5	61.7	20.8	3290
12 Renskoog	3.64	16.1	57.1	26.8	669
13 Tregstad	23.71	18.3	65.0	16.6	4860
14 Spydeberg	31.25	19.4	65.8	14.8	4438
15 Askim	194.07	19.0	65.8	15.2	13391
16 Eidsberg	39.98	19.0	63.7	17.3	9435
17 Skiptvet	30.79	20.0	64.3	15.7	3141
18 Rakkestad	16.35	18.3	63.6	18.1	7080
19 Tråkle	51.40	19.2	66.2	14.6	6117

The Map-button  is now enabled, and you are ready to make your map.

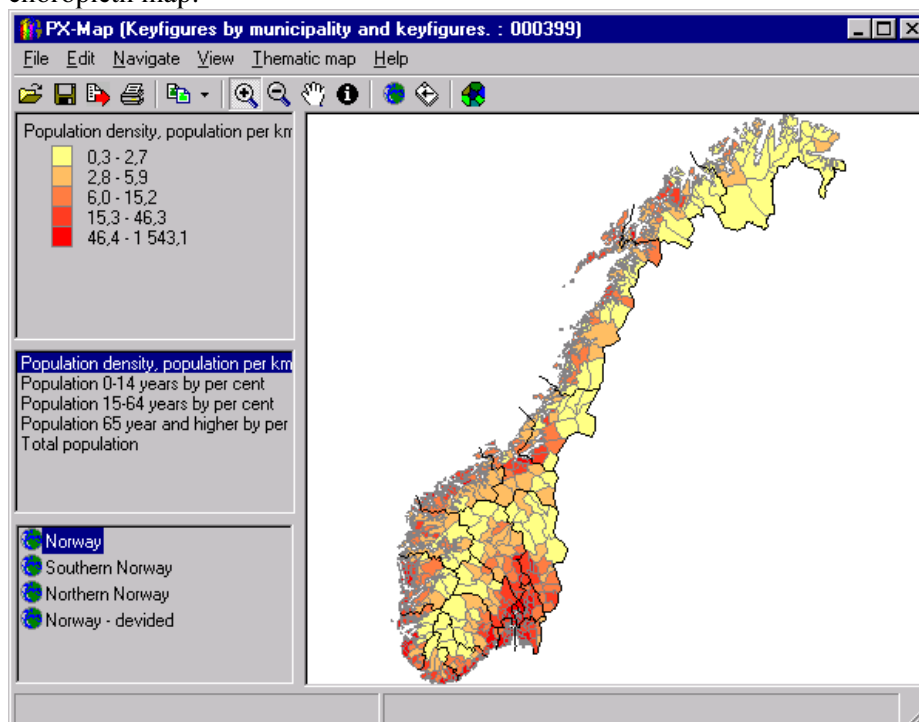
### 2.3 Launching PX-Map from PC-axis

After finishing your data selection, launch PX-Map by pressing the  button in PC-Axis. Then your screen will look like:



Choose the type of thematic map you want to make. Refer to chapter 4 to get more information about thematic maps.

Example: Pressing the OK-button in the Choose Map Type dialog-box, and PX-Map produces the choropleth map:





**View**

- information mousepointer changes to info-icon

**Thematic map**

change classification type, number of classes and colors

**Help**

- help on PX-Map  
- about PX-Map

**Toolbar**


	-	open
	-	save as
	-	export
	-	print
	-	copy map, legend and title
	-	zoom in
	-	zoom out
	-	pan (Move)
	-	information
	-	full extent
	-	previous extent
	-	thematic map

**3.3 Legend**

The **current variable** is the variable presented in the map. And this variable is the one spaced out in the list of data variables available (see chapter 3.4).


**Default values****Choropleth maps**

Default attribute setting for choropleth maps are 5 classes of classification type quantiles. **Legend values** are listed with minimum and maximum values for each class after the **legend figures**. The color-scale of the legend figures varies from light yellow for the lowest values to red for the highest values.

The attribute setting can be changed by activating the thematic map button  or the corresponding menu selection. Refer to chapter 4.2 to get more information.

**Symbol maps**

For symbol maps the default symbol-color is set to light yellow, and the symbols percentage of the area is set to 10. It is the minimum value and the maximum value that are shown in the legend for symbol maps. The symbols are not shown in the legend, they are only used in the map. The reason is depending on the map-scale the size of symbols is varying. When zooming in the symbol size increases, and opposite, the symbol sizes decreases when zooming out.

The attribute setting can be changed by activating the thematic map button  or the corresponding menu-selection. Refer to chapter 4.3 for more information.

**3.4 Data variables**

The **data variables** listed are the same as those selected in PC-Axis. To alter between the available statistic variables, just point in the list of data variables.

