

## Lesson 10 – Chart Generating and Printing

### 1. Elements of a Chart

#### Title

The Title describes the purpose of the chart and for this reason must be on a prominent position.

#### Size

The size depends on the purpose of the chart and on the limitations of the user's output device.

The basic format is the A0, from which the other formats derive. The following table presents the most used formats, considering the line of the outer margin, which is the indication for cutting the paper.

ABNT Drawing Formats

Format	Height	Length
A0	841 mm	1189 mm
A1	594 mm	841 mm
A2	420 mm	594 mm
A3	297 mm	420 mm
A4	210 mm	297 mm

#### Scale

One must choose the scale considering the information that the chart will show. The correct scale depends on the resolution of the original data, as well as on the detail level the user wants for his chart.

The scale must be placed on a prominent position on the chart.

One can represent it as a fractional (1:300.000) or graphic scale.

The graphic scale is a straight line segment divided to allow the measure of distances on the chart. This kind of scale allows one to easily visualize the dimensions of the objects presented on the chart. The following example indicates, on the chart, the distance equivalent to 3 km.



The use of the graphic scale has advantages over the other types, because it is amplified or reduced with the chart, through photographic or copy methods, so it is always possible to know the scale of the document one is working with.

Usually the scales are classified based on the theme that is represented. The table below shows a general classification of the scales based on the size and the representation.

Regarding the size	Regarding the representation	Scale	Uses
Large Scale	Detail Scale	Up to 1:25.000	Cadastral Plants, Mapping of details or topographic planes.
Medium Scale	Semi-detail Scale	from 1:25:0000 to 1:250.000	Topographic charts.
Small Scale	Reconnaissance or Synthesis Scale	from 1:250.000 and smaller.	Chorographic and General Charts.

### Legend

The legend is a class that links non-spatial attributes to spatial entities. Non-spatial attributes can be visually indicated by colors, symbols or shadows, as defined on the legend.

### Localization

A chart is as reliable as the object is confronted with the space that contains it. This is why each chart must have a coordinate system. Normally it is used a network of geographic or land coordinates, latitude and longitude.

### Balance and Layout

The balance on a visual drawing of a chart is given by the position of the components shown in a logic way, to draw the attention to what one wants to focus. In a well balanced drawing nothing is too bright or too dark, short or long, small or big.

The layout is the process of reaching the desired balance. The user can perform as many balances as necessary.

### **Pattern Contrast**

One can use different patterns to represent different regions of the chart. The patterns can be composed by lines or dot or combinations of both. In regular areas, the visualization of boundaries and the general view of the chart are complicated when one does not use lines with different spacing and orientation.

A chart represented by a dot pattern is more stable and its boundaries are more easily seen.

### **Color**

The color is the strongest visual variable, easily seen and intensely selective. It is also the most delicate manipulate to and the hardest to use.

Depending on how much emphasis is desirable for a data, on the chart, a color is chosen. Some colors are more perceivable than others. The human eye is more sensitive to red, followed by green, yellow, blue and purple.

The user must consult the most used colors to represent data in his chart. Examples: roads are represented in red, rivers and seas in blue, forests in green, on climate charts, tropical areas are red and the dry weather regions, yellow.

### **Clarity and readability**

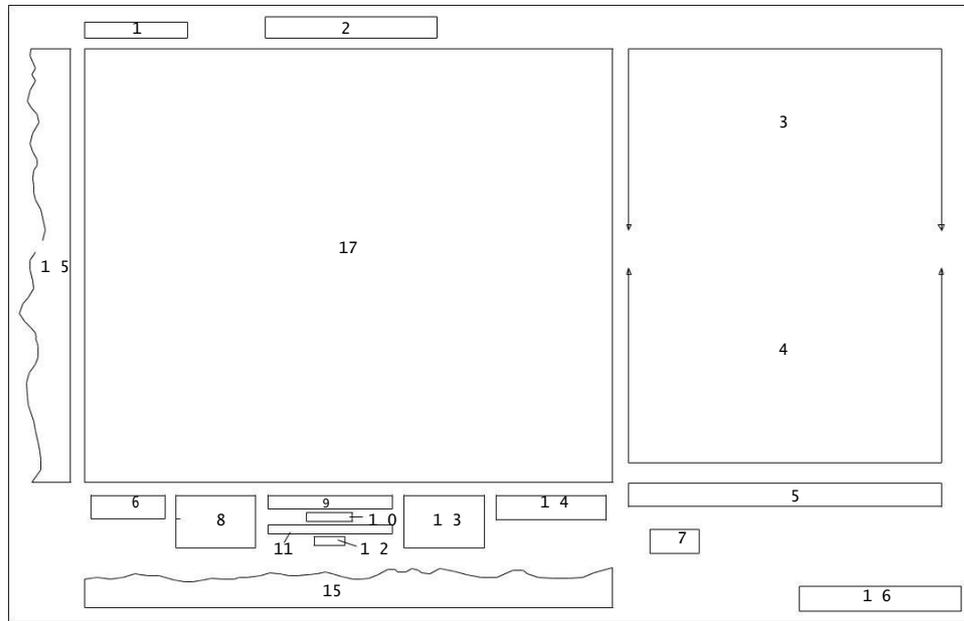
When a chart presents clarity and readability, the information that it shows are easily found and memorized. The readability can be obtained by the appropriate choice of lines, shapes and colors and by its precise and correct delineation. The lines must be light, thin and uniform. Colors, patterns and shadow must be easily distinguished and correctly registered. The shapes of the symbols must not be confused.

One must try to separate stains and symbols that represent the theme from the ones of the base map, avoiding a greater graphic density that

would turn the map reading confused and complicated, on a badly distributed chart.

### Chart Presentation

The presentation style of a chart is very important.



Where:

1- Name and code of the page Ex: São Paulo - SF-23-Y-C-VI-2	9- Chart name
2- Name of the contractor and implementer departments	10- Numeric scale
3- Description of the litostratigraphic units	11- Graphic scale
4- Geological conventions	12- Year of implementation
5- Planialtimetric conventions	13- Page articulation
6- Information about the base-map	14- Project and implementer team
7- Magnetic declination	15- Areas for the localization of the geologic sections
8- Page localization	16- Reserved area (optional) for chart title and bibliographic references

### 2. Chart Generation (SCARTA)

#### ▷ *Starting the chart generation*

**Windows:** # Start - Spring <version><language><system> - Spring <version><language>

**Linux:** Command to be typed on the terminal (Shell) - # s\_ spring

**MAC:** #Dock - Launchpad - Spring <version>< language>

## SPRING

- *Activate database* **Curso**
- *Activate project* **Brasilia**
- *On the toolbar, click on the button "Activate Scarta"* .