**3.5 Map data**

This list consists of basis **map data** available for the current px-file. This map data are stored in the

ArcView shape-format, and in the *map-parameter-file* there are pointers to this maps. To change the basis map data in PX-Map just point to map data desired in the list.


### 3.6 Map picture

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In the **map picture** your thematic map is displayed.

### 3.7 Information

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When pointing to a region with the pointing tool  in the map picture, you get **information** about the region-ID, region-name and the value for the statistic variable for this specific region.

## 4. Thematic Map


PX-Map allows producing two types of thematic maps. Choropleth maps and proportional symbol maps or only symbol maps. The default is choropleth map.

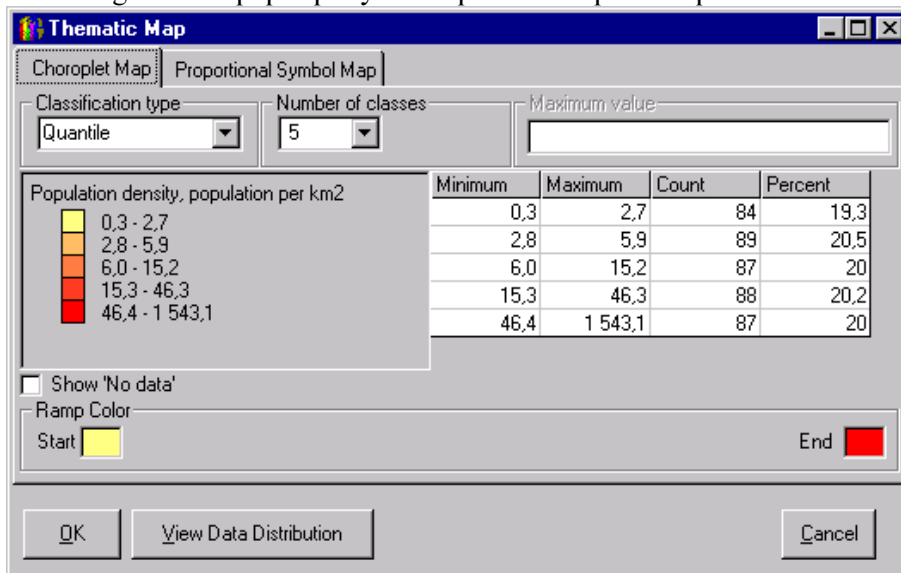
As a general rule choose choropleth map for proportional data and symbol map for absolute data.

In developing PX-Map it is carefully considered the choices of default values for the map-attributes, Anyway, some examples of manipulating map-attributes are discussed below.

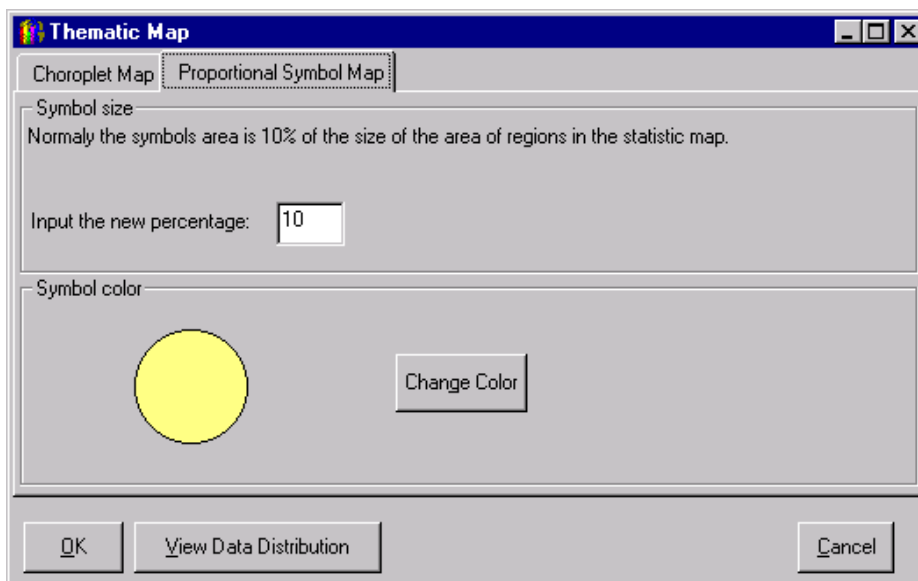
### 4.1 Data distribution

Getting more knowledge about your data, give you better background to decide the thematic map type your data suits for, and it will simplify the limitation-setting of number of classes and class-values.

There is a possibility in PX-Map that makes an overview of your data. First activate the thematic map-button  or the corresponding menu-selection. Then press the View Data Distribution button. Following window pops up if your map is a choropleth map:

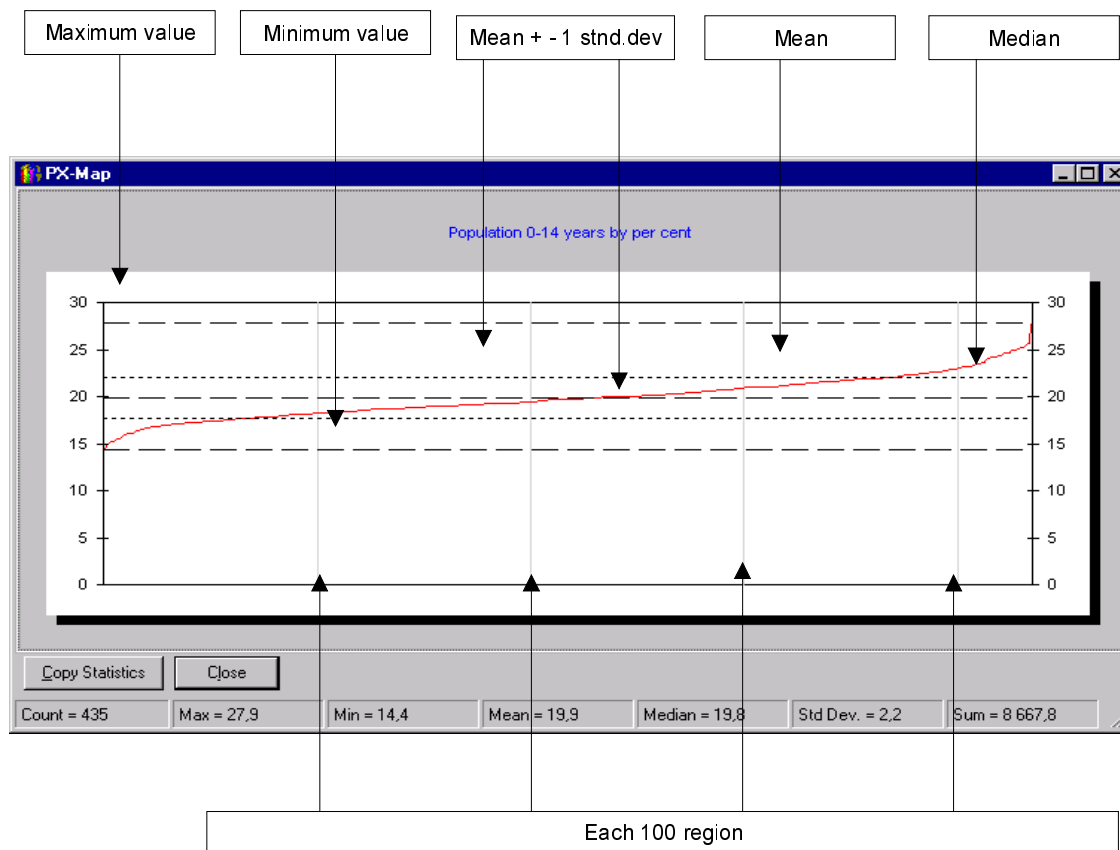


If your map is a symbol map, you will get a window like this:



Anyway, both windows offer the same possibility for viewing the data distribution. Pressing the button

View Data Distribution gives an overview like the one below.



This example shows some basic statistics for the population aged 0 - 14 years by municipality (the red curved line). The values are given as percentages of the total population in each municipality

The vertical axis represents the values of the statistic variable. In this example the unit is percentage.

The horizontal axis represents the municipalities. The municipalities with the least significant values are placed to the left and opposite.

The different dotted lines are termed in the textboxes of the dialog-box. Std.dev is an abbreviation for standard deviation.

In addition to the properties mentioned in the text-boxes you will find at the bottom of the dialog-box, the **number** of regions and the **sum** (total) of the values for the statistic variable. The sum-value makes no sense in this example since we deal with percentages.

To make a copy of this basic statistics for use in a Word document, press the Copy statistic button and following text is copied to the Clipboard:

Count = 435  
 Max = 27,9  
 Min = 14,4  
 Mean = 19,9  
 Median = 19,8  
 Std Dev. = 2,2  
 Sum = 8 667,8

Return to the Thematic Map window by pressing the Close-button.

## 4.2 Choropleth Map

Choropleth maps are best suited for proportional data or ratios. An example of a variable that suits for choropleth map could be *population per area-unit*.

For choropleth maps in PX-Map the default classification type is set to quantiles.

### Classification types

There are various ways of classifying data. PX-Map only supports 3 possibilities. Quantiles, equal intervals (ranges) and custom classification.

#### Quantiles

This classification method distributes the objects into classes that contain the same number.