\* *On a new tab, the Scarta main screen will be presented. On the right side, a control panel will show the elements of the chart.*

## SCARTA

- Menu [Scarta] [Chart] [Create Chart...]  
**Create Chart**
  - {Name: Mapa\_Df}
  - (Create)

\* *A layout with the chart frames will be shown.*

### 2.1 Chart Characteristics

- ▷ *Defining the paper and data characteristics*

#### SCARTA

#### Chart Elements

- [Characteristics...] or button 

#### Chart Characteristics

- (Size  $\hat{U}$  A4)
- (Orientation  $\hat{U}$  Horizontal)

- ▷ *Defining chart working area with a 1 cm margin*

#### Chart Characteristics - Chart Area (cm)

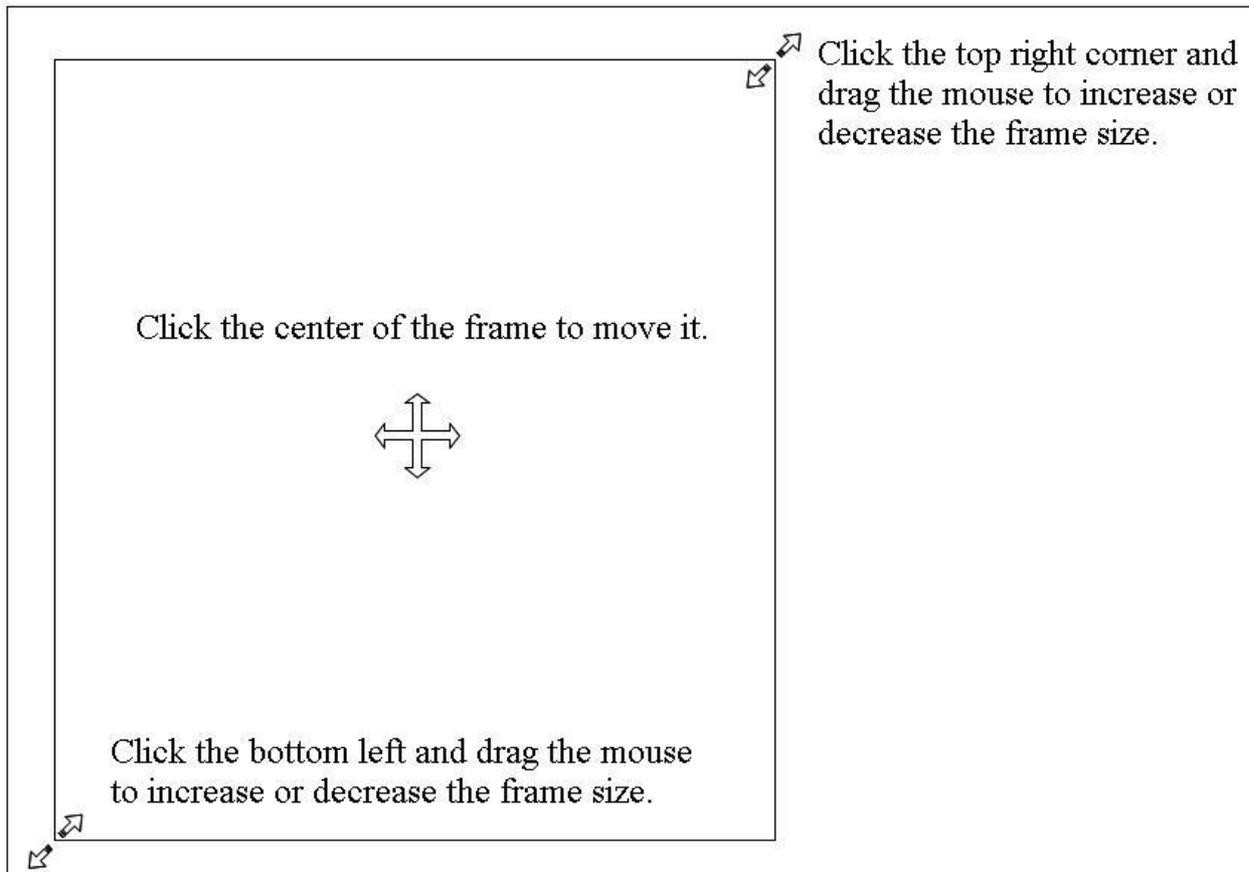
- {X1: 1.00} , {X2: 28.70} , {Y1: 1.00} , {Y2: 20.00}

- ▷ *Defining the data area*

#### Data Characteristics

- {Scale: 1 / 77000}

- (Position ⇔ Cm of the paper)
- (Coordinates ⇔ Planes)
- *The frame positioning can be performed by the setting of coordinates or manually, using the mouse. To change the position with the mouse, follow the instructions below.*



- *If you want to add the coordinates manually, set the values below.*
- (Coordinates (cm))
- {X1: 3.20}, {Y1: 2.40}, {X2: 18.00}, {Y2: 18.60}
- Click on the button [Draw]  on the main toolbar.
- [Close].

## 2.2 Data Presentation on the Chart

Presenting the data on the chart is the same as choosing which ILs should be selected. On this chart the following ILs will be shown: **Mapa rios**, **Mapa\_dist \_Drenagem** and **ComposicaoR4G5B3**.