#### Equal intervals

This classification divides the maximum value of your data by the number of classes. I.e the number of occurrences will differ from class to class, and in some cases classes could be empty.

#### Custom

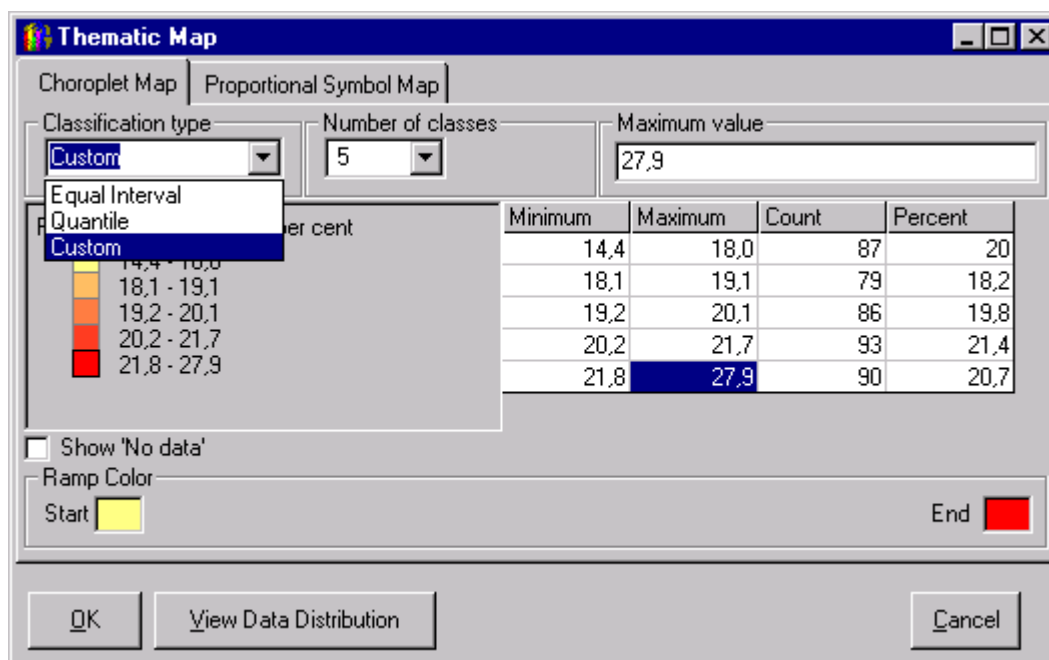
The custom classification type supports making your own class-values.

### Altering map-attributes

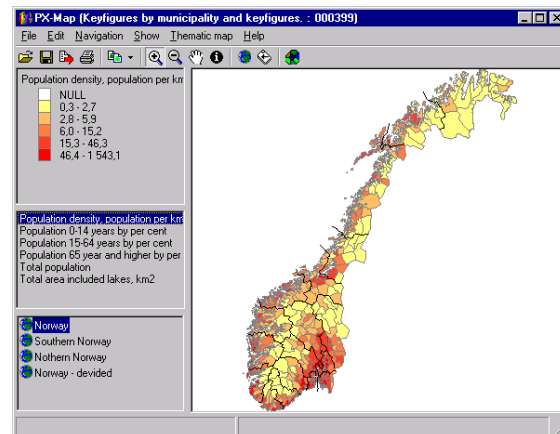
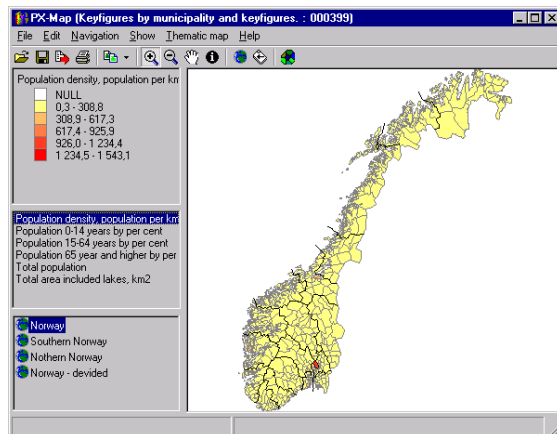
PX-Map makes it possible to alter some map-attributes. But, as mentioned in chapter 1, be aware of the influence the different attributes like colors, class-sizes and symbol-sizes can make to the resulting map.

### Altering classification type

The default value for classification type is set to *quantile* and number of classes is set to 5. To enter the Thematic Map dialog-box, press the thematic map button in the main PX-Map-window.



Altering classification type and number of classes only make sense to choropleth maps in PX-Map. The result of your map can differ a great deal depending of the choices of classification attributes. This is clearly demonstrated in the example below.