### SCARTA

– [Control Panel...] or button 

#### Control Panel

- (Categories | Draining)
- (Infolayers | River Map)
- (Lines) – (Classes)
- (Categories | Distances)
- (Infolayers | Mapa\_dist\_Drenagem)
- (Lines) – (Classes)
- (Categories | TM\_Image)
- (Infolayers | ComposicaoR4G5B3)
- (Synthetic Image)

- *To define the priority of the data presentation (ILs that will be placed on the front or on the back), on Control Panel, click on the tab "Selected ILs", click with the right button on the desired IL and define its priority + or -.*

### *Visualizing the chart*

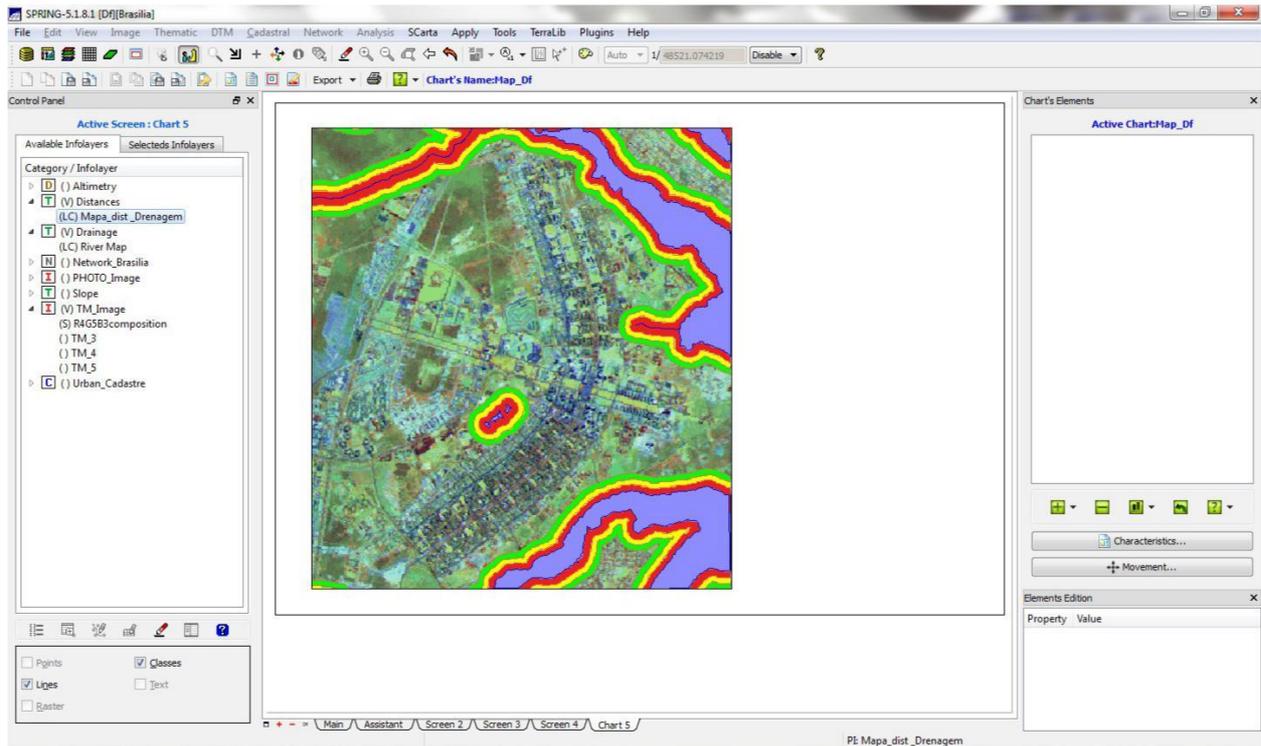
#### SCARTA

– [Execute] [Draw] or button



☞ Check the example

below



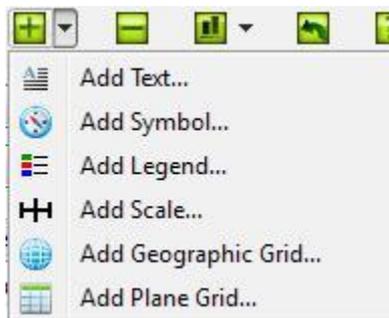
## 2.3 Grid Presentation

↳ *Editing grids in plane coordinates*

### SCARTA

#### Chart Elements

– Click on the button [Add...]  [Add Plane Grid...]



#### Grid Definition

#### *Plane Grid Edition*

*Obs.: Do not change the values of fields not listed below.*

Reference Values

- {X: 185840}, {Y: 8256273} - *Obs.: Initial Grid*

*Coordinates. Spacing*

- {|dx|: 2300}, {|dy|:2500}

Limits

- {Secondaries for main: 0} - *Obs.: Eliminating secondary lines, showing all as main lines.*
- {Line Category: Main}

Color

- *Select the **Black** color for the main line*
- {Width (mm): 0.00}
- {Line Type: Continuous}

Trace (mm)

- {Show coordinates: True}

\* See example images below

The screenshot shows a software interface for editing chart elements. On the left, a chart is displayed with a geographic grid. The grid lines are labeled with coordinates: X-axis values are 185840.0, 188140.0, 190440.0, and 192740.0; Y-axis values are 8256273.0, 8253773.0, 8251273.0, and 8248773.0. The chart area shows a map with a color-coded region. On the right, the 'Elements Edition' panel is open, showing a table of properties and values for the selected element.

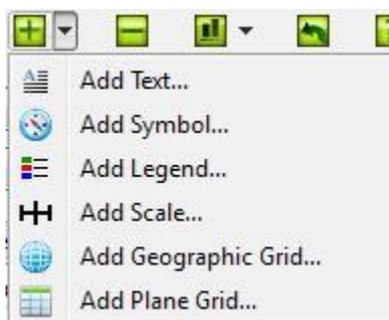
Property	Value
<b>Plane Grid Edition</b>	
Reference Values	
X	185840.00
Y	8256273.00
Spacing	
dx	2300.00
dy	2500.00
Secondaries by main	0
Line Category	Principal
Color	
Red	0
Green	0
Blue	0
Alpha	255
Width (mm)	0.00
Line Type	Continua
Dash (mm)	
X	2290.49
Y	2532.52
Show Coordinates	<input checked="" type="checkbox"/> True
Corner coordinates	<input type="checkbox"/> False
Distance (mm)	3.00
Presentation	<input type="checkbox"/> False
<b>Text Configuration</b>	
Height	2.00
Color	
Red	0
Green	0
Blue	0
Alpha	255
Style	
Style	dpi
Preview	ABCDEFGHIJ... abcdefghij...

▷ *Editing coordinate grid*

SCARTA

Chart Elements

– Click on the button [Add...]  [Add Geographic Grid...]



**Grid Definition*****Geographic Grid Edition***

*Obs.: Do not change the values of fields not listed below.*

## Reference Values

– {Longitude: o 47 55 20.0}, {Latitude: o 15 45 50.0}

## Spacing

– {|dx|: e 0 2 40}, {|dy|: e 0 2 40}

## Limits

– {Secondaries for main: 0} – *Obs.: Eliminating secondary lines, showing all as main lines.*

– {Line Category: Main}

## Color

– Select the **Light Gray** color for the main line

– {Red: 240}, {Green: 240}, {Blue: 240}

– {Width (mm): 0.00}

– {Line Type: Crossings}

## Trace (mm)

– {x: 2.00}, {y: 2.00}

– {Show coordinates: True}

– {Show corner coordinates: True}

– {Distance (mm): 1.00}

## Presentation

– {Seconds: False}

***Text Configuration***

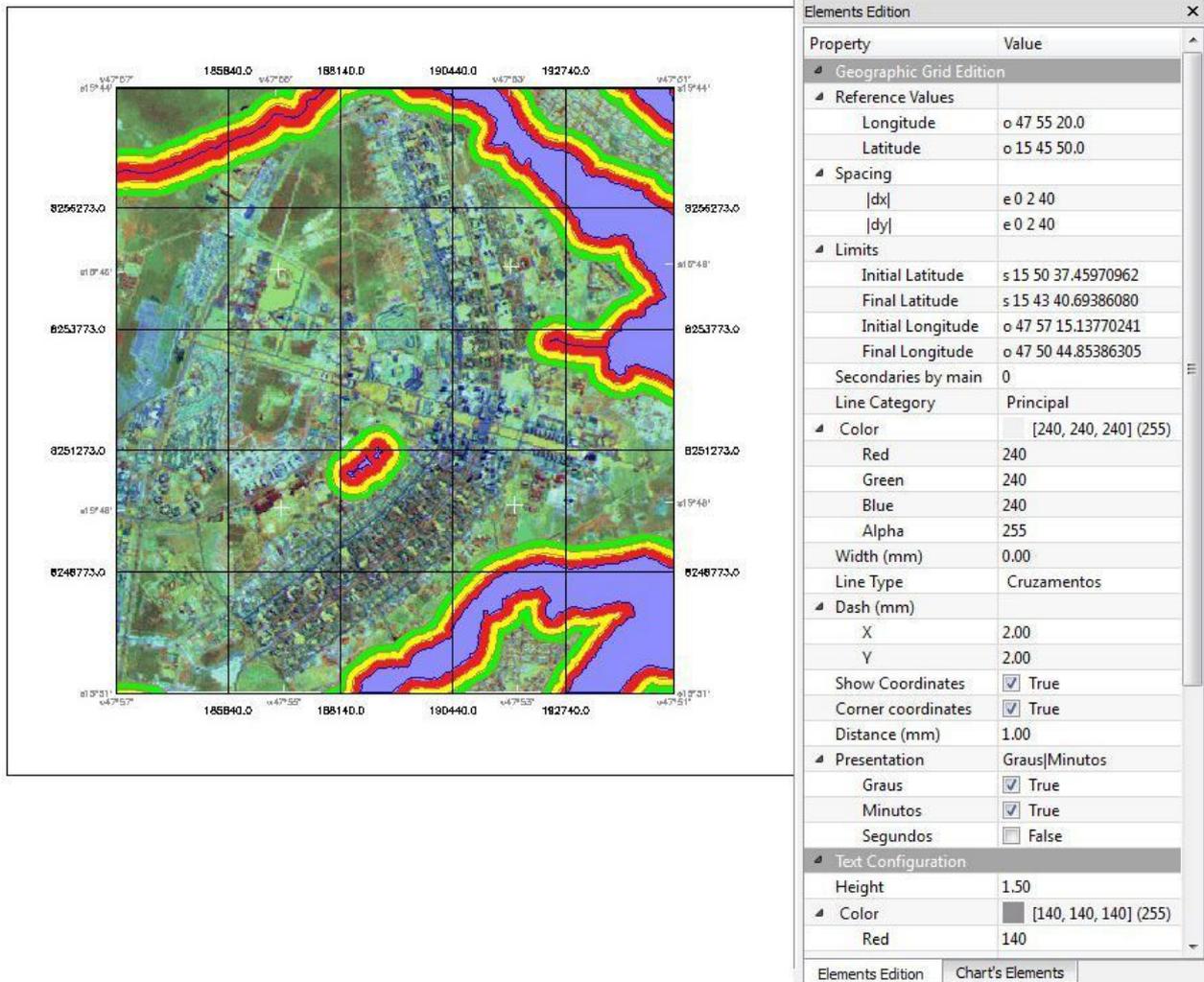
– {Height:

1.5} Color

– *Select the Dark Gray* color for the text

– {Red: 140}, {Green: 140}, {Blue: 140}

\* See example images below



## 2.4 Line Editor

### ↳ *Editing Lines*

#### SCARTA

– Menu [Scarta] [Edit] [Lines...]

#### Line Editor

- *Define thickness and color of the line (color: **black**)*
- {Create: Yes}
- {Orthogonal: Yes}
- {Assistance: Close}
- *Digitalize a line dividing the map area and the area to insert the map information.*

*Obs.: To digitalize the line, click and release the left button of the mouse, drag, click and release again. To end the line edition, click with the right button of the mouse.*

- *Test the creation of non-orthogonal lines.*
- *Test the creation of lines with middle, close and normal assistances.*

▷ ***Eliminating lines***

**Line editor**

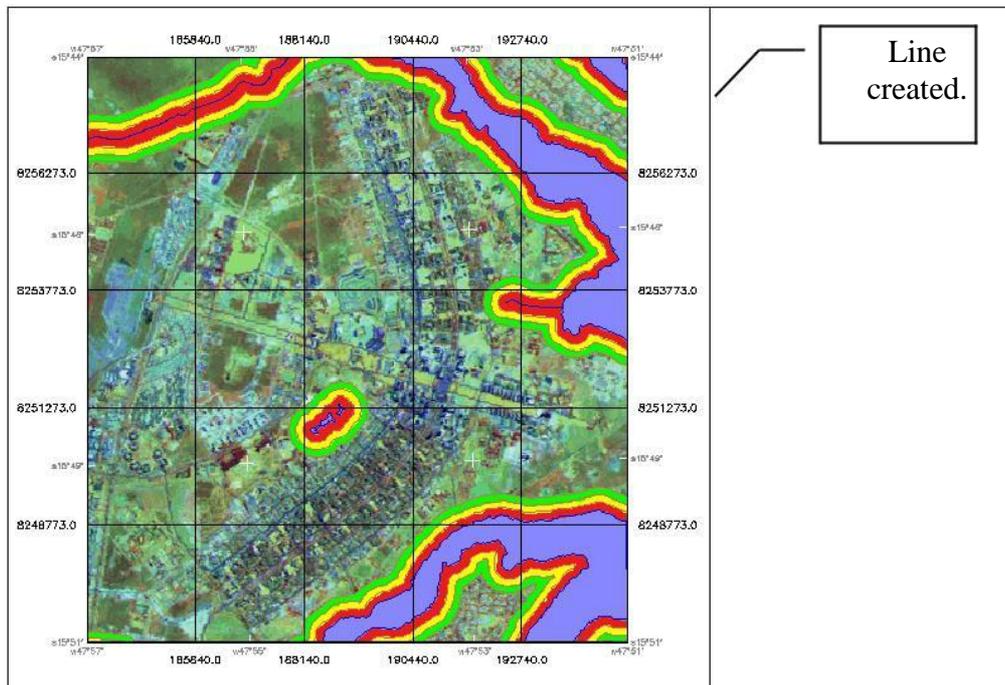
- (Create – No)
- *Select lines to suppress on the screen*
- (Erase)