The two maps present exactly the same data, population density. The density is population per square kilometer. The classification type for the map to the left is equal intervals and for the map to the right quantiles. The data presented has a skew data distribution (i.e. the city of Oslo and its surrounding areas have the greatest percentage of the total Norwegian population), and then depending on the classification type selected this will influence on the map-results. To check the data distribution refer to chapter 4.1.

To make your own classification, choose Custom as classification type, and set the number of classes desired. In the example below the number of classes is set to 4.

Thematic Map

Choropleth Map | Proportional Symbol Map

Classification type: Custom | Number of classes: 4 | Maximum value: 27,9

Population 0-14 years by per cent	Minimum	Maximum	Count	Percent
14,4 - 18,0	14,4	18,0	87	20
18,1 - 19,1	18,1	19,1	79	18,2
19,2 - 20,1	19,2	20,1	86	19,8
20,2 - 27,9	20,2	27,9	183	42,1

Show 'No data'

Ramp Color  
 Start: [Yellow] | End: [Red]

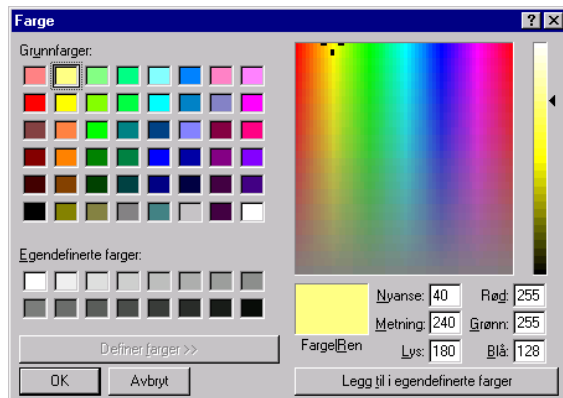
OK | View Data Distribution | Cancel

Notice that the Maximum value field now is enabled. To alter the limits for class-values, point to the maximum value of the **last** class. Edit this value and press ENTER. Then point to the maximum value of the last class but one. Edit the value and press ENTER. Now the minimum value of the last class is automatically set. Go on like this until you have finished all classes.

### Colors

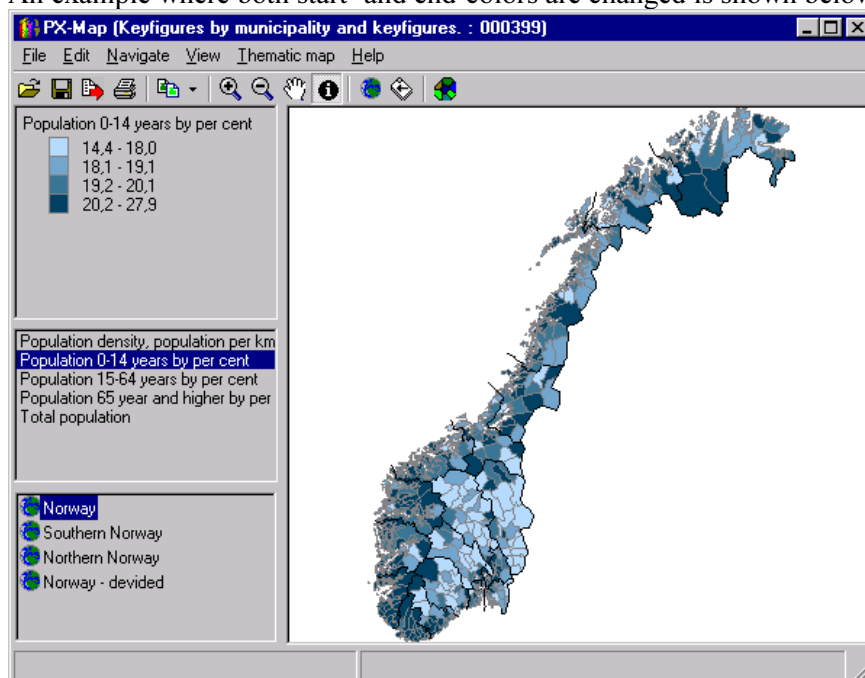
If it is desirable to change colors, a good rule to comply is: low values - light colors, high values - dark colors and the colors are recommended to keep within the same scale of color.

The way of changing colors for choropleth maps in PX-Map, is to set the start color (for the lowest class-values) and the end color (for the highest class-values). Then PX-Map will generate the between colors. To change the start- or end-color double-click the colored rectangle. The standard Windows color dialog-box appears (note that it is Norwegian Windows NT used in the example):



The colors can be set in different ways in this color-palette.(Refer to Windows Help for information about this dialog-box). Press the OK-button to activate the new color, or press Cancel to return to the Thematic Map window without changing color.