▷ ***Moving lines***

**Line editor**

- (Create – No)
- *Select lines to move on screen*
- *Move to the new position*

\* See example images below



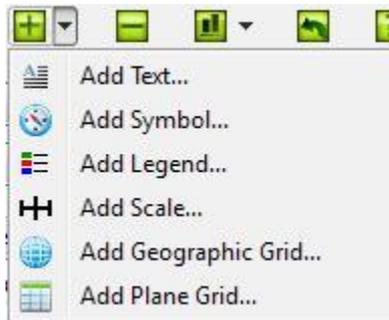
## 2.5 Chart Elements Presentation

▷ ***Adding texts, symbols, legends and scale***

**Chart Element – Add text**

*\* Inserting the first text – Title*

- Click on the button [Add...]  [Add Text...]



- On the “Chart Elements” list, click on the text created

***Elements Edition***

*Obs.: Do not change the values of fields not listed below.*

Text

- {Text: Distance Map  
of} Text Configuration
- {Height: 2.00}
- {Style: dpi}

*– Click on the Text (on the map) and drag it to the desired location.*

*\* Inserting the second text – Title continuation*

- Click on the button [Add...]  [Add Text...]
- On the “Chart Elements” list, click on the text created

***Elements Edition***

*Obs.: Do not change the values of fields not listed below.*

Text

- {Text: Hydrographic Network of  
} Text Configuration
- {Height: 2.00}
- {Style: dpi}

*– Click on the text (on the map) and drag it below the first*

*text. \* Inserting the third text – Title Continuation*

- Click on the button [Add...]  [Add Text...]

- On the “Chart Elements” list, click on the text created

***Elements Edition***

*Obs.: Do not change the values of fields not listed below.*

Text

- {Text: Brasília }

Text Configuration

- {Height: 4.62}

- {Style: dpi}

- *Click on the text (on the map) and drag it below the second*

*text. \* Inserting the fourth text –Legend Title*

- Click on the button [Add...]  [Add Text...]

- On the “Chart Elements” list, click on the text created

***Elements Edition***

*Obs.: Do not change the values of fields not listed below.*

Text

- {Text: Legend }

Text Configuration

- {Height: 1.00}

- {Style: dpi}

- *Click on the text (on the map) and drag it to the desired place (afterward the map legend will be inserted).*

*\* Inserting the fifth text – Graphic Scale*

- Click on the button [Add...]  [Add Text...]

- On the “Chart Elements” list, click on the text created

***Elements Edition***

*Obs.: Do not change the values of fields not listed below.*

Text

- {Text: Graphic Scale

} Text Configuration

- {Height: 1.00}

- {Style: dpi}

- *Click on the text (on the map) and drag it to the desired place (afterward the map scale will be inserted).*

*\* Inserting the sixth text – Projection/Datum*

- Click on the button [Add...]  [Add Text...]
- On the “Chart Elements” list, click on the text created

***Elements Edition***

*Obs.: Do not change the values of fields not listed below.*

Text

- {Text: Projection/Datum: UTM z23s / SAD69 }

Text Configuration

- {Height: 1.00}
- {Style: dpi}
- *Click on the text (on the map) and drag it to the desired*

*place. \* Inserting the seventh text – Font and organization*

- Click on the button [Add...]  [Add Text...]
- On the “Chart Elements” list, click on the text created

***Elements Edition***

*Obs.: Do not change the values of fields not listed below.*

Text

- {Text: Source / Organization: “Author’s Name” / Author’s Name” }

Text Configuration

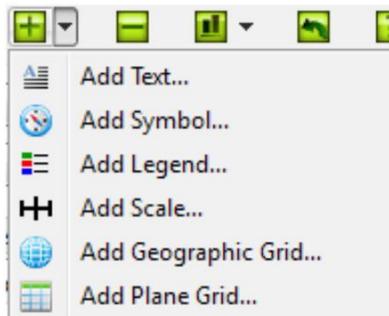
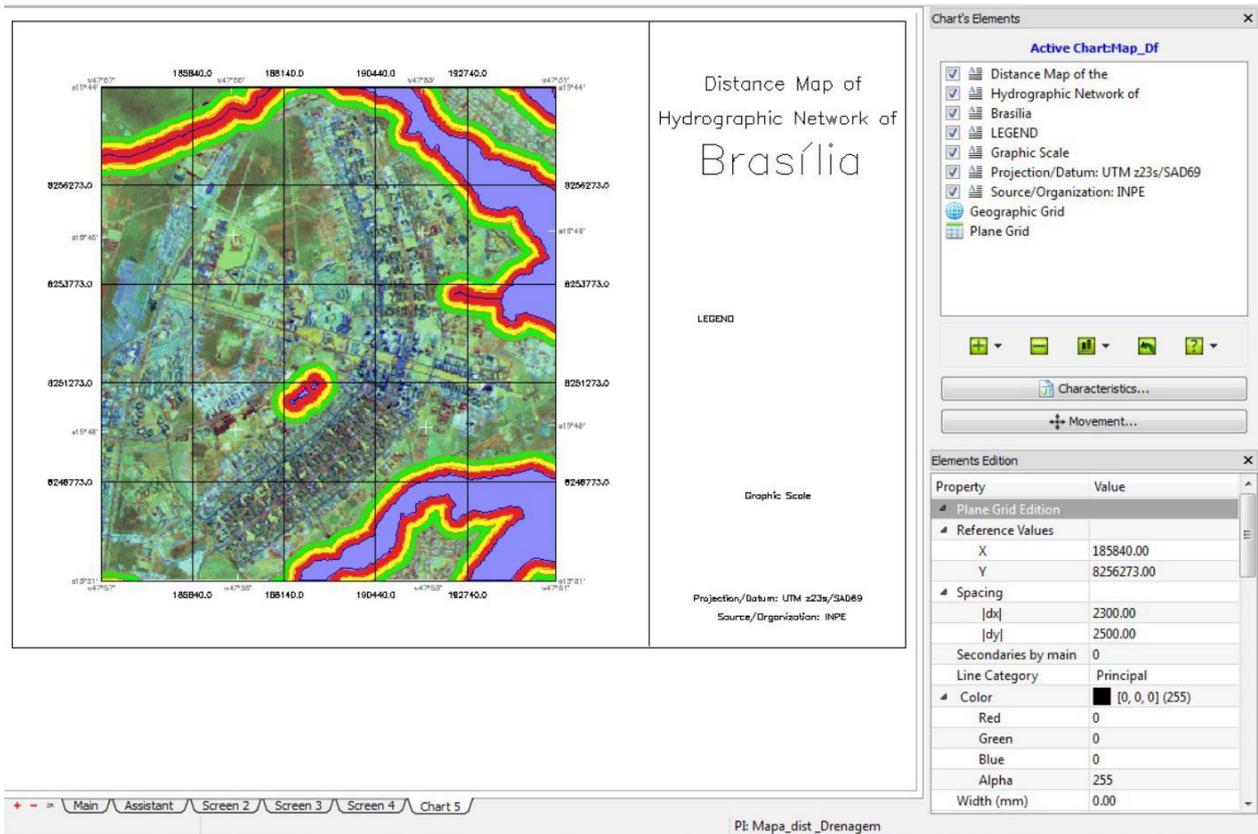
- {Height: 1.00}
- {Style: dpi}
- *Click on the text (on the map) and drag it to the desired place.*