An example where both start- and end-colors are changed is shown below:



### 4.3 Symbol Map

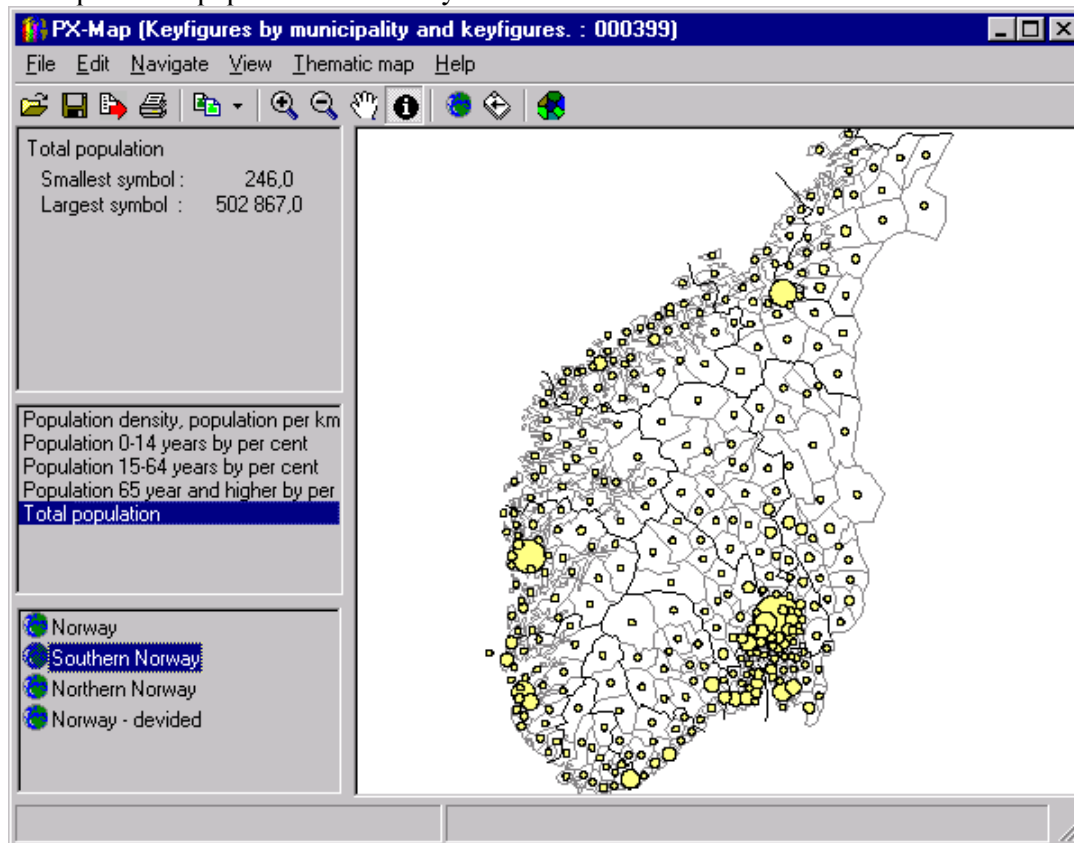
A symbol map is often the best choice of map types when your data present absolute values. An example of this could be *Total number of inhabitants in a region*.

There is only one type of symbols available in PX-Map, that is area proportional circles.

#### **Making a symbol map**

Do your selection of data in PC-Axis (Chapter 2.2), and follow the procedure explained in chapter 4.3. Point to the radio-button for symbolmap and press the OK-button. Your map will be drawn in PX-Map as a symbol map.

Example: Total population of Norway.