\* See example images below

## Chart Elements – Add Symbol

### ▷ ***Adding Symbol***

- Click on the button [Add...]  [Add Symbol...]



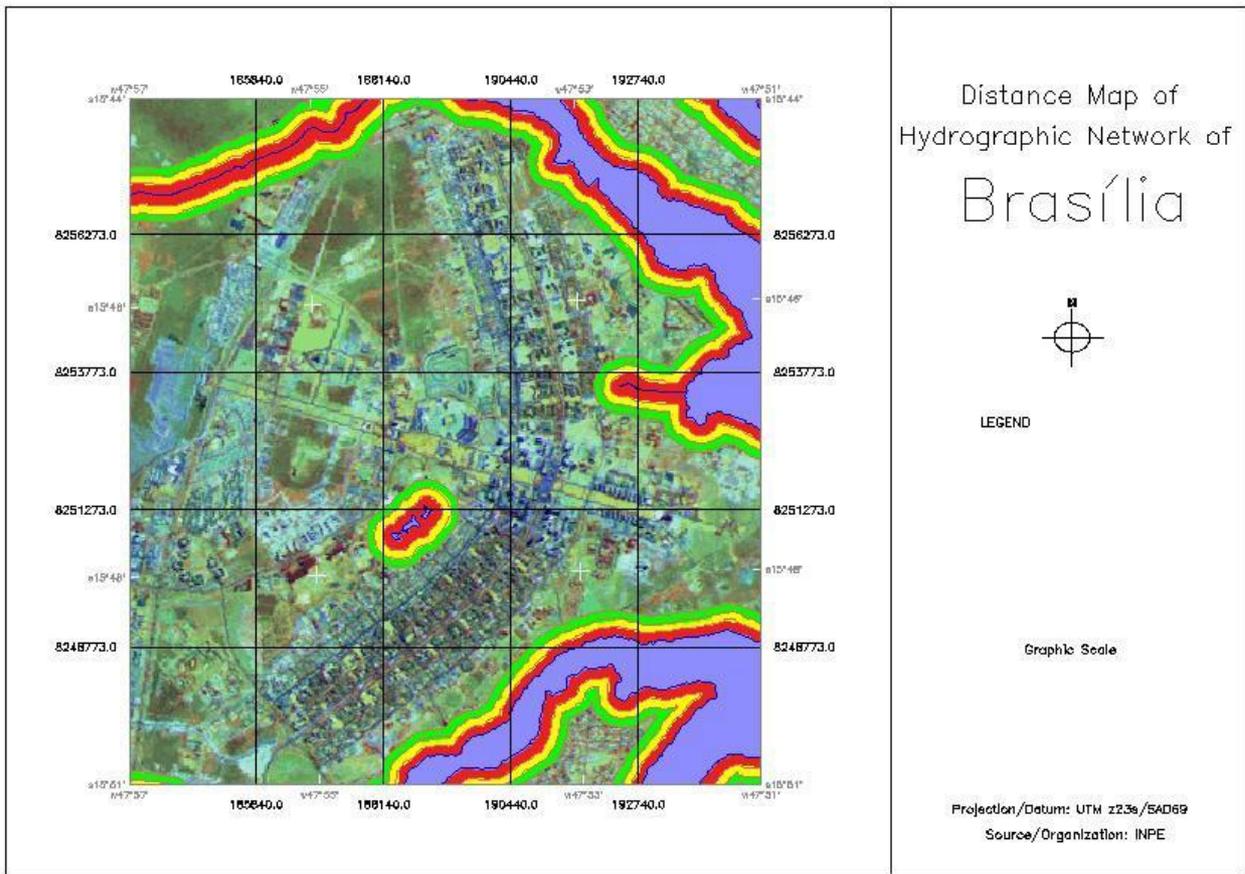
– On the “Chart Elements” list, click on the symbol “aeroplanel1”

***Elements Edition***

*Obs.: Do not change the values of fields not listed below.*

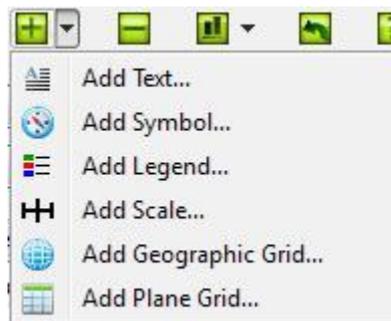
- {Height: 12: Draining}
- {Symbol: North}
- *Click on the symbol (on the map) and drag it to the desired place (see image below).*

**Chart Elements – Add and Edit Legend**



**▷ Adding Legend**

- Click on the button [Add...]  [Add Legend...]



**Insert Legends on the Chart**

- {Category: Draining}
- {Add: All}
- *Click on the legend (on the map) and drag it to the desired place.*

- Click on the button [Add...]  [Add Legend...]

**Insert Legends on the Chart**

- {Category: Distances}
- {Add: All}
- *Click on the legend (on the map) and drag it to the desired place (see image below).*

**▷ *Editing Legend***

- On the “Chart Elements” list, click on the legend “Main”

***Elements Edition***

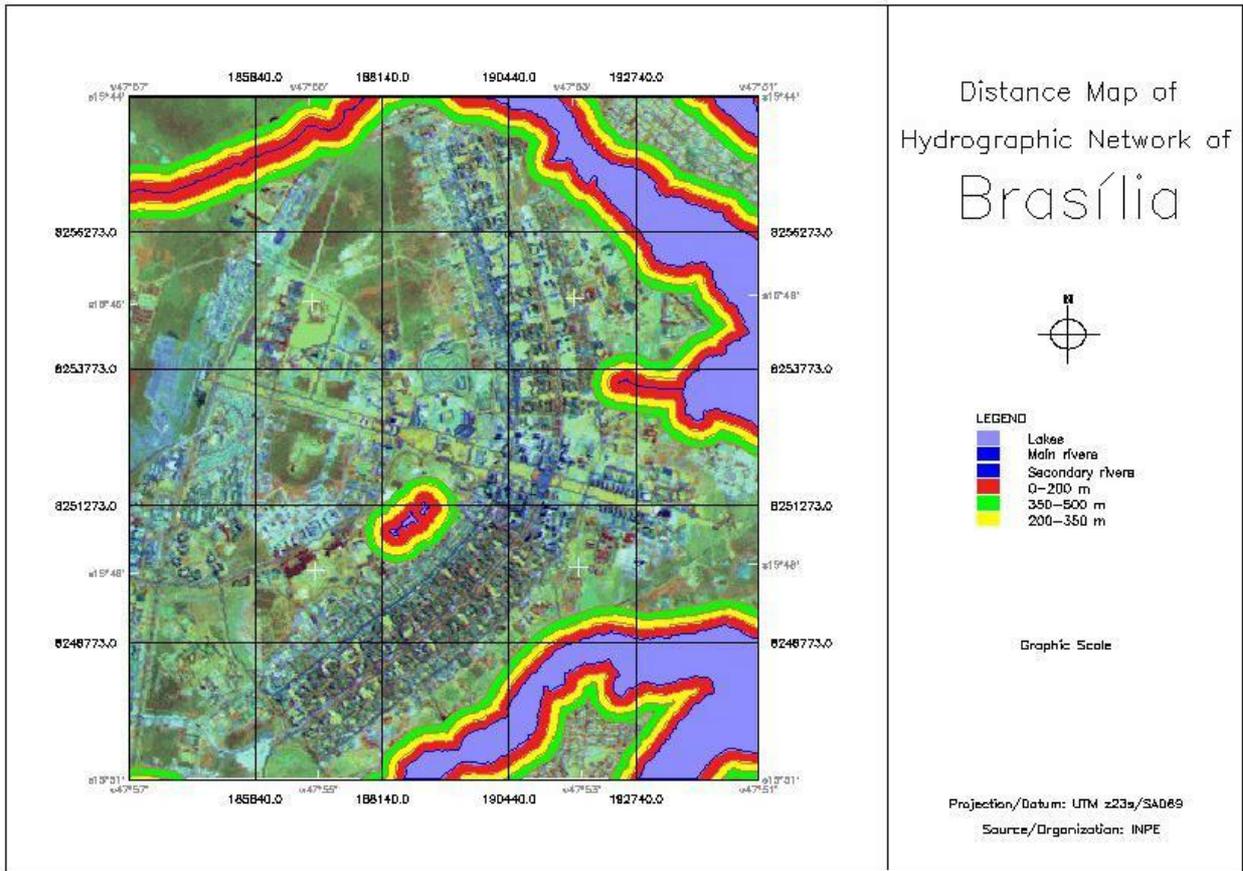
*Obs.: Do not change the values of fields not listed below.*

Text

- {Text: Main Rivers }

Type

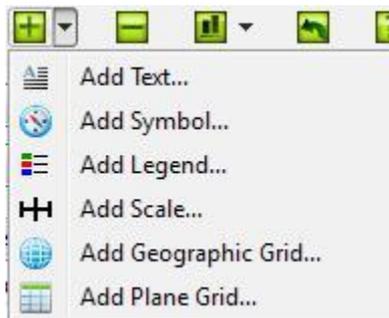
- {Polygon: True}
- {Line: False}
- {Points: False}
- *Obs.: Repeat the name and type changing procedure for the other items of the legend, change the names according to the following image.*



**Chart Elements – Add and Edit a Graphic Scale**

▷ **Adding Scale**

– Click on the button [Add...]  [Add Scale...]



▷ **Editing Scale**

– On the “Chart Elements” list, click on the legend “Main”