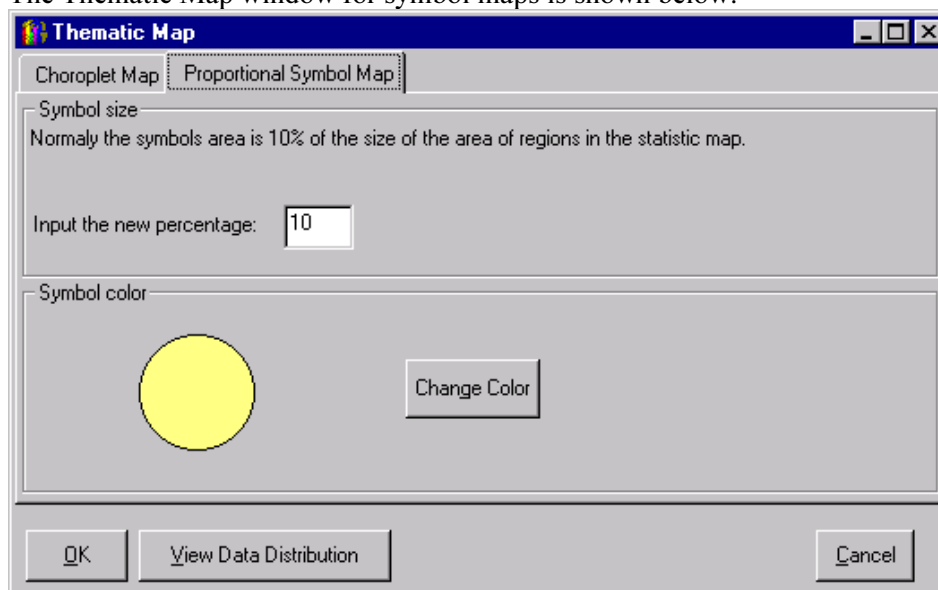


### ***Symbols size and color***

PX-Map has a default value for the size of the area that all symbols occupy of the total map-area. This default value is set to 10 per sent. On the bases of this per sent-value, each symbol size is calculated such that it corresponds to the data-value it represents.

The default color for circle-symbols is light yellow.

The Thematic Map window for symbol maps is shown below:

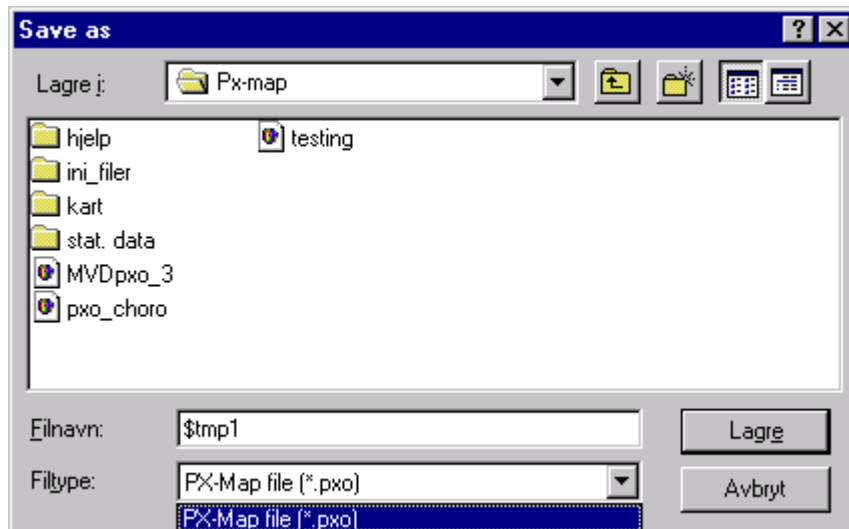


In this dialog-box there are possibilities for changing the percentage for the total symbol area, the symbol color and to view data distribution.

## 5. Save as, export, print and copy

### 5.1 Save as

The menu selection Save as is found on the File menu in the main PX-Map window. Save as makes it possible to save your map for later use. The map and all its attribute settings included the connection to the px-file, will be stored in an option-file, (.pxo). (Note that it is Norwegian Windows NT used in the example):



PX-Map gives a name-suggestion, but this is changeable.

To open this option-file later on, choose File and Open on the menu in the main PX-Map window, and navigate to the pxo-file. Open it and PX-Map will draw your map with the same colors, extent and the other attributes you saved.

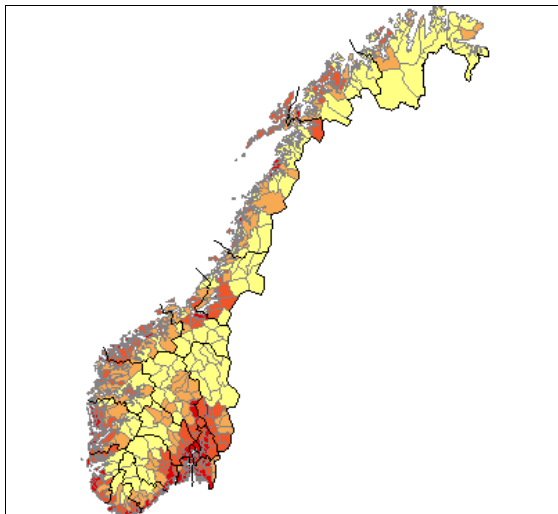
An option-file is a text-file that can be edited in a normal text-editor. Refer to the Producer's guide for more information.

### 5.2 Export

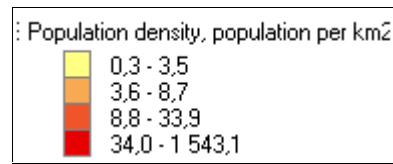
The Export utility makes it possible to store the picture and the legend of your map in 3 different picture formats. This 3 formats are Bitmap (.bmp), Windows metafile (.wmf) and Portable Network Graphics (.png). Which format to prefer depends on your needs. The properties that differ from format to format is specially the file-size and the quality of the pictures.