*Elements Edition*

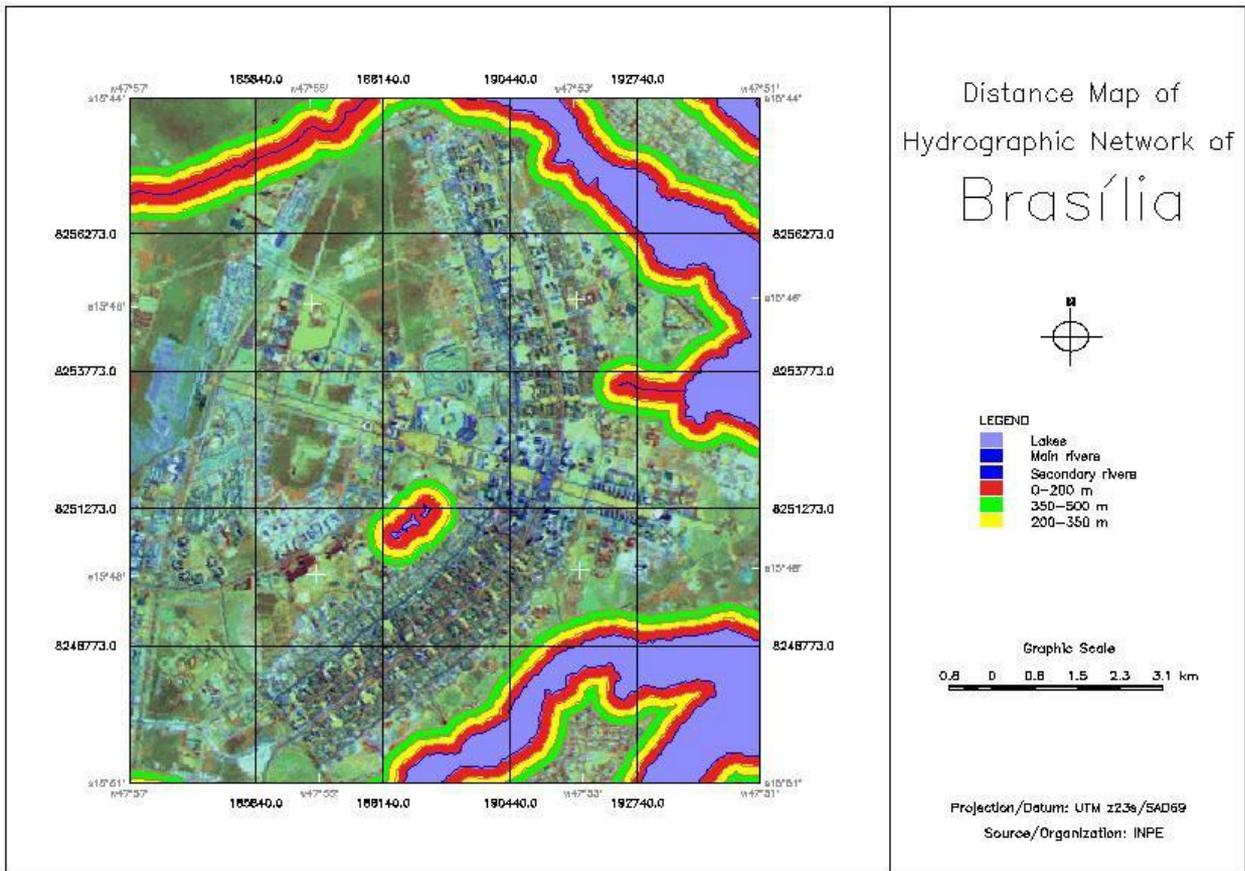
*Obs.: Do not change the values of fields not listed below.*

Scale Edition

- {Height: 1 mm }
- {Width: 1 cm }
- {Unit: km }

Type

- {Type: 3}



## 2.6 Frame Presentation

### ▷ *Editing Frames*

#### SCARTA

- [Edit], [Frames...] or button 

**Create Frames**

**Chart Boundaries**

- {Line Thickness (mm): 2.0}

- {Color: Black}

Data Contour

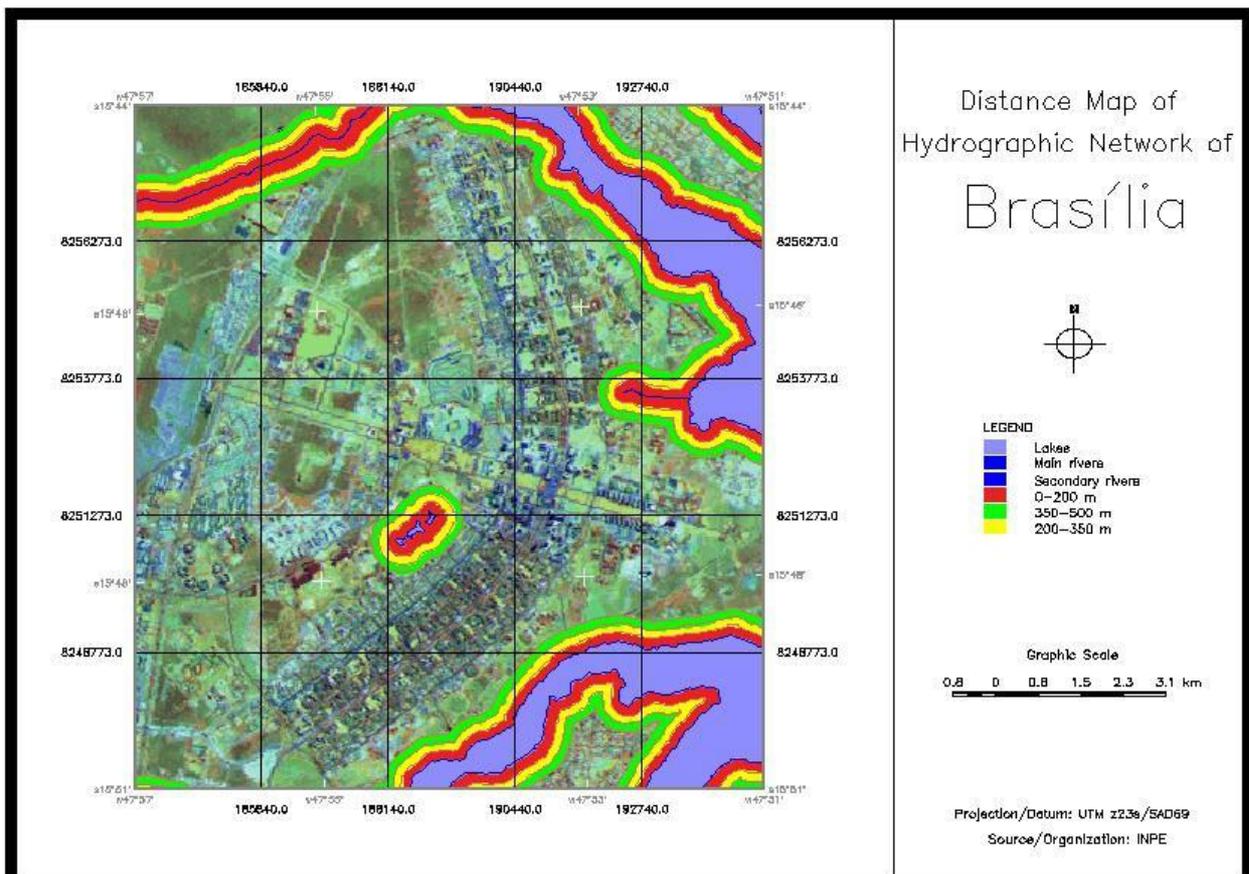
- {Line Thickness (mm): 0.5}

- {Color: Dark Gray}

- *Define line thickness and color for the chart boundary*

- *Define line thickness and color for the data contour*

- (Execute)



## 2.7 Salve Chart and Template

- ▷ *Saving the chart created*

### SCARTA

- [File] [Save Chart] or button 

- ▷ *Saving the template of the chart created*

### SPRING CHART

- [File] [Save Template]