Independent of which of the 3 formats selected, Export will create 3 image-files. One for the simple map, one for the legend inclusive figures, values and the variable name and the last image-file consists of the legend figures only. Below are the 3 different image-files (within the frames) that Export creates illustrated.

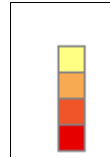
**Figure 1** <filename>.<ext>



**Figure 2**<filename>L.<ext>



**Figure 3**<filename>LI.<ext>



<filename> is the user-defined name. The letters L (Legend) and LI (Legend Image) are put on by PX-Map. The <ext> is either bmp, wmf or png, it depends on the selected export-format.

The storage size for the Bitmap format is definitely the largest, then follows the Window metafile format and at last the Portable Network Graphics format. Table 1 indicates the size for each of the 3 files made by each picture-format in the example.

**Table 1 Different picture-formats made by export. Size in kilo bytes (kB)**

	Bitmap (.bmp)	Windows metafile (.wmf)	Portable Network Graphics (.png)
<filename>.<ext>	436	15	6
<filename>L.<ext>	51	137	2
<filename>LI.<ext>	14	40	1
Total	501	192	9

Which file-format to choose depends on your needs. Since the file-size of pictures stored in png-format is very small compared to the other formats, the png-format is best suited for Internet-use and other data interchange.

### 5.3 Print

With the print function the map (exclusive the legend) is sent to printer. The standard printer dialog-box on your PC appears.

### 5.4 Copy

The copy function is being like the export function. The main difference is that the copy function sends the pictures to the clipboard opposite to the export function that stores the pictures in files. The copy functions also have a few other possibilities to copy specific contents. When desirable to put maps and/or legends in a Word-document it is useful to use copy and paste functionality. An overview of the different copy possibilities is given in Table 2.

**Table 2 Copy possibilities in PX-Map. Description**

Copy Function	The result of the copy
---------------	------------------------

Copy Map	The map only
Copy Legend	The legend <sup>1</sup>
Copy Legend Image	The legend image <sup>2</sup>
Copy Legend Text	Only the text representing the class-values.
Copy Title	The Content field <sup>3</sup> and the name of the current data variable

<sup>1</sup> Same as Figure 2

<sup>2</sup> Same as Figure 3

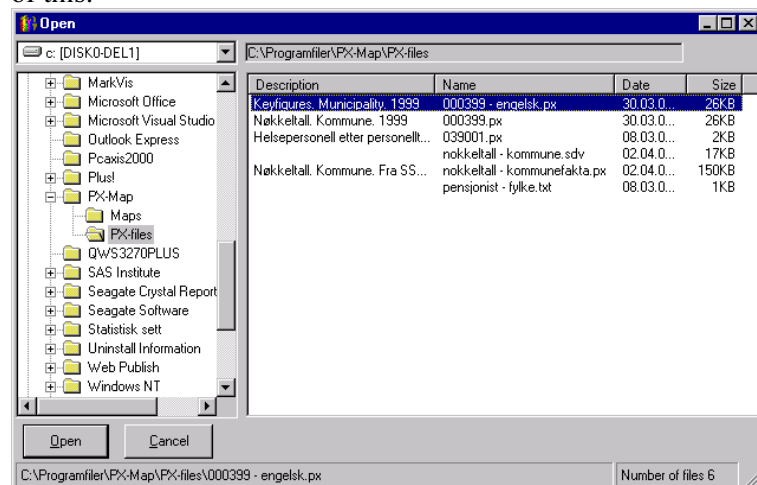
<sup>3</sup> Refer to chapter 6

## 6. Other functions

### 6.1 Standalone Product

PX-Map can run as an interactive standalone application. In addition to px-files, PX-Map accepts semicolon separated files as well as PX-Map option-files.

Choose File/Open in the main PX-Map window to be able to open your data-file. Below is an example of this:



Note that the Description field only is filled in for Px-files.

### 6.2 Batch

PX-Map can run in batch with parameter input. This can be useful when desirable to run PX-Map from other applications.

### 6.3 Language

PX-Map runs with user interface of any language. The only requirement is that a language-file of the desired language is available.

### 6.4 Own data

You can run PX-Map with your own statistical data and maps when the requirement for the data structure is fulfilled.

#### **Statistical Data**

PX-files are the only valid file-format for PX-Map when launched from PC-Axis. When PX-Map runs as a standalone application, valid file-format in addition to px-files are semicolon separated files and PX-Map option files.

#### **Map Data**

The valid map file-format is ArcView shape files. This is a widespread format for geographical data.

Paths to your map-data and some detailed information about this must be specified in a *map-parameter-file*.

### 6.5 More information

Check the Producer's Guide for more information about the above issues